❹ ADDENDUM NO. 4, AUGUST 21, 2020
❷ ADDENDUM NO. 2, AUGUST 6, 2020

jmr

COMMONWEALTH OF MASSACHUSETTS



CONTRACT DOCUMENTS AND SPECIAL PROVISIONS

PROPOSAL NO.	604123-111717
P.V. =	$17,186,000.00
PLANS	YES

FOR

Federal Aid Project Nos. CMQ-003S(390), STP-003S(390) & TAP-003S(390)
Roadway Reconstruction and Related Work along Route 126 (Pond Street)

in the Town of

ASHLAND

In accordance with the STANDARD SPECIFICATIONS

❹❷ This Proposal to be opened and read: **TUESDAY, SEPTEMBER 1, 2020 @ 2:00 P.M.**

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Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, Secretary & CEO
Jonathan L. Gulliver, Highway Administrator

MassDOT
Massachusetts Department of Transportation
Highway Division

August 28, 2020

604123-111717

ADDENDUM NO. 6

To Prospective Bidders and Others on:

ASHLAND
Federal Aid Project Nos. CMQ-003S(390), STP-003S(390) & TAP-003S(390)
Roadway Reconstruction and Related Work along Route 126 (Pond Street)

BIDS TO BE OPENED AND READ ON: TUESDAY, SEPTEMBER 1, 2020 AT 2:00 P.M.

Transmitting revisions to the Contract Documents as follows:

RESPONSES TO CONTRACTOR'S QUESTIONS:	1 Page
DOCUMENT 00010:	Revised page 3
DOCUMENT 00880:	Revised pages 3-11
DOCUMENT A00893:	Inserted new document (38 pages)

Take note of the above, substitute revised pages for the originals, insert new document in proper order, and acknowledge Addendum No. 6 in your Expedite Proposal file before submitting your bid.

Sincerely,

Eric M. Cardone
Digitally signed by Eric M. Cardone
Date: 2020.08.28 10:22:24 -04'00'

Eric M. Cardone, P.E.
Construction Contracts Engineer

Cc: Lawrence Cash, Project Manager
EMC/jmr

Ten Park Plaza, Suite 4160, Boston, MA 02116
Tel: 857-368-4636, TTY: 857-368-0655
www.mass.gov/massdot

McCourt Construction email dated August 27, 2020:

Question #67: The Pavement Cores provided in Document A00892 do not provide any information on the thickness of the existing pavement. Please provide the thickness of the existing roadway pavement.

Response #67: Refer to the Remarks section of pages A00892-21 through A00892-26. See Document A00893.

Question #68: The response to Question #38 indicated that the test pit results for the forty test pits would be provided. These results are not included in the referenced documents. Please provide the test pit records.

Response #68: See Document A00893.

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, Secretary & CEO
Jonathan L. Gulliver, Highway Administrator

massDOT
Massachusetts Department of Transportation
Highway Division

August 27, 2020

604123-111717

ADDENDUM NO. 5

To Prospective Bidders and Others on:

ASHLAND
Federal Aid Project Nos. CMQ-003S(390), STP-003S(390) & TAP-003S(390)
Roadway Reconstruction and Related Work along Route 126 (Pond Street)

BIDS TO BE OPENED AND READ ON: TUESDAY, SEPTEMBER 1, 2020 AT 2:00 P.M.

Transmitting revisions to the Contract Documents as follows:

RESPONSES TO CONTRACTORS' QUESTIONS:	9 Pages
DOCUMENT 00010:	Revised page 3
DOCUMENT A00801:	Revised pages 97, 99, 128, 173, 177, 178,195, 196, 203, 207, 208, and 213
DOCUMENT A00802:	Revised page 7
DOCUMENT A00892:	Inserted new pages 21-26 (6 pages)
DOCUMENT B00420:	Revised pages 6, 8, 11, 12, 13 through 33
PLAN SET:	Revised sheets 19, 20, 97, 98, 100, 101, 103, 105 through 109, 147, 155, 159, 191, 201, 205, 206, and 212 of 331.

Take note of the above, substitute revised pages and plans for the originals, insert new pages in proper order, and acknowledge Addendum No. 5 in your Expedite Proposal file before submitting your bid.

Sincerely,

Eric M. Cardone
Digitally signed by Eric M. Cardone
Date: 2020.08.27 08:37:36 -04'00'

Eric M. Cardone, P.E.
Construction Contracts Engineer

Cc: Lawrence Cash, Project Manager
EMC/jmr

Ten Park Plaza, Suite 4160, Boston, MA 02116
Tel: 857-368-4636, TTY: 857-368-0655
www.mass.gov/massdot

J.H. Lynch & Sons, Inc., email dated August 4, 2020 (from Addendum No. 3)**:**

Question #19: Regarding traffic management plans the note on plan sheet 155 states it is recommended that the wall is to be constructed prior to any utility pole relocation. Please provide a temporary traffic control plan for the construction of the Eliot St. wall.

Response #19: The Phase 1 traffic management plan at Eliot Street/Pond Street intersection is intended to cover the temporary traffic control setup needed for the construction of the retaining wall, no additional site-specific temporary traffic control plans are needed. See revised sheets 155 and 159 of 331.

Question #20: The Parking lot behind the retaining wall at Sta. 32+15 – 34+90 Left will likely need to be patched/paved as a result of excavation impacts with the wall, under what item will this HMA be paid for? Confirm it will be constructed as an HMA driveway-2.5" SIC 19.0 & 1.75" of SSC-12.5 and paid under Item 702. Confirm fine grading of the area prior to driveway repair will be paid for under Item 170.

Response #20: The repairs to the noted parking lot will be paid under Items 415.3, 450.23 and 451. See revised sheets 19, 20, and 97 of 331.

Question #22: Can the parking lot behind the wall within the Temp. Easement shown on plan sheet 19 and 20 be closed during construction to not allow traffic on top of the support of excavation area?

Response #22: No, the entire parking cannot be closed off. Only the parking located within the temporary easement can be closed off. The temporary easement is to allow the Contractor to access and construct the wall and guardrail only. Any further closing of parking spaces beyond the temporary easement (for constructability, not convenience) would need to be discussed first with the Town, property owner, and MassDOT ROW during construction. The easement is not for storage of construction equipment, materials, or stockpiles not associated with the wall and guardrail.

Question #23: Please provide a traffic management plan for the Spyglass retaining wall.

Response #23: The typical temporary two-lane road shoulder and/or travel lane closure application on Sheet 147 can be used as a temporary traffic management setup for the construction of the Spyglass retaining wall. See revised Sheet 147 of 331 for additional notes.

J.H. Lynch & Sons, Inc., email dated August 4, 2020 (from Addendum No. 3)**:**

Question #28: At the start and end of Eliot St. retaining wall, the exposed heights are +/-7' +/-10' respectively. Can the wall ends be extended or grading plans be provided for the Eliot St. wall ends as this seems extremely high to have the retaining walls end at those heights.

Response #28: See revised Sheets 205 and 206 of 331.

Question #29: Would extending the wall be considered incidental to the lump sum wall item or will the contractor be paid if the walls need to be lengthened to adjust for field conditions.

Response #29: A wall extension/lengthening is not anticipated for this item.

Question #36: Item 997.2 Special Drainage Structure No. 2 states that it is for the work required to cast-in-place the culvert extension. It then states the "The manufacturer shall submit evidence at the request of the Engineer showing that he has successfully completed work of similar magnitude prior to being approved as the source of the material for this work. The manufacturing process shall be closely supervised by experienced plant personnel and records of plastic and concrete strength shall be kept and submitted to the Engineer for control." If this work is Cast-in-Place, what is this requirement referring to? The last 4 paragraphs on Page A00801-207 go on describing precast requirements. Is the culvert extension Cast-In-Place or Precast?

Response #36: See revised page A00801 – 207.

Question #37: Item 997.2 special provision also references that the work includes the Headwalls and rip rap. Confirm that rip rap shall be paid under Item 983.1 and not as part of the Lump Sum.

Response #37: The stones for Item 997.2 will be paid for under Item 258. See revised pages A00801-207 and A00801-208.

J.H. Lynch & Sons, Inc., email dated August 4, 2020 (from Addendum No. 3)**:**

Question #39: Regarding Item 945.011-30 Inch Utility Pole Caisson-please provide the loads and pole height that the special provisions state will be provided by Eversource so that contractors can design the caisson.

Response #39: See revised pages A00801-195 and A00801-196.

Question #41: The plans for the Eliot Street retaining wall include footing elevations that differ from the elevations shown in the cross section. At station 32+50, the cross section shows the bottom of the footing for the wall slightly below 232'. The Plans show the footing to be placed at 234'. Please clarify which drawing will govern.

Response #41: The plans for the Eliot Street retaining wall will govern the bottom of footing elevation. See revised Sheets 205 and 206 of 331.

McCourt Construction email dated August 6, 2020 (from Addendum No. 3)**:**

Question #44: What are the work area restrictions and allowable work hours for the full depth pavement construction work?

Response #44: See page A00801-25.

Question #45: Will existing traffic be allowed to travel on unpaved sections of the roadway?

Response #45: Yes, existing traffic will be allowed to travel on unpaved sections of the roadway.

Question #46: What is the length of the work zone that existing traffic can travel on unpaved sections of the roadway?

Response #46: The portions of unpaved roadway open to vehicular traffic shall be at the discretion of the Engineer. The Contractor shall be required to provide dust control and maintain the unpaved road to allow for the safe and efficient passage of traffic or as directed by the Engineer.

Question #48: Per the COVID 19 Guidelines and Procedures included within Article A00801, please provide the number of field stall that MassDOT will assign to the project so that the PPE that the Contractor supplies to department field personnel can be determined.

Response #48: There will be no more than three MassDOT field staff.

McCourt Construction email dated August 6, 2020 (from Addendum No. 3)**:**

Question #50: Typical Sections shown on Sheet 13 show either 8" of existing subbase meeting Specification M1.03.0 or 8" of gravel borrow below the sidewalks, multi-use path/sidewalk, ect. Will payment of the use of the existing subbase material be paid under Item 151.2, Gravel Borrow, once it meets Specification M1.03.0?

Response #50: The Contractor will be paid under Item 151.2 if existing material meeting M1.03.0 is excavated and installed at the noted locations.

Question #51: Under what bid item shall the Proposed Cement Concrete Bike Ramps be paid under?

Response #51: The proposed cement concrete bike ramps are paid under Item 701.2. See revised Sheet 201 of 331.

Question #52: On Sheet No. 19, Construction Plans (4 of 17), proposed cement concrete curb is shown. Please add pay item for this work.

Response #52: See revised Sheet No. 19 of 331.

E.T.& L. Corp. email dated August 6, 2020 (from Addendum No. 3)**:**

Question #53: 6"x6" tapping sleeves are proposed at relocate hydrant locations on Rte. 126, Sta.'s 78+68 & 96+58. There is no bid item for 6"x6" tapping sleeves.

Response #53: See revised Sheets 98, 100, 101, 103, 105, 106, 107, 108, and 109 of 331 and revised page B00420-12.

P. Gioioso & Sons, Inc. email dated August 10, 2020 (from Addendum No. 3)**:**

Question: #54: Regarding Item 120 Earth Excavation, would it be possible to add a Bid Item for excavation of existing HMA and Concrete Pavements ?

Response #54: Per MassDOT's Standard Specifications Subsection 120.21, the excavation of existing HMA and concrete pavement is included under Item 120.

J.H. Lynch & Sons, Inc., email dated August 12, 2020 (from Addendum No. 3)**:**

Question #55: The Special Provisions for Item 755.35 state that monitoring wells shall include data loggers.
Please provide a detail of the monitoring well
Please provide information regarding the data loggers such as acceptable brands and model numbers.

Response #55: See revised Sheet 191 of 331. The Contractor shall submit data logger shop drawings to the Wetland Specialist for approval.

J.H. Lynch & Sons, Inc., email dated August 13, 2020 (from Addendum No. 3)**:**

Question #56a: The Special Provisions state "All trees, stumps, or brush not specified to remain shall be removed and shall not be stockpiled in the wetland resource areas while awaiting disposal. Work shall be coordinated with the Clearing or Tree Removal item and compensated under that Item."
Please confirm that 'that Item' refers to the Clearing and/or Tree Removal items and not Item 755.35.

Question #56b: The Basis of Payment states "Excavation in access of 12 needed for wetland soil will be paid under Item 120.1"
Should this read 'Excavation in access of 12 inches needed for wetland soil will be paid under Item 120.'?

Response #56a: The special provision is referring to the Item 101. Clearing and Grubbing, Item 103. Tree Removed – Diameter Under 24 Inches, and Item 104. Tree Removed – Diameter 24 Inches and Over.

Response #56b: See revised page A00801 - 128

E.T.& L. Corp. email dated August 13, 2020:

Question #57: Will any clearing and grubbing that may be required at the Wetland Replication Area (70 Cedar Street) be compensated under Item # 101. – Clearing and Grubbing?

Response #57: Yes, any clearing and grubbing that is required at the wetland replication area will be compensated under Item 101.

Question #58: Please inform which service connections are to be included under Item # 813.81? Is this item only for the (3) each traffic signal locations? Or does this item include the service connections for the two lighting load centers and the AC powered rectangular rapid flashing beacon?

Response #58: Item 813.81 only includes the service connections for the lighting load centers. Per the specifications, the service connections for the traffic signals are included in Item 815.1, 815.2, and 815.3.

Question #59: Please confirm the bid quantity for Item # 220. – Drainage Structure Adjusted. For the 200+ new drainage structures installed within this project, under which item shall the adjustment of castings from HMA intermediate course grade to final surface course grade be paid?

Response #59: The adjustment will be paid for under Item 220. See revised page B00420 – 8,

J.H. Lynch & Sons, Inc., email dated August 17, 2020:

Question #60: In regards to the response to Question #38
*The Pavement Core reports to do not indicate the thickness of HMA pavement.
Was this information recorded?
*Please provide the data for the 48 Test Pits.
*If no information regarding the thickness of the existing roadway pavement is available, please consider adding an item for pavement excavation by the cubic yard.

Response #60: See new pages A00892-21 through A00892-26. Per MassDOT's Standard Specifications, excavation of existing HMA will be paid for as identified in Subsection 120.21.

Dagle Electrical Construction email dated August 18, 2020:

Question #61: The specifications for the project call for the mast arms to follow MassDOT's December 2015 Overhead Signal Structure & Foundation Standard Drawings. The project specifications go on to state that longhand design calculations shall be submitted by the Contractor with the shop drawings for all Type 2 mast arm poles. The Contractor shall provide a set of calculations, stamped by a Structural Engineer registered in the Commonwealth of Massachusetts, along with plans and specifications for the poles for review by the Project Engineer. These two statements contradict in the MassDOT 2015 Overhead Signal Structure & Foundation Standard Drawings. The Engineering Directive E-16-001 state that the contractor is not required to submit load calculations for mast arm designs that conform to the standard drawings. Shop drawings are to be limited to identifying the dimensions of the mast arm and foundation. Furthermore, note 3 on the standard drawings states that for non-standard mast arms, including but not limited to specialty mast arms or mast arms that have loading conditions that exceed what is depicted on Sheets 2 and 3 of this set, it shall be the responsibility of the Design Engineer to submit a design for the structure and foundation that conforms to the latest edition of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals. Please clarify if the mast arm submission for this project should follow the MassDOT standard guidelines.

Response #61: Per Special Provisions for Items 815.1 through 816.801, the Contractor is responsible for providing designs and calculations for the pole and arm for non-standard loading only.

The Contractor is not responsible for providing designs or calculations for the mast arms that conform to the standard loading conditions.

P. Gioioso & Sons, Inc. email dated August 19, 2020:

Question #62: Would it be possible to add a Bid Item 703 for the HMA Driveways? The cost of the driveways is substantially different from the other HMA mixes provided in the bid.

Response #62: The cost of the driveways will be paid for under Item 702.

Question #63: Please confirm that Item 702 includes the paving for the HMA Multi-Use Path.

Response #63: Confirmed. The HMA Multi-Use Paths will be paid for under Item 702.

P. Gioioso & Sons, Inc. email dated August 20, 2020:

Question #64: Items 815.1 to 815.3 (Traffic Signals, page 172) indicate that 6 of the 11 mast arm foundations are paid under Items 945.102-202-502. The remaining 5 mast arms are similar in soil conditions, excavation and construction. Would the Department consider payment of all 11 foundations under Items 945.102 to 502.

Response #64: All 11 foundations will not be paid for under Items 945.102 through 945.502.

The 6 mast arm foundations to be paid for under Items 945.102, 945.202, and 945.502 (Mast Arm Nos. MA-1 to MA-6) are to be Drilled Shaft foundations. These foundations are used at these locations because the soil conditions or ledge prevent the use of MassDOT standard foundation type.

See Items 815.1 through 816.801 for information on soil conditions, excavation, and construction. The remaining 5 mast arms are Pier foundations and are to be constructed in accordance with MassDOT's "Overhead Signal Structure & Foundation Standard Drawings" dated December 2015.

The costs of the 5 Pier foundations are to be included in the respective lump sum prices bid for Items 815.1 through 815.3

P. Gioioso & Sons, Inc. email dated August 20, 2020 (Continued)**:**

Question #65: Regarding Item 813.81 Service Connection (underground), does this Lump Sum include the connections for all of the 3 new Traffic Signals and 2 new Lighting Load Centers ? Are conduits and wires paid under the separate bid items, or included in this Lump Sum ? Also is the contractor responsible for the connection fees to the electrical utility, or will the utility connect as part of their force account with the Department ?

Response #65: Item 813.81 only includes the service connections for the lighting load centers. Per the specifications, the service connections for the traffic signals are included in Item 815.1, 815.2 and 815.3. In addition, the conduits and wires required for the service connections are included and paid for under the lump sum for Items 813.81, 815.1, 815.2 and 815. Lastly, the Contractor is responsible for the connection fees.

Dagle Electrical Construction email dated August 24, 2020:

Question #66: Please look at the attached page from specification 812.50 through 821.53
there is a reference to REMOVE the GFCI outlets and the Town of Ashland Seal from the Base Casing
Please confirm that this is incorrect and that the requirement for the outlet and seal are required for this project

Response #66: GFCI outlets will be included. The Town seal will not be included. See revised pages A00801-173, A00801-177, and A00801-178.

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-003S(390)	19	331
PROJECT FILE NO.	604123		

CONSTRUCTION PLANS (4 OF 17)

*HIGHWAY GUARD DETAILS

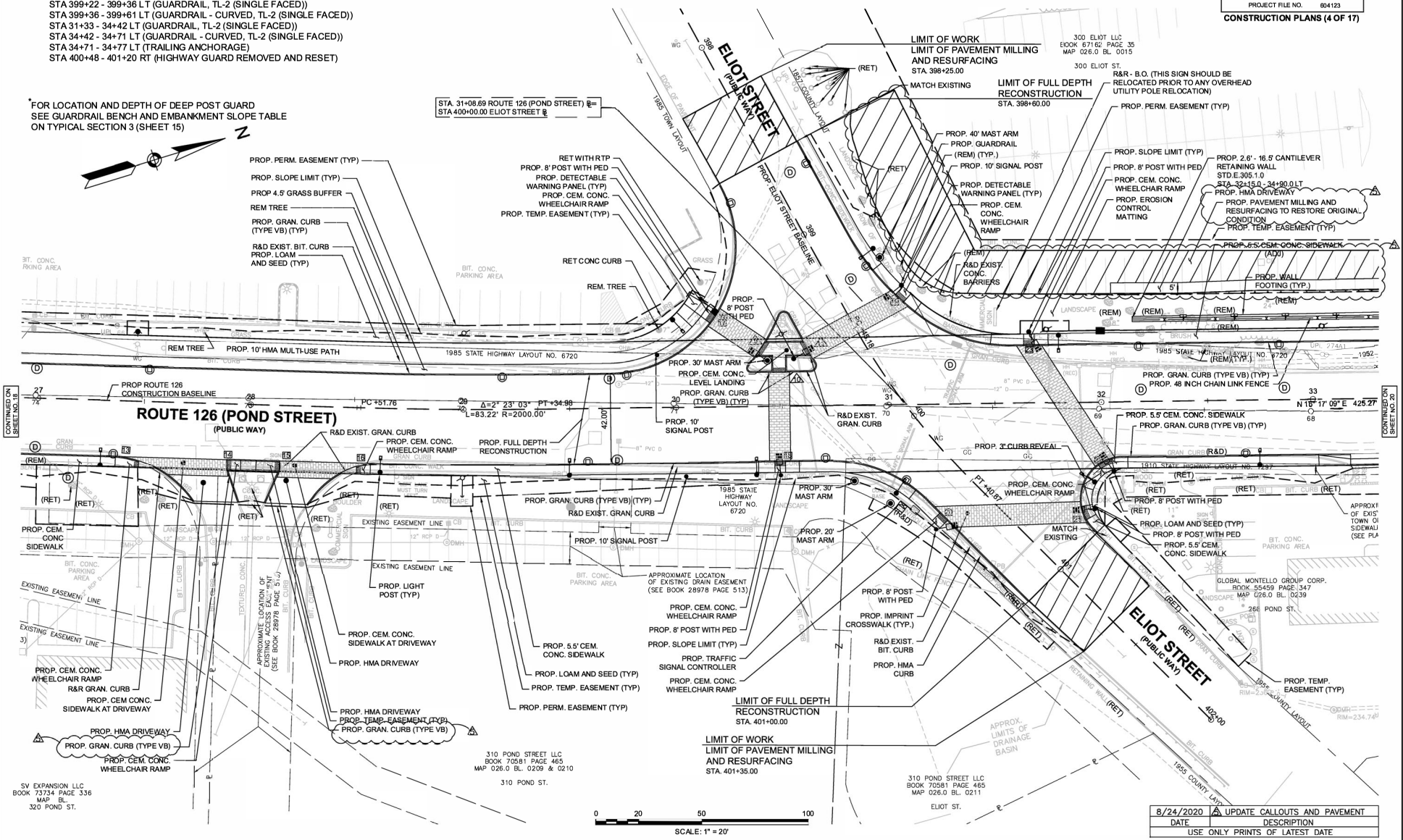
STA 399+13 - 399+22 LT (TRAILING ANCHORAGE)
STA 399+22 - 399+36 LT (GUARDRAIL, TL-2 (SINGLE FACED))
STA 399+36 - 399+61 LT (GUARDRAIL - CURVED, TL-2 (SINGLE FACED))
STA 31+33 - 34+42 LT (GUARDRAIL, TL-2 (SINGLE FACED))
STA 34+42 - 34+71 LT (GUARDRAIL - CURVED, TL-2 (SINGLE FACED))
STA 34+71 - 34+77 LT (TRAILING ANCHORAGE)
STA 400+48 - 401+20 RT (HIGHWAY GUARD REMOVED AND RESET)

*FOR LOCATION AND DEPTH OF DEEP POST GUARD SEE GUARDRAIL BENCH AND EMBANKMENT SLOPE TABLE ON TYPICAL SECTION 3 (SHEET 15)

TRAFFIC SIGNAL CONDUIT
SEE SHEET NO. 134

WATER SUPPLY ALTERATIONS
SEE SHEET NO. 97

DRAINAGE DETAILS
SEE SHEET NO. 97



8/24/2020	Δ UPDATE CALLOUTS AND PAVEMENT
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

FOR PROFILE:
SEE SHEET NO. 36 & 51

604123_HD0R(CONSTRUCTION PLANS).DWG Plotted on 24-Aug-2020 10:00 AM

*HIGHWAY GUARD DETAILS

STA 31+33 - 34+42 LT (GUARDRAIL, TL-2 (SINGLE FACED))
STA 34+42 - 34+71 LT (GUARDRAIL - CURVED, TL-2 (SINGLE FACED))
STA 34+71 - 34+77 LT (TRAILING ANCHORAGE)
STA 35+88 - 36+25 RT (GUARDRAIL TANGENT END TREATMENT, TL-2)
STA 36+25 - 37+78 RT (GUARDRAIL, TL-2 (SINGLE FACED))
STA 37+78 - 37+88 RT (TRAILING ANCHORAGE)
STA 37+10 - 37+19 LT (TRAILING ANCHORAGE)
STA 37+19 - 37+67 LT (GUARDRAIL, TL-2 (SINGLE FACED))
STA 37+67 - 38+05 LT (GUARDRAIL TANGENT END TREATMENT, TL-2)

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

SEE SHEET NO. 98

DRAINAGE DETAILS

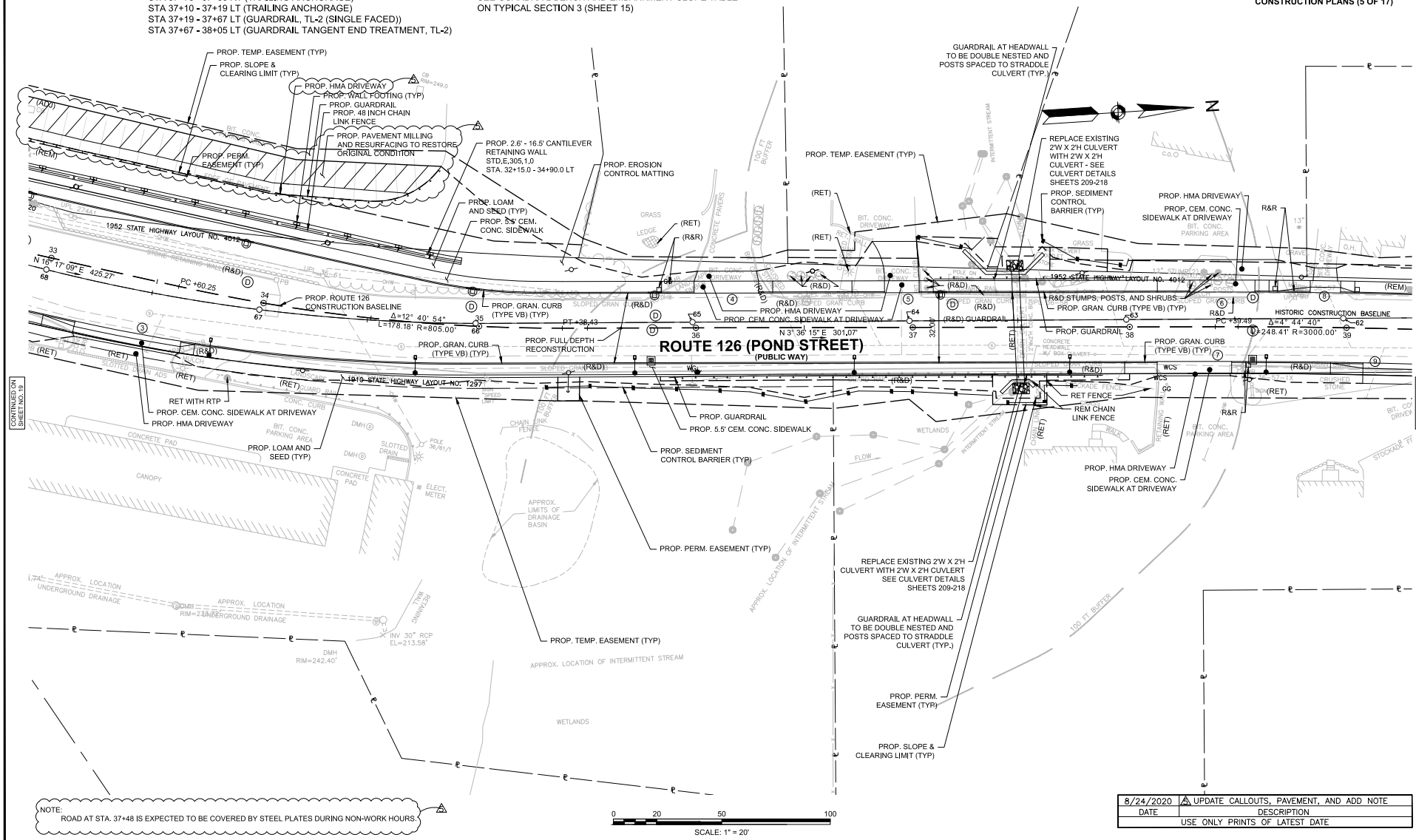
SEE SHEET NO. 98

*FOR LOCATION AND DEPTH OF DEEP POST GUARD SEE GUARDRAIL BENCH AND EMBANKMENT SLOPE TABLE ON TYPICAL SECTION 3 (SHEET 15)

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0035(390)	20	331
PROJECT FILE NO. 604123			

CONSTRUCTION PLANS (5 OF 17)



NOTE:
ROAD AT STA. 37+48 IS EXPECTED TO BE COVERED BY STEEL PLATES DURING NON-WORK HOURS.

SCALE: 1" = 20'

DATE	DESCRIPTION
8/24/2020	5 UPDATE CALLOUTS, PAVEMENT, AND ADD NOTE
USE ONLY PRINTS OF LATEST DATE	

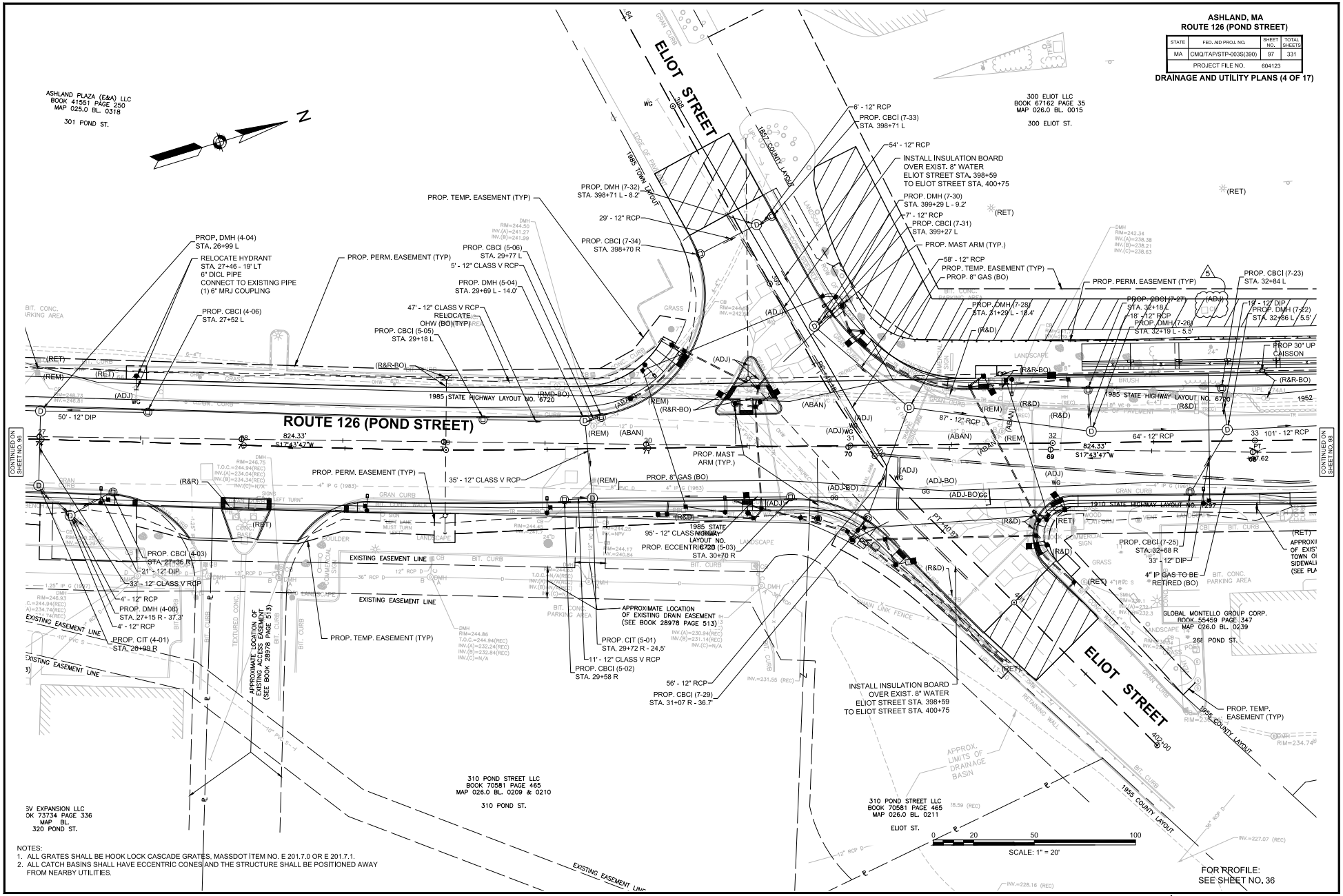
FOR PROFILE:
SEE SHEET NO. 37

604123_HD08\CONSTRUCTION PLANS.DWG Plotted on 24-Aug-2020 10:01 AM

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-003S(390)	97	331
PROJECT FILE NO.	604123		

DRAINAGE AND UTILITY PLANS (4 OF 17)



NOTES:
1. ALL GRATES SHALL BE HOOK LOCK CASCADE GRATES, MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.

5 ADDENDUM NO. 5, AUGUST 24, 2020

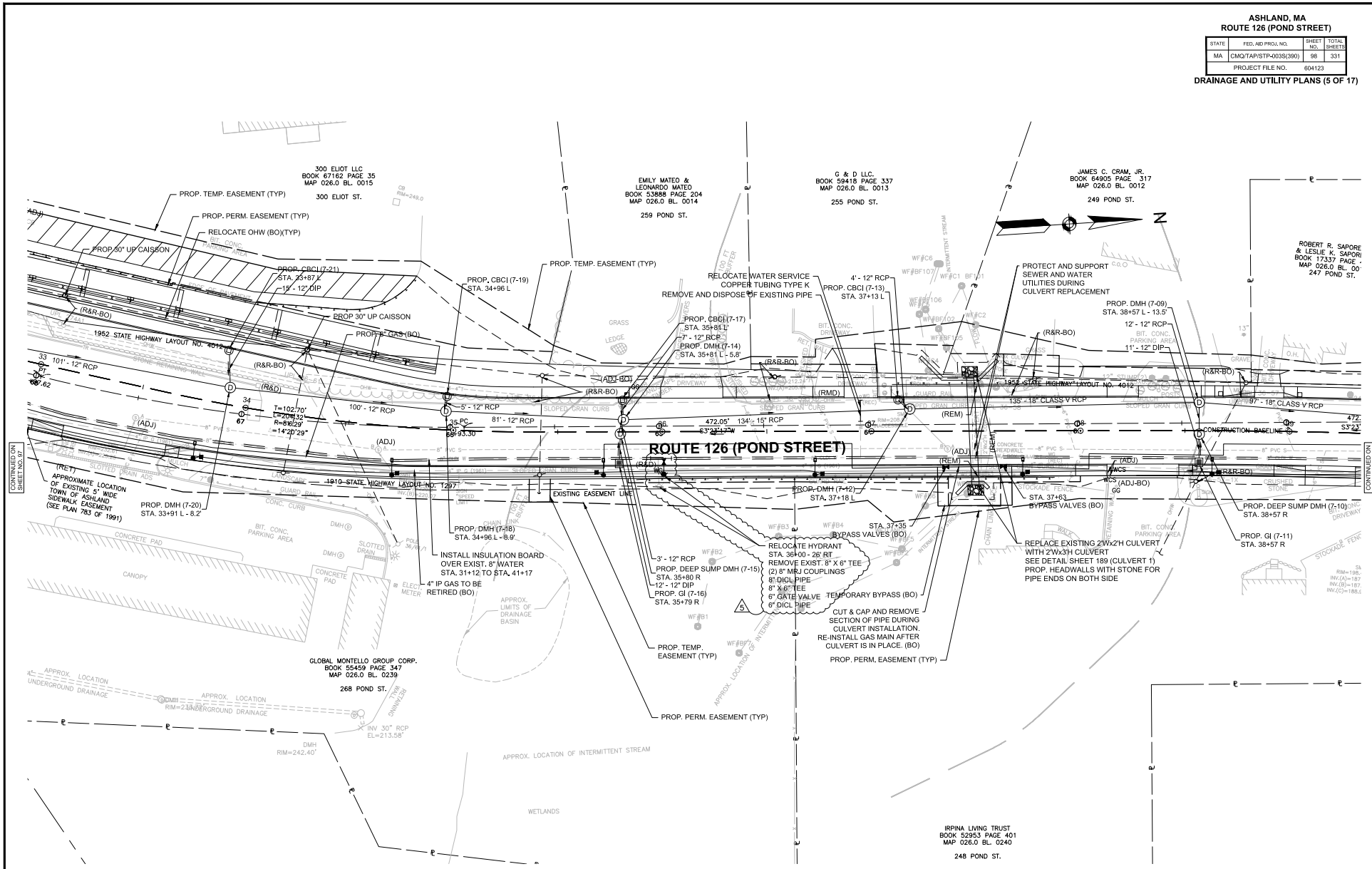
604123_HD13\DRAINAGE&UTIL.DWG Plotted on 12-Mar-2018 8:03 AM

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-003S(390)	98	331
PROJECT FILE NO.	604123		

DRAINAGE AND UTILITY PLANS (5 OF 17)

604123_HD13\DRAINAGE&UTIL.DWG Plotted on 12-Mar-2018 8:03 AM



NOTES:
1. ALL GRATES SHALL BE HOOK LOCK CASCADE GRATES, MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.

0 20 50 100
SCALE: 1" = 20'

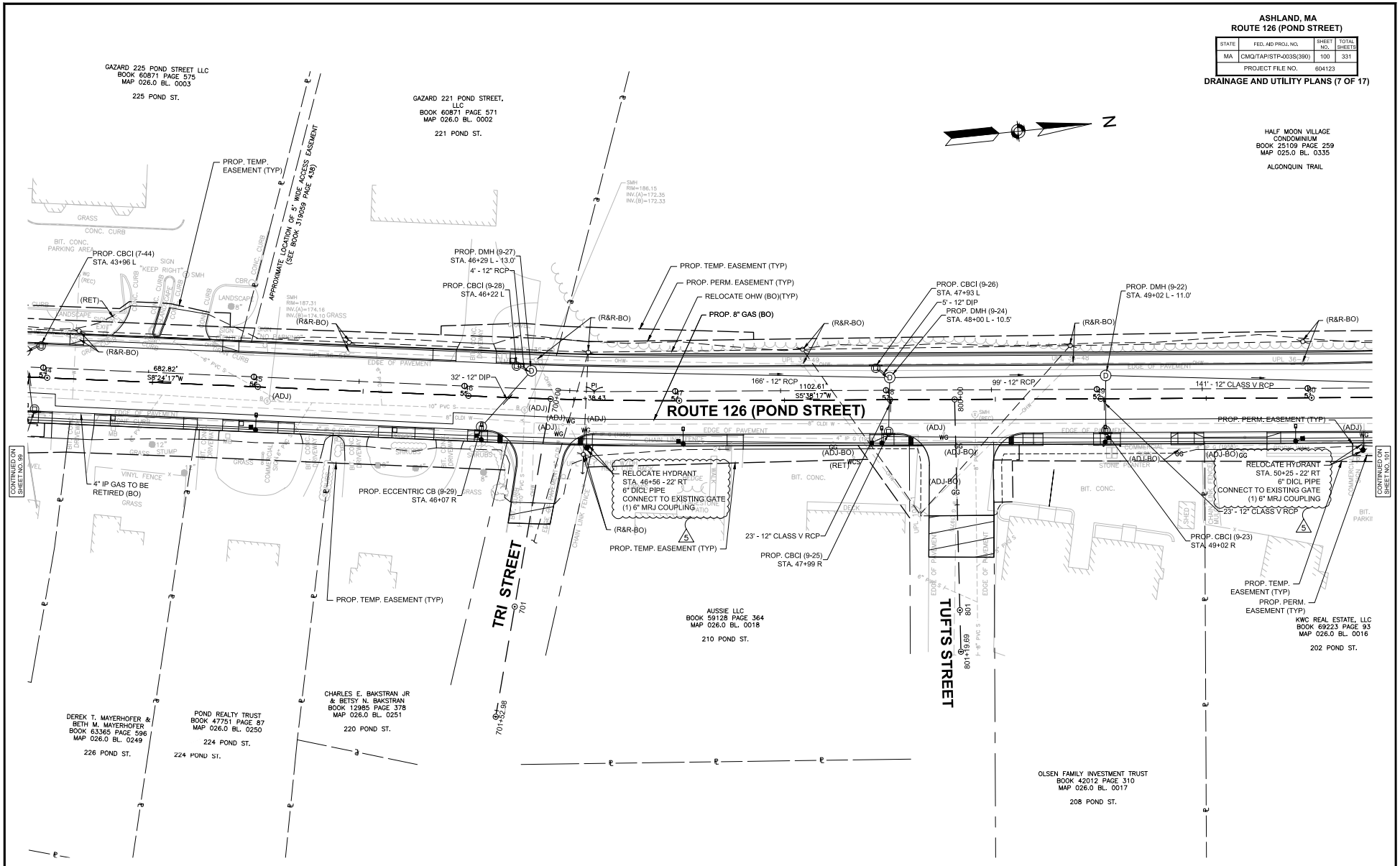
FOR PROFILE:
SEE SHEET NO. 37

5 ADDENDUM NO. 5, AUGUST 24, 2020

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-003S(390)	100	331
PROJECT FILE NO. 604123			

DRAINAGE AND UTILITY PLANS (7 OF 17)



NOTES:
1. ALL GRATES SHALL BE HOOK LOCK CASCADE GRATES, MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.

FOR PROFILE:
SEE SHEET NO. 39

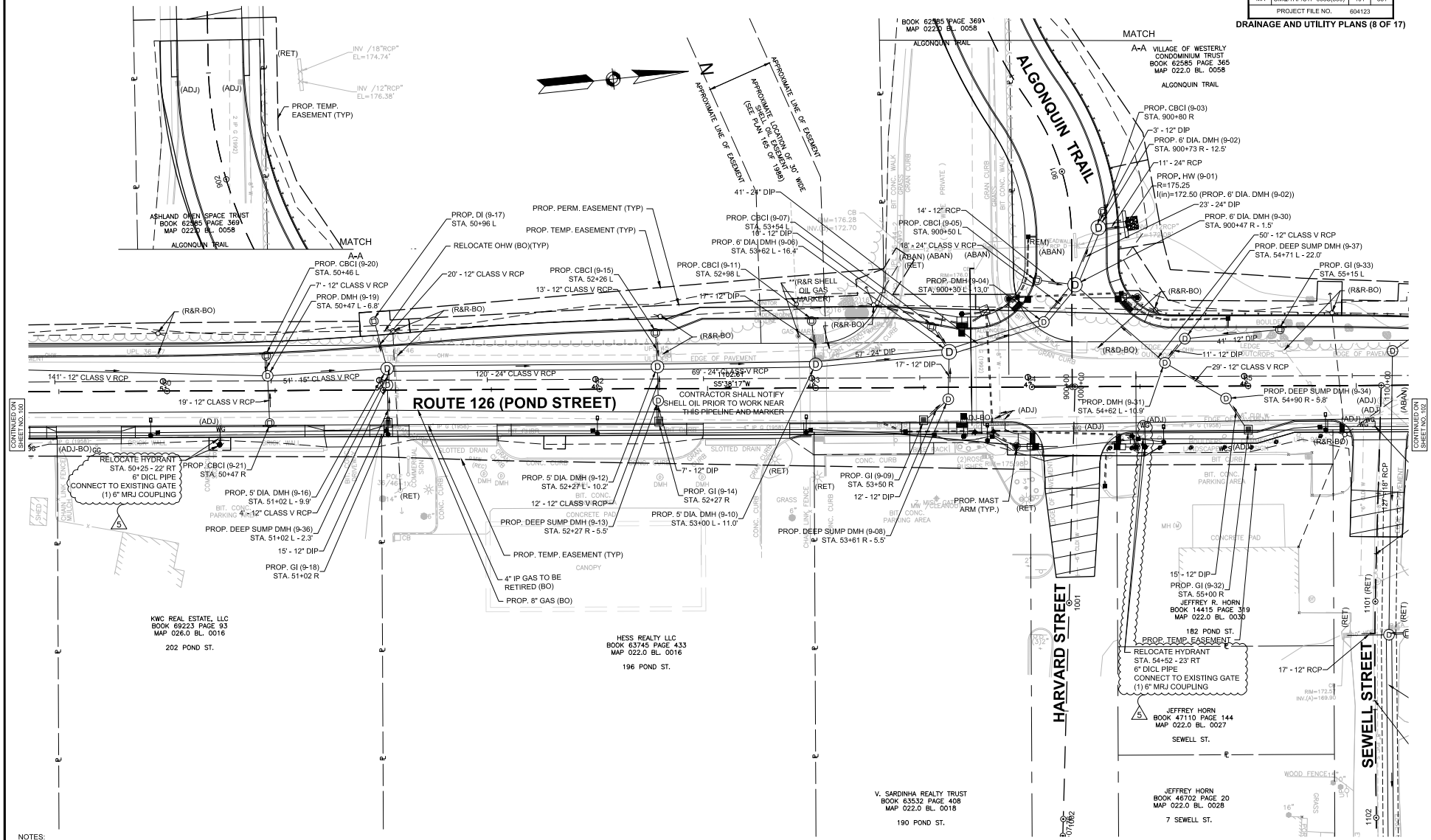
5 ADDENDUM NO. 5, AUGUST 24, 2020

604123_HD13\DRAINAGE&UTIL.DWG Plotted on 12-Mar-2018 8:03 AM

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-003S(390)	101	331
PROJECT FILE NO.	604123		

DRAINAGE AND UTILITY PLANS (8 OF 17)



NOTES:
1. ALL GRATES SHALL BE HOOK LOCK CASCADE GRATES, MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.
3. CONTRACTOR SHALL CONTACT AND COORDINATE WITH SHELL OIL PRIOR TO PERFORMING WORK WITHIN THE LOCATION OF THESE FACILITIES.

0 20 50 100
SCALE: 1" = 20'

FOR PROFILE: SEE SHEET NO. 40

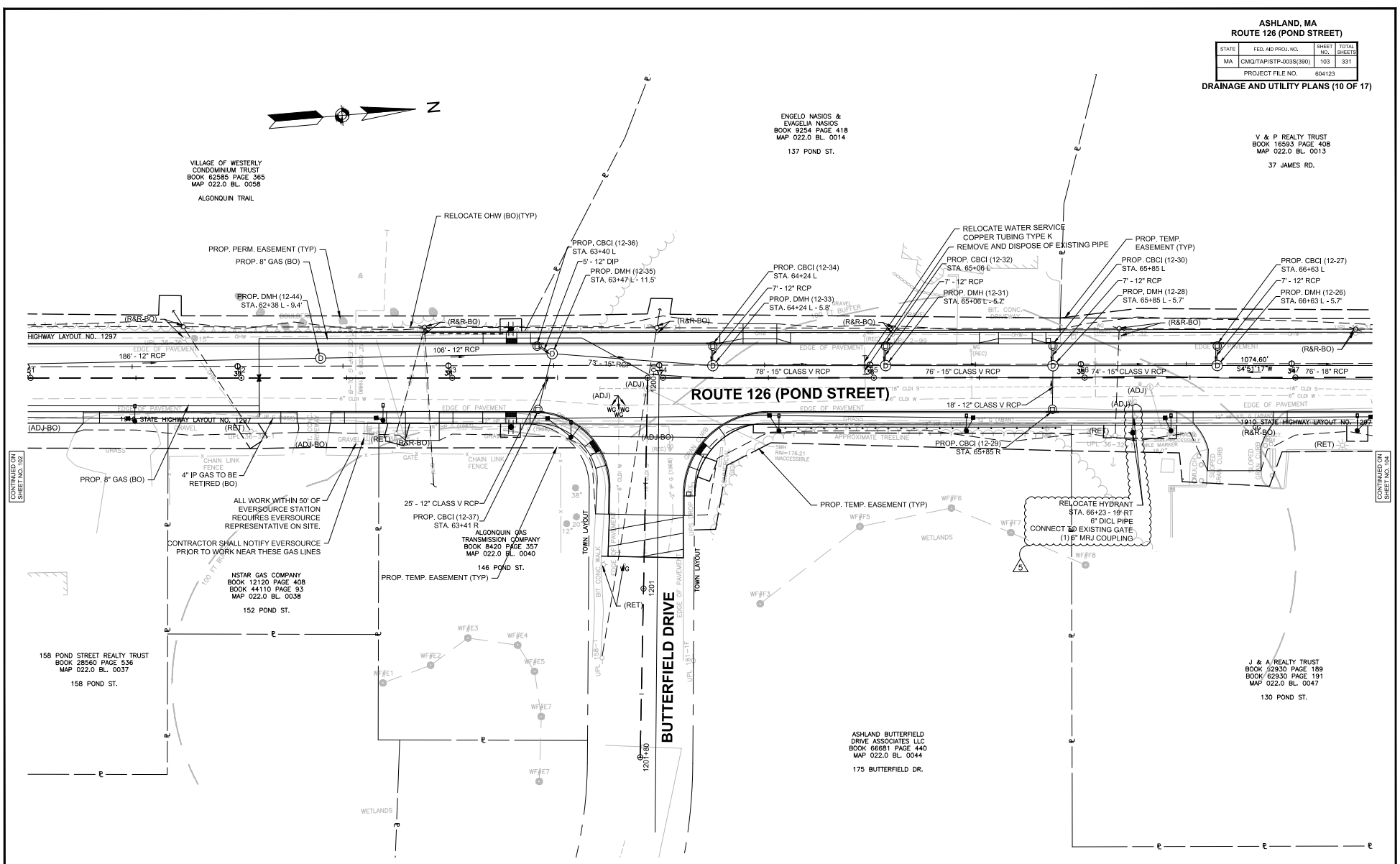
5 ADDENDUM NO. 5, AUGUST 24, 2020

604123_HD13\DRAINAGE&UTIL.DWG Plotted on 12-Mar-2018 8:03 AM

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-003S(390)	103	331
PROJECT FILE NO.	604123		

DRAINAGE AND UTILITY PLANS (10 OF 17)



0 20 50 100
SCALE: 1" = 20'

NOTES:
1. ALL GRATES SHALL BE HOOK LOCK CASCADE GRATES, MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.

FOR PROFILE:
SEE SHEET NO. 42

5 ADDENDUM NO. 5, AUGUST 24, 2020

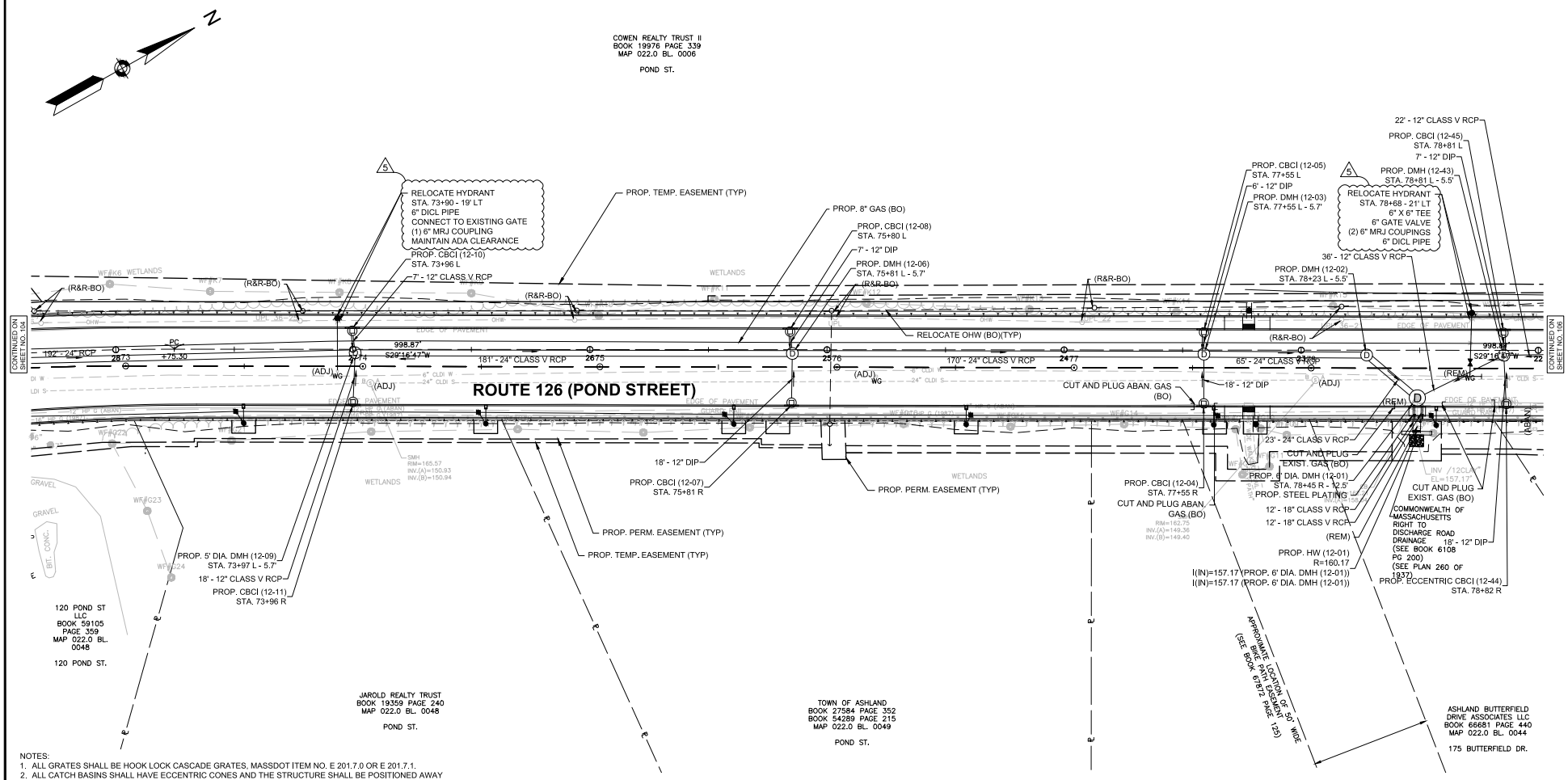
604123_HD13\DRAINAGE\UTIL.DWG Plotted on 12-Mar-2018 8:03 AM

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-003S(390)	105	331
PROJECT FILE NO.	604123		

DRAINAGE AND UTILITY PLANS (12 OF 17)

604123_HD13\DRAINAGE&UTIL.DGN Plotted on 12-Mar-2018 8:03 AM



NOTES:
1. ALL GRATES SHALL BE HOOK LOCK CASCADE GRATES, MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.
3. CONTRACTOR TO COORDINATE WITH EVERSOURCE FOR CUTTING AND CAPPING OF ABANDONED 12" GAS AND INSTALLATION OF STEEL PLATE BETWEEN DRAINAGE PIPE AND EXISTING 16" GAS AT STA. 78+45.
4. THE 16" GAS PIPE SHALL BE PROTECTED AND SUPPORTED WHILE EXPOSED DURING THE DURATION OF ALL WORK, INCLUDING WORK ON THE CULVERT. CONTRACTOR TO COORDINATE WORK WITH EVERSOURCE.

FOR PROFILE:
SEE SHEET NO. 44

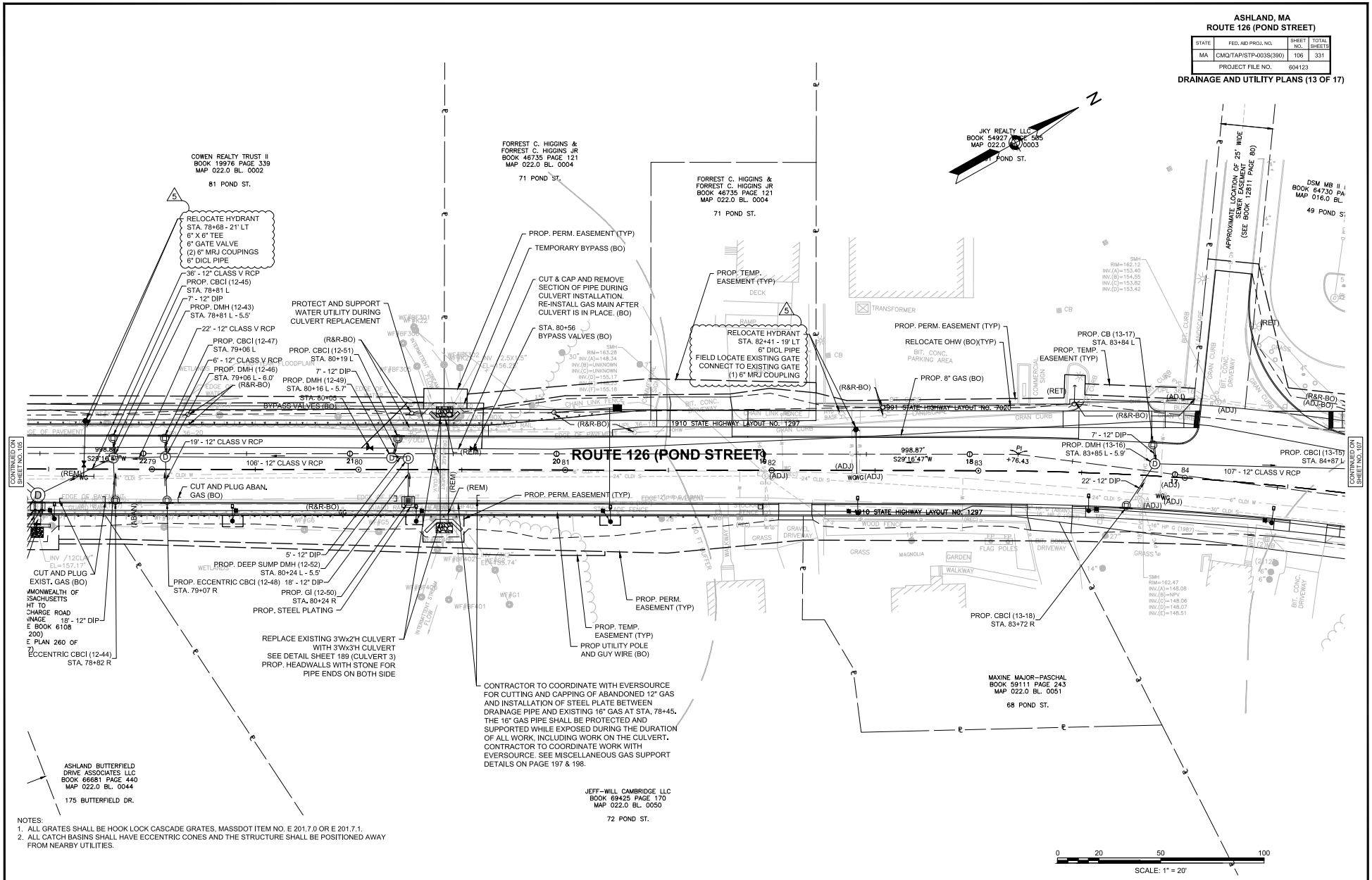
5 ADDENDUM NO. 5, AUGUST 24, 2020

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0035(390)	106	331
PROJECT FILE NO.	604123		

DRAINAGE AND UTILITY PLANS (13 OF 17)

604123_HD13\DRAINAGE&UTIL.DGN Plotted on 12-Mar-2018 8:03 AM



NOTES:
1. ALL GRATES SHALL BE HOOK LOCK CASCADE GRATES, MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.

FOR PROFILE:
SEE SHEET NO. 45

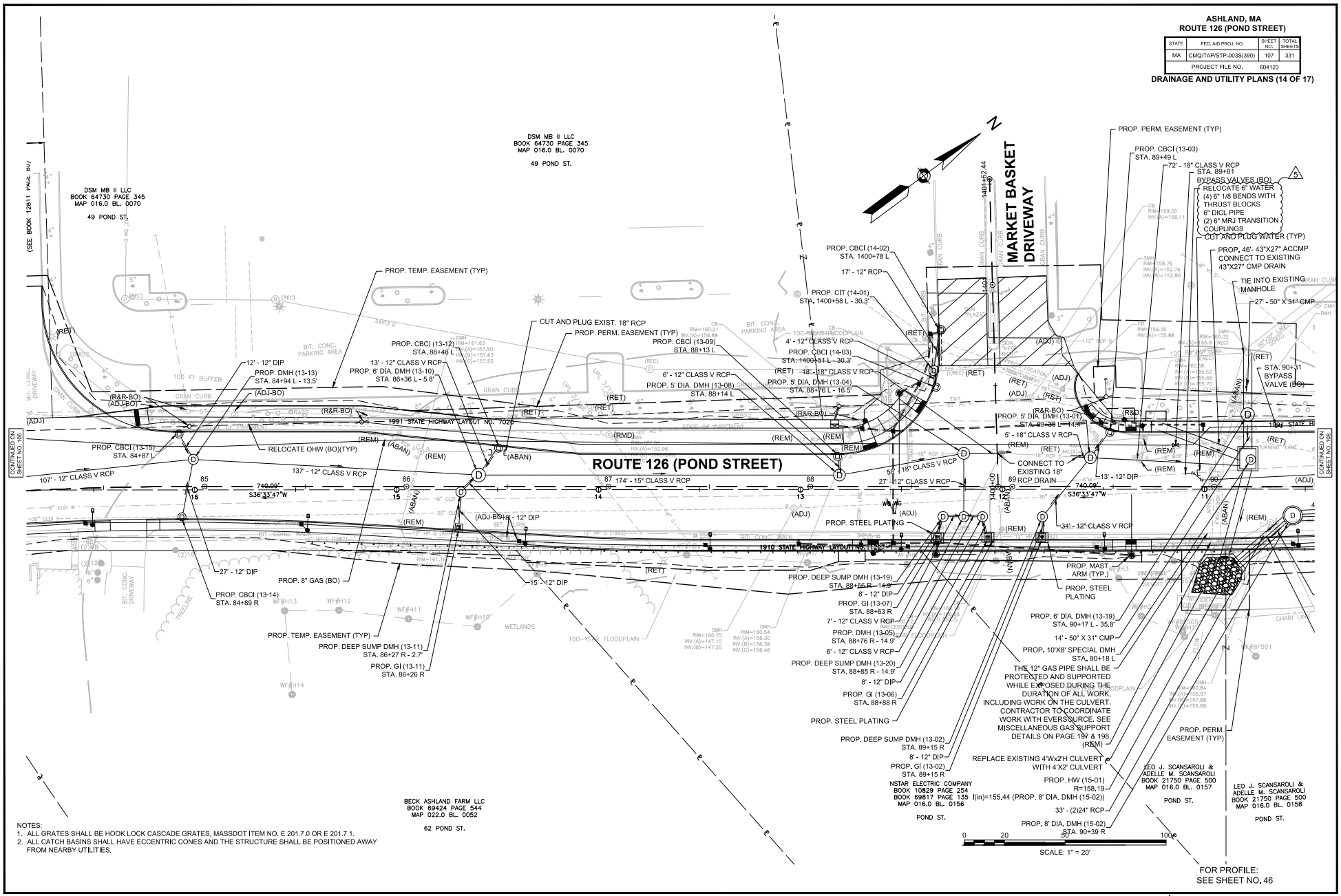
5 ADDENDUM NO. 5, AUGUST 24, 2020

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-003S(390)	107	331
PROJECT FILE NO.	604123		

DRAINAGE AND UTILITY PLANS (14 OF 17)

604123_HD13\DRAINAGE\UTIL.DWG Plotted on 12-Mar-2018 8:03 AM



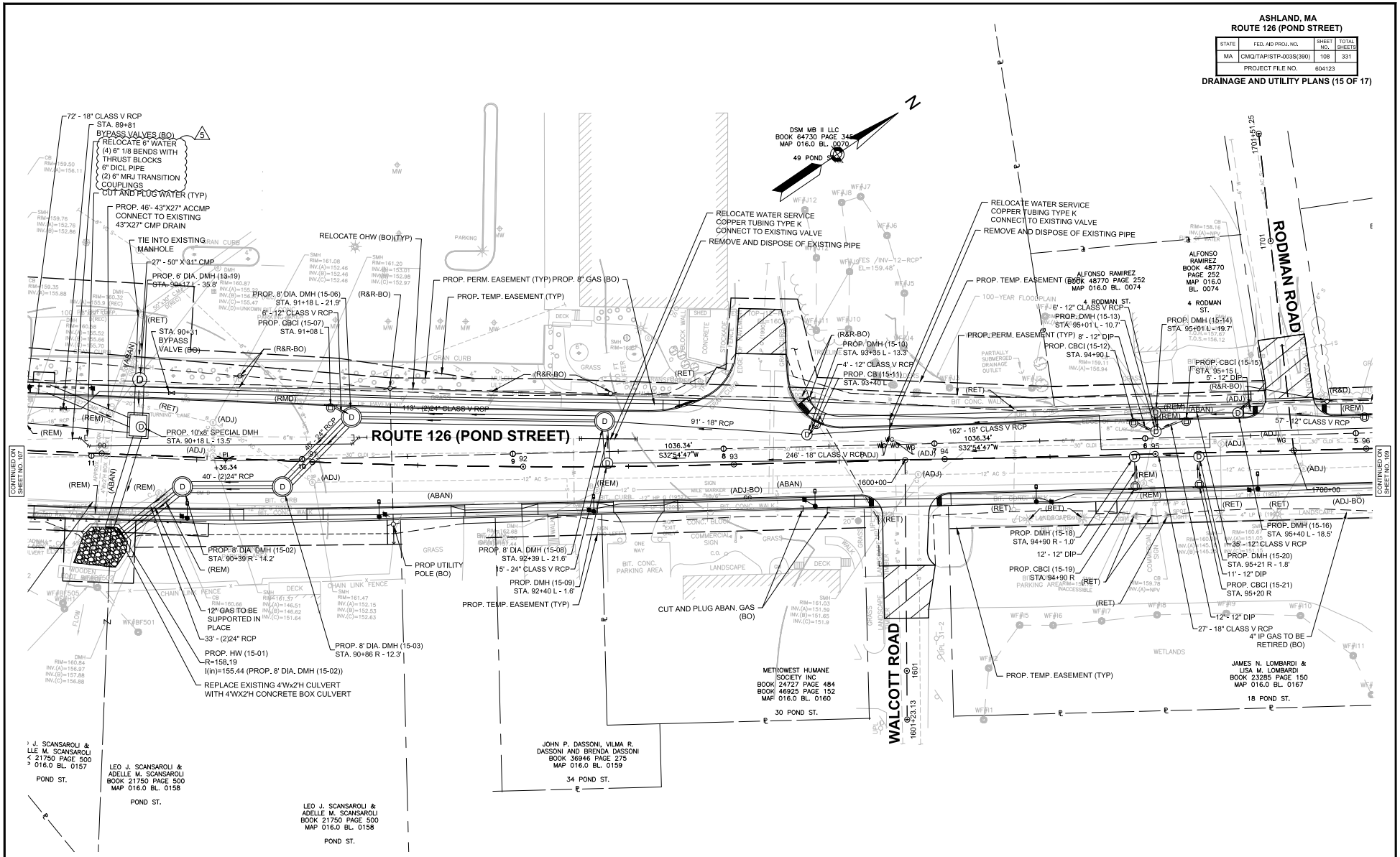
NOTES:
1. ALL GRATES SHALL BE HOOK LOCK CASCADE GRATES, MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.

5 ADDENDUM NO. 5, AUGUST 24, 2020

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-003S(390)	108	331
PROJECT FILE NO.	604123		

DRAINAGE AND UTILITY PLANS (15 OF 17)

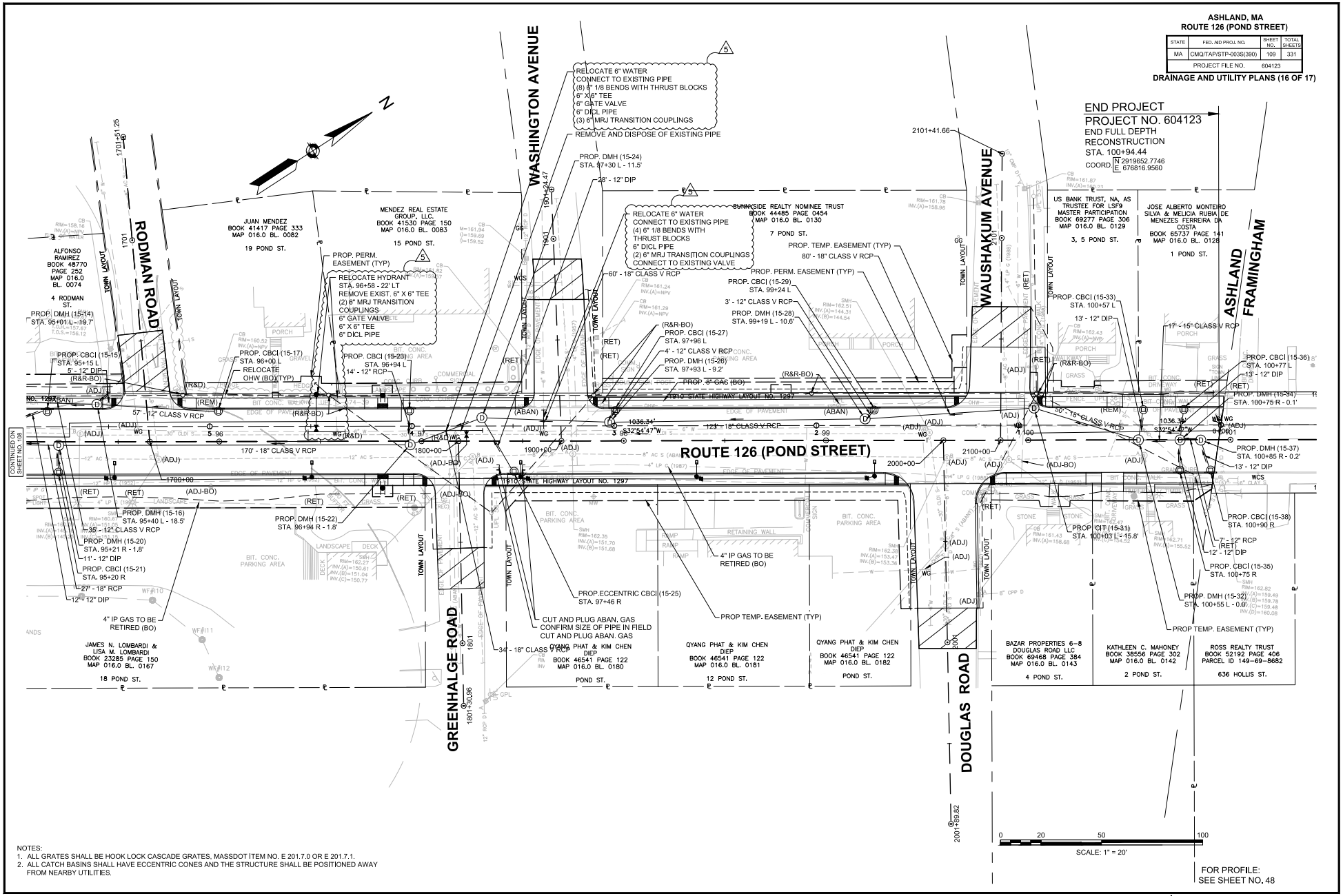


NOTES:
1. ALL GRATES SHALL BE HOOK LOCK CASCADE GRATES, MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.

FOR PROFILE:
SEE SHEET NO. 47

5 ADDENDUM NO. 5, AUGUST 24, 2020

604123_HD13\DRAINAGE&UTIL.DWG Plotted on 12-Mar-2018 8:03 AM



NOTES:
1. ALL GRATES SHALL BE HOOK LOCK CASCADE GRATES, MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.

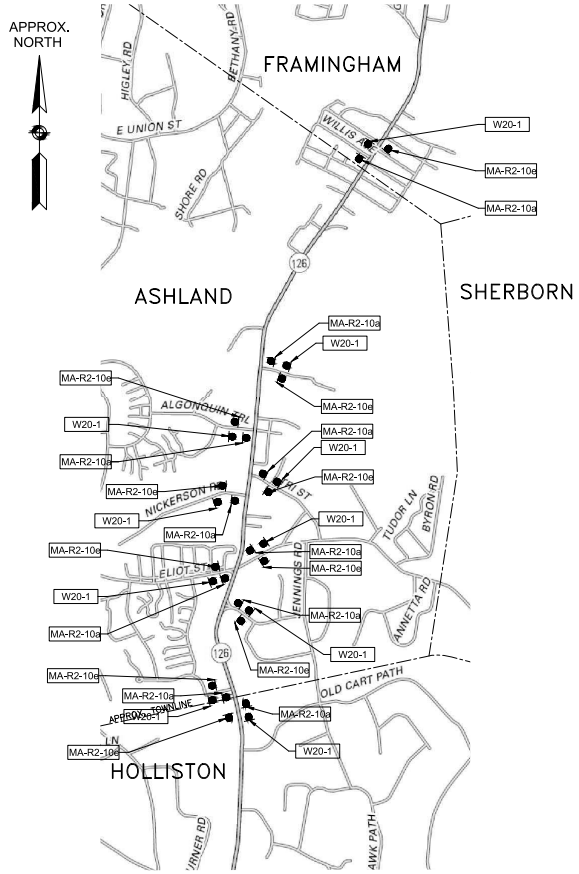
5 ADDENDUM NO. 5, AUGUST 24, 2020

604123_HD13\DRAINAGE&UTIL.DGN Plotted on 12-Mar-2018 8:03 AM

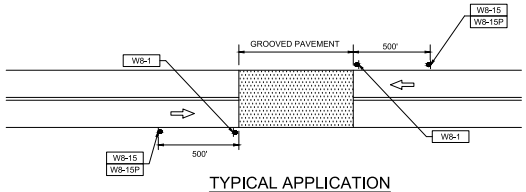
ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-003S(390)	147	331
PROJECT FILE NO.	604123		

TEMPORARY TRAFFIC CONTROL PLANS
TYPICAL APPLICATIONS 1

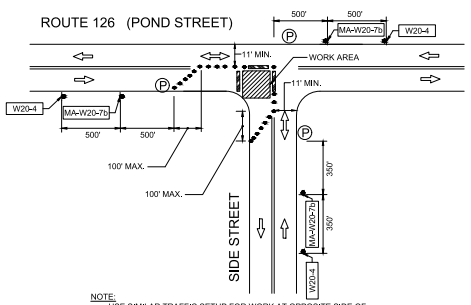


OVERALL TRAFFIC MANAGEMENT PLAN



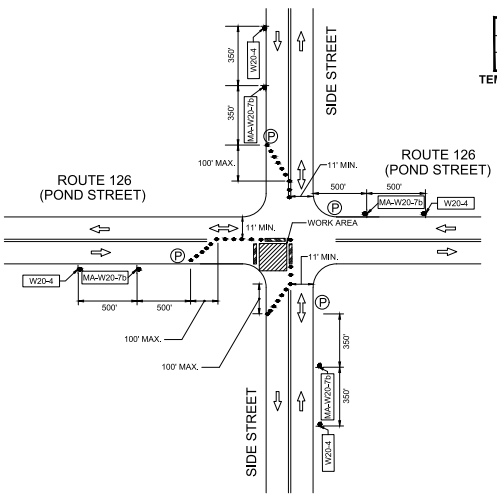
TYPICAL APPLICATION
GROOVED PAVEMENT

NOT TO SCALE



NOTE:
USE SIMILAR TRAFFIC SETUP FOR WORK AT OPPOSITE SIDE OF INTERSECTION.

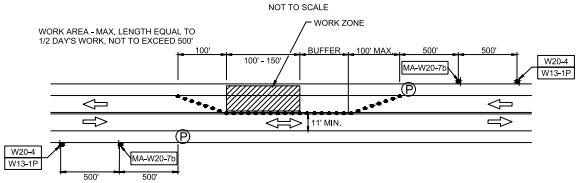
TYPICAL APPLICATION - SINGLE LANE
APPROACH ONE QUADRANT CLOSURE AT T-INTERSECTION



NOTE:
USE SIMILAR TRAFFIC SETUP FOR WORK AT OPPOSITE SIDE OF INTERSECTION.

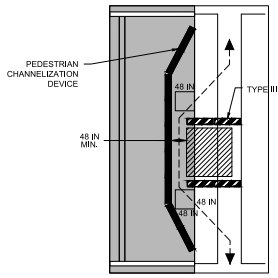
TYPICAL APPLICATION - SINGLE LANE
APPROACH ONE QUADRANT CLOSURE

NOT TO SCALE



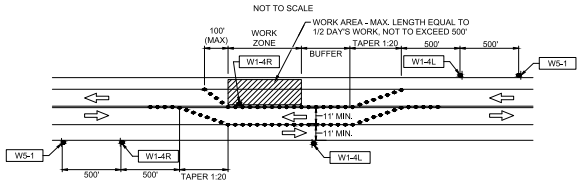
TYPICAL APPLICATION - TWO LANE ROAD
ONE LANE ALTERNATING TRAFFIC

NOT TO SCALE



PEDESTRIAN BYPASS

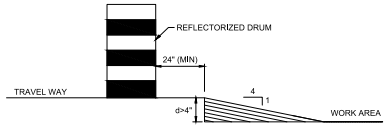
NOT TO SCALE



TYPICAL APPLICATION - TWO LANE ROAD
SHOULDER AND TRAVEL LANE CLOSURE

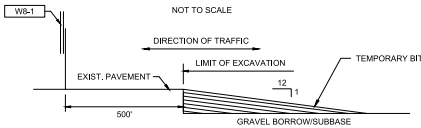
NOT TO SCALE

NOTES:
1. THIS TYPICAL TRAFFIC SETUP MAY BE USED FOR CONSTRUCTION OF DRAINAGE CULVERTS AT FOLLOWING STATIONS:
   - STATION 37+48,
   - STATION 41+98,
   - STATION 80+41, AND
   - STATION 90+14
2. IF THE TRAFFIC CONTROL SETUP IS USED FOR CULVERT INSTALLATION, AT THE END OF EACH WORK DAY, STEEL PLATING SHALL BE USED TO COVER THE TRENCH TO ALLOW FOR SAFE PASSAGE OF TRAFFIC AND RESTORATION OF NORMAL TRAFFIC OPERATIONS



LATERAL DROP-OFF DETAIL

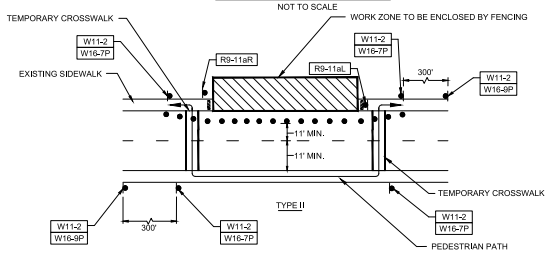
NOT TO SCALE



LONGITUDINAL DROP-OFF DETAIL

NOT TO SCALE

NOTES:
1. THIS TYPICAL TRAFFIC SETUP MAY BE USED FOR CONSTRUCTION OF DRAINAGE CULVERTS AT FOLLOWING STATIONS:
   - STATION 37+48,
   - STATION 41+98,
   - STATION 80+41, AND
   - STATION 90+14
2. IF THE TRAFFIC CONTROL SETUP IS USED FOR CULVERT INSTALLATION, AT THE END OF EACH WORK DAY, STEEL PLATING SHALL BE USED TO COVER THE TRENCH TO ALLOW FOR SAFE PASSAGE OF TRAFFIC AND RESTORATION OF NORMAL TRAFFIC OPERATIONS



TYPICAL APPLICATION - SIDEWALK WORK
MIDBLOCK WITH TEMPORARY PEDESTRIAN PATH

NOT TO SCALE

LEGEND
- DIRECTION OF TRAFFIC
- SIGN
- POLICE OFFICER
- REFLECTORIZED DRUM
- WORK ZONE
- TYPE III BARRICADE
- TEMPORARY BARRIER
- IMPACT ATTENUATOR

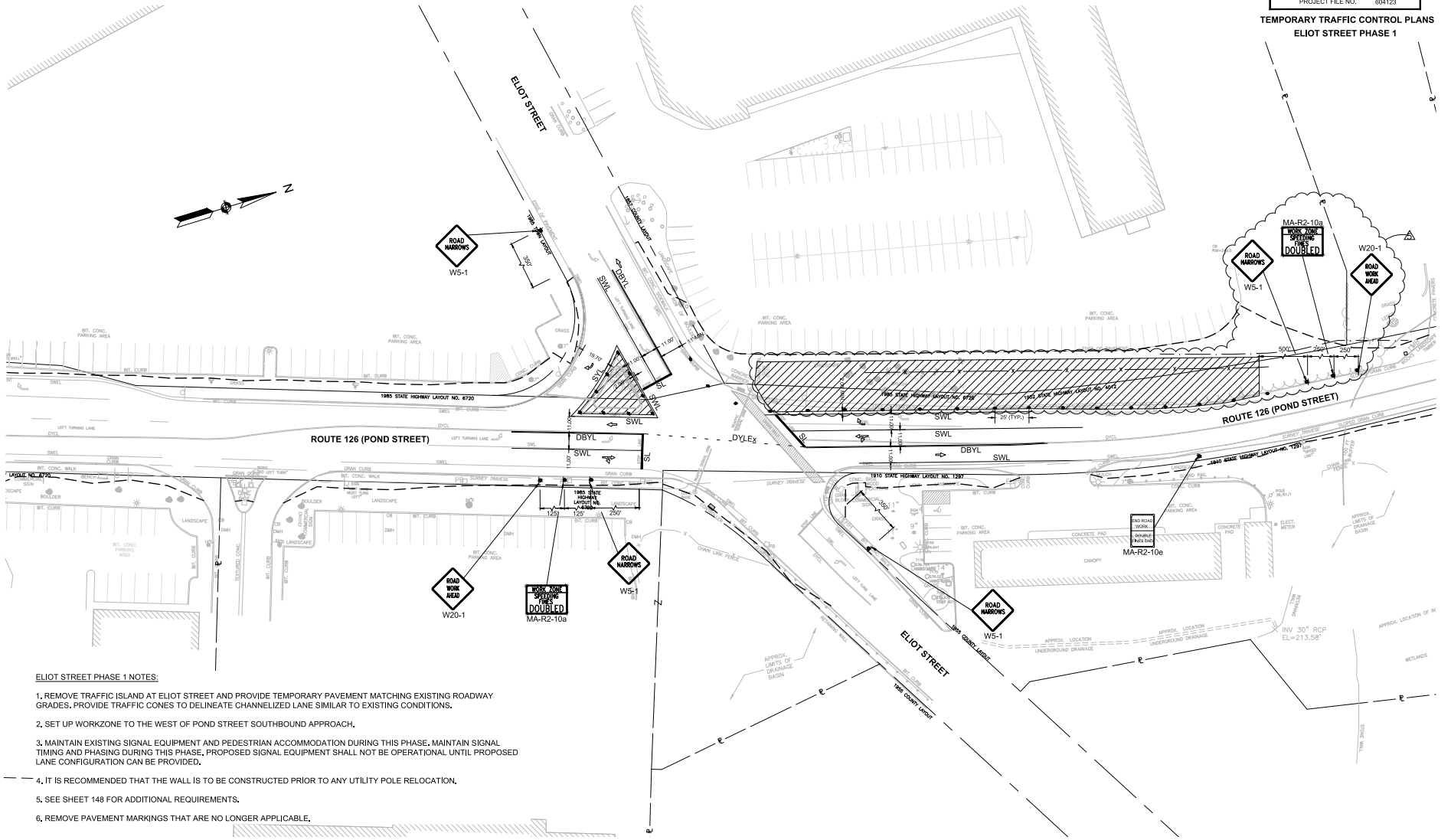
DATE	DESCRIPTION
8/24/2020	A TYPICAL NOTES REVISION
USE ONLY PRINTS OF LATEST DATE	

604123_H020\CONSTRUCTION SIGN SUMMARY.DWG Plotted on 18-Oct-2017 11:42 AM

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-003S(390)	155	331
PROJECT FILE NO.	604123		

TEMPORARY TRAFFIC CONTROL PLANS
ELIOT STREET PHASE 1



ELIOT STREET PHASE 1 NOTES:

1. REMOVE TRAFFIC ISLAND AT ELIOT STREET AND PROVIDE TEMPORARY PAVEMENT MATCHING EXISTING ROADWAY GRADES. PROVIDE TRAFFIC CONES TO DELINEATE CHANNELIZED LANE SIMILAR TO EXISTING CONDITIONS.

2. SET UP WORKZONE TO THE WEST OF POND STREET SOUTHBOUND APPROACH.

3. MAINTAIN EXISTING SIGNAL EQUIPMENT AND PEDESTRIAN ACCOMMODATION DURING THIS PHASE. MAINTAIN SIGNAL TIMING AND PHASING DURING THIS PHASE. PROPOSED SIGNAL EQUIPMENT SHALL NOT BE OPERATIONAL UNTIL PROPOSED LANE CONFIGURATION CAN BE PROVIDED.

4. IT IS RECOMMENDED THAT THE WALL IS TO BE CONSTRUCTED PRIOR TO ANY UTILITY POLE RELOCATION.

5. SEE SHEET 148 FOR ADDITIONAL REQUIREMENTS.

6. REMOVE PAVEMENT MARKINGS THAT ARE NO LONGER APPLICABLE.

DATE	DESCRIPTION
8/24/2020	2 UPDATE WORK ZONE
USE ONLY PRINTS OF LATEST DATE	

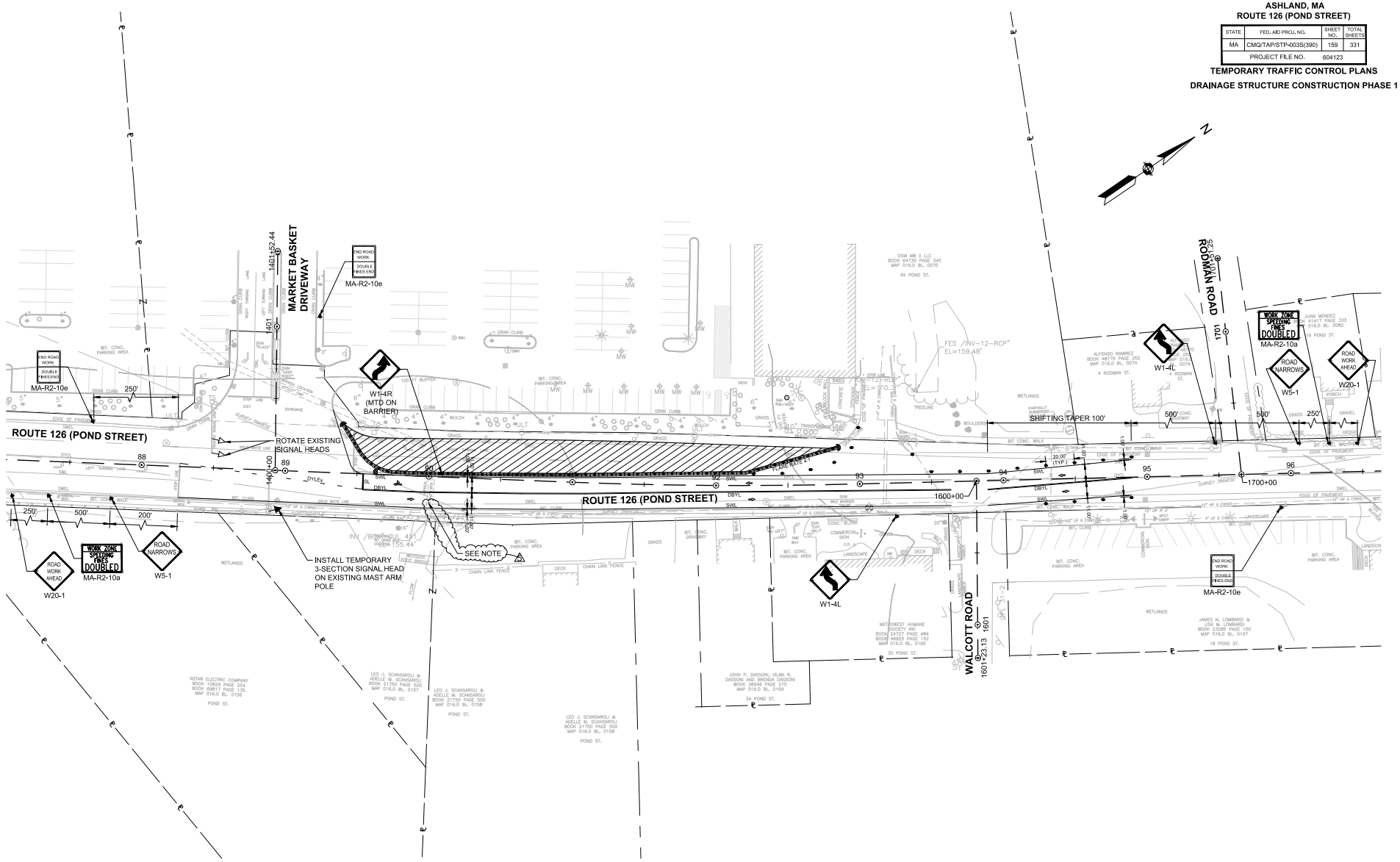
604123_H020\CONSTRUCTION SIGN SUMMARY.DWG Plotted on 18-Oct-2017 11:42 AM

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-003S(390)	159	331
PROJECT FILE NO.	604123		

TEMPORARY TRAFFIC CONTROL PLANS
DRAINAGE STRUCTURE CONSTRUCTION PHASE 1

Plotted on 12-Mar-2018 8:03 AM
604123_HD_CULVERT TMP.DWG



NOTE:

FOR DRAINAGE PIPE INSTALLATION OUTSIDE OF THE LONG-TERM WORKZONES COVERED BY STAGE 1 AND 2 SHOWN ON THIS SHEET AND ON SHEET 160, RESPECTIVELY, TYPICAL TRAFFIC MANAGEMENT SETUPS SHOWN ON SHEET 147 MAY BE USED TO FACILITATE CONSTRUCTION.

0 30 60 100
SCALE: 1" = 30'

8/24/2020	A ADD NOTE
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

WETLAND REPLICATION AREA SEDIMENTATION AND EROSION CONTROL NOTES:

1. PRIOR TO STARTING ANY WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION & SEDIMENTATION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS IDENTIFIED IN ALL APPROVAL DOCUMENTS PERTAINING TO THIS PROJECT.
2. PERIODIC INSPECTION AND MAINTENANCE OF ALL SEDIMENT CONTROL STRUCTURES SHALL BE PROVIDED TO INSURE THAT THE INTENDED PURPOSE IS ACCOMPLISHED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SEDIMENT LEAVING THE LIMIT OF WORK. SEDIMENT CONTROL MEASURES SHALL BE IN WORKING CONDITION AT THE END OF EACH WORKING DAY.
3. ALL POINTS OF CONSTRUCTION INGRESS OR EGRESS WILL BE PROTECTED TO PREVENT TRACKING OF MUD ONTO PUBLIC WAYS.
4. AFTER ANY SIGNIFICANT RAINFALL, SEDIMENT CONTROL STRUCTURES SHALL BE INSPECTED FOR INTEGRITY. ANY DAMAGED DEVICES SHALL BE CORRECTED IMMEDIATELY.
5. ANY SEDIMENT TRACKED ONTO PAVED AREAS SHALL BE SWEPT AT THE END OF EACH WORKING DAY.
6. ALL DEBRIS GENERATED DURING SITE PREPARATION ACTIVITIES SHALL BE LEGALLY DISPOSED OF OFF-SITE.
7. AN EROSION CONTROL BARRIER SHALL BE INSTALLED AS SHOWN ON THE PLANS.
8. MEANS OF EROSION AND SEDIMENT PROTECTION AS NOTED ON THE DRAWINGS INDICATE THE MINIMUM PROVISIONS NECESSARY. ADDITIONAL MEANS OF PROTECTION SHALL BE PROVIDED BY THE CONTRACTOR AS REQUIRED FOR CONTINUED OR UNFORESEEN EROSION PROBLEMS, AT NO ADDITIONAL EXPENSE TO THE OWNER.

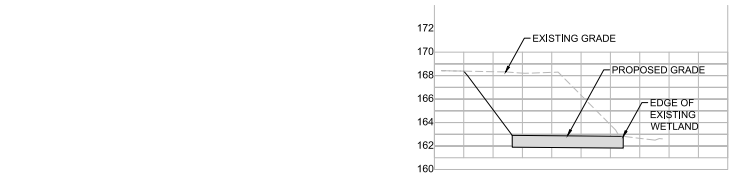
WETLAND REPLICATION AREA PLANTING NOTES AND CONSTRUCTION SEQUENCE:

1. CONTRACTOR SHALL COORDINATE WITH THE TOWN OF ASHLAND REGARDING ACCESS.
2. EROSION CONTROLS WILL BE INSTALLED ALONG THE EXISTING WETLAND BOUNDARY. THIS WILL ALLOW THE SITE CONTRACTOR TO PROPERLY TIE - IN PROPOSED CONTOURS AT THE EDGE OF THE EXISTING WETLAND.
3. UNDER THE DIRECTION OF THE WETLAND SPECIALIST, THE CONTRACTOR SHALL PROVIDE ROUGH GRADING (+/- 3 INCHES) WITHIN THE REPLICATION WETLAND. WETLAND MITIGATION GRADING IS SUBJECT TO MODIFICATION BASED ON ACTUAL SITE CONDITIONS. THE WETLAND SPECIALIST WILL INSPECT THE SUB-GRADE OF THE REPLICATION AREA TO ENSURE THAT THE PROPER HYDROLOGY AND MICROTOPOGRAPHY HAS BEEN ESTABLISHED.
4. PRIOR TO SOIL ADDITIONS AND/OR PLANTINGS, PROJECT SURVEYORS SHOULD VERIFY THAT GRADES HAVE BEEN ACHIEVED AS SHOWN ON THIS DRAWING.
5. PRIOR TO PLANTING, THE MITIGATION AREA SHOULD BE EXCAVATED APPROXIMATELY 1 FOOT BELOW THE FINISHED GRADE OF THE WETLAND MITIGATION AREA. FOLLOWING EXCAVATION OF THE MITIGATION AREA, A SOIL MIXTURE (NATURAL OR MANMADE) CONSISTING OF EQUAL VOLUMES OF ORGANIC (COMPOST) MATERIAL AND MINERAL SOIL MATERIAL SUCH AS A RICH LOAMY SAND (WITH A LOOSE FRIABLE CONSISTENCY) SHALL BE USED TO BRING THE EXCAVATED WETLAND MITIGATION AREA TO FINISHED GRADE. PRIOR TO USE, THE SOIL MIXTURE WILL BE ANALYZED BY A SOIL TESTING LABORATORY FOR TEXTURE AND NUTRIENTS. THE SELECTED CONTRACTOR WILL BE RESPONSIBLE FOR THIS COORDINATION. SEE SPECIAL PROVISION.
6. ESTIMATES OF SEASONAL HIGH GROUNDWATER (SHGW) SHALL BE DETERMINED IN THE FIELD AT THE TIME OF REPLICATION GRADING. THE FINISH GRADE OF THE WETLAND MITIGATION AREA SHALL BE SET SO THAT GROUNDWATER IS WITHIN 12" OF THE SURFACE FOR AT LEAST 14 CONSECUTIVE DAYS DURING THE GROWING SEASON.
7. PENDING SITE AND WEATHER CONDITIONS ALL PLANTINGS WILL TAKE PLACE IN SPRING (MAY 15-JUNE 15) OR FALL (SEPTEMBER 1 - NOVEMBER 1).
8. TREES PLANTED IN THE REPLICATION AREA SHALL BE LOCATED ON AREAS OF HIGHER ELEVATION (I.E., GRADED MOUNDS). TREES SHALL BE LOCATED IN THE FIELD BY THE WETLAND SPECIALIST.
9. 4" OF LOAM (WEED-FREE, FINE SANDY LOAM) AND A CONSERVATION/WILDLIFE SEED MIX WILL BE SPREAD THROUGHOUT THE GRADED 3:1 UPLAND SLOPES AND IN ALL OTHER AREAS DISTURBED BY THE CONTRACTOR AS SPECIFIED. LOAM, SEED MIXTURE AND SOURCE SHALL BE APPROVED BY THE WETLAND SPECIALIST.

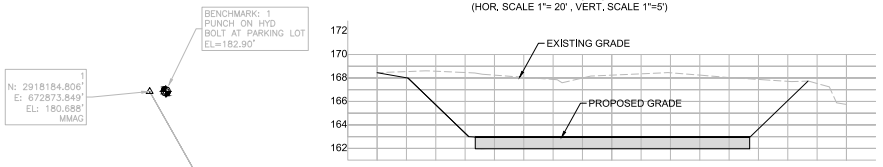
ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0035(390)	191	331
PROJECT FILE NO.	604123		

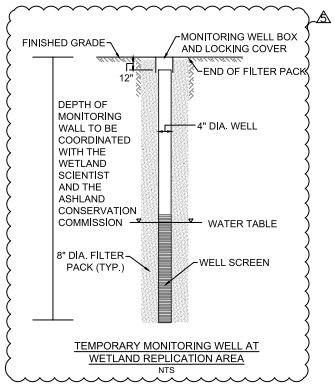
WETLAND REPLICATION PLAN
SHEET 1 OF 1



SECTION (A-A')
(HOR. SCALE 1"= 20' , VERT. SCALE 1"=5')

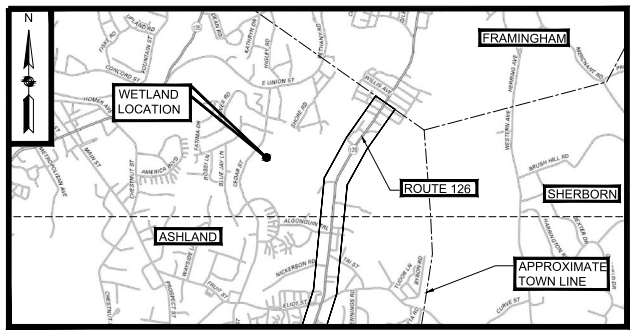


SECTION (B-B')
(HOR. SCALE 1"= 20' , VERT. SCALE 1"=5')



TEMPORARY MONITORING WELL AT WETLAND REPLICATION AREA
NTS

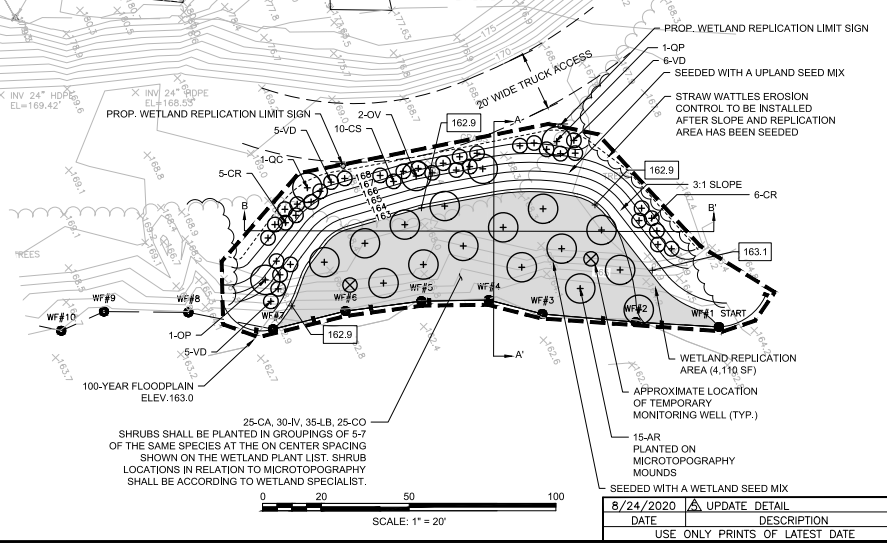
NOTE: ENTIRE LIMIT OF WORK IS LOCATED WITHIN 200' RIVERFRONT AREA ASSOCIATED WITH TRIBUTARY TO WAUSHAKUM POND.



LOCUS PLAN

LEGEND

- 4" LOAM BORROW AND CONSERVATION SEED MIX IN ALL DISTURBED UPLAND AND SLOPED AREAS
- WETLAND SOIL AND WETLAND SEED MIX
- LIMIT OF WORK
- STRAW WATTLES
- 168 — PROPOSED CONTOUR
- 170 — EXISTING CONTOUR
- COMPOST FILTER TUBE
- 163.3 — PROPOSED SPOT GRADE
- TREE



8/24/2020	1 UPDATE DETAIL
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

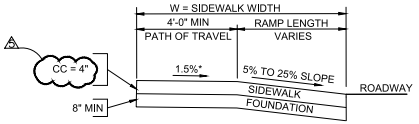
604123_HD25(WETLAND REPLICATION).DWG Plotted on 24-Aug-2020 1:30 PM

ASHLAND
ROUTE 126 (POND STREET)

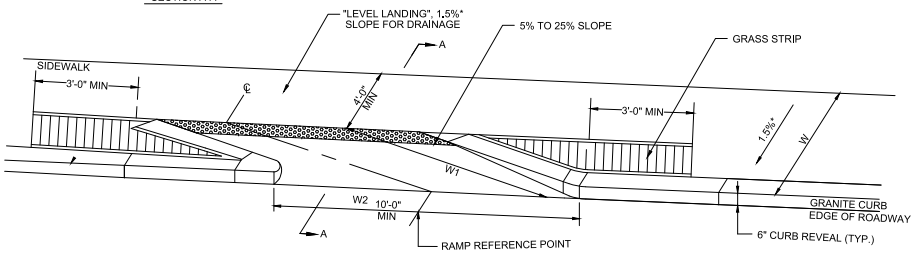
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-003S(390)	201	331
PROJECT FILE NO.	604123		

WHEELCHAIR RAMP DETAILS 3

604123_HD27\DRIVEWAY DETAILS.DWG 3-Jan-2018



SECTION A-A



BIKE RAMP #	STATION	OFFSET	WIDTH OF SIDEWALK (W) (INCLUDING GRASS STRIP)	PATH OF RAMP (W1)	WIDTH OF RAMP ENTRANCE (W2)
1	23+05.27	18.26 R	18.74	20.57	15.91
2	23+26.78	22.00 L	13.50	13.01	14.20
3	301+36.74	20.00 R	15.00	10.80	14.20
4	301+22.14	20.00 L	15.00	11.83	14.20
5	26+25.45	26.00 R	15.00	11.89	14.20
6	26+65.46	16.00 L	15.00	11.83	14.20

NOTES:
* CONSTRUCTION TOLERANCE ± 0.5%
– SEE CONSTRUCTION STANDARD E 107.6.0
** SEE CONSTRUCTION STANDARD E 107.9.0
– DETECTABLE WARNING PANELS SHALL BE INSTALLED IN ACCORDANCE WITH CONSTRUCTION STD E 107.6.5
– CONTRACTOR IS ULTIMATELY RESPONSIBLE FOR CONSTRUCTING RAMPS COMPLIANT WITH ADA/AAB RULES, REGULATIONS AND STANDARDS. CONTRACTOR SHALL VERIFY RAMPS ARE ADA/AAB COMPLIANT BEFORE POURING CEMENT CONCRETE.
*** 3 INCH CURB REVEAL

BICYCLE RAMP INTO SIDEWALK

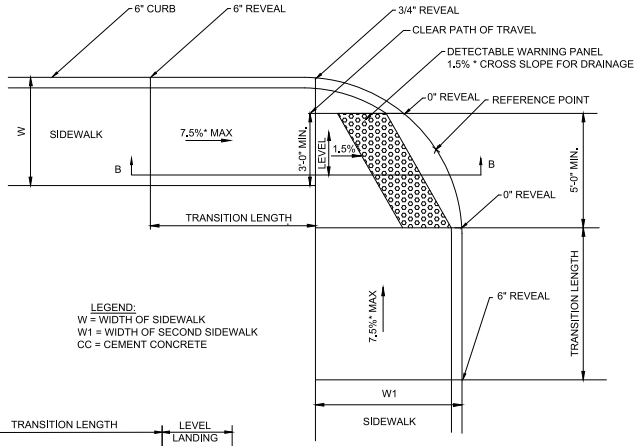
NOT TO SCALE

WCR NO.	STATION	OFFSET	WIDTH OF OPENING
1	24+05.71	6.14 R	14.00
2	24+05.80	5.25 L	13.80
3	24+87.54	86.83 R	14.00
4	25+07.51	84.33 R	13.60
5	24+73.32	84.52 L	14.00
6	24+91.52	86.44 L	14.30
7	25+83.43	3.70 L	10.67
8	25+82.15	9.03 R	10.50
9	30+39.86	26.96 L	7.30
10	30+48.73	16.00 L	6.00
11	30+62.41	27.03 L	6.80

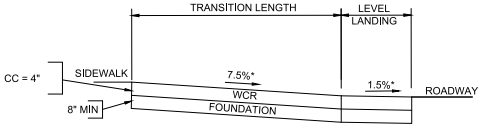
NOTE:
ALL CROSSWALK OPENINGS AT TRAFFIC ISLANDS SHALL CONFORM TO ADA/AAB REQUIREMENTS AND SHALL NOT HAVE SLOPES EXCEED 2% IN ANY DIRECTION.

CROSSWALK OPENINGS AT TRAFFIC ISLANDS

NOT TO SCALE



LEGEND:
W = WIDTH OF SIDEWALK
W1 = WIDTH OF SECOND SIDEWALK
CC = CEMENT CONCRETE



SECTION B-B

CURB CUT RAMP DETAIL

("T" INTERSECTION WHEELCHAIR RAMP)

NOT TO SCALE

WCR NO.	STATION	OFFSET	WIDTH OF SIDEWALK (W)	WIDTH OF SECOND SIDEWALK (W1)	ROADWAY GUTTER SLOPE	LEFT SIDE TRANSITION LENGTH	RIGHT SIDE TRANSITION LENGTH
3	16+35.78	25.50 L	8.00	8.00	1.20%	6.50	6.50

NOTES:
* CONSTRUCTION TOLERANCE ± 0.5%
– SEE CONSTRUCTION STANDARD E 107.6.0
** SEE CONSTRUCTION STANDARD E 107.9.0
– DETECTABLE WARNING PANELS SHALL BE INSTALLED IN ACCORDANCE WITH CONSTRUCTION STD E 107.6.5
– CONTRACTOR IS ULTIMATELY RESPONSIBLE FOR CONSTRUCTING RAMPS COMPLIANT WITH ADA/AAB RULES, REGULATIONS AND STANDARDS. CONTRACTOR SHALL VERIFY RAMPS ARE ADA/AAB COMPLIANT BEFORE POURING CEMENT CONCRETE.
*** 3 INCH CURB REVEAL

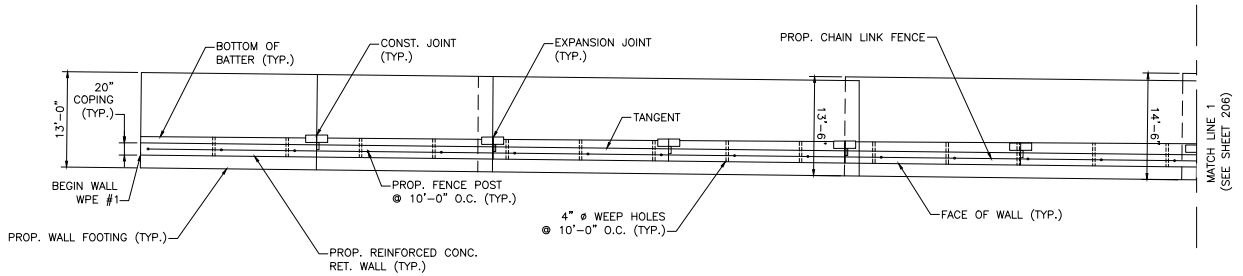
DATE	DESCRIPTION
8/24/2020	⚠ UPDATE DIMENSION
USE ONLY PRINTS OF LATEST DATE	

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-003S(390)	205	331
PROJECT FILE NO.	604123		

ELIOT STREET RETAINING WALL PLAN AND ELEVATION SHEET 1 OF 2





WB-4

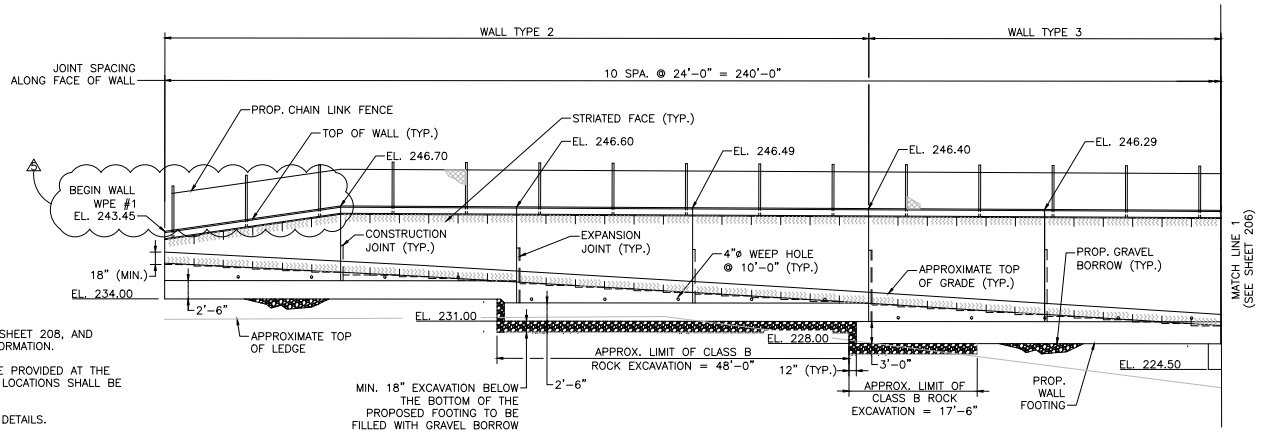
ELIOT RETAINING WALL WORKING POINT TABLE					
WORKING POINT	DESCRIPTION	STATION	OFFSET	NORTHING	EASTING
WPE #1	BEGIN WALL	32+15.00	37.62'	2913275.07	674747.05
WPE #2	POINT OF CURVATURE	34+55.95	32.05'	2913502.30	674813.56
WPE #3	END WALL	34+90.00	28.11'	2913534.32	674822.22

NOTE:
1. ELIOT WORKING POINTS LABELED AS "WPE".

ELIOT STREET RETAINING WALL LAYOUT PLAN 1
SCALE: 1/8" = 1'-0"

TANGENT DATA	
PT	= STA. 29+34.98
L	= 425.27'
PC	= STA. 33+60.25

CURVE 1 DATA	
PC	= STA. 33+60.25
Δ	= 12°-40'-54"
R	= 805.00'
L	= 178.18'
PT	= STA. 35+38.43



NOTES:
1. REFER TO TYPICAL WALL CROSS SECTIONS ON SHEET 208, AND HIGHWAY CROSS SECTIONS FOR ADDITIONAL INFORMATION.
2. TEMPORARY SUPPORT OF EXCAVATION SHALL BE PROVIDED AT THE FRONT AND BACK OF THE WALL AS REQUIRED, LOCATIONS SHALL BE APPROVED BY THE ENGINEER.
3. SEE SHEET 19 FOR CONSTRUCTION ALIGNMENT DETAILS.
4. RETAINING WALL LAID OUT BASED ON THE LINE WORK REPRESENTING THE FACE OF CURB (EXTERIOR EDGE OF SIDEWALK AS SPECIFIED ON THE HIGHWAY DESIGN DRAWINGS).

ELIOT STREET RETAINING WALL ELEVATION 1
SCALE: 1/8" = 1'-0"

8/24/2020	△5 CHANGED TOP OF WALL ELEVATION
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

604123_HD04&05(RETWALL GENERAL PLAN & ELEVATION)_REV_1.DWG Plotted on 19-Aug-2020 4:16 PM

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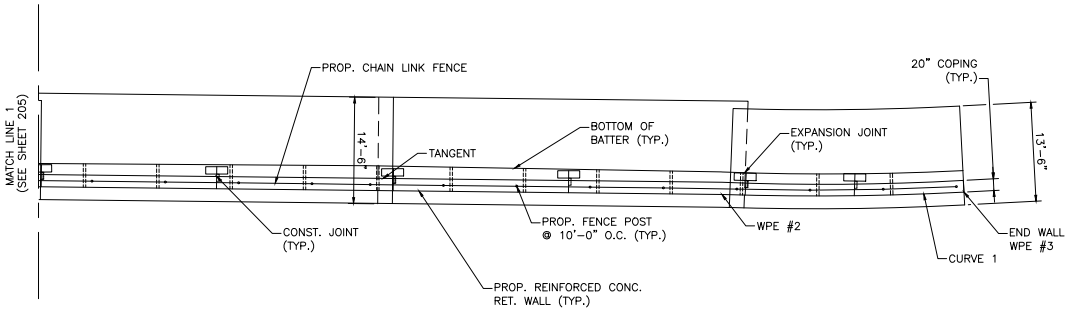
ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-003S(390)	206	331
PROJECT FILE NO.	604123		

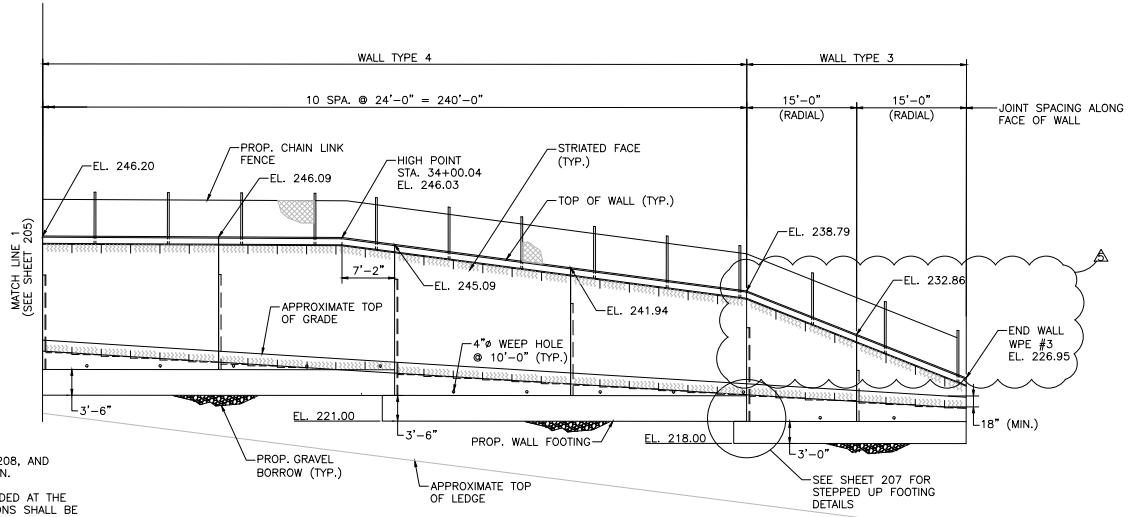
ELIOT STREET RETAINING WALL
PLAN AND ELEVATION
SHEET 2 OF 2



ELIOT STREET RETAINING WALL LAYOUT PLAN 2
SCALE: 1/8" = 1'-0"

TANGENT DATA	
PT	= STA. 29+34.98
L	= 425.27'
PC	= STA. 33+60.25

CURVE 1 DATA	
PC	= STA. 33+60.25
Δ	= 12°-40'-54"
R	= 805.00'
L	= 178.18'
PT	= STA. 35+38.43



ELIOT STREET RETAINING WALL ELEVATION 2
SCALE: 1/8" = 1'-0"

NOTES:
1. REFER TO TYPICAL WALL CROSS SECTIONS ON SHEET 208, AND HIGHWAY CROSS SECTIONS FOR ADDITIONAL INFORMATION.
2. TEMPORARY SUPPORT OF EXCAVATION SHALL BE PROVIDED AT THE FRONT AND BACK OF THE WALL AS REQUIRED, LOCATIONS SHALL BE APPROVED BY THE ENGINEER.
3. SEE SHEET 20 FOR CONSTRUCTION ALIGNMENT DETAILS.
4. RETAINING WALL LAID OUT BASED ON THE LINE WORK REPRESENTING THE FACE OF CURB (EXTERIOR EDGE OF SIDEWALK AS SPECIFIED ON THE HIGHWAY DESIGN DRAWINGS).

8/24/2020	⚠ CHANGED TOP OF WALL ELEVATION
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

\\251\Engineering\Projects\2021\13033\13033.DAR — Ashland Route 126\604123\2400\Revised Plans 2020-0727\604123_H0044051Retwall General Plan & Elevation(1_Rev_).dwg

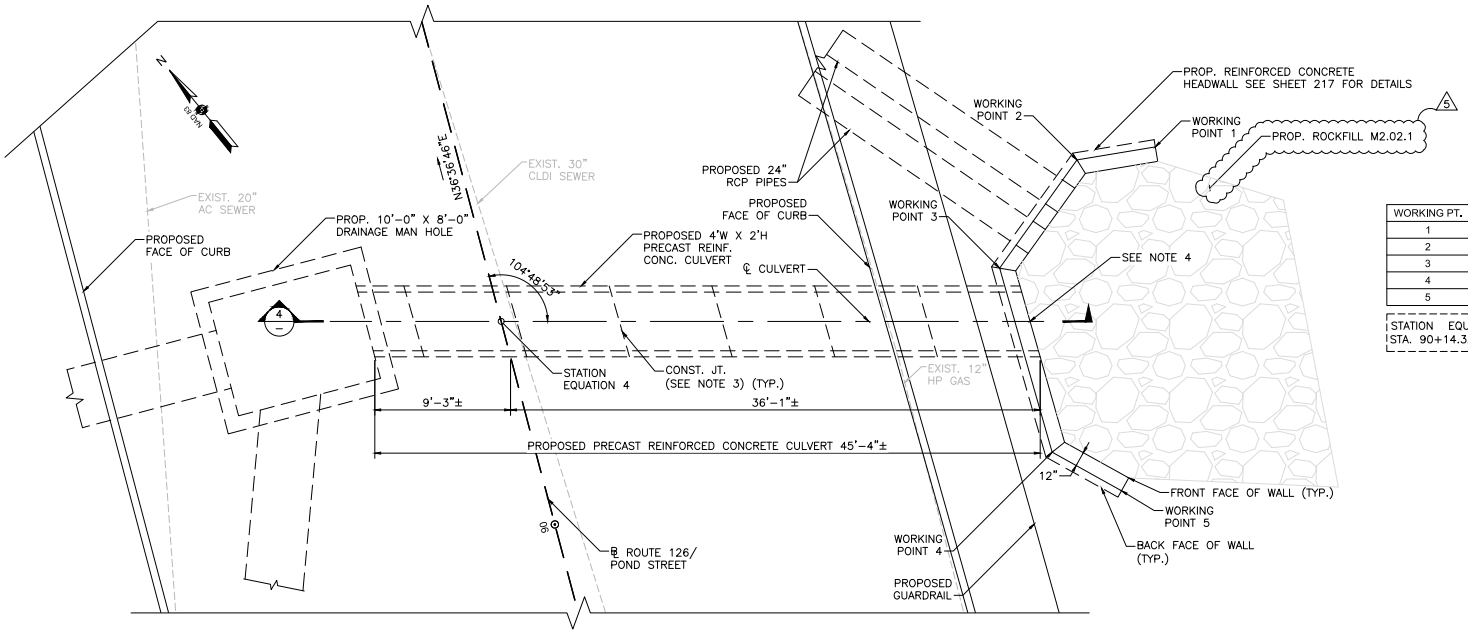
604123_H0044051RETWALL GENERAL PLAN & ELEVATION(_REV_-1.DWG Plotted on 19-Aug-2020 4:16 PM

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-003S(390)	212	331
PROJECT FILE NO.	604123		

SPECIAL DRAINAGE STRUCTURE NO.4
PLAN & SECTION

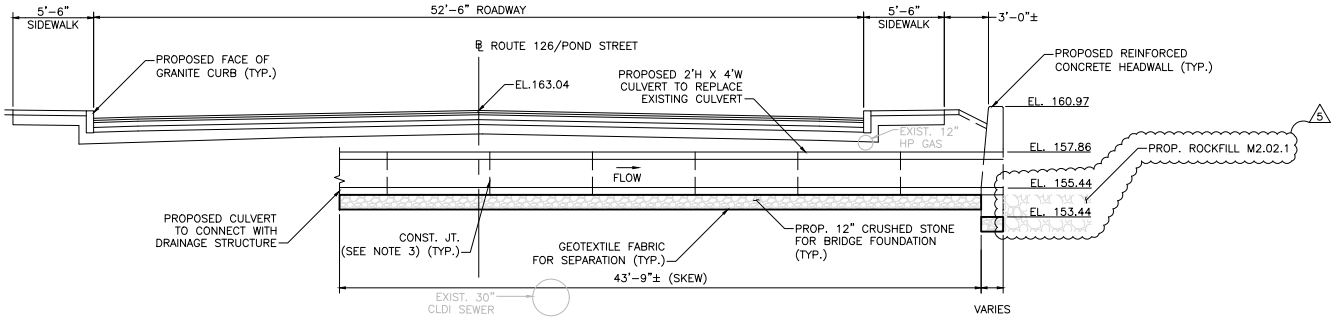
Plotted on 24-Aug-2020 8:33 AM
604123_BR01(CULVERT PLAN & ELL).DWG



WORKING PT.	STA.	OFFSET R. FT	NORTHING	EASTING
1	90+14.42	46.16	2918725.01	676257.76
2	90+14.92	40.77	2918728.64	676253.74
3	90+09.14	33.78	2918728.16	676244.68
4	89+96.09	34.04	2918717.54	676237.11
5	89+92.34	37.94	2918712.20	676238.00

STATION EQUATION 4: ROUTE 126 (POND STREET) CONSTRUCTION ℄ STA. 90+14.32 = CULVERT ℄

SPECIAL DRAINAGE STRUCTURE NO.4 PLAN
SCALE: 1/4" = 1'-0"



SECTION 4 – STA. 90+14.32 CULVERT (UPSTATION)
SCALE: 1/4" = 1'-0"

NOTES:

1. PROPOSED GUARDRAIL NOT SHOWN AT CULVERT SECTION SINCE ALL PROPOSED GUARDRAIL WILL SPAN OVER PROPOSED CULVERT SECTION.
2. SEE SHEETS 13 – 15 FOR TYPICAL APPROACH/ROADWAY CROSS SECTION AT CULVERT LOCATION.
3. PRECAST REINFORCED CONCRETE CULVERT CONSTRUCTION JOINT SPACING WILL VARY PER PRECASTER UP TO 7'-0" MAXIMUM SPACING.
4. FACE OF PRECAST REINFORCED CONCRETE CULVERT TO BE SKEWED AND WILL REQUIRE SPECIAL FABRICATION FORM THE PRECASTER.
5. ALL EXISTING UTILITY DEPTHS ARE APPROXIMATE AND SHALL BE FIELD VERIFIED PRIOR TO WORK.

0 20 50 100
SCALE: 1" = 20'

5 ADDENDUM NO. 5, AUGUST 24, 2020

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, Secretary & CEO
Jonathan L. Gulliver, Highway Administrator

massDOT
Massachusetts Department of Transportation
Highway Division

August 21, 2020

604123-111717

ADDENDUM NO. 4

To Prospective Bidders and Others on:

ASHLAND
Federal Aid Project Nos. CMQ-003S(390), STP-003S(390) & TAP-003S(390)
Roadway Reconstruction and Related Work along Route 126 (Pond Street)

OPENING OF BIDS POSTPONED TO: TUESDAY, SEPTEMBER 1, 2020 AT 2:00 P.M.

Transmitting revisions to the Contract Documents as follows:

COVER PAGE:	Revised
DOCUMENT 00104:	Revised pages 1 and 3
DOCUMENT 00813:	Deleted document in its entirety and inserted new document (4 pages)

Take note of the above, substitute revised pages for the originals, delete document indicated, insert new document in proper order, and acknowledge Addendum No. 4 in your Expedite Proposal file before submitting your bid.

Sincerely,

Eric M. Cardone
Digitally signed by Eric M. Cardone
Date: 2020.08.21 11:01:31 -04'00'

Eric M. Cardone, P.E.
Construction Contracts Engineer

Cc: Lawrence Cash, Project Manager
EMC/jmr

Ten Park Plaza, Suite 4160, Boston, MA 02116
Tel: 857-368-4636, TTY: 857-368-0655
www.mass.gov/massdot

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, Secretary & CEO
Jonathan L. Gulliver, Highway Administrator

massDOT
Massachusetts Department of Transportation
Highway Division

August 14, 2020

604123-111717

ADDENDUM NO. 3

To Prospective Bidders and Others on:

ASHLAND
Federal Aid Project Nos. CMQ-003S(390), STP-003S(390) & TAP-003S(390)
Roadway Reconstruction and Related Work along Route 126 (Pond Street)

BIDS TO BE OPENED AND READ ON: TUESDAY, AUGUST 25, 2020 AT 2:00 P.M.

Transmitting revisions to the Contract Documents as follows:

RESPONSES TO CONTRACTORS' QUESTIONS:	13 Pages
DOCUMENT 00010:	Revised pages 2 and 3
DOCUMENT 00104:	Revised page 3
DOCUMENT 00880:	Revised pages 3 through 11
DOCUMENT A00801:	Revised pages 105, 151, 199, 205, 206, 208, 212, and 214
DOCUMENT A00803:	Inserted new document (4 pages)
DOCUMENT A00891:	Inserted new document (72 pages)
DOCUMENT A00892:	Inserted new document (20 pages)

Take note of the above, substitute revised pages for the originals, insert new documents in proper order, and acknowledge Addendum No. 3 in your Expedite Proposal file before submitting your bid.

Sincerely,

Eric M. Cardone
Digitally signed by Eric M. Cardone
Date: 2020.08.14 13:09:03 -04'00'

Eric M. Cardone, P.E.
Construction Contracts Engineer

Cc: Lawrence Cash, Project Manager
EMC/jmr

Ten Park Plaza, Suite 4160, Boston, MA 02116
Tel: 857-368-4636, TTY: 857-368-0655
www.mass.gov/massdot

Mass Bay Electrical Corp. email dated July 27, 2020 (from Addendum No. 1)**:**

Question #3: We cannot find any of bid item 813.30 - WIRE TYPE 7 NO. 10 GENERAL PURPOSE – 45,500 FEET. The No. 10 wire from handholes to light fixtures and receptacles is paid for under item 813.399 – SPLICE AND EXTENSION FRON HANDHOLE TO LIGHTING FIXTURES. Should bid item 813.30 be eliminated?

Response #3: See revised page A00801-151.

Question #4: Are both lighting and pole mounted receptacles to be controlled by contactors? If so, load center details on drawing 180 do not show enough contactors. Our understanding is that there should be two 10-pole contactors in load center 1, and two 8-pole contactors in load center 2. Please advise.

Response #4: No, the pole mounted receptacles are controlled by the contactors, the lighting is controlled by a photocell.

J. H. Lynch email dated July 28, 2020 (from Addendum No. 1)**:**

Question #6: Sheet 192 Roundabout Apron Detail
Please provide a detail of the expansion and contraction joints, including smooth dowels bars and preformed joint filler.
Please provide clarification of the 12"x12" slate stone, 12" wide patterned accent strips.
Are the accent strips to be colored concrete (gray?) or slate stone?

Response #6: See new Document A00803 and revised page A00801-105.

Mass Bay Electrical Corp. email dated August 4, 2020:

Question #7: In regards to vehicle detection, will the project be open to replacing the proposed loop detectors with video detection?

Response #7: The Contractor shall bid the work as specified in the Contract Documents. Alternative construction methods and materials may be submitted by the Contractor during shop drawings review process. Any alternatives must be approved by the Engineer prior construction.

Question #8: A section in the mast arm foundation specification states "Construction of PIER foundations shall be performed in accordance with MassDOT's "Overhead Signal Structure & Foundation Standard Drawings" dated December 2015. In the event that soil conditions or ledge prevent the use of MassDOT standard foundation type, shaft foundation design by Lamson Engineering Corporation shall be followed. The design is detailed in memo titled "Mast Arm Foundation Design" dated June 10, 2020.

Could you please indicate where in the specification is the "Mast Arm Foundation Design" dated June 10, 2020?

Response #8: See new Document A00891.

J.H. Lynch & Sons, Inc., email dated August 4, 2020:

Question #9: Item 183.1-Treatment of contaminated groundwater, page A00801-86 states "Groundwater stored and tested but not requiring treatment or off-site disposal shall be discharged to a location subject to the approval of MASSDOT without payment to the contractor." Please provide pre-construction sampling and testing data of groundwater so the contractor can make this determination.

Response #9: No additional pre-construction sampling and testing has been done. Per the Spec under "Establishment of Treatment Procedure", the Contractor is responsible to perform pre-construction sampling as noted.

Question #10: Item 183.1-If groundwater testing reveals it does not require treatment or off-site disposal, under what item will the contractor be paid to compensate for the pumping water, storage tanks, testing, and labor and effort to comply with the specification?

Response #10: See revised page A00801-199.

J.H. Lynch & Sons, Inc., email dated August 4, 2020 (Continued)**:**

Question #11: The special provisions for Item 183.1 on Page A00801-83 states it is LIKELY that treatment using carbon will be required. Page A00801-85 states to establish a basis for the bid it is ANTICIPATED that carbon will be required. Page A00801-86 states "for the purposes of bidding process, it is ANTICIPATED that sedimentation tanks and carbon filtering will be used. MASSDOT clearly desires bids based on water requiring carbon filtration. However, if the water does not require it, MASSOT does not want to pay any costs for handling water. Please establish a pay item for Treatment of NON-Contaminated groundwater to compensate contractors for handling water in case it turns out to not require carbon filtration.

Response #11: See Response #10.

Question #12: Item 953.31-953.34-Special provision on page A00801-196 states the maximum depth of excavation is 15'. The next paragraph states the excavation support system shall be designed to allow for a 2 foot depth of over excavation. Is this in addition to the 15' or, does the 15' take into account this 2 foot potential over-excavation depth?

Response #12: The 15 foot depth considers the 2 foot potential over-excavation depth.

Question #13: Confirm that item 183.1 and 183.2 will be used as compensation for treatment of groundwater generated during dewatering in addition to Items 991.11-991.14 Control of Water-Drain Structures 1-4.

Response #13: Items 183.1 and 183.2 shall be used as compensation for treatment of contaminated groundwater. Items 991.11 through 991.14 shall be used for control of water for non-contaminated water.

Question #14: Confirm that item 183.1 and 183.2 will be used as compensation for handling surface water runoff during construction in addition to Items 991.11-991.14 Control of Water-Drain Structures 1-4.

Response #14: Items 183.1 and 183.2 shall not be used as compensation for handling surface water runoff. Items 991.11 through 991.14 shall be used for handling of surface water and groundwater.

J.H. Lynch & Sons, Inc., email dated August 4, 2020 (Continued)**:**

Question #15: Items 991.11 through 991.14-Control of Water require the contractor to control flow of existing surface water and groundwater. By reviewing the WQC, it seems there will not be a requirement for any bypass pumping as they are intermittent streams and work is to be done during low flow periods. If there are certain flow rates that are to be maintained at each Drainage Structure, please provide them.

Response #15: Flow rates are not to be maintained at any of the four drainage areas.

Question #16: If flow data can not be provided, what flow rate (gpm), if any, will the submittal reviewing engineer check the contractor submittal against to make sure the contractor meets the required capacity?

Response #16: There is no required capacity for flow rates since these are intermittent streams and work is required to be performed during low flow periods.

Question #17: Page A00801-199 under Basis of Payment for items 991.11-991.14 states that the control of water items shall include "all labor, equipment, transportation, ***additional site testing***, maintenance, removal and disposal of materials and structures, and incidentals necessary to complete the work." What is required or what it the intent for the requirement of "***additional site testing***"?

Response #17: Testing for groundwater contamination is covered under Item 183.1. See revised page A00801-199.

Question #18: Plan Sheets 159 and 160 show traffic management plans for Drain Structure No. 4 at Pond St. Sta. 90+14. In stage 1 there is 1 lane in each direction. Then stage 2 calls for 1 lane NB and 2 lanes SB. Can stage 2 be allowed to put 1 lane in each direction and allow a larger work zone to accommodate the work in the middle of the road?

Response #18: The traffic management plans were designed based on the existing signal layout and minimizing the impact to traffic operation and have been approved by MassDOT. The work in the middle of the road involves installing drainage pipeline, which can be covered by typical traffic management applications in Sheet 147. As indicated in temporary traffic control notes, the contractor shall coordinate approval of any changes to the temporary traffic control plan with the Engineer prior to construction activities.

J.H. Lynch & Sons, Inc., email dated August 4, 2020 (Continued)**:**

Question #19: Regarding traffic management plans the note on plan sheet 155 states it is recommended that the wall is to be constructed prior to any utility pole relocation. Please provide a temporary traffic control plan for the construction of the Eliot St. wall.

Response #19: *This question will be addressed in a later addendum.*

Question #20: The Parking lot behind the retaining wall at Sta. 32+15 – 34+90 Left will likely need to be patched/paved as a result of excavation impacts with the wall, under what item will this HMA be paid for? Confirm it will be constructed as an HMA driveway-2.5" SIC 19.0 & 1.75" of SSC-12.5 and paid under Item 702. Confirm fine grading of the area prior to driveway repair will be paid for under Item 170.

Response #20: *This question will be addressed in a later addendum.*

Question #21: Are tiebacks or any portions of support of excavation systems allowed to remain permanently in the ground within the temporary easement area located at the Eliot St. wall?

Response #21: Portions of the support of excavation systems or tiebacks are not allowed to remain permanently in the grown within the temporary easement area located at the Eliot Street wall.

Question #22: Can the parking lot behind the wall within the Temp. Easement shown on plan sheet 19 and 20 be closed during construction to not allow traffic on top of the support of excavation area?

Response #22: *This question will be addressed in a later addendum.*

J.H. Lynch & Sons, Inc., email dated August 4, 2020 (Continued)**:**

Question #23: Please provide a traffic management plan for the Spyglass retaining wall.

Response #23: *This question will be addressed in a later addendum.*

Question #24: Please provide a phased traffic management plan for Drainage Structure No. 1 at Pond St. Sta. 37+48.

Response #24: The two-lane road one lane alternating traffic application and the two-lane road shoulder and travel lane closure traffic application on Sheet 147 can be used as traffic management setup for construction of Drainage Structure No. 1.

Question #25: Please provide a phase traffic management plan for Drainage Structure No. 2 at Pond St. Sta. 41+98.

Response #25: The two-lane road shoulder and travel lane closure traffic application on Sheet 147 can be used as traffic management setup for construction of Drainage Structure No. 2. Drainage structure No. 2 is a culvert extension that would be cast in place, temporary concrete barriers can be deployed in place of the guardrail for a period of time.

Question #26: Please provide a phased traffic management plan for Drainage Structure No. 3 at Pond St. Sta. 80+41.

Response #26: The two-lane road, one lane alternating traffic application, the two-lane road shoulder, and travel lane closure application on sheet 147 can be used as traffic management setup for construction of Drainage Structure No. 3.

J.H. Lynch & Sons, Inc., email dated August 4, 2020 (Continued)**:**

Question #27: Plan Sheets 159 and 160 show traffic management plan for the drainage structure at Sta. 90+00 to 91+00. In stage 1 there is 1 lane in each direction. Then stage 2 calls for 1 lane NB and 2 lanes SB. This is in conflict with the minimum lane requirements shown on the detail on plan sheet 148 "Typical Application-Two Lane Road Shoulder and Travel Lane Closure" showing 2 each 11' wide lanes. Can stage 2 be allowed to put 2 each 11' lanes and allow a larger work zone to accommodate the work in the middle of the road?

Response #27: Traffic management plans in plan sheets 159 and 160 are designed for proposed construction in the vicinity of a signalized intersection, and it is not in conflict with the minimum lane requirements shown on the detail on plan sheet 147 "Typical Application-Two Lane Road Shoulder and Travel Lane Closure" showing two 11' wide lanes.

The traffic management plans were designed based on the existing signal layout and minimizing the impact to traffic operation and have been approved by MassDOT. The work in the middle of the road involves installing drainage pipeline, which can be covered by typical traffic management applications on Sheet 147. As indicated in the temporary traffic control notes, the contractor shall coordinate approval of any changes to the temporary traffic control plan with the Engineer prior to construction activities.

Question #28: At the start and end of Eliot St. retaining wall, the exposed heights are +/-7' +/-10' respectively. Can the wall ends be extended or grading plans be provided for the Eliot St. wall ends as this seems extremely high to have the retaining walls end at those heights.

Response #28: *This question will be addressed in a later addendum.*

Question #29: Would extending the wall be considered incidental to the lump sum wall item or will the contractor be paid if the walls need to be lengthened to adjust for field conditions.

Response #29: *This question will be addressed in a later addendum.*

Question #30: Confirm that no mock-ups are required for the Wall Structure No. 1 and 2 to evaluator color, texture, appearance of the concrete walls.

Response #30: Confirmed. No mock-ups are required for the Wall Structures No. 1 and No. 2 to evaluate color, texture, appearance of the concrete walls.

J.H. Lynch & Sons, Inc., email dated August 4, 2020 (Continued)**:**

Question #31: Confirm that no color staining, stone patterns, or any other architectural feature other than striation is required for Wall Structure No. 1 and 2.

Response #31: Confirmed. No color staining, stone patterns, or any other architectural feature other than striation is required for Wall Structures No. 1 and No. 2.

Question #32: Regarding the Lump Sum drainage structures, Page A00801-204 states that existing utility locations shall be verified in the field prior to starting this work. Special Provision on page A00801-205 states the contractor shall dig test pits to verify the existing culvert dimensions prior to ordering the material and all costs shall be incidental and paid for under the lump sum price. These special provisions are repeated for all 4 wall item No.'s 997.1 through 997.4. Are test pits at the special drainage structures incidental or, will they be paid under Item 141.1-Test Pit for Exploration?

Response #32: See revised pages A00801-205, A00801-206, A00801-208, A00801-212, and A00801-214.

Question #33: Confirm excavation for culverts will be paid for under Item 141.and is not considered incidental to Item No's 997.1-997.4.

Response #33: No. The excavation for the culverts will be paid for under Item 140.

Question #34: Confirm crushed stone for bridge foundation will be paid for under Item 156.1 and is not considered incidental to Item No's 997.1-997.4.

Response #34: Confirmed. Crushed stone for the bridge foundation will be paid for under Item 156.1.

Question #35: Confirm Gravel Borrow for backfilling structures and pipes will be paid for under Item 151.2 and is not considered incidental to Item No's 997.1-997.4.

Response #35: Confirmed. Gravel borrow for backfilling structures and pipes will be paid for under Item 151.2.

J.H. Lynch & Sons, Inc., email dated August 4, 2020 (Continued)**:**

Question #36: Item 997.2 Special Drainage Structure No. 2 states that it is for the work required to cast-in-place the culvert extension. It then states the "The manufacturer shall submit evidence at the request of the Engineer showing that he has successfully completed work of similar magnitude prior to being approved as the source of the material for this work. The manufacturing process shall be closely supervised by experienced plant personnel and records of plastic and concrete strength shall be kept and submitted to the Engineer for control." If this work is Cast-in-Place, what is this requirement referring to? The last 4 paragraphs on Page A00801-207 go on describing precast requirements. Is the culvert extension Cast-In-Place or Precast?

Response #36: *This question will be addressed in a later addendum.*

Question #37: Item 997.2 special provision also references that the work includes the Headwalls and rip rap. Confirm that rip rap shall be paid under Item 983.1 and not as part of the Lump Sum.

Response #37: *This question will be addressed in a later addendum.*

Question #38: The Boring Log Location Plans indicates six Pavement Core locations and forty six Test Pits locations. Please provide the results of the pavement cores and test pits.

Response #38: See new Documents A00891 and A00892.

Question #39: Regarding Item 945.011-30 Inch Utility Pole Caisson-please provide the loads and pole height that the special provisions state will be provided by Eversource so that contractors can design the caisson.

Response #39: *This question will be addressed in a later addendum.*

J.H. Lynch & Sons, Inc., email dated August 4, 2020 (Continued)**:**

Question #40: Regarding Item 945.011-special provisions state the contractor is responsible for soil type determination-can MassDOT provide a soil type so all bidders are bidding on the same soil conditions similar to what is done for mast arm foundations?

Response #40: See new Documents A00891 and A00892.

Question #41: The plans for the Eliot Street retaining wall include footing elevations that differ from the elevations shown in the cross section. At station 32+50, the cross section shows the bottom of the footing for the wall slightly below 232'. The Plans show the footing to be placed at 234'. Please clarify which drawing will govern.

Response #41: *This question will be addressed in a later addendum.*

Question #42: Were any precast wall systems considered as a more cost effective option to the cast-in-place retaining walls? If so, can you provide the design information as to the reasoning that the CIP option was chosen?

Response #42: The Contractor shall bid the work as specified in the Contract Documents.

Highway Tech Signal Equipment Sales, Inc., email dated August 5, 2020:

Question #43: In regards to the light poles for Items 821.50, 821.51, 821.52,821.53. On page 173 of the special provisions it stats under "material" that "a. Pole shaft: shall be ASTM A240 201L Stainless Steel," and "c. Base Plate: ASTM A240 stainless steel with circumferential welding top and bottom, to pole." Then its states further on in the specification to paint them gloss black. Do these light poles need to be stainless steel? Would galvanized steel be considered an approved equal, how the final finish will be powder coat gloss black?

Response #43: As part of the submittal process, the Contractor may propose alternative materials.

McCourt Construction email dated August 6, 2020:

Question #44: What are the work area restrictions and allowable work hours for the full depth pavement construction work?

Response #44: *This question will be addressed in a later addendum.*

Question #45: Will existing traffic be allowed to travel on unpaved sections of the roadway?

Response #45: *This question will be addressed in a later addendum.*

Question #46: What is the length of the work zone that existing traffic can travel on unpaved sections of the roadway?

Response #46: *This question will be addressed in a later addendum.*

Question #47: Is the Contractor responsible for installing the support system for the temporary gas bypass?

Response #47: The Contractor is responsible for installing the support system for the temporary gas bypass and coordination with the gas company.

Question #48: Per the COVID 19 Guidelines and Procedures included within Article A00801, please provide the number of field stall that MassDOT will assign to the project so that the PPE that the Contractor supplies to department field personnel can be determined.

Response #48: *This question will be addressed in a later addendum.*

Question #49: Sheet No. 5, Boring Location Plan, shows Pavement Core and Test Pits. Please provide the logs and information for these subsurface investigations.

Response #49: See new Documents A00891 and A00892.

Question #50: Typical Sections shown on Sheet 13 show either 8" of existing subbase meeting Specification M1.03.0 or 8" of gravel borrow below the sidewalks, multi-use path/sidewalk, ect. Will payment of the use of the existing subbase material be paid under Item 151.2, Gravel Borrow, once it meets Specification M1.03.0?

Response #50: *This question will be addressed in a later addendum.*

Question #51: Under what bid item shall the Proposed Cement Concrete Bike Ramps be paid under?

Response #51: *This question will be addressed in a later addendum.*

Question #52: On Sheet No. 19, Construction Plans (4 of 17), proposed cement concrete curb is shown. Please add pay item for this work.

Response #52: *This question will be addressed in a later addendum.*

E.T.& L. Corp. email dated August 6, 2020:

Question #53: 6"x6" tapping sleeves are proposed at relocate hydrant locations on Rte. 126, Sta.'s 78+68 & 96+58. There is no bid item for 6"x6" tapping sleeves.

Response #53: *This question will be addressed in a later addendum.*

P. Gioioso & Sons, Inc. email dated August 10, 2020:

Question: #54: Regarding Item 120 Earth Excavation, would it be possible to add a Bid Item for excavation of existing HMA and Concrete Pavements ?

Response #54: *This question will be addressed in a later addendum.*

J.H. Lynch & Sons, Inc., email dated August 12, 2020:

Question #55: The Special Provisions for Item 755.35 state that monitoring wells shall include data loggers.
Please provide a detail of the monitoring well
Please provide information regarding the data loggers such as acceptable brands and model numbers.

Response #55: *This question will be addressed in a later addendum.*

J.H. Lynch & Sons, Inc., email dated August 13, 2020:

Question #56: The Special Provisions state "All trees, stumps, or brush not specified to remain shall be removed and shall not be stockpiled in the wetland resource areas while awaiting disposal. Work shall be coordinated with the Clearing or Tree Removal item and compensated under that Item."
Please confirm that 'that Item' refers to the Clearing and/or Tree Removal items and not Item 755.35.

The Basis of Payment states "Excavation in access of 12 needed for wetland soil will be paid under Item 120.1"
Should this read 'Excavation in access of 12 inches needed for wetland soil will be paid under Item 120.'?

Response #56: *This question will be addressed in a later addendum.*

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, Secretary & CEO
Jonathan L. Gulliver, Highway Administrator

MassDOT
Massachusetts Department of Transportation
Highway Division

August 6, 2020

604123-111717

ADDENDUM NO. 2

To Prospective Bidders and Others on:

ASHLAND
Federal Aid Project Nos. CMQ-003S(390), STP-003S(390) & TAP-003S(390)
Roadway Reconstruction and Related Work along Route 126 (Pond Street)

OPENING OF BIDS POSTPONED TO: TUESDAY, AUGUST 25, 2020 AT 2:00 P.M.

Transmitting revisions to the Contract Documents as follows:

COVER PAGE: Revised

DOCUMENT 00104: Revised page 1

Take note of the above, substitute revised pages for the originals, and acknowledge Addendum No. 2 in your Expedite Proposal file before submitting your bid.

Sincerely,

Eric M. Cardone
Digitally signed by Eric M. Cardone
Date: 2020.08.06 13:34:45 -04'00'

Eric M. Cardone, P.E.
Acting Construction Contracts Engineer

Cc: Lawrence Cash, Project Manager
EMC/jmr

Ten Park Plaza, Suite 4160, Boston, MA 02116
Tel: 857-368-4636, TTY: 857-368-0655
www.mass.gov/massdot

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, Secretary & CEO
Jonathan L. Gulliver, Highway Administrator

MassDOT
Massachusetts Department of Transportation
Highway Division

July 31, 2020

604123-111717

ADDENDUM NO. 1

To Prospective Bidders and Others on:

ASHLAND
Federal Aid Project Nos. CMQ-003S(390), STP-003S(390) & TAP-003S(390)
Roadway Reconstruction and Related Work along Route 126 (Pond Street)

BIDS TO BE OPENED AND READ ON: TUESDAY, AUGUST 11, 2020 AT 2:00 P.M.

Transmitting revisions to the Contract Documents as follows:

RESPONSES TO CONTRACTORS' QUESTIONS:	2 Pages
DOCUMENT 00010:	Revised page 1
DOCUMENT 00715:	Deleted document in its entirety and inserted new document (54 pages)
DOCUMENT 00813:	Deleted document in its entirety and inserted new document (4 pages)
DOCUMENT A00801:	Revised pages 2, 7, 203, 206, 209, 212, and 215
PLAN SET:	Revised Sheets 135, 137, and 139 of 331

Take note of the above, substitute revised pages and plans for the originals, delete documents indicated, insert new documents in proper order, and acknowledge Addendum No. 1 in your Expedite Proposal file before submitting your bid.

Sincerely,

Lawrence Poulos
Digitally signed by Lawrence Poulos
Date: 2020.07.31 11:53:54 -04'00'

for Eric M. Cardone, P.E.
Acting Construction Contracts Engineer

Cc: Lawrence Cash, Project Manager
EMC/jmr

Ten Park Plaza, Suite 4160, Boston, MA 02116
Tel: 857-368-4636, TTY: 857-368-0655
www.mass.gov/massdot

J. H. Lynch email dated July 23, 2020:

Question #1: The RRFB's (Item 824.211 to 824.227) are not called out on any plans. Please provide plans to show foundations and conduit locations.

Response #1: The Pavement Marking & Signing Plans include the RRFB callouts and the related conduit. Refer to the RRFB Details plan for additional information related to the RRFB foundations.

Question #2: The Traffic Signal plans call out for service connections at Traffic Signal Location # 2 and Traffic Signal Location # 3. Please add the items 813.82 and 813.83 that are shown on sheets 136 and 138 respectively.

Response #2: Per the specification, the service connections are included under Items 815.1, 815.2, and 815.3. Refer to revised Sheets 135, 137, and 139 of 331.

Mass Bay Electrical Corp. email dated July 27, 2020:

Question #3: We cannot find any of bid item 813.30 - WIRE TYPE 7 NO. 10 GENERAL PURPOSE – 45,500 FEET. The No. 10 wire from handholes to light fixtures and receptacles is paid for under item 813.399 – SPLICE AND EXTENSION FRON HANDHOLE TO LIGHTING FIXTURES. Should bid item 813.30 be eliminated?

Response #3: *This question will be addressed in a later addendum.*

Question #4: Are both lighting and pole mounted receptacles to be controlled by contactors? If so, load center details on drawing 180 do not show enough contactors. Our understanding is that there should be two 10-pole contactors in load center 1, and two 8-pole contactors in load center 2. Please advise.

Response #4: *This question will be addressed in a later addendum.*

J. H. Lynch email dated July 28, 2020:

Question #5: The Drainage & Utility Details state to see MassDOT Detail E 205.2.0 for the standard leaching basin detail.
Please confirm that the leaching basins may be precast, in lieu of being constructed of cement concrete blocks.

Response #5: Precast leaching basins are acceptable.

Question #6: Sheet 192 Roundabout Apron Detail
Please provide a detail of the expansion and contraction joints, including smooth dowels bars and preformed joint filler.
Please provide clarification of the 12"x12" slate stone, 12" wide patterned accent strips.
Are the accent strips to be colored concrete (gray?) or slate stone?

Response #6: *This question will be addressed in a later addendum.*

Advanced Drainage Systems, Inc., email dated July 29, 2020:

Question #7: The Project is currently specified with 12-, 15-, 18-, and 24-inch Reinforced Concrete Pipe (RCP), as well as 12-, 15-, 18-, and 24-inch RCP Class V. Item Number and quantities are as follows:

241.12 = 12-Inch Reinforced Concrete Pipe (2,500 LF)
241.15 = 15-Inch Reinforced Concrete Pipe (475 LF)
241.18 = 18-Inch Reinforced Concrete Pipe (880 LF)
241.24 = 24-Inch Reinforced Concrete Pipe (1,000 LF)

244.12 = 12-inch Reinforced Concrete Pipe Class V (1,900 LF)
244.15 = 15-inch Reinforced Concrete Pipe Class V (500 LF)
244.18 = 18-Inch Reinforced Concrete Pipe Class V (1,750 LF)
244.24 = 24-Inch Reinforced Concrete Pipe Class V (1,170 LF)

We would like to respectfully request that corrugated polypropylene pipe (per AASHTO M330) be allowed under the pipe option for the above referenced items; polypropylene pipe (per AASHTO M330) is included within the Commonwealth of Massachusetts Department of Transportation Standard Specifications for Highways and Bridges (2020 Edition) Division III-Materials Specifications, Section M5.03.10 Corrugated Plastic Pipe. If allowed, the installation of the corrugated polypropylene pipe (per AASHTO M330) would follow MassDOT Installation Guidelines.

Response #7: The concrete pipes, as specified in the contract documents, shall be used.

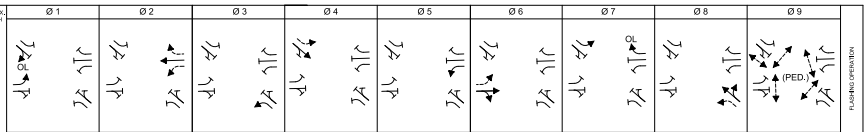
ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0035(390)	135	331
PROJECT FILE NO. 604123			

TRAFFIC SIGNAL TIMING PLAN
LOCATION 1
ROUTE 126 (POND STREET) AT ELIOT STREET

SEQUENCE & TIMING FOR FULL ACTUATED CONTROL ELIOT STREET AT ROUTE 126 (POND STREET)

APPROX. NORTH



INTERVALS

APPROACH	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	4	5	6	13	14	15	16	17	18	19	20	21	22	23	24
ROUTE 126 (POND STREET)	NB	A,S																											
ROUTE 126 (POND STREET)	NB	B,C	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	FY
ROUTE 126 (POND STREET)	SB	G																											
ROUTE 126 (POND STREET)	SB	H,J	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FY
ROUTE 126 (POND STREET)	SB	K	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FY
ELIOT STREET	EB	D																											
ELIOT STREET	EB	E,F	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FR
ELIOT STREET	EB	P,Q,R			R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FR
ELIOT STREET	WB	L																											
ELIOT STREET	WB	M,N	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	FR
PEDESTRIAN	ALL	P,Q,R	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	OFF

TIMING IN SECONDS

MINIMUM GREEN (INITIAL)	8			10			6			8			6			10			6			8					
MAX GREEN 1	12			44			6			28			6			51			17			15					
MAX GREEN 2	11			40			9			25			6			47			12			23					
VEHICLE EXTENSION	3			3			3			3			3			3			3			3					
YELLOW CLEARANCE		3			4			3			3			3			4			3			3				
RED CLEARANCE			4,5			3			5,5			4			4,5			3			5,5			4			3
PED WALK INTERVAL																										7		
PED CLEARANCE INTERVAL																											23	
DETECTION (MEMORY)		NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			LOCK		
RECALL		OFF			MIN			OFF			OFF			OFF			MIN			OFF			OFF			OFF		

EMERGENCY ONLY

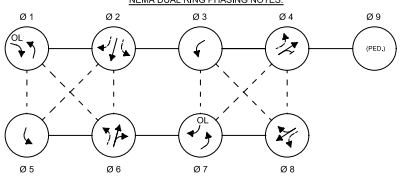
MAJOR ITEMS REQUIRED

SYS DESC	QUANTITY	ITEM
	1	SERVICE CONNECTION (UNDERGROUND)
	1	CONTROLLER NEMA 8 PHASE TS2 (TYPE 1), CAB, & FDN
	1	40 FT TYPE EL GALV, STEEL MAST ARM ASSEMBLY, BASE & FDN
	1	30 FT TYPE EL GALV, STEEL MAST ARM ASSEMBLY, BASE & FDN
	2	20 FT TYPE EL GALV, STEEL MAST ARM ASSEMBLY, BASE & FDN
	3	10 FT SIGNAL POST, BASE & FDN
	7	8 FT PEDESTRIAN SIGNAL POST, BASE & FDN
	11	12 INCH 1 WAY SEGCTION LED VEHICLE SIGNAL INDICATION
	5	12 INCH 1 WAY SEGCTION LED VEHICLE SIGNAL INDICATION
815,1	1	12 INCH 1 WAY SEGCTION LED VEHICLE SIGNAL INDICATION
	10	16 INCH LED PEDESTRIAN SIGNAL INDICATION WITH COUNTDOWN
	10	APS DEVICE, SIGN & SADDLE
	1	PREEMPTION PHASE SELECTOR MODULE-FOUR CHANNEL
	1	PREEMPTION CARD RACK
	1	EMERGENCY PRE-EMPTION CONFIRMATION STROBE LIGHT
	4	EMERGENCY PRE-EMPTION RECEIVER (DETECTOR) - ONE WAY
	19	TYPE Q ROADWAY STANDARD QUADRUPOLE LOOP DETECTOR (6'X27')
	2	TYPE DQ ROADWAY DOUBLE QUADRUPOLE LOOP DETECTOR (5'X4,5')
	3	FOUR CHANNEL LOOP DETECTOR AMPLIFIER
	1	BUS INTERFACE UNIT (SPARE)
	1	DUAL CHANNEL LOOP DETECTOR AMPLIFIER (SPARE)
811,31	15	12" x 12" PULLBOX (SDD,031)

PLUS ALL NECESSARY DUCT, CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION OF A FULLY OPERATIONAL SIGNAL SYSTEM AS INTENDED ON THESE PLANS

NOTES:
1. STANDARD NEMA CLEARANCES SHALL APPLY.
2. MAXIMUM GREEN 1 SHALL BE IN EFFECT ON WEEKDAYS FROM 6AM TO 9AM.
3. MAXIMUM GREEN 2 SHALL BE IN EFFECT ALL OTHER TIMES.
4. PREEMPTION MINIMUM GREENS SHALL BE SIX SECONDS.
5. EMERGENCY VEHICLE PREEMPTION SHALL BE ACTUATED BY AN OPTICAL SIGNAL FROM AN OPTICAL EMITTER MOUNTED ON AN EMERGENCY VEHICLE AND RECEIVED BY AN OPTICAL DETECTOR LOCATED AT INTERSECTION. A SEPARATE RECEIVING DETECTOR IS REQUIRED FOR EACH DETECTED APPROACH.
6. NORMAL CLEARANCES SHALL BE PROVIDED ON PHASES THAT ARE TERMINATED BY PREEMPTION DEMAND.
7. PEDESTRIAN PHASE SHOULD ONLY BE SERVED UPON PEDESTRIAN PUSHBUTTON ACTIVATION.

NEMA DUAL RING PHASING NOTES:



1. PHASES ASSOCIATED BY A SOLID LINE SHALL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE MAY OPERATE CONCURRENTLY.
3. THROUGH MOVEMENTS MAY INCLUDE RIGHT TURNS.
4. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT SHALL NOT CHANGE DURING THE CHANGE INTERVAL(S) UNLESS OTHERWISE NOTED.

LOOP DETECTOR DATA

SEE PLAN SHEET LOOP DETECTOR DETAILS FOR LOOP CONSTRUCTION, SPLICING, DETAILS & NOTES. DELAY TIME EFFECTIVE ONLY DURING CALLED Ø RED TIME IN SEC.

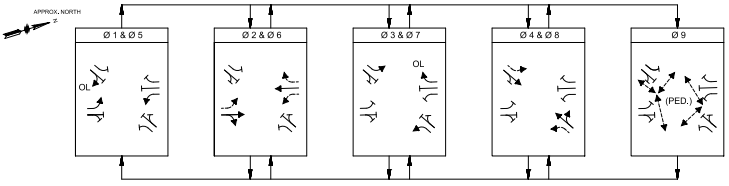
DETECTOR NUMBER	AMPLIFIER NUMBER	CHANNEL NUMBER	LOOP SIZE	NUM. OF TURNS	Ø CALLED	Ø EXT.	MODE A=PULSE B=PRES.	DELAY TIME	EXT. TIME
1	1	1	6'X23'	2-4-2	1	1 & 5	B	-	-
2	1	2	6'X23'	2-4-2	6	6	B	-	-
3	1	3	5'X4,5'	2-4-2	6	6	B	-	-
4	2	1	5'X4,5'	4-3-3-4	2	2	B	-	-
5	2	2	6'X23'	4-5-4	2	2	B	-	-
6	2	3	6'X23'	2-4-2	2	2	B	-	-
7	2	4	6'X23'	2-4-2	5	2 & 5	B	-	-
8	3	1	6'X23'	2-4-2	4	4	B	-	-
9	3	2	6'X23'	2-4-2	7	4 & 7	B	-	-
10	3	3	6'X23'	2-4-2	3	3 & 8	B	-	-
11	3	4	6'X23'	2-4-2	8	8	B	-	-
12	1	4	6'X23'	2-4-2	1	1	B	-	-

FIRE PRE-EMPTION SCHEDULE

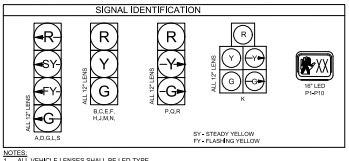
RECEIVER AND PRIORITY	PRE-EMPT PHASE ASSIGNMENT	APPROACH AND MOVEMENT	VEHICLE PHASE ASSIGNMENT	NEXT PHASE CALLED
R1	1	EB	Ø 4 + Ø 7	Ø 4 + Ø 8
R2	2	WB	Ø 3 + Ø 8	Ø 4 + Ø 8
R3	3	NB	Ø 1 + Ø 6	Ø 2 + Ø 6
R4	4	SB	Ø 2 + Ø 5	Ø 2 + Ø 6

NOTES:
1. EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL RECEIVERS LOCATED AT THE INTERSECTION.
2. PRE-EMPTION SIGNALS SHALL BE SERVICED ON A PRIORITY BASIS WITH RECEIVERS ASSIGNED DESCENDING PRIORITIES AS FOLLOWS: (R2, R1, R4 THEN R3)
3. IN RESPONSE TO A PRE-EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL RECEIVER R4 (OR OTHERS AS PROVIDED) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCE PRE-EMPTION THE ASSOCIATED GREEN PHASE FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE-EMPTION SIGNAL CEASES, THE CONTROLLER SHALL THEN PROVIDE PRE-EMPTION PHASE CLEARANCE SERVICE THEN RESUME NORMAL OPERATION.
4. MINIMUM GREEN, NORMAL VEHICLE AND PEDESTRIAN CLEARANCE SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE-EMPTION DEMAND.
5. EMERGENCY VEHICLE PRE-EMPTION SHALL OVERRIDE COORDINATION.
6. ONCE PRE-EMPTION TERMINATES THE SIGNAL WILL RETURN TO PHASE SHOWN IN COLUMN "NEXT PHASE CALLED" TO RESUME NORMAL OPERATION.

PREFERENTIAL PHASING SEQUENCE



SIGNAL IDENTIFICATION



NOTES:
1. ALL VEHICLE LENSES SHALL BE LED TYPE.
2. ALL VEHICLE SIGNAL HEADS SHALL BE 12 INCHES.
3. ALL HOUSINGS TO BE PROVIDED WITH 3/4 TUNNEL VISORS AND 3-INCH NON-LOUVERED BACKPLATES WITH 3/4INCH YELLOW TAPE RETROREFLECTIVE BORDER.
4. ALL HOUSINGS TO BE FIXED MOUNTED.

7/30/2020	⚠ DELETE REFERENCE TO ITEM 813.81
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

D:\Projects\2019\19133\133.00\4_Signal Plans\604123\ACAD\Plotted Plans\604123 HDW Sequence & Timing Plan_Rev_1.dwg, Jul 30, 2020 2:35pm

604123_HDW SEQUENCE & TIMING PLANS_REV_1.DWG 30-Jul-2020

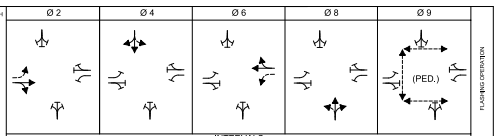
ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0035(390)	137	331
PROJECT FILE NO.	604123		

TRAFFIC SIGNAL TIMING PLAN
LOCATION 2
ROUTE 126 (POND STREET) AT
ALGONQUIN TRAIL/HARVARD STREET

SEQUENCE & TIMING
FOR
FULL ACTUATED CONTROL
ALGONQUIN TRAIL / HARVARD STREET
AT
ROUTE 126
(POND STREET)

APPROX. NORTH



FLASHING OPERATION

INTERVALS

APPROACH	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
ROUTE 126 (POND STREET)	SB	A,B,C	R	R	R	R	R	R	R→G	G→Y	Y→R	R	R	R	R	R	R	FY
ROUTE 126 (POND STREET)	NB	D,E,F	R→G	G→Y	Y→R	R	R	R	R	R	R	R	R	R	R	R	R	FY
HARVARD STREET	WB	G,H	R	R	R	R	R	R	R	R	R	Q	Y	R	R	R	R	FR
ALGONQUIN TRAIL	EB	J,K	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	FR
PEDESTRIAN	ALL	P1-P6	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	OFF

TIMING IN SECONDS

MINIMUM GREEN	10			6			10			6						
MAX GREEN 1	36			10			36			10						
MAX GREEN 2	36			10			36			10						
VEHICLE EXTENSION	3			3			3			3						
YELLOW CLEARANCE		3.5			3			3.5			3					
RED CLEARANCE			2.5			4.5			2.5			4.5				3
PED WALK INTERVAL														7		
PED CLEARANCE INTERVAL															14	
DETECTION (MEMORY)	NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			LOCK			
RECALL	MIN			OFF			MIN			OFF			OFF			

EMERGENCY ONLY

NOTES:
1. STANDARD NEMA CLEARANCES SHALL APPLY.
2. MAXIMUM GREEN 1 SHALL BE IN EFFECT ON WEEKDAYS FROM 6AM TO 9AM.
3. MAXIMUM GREEN 2 SHALL BE IN EFFECT ALL OTHER TIMES.
4. NORMAL CLEARANCES SHALL BE PROVIDED ON PHASES THAT ARE TERMINATED BY PREEMPTION DEMAND.
5. PEDESTRIAN PHASE SHOULD ONLY BE SERVED UPON PEDESTRIANS' PUSHBUTTON ACTIVATION.

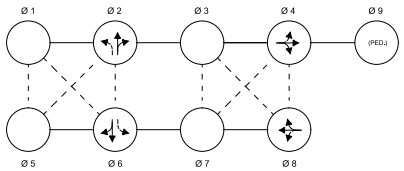
MAJOR ITEMS REQUIRED

PAY ITEM	QUANTITY	ITEM
	1	SERVICE CONNECTION (UNDERGROUND)
	1	CONTROLLER NEMA 8 PHASE TS-2 (TYPE 1), CAB, & FDN
	1	20 FT TYPE III GALV. STEEL MAST ARM ASSEMBLY, BASE & FDN
	1	25 FT TYPE III GALV. STEEL MAST ARM ASSEMBLY, BASE & FDN
	2	35 FT TYPE III GALV. STEEL MAST ARM ASSEMBLY, BASE & FDN *
	2	8 FT PEDESTRIAN SIGNAL POST, BASE & FDN
	10	12 INCH 1 WAY 3-SECTION LED VEHICLE SIGNAL INDICATION
	6	16 INCH LED PEDESTRIAN SIGNAL INDICATION WITH COUNTDOWN
	6	APS DEVICE, SIGN & SADDLE
815.2	1	PREEMPTION PHASE SELECTOR MODULE-FOUR CHANNEL
	1	PREEMPTION CARD RACK
	1	EMERGENCY PRE-EMPTION CONFIRMATION STROBE LIGHT
	4	EMERGENCY PRE-EMPTION RECEIVER (DETECTOR) - ONE WAY
	12	TYPE Q ROADWAY STANDARD QUADRUPOLE LOOP DETECTOR (6'x23')
	2	TYPE DQ ROADWAY DOUBLE QUADRUPOLE LOOP DETECTOR (6'x3.75')
	4	FOUR CHANNEL LOOP DETECTOR AMPLIFIER
	1	BUS INTERFACE UNIT (SPARE)
	1	DUAL CHANNEL LOOP DETECTOR AMPLIFIER (SPARE)
811,31	9	12" x 12" PULLBOX (SD2,031)

PLUS ALL NECESSARY DUCT, CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION OF A FULLY OPERATIONAL SIGNAL SYSTEM AS INTENDED ON THESE PLANS

* EACH OF THE TWO 35 FT MAST ARMS SHALL BE DESIGNED TO ACCOMMODATE LOADING OF A NEW 12 INCH 1 WAY 4-SECTION LED VEHICLE SIGNAL INDICATION FOR SIGNAL HEAD "C" OR "D". SEE SPECIAL PROVISIONS FOR DETAILS.

NEMA DUAL RING PHASING NOTES:



1. PHASES ASSOCIATED BY A SOLID LINE SHALL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE MAY OPERATE CONCURRENTLY.
3. THROUGH MOVEMENTS MAY INCLUDE RIGHT TURNS.
4. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT SHALL NOT CHANGE DURING THE CHANGE INTERVAL(S) UNLESS OTHERWISE NOTED.

LOOP DETECTOR DATA

SEE PLAN SHEET LOOP DETECTOR DETAILS FOR LOOP CONSTRUCTION. SPLICING, DETAILS & NOTES. DELAY TIME EFFECTIVE ONLY DURING CALLED Ø RED. TIME IN SEC.

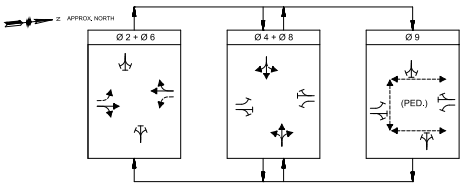
DETECTOR NUMBER	AMPLIFIER NUMBER	CHANNEL NUMBER	LOOP SIZE	NUM. OF TURNS	Ø CALLED	Ø EXT.	MODE A=PULSE B=PRES.	DELAY TIME	EXT. TIME
1	1	1	6'X23'	3-4-2	2	2	B	-	-
2	1	2	6'X23'	3-4-2	2	2	B	-	-
3	1	3	5'X3.75'	4-5-5-4	2	2	B	-	-
4	2	1	5'X3.75'	4-5-5-4	6	6	B	-	-
5	2	2	6'X23'	3-4-2	6	6	B	-	-
6	2	3	6'X23'	3-4-2	6	6	B	-	-
7	3	1	6'X23'	2-3-2	4	4	B	-	-
8	3	2	6'X23'	2-3-2	8	8	B	-	-

FIRE PRE-EMPTION SCHEDULE

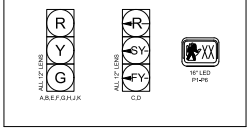
RECEIVER AND PRIORITY	PRE-EMPT PHASE ASSIGNMENT	APPROACH AND MOVEMENT	VEHICLE PHASE ASSIGNMENT	NEXT PHASE CALLED
R1	1	NB	Ø 2	Ø 2 + Ø 6
R2	2	SB	Ø 6	Ø 2 + Ø 6
R3	3	EB	Ø 4	Ø 4 + Ø 8
R4	4	WB	Ø 8	Ø 4 + Ø 8

NOTES:
1. EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL RECEIVERS LOCATED AT THE INTERSECTION.
2. PRE-EMPTION SIGNALS SHALL BE SERVICED ON A PRIORITY BASIS WITH RECEIVERS ASSIGNED DESCENDING PRIORITIES AS FOLLOWS: (R2, R1, R3, THEN R4)
3. IN RESPONSE TO A PRE-EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL RECEIVER R4 (OR OTHERS AS PROVIDED) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCE PRE-EMPTION THE ASSOCIATED GREEN PHASE FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE-EMPTION SIGNAL CEASES, THE CONTROLLER SHALL THEN PROVIDE PRE-EMPTION PHASE CLEARANCE SERVICE THEN RESUME NORMAL OPERATION.
4. MINIMUM GREEN, NORMAL VEHICLE AND PEDESTRIAN CLEARANCE SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE-EMPTION DEMAND.
5. EMERGENCY VEHICLE PRE-EMPTION SHALL OVERRIDE COORDINATION.
6. ONCE PRE-EMPTION TERMINATES THE SIGNAL WILL RETURN TO PHASE SHOWN IN COLUMN "NEXT PHASE CALLED" TO RESUME NORMAL OPERATION.

PREFERENTIAL PHASING SEQUENCE



SIGNAL IDENTIFICATION



NOTES:
1. ALL VEHICLE LENSES SHALL BE LED TYPE.
2. ALL VEHICLE SIGNAL HEADS SHALL BE 12 INCHES.
3. ALL HOUSINGS TO BE PROVIDED WITH 3/4 TUNNEL VISORS AND 5-INCH NON-LOUVERED BACKPLATES WITH 3-INCH YELLOW TAPE RETROREFLECTIVE BORDER.
4. ALL HOUSINGS TO BE FIXED MOUNTED.

DATE	DESCRIPTION
7/30/2020	⚠1 DELETE REFERENCE TO ITEM 813.82

USE ONLY PRINTS OF LATEST DATE

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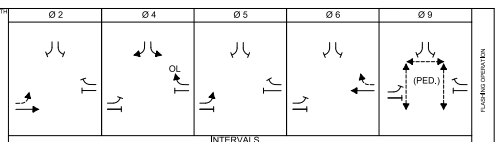
604123_HDR\SIGNAL\SIGNAL PLANS\SIGNAL PLANS (REV_1).DWG 31-Jul-2020

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	CMQ/TAP/STP-0035(390)	139	331
PROJECT FILE NO.	604123		

TRAFFIC SIGNAL TIMING PLAN
LOCATION 3
ROUTE 126 (POND STREET) AT
MARKET BASKET

SEQUENCE & TIMING
FOR
FULL ACTUATED CONTROL
MARKET BASKET DRIVEWAY
AT
ROUTE 126
(POND STREET)



INTERVALS

APPROACH	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
ROUTE 126 (POND STREET)	SB	A,H	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	FY
ROUTE 126 (POND STREET)	SB	B	R	R	R	R/G	R	R	R	R	R	G	Y	R	R	R	R	FY
ROUTE 126 (POND STREET)	NB	C,I	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FR
ROUTE 126 (POND STREET)	NB	D,E	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	FY
MARKET BASKET DRIVEWAY	EB	F,G	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	FR
PEDESTRIAN	ALL	P1-P6	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	OFF

TIMING IN SECONDS

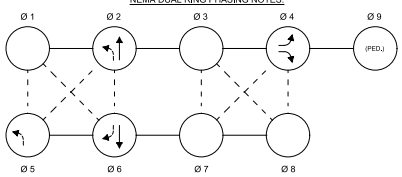
MINIMUM GREEN	8			6			6			8							EMERGENCY ONLY
MAX GREEN 1	40			6			10			26,5							
MAX GREEN 2	54,0			12			10			42,5							
VEHICLE EXTENSION	3			3			3			3							
YELLOW CLEARANCE		3,5			3			3,5			3,0						
RED CLEARANCE			2			4			2			2					3
PED WALK INTERVAL														7			
PED CLEARANCE INTERVAL															20		
DETECTION (MEMORY)	NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK					LOCK		
RECALL	SOFT			OFF			SOFT			SOFT					OFF		

NOTES:
1. STANDARD NEMA CLEARANCES SHALL APPLY.
2. MAXIMUM GREEN 1 SHALL BE IN EFFECT ON WEEKDAYS FROM 6AM TO 9AM.
3. MAXIMUM GREEN 2 SHALL BE IN EFFECT ALL OTHER TIMES.
4. NORMAL CLEARANCES SHALL BE PROVIDED ON PHASES THAT ARE TERMINATED BY PREEMPTION DEMAND.
5. PEDESTRIAN PHASE SHOULD ONLY BE SERVED UPON PEDESTRIANS' PUSHBUTTON ACTIVATION.

MAJOR ITEMS REQUIRED

PAY ITEM	QUANTITY	ITEM
	1	SERVICE CONNECTION (UNDERGROUND)
	1	CONTROLLER NEMA 8 PHASE TS-2 (TYPE 1); CAB, & FDN
	1	20 FT TYPE II, GALV. STEEL MAST ARM ASSEMBLY, BASE & FDN
	1	30 FT TYPE II, GALV. STEEL MAST ARM ASSEMBLY, BASE & FDN
	1	40 FT TYPE II, GALV. STEEL MAST ARM ASSEMBLY, BASE & FDN
	3	8 FT PEDESTRIAN SIGNAL POST, BASE, & FDN
	1	10 FT SIGNAL POST, BASE & FDN
815,3	6	12 INCH 1 WAY 3-SECTION LED VEHICLE SIGNAL INDICATION
	2	12 INCH 1 WAY 4-SECTION LED VEHICLE SIGNAL INDICATION
	1	12 INCH 1 WAY 5-SECTION LED VEHICLE SIGNAL INDICATION
	6	16 INCH LED PEDESTRIAN SIGNAL INDICATION WITH COUNTDOWN
	6	APS DEVICE, SIGN & SADDLE
	1	PREEMPTION PHASE SELECTOR MODULE-TWO CHANNEL
	1	PREEMPTION CARD RACK
	1	EMERGENCY PRE-EMPTION CONFIRMATION STROBE LIGHT
	2	EMERGENCY PRE-EMPTION RECEIVER (DETECTOR) - ONE WAY
	12	TYPE Q ROADWAY STANDARD QUADRUPOLE LOOP DETECTOR (6'x23')
	2	TYPE D-Q ROADWAY DOUBLE QUADRUPOLE LOOP DETECTOR (6'x3,75')
	3	FOUR CHANNEL LOOP DETECTOR AMPLIFIER
	1	BUS INTERFACE UNIT (SPARE)
	1	DUAL CHANNEL LOOP DETECTOR AMPLIFIER (SPARE)
811,21	11	12" x 12" PULLBOX (SEE 2.01)
		PLUS ALL NECESSARY DUCT, CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION OF A FULLY OPERATIONAL SIGNAL SYSTEM AS INTENDED ON THESE PLANS

NEMA DUAL RING PHASING NOTES:



1. PHASES ASSOCIATED BY A SOLID LINE SHALL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE MAY OPERATE CONCURRENTLY.
3. THROUGH MOVEMENTS MAY INCLUDE RIGHT TURNS.
4. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT SHALL NOT CHANGE DURING THE CHANGE INTERVAL(S) UNLESS OTHERWISE NOTED.

LOOP DETECTOR DATA

SEE PLAN SHEET-LOOP DETECTOR DETAILS FOR LOOP CONSTRUCTION, SPLICING, DETAILS & NOTES. DELAY TIME EFFECTIVE ONLY DURING CALLED Ø RED. TIME IN SEC.

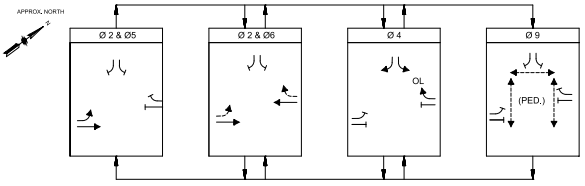
DETECTOR NUMBER	AMPLIFIER NUMBER	CHANNEL NUMBER	LOOP SIZE	NUM. OF TURNS	Ø CALLED	Ø EXT.	MODE A=PULSE B=PRES.	DELAY TIME	EXT. TIME
1	1	1	6'X23'	3-4-2	5	2 & 5	B	-	-
2	1	2	6'X23'	3-4-2	2	2	B	-	-
3	1	3	5'X3,75'	4-4-3-4	2	2	B	-	-
4	2	1	6'X23'	3-4-2	6	6	B	-	-
5	2	2	5'X3,75'	4-4-3-4	6	6	B	-	-
6	2	3	6'X23'	3-4-2	6	6	B	-	-
7	3	1	6'X23'	3-4-2	4	4	B	-	-
8	3	2	6'X23'	2-4-2	4	4	B	-	-

FIRE PRE-EMPTION SCHEDULE

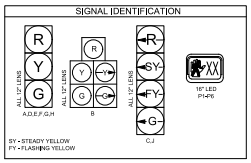
RECEIVER AND PRIORITY	PRE-EMPT PHASE ASSIGNMENT	APPROACH AND MOVEMENT	VEHICLE PHASE ASSIGNMENT	NEXT PHASE CALLED
R1	1	NB	Ø 2	Ø 2 + Ø 6
R2	2	SB	Ø 6	Ø 2 + Ø 6

NOTES:
1. EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL RECEIVERS LOCATED AT THE INTERSECTION.
2. PRE-EMPTION SIGNALS SHALL BE SERVICED ON A PRIORITY BASIS WITH RECEIVERS ASSIGNED DESCENDING PRIORITIES AS FOLLOWS: (R2 THEN R1)
3. IN RESPONSE TO A PRE-EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL RECEIVER R4 (OR OTHERS AS PROVIDED) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCE PRE-EMPTION THE ASSOCIATED GREEN PHASE FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE-EMPTION SIGNAL CEASES, THE CONTROLLER SHALL THEN PROVIDE PRE-EMPTION PHASE CLEARANCE SERVICE THEN RESUME NORMAL OPERATION.
4. MINIMUM GREEN, NORMAL VEHICLE AND PEDESTRIAN CLEARANCE SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE-EMPTION DEMAND.
5. EMERGENCY VEHICLE PRE-EMPTION SHALL OVERRIDE COORDINATION.
6. ONCE PRE-EMPTION TERMINATES THE SIGNAL WILL RETURN TO PHASES 2+6 TO RESUME NORMAL OPERATION.

PREFERENTIAL PHASING SEQUENCE



SIGNAL IDENTIFICATION



SY = STEADY YELLOW
FY = FLASHING YELLOW

NOTES:
1. ALL VEHICLE LENSES SHALL BE LED TYPE.
2. ALL VEHICLE SIGNAL HEADS SHALL BE 12 INCHES.
3. ALL HOUSINGS TO BE PROVIDED WITH 3/4 TUNNEL VISORS AND 5-INCH NON-LOUVERED BACKPLATES WITH 5-INCH YELLOW TAPE RETROREFLECTIVE BORDER.
4. ALL HOUSINGS TO BE FIXED MOUNTED.

7/30/2020	⚠1 DELETE REFERENCE TO ITEM 813.83
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

C:\Projects\2019\19139\19139-XXX - Ashland Route 126\SIG\Revised Plans 2020-07-27\604123 - 139 of 331 - Sequence & Timing Plan - Rev. 1.dgn 30-Jul-2020 8:39am

30-Jul-2020 8:41:23 J:\PROJECTS\2019\19139\SIG\REVISED PLANS 2020-07-27\604123 - 139 OF 331 - SEQUENCE & TIMING PLAN1 - REV. 1.DWG

❶ ADDENDUM NO. 1, JULY 31, 2020

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DOCUMENT 00104

❹ ADDENDUM NO. 4, AUGUST 21, 2020
❷ ADDENDUM NO. 2, AUGUST 6, 2020

NOTICE TO CONTRACTORS

Electronic proposals for the following project will be received through the internet using Bid Express until the date and time stated below and will be posted on www.bidx.com forthwith after the bid submission deadline. No paper copies of bids will be accepted. All Bidders must have a valid Digital ID issued by MassDOT in order to bid on projects. Bidders need to apply for a Digital ID at least 14 days prior to a scheduled bid opening date with Bid Express.

❹❷

TUESDAY, SEPTEMBER 1, 2020 at 2:00 P.M. **
ASHLAND
Federal Aid Project Nos. CMQ-003S(390), STP-003S(390) & TAP-003S(390)
Roadway Reconstruction and Related Work along Route 126 (Pond Street)
****Date Subject to Change**

PROJECT VALUE = $17,186,000.00

Bidders must be pre-qualified by the Department in the HIGHWAY – CONSTRUCTION category to bid on the above project. An award will not be made to a Contractor who is not pre-qualified by the Department prior to the opening of Proposals.

All prospective Bidders who intend to bid on this project must obtain "Request Proposal Form (R109)". The blank "Request Proposal Form (R109)" can be obtained at: https://www.mass.gov/prequalification-of-horizontal-construction-firms.

All prospective Bidders must complete and e-mail an electronic copy of "Request Proposal Form (R109)" to the MassDOT Director of Prequalification for approval: prequal.r109@dot.state.ma.us.

Proposal documents for official bidders are posted on www.bidx.com. Other interested parties may receive informational Contract Documents containing the Plans and Special Provisions, free of charge.

Bids will be considered, and the contract awarded in accordance with statutes governing such contracts in accordance with Massachusetts General Laws Chapter 30 § 39M.

The Project Bids File Attachments folder for proposals at www.bidx.com shall be used for submitting at the time of bid required information such as the Bid Bond required document, and other documents that may be requested in the proposal.

NOTICE TO CONTRACTORS (Continued)

All parties who wish to have access to information plans and specification must send a "Request for Informational Documents" to MassDOTBidDocuments@dot.state.ma.us.

A Proposal Guaranty in the amount of 5% of the value of the bid is required.

This project is subject to the schedule of prevailing wage rates as determined by the Commissioner of the Massachusetts Department of Labor and Workforce Development, the Division of Occupational Safety, and the United States Department of Labor.

Plans will be on display and information will be available at the MassDOT Boston Office and at the District Office in WORCESTER.

The Massachusetts Department of Transportation, in accordance with Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d to 2000d-4) and the Regulations, hereby affirmatively ensures that for any contract entered into pursuant to this advertisement, all bidders, including disadvantaged business enterprises, will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, national origin in consideration for an Award.

This Proposal contains the "STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONTRACT SPECIFICATIONS (EXECUTIVE ORDER 11246)". The goals and timetables applicable to this proposal for minority and female participation, expressed in percentage terms for the Contractor's aggregate work force in each trade on all work, are contained in Appendices A and B-80 of the above specifications.

The Contractor (hereinafter includes consultants) will comply with the Acts and Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, Federal Highway Administration (FHWA), as they may be amended from time to time, which are herein incorporated by reference and made a part of this Contract as contained in Appendices C and D of the above specifications.

❹ ADDENDUM NO. 4, AUGUST 21, 2020
❸ ADDENDUM NO. 3, AUGUST 14, 2020

NOTICE TO CONTRACTORS (Continued)

❹❸ PRICE ADJUSTMENTS

This Contract contains price adjustments for hot mix asphalt and Portland cement mixtures, diesel fuel, and gasoline. For this project the base prices are as follows: liquid asphalt $490.00 per ton, Portland cement $135.98 per ton, diesel fuel $1.669 per gallon, and gasoline $1.625 per gallon. MassDOT posts the **Price Adjustments** on their Highway Division's website at https://www.mass.gov/topics/highway-construction-resources

This Contract contains Price Adjustments for steel. See Document 00813 - PRICE ADJUSTMENT FOR STRUCTURAL STEEL AND REINFORCING STEEL for their application and base prices.

MassDOT projects are subject to the rules and regulations of the Architectural Access Board (521 CMR 1.00 et seq.)

Prospective bidders and interested parties can access this information and more via the internet at WWW.COMMBUYS.COM.

BY: Stephanie Pollack, Secretary and CEO, MassDOT
Jonathan L. Gulliver, Administrator, MassDOT Highway Division
SATURDAY, JUNE 27, 2020

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DOCUMENT 00210

REQUIREMENTS OF MASSACHUSETTS GENERAL LAWS
CHAPTER 30, SECTION 39R;
CHAPTER 30, SECTION 39O

July 1, 1981, updated October 2016

M.G.L. c. 30, § 39R. Award of Contracts; Accounting Statements; Annual Financial Statements; Definitions.

(a) The words defined herein shall have the meaning stated below whenever they appear in this section:

(1) “Contractor" means any person, corporation, partnership, joint venture, sole proprietorship, or other entity awarded a contract pursuant to sections thirty-eight A1/2 to thirty-eight O, inclusive, of chapter seven and any contract awarded or executed pursuant to section eleven C of chapter twenty-five A, section thirty-nine M of chapter thirty, or sections forty-four A to forty-four H, inclusive, of chapter one hundred and forty-nine, which is for an amount or estimated amount greater than one hundred thousand dollars.

(2) "Contract" means any contract awarded or executed pursuant to sections thirty-eight A1/2 to thirty-eight O, inclusive, of chapter seven and any contract awarded or executed pursuant to section eleven C of chapter twenty-five A, section thirty-nine M of chapter thirty, or sections forty-four A through forty-four H, inclusive, of chapter one hundred and forty-nine, which is for amount or estimated amount greater than one hundred thousand dollars.

(3) “Records" means books of original entry, accounts, checks, bank statements and all other banking documents, correspondence, memoranda, invoices, computer printouts, tapes, discs, papers and other documents or transcribed information of any type, whether expressed in ordinary or machine language.

(4) “Independent Certified Public Accountant" means a person duly registered in good standing and entitled to practice as a certified public accountant under the laws of the place of his residence or principal office and who is in fact independent. In determining whether an accountant is independent with respect to a particular person, appropriate consideration should be given to all relationships between the accountant and that person or any affiliate thereof. Determination of an accountant's independence shall not be confined to the relationships existing in connection with the filing of reports with the awarding authority.

(5) “Audit", when used in regard to financial statements, means an examination of records by an independent certified public accountant in accordance with generally accepted accounting principles and auditing standards for the purpose of expressing a certified opinion thereon, or, in the alternative, a qualified opinion or a declination to express an opinion for stated reasons.

(6) "Accountant's Report", when used in regard to financial statements, means a document in which an independent certified public accountant indicates the scope of the audit which he has made and sets forth his opinion regarding the financial statements taken as a whole with a listing of noted exceptions and qualifications, or an assertion to the effect that an overall opinion cannot be expressed. When an overall opinion cannot be expressed the reason therefor shall be stated. An accountant's report shall include as a part thereof a signed statement by the responsible corporate officer attesting that management has fully disclosed all material facts to the independent certified public accountant, and that the audited financial statement is a true and complete statement of the financial condition of the contractor.

(7) “Management", when used herein, means the chief executive officers, partners, principals or other person or persons primarily responsible for the financial and operational policies and practices of the contractor.

(8) Accounting terms, unless otherwise defined herein, shall have a meaning in accordance with generally accepted accounting principles and auditing standards.

(b) Subsection (a)(2) hereof notwithstanding, every agreement or contract awarded or executed pursuant to sections thirty-eight A 1/2 to thirty-eight O, inclusive, of chapter seven, or eleven C of chapter twenty-five A, and pursuant to section thirty-nine M of chapter thirty or to section forty-four A through H, inclusive, of chapter one hundred and forty-nine, shall provide that:

(1) The contractor shall make, and keep for at least six years after final payment, books, records, and accounts which in reasonable detail accurately and fairly reflect the transactions and dispositions of the contractor, and

(2) Until the expiration of six years after final payment, the office of inspector general, and the commissioner of capital asset management and maintenance shall have the right to examine any books, documents, papers or records of the contractor or of his subcontractors that directly pertain to, and involve transactions relating to, the contractor or his subcontractors, and

(3) If the agreement is a contract as defined herein, the contractor shall describe any change in the method of maintaining records or recording transactions which materially affect any statements filed with the awarding authority, including in his description the date of the change and reasons therefor, and shall accompany said description with a letter from the contractor's independent certified public accountant approving or otherwise commenting on the changes, and

(4) If the agreement is a contract as defined herein, the contractor has filed a statement of management on internal accounting controls as set forth in paragraph (c) below prior to the execution of the contract, and

(5) If the agreement is a contract as defined herein, the contractor has filed prior to the execution of the contracts and will continue to file annually, an audited financial statement for the most recent completed fiscal year as set forth in paragraph (d) below.

(c) Every contractor awarded a contract shall file with the awarding authority a statement of management as to whether the system of internal accounting controls of the contractor and its subsidiaries reasonably assures that:

(1) transactions are executed in accordance with management's general and specific authorization;

(2) transactions are recorded as necessary

i. to permit preparation of financial statements in conformity with generally accepted accounting principles, and

ii. to maintain accountability for assets;

(3) access to assets is permitted only in accordance with management's general or specific authorization; and

(4) the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action was taken with respect to any difference.

Every contractor awarded a contract shall also file with the awarding authority a statement prepared and signed by an independent certified public accountant, stating that he has examined the statement of management on internal accounting controls, and expressing an opinion as to:

(1) whether the representations of management in response to this paragraph and paragraph (b) above are consistent with the result of management's evaluation of the system of internal accounting controls; and

(2) whether such representations of management are, in addition, reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the applicant's financial statements.

(d) Every contractor awarded a contract by the commonwealth or by any political subdivision thereof shall annually file with the commissioner of capital asset management and maintenance during the term of the contract a financial statement prepared by an independent certified public accountant on the basis of an audit by such accountant. The final statement filed shall include the date of final payment. All statements shall be accompanied by an accountant's report. Such statements shall be made available to the awarding authority upon request.

(e) The office of inspector general, the commissioner of capital asset management and maintenance and any other awarding authority shall enforce the provisions of this section. The commissioner of capital asset management and maintenance may after providing an opportunity for the inspector general and other interested parties to comment, promulgate pursuant to the provisions of chapter thirty A such rules, regulations and guidelines as are necessary to effectuate the purposes of this section. Such rules, regulations and guidelines may be applicable to all awarding authorities. A contractor's failure to satisfy any of the requirements of this section may be grounds for debarment pursuant to section forty-four C of chapter one hundred and forty-nine.

(f) Records and statements required to be made, kept or filed under the provisions of this section shall not be public records as defined in section seven of chapter four and shall not be open to public inspection; provided, however, that such records and statements shall be made available pursuant to the provisions of clause (2) of paragraph (b).

M.G.L. c. 30, § 39O: Suspension, Delay, or Interruption or Failure to Act by Awarding Authority; Adjustment in Contract Price; Submission of Claims.

Section 39O. Every contract subject to the provisions of section thirty-nine M of this chapter or subject to section forty-four A of chapter one hundred forty-nine shall contain the following provisions (a) and (b) in their entirety and, in the event a suspension, delay, interruption or failure to act of the awarding authority increases the cost of performance to any subcontractor, that subcontractor shall have the same rights against the general contractor for payment for an increase in the cost of his performance as provisions (a) and (b) give the general contractor against the awarding authority, but nothing in provisions (a) and (b) shall in any way change, modify or alter any other rights which the general contractor or the subcontractor may have against each other.

(a) The awarding authority may order the general contractor in writing to suspend, delay, or interrupt all or any part of the work for such period of time as it may determine to be appropriate for the convenience of the awarding authority; provided however, that if there is a suspension, delay or interruption for fifteen days or more or due to a failure of the awarding authority to act within the time specified in this contract, the awarding authority shall make an adjustment in the contract price for any increase in the cost of performance of this contract but shall not include any profit to the general contractor on such increase; and provided further, that the awarding authority shall not make any adjustment in the contract price under this provision for any suspension, delay, interruption or failure to act to the extent that such is due to any cause for which this contract provides for an equitable adjustment of the contract price under any other contract provisions.

(b) The general contractor must submit the amount of a claim under provision (a) to the awarding authority in writing as soon as practicable after the end of the suspension, delay, interruption or failure to act and, in any event, not later than the date of final payment under this contract and, except for costs due to a suspension order, the awarding authority shall not approve any costs in the claim incurred more than twenty days before the general contractor notified the awarding authority in writing of the act or failure to act involved in the claim.

<<<<<<<<<<>>>>>>>>>>

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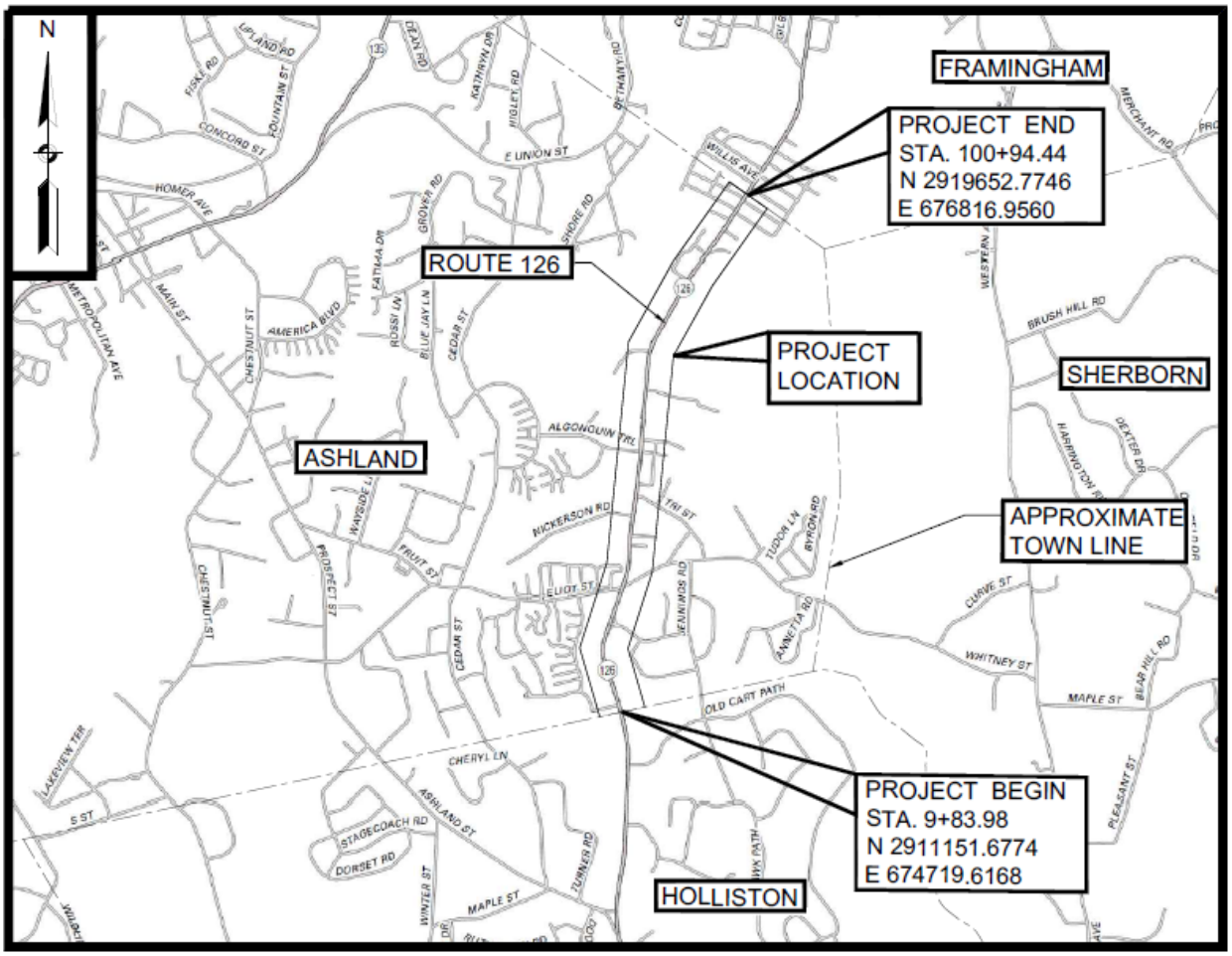
DOCUMENT 00331

LOCUS MAP

ASHLAND
Federal Aid Project Nos. CMQ-003S(390), STP-003S(390) & TAP-003S(390)
Roadway Reconstruction and Related Work along Route 126 (Pond Street)



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DOCUMENT 00439

Final Report ☐

Interim Report ☐

CONTRACTOR PROJECT EVALUATION FORM

For instructions on using this form, see Engineering Directive E-10-002, Dated 4/20/2010

Date: _____

City/Town: _____ Contractor: _____

Project: _____ Address: _____

F.A. No: _____ Contract Number: _____

Bid Price: _____ Notice to Proceed: _____

Funds: State: _____ Fed Aid: _____ Current Contract Completion Date: _____

Date Work Started: _____ Date Work Completed*: _____

Contractor's Superintendent: _____

Division: (indicates class of work) Highway: _____ Bridge: _____ Maintenance: _____

*If work was NOT completed within specified time (including extensions) give reasons on following page.

	Excellent 10	Very Good 9	Average 8	7	Fair 6	5	Poor 4	% Rating
1. Workmanship								x 2=
2. Safety								x 2=
3. Schedule								x 1.5=
4. Home Office Support								x 1=
5. Subcontractors Performance								x 1=
6. Field Supervision/ Superintendent								x 1=
7. Contract Compliance								x 0.5=
8. Equipment								x 0.5=
9. Payment of Accounts								x 0.5=
(use back for additional comments)						**Overall Rating:**		

(Give explanation of items 1 through 9 on the following page in numerical order if overall rating is below 80%. Use additional sheets if necessary.)

_____ _____

District Construction Engineer's Signature/Date Resident Engineer's Signature/Date

_____

Contractor's Signature Acknowledging Report/Date

Contractor Requests Meeting with the District: No ☐ Yes ☐ Date Meeting Held: _____

Contractor's Comments/Meeting Notes (extra sheets may be added to this form and noted here if needed): _____

_____

_____

CONTRACTOR PROJECT EVALUATION FORM (Continued)

Date: _____ Contract Number: _____

INFORMATION FOR DISTRICT HIGHWAY DIRECTORS RELATING TO PREQUALIFICATION

A deduction shall be recommended for unsatisfactory performance if computed overall rating is under 80%.
A deduction may be recommended for this project being completed late due to the Contractor's fault.

RECOMMENDATIONS FOR DEDUCTIONS FROM CONTRACTORS' ASSIGNED FACTOR
(*Write Yes or No in space provided*)

I recommend a deduction for Contractor's unsatisfactory performance: _____

I recommend a deduction for project completed late: _____

Signed: _____
District Highway Director

EXPLANATION OF RATINGS 1 – 9: _____

WORK NOT COMPLETED WITHIN SPECIFIED TIME: _____

Revised: 04/28/17

*** END OF DOCUMENT ***

DOCUMENT 00440

Final Report ☐

Interim Report ☐

SUBCONTRACTOR PROJECT EVALUATION FORM

For instructions on using this form, see Engineering Directive E-10-002, Dated 4/20/2010

Date: _____

City/Town: _____ Subcontractor: _____

Project: _____ Address: _____

F.A. No.: _____ Contract Number: _____

Prime Contractor _____ Current Contract Completion Date: _____

Date Work Started: _____ Date Work Completed*: _____

Subcontractor's Superintendent: _____

Type of Work Performed by Subcontractor: _____

*If work was NOT completed within specified time (including extensions) give reasons on following page.

	Excellent 10	Very Good 9	Average 8	7	Fair 6	5	Poor 4	% Rating
1. Workmanship								x 2=
2. Safety								x 2=
3. Schedule								x 1.5=
4. Home Office Support								x 1.5=
5. Field Supervision/ Superintendent								x 1=
6. Contract Compliance								x 1=
7. Equipment								x 0.5=
8. Payment of Accounts								x 0.5=
(use back for additional comments)						**Overall Rating:**		

(Give explanation of items 1 through 8 on the following page in numerical order if overall rating is below 80%. Use additional sheets if necessary.)

_____ _____

District Construction Engineer's Signature/Date Resident Engineer's Signature/Date

_____ _____

Contractor Signature Acknowledging Report/Date Subcontractor Signature Acknowledging Report/Date

Subcontractor Requests Meeting with the District: No ☐ Yes ☐ Date Meeting Held: _____

Subcontractor's Comments / Meeting Notes (extra sheets may be added to this form and noted here if needed):

_____

_____

Contractor's Comments: _____

_____

SUBCONTRACTOR PROJECT EVALUATION FORM (Continued)

Date: _____ Contract Number:_____

INFORMATION FOR DISTRICT HIGHWAY DIRECTORS RELATING TO PREQUALIFICATION

A deduction shall be recommended for unsatisfactory performance if computed overall rating is under 80%.
A deduction may be recommended for this project being completed late due to the Contractor's fault.

RECOMMENDATIONS FOR DEDUCTIONS FROM CONTRACTORS' ASSIGNED FACTOR
(*Write Yes or No in space provided*)

I recommend a deduction for Contractor's unsatisfactory performance: _____

I recommend a deduction for project completed late:_____

Signed: _____
District Highway Director

EXPLANATION OF RATINGS 1 – 8: _____

_____

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_____

_____

WORK NOT COMPLETED WITHIN SPECIFIED TIME: _____

_____

_____

_____

_____

_____

_____

Revised: 04/28/17

*** END OF DOCUMENT ***

DOCUMENT 00710
GENERAL CONTRACT PROVISIONS
Revised: 06/02/2020

NOTICE OF AVAILABILITY

The STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES dated 2020, the SUPPLEMENTAL SPECFICATIONS, the 1996 METRIC CONSTRUCTION AND TRAFFIC STANDARD DETAILS, the 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS; the 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING and the 2017 CONSTRUCTION STANDARD DETAILS are available online at https://www.mass.gov/massdot-highway-division-manuals-and-publications

SPECIAL PROVISIONS FOR RIGHT-TO-KNOW ACT REQUIREMENTS

The Contractor's attention is directed to Massachusetts General Laws, Chapter 111F, commonly known as the Right-To-Know Act, and to the regulations promulgated pursuant thereto. Among the provisions of the Right-To-Know Act is a requirement that employers make available to employees Materials Safety Data Sheets (MSDS) for any substance on the Massachusetts Substance List (MSL) to which employees are, have been, or may be exposed.

To ensure prompt compliance with these regulations and legislation, the Contractor shall:

1. Deliver to the Department, prior to the start of any work under this contract, copies of MSDS for all MSL substances to be used, stored, processed or manufactured at the worksite by the Contractor.

2. Train employees of the Department, who may be exposed to MSL substances as a result of the Contractor's work under this contract, with regard to those specific substances in accordance with requirements of the Right-To-Know Act.

3. Observe all safety precautions recommended on the MSDS for any MSL substance to be used, stored, processed, or manufactured at the worksite by the Contractor.

4. Inform the Department in writing regarding specific protective equipment recommended in the MSDS for MSL substances to which employees of the Department may be exposed as a result of the Contractor's work under this contract.

The Department shall not be liable for any delay or suspension of work caused by the refusal of its employees to perform any work due to the Contractor's failure to comply with the Right-To-Know Act. The Contractor agrees to hold the Department or the Commissioner of the Department harmless and fully indemnified for any and all claims, demands, fines, actions, complaints, and causes of action resulting from or arising out of the Contractor's failure to comply with the requirements of the Right-To-Know Act.

ALTERNATIVE DISPUTE RESOLUTION
Forum, Choice of Law and Mediations:

Any actions arising out of a contract shall be governed by the laws of Massachusetts and shall be brought and maintained in a State or federal court in Massachusetts which shall have exclusive jurisdiction thereof. MassDOT and the Contractor may both agree to mediation of any claim and will share the costs of such mediation pro rata based on the number of parties involved.

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DOCUMENT 00713

SUBSECTION 701: CEMENT CONCRETE SIDEWALKS, WHEELCHAIR RAMPS, AND DRIVEWAYS

DESCRIPTION

701.20: General

This work shall consist of the construction of cement concrete sidewalks, wheelchair ramps, and driveways in accordance with the specifications and within the tolerances established on the plans.

MATERIALS

701.30: General

Materials shall meet the requirements specified in the following Subsections of Division III, Materials except as noted herein:

Gravel Borrow, Type b.....M1.03.0
Cement Concrete (≥ 4,000 psi) M4.02.00
Preformed Expansion Joint Filler.....M9.14.0

The following best practices may be incorporated into the cement concrete mix design at no additional cost to the Department as identified herein.

A. Combined Aggregate System.

The combined aggregate system for the mix design may be analyzed using the Tarantula Curve, Shilstone Chart, fineness modulus, and coarse aggregate content to enhance the properties of the concrete.

1. Tarantula Curve.

The combined aggregate system for the mix design may be analyzed using the Tarantula Curve to evaluate potential properties of the concrete, including workability, segregation, edge slumping, surface finishing, and cohesion.

Table 701.30-1: Tarantula Curve Particle Size Distribution

Sieve Opening	Percent by Mass Targets (%)		Percent by Mass Retained (%)		
	Passing	Retained			
1-1/2 in.	100	–	–	–	–
1 in.	92	8	0 – 16	–	–
3/4 in.	82	10	0 – 20	–	–
1/2 in.	70	13	4 – 20	–	–
3/8 in.	58	13	4 – 20	–	–
No. 4	46	13	4 – 20	–	–
No. 8	40	6	0 – 12	Coarse Sand 20 – 40	–
No. 16	34	6	0 – 12		–
No. 30	22	13	4 – 20		Fine Sand 24 – 34
No. 50	10	13	4 – 20	–	
No. 100	5	5	0 – 10	–	
No. 200	0	0	0 – 2	–	

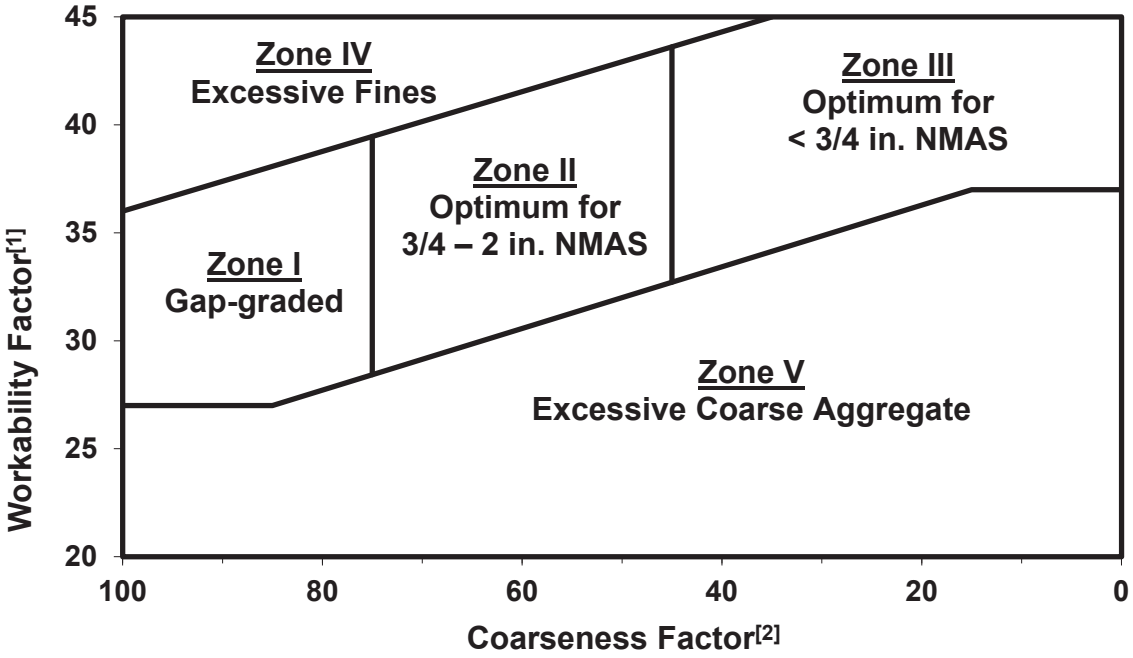
2. Shilstone Workability-Coarseness Chart.

The combined aggregate system for the mix design may be analyzed using the Shilstone Workability-Coarseness Chart, to evaluate potential properties of the concrete, including workability.

Table 701.30-2: Shilstone Workability-Coarseness

Zone	Property	Cause
Zone I	Gap-graded; High potential for segregation during placement and consolidation; Cracking, blistering, spalling, and scaling	Deficiency in intermediate particles; Non-cohesive
Zone II	Optimum mixture for nominal maximum aggregate size from 2 in. – ¾ in.	Optimized workability factor and coarseness factor
Zone III	Optimum mixture for nominal maximum aggregate size < ¾ in.	Optimized workability factor and coarseness factor
Zone IV	Sticky; High potential for segregation during consolidation and finishing; Variable strength, high shrinkage, cracking, curling, spalling, and scaling	Excessive fines
Zone V	Rocky; Lacking plasticity	Excessive amount of coarse and intermediate aggregate

Figure 701.30-1: Shilstone Workability-Coarseness Chart



[1] The workability factor is determined by the equation WF = W + (C - 564) / 38, where WF = workability factor, W = percent passing No. 8 sieve and C = total cementitious materials content.

[2] The coarseness factor is determined by the equation CF = (Q/R) / 100, where CF = coarseness factor, Q = cumulative percent retained on 3/8 in. sieve and R = cumulative percent retained on No. 8 sieve.

3. Fineness Modulus.

The combined aggregate system for the mix design may be analyzed using the fineness modulus, to evaluate potential properties of the concrete, including the fineness or coarseness of the mix design and estimating the design proportions of fine and coarse aggregates. The coarseness of the mix design increases as the fineness modulus increasers. The fineness modulus is determined by calculating the total cumulative percentages by mass retained on each designated sieve and dividing by 100.

4. Coarse Aggregate Content.

The combined aggregate system for the mix design may be analyzed using the coarse aggregate content. The coarse aggregate content is determined by calculating the total cumulative percentages by mass retained on the No. 4 sieve.

B. Paste System.

The quality of the paste system is determined by the water-cementitious ratio, air content, cementitious materials, and chemical admixtures incorporated into the mix design.

1. Water-Cementitious Ratio.

The water-cementitious ratio for the mix design may be analyzed to evaluate potential properties of the concrete, including strength, concrete and reinforcement bonding, and resistance to freezing, thawing, de-icing, sulfate reaction, corrosion of steel reinforcement, drying shrinkage, cracking, and

volume change from wetting and drying. The water-cementitious ratio is determined by calculating the total water content by mass and dividing by the total cement and supplementary cementitious material (SCM) content by mass. The recommended water-cementitious ratio design target is identified in Table 701.30-5. The water-cementitious ratio shall be less than or equal to 0.45.

Table 701.30-5: Freezing, Thawing, and De-icing Resistance

Exposure Class	Severity	Condition	Water-Cementitious Ratio	
			Recommendation	Requirement
F3	Very Severe	Exposed to freezing and thawing cycles and accumulation of snow, ice, and de-icing chemicals; Frequent exposure to water	≤ 0.40	≤ 0.45

2. Air Content.

The air content for the mix design may be analyzed to evaluate potential properties of the concrete, including strength and resistance to freezing, thawing, de-icing, and sulfate reaction. The recommended air content design targets are identified in Table 701.30-6.

Table 701.30-6: Freezing, Thawing, and De-icing Resistance

Exposure Class	Severity	Condition	Nominal Maximum Aggregate Size (in.)	Air Content Target Recommendation (%)
F3	Very Severe	Exposed to freezing and thawing cycles and accumulation of snow, ice, and de-icing chemicals; Frequent exposure to water	3/8	7.5
			1/2	7.0
			3/4	6.0

3. Cement and Supplementary Cementitious Materials Content.

The cement and supplementary cementitious materials content incorporated into the mix design shall promote quality properties of the cement concrete, including resistance to alkali silica reaction, freezing, thawing, de-icing, and sulfate reaction. Incorporation of supplementary cementitious materials (SCM) in cement concrete may affect workmanship properties, including workability, bleed rate, setting time, and other properties. Adequate adjustments in Contractor workmanship practices, including placement, finishing, curing, and other construction practices shall be required to account for these changes in properties and to prevent scaling due to freezing, thawing, and de-icing cycles. The cement and supplementary cementitious materials content shall meet the design criteria identified in Table 701.30-7.

Table 701.30-7: Alkali Silica Reaction and Freezing, Thawing, and De-icing Resistance[1][2]

Exposure Class	Severity	Condition	Material	Replacement by Weight of Cement (%)
F3	Very Severe	Exposed to freezing and thawing cycles and accumulation of snow, ice, and de-icing chemicals; Frequent exposure to water	Low Alkali Cement (≤ 0.60% Alkalinity)	–
			Blended Hydraulic Cement[3]	–
			Fly Ash (Class F)	15 – 30
			Slag (Grade 100 or 120)	25 – 50
			Silica Fume	5 – 10
			Total SCM	≤ 50
			Total Fly Ash and Silica Fume	≤ 35

[1] Acceptable replacement by weight of cement for alkali silica reaction resistance shall be determined by the alkali silica reaction resistance performance test results and the criteria identified in Table 701.73-1: Minimum Acceptance Sampling and Testing Requirements.

[2] Test results meeting the alkali silica reaction resistance performance criteria of Table 701.30-8: Alternative Performance Evaluation to Alkali Silica Reaction Resistance Design Criteria may supersede the replacement by weight of cement design criteria.

[3] SCMs in blended hydraulic cement shall meet the criteria identified for fly ash, slag, and silica fume.

Table 701.30-8: Alternative Performance Evaluation to Alkali Silica Reaction Resistance Design Criteria

Method	Quality Characteristic	Criteria
C295	Petrographic Examination for Potential Alkali Aggregate Reactive Constituents and Deleterious Materials in Aggregate[1]	–
	Optically Strained, Microfractured or Microcrystalline Quartz (%)	≤ 5.0
	Chert or Chalcedony (%)	≤ 3.0
	Trydimite or Cristobalite (%)	≤ 1.0
	Opal (%)	≤ 0.5
	Natural Volcanic Glass (%)	≤ 3.0
T 380	Alkali Silica Reaction Resistance: Expansion of Miniature Concrete Prisms at 56 days (%)	≤ 0.03[2]

[1] Examination of aggregate shall be performed and reported to identify and quantify potential alkali-aggregate reactive constituents and deleterious materials in aggregate, as defined in ASTM C294 Standard Descriptive Nomenclature for Constituents of Concrete Aggregates and ASTM C295 Standard Guide for Petrographic Examination of Aggregates for Concrete.

[2] 56-day expansion results greater than 0.03 but less than or equal to 0.04 shall be considered non-reactive if the average two-week rate of expansion from day 56 to day 84 is less than or equal to 0.01%, otherwise, expansion results shall be considered reactive.

4. Chemical Admixtures.

Chemical admixtures may be incorporated into the mix design to enhance the properties of the concrete.

Table 701.30-7: Chemical Admixtures

Spec.	Type	Chemical Admixture	Properties
M 194	A	Water-Reducing	Increases Workability and Air Content; Decreases Water Demand (5 – 10%, 3 – 6 in. Slump)
	B	Retarding	Increases Initial and Final Setting Time, Air Content, Long-Term Strength; Offsetting of Accelerating Effect of Hot Weather; Decreases Early-Age Strength
	D	Water-Reducing and Retarding	Type A and Type B Admixture Properties
	F	High Range Water-Reducing	Increases Workability (More Effective than Type A), Air Content, Early-Age Strength, and Ultimate Strength; Decreases Water Demand (12 – 40%, > 6 in. Slump) and Permeability
	G	High Range Water-Reducing and Retarding	Type F and Type B Admixture Properties
	S-SRA	Shrinkage Reducing	Increases Setting Time; Decreases Drying Shrinkage Cracking and Bleed Rate
	S-CRA	Crack Reducing	Decreases Cracking (More Effective than SRAs) and Crack Width
M 154	AEA	Air-Entraining	Increases Cohesion, Workability, Stabilization of Air Bubbles, Resistance to Freezing, Thawing, and De-icing, Resistance to Alkali-Reactive Environment, and Resistance to Sulfate Reaction
M 194[1]	MRWRA	Mid Range Water-Reducing	Type A and Type F Admixture Properties; Increases Workability (Especially Concrete with SCMs); Decreases Water Demand (6 – 12 %, 5 – 8 in. Slump)
C1622	CWA	Cold Weather	Increases Hydration Rate; Decreases Freezing Point of Mixing Water

[1] Mid range water-reducing admixtures (MRWRA) may meet either water-reducing (A) or high range water-reducing (F) admixture criteria.

5. Paste Content.

The paste content for the mix design may be optimized to enhance potential properties of the concrete, including workability, strength, permeability, and resistance to drying shrinkage and cracking and volume change from wetting and drying. The volume of paste should adequately fill

the voids and provide sufficient separation between the aggregate particles to promote workability and effective bonding of particles.

Table 701.30-8: Paste Content

Mix Design Characteristic	Recommendation
Volume of Cement Concrete (cf)[1]	27
Paste Content (%)[2]	≤ 28[3]
Paste Content to Aggregate Void Content Ratio[4]	1.25 – 1.75
Excess Volume of Paste for Workability (%)[5]	–

[1] The volume of cement concrete is determined by the following equation, where W = Weight (lbs.), SG = Specific Gravity, D = Density (pcf), and V = Volume (cf).

$V_{CEMENT} = W_{CEMENT} / SG_{CEMENT} * D_{WATER}$

$V_{SCM} = W_{SCM} / SG_{SCM} * D_{WATER}$

$V_{ADMIXTURE} = V_{ADMIXTURE}$ in oz. / 957.5 oz. per cf

$V_{WATER} = V_{WATER}$ in gal. / 7.48 gal. per cf

$V_{COARSE} = W_{COARSE} / SG_{COARSE} * D_{WATER}$

$V_{FINE} = W_{FINE} / SG_{FINE} * D_{WATER}$

$V_{CONCRETE} = V_{CEMENT} + V_{SCM} + V_{ADMIXTURE} + V_{WATER} + V_{COARSE} + V_{FINE} + V_{AIR}$

[2] The paste content by volume of cement concrete is determined by the following equation, where V = Volume (cf) and PC = Paste Content (%).

$V_{PASTE} = V_{CEMENT} + V_{SCM} + V_{ADMIXTURE} + V_{WATER}$

$PC_{CONCRETE} = V_{PASTE} / V_{CONCRETE}$

[3] The cracking tendency of structural concrete is significantly reduced when the paste content by volume is less than or equal to 28 percent.

[4] The paste content to aggregate void content ratio is determined by the following equation, where D = Density (pcf), SG = Specific Gravity, BD = Bulk Density (pcf), VC = Void Content (%), V = Volume (cf), AVC = Aggregate Void Content (%), PC = Paste Content (%), and R = Ratio. Workability increases as the paste content to aggregate void content ratio increases. Decreased paste content to aggregate void content ratios will result in decreased workability, where water-reducing admixtures provide no benefit.

$D_{COARSE} = SG_{COARSE} * D_{WATER}$

$D_{FINE} = SG_{FINE} * D_{WATER}$

$VC_{COARSE} = D_{COARSE} - BD_{COARSE} / D_{COARSE}$

$VC_{FINE} = D_{FINE} - BD_{FINE} / D_{FINE}$

$VC_{AGGREGATE} = [(V_{COARSE} / (V_{COARSE} + V_{FINE})) * VC_{COARSE} + (V_{FINE} / (V_{COARSE} + V_{FINE})) * VC_{FINE}]$

$AVC_{CONCRETE} = [VC_{AGGREGATE} * ((V_{COARSE} + V_{FINE}) / V_{CONCRETE})]$

$R_{PC\text{-}AVC} = PC_{CONCRETE} / AVC_{CONCRETE}$

[5] The excess paste content for workability is determined by the following equation, where PC = Paste Content (%), AC = Air Content (%), AVC = Aggregate Void Content (%), and EPC = Excess Paste Content for Workability (%).

$$EPC_{CONCRETE} = PC_{CONCRETE} + AC_{CONCRETE} - AVC_{CONCRETE}$$

C. Initial Curing Materials.

The materials and procedures used for initial curing methods of cement concrete shall meet the Manufacturer's instructions and recommendations and the requirements specified herein.

Cement concrete with a low to negligible bleeding rate, exposure to highly evaporative environments, high content of silica fume, fine cement, or other fine cementitious material, low water to cementitious ratio, high air content, or water-reducing admixtures have an increased susceptibility to surface drying and plastic shrinkage between placement and finishing operations. Initial curing materials and procedures shall be applied immediately after the bleed water sheen has disappeared from the surface of the concrete or the concrete surface exhibits loss of moisture and surface drying, between placement and finishing operations. Initial curing materials shall not be worked into the surface in subsequent finishing operations.

1. Liquid-Applied Evaporation Reducers.

Liquid-applied evaporation reducers used for initial curing methods shall produce an effective monomolecular film over the bleed water layer, to reduce the rate of evaporation of the bleed water from the surface and plastic shrinkage when the evaporation rate equals or exceeds the bleeding rate.

D. Intermediate Curing Materials.

The materials and procedures used for intermediate curing methods of cement concrete shall meet the Manufacturer's instructions and recommendations and the requirements specified herein.

In instances where finishing operations have been completed prior to the concrete achieving final set and the concrete surface exhibits loss of moisture and surface drying, the following curing materials and procedures shall be applied immediately to the concrete surface prior to the application of final curing materials, to prevent the loss of moisture without damaging the concrete surface, until final set of the concrete has been achieved and final curing materials have been applied to the concrete surface.

- 701.30.C.1: Liquid-Applied Evaporation Reducers
- 701.30.E.3.a: Liquid Membrane-Forming Compounds for Curing
- 701.30.E.3.b: Liquid Membrane-Forming Compounds for Curing and Sealing

E. Final Curing Materials.

The materials and procedures used for final curing methods of cement concrete shall meet the Manufacturer's instructions and recommendations and the requirements specified herein.

Curing water shall be free of deleterious impurities, causing staining and deterioration. The potential staining ability of curing water shall be evaluated by means of CRD-C401 (US Army Corps of Engineers 1975) for instances where curing water quality is questioned. Curing water shall not exceed a temperature differential of more than 20°F from the internal concrete temperature, to

prevent cracking due to temperature gradients causing strain that exceeds the strain capacity of concrete. Curing water shall remain above freezing temperatures throughout the duration of the curing cycle.

Final curing materials and procedures shall be applied to the concrete surface immediately after application of initial and intermediate curing materials, finishing operations, and final set of cement concrete, to prevent the loss of moisture and surface drying.

Materials used for final curing methods of cement concrete shall accommodate all exposed cement concrete surfaces with a continuous application of moisture throughout the entire duration of the final curing method cycle and provide controlled and gradual termination of the final curing method cycle.

Final curing materials applied to the concrete shall allow the concrete to mature sufficiently to achieve its designed and desired properties, including strength, volume stability, permeability, durability, and resistance to freezing, thawing, and de-icing cycles. Insufficient application of final curing materials results in decreased strength and durability of the top surface of concrete.

Protection to the concrete surface and curing materials shall be required in instances where adverse weather conditions are present, until curing operations can be initiated without damaging the surface of the concrete.

Final curing materials and procedures shall be applied to the concrete surface throughout the entire duration of the curing cycle and meet minimum sustained temperature, duration, and strength requirements, as specified in applicable Division II: Construction Details and herein. Controlled and gradual termination of the final curing method cycle shall begin only after all specified conditions are met, until the concrete gradually cools to within 20°F of the ambient temperature.

1. Saturated Covers.

Saturated covers used for final curing methods shall meet AASHTO M 182, Class 3. Saturated covers shall be in good condition, free from holes, tears, or other defects that would render it unsuitable for curing cement concrete and cementitious materials. Saturated covers shall be dried to prevent mildew when storing. Prior to application, saturated covers shall be thoroughly rinsed in water and free of harmful substances that are deleterious or cause discoloration to cement concrete and cementitious materials. Saturated covers shall have sufficient thickness and proper positioning onto the surface to maximize moisture retention. Saturated covers shall contain a sufficient amount of moisture to prevent moisture loss from the surface of cement concrete and cementitious materials. Saturated covers shall have the ability to retain sufficient moisture from continuous watering so that a film of water remains on the surface of cement concrete and cementitious materials throughout the entire duration of the final curing method cycle. Saturated covers shall not absorb water from cement concrete and cementitious materials. Polyethylene film may be applied over the saturated cover to limit the amount of continuous watering required for sufficient moisture retainage. Saturated covers shall accommodate uniform and slow drying of cement concrete and cementitious materials surfaces immediately prior to removal.

2. Sheet Materials.

Sheet materials, including polyethylene film, white burlap-polyethylene sheeting, and reinforced paper, used for final curing methods shall meet ASTM C171 and the requirements specified herein.

Sheet materials shall inhibit moisture loss and reduce temperature rise in concrete exposed to radiation from the sun during the final curing method cycle. Adjoining covers shall overlap not less than 12 inches. All edges of the sheet materials shall be secured to maintain a moist environment.

a. Polyethylene Film.

Polyethylene film shall be clear, white, or black in color and consist of a single sheet manufactured from polyethylene resins, be free of visible defects, including tears, wrinkles, and discontinuity. The film shall prohibit mottling and uneven spots from appearing on the surface of concrete, due to variations in temperature, moisture content, or both. Application of additional curing water under the film or application of a polyethylene film bonded to absorbent fabric to the concrete surface may be required to prevent mottling and to retain and evenly distribute the moisture. Polyethylene film shall accommodate concrete surfaces with constant contact without damage. The film shall be sufficient in length to extend beyond the edges of the concrete surface. Edges of adjacent polyethylene film shall overlap a minimum of 6 inches and be tightly sealed with the use of sand, wood planks, pressure-sensitive tape, mastic, or glue to maintain close contact with the concrete surface, retain moisture, and prevent the formation of air pockets throughout the entire duration of the final curing method cycle.

i. White Polyethylene Film.

White polyethylene film shall minimize heat gain caused by absorption of solar radiation and shall be exclusively used during warm weather applications.

ii. Clear and Black Polyethylene Films.

Clear and black polyethylene films shall inhibit absorption of solar radiation for cold weather applications.

b. White Burlap-Polyethylene Sheeting.

White burlap-polyethylene sheeting shall be securely bonded to the burlap so to avoid separation of the materials during handling and curing of the concrete.

c. Reinforced Impervious Paper.

Reinforced impervious paper shall be white in color, consist of two sheets of kraft paper cemented together with a bituminous adhesive, and reinforced with embedded cords or strands of fiber running in both directions. Reinforced impervious paper shall be free of holes, tears, and pin holes from deterioration of the paper through repeated use. Reinforced impervious paper shall be treated to prevent tearing when wetted and dried. Reuse of reinforced impervious paper shall be permitted so long as it is able to retain moisture on the surface of concrete. The paper shall be discarded and prohibited from use when moisture is no longer retained in the material.

3. Liquid Membrane-Forming Compounds.

Compounds shall form a continuous, non-yellowing, and durable film with quality moisture-retention properties. Compounds shall maintain the relative humidity of the concrete surface above 80% for seven days to sustain cement hydration. Compounds shall not affect the original color of the concrete surface. Compounds shall not degrade due to exposure to ultraviolet light

from direct sunlight. Compounds shall meet the local and federal allowable Volatile Organic Compound (VOC) content limits.

White-pigmented compounds shall be used in instances where solar-heat gain is concern to the concrete surface. White-pigmented compounds shall be agitated in the container prior to application to prevent pigment from settling out resulting in non-uniform overage and ineffective curing.

Careful considerations shall be made by the Contractor to determine if the evaporation rate is exceeding the rate of bleeding, thus causing the surface to appear dry even though bleeding is still occurring. To diagnose and prevent this condition, the Contractor may place a transparent plastic sheet over a test area of the uncured and unfinished concrete surface and shall determine if any bleed water accumulates under the plastic. Under such conditions, the application of liquid membrane-forming compounds to the concrete surface shall be delayed to prevent bleed water from being sealed below the concrete surface, map cracking of the membrane films, reduction in moisture-retention capability, and the need for reapplication of the compound.

Prior to use, compounds shall be thoroughly mixed, stirred, and agitated per the Manufacturer's instructions and recommendations.

Compounds shall be applied continuously and uniformly to the surface of the concrete per the Manufacturer's instructions and recommendations. Compounds shall be applied immediately after the disappearance of the surface water sheen following final finishing. Applicating of the compound immediately after final finishing and before all free water on the surface has evaporated will help prevent the formation of cracks. When using compounds to reduce moisture loss from formed surfaces, the exposed surface shall be wetted immediately after form removal and kept moist until the curing compound is applied. The concrete shall be allowed to reach a uniformly damp appearance with no free water on the surface, and then application of the compound shall begin at once. Delayed application will result in surface drying, absorption of the compound into the concrete, and no forming of a continuous membrane.

The concrete surface shall be damp when the compound is applied. Power-driven spray equipment shall be used for uniform application of compounds on large paving projects. Spray nozzles recommended by the compound Manufacturer and use of windshields shall be arranged by the Contractor to prevent wind-blown loss of compound and to ensure proper coverage application rates are achieved. The compound shall be applied by power sprayer, using appropriate wands and nozzles with pressures between 25 and 100 psi. The Contractor shall fill the power sprayer with curing compound from the Manufacturer's original container in the presence of the Engineer. Any dilution as recommended by the Manufacturer shall take place in the presence of the Engineer. For very small areas such as repairs, the compound shall be applied with a wide, soft-bristled brush or paint roller.

The Contractor shall verify the application rate and procedures are in accordance with the Manufacturer's instructions and recommendations. At least one uniform coat shall be applied at a rate of 150 to 200 ft2/gallon. On very deeply textured surfaces, the surface area to be treated shall be at least twice the surface area of the surface. In such cases, two separate applications may be needed, each at 200 ft2/gallon or greater if specified by the Manufacturer to achieve the desired moisture retention rate, with the first being allowed to become tacky before the second is applied.

If two coats are necessary to ensure complete coverage, for effective protection the second coat should be applied at right angles to the first. Complete coverage of the surface shall be attained due to the potential for formation of small pinholes in the membrane, which will result in loss of moisture from the concrete. Compounds shall not sag, run off peaks, or collect in grooves.

Compounds and procedures shall be compatible with concrete surfaces receiving subsequent applications or placements of concrete, overlays, coatings, paints, sealers, finishes or other toppings to ensure acceptable bonding to the concrete. Testing to establish compatibility among the curing compound, subsequent surface treatments, concrete moisture content and the actual finished surface texture of the concrete shall be conducted when compatibility is not known. The compound Manufacturer shall be consulted by the Contractor to determine the compatibility of the application. Compounds shall not be applied to concrete surfaces where bonding of subsequent applications or placements is incompatible or is of concern. The use of wax-based curing compounds shall be prohibited in instances where concrete surfaces are subject to additional toppings and vehicular, pedestrian, or other traffic. Deliberate removal of compounds in the presence of the Engineer and in accordance with Manufacturer's instructions and recommendations shall be conducted as an alternative to compatibility testing, incompatibility, or in instances where bonding is of concern. Bonding of subsequent materials may still be inhibited by the presence of the compound even after the moisture retention characteristics of the compound have diminished.

a. Liquid Membrane-Forming Compounds for Curing.

Liquid membrane-forming compounds for curing shall meet ASTM C309, the Manufacturer's instructions and recommendations, and the requirements specified herein.

Table 701.30-1: Types of Compounds for Curing

Type	Description
Type 1	Clear or translucent without dye
Type 1-D	Clear or translucent with fugitive dye
Type 2	White pigmented

Table 701.30-2: Composition Class of Compounds for Curing

Type	Description
Class A	Unrestricted composition, generally wax-based products
Class B	ASTM D883 resin-based products

b. Liquid Membrane-Forming Compounds for Curing and Sealing.

Liquid membrane-forming compounds for curing and sealing shall meet ASTM C 1315, the Manufacturer's instructions and recommendations, and the requirements specified herein.

In addition to moisture-retention capabilities compounds shall exhibit specific properties, including alkali resistance, acid resistance, adhesion-promoting quality, and resistance to degradation by ultraviolet light.

Table 701.30-3: Types of Compounds for Curing and Sealing

Type	Description
Type I	Clear or translucent
Type II	White pigmented

Table 701.30-4: Class of Compounds for Curing and Sealing

Type	Description
Class A	Non-yellowing

F. Protective Sealing Compounds.

Protective sealing compounds shall maintain valid listing on the Department Qualified Construction Materials List (QCML) and meet AASHTO M 224, NCHRP Report 244 and the requirements specified herein.

Protective sealing compounds shall sufficiently penetrate the concrete to seal the surface pores and fill the capillaries of the concrete by chemically reacting with the concrete and forming a hydrophobic layer. Protective sealing compounds shall limit the penetration of liquids, gases, and harmful substances into hardened concrete, including water, de-icing agents, and carbon dioxide to protect concrete from freezing, thawing, and de-icing cycles, corrosion of reinforcing steel, and acid attack. Protective sealing compounds shall limit the buildup of vapor pressure between the concrete and the applied sealer. Protective sealing compounds shall retard the penetration of harmful substances into hardened concrete. Protective sealing compounds shall maintain their protective properties during environmental exposure to freezing, thawing, and de-icing cycles. Protective sealing compounds shall not reduce the frictional properties of the concrete. Protective sealing compounds shall not affect the original color of the concrete surface if maintaining the original color is desired by the Department. Protective sealers shall meet the local and federal allowable Volatile Organic Compound (VOC) content limits.

Curing methods conforming to Department specifications shall be applied to the concrete prior to the application of protective sealers. Protective sealers shall not be applied to the concrete for a minimum of 28 days after placement and the surface shall be sufficiently prepared, clean, and dry for at least 24 hours with ambient temperatures exceeding 60°F. Protective sealers shall not be applied to concrete placed where freezing, thawing, and de-icing cycles are expected immediately after, due to the retainage of water in the concrete. Periodic re-application shall be required for protective penetrants requiring multiple applications and for concrete surfaces exhibiting wear to ensure long-term protection of the concrete surface.

G. Cold Weather Concreting Materials.

Cold weather concreting shall be defined as the procedures, operations, materials, and equipment required for the mixing, delivery, placement, finishing, curing, and protection of concrete during cold weather conditions, while exposed to air temperatures falling below, or expected to fall below 40°F.

The protection period shall be defined as the minimum duration required to prevent concrete from the negative effects of cold weather exposure. The protection period shall remain in place while

cold weather conditions exist. Controlled and gradual termination of the protection period shall be conducted only after 100% f'c is attained and all specified conditions are met.

The procedures, operations, materials, and equipment selected for cold weather concreting shall adequately maintain specified temperature ranges by addressing all variables, including ambient weather conditions, geometry of the structure, and mix design proportions. Concrete temperatures for cold weather concreting shall meet Table 701.30-5.

Table 701.30-5: Concrete Temperature Requirements for Cold Weather Concreting

Phase	Cold Weather Temperature (°F)	Thickness of Sections (ft.)			
		< 1	1-3	3-6	> 6
		Concrete Temperature (°F)			
Mixing	30-39	60-75	55-70	50-65	45-60
	0-30	65-80	60-75	55-70	50-65
	< 0	70-85	65-80	60-75	55-70
Placement	< 40	55-75	50-70	45-65	40-60
Protection Period	< 40	55-75	50-70	45-65	40-60
Termination of Protection Period – Allowable Rate of Decrease in 24 Hours	< 40	≤ 50	≤ 40	≤ 30	≤ 20

Cold weather concreting procedures, operations, materials, and equipment shall be developed and performed to prevent damage to concrete due to freezing at early ages, to ensure that the concrete develops the recommended strength for safe removal of forms, to maintain curing conditions that promote quality strength and durability development, to limit rapid temperature fluctuation, and to provide protection consistent with intended serviceability of the structure. The Contractor shall develop and submit to the Department for review and approval, cold weather concreting procedures for the mixing, delivery, placement, finishing, curing, and protection of concrete during cold weather, including:

- Procedures for protecting the subgrade from frost and the accumulation of ice or snow on reinforcement or forms prior to placement
- Methods and requirements for cold weather protection and temperature control of constituent materials incorporated into the mix design
- Chemical admixtures incorporated into the mix design for cold weather protection and temperature control
- Methods and requirements for cold weather protection and temperature control during mixing, delivery, placement, finishing, curing, and protection period
- Curing methods to be used during and following the protection period
- Types of covering, insulation, heating, or enclosures to be provided
- Methods for verification of in-place strength
- Procedures for measuring and recording concrete temperatures
- Procedures for preventing drying during dry, windy conditions

All procedures, operations, materials, and equipment required for adequate protection and curing shall be present and ready for use prior to concrete production.

1. Insulating Materials.

Insulating materials used for cold weather concreting shall meet the requirements specified herein. The thermal resistance of the proposed insulation system shall be determined to meet the concrete temperature range requirements specified herein. Supplemental heat, including hydronic heating systems, shall be applied in instances where insulating materials cannot achieve the concrete temperature requirements.

2. Heaters.

Heaters used for cold weather concreting including direct fired, indirect fired, and hydronic heaters shall meet ANSI A10.10 carbon monoxide limits, safety regulations for ventilation, and the stability, operation, fueling, and maintenance of heaters and the requirements specified herein.

a. Direct Fired Heaters.

Direct fired heaters generate heat to an enclosed space through the combustion of fossil fuels, including oil, kerosene, propane, gasoline, and natural gas. Hot air comprised of carbon dioxide and carbon monoxide combustion products, is discharged into the enclosed space. Direct fired heaters shall be prohibited from heating the air directly surrounding the concrete surface due to calcium carbonate formation interfering with the hydration reaction, from the reaction between the carbon dioxide generated from the combustion of fossil fuels and the calcium hydroxide on the surface of freshly placed concrete, resulting in a soft, chalky, and nondurable concrete surface. Direct fired heaters shall only be used on concrete surfaces protected from fossil fuel combustion products.

b. Indirect Fired Heaters.

Indirect fired heaters generate heat to an enclosed space through the combustion of fossil fuels, including oil, kerosene, propane, gasoline, and natural gas. The carbon dioxide and carbon monoxide combustion products are expelled through venting, resulting in clean heated air discharged into the enclosed space. Indirect fired heaters are suitable for heating the air directly surrounding the concrete surface.

c. Hydronic Heaters.

Hydronic heaters generate heat to an enclosed space through the circulation of the heat-transfer fluid in a closed system of pipes or hoses. The heat-transfer fluid is comprised of a propylene glycol water solution and is heated through the combustion of fossil fuels, including diesel fuel and kerosene. The combustion of fossil fuel occurs outside of the enclosed space and does not expose the concrete surface to the deleterious effects of carbon dioxide.

After the concrete placement achieves final set, polyethylene film or other suitable material shall sufficiently serve as a vapor barrier. The heat-transfer hoses shall be placed on top of the vapor barrier and covered with insulating materials meeting 701.30.G.1. Hydronic heaters shall be used to thaw or preheat subgrades prior to concrete placement and provide supplementary heat to insulating materials. Hydronic heaters shall provide an even distribution of heat to prevent curling and cracking induced by temperature gradients within concrete.

3. Enclosures.

Enclosures shall be made of wood, canvas tarpaulins, polyethylene film, or prefabricated rigid plastic. Enclosures shall be airtight, block wind, prevent admittance of cold air, conserve heat, and withstand wind and snow loads. Enclosures shall provide adequate headroom for craftsmen and sufficient space between the concrete and the enclosure to permit free circulation of warm air. Supplementary heat shall be supplied to enclosures by hydronic heaters, live steam, hot forced air, or indirect fired combustion heaters. Icing along the perimeter of the enclosure shall be prevented when live steam is utilized. Heaters and ducts shall be positioned to prevent the hot, dry air from overheating or drying the concrete surface. Insulating materials meeting 701.30.G.1 shall be applied as a vapor barrier to the concrete surface immediate after final set is attained.

H. Hot Weather Concreting Materials.

Hot weather concreting shall be defined as the procedures, operations, materials, and equipment required for the mixing, delivery, placement, finishing, bleed water evaporation, curing, and protection of concrete during hot weather conditions, while exposed to air temperatures exceeding, or expected to exceed 80°F; concrete temperatures approaching, or expected to approach 90°F; evaporation rates of surface water approaching, or expected to approach the bleeding rate of the concrete; high solar radiation; low relative humidity; and high wind speed.

The protection period shall be defined as the minimum duration required to prevent concrete from the negative effects of hot weather exposure, including the acceleration of rate of moisture loss and rate of cement hydration, difficulties in curing, increased concrete temperature, increased water demand, accelerated slump loss, increased rate of setting, increased tendency for plastic shrinkage and thermal cracking, increased potential for cold joints, and difficulties in controlling entrained air content. The protection period shall remain in place while hot weather conditions exist. Controlled and gradual termination of the protection period shall be conducted when conditions permit. The allowable rate of temperature decrease shall not exceed 5°F per hour and meet the allowable rate of temperature decrease specified in 701.30.G: Cold Weather Concreting Materials.

The procedures, operations, materials, and equipment selected for hot weather concreting shall adequately maintain specified temperature ranges and evaporation rates by addressing all variables, including ambient weather conditions, geometry of the structure, and mix design proportions. Initial materials meeting 701.30.C: Initial Curing Materials shall be applied to the concrete surface while the concrete and air temperatures, relative humidity of the air, and the wind speed have the capacity to evaporate free water from the fresh concrete surface at a rate that is equal to or greater than bleeding rate of the concrete. The evaporation rate of surface water shall be determined by the following equation:

$$E = (T_c^{2.5} - r * T_a^{2.5})(1 + 0.4V) \times 10^{-6}$$

where E = evaporation rate of water-covered surface ($lb/ft^2/hr$), T_c = concrete temperature of the evaporating surface (°F), r = relative humidity of air surrounding the evaporating surface (%), T_a = temperature of the air surrounding the evaporative surface (°F), and V = average wind speed 20 inches above the evaporating surface. The air surrounding the evaporating surface shall be defined as the air approximately 4 to 6 feet above the evaporating surface on the windward side and shielded from the sun's rays.

Hot weather concreting procedures, operations, materials, and equipment shall be developed and performed to prevent damage to concrete and promote long-term durability. The Contractor shall develop and submit to the Department for review and approval, hot weather concreting procedures for the mixing, delivery, placement, finishing, curing, and protection of concrete during hot weather, including:

- Procedures for preparing the subgrade prior to placement
- Methods and requirements for hot weather protection and temperature control of constituent materials incorporated into the mix design
- Chemical admixtures incorporated into the mix design for hot weather protection and temperature control
- Methods and requirements for hot weather protection and temperature control during mixing, delivery, placement, finishing, curing, and protection period
- Initial curing methods to be used to reduce surface evaporation
- Curing methods to be used during and following the protection period
- Types of covering, insulation, cooling, or enclosures to be provided
- Evaporation rate and bleeding rate of concrete calculations
- Procedures for measuring and recording concrete temperatures
- Procedures for preventing drying during dry, windy conditions

All procedures, operations, materials, and equipment required for adequate protection and curing shall be present and ready for use prior to concrete production.

CONSTRUCTION METHODS

701.40: Pre-Placement

A. Excavation.

Excavation of the area shall be in accordance with the applicable portions of Subsection 120: Excavation.

B. Subgrade and Subbase.

The subgrade for the sidewalks and driveways shall be shaped parallel to the proposed surface of the sidewalks and driveways and thoroughly compacted. All depressions in the subgrade shall be filled with suitable material and again compacted until the surface is smooth and hard. Prior to the placement of the subbase, the Contractor shall inspect the prepared subgrade to ensure that it is in conformance with the required grade and cross-section. Subgrade shall be fine graded to meet the applicable requirements of Subsection 170: Grading.

After the subgrade has been prepared, a gravel subbase shall be placed upon it. After being compacted thoroughly, the subbase shall be at least 8 inches thick and parallel to the proposed surface of the sidewalk. Prior to the placement of the cement concrete, the Contractor shall inspect the prepared subbase material to ensure that it is in conformance with the required grade and cross-section. Subbase material that is not in accordance with the plans or specifications shall be reworked or replaced to meet the applicable requirements of Subsection 170: Grading before the start of cement concrete placement. When placing cement concrete, the compacted subbase shall not be frozen or have standing water.

C. Forms.

Side forms and transverse forms shall be smooth, free from warp, of sufficient strength to resist springing out of shape, of a depth to conform to the thickness of the proposed sidewalk or wheelchair ramp and of a type satisfactory to the Engineer.

All mortar or dirt from previously used forms shall be completely removed prior to use. The forms shall be well staked and thoroughly graded and set to the established lines with their upper edge conforming to the grade of the finished sidewalk or wheelchair ramp which shall have sufficient pitch to the roadside edge to provide for surface drainage.

All wheelchair ramp joints and transition sections which define grade changes shall be formed staked and checked for dimension, grade and slope conformance prior to placing cement concrete.

All forms shall be oiled before placing concrete.

701.41: Placement

The concrete shall be placed in alternate slabs 30 ft long except as otherwise ordered. The slabs shall be separated by transverse preformed expansion joint filler ½ in. thick.

Preformed expansion joint filler shall be placed adjacent to or around existing structures as directed.

Detectable warning panels conforming to the plans shall be securely incorporated into the work by means acceptable to the Engineer.

On the foundation as specified above, the concrete shall be placed in such quantity that after being thoroughly consolidated in place it shall be 4 in. deep. At driveways, the sidewalks shall be 6 in. deep.

In conveying the concrete from the place of mixing to the place of deposit, the operation shall be conducted in such a manner that no mortar will be lost, and the concrete shall be so handled that the concrete will be of uniform composition throughout, showing neither excess nor lack of mortar in any one place.

The surface of all concrete sidewalks shall be uniformly scored into block units of areas not more than 36 ft². The depth of the scoring shall be at least ½ in. deep and no more than ½ in. wide.

701.42: Finishing

The finishing of concrete surface shall be done by experienced and competent cement finishers. No finishing operation shall be performed while free water is present. Finishing operations shall be delayed until all bleed water and water sheen has left the surface and the concrete has started to stiffen. After water sheen has disappeared, edging operations, where required, shall be completed. After edging and joining operations, the surface shall be floated. Magnesium floats shall be used for all finishing operations. If necessary tooled joints and edges shall be rerun before and after floating to maintain uniformity. After floating, the surface shall be brushed by drawing a soft-bristled push broom with a long handle over the surface of the concrete to produce a nonslip surface.

701.43: Initial Curing

In instances where the bleed water sheen has disappeared from the surface of the concrete or the concrete surface exhibits loss of moisture and surface drying between placement and finishing operations, the Contractor shall apply one of the following initial curing materials and procedures meeting 701.30.C: Initial Curing Materials until finishing operations occur.

- 701.30.C.1: Liquid-Applied Evaporation Reducers

Initial curing materials shall not be worked into the surface in subsequent finishing operations.

701.44: Intermediate Curing

In instances where finishing operations have been completed prior to the concrete achieving final set and the concrete surface exhibits loss of moisture and surface drying, the Contractor shall apply one of the following intermediate curing materials and procedures meeting 701.30.D: Intermediate Curing Materials immediately to the concrete surface prior to the application of final curing materials, to prevent the loss of moisture without damaging the concrete surface, until final set of the concrete has been achieved and final curing materials have been applied to the concrete surface.

- 701.30.C.1: Liquid-Applied Evaporation Reducers
- 701.30.E.3.a: Liquid Membrane-Forming Compounds for Curing
- 701.30.E.3.b: Liquid Membrane-Forming Compounds for Curing and Sealing

701.45: Final Curing

The Contractor shall apply one of the following final curing materials and procedures meeting 701.30.E: Final Curing Materials to the concrete surface immediately after application of initial and intermediate curing materials, finishing operations, and final set of cement concrete, to prevent the loss of moisture and surface drying.

- 701.30.E.1: Saturated Covers
- 701.30.E.2: Sheet Materials
- 701.30.E.3.a: Liquid Membrane-Forming Compounds for Curing
- 701.30.E.3.b: Liquid Membrane-Forming Compounds for Curing and Sealing

The Contractor shall apply final curing materials and procedures to the concrete surface throughout the entire duration of the curing cycle and meet minimum sustained temperature, duration, and strength requirements, as specified in in Table 701.45-1. Controlled and gradual termination of the curing cycle shall begin after all specified conditions are met.

Table 701.45-1: Termination of Curing Cycle

Sustained Concrete Temperature	Final Curing Cycle Duration	Compressive Strength[1]
50°F ≤ °F ≤ 90°F	≥ Seven (7) days	≥ 70% f'_c

[1] Compressive strength cylinders for termination of curing cycle shall be cast and field cured with the same environmental conditions that the sidewalk is subjected to throughout the entire duration of the final curing cycle, per 701.73: Acceptance Sampling and Testing.

701.46: Protective Sealing

The Contractor shall apply sealing materials and procedures meeting 701.30.F: Protective Sealing Compounds only if one or more of the following final curing materials and procedures were applied:

- 701.30.E.1: Saturated Covers
- 701.30.E.2: Sheet Materials
- 701.30.E.3.a: Liquid Membrane-Forming Compounds for Curing

Protective sealing compounds shall not be applied to concrete surfaces applied with a final curing material and procedure meeting 701.30.E.3.b: Liquid Membrane-Forming Compounds for Curing and Sealing.

701.47: Cold Weather Concreting

The Contractor shall conduct cold weather concreting procedures, operations, materials, and equipment required for the mixing, delivery, placement, finishing, curing, and protection of concrete, while surfaces are exposed to air temperatures falling below, or expected to fall below 40°F in accordance with 701.30.G: Cold Weather Concreting Materials. All procedures, operations, materials, and equipment required for adequate protection and curing shall be present and ready for use prior to concrete production.

701.48: Hot Weather Concreting

The Contractor shall conduct hot weather concreting procedures, operations, materials, and equipment required for the mixing, delivery, placement, finishing, curing, and protection of concrete, while surfaces are exposed to air temperatures exceeding, or expected to exceed 80°F; concrete temperatures approaching, or expected to approach 90°F; evaporation rates of surface water approaching, or expected to approach the bleeding rate of the concrete; high solar radiation; low relative humidity; and high wind speed in accordance with 701.30.H: Hot Weather Concreting Materials. All procedures, operations, materials, and equipment required for adequate protection and curing shall be present and ready for use prior to concrete production

CONTRACTOR QUALITY CONTROL

701.60: General

The following best practices and minimum Contractor Quality Control requirements are recommended herein.

The Contractor shall provide adequate Quality Control (QC) to ensure that all materials and workmanship conform with the specification requirements. The Contractor shall perform QC activities as outlined further below.

701.61: Contractor Quality Control Plan

The Contractor shall provide and maintain a Quality Control Plan (QC Plan). The QC Plan should sufficiently document the QC processes of all Contractor parties (i.e. Prime Contractor, Subcontractors, Producers) performing work required under this specification.

701.62: Production Personnel

A. Foreman.

A foreman shall be present throughout the entire duration of the construction operation with at least one of the following personnel certifications.

- NRMCA Concrete Exterior Finisher Certification
- ACI Concrete Flatwork Technician and Flatwork Finisher

The foreman is responsible for the oversight of the construction operation per the requirements specified in Table 701.62-1.

Table 701.62-1: Minimum Foreman Requirements

Operation	Foreman	Activity
Oversight	One (1)	Review and compare batch ticket quantities and sources to approved mix design
		Monitors conformance to AASHTO M 157 Standard Specification for Ready-Mixed Concrete
		Monitors conformance to Department specifications
		Monitors Production Personnel activities
		Verifies proper equipment is on hand prior to start of construction
		Monitors equipment, environmental conditions, materials, and workmanship
		Prohibits the use of prohibited equipment and practices
		Acknowledges sampling, testing, and inspection results

B. Operators.

Concrete sidewalk shall be constructed by sufficiently trained, experienced, and qualified equipment operators and craftsmen, who are presently involved in sidewalk construction, throughout the entire duration of the construction operation, per the requirements specified in Table 701.62-2.

Table 701.62-2: Minimum Operator Requirements

Operation	Operators	Activity
701.40: Pre-Placement	Two (2)	Apply sufficient base compaction
		Moisten sub-base, free of standing water
		Secure forms, straight and level
		Mark expansion locations
		Prohibited Practices: Placement on frozen sub-grade
701.41: Placement (Concrete Discharging)	Two (2)	Direct concrete trucks
		Handle chute discharge and truck movement
		Assist in preparing concrete for testing
		Direct trucks to washout area
		Provide general help
		Prohibited Practices: Adding constituent materials not in conformance with AASHTO M 157 or without Department consent
701.41: Placement	Two (2)	Localize placement to minimize moving material
		Level concrete in front of the screed
		Operate come-alongs or flat headed shovel to move concrete in form
		Consolidate concrete along form edge to avoid honeycombing
		Operate screed over top of forms in sawing action for surface leveling
		Operate magnesium bull float to push coarse aggregate below the surface and fill in the low spots or depressions
		Prohibited Practices: Toothed raking, dragging of internal vibrator, and internal vibrator to move concrete; steel troweling or floating
701.42: Initial Curing	Apply an initial curing material and procedure per 701.42	
	One (1)	701.30.C.1: Liquid-Applied Evaporation Reducers
701.43: Finishing	Two (2)	Permit bleed water to dissipate and concrete to set
		Operate a hose drag or squeegee to remove water from the surface
		Check surface for flatness, fill/cut as necessary
		Finish surface with magnesium float
		Apply pulled broom finish at proper time to acceptable texture
		Clean broom when excessive mortar adheres
		Remove excess water from broom before use
		Finish edges and joints
		Finish well formed, properly spaced joints to sufficient depth
		Prohibited Practices: Steel troweling or floating; adding water to the surface; excessive working of surface; pushing broom across surface

Table 701.62-2: Minimum Operator Requirements (Continued)

Operation	Operators	Activity
701.44: Intermediate Curing	If applicable, apply an intermediate curing material and procedure per 701.44	
	One (1)	701.30.C.1: Liquid-Applied Evaporation Reducers
	One (1)	701.30.E.3.a: Liquid Membrane-Forming Compounds
	One (1)	701.30.E.3.b: Liquid Membrane-Forming Compounds for Curing and Sealing
701.45: Final Curing	Apply a final curing material and procedure meeting 701.45	
	Four (4)	701.30.E.1: Saturated Covers
	Four (4)	701.30.E.2: Sheet Materials
	One (1)	701.30.E.3.a: Liquid Membrane-Forming Compounds
	One (1)	701.30.E.3.b: Liquid Membrane-Forming Compounds for Curing and Sealing
701.46: Protective Sealing	One (1)	If applicable, apply a protective sealing material and procedure per 701.46
701.47: Cold Weather Concreting	Four (4)	If applicable, apply cold weather concreting materials and procedures per 701.47 and the Contractor's cold weather concreting plan
701.48: Hot Weather Concreting	Four (4)	If applicable, apply hot weather concreting materials and procedures per 701.48 and the Contractor's hot weather concreting plan

701.63: Quality Control Inspection

Quality Control inspection shall be performed and reported on inspection report forms by qualified Quality Control Technicians, to confirm conformance to specifications and to visually inspect equipment, environmental conditions, materials, and workmanship. Quality Control inspection report forms shall be completed by the Contractor and submitted to the Department for review.

DEPARTMENT ACCEPTANCE

701.70: General

Acceptance shall be performed by the Department, including consultants under direct contract with the Department independent of the Contractor, to evaluate the degree of compliance with contract requirements, to monitor each Contractor entity's Quality Control activities, to determine the corresponding value for a given product, and to determine the acceptability of all material produced and placed.

701.71: Acceptance of Contractor Quality Control Plan

The Department will review the Contractor Quality Control Plan. Department approval shall be subject to conformance with the requirements specified herein.

701.72: Acceptance Inspection

Acceptance inspection will be performed and reported by qualified Department (or designee) Acceptance Technicians, to confirm conformance to specifications and to visually inspect equipment, environmental conditions, materials, and workmanship.

701.73: Acceptance Sampling and Testing

Acceptance sampling and testing will be performed and reported by qualified Department (or designee) Acceptance Technicians, to provide quality characteristic data used for Department Acceptance determination, per the requirements specified herein.

Table 701.73-1: Minimum Acceptance Sampling and Testing Requirements

Property	Method	Quality Characteristic	Sublot Size	Minimum Test Frequency	Point of Sampling	Criteria	
Uniformity	T 121	Unit Weight Allowable Tolerance (lbs / ft^3)[1]	100 cy	1 per Sublot	Point of Discharge	± 3.0	
	T 119	Slump Allowable Tolerance (in.)[1]	100 cy	1 per Sublot	Point of Discharge	**Slump**	**Criteria**
						< 4 in.	± 1.0
						4 – 6 in.	± 1.5
Workability	T 119	Segregation Resistance[2]	100 cy	1 per Sublot	Point of Discharge	Pass	
Thermal	T 309	Concrete Temperature (°F)	100 cy	1 per Sublot	Point of Discharge	50 – 90	
Strength	T 22	Compressive Strength at 7 Days for Curing Termination (psi)[3]	100 cy	1 per Sublot	Point of Discharge	≥ 70% f'_c	
		Compressive Strength at 28 Days (psi)[3]	100 cy	1 per Sublot	Point of Discharge	≥ 100% f'_c	
		Compressive Strength at 56 Days (psi)[3][4]	100 cy	1 per Sublot	Point of Discharge	≥ 100% f'_c	
Durability	T 121 T 152 T 196	Freezing and Thawing Resistance: Air Content (%)	100 cy	1 per Sublot	Point of Discharge	5.5 – 8.5	
	T 303 or C1567	Alkali Silica Reaction Resistance: Expansion at 14 Days (%)	–	1 per Annual Mix Design Submission Cycle	–	≤ 0.08	

[1] Test result and the Producer's mix design target shall be within the specified allowable tolerances.

[2] Testing for segregation resistance shall be performed while the concrete is being discharged and during AASHTO T 119 Standard Method of Test for Slump of Hydraulic Cement Concrete. Visual signs of segregation include coarse particles advancing in front of or behind the fine particles and mortar and a tendency for coarse aggregate to separate from the mortar, particularly when the mixture is being consolidated.

[3] Three (3) 4 x 8 in. compressive strength cylinders shall be cast and tested for each age per sublot.

[4] Testing only required if compressive strength results at 28 days do not conform with specifications.

COMPENSATION

701.80: Method of Measurement

Cement Concrete Sidewalks, Wheelchair Ramps, and Driveways will be measured in square yards.

Excavation will be measured by the cubic yard as specified in 120.80: Method of Measurement.

Gravel Borrow will be measured by the cubic yard as specified in 150.80: Method of Measurement.

Fine grading and compacting will be measured by the square yard as specified in 170.80 Method of Measurement.

701.81: Basis of Payment

Cement Concrete Sidewalk, Cement Concrete Wheelchair Ramp, and Cement Concrete Driveway will be paid for at the contract unit price per square yard complete in place and shall include detectable warning panels.

Gravel will be paid for at the contract unit price per cubic yard under Item 151. Gravel Borrow.

Fine grading and compacting will be paid for at the contract unit price per square yard under Item 170., Fine Grading and Compacting – Subgrade Areas.

Excavation will be paid for at the contract unit price per cubic yard under the excavation items.

701.82: Payment Items

701.	Cement Concrete Sidewalk	Square Yard
701.1	Cement Concrete Sidewalk Driveways	Square Yard
701.2	Cement Concrete Wheelchair Ramp	Square Yard

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SUPPLEMENTAL SPECIFICATIONS

(English Units)

DATE: JUNE 30, 2020

The 2020 *Standard Specifications for Highways and Bridges* are amended by the following modifications, additions and deletions. This Supplemental Specifications prevail over those published in the Standard Specifications.

The MassDOT–Highway Specifications Committee has issued these Supplemental Specifications for inclusion into each proposal until such time as they are approved as Standard Specifications.

Contractors are cautioned that these Supplemental Specifications are dated and may vary from time to time as they are updated.

DIVISION I
GENERAL REQUIREMENTS AND COVENANTS

SECTION 4.00: SCOPE OF WORK

Subsection 4.04 Changed Conditions.

(page I.22) Delete the two sequential paragraphs near the end that begin "The Contractor shall be estopped…" and "Any unit item price determined …"

SECTION 8.00: PROSECUTION AND PROGRESS

Subsection 8.08 Preservation of Roadside Growth

(page I.74) Delete the last paragraph of this subsection which reads; All scars on trees shall be painted as soon as possible with an approved tree paint.

DIVISION II
CONSTRUCTION DETAILS

SECTION 200: DRAINAGE
SUBSECTION 230: CULVERTS, STORM DRAINS, AND SEWAR PIPES

Subsection 230: CULVERTS, STORM DRAINS, AND SEWAR PIPES
(page II.63) Change SEWAR to SEWER in the title of this subsection.

230.20 General.
(page II.63) Delete the words Reinforced Concrete or Metal.

230.40 General.
230.62 Pipe Joints.
230.82 Payment Items
(page II.63, II.64 and II.68) Replace the words Corrugated Plastic (Polyethylene) Pipe with the words Corrugated Plastic Pipe.

230.64 Field Testing of Corrugated Plastic Pipe
(page II.65) Delete the word thermoplastic in the first sentence of this subsection.

SECTION 400: SUB-BASE, BASE COURSES, SHOULDERS, PAVEMENTS AND BERMS
SUBSECTION 450: HOT MIX ASPHALT PAVEMENT

SUBSECTION 453.93 Payment Items.
(page II.181) Change the pay unit of item 452. Tack Coat from Ton to Gallons and the pay unit of item 453. HMA Joint Sealant from Ton to Foot.

SECTION 700: INCIDENTAL WORK
SUBSECTION 702: HOT MIX ASPHALT SIDEWALKS AND DRIVEWAYS

SUBSECTION 702.41 Preparation of Underlying Surface.
(page II.303) Add the following sentence to the end of the first paragraph;

Existing pavements shall be sawcut in accordance with 450.49: Hot Mix Asphalt Joints.

SUBSECTION 702.81 Basis of Payment.
(page II.314) Add the following after the last paragraph;

All required sawcutting in the existing pavement in accordance with this specification will be included in the contract unit price for Hot Mix Asphalt Sidewalks and Driveways.

SUBSECTION 765: SEEDING

SUBSECTION 765.40 General.
(page II.332) Add the following material to the end of this subsection;

Short Term Erosion Control Seed M6.03.1

SUBSECTION 765.63 Seeding Grass.
(page II.333) Replace the first sentence with the following;

After the loamed or topsoil areas have been prepared and treated as hereinbefore described, grass seed conforming to the respective formulas hereinbefore specified shall be carefully sown thereon at the rate as specified by the supplier.

SUBSECTION 765.65 Seeding Grass by Spray Machine.
(page II.333) Change the title of this subsection to Hydroseeding. Delete the last paragraph of this subsection that begins with "If the results …", and Replace the first two sentences of the first paragraph with the following;

A hydroseed machine approved by the Engineer and designed specifically for seed dissemination may be utilized. The application of limestone as necessary, fertilizer as necessary and grass seed may be accomplished in one operation by the use of the approved hydroseed machine.

SUBSECTION 765.81 Basis of Payment.
(page II.334) Replace this subsection with the following;

Payment for Seeding and Seeding for Short Term Erosion Control, including all mowing, will be paid for at the contract unit price per square yard, complete in place. When a satisfactory stand of grass has not been established at the time of acceptance, no payment for seeding shall be allowed at the time of acceptance. At the time the final estimate is ready to be forwarded to the Contractor the seeded areas will again be inspected by the Engineer and the seeded areas with a satisfactory stand of grass will be included for payment.

SUBSECTION 765.82 Payment Items.
(page II.334) Add the following payment item;

765.2 Seed for Short Term Erosion Control ..... Square Yard

SUBSECTION 766: REFERTILIZATION

SUBSECTION 766 Refertilization.
(page II.335) Delete this entire subsection.

SUBSECTION 767: MULCHING; SEED FOR EROSION CONTROL

SUBSECTION 767 Mulching; Seed for Erosion Control.
(page II.336) Change the title of this subsection to Mulching and Erosion Control.

SUBSECTION 767.40 General.
(page II.336) Delete Seeding for Erosion Control … M6.03.1.

SUBSECTION 767.62 Hay Mulch with Seed for Erosion Control.
(page II.337) Change the title of this subsection to Hay Mulch with Seed for Short Term Erosion Control.

SUBSECTION 767.80 Method of Measurement.
(page II.338) Delete the last paragraph of this subsection which reads "Seed for Erosion Control will be measured by the pound."

SUBSECTION 767.81 Basis of Payment.
(page II.338) Delete the last paragraph of this subsection which reads "Seed for Erosion Control will be paid for at the contract unit price per pound."

SUBSECTION 767.82 Payment Items.
(page II.339) Delete item 765.2 Seed for Erosion Control.

SUBSECTION 771: PLANTING TREES, SHRUBS AND GROUNDCOVER

SUBSECTION 771.40 General.
(page II.338) Replace the last three paragraphs of third, fourth and fifth paragraphs of this subsection with the following;

All plants shall be northern grown nursery stock. The American Standards for Nursery Stock (ANSI Z60.1 shall serve as the Department's standard for plants and for plant, root ball, and container size, as well as growth and form requirements.

The latest editions of ANSI A300 Standards Part 1 Pruning and Part 6 Planting and Transplanting shall apply for all work of planting and pruning.

Trees and shrubs shall be balled and burlapped (B&B) or containerized. The caliper, height, age and other dimensions as specified for all planting material shall apply at the time planting is done and the plants will be inspected by the Engineer at this time as to these requirements as well as the quality or grade and varieties required. The Contractor shall remove all plants not approved by the Engineer from the project.

SUBSECTION 771.61 Seasons for Planting.
(page II.346) In table 771.61-1: Calendar Guidance for Planting replace "March 21 through May 15" with "March 21 through June 15".

SECTION 900: STRUCTURES

SUBSECTION 965: MEMBRANE WATERPROOFING FOR NEW BRIDGE DECKS

SUBSECTION 965 Membrane Waterproofing for New Bridge Decks.
(page II.552) Add this new section.

SUBSECTION 965: MEMBRANE WATERPROOFING FOR NEW BRIDGE DECKS

DESCRIPTION

965.20: General

Membrane waterproofing systems are defined as a thin impermeable membrane that is used to protect the concrete deck from penetration of moisture and deicing chemicals.

The work to be performed shall consist of the furnishing and application of an approved membrane system and all concrete surface preparation work necessary to install the membrane system. The membrane waterproofing system applied to the surface of the bridge deck as indicated on the plans shall consist of the primer, spray applied membrane (either methyl methacrylate, polyurea, or polyurethane methyl methacrylate), aggregate keycoat, and polymer modified tack coat.

MATERIALS

965.30: General

Materials shall meet the requirements specified in the following Subsections of Division III, Materials:

Spray Applied Waterproofing Membrane M9.08.1

CONSTRUCTION METHODS

965.40: Submittals

The Contractor shall submit to the Engineer for approval the following documents:

1. Initial submission (at least 30 days prior to application):
   - The membrane system to be installed.
   - The manufacturer's installation instructions for the applicable system
   - Safety data sheets (SDS) for all components
   - Cleaning solvents approved by the membrane manufacturer
2. At the pre-application meeting (at least 14 days prior to application):
   - Manufacturer's written approval of the Applicator's qualifications.
   - List of personnel performing the installation, inspection, and testing.
   - Installation procedure including storage and protection instructions as well as handling and mixing instructions.
   - List of application equipment to be used.
   - Manufacturer's written approval of the proposed polymer modified tack coat and the application rate that it shall be applied at.
   - Certificate of Compliance certifying that the aggregate for the keycoat meets the required hardness.
3. A minimum of 48 hours prior to installation a certificate of analysis for the proposed polymer modified tack coat shall be submitted by the Supplier of the tack coat to the Engineer for approval.
4. Upon completion of installation:
   - All QC installation test results for the tests specified in the materials section, including the name, address, and contact person of the laboratory that performed the tests and the date of the tests.
   - A Certificate of Compliance, from the membrane waterproofing system manufacturer, certifying that the membrane waterproofing system materials meet the requirements of the manufacturer and the contract specifications.

965.41: Preconstruction

Membrane waterproofing shall be installed in accordance with the manufacturer's instructions. The handling, mixing, and addition of membrane components shall be performed in a safe manner to achieve the desired results in accordance with the manufacturer's recommendations. Care shall be taken to prevent adjacent areas from overspray or other contamination.

965.42: Applicator Qualifications

The Contractor applying the waterproofing system shall be certified by the membrane waterproofing system manufacturer and have at least 2 years of experience in membrane installation. The Engineer shall receive the manufacturer's written approval of the contractor's qualifications at least 30 days prior to the application of any system component. This approval shall apply only to the named individuals performing the application.

965.43: Material Delivery and Storage

All components of the membrane system shall be delivered to the site in the manufacturer's original packaging, clearly identified with the products type and batch number. The storage area for all components shall be cool, dry, out of direct sunlight, and comply with relevant health and safety regulations. Copies of safety data sheets for all components shall be given to the Engineer and kept on site at the Contractor's field office.

965.44: Pre-Application Meeting

A minimum of 14 days before the anticipated start of membrane application, the Contractor shall schedule and conduct a pre-application meeting at the site to review the approved submittals, and other pertinent matters related to the application including the schedule for coordination between trades. At a minimum, the Contractor, the subcontractor performing the application and the Engineer shall be present at the meeting.

965.45: Mockup to Validate Bond Strength

For those projects where the concrete will be aged less than 28 days the manufacturer shall concur that the system is acceptable for use with the shortened aging period and a mockup shall be required. The intent is to validate the bond strength using the membrane waterproofing manufacture's primer and membrane.

In order to emulate the actual placement conditions, the mockup shall take place as close as possible to the intended date of the waterproofing application but be a minimum of 7 days before concrete placement. The mockup activities shall be representative of what will take place during the specified final bridge placement. It shall include the placement and surface preparation of the concrete and installation of membrane waterproofing system.

Inspection and testing shall be in accordance with Tables 965.63-1 and 965.64-1. The results of moisture and adhesion testing performed on a mockup of the bridge deck and closure pours shall meet these specifications. The mockup shall simulate the actual job conditions in all respects including air temperature, transit equipment, travel conditions, admixtures, forming, placement equipment, and personnel. If the mockup is unable to validate that the waterproofing membrane meets the project requirements, then the Engineer may require the Contractor to conduct additional mockups.

Removal of the mockup after its completion shall be the responsibility of the Contractor. In addition to the requirements contained herein, all weather and concrete temperature requirements contained in Section 901 shall be satisfied.

Acceptance of the mockup shall be the responsibility of the Engineer.

965.46: Application

The installation procedure shall consist of preparation of the concrete surface and application of primer, membrane, aggregate keycoat, and polymer modified tack coat. Special attention shall be paid to the bridge deck surface preparation prior to the membrane waterproofing system application. The membrane system shall be installed in accordance with the manufacturer's requirements. The Contractor shall be responsible for the field testing including, but not limited to, adhesion bond testing, deck moisture content measurement, and all other required documentation and reporting.

The membrane waterproofing system shall not be applied in either wet, damp, or foggy weather, or when the ambient temperature is 40°F or below or is forecast to fall below 40°F during the application period. The temperature of the concrete deck surface shall also exceed the dew point by at least 5°F.

The membrane waterproofing shall not be placed until the Contractor is ready to follow within 24 hours with the first layer of hot mix asphalt pavement. A longer period will be allowed only with prior written approval from the Engineer.

Where the areas to be waterproofed are bound by a vertical surface including, but not limited to, a curb or a wall, the membrane waterproofing system shall be continued up the vertical as necessary. A neat finish with well-defined boundaries and straight edges shall be provided.

A. Concrete Surface Preparation

Concrete surfaces which are to be waterproofed shall be screeded to the true cross section and sounded. All spalls and depressions shall be repaired prior to the application of the primer. Depressions shall be filled to a smooth flush surface with 1:2 mortar (1-part cement to two parts sand) or an approved rapid setting patching mortar that is compatible with the membrane waterproofing system. Other surfaces shall be trimmed free of rough spots, projections, or other defects which might cause puncture of the membrane so that the surface profile of the prepared concrete surface shall not exceed a ¼ inch amplitude, peak to valley.

The use of resin or wax-based deck curing membranes are not acceptable. Unless a mockup is completed in accordance with 965.45, the concrete shall be aged a minimum of 28 days, including curing time, before application of the membrane waterproofing system.

Immediately prior to the application of the primer, the concrete to which the membrane is to be applied shall be cleaned of all existing bond inhibiting materials in accordance with ASTM D4259 or as required by the manufacturer. Dust or loose particles shall be removed using clean, dry, oil-free compressed air or industrial vacuums. The surface preparation shall produce a clean dry surface and ensure that the concrete surface is free of asphaltic product, surface laitance, oil staining, soiling, and dust.

Any exposed steel components to receive membrane waterproofing shall be blast cleaned in accordance with the Society for Protective Coatings (SSPC) SSPC-SP6 or as required by the manufacturer and coated with the membrane waterproofing system within the same work shift.

B. Applying Primer

The primer shall only be applied when the temperature of the concrete deck surface exceeds the dew point by at least 5°F and when the concrete deck surface has a moisture content of 5% or less, as confirmed by a portable electronic surface moisture meter supplied by the Contractor.

The primer shall be applied in a manner to ensure full coverage and shall consist of one coat with an overall coverage rate of 125-175 ft^2/gallon unless otherwise recommended in the manufacturer's written instructions. All components shall be measured and mixed in accordance with the manufacturer's recommendations. The primer shall be spray applied using a single or multiple component spray system approved for use by the manufacturer. If required by site conditions, brush or roller application shall be allowed. The primer shall be allowed to cure tack-free for a minimum of 30 minutes or as required by the manufacturer's instructions, whichever time is greater, prior to application of the first lift of waterproofing membrane.

A second coat of primer shall be required if the first coat is absorbed by the concrete. The membrane shall be applied within the primer re-coat drying time allowed by the manufacturer but in no case shall it exceed 24 hours. Beyond this period, the surface shall be prepared again and re-primed following the manufacturer's recommendations prior to membrane application.

C. Applying Membrane

The waterproofing membrane shall be applied following the approved mixing and application procedure. The membrane shall be spray applied, with the mixing of the two components taking place at the nozzle and shall be applied to the primed deck in accordance with the manufacturer's instructions. The spray equipment shall be controlled so that the quantities applied may be monitored and shall allow for coverage rates to be checked.

Following the application of the membrane waterproofing system, the cured surface shall be visually inspected. If any defects or pinholes are found, an appropriate quantity of membrane material shall be mixed and repaired in accordance with Subsection 965.46 Part D. In all cases, the thickness of the repair shall be sufficient to bring the area up to the specified thickness. The thickness of the repair patch, measured over peaks, shall be a minimum of 80 mils or the thickness used to pass the ASTM C1305 Crack Bridging Test, whichever is greater.

For multi-stage construction, the subsequent stage membrane application shall overlap the existing cured membrane from the previous stage to form a continuous layer with a 6-inch overlap onto the existing membrane. The existing membrane shall be cleaned of all contamination including tack coat material or dirt to an edge distance of a least 6 inches and wiped with a solvent as approved by the membrane waterproofing manufacturer.

D. Repairs

If an area of membrane requires repair or if the membrane becomes damaged, a patch repair shall be carried out to restore the integrity of the membrane waterproofing system. The damaged area shall be cut back to sound materials and wiped with a solvent up to a width of at least 6 inches beyond the periphery of the damaged area, removing contaminants. The concrete shall be primed as necessary followed by the application of the membrane. A continuous layer shall be obtained over the concrete with a 6-inch overlap onto the existing membrane. The solvent shall be as approved by the membrane waterproofing manufacturer. Repairs shall comply with the manufacturer's guidelines for any over-coating times.

Where the membrane is to be joined to existing cured material and at joints, the new application shall overlap the existing membrane/joint by at least 4 inches. The existing membrane/joint shall be cleaned of all contamination including tack coat material or dirt to an edge distance of a least 6 inches and wiped with a solvent as approved by the membrane waterproofing manufacturer.

If pin holes or holidays are observed in the membrane surface they shall be repaired in accordance with the manufacturer's instructions and the approved Contractor Quality Control Plan (QC Plan).

In all cases, the thickness of the repair shall be sufficient to bring the area up to the specified thickness. The thickness of the repair patch, measured over peaks, shall be a minimum of 80 mils or the thickness used to pass the ASTM C1305 Crack Bridging Test, whichever is greater.

E. Applying Aggregate for Keycoat

Following the membrane application, an additional layer of membrane or resin, compatible with the membrane, shall be spray applied to a thickness of 30 to 40 mils into which an aggregate approved by the membrane manufacturer shall be broadcast ensuring a minimum coverage of 95%. The application rate shall be designated by the manufacturer. Loose aggregate shall be removed with brooms or oil/moisture-free compressed air before applying the tack coat.

For multi-stage construction, the aggregate keycoat of the previous stage shall be applied to a limit of 6-inches from the stage construction joint to allow the subsequent stage membrane material to bond directly to the existing membrane. The application of the aggregate keycoat for the subsequent stage shall cover the 6-inch overlap.

F. Applying Tack Coat

The polymer modified tack coat shall be applied in accordance with the membrane manufacturer's recommendations after a minimum of three hours from initial membrane application. The tack coat shall be allowed to cool for a minimum of 1 hour prior to HMA paving. The tack coat application rate shall be in accordance with the manufacturer's recommendation. The application rate of the tack coat shall be set at a rate that achieves the specified residual rate and coverage. Tack coat shall be applied to cover a minimum of 95% of the membrane surface. The tack coat application shall be monitored by Quality Control personnel in accordance with the approved QC Plan.

G. HMA Pavement Over Membrane

Placement of the HMA surface shall be in accordance with Section 450 and the contract specifications. During paving, a light soap spray should be applied to the paving equipment wheels to prevent tack coat pick-up.

965.47: Protection of Exposed Surfaces

The Contractor shall exercise care in the application of the waterproofing membrane system to prevent surfaces not receiving treatment from being spattered or marred, such as the face of curbs, copings, finished surfaces, substructure exposed surfaces, and outside faces of the bridge. Any material that spatters on these surfaces shall be removed and the surfaces cleaned to the satisfaction of the Engineer.

CONTRACTOR QUALITY CONTROL

965.60: General

The Contractor shall provide a Quality Control System (QC System) and, when required, a QC Plan, adequate to ensure that all materials and workmanship meet the required quality levels for each specified Quality Characteristic. The Contractor shall provide qualified QC personnel and QC laboratory facilities and perform Quality Control inspection, sampling, testing, data analysis, corrective action (when necessary), and documentation as outlined further below.

965.61: Contractor Quality Control Plan

The Contractor shall provide and maintain a QC Plan which should sufficiently document the QC processes of all Contractor parties (i.e. Prime Contractor, Subcontractors, Producers) performing work required under this specification.

A. QC Plan Submittal Requirements

At the pre-construction meeting, the Contractor shall be prepared to discuss the QC Plan. Information to be discussed shall include the proposed QC Plan submittal date, QC organization, and sources of materials. The Contractor shall submit the QC Plan to the Engineer for approval not less than 30 days prior to the start of any work activities related to membrane waterproofing installation (including preparation of underlying surface) addressed in Subsections 965.40 thru 965.47. The Contractor shall not start work on the subject work items without an approved QC Plan.

B. QC Plan Format and Contents

The QC Plan shall be structured to follow the format and section headings outlined in the MassDOT Model QC Plan. The pages of the QC Plan shall be sequentially numbered. The QC Plan shall address, in sufficient detail, the specific information requested under each section and subsection contained in the MassDOT Model QC Plan.

C. QC Plan Approval and Modifications

Approval of the QC Plan will be based on the inclusion of the required information. Revisions to the QC Plan may be required prior to approval for any part of the QC Plan that is determined by the Department to be insufficient. Approval of the QC Plan does not imply any warranty by the Engineer that the QC Plan will result in completed work that complies with the specifications. It remains the responsibility of the Contractor to demonstrate such compliance. The Contractor may modify the QC Plan as work progresses when circumstances necessitate changes in Quality Control personnel, laboratories, or procedures. In such case, the Contractor shall submit an amended QC Plan to the Department for approval a minimum of three calendar days prior to the proposed changes being implemented.

965.62: Quality Control Personnel Requirements

The Contractor's Quality Control organization shall, at a minimum, consist of the personnel qualified by the manufacturer to perform the required inspection and testing. Every effort should be made to maintain consistency in the QC organization; however, substitution of qualified personnel shall be allowed. When circumstances necessitate substitution of QC personnel not originally listed in the approved QC Plan, the Contractor shall submit an amended QC Plan for approval in accordance with Subsection 965.61 Part C.

965.63: Quality Control Inspection

The Contractor shall perform QC inspection of all work items addressed under this specification. Inspection activities during placement may be performed by qualified production personnel (e.g. Skilled Laborers, Foremen, and Superintendents). However, the Contractor's QC personnel shall have overall responsibility for QC inspection. The Contractor shall not rely on the results of the Engineer's Acceptance inspection for QC purposes. The Engineer shall be provided the opportunity to monitor and witness all QC inspection.

QC inspection activities must address the following four primary components:

a) Equipment
b) Materials
c) Environmental Conditions
d) Workmanship

The minimum frequency of QC inspection activity shall be in accordance with the requirements below and as outlined in the approved QC Plan. The Contractor shall document the results and findings of QC inspection.

The quality of each waterproofing membrane surface will be inspected and evaluated on the basis of Lots and Sublots. A Lot is defined as an isolated quantity of work which is assumed to be produced by the same controlled process. A Lot shall constitute no greater than the entire waterproofing membrane surface area on the bridge deck completed within the same construction season using the same placement process. Each Lot shall be divided into Sublots of equal sizes unless specified otherwise below.

All inspection reports shall be submitted to the Engineer within 72 hours of the test completion.

A. QC Inspection for Preparation of Underlying Surface

The Contractor's personnel will perform QC inspection during preparation of the underlying surface in accordance with the requirements of Subsection 965.46 Part A. The minimum items to be inspected shall be as outlined in Table 965.63-1. The Contractor shall identify in the QC Plan the specific inspection activities necessary to ensure the quality of the work, including any additional inspection activities not specifically listed in the table.

B. QC Inspection for Placement of Waterproofing Membrane

The Contractor's QC personnel will perform QC inspection at the site of waterproofing membrane field placement to ensure that the production and placement processes are providing work conforming to the contract and manufacturer requirements. The minimum items to be inspected for each waterproofing membrane Lot shall be in accordance with the requirements of Subsection 965.43 thru Subsection 965.47 and as outlined in Table 965.63-1. The Contractor shall identify in the QC Plan the specific inspection activities necessary to ensure the quality of the work, including any additional inspection activities not specifically listed in the table. Inspection shall include:

a) Pin Hole/Holidays: The surface of the membrane shall be inspected for pin holes and/or holidays. All pin hole/holidays shall be located, marked for repair, documented, and repaired in accordance with a repair procedure developed by the manufacturer and approved by the Engineer.
b) Coverage Rates: Rates for all layers shall be monitored by checking quantity of material used against the area covered.
c) Visual inspections shall be conducted throughout the application process. The Contractor shall take progress photos for incorporation with the final review report to the Engineer.

Table 965.63-1 - Minimum QC Inspection of Waterproofing Membrane Operations

Inspection Component	Inspection Attribute	Minimum Inspection Frequency	Point of Inspection	Inspection Method
Equipment	As specified in QC Plan	Per QC Plan	Per QC Plan	Per QC Plan
Materials	Primer (Correct Type)	Per QC Plan	Per QC Plan	Check Manufacturer COC
	Membrane (Correct Type)	Per QC Plan	Per QC Plan	Check Manufacturer COC
	Aggregate (Correct Type)	Per QC Plan	Per QC Plan	Check Manufacturer COC
	Tack Coat (Correct Type)	Per QC Plan	Per QC Plan	Check Manufacturer COC
Environmental Conditions	Temperature of Air & Underlying Surface	1 per Day	At Project Site	Check Measurement
	Underlying Surface (Soundness)	Per QC Plan	Underlying Surface	Visual Check
	Surface (Standing Moisture)	Per QC Plan	Underlying Surface & Membrane Surface	Visual Check
	Surface (Cleanliness)	Per QC Plan	Underlying Surface & Membrane Surface	Visual Check
Workmanship	Pin Hole/Holidays	Per QC Plan	Membrane Surface	Visual Check
	Membrane Coverage Rate	Per QC Plan	From Distributor	Check Measurement
	Aggregate Coverage Rate	Per QC Plan	Membrane Surface	Visual Check
	Tack Coat Application Rate	Per QC Plan	From Distributor	Check Measurement

965.64: Quality Control Sampling and Testing Requirements

The Contractor's QC personnel will perform QC sampling and testing at the site of membrane waterproofing placement to ensure that the production and placement processes are providing work conforming to the contract and manufacturer's requirements. The Engineer will not sample or test for Quality Control or assist in controlling the Contractor's operations. All QC sampling and testing shall be in accordance with the current AASHTO, ASTM, NETTCP, or Department procedures specified in Table 965.64-1. The Contractor shall furnish approved containers for all material samples. The Engineer shall be provided the opportunity to monitor and witness all QC sampling and testing.

The following testing shall be conducted and recorded on a test report form to be submitted to the Engineer. All reports shall be submitted to the Engineer within 72 hours of the test completion.

a) Deck moisture: The concrete deck's surface moisture content shall be measured to determine if it is suitable to allow for installation to proceed.
b) Primer Adhesion: Random tests for adequate tensile bond strength shall be conducted in accordance with ASTM D7234 using the membrane Manufacture's primer. Minimum bond strength of 100 psi and failure in the concrete will be required for acceptance. Testing shall be at a frequency of 1 test per 5,000 square feet with a minimum of 3 tests per day. Areas smaller than 5,000 square feet shall receive a minimum of 3 tests.
c) Film Thickness:
    - Wet film thickness shall be checked every 300 square feet in accordance with ASTM D4414 using a gauge pin or standard comb type thickness gauge or a magnetic gauge. Film thickness checks shall be carried throughout the application process.
    - Dry Film Thickness: If the membrane waterproofing system cures too quickly to perform wet film thickness testing, dry film thickness shall be checked every 300 square feet in accordance with ASTM D6132 using magnetic or ultrasonic gauges or using a destructive method. If a destructive method is used, areas shall be repaired in accordance with Subsection 965.46 Part C.
d) Membrane Adhesion: Random tests for adequate tensile bond strength shall be conducted in accordance with ASTM D7234 using the membrane Manufacture's primer and membrane. The portion of the membrane to be tested shall be separated from the rest of the membrane surface prior to performing the test so only that portion under the dolly receives the tensile force. A minimum bond strength of 100 psi and failure in the concrete will be required for acceptance. Testing shall be at a frequency of 1 test per 5,000 square feet with a minimum of 3 tests per day. Areas smaller than 5,000 square feet shall receive a minimum of 3 tests.

The Contractor shall take a representative sample of the membrane from that day's installation. The samples shall consist of 2 10-inch by 10-inch square samples of the membrane with smooth surfaces. The primer and aggregate shall not be incorporated into the sample. The sample shall be sprayed separate from the bridge deck on a non-adhesive surface using the same application techniques used for the deck. These samples shall be peeled off the non-adhesive surface and be provided to the Engineer to be tested by the Department.

Table 965.64-1: Minimum Quality Control Sampling & Testing of Waterproofing Membrane Lots

Quality Characteristic	Test Method(s)	Sublot Size	Minimum Test Frequency	Point of Sampling	Engineering Limits
Deck Concrete Moisture	Manufacturer's Recommendation	5,000 ft^2	1 per Sublot [(1)]	Deck Concrete Surface	≤ 5%
Primer Adhesion to Concrete	ASTM D7234	5,000 ft^2	1 per Sublot [(1)]	Primed Concrete Surface	≥ 100 psi minimum and failure in concrete
Film Thickness	Wet: ASTM D4414 Dry: ASTM D6132 or other approved method	300 ft^2	1 per Sublot [(1)]	Membrane Surface	≥ 80 mils minimum measured over peaks or ≥ Thickness used to pass ASTM C1305 (Whichever thickness is greater)
Membrane Adhesion to Concrete	ASTM D7234	5,000 ft^2	1 per Sublot [(1)]	Membrane Surface	≥ 100 psi minimum and failure in concrete

[(1)] In the event that the total daily production is less than three Sublots, a minimum of three random QC samples shall be obtained for the day's production.

DEPARTMENT ACCEPTANCE

965.70: General

The Department is responsible for performing all Acceptance activities and making the final Acceptance determination for each membrane waterproofing surface. The Department's Acceptance system will include monitoring the Contractor's QC activity and performing Acceptance inspection and testing in order to determine the quality and corresponding payment for each Lot.

965.71: Acceptance Inspection

The Engineer will perform Acceptance inspection of all work items addressed under Section 965 to ensure that materials and completed work are in conformance with the contract requirements. Acceptance inspection is intended to visually assess the quality of each Lot produced and placed and will address only the inspection components of Materials and Workmanship in support of the Department's final Acceptance determination.

All Acceptance inspection activities by the Department will be performed independent of the Contractor's QC inspection.

Table 965.71-1 – Department Acceptance Inspection of Waterproofing Membrane Operations

Inspection Component	Inspection Attribute	Minimum Inspection Frequency	Point of Inspection	Inspection Method
Materials	Primer (Correct Type)	1 Per Day	At Placement Site	Check Manufacturer COC
	Membrane (Correct Type)	1 Per Day	At Placement Site	Check Manufacturer COC
	Aggregate (Correct Type)	1 Per Day	At Placement Site	Check Manufacturer COC
	Tack Coat (Correct Type)	1 Per Day	At Placement Site	Check Manufacturer COC
Workmanship	Pin Hole/Holidays	25% of Sublots	Membrane Surface	Visual Check
	Membrane Coverage Rate	25% of Sublots	From Distributor	Check Measurement
	Aggregate Coverage Rate	25% of Sublots	Membrane Surface	Visual Check
	Tack Coat Application Rate	25% of Sublots	From Distributor	Check Measurement

965.72: Acceptance Sampling and Testing Requirements

The 2 10-inch by 10-inch samples fabricated by the Contractor during installation shall be submitted to the Department for testing.

Table 965.72-1: Department Acceptance Sampling and Testing of Waterproofing Membrane Lots

Quality Characteristic	Test Method(s)	Engineering Limits
Minimum Thickness (Membrane only)	ASTM D6132 or other approved method	≥ 80 mils minimum measured over peaks or ≥ thickness used to pass ASTM C1305 (Whichever thickness is greater)
Percent Elongation at Break	ASTM D638	≥ 130%
Tensile Strength	ASTM D638 Type IV @ 2 in/min	> 1,100 psi
Shore Hardness	ASTM D2240 (1)	≥ 50 Type 00

(1) ASTM D2240 shall be modified in accordance with ASTM C836 Section 6.5.

965.73: Lot Acceptance Determination Based on Inspection Results

The Engineer's Acceptance inspection results will be used in the final Acceptance determination for all Lots. Prior to final Acceptance of each Lot produced and placed, the Engineer will periodically evaluate all Acceptance inspection information for the prepared underlying surface and the Lot. The materials and product workmanship for the completed work will be evaluated for conformance with the plans and the requirements specified in Subsections 965.40 thru 965.47.

When the Acceptance information identifies deficiencies in either material quality or product workmanship for any underlying surface location or waterproofing membrane Sublot(s), the location or Sublot(s) will be isolated and further evaluated by the Engineer through additional Acceptance inspection (or sampling and testing, if relevant or possible). Depending upon the findings of the additional Acceptance inspection activity, the Engineer will determine the disposition of the nonconforming work in accordance with Division I, Subsection 5.03, Conformity with Plans and Specifications.

965.74: Lot Acceptance Determination Based on Testing Data

Evaluation of Testing Data

Prior to final Acceptance of each Lot produced and placed; the Engineer will periodically evaluate all available Acceptance testing data for the Lot.

Conformance with Engineering Limits

The Engineer will evaluate all Acceptance testing data and Contractor QC testing data for each Lot to determine conformance with the Engineering Limits in Tables 965.63-1 and 965.72-1. Each Sublot test value for the Acceptance Quality Characteristics identified in the tables shall be within the Engineering Limits.

If a Sublot test result is outside of the Engineering Limits, the Contractor and Engineer will further assess the Sublot quality to determine whether the material in the Sublot can remain in place. The Engineer will determine the disposition of the Sublot in accordance with Division I, Subsection 5.03, Conformity with Plans and Specifications.

If the Engineer's assessment determines that the material quality is not sufficient to permit the Sublot to remain in place the Sublot shall be removed and replaced. When a nonconforming Sublot is corrected or replaced, the Engineer will perform Acceptance testing of the Sublot and evaluate the test results for conformance with the Engineering Limits. Once the above requirements have been met, the Engineer will accept all completed Sublots.

965.75: Final Lot Acceptance Determination

For each Lot produced and placed, the Engineer will evaluate all Acceptance inspection and testing data for the Lot after all Sublots are complete in place. The final review and visual inspection shall be conducted jointly by the Contractor and Engineer. Irregularities or other items that do not meet the requirements of the specifications and plans shall be addressed/repaired at this time, at no additional cost to the Department.

After each Lot is complete, including any corrective action, the Engineer will perform a final evaluation of all Acceptance data and Contractor QC data for the Lot. The Engineer will accept the Lot if the Engineer's evaluation of all inspection and testing data for the Lot is in conformance with this specification and the contract documents.

COMPENSATION

965.90: Method of Measurement

Membrane Waterproofing for Bridge Decks will be measured by the square foot of the membrane system complete in place with no allowance for overlapping or for edges turned up or carried into recesses for seals, except that the area of the full membrane turned down in back of the backwalls and extended up the face of the curb or under and in back of median curbs shall be included for payment.

965.91: Basis of Payment

Payment under this Item shall be made at the unit bid price per square foot, which includes the primer, spray applied membrane, aggregate for keycoat, polymer modified tack coat, and all labor, materials, equipment, safety devices, tools, inspections and incidentals necessary to complete all work specified under this Item.

965.92: Payment Items

965.	Membrane Waterproofing for Bridge Decks	Square Foot

SUBSECTION 966: MEMBRANE WATERPROOFING FOR BRIDGE DECK REPAIRS

SUBSECTION 966 Membrane Waterproofing for Bridge Deck Repairs.
(page II.552) Add this new section.

SUBSECTION 966: MEMBRANE WATERPROOFING FOR BRIDGE DECK REPAIRS

DESCRIPTION

966.20: General

Membrane waterproofing applied to the repaired deck surface as indicated on the plan and elsewhere as directed shall consist of one of the following systems:

- Sheet membrane - either reinforced rubberized asphalt or reinforced tar and resin.
- Hot applied rubberized asphalt membrane. This system shall not be used on grades in excess of 3 percent.

MATERIALS

966.30: General

Materials shall meet the requirements specified in the following Subsections of Division III, Materials:

Asphalt Emulsions	M3.03.1
Sheet Membrane	M9.08.2
Hot Applied Rubberized Asphalt Membrane	M9.08.3
Primer	M9.09.1

CONSTRUCTION METHODS

966.40: Application

A. Preparation of Surface

No waterproofing shall be done in wet, damp or foggy weather, nor when the ambient temperature is 40°F or below, without permission of the Engineer.

The membrane waterproofing on bridge deck repairs shall not be placed unless the Contractor is ready to follow within 24 hours with the first layer of hot mix asphalt pavement; a longer period of time will be allowed only with the approval of the Engineer.

Immediately prior to the membrane application, the concrete surface shall be thoroughly swept and blown clean with an air compressor to remove any loose debris. If the concrete surface is damp it shall be dried by use of a propane gas torch or similar equipment.

B. Applying Primer

The primer shall be applied to all surfaces at a rate of 0.015 gallon per square yard. The primer shall be thoroughly mixed and continuously agitated during application. It shall be applied by spray or squeegee. It shall thoroughly dry before application of the rubberized asphalt membrane. Should the membrane not be placed over the primed surface within 8 hours the surface shall be re-primed.

C. Applying Membrane

(1) Sheet Membranes

This system shall consist of the application of preformed reinforced rubberized asphalt membrane. Composition and dimensional requirements shall be as stipulated by the manufacturer of the sheet membrane.

Membrane Application

Membrane application shall be in accordance with the manufacturer's instructions. The preformed membrane sheets shall be applied to the primed surfaces either by hand or by mechanical applicators.

The membrane sheet shall be placed in such a manner that a shingling effect is achieved in the direction that water will drain. After being laid, the membrane sheets shall be rolled with hand rollers or other apparatus as necessary to develop a firm and uniform bond with the primed concrete surface. Wrinkles and air bubbles shall be eliminated to the extent possible.

A mastic, approved by the Sheet Membrane manufacturer, shall be applied as a bead along the exposed edge of the membrane sheet that extends up the barrier railing or curb face and that terminates in the high-side gutter after the sheets have been installed.

Any tears, cuts, or narrow overlaps shall be patched, using a satisfactory adhesive and by placing sections of membrane sheet over the defective area in such a manner that the patch extends at least 6 inches beyond the defect.

(2) Hot Applied Rubberized Asphalt Membrane

Membrane Application

Melting of the rubberized asphalt membrane shall be in accordance with the manufacturer's instructions. The kettle shall be equipped with a suitable agitator and temperature gauges for the kettle.

Sufficient lead time shall be allowed for heating of the rubberized asphalt so that it will be in a fluid state at the time scheduled for application. Caution should be observed that the melting temperature does not exceed the manufacturer's recommendation. When fluid, the material shall be drawn off in suitable containers and poured onto the primed and dried deck surface.

It shall be evenly spread with a special spray nozzle or silicone squeegees at a uniform rate to yield a coating at a minimum thickness of 1/8 inch and an average of 3/16 inch All horizontal surfaces shall be completely covered and vertical surfaces (curbing, edging, etc.) shall be covered up to 4 inches above the deck surface.

Any defects shall be repaired in accordance with the manufacturer's recommendations prior to HMA pavement overlayment.

Immediately following the application of the hot applied rubberized asphalt membrane and before it cools, the protective covering shall be laid parallel to the roadway centerline covering the entire area of membrane waterproofing.

D. Repairs

If an area of membrane requires repair or if the membrane becomes damaged, a patch repair shall be carried out to restore the integrity of the membrane waterproofing system. The damaged area shall be cut back to sound materials to a width of at least 6 inches beyond the periphery of the damaged area, removing contaminants. The concrete shall be primed as necessary followed by the application of the membrane. A continuous layer shall be obtained over the concrete with a 6-inch overlap onto the existing membrane. The solvent shall be as approved by the membrane waterproofing manufacturer. Repairs shall comply with the manufacturer's guidelines.

Where the membrane is to be joined to existing cured material and at joints, the new application shall overlap the existing membrane/joint by at least 4 inches. The existing membrane/joint shall be cleaned of all contamination including tack coat material or dirt to an edge distance of a least 6 inches.

If pin holes or holidays are observed in the membrane surface they shall be repaired in accordance with the manufacturer's instructions.

E. Applying Tack Coat

Tack coat, meeting Subsection 966.30, shall be applied in accordance with the membrane manufacturer's recommendations after a minimum of three hours from initial membrane application. The tack coat application rate shall be in accordance with the manufacturer's recommendation. The application rate of the tack coat shall be set at a rate that achieves the specified residual rate and coverage.

F. HMA Pavement Over Membrane

Placement of the HMA surface shall be in accordance with Section 450 and the contract specifications. To eliminate any possible damage to the membrane and in accordance with Subsection 450.50, the HMA overlayment shall be applied as soon as possible. Caution must be observed to assure that the paver does not cause damage to the membrane. During paving, a light soap spray should be applied to the paving equipment wheels to prevent tack coat pick-up.

966.41: Protection of Exposed Surfaces

The Contractor shall exercise care in the application of the waterproofing membrane system to prevent surfaces not receiving treatment from being spattered or marred, such as the face of curbs, copings, finished surfaces, substructure exposed surfaces, and outside faces of the bridge. Any material that spatters on these surfaces shall be removed and the surfaces cleaned to the satisfaction of the Engineer.

CONTRACTOR QUALITY CONTROL

966.60: General

The Contractor shall provide Quality Control (QC) activities to ensure that their operations will provide waterproofing that conforms to the specified material and workmanship requirements.

966.61: Quality Control Inspection

The Contractor shall perform QC inspection of all work items addressed under this specification. Inspection activities during placement may be performed by qualified production personnel (e.g. Skilled Laborers, Foremen, and Superintendents). The Contractor shall not rely on the results of the Engineer's Acceptance inspection for QC purposes. The Engineer shall be provided the opportunity to monitor and witness all QC inspection.

QC inspection activities must address the following four primary components:

a) Equipment.
b) Materials.
c) Environmental Conditions.
d) Workmanship.

The minimum frequency of QC inspection activity shall be in accordance with the requirements below. The Contractor shall document the results and findings of QC inspection.

A. QC Inspection for Preparation of Underlying Surface

The Contractor's personnel will perform QC inspection during preparation of the underlying surface in accordance with the requirements of Subsection 966.40 Part A. The minimum items to be inspected shall be as outlined in Table 966.61-1.

B. QC Inspection for Placement of Waterproofing Membrane

The Contractor will perform QC inspection at the site of waterproofing membrane field placement to ensure that the production and placement processes are providing work conforming to the contract and manufacturer requirements. The minimum items to be inspected for each waterproofing membrane shall be in accordance with the requirements of Subsection 966.40 Parts C thru F and as outlined in Table 966.61-1. Inspection shall include:

a) Pin Hole/Holidays: The surface of the membrane shall be inspected for pin holes and/or holidays. All pin hole/holidays shall be located, marked for repair, documented, and repaired in accordance with a repair procedure approved by the manufacturer.
b) Visual inspections shall be conducted throughout the application process. The Contractor shall take progress photos for incorporation with the final review report to the Engineer.

Table 966.61-1 - Minimum QC Inspection of Waterproofing Membrane Operations

Inspection Component	Inspection Attribute	Minimum Inspection Frequency	Point of Inspection	Inspection Method
Equipment	As specified by Contractor	As specified by Contractor	As specified by Contractor	As specified by Contractor
Materials	Primer (Correct Type)	1 per Day	As specified by Contractor	Check Manufacturer COC
	Membrane (Correct Type)	1 per Day	As specified by Contractor	Check Manufacturer COC
	Tack Coat (Correct Type)	1 per Day	Per QC Plan	Check Manufacturer COC
Environmental Conditions	Temperature of Air & Underlying Surface	1 per Day	At Project Site	Check Measurement
	Underlying Surface (Soundness)	Entire Surface	Underlying Surface	Visual Check
	Surface (Standing Moisture)	Entire Surface	Underlying Surface & Membrane Surface	Visual Check
	Surface (Cleanliness)	Entire Surface	Underlying Surface & Membrane Surface	Visual Check
Workmanship	Pin Hole/Holidays	Entire Surface	Membrane Surface	Visual Check
	Membrane Coverage Rates	Entire Surface	From Distributor	Visual Check
	Tack Coat Application Rate	1 per Day	From Distributor	Check Measurement

DEPARTMENT ACCEPTANCE

966.70: General

The Department is responsible for performing all Acceptance activities and making the final Acceptance determination for each membrane waterproofing surface. The Department's Acceptance system will include monitoring the Contractor's QC activity and performing Acceptance inspection in order to determine the quality and corresponding payment.

966.71: Acceptance Inspection

The Engineer will perform Acceptance inspection of all work items addressed under Section 966 to ensure that materials and completed work are in conformance with the contract requirements. Acceptance inspection is intended to visually assess the quality of the materials and work and will address only the inspection components of Materials and Workmanship in support of the Department's final Acceptance determination.

All Acceptance inspection activities by the Department will be performed independent of the Contractor's QC inspection.

Table 965.71-1 – Department Acceptance Inspection of Waterproofing Membrane Operations

Inspection Component	Inspection Attribute	Minimum Inspection Frequency	Point of Inspection	Inspection Method
Materials	Primer (Correct Type)	1 Per Day	At Placement Site	Check Manufacturer COC
	Membrane (Correct Type)	1 Per Day	At Placement Site	Check Manufacturer COC
	Tack Coat (Correct Type)	1 Per Day	At Placement Site	Check Manufacturer COC
Workmanship	Pin Hole/Holidays	Entire Surface	Membrane Surface	Visual Check
	Membrane Coverage Rates	Entire Surface	At Placement Site	Visual Check
	Tack Coat Application Rate	1 per day	At Placement Site	Check Measurement

966.72: Acceptance Determination

The Engineer's Acceptance inspection results will be used in the final Acceptance determination. Prior to final Acceptance, the Engineer will periodically evaluate all Acceptance inspection information for the prepared underlying surface and the waterproofing membrane. The materials and product workmanship for the completed work will be evaluated for conformance with the plans and the requirements specified in Subsections 966.40 and 966.41.

When the Acceptance information identifies deficiencies in either material quality or product workmanship for any underlying surface location or waterproofing membrane, the location will be isolated and further evaluated by the Engineer through additional Acceptance inspection. Depending upon the findings of the additional Acceptance inspection activity, the Engineer will determine the disposition of the nonconforming work in accordance with Division I, Subsection 5.03, Conformity with Plans and Specifications.

The final review and visual inspection shall be conducted jointly by the Contractor and Engineer. Irregularities or other items that do not meet the requirements of the specifications and plans shall be addressed/repaired at this time, at no additional cost to the Department.

After the work is complete, including any corrective action, the Engineer will perform a final evaluation of all Acceptance data and Contractor QC data. The Engineer will accept the work if the Engineer's evaluation of all inspection data is in conformance with this specification and the contract documents.

COMPENSATION

966.90: Method of Measurement

Membrane waterproofing for bridge deck repairs will be measured by the square foot of surface covered with no allowance for overlapping or for edges turned up or carried into recesses for seals, except that the area of the full membrane turned down in back of the backwalls and extended under and in back of curb or edging will be included for payment.

966.91: Basis of Payment

The membrane waterproofing will be paid for at the contract unit price per square foot under the item for Membrane Waterproofing for Bridge Deck Repairs, complete in place. Tack coat shall be paid under item 452. Tack Coat.

966.92: Payment Items

966. Membrane Waterproofing for Bridge Deck Repairs Square Foot

SUBSECTION 970: BITUMINOUS DAMP-PROOFING

SUBSECTION 970 Bituminous Damp-Proofing.
(page II.552) Replace this subsection with the following.

SECTION 970: DAMP-PROOFING

DESCRIPTION

970.20: General

Damp-proofing to be applied as shown on the plans shall consist of a primer and damp-proofing material. If material other than that specified herein is permitted to be used, the method of application shall conform to the published specifications of the manufacturer.

MATERIALS

970.30: General

Materials shall meet the requirements specified in the following Subsections of Division III, Materials:

Primer M9.09.1
Damp-proofing M9.09.2

CONSTRUCTION METHODS

970.40: General

Concrete surfaces shall be allowed to dry for a period of at least 5 days after the removal of forms before damp-proofing is applied.

Surfaces to be damp-proofed shall be made reasonably smooth and free from all projections and holes. All holes in concrete surfaces shall be satisfactorily filled with 1-part cement to 2 parts sand mortar before damp-proofing is applied. Concrete surfaces shall be properly cured before being damp-proofed. Surfaces shall be dry and immediately before the application of the damp-proofing shall be thoroughly cleaned of dust and all loose material. Damp-proofing shall not be done during wet, damp, or foggy weather, or when the ambient temperature is 40°F or below or is forecast to fall below 40°F during the application period. The temperature of the concrete surface shall also exceed the dew point by at least 5°F.

One coat of primer shall be uniformly applied to the surface in accordance with the manufacturer's recommendation. The material for damp-proofing shall be mopped or sprayed on the designated surfaces in two coats. Application methods, rates, temperature constraints shall be as recommended by the manufacturer.

The initial coat of damp-proofing shall be allowed to dry thoroughly before a second coat is applied. The final coat shall be thoroughly dry before any fill is placed against it.

CONTRACTOR QUALITY CONTROL

970.60: General

The Contractor shall provide Quality Control (QC) activities to ensure that their operations will provide damp-proofing that conforms to the specified material and workmanship requirements.

970.61: Damp-proofing Materials and Workmanship

The Contractor shall verify that they are using the correct damp-proofing materials as specified under Subsection 970.30. All damp-proofing operations shall exhibit satisfactory workmanship including ensuring a dry, smooth, and clean concrete surface which is cured properly, as well as, correct application of the primer and damp-proofing.

DEPARTMENT ACCEPTANCE

970.70: General

The Department shall verify that the Contractor is correctly performing the work and QC activities.

970.71: Damp-proofing Materials and Workmanship

The Engineer will verify that the damp-proofing materials and workmanship conform with Subsection 970.61.

COMPENSATION

970.80: Method of Measurement

Damp-proofing will be measured by the actual area of surface covered in square foot.

970.81: Basis of Payment.

Damp-proofing will be paid for at the contract unit price per square foot of surface and shall include the primer and all materials, equipment and labor to install the damp-proofing complete in place.

970.82: Payment Items.

970.	Damp-Proofing	Square Foot

DIVISION III
MATERIALS SPECIFICATIONS

SECTION M2: AGGREGATES AND RELATED MATERIALS

SUBSECTION M2.01.0 Crushed Stone.
(page III.10) In table M2.01.0-1 under the column for M2.01.6 3/8 Inch Crushed Stone change the percent passing the No.4 sieve from 20-20 to 20-50.

SECTION M3: ASPHALTIC MATERIALS

SECTION M3: ASPHALTIC MATERIALS
(page III.15) Replace this subsection with the following;

M3.00.0 General.

Asphaltic materials (also referred to as bituminous materials) include liquid asphalts as well as Hot Mix Asphalt (HMA) mixtures and other related materials. All asphaltic materials shall conform to the requirements of the specifications as designated hereinafter.

Unless otherwise stipulated, the sampling of liquid asphalt materials shall be in accordance with AASHTO R 66.

The following procedure shall be followed in obtaining liquid asphalt samples from pressure distributors or tankers used for the transport of liquid asphalt materials:

1. Distributors and tankers shall be equipped with approved sampling valves. The sampling valves on tankers shall be installed in the rear bulkhead approximately 1/3 of the height from the bottom. The sampling valves on pressure distributors may be located in the side of the tank somewhere in the middle third of the tank depth.
2. At least 1 gallon of material shall be drained off through the sampling valve and discarded before the sample is obtained.
3. Sample containers shall be new, clean and sealed with a tight-fitting cap. Washing of sample containers with solvents or water will not be permitted.

M3.01.0 Performance Graded Asphalt Binder.

Performance Graded Asphalt Binder (PGAB) delivered to a project or to an HMA plant must be accompanied by a Bill of Lading (BOL) signed by the asphalt binder Supplier's authorized representative in accordance with AASHTO R 26. Shipments of material not accompanied by a BOL will not be accepted for use in the work.

The PGAB Supplier and the Contractor shall perform random Quality Control (QC) sampling and testing of PGAB as specified in Subsection 450.65F(1). The Contractor shall furnish, to the Engineer, the PGAB Supplier's BOL for each truckload of asphalt binder shipped to the project or HMA plant. The Contractor shall also submit to the Engineer the Supplier's Certificate of Compliance (COC) along with copies of the Certificate of Analysis (COA) showing the certified AASHTO M 320 test results for each Supplier Lot of PGAB. The COA shall meet the requirements of AASHTO R 26. The Contractor shall maintain a copy of the COA for each Lot of PGAB used, with a copy attached to each sample obtained for testing.

The Contractor shall assist the Engineer in obtaining random Department Acceptance samples of PGAB from the HMA plant in accordance with AASHTO R 66 and as specified in Subsection 450.74C. Each sample shall be labeled with the PGAB grade, Supplier source and Lot number, sampling location, quantity represented, project name, plant, date, and the sampling inspector. When the PGAB is used for HMA production under Section 450 the sample shall be obtained from an in-line sample valve located between the asphalt tanks and mixing chamber at a sampling location downstream of all additive injection ports.

The Engineer will test the Department Acceptance samples for verification of the PGAB grade. The material shall conform to the specification requirements for the applicable performance grade as specified herein. Material not conforming to specification requirements shall be subject to corrective action, production suspension, rejection, or removal as determined by the Engineer.

The blending of binder of different grades or binder from different Suppliers at the HMA plants is strictly prohibited without the Engineer's approval. Contractors may switch to another approved source of binder, upon written notification to the Engineer, and by certifying that the tank to be utilized has been drained to an un-pumpable condition. The binder tanks at the HMA production facility shall be managed in a manner which prevents contamination.

Contractors who modify, blend PG binders, or add additives to the PGAB at the HMA production facility will be reclassified as a Supplier and shall be required to certify the binder in accordance with AASHTO R 26.

A copy of the COA for each Lot shall be provided in accordance with AASHTO R 26. The data reported shall meet the requirements of the specific binder specification:

1. For AASHTO M 320 – Table 1
2. For AASHTO M 332 – Table 1
3. For Crumb Rubber Modified Asphalt ASTM D6114-09 – Table 1

M3.01.1 Standard Asphalt Binder Grade.

The asphalt binder for HMA mixtures shall be a PGAB which meets the specification requirements of AASHTO Standard M 320. PGAB shall be provided by an Approved Supplier in accordance with AASHTO R 26. Approved Suppliers shall be listed on the MassDOT Qualified Construction Materials List (QCML).

Unless indicated otherwise on the Plans or in the Special Provisions, the standard PGAB Grade of **PG64-28** shall be used.

M3.01.2 Modified Asphalt Binder Grades.

When specified by the contract documents, the PGAB shall be modified in accordance with the following:

A. Polymer Modified Asphalt Binder

The polymer modified asphalt binder shall be a PGAB which meets the specification requirements of AASHTO M 332, however "E" grades will not be subject to the $J_{nr\text{diff}}$ difference requirement. PGAB shall be provided by an approved Supplier in accordance with the AASHTO R 26. The modified PGAB Grade of **PG64E-28** shall be used.

B. Crumb Rubber Modified Asphalt Binder

The modified binder shall be in accordance with ASTM D6114-09, Type II. Virgin PGAB for the crumb rubber modified asphalt shall be a PG 58-28 or PG 64-28 provided by an approved Supplier in accordance with the AASHTO R 26. The grade selected shall be based on laboratory testing by the asphalt rubber Manufacturer.

The granulated rubber shall be vulcanized rubber product from the ambient temperature processing of scrap, pneumatic tires. The granulated rubber shall meet the gradation found in Table M3.1.

Table M3.1 – Crumb Rubber Gradation

Sieve Size	Percent by Weight Passing
#10	100
#16	90 – 100
#30	25 – 75
#80	0 – 20

The use of crumb rubber of multiple types from multiple sources is acceptable provided that the overall blend of crumb rubber meets the gradation requirements. The length of the individual rubber particles shall not exceed 1/8". The rubber shall be certified by the crumb rubber Manufacturer.

The percent of crumb rubber shall be a minimum of 15% by weight of binder. The temperature of the asphalt shall be between 350°F and 400°F at the time of addition of the granulated crumb rubber. The asphalt and crumb rubber shall be combined and mixed together in a blender unit and reacted in the distributor for a period of time as required by design. The temperature of the asphalt rubber mixture shall be above 325°F during the reaction for a period of one hour.

M3.01.3 Asphalt Binder Grade for Recycled Asphalt Materials.

For any HMA mixture containing recycled asphalt materials, a binder that is softer than the standard asphalt binder shall be utilized in the mixture to account for the amount and stiffness of the recycled binder in accordance with Table M3.2.

If greater than 25% Reclaimed Asphalt Pavement (RAP) or any quantity of Recycled Asphalt Shingles (RAS) are used in an asphalt mixture, the virgin PGAB grade when blended with the RAP binder shall meet the binder grade specified by the project. The resulting final PGAB grade shall be in accordance with Table M3.2. Only PGABs meeting the requirements of AASHTO M 320 or M 323 will be used.

The type and amount of virgin asphalt binder to be used in the HMA mixture shall be included as part of the Laboratory Trial Mix Formula (LTMF). The Contractor shall submit certified test results from an AASHTO accredited laboratory showing the testing of the individual binders and the blending.

Table M3.2 – PGAB Grades for HMA Containing RAP/RAS

Amount of RAP in Mixture	Virgin PGAB Grade	Resulting PGAB Grade
≤ 25% RAP by Weight of Mixture	Project Specified Grade	Project Specified Grade
> 25% to 40% RAP by Weight of Mixture	Follow AASHTO M 323 Appendix X1	
≤ 5% RAS by Weight of Mixture	Follow AASHTO PP 78	

M3.01.4 Warm Mix Asphalt Additive.

All HMA shall be modified using a warm mix asphalt (WMA) additive. The WMA additive shall be evaluated by AASHTO's National Transportation Product Evaluation Program (NTPEP) and be listed on the MassDOT QCML. No WMA foaming technology which requires the mechanical injection of steam or water into the liquid asphalt will be permitted.

For HMA placed on bridge decks, the WMA additive shall not be used to lower the mixing and compaction temperatures. The mixing and compaction temperatures specified for the binder prior to addition of the WMA additive shall be used.

The WMA additive must be compatible with polyphosphoric acid modified binders, polymer modified binders, and anti-stripping agents. The WMA additive shall be introduced in accordance with the Manufacturer's dosing rates and approved blending methods.

The HMA mixture design shall incorporate the requirements of AASHTO R35 Appendix X2: Special Mixture Design Considerations and Practices for Warm Mix Asphalt (WMA). Laboratory mixing and compaction temperatures shall be reduced per the WMA Manufacturer's recommendations, however, the optimum laboratory compaction temperature for unmodified asphalt binders shall be less than 260°F. Target laboratory mixing and compaction temperatures shall be submitted to the Research & Materials Section (RMS) for review prior to performing a mix design.

When the asphalt binder is modified with the WMA additive at the HMA plant, all WMA additive equipment shall be fully automated and integrated into the plant controls and shall record actual dosage rates on the plant printouts. The Contractor's Quality System Manual shall provide mixture production and placement alterations due to the WMA additive and shall incorporate the modification of asphalt binders when the WMA additive is blended with the asphalt binder at the plant. This plan shall specifically address WMA metering requirements, tolerances and other Quality Control measures.

M3.01.5 Asphalt Anti-Stripping Additive.

An anti-stripping additive may be required in an HMA mixture to increase the resistance of the asphalt binder coating to stripping in the presence of water. An anti-stripping additive may be a liquid anti-strip or hydrated lime.

The Engineer may verify the effectiveness of the anti-strip used in an HMA mixture. When added at the dosage rate recommended by the Manufacturer to an HMA mixture showing moisture susceptibility, the anti-strip shall cause an improvement to the mixture's moisture susceptibility. This shall be determined by testing specimens with and without the liquid anti-strip additive in accordance with AASHTO T 324. If the antistrip does not show an improvement in the moisture susceptibility the additive will not be permitted for use.

The Manufacturer shall certify that the material is in accordance with this specification. The Manufacturer shall submit a COC for each Lot in accordance with Division 1 Section 6.0. The COC shall also include the:

1. Brand name and designation.
2. Composition or description of the anti-strip additive.
3. Manner in which the material will be identified on the containers.

A. Hydrated Lime

The hydrated lime for HMA shall conform to the requirements of AASHTO M 303.

B. Liquid Anti-Strip

The anti-strip Manufacture shall submit product documentation, including the recommended dosage rate, to RMS for approval. Approved anti-strip additives shall be listed on the MassDOT QCML.

Anti-stripping additives shall be an organic chemical compound free from inorganic mineral salts or inorganic mineral soaps. The anti-strip additive shall be chemically inert to asphalt binder and shall not appreciably alter the specified characteristics of the asphalt binder. When blended with asphalt binder, it shall be stable and withstand storage at a temperature of 400°F for extended periods without loss of effectiveness.

M3.01.6 Asphalt Release Agents.

Approved asphalt release agents will be listed on the MassDOT QCML. The asphalt release agent shall not be detrimental to the HMA and shall not dissolve asphalt binder when applied to the truck bed. Dilution by diesel or other petroleum products will not be permitted.

Asphalt release agents shall be evaluated by AASHTO's National Transportation Product Evaluation Program (NTPEP). Release agents shall meet the following minimum requirements:

1. 7-Day Stripping Test
   a. No stripping or discoloration when used in full strength and diluted forms.
2. Mixture Slide Test
   a. 10.0 grams retained, maximum.
3. Asphalt Performance Test
   a. Able to pull the cooled binder from the metal plate without adherence, a minimum of three pours.
4. Flash Point, ASTM D93
   a. Have a flash point greater than 400°F on the undiluted product and contain no flammable materials, solvents, or petroleum elements.

The Manufacturer shall submit a Certificate of Compliance (COC) for each Lot of asphalt release agent in accordance with Division 1 Section 6.0. The COC shall also include the:

1. Brand name and designation.
2. Composition or description of the release agent.
3. Manner in which the material will be identified on the containers.

The Manufacturer shall certify that the material is in accordance with this specification. In addition, the Manufacturer shall furnish information for any dilution requirements, including the minimum dilution rate and special application requirements.

M3.02.0 Cutback Asphalts.

These materials shall be blends of asphalt cements and suitable solvents. They shall be homogeneous, free from water and conform to the requirements of AASHTO M 81 for the rapid curing type and AASHTO M 82 for the medium curing type.

M3.03.0 Asphalt Emulsions.
M3.03.1 Anionic Emulsified Asphalt.

These materials shall conform to the requirements of AASHTO M 140. Anionic emulsion used for tack coat shall be grade **RS-1h**.

When supplied in 5-gallon buckets the anionic emulsion used for tack coat shall be grade **RS-1**.

M3.03.2 Cationic Emulsified Asphalt.

This material shall conform to the requirements of AASHTO M 208. Cationic asphalt emulsion used for tack coat shall be grade **CRS-1h**.

When supplied in 5-gallon buckets the cationic emulsion used for tack coat shall be grade C**RS-1**.

M3.03.3 Polymer Modified Emulsified Asphalt.

This material shall conform to the requirements of AASHTO M 316. Polymer modified asphalt emulsion used for tack coat shall be grade **CRS-1P**.

M3.05.0 Hot Poured Joint Sealer.

This sealer shall meet the requirements of ASTM D6690 Type II. Products shall be evaluated by the National Transportation Product Evaluation Program (NTPEP) as an HMA Crack Sealer (CS) and be listed on the MassDOT QCML.

M3.05.1 Asphalt-Fiber Joint and Crack Sealer.

This material shall consist of a blend of asphalt cement (PG64-28) and polyester fibers. The asphalt-fiber blend shall consist of 6% fiber by weight of asphalt binder.

M3.05.2 Preformed Bituminous Joint Filler for Concrete.

This material shall be a non-extruding and resilient bituminous type preformed expansion joint filler. It shall conform to the requirements of AASHTO M 213.

M3.05.3 Hot Applied Asphalt Crack Sealer.

This specification covers a hot applied crack sealer suitable for use in cement concrete and hot mix asphalt pavement. This sealer shall meet the requirements of ASTM D6690 Type II. Products shall be evaluated by the National Transportation Product Evaluation Program (NTPEP) as an HMA Crack Sealer (CS) and be listed on the MassDOT QCML.

M3.11.0 Hot Mix Asphalt.

M3.11.1 General.

All Hot Mix Asphalt (HMA) mixtures shall meet the requirements of the Superpave volumetric mix design system as well as the following. Asphalt mixtures shall be composed of the following:

1. Mineral aggregate.
2. Mineral filler (if required).
3. Performance Graded Asphalt Binder (PGAB).

The use of recycled materials shall be at the Contractor's option in accordance with these specifications. And as permitted, recycled materials shall be limited to:

1. Recycled Asphalt Pavement (RAP).
2. Recycled Asphalt Shingles (RAS).
3. Processed Glass Aggregate (PGA).

Each HMA pavement course placed shall be compromised of one of the mixture types listed in Table 450.1HMA Pavement Courses & Mixture Types.

M3.11.2 Aggregate for Hot Mix Asphalt.

A. Coarse Aggregate

The coarse mineral aggregate shall be clean, hard, durable, crushed rock consisting of the angular fragments obtained by breaking and crushing shattered natural rock, reasonably free from thin and/or elongated pieces, free from dirt or other objectionable materials. It shall be surface dry and shall have a moisture content of not more than ½ percent after drying. Aggregates from multiple sources of supply shall not be mixed or stored in the same stockpile.

B. Fine Aggregate

The fine aggregate shall consist of one of the following:

1. 100% Natural Sand.
2. 100% Stone Sand.
3. A blend of sand and stone screenings, the proportions of which shall be approved by the Engineer.
4. A blend of natural sand and stone sand.

Natural sand shall consist of inert, hard, durable grains of quartz or other hard, durable rock, free from topsoil or clay, surface coatings, organic matter or other deleterious materials.

Stone sand shall be a processed material prepared from stone screenings to produce a consistently graded material conforming to specification requirements.

Stone screenings shall be the product of a secondary crusher and shall be free from dirt, clay, organic matter, excess fines or other deleterious material.

C. Consensus Properties

Aggregates utilized in HMA mixtures, including RAP if used in the mixture, shall be tested for conformance with the Consensus Property requirements outlined in AASHTO M 323 Sections 6.2 to 6.6 and Table M3.5 below.

D. Source Properties

The coarse aggregate utilized in asphalt mixtures shall be clean, crushed rock consisting of the angular fragments obtained by breaking and crushing shattered natural rock. It shall be free from dirt or other objectionable materials. The coarse aggregate, including RAP if used in the mixture, shall be tested for conformance with the requirements indicated in Table M3.6. The specific gravity of each aggregate component shall be determined as specified in Table M3.7 below.

To determine the bulk specific gravity of RAP aggregate, the method outlined in FHWA Publication Number FHWA-HRT-11-021 "Reclaimed Asphalt Pavement in Asphalt Mixtures: State of the Practice" shall be used. The following excerpt is the method to be followed:

If the source of RAP is known and original construction records are available, the bulk specific gravity (BSG) value of the virgin aggregate from the construction records may be used as the BSG value of the RAP aggregate. However, if original construction records are not available, the recommended procedure for estimating BSG of the RAP aggregate is a simple three-step process as follows:

Determine the maximum theoretical specific gravity of the RAP mixture, G_{mm}^{RAP}, according to AASHTO T 209.

Calculate the effective specific gravity of the RAP aggregate, G_{se}^{RAP}, using G_{mm}^{RAP}, the asphalt content of the RAP mixture (P_b) and an assumed asphalt specific gravity (G_b) as follows:

$$G_{se}^{RAP} = \frac{100 - P_b}{\frac{100}{G_{mm}} - \frac{P_b}{G_b}}$$

Where $G_b = 1.030$.

The asphalt absorption, P_{ba}, shall be assumed to be 0.5%. Use this value to estimate the BSG of the RAP aggregate, G_{sb}^{RAP}, from the calculated G_{se}^{RAP}.

$$G_{sb}^{RAP} = G_{se}^{RAP} / \left(\frac{P_{ba} \times G_{se}^{RAP}}{100 G_b} + 1 \right)$$

E. Recycled Asphalt Pavement

Reclaimed Asphalt Pavement (RAP) shall meet the requirements of Subsection M3.11.2C and D as well as the following. RAP shall consist of the material obtained from state highways or streets by crushing or milling existing HMA pavements. This material shall be transported to the HMA production facility yard and processed through an appropriate crusher so that the resulting material will contain no particles larger than the maximum aggregate size of the HMA mixture in which it will be used.

The RAP shall be stockpiled on a free draining base and kept separate from the other aggregates. RAP stockpiles shall be covered in a manner that prevents the intrusion of water but also allows the flow of air. The RAP stockpiles shall have a reasonably uniform gradation from fine to coarse and shall not be contaminated by foreign materials. The RAP used in the HMA mix production shall have a moisture content such that the final HMA contains no more than 0.5% moisture.

The use of RAP will be permitted at the option of the Contractor and provided that the end product is in conformance with the approved Job Mix Formula (JMF). The proportion of RAP to virgin aggregate shall be in accordance with Table M3.4 and Subsection M3.01.3.

Table M3.4 – Maximum Allowed RAP Content by Mix Type

Mix Type	Maximum Amount of RAP Allowed (%)	Maximum Amount of RAS Allowed (%)(1)
Friction Course (OGFC)	0	0
Friction Course (ARGG)	10	0
Surface Course	15	0
Leveling Course		5
Bridge Surface Course		0
Bridge Protective Course		0
Intermediate Course	40	5
Base Course		5
(1) When RAS is used in HMA mixtures containing RAP or other recycled materials, the RAS will be considered as part of the overall allowable weight of recycled materials in the mixture.		

F. Recycled Asphalt Shingles

Recycled Asphalt Shingles (RAS) shall consist of only the by-product materials obtained from the roofing shingle manufacturing process. Post-consumer shingle waste and re-roofing shingle scrap will not be allowed. The Contractor or the plant shall provide certification from the roofing shingle manufacturer that RAS material provided is a by-product of the shingle manufacturing process. This material shall be transported to the HMA production facility yard and processed through an appropriate crusher so that the resulting material will contain no particles larger than ½ inch. The material shall be stockpiled on a free draining base and kept separate from the other aggregates. The material contained in the processed stockpile shall not be contaminated by foreign materials. RAS stockpiles shall be covered in a manner that prevents the intrusion of water but also allows the flow of air.

RAS may be used in HMA leveling courses, HMA intermediate courses, and HMA base courses at a maximum rate of 5% by weight. When RAS is used in HMA mixtures containing RAP or other recycled materials, the RAS will be considered as part of the overall allowable weight of recycled materials in the mixture.

G. Processed Glass Aggregate

The use of Processed Glass Aggregate (PGA) meeting the requirements of Subsection M2.01.8 may be added at a maximum addition rate of 10% by weight. This addition will only be allowed in base and intermediate mixtures. PGA in mixes containing RAP will be considered as part of the overall allowable mass of RAP in the mix. If PGA is used in the mix, a separate aggregate bin shall be used and the use of lime as an anti-stripping agent shall be required.

Table M3.5 – Aggregate Consensus Property Requirements

Traffic Level	Design ESALs (Millions)(1)	Fractured Faces, Coarse Aggregate, (2) % Minimum		Uncompacted Void Content of Fine Aggregate, % Minimum		Sand Equivalent, % Minimum	Flat and Elongated,(2) % Maximum
		All Courses (except Base Course)	Base Course	All Courses (except Base Course)	Base Course		
1	< 0.3	55/--	--/--	--(4)	--	40	--
2	0.3 to < 10	85/80(3)	60/--	45	40	45	10
3	≥ 10	95/90	80/75	45	40	45	10

(1) The anticipated project traffic level expected on the design lane over a 20-year period. Regardless of the actual design life of the roadway, determine the design ESALs for 20 years.
(2) This criterion does not apply to 4.75 mm nominal maximum size mixtures.
(3) 85/80 denotes that 85 percent of the coarse aggregate has one fractured face and 80 percent has two or more fractured faces.
(4) For 4.75 mm nominal maximum size mixtures designed for traffic levels below 0.3 million ESALs, the minimum Uncompacted Void Content is 40.

Table M3.6 – Aggregate Source Property Requirements

Source Property Test	Test Method	Limit
Toughness	AASHTO T 96	< 30 %
Soundness	AASHTO T 104	< 10 %
Deleterious Materials	AASHTO T 112	< 0.5 %

Table M3.7 – Aggregate Specific Gravity Test Method

Aggregate Type	Test Method
Coarse	AASHTO T 85
Fine	AASHTO T 84 or ASTM D7370
Mineral Filler	AASHTO T 100
RAP	From FHWA-HRT-11-021

M3.11.3 Performance Graded Asphalt Binder.

The PGAB utilized in the HMA mixture shall be specified by the Contract and shall comply with the requirements of Subsection M3.01.0.

M3.11.4 Hot Mix Asphalt Mixture Design.

The Contractor shall be responsible for development of all HMA mixture designs. All HMA surface courses, intermediate courses, base courses, leveling courses, bridge surface courses, and bridge protective courses shall be supported by volumetric mixture designs using the Superpave mixture design system. All Superpave HMA designs shall be developed in accordance with the following AASHTO standards, as modified herein:

1. AASHTO M 323
2. AASHTO R 35
3. AASHTO T 312

Open Graded Friction Course (OGFC) and Asphalt Rubber Gap Graded (ARGG) mixtures shall be designed in accordance with Subsections M3.11.4G and M3.11.4H, respectively.

A. Development of Laboratory Trial Mix Formula

The Contractor shall develop and submit a Laboratory Trial Mix Formula (LTMF) for each HMA mixture type, which is to be proposed as a Job Mix Formula (JMF), a minimum of sixty (60) days prior to HMA production. Each LTMF shall be submitted with supporting documentation and adequate amount of blended aggregate material and PGAB in order to verify the LTMF.

Once verified by the Department, the LTMF may become the Job Mix Formula (JMF) for a project. Two or more JMFs per HMA type may be approved for a particular plant, however, only mixture conforming to one JMF is permitted to be produced and placed on any given day.

B. Estimated Design Traffic

The estimated traffic level to be used for HMA mix designs shall be specified by the contract. The traffic level shall be expressed in Equivalent Single Axle Loads (ESALs) for the design travel lane over a 20-year period in million 18-kip ESALs.

C. Specific Gravity Requirements

The individual aggregate, mineral filler, and PGAB specific gravities shall be included with the LTMF. The Contractor shall provide samples of each aggregate material a minimum of sixty (60) days prior to production for each LTMF to the Department for verification specific gravity of each stockpile.

D. Superpave Aggregate Gradation Requirements

The combined aggregate blend for each Superpave HMA mixture shall conform to the Gradation Control Point requirements specified in Table M3.8. The results of the selected optimum design aggregate structure shall be plotted on a 0.45 power chart and included with the LTMF.

The combined aggregate gradation shall be classified as coarse-graded when it passes below the Primary Control Sieve (PCS) control point as defined in Table M3.9. All other gradations shall be classified as fine graded.

When a Superpave Surface Course - 19.0 (SSC - 19.0) is specified in the contract, the LTMF aggregate gradation shall provide a fine-graded HMA mixture as defined in Table M3.9.

E. Gyratory Compaction Criteria

Each asphalt mixture shall be designed and controlled during production using an approved gyratory compactor which meets the requirements of AASHTO T 312. Compaction shall be in accordance with the requirements of AASHTO T 312. The density of each HMA mixture shall be evaluated at the initial number of gyrations ($N_{initial}$), the design number of gyrations (N_{design}), and the maximum number of gyrations (N_{max}). The gyratory-compacted specimens for each LTMF shall meet the density requirements specified in Table M3.10 below.

F. Superpave Volumetric Design Requirements.

Each Superpave HMA mixture shall be designed in accordance with the volumetric mixture design specifications contained in AASHTO M 323 and procedures contained in AASHTO R 35, as modified herein. Each HMA mixture LTMF shall be tested for conformance with the following volumetric properties:

1. Air Voids at N_{design} (V_a).
2. Voids in the Mineral Aggregate at N_{design} (VMA).
3. Voids Filled with Asphalt at N_{design} (VFA).
4. Fines to Effective Asphalt Ratio ($P_{0.075}$ / P_{be}).

The volumetric property test results shall be submitted with the LTMF for each Superpave HMA mixture. The required minimum or maximum criteria for each of the volumetric property tests are specified in Tables M3.10, M3.11, and M3.12.

Table M3.8 – Superpave Aggregate Gradation Control Points

Sieve	Nominal Maximum Aggregate Size – Control Points (% Passing)											
	#4 (4.75 mm)		3/8" (9.5 mm)		1/2" (12.5 mm)		3/4" (19.0 mm)		1" (25.0 mm)		1 1/2" (37.5 mm)	
Inches	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
2											100	
1 1/2									100		90	100
1							100		90	100		90
3/4					100		90	100		90		
1/2	100		100		90	100		90				
3/8	95	100	90	100		90						
#4	90	100		90								
#8			32	67	28	58	23	49	19	45	15	41
#16	30	55										
#30												
#50												
#100												
#200	6	13	2	10	2	10	2	8	1	7	0	6

Table M3.9 – Gradation Classification

PCS Control Point for Mixture Nominal Maximum Aggregate Size (% Passing)					
Nominal maximum aggregate size	3/8" (9.5 mm)	1/2" (12.5 mm)	3/4" (19.0 mm)	1" (25.0 mm)	1 ½" (37.5 mm)
Primary control sieve	#8 (2.36 mm)	#8 (2.36 mm)	#4 (4.75 mm)	#4 (4.75 mm)	3/8" (9.5 mm)
PCS control point, % passing	47	39	47	40	47

Table M3.10 – Superpave Asphalt Mixture Design Laboratory Compaction Requirements

Traffic Level	Design ESALs	Number of Gyrations			Percent Density of G_{mm} from Asphalt Mixture Gyratory Specimen		
	(millions)	N_{ini}	N_{des}	N_{max}	N_{ini}	N_{des}	N_{max}
1	< 0.3	6	50	75	≤ 91.5	96.0	≤ 98.0
2	0.3 to < 10	7	75	115	≤ 90.5	96.0	≤ 98.0
3	≥ 10	8	100	160	≤ 89.0	96.0	≤ 98.0

Table M3.11 – Superpave Volumetric Requirements

	Nominal Maximum Aggregate Size					
	#4 (4.75 mm)	3/8" (9.5 mm)	1/2" (12.5 mm)	3/4" (19.0 mm)	1" (25.0 mm)	1 ½" (37.5 mm)
P_b	LTMF Value					
G_{mb}						
G_{mm}						
V_a	4.0					
VMA	≥ 17.0	≥ 16.0	≥ 15.0	≥ 14.0	≥ 13.0	≥ 12.0
VFA	Table M3.12					
Dust/P_{be}(1)	0.9 - 2.0	0.6 - 1.2	0.6 - 1.2	0.6 - 1.2	0.6 - 1.2	0.6 - 1.2
Mixture Temp	Unmodified PGAB ≤ 325°F Modified PGAB ≤ 350°F					

(1) If the aggregate gradation passes beneath the PCS Control Point specified in M 323 Table 5, the dust-to-binder ratio range may be increased from 0.6-1.2 to 0.8-1.6 at the Engineer's discretion.

(2) Laboratory mixing and compaction temperatures shall be based on the PGAB Certificate of Analysis. When additives such as WMA, polymers, and rubber are introduced the mixing and compaction temperatures may be modified from the PGAB COA. Temperature modifications shall be recommended by the binder Supplier and approved at the Engineer's discretion.

Table M3.12 – Superpave Asphalt Mixture VFA Requirements

Traffic Level	Design ESALs (Millions)	Voids Filled with Asphalt (VFA) Based on Nominal Maximum Aggregate Size					
		#4 (4.75 mm)	3/8" (9.5 mm)	1/2" (12.5 mm)	3/4" (19.0 mm)	1" (25.0 mm)	1 ½" (37.5 mm)
1	< 0.3	70 - 80	70 – 80	70 - 80	70 - 80	67 – 80	64 - 80
2	0.3 to < 10	65 - 78	65 – 78	65 - 78	65 - 78	65 – 78	64 - 78
3	≥ 10	75 - 78	73 – 76	65 - 75	65 - 75	65 – 75	64 - 75

G. Open Graded Friction Course Design Requirements

Each OGFC asphalt mixture shall be designed in accordance AASHTO PP 77, as modified herein. The combined aggregate gradation shall conform to Table M3.13 and the mixture shall conform to Table M3.14.

1. OGFC-P will utilize asphalt binder meeting the requirements of Subsection M3.01.2A.
2. OGFC-AR will utilize asphalt binder meeting the requirements of Subsection M3.01.2B.

Table M3.13 – OGFC Aggregate Gradation Control Points

Sieve	Nominal Maximum Aggregate Size Control Points (% Passing)	
	3/8" (9.5 mm)	
Inches	Min	Max
1	-	-
3/4	-	-
1/2	100	-
3/8	85	100
#4	20	40
#8	5	15
#200	0	4

Table M3.14 – OGFC Mixture Requirements

Property	Requirement
N_{des}, gyrations	50
P_b, % (Polymer)	≥ 6.5
P_b, % (Asphalt Rubber)	≥ 7.5
V_a, %	18 – 22
VCA_{mix}, %	< VCA_{DRC}
Draindown, %(1)	≤ 0.3
Abrasion Loss, %(2)	≤ 15
Moisture Susceptibility, %(3)	≥ 70
Permeability, in/sec(4)	≥ 0.0178

(1) Draindown shall be tested in accordance with AASHTO T 305 at the production temperature.
(2) Abrasion loss shall be tested in accordance with AASHTO TP 108.
(3) Moisture susceptibility shall be tested in accordance with AASHTO T 283.
(4) Permeability shall be performed in accordance with the procedure outlined by RMS.

H. ARGG Design Requirements

Each Asphalt Rubber Gap Graded (ARGG) asphalt mixture shall be designed in accordance with the AASHTO M 323 and procedures contained in AASHTO R 35, as modified herein. The combined aggregate gradation shall conform to Table M3.15 and the mixture shall conform to Table M3.16.

ARGG will utilize asphalt binder meeting the requirements of Subsection M3.01.2B.

Table M3.15 – ARGG Aggregate Gradation Control Points

Sieve	Nominal Maximum Aggregate Size Control Points (% Passing)	
	½" (12.5 mm)	
Inches	Min	Max
1	-	-
3/4	100	-
1/2	90	100
3/8	83	87
#4	28	42
#8	14	22
#200	0	6

Table M3.16 – ARGG Mixture Requirements

Property	Requirement
N_{des}, gyrations	100
P_b, %	≥ 7.6
V_a, %	3 – 6
VMA, %	18 – 23
Draindown, %(1)	≤ 0.3
(1) Draindown shall be tested in accordance with AASHTO T 305 at the production temperature.	

M3.11.5 Verification of Laboratory Trial Mix Formula.

The Contractor shall submit an LTMF in accordance with Subsection M3.11.4. The Engineer will perform laboratory verification of each LTMF.

If the Engineer is unable to verify the Contractor's LTMF in accordance with the applicable LTMF Verification Limits in Table M3.17, Table M3.18, or Table M3.19, then the Engineer will work with the Contractor to resolve the verification issue(s). The Contractor shall not proceed with production and placement of a Control Strip under Section 450 until the LTMF is verified by the Engineer.

Table M3.17 – Superpave LTMF Verification Limits

Properties	Test Method	LTMF Verification Limit
Asphalt Binder Content (P_b)	AASHTO T 308	Target □ 0.3%
Gradation Passing #4 (4.75 mm) and Larger Sieves	AASHTO T 30	Target □ 6.0%
Gradation Passing #8 (2.36 mm) Sieve		Target □ 5.0%
Gradation Passing #16 (1.18 mm) to #50 (0.30 mm) Sieve		Target □ 3.0%
Gradation Passing #100 (0.15 mm) Sieve		Target □ 2.0%
Gradation Passing #200 (75 µm) Sieve		Target □ 1.0%
Bulk Specific Gravity (G_{mb})	AASHTO T 166	Target ± 0.022
Max. Theo. Specific Gravity (G_{mm})	AASHTO T 209	Target □ 0.020
Air Voids (V_a)	AASHTO R 35	Target □ 1.0%
Voids in Mineral Aggregate (VMA)		Target □ 1.0%
Voids Filled With Asphalt (VFA)		Target □ 5.0%
Rutting and Moisture Susceptibility	AASHTO T 324	Table M3.20

Table M3.18 – OGFC LTMF Verification Limits

Properties	Test Method	LTMF Verification Limit
Asphalt Binder Content (P_b)	AASHTO T 308	Target □ 0.3%
Gradation Passing #4 (4.75 mm) and Larger Sieves	AASHTO T 30	Target □ 6.0%
Gradation Passing #8 (2.36 mm) Sieve		Target □ 5.0%
Gradation Passing #16 (1.18 mm) to #50 (0.30 mm) Sieve		Target □ 3.0%
Gradation Passing #100 (0.15 mm) Sieve		Target □ 2.0%
Gradation Passing #200 (75 µm) Sieve		Target □ 1.0%
Bulk Specific Gravity (G_{mb})	AASHTO T 331	Target ± 0.022
Max. Theo. Specific Gravity (G_{mm})	AASHTO T 209	Target □ 0.020
Air Voids (V_a)	AASHTO R 35	Target □ 2.0%
Voids in Mineral Aggregate (VMA)		Target □ 2.0%
Voids Filled with Asphalt (VFA)		Target □ 5.0%
Draindown	AASHTO T 305	≤ 0.3%
Abrasion Loss	AASHTO TP 108	≤ 15%
Tensile Strength Ratio	AASHTO T 283	≥ 70%

Table M3.19 – ARGG LTMF Verification Limits

Properties	Test Method	LTMF Verification Limit
Asphalt Binder Content (P_b)	AASHTO T 308	Target □ 0.3%
Gradation Passing ¾" (19.0 mm) Sieve	AASHTO T 30	Target □ 0.0%
Gradation Passing #4 (4.75 mm) to ½" Sieve		Target □ 6.0%
Gradation Passing #8 (2.36 mm) Sieve		Target □ 5.0%
Gradation Passing #16 (1.18 mm) to #50 (0.30 mm) Sieve		Target □ 3.0%
Gradation Passing #100 (0.15 mm) Sieve		Target □ 2.0%
Gradation Passing #200 (75 µm) Sieve		Target □ 1.0%
Bulk Specific Gravity (G_{mb})	AASHTO T 166	Target ± 0.022
Max. Theo. Specific Gravity (G_{mm})	AASHTO T 209	Target □ 0.020
Air Voids (V_a)	AASHTO R 35	Target □ 1.0%
Voids in Mineral Aggregate (VMA)		Target □ 1.0%
Draindown	AASHTO T 305	≤ 0.3%
Rutting and Moisture Susceptibility	AASHTO T 324	Table M3.20

Evaluation of Rutting and Moisture Sensitivity

Each HMA mixture, with the exception of Base Courses and OGFC, shall be tested by RMS for rutting and moisture sensitivity in accordance with the requirements of AASHTO T 324 using the Hamburg Wheel-Tracking Device (HWTD).

The Engineer may also require that mixtures meet the requirements of AASHTO T 283 with a minimum tensile strength ratio of 80%.

Table M3.20 – Hamburg Wheel Tracking Device Requirements

Traffic Level	Maximum Rut Depth Inches (mm)	Minimum number of passes before Stripping Inflection Point is observed
1	½ (12.5)	10,000
2		15,000
3		15,000

M3.11.6 HMA for Driveways, Sidewalks, Berm, and Curb.

HMA mixtures for driveways, sidewalks, berm, and curb shall conform to the master ranges in Table M3.21. The PGAB shall conform to Subsection M3.01.1. The Contractor shall submit a Job Mix Formula (JMF) prior to production which shows the target aggregate gradation and PG asphalt binder content for each HMA mixture for driveways, sidewalks, berm, and curb.

With the approval of the Engineer, the Contractor may substitute a MassDOT approved 9.5 mm or 12.5 mm Superpave Surface Course mixture (Traffic Level 1 or 2) for Driveways and Sidewalks.

The Contractor shall perform QC testing at the start of plant production and in conjunction with the calibration of the plant in order to verify that the JMF can be produced within the Engineering Limits specified in Table M3.22.

The composition limits in Table M3.21 are HMA mix design master ranges for aggregate gradation and asphalt binder content. The JMF for each HMA mixture type shall establish a single percentage of aggregate passing each required sieve size, and a single percentage of asphalt binder material to be added to the aggregate.

The JMF shall be submitted in writing by the Contractor to the Engineer at least 30 days prior to the start of paving operations and shall include the following as a minimum:

1. Source of materials.
2. Percent of each aggregate stockpile.
3. Percent passing each sieve size.
4. Combined aggregate specific gravity.
5. Percent of asphalt binder.
6. Performance grading test results and Certificate of Compliance certifying the PG grade.
7. Mixing temperature.
8. Compaction temperature.
9. Temperature of mix when discharged from the mixer.
10. Maximum theoretical specific gravity of the mixture.

AASHTO T 195 (Ross Count) with a coating factor of 98% will be used when necessary to evaluate proper mixing time.

The use of recycled materials will be permitted at the option of the Contractor and provided that the end product is in conformance with the designated JMF. The proportion of reclaimed materials (including RAP, PGA, and RAS) in the total mix shall be limited to a maximum of 15%.

All HMA JMFs for sidewalks, wheelchair ramps, driveways, and berm will be submitted to the Engineer for approval. The JMF shall bind the Contractor to furnish paving mixtures not only within the master ranges, but also conforming to the exact formula thus set up for the project, within the Engineering Limits found in Table M3.22.

For each project, at least one QC sample shall be randomly obtained by the Contractor for every 2,000 tons produced, but not less than one QC sample per day. The Engineer shall also obtain a minimum of one random Acceptance sample for every 2,000 tons produced. The sample will be tested for conformance with the submitted JMF and Engineering Limits. When testing shows the mixture is not in conformance the Engineer will determine the disposition in accordance with Section 6.04 of Division I.

The JMF for each mixture shall be in effect until modified in writing by the Contractor and approved by the Engineer. Should a change in sources of materials be made, a new JMF must be approved by the Engineer before the new material is used.

Table M3.21 – Master Ranges for HMA for Driveways, Sidewalks, Berm, and Curb

	Nominal Maximum Aggregate Size Control Points (% Passing)			
Mixture Type	Driveways, Sidewalks, and Berm		Berm and Curb Only	
Sieve (Inches)	Min	Max	Min	Max
1	-	-	-	-
3/4	100	-	-	-
1/2	95	100	100	-
3/8	87	93	87	93
#4	57	69	62	73
#8	41	45	52	55
#16	30	36	40	45
#30	21	25	28	34
#50	14	17	18	23
#100	9	12	10	14
#200	4	5	6	6
P_b, %	6.0	6.6	7.4	7.6

Table M3.22 – Engineering Limits for Aggregate Gradation and Asphalt Binder Content

Sieve Designation / Binder Content	Engineering Limits
Passing No. 4 and larger sieve sizes	JMF Target ± 6%
Passing No. 8 sieve	JMF Target ± 5%
Passing No. 16 to No. 50 sieves (inclusive)	JMF Target ± 3%
Passing No. 100 sieve	JMF Target ± 2%
Passing No. 200 sieve	JMF Target ± 1%
Asphalt Binder Content	JMF Target ± 0.4%

M3.11.7 Cold Patch for Temporary Patching.

When HMA is not available due to seasonal limitations the Contractor shall use stockpiled cold patch mixtures approved by the Research & Materials Section.

M3.11.8 Stress Absorbing Membrane & Stress Absorbing Membrane Interlayer.

All Stress Absorbing Membrane (SAM) and Stress Absorbing Membrane Interlayer (SAMI) mixtures shall meet the requirements as specified below. SAM & SAMI mixtures shall be composed of the following:

1. Mineral aggregate
2. Performance Graded Asphalt Binder

A. Aggregate.

The aggregate shall conform to Subsection M3.11.2. Crushed gravel stone will not be permitted. The aggregate shall be pre-heated to a temperature between 200°F and 300°F, and be pre-coated with 0.4% to 0.8% asphalt binder (by weight of aggregate) prior to application. The aggregate shall meet the requirements in Tables M3.23 and M3.24.

Table M3.23 – SAM & SAMI Aggregate Control Points

	Nominal Maximum Aggregate Size – Control Points (% Passing)					
Type	3/8" (9.5 mm)		1/2" (12.5 mm)		3/8" (9.5 mm) SAMI ONLY	
Sieve (Inches)	Min	Max	Min	Max	Min	Max
5/8	100	-	100	-	100	-
½	100	-	90	100	100	-
3/8	85	100	25	65	85	100
#4	0	8	0	8	0	30
#8	0	4	0	4	0	5
#200	0	2	0	2	0	2

Table M3.24 – SAM & SAMI Aggregate Source Property Requirements

Source Property Test	Test Method	Limit
Toughness	AASHTO T 96	< 30 %
Flakiness Index (For SAM)	TEX-224-F(1)	< 20%
Flakiness Index (For SAMI)	TEX-224-F(1)	< 30%
(1) Determined following TxDOT's Test Procedure for Determining Flakiness Index.		

B. Performance Graded Asphalt Binder.

The PGAB binder to be applied to the pavement shall be in conformance with Subsection M3.01.2B. Asphalt binder that is pre-coated onto the aggregate shall be in conformance with Subsection M3.01.1.

M3.11.9 Ultrathin Bonded Overlay

All Ultrathin Bonded Overlay (UTBO) mixtures shall meet the requirements as specified below. UTBO mixtures shall be composed of the following:

1. Mineral aggregate.
2. Mineral filler (if required).
3. Performance Graded Asphalt Binder (PGAB).

The use of recycled materials will not be permitted.

A. Coarse Aggregate.

Coarse aggregate shall meet the requirement of M3.11.2A. Where coarse aggregates for these mixes are from more than one source or of more than one type of material, they shall be proportioned and blended to provide a uniform mixture.

B. Fine Aggregate.

Fine aggregate shall meet the requirement of M3.11.2B as well as one of the following. Fine aggregate shall be 100% crushed and consist of one of the following:

1. 100% Stone Sand.
2. A blend of stone sand and stone screenings.

Table M3.25 – Fine Aggregate Consensus Property Requirements

Source Property Test	Test Method	Limit
Sand Equivalence	AASHTO T 176	> 60 %
Methylene Blue	AASHTO T 330	≤ 10 mg/g

C. Mineral Filler

Hydrated lime, fly ash, baghouse fines, and cement are acceptable as mineral filler.
Typical acceptable gradation: #30 - 100% passing
#200 - 75-100% passing

D. Performance Graded Asphalt Binder.

The PGAB utilized in the HMA mixture shall be specified by the Contract and shall comply with the requirements of Subsection M3.01.2.

E. UTBO Mixture Design.

The Contractor shall be responsible for development of all UTBO mixture designs. All UTBO designs shall be developed in accordance with the requirements specified below.

F. Development of Laboratory Trial Mix Formula

The Contractor shall develop and submit a Laboratory Trial Mix Formula (LTMF) for each UTBO mixture type, which is to be proposed as a Job Mix Formula (JMF), a minimum of sixty (60) days prior to UTBO production. Each LTMF shall be submitted with supporting documentation and adequate amount of blended aggregate material and PGAB in order to verify the LTMF. Once verified by the Department, the LTMF may become the Job Mix Formula (JMF) for a project.

G. Specific Gravity Requirements

The individual aggregate, mineral filler, and PGAB specific gravities shall be included with the LTMF. The Contractor shall provide samples of each material a minimum of sixty (60) days prior to production for each LTMF to the Department for verification specific gravity of each stockpile.

H. UTBO Aggregate Gradation Requirements

The combined aggregate blend for each UTBO mixture shall conform to the Gradation Control Point requirements specified in Table M3.26. The results of the selected optimum design aggregate structure shall be plotted on a 0.45 power chart and included with the LTMF.

Table M3.26 – UTBO Aggregate Control Points

	Nominal Maximum Aggregate Size – Control Points (% Passing)					
Type	Type 1		Type 2(1)		Type 3(1)	
Sieve (Inches)	Min	Max	Min	Max	Min	Max
¾	100	-	100	-	100	-
½	100	-	92	100	85	100
3/8	85	100	55	90	45	85
#4	24	40	24	41	24	41
#8	21	32	21	33	21	33
#16	16	26	15	26	15	26
#30	12	20	11	20	11	20
#50	8	16	8	16	8	16
#100	5	10	5	10	5	10
#200	5	7	4	7	4	7
(1) When asphalt rubber is specified the gradation master ranges may be modified with the prior approval from the Research & Materials Section.						

I. UTBO Mixture Requirements

The combined mixture for each UTBO mixture shall conform to the mixture requirements specified in Table M3.27. The results of the selected optimum design shall be included with the LTMF.

Table M3.27 – UTBO Mixture Requirements

Property	Requirement
P_b, % (Polymer)	4.8 – 5.2
P_b, % (Asphalt Rubber)(1)	5.8 – 6.2
Draindown, %(2)	≤ 0.1
Moisture Susceptibility, %(3)	≥ 80
(1) Type 1 UTBO shall not use asphalt rubber. (2) Draindown shall be tested in accordance with AASHTO T 305 at the production temperature. (3) The mixture shall be compacted according to AASHTO T 312 and tested in accordance with AASHTO T 283.	

J. Verification of Laboratory Trial Mix Formula.

The Contractor shall submit an LTMF in accordance with Subsections M3.11.9A to M3.11.9I. The Engineer will perform laboratory verification of each LTMF.

If the Engineer is unable to verify the Contractor's LTMF in accordance with the applicable LTMF Verification Limits in Table M3.28, then the Engineer will work with the Contractor to resolve the verification issue(s). The Contractor shall not proceed with production and placement of a Control Strip under Section 467 until the LTMF is verified by the Engineer.

Table M3.28 – UTBO LTMF Verification Limits

Properties	Test Method	LTMF Verification Limit
Asphalt Binder Content (P_b)	AASHTO T 308	Target □ 0.3%
Gradation Passing ¾" (19.0 mm) Sieve	AASHTO T 30	Target □ 0.0%
Gradation Passing #4 (4.75 mm) and Larger Sieves		Target □ 6.0%
Gradation Passing #8 (2.36 mm) Sieve		Target □ 5.0%
Gradation Passing #16 (1.18 mm) to #50 (0.30 mm) Sieve		Target □ 3.0%
Gradation Passing #100 (0.15 mm) Sieve		Target □ 2.0%
Gradation Passing #200 (75 µm) Sieve		Target □ 1.0%
Draindown	AASHTO T 305	≤ 0.1%
Tensile Strength Ratio	AASHTO T 283	≥ 80%

M3.12.0 Hot Mix Asphalt Production Facility.

All facilities producing HMA must be approved on an annual basis by the Department. All sources of materials used for the production of HMA must be approved by the Department prior to their use. Such materials shall include:

1. Coarse aggregate.
2. Fine aggregate.
3. Mineral filler.
4. Performance graded asphalt binder.
5. Modifiers and/or additives.

HMA production operations shall follow industry accepted best management practices including:

1. Aggregate handling and stockpile management.
2. Recycled asphalt pavement handling and stockpile management.
3. PGAB storage.
4. Plant process controls.
5. Silo loading.
6. Truck loading.

The plant shall meet the requirements of AASHTO M 156 as well as the following provisions. HMA plants meeting these requirements and which have been approved by RMS shall be listed on the MassDOT QCML.

An adequate quantity of each size aggregate, mineral filler and asphalt binder shall be maintained at the HMA plant site at all times while the plant is in operation to ensure that the plant can continuously produce mixtures that meet these specifications. The quantity of such materials shall never be less than one day's production capacity.

M3.12.1 Scales.

Plant and truck scales shall be certified:

1. At the start of each construction season, prior to use for MassDOT projects.
2. At intervals of not more than 90 calendar days.
3. Whenever the plant changes location.
4. At any time as requested by the Engineer.

M3.12.2 Calibration of Plant Equipment.

The plant's systems shall be calibrated:

1. At the start of each construction season, prior to use for MassDOT projects.
2. Whenever there is a significant change to the material.
3. Whenever a plant component supply system affecting the ingredient proportions has been repaired, replaced, or adjusted.
4. At any time as requested by the Engineer.

M3.12.3 Automatic Recordation.

Recordation equipment shall be provided. Each recorder shall include an automatic printer system. The printer shall be so positioned that the digital display and the printer can be readily observed within the plant's control room by the Engineer and the plant operator, simultaneously. The delivery ticket shall be printed with an original and at least one copy. The original shall be furnished to the Engineer at the paving site and the copy to the Engineer at the plant. The delivery ticket format shall be approved by RMS and will include the following information:

1. Company / plant location.
2. MassDOT contract number and/or distinct project name.
3. MassDOT mix ID number and/or distinct mix description.
4. Percentage of RAP in the mixture.
5. Percentage of asphalt binder in the mixture.
6. Date and time of loading.
7. Sequential load number for the contract for a 24-hour period.
8. Total weight of mix in truck (pay weight).

The following mixture production information shall also be provided:

For Batch Plants
1. Date mixed.
2. Time of batching.
3. Tare weight of aggregate weigh box.
4. Tare weight of PGAB weigh bucket.
5. Moisture content of recycled materials.
6. Target and actual cumulative or net weights as batched for each bin with a batch total for all net ingredients.
7. Target and actual weight of PGAB.
8. Total weight of mix in truck (pay weight).

Note: This information shall be included on the delivery ticket when the mix is batched directly into a truck. When the mix is batched and stored in a silo the information may be separate from the delivery ticket however it must be provided to the Engineer at the plant.

For Drum Plants
1. Percent of mixture as well as the target and actual production rate for each individual mix component including:
    a. Aggregate
    b. Mineral Filler
    c. PGAB
    d. Recycled materials
    e. Additives
2. Moisture content of aggregates and recycled materials.
3. PGAB temperature.
4. Target and actual mix temperature.
5. Target and actual mix production rate.

Note: This information is not required to be included on the delivery ticket however it must be provided to the Engineer at the plant.

M3.12.4 Surge and Storage Silo Holding Time.

Unless otherwise permitted by the Engineer, the mixtures shall not be stored in surge and storage bins longer than the following:

1. Unheated and not insulated ..... 2 hours
2. Unheated and insulated with heated gate ..... 15 hours
3. Insulated and heated ..... 24 hours

Note: In order to prevent excessive draindown, OGFC shall not be stored in a surge or storage bin for longer than two (2) hours. ARGG shall not be stored for more than six (6) hours.

M3.12.5 Asphalt Release Agents.

The plant shall have a method of applying MassDOT approved asphalt release agents to the haul units in accordance with the Manufacturer's recommendations. Spray systems may either be manual or automated but application of the release agent must be at the rate specified by the Manufacturer.

M3.12.6 Air Quality.

The plant shall be designed and operated to meet all current Federal and State air quality requirements.

M3.12.7 Equipment Failure.

If at any time the automatic proportioning or recording system becomes inoperative, the plant will cease all HMA production. Work will only be allowed to restart once all automatic controls and recording systems are functional.

M3.12.8 HMA Plant Facility Inspection.

The Engineer shall have access at any time to all parts of the plant for:

1. Inspections of the conditions and operations of the plant.
2. Confirmation of the adequacy of the equipment in use.
3. Verification of the character and proportions of the mixture.
4. Determination of temperatures being maintained in the preparation of the mixture.
5. Inspection of incidental related procedures.

M3.13.0 Hot Mix Asphalt Materials Testing Laboratory and Equipment.

M3.13.1 Contractor Quality Control Laboratory.

All Contractor QC testing shall be performed in laboratories that are approved by RMS and qualified through the NETTCP Laboratory Qualification Program (LQP) or accredited through the AASHTO Accreditation Program (AAP). All laboratories shall maintain a Quality System Manual (QSM) in accordance with the outline maintained by the Research & Materials Section.

1. Laboratories that perform HMA mix designs or QC testing under Section 450 shall at a minimum be qualified as a NETTCP LQP Category 2 laboratory.
2. Laboratories performing only QC testing shall be qualified as a NETTCP LQP Category 3 laboratory.
   a. Contractors who do not produce mixtures under Section 450 will not be required to have their own laboratory at the production facility but will be required to either test at their central laboratory or hire a Consultant testing company to perform the QC testing required in the specification. The Contractor will still be required to maintain a QSM for the HMA Production Facility.

The Contractor's QC laboratory shall be qualified to perform all testing required by Table M3.29 as well as contract specifications.

Laboratories meeting these requirements, and which have been approved by the RMS shall be listed on the MassDOT QCML.

The Contractor's QC Manager shall have overall responsibility for ensuring that all laboratories utilized for Quality Control are in compliance with the requirements of the NETTCP LQP. This includes providing required AASHTO, ASTM, and NETTCP reference documents and ensuring that all required equipment and tools are properly functioning and calibrated.

The Engineer shall be permitted unrestricted access to inspect and review the Contractor's laboratory facility.

Along with the required testing capabilities the laboratory facilities shall meet the following:

1. Be kept clean and all equipment shall be maintained in proper working condition.
2. Provide adequate environmental control to the satisfaction of the Engineer and must be able to maintain an inside temperature of 68 to 86°F during working hours.
3. Adequate ventilation to remove dust and fumes from the laboratory.
4. Hot and cold potable water.
5. First aid kit and emergency eye wash station.
6. Multi-class ABC fire extinguisher.
7. A restroom shall also be made available within 500 ft of the laboratory during all work shifts. The restroom facilities shall be enclosed in a separate room with proper ventilation and comply with applicable sanitary codes as well as:
    a. A flush toilet.
    b. A sink with hot and cold running water.
    c. A sewer or septic tank with connections.
    d. Adequate rest room supplies.
    e. Maintained environmental control and cleanliness.

M3.13.2 Department Acceptance Laboratory at HMA Production Facility

The Engineer shall be provided laboratory working space meeting the requirements of Subsection M3.12.1 as well as the following. A desk must be located in close proximity to the laboratory but be separated from the ovens, sieve shakers, and anything else that can cause poor air and sound quality. The Engineer's desk and laboratory space will not be shared with any other entity.

Contractors who do not produce mixtures under Section 450 will not be required to have a Department Acceptance Laboratory at the production facility but will be required to allow the Engineer to perform Acceptance testing at their central laboratory or Consultant testing company laboratory. These laboratories are still required to meet Subsection M3.12.1.

If the Engineer is unable to perform their duties either due to lack of working space, poor working conditions, or access to equipment it will be considered a laboratory facility deficiency. The Engineer will advise the Contractor in writing of any noted deficiencies concerning the laboratory facility, equipment, supplies, or testing personnel and procedures. Deficiencies shall be grounds for the Engineer to order an immediate stoppage of work until the deficiencies are corrected.

Unless approved by the Engineer, the plant, silos, and sample rack shall be in view of laboratory when performing testing under Section 450.

The Engineer shall be provided with the following:

A. Computer

For plants producing HMA in accordance with Section 450, the Engineer shall be furnished with a computer with high speed internet access which conforms to the requirements determined by RMS. The minimum requirements shall include:

1. The Engineer is required to have one (1) computer at the laboratory.
2. Computers shall be required to have the latest MS Office Professional with all security updates, Antivirus software with all current security updates maintained, and any other software required by RMS.
3. A laser printer with the capability to also scan and copy. The printer shall be compatible and connected to the laboratory's computer.

B. Testing Equipment

The Contractor shall supply the Engineer with the following equipment. This equipment shall only be utilized by the Engineer and shall be labeled as such. It shall be the Contractor's responsibility to maintain and replace equipment as needed.

1. For T 27 and T 30:
   a. 12-inch sieve stack (2 inch to #200) with cover and pan.
   b. Mechanical sieve shaker (only for Section 450 Category A Lots).
   c. Electronic balance (only for Section 450 Category A Lots).
2. For T 166 and T 209:
   a. Complete setup (only for Section 450).
3. For T 312:
   a. Gyratory mold.
4. For T 308:
   a. Ignition oven sample basket.
   b. Ignition oven and two (2) sample baskets (only for Section 450 Category A Lots).
5. Miscellaneous equipment such as sample buckets, scoops, pans, brushes, thermometers, etc.
6. Oven which meets AASHTO R 30 and is capable of storing the sample buckets for 3 samples (only for Section 450 Category A Lots).
7. Supply of sample boxes.
8. Sample rack which is a suitable sampling platform from which the Engineer is able to stand and sample the material in the truck bed adequately and safely. The rack shall:
   a. Be of sturdy construction.
   b. Be able to safely accommodate at least two people at a time (min. standing area of 4 ft x 4 ft).
   c. Have a safe stairway that is attached to the sampling platform.
   d. Be at a height which allows the Technician the ability to reach the HMA in the bed of any size truck safely and efficiently.
   e. Have a mounted spot light to allow for sampling at night.
   f. Be within 100 ft of the laboratory and visible from the laboratory.
   g. Meet applicable OSHA standards.

Table M3.29 – Required Test Methods by Laboratory

Test Method	Description	Mix Design Laboratory	QC Laboratory	Department Acceptance Laboratory
AASHTO M 323	Superpave Volumetric Mix Design	X		
AASHTO R 30(1)	Mixture Conditioning of HMA	X		
AASHTO R 35	Superpave Volumetric Design for Asphalt Mixtures	X		
AASHTO R 47	Reducing Samples of HMA to Testing Size	X	X	X
AASHTO R 66	Sampling of Asphalt Materials		X	
AASHTO R 76	Reducing Samples of Aggregate to Testing Size	X	X	
AASHTO R 79 (2)	Vacuum Drying Compacted HMA Specimens		X	
AASHTO R 90	Sampling of Aggregates		X	
AASHTO R 97	Sampling Bituminous Paving Mixtures		X	X
AASHTO T 11	Material Finer Than #200 Sieve by Washing	X	X	X
AASHTO T 27	Sieve Analysis of Fine and Coarse Aggregates	X	X	X
AASHTO T 30	Sieve Analysis of Extracted Aggregate	X	X	X
AASHTO T 84	Specific Gravity and Absorption of Fine Aggregate	X		
AASHTO T 85	Specific Gravity and Absorption of Coarse Aggregates	X		
AASHTO T 96	Coarse Aggregate L.A. Abrasion	X		
AASHTO T 104	Soundness of Aggregates	X		
AASHTO T 166	Bulk Specific gravity of HMA	X	X	X
AASHTO T 176	Sand Equivalence	X		
AASHTO T 209	Theoretical Maximum Specific Gravity of HMA	X	X	X
AASHTO T 255	Moisture Contents of Aggregates		X	
AASHTO T 283(4)	Resistance of Compacted Asphalt Mixtures to Moisture-Induced Damage	X		
AASHTO T 304	Un-compacted Void Content of Fine Aggregate	X		
AASHTO T 305(3)	Draindown in Uncompacted Asphalt Mixtures	X		
AASHTO T 308	Asphalt Binder Content by Ignition Oven		X	X
AASHTO T 312	Density of HMA by Superpave Gyratory	X	X	X
AASHTO T 329	Moisture Control of HMA		X	X
AASHTO T 331(4)	Bulk Specific Gravity and Density of Compacted Asphalt Mixtures Using Automatic Vacuum Sealing	X	X	X
AASHTO T 335	Determining the Percentage of Fracture in Coarse Aggregate	X		
ASTM D3549	Thickness of Compacted HMA Specimens		X	
ASTM D4791	Flat & Elongated Particles in Coarse Aggregate	X		
ASTM D7370 (2)	Relative Density and Absorption of Aggregate Using Combined Vacuum Saturation and Rapid Submersion	X		

(1) Two ovens shall be required; one to heat binder, aggregate, and mixing tools to mixing temperature and one to condition the loose mixture at the compaction or conditioning temperature.
(2) Optional test.
(3) Required for Open Graded Friction Course and Asphalt Rubber Gap Graded.
(4) Required for Open Graded Friction Course.

SECTION M5: PIPE, CULVERT SECTIONS AND CONDUIT

SUBSECTION M5.03.10 Corrugated Plastic Pipe.
(page III.74) Replace this subsection with the following;

Pipe shall consist of corrugated polyethylene or polypropylene tubing, flare ends, couplings and fittings. Materials, dimensions, physical properties and fabrication shall be in accordance with AASHTO M 294, Type S or D or AASHTO M330 Type S or D. Perforated pipe shall meet Type SP, DP or CP.

SECTION M6: ROADSIDE DEVELOPMENT MATERIALS

SUBSECTION M6.03.0 Long Term Seed Mixes for Lawns and Slopes.
(page III.79) In table M6.03.0-1 Grass Seed Requirements for Lawn Grass Areas change the proportion of Creeping Red and/or Chewing Fescue from 55% to 59% and change the proportion of Dutch White Clover from 5% to 1%. In table M6.03.0-2 Grass Seed Requirements for Slopes and Shoulders change Kentucky Blue Grass to Tall Fescue. Delete table M6.03.0-3 Grass Seed Requirements for Warm Season Mix.

SUBSECTION M5.03.1 Short Term Erosion Control Seed.
(page III.79) Change the subsection number from M5.03.1 to M6.03.1. Change the table number from M5.03.1-1 to M6.03.1-1.

SECTION M9: MISCELLANEOUS MATERIALS

SUBSECTION M9.08.0: Preformed Sheet Membrane
(page III.128) Replace this subsection with the following;

M9.08.0: Waterproofing Membranes

M9.08.1: Spray Applied Waterproofing Membrane

A. General Requirements

Only products listed on the MassDOT Qualified Construction Materials List (QCML) will be accepted for use. The membrane waterproofing system shall consist of:

- Primer
- One or two coat rapid curing cold liquid spray applied seamless methyl methacrylate, polyurea, or polyurethane methyl methacrylate membrane
- Aggregate keycoat
- Polymer modified tack coat

B. Material Requirements

The total minimum base thickness for the membrane shall be 80 mils measured over peaks. The membrane shall easily accommodate the need for day joints and patch repairs. The membrane shall be able to bridge live cracks up to 1/8 inch in width and meet the criteria specified in Table M9.08.1-2.

The membrane waterproofing system shall be asbestos-free. The chemical composition of the primer, membrane, aggregate keycoat and tack coat that make up the membrane waterproofing system shall conform to the manufacturer's specifications for the material. All components shall be approved by the manufacturer as being compatible for use with the specified membrane. Cleaning solvents shall also be approved by the manufacturer for use with the membrane.

Primer for Spray Applied Membrane

The primer shall promote adhesion of the membrane to the concrete surface.

Table M9.08.1-1: Primer Material Properties

Property	Test	Requirements
Gel Time		> 5 minutes
Tack Free Time		< 2.5 hours, max at 77°F
Adhesion to Concrete	ASTM D7234	≥ 100 psi minimum and failure in concrete

Membrane

The membrane shall be meet the requirements in Table M9.08.1-2.

Table M9.08.1-2: Spray Applied Waterproofing Membrane Material Properties

Property	Test	Requirements
Solids Content		100%
Stability	ASTM C836	≥ 6 months
Crack Bridging (Neat Material + Aggregated Keycoat)	ASTM C1305 (1)	Pass, no cracking
Extensibility after Heat Aging	ASTM C1522	For information only
Percent Elongation at Break	ASTM D638	≥ 130%
Tensile Strength	ASTM D638 Type IV @ 2 in/min	> 1,100 psi
Shore Hardness	ASTM D2240 (2)	≥ 50 Type 00
Minimum Thickness (Membrane only)	ASTM D6132 or other approved method	≥ 80 mils minimum measured over peaks or ≥ thickness used to pass ASTM C1305 (Whichever thickness is greater)
Membrane Waterproofing System Adhesion to Concrete	ASTM D7234	≥ 100 psi minimum and failure in concrete
Permeance	ASTM E96 Water Method, Procedure B	≤ 1.0 perms

(1) ASTM C1305 shall be modified to 25 cycles at -15°F no failure at 1/8 inch per hour.
(2) ASTM D2240 shall be modified per ASTM C836 section 6.5.

Aggregate for Keycoat

The broadcast aggregate shall be durable and provide shear resistant to prevent the hot mix asphalt (HMA) from shoving. Aggregate shall have a minimum Mohs hardness rating of seven (7) and be approved by the manufacturer.

Polymer Modified Tack Coat

The tack coat shall consist of either a polymer modified asphalt emulsion, or a polymer modified asphalt binder approved for use by the membrane waterproofing manufacturer and the Engineer.

C. Material Qualification

A manufacturer requesting approval of a spray applied membrane system shall furnish to the Research and Materials Section the following:

1. The membrane system material specifications including product performance data.
2. Certified independent test reports demonstrating conformance to Table M9.08.1-2.
   - The independent lab shall be recognized by the National Cooperation for Laboratory Accreditation (NACLA) in Construction Materials Engineering and Testing (CMET) or an equal program approved by Research and Materials.
   - All testing shall be performed by one independent lab unless approved by the Engineer. Independent test reports must be dated within two (2) years from the initial submission.
   - Samples for all required testing shall be fabricated at the same time. Test reports shall denote the lot of material as well as the sample fabrication and testing dates.
3. MassDOT shall perform prequalification testing on the membrane.
   - Two (2) 10 inch by 10-inch square samples of the proposed membrane with smooth surfaces (no primer or aggregate in the keycoat). The samples shall be a minimum of 80 mils thick or the thickness used to pass the crack bridging requirement found in Table M9.08-4.

All submittals shall be certified to be in conformance with the manufacturer's instructions. Systems qualified by MassDOT per the performance criteria shall be considered for placement on the MassDOT QCML. Membrane waterproofing systems shall remain on the QCML for a period of five (5) years at which time the manufacturer will be required to submit certified test reports demonstrating conformance to this specification.

M9.08.2: Sheet Membrane

A. General Requirements

Only products listed on the MassDOT Qualified Construction Materials List (QCML) will be accepted for use. Chemical composition, physical properties and dimensional requirements of the sheet membrane shall conform to the manufacturer's specifications for the material.

Also, all accessory materials such as, flashing, primer, etc., used in the application of the sheet membrane will be considered a part of this specification and shall conform to the manufacturer's requirements. The membrane waterproofing system shall consist of:

- Primer
- Sheet Membrane
- Mastic

B. Material Requirements

The primer shall meet the requirements of Subsection M9.09.1.

The membrane sheet shall meet the requirements in Table M9.08.2-1.

The mastic for use with rubberized sheets shall be a rubberized asphalt cold-applied joint sealant. The mastic for use with modified bitumen sheet shall be a blend of bituminous and synthetic resins. The mastic shall be approved for use by the manufacturer.

Table M9.08.2-1: Sheet Membrane Material Properties

Property	Test	Requirements
Thickness	ASTM D3767	≥60 mils
Thickness at 350°F		≥55 mils
Thermal stability at 350°F		≤5% increase in area
Tensile Strength, Membrane	ASTM D412, Die C	≥250 psi
Tensile Strength, Film	ASTM D882 (1)	≥3,000 psi
Elongation	ASTM D412	≥300%
Flexibility	ASTM D1970 (2)	Unaffected
Adhesion to Concrete	ASTM D903 (3)	≥6 lbs/in.
Permeance	ASTM E96 Water Method, Procedure B	≤0.1 perms
Water Absorption	ASTM D570	≤0.5%
Puncture Resistance	ASTM E154	≥40 lbs

(1) Method A, 1-inch wide strip with 4-inch minimum initial separation and 4-inch gage length at 2 inches per minute at 73.4F ± 3.6F. Average 5 samples.
(2) ASTM D1970 shall be based on a 180° bend over 1 in. mandrel at -20°F.
(3) Concrete is cast against the protective coating surface of the membrane and allowed to cure (7 days minimum). Peel adhesion of membrane to concrete is measured at a rate of 2 in. per minute at room temperature.

C. Material Qualification

A manufacturer requesting approval of a preformed sheet membrane shall furnish to the Research and Materials Section the following:

1. The membrane system material specifications including product performance data.
2. The peel-off backing material shall be tear resistant to prevent portions of it from remaining after the membrane is applied.
3. Certified independent test reports demonstrating conformance to Table M9.08.2-1.
   - The independent lab shall be recognized by the National Cooperation for Laboratory Accreditation (NACLA) in Construction Materials Engineering and Testing (CMET) or an equal program approved by Research and Materials. All testing shall be performed by the same independent lab
   - Independent test reports must be dated within two (2) years from the initial submission. Samples for all required testing shall be fabricated at the same time. Test reports shall denote the lot of material as well as the sample fabrication and testing dates.

M9.08.3: Hot Applied Rubberized Asphalt Membrane

A. General Requirements

Only products listed on the MassDOT Qualified Construction Materials List (QCML) will be accepted for use. Chemical composition, physical properties and dimensional requirements of the sheet membrane shall conform to the manufacturer's specifications for the material. The membrane waterproofing system shall consist of:

- Primer
- Hot poured rubberized asphalt membrane consisting of a single component hot applied asphalt
- Protective covering

B. Material Requirements

The primer shall meet the requirements of Subsection M9.09.1.

The membrane shall be able to bridge live cracks up to 1/8 inch in width and meet the criteria specified in Table M9.08.3-1.

The protective covering shall be rolled asphalt sheets conforming to ASTM D6380, Type II.

Table M9.08.3-1: Hot Applied Rubberized Asphalt Membrane Material Properties

Property	Test	Requirements
Solids Content		100%
Flash Point	AASHTO T 48	≥ 500°F
Bond, Non-Immersed	ASTM D5329	Pass, no separation
Flexibility	ASTM D5329	No delamination or cracking
Flow	ASTM D5329	at 120°F = 0 in. at 140°F ≤ 1/8 in.
Penetration	ASTM D5329	at 77°F ≤ 110 at 140°F ≤ 200
Permeance	ASTM E96 Water Method, Procedure B	≤ 0.1 perms

C. Material Qualification

A manufacturer requesting approval of a hot applied rubberized asphalt membrane shall furnish to the Research and Materials Section the following:

1. The membrane system material specifications including product performance data.
2. Certified independent test reports demonstrating conformance to Table M9.08.3-1.
   - The independent lab shall be recognized by the National Cooperation for Laboratory Accreditation (NACLA) in Construction Materials Engineering and Testing (CMET) or an equal program approved by Research and Materials. All testing shall be performed by one independent lab unless approved by the Engineer.
   - Independent test reports must be dated within two (2) years from the initial submission. Samples for all required testing shall be fabricated at the same time. Test reports shall denote the lot of material as well as the sample fabrication and testing dates.

SUBSECTION M9.09.0 Primer and Damp-Proofing.
(page III.15) Add this new subsection.

M9.09.1: Primer

This material shall be suitable for priming concrete and masonry surfaces prior to the application of waterproofing or damp-proofing and shall meet the requirements of ASTM D41.

M9.09.2: Damp-Proofing

This material shall meet the requirements of ASTM D449, Type II.

<<<<<<<<<<>>>>>>>>>>
END OF INTERIM SUPPLEMENTAL SPECIFICATIONS

DOCUMENT 00719
(Revised June 6, 2016 – for all Federally Aided Projects)

SPECIAL PROVISIONS FOR PARTICIPATION BY DISADVANTAGED BUSINESS ENTERPRISES
(IMPLEMENTING TITLE 49 OF THE CODE OF FEDERAL REGULATIONS, PART 26)

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POLICY

The Massachusetts Department of Transportation (MassDOT) receives Federal financial assistance from the Federal Highway Administration (FHWA), United States Department of Transportation (U.S. DOT), and as a condition of receiving this assistance, has signed an assurance that it will comply with 49 CFR Part 26 (Participation By Disadvantaged Business Enterprises In Department Of Transportation Financial Assistance Programs). The U.S. DOT Disadvantaged Business Enterprise Program is authorized by the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users ("SAFETEA-LU"), as amended, at Title 23, United States Code, § 1101.

Accordingly, MassDOT has established a Disadvantaged Business Enterprise (DBE) Program in accordance with 49 CFR Part 26. It is the policy of MassDOT to ensure that DBEs have an equal opportunity to receive and participate in U.S. DOT assisted Contracts, without regard to race, color, national origin, or sex. To this end, MassDOT shall not directly, or through contractual or other arrangements, use criteria or methods of administration that have the effect of defeating or substantially impairing accomplishment of the program objectives stated below:

- To ensure nondiscrimination in the award and administration of U.S. DOT assisted Contracts;
- To create a level playing field on which DBEs can compete fairly for U.S. DOT assisted Contracts;
- To ensure that the DBE Program is narrowly tailored in accordance with applicable law;
- To ensure that only firms that fully meet 49 CFR Part 26 eligibility standards are permitted to participate as DBEs;
- To help remove barriers to the participation of DBEs in U.S. DOT assisted Contracts; and
- To assist the development of firms that can compete successfully in the market place outside the DBE Program.

The Director of Civil Rights of MassDOT has been designated as the DBE Liaison Officer. The DBE Liaison Officer is responsible for implementing all aspects of the DBE Program. Other MassDOT employees are responsible for assisting the Office of Civil Rights in carrying out this obligation. Implementation of the DBE Program is accorded the same priority as compliance with all other legal obligations incurred by MassDOT in its financial assistance agreements with each operating administration of the U.S. DOT. Information on the Federal requirements and MassDOT's policies and information can be found at:

Type of Info	***Website***	***Description***
MassDOT Highway Division Policies and Info	http://www.massdot.state.ma.us/highway/DoingBusinessWithUs/ContractorVendorInformation.aspx	*MassDOT– Highway Div'n Page*
For copies of the Code of Federal Regulations	http://www.gpo.gov/fdsys/browse/collectionCfr.action?collectionCode=CFR	FDsys – US Gov't Printing Office
For information about the U.S.DOT DBE Program	https://www.transportation.gov/small-business/disadvantaged-business-enterprise-dbe-program	U.S. DOT/ FHWA page

1. DEFINITIONS

As used in these provisions, the terms set out below are defined as follows:

"Broker", for purposes of these provisions, shall mean a DBE Entity that has entered into a legally binding relationship to provide goods or services delivered or performed by a third party. A broker may be a DBE Entity that arranges or expedites transactions but performs no work or installation services.

"Contractor", "General" or "Prime" Contractor, "Bidder," and "DB Entity" shall mean a person, firm, or other entity that has contracted directly with MassDOT to provide contracted work or services.

"Contract" shall mean the Contract for work between the Contractor and MassDOT.

"DBB" or "Design-Bid-Build" shall mean the traditional design, bid and project delivery method consisting of separate contracts between awarding authority and a designer resulting in a fully designed project; and a separate bidding process and Contract with a construction Contractor or Bidder.

"DB" or "Design-Build" shall mean an accelerated design, bid and project delivery method consisting of a single contract between the awarding authority and a DB Entity, consisting of design and construction companies that will bring a project to full design and construction.

"Disadvantaged Business Enterprise" or "DBE" shall mean a for-profit, small business concern:

(a) that is at least fifty-one (51%) percent owned by one or more individuals who are both socially and economically disadvantaged, or, in the case of any corporation, in which at least fifty-one (51%) percent of the stock is owned by one or more such individuals; and

(b) where the management and daily business operations are controlled by one or more of the socially and economically disadvantaged individuals who own it.

"FHWA" shall mean the Federal Highway Administration," an agency within U.S. DOT that supports State and local governments in the design, and maintenance of the Nation's highway system (Federal Aid Highway Program).

"Good faith efforts" shall mean efforts to achieve a DBE participation goal or other requirement of these Special Provisions that, by their scope, intensity, and appropriateness to the objective, can reasonably be expected to fulfill the program requirement. Such efforts must be deemed acceptable by MassDOT.

"Joint Venture" shall mean an association of a DBE firm and one or more other firms to carry out a single, for-profit business enterprise, for which the parties combine their property, capital, efforts, skills and knowledge, and in which the DBE is responsible for a distinct, clearly defined portion of the work of the Contract and whose share in the capital contribution, control, management, risks, and profits of the joint venture are commensurate with its ownership interest.

"Approved Joint Venture" shall mean a joint venture, as defined above, which has been approved by MassDOT's Prequalification Office and Office of Civil Rights for DBE participation on a particular Contract.

"Manufacturer" shall mean a firm that operates or maintains a factory or establishment that produces, on the premises, the materials, supplies, articles or equipment required under the contract and of the general character described by the specifications.

"Regular Dealer" shall mean a DBE firm that owns, operates, or maintains a store, warehouse, or other establishment in which materials, supplies, articles or equipment of the general character described by the specifications and required under the Contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business.

(a) To be a regular dealer, the firm must be an established, regular business that engages, as its principal business, and under its own name, in the purchase and sale of the products in question.

(b) A person may be a regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone, or asphalt without owning, operating, or maintaining a place of business as provided above if the person both owns and operates distribution equipment for the products. Any supplementing of regular dealers' own distribution equipment shall be by long term lease agreement and not on an ad hoc or contract by contract basis.

(c) Packagers, brokers, manufacturers' representatives, or other persons who arrange or expedite transactions are not regular dealers within the meaning of this definition.

"Responsive" and "Responsible" refers to the bidder's submittal meeting all of the requirements of the advertised request for proposal. The term responsible refers to the ability of the Contractor to perform the work. This ability can be determined prior to bid invitations.[1]

"Small Business or Small Business Concern" shall mean a small business concern or company as defined in Section 3 of the Small Business Act and SBA regulations implementing it (13 CFR Part 121); and is a business that does not exceed the cap on annual average gross receipts established by the U.S. Secretary of Transportation pursuant to 49 CFR Part 26.65; see also 49 CFR Part 26.39.

"SDO" shall mean the Massachusetts Supplier Diversity Office, formerly known as the State Office of Minority and Women Business Assistance (SOMWBA). In 2010, SOMWBA was abolished and the SDO was established. *See* St. 2010, c. 56. The SDO has assumed all the functions of SOWMBA. SDO is an agency within the Commonwealth of Massachusetts Executive office of Administration and Finance (ANF) Operational Services Division (OSD). The SDO mandate is to help promote the development of business enterprises and non-profit organizations owned and operated by minorities and women.

"Socially and economically disadvantaged individuals" shall mean individuals who are citizens of the United States (or lawfully admitted permanent residents) and who are:

(a) Individuals found by SDO to be socially and economically disadvantaged individuals on a case by case basis.

(b) Individuals in the following groups, members of which are rebuttably presumed to be socially and economically disadvantaged:

[1] http://www.fhwa.dot.gov/resourcecenter/teams/operations/gloss.cfm

(1) "Black Americans" which includes persons having origin in any of the Black racial groups of Africa; (2) "Hispanic Americans" which include persons of Mexican, Puerto Rican, Cuban, Dominican, Central or South American, or other Spanish or Portuguese culture or origin, regardless of race; (3) "Native Americans" which include persons who are American Indians, Eskimos, Aleuts, or Native Hawaiians; (4) "Asian Pacific Americans" which includes persons whose origins are from Japan, China, Taiwan, Korea, Burma (Myanmar), Vietnam, Laos, Cambodia (Kampuchea), Thailand, Malaysia, Indonesia, the Philippines, Brunei, Samoa, Guam, the U.S. Trust Territories of the Pacific Islands (Republic of Palau), the Commonwealth of the Northern Marianas Islands, Macao, Fiji, Tonga, Kiribati, Tuvalu, Nauru, Federated States of Micronesia, or Hong Kong; (5) "Subcontinent Asian Americans" which includes persons whose origins are from India, Pakistan, Bangladesh, Bhutan, the Maldives Islands, Nepal or Sri Lanka; (6) Women; or (7) Any additional groups whose members are designated as socially and economically disadvantaged by the Small Business Administration (SBA), at such time as the SBA designation becomes effective.

Other terms and definitions applicable to the U.S. DOT DBE Program may be found at 49 CFR Part 26 and related appendices and guidance pages.

2. DBE PARTICIPATION

a. Goal

On this Contract, MassDOT has established the following goal(s) for participation by firms owned and controlled by socially and economically disadvantaged persons. At least half of the goal must be met in the form of DBE Subcontractor construction activity as opposed to material supplies or other services. The applicable goal remains in effect throughout the life of the contract regardless of whether pre-identified DBE Subcontractors remain on the Project or under Contract.

☒ Design-Bid-Build Projects: DBE Participation Goal **10 %**
(*One half of this goal shall be met in the form of Subcontractor construction activity*)

☐ Design-Build Projects: DBE Design Participation Goal **_____%** and DBE Construction Participation Goal **_____%**
(One half of the Construction Goal shall be met in the form of Subcontractor construction activity)

b. Bidders List

Pursuant to the provisions of 49 CFR Part 26.11(c), Recipients such as MassDOT, must collect from all Bidders who seek work on Federally assisted Contracts the firm full company name(s), addresses and telephone numbers of all firms that have submitted bids or quotes to the Bidders in connection with this Project. All bidders should refer to the Special Provision Document "A00801" of the Project proposal for this requirement.

In addition, MassDOT must provide to U.S. DOT, information concerning contractors firm status as a DBE or non-DBE, the age of the firm, and the annual gross receipts of the firm within a series of brackets (e.g., less than $500,000; $500,000–$1 million; $1–2 million; $2–5 million, etc.). The status, firm age, and annual gross receipt information will be sought by MassDOT regularly prior to setting its DBE participation goal for submission to U.S. DOT. MassDOT will survey each individual firm for this information directly.

Failure to comply with a written request for this information within fifteen (15) business days may result in the suspension of bidding privileges or other such sanctions, as provided for in Section 9 of this provision, until the information is received.

3. CONTRACTOR ASSURANCES

No Contractor or any Subcontractor shall discriminate on the basis of race color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in all respects and as applicable prior to, or subsequent to, award of U.S. DOT assisted Contracts. The Contractor agrees to affirmatively seek out and consider DBE firms as Contractors, Subcontractors, and/or suppliers of materials and services for this Contract. No Contract will be approved until MassDOT has reviewed Bidders'/Contractors' affirmative actions concerning DBEs. Failure to carry out these requirements is a material breach of this Contract which may result in the termination of the Contract or such other remedy as MassDOT or FHWA deem appropriate.

4. REQUIRED SUBCONTRACT PROVISIONS

The Prime Contractor shall include the provisions of Section 3 above in every subcontract, making those provisions binding on each Subcontractor; in addition, the Prime Contractor shall include a copy of this Special Provision, in its entirety, in every subcontract with a DBE firm which is, or may be, submitted for credit toward the Contract participation goal.

5. ELIGIBILITY OF DBES

Only firms that have been certified by SDO and confirmed by MassDOT as eligible in accordance with 49 CFR Part 26 to participate as DBEs on federally aided MassDOT Contracts may be used on this Contract for credit toward the DBE participation goal.

a. Massachusetts DBE Directory

MassDOT makes available to all bidders the most current Massachusetts Disadvantaged Business Enterprise Directory. This directory is made available for Contractors' convenience and is informational only. The Directory lists those firms that have been certified as eligible in accordance with the criteria of 49 CFR Part 26 to participate as DBEs on federally aided MassDOT contracts. The Directory also lists the kinds of work each firm is certified to perform but does not constitute an endorsement of the quality of performance of any business and does not represent MassDOT Subcontractor approval.

Contractors are encouraged to make use of the DBE Directory maintained by SDO on the Internet. This listing is updated daily and may be accessed at the SDO's website at: https://www.**sdo**.osd.state.ma.us .

b. DBE Certification

A firm must apply to SDO, currently acting as certification agent for MassDOT, for DBE certification to participate on federally aided MassDOT Contracts. A DBE application may be made in conjunction with a firm's application to SDO for certification to participate in state-funded minority and women business enterprise programs or may be for DBE certification only. An applicant for DBE certification must identify the area(s) of work it seeks to perform on U.S. DOT funded projects.

c. Joint Venture Approval

To obtain recognition as an approved DBE Joint Venture, the parties to the joint venture must provide to MassDOT's Office of Civil Rights and Prequalification Office, at least fourteen (14) business days before the bid opening date, an Affidavit of DBE/Non-DBE Joint Venture in the form attached hereto, and including, but not limited to the following:

1. a copy of the Joint Venture Agreement;
2. a description of the distinct, clearly defined portion of the contract work that the DBE will perform with its own forces; and,
3. all such additional information as may be requested by MassDOT for the purpose of determining whether the joint venture is eligible.

6. COUNTING DBE PARTICIPATION TOWARDS DBE PARTICIPATION GOALS

In order for DBE participation to count toward the Contract participation goal, the DBE(s) must have served a commercially useful function in the performance of the Contract and must have been paid in full for acceptable performance.

a. Commercially Useful Function

(1) In general, a DBE performs a commercially useful function when it is responsible for execution of the work of the contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. With respect to materials and supplies used on the Contract, the DBE must be responsible for negotiating price, determining quality and quantity, ordering the material, installing (where applicable) and paying for the material itself.

(2) To determine whether a DBE is performing a commercially useful function, MassDOT will evaluate the amount of work subcontracted, industry practices, whether the amount the firm is to be paid under the Contract is commensurate with the work it is actually performing and the DBE credit claimed for its performance of the work, and other relevant factors.

(3) A DBE does not perform a commercially useful function if its role is limited to that of an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of DBE participation. In determining whether a DBE is such an extra participant, MassDOT will examine similar transactions, particularly those in which DBEs do not participate.

b. Counting Participation Toward The Contract Participation Goal

DBE participation which serves a commercially useful function shall be counted toward the DBE participation goal in accordance with the Provisions of 49 CFR Part 26.55(a) to (h), as follows:

(1) When a DBE participates in a construction Contract, MassDOT will count the value of the work performed by the DBE's own forces. MassDOT will count the cost of supplies and materials obtained by the DBE for the work of its contract, including supplies purchased or equipment leased by the DBE. Supplies, labor, or equipment the DBE Subcontractor uses, purchases, or leases from the Prime Contractor or any affiliate of the Prime Contractor will not be counted.

(2) MassDOT will count the entire amount of fees or commissions charged by a DBE firm for providing bona fide services, such as professional, technical, consultant, or managerial services, or for providing bonds or insurance specifically required for the performance of a U.S. DOT assisted Contract, toward DBE participation goals, provided it is determined that the fee is reasonable and not excessive as compared with fees customarily allowed for similar services.

(3) When a DBE performs as a participant in a joint venture, MassDOT will count toward DBE participation goals a portion of the total dollar value of the contract that is equal to the distinct, clearly defined portion of the work of the Contract that the DBE performs with its own forces.

(4) MassDOT will use the following factors in determining whether a DBE trucking company is performing a commercially useful function:

(i) the DBE must be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract; there cannot be a contrived arrangement for the purpose of meeting DBE participation goals.

(ii) the DBE must itself own and operate at least one fully licensed, insured, and operational truck used on the Contract.

(iii) the Contractor will receive DBE credit for the total value of the transportation services the DBE provides on the Contract using trucks owned, insured, and operated by the DBE itself and using drivers the DBE employs alone.

(iv) the DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The Contractor who has a contract with a DBE who leases trucks from another DBE will receive credit for the total value of the transportation services of the lease.

(v) the DBE may also lease trucks from a non-DBE firm, including an owner-operator. The Contractor who has a Contract with a DBE who leases trucks from a non-DBE is entitled to credit for the total value of the transportation services provided by non-DBE lessees not to the exceed the value of transportation services provided by DBE-owned trucks on the Contract. Additional participation by non-DBE lessees receives credit only for the fee or commission it receives as a result of the lease arrangement, fee or commission it receives as a result of the lease arrangement. The DBE does not receive credit for the total value of the transportation services provided by the lessee, since these services are not provided by a DBE.

(vi) the lease must indicate that the DBE has exclusive use of, and control over, the truck. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks must display the name and identification number of the DBE.

(5) MassDOT will count the Prime Contractor's expenditures with DBEs for materials or supplies toward DBE participation goals as follows:

(i) if the materials or supplies are obtained from a DBE manufacturer, as defined in Section 1 above, MassDOT will count one hundred (100%) percent of the cost of the materials or supplies toward DBE participation goals, provided the DBE meets the other requirements of the regulations.

(ii) if the materials or supplies are purchased from a DBE regular dealer, as defined in Section 1 above, MassDOT will count sixty (60%) percent of the cost of the materials or supplies toward the Contract participation goal, provided the DBE meets the other requirements of the regulations.

(iii) for materials or supplies purchased from a DBE which is neither a manufacturer nor a regular dealer, MassDOT will count the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a job site toward the Contract participation goal, provided that MassDOT determines the fees to be reasonable and not excessive as compared with fees customarily allowed for similar services; the cost of the materials and supplies themselves will not be counted; and provided the DBE meets the other requirements of the regulations.

c. Joint Check Policy

MassDOT recognizes that the use of joint checks may be a business practice required by material suppliers and vendors in the construction industry. A joint check is a two-party check issued by a/the Prime Contractor to a DBE third party such as a regular dealer of material or supplies. The Prime Contractor issues the check as payor to the DBE and the third party jointly as payees to guarantee payment to the third party for materials or supplies obtained or to be used by the DBE. FHWA has established criteria to ensure that DBEs are in fact performing a commercially useful function ("CUF") while using a joint check arrangement. Contractors and DBEs must meet and conform to these conditions and criteria governing the use of joint checks.

In the event that a Contractor or DBE Subcontractor desires to a use joint check, MassDOT will require prior notice and will closely monitor the arrangement for compliance with FHWA regulations and guidance. MassDOT may allow a joint check arrangement and give credit to a Contractor for use of the DBE where one or more of the following conditions exist:

- The use of a joint check is in fact required by this type of vendor or supplier as a standard industry practice that applies to all Contractors (DBEs and non-DBEs); or is required by a specific vendor or supplier;

- Payment for supplies or materials would be delayed for an unreasonably extended period without the joint check arrangement;

- The DBE (or any of its Subcontractors) has a pattern or history of not paying a vendor or supplier within a reasonable time or has not established enough of a credit history with the supplier or vendor; and/or

- The presence of severe adverse economic conditions, where credit resources may be limited and such practices may be necessary or required to effect timely payments.

Other factors MassDOT may consider:

- Whether there is a requirement by the Prime Contractor that a DBE should use a specific vendor or supplier to meet their Subcontractor specifications;
- Whether there is a requirement that a DBE use the Prime Contractor's negotiated price;
- The independence of the DBE;
- Whether approval has been sought prior to use of a joint check arrangement; and
- Whether any approved joint check arrangement has exceeded a reasonable period of use;
- The operation of the joint check arrangement; and
- Whether the DBE has made an effort to establish alternate arrangements for following periods (i.e., the DBE must show it can, or has, or why it has not, established or increased a credit line with the vendor or supplier).

Even with the use of a Joint Check, both the Contractor and DBE remain responsible for compliance with all other elements under 49 CFR § 26.55 (c) (1), and must still be able to prove that a commercially useful function is being performed for the Contractor.

d. Joint Check Procedure(s)

- The DBE advises its General or Prime Contractor that it will have to use a Joint Check and provide proof of such requirement.
- The General or the Prime Contractor submits a request for approval to MassDOT, using MassDOT's approved Joint Check Request form (Document B00855) and by notification on the DBE Letter of Intent (Document B00854), and any other relevant documents. Requests that are not initiated during the bid process should be made in writing and comply with the procedure.
- The MassDOT Office of Civil Rights will review the request and render a decision as part of the approval process for DBE Schedules and Letters of Intent.
- Review and Approval will be project specific and relevant documents will be made part of the project Contract file.
- Payments should be made in the name of both the DBE and vendor or supplier. Payments should be issued and signed by the Contractor as only the guarantor for prompt payment of purchases to the vendor or supplier. The payment to the vendor or supplier should be handled by the DBE (i.e. if possible, funds or the joint check should be processed by the DBE and sent by the DBE to the vendor or supplier).
- MassDOT may request copies of cancelled checks (front and back) and transmittal information to verify any payments made to the DBE and vendor or supplier.
- MassDOT may request other information and documents, and may ask questions of the Contractor, Subcontractor and vendor or supplier prior to, during, and after the project performance to ascertain whether the Subcontractor is performing a commercially useful function and all parties are complying with DBE Program policies and procedures as part of the Subcontractor approval process.

7. AWARD DOCUMENTATION AND PROCEDURES

a. The two lowest bidders shall submit, by the close of business on the third (3rd) business day after the bid opening, a completed Schedule of Participation by DBEs (Document B00853) which shall list:

(1) The full company name, address and telephone number of each DBE with whom the bidder intends to make a commitment;

(2) The contract item(s), by number(s) and quantity(ies), if applicable, or specific description of other business activity to be performed by each DBE as set forth in the Letters of Intent. The Bidder shall list only firms which have the capacity to perform, manage and supervise the work proposed in accordance with the requirements of 49 CFR Part 26 and Section **6.b** of these Special Provisions.

(3) The total dollar amount to be paid to each DBE. (Bidders are cautioned that at least one half of the participation goal must be met with construction activity work.)

(4) The total dollar amount to be paid to each DBE that is eligible for credit toward the DBE participation goal under the counting rules set out in Section **6.b**.

(5) The total creditable DBE participation as a percentage of the total bid price.

b. All firms listed on the Schedule must be currently certified.

c. The two lowest bidders shall each submit, with their Schedules of Participation, fully completed, signed Letters of Intent (Document B00854) from each of the DBEs listed on the Schedule. The Letters of Intent shall be in the form attached and shall identify specifically the contract activity the DBE proposes to perform, expressed as contract item number, if applicable, description of the activity, NAICS code, quantity, unit price and total price. In the event of discrepancy between the Schedule and the Letter of Intent, the Letter of Intent shall govern.

d. Evidence of good faith efforts will be evaluated by MassDOT in the selection of the lowest responsible bidder.

All information requested by MassDOT for the purpose of evaluating the Contractor's efforts to achieve the participation goal must be provided within three (3) calendar days and must be accurate and complete in every detail. The apparent low bidder's attainment of the DBE participation goal or a satisfactory demonstration of good faith efforts is a prerequisite for award of the Contract.

e. Failure to meet, or to demonstrate good faith efforts to meet, the requirements of these Special Provisions shall render a bid non-responsive. Therefore, in order to be eligible for award, the bidder (1) must list all DBE's it plans to employ on the Schedule of Participation; and provide the required Letters of Intent for, DBE participation which meets or exceeds the Contract goal in accordance with the terms of these Special Provisions or (2) must demonstrate, to the satisfaction of MassDOT, that good faith efforts were made to achieve the participation goal. MassDOT will adhere to the guidance provided in Appendix A to 49 CFR Part 26 on the determination of a Contractor's good faith efforts to meet the DBE participation goal(s) set forth in Section 2 herein.

f. If MassDOT finds that the percentage of DBE participation submitted by the bidder on its Schedule does not meet the Contract participation goal, or that Schedule and Letters of Intent were not timely filed, and that the bidder has not demonstrated good faith efforts to comply with these requirements, it shall propose that the bidder be declared ineligible for award. In that case, the bidder may request administrative reconsideration. Such requests must be sent in writing within three (3) calendar days of receiving notice of proposed ineligibility to: The Office of the General Counsel, Massachusetts Department of Transportation, 10 Park Plaza, Boston, MA, 02116.

g. If, after administrative reconsideration, MassDOT finds that the bidder has not shown that sufficient good faith efforts were made to comply with the requirements of these Special Provisions, it shall reject the bidder's proposal and may retain the proposal guaranty.

h. Actions which constitute evidence of good faith efforts to meet a DBE participation goal include, but are not limited to, the following examples, which are set forth in 49 CFR Part 26, Appendix A:

(1) Soliciting through all reasonable and available means (e.g., attendance at pre-bid meetings, advertising and/or written notices) the interest of all certified DBEs who have the capability to perform the work of the Contract. The bidder must solicit this interest within sufficient time to allow the DBEs to respond to the solicitation. The bidder must determine with certainty if the DBEs are interested by taking appropriate steps to follow up initial solicitations.

(2) Selecting portions of the work to be performed by DBEs in order to increase the likelihood that the DBE participation goal will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the Prime Contractor might otherwise prefer to perform these work items with its own forces.

(3) Providing interested DBEs with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.

(4) Negotiating in good faith with interested DBEs. It is the bidder's responsibility to make a portion of the work available to DBE Subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE Subcontractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone number of DBEs that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBEs to perform the work.

A bidder using good business judgment would consider a number of factors in negotiating with Subcontractors, including DBE Subcontractors, and would take a firm's price and capabilities as well as Contract participation goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBEs is not in itself sufficient reason for a bidder's failure to meet the Contract DBE participation goal, as long as such costs are reasonable. Also, the ability or desire of a Prime Contractor to perform the work of a Contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. Prime Contractors are not, however, required to accept higher quotes from DBEs if the price difference is excessive or unreasonable.

(5) Not rejecting DBEs as being unqualified without sound reasons based on a thorough investigation of their capabilities. Contractors should be careful of adding additional requirements of performance that would in effect limit participation by DBEs or any small business. The Contractor's standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations (for example union vs. nonunion employee status) are not legitimate causes for the rejection or non-solicitation of bids in the Contractor's efforts to meet the Contract participation goal.

(6) Making efforts to assist interested DBEs in obtaining bonding, lines of credit, or insurance as required by the recipient or contractor.

(7) Making efforts to assist interested DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services.

(8) Effectively using the services of available minority/women community organizations; minority/women contractors' groups; local, state, and federal minority/women business assistance offices; and other organizations as allowed on a case by case basis to provide assistance in the recruitment and placement of DBEs.

8. COMPLIANCE

a. All activity performed by a DBE for credit toward the Contract participation goal must be performed, managed and supervised by the DBE in accordance with all commercially useful function requirements of 49 CFR Part 26. The Prime Contractor shall not enter into, or condone, any other arrangement.

b. The Prime Contractor shall not perform with its own organization, or assign to any other business, an activity designated for the DBE(s) named on the Schedule(s) submitted by the Prime Contractor under Section 7 or under paragraph **8.f** of this section, without the approval of MassDOT in accordance with the requirements of paragraphs **8.f** and **8.j** of this section.

c. MassDOT may suspend payment for any activity that was not performed by the DBE to whom the activity was committed on the approved Schedule of Participation, or that was not performed in accordance with the requirements of Section 6.

d. MassDOT retains the right to approve or disapprove of any or all Subcontractors. Requests by the Prime Contractor for approval of participation by a DBE Subcontractor for credit toward the Contract participation goal must include, in addition to any other requirements for Subcontractor approval, the following:

(1) A copy of the proposed subcontract. The subcontract must be for at least the dollar amount, and for the work described, in the Bidder's Schedule of Participation.

(2) A resume stating the qualifications and experience of the DBE Superintendent and/or foreperson who will supervise the on-site work. A new resume will be required for any change in supervisory personnel during the progress of the work.

(3) A Schedule of Operations indicating when the DBE is expected to perform the work.

(4) A list of (1) equipment owned by the DBE to be used on the Project, and (2) equipment to be leased by the DBE for use on the Project.

(5) A list of: (1) all projects (public and private) which the DBE is currently performing; (2) all projects (public and private) to which the DBE is committed; and (3) all projects (public and private) to which the DBE intends to make a commitment. For each Contract, list the contracting organization, the name and telephone number of a contact person for the contracting organization, the dollar value of the work, a description of the work, and the DBE's work schedule for each project.

e. If, pursuant to the Subcontractor approval process, MassDOT finds that a DBE Subcontractor does not have sufficient experience or resources to perform, manage and supervise work of the kind proposed in accordance with the requirements of 49 CFR Part 26, approval of the DBE Subcontractor may be denied. In the event of such denial, the Prime Contractor shall proceed in accordance with the requirements paragraphs **8.f** and **8.j** of this section.

f. If, for reasons beyond its control, the Prime Contractor cannot comply with its DBE participation commitment in accordance with the Schedule of Participation submitted under Section 7, the Prime Contractor shall submit to MassDOT the reasons for its inability to comply with its obligations and shall submit, and request approval for, a revised Schedule of Participation. If approved by MassDOT, the revised Schedule shall govern the Prime Contractor's performance in meeting its obligations under these Special Provisions.

g. A Prime Contractor's compliance with the participation goal in Section 2 shall be determined by reference to the established percentage of the total contract price, provided, however, that no decrease in the dollar amount of a bidder's commitment to any DBE shall be allowed without the approval of MassDOT.

h. If the contract amount is increased, the Prime Contractor may be required to submit a revised Schedule of Participation in accordance with paragraphs **8.f** and **8.j** of this section.

i. In the event of the decertification of a DBE scheduled to participate on the Contract for credit toward the participation goal, but not under subcontract, the Contractor shall proceed in accordance with paragraphs **8.f** and **8.j** of this section.

j. The Prime Contractor shall notify MassDOT immediately of any facts that come to its attention indicating that it may or will be unable to comply with any aspect of its DBE obligation under this Contract.

k. Any notice required by these Special Provisions shall be given in writing to: (1) the Resident Engineer; (2) the District designated Compliance Officer; and (3) the Director of Compliance, MassDOT Office of Civil Rights, 10 Park Plaza, 4th Floor East, Boston, MA, 02116.

l. The Prime Contractor and its Subcontractors shall comply with MassDOT's Electronic Reporting System Requirements (MassDOT Document 00821) and submit all information required by MassDOT related to the DBE Special Provisions through the Equitable Business Opportunity Solution ("EBO"). MassDOT reserves the right to request reports in the format it deems necessary anytime during the performance of the Contract.

m. Termination of DBE by Prime Contractor

(1) A Prime Contractor shall not terminate a DBE Subcontractor or an approved substitute DBE firm without the prior written consent of MassDOT. This includes, but is not limited to, instances in which a Prime Contractor seeks to perform work originally designated for a DBE Subcontractor with its own forces or those of an affiliate, a non-DBE firm, or with another DBE firm.

(2) MassDOT may provide such written consent only if MassDOT agrees, for reasons stated in its concurrence document, that the Prime Contractor has good cause to terminate the DBE firm.

(3) For purposes of this paragraph, good cause includes the following circumstances:

(i) The DBE Subcontractor fails or refuses to execute a written contract;

(ii) The DBE Subcontractor fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Good cause, however, does not exist if the failure or refusal of the DBE Subcontractor to perform its work on the subcontract results from the bad faith or discriminatory action of the Prime Contractor;

(iii) The DBE Subcontractor fails or refuses to meet the Prime Contractor's reasonable, non-discriminatory bond requirements.

(iv) The DBE Subcontractor becomes bankrupt, insolvent, or exhibits credit unworthiness;

(v) The DBE Subcontractor is ineligible to work on public works projects because of suspension and debarment proceedings pursuant 2 CFR Parts 180, 215 and 1,200 or applicable State law;

(vii) MassDOT has determined that the listed DBE Subcontractor is not a responsible contractor;

(vi) The listed DBE Subcontractor voluntarily withdraws from the Project and provides written notice of its withdrawal;

(vii) The listed DBE is ineligible to receive DBE credit for the type of work required;

(viii) A DBE owner dies or becomes disabled with the result that the listed DBE Contractor is unable to complete its work on the Contract;

(ix) Other documented good cause that MassDOT determines compels the termination of the DBE Subcontractor. Good cause, however, does not exist if the Prime Contractor seeks to terminate a DBE it relied upon to obtain the Contract so that the Prime Contractor can self-perform the DBE work or substitute another DBE or non-DBE Contractor after Contract Award.

(4) Before transmitting to MassDOT a request to terminate and/or substitute a DBE Subcontractor, the Prime Contractor must give notice in writing to the DBE Subcontractor, with a copy to MassDOT, of its intent to request to terminate and/or substitute, and the reason for the request.

(5) The Prime Contractor must give the DBE five (5) business days to respond to the Prime Contractor's notice. The DBE must advise MassDOT and the Contractor of the reasons, if any, why it objects to the proposed termination of its subcontract and why MassDOT should not approve the Prime Contractor's action. If required in a particular case as a matter of public necessity (e.g., safety), MassDOT may provide a response period shorter than five (5) business days.

(6) In addition to post-award terminations, the provisions of this section apply to pre-award deletions of or substitutions for DBE firms.

n. Prompt Payment.

Contractors are required to promptly pay Subcontractors under this Prime Contract within ten (10) business days from the receipt of each payment the Prime Contractor receives from MassDOT. Failure to comply with this requirement may result in the withholding of payment to the Prime Contractor until such time as all payments due under this provision have been received by the Subcontractor(s) and/or referral to the Prequalification Committee for action which may affect the Contractor's prequalification status.

9. SANCTIONS

If the Prime Contractor does not comply with the terms of these Special Provisions and cannot demonstrate to the satisfaction of MassDOT that good faith efforts were made to achieve such compliance, MassDOT may, in addition to any other remedy provided for in the Contract, and notwithstanding any other provision in the Contract:

a. Retain, in connection with final acceptance and final payment processing, an amount determined by multiplying the total contract amount by the percentage in Section 2, less the amount paid to approved DBE(s) for work performed under the Contract in accordance with the provisions of Section 8.

b. Suspend, terminate or cancel this Contract, in whole or in part, and call upon the Prime Contractor's surety to perform all terms and conditions in the Contract.

c. In accordance with 720 CMR 5.05(1)(f), modify or revoke the Prime Contractor's Prequalification status or recommend that the Prime Contractor not receive award of a pending Contract. The Prime Contractor may appeal the determination of the Prequalification Committee in accordance with the provisions of 720 CMR 5.06.

d. Initiate debarment proceedings pursuant to M.G.L. c. 29 §29F and, as applicable, 2 CFR Parts 180, 215 and 1,200.

e. Refer the matter to the Massachusetts Attorney General for review and prosecution, if appropriate, of any false claim or pursuant to M.G.L. c. 12, §§ 5A to 5O (the Massachusetts False Claim Act).

f. Refer the matter to the U.S. DOT's Office of the Inspector General or other agencies for prosecution under Title 18, U.S.C. § 1001, 49 CFR Parts 29 and 31, and other applicable laws and regulations.

10. FURTHER INFORMATION; ENFORCEMENT, COOPERATION AND CONFIDENTIALITY.

a. Any proposed DBE, bidder, or Contractor shall provide such information as is necessary in the judgment of MassDOT to ascertain its compliance with the terms of this Special Provision. Further, pursuant to 49 CFR, Part 26.107:

(1) If you are a firm that does not meet the eligibility criteria of 49 CFR, Parts 26.61 to 26.73 ("subpart D"), that attempts to participate in a DOT- assisted program as a DBE on the basis of false, fraudulent, or deceitful statements or representations or under circumstances indicating a serious lack of business integrity or honesty, MassDOT or FHWA may initiate suspension or debarment proceedings against you under 49 CFR Part 29.

(2) If you are a firm that, in order to meet DBE Contract participation goals or other DBE Program requirements, uses or attempts to use, on the basis of false, fraudulent or deceitful statements or representations or under circumstances indicating a serious lack of business integrity or honesty, another firm that does not meet the eligibility criteria of subpart D, FHWA may initiate suspension or debarment proceedings against you under 49 CFR Part 29.

(3) In a suspension or debarment proceeding brought either under subparagraph **a.(1)** or **b.(2)** of this section, the concerned operating administration may consider the fact that a purported DBE has been certified by a recipient. Such certification does not preclude FHWA from determining that the purported DBE, or another firm that has used or attempted to use it to meet DBE participation goals, should be suspended or debarred.

(4) FHWA may take enforcement action under 49 CFR Part 31, Program Fraud and Civil Remedies, against any participant in the DBE Program whose conduct is subject to such action under 49 CFR Part 31.

(5) FHWA may refer to the Department of Justice, for prosecution under 18 U.S.C. 1001 or other applicable provisions of law, any person who makes a false or fraudulent statement in connection with participation of a DBE in any DOT-assisted program or otherwise violates applicable Federal statutes.

b. Pursuant to 49 CFR Part 26.109, the rules governing information, confidentiality, cooperation, and intimidation or retaliation are as follows:

(1) Availability of records.

(i) In responding to requests for information concerning any aspect of the DBE Program, FHWA complies with provisions of the Federal Freedom of Information and Privacy Acts (5 U.S.C. 552 and 552a). FHWA may make available to the public any information concerning the DBE Program release of which is not prohibited by Federal law.

(ii) MassDOT shall safeguard from disclosure to unauthorized persons information that may reasonably be considered as confidential business information, consistent with Federal and Massachusetts General Law (M.G.L. c. 66, § 10, M.G.L. c. 4, §7 (26), 950 CMR 32.00).

(2) Confidentiality of information on complainants. Notwithstanding the provisions of subparagraph **b.(1)** of this section, the identity of complainants shall be kept confidential, at their election. If such confidentiality will hinder the investigation, proceeding or hearing, or result in a denial of appropriate administrative due process to other parties, the complainant must be advised for the purpose of waiving the privilege. Complainants are advised that, in some circumstances, failure to waive the privilege may result in the closure of the investigation or dismissal of the proceeding or hearing.

(3) Cooperation. All participants in FHWA's DBE Program (including, but not limited to, recipients, DBE firms and applicants for DBE certification, complainants and appellants, and Contractors using DBE firms to meet Contract participation goals) are required to cooperate fully and promptly with U.S. DOT and recipient compliance reviews, certification reviews, investigations, and other requests for information. Failure to do so shall be a ground for appropriate action against the party involved (e.g., with respect to recipients, a finding of noncompliance; with respect to DBE firms, denial of certification or removal of eligibility and/or suspension and debarment; with respect to a complainant or appellant, dismissal of the complaint or appeal; with respect to a Contractor which uses DBE firms to meet participation goals, findings of non-responsibility for future Contracts and/or suspension and debarment).

(4) Intimidation and retaliation. No recipient, Contractor, or any other participant in the program, may intimidate, threaten, coerce, or discriminate against any individual or firm for the purpose of interfering with any right or privilege secured by this part or because the individual or firm has made a complaint, testified, assisted, or participated in any manner in an investigation, proceeding, or hearing under this part. If any recipient or contractor violates this prohibition, that entity is in noncompliance with this 49 CFR Part 26.

11. LIST OF ADDITIONAL DOCUMENTS.

a. The following documents shall be completed and signed by the bidder and designated DBEs in accordance with Section 7 - Award Documentation and Procedures. These documents must be returned by the bidder to MassDOT's Bid Document Distribution Center:

- □ Schedule of DBE Participation (Document B00853)
- □ Letter of Intent (Document B00854)
- □ DBE Joint Check Arrangement Approval Form (Document B00855), if Contractor and DBE plan, or if DBE is required to use a Joint Check

b. The following document shall be signed and returned by Contractor and Subcontractors/DBEs to the MassDOT District Office overseeing the Project, as applicable:

- □ Contractor/Subcontractor Certification Form (Document No. 00859) (a checklist of other documents to be included with every subcontract (DBEs and non-DBEs alike)).

c. The following document shall be provided to MassDOT's Office of Civil Rights and Prequalification Office at least fourteen (14) business days before the bid opening date, if applicable:

- □ Affidavit of DBE/Non-DBE Joint Venture (Document B00856)

*** END OF DOCUMENT ***

DOCUMENT 00760

FHWA-1273
REQUIRED CONTRACT PROVISIONS FOR FEDERAL-AID CONSTRUCTION CONTRACTS
Revised May 1, 2012

I. General
II. Nondiscrimination
III. Nonsegregated Facilities
IV. Davis-Bacon and Related Act Provisions
V. Contract Work Hours and Safety Standards Act Provisions
VI. Subletting or Assigning the Contract
VII. Safety: Accident Prevention
VIII. False Statements Concerning Highway Projects
IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
X. Compliance with Government wide Suspension and Debarment Requirements
XI. Certification Regarding Use of Contract Funds for Lobbying

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding $10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. Davis-Bacon and Related Act Provisions

This section is applicable to all Federal-aid construction projects exceeding $2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 “Contract provisions and related matters” with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4).

Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH–1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. (1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b. (1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g. , the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/esa/whd/forms/wh347instr.htm or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH–347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contacting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term “perform work with its own organization” refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;

(2) the prime contractor remains responsible for the quality of the work of the leased employees;

(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and

(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.
2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost $25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1**. Instructions for Certification – First Tier Participants:**

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. “First Tier Covered Transactions” refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. **Instructions for Certification - Lower Tier Participants:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost $25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. “First Tier Covered Transactions” refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5.The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

END OF DOCUMENT

DOCUMENT 00811

SPECIAL PROVISIONS
MONTHLY PRICE ADJUSTMENT FOR HOT MIX ASPHALT (HMA) MIXTURES
ENGLISH AND METRIC UNITS
Revised: 06/04/2019

This provision applies to all projects using greater than 100 tons (91 megagrams) of hot mix asphalt (HMA) mixtures containing liquid asphalt cement as stipulated in the Notice to Contractors section of the bid documents.

Price Adjustments will be based on the variance in price, for the liquid asphalt component only, between the Base Price and the Period Price. They shall not include transportation or other charges. Price Adjustments will occur on a monthly basis.

Base Price

The Base Price of liquid asphalt on a project as listed in the Notice to Contractors section of the bid documents is a fixed price determined by the Department at the time of the bid using the same method as the determination of the Period Price detailed below. The Base Price shall be used in all bids.

Period Price

The Period Price is the price of liquid asphalt for each monthly period as determined by the Department using the average selling price per standard ton of PG64-28 paving grade (primary binder classification) asphalt, FOB manufacturer's terminal, as listed under the "East Coast Market - New England, Boston, Massachusetts area" section of the Poten & Partners, Inc. "Asphalt Weekly Monitor". This average selling price is listed in the issue having a publication date of the second Friday of the month and will be posted as the Period Price for that month. The Department will post this Period Price on its website at https://www.mass.gov/service-details/2019-massdot-contract-price-adjustments within two (2) business days following its receipt of the relevant issue of the "Asphalt Weekly Monitor". Poten and Partners has granted the Department the right to publish this specific asphalt price information sourced from the Asphalt Weekly Monitor. This method of period price determination was formerly called the New Asphalt Period Price Method. Separate website postings using both the New Asphalt Period Price Method and the Old Asphalt Period Price Method were discontinued after June 2013.

Price Adjustment Determination, Calculation and Payment

The Contract Price of the HMA mixture will be paid under the respective item in the Contract. Price Adjustments, as herein provided, either upwards or downwards, will be made after the work has been performed using the monthly period price for the month during which the work was performed.

Price Adjustments will be paid only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

The Price Adjustment applies only to the actual virgin liquid asphalt content in the mixture placed on the job in accordance with the Standard Specifications for Highways and Bridges, Division III, Section M3.11.03.

Price Adjustments will be separate payment items. The pay item numbers are 999.401 for a positive price adjustment (a payment) and 999.402 for a negative price adjustment (a deduction). Price Adjustments will be calculated using the following equation:

Price Adjustment = Tons of HMA Placed X Liquid Asphalt Content % X RAP Factor X (Period Price - Base Price)

No Price Adjustment will be allowed beyond the Completion Date of this Contract, unless there is a Department-approved extension of time.

******** END OF DOCUMENT ********

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DOCUMENT 00812

SPECIAL PROVISIONS
MONTHLY PRICE ADJUSTMENT FOR DIESEL FUEL AND GASOLINE
ENGLISH UNITS
Revised: 06/04/2019

This monthly fuel price adjustment is inserted in this contract because the national and worldwide energy situation has made the future cost of fuel unpredictable. This adjustment will provide for either additional compensation to the Contractor or repayment to the Commonwealth, depending on an increase or decrease in the average price of diesel fuel or gasoline.

This adjustment will be based on fuel usage factors for various items of work developed by the Highway Research Board in Circular 158, dated July 1974. These factors will be multiplied by the quantities of work done in each item during each monthly period and further multiplied by the variance in price from the Base Price to the Period Price.

The Base Price of Diesel Fuel and Gasoline will be the price as indicated in the Department's web site (https://www.mass.gov/service-details/2019-massdot-contract-price-adjustments) for the month in which the contract was bid, which includes State Tax.

The Period Price will be the average of prices charged to the State, including State Tax for the bulk purchases made during each month.

This adjustment will be effected only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

No adjustment will be paid for work done beyond the extended completion date of any contract.

Any adjustment (increase or decrease) to estimated quantities made to each item at the time of final payment will have the fuel price adjustment figured at the average period price for the entire term of the project for the difference of quantity.

The fuel price adjustment will apply only to the following items of work at the fuel factors shown:

ITEMS COVERED	FUEL FACTORS	
	Diesel	Gasoline
Excavation: and Borrow Work: Items 120, 120.1, 121, 123, 124, 125, 127, 129.3, 140, 140.1, 141, 142, 143, 144, 150, 150.1, 151 and 151.1 (Both Factors used)	0.29 Gallons / CY.	0.15 Gallons / CY
Surfacing Work: All Items containing Hot Mix Asphalt	2.90 Gallons / Ton	Does Not Apply

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ADDENDUM NO. 4, AUGUST 21, 2020

DOCUMENT 00813

SPECIAL PROVISIONS

PRICE ADJUSTMENTS FOR STRUCTURAL STEEL AND REINFORCING STEEL

August 18, 2020

This special provision applies to all projects containing the use of structural steel and/or reinforcing steel as specified elsewhere in the Contract work. It applies to all structural steel and all reinforcing steel, as defined below, on the project. Compliance with this provision is mandatory, i.e., there are no "opt-in" or "opt-out" clauses. Price adjustments will be handled as described below and shall only apply to unfabricated reinforcing steel bars and unfabricated structural steel material, consisting of rolled shapes, plate steel, sheet piling, pipe piles, steel castings and steel forgings.

Price adjustments will be variances between Base Prices and Period Prices. Base Prices and Period Prices are defined below.

Price adjustments will only be made if the variances between Base Prices and Period Prices are 5% or more. A variance can result in the Period Price being either higher or lower than the Base Price. Once the 5% threshold has been achieved, the adjustment will apply to the full variance between the Base Price and the Period Price.

Price adjustments will be calculated by multiplying the number of pounds of unfabricated structural steel material or unfabricated reinforcing steel bars on a project by the index factor calculated as shown below under Example of a Period Price Calculation.

Price adjustments will ***not*** include guardrail panels or the costs of shop drawing preparation, handling, fabrication, coatings, transportation, storage, installation, profit, overhead, fuel costs, fuel surcharges, or other such charges not related to the cost of the unfabricated structural steel and unfabricated reinforcing steel.

The weight of steel subject to a price adjustment shall not exceed the final shipping weight of the fabricated part by more than 10%.

Base Prices and Period Prices are defined as follows:

Base Prices of unfabricated structural steel and unfabricated reinforcing steel on a project are fixed prices determined by the Department and found in the table below. While it is the intention of the Department to make this table comprehensive, some of a project's unfabricated structural steel and/or unfabricated reinforcing steel may be inadvertently omitted. Should this occur, the Contractor shall bring the omission to the Department's attention so that a contract alteration may be processed that adds the missing steel to the table and its price adjustments to the Contract.

The Base Price Date is the month and year in which MassDOT opened bids for the project. This date is used to select the Base Price Index.

Period Prices of unfabricated structural steel and unfabricated reinforcing steel on a project are variable prices that have been calculated using the Period Price Date and an index of steel prices to adjust the Base Price.

The Period Price Date is the date the steel was delivered to the fabricator as evidenced by an official bill of lading submitted to the Department containing a description of the shipped materials, weights of the shipped materials and the date of shipment. This date is used to select the Period Price Index.

The index used for the calculation of Period Prices is the U.S. Department of Labor Bureau of Labor Statistics Producer Price Index (PPI) Series ID WPU101702 (Not Seasonally Adjusted, Group: Metals and Metal Products, Item: Semi-finished Steel Mill Products.) As this index is subject to revision for a period of up to four (4) months after its original publication, no price adjustments will be made until the index for the period is finalized, i.e., the index is no longer suffixed with a "(P)".

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DOCUMENT 00814

SPECIAL PROVISIONS
PRICE ADJUSTMENT FOR PORTLAND CEMENT CONCRETE MIXES

January 12, 2009

This provision applies to all projects using greater than 100 Cubic Yards (76 Cubic Meters) of Portland cement concrete containing Portland cement as stipulated in the Notice to Contractors section of the Bid Documents. This Price Adjustment will occur on a monthly basis.

The Price Adjustment will be based on the variance in price for the Portland cement component only from the Base Price to the Period Price. It shall not include transportation or other charges.

The Base Price of Portland cement on a project is a fixed price determined at the time of bid by the Department by using the same method as for the determination of the Period Price (see below) and found in the Notice to Contractors.

The Period Price of Portland cement will be determined by using the latest published price, in dollars per ton (U.S.), for Portland cement (Type I) quoted for Boston, U.S.A. in the **Construction Economics** section of *ENR Engineering News-Record* magazine or at the ENR website http://www.enr.com under **Construction Economics**. The Period Price will be posted on the MassDOT website the Wednesday immediately following the publishing of the monthly price in ENR, which is normally the first week of the month.

The Contract Price of the Portland cement concrete mix will be paid under the respective item in the Contract. The price adjustment, as herein provided, upwards or downwards, will be made after the work has been performed, using the monthly period price for the month during which the work was performed.

The price adjustment applies only to the actual Portland cement content in the mix placed on the job in accordance with the Standard Specifications for Highways and Bridges, Division III, Section M4.02.01. No adjustments will be made for any cement replacement materials such as fly ash or ground granulated blast furnace slag.

The Price Adjustment will be a separate payment item. It will be determined by multiplying the number of cubic yards of Portland cement concrete placed during each monthly period times the Portland cement content percentage times the variance in price between the Base Price and Period Price of Portland cement.

This Price Adjustment will be paid only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

No Price Adjustment will be allowed beyond the Completion Date of this Contract, unless there is a Department-approved extension of time.

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DOCUMENT 00820

THE COMMONWEALTH OF MASSACHUSETTS SUPPLEMENTAL EQUAL EMPLOYMENT OPPORTUNITY, NON-DISCRIMINATION AND AFFIRMATIVE ACTION PROGRAM

I. Definitions

For purposes of this contract,

"Minority" means a person who meets one or more of the following definitions:

(a) American Indian or Native American means: all persons having origins in any of the original peoples of North America and who are recognized as an Indian by a tribe or tribal organization.
(b) Asian means: All persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian sub-continent, or the Pacific Islands, including, but Not limited to China, Japan, Korea, Samoa, India, and the Philippine Islands.
(c) Black means: All persons having origins in any of the Black racial groups of Africa, including, but not limited to, African-Americans, and all persons having origins in any of the original peoples of the Cape Verdean Islands.
(d) Eskimo or Aleut means: All persons having origins in any of the peoples of Northern Canada, Greenland, Alaska, and Eastern Siberia.
(e) Hispanic means: All persons having their origins in any of the Spanish-speaking peoples of Mexico, Puerto Rico, Cuba, Central or South America, or the Caribbean Islands.

"State construction contract" means a contract for the construction, reconstruction, installation, demolition, maintenance or repair of a building or capital facility, or a contract for the construction, reconstruction, alteration, remodeling or repair of a public work undertaken by a department, agency, board, or commission of the commonwealth.

"State assisted construction contract" means a contract for the construction, reconstruction, installation, demolition, maintenance or repair of a building or capital facility undertaken by a political subdivision of the commonwealth, or two or more political subdivisions thereof, an authority, or other instrumentality and whose costs of the contract are paid for, reimbursed, grant funded, or otherwise supported, in whole or in part, by the commonwealth.

II. Equal Opportunity, Non-Discrimination and Affirmative Action

During the performance of this Contract, the Contractor and all subcontractors (hereinafter collectively referred to as "the Contractor") for a state construction contract or a state assisted construction contract, for him/herself, his/her assignees and successors in interest, agree to comply with all applicable equal employment opportunity, non-discrimination and affirmative action requirements, including but not limited to the following:

In connection with the performance of work under this contract, the Contractor shall not discriminate against any employee or applicant for employment because of race, color, religious creed, national origin, sex, sexual orientation, genetic information, military service, age, ancestry or disability, shall not discriminate in the selection or retention of subcontractors, and shall not discriminate in the procurement of materials and rentals of equipment.

The aforesaid provision shall include, but not be limited to, the following: employment upgrading, demotion, or transfer; recruitment advertising, layoff or termination; rates of pay or other forms of compensation; conditions or privileges of employment; and selection for apprenticeship or on-the-job training opportunity. The Contractor shall comply with the provisions of chapter 151B of the Massachusetts General Laws, as amended, and all other applicable anti-discrimination and equal opportunity laws, all of which are herein incorporated by reference and made a part of this Contract.

The Contractor shall post hereafter in conspicuous places, available for employees and applicants for employment, notices to be provided by the Massachusetts Commission Against Discrimination setting forth the provisions of the Fair Employment Practices Law of the Commonwealth (Massachusetts General Laws Chapter l51 B).

In connection with the performance of work under this contract, the Contractor shall undertake, in good faith, affirmative action measures to eliminate any discriminatory barriers in the terms and conditions of employment on the grounds of race, color, religious creed, national origin, sex, sexual orientation, genetic information, military service, age, ancestry or disability. Such affirmative action measures shall entail positive and aggressive measures to ensure nondiscrimination and to promote equal opportunity in the areas of hiring, upgrading, demotion or transfer, recruitment, layoff or termination, rate of compensation, apprenticeship and on-the-job training programs. A list of positive and aggressive measures shall include, but not be limited to, advertising employment opportunities in minority and other community news media; notifying minority, women and other community-based organizations of employment opportunities; validating all job specifications, selection requirements, and tests; maintaining a file of names and addresses of each worker referred to the Contractor and what action was taken concerning such worker; and notifying the administering agency in writing when a union with whom the Contractor has a collective bargaining agreement has failed to refer a minority or woman worker. These and other affirmative action measures shall include all actions required to guarantee equal employment opportunity for all persons, regardless of race, color, religious creed, national origin, sex, sexual orientation, genetic information, military service, age, ancestry or disability. One purpose of this provision is to ensure to the fullest extent possible an adequate supply of skilled tradesmen for this and future Commonwealth public construction projects.

III. Minority and Women Workforce Participation

Pursuant to his/her obligations under the preceding section, the Contractor shall strive to achieve on this project the labor participation goals contained herein. Said participation goals shall apply in each job category on this project including but not limited to bricklayers, carpenters, cement masons, electricians, ironworkers, operating engineers and those classes of work enumerated in Section 44F of Chapter 149 of the Massachusetts General Laws. The participation goals for this project shall be 15.3% for minorities and 6.9% for women. The participation goals, as set forth herein, shall not be construed as quotas or set-asides; rather, such participation goals will be used to measure the progress of the Commonwealth's equal opportunity, non-discrimination and affirmative action program. Additionally, the participation goals contained herein should not be seen or treated as a floor or as a ceiling for the employment of particular individuals or group of individuals.

IV. Liaison Committee

At the discretion of the agency that administers the contract for the construction project there may be established for the life of the contract a body to be known as the Liaison Committee. The Liaison Committee shall be composed of one representative each from the agency or agencies administering the contract for the construction project, hereinafter called the administering agency, a representative from the Office of Affirmative action, and such other representatives as may be designated by the administering agency. The Contractor (or his/her agent, if any, designated by him/her as the on-site equal employment opportunity officer) shall recognize the Liaison Committee as an affirmative action body, and shall establish a continuing working relationship with the Liaison Committee, consulting with the Liaison Committee on all matters related to minority recruitment, referral, employment and training.

V. Reports and Records

The Contractor shall prepare projected workforce tables on a quarterly basis when required by the administering agency. These shall be broken down into projections, by week, of workers required in each trade. Copies shall be furnished one week in advance of the commencement of the period covered, and also, when updated, to the administering agency and the Liaison Committee when required.

The Contractor shall prepare weekly reports in a form approved by the administering agency, unless information required is required to be reported electronically by the administering agency, the number of hours worked in each trade by each employee, identified as woman, minority, or non-minority. Copies of these shall be provided at the end of each such week to the administering agency and the Liaison Committee.

Records of employment referral orders, prepared by the Contractor, shall be made available to the administering agency on request.

The Contractor will provide all information and reports required by the administering agency on instructions issued by the administering agency and will permit access to its facilities and any books, records, accounts and other sources of information which may be determined by the administering agency to effect the employment of personnel. This provision shall apply only to information pertinent to the Commonwealth's supplementary non-discrimination, equal opportunity and access and opportunity contract requirements. Where information required is in the exclusive possession of another who fails or refuses to furnish this information, the Contractor shall so certify to the administering agency and shall set forth what efforts he has made to obtain the information.

VI. Access to Work Site

A designee of the administering agency and a designee of the Liaison Committee shall each have a right to access the work site.

VII. Solicitations for Subcontracts, and for the Procurement of Materials and Equipment

In all solicitations either by competitive bidding or negotiation made by the Contractor either for work to be performed under a subcontract or for the procurement of materials or equipment, each potential subcontractor or supplier shall be notified in writing by the Contractor of the Contractor's obligations under this contract relative to non-discrimination and equal opportunity.

VIII. Sanctions

Whenever the administering agency believes the General or Prime Contractor or any subcontractor may not be operating in compliance with the provisions of the Fair Employment Practices Law of the Commonwealth (Massachusetts General Laws Chapter 151B), the administering agency may refer the matter to the Massachusetts Commission Against Discrimination ("Commission") for investigation.

Following the referral of a matter by the administering agency to the Massachusetts Commission Against Discrimination, and while the matter is pending before the MCAD, the administering agency may withhold payments from contractors and subcontractors when it has documentation that the contractor or subcontractor has violated the Fair Employment Practices Law with respect to its activities on the Project, or if the administering agency determines that the contractor has materially failed to comply with its obligations and the requirements of this Section. The amount withheld shall not exceed a withhold of payment to the General or Prime Contractor of 1/100 or 1% of the contract award price or $5,000, whichever sum is greater, or, if a subcontractor is in non-compliance, a withhold by the administering agency from the General Contractor, to be assessed by the General Contractor as a charge against the subcontractor, of 1/100 or 1% of the subcontractor price, or $1,000 whichever sum is greater, for each violation of the applicable law or contract requirements. The total withheld from anyone General or Prime Contractor or subcontractor on a Project shall not exceed $20,000 overall. No withhold of payments or investigation by the Commission or its agent shall be initiated without the administering agency providing prior notice to the Contractor.

If, after investigation, the Massachusetts Commission Against Discrimination finds that a General or Prime Contractor or subcontractor, in commission of a state construction contract or state-assisted construction contract, violated the provisions of the Fair Employment Practices Law, the administering agency may convert the amount withheld as set forth above into a permanent sanction, as a permanent deduct from payments to the General or Prime Contractor or subcontractor, which sanction will be in addition to any such sanctions, fines or penalties imposed by the Massachusetts Commission Against Discrimination.

No sanction enumerated under this Section shall be imposed by the administering agency except after notice to the General or Prime Contractor or subcontractor and an adjudicatory proceeding, as that term is used, under Massachusetts General Laws Chapter 30A, has been conducted.

IX. Severability

The provisions of this section are severable, and if any of these provisions shall be held unconstitutional by any court of competent jurisdiction, the decision of such court shall not affect or impair any of the remaining provisions.

X. Contractor's Certification

After award and prior to the execution of any contract for a state construction contract or a state assisted construction contract, the Prime or General Contractor shall certify that it will comply with all provisions of this Document 00820 Supplemental Equal Employment Opportunity, Non-Discrimination and Affirmative Action Program, by executing Document 00859 Contractor/Subcontractor Certification Form.

XI. Subcontractor Requirements

Prior to the award of any subcontract for a state construction contract or a state assisted construction contract, the Prime or General Contractor shall provide all prospective subcontractors with a complete copy of this Document 00820 entitled "Supplemental Equal Employment Opportunity, Non-Discrimination and Affirmative Action Program" and will incorporate the provisions of this Document 00820 into any and all contracts or work orders for all subcontractors providing work on the Project. In order to ensure that the said subcontractor's certification becomes a part of all subcontracts under the prime contract, the Prime or General Contractor shall certify in writing to the administering agency that it has complied with the requirements as set forth in the preceeding paragraph by executing Document 00859 Contractor/Subcontractor Certification Form.

Rev'd 03/07/14

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DOCUMENT 00821

ELECTRONIC REPORTING REQUIREMENTS
CIVIL RIGHTS PROGRAMS AND CERTIFIED PAYROLL

Implemented on March 2, 2009 Revised June 04, 2019

The Massachusetts Department Of Transportation (MassDOT) has replaced the CHAMP reporting system with Equitable Business Opportunity Solution (EBO), a new web-based civil rights reporting software system. This system is capable of handling both civil rights reporting requirements and certified payrolls. The program's functions include the administration of Equal Employment Opportunity (EEO) requirements, On-The-Job Training requirements (OJT), Disadvantage Business Enterprise (DBE) and/or Minority / Women's Business Enterprise (M/WBE) subcontracting requirements, and the electronic collection of certified payrolls associated with MassDOT projects. In addition, this system is used to generate various data required as part of the American Recovery and Reinvestment Act (ARRA). Contractors are responsible for all coordination with all sub-contractors to ensure timely and accurate electronic submission of all required data.

Contractor and Sub-Contractor EBO User Certification

All contractors and sub-contractors must use the EBO software system. The software vendor, Internet Government Solutions (IGS), has developed an online EBO Training Module that is available to contractors and sub-contractors. This module is a self-tutorial which allows all users in the company to access the training, complete the tutorial, and become certified as EBO users for a one time fee of $75.00. This is the only cost to contractors and sub-contractors associated with the EBO software system. The online EBO Training Module can be accessed at www.ebotraining.com. Click the "Register My Company" button on the login page to begin your training registration. Questions regarding EBO online training should be directed to Gerry Anguilano, IGS at (440) 238-1684.

MassDOT will track contractors and sub-contractors who have successfully completed the on-line training module. All persons performing civil rights program and/or certified payroll functions should be EBO certified.

Vetting of Firms and Designated Firm Individuals

Contractors must authorize a Primary Log-In ID Holder who has completed EBO on-line training to have access to the EBO system by completing and submitting the "Request For EBO System Log-In/Password Form" located on the MassDOT website at: https://www.mass.gov/how-to/how-to-get-an-ebo-login
Contractors must also agree to comply with the EBO system user agreement located on the MassDOT website.

All subcontracts entered into on a project must include language that identifies the submission and training requirements that the sub-contractor must perform. Sub-contractors will be approved by the respective District Office of MassDOT through the existing approval process. When new sub-contractors, who have not previously worked for MassDOT, are initially selected by a general contractor, the new sub-contractor must be approved by the District before taking the EBO on-line training module.

Interim Reporting Requirements

Until MassDOT is satisfied that the EBO system is fully operational and functioning as designed, contractors and sub-contractors will be required to submit certified payrolls manually. There will be a transition period where dual reporting, through manual and electronic submission, will be required. MassDOT, however, will notify contractors and sub-contractors when they may cease manual submission of certified payrolls.

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DOCUMENT 00859

CONTRACTOR/SUBCONTRACTOR CERTIFICATION FORM ‡

_____ **(Contractor)** **Date:**_____

‡This form shall be prepared and submitted to MassDOT for each and every subcontractor; the Prime Contractor shall ensure that the indicated documents have been given, as applicable, to its SubContractors.

_____ **(Subcontractor)** ☐ District Approved **S**ubcontractor

Contract No: 111717 **Project No:** 604123 **Federal Aid No:** CMQ/STP/TAP-003S(390)

Location: Ashland

Project Description: Roadway Reconstruction and Related Work along Route 126 (Pond Street)

PART 1 CONTRACTOR CERTIFICATION: I hereby certify, as an authorized official of this company, that to the best of my knowledge, information and belief, the company is in compliance with all applicable federal and state laws, rules, and regulations governing fair labor and employment practices, that the company will not discriminate in their employment practices, that the company will make good faith efforts to comply with the minority employee and women employee workforce participation ratio goals and specific affirmative action steps contained in Contract Document 00820 The Commonwealth of Massachusetts Supplemental Equal Employment Opportunity, Non-Discrimination and Affirmative Action Program, and that the company will comply with the special provisions and documentation indicated below (as checked).

I further hereby certify, as an authorized official of this company, that the special provisions and documentation indicated below (as checked) have been or are included in, and made part of, the Subcontractor Agreement entered into with the firm named above.

☐ **This is not a Federally-aided construction project**

Document #

☐ 00718 – Participation By Minority Or Women's Business Enterprises and SDVOBE†
☐ 00761 – Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion
☐ 00820 – MA Supplemental Equal Employment Opportunity, Non-Discrimination, and Affirmative Action Program
☐ 00821 – Electronic Reporting Requirements, Civil Rights Programs, and Certified Payroll
☐ 00859 – Contractor/Subcontractor Certification Form (this document)
☐ 00860 – MA Employment Laws
☐ 00861 – Applicable State Wage Rates in the Contract Proposal**
☐ B00842 – MA Schedule of Participation By Minority or Women Business Enterprises (M/WBEs)†
☐ B00843 – MA Letter of Intent – M/WBEs†

** Does not apply to Material Suppliers, unless performing work on-site
† Applies only if Subcontractor is a M/WBE; only include these forms for the particular M/WBE Entity

☐ B00844 – Schedule of Participation By SDVOBE
☐ B00845 – Letter of Intent – SDVOBE
☐ B00846 – M/WBE or SDVOBE Joint Check Arrangement Approval Form
☐ B00847 – Joint Venture Affidavit

☐ **This is a Federally-aided construction project (Federal Aid Number is present)**

Document #

☐ 00719 – Special Provisions for Participation by Disadvantaged Business Enterprises†
☐ 00760 – Form FHWA 1273 - Required Contract Provisions for Federal-Aid Construction Contracts
☐ 00820 – MA Supplemental Equal Employment Opportunity, Non-Discrimination and Affirmative Action Program
☐ 00821 – Electronic Reporting Requirements, Civil Rights Programs and Certified Payroll
☐ 00859 – Contractor/Subcontractor Certification Form (this document)
☐ 00860 – MA Employment Laws
☐ 00870 – Standard Federal Equal Employment Opportunity Construction Contract Specifications Executive Order 11246, (41 CFR Parts 60-4.2 and 60-4.3 (Solicitations and Equal Opportunity Clauses)*
☐ 00875 – Federal Trainee Special Provisions

☐ B00853 – Schedule of Participation by Disadvantaged Business Enterprise†
☐ B00854 – Letter of Intent – DBEs†
☐ B00855 – DBE Joint Check Arrangement Approval Form
☐ B00856 – Joint Venture Affidavit
☐ 00861/00880 – Applicable state and federal wage rates from Contract Proposal**

*Applicable only to Contracts or Subcontracts in excess of $10,000
**Does not apply to Material Suppliers, unless performing work on-site
† Applies only if Subcontractor is a DBE; only include these forms for the particular DBE Entity

Signed this _____ Day of _____, 20_____ Under The Pains And Penalties Of Perjury.

_____ _____
(Print Name and Title) (Authorized Signature)

PART 2

PART 2 SUBCONTRACTOR CERTIFICATION: I hereby certify, as an authorized official of this company, that the required documents in Part 1 above were physically incorporated in our Agreement/Subcontract with the Contractor and give assurance that this company will fully comply or make every good faith effort to comply with the same. I further certify that:

1. This company recognizes that if this is a Federal-Aid Project, then this Contract is covered by the equal employment opportunity laws administered and enforced by the United States Department of Labor ("USDOL"), Office of Federal Contract Compliance Programs ('OFCCP"). By signing below, we acknowledge that this company has certain reporting obligations to the OFCCP, as specified by 41 CFR Part 60-4.2.
2. This company further acknowledges that any contractor with fifty (50) or more employees on a Federal-aid Contract with a value of fifty-thousand ($50,000) dollars or more must annually file an EEO-1 Report (SF 100) to the EEOC, Joint Reporting Committee, on or before September 30th, each year, as specified by 41 CFR Part 60-1.7a.
3. For more information regarding the federal reporting requirements, please contact the USDOL, OFCCP Regional Office, at 1-646-264-3170 or EEO-1, Joint Reporting Committee at 1-866-286-6440. You may also find guidance at: http://www.dol.gov/ofccp/TAguides/consttag.pdf or http://www.wdol.gov/dba.aspx#0.
4. This company ☐ has, ☐ has not, participated in a previous contract or subcontract subject to the Equal Opportunity clauses set forth in 41 CFR Part 60-4 and Executive Order 11246, and where required, has filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance Programs or the EEO Commission all reports due under the applicable filing requirements.
5. This company is in full compliance with applicable Federal and Commonwealth of Massachusetts laws, rules, and regulations and is not currently debarred or disqualified from bidding on or participating in construction contracts in any jurisdiction of the United States. See : http://www.massdot.state.ma.us/Debarred.aspx.
6. This company is properly registered and in good standing with the Office of the Secretary of the Commonwealth.

Signed this _____ Day of _____, 20_____, Under The Pains And Penalties Of Perjury.

Firm: _____
Address: _____
_____
_____
Telephone Number:_____
Federal I.D. Number:_____
Estimated Start Date:_____
Estimated Completion Date:_____
Estimated Dollar Amount:_____

_____
(Print Name and Title)

_____
(Authorized Signature)

_____
(Date)

Rev'd 06/03/14

*** END OF DOCUMENT ***

DOCUMENT 00860

COMMONWEALTH OF MASSACHUSETTS PUBLIC EMPLOYMENT LAWS

Revised February 20, 2019

The Contractor's attention is directed to Massachusetts General Laws, Chapter 149, Sections 26 through 27H, and 150A. This contract is considered to fall within the ambit of that law, which provides that in general, the Prevailing Rate or Total Rate must be paid to employees working on projects funded by the Commonwealth of Massachusetts or any political subdivision including Massachusetts Department of Transportation (MassDOT).

A Federal Aid project is also subject to the Federal Minimum Wage Rate law for construction. When comparing a state minimum wage rate, monitored by the Massachusetts Attorney General, versus federal minimum wage rate, monitored by the U.S. Department of Labor Wage and Hour Division, for a particular job classification the higher wage is at all times to be paid to the affected employee.

Every contractor or subcontractor engaged in this contract to which sections twenty-seven and twenty-seven A apply will keep a true and accurate record of all mechanics and apprentices, teamsters, chauffeurs and laborers employed thereon, showing the name, address and occupational classification of each such employee on this contract, and the hours worked by, and the wages paid to, each such employee, and shall furnish to the MassDOT's Resident Engineer, on a weekly basis, a copy of said record, in a form approved by MassDOT and in accordance with M.G.L. c. 149, § 27B, signed by the employer or his/her authorized agent under the penalties of perjury.

Each such contractor or subcontractor shall preserve its payroll records for a period of three years from the date of completion of the contract.

The Prevailing Wage Rate generally includes the following:

> Minimum Hourly Wage + Employer Contributions to Benefit Plans = Prevailing Wage Rate or Total Rate
>
> Any employer who does not make contributions to Benefit Plans must pay the total Prevailing Wage Rate directly to the employee.

Any deduction from the Prevailing Wage Rate or Total Rate for contributions to benefit plans can only be for a Health & Welfare, Pension, or Supplementary Unemployment plan meeting the requirements of the Employee Retirement Income Security Act (ERISA) of 1974. The maximum allowable deduction for these benefits from the prevailing wage rate cannot be greater than the amount allowed by Executive Office of Labor (EOL) for the specified benefits. Any additional expense of providing benefits to the employees is to be borne by the employer and cannot be deducted from the Minimum Hourly Wage. If the employer's benefit expense is less than that so provided by EOL the difference will be paid directly to the employee. The rate established must be paid to all employees who perform work on the project.

When an employer makes deductions from the Minimum Hourly Wage for an employee's contribution to social security, state taxes, federal taxes, and/or other contribution programs, allowed by law, the employer shall furnish each employee a suitable pay slip, check stub or envelope notifying the employee of the amount of the deductions.

No contractor or subcontractor contracting for any part of the contract week shall require or permit any laborer or mechanic to be employed on such work in excess of forty hours in any workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times his basic rate of pay for all hours worked in excess of forty hours in such workweek, whichever is the greater number of overtime hours.

Apprentice Rates are permitted only when there is an Apprentice Agreement registered with the Massachusetts Division of Apprentice Training in accordance with M.G.L. c. 23, § 11E-11L.

The Prevailing Wage Rates issued for each project shall be the rates paid for the entire project. The Prevailing Wage Rates must be posted on the job site at all times and be visible from a public way.

In addition, each such contractor and subcontractor shall furnish to the MassDOT's Resident Engineer, within fifteen days after completion of its portion of the work, a statement, executed by the contractor or subcontractor or by any authorized officer or employee of the contractor or subcontractor who supervises the payment of wages, in the following form:

STATEMENT OF COMPLIANCE

Date: _____

I , _____do hereby state:
(Name of signatory party) (Title)

That I pay or supervise the payment of the persons employed by:

_____
(Contractor or Subcontractor)

on the _____
(MassDOT Project Location and Contract Number)

and that all mechanics and apprentices, teamsters, chauffeurs and laborers employed on said project have been paid in accordance with wages determined under the provisions of sections twenty-six and twenty-seven of chapter one hundred and forty-nine of the General Laws.

Signature _____

Title _____

The above-mentioned copies of payroll records and statements of compliance shall be available for inspection by any interested party filing a written request to the MassDOT's Resident Engineer for such inspection and copying.

Massachusetts General Laws c. 149, §27, requires annual updates to prevailing wage schedules for all public construction contracts lasting longer than one year. MassDOT will request the required updates and furnish them to the Contractor. The Contractor is required to pay no less than the wage rates indicated on the annual updated wage schedules.

MassDOT will request the updates no later that two week before the anniversary of the Notice to Proceed date of the contract to allow for adequate processing by the Department of Labor Standards (DLS). The effective date for the new rates will be the anniversary date of the contract (i.e. the notice to proceed date), regardless of the date of issuance on the schedule from DLS.

All bidders are cautioned that the aforementioned laws require that employers pay to covered employees no less than the applicable minimum wages. In addition, the same laws require that the applicable prevailing wages become incorporated as part of this contract. The prevailing minimum wage law establishes serious civil and criminal penalties for violations, including imprisonment and exclusion from future public contracts. Bidders are cautioned to carefully read the relevant sections of the Massachusetts General Laws.

*** END OF DOCUMENT ***

DOCUMENT 00861

STATE WAGE RATES

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CHARLES D. BAKER
Governor

KARYN E. POLITO
Lt. Governor

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DEPARTMENT OF LABOR STANDARDS

Prevailing Wage Rates

As determined by the Director under the provisions of the Massachusetts General Laws, Chapter 149, Sections 26 to 27H

ROSALIN ACOSTA
Secretary

MICHAEL FLANAGAN
Director

Awarding Authority: MassDOT

Contract Number: 604123-111717 **City/Town:** ASHLAND

Description of Work: Ashland - Federal Aid Project Nos. CMQ-003S(390), STP-003S(390) & TAP-003S(390) Roadway Reconstruction and Related Work along Route 126 (Pond Street)

Job Location: Ashland: Route 126

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the "Wage Request Number" on all pages of this schedule.
- An Awarding Authority must request an updated wage schedule from the Department of Labor Standards ("DLS") if it has not opened bids or selected a contractor within 90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
- The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or any sub-contractor.
- All apprentices working on the project are required to be registered with the Massachusetts Department of Labor Standards, Division of Apprentice Standards (DLS/DAS). Apprentice must keep his/her apprentice identification card on his/her person during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DLS/DAS regardless of whether or not they are registered with any other federal, state, local, or private agency must be paid the journeyworker's rate for the trade.**
- The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule. Awarding authorities are required to request these updates no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor. For multi-year CM AT RISK projects, awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. Contractors are required to obtain the wage schedules from awarding authorities, and to pay no less than these rates to covered workers. The annual update requirement is not applicable to 27F "rental of equipment" contracts.
- Every contractor or subcontractor which performs construction work on the project is required to submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee's name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. A sample of a payroll reporting form may be obtained at http://www.mass.gov/dols/pw.
- Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may report the violation to the Fair Labor Division of the office of the Attorney General at (617) 727-3465.
- Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and criminal penalties.

Issue Date: 07/14/2020 **Wage Request Number:** 20200714-031

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2020	$35.15	$12.41	$13.72	$0.00	$61.28
	08/01/2020	$35.15	$12.91	$13.72	$0.00	$61.78
	12/01/2020	$35.15	$12.91	$14.82	$0.00	$62.88
	06/01/2021	$35.95	$12.91	$14.82	$0.00	$63.68
	08/01/2021	$35.95	$13.41	$14.82	$0.00	$64.18
	12/01/2021	$35.95	$13.41	$16.01	$0.00	$65.37
(3 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2020	$35.22	$12.41	$13.72	$0.00	$61.35
	08/01/2020	$35.22	$12.91	$13.72	$0.00	$61.85
	12/01/2020	$35.22	$12.91	$14.82	$0.00	$62.95
	06/01/2021	$36.02	$12.91	$14.82	$0.00	$63.75
	08/01/2021	$36.02	$13.41	$14.82	$0.00	$64.25
	12/01/2021	$36.02	$13.41	$16.01	$0.00	$65.44
(4 & 5 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2020	$35.34	$12.41	$13.72	$0.00	$61.47
	08/01/2020	$35.34	$12.91	$13.72	$0.00	$61.97
	12/01/2020	$35.34	$12.91	$14.82	$0.00	$63.07
	06/01/2021	$36.14	$12.91	$14.82	$0.00	$63.87
	08/01/2021	$36.14	$13.41	$14.82	$0.00	$64.37
	12/01/2021	$36.14	$13.41	$16.01	$0.00	$65.56
ADS/SUBMERSIBLE PILOT *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2019	$102.78	$9.90	$21.15	$0.00	$133.83
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR *LABORERS - ZONE 2*	06/01/2020	$34.81	$8.60	$15.77	$0.00	$59.18
	12/01/2020	$35.70	$8.60	$15.77	$0.00	$60.07
	06/01/2021	$36.62	$8.60	$15.77	$0.00	$60.99
	12/01/2021	$37.53	$8.60	$15.77	$0.00	$61.90
For apprentice rates see "Apprentice- LABORER"						
ASBESTOS REMOVER - PIPE / MECH. EQUIPT. *HEAT & FROST INSULATORS LOCAL 6 (BOSTON)*	06/01/2020	$38.00	$12.50	$8.85	$0.00	$59.35
	12/01/2020	$39.00	$12.50	$8.85	$0.00	$60.35
ASPHALT RAKER *LABORERS - ZONE 2*	06/01/2020	$34.31	$8.60	$15.77	$0.00	$58.68
	12/01/2020	$35.20	$8.60	$15.77	$0.00	$59.57
	06/01/2021	$36.12	$8.60	$15.77	$0.00	$60.49
	12/01/2021	$37.03	$8.60	$15.77	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$49.33	$13.00	$15.70	$0.00	$78.03
	12/01/2020	$50.48	$13.00	$15.70	$0.00	$79.18
	06/01/2021	$51.58	$13.00	$15.70	$0.00	$80.28
	12/01/2021	$52.73	$13.00	$15.70	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$49.33	$13.00	$15.70	$0.00	$78.03
	12/01/2020	$50.48	$13.00	$15.70	$0.00	$79.18
	06/01/2021	$51.58	$13.00	$15.70	$0.00	$80.28
	12/01/2021	$52.73	$13.00	$15.70	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BARCO-TYPE JUMPING TAMPER *LABORERS - ZONE 2*	06/01/2020	$34.31	$8.60	$15.77	$0.00	$58.68
	12/01/2020	$35.20	$8.60	$15.77	$0.00	$59.57
	06/01/2021	$36.12	$8.60	$15.77	$0.00	$60.49
	12/01/2021	$37.03	$8.60	$15.77	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER *LABORERS - ZONE 2*	06/01/2020	$34.81	$8.60	$15.77	$0.00	$59.18
	12/01/2020	$35.70	$8.60	$15.77	$0.00	$60.07
	06/01/2021	$36.62	$8.60	$15.77	$0.00	$60.99
	12/01/2021	$37.53	$8.60	$15.77	$0.00	$61.90
For apprentice rates see "Apprentice- LABORER"						
BOILER MAKER *BOILERMAKERS LOCAL 29*	01/01/2020	$46.10	$7.07	$17.98	$0.00	$71.15

Apprentice - *BOILERMAKER - Local 29*

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	$29.97	$7.07	$11.69	$0.00	$48.73
2	65	$29.97	$7.07	$11.69	$0.00	$48.73
3	70	$32.27	$7.07	$12.59	$0.00	$51.93
4	75	$34.58	$7.07	$13.49	$0.00	$55.14
5	80	$36.88	$7.07	$14.38	$0.00	$58.33
6	85	$39.19	$7.07	$15.29	$0.00	$61.55
7	90	$41.49	$7.07	$16.18	$0.00	$64.74
8	95	$43.80	$7.07	$17.09	$0.00	$67.96

Notes:

Apprentice to Journeyworker Ratio:1:4

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) *BRICKLAYERS LOCAL 3 (LOWELL)*	02/01/2020	$52.26	$10.75	$21.30	$0.00	$84.31
	08/01/2020	$53.61	$10.75	$21.45	$0.00	$85.81
	02/01/2021	$54.21	$10.75	$21.45	$0.00	$86.41
	08/01/2021	$55.61	$10.75	$21.61	$0.00	$87.97
	02/01/2022	$56.19	$10.75	$21.61	$0.00	$88.55

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *BRICK/PLASTER/CEMENT MASON - Local 3 Lowell*

Effective Date - 02/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.13	$10.75	$21.30	$0.00	$58.18
2	60	$31.36	$10.75	$21.30	$0.00	$63.41
3	70	$36.58	$10.75	$21.30	$0.00	$68.63
4	80	$41.81	$10.75	$21.30	$0.00	$73.86
5	90	$47.03	$10.75	$21.30	$0.00	$79.08

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.81	$10.75	$21.45	$0.00	$59.01
2	60	$32.17	$10.75	$21.45	$0.00	$64.37
3	70	$37.53	$10.75	$21.45	$0.00	$69.73
4	80	$42.89	$10.75	$21.45	$0.00	$75.09
5	90	$48.25	$10.75	$21.45	$0.00	$80.45

Notes:

Apprentice to Journeyworker Ratio:1:5

BULLDOZER/GRADER/SCRAPER *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$48.81	$13.00	$15.70	$0.00	$77.51
	12/01/2020	$49.95	$13.00	$15.70	$0.00	$78.65
	06/01/2021	$51.04	$13.00	$15.70	$0.00	$79.74
	12/01/2021	$52.18	$13.00	$15.70	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CAISSON & UNDERPINNING BOTTOM MAN *LABORERS - FOUNDATION AND MARINE*	06/01/2020	$40.30	$8.60	$17.24	$0.00	$66.14
	12/01/2020	$41.28	$8.60	$17.24	$0.00	$67.12
	06/01/2021	$42.30	$8.60	$17.24	$0.00	$68.14
	12/01/2021	$43.31	$8.60	$17.24	$0.00	$69.15
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING LABORER *LABORERS - FOUNDATION AND MARINE*	06/01/2020	$39.15	$8.60	$17.24	$0.00	$64.99
	12/01/2020	$40.13	$8.60	$17.24	$0.00	$65.97
	06/01/2021	$41.15	$8.60	$17.24	$0.00	$66.99
	12/01/2021	$42.16	$8.60	$17.24	$0.00	$68.00
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING TOP MAN *LABORERS - FOUNDATION AND MARINE*	06/01/2020	$39.15	$8.60	$17.24	$0.00	$64.99
	12/01/2020	$40.13	$8.60	$17.24	$0.00	$65.97
	06/01/2021	$41.15	$8.60	$17.24	$0.00	$66.99
	12/01/2021	$42.16	$8.60	$17.24	$0.00	$68.00
For apprentice rates see "Apprentice- LABORER"						
CARBIDE CORE DRILL OPERATOR *LABORERS - ZONE 2*	06/01/2020	$34.31	$8.60	$15.77	$0.00	$58.68
	12/01/2020	$35.20	$8.60	$15.77	$0.00	$59.57
	06/01/2021	$36.12	$8.60	$15.77	$0.00	$60.49
	12/01/2021	$37.03	$8.60	$15.77	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CARPENTER *CARPENTERS -ZONE 2 (Eastern Massachusetts)*	03/01/2020	$42.50	$9.40	$18.95	$0.00	$70.85
	09/01/2020	$43.15	$9.40	$18.95	$0.00	$71.50
	03/01/2021	$43.75	$9.40	$18.95	$0.00	$72.10
	09/01/2021	$44.40	$9.40	$18.95	$0.00	$72.75
	03/01/2022	$45.00	$9.40	$18.95	$0.00	$73.35
	09/01/2022	$45.65	$9.40	$18.95	$0.00	$74.00
	03/01/2023	$46.25	$9.40	$18.95	$0.00	$74.60

Apprentice - *CARPENTER - Zone 2 Eastern MA*

Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.25	$9.40	$1.73	$0.00	$32.38
2	60	$25.50	$9.40	$1.73	$0.00	$36.63
3	70	$29.75	$9.40	$13.76	$0.00	$52.91
4	75	$31.88	$9.40	$13.76	$0.00	$55.04
5	80	$34.00	$9.40	$15.49	$0.00	$58.89
6	80	$34.00	$9.40	$15.49	$0.00	$58.89
7	90	$38.25	$9.40	$17.22	$0.00	$64.87
8	90	$38.25	$9.40	$17.22	$0.00	$64.87

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.58	$9.40	$1.73	$0.00	$32.71
2	60	$25.89	$9.40	$1.73	$0.00	$37.02
3	70	$30.21	$9.40	$13.76	$0.00	$53.37
4	75	$32.36	$9.40	$13.76	$0.00	$55.52
5	80	$34.52	$9.40	$15.49	$0.00	$59.41
6	80	$34.52	$9.40	$15.49	$0.00	$59.41
7	90	$38.84	$9.40	$17.22	$0.00	$65.46
8	90	$38.84	$9.40	$17.22	$0.00	$65.46

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 $30.26/ 3&4 $36.18/ 5&6 $54.64/ 7&8 $60.62

Apprentice to Journeyworker Ratio:1:5

CARPENTER WOOD FRAME *CARPENTERS -ZONE 2 (Wood Frame)*	10/01/2019	$27.95	$7.07	$7.86	$0.00	$42.88

All Aspects of New Wood Frame Work

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *CARPENTER (Wood Frame) - Zone 2*

Effective Date - 10/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$16.77	$7.07	$0.00	$0.00	$23.84
2	60	$16.77	$7.07	$0.00	$0.00	$23.84
3	65	$18.17	$7.07	$7.86	$0.00	$33.10
4	70	$19.57	$7.07	$7.86	$0.00	$34.50
5	75	$20.96	$7.07	$7.86	$0.00	$35.89
6	80	$22.36	$7.07	$7.86	$0.00	$37.29
7	85	$23.76	$7.07	$7.86	$0.00	$38.69
8	90	$25.16	$7.07	$7.86	$0.00	$40.09

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 $19.65/ 3&4 $27.19/ 5&6 $34.50/ 7&8 $37.29

Apprentice to Journeyworker Ratio:1:5

CEMENT MASONRY/PLASTERING *BRICKLAYERS LOCAL 3 (LOWELL)*	01/01/2020	$45.23	$12.75	$22.41	$0.62	$81.01

Apprentice - *CEMENT MASONRY/PLASTERING - Lowell*

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$22.62	$12.75	$15.41	$0.00	$50.78
2	60	$27.14	$12.75	$17.41	$0.62	$57.92
3	65	$29.40	$12.75	$18.41	$0.62	$61.18
4	70	$31.66	$12.75	$19.41	$0.62	$64.44
5	75	$33.92	$12.75	$20.41	$0.62	$67.70
6	80	$36.18	$12.75	$21.41	$0.62	$70.96
7	90	$40.71	$12.75	$22.41	$0.62	$76.49

Notes:

Steps 3,4 are 500 hrs. All other steps are 1,000 hrs.

Apprentice to Journeyworker Ratio:1:3

CHAIN SAW OPERATOR *LABORERS - ZONE 2*	06/01/2020	$34.31	$8.60	$15.77	$0.00	$58.68
	12/01/2020	$35.20	$8.60	$15.77	$0.00	$59.57
	06/01/2021	$36.12	$8.60	$15.77	$0.00	$60.49
	12/01/2021	$37.03	$8.60	$15.77	$0.00	$61.40

For apprentice rates see "Apprentice- LABORER"

CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$50.33	$13.00	$15.70	$0.00	$79.03
	12/01/2020	$51.48	$13.00	$15.70	$0.00	$80.18
	06/01/2021	$52.58	$13.00	$15.70	$0.00	$81.28
	12/01/2021	$53.73	$13.00	$15.70	$0.00	$82.43

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
COMPRESSOR OPERATOR *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$32.72	$13.00	$15.70	$0.00	$61.42
	12/01/2020	$33.50	$13.00	$15.70	$0.00	$62.20
	06/01/2021	$34.25	$13.00	$15.70	$0.00	$62.95
	12/01/2021	$35.04	$13.00	$15.70	$0.00	$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE) *PAINTERS LOCAL 35 - ZONE 2*	07/01/2020	$51.51	$8.25	$22.40	$0.00	$82.16
	01/01/2021	$52.06	$8.25	$22.75	$0.00	$83.06

Apprentice - *PAINTER Local 35 - BRIDGES/TANKS*

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.76	$8.25	$0.00	$0.00	$34.01
2	55	$28.33	$8.25	$6.05	$0.00	$42.63
3	60	$30.91	$8.25	$6.60	$0.00	$45.76
4	65	$33.48	$8.25	$7.15	$0.00	$48.88
5	70	$36.06	$8.25	$19.10	$0.00	$63.41
6	75	$38.63	$8.25	$19.65	$0.00	$66.53
7	80	$41.21	$8.25	$20.20	$0.00	$69.66
8	90	$46.36	$8.25	$21.30	$0.00	$75.91

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.03	$8.25	$0.00	$0.00	$34.28
2	55	$28.63	$8.25	$6.16	$0.00	$43.04
3	60	$31.24	$8.25	$6.72	$0.00	$46.21
4	65	$33.84	$8.25	$7.28	$0.00	$49.37
5	70	$36.44	$8.25	$19.39	$0.00	$64.08
6	75	$39.05	$8.25	$19.95	$0.00	$67.25
7	80	$41.65	$8.25	$20.51	$0.00	$70.41
8	90	$46.85	$8.25	$21.63	$0.00	$76.73

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN *LABORERS - ZONE 2*	12/01/2019	$39.30	$8.10	$16.60	$0.00	$64.00
For apprentice rates see "Apprentice- LABORER"						
DEMO: BACKHOE/LOADER/HAMMER OPERATOR *LABORERS - ZONE 2*	12/01/2019	$40.30	$8.10	$16.60	$0.00	$65.00
For apprentice rates see "Apprentice- LABORER"						
DEMO: BURNERS *LABORERS - ZONE 2*	12/01/2019	$40.05	$8.10	$16.60	$0.00	$64.75
For apprentice rates see "Apprentice- LABORER"						
DEMO: CONCRETE CUTTER/SAWYER *LABORERS - ZONE 2*	12/01/2019	$40.30	$8.10	$16.60	$0.00	$65.00
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DEMO: JACKHAMMER OPERATOR *LABORERS - ZONE 2* For apprentice rates see "Apprentice- LABORER"	12/01/2019	$40.05	$8.10	$16.60	$0.00	$64.75
DEMO: WRECKING LABORER *LABORERS - ZONE 2* For apprentice rates see "Apprentice- LABORER"	12/01/2019	$39.30	$8.10	$16.60	$0.00	$64.00
DIRECTIONAL DRILL MACHINE OPERATOR *OPERATING ENGINEERS LOCAL 4* For apprentice rates see "Apprentice- OPERATING ENGINEERS"	06/01/2020	$48.81	$13.00	$15.70	$0.00	$77.51
	12/01/2020	$49.95	$13.00	$15.70	$0.00	$78.65
	06/01/2021	$51.04	$13.00	$15.70	$0.00	$79.74
	12/01/2021	$52.18	$13.00	$15.70	$0.00	$80.88
DIVER *PILE DRIVER LOCAL 56 (ZONE 1)* For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2019	$68.52	$9.90	$21.15	$0.00	$99.57
DIVER TENDER *PILE DRIVER LOCAL 56 (ZONE 1)* For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2019	$48.94	$9.90	$21.15	$0.00	$79.99
DIVER TENDER (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 1)* For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2019	$73.41	$9.90	$21.15	$0.00	$104.46
DIVER/SLURRY (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 1)* For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2019	$102.78	$9.90	$21.15	$0.00	$133.83
ELECTRICIAN *ELECTRICIANS LOCAL 96*	07/01/2019	$44.07	$10.72	$16.04	$0.00	$70.83

Apprentice - *ELECTRICIAN - Local 96*

Effective Date - 07/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$17.63	$10.72	$0.53	$0.00	$28.88
2	43	$18.95	$10.72	$0.57	$0.00	$30.24
3	48	$21.15	$10.72	$12.93	$0.00	$44.80
4	55	$24.24	$10.72	$13.27	$0.00	$48.23
5	65	$28.65	$10.72	$13.88	$0.00	$53.25
6	80	$35.26	$10.72	$14.81	$0.00	$60.79

Notes:

Steps 1-2 are 1000 hrs; Steps 3-6 are 1500 hrs.

Apprentice to Journeyworker Ratio:2:3***

ELEVATOR CONSTRUCTOR *ELEVATOR CONSTRUCTORS LOCAL 4*	01/01/2020	$61.42	$15.73	$18.41	$0.00	$95.56
	01/01/2021	$63.47	$15.88	$19.31	$0.00	$98.66
	01/01/2022	$65.62	$16.03	$20.21	$0.00	$101.86

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *ELEVATOR CONSTRUCTOR - Local 4*

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$30.71	$15.73	$0.00	$0.00	$46.44
2	55	$33.78	$15.73	$18.41	$0.00	$67.92
3	65	$39.92	$15.73	$18.41	$0.00	$74.06
4	70	$42.99	$15.73	$18.41	$0.00	$77.13
5	80	$49.14	$15.73	$18.41	$0.00	$83.28

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$31.74	$15.88	$0.00	$0.00	$47.62
2	55	$34.91	$15.88	$19.31	$0.00	$70.10
3	65	$41.26	$15.88	$19.31	$0.00	$76.45
4	70	$44.43	$15.88	$19.31	$0.00	$79.62
5	80	$50.78	$15.88	$19.31	$0.00	$85.97

Notes:
Steps 1-2 are 6 mos.; Steps 3-5 are 1 year

Apprentice to Journeyworker Ratio:1:1

ELEVATOR CONSTRUCTOR HELPER *ELEVATOR CONSTRUCTORS LOCAL 4*	01/01/2020	$42.99	$15.73	$18.41	$0.00	$77.13
	01/01/2021	$44.43	$15.88	$19.31	$0.00	$79.62
	01/01/2022	$45.93	$16.03	$20.21	$0.00	$82.17
For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"						
FENCE & GUARD RAIL ERECTOR *LABORERS - ZONE 2*	06/01/2020	$34.31	$8.60	$15.77	$0.00	$58.68
	12/01/2020	$35.20	$8.60	$15.77	$0.00	$59.57
	06/01/2021	$36.12	$8.60	$15.77	$0.00	$60.49
	12/01/2021	$37.03	$8.60	$15.77	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER"						
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	05/01/2020	$44.73	$12.50	$15.70	$0.00	$72.93
	11/01/2020	$45.73	$12.50	$15.70	$0.00	$73.93
	05/01/2021	$46.88	$12.50	$15.70	$0.00	$75.08
	11/01/2021	$47.88	$12.50	$15.70	$0.00	$76.08
	05/01/2022	$49.03	$12.50	$15.70	$0.00	$77.23
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	05/01/2020	$46.23	$12.50	$15.70	$0.00	$74.43
	11/01/2020	$47.24	$12.50	$15.70	$0.00	$75.44
	05/01/2021	$48.40	$12.50	$15.70	$0.00	$76.60
	11/01/2021	$49.41	$12.50	$15.70	$0.00	$77.61
	05/01/2022	$50.57	$12.50	$15.70	$0.00	$78.77
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	05/01/2020	$22.64	$12.50	$15.70	$0.00	$50.84
	11/01/2020	$23.23	$12.50	$15.70	$0.00	$51.43
	05/01/2021	$23.91	$12.50	$15.70	$0.00	$52.11
	11/01/2021	$24.51	$12.50	$15.70	$0.00	$52.71
	05/01/2022	$25.18	$12.50	$15.70	$0.00	$53.38
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER *ELECTRICIANS LOCAL 96*	07/01/2019	$44.07	$10.72	$16.04	$0.00	$70.83
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINT/COMMISSIONING *ELECTRICIANS LOCAL 96*	07/01/2019	$44.07	$10.72	$16.04	$0.00	$70.83
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIREMAN (ASST. ENGINEER) *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$40.30	$13.00	$15.70	$0.00	$69.00
	12/01/2020	$41.25	$13.00	$15.70	$0.00	$69.95
	06/01/2021	$42.16	$13.00	$15.70	$0.00	$70.86
	12/01/2021	$43.11	$13.00	$15.70	$0.00	$71.81
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER *LABORERS - ZONE 2*	06/01/2020	$23.50	$8.60	$15.77	$0.00	$47.87
	12/01/2020	$24.50	$8.60	$15.77	$0.00	$48.87
	06/01/2021	$24.50	$8.60	$15.77	$0.00	$48.87
	12/01/2021	$24.50	$8.60	$15.77	$0.00	$48.87
For apprentice rates see "Apprentice- LABORER"						
FLOORCOVERER *FLOORCOVERERS LOCAL 2168 ZONE I*	03/01/2020	$47.05	$9.40	$19.25	$0.00	$75.70
	09/01/2020	$47.85	$9.40	$19.25	$0.00	$76.50
	03/01/2021	$48.65	$9.40	$19.25	$0.00	$77.30
	09/01/2021	$49.45	$9.40	$19.25	$0.00	$78.10
	03/01/2022	$50.25	$9.40	$19.25	$0.00	$78.90

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *FLOORCOVERER - Local 2168 Zone I*

Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.53	$9.40	$1.79	$0.00	$34.72
2	55	$25.88	$9.40	$1.79	$0.00	$37.07
3	60	$28.23	$9.40	$13.88	$0.00	$51.51
4	65	$30.58	$9.40	$13.88	$0.00	$53.86
5	70	$32.94	$9.40	$15.67	$0.00	$58.01
6	75	$35.29	$9.40	$15.67	$0.00	$60.36
7	80	$37.64	$9.40	$17.46	$0.00	$64.50
8	85	$39.99	$9.40	$17.46	$0.00	$66.85

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.93	$9.40	$1.79	$0.00	$35.12
2	55	$26.32	$9.40	$1.79	$0.00	$37.51
3	60	$28.71	$9.40	$13.88	$0.00	$51.99
4	65	$31.10	$9.40	$13.88	$0.00	$54.38
5	70	$33.50	$9.40	$15.67	$0.00	$58.57
6	75	$35.89	$9.40	$15.67	$0.00	$60.96
7	80	$38.28	$9.40	$17.46	$0.00	$65.14
8	85	$40.67	$9.40	$17.46	$0.00	$67.53

Notes: Steps are 750 hrs.
% After 09/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)
Step 1&2 $32.36/ 3&4 $38.80/ 5&6 $58.01/ 7&8 $64.50

Apprentice to Journeyworker Ratio:1:1

FORK LIFT/CHERRY PICKER *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$49.33	$13.00	$15.70	$0.00	$78.03
	12/01/2020	$50.48	$13.00	$15.70	$0.00	$79.18
	06/01/2021	$51.58	$13.00	$15.70	$0.00	$80.28
	12/01/2021	$52.73	$13.00	$15.70	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GENERATOR/LIGHTING PLANT/HEATERS *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$32.72	$13.00	$15.70	$0.00	$61.42
	12/01/2020	$33.50	$13.00	$15.70	$0.00	$62.20
	06/01/2021	$34.25	$13.00	$15.70	$0.00	$62.95
	12/01/2021	$35.04	$13.00	$15.70	$0.00	$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) *GLAZIERS LOCAL 35 (ZONE 2)*	07/01/2020	$41.01	$8.25	$22.40	$0.00	$71.66
	01/01/2021	$41.56	$8.25	$22.75	$0.00	$72.56

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *GLAZIER - Local 35 Zone 2*

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.51	$8.25	$0.00	$0.00	$28.76
2	55	$22.56	$8.25	$6.05	$0.00	$36.86
3	60	$24.61	$8.25	$6.60	$0.00	$39.46
4	65	$26.66	$8.25	$7.15	$0.00	$42.06
5	70	$28.71	$8.25	$19.10	$0.00	$56.06
6	75	$30.76	$8.25	$19.65	$0.00	$58.66
7	80	$32.81	$8.25	$20.20	$0.00	$61.26
8	90	$36.91	$8.25	$21.30	$0.00	$66.46

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.78	$8.25	$0.00	$0.00	$29.03
2	55	$22.86	$8.25	$6.16	$0.00	$37.27
3	60	$24.94	$8.25	$6.72	$0.00	$39.91
4	65	$27.01	$8.25	$7.28	$0.00	$42.54
5	70	$29.09	$8.25	$19.39	$0.00	$56.73
6	75	$31.17	$8.25	$19.95	$0.00	$59.37
7	80	$33.25	$8.25	$20.51	$0.00	$62.01
8	90	$37.40	$8.25	$21.63	$0.00	$67.28

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

HOISTING ENGINEER/CRANES/GRADALLS *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$49.33	$13.00	$15.70	$0.00	$78.03
	12/01/2020	$50.48	$13.00	$15.70	$0.00	$79.18
	06/01/2021	$51.58	$13.00	$15.70	$0.00	$80.28
	12/01/2021	$52.73	$13.00	$15.70	$0.00	$81.43

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *OPERATING ENGINEERS - Local 4*

Effective Date - 06/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$27.13	$13.00	$0.00	$0.00	$40.13
2	60	$29.60	$13.00	$15.70	$0.00	$58.30
3	65	$32.06	$13.00	$15.70	$0.00	$60.76
4	70	$34.53	$13.00	$15.70	$0.00	$63.23
5	75	$37.00	$13.00	$15.70	$0.00	$65.70
6	80	$39.46	$13.00	$15.70	$0.00	$68.16
7	85	$41.93	$13.00	$15.70	$0.00	$70.63
8	90	$44.40	$13.00	$15.70	$0.00	$73.10

Effective Date - 12/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$27.76	$13.00	$0.00	$0.00	$40.76
2	60	$30.29	$13.00	$15.70	$0.00	$58.99
3	65	$32.81	$13.00	$15.70	$0.00	$61.51
4	70	$35.34	$13.00	$15.70	$0.00	$64.04
5	75	$37.86	$13.00	$15.70	$0.00	$66.56
6	80	$40.38	$13.00	$15.70	$0.00	$69.08
7	85	$42.91	$13.00	$15.70	$0.00	$71.61
8	90	$45.43	$13.00	$15.70	$0.00	$74.13

Notes:

Apprentice to Journeyworker Ratio:1:6

HVAC (DUCTWORK) *SHEETMETAL WORKERS LOCAL 17 - A*	02/01/2020	$49.36	$13.35	$24.12	$2.61	$89.44
	08/01/2020	$50.96	$13.35	$24.12	$2.66	$91.09
	02/01/2021	$52.61	$13.35	$24.12	$2.71	$92.79
	08/01/2021	$54.36	$13.35	$24.12	$2.76	$94.59
	02/01/2022	$56.11	$13.35	$24.12	$2.81	$96.39
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (ELECTRICAL CONTROLS) *ELECTRICIANS LOCAL 96*	07/01/2019	$44.07	$10.72	$16.04	$0.00	$70.83
For apprentice rates see "Apprentice- ELECTRICIAN"						
HVAC (TESTING AND BALANCING - AIR) *SHEETMETAL WORKERS LOCAL 17 - A*	02/01/2020	$49.36	$13.35	$24.12	$2.61	$89.44
	08/01/2020	$50.96	$13.35	$24.12	$2.66	$91.09
	02/01/2021	$52.61	$13.35	$24.12	$2.71	$92.79
	08/01/2021	$54.36	$13.35	$24.12	$2.76	$94.59
	02/01/2022	$56.11	$13.35	$24.12	$2.81	$96.39
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING -WATER) *PIPEFITTERS LOCAL 537*	03/01/2020	$56.19	$10.95	$19.74	$0.00	$86.88
	09/01/2020	$57.69	$10.95	$19.74	$0.00	$88.38
	03/01/2021	$59.19	$10.95	$19.74	$0.00	$89.88
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HVAC MECHANIC *PIPEFITTERS LOCAL 537*	03/01/2020	$56.19	$10.95	$19.74	$0.00	$86.88
	09/01/2020	$57.69	$10.95	$19.74	$0.00	$88.38
	03/01/2021	$59.19	$10.95	$19.74	$0.00	$89.88
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HYDRAULIC DRILLS *LABORERS - ZONE 2*	06/01/2020	$34.81	$8.60	$15.77	$0.00	$59.18
	12/01/2020	$35.70	$8.60	$15.77	$0.00	$60.07
	06/01/2021	$36.62	$8.60	$15.77	$0.00	$60.99
	12/01/2021	$37.53	$8.60	$15.77	$0.00	$61.90
For apprentice rates see "Apprentice- LABORER"						
INSULATOR (PIPES & TANKS) *HEAT & FROST INSULATORS LOCAL 6 (BOSTON)*	09/01/2019	$48.44	$12.80	$16.40	$0.00	$77.64

Apprentice - *ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Boston*

Effective Date - 09/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.22	$12.80	$11.90	$0.00	$48.92
2	60	$29.06	$12.80	$12.80	$0.00	$54.66
3	70	$33.91	$12.80	$13.70	$0.00	$60.41
4	80	$38.75	$12.80	$14.60	$0.00	$66.15

Notes:
Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

IRONWORKER/WELDER *IRONWORKERS LOCAL 7 (WORCESTER AREA)*	03/16/2019	$46.36	$8.00	$23.50	$0.00	$77.86

Apprentice - *IRONWORKER - Local 7 Worcester*

Effective Date - 03/16/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$27.82	$8.00	$23.50	$0.00	$59.32
2	70	$32.45	$8.00	$23.50	$0.00	$63.95
3	75	$34.77	$8.00	$23.50	$0.00	$66.27
4	80	$37.09	$8.00	$23.50	$0.00	$68.59
5	85	$39.41	$8.00	$23.50	$0.00	$70.91
6	90	$41.72	$8.00	$23.50	$0.00	$73.22

Notes:
Structural 1:6; Ornamental 1:4

Apprentice to Journeyworker Ratio:

JACKHAMMER & PAVING BREAKER OPERATOR *LABORERS - ZONE 2*	06/01/2020	$34.31	$8.60	$15.77	$0.00	$58.68
	12/01/2020	$35.20	$8.60	$15.77	$0.00	$59.57
	06/01/2021	$36.12	$8.60	$15.77	$0.00	$60.49
	12/01/2021	$37.03	$8.60	$15.77	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER *LABORERS - ZONE 2*	06/01/2020	$34.06	$8.60	$15.77	$0.00	$58.43
	12/01/2020	$34.95	$8.60	$15.77	$0.00	$59.32
	06/01/2021	$35.87	$8.60	$15.77	$0.00	$60.24
	12/01/2021	$36.78	$8.60	$15.77	$0.00	$61.15

Apprentice - *LABORER - Zone 2*

Effective Date - 06/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$20.44	$8.60	$15.77	$0.00	$44.81
2	70	$23.84	$8.60	$15.77	$0.00	$48.21
3	80	$27.25	$8.60	$15.77	$0.00	$51.62
4	90	$30.65	$8.60	$15.77	$0.00	$55.02

Effective Date - 12/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$20.97	$8.60	$15.77	$0.00	$45.34
2	70	$24.47	$8.60	$15.77	$0.00	$48.84
3	80	$27.96	$8.60	$15.77	$0.00	$52.33
4	90	$31.46	$8.60	$15.77	$0.00	$55.83

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER: CARPENTER TENDER *LABORERS - ZONE 2*	06/01/2020	$34.06	$8.60	$15.77	$0.00	$58.43
	12/01/2020	$34.95	$8.60	$15.77	$0.00	$59.32
	06/01/2021	$35.87	$8.60	$15.77	$0.00	$60.24
	12/01/2021	$36.78	$8.60	$15.77	$0.00	$61.15
For apprentice rates see "Apprentice- LABORER"						
LABORER: CEMENT FINISHER TENDER *LABORERS - ZONE 2*	06/01/2020	$34.06	$8.60	$15.77	$0.00	$58.43
	12/01/2020	$34.95	$8.60	$15.77	$0.00	$59.32
	06/01/2021	$35.87	$8.60	$15.77	$0.00	$60.24
	12/01/2021	$36.78	$8.60	$15.77	$0.00	$61.15
For apprentice rates see "Apprentice- LABORER"						
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER *LABORERS - ZONE 2*	06/01/2020	$34.15	$8.60	$15.83	$0.00	$58.58
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER *LABORERS - ZONE 2*	06/01/2020	$34.31	$8.60	$15.77	$0.00	$58.68
	12/01/2020	$35.20	$8.60	$15.77	$0.00	$59.57
	06/01/2021	$36.12	$8.60	$15.77	$0.00	$60.49
	12/01/2021	$37.03	$8.60	$15.77	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER"						
LABORER: MULTI-TRADE TENDER *LABORERS - ZONE 2*	06/01/2020	$34.06	$8.60	$15.77	$0.00	$58.43
	12/01/2020	$34.95	$8.60	$15.77	$0.00	$59.32
	06/01/2021	$35.87	$8.60	$15.77	$0.00	$60.24
	12/01/2021	$36.78	$8.60	$15.77	$0.00	$61.15
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: TREE REMOVER *LABORERS - ZONE 2*	06/01/2020	$34.06	$8.60	$15.77	$0.00	$58.43
	12/01/2020	$34.95	$8.60	$15.77	$0.00	$59.32
	06/01/2021	$35.87	$8.60	$15.77	$0.00	$60.24
	12/01/2021	$36.78	$8.60	$15.77	$0.00	$61.15
This classification applies to the removal of standing trees, and the trimming and removal of branches and limbs when related to public works construction or site clearance incidental to construction . For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR *LABORERS - ZONE 2*	06/01/2020	$34.31	$8.60	$15.77	$0.00	$58.68
	12/01/2020	$35.20	$8.60	$15.77	$0.00	$59.57
	06/01/2021	$36.12	$8.60	$15.77	$0.00	$60.49
	12/01/2021	$37.03	$8.60	$15.77	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER"						
MARBLE & TILE FINISHERS *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	02/01/2020	$41.49	$10.75	$20.12	$0.00	$72.36
	08/01/2020	$42.57	$10.75	$20.27	$0.00	$73.59
	02/01/2021	$43.08	$10.75	$20.27	$0.00	$74.10
	08/01/2021	$44.20	$10.75	$20.43	$0.00	$75.38
	02/01/2022	$44.67	$10.75	$20.43	$0.00	$75.85

Apprentice - *MARBLE & TILE FINISHER - Local 3 Marble & Tile*

Effective Date - 02/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.75	$10.75	$20.12	$0.00	$51.62
2	60	$24.89	$10.75	$20.12	$0.00	$55.76
3	70	$29.04	$10.75	$20.12	$0.00	$59.91
4	80	$33.19	$10.75	$20.12	$0.00	$64.06
5	90	$37.34	$10.75	$20.12	$0.00	$68.21

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.29	$10.75	$20.27	$0.00	$52.31
2	60	$25.54	$10.75	$20.27	$0.00	$56.56
3	70	$29.80	$10.75	$20.27	$0.00	$60.82
4	80	$34.06	$10.75	$20.27	$0.00	$65.08
5	90	$38.31	$10.75	$20.27	$0.00	$69.33

Notes:

Apprentice to Journeyworker Ratio:1:3

MARBLE MASONS,TILELAYERS & TERRAZZO MECH *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	02/01/2020	$54.42	$10.75	$21.93	$0.00	$87.10
	08/01/2020	$55.77	$10.75	$22.08	$0.00	$88.60
	02/01/2021	$56.41	$10.75	$22.08	$0.00	$89.24
	08/01/2021	$57.81	$10.75	$22.24	$0.00	$90.80
	02/01/2022	$58.38	$10.75	$22.24	$0.00	$91.37

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *MARBLE-TILE-TERRAZZO MECHANIC - Local 3 Marble & Tile*

Effective Date - 02/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.21	$10.75	$21.93	$0.00	$59.89
2	60	$32.65	$10.75	$21.93	$0.00	$65.33
3	70	$38.09	$10.75	$21.93	$0.00	$70.77
4	80	$43.54	$10.75	$21.93	$0.00	$76.22
5	90	$48.98	$10.75	$21.93	$0.00	$81.66

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.89	$10.75	$22.08	$0.00	$60.72
2	60	$33.46	$10.75	$22.08	$0.00	$66.29
3	70	$39.04	$10.75	$22.08	$0.00	$71.87
4	80	$44.62	$10.75	$22.08	$0.00	$77.45
5	90	$50.19	$10.75	$22.08	$0.00	$83.02

Notes:

Apprentice to Journeyworker Ratio:1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES) *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$48.81	$13.00	$15.70	$0.00	$77.51
	12/01/2020	$49.95	$13.00	$15.70	$0.00	$78.65
	06/01/2021	$51.04	$13.00	$15.70	$0.00	$79.74
	12/01/2021	$52.18	$13.00	$15.70	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MECHANICS MAINTENANCE *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$48.81	$13.00	$15.70	$0.00	$77.51
	12/01/2020	$49.95	$13.00	$15.70	$0.00	$78.65
	06/01/2021	$51.04	$13.00	$15.70	$0.00	$79.74
	12/01/2021	$52.18	$13.00	$15.70	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MILLWRIGHT (Zone 2) *MILLWRIGHTS LOCAL 1121 - Zone 2*	04/01/2019	$38.87	$9.90	$18.50	$0.00	$67.27

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *MILLWRIGHT - Local 1121 Zone 2*

Effective Date - 04/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$21.38	$9.90	$5.31	$0.00	$36.59
2	65	$25.27	$9.90	$15.13	$0.00	$50.30
3	75	$29.15	$9.90	$16.10	$0.00	$55.15
4	85	$33.04	$9.90	$17.06	$0.00	$60.00

Notes:

Steps are 2,000 hours

Apprentice to Journeyworker Ratio:1:5

MORTAR MIXER *LABORERS - ZONE 2*	06/01/2020	$34.31	$8.60	$15.77	$0.00	$58.68
	12/01/2020	$35.20	$8.60	$15.77	$0.00	$59.57
	06/01/2021	$36.12	$8.60	$15.77	$0.00	$60.49
	12/01/2021	$37.03	$8.60	$15.77	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER"						
OILER (OTHER THAN TRUCK CRANES,GRADALLS) *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$23.13	$13.00	$15.70	$0.00	$51.83
	12/01/2020	$23.70	$13.00	$15.70	$0.00	$52.40
	06/01/2021	$24.25	$13.00	$15.70	$0.00	$52.95
	12/01/2021	$24.83	$13.00	$15.70	$0.00	$53.53
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OILER (TRUCK CRANES, GRADALLS) *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$27.79	$13.00	$15.70	$0.00	$56.49
	12/01/2020	$28.47	$13.00	$15.70	$0.00	$57.17
	06/01/2021	$29.11	$13.00	$15.70	$0.00	$57.81
	12/01/2021	$29.79	$13.00	$15.70	$0.00	$58.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OTHER POWER DRIVEN EQUIPMENT - CLASS II *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$48.81	$13.00	$15.70	$0.00	$77.51
	12/01/2020	$49.95	$13.00	$15.70	$0.00	$78.65
	06/01/2021	$51.04	$13.00	$15.70	$0.00	$79.74
	12/01/2021	$52.18	$13.00	$15.70	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PAINTER (BRIDGES/TANKS) *PAINTERS LOCAL 35 - ZONE 2*	07/01/2020	$51.51	$8.25	$22.40	$0.00	$82.16
	01/01/2021	$52.06	$8.25	$22.75	$0.00	$83.06

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 - BRIDGES/TANKS*

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.76	$8.25	$0.00	$0.00	$34.01
2	55	$28.33	$8.25	$6.05	$0.00	$42.63
3	60	$30.91	$8.25	$6.60	$0.00	$45.76
4	65	$33.48	$8.25	$7.15	$0.00	$48.88
5	70	$36.06	$8.25	$19.10	$0.00	$63.41
6	75	$38.63	$8.25	$19.65	$0.00	$66.53
7	80	$41.21	$8.25	$20.20	$0.00	$69.66
8	90	$46.36	$8.25	$21.30	$0.00	$75.91

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.03	$8.25	$0.00	$0.00	$34.28
2	55	$28.63	$8.25	$6.16	$0.00	$43.04
3	60	$31.24	$8.25	$6.72	$0.00	$46.21
4	65	$33.84	$8.25	$7.28	$0.00	$49.37
5	70	$36.44	$8.25	$19.39	$0.00	$64.08
6	75	$39.05	$8.25	$19.95	$0.00	$67.25
7	80	$41.65	$8.25	$20.51	$0.00	$70.41
8	90	$46.85	$8.25	$21.63	$0.00	$76.73

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) *	07/01/2020	$41.21	$8.25	$22.40	$0.00	$71.86
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.*PAINTERS LOCAL 35 - ZONE 2*	01/01/2021	$42.96	$8.25	$22.75	$0.00	$73.96

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 Zone 2 - Spray/Sandblast - New*

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.61	$8.25	$0.00	$0.00	$28.86
2	55	$22.67	$8.25	$6.05	$0.00	$36.97
3	60	$24.73	$8.25	$6.60	$0.00	$39.58
4	65	$26.79	$8.25	$7.15	$0.00	$42.19
5	70	$28.85	$8.25	$19.10	$0.00	$56.20
6	75	$30.91	$8.25	$19.65	$0.00	$58.81
7	80	$32.97	$8.25	$20.20	$0.00	$61.42
8	90	$37.09	$8.25	$21.30	$0.00	$66.64

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.48	$8.25	$0.00	$0.00	$29.73
2	55	$23.63	$8.25	$6.16	$0.00	$38.04
3	60	$25.78	$8.25	$6.72	$0.00	$40.75
4	65	$27.92	$8.25	$7.28	$0.00	$43.45
5	70	$30.07	$8.25	$19.39	$0.00	$57.71
6	75	$32.22	$8.25	$19.95	$0.00	$60.42
7	80	$34.37	$8.25	$20.51	$0.00	$63.13
8	90	$38.66	$8.25	$21.63	$0.00	$68.54

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, REPAINT) *PAINTERS LOCAL 35 - ZONE 2*	07/01/2020	$40.47	$8.25	$22.40	$0.00	$71.12
	01/01/2021	$41.02	$8.25	$22.75	$0.00	$72.02

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 Zone 2 - Spray/Sandblast - Repaint*

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.24	$8.25	$0.00	$0.00	$28.49
2	55	$22.26	$8.25	$6.05	$0.00	$36.56
3	60	$24.28	$8.25	$6.60	$0.00	$39.13
4	65	$26.31	$8.25	$7.15	$0.00	$41.71
5	70	$28.33	$8.25	$19.10	$0.00	$55.68
6	75	$30.35	$8.25	$19.65	$0.00	$58.25
7	80	$32.38	$8.25	$20.20	$0.00	$60.83
8	90	$36.42	$8.25	$21.30	$0.00	$65.97

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.51	$8.25	$0.00	$0.00	$28.76
2	55	$22.56	$8.25	$6.16	$0.00	$36.97
3	60	$24.61	$8.25	$6.72	$0.00	$39.58
4	65	$26.66	$8.25	$7.28	$0.00	$42.19
5	70	$28.71	$8.25	$19.39	$0.00	$56.35
6	75	$30.77	$8.25	$19.95	$0.00	$58.97
7	80	$32.82	$8.25	$20.51	$0.00	$61.58
8	90	$36.92	$8.25	$21.63	$0.00	$66.80

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (TRAFFIC MARKINGS) *LABORERS - ZONE 2*	06/01/2020	$34.06	$8.60	$15.77	$0.00	$58.43
	12/01/2020	$34.95	$8.60	$15.77	$0.00	$59.32
	06/01/2021	$35.87	$8.60	$15.77	$0.00	$60.24
	12/01/2021	$36.78	$8.60	$15.77	$0.00	$61.15
For Apprentice rates see "Apprentice- LABORER"						
PAINTER / TAPER (BRUSH, NEW) *	07/01/2020	$41.01	$8.25	$22.40	$0.00	$71.66
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.*PAINTERS LOCAL 35 - ZONE 2*	01/01/2021	$41.56	$8.25	$22.75	$0.00	$72.56

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER - Local 35 Zone 2 - BRUSH NEW*

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.51	$8.25	$0.00	$0.00	$28.76
2	55	$22.56	$8.25	$6.05	$0.00	$36.86
3	60	$24.61	$8.25	$6.60	$0.00	$39.46
4	65	$26.66	$8.25	$7.15	$0.00	$42.06
5	70	$28.71	$8.25	$19.10	$0.00	$56.06
6	75	$30.76	$8.25	$19.65	$0.00	$58.66
7	80	$32.81	$8.25	$20.20	$0.00	$61.26
8	90	$36.91	$8.25	$21.30	$0.00	$66.46

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.78	$8.25	$0.00	$0.00	$29.03
2	55	$22.86	$8.25	$6.16	$0.00	$37.27
3	60	$24.94	$8.25	$6.72	$0.00	$39.91
4	65	$27.01	$8.25	$7.28	$0.00	$42.54
5	70	$29.09	$8.25	$19.39	$0.00	$56.73
6	75	$31.17	$8.25	$19.95	$0.00	$59.37
7	80	$33.25	$8.25	$20.51	$0.00	$62.01
8	90	$37.40	$8.25	$21.63	$0.00	$67.28

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT) *PAINTERS LOCAL 35 - ZONE 2*	07/01/2020	$39.07	$8.25	$22.40	$0.00	$69.72
	01/01/2021	$39.62	$8.25	$22.75	$0.00	$70.62

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 Zone 2 - BRUSH REPAINT*

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$19.54	$8.25	$0.00	$0.00	$27.79
2	55	$21.49	$8.25	$6.05	$0.00	$35.79
3	60	$23.44	$8.25	$6.60	$0.00	$38.29
4	65	$25.40	$8.25	$7.15	$0.00	$40.80
5	70	$27.35	$8.25	$19.10	$0.00	$54.70
6	75	$29.30	$8.25	$19.65	$0.00	$57.20
7	80	$31.26	$8.25	$20.20	$0.00	$59.71
8	90	$35.16	$8.25	$21.30	$0.00	$64.71

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$19.81	$8.25	$0.00	$0.00	$28.06
2	55	$21.79	$8.25	$6.16	$0.00	$36.20
3	60	$23.77	$8.25	$6.72	$0.00	$38.74
4	65	$25.75	$8.25	$7.28	$0.00	$41.28
5	70	$27.73	$8.25	$19.39	$0.00	$55.37
6	75	$29.72	$8.25	$19.95	$0.00	$57.92
7	80	$31.70	$8.25	$20.51	$0.00	$60.46
8	90	$35.66	$8.25	$21.63	$0.00	$65.54

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PANEL & PICKUP TRUCKS DRIVER *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2020	$34.98	$12.41	$13.72	$0.00	$61.11
	08/01/2020	$34.98	$12.91	$13.72	$0.00	$61.61
	12/01/2020	$34.98	$12.91	$14.82	$0.00	$62.71
	06/01/2021	$35.78	$12.91	$14.82	$0.00	$63.51
	08/01/2021	$35.78	$13.41	$14.82	$0.00	$64.01
	12/01/2021	$35.78	$13.41	$16.01	$0.00	$65.20
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) *PILE DRIVER LOCAL 56 (ZONE 1)* For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2019	$48.94	$9.90	$21.15	$0.00	$79.99
PILE DRIVER *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2019	$48.94	$9.90	$21.15	$0.00	$79.99

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PILE DRIVER - Local 56 Zone 1*

Effective Date - 08/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.47	$9.90	$21.15	$0.00	$55.52
2	60	$29.36	$9.90	$21.15	$0.00	$60.41
3	70	$34.26	$9.90	$21.15	$0.00	$65.31
4	75	$36.71	$9.90	$21.15	$0.00	$67.76
5	80	$39.15	$9.90	$21.15	$0.00	$70.20
6	80	$39.15	$9.90	$21.15	$0.00	$70.20
7	90	$44.05	$9.90	$21.15	$0.00	$75.10
8	90	$44.05	$9.90	$21.15	$0.00	$75.10

Notes:

Apprentice to Journeyworker Ratio:1:5

PIPEFITTER & STEAMFITTER *PIPEFITTERS LOCAL 537*	03/01/2020	$56.19	$10.95	$19.74	$0.00	$86.88
	09/01/2020	$57.69	$10.95	$19.74	$0.00	$88.38
	03/01/2021	$59.19	$10.95	$19.74	$0.00	$89.88

Apprentice - *PIPEFITTER - Local 537*

Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$22.48	$10.95	$8.00	$0.00	$41.43
2	45	$25.29	$10.95	$19.74	$0.00	$55.98
3	60	$33.71	$10.95	$19.74	$0.00	$64.40
4	70	$39.33	$10.95	$19.74	$0.00	$70.02
5	80	$44.95	$10.95	$19.74	$0.00	$75.64

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$23.08	$10.95	$8.00	$0.00	$42.03
2	45	$25.96	$10.95	$19.74	$0.00	$56.65
3	60	$34.61	$10.95	$19.74	$0.00	$65.30
4	70	$40.38	$10.95	$19.74	$0.00	$71.07
5	80	$46.15	$10.95	$19.74	$0.00	$76.84

Notes:

** 1:3; 3:15; 1:10 thereafter / Steps are 1 yr.
Refrig/AC Mechanic **1:1;1:2;2:4;3:6;4:8;5:10;6:12;7:14;8:17;9:20;10:23(Max)

Apprentice to Journeyworker Ratio:**

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PIPELAYER *LABORERS - ZONE 2*	06/01/2020	$34.31	$8.60	$15.77	$0.00	$58.68
	12/01/2020	$35.20	$8.60	$15.77	$0.00	$59.57
	06/01/2021	$36.12	$8.60	$15.77	$0.00	$60.49
	12/01/2021	$37.03	$8.60	$15.77	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER"						
PLUMBERS & GASFITTERS *PLUMBERS & GASFITTERS LOCAL 12*	03/01/2020	$58.69	$12.07	$17.26	$0.00	$88.02
	09/01/2020	$60.19	$12.07	$17.26	$0.00	$89.52
	03/01/2021	$61.69	$12.07	$17.26	$0.00	$91.02

Apprentice - *PLUMBER/GASFITTER - Local 12*

Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$20.54	$12.07	$6.24	$0.00	$38.85
2	40	$23.48	$12.07	$7.08	$0.00	$42.63
3	55	$32.28	$12.07	$9.63	$0.00	$53.98
4	65	$38.15	$12.07	$11.33	$0.00	$61.55
5	75	$44.02	$12.07	$13.03	$0.00	$69.12

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$21.07	$12.07	$6.24	$0.00	$39.38
2	40	$24.08	$12.07	$7.08	$0.00	$43.23
3	55	$33.10	$12.07	$9.63	$0.00	$54.80
4	65	$39.12	$12.07	$11.33	$0.00	$62.52
5	75	$45.14	$12.07	$13.03	$0.00	$70.24

Notes:

** 1:2; 2:6; 3:10; 4:14; 5:19/Steps are 1 yr
Step4 with lic$65.32, Step5 with lic$72.89

Apprentice to Journeyworker Ratio:**

PNEUMATIC CONTROLS (TEMP.) *PIPEFITTERS LOCAL 537*	03/01/2020	$56.19	$10.95	$19.74	$0.00	$86.88
	09/01/2020	$57.69	$10.95	$19.74	$0.00	$88.38
	03/01/2021	$59.17	$10.95	$19.74	$0.00	$89.86
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
PNEUMATIC DRILL/TOOL OPERATOR *LABORERS - ZONE 2*	06/01/2020	$34.31	$8.60	$15.77	$0.00	$58.68
	12/01/2020	$35.20	$8.60	$15.77	$0.00	$59.57
	06/01/2021	$36.12	$8.60	$15.77	$0.00	$60.49
	12/01/2021	$37.03	$8.60	$15.77	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER"						
POWDERMAN & BLASTER *LABORERS - ZONE 2*	06/01/2020	$35.06	$8.60	$15.77	$0.00	$59.43
	12/01/2020	$35.95	$8.60	$15.77	$0.00	$60.32
	06/01/2021	$36.87	$8.60	$15.77	$0.00	$61.24
	12/01/2021	$37.78	$8.60	$15.77	$0.00	$62.15
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
POWER SHOVEL/DERRICK/TRENCHING MACHINE *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$49.33	$13.00	$15.70	$0.00	$78.03
	12/01/2020	$50.48	$13.00	$15.70	$0.00	$79.18
	06/01/2021	$51.58	$13.00	$15.70	$0.00	$80.28
	12/01/2021	$52.73	$13.00	$15.70	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$49.33	$13.00	$15.70	$0.00	$78.03
	12/01/2020	$50.48	$13.00	$15.70	$0.00	$79.18
	06/01/2021	$51.58	$13.00	$15.70	$0.00	$80.28
	12/01/2021	$52.73	$13.00	$15.70	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$32.72	$13.00	$15.70	$0.00	$61.42
	12/01/2020	$33.50	$13.00	$15.70	$0.00	$62.20
	06/01/2021	$34.25	$13.00	$15.70	$0.00	$62.95
	12/01/2021	$35.04	$13.00	$15.70	$0.00	$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER *TEAMSTERS 170 - Dauphinais (Bellingham)*	01/01/2020	$24.00	$11.01	$2.50	$0.00	$37.51
RECLAIMERS *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$48.81	$13.00	$15.70	$0.00	$77.51
	12/01/2020	$49.95	$13.00	$15.70	$0.00	$78.65
	06/01/2021	$51.04	$13.00	$15.70	$0.00	$79.74
	12/01/2021	$52.18	$13.00	$15.70	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
RIDE-ON MOTORIZED BUGGY OPERATOR *LABORERS - ZONE 2*	06/01/2020	$34.31	$8.60	$15.77	$0.00	$58.68
	12/01/2020	$35.20	$8.60	$15.77	$0.00	$59.57
	06/01/2021	$36.12	$8.60	$15.77	$0.00	$60.49
	12/01/2021	$37.03	$8.60	$15.77	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER"						
ROLLER/SPREADER/MULCHING MACHINE *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$48.81	$13.00	$15.70	$0.00	$77.51
	12/01/2020	$49.95	$13.00	$15.70	$0.00	$78.65
	06/01/2021	$51.04	$13.00	$15.70	$0.00	$79.74
	12/01/2021	$52.18	$13.00	$15.70	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg) *ROOFERS LOCAL 33*	03/01/2020	$45.67	$11.50	$15.90	$0.00	$73.07
	08/01/2020	$47.10	$11.50	$15.90	$0.00	$74.50
	02/01/2021	$48.53	$11.50	$15.90	$0.00	$75.93
	08/01/2021	$49.96	$11.50	$15.90	$0.00	$77.36
	02/01/2022	$51.39	$11.50	$15.90	$0.00	$78.79

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *ROOFER - Local 33*

Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$22.84	$11.50	$3.69	$0.00	$38.03
2	60	$27.40	$11.50	$15.90	$0.00	$54.80
3	65	$29.69	$11.50	$15.90	$0.00	$57.09
4	75	$34.25	$11.50	$15.90	$0.00	$61.65
5	85	$38.82	$11.50	$15.90	$0.00	$66.22

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.55	$11.50	$3.69	$0.00	$38.74
2	60	$28.26	$11.50	$15.90	$0.00	$55.66
3	65	$30.62	$11.50	$15.90	$0.00	$58.02
4	75	$35.33	$11.50	$15.90	$0.00	$62.73
5	85	$40.04	$11.50	$15.90	$0.00	$67.44

Notes: ** 1:5, 2:6-10, the 1:10; Reroofing: 1:4, then 1:1
Step 1 is 2000 hrs.; Steps 2-5 are 1000 hrs.
(Hot Pitch Mechanics' receive $1.00 hr. above ROOFER)

Apprentice to Journeyworker Ratio:**

ROOFER SLATE / TILE / PRECAST CONCRETE *ROOFERS LOCAL 33*	03/01/2020	$45.92	$11.50	$15.90	$0.00	$73.32
	08/01/2020	$47.35	$11.50	$15.90	$0.00	$74.75
	02/01/2021	$48.78	$11.50	$15.90	$0.00	$76.18
	08/01/2021	$50.21	$11.50	$15.90	$0.00	$77.61
	02/01/2022	$51.64	$11.50	$15.90	$0.00	$79.04
For apprentice rates see "Apprentice- ROOFER"						
SHEETMETAL WORKER *SHEETMETAL WORKERS LOCAL 17 - A*	02/01/2020	$49.36	$13.35	$24.12	$2.61	$89.44
	08/01/2020	$50.96	$13.35	$24.12	$2.66	$91.09
	02/01/2021	$52.61	$13.35	$24.12	$2.71	$92.79
	08/01/2021	$54.36	$13.35	$24.12	$2.76	$94.59
	02/01/2022	$56.11	$13.35	$24.12	$2.81	$96.39

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *SHEET METAL WORKER - Local 17-A*

Effective Date - 02/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	$20.73	$13.35	$5.89	$0.00	$39.97
2	42	$20.73	$13.35	$5.89	$0.00	$39.97
3	47	$23.20	$13.35	$11.13	$1.43	$49.11
4	47	$23.20	$13.35	$11.13	$1.43	$49.11
5	52	$25.67	$13.35	$12.08	$1.53	$52.63
6	52	$25.67	$13.35	$12.33	$1.54	$52.89
7	60	$29.62	$13.35	$13.70	$1.70	$58.37
8	65	$32.08	$13.35	$15.15	$1.80	$62.38
9	75	$37.02	$13.35	$16.56	$2.01	$68.94
10	85	$41.96	$13.35	$17.96	$2.20	$75.47

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	$21.40	$13.35	$5.89	$0.00	$40.64
2	42	$21.40	$13.35	$5.89	$0.00	$40.64
3	47	$23.95	$13.35	$11.13	$1.45	$49.88
4	47	$23.95	$13.35	$11.13	$1.45	$49.88
5	52	$26.50	$13.35	$12.08	$1.56	$53.49
6	52	$26.50	$13.35	$12.33	$1.57	$53.75
7	60	$30.58	$13.35	$13.70	$1.73	$59.36
8	65	$33.12	$13.35	$15.15	$1.85	$63.47
9	75	$38.22	$13.35	$16.56	$2.04	$70.17
10	85	$43.32	$13.35	$17.96	$2.24	$76.87

Notes:
Steps are 6 mos.

Apprentice to Journeyworker Ratio:1:4

SPECIALIZED EARTH MOVING EQUIP < 35 TONS *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2020	$35.44	$12.41	$13.72	$0.00	$61.57
	08/01/2020	$35.44	$12.91	$13.72	$0.00	$62.07
	12/01/2020	$35.44	$12.91	$14.82	$0.00	$63.17
	06/01/2021	$36.24	$12.91	$14.82	$0.00	$63.97
	08/01/2021	$36.24	$13.41	$14.82	$0.00	$64.47
	12/01/2021	$36.24	$13.41	$16.01	$0.00	$65.66
SPECIALIZED EARTH MOVING EQUIP > 35 TONS *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2020	$35.73	$12.41	$13.72	$0.00	$61.86
	08/01/2020	$35.73	$12.91	$13.72	$0.00	$62.36
	12/01/2020	$35.73	$12.91	$14.82	$0.00	$63.46
	06/01/2021	$36.53	$12.91	$14.82	$0.00	$64.26
	08/01/2021	$36.53	$13.41	$14.82	$0.00	$64.76
	12/01/2021	$36.53	$13.41	$16.01	$0.00	$65.95

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SPRINKLER FITTER *SPRINKLER FITTERS LOCAL 550 - (Section A) Zone 1*	03/01/2020	$60.82	$9.68	$20.55	$0.00	$91.05
	10/01/2020	$62.32	$9.68	$20.55	$0.00	$92.55
	03/01/2021	$63.82	$9.68	$20.55	$0.00	$94.05

Apprentice - *SPRINKLER FITTER - Local 550 (Section A) Zone 1*

Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$21.29	$9.68	$11.61	$0.00	$42.58
2	40	$24.33	$9.68	$12.30	$0.00	$46.31
3	45	$27.37	$9.68	$12.99	$0.00	$50.04
4	50	$30.41	$9.68	$13.73	$0.00	$53.82
5	55	$33.45	$9.68	$14.36	$0.00	$57.49
6	60	$36.49	$9.68	$15.05	$0.00	$61.22
7	65	$39.53	$9.68	$15.74	$0.00	$64.95
8	70	$42.57	$9.68	$16.43	$0.00	$68.68
9	75	$45.62	$9.68	$17.11	$0.00	$72.41
10	80	$48.66	$9.68	$17.80	$0.00	$76.14

Effective Date - 10/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$21.81	$9.68	$11.61	$0.00	$43.10
2	40	$24.93	$9.68	$12.30	$0.00	$46.91
3	45	$28.04	$9.68	$12.99	$0.00	$50.71
4	50	$31.16	$9.68	$13.73	$0.00	$54.57
5	55	$34.28	$9.68	$14.36	$0.00	$58.32
6	60	$37.39	$9.68	$15.05	$0.00	$62.12
7	65	$40.51	$9.68	$15.74	$0.00	$65.93
8	70	$43.62	$9.68	$16.43	$0.00	$69.73
9	75	$46.74	$9.68	$17.11	$0.00	$73.53
10	80	$49.86	$9.68	$17.80	$0.00	$77.34

Notes: Apprentice entered prior 9/30/10:
40/45/50/55/60/65/70/75/80/85
Steps are 850 hours

Apprentice to Journeyworker Ratio:1:3

STEAM BOILER OPERATOR *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$48.81	$13.00	$15.70	$0.00	$77.51
	12/01/2020	$49.95	$13.00	$15.70	$0.00	$78.65
	06/01/2021	$51.04	$13.00	$15.70	$0.00	$79.74
	12/01/2021	$52.18	$13.00	$15.70	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$48.81	$13.00	$15.70	$0.00	$77.51
	12/01/2020	$49.95	$13.00	$15.70	$0.00	$78.65
	06/01/2021	$51.04	$13.00	$15.70	$0.00	$79.74
	12/01/2021	$52.18	$13.00	$15.70	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TERRAZZO FINISHERS *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	02/01/2020	$53.34	$10.75	$21.94	$0.00	$86.03
	08/01/2020	$54.69	$10.75	$22.09	$0.00	$87.53
	02/01/2021	$55.33	$10.75	$22.09	$0.00	$88.17
	08/01/2021	$56.73	$10.75	$22.25	$0.00	$89.73
	02/01/2022	$57.32	$10.75	$22.25	$0.00	$90.32

Apprentice - *TERRAZZO FINISHER - Local 3 Marble & Tile*

Effective Date - 02/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.67	$10.75	$21.94	$0.00	$59.36
2	60	$32.00	$10.75	$21.94	$0.00	$64.69
3	70	$37.34	$10.75	$21.94	$0.00	$70.03
4	80	$42.67	$10.75	$21.94	$0.00	$75.36
5	90	$48.01	$10.75	$21.94	$0.00	$80.70

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.35	$10.75	$22.09	$0.00	$60.19
2	60	$32.81	$10.75	$22.09	$0.00	$65.65
3	70	$38.28	$10.75	$22.09	$0.00	$71.12
4	80	$43.75	$10.75	$22.09	$0.00	$76.59
5	90	$49.22	$10.75	$22.09	$0.00	$82.06

Notes:

Apprentice to Journeyworker Ratio:1:3

TEST BORING DRILLER *LABORERS - FOUNDATION AND MARINE*	06/01/2020	$40.55	$8.60	$17.24	$0.00	$66.39
	12/01/2020	$41.53	$8.60	$17.24	$0.00	$67.37
	06/01/2021	$42.55	$8.60	$17.24	$0.00	$68.39
	12/01/2021	$43.56	$8.60	$17.24	$0.00	$69.40
For apprentice rates see "Apprentice- LABORER"						
TEST BORING DRILLER HELPER *LABORERS - FOUNDATION AND MARINE*	06/01/2020	$39.27	$8.60	$17.24	$0.00	$65.11
	12/01/2020	$40.25	$8.60	$17.24	$0.00	$66.09
	06/01/2021	$41.27	$8.60	$17.24	$0.00	$67.11
	12/01/2021	$42.28	$8.60	$17.24	$0.00	$68.12
For apprentice rates see "Apprentice- LABORER"						
TEST BORING LABORER *LABORERS - FOUNDATION AND MARINE*	06/01/2020	$39.15	$8.60	$17.24	$0.00	$64.99
	12/01/2020	$40.13	$8.60	$17.24	$0.00	$65.97
	06/01/2021	$41.15	$8.60	$17.24	$0.00	$66.99
	12/01/2021	$42.16	$8.60	$17.24	$0.00	$68.00
For apprentice rates see "Apprentice- LABORER"						
TRACTORS/PORTABLE STEAM GENERATORS *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$48.81	$13.00	$15.70	$0.00	$77.51
	12/01/2020	$49.95	$13.00	$15.70	$0.00	$78.65
	06/01/2021	$51.04	$13.00	$15.70	$0.00	$79.74
	12/01/2021	$52.18	$13.00	$15.70	$0.00	$80.88

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2020	$36.02	$12.41	$13.72	$0.00	$62.15
	08/01/2020	$36.02	$12.91	$13.72	$0.00	$62.65
	12/01/2020	$36.02	$12.91	$14.82	$0.00	$63.75
	06/01/2021	$36.82	$12.91	$14.82	$0.00	$64.55
	08/01/2021	$36.82	$13.41	$14.82	$0.00	$65.05
	12/01/2021	$36.82	$13.41	$16.01	$0.00	$66.24
TUNNEL WORK - COMPRESSED AIR *LABORERS (COMPRESSED AIR)*	06/01/2020	$51.38	$8.60	$17.69	$0.00	$77.67
	12/01/2020	$52.36	$8.60	$17.69	$0.00	$78.65
	06/01/2021	$53.38	$8.60	$17.69	$0.00	$79.67
	12/01/2021	$54.39	$8.60	$17.69	$0.00	$80.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) *LABORERS (COMPRESSED AIR)*	06/01/2020	$53.38	$8.60	$17.69	$0.00	$79.67
	12/01/2020	$54.36	$8.60	$17.69	$0.00	$80.65
	06/01/2021	$55.38	$8.60	$17.69	$0.00	$81.67
	12/01/2021	$56.39	$8.60	$17.69	$0.00	$82.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR *LABORERS (FREE AIR TUNNEL)*	06/01/2020	$43.45	$8.60	$17.69	$0.00	$69.74
	12/01/2020	$44.43	$8.60	$17.69	$0.00	$70.72
	06/01/2021	$45.45	$8.60	$17.69	$0.00	$71.74
	12/01/2021	$46.46	$8.60	$17.69	$0.00	$72.75
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR (HAZ. WASTE) *LABORERS (FREE AIR TUNNEL)*	06/01/2020	$45.45	$8.60	$17.69	$0.00	$71.74
	12/01/2020	$46.43	$8.60	$17.69	$0.00	$72.72
	06/01/2021	$47.45	$8.60	$17.69	$0.00	$73.74
	12/01/2021	$48.46	$8.60	$17.69	$0.00	$74.75
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2020	$35.44	$12.41	$13.72	$0.00	$61.57
	08/01/2020	$35.44	$12.91	$13.72	$0.00	$62.07
	12/01/2020	$35.44	$12.91	$14.82	$0.00	$63.17
	06/01/2021	$36.24	$12.91	$14.82	$0.00	$63.97
	08/01/2021	$36.24	$13.41	$14.82	$0.00	$64.47
	12/01/2021	$36.24	$13.41	$16.01	$0.00	$65.66
VOICE-DATA-VIDEO TECHNICIAN *ELECTRICIANS LOCAL 96*	07/01/2019	$30.10	$10.57	$14.15	$0.00	$54.82

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *VOICE-DATA-VIDEO TECHNICIAN - Local 96*

Effective Date - 07/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$15.05	$10.57	$3.83	$0.00	$29.45
2	55	$16.56	$10.57	$3.88	$0.00	$31.01
3	60	$18.06	$10.57	$13.79	$0.00	$42.42
4	65	$19.57	$10.57	$13.84	$0.00	$43.98
5	70	$21.07	$10.57	$13.88	$0.00	$45.52
6	75	$22.58	$10.57	$13.93	$0.00	$47.08
7	80	$24.08	$10.57	$13.97	$0.00	$48.62
8	85	$25.59	$10.57	$14.02	$0.00	$50.18

Notes:

Apprentice to Journeyworker Ratio:1:1

WAGON DRILL OPERATOR *LABORERS - ZONE 2*	06/01/2020	$34.31	$8.60	$15.77	$0.00	$58.68
	12/01/2020	$35.20	$8.60	$15.77	$0.00	$59.57
	06/01/2021	$36.12	$8.60	$15.77	$0.00	$60.49
	12/01/2021	$37.03	$8.60	$15.77	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER"						
WASTE WATER PUMP OPERATOR *OPERATING ENGINEERS LOCAL 4*	06/01/2020	$49.33	$13.00	$15.70	$0.00	$78.03
	12/01/2020	$50.48	$13.00	$15.70	$0.00	$79.18
	06/01/2021	$51.58	$13.00	$15.70	$0.00	$80.28
	12/01/2021	$52.73	$13.00	$15.70	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER *PLUMBERS & GASFITTERS LOCAL 12*	03/01/2020	$58.69	$12.07	$17.26	$0.00	$88.02
	09/01/2020	$60.19	$12.07	$17.26	$0.00	$89.52
	03/01/2021	$61.69	$12.07	$17.26	$0.00	$91.02
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						
Outside Electrical - East						
CABLE TECHNICIAN (Power Zone) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	09/01/2019	$28.83	$8.75	$1.86	$0.00	$39.44
	08/30/2020	$29.67	$9.25	$1.89	$0.00	$40.81
For apprentice rates see "Apprentice- LINEMAN"						
CABLEMAN (Underground Ducts & Cables) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	09/01/2019	$40.84	$8.75	$10.02	$0.00	$59.61
	08/30/2020	$42.03	$9.25	$10.27	$0.00	$61.55
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN CDL *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	09/01/2019	$33.64	$8.75	$9.86	$0.00	$52.25
	08/30/2020	$34.62	$9.25	$10.07	$0.00	$53.94
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN -Inexperienced (<2000 Hrs) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	09/01/2019	$26.43	$8.75	$1.79	$0.00	$36.97
	08/30/2020	$27.20	$9.25	$1.82	$0.00	$38.27
For apprentice rates see "Apprentice- LINEMAN"						
EQUIPMENT OPERATOR (Class A CDL) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	09/01/2019	$40.84	$8.75	$14.10	$0.00	$63.69
	08/30/2020	$42.03	$9.25	$14.35	$0.00	$65.63
For apprentice rates see "Apprentice- LINEMAN"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
EQUIPMENT OPERATOR (Class B CDL) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	09/01/2019	$36.04	$8.75	$10.65	$0.00	$55.44
	08/30/2020	$37.09	$9.25	$10.87	$0.00	$57.21
GROUNDMAN *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	09/01/2019	$21.62	$8.75	$1.65	$0.00	$32.02
	08/30/2020	$22.25	$9.25	$1.67	$0.00	$33.17
GROUNDMAN -Inexperienced (<2000 Hrs.) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104* For apprentice rates see "Apprentice- LINEMAN"	09/01/2019	$26.43	$8.75	$1.79	$0.00	$36.97
	08/30/2020	$27.20	$9.25	$1.82	$0.00	$38.27
JOURNEYMAN LINEMAN *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	09/01/2019	$48.05	$8.75	$17.19	$0.00	$73.99
	08/30/2020	$49.45	$9.25	$17.48	$0.00	$76.18

Apprentice - *LINEMAN (Outside Electrical) - East Local 104*

Effective Date - 09/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$28.83	$8.75	$3.36	$0.00	$40.94
2	65	$31.23	$8.75	$3.44	$0.00	$43.42
3	70	$33.64	$8.75	$3.51	$0.00	$45.90
4	75	$36.04	$8.75	$5.08	$0.00	$49.87
5	80	$38.44	$8.75	$5.15	$0.00	$52.34
6	85	$40.84	$8.75	$5.23	$0.00	$54.82
7	90	$43.25	$8.75	$7.30	$0.00	$59.30

Effective Date - 08/30/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$29.67	$9.25	$3.39	$0.00	$42.31
2	65	$32.14	$9.25	$3.46	$0.00	$44.85
3	70	$34.62	$9.25	$3.54	$0.00	$47.41
4	75	$37.09	$9.25	$5.11	$0.00	$51.45
5	80	$39.56	$9.25	$5.19	$0.00	$54.00
6	85	$42.03	$9.25	$5.26	$0.00	$56.54
7	90	$44.51	$9.25	$7.34	$0.00	$61.10

Notes:

Apprentice to Journeyworker Ratio:1:2

TELEDATA CABLE SPLICER *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	02/04/2019	$30.73	$4.70	$3.17	$0.00	$38.60
TELEDATA LINEMAN/EQUIPMENT OPERATOR *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	02/04/2019	$28.93	$4.70	$3.14	$0.00	$36.77
TELEDATA WIREMAN/INSTALLER/TECHNICIAN *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	02/04/2019	$28.93	$4.70	$3.14	$0.00	$36.77

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Additional Apprentice Information:

Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the pre-determined hourly wage rate established by the Commissioner under the provisions of the M.G.L. c. 149, ss. 26-27D. Apprentice ratios are established by the Division of Apprenticeship Training pursuant to M.G.L. c. 23, ss. 11E-11L.

All apprentices must be registered with the Division of Apprenticeship Training in accordance with M.G.L. c. 23, ss. 11E-11L.

All steps are six months (1000 hours.)
Ratios are expressed in allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified.

** Multiple ratios are listed in the comment field.
*** APP to JM; 1:1, 2:2, 2:3, 3:4, 4:4, 4:5, 4:6, 5:7, 6:7, 6:8, 6:9, 7:10, 8:10, 8:11, 8:12, 9:13, 10:13, 10:14, etc.
**** APP to JM; 1:1, 1:2, 2:3, 2:4, 3:5, 4:6, 4:7, 5:8, 6:9, 6:10, 7:11, 8:12, 8:13, 9:14, 10:15, 10:16, etc.

DOCUMENT 00870

STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION CONTRACT SPECIFICATIONS
(EXECUTIVE ORDER 11246)
Revised April 9, 2019

1. As used in these specifications:

   a. "Covered area" means the geographical area described in the solicitation from which this contract resulted:

   b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority.

   c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.

   d. "Minority" includes:

      (i) Black (all persons having origins in any of the black African racial groups not of Hispanic origin);
      (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
      (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
      (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of $ 10,000 the provisions of the specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

4. The Contractor shall implement the specific affirmative action standards provided in Paragraphs 7a through p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. The Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.

6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

    a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

    b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

    c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.

    d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

    e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.

    f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

    g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with on-site supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

    h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.

i. Direct its recruitment efforts both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's work force.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

n. Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

p. Conduct a review, at least annually, of all supervisor's adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these Specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female work force participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).

10. The Contractor shall not use the goals and timetables of affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

11 The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as many be required by the Government and keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

APPENDIX A

The following goals and timetables for female utilization shall be included in all Federal and federally assisted construction contracts and subcontracts in excess of $ 10,000. The goals are applicable to the Contractor's aggregate on-site construction workforce whether or not part of that workforce is performing work on a Federal or federally-assisted construction contract or subcontract.

Area covered: Goal for Women apply nationwide

Goals and Timetables

Timetable	Goals (percent)
From Apr. 1, 1980 until further notice	6.9

APPENDIX B-80

Until further notice, the following goals for minority utilization in each construction craft and trade shall included in all Federal or federally assisted construction contracts and subcontracts in excess of $ 10,000 to be performed in the respective geographical areas. The goals are applicable to each nonexempt contractor's total on- site construction workforce, regardless of whether or not part of that workforce is performing work on a Federal, federally assisted or nonfederally related project, contract or subcontract.

Construction contractors participating in an approved Hometown Plan (see 41 CFR 6-4.5) are required to comply with the goals of the Hometown Plan with regard to construction work they perform in the area covered by the Hometown Plan. With regard to all their other covered construction work, such contractors are required to comply with the applicable SMSA or EA goal contained in this Appendix B-80.

Economic Areas

STATE:	Goals (percent)
MASSACHUSETTS	
004 Boston MA: SMSA Counties: 1123 Boston-Lowell-Brockton-Lawrence-Haverhill, MA-NH	4.0
MA Essex, MA Middlesex, MA Norfolk, MA Plymouth, MA Suffolk, NH Rockingham.	
5403 Fall River- New Bedford MA, Bristol	1.6
9243 Worcester-Fitchburg-Leominster, MA	1.6
6323 Springfield-Chicopee-Holyoke MA-CT MA Hampden, MA Hampshire	4.8
Non-SMSA Counties: MA Barnstable, MA Dukes, MA Nantucket	3.6
Non-SMSA Counties: MA Franklin	5.9

APPENDIX C

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

1. **Compliance with Regulations:** The contractor (hereinafter includes consultants) will comply with the Acts and Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, Federal Highway Administration (FHWA), as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.

2. **Non-discrimination:** The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, national origin (including limited English proficiency), age, sex, disability, or low-income status in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.

3. **Solicitations for Subcontractors, including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor's obligations under this contract and the Acts and the Regulations relative to nondiscrimination on the grounds of race, color, national origin (including limited English proficiency), age, sex, disability, or low-income status.

4. **Information and Reports:** The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto, and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Massachusetts Department of Transportation (MassDOT) or FHWA to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information, the contractor will so certify to MassDOT or FHWA, as appropriate, and will set forth what efforts it has made to obtain the information.

5. **Sanctions for Noncompliance:** In the event of a contractor's noncompliance with the Nondiscrimination provisions of this contract, MassDOT will impose such contract sanctions as it or FHWA may determine to be appropriate, including, but not limited to:

    a. withholding payments to the contractor under the contract until the contractor complies; and/or
    b. cancelling, terminating, or suspending a control, in whole or in part.

6. **Incorporation of Provisions:** The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations, and directives issued pursuant thereto. The contractor will take action with respect to any subcontract or procurement as MassDOT or FHWA may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request MassDOT to enter into any litigation to protect the interests of MassDOT. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

APPENDIX D

During the performance of this contact, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor," which includes consultants) agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

PERTINENT NON-DISCRIMINATION AUTHORITIES:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252) (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21

- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 U.S.C. § 4601) (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-Aid programs and projects)

- Federal-Aid Highway Act of 1973 (23 U.S.C. § 324 *et seq.*) (prohibits discrimination on the basis of sex)

- Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. § 794 *et seq.*), as amended (prohibits discrimination on the basis of disability) and 49 CFR Part 27

- The Age Discrimination Act of 1975, as amended (42 U.S.C. § 6101 *et seq.*) (prohibits discrimination on the basis of age)

- Airport and Airway Improvement Act of 1982 (49 U.S.C. § 471, Section 47123), as amended (prohibits discrimination based on race, creed, color, national origin, or sex)

- The Civil Rights Restoration Act of 1987 (PL 100-209) (broadened the scope, coverage, and applicability of Title VI of the Civil Rights Act of 1964, the Age Discrimination Act of 1975, and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of Federal-Aid recipients, sub-recipients, and contractors, whether such programs or activities are Federally funded or not)

- Titles II and III of the Americans with Disabilities Act (42 U.S.C. §§ 12131-12189), as implemented by Department of Transportation regulations at 49 CFR parts 37 and 38 (prohibits discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities)

- The Federal Aviation Administration's Non-Discrimination Statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex)

- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (ensures discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations)

- Executive Order 13166, Improving Access to Services for People with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100)

- Title IX of the Education Amendments Act of 1972, as amended (20 U.S.C. 1681 *et seq*.) (prohibits discrimination on the basis of sex in education programs or activities)

*** END OF DOCUMENT ***

DOCUMENT 00875
TRAINEE SPECIAL PROVISIONS
Revised October, 2016

THE REQUIRED NUMBER OF TRAINEES TO BE TRAINED UNDER THIS CONTRACT WILL BE **5**

The contractor shall provide on-the job training aimed at developing full journeyworkers in the type of trade of job classification involved.

In the event that a contractor subcontracts a portion of the contract work, the General Contractor shall determine how many, if any, of the trainees are to be trained by the subcontractor, provided, however, that the contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The contractor shall also insure that this training special provision is made applicable to such subcontract. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

The number of trainees shall be distributed among the work classifications on the basis of the contractor's needs and the availability of journeyworkers in the various classifications within a reasonable area of recruitment. Prior to commencing construction, the contractor shall submit to the Massachusetts Department Of Transportation (MassDOT) for approval the number of trainees to be trained in each selected classification and training program to be used. Furthermore, the contractor shall specify the starting time for training in each of the classifications. The contractor will be credited for each trainee employed on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees as provided hereinafter.

Training and upgrading of minorities and women toward journeyworker status is a primary objective of the Training Special Provision. Accordingly, the contractor shall make every effort to enroll minority and women trainees (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent that such persons are available within a reasonable area of recruitment. The contractor will be responsible for demonstrating the steps that have been taken in pursuance thereof, prior to a determination as to whether the contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training.

No employee shall be trained under this Special Provision in any classification in which he or she has successfully completed a training course leading to journeyworker status or in which he or she has been employed as a journeyworker. The contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used the contractor's records should document the finding in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the contractor and approved by the Massachusetts Department Of Transportation and the Federal Highway Administration. The Massachusetts Department Of Transportation and the Federal Highway Administration shall approve a program if it is reasonably calculated to meet the equal employment opportunity obligations of the contractor and to qualify the average trainee for journeyworker status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau and training programs approved but not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather that clerk-typist or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc. where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the Federal Highway Administration division office. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Reimbursement

Under these Training Special Provisions, reimbursement will be as follows:

The Contractor will only be reimbursed 80 cents for each hour of on the job training as specified in the approved Training Program.

The Contractor is advised and encouraged that it may train additional persons in excess of the number specified and will be reimbursed as stated above. Reimbursement will be made even though the contractor receives additional training program funds from other sources, provided such other source does not specifically prohibit the contractor from receiving other reimbursement.

If less than full training specified in the approved training programs is provided, payment to the contractor will be made at a rate of 80 cents for each hour of training completed under this contract. However, no payment shall be made to the contractor if either the failure to provide the required training, or the failure to hire the trainee as a journeyworker, is caused by the contractor and evidences a lack of good faith on the part of the contractor in meeting the requirements of this Training Special Provision.

Payment

Trainees will be paid:

1. Percentage (%) of the journeyworker's rate as provided in the existing programs approved by the Department of Labor or Transportation as of September 15, 1970.

2. For journeyworker programs submitted by the Contractor and approved by Massachusetts Department Of Transportation and the Federal Highway Administration at least 60 percent of the appropriate minimum journeyworker's rate specified in the contract for the first half of the training period, 75 percent for the third quarter if the training period, and 90 percent for the last quarter of the training period.

3. For skilled laborer programs, the minimum starting wage rate of unskilled laborer. At the conclusion of training, he or she will be paid the minimum wage rate of the Classification for programs submitted by the Contractor and approved by the Massachusetts Department Of Transportation and the Federal Highway Administration.

4. For the purposes of meeting the legal requirements of State Prevailing Wage Law, please be advised that no person may be paid the Apprentice wage rate as listed on a MA Prevailing Wage Rates schedule, unless that person and program is registered with the Department of Labor Standards/Division of Apprentice Standards (DLS/DAS). Any person or program not registered with DLS/DAS, regardless of whether or not they are registered with any other federal, state, local, or private entity must be paid the journeyworker’s rate for the trade.

The contractor shall provide each trainee with a certification showing the type and length of training satisfactorily complete.

The contractor will provide for the maintenance of records and furnish periodic reports documenting his performance under this Training Special Provision.

Form FHWA-1409, Federal-aid Highway Construction Contracting Semi Annual Training Report, shall be submitted as per instructions on the Form.

*** END OF DOCUMENT ***

DOCUMENT 00880

MINIMUM WAGES FOR FEDERAL AND FEDERALLY ASSISTED CONTRACTS
Revised February 20, 2019

DEPARTMENT OF LABOR

Employment Standards Administration

MINIMUM WAGES FOR FEDERAL AND FEDERALLY ASSISTED CONSTRUCTION

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General Decision Number: MA20200025 08/28/2020

Superseded General Decision Number: MA20190025

State: Massachusetts

Construction Type: Highway

County: Worcester County in Massachusetts.

HIGHWAY CONSTRUCTION PROJECTS

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.80 for calendar year 2020 applies to all contracts
subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.80 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year
2020. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/03/2020
1	02/14/2020
2	08/07/2020

3 08/28/2020

CARP0336-004 09/01/2019

	Rates	Fringes
CARPENTER (Includes Form Work)	$ 41.90	29.00

ELEC0103-007 03/01/2020

	Rates	Fringes
ELECTRICIAN	$ 53.50	38.00

ENGI0004-030 06/01/2020

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
Group 1	$ 48.73	29.25+A
GROUP 1	$ 49.33	29.75+a
Group 2	$ 48.23	29.25+A
GROUP 2	$ 48.81	29.75+a

FOOTNOTE FOR POWER EQUIPMENT OPERATORS:
A. PAID HOLIDAYS: New Year's Day, Washington's Birthday, Labor Day, Memorial Day, Independence Day, Patriot's Day, Columbus Day, Veteran's Day, Thanksgiving Day, Christmas Day

POWER EQUIPMENT OPERATORS CLASSIFICATIONS
Group 1: Backhoe/Excavator/Trackhoe; Bobcat/Skid Steer/Skid
Loader; Broom/Sweeper; Gradall; Loader; Paver (Asphalt, Aggregate, and Concrete); Post Driver (Guardrail/Fences)
Group 2: Bulldozer; Grader/Blade; Roller

ENGI0004-031 12/01/2017

	Rates	Fringes
POWER EQUIPMENT OPERATOR: (Milling Machine)	$ 29.80	26.66+A

FOOTNOTE FOR POWER EQUIPMENT OPERATORS:

A. PAID HOLIDAYS: New Year's Day, Washington's Birthday,
Labor Day, Memorial Day, Independence Day, Patriot's Day,
Columbus Day, Veteran's Day, Thanksgiving Day, Christmas Day

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* IRON0007-028 03/16/2020

	Rates	Fringes
IRONWORKER, STRUCTURAL	$ 47.72	33.43

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* IRON0007-029 03/16/2020

	Rates	Fringes
IRONWORKER, ORNAMENTAL	$ 48.02	33.43

LABO0039-003 06/01/2018

	Rates	Fringes
LABORER		
Asphalt, Includes Raker, Shoveler, Spreader and Distributor	$ 33.50	22.92
Common or General	$ 33.25	22.92
Guardrail Installation	$ 33.50	22.92

PAIN0035-023 07/01/2019

	Rates	Fringes
PAINTER (Steel)	$ 50.66	30.90

SUMA2014-015 01/11/2017

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER	$ 56.70	21.08
IRONWORKER, REINFORCING	$ 56.48	20.62
LABORER: Concrete Saw (Hand		

Held/Walk Behind)	$ 41.78	18.37
LABORER: Landscape	$ 40.39	17.68
OPERATOR: Crane	$ 52.14	21.08
OPERATOR: Forklift	$ 64.67	0.00
OPERATOR: Mechanic	$ 48.14	17.02
OPERATOR: Piledriver	$ 44.46	16.94
PAINTER: Spray (Linestriping)	$ 48.00	0.00
PILEDRIVERMAN	$ 45.65	23.33
TRAFFIC CONTROL: Flagger	$ 23.00	20.44
TRAFFIC CONTROL: Laborer-Cones/ Barricades/Barrels - Setter/Mover/Sweeper	$ 44.49	12.41
TRUCK DRIVER: Concrete Truck	$ 33.69	15.79
TRUCK DRIVER: Dump Truck	$ 30.38	7.20
TRUCK DRIVER: Flatbed Truck	$ 48.53	0.00

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year.

Employees must be permitted to use paid sick leave for their
own illness, injury or other health-related needs, including
preventive care; to assist a family member (or person who is
like family to the employee) who is ill, injured, or has other
health-related needs, including preventive care; or for reasons
resulting from, or to assist a family member (or person who is
like family to the employee) who is a victim of, domestic
violence, sexual assault, or stalking. Additional information
on contractor requirements and worker protections under the EO
is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within
the scope of the classifications listed may be added after
award only as provided in the labor standards contract clauses
(29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification
and wage rates that have been found to be prevailing for the
cited type(s) of construction in the area covered by the wage
determination. The classifications are listed in alphabetical
order of ""identifiers"" that indicate whether the particular
rate is a union rate (current union negotiated rate for local),
a survey rate (weighted average rate) or a union average rate

(weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed
in dotted lines beginning with characters other than ""SU"" or
""UAVG"" denotes that the union classification and rate were
prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of
the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198
indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that
no one rate prevailed for this classification in the survey and
the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination.

5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union
average rate. OH indicates the state. The next number, 0010 in
the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion datefor the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on
  a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour
Regional Office for the area in which the survey was conducted because those Regional Offices have

responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator
(See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION"

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DOCUMENT A00801

SPECIAL PROVISIONS

ASHLAND
Federal Aid Project Nos. CMQ-003S(390), STP-003S(390) & TAP-003S(390)
Roadway Reconstruction and Related Work along Route 126 (Pond Street)

Labor participation goals for this Project shall be 15.3% for minorities and 6.9% for women for each job category. The goals are applicable to both Contractor's and Subcontractor's on-site construction workforce. Refer to Document 00820 for details.

SCOPE OF WORK

The work under this Contract consists of improvements to Route 126 (Pond Street) in the Town of Ashland beginning at the Holliston Town Line and ending at the Framingham Town Line, approximately 9,110 feet.

The project includes the following:

- Geometric improvements
- Full depth pavement reconstruction
- Constructing a roundabout at the intersection of Route 126 and spyglass hill road
- Traffic signal upgrades at the intersection of Route 126 and Eliot Street
- Reconstructing a section of Algonquin Trail to align with Harvard Street
- Installing new traffic signals at the intersection of Route 126 and Algonquin Trail and the intersection of Route 126 and the market basket driveway
- Excavation; pavement milling and box widening; pavement resurfacing
- Furnishing and installing new drainage structures and pipe
- Removing and replacing culverts; constructing headwalls
- Wetland area replication
- Furnishing and installing new granite curb; removing and resetting existing granite curb
- Constructing ADA compliant cement concrete sidewalks and wheelchair accessible ramps
- Constructing cantilever retaining walls
- Supplying and installing erosion control devices
- Furnishing and installing guardrail
- Supplying and placing loam and seed; planting landscape areas
- Installing signs and pavement markings
- Furnishing and setting bounds
- Providing traffic control

All work under this contract shall be done in conformance with the *2020 Standard Specifications for Highways and Bridges*, the *Supplemental Specifications* contained in this book, the *2017 Construction Standard Details*, the *Traffic Management Plans and Detail Drawings*, the *1990 Standard Drawings for Signs and Supports*; the 2015 Overhead Signal Structure and Foundation Standard Drawings, the *2009 Manual on Uniform Traffic Control Devices (MUTCD)* with Massachusetts Amendments; the *1968 Standard Drawings for Traffic Signals and Highway Lighting*; *The American Standard for Nursery Stock*; the Plans and these Special Provisions.

❶ ADDENDUM NO. 1, JULY 29, 2020

SUBSECTION 7.05 INSURANCE REQUIREMENTS
B. Public Liability Insurance

The insurance requirements set forth in this section are in addition to the requirements of the Standard Specifications and supersede all other requirements.

Paragraphs 1 and 2

The Massachusetts Department of Transportation and applicable railroads shall be named as additional insureds.

❶ **Paragraph 4**

Asbestos Liability Insurance shall be obtained for this project. The Contractor and the Massachusetts Department of Transportation shall be named as additional insureds.

CONTRACTOR QUESTIONS AND ADDENDUM ACKNOWLEDGEMENTS

Prospective bidders are required to submit all questions to the Construction Contracts Engineer by 1:00 P.M. on the Thursday before the scheduled bid opening date. Any questions received after this time will not be considered for review by the Department.

Contractors should email questions and addendum acknowledgements to the following email address massdotspecifications@dot.state.ma.us The MassDOT project file number and municipality is to be placed in the subject line.

DESIGNER/PROJECT MANAGER

DESIGNER
Green International Affiliates, Inc.
239 Littleton Road, Suite 3
Westford, MA 01886
Ko Ishikura, P.E.
Tel: (978) 923-0400

MassDOT PROJECT MANAGER
MassDOT Highway Division
10 Park Plaza, Suite 6430
Boston, MA 02116
Lawrence Cash, P.E.
Tel: (857) 368-9353

COVID 19 GUIDELINES AND PROCEDURES

Commonwealth of Massachusetts COVID-19 GUIDELINES AND PROCEDURES FOR ALL CONSTRUCTION SITES AND WORKERS AT ALL PUBLIC WORK dated March 2020 as amended shall be adhered to.

It is the Contractor's responsibility to stay current with any changes or addendums issued to these guidelines. For copies of the guidelines go to:

https://www.mass.gov/covid-19-guidelines-and-procedures-for-all-construction-sites-and-workers-at-all-public-work

These Guidelines and Procedures will remain in effect until further notice. At the start of the Work the Contractor is required to submit a letter to the Engineer certifying that the Contractor is in compliance with CDC, OSHA and the Commonwealth's COVID-19 guidelines. The certification applies to the general contractor as well as all subcontractors engaged with the Work covered under this contract. No Work will be allowed to begin until the letter is submitted and approved by the Engineer. In addition, on a daily basis, the Contractor is required to submit a copy of the MassDOT Contractor COVID-19 Guidelines Compliance Checklist to the Engineer. If the Contractor fails to submit the daily checklist no work will be allowed until one is submitted. Any items checked with a NO will require immedidate corrective action by the Contractor before any Work can begin.

Per Subsection 5.09 – Inspection of the Work - the Contractor is required to provide assistance to the Engineer to make a complete and detailed inspection of the work. That assistance includes furnishing equipment to perform the inspection, therefore the Contractor will be required to provide CDC compliant Personal Protective Equipment (PPE) to Department personnel field staff. The CDC compliant PPE shall consist of face masks, gloves and eye protection.

All costs associated with compliance with this provision are considered to be incidental to the contract cost and therefore the contractor will not be entitled to any additional compensation.

ACCESS MASSDOT HIGHWAY INFORMATION ON WEBSITE

Access MassDOT Highway Information related to Construction, Design/Engineering, Contractor/Vendor Information, Approved Materials and Fabricators, Manuals, Publications and Forms at:

http://www.mass.gov/massdot/highway

NOTIFICATION OF FUNDING SOURCES FOR WORK TO BE PAID BY OTHERS

This contract contains work that shall be paid by the ***Town of Ashland.*** The said ***Town*** shall be responsible for construction costs associated with a Non-Participating Agreement with MassDOT.

CONTRACTOR/SUBCONTRACTOR CERTIFICATION – CONTRACT COMPLIANCE

(Revision 03-23-10)

Pursuant to 23 C.F.R. § 633.101 et seq., the Federal Highway Administration requires each contractor to "insert in each subcontract, except as excluded by law or regulation, the required contract provisions contained in Form FHWA–1273 and further requires their inclusion in any lower tier subcontract that may in turn be made. The required contract provisions of Form FHWA–1273 shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the requirements contained in the provisions of Form FHWA–1273." The prime contractor shall therefore comply with the reporting and certification requirements provided in MassDOT's CONTRACTOR/SUBCONTRACTOR CERTIFICATION Form (DOT-DIST-192) certifying compliance with 23 C.F.R. § 633.101 for each subcontract agreement entered into by the contractor. The contractor shall provide a fully executed original copy of said CONTRACTOR/SUBCONTRACTOR CERTIFICATION Form to MassDOT upon execution of any subcontract agreement. Failure to comply with the reporting and certification requirement of the CONTRACTOR/SUBCONTRACTOR CERTIFICATION Form may result in action against the prequalification status of the prime contractor with MassDOT.

CONTRACT AWARD AND NOTICE TO PROCEED PROCEDURES

(Amending and Supplementing Subsections 3.03 and 3.05)

The prepared Contract Package is to be completed in duplicate by the successful Bidder who shall execute and deliver the Contract Package and furnish the required surety to the Department. The date of the Contract shall be the date of the Bidder's signature and shall be typed on all forms by the successful Bidder. The Contract Package consists of the contract forms for execution all of which must be returned. These documents are available on www.bidx.com. as a separate file.

The company's corporate seal should be affixed to both the Contract and bonds.

The Board of Director's Vote will indicate who is authorized to sign and execute the Contract and bonds and affix the corporate seal. The vote shall show that said vote is in full force and effect and has not been amended or rescinded. The vote of the board of directors should be dated the same date as indicated on the contract form and should bear the imprint of the company's corporate seal.

HOLIDAY WORK RESTRICTIONS FOR CALENDAR YEAR 2020

(Supplementing Subsection 7.09)

The District Highway Director (DHD) may authorize work to continue during these specified time periods if it is determined by the District that the work will not negatively impact the traveling public.

Below are the holiday work restrictions for the calendar year 2020.

New Year's Day (Federal Holiday)
Wednesday, January 1, 2020:
No work on major arterial roadways from 5:00 AM on Tuesday, December 31, 2019 until the normal start of business on Thursday, January 2, 2020. No work on local roadways on the holiday without permission by the DHD and the local police chief.

Martin Luther King's Birthday (Federal Holiday)
Monday, January 20, 2020:
No work restrictions due to traffic concerns however work on local roadways requires permission by the DHD and local police chief.

President's Day (Federal Holiday)
Monday, February 17, 2020:
No work restrictions due to traffic concerns however work on local roadways requires permission by the DHD and local police chief.

Evacuation Day (Suffolk County State Holiday)
Tuesday, March 17, 2020:
No work restrictions due to traffic concerns.

Patriot's Day (State Holiday)
Monday, April 20, 2020:
Work restrictions will be in place for Districts 3, 4 and 6 along the entire Boston Marathon route and any other locations that the DHD in those districts determine are warranted so as to not to impact the marathon. All other districts work restrictions will be as per DHD.

Mother's Day
Sunday, May 10, 2020:
No work on Western Turnpike and Metropolitan Highway System from 5:00 AM on Friday, May 8, 2020 until the normal start of business on Monday, May 11, 2020.

Memorial Day (Federal Holiday)
Monday, May 25, 2020:
No work on major arterial roadways from 5:00 AM on Friday, May 22, 2020 until the normal start of business on Tuesday, May 26, 2020.

HOLIDAY WORK RESTRICTIONS FOR CALENDAR YEAR 2020 (Continued)

Bunker Hill Day (Suffolk County State Holiday)
Wednesday, June 17, 2020:
No work restrictions due to traffic concerns.

Independence Day (Federal Holiday)
Saturday, July 4, 2020:
No work on major arterial roadways from 5:00 AM on Friday, July 3, 2020 until the normal start of business on Monday, July 6, 2020.

Labor Day (Federal Holiday)
Monday, September 7, 2020:
No work on major arterial roadways from 5:00 AM on Friday, September 4, 2020 until the normal start of business on Tuesday, September 8, 2020.

Columbus Day (Federal Holiday)
Monday, October 12, 2020:
No work on major arterials from 5:00 AM on Friday, October 9, 2020 until the normal start of business on Tuesday, October 13, 2020. DHD may allow work in those areas on a case by case basis and where work is behind barrier and will not impact traffic.

Veterans' Day (Federal Holiday)
Wednesday, November 11, 2020:
No work restrictions due to traffic concerns.

Thanksgiving Day (Federal Holiday)
Thursday, November 26, 2020:
No work on major arterials from 5:00 AM on Wednesday, November 25, 2020 until the normal start of business on the Monday, November 30, 2020.

Christmas Day (Federal Holiday)
Friday, December 25, 2020:
No work on major arterial roadways from 5:00 AM on Thursday, December 24, 2020 until the normal start of business on Monday, December 28, 2020.

❶ ADDENDUM NO. 1, JULY 31, 2020

BIDDERS LIST

Pursuant to the provisions of 49 CFR Part 26.11 all official bidders will be required to report the names, addresses and telephone numbers of all firms that submitted bids or quotes in connection with this project. Failure to comply with a written request for this information within 15 business days may result in a recommendation to the Prequalification Committee that prequalification status be suspended until the information is received.

The Department will survey all firms that have submitted bids or quotes during the previous year prior to setting the annual goal and shall request that each firm report its age and gross receipts for the year.

❶

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION FILE NUMBER SIGN

This project is subject to Massachusetts General Laws, Chapter 131, Section 40 as amended. Signs shall be in accordance with the latest MassDOT Construction Standards. All costs for the manufacture, erection, maintenance, moving, and removal of the signs shall be absorbed by the contractor with no additional compensation other than the contract unit prices.

For this project, the Massachusetts Department of Environmental Protection File Number is 95-931.

SUBSECTION M4.02.14 Precast Units
Replace this Subsection with the following :

SUBSECTION M4.02.14 Precast Concrete Highway Units

The following Precast Concrete Highway Units shall meet the materials and fabrication requirements specified herein:

(a) Standard Temporary and Permanent Barriers
(b) Box Culverts with spans less than or equal to 10 feet
(c) Catch basins
(d) Drainage Pipes
(e) Pipe Flared Ends
(f) Manholes
(g) Handholes
(h) Proprietary Retaining Wall Systems
(i) Traffic Light Pole Bases
(j) Luminaire Bases

Precast Concrete Highway Units shall be fabricated in conformance with the MassDOT Construction Standard Details, Traffic Standard Drawings for Traffic Signals and Highway Lighting, Overhead Signal Structure and Foundation Standard Drawings, and Standard Drawings for Signs and Supports. Circular vertical precast reinforced concrete manholes and structures used in sewer, drainage, and water works shall conform with the requirements of AASHTO M 199. The outside surface of the tapered or cone section of precast drainage structures shall be dried, cleaned, and coated with an RS-1-H coating meeting the requirements of AASHTO M 140.

QUALITY ASSURANCE

A. General.

Quality Assurance includes all the planned and systematic actions necessary to provide confidence that a product or facility will perform satisfactorily in service. It is an all-encompassing term that includes Quality Control (performed by the Fabricator) and Acceptance (performed by MassDOT. Fabricator Quality Control activities and MassDOT Acceptance activities shall remain independent from one another. MassDOT Acceptance activities shall not replace Fabricator Quality Control activities.

B. Plant.

Prior to the fabrication of Precast Concrete Highway Units, the Fabricator's precast concrete plant shall obtain the following:

(a) Certification by the National Precast Concrete Association (NPCA) Plant Certification Program or Precast/Prestressed Concrete Institute (PCI) Plant Certification Program, for the applicable types of Precast Concrete Highway Unit(s) being fabricated
(b) MassDOT Approval

SUBSECTION M4.02.14 PRECAST UNITS (Continued)

C. Fabricator Quality Control.

Quality Control shall be performed by the Fabricator. The Fabricator shall maintain a Quality Control system to monitor, assess, and adjust placement and fabrication processes to ensure the fabricated Precast Concrete Highway Unit(s) meet the specified level of quality, through sufficient Quality Control sampling, testing, inspection, and corrective action (where required). The Fabricator's Quality Control system shall address all key activities during the placement and fabrication and shall be performed in conformance with the Fabricator's NPCA or PCI Certification. Quality Control inspection documentation shall meet the requirements of the *Fabricator Quality Control – Documentation* section below. Upon request, Fabricator Quality Control documentation shall be provided to the MassDOT Plant Inspector.

1. Personnel.

The Fabricator shall provide adequate training for all QC personnel in accordance with the Fabricator's NPCA or PCI Certification. A sufficient amount of QC personnel shall be trained and certified to perform the tests as specified in M4.02.13, Part D. At a minimum, the Fabricator's Quality Control personnel shall maintain the following qualifications and certifications:

(a) QC Manager with an active NETTCP Field Technician or ACI Concrete Field Testing Technician – Grade I certification or higher, and a minimum of six (6) months continuous experience in the manufacture of Precast Concrete Highway Products. The QC Manager shall be on site while the batch plant is producing and placing concrete for MassDOT projects.
(b) Technicians/Inspectors with an active American Concrete Institute (ACI) Concrete Field Testing Technician – Grade I certification, or higher.

The Fabricator shall provide to the MassDOT Plant Inspector copies of the Fabricator's Quality Control Personnel required qualifications, as specified above.

2. Laboratory.

The Fabricator shall provide a room of sufficient size to house all equipment and to adequately perform all testing. The room shall have either a separate moisture storage room or curing box for concrete cylinders. The moisture storage room or curing box shall be thermostatically controlled to maintain temperatures consistent with AASHTO T23. The laboratory shall include a desk and file cabinet for proper record keeping, and have good lighting and ventilation. This room shall be kept for testing and quality control and not used for any other purpose. An additional desk and file cabinet shall be provided for exclusive use of the Engineer. No exception from these requirements will be allowed without the express written permission of the Engineer.

SUBSECTION M4.02.14 PRECAST UNITS (Continued)

3. Testing Equipment.

At a minimum, the Fabricator's plant facility shall have the following testing equipment:

(a) Air Content Meter Type A or B: AASHTO T152
(b) Air Content Meter Volumetric Method: AASHTO T196 (Required for Lightweight Concrete)
(c) Slump Cone: AASHTO T119
(d) Cylinder Molds: AASHTO M205
(e) Concrete Testing Machine: AASHTO T22
(f) Screening Sieve: AASHTO T27, AASHTO T11
(g) Curing Box: AASHTO T23
(h) Spread Test Base Plate for Self-Consolidating Concrete (SCC): ASTM 1611
(i) All other equipment prescribed by AASHTO and ASTM standards for the tests to be performed by the Fabricator as specified

4. Inspection.

Quality Control personnel shall monitor and inspect the fabrication of each Precast Concrete Highway Unit. Quality Control personnel shall report all inspection activities on Quality Control Inspection Reports and non-conformances on Non-Conformance Reports (NCRs) throughout the entire fabrication process, as speciefied herein.

5. Temperature Monitoring.

At a minimum, the Fabricator shall monitor, record, and report the temperatures of the form and ambient temperatures surrounding the concrete continuously, without interruption as specified below:

(a) Prior to placement of concrete to verify the temperatures are greater than or equal to 50°F.
(b) Immediately after placement to verify that the temperatures are greater than or equal to 50°F.
(c) Throughout the entire duration of the curing cycle, at regular intervals not to exceed one hour until 70% Design Strength (f'_c) is attained.

At a minimum, the temperature measuring devices shall record and report the temperature of the concrete to the nearest 2°F. The Fabricator shall verify all temperature requirements meet the specifications herein. Fabricator Quality Control concrete temperature monitoring records reporting the concrete temperature at the specified minimum frequency shall be provided to the MassDOT Inspector upon request.

6. Sampling and Testing.

At a minimum, the Fabricator shall perform random Quality Control sampling and testing for each Sublot of concrete produced as specified in *Table 1: Quality Control Sampling and Testing*. The Fabricator shall perform additional Quality Control sampling and testing on concrete that has been retempered with admixtures or hold-back water during fabrication. Test specimens shall conform to the requirements of Subsection M4.02.13 and AASHTO R 60.

SUBSECTION M4.02.14 PRECAST UNITS (Continued)

Table 1: Quality Control Sampling and Testing

Quality Characteristic	Test Method	Sample Size	Specification Limit	Lot Size [b]	Sublot Size [c]	Frequency	Point of Sampling
Slump (in.) [a]	AASHTO T 119	Per AASHTO	≤ 8 in. or as approved by the Engineer	Total Quantity of Concrete (cy) produced in a year, per Mix Design	50 cy	One (1) per Sublot or fraction thereof	Point of Discharge
Air Content (%)	AASHTO T 152	Per AASHTO	5% ≤ % ≤ 8%				
Temperature (°F)	AASHTO T 309	Per AASHTO	50°F ≤ °F ≤ 90°F				
Compressive Strength (psi)	AASHTO T 22 AASHTO T 23	Stripping Cylinders: One (1) set of Three (3) 4 x 8 in.	≥ 70% f'c at Stripping				
		7-day Cylinders: One (1) set of Three (3) 4 x 8 in.	For Information at 7 days				
		28-day Cylinders: One (1) set of Three (3) 4 x 8 in.	≥ 100% f'c at 28 days				

Notes:

(a) Self-consolidating concrete (SCC) shall meet the requirements of M4.02.17.
(b) Lot shall be defined as a specific quantity of material from a single source, produced or placed by the same controlled process.
(c) Sublot shall be defined as an equal division or part of a Lot from which a sample of material is obtained in order to assess the Quality Characteristics of the Lot.

SUBSECTION M4.02.14 PRECAST UNITS (Continued)

7. Certificate of Compliance.

The Fabricator shall provide a Certificate of Compliance in accordance with Standard Specifications, Division I, Subsection 6.01, stating that QC test cylinders have achieved the design strength, f'_c. A Certificate of Compliance shall accompany each shipment and shall be presented to the MassDOT Resident Engineer or designee upon delivery to the site.

8. Documentation.

At a minimum, the Fabricator shall maintain a filing system for the following QC records and documentation. All QC records and documentation shall be made available to MassDOT upon the request of the Department.

(a) Current MassDOT Approved Mix Design Sheet(s) and Approval Letter(s)
(b) PCI or NPCA Certification
(c) Current Qualifications and Certifications for QC Manager(s) and QC Technician(s)
(d) Most current set of MassDOT Standard Shop Drawings
(e) Fabricator Certificate of Compliance for each fabricated Precast Concrete Highway Unit
(f) Admixture Manufacturer's Certification of Compliance and Technical Data Sheet for each approved Admixture
(g) Completed QC Inspection Checklist for each fabricated Precast Concrete Highway Unit
(h) Identification Number for each fabricated Precast Concrete Highway Unit
(i) Time and date of casting of each fabricated Precast Concrete Highway Unit
(j) Date of stripping the forms of each fabricated Precast Concrete Highway Unit
(k) Batch Ticket Printout reporting the quantity of concrete produced for each batch of concrete produced
(l) QC Test Report Forms for each sublot of concrete produced
(m) Non-Conformance Reports (NCRs)
(n) Documentation of Repairs (if applicable)

D. Acceptance.

MassDOT will perform Acceptance inspection, sampling, and testing during fabrication and installation, to evaluate the quality and degree of compliance of the fabricated Precast Concrete Highway Unit to MassDOT specifications. Additionally, MassDOT Inspectors will monitor the Fabricator's Quality Control activities to ensure the Fabricator is properly administering Quality Control in conformance with the Fabricator's NPCA or PCI Certification. Acceptance inspection and test results not meeting MassDOT specifications will result in Non-conformance Reports (NCR) being issued by MassDOT to the Fabricator or Contractor for corrective action. Final Acceptance for the fabricated Precast Concrete Highway Units shall be determined by MassDOT.

SUBSECTION M4.02.14 PRECAST UNITS (Continued)

1. Inspection.

A MassDOT Inspector may be assigned to perform Acceptance activities during the fabrication of the Precast Concrete Highway Products, which includes the inspection of the materials, work procedures, and Precast Concrete Highway Units. When a MassDOT Inspector is assigned to the Fabricator's plant, at least seven (7) days prior to the scheduled start of fabrication, the Fabricator shall contact the MassDOT Research and Materials Section (RMS) to provide notice of the scheduled start date. The Fabricator shall perform the following activites prior to notifying MassDOT RMS of the scheduled start date:

(a) Receive approval for all submitted Fabricator cement concrete mix designs from the MassDOT Research and Materials Section for the current year, as specified under the *Mix Design* section and *Table 3: Trial Batch Sampling Testing for New Mix Designs*. Self-consolidating concrete shall meet the requirements of M4.02.17.

Prior to the start of fabrication, the Fabricator shall review the fabrication schedule with the MassDOT Inspector. Fabrication shall only proceed when:

(a) The QC Inspector and MassDOT Inspector are present to inspect the Precast Concrete Highway Unit(s) being fabricated.
(b) The QC Manager is present at the Fabricator's plant.

The Fabricator shall grant access to all required areas of the Fabricator's plant to the MassDOT Inspector, during the hours of fabrication. Fabrication without MassDOT Inspector access to required areas is prohibited, and will result in the rejection of the fabricated Precast Concrete Highway Unit(s).

Additionally, the MassDOT Inspector will monitor the adequacy of the Fabricator's Quality Control activities. MassDOT Inspector Acceptance activities performed at the Fabricator's plant shall remain independent from the Fabricator, and does not replace the Fabricator's required Quality Control activities.

2. Sampling and Testing.

At a minimum, the MassDOT Inspector will perform random Acceptance sampling and testing for each Sublot of concrete produced as specified in *Table 2: Acceptance Sampling and Testing.* The MassDOT Inspector will also perform Acceptance sampling and testing on concrete that has been retempered with admixtures or hold-back water during production. Test Specimens will conform to the requirements of Section M4.02.13 of the MassDOT Standard and Supplemental Specifications and AASHTO R 60.

SUBSECTION M4.02.14 PRECAST UNITS (Continued)

Table 2: Acceptance Sampling and Testing

Quality Characteristic	Test Method	Sample Size	Specification Limit	Lot Size [c]	Sublot Size [d]	Frequency	Point of Sampling
Slump (in.) [a]	AASHTO T 119	Per AASHTO	≤ 8 in. or as approved by the Engineer	Total Quantity of Concrete (cy) produced in a year, per Mix Design	50 cy	One (1) per Sublot or fraction thereof	Point of Discharge
Air Content (%)	AASHTO T 152	Per AASHTO	5% ≤ % ≤ 8%				
Temperature (°F)	AASHTO T 309	Per AASHTO	50°F ≤ °F ≤ 90°F				
Compressive Strength (psi)	AASHTO T 22 AASHTO T 23	7-day Cylinders: One (1) set of Three (3) 4 x 8 in.	For Information at 7 days				
		28-day Cylinders: One (1) set of Three (3) 4 x 8 in.	≥ 100% f'_c at 28 days				
		56-day Cylinders: One (1) set of Three (3) 4 x 8 in.	≥ 100% f'_c at 56 days [b]				

Notes:

(a) Self-consolidating concrete (SCC) shall meet the requirements of M4.02.17.

(b) 56-day Compressive Strength test specimens shall require testing only when 28-day Compressive Strength test specimens have failed to meet Design Strength (f'_c).

SUBSECTION M4.02.14 PRECAST UNITS (Continued)

(c) Lot shall be defined as a specific quantity of material from a single source, produced or placed by the same controlled process.
(d) Sublot shall be defined as an equal division or part of a Lot from which a sample of material is obtained in order to assess the Quality Characteristics of the Lot.

MATERIALS

E. Materials.
Materials shall meet the following specifications, where applicable:

General	M4.00.00
Portland Cement	M4.01.0
Blended Hydraulic Cements	M4.01.1
Fly Ash	M4.01.2
Cement Concrete	M4.02.00
Cement	M4.02.01
Aggregates	M4.02.02
Lightweight Aggregates	M4.02.03
Water	M4.02.04
Cement Concrete Additives	M4.02.05
Proportioning	M4.02.06
Mixing and Delivery	M4.02.10
Test Specimens	M4.02.13
Self-Consolidating Concrete (SCC)	M4.02.17
Slag	AASHTO M-302
High Performance Cement Concrete	M4.06.1
Reinforcing Bars	M8.01.0
Epoxy Coated Reinforcing Bars	M8.01.7
Asphalt Emulsions	M3.03.0

1. Cement Concrete Mix Design.

Cement concrete for Precast Concrete Highway Units shall meet the requirements of M4.02.0. When used, High Performance Cement Concrete shall meet the requirements of M4.06.1 and self-consolidating concrete (SCC) shall meet the requirements of M4.02.17. The cement concrete shall be composed of specified proportions by the mass of aggregates, cement, supplementary cementitious materials (SCMs), water, and QCML approved admixtures to form a homogenous composition. The particular quantities and uniform combination of materials and sources of supply to be used by the Fabricator on MassDOT Highway Construction contracts shall be reported on the MassDOT Cement Concrete Mix Design Sheet and submitted to MassDOT RMS for review and approval. All mix design yields shall be designed for 1.0 cubic yards of concrete, with an allowable tolerance of +/- 1.0 %. All liquids incorporated into the proposed mix design(s) shall include both water and admixtures in the liquid mass calculation.

SUBSECTION M4.02.14 PRECAST UNITS (Continued)

Prior to the production and placement of the cement concrete for Precast Concrete Highway Units, the Fabricator's proposed mix design shall be approved by MassDOT RMS. Modifications made to the aggregate, cement, supplementary cementitious materials (SCMs), admixtures (including coloring agents), or formulation to previously approved mix designs during fabrication are prohibited. All new mix design formulations and modifications made to previously approved mix designs will require resubmission of the Cement Concrete Mix Design Sheet to MassDOT RMS for review and trial batch testing for the new mix design(s) by the Fabricator. The Fabricator shall notify MassDOT RMS to schedule trial batch testing for the new mix design(s). Trial batch testing shall meet the following requirements:

(a) Performed by a qualified laboratory and/or AASHTO accredited laboratory.
(b) Performed and/or sampled in the presence of a MassDOT Inspector.
(c) Meet the requirements as specified in *Table 3: Trial Batch Sampling Testing for New Mix Designs*. Self-consolidating concrete (SCC) shall meet M4.02.17.

Failure to perform all of the required trial batch testing or provide MassDOT RMS trial batch test results within the Specification Limits (as specified in Table 3) will result in the disqualification of the Fabricator's proposed mix design(s).

Table 3: Trial Batch Sampling and Testing for New Mix Designs

Quality Characteristic	Test Method	Sample Size	Specification Limit	Performed By
Slump [(a)]	AASHTO T 119	Per AASHTO	Max. 8 inches or as approved by the Engineer	Quality Control
Air Content (AC)	AASHTO T 152	Per AASHTO	$5\% \leq AC \leq 8\%$	Quality Control
Temperature (°F)	AASHTO T 309	Per AASHTO	$50°F \leq °F \leq 90°F$	Quality Control
Compressive Strength [(b)]	AASHTO T 22 AASHTO T 23	28-day Cylinders: One (1) set of Three (3) 4 x 8 in.	Lab Mixed: 130% f'_c at 28 days	MassDOT
			Batch Mixed: 120% f'_c at 28 days	
Alkali-Silica Reaction (ASR) [(c)]	ASTM C 1567	Per ASTM	M4.02.00	Quality Control
Resistance to Chloride Ion Penetration [(d)]	AASHTO T 358 [(e)]	28-day Cylinders: One (1) set of Three (3) 4 x 8 in.	Resistivity ≥ 15 kΩ-cm at 28 days	MassDOT

SUBSECTION M4.02.14 PRECAST UNITS (Continued)

Notes:

(a) Self-consolidating concrete (SCC) shall meet the requirements of M4.02.17.
(b) Trial batch compressive strength testing shall be performed by MassDOT. Cylinders shall be haLaboratory mixed trial batch compressive strength results shall achieve 130% Design Strength (f'_c). Batch mixed trial batch compressive results shall achieve 120% f'_c. Acceptance will be based on compressive strength testing performed by MassDOT.
(c) Alkali Silica Reaction (ASR) testing shall meet the requirements of M4.02.00. Independent laboratories performing ASR testing shall be listed on the MassDOT Quality Construction Materials List (QCML).
(d) Resistance to Chloride Ion Penetration testing shall be performed only on proposed High Performance Cement Concrete mix designs. The calcium nitrite shall be removed from mix designs containing the admixture and replaced by an equivalent quantity of water when preparing Chloride Ion Penetration resistance trial batch test specimens.
(e) The Wenner probe tip spacing "a" shall be 1.5.

CONSTRUCTION METHODS – PLANT FABRICATION

F. Shop Drawings.

Fabricator shop drawings for Precast Concrete Highway Units shall conform with the MassDOT Construction Standard Details, Traffic Standard Drawings for Traffic Signals and Highway Lighting, Overhead Signal Structure and Foundation Standard Drawings, and Standard Drawings for Signs and Supports. Circular vertical precast reinforced concrete manholes and structures used in sewer, drainage, and water works shall conform with the requirements of AASHTO M 199.

G. Tolerances.

Precast unit tolerances shall be as indicated on the plans, as specified in Subsection 901, or as indicated in the MassDOT Construction Standard Details, as appropriate.

H. Forms.

Concrete shall be cast in rigidly constructed forms, which will maintain the Precast Concrete Highway Units within specified tolerances to the shapes, lines and dimensions shown on the MassDOT Construction Standard Details. Forms shall be constructed from flat, smooth, non-absorbent material and shall be sufficiently tight to prevent the leakage of the plastic concrete. When wood forms are used, all faces in contact with the concrete shall be laminated or coated with a non-absorbent material. All worn or damaged forms, which cause irregularities on the concrete surface or damage to the concrete during form removal, shall be repaired or replaced before being reused. Any defects or damage of more than minor nature, due to form work, stripping or handling, shall be cause for rejection, as defined in Repairs and Replacement, unless approved for repair through the NCR process. If threaded inserts are cast into the elements for support of formwork, the inserts shall be recessed a minimum of 1 inch and shall be plugged after use with a grout of the same color as that of the precast cement concrete.

SUBSECTION M4.02.14 PRECAST UNITS (Continued)

I. Mixing of Concrete.

The concrete shall be proportioned and mixed in conformance with the Fabricator's MassDOT approved mix design and M4.02.10 Mixing and Delivery. Fabrication shall not occur without a MassDOT approved mix design. The Fabricator shall provide copies of batch tickets to the MassDOT Plant Inspector. The MassDOT Plant Inspector will verify if the batch ticket quantities are within the tolerances of the Fabricator's MassDOT approved mix design.

J. Placement of Concrete.

Prior to the placement of concrete, the temperature of the forms shall be greater than or equal to 50°F. Quality Control inspection shall be performed by the Fabricator as specified in the *Fabricator Quality Control* section. The Quality Control Inspector shall inspect and accept the placement of the reinforcing steel prior to the placement of concrete into the forms. When a MassDOT Inspector is assigned to perform Acceptance activities at the Fabricator's facility, placement of the concrete shall not proceed until the MassDOT Plant Inspector is present to perform inspection and begin monitoring Fabricator Quality Control inspection activities, and is in compliance with specifications. The MassDOT Plant Inspector shall inspect and accept the placement of the reinforcing steel prior to the placement of concrete into the forms. The Fabricator shall verify all materials and equipment required for protecting and curing the concrete are readily available and meet the requirements of the *Final Curing Methods* section below. All items encased in the concrete shall be accurately placed in the position shown on the Plans and firmly held during the placing and setting of the concrete. Clearance from the forms shall be maintained by supports, spacers, or hangers and shall be of approved shape and dimension.

During placement, the concrete shall maintain a concrete temperature range between 50°F and 90°F. The Fabricator shall minimize the time to concrete placement (measured from start of mixing to completion of placement). In no event shall time to placement exceed 90 minutes. The Fabricator shall perform additional Quality Control sampling and testing on concrete that has been retempered with admixtures or hold-back water during the placement of the concrete as specified in the *Fabricator Quality Control* section above. Delays or shutdowns of over 30 minutes shall not be allowed during the continuous filling of individual forms.

SUBSECTION M4.02.14 PRECAST UNITS (Continued)

K. Consolidation of Concrete.

Suitable means shall be used for placing concrete to prevent segregation or displacement of reinforcing steel or forms. The concrete shall be thoroughly consolidated by external or internal vibrators or a combination of both. Vibrators shall not be used to move concrete within the forms. Vibrators shall be used as specified in 901.63C and as directed by the Engineer. Concrete shall be placed and consolidated in a way that minimizes the presence of surface voids or bug holes on the formed surfaces. When used, self-consolidating concrete (SCC) shall meet the requirements of M4.02.17.

L. Exposed Surfaces of Precast Concrete Highway Units.

As soon as conditions permit and before the concrete has fully hardened; all dirt, laitance, and loose aggregate shall be removed from the exposed concrete surfaces. Contractor shall not allow foot traffic on the uncured concrete until it has reached sufficient strength to prevent damage.

M. Final Curing Methods.

All exposed concrete surfaces shall meet the requirements of the selected final curing method and maintain the required concrete temperature ranges throughout the duration of the final curing method cycle. Controlled and gradual termination of the final curing method cycle shall occur after all the specified conditions are met.

1. Water Spray Curing.

The final curing method cycle shall begin immediately after the concrete has hardened sufficiently to prevent surface damage from the water spray. After the concrete has sufficiently hardened, all exposed concrete surfaces shall remain moist with a continuous fine spray of water throughout the entire duration of the final curing method cycle. Controlled and gradual termination of the final curing method cycle shall occur after all specified conditions are met (see *Table 4: Termination of Curing Cycle for Water Spray Curing*).

Table 4: Termination of Curing Cycle for Water Spray

Sustained Ambient Temperature	Compressive Strength
50°F ≤ °F ≤ 90°F	≥ 70% f'_c

2. Saturated Covers for Curing.

The final curing method cycle shall begin immediately after the concrete has hardened sufficiently to prevent surface damage from the saturated burlap. After the concrete has sufficiently hardened, all exposed concrete surfaces shall be covered with water-saturated burlap throughout the entire duration of the final curing method cycle. Controlled and gradual termination of the final curing method cycle shall occur after all specified conditions are met (see *Table 5: Termination of Curing Cycle for Saturated Cover Curing*).

SUBSECTION M4.02.14 PRECAST UNITS (Continued)

Table 5: Termination of Curing Cycle for Saturated Covers

Sustained Ambient Temperature	Compressive Strength
50°F ≤ °F ≤ 90°F	≥ 70% f'c

3. Curing Covers.

Curing covers shall be Plastic Coated Fiber Blankets or Polyethylene Curing Covers. Proposed curing covers shall be submitted for approval to the Designer of Record with a copy to the MassDOT Research and Materials Section. The final curing method cycle shall begin immediately after the concrete has hardened sufficiently to prevent surface damage from the curing covers. After the concrete has sufficiently hardened, all exposed concrete surfaces shall be covered with curing covers throughout the entire duration of the final curing method cycle. The Fabricator shall ensure that the surface of the concrete remains wet until the covers are placed. If forms are removed from the Precast Concrete Highway Unit, curing covers shall be placed over the exposed concrete for the remainder of the final curing method cycle. Adjoining covers shall overlap not less than 12 inches. All edges of the covers shall be secured to maintain a moist environment (100% minimum relative humidity). Controlled and gradual termination of the final curing method cycle shall occur after all specified conditions are met (see *Table 6: Termination of Curing Cycle for Curing Covers*).

Table 6: Termination of Curing Cycle for Curing Covers

Sustained Ambient Temperature	Compressive Strength
50°F ≤ °F ≤ 90°F	≥ 70% f'c

N. Stripping.

The Fabricator shall not strip forms or handle the Precast Concrete Highway Unit until Quality Control compressive strength cylinders attain a minimum compressive strength of 70% Design Strength (f'c).

O. Handling and Storage of Precast Concrete Highway Units.

Precast Concrete Highway Units shall not be exposed to temperatures below 50°F until Quality Control compressive strength results have achieved 70% f'c. Precast units shall be lifted at the designated points by approved lifting devices embedded in the concrete and in accordance with proper lifting and handling procedures. Storage areas shall be smooth and well compacted to prevent damage due to differential settlement. Precast units shall be supported on the ground by means of continuous blocking.

SUBSECTION M4.02.14 PRECAST UNITS (Continued)

Precast units shall be loaded on a trailer with continuous blocking. Shock-absorbing cushioning material shall be used at all bearing points during transportation of the precast units. Blocking shall be provided at all locations of tie-down straps. The precast units shall not be subject to damaging torsional or impact stresses.

P. Repairs and Replacement (not including Proprietary Retaining Wall Systems)

Where noted, defects shall be repaired according to the PCI Northeast Region Guidelines for Resolution of Non-Conformances in Precast Concrete Highway Units, Report Number PCINE-18-RNPCBE. Please note that reference to PCINE-18-RNPCBE is made for repair details only. In the case of conflict with this specification, this specification shall govern.

Any required repairs shall utilize materials listed on the MassDOT QCML. All repairs shall be completed at the expense of the Contractor.

Q. Repairs and Replacement for Proprietary Retaining Wall Systems.

In the event defects are identified, they shall be classified in the following categories and a non-conformance report (NCR) shall be filed if required. The NCR shall be submitted to MassDOT for review. Defects in all categories shall be documented by plant Quality Control personnel and made available to MassDOT upon request. Any required repairs shall utilize materials listed on the MassDOT QCML.

1. Category 1, Surface Defects.

Category 1 defects do not need to be repaired, and an NCR does not need to be filed. Surface defects are defined as:

(a) Surface voids or bug holes that are less than 5/8-inch in diameter and less than ¼-inch deep, except when classified as Category 3
(b) cracks less than or equal to 0.006” wide

2. Category 2, Minor Defects.

Category 2 defects shall be repaired and documented. Non-conformance Reports are not required for this category. Documentation of the repair shall be submitted to the MassDOT District Engineer. Minor defects are defined as:

(a) Spalls, honeycombing, surface voids that are less than 2 inches deep and have no dimension greater than 12 inches
(b) Cracks greater than 0.006” and less than or equal to 0.060”
(c) Broken corners without exposed reinforcing steel

Defects and cracks shall be repaired according to the Guidelines for Resolution of Non-Conformances in Precast Concrete Highway Units, Report Number PCINE-18-RNPCBE and this specification. All repairs shall be completed at the expense of the Contractor. Any required repairs shall utilize materials listed on the MassDOT QCML.

SUBSECTION M4.02.14 PRECAST UNITS (Continued)

3. Category 3, Rejectable Defects.

Rejectable defects as determined by the MassDOT Inspector and MassDOT Resident Engineer will be rejected, unless the Fabricator receives MassDOT approval of a Non-Conformance Report. Some rejectable defects are defined as:

(a) Surface defects on more than 5% of the surface area
(b) Minor defects that in total make up more than 5% of the surface area of the unit
(c) Concentrated area of defects consisting of four or more Category 2 Defects within a 4-square foot area.
(d) Exposed reinforcing steel
(e) Spalls, honeycombing and surface voids that are deeper than 2 inches or have any dimension greater than 12 inches, when measured along a straight line
(f) Cracks greater than 0.060" in width
(g) Elements fabricated outside of the specified tolerances
(h) Compressive strength that does not meet the specified Design Strength, f'_c

R. Loading.

Prior to the Fabricator loading the Precast Concrete Highway Unit on to the truck for shipping, the Fabricator shall provide the MassDOT Plant Inspector and RMS a minimum seven (7) days' notice of the Fabricator's intent to load the Precast Concrete Highway Unit. Inspection by the MassDOT Plant Inspector shall take place while the element is still on dunnage in the yard. The element shall not be loaded onto the truck until the MassDOT Plant Inspector has performed the inspection.

S. Shipping.

Prior to shipment, the Fabricator shall perform the following actions and provide the required documentation to the MassDOT Plant Inspector:

SUBSECTION M4.02.14 PRECAST UNITS (Continued)

(a) Precast Concrete Highway Units shall remain at the Fabricator's plant for a minimum of 7 days after cast date.
(b) QC Inspection Reports shall be signed by the Quality Control Manager and provided to the MassDOT Plant Inspector.
(c) QC Compressive Strength Test Report Forms attaining Design Strength, f'_c for the Precast Concrete Highway Unit's representative Sublot shall be generated by the Fabricator and provided to the MassDOT Plant Inspector.
(d) Certificate of Compliance shall be generated by the Fabricator as described under the Fabricator Quality Control section and provided to the MassDOT Plant Inspector.
(e) All MassDOT RMS approved Corrective Actions submitted on the Non-Conformance Reports (NCR), shall be verified to have been completed by the MassDOT Plant Inspector and Quality Control Manager.
(f) All NCRs shall be signed off by the Quality Control Manager and MassDOT Inspector and/or MassDOT RMS.

T. Delivery.

Upon Delivery, the following documentation shall be provided to the MassDOT Resident Engineer or designee:

(a) QC Compressive Strength Test Report Forms attaining Design Strength, f'_c for the Precast Concrete Highway Unit's representative Sublot.
(b) Certificate of Compliance generated by the Fabricator as described under the *Fabricator Quality Control* section.
(c) QC Inspection Reports signed by the Quality Control Manager.

The Contractor shall inspect Precast Concrete Highway Units upon receipt at the site. Precast Concrete Highway Units damaged during delivery shall be repaired or replaced at MassDOT's direction at no cost to MassDOT..

NORTHERN LONG-EARED BAT PROTECTION

The U.S. Fish and Wildlife Service (USFWS) has listed the northern long-eared bat as threatened under the Endangered Species Act (ESA) and the following requirements exist to protect the bat and its habitat.

This project has been consulted with the USFWS through the Optional Framework to Streamline Section 7 Consultation and is consistent with the Programmatic Biological Opinion under the authority of section 4(d) of the Endangered Species Act and the Final 4(d) Rule published in the Federal Register on January 14, 2016. No conservation measures or time of year restrictions on tree cutting are required. If additional cutting is proposed by the Contractor that is outside the scope of this contract, additional review is required by the MassDOT Highway Division's Environmental Services Section, additional review may be required by the USFWS, and time of year restrictions could apply to such tree cutting.

EMERALD ASH BORER ADVISORY

To the extent possible, all trees and brush shall be disposed on site, typically chipped and spread in place. When trees or brush must be removed, such as in urban, or otherwise populated areas, Contractor shall identify proposed location for disposal, and provide written notification to the Engineer for approval. Disposal shall be in city or town of project, or at minimum, within county, of construction operations.

WORK SCHEDULE

A normal workday on this project is to be between 8:00am and 4:30pm, Monday through Friday, with Contractors and Subcontractors working on the same shift. Work hours may be extended to 7:00pm with the approval of the Engineer.

Work that restricts traffic flow or requires lane closures shall be performed between 8:30am to 4:00pm.

NOTICE TO OWNERS OF UTILITIES

Written notice shall be given by the Contractor to all public service corporations or Municipal and State officials owning or having charge of publicly or privately owned utilities of his intention to commence operations affecting such utilities at least one week in advance of the commencement of such operations. The Contracotr shall, at the same time, file a copy of such notice with the Engineer.

Before beginning any work or operations, which might damage any subsurface structures, the Contractor shall carefully locate all such structures and conduct his operations so as to avoid any damage to them.

The following website lists the names and addresses of the utilitites may be affected, but the completeness of the lsit is not guaranteed:

https://www.mass.gov/info-details/utility-contacts-by-district-and-municipality

PROTECTION OF UNDERGROUND FACILITIES

The Contractor's attention is directed to the necessity of making their own investigation in order to ensure that no damage to existing structures, drainage lines, traffic signal conduits, etcetera, will occur.

The Contractor shall notify Massachusetts DIG SAFE and procure a Dig Safe Number for each location prior to disturbing existing ground in any way. The telephone number of the Dig Safe Call Center is 811 or 1-888-344-7233.

The Contractor shall notify the respective utility company immediately following the Notice to Proceed from MassDOT to generate a Work Order for each utility requiring relocation.

Following is a list of Utility Companies and others who may be involved in this project but the completeness of the list is not guaranteed:

Ashland DPW (Water & Sewer) 20 Ponderosa Road Ashland, MA 01721	Doug Small Tel: (508) 881-0120
Eversource (Electric) 50 Duchaine Blvd. New Bedford, MA 02745	Richard Comeau Tel: (508) 441-5881
Verizon 385 Myles Standish Blvd. Taunton, MA 02780 Somerville, MA 02145	Karen Mealy Tel: (774) 409-3160
Eversource (Gas) 157 Cordaville Road, 3113 Southborough, MA 01772	Jeffrey Evans-Mongeon Tel: (508) 305-6970
Comcast PO Box 6505 – 5 Omni Way Chelmsford, MA 01824	William Wasylak Tel: (978) 848-5640

EVERSOURCE EMERGENCY TELEPHONE NUMBERS

GAS:
Outage/ Emergency: 800-592-2000
New Service: 866-678-2744
Customer Support: 800-592-2000

ELECTRIC:
Outage/ Emergency: 800-592-2000 or 844-726-7562
New Service: 1-888-633-3797 (1-888-need pwr)
Customer Support: 1-800-340-9822

EQUIVALENT SINGLE AXLE LOADS (ESALS)

The estimated traffic level to be used for SUPERPAVE HMA mixture designs for this contract, expressed in Equivalent Single Axle Loads (ESALs) for the design travel lane over a 20-year period, is ***0.3 to 3.0*** 18-kip (80-kn) ESALs.

WORK RELATED TO WATER ITEMS

The Contractor shall be responsible for notifying the Town of Ashland Water and Sewer Department and the Engineer of service shutdown 48 hours prior to the actual shutdown. The shutdown of the water services will be performed only by personnel of the Ashland Water and Sewer Department. Valves, hydrants, corporations and curb stops will be operated by the Ashland Water and Sewer Department personnel only.

No less than 24 hours prior notice shall be given to owners of properties affected by proposed shutdowns of water mains and services. Shutdown of fire service(s) requires prior notification to, and approval of, the Ashland Fire Department. No water main or service supplying any home, place of business or fire hydrant shall be shut down for more than four (4) hours unless an approved temporary means of supply is provided.

The Contractor shall notify and coordinate with business owners and commercial establishments of any disruptions to, or shutdowns of, water service to their facilities. The Contractor shall schedule service disruptions or shutdowns such that operations of business and commercial establishments are not impacted, and furthermore shall coincide with periods of minimal water usage by these properties.

WORK NEAR SHELL OIL PIPELINE AND MARKER – ALGONQUIN TRAIL

The Contractor shall be responsible for notifying the Shell Oil Company before doing any work near the pipeline and marker south of Algonquin Trail. The Contact person for Shell Oil Company is Preston Hathaway at 508-822-9330 (Work) or 508-941-3280 (Mobile). According to Shell Oil, the pipeline is currently idle. The relocation of the pipeline marker shall be done in coordination with Shell Oil Company. The Contractor shall notify and coordinate with Shell Oil Company prior to beginning any work in the vicinity of Algonquin Trail. The Contractor shall notify Shell Oil Company immediately if the pipeline is impacted during construction.

WORK NEAR EVERSOURCE GASLINES – 156 POND STREET

The Contractor shall be responsible for notifying Eversource before doing any work within 50' of the Regulator Station at 156 Pond Street. Any work within the station will require an Eversource representative on site and a three days' noticed is required for a technician to be on site. The Contractor shall notify and coordinate with Eversource immediately if the pipeline is impacted during construction.

EVERSOURE GAS LINE BY-PASS AT CULVERTS

The Contractor shall coordinate the work at the culverts with Eversource. Eversource will cut the existing pipe and install a temporary by-pass at the locations where the gas line interferes with the work at the culverts. The Contractor shall remove the entire cut section of pipe during installation of the culvert. Prior to the Contractor backfilling the culvert, Eversource will re-install the 8 inch plastic gas pipe and remove the temporary by-pass. Should any gas line be constructed below a culvert, the gas line shall have a 10" sleeve with a 12" layer of sand around it. Eversource will be on site to inspect the backfilling of the excavation. The Contractor shall take this work into consideration when preparing the bid and there will be no additional compensation for this work.

VALUE ENGINEERING CHANGE PROPOSAL

This Subsection defines the conditions and requirements which apply to Value Engineering Change Proposals ("VECPs"). The purpose of this provision is to encourage the Contractor to propose changes in certain project requirements that will maintain the project's functional requirements at a savings in contract time, contract price, or both. The net savings obtained by using a VECP that meets the conditions and requirements set forth here will be shared by the Contractor and MassDOT.

VECP's under this provison are to be initiated, developed and submitted to MassDOT by the Contractor. The VECP must show the contemplated changes to the Drawings, Specifications and other requirements in the Contract. When a VECP submitted pursuant to this section is fully accepted by MassDOT, the VECP will be implemented by the Contractor and paid using the current cost and resource loaded schedule. Contractor shall demonstrate that the VECP is equal to, or better than, the original design or material; that there is an interest in public safety within the VECP; that there is a life-cycle cost benefit; and/or that end users will benefit from the shortened schedule. VECPs shall be consistent with the MassHighway/MassDOT Standard Specifications for Highways and Bridges and other applicable reference documents and directives. Any proposed deviation from these documents will need to be clearly identified in the VECP Proposal Documents, and must be approved by MassDOT's Chief Engineer before accepting this VECP.

A. In order to be considered for MassDOT review each VECP shall:

1. Be clearly labeled pursuant to this Subsection;

2. Yield a net savings at least two hundred and fifty thousand (250,000.00) Dollars and/or a net saving of contract completion duration of at least three (3) months;

3. The proposed changes to contract items must:

    a. maintain the specified items' required functions (service life, reliability);

    b. meet applicable safety regulations and codes;

    c. material substitutions must be in accordance with DOT prequalified/preapproved products and must be tested in accordance with standard material specs/testing methods (and considering all relevant environmental, load, and other relevant factors);

    d. show economy of operation, ease of maintenance, ease of construction, and necessary standardized features and appearance; and

4. Shall not require an extension of Contract Time or Contract Milestones, with the exception of cases when there are anticipated significant cost saving.

VALUE ENGINEERING CHANGE PROPOSAL (Continued)

The thresholds above are considered to be a general guideline. MassDOT will consider VECPs outside of these thresholds if a significant benefit is demonstrated. Additionally, notwithstanding this VECP process, MassDOT will consider minor revisions in the form of a Contract Modification.

Further, any VECP submitted shall be in sufficient detail to clearly define the proposed change. The Contractor's failure to provide information of the type, detail and in a format to facilitate the MassDOT's review, may be grounds for rejection of the VECP. Additionally, the Contractor will not be entitled to any equitable adjustment or increased Time, due to any aspect of any of the proposed VECP including permitting, right of way, utility coordination or delayed responses by MassDOT. If, after the progression of the work associated with the executed Contract Modification for the VECP, any additional costs are realized by the Contractor or any of the sub-consultants, sub-contractors, or suppliers, the Contractor shall be obligated to pay for any and all costs.

B. The following initial items shall be provided by the Contractor for MassDOT's review. *Items 1-6 need to be submitted prior to the start of MassDOT's review of the VECP and item 7 is an important consideration for the pricing of the VECP and the timeline of the proposed VECP schedule.*

1. ***VECP Description***: A description of the difference between the existing and the proposed Contract requirements, and the comparative advantages and disadvantages of each;

2. ***VECP Change Listing***: A listing of the Contract requirements that will need to be changed, modified, or reviewed as well as the proposed Contract document changes in the Instructions to Bidders, Contract, Standard Specifications, General Requirements and Special Provisions required by the VECP.

3. ***Construction Schedule Update*****:** Any changes in the Contract Time(s) or Contract Milestone(s), that will result from acceptance of the VECP, shall be accompanied by a contemporaneous schedule analysis *(i.e, the Contractor's baseline schedule submission, all past/required monthly schedule updates, a detailed assessment of all past delays, and a resource loaded Crticial Path Method schedule as specified in Section 8.0 / Subsection 8.02 of this Contract)* of the projected Work that remains including the proposed VECP related schedule changes *(inclusive of the timeline to review accept the VECP and the timeline for implementing the design changes)* in the remaining work. This shall be submitted in the form of a Proposal Schedule until the VECP has been formally accepted. Note: All of this information is to be updated, recertified, and formally accepted by MassDOT before final acceptance of this this VECP is issued.

VALUE ENGINEERING CHANGE PROPOSAL (Continued)

4. ***Date for MassDOT's Acceptance***: A statement that clearly justifies the date by which the VECP must be accepted to obtain the maximum price reduction, noting any effect upon the Contract Time(s) and/or Contract Milestone(s). This statement must include a narrative that demonstrates the most recent construction schedule has been utilized to justify that proposed acceptance date *(e.g. "in order to start to fabricate critical materials, authorization must be provided to work on the shop drawings by no later than [date]").* The Contractor should allow for at least sixty (60) to ninety (90) days for acceptance by MassDOT once all of the VECP documentation has been provided. Acceptance shall mean that MassDOT has received a finalized and executed contract modification. However, this is a proposed Contract change.

   The Contractor is fully obligated to progress the Work of the original Contract and MassDOT is not liable for any delays or costs that may occur in the review phase of any VECP proposal.

5. ***Cost and Savings Estimates***: A detailed estimate of the anticipated net savings, calculated as follows:

   a. ***Original Scope:*** Isolate the cost of performing the original contract construction activities, in accordance with the original Contract Documents, as originally bid by the Contractor, that are anticipated to be superseded by the VECP. *This cost is to include any original contract scope that is anticipated to be altered or eliminated by the VECP such as, shop drawing preparation, inspection work, testing, maintenance of traffic, or any other original contract costs, that have yet to have been performed at the time of this VECP submission.*

   b. ***New VECP Scope:*** Calculate the cost of performing the comparable construction activities associated with the VECP.

   c. ***Contractor's Engineer & Inspection***: Calculate the cost of engineering, inspection, and design work by the Contractor's Engineer/Designer. This should be a realistic estimate of the costs of any required engineering, design and review work by the Contractor's Engineer.

   d. ***MassDOT's Costs:*** MassDOT's estimate of costs to perform engineering/design reviews, cost estimate reviews, schedule reviews, and any other administrative costs to review and recommend implementation of the proposed VECP. *(including all anticipated increased costs to MassDOT on other Contracts and all anticipated follow-on increased costs to MassDOT, if any)* as provided by MassDOT. MassDOT's estimated costs must be included the VECP calculation and will be provided by MassDOT in support of the VECP evaluation process.

   e. ***Other Costs:*** Estimated costs associated with any revisions to other project related costs, such as Environmental Permits or Right of Way acquisitions, including other agency or municipality costs, as provided by MassDOT.

VALUE ENGINEERING CHANGE PROPOSAL (Continued)

Net Savings:

The net savings to be split between MassDOT and the Contractor shall be calculated using the items above as follows: a - (b+c+d+e) = net savings

6. *The Contractor shall also provide:*

   a. A proposed Change Order, which explains and justifies any required Equitable Adjustment in the Contract Price.

   b. The Contractor's actual costs expended for developing the VECP as of the date of the VECP submission;

7. ***Design Changes and Drawings*****:** The costs that are outlined above should be inclusive of the following design and engineering responsibilities.

   a. Design changes shall be prepared and stamped by the Contractor's professional designer and/or engineer. In addition, in the development of the VECP; the Contractor is responsible for anticipating and managing all aspects associated with any VECP design work that must be performed by a licensed Engineer.

   b. The Contractor's engineer must analyze and stamp all components of any aspect of the project that has been redesigned, changed, or altered as a result of this VECP.

   c. The Contractor's engineer shall provide all calculations and supporting design/engineering documentation that was utilized to develop the changes and stamped drawings. These will be used by MassDOT's Designer-of-Record to review the VECP changes. The Contractor is limited to selecting only those engineer's that have been pre-qualified by MassDOT's A&E Board.

   d. MassDOT's Designer-of-Record will review and respond to all completed design submissions related to this VECP within thirty (30) calendar days, unless determined to be a non-critical path item.

   e. MassDOT will be responsible for estimating and managing MassDOT's Designer-of-Record during the VECP review and implementation. Should any significant conflicts arise, between the Contractor's Engineer and MassDOT's Designer-of-Record, the DOT and the Contractor will work expeditiously to resolve the conflict. Should this type of conflict continue for greater than five (5) days, the Contractor is to bear all financial and time related impacts of such delay and must seek to resolve the design conflict, in an acceptable manner to MassDOT. The resolution of this conflict will be funded at the Contractor's expense – exclusive of the net saving that was agreed to at the execution of the contract modification for this VECP.

   f. The Contractor's Engineer may also be required to inspect the construction work. The Contractor is to include such anticipated inspection costs in the initial VECP.

VALUE ENGINEERING CHANGE PROPOSAL (Continued)

g. MassDOT's Designer of Record will remain the Designer-of-Record for the entire Project. Any costs incurred in the use of MassDOT's Designer-of-Record by MassDOT or Contractor associated with the review of a VECP are to be included in the calculated net savings.

C. Approval of the VECP shall not occur until a Contract Modification, incorporating the VECP, is issued by MassDOT and properly executed by the Contractor. MassDOT may accept or reject part or all of any VECP at any time prior to an executed Contract Modification for the applicable VECP. The decision of MassDOT, concerning acceptance or rejection of any VECP, shall be final and shall not be subject to dispute resolution.

It is expected that several weeks may go by before the final VECP documentation has been executed with a Contract Modification. Therefore, MassDOT intends to make certain that the initial cost estimate information has not changed before entering into a Contract Modification. As the VECP evaluation process is finalized, and prior to the signed Contract Modification for the VECP, the Contractor and MassDOT must re-certify the current status of the originally proposed cost and/or schedule savings.

Until a contract modification is issued and schedule and cost/savings re-certification is complete and accepted by MassDOT, the Contractor shall remain obligated to perform the Work in accordance with the terms and conditions of the original Contract Documents.

Upon completion of the work associated with the VECP, MassDOT may require verification that the VECP savings has been achieved.

D. VECPs will be processed (distributed, reviewed, commented upon, accepted or rejected) expeditiously (pursuant to M.G.L. c. 30, § 39R); however, as this is an elective modification to the contract, MassDOT shall not be liable for any delay or cost in the review and acceptance of the VECP. During the review of the VECP, the Contractor remains obligated to progress the original Contract scope, and schedule, as planned; until a Contract Modification, accepting the Contractor re-certified VECP, has been executed by MassDOT.

The Contractor has the right to withdraw part, or all of any VECP, prior to acceptance by MassDOT. Such withdrawal shall be made in writing to the Engineer. The Contractor shall state the period of time, from the date of the initial VECP submittal, that the VECP shall remain valid and feasible. Revision of this validity and feasibility period shall be allowed only by mutual agreement of the Contractor and the Engineer in writing.

If the Contractor desires to withdraw the proposal prior to the expiration of this period for non-technical reason, MassDOT reserves the right to recover all actual costs that have been incurred to MassDOT.

VALUE ENGINEERING CHANGE PROPOSAL (Continued)

If the Contractor withdraws the VEC Proposal, MassDOT reserves the right to proceed with the VECP or any portion of the VECP as a normal change and the Contractor waives any right it may have had to share in net savings thereunder.

For purposes of this provision, expiration of the time established by the Contractor for approval shall be considered as withdrawal by the Contractor if MassDOT requests an extension of that time and the Contractor does not provide a written extension.

E. With regard to unknown conditions or sub-surface work, in general, the expectation is that the Contractor and MassDOT will strive to gain enough knowledge about the risks in order to provide a forward-priced Change Proposal. Therefore, any costs to fully evaluate the proposal, such as additional borings and/or test pits, must be considered in the cost evaluation of whether the VECP is worth pursuing. However, if it is impractical to gather conclusive exploratory information, before the VECP is executed, MassDOT may consider provisions in the VECP that clearly identifies the risk sharing (cost and time) related specifically to the unknown/sub-surface conditions. If these VECP provisions are acceptable to MassDOT they are to include supplemental language to provide a determination of the final savings/cost, and time impacts, no later than 45 days after the sub-surface work is completed. All other aspects of the VECP, unrelated to these Provisions, will be binding upon execution of the VECP.

SUBSECTION 8.02 SCHEDULE OF OPERATIONS

Replace this subsection with the following:

An integrated cost and schedule controls program shall be implemented by the Contractor to track and document the progress of the Work from Notice to Proceed (NTP) through the Contractor Field Completion (CFC) Milestone. The Contractor's schedules will be used by the Engineer to monitor project progress, plan the level-of-effort required by the Department's work force and consultants and as a critical decision-making tool. Accordingly, the Contractor shall ensure that it complies fully with the requirements specified herein and that its schedules are both accurate and updated as required by the specification throughout the life of the project. Detailed requirements are provided in Division II, Section 722 Construction Scheduling.

SUBSECTION 8.14 UTILITY COORDINATION, DOCUMENTATION, AND MONITORING RESPONSIBILITIES

A. GENERAL

In accordance with the provisions of Section 8.00 Prosecution and Progress, utility coordination is a critical aspect to this Contract. This section defines the responsibility of the Contractor and MassDOT, with regard to the initial utility relocation plan and changes that occur as the prosecution of the Work progresses. The Engineer, with assistance from the Contractor shall coordinate with Utility companies that are impacted by the Contractor's operations. To support this effort, the Contractor shall provide routine and accurate schedule updates, provide notification of delays, and provide documentation of the steps taken to resolve any conflicts for the temporary and/or permanent relocations of the impacted utilities. The Contractor shall provide copies to the Engineer of the Contractor communication with the Utility companies, including but not limited to:

- Providing advanced notice, for all utility-related meetings initiated by the Contractor.
- Providing meeting minutes for all utility-related meetings that the Contractor attends.
- Providing all test pit records.
- Request for Early Utility work requirements of this section (see below).
- Notification letters for any proposed changes to Utility start dates and/or sequencing.
- Written notification to the Engineer of all apparent utility delays within seven (7) Calendar Days after a recognized delay to actual work in the field – either caused by a Utility or the Contractor.
- Any communication, initiated by the Contractor, associated with additional Right-of-Way needs in support of utility work.
- Submission of completed Utility Completion Forms.

B. PROJECT UTILITY COORDINATION (PUC) FORM

The utility schedule and sequence information provided in the Project Utility Coordination Form (if applicable) is the best available information at the time of the bid and has been considered in setting the contract duration. The Contractor shall use all of this information in developing the bid price and the Baseline Schedule Submission, inclusive of the individual utility durations sequencing requirements, and any work that has been noted as potentially concurrent utility installations.

C. INITIATION OF UTILITY WORK

The Engineer will issue all initial notice-to-proceed dates to each Utility company based on either the:

1) Contractor's accepted Baseline Schedule
2) An approved Early Utility Request in the form of an Early Utility sub-net schedule (in accordance with the requirements of this Subsection)
3) An approved Proposal Schedule

C.1 - BASELINE SCHEDULE – UTILITY BASIS

The Contractor shall provide a Baseline Schedule submission in accordance with the requirements of Subsection 8.02 and inclusive of all of the information provided in the PUC Form that has been issued in the Contract documents. This is to include the utility durations, sequencing of work, allowable concurrent work, and all applicable considerations that have been depicted on the PUC Form.

SUBSECTION 8.14 (Continued)

C.2 – EARLY UTLITY REQUEST – (aka SUBNET SCHEDULE) PRIOR TO THE BASELINE

All early utility work is defined as any anticipated/required utility relocations that need to occur prior to the Baseline Schedule acceptance. In all cases of proposed early utility relocation, the Contractor shall present all known information at the pre-construction conference in the form of a 'sub-net' schedule showing when each early utility activity needs to be issued a notice-to-proceed. The Contractor shall provide advance notification of this intent to request early utility work in writing at or prior to the Pre-Construction meeting. Prior to officially requesting approval for early utility work, the Contractor shall also coordinate with MassDOT and all utility companies (private, state or municipal) which may be impacted by the Contract. If this request is acceptable to the Utilities and to MassDOT, the Engineer will issue a notice-to-proceed to the affected Utilities, based on these accepted dates.

C.3 – PROPOSAL SCHEDULE - CHANGES TO THE PUC FORM

If the Contractor intends to submit a schedule (in accordance with MassDOT Standard Specifications, Division I, Subsection 8.02) that contains durations or sequencing that vary from those provided in the Project Utility Coordination (PUC) Form, the Contactor must submit this as an intended change, in the form of a Proposal Schedule and in accordance with MassDOT Standard Specifications, Division I, Subsection 8.02. These proposed changes are subject to the approval of the Engineer and the impacted utilities, in the form of this Proposal Schedule and a proposed revision to the PUC form. The Contractor shall not proceed with any changes of this type without written authorization from the Engineer, that references the approved Proposal Schedule and PUC form changes. The submission of the Baseline Schedule should not include any of these types of proposed utility changes and should not delay the submission of the Baseline Schedule. As a prerequisite to the Proposal Schedule submission, and in advance of the utility notification(s) period, the Contractor shall coordinate the proposed utility changes with the Engineer and the utility companies, to develop a mutually agreed upon schedule, prior to the start of construction.

D. UTILITY DELAYS

The Contractor shall notify the Engineer upon becoming aware that a Utility owner is not advancing the work in accordance with the approved utility schedule. Such notice shall be provided to the Engineer no later than seven (7) calendar days after the occurrence of the event that the Contractor believes to be a utility delay. After such notice, the Engineer and the Contractor shall continue to diligently seek the Utility Owner's cooperation in performing their scope of Work.

In order to demonstrate that a critical path delay has been caused by a third-party Utility, the Contractor must demonstrate, through the requirements of the monthly Progress Schedule submissions and the supporting contract records associated with Subsection 8.02, 8.10 and 8.14, that the delays were beyond the control of the Contractor.

SUBSECTION 8.14 (Continued)

All documentation provided in this section is subject to the review and verification of the Engineer and, if required, the Utility Owner. In accordance with MassDOT Specifications, Division I, Subsection 8.10, a Time Extension will be granted for a delay caused by a Utility, only if the actual duration of the utility work is in excess of that shown on the Project Utility Coordination Form, and only if;

1) proper Notification of Delay was provided to MassDOT in accordance with the time requirements that are specified in this Section
2) the utility delay is a critical path impact to the Baseline Schedule (or most recently approved Progress Schedule)

E. LOCATION OF UTILITIES

The locations of existing utilities are shown on the Contract drawings as an approximation only. The Contractor shall perform a pre-construction utility survey, including any required test pits, to determine the location of all known utilities no later than thirty (30) calendar days before commencing physical site work in the affected area.

F. POST UTILITY SURVEY – NOTIFICATION

Following completion of a utility survey of existing locations, the Contractor will be responsible to notify the Engineer of any known conflicts associated with the actual location of utilities prior to the start of the work. The Engineer and the Contractor will coordinate with any utility whose assets are to be affected by the Work of this Contract. A partial list of utility contact information is provided in the Project Utility Coordination Form.

G. MEETINGS AND COOPERATION WITH UTILITY OWNERS

The Contractor shall notify the Engineer in advance of any meeting they initiate with a Utility Owner's representative to allow MassDOT to participate in the meeting if needed.

Prior to the Pre-Construction Meeting, the Contractor should meet with all Utility Owners who will be required to perform utility relocations within the first 6 months of the project, to update the affected utilities of the Project Utility Coordination Form and all other applicable Contract requirements that impact the Utilities. The Contractor shall copy the Engineer on any correspondence between the Utility Owner and the Contractor.

H. FORCE ACCOUNT / UTILITY MONITORING REQUIREMENTS

The Engineer will be responsible for recording daily Utility work force reports. The start, suspension, re-start, and completion dates of each of the Utilities, within each phase of the utility relocation work, will be monitored and agreed to by the Engineer and the Contractor as the work progresses.

I. ACCESS AND INSPECTION

The Contractor shall be responsible for allowing Utility owners access to their own utilities to perform the relocations and/or inspections. The Contractor shall schedule their work accordingly so as not to delay or prevent each utility from maintaining their relocation schedule.

SECTION 722
CONSTRUCTION SCHEDULING

DESCRIPTION

722.20 General

The Contractor's approach to prosecution of the Work shall be disclosed to the Department by submission of a Critical Path Method (CPM) schedule and a cost/resource loaded Construction Schedule when required in this Subsection. These requirements are in addition to, and not in limitation of, requirements imposed in other sections.

The requirements for scheduling submissions are established based on the Project Value at the time of the bid and are designated as Type A, B, C or D. The definitions of these Schedule Requirement Types are summarized below. Complete descriptions of all detailed requirements are established elsewhere in this specification.

Type A – for all Site-Specific Contracts with a Project Value over $20 Million

- Schedule Planning Session
- Baseline CPM Schedule
- Monthly Update CPM Schedule
- Short-term Construction Schedule
- Contract Schedule Update Meeting
- Resource-Loading
- Resources Graphic Reporting
- Cash Flow Projections from the CPM
- Cash Flow Charts
- Cost-loaded CPM
- Contractor-furnished CPM software, computer and training

Type B – for all Site-Specific Contracts with a Project Value between $10 Million and $20 Million

- Schedule Planning Session
- Baseline CPM Schedule
- Monthly Update CPM Schedule
- Short-term Construction Schedule
- Contract Schedule Update Meeting
- Cost-loaded CPM
- Resource-Loading
- Monthly Projected Spending Report (PSR)
- Contractor-furnished CPM software, computer and training

SECTION 722 (Continued)

Type C – for all Site-Specific Contracts with a Project Value between $3 Million and $10 Million

- Schedule Planning Session
- Baseline CPM Schedule
- Monthly Update CPM Schedule
- Short-term Construction Schedule
- Contract Schedule Update Meeting
- Monthly Projected Spending Report (PSR)
- Contractor-furnished CPM software, computer and training

Type D - for all contracts with a Project Value less than $3 Million; various locations contracts of any dollar amount; contracts with durations less than one-hundred and eighty (180) Calendar Days; and other contracts as determined by the Engineer.

- Bar chart schedule updated monthly or at the request of the Engineer (See Section 722.62.B - Bar Charts.)
- Monthly Projected Spending Report (PSR) (See Section 722.62.F - Projected Spending Reports.)

MATERIALS, EQUIPMENT, PERSONNEL

722.40 General

A. Software Requirements (Types A, B and C)

The Contractor shall use Primavera P6 computer scheduling software.

In addition to the requirements of Section 740 – Engineer's Field Office and Equipment, the Contractor shall provide to the Department one (1) copy of the scheduling software, one (1) software license and one (1) computer capable of running the scheduling software for the duration of the Contract. This computer and software shall be installed in the Engineer's Field Office within twenty-eight (28) Calendar Days after Notice to Proceed. The computer and software shall be maintained and serviced as recommended by the computer manufacturer and/or as required by the Engineer during the duration of the Contract at no additional cost to the Department. The Contractor shall provide professional training in the basic use of the software for up to eight (8) Department employees. The trainer shall be approved by the Engineer. This training shall be provided within twenty-eight (28) Calendar Days after Notice to Proceed.

B. Scheduler Requirements

For all schedule types, if the Contractor plans to use outside scheduling services, the scheduler shall be approved as a subcontractor by the Engineer.

For Type A, B and C Schedules the name of the Contractor's Project Scheduler together with his/her qualifications shall be submitted to the Department for approval by the Engineer within seven (7) Calendar Days after NTP. The Project Scheduler shall have a minimum of five [5] years of project CPM scheduling experience, three [3] years of which shall be on projects of similar scope and value as the project for which the Project Scheduler is being proposed. References shall be provided from past projects that can attest to the capabilities of the Project Scheduler.

SECTION 722 (Continued)

CONSTRUCTION METHODS

722.60 General

A. Schedule Planning Session
(Types A, B and C)

The Contractor shall conduct a schedule planning session within seven (7) Calendar Days after the Contractor receives the NTP and prior to submission of the Baseline Schedule. This session will be attended by the Department and its consultants. During this session, the Contractor shall present its planned approach to the project including, but not limited to:

1. the Work to be performed by the Contractor and its subcontractors;
2. the planned construction sequence and phasing; planned crew sizes;
3. summary of equipment types, sizes, and numbers to be used for each work activity;
4. all early work related to third party utilities;
5. identification of the most critical submittals and projected submission timelines;
6. estimated durations of major work activities;
7. the anticipated Critical Path of the project and a summary of the activities on that Critical Path;
8. a summary of the most difficult schedule challenges the Contractor is anticipating and how it plans to manage and control those challenges;
9. a summary of the anticipated quarterly cash flow over the life of the project.

This will be an interactive session and the Contractor shall answer all questions that the Department and its consultants may have. The Contractor shall provide a minimum of five (5) copies of a written summary of the information presented and discussed during the session to the Engineer. The Contractor's Baseline Schedule and accompanying Schedule Narrative shall incorporate the information discussed at this Schedule Planning Session.

B. Schedule Reviews by the Department (All Types)

1. Baseline Schedule Reviews
   The Engineer will respond to the Baseline Schedule Submission within thirty (30) Calendar Days of receipt providing comments, questions and/or disposition that either accepts the schedule or requires revision and resubmittal. Baseline Schedules shall be resubmitted within fifteen (15) Calendar Days after receipt of the Engineer's comments.

2. Contract Progress Schedule / Monthly Update Reviews
   The Engineer will respond to each submittal within twenty one (21) Calendar Days. Schedules shall be resubmitted by the Contractor within five (5) Calendar Days after receipt of the Engineer's comments.

   Failure to submit schedules as and when required could result in the withholding of full or partial pay estimate payments by the Engineer.

SECTION 722 (Continued)

722.61 Schedule Content and Preparation Requirements
(Types A, B and C unless otherwise noted)

Each Contract Progress Schedule shall fully conform to these requirements.

A. LOGIC

The schedules shall divide the Work into activities with appropriate logic ties to show:

1. conformance with the requirements of this Section and Division I, Subsection 8.02 - Schedule of Operations
2. the Contractor's overall approach to the planning, scheduling and execution of the Work
3. conformance with any additional sequences of Work required by the Contract Documents, including, but not limited to, Subsection 8.03 - Prosecution of Work and Subsection 8.06 – Limitations of Operations.

B. ACTIVITIES

The schedules shall clearly define the progression of the Work from NTP to Contractor Field Completion (CFC) by using separate activities for each of the following items:

1. NTP
2. Each component of the Work defined by specific activities
3. Detailed activities to satisfy permit requirements
4. Procurement of fabricated materials and equipment with long lead times, including time for review and approval of submittals required before purchasing
5. The preparation and submission of shop drawings, procedures and other required submittals, with a planned duration that is to be demonstrated to the Engineer as reasonable
6. The review and return of shop drawings, procedures and other required submittals, approved or with comments, the duration of which shall be thirty (30) Calendar Days, unless otherwise specified or as approved by the Engineer
7. Interfaces with adjacent work, utility companies, other public agencies, sensitive abutters, and/or any other third party work affecting the Contract
8. The Critical Path, clearly defined and organized
9. Float shall be clearly identified
10. Access Restraints – restrictions on access to areas of the Work that are defined by the Department in the bid package, in Subsection 8.06 – Limitations of Operations or elsewhere in the Contract
11. Milestones listed in Subsection 8.03 - Prosecution of Work or elsewhere in the Contract Documents
12. Subcontractor approvals at fifteen (15) Calendar Days from submittal to response
13. Full Beneficial Use (FBU) Contract Milestone per the requirements of Subsection 8.03 - Prosecution of Work
14. Contractor’s request for validation of FBU (ready to open to traffic)
15. The Department’s confirmation of completed work to allow for FBU

SECTION 722 (Continued)

16. Substantial Completion Contract Milestone per the requirements of Subsections 7.15 - Claims Against Contractors for Payment of Labor, Materials and Other Purposes and 8.03 - Prosecution of Work
17. Contractor's request for validation of Substantial Completion
18. Punchlist Completion Period of at least thirty (30) Calendar Days per the requirements of Subsections 5.11 - Final Acceptance, 7.15 - Claims Against Contractors for Payment of Labor, Materials and Other Purposes and 8.03 - Prosecution of Work
19. Contractor confirmation that all punchlist work and documentation has been completed
20. Physical Completion of the Work Contract Milestone per the requirements of Subsections 5.11 - Final Acceptance and 8.03 - Prosecution of Work
21. Documentation Completion per the requirements of Subsections 5.11 - Final Acceptance and 8.03 - Prosecution of Work
22. Contractor Field Completion Contract Milestone per the requirements of Subsections 5.11 - Final Acceptance and 8.03 - Prosecution of Work
23. Utility work to be performed in accordance with the Project Utility Coordination (PUC) Form as provided in Section 8.14 - Utilities Coordination, Documentation and Monitoring Responsibilities
24. Traffic work zone set-up and removal, night work and phasing
25. Early Utility Relocation (by others) that has been identified in the Contract
26. Right-of-Way (ROW) takings that have been identified in the Contract
27. Material Certifications
28. Work Breakdown Structure in accordance with the MassDOT-Highway Division Contractor Construction Schedule Toolkit located on the MassDOT-Highway Division website at:
    https://www.mass.gov/info-details/massdot-highway-contractors-schedule-toolkit
29. For Type A and B Contracts only: All items to be paid, including all Unit Price and Lump Sum pay items, shall be identified by activity. This shall include all non-construction activities such as engineering work; purchase of permanent materials and equipment, purchase of structural steel stock, equipment procurement, equipment delivery to the site or storage location and the representative amount of overhead/indirect costs that was included in the Contractor's Bid Prices.

C. EARLY AND LATE DATES

Early Dates shall be based on proceeding with the Work or a designated part of the Work exactly on the date when the corresponding Contract Time commences. Late Dates shall be based on completing the Work or a designated part of the Work exactly on the corresponding Contract Time, even if the Contractor anticipates early completion.

SECTION 722 (Continued)

D. DURATIONS

Activity durations shall be in Work Days. Planned Original Durations shall be established with consideration to resources and production rates that correspond to the Contractor's Bid Price. Within all of the Department-required schedules, the Contractor shall plan the Work using durations for all physical construction activities of no less than one (1) Work Day and no greater than fourteen (14) Work Days, unless approved by the Engineer as part of the Baseline Schedule Review.

Should there be an activity with a duration that is determined by the Engineer to be unreasonable, the Contractor will be asked to provide a basis of the duration using bid documents, historic production rates for similar work, or other form of validation that is acceptable to the Engineer. Should the Contractor and the Engineer be unable to agree on reasonable activity durations, the Engineer will, at a minimum, note the disagreement in the Baseline Schedule Review along with a duration the Engineer considers reasonable and the basis for that duration. A schedule that contains a substantial number of activities with durations that are deemed unreasonable by the Engineer will not be accepted.

E. MATERIALS ON HAND (for Types A and B only)

The Contractor shall identify in the Baseline Schedule all items of permanent materials (Materials On Hand) for which the Contractor intends to request payment prior to the incorporation of such items into the Work.

F. ACTIVITY DESCRIPTIONS

The Contractor shall use activity descriptions in all schedules that clearly describe the work to be performed using a combination of words, structure numbers, station numbers, bid item numbers, work breakdown structure (WBS) and/or elevations in a concise and compact label as specified in the MassDOT-Highway Division Contractor Construction Schedule Toolkit located on the MassDOT-Highway Division website at:

https://www.mass.gov/info-details/massdot-highway-contractors-schedule-toolkit

G. ACTIVITY IDENTIFICATION NUMBERS

The Contractor shall use the activity identification numbering system specified in the MassDOT-Highway Division Contractor Construction Schedule Toolkit located online at the address above.

H. ACTIVITY CODES

The Contractor shall use the activity codes specified in the MassDOT-Highway Division Contractor Construction Schedule Toolkit located online at the address above.

I. CALENDARS

Different calendars may be created and assigned to all activities or to individual activities. Calendars define the available hours of work in each Calendar Day, holidays and general or project-specific non-Work Days such as Fish Migration Periods, time of year (TOY) restrictions and/or area roadway restrictions.

SECTION 722 (Continued)

Examples of special calendars include, but are not limited to:

- Winter Shutdown Period, specific work is required by separate special provision to be performed during the winter. See Special Provision 8.03 (if applicable)
- Peak traffic hours on heavily traveled roadways. This shall be from 6:30 am to 9:30 am and from 3:30 pm to 7:00 pm, unless specified differently elsewhere in the Contract.
- Special requirements by sensitive abutters, railroads, utilities and/or other state agencies as defined in the Contract.
- Cape Cod and the Islands Summer Roadway Work Restrictions: A general restriction against highway and bridge construction is enforced between Memorial Day and Labor Day, unless otherwise directed by the Engineer. Refer to the Project Special Provisions for specific restrictions.
- Cape Ann Summer Roadway Work Restrictions: While there are no general restrictions for Cape Ann as there are for Cape Cod and the Islands, project-specific restrictions may be enforced. Refer to the Project Special Provisions for specific restrictions.
- Turtle and/or Fish Migration Periods and/or other in-water work restrictions: Refer to the Project Special Provisions for specific restrictions.
- Working over Waterways Restricted Periods: Refer to the Project Special Provisions for specific restrictions.
- Night-time paving and striping operations, traffic and temperature restrictions: Refer to the Project Special Provisions for specific restrictions.
- Utility Restrictions shall be as specified within the Contract.

J. FLOAT

For the calculation of float in the CPM schedule, the setting for *Retained Logic* is required for all schedule submissions, starting with the Baseline Schedule Submission. Should the Contractor have a reason to propose that an alternative calculation setting such as *Progress Override* be used, the Contractor shall obtain the Engineer's approval prior to modifying to this setting.

K. COST AND RESOURCE LOADING (Types A and B only)

For all Type A and B Schedules, the Contractor shall provide a cost and resource-loaded schedule with an accurate allocation of the costs and resources necessary to complete the Work. The costs and resources shall be assigned to all schedule activities in order to enable the Contractor to efficiently execute the Contract requirements and the Engineer to validate the original plan, monitor progress, provide cash flow projections and analyze delays.

1. Each schedule activity shall have an assigned cost that accurately represents the value of the Work. Each schedule activity shall have its resources assigned to it by craft and the anticipated hours to accomplish the work. Each schedule activity's equipment resources shall be assigned to it by equipment type and hours operated. Front-loading or other unbalancing of the cost distribution will not be permitted.
2. The sum of the cost of all schedule activities shall be equal to the Contractor's Bid Price.
3. Indicating the labor hours per individual, per day, by craft and equipment hours/day will be acceptable.

SECTION 722 (Continued)

4. The Engineer reserves the right to use the cost-loading as a means to resolve changes, disputes, time entitlement evaluations, increases or decreases in the scope of Work, unit price renegotiations and/or claims.
5. For all Type A and B Schedules, all subnets, fragnets, Proposal Schedules, and Recovery Schedules shall be cost and resource- loaded to help to quickly validate and monitor the duration of the Work to be performed.
6. For Type A Schedules, cost-loading of the schedule will also be used for cash flow projection purposes.
7. The cost-loading of each activity shall indicate the portion of the cost for that activity that is applicable to a specific bid item (cost account.) The total cost for each cost account must equal the bid item price.
8. For Type A Schedules, each month, the Contractor will be paid using the Cost-loaded CPM activities for Lump Sum payment items. This requirement supersedes any requirements elsewhere in this Contract regarding partial payments of schedule-of-values for all Lump Sum items.

L. NOT TO BE USED IN THE CONTRACTOR'S CPM SCHEDULE

1. Milestones or constraint dates not specified in the Contract
2. Scheduled work not required for the accomplishment of a Contract Milestone
3. Use of activity durations, logic ties and/or sequences deemed unreasonable by the Engineer
4. Delayed starts of follow-on trades
5. Float suppression techniques

722.62 Submittal Requirements

All schedules shall be prepared and submitted in accordance with the requirements listed below.

Each monthly Contract Progress Schedule submittal shall be uniquely identified.

Except as stated elsewhere in this subsection, schedule submittals shall include each of the documents listed below, prepared in two formats, for distribution as follows:

a. four (4) compact discs (CD); one (1) each for the Office of Project Controls and Performance Oversight (O-PC&PO), the Boston Construction Section Office, the District Construction Office and the Resident Engineer's Office. Additional copies shall be required if the work is performed in more than one district.
b. two (2) hard copies plotted in color on 24" X 36" paper; one (1) copy each for the District Construction Office and the Resident Engineer's Office. No copies for the O-PC&PO and the Boston Construction Section Office. Additional copies shall be required if the work is performed in more than one district.

SECTION 722 (Continued)

A. Narratives

A written narrative shall be submitted with every schedule submittal. The narrative shall:

1. itemize and describe the flow of work for all activities on the Critical Path in a format that includes any changes made to the schedule since the previous Contract Progress Schedule / Monthly Update or the Baseline Schedule, whichever is most recent;
2. provide a description of any specification requirements that are not being followed. Identify those that are improvements and those that are not considered to be meeting the requirements;
3. provide all references to any Notice of Delay that has been issued, within the time period of the Contract Progress Schedule Update, by letter to the Engineer. Note that any Notice of Delay that is not issued by letter will not be recognized by the Engineer. See Subsection 722.64.A - Notice of Delay;
4. provide a description of each third-party utility's planned vs. actual progress and note any that are trending late or are late per the durations and commitments as provided in the PUC Form; provide a description of the five (5) most important responses needed from the Department and the need date for the responses in order to maintain the current Schedule of Record;
5. provide a description of all critical issues that are not within the control of the Contractor or the Department (third party) and any impact they had or may have on the Critical Path;
6. provide a description of any possible considerations to improve the probability of completing the project early or on-time;
7. compare Early and Late Dates for activities on the Critical Path and describe reasons for changes in the top three (3) most critical paths ;
8. describe the Contractor's plan, approach, methodologies and resources to be employed for completing the various operations and elements of the Work for the top three (3) most critical paths. For update schedules, describe and propose changes to those plans and verify that a Proposal Schedule is not required;
9. describe, in general, the need for shifts that are not 5 days/week, 8 hours/day, the holidays that are inserted into each calendar and a tabulation of each calendar that has been used in the schedule;
10. describe any out-of-sequence logic and provide an explanation of why each out-of-sequence activity does not require a correction, if one has not been provided, and an adequate demonstration that these changes represent the basis of how these activities will be built, including considerations for resources, dependencies and previously-approved production rates;
11. identify any possible duration increases resulting from actual or anticipated unit price item quantity overruns as compared to the baseline duration, with a corresponding suggestion to mitigate any possible delays to the Critical Path. If the delay is anticipated to impact the Critical Path, refer to Subsections 4.06 - Increased or Decreased Contract Quantities and 8.10 - Determination and Extension of Contract Time for Completion and submit a letter to the Engineer notifying of a potential delay;
12. include a schedule log consisting of the name of the schedule, the data date and the date submitted.

SECTION 722 (Continued)

B. Bar Charts (Types A, B, C and D)

One (1) time-scaled bar chart containing all activities shall be prepared and submitted using a scale that yields readable plots and that meets the requirements of Subsection 722.61 - Schedule Content and Preparation Requirements Activities shall be linked by logic ties and shown on their Early Dates. Critical Paths shall be highlighted and Total Float shall be shown for all activities.

A second time-scaled bar chart shall also be prepared containing only the Critical Path or, if the Critical Path is not the longest path, the Longest Path using a scale that yields readable plots and that meets the requirements of Subsection 722.61 - Schedule Content and Preparation Requirements. Activities shall be linked by logic ties and shown on their Early Dates. Total Float shall be shown for all activities.

Bar Charts shall be printed in color and submitted on 11" X 17" paper or, if approved by the Engineer, as a .pdf file.

C. Detailed Activity Schedule Comparisons

A Detailed Activity Schedule Comparison (DASC) is a simple reporting tool in the format of a graphical report that will provide Resident Engineers with immediate, timely and up-to-date information. The DASC consists of an updated bar chart that overlays the current time period's bar chart onto the previous time period's bar chart for an easily-read comparison of progress during the present and previous reporting periods. The DASC shall be prepared and submitted in accordance with the instructions contained in the Construction Schedule Toolkit located on the MassDOT-Highway Division website at:

https://www.mass.gov/info-details/massdot-highway-contractors-schedule-toolkit

The reports described in Subsections D, E and F below shall be submitted with all of the schedules listed in Subsection722.20 - General:

D. Activity Cost Report and Monthly Cash Flow Projections (Type A only)

With each Contractor Quantity Estimate (CQE), the Contractor shall submit an Activity Cost Report and Cash Flow Projection that includes all activities grouped by Contract Bid Item.

The Activity Cost Report shall be generated from the Schedule of Record and shall be the basis of the Monthly Cash Flow Projection. Within each contract Bid Item, activities shall be sequenced by ascending activity identification number and shall show:

1. activity ID and description,
2. forecast start and finish dates for each activity and,
3. when submitted as a revised schedule, actual start and finish dates for each completed activity.

For Unit Price pay items, in addition to the above, estimates to complete and any variance to the estimated Contract quantity shall be shown.

E. Resource Graphs (Type A only)

Monthly and cumulative resource graphs for the remaining Contract period using the Early Dates and Late Dates in the Contract Progress Schedule shall be included as part of each schedule submittal.

SECTION 722 (Continued)

F. Projected Spending Reports (Types B, C and D)

A Projected Spending Report (PSR) shall be prepared and submitted in accordance with the instructions listed at the end of this section. The PSR shall indicate the monthly spending (cash flow) projection for each month from NTP to Contractor Field Completion (CFC). Each month's actual spending shall be calculated using all CQEs paid during that month. If the difference between the Contractor's monthly projections vs. the actual spending is greater than 10%, the Contractor's monthly spending projection shall be revised and resubmitted within fifteen (15) Calendar Days.

The Projected Spending Report (PSR) shall be depicted in a tabular format and printed in color on 11 x 17-sized paper or larger as approved by the Engineer. For additional instructions and a template for preparing the Projected Spending Report (PSR), refer to the Contractor's Construction Schedule Toolkit located on the MassDOT-Highway Division website at: https://www.mass.gov/info-details/massdot-highway-contractors-schedule-toolkit or consult with the District Construction Scheduler.

722.63. Progress Schedule Requirements

A. Baseline Schedule

The Baseline Schedule shall be due thirty (30) Calendar Days after Notice to Proceed (NTP.) The Baseline Schedule shall only reflect the Work awarded to the Contractor and shall not include any additional work involving Extra Work Orders or any other type of alleged delay. The Baseline Schedule shall be prepared and submitted in accordance with Subsections 722.61 - Schedule Content and Preparation Requirements and 722.62 - Submittal Requirements. Once the Baseline Schedule has been accepted by the Engineer, with or without comments, it shall represent the as-planned schedule for the Work and become the Contract Progress Schedule of Record until such time as the schedule is updated or revised under Subsections 722.63.C - Contract Progress Schedules / Monthly Updates, 722.64.C - Recovery Schedules and 722.64.D - Proposal Schedules.

The Cost and Resource-Loading information (Types A and B only) shall be provided by the Contractor within forty-five (45) Calendar Days after NTP.

The Engineer's review comments on the Baseline Schedule and the Contractor's responses to them will be maintained for the duration of the Contract and will be used by the Engineer to monitor the Contractor's work progress by comparing it to the Contract Progress Schedule / Monthly Update.

B. Interim Progress-Only Schedule Submissions

The first monthly update of the Contract Progress Schedule/Monthly Update is due within seventy (70) Calendar Days after Notice to Proceed (NTP.) The Baseline Schedule review period ends at sixty (60) Calendar Days after NTP, see Subsection 722.60.B - Schedule Reviews by the Department. If the Baseline Schedule has not been accepted within sixty (60) Calendar Days after NTP, an Interim Progress-Only Schedule shall be due within seventy (70) Calendar Days after NTP. The purpose of the Interim Progress-Only Schedule is to document the actual progress of all activities, including non-construction activities, from NTP until the Baseline Schedule is accepted.

SECTION 722 (Continued)

C. Contract Progress Schedules / Monthly Updates (Types A, B, C and D)

The first Contract Progress Schedule shall be submitted by the Contractor no later than seventy (70) Calendar Days after NTP. The data date for this first Progress Schedule shall be sixty (60) Calendar Days after NTP. Subsequent Progress Schedules shall be submitted monthly.

Each Contract Progress Schedule shall reflect progress up to the data date. Updated progress shall be limited to as-built sequencing and as-built dates for completed and in-progress activities. As-built data shall include actual start dates, remaining Work Days and actual finish dates for each activity, but shall not change any activity descriptions, the Original Durations, or the Original Resources (as planned at the time of bid), without the acceptance of the Engineer. If any activities have been completed out-of-sequence, the Contractor shall propose new logic ties for affected in-progress and future activities that accurately reflect the previously-approved sequencing. Alternatively, the Contractor may submit to the Engineer for approval an explanation of why an out-of-sequence activity does not require a correction and an adequate demonstration that the changes accurately represent how the activities will be built, including considerations for resources, dependencies and previously approved production rates. Once approved by the Engineer, the Contractor may incorporate the changes in the next Contract Progress Schedule/Monthly Update with the affected activities clearly identified and explained in the Schedule Narrative.

No revisions to logic ties; sequence, description or duration of future activities; or planned resource costs shall be made without prior approval by the Engineer.

Any proposed logic changes for in-progress or future activities shall be submitted to the Engineer for approval before being incorporated into a Contract Progress Schedule. The logic changes must be submitted using a Proposal Schedule or a schedule fragnet submission. Once approved by the Engineer, the Contractor may incorporate the logic in the next Contract Progress Schedule/Monthly Update with the affected activities clearly identified and explained in the Schedule Narrative.

For any proposed changes to the original sequence, description or duration of future activities, the Contractor shall submit to the Engineer for approval an explanation of how the proposed description or duration change reflects how the activity will be progressed, including considerations for resources and previously approved production rates. Any description or duration change that does not accurately reflect how the activity will be progressed will not be approved by the Engineer. Once approved by the Engineer, the Contractor may incorporate the changes in the next Contract Progress Schedule/Monthly Update with the affected activities clearly identified and explained in the Schedule Narrative.

Except as otherwise designated by a Contract Modification, no Contract Progress Schedule that extends performance beyond the Contract Time and/or beyond any Contract Milestone shall be approved by the Engineer. The Contractor shall submit a Recovery Schedule if any Contract Progress Schedule/Monthly Update indicates a failure to meet the Contract Dates.

D. Short-Term Construction Schedule

The Contractor shall provide a Short-Term Construction Schedule that details daily work activities, including any multiple shift work that the Contractor intends to conduct, in a bar chart format. The daily activities shall directly correspond to the Contract Progress Schedule activities, with a matching reference to the activity identification number in the Contract Progress Schedule, and may be at a greater level of detail.

SECTION 722 (Continued)

The Short-Term Construction Schedule shall be submitted every two weeks. It shall display all work for a thirty-five (35) Calendar Day period consisting of completed work for the two (2) week period prior and all planned work for the following three (3) week period. The initial submission shall be provided no later than thirty (30) Calendar Days after NTP or as required by the Engineer.

The Contractor shall be prepared to discuss the Short-Term Construction Schedule, in detail, with the Engineer in order to coordinate field inspection staff requirements, the schedule of work affecting abutters and any corresponding work with affected utilities. Short-Term Construction Schedules shall be prepared and submitted in accordance with Subsections 722.61 - Schedule Content and Preparation Requirements and 722.62 - Submittal Requirements.

Failure to submit Short-Term Construction Schedules every two (2) weeks may result in withholding of full or partial payments by the Engineer.

722.64 Impacted Schedule Requirements

A. Notice of Delay

The Contractor shall notify the Engineer in writing, with copies to the District and State Construction Engineers, within three (3) Calendar Days of the start of any delays to the Critical Path that are caused by actions or inactions that were not within the control of the Contractor. Delay notifications that are not provided in a letter to the Engineer, such as a delay notification in the schedule narrative, will not be recognized as contractual notice in the determination of any Time Extension related to the impacts to the work associated with this specific alleged delay. Should such delay continue for more than one (1) week, the Contractor shall note it in the Schedule Narrative until the delay is no longer impacting the Critical Path for the completion of the Contract Milestones. The Engineer will evaluate the alleged delay and its impact and will respond to the Contractor within ten (10) Calendar Days after receipt of a notice of delay.

B. Time Entitlement Analysis

A Time Entitlement Analysis (TEA) shall consist of a descriptive narrative, prepared in accordance with Subsection 722.62.A - Narratives, and an as-built CPM schedule, which may be in the form of a schedule fragnet (that has been developed from the project's Contract Progress Schedule of Record, and illustrates the impact of a delay to the Critical Path, Contract Milestones and/or Contract Completion Date as required in Subsection 8.10 - Determination and Extension of Contract Time for Completion. TEAs shall also be used to determine the schedule impact of proposed Extra Work Orders (EWO) as also required in Subsection 8.10.

TEAs shall be prepared and submitted in accordance with the requirements of Subsections 722.61 - Schedule Content and Preparation Requirements and 722.62 - Submittal Requirements and shall be based on the Contract Progress Schedule of Record applicable at the start of the delay or impact from an EWO. A TEA fragnet must start with a specific new activity describing the work contained in either a Notice of Delay previously submitted to the Department per Subsection 722.64.A - Notice of Delay or an EWO.

SECTION 722 (Continued)

TEAs shall be submitted:

1. as part of any Extra Work Order that may impact Contract Time,
2. with a request for a Time Extension,
3. within fourteen (14) Calendar Days after a request for a TEA by the Engineer for any other reason.

A TEA shall be submitted to the Engineer before any Time Extension is granted to the Contractor. Time Extensions will not be granted unless the TEA accurately reflects an evaluation of all past delays and the actual events that occurred that impacted the Critical Path. The TEA must also demonstrate a plan for the efficient completion of all of the remaining work through an optimized CPM Schedule. The analysis shall include all delays, including Contractor-caused delays, and shall be subdivided into timeframes and causes of delays.

TEAs shall incorporate any proposed activities, logic ties, resource considerations, and activity costs required to most efficiently demonstrate the schedule impacts in addition to detailing all impacts to existing activities, logic ties, the Critical Path, Contract Milestones and the Contract Completion Date. In addition, TEAs shall accurately reflect any changes made to activities, logic ties, restraints and activity costs, necessitated by an Extra Work Order or other schedule impact, for the completion of the remaining work. The Contractor shall provide TEAs that demonstrate that all delays have been mitigated to the fullest extent possible without requiring an Equitable Adjustment to the original bid basis.

All TEAs shall clearly indicate any overtime hours, additional shifts and the resource that are proposed to be incorporated in the schedule. The Engineer shall have final discretion over the use of overtime hours and additional shifts. The Engineer shall have the right to require that overtime hours and/or additional shifts be used to minimize the duration of Time Extensions if it is determined to be in the best interest of the Department to do so.

When accepted, the changes included in a TEA shall be incorporated into the next Contract Progress Schedule per the requirements of Subsection 722.63.C - Contract Progress Schedules / Monthly Updates.

During the review of any TEA, all Contract Progress Schedules shall continue to be submitted as required.

The Engineer may request that the Contractor prepare a Proposal Schedule or a Recovery Schedule to further mitigate any delays that are shown in the accepted TEA/Contract Progress Schedule.

C. Recovery Schedules

The Contractor shall promptly report to the Engineer all schedule delays during the prosecution of the Work. Except as otherwise designated by a Contract Modification, no Contract Progress Schedule that extends performance beyond the Contract Time and/or beyond any Contract Milestone shall be approved by the Engineer. The Contractor shall submit a Recovery Schedule within fourteen (14) Calendar Days of a Contract Progress Schedule submission that shows failure to meet the Contract Dates. This requirement is critical to the Department's ability to make informed decisions regarding Contract Time and costs.

SECTION 722 (Continued)

During the prosecution of the Work, should the Contractor's progress on a critical operation clearly not meet anticipated production, without cause by fault of the Department, or should a critical activity or series of activities not be staffed in accordance with the Contractor's approved Baseline Schedule resource planning, the Contractor shall be obligated to recover such delay. Recovery Schedules shall be prepared and submitted in accordance with Subsections 722.61 - Schedule Content and Preparation Requirements and 722.62 - Submittal Requirements within fourteen (14) Calendar Days of any of the cases listed above.

Recovery Schedules shall clearly indicate any proposed overtime hours, additional shifts, and the resources that are proposed to be incorporated in to the schedule. The Engineer shall have final discretion over the use of overtime hours and additional shifts and shall have the right to require that overtime hours and/or additional shifts be used to minimize the duration of Time Extensions, without additional compensation for any Contractor delays, if it is determined to be in the best interest of the Department to do so.

During the review of any Recovery Schedule, all Contract Progress Schedules shall continue to be required every month.

The Engineer may request that the Contractor prepare a Recovery Schedule to further mitigate any delays that are shown in an accepted TEA/Contract Progress Schedule.

Changes represented in accepted Recovery Schedules shall be incorporated into the next Contract Progress Schedule.

D. Proposal Schedules

A Proposal Schedule is an alternative schedule used to evaluate proposed changes to the Contract scope or significant alternatives to previously approved approaches to complete the Work, which may include changes to activity durations, logic and sequence. For Types A and B Schedules, the Proposal Schedule shall be cost and resource-loaded.

A Proposal Schedule may be requested by the Department at any time or may be offered by the Contractor. The Engineer may request that the Contractor prepare a Proposal Schedule to further mitigate any delays that are shown in an accepted TEA/Contract Progress Schedule.

The Contractor shall submit the Proposal Schedule within thirty (30) Calendar Days of a request from the Department.

The Proposal Schedule shall not be considered a Schedule of Record until the logic, durations, narrative and basis of the Proposal Schedule have been accepted by the Engineer. If the Proposal Schedule took the form of a fragnet, it must be incorporated into the Contract Progress Schedule of Record showing the current progress of all other activities and the impacts/results of the changes made by the Proposal Schedule before the Proposal Schedule is accepted by the Department.

Proposal Schedules shall clearly indicate any proposed overtime hours, additional shifts, and the resources that are proposed to be incorporated in the schedule. The Engineer shall have final discretion over the use of overtime hours and additional shifts.

Changes represented in accepted Proposal Schedules shall be incorporated into the next Contract Progress Schedule. During the review of any Proposal Schedule, all Contract Progress Schedules shall continue to be required every month.

SECTION 722 (Continued)

E. Disputes (Types A, B, C and D)

All schedules shall be submitted, reviewed, dispositioned and accepted in the timely manner specified herein so as to provide the greatest possible benefit to the execution of this Contract.

Any dispute concerning the acceptance of a schedule or any other question of fact arising under this subsection shall be determined by the Engineer. Pending resolution of any dispute, the last schedule accepted by the Engineer will remain the Contract Schedule of Record.

COMPENSATION

722.80 Method of Measurement and Basis of Payment (Types A, B, C and D)

The Special Provisions will specify the fixed-price amount to be paid to the Contractor for the Project Schedule requirements contained herein. Each bidder shall include this lump-sum, fixed-price bid item amount in his/her bid. Failure to do so may be grounds for the rejection of the bid.

All required schedule-related work, including, but not limited to computers, computer software, the planning and coordination with utilities, training, schedule preparation and schedule submittals will be paid for under the fixed price amount.

This fixed price amount is for payment purposes only and is separate from what the Department considers to be the Contractor's General Condition costs. If the Contractor deems it necessary to include additional costs to provide all of the requirements of this section, these additional costs shall be included in the Contractor's overall bid price.

Twenty percent (20%) of this pay item will be paid upon the Engineer's acceptance of the Contractor's Baseline Schedule, prepared and submitted in accordance with Subsection 722.63.A.

The remaining eighty percent (80%) of this pay item will be paid in equal monthly installments distributed across the Contract Duration from Notice to Proceed (NTP) to Contractor Field Completion (CFC), less the 2 months required for the submittal and review of the Baseline Schedule in accordance with the following formula:

$$\text{Monthly Payment} = \frac{\text{Remaining Fixed Price amount (80\% of Item 100.)}}{\text{Contract Duration in whole months} - 2 \text{ months}}$$

The timely and accurate submission of the Baseline Schedule is critical to the Contract and the Department's ability to make informed decisions. Only payments under Item 740 - Engineer's Field Office and Item 748 – Mobilization will be made until the Baseline Schedule is accepted by the Engineer.

SECTION 722 (Continued)

No payment for any other pay item will be processed beyond seventy-five (75) Calendar Days from Notice to Proceed (NTP) until the Baseline Schedule is accepted by the Engineer. Until the Engineer's acceptance of the Baseline Schedule, the combined total of all payments made to the Contractor will be limited to an amount no greater than the total price for Item 748 - Mobilization or 3% of the contract price, whichever is less.

All Contract Progress Schedule Updates submitted later than ten (10) Calendar Days after the CQE (Contract Quantity Estimate) completion date, or greater than forty (40) Calendar Days from the Data Date of the previous submission, will be deemed to be no longer useful and will not qualify for payment. Late submittal of missed Contract Progress Monthly Updates will not result in recovery of the previously forfeited portion of the Schedule of Operations Fixed Price Payment Item.

Failure to submit schedules as and when required may result in the forfeiture of that portion of the Schedule of Operations Fixed Price Payment and/or the withholding of the full or partial CQE payments by the Engineer.

Failure to submit schedules that are acceptable to the Engineer may result in the forfeiture of that portion of the Schedule of Operations Fixed Price Payment and/or the withholding of the full or partial CQE payments by the Engineer.

The Schedule of Operations pay item will be adjusted to pay for only the actual quantity of schedules that have been submitted in accordance with this section.

The Contractor's failure or refusal to comply with the requirements of this Section shall be reasonable evidence that the Contractor is not prosecuting the Work with due diligence and may result in the withholding of full or partial payments by the Engineer.

Should there be a Time Extension granted to the Contractor, the Engineer may provide an Equitable Adjustment for additional Contract Progress Schedule Updates at intervals directed by the Engineer. Item 100. will be the basis for this Equitable Adjustment.

722.82 Payment Items

100.	SCHEDULE OF OPERATIONS - FIXED PRICE $_____	LUMP SUM

ITEM 102.3 CONTROL OF INVASIVE PLANTS EXISTING ON SITE HOUR

Work under this item consists of controlling invasive plants within the project limits. An Invasive Plant Management Strategy (IPMS) for their control shall be submitted to the Engineer for review and approval and the IPMS shall be implemented on site. The IPMS shall be measured and paid for under Item 102.33, Invasive Plant Management Strategy.

Work under this item shall be coordinated with work and schedule for Selective Clearing, Clearing and Grubbing, Mowing, Tree Removal, Planting, and Wetland Mitigation items.

Herbicide shall be applied during daytime hours only.

Payment is per hour on site and shall be compensation for a minimum crew of 2 licensed applicators, 2 back-pack sprayers and mist-blowers, a properly equipped spray truck with spray hoses, and a tank with sufficient capacity for a full day of work.

The overall intent is to improve the habitat value of the site, protect proposed landscape restoration, improve future maintenance operations, and attempt to prevent future spread both on-site and to adjacent sites.

Measures to prevent the introduction of invasive plant species to the site and to correct their introduction as a result of construction-related activities shall be covered under the Standard Specifications, Division I - Sections 7.01(D) Plant Pest Control and 7.13 Protection and Restoration of Property as amended in these Special Provisions.

Plant species targeted for management under this item shall be as determined in the field per the site walk and as specified in the IPMS.

The definition of invasive plant species shall be as described by Massachusetts Invasive Plant Advisory Group (MIPAG): “non-native species that have spread into native or minimally managed plant systems in Massachusetts, causing economic or environmental harm by developing self-sustaining populations and becoming dominant and/or disruptive to those systems.”

Control of invasive plants shall begin immediately with the initiation of construction activities and prior to any clearing or site disturbance. Treatment areas shall include stockpile locations and may, upon approval of the Engineer, extend outside the project limit. Treatment shall be done each consecutive year for the duration of the contract unless specified otherwise in the IMPS or unless directed otherwise by the MassDOT invasive species contact. Work shall be done during the growing season from May – October unless otherwise specified in the IPMS.

Areas identified for vegetation control measures shall be as shown on the plans and as determined in the field by the Engineer and a MassDOT Landscape Architect. Contact at MassDOT Landscape Design Section is Andrew Schlenker at email: andrew.schlenker@dot.state.ma.us .

ITEM 102.3 (Continued)

Submittals
No work shall begin without approval of the submittals.

Within 15 business days prior to the site walk, the Contractor shall submit all qualifications to the Engineer for approval by MassDOT Landscape Design.

Submittals include the following items.

Qualifications
1. Company must provide proof of qualifications by providing the following:
    a. Narrative describing company, its expertise and experience with invasive plant control.
    b. Demonstrate experience with herbicide treatment as part of restorations and in sensitive areas
    c. Describe company's technical qualifications and past performance.

2. Company must meet licensing requirements:
    a. All crew applicators must have a Massachusetts Commercial Applicator License (CORE).
    b. At least one or more applicator must have ROW certification if required for specific project.
    c. Company must provide name(s) of applicator(s) and Applicator License/Certification number for all contractor crew leaders working on the project.
    d. Company must provide documentation of any warnings, penalties or fines received in the last three (3) years.

3. Company must provide proof of experience with invasive plant control and include following:
    a. At least five (5) references from prior invasive plant control work completed in last five (5) years. Provide contact information including address, phone number and email.
    b. Provide a summary of each of these projects including nature of the problem, specific invasive vegetation treated, dates and period of treatment, methodologies used, and summary of success or not in terms of meeting performance objectives. Include summary of equipment used.
    c. Photo documentation of these projects.
    d. GPS coordinates of project locations, if available.

4. Crew leader must have expertise with invasive plant control and provide the following:
    a. Have held Core license for at least five (5) years.
    b. Resume listing five (5) or more years of experience applying pesticides with the company or with another company specializing in vegetation management.

ITEM 102.3 (Continued)

The following companies are pre-approved by MassDOT Landscape Design Section:

Groundscapes Express, Inc.
P.O. Box 737
Wrentham, MA 02093
Contact: Butch Goodwin
Email: butch@groundscapesexpress.com
Phone: 508-400-5366

Solitude Lake Management
590 Lake Street
Shrewsbury, MA 01545
Contact: Keith Gazaille
kgazaille@solitudelake.com
Phone: 508-885-0101

Land Stewardship, Inc.
PO Box 511
Turner Falls, MA 01376
Contact: Chris Polatin
Email: info@landstewardshipinc.com
Phone: 413-367-5292

SWCA Environmental Consultants
15 Research Drive
Contact: Scott Fisher
Phone: 413-658.2056
Email: sfisher@swca.com
Amherst, MA 01002

Native Habitat Restoration
P.O. Box 582
Stockbridge, MA 01262
Contact: Jess M. Toro : 413-358-7400
Email: nativehabitatrestoration@gmail.com
Phone: 413-394-0277

Vegetation Control Service, Inc.
2342 Main St.
Athol, MA 01331
Contact: Andrew Powers
Email: apowers@vegetationcontrol.com
Phone: 800-323-7706

Invasive Plant Management Strategy (IPMS)
At least thirty (30) days prior to proposed treatment the IPMS shall be submitted for approval by the Engineer and MassDOT Landscape Architect. All chemicals, methods and work shall be consistent with the IPMS. The IPMS shall be as described under Item 102.33.

Follow-Up Treatment
Depending on treatment results after the first year, the IPMS may be amended for the second year to address additional concerns or adjust to conditions. Treatment shall be adjusted accordingly.

Herbicide Use Report
Within two (2) weeks after each application, the Contractor shall provide to the Engineer a completed and signed MassDOT Herbicide Use Report. Where applicable, the Contractor shall provide the name/s of the associated water body/bodies affected by potential discharge, per the requirements of Sections 7.1 and 7.2 of the USEPA Pesticide General Permit for the Discharges from the Application of Pesticides.

ITEM 102.3 (Continued)

Photo Documentation
Digital photos with date and time stamp shall be provided with IPMS and follow-up reporting. Photos shall show existing conditions and post-treatment conditions.

Materials
All proposed herbicides shall be as approved in the IPMS. Herbicides shall be labeled for the method of treatment and shall meet all federal, state and local regulation requirements. Application rates will depend on herbicide proposed and shall be per the manufacturer's label for specific application.

Construction Methods
All methods used shall be as approved in the IPMS.

Prior to the start of any work, Contractor shall walk the site with the Engineer and the MassDOT Landscape Architect. The purpose of the site inspection is to identify limits of work, mark locations of areas designated for treatment, and mark individual plants targeted for treatment or removal according to the IPMS. Contractor shall be responsible for marking delineated areas and plants to be preserved, removed, or otherwise treated. Fencing or other materials needed for marking and delineating protected areas shall be incidental to this item.

Herbicide Applications
All herbicide application shall conform to Massachusetts Pesticide Laws and Regulations per the Massachusetts Department of Agricultural Resources (MDAR) Pesticide Bureau.

Mixing, applying and/or disposing of herbicides shall always be in accordance with instructions on their labels and all applicable federal, state, and local regulations. Mixing shall not occur within sensitive areas, wetlands, or buffer zones.

Contractor shall not spray 2 hours prior to precipitation, during rain, or during windy conditions. The Contractor shall be responsible for monitoring weather conditions and adjusting the work schedule as appropriate for the herbicide and application method to be used.

Targeted vegetation shall be identified and marked prior to treatment. Plants treated by foliar spray, injection or glove application or other methods that leave standing vegetation, as opposed to cut-stump application, shall remain clearly marked for identification through the contract period.

Desirable vegetation shall be protected from both spray and other physical damage.

Contractor is responsible for any damage to vegetation not designated for removal or treatment. Vegetation damaged shall be restored. Cost of replacement plants and/or restoration shall be borne by the Contractor.

Contractor shall ensure that the public does not enter a work area while herbicide application or spraying is underway.

ITEM 102.3 (Continued)

Disposal of Invasive Plant Material

All material to be cleared shall become the property of the Contractor. The satisfactory disposal of all cleared plant material (seeds, roots, woody vegetation, associated soils, etc.) shall be the Contractor's responsibility.

The Contractor shall take measures to prevent viable plant material from leading to further infestations (seeds, roots, woody material, etc.) while stockpiled, in transit, or at final disposal locations. All precautions shall be taken to avoid contamination of natural landscapes with invasive plants or invasive plant material.

Chipping, shredding, or on-site burning of plant material shall not be permitted unless written approval is given as part of the Invasive Plant Management Strategy.

For plant material taken to an incinerating facility per the IPMS, a receipt from that facility shall be submitted to the Engineer as proof of disposal.

Where feasible, it is preferable to dispose of plants on site or to bury them on site with on-going monitoring for re-sprouting. Disposal locations and methods must be approved and included in the IPMS. Site work such as grading and seeding to stabilize and restore disposal area shall be incidental to this item.

Contractor shall be responsible for treating areas of re-growth due to improper disposal.

Monitoring

After initial herbicide treatment, all treated plants and areas shall be monitored through visual observation and re-treated as necessary and appropriate throughout the season and for the duration of the contract per the management proposal and schedule for control submitted by Contract. Monitoring shall be incidental paid for under Item 102.33, Invasive Plant Management Strategy.

Measure of Success

The expectation is a minimum of 85-95 percent control achieved after the first treatment, depending on plants targeted and extent of population, and based on the expectations laid out in the IPMS. The expectation for the contract duration is 95-100% eradication by the end of the treatment period, unless otherwise specified in the IPMS.

ITEM 102.3 (Continued)

Method of Measurement
Item 102.3 will be measured for payment by the Hour of crew time spent on the project doing actual work. A crew shall be defined as a minimum of two licensed applicators each equipped with (at minimum) back-pack sprayer and mist blower. The crew shall also have a properly equipped spray truck with hoses and a tank with sufficient capacity for a full day of work.

Basis of Payment
Item 102.3 will be paid at the contract unit price per Hour, which price shall include all labor, materials, equipment, tools and all incidentals required to complete the work.

Payment will be based upon time spent on the project doing actual work and shall not include travel time to and from the Contractor's place of business and shall also not include time for investigative field trips.

The Invasive Plant Management Strategy will be paid for under Item 102.33.

ITEM 102.33 INVASIVE PLANT MANAGEMENT STRATEGY HOUR

This item consists of providing an Invasive Plant Management Strategy (IPMS) for the control of invasive plants on the project site and shall be coordinated with Item 102.3 Control of Invasive Plants Existing on Site. The IPMS shall be submitted to the Engineer for review and approval and the IPMS shall be implemented on site.

Invasive plant control treatment on site shall be as described under Item 102.3 Control of Invasive Plants Existing on Site and shall be compensated per that Item.

Work under this item shall be coordinated with work and schedule for Selective Clearing, Clearing and Grubbing, Mowing, Tree Removal, Planting, and Wetland Mitigation items.

Individual attending the site walk and determining the Invasive Plant Management Strategy must demonstrate expertise with vegetation management and invasive plant control.

Submittals
Individual shall be from the same company as that providing services for Item 102.3 Control of Invasive Plants Existing on Site or shall meet the following requirements:

- Submit copy of current Core license
- Submit a resume listing five (5) or more years of experience managing invasive plants with a company specializing in vegetation management.

Task Summary: for measurement of payment, the contractor shall submit the total sum and a breakdown of hours for the following tasks performed, which shall include at least: Site Walk/s, IPMS Written Reports, Site Monitoring if required, and Final Report if required.

ITEM 102.33 (Continued)

Invasive Plant Management Strategy (IPMS)
Prior to the start of any invasive plant control treatment, submit in writing an IPMS proposal and Schedule of Control for approval by the Engineer and MassDOT Landscape Architect at least thirty (30) days prior to proposed treatment. All chemicals and methods proposed shall be consistent with applicable Massachusetts Wetlands Protection Act Order of Conditions.

The IPMS shall include the following:

1. Description of treatment areas including identification of targeted invasive plant species, locations, approximate size of areas and digital photos with time/date stamp. Delineate treatment areas with polygons outlining their perimeter or locations of individual plants. A free-hand sketch drawn on construction plans or an aerial photo can be used to show locations.
2. Note coordination as required with items for clearing, clearing and grubbing, tree removal, mowing, planting, and wetland mitigation.
3. Describe strategy for management of soils that contain invasive plant roots or seeds based on input from the Contractor and the Engineer.
4. Proposed methods of treatment for each species or area. Treatment may include manual removal if herbicides are not permitted.
5. If herbicides are proposed, submit product label including application methods and rates (entire MSDS information need not be submitted if available online).
6. Proposed time of treatment based on target plant species and construction schedule.
7. Method for disposing of invasive plant material including stems, trunks, branches, roots, and roots, if required.
8. General monitoring schedule.
9. Preliminary re-treatment schedule. Re-treatment shall be based on assessment of initial results and time of year.
10. Proposed performance metrics, or measure of treatment success, which shall be agreed upon by MassDOT.
11. Expected end date of contract and last treatment.

Note: The IPMS is critical for identifying pre-construction conditions as well as strategies for minimizing import or spread of invasive plants. Failure to provide approved IPMS may jeopardize this item, in which case, the contractor will be responsible for control of invasive plants found on site at no cost to the contract.

Follow-Up Treatment Schedule
Depending on treatment results after the first year, the IPMS may be amended for the following year/s to address additional concerns or adjust to conditions. A follow-up treatment schedule shall follow the same format as outlined above and submitted to the Engineer and MassDOT Landscape Architect for approval at least thirty (30) days prior to proposed treatment.

ITEM 102.33 (Continued)

Reporting
Within two (2) weeks after each application, the Contractor shall provide to the Engineer a completed and signed MassDOT Herbicide Use Report. Where applicable, the Contractor shall provide the name/s of the associated water body/bodies affected by potential discharge, per the requirements of Sections 7.1 and 7.2 of the USEPA Pesticide General Permit for the Discharges from the Application of Pesticides.

Final Report
A final report documenting status of invasive control at the end of the project may be required for regulatory purposes or for instances where control will be continued by other means. Report shall include photo documentation, notation on a plan or aerial image of area treated, summary of treatment performed, and control achieved.

Photo Documentation
Digital photos with date and time stamp shall be provided with IPMS and follow-up reporting.

Method of Measurement
Item 102.33 will be measured for payment by the Hour. The basis for measurement shall be per the completion of tasks as approved under the Task Summary submittal.

Basis of Payment
Item 102.33 will be paid at the contract unit price per Hour, which price shall include all labor, materials, equipment, tools and all incidentals required to complete the work.

Payment shall not include travel time to and from the Contractor's place of business.

ITEM 102.511 TREE PROTECTION – ARMORING & PRUNING EACH

The work under this item shall conform to the relevant provisions of Subsection 771 and shall be for furnishing and installing temporary tree trunk protection and for minor limb pruning or removal of lower tree limbs to prevent injury to the tree from construction equipment and activities.

Trunk armoring is for instances where construction activity (the use of heavy equipment) comes close enough to potentially damage the tree trunk or limbs. It is to be used where shown on the plans and as directed by the Engineer.

References
If requested, the Contractor shall provide to the Engineer one copy of the latest edition of the American National Standards Institute (ANSI) A300 Standard Practices for Tree, Shrub, and Other Woody Plant Maintenance: Part 1-Pruning and Part 5-Construction Management Standard. Provision of reference shall be incidental to this item.

Materials
Trunk armoring shall be such that it prevents damage to the trunk from construction equipment. Selected material shall be such that installation and removal will not damage the trunk.

Acceptable materials include 2x4 wood cladding with wire or metal strapping, or, for instances when duration of construction activities is less than three months, corrugated plastic pipe mounted with duct tape. Height of cladding shall be from base of tree (including root flare) to the bottom of the first branch, eight feet above the ground, or as required by the Engineer. Material and methods shall be approved by the Engineer.

Other materials or methods may be acceptable if approved by MassDOT Landscape Design or by an Arborist (if included in the contract).

Methods of Work
Prior to construction activities, the Engineer, the Contractor, the Town Tree Warden, and the Arborist (if item is included in the contract), shall review trees noted on the plans to be protected. Final decision as to trees armored and/or pruned shall be per the Engineer.

Care shall be taken to avoid damage to the bark during installation and removal of armoring. Trunk armoring shall be replaced and maintained such that it is effective for as long as required and shall be removed immediately upon completion of work activities adjacent to trees.

Pruning of limbs shall conform to the techniques and standards of the most recent ANSI A300 standards.

ITEM 102.511 (Continued)

Damages & Penalties

In the event that trees designated for protection under this item are damaged, including root damage from unapproved trespassing onto the root zone, the Contractor shall, at his own expense obtain an Arborist. The Arborist shall be approved by MassDOT.

If, based on the recommendations of the Arborist, the Engineer determines that damages can be remedied by corrective measures, such as repairing trunk or limb injury, soil compaction remediation, pruning, and/or watering, the damage will be repaired as soon as possible within the appropriate season for such work and according to industry standards.

If the Engineer determines that damages are irreparable, the Contractor shall pay for the damages in the amount of $500.00 per diameter inch at breast height (DBH) per tree.

Additionally, if the Engineer determines that the damages are such that the tree is sufficiently compromised as to pose a future safety hazard, the tree shall be removed. Tree removal will include clean up of all wood parts, grinding of the stump to a depth sufficient to plant a replacement tree or plant, removal of all chips from the stump site, and filling the resulting hole with topsoil.

Method of Measurement and Basis of Payment

Item 102.511 will be measured and paid at the contract unit price per each. This will include full compensation for all labor, equipment, materials, and incidentals for the satisfactory completion of the work and the subsequent removal and satisfactory disposal of the protective materials upon completion of the contract.

In the event of tree damage, cost of Arborist services, of remediation measures, and/or tree removal will be borne by the Contractor.

Payment under this item will be scheduled throughout the length of contract:

- 40% of value shall be paid upon installation of trunk armoring and completion of pruning work, if required.
- 60% shall be paid at the end of construction operations that would damage the tree and after protection materials have been removed and properly disposed of by the Contractor. In the event of repairable damages, payment shall be made after the completion of remediation measures.

In the event of irreparable damage due to lack of proper protective measures being take there will be no compensation in addition to the $500.00 per diameter inch penalty.

ITEM 102.521 TREE AND PLANT PROTECTION FENCE FOOT

The work under this Item shall conform to the relevant provisions of Subsections 644 and 771 of the Standard Specifications and the following:

Work under this item consists of furnishing, installing, removing and resetting, maintaining fence in a vertical and effective position at all times, and final removal of temporary fence.

The purpose of the fence is to prevent damage to tree roots, tree trunks, soil, and all other vegetation within a delineated Tree and Plant Protection Zone (TPPZ) as shown on the plans, as directed by the Engineer, and as described herein.

Protection shall be for the duration of the construction activities unless otherwise directed.

Materials
Temporary Fence shall be such that it provides a minimum 48-inch tall barrier that remains vertical and effective (not sagging) for the duration of period required. Fence shall be plastic orange safety fence (recommended where high visibility is necessary), wooden snow fencing, or other approved material.

Per the Engineer, additional posts, deeper post depths, and/or additional attachments will be used if the fabric or fence sags, leans or otherwise shows signs of failing to create a sufficient barrier to access.

References
If requested, the Contractor shall provide to the Engineer one copy of the American National Standards Institute (ANSI) A300 Standard Practices for Tree, Shrub, and Other Woody Plant Maintenance Part 1, Pruning and Part 5, Construction Management Standard. Provision of reference shall be incidental to this item.

Establishment of TPPZ
Fencing shall be used for construction areas, staging areas, and stockpile areas as shown on the plans and as directed by the Engineer to establish the Tree and Plant Protection Zone (TPPZ).

Fence shall be located as close to the work zone limit and as far from the trunk as possible to maximize the area to be protected. Fence shall run parallel and adjacent to construction activity to create a barrier between the work zone and the root zone or designated limit of plants and soils to be protected.

When construction activities surround (or have the potential to surround) trees or plants to be protected, a circular enclosure shall be used. In these instances, the TPPZ limit shall be the Drip Line of each tree or as close as possible to the Drip Line, and as shown on the plans and details. The Drip Line is defined as the limit of tree canopy.

ITEM 102.521 (Continued)

The Contractor shall not engage in any construction activity within the TPPZ without the approval of the Engineer, including: operating, moving or storing equipment; storing supplies or materials; locating temporary facilities including trailers or portable toilets; and shall not permit employees to traverse the area to access adjacent areas of the project or use the area for lunch or any other work breaks.

Method of Work
Fence shall be installed prior to any construction work or staging activities and shall be installed and maintained in a vertical and effective position at all times.

Fence shall be repositioned where and as necessary for optimum effectiveness. Repositioning shall be incidental to this item. Fence shall not be moved without prior approval by the Engineer.

The TPPZ shall be protected at all times from compaction of the soil; damage of any kind to trunks, bark, branches, leaves, and roots of all plants; and contamination of the soil with construction materials, debris, silt, fuels, oils, and any chemicals substance.
After construction activities are completed, or when directed by the Engineer, fence, stakes, and other materials shall be removed and disposed off-site by the Contractor.

Required Work Within the TPPZ
In the event that grading, trenching, utility work, or storage is unavoidable within the TPPZ, the Engineer shall be notified. Measures may be required for tree protection and preservations, including air spading, the use of six-inch depth of wood chips or approved matting for root protection, pruning of branches, and/or trunk protection. These protection measures will be paid under applicable items.

Landscaping work specified within the TPPZ shall be accomplished by hand tools. Where hand work is not feasible, with permission of the Engineer, work shall be conducted with the smallest mechanized equipment necessary.

Tree and Plant Damages or Loss
If the TPPZ is intruded upon, at the discretion of the Engineer, the Contractor will be required to provide a more durable barrier (e.g., Jersey Barriers) to secure the area. Cost of furnishing and installing additional or more durable barrier shall be borne by the Contractor.

If the Contractor intrudes into a TPPZ without approval, soil will be considered compacted and tree root damage will be assumed. Action will be taken as specified below.

In the event that trees designated for protection under this item are damaged, including root damage from unapproved trespassing onto the root zone, the Contractor shall, at his own expense obtain an Arborist. The Arborist shall be approved by MassDOT.

In the event of spills, compaction or damage, the Contractor shall take corrective action immediately using methods approved by the Engineer in coordination with the Arborist.

ITEM 102.521 (Continued)

If, based on the recommendations of the Arborist, the Engineer determines that damages can be remedied by corrective measures, such as repairing trunk or limb injury, soil compaction remediation, pruning, and/or watering, the damage will be repaired as soon as possible within the appropriate season for such work and according to industry standards.

If the Engineer determines that damages are irreparable, the Contractor shall pay for the damages in the amount of $500.00 per diameter inch at breast height (DBH) per tree.

Additionally, if the Engineer determines that the damages are such that the tree is sufficiently compromised as to pose a future safety hazard, the tree shall be removed. Tree removal will include cleanup of all wood parts, grinding of the stump to a depth sufficient to plant a replacement tree or plant, removal of all chips from the stump site, and filling the resulting hole with topsoil.

Shrubs will be replaced with a plant of similar species and equal size or the largest size plants reasonably available. The Engineer will approve the size and quality of the replacement plant. Replacement will include a minimum of one year of watering and care.

Method of Measurement and Basis of Payment
Item 102.521 will be measured and paid for payment by the foot of Tree and Plant Protection Fence, complete in place. This includes all labor, materials, equipment, maintenance, final removal and disposal of the protective materials, damages repair, and all incidental cost required to complete the work.

Payment of 40 percent of value will be made upon installation of Fence. The remaining 60 percent will be made when protection materials have been removed and disposed off-site.

No separate payment will be made for costs of remedial actions, including addition of more durable barriers, or arborist services, but all costs in connection therewith shall be included in the Contract unit price bid.

In the event of irreparable damage due to lack of proper protective measures being take there will be no compensation in addition to the $500.00 per diameter inch penalty.

ITEM 120. EARTH EXCAVATION CUBIC YARD

Work under this item shall conform to the relevant provisions of Subsection 100 of the Standard Specifications and the following:

Earth Excavation includes, as incidental to the general work, the removal and disposal of 4" and 8" gas lines that are proposed to be removed for installation of drainage items throughout the project and prior to the culvert installations near Sta. 37+50, Sta. 42+00, Sta. 80+40, and Sta. 90+15. Eversource will cut the pipe and install a temporary by-pass.

The Contractor shall notify and coordinate with Eversource a minimum of 72 hours prior to this work being done.

Method of Measurement
Item 120. will be measured per Cubic Yard, complete in place.

Basis of Payment
Item 120. will be paid for at the Contract unit price per Cubic Yard which price shall include all labor, materials, equipment, and incidental costs necessary to complete the work.

ITEM 141. CLASS A TRENCH EXCAVATION CUBIC YARD

Work under this item shall conform to the relevant provisions of Subsections 120 and 140 of the Standard Specifications and the following:

Class A Trench Excavation shall also include any temporary earth support required or temporary support of excavation required to construct wall structure no. 1 and wall structure no. 2 and it is incidental to this item.

Method of Measurement
Item 141. will be measured per Cubic Yard, complete in place.

Basis of Payment
Item 141. will be paid for at the Contract unit price per Cubic Yard which price shall include all labor, materials, equipment, and incidental costs necessary to complete the work.

ITEM 180.01 ENVIRONMENTAL HEALTH AND SAFETY PROGRAM LUMP SUM

The work shall consist of ensuring the health and safety of the Contractor's employees and subcontracting personnel, the Engineer, their representatives, the environment, and public welfare from any on-site chemical contamination present in air, soil, water and sediment.

The Contractor shall prepare and implement a site-specific Environmental Health and Safety Plan (EHASP) which has been approved and stamped by a Certified Industrial Hygienist (CIH) and includes the preparer's name and work experience. The EHASP shall include appropriate components required by OSHA Standard 29 CFR 1910.120(b) and the Massachusetts Contingency plan (MCP) 310 CMR 40.0018 and must comply with all applicable state and federal laws, regulations, standards and guidelines, and provide a degree of protection and training appropriate for implementation on the project. The EHASP shall be a dynamic document with provision for change to reflect new information, new practices or procedures, changing site environmental conditions or other situations which may affect site workers and the public. The EHASP shall be developed and implemented independently from the standard construction HASP required to work on all MassDOT construction projects.

Health and safety procedures provided by the Contractor shall comply with all the appropriate regulations that address employee working conditions, including but not limited to standards established by OSHA and National Institute for Occupational Safety and Health (NIOSH). Equipment used for the purpose of health and safety shall be approved by and meet pertinent standards and specifications of the appropriate regulatory agencies.

A copy of the most up-to-date version of the EHASP shall be maintained on-site at all times by the Contractor. The on-site copy shall contain the signature of the Engineer and each on-site employee of the MassDOT, Contractor, and Subcontractors involved with on-site activities. The employee's signature on the EHASP shall be deemed prima facie evidence that the employee has read and understands the plan. Updated copies of signature sheets shall be submitted to the Engineer.

The EHASP shall specify a Contractor Site Safety and Health Officer responsible for implementation of the EHASP and to oversee all construction activities, including handling, storage, sampling and transport, which require contact with or exposure to potentially hazardous materials.

The level of protection, required to ensure the health and safety of on-site personnel will be stipulated in the EHASP. The Site Safety and Health Officer shall implement the EHASP based on changing site and weather conditions, type of operation or activity, chemical compounds identified on-site, concentration of the chemicals, air monitoring data, physical state of the hazardous materials, potential duration of exposure to hazardous materials, dexterity required to perform work, decontamination procedures, necessary personnel and type of equipment to be utilized.

ITEM 180.01 (Continued)

During implementation of the EHASP, a daily log shall be kept by the Site Safety and Health Officer and a copy shall be provided weekly to the Engineer. This log shall be used to record a description of the weather conditions, levels of personal protection being employed, screening data and any other information relevant to on-site environmental safety conditions. The Site Safety and Health Officer shall sign and date the daily log.

Method of Measurement and Basis of Payment
Preparation and implementation of the Environmental Health and Safety Program, including the monitoring, protection and storage of all contaminated materials, as well as subsequent modifications to the EHASP, will be measured and paid for at the Lump Sum Bid Price.

Payment of 50% of the Environmental Health and Safety Program contract price will be made upon the initial acceptance of the EHASP by the Engineer. Payment of the remaining 50% of the Environmental Health and Safety Program contract price will be made upon completion of the work. The bid price shall include preparation and implementation of the EHASP as well as the cost for its enforcement by the Site Safety and Health Officer along with any necessary revisions and updates. The work of implementing the Environmental Health and Safety Program includes work involving, but not limited to, the monitoring, protection, and storage of all contaminated materials.

ITEM 180.02 PERSONAL PROTECTION LEVEL C UPGRADE HOUR

The work shall consist of providing appropriate personal protective equipment (PPE) for all personnel in an area either containing or suspected of containing a hazardous environment.

Contingencies for upgrading the level of protection for on-site workers will be identified in the EHASP and the Contractor shall have the capability to implement the personal protection upgrade in a timely manner. The protective equipment and its use shall be in compliance with the EHASP and all appropriate regulations and/or standards for employee working conditions.

Personal Protection Level C Upgrade will be measured and paid only upon upgrade to Level C and will be at the contract unit price, per hour, per worker, required in Level C personal protection. No payment will be made to the Contractor to provide Level D PPE.

ITEM 180.03 LICENSED SITE PROFESSIONAL SERVICES HOUR

Within limited areas of the project site, soils, sediments and/or groundwater may be contaminated. A Licensed Site Professional (LSP) shall be required to provide the services necessary to comply with the requirements of the MCP. These services may include sampling, analysis and characterization of potentially contaminated media, preparation of Immediate Response Action (IRA) Plans, Utility-Related Abatement Measure (URAM) and Release Abatement Measure (RAM) Plans, Imminent Hazard Evaluations, status reports, transmittal forms, release notification forms, risk assessments, completion statements, and related documents required pursuant to the Massachusetts Contingency Plan (MCP). LSP hours related to the characterization and disposal of contaminated soil and/or sediment are incidental to the disposal items. An estimate of LSP services to be provided shall be submitted to the Engineer for approval before any LSP activity begins.

The name and qualifications of the LSP and all environmental technicians to be assigned to the project shall be submitted to the Engineer for approval at least four weeks prior to initial site activities. The LSP shall have a current, valid license issued by the Massachusetts Board of Registration of Hazardous Waste Site Cleanup Professionals. The LSP shall have significant experience in the oversight of MCP activities at active construction sites. Qualification packages for the LSP and each technician shall include a resume, all recent work assignments with responsibilities identified (previous 5 years), and applicable training and certifications. A list of all Notices of Noncompliance, Notice of Audit Findings and Enforcement Orders issued by the DEP shall be submitted for all work assignments listed for the LSP and environmental technicians.

The LSP shall evaluate soil and/or sediment with discoloration, odor, and presence of petroleum liquid or sheening on the groundwater surface, or any abnormal gas or materials in the ground which are known or suspected to be oil or hazardous materials. Excavated soil and sediment which is suspected of petroleum contamination shall be field screened using the jar headspace procedures according to established DEP Guidance. All field screening equipment must be pre-approved by the Engineer. The LSP shall ensure proper on site calibration of all field screening instrumentation.

The Engineer shall be contacted immediately when observations or any field screening results verify contamination requiring further analysis, and/or enhanced management of suspect soil and/or sediment. Any enhanced management of contaminated soil to ensure proper stockpiling and storage is incidental to the LSP Services item. The LSP shall adequately characterize subsurface conditions prior to backfill in areas where contaminated material has been excavated. The Engineer shall approve the locations of the testing sites prior to the sampling.

ITEM 180.03 (Continued)

Contaminated soil, sediment and/or groundwater shall be handled in accordance with all applicable state and federal statutes, regulations and policies. The LSP shall adequately characterize contaminated media for comparison to the requirements of the MCP. The Contractor and the LSP shall be aware of the reporting requirements for releases of oil and/or other hazardous material (OHM) as set forth in federal and state laws and regulations, and shall both be held responsible for performing the work in accordance with all applicable Federal and State laws and regulations. The LSP shall maintain written records in a clear and concise format which tracks the excavation, stockpiling, analysis and reuse/disposal of all suspect contaminated soils, sediments and groundwater. These records shall be up-to-date and available to the Engineer on a bi-weekly basis. The LSP shall review and summarize the laboratory data from any analyses performed on contaminated media. A report shall be delivered to the Engineer outlining the material sampling methods, laboratory analysis results and proposed course of action. The laboratory report together with Chain of Custody forms for all analytical results shall be submitted to the Engineer within 14 days after completion of such analyses.

The LSP and Contractor shall be held responsible for the submission of all MCP-related documents to the Engineer at least 14 days in advance of any timeframe specified in the MCP and for the timely submission of data and tracking information as noted within this Item. All documents prepared under this Item must be reviewed and signed by the approved LSP. The Contractor and LSP shall be responsible for all fines, penalties and enforcement requirements imposed by applicable regulatory agencies for failure to meet regulatory and contract timeframes. No compensation will be provided for such fines, penalties and enforcement actions.

The Contractor and the LSP shall be aware of the reporting requirements for releases of oil and/or other hazardous material (OHM) as set forth in federal and state laws and regulations, and shall both be held responsible for performing the work in accordance with all applicable Federal and State laws and regulations.

If the Contractor causes a release of OHM, the Contractor shall be responsible for assessing and remediating the release in accordance with all pertinent State and Federal regulations, including securing the services of a LSP, at his own expense.

The LSP shall coordinate all activities involving both MassDOT and the DEP through the Engineer. Any notification of release shall be approved by the Department before submittal to the DEP, except if an imminent hazard condition exists as defined in 309 CMR 4.03(4)(b).

ITEM 180.03 (Continued)

Laboratory Testing in Support of LSP Services

Laboratory testing provides for analytical testing in support of LSP services related to maintaining MCP compliance, such as delineating the extent and type of contamination present. Sampling and testing for disposal purposes are not included.

In order to maintain compliance with the MCP or other regulatory requirements, the LSP shall request approval from the Engineer to obtain samples from various locations and depths within the project area and to perform laboratory analyses on those samples. The samples shall be delivered to a DEP-certified laboratory using proper chain-of-custody documentation for analyses which, depending upon site conditions and suspected and/or identified contaminants of concern, may include, but are not limited to, metals, polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, polycyclic aromatic hydrocarbons (PAHs), extractable petroleum hydrocarbons (EPHs) and volatile petroleum hydrocarbons (VPHs). Subsequent testing, depending upon initial results, may be required for Toxicity Characteristic Leaching Procedure (TCLP) analyses (EPA Method 1311) for metals.

Method of Measurement and Basis of Payment

LSP Services for work under this item will be measured per person, per hour of service provided by LSP, Environmental Technicians and other approved personnel. Travel time shall not be included in the billable hours. LSP hours related to soil/sediment disposal (disposal characterization, landfill acceptance, disposal package preparation, etc.) shall be incidental to disposal items.

The quantity and type of laboratory tests must be approved by the Engineer beforehand. The contractor will be reimbursed upon satisfactory written evidence of payment. The contractor may be required to obtain cost estimates from three DEP certified laboratories for the Engineer to choose the service provider. Laboratory testing related to soil/sediment disposal (disposal characterization, landfill acceptance, disposal package preparation, etc.) shall be incidental to disposal items.

LSP Services will be paid at the Contractor bid price for each hour, or fraction thereof, spent to perform the work as described above. The bid price shall be a blended rate that includes the cost of the LSP, environmental technicians and other personnel, the performance of all work tasks and field screening, including required equipment, materials and instrumentation, and production of all documentation described above. All requests for payment must be accompanied by the following information: the names of the personnel associated with the work charged under LSP Services, dates and hours worked, work conducted, including, where appropriate, locations as identified on the construction plans, and a copy of the field diary for the dates submitted.

Laboratory Testing will be reimbursed upon receipt of paid invoices for testing approved by the Engineer.

ITEM 181.11 DISPOSAL OF UNREGULATED SOIL TON
ITEM 181.12 DISPOSAL OF REGULATED SOIL IN-STATE FACILITY TON
ITEM 181.13 DISPOSAL OF REGULATED SOIL OUT-OF-STATE FACILITY TON
ITEM 181.14 DISPOSAL OF HAZARDOUS WASTE TON

The work under these Items shall include the transportation and disposal of contaminated material excavated, or excavated and stockpiled. It shall also include the cost of any additional laboratory analyses required by a particular disposal facility beyond the standard disposal test set.

Excavation of existing subsurface materials may include the excavation of contaminated soils. The Contractor shall be responsible for the proper coordination of characterization, transport and disposal, recycling or reuse of contaminated soils. Disposal, recycling or reuse will be referred to as "disposal" for the purposes of this specification. However, regardless of the use of the term herein, there will be no compensation under these items for reuse within the project limits. The Contractor will be responsible for coordinating the activities necessary for characterization, transport and disposal of contaminated soils. Such coordination will include the Engineer and his/her designee overseeing management of contaminated materials. Contaminated soils must be disposed of in a manner appropriate for the soil classification as described below and in accordance with the applicable laws of local, state and federal authorities. The Contractor shall be responsible for identifying disposal facility (ies) licensed to accept the class of contaminated soils to be managed and assure that the facility can accept the anticipated volume of soil contemplated by the project. The Contractor shall be responsible for hiring a Licensed Site Professional (LSP) and all ancillary professional services including laboratories as needed for this work. The Contractor will be responsible for obtaining all permits, approvals, manifests, waste profiles, Bills of Lading, etc. subject to the approval of the Engineer prior to the removal of the contaminated soil from the site. The Contractor and LSP shall prepare and submit to the Engineer for approval all documents required under the Massachusetts Contingency Plan (MCP) and related laws and environmental regulations to conduct characterization, transport, and disposal of contaminated materials.

Classes of Contaminated Soils
The Contractor and its LSP shall determine if soil excavated or soil to be excavated is unregulated soil or contaminated soil as defined in this section. Such materials shall be given a designation for purposes of reuse or disposal based on the criteria of the MCP. Soils and sediments which are not suitable for reuse will be given a designation for purposes of off-site disposal based on the characterization data and disposal facility license requirements. The Classes of Contaminated Soils are defined as follows:

ITEMS 181.11 through **181.14** (Continued)

Unregulated Soil consists of soil, fill and dredged material with measured levels of oil and hazardous material (OHM) contamination at concentrations below the applicable Reportable Concentrations (RCs) presented in the MCP. Unregulated soil consists of material which may be reused (or otherwise disposed) as fill within the Commonwealth of Massachusetts subject to the non-degradation criteria of the MCP (310 CMR 40.0032(3), in a restricted manner, such that they are sent to a location with equal or higher concentrations of similar contaminants. Disposal areas include licensed disposal facilities, approved industrial settings in areas which will be capped or covered with pavement or loamed and seeded, and for purposes of this project should be reused as fill within the project site construction corridor whenever possible. The material cannot be placed in residential and/or environmentally sensitive (e.g. wetlands) areas. Under no circumstances shall contaminated soils be placed in an uncontaminated or less contaminated area (including the area above the groundwater table if this area shows no sign of contamination).

The Contractor shall submit to MassDOT the proposed disposal location for unregulated soils for approval. If such a disposal location is not a licensed disposal facility, the Contractor shall submit to the Engineer analytical data to characterize the disposal area sufficiently to verify that the unregulated material generated within the MassDOT construction project limits is equal to or less than the contaminant levels at the disposal site and meets the non-degradation requirements of the MCP. In addition, the Contractor shall provide written confirmation from the owner of the proposed disposal location that they have been provided with the analytical data for both the materials to be disposed as well as the disposal site characterization and that s/he agrees to accept this material. A Material Shipping Record or Bill of Lading, as appropriate, shall be used to track the off-site disposal of unregulated soil and a copy, signed by the disposal facility or property owner, shall be provided to the Engineer in order to document legal disposal of the unregulated material.

The cost of on-site disposal of unregulated soil within the project area will be considered incidental to the item of work to which it pertains.

ITEMS 181.11 through **181.14** (Continued)

Regulated Soil consists of materials containing measurable levels of OHM that are equal to or exceed the applicable Reportable Concentrations for the site as defined by the MCP, 310 CMR 40.0000. Regulated soil which meets the MCP reuse criteria of the applicable soil/groundwater category for this project area may be reused on site provided that it meets the appropriate geotechnical criteria established by the Engineer. Regulated Soil may be reused (as daily or intermediate cover or pre-cap contouring material) or disposed (as buried waste) at lined landfills within the Commonwealth of Massachusetts or at an unlined landfill that is approved by the Massachusetts Department of Environmental Protection (DEP) for accepting such material, in accordance with DEP Policy #COMM-97-001, or at a similar out-of-state facility. It should be noted that soils which exceed the levels and criteria for disposal at in-state landfills, as outlined in COMM-97-001, may be shipped to an in-state landfill, but require approval from the DEP Division of Solid Waste Management and receiving facility. An additional management alternative for this material is recycling into asphalt. Regulated Soils may also be recycled at a DEP approved recycling facility possessing a Class A recycling permit subject to acceptance by the facility and compliance with DEP Policy #BWSC-94-400. Regulated Soil removed from the site for disposal or treatment must be removed via an LSP approved Bill of Lading, Manifest or applicable material tracking form. This type of facility shall be approved/permitted by the State in which it operates to accept the class of contaminated soil in accordance with all applicable local, state and federal regulations.

Hazardous Waste consists of materials which must be disposed of at a facility permitted and operated in full compliance with Federal Regulation 40 CFR 260-265, Massachusetts Regulation 310 CMR 30.000, Toxic Substances Control Act (TSCA) regulations, or the equivalent regulations of other states, and all other applicable local, state, and federal regulations. All excavated materials classified as hazardous waste shall be disposed of at an out-of-state permitted facility. This facility shall be a RCRA hazardous waste or TSCA facility, or RCRA hazardous waste incinerator. This type of facility shall be approved/permitted by the State in which it operates to accept hazardous waste in accordance with all applicable local, state and federal regulations and shall be permitted to accept all contamination which may be present in the soil excavate. The Contractor shall ensure that, when needed, the facility can accept TSCA waste materials i.e. polychlorinated biphenyls (PCBs). Hazardous waste must be removed from the site for disposal or treatment via an LSP approved Manifest.

Monitoring/Sampling/Testing Requirements

The Contractor shall be responsible for monitoring, sampling and testing during and following excavation of contaminated soils to determine the specific class of contaminated material. Monitoring, sampling and testing frequency and techniques should be performed in accordance with Item 180.03 – LSP Services. Additional sampling and analysis may be necessary to meet the requirements of the disposal facility license. The cost of such additional sampling and analysis shall be included in the bid cost for the applicable disposal items. The Contractor shall obtain sufficient information to demonstrate that the contaminated soil meets the disposal criteria set by the receiving facility that will accept the material.

ITEMS 181.11 through **181.14** (Continued)

No excavated material will be permanently placed on-site or removed for off-site disposal until the results of chemical analyses have been received and the materials have been properly classified. The Contractor shall submit to the Engineer results of field and laboratory chemical analyses tests within seven days after their completion, accompanied by the classification of the material determined by the Contractor, and the intended disposition of the material. The Contractor shall submit to the Engineer for review all plans and documents relevant to LSP services, including but not limited to, all documents that must be submitted to the DEP.

Waste Tracking:
Copies of the fully executed Weight Slips/Bills of Lading/ Manifests/Material Shipping Records or other material tracking form received by the Contractor from each disposal facility and for each load disposed of at that facility, shall be submitted to Engineer and the Contractor's LSP within three days of receipt by the Contractor. The Contractor is responsible for preparing and submitting such documents for review and signature by the LSP or other appropriate person with signatory authority, three days in advance of transporting soil off-site. The Contractor shall furnish a form attached to each manifest or other material tracking form for all material removed off-site, certifying that the material was delivered to the site approved for the class of material. If the proposed disposition of the material is for reuse within the project construction corridor, the Contractor shall cooperate with MassDOT to obtain a suitable representative sample(s) of the material to establish its structural characteristics in order to meet the applicable structural requirements as fill for the project.

All material transported off-site shall be loaded by the Contractor into properly licensed and permitted vehicles and transported directly to the selected disposal or recycling facility and be accompanied by the applicable shipping paper. At a minimum, truck bodies must be structurally sound with sealed tail gates, and trucks shall be lined and loads covered with a liner, which shall be placed to form a continuous waterproof tarpaulin to protect the load from wind and rain.

Decontamination of Equipment
Tools and equipment which are to be taken from and reused off site shall be decontaminated in accordance with applicable local, state and federal regulations. This requirement shall include, but not be limited to, all tools, heavy machinery and excavating and hauling equipment used during excavation, stockpiling and handling of contaminated material. Decontamination of equipment is considered incidental to the applicable excavation item.

ITEMS 181.11 through **181.14** (Continued)

Regulatory Requirements

The Contractor shall be responsible for adhering to regulations, specifications and recognized standard practices related to contaminated material handling during excavation and disposal activities. MassDOT shall not be responsible at any time for the Contractor's violation of pertinent State or Federal regulations or endangerment of laborers and others. The Contractor shall comply with all rules, regulations, laws, permits and ordinances of all authorities having jurisdiction including, but not limited to, Massachusetts DEP, the U.S. Environmental Protection Agency (EPA), Federal Department of Transportation (DOT), Massachusetts Water Resources Authority (MWRA), the Commonwealth of Massachusetts and other applicable local, state and federal agencies governing the disposal of contaminated soils.

All labor, materials, equipment and services necessary to make the work comply with such regulations shall be provided by the Contractor without additional cost to MassDOT. Whenever there is a conflict or overlap within the regulations, the most stringent provisions shall apply. The Contractor shall reimburse MassDOT for all costs it incurs, including penalties and/or for fines, as a result of the Contractor's failure to adhere to the regulations, specifications, recognized standard practices, etc., that relate to contaminated material handling, transportation and disposal.

Submittals

I. Summary of Sampling Results, Classification of Material and Proposed Disposal Option.

The following information, presented in tabular format, must be submitted to the Engineer for review and approval prior to any reuse on-site or disposal off-site. This requirement is on-going throughout the project duration. At least two weeks prior to the start of any excavation activity, the Contractor shall submit a tracking template to be used to present the information as stipulated below. Excavation will not begin until the format is acceptable to MassDOT.

Characterization Reports will be submitted for all soil, sediment, debris and groundwater characterized through the sampling and analysis program. Each report will include a site plan which identifies the sampling locations represented in the Report. The Construction Plan sheets may be used as a baseplan to record this information.

The Sampling Results will be presented in tabular format. Each sample will be identified by appropriate identification matching the sample identification shown on the Chain of Custody Record. The sample must also be identified by location (e.g. grid number or stockpile number). For each sample, the following information must be listed: the classification (unregulated, regulated, etc.), proposed disposal option for the stockpile or unit of material represented, and, all analytical results.

ITEMS 181.11 through **181.14** (Continued)

Each Characterization Report will include the laboratory analytical report and Chain of Custody Record for the samples included in the Report.

II. Stockpiling, Transport, and Disposal.

At least two weeks prior to the start of any excavation activity, the Contractor shall submit, in writing, the following for review and shall not begin excavation activity until the entire submittal is acceptable to MassDOT.

Excavation and Stockpiling Protocol:
Provide a written description of the management protocols for performing excavation and stockpiling and/or direct loading for transport, referencing the locations and methods of excavating and stockpiling excavated material.

Disposal and Recycling Facilities:
Provide the name, address, applicable licenses and approved waste profile for disposal and/or recycling location(s) where contaminated soil will be disposed. Present information substantiating the suitability of proposed sites to receive classifications of materials intended to be disposed there, including the ability of the facility to accept anticipated volumes of material.

Provide a summary of the history of compliance actions for each disposal/recycling facility proposed to be used by the Contractor. The compliance history shall include a comprehensive list of any state or federal citations, notices of non-compliance, consent decrees or violations relative to the management of waste (including remediation waste) at the facility. Material should not be sent to facilities which are actively considered by the DEP, USEPA or other responsible agency to be in violation of federal, state or local hazardous waste or hazardous material regulations. MassDOT reserves the right to reject any facility on the basis of poor compliance history.

Transportation:
The name, address, applicable license and insurance certificates of the licensed hauler(s) and equipment and handling methods to be used in excavation, segregation, transport, disposal or recycling.

III. Material Tracking and Analytical Documentation for Reuse/Disposal.

The following documents are required for all excavation, reuse and disposal operations and shall be in the format described. At least two weeks prior to the start of any excavation or demolition activity, the Contractor shall submit the tracking templates required to present the information as stipulated below. Excavation or demolition will not begin until the format is acceptable to MassDOT.

ITEMS 181.11 through **181.14** (Continued)

All soils, sediments and demolition debris must be tracked from the point of excavation to stockpiling to onsite treatment/processing operations to off-site disposal or onsite reuse as applicable.

Demolition Debris:
Demolition debris must be tracked if the debris is stockpiled at a location other than the point of origin or if treatment or material processing is conducted. Identification of locations will be based on the station-offset of the location. The tracking table will identify date and point of generation, any field screening such as PID or dust monitoring, visual observations/comments, quantity, and stockpile ID/processing operation location. For each unit of material tracked, the table will also track reuse of the material on-site, providing reuse date, location of reuse as defined by start and end station, width of reuse location by offset, the fill elevation range, quantity, and finish grade for said location. For demolition debris which is not reused on site, the table will also track disposal of the material as defined by disposal date, quantity and disposal facility. The table must provide a reference to any analytical data generated for the material.

Soil/Sediment:
Soil excavation will be identified based on the station-offset of the excavation location limits. The tracking table will identify date and point of generation, any field screening such as PID or dust monitoring, visual observations, quantity, and stockpile number/location. For each unit of material tracked, the table will also track reuse of the material on-site and disposal of the material off-site using the same categories identified for demolition debris above.

Method of Measurement and Basis of Payment
Disposal of contaminated soil shall be measured for payment by the Ton of actual and verified weight of contaminated materials removed and disposed of. The quantities will be determined only by weight slips issued by and signed by the disposal facility. The most cost-effective, legal disposal method shall be used. The work of the LSP for disposal under all of these items shall be incidental to the work with no additional compensation.

Item 181.11 Measurement for Disposal of Unregulated Soil shall be under the Contract Unit Price by the weight, in tons, of contaminated materials removed from the site and transported to and disposed of at an approved location or licensed facility, and includes any and all costs for approvals, permits, fees and taxes, additional testing/characterization required by the facility beyond the standard disposal test set, decontamination procedures, transportation and disposal.

Item 181.12 Measurement for Disposal of Regulated Soil – In-State Facility shall be under the Contract Unit Price by the weight in tons of contaminated materials removed from the site and transported to and disposed of at an approved in-state facility, and includes any and all costs for approvals, permits, fees and taxes, testing/characterization required by the facility beyond the standard disposal test set, decontamination procedures, transportation and disposal.

ITEMS 181.11 through **181.14** (Continued)

Item 181.13 Measurement for Disposal of Regulated Soil - Out-of-State Facility shall be under the Contract Unit Price by the weight in tons of contaminated materials removed from the site and transported to and disposed of at an approved out-of-state facility, and includes any and all costs for approvals, permits, fees and taxes, testing/characterization required by the facility beyond the standard disposal test set, decontamination procedures, transportation and disposal.

Item 181.14 Measurement for Disposal of Hazardous Waste shall be under the Contract Unit Price by the weight in tons of hazardous waste removed from the site and transported to and disposed of at the licensed hazardous waste facility, and includes any and all costs for approvals, permits, fees and taxes, testing/characterization required by the facility beyond the standard disposal test set, decontamination procedures, transportation and disposal.

ITEM 182.21	**ASBESTOS REMOVAL PERMITS**	**LUMP SUM**
ITEM 182.22	**REMOVAL OF ASBESTOS PIPE**	**FOOT**

The work under these items includes permitting, abatement, removal, and disposal of Asbestos Cement Pipe (ACP) as indicated on the Plans and shall comply with the requirements of all regulatory agencies.

Based on available information, existing water lines within the scope of this project are Asbestos Cement Pipe. The Contractor will likely encounter ACP, also referred to as asbestos fiber cement and Transite pipe, while constructing the proposed improvements along Pond Street. It is anticipated that certain sections of the ACP will require removal as part of the work and certain sections of unexposed ACP will be left undisturbed and in place. During the execution of this work, exposed or damaged ACP must be properly removed and disposed of at a licensed facility.

The exact location and depth of the ACP is unknown. Based on the proposed location of the new water line, drain line, subdrain and other proposed improvements, sections of the existing ACP will likely be encountered/exposed and may require removal.

The asbestos cement pipe shall be removed and disposed of by a contractor with a current Massachusetts Asbestos Contractor license. The removal and disposal of the asbestos cement pipe shall follow all state and federal asbestos handling regulations.

Dust suppression in the form of light water sprays, foams, dust suppressants and calcium chloride will be implemented as required to control dust during trenching and excavation. Alternatively, intrusive activities may be reduced or curtailed under high wind or heavy rain condition, which in the opinion of the Engineer may pose a safety hazard to the workers.

ITEM 182.21 and **ITEM 182.22** (Continued)

To complete the installation of the new water line, the Contractor shall be responsible for the identification and proper removal of ACP as may be required for this project. The removal of ACP must meet the applicable requirements of the Massachusetts Department of Environmental Protection (MassDEP) Asbestos Regulation 310 CMR 7.15, and adhere to the MassDEP "Asbestos Cement Pipe Guidance Document and Conditional Enforcement Discretion", dated June 2011 and amended May 22, 2015. A copy of the guidance document is presented for reference purposes in Appendix A.

The Contractor is responsible for filing the asbestos abatement notifications as required by MassDEP including submittal of an Asbestos Notification Form ANF-001/BWP AQ-04 (the Town is exempt from filing fees). A copy of the ANF and any other project-related asbestos submittals shall be provided to the Engineer for review and signatures, as may be required, prior to the Contractor submitting to the governing agency.

The Contractor is responsible for engaging the services of an independent Department of Labor (DLS) Licensed Inspector/Monitor as may be required to complete this work and provide documentation to the Engineer that the workers performing the ACP removal have been properly trained to participate in the removal of the ACP.

The Contractor shall be responsible for the proper daily handling, packaging and secure storage of removed ACP and asbestos-containing waste materials (ACWM) generated during the execution of the work in accordance with applicable sections of MassDEP 310 CMR 7.15 regulations and guidelines.

The Contractor shall submit ACP-related documents (ANF, transportation, disposal, etc.) to the Engineer and Owner for review and signatures 3 days in advance of issuance by the Contractor.

Method of Measurement
Item 182.22 will be measured per Foot of asbestos cement pipe removed.

Basis of Payment
Item 182.21 will be paid for at the contract unit price, Lump Sum for all work required for preparing and filing the permits, including plan preparation, required revisions, revisions/addenda during construction, monthly reports and filing fees necessary for the proper removal and disposal of the asbestos material

Item 182.22 will be paid for at the contract unit price per Foot, which shall be full compensation for furnishing all labor, equipment, tools, materials, and incidentals necessary to complete the work for the proper removal and disposal of the asbestos pipe.

ITEM 183.1 **TREATMENT OF CONTAMINATED GROUNDWATER** **GALLON**

This Item addresses the treatment and disposal of contaminated groundwater encountered during excavation operations. The work generally consists of furnishing the materials, equipment, labor, services, testing/sampling, waste characterization, transportation, disposal, permits and agreements necessary to perform the work required for the collection, treatment and disposal of contaminated groundwater.

The Contractor is advised that contaminated groundwater may be encountered during dewatering activities. The levels and nature of contamination may vary depending on location and/or depth. No data has been provided in this specification indicating the types of contaminants that may be found in groundwater encountered during this work. It will be the responsibility of the Contractor to ensure that water removed during dewatering operations is treated and disposed of in accordance with all applicable laws and regulations and in accordance with this specification.

The Contractor shall monitor the quantity of groundwater collected for treatment using an in-line totalizer flowmeter or an alternate method approved by MassDOT. The Contractor shall, at all times, minimize the quantity of groundwater removed from the excavations. All groundwater determined to be contaminated will be managed in accordance with all applicable local, state and federal regulations.

It is not the intent herein for the Department to design for or specify to the Contractor which particular treatment is to be used, if necessary. Rather, it is the Department's intent to provide guidance to the Contractor for informational and bidding purposes only. It is, therefore, the Contractor's responsibility to use a treatment method to allow him/her to meet any and all laws, regulations, policies, guidelines and permit requirements. Treatment of contaminated groundwater for dewatering operations is generally performed using a mobile treatment trailer equipped with one or more granular-activated carbon (GAC) canisters, although other techniques are also used.

It is likely that treatment of the contaminated groundwater using granular-activated carbon will be required to complete the work under this Contract. The Methods described under Item 183.1 provides for the identification, testing, management and treatment or disposal of contaminated groundwater and shall be implemented, at a minimum and as necessary by the Contractor via Methods under Item 183.1.

The overall handling and management of contaminated groundwater is regulated under the provisions of 310 CMR 40.0000, 314 CMR 3.00 and 5.00, NPDES and other applicable laws. The unpermitted discharge of contaminated dewatering effluent into the environment (storm drain, surface water body, onto the ground) is a violation of federal and state laws and regulations. Should dewatering of contaminated groundwater be necessary, approvals must be sought from the appropriate federal, state, or local regulatory jurisdiction. The USEPA will not specify a treatment system or method, but normally requires that the treated discharge meet Massachusetts Drinking Water Standards.

ITEM 183.1 (Continued)

The discharge standards are normally met by treating the dewatered groundwater through granular-activated carbon canisters, or similar techniques. Longer term discharges to surface waters or storm drains, and any discharges to the ground, require approval and/or issuance of a permit from the DEP Division of Water Pollution Control. The Contractor shall be responsible for applying for, paying all fees for and obtaining all permits required for treatment and/or disposal of contaminated groundwater. Additional requirements may be mandated by local/regional sewer authorities for discharge to sanitary sewer or Publicly Owner Treatment Works (POTW). Copies of permit applications and correspondence from federal and state agencies and sewer authorities shall be supplied to the Engineer prior to dewatering activities.

EPA regulations published in the Federal Register on September 9, 2005 (70 FR 53663) require a National Pollutant Discharge Elimination System (NPDES) Remediation & Miscellaneous Contaminated Sites General Permit (RGP) for all contaminated construction site dewatering activities in Massachusetts (MAG910000) that will involve the discharge of water to classes of receiving waters designated in the Massachusetts Water Quality Standards (314 CMR 4.00). The application requires that operators of proposed new discharges seeking coverage under this general permit submit a Notice of Intent (NOI) to EPA New England post-marked at least 14 days prior to commencement of discharge. The Contractor is solely responsible for applying for and obtaining coverage under the NPDES Remediation General Permit from EPA and, if applicable, DEP, including the costs associated with sampling and analysis of groundwater and any application fees. The Contractor is required to submit a completed copy of the NOI to the Engineer and the Director of Environmental Programs, Construction Division, 10 Park Plaza, Boston, prior to commencement of discharge.

Upon permanent cessation of the discharges authorized by the RGP, the Contractor shall be responsible for submitting a Notice of Termination (NOT) to EPA New England within 30 days of the permanent cessation. The Contractor is required to submit to MassDOT a completed copy of the NOT within 14 days of the permanent cessation of the discharges authorized by the RGP. All costs and fees associated with the submission of the NOT will be the responsibility of the Contractor.

The Contractor shall be responsible for adhering to regulations, specifications, and recognized standard practices related to contaminated groundwater handling during dewatering activities. MassDOT shall not be responsible at any time for the Contractor's violation of pertinent local, state or federal regulations or endangerment of laborers and others. The Contractor shall comply with all rules regulations, laws, permits and ordinances of all authorities having jurisdiction including, but not limited to, Massachusetts Department of Environmental Protection (DEP), the U.S. Environmental Protection Agency (EPA), Federal Department of Transportation (DOT), Massachusetts Water Resources Authority (MWRA), the Commonwealth of Massachusetts and other applicable local, state and federal agencies governing this work.

ITEM 183.1 (Continued)

The Contractor shall be responsible for determining compliance with the requirements of any permit and for any sampling, testing, and disposal required in connection with said permits. MassDOT and the City/Town reserve the right to collect additional samples of dewatered groundwater to determine the Contractor's compliance with the Permit's requirements. All laboratory testing is to be performed by a DEP certified laboratory for all parameters being tested. Copies of all field and laboratory testing results, reports, etc. required by the permits must be supplied to the Engineer. MassDOT, DEP, and the permit-granting agency, where applicable, reserve the right to collect additional samples of discharged groundwater to verify compliance with permit requirements.

For the purpose of these specifications and to establish a basis for the bid, it is anticipated that granular-activated carbon will be the treatment medium for dewatered contaminated groundwater. The bidder shall factor into the payment item all costs associated with the testing and analyses that may be required by the permitting agency. In addition, any laboratory testing of groundwater is to be performed by a DEP certified laboratory for the parameters being tested. Copies of all field and laboratory testing results will be supplied to the Engineer. Bid price shall also include full compensation for labor, materials, maintenance, mobilization, rental and other related costs. Item 183.2 will be used for disposal of used granular-activated carbon canisters.

Submittals

Prior to initiating work, the Contractor shall submit an excavation dewatering plan to the MassDOT that includes a detailed description of the approach to dewatering, a description of methodology for sealing the excavation to minimize infiltration of groundwater, if deemed applicable to the work, anticipated treatment, discharge points, sampling frequency, required permits, transporters and waste facilities complete with license numbers, permit numbers, contact person, and address and telephone number that the Contractor plans to utilize for waste disposal. The plan shall be submitted for the record.

The Contractor shall submit to MassDOT for review, the proposed methods for dewatering and groundwater treatment and disposal for the various portions of the work to be done. The review shall be for methods only. The Contractor shall remain responsible for the maintenance, performance, structural integrity and safety of the systems installed for this work as well as regulatory compliance of the applicable local, state and federal discharge standards. The contractor shall provide all groundwater sampling and analyses, results and reports required by all applicable local, state and federal agencies. The Contractor shall submit to MassDOT for review all plans and documents that must be submitted to the EPA and DEP, including NOI, NOT, treatment system analytical reports and correspondence. Copies of all permits and approvals and lab analyses and test results associated with groundwater treatment and disposal must be submitted to MassDOT within 3 days of receipt by the Contractor.

ITEM 183.1 (Continued)

Establishment Of Treatment Procedure:
Since concentrations of contaminants in groundwater cannot be easily assessed in the field, all groundwater extracted from the ground will be considered contaminated and will be initially pumped and stored into open settling tank(s) or a fractionation tank until it can be sampled and analyzed, unless otherwise directed by MassDOT. The Contractor will perform initial sampling and analyses of the groundwater to determine the need for a permit to dispose of contaminated groundwater. Based on the results of the initial sample analysis, which must be provided to the Engineer within twenty-four (24) hours of the time the samples are received by the laboratory, the Contractor will determine the necessity for treatment(s) and disposal procedures. Sampling must also be performed to meet applicable discharge criteria as set by the appropriate regulatory agencies for the permit obtained for disposal. All discharges must meet regulatory standards set forth in the permits required for discharge. For the purposes of the bidding process, it is anticipated that the treatment system will consist of sedimentation tanks, an oil water separator and liquid-phase granular activated carbon as the primary on-site treatment medium for dewatered contaminated groundwater. MassDOT may require additional treatment processes if such is determined necessary during the groundwater testing procedure. The Contractor shall integrate the additional treatment process into the treatment system, if necessary.

The Contractor shall provide all labor, equipment and appurtenances required to treat the groundwater, subject to the approval of MassDOT. Groundwater stored and tested but not requiring treatment or off-site disposal shall be discharged to a location subject to the approval of MassDOT without payment to the Contractor.

Treatment Units
The Contractor shall furnish all labor and materials, and shall install and operate temporary groundwater treatment and disposal system(s) as necessary to treat contaminated groundwater pumped from excavations during construction activities under the Contract. Such systems shall be capable of treating groundwater to meet applicable discharge criteria as set by the appropriate regulatory agencies.

The Contractor or their Environmental Consultant shall operate, maintain and modify the selected treatment system, and conduct the necessary monitoring and reporting of influent, midpoint and effluent results, as required by the discharge permit for the disposal option selected.

ITEM 183.1 (Continued)

Method of Measurement

Provide a treatment system that meets permit discharge requirements, mobilize it to the site, provide copies of laboratory analytical data indicating that the system is performing appropriately to meet permit requirements, and demobilize it from the site. This includes management and disposal of wastes generated during treatment prior to discharging such as activated carbon, etc. Work under Item 183.1 is based upon the number of gallons disposed or contaminated groundwater pumped through the granular-activated carbon (Item 183.2) as the medium for the treatment of contaminated groundwater that is found in pipe trenches, manhole excavations, catch basin excavations, that need to be dewatered.

Basis of Payment

Payment shall be made at the unit price bid per gallon of groundwater pumped, stored, treated as needed and tested as required by discharge permits and regulatory requirements, which price shall be full compensation for all necessary labor and materials, mobilization, maintenance, demobilization of the appropriate unit(s), freight, rental costs, field and laboratory testing costs and permits. Costs associated with the disposal of granular-activated carbon shall be covered under Item 183.2.

ITEM 183.2 DISPOSAL OF GRANULAR-ACTIVATED CARBON POUND

Work under Item 183.2 is based upon the disposal of used granular-activated carbon as the treatment medium for contaminated groundwater (Item 183.1) that is found during excavations in which contaminated groundwater is encountered.

Basis of Payment

Payment shall be made at the unit price bid per pound of carbon that is properly disposed and replaced, as necessary, to meet treated water discharge requirements during dewatering operations at the site. Payment for Disposal of Granular Activated Carbon shall include compensation for all labor, equipment, materials, permits, characterization, sampling and on-site or laboratory analysis as needed or required by permits, for replacement and disposal of liquid-phase activated carbon for the on-site contaminated groundwater pumping, collection, treatment and treated water discharge system during the time period required to complete the work. No payments shall be made for replacing carbon which is spent due to the Contractor's failure to remove floating petroleum product or excess sediments prior to the groundwater entering the carbon treatment units. All other costs associated with treatment of contaminated groundwater will be covered under Item 183.1- Treatment of Contaminated Groundwater.

ITEM 184.1 DISPOSAL OF TREATED WOOD PRODUCTS TON

Work under this item shall include the transportation and disposal of all treated existing wood product as directed by the Engineer.

The timber components of the existing structure are suspected to be treated with creosote, pentachlorophenol and/or CCA. This item shall include all costs for sampling, laboratory testing, loading, transportation and disposal of the treated wood. The Contractor is required to submit disposal manifests to the Engineer prior to the completion of the project. All aspects of this Item are to be completed in accordance with state and federal regulations.

Compensation
Measurement and payment will be by the weight, in tons, of treated timber transported and accepted at a licensed facility. The work shall be considered full compensation for all labor, tools, equipment, materials, testing, loading, transportation, approvals, and permits necessary for the completion of the work.

ITEM 201.3 SPECIAL CATCH BASIN EACH

The work under this item shall conform to the relevant provisions of Subsections 201, 901, M4, and M8 of the Standard Specifications and the following:

Special catch basins shall be as shown in Construction Standard drawing E 201.3.0 or E 201.4.0 except the sump shall be 4 feet deep and shall be provided with hood on the outlet pipe.

Special catch basins shall be precast concrete conforming to the latest ASTM Specifications for precast reinforced concrete sections (ASTM C478). Concrete shall have a minimum compressive strength of 4,000 psi. Reinforcing steel shall conform to the latest ASTM A1064 Specifications. The manhole shall be capable of supporting an HS 20-44 live load.

The joints of the precast catch basin sections shall be sealed with either a round rubber "O"-ring gasket or a flexible joint sealant. The "O"-ring shall conform to ASTM C443.

Special catch basins shall be monolithic to a point 6 inches above the crown of the highest pipe. The cone sections shall be replaced with flat top sections, when approved by the Engineer, at no additional cost.

When utility conflicts are encountered, alternate offset cones or flat slabs designed to meet or exceed H-20 loading shall be used in place of the standard cone section with the approval of the Engineer and at no additional cost.

Cutting into the cone sections will not be allowed.

ITEM 201.3 (Continued)

Backfilling for structures shall consist of suitable materials uniformly distributed and thoroughly compacted in conformance with relevant provisions of Subsections 150 and 200 of the Standard Specifications. When suitable backfilling material cannot be obtained from excavation, proposed drainage structures shall be constructed on a bedding of 12 inches of gravel borrow. Gravel borrow for bedding shall be in conformance with Materials Section M1.03.0. Crushed stone bedding shall be used where necessary, for bedding in wet conditions.

All castings located within the pavement area shall not be set to finished grade until after the binder course has been placed.

All frames shall be set in a concrete collar conforming to Construction Standard Detail E 202.9.0 prior to placement of the top course pavement.

Cut and plug of existing utilities in order to replace proposed drainage structures shall be coordinated with utility companies prior the work.

Method of Measurement
Item 201.3 will be measured per each, as a complete unit, regardless of depth.

Basis of Payment
Item 201.3 will be paid for at the contract unit price per Each, which price shall include all labor, materials, equipment, cutting and plugging of existing utilities in order to install new drainage structure, and incidentals necessary to complete the work.

Hoods will be paid under Item 224.12.

Gravel borrow will be paid under Item 151.2.

ITEM 202.11 SPECIAL MANHOLE (10 FT X 8 FT) LUMP SUM

The work under this item shall conform to the relevant provisions of Subsections 201, 901, M4 and M8 of the Standard Specifications and the following:

The structure shall measure 10' long x 8' wide internally and approximately 4.5' high.

The Special Manhole shall be precast concrete conforming to the latest ASTM Specifications for precast reinforced concrete sections (ASTM C1577).

Concrete shall have a minimum compressive strength of 4,000 psi. Reinforcing steel shall conform to the latest ASTM A1064 Specifications. The manhole shall be capable of supporting an HS 20-44 live load.

The joints of the precast manhole sections shall be sealed with a flexible joint sealant and shall conform to ASTM C990.

The Special Manhole shall be constructed on a bedding of 12 inches of gravel borrow. Gravel borrow for bedding shall be in conformance with Materials Section M1.03.0. Gravel borrow will be paid under Item 151.2. Crushed stone bedding shall be used where necessary, for bedding in wet conditions.

All castings located within the pavement area shall not be set to finished grade until after the binder course has been placed.

All frames shall be set in a concrete collar conforming to Construction Standard Detail E 202.9.0 prior to placement of the top course pavement.

Cut and plug of existing utilities in order to replace proposed drainage structures shall be coordinated with utility companies prior the work.

The contractor shall submit to the Engineer for approval, a shop drawing that includes backup calculations for design of the structure that is signed and stamped by a Professional Engineer licensed in the state of Massachusetts.

Basis of Payment

Item 202.11 will be paid for at the contract unit price, Lump Sum. This price shall include all labor, materials, manufacture, equipment, cutting and plugging of existing utilities in order to install the new drainage structure, and incidentals necessary to complete the work.

ITEM 202.5	**MANHOLE (5 FT DIAMETER)**	**EACH**
ITEM 202.6	**MANHOLE (6 FT DIAMETER)**	**EACH**
ITEM 202.8	**MANHOLE (8 FT DIAMETER)**	**EACH**

The work under these items shall conform to the relevant provisions of Subsections 201, 901, M4, and M8 of the Standard Specifications and the following:

Drain manholes that are 5', 6',and 8' in diameter shall be precast concrete conforming to the latest ASTM Specifications for precast reinforced concrete sections (ASTM C478).

Concrete shall have a minimum compressive strength of 4,000 psi.

Reinforcing steel shall conform to the latest ASTM A1064 Specifications.

The manhole shall be capable of supporting an HS 20-44 live load.

The joints of the precast manhole sections shall be sealed with either a round rubber "O"-ring gasket or a flexible joint sealant. The "O"-ring shall conform to ASTM C443.

The manhole base section of the 5', 6',and 8' diameter manholes shall be monolithic to a point 6 inches (6") above the crown of the highest pipe. The cone sections shall be replaced with flat top sections, when approved by the Engineer, at no additional cost.

When utility conflicts are encountered alternate offset cones or flat slabs designed to meet or exceed H-20 loading shall be used in place of the standard cone section with the approval of the Engineer and at no additional cost.

Cutting into the cone sections will not be allowed.

Backfilling for structures shall consist of suitable materials uniformly distributed and thoroughly compacted in conformance with relevant provisions of Sections 150 and 200 of the Standard Specifications. When suitable backfilling material cannot be obtained from excavation, proposed drainage structures shall be constructed on a bedding of 12 inches of gravel borrow. Gravel borrow for bedding shall be in conformance with Materials Section M1.03.0. Gravel borrow will be paid under Item 151.2. Crushed stone bedding shall be used where necessary, for bedding in wet conditions.

All castings located within the pavement area shall not be set to finished grade until after the binder course has been placed.

All frames shall be set in a concrete collar conforming to Construction Standard Detail E 202.9.0 prior to placement of the top course pavement.

Cut and plug of existing utilities in order to replace proposed drainage structures shall be coordinated with utility companies prior the work.

ITEM 202.5 through **ITEM 202.8** (Continued)

Method of Measurement
Item 202.5, Item 202.6, and Item 202.8 will be measured per Subsection 201.80.

Basis of Payment
Item 202.5, Item 202.6, and Item 202.8 will be paid for at the respective contract unit prie per Each. This price shall include all labor, materials, equipment, cutting and plugging of existing utilities in order to install new drainage structure, and incidentals necessary to complete the work.

All gravel borrow for backfilling shall be paid under item 151.2.

All crushed stone for backfilling shall be paid under item 156.

ITEM 202.9 DEEP SUMP MANHOLE EACH

The work under this Item shall conform to the relevant provisions of Subsection 201 and the following:

Deep Sump Manholes shall be precast concrete structures with a 4-foot sump and shall be provided with hood on the outlet pipe as shown on the detail sheet. Hoods will be paid under Item 224.12.

The manhole shall be capable of supporting an HS 20-44 live load.

Frame and cover shall conform to and be paid for under Item 221.

Backfilling for Deep Sump Manholes shall consist of suitable materials uniformly distributed and thoroughly compacted in conformance with relevant provisions of ubsSections 150 and 200 of the Standard Specifications.

When suitable backfilling material cannot be obtained from excavation, proposed drainage structures shall be constructed on a bedding of 12 inches of gravel borrow. Gravel borrow for bedding shall be in conformance with Materials Section M1.03.0. Gravel borrow will be paid under Item 151.2. Crushed stone bedding shall be used where necessary, for bedding in wet conditions.

The cone sections of catch basins shall be replaced with flat tops sections, when approved by the Engineer, at no additional cost.

All castings located within the pavement area shall not be set to finished grade until after the binder course has been placed.

All frames shall be set in a concrete collar conforming to Construction Standard Detail E 202.9.0 prior to placement of the top course pavement. The cost of the concrete collar shall be included in the unit price bid for this item.

ITEM 202.9 (Continued)

Cut and plug of existing utilities in order to replace proposed drainage structures shall be coordinated with utility companies prior the work.

Method of Measurement
Item 202.9 will be measured by the unit Each, regardless of required depth. There shall be no additional compensation for the deep sump.

Basis of Payment
Item 202.9 will be paid for at the contract unit price per Each, which price shall includee all excavation, labor, materials, equipment and incidentals necessary to complete the work. Incidental costs include the cutting and plugging of existing utilities in order to install new drainage structure.

ITEM 204.11 GUTTER INLET - SPECIAL EACH

The work under this item shall conform to the relevant provisions of Subsections 201, 901, and Materials Section M4 and M8 of the Standard Specification and the following:

The work shall consist of the construction of new gutter inlets as shown on the plans.

The gutter inlets shall be placed on a bedding of 6 inches of 3/4" gravel borrow.

Where the gutter inlet structure is proposed above an existing gas line, a steel plate shall be positioned underneath the ¾" gravel borrow and above the sand borrow that shall be used as backfill over existing gas line. The sand borrow shall fill the remaining depth between the steel plate and existing gas pipe. The steel plate shall be 1/2" thick with a 5'x5' dimension, extending 12" all around the gutter inlet structure to distribute loads away from the gas line.

Gutter inlets require castings of shallow 4" high 24"x24" frame and grate.

The Contractor shall cut and plug of existing utilities in order to replace proposed drainage structures shall be coordinated with utility companies prior the work.

ITEM 204.11 (Continued)

Method of Measurement
Item 204.11 will be measured per unit Each special gutter inlet installed.

Basis of Payment
Item 204.11 will be paid for at the contract unit price per Each. This price shall include all excavation, labor, materials, tools and equipment, and incidentals necessary for the construction of the gutter inlets, including walls, base, concrete masonry and shall also include excavation, disposal of surplus materials, backfilling, cutting and plugging existing utilities, steel plates, and incidentals necessary for constructing a complete gutter inlet of the type specified and shown in the Plans.

The shallow 4" high castings, which will be paid for under Item 222.1.

Gravel Borrow for bedding shall be paid for under Item 151.2.

Sand Borrow for backfill above existing gas shall be paid for under Item 154.

ITEM 220.8 SANITARY STRUCTURE REMODELED EACH

Work under this Item shall conform to the relevant provisions of Subsection 220 of the Standard Specifications and the following:

All sanitary structures which are the property of the municipality shall be remodeled to meet the proposed grade when the adjustment of the structure to line or grade or both line and grade is greater than 6 inches. Existing castings shall be retained.

Work shall include remodeling existing sanitary structures, including brick and mortar, concrete collar, and frames to allow the frame to be set to the proposed line and grade. All associated work shall conform to the Municipality's requirements.

Method of Measurement
Item 220.8 will be measured per each, complete in place and approved.

Basis of Payment
Item 220.8 will be paid for at the Contract unit price per each, which price shall include all labor, materials, equipment, and incidentals necessary to complete the work.

ITEM 303.06	**6 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT)**	**FOOT**
ITEM 303.08	**8 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT)**	**FOOT**
ITEM 303.12	**12 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT)**	**FOOT**

The work under these items will conform to the relevant provisions of Subsection 300 of the Standard Specifications and the following:

The work includes furnishing, laying, jointing, testing, and disinfecting all water pipes and fittings, as indicated on the Contract Drawings and in accordance with the current requirements of the Ashland Department of Public Works (DPW).

The Contractor shall notify and coordinate with owners of business and commercial establishments of any disruptions to, or shutdowns of, water service to their facilities. The Contractor shall schedule service disruptions or shutdowns such that operations of business and commercial establishments are not impacted, and furthermore shall coincide with periods of minimal water usage by these properties.

Piping shall be installed at the locations indicated on the Contract Drawings and as designated in these Specifications. Data relative to existing water mains, services, etc. shown on the plans has been compiled from plans and field information but such data is not guaranteed as to exact location or elevation.

Unless otherwise shown or stated, the minimum total finished cover over the top of the barrel of all installed pipe shall be 5 feet. All excavation necessary for the pipe installation, excluding Class B excavation, shall be included in the cost of the pipe.

Reaction or thrust blocks of concrete shall be constructed at all tees, plugs, and bends, as required, or as detailed on the drawings. The blocks shall be poured against undisturbed original ground and shall be so placed that pipe joints will be accessible for any possible future repairs. All concrete for thrust blocks shall be as specified under Item 903. Method of restraint may be either locking joint or mechanical restraint as approved by the Ashland DPW.

The water pipe shall be connected to existing or new structures and/or piping by the Contractor as shown on the Contract Drawings. Test pits shall be dug as required by the Engineer to verify the size and the type of existing pipe where connections are to be made. The Contractor shall furnish and install all such fittings and appurtenances as necessary to make the connections shown whether all such fittings are detailed or not. Couplings, where required, shall be as specified under Items 371.06, 371.08, or 371.12.

ITEM 303.06 through **ITEM 303.12** (Continued)

All pipes, fittings, and appurtenances to be laid in open trench excavations shall be bedded in and uniformly supported over its full length as shown on the Contract Drawings.

Backfilling of the pipe trench shall be done as specified under Subsection 100 of the Standard Specifications.

Mechanical Restrained Joints
Ductile iron water pipes and fittings shall be restraint with mechanical restrained joints.

Mechanical joint restraint shall be incorporated in the design of the follower gland and shall include a restraining mechanism which, when actuated, imparts multiple wedging action against the pipe, increasing its resistance as the pressure increases. Flexibility of the joint shall be maintained after burial. Glands shall be manufactured of ductile iron conforming to ASTM A 536-80. Restraining devices shall be of ductile iron heat treated to a minimum hardness of 370 BHN.

Dimensions of the gland shall be such that it can be used with the standardized mechanical joint bell and tee-head bolts conforming to ANSI/AWWA C111/A21.11 and ANSI/AWWA Cl53/A2l.53 of latest revision. Twist-off nuts shall be used to insure proper actuating of the restraining devices.

The mechanical joint restraint device shall have a working pressure of at least 250 psi with a minimum safety factor of 2:1. The method of restraining shall be an interlocking type of mechanical joint with retainer gland as specified by the Ashland DPW. Joints shall be furnished with either follower glands or ductile iron retaining glands as shown on the drawings. Mechanical joint restraints shall be approved by the Ashland DPW prior to ordering.

Method of Measurement
Items 303.06, 303.08, and 303.12 will be measured per Foot of ductile iron water pipes furnished and installed.

Basis of Payment
Items 303.06, 303.08, and 303.12 will be paid for at the respective contract unit price per Foot. This price shall include the removal and disposal of existing water pipe and appurtenances encountered during construction, furnishing and installing the ductile iron water pipes, mechanical restrained joints, cutting and plugging the existing water pipe, and furnishing all materials, preparation and installation, including all excavation, compaction and backfilling of ordinary borrow backfill above initial backfill, water line testing and disinfecting, brass caps and wedges, buried pipe identification tape, cement lining, support of excavation, dewatering, and for all labor, equipment, tools and incidentals necessary to complete the work.

Pipe bedding shall be paid under Item 151.2.

❺ ADDENDUM NO. 5, AUGUST 27, 2020

❺

ITEM 371.06	**6 INCH COUPLING**	**EACH**
ITEM 371.08	**8 INCH COUPLING**	**EACH**
ITEM 371.12	**12 INCH COUPLING**	**EACH**

The work under these items shall conform to the relevant provisions of Subsection 300 of the Standard Specifications and the following:

The Contractor shall furnish and install couplings.

All couplings connected to existing pipes shall be restrained insulating mechanical transition couplings.

Couplings shall be of a type equal to Smith Blair, Style 441; Dresser, Style 153; Romac Style 501, or an equal approved by the Municipality's Water Superintendent.

Couplings shall be provided with plain, Grade 27, rubber gaskets and with black, steel, track-head bolts with nuts.

ITEM 371.06 through **ITEM 371.12** (Continued)

Construction Methods
Test pits shall be performed to specify material of existing water prior to ordering products.

Shut down of water mains shall be coordinated with the Town of Ashland.

There shall be zero gaps between proposed water mains and existing water mains within proposed couplings.

Method of Measurement
Items 371.06, 371.08, and 371.12 will be measured per Each coupling furnished and installed, complete in place.

Basis of Payment
Items 371.06, 371.08, and 371.12 will be paid for at the respective contract unit price per Each, which price shall include all labor, materials, equipment, and incidentals necessary to complete the work.

ITEM 373. WATER PIPE INSULATION BOARD FOOT

The work under this item shall conform to the relevant provisions of Subsection 301.60 of the Standard Specifications and the following:

The work under this item includes all work required to furnish and install insulation for sections of the existing water main in areas identified on the plans or as required by the Engineer.

The Contractor shall dig test pits to determine the depth of the existing pipe prior to adding insulation. The test pits shall be performed at the end of each run of insulation and as directed by the Engineer. The Contractor shall request the Town mark out or trace the waterline prior to performing the test pit. Test pits shall be paid under Item 141.1.

Pipe Insulation shall be cellular glass conforming to ASTM C-552 or conforming to ASTM C-578. Buried pipe insulation shall be high-density, moisture resistant, and suitable for underground insulation.

Insulation shall be installed where required, in accordance with Sections 300 and M9.11 of the Standard Specifications, as directed by the Engineer, and the manufacturer's instructions.

Method of Measurement
Item 373. will be measured per Foot for the length of pipe insulation board actually installed in accordance with the plans and/or as required by the Engineer.

Basis of Payment
Item 373. sill be paid for at the contract unit price bid per Foot which shall include all labor, materials, excavation, placement of insulation board, backfill, equipment and incidentals necessary to finish the work.

❺ ADDENDUM NO. 5, AUGUST 27, 2020

❺

ITEM 375.06	**6 INCH INSERTION VALVE AND BOX**	**EACH**
ITEM 375.08	**8 INCH INSERTION VALVE AND BOX**	**EACH**
ITEM 375.12	**12 INCH INSERTION VALVE AND BOX**	**EACH**

The work under these items shall conform to the relevant provisions of Subsection 300 of the Standard Specifications and the following:

Under this Item, the Contractor shall furnish and install insertion valves and boxes as indicated on the Contract Drawings.

Valves shall be constructed of a two (2) piece ductile iron casting, pieces to be bolted together using ductile iron bolts with zinc alloy anodes manufactured to comply with ASTM A536 65-45-12.

Ductile Iron Gate shall have a resilient rubber seal 360 degrees around the gate which is expandable to the inside diameter of the pipe.

Test pits shall be performed to specify material of existing water pipe prior to ordering products.

The valve assembly shall be designed to enable the valve assembly to be rotated 120 degrees, perpendicular across the top of the pipe, while riding on two styrene butadiene rubber (SBR) rubber gaskets construed of SBR, by using a perpendicular rotary feed mechanism, driven by a chain.

❺ **Method of Measurement**

Items 375.06, 375.08, and 375.12 will be measured per Each vale and box unit furnished and installed.
Valves will be measured per each, compete in place.

❺ **Basis of Payment**

Items 375.06, 375.08, and 375.12 will be paid for at the respective contract unit price per Each, which price shall include all labor, materials, equipment, and incidentals necessary to complete the work.

ITEM 376.5 HYDRANT - ADJUSTED EACH

The work under this item shall conform to the relevant provisions of Subsection 300 of the Standard Specifications, the Town of Ashland requirements, and the following:

The Contractor will be held responsible for retaining and protecting the existing hydrants. Any materials damaged during construction shall be replaced with materials in conformance with Subsection 300 of the Standard Specifications and the Municipality's requirements.

When the proposed surface varies from the existing surface at an existing hydrant, the existing hydrant shall be adjusted so the safety flange is at the height recommended by the manufacturer at the final grade.

Method of Measurement
Item 376.5 will be measured per Each hydrant, adjustment complete.

Basis of Payment
Item 376.5 will be paid for at the Contract unit price per Each, which price shall include all labor, materials, equipment, and incidentals necessary to complete the work.

ITEM 506. GRANITE CURB TYPE VB - STRAIGHT FOOT
ITEM 506.1 GRANITE CURB TYPE VB - CURVED FOOT

The work under items shall conform to the relevant provisions of Subsection 501 of the Standard Provisions and the following:

The work includes furnishing and installing granite curb type VB as shown on the Contract Drawings.

Materials shall be in accordance with sections M9.04.0 and M9.04.01 of the Standard Specifications. Curb shall be as shown on the Plans and cut to the radius specified.

Granite curb type VB shall be installed at the radius and final grades as shown on the Plans and as required by the Engineer.

Method of Measurement
Item 506. and 506.1 will be measured by the Foot along the front face of curb, installed complete in place.

Basis of Payment
Item 506. and 506.1 will be paid for at the respective contract unit price per Foot, which price shall include all labor, materials, furnishing and installing the concrete placed behind the granite curb as shown in the Tree Planting Trench detail, equipment, and incidentals required to install the curb.

ITEM 507. TYPE T100 GRANITE CURB FOOT

The work under this item shall conform to the relevant provisions of Subsection 501 of the Standard Specifications and the following:

The work includes furnishing and installing Type T100 granite curb as shown on the Contract Drawings and as required by the Engineer.

Materials shall be in accordance with sections M9.04.0 and M9.04.01 of the Standard Specifications.

Type T100 granite curb shall be cut and installed to the radius and final grades as shown on the Plans.

Method of Measurement
Item 507. will be measured by the Foot along the front face of curb, installed complete in place.

Basis of Payment
Item 507. will be paid for at the contract unit price per Foot, which price shall include all labor, materials, equipment, and incidentals necessary to install the curb.

ITEM 531. TIMBER CURB FOOT

The work under this item shall conform to the relevant provisions of Subsection 501 of the Standard Specification and the following:

The work shall consist of the furnishing and installing of Timber Curb in the locations as shown on the plans, in accordance with these specifications, and/or as required by the Engineer.

Pressure treated timbers for use as Timber Curb shall conform to the relevant provisions of Subsection 955. They shall match the size of the timbers they abut. Landscape Timber screws shall be self-tapping heat-treated steel screws with release coating. Anchor spikes shall be 24-inch #7 rebar.

Timber Curb shall meet the finished ground elevation behind the curb.

Measurement
Item 531. will be measured for payment per Foot, furnished and installed, complete in place.

Basis of Payment
Item 531. will be paid for at the contract unit price Foot, which price shall include all labor, materials, equipment, and incidentals necessary to install the timber curb.

ITEM 655.3 WOOD RAIL FENCE FOOT

The work under this item shall conform to the relevant provisions of Subsection 644 of the Standard Specifications and the following:

The work includes furnishing and installing wood rail fencing consisting of wood posts and wood rails as shown on the Contract Drawings and as required by the Engineer.

Submittals
The Contractor shall provide to the Engineer for approval, the following submittals:

- Shop Drawings for the wood rail fence showing complete construction detailing.
- Manufacturer's product literature: Submit manufacturer's material descriptions.

Materials
Posts and rails shall be made of No. 1 western red cedar or white oak. Pressure treated Southern Yellow Pine or Douglas Fir is acceptable.

Both ends shall be cut square.

Posts: Posts will be shown as on the drawings and incidental to the cost of the fence.

Included under this item is all the hardware, galvanized steel screws, etc., necessary to attach the 1-1/4-inch x 6-inch rail to the 4-inch x 4-inch fence post.

The wood rail wood fence shall be pressure-treated with Chromated Copper Arsenate (CCA) chemical preservative. Pressure-treated rails shall be 1-1/4-inch x 6-inch. Fence post shall be set at maximum intervals of8-feet and set so the top of the post is not less than 3-feet from proposed ground level.

Construction Methods
Wood rail fence posts shall be set plumb, backfilled with ordinary borrow, as required, and compacted to the lines and grades given.

The Contractor shall embed each post the minimum depth required as shown in the plans. Longer post may be required at transition areas or where field conditions warrant.

Where solid rock or boulder is encountered without an overburden soil, posts shall be set at a minimum depth of 18-inches in the solid rock. The posts shall be cut before installation to lengths, which will give the required length of post above ground.

After the post is set and plumbed, the hole shall be filled with grout consisting of one-part Portland cement and one-part clean, well-graded sand. The grout shall be thoroughly worked into the hole to leave no voids. Concrete base shall be 3,000 psi – 1-1/2-inch cement concrete masonry.

ITEM 655.3 (Continued)

When loose rock or small boulders are encountered, the post shall be set to the full depth as shown in the Drawings after removing the rock and small boulders.

Method of Measurement
Item 655.3 will be measured by the Foot along the top rail, installed complete in place.

Basis of Payment
Item 655.3 will be paid for at the Contract unit price Foot, including all labor, materials, concrete, sand, equipment, and incidentals necessary to install the fence.

ITEM 697.1 SILT SACK EACH

Work under this item shall conform to the relevant provisions of Subsections 227 and 670 of the Standard Specifications and the following:

The work under this item includes the furnishing, installation, maintenance and removal of a reusable fabric sack to be installed in drainage structures for the protection of wetlands and other resource areas and the prevention of silt and sediment from the construction site from entering the storm water collection system. Devices shall be ACF Environmental (800)-448-3636; Reed & Graham, Inc. Geosynthetics (888)-381-0800; The BMP Store (800)-644-9223; or approved equal.

Construction
Silt sacks shall be installed in retained existing and proposed catch basins and drop inlets within the project limits and as required by the Resident Engineer.

The silt sack shall be as manufactured to fit the opening of the drainage structure under regular flow conditions, and shall be mounted under the grate. The insert shall be secured from the surface such that the grate can be removed without the insert discharging into the structure. The filter material shall be installed and maintained in accordance with the manufacturer's written literature and as directed by the Engineer.

Silt sacks shall remain in place until the placement of the pavement overlay or top course and the graded areas have become permanently stabilized by vegetative growth. All materials used for the filter fabric will become the property of the Contractor and shall be removed from the site.

The Contractor shall inspect the condition of silt sacks after each rainstorm and during major rain events. Silt sacks shall be cleaned periodically to remove and disposed of accumulated debris as required. Silt sacks, which become damaged during construction operations, shall be repaired or replaced immediately at no additional cost to the Department.

ITEM 697.1 (Continued)

When emptying the silt sack, the contractor shall take all due care to prevent sediment from entering the structure. Any silt or other debris found in the drainage system at the end of construction shall be removed at the Contractors expense. The silt and sediment from the silt sack shall be legally disposed of offsite. Under no condition shall silt and sediment from the insert be deposited on site and used in construction.

All curb openings shall be blocked to prevent stormwater from bypassing the device.

All debris accumulated in silt sacks shall be handled and disposed of as specified in Section 227 of the Standard Specifications

Compensation
Silt sacks will be measured and paid at the Contract unit price per each, complete in place, which price shall include all labor, materials, equipment and incidental costs required to complete the work. No separate payment will be made for removal and disposal of the sediment from the insert, but all costs in connection therewith shall be included in the Contract unit price bid.

ITEM 698.3 GEOTEXTILE FABRIC FOR SEPARATION SQUARE YARD

Work to be performed under this Item consists of furnishing and placing geotextile fabric in accordance with the Standard Specifications, the manufacturer's directions and the details shown on the plans.

Geotextile fabric for separation (Class 1 or Class 2) shall conform to the requirements of AASHTO M 288 in accordance with Subsection M9.50.0 of the Standard Specifications and shall be one of those included on MassDOT's Qualified Construction Materials List. Geotextile fabric shall be Class 1 or 2 in accordance with the requirements outlined in Table 4 of AASHTO M 288.

The geotextile fabric shall be installed in accordance with the Construction/Installation Guidelines specified in AASHTO M288 in addition to the following requirements. Geotextile fabric shall be embedded into the embankment as shown on the plans. Fabric shall be overlapped 12 inches minimum.

Method of Measurement
Item 698.3 will be measured per Square Yard, complete in place. Overlapped material will not be included in the measurement.

Basis of Payment
Item 698.3 will be paid for at the Contract unit price per Square Yard, which price shall include all labor, materials, equipment, and incidentals necessary to complete the work.

❸ ADDENDUM NO. 3, AUGUST 14, 2020

ITEM 701.31 STAMPED CEMENT CONCRETE PAVEMENT SQUARE YARD

The work under this item shall conform to the relevant provisions of Subsection 476 of the Standard Specifications and the following:

Stamped cement concrete pavement shall consist of red colored stamped cement concrete around the central island and perimeter of the roundabout as shown on the plans. The cement concrete shall be 9 inches in thickness. A stamped brick pattern shall be utilized.

❸ Cement concrete shall be reinforced with 6”x6”x10” gauge welded steel fabric. Reinforcement shall be placed approximately 4” from the bottom of the concrete.

❸ The 12”x12” slate stone band is a band with a different stamp pattern that is comprised of 12”x12” squares textured to look like stone. The field will be a running bond brick stamp pattern as stated in the special provision. The 12” by 12” slate stone band shall be placed at one edge of all visible joints as shown on the drawing. Note that all colored stamped concrete will be red brick color. The slate stone band is part of the same pour as the adjacent brick pattern.

The cement concrete shall be an integrally colored cast in place concrete admixture formulated by L. M. Scofield (201-672-9050), Davis Colors (800-638-4444), Butterfield Color (1-800-282-3388), or an approved equal. The color shall be a red brick color and a sample color shall be sumitted for approval by the Engineer.

The Contractor shall submit for approval, the complete technical data sheets for the colored admixture, curing compound, design mixes, color sample, and stamped brick pattern.

The Installer shall have a minimum of 5 years of experience installing colorized cast in place concrete in similar applications.

The Contractor shall install in place, an integrally colored concrete mockup for the cement concrete truck apron. The mockup shall be a minimum of 3 square yards. For accurate color, the quantity of concrete mixed to produce the sample should not be less than 3 cubic yards (or not less than 1/3 the capacity of the mixing drum on the ready-mix truck) and should always be in full cubic yard increments. The constructed mockup shall use processes and techniques intended for use on the permanent work, including curing procedures.

The Contractor shall include samples of control, construction, stamped brick pattern, and expansion joints in sample panels. Mockup shall be produced by the individual workers who will perform the work. The accepted mockup provides the visual standard for work and shall remain through completion of the work for use as a quality standard for the finished work.

Concrete materials and design shall be per Manufacturer’s recommendations. Admixture shall be added per Manufacturer’s recommendations.

Concrete mockup shall be allowed to cure for one month prior to review for color acceptance. Construct as many mockups as required by the Engineer until satisfactory colors and patterns are provided. The mockup will not be part of the finished work.

ITEM 701.31 (Continued)

Method of Measurement
Item 701.31 will be measured per Square Yard of stamped concrete pavement installed, complete in place.

Basis of Payment
Item 701.31 will be paid for at the contract unit price per Square Yard. This price shall include all labor, materials, preformed joint filler, smooth dowels bars, equipment, and incidentals necessary to complete the work.

ITEM 703.9 IMPRINT CROSSWALK SYSTEM SQUARE FOOT

This work under this item shall consist of furnishing and installing a colored imprint crosswalk system as detailed on the plans in accordance with these specifications, and as required by the Engineer.

The imprint crosswalk system shall be constructed to the lines and grades shown on the plans.

Also included under this item are all materials, labor, sawcuts, milling and base preparation.

The imprint crosswalk system shall consist of a hot applied, polymer modified, synthetic asphalt compound incorporating graded sand and granite aggregates, reinforced with two types of fibers. The system shall be applied over the pavement substrates to create a functional and decorative mid-block textured pavement as shown on the Drawings.

All materials shall be produced under a quality system in accordance with ISO 9002 series, and designed to provide durability, load carrying capacity and architectural compatibility with the environment. All raw materials shall be carefully graded for consistency and quality.

The imprint crosswalk system shall be installed flush and level with the pavement surface.

Only installers authorized by the manufacturers of the imprint concrete system product may perform this work.

ITEM 703.9 (Continued)

The following submittals are required for this item:

a. Written proof the installer shall have completed a minimum of five (5) previous successful installations and a minimum of five (5) years of experience installing the product in Massachusetts. The written proof shall include reference names and telephone numbers.
b. Proof of purchase of the materials as supplied by the manufacturer.
c. Stamping pattern(s) and colors for approval prior to starting work.

The imprint crosswalk system material to be utilized in the decorative surfacing system shall conform to the following physical properties.

Grade	45
Average Temp. Range	5 - 113º F
Wheel Tracking @ 113º F	less than 1 mm/ hr
Density	2.12
Cone Flow Test	15% maximum (5 hrs. @ 194º F)
Plane Test (5 hrs. @ 194º F)	5% maximum
Indent @ 104º F	25 dmm maximum
Ash Content	90% maximum
Skid Resistance Value	55 - 70

The imprint crosswalk system shall be imprinted brick with the staggered pattern as shown on the plans with length of bricks perpendicular to crosswalk pavement markings on the interior and one running course with bricks parallel to the crosswalk pavement markings along both outside edges of brick work adjacent the crosswalk. Color shall be “oxide red”. The color pigment shall be throughout the material.

The Contractor shall provide a 3-foot by 3-foot (3’ x 3’) sample area for review and approval by the Engineer.

The imprint crosswalk system shall be installed over new pavement. The pavement shall be firm, stable, and free from defects such as cracks, settlement, visible seams, ruts, and spalling. The pavement shall be in place 14 days prior to installing the imprint crosswalk system.

The pavement shall be milled to the proper depth so the imprint crosswalk system will be flush with the pavement surface when completed. The depth of the milled area shall allow the depth of the imprint crosswalk system material to be maintained within a range of ¾-inch to 1-inch depth across the entire installation.

ITEM 703.9 (Continued)

The pavement surface shall be dry and clean, free of all dirt, debris, salts and any chemical residues. Bituminous residue must be removed from new HMA pavement surfaces prior to installation of the imprint crosswalk system. Removal of contaminants may be done by brooming, compressed air, pressure washing or if necessary, light-grit blasting. A wire brush may be used to remove loose or powdery materials.

The imprint crosswalk system shall be installed per the manufacturer's instructions. The Contractor shall have all special equipment required by the manufacturer for installation of the product.

All residue resulting from this work shall be removed and disposed of in a proper manner. The completed work area is to be left in a neat and clean condition.

Once the finished surface has cooled sufficiently, the application area may be opened to vehicular and/or pedestrian traffic.

Method of Measurement
Item 703.9 will be measured per Square Foot of imprinted crosswalk system installed. No deduction will be made for the area(s) occupied by manhole or gate covers.

Basis of Payment
Item 703.9 will be paid for at the contract unit price per Square Foot. This price shall include all materials, equipment, surface preparation, tools, labor, saw cutting, milling, disposal of surplus material, and incidentals necessary to complete the work.

ITEM 704.2 GRAVEL FOR DRIVEWAYS SQUARE YARD

The work under this Item shall conform to the relevant provisions of Subsections 150 and 701 of the Standard Specifications and the following:

The Contractor shall place peastone, gravel borrow, type c, or other material approved by the Engineer at the locations shown on the plans. All peastone and gravel borrow shall match the existing driveway material.

The depth of Gravel for Driveways shall match the existing driveway depth (4 inches minimum) after compaction.

ITEM 704.2 (Continued)

Peastone shall meet the following gradation requirements.

Sieve Size	Percent Passing by Weight
½ inch	100
3/8 inch	97
No. 4	10
No. 8	2

Gravel borrow, type c shall meet the requirements of M1.03.0

Gravel borrow, type c and peastone shall be placed and compacted in one lift.

Method of Measurement
Item 704.2 will be measured per Square Yard of gravel placed as measured in place after compaction. There will not be any additional percentage added for compaction.

Basis of Payment
Item 704.2 will be paid for at the contract unit price per Square Yard, which price shall include all labor, materials, equipment, and incidentals necessary to complete the work.

ITEM 705.1 FLAGSTONE WALK REMOVED AND RESET SQUARE YARD

The work under this item includes removing and resetting existing field stone walk.

The Contractor shall remove and reset existing field stone walk on a stone dust base at the locations shown on the plans. The Contractor shall exercise care in the removal, storage and resetting of the field stone walk to avoid damaging the field stones. Field stones damaged by the Contractor shall be replaced by the Contractor at no additional cost.

Stone dust setting bed shall be 4 inches in depth and meet the following sieve analysis:

Sieve	Percent Finer Than
No. 4	100
No. 8	96
No. 28	61
No. 48	49
No. 100	38
No. 200	23

ITEM 705.1 (Continued)

Method of Measurement
Item 705.1 will be measured by the Square Yard, complete in place.

Basis of Payment
Item705.1 will be paid for at the contract unit price per Square Yard, which price shall include all labor, materials, stone dust base, equipment, and incidentals necessary to complete the work.

ITEM 712. BOUND REMOVED AND STACKED EACH

The work under this item shall conform to the relevant provisions of Subsection 710 of the Standard Specifications and the following:

The work under this item shall consist of removing and stacking bounds.

The Contractor shall carefully excavate the bounds and stack them by methods that will not damage the bounds. The Contractor shall store and protect the bounds until they are delivered by the Contractor to the Ashland DPW. The Contractor shall stack the bounds on at wood pallet at the DPW storage yard.

Method of Measurement
Item 712. will be measured per each bound removed and stacked.

Basis of Payment
Item 712. Will be paid for at the contract unit price per Each. This price shall be full compensation for removing, storing, protecting, stacking the bounds and providing the wood pallets including, all labor, materials, equipment and incidentals necessary to complete the work.

ITEM 720. BOULDERS REMOVED AND RESET EACH

The work under this item shall conform to the relevant provisions of Subsection 690 of the Standard Specifications and the following:

The work under this item consists of removing and resetting the boulders at the locations shown on the Plans.

The Contractor shall carefully remove and relocate the boulders to the location shown on the plans. The final orientation of the boulders shall be as required by the Engineer. The Contractor shall reposition the boulders that have been reset until the Engineer approves the final orientation.

The Contractor shall use care during removing and resetting operations to avoid damaging the boulders. Boulders that are damaged by the Contractor shall be replaced with boulders similar in shape and color at no additional cost to the Department. Replacement boulders shall be approved by the Engineer prior to placement.

Method of Measurement
Item 720. will be measured per Each for the number of boulders removed and reset in accordance with the plans and/or as required by the Engineer.

Basis of Payment
Item 720. Will be paid for at the contract unit price per Each, which price shall be full compensation for all labor, materials, equipment, removing, storing and resetting the boulders, and incidentals necessary to complete the work.

ITEM 740. ENGINEERS FIELD OFFICE AND EQUIPMENT (TYPE A) MONTH

Work under this item shall conform to the relevant provisions of Section 740 and the following:

Three computer systems, printer system, and a digital camera meeting the requirements set forth below including installation, maintenance, power, paper, disks, and other supplies shall be provided at the Resident Engineer's Office:

All equipment shall be UL approved and Energy Star compliant.

ITEM 740. (Continued)

The Computer System shall meet the following minimum criteria or better:

Processor:	Intel, 3.5 GHz
System Memory (RAM):	8GB
Hard Drive:	500GB
Optical Drive:	DVD-RW/DVD+RW/CD-RW/CD+RW
Graphics Card:	4GB
Card Reader:	6-in-1 Card Reader, 2 total USB 3.0, audio
Network Adapter:	10/100 Mbit/s
USB Ports:	6 USB 3.0 ports
Keyboard:	Generic
Mouse:	Optical mouse with scroll, MS-Mouse compliant
OS:	Windows Professional with all security updates
Web Browser:	Latest Internet Explorer with all security updates
Applications:	Latest MS Office Professional with all security updates Latest Adobe Acrobat Professional with all security updates Latest Autodesk AutoCAD LT Antivirus software with all current security updates maintained through the life of the contract.
Monitor:	24" LED with built-in speakers, 1920 x 1200 max resolution
Flash drives:	2 - 32GB USB 3.0
Internet access:	High Speed (min. 24 mbps) internet access with wireless router.

The Multifunction Printer System shall meet the following minimum criteria or better:

Color laser printer, fax, scanner, email and copier all in one with the following minimum capabilities:

- Estimated volume 8,000 pages per month
- LCD touch panel display
- 50 page reversing automatic document feeder (RADF)
- Reduction/enlargement capability
- Ability to copy and print 11” x 17” paper size
- email and network pc connectivity
- Microsoft and Apple compatibility
- ability to overwrite latent images on hard drive
- 600 x 600 dpi capability
- 30 pages per minute print speed (color),
- 4 Paper Trays Standard (not including the bypass tray)
- Automatic duplexing
- Finisher with staple functions
- Standard Ethernet. Print Controller
- Scan documents to PDF, PC and USB
- ability to print with authenticated access protection

ITEM 740. (Continued)

The Contractor shall supply a maintenance contract for next day service, and all supplies (toner, staples, paper) necessary to meet estimated monthly usage.

A Digital Camera shall meet the following minimum criteria or better:

Resolution:	12 Megapixel
Optical Zoom:	5x
Internal Memory Included:	Yes
Memory:	8 GB SD Card
Screen:	3 inch Clear Photo LCD
Min Operating Temperature:	14°F
Max Depth of Water Resistant:	30feet
Height of Shock Resistant:	5 feet
Battery Power:	2 rechargeable batteries and a battery charger
Carrying Case:	Rain-proof with shoulder strap

The Engineer's Field Office and the equipment included herein including the computer system, printer and camera shall remain the property of the Contractor at the completion of the project. Disks, flash drives, and card readers with cards shall become the property of the Department.

Compensation for this work will be made at the contract unit price per month which price includes full compensation for all services and equipment, and incidentals necessary to provide equipment, maintenance, insurance as specified and as directed by the Engineer.

ITEM 751.2 PLANTING TRENCH SOIL CUBIC YARD

The work under this item shall conform to the relevant provisions of Subsection 751 of the Standard Specifications and the following:

The work includes excavation of tree planting trench, furnishing and installing plantable soil borrow and gravel borrow in accordance with these specifications, as detailed on the plans and as directed by the Engineer. It shall include excavation needed to construct the trench and placement of the plantable soil borrow. The tree planting trench shall be constructed in the locations and grades shown on the plans.

The plantable soil borrow shall be 5 parts loam borrow and 1 part compost.

Materials shall meet the requirements specified in the following Subsections of Division III, Materials:

Loam Borrow: M1.05.0

ITEM 751.2 (Continued)

Compost shall be compost meeting the requirements for Organic Soil Additives: M 1.06.0 of the Standard Specifications and the following:

a. No kiln-dried wood or construction debris shall be allowed.
b. Organic matter content shall be minimum 30 percent (dry weight basis) as determined by ASTM.

Samples and Submittals
Contractor shall provide agricultural soil testing of loam borrow. Contractor shall provide test results and recommendations as necessary for soil amendment to the Engineer for his approval. Soil amendments shall be as described in Subsection 771.

Contractor shall provide test results for compost. Contractor shall provide these test results to the Engineer for his approval.

Construction Methods
Test pits shall be dug at each tree planting trench and along each trench at approximately 100 feet intervals on center to test percolation rates. Percolation rates less than 1 inch per hour shall require corrective measures as recommended by the Contractor and approved by the Engineer.

Trench shall be excavated in the locations and to the dimensions shown on the drawings.

Granite curb street curb adjacent to tree planting trench shall be supported with additional concrete.

All construction debris and impervious pavement bases below the trench shall be removed. Any voids shall be filled with gravel borrow.

Gravel borrow shall be placed in a six inch layer at the bottom of the trench.

Plantable soil borrow shall be thoroughly mixed prior to placement in the trench.

Placement shall be in four inch lifts as per Item 751.

Method of Measurement
Item 751.2 will be measured per Cubic Yard of tree planting trench plantable soil borrow complete in place.

Basis of Payment
Item 751.2 will be paid for at the contract unit price per Cubic Yard of plantable soil borrow at tree planting trench, which price shall be full compensation for all labor, materials, equipment, and incidentals necessary to complete the work.

Additonal concrete support for granite curb shall be paid for under respective curb item number.

ITEM 751.7 COMPOST TOPSOIL SQUARE YARD

The purpose of this item is to provide compost mulch for erosion control and better seed establishment. Typically, hydraulic application equipment will be required for this item, unless otherwise permitted by the Engineer, in writing.

Unless otherwise specified on the drawings, depth shall be 2 inches.

Materials
Coarse compost shall be compost meeting the requirements for Organic Soil Additives, Section M 1.06.0 of the Standard Specifications. No kiln-dried wood or construction debris shall be allowed.

Organic matter content shall be minimum 30 percent (dry weight basis) as determined by ASTM D2974 (method A) Standard Test Methods for Moisture, Ash and Organic Matter of Peat and Other Organic Soils.

Moisture content shall be 40-60 percent as measured by ASTM D2216 Standard Test Method for Laboratory Determination of Water Content of Soil and Rock and ASTM D2974 (cited above).

Construction Methods
Prior to placement of compost, soil surface shall be free of stones larger than 2 inches in the largest dimension, and shall be tilled or tracked to ensure an uneven surface for mixing of compost and soil. Surface preparation shall be incidental to this item.

Compost shall be hydraulically applied unless otherwise permitted. Seed may be added to the hydraulically applied compost, however seed course shall be within ½ inch of the compost depth.

Method of Measurement and Payment
Item 751.7 will be measured per Square Yard of compost topsoil placed, approved and maintained.

Basis of Payment
Item 751.7 will be paid for at the contract unit price per Square Yard. This price shall be compensation for all labor, materials, equipment, and incidentals necessary to complete the work specified above.

ITEM 755.35 INLAND WETLAND REPLICATION AREA LUMP SUM

This special provision is specific to Project #604123.

The work under this item shall conform to the relevant provisions of Sections 120, 770, 771 of the Standard Specifications and the following:

The work under this item shall include furnishing material and the construction and maintenance of inland wetland replication areas as shown on the drawings and as required by the Engineer. Inland Wetland Replication Area shall hereafter be referred to as Replication Area. All work shall be in coordination with an approved Wetland Specialist.

Wetland Restoration shall be as specified under the appropriate item and compensated under that item. Construction of tidal wetlands shall be as specified under the appropriate item for tidal wetland mitigation.

Replication Area shall be constructed prior to wetland impacts unless otherwise approved by the Engineer. Construction schedule shall be appropriate to planting and seeding season (see below). Changes to this schedule will require written approval from the Engineer.

Description

Construction of the Replication Area shall be completed as shown on the drawings at the following location(s):

Area: 70 Cedar Street, Ashland, MA (Ashland Fire Department)
Replication Area = 4,110 sf.

Replication Area shall be constructed to meet the requirements of all associated permits and certifications, including relevant performance standards of the Massachusetts Wetlands Protection Act (MGL C. 131, s40), Section 401 Water Quality Certification, and Section 404, U.S. Army Corps of Engineers General Permit.

The Contractor is responsible for protection and preservation of natural areas adjacent to the Replication Area both within and outside the project limits and for the duration of the contract. Damage to soils or vegetation due to sedimentation, compaction, trampling, vehicles, storage of materials, or other negligence shall be repaired to the satisfaction of the Engineer and at the Contractor's expense.

The Wetland Specialist overseeing the wetland construction work shall not be from the same company as that planting, seeding, or participating in any aspect of the wetland construction.

Wetland Restoration for the project shall be completed as shown on the drawings at the following location(s):

Wetland Restoration Area/s:
See plans for individual locations: = 2,730 sf.

ITEM 755.35 (Continued)

Submittals - Documents

Request for Conditional Acceptance: As specified below, a letter requesting Conditional Acceptance of the work and the site conditions shall be submitted to the Engineer.

Request for Certificate of Compliance (Partial or Full): As specified below, shall be submitted to the Engineer for distribution to appropriate regulatory agencies.

Monitoring Reports: Reports shall be submitted to the Engineer as specified below. Reports shall be compensated under Item 755.75 and 755.76.

Submittals - Materials

Soil and Amendments

No soil, compost, or other soil amendment imported to the work site shall contain seeds, roots, stems, or other viable parts of invasive plants.

At least sixty (60) days prior to installation Contractor shall submit for approval all sources of soil and amendments, including compost, prior to ordering. Off-site sources shall be identified and available for inspection by the Wetland Specialist prior to transport of material to the site to verify that they are likely to be free of invasive plant species, including all viable plant parts.

Samples of tested and approved wetland soil and soil amendments will be required if requested by the Engineer.

Seed Mix

Certificate of Materials from the supplier shall be submitted 30 days prior to seeding and must be approved prior to ordering materials. Seed species listed on the certificate shall include ecotype region (i.e., *Asclepias incarnata*, PA Ecotype).

Seed tag from the bag of seed used shall be submitted to the Engineer at the time of seeding. Seed tag shall include ecotype region and species, shall match the Certificate of Materials, include the name of the supplier, and date material was sent.

Bill of lading or notarized Certificate of Compliance from the Supplier serving as proof of purchase shall be submitted if requested by the Engineer. Document shall include date of sale, quantity, lot number, and address of Supplier. This shall match the seed tag.

Plant Certification

Plant Certification shall be per the applicable requirements of Section 771, PLANTING TREES, SHRUBS AND GROUNDCOVER, of the latest edition of the Standard Special Provisions. The nursery source shall certify the provenance or origin of all plants.

Other Material: Submittals shall be per the respective item.

ITEM 755.35 (Continued)

Materials

Sediment Control Barrier and Erosion Control Measures
Sediment Barriers shall be per Item 767.121 except that no straw wattles with plastic netting shall be used in or near existing or proposed wetland. No sediment barriers with non-biodegradable fabric or photo-degradable fabrics may be used. Sediment Barriers surrounding the wetland replication shall be paid for under **Item 755.35**.

Erosion Control
Erosion control for slope and soil stabilization shall be Jute Mesh Erosion Control Fabric.

Sediment and erosion controls shall be compensated under the respective items.

Wetland Soil
Wetland soil for Replication Area may be either soil excavated from impacted wetland area or manufactured hydric soil.

If using soil from the impacted wetland area, soil shall be handled such that the original soil structure is preserved and shall not be compacted, screened, or otherwise processed.

Wetland soil from the impacted wetland that is infested with invasive plant species shall not be used in the Replication, unless approved by the Wetland Specialist. To the extent possible, that infested soil shall be disposed of within the project limits in an upland area or buried at least three feet deep.

Manufactured soil shall consist of on-site borrow from the proposed replacement site (if apprved by the Wetland Specialist) thoroughly mixed with compost to achieve a target organic content of 10-12% by weight. Compost to soil ratio shall be 1:1 by volume. Off-site borrow may be used for mixing if approved in advance by the Engineer.

No soil or soil amendment shall be brought on site without approval of the material source by the Wetland Specialist and the Engineer. Soils used in the replacement area shall be free of rocks greater than 4 inches in diameter.

Specific to this project: upland areas above wetland area on the 70 Cedar Street site shall be included in this item. Four inches of loam borrow conforming to the applicable requirements of Section 751 LOAM BORROW shall be spread on slopes and any upland areas disturbed by construction. Source of the loam borrow shall be approved by the Wetland Specialist. Slopes and disturbed upland areas shall also be seeded with conservation seed mix, as specified here in and meeting the applicable requirements of Section 765 SEEDING .

ITEM 755.35 (Continued)

Plants
Plant material shall conform to the applicable requirements of Section 771, PLANTING TREES, SHRUBS AND GROUNDCOVER, of the latest edition of the Standard Special Provisions.

Plants shall be straight native species, not cultivars. To the extent possible, plants shall originate from the applicable EPA Level III Ecoregion.

Plant species and sizes to be included in the Replication Area shall be:
- as specified on the plans.

Requests for substitutions shall be submitted in writing to the Engineer for review by the Wetland Specialist, MassDOT Landscape Architect, and, if required, the relevant regulatory agency at least thirty (30) days prior to planting. All proposed substitutes shall be in conformance with the requirements herein and suitable for the site conditions.

Transplanting and plant material collected from the wild is prohibited unless approved in writing by the Engineer. Plants shall be selected from certified nurseries that have been inspected by state and/or federal agencies.

Seed Mix
Seeding shall conform to the Standard Specifications SUBSECTION M6, ROADSIDE DEVELOPMENT MATERIALS.

Wetland Seed Mix typical species may include - Fox Sedge (*Carex vulpinoidea*), Lurid Sedge (*Carex lurida*), Blunt Broom Sedge (*Carex scoparia*), Blue Vervain (*Verbena hastata*), Fowl Bluegrass (*Poa palustris*), Hop Sedge (*Carex lupulina*), Green Bulrush (*Scirpus atrovirens*), Creeping Spike Rush (*Eleocharis palustris*), Fringed Sedge (*Carex crinita*), Soft Rush (*Juncus effusus*), Spotted Joe Pye Weed (*Eupatorium maculatum*), Rattlesnake Grass (*Glyceria canadensis*), Swamp aster (*Aster puniceus*), Blueflag (*Iris versicolor*), Swamp Milkweed (*Asclepias incarnata*), Square stemmed Monkey Flower (*Mimulus ringens*).

The proposed wetland seed mix will be applied at the recommended rate of approximately one pound per 2,000 square feet (18 pounds per acre).

Conservation Seed Mix typical species may include - Virginia Wild Rye (*Elymus virginicus*), Little Bluestem (*Schizachyrium scoparium*), Big Bluestem (*Andropogon gerardii*), Red Fescue (*Festuca rubra*), Switch Grass (*Panicum virgatum*), Partridge Pea (*Chamaecrista fasciculata*), Panicledleaf Tick Trefoil (*Desmodium paniculatum*), Indian Grass (*Sorghastrum nutans*), Blue Vervain (*Verbena hastata*), Butterfly Milkweed (*Asclepias tuberosa*), Black Eyed Susan (*Rudbeckia hirta*), Common Sneezeweed (*Helenium autunale*), Heath Aster (*Asterpilosus/Symphyotrichum pilosum*), Early Goldenrod (*Solidago juncea*), Upland Bentgrass (*Agrostis perennans*).

ITEM 755.35 (Continued)

The proposed conservation seed mix will be applied at the recommended rate of approximately one pound per 1,750 square feet (25 pounds per acre).

Fertilizers shall not be used.

Water

The Contractor shall provide water and all equipment required at no extra cost. Water shall be suitable for irrigation and free from ingredients harmful to plants and wildlife. According to DEP requirements, water from the adjacent water bodies or waterways shall not be utilized. It is the Contractor's responsibility to correct injury or damage due to the lack of water, too much water, or use of contaminated water.

Mulch/Topdressing for Seeding

Hydromulch shall be per the manufacturer's recommendations and shall be wood fiber or straw mulch only. Compost topdressing, if used, shall meet the material and submittal requirements of that item and shall be applied as specified below. Mulch or compost topdressing for seeding shall be incidental to this item.

Construction Methods & Sequence

Site Protection Measures

Minimizing Damage

The Contractor shall plan and execute operations in a manner minimizing the amount of excavated and exposed fill or other foreign materials that could be washed or otherwise carried into Replication Area and nearby resource areas.

Construction of and access to the Replication Area shall minimize damage to existing vegetation and soils as specified herein. Damage to soils or vegetation shall be repaired to the satisfaction of the Engineer and at the Contractor's expense. If required for soil remediation, tilling and the addition of compost shall be at the Contractor's expense.

The Contractor shall use boards, mats, or other approved material as necessary, to protect existing and/or new wetlands from compaction due to heavy foot traffic or if equipment is required to travel over wetland soil. All labor and materials required for protection and preservation of site shall be incidental to this item.

Stockpiling of Soil

Stockpiling of soil, including hydric soil for replication, shall be outside the resource area and at least 100 feet from the edge of the wetland unless approved otherwise by the Engineer. Stockpiled soils shall be securely stabilized and contained. In the event that there is excess borrow, it shall be disposed of without additional compensation.

ITEM 755.35 (Continued)

Sediment Barriers

Placement: Sediment barriers shall be installed along the downslope perimeter of the Replication Area beginning and ending in the surrounding upland so that no excavated material or disturbed soil can enter adjacent wetlands or waters. Where construction work is immediately upgradient of the wetland, barriers shall be located so as to protect the Replication Area until slopes are stabilized. Sediment barriers shall be in place and approved by the Engineer prior to excavation work. No work shall take place outside the barriers.

Maintenance: The Contractor shall ensure that all sediment barriers function as intended and at all times per the specifications of those respective items.

Existing Trees to Remain

Tree protection shall be asper the relevant specifications and as shown on the plans or required by the Engineer. To protect root systems of existing trees, the limits of the Replication Area may be adjusted, but, the total area of replication required by all permits shall not be reduced. Access route may be adjusted as required.

Trees to be left as snags (upright dead or dying trees left for wildlife habitat) within or adjacent to the Replication Area shall be as shown on the plans or as directed by the Wetland Specialist or Landscape Architect during the walk through. Trees that pose a potential fall hazard (i.e., are near a roadway) should have limbs and trunk cut such that the tree does not pose a fall hazard.

Course Woody debris in the form of cut trees, stumps, logs, and brush that shall be incorporated as shown on the plans or as directed by the Wetland Specialist or Landscape Architect. On site material shall be selected by the Wetland Specialist, retained on the project site, and placed as specified below under Incorporation of Coarse Woody Debris.

All trees, stumps, or brush not specified to remain shall be removed and shall not be stockpiled in the wetland resource areas while awaiting disposal.

Work shall be coordinated with the Clearing or Tree Removal item and compensated under that Item.

Pre-Construction Site Walk

Delineating the Replication Area and Access Route. The Contractor shall stake out the Replication Area boundaries and the intended access route and set grade stakes for approval by the Wetland Specialist and Engineer. Following staking and demarcation of areas, the Engineer and Wetland Specialist shall approve or modify as necessary the limits of work, the access route, final location and configuration of replication, grade stake elevations, proposed location of sediment barriers, and review proposed construction methods.

ITEM 755.35 (Continued)

As part of the delineation and approval process, the Wetland Specialist shall mark trees to be converted to snags, select course woody debris to be retained for re-use, and select rocks or other elements to be used for habitat features.

Invasive Plants: As part of the initial site walk, the wetland to be impacted and the proposed replication site shall be inspected for the presence of invasive plants. If invasive plants are found they shall be addressed as described under Invasive Plants.

Soil Work

Final grades in the Replication Area shall meet the target elevations as shown on the Plans or as adjusted by the Wetland Specialist. If adjustments are required, a Request for Information (RFI) shall be submitted to the Engineer for approval. Adjustments shall be documented and included in the As-Built plans (if required) and/or other applicable required documents.

Excavation & Grading
When required by permits, the Wetland Specialist shall notify MADEP at least 72 hours prior to excavation.

The Replication Area shall be excavated to a depth 1 foot below the final finished target elevation. The exposed sub-grade shall be scarified *to a depth of 4-6 inches prior to being backfilled with suitable soil, as described under Wetland Soil, to meet the final* finish target elevation.

Where the proposed wetland area is an extension of an existing wetland area, excavation shall begin at the limit of work shown on the plans and shall be a minimum depth of 12 inches below the adjacent wetland grade or as established by the Wetland Specialist.

Soil in the proposed wetland areas that must be removed for grades to conform to the proposed elevations shall be stripped and disposed of, or, if suitable for reuse, be stockpiled in an approved location. Stockpiled soils shall be kept wet and not allowed to dry out. Procedures for maintaining appropriate moisture levels shall be documented by the Wetland Specialist and provided to the Engineer and the Contractor.

Placement of Wetland Soil
Following excavation and grading of sub-grade, and after the sub-grade elevations are approved by the Wetland Specialist, the native wetland topsoil previously removed or manufactured soil shall be spread over the proposed wetland areas as shown on the plans and as directed by the Wetland Specialist.

Vehicles used to transport soil from offsite shall be washed or cleaned with air pressure to prevent exotic or invasive seeds or root fragments from contaminating the replication area.

ITEM 755.35 (Continued)

Final Grading
The finished grade of the Replication Area shall be at an elevation that will provide a hydrologic connection between the Replication Area and adjacent resource areas. The hydrologic connection should be in keeping with restoring the intended function of the replacement wetland. The Contractor shall verify that this elevation is not at a level that could negatively alter the hydrology of an adjacent wetland. Microtopography in the form of hummocks, pits and mounds shall be as shown on the plans or as adjusted by the Wetland Specialist. Final elevations and grading of wetland soil shall be approved by the Wetland Specialist and the Engineer.

To avoid compaction once soil has been placed, no heavy equipment shall travel across placed soil and no work shall occur in wet or moist soil. Soil that is compacted due to construction activities shall be replaced with soil as specified herein and at the Contractor's expense.

Installation of Monitoring Wells
For wetlands over 1000 square feet, monitoring wells shall be installed in locations as shown on the Plans. Monitoring wells shall include data loggers. Data shall be collected by the Wetland Specialist and submitted with Monitoring Reports and as required by applicable permits. Wells shall be installed immediately following completion of construction of the wetland.

Restoring Vegetation

Incorporation of Coarse Woody Material
If specified within this contract or if directed by the Wetland Specialist or Landscape Architect during the initial site walk, woody debris shall be incorporated into the Replication Area and/or adjacent upland buffer. Material shall be placed as shown on the plans or as directed following placement of wetland soil and prior to application of compost and/or seed. Woody material shall cover a minimum of 5-20 percent of the Replication Area, depending on whether it is a meadow or woodland wetland and how much wood is available from construction clearing. Where trees are cut for construction purposes, logs of a minimum length of 8 feet must comprise a minimum of 50% of the woody material left on site. Brush shall be included along with logs and stumps as directed. Woody material shall be placed in a deliberate and naturalistic manner.

Planting
Following placement of wetland soil and approval of final grade and conditions, Replication Area shall be planted. Planting shall conform to SECTION 771 PLANTING TREES, SHRUBS AND GROUNDCOVER of the Division I Standard Special Provisions and as amended below.

Planting Season shall be May 15-June 15 and September 1-November 1 unless approved following written request from the contractor.

Prior to planting, the Wetland Specialist shall approve the condition of the plant material and the method of installation and shall over see the planting work. Replication Area shall be planted in the dry and according to the planting details within the range of target elevations and at the spacing shown on the Plans. Unless otherwise noted on the Plans, final plant locations shall be determined on site and located with regard to expected hydrology, plant growth characteristics, habitat desired, and water protection.

ITEM 755.35 (Continued)

Plant material shall be installed as soon as possible after delivery. Plants stored on-site prior to installation shall be stored in the shade and watered twice daily up until time of installation. Plants showing signs of stress or compromised health may be rejected by the Engineer or Wetland Specialist with replacement at the Contractor's expense.

Seeding

Following placement of wetland soil and planting (if included), the Replication Area shall be seeded using one of the following methods:

- Hand broadcast seed and straw mulch.
- Seeding with hydromulch per the Standard Specifications and per the manufacturer's directions.
- Hand broadcast seed with compost topdressing pneumatically applied at the same time to ensure light cover of soil over seed.

If required, seeding limits for different seed mixes shall be determined by the Wetland Specialist.

Plant Establishment and Invasive Management

Plants shall be watered as necessary to maintain healthy establishment. Plants that fail by September 1 after spring planting or by May 15 after fall planting shall be replaced within the immediate or next planting period and at the Contractor's expense.

Seeding that fails to establishshall be over-seeded as required by the Engineer. Excessive weed growth shall be pulled out by the roots or, with approval from the Engineer, cut prior to over-seeding. Weed control is incidental to this item.

Invasive Plants: Corrective measures shall be taken to remove or treat invasive plant species in the Replication Area and in the adjacent buffer zone within the public right of way and/or MassDOT easement. Invasive plants shall include those listed as invasive by Massachusetts Invasive Plant Advisory Group (MIPAG) and the US Army Corp of Engineer's New England District's Compensatory Mitigation Guidance

- The strategy for chemical and/or manual removal shall be as directed by the Wetland Specialist, shall continue for the duration of the monitoring period, and shall be incidental to this item.

ITEM 755.35 (Continued)

Conditional Acceptance of Work

Conditional Acceptance shall indicate approval of the wetland construction work and agreement that work has been done according to plan or modified as approved.

Upon completion of construction, the Contractor shall submit a Request for Conditional Acceptance that includes a brief narrative from the Wetland Scientist demonstrating that the construction work was done according to plans (or how modified) and meets required permit conditions. The narrative shall include photo documention of pre-construction conditions as well as soil work, planting, and seeding. Seed tags shall be submitted as part of the Request for Conditional Acceptance.

Upon receipt of a Request for Conditional Acceptance, the Engineer, the Wetland Specialist and regulatory representative (if required) shall assess the replication and surrounding areas. The following conditions shall be included in the narrative and reviewed as part of the on-site assessment of whether:

- The final finished target elevations have been met and maintained. Areas that are too high or too low should be identified along with suggested corrective measures.
- Hydrology meets performance standards.
- Specified seed mix has been seeded. If inspected 30 or more days after seeding, seeded species in the wetland and adjacent upland shall show signs of good germination and healthy growth.
- Planted woody and herbaceous species meet specifications and are establishing well.
- Soils are stabilized and there is no sediment in the wetland and no channeling of slopes. There are no invasive plants visible in the replication area.

Upon approval that the work meets the above conditions, MassDOT will issue a letter of Conditional Acceptance. If the Wetland Replication work is not approved, MassDOT will issue a rejection letter requiring corrective actions. The Wetland Specialist shall recommend corrective actions. Work not approved shall be addressed by the Contractor at no extra cost.

Wetland Specialist shall be compensated under Item 755.75.

Erosion of adjacent slopes or the flow of sediments into the wetland between Conditional and Final Acceptance shall be immediately addressed by the Contract.

ITEM 755.35 (Continued)

Request for Certificate of Compliance
If required, a request for a Certificate of Compliance (Partial or Full) pursuant to the Massachusetts Wetlands Protection Act regulations shall be prepared and submitted to MassDOT within 30 days following Conditional Acceptance.

The Request for Certificate of Compliance shall include the following:

- A brief narrative of the work on company letterhead signed by the Wetland Specialist. Narrative shall be in MS Word document and shall include substantive explanation that demonstrates compliance with EACH relevant permit condition. Narrative shall note variations from the originally permitted design.
- As-built Drawings signed by the Contractor's PE. As-built drawings shall show hydrologic conditions, status of plantings and seeding, and shall include a narrative and minimum of 4 photographs documenting site conditions. Plans should note variations from the originally permitted design.

  When required, drawings shall meet the Army Corp of Engineer's New England District's Compensatory Replication Guidance, including: scale in the range of 1"=20' to 1" = 100', contours at 1' intervals, spot elevations for intermediate elevations, and polygons outlining each wetland Replication area. The As-built Drawings shall be provided to the Engineer electronically in Portable Document Format (PDF). If requested by the Engineer, the Drawings shall be provided in printed paper format (11" x 17" sheets, unless otherwise directed). Drawings must be scalable.

- Other documents as required.

Final Acceptance of Work
Following one full growing season, the Contractor shall submit a Request for Final Acceptance. Submittal shall include a brief narrative of conditions. Upon receiving the Request, the Engineer, Wetland Specialist and regulatory representative (if required) shall assess the Replication Area. Final Acceptance will initiate the start of the Wetland Monitoring Perio

ITEM 755.35 (Continued)

The following conditions shall be inspected and approved for acceptance and payment.

- Hydrology is functioning as intended.
- Seeded species are establishing well and cover 95 percent of the area, excluding areas of open water areas or planned bare soil.
- No sediments have entered wetland.
- Adjacent slopes are stabilized with desirable vegetation.
- All planted species (if included) are living and establishing well.
- There are no visible invasive plants.
- Silt fence and non-biodegradable sediment barrier materials have been removed.

If the mitigation work does not meet the above condition and is not approved, MassDOT will issue a rejection letter requiring corrective action. The Wetland Specialist shall recommend corrective actions. Work not approved will be addressed by the Contractor at no extra cost.

Wetland Specialist shall be compensated under Item 755.75.

Monitoring Reports for Regulatory Compliance
Post wetland construction Monitoring Reports shall be completed and submitted by the Wetland Specialist as specified and compensated under Item 755.76 Wetland Monitoring Reports.

Generally, the following conditions shall be met upon each inspection:

- Hydrology is functioning as intended.
- Seeded species are establishing well and cover 100 percent of the area, excluding areas of open water areas or planned bare soil.
- No sediments have entered into wetland.
- Adjacent slopes are stabilized with desirable vegetation.
- All planted species (if included) are living and establishing well.
- There are no visible invasive plants.

If, at the end of the required monitoring period, the requirements have not been met and success of the wetland replication area has not been achieved as determined by the Monitoring Reports, the Contractor shall provide corrective measures. All costs associated with corrective measures and plant replacement shall be incidental to this item with no additional compensation.

❺ ADDENDUM NO. 5, AUGUST 27, 2020

ITEM 755.35 (Continued)

Basis of Payment
Item 755.35 will be paid for at the Contract unit price, Lump Sum, which price shall include all labor, materials, equipment, submittals, maintenance, all required hydric soil, site preparation, grading, wetland seeding, mulching, watering, monitoring wells, as-built plans, request for Certificate of Compliance, and all incidental costs necessary to complete the work as required.

Payment shall be as follows:

- 60% upon Conditional Acceptance.
- 20% after receipt and acceptance of Certificate of Compliance by the Engineer and once all permit construction requirements have been met and approved.
- 20% upon Final Acceptance.

❺ Excavation in excess of 12 inches needed for wetland soil will be paid under Item 120.1
Compost Topdressing will be paid under Item 751.72 unless used in conjunction with seeding.
Wetland Specialist will be paid under Item 755.75
Wetland Monitoring Reports for follow-up monitoring will be paid under Item 755.76

ITEM 755.75 WETLAND SPECIALIST HOUR

This special provision is specific to Project #604123.

Work under this Item shall be for services of a Wetland Scientist, Wetland Ecologist, Restoration Ecologist, or other professional with similar qualifications hereafter referred to as the Wetland Specialist. Wetland Specialist shall demonstrate knowledge and expertise to coordinate and oversee all work associated with all wetland mitigation, as defined herein, as shown on the Plans, as required by permits, and as specified under Item 755.35 Inland Wetland Replication Area (hereafter referred to as 755.35) .

"Wetland Mitigation" shall be used herein for applicable wetland work, whether Wetland Replication (creation of a new wetland) or Wetland Restoration (restoration after temporary impacts).

Regulatory monitoring reports following Final Acceptance of the Wetland Mitigation shall be per Item 755.76, Wetland Monitoring Reports.

For all onsite work, the Wetland Specialist shall sign in and sign out with the Engineer.

The Wetland Specialist shall not be from the same company as the company responsible for planting, seeding, and/or maintaining the wetland.

ITEM 755.75 (Continued)

Qualifications

The Wetland Specialist shall have a minimum of five (5) years of experience with construction and monitoring of wetland mitigation areas similar in size, type, and complexity to the Contract mitigation. When required by permits, ten (10) years of experience may be required. The Wetland Specialist shall be thoroughly versed in the Commonwealth of Massachusetts Wetlands Protection Act (MGL C.131, s.40), U.S. Army Corps of Engineers New England District Compensatory Mitigation Guidance, and all other relevant regulations of the Massachusetts Department of Environmental Protection and the U.S. Army Corps of Engineers New England District.

Qualification Submittal

Within sixty (60) days following the Notice to Proceed, the Contractor shall provide proof of qualifications for the Wetland Specialist to the Engineer. Submittals shall include, but not be limited to, the following:

- Resume of individual implementing the wetland specialist work. If the Wetland Specialist changes over the course of the project, the new individual shall submit resume and qualifications for approval 30 days prior to doing any work on site.
- Resume of any personnel working on-site in place of the Wetland Specialist. Individual shall be approved prior to work on-site.
- Narrative describing company, its expertise, technical qualifications and experience with wetland construction.
- At least three (3) references from prior work of a similar nature completed in the last five (5) years and by the individuals who will perform the work. Provide contact information for each reference including address, phone number and email.
- A summary of each reference project including nature of the work, project size, dates and period of construction and monitoring, methodologies used, and summary of success or not in terms of meeting performance objectives. Summary shall include a minimum of one before and one after photo for each project.

ITEM 755.75 (Continued)

Submittals-Documentation and Reports

Wetland Construction Oversight

Wetland Specialist shall provide documentation of pre-existing conditions and wetland construction as specified below and as part of fulfilling the Scope of Work. Documentation shall include photos that are clear and legible. Photos are incidental to this item.

- ***Site Walk Prior to Disturbance and Construction of Wetland:*** Provide brief assessment with photos, including documentation of the existing wetlands to be impacted, proposed wetland replication, restoration site(s) if applicable, and reference/model wetland areas (typically an adjacent undisturbed wetland or the existing wetland to be impacted).
- ***Excavation and Grading:*** Documentation shall include minimum of two photos of the excavated wetland and two photos after final grading prior to planting and seeding. For restoration areas, photos shall show soil preparation (i.e, tilling and grading), if applicable.
- ***Planting and Seeding:*** Provide assessment and photos of vegetation upon completion of planting and seeding work.
- ***Data logger output*** shall be submitted with reports, if applicable and requested.

Wetland construction documentation and reports shall be submitted with Request for Conditional Acceptance and for the Order of Conditions.

Requests for Acceptance of Work & Regulatory Compliance

The Wetland Specialist shall submit the following documents as specified herein and under Item 755.35:

- Request for Conditional Acceptance.
- Request for Certificate of Compliance (Partial or Full) when applicable.
- Request for Final Acceptance

Scope of Work

In the event of discrepancies with the applicable permits, the Wetland Specialist shall submit a Request for Information (RFI) to the Engineer.

ITEM 755.75 (Continued)

General

The Wetland Specialist shall be responsible for the following:

- Review and have a comprehensive knowledge of the environmental permits relevant to the specific mitigation work being done so as to ensure compliance throughout the duration of the contract.
- Identify and inform the Contractor and Engineer of unique site conditions which may require adjustments to the schedule, design, or construction methods. For example, wildlife nesting, illegal dumping, or rare species.
- Identify and inform the Contractor and Engineer of any sediment or erosion control problems observed within mitigation areas.
- Advise so as to avoid impacts to adjacent areas and regulated wetland resources.
- Participate in necessary meetings as required by permits and when requested by the Engineer.

Inspections & Construction Oversight

The Wetland Specialist shall be responsible for oversight and approval of, but not limited to, the following:

- Pre-Construction Site Walk
    - Following surveying, flagging, and staking of all relevant boundaries and elevations by the Contractor, the Wetland Specialist shall walk the site with the Engineer and the Contractor to review existing and proposed conditions, recommend changes if necessary, and approve the following: location and boundaries of Replication Area, target elevations and grades, location of tree protection associated with the Mitigation Area, and limits of clearing for Replication Area and access route.
    - Select and mark snags, logs, and woody material to be retained for incorporation into the Wetland Mitigation, as appropriate.
    - Note invasive plants in and adjacent to Wetland Mitigation.
- Excavation, Soil Placement, Grading for Replication Areas
    - Approve excavated depth and grading for appropriate wetland hydrology, subsoil preparation, and finished grade of placed wetland soil. If grades need to be adjusted, submit an RFI to the Engineer.
    - If requsted by the Enginer, the Wetland Specilaist shall inspect stockpiled wetland soil for moisture content and signs of undesirable weeds.
    - Adjust grades as required and approve microtopography.
- Re-vegetation of Mitigation Area(s)
    - Locate woody material to be re-used.
    - Verify seed used complies with specifications and site conditions, determine limits for wetland seeding based on elevations, approve seeding and mulching methods, and collect seed tags to submit with Request for Conditional Acceptance.
    - Review planting methods (if applicable) prior to installation and oversee layout of plants.

ITEM 755.75 (Continued)

Conditional Acceptance

Upon completion of construction of the wetland, as part of the Request for Conditional Acceptance, the Wetland Specialist shall provide a brief narrative demonstrating that the wetland construction work was done according to plans (or how modified) and meets the conditions required for acceptance as specified under Item 755.35. Submittal shall include a report and photo documention of pre-construction conditions, construction work, seeding, planting, and other work as specified under that item.

Upon receipt of a Request for Conditional Acceptance, the Engineer, the Wetland Specialist and regulatory representative (if required) shall assess the Wetland Mitigation and surrounding area to ensure that it meets the conditions specified under Item 775.35.

Upon approval, MassDOT will issue a letter of Conditional Acceptance. If the Wetland Mitigation work is not approved, MassDOT will issue a rejection letter requiring corrective action. The Wetland Specialist shall recommend corrective actions.

Request for Certificate of Compliance

If required, a Request for Certificate of Compliance shall be prepared and submitted to Engineer immediately following Conditional Acceptance. Request shall be as specified under Item 755.35.

Request for Final Acceptance

Following one full growing season, the Wetland Specialist shall provide a brief narrative of the status of the Wetland Mitigation to be submitted with the Request for Final Acceptance.

Upon receipt of the Request, the Engineer, the Wetland Specialist and regulatory representative (if required) shall assess the Wetland Mitigation and surrounding area to ensure that it meets the conditions specified under Item 775.35.

If the Wetland Mitigation is not approved, MassDOT will issue a rejection letter requiring corrective action. The Wetland Specialist shall recommend corrective actions.

ITEM 755.75 (Continued)

Method of Measurement
Item 755.75 Wetland Specialist shall be measured per hour for on-site service provided by the Wetland Specialist.

Work shall include all inspections, photos, submittals, and associated tasks for construction and restoration oversight, narratives for Conditional and Final Acceptance, Request for Certificate of Compliance (Partial or Full) if required, documentation required for permits, and all other work specified above. Payment shall not include travel time or time spent off-site on reports. Decimal Pay Limits will be 0.25 hours.

Basis of Payment
Item 755.75 Wetland Specialist shall be paid at the Contractor bid price for each hour, or fraction thereof, spent on-site to perform the work as described above. Reports and photo documentation are required for payment.

Post wetland construction reports shall be per Item 755.76, Wetland Monitoring Reports.

ITEM 755.76 WETLAND MONITORING REPORTS LUMP SUM

Work under this item shall be for the submittal of Wetland Monitoring Reports following the completion of wetland construction and shall include all inspections, photos, and other work required to complete those reports as specified herein and under Item 755.35 Inland Wetland Replication Area (hereafter referred to as 755.35).

The Contractor shall retain the services of a Wetland Scientist, Wetland Ecologist, Restoration Ecologist, or other professional with similar qualifications, hereafter referred to as the Wetland Specialist, to complete the work of those reports. Wetland Specialist shall meet requirements specified under Item 755.75 Wetland Specialist.

The Wetland Specialist shall not be from the same company as the company responsible for planting, seeding, and/or maintaining the wetland.

All on-site wetland specialist services required to complete the construction and revegetation of the wetland replication, including preparation and submission of monitoring reports during construction, shall be per Item 755.75 Wetland Specialist.

ITEM 755.76 (Continued)

Scope of Work

Post-Construction Wetland Monitoring Reports

Final Acceptance of the wetland construction work, as specified under item 755.35 shall initiate the beginning of the Monitoring Period.

Inspections and reports shall be performed to ensure compliance with mitigation requirements defined under Item 755.35 and with all applicable environmental permits. Monitoring reports shall cover the following:

- Identification of all plant species present
- Percent cover for each plant species and overall percent surface area cover by indigenous wetland plant species for replication area and upland
- Description of the viability, health, and vigor of installed plants as well as volunteer plant species within the replication areas
- Description of remedial measures taken to ensure criteria are met
- Depth to apparent water table and/or depth of surface inundation, both as measured from the soil surface.
- A conclusion regarding the success of the wetland mitigation area relative to the performance standards at 310 CMR 10.55(4)(b) (unless varied), the design plans, and performance criteria established by MADEP in the variance conditions (when applicable), and a recommendation for a corrective plan of action if needed

Reports shall be submitted to the Engineer as a digital copy in Portable Document Format (PDF). Hard copies shall be provided as requested by the Engineer. All reports shall be marked with the applicable permit numbers and identifying information as required in the permits.

Spring Reports, when required, shall be submitted to the Engineer by July 1 for dispersal to the appropriate permitting agencies.

End of Year Reports (which may serve as the Fall Report) shall be based on inspections that occur prior to October 15th. Reports shall be submitted to the Engineer no later than November 1 of each year.

Monitoring Reports shall be as follows for 2 years:
Conservation Commission: 4 Reports (1 spring and 1 end of year for 2 years).

ITEM 755.76 (Continued)

Basis of Payment
Item 755.76 Wetland Monitoring Reports and associated inspections shall be at the Contract unit price per Lump Sum and shall include all labor, materials, equipment, and all incidental costs required to complete the work. Lump Sum will be paid in equal installments of the Lump Sum divided by the number of reports submitted. Payment shall be upon submittal and acceptance of each report, based on the following schedule:

- Year 1 = 2 Reports
- Year 2 = 2 Reports

ITEM 756. NPDES STORM WATER POLLUTION PREVENTION PLAN LUMP SUM

This Item addresses the preparation and implementation of a Storm Water Pollution Prevention Plan required by the National Pollutant Discharge Elimination System (NPDES) and applicable Construction General Permit (CGP) issued by the U.S. Environmental Protection Agency (EPA).

Pursuant to the Federal Clean Water Act, construction activities which disturb one acre or more are required to apply to the EPA for coverage under the NPDES General Permit for Storm Water Discharges from Construction Activities. On February 16, 2012 (77 FR 12286), EPA issued the final NPDES Construction General Permit (CGP) for construction activity. The Contractor shall be fully responsible for compliance with the CGP. Should a fine or penalty be assessed against it, or MassDOT, as a result of a local, state, or federal enforcement action due to non-compliance with the CGP, the Contractor shall take full responsibility.

The NPDES CGP requires the submission of a Notice of Intent (NOI) to the EPA prior to the start of construction (defined as any activity which disturbs land, including clearing and grubbing). There is a fourteen (14) day review period commencing from the date on which EPA enters the Notice into their database. The Contractor is advised that, based on the review of the NOI, EPA may require additional information, including but not limited to, the submission of the Storm Water Pollution Prevention Plan (SWPPP) for review. Work may not commence on the project until final authorization has been granted by EPA. Any additional time required by EPA for review of submittals will not constitute a basis for claim of delay.

In addition, if the project discharges to an Outstanding Resource Water, vernal pool, or is within a coastal ACEC as identified by the Massachusetts Department of Environmental Protection (DEP), a separate notification to DEP is required. DEP may also require submission of the Storm Water Pollution Prevention Plan for review and approval. Filing fees associated with the notification to DEP and, if required, the SWPPP filing to DEP shall be paid by the Contractor.

ITEM 756. (Continued)

The CGP also requires the preparation and implementation of a SWPPP in accordance with the afore-mentioned statutes and regulations. The Plan will include the CGP conditions and detailed descriptions of controls of erosion and sedimentation to be implemented during construction. It is the responsibility of the Contractor to prepare the SWPPP to meet the requirements of the most recently issued CGP. The Contractor shall submit the Plan to the Engineer for approval at least four (4) weeks prior to any site activities. It is the responsibility of the Contractor to comply with the CGP conditions and the conditions of any state Wetlands Protection Act Order, Water Quality Certification, Corps of Engineers Section 404 Permit and other environmental permits applicable to the project and to include in the SWPPP the methods and means necessary to comply with applicable conditions of said permits (reference to Part 9.1.1 of the 2012 CGP).

It is the responsibility of the Contractor to complete the SWPPP in accordance with the EPA CGP, provide all information required, and obtain any and all certifications as required by the CGP. Any amendments to the SWPPP required by site conditions, schedule changes, revised work, construction methodologies, and the like are the responsibility of the Contractor. Amendments will require the approval of the Engineer prior to implementation.

Included in the CGP conditions is the requirement for inspection of all erosion controls and site conditions on a weekly basis as well as after each incidence of rainfall exceeding 0.25 inches in twenty-four hours. For multi-day storms, EPA requires that an inspection must be performed during or after the first day of the event and after the end of the event. The CGP requires that inspections be performed by a qualified individual. MassDOT requires proof of completion of a 4 hour minimum sedimentation and erosion control training class current to the latest CGP. This individual can be, but not limited to, someone that is either a certified inspector, certified professional, or certified storm water inspector. The documentation shall be included as an appendix in the SWPPP. The Engineer must approve the contractor's inspector. This individual shall be on-site during construction to perform these inspections. In addition, if the Engineer determines at any time that the inspector's performance is inadequate, the Contractor shall provide an alternate inspector. Written weekly inspection forms, storm event inspection forms, and Monthly Summary Reports must be completed and provided to the Engineer. Monthly Summary Reports must include a summary of construction activities undertaken during the reporting period, general site conditions, erosion control maintenance and corrective actions taken, the anticipated schedule of construction activities for the next reporting period, any SWPPP amendments, and representative photographs.

The Contractor is responsible for preparation of the Plan, all SWPPP certifications, inspections, reports and any and all corrective actions necessary to comply with the provisions of the CGP. Work associated with performance of inspections is not included under this Item. The Standard Specifications require adequate erosion control for the duration of the Contract. All Control measures must be properly selected, installed, and maintained in accordance with manufacturer specifications and good engineering practices. If periodic inspections or other information indicates a control has been used inappropriately or is no longer adequate, it is the responsibility of the Contractor to replace or modify the control for site conditions at no additional cost to the Department. Contractor must maintain all control measures and other protective measures in effective operating condition and shall consider replacement of erosion controls for each construction season.

ITEM 756. (Continued)

This Item addresses acceptable completion of the SWPPP, any revisions/amendments required during construction, and preparation of monthly reports. In addition, any erosion controls beyond those specified in bid items elsewhere in this contract which are selected by the Contractor to facilitate and/or address the Contractor's schedule, methods and prosecution of the work shall be considered incidental to this item.

The Contractor is advised The CGP provides specific requirements for temporary and final stabilization. This shall be incorporated into the project schedule. The permit defines specific deadline requirements for Initial Stabilization ("immediately", i.e., no later than the end of the next work day following the day when earth-disturbing activities have temporarily or permanently ceased) and for Complete Stabilization Activities (no later than 14 calendar days after the initiation of stabilization). Stabilization criteria for vegetative and non-vegetative measures are provided in the CGP.

The CGP requires the submission of a Notice of Termination (NOT) from all operators when final stabilization has been achieved, as well as removal and proper disposal of all construction materials, waste and waste handling devices, removal of all equipment and construction vehicles, removal of all temporary stormwater controls, etc. . Approval of final stabilization by the Engineer and confirmation of submission of the NOT will be required prior to submission of the Resident Engineer's Final Estimate. The permittee is required to use EPA's electronic NOI system or "eNOI system" to prepare and submit NOT. The electronic NOT form can be found at https://www.epa.gov/npdes/stormwater-discharges-construction-activities#ereporting . If you are given approval by the EPA Regional Office to use a paper NOT, you must complete the form in Appendix K of the 2017 CGP.

Compensation
Payment for all work under this Item shall be made at the contract unit price, lump sum, which shall include all work detailed above, including Plan preparation, required revisions, revisions/addenda during construction, monthly reports and filing fees.

Payment of fifty (50) % of the contract price shall be made upon acceptance of the Stormwater Pollution Prevention plan. Payment of forty (40) % of the contract price shall be made in equal installments for implementation of the Stormwater Pollution Prevention plan. Payment of the final ten (10) % of the contract price shall be paid upon satisfactory submissions of a Notice of termination (NOT) when final stabilization has been achieved.

ITEM 765.422 **SEEDING - MID-HEIGHT UPLAND NATIVE MIX - FULL SUN** **SQUARE YARD**

Herbaceous Species may be substituted with similar species native to Massachusetts if those specified are not available. Please check with MassDOT Landscape Design on grass substitutions.

	Botanical Name	Common Name	% PLS By Weight
Grass			
	Schizachyrium scoparium 'Albany Pine'	Little Bluestem 'Albany Pine'	25.3%
	Elymus virginicus	Virginia Wild Rye	10.0%
	Elymus Canadensis	Canada Wild Rye	10.0%
	Panicum virgatum ‘Shelter’	Switchgrass ‘Shelter	25.0%
	Panicum clandestinum 'Tioga'	Deer Tongue 'Tioga'	15.0%
	Agrostis perennans	Upland Bentgrass	4.0%
			89.3%
Herb/Forb			
	Chamaecrista fasciculata	Partridge Pea	4. 0%
	Rudbeckia hrita	Black-eyed Susan	2.7%
	Aster laevis	Smooth Aster	2.0%
	Asclepias syriaca	Common Milkweed	1.0%
	Monarda fistulosa	Wild Bergamot	0.7%
	Solidago canadensis	Canada Goldenrod	0.3%
			10.7%
			100.00%

Seeding Rate
Apply this mix at 10 lbs PLS/acre on areas of less than 3:1 slope and 25 lbs PLS on areas of greater than 3:1 slope.
Add 30 lbs/acre of a cover crop. For a cover crop use either grain oats (1 Jan to 31 July) or grain rye (1 Aug to 31 Dec. Cover crop shall be incidental to seeding item.

Any species substitutions shall be with a species having similar characteristics and native to New England. Substantial changes in the mix shall be approved by MassDOT Landscape Design Section.

Fertilizer
No fertilizers shall be applied.

Water
Water, including hose and all other watering equipment required for the work, shall be furnished by the Contractor to the site at no additional cost. Water shall be suitable for irrigation and free from ingredients harmful to plant life. All plants injured or work damaged due to the lack of water or the use of too much water shall be the Contractor's responsibility to correct.

ITEM 765.422 (Continued)

Mulch
Seed areas shall be separately mulched with hydromulch, straw or as specified below when incorporated with compost topsoil.

Photo Documentation
Contractor shall submit photo documentation to the Engineer and Landscape Design Section. Each photo shall be date stamped. Photos shall be submitted after the following stages of construction:

- Soil preparation
- Seed and hydromulch/Compost topsoil and seed
- Germination
- Grass establishment after one full growing season (June-September)

Construction

Surface Preparation
Soil preparation and seeding shall occur only when the bed is in a friable condition, not muddy or hard. Bare soils shall be raked to remove large stiff clods, lumps, brush, roots, stumps, litter and other foreign matter. All ruts and any depressions caused by settlement, erosion or rolling shall be filled with additional loam or compost and the soil shall be re-graded to a smooth and even finish corresponding to the required grades. No tracking or rolling shall be done on wet soil.

Prior to seeding, site preparation shall be approved by the Engineer.

Seeding Methods:

Seeding on Loam
Seeding application shall be by broadcast methods followed by hydromulching. Seed may be broadcast by using a cyclone or whirlwind seeder, or by hand.

If spread by hand, small or light-seeded species such as bluestem may be mixed with approved filler (e.g., sawdust, rice, kitty litter, or clean damp sand) to achieve an even distribution. Broadcast seeding shall be undertaken in two separate passes at ninety degrees to each other. One-half the seeding rate shall be applied in each direction. Seed shall be incorporated 1/8 to 1/4-inch deep by raking or dragging, culti-packing, or tracking with heavy machinery. Raked areas shall be rolled with a weighted roller to provide good seed to soil contact. Do not roll or track the seed if the soil is wet.

Immediately following completion of broadcast seeding and packing, area shall be hydromulched.

Hydromulch shall be per the Standard Specifications and per the manufacturer's directions. Mulch for hydroseeding shall be wood fiber only.

ITEM 765.422 (Continued)

Seeding in Combination with Compost Topsoil
If proposed in the contract, compost topsoil shall be as specified under Item 751.7 Compost Topsoil.

Seeding shall be done as a second operation after placement of compost has been approved by the Engineer. Seeding shall be broadcast followed by hydro-mulching.

Contractor shall notify Engineer prior to seeding operation to obtain written approval of site preparation and compost topsoil application.

Irrigation
After seeding and mulching, water seeded areas to moisten soil to a depth of at least 2 inches.

No seeding shall be done if soils are muddy or dry and compacted.

Care during Seed Germination
Contractor shall care for seeded areas as required. Care shall include irrigation and weed removal as necessary for germination and healthy growth.

Over-seeding
If there are numerous areas of bare ground greater than 10-12 inches, these areas shall be over-seeded. Areas where seed fails to germinate and that become invaded by weeds shall be mowed as low as possible and over-seeded. Soil that is compacted shall be raked or roughened prior to seeding to ensure seed to soil contact.

Over-seeding application rates and methods shall be the same as those listed above. After seeding, areas shall be mulched with straw mulch or ¼ - ½ inch compost topsoil and watered with a fine mist to moisten soil to a depth of at least 2 inches.

Over-seeding shall be incidental and shall not be paid for separately.

Care during Grass Establishment
Following germination of seeded species, the contractor shall maintain the stand of grasses to ensure healthy growth.

Work shall include mowing or weed-whacking for weed control, irrigation if necessary, and monitoring for invasive plants. Watering shall provide uniform coverage without eroding soil or grassed surfaces. Treatment of invasive plants shall be per the requirements of the Engineer and the MassDOT Landscape Architect.

The Contractor shall provide all labor, equipment, materials, and water required for establishment. Contractor shall water all seeded areas as necessary to a depth of 2 inches or greater.

ITEM 765.422 (Continued)

Expectations of Establishment

Native upland grasses and forbs will not look like turf grass. Many of the native grasses are bunch type grasses and will not form a uniform growth or have a sod-type appearance. However, seeded area shall show general uniform growth of the seeded species throughout the area. Areas with gaps of bare soil greater than 10-12 inches will be considered unacceptable and shall be over-seeded.

A well-established stand of grasses at the end of one full growing season (June-September), as determined by the Engineer in consultation with the MassDOT Landscape Architect, will be required for acceptance. At least 80-90 percent of the grass established shall be the seeded species and any invasive or aggressive weeds (mugwort, ragweed, or knapweed) shall have been cut or otherwise managed.

Method of Measurement and Basis of Payment

Item 765.422 will be measured for payment by the Square Yard at the end of one full growing season upon approval of establishment by the Engineer in coordination with the MassDOT Landscape Architect.

Item 765.422 will be paid for at the Contract unit price per Square Yard upon receipt of required submittals as specified above and upon approval of established stand of grass as specified above. This price shall include surface preparation prior to seeding as specified under Surface Preparation, and as required by the Engineer, seeding, reseeding, irrigation, care during germination and establishment, labor materials, equipment, photo documentation, and all incidental costs required to complete the work.

ITEM 767.121 SEDIMENT CONTROL BARRIER FOOT

The work under this item shall conform to the relevant provisions of Sections 670, 751 and 767 of the Standard Specifications and shall include the furnishing and placement of a sediment control barrier. Sediment control barrier shall be installed prior to disturbing upslope soil.

The purpose of the sediment control barrier is to slow runoff velocity and filter suspended sediments from storm water flow. Sediment barrier may be used to contain stockpile sediments, to break slope length, and to slow or prevent upgradient water or water off road surfaces from flowing into a work zone. Contractor shall be responsible for ensuring that barriers fulfill the intent of adequately controlling siltation and runoff.

Twelve-inch diameter (after installation) compost filter tubes with biodegradable natural fabric (i.e., cotton, jute, burlap) are intended to be the primary sedimentation control barrier.

ITEM 767.121 (Continued)

For small areas of disturbance with minimal slope and slope length, the Engineer may approve the following sediment control methods:

- 9-inch compost filter tubes
- Straw bales which shall be trenched

No straw wattles may be used. Additional compost filter tubes (adding depth or height) shall be used at specific locations of concentrated flow such as at gully points, steep slopes, or identified failure points in the sediment capture line.

When required by permits, additional sediment barrier shall be stored on-site for emergency use and replacement for the duration of the contract.

Where shown on the plans or when required by permits, silt fence shall be used in addition to compost filter tubes and straw bales and shall be incidental to the item.

Sediment control barriers shall be installed in the approximate location as shown on the plans and as required so that no excavated or disturbed soil can enter mitigation areas or adjacent wetlands or waterways. Barriers shall be in place prior to excavation work. No work shall take place outside the barriers.

Materials and Construction
Prior to initial placement of barriers, the Contractor and the Engineer shall review locations specified on the plans and adjust placement to ensure that the placement will provide maximum effectiveness.

Barriers shall be staked, trenched, and/or wedged as specified herein and according to the Manufacturer's instructions. Barriers shall be securely in contact with existing soil such that there is no flow beneath the barrier.

Compost Filter Tube
Compost material inside the filter tube shall meet M1.06.0, except for the following: no peat, manure or bio-solids shall be used; no kiln-dried wood or construction debris shall be allowed; material shall pass through a 2-inch sieve; and the C:N ratio shall be disregarded.

Outer tube fabric shall be made of 100% biodegradable materials (i.e., cotton, hemp or jute) and shall have a knitted mesh with openings that allow for sufficient water flow and effective sediment capture.

Tubes shall be tamped, but not trenched, to ensure good contact with soil. When reinforcement is necessary, tubes shall be stacked as shown on the detail plans.

ITEM 767.121 (Continued)

Straw Bales
Straw bales shall be used if shown on the plans or when specified by Orders of Condition or other permit requirements.

Bales should be placed in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another. All bales should be either wire-bound or string-tied. Straw bales should be installed so that bindings are oriented around the sides (rather than along the tops and bottoms) of the bales in order to prevent deterioration of the bindings.

The barrier should be entrenched and backfilled. A trench should be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches. The trench must be deep enough to remove all grass and other material which might allow underflow. After the bales are staked and chinked (filled by wedging), the excavated soil should be backfilled against the barrier. Backfill soil should conform to the ground level on the downhill side and should be built up to 4 inches against the uphill side of the barrier.

Each bale should be securely anchored by at least 2 stakes or re-bars driven through the bale. The first stake in each bale should be driven toward the previously laid bale to force the bales together. Stakes or re-bars should be driven deep enough into the ground to securely anchor the bales. For safety reasons, stakes should not extend above the bales but should be driven in flush with the top of the bale.

The gaps between the bales should be chinked (filled by wedging) with straw to prevent water from escaping between the bales. Loose straw scattered over the area immediately uphill from a straw bale barrier tends to increase barrier efficiency. Wedging must be done carefully in order not to separate the bales.

When used in a swale, the barrier should be extended to such a length that the bottoms of the end bales are higher in elevation than the top of the lowest middle bale to assure that sediment-laden runoff will flow either through or over the barrier but not around it.

Silt Fence
Materials and Installation shall be per Section 670.40 and 670.60 of the Standard Specifications and the following:

Silt fence shall only be used if shown on the plans or when specified by Orders of Condition or other permit requirements.

When used with compost filter tubes, the tube shall be placed on a minimum of 8 inches of folded fabric on the upslope side of the fence. Fabric does not need to be trenched.

When used with straw bales, an 8-inch deep and 4-inch wide trench or V-trench shall be dug on the upslope side of the fence line. One foot of fabric shall be placed in the bottom of the trench followed by backfilling with compacted earth or gravel. Stakes shall be on the down slope side of the trench and shall be spaced such that the fence remains vertical and effective.

ITEM 767.121 (Continued)

Width of fabric shall be sufficient to provide a 36-inch high barrier after fabric is folded or trenched. Sagging fabric will require additional staking or other anchoring.

Maintenance
Maintenance of the sediment control barrier shall be per Section 670.60 of the Standard Specifications or per the Stormwater Pollution Prevention Plan (SWPPP), whichever is more restrictive.

The contractor shall inspect the sediment barrier in accordance with relevant permits. At a minimum, barriers shall be inspected at least once every 7 calendar days and after a rain event resulting in 0.25 inches or more of rainfall. Contractor shall be responsible for ensuring that an effective barrier is in place and working effectively for all phases of the Contract.

Barriers that decompose such that they no longer provide the function required shall be repaired or replaced as directed. If the resulting berm of compost within the fabric tube is sufficiently intact and continues to provide effective water and sediment control, barrier does not necessarily require replacement.

Dismantling and Removing
Barriers shall be dismantled and/or removed, as required, when construction work is complete and upslope areas have been permanently stabilized and after receiving permission to do so from the Engineer.

Regardless of site context, nonbiodegradable material and components of the sediment barriers, including photo-biodegradable fabric, plastic netting, nylon twine, and silt fence, shall be removed and disposed off-site by the Contractor.

For naturalized areas, biodegradable, natural fabric and material may be left in place to decompose on-site. In urban, residential, or other locations where aesthetics is a concern, the following shall apply:

- Compost filter tube fabric shall be cut and removed, and compost shall be raked to blend evenly (as would be done with a soil amendment or mulch). No more than a 2-inch depth shall be left on soil substrate.
- Straw bales shall be removed and disposed off-site by the Contractor. Areas of trenching shall be raked smooth and disturbed soils stabilized with a seed mix matching adjacent seeding or existing grasses (i.e., lawn or native grass mix).
- Silt fence, stakes, and other debris shall be removed and disposed off-site. Site shall be restored to a neat and clean condition.

ITEM 767.121 (Continued)

Method of Measurement and Basis of Payment
Item 767.121 will be measured and paid for at the contract unit price per Foot of sediment control barrier which price shall include all labor, equipment, materials, maintenance, dismantling, removal, restoration of soil, and all incidental costs required to complete the work.

Silt fence, when used in conjunction with compost filter tubes or straw bales, will be incidental to this item.

Additional barrier, such as double or triple stacking of compost filter tubes, will be paid for per foot of tube installed.

Barriers that have been driven over or otherwise damage by construction activities shall be repaired or replaced as directed by the Engineer at the Contractors expense.

ITEM 767.77 COMPOSTED MULCH OVER MODIFIED ROCK SQUARE YARD

The purpose of this item is to provide compost mulch for mixing with seed, to be placed on designated rip rap slopes in areas where establishment of vegetation in the rock slope is desired. This item shall conform to the requirements of Subsections 767 and 765 of the Standard Specifications and the following.

Composted mulch
Composted Mulch shall be an aged organic substance meeting the requirements of M1.06.0 of the Supplemental Standard Specifications. No manure, bio-solids, kiln dried wood, or construction debris shall be allowed.

Organic matter content shall be between 20-100% (dry weight basis) as determined by ASTM D2974 (method A) Standard Test Methods for Moisture, Ash and Organic Matter of Peat and Other Organic Soils.

Moisture content shall be <15% by dry weight (<60% by wet weight) as measured by ASTM D2216 Standard Test Method for Laboratory Determination of Water Content of Soil and Rock and ASTM D2974 (cited above).

Particle size as measured by sieving shall be as follows:

Sieve Size	**%Passing**
2 in	100%
¾ in	70-100%
#4	30-75%
#20	20-40%

Soluble salts shall be <5.0 mmhos/cm (dS/m). The pH shall be between 5.5 and 8.0.

ITEM 767.77 (Continued)

Seed
Seed shall be a native mix as specified under Item 765.422, Seeding - Mid-Height Upland Native Mix – Full Sun

Construction Methods
Methods of installation shall be reviewed and approved by the Engineer prior to placement of material.

Placement of compost mulch shall be as shown on the plans and as directed by the Engineer. Compost mulch material shall be applied pneumatically. Material shall be placed so that settled material is at or slightly below the surface plane of the stone. Contractor shall ensure that there will be adequate quantity, including adjustment for settlement.

Seeding shall be done at the same time as compost topsoil is being applied and shall be by broadcast method as specified under the seeding item and such that a very thin blanket of material covers the seed.

Method of Measurement and Basis of Payment
Compost Mulch for Modified Rock will be measured and paid for at the Contract unit price per Square Yard which price shall include all labor, materials, equipment, site preparation, and all incidental costs required to complete the work.

Seed shall be compensated at the bid price under Item 765.422.

ITEM 767.9 MATTING FOR EROSION CONTROL SQUARE YARD

The work under this Item shall conform to the relevant provisions of Subsection 767 of the Standard Specifications as amended and the following:

Matting for erosion control shall be used within grass swales and on slopes exceeding one (1) foot of vertical change per three (3) feet of horizontal change and as directed by the Engineer. Matting for erosion control shall provide sufficient thickness and void space to permit soil filling and/or retention to allow for the development of vegetation. The matting for erosion control furnished shall be mulch control netting or erosion control blanket.

Mulch Control Netting shall be a temporary biodegradable rolled erosion control product (RECP) composed of planar woven natural fibers. Erosion Control Blanket shall be a temporary all natural biodegradable rolled erosion control product composed of processed fibers mechanically bound together to form a continuous matrix. Matting for erosion control shall also meet the following requirements:

ITEM 767.9 (Continued)

Product Description	Material Composition	Longevity (months)	Slope Applications*		Channel Applications*	Minimum Tensile Strength[1] kN/m(lbs/ft)
			Maximum Gradient (H:V)	C Factor[2,5]	Maximum Shear Stress[3,4,6] Pa(lbs/ft^2)	
Mulch Control Nets	All natural biodegradable mesh or woven netting.	3	5:1	≤ 0.10	12 (0.25)	0.073 (5)
		12	5:1	≤ 0.10	12 (0.25)	0.073 (5)
		24	5:1	≤ 0.10	12 (0.25)	0.36 (25)
Netless Rolled Erosion Control Blankets	All natural biodegradable fibers mechanically interlocked together to form a continuous matrix.	3	4:1	≤ 0.10	24 (0.5)	0.073 (5)
		12	4:1	≤ 0.10	24 (0.5)	0.073 (5)
Single-net Erosion Control Blankets	All natural processed, biodegradable fibers mechanically bound together by a single net of yarn or twine woven into a continuous matrix.	3	3:1	≤ 0.15	72 (1.5)	0.73 (50)
		12	3:1	≤ 0.15	72 (1.5)	0.73 (50)
Double-net Erosion Control Blankets	All natural processed, biodegradable fibers mechanically bound together between two nets of yarn or twine woven into a continuous matrix.	3	2:1	≤ 0.20	84 (1.75)	1.09 (75)
		12	2:1	≤ 0.20	84 (1.75)	1.09 (75)
		24	1.5:1	≤ 0.25	96 (2.00)	1.45 (100)
		36	1:1	≤ 0.25	108 (2.25)	1.82(125)

Notes:

* "C" factor and shear stress for mulch control nettings must be obtained with netting used in conjunction with pre-applied mulch material.

1 Minimum Average Roll Values, Machine direction using Erosion Control Technology Council (ECTC) Mod. ASTM D 5035.

The ground surface shall be shaped to the lines and grades shown on the Plans and shall have a smooth surface free of depressions and eroded areas that would allow water to collect or flow under the matting. The surface shall be cleared of stones, sticks, and other objectionable material that would prevent the matting from maintaining close contact with the ground. Placement of topsoil, fertilizer, seed and mulch, when required, shall be completed prior to placement of the matting.

After the soil has been properly shaped, fertilized and seeded, the matting shall be placed parallel to the flow of water in channels or vertically on slopes and in direct contact with the soil surface.

The matting for erosion control shall have a minimum 4” overlap at all seams. Staples shall be placed at 12 inch intervals along all seams, and as directed by the Engineer. The Contractor shall not stretch or allow material to bridge over surface inconsistencies. Erosion matting and ground fasteners shall be installed as recommended by the manufacturer for the particular application.

ITEM 767.9 (Continued)

Matting for erosion control that is determined by the Engineer to be ripped, torn or otherwise defective shall be replaced by the Contractor at no additional cost to the Owner.

No vehicular traffic of any kind shall be permitted over the matting during or after placement. Any torn or damaged material shall be replaced at the Contractor's expense. The Contractor shall maintain the matted areas until vegetation is established and has been accepted by the Engineer.

Method of Measurement
Item 767.9 will be measured by the Square Yard as measured on the slope face.

Basis of Payment
Item 767.9 will be paid for at the Contract unit price per Square Yard, which price shall include all labor, materials, furnishing, transporting, handling, tools, equipment, fabric and staples as shown in the contract plans or as required by the Engineer, equipment, and incidentals necessary to complete the work.

No additional payment will be made for ripped, torn or otherwise defective erosion matting as determined by the Engineer.

ITEM 775.027	**ELM - 'PRINCETON' 2-2.5 INCH CAL**	**EACH**
ITEM 775.035	**HOPHORNBEAM – AMERICAN 2-2.5 INCH CALIPER**	**EACH**
ITEM 775.431	**LOCUST HONEY - SHADEMASTER 2-2.5 INCH CALIPER**	**EACH**
ITEM 776.523	**MAPLE – RED- ARMSTRONG 2-2.5 INCH CALIPER**	**EACH**
ITEM 776.529	**MAPLE – RED- 'KARPICK' 2-2.5 INCH CAL**	**EACH**
ITEM 777.679	**SWEETGUM - 'HAPDELL' 2-2.5 INCH CAL**	**EACH**
ITEM 778.025	**GINKGO -AUTUMN GOLD 2-2.5 INCH CAL**	**EACH**
ITEM 778.167	**BIRCH – RIVER 'HERITAGE' SINGLE STEM**	**EACH**
ITEM 778.409	**CRABAPPLE - ADIRONDACK 2.5-3 INCH CAL**	**EACH**
ITEM 780.181	**DOGWOOD - 'CONSTELLATION' 1.5 INCH CAL**	**EACH**
ITEM 782.423	**PEAR - CALLERY -'CHANTICLEER' 2-2.5 INCH CALIPER**	**EACH**
ITEM 785.587	**HOLLY - JAPANESE 'HETZ' 24-30 INCH**	**EACH**
ITEM 786.031	**JUNIPER - ANDORRA 18-24 INCH**	**EACH**
ITEM 786.083	**JUNIPER - 'BAR HARBOR' 18-24 INCH SPREAD**	**EACH**
ITEM 786.099	**JUNIPER - 'BLUE STAR' 12-18 INCH SPREAD**	**EACH**
ITEM 786.473	**JUNIPER - 'SEA GREEN' 24-30 INCH SPREAD**	**EACH**
ITEM 794.337	**SUMAC - FRAGRANT - 'GRO -LOW' 18-24 INCH SPREAD**	**EACH**
ITEM 794.805	**SWEETFERN 2 GALLON**	**EACH**
ITEM 796.433	**FOUNTAIN GRASS - 'KARLEY ROSE' 1 GALLON**	**EACH**
ITEM 796.457	**SWITCH GRASS – 'HEAVY METAL' 1 GALLON**	**EACH**
ITEM 796.459	**SWITCH GRASS - 'SHENENDOAH' 1 GALLON**	**EACH**
ITEM 796.727	**CATMINT - 'WALKERS LOW' 1 GALLON**	**EACH**
ITEM 796.753	**DAYLILLY - 'HAPPY RETURNS' 1 GALLON**	**EACH**
ITEM 796.757	**DAYLILLY - 'PURPLE RETURNS' 1 GALLON**	**EACH**
ITEM 796.761	**DAYLILLY - 'RED HOT RETURNS' 1 GALLON**	**EACH**

ITEM 775.027 through **ITEM 796.761** (Continued)

This work under these Items shall consist of supplying and planting specified plants and trees at the locations as shown on the plans and/or as directed by the Engineer and in accordance with the Standard Specifications and the following:

The Contractor shall take note of the requirements for submittals and allowable planting dates.

Method of Measurement and Basis of Payment
The quantity of trees, shrubs, vines, grasses and ground cover plants measured will be paid for at the contract unit prices per each for planting of the types, species and sizes called for in the bid schedule. The unit price per planting item shall include furnishing and delivering all plants, furnishing and delivering prepared backfill soil, mulch, fertilizer, excavation for plant pits, backfilling, planting, pruning, guying and staking, mulching, weeding, watering, cleanup, plant establishment work and care including replacements, and for all labor, equipment, tools and incidentals necessary to complete the work prescribed in this section.

Mulching will be paid for under Item 767.6.

ITEM 811.27 ELECTRIC HANDHOLE – (MUNICIPAL STANDARD) EACH

The work under this item shall be performed in accordance with the relevant provisions of Subsection 800 of the Standard Specifications and the following:

The handhole and cover must meet the loading requirements of AASHTO H20 and shall be as shown on the Plans. The handhole cover shall read “Electric”.

Method of Measurement
Item 811.27 will be measured per Each, electric handhole furnished and installed, complete in place.

Basis of Payment
Item 811.27 will be paid for at the contract unit price per Each. This price shall include full compensation for furnishing all labor, tools, materials, equipment, and incidentals necessary to complete the work.

ITEM 812.16 LIGHT FOUNDATION - CONCRETE EACH
ITEM 812.17 DEEP LIGHT FOUNDATION - CONCRETE EACH

The work of these items shall conform to the relevant provisions of Subsections 801, 813 and 820 of the Standard Specifications, and the following:

The work shall include furnishing and installing concrete light foundations and deep concrete light foundations for the street lighting system as shown on the plans, in accordance with the light pole manufacturer, and as required by the Engineer.

Refer to the plans for the details of the light foundations.

The concrete shall be 4000 psi, 1.5 in., 565 cement concrete for cast-in-place foundations and 4000 psi concrete for precast foundations.

All light foundations shall be constructed per Subsection 801.62 of the Standard specifications, except deviations may be required based on field conditions. All deviations must be approved by the Engineer prior to making any changes.

Light foundations shall be placed per the plans and positioned using an approved grade. Cast in place concrete foundations shall furnish and install a sonotube of required diameter. Cast in place or precast concrete foundations shall include galvanized reinforcing rods and hoops, as shown on the plans, and per the manufacturer's Structural Engineer's recommendations. Confirm exact light fixture pole base anchor bolt requirements for size, length, projection, bolt circle diameter and pattern with the pole manufacturer prior to furnish and installation and install accordingly. For the foundations serving the ornamental post top lighting, the diameter of the foundation shall be adjusted to exceed the diameter of the decorative base by 6" all around. Minimum foundation diameter shall be as indicated on the plans.

Furnish and install 2" galvanized rigid metal conduit in foundation and coupling and 2" plastic type NM conduit stub out over to adjacent handhole, as shown on the plans.

Method of Measurment
Items 812.16 and 812.17 will be measured by the unit Each, complete, in place, and approved.

Basis of Payment
Items 812.16 and 812.17 will be paid for at the respective contract unit price, per Each, which price shall include all labor, materials, equipment, and incidentals necessary to complete the work.

❸ ADDENDUM NO. 3, AUGUST 14, 2020

ITEM 813.30	**WIRE TYPE 7 NO. 10 GENERAL PURPOSE**	**FOOT**
ITEM 813.33	**WIRE TYPE 7 NO. 4 GENERAL PURPOSE**	**FOOT**
ITEM 813.34	**WIRE TYPE 7 NO. 2 GENERAL PURPOSE**	**FOOT**
ITEM 813.35	**WIRE TYPE 7 NO. 1 GENERAL PURPOSE**	**FOOT**

The work under these items shall conform to the relevant provisions of Subsections 813 and 820 of the Standard Specifications and the following:

The work shall include furnishing and installing the electrical wire having XHHW insulation for the street lighting system as shown on the plans and as required by the Engineer.

ITEM 813.399 **SPLICE AND EXTENSION FROM HANDHOLE TO LIGHTING FIXTURES** **EACH**

The work under this item shall conform to the relevant provisions of Subsection 813 of the Standard Specifications and the following:

The work shall include the splicing of branch circuits for the luminaries and pole mounted receptacles from the adjacent handholes to the pole base access.

The work under this item shall include all splicing and wiring extension from the handhole to the lighting fixture for branch circuitry and also the supplemental equipment grounding from pole ground bar to the handhole grounding rod. See plans for details.

❸ All wire for light fixtures and receptacles shall be Wire Type 7 No. 10 General Purpose.

Method of Measurement
Item 813.399 will be measured by the unit Each, complete, in place, and approved.

Basis of Payment
Item 813.399 will be paid for at the contract unit price, per Each, whichce price shall include all labor, materials, equipment, and incidentals necessary to complete the work.

❸ All No. 10 wire used for lighting fixtures and receptacles will be paid for under Item 813.30..

ITEM 815.1	**TRAFFIC CONTROL SIGNAL LOCATION NO. 1**	**LUMP SUM**
ITEM 815.2	**TRAFFIC CONTROL SIGNAL LOCATION NO. 2**	**LUMP SUM**
ITEM 815.3	**TRAFFIC CONTROL SIGNAL LOCATION NO. 3**	**LUMP SUM**
ITEM 816.80	**TRAFFIC CONTROL SIGNAL REMOVED AND STACKED**	**LUMP SUM**
ITEM 816.801	**TRAFFIC CONTROL SIGNAL REMOVED AND STACKED**	**LUMP SUM**

The work under these items shall conform to the relevant provisions of Subsection 800, "Traffic Control Devices" of the MassDOT Standard Specifications for Highway and Bridges, the 2009 Manual on Uniform Traffic Control Devices (MUTCD), and the following:

The traffic control signal work shall consist of furnishing and installation of part or all of the following items: traffic signal controller, cabinet and foundation, signal posts and bases, mast arm assemblies with anchor bolts and foundations, signal housing, retroreflective backplates, loop vehicle and bicycle detectors, pedestrian signals with countdown timers and audible warning devices, pedestrian push buttons with signage, emergency vehicle preemption, wires, cables, ground rods, equipment grounding and bonding, and traffic control equipment, also making all electrical connections, tying in electrical service connections and providing all incidental equipment, materials and incidental costs necessary for fully operation and controlling the traffic control signals as specified herein and as shown on the plans at the following locations:

Traffic Control Signal Locations
Loc. No. 1: Route 126 at Eliot Street

Loc. No. 2: Route 126 at Algonquin Trail / Harvard Street

Loc. No. 3: Route 126 at Market Basket Driveway

Removing and stockpiling of existing traffic control signal installations is shown on the applicable signal plans at the following locations:

Traffic Control Signal Removed and Stacked Locations
Loc. No. 1: Route 126 at Eliot Street

Loc. No. 2: Route 126 at Market Basket Driveway

General Requirements
A list of the major traffic signal items required is included on the traffic signal plans.

All traffic signal equipment shall comply with the MassDOT Qualified Traffic Control Equipment (QTCE) List unless otherwise approved by the Engineer.

Within 30 days following Notice to Proceed, the Contractor shall submit a list of equipment and manufacturer's equipment specifications he proposes to install to the Engineer in accordance with the relevant provisions of Section 815.20. No equipment or accessories will be accepted unless type tested and approved by the MassDOT - Highway Division prior to the date of proposal.

ITEM 815.1 through **ITEM 816.801** (Continued)

No work on the signals shall be commenced by the Contractor until approval of the shop drawings and the manufacturer's data has been received in writing from the Engineer. Approval of these drawings shall be general in character and shall not relieve the Contractor from the responsibility of, or the necessity of, furnishing materials and workmanship conforming to the plans and specifications.

The Contractor shall deliver to the Engineer a certificate of compliance with the manufacturer for all materials purchased from the manufacturer.

All Electrical Contractors performing work on roadways or signals must be on the MassDOT Approved Contractor List and also have International Municipal Signal Association (IMSA) Certification as a Traffic Signal Electrician Level II.

The Contractor's attention is directed to a rule of the Board of State Examiners of Electricians which states that the installation of wiring in ducts by Contractors in construction of State Highways will not be permitted unless installed by licensed electricians. The installation of the duct work can be performed by skilled laborers. Additionally, the foreman shall be certified as an International Municipal Signal Association (IMSA) Traffic Signal Technician, Level 1 at a minimum.

Service Connections
As soon as notice to proceed with construction is given, the electrical contractor shall submit a request to the servicing utility companies for electrical service on behalf of MassDOT.

The electric company will connect power as required. No work shall be done in manholes or on power poles without a representative of the electric company being present. The Contractor will be responsible for coordinating work with the electric company.

A 100-ampere meter socket approved by the servicing utility company shall be furnished and installed on the side of the control cabinet by the serving utility company.

A 3” PVC conduit shall be installed from the controller cabinet to the utility pole and/or electric manhole, which will supply electrical service to the controller cabinet. This conduit shall be encased in concrete where crossing roadways and/or driveways.

The Contractor shall furnish and install, or cause to be installed, all service equipment to the satisfaction of the electric utility company. It shall also be the Contractor’s responsibility to pay all charges to the utility company for performing the work previously described.

No direct reimbursement will be made under this contract to the Contractor for payment made to electric company, it being understood that full compensation for any payment made by the Contractor to the utility company will be included in the contract prices bid.

ITEM 815.1 through **ITEM 816.801** (Continued)

Cabinet Power Supply
A power supply shall be supplied and installed in the TS 2 cabinet. At a minimum, the power supply shall meet all requirements of Paragraph 5.3.5 of the NEMA TS 2 Standard. The unit shall be AC line powered and provide regulated DC power, unregulated AC power, a line frequency reference for the rack mounted loop amplifiers, bus interface units, load switches and other auxiliary cabinet equipment as required.

The power supply shall be either shelf mounted or installed as part of the loop detector rack assembly.

The unit shall contain four LED indicators on the front panel to indicate the four outputs:

1. + 12 VDC ± 1 VDC @ 2.0 amps,
2. + 24 VDC ± VDC @ 2.0 amps,
3. 12 VAC @ 250 milliamps, and
4. 60 Hz line frequency reference.

A test point terminal shall also be located on the unit's front panel for + 24 VDC and logic ground testing.

Load Switches
Load switches shall comply with Subsection 6.2 of the NEMA TS 2 Standard. All load switches shall utilize optically isolated encapsulated modular solid-state relays. Discrete components on circuit boards are not acceptable.

Load switch indicator lights shall be LED-type and wired on the input side of the device.

Note: The controller cabinet assembly shall be initially supplied with a full compliment of load switches to accommodate each available position of the backpanel.

Flashing Operation
The controller shall be equipped with a separate emergency flashing mechanism capable of providing flashing operation at the rate of 50 to 60 flashes per minute. This mechanism shall be so wired and so mounted within the cabinet that it will continue to cause the signals to flash even when the basic controller is removed from the cabinet.

Flashing operations and transition requirements shall be in accordance with Section 4D.28 thru 4D.31 of the MUTCD and shall be as shown on the Plans. Flashing yellow arrow operations shall be in conformance with Sections 4D.18 and 4D.20 of the MUTCD.

Flasher
Flashers shall comply with Subsection 6.3.3 of the NEMA TS 2 Standard and be equipped with two output indicator lights which will show flashing power out to the cabinet assembly.

ITEM 815.1 through **ITEM 816.801** (Continued)

Flash Transfer Relays
Flash transfer relays shall comply with Subsection 6.4 of the NEMA TS 2 Standard.

The field electrical loading for flash operation shall be wired through the transfer relays such that the load on the 2-circuit flasher is as balanced as possible within the limitations of the signal phasing.

Note: The controller cabinet assembly shall be initially supplied with a full compliment of flash transfer relays to accommodate each available position of the backpanel.

Traffic Controller Cabinet
The controller cabinets shall conform to the NEMA TS 2 Type 1 Standards, Section 7. The controller cabinet shall be made of aluminum.

Note: The control cabinet shall be initially wired with a "D" harness. All wires for this harness shall be properly terminated on the back panel.

The cabinet shall also be wired with a normally closed switch connected to a user defined input to the controller for remote monitoring of the control cabinets' door open status. The controller cabinet shall also be supplied with a Manual Police Button to manually control the operations of the traffic signal via the Police Door Access Panel.

Controller cabinet foundations shall not obstruct a sidewalk or crosswalk so that passage by physically challenged persons is impaired.

The following requirements are applicable to each signalized location and are designed for effective use of a laptop computer in conjunction with traffic signal controllers. These requirements are also designed to permit all engineers, electricians and technicians (including those who are disabled but ambulatory) to work in the cabinet in a safe, effective and comfortable manner. To this extent, the following meets applicable ADA requirements.

1. Furnish and install one slide-out/slide-in shelf or swing-out/swing-in shelf appropriate for the size and load of a laptop computer. This moveable shelf shall support the bottom of the laptop computer at a height between 3'-4" and 3'-8" above finished grade in front of the cabinet.

2. Both the firmware and software version in each timer unit shall be the same throughout the project, and shall be the latest version available on the market. In addition, the contractor shall promptly furnish to the owner and install all upgraded versions of both firmware and software through the last day of the inspection period, guarantee period or warranty period, whichever date is later.

ITEM 815.1 through **ITEM 816.801** (Continued)

3. The contractor shall furnish one cable with each new timer unit to connect a controller timing mechanism to a laptop computer. This cable shall have a termination at one end to match the controller. It shall have a termination on the other end to match the type of serial port found on laptop computers, usually DB9. This cable shall be wired to provide serial RS232C communication between the controller and the computer.

Payment for the work described above shall be deemed to be incidental to and included in the prices bid for the traffic signal work, and no additional payment shall be made for the work described above.

Cabinet Door Sticker
The Contractor shall supply and install a laminated door sticker on each proposed cabinet. This sticker shall be permanently affixed to the upper left hand side of the interior main cabinet door. The sticker shall contain, at a minimum, the following:

- Vehicle and bicycle detection information including detector channel assignment, phase assigned, approach and termination points.
- Network communications information including IP address, subnet mask and MAC address.
- Per approach preemption information including channel, approach/direction and termination points.

Traffic Signal Controller
The controller unit shall be a keyboard-entry menu-driven unit conforms to the Standard Specifications, with internal time base coordination, emergency preemption, and programmatic capability. The controller shall also be complete with a module for closed loop system functions.

Controller shall conform to Section 3, Controller Units of NEMA No. TS 2 Standard, Traffic Controller Assemblies. The controller unit shall meet all applicable requirements of the NEMA Standard Publication No. TS 2 Type 1 and the Department's 1988 Standard Specifications and supplemental specifications. Controller shall utilize an input/output interface conforming to Section 3.3.1 of the NEMA TS 2 Standard for all input/output functions with the back-panel terminals and facilities, the malfunction management unit, detector rack assemblies and auxiliary devices. The controller unit shall also meet the requirements of Paragraph 3.3.6 "NTCIP Requirements" of the NEMA TS 2 Standard.

The controller shall be complete with a module, including modem card and physical connector to support future closed loop communication.

ITEM 815.1 through **ITEM 816.801** (Continued)

Traffic Signal Equipment
The traffic signal controller unit (CU), malfunction management unit (MMU), detector amplifiers, cabinet power supply, bus interface units (BIUs) and all other ancillary traffic signal control components included in the traffic control cabinet shall comply with the National Electrical Manufacturers Association (NEMA) Standard TS 2-1988, Traffic Controller Assemblies with National Transportation Communications for ITS Protocol (NTCIP) Requirements.

Malfunction Management Units
The malfunction management units (MMU) shall comply with Section 4 of the NEMA TS 2 standard. The MMU shall be capable of operating as either a Type 16 with 16 channels (8 vehicle, 4 pedestrian, 4 overlap) or a Type 12 with 12 channels (8 vehicle, 4 overlap). The MMU's supplied shall be configured to operate as Type 16 units.

The MMU's in either the Type 16 or Type 12 configuration shall be capable of operating in a NEMA TS 2 Type 1 cabinet, a NEMA TS 2 Type 2 cabinet, or a NEMA TS 1 cabinet without loss of functionality. The MMU shall be connected directly to the controller unit to support enhanced MMU monitoring of controller operations.

MMU must be compatible with Flashing Yellow Arrow (FYA).

Bus Interface Units
The Bus Interface Unit (BIU) shall comply with Section 8 of the NEMA TS 2 Standard. The BIU shall be fully interchangeable with any other manufacturer's unit and interchangeable in a NEMA TS 2 Type 1 cabinet assembly.

At a minimum the BIU shall perform the interface function between Port 1 at the controller unit, the malfunction management unit, loop detector rack assembly, and the backpanel terminal and facilities. The cabinets shall be supplied with the appropriate number of BIUs required to provide an operating traffic control signal according to the plans and these specifications.

At a minimum, two (2) LED indicators shall be provided on the BIU front panel. One indicator shall serve a dual use: as a power on indication and as a diagnostic indicator for proper operation of the device. The second indicator shall serve as a transmit indicator illuminating each time data is transmitted.

Vehicle and Bicycle Loop Detectors and Amplifiers
The loop detector amplifiers shall be supplied as two or four-channel rack mounted units with programmable delay and extension timing. However, all delay and extension programming shall be completed internally in the controller unit.

A chart shall be permanently affixed to the controller cabinet door, which labels each amplifier channel. The chart shall indicate the detector number, street name, approach direction, lane assignment, corresponding phase and terminal number for each amplifier channel.

ITEM 815.1 through **ITEM 816.801** (Continued)

The detector lead-in cables shall also be similarly labeled, both in the controller cabinet and in the pull box containing the detector lead-in splice. This labeling and attachment shall be of durable materials such as brass or plastic, attached by wire or plastic ties. Adhesive attachment of the label shall not be acceptable.

All controller cabinets shall be supplied with the number of rack mounted loop amplifiers as noted in the major items list on the plan sheets.

Wire loop detectors shall be installed in the roadway for vehicle/bicycle detection. In advance of the loop detector installation, the Contractor shall mark, on site, the loop detectors with any changes required by field conditions such as manholes. The loop detector layout shall be inspected and approved by the Engineer before the loop detectors are installed**.**

Loop wire shall be encased in a protected plastic tubing of PVC or polyethylene plastic, IMSA 51-5, 1/4-inch outside diameter, and the wire may have cross-linked polyethylene insulation or it may have THHN/THWN insulation.

The heat source for soldering shall be electrical, not exceeding 30W capacity.

Splicing insulator shall be an approved re-enterable body splice kit with a non-hardening sealing compound compatible with the wire insulation.

Splice and Connection: Splicing and connection shall be made in the pull box nearest the roadway loop sensor. All loops included in a detector group as shown on the plans shall be spliced in a single pull box. Each lead and lead-in connector shall be stripped back and spliced using a pressure type wire connector applied with a crimping tool. Multiple loop sensors shall be identified as detailed on the plans.

Lead-in splicing shall be staggered to prevent contact with each other. Each crimped splice shall be soldered and insulated. The insulation material shall be heat-shrinked polyolefin. The shielded lead-in cable outer jacket and shield shall be stripped back sufficiently to ensure that the shield cannot come into contact with the spliced conductors. Follow the instructions of the manufacturer when installing the re-enterable splice kit.

NOTE WELL: The above splice shall be done on the day of the loop wire installation to prevent the entrance of any moisture into the plastic tubing.

The lead-in conductors shall be connected to the appropriate terminals in the controller cabinet, by using crimped and soldered terminal ends. The heat source for soldering shall be electrical not exceeding 30W capacity.

ITEM 815.1 through **ITEM 816.801** (Continued)

Testing of Loops
The test procedure shall be performed in the presence of the Engineer before and after the loop sensor is sealed in the pavement as stipulated in subsection 815.66. The cost of equipment, labor, and materials to perform such testing and similar re-testing following repairs, replacement, or adjustment of any detector within the project area shall be included in the price bid for the traffic control signal items.

The meter used for these tests shall be checked for calibration each day of use by using a resistor block of ±5% resistors simulating loads of 1 megohm, 20 megohm and 100 megohms. The observed meter reading shall be ±10% of the nominal resistor load.

Spare Equipment
The Contractor shall provide the following spare signal equipment in the traffic signal controller cabinet listed below:

- Two (2) Bus Interface Units (BIU's)
- Two (2) Type C, 2-Channel Card Rack Loop Detector Amplifiers.

Surge Suppression
Each cabinet shall have each input and output surge protected except signal outputs from cabinet load switches. (The load switches act as surge suppressors.)

The surge protector must be electrically connected to the nearest grounded metal structure or nearest ground rod.

Surge protection for power service shall conform to the NEMA TS-2 standard. The product complies when a lab report summary from an independent test laboratory stating the product passes the current NEMA TS-2 (5.4.2.4) specification is submitted with the shop drawings.

Surge protection for all loop, pedestrian button, and pre-emption connections shall have peak surge current protection of at least 10kA with a response time of less than 5 nanoseconds. The product complies when a lab report summary from an independent test laboratory stating the product passes this specification is submitted with the shop drawings.

Units shall be plug mounted in the controller cabinet.

Units shall be unconditionally warranted for at least 5 years.

Manufacturers without publicly advertised 5 year warranties must provide written confirmation that they will warranty the surge suppression unit for five years and this documentation is to be provided with the shop drawing submission.

ITEM 815.1 through **ITEM 816.801** (Continued)

Testing of Grounding System
The Contractor shall perform testing of the equipment grounding system in the presence of the Engineer in accordance with MassDOT Standard Specifications.

Posts and Bases
A traffic signal post shall be a one-piece aluminum (single post + base) construction painted black. Signal base foundations shall not obstruct a sidewalk or crosswalk so that passage by physically challenged persons is impaired and installation shall be in compliance with ADA/AAB standards.

Mast Arms, Poles, and Foundations
Mast arm poles and foundations shall be fabricated and constructed in conformance with the MassDOT Standard Drawings included in the plans.

All mast arm poles shall be Type II galvanized steel monolevers primed and painted black, with shoe bases, unless otherwise directed.

For those mast arms and poles with loading characteristics in compliance with MassDOT's "Overhead Signal Structure & Foundation Standard Drawings" issued December 2015, mast arm poles shall be fabricated and constructed in conformance with the MassDOT's "Overhead Signal Structure & Foundation Standard Drawings" issued December 2015, as included in the plans and as stated below.

Acceptance of Type II steel monolever mast arm poles shall be contingent upon review and approval of shop drawings submitted by the Contractor and stamped by a Civil or Structural Engineer licensed in the Commonwealth of Massachusetts. Should the mast arm loading noted on the traffic signal plans be higher than the loading shown on MassDOT's "Overhead Signal Structure & Foundation Standard Drawings" issued December 2015, the Contractor is responsible to select and design an alternative mast arm pole and arm. Longhand design calculations shall be submitted by the Contractor's design engineer with the shop drawings for all Type II steel monolever mast arms.

For the following two 35' mast arms at intersection of Route 126 (Pond Street) at Algonquin Trail/Harvard Street, each mast arm shall be designed to accommodate loading of a 12 inch 1-way 4-section LED vehicle for signal head "C" or "D".

Station 53+89.4, 40.8 left, 35' mast arm

Station 54+48.1, 28.1 right, 35' mast arm

For those mast arms and poles with loading characteristics in compliance with MassDOT's "Overhead Signal Structure & Foundation Standard Drawings" issued December 2015, mast arm foundations shall be constructed in conformance with the MassDOT's "Overhead Signal Structure & Foundation Standard Drawings" issued December 2015.

ITEM 815.1 through **ITEM 816.801** (Continued)

Construction of PIER foundations shall be performed in accordance with MassDOT's "Overhead Signal Structure & Foundation Standard Drawings" dated December 2015. In the event that soil conditions or ledge prevent the use of MassDOT standard foundation type, shaft foundation design by Lamson Engineering Corporation shall be followed. The design is detailed in memo titled "Mast Arm Foundation Design" dated June 10, 2020.

Based on the information obtained from Borings B-1, B-3, B-4 and B-7; Mast Arm Nos. MA-1 to MA-5 can be supported by 3'-6" diameter drilled shaft socketed 3'-0" into bedrock. If bedrock is encountered above 12' below the top of the drilled shaft, the total embedment depth (soil + rock) need not exceed 12'-0". If bedrock is not encountered 12' below the top of the driled shaft, drilled shaft should be embedded 12'-0" into soil.

Based on the information obtained from Boring B-9, Mast Arm No. MA-6 can be supported by 3'-6" diameter drilled shaft embedded 12'-0" into soil.

Foundation design shall be as follows:

Location No. 1

Foundation Type	Sta./ Offset	Soil Type	Mast Arm Length	Foundation Diameter	Foundation Type & Depth	Rock Socket Length	Vertical Bars	Tie Bars
Shaft (MA-1)	30+43.2 LT 21.5	Wet, Medium Dense, Sand	20'	3.5'	Drilled Shaft into bedrock or embedded into soil (Note 1)	3' (Note 1)	18-#8	#5 @ 12"
Shaft (MA-2)	30+83.5 RT 36.0	Wet, Very Dense, Sand & Boulder	30'	3.5'	Drilled Shaft into bedrock or embedded into soil (Note 1)	3' (Note 1)	18-#8	#5 @ 12"
Shaft (MA-3)	400+23.4 RT 35.2	Wet, Very Dense, Sand & Boulder	20'	3.5'	Drilled Shaft into bedrock or embedded into soil (Note 1)	3' (Note 1)	18-#8	#5 @ 12"
Pier	399+26.6 LT 26.1	Wet, Dense Sand	40'	3.5'	10.5'		18-#8	#5 @ 9"

ITEM 815.1 through **ITEM 816.801** (Continued)

Location No. 2

Foundation Type	Sta./Offset	Soil Type	Mast Arm Length	Foundation Diameter	Foundation Depth	Rock Socket Length	Vertical Bars	Tie Bars
Shaft (MA-5)	53+89.4 LT 40.8	Wet, Dense, Sand	35’	3.5’	Drilled Shaft into bedrock or embedded into soil (Note 1)	3’ (Note 1)	18-#8	#5 @ 9”
Shaft (MA-4)	54+48.9 LT 41.1	Wet, Very Dense, Sand & Gravel	25’	3.5’	Drilled Shaft into bedrock or embedded into soil (Note 1)	3’ (Note 1)	18-#8	#5 @ 12”
Pier	53+71.2 RT 27.4	Wet, Dense, Sand	20’	3.5’	8.5’		18-#8	#5 @ 12”
Pier	54+48.1 RT 28.1	Dry, Dense, Sand	35’	3.5’	8.5’		18-#8	#5 @ 9”

Location No. 3

Foundation Type	Sta./Offset	Soil Type	Mast Arm Length	Foundation Diameter	Foundation Depth	Vertical Bars	Tie Bars
Pier	88+44.0 LT 46.4	Wet, Dense, Sand	40’	3.5’	10.5’	18-#8	#5 @ 9”
Pier	88+62.2 RT 33.5	Wet, Dense, Sand	20’	3.5’	8.5’	18-#8	#5 @ 12”
Shaft (MA-6)	89+59.1 RT 33.9	Wet, Dense, Sand	30’	3.5’	12.0’	18-#8	#5 @ 12”

Note 1: If bedrock is deeper than 12’ below the top of the drilled shaft, 3’-0” min. rock socket is not required for the drilled shaft. Drilled shaft can just be embedded 12’-0” into soil.

ITEM 815.1 through **ITEM 816.801** (Continued)

CEMENT CONCRETE FOUNDATIONS

Foundations for Signal Posts, Mast Arm Poles, and Controller Cabinets Foundations shall be constructed using 4000 psi, ¾ inch, 565 Cement Concrete Masonry conforming to the relevant provisions of Section M4 of the Standard Specifications and the following:

1. Reinforcing steel shall be ASTM A-615, Grade 60.

2. The top forming of cast-in-place units shall extend downward for a minimum of 24" on the side of any foundation. The lower portions of all foundations shall be placed directly against undisturbed earth. No forms or reinforcing for foundations for mast arm poles, span wire poles and control cabinets shall be set nor shall concrete be placed until the excavation has been inspected by the Engineer and his approval to proceed has been given.

Foundations shall not obstruct a sidewalk or crosswalk so that passage by physically challenged persons is not impaired.

Wire Insulation
The contractor should work the necessary utility companies to provide insulation to those overhead wires that are in close proximity to proposed traffic signal infrastructure.

Emergency Vehicle Preemption
New emergency vehicle preemption equipment shall be installed.

Optically actuated emergency preemption equipment shall be installed for local control of the signals during the passing of appropriately equipped emergency vehicles through intersections.

Traffic signal timing plans illustrate the proposed location for the emergency preemption receivers and pre-empt control of the intersections.

The emergency vehicle preemption control system shall consist of a data-encoded phase selector to be installed within the traffic control cabinet. This unit will serve to validate, identify, classify and record the signal from the optical detectors located on support structures at the intersection. Upon receiving a valid signal from the detector, the phase selector shall generate a preempt call to the controller initiating a preemption operation as shown on the plans.

The optical detectors shall be single input, single output units used to control one approach. A minimum of two optical detectors shall be supplied unless otherwise noted in the major item list.

The Contractor shall install a confirmation strobe at each traffic signal location as shown on the plans.

The following description of work specifies the responsibilities involved in the installation of an optical emergency vehicle preemption system.

ITEM 815.1 through **ITEM 816.801** (Continued)

The Contractor is required to supply material and labor, required or shown, for the complete installation of optical preemption equipment including optical detectors, cable, interfacing equipment to the local controller, making electrical connections and all required incidentals. Prior to ordering, the Contractor shall coordinate with the Town of Ashland to ensure that the new preemption equipment is compatible with the Town's existing preemption equipment.

The following are the optical requirements of the emergency preemption system:

The Contractor shall arrange for a trained representative of the manufacturer of the optical energy preemption equipment to perform the following field supervision and turn-on services.

The representative shall initiate documentation for As-Built drawings.

The representative shall demonstrate the system and instruct the drivers of fire fighting vehicles in the operation of the system. Any operation problems occurring within the next 30-days shall be corrected by the Contractor or by a Field Service Representative if the Contractor cannot do so.

The cost of these field supervision and turn-on services shall be included in the Lump Sum Bid Price, and no additional payment shall be made therefore. Preemption System Design and Documentation shall include the following:

Provide the controller manufacturer, engineer, and owner with electrical diagrams.

The installer shall install the equipment consistent with the preemption equipment, the manufacturer's recommended installation procedures and electrical diagrams in a neat and workmanlike manner.

The preemption equipment manufacturer shall be responsible for operational checkouts of the specified preemption functions prior to final acceptance and approval.

Operating checkouts includes the following:

Verifying that the priority system timing and range are properly set.

Preemption equipment warranties are put into effect.

Signal Timing and Sequence under Preemption Control. See preemption data as shown on the Traffic Signal Timing Plans.

ITEM 815.1 through **ITEM 816.801** (Continued)

Equipment Finish and Color

Traffic signal equipment including, but not limited to, signal pole/posts, bases, signal heads, visors (outside), doors, mast arms, pushbutton saddles, controller cabinets, service meter socket box, optical preemption detectors, hardware, and rigid mounting brackets for signal and signs shall be black. The Contractor shall submit to the Engineer paint chips and sample finishes on steel and aluminum of the intended color prior to any work being done under this heading.

Signal heads, doors, visors, mounting brackets, and hardware supplied direct from the manufacturers in the color stipulated above may be acceptable provided it meets or exceeds the finish process for the material indicated below.

Steel Equipment

Galvanizing

All bolts, screws, nuts, rods and washers shall be galvanized in accordance with AASHTO M232 and the Standard Specifications. The hardened machine screws may be electroplate galvanized. Stainless steel studs, bolts, screws, nuts, straps and washers shall not be galvanized. Galvanized hardware need not be painted; however, the ends of bolts, nuts, and washers shall be painted in the field according to section "Touch-up and Repairs." Immediately prior to galvanizing, the steel shall be immersed in a bath of zinc ammonium chloride. The dry kettle galvanizing process shall be used.

All steel components, other than above, shall be galvanized after fabrication in accordance with AASHTO M111. The galvanizing bath shall contain nickel (0.05% to 0.09% by weight).

Galvanized members requiring shop assembly shall be welded and drilled prior to galvanizing.

Touch-Up and Repairs

Should any damage occur to the galvanized coating during shipping or handling at the job site, the Contractor shall repair and touch-up any damaged areas to the satisfaction of the Engineer and the following:

Touch-up of galvanizing before the finish coat is applied shall be accomplished by applying galvanizing repair paint. The dry film thickness of the applied repair paint shall not be less than 4.0 mils. Applications shall be in accordance with the manufacturer's instruction.

Field touch-up procedures shall conform to the recommendations of the Galvanizer. Touch-up of the finish coat shall be by applying a coating of a two-part urethane, as supplied by the Galvanizer, to achieve a dry film thickness of at least 4.0 mils. Prior to the application of the paint, remove all damaged coatings down to a solidly adhered coating and apply galvanizing repair paint as primer. Allow the primer to dry for at least 4 hours prior to top coating.

The Contractor shall also use the touch-up paint material and procedures to paint the galvanized hardware used in field erection that has not been finish coated previously.

ITEM 815.1 through **ITEM 816.801** (Continued)

A Certificate of Compliance of the powder coating system is required for the Engineer's approval.

Coating Over Galvanized Steel
Prior to painting, the applicator shall ensure that all components are smooth and without sharp protrusions that would present and injury hazard to pedestrians. Also, the fabricator shall ensure that all welds shall be cleaned thoroughly in accordance with good practice and according to AWD D1.5 and ASTM A123-89a and shall have a suitable surface to accept the galvanizing.

In preparation for the two coat painting system, the surface shall be blast cleaned in accordance with the requirements of SSPC SP7 "Brush-Off Blast Cleaning" or other method producing equivalent results and uniform profile, to achieve a 1.0 to 1.5 mils anchor profile as indicated be a Keane Tator profile comparator or similar device. The creation of the anchor profile shall be performed prior to the formation of "white rust" on the galvanized surface.

Following blast cleaning, the zinc coating thickness shall be measured to verify that the coating thickness is in accordance with AASHTO M111.

A two-coat painting system shall be applied by the Galvanizer in his own facility within twelve hours of galvanizing the steel components.

The prime coat material shall be a polyamide epoxy applied to minimum dry film thickness of 2.0 to 4.0 mils (0.002-0.004 in.) and force cured as given below for the finish coat.

The finish coat material shall be a two component, catalyzed aliphatic urethane applied by airless spray to a minimum dry film thickness of 4.0 mils.

The color shall be BLACK. The fabricator shall submit to the Engineer for approval, paint chips of the intended color prior to any work being done under this heading.

All finish coat material shall be applied under conditions within the following tolerances:

Air Temperature	50°F min., 90°F max.
Surface Temperature	50°F min., 100°F max.

Surface temperature must be at least 5°F above the dew point. The finish coat shall be cured in a booth capable of maintaining 150°F for 2-4 hours.

ITEM 815.1 through **ITEM 816.801** (Continued)

Aluminum Equipment
All aluminum signal posts and poles shall have a powder coat finish BLACK in color. The coating shall be a polyester-TGIC (triglycidyl isocyanurat) resin system conforming to the following:

Quality	Test	Limits
Abrasion	Taber abraser CS-10, 1000 gram load, 1000 cycle, ASTM D4060	100 mg. Maximum weight loss
Adhesion	ASTM D .59 Initial 1000 hours	 5A 5A
Gloss	ASTM D 523 60° - 600 hours 60° - 1000 hours	 82% retention 90% retention (washed)
Hardness	ASTM D 3363	2H – No Gouge
Impact	ASTM D 2794 Direct	Pass 80 inch-lb.
Salt Spray Resistance	ASTM B 177 ASTM D 1654 1000 hours unscribed 400 hours scribed	 Table 2-10 Table 1-10
Weather Resistant	ASTM G 23, 1000 hours, 18 min. waterspray, 102 min. light	No film failure
Color	Black	
Identify	Ifrared fingerprint	Match
Flexibility	180° bend; ½" dia, mandrel within 10 seconds	No breaks, flaking or cracks. Tested with a Q-panel with 2 mils or less of coating
Humidity	ASTM D 2247, 1000 hours	No blister or film failure
Thickness		4 mils +/- 1 mils
Mar Resistance		Good

Signal Heads
Signal heads shall be rigid mounted on mast arms, with the bottom of all signals at the same height. All traffic signal lenses shall be 12" in diameter. Non-louvered backplates shall be 5" with 3" yellow tape retroreflective border and provided on all signal heads where noted on the plans. All signal heads shall be equipped with light emitting diode (L.E.D.) 12" modules as noted on the plans.

Signal heads shall be made of aluminum. Signal heads shall be installed with 3/4 tunnel visors unless otherwise noted on the plans.

ITEM 815.1 through **ITEM 816.801** (Continued)

TRAFFIC SIGNAL LED MODULE

All signal and pedestrian displays shall be equipped with LED signal modules. All red, amber, green, and pedestrian signal housings with the exception of optically programmed and fiber optic housings and shall conform to the following where applicable:

- ITE's Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Arrow Traffic Signal Supplement, Dated July 1, 2007
- ITE's Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Circular Signal Supplement, Dated June 27, 2005.
- ITE's Pedestrian and Countdown Signal Modules Compliant to PTCSI - Part 2 Light Emitting Diode (LED), Dated, February 2011
- On the MassDOT Traffic Signal Approved Equipment List

For an LED module to installed on this project, the LED module shall have approval from the MassDOT Traffic Control Products Approved Equipment Committee and be included on the Traffic Control Products List prior to the date of this proposal

To prevent the LED module warranty from being voided, the connecting leads on the module shall not be cut. The original LED module leads shall be connected to the signal head terminal block as continuous wire without splices.

The LED signal module will be replaced or repaired by the manufacturer if it exhibits one of the following:

- A failure due to workmanship or material defects within the first 60 months of field operation.
- A greater than 40 percent light output degradation or a fall below the minimum intensity levels (as defined by the latest ITE performance specifications) within the first 36 months of field operation

ITEM 815.1 through **ITEM 816.801** (Continued)

Accessible Pedestrian Signal
Accessible Pedestrian Signal (APS) system shall be provided as specified on the plans. All pedestrian heads shall include audible devices in conformance with the MassDOT Accessible Pedestrian Signal Installation Policy, dated June 1, 2012 and as revised. The system shall provide a vibro-tactile ADA compliant 2" pushbutton with a raised directional arrow and audible sounds during the walk cycle. The pushbutton shall be accompanied with a R10-3e sign mounted above the pushbutton per the APS system manufacturer's recommendation; the costs of furnishing and installation of R10-3e signs shall be considered incidental to the cost of the traffic signal system.

Where the two APS are separated by 10 feet or more, the audible walk indication shall be a percussive tone; where the distance between two APS is less than 10 feet, a speech walk message shall be used for the audible walk indication. A locator tone shall be provided during the pedestrian clearance and don't walk phases. Sound will be emitted from inside a unit via a waterproof speaker mounted behind the pedestrian sign. All audible tone duration and volume shall be set in accordance with the latest MUTCD requirements.

The accessible pedestrian signal shall consist of a pedestrian pushbutton unit, control unit, and pedestrian pole unit. The APS system to be used shall be on the MassDOT Approved Equipment List.

Pedestrian Heads
All pedestrian heads shall be 16-inch, single units, with countdown timers. Pedestrian head indications shall be illuminated L.E.D. type displaying the graphical symbols of a walking person and/or upraised hand and countdown timers. All LED indications on the pedestrian signal shall have an automatic dimming circuit for night illumination to reduce long-term degradation to the LEDs. Pedestrian heads shall be made of aluminum.

Each visual pedestrian indication shall be complemented by a time display indication. Each time display indication shall be self-programming and microprocessor based, with red LEDs used in the display. The time display will countdown the amount of time remaining in flashing don't walk time interval for viewing by the ambulatory public. The time display pedestrian indication shall meet or exceed the specifications of the TASSIMCO Countdown Pedestrian Signal.

Pedestrian Push Buttons
Pedestrian push button shall be an all one-piece construction designs with raised cast legend and a plunger type pushbutton with a minimum 2" diameter meeting all requirements of the ADA. The force required to activate the controls shall be no greater than 3.5 Pound Force. Pedestrian push buttons shall be 4-wire. Pedestrian push button sign saddle shall be painted black. Countdown signage shall be 9"x15".

Pedestrian push buttons shall be located as close as practicable to the sidewalk curb ramp serving the controlled crossing and shall permit operation from a clear ground space. If two crosswalks, oriented in different directions, end at or near the same location, the positioning of pedestrian push buttons and/or legends on the pedestrian push button signs should clearly indicate which crosswalk signal is actuated by each pedestrian push button.

ITEM 815.1 through **ITEM 816.801** (Continued)

A maximum mounting height of 42 inches above the finish sidewalk grade shall be used for pedestrian push buttons. Mounting height shall be ADA compliant.

Where necessary, the Contractor shall provide extension bracket mounted on the signal poles such that the pedestrian pushbutton detector shall be located within 10 inches from the back of wheelchair ramp level landing. The extension bracket including pushbutton and signs shall not encroach into level landing resulting in a level area smaller than 4 feet by 5 feet. The bracket extension shall provide the provision of mounting pushbutton and 9 inch by 15 inch sign required per ADA and MUTCD guidelines. The bracket extension shall be installed per manufacter's recommendation and the length of the extension shall be field verified and adjusted as needed. If the final installed location of a pushbutton and sign is located outside of the specified range, the Contractor shall be responsible for reinstalling the bracket extension with pushbutton at the specified location at no additional cost. The final location shall be approved by the Engineer.

Software
All local controller, malfunction management unit, loop detector amplifier and emergency vehicle preemption software shall be supplied with the latest available revision. Any software upgrades released by the manufacturer shall be supplied at no additional cost to the municipality for a period of five years after acceptance of the traffic signal installation.

Existing Signal Removal and Stockpiling
The Contractor shall maintain operation of the existing traffic signal systems to be removed throughout the construction period and until the new signal system is operational. The Contractor may install temporary supports for signal heads as necessary to allow for construction activities. Any temporary installation shall be in conformance with the MUTCD in every case. If an existing signal is to be turned off temporarily to allow controller switchover or requiring temporary turn-off, a police detail shall be used to control traffic at the intersection until signal operations are restored. Traffic signal control downtime shall be minimized. Unless called out to be adjusted or otherwise retained on the Plans, existing hand holes and hand hole castings shall be removed and discarded and all conduit shall be plugged and abandoned.

The Contactor shall avoid damaging existing equipment and materials while removing signal equipment. Damage that occurs due to the action or inaction of the Contractor shall be repaired by the Contractor at no additional cost.

Unless otherwise indicated on the Plans, a Plan callout to remove and dispose the foundation of a traffic signal pole or cabinet shall require the removal of the foundation, including all reinforcement, ground rods, and conduit/wiring within, to a minimum depth of twenty four (24) inches below the finished grade surrounding the foundation, with the remaining portion of the foundation to remain buried in place. The resulting excavated areas shall be backfilled with suitable material, compacted, and finished in accordance with the applicable Section of the Standard Specifications so that the patched areas will match existing conditions to the satisfaction of the Engineer.

ITEM 815.1 through **ITEM 816.801** (Continued)

Once construction is completed and the new signal system is in operation, the old signal system shall be completely removed and stacked as directed by the Engineer in accordance with Section 815.65. Removed signal equipment shall be stacked at MassDOT District 3 storage facility at 403 Belmont Street, Worcester, MA. If MassDOT elects not to retain the signal equipment, the Contractor shall dispose of the equipment at their own expense.

Documentation
Each programmable local hardware component (i.e. controller, malfunction management unit, loop detector amplifier, emergency vehicle preemption phase selector) shall be initially programmed by the Contractor based on information contained on the plans.

Note: Three bound sets of hard copy programming per device shall be supplied to the municipality by the CONTRACTOR.

Upon final acceptance of the signal by MassDOT, the Contractor shall supply 8½"x11" or 11"x17" laminated copy of the traffic signal design plan and sequence and timing chart to be left in the cabinet documentation envelope mounted on the inside of the cabinet door.

Electric Power Cost
The payment for power under Items 815.1, 815.2 and 815.3 will be by the Contractor during the construction period. After the project's completion and acceptance by MassDOT, the utility charges will be to the responsibilioty of the Town of Ashland.

Traffic Signal Timing – Fine Tuning
The Contractor shall notify the MassDOT and Town of Ashland in writing of the starting date of the fine-tuning period and shall have MassDOT and the Town present for an inspection of the traffic signal.

Technical Manuals and "Box Prints"
Per MassDOT Specifications the Contractor shall provide prior to final acceptance as furnished by the manufacturer.

1. Controller Unit, Flasher, Load Switches, Conflict Monitor and all external logic units.
   a. Electronic schematic of circuit boards.
   b. Pictorial layout of components on circuit boards.
   c. Service manual for troubleshooting.
   d. Manual describing the theory of operations.
   e. Parts list showing manufacturer's part number and location.

2. Controller cabinet.
   a. Cabinet wiring diagram (3 sets).
   b. Filed wiring diagram (3 sets).

ITEM 815.1 through **ITEM 816.801** (Continued)

Basis of Payment
Items 815.1, 815.2 and 815.3 will be paid for at the respective contract unit price, Lump Sum. This price shall constitute full compensation for all labor, materials, equipment, and incidentals necessary to complete the work at each location as specified.

Conduit shall be paid separately under Item 804.3.

Pull boxes shall be paid separately under Items 811.27 and 811.31.

The six drilled shaft mast arm foundations shall be paid separatly under Item 945.102, Drilled Shaft Excavation 3.5 Foot Diameter, Item 945.202, Rock Socket Excavation 3.5 Foot Diameter, and Item 945.502, Drilled Shaft 3.5 Foot Diameter.

Items 816.80 and 816.801 will be paid for at the respective contract unit price, Lump Sum, which price shall include all labor, materials, equipment, and incidentals necessary to complete the work at each location.

No separate payment will be made for dismantling, loading, transporting, and stacking of the traffic control signals as designated above, the excavation and disposal of the existing foundations, the supplying and replacing of compacted gravel backfill and restoration or replacement, in kind, of the area where foundations and posts are removed, but all costs in connection therewith shall be included in each of the Contract unit price bid.

ITEM 821.50	**LIGHT POLE AND SINGLE PENDANT LUMINAIRE W/ 8' ARM AND BANNER ARM**	**EACH**
ITEM 821.51	**LIGHT POLE AND SINGLE PENDANT LUMINAIRE W/ 12' ARM AND BANNER ARM**	**EACH**
ITEM 821.52	**LIGHT POLE AND SINGLE PENDANT LUMINAIRE W/ 4' ARM AND BANNER ARM**	**EACH**
ITEM 821.53	**LIGHT POLE AND DOUBLE PENDANT LUMINAIRE AND BANNER ARM**	**EACH**

The work to be done under this item shall conform to the following:

Drawing Designation: PT-1 (Item 821.50, 821.51, 821.52) & PT-2 (Item 821.53)

A. Light Pole:
1. Qty: 1
2. 25'-0" Overall Shaft Height
3. Diameter: 7" to 3.5" Round Tapered Stainless Steel Pole
4. Diameter Transition: Constant Linear Taper
5. Photometric Center: Approx. at 25'-0"
6. Base: 7" Round
7. Bot Circle: 10" ASTM A240 stainless steel with slotted bolt holes.
8. Tenon Size: 4" x 5.5"

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ITEM 821.50 through **ITEM 821.53** (Continued)

9. Wall Thickness: .109
10. Hand Hole: 3" x 5" opening, with reinforced flush doorway and grounding lug, opposite opening inside pole.
11. Access Door: Flush with pole and inline with base cover access.
12. Ground Provision: 5/16" – 16 ground lug welded to inside wall of pole shaft, opposite hand hole opening, to accommodate ground stud (ground stud by others).
13. Material:
    a. Pole shaft: ASTM A240 201L Stainless Steel
    b. Anchor bolts: ASTM F1554 grade 55 steel w/ 12" min. galvanized threads.
    c. Base Plate: ASTM A240 stainless steel with circumferential welding top and bottom, to pole.
14. Finish:
    a. Prime Coat: One component moisture cure etching primer, two component high solids aliphatic.
    b. Shaft, Base and Cross Arm finish coat: Polyurea coat system - Gloss Black
    c. Testing: In accordance with ASTM
    d. Salt Spray: ASTM B117 Salt Spray exposure: 5,000 hr min.
15. Anchor Bolt: (4) 1" x 36" +4" Leg (fully galvanized with (2) hexagonal nuts and (2) flat washers per bolt).
16. Bolt Projection: 5"
17. ❺ GFCI Outlet: See basis of design.

B. Base Cover:
1. Qty: 1 (Item 821.50, 821.51, 821.52), 2 (Item 821.53)
2. 2'-9" Overall height.
3. Diameter: 1'-5"
4. Material: Cast Aluminum
5. Finish
    a. Prime Coat: One component moisture cure etching primer, two component high solids aliphatic.
    b. Shaft, Base and Cross Arm finish coat: Polyurea coat system - Gloss Black
    c. Testing: In accordance with ASTM
    d. Salt Spray: ASTM B117 Salt Spray exposure: 5,000 hr min.
6. Ashland Town Seal Casting: REMOVED

C. Banner Arm:
1. Qty: 1 (Item 821.50, 821.51, 821.52), 2 (Item 821.53)
2. Overall Height: 5'-0"
3. Location: 15'-0" AFF for bottom arm, 20'-0" AFF to top arm.
4. Material: Spring loaded cast aluminum with fiberglass
5. Location: Located on sidewalk side of pole, 180 degrees offset from cross arm.
6. Finish: Gloss Black.

ITEM 821.50 through **ITEM 821.53** (Continued)

D. Cross Arm:

1. Qty: 1 (Item 821.50, 821.51, 821.52), 2 (Item 821.53)
2. Arm Rise: 2'-10 1/2"
3. Arm Span: 4'-0"(Item 821.52), 8'-0" (Item 821.50, 821.53), 12'-0" (Item 821.51)
4. Material: 2" (2.38 O.D.) Sch. 40 pipe
5. Attachment to Pole: Steel Outer Slipfitter, 4" ID.
6. Securement: 3 Stainless steel screws.
7. Finish:
   a. Prime Coat: One component moisture cure etching primer, two component high solids aliphatic.
   b. Shaft, Base and Cross Arm finish coat: Polyurea coat system - Gloss Black
   c. Testing: In accordance with ASTM
   d. Salt Spray: ASTM B117 Salt Spray exposure: 5,000 hr min.

E. Luminaire:

1. Qty: 1(Item 821.50, 821.51, 821.52), 2 (Item 821.53)
2. Height: 2'-1 1/8"
3. Width: 1'10"
4. Material:
   a. Heavy grade A319 cast aluminum housing, with attached decorative one-piece spun aluminum alloy bottom shroud. Minimum thickness of 0.09".
   b. Lens: #9000 clear borosilicate glass (fully annealed), with minimum thickness of 0.3".
5. Lens: Sag glass lens, secured by means of a cast A319 aluminum holding ring. Sealed to provide IP66 ingress rating. Continuous circular gasket rated for 270°F holds the lens in place with the cast ring assembly.
6. Fixture Connection: Stainless steel alloy hardware.
7. Finish:
   a. Housing finished with 13 step KingCoat Super Durable polyester TGCI Glass Black powder coat.
   b. Testing: In accordance with ASTM
8. Lamping: 120 watt LED
9. Lumens: 14,470 lm
10. Voltage: Universal Electronic, wired at 120v to 277v
11. CCT: 4000K
12. CRI: Minimum of 70
13. Distribution: Type III, achieved through an integral refractive lens.
14. Driver: Class 2 dimmable driver w/ IP66 minimum rating.
    a. Power Factor: 0.9 or greater
    b. Harmonic Distortion: 20% or less
    c. Temp Range: -35deg Celsius to 65deg Celsius
    d. Surge Protection: ANSI C136.2 and designed to withstand surges of up to 20kA and 10kV of transient line surge as per IEEE C62.41.2 C
    e. EFT Protection: In-line ferrite choke
15. Driver Location: Integral to fixture, mounted to heavy duty fabricated galvanized steel bracket to allow for tool-less maintenance.

ITEM 821.50 through **ITEM 821.53** (Continued)

16. Thermal Management: LEDs mounted to metal core circuit board on high performance heat sink, which is vented to outside air to provide dynamic airflow and cooling.
17. Life: L70 of 100,000 hours.
18. House Side Shield: Attached micro-prismatic modification to optical lens.
19. Warranty:
    a. Installation checkout: Upon completion of initial system installation and fixture cleaning, the Trade Subcontractor shall notify the Engineer that the system has been completed. At this time, the Contractor shall verify that the installation has been done in full accordance with the design and specification and is in full and complete working order.
    b. The Trade Subcontractor and Manufacturer shall guarantee all lighting fixtures and major components, except lamps, for a minimum period of one (1) year after acceptance of the project and final payment is made. The guarantee shall be in an acceptable form to the Engineer, and shall be signed and notarized by a person or persons authorized to execute such a document on behalf of the company.
    c. The Trade Subcontractor and Manufacturer shall guarantee all LED modules and drivers for a period of five (5) years after acceptance of the project and final payment is made. The guarantee shall be in an acceptable form to the Engineer, and shall be signed and notarized by a person or persons authorized to execute such a document on behalf of the company.

20. Listing & Rating:
    a. Minimum IP66
    b. All fixtures shall be manufactured in strict accordance with the appropriate and current requirements of the Underwriters Laboratories Inc. "Standards for Safety," and others as they may be applicable. A UL listing shall be provided for each stock fixture type, and the appropriate label or labels shall be affixed to each fixture in a position concealing it from normal view. Testing and labeling by other nationally recognized facilities such as ETL will be acceptable if submitted to and approved by the Engineer in advance. UL listing of components only is not acceptable for luminaires for this project.
    c. Tested and in conformance w/ IESNA LM-79 & LM-80 test standards at 25 degree Celsius
21. Submittals
    a. Shop drawings shall clearly indicate the Contract Drawing number of fixture details used as a reference in the development of the shop drawings, and the names of the job Engineer.
    b. The Contractor shall coordinate all his/her lighting fixture drawings with the drawings and details of the Civil, Structural, Electrical, Mechanical, and other related trades to assure a perfect and efficient installation.
    c. No variation from the general arrangement and details indicated on the drawings shall be made on the shop drawings unless required to suit the actual conditions on the premises, and then only with the written approval of the Engineer.
    d. Catalogue cuts lacking sufficient detail to indicate compliance with Contract Documents will not be acceptable.

ITEM 821.50 through **ITEM 821.53** (Continued)

e. Timely submission: Shop drawings for all lighting fixtures shall be received no later than sixty (60) days after award of Contract.
f. Review of shop drawings or samples does not waive Contract requirements.
g. Photometric Data: Where indicated on the fixture schedule and Contract Drawings, supply complete photometric data for the fixture, including optical performance rendered by independent testing laboratory, developed according to methods of the Illuminating Engineering Society of North America.
h. Supply complete photometric data for any fixture offered in substitution for a specified fixture.
i. Test Reports: All submittals to be provided with the following test results: LM-79 Photometric Test Reports, LM-80 and TM-21 Lumen Maintenance Documentation, Paint Adherence Testing, Minimum IP66 Certificate(s), Vibration Testing per ANSI C136.31-2010, Written Warranties (minimum requirements detailed below), Manufacturer Experience Records, Electrical Data for LED Drivers, PCB, LEDs, Wiring Diagrams, product certificates for pole loading per AASHTO 2009.

22. Shop Drawings

a. Submit shop drawings to the Engineer for review in accordance with the requirements of the Contract Documents.
b. Shop drawings shall include details and cuts of each fixture type scheduled herein, and shall include for each type the following information:
    1. Type, lamping, size, material exterior and interior, ballast type (where applicable), lenses, baffles, finishes, and means and methods of attachment.
    2. Photometric data for each fixture.
    3. Thermal and acoustic test data for all ballasts, transformers, and/or drivers.
c. Shop drawings for poles and mounting hardware shall include the following information:
    1. Pole drawings must be stamped and signed by a MA Registered Professional Engineer.
    2. Wind load calculations
    3. AASHTO testing information.
d. Clearly indicate work to be provided by other trade subcontractors and coordinate accordingly.

❺ ADDENDUM NO. 5, AUGUST 27, 2020

ITEM 821.50 through **ITEM 821.53** (Continued)

Basis of Design

Pole:

- Millerbernd MFG # DTA-F-073-250-PT6-R-FP-BSP
- Spring City Electrical MFG# SSSHSM-G11-0700-25- TN2.875/6.00-CW (GLOSS BLACK)
- King Luminaire # KMRF-700A253-P9=GF-HH-AB-BK (GLOSS BLACK)
- An Approved Equal

Luminaire:

- King Luminaire # K820-P4FL-III-120(SSL)8060-120V-KPL21-4K-BK-PR-HSS
- Ghisamestieri # GAM F_GF09-1000-GLOSS BLACK
- Spring City Electrical MFG # ALMIVY-FG-LE120-120-40-CR3-CU (GLOSS BLACK)
- An Approved Equal

Cross Arm:

- Millerbernd MFG # BA4 (Item 821.52), BA8 (Item 821.50, 821.53), BA12 (Item 821.51)
- King Luminaire # KA30-T-1-96-BK(GLOSS BLACK)
- Spring City Electrical MFG # AARCL-1S-96-CU (GLOSS BLACK)
- An Approved Equal

Base:

- Millerbernd MFG # BCJEF1733
- Spring City Electrical MFG # WBCMB-17-CU (GLOSS BLACK)
- King Luminaire: KSB85-BK (GLOSS BLACK)
- An Approved Equal

Banner Arm:

- Britten # PRO2000-SMALL
- Kalamazoo Banner Works # D3 AIROW Series
- Sign Bracket # 300-BB-BSLG
- An Approved Equal

Photocell:

- EYE Lighting # EYE-124-DSS-BK
- Gateway International 360 # GW-124
- Intermatic # LED4536SC
- An Approved Equal

House Shield:

- King Luminaire # 50-01272
- Ghisamestieri # GAM - F-BACK SHIELD
- Spring City Electrical MFG # IVY-HSS
- An Approved Equal

❺ GFCI Receptacle:

- Hubbell #GF20BKLA
- Eaton #SGF15BK
- Leviton #R95-GFTR2-0KE
- An Approved Equal

❺ ADDENDUM NO. 5, AUGUST 27, 2020

ITEM 821.50 through **ITEM 821.53** (Continued)

❺ Receptable Cover:

- Taymac #MX4280S
- Red Dot #CKSUV
- Raco #MX4280S
- An Approved Equal

Method of Measurement
Item 821.50 through Item 821.53 will be measured per Each unit, complete, in place, and approved.

Basis of Payment
Item 821.50 through Item 821.53 will be will be paid for at the respective contract unit price, per Each, which price shall include all labor, materials, equipment, and incidentals required to complete the work.

ITEM 823.61	**HIGHWAY LIGHTING LOAD CENTER NO.1**	**LUMP SUM**
ITEM 823.62	**HIGHWAY LIGHTING LOAD CENTER NO.2**	**LUMP SUM**

The work under these items shall conform to the relevant provisions of Subsection 820 of the Standard Specifications and the following:

The work shall include furnishing and installing the highway lighting load centers at the locations shown on the plans.

Materials
The highway lighting load center shall be as follows:

A. Enclosure

The enclosure shall be a NEMA 3R rated UL: listed convection ventilated and consist of a cabinet and a gasketed door assembly, constructed from 5052-h32 sheet aluminum alloy (less than 0.02% copper) of at least 3,175mm thickness. The enclosure shall be free of dents, cracks and other imperfections.

The enclosure base shall be reinforced for pedestal mounting on a concrete base. Refer to plans and specifications for anchor bolt and mounting details to withstand dead loads and predicted dynamic loads developed by a minimum wind velocity of 90 MILES per hour with an additional 30% gust factor. The enclosure manufacturer shall review modifications or comments shall be so noted in the submittals.

The enclosure shall be provided with (2) two adjustable ”c” mounting channels on both side walls and back wall of the enclosure and an aluminum back panel. The construction features and details shall comply with the specified product.

ITEM 823.61 and **ITEM 823.62** (Continued)

B. Panelboard

The branch circuit breakers frame shall be rated 100 amperes with a UL listed interrupting rating of 18,000 amperes symmetrical at 240 volts.

The circuit breakers control coil shall be controlled via one (1) time clock and photocell, with the division of the controlled circuits as directed in the field. The circuit breakers control circuits shall be wired to an insulated terminal strip in a workmanlike manner.

C. Receptacle

Receptacle shall be a specification grade NEMA 5-20R ground fault circuit interrupter type and stainless steel cover in a surface utility outlet box. Receptacle shall be manufactured by Hubbell, Leviton, Bryant, or an approved equal.

D. Switch and Lighting Fixture

Switch shall be specification grade 120/277VAC 20amp switch and stainless steel cover in a utility outlet box. Lighting fixture shall be a surface mount 2'-0" long fluorescent with zero degree ballast.

E. Meter Socket

Meter socket shall be utility company approved UL listed 200 amp 240/120V 1 phase 3 wire outdoor type. Number of terminals, bypass release and other features shall be provided as to match utility meter.

F. Grounding Electrode

Grounding electrodes shall be ¾" diameter by 8' long copperweld rods. Rods shall be driven vertically. Coordinate with all existing conditions and underground utilities, and follow "call before dig" procedures prior to driving the rods.

Grounding Requirements

A. Ground all systems and equipment in accordance with best industry practice and herein.

B. Provide grounding bonds between all metallic conduits of the light and power system which enter and leave cable chambers or other non-metallic cable pulling and splicing boxes. Accomplish this by equipping the conduits with bushings of the grounding type individually cross connected.

C. Bond metallic conduits containing grounding electrode conductors and main bonding conductors to the ground bus service enclosure and/or grounding electrode at both ends of each run utilizing grounding bushings and jumpers.

ITEM 823.61 and **ITEM 823.62** (Continued)

D. Provide grounding bonds for all metallic conduits of the light and power system which terminate in pits below equipment for which a ground bus is specified. Accomplish this by equipping the conduits with bushings of the grounding type connected individually to the ground bus.

E. Provide supplementary ground bonding where metallic conduits terminate at metal clad equipment (or at the metal pull box of equipment) for which a ground bus is specified.

   Accomplish this by equipping the conduits with bushings of the grounding type connected individually by means of jumpers to the ground bus. Exclude the jumpers where directed.

F. Each grounding type bushing shall have the maximum ground wire accommodation available in standard manufacture for the particular conduit size. Connection to bushing shall be with wire of this maximum size.

G. Bonding conductors on the load size of the service device and equipment grounding conductors shall be sized in relation to the fuses or trip size of the over current device supplying the circuit.

Each street lighting power control cabinet shall be provided with all necessary components as listed below and all necessary accessories to complete the system. Refer to electrical drawings for power control cabinet wiring schematic and proposed arrangement.

Main breaker secondary service entrance shall be grounded per code.

Refer to plans and specifications for street lighting power cabinet foundation requirements.

Installation
The Contractor shall notify the respective electric utility company immediately following the Notice to Proceed from MassDOT to generate a Work Order for the new load center services.

The service and all costs and or fees required by the respective utility provider to perform the work associated with this service shall be included in the cost of this item.

Location and orientation of the highway lighting load centers shall be field determined with the Engineer to ensure that access to the cabinet and physical protection is sufficient to protect from damage. The location shall not prohibit pedestrian travel. All branch circuitry originating from the cabinet shall be routed directly into the circuit breakers. Provide empty (2)-1" and (2) 1 ½" stub outs to below grade to the nearest non paved area for future use.

Cabinet shall be installed per manufacturer's requirements for a level and plumb installation. Provide touched up finish paint as required for any blemishes.

ITEM 823.61 and **ITEM 823.62** (Continued)

Basis of Payment
Item 823.61 and Item 823.62 will be paid for at the respective contract unit price, Lump Sum, which shall include all labor, materials, equipment, and incidentals necessary to complete the work.

ITEM 824.211 RECTANGULAR RAPID FLASHING BEACON (AC POWERED) LUMP SUM

The work under this item shall conform to the relevant provisions of Subsection 800 of the Standard Specifications, the Plans, and the following:

The work shall include furnishing and installing an AC-powered, pedestrian actuated, rectangular rapid flashing beacon (RRFB) system on west side of Pond Street (Route 126) to the south of Butterfield Drive as shown in the plans. RRFBs are intended to provide supplemental warning to approaching vehicles of the potential for pedestrians to be crossing in an adjacent crosswalk.

Materials
An AC powered RRFB system shall, at a minimum, consist of the following items, which shall be included in the lump sum bid:

- (1) concrete foundations;
- (1) 15’ traffic signal posts and pedestals;
- (1) APS pushbutton systems;
- (2) dual rectangular yellow LED beacons in NEMA enclosures;
- (1) 9”x12” R10-25 (PUSH BUTTON TO TURN ON WARNING LIGHTS) signs;
- (2) 30”x30” W11-2 (Pedestrian Warning);
- (1) 24”x12” W16-7PR and (1) 24”x12” W16-7PL (Diagonal Downward Arrow) signs;
- (1) NEMA Type 3R or higher enclosures to house:
  - Electrical components, including wiring and solid-state circuit boards;
  - On-board user interface;
  - Battery; and
  - Frequency hopping spread spectrum (or other alternate FCC approved) wireless activation unit with a minimum 150’ range; and
- All mounting and supporting hardware and wiring necessary to complete a working system.

RRFB controller and LED beacons, APS pushbutton systems, and traffic signal posts and pedestals shall be listed on the Qualified Traffic Control Equipment List. Pedestals shall be cast iron.

ITEM 824.211 (Continued)

The light intensity of the LED beacons during daytime conditions shall meet the minimum specifications for Class 1 yellow peak luminous intensity in the Society of Automotive Engineers (SAE) Standard J595 (Directional Flashing Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles) dated January, 2005. An automatic signal dimming device shall be included to reduce the brilliance of the LED beacons during nighttime conditions.

All signs shall be MUTCD-compliant. Rl0-25 signs shall have a black border and legend on a white background. Wll-2, W16-7PR, and W16-7PL signs shall have a black border and legend on a fluorescent yellow-green background. All sign sheeting materials shall be per Subsection 828.41.

Rl0-25 signs may be integrated into the APS pushbutton system as a single unit or mounted separately on Type A aluminum.

W11-2, W16-7PR, and W16-7PL signs shall be Type A aluminum per Subsection 828.42.

Any proprietary software required for the programming and/or operation of the system shall be included at no additional cost.

Functional Requirements
The RRFB system shall remain dark until pedestrian actuation.

Upon actuation, all LED beacons shall activate and flash in a rapidly flashing sequence. Each sequence shall last 800 milliseconds and there shall be 75 sequences per minute. The sequence shall be the same for each pair of LED beacons in an enclosure and shall be as follows:

1. The RRFB indication on the left-hand side shall be illuminated for approximately 50 milliseconds.
2. Both RRFB indications shall be dark for approximately 50 milliseconds.
3. The RRFB indication on the right-hand side shall be illuminated for approximately 50 milliseconds.
4. Both RRFB indications shall be dark for approximately 50 milliseconds.
5. The RRFB indication on the left-hand side shall be illuminated for approximately 50 milliseconds.
6. Both RRFB indications shall be dark for approximately 50 milliseconds.
7. The RRFB indication on the right-hand side shall be illuminated for approximately 50 milliseconds.
8. Both RRFB indications shall be dark for approximately 50 milliseconds.
9. Both RRFB indications shall be illuminated for approximately 50 milliseconds.
10. Both RRFB indications shall be dark for approximately 50 milliseconds.
11. Both RRFB indications shall be illuminated for approximately 50 milliseconds.
12. Both RRFB indications shall be dark for approximately 250 milliseconds.

ITEM 824.211 (Continued)

The flash rate of each individual RRFB indication, as applied over the full flashing sequence, shall not be between 5 and 30 flashes per second.

All RRFBs within the system shall commence and cease operation simultaneously.

The length of the flashing cycle upon actuation shall be per the plans. These settings shall be user-programmable through the on-board user interface. No-fee wireless (Wi-Fi, Bluetooth®, etc.) may be used as an alternative programming method.

Each APS pushbutton shall have a tactile arrow and locator tone. The tactile arrow shall be oriented to point in the direction of the crosswalk. The locator tone shall have a duration of 0.15 seconds or less and shall repeat at 1-second intervals. The locator tone shall be set 2 to 5 dBA above ambient sound, shall automatically adjust intensity, but cap at a maximum volume of 100 dBA. The tone shall be audible whenever the LED modules are not active.

Upon activation of the LED modules, a speech message shall state, "Yellow lights are flashing." This message shall be stated twice. No vibrotactile or percussive indications shall be used.

If a pushbutton is pressed before the minimum time between actuation intervals is met, a speech message shall state, "Wait," and the locator tone shall resume until the LED modules activate.

Construction Methods
No work shall commence until the shop drawings are approved.

Layout and design of the RRFB system shall conform to the plans.

Conduit installations shall be per Subsection 801.60.

Pull box installations shall be per Subsection 801.61.

Foundation installations shall be per Subsection 801.62. The top of the foundation shall be¼" to 1" proud of the sidewalk and chamfered at 45 degrees. Gaps between the sidewalk and foundation shall be no larger than ¼" and grouted with preformed joint filler.

Equipment grounding shall be per Subsections 813.61 and 813.62.

Service connection shall be per Subsection 813.63. Contractor shall be required to pay all costs associated with the utility connection until final acceptance of the system. Upon acceptance, the contractor shall notify the Ashland Department of Public Works in writing with the account number and meter number in order to transfer payment of the account.

The Contractor shall diagnose and replace any part of the pedestrian activated warning system that is found to be defective in workmanship, material, or manner of functioning within six months of final acceptance by the Engineer. This requirement does not supersede the one-year warranty period on materials specified in Subsection 815.20.

ITEM 824.211 (Continued)

Basis of Payment
Item 824.11 will be paid for at the contract unit price, Lump Sum. This shall include all labor, materials, equipment, and incidentals necessary to complete the work.

Conduit, pull boxes, service connections, and equipment grounding shall be paid for separately under their respective pay items.

ITEM 824.221	**RECTANGULAR RAPID FLASHING BEACON (SOLAR), LOCATION NO. 1**	**LUMP SUM**
ITEM 824.222	**RECTANGULAR RAPID FLASHING BEACON (SOLAR), LOCATION NO. 2**	**LUMP SUM**
ITEM 824.223	**RECTANGULAR RAPID FLASHING BEACON (SOLAR), LOCATION NO. 3**	**LUMP SUM**
ITEM 824.224	**RECTANGULAR RAPID FLASHING BEACON (SOLAR), LOCATION NO. 4**	**LUMP SUM**
ITEM 824.225	**RECTANGULAR RAPID FLASHING BEACON (SOLAR), LOCATION NO. 5**	**LUMP SUM**
ITEM 824.226	**RECTANGULAR RAPID FLASHING BEACON (SOLAR), LOCATION NO. 6**	**LUMP SUM**
ITEM 824.227	**RECTANGULAR RAPID FLASHING BEACON (SOLAR), LOCATION NO. 7**	**LUMP SUM**

The work under these items shall conform to the relevant provisions of Subsection 800 of the Standard Specifications and the following:

Description
Rectangular rapid flashing beacons (RRFBs) are intended to provide supplemental warning to approaching vehicles of the potential for pedestrians to be crossing in an adjacent crosswalk. The work shall include furnishing and installing two pairs of solar-powered, pedestrian actuated, rectangular rapid flashing beacon (RRFB) systems at each location of Locations No. 1 to No. 4, one solar-powered, pedestrian actuated RRFB system at Location 5, and a pair of solar-powered, pedestrian actuated RRFB systems at each location of Locations No. 6 and No. 7:

ITEM 824.221 through **ITEM 824.227** (Continued)

Locations

1. South leg of the roundabout at Pond Street (Route 126) at Spyglass Hill Drive and Shaw's Plaza
2. West leg of the roundabout at Pond Street (Route 126) at Spyglass Hill Drive and Shaw's Plaza
3. North leg of the roundabout at Pond Street (Route 126) at Spyglass Hill Drive and Shaw's Plaza
4. East leg of the roundabout at Pond Street (Route 126) at Spyglass Hill Drive and Shaw's Plaza
5. East Side of Pond Street (Route 126) to the south of Butterfield Drive
6. Pond Street (Route 126) at about Station 77+75
7. Pond Street (Route 126) at about Station 96+80

Materials

An RRFB system shall, at a minimum, consist of the following items at each location of Locations No. 1 to No. 4, which shall be included in the lump sum bid:

- (4) concrete foundations;
- (4) 15' traffic signal posts and pedestals;
- (4) APS pushbutton systems;
- (4) dual rectangular yellow LED beacons in NEMA enclosures;
- (4) 9"x12" R10-25 (PUSH BUTTON TO TURN ON WARNING LIGHTS) signs;
- (4) 30"x30" W11-15 (Bicycle/Pedestrian Warning) signs;
- (2) 24"x12" W16-7PR and (2) 24"x12" W16-7PL (Diagonal Downward Arrow) signs;
- (4) solar panels;
- (4) NEMA Type 3R or higher enclosures to house:
  - Electrical components, including wiring and solid-state circuit boards;
  - On-board user interface;
  - Battery; and
  - Frequency hopping spread spectrum (or other alternate FCC approved) wireless activation unit with a minimum 150' range; and
- All mounting and supporting hardware and wiring necessary to complete a working system.

ITEM 824.221 through **ITEM 824.227** (Continued)

An RRFB system shall, at a minimum, consist of the following items at Location No. 5, which shall be included in the lump sum bid:

- (1) concrete foundations;
- (1) 15' traffic signal posts and pedestals;
- (1) APS pushbutton systems;
- (2) dual rectangular yellow LED beacons in NEMA enclosures;
- (1) 9"x12" R10-25 (PUSH BUTTON TO TURN ON WARNING LIGHTS) signs;
- (2) 30"x30" W11-2 (Pedestrian Warning);
- (1) 24"x12" W16-7PR and (1) 24"x12" W16-7PL (Diagonal Downward Arrow) signs;
- (1) solar panels;
- (1) NEMA Type 3R or higher enclosures to house:
    - Electrical components, including wiring and solid-state circuit boards;
    - On-board user interface;
    - Battery; and
    - Frequency hopping spread spectrum (or other alternate FCC approved) wireless activation unit with a minimum 150' range; and
- All mounting and supporting hardware and wiring necessary to complete a working system.

An RRFB system shall, at a minimum, consist of the following items at each location of Locations No. 6 and No. 7, which shall be included in the lump sum bid:

- (2) concrete foundations;
- (2) 15' traffic signal posts and pedestals;
- (2) APS pushbutton systems;
- (4) dual rectangular yellow LED beacons in NEMA enclosures;
- (2) 9"x12" R10-25 (PUSH BUTTON TO TURN ON WARNING LIGHTS) signs;
- (4) 30"x30" W11-2 (Pedestrian Warning);
- (2) 24"x12" W16-7PR and (2) 24"x12" W16-7PL (Diagonal Downward Arrow) signs;
- (2) solar panels;
- (2) NEMA Type 3R or higher enclosures to house:
    - Electrical components, including wiring and solid-state circuit boards;
    - On-board user interface;
    - Battery; and
    - Frequency hopping spread spectrum (or other alternate FCC approved) wireless activation unit with a minimum 150' range; and
- All mounting and supporting hardware and wiring necessary to complete a working system.

Each RRFB assembly shall be in conformance with all applicable MUTCD standards and guidelines, and shall exceed the minimum requirements specified in FHWA Memorandum IA-11, Interim Approval for Optional Use of Rectangular Rapid Flashing Beacons.

RRFB controller and LED beacons, APS pushbutton systems, and traffic signal posts and pedestals shall be listed on the Qualified Traffic Control Equipment List. Pedestals shall be cast iron.

ITEM 824.221 through **ITEM 824.227** (Continued)

The light intensity of the LED beacons during daytime conditions shall meet the minimum specifications of Class 1 yellow peak luminous intensity in the Society of Automotive Engineers (SAE) Standard J595 (Directional Flashing Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles) dated January 2005. An automatic signal dimming device shall be included to reduce the brilliance of the LED beacons during nighttime conditions.

All signs shall be MUTCD-compliant. R10-25 signs shall have a black border and legend on a white background. W11-2 (or W11-15), W16-7PR, and W16-7PL signs shall have a black border and legend on a fluorescent yellow-green background. All sign sheeting materials shall be per Subsection 828.41.

R10-25 signs may be integrated into the APS pushbutton system as a single unit or mounted separately on Type A aluminum.

W11-2, W11-15, W16-7PR, and W16-7PL signs shall be Type A aluminum per Subsection 828.42.

Any proprietary software required for the programming and/or operation of the system shall be included at no additional cost.

The solar panels shall be affixed to an aluminum plate and bracket, adjustable at an angle of 45° to 60° and each assembly shall be mounted on a 360° rotatable pole cap mount to facilitate adjustment for maximum solar collection and optimal battery strength. The solar panel assemblies shall be rated for 90 mph wind conditions.

The batteries shall conform to Battery Council International speficications and have a capacity allowing up to 30 days of autonomy without sunlight and varying with ambient temperature and number of activations. The batteries shall be rated for a minimum lifespan of 3 years. Batteries shall be replaceable independently of other components.

The solar penels and battery shall have a minmum operating temperature range of -40° to 122°F (-40° to 50°C).

The Contractor shall provide shop drawings and calculations to confirm solar panel sizing and battery/solar energy storage will meet the functional requirements of the system.

ITEM 824.221 through **ITEM 824.227** (Continued)

Functional Requirements
The RRFB system shall remain dark until pedestrian actuation.

Upon actuation, all LED beacons shall activate and flash in a rapidly flshing sequence. Each sequence shall last 800 milliseconds and there shall be 75 sequences per minute. The sequence shall be the same for each pair of LED beacons in an enclosure and shall be as follows:

1. The RRFB indication on the left-hand side shall be illuminated for approximately 50 milliseconds.

2. Both RRFB indications shall be dark for approximately 50 milliseconds.

3. The RRFB indication on the right-hand side shall be illuminated for approximately 50 milliseconds.

4. Both RRFB indications shall be dark for approximately 50 milliseconds.

5. The RRFB indication on the left-hand side shall be illuminated for approximately 50 milliseconds.

6. Both RRFB indications shall be dark for approximately 50 milliseconds.

7. The RRFB indication on the right-hand side shall be illuminated for approximately 50 milliseconds.

8. Both RRFB indications shall be dark for approximately 50 milliseconds.

9. Both RRFB indications shall be illuminated for approximately 50 milliseconds.

10. Both RRFB indications shall be dark for approximately 50 milliseconds.

11. Both RRFB indications shall be illuminated for approximately 50 milliseconds.

12. Both RRFB indications shall be dark for approximately 250 milliseconds.

The flash rate of each individual RRFB indication, as applied over the full flashing sequence, shall be between 5 and 30 flashes per second.

All RRFBs within the system shall commence and cease operation simultaneously.

The length of the flashing cycle upon actuation and the minimum allowable time between actuations shall be per the plans. These settings shall be user-programmable through the on-board user interface. No-fee wireless (Wi-Fi, Bluetooth®, etc.) may be used as an alternative programming method.

ITEM 824.221 through **ITEM 824.227** (Continued)

Each APS pushbutton shall have a tactile arrow and locator tone. The tactile arrow shall be oriented to point in the direction of the crosswalk. The locator tone shall have a duration of 0.15 seconds or less and shall repeat at 1-second intervals. The locator tone shall be set 2 to 5 dBA above ambient sound, shall automatically adjust intensity, but cap at a maximum volume of 100 dBA. The tone shall be audible whenever the LED modules are not active.

Upon activation of the LED modules, a speech message shall state, "Yellow lights are flashing". This message shall be stated twice. No vibrotactile or percussive indications shall be used.

If a pushbutton is pressed before the minimum time between actuation intervals is met, a speech message shall state, "Wait," and the locator tone shall resume until the LED modules activate.

Construction Methods
Each RRFB shall be mounted on a 4.5" OD pedestal pole with breakaway base and bolt kits.

No work shall commence until the shop drawings are approved.

Layout and design of the RRFB system shall conform to the plans.

Foundation installations shall be per Subsection 801.62. The top of the foundation shall be ¼" to 1" above the sidewalk and chamfered at 45 degrees. Gaps between the sidewalk and foundation shall be no larger than 1/4" and grouted with performed joint filler.

The contractor shall provide extension bracket mounted on the signal posts such that the pedestrian pushbutton detector shall be located within the 10 inches from the back of wheelchair ramp level landing. The extension bracket including pushbutton and signs shall not encroach into level landing resulting in a level landing area smaller than 4 feet by 5 feet. The bracket extension shall provide the provision of mounting pushbutton and 9 inch by 15 inch sign required per ADA and MUTCD guidelines. The bracket extension shall be installed per manufacturer's recommendation and the length of the extension shall be field verified and adjusted as needed. If the final installed location of pushbutton and sign is located outside of the specified range, the Contractor shall be responsible for reinstalling the bracket extension with pushbutton at the specified location at no additional cost to the state. The final location shall be approved by the Engineer.

The Contractor shall diagnose and replace any part of the pedestrian activated warning system that is found to be defective in workmanship, material, or manner of functioning within six months of final acceptance by the Engineer. This requirement does not supersede the one-year warranty period on materials specified in Subsection 815.20.

All RRFB equipment including, but not limited to, signal pole/posts, bases, pushbutton saddles and control cabinets shall be painted black.

ITEM 824.221 through **ITEM 824.227** (Continued)

Basis of Payment
Item 824.221 through Item 824.227 will be paid for at the respective contract unit price, Lum Sum. This price shall include all labor, materials, equipment, and incidentals necessary to complete the work.

ITEM 852.11	**TEMPORARY PEDESTRIAN BARRICADE**	**FOOT**
ITEM 852.12	**TEMPORARY PEDESTRIAN CURB RAMP**	**EACH**

Work under these items consist of furnishing, deploying, maintaining in proper operating conditions, and removing temporary pedestrian barricades and temporary pedestrian ramps as part of a Temporary Pedestrian Access Route (TPAR) in order to guide pedestrians around a fully- or partially-closed sidewalk. These devices are intended to prevent pedestrians from entering the work area and to prevent pedestrians from inadvertently entering the vehicle travel lane by providing visual and physical separation between each space.

The Temporary Pedestrian Barricade shall have a continuous bottom rail or edge no more than two (2) inches above the ground and eight (8) inches in height (minimum) to accommodate cane users, have a smooth and continuous hand railing along the top edge no less than 32 inches above the ground and not obstruct or project into the pedestrian path of travel. Barricade walls shall be nearly vertical and generally within the same plane.

If exposed to traffic, Temporary Pedestrian Barricades shall be crashworthy.

The Temporary Pedestrian Curb Ramp shall provide a 48 inch minimum width, with a firm, stable, and non-slip surface. Protective edging with a two (2) inch minimum height shall be installed when the curb ramp or landing platform has a vertical drop of six (6) inches or greater.

The Temporary Pedestrian Curb Ramp walkway and landing area surface shall be of a solid, continuous, contrasting color abutting up to the existing sidewalk.

If a Temporary Pedestrian Curb Ramp leads to a crosswalk, a detectable warning pad must be used at the base of the ramp; if it leads to a protected path that does not conflict with vehicular traffic then a detectable pad shall not be used.

The Temporary Pedestrian Barricade shall be placed in an area that will provide pedestrians with a TPAR on a smooth, continuous hard surface for its entirety. The geometry and alignment of the facility shall meet the applicable requirements of the “Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities” and the Massachusetts Architectural Access Board.

ITEM 852.11 and **ITEM 852.12** (Continued)

The recommended width of the TPAR is 60 inches, but if constraints exist a minimum clear width of 48 inches shall be provided along its entirety. If a 60 inch width cannot be accommodated in full, a 60 inch by 60 inch passing space shall be provided every 200 feet or less along the TPAR.

Turning areas shall be 60 inches by 60 inches minimum.

Lateral joints between any surfaces shall not exceed 0.5 inches. Lateral edges may be vertical up to 0.25 inches high and shall be beveled at 1V:2H between 0.25 inches and 0.5 inches.

The TPAR shall be kept clear of debris, snow, and ice and the Temporary Pedestrian Barricades and Temporary Pedestrian Curb Ramps shall not obstruct drainage.

Removal and/or resetting of Temporary Pedestrian Barricades and Temporary Pedestrian Curb Ramps shall be considered incidental.

Compensation
Payment for Temporary Pedestrian Barricades will be made at the contract price per foot installed in place, including all incidental items. This price shall include the cost of furnishing, installing, resetting, removal, and maintaining in good working condition.

Payment for Temporary Pedestrian Curb Ramps will be made at the contract price per each unit installed in place, including all incidental items. This price shall include the cost of furnishing, installing, resetting, removal, and maintaining in good working condition.

ITEM 853.501	**TEMPORARY IMPACT ATTENUATOR REMOVED AND RESET**	**EACH**
ITEM 853.63	**TEMPORARY IMPACT ATTENUATOR, UNI-DIRECTIONAL, REDIRECTIVE (TL-3)**	**EACH**

Work under Item 853.501 shall conform to the relevant provisions of Subsection 850 and shall consist of maintaining, removing and reinstalling temporary impact attenuators where indicated on the plans or as directed by the Engineer.

Work under Item 853.63 shall conform to the relevant provisions of Subsection 850 and shall consist of furnishing, installing, maintaining and final removal of temporary impact attenuator systems for protection of the ends of temporary barrier and other roadside hazards in work zones. All work shall be in conformance with the specifications of the manufacturer and in close conformance with the locations, lines, and grades shown on the plans.

ITEM 853.501 and **ITEM 853.63** (Continued)

Materials

The Contractor shall supply a temporary impact attenuator that meets the same or higher crash Test Level (TL) as the adjacent temporary barrier, unless otherwise shown on the plans. The temporary attenuator shall be listed on the Department's Qualified Traffic Control Equipment List.

The temporary impact attenuator shall be designed to fit within reasonably close tolerance of the dimensions given on the plans.

The Contractor shall supply shop drawings for the temporary attenuator and for any anchorage system and for any transitions or connections between the temporary attenuator and the adjacent barrier or other roadside hazard.

The side of the temporary attenuator that faces traffic shall include a Type 3 Object Marker that conforms to the language found in Sections 2C.64 and 2C.65 of the *Manual on Uniform Traffic Control Devices.*

Unless a separate barrier system protects it from opposing traffic, only temporary impact attenuators that are certified for bi-directional use shall be used in medians.

Construction Methods

Installation means and methods shall be per the manufacturer's specifications and/or drawings.

Temporary Impact Attenuators Removed and Reset consists of removing temporary impact attenuators, relocating and reinstalling at a new location per the specifications and recommendations of the manufacturer and as shown on the plans or as directed by the Engineer.

Excavation for temporary attenuator foundations and anchorage shall be made to the required depth and to a width that will permit the installation and bracing of forms where necessary. All soft and unsuitable material shall be replaced with compacted gravel borrow.

The Contractor shall supply the Engineer instructions for installation and the manufacturer's recommended routine inspection and maintenance program. The cost of inspection and maintenance of temporary attenuators shall be considered incidental in nature.

Damaged temporary impact attenuators shall be replaced by the Contractor within 24 hours or as directed by the Engineer, at the Contractor's expense. A truck mounted attenuator that meets the same or higher TL, or other means of protecting the damaged temporary impact attenuator, shall be deployed until the repairs or replacement has been completed, at the Contractor's expense.

ITEM 853.501 and **ITEM 853.63** (Continued)

Method of Measurement
Item 853.501 will be measured as a single unit Each.

Item 853.63 shall be measured as a single unit Each furnished and installed in place.

Basis of Payment
Payment for work under these items will be made at the contract unit price Each. This price shall include the cost of all labor and materials for furnishing, foundations and anchorages, installation, maintenance and final removal, and all incidental work necessary to complete the work as specified.

ITEM 864.35 SLOTTED PAVEMENT MARKER TWO-WAY YELLOW/YELLOW EACH

The work to be done under this item shall consist of furnishing and installing two-way yellow/yellow reflectorized pavement markers (slotted in pavement) in accordance with the relevant provisions of Traffic Standard TR.6.5 "Typical Pavement Markings for Conventional Roadways", and the following:

The work shall include cutting the tapered pavement slot to the dimensions shown on the typical details for the two-way markers, application of the manufacturer's recommended epoxy adhesive and placing the reflectorized pavement marker in the proper position within the slot so that the reflectorized face is visible and perpendicular to oncoming traffic and so that the top of the marker is set 1/8± inch below the top of the adjacent pavement. Surface preparation and installation shall be strictly in accordance with the manufacturer's instructions.

- Markers shall be installed along the double yellow centerlines as shown in the plans at 40-foot intervals.

Materials
The Contractor shall provide a reflectorized pavement marker from the MassDOT's Approved Products list.

Method of Measurement
Item 864.35 will be measured per Each reflectorized pavement marker installed, complete in place.

Basis of Payment
Item 864.35 will be paid for at the contract unit price per Each. This price shall include cutting the tapered pavement slot, furnishing and installation of the reflectorized markers, and all materials, labor, equipment, and incidentals necessary to complete the work.

ITEM 874.1 STREET SIGN REMOVED AND RESET EACH
ITEM 874.2 TRAFFIC SIGN REMOVED AND RESET EACH

The work under these Items shall conform to the relevant provisions of Subsection 840 of the Standard Specifications and the following:

The work includes removing and resetting the existing street, warning and regulatory signs and their supports to new locations as shown on the Plans or as required by the Engineer.

The Contractor shall replace at their expense, all sign panels and supports that are damaged or lost either directly or indirectly because of the Contractor's actions.

Materials for street signs and traffic signs removed and reset shall be the existing signs and supports. If in the opinion of the Engineer, the existing sign panel and/or support are unsuitable for reuse, a new sign panel and/or support of a size and composition equal to the existing sign panel and/or support, shall be furnished, as required by the Engineer.

The sign shall be mounted in accordance with the Manual on Uniform Traffic Control Devices (MUTCD) and the 1990 Standard Drawings for Signs and Supports.

When the visibility of the relocated sign panels is obstructed by trees and other vegetation, the Contractor shall clear the obstruction for proper sight distance. All clearing shall be done within the roadway layout, as approved by the Engineer.

Traffic sign panels and supports, to be removed and reset, shall be cleaned before being reset.

Damage during removal or resetting to any sign panel and/or support designated for reuse by the Engineer shall be repaired or replaced by the Contractor at his own expense.

Method of Measurement
Items 874.1 and 874.2 will be measured per Each, as complete units, in place, as determined by actual count.

Basis of Payment
Items 874.1 and 874.2 will be paid for at the contract unit price per Each. This price and shall include full compensation for furnishing all labor, necessary mounting fixtures (nuts, bolts and other miscellaneous items)tools, materials, excavation, backfill and vegetation clearing, involved in removing and resetting signs and supports equipment, and incidentals necessary to complete the work.

If required by the Engineer, new sign posts for Traffic Signs and Street Signs shall be paid for separately under Item 847.1.

If required by the Engineer, new Traffic Sign panels and Street Sign panels shall be furnished, installed, and paid for under Item 832. and Item 874., respectively.

The cost of any work or materials required, due to the Contractor's negligence, shall be borne by the Contractor.

❺ ADDENDUM NO. 5, AUGUST 27, 2020

ITEM 874.41 TRAFFIC SIGN REMOVED AND DISCARDED EACH

The work to be done under this item consists of dismantling, removing, and discarding existing warning and regulatory sign panels and guide signs, including their supports and all mounting hardware, designated to be removed and discarded on the plans or as required by the Engineer.

All signs and supports to be removed and discarded shall become the property of the Contractor, and the Contractor shall legally dispose of them away from the site.

The Contractor shall backfill all holes resulting from removal of existing signs and their foundations with compacted gravel and restore the area to match the existing conditions of adjacent areas.

The existing signs shall not be removed without the prior approval of the Engineer.

Method of Measurement

Item 874.41 will be measured as one unit, Each. One unit shall include the sign panel, signpost(s), appurtenances, and foundation(s).

Basis of Payment

Item 874.41 be paid for at the Contract unit price per Each, which price shall include all labor, materials, equipment, gravel borrow, site restoration, and incidental costs required to complete the work.

ITEM 945.011 30 INCH UTILITY POLE CAISSON EACH

The work under this item shall conform to the relevant provisions of Subsections 940 and 150 of the Standard Specifications and the following:

The caisson design is to be based on loads provided by Eversource Electric, based on soil type at the locations indicated on the drawings. Contractor is responsible for soil type determination. The design shall be performed by a Professional Engineer licensed in the Commonwealth of Massachusetts.

Utility pole caissons will be protected until the utility poles are installed. Location of each caisson shall not obstruct the use of the existing roadway or sidewalks and shall be installed in a manner to minimize impact and not impair the construction or long term maintenance of retaining wall.

❺ The Contractor is responsible for coordinating with Eversource Electric to determine the loads and the pole height.

❺ ADDENDUM NO. 5, AUGUST 27, 2020

ITEM 945.011 (Continued)

Submittals

Forty-five (45) days prior to installing the caissons the Contractor shall submit for review and approval by the Engineer the shop drawings and installation plan which shall include but not be limited to the following:

1. A description of the equipment to be used including pile-driving equipment and cranes, as required.
2. A description of the overall pile installation operation and sequence.
3. Details of concrete formwork attachment to piles.
4. Splice details and approved welding procedure as required.

The Contactor shall not begin pile-driving operations until written approval of the above submittals have been received from the Engineer, including a schedule of their proposed methods and equipment for all related installation procedures.

Method of Measurement

Item 945.011 will be measured per Each caisson installed, complete in place.

❺ **Basis of Payment**

Item 945.011 will be paid for at the contract unit price per Each, which price shall include all labor, materials, pre-drilling for caisson, drill through and/or remove obstruction(s), provide specified clearance necessary for driving the caisson within the specified tolerance and without damage, test borings, submission, shop drawings, utility coordination, concrete to secure pole in place, equipment, and incidentals necessary to complete the work.

ITEM 953.31	**EXCAVATION SUPPORT SYSTEM SPECIAL DRAINAGE STRUCTURE NO. 1**	**LUMP SUM**
ITEM 953.32	**EXCAVATION SUPPORT SYSTEM SPECIAL DRAINAGE STRUCTURE NO. 2**	**LUMP SUM**
ITEM 953.33	**EXCAVATION SUPPORT SYSTEM SPECIAL DRAINAGE STRUCTURE NO. 3**	**LUMP SUM**
ITEM 953.34	**EXCAVATION SUPPORT SYSTEM SPECIAL DRAINAGE STRUCTURE NO. 4**	**LUMP SUM**

The work under these items shall conform to the relevant provisions of Subsection 950 of the Standard Specifications and the following:

The Contractor shall furnish, install, maintain, and remove the excavation support system as required based upon the actual site conditions, for the protection of adjacent utilities, the proposed demolition of the existing culvert, wingwall and headwall and the construction of the proposed box culvert, headwalls and wingwalls. This excavation support system shall be designed by the Contractor and shall be configured to serve the intended purpose during all stages of construction without the need for reinstallation or major modifications. The maximum depth of excavation below existing ground is approximately 15 feet at the proposed wingwalls.

ITEM 953.31 through **ITEM 953.34** (Continued)

All permanent and temporary support of excavation that protrudes into the soil that supports the structure shall be left in place. Supporting soil shall be defined as all soil directly below the footing contained within a series of planes that originate at the perimeter of the bottom of the footing and project down and away from the footing at an angle of 45 deg. from the horizontal.

The excavation support system shall consist of sheet piling, soldier piling and lagging, braced excavation, concrete blocks or any other system that satisfies the design criteria contained herein. The excavation support system must be capable of supporting all loads applied throughout the construction, including active soil pressure and highway surcharge. The excavation support system shall be designed to allow for a 2-foot depth of over-excavation.

All material used for the excavation support system shall be sound and free from strength impairing defects. Steel sheeting (if used) shall conform to the applicable requirements of Subsection 950.

The excavation support system must be installed with the overhead wires maintained in their current locations without any intent for a relocation to be done by others. Any utility relocation required to accommodate the installation of the excavation support system will need to be arranged by the Contractor at his/her own expense and without any allowance for a contract extension.

The Contractor shall submit to the Engineer for approval the excavation support system layout and design calculations for all applicable AASHTO loads, including, but not limited to, earth pressure and surcharge due to vehicular live load. The Contractor shall account for the variability of subsurface conditions such as boulders and variable water surface conditions. The excavation support system shall be designed and stamped by a Professional Engineer registered in the Commonwealth of Massachusetts. Prior to any excavation, the Engineer must approve complete detailed drawings and complete calculations for the excavation support system in writing.

The Contractor shall accurately locate all utilities and structures to ensure that the proposed temporary earth support systems will not interfere with any existing utilities and structures.

The pumping of water and the treatment of the water for sediment is not included in this item. This activity is paid for under Items 991.1 to 991.4.

Basis of Payment
Items 953.31 through 953.34 will be paid for at the respective contract unit price, Lump Sum; which price shall be considered full compensation for all labor, equipment, reinstallation of the support system during subsequent stages of construction, materials, tools and incidentals necessary complete the work.

Payment shall be made based upon the following percentages: 10% upon approval of design, 60% upon completion of installation, and 30% upon removal or cut down.

ITEM 986.1 MODIFIED ROCKFILL SQUARE YARD

The work under this item shall conform to the relevant provisions of Subsection 983 of the Standard Specifications and the following:

The work includes furnishing and installing Modified Rockfill at the locations shown on the plans. Modified Rockfill shall meet the requirements of Materials Section M2.02.4.

Modified Rockfill shall be placed to the minimum layer thickness indicated on the Contract Drawings and as required by the Engineer. The stones shall be placed on a bed of crushed stone overlaying geotextile fabric for separation as shown on the plans. The crushed stone shall meet the requirements for Section M2.01.1 of the Standard Specifications.

Method of Measurement
Item 986.1 will be measured per Square Yard of modified rockfilll set, complete in place.

Basis of Payment
Item 986.1 will be paid for at the Contract unit price per Square Yard which price shall include all labor, materials, equipment, and incidentals necessary to complete the work.

The crushed stone bed shall be paid for under Item 156.

The geotextile fabric shall be paid for under Item 698.3.

ITEM 991.11	**CONTROL OF WATER – SPECIAL DRAINAGE STRUCTURE NO. 1**	**LUMP SUM**
ITEM 991.12	**CONTROL OF WATER – SPECIAL DRAINAGE STRUCTURE NO. 2**	**LUMP SUM**
ITEM 991.13	**CONTROL OF WATER – SPECIAL DRAINAGE STRUCTURE NO. 3**	**LUMP SUM**
ITEM 991.14	**CONTROL OF WATER – SPECIAL DRAINAGE STRUCTURE NO. 4**	**LUMP SUM**

The work under these Items shall conform to the relevant provisions of Subsection 140.60 of the Standard Specifications and the following:

Thee work shall consist of designing, furnishing, installing, operating, and removing temporary water control systems with pumping operations to lower and control water during the installation of the precast concrete box culvert sections, cast in place concrete box culvert and wingwalls as required by the Engineer.

The Contractor shall be prepared to furnish a groundwater control system for construction operations at the bottom of excavation level, as well as a surface water collection and disposal system in accordance with the provisions contained herein.

❸ ADDENDUM NO. 3, AUGUST 14, 2020

ITEM 991.11 through **ITEM 991.14** (Continued)

The Contractor shall prepare working drawings in which the materials and methods of control of water are shown for approval by the Engineer. The working drawings shall be submitted for the proposed type of dewatering systems, arrangement, location and depths of system components, the method of disposal of pumped water, and a description of equipment and instrumentation to be used. Design computations shall be submitted for all parts of the dewatering system as applicable. The working drawings shall be certified by a Professional Engineer registered in the Commonwealth of Massachusetts. Approval of the working drawing does not relieve the Contractor of the responsibility of providing for the safety of the work and the successful completion of the project.

The Contractor shall submit a plan for management of surface and groundwater flow and potential sedimentation thereof during the installation period to the Engineer and Ashland Conservation Commission for approval prior to any work. Contractor to control surface and groundwater through the duration of the project including the stabilization period after completion of construction activities and as per the Ashland Conservation Commission.

The dewatering system shall reduce the hydrostatic pressure and lower the groundwater levels a minimum of 12 inches below the bottom of excavation elevations indicated on the Plans. All concrete work shall be done in the dry. The dewatering system shall prevent heaving of the bottom of the excavation, and shall not result in damage to adjacent properties, structures, utilities, and other work. Acceptable dewatering methods include sump pumping, single or multiple stage well point systems, eductor, and ejector type systems, deep wells or combinations thereof. Temporary surface water control measures shall be provided to prevent surface water from entering the excavation. A sufficient number of pumps with adequate capacity shall be provided at the site. Provisions shall be made for having backup power generation and groundwater control system components available for maintaining continuous operations should failure of the primary equipment occur.

Dewatering procedures that cause or threaten to cause damage to new or existing construction shall be modified by the Contractor at no additional expense to the Department.

The dewatering system shall be installed, maintained, and removed in such a manner as to prevent movement, settlement, loss of ground or damage to new and existing structures.

Collection and disposal of groundwater discharge shall be performed, in accordance with all Federal, State, and local codes, rules and regulations. Sedimentation control shall be used to segregate silt from the groundwater that is recharged into the brook outside of the limits of excavation. Pumped groundwater shall not be discharged into the roadway Right-of-Way.

Basis of Payment

❸ Items 991.11 through 991.14 shall be paid for at the respective contract unit price, Lump Sum. This price shall be full compensation for the design of the water control systems, all labor, materials, equipment, transportation, maintenance, removal and disposal of materials and structures, and incidentals necessary to complete the work.

❸ For non-contaminate water, payment for pumping water, storage tanks, testing, labor, equipment, materials, and incidentals necessary to perform the work will be paid for under the pertinent items, Items 991.11 through 991.14.

ITEM 992.33 COORDINATION AND SUPPORT OF GAS MAINS AT CULVERTS LUMP SUM

The work under this item shall conform to the relevant provisions of Subsection 900 of the MassDOT Standard Specifications and the following:

Work included under this item shall include the installation of temporary support systems for the active 12-inch and 16-inch gas mains, and the temporary by-pass for the 8-inch gas main at the various culvert replacement locations. This work shall be performed at the locations identified on the plans and per the direction and plan details provided by Eversource Engineering. Eversource shall be given a minimum of 72 hours' notice prior to any work at these locations, as well as any construction occurring within 50 feet of the Eversource Station near Butterfield Drive.

8-INCH GAS BYPASS LOCATIONS

Work included under this heading includes coordination with the gas company and the installation of support systems to carry the temporary bypass relocation of the newly installed 8-inch plastic intermediate pressure gas line at the locations shown on the plans and per the details and direction provided by Eversource Gas. The Contractor shall coordinate the exact layout of the bypass with Eversource Gas. The support systems shall be provided at the culvert replacements located at approximate stations 37+50, 80+40, and 90+15 with minimal disturbance to adjacent wetlands. Once Eversource installs the bypass onto the supports, and cuts and caps the 8-inch main, the Contractor shall remove the cut section of the 8-inch main. Once the Contractor installs the culverts, Eversource will re-install the 8-inch main and remove the by-pass piping prior to final backfilling, restoration, and paving by the Contractor. The Contractor shall remove and dispose all support systems and restore the area disturbed by the temporary support system back to its original condition.

SUPPORT OF 12-INCH AND 16-INCH HIGH PRESSURE GAS

Work under this heading includes coordination with the gas company and installation of support systems to carry the existing 12-inch and 16-inch high pressure gas mains at the locations shown on the plans and per the details and direction provided by Eversource Gas. The support systems shall be provided at the culvert replacements located at approximate stations 80+40 and 90+15.

Basis of Payment:
Item 992.33 will be paid for at the contract unit price, Lump Sum. This price shall include, labor, materials, equipment, coordination with Eversource Gas, site preparation, excavation, installing support systems, backfilling, removal of recently installed 8-inch gas line in the vicinity of the culverts, removal of temporary supports, site restoration, and incidentals necessary to complete the work..

ITEM 996.01	**WALL STRUCTURE, WALL NO. 1**	**LUMP SUM**
ITEM 996.02	**WALL STRUCTURE, WALL NO. 2**	**LUMP SUM**

The work under these items shall conform to the relevant provisions of Subsection 995 of the Standard Specifications and the following:

For those component parts where no specific requirement is stipulated, the Standard Specifications shall apply except for payment.

Work under these items shall include all materials, equipment and labor needed to construct the following for Wall Structure Wall No. 1 (Spyglass Wall) and Wall Structure Wall No. 2 (Eliot Street Wall):

- Cast-in-place concrete cantilever retaining walls, and all the steel reinforcement for these items;
- Protective Screen (CLF) (For Eliot Street Wall only);
- Damp-proofing;
- All items included hereinafter under Basis for Partial Payments.

The work does not include any items listed separately in the proposal. Payment for materials shown on the Plans as being part of this wall structure or which may be incidental to its construction and are not specifically included for payment under another Item shall be considered incidental to the work performed under this Item and shall be included in the unit price of the component of which they are part.

4000 psi, 3/4", 610 CEMENT CONCRETE

The work to be done under this heading shall conform to the relevant provisions of Subsection 901 supplemented and amended as follows:

All concrete shall be placed in the dry.

The various classes of concrete shall be used as specified on the Plans, and generally described as follows:

4000 psi, 3/4", 610 cement concrete shall be used to construct the retaining wall footings and stems.

Included in the work are the furnishing and installing of preformed fillers and other items incidental to the furnishing and placing of concrete. All other work covered in the Schedule of Basis for Partial Payments or for which payment is not provided elsewhere in the contract shall be considered as included in the unit price per cubic yard of concrete, as stated by the Contractor and approved by the Engineer, in the respective "Basis for Partial Payment".

ITEM 996.01 and **ITEM 996.02** (Continued)

The work under this heading does not include the various classes of excavation, gravel borrow for backfilling structures and pipes, or crushed stone. Any temporary support of excavation required to construct the proposed retaining walls shall be incidental to the excavation items. Locations of the temporary excavation support shall be approved by the Engineer.

PROTECTIVE SCREEN (CHAIN LINK FENCE)

The work to be done under this heading shall conform to the relevant provisions of Subsection 644 of the Standard Specifications and the specific requirements stipulated below for the component parts of this Item.

Work under this Item shall include all materials, equipment and labor needed to install protective screen (chain link fence) on top of retaining wall for Eliot Street Wall.

DAMP-PROOFING

Damp-proofing shall be applied as shown on the plans and shall consist of a primer and damp-proofing material. The primer shall be suitable for priming concrete and masonry surfaces prior to the application of damp-proofing and shall meet the requirements of ASTM D41.

The damp-proofing material shall be suitable for use as a damp-proofing for concrete surfaces and shall meet the requirements of ASTM D449, Type II. Concrete surfaces shall be allowed to dry for a period of at least 5 days after the removal of forms before damp-proofing is applied. Surfaces to be damp-proofed shall be made reasonably smooth and free from all projections and holes. All holes in concrete surfaces shall be satisfactorily filled with mortar consisting of 1 part cement to 2 parts sand before damp-proofing is applied. Concrete surfaces shall be properly cured before being damp-proofed. Surfaces shall be dry and immediately before the application of the damp-proofing shall be thoroughly cleaned of dust and all loose material. Damp-proofing shall not be done during wet weather, nor when the weather conditions as to temperature otherwise are unsatisfactory.

One (1) coat of primer shall be uniformly applied to the surface. The material for damp-proofing shall be mopped or sprayed on the designated surfaces as directed and in amounts necessary to obtain a two (2) coat coverage. Application methods, rates, temperature constraints shall be recommended by the Manufacturer. The initial coat of damp-proofing shall be allowed to dry thoroughly before a second coat is applied. The final coat shall be thoroughly dry before any fill is placed against it.

❺ ADDENDUM NO. 5, AUGUST 27, 2020
❶ ADDENDUM NO. 1, JULY 31, 2020

ITEM 996.01 and **ITEM 996.02** (Continued)

SCHEDULE OF BASIS FOR PARTIAL PAYMENTS

Within ten days after the Notice to Proceed, the Contractor shall submit a schedule of unit prices for the major component Sub-Items that make up Item 996.01 and 996.02 as well as their total wall structure Lump Sum cost for the Wall No. 1 and Wall No. 2. The wall structure Lump Sum breakdown quantities provided in the proposal form are estimated and not guaranteed. The total of all partial payments to the Contractor shall equal the Lump Sum contract price regardless of the accuracy of the quantities furnished by the Engineer for the individual wall components. The cost of labor and materials for any Item not listed but required to complete the work shall be considered incidental to Item 996.01 and 996.02 and no further compensation will be allowed.

The schedule on the proposal form applies on to Wall No. 1 and Wall No. 2. Payment for similar materials and construction at locations other than at this wall structure shall not be included under this item. Sub-item numbering is presented for information only in coordination with MassDOT Standard Nomenclature.

Item 996.01 Wall Structure, Wall No. 1 (Spyglass Wall)

Sub-Item	Description	Quantity	Unit	Unit Price	Amount
904.	4000 PSI, 3/4 IN., 610 Cement Concrete	235	CY		
910.1	Steel Reinforcement for Structures – Epoxy Coated	25,700	LB		
❶ 970.	Damp-proofing	1,350	SF		

Total Cost of Item 996.01 = _____

Item 996.02 Wall Structure, Wall No. 2 (Eliot Street Wall)

Sub-Item	Description	Quantity	Unit	Unit Price	Amount
638.1	Protective Screen (Chain Link)	240	FT		
❺ 904.	4000 PSI, 3/4 IN., 610 Cement Concrete	845	CY		
❺ 910.1	Steel Reinforcement for Structures – Epoxy Coated	82,200	LB		
❶ 970.	Damp-proofing	3,690	SF		

Total Cost of Item 996.02 = _____

ITEM 997.1 SPECIAL DRAINAGE STRUCTURE NO.1 LUMP SUM

The work under this Item shall conform to the relevant provisions of Subsections 901, 904, 910, 967, 970, and 983 of the Standard Specifications, and the following:

The work under this Item shall consist of furnishing all labor, materials, tools and equipment and the performance of all work required to furnish and install the 2'Wx2'H precast concrete box culvert at Sta. 37+48.51, the cast-in-place headwalls, and stones as shown on the plans. Stone baffles of 6" max thickness, placed every 7' including at the inlet and outlet, shall be provided along the bottom to retain the natural streambed material, as shown in the plans and details.

The Manufacturer shall submit evidence at the request of the Engineer showing that he has successfully completed work of similar magnitude prior to being approved as the source of the material for this work. The manufacturing process shall be closely supervised by experienced plant personnel and records of plastic and concrete strength shall be kept and submitted to the Engineer for control.

Materials
Materials shall meet the requirements specified in the following subsections of Division III, Materials Specifications of the Standard Specifications:

Cement Concrete	M4.02
Epoxy Coated Reinforcing Bars	M8.01.7
Stone for Pipe Ends	M2.02.3
Crushed Stone	M2.01.3
Geotextile Fabric	M9.50.0

The payment for Stone for Pipe Ends, Crushed Stone and Geotextile Fabric shall be paid under their respective items.

The precast box culvert (2'Wx2'H) shall be reinforced concrete and shall be manufactured in accordance with ASTM C76 standard specifications for reinforced concrete culvert. The culvert shall be designed to support an HS-20 (32,000 lbs.) truck axle load and dead load from earth cover over the top of the culvert as shown on the plans, and shall conform to all applicable 2017 AASHTO LRFD Bridge Design Specifications with current interim Specifications.

The Contractor shall submit shop drawings and structural calculations stamped by a Structural Engineer registered in the Commonwealth of Massachusetts for approval as specified in Section 5.02 of the Standard Specifications. The shop drawings shall show the size and location of all inserts and openings as shown on the Plans.

Existing utility locations shall be verified in the field prior to starting this work. The Contractor shall provide the Engineer with a plan showing existing utility locations and elevations prior to undertaking this work.

❸ ADDENDUM NO. 3, AUGUST 14, 2020

ITEM 997.1 (Continued)

The Contractor shall dig test pits to verify the dimensions of the existing culvert prior to ordering the material and all costs shall be incidental and be paid for under the lump sum price.

NATURAL STREAMBED MATERIAL

The work under this heading shall consist of installation of natural streambed material within the bottom of the culvert to provide a natural streambed for aquatic organisms. The natural streambed construction material is to be placed within the bottom 6" of the culvert with baffles on each end, as depicted on the plans.

The intent of this work is to ensure a natural streambed within the culvert, to provide fisheries and wildlife habitat enhancement as part of the wetland replication area and natural wetlands. The natural streambed material shall be comprised of the stones 4 inches and under, that shall meet the following gradation:

Sieve opening	Percent by Mass Passing Through
4"	95
2"	55 – 65
¾"	30 – 45
#4	0 – 5

Partially angular rock is preferred over round and shall be able to lock together to prevent movement during high flows. Crushed Stone will not be accepted for any components. The inlet/outlet elevations of the proposed culvert shall match the proposed plans.

Construction of Special Drainage Structure
Work shall include removal and disposal of the existing 2'Wx2'H box culvert and existing headwalls and installing the new box culvert and new cast-in-place headwalls.

The precast concrete box culvert shall be constructed as shown on the Plans.

All precast units shall be carefully loaded, hauled, stored and erected to prevent damage. They shall be erected by experienced workmen, true to the lines and grades as shown on the Plans or directed by the Engineer. Any members superficially damaged during shipment or erection shall be rejected and shall be repaired by experienced workmen. Units badly damaged shall be rejected and shall be replaced with new units at no additional cost to the Owner. The Engineer shall be the sole judge of this damage. No holes shall be cut or drilled in the field without written approval of the Engineer.

❸

❸ ADDENDUM NO. 3, AUGUST 14, 2020
❶ ADDENDUM NO. 1, JULY 31, 2020

ITEM 997.1 (Continued)

❸ **Basis of Payment**

This Item will be paid for at the contract unit price per lump sum installed and completed in place. The Special Drainage Structure lump sum price shall include full compensation for all labor, materials, tools and equipment, test pits, removal, delivery and disposal at an approved landfill, the cost for approvals, testing, transportation, and other incidental expenses necessary to complete this Item.

Schedule of Basis for Partial Payments

Within ten days after the Notice to Proceed, the Contractor shall submit a schedule of unit prices for the major component Sub-Items that make up Item 997.1 as well as his/her total drainage structure Lump Sum cost for the Special Drainage Structure No. 1. The drainage structure Lump Sum breakdown quantities provided in the proposal form are estimated and not guaranteed. The total of all partial payments to the Contractor shall equal the Lump Sum contract price regardless of the accuracy of the quantities furnished by the Engineer for the individual drainage components. The cost of labor and materials for any Item not listed but required to complete the work shall be considered incidental to Item 997.1 and no further compensation will be allowed.

The schedule on the proposal form applies only to Special Drainage Structure No. 1. Payment for similar materials and construction at locations other than at this drainage structure shall not be included under this Item. Sub-Item numbering is presented for information only in coordination with MassDOT Standard Nomenclature.

Sub-Item	Description	Quantity	Unit	Unit Price	Total
901.	4000 PSI, 1.5 IN., 565 CEMENT CONCRETE	80	CY		
904.3	5000 PSI, ¾ IN., 685 HP CEMENT CONCRETE	10	CY		
910.2	Steel Reinforcement for Structures – Coated	2000	LB		
❶ 970.	Damp-Proofing	1305	SF		
983.52.	Natural Streambed Material	5	CY		
				Total Cost of Item 997.1=	

❺ ADDENDUM NO. 5, AUGUST 27, 2020

ITEM 997.2 SPECIAL DRAINAGE STRUCTURE NO.2 LUMP SUM

The work under this Item shall conform to the relevant provisions of Subections 901, 904, 910, 967, 970 and 983 of the Standard Specifications, and the following:

❺ The work under this Item shall consist of furnishing all labor, materials, tools and equipment and the performance of all work required to furnish and install the 5'Wx3'H cast-in-place concrete box culvert extension at Sta. 41+98.85, the cast-in-place Headwalls as shown on the plans.

❺

Materials

Materials shall meet the requirements specified in the following subsections of Division III, Materials Specifications of the Standard Specifications:

Cement Concrete	M4.02
Epoxy Coated Reinforcing Bars	M8.01.7
Stone for Pipe Ends	M2.02.3
Crushed Stone	M2.01.3
Geotextile Fabric	M9.50.0

The payment for Stone for Pipe Ends, Crushed Stone and Geotextile Fabric shall be paid under their respective items.

❺ The box culvert (5'x3') shall be reinforced concrete and shall be manufactured in accordance with ASTM C76 standard specifications for reinforced concrete culvert. The culvert shall be designed to support an HS-20 (32,000 lbs.) truck axle load and dead load from earth cover over the top of the culvert as shown on the plans, and shall conform to all applicable 2017 AASHTO LRFD Bridge Design Specifications with current interim Specifications .

The Contractor shall submit shop drawings and structural calculations stamped by an Engineer registered in the Commonwealth of Massachusetts for approval as specified in Section 5.02 of the Standard Specifications. The shop drawings shall show the size and location of all inserts and openings as shown on the Plans.

Existing utility locations shall be verified in the field prior to starting this work. The Contractor shall provide the Engineer with a plan showing existing utility locations and elevations prior to undertaking this work.

The Contractor shall dig test pits to verify the dimensions of the existing culvert prior to ordering the material. All costs shall be incidental and be paid for under the lump sum price.

❺ ADDENDUM NO. 5, AUGUST 27, 2020

ITEM 997.2 (Continued)

Construction of Special Drainage Structure
Work shall include removal and disposal of existing headwalls and installing new culvert connecting to existing culvert and installation of new cast-in-place headwalls.

The cast-in-place concrete box culvert shall be constructed as shown on the Plans.

Repair of Existing Culvert
The work to be performed shall include the repair of the existing Culvert. The culvert has a clear opening of approximately 5' wide x 3' high. The repairs shall be done within the limits of the culvert in accordance with these specifications and as shown on the plans and all the repair areas of the culvert shall be identified and located by the Engineer in the field. Below is the summary of the repairs based on inspection finding memo dated 10/9/2019.

1. Clean the stone masonry, as necessary.
2. Fill the voids in masonry walls and roof slab with MassDOT approved material or material from MassDOT QCML or grout bags.
3. Clear all the vegetation growing from stone masonry.
4. Clear all debris and vegetation from the channel.
5. Replace all chinking stones and fill voids with grout bags.

For the repair methods, material manufacturer's recommendations shall be utilized. All materials, labor and equipment necessary for the repair shall be incidental to Item 997.2.

❺ **Basis of Payment**
Item 997.2 will be paid for at the contract unit price, Lump Sum, installed and completed in place. This price shall include full compensation for all labor, materials, tools, equipment, test pits, removal, delivery and disposal at an approved landfill, the cost for approvals, testing, transportation, the removal and disposal of existing headwalls, installing new culvert connecting to existing culvert, control of water, installing new cast-in-place headwalls, and incidentals necessary to complete this Item.

Schedule of Basis for Partial Payments
Within 10 days of the Notice to Proceed, the Contractor shall submit their proposal form a schedule of unit prices for the major component Sub-Items that make up Item 997.2 as well as their total drainage structure Lump Sum cost for the Special Drainage Structure No. 2. The drainage structure Lump Sum breakdown quantities provided in the proposal form are estimated and not guaranteed. The total of all partial payments to the Contractor shall equal the Lump Sum contract price regardless of the accuracy of the quantities furnished by the Engineer for the individual drainage components. The cost of labor and materials for any Item not listed but required to complete the work shall be considered incidental to Item 997.2 and no further compensation will be allowed.

❶ ADDENDUM NO. 1, JULY 31, 2020

ITEM 997.2 (Continued)

The schedule on the proposal form applies only to Special Drainage Structure No. 2. Payment for similar materials and construction at locations other than at this drainage structure shall not be included under this Item. Sub-Item numbering is presented for information only in coordination with MassDOT Standard Nomenclature.

Special Drainage Structure No. 2

Sub-Item	Description	Quantity	Unit	Unit Price	Total
901	4000 PSI, 1.5 IN., 565 CEMENT CONCRETE	45	CY		
904.3	5000 PSI, ¾ IN., 685 HP CEMENT CONCRETE	5	CY		
910.2	Steel Reinforcement for Structures – Coated	1200	LB		
912	Drilling and Grouting Dowels	21	EA		
❶ 970.	Damp-Proofing	135	SF		
989.222	Repair of Voids in Masonry	4	EA		
989.223	Repair of Crack in Masonry	10	FT		

Total Cost of Item 997.2= _____

ITEM 997.3 SPECIAL DRAINAGE STRUCTURE NO.3 LUMP SUM

The work under this Item shall conform to the relevant provisions of Subsections 901, 904, 910, 967, 970, and 983 of the Standard Specifications, and the following:

The work under this Item shall consist of furnishing all labor, materials, tools and equipment and the performance of all work required to furnish and install the 3'Wx2'H precast concrete box culvert at Sta. 80+41.57, the cast-in-place Headwalls, and riprap as shown on the plans. Stone baffles of 6" max thickness, placed every 7' including at the inlet and outlet, shall be provided along the bottom to retain the natural streambed material, as shown in the plans and details.

The manufacturer shall submit evidence at the request of the Engineer showing that he has successfully completed work of similar magnitude prior to being approved as the source of the material for this work. The manufacturing process shall be closely supervised by experienced plant personnel and records of plastic and concrete strength shall be kept and submitted to the Engineer for control.

Materials
Materials shall meet the requirements specified in the following subsections of Division III, Materials Specifications of the Standard Specifications:

Cement Concrete	M4.02
Epoxy Coated Reinforcing Bars	M8.01.7
Stone for Pipe Ends	M2.02.3
Crushed Stone	M2.01.3
Geotextile Fabric	M9.50.0

The payment for Stone for Pipe Ends, Crushed Stone and Geotextile Fabric shall be paid under their respective items.

The precast box culvert (3'x2') shall be reinforced concrete and shall be manufactured in accordance with ASTM C76 standard specifications for reinforced concrete culvert. The culvert shall be designed to support an HS-20 (32,000 lbs.) truck axle load and dead load from earth cover over the top of the culvert as shown on the plans, and shall conform to all applicable 2017 AASHTO LRFD Bridge Design Specifications with current interim Specifications .

The Contractor shall submit shop drawings and structural calculations stamped by an Engineer registered in the Commonwealth of Massachusetts for approval as specified in Section 5.02 of the Standard Specifications. The shop drawings shall show the size and location of all inserts and openings as shown on the Plans.

Existing utility locations shall be verified in the field prior to starting this work. The Contractor shall provide the Engineer with a plan showing existing utility locations and elevations prior to undertaking this work.

ITEM 997.3 (Continued)

The Contractor shall dig test pits to verify the dimensions of the existing culvert prior to ordering the material. All costs shall be incidental and be paid for under the lump sum price.

The work under this item shall consist of installation of natural streambed material within the bottom of the culvert to provide a natural streambed for aquatic organisms. The natural streambed construction material is to be placed within the bottom 6" of the culvert with baffles on each end, as depicted on the plans.

The intent of this item is to ensure a natural streambed within the culvert, to provide fisheries and wildlife habitat enhancement as part of the wetland replication area and natural wetlands. The natural streambed material shall be comprised of the stones 4 inches and under, that shall meet the following gradation:

Sieve opening	Percent by Mass Passing Through
4"	95
2"	55 – 65
¾"	30 – 45
#4	0 – 5

Partially angular rock is preferred over round and shall be able to lock together to prevent movement during high flows. Crushed Stone will not be accepted for any components. The inlet/outlet elevations of the proposed culvert shall match the proposed plans.

Construction of Special Drainage Structure
Work shall include removal and disposal of the existing 3'Wx2'H box culvert and existing headwalls and installing the new box culvert and new cast-in-place headwalls.

The precast concrete box culvert shall be constructed as shown on the Plans.

All precast units shall be carefully loaded, hauled, stored and erected to prevent damage. They shall be erected by experienced workmen, true to the lines and grades as shown on the Plans or directed by the Engineer. Any members superficially damaged during shipment or erection shall be rejected and shall be repaired by experienced workmen. Units badly damaged shall be rejected and shall be replaced with new units at no additional cost to the Owner. The Engineer shall be the sole judge of this damage. No holes shall be cut or drilled in the field without written approval of the Engineer.

❸ ADDENDUM NO. 3, AUGUST 14, 2020
❶ ADDENDUM NO. 1, JULY 31, 2020

ITEM 997.3 (Continued)

❸ **Basis of Payment**

Item 997.3 will be paid for at the contract unit price, Lump Sum. This price shall include all labor, materials, tools, test pits, the removal and disposal of existing headwalls, installing new culvert connecting to existing culvert, control of water, installing new cast-in-place headwalls, equipment, removal, delivery and disposal at an approved landfill, the cost for approvals, testing, transportation, and incidentals necessary to complete the work.

SCHEDULE OF BASIS FOR PARTIAL PAYMENTS

Within 10 days of the Notice to Proceed, the Contractor shall submit their proposal form a schedule of unit prices for the major component Sub-Items that make up Item 997.3 as well as their total drainage structure Lump Sum cost for the Special Drainage Structure No. 3. The drainage structure Lump Sum breakdown quantities provided in the proposal form are estimated and not guaranteed. The total of all partial payments to the Contractor shall equal the Lump Sum contract price regardless of the accuracy of the quantities furnished by the Engineer for the individual drainage components. The cost of labor and materials for any Item not listed but required to complete the work shall be considered incidental to Item 997.3 and no further compensation will be allowed.

The schedule on the proposal form applies only to Special Drainage Structure No. 3. Payment for similar materials and construction at locations other than at this drainage structure shall not be included under this Item. Sub-Item numbering is presented for information only in coordination with MassDOT Standard Nomenclature.

Special Drainage Structure No. 3

Sub-Item	Description	Quantity	Unit	Unit Price	Total
901	4000 PSI, 1.5 IN., 565 CEMENT CONCRETE	30	CY		
904.3	5000 PSI, ¾ IN., 685 HP CEMENT CONCRETE	10	CY		
910.2	Steel Reinforcement for Structures – Coated	900	LB		
❶ 970.	Damp-Proofing	1575	SF		
983.521.	Natural Streambed Material	10	CY		

Total Cost of Item 997.3= _____

❺ ADDENDUM NO. 5, AUGUST 27, 2020

ITEM 997.4 SPECIAL DRAINAGE STRUCTURE NO.4 LUMP SUM

The work under this Item shall conform to the relevant provisions of Subsections 901, 904, 910, 967, 970 and 983 of the Standard Specifications, and the following:

❺ The work under this Item shall consist of furnishing all labor, materials, tools and equipment and the performance of all work required to furnish and install the 4'Wx2'H precast concrete box culvert at Sta. 90+14.32, the cast-in-place Headwalls as shown on the plans.

The manufacturer shall submit evidence at the request of the Engineer showing that he has successfully completed work of similar magnitude prior to being approved as the source of the material for this work. The manufacturing process shall be closely supervised by experienced plant personnel and records of plastic and concrete strength shall be kept and submitted to the Engineer for control.

Materials

Materials shall meet the requirements specified in the following subsections of Division III, Materials Specifications of the Standard Specifications:

Cement Concrete	M4.02
Epoxy Coated Reinforcing Bars	M8.01.7
Stone for Pipe Ends	M2.02.3
Crushed Stone	M2.01.3
Geotextile Fabric	M9.50.0
❺ Rockfill	M2.02.1

❺ The payment for Stone for Pipe Ends, Crushed Stone, Rockfill, and Geotextile Fabric shall be paid under their respective items.

The precast box culvert (4'x2') shall be reinforced concrete and shall be manufactured in accordance with ASTM C76 standard specifications for reinforced concrete culvert. The culvert shall be designed to support an HS-20 (32,000 lbs.) truck axle load and dead load from earth cover over the top of the culvert as shown on the plans, and shall conform to all applicable 2017 AASHTO LRFD Bridge Design Specifications with current interim Specifications .

The Contractor shall submit shop drawings and structural calculations stamped by an Engineer registered in the Commonwealth of Massachusetts for approval as specified in Section 5.02 of the Standard Specifications. The shop drawings shall show the size and location of all inserts and openings as shown on the Plans.

Existing utility locations shall be verified in the field prior to starting this work. The Contractor shall provide the Engineer with a plan showing existing utility locations and elevations prior to undertaking this work.

The Contractor shall dig test pits to verify the dimensions of the existing culvert prior to ordering the material. All costs shall be incidental and be paid for under the lump sum price.

❸ ADDENDUM NO. 3, AUGUST 14, 2020

ITEM 997.4 (Continued)

Construction of Special Drainage Structure
Work shall include abandonment of existing culverts and removal and disposal of headwalls, installing new culvert connecting to the new special drainage manholes and new headwall, and installation of new cast-in-place headwalls.

The precast concrete box culvert shall be constructed as shown on the Plans.

All precast units shall be carefully loaded, hauled, stored and erected to prevent damage. They shall be erected by experienced workmen, true to the lines and grades as shown on the Plans or directed by the Engineer. Any members superficially damaged during shipment or erection shall be rejected and shall be repaired by experienced workmen. Units badly damaged shall be rejected and shall be replaced with new units at no additional cost to the Owner. The Engineer shall be the sole judge of this damage. No holes shall be cut or drilled in the field without written approval of the Engineer.

❸ **Basis of Payment**
Item 997.4 will be paid for at the contract unit price, Lump Sum, installed and completed in place. This price shall include full compensation for all labor, materials, tools, equipment, test pits, the removal and disposal of existing headwalls and installing new culvert connecting to existing culvert, control of water, and installing new cast-in-place headwalls, delivery and disposal at an approved landfill, the cost for approvals, testing, transportation, and incidentals necessary to complete the work.

SCHEDULE OF BASIS FOR PARTIAL PAYMENTS

Within 10 days of the Notice to Proceed, the Contractor shall submit their proposal form a schedule of unit prices for the major component Sub-Items that make up Item 997.4 as well as their total drainage structure Lump Sum cost for the Special Drainage Structure No. 4. The drainage structure Lump Sum breakdown quantities provided in the proposal form are estimated and not guaranteed. The total of all partial payments to the Contractor shall equal the Lump Sum contract price regardless of the accuracy of the quantities furnished by the Engineer for the individual drainage components. The cost of labor and materials for any Item not listed but required to complete the work shall be considered incidental to Item 997.4 and no further compensation will be allowed.

The schedule on the proposal form applies only to Special Drainage Structure No. 4. Payment for similar materials and construction at locations other than at this drainage structure shall not be included under this Item. Sub-Item numbering is presented for information only in coordination with MassDOT Standard Nomenclature.

❶ ADDENDUM NO. 1, JULY 31, 2020

ITEM 997.4 (Continued)

Special Drainage Structure No. 4

Sub-Item	Description	Quantity	Unit	Unit Price	Total
901.	4000 PSI, 1.5 IN., 565 CEMENT CONCRETE	35	CY		
904.3	5000 PSI, ¾ IN., 685 HP CEMENT CONCRETE	15	CY		
910.2	Steel Reinforcement for Structures – Coated	1100	LB		
❶ 970.	Damp-Proofing	540	SF		

Total Cost of Item 997.4= _____

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DETAIL SHEETS

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TOWN/CITY:	Ashland	YEAR:	2020
STATION:	9+83.98 to 100+94.44	ROAD:	Route 126 (Pond Street)

Excavation		**Embankment**	
Earth Excavation:	27,500 CY	Embankment +15%:	0 CY
Muck Excavation;	550 CY	Special Borrow:	640 CY
Bridge Excavation:	1,120 CY	Gravel for Driveways:	680 CY
Class “A” Trench Excavation:	9,340 CY	Gravel for Sidewalks:	2,960 CY
Class “B” Trench Excavation:	1,250 CY	Gravel for Subbase:	12,860CY
Class “A” Rock Excavation:	1,000 CY	Gravel for Bridge Foundation:	325 CY
Class “B” Rock Excavation:	750 CY	Gravel for Backfill Str./Pipe:	5,100 CY

PAVEMENT NOTES

PROPOSED FULL DEPTH PAVEMENT AND BOX WIDENING:

SURFACE: 1.75” SUPERPAVE SURFACE COURSE 12.5 (SSC – 12.5) OVER
ASPHALT EMULSION FOR TACK COAT (RS-1) AT 0.08 GAL/SY OVER
2.5” SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC – 19.0)
ASPHALT EMULSION FOR TACK COAT (RS-1) AT 0.08 GAL/SY OVER

BASE: 4.5” SUPERPAVE BASE COURSE 37.5 (SBC – 37.5)
PLACED IN ONE COURSE.

SUBBASE: 4” DENSE GRADED CRUSHED STONE SUBBASE FOR LEVELING
OVER EXISTING SUBBASE MEETING SPECIFICATION M1.03.0
GRAVEL BORROW, TYPE B OR 8” GRAVEL BORROW, TYPE B

PROPOSED PAVEMENT MICROMILLING & PAVEMENT RESURFACING:

SURFACE: 1.75” PAVEMENT MICROMILLING
TO MEET PROPOSED GRADING
1.75” SUPERPAVE SURFACE COURSE 12.5 (SSC – 12.5) OVER
ASPHALT EMULSION FOR TACK COAT (RS-1) AT 0.09 GAL/SY
OVER MILLED SURFACE.

PROPOSED HOT MIX ASPHALT MULTI-USE PATH / HOT MIX ASPHALT WALK:

SURFACE: 1.75" SUPERPAVE SURFACE COURSE 12.5 (SSC – 12.5) OVER ASPHALT EMULSION FOR TACK COAT (RS-1) AT 0.08 GAL/SY OVER 2.5" SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC-19.0)

SUBBASE: 8" EXISTING SUBBASE MEETING SPECIFICATION M1.03.0 GRAVEL BORROW, TYPE B OR 8" GRAVEL BORROW, TYPE B

PROPOSED CEMENT CONCRETE WALK / WHEEL CHAIR RAMP

SURFACE: 4" CEMENT CONCRETE

SUBBASE: 8" EXISTING SUBBASE MEETING SPECIFICATION M1.03.0 GRAVEL BORROW, TYPE B OR 8" GRAVEL BORROW, TYPE B

PROPOSED HMA DRIVEWAY AND SLOPE PAVING:

SURFACE: 1.75" SUPERPAVE SURFACE COURSE 12.5 (SSC – 12.5) OVER ASPHALT EMULSION FOR TACK COAT (RS-1) AT 0.08 GAL/SY OVER 2.5" SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC-19.0)

SUBBASE: 8" EXISTING SUBBASE MEETING SPECIFICATION M1.03.0 GRAVEL BORROW, TYPE B OR 8" GRAVEL BORROW, TYPE B

ITEM 101. CLEARING AND GRUBBING
Clearing and grubbing needed at wetland replication area

10+00 to 13+30 RT		54+00 to 64+00 LT
11+45 to 13+30 LT	6	8+60 to 70+22 RT
13+50 to 18+00 RT		70+71 to 80+87 LT
31+50 to 35+85 LT		72+96 to 81+15 RT
46+47 to 53+33 LT		85+50 to 87+25 RT

ITEM 102.1 TREE TRIMMING
Tree trimming needed for overhead wires.

46+57 to 53+28 LT	70+62 to 80+96 LT
53+93 to 63+90 LT	

ITEM 102.511 TREE PROTECTION – ARMORING & PRUNING

33+90.0 RT	66+98.0 RT
39+62.0 LT	70+62.0 RT
55+83.0 RT	80+83.0 LT
66+79.0 RT	93+58.0 RT
100+52.0 RT	100+79.0 RT

ITEM 102.521 TREE AND PLANT PROTECTION FENCE
As required by the Engineer and at the following locations:

33+90.0 RT	68+98.0 RT
39+62.0 LT	70+62.0 RT
55+83.0 RT	80+83.0 LT
68+79.0 RT	86+10 to 88+10 RT
93+58.0 RT	89+65 to 92+70 RT
100+52.0 RT	100+79.0 RT

ITEM 103. TREE REMOVED – DIAMETER UNDER 24 INCHES
As required by the Engineer and at the following locations:

43+41.0 RT	60+12.0 LT
68+19.0 RT	61+78.0 LT
89+80.0 RT	53+16.0 LT
14+33.0 LT	53+21.0 LT
71+90.0 RT	72+00.0 RT
22+56.0 LT	39+62.0 LT

ITEM 104. TREE REMOVED – DIAMETER 24 INCHES AND OVER

As required by the Engineer and at the following locations:

32+85 LT	39+45 LT
39+29 LT	39+69 LT
47+23 RT	81+46 RT

ITEM 105. STUMP REMOVED

38+40 LT	44+50 RT
38+45 LT	60+15 LT
	68+70 RT

ITEM 220.7 SANITARY STRUCTURE ADJUSTED

33+50 RT	81+97 RT
34+65 RT	83+80 RT
37+36 RT	84+13 LT
39+70 RT	87+92 RT
500+58 RT	89+09 LT
45+05 RT	90+52 LT
46+27 RT	90+53 LT
55+61 RT	91+00 RT
56+71 RT	93+87 RT
60+06 RT	95+31 LT
63+93 RT	95+70 RT
66+31 RT	97+25 RT
69+28 RT	97+75 RT
70+45 RT	99+51 LT
71+69 RT	99+60 RT
74+03 RT	99+90 RT
78+02 RT	100+57 RT
	2000+52 LT

❺ ADDENDUM NO. 5, AUGUST 27, 2020

ITEM 358. GATE BOX ADJUSTED

10+55 LT	32+02 RT
10+61 LT	39+67 RT
11+43 LT	41+50 RT
11+93 LT	42+80 RT (3 at this location)
11+96 LT	46+43 RT
12+05 LT	46+45 RT
15+60 LT	46+56 RT
19+30 LT	48+25 RT
24+95 LT	50+25 RT
24+98 LT	53+83 RT
24+98 RT	53+85 RT
25+23 RT	53+87 RT
27+46 LT	54+21 RT
30+62 LT	54+52 RT
30+99 LT	55+53 RT
31+02 LT	55+56 RT
31+24 RT	58+80 RT
63+76 RT	88+43 RT
63+79 RT	93+70 LT
63+82 RT	93+74 LT
66+23 RT	93+77 LT
70+09 LT	93+84 LT
70+52 RT	95+60 LT
70+55 RT	96+58 LT
❺ 70+57 RT	
73+89 RT	97+60 LT
76+17 RT	99+48 LT
78+67 RT	99+50 RT
82+39 RT	99+95 LT
82+42 RT	100+00 LT
83+89 RT	100+93 LT
83+91 RT	100+96 LT
88+38 RT	

ITEM 376.2 HYDRANT - REMOVED AND RESET

11+43 LT	54+52 RT
27+46 LT	66+23 RT
36+00 RT	73+90 LT
41+51 RT	78+68 LT
46+56 RT	82+41 LT
50+25 RT	96+58 LT
78+68 LT	

ITEM 381.3 SERVICE BOX ADJUSTED

38+13 RT 54+90 RT
57+47RT

ITEM 482.5 SAWCUTTINGING ASPHALT PAVEMENT FOR BOX WIDENING

10+00 to 12+40 RT

ITEM 506. GRANITE CURB TYPE VB – STRAIGHT

10+49.7	to	10+49.7	LT	97+93.0	to	99+60.0	LT
10+85.9	to	10+85.9	LT	100+15.8	to	100+39.5	LT
11+17.1	to	16+43	LT	100+73.0	to	100+96.7	LT
23+02	to	23+94	RT	10+00.0	to	23+30.5	RT
16+89.0	to	23+30	LT	24+12.1	to	24+27.9	RT
23+09.1	to	24+01.1	LT & RT	300+53.4	to	300+80.8	LT
23+33.0	to	23+88.0	LT	300+69.6	to	300+81.0	LT
21+63.9	to	23+88.3	LT	300+81.0	to	300+81.0	LT & RT
24+01.3	to	24+01.3	LT & RT	300+91.1	to	300+91.1	LT & RT
24+11.0	to	24+11.0	LT & RT	300+92.1	to	301+23.6	LT
24+11.6	to	24+21.4	LT	301+60.7	to	301+80.0	LT
298+67.9	to	299+00.0	RT	300+91.9	to	301+27.0	RT
298+67.9	to	299+08.5	RT	301+62.4	to	301+35.4	RT
299+19.9	to	299+35.1	RT	25+61.5	to	25+76.5	RT
299+09.4	to	299+09.4	LT & RT	25+88.9	to	26+50.4	RT
299+19.4	to	299+19.4	LT & RT	25+96.1	to	27+34.0	RT
298+67.9	to	299+08.0	LT	28+51.0	to	30+38.7	RT
299+19.9	to	299+30.8	LT	30+57.1	to	30+70.8	RT
298+67.9	to	299+00.0	LT	400+61.9	to	401+00.0	RT
299+28.9	to	299+80.2	LT	32+11.0	to	33+01.8	RT
25+58.3	to	25+77.6	LT	33+70.3	to	37+98.1	RT
25+78.7	to	25+78.7	LT	38+53.6	to	38+91.6	RT
25+87.5	to	25+87.5	LT	39+38.3	to	39+43.7	RT
25+89.1	to	26+49.8	LT	39+94.1	to	40+71.8	RT
26+00.0	to	26+58.4	LT	41+23.5	to	41+48.0	RT
26+62.6	to	29+69.2	LT	41+87.6	to	43+96.1	RT
30+33.2	to	30+45.8	LT	44+30.5	to	44+65.0	RT
30+45.8	to	30+45.8	LT	44+91.8	to	45+09.8	RT
30+37.5	to	30+45.8	LT	45+64.4	to	45+75.0	RT
30+41.9	to	30+61.2	LT	46+02.5	to	46+09.5	RT

ITEM 506. GRANITE CURB TYPE VB – STRAIGHT (Continued)

30+51.8	to	30+51.8	LT	700+33.9	to	700+50.0	RT
30+51.8	to	30+64.3	LT	46+59.4	to	47+20.8	RT
30+51.8	to	30+63.4	LT	47+66.6	to	48+01.0	RT
399+60.6	to	399+64.5	RT	48+63.6	to	48+72.5	RT
399+37.6	to	399+51.8	RT	49+00.0	to	49+05.0	RT
399+60.0	to	399+28.2	LT	49+85.1	to	50+65.0	RT
399+53.3	to	399+58.2	LT	51+00.0	to	51+04.6	RT
31+74	to	35+85.0	LT	51+59.0	to	52+39.5	RT
36+34.6	to	36+72.3	LT	52+87.0	to	52+91.0	RT
37+09.9	to	37+80.3	LT	52+93.9	to	53+56.9	RT
38+31.7	to	38+68.3	LT	53+76.9	to	53+90.5	RT
39+03.5	to	40+23.2	LT	1000+30.8	to	1000+34.4	RT
40+60.5	to	41+74.7	LT	54+46.5	to	55+36.9	RT
42+20.5	to	42+73.2	LT	1100+26.5	to	1100+28.5	RT
42+26.6	to	42+56.5	LT	55+83.9	to	57+82.0	RT
43+37.1	to	44+10.4	LT	58+21.3	to	58+76.1	RT
44+49.1	to	44+51.6	LT	59+22.0	to	60+07.9	RT
44+52.8	to	44+56.4	LT	60+47.8	to	60+88.7	RT
44+90.8	to	45+86.3	LT	61+28.2	to	62+18.6	RT
46+18.0	to	53+57.8	LT	62+49.0	to	63+13.9	RT
900+57.7	to	900+70.4	LT	63+37.0	to	63+39.4	RT
901+29.5	to	901+54.7	LT	1200+53.1	to	1200+65.0	RT
900+57.5	to	901+54.7	RT	1200+55.6	to	1200+65.0	LT
54+64.9	to	63+15.1	LT	64+50.0	to	66+43.7	RT
63+37.5	to	64+27.2	LT	66+96.2	to	70+66.4	RT
64+60.7	to	65+48.2	LT	71+13.0	to	72+04.9	RT
65+81	to	67+55.3	LT	72+43.2	to	77+63.6	RT
68+49.6	to	68+34.4	LT	77+82.6	to	81+95.3	RT
68+89.0	to	69+04.6	LT	82+25.9	to	83+16.1	RT
68+95.6	to	69+42.8	LT	83+50.0	to	84+45.8	RT
69+42.3	to	69+50.2	LT	84+77.1	to	88+20.3	RT
69+76.5	to	69+90.9	LT	88+41.0	to	89+50.0	RT
69+96.0	to	70+04.3	LT	89+69.7	to	90+59.7	RT
70+58.6	to	77+63.6	LT	91+04.9	to	91+65.3	RT
77+83.0	to	81+44.7	LT	92+06.4	to	92+34.3	RT
81+89.1	to	83+41.3	LT	92+72.6	to	93+56.5	RT
83+89.9	to	83+96.7	LT	94+02.6	to	96+95.8	RT
84+20.9	to	84+20.9	LT	97+42.0	to	99+28.1	RT

ITEM 506. **GRANITE CURB TYPE VB – STRAIGHT** (Continued)

84+83.9	to	88+14.4	LT	2000+32.1	to	2000+83.0	RT
89+69.7	to	92+59.6	LT	99+89.5	to	100+28.3	RT
93+27.6	to	93+27.6	LT	100+53.6	to	100+92.0	RT
93+52.7	to	95+42.9	LT	55+73	to	55+73	RT
95+52.9	to	95+52.9	LT	48+96	to	49+09	RT
95+88.7	to	97+46.1	LT	49+33	to	49+49	RT
				49+36	to	49+44	RT

ITEM 506.1 **GRANITE CURB TYPE VB – CURVED**

10+46	to	10+54	LT	43+35	to	43+37	LT
10+77	to	10+88	LT	44+49	to	44+53	LT
10+99	to	11+17	LT	46+10	to	46+12	RT
16+20	to	16+27	LT	700+24	to	700+34	RT
23+07	to	23+10	LT & RT	46+59	to	46+60	RT
24+00	to	24+00	RT	48+63	to	48+64	RT
24+00	to	24+00	LT	52+75	to	52+88	RT
24+11	to	24+12	RT	53+78	to	53+86	LT
24+11	to	24+12	LT	53+90	to	53+93	RT
24+15	to	24+53	RT	900+46	to	900+57	RT
24+22	to	24+28	LT & RT	900+48	to	900+58	LT
299+31	to	299+70	RT	900+69	to	900+35	RT
299+35	to	299+35	LT & RT	54+45	to	54+46	RT
299+19	to	299+20	RT	54+52	to	54+65	LT
299+19	to	299+20	LT	63+39	to	63+42	RT
300+80	to	300+80	RT	1200+29	to	1200+53	RT
300+81	to	300+81	LT	1200+24	to	1200+57	LT
300+64	to	300+81	LT & RT	64+44	to	64+50	RT
300+91	to	300+92	RT	70+04	to	70+04	LT
300+80	to	300+81	RT	1300+28	to	1300+37	RT
301+31	to	301+31	LT & RT	70+56	to	70+58	LT
300+91	to	300+92	RT	83+95	to	83+98	LT
300+78	to	300+45	LT	84+24	to	84+52	LT
25+57	to	25+61	LT & RT	84+75	to	84+85	LT
25+76	to	25+77	RT	88+14	to	88+16	LT
25+77	to	25+78	LT	88+41	to	88+47	LT
25+87	to	25+88	RT	1400+47	to	1400+71	RT
25+88	to	25+89	LT	1400+43	to	1400+55	LT

ITEM 506.1 GRANITE CURB TYPE VB – CURVED (Continued)

26+50	to	26+50	RT	89+44	to	89+51	LT
27+34	to	27+37	RT	92+60	to	92+67	LT
29+69	to	30+11	LT	92+90	to	93+01	LT
399+60	to	400+12	RT	93+26	to	93+28	LT
30+32	to	30+38	LT	93+42	to	93+52	LT
399+34	to	399+54	RT	99+28	to	99+29	RT
30+63	to	30+66	LT	2000+22	to	2000+32	LT
30+72	to	31+13	RT	95+52	to	95+53	LT
31+15	to	31+48	LT	55+47	to	55+48	RT
31+91	to	31+92	RT	55+73	to	55+74	RT
600+26	to	600+38	LT	700+24	to	700+31	LT
				28+57	to	28+63	RT

ITEM 507. TYPE T100 GRANITE CURB

24+44 to 25+41

ITEM 509. GRANITE TRANSITION CURB FOR WHEELCHAIR RAMPS – STRAIGHT

16+36	to	16+36	LT	53+70	to	53+77	RT
16+75	to	16+75	LT	1000+31	to	1000+47	LT
10+37	to	10+44	RT	55+37	to	55+39	RT
23+88	to	23+89	LT	1100+26	to	1100+28	LT
299+15	to	299+21	RT	55+83	to	55+84	RT
300+79	to	300+85	RT	57+82	to	57+88	RT
300+96	to	301+05	RT	58+12	to	58+21	RT
299+16	to	299+21	LT	58+76	to	58+82	RT
299+32	to	299+41	LT	59+12	to	59+21	RT
300+98	to	301+43	LT	60+09	to	60+15	RT
25+68	to	25+83	LT	60+39	to	60+48	RT
25+93	to	26+00	LT	60+89	to	60+96	RT
26+13	to	26+37	RT	61+20	to	61+28	RT
30+39	to	30+46	RT	62+19	to	62+26	RT
30+51	to	30+58	RT	62+42	to	62+49	RT
30+93	to	31+04	LT	63+14	to	63+25	RT
31+07	to	31+13	LT	63+15	to	63+26	LT
400+51	to	400+63	RT	63+30	to	63+37	RT

ITEM 509. GRANITE TRANSITION CURB FOR WHEELCHAIR RAMPS – STRAIGHT (Continued)

400+65	to	400+73	RT	63+31	to	63+37	LT
400+95	to	401+00	LT	64+27	to	64+38	LT
27+89.0	to	28+14.0	RT	64+54	to	64+61	LT
31+69	to	31+76	LT	65+61	to	65+72	LT
32+10	to	32+18	RT	65+89	to	65+95	LT
33+02	to	33+17	RT	66+44	to	66+51	RT
33+65	to	33+71	RT	66+90	to	66+96	RT
35+85	to	36+00	LT	67+65	to	67+73	LT
36+28	to	36+35	LT	68+13	to	68+19	LT
36+72	to	36+87	LT	68+34	to	68+41	LT
37+03	to	37+10	LT	68+89	to	68+95	LT
37+80	to	37+95	LT	69+42	to	69+50	LT
37+98	to	38+13	RT	69+89	to	69+96	LT
38+25	to	38+32	LT	70+67	to	70+75	RT
38+47	to	38+54	RT	71+05	to	71+12	RT
38+68	to	38+83	LT	72+05	to	72+13	RT
38+93	to	39+08	RT	72+37	to	72+44	RT
38+97	to	39+03	LT	77+63	to	77+71	LT
39+32	to	39+39	RT	77+64	to	77+71	RT
39+44	to	39+54	RT	77+76	to	77+83	LT
39+91	to	39+94	RT	77+76	to	77+83	RT
40+23	to	40+38	LT	81+44	to	81+51	LT
40+54	to	40+60	LT	81+81	to	81+88	LT
40+73	to	40+87	RT	81+96	to	82+03	RT
41+17	to	41+23	RT	82+19	to	82+26	RT
41+48	to	41+62	RT	83+16	to	83+24	RT
41+75	to	41+86	LT	83+40	to	83+48	LT
41+82	to	41+89	RT	83+43	to	83+50	RT
42+20	to	42+27	LT	83+83	to	83+89	LT
42+56	to	42+58	LT	84+05	to	84+05	LT
43+97	to	44+03	RT	84+45	to	84+53	RT
44+10	to	44+17	LT	84+71	to	84+78	RT
44+23	to	44+31	RT	88+21	to	88+29	RT
44+66	to	44+72	RT	88+34	to	88+40	RT
44+83	to	44+90	RT	89+50	to	89+56	RT
44+84	to	44+92	RT	89+53	to	89+56	LT
45+10	to	45+18	RT	89+61	to	89+69	RT
45+58	to	45+65	RT	89+61	to	89+69	LT

ITEM 509. GRANITE TRANSITION CURB FOR WHEELCHAIR RAMPS – STRAIGHT (Continued)

45+75	to	45+84	RT	90+62	to	90+68	RT
45+86	to	45+95	LT	90+98	to	91+06	RT
46+00	to	46+04	RT	91+66	to	91+73	RT
46+11	to	46+17	LT	91+99	to	92+07	RT
47+22	to	47+31	RT	92+35	to	92+43	RT
47+61	to	47+67	RT	92+67	to	92+73	RT
47+61	to	47+67	RT	93+57	to	93+60	RT
48+02	to	48+04	RT	94+02	to	94+03	RT
48+02	to	48+16	RT	95+42	to	95+43	LT
48+52	to	48+63	RT	95+85	to	95+89	LT
48+96	to	49+00	RT	96+96	to	96+97	RT
49+05	to	49+09	RT	97+32	to	97+43	RT
49+33	to	49+36	RT	97+41	to	97+43	RT
49+44	to	49+49	RT	97+46	to	97+48	LT
49+79	to	49+85	RT	97+82	to	97+93	LT
50+65	to	50+73	RT	97+90	to	97+93	LT
50+94	to	51+00	RT	99+29	to	99+40	RT
51+05	to	51+13	RT	99+59	to	99+70	LT
51+53	to	51+59	RT	99+89	to	99+89	RT
52+40	to	52+48	RT	100+11	to	100+16	LT
52+88	to	52+94	RT	100+29	to	100+36	RT
53+57	to	53+65	LT	100+39	to	100+47	LT
53+58	to	53+65	RT	100+47	to	100+54	RT
53+70	to	53+73	LT	100+67	to	100+73	LT

ITEM 509.1 GRANITE TRANSITION CURB FOR WHEELCHAIR RAMPS – CURVED

10+17	to	10+23	LT	53+93	to	54+02	RT
10+31	to	10+38	LT	900+38	to	900+47	LT
10+42	to	10+46	LT	1000+26	to	1000+30	RT
10+99	to	11+11	LT	900+38	to	900+49	RT
16+25	to	16+31	LT	54+39	to	54+45	RT
16+75	to	16+91	LT	54+46	to	54+52	LT
23+89	to	23+98	LT	55+39	to	55+45	RT
23+89	to	23+98	RT	55+77	to	55+83	RT
24+07	to	24+14	LT	63+42	to	63+55	RT
24+08	to	24+15	RT	63+60	to	63+66	RT

ITEM 509.1 GRANITE TRANSITION CURB FOR WHEELCHAIR RAMPS – CURVED (Continued)

299+31	to	299+46	RT	64+12	to	64+16	RT
300+78	to	300+86	LT	64+19	to	64+29	RT
300+93	to	300+97	RT	70+04	to	70+12	LT
25+63	to	25+79	RT	1300+21	to	1300+27	LT
25+89	to	25+96	RT	70+50	to	70+56	LT
26+37	to	26+47	RT	83+98	to	84+05	LT
27+39	to	27+46	RT	84+66	to	84+75	LT
399+23	to	399+37	LT	88+17	to	88+27	LT
399+13	to	399+20	LT	88+33	to	88+41	LT
400+30	to	400+36	RT	1400+28	to	1400+39	LT
31+48	to	31+64	LT	1400+36	to	1400+43	LT
400+88	to	401+00	RT	89+39	to	89+44	LT
400+70	to	400+81	RT	92+67	to	92+75	LT
31+89	to	31+90	RT	93+35	to	93+42	LT
32+00	to	32+10	RT	93+60	to	93+66	RT
39+54	to	39+59	RT	93+96	to	94+02	RT
39+88	to	39+91	RT	95+43	to	95+49	LT
42+58	to	42+66	LT	95+79	to	95+85	LT
43+19	to	43+23	LT	96+97	to	97+03	LT
43+28	to	43+35	LT	97+35	to	97+41	RT
44+48	to	44+52	LT	97+48	to	97+53	LT
46+12	to	46+17	RT	97+85	to	97+90	LT
46+53	to	46+59	RT	99+29	to	99+36	RT
48+04	to	48+11	RT	99+59	to	99+66	LT
48+56	to	48+63	RT	99+81	to	99+89	RT
53+73	to	53+78	LT	100+05	to	100+11	LT
53+86	to	53+92	LT	27+37	to	27+48	RT
				28+50	to	28+57	RT

ITEM 514. GRANITE CURB INLET – STRAIGHT EACH

To be used at all catch basins called out as “CBCI” or “GI” on the plans. This excludes curb inlets included under Item 515.

ITEM 515. GRANITE CURB INLET – CURVED

16+92 LT	30+70 RT
299+26 RT	900+48 LT
299+49 RT	1400+51 LT
299+30 LT	25+18 LT
300+82 LT	26+18 LT
301+08 RT	31+07 RT
29+77 LT	53+54 LT
398+70 RT	89+49 LT
399+29 LT	93+40 LT

ITEM 580. CURB REMOVED AND RESET

16+63 to 16+67 LT

ITEM 594. CURB REMOVED AND DISCARDED

10+01	to	10+50	LT	96+61	to	97+46	LT
10+84	to	11+25	LT	300+34	to	301+50	RT
16+00	to	16+41	LT	300+29	to	300+58	RT
16+82	to	17+14	LT	300+37	to	301+31	LT & RT
299+56	to	299+96	RT	300+27	to	300+70	LT
299+56	to	299+68	LT & RT	300+36	to	301+24	LT
299+56	to	299+67	LT	25+90	to	27+32	RT
27+72	to	29+73	LT	27+88	to	28+16	RT
398+60	to	399+73	RT	28+20	to	30+80	RT
399+30	to	399+73	RT	400+30	to	401+00	RT
398+60	to	399+65	LT	400+66	to	410+00	LT
34+29	to	35+77	LT	31+89	to	33+18	RT
36+28	to	36+87	LT	33+66	to	38+11	RT
37+04	to	37+91	LT	38+46	to	39+38	RT
38+19	to	38+55	LT	39+87	to	40+75	RT
39+08	to	40+33	LT	40+79	to	40+94	RT
40+57	to	41+86	LT	41+17	to	41+19	RT
42+19	to	42+73	LT	41+23	to	41+62	RT
600+15	to	600+43	RT	41+88	to	44+03	RT
43+28	to	44+14	LT	51+00	to	51+14	RT
44+45	to	44+56	LT	51+53	to	52+48	RT

ITEM 594. **CURB REMOVED AND DISCARDED** (Continued)

44+76	to	44+97	LT	1200+23	to	1200+65	RT
900+12	to	902+65	LT	1200+19	to	1200+65	LT
900+12	to	902+65	RT	89+20	to	89+95	RT
67+47	to	67+70	LT	90+65	to	91+09	RT
68+13	to	68+30	LT	91+46	to	91+77	RT
68+88	to	69+69	LT	91+97	to	93+58	RT
69+77	to	70+22	LT	52+73	to	52+97	RT
81+90	to	83+43	LT	700+20	to	700+50	RT
89+35	to	89+76	LT	53+03	to	54+05	RT
92+87	to	93+01	LT	88+12	to	88+63	LT
93+26	to	93+35	LT	27+50	to	27+80	RT

ITEM 627.1 **TRAILING ANCHORAGE**

399+13	LT	65+89	RT
34+75	LT	72+38	RT
37+10	LT	70+60	LT
37+88	RT	77+70	RT
43+96	RT	81+70	RT
902+15	RT	90+50	RT

ITEM 630.2 **HIGHWAY GUARD REMOVED AND DISCARDED**

13+25	to	15+50	LT	41+78	to	44+00	RT
15+50	to	16+04	LT	72+53	to	77+66	RT
17+15	to	23+35	LT	77+75	to	80+87	RT
36+00	to	37+87	RT	79+80	to	81+00	LTS
37+08	to	37+88	LT	85+79	to	89+50	RT
				89+67	to	90+24	RT

ITEM 655.3 **WOOD RAIL FENCE**

14+85	to	16+35	LT	16+85	to	23+85	LT

ITEM 669. **FENCE REMOVED AND STACKED**

18+85	to	20+95	RT	37+57	to	37+57	RT
40+50	to	41+75	LT	80+84	to	81+43	LT
46+59	to	47+25	RT	81+87	to	82+18	LT
81+00	to	82+04	RT	43+80	to	43+80	RT
82+19	to	83+23	RT	43+24	to	43+26	RT

ITEM 698.3 GEOTEXTILE FABRIC FOR SEPARATION

At various locations with modified rockfill and at culverts.

ITEM 701.31 STAMPED CEMENT CONCRETE PAVEMENT

To be used at the roundabout from station 24+44 to 25+41.

ITEM 711. BOUND REMOVED AND RESET

21+66 RT	39+81 LT
39+77 LT	68+37 LT
	90+59 RT

ITEM 715. RURAL MAIL BOX REMOVED AND RESET

35+88 LT	83+60 RT
37+06 LT	38+50 RT
39+85 RT	38+75 RT
39+91 RT	40+30 LT
44+31 RT	44+85 RT
45+39 RT	46+25 LT
65+95 LT	64+14 RT
81+72 RT	

ITEM 767.121 SEDIMENT CONTROL BARRIER

9+95	to	13+40 RT	64+41	to	65+89 RT
14+44	to	16+34 LT	70+58	to	81+16 LT
35+31	to	37+76 RT	72+35	to	77+68 RT
37+02	to	38+13 LT	77+80	to	82+03 RT
41+74	to	44+03 RT	84+71	to	87+00 RT
54+75	to	57+00 LT	87+00	to	90+14 RT
57+00	to	59+57 LT	93+28	to	94+70 LT
900+38	to	902+76RT	93+97	to	97+04 RT
62+59	to	63+66 RT	1107+76	to	1108+46LT

ITEM 769. PAVEMENT MILLING MULCH UNDER GUARDRAIL

16+84	to	19+17 LT	35+87	to	37+62 LT
900+57	to	902+15RT	37+10	to	37+80 LT
54+41	to	58+50 LT	41+78	to	43+96 RT
30+94	to	35+24 LT	72+37	to	77+70 RT
70+60	to	74+50 LT	77+78	to	82+00 RT
80+55	to	81+25 LT	85+50	to	90+51 RT

ITEM 811.31 PULL BOX 12 X 12 INCHES – SD2.031

30+09 RT	30+52 RT
30+56 RT	30+75 RT
30+98 RT	31+17 RT
31+90 RT	31+92 RT
32+09 RT	30+18 LT
30+53 LT	30+55 LT
31+01 LT	31+59 LT
32+07 LT	53+31 RT
53+73 RT	53+80 RT
54+33 RT	54+47 RT
53+93 LT	53+99 LT
54+41 LT	54+91 LT
87+94 RT	88+25 RT
88+41 RT	88+62 RT
89+08 RT	88+26 LT
88+41 LT	88+54 LT
88+59 LT	89+44 LT
89+65 LT	89+95 LT

ITEM 874. STREET NAME SIGN

10+15 LT	48+33 LT
24+45 RT	54+36 RT

ITEM 874.1 STREET SIGN REMOVED AND RESET

36+60 LT (2 signs at this location)	
70+50 LT	53+94 LT

ITEM 874.2 TRAFFIC SIGN REMOVED AND RESET

10+12 RT	53+82 LT (2 signs at this location)
13+35 RT	84+67 LT
44+34 LT	88+51 LT
	100+81 LT

ITEM 874.41 TRAFFIC SIGN REMOVED AND DISCARDED

12+84 LT	37+75 LT
10+09 RT	39+97 RT
22+65 RT	40+20 LT
24+50 RT	45+05 LT
24+80 LT	43+27 RT
24+40 LT	46+08 RT
25+57 LT	53+38 LT
25+57 RT	56+67 LT
24+91 LT	84+46 LT
25+17 RT	85+79 RT
25+37 RT	89+88 RT
27+17 RT	91+84 LT
27+26 RT	92+96 LT
27+57 LT	100+45LT
28+70 RT	13+52 RT
31+75 LT	18+75 RT
30+11 LT	24+90 RT
30+50 LT	46+34 LT
32+71 LT	52+30 LT
34+70 LT	53+40 RT
35+04 RT	54+40 RT

ITEM 986.1 MODIFIED ROCKFILL

74+50 to	80+55 LT
76+05 to	80+60 RT

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DRAWINGS AND SKETCHES

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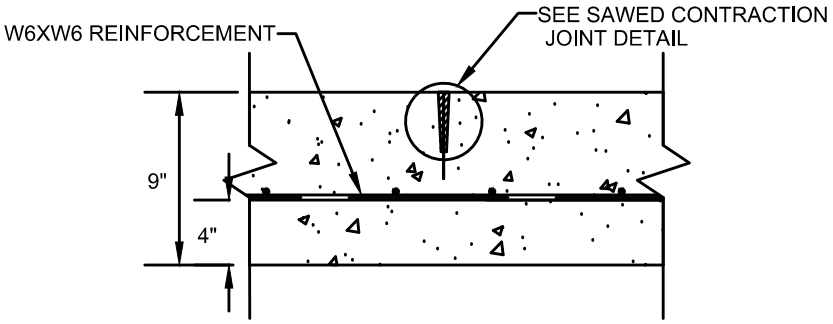
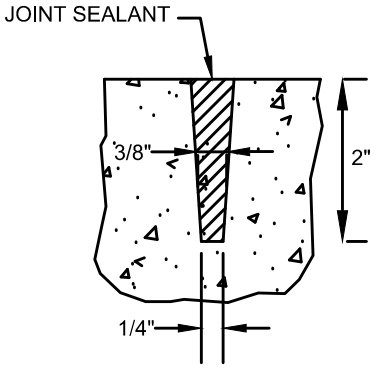
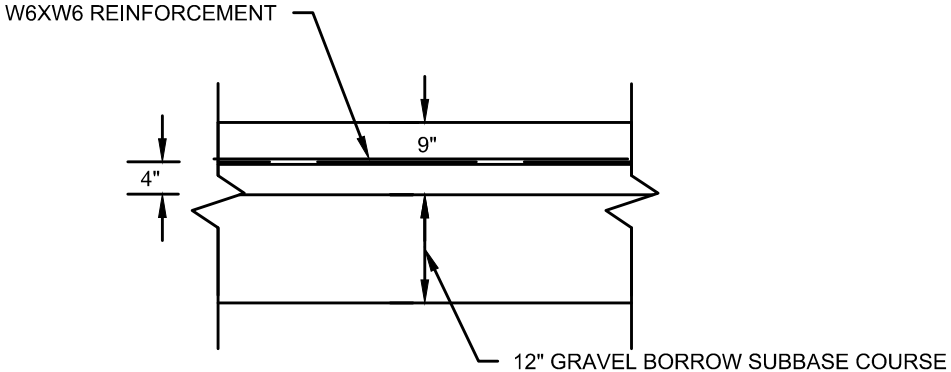


TYPICAL SECTION THRU CONTRACTION JOINT
NOT TO SCALE



SAWED CONTRACTION JOINT DETAIL
NOT TO SCALE



TYPICAL STAMPED CONCRETE SECTION
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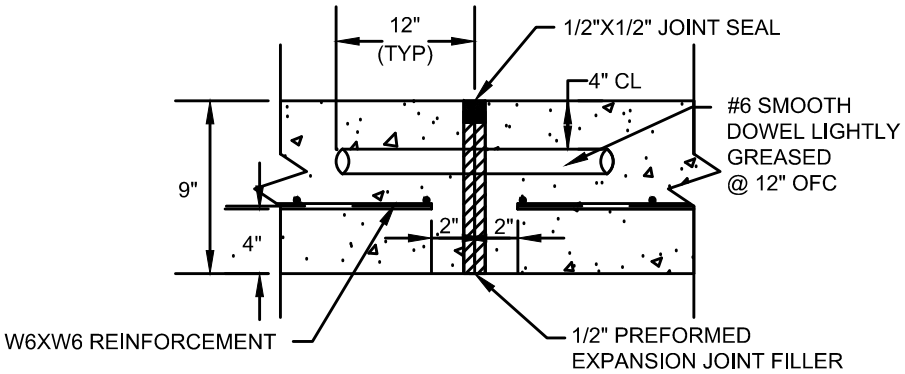

TYPICAL SECTION THRU EXPANSION JOINT
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DOCUMENT A00808

PROJECT UTILITY COORDINATION FORM

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Project Utilities Coordination (PUC) Form

CONTACTS AND GENERAL UTILITY INFORMATION

Revision Date:

City/Town:	Project File #:	PUC Completed by:	Utility Pole Set:		
Ashland	604123	R. Goodale	Eversource Electric		
Route/Street:	**Resident Engineer:**	**Mass DOT PM:**	**Scheduled Ad Date:**	**Total Poles Relocated:**	6/29/2020 PRINTED
Route 126 (Pond Street)	*TBD*	Larry Cash	6/27/2020	82	

Consultant:	Contact:	Office #	Cell #	Email
Green International	Paul Milewski	978-923-0400 x320		PMilewski@greenintl.com

Utility Company	Contact	Office #	Cell #	Email	Scope, Budget, Duration Submitted		Reimbursement			Potential for District Initiated Early Relocation *		Utilities On Bridge/Structure		Utilities Underground (UG) /Aerial (OH)	
					Yes	No	Agreement	Non-Reimb'le	Notes	YES	NO	YES	NO	UG	OH
Eversource Electric	Richard Comeau	781-441-8162		richard.comeau@eversource.com	X		X				X				X
Eversource Fiber	Tomi Fadipe	781-441-3864		oloruntomi.fadipe@eversource.com	X		X				X				X
Fire Alarm	Chief Keith Robie	508-532-7991		krobie@ashlandfire.com		X	X		Fire alarm inactive. Ashland Fire indicated most of wire along Pond Street has been removed. Contact Fire Department if any inactive cable is found		X				X
Comcast	Wendy Brown	978-848-5163		wendy_brown@comcast.com	X		X				X				X
Verizon	Paul.M.Styspeck	(413) 787-1845		paul.m.styspeck@verizon.com	X		X				N/A				X
Eversource Gas	Jeffrey Evans-Mongeon	781-441-8157		Jeffrey.Evans-Mongeon@eversource.com	X		X		See additional notes		X			X	
Town of Ashland DPW	Doug Small	508-881-0120		dsmall@ashlandmass.com	N/A				Contact Info Only						
Algonquin Gas/Spectra Energy	Frank Bailey	508-938-7713		fbbailey@spectraenergy.com	N/A				Contact Info Only						
Tennesee Gas Pipeline	David Wood	860-763-6005		David_Wood@KinderMorgan.com	N/A				Contact Info Only						
Enbridge	Kathy Aruda	508-938-7728		kathleen.aruda@enbridge.com	N/A				Contact Info Only						
Shell Oil Pipeline	Preston Hathaway	508-941-3280			N/A				Contact information for Oil Pipeline Marker Remove and Reset at STA 52+25LT						

Utility Relocation Notes for MassDOT Contractor

Unless otherwise noted by Contract, the MassDOT Contractor is to provide the District Construction Office with 7 Calendar Days advance notification in order to validate the current progress and provide the required 30 Days advance notice-to-proceed for the first Utility - and each subsequent Utility. These advance notifications are to be identified in the Contractor's Schedules (Pre-Con preparation, Baseline, Subnets, and Updated/Monthly Schedules) as specified in Subsection 8.02 (for DBB Contracts) and/or Section 9 (of DB Contracts). Note: The durations included below do not include these lead-times. See Additional 'Important Basis notes for Contractor' - on last PUC Form page.

Additional notes:

Eversource Gas has provided a basic support plan for the existing 12"/16" EH Steel Main for the culvert replacement at STA 80+40 and STA 90+15. These plans will be included in the contract documents. MassDOT contractor will need to coordinate all work associated on and around the 12"/16" gas main and will provide oversight during these operations. This includes a review of the support provided by the MassDOT contractor. Eversource Gas would also be on site to ensure the backfill and burial meet the requirements for supporting the gas main.

Suggested Sequence of Relocation (Based on Consultant proposed construction staging)

The sequence as detailed on the following pages is based on the consultants proposed staging plan. This information was compiled through meetings that included all of the utilities listed below along with the designer and the (Town of Ashland). The information provided is the best available information prior to project advertisement.

Proposal No. 604123-111717

Is 'enabling' (prep) work, by the Contractor, necessary prior to the start of the first series of utility relocations:	Yes	No
	X	

Has any of the Utility work been identified to work concurrently	Yes	No
	X	

6/29/2020
PRINTED

massDOT Massachusetts Department of Transportation Highway Division

	RESPONSIBLE PARTY		DESCRIPTION - Utility Relocation Phases, Tasks and Activities	Estimated Duration (Work Days) by Utilities (Lead time not included)	Concurrent / Exclusive Utility Work Contractor note: In planning and executing the work, the Access Restraints listed in the Special Provisions, takes precedence over the checklist in these 4 columns.				Access Restraint & Limitations of Operations Notes Should an AR be considered for the Contractor ?	
					Exclusive Utility on site	Concurrent Utilities	Contractor Off-Site	Contractor Concurrent		
	C = Contractor	U = Utility Co.			Utility working with no other Utilities in vicinity	Utility working with other Utilities on site	No Contractor physical construction operations on-site (while Utility is	Contractor and Utility are working on-site - but NOT in the same vicinity	Potential Access Restraint (Yes/No)	Reason/Note (optional)
	C		Enabling' work by the Contractor - Tree trimming and tree removal prior to utilities installing utility poles. Perform widening of Route 16 from STA 15+00±LT to STA 19+50±LT to accommodate installation of UP 36-74, 36-73 and UP 36-72. Construct utility pole caissons from STA 32+10±LT to STA 35+00±LT prior to utility pole relocation in this area. Coordinate with Eversource Electric regarding riser relocations identified in Eversource Electric force account							
			UTILITY OPERATIONS - Overhead							
Task: 1			***Eversource Electric -***							
		U	Install/Replace 15 poles	21	X			X	No	
		U	Install guy/anchors	7	X			X	No	
		U	Relocate 71 Poles (Majority 50-ft poles)	100	X			X	No	
		U	Frame poles	25	X			X	No	
		U	Install OH	60	X			X	No	
		U	Transfers	25	X			X	No	
		U	Build Risers, install cable, replace switch (underground work)	18	X			X	No	
		U	Remove cable (underground work)	3	X			X	No	
		U	Install Duct / Conduit Inspection (underground work)	20	X			X	No	
			Sub-Total	**279**						
Task: 2			***Eversource Fiber***							
		U	Transfer Fiber (**See Note 9)	4	x			X	No	
			Sub-Total	**4**						
Task: 3			***Comcast***							
		U	Construct new strand and lash cable	21	X			X	No	
		U	Cold Splice	15	X			X	No	
		U	Power Supply Transfers	2	X			X	No	
		U	Night splice and activation of 3 Nodes to new coaxial replacemetn cables	3	X			X	No	
		U	de-lash old strand/coaxial plant from existing fiber and relash or trasnfer existing aerial fiber to new pole locations	10	X			X	No	
		U	Wreckout old coaxial cables/strand and dispose	5	X			X	No	
			Sub-Total	**56**						
Task: 4			***Verizon***							
		U	Pole work-Stencil Poles, place/remove pole anchors	17	x			X	No	
		U	Transfer and place cable	30	x			X	No	
		U	Remove cable	40	x			X	No	
		U	Splice/trim out cables	52	x			X	No	
		U	Place/remove/transfer drop wires	8	x			X	No	
			Sub-Total	**147**						
Task: 5			***Eversource Electric***							
		U	Remove poles and OH wire	27	x			x	No	
			Sub-Total	**27**						
	C		Enabling' work by the Contractor - MassDOT contractor to coordinate with Eversource Gas prior to Eversource gas temporarily relocating the existing 8-inch gas main in the locations of culvert replacement at STA 37+50, 80+40, and 90+15. MassDOT contractor to prepare the site for the temporoay relocation of the gas mains and install support system per plan. Once temporary gas main is installed MassDOT contractor to remove existing 8-inch gas main (once cut and capped by Eversource Gas) in preparation for culvert replacement. Coordinate with Eversource Gas to reinstall permanent gas main. Relocate water main prior to UP relocation at STA 14+40LT, 15+80LT and STA 17+30LT.							
			UTILITY OPERATIONS - Underground							
Task: 1			***Eversource Gas - Temporary Relocation***							
		U	Install by pass for existing 8-inch gas main, cut and cap 8-inch plastic main (3 locations per plan. Assume 13 days each)	40		X		X	No	
			Sub-Total	**40**						
Task: 2			***Eversource Gas - Permanent Installation***							
		U	Install 8-inch plastic main over new culvert and remove bypass (3 locations per plan. Assume 8 days each)	24		X		X	No	
			Sub-Total	**24**						
			IMPORTANT BASIS NOTES - FOR CONTRACTOR							

RESPONSIBLE PARTY C = Contractor U = Utility Co.	DESCRIPTION - Utility Relocation Phases, Tasks and Activities	Estimated Duration (Work Days) by Utilities (Lead time not included)	Concurrent / Exclusive Utility Work Contractor note: In planning and executing the work, the Access Restraints listed in the Special Provisions, takes precedence over the checklist in these 4 columns.				Access Restraint & Limitations of Operations Notes Should an AR be considered for the Contractor ?	
			Exclusive Utility on site	Concurrent Utilities	Contractor Off-Site	Contractor Concurrent		
			Utility working with no other Utilities in vicinity	Utility working with other Utilities on site	No Contractor physical construction operations on-site (while Utility is	Contractor and Utility are working on-site - but NOT in the same vicinity	Potential Access Restraint (Yes/No)	Reason/Note (optional)
	1 Unless otherwise specified in the MassDOT Construction Contract, or unless specifically noted within this PUC Form, these durations (herein) are based upon the Contractor providing *unimpeded access* to the Utility company to perform Utility relocations (see Note 5 - Access).							
	2 "Concurrent Utilities" operations noted herein, are to signify those Utility Company operations that can be worked concurrently (e.g. Utility A and Utility B work on-site together) - MassDOT and the Contractor are to prepare NTPs to Utilities accordingly.							
	3 "Potential Access Restraints" noted within this PUC Form are for planning purposes. See MassDOT Contract for Contractual Access Restraints (refer to Subsections 8.02, 8.03, and/or 8.06 for Design Bid Build Contracts and Volume II Section 9 for Design Build Contracts).							
	4 Utility non-work periods - For planning purposes, the durations above contain some non work days (contingency) for New England conditions (precipitation, high temperatures, low temperatures, snow, ice). Gas line work however, typically has a seasonal restriction and can NOT be installed from 15-November to 15-March. Municipally Owned Electric and Gas Utilities are also restricted from proceeding from 15-November to 15-March. The Contractor shall (and the CTD plan) reflect this calendar restriction within the schedule (unless otherwise note).							
	5 Access - Unless otherwise noted in the Contract, and in addition to the 'enabling' notes above, the Contractor must provide safe and unimpeded access (for trucks, lifts, cranes, etc.) to the Utilities, to allow for the proposed relocation(s) - including but not limited to snow removal, clearing and grubbing, guard rail removal, barrier removal, tree removal, and grading.							
	6 For all MassDOT construction contracts issued after January 2014, the new Utility Coordination/documentation specification is required. This is Section 8.14 in Design-Bid-Build Contracts (see Design-Build index reference for applicable section #).							
	7 Prior to starting any and all enabling work for Utilities, the Contractor is to plan in advance with submittals and approved durations.							
	8 * Potential District Initiated Early Utility Relocation - if noted herein, the District reserves the right to initiate early utility relocation in advance of the Contract NTP. In submitting a bid price and in the development/basis of the Baseline Schedule, the Contractor shall not plan the Work with the potential benefit of any form of 'early utility relocation.' As a requirement of the Baseline submission, unless otherwise noted in this Specification, the earliest that the first Utility company is to receive the 30 days advance notification to mobilize to the site, will be 7 calendar days after the pre-construction meeting and never sooner than 7 days after the Contract NTP.							
	9 Eversource Fiber is only on poles from 152 Pond Street North to the Framingham Town Line							

Proposal No. 604123-111717

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DOCUMENT A00810

MassDOT Herbicide Use Report

MassDOT Herbicide Use Report

Date Submitted:

Use multiple sheets for multiple application techniques or sites as needed.

Contractor Performing Work:

Project or Contract No:

Town/s:

Associated Route:

Project Description:

Treatment Description:

Area Treated (as applicable)

Acres: **Sq Yds:** **Miles:**

Weeds Targeted:

Gallons Formula Used:

Date/Time Began:

Application Method:

Date/Time End:

Product Used:

Name: _____	Name: _____	Name: _____
EPA Reg. No: _____	EPA Reg. No: _____	EPA Reg. No: _____
% Active Ingredient	% Active Ingredient	% Active Ingredient
Dry: _____	Dry: _____	Dry: _____
Liquid: _____	Liquid: _____	Liquid: _____
Formulation (dilution rate): _____	Formulation (dilution rate): _____	Formulation (dilution rate): _____

Additional products used (surfactants, etc.) or other information:

Applicators:	**License Numbers:**

Upon completion, please submit form to MassDOT District Engineer and Landscape Design Section in Boston office.

11-16-2017

DOCUMENT A00820

Massachusetts Department of Transportation
Conditions of Custody

REQUEST FOR RELEASE OF MASSDOT AUTOCAD FILES FORM
(Only to be used following award of contract)

Contract Number: 111717 Project File Number: 604123

City/Town: Ashland

Project Description: Roadway Reconstruction and Related Work along Route 126 (Pond Street)

All AutoCAD files are provided solely as a courtesy to facilitate public access to information. MassDOT attempts to provide current and accurate information but cannot guarantee so. MassDOT provides such documents, files or other data "as is" without any warranty of any kind, either expressed or implied, including but not limited to, accuracy, reliability, omissions, completeness and currentness. The Commonwealth of Massachusetts and its Consultants shall not be liable for any claim for damages, including lost profits or other consequential, exemplary, incidental, indirect or special damages, relating in any way to the documents, files or other data accessible from this file, including, but not limited to, claims arising out of or related to electronic access or transmission of data or viruses. Because data stored on electronic media can deteriorate undetected or be modified without our knowledge, MassDOT cannot be held liable for its completeness or correctness. MassDOT makes no representation as to the compatibility of these files beyond the version of the stated CAD software.

By signing this form, I agree that it shall be my responsibility to reconcile this electronic data with the conformed contract documents, and that only the conformed contract documents shall be regarded as legal documents for this Project. I understand that this authorization does not give me the right to distribute the files. I agree to the terms above and wish to receive the AutoCAD files.

This signed form shall be mailed to:

Highway Design Engineer
MassDOT – Highway Division
10 Park Plaza, Room 6260 Attn: AutoCAD Files
Boston, MA 02116

Name of person requesting AutoCAD files: _____

Affiliation/Company: _____

Address: _____

_____

Telephone number: _____

Email address: _____

Signature/Date: _____

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DOCUMENT A00830

ARMY CORPS OF ENGINEERS

APPLICATION

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Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, Secretary & CEO
Thomas Tinlin, Acting Administrator

massDOT
Massachusetts Department of Transportation
Highway Division

February 19, 2020

Mr. Dan Vasconcelos
Regulatory Division, Department of the Army
New England District, Corps of Engineers
696 Virginia Road
Concord, Massachusetts 01742

Re: Application for Pre-Construction Notification
Route 126 (Pond Street)
Ashland, Massachusetts
MassDOT Project 604123

The Massachusetts Department of Transportation – Highway Division (MassDOT) respectfully submits this application for a Pre-Construction Notification (PCN) for roadway, safety, and drainage improvements on Route 126 (Pond Street) in the Town of Ashland under General Permit 1.

The project will include full-depth reconstruction of deteriorated roadway pavements, construction of new sidewalks to improve pedestrian safety, construction of subsurface drainage improvements to extend pavement life spans, and surface drainage improvements to improve safety by reducing stormwater ponding on reconstructed roadway pavements. Intersection improvements at Spyglass Hill Drive, Eliot Street, Algonquin Trail and James Road are also proposed. Three culverts will also be replaced as part of this project. These improvements will result in enhanced roadway safety for all roadway users including bicyclists, pedestrians, and vehicles.

The project will temporarily impact 2,730 square feet of Vegetated Wetland and permanently impact 3,686 square feet of Vegetated Wetland. Approximately 4,110 square feet of Vegetated Wetland will be replicated behind the Ashland Fire Department Headquarters. There are no impacts to Waters of the US proposed under this project, since all the waterways within the project limits are intermittent streams.

If you have questions or require additional information, please contact me at 857-368-8807 or at susan.mcarthur@state.ma.us. We look forward to working with you on this project.

Sincerely,

Susan McArthur

Susan McArthur
Wetlands Unit Supervisor
MassDOT, Highway Division

cc: Lawrence Cash, Massachusetts Department of Transportation
Christopher Ross, Massachusetts Department of Environmental Protection

Enclosures: Pre-Construction Notification Application

WATER QUALITY CERTIFICATE APPLICATION

Route 126 (Pond Street)
Ashland, Massachusetts

MassDOT Contract No. 604123



Prepared for

Massachusetts Department of Transportation

January 31, 2020

Prepared by

GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers

Building Strong Client Relationships Through Engineering Excellence

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ATTACHMENTS

Attachment A – Figures
Figure 1 - USGS Map
Figure 2 - Aerial Map
Figure 3 - Environmental Constraints Map
Attachment B – Wetland Delineation and Replication Report (Epsilon)
Attachment C – Order of Conditions (OOC)
Attachment D – Public Notice
Attachment E – Stormwater Report (bound separately)
Attachment F – WQC Submission Plans (bound separately)
Attachment G – Cultural Resource Coordination
Attachment H – ROW Parcel Summary Sheet/Abutters
Attachment I – 4d Submittal (Northern Long Eared Bats)

ENG FORM 4345

U.S. Army Corps of Engineers (USACE)

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

33 CFR 325. The proponent agency is CECW-CO-R.

Form Approved - OMB No. 0710-0003 Expires: 01-08-2018

The public reporting burden for this collection of information, OMB Control Number 0710-0003, is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR APPLICATION TO THE ABOVE EMAIL.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned. System of Record Notice (SORN). The information received is entered into our permit tracking database and a SORN has been completed (SORN #A1145b) and may be accessed at the following website: http://dpcld.defense.gov/Privacy/SORNsIndex/DOD-wide-SORN-Article-View/Article/570115/a1145b-ce.aspx

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First - Susan Middle - Last - McArthur	First - Danielle Middle - Last - Spicer
Company - Mass Department of Transportation - Highway Division	Company - Green International Affiliates, Inc.
E-mail Address - Susan.McArthur@dot.state.ma.us	E-mail Address - dspicer@greenintl.com
6. APPLICANT'S ADDRESS:	9. AGENT'S ADDRESS:
Address- 10 Park Plaza, Room 4260	Address- 239 Littleton Rd, Suite 3
City - Boston State - MA Zip - 02116 Country - USA	City - Westford State - MA Zip - 01886 Country - USA
7. APPLICANT'S PHONE NOs. w/AREA CODE	10. AGENTS PHONE NOs. w/AREA CODE
a. Residence b. Business 857-368-8807 c. Fax 857-368-0609	a. Residence b. Business 978-923-0400 x270 c. Fax

STATEMENT OF AUTHORIZATION

11. I hereby authorize, _____ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

_____ _____

SIGNATURE OF APPLICANT DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)

Route 126 (Pond Street) Proposed Roadway Reconstruction

13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
Beaverdam Brook, Waushakum Pond	Address Route 126 (Pond Street)
15. LOCATION OF PROJECT	City - Ashland State- MA Zip- 01721
Latitude: ◦N 41° 14' 50" N Longitude: ◦W 71° 25' 49" W	

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)

State Tax Parcel ID Municipality Ashland

Section - Township - Range -

17. DIRECTIONS TO THE SITE

The project is located at Route 126 (Pond Street) in the Town of Ashland, from the intersection of Framingham town line to the Holliston town line. The total project length is 1.7 miles.

18. Nature of Activity (Description of project, include all features)

The project will include full-depth reconstruction of deteriorated roadway pavements, construction of new sidewalks to improve pedestrian safety, construction of subsurface drainage improvements to extend pavement life spans, and surface drainage improvements to improve safety by reducing stormwater ponding on reconstructed roadway pavements. Intersection improvements at Spyglass Hill Drive, Eliot Street, Algonquin Trail and James Road are also proposed. Three culverts will also be replaced as part of this project.

The project will temporarily impact 2,730 square feet of Vegetated Wetland and permanently impact 3,686 square feet of Vegetated Wetland. Approximately 4,000 square feet of Vegetated Wetland will be replicated behind the Ashland Fire Department Headquarters. There are no impacts to Waters of the US proposed under this project because all the waterways within the project limits are intermittent streams.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

The purpose of the improvements is to enhance roadway safety for all roadway users including bicyclists, pedestrians, and vehicles.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

The construction of new sidewalk and full-depth roadway reconstruction to achieve a typical pavement width of 32 to 44 feet results in permanent (fill) and temporary impacts to Vegetated Wetlands.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards
Roadway fill (approximately 115 CY)		

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres 0.084 acres (3,686 SF) of permanent impact/fill

or

Linear Feet

23. Description of Avoidance, Minimization, and Compensation (see instructions)

To protect the wetland resource areas during construction, a combination of erosion and sediment control BMPs will be installed. Erosion control measures will be implemented as described in the Order of Conditions (OOC) and approved plans. Primary erosion control techniques proposed include compost filter tubes, sedimentation fence barriers, and street sweeping. The Contractor will have a stockpile of materials required to control erosion on-site to be used to supplement or repair erosion control devices. These materials will include, but are not limited to, compost filter tubes, sedimentation fence, silt sacks for catch basins, erosion control matting and crushed stone. The erosion controls will be maintained in good condition until on-site.

24. Is Any Portion of the Work Already Complete? ☐ Yes ☒ No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address- See Attachment H, ROW Parcel Summary

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
MassDEP	401 WQC Fill	X284907	2020-02-11	N/A	N/A
Ashland ConCom	OOC	95-931	2019-07-01	2019-12-09	

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

Susan McArthur — 2020-02-19

SIGNATURE OF APPLICANT | DATE | SIGNATURE OF AGENT | DATE

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

1.0 INTRODUCTION AND OVERVIEW

This Water Quality Certificate Application has been prepared for roadway, safety and drainage improvements on Route 126 (Pond Street) in the Town of Ashland, from the intersection of Framingham town line to the Holliston town line for a total project length of 1.7 miles. Intersection improvements at Spyglass Hill Drive and Pond Street, Eliot Street and Pond Street, Algonquin Trail and Pond Street, and James Road and Pond Street are also proposed. This project consists of maintenance and improvement of an existing roadway (including widening of less than a single lane, improvements to existing drainage systems, and repaving).

The project will include full-depth reconstruction of deteriorated roadway pavements, construction of new sidewalks to improve pedestrian safety, construction of subsurface drainage improvements to extend pavement life spans, and surface drainage improvements to improve safety by reducing stormwater ponding on reconstructed roadway pavements. Minor horizontal and vertical roadway alignment improvements are also proposed. Three culverts will also be replaced as part of this project. These improvements will result in enhanced safety of roadway for all roadway users including bicyclists, pedestrians, and vehicles.

The proposed work within Waters of the United States requires a Section 401 Water Quality Certification pursuant to 314 CMR 9.04(1) since the project will result in the loss of more than 5,000 square feet cumulatively of temporary and permanent Bordering Vegetated Wetland, an area subject to 310 CMR 10.00: Wetlands Protection which is also subject to 33 U.S.C. §1251 *et seq.* (1972), The Clean Water Act (CWA). Therefore, the Water Quality Certification application package is being submitted to the Department of Environmental Protection (DEP) in association with this project. The proposed work will not involve dredging, or placement of fill, in waterways. Since the project will result in cumulative impacts, both temporary and permanent, to over 5,000 square feet of wetlands, the proposed project will require filing of a Pre-Construction Notification (PCN) Form with Army Corps of Engineers (ACOE).

The Notice of Intent (NOI) was submitted to the Ashland Conservation Commission pursuant to the Massachusetts Wetlands Protection Act (WPA) Regulations and its implementing regulations 310 CMR 10.00 for work within Bordering Vegetated Wetland (BVW), Inland Bank, 200-foot Riverfront Area, the 100-foot Buffer Zone, and within Bordering Land Subject to Flooding (BLSF) (MassDEP File No. 95-931). An Order of Conditions (OOC) for the project was issued by the Ashland Conservation Commission on 12/23/2019 and is included in Attachment C to this Application.

The proposed works exceeds the activity thresholds described in 301 CMR 11.03(3)(b)1.d.; consequently, an Environmental Notification Form will be filed to initiate project review under MEPA by the Executive Office of Energy and Environmental Affairs.

2.0 EXISTING CONDITIONS

Pond Street is an Urban Principal Arterial, located southeast of Route 135 and west of Route 27, extending from the Framingham town line to the Holliston town line. Pond Street is located within a public right-of-way which is generally around 46 feet wide, but which widens around curves and intersections. Pavement widths vary from approximately 35 feet to 45 feet, but it is as wide as 58 feet at some intersections with turning lanes. The travel lanes are generally 12-14 feet wide with shoulders between 2 and 5 feet widths. There are no bicycle accommodations on the roadway, other than bicycle detection at signalized intersections, and limited pedestrian accommodations.

There are wetlands that exist either directly adjacent to Pond Street on both sides of the roadway or nearby. Runoff from the site currently discharges via a combination of closed drainage systems, "country drainage" off the pavement edges, or via gutter flow along the pavement edges in areas where the roadway is lower than the surrounding terrain. The site discharges to twenty distinct discharge points. The wetlands are identified as Wetlands "A" through "L" and can be seen on Figure 3, Environmental Constraints Map, in Attachment A to this Application.

Wetlands on the east/northeast side of the project are a part of the Beaverdam Brook watershed. Beaverdam Brook, on the east side of the road, is generally flowing north-northeast in the vicinity of the project. Wetlands on the northwestern side of the project are located within the Tributary to Waushakum Pond watershed. Both Waushakum Pond and Beaverdam Brook are parts of the major Concord River Watershed. There are four intermittent streams within the project area; no perennial streams are present within the limit of work. Tributary to Waushakum Pond is flowing approximately 150 feet east of the proposed replication area behind the Fire Station. Beaverdam Brook and Tributary to Waushakum Pond have not been assessed for water quality, however Waushakum Pond is classified as a Class "B" waterbody, which designates the waterway as suitable for swimming, boating, fish and wildlife habitat, irrigation and agricultural use, and industrial cooling and process use. Waushakum Pond is listed in the 303(d) list as a Category 5 water requiring a TMDL, for being impaired with phosphorus, aquatic plants (macrophytes), non-native aquatic plants, dissolved oxygen and turbidity.

3.0 PROPOSED CONDITIONS

The proposed project includes performing full-depth reconstruction of approximately 9,000 feet of roadway to achieve a typical pavement width of thirty-two (32) to forty-four (44) feet, including two 11-foot travel lanes and 5-foot shoulders/bicycle lanes on both sides of the road, and to address numerous substandard safety and drainage issues along the roadway. Continuous sidewalks are also proposed along both sides of the road for the entire project length. The new drainage systems will improve the quality of stormwater runoff and will overall maintain historic drainage patterns, distributing runoff to the existing discharge points. All work will be done in a manner that will limit the impacts to adjacent resource areas.

As part of the NOI Application hearing process, Green International Affiliates, Inc. performed evaluation and CCTV investigation of existing culverts and headwall openings along different stations of the project site. The inspection findings and recommendation were discussed with the Conservation Commission during the NOI hearing on November 4, 2019. Based on the results of the CCTV evaluation, culvert #1 at Sta. 37+50, culvert #3 at Sta. 80+40) and culvert #4 at Sta. 90+00 are proposed to be replaced as part of this project. Both culvert #1 (2'Wx2'H) and culvert #3 (3'Wx2'H) will be replaced respectively with 2'Wx3'H and 3'Wx3'H box culverts with flow baffles where the bottom 12" will be filled with a natural stream bed material. Both culvert #1 and #3 crossings connect wetlands on each side of the roadway, and as such, the Stream Crossing General Standards do not apply; however, the design still employs a natural stream bottom to provide wildlife with an improved crossing. The proposed culvert replacement at Sta. 90+00 (culvert #4) was not designed to comply with the Stream Crossing Standards, since it is collecting runoff from a closed drainage system and is not serving as a stream crossing.

The construction of subsurface and surface drainage improvements is necessary to extend pavement life spans and to improve safety by reducing stormwater ponding on reconstructed roadway pavements.

4.0 ANTICIPATED CONSTRUCTION SEQUENCE

Construction phasing will ultimately be determined by the project contractor. The construction phasing is assumed to generally be as follows:

Construction Sequence

1. Install erosion and sedimentation control measures.
2. Fence off, mobilize equipment and crews, prepare work area(s) and set up staging and storage area(s)
3. Set up traffic controls
4. Demolish pavement in sections along Route 126 (Pond Street)
5. Replace Culverts #1, #3 and #4 with precast box culverts with an equivalent capacity and dimensions as the existing ones and as specified in the details. Culvert #1 and #3 are proposed to have a natural stream bottom.
6. Construct new storm drains in sections along Route 126 (Pond Street)
7. Construct roadway base and binder pavements in sections along Route 126
8. Install new traffic signal equipment
9. Complete roadway construction and stripe new pavements
10. Install landscaping and grassed areas
11. Remove erosion and sedimentation controls and protective measures for vegetation indicated to remain.
12. Shift traffic to fully utilize new roadway

Equipment that is likely to be utilized for this project includes dump trucks, flatbed trucks, front-end loader(s), backhoe(s), skid steer(s), excavator, hoe rams, drilling rigs, concrete pumpers, air hammers, air compressor(s), and a crane. Equipment can be parked on roadway pavements off-limits for construction staging purposes. Staging equipment in Vegetated Wetland or Waterway resource areas overnight or on weekends shall be prohibited.

5.0 IMPACTS TO WATERS OF THE UNITED STATES

The project's resource area impacts will occur in Vegetated Wetlands, resulting from both permanent and temporary construction taking place along the Route 126 (Pond Street). There are no impacts to Waterways/LUW proposed under this project, since all the waterways within the project limits are intermittent streams.

The overall impacts to Vegetated Wetlands are summarized below:

Table 5.1: Vegetated Wetland Impacts

Wetland Area	Permanent Impacts (ft^2)	Temporary Impacts (ft^2)
Wetland A	119	142
Wetland B	30	17
Wetland C	201	248
Wetland D	338	294
Wetland G	536	588
Wetland K	1,721	1,167
Wetland H	741	274
Total	**3,686**	**2,730**

5.1 Permanent Vegetated Wetland Impacts

Extended areas of Vegetated Wetland are located along the Route 126 (Pond Street) throughout the project limits. Vegetated Wetland limits at times extend close to each side of the roadway. The project's purpose to provide roadway, safety and drainage improvements on Route 126 (Pond Street) will result in permanent impacts to Vegetated Wetland areas that can not be avoided. No Isolated Vegetated Wetlands are present in the vicinity of the project area.

The direct impacts to wetland resource areas associated with the project are associated with the reconstruction and minor widening of the roadway in select areas, the construction of new sidewalks, the construction of stone waterways located along Pond Street and the replacement of three culverts (See Table 5.1 for a summary of impacts). Resource areas are shown on Figure 3 – Environmental Constraints Map in Attachment A of this Application. To minimize the impacts to the wetland areas, proper erosion and sediment controls will be installed during construction. These impacts will be mitigated by constructing a wetland replication area. See Section 6.0 below for more detail.

5.2 Temporary Vegetated Wetland Impacts

Temporary disturbance to Vegetated Wetlands (2,730 square feet) will be required for installation of Erosion & Sediment Control Best Management Practices (BMPs). After the erosion controls have been removed the Vegetated Wetlands will be restored to preexisting conditions in accordance with the MassDOT Specification 755.35, INLAND WETLAND REPLICATION AREA, included in the Attachment B – Wetland Replication Plan for MassDOT Route 126 (Pond Street) Maintenance and Improvement Project (Epsilon) of this Application. In addition to the minimum control measures included in the plan set, a Stormwater Pollution Prevention Plan (SWPPP) for construction activities will be prepared by the Contractor for the site in compliance with the EPA's Construction General Permit. It will include measures to minimize exposed soil areas through work sequencing and temporary stabilization, and establish a permanent vegetative cover or other forms of stabilization as soon as practicable.

6.0 WETLAND REPLICATION/MITIGATION

The project has been designed to avoid wetland resource area impacts to the maximum extent practicable and will mitigate unavoidable resource area impacts in accordance with state regulations (Massachusetts

Wetland Protection Act regulations at 310 CMR 10.55(4)(b), and the Massachusetts Department of Environmental Protection's ("MassDEP") "Massachusetts Inland Wetland Replication Guidelines" (MassDEP, March 2002)).

To mitigate for total Vegetated Wetland losses (fill) of 3,686 square feet, a wetland replication area is proposed to be constructed on the parcel located at 70 Cedar Street behind the Ashland Fire Department Headquarters. The wetland replication area will equal approximately 4,000 square feet and will provide mitigation for the wetland losses at a ratio greater than 1:1.

The Wetland Replication Plan for MassDOT Route 126 (Pond Street) Maintenance and Improvement Project by Epsilon and the Order of Conditions (OOC) are included in Attachments B and C of this Application, providing detailed information regarding wetland impacts minimization and mitigation, the existing and proposed conditions, construction methods, and monitoring at the replication site.

7.0 SEDIMENTATION CONTROL MEASURES

To protect the wetland resource areas during construction, a combination of erosion and sediment control BMPs will be installed. Erosion control measures will be implemented as described in the Order of Conditions (OOC) and approved plans. Primary erosion control techniques proposed include compost filter tubes, sedimentation fence barriers, and street sweeping. The Contractor will have a stockpile of materials required to control erosion on-site to be used to supplement or repair erosion control devices. These materials will include, but are not limited to, compost filter tubes, sedimentation fence, silt sacks for catch basins, erosion control matting and crushed stone. The erosion controls will be maintained in good condition until on-site soils are stabilized. All areas will be permanently stabilized following the completion of construction work.

Please refer to the Order of Conditions (OOC) in the Attachment C for detailed information on sedimentation control measures proposed.

8.0 DEWATERING

It is anticipated that a NPDES Construction General Permit (CGP) will be required for the project; therefore, if dewatering is needed, all pumped effluent will be done in compliance with the dewatering requirements within the CGP. There will be no direct discharge of pumped water into any wetland, resource area, or closed drainage system.

9.0 STORMWATER MANAGEMENT

Please refer to the Stormwater Report included as Attachment E to this Application for detailed Stormwater Management measures proposed for this project.

10.0 FISHERIES AND WILDLIFE / NATURAL HERITAGE ENDANGERED SPECIES / VERNAL POOLS

There are no Fisheries and/or Natural Heritage and Endangered Species Program (NHESP) Priority Habitat or Estimated Habitat for any species of concern in proximity to the project area. The closest NHESP Priority Habitat of Rare Species (PH 1189) is located approximately 850 feet west of the northern project limit. There are no Certified Vernal Pools (CVPs) identified on MassGIS closer than 3,800 feet west of the southern

project limit. There are no Potential Vernal Pools (PVPs) closer than 1,500 feet of the project area. The MassDOT does not anticipate any portion of this project to negatively impact these vernal pools. The project is not located within or in close proximity to Areas of Critical Environmental Concern (ACECs) and Outstanding Resource Waters (ORWs). The closest Area of Critical Environmental Concern (ACEC) to the project site is the Cedar Swamp ACEC in the Town of Westborough, the limits of which are approximately 6 miles west of the project. The closest ORW to the project site is the Public Water Supply Watershed of the Reservoir No. 3 in the City of Framingham, the limits of which are approximately 3 miles northwest of the project. Please refer to Figure 3 – Environmental Constraints Map in Attachment A for details.

According to the Federally Listed Endangered and Threatened Species in Massachusetts, the Northern Long-eared Bat (*Myotis septentrionalis*) (NLEB) is a proposed Endangered Species located Statewide; however, this species is protected by the Massachusetts Natural Heritage and Endangered Species Program (NHESP). Review of their habitat on NHESP's website indicate that in warmer months they can be found in forested areas, specifically in clustered stands of large trees and in colder months they can be found in natural caves and abandoned mines. The closest recorded NLEB hibernaculum is located 8.5 miles east of the project site in the Town of Wellesley. Based on this information the proposed project is not located within habitat that would support the NLEB; therefore it can be assumed that this project will not result in any impacts to the NLEB.

11.0 ALTERNATIVE ANALYSIS

The intent of this project is to provide multi-modal accommodations for all types of roadway users by taking a Complete Streets approach. This includes providing accommodations for vehicular traffic, bicyclists, and pedestrians. The Proponent considered several options with respect to finding the best design solution to accommodate the intent of the project, while avoiding and minimizing impacts to the surrounding resource areas. An alternative to eliminate sidewalks or bicycle accommodating shoulders was not considered as this would defeat MassDOT's and the Town's reason to pursue this project, which is to improve safety for all users and provide a Complete Street.

Three alternatives have been identified and discussed below:

Alternative 1: No Build

The current roadway condition of Route 126 (Pond Street) in the Town of Ashland is deteriorated, with substandard pedestrian and bicycle accommodations. ADA accessible ramps are lacking, existing traffic signal equipment is obsolete, and pavement markings/signage do not meet the latest MUTCD standards. Flooding issues have also been reported in some locations. The no-build alternative would allow the corridor to remain in its existing state and deteriorate even more over time., The safety of vehicle operators, bicyclists, and pedestrians would continue to be a concern. This alternative would fail to achieve MassDOT's and the Town's objective to enhance the safety, traffic operations, aesthetic appeal, and business vitality along the corridor.

Alternative 2 (Preferred): Reduced Travel Lane Widths with No Guardrail Bench

While MassDOT requires 12-foot travel lanes and 8-foot shoulders for this classification of roadway, the 11-foot travel lanes and 5-foot shoulders currently proposed are the absolute minimums for providing a Complete Street. This design still provides a safe width for vehicular traffic and meets the minimum width for bicycle accommodations. This alternative further reduced impacts to adjacent wetlands by reducing/eliminating the usual bench behind the guardrail. Based on Standard Detail 400.1.5 of the

MassDOT October 2017 Standard Details, guardrail is allowed to be installed within a 2:1 slope so long as deep post guardrail is used. This alternative of 11-foot travel lanes, 5-foot shoulders, and reduced/eliminated guardrail bench is selected as the preferred alternative based on: still allowing the safe minimum widths of both the travel lanes and shoulders to provide a Complete Street; and the minimized impacts realized to the abutting wetlands due to the removal of the bench behind guardrails in the vicinity of the wetland areas.

This alternative was selected after considering every other option to reduce the permanent BVW impacts to below 5,000 square feet. As a result of this option, the permanent (direct impacts to wetlands) were reduced to 3,686 square feet, and the temporary impacts associated with the erosion and sediment controls were reduced to 2,730 square feet. The total combined reduction in impacts to surrounding BVWs when compared to Alternative 3 is 1,142 square feet.

Alternative 3: Reduced Travel Lane Widths with Bench

Alternative 3 was considered the preferred alternative at the earlier design stages since it also provided 11-foot travel lanes and 5-foot shoulders which were the absolute minimums for providing a Complete Street. Based on the previous Standard Detail 401.1.1 of the MassDOT December 2016 Standard Details, a 2-foot minimum bench behind the guardrail was required. In an attempt to minimize the impacts to the surrounding wetlands, this design considered a 1.5:1 slope in the area of wetland series K and G, where the majority of impacts occur. This alternative resulted in 4,556 square feet of permanent and 3,002 square feet of temporary impacts to BVWs, which is cumulatively 1,142 square feet more than the preferred alternative.

12.0 SPECIFICATIONS TO BE INCLUDED IN CONTRACT

- ☐ Demo
- ☒ Wetland Replication (ITEM 755.35 INLAND WETLAND REPLICATION AREA)
- ☐ Mussel Survey/Transplant Protocol
- ☐ Vegetation Survey/Transplant Protocol

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ATTACHMENTS

Attachment A – Figures:
- Figure 1 - USGS Map
- Figure 2 - Aerial Map
- Figure 3 - Environmental Constraints Map

Attachment B – Wetland Delineation and Replication Report (Epsilon)
Attachment C – Order of Conditions (OOC)
Attachment D – Public Notice
Attachment E – Stormwater Report (bound separately)
Attachment F – WQC Submission Plans (bound separately)
Attachment G – Cultural Resource Coordination
Attachment H – ROW Parcel Summary Sheet/Abutters
Attachment I – 4d Submittal (Northern Long Eared Bats)

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Attachment A – Figures

- Figure 1 - USGS Map
- Figure 2 - Aerial Map
- Figure 3 - Environmental Constraints Map

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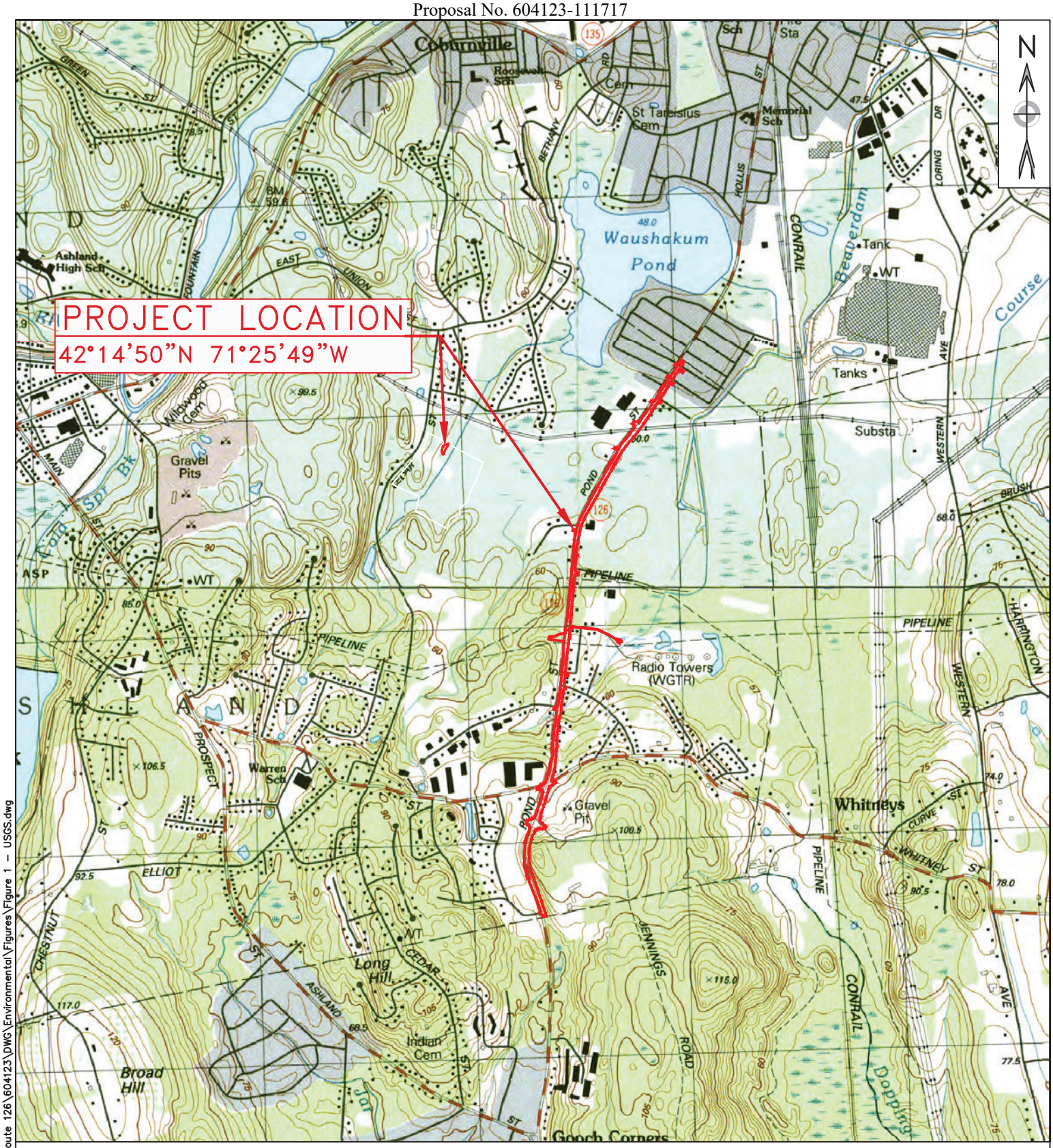

USGS LOCUS MAP

RECONSTRUCTION ON ROUTE 126 (POND STREET)

FROM THE FRAMINGHAM TOWN LINE TO THE HOLLISTON TOWN LINE, ASHLAND, MA

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS
239 LITTLETON RD, WESTFORD, MA (978) 923-0400
24 ALBION RD, LINCOLN, RI (401) 305-7895

PREPARED FOR:
massDOT
Massachusetts Department of Transportation
Highway Division

SCALE: AS NOTED	PROJECT NO. 13033.044	FIGURE 1
DATE: 01/31/2020 REVISED:	DRAWN BY: EA CHECKED BY: DS	

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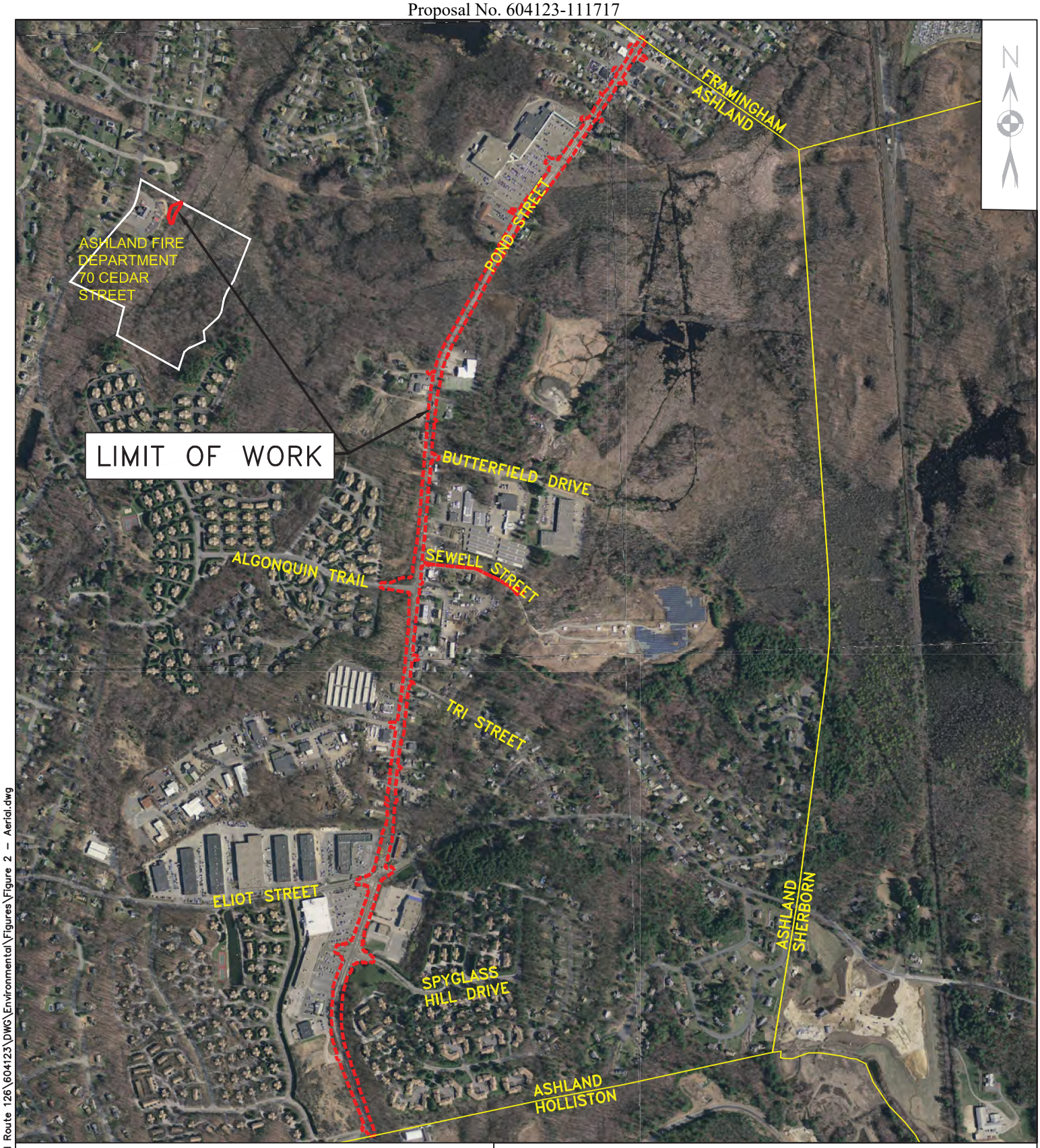

AERIAL LOCUS MAP

RECONSTRUCTION ON ROUTE 126 (POND STREET)

FROM THE FRAMINGHAM TOWN LINE TO THE HOLLISTON TOWN LINE, ASHLAND, MA

SCALE IN FEET

500 0 500 1000

NOTE: DATA TAKEN FROM MASSGIS

PREPARED BY:	PREPARED FOR:
GREEN INTERNATIONAL AFFILIATES, INC. CIVIL AND STRUCTURAL ENGINEERS 239 LITTLETON RD, WESTFORD, MA (978) 923-0400 24 ALBION RD, LINCOLN, RI (401) 305-7895	massDOT Massachusetts Department of Transportation Highway Division

SCALE: AS NOTED	PROJECT NO. 13033.044	FIGURE 2
DATE: 01/31/2020 REVISED:	DRAWN BY: EA/OF CHECKED BY: DS	

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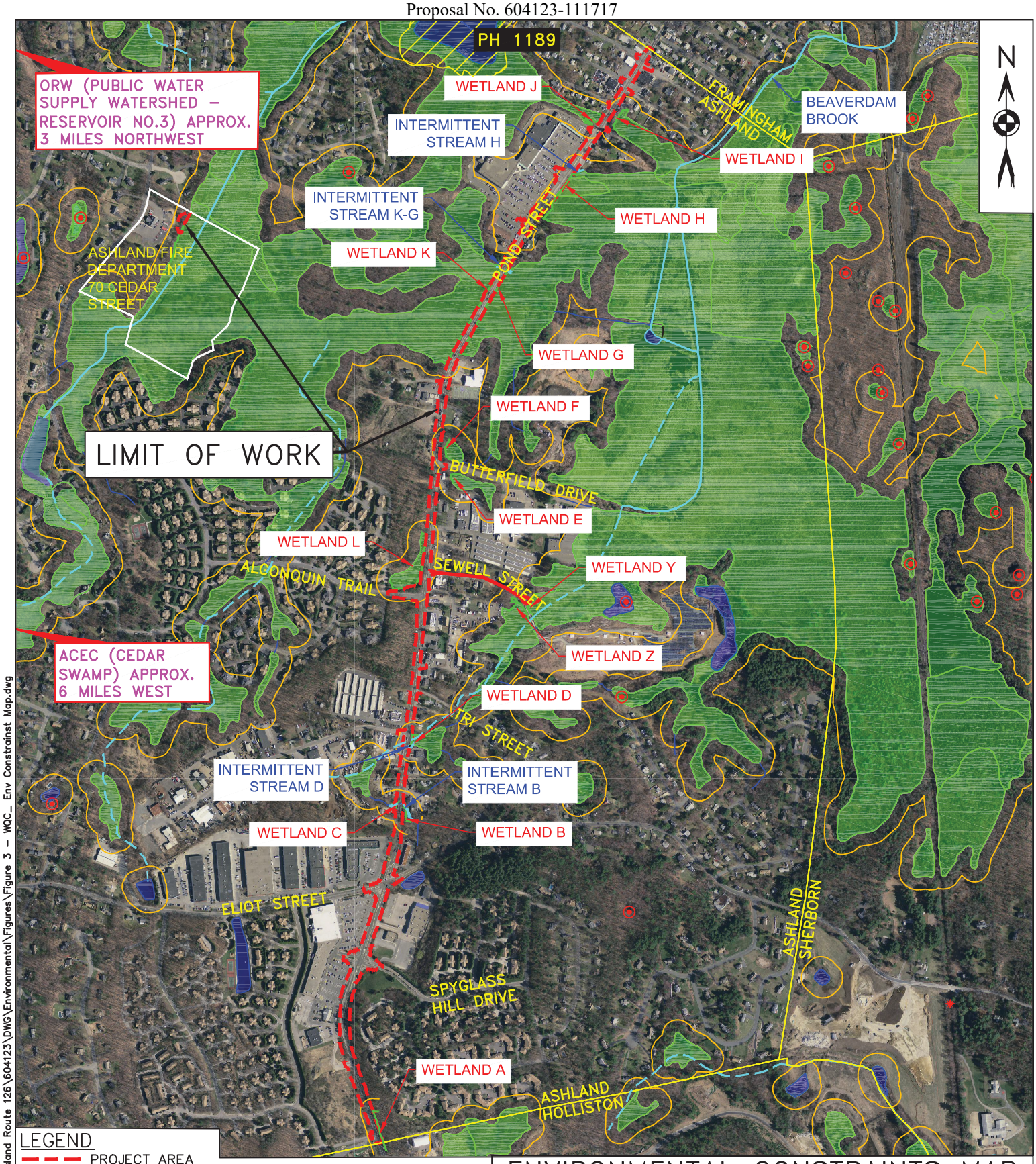

LEGEND

- PROJECT AREA
- NHESP ESTIMATED HABITATS OF RARE WILDLIFE
- NHESP PRIORITY HABITATS OF RARE WILDLIFE
- AREAS OF CRITICAL ENVIRONMENTAL CONCERN
- OUTSTANDING RESOURCE WATERS
- CERTIFIED VERNAL POOLS
- POTENTIAL VERNAL POOLS
- PERENNIAL STREAM
- INTERMITTENT STREAM
- VEGETATED WETLAND (BVW)
- HYDRAULIC CONNECTIONS
- 100-FT WETLAND BUFFER

SCALE IN FEET
500 0 500 1000
1" = 1000'
NOTE: DATA TAKEN FROM MASSGIS

ENVIRONMENTAL CONSTRAINTS MAP

RECONSTRUCTION ON ROUTE 126 (POND STREET)
FROM THE FRAMINGHAM TOWN LINE TO THE HOLLISTON TOWN LINE, ASHLAND, MA

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS
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24 ALBION RD, LINCOLN, RI (401) 305-7895

PREPARED FOR:
massDOT
Massachusetts Department of Transportation
Highway Division

SCALE: AS NOTED	PROJECT NO. 13033.044	FIGURE 3
DATE: 01/31/2020	DRAWN BY: OF	
REVISED:	CHECKED BY: DS	

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Attachment B – Wetland Replication Plan for MassDOT Route 126 (Pond Street) Maintenance and Improvement Project; MassDEP File No. 095-0931 (Epsilon)

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Epsilon ASSOCIATES INC.

Projects:\4229\MassDOT\Assignment 40

January 7, 2020

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978 897 7100
FAX 978 897 0099

Ashland Conservation Commission
101 Main Street, 2nd Floor
Ashland, MA 01721

Subject: Wetland Replication Plan for MassDOT Route 126 (Pond Street) Maintenance and Improvement Project; MassDEP File No. 095-0931

Dear Commissioners:

As requested by the Massachusetts Department of Transportation ("MassDOT"), Epsilon Associates, Inc. ("Epsilon") conducted a wetland delineation at 70 Cedar Street (Ashland Fire Department Headquarters) associated with proposed roadway maintenance and improvement work on Route 126 (Pond Street) in Ashland, MA. On December 12, 2019 Epsilon delineated a portion of the western edge of bordering vegetated wetland ("BVW") on land owned by the Town of Ashland. The BVW is associated with an unnamed perennial tributary to Waushakum Pond. More specifically, the delineation was conducted to help identify a wetland replication area for project related impacts located along Route 126 (Pond Street). Additional detail describing our findings and the wetland replication plan is provided in the balance of this report.

Existing Conditions – Proposed Wetland Replication Area & Reference Wetland

As mentioned above, uplands located along the western edge of BVW, located at 70 Cedar Street, were assessed for potential as a wetland replication area. The attached Figure 1 - USGS Site Location and Figure 2 - Aerial Site Location, located in Attachment A, generally depict the project site and the proposed wetland replication area. The adjacent delineated wetland system (see wetland flags WF-1 to WF-14) was used as a reference for the wetland replication plan. The wetland system is located to the east of the Ashland Fire Department Headquarters ("Fire Station"). The Fire Station is located on a residential street, with houses located to the north and west, and large forested upland and wetland areas located to the south and east.

The proposed wetland replication area is in uplands near the northern property boundary and immediately adjacent to the delineated BVW. The Wetland Replication Plan located in Attachment D depicts the location of the planned mitigation site. According to a topographic survey, conducted by others, existing elevations within the proposed wetland replication area range from approximately 162 to 168 feet. The property has multiple graded terraces from the existing wetland to the Fire Station. Uplands adjacent

to the existing wetland are comprised mainly of a nearly flat maintained grassy area, with a gravel access road utilized by the fire department for training purposes and storage. The existing gravel access is shown on Figure 1 (Attachment A). There is a steep slope that extends east to west from the existing wetland. Upland vegetation observed along this slope includes red oak (*Quercus rubra*), red maple, multiflora rose (*Rosa multiflora*), oriental bittersweet, honeysuckle (*Lonicera sp.*), white pine (*Pinus strobus*), and poison ivy (*Toxicodendron radicans*).

The existing wetland exhibits strong indicators of hydrology including standing water, high water table, drainage patterns, and microtopographic relief. The reference wetland had an abundance of hydrophytic vegetation, including red maple (*Acer rubrum*), winterberry (*Ilex verticillata*), spicebush (*Lindera benzoin*), silky dogwood (*Cornus amomum*), gray dogwood (*Cornus racemosa*), sensitive fern (*Onoclea sensibilis*), and cattail (*Typha latifolia*). Invasive plants observed within the reference wetland included oriental bittersweet (*Celastrus orbiculatus*), and multiflora rose. See Attachment B and C for representative site photographs and wetland determination data forms, respectively.

The proposed wetland replication site provides sufficient area for replication, and access to the site can be obtained from an existing access road, which loops behind the Fire Station. The existing access road will be maintained for future use by the Fire Station.

Wetland Resource Areas and Wetland Delineation Methodology

Vegetated wetlands were delineated in accordance with the U.S. Army Corps of Engineers *Wetland Delineation Manual* (USACE, 1987), the "Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, Version 2.0" (2012), the Massachusetts Wetlands Protection Act and implementing regulations (310 CMR 10.00), and the Massachusetts Department of Environmental Protection's handbook, *Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act* (MADEP, 1995). The state and federal delineation methodologies generally prescribe a multi-parameter approach, where hydrophytic vegetation and hydrology (including hydric soils) are reviewed in conjunction with one another when delineating a wetland edge.

Based on field observations and MassGIS data the following resource areas are located within the vicinity of the proposed wetland replication site:

- BVW,
- 200-foot Riverfront Area, and
- 100-Year Floodplain.

Wetland Replication

To mitigate for total BVW wetland losses (fill) of 3,686 square feet (sf), a wetland replication area will be constructed on the parcel located at 70 Cedar Street. The wetland replication area will equal approximately 4,000 sf. As noted above, the wetland

replication area will be located along the western edge of a BVW associated with an unnamed perennial tributary to Waushakum Pond. The amount of wetland that will be created will provide mitigation for the wetland losses at a ratio of approximately 1:1.

Details regarding the existing and proposed conditions, construction methods, and monitoring at this site is provided below and in the Wetland Replication Plan (Sheet 185) located in Attachment D.

Wetland Replication Design Considerations, Construction Approach and Sequencing

The BVW replication area described in this report has been designed in accordance with the Massachusetts Wetland Protection Act regulations at 310 CMR 10.55(4)(b), and the Massachusetts Department of Environmental Protection's ("MassDEP") "Massachusetts Inland Wetland Replication Guidelines" (MassDEP, March 2002). More specifically, the BVW replication area has been designed to function in a manner similar to BVW that will be lost with regard to surface area, groundwater and surface elevations, hydrology, and wetland plant species and soil types. The wetland replication also incorporates important wildlife habitat features into the design.

The wetland replication is one part of a larger construction Project associated with Route 126 (Pond Street). Portions of the work may be completed concurrent with similar activities throughout the site. Below is a summary of design considerations, construction approach and sequencing for the wetland replication. Design considerations and construction sequencing are subject to modification based on site conditions and scheduling of various project elements.

The proposed replication area will be cleared of trees, re-graded, supplemented with soil amendments, and planted with wetland vegetation and seeded with a native wetland seed mix. The following is a summary of measures that will be implemented to build and maintain the wetland mitigation area.

Design Considerations

In designing the wetland replication area that will replace the amount of wetland filled by the project, three wetland characteristics were considered. These included the depth to groundwater, types of soils that would be used, and the types of vegetation that would be planted there.

Depth to Groundwater

The replication area is designed at generally the same elevation as the adjacent existing wetland. Accordingly, hydrology in the created wetland areas is expected to function in a similar manner as that of the existing wetland. Groundwater flows will have an

unrestricted connection to the wetland replication area. The wetland replication site will be contiguous with the existing wetland community to the east with planned elevations of approximately 163 and 162 feet. At this elevation groundwater is expected to be between the finished surface of the replication area and no greater than 12 inches below the surface for 14 or more consecutive days during the growing season. Cross sections are included in the attached Wetland Replication Plan (Sheet 185) which show the horizontal configuration of the replication area, as well as the existing wetlands to the east.

Soils

The wetland replication area will have a minimum of 12 inches of an organic enriched A-Horizon over the excavated base elevation. The base elevation in the wetland replication area will be established so that the mean annual ground water elevation will be no greater than 12 inches below the surface for 14 or more consecutive days during the growing season. Micro-topography in the form of hummocks, pits and mounds, and similar features shall be constructed within the replaced soils. Final base grades shall be approved by the Wetland Specialist and Resident Engineer.

Common practice in building replacement wetland areas is to salvage and translocate soils from the filled wetland into the wetland replacement area. Suitable material excavated from the permanent impact site will be used within the wetland replication site to the extent practicable. If soil from the impacted wetland area is used, the soil shall be handled such that the original soil structure is preserved and shall not be compacted, screened, or otherwise processed. Wetland soil from the impacted wetland that is infested with invasive plant species shall not be used in the mitigation, unless approved by the Wetland Specialist.

If additional material is required, a manmade soil mixture consisting of equal volumes of organic (compost) and mineral material such as rich loamy sand with a loose to friable consistency will be used. Manufactured wetland soil shall consist of on-site borrow from the proposed replacement site thoroughly mixed with compost to achieve a target organic content of 10-12% by weight. Where empirical data are lacking, compost to soil ratio shall be 1:1 by volume. Off-site borrow may be used for mixing if approved in advance by the Wetland Specialist and the Resident Engineer.

No soil, compost, or other soil amendment imported to the work site shall contain seeds, roots, stems, or other viable parts of invasive plants. No soil or soil amendment shall be brought on site without approval of the material source by the Wetland Specialist and the Resident Engineer. Soils used in the replacement area shall be free of rocks greater than 4 inches in diameter.

No wood chips will be added to the manmade soil. Soil material will be spread in a manner that will minimize soil compaction in the wetland replication area.

The mitigation area side slopes will be top-dressed with approximately 4 inches of a loam borrow. The soil shall be weed free, uncontaminated, and shall not include any woodchips.

Incorporation of Coarse Woody Material

Trees adjacent to or within the wetland mitigation area may be left as snags for wildlife if they do not pose a fall hazard (i.e., are not near a roadway, building, etc.). Trees left as snags shall be directed by the Wetland Specialist or Landscape Architect. Woody material removed from the footprint of the replication area shall be saved and stockpiled for future incorporation. Woody material shall include tree trunks (logs) as well as stumps. Tree limbs and brush may also be included as directed. Woody material shall be placed in a deliberate and naturalistic manner. Dead or dying woody debris shall cover at least 15 to 20 percent of the ground throughout the mitigation site.

Vegetation

A mix of Palustrine Forested (PFO), Scrub-Shrub (PSS), and Emergent (PEM) community types will be encouraged in the replication area with a target coverage of 75% native species. Trees and shrubs selected for the wetland replication area will be healthy disease-free native (not cultivar) stock from a regional nursery. All plant material planted in the wetland replication area shall be guaranteed for one year following the date of final acceptance. Plant material that fails to become established within one year shall be replaced in-kind. Alternative species may be added to the landscape plan pending availability of plant species identified for use as approved by the Wetland Specialist.

The tree and shrub species selected are found in the surrounding wetlands and are suitable to the existing site conditions. The species identified in the table below have been selected for their wildlife value as potential nesting sites, protective cover habitat, and food sources. The species selected for the wetland replication area will be planted according to standard planting protocols and planting depths. All planted tree and shrub specimens shall be either bare root or potted and be inspected by the Wetland Specialist prior to placing the specimens in the wetland replication area.

The planting schedule is also provided in the attached Wetland Replication Plan (Sheet 185) (Attachment D). Trees planted in the replication area will be located along the fringe and areas of higher elevation (i.e., graded mounds). Shrubs planted in the mitigation area will be randomly placed in clusters of the same species. A cluster will consist of 3 to 5 specimens, spaced according to the planting schedule below. If soil conditions are found to be particularly soft or plantings are top-heavy, stakes and soft cables (i.e., wire with

rubber tubes at plant contact points) will be used to keep the plantings upright. If necessary, a two-foot radius of bark or wood chip mulch will be used around each planting cluster to reduce competition from herbaceous growth. As necessary, mulch will be applied to a depth of three inches though with only minimal coverage immediately adjacent to each root crown (i.e., saucer-shaped pattern around the planting: meristems not buried). Plantings will be watered-in immediately after planting, as necessary. Terrasorb, or similar, will be applied, as necessary, to each planting to reduce watering and ensure plants get the water they need. The planting arrangement is intended to simulate natural growth patterns and create cover habitat for birds and small mammals as the shrubs mature. Sweet pepperbush's habit of growing in dense colonies will also help to discourage growth of invasive species. As shown in the table below, a native wetland seed mix will provide a herbaceous layer that will further help prevent the establishment of invasive species. The seed mix and source shall be approved by the Wetland Specialist.

The 3:1 graded slope located around the perimeter of the wetland replication site will be seeded with a native conservation/wildlife mix. Typical species of this seed mixture are detailed below. As noted above, the seed mix and source shall be approved by the Wetland Specialist.

Wetland & Buffer Planting Schedule

Specimen	Wetland Status	Plant Type	Plant Size	Quantity	Density/Spacing
Red maple (*Acer rubrum*)	FAC	Tree	4-6' HT	15	Random at raised elevations
Sweet pepperbush (*Clethra alnifolia*)	FAC	Shrub	3–4' HT	25	5–6 ft. on center
Silky dogwood (Cornus *Amomum*)	FACW	Shrub	3–4' HT	25	5–6 ft. on center
Spicebush (*Lindera benzoin*)	FACW	Shrub	3-4' HT	35	5–6 ft. on center
Common Winterberry (*Ilex verticillata*)	FACW	Shrub	3–4' HT	30	5–6 ft. on center
Wetland seed mix[1]	-	Herbaceous	-		1 lb/2,000 sf
Upland/Buffer seed mix[2]	-	Herbaceous	-		1 lb/1,750 sf

[1] Wetland seed mix typical species: Fox Sedge (*Carex vulpinoidea*), Lurid Sedge (*Carex lurida*), Blunt Broom Sedge (*Carex scoparia*), Blue Vervain (*Verbena hastata*), Fowl Bluegrass (*Poa palustris*), Hop Sedge (*Carex lupulina*), Green Bulrush (*Scirpus atrovirens*), Creeping Spike Rush (*Eleocharis palustris*), Fringed Sedge (*Carex crinita*), Soft Rush (*Juncus effusus*), Spotted Joe Pye Weed (*Eupatorium maculatum*), Rattlesnake Grass (*Glyceria canadensis*), Swamp aster (*Aster puniceus*), Blueflag (*Iris versicolor*), Swamp Milkweed (*Asclepias incarnata*), Square stemmed Monkey Flower (*Mimulus ringens*).

[2] Conservation seed mix typical species: Virginia Wild Rye (*Elymus virginicus*), Little Bluestem (*Schizachyrium scoparium*), Big Bluestem (*Andropogon gerardii*), Red Fescue (*Festuca rubra*), Switch Grass (*Panicum virgatum*), Partridge Pea (*Chamaecrista fasciculata*), Panicledleaf Tick Trefoil (*Desmodium paniculatum*), Indian Grass (*Sorghastrum nutans*), Blue Vervain (*Verbena hastata*), Butterfly Milkweed (*Asclepias tuberosa*), Black Eyed Susan (*Rudbeckia hirta*), Common Sneezeweed (*Helenium autunale*), Heath Aster (*Asterpilosus/Symphyotrichum pilosum*), Early Goldenrod (*Solidago juncea*), Upland Bentgrass (*Agrostis perennans*).

The development of vegetation in the wetland replication area will be monitored during the first two growing seasons and/or in accordance with the Order of Conditions. Corrective measures may be implemented in the course of monitoring to ensure successful completion of the Project. As the planted specimens mature, the wetland trees and shrubs will provide nesting, cover, and food for wildlife in the area. A ground cover

of herbaceous species, including wetland grasses, sedges, rushes, and forbs, will become established as the herbaceous species flower and produce seeds.

Wetland Replication Construction Sequence

As previously noted, the wetland replication is one part of a larger construction project. Portions of the work may be completed concurrent with similar activities. Below is a general construction sequence for the wetland replication. This sequence is subject to modification based on site conditions and scheduling of various project elements.

1. Installation of Erosion Controls. Prior to commencement of construction activities in the wetland mitigation area all existing vegetation will be removed. Following removal, temporary erosion controls will be installed along the entire perimeter of the proposed wetland replication area.

2. Site Preparation. Following vegetation removal and installation of the erosion control barrier at the outer limits of the mitigation site, the site will be grubbed as necessary and all roots and stumps removed from the replication site. These may be stockpiled for use as woody debris within the replication area. Soils will then be excavated and removed from the site until a rough grade is achieved approximately six inches to 12 inches below estimated mean annual high groundwater.

3. Placement of Soils. Following rough grading (including microtopography) of the wetland replication area, it will be backfilled with 12 inches of suitable material excavated from the permanent work pad location and/or organically enriched manmade soils. To avoid compaction, heavy mechanical equipment will not be allowed in this area once the soils have been placed.

4. Incorporation of Coarse Woody Material. A supply of dead or dying woody debris (i.e., logs, stumps, limbs/brush) shall cover at least 15 to 20 percent of the ground throughout the mitigation site. These materials shall not include invasive species.

5. Vegetation Planting. Following placement of the wetland soils in the wetland replication area, wetland plants will then be installed. Upon final stabilization all erosion controls will be removed. Pending actual site and weather conditions all plantings will take place in spring (May 15–June 15) or fall (September 1–November 1).

6. Maintenance. As necessary following planting, the wetland replication area will be irrigated to insure successful establishment of newly planted vegetation.

Wetland Replication Monitoring

The wetland replication area will be monitored during the first two growing seasons and/or in accordance with the Order of Conditions following planting to evaluate the success of the wetland and monitor the area for invasive species. If any invasive species are found, they shall be uprooted and removed from the area by hand.

Two or three 3x3 meter (m) plots shall be permanently staked within the replication area. The vegetation community in these plots will be inventoried late in the growing season to determine the percent cover of hydrophytes growing in the replication area. Yearly monitoring reports shall be prepared summarizing the year's findings and providing recommendations to ensure the success of the replication effort. These reports are to be provided to MassDOT and the Conservation Commission. MassDOT shall undertake whatever efforts are necessary to ensure compliance with this plan. Groundwater elevations will be monitored in the wetland replication areas concurrent with vegetation monitoring. To monitor groundwater two shallow ground water monitoring wells will be installed in the replication area to a depth of three to four feet, as necessary. The wetland replication area will be monitored twice per growing season. Once in the mid to late spring and again during mid to late summer. The reports will provide details on the success standards described below.

- **The proposed vegetation diversity and/or density goals for woody plants from the Wetland Replication Plan (Sheet 185) are met.** The planting area will be monitored to assess whether the established plantings are healthy and vigorous and whether they provide a vegetated cover of at least 75% surface area.

- **The mitigation area will exhibit wetland hydrology indicators**. As meant here wetland indicators include primary indicators such as surface water, high water table, soil saturation and others for an adequate duration as detailed in the US Army Corps of Engineers, "Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region", January 2012.

The first year of monitoring will be the first year that the site has been through a full growing season after planting. For monitoring purposes, a growing season starts no later than May 31. If there are problems that need to be addressed and if the measures to correct them require prior approval from the Conservation Commission, the permittee will contact the Commission as soon as the need for corrective action is discovered.

Remedial measures will be implemented as necessary to attain the success standard described below within two growing seasons after completion of installation of the plantings.

Annual Wetland Monitoring Report Content

The wetland replication monitoring report will address the following:

- Consistency with success vegetation and hydrology success standards.
- Descriptions of the monitoring inspections that occurred since the last report.
- Descriptions of the remedial actions completed during the monitoring year to meet the two success standards, including such actions as removing debris, replanting, re-grading any areas, applying additional topsoil or soil amendments, etc.
- Descriptions of the general health and vigor of the planted specimens, prognosis for future survival, and diagnosis of cause(s) of morbidity or mortality.
- Percent cover and percent survival for each species of planted specimens.
- Observed wetland hydrology during spring and fall for the first two years.
- Recommended remedial measures to achieve or maintain achievement of the two success standards identified above.
- Representative photographs of the planting areas taken from the same locations for each monitoring event.

If you have any questions, please do not hesitate to contact Susan McArthur (MassDOT) at (857) 368-8807, susan.mcarthur@state.ma.us; or Matt Kelly (Epsilon) (978) 461-6237, mkelly@epsilonassociates.com.

Sincerely,
EPSILON ASSOCIATES, INC.



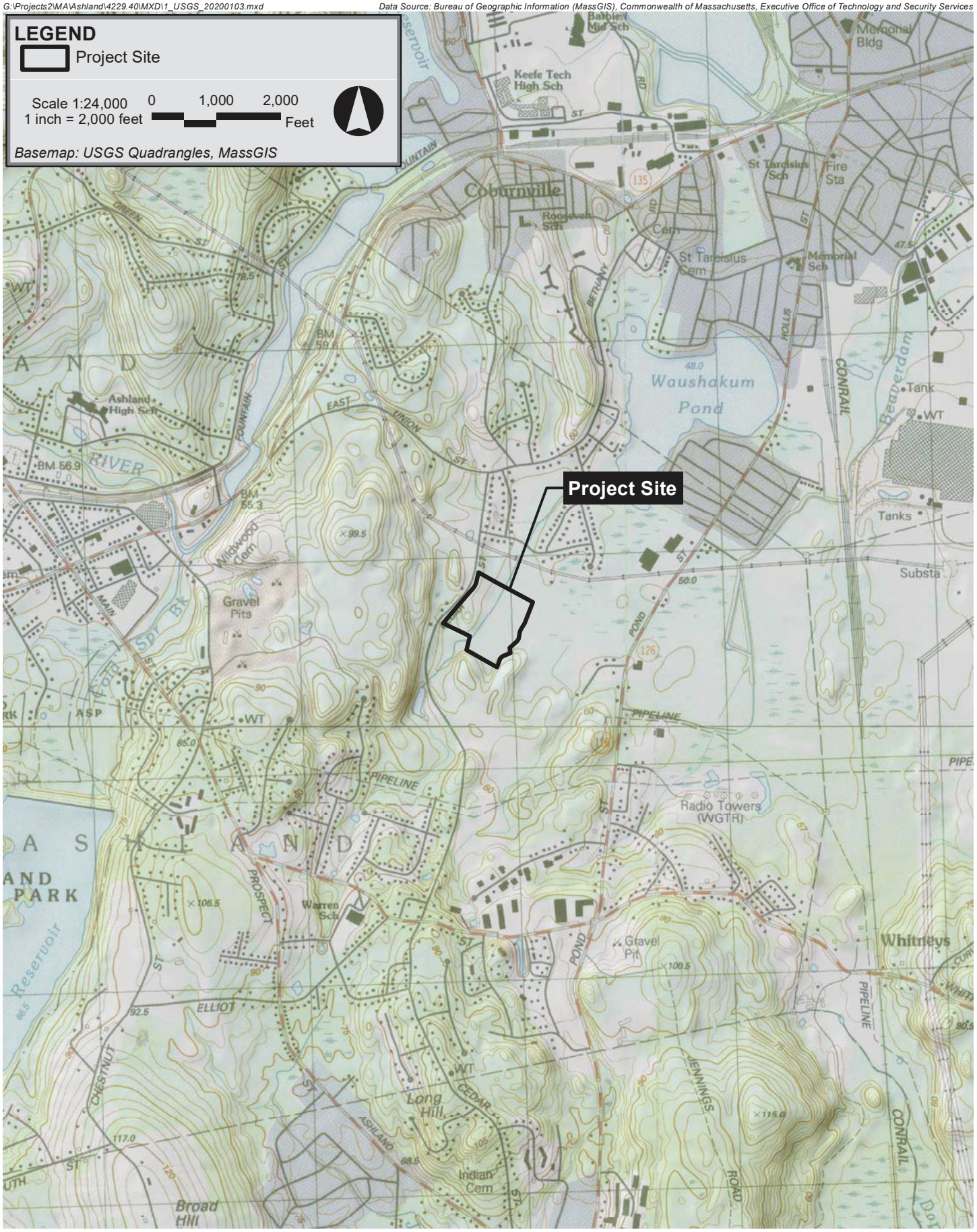
Matt Kelly
Senior Scientist

Attachment A

Figures

G:\Projects2\MA\Ashland\4229.40\MXD\1_USGS_20200103.mxd

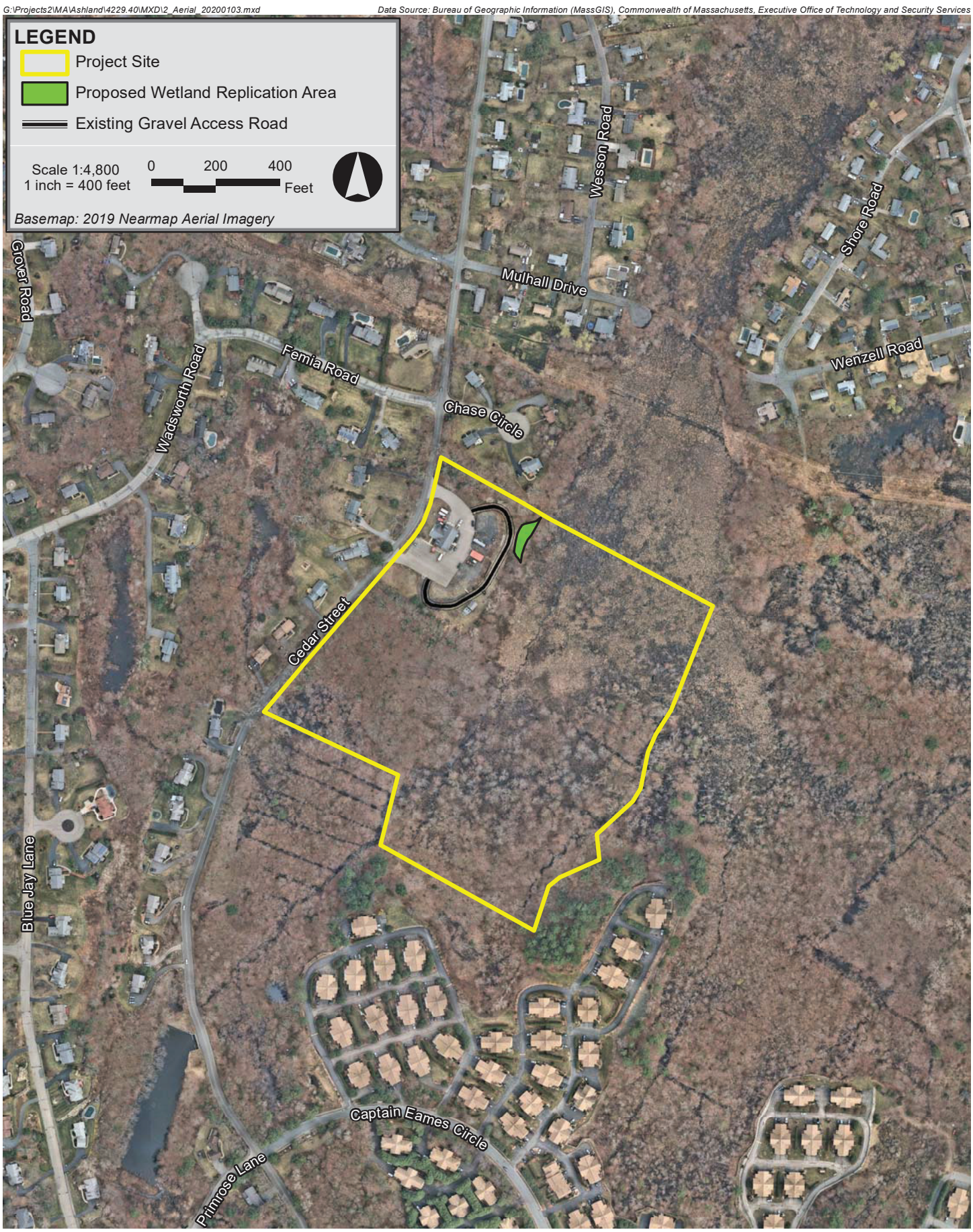
Data Source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services



70 Cedar Street Ashland, Massachusetts

Epsilon Associates Inc.

Figure 1
USGS Locus Map



70 Cedar Street Ashland, Massachusetts

Epsilon Associates Inc.

Figure 2
Aerial Locus Map

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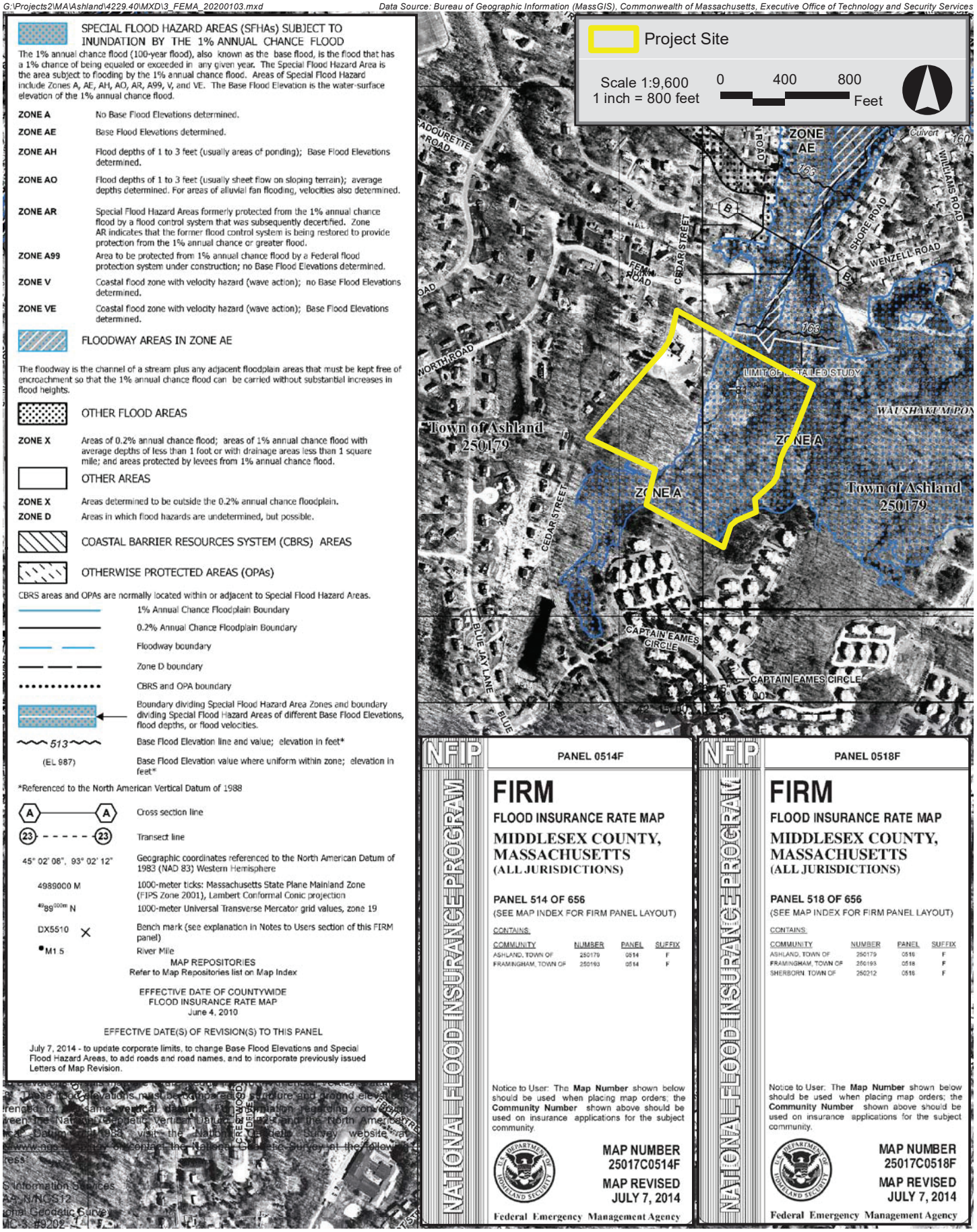
Data Source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services



70 Cedar Street Ashland, Massachusetts

Epsilon Associates Inc.

Figure 3
FEMA Flood Zones

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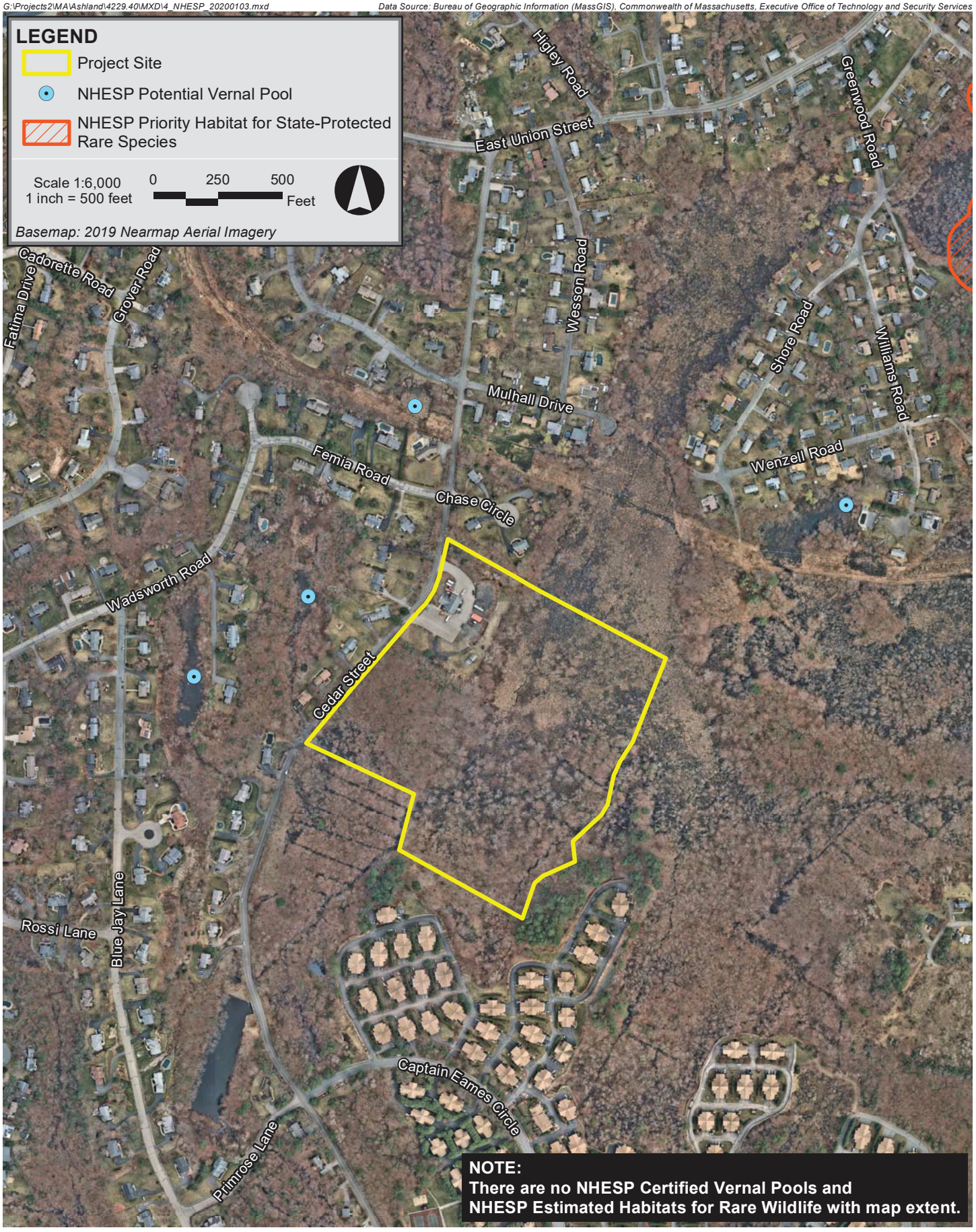
Data Source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services



70 Cedar Street Ashland, Massachusetts

Epsilon Associates Inc.

Figure 4

Natural Heritage and Endangered Species Program

Attachment B

Representative Site Photographs



Photo 1: View of the existing wetland facing south near wetland flags WF-2 and WF-3. The replication area will be located along the right side of the photo.



Photo 2: View of the existing wetland facing north near wetland flag WF-3. The wetland replication site will be located to the west along the left side of the photo.



Photo 3: A view of the proposed wetland replication site looking northeast from the Fire Station parking lot.

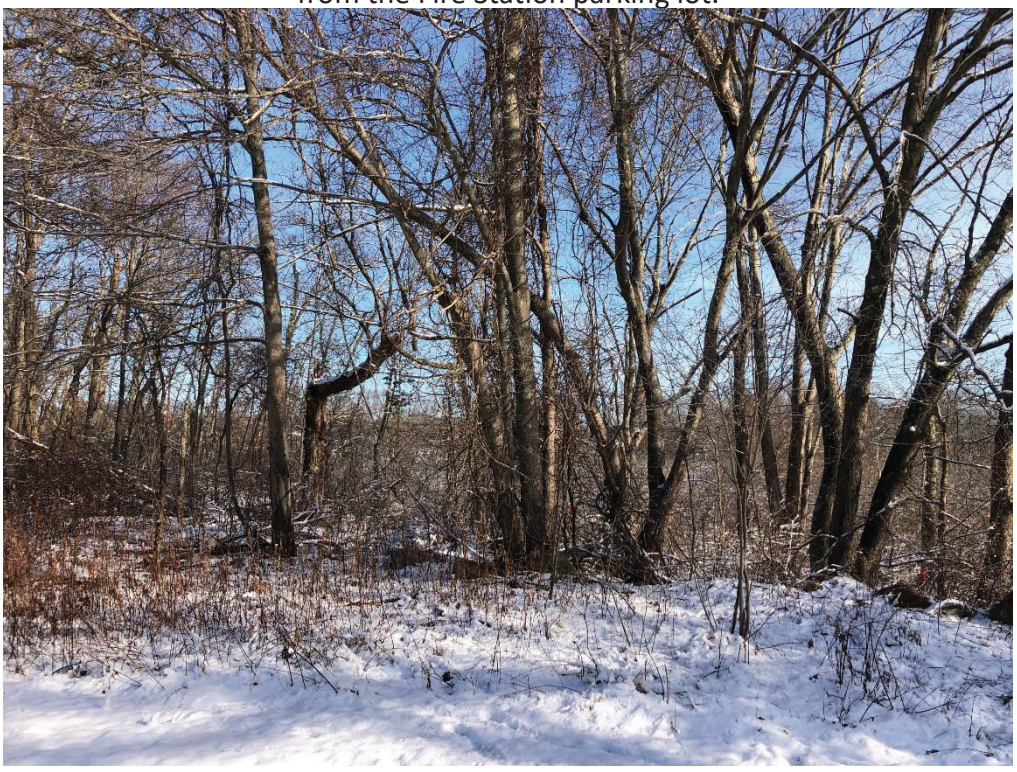


Photo 4: View of the proposed wetland replication site looking northeast from the Fire Station access road.



Photo 5: View southwest of the access road leading to the exercise building used by the Fire Department.



Photo 6: View northwest of the access road leading from the Fire Station parking lot.



Photo 7: View of existing gravel access road that leads from the Fire Station parking lot to the exercise grounds.



Photo 8: Soil profile of the wetland plot for the transect near WF-3.



Photo 9: Soil profile of the wetland plot for the transect near WF-7.



Photo 10: Soil profile of the wetland plot for the transect near WF-14.

Attachment C

Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 70 Cedar Street; Wetland Mitigation Area City/County: Ashland Sampling Date: 12/12/2019

Applicant/Owner: MassDOT State: MA Sampling Point: UPL-3

Investigator(s): Matt Kelly, Megan Kearns Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None

Slope (%): 2% Lat: 42.256031 Long: -71.437006 Datum: NAD83

Soil Map Unit Name: Deerfield loamy fine sand; 0 to 3 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ✓	Depth (inches): ____
Water Table Present?	Yes ____	No ✓	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No ✓	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: UPL-3

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus rubra	25	Y	FACU
2. Acer rubrum	20	Y	FAC
3.			
4.			
5.			
6.			
7.			
	45	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Rosa multiflora	15	Y	FACU
2. Lindera benzoin	8	N	FACW
3. Lonicera sp.	20	Y	FACU
4.			
5.			
6.			
7.			
	43	= Total Cover	
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	0	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1. Celastrus orbiculatus	15	Y	UPL
2.			
3.			
4.			
	15	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ Rapid Test for Hydrophytic Vegetation

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: UPL-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6"	10YR 3/3	100					sandy loam	many fine roots
6-20"	10YR 2/2	100					sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

Soil pit was located along the slope. Soils were previously disturbed.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 70 Cedar Street; Wetland Mitigation Area City/County: Ashland Sampling Date: 12/12/2019

Applicant/Owner: MassDOT State: MA Sampling Point: WET-3

Investigator(s): Matt Kelly, Megan Kearns Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None

Slope (%): 2% Lat: 42.256031 Long: -71.437006 Datum: NAD83

Soil Map Unit Name: Deerfield loamy fine sand; 0 to 3 percent slopes NWI classification: PFO/PSS

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** **Yes ✓** **No ____**
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ✓	Depth (inches): ____
Water Table Present?	Yes ✓	No ____	Depth (inches): 8"
Saturation Present? (includes capillary fringe)	Yes ✓	No ____	Depth (inches): 6"

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: WET-3

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	20	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	20	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Ilex verticillata	15	Y	FACW
2. Cornus racemosa	10	Y	FAC
3. Cornus amomum	5	N	FACW
4. Lindera benzoin	10	Y	FACW
5.			
6.			
7.			
	40	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Onoclea sensibilis	8	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	8	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1. Celastrus orbiculatus	15	Y	UPL
2.			
3.			
4.			
	15	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ Rapid Test for Hydrophytic Vegetation

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10"	10YR 2/1	100					organic	Oa
10-12"	10YR 5/2	100					loamy fine sand	
12-18"	10YR 4/2	95	10YR 6/2	5	D	M	loamy fine sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ✓ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

See Photo #8 for view of soil profile.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 70 Cedar Street; Wetland Mitigation Area City/County: Ashland Sampling Date: 12/12/2019

Applicant/Owner: MassDOT State: MA Sampling Point: UPL-7

Investigator(s): Matt Kelly, Megan Kearns Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None

Slope (%): 2% Lat: 42.255751 Long: -71.437186 Datum: NAD83

Soil Map Unit Name: Freetown muck, 0 to 1 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** ✓
Hydric Soil Present?	Yes ____	No ✓	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ✓	Depth (inches): ____
Water Table Present?	Yes ____	No ✓	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No ✓	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: UPL-7

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	10	Y	FAC
2. Quercus alba	25	Y	FACU
3.			
4.			
5.			
6.			
7.			
	35 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Lonicera sp.	15	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	15 = Total Cover		
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Celastrus orbiculatus	10	Y	UPL
2.			
3.			
4.			
	10 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ Rapid Test for Hydrophytic Vegetation

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: UPL-7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8"	10YR 5/4	100					loamy fine sand	
8-16"	10YR 5/4	90	10YR 4/6	10	C	M	loamy fine sand	discontinuous mottle lenses

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** ✓

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 70 Cedar Street; Wetland Mitigation Area City/County: Ashland Sampling Date: 12/12/2019

Applicant/Owner: MassDOT State: MA Sampling Point: WET-7

Investigator(s): Matt Kelly, Megan Kearns Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None

Slope (%): 1% Lat: 42.255751 Long: -71.437186 Datum:

Soil Map Unit Name: Freetown muck, 0 to 1 percent slopes NWI classification: PFO/PSS

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** **Yes ✓** **No ____**
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ✓	Depth (inches): ____
Water Table Present?	Yes ✓	No ____	Depth (inches): 12"
Saturation Present? (includes capillary fringe)	Yes ✓	No ____	Depth (inches): 12"

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: WET-7

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	15	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	15 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Ilex verticillata	30	Y	FACW
2. Rosa multiflora	15	Y	FACU
3. Lindera benzoin	15	Y	FACW
4.			
5.			
6.			
7.			
	60 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Symplocarpus foetidus	2	N	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	2 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Celastrus orbiculatus	15	Y	UPL
2.			
3.			
4.			
	15 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ Rapid Test for Hydrophytic Vegetation

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET-7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4"	10YR 2/2	100					loamy fine sand	many fine roots (likely HTM)
4-15"	10YR 5/2	93	7.5YR 4/8	7	C	M	loamy fine sand	(likely HTM)
15-24+"	10YR 2/1	100					muck	buried Oa horizon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ✓ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** ___

Remarks:

The two horizons located within the top 15" are likely fill and disturbed.

Attachment D

Wetland Replication Plan

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	189	327
PROJECT FILE NO.	604123		

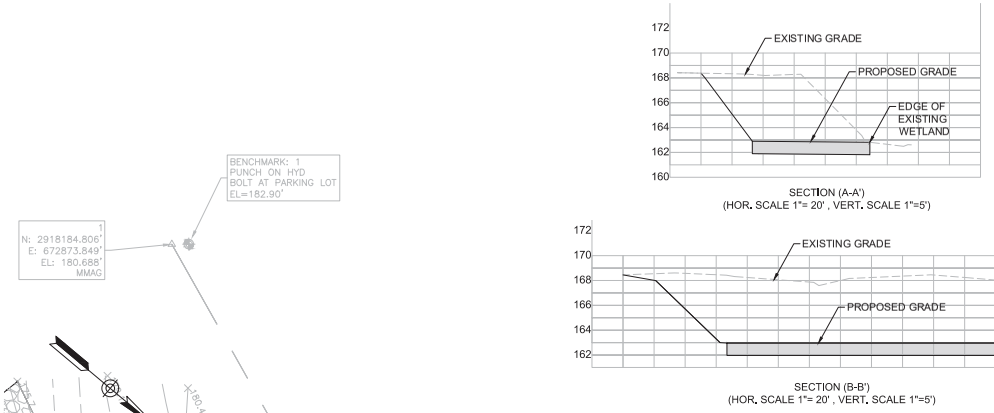
WETLAND REPLICATION PLAN
SHEET 1 OF 1

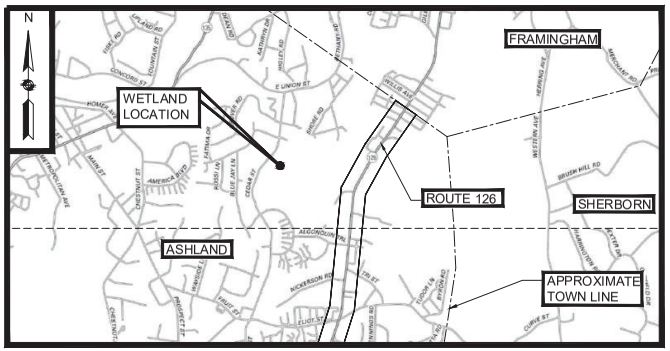
WETLAND REPLICATION AREA SEDIMENTATION AND EROSION CONTROL NOTES:

1. PRIOR TO STARTING ANY WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION & SEDIMENTATION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS IDENTIFIED IN ALL APPROVAL DOCUMENTS PERTAINING TO THIS PROJECT.
2. PERIODIC INSPECTION AND MAINTENANCE OF ALL SEDIMENT CONTROL STRUCTURES SHALL BE PROVIDED TO INSURE THAT THE INTENDED PURPOSE IS ACCOMPLISHED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SEDIMENT LEAVING THE LIMIT OF WORK. SEDIMENT CONTROL MEASURES SHALL BE IN WORKING CONDITION AT THE END OF EACH WORKING DAY.
3. ALL POINTS OF CONSTRUCTION INGRESS OR EGRESS WILL BE PROTECTED TO PREVENT TRACKING OF MUD ONTO PUBLIC WAYS.
4. AFTER ANY SIGNIFICANT RAINFALL, SEDIMENT CONTROL STRUCTURES SHALL BE INSPECTED FOR INTEGRITY. ANY DAMAGED DEVICES SHALL BE CORRECTED IMMEDIATELY.
5. ANY SEDIMENT TRACKED ONTO PAVED AREAS SHALL BE SWEPT AT THE END OF EACH WORKING DAY.
6. ALL DEBRIS GENERATED DURING SITE PREPARATION ACTIVITIES SHALL BE LEGALLY DISPOSED OF OFF-SITE.
7. AN EROSION CONTROL BARRIER SHALL BE INSTALLED AS SHOWN ON THE PLANS.
8. MEANS OF EROSION AND SEDIMENT PROTECTION AS NOTED ON THE DRAWINGS INDICATE THE MINIMUM PROVISIONS NECESSARY. ADDITIONAL MEANS OF PROTECTION SHALL BE PROVIDED BY THE CONTRACTOR AS REQUIRED FOR CONTINUED OR UNFORESEEN EROSION PROBLEMS, AT NO ADDITIONAL EXPENSE TO THE OWNER.

WETLAND REPLICATION AREA PLANTING NOTES AND CONSTRUCTION SEQUENCE:

1. CONTRACTOR SHALL COORDINATE WITH THE TOWN OF ASHLAND REGARDING ACCESS.
2. EROSION CONTROLS WILL BE INSTALLED ALONG THE EXISTING WETLAND BOUNDARY. THIS WILL ALLOW THE SITE CONTRACTOR TO PROPERLY TIE - IN PROPOSED CONTOURS AT THE EDGE OF THE EXISTING WETLAND.
3. UNDER THE DIRECTION OF THE WETLAND SPECIALIST, THE CONTRACTOR SHALL PROVIDE ROUGH GRADING (+/- 3 INCHES) WITHIN THE REPLICATION WETLAND. WETLAND MITIGATION GRADING IS SUBJECT TO MODIFICATION BASED ON ACTUAL SITE CONDITIONS. THE WETLAND SPECIALIST WILL INSPECT THE SUB-GRADE OF THE REPLICATION AREA TO ENSURE THAT THE PROPER HYDROLOGY AND MICROTOPOGRAPHY HAS BEEN ESTABLISHED.
4. PRIOR TO SOIL ADDITIONS AND/OR PLANTINGS, PROJECT SURVEYORS SHOULD VERIFY THAT GRADES HAVE BEEN ACHIEVED AS SHOWN ON THIS DRAWING.
5. PRIOR TO PLANTING, THE MITIGATION AREA SHOULD BE EXCAVATED APPROXIMATELY 1 FOOT BELOW THE FINISHED GRADE OF THE WETLAND MITIGATION AREA. FOLLOWING EXCAVATION OF THE MITIGATION AREA, A SOIL MIXTURE (NATURAL OR MANMADE) CONSISTING OF EQUAL VOLUMES OF ORGANIC (COMPOST) MATERIAL AND MINERAL SOIL MATERIAL SUCH AS A RICH LOAMY SAND (WITH A LOOSE FRIABLE CONSISTENCY) SHALL BE USED TO BRING THE EXCAVATED WETLAND MITIGATION AREA TO FINISHED GRADE. PRIOR TO USE, THE SOIL MIXTURE WILL BE ANALYZED BY A SOIL TESTING LABORATORY FOR TEXTURE AND NUTRIENTS. THE SELECTED CONTRACTOR WILL BE RESPONSIBLE FOR THIS COORDINATION. SEE SPECIAL PROVISION.
6. ESTIMATES OF SEASONAL HIGH GROUNDWATER (SHGW) SHALL BE DETERMINED IN THE FIELD AT THE TIME OF REPLICATION GRADING. THE FINISH GRADE OF THE WETLAND MITIGATION AREA SHALL BE SET SO THAT GROUNDWATER IS WITHIN 12" OF THE SURFACE FOR AT LEAST 14 CONSECUTIVE DAYS DURING THE GROWING SEASON.
7. PENDING SITE AND WEATHER CONDITIONS ALL PLANTINGS WILL TAKE PLACE IN SPRING (MAY 15-JUNE 15) OR FALL (SEPTEMBER 1 - NOVEMBER 1).
8. TREES PLANTED IN THE REPLICATION AREA SHALL BE LOCATED ON AREAS OF HIGHER ELEVATION (I.E., GRADED MOUNDS). TREES SHALL BE LOCATED IN THE FIELD BY THE WETLAND SPECIALIST.
9. 4" OF LOAM (WEED-FREE, FINE SANDY LOAM) AND A CONSERVATION/WILDLIFE SEED MIX WILL BE SPREAD THROUGHOUT THE GRADED 3:1 UPLAND SLOPES AND IN ALL OTHER AREAS DISTURBED BY THE CONTRACTOR AS SPECIFIED. LOAM, SEED MIXTURE AND SOURCE SHALL BE APPROVED BY THE WETLAND SPECIALIST.





LOCUS PLAN

LEGEND

- 4" LOAM BORROW AND CONSERVATION SEED MIX IN ALL DISTURBED UPLAND AND SLOPED AREAS
- WETLAND SOIL AND WETLAND SEED MIX
- LIMIT OF WORK
- STRAW WATTLES
- 168 PROPOSED CONTOUR
- 170 EXISTING CONTOUR
- COMPOST FILTER TUBE
- 163.3 PROPOSED SPOT GRADE
- TREE

A00830 - 62

Proposal No. 604123-111717

ITEM 755.35 INLAND WETLAND REPLICATION AREA Lump Sum

This special provision is specific to Project #604123.

The work under this item shall conform to the relevant provisions of Sections 120, 770, 771 of the Standard Specifications and the following:

The work under this item shall include furnishing material and the construction and maintenance of inland wetland replication areas as shown on the drawings and as required by the Engineer. Inland Wetland Replication Area shall hereafter be referred to as Replication Area. All work shall be in coordination with an approved Wetland Specialist.

Construction of tidal wetlands shall be as specified under the appropriate item for tidal wetland mitigation. Wetland Restoration shall be as specified under the appropriate item and compensated under that item.

Replication Area shall be constructed prior to wetland impacts unless otherwise approved by the Engineer. Construction schedule shall be appropriate to planting and seeding season (see below). Changes to this schedule will require written approval from the Engineer.

DESCRIPTION OF WORK

Construction of the Replication Area shall be completed as shown on the drawings at the following location(s):

Area: 70 Cedar Street, Ashland, MA (Ashland Fire Department)
Replication Area = 4,110 sf.

Replication Area shall be constructed to meet the requirements of all associated permits and certifications, including relevant performance standards of the Massachusetts Wetlands Protection Act (MGL C. 131, s40), Section 401 Water Quality Certification, and Section 404, U.S. Army Corps of Engineers General Permit.

The Contractor is responsible for protection and preservation of natural areas adjacent to the Replication Area both within and outside the project limits and for the duration of the contract. Damage to soils or vegetation due to sedimentation, compaction, trampling, vehicles, storage of materials, or other negligence shall be repaired to the satisfaction of the Engineer and at the Contractor's expense.

The Wetland Specialist overseeing the wetland construction work shall not be from the same company as that planting, seeding, or participating in any aspect of the wetland construction.

Wetland Restoration for the project shall be completed as shown on the drawings at the following location(s):

Wetland Restoration Area/s:
See plans for individual locations: = 2,730 sf.

SUBMITTALS - DOCUMENTS

Request for Conditional Acceptance: As specified below, a letter requesting Conditional Acceptance of the work and the site conditions shall be submitted to the Engineer.

Request for Certificate of Compliance (Partial or Full): As specified below, shall be submitted to the Engineer for distribution to appropriate regulatory agencies.

Monitoring Reports: Reports shall be submitted to the Engineer as specified below. Reports shall be compensated under Item 755.75 and 755.76.

SUBMITTALS - MATERIAL

Soil and Amendments

No soil, compost, or other soil amendment imported to the work site shall contain seeds, roots, stems, or other viable parts of invasive plants.

At least sixty (60) days prior to installation Contractor shall submit for approval all sources of soil and amendments, including compost, prior to ordering. Off-site sources shall be identified and available for inspection by the Wetland Specialist prior to transport of material to the site to verify that they are likely to be free of invasive plant species, including all viable plant parts.

Samples of tested and approved wetland soil and soil amendments will be required if requested by the Engineer.

Seed Mix

Certificate of Materials from the supplier shall be submitted 30 days prior to seeding and must be approved prior to ordering materials. Seed species listed on the certificate shall include ecotype region (i.e., *Asclepias incarnata*, PA Ecotype).

Seed tag from the bag of seed used shall be submitted to the Engineer at the time of seeding. Seed tag shall include ecotype region and species, shall match the Certificate of Materials, include the name of the supplier, and date material was sent.

Bill of lading or notarized Certificate of Compliance from the Supplier serving as proof of purchase shall be submitted if requested by the Engineer. Document shall include date of sale, quantity, lot number, and address of Supplier. This shall match the seed tag.

Plant Certification

Plant Certification shall be per the applicable requirements of Section 771, PLANTING TREES, SHRUBS AND GROUNDCOVER, of the latest edition of the Standard Special Provisions. The nursery source shall certify the provenance or origin of all plants.

Other Material: Submittals shall be per the respective item.

MATERIALS

Sediment Barrier

Sediment Barriers shall be per Item 767.121 except that no straw wattles with plastic netting shall be used in or near existing or proposed wetland. No sediment barriers with non-biodegradable fabric or photo-degradable fabrics may be used.

Erosion Control

Erosion control for slope and soil stabilization shall be Jute Mesh Erosion Control Fabric.

Sediment and erosion controls shall be compensated under the respective items.

Wetland Soil

Wetland soil for Replication Area may be either soil excavated from impacted wetland area or manufactured hydric soil.

If using soil from the impacted wetland area, soil shall be handled such that the original soil structure is preserved and shall not be compacted, screened, or otherwise processed.

Wetland soil from the impacted wetland that is infested with invasive plant species shall not be used in the Replication, unless approved by the Wetland Specialist. To the extent possible, that infested soil shall be disposed of within the project limits in an upland area or buried at least three feet deep.

Manufactured wetland soil shall consist of on-site borrow from the proposed replacement site thoroughly mixed with compost to achieve a target organic content of 10-12% by weight. Where empirical data are lacking, compost to soil ratio shall be 1:1 by volume. Off-site borrow may be used for mixing if approved in advance by the Engineer.

No soil or soil amendment shall be brought on site without approval of the material source by the Wetland Specialist and the Engineer. Soils used in the replacement area shall be free of rocks greater than 4 inches in diameter.

Specific to this project: upland areas above wetland area on the 70 Cedar Street site shall be included in this item. Four inches of loam borrow conforming to the applicable requirements of Section 751 LOAM BORROW shall be spread on slopes and any upland areas disturbed by construction. Source of the loam borrow shall be approved by the Wetland Specialist. Slopes and disturbed upland areas shall also be seeded with conservation seed mix, as specified here in and meeting the applicable requirements of Section 765 SEEDING .

Plants

Plant material shall conform to the applicable requirements of Section 771, PLANTING TREES, SHRUBS AND GROUNDCOVER, of the latest edition of the Standard Special Provisions.

Plants shall be straight native species, not cultivars. To the extent possible, plants shall originate from the applicable EPA Level III Ecoregion.

Plant species and sizes to be included in the Replication Area shall be:

- as specified on the plans.

Requests for substitutions shall be submitted in writing to the Engineer for review by the Wetland Specialist, MassDOT Landscape Architect, and, if required, the relevant regulatory agency at least thirty (30) days prior to planting. All proposed substitutes shall be in conformance with the requirements herein and suitable for the site conditions.

Transplanting and plant material collected from the wild is prohibited unless approved in writing by the Engineer. Plants shall be selected from certified nurseries that have been inspected by state and/or federal agencies.

Seed Mix

Seeding shall conform to the Standard Specifications SUBSECTION M6, ROADSIDE DEVELOPMENT MATERIALS.

Wetland Seed Mix typical species may include - Fox Sedge (*Carex vulpinoidea*), Lurid Sedge (*Carex lurida*), Blunt Broom Sedge (*Carex scoparia*), Blue Vervain (*Verbena hastata*), Fowl Bluegrass (*Poa palustris*), Hop Sedge (*Carex lupulina*), Green Bulrush (*Scirpus atrovirens*), Creeping Spike Rush (*Eleocharis palustris*), Fringed Sedge (*Carex crinita*), Soft Rush (*Juncus effusus*), Spotted Joe Pye Weed (*Eupatorium maculatum*), Rattlesnake Grass (*Glyceria canadensis*), Swamp aster (*Aster puniceus*), Blueflag (*Iris versicolor*), Swamp Milkweed (*Asclepias incarnata*), Square stemmed Monkey Flower (*Mimulus ringens*).

The proposed wetland seed mix will be applied at the recommended rate of approximately one pound per 2,000 square feet (18 pounds per acre).

Conservation Seed Mix typical species may include - Virginia Wild Rye (*Elymus virginicus*), Little Bluestem (*Schizachyrium scoparium*), Big Bluestem (*Andropogon gerardii*), Red Fescue (*Festuca rubra*), Switch Grass (*Panicum virgatum*), Partridge Pea (*Chamaecrista fasciculata*), Panicledleaf Tick Trefoil (*Desmodium paniculatum*), Indian Grass (*Sorghastrum nutans*), Blue Vervain (*Verbena hastata*), Butterfly Milkweed (*Asclepias tuberosa*), Black Eyed Susan (*Rudbeckia hirta*), Common Sneezeweed (*Helenium autunale*), Heath Aster (*Asterpilosus/Symphyotrichum pilosum*), Early Goldenrod (*Solidago juncea*), Upland Bentgrass (*Agrostis perennans*).

The proposed conservation seed mix will be applied at the recommended rate of approximately one pound per 1,750 square feet (25 pounds per acre).

Fertilizers shall not be used.

Water

The Contractor shall provide water and all equipment required at no extra cost. Water shall be suitable for irrigation and free from ingredients harmful to plants and wildlife. According to DEP

requirements, water from the adjacent water bodies or waterways shall not be utilized. It is the Contractor's responsibility to correct injury or damage due to the lack of water, too much water, or use of contaminated water.

Mulch/Topdressing for Seeding

Hydromulch shall be per the manufacturer's recommendations and shall be wood fiber or straw mulch only. Compost topdressing, if used, shall meet the material and submittal requirements of that item and shall be applied as specified below. Mulch or compost topdressing for seeding shall be incidental to this item.

CONSTRUCTION METHODS & SEQUENCE

SITE PREPARATION

Minimizing Damage

The Contractor shall plan and execute operations in a manner minimizing the amount of excavated and exposed fill or other foreign materials that could be washed or otherwise carried into Replication Area and nearby resource areas.

Construction of and access to the Replication Area shall minimize damage to existing vegetation and soils as specified herein. Damage to soils or vegetation shall be repaired to the satisfaction of the Engineer and at the Contractor's expense. If required for soil remediation, tilling and the addition of compost shall be at the Contractor's expense.

The Contractor shall use boards, mats, or other approved material as necessary, to protect existing and/or new wetlands from compaction due to heavy foot traffic or if equipment is required to travel over wetland soil. All labor and materials required for protection and preservation of site shall be incidental to this item.

Stockpiling of Soil

Stockpiling of soil, including hydric soil for replication, shall be outside the resource area and at least 100 feet from the edge of the wetland unless approved otherwise by the Engineer. Stockpiled soils shall be securely stabilized and contained. In the event that there is excess borrow, it shall be disposed of without additional compensation.

Sediment Barriers

Placement: Sediment barriers shall be installed along the downslope perimeter of Replication Area beginning and ending in the surrounding upland so that no excavated material or disturbed soil can enter adjacent wetlands or waters. Sediment barriers shall be in place and approved by the Engineer prior to excavation work. No work shall take place outside the barriers.

Maintenance: The Contractor shall ensure that all sediment barriers function as intended and at all times per the Special Provisions of those respective items. Barriers shall be inspected after each rainfall and at least daily during prolonged rainfall. The Contractor shall remove sediment deposits as necessary to maintain the filters in working condition at all times.

Upon completion of work, biodegradable compost filter tubes may remain in place to degrade over time. Wooden stakes shall be removed or left neatly and discretely on site.

Existing Trees

Tree protection shall be as shown or the plans or required by the Engineer. To protect root systems of existing trees, the limits of the Replication Area may be adjusted, but, the total area of replication required by all permits shall not be reduced. To the extent possible, limits shall be a minimum of 6 feet from trunks of existing trees. Access route may be adjusted as required.

Trees to be left as snags (upright dead or dying trees left for wildlife habitat) within or adjacent to the replication area shall be as shown on the plans or as directed by the Wetland Specialist or Landscape Architect and shall be marked prior to clearing. Trees that pose a potential fall hazard (i.e., are near a roadway) should have limbs and trunk cut such that the tree does not pose a fall hazard.

Woody debris in the form of cut trees, logs, and brush that shall be incorporated as shown on the plans or as directed by the Wetland Specialist or Landscape Architect shall be selected and marked by the Wetland Specialist and placed as specified below under Incorporation of Coarse Woody Debris.

All trees, stumps, or brush not specified to remain shall be removed. Materials shall not be stockpiled in the resource areas or buffer zone while awaiting disposal.

Work shall be coordinated with the Clearing or Tree Removal item and compensated under that Item.

PRE-CONSTRUCTION SITE WALK

Staking & Marking*:* The Contractor shall stake out Replication Area boundaries and the intended access route and set grade stakes for approval by the Wetland Specialist and Engineer. Following staking and demarcation of areas, the Engineer and Wetland Specialist shall approve or modify as necessary the limits of work, the access route, final location and configuration of replication, grade stake elevations, proposed location of sediment barriers, and review proposed construction methods.

Snags and Woody Debris*:* The Wetland Specialist will mark trees and select course woody debris to be retained for re-use.

Invasive Plants: As part of the initial site walk, the wetland to be impacted and the proposed replication site shall be inspected for the presence of invasive plants. If invasive plants are found they shall be addressed as described under Invasive Plants.

SOIL WORK

Final grades in the Replication Area shall meet the target elevations as shown on the Plans or as adjusted by the Wetland Specialist. If adjustments are required, a Request for Information (RFI)

shall be submitted to the Engineer for approval. Adjustments shall be documented and included in the As-Built plans (if required) and/or other applicable required documents.

Excavation & Grading of Sub-Grade

If suitable soils are not present at the required depth within the target elevations, the proposed wetland area shall be excavated to a depth of one (1) foot below proposed target elevations and backfilled with planting soil as described in the materials section.

Where the proposed wetland area is an extension of an existing wetland area, excavation shall begin at the limit of work shown on the plans and shall be a minimum depth of 12 inches below the adjacent wetland grade or as established by the Wetland Specialist.

Usable soil in the proposed wetland areas that must be removed for grades to conform to the proposed elevations shall be stripped and stockpiled in an approved location for reuse. Stockpiled soils shall be kept wet and not allowed to dry out. Procedures for maintaining appropriate moisture levels shall be documented by the Wetland Specialist in the monitoring reports.

Placement of Wetland Soil

Following excavation and grading of sub-grade, and after the sub-grade elevations are approved by the Wetland Specialist, the native wetland topsoil previously removed or manufactured soil shall be spread over the proposed wetland areas as shown on the plans and as directed by the Wetland Specialist.

Final Grading

The finished grade of the Replication Area shall be at an elevation that will provide a hydrologic connection between the Replication Area and adjacent resource areas. The hydrologic connection should be in keeping with restoring the intended function of the replacement wetland. The Contractor shall verify that this elevation is not at a level that could negatively alter the hydrology of an adjacent wetland. Microtopography shall be as shown on the plans or as adjusted by the Wetland Specialist. Final elevations and grading of wetland soil shall be approved by the Wetland Specialist and the Engineer.

To avoid compaction once soil has been placed, no heavy equipment shall travel across placed soil and no work shall occur in wet or moist soil. Soil that is compacted due to construction activities shall be replaced with hydric soil as specified herein and at the Contractor's expense.

Installation of Monitoring Wells

For wetlands over 1000 square feet, monitoring wells shall be installed in locations as shown on the Plans. Monitoring wells shall include data loggers. Data shall be collected by the Wetland Specialist and submitted with Monitoring Reports and as required by applicable permits. Wells shall be installed immediately following completion of construction of the wetland.

RESTORING VEGETATION

Incorporation of Coarse Woody Material

If specified within this contract or if directed by the Wetland Specialist or Landscape Architect, logs and coarse woody debris shall be incorporated into the Replication Area and/or adjacent upland buffer. Material shall be placed as shown on the plans or as directed following placement of wetland soil and prior to application of compost and/or seed. Woody material shall cover a minimum of 15-20 percent of the Replication Area, depending on whether it is a meadow or woodland wetland and how much wood is available from construction clearing. Where trees are cut for construction purposes, logs of a minimum length of 8 feet must comprise a minimum of 50% of the woody material left on site. Brush shall be included along with logs and stumps as directed. Woody material shall be placed in a deliberate and naturalistic manner.

Planting

Following placement of wetland soil and approval of final grade and conditions, Replication Area shall be planted. Planting shall conform to SECTION 771 PLANTING TREES, SHRUBS AND GROUNDCOVER of the Division I Standard Special Provisions and as amended below.

Planting Season shall be May 15-June 15 and September 1-November 1 unless approved following written request from the contractor.

Prior to planting, the Wetland Specialist shall approve the condition of the plant material and the method of installation and shall over see the planting work. Replication Area shall be planted in the dry and according to the planting details within the range of target elevations and at the spacing shown on the Plans. Unless otherwise noted on the Plans, final plant locations shall be determined on site and located with regard to expected hydrology, plant growth characteristics, habitat desired, and water protection.

Plant material shall be installed as soon as possible after delivery. Plants stored on-site prior to installation shall be stored in the shade and watered twice daily up until time of installation. Plants showing signs of stress or compromised health may be rejected by the Engineer or Wetland Specialist with replacement at the Contractor's expense.

Seeding

Following placement of wetland soil and planting (if included), the Replication Area shall be seeded using one of the following methods:

- Hand broadcast seed and straw mulch.
- Seeding with hydromulch per the Standard Specifications and per the manufacturer's directions.
- Hand broadcast seed with compost topdressing pneumatically applied at the same time to ensure light cover of soil over seed.

If required, seeding limits for different seed mixes shall be determined by the Wetland Specialist.

Seed tags shall be submitted with the Request for Conditional Acceptance.

POST CONSTRUCTION MAINTENANCE

Plants shall be watered as necessary to maintain healthy establishment. Plants that fail by September 1 after spring planting or by June 1 after fall planting shall be replaced at the Contractor's expense.

Seeding that fails to established shall be over-seeded as required by the Engineer. Excessive weed growth shall be cut prior to over-seeding. Cutting and over-seeding are incidental to this item.

Invasive Plants: Plant species listed as invasive by Massachusetts Invasive Plant Advisory Group (MIPAG) and the US Army Corp of Engineer's New England District shall be identified in the monitoring reports and corrective measures taken to remove them within the limits of the Replication Areas for the duration of the monitoring period.

- If invasive species are found growing within the replication area, following construction, they shall be uprooted and removed from the area by hand.

- If chemical treatment of invasive plants is necessary, the strategy for treatment shall be as determined under Items 102.3 Invasive Plant Management Strategy. That strategy shall be coordinated with the Wetland Specialist and all applicable permits and permitting agencies. Chemical application shall be per 102.33 Invasive Plant Management On-site and shall be for the duration of the contract.

- The strategy for chemical and/or manual removal shall be as directed by the Wetland Specialist and shall be incidental to this item.

CONDITIONAL ACCEPTANCE OF WORK

Conditional Acceptance shall indicate approval of the wetland construction work and agreement that work has been done according to plan or modified as approved and will initiate the start of the Monitoring period.

Upon completion of construction, the Contractor shall submit a Request for Conditional Acceptance. Request shall include documentation of pre-existing conditions and construction work as specified under Item 755.75.

Upon receipt of a Request for Conditional Acceptance, the Engineer, the Wetland Specialist and regulatory representative (if required) shall assess the replication and surrounding areas. The following conditions shall be included in the narrative and reviewed as part of the on-site assessment:

- The target elevations and hydrology for the Replication Area have been met and maintained. Areas that are too high or too low should be identified along with suggested corrective measures.
- Specified seed mix has been seeded. If inspected 30 or more days after seeding, seeded species in the wetland and adjacent upland shall show signs of good germination and healthy growth.
- Planted woody and herbaceous species meet specifications and are establishing well.

- Soils are stabilized and there is no sediment in the wetland and no channeling of slopes.
- There are no invasive plants visible in the replication area.

Upon approval of the work, MassDOT will issue a letter of Conditional Acceptance. If the replication work is not approved, MassDOT will issue a rejection letter requiring corrective actions.

CERTIFICATE OF COMPLIANCE

If required, a request for a Certificate of Compliance shall be prepared and submitted within 30 days following Conditional Acceptance. The Replication Area shall be surveyed and as-built Drawings prepared by the Contractor to accompany the Request.

The Request for Certificate of Compliance shall include the following:

- A brief narrative of the work on company letterhead signed by the Wetland Specialist. Narrative shall be in MS Word document and shall include substantive explanation that demonstrates compliance with EACH relevant permit condition. Narrative shall note variations from the originally permitted design.
- As-built Drawings signed by the Contractor's PE. As-built drawings shall show hydrologic conditions, status of plantings and seeding, and shall include a narrative and minimum of 4 photographs documenting site conditions. Plans should note variations from the originally permitted design.

  When required, drawings shall meet the Army Corp of Engineer's New England District's Compensatory Replication Guidance, including: scale in the range of 1"=20' to 1" = 100', contours at 1' intervals, spot elevations for intermediate elevations, and polygons outlining each wetland Replication area. The As-built Drawings shall be provided to the Engineer electronically in Portable Document Format (PDF). If requested by the Engineer, the Drawings shall be provided in printed paper format (11" x 17" sheets, unless otherwise directed). Drawings must be scalable.

- Other documents as required.

Work that does not meet the requirements specified above shall be addressed by the contractor at no extra cost.

FINAL ACCEPTANCE OF WORK

Following one full growing season, the Contractor shall submit a Request for Final Acceptance. Submittal shall include a brief narrative of conditions. Upon receiving the Request, the Engineer, Wetland Specialist and regulatory representative (if required) shall assess the Replication Area. The following conditions shall be inspected and approved for acceptance and payment.

- Hydrology is functioning as intended.
- Seeded species are establishing well and cover 100 percent of the area.
- No sediments have entered into wetland.
- Adjacent slopes are stabilized with desirable vegetation.
- Seeded species are establishing well and cover 100 percent of the area.

- All planted species (if included) are living and establishing well.
- There are no visible invasive plants.

If the mitigation work is not approved, MassDOT will issue a rejection letter requiring corrective action.

MONITORING REPORTS FOR REGULATORY COMPLIANCE

Monitoring after construction shall be conducted in accordance with the Order of Conditions.

Monitoring Reports shall be as follows or as required by the Order of Conditions:

- MassDEP: 1 spring inspection, and 1 fall inspection. The annual report shall be submitted by November 15.
- Conservation Commission: 1 spring inspection, and 1 fall inspection. The annual report shall be submitted by November 15.

Reports shall be completed and submitted by the Wetland Specialist as specified and compensated under item 755.76, Wetland Monitoring Reports.

Annual reports shall be submitted to the Engineer by November 15 for dispersal to the appropriate permitting agencies.

All regulatory requirements and the following, at a minimum, shall be met upon at each inspection:

- Hydrology is functioning as intended.
- Seeded species are establishing well and cover 100 percent of the area.
- No sediments have entered into wetland.
- Adjacent slopes are stabilized with desirable vegetation.
- All planted species (if included) are living and establishing well.
- There are no visible invasive plants.

If, at the end of the required monitoring period, the requirements have not been met, the Contractor shall provide corrective measures. All costs associated with corrective measures and plant replacement shall be incidental to this item.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 755.35 will be paid for at the Contract unit price per Lump Sum, which price shall include all labor, materials, equipment, submittals, maintenance, all required hydric soil, site preparation, grading, wetland seeding, mulching, watering, monitoring wells, as-built plans, request for Certificate of Compliance, and all incidental costs necessary to complete the work as required.

Payment shall be as follows:

- 60% upon Conditional Acceptance.
- 20% after receipt and acceptance of Certificate of Compliance by the Engineer and once all permit construction requirements have been met and approved.
- 20% upon Final Acceptance.

Attachment C – Order of Conditions (OOC)

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Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
95-931
MassDEP File #

eDEP Transaction #

Ashland
City/Town

A. General Information

Please note: this form has been modified with added space to accommodate the Registry of Deeds Requirements

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

1. From: Ashland
Conservation Commission

2. This issuance is for (check one): a. ☒ Order of Conditions b. ☐ Amended Order of Conditions

3. To: Applicant:

Susan
a. First Name

McArthur
b. Last Name

Massachusetts DOT
c. Organization

10 Park Plaza, Room 4260
d. Mailing Address

Boston
e. City/Town

MA
f. State

02116
g. Zip Code

4. Property Owner (if different from applicant):

a. First Name

b. Last Name

c. Organization

d. Mailing Address

e. City/Town

f. State

g. Zip Code

5. Project Location:

Route 126 (Pond Street)
a. Street Address

Ashland
b. City/Town

N/A
c. Assessors Map/Plat Number

d. Parcel/Lot Number

Latitude and Longitude, if known: 41d 14m 50s
d. Latitude

71 d 25 m 49s
e. Longitude

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A. General Information (cont.)

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):

a. County | b. Certificate Number (if registered land)

c. Book | d. Page

7. Dates: July 1, 2019 (a. Date Notice of Intent Filed) | December 9, 2019 (b. Date Public Hearing Closed) | December 23, 2019 (c. Date of Issuance)

8. Final Approved Plans and Other Documents (attach additional plan or document references as needed):

Massachusetts Department of Transporation Highway Division: Route 126 (Pond Street)
a. Plan Title

Green International Affiliates
b. Prepared By

Paul Milewski (Civil No. 48166)
c. Signed and Stamped by

Various. See Attachment A
d. Final Revision Date

As noted on various sheets
e. Scale

NOI and Associated documents
f. Additional Plan or Document Title

7/ 1/ 2019
g. Date

B. Findings

1. Findings pursuant to the Massachusetts Wetlands Protection Act:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act (the Act). Check all that apply:

a. ☒ Public Water Supply
b. ☐ Land Containing Shellfish
c. ☒ Prevention of Pollution
d. ☒ Private Water Supply
e. ☒ Fisheries
f. ☒ Protection of Wildlife Habitat
g. ☒ Groundwater Supply
h. ☒ Storm Damage Prevention
i. ☒ Flood Control

2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

Approved subject to:

a. ☒ the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

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B. Findings (cont.)

Denied because:

b. ☐ the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect the interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**

c. ☐ the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**

3. ☒ Buffer Zone Impacts: Shortest distance between limit of project disturbance and the wetland resource area specified in 310 CMR 10.02(1)(a) — 1 foot (a. linear feet)

Inland Resource Area Impacts: Check all that apply below. (For Approvals Only)

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. ☒ Bank	137 (perm) 48 (temp)	137 (perm) 48 (temp)	137 (perm) 48 (temp)	137 (perm) 48 (temp)
5. ☒ Bordering Vegetated Wetland	3,798 (perm) 2,904 (temp)	3,798 (perm) 2,904 (temp)	3,798 (perm) 2,904 (temp)	3,798 (perm) 2,904 (temp)
6. ☐ Land Under Waterbodies and Waterways	a. square feet	b. square feet	c. square feet	d. square feet
	e. c/y dredged	f. c/y dredged		
7. ☒ Bordering Land Subject to Flooding	1,240 a. square feet	1,240 b. square feet	1,240 c. square feet	1,240 d. square feet
Cubic Feet Flood Storage	395 e. cubic feet	395 f. cubic feet	395 g. cubic feet	395 h. cubic feet
8. ☐ Isolated Land Subject to Flooding	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9. ☐ Riverfront Area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	g. square feet	h. square feet	i. square feet	j. square feet

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B. Findings (cont.)

Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)

	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. ☐ Land Under the Ocean	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
12. ☐ Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. ☐ Coastal Beaches	a. square feet	b. square feet	c. nourishment cu yd	d. nourishment cu yd
14. ☐ Coastal Dunes	a. square feet	b. square feet	c. nourishment cu yd	d. nourishment cu yd
15. ☐ Coastal Banks	a. linear feet	b. linear feet		
16. ☐ Rocky Intertidal Shores	a. square feet	b. square feet		
17. ☐ Salt Marshes	a. square feet	b. square feet	c. square feet	d. square feet
18. ☐ Land Under Salt Ponds	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
19. ☐ Land Containing Shellfish	a. square feet	b. square feet	c. square feet	d. square feet
20. ☐ Fish Runs	Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above			
	a. c/y dredged	b. c/y dredged		
21. ☐ Land Subject to Coastal Storm Flowage	a. square feet	b. square feet		
22. ☐ Riverfront Area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	g. square feet	h. square feet	i. square feet	j. square feet

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B. Findings (cont.)

* #23. If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c (BVW) or B.17.c (Salt Marsh) above, please enter the additional amount here.

23. ☐ Restoration/Enhancement *:

a. square feet of BVW | b. square feet of salt marsh

24. ☐ Stream Crossing(s):

a. number of new stream crossings | b. number of replacement stream crossings

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects.

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
   a. The work is a maintenance dredging project as provided for in the Act; or
   b. The time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
   c. If the work is for a Test Project, this Order of Conditions shall be valid for no more than one year.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order. An Order of Conditions for a Test Project may be extended for one additional year only upon written application by the applicant, subject to the provisions of 310 CMR 10.05(11)(f).
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on December 23, 2022, unless extended in writing by the Department.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.

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C. General Conditions Under Massachusetts Wetlands Protection Act

8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.

9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.

10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,

"Massachusetts Department of Environmental Protection" [or, "MassDEP"]

"File Number 95-931 "

11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.

12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.

13. The work shall conform to the plans and special conditions referenced in this order.

14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.

15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.

16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.

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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.

18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

19. The work associated with this Order (the "Project")
    (1) ☒ is subject to the Massachusetts Stormwater Standards
    (2) ☐ is NOT subject to the Massachusetts Stormwater Standards

    If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:

    a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

    b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:
    i. all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures;
    ii. as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;
    iii. any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;

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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

iv. all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;

v. any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement) for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following:

i.) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and

ii.) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 18(f) through 18(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.

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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

g) The responsible party shall:
1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions (if you need more space for additional conditions, please attach a text document):
See pages 9A through 9O.

20. For Test Projects subject to 310 CMR 10.05(11), the applicant shall also implement the monitoring plan and the restoration plan submitted with the Notice of Intent. If the conservation commission or Department determines that the Test Project threatens the public health, safety or the environment, the applicant shall implement the removal plan submitted with the Notice of Intent or modify the project as directed by the conservation commission or the Department.

Ashland Special Conditions
Findings of Fact
Route 126 (Pond Street)
Redevelopment Project

Approved Work:

Work shall consist of the redevelopment of Route 126 (Pond Street) to improve traffic flow, pedestrian safety, and the aesthetics to the corridor. The project will also increase commerce for the Town of Ashland. The project will achieve these goals by widening the roadway width to include two travel lanes at a width of 11 feet each. In addition, a five foot wide sidewalk will be installed, as well as a modular path of eight to ten feet in width.

Algonquin Trail will be realigned with Harvard Street and street lights will be added at this intersection. The intersection of Spy Glass Hill Drive, Pond Street, and the entrance to the Shaw's shopping plaza will be upgraded to a rotary. In addition, the intersection at Eliot Street will be improved by adding crosswalks.

Stormwater will be improved by adding deep sumps and hoods in existing catch basins. Currently, the existing catch basins are in a basin to basin connection, a process that is no longer allowed under current standards. The project will eliminate these connections. In addition, three existing culverts in Route 126 will be replaced. Of the three culverts, two of them will be replaced with a natural stream bottom. Finally, a drywell may be installed closer to Spy Glass Hill.

Work will take place in Bordering Vegetated Wetlands, Bordering Land Subject to Flooding, buffer zone, the 25' No Disturb Zone, and the 200 Foot Riverfront Area. Note that during the hearings, a system flagged by Algonquin Trail was determined by the Commission as not being a wetland system due to soil and vegetation observed on site during a site walk.

A replication area will need to be installed and will either be installed abutting the intersection of Pond Street and Butterfield Drive, or will be located behind the fire station at Cedar Street. Note that the wetland system behind the fire station has the same connection to the wetland systems being impacted by the project.

Note that final dates of plans and supporting documents is shown on Attachment A.

General Conditions:

All state conditions shall apply to this Order of Conditions. The following conditions for the Ashland Wetlands Protection Bylaw is stated between numbers from 21 to 45.

21. Administrative Conditions

a) The project proponent shall be responsible for the compliance with all conditions of this Order. If the property is transferred, this Order of Conditions shall apply to any successor in control or successor in interest of the property described in the Notice of Intent and referenced plans. The project proponent shall provide written verification of the transfer of this Order and understanding of the conditions by the new owner within 60 days of property transfer.

b) All work must conform to the referenced plan set for the project site. Any changes to the proposed project, relating to the location of proposed contours, limits of work, location of erosion control measures, or permanent or temporary alterations of regulated wetland resource areas shall be submitted to the Ashland Conservation Commission prior to the start of construction. The Ashland Conservation Commission shall determine if the proposed change warrants submission of a new Notice of Intent.

c) All other necessary local, state and federal permits shall be obtained prior to construction.

d) Pursuant to the 2000 Massachusetts Second Annual Session, Chapter 144, the Ashland Conservation Commission reserves the right to hire, at the applicant's expense, outside consultants to perform inspections and or project review to ensure compliance with appropriate federal, state and local laws and regulations, at any point between the filing of an application to the issuance of a Certificate of Compliance.

e) In the event of a discrepancy between the project plan and this Order of Conditions, the Order of Conditions shall prevail.

f) Copies of the construction site Stormwater Pollution Prevention Plan (SWPPP) and National Pollutant Discharge Elimination System (NPDES) reports shall be forwarded to the Ashland Conservation Commission prior to the start of construction activities.

g) The Ashland Conservation Commission's failure to discover or take action with respect to the proponent's compliance with any part of any condition does not constitute a waiver of rights to enforce this Order of Conditions.

h) Final construction plans, stamped by an engineer shall be submitted to the Conservation Commission or Agent of the Commission for review and approval.

22. Deed Recording—All restrictions imposed by this Order of Conditions shall continue in force until compliance with the conditions is certified by the issuance of a Certificate of Compliance and said Certificate has been recorded with the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property.

23. **Notification of Activity** - The applicant shall provide the Ashland Conservation Commission with written notification at least five (5) days, but not more than ten (10) days, before any activity commences on the project site. This applies to all project activities, including but not limited to, installation of erosion and sedimentation control measures.

24. **Right to Enter** — Members and agents of the Ashland Conservation Commission shall have the right to enter and inspect the premises to evaluate compliance with the conditions stated in this Order of Conditions, and may require the submittal of any data deemed necessary by the Commission for that evaluation. The Ashland Conservation Commission also reserves the right to require additional measures if determined necessary to protect resource areas and the interests of the Wetlands Protection Act as defined in M.G.L. Ch. 131 § 40 (310 CMR 10.00).

25. **Read and Post Order** — The developer or contractor responsible for the project's completion shall be notified of, and made responsible for reading and complying with, the requirements and conditions of this Order of Conditions. A copy of this Order and referenced plans shall be available at the site while activities regulated by this Order are being performed.

26. **Construction Sequence** - A construction sequence is to be submitted to the Commission for review and approval prior to construction activities.

27. **Erosion Controls**

    a) Prior to commencing **ANY** alteration activities, erosion and siltation control barriers shall be placed along the line depicted in the referenced plans. Prior to installation, the location of erosion and siltation control barriers shall be established by survey methods and staked. **The use of construction hay is prohibited by this Order of Conditions.**

    b) Sediment runoff is not permitted to leave the site. Perimeter erosion controls include but are not limited to silt fencing, silt socks, and straw bales, provided that they are installed per state and manufacturer standards. Untreated stormwater discharge into wetlands, public roadways, or stormwater systems may result in fines from the Conservation Commission or its Agent, and/or the Department of Public Works.

    c) Should the Ashland Conservation Commission determine additional erosion controls are needed, the developer or contractor shall immediately comply with the request from the Ashland Conservation Commission or its Agent.

    d) The limit of work for the project shall be the erosion control barrier as illustrated on the referenced plans. No temporary or permanent construction work, storage of materials, discarding of materials, or access by construction personnel or equipment shall occur beyond the limit of work as delineated by the erosion control barrier.

    e) All erosion control barriers shall be properly installed before any site work, including clearing, can proceed. Once the erosion controls are

installed, the Ashland Conservation Commission shall be notified and the site shall be inspected. Approval of the erosion control installation by the Ashland Conservation Commission or its agent is required before further site construction is initiated.

f) The erosion and siltation controls shall be maintained in a state of good repair until all disturbed areas have been permanently stabilized, or until a determination has been made by the Ashland Conservation Commission indicating that control measures are no longer necessary.

g) All erosion and siltation controls measures and structures are to be inspected daily and maintained as necessary by an Environmental Monitor. The contact information of the Environmental Monitor shall be forwarded to the Agent of the Commission. This information shall include the name of the Environmental Monitor, their company and title, their phone number and their address. In addition to the daily inspections of the erosion controls, an inspection shall be made after every rainfall event equal to or greater than .25" in a 24-hour period or greater than 1.0" per hour to ensure their integrity.

h) The areas of construction shall be left in a stable condition at the close of each construction day. Erosion and siltation controls shall be inspected at this time and repaired, maintained or reinforced as necessary.

i) A barrier of four (4) foot high orange plastic construction fencing, snow fencing or approved alternative shall be placed along the erosion control barrier to provide additional demarcation of the limit of work within 50 feet of any wetland resource area.

28. **Dry well**—prior to the preconstruction meeting, the Applicant shall confirm to the Conservation Commission or its Agent, if a dry well will be installed near Spyglass Hill Drive as stated in the Findings of the Fact for this Order of Conditions. Plans should be submitted to the Conservation Commission or its Agent prior to the preconstruction meeting.

29. **Survey and Plans**—Per the hearing held on December 9, 2019, with the Conservation Commission, a wetland delineation shall be performed at the system behind the fire station located at Cedar Street to determine if this location will be better than what is shown on approved plans at Butterflied Drive. The delineation report, and plans shall be submitted to the Conservation Commission to determine as soon as it is available. The determination shall be made by the Conservation Commission, in conjunction with the Applicant and its representatives. A hard copy of the plans shall be submitted to the Agent of the Commission for the file.

30. **CAD Files**—CAD files of final construction plans shall be submitted to the Conservation Agent, and to the Town's Project Engineer. In addition, final as-built plans shall be submitted in a pdf and CAD format. The CAD files must be georeferenced to NAD State Plane 83 feet.

31. **Preconstruction Meeting**

a. Prior to any work on the project site, the applicant shall request a pre-construction meeting between the developer, contractor, Erosion Control (assigned to the project in accordance with Conditions 32), the building inspector and members of the Ashland Conservation Commission or its agent. Meeting participants shall review in detail this Order of Conditions, the appropriate site plans, the Notice of Intent and other appropriate environmental protection documents and issues. The Conservation Agent or Ashland Conservation Commission shall be provided the name, telephone number and email address of the person who will be immediately responsible for supervision of all work on the project site and compliance with this Order of Conditions. The Conservation Agent or Ashland Conservation Commission shall be notified in the event that the site supervisor or contractor is changed.

b. Prior to the preconstruction meeting, that Applicant or his representative shall:

i. Install wetland flags with the flag numbers written on the flags

ii. Install stakes shall be installed outlining the erosion control line and shall be placed in accordance with the approved plans.

iii. Submit deed recording information to the Agent of the Commission as required in Condition number 9.

iv. Post a sign no bigger than two feet by two feet. The sign shall contain the DEP file number on it, and shall be posted along the roadway.

v. Submit the construction sequence shall be forwarded to the Conservation Commission (see condition Number 26)

32. Culvert Replacement—the culvert replacements shall take place during low flow periods and shall be constructed in accordance with the approved plans as outlined in Attachment A.

33. Replication

a) The wetland replication shall comply and conform to 310 CMR 10.55 (4) and with the DEP Guidance Document *Massachusetts Inland Wetland Replication Guidelines, Guidance No. BRP/DWM/WetG02-2, dated March 1, 2002.*

b) A qualified wetland scientist with experience in wetland replication (Wetland Monitor) and with a working knowledge of botany and hydrology shall supervise construction of the replication area. The contact information of the Wetland Monitor shall be forwarded to the Agent of the Commission. The contact information of the Wetland Monitor shall consist of their name, company name, title, phone number and e-mail address. The Wetland Monitor shall conduct monitoring of the replication area for the first two complete growing seasons following completion. Monitoring reports shall be submitted to the Ashland

Conservation Commission to demonstrate conformance with the appropriate Performance Standards (310 CMR 10.00). A Certificate of Compliance shall not be issued until the wetland replication area is in place and functioning and is verified by the ACC.

c) Alteration of regulated wetland resource areas, 25-foot no disturb area or the 100-foot buffer zone shall not proceed until the replication area has been excavated and prepared, according to design, and is ready to accept wetland soils.

d) The replication area shall utilize organic soils from the vegetated wetland fill area to the greatest extent possible. Preparation of the replication area shall entail bringing the grade down, leaving trees of 10-inch diameter breast height or greater in place, leaving boulders in place, and generally creating micro topography.

e) The soils for the replication area shall be amended with a mixture of equal volumes of organic and mineral materials. These materials shall be uncontaminated and shall not include any woodchips. The organic material used shall be well or partially decomposed; clean leaf compost is preferred. Mineral materials shall be predominately in the loam, loamy-sand to silty-loam texture range.

f) The applicant shall notify the ACC by telephone or by email upon completion of the excavation of the replication area and 48 hours prior to alteration of the vegetated wetland. The ACC may inspect and request verification of excavated elevations.

g) Once the replication area has been backfilled with wetland soils, planting shall be completed by the end of October of the construction year.

h) Planting of the replication areas shall not take place between November 1st and April 15th.

i) The Wetland Protection Act Regulations outlined in 310 CMR 10.55(4)(b)(6) require that at least 75 percent of the surface of the replacement area be re-established with indigenous wetland plant species within two (2) growing seasons. If monitoring data indicates that this objective cannot be met, a corrective action plan shall be submitted to the Ashland Conservation Commission for approval, and implemented under the supervision of a wetland specialist.

j) A 25-foot no disturb area shall be created and subsequently maintained around the wetland replication area.

k) The designated Wetland Monitor shall conduct weekly inspections during construction.

l) The Wetland Monitor shall be present and shall submit written reports to the ACC within one week of the inspection date of the following activities:

1. Before excavation or erosion control installation work begins to inspect site flagging;
2. During excavation of the altered area while soils and/or vegetation are being translocated the replication area;
3. To inspect excavated elevations and estimated post-construction ground water elevation for the replication area;
4. After each stage of grading work in the replication area is completed to inspect finished elevations;
5. After one growing season to observe vegetation development and regulatory compliance;
6. After two growing seasons to observe vegetation development and regulatory compliance;
7. After three growing seasons to observe vegetation development and regulatory compliance.

m) The Ashland Conservation Commission reserves the right to make a determination as to the success or failure of the wetland replication efforts and reserves the right to require additional replication.

34. Stockpiles—Soil stockpiles shall be a maximum of 20-feet high with a maximum 2:1 slope on all sides and be surrounded by temporary erosion controls within 3-ft of the base of the stockpile and down gradient of the stockpiles when not in use for more than 24-hrs. Soil Stockpiles shall be located at least 50-ft from any wetland, waterbody, drain inlet, or open channel. Stockpiled soil on site shall be stabilized by mulching or temporary vegetation if the stockpiles remain inactive for more than 14 days. All debris, fill and excavated material shall be stockpiled far enough away from designated wetlands and in a location or in a manner to prevent sediment from entering the wetlands via surface runoff.

35. Soil Stabilization — Seeding or sod shall permanently stabilize all disturbed soils. During construction, disturbed soils shall be temporarily stabilized by the use of invasive species-free mulch or spread straw, or other method approved by the U.S. Department of Agriculture or Natural Resources Conservation Service, and approved by the ACC. All disturbed areas shall be brought to final finished grade and either (a) loamed and seeded within fourteen (14) days of final grading accordance with NRCS guidelines for permanent stabilization or (b) stabilized in another manner approved by the ACC.

36. Landscaping—Landscaping specimens shall be native to the Northeast of the United States. No invasive or likely invasive species shall be planted within jurisdictional areas. If any changes are proposed to the landscaping plan (see Attachment A), a final landscaping plan shall be submitted to the Conservation Commission or its Agent for approval.

37. Catch Basins

a) Silt sacks, or approved equivalent, shall be installed on all new and existing functioning catch basins and drop inlets in the project area.

b) New and existing catch basins in the project area shall be equipped with 4-foot sumps and hooded outlets and shall be inspected and cleaned as per the Operations and Maintenance program outlined in the Notice of Intent.

c) Rims of all catch basins shall be set flush with pavement throughout the construction of the project.

38. **Remove Debris from Wetlands** — All man-made debris shall be removed from the wetlands and 25-foot No Disturb Zone and disposed of properly prior to requesting a Certificate of Compliance.

39. **Downstream Impacts** — The issuance of this Order of Conditions does not in any way imply nor certify that the site or downstream areas will not be subject to flooding, storm damage, or any other form of damage due to wetness.

40. **Request for Certificate of Compliance** — The applicant shall submit a written request for a Certificate of Compliance, together with an as-built plan and an affidavit prepared by a professional engineer or land surveyor registered in the Commonwealth of Massachusetts, stating that the site has been developed in accordance with the requirements of this Order of Conditions, based upon an on-site inspection and the referenced site plan. The affidavit shall state any deviations from the approved plans and this Order of Conditions.

The as-built plans shall include all components of the project including but not limited to stormwater structures and systems elevations and inverts. The Ashland Conservation Commission or its agent reserves the right to inspect the complete site before the issuance of a Certificate of Compliance. Upon receipt of a Certificate of Compliance, erosion controls shall be removed within 60 days. If a partial Certificate of Compliance is issued, there will be no additional fee if a full Certificate of Compliance is requested within six months.

Conditions to Extend in Perpetuity

41. **Stormwater Operations & Maintenance** Best management practices, outlined in the Stormwater Management Report, include maintenance and operations procedures which will apply to the site once the project is complete and ongoing. Maintenance and operations procedures associated with the site drainage structures will not require supplemental filings after the Certificate of Compliance is issued provided items noted below are followed. These practices are itemized on O& M Plans entitled: *Operations, and Maintenance Plan*, dated April 2019.

c. **Post Construction Routine Schedule**

The property's stormwater handling facilities must be inspected on a regular basis in order to comply with the project's wetlands permit. Routine inspections must be made during the months of May, August, November and February.

Deep Sump Catch Basins

Have all catch basins and area drains inspected quarterly and sumps cleaned or if greater than 1.5 feet of sediment has accumulated.

Water Quality Inlet Structures

The structures are to be inspected a minimum 4 times a year and cleaned when 18 inches of sediment and hydrocarbons are observed

Street Sweeping

Have all pavement machine swept four times annually during November to May. (by outside contractor.)

Landscaping

Inspect for diseased/dying trees, shrubs, ground cover and grass. Replace as required.

Inspect mulch beds. Supplement as required to provide 4" minimum depth (loose measure)

Rip Rap (Stone) Protection

Inspect stone protection on embankments, spillways, pipe outlets and elsewhere. Cut emerging young trees. Repair as required.

Stormwater Management Area

- Inspect fencing and locks. Repair as required.
- Inspect areas between forebay, water quality area, recharge area.
- Grassed areas are to be maintained on a regular basis during the growing season. Any grass clipping are to be removed from the site.
- Inspect water detention basin outlets.
- Inspect culvert to wetlands.
- Inspect and maintain vegetation in the constructed stormwater wetland and replant as needed
- Inspect forebay bottom. If accumulated silt is deeper than 12 inches over its full bottom area, have cleaned.

d. **Post Construction Non-routine Schedule**

Area Drains/Stormwater Management Area
Inspect after each significant rainfall (1/2" or more) for first six months after their construction to ensure surface vegetation is healthy, discharge devices are not blocked and banks are not eroding. Check all components after each major storm (more than 2" rainfall in 24 hours). Clean and repair as required.

42. **Snow Storage and Disposal** — All snow storage and disposal shall conform to the Department of Environmental Protection's Snow Disposal Guidelines. This condition shall remain in effect in perpetuity and shall not be released by a Certificate of Compliance.

43. **Emergency Release, Spills, or Other contamination Release-**the owner will provide for Ashland Conservation Commission review and approval prior to construction an Emergency Response Procedure for accidental release of contaminants. This procedure will include notification of the Ashland Fire Department for any uncontrolled release, maintenance of a site spill response kit suitable to clean up and contain a 40 gallon spill, and procedures for containment of any spill.

44. **Landscaping Waste** — No grass clippings, leaves or other landscaping waste may be deposited in any detention basin, forebay, wetland resource area or 25-foot no disturb area. This condition shall remain in effect in perpetuity and shall not be released by a Certificate of Compliance.

45. **Land disturbance-** The Applicant is responsible for disturbance of the property and any fill, soils, clay, or other natural or man-made debris that is brought on site. It is the responsibility of the applicant to ensure that all materials coming in are clean. All materials that are removed from the site shall be properly disposed of.

ATTACHMENT A

Final Dates of Plans and Supporting Documents

Plans

Plan Title	Sheet No.	Date
Massachusetts Department of Transportation: Highway Division Plan and Profile of Route 126 (Pond Street) in the town of Ashland Middlesex County	1	12/9/2019
Ashland Ma, Route 126 (Pond Street): Legend & Abbreviations	2	8/14/2018
Ashland Ma, Route 126 (Pond Street): General Notes	3	10/22/2019
Ashland Ma, Route 126 (Pond Street): Key Plan	4	8/14/2018
Ashland MA, Route 126 (Pond Street): Typical Section 1	11	8/17/2018
Ashland MA, Route 126 (Pond Street): Typical Section 2	12	8/17/2018
Ashland MA, Route 126 (Pond Street): Typical Section 3	13	8/17/2018
Ashland MA, Route 126 (Pond Street): Construction Plans (1 of 17)	14	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (2 of 17)	15	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (3 of 17)	16	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (4 of 17)	17	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (5 of 17)	18	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (6 of 17)	19	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (7 of 17)	20	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (8 of 17)	21	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (9 of 17)	22	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (10 of 17)	23	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (11 of 17)	24	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (12 of 17)	25	10/22/2019
Ashland Ma, Route 126 (Pond Street): Construction Plans (13 of 17)	26	10/22/2019

Ashland MA, Route 126 (Pond Street): Construction Plans (14 of 17)	27	10/22/2019
Ashland Ma, Route 126 (Pond Street): Construction Plans (15 of 17)	28	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (16 of 17)	29	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (17 of 17)	30	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (1 of 16)	31	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (2 of 16)	32	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (3 of 16)	33	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (4 of 16)	34	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (5 of 16)	35	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (6 of 16)	36	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (7 of 16)	37	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (8 of 16)	38	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (9 of 16)	39	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (10 of 16)	40	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (11 of 16)	41	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (12 of 16)	42	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (13 of 16)	43	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (14 of 16)	44	10/22/2019
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Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (16 of 16)	46	10/22/2019
Ashland MA, Route 126 (Pond Street): Converse Way Profile	47	10/22/2019
Ashland MA, Route 126 (Pond Street): Spyglass Hill Profile	48	10/22/2019
Ashland MA, Route 126 (Pond Street): Eliot Street Profile	49	10/22/2019

Ashland MA, Route 126 (Pond Street): Nash Avenue Profile	50	10/22/2019
Ashland MA, Route 126 (Pond Street): Nickerson Road Profile	51	10/22/2019
Ashland MA, Route 126 (Pond Street): Tri Street Profile	52	10/22/2019
Ashland MA, Route 126 (Pond Street): Tufts Street Profile	53	10/22/2019
Ashland MA, Route 126 (Pond Street): Algonquin Trial Profile	54	10/22/2019
Ashland MA, Route 126 (Pond Street): Harvard Street Profile	55	10/22/2019
Ashland MA, Route 126 (Pond Street): Sewell Street Profile	56	10/22/2019
Ashland MA, Route 126 (Pond Street): Butterfield Drive Profile	57	10/22/2019
Ashland MA, Route 126 (Pond Street): James Road Profile	58	10/22/2019
Ashland MA, Route 126 (Pond Street): Market Basket Driveway Profile	59	10/22/2019
Ashland MA, Route 126 (Pond Street): Walcott Road Profile	60	10/22/2019
Ashland MA, Route 126 (Pond Street): Rodman Road Profile	61	10/22/2019
Ashland MA, Route 126 (Pond Street): Greenhalge Road Profile	62	10/22/2019
Ashland MA, Route 126 (Pond Street): Washington Ave Profile	63	10/22/2019
Ashland MA, Route 126 (Pond Street): Douglas Road Profile	64	10/22/2019
Ashland MA, Route 126 (Pond Street): Waushakum Avenue Profile	65	10/22/2019
Ashland MA, Route 126 (Pond Street): Roundabout Profile	66	10/22/2019
Ashland MA, Route 126 (Pond Street): Drainage & Utility Plans (1 of 17)	92	10/22/2019
Ashland MA, Route 126 (Pond Street): Drainage & Utility Plans (2 of 17)	93	10/22/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (3 of 17)	94	11/18/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (4 of 17)	95	10/22/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (5 of 17)	96	11/18/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (6 of 17)	97	11/18/2019
Ashland Ma, Route 126 (Pond Street): Drainage and	98	10/22/2019

Utility Plan (7 of 17)		
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (8 of 17)	99	11/18/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (9 of 17)	100	10/22/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (10 of 17)	101	10/22/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (11 of 17)	102	10/22/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (12 of 17)	103	10/22/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (13 of 17)	104	11/18/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (14 of 17)	105	11/18/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (15 of 17)	106	11/18/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (16 of 17)	107	10/22/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (17 of 17)	108	10/22/2019
Ashland Ma, Route 126 (Pond Street): Landscape and Wetland Replication Details (1 of 2)	181	10/22/2019
Ashland Ma, Route 126 (Pond Street): Landscape and Wetland Replication Details (2 of 2)	182	10/22/2019
Ashland Ma, Route 126 (Pond Street): Wetland Replication Plan (Sheet 2 of 2)	185	11/18/2019
Ashland, MA. Route 126 (Pond Street): Construction Details	185	11/18/2019
Ashland, MA. Route 126 (Pond Street): Construction Details	186	10/22/2019
Ashland, MA. Route 126 (Pond Street): Drainage & Utility Details (1 of 4)	187	12/6/2019
Ashland Ma, Route 126 (Pond Street): Drainage & Utility Details (2 of 4)	188	12/6/2019
Ashland Ma, Route 126 (Pond Street): Drainage & Utility Details (3 of 4)	189	12/6/2019
Ashland Ma, Route 126 (Pond Street): Drainage & Utility Details (4 of 4)	190	12/6/2019

Documents:

Document Title	Description	Date
Notice of Intent: Route 126 (Pond Street) Ashland, Massachusetts	Mass DOT Contract No. 604123	7/1/2019
Stormwater Report: Route 126 (Pond Street): Ashland Massachusetts	Green International Affiliates , INC.	12/9/2019
USGS Locus Map	Figure 1	5/31/2017
Aerial Locus Map	Figure 2	5/31/2017
Soils Map	Figure 3	8/1/2017
FEMA Map	Figure 4	8/1/2017
Resource Area Map	Figure 5	10/8/2019
Route 126 (Pond Street): Existing Watershed Plan	Figure 6	10/15/2019
Route 126 (Pond Street): Proposed Watershed Plan	Figure 7	10/15/2019
Resource Area Impacts	Figure 8A	10/11/2019
Resource Area Impacts	Figure 8B	10/11/2019
Resource Area Impacts	Figure 8C	10/11/2019
Resource Area Impacts	Figure 8D	11/18/2019
Resource Area Impacts	Figure 8E	11/18/2019
Resource Area Impacts	Figure 8F	10/11/2019
Resource Area Impacts	Figure 8G	10/11/2019
Resource Area Impacts	Figure 8H	10/11/2019
Potential Wetland Replication Option	Figure 9	12/6/2019

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
95-931
MassDEP File #

eDEP Transaction #

Ashland
City/Town

D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? ☐ Yes ☒ No

2. The Ashland (Conservation Commission) hereby finds (check one that applies):

   a. ☐ that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:

   1. Municipal Ordinance or Bylaw | 2. Citation

   Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

   b. ☐ that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:

   Wetlands Protection Bylaw (1. Municipal Ordinance or Bylaw) | c. 280 (2. Citation)

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.

   The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):

   Note that there is a local Wetlands Protection Bylaw within the Town of Ashland, but the Applicant only filed the Notice of Intent for the Wetlands Proteciton Act, and not the Wetlands Protection Bylaw.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
95-931
MassDEP File #

eDEP Transaction #

Ashland
City/Town

E. Signatures

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

12/23/2019
1. Date of Issuance

Please indicate the number of members who will sign this form.
This Order must be signed by a majority of the Conservation Commission.

4
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Signatures:

☐ by hand delivery on

Date

☑ by certified mail, return receipt requested, on

12/30/19
Date

F. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
95-931
MassDEP File #

eDEP Transaction #

Ashland
City/Town

G. Recording Information

Prior to commencement of work, this Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

Ashland
Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

Ashland
Conservation Commission

Please be advised that the Order of Conditions for the Project at:

Project Location _____ MassDEP File Number _____

Has been recorded at the Registry of Deeds of:

County _____ Book _____ Page _____

for: Property Owner _____

and has been noted in the chain of title of the affected property in:

Book _____ Page _____

In accordance with the Order of Conditions issued on:

Date _____

If recorded land, the instrument number identifying this transaction is:

Instrument Number _____

If registered land, the document number identifying this transaction is:

Document Number _____

Signature of Applicant _____

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

Request for Departmental Action Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

Provided by DEP

A. Request Information

1. Location of Project

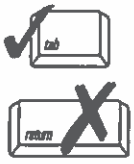
a. Street Address

b. City/Town, Zip

c. Check number

d. Fee amount

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



2. Person or party making request (if appropriate, name the citizen group's representative):

Name

Mailing Address

City/Town

State

Zip Code

Phone Number

Fax Number (if applicable)

3. Applicant (as shown on Determination of Applicability (Form 2), Order of Resource Area Delineation (Form 4B), Order of Conditions (Form 5), Restoration Order of Conditions (Form 5A), or Notice of Non-Significance (Form 6)):

Name

Mailing Address

City/Town

State

Zip Code

Phone Number

Fax Number (if applicable)

4. DEP File Number:

B. Instructions

1. When the Departmental action request is for (check one):

☐ Superseding Order of Conditions – Fee: $120.00 (single family house projects) or $245 (all other projects)

☐ Superseding Determination of Applicability – Fee: $120

☐ Superseding Order of Resource Area Delineation – Fee: $120

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

Request for Departmental Action Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

Provided by DEP

B. Instructions (cont.)

Send this form and check or money order, payable to the *Commonwealth of Massachusetts,* to:

Department of Environmental Protection
Box 4062
Boston, MA 02211

2. On a separate sheet attached to this form, state clearly and concisely the objections to the Determination or Order which is being appealed. To the extent that the Determination or Order is based on a municipal bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

3. Send a **copy** of this form and a **copy** of the check or money order with the Request for a Superseding Determination or Order by certified mail or hand delivery to the appropriate DEP Regional Office (see http://www.mass.gov/eea/agencies/massdep/about/contacts/).

4. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Attachment D – Public Notice

Public Notice

Massachusetts Department of Environmental Protection
Division of Wetlands and Waterways
Southeast Region
20 Riverside Drive
Lakeville, MA 02347

Pursuant to 33 U.S.C. 1341 M.G.L. c. 21 §§ 26 - 53, notice is given of a 401 Water Quality Certification application for discharge of fill for the reconstruction of Route 126 (Pond Street) in the Town of Ashland, MA, by the Massachusetts Department of Transportation – Highway Division, 10 Park Plaza, Room 4260, Boston, MA 02116. The project will include full-depth reconstruction of deteriorated roadway pavements and construction of new sidewalks, subsurface drainage improvements, and surface drainage improvements. The project also includes minor horizontal and vertical roadway alignment improvements and three culvert replacements. Additional information may be obtained from the Massachusetts Department of Transportation - Highway Division at the above address, Attention Susan McArthur, (857) 368-8807. Written comments should be sent to DEP, Division of Wetlands and Waterways, Attention Chris Ross, Southeast Region, 20 Riverside Drive, Lakeville, MA 02347 within 21 days of this notice. Any group of ten persons, any aggrieved person, or any governmental body or private organization with a mandate to protect the environment who submits written comments may appeal the Department's Certification. Failure to submit written comments before the end of the public comment period may result in the waiver of any right to an adjudicatory hearing.

Attachment E – Stormwater Report
(bound separately)

Attachment F –WQC Submission Plans
(bound separately)

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

PLAN AND PROFILE OF

ROUTE 126 (POND STREET)

IN THE TOWN OF

ASHLAND

MIDDLESEX COUNTY

FEDERAL AID PROJECT NO.

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	1	327
PROJECT FILE NO.	604123		

TITLE SHEET & INDEX

THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 1988, AS AMENDED, THE SUPPLEMENTAL SPECIFICATIONS DATED APRIL 1, 2019, THE INTERIM SUPPLEMENTAL SPECIFICATIONS CONTAINED IN THIS CONTRACT, THE OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE LATEST MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS WITH MASSACHUSETTS AMENDMENTS AND THE STANDARD MUNICIPAL TRAFFIC CODE, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1996 CONSTRUCTION AND TRAFFIC STANDARD DETAILS (AS RELATES TO THE PAVEMENT MARKINGS DETAILS ONLY), THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK, THE PLANS AND THESE SPECIAL PROVISIONS, WILL GOVERN.

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Proposal No. 604123-111717

INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET & INDEX
2	LEGEND & ABBREVIATIONS
3	GENERAL NOTES
N/A	RESOURCE AREA IMPACTS (SHEETS 4-10 OF 18)
4	KEY PLAN (NOT INCLUDED IN THIS SUBMISSION)
5	BORING LOCATION PLAN (NOT INCLUDED IN THIS SUBMISSION)
6-12	BORING LOGS (NOT INCLUDED IN THIS SUBMISSION)
13-15	TYPICAL SECTIONS (NOT INCLUDED IN THIS SUBMISSION)
16-32	CONSTRUCTION PLANS (NOT INCLUDED IN THIS SUBMISSION)
33-68	CONSTRUCTION PROFILES (NOT INCLUDED IN THIS SUBMISSION)
69-85	CURB TIE PLANS (NOT INCLUDED IN THIS SUBMISSION)
86-88	GRADING PLANS (NOT INCLUDED IN THIS SUBMISSION)
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94-110	DRAINAGE AND UTILITY PLANS (NOT INCLUDED IN THIS SUBMISSION)
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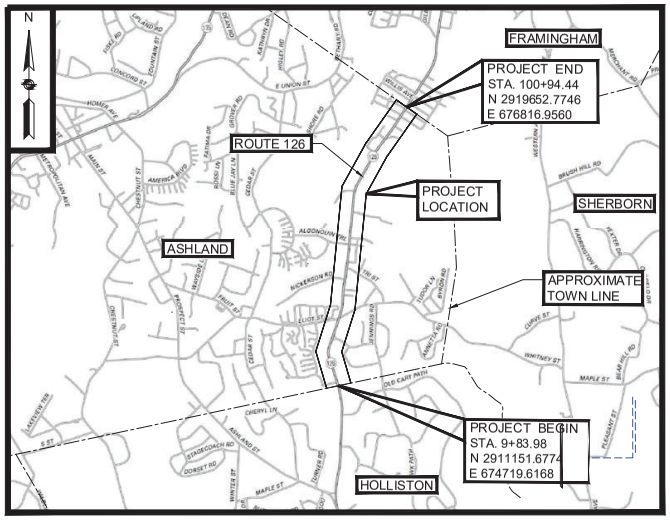
199-204	WALL PLANS (NOT INCLUDED IN THIS SUBMISSION)
205-214	CULVERT DETAILS
215-327	CROSS SECTIONS (NOT INCLUDED IN THIS SUBMISSION)



LOCATION PLAN

2000 0 2000 4000

SCALE 1" = 4000'

LENGTH OF PROJECT = 9,110.46 FEET = 1.725 MILES

WQC/ACOE PLANS SHEET 1 OF 18

DESIGN DESIGNATION - ROUTE 126 (POND STREET)

DESIGN SPEED	45 MPH - Begin to 15+00, 36+00 to 81+00 40 MPH - 15+00 to 36+00, 81+00 to End	
	Framingham Town Line	South of Spyglass Hill Dr
ADT (2014)	17,730	12,100
ADT (2034)	19,590	13,370
K	7.8	8.1
D	53.4	55.3
T (PEAK HOUR)	6.7	8.9
T (AVERAGE DAY)	7.5	9.3
DHV	1,528	1,083
DDHV	816	599
FUNCTIONAL CLASSIFICATION	URBAN PRINCIPAL ARTERIAL	URBAN PRINCIPAL ARTERIAL

WQC SUBMISSION

DATE: JANUARY 31, 2020

DATE	DESCRIPTION	REV #
01/17/2020	100% SUBMISSION	2
10/5/2018	REVISED 75% SUBMISSION	1

GREEN INTERNATIONAL AFFILIATES, INC.
TRANSPORTATION | STRUCTURAL | WATER RESOURCES | CIVIL/SITE
239 LITTLETON ROAD, SUITE 3 WESTFORD, MA 01886
978.923.0400 | www.greenintl.com

massDOT Massachusetts Department of Transportation Highway Division

RECOMMENDED FOR APPROVAL

CHIEF ENGINEER _____ DATE _____

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR _____ DATE _____

APPROVED

HIGHWAY ADMINISTRATOR _____ DATE _____

GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
JB	JB	JERSEY BARRIER
CB	CB	CATCH BASIN
		CATCH BASIN CURB INLET
FP	FP	FLAG POLE
GP	GP	GAS PUMP
MB	MB	MAIL BOX
		POST SQUARE
		POST CIRCULAR
WELL	WELL	WELL
EHH	EHH	ELECTRIC HANDHOLE
		FENCE GATE POST
GG	GG	GAS GATE
BHL #	BHL #	BORING HOLE
MW #	MW #	MONITORING WELL
TP #	TP #	TEST PIT
		HYDRANT
		LIGHT POLE
CO.BD.		COUNTY BOUND
		GPS POINT
		CABLE MANHOLE
		DRAINAGE MANHOLE
		ELECTRIC MANHOLE
		GAS MANHOLE
		MISC MANHOLE
		SEWER MANHOLE
		TELEPHONE MANHOLE
		WATER MANHOLE
MHB	MHB	MASSACHUSETTS HIGHWAY BOUND
MON		MONUMENT
SB		STONE BOUND
TB		TOWN OR CITY BOUND
		TRAVERSE OR TRIANGULATION STATION
TPL or GUY	TPL or GUY	TROLLEY POLE OR GUY POLE
HTP		TRANSMISSION POLE
UFB	UFB	UTILITY POLE W/ FIREBOX
UPDL	UPDL	UTILITY POLE WITH DOUBLE LIGHT
ULT	ULT	UTILITY POLE W / 1 LIGHT
UPL	UPL	UTILITY POLE
		BUSH
SIZE & TYPE		TREE
		STUMP
		SWAMP / MARSH
WG	WG	WATER GATE
PM	PM	PARKING METER
		OVERHEAD CABLE/WIRE
		CURBING
100 99		CONTOURS (ON-THE-GROUND SURVEY DATA)
100 99		CONTOURS (PHOTOGRAMMETRIC DATA)
		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND WATER MAIN (DOUBLE LINE 24 INCH AND OVER)
		BALANCED STONE WALL
		GUARD RAIL - STEEL POSTS
		GUARD RAIL - WOOD POSTS
		CHAIN LINK OR METAL FENCE
		WOOD FENCE
		HAY BALES/SILT FENCE
		TREE LINE
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		EDGE OF PAVEMENT
		LIMIT OF MICROMILLING AND OVERLAY
		BANK OF RIVER OR STREAM
		BORDER OF WETLAND
		100 FT WETLAND BUFFER
		200 FT RIVERFRONT BUFFER
		STATE HIGHWAY LAYOUT
		TOWN OR CITY LAYOUT
		COUNTY LAYOUT
		RAILROAD SIDELINE
		TOWN OR CITY BOUNDARY LINE
		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT
		SEDIMENT CONTROL BARRIER
		HAND HOLE FOR LIGHT POST

TRAFFIC SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
1	1	CONTROLLER PHASE ACTUATED
		TRAFFIC SIGNAL HEAD (SIZE AS NOTED)
		WIRE LOOP DETECTOR (6' x 6' TYP UNLESS OTHERWISE SPECIFIED)
		VIDEO DETECTION CAMERA
		MICROWAVE DETECTOR
		PEDESTRIAN PUSH BUTTON, SIGN (DIRECTIONAL ARROW AS SHOWN) AND SADDLE
	*	EMERGENCY PREEMPTION CONFIRMATION STROBE LIGHT
		VEHICULAR SIGNAL HEAD
		VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED
		FLASHING BEACON
		PEDESTRIAN SIGNAL HEAD, (TYPE AS NOTED OR AS SPECIFIED)
RRSG	RRSG	RAILROAD SIGNAL
OR		SIGNAL POST AND BASE (ALPHA-NUMERIC DESIGNATION NOTED)
	20'	MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)
		HIGH MAST POLE OR TOWER
		SIGN AND POST
		SIGN AND POST (2 POSTS)
	20'	MAST ARM WITH LUMINAIRE
		OPTICAL PRE-EMPTION DETECTOR
		CONTROL CABINET, GROUND MOUNTED
		CONTROL CABINET, POLE MOUNTED
		FLASHING BEACON CONTROL AND METER PEDESTAL
		LOAD CENTER ASSEMBLY
		PULL BOX 12"x12" (OR AS NOTED)
		ELECTRIC HANDHOLE 12"x24" (OR AS NOTED)
		TRAFFIC SIGNAL CONDUIT

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		PAVEMENT ARROW - WHITE
ONLY	ONLY	LEGEND "ONLY" - WHITE
	SL	STOP LINE - 12"
	CW	CROSSWALK
	SWL	SOLID WHITE LINE - 6"
	SYL	SOLID YELLOW LINE - 6"
	BWL	BROKEN WHITE LINE - 6" (10' LINE SEGMENT, 30' GAP)
	BYL	BROKEN YELLOW LINE - 6" (10' LINE SEGMENT, 30' GAP)
	DWL	DOTTED WHITE LINE - 6" (3' LINE SEGMENT, 9' GAP)
	DYL	DOTTED YELLOW LINE - 6" (3' LINE SEGMENT, 9' GAP)
	DWLEx	DOTTED WHITE LINE EXTENSION - 6" (2' LINE SEGMENT, 6' GAP)
	DWBLEx	DOTTED WHITE BICYCLE LINE EXTENSION - 6" (2' LINE SEGMENT, 2' GAP)
	DYLEx	DOTTED YELLOW LINE EXTENSION - 6" (2' LINE SEGMENT, 6' GAP)
	DBWL	DOUBLE WHITE LINE - 6"
	DBYL	DOUBLE YELLOW LINE - 6"
	SWGL	SOLID WHITE GORE LINE - 12"
	SYGL	SOLID YELLOW GORE LINE - 12"
	YL	YIELD LINE
		SLOTTED PAVEMENT MARKER TWO-WAY YELLOW/YELLOW

ABBREVIATIONS

GENERAL

AADT	ANNUAL AVERAGE DAILY TRAFFIC
ABAN	ABANDON
ADJ	ADJUST
APPROX.	APPROXIMATE
A.C.	ASPHALT CONCRETE
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE
BIT.	BITUMINOUS
BC	BOTTOM OF CURB
BD.	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCHMARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
BR.	BRIDGE
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CC	CEMENT CONCRETE
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CI	CURB INLET
CIP	CAST IRON PIPE
CLDI	CEMENT LINED DUCTILE IRON
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CSP	CORRUGATED STEEL PIPE
CO.	COUNTY
CONC	CONCRETE
CONT	CONTINUOUS
CONST	CONSTRUCTION
CR GR	CROWN GRADE
DHV	DESIGN HOURLY VOLUME
DI	DROP INLET
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DICL	DUCTILE IRON CEMENT-LINED
DW	STEADY DON'T WALK - PORTLAND ORANGE
DWY	DRIVEWAY
ELEV (or EL.)	ELEVATION
EMB	EMBANKMENT
EOP	EDGE OF PAVEMENT
EXIST (or EX)	EXISTING
EXC	EXCAVATION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FDN.	FOUNDATION
FLDSTN	FIELDSTONE
GAR	GARAGE
GD	GROUND
GG	GAS GATE
GI	GUTTER INLET
GIP	GALVANIZED IRON PIPE
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
HDW	HEADWALL
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HYD	HYDRANT
INV	INVERT
JCT	JUNCTION
L	LENGTH OF CURVE
LB	LEACH BASIN
LP	LIGHT POLE
LT	LEFT
MAX	MAXIMUM
MB	MAILBOX
MH	MANHOLE
MHB	MASSACHUSETTS HIGHWAY BOUND
MIN	MINIMUM
MRJ	MECHANICAL RESTRAINING JOINT
NIC	NOT IN CONTRACT
NO.	NUMBER
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
P.G.L.	PROFILE GRADE LINE
PI	POINT OF INTERSECTION
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE
PROJ	PROJECT
PROP	PROPOSED
PSB	PLANTABLE SOIL BORROW
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	2	327
PROJECT FILE NO.	604123		

LEGEND & ABBREVIATIONS

ABBREVIATIONS (cont.)

GENERAL

PVT	POINT OF VERTICAL TANGENCY
PVMT	PAVEMENT
PWW	PAVED WATER WAY
R	RADIUS OF CURVATURE
R&D	REMOVE AND DISPOSE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDWY	ROADWAY
REM	REMOVE
RET	RETAIN
RET WALL	RETAINING WALL
RMD	REMODEL
ROW	RIGHT OF WAY
RR	RAILROAD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RT	RIGHT
RTP	ROADWAY TREE PROTECTION
SB	STONE BOUND
SHLD	SHOULDER
SMH	SEWER MANHOLE
ST	STREET
STA	STATION
SSD	STOPPING SIGHT DISTANCE
SHLO	STATE HIGHWAY LAYOUT LINE
SW	SIDEWALK
T	TANGENT DISTANCE OF CURVE/TRUCK %
TAN	TANGENT
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SLOPE
TYP	TYPICAL
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
WCR	WHEEL CHAIR RAMP
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
X-SECT	CROSS SECTION

TRAFFIC SIGNAL ABBREVIATIONS

CAB	CABINET
CCVE	CLOSED CIRCUIT VIDEO EQUIPMENT
DW	STEADY UPRAISED HAND
FDW	FLASHING UPRAISED HAND
FR	FLASHING CIRCULAR RED
FRL	FLASHING RED LEFT ARROW
FRR	FLASHING RED RIGHT ARROW
FY	FLASHING CIRCULAR YELLOW
FYL	FLASHING YELLOW LEFT ARROW
FYR	FLASHING YELLOW RIGHT ARROW
G	STEADY CIRCULAR GREEN
GL	STEADY GREEN LEFT ARROW
GR	STEADY GREEN RIGHT ARROW
GSL	STEADY GREEN SLASH LEFT ARROW
GSR	STEADY GREEN SLASH RIGHT ARROW
GV	STEADY GREEN VERTICAL ARROW
OL	OVERLAP
PED	PEDESTRIAN
PTZ	PAN, TILT, ZOOM
R	STEADY CIRCULAR RED
RL	STEADY RED LEFT ARROW
RR	STEADY RED RIGHT ARROW
TR SIG	TRAFFIC SIGNAL
TSC	TRAFFIC SIGNAL CONDUIT
W	STEADY WALKING PERSON
Y	STEADY CIRCULAR YELLOW
YL	STEADY YELLOW LEFT ARROW

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GENERAL NOTES

1. THE LOCATION OF THE EXISTING UTILITIES ARE SHOWN APPROXIMATE AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES AND SUBSURFACE STRUCTURES. THE CONTRACTOR IS RESPONSIBLE FOR MAKING FIELD INVESTIGATIONS AND OBTAINING INFORMATION FROM UTILITY COMPANIES AND INDIVIDUALS TO PINPOINT THE LOCATION AND ELEVATION OF ALL SUBSURFACE UTILITIES AND STRUCTURES. DIG-SAFE : TELEPHONE 1-888-344-7233
2. ALL UTILITY POLES REQUIRING RELOCATION ARE TO BE RELOCATED BY OTHERS.
3. ALL SIDEWALKS WITHIN THE LIMITS OF FULL-DEPTH CONSTRUCTION ARE TO BE CEMENT CONCRETE UNLESS OTHERWISE NOTED.
4. MINIMUM CLEAR PATH ON THE SIDEWALKS SHALL BE 4'-0" EXCLUDING THE SURFACE OF THE CURB.
5. WHEELCHAIR RAMPS AND DRIVEWAYS SHALL CONFORM TO THE CURRENT MASSDOT STANDARDS.
6. TRANSITION GRANITE CURB AT PROJECT LIMITS TO MATCH EXISTING ELEVATIONS (PAVEMENT OR EXISTING CURB).
7. THE CONTRACTOR SHALL RETAIN ALL CURBS, FENCES, WALLS, TREES, SHRUBS, POSTS, LANDSCAPE FEATURES, AND OTHER MISCELLANEOUS ITEMS WITHIN ABUTTING PROPERTIES, UNLESS OTHERWISE NOTED. WHEN RETAINING THOSE ITEMS IS NOT PRACTICAL IN THE OPINION OF THE ENGINEER, THE CONTRACTOR SHALL REMOVE, STOCKPILE, PROTECT AND RESET THE ITEMS. THE CONTRACTOR SHALL REPLACE ITEMS DAMAGED DURING REMOVAL, STOCKPILING, OR RESETTING DUE TO NEGLIGENCE, CARELESSNESS, OR MISHANDLING WITH EQUIVALENT NEW ITEMS AT NO COST TO THE OWNER.
8. ALL TREES WITHIN THE SLOPE LIMIT SHALL BE RETAINED AND PROTECTED UNLESS OTHERWISE NOTED.
9. ALL TREES CALLED OUT TO BE RETAINED WITH ROADWAY TREE PROTECTION SHALL BE PROTECTED USING TREE PROTECTION - INDIVIDUAL AND TREE PROTECTION - TEMPORARY FENCE.
10. CONTRACTOR SHALL PROTECT ALL PROPERTY MARKERS OF ABUTTERS.
11. TREATMENT OF SLOPE AREAS SHALL BE REPLACED IN KIND UNLESS OTHERWISE NOTED.
12. THE EXISTING CONDITIONS SHOWN ON THIS BASEMAP ARE THE RESULT OF AN ON THE GROUND INSTRUMENT SURVEY PERFORMED BETWEEN 4/15/2014 AND 12/19/2014 BY GREEN INTERNATIONAL AFFILIATES, INC. (GREEN). ADDITIONAL GROUND SURVEY WAS PERFORMED BETWEEN 1/30/2017 AND 4/27/2017, AND BETWEEN 2/21/18 AND 2/23/18 BY GREEN TO SUPPLEMENT EXISTING GROUND SURVEY.
12. HORIZONTAL AND VERTICAL CONTROL WAS ESTABLISHED WITH STATIC GPS VECTORS ON 4/17/2014 BY GREEN (SEE GREEN FIELD BOOK NO. 290-138). HORIZONTAL DATUM IS BASED ON THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM, VERTICAL DATUM IS NAVD88 (COMPUTED USING GEOID12A). THE UNIT OF MEASUREMENTS IS US SURVEY FEET.
13. WETLANDS WERE DELINEATED BY GREEN 4/18/2014, 4/29/2014, 2/22/18, 8/12/2019, 8/13/2019 AND 8/14/2019 IN ACCORDANCE WITH THE MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION AND FIELD LOCATED BY GREEN ON MAY 2014 AND AUGUST 2019..
14. THE RIGHT OF WAY LINES SHOWN ON THIS PLAN ARE THE DIRECT RESULT OF AN INSTRUMENT SURVEY PERFORMED ON THE GROUND BY GREEN INTERNATIONAL AFFILIATES, INC. WITH AN ERROR OF CLOSURE LESS THAN 1:15,000, AND FROM PLANS AND DEEDS OF RECORD. PRIVATE PROPERTY LINES ARE COMPILED FROM DEEDS AND PLANS AND SHOULD BE CONSIDERED APPROXIMATE.
15. THE SAID PARCELS SHOWN HERE ARE SUBJECT TO RIGHTS AND EASEMENTS AS CONTAINED IN THE VARIOUS DEEDS OF RECORD DESCRIBING SAID PREMISES. THE LOCATIONS AND EXTENT OF SAID RIGHTS AND EASEMENTS ARE NOT THE SUBJECT OF THIS SURVEY.

UTILITY NOTES:

1. ALL UNDERGROUND UTILITIES AS SHOWN WERE COMPILED USING FIELD SURVEY INFORMATION AND AVAILABLE RECORD INFORMATION. THE LOCATION OF EXISTING PIPES OR OTHER UNDERGROUND STRUCTURES OR PROPERTY LINES ARE NOT WARRANTED TO BE EXACT, NOR IS IT WARRANTED THAT ALL UNDERGROUND PIPES OR STRUCTURES ARE SHOWN. THE CONTRACTOR SHALL CALL "DIG SAFE" (1-888-344-7233) 72 HOURS (EXCLUDING SATURDAYS, SUNDAYS AND HOLIDAYS) PRIOR TO ANY EXCAVATION TO OBTAIN ACCURATE UTILITY LOCATIONS.
2. RECORD UTILITY INFORMATION FROM THE VARIOUS UTILITY COMPANIES AND PUBLIC AGENCIES ARE APPROXIMATE ONLY AND ACTUAL LOCATIONS MUST BE DETERMINED IN THE FIELD.
3. THE COMPLETION AND ACCURACY OF LATERAL UTILITY SERVICES IS NOT GUARANTEED AND MUST BE VERIFIED BY THE CONTRACTOR IN THE FIELD.
4. ALL UTILITY COMPANIES, PUBLIC AND PRIVATE MUST BE NOTIFIED, INCLUDING THOSE IN CONTROL OF UTILITIES NOT SHOWN ON THIS PLAN, (SEE CHAPTER 370, ACTS OF 1963, MASSACHUSETTS) PRIOR TO DESIGNING, EXCAVATING, BLASTING, INSTALLING, BACKFILLING, GRADING, PAVEMENT RESTORING OR REPAVING.
5. SUBSURFACE UTILITY LOCATIONS HAVE BEEN PLOTTED TO MEET UTILITY QUALITY LEVEL "C" AS DESCRIBED IN ASCE STANDARD 38-02 AND SUMMARIZED ON THIS SHEET. THE UNDERGROUND UTILITIES ARE SHOWN IN APPROXIMATE LOCATIONS BASED ON ABOVE-GROUND FIELD OBSERVATION AND EXISTING RECORD INFORMATION RECEIVED FROM UTILITY STAKE-HOLDERS.
6. INVERTS SHOWN ON PLAN ARE NOT GUARANTEED TO BE ACCURATE. DUE TO THE LIMITATIONS OF FIELD OBSERVATION AND SURVEY TECHNIQUES THE INVERTS ARE SHOWN AS APPROXIMATE ONLY AND SHALL NOT BE WARRANTED TO BE CORRECT. ADDITIONAL FIELD INVESTIGATION IS NECESSARY WHERE ACCURATE MEASUREMENTS ARE REQUIRED FOR DESIGN OF CRITICAL AREAS.
7. THE EXISTING CONDITIONS PLAN IS TO BE USED FOR THE SPECIFIED PROJECT ONLY AND IS NOT WARRANTED TO BE COMPLETE FOR ANY OTHER FUTURE PROJECTS.

SUMMARY OF UTILITY MAPPING QUALITY LEVELS:

THE FOLLOWING IS A SUMMARY OF THE SURVEY MAPPING LEVELS FOR UTILITIES AS DESCRIBED IN ASCE STANDARD 38-02, "STANDARD GUIDELINE FOR THE DEPICTION OF EXISTING SUBSURFACE UTILITY DATA". THESE GUIDELINES ARE MORE FULLY DESCRIBED IN THE ASCE STANDARD.

UTILITY QUALITY LEVEL A:
PRECISE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES OBTAINED BY THE ACTUAL EXPOSURE (OR VERIFICATION OF PREVIOUSLY EXPOSED AND SURVEYED UTILITIES) AND SUBSEQUENT MEASUREMENT OF SUBSURFACE UTILITIES, USUALLY AT A SPECIFIC POINT. MINIMALLY INTRUSIVE EXCAVATION EQUIPMENT IS TYPICALLY USED TO MINIMIZE THE POTENTIAL FOR UTILITY DAMAGE. A PRECISE HORIZONTAL AND VERTICAL LOCATION, AS WELL AS OTHER UTILITY ATTRIBUTES, IS SHOWN ON PLAN DOCUMENTS. ACCURACY IS TYPICALLY SET TO 15-MM VERTICAL AND TO APPLICABLE HORIZONTAL SURVEY AND MAPPING ACCURACY AS DEFINED OR EXPECTED BY THE PROJECT OWNER.

UTILITY QUALITY LEVEL B:
INFORMATION OBTAINED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF SUBSURFACE UTILITIES. QUALITY LEVEL B DATA SHOULD BE REPRODUCIBLE BY SURFACE GEOPHYSICS AT ANY POINT OF THEIR DEPICTION. THIS INFORMATION IS SURVEYED TO APPLICABLE TOLERANCES DEFINED BY THE PROJECT AND REDUCED ONTO PLAN DOCUMENTS.

UTILITY QUALITY LEVEL C:
INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE-GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGMENT IN CORRELATING THIS INFORMATION TO QUALITY LEVEL D INFORMATION.

UTILITY QUALITY LEVEL D:
INFORMATION DERIVED FROM EXISTING RECORDS OR ORAL RECOLLECTIONS.

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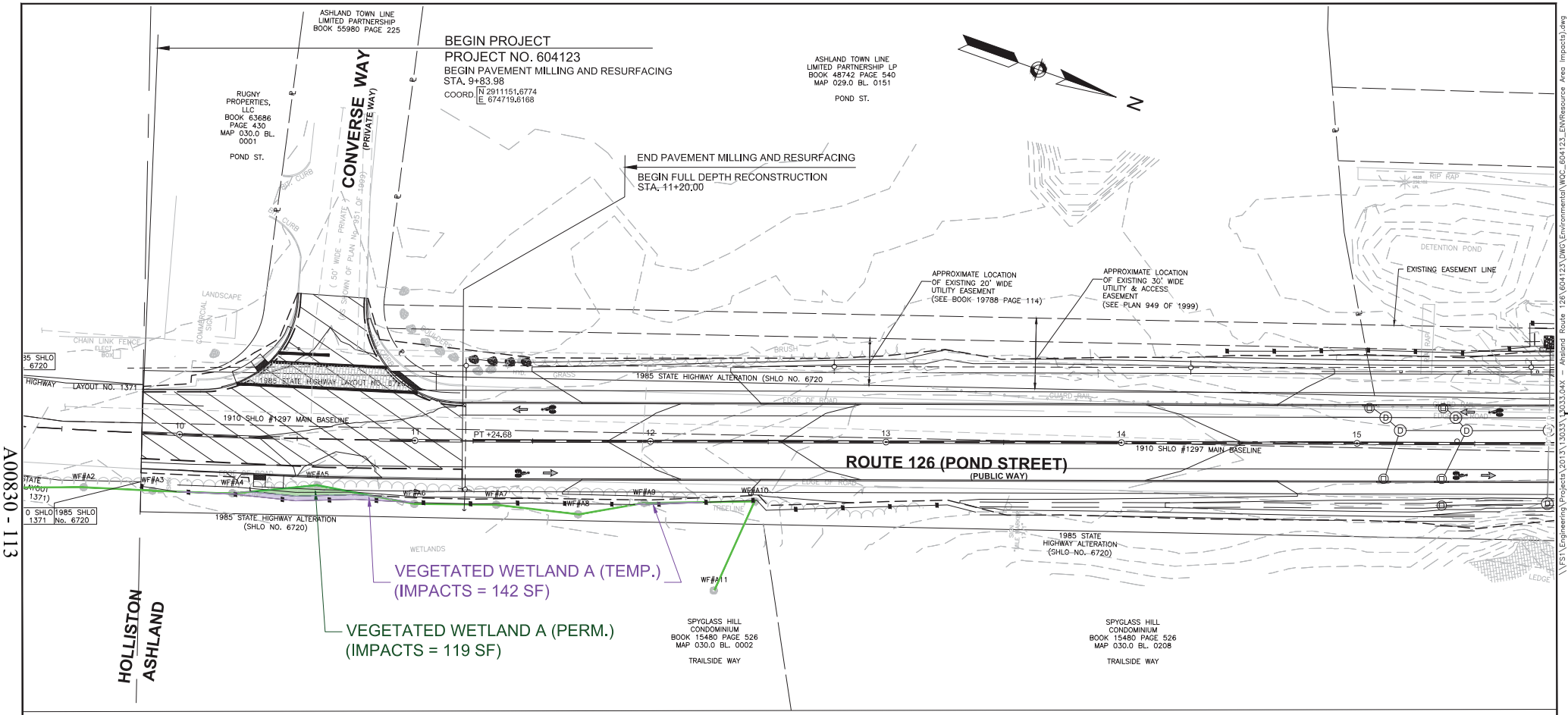
Proposal No. 604123-111717



LEGEND

- PERMANENT VEGETATED WETLAND IMPACT AREA
- TEMPORARY VEGETATED WETLAND IMPACT AREA
- VEGETATED WETLAND REPLICATION AREA
- VEGETATED WETLAND LINE
- INTERMITTENT STREAM BANK
- COMPOST FILTER TUBES

40 0 40 80

SCALE IN FEET
1" = 40'

TOTAL IMPACTS	
PERMANENT VEGETATED WETLAND IMPACT (SF)	3,686
TEMPORARY VEGETATED WETLAND IMPACT (SF)	2,730
VEGETATED WETLAND REPLICATION AREA (SF)	4,110

RESOURCE AREA IMPACTS

ASHLAND, MA
ROUTE 126 (POND STREET), MASSDOT PROJECT #604123
FROM HOLLISTON TOWN LINE TO FRAMINGHAM TOWN LINE

PREPARED BY:	PREPARED FOR:
GREEN INTERNATIONAL AFFILIATES, INC. CIVIL AND STRUCTURAL ENGINEERS 239 LITTLETON RD, WESTFORD, MA (978) 923-0400 24 ALBION RD, LINCOLN, RI (401) 305-7595	massDOT Massachusetts Department of Transportation Highway Division
SCALE: AS NOTED	PROJECT NO. 13033.04
DATE: 01/31/2020 REVISED:	DRAWN BY: OF CHECKED BY: DS

A00830 - 113
Proposal No. 604123-111717
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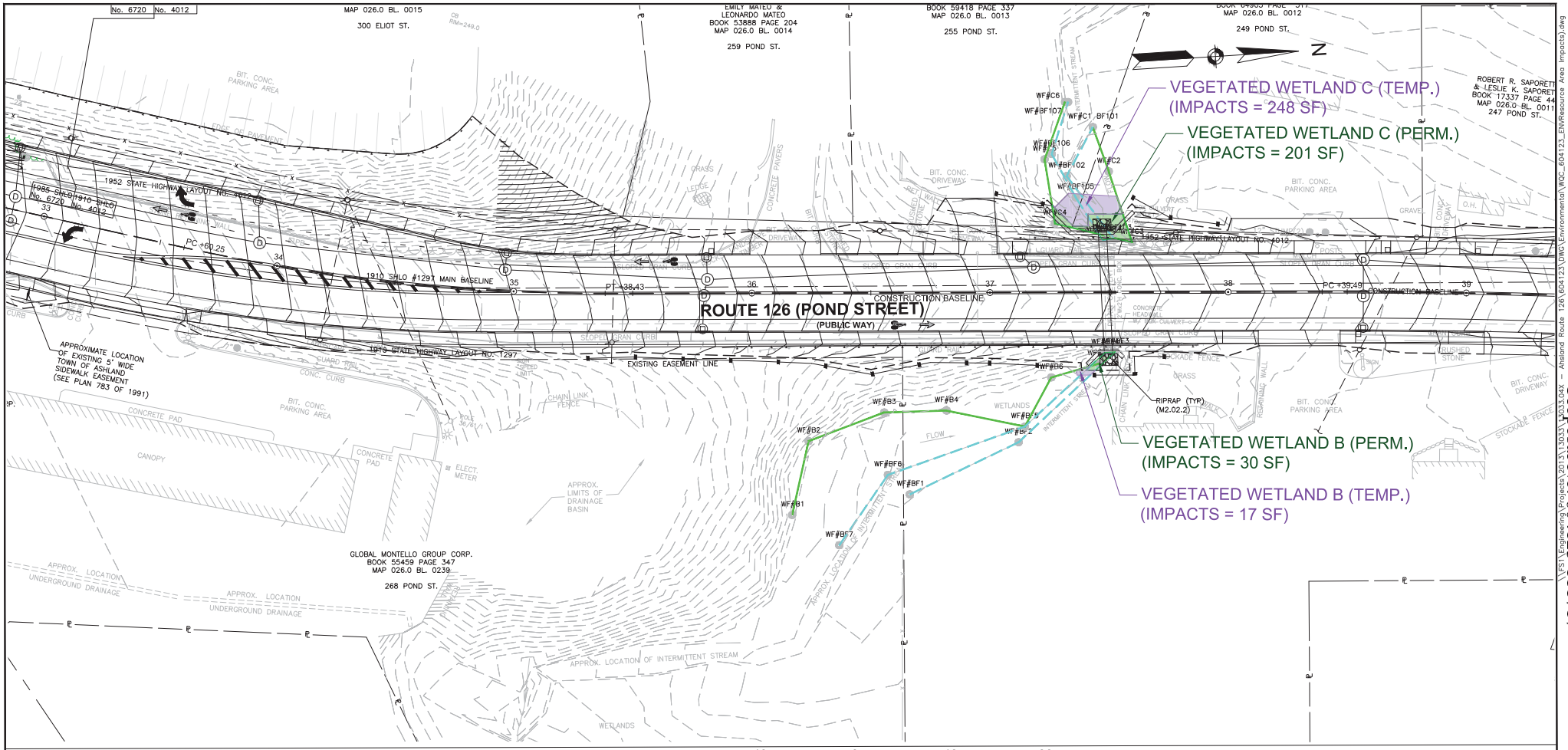

40 0 40 80

SCALE IN FEET
1" = 40'

LEGEND

- PERMANENT VEGETATED WETLAND IMPACT AREA
- TEMPORARY VEGETATED WETLAND IMPACT AREA
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- VEGETATED WETLAND LINE
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- COMPOST FILTER TUBES

RESOURCE AREA IMPACTS

ASHLAND, MA

ROUTE 126 (POND STREET), MASSDOT PROJECT #604123
FROM HOLLISTON TOWN LINE TO FRAMINGHAM TOWN LINE

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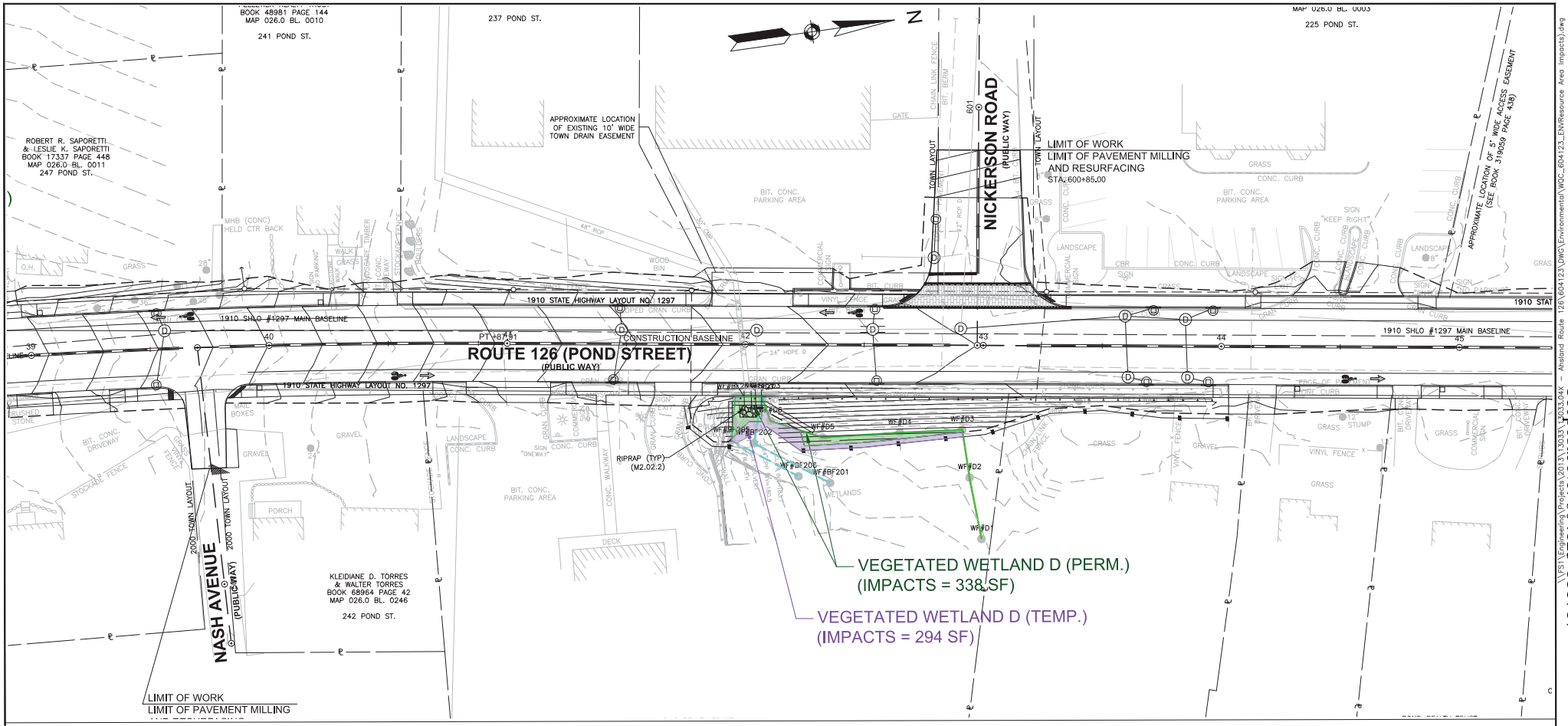
WQC/ACOE PLANS SHEET 5 OF 18

\\FS1\Engineering\Projects\2013\13033\13033.04X - Ashland Route 126\604123\DWG\Environmental\WQC_604123_ENVResource Area Impacts).dwg

Proposal No. 604123-111717



LEGEND

- PERMANENT VEGETATED WETLAND IMPACT AREA
- TEMPORARY VEGETATED WETLAND IMPACT AREA
- VEGETATED WETLAND REPLICATION AREA
- VEGETATED WETLAND LINE
- INTERMITTENT STREAM BANK
- COMPOST FILTER TUBES

40 0 40 80

SCALE IN FEET
1" = 40'

RESOURCE AREA IMPACTS

ASHLAND, MA
ROUTE 126 (POND STREET), MASSDOT PROJECT #604123
FROM HOLLISTON TOWN LINE TO FRAMINGHAM TOWN LINE

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WQC/ACOE PLANS SHEET 6 OF 18

Proposal No. 604123-111717
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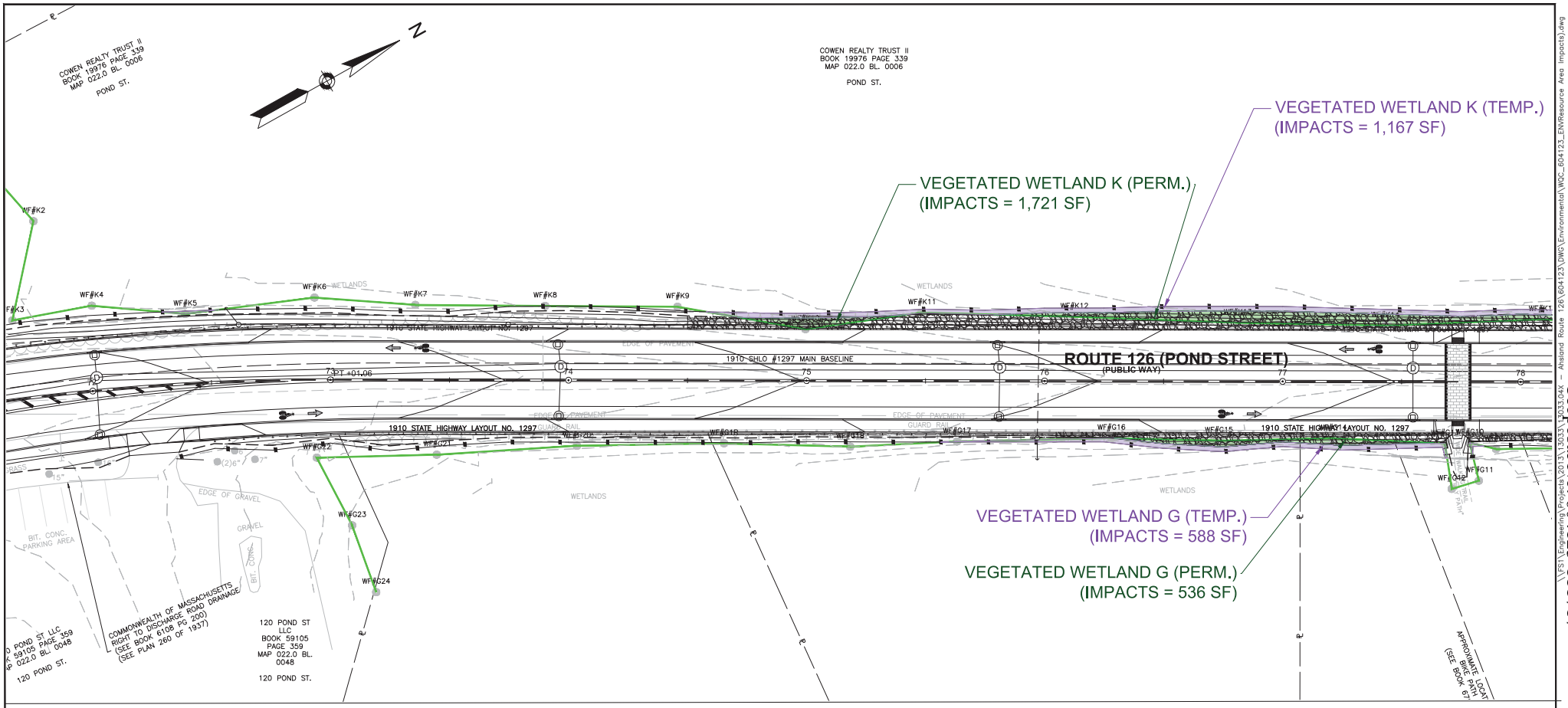

LEGEND

- PERMANENT VEGETATED WETLAND IMPACT AREA
- TEMPORARY VEGETATED WETLAND IMPACT AREA
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- INTERMITTENT STREAM BANK
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SCALE IN FEET
1" = 40'

RESOURCE AREA IMPACTS

ASHLAND, MA
ROUTE 126 (POND STREET), MASSDOT PROJECT #604123
FROM HOLLISTON TOWN LINE TO FRAMINGHAM TOWN LINE

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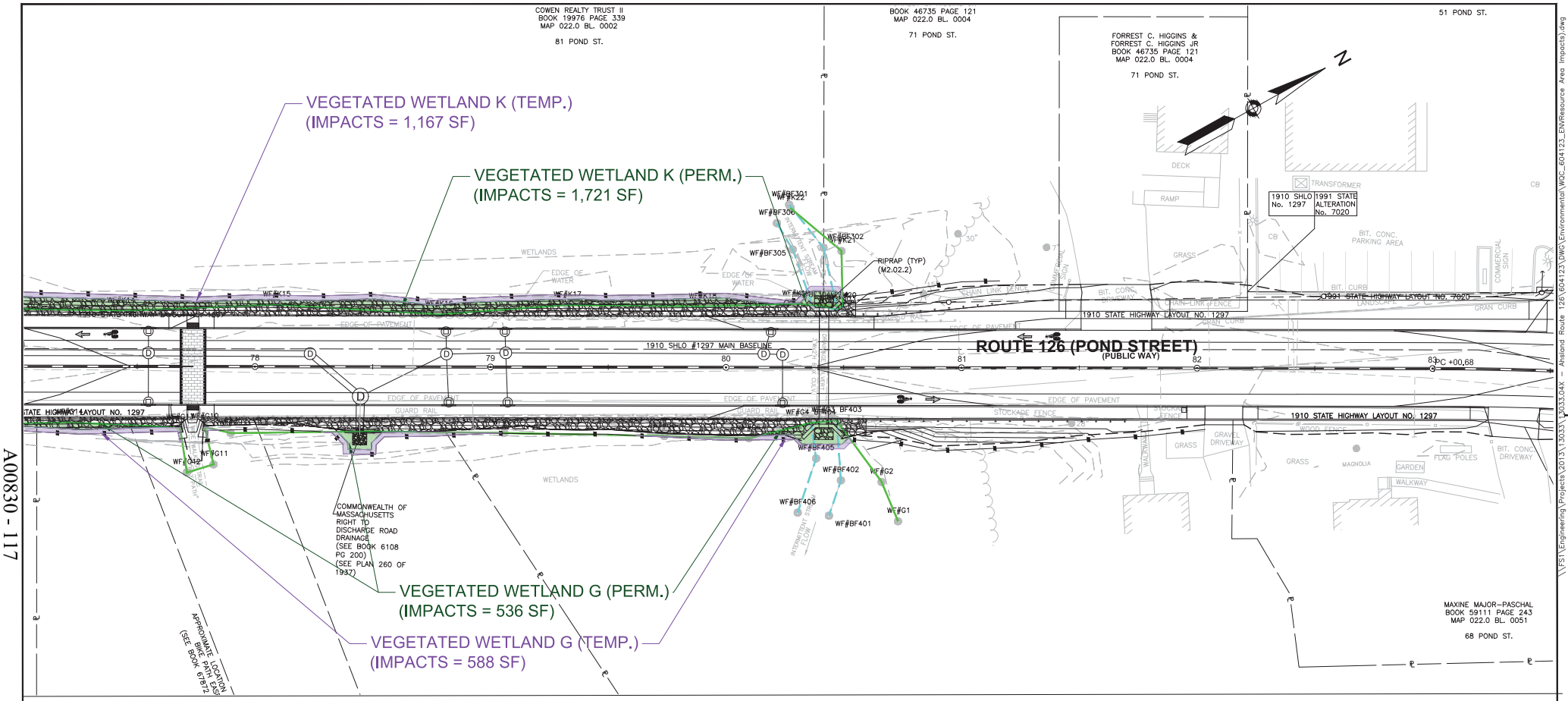
WQC/ACOE PLANS SHEET 7 OF 18

A00830 - 116

Proposal No. 604123-111717

\\FS1\Engineering Projects\2013\13033\13033.04\Ashland Route 126\604123\DWG\Environmental\WQC_604123_ENVResource Area Impacts).dwg



LEGEND

- PERMANENT VEGETATED WETLAND IMPACT AREA
- TEMPORARY VEGETATED WETLAND IMPACT AREA
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SCALE IN FEET
1" = 40'

RESOURCE AREA IMPACTS

ASHLAND, MA
ROUTE 126 (POND STREET), MASSDOT PROJECT #604123
FROM HOLLISTON TOWN LINE TO FRAMINGHAM TOWN LINE

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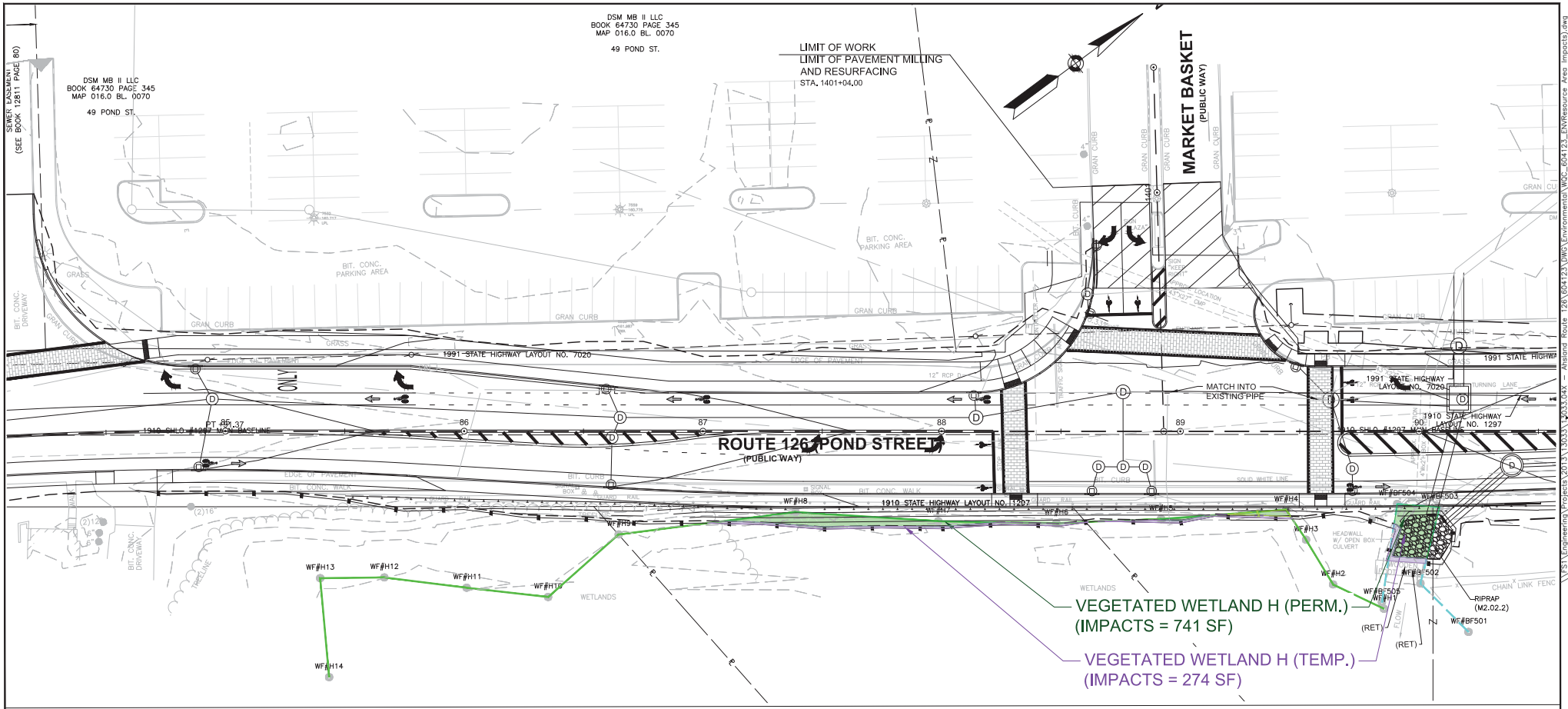
WQC/ACOE PLANS SHEET 8 OF 18

Proposal No. 604123-111717
\\FS1\Engineering\Projects\2013\13033\13033.04\Ashland Route 126\604123\DWG\Environmental\WQC_604123_ENVResource Area Impacts).dwg



LEGEND

- PERMANENT VEGETATED WETLAND IMPACT AREA
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SCALE IN FEET
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RESOURCE AREA IMPACTS

ASHLAND, MA
ROUTE 126 (POND STREET), MASSDOT PROJECT #604123
FROM HOLLISTON TOWN LINE TO FRAMINGHAM TOWN LINE

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WQC/ACOE PLANS SHEET 9 OF 18

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Proposal No. 604123-111717

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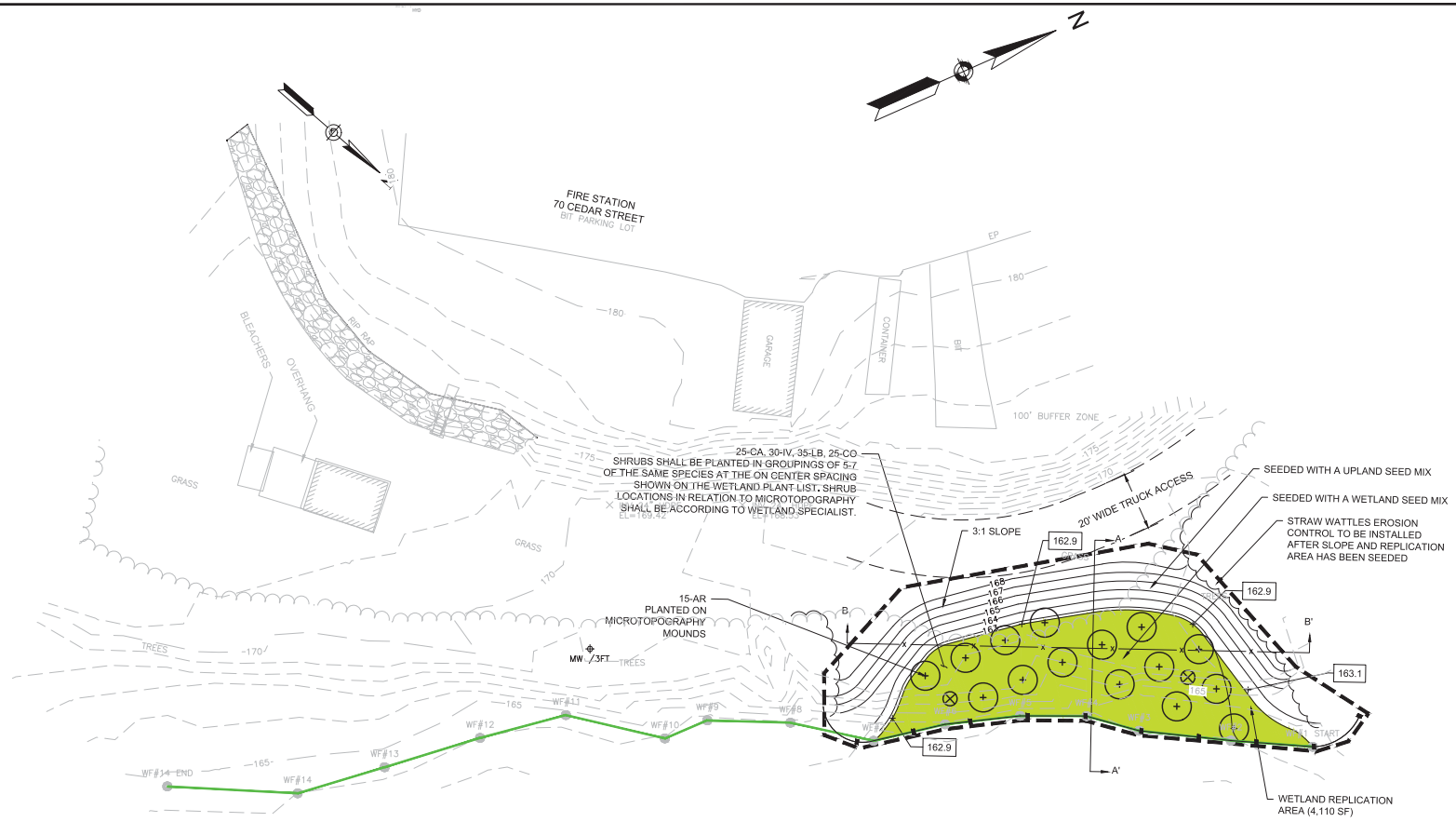

LEGEND

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- INTERMITTENT STREAM BANK
- COMPOST FILTER TUBES

40 0 40 80

SCALE IN FEET
1" = 40'

RESOURCE AREA IMPACTS

ASHLAND, MA
ROUTE 126 (POND STREET), MASSDOT PROJECT #604123
FROM HOLLISTON TOWN LINE TO FRAMINGHAM TOWN LINE

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WQC/ACOE PLANS SHEET 10 OF 18

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Proposal No. 604123-111717

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WETLAND REPLICATION AREA SEDIMENTATION AND EROSION CONTROL NOTES:

1. PRIOR TO STARTING ANY WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION & SEDIMENTATION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS IDENTIFIED IN ALL APPROVAL DOCUMENTS PERTAINING TO THIS PROJECT.
2. PERIODIC INSPECTION AND MAINTENANCE OF ALL SEDIMENT CONTROL STRUCTURES SHALL BE PROVIDED TO INSURE THAT THE INTENDED PURPOSE IS ACCOMPLISHED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SEDIMENT LEAVING THE LIMIT OF WORK. SEDIMENT CONTROL MEASURES SHALL BE IN WORKING CONDITION AT THE END OF EACH WORKING DAY.
3. ALL POINTS OF CONSTRUCTION INGRESS OR EGRESS WILL BE PROTECTED TO PREVENT TRACKING OF MUD ONTO PUBLIC WAYS.
4. AFTER ANY SIGNIFICANT RAINFALL, SEDIMENT CONTROL STRUCTURES SHALL BE INSPECTED FOR INTEGRITY. ANY DAMAGED DEVICES SHALL BE CORRECTED IMMEDIATELY.
5. ANY SEDIMENT TRACKED ONTO PAVED AREAS SHALL BE SWEPT AT THE END OF EACH WORKING DAY.
6. ALL DEBRIS GENERATED DURING SITE PREPARATION ACTIVITIES SHALL BE LEGALLY DISPOSED OF OFF-SITE.
7. AN EROSION CONTROL BARRIER SHALL BE INSTALLED AS SHOWN ON THE PLANS.
8. MEANS OF EROSION AND SEDIMENT PROTECTION AS NOTED ON THE DRAWINGS INDICATE THE MINIMUM PROVISIONS NECESSARY. ADDITIONAL MEANS OF PROTECTION SHALL BE PROVIDED BY THE CONTRACTOR AS REQUIRED FOR CONTINUED OR UNFORESEEN EROSION PROBLEMS, AT NO ADDITIONAL EXPENSE TO THE OWNER.

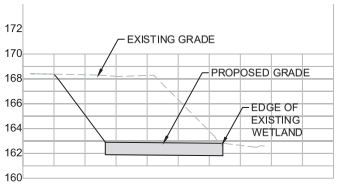
WETLAND REPLICATION AREA PLANTING NOTES AND CONSTRUCTION SEQUENCE:

1. CONTRACTOR SHALL COORDINATE WITH THE TOWN OF ASHLAND REGARDING ACCESS.
2. EROSION CONTROLS WILL BE INSTALLED ALONG THE EXISTING WETLAND BOUNDARY. THIS WILL ALLOW THE SITE CONTRACTOR TO PROPERLY TIE - IN PROPOSED CONTOURS AT THE EDGE OF THE EXISTING WETLAND.
3. UNDER THE DIRECTION OF THE WETLAND SPECIALIST, THE CONTRACTOR SHALL PROVIDE ROUGH GRADING (+/- 3 INCHES) WITHIN THE REPLICATION WETLAND. WETLAND MITIGATION GRADING IS SUBJECT TO MODIFICATION BASED ON ACTUAL SITE CONDITIONS. THE WETLAND SPECIALIST WILL INSPECT THE SUB-GRADE OF THE REPLICATION AREA TO ENSURE THAT THE PROPER HYDROLOGY AND MICROTOPOGRAPHY HAS BEEN ESTABLISHED.
4. PRIOR TO SOIL ADDITIONS AND/OR PLANTINGS, PROJECT SURVEYORS SHOULD VERIFY THAT GRADES HAVE BEEN ACHIEVED AS SHOWN ON THIS DRAWING.
5. PRIOR TO PLANTING, THE MITIGATION AREA SHOULD BE EXCAVATED APPROXIMATELY 1 FOOT BELOW THE FINISHED GRADE OF THE WETLAND MITIGATION AREA. FOLLOWING EXCAVATION OF THE MITIGATION AREA, A SOIL MIXTURE (NATURAL OR MANMADE) CONSISTING OF EQUAL VOLUMES OF ORGANIC (COMPOST) MATERIAL AND MINERAL SOIL MATERIAL SUCH AS A RICH LOAMY SAND (WITH A LOOSE FRIABLE CONSISTENCY) SHALL BE USED TO BRING THE EXCAVATED WETLAND MITIGATION AREA TO FINISHED GRADE. PRIOR TO USE, THE SOIL MIXTURE WILL BE ANALYZED BY A SOIL TESTING LABORATORY FOR TEXTURE AND NUTRIENTS. THE SELECTED CONTRACTOR WILL BE RESPONSIBLE FOR THIS COORDINATION. SEE SPECIAL PROVISION.
6. ESTIMATES OF SEASONAL HIGH GROUNDWATER (SHGW) SHALL BE DETERMINED IN THE FIELD AT THE TIME OF REPLICATION GRADING. THE FINISH GRADE OF THE WETLAND MITIGATION AREA SHALL BE SET SO THAT GROUNDWATER IS WITHIN 12" OF THE SURFACE FOR AT LEAST 14 CONSECUTIVE DAYS DURING THE GROWING SEASON.
7. PENDING SITE AND WEATHER CONDITIONS ALL PLANTINGS WILL TAKE PLACE IN SPRING (MAY 15-JUNE 15) OR FALL (SEPTEMBER 1 - NOVEMBER 1).
8. TREES PLANTED IN THE REPLICATION AREA SHALL BE LOCATED ON AREAS OF HIGHER ELEVATION (I.E., GRADED MOUNDS). TREES SHALL BE LOCATED IN THE FIELD BY THE WETLAND SPECIALIST.
9. 4" OF LOAM (WEED-FREE, FINE SANDY LOAM) AND A CONSERVATION/WILDLIFE SEED MIX WILL BE SPREAD THROUGHOUT THE GRADED 3:1 UPLAND SLOPES AND IN ALL OTHER AREAS DISTURBED BY THE CONTRACTOR AS SPECIFIED. LOAM, SEED MIXTURE AND SOURCE SHALL BE APPROVED BY THE WETLAND SPECIALIST.

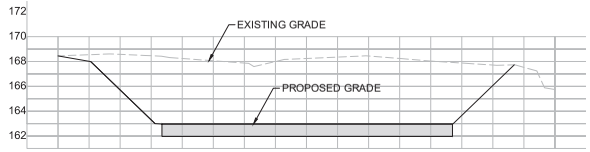
ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	189	327
PROJECT FILE NO.	604123		

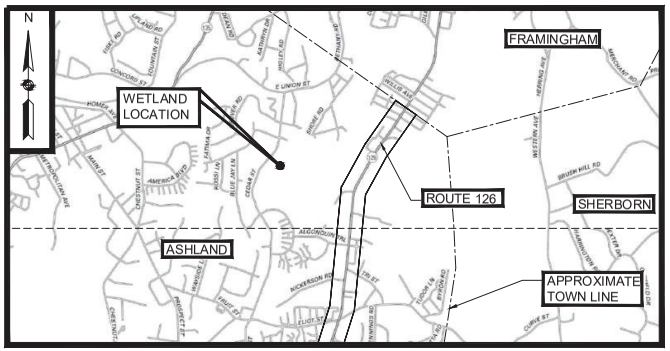
WETLAND REPLICATION PLAN
SHEET 1 OF 1



SECTION (A-A')
(HOR. SCALE 1"= 20' , VERT. SCALE 1"=5')



SECTION (B-B')
(HOR. SCALE 1"= 20' , VERT. SCALE 1"=5')



LOCUS PLAN

LEGEND

- 4" LOAM BORROW AND CONSERVATION SEED MIX IN ALL DISTURBED UPLAND AND SLOPED AREAS
- WETLAND SOIL AND WETLAND SEED MIX
- LIMIT OF WORK
- STRAW WATTLES
- 168 PROPOSED CONTOUR
- 170 EXISTING CONTOUR
- COMPOST FILTER TUBE
- 163.3 PROPOSED SPOT GRADE
- TREE

WQC/ACOE PLANS SHEET 11 OF 18

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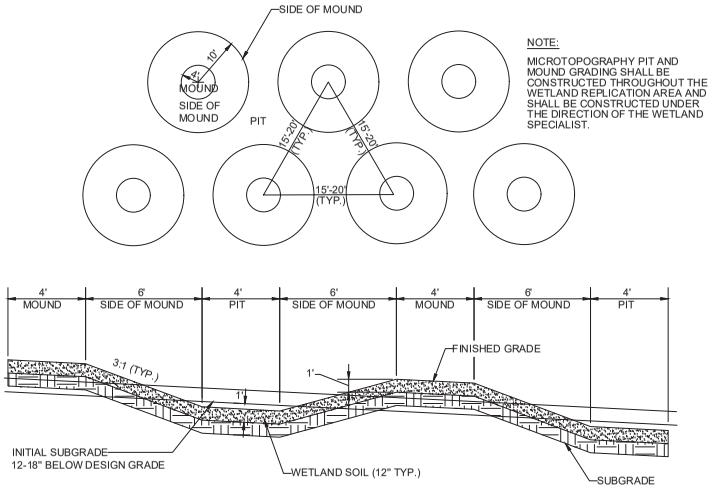
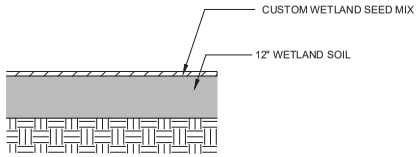
Proposal No. 604123-111717



1 WETLAND REPLICATION MICROTOPOGRAPHY
NOT TO SCALE

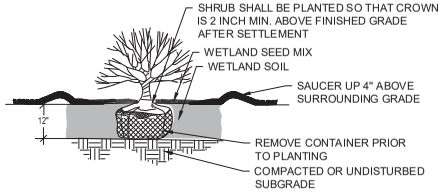


NOTES:
1. WETLAND SPECIALIST SHALL APPROVE GRADES PRIOR TO SOIL INSTALLATION.
2. SEE NON TIDAL WETLAND MITIGATION SPEC FOR SOIL AND PLANTING REQUIREMENTS.

3 WETLAND REPLICATION DETAIL
NOT TO SCALE

RAISE AND REPLANT ANY SHRUBS WHICH SETTLE MORE THAN 2 INCHES AFTER PLANTING & WATERING IN SHRUBS SHALL BE SET PLUMB

WATER BY FLOODING TWICE IN FIRST TWO HOURS AFTER PLANTING. WATER & MAINTAIN AS PER STANDARD SPECIFICATIONS

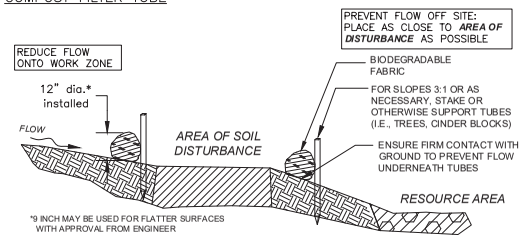


4 WETLAND SHRUB PLANTING
NOT TO SCALE

PLANT LIST - WETLAND REPLICATION TOTAL							
KEY	QTY	WETLAND STATUS	BOTANICAL NAME	COMMON NAME	PLANT TYPE	PLANT SIZE	DENSITY/SPACING
AR	15	FAC	ACER RUBRUM	RED MAPLE	TREE	4-6' HT	RANDOM AT RAISED MOUNDS
CA	25	FAC	CLETHRA ALNIFOLIA	SWEET PEPPERBUSH	SHRUB	3-4' HT	5-6' ON CENTER
CO	25	FACW	CORNUS AMOMUM	SILKY DOGWOOD	SHRUB	3-4' HT	5-6' ON CENTER
IV	30	FACW	ILEX VERTICILATA	COMMON WINTERBERRY	SHRUB	3-4' HT	5-6' ON CENTER
LB	35	FACW	LINDERA BENZOIN	SPICEBUSH	SHRUB	3-4' HT	5-6' ON CENTER
	-	-	-	WETLAND SEEED MIX	HERBACEOUS	-	1LB/2,000 SF
	-	-	-	UPLAND/BUFFER SEED MIX	HERBACEOUS	-	1LB/2,000 SF

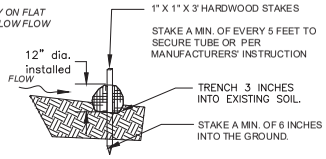
5 PLANT LIST WETLAND
NOT TO SCALE

COMPOST FILTER TUBE



12 INCH STRAW WATTLE

TO BE USED ONLY ON FLAT SURFACES WITH LOW FLOW



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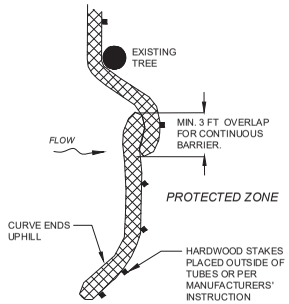


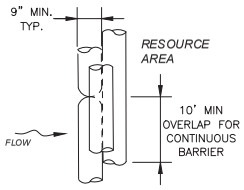
PLACE TUBE ALONG CONTOURS AND PERPENDICULAR TO FLOW.

ADJUST LOCATION AS REQUIRED FOR OPTIMUM EFFECTIVENESS. DO NOT INSTALL IN WATERWAYS.

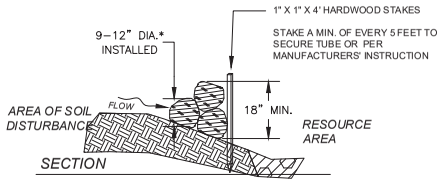
PLACE STAKES AS NEEDED TO SECURE TUBES IN PLACE.

PLAN VIEW

SEDIMENT CONTROL BARRIERS - COMPOST FILTER TUBE & STRAW WATTLES
NOT TO SCALE

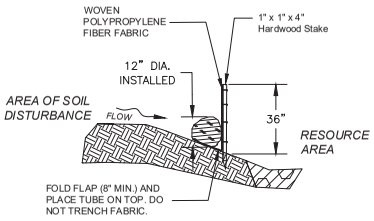


PLAN VIEW



SECTION

COMPOST FILTER TUBE BERM (SLOPES 2:1 OR STEEPER)
NOT TO SCALE



SECTION

COMPOST FILTER TUBE & SILT FENCE
NOT TO SCALE

2 SEDIMENT CONTROL BARRIERS - COMPOST FILTER TUBE & STRAW WATTLES
NOT TO SCALE

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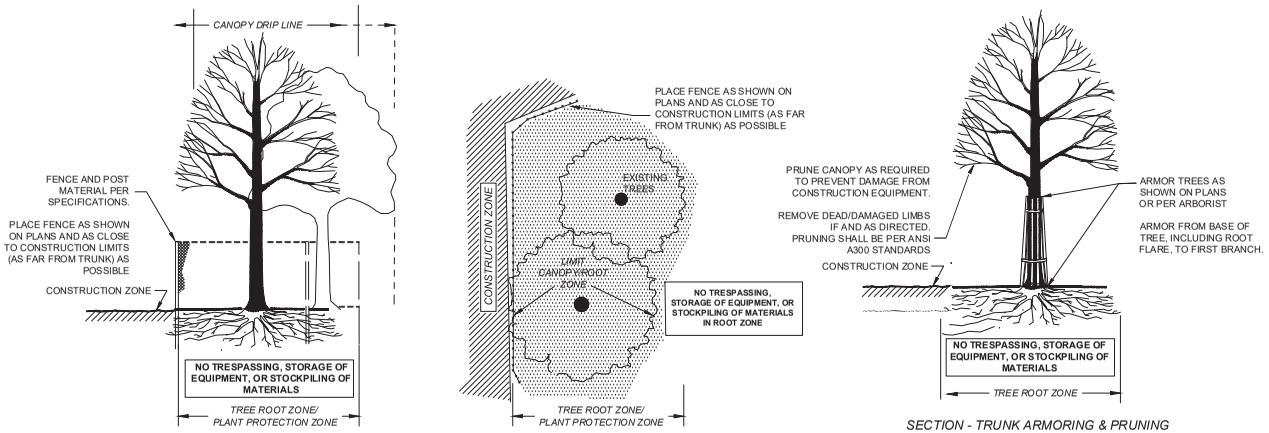
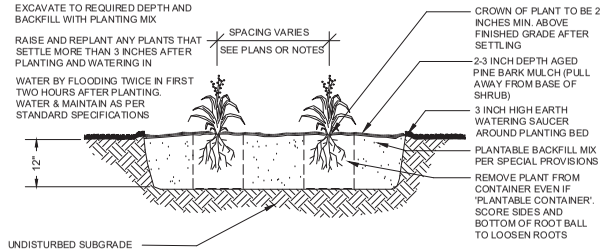
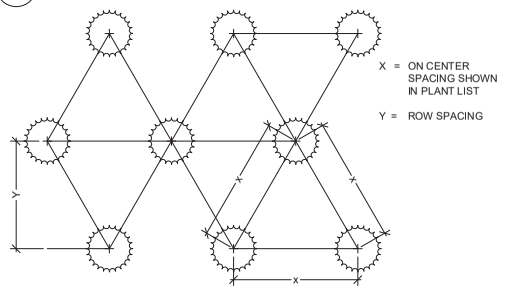
Proposal No. 604123-111717



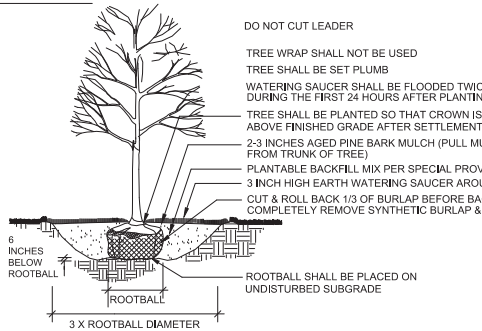
1 TREE PROTECTION DETAILS
NOT TO SCALE



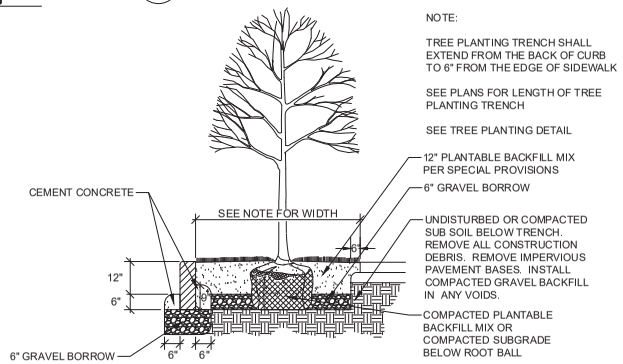
3 PERENNIAL AND ORNAMENTAL GRASS PLANTING
NOT TO SCALE



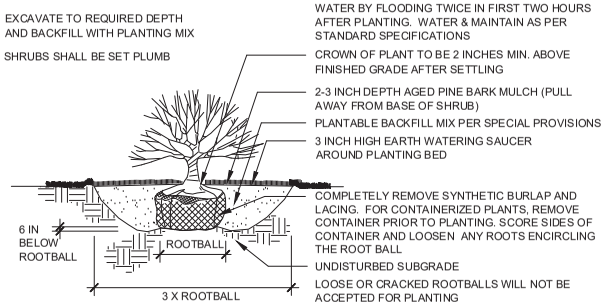
5 SHRUB, PERENNIAL AND ORNAMENTAL GRASS SPACING PLAN DETAIL
NOT TO SCALE



4 TREE PLANTING
NOT TO SCALE



6 TREE PLANTING TRENCH
NOT TO SCALE



2 SHRUB PLANTING
NOT TO SCALE

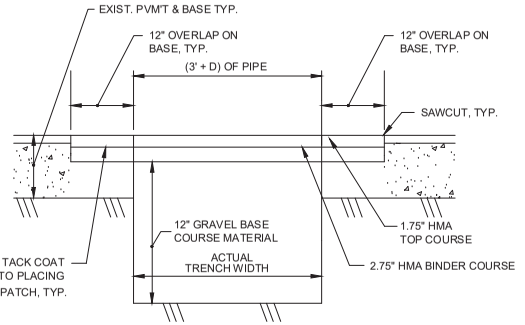
PLANT LIST - TOTAL FOR UPLAND

KEY	QTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS/ SPACING	ROOT
		DECIDUOUS TREES				
ARS	5	ACERXFREEDMANI 'ARMSTRONG'	ARMSTRONG FREEDMAN MAPLE	2-2.5" CAL.		B&B
ARK	2	ACER RUBRUM 'KARPICK'	KARPICK RED MAPLE	2-2.5" CAL.		B&B
BN	3	BETULA NIGRA	RIVER BIRCH	2-2.5" CAL.	SINGLE STEM	B&B
OV	3	OSTRYA VIRGINIANA	HOP HORNBEAM	2-2.5" CAL.	SINGLE STEM	B&B
CR	1	CORNUS 'RUTCAN' CONSTELLATION	CONSTELLATION DOGWOOD	1.5" CAL		CONT #15
GB	14	GINKGO BILOBA AUTUMN GOLD	AUTUMN GOLD GINKO	2-2.5" CAL.		B&B
GT	10	GLEDITSIA TRIACANTHOS 'SHADEMASTER'	SHADEMASTER HONEYLOCUST	2-2.5" CAL.		B&B
LSH	3	LIQUIDAMBAR STYRACIFLUA 'HAPDELL'	HAPPIDAZE FRUITLESS SWEET GUM	2-2.5" CAL.		B&B
MA	11	MALUS 'ADIRONDACK'	ADIRONDACK CRABAPPLE	2-2.5" CAL.		B&B
PC	9	PYRUS CALLERYANA ' CHANTICLEER'	CLEVELAND SELECT PEAR	2-2.5" CAL.		B&B
UAP	4	ULMNUS AMERICANA 'PRINCETON'	PRINCETON ELM	2-2.5" CAL.		B&B
		DECIDUOUS SHRUBS				
CP	33	COMPTONIA PEREGRINA	SWEETFERN	18-24" SP.	4' O.C.	CONT #3
RA	92	RHUS AROMATICA 'GRO-LOW'	GRO-LOW FRAGRANT SUMAC 2 GAL	18-24" SP.	3.5' O.C.	CONT #3
		EVERGREEN SHRUBS				
IC	4	ILEX CRENATA 'HETZII'	HETZ HOLLY	24-30" SP.	4' O.C.	CONT #5
JHB	18	JUNIPERUS HORIZONTALIS 'BAR HARBOR'	BAR HARBOR JUNIPER	18-24" SP.	3' O.C.	CONT #2
JHP	62	JUNIPERUS HORIZONTALIS PLUMOSA COMPACTA	COMPACT ANDORRA JUNIPER	18-24" SP.	3' O.C.	CONT #2
JSB	96	JUNIPEROUS SQUAMATA 'BLUE STAR'	BLUE STAR JUNIPER	12-18" SP.	18" O.C.	CONT #2
JSG	9	JUNIPERUS CHINESIS 'SEA GREEN'	SEA GREEN JUNIPER	2-2.5 FT	4' O.C.	CONT #5
		PERENNIALS AND GRASSES				
HH	48	HEMEROCALLIS HAPPY RETURNS	HAPPY RETURNS DAY LILLY	CONT #1	18" O.C.	
HP	90	HEMEROCALLIS PURPLE	PURPLE D'ORO DAY LILLY	CONT #1	18" O.C.	
HR	57	HEMEROCALLIS RED HOT RETURNS	RED HOT RETURNS DAY LILLY	CONT #1	18" O.C.	
NW	255	NEPETA RACEMOSA 'WALKERS LOW'	WALKERS LOW CAT MINT	CONT #1	18" O.C.	
PHM	131	PANICUM VIRGATUM 'HEAVY METAL'	HEAVY METAL SWITCH GRASS	CONT #2	18" O.C.	
PVS	71	PANICUM VIRGATUM 'SHENANDOAH'	SHENANDOAH SWITCH GRASS	CONT #2	18" O.C.	
PKR	124	PENNESETUM OREINTALE 'KARLY ROSE'	KARLEY ROSE FLOWERING FOUNTAIN GRASS	CONT #2	24" O.C.	

7 PLANT LIST TOTAL FOR PLAN
NOT TO SCALE

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	191	327
PROJECT FILE NO.	604123		

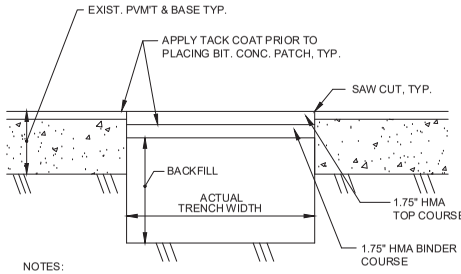
DRAINAGE & UTILITY DETAILS (1 OF 4)



NOTES:
1. PERMANENT PATCH IS TO BE USED ON SEWELL STREET.
2. MATCH EXISTING PAVEMENT ELEVATION.
3. PERMANENT HMA PATCH IS NOT REQUIRED WITHIN THE LIMITS OF FULL DEPTH RECONSTRUCTION, TEMPORARY HMA PATCH SHALL BE MAINTAINED UNTIL FULL DEPTH RECONSTRUCTION IS PERFORMED IN THESE AREAS.
4. PERMANENT PATCH TO BE PAID FOR UNDER ITEM 451.

1 PERMANENT HMA PATCH DETAIL

SCALE: NOT TO SCALE



NOTES:
1. PERMANENT HMA PATCH SHALL BE USED IN ALL AREAS THAT WILL BE MILLED & OVERLAID. PERMANENT HMA PATCH IS NOT REQUIRED WITHIN THE LIMITS OF FULL DEPTH RECONSTRUCTION, TEMPORARY HMA PATCH SHALL BE MAINTAINED UNTIL FULL DEPTH RECONSTRUCTION IS PERFORMED IN THESE AREAS.
2. TEMPORARY HMA PATCH IN AREAS THAT WILL BE SUBJECT TO FULL DEPTH CONSTRUCTION, IN-SITU MATERIAL MAY BE USED FOR BACKFILL.
3. PAVEMENT FOR TEMPORARY HMA PATCH SHALL BE PAID FOR UNDER ITEM 472.

2 TEMPORARY HMA PATCH DETAIL

SCALE: NOT TO SCALE

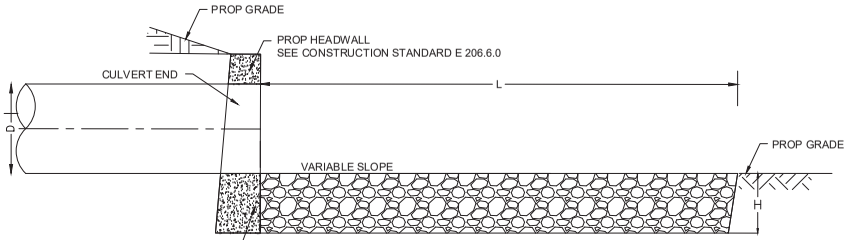
CULVERT SIZE D (INCHES)	LENGTH OF APRON L (FEET)	DEPTH OF APRON H (INCHES)	MASSDOT RIPRAP SIZE
30	12.5	24	M2.02.2
36	16	24	M2.02.2
42	21	30	M2.02.1
48	24	30	M2.02.1

SOURCE:

FHWA STANDARD DRAWING C251-50

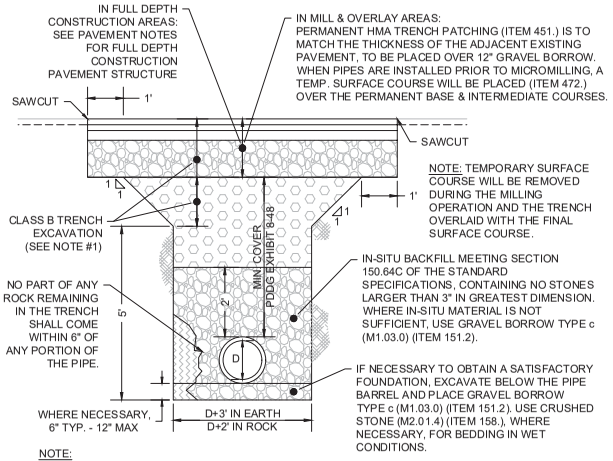
NOTES:

FOR PIPES 24" DIA. AND LESS, USE STONE PIPE ENDS MASSDOT STANDARD DETAIL E 206.7.0



RIPRAP APRON

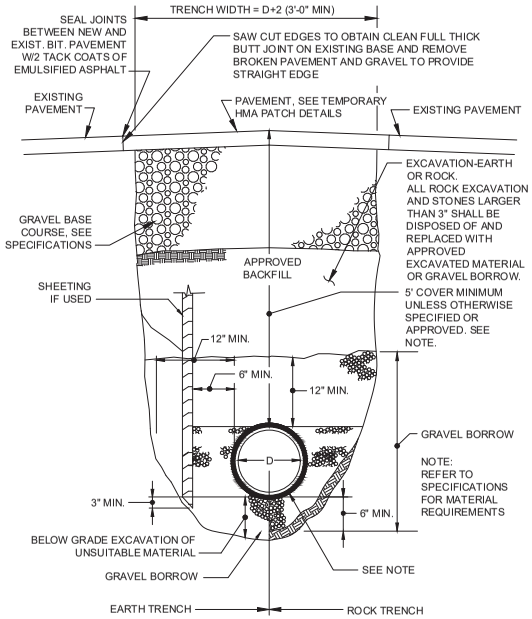
CROSS SECTION VIEW
NOT TO SCALE



NOTE:
1. CLASS B TRENCH EXCAVATION IS MEASURED FROM THE BOTTOM OF THE ROADWAY EXCAVATION OR EXISTING GROUND, WHICHEVER IS LOWER.
2. ALL BACKFILL IS TO BE PLACED AND COMPACTED IN 6" LAYERS.
3. REFER TO HMA PATCH DETAILS.
4. BACKFILL TRENCH TO A POINT 2' OVER THE PIPE USING NO STONES LARGER THAN 3" IN GREATEST DIMENSION.

3 TYPICAL TRENCH DRAIN DETAIL

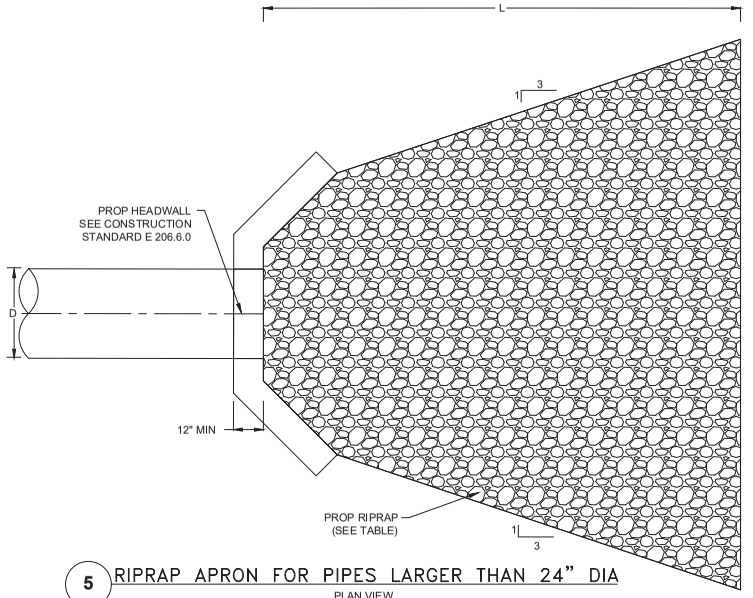
NOT TO SCALE



NOTE: FURNISH AND INSTALL CLOSED CELL GLASS INSULATION, 2" THICK FOAMGLASS ONE BY PITTSBURG CORNING OR EQUAL, WITH PITTWRAPP AA JACKETING BY PITTSBURG CORNING OR EQUAL WHEN WATER MAIN CANNOT BE INSTALLED AT OR BELOW THE REQUIRED BURIAL DEPTH OF FIVE (5) FEET

4 WATER TRENCH SECTION

NOT TO SCALE



5 RIPRAP APRON FOR PIPES LARGER THAN 24" DIA

PLAN VIEW
NOT TO SCALE

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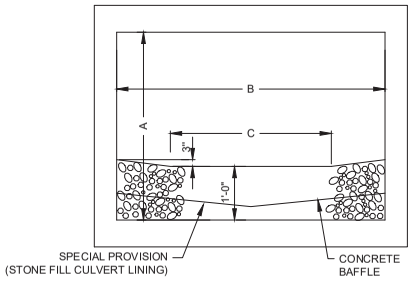
Proposal No. 604123-111717

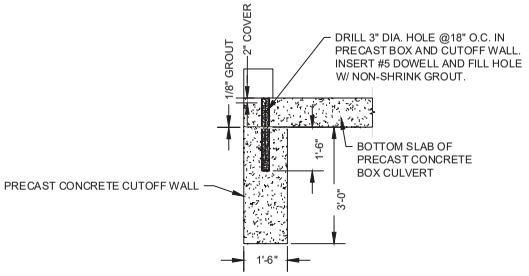


NOTES:
1. PAYMENT FOR BAFFLE WILL BE CONSIDERED INCIDENTAL IN THE COST OF THE PRECAST CULVERT.

11 CULVERT TYPICAL SECTION STA.37+50 & 80+40

NOT TO SCALE

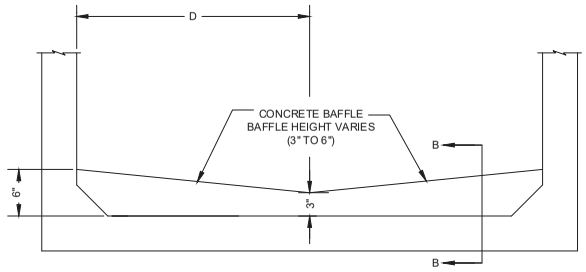
	DIMENSIONS (FT)			
	A	B	C	D
CULVERT 1 AT STA. 37+50	3	2	1	1
CULVERT 3 AT STA. 80+40	3	3	2	1.5



NOTES:
1. PAYMENT FOR CUTOFF WALL CONCRETE, REINFORCING STEEL, DOWEL AND NON-SHRINK GROUT SHALL BE INCLUDED IN THE COST OF THE PRECAST CULVERT.

12 CUTOFF WALL DETAIL

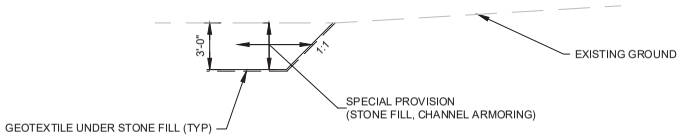
NOT TO SCALE



NOTES:
1.BAFFLES SHALL BE 6" DEEP (MAX).
2.BAFFLES TO BE PLACED EVERY 7' INCLUDING AT THE INLET AND OUTLET.

13 PRECAST CONCRETE BAFFLE DETAIL

NOT TO SCALE



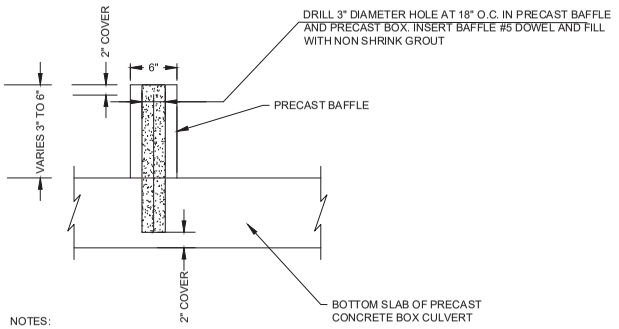
14 STREAM BED MATERIAL TRANSITION

NOT TO SCALE

STONE FILL GENERAL NOTES:
1. PRIOR TO PLACING MATERIALS, PREPARE SLOPE AS FOLLOWS:
   A. CUT OFF TREES AND EXISTING STUMPS TO GROUND LEVEL. LEAVE STUMPS & ROOTS BELOW GRADE IN PLACE.
   B. EXCAVATE VEGETATION (EXCEPT STUMPS) AND ORGANIC SOILS FROM SURFACE OF SLOPE.
   C. COMPACT SURFACE OF SLOPE (COMPACTION WITH EXCAVATOR BUCKET ACCEPTABLE).
   D. PLACE MATERIALS AS SHOWN ON THE DETAILS.
2. THE NATURAL STREAMBED MATERIAL SHALL CONSIST OF FIELD STONE OR NATURAL RIVER ROCK SIMILAR IN COLOR AND APPEARANCE TO IN-SITU NATIVE MATERIALS. CRUSHED STONE SHALL NOT BE PERMITTED. THE NATURAL STREAMBED MATERIAL SHALL APPROXIMATE THE FOLLOWING SIZE DISTRIBUTION; AMOUNT FINER THAN EACH LABORATORY SIEVE (SQUARE OPENINGS)(PERCENT BY WEIGHT):

SIEVE OPENING	PERCENT FINER
4-INCH	100%
3.5-INCH	85% - 95%
2.5-INCH	40% - 60%
1.25-INCH	25% - 35%
0.25-INCH	5% - 15%

3. THE CONTRACTOR SHALL INSTALL A 1' - 1'3" THICK LAYER OF STREAMBED MATERIAL WITHIN THE BOX, AS DEPICTED ON THE PLANS OR AS REQUIRED BY THE ENGINEER. THE MATERIAL SHALL BE INSTALLED DURING DEWATERED CONDITIONS AND IN ACCORDANCE WITH THE ENVIRONMENTAL PERMITS. MICROTOPOGRAPHY SHALL BE ESTABLISHED WITHIN THE CULVERT TO CREATE A LOW FLOW THALWEG THROUGHOUT THE STRUCTURE.



NOTES:
PAYMENT FOR BAFFLE AND #5 DOWEL WILL BE CONSIDERED INCIDENTAL IN THE COST OF THE PRECAST CULVERT.

15 SECTION B-B BAFFLE DETAIL

NOT TO SCALE

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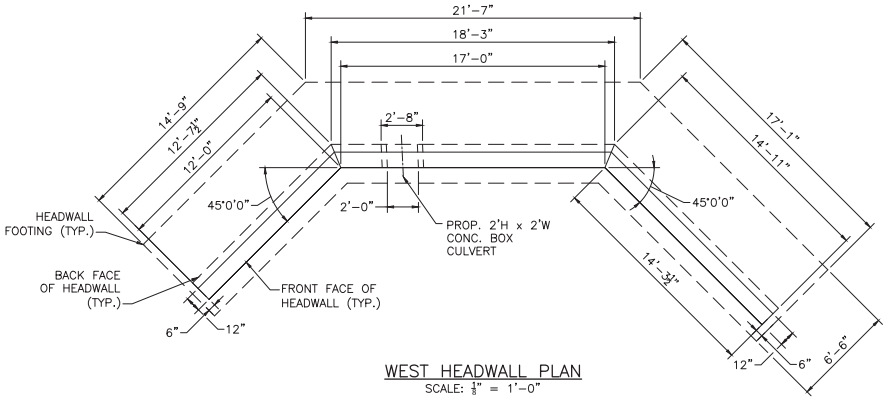
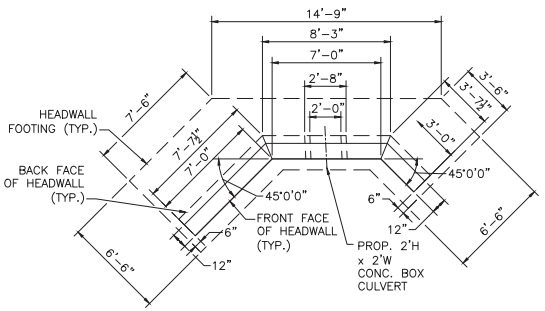
Proposal No. 604123-111717

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	210	327
PROJECT FILE NO.	604123		

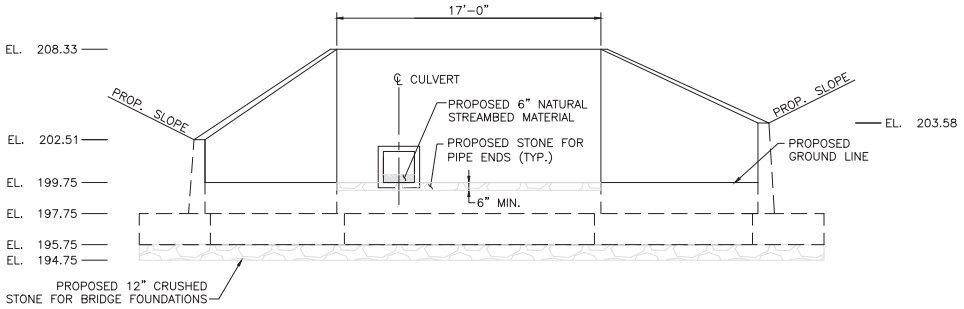
SPECIAL DRAINAGE STRUCTURE NO.1 DETAILS



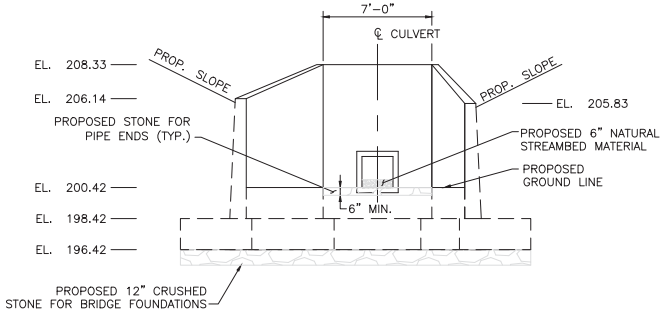
WEST HEADWALL PLAN
SCALE: ⅜" = 1'-0"



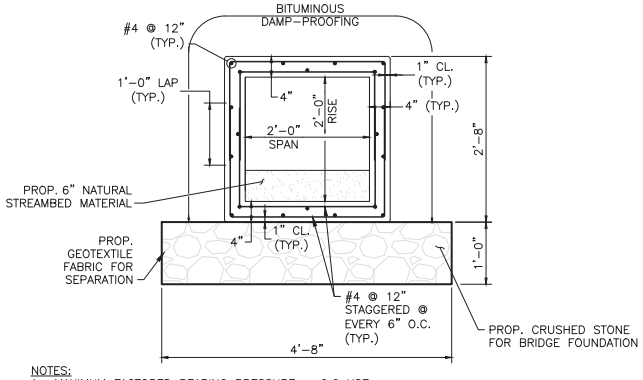
EAST HEADWALL PLAN
SCALE: ⅜" = 1'-0"



WEST HEADWALL ELEVATION
SCALE: ⅜" = 1'-0"



EAST HEADWALL ELEVATION
SCALE: ⅜" = 1'-0"



NOTES:
1. MAXIMUM FACTORED BEARING PRESSURE = 2.6 KSF.
2. TRANSVERSE REINFORCING SHALL BE PLACED NORMAL TO THE ℄ OF THE CULVERT.
3. PRECAST CONCRETE CULVERT TO BE 5000 PSI, ¾ INCH, 686 HP CEMENT CONCRETE.

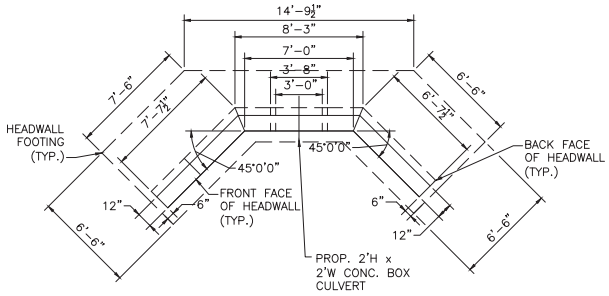
CULVERT REINFORCEMENT DETAIL
SCALE: ½" = 1'-0"

NOTES:

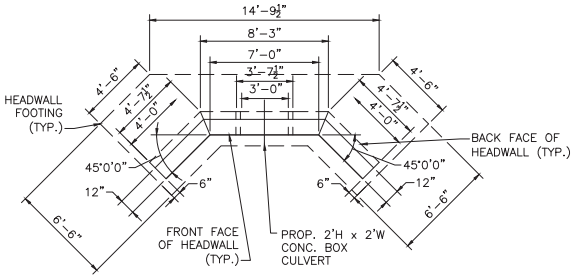
1. SEE SHEET 205 FOR GENERAL PLAN AND ELEVATION OF STRUCTURE.
2. SEE SHEET 214 FOR HEADWALL REINFORCEMENT DETAILS.

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	212	327
PROJECT FILE NO.		604123	

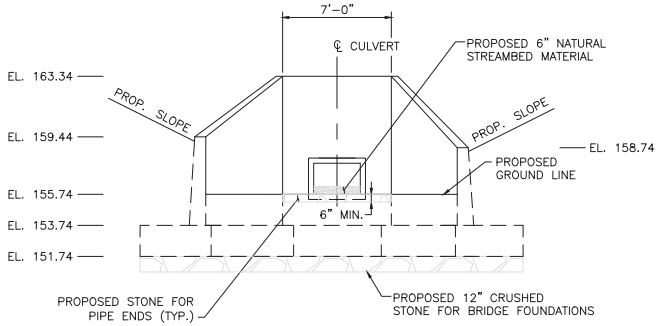
SPECIAL DRAINAGE STRUCTURE NO.3
DETAILS



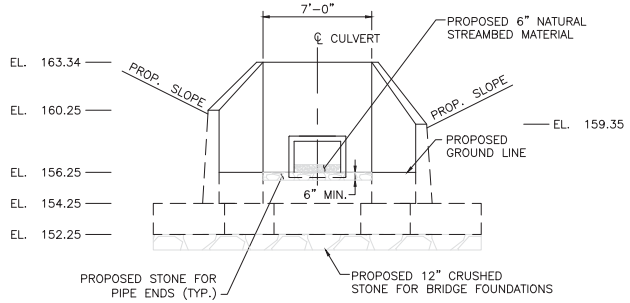
EAST CULVERT PLAN
SCALE: ⅛" = 1'-0"



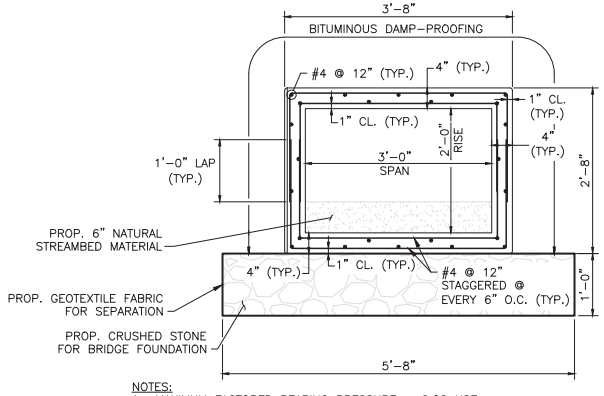
WEST CULVERT PLAN
SCALE: ½" = 1'-0"



EAST CULVERT ELEVATION
SCALE: ⅛" = 1'-0"



WEST CULVERT ELEVATION
SCALE: ½" = 1'-0"



NOTES:
1. MAXIMUM FACTORED BEARING PRESSURE = 2.02 KSF.
2. TRANSVERSE REINFORCING SHALL BE PLACED NORMAL TO THE ℄ OF THE CULVERT.
3. PRECAST CONCRETE CULVERT TO BE 5000 PSI, ¾ INCH, 686 HP CEMENT CONCRETE.

CULVERT REINFORCEMENT
SCALE: ½" = 1'-0"

NOTES:
1. SEE SHEET 207 FOR GENERAL PLAN AND ELEVATION OF STRUCTURE.
2. SEE SHEET 214 FOR HEADWALL REINFORCEMENT DETAILS.

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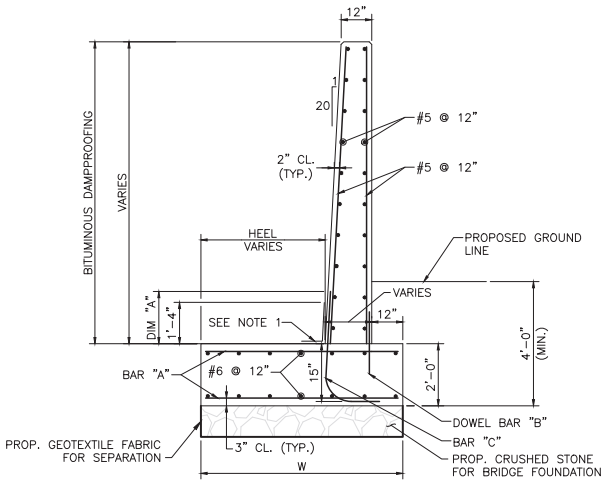
Proposal No. 604123-111717

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	214	327
PROJECT FILE NO.	604123		

HEADWALL & MISCELLANEOUS DETAILS

SUMMARY OF BEARING CAPACITIES			
WALL TYPE	MAXIMUM FACTORED BEARING PRESSURE (KSF)	CONTROLLING LOAD CASE	FACTORED BEARING RESISTANCE (KSF)
STA 37+50	2.14	STRENGTH I	4.1
STA 42+00	2.48	STRENGTH I	4.2
STA 80+40	1.97	STRENGTH I	4.7

HEADWALL DIMENSIONS AND REINFORCEMENT SUMMARY							
WALL TYPE	W	HEEL	BAR "A"	BAR "B"	BAR "B" LENGTH	BAR "C"	DIM "A"
STA 37+50	6'-6"	VARIES	#5 @ 12"	#5 @ 12"	2'-0"	#5 @ 12"	19"
STA 42+00	7'-0"	VARIES	#6 @ 12"	#6 @ 12"	2'-6"	#6 @ 12"	23"
STA 80+40	6'-6"	VARIES	#5 @ 12"	#5 @ 12"	2'-0"	#5 @ 12"	19"

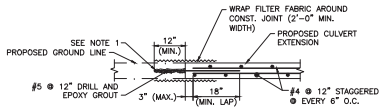


NOTES:

1. MEMBRANE WATERPROOFING AND 8"x16"x2", 4000 PSI, ¾ IN, 610 CEMENT CONCRETE BLOCKS LAID IN MORTAR OR OTHER WATERPROOFING PROTECTIVE COURSE, MIN. 2" THICK AS SPECIFIED IN MASSDOT STANDARD SPECIFICATIONS.
2. ALL CONCRETE SHALL BE 4000 PSI, 1½ IN, 565 CEMENT CONCRETE.
3. SEE TABLES BELOW FOR FACTORED BEARING PRESSURES AND FACTORED BEARING RESISTANCES FOR ALL WALL TYPES. FACTORED BEARING RESISTANCE IS THE PRODUCT OF THE NOMINAL BEARING RESISTANCE AND A RESISTANCE FACTOR OF 0.45.

TYPICAL HEADWALL SECTION

SCALE: 1" = 1'-0"

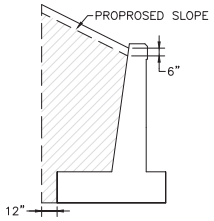


CONNECTION NOTES:

1. DOWEL IN #5 BARS AT 1'-0" MAX. SPACING HORIZONTALLY INTO CENTER OF WALL AND FILL HOLES WITH EPOXY GROUT.
2. ROUGHEN AND CLEAN EXISTING OR EXPOSED SURFACE AND COAT WITH TYPE A EPOXY BONDING COMPOUND IN ACCORDING WITH THE MANUFACTURER'S RECOMMENDATIONS.

TYPICAL CONNECTION DETAIL

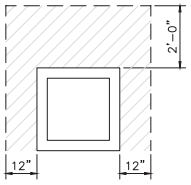
SCALE: ¾" = 1'-0"



NOTE:
HATCHED AREA INDICATES LIMITS OF GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES.

LIMITS OF GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES

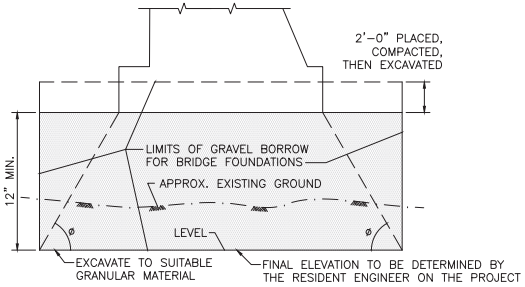
SCALE: 1" = 1'-0"



NOTE:
HATCHED AREA INDICATES LIMITS OF GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES.

LIMITS OF GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES

NOT TO SCALE



NOTES:

1. ø = 45° FOR DEPTH OF 5'-0" OR LESS.
   ø = 60° FOR DEPTH OVER 5'-0".
2. SAME TREATMENT IS TO BE USED AT ENDS OF WALLS.

LIMITS OF GRAVEL BORROW FOR BRIDGE FOUNDATIONS

NOT TO SCALE

A00830 - 127

Proposal No. 604123-111717

Attachment G – Cultural Resource Coordination

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, Secretary & CEO
Thomas Tinlin, Acting Administrator

MassDOT
Massachusetts Department of Transportation
Highway Division

September 20, 2017

RE: ASHLAND, MassDOT Project Number: 604123
Reconstruction on Rt. 126 (Pond St.) from Holliston Town Line to Framingham Town Line
Project Notification Form

Ms. Brona Simon
State Historic Preservation Officer
Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, MA 02125

Dear Ms. Simon:

Attached please find a Project Notification Form (PNF) for the above noted project. This project will be supported by federal funds but work in water will require a U.S. Army Corps of Engineers' permit. MassDOT is submitting the enclosed project information for your review in compliance with the Corps' permit requirements pertaining to Section 106 of the National Historic Preservation Act of 1966, as amended.

Please submit any written comments or concerns regarding properties of historical or cultural significance that may be affected by this project to Patricia A. Leavenworth, P.E., Chief Engineer, Massachusetts Department of Transportation, 10 Park Plaza, Boston, MA 02116-3973, Attn: Jeffrey Shrimpton. Please feel free to contact me (at 857-368-8826) if you have any questions regarding this project.

Sincerely,

M. Hafferty

Mary Hafferty
Historic Resources Specialist
Environmental Services

encs: PNF and attachments

Ten Park Plaza, Suite 4160, Boston, MA 02116
Tel: 617-973-7000, TDD: 617-973-7306
www.mass.gov/massdot

950 CMR: OFFICE OF THE SECRETARY OF THE COMMONWEALTH

RC.57584

RECEIVED

SEP 2 2 2017

MASS. HIST. COM.

APPENDIX A

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD
BOSTON, MASS. 02125
617-727-8470, FAX: 617-727-5128

PROJECT NOTIFICATION FORM

Project Name: Reconstruction on Route 126 (Pond Street) (MassDOT# 604123)

Location /Address: Pond Street from Holliston Town Line to the Framingham Town Line

City/Town: Ashland, MA

Project Proponent

Name: Massachusetts Department of Transportation

Address: 10 Park Plaza

City/Town/Zip/Telephone: Boston, MA 02116 / T: 617-973-7000

After review of MHC files and the materials you submitted, it has been determined that this project is unlikely to affect significant historic or archaeological resources.

10/10/17
Date

Empowered, Preservation Planner
Massachusetts Historical Commission

Agency license or funding for the project (list all licenses, permits, approvals, grants or other entitlements being sought from state and federal agencies).

Agency Name	Type of License or funding (specify)
Army Corps of Engineers	General permit, Section 404 of the Clean Water Act
Federal Highway Administration	Federal funding

Project Description (narrative):

This project will reconstruct the existing roadway (two lanes in each direction) to achieve uniform 11'-wide travel lanes, 5'-wide shoulders, and new 5'-wide sidewalks along both sides of the roadway. Selected segments of the sidewalks will be 10'-wide to accommodate a multi-use trail.

This project will incorporate a number of intersection improvements:

- The four-way intersection at Pond Street/Spyglass Hill Drive/Shaw's Driveway will have a new 130'-diameter roundabout installed in its center. New traffic medians and islands will be installed at the four intersection approaches to help channel traffic into the roundabout.
- The four-way intersection at Pond Street/Eliot Street will have new mast arm and steel post traffic signals installed, and the existing dedicated left-turn lanes will be retained. A new right-turn only lane will be installed for vehicles turning from Pond Street southbound onto Eliot Street.
- The intersections of Pond Street/Algonquin Trail and Pond Street/Harvard Street will be reconfigured into a four-way signalized intersection. The Algonquin Trail intersection approach will be relocated approximately 60' to the north to align it with the Pond Street/ Harvard Street intersection. Mast arm and street post traffic signals will be installed at the newly reconfigured intersection and new left-turn only lanes will be added to Pond Street to better access the side street approaches.
- Upgraded mast arm and steel post traffic signals will be installed at the Pond Street/Market Basket Driveway intersection.
- A new left-turn only lane will be added to Pond Street northbound and its intersection with James Road.
- Butterfield Drive's approach to Pond Street will be restriped, so it has left- and right-turn only lanes onto Pond Street.

All of the intersections listed above and the vast majority of the side street approach roadways will have new crosswalks installed as part of this project.

Related work within the project area will include: completing full-depth roadway reconstruction or cold planing and resurfacing; installing ADA compliant wheelchair ramps and bicycle ramps; building cemented stone masonry retaining walls in selected areas; removing and resetting highway guardrails and installing new guardrail as needed; installing drainage measures and upgrades to existing culverts; placing loam and seed and completing other landscape improvements; applying new pavement markings; and completing other incidental work as required. An Army Corps permit will be necessary to construct a 4,800 square foot wetlands replications area at the northeast corner of the Pond Street/Butterfield Drive intersection.

Does the project include demolition? If so, specify nature of demolition and describe the building(s) which are proposed for demolition.

n/a

Does the project include rehabilitation of any existing buildings? If so, specify nature of rehabilitation and describe the building(s) which are proposed for rehabilitation.

n/a

Does the project include new construction? If so, describe (attach plans and elevations if necessary).

n/a

To the best of your knowledge, are any historic or archaeological properties known to exist within the project's area of potential impact? If so, specify.

A review of the NRHP revealed no listed properties within or adjacent to the project area. A review of the Inventory of Historic and Archaeological Assets of the Commonwealth revealed three inventoried properties.
- Marconi's Restaurant (ASL.168), at 12 Pond Street, is a Contemporary Style restaurant that was constructed in 1956. The building has been altered with replacement windows and the permanent removal of sections of band windows; an intrusive handicap ramp that partially blocks the view of the façade; a remodeled façade entrance; and the loss of the original mid-century sign.
- The Reginald Rodman Janes House (ASL.169), at 19 Pond Street, is a simple 1.5-story tall, early-twentieth century vernacular house. It has a number of replacement windows and two additions.
- Harold C. Butterfield House (ASL.170), at 166 Pond Street, is a circa 1933 1.5-story tall vernacular cottage. The house is clad with synthetic siding and has replacement one-over-one sash windows.

A review of the archaeological base maps revealed two pre-contact archaeological sites within ½ mile of the project area: Step Rock Site (19-MD-873), which is located approximately 1,150' to the east of the Pond Street/Tufts Street intersection; and Fafard 1 Site (19-MD-703) and Fafard 2 Site (19-MD-704), which are located approximately 2,050' west of Pond Street/James Street intersection. The nearest historic archaeological sites, Workmen's Circle Camp (ASL.1), Bigelow-Cole Homestead (ASL.2), Bigelow's Mill, Dam, and Mill Pond (ASL.3), and Tin Can Factory (ASL.4), are located approximately 2,250' west of the Pond Street/Algonquin Trail intersection. An archaeological survey of the Workmen's Circle Area conducted in 1985 revealed two small, low-density sites (Fafard 1 and 2 Sites) and 10 isolated finds. All sites, both pre-contact and historic, were found to be extensively disturbed and no further testing was recommended. In 2002, an archaeological survey conducted in advance of the Pond Street Sewer Project revealed one pre-contact site (Step Rock Site). This site included one quartz flake and one rhyolite flake from plow zone

APPENDIX A (continued)

contexts mixed with a scatter of historic artifacts. No further survey was recommended. A site visit by MassDOT CRU staff on July 14, 2015 revealed that the area to be impacted by the proposed rotary consists of open, graded land. The proposed wetland replication area is a small graded area with secondary tree growth situated at the corner of Pond Street and Butterfield Drive. It is the opinion of the MassDOT Staff Archaeologist that little or no archaeological potential can be ascribed to the project area based on the results of past archaeological surveys in the immediate area, the limited scope of work and the effects of past roadway and drainage construction, grading and landscaping.

What is the total acreage of the project area?

			Productive Resources:		
Woodland	_____	acres			
Wetland	_____	acres	Agriculture	_____	acres
Floodplain	_____	acres	Forestry	_____	acres
Open Space	_____	acres	Mining/Extraction	_____	acres
Developed	_____	acres	Total Project Acreage	_____	acres

What is the acreage of the proposed new construction? _____ acres

What is the present land use of the project area?

Route 126 is developed with commercial businesses, retail shopping plazas, and a number of residences that are located adjacent to the roadway. There are also undeveloped wooded areas throughout the project area as well.

Please attach a copy of the section of the USGS quadrangle map which clearly marks the project location. This Project Notification Form has been submitted to the MHC in compliance with 950 CMR 71.00.

Signature of person submitting this form: M. Hafferty **Date:** 9/20/2019

Name: Mary Hafferty

Address: 10 Park Plaza

City/Town/Zip: Boston, MA 02116

Telephone: 857-368-8826

REGULATORY AUTHORITY

950 CMR 71.00: M.G.L. c. 9, §§ 26-27C as amended by St. 1988, c. 254.

CC:

Army Corps.



GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

Figure 1
Project Location
Route 126
Ashland, MA

From: Harwood, Jameson (DOT)
To: Robinson, David S (EEA)
Cc: Hafferty, Mary H. (DOT); Shrimpton, Jeffrey P. (DOT)
Subject: MassDOT Project #604123: Ashland Route 126 project notification
Date: Friday, December 13, 2019 8:49:03 AM
Attachments: Ashland -BUAR Highway Plans.pdf
Ashland Topo Map.pdf
Ashland -Tribal MHC Map.pdf
Ashland -Wetland Replication Area Photo.pdf
Ashland -Signed BUAR PNF & Cover Letter.pdf

David,

Please find attached the project notification package for the above referenced project. Please contact me if you have any questions.

Also, we are in the process of updating our notification cover letter. Some submittals may still list Patricia Leavenworth or David White as the contact for comments. All comments can be submitted directly to me at my email or by mail.

Thanks!
Jamie

Jameson M. Harwood – MassDOT Archaeologist
Archaeology / Contracts
MassDOT Environmental
10 Park Plaza – Room 4260
Boston, MA 02116
857-368-8799

The COMMONWEALTH OF MASSACHUSETTS
BOARD OF UNDERWATER ARCHAEOLOGICAL RESOURCES
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS
251 Causeway Street, Suite 800, Boston, MA 02114-2136
Tel. (617) 626-1014 Fax (617) 626-1240
www.mass.gov/orgs/board-of-underwater-archaeological-resources

December 31, 2019

David White
Acting Director
Environmental Services
Massachusetts Department of Transportation
10 Park Plaza
Boston, MA 02116
Attn: Jameson Harwood

RE: MassDOT Project #604123, Reconstruction on Rt. 126 (Pond St) from Holliston Town Line to Framingham Town Line, Ashland, MA

Dear Mr. White,

The staff of the Massachusetts Board of Underwater Archaeological Resources has reviewed the above-referenced project's Massachusetts Historical Commission (MHC) Project Notification Form (PNF) and accompanying maps, plans, and photographs. We offer the following comments.

The Board has conducted a preliminary review of its files, the MHC's MACRIS archaeological site inventory geospatial database, and secondary literature sources to identify known and potential submerged cultural resources in the proposed project area. No record of any underwater archaeological resources was found. Based on the results of this review and the PNF-described results of past archaeological surveys and the limited nature of the reconstruction project's impacts to within disturbed areas of past roadway and drainage construction, grading and landscaping, the Board expects that this project is unlikely to impact submerged cultural resources.

Should heretofore-unknown submerged cultural resources be encountered during the course of the project, the Board expects that the project's sponsor will take steps to limit adverse effects and notify the Board and the Massachusetts Historical Commission, as well as other appropriate agencies, immediately, in accordance with the Board's *Policy Guidance for the Discovery of Unanticipated Archaeological Resources*.

The Board appreciates the opportunity to provide these comments as part of the review process. Should you have any questions regarding this letter, please do not hesitate to contact me at the address above, by email at david.s.robinson@mass.gov, or by telephone at (617) 626-1014.

Sincerely,

David S. Robinson
Director

/dsr

Printed on Recycled Paper

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, MassDOT Secretary & CEO

massDOT
Massachusetts Department of Transportation

September 20, 2017

Ms. Ramona Peters
Tribal Historic Preservation Officer
Mashpee Wampanoag Tribe
483 Great Neck Road South
Mashpee, MA 02649

RE: ASHLAND, MassDOT Project Number: 604123
Reconstruction on Rt. 126 (Pond St.) from Holliston Town Line to Framingham Town Line
Project Notification Form

Dear Ms. Peters:

The enclosed project notification package has been submitted in accordance with the following:

- The U.S. Army Corps of Engineers consultation requirements

- The 2015 Memorandum of Understanding among FHWA, the Mashpee Wampanoag Tribe, and MassDOT regarding the initiation of consultation under Section 106

MassDOT requests that the Mashpee Wampanoag Tribal Historic Preservation Officer (THPO) review the enclosed materials at the THPO's earliest convenience and solicits any comments that the THPO wishes to make regarding this project. Written comments should be submitted to: David White, Acting Director, Environmental Services, Massachusetts Department of Transportation, 10 Park Plaza, Room 4260, Boston, MA 02116, Attn: Jameson Harwood.

If you have any questions concerning the project information, please feel free to contact Jameson Harwood at (857.368.8799).

Sincerely,

M. O'Hafferty

Mary Hafferty
Historic Resources Specialist
Environmental Services

Attachments: PNF/Project Plans/Locus Map/MACRIS map

Ten Park Plaza, Suite 4160, Boston, MA 02116
Tel: 857-368-4636, TTY: 857-368-0655
www.mass.gov/massdot

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APPENDIX A
MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD
BOSTON, MASS. 02125
617-727-8470, FAX: 617-727-5128

PROJECT NOTIFICATION FORM

Project Name: Reconstruction on Route 126 (Pond Street) (MassDOT# 604123)

Location /Address: Pond Street from Holliston Town Line to the Framingham Town Line

City/Town: Ashland, MA

Project Proponent

Name: Massachusetts Department of Transportation

Address: 10 Park Plaza

City/Town/Zip/Telephone: Boston, MA 02116 / T: 617-973-7000

Agency license or funding for the project (list all licenses, permits, approvals, grants or other entitlements being sought from state and federal agencies).

Agency Name	Type of License or funding (specify)
Army Corps of Engineers	General permit, Section 404 of the Clean Water Act
Federal Highway Administration	Federal funding

Project Description (narrative):

This project will reconstruct the existing roadway (two lanes in each direction) to achieve uniform 11'-wide travel lanes, 5'-wide shoulders, and new 5'-wide sidewalks along both sides of the roadway. Selected segments of the sidewalks will be 10'-wide to accommodate a multi-use trail.

This project will incorporate a number of intersection improvements:

- The four-way intersection at Pond Street/Spyglass Hill Drive/Shaw's Driveway will have a new 130'-diameter roundabout installed in its center. New traffic medians and islands will be installed at the four intersection approaches to help channel traffic into the roundabout.
- The four-way intersection at Pond Street/Eliot Street will have new mast arm and steel post traffic signals installed, and the existing dedicated left-turn lanes will be retained. A new right-turn only lane will be installed for vehicles turning from Pond Street southbound onto Eliot Street.
- The intersections of Pond Street/Algonquin Trail and Pond Street/Harvard Street will be reconfigured into a four-way signalized intersection. The Algonquin Trail intersection approach will be relocated approximately 60' to the north to align to align with the Pond Street/ Harvard Street intersection. Mast arm and street post traffic signals will be installed at the newly reconfigured intersection and new left-turn only lanes will be added to Pond Street to better access the side street approaches.
- Upgraded mast arm and steel post traffic signals will be installed at the Pond Street/Market Basket Driveway intersection.
- A new left-turn only lane will be added to Pond Street northbound and its intersection with James Road.
- Butterfield Drive's approach to Pond Street will be restriped, so it has left- and right-turn only lanes onto Pond Street.

All of the intersections listed above and the vast majority of the side street approach roadways will have new crosswalks installed as part of this project.

Related work within the project area will include the following construction activities: completing full-depth roadway reconstruction or cold planing and resurfacing; installing ADA compliant wheelchair ramps and bicycle ramps; building cemented stone masonry retaining walls in selected areas; removing and resetting highway guardrails and installing new guardrail as needed; installing drainage measures and upgrades to existing culverts; placing loam and seed and completing other landscape improvements; applying new pavement markings; and completing other incidental work as required. An Army Corps permit will be necessary to construct a 4,800 square foot wetlands replications area at the northeast corner of the Pond Street/Butterfield Drive intersection.

Does the project include demolition? If so, specify nature of demolition and describe the building(s) which are proposed for demolition.

n/a

Does the project include rehabilitation of any existing buildings? If so, specify nature of rehabilitation and describe the building(s) which are proposed for rehabilitation.

n/a

Does the project include new construction? If so, describe (attach plans and elevations if necessary).

n/a

To the best of your knowledge, are any historic or archaeological properties known to exist within the project's area of potential impact? If so, specify.

A review of the archaeological base maps revealed two pre-contact archaeological sites within ½ mile of the project area: Step Rock Site (19-MD-873), which is located approximately 1,150' to the east of the Pond Street/Tufts Street intersection; and Fafard 1 Site (19-MD-703) and Fafard 2 Site (19-MD-704), which are located approximately 2,050' west of Pond Street/James Street intersection. The nearest historic archaeological sites, Workmen's Circle Camp (ASL.1), Bigelow-Cole Homestead (ASL.2), Bigelow's Mill, Dam, and Mill Pond (ASL.3), and Tin Can Factory (ASL.4), are located approximately 2,250' west of the Pond Street/Algonquin Trail intersection. An archaeological survey of the Workmen's Circle Area conducted in 1985 revealed two small, low-density sites (Fafard 1 and 2 Sites) and 10 isolated finds. All sites, both pre-contact and historic, were found to be extensively disturbed and no further testing was recommended. In 2002, an archaeological survey conducted in advance of the Pond Street Sewer Project revealed one pre-contact site (Step Rock Site). This site included one quartz flake and one rhyolite flake from plow zone contexts mixed with a scatter of historic artifacts. No further survey was recommended. A site visit by MassDOT CRU staff on July 14, 2015 revealed that the area to be impacted by the proposed rotary consists of open, graded land. The proposed wetland replication area is a small graded area with secondary tree growth situated at the corner of Pond Street and Butterfield Drive. It is the opinion of the MassDOT Staff Archaeologist that little or no archaeological potential can be ascribed to the project area based on the results of past archaeological surveys in the immediate area, the limited scope of work and the effects of past roadway and drainage construction, grading and landscaping.

What is the total acreage of the project area?

APPENDIX A (continued)

Woodland	_____	acres	Productive Resources:		
Wetland	_____	acres	Agriculture	_____	acres
Floodplain	_____	acres	Forestry	_____	acres
Open Space	_____	acres	Mining/Extraction	_____	acres
Developed	_____	acres	Total Project Acreage	_____	acres

What is the acreage of the proposed new construction? _____ acres

What is the present land use of the project area?

Route 126 is developed with commercial businesses, retail shopping plazas, and a number of residences that are located adjacent to the roadway. There are also undeveloped wooded areas throughout the project area as well.

Please attach a copy of the section of the USGS quadrangle map which clearly marks the project location.
This Project Notification Form has been submitted to the MHC in compliance with 950 CMR 71.00.

Signature of person submitting this form: M. Hafferty **Date:** 9/20/2017

Name: Mary Hafferty

Address: 10 Park Plaza

City/Town/Zip: Boston, MA 02116

Telephone: 857-368-8826

REGULATORY AUTHORITY

950 CMR 71.00: M.G.L. c. 9, §§ 26-27C as amended by St. 1988, c. 254.

CC:

Army Corps.

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, Secretary & CEO
Thomas Tinlin, Acting Administrator

MassDOT
Massachusetts Department of Transportation
Highway Division

September 20, 2017

Ms. Bettina Washington
Tribal Historic Preservation Officer
Wampanoag Tribe of Gay Head (Aquinnah)
20 Black Brook Road
Aquinnah, MA 02535

RE: ASHLAND, MassDOT Project Number: 604123
Reconstruction on Rt. 126 (Pond St.) from Holliston Town Line to Framingham Town Line
Project Notification Form

Dear Ms. Washington:

The enclosed project notification package has been submitted in accordance with the following:

- The U.S. Army Corps of Engineers consultation requirements.

- Federal Highway Administration requirements for the initiation of tribal consultation under Section 106.

MassDOT requests that the Tribal Historic Preservation Officer (THPO) for the Wampanoag Tribe of Gay Head (Aquinnah) review the enclosed materials at the THPO's earliest convenience and solicit any comments that the THPO wishes to make regarding this project. Written comments should be submitted to: David White, Acting Director, Environmental Services, Massachusetts Department of Transportation, 10 Park Plaza, Room 4260, Boston, MA 02116, Attn: Jameson Harwood.

If you have any questions concerning the project information, please feel free to contact Jameson Harwood at (857.368.8799).

Sincerely,

M. Hafferty

Mary Hafferty
Historic Resources Specialist
Environmental Services

Attachments: PNF/Project Plans/Locus Map/MACRIS map

Ten Park Plaza, Suite 4160, Boston, MA 02116
Tel: 857-368-4636, TTY: 857-368-0655
www.mass.gov/massdot

950 CMR: OFFICE OF THE SECRETARY OF THE COMMONWEALTH

APPENDIX A
MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD
BOSTON, MASS. 02125
617-727-8470, FAX: 617-727-5128

PROJECT NOTIFICATION FORM

Project Name: Reconstruction on Route 126 (Pond Street) (MassDOT# 604123)

Location /Address: Pond Street from Holliston Town Line to the Framingham Town Line

City/Town: Ashland, MA

Project Proponent

Name: Massachusetts Department of Transportation

Address: 10 Park Plaza

City/Town/Zip/Telephone: Boston, MA 02116 / T: 617-973-7000

Agency license or funding for the project (list all licenses, permits, approvals, grants or other entitlements being sought from state and federal agencies).

Agency Name	Type of License or funding (specify)
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Does the project include demolition? If so, specify nature of demolition and describe the building(s) which are proposed for demolition.

n/a

Does the project include rehabilitation of any existing buildings? If so, specify nature of rehabilitation and describe the building(s) which are proposed for rehabilitation.

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n/a

To the best of your knowledge, are any historic or archaeological properties known to exist within the project's area of potential impact? If so, specify.

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What is the total acreage of the project area?

950 CMR: OFFICE OF THE SECRETARY OF THE COMMONWEALTH

APPENDIX A (continued)

			Productive Resources:		
Woodland	_____	acres			
Wetland	_____	acres	Agriculture	_____	acres
Floodplain	_____	acres	Forestry	_____	acres
Open Space	_____	acres	Mining/Extraction	_____	acres
Developed	_____	acres	Total Project Acreage	_____	acres

What is the acreage of the proposed new construction? _____ acres

What is the present land use of the project area?

Route 126 is developed with commercial businesses, retail shopping plazas, and a number of residences that are located adjacent to the roadway. There are also undeveloped wooded areas throughout the project area as well.

Please attach a copy of the section of the USGS quadrangle map which clearly marks the project location.
This Project Notification Form has been submitted to the MHC in compliance with 950 CMR 71.00.

Signature of person submitting this form: M. Hafferty **Date:** 9/20/2017

Name: Mary Hafferty

Address: 10 Park Plaza

City/Town/Zip: Boston, MA 02116

Telephone: 857-368-8826

REGULATORY AUTHORITY

950 CMR 71.00: M.G.L. c. 9, §§ 26-27C as amended by St. 1988, c. 254.

CC:

Army Corps.

***Attachment H* – ROW Parcel Summary Sheet/Abutters**

PARCEL NO.	PLAN SHEET NO.	TITLEHOLDER	TITLE REFERENCE				AREA (S.F. +/-)						TOTAL PROPERTY AREA (S.F.)	REMARKS
			DEED BOOK	PAGE NO.	LCC NO.	CERT NO.	TAKEN		EASEMENT		TOTAL TAKEN	REMAINING		
							TOWN	STATE	TYPE	AREA				
9-1	39	RUGNY PROPERTIES, LLC	63686	430				120			120	10,989	11,109	
9-TE-1	39	RUGNY PROPERTIES, LLC	63886	430					TEMP.	380				GRADING, LOAM & SEED
9-2	39	ASHLAND TOWN LINE LIMITED PARTNERSHIP	55980	225				370			370	20213	20,583	
9-TE-71	39	ASHLAND TOWN LINE LIMITED PARTNERSHIP	55980	225					TEMP.	2,033				GRADING, LOAM & SEED, RECONSTRUCT PRIVATE WAY
9-3	39,40	ASHLAND TOWN LINE LIMITED PARTNERSHIP LP	48742	540				2,325			2,325	153,641	155,966	
9-PUE-S-50	39,40	ASHLAND TOWN LINE LIMITED PARTNERSHIP LP	48742	540					PERM.	2,849				
9-TE-2	39,40	ASHLAND TOWN LINE LIMITED PARTNERSHIP LP	48742	540					TEMP.	3,000				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY, CONSTRUCT WALL
9-69	39,40	VRS/LCB ASHLAND, LLC	63732	472				5,146			5,146	144,991	150,137	
9-PUE-S-51	39,40	VRS/LCB ASHLAND, LLC	63732	472					PERM.	327				
9-PUE-S-57	40	VRS/LCB ASHLAND, LLC	63732	472					PERM.	1,049				
9-D-13	40	VRS/LCB ASHLAND, LLC	63732	472					PERM.	159				
9-D-PUE-S-37	40	VRS/LCB ASHLAND, LLC	63732	472					PERM.	91				
9-TE-97	39,40	VRS/LCB ASHLAND, LLC	63732	472					TEMP.	4,970				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY, CONSTRUCT WALL
9-4	40	A.S.J. REALTY LLC	67704	397				465			465	65,474	65,939	
9-GR-PUE-S-29	40	A.S.J. REALTY LLC	67704	397					PERM.	632				
9-TE-3	40	A.S.J. REALTY LLC	67704	397					TEMP.	321				GRADING, LOAM & SEED, CONSTRUCT WALL
9-5	41	ASHLAND PLAZA (E&A) LLC	41551	250				771			8,202	438,288	446,490	
9-6	41,42	ASHLAND PLAZA (E&A) LLC	41551	250				657						
9-47	41	ASHLAND PLAZA (E&A) LLC	41551	250				6,564						
9-48-T	42	ASHLAND PLAZA (E&A) LLC	41551	250			210							
9-HS-1	41	ASHLAND PLAZA (E&A) LLC	41551	250					PERM.	224				
9-PUE-1	41,42	ASHLAND PLAZA (E&A) LLC	41551	250					PERM.	2,486				
9-PUE-S-31	40,41	ASHLAND PLAZA (E&A) LLC	41551	250					PERM.	473				
9-PUE-46	41	ASHLAND PLAZA (E&A) LLC	41551	250					PERM.	82				
9-WM-3	42	ASHLAND PLAZA (E&A) LLC	41551	250					PERM.	67				
9-TE-4	41	ASHLAND PLAZA (E&A) LLC	41551	250					TEMP.	7,892				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY, STRIPING
9-TE-5	42	ASHLAND PLAZA (E&A) LLC	41551	250					TEMP.	372				GRADING, LOAM & SEED
9-50	41	SPYGLASS HILL CONDOMINIUM	15480	526				155			213	767,750	767,963	
9-7-T	41	SPYGLASS HILL CONDOMINIUM	15480	526			58							
9-W-1	40,41	SPYGLASS HILL CONDOMINIUM	15480	526					PERM.	1,452				
9-TE-6	40,41	SPYGLASS HILL CONDOMINIUM	15480	526					TEMP.	6,337				GRADING, LOAM & SEED
9-TE-98	41	SPYGLASS HILL CONDOMINIUM	15480	526					TEMP.	1,640				GRADING, LOAM & SEED
9-70	41	310 POND STREET LLC	70581	465				192			347	200,867	201,214	
9-71	42	310 POND STREET LLC	70581	465				66						
9-8-T	41	310 POND STREET LLC	70581	465			89							
9-PUE-48	42	310 POND STREET LLC	70581	465					PERM.	147				
9-TE-86	42	310 POND STREET LLC	70581	465					TEMP.	655				GRADING, LOAM & SEED
9-TE-101	42	310 POND STREET LLC	70581	465					TEMP.	541				GRADING, LOAM & SEED, INSTALLATION OF TRAFFIC SIGNAL EQUIPMENT
9-TE-105	41	310 POND STREET LLC	70581	465					TEMP.	1,346				GRADING, LOAM & SEED
9-TE-106	42	310 POND STREET LLC	70581	465					TEMP.	1,429				RECONSTRUCT DRIVEWAY, INSTALLATION OF TRAFFIC SIGNAL
9-9	41	SV EXPANSION LLC	73734	336				447			447	38,011	38,458	
9-D-16	41,42	SV EXPANSION LLC	73734	336					PERM.	1,332				
9-TE-7	41	SV EXPANSION LLC	73734	336					TEMP.	875				GRADING, LOAM & SEED
9-TE-102	42	SV EXPANSION LLC	73734	336					TEMP.	523				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-10	42,43	300 ELIOT LLC	67162	35				1,762			1,958	195,369	197,327	
9-50-T	42	300 ELIOT LLC	67162	35			196							
9-HS-PUE-W-2	42	300 ELIOT LLC	67162	35					PERM.	61				
9-PUE-W-2	42,43	300 ELIOT LLC	67162	35					PERM.	6,542				
9-TE-79	42,43	300 ELIOT LLC	67162	35					TEMP.	16,967				WALL CONSTRUCTION, GRADING LOAM & SEED

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STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	21	55
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PARCEL SUMMARY
SHEET 1 OF 7

604123_RWM\PARCEL SUM1.DWG Plotted on 26-Nov-19

Proposal No. 604123-111717

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PARCEL NO.	PLAN SHEET NO.	TITLEHOLDER	TITLE REFERENCE				AREA (S.F. +/-)						TOTAL PROPERTY AREA (S.F.)	REMARKS
			DEED BOOK	PAGE NO.	LCC NO.	CERT NO.	TAKEN		EASEMENT		TOTAL TAKEN	REMAINING		
							TOWN	STATE	TYPE	AREA				
9-GR-4	43	GLOBAL MONTELLO GROUP CORP.	55459	347					PERM.	158			74,923	
9-PUE-37	43	GLOBAL MONTELLO GROUP CORP.	55459	347					PERM.	110				
9-E-2	42	GLOBAL MONTELLO GROUP CORP.	55459	347					PERM.	220				
9-E-1-T	42	GLOBAL MONTELLO GROUP CORP.	55459	347					PERM.	545				
9-HS-15-T	42	GLOBAL MONTELLO GROUP CORP.	55459	347					PERM.	60				
9-TE-9	42,43	GLOBAL MONTELLO GROUP CORP.	55459	347					TEMP.	5,060				GRADING, LOAM & SEED
9-TE-84	43	GLOBAL MONTELLO GROUP CORP.	55459	347					TEMP.	1,371				GRADING, LOAM & SEED
9-TE-80	43	EMILY MATEO & LEONARDO MATEO	53888	204					TEMP.	295				GRADING, LOAM & SEED
9-PUE-4	43	G&D LLC.	59418	337					PERM.	202			30,928	
9-D-PUE-S-38	43	G&D LLC.	59418	337					PERM.	483				
9-TE-11	43	G&D LLC.	59418	337					TEMP.	833				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-D-PUE-S-5	43	JAMES C. CRAM, JR.	64905	317					PERM.	280			40,946	
9-PUE-38	43	JAMES C. CRAM, JR.	64905	317					PERM.	538				
9-PUE-S-59	43	JAMES C. CRAM, JR.	64905	317					PERM.	138				
9-S-3	43	JAMES C. CRAM, JR.	64905	317					PERM	142				
9-TE-12	43	JAMES C. CRAM, JR.	64905	317					TEMP.	1,219				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-PUE-6	43,44	ROBERT R. SAPORETTI & LESLIE K. SAPORETTI	17337	448					PERM.	644			10,890	
9-TE-13	43,44	ROBERT R. SAPORETTI & LESLIE K. SAPORETTI	17337	448					TEMP.	519				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-13	43,44	IRPINA LIVING TRUST	52953	401				141			141	63,859	64,000	
9-D-GR-1	43	IRPINA LIVING TRUST	52953	401					PERM.	350				
9-GR-7	43	IRPINA LIVING TRUST	52953	401					PERM.	183				
9-GR-8	43	IRPINA LIVING TRUST	52953	401					PERM.	105				
9-TE-14	43,44	IRPINA LIVING TRUST	52953	401					TEMP.	3,241				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-PUE-8	44	PELLETIER REALTY TRUST	48981	144					PERM.	659			17,673	
9-TE-81	44	PELLETIER REALTY TRUST	48981	144					TEMP.	324				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-15	44	PELLETIER REALTY TRUST	48981	142				224			705	42,855	43,560	
9-51-T	44	PELLETIER REALTY TRUST	48981	142			481							
9-PUE-9	44	PELLETIER REALTY TRUST	48981	142					PERM.	1,326				
9-TE-16	44	PELLETIER REALTY TRUST	48981	142					TEMP.	1,258				GRADING, LOAM & SEED
9-17	44,45	GAZARD 225 POND STREET LLC	60871	575				86			86	37,256	37,342	
9-PUE-11	44,45	GAZARD 225 POND STREET LLC	60871	575					PERM.	1,801				
9-TE-18	44,45	GAZARD 225 POND STREET LLC	60871	575					TEMP.	1,083				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-18	44	KLEIDIANE D. TORRES & WALTER TORRES	68964	42				222			222	10,778	11,000	
9-HS-3	44	KLEIDIANE D. TORRES & WALTER TORRES	68964	42					PERM.	95				
9-TE-19	44	KLEIDIANE D. TORRES & WALTER TORRES	68964	42					TEMP.	1,135				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY

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MA	-	22	55
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PARCEL NO.	PLAN SHEET NO.	TITLEHOLDER	TITLE REFERENCE				AREA (S.F. +/-)						TOTAL PROPERTY AREA (S.F.)	REMARKS
			DEED BOOK	PAGE NO.	LCC NO.	CERT NO.	TAKEN		EASEMENT		TOTAL TAKEN	REMAINING		
							TOWN	STATE	TYPE	AREA				
9-19	44	S&G REALTY TRUST	46439	544				365			365	58,005	58,370	
9-D-GR-S-6	44	S&G REALTY TRUST	46439	544					PERM.	1,254				
9-GR-S-15	44	S&G REALTY TRUST	46439	544					PERM.	1,431				
9-WM-1	44	S&G REALTY TRUST	46439	544					PERM.	60				
9-TE-87	44	S&G REALTY TRUST	46439	544					TEMP.	1,659				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-20	44	THE HAPPINESS REALTY TRUST	65247	360				130			130	33,770	33,900	
9-GR-3	44	THE HAPPINESS REALTY TRUST	65247	360					PERM.	584				
9-TE-21	44	THE HAPPINESS REALTY TRUST	65247	360					TEMP.	1,074				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-21	44,45	DEREK T. MAYERHOFER & BETH M. MAYERHOFER	63365	596				72			72	12,723	12,795	
9-TE-22	44,45	DEREK T. MAYERHOFER & BETH M. MAYERHOFER	63365	596					TEMP.	786				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-24	44,45	POND REALTY TRUST	47751	87				75			75	13,225	13,300	
9-TE-23	44,45	POND REALTY TRUST	47751	87					TEMP.	851				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-25	45	CHARLES E. BAKSTRAN JR & BETSY N. BAKSTRAN	12985	378				91			91	11,258	11,349	
9-TE-26	45	CHARLES E. BAKSTRAN JR & BETSY N. BAKSTRAN	12985	378					TEMP.	1,090				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-22	45	GAZARD 221 POND STREET, LLC	60871	571				135			135	29,992	30,127	
9-PUE-12	45	GAZARD 221 POND STREET, LLC	60871	571					PERM.	976				
9-TE-24	45	GAZARD 221 POND STREET, LLC	60871	571					TEMP.	335				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-23	45,46	HALF MOON VILLAGE CONDOMINIUM	25109	259				3,428			3,428	545,732	549,160	
9-D-PUE-6	46	HALF MOON VILLAGE CONDOMINIUM	25109	259					PERM.	211				
9-PUE-13	45,46	HALF MOON VILLAGE CONDOMINIUM	25109	259					PERM.	3,480				
9-PUE-49	46	HALF MOON VILLAGE CONDOMINIUM	25109	259					PERM.	1,145				
9-TE-25	46	HALF MOON VILLAGE CONDOMINIUM	25109	259					TEMP.	1,714				GRADING, LOAM & SEED, RECONSTRUCT PRIVATE WAY
9-TE-77	45	HALF MOON VILLAGE CONDOMINIUM	25109	259					TEMP.	485				GRADING, LOAM & SEED
9-67	46	ASHLAND OPEN SPACE TRUST	62585	369				1,287			6,371	79,747	86,118	
9-68-T	46	ASHLAND OPEN SPACE TRUST	62585	369			146							
9-69-T	46	ASHLAND OPEN SPACE TRUST	62585	369			4,938							
9-HS-PUE-61	46	ASHLAND OPEN SPACE TRUST	62585	369					PERM.	457				
9-TE-103	46	ASHLAND OPEN SPACE TRUST	62585	369					TEMP.	8,136				GRADING, LOAM & SEED, RECONSTRUCT PRIVATE WAY
9-49	46,47	VILLAGE OF WESTERLY CONDOMINIUM TRUST	62585	365				3,281			8,884	540,192	549,076	
9-53-T	46	VILLAGE OF WESTERLY CONDOMINIUM TRUST	62585	365			5,603							
9-D-HS-GR-1-T	46	VILLAGE OF WESTERLY CONDOMINIUM TRUST	62585	365					PERM.	721				
9-GR-S-1-T	46	VILLAGE OF WESTERLY CONDOMINIUM TRUST	62585	365					PERM.	1,937				
9-D-GR-PUE-S-36	46,47	VILLAGE OF WESTERLY CONDOMINIUM TRUST	62585	365					PERM.	2,844				
9-GR-PUE-S-39	46,47	VILLAGE OF WESTERLY CONDOMINIUM TRUST	62585	365					PERM.	987				
9-HS-PUE-6	48	VILLAGE OF WESTERLY CONDOMINIUM TRUST	62585	365					PERM.	60				
9-PUE-41	47,48	VILLAGE OF WESTERLY CONDOMINIUM TRUST	62585	365					PERM.	4,137				
9-TE-76	46,47	VILLAGE OF WESTERLY CONDOMINIUM TRUST	62585	365					TEMP.	3,467				GRADING, LOAM & SEED, RECONSTRUCT PRIVATE WAY
9-26	45	AUSSIE LLC	59128	364				141			141	25,359	25,500	
9-PUE-58	45	AUSSIE LLC	59128	364					PERM.	422				
9-TE-27	45	AUSSIE LLC	59128	364					TEMP.	1,074				GRADING, PARKING LOT STRIPING

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PARCEL NO.	PLAN SHEET NO.	TITLEHOLDER	TITLE REFERENCE				AREA (S.F. +/-)						TOTAL PROPERTY AREA (S.F.)	REMARKS
			DEED BOOK	PAGE NO.	LCC NO.	CERT NO.	TAKEN		EASEMENT		TOTAL TAKEN	REMAINING		
							TOWN	STATE	TYPE	AREA				
9-27	45	OLSEN FAMILY INVESTMENT TRUST	42012	310				100			100	19,900	20,000	
9-HS-4	45	OLSEN FAMILY INVESTMENT TRUST	42012	310					PERM.	88				
9-TE-28	45	OLSEN FAMILY INVESTMENT TRUST	42012	310					TEMP.	887				GRADING, PARKING LOT STRIPING
9-28	45,46	KWC REAL ESTATE, LLC	69223	93				152			152	29,848	30,000	
9-WM-2	45,46	KWC REAL ESTATE, LLC	69223	93					PERM.	60				
9-TE-29	45,46	KWC REAL ESTATE, LLC	69223	93					TEMP.	1,272				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-E-3	46	HESS REALTY LLC	63745	433					PERM.	203			35,000	
9-HS-5	46	HESS REALTY LLC	63745	433					PERM.	60				
9-TE-30	46	HESS REALTY LLC	63745	433					TEMP.	2,395				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-30	46	V. SARDINHA REALTY TRUST	63532	408				334			334	19,666	20,000	
9-TE-31	46	V. SARDINHA REALTY TRUST	63532	408					TEMP.	1,326				GRADING, LOAM & SEED
9-31	46,47	JEFFREY R. HORN	14415	319				569			569	14,431	15,000	
9-TE-32	46,47	JEFFREY R. HORN	14415	319					TEMP.	1,011				GRADING, LOAM & SEED
9-32	47	158 POND STREET REALTY TRUST	45872	596				200			200	64,700	64,900	
9-PUE-40	47	158 POND STREET REALTY TRUST	45872	596					PERM.	132				
9-TE-33	47	158 POND STREET REALTY TRUST	45872	596					TEMP.	940				GRADING, LOAM & SEED
9-TE-99	47	158 POND STREET REALTY TRUST	45872	596					TEMP.	184				GRADING, LOAM & SEED
9-33	47	162 POND STREET REALTY TRUST	28560	543				148			148	269,052	269,200	
9-TE-34	47	162 POND STREET REALTY TRUST	28560	543					TEMP.	2,262				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-E-34	47	158 POND STREET REALTY TRUST	28560	536					PERM.	36			30,001	
9-TE-35	47,48	158 POND STREET REALTY TRUST	28560	536					TEMP.	2,123				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-PUE-14	48	ENGELO NASIOS & EVAGELIA NASIOS	9254	418					PERM.	1,853			32,234	
9-PUE-15	48,49	V & P REALTY TRUST	16593	408					PERM.	1,260			35,284	
9-TE-37	48,49	V & P REALTY TRUST	16593	408					TEMP.	1,123				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-PUE-59	48	NSTAR GAS COMPANY	12120 44110	408 93					PERM.	108			10,000	
9-TE-38	48	NSTAR GAS COMPANY	12120 44110	408 93					TEMP.	644				GRADING, LOAM & SEED
9-TE-100	48	NSTAR GAS COMPANY	12120 44110	408 93					TEMP.	421				GRADING, LOAM & SEED

ASHLAND
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STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	24	55
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PARCEL SUMMARY
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PARCEL NO.	PLAN SHEET NO.	TITLEHOLDER	TITLE REFERENCE				AREA (S.F. +/-)						TOTAL PROPERTY AREA (S.F.)	REMARKS
			DEED BOOK	PAGE NO.	LCC NO.	CERT NO.	TAKEN		EASEMENT		TOTAL TAKEN	REMAINING		
							TOWN	STATE	TYPE	AREA				
9-70-T	48	ASHLAND BUTTERFIELD DRIVE ASSOCIATES LLC	66681	440			46				46	1,205,695	1,205,741	
9-D-GR-PUE-S-11	50	ASHLAND BUTTERFIELD DRIVE ASSOCIATES LLC	66681	440					PERM.	345				
9-GR-S-14	50	ASHLAND BUTTERFIELD DRIVE ASSOCIATES LLC	66681	440					PERM.	1,517				
9-GR-PUE-S-44	50	ASHLAND BUTTERFIELD DRIVE ASSOCIATES LLC	66681	440					PERM.	54				
9-GR-S-6	50,51	ASHLAND BUTTERFIELD DRIVE ASSOCIATES LLC	66681	440					PERM.	306				
9-GR-HS-S-7	50	ASHLAND BUTTERFIELD DRIVE ASSOCIATES LLC	66681	440					PERM.	54				
9-HS-8	48	ASHLAND BUTTERFIELD DRIVE ASSOCIATES LLC	66681	440					PERM.	62				
9-GR-PUE-S-56	48	ASHLAND BUTTERFIELD DRIVE ASSOCIATES LLC	66681	440					PERM.	603				
9-TE-47	50	ASHLAND BUTTERFIELD DRIVE ASSOCIATES LLC	66681	440					TEMP.	547				GRADING, LOAM & SEED
9-TWLR-1	48	ASHLAND BUTTERFIELD DRIVE ASSOCIATES LLC	66681	440					TEMP.	11,979				GRADING, LOAM & SEED, REPLICATE WETLANDS
9-TE-93	50,51	ASHLAND BUTTERFIELD DRIVE ASSOCIATES LLC	66681	440					TEMP.	69				GRADING, LOAM & SEED
9-HS-7	48	ALGONQUIN GAS TRANSMISSION COMPANY	8420	357					PERM.	60			14,857	
9-PUE-60	48	ALGONQUIN GAS TRANSMISSION COMPANY	8420	357					PERM.	95				
9-TE-39	48	ALGONQUIN GAS TRANSMISSION COMPANY	8420	357					TEMP.	829				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-35	49	J & A REALTY TRUST	62930 62930	189 191				101			101	56,242	56,343	
9-PUE-WM-4	48	J & A REALTY TRUST	62930 62930	189 191					PERM.	214				
9-PUE-64	48,49	J & A REALTY TRUST	62930 62930	189 191					PERM.	74				
9-PUE-65	49	J & A REALTY TRUST	62930 62930	189 191					PERM.	74				
9-TE-41	48,49	J & A REALTY TRUST	62930 62930	189 191					TEMP.	3,647				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-PUE-16	49	KYROMINA LLC	66135	593					PERM.	1,082			31,799	
9-TE-42	49	KYROMINA LLC	66135	593					TEMP.	685				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-TE-73	49	KYROMINA LLC	66135	593					TEMP.	1,169				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-60	49,50,51	COWEN REALTY TRUST II	19976	339				4,548			4,548	534,289	538,837	
9-D-S-8	51	COWEN REALTY TRUST II	19976	339					PERM.	97				
9-PUE-42	49	COWEN REALTY TRUST II	19976	339					PERM.	93				
9-PUE-43	49	COWEN REALTY TRUST II	19976	339					PERM.	88				
9-S-1	50,51	COWEN REALTY TRUST II	19976	339					PERM.	1,452				
9-TE-92	49,50,51	COWEN REALTY TRUST II	19976	339					TEMP.	6,427				GRADING, LOAM & SEED
9-36	49	120 POND ST LLC	59105	359				1,639			1,639	172,601	174,240	
9-GR-PUE-S-8	49,50	120 POND ST LLC	59105	359					PERM.	904				
9-HS-9	49	120 POND ST LLC	59105	359					PERM.	62				
9-TE-44	49,50	120 POND ST LLC	59105	359					TEMP.	161				GRADING, LOAM & SEED
9-TE-96	49	120 POND ST LLC	59105	359					TEMP.	3,748				GRADING, LOAM & SEED
9-GR-PUE-S-40	50	JAROLD REALTY TRUST	19359	240					PERM.	54			174,240	
9-GR-PUE-S-41	50	JAROLD REALTY TRUST	19359	240					PERM.	54				
9-GR-S-2	50	JAROLD REALTY TRUST	19359	240					PERM.	1,119				
9-TE-94	50	JAROLD REALTY TRUST	19359	240					TEMP.	242				GRADING, LOAM & SEED

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	25	55
PROJECT FILE NO.	604123		

PRELIMINARY RIGHT OF WAY
PARCEL SUMMARY
SHEET 5 OF 7

604123_RWM\PARCEL SUM1.DWG Plotted on 26-Nov-19

Proposal No. 604123-111717

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PARCEL NO.	PLAN SHEET NO.	TITLEHOLDER	TITLE REFERENCE				AREA (S.F. +/-)						TOTAL PROPERTY AREA (S.F.)	REMARKS
			DEED BOOK	PAGE NO.	LCC NO.	CERT NO.	TAKEN TOWN	TAKEN STATE	EASEMENT TYPE	EASEMENT AREA	TOTAL TAKEN	REMAINING		
9-GR-S-13	50	TOWN OF ASHLAND	27584 54289	352 215					PERM.	969			43,560	
9-GR-PUE-S-42	50	TOWN OF ASHLAND	27584 54289	352 215					PERM.	54				
9-GR-PUE-S-43	50	TOWN OF ASHLAND	27584 54289	352 215					PERM.	54				
9-GR-S-4	50	TOWN OF ASHLAND	27584 54289	352 215					PERM.	1,034				
9-GR-HS-S-6	50	TOWN OF ASHLAND	27584 54289	352 215					PERM.	54				
9-GR-PUE-S-47	50	TOWN OF ASHLAND	27584 54289	352 215					PERM.	164				
9-TE-46	50	TOWN OF ASHLAND	27584 54289	352 215					TEMP.	210				GRADING, LOAM & SEED
9-TE-85	50	TOWN OF ASHLAND	27584 54289	352 215					TEMP.	311				GRADING, LOAM & SEED
9-41	51	FORREST C. HIGGINS & FORREST C. HIGGINS JR	46735	121				931			931	44,977	45,908	
9-D-S-9	51	FORREST C. HIGGINS & FORREST C. HIGGINS JR	46735	121					PERM.	107				
9-PUE-S-1	51	FORREST C. HIGGINS & FORREST C. HIGGINS JR	46735	121					PERM.	1,107				
9-TE-95	51	FORREST C. HIGGINS & FORREST C. HIGGINS JR	46735	121					TEMP.	1,020				GRADING, LOAM & SEED
9-PUE-S-2	51	JKY REALTY LLC	54927	535					PERM.	536			78,408	
9-TE-49	51	JKY REALTY LLC	54927	535					TEMP.	264				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-E-4	51,52	DSM MB II LLC	64730	345					PERM.	852			945,252	
9-E-5	52	DSM MB II LLC	64730	345					PERM.	73				
9-E-6	53	DSM MB II LLC	64730	345					PERM.	5				
9-HS-13	52,53	DSM MB II LLC	64730	345					PERM.	50				
9-PUE-20	52	DSM MB II LLC	64730	345					PERM.	1,738				
9-PUE-21	52,53	DSM MB II LLC	64730	345					PERM.	4,241				
9-TE-52	52, 53	DSM MB II LLC	64730	345					TEMP.	6,674				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-TE-72	51,52	DSM MB II LLC	64730	345					TEMP.	4,307				GRADING, LOAM & SEED
9-TE-75	53	DSM MB II LLC	64730	345					TEMP.	2,250				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-GR-S-7	51	JEFF-WILL CAMBRIDGE LLC	69425	170					PERM.	4,543			789,743	
9-GR-PUE-S-45	51	JEFF-WILL CAMBRIDGE LLC	69425	170					PERM.	54				
9-GR-PUE-S-46	51	JEFF-WILL CAMBRIDGE LLC	69425	170					PERM.	36				
9-GR-PUE-S-48	51	JEFF-WILL CAMBRIDGE LLC	69425	170					PERM.	46				
9-D-GR-S-10	51	JEFF-WILL CAMBRIDGE LLC	69425	170					PERM.	254				
9-TE-50	51	JEFF-WILL CAMBRIDGE LLC	69425	170					TEMP.	590				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-TE-83	51	MAXINE MAJOR-PASCHAL	59111	243					TEMP.	1,454				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-GR-9	52	BECK ASHLAND FARM LLC	69424	544					PERM.	114			154,202	
9-TE-51	51,52	BECK ASHLAND FARM LLC	69424	544					TEMP.	383				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-TE-53	52	BECK ASHLAND FARM LLC	69424	544					TEMP.	612				GRADING, LOAM & SEED
9-64	52	NSTAR ELECTRIC COMPANY	10829 69817	254 135				167			167	55,590	55,757	
9-GR-S-10	52	NSTAR ELECTRIC COMPANY	10829 69817	254 135					PERM.	1,332				
9-GR-HS-S-12	52	NSTAR ELECTRIC COMPANY	10829 69817	254 135					PERM.	72				
9-TE-54	52	NSTAR ELECTRIC COMPANY	10829 69817	254 135					TEMP.	1,816				GRADING, LOAM & SEED

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	26	55
PROJECT FILE NO.	604123		

PRELIMINARY RIGHT OF WAY
PARCEL SUMMARY
SHEET 6 OF 7

604123_RWH\PARCEL SUM1.DWG Plotted on 26-Nov-19

Proposal No. 604123-111717

A00830 - 150

PARCEL NO.	PLAN SHEET NO.	TITLEHOLDER	TITLE REFERENCE				AREA (S.F. +/-)						TOTAL PROPERTY AREA (S.F.)	REMARKS
			DEED BOOK	PAGE NO.	LCC NO.	CERT NO.	TAKEN		EASEMENT		TOTAL TAKEN	REMAINING		
							TOWN	STATE	TYPE	AREA				
9-68	52	LEO J. SCANSAROLI & ADELLE M. SCANSAROLI	21750	500				592			592	55,165	55,757	
9-D-15	52,53	LEO J. SCANSAROLI & ADELLE M. SCANSAROLI	21750	500					PERM.	803				
9-D-GR-S-11	52,53	LEO J. SCANSAROLI & ADELLE M. SCANSAROLI	21750	500					PERM.	198				
9-GR-S-11	52,53	LEO J. SCANSAROLI & ADELLE M. SCANSAROLI	21750	500					PERM.	109				
9-GR-S-12	52,53	LEO J. SCANSAROLI & ADELLE M. SCANSAROLI	21750	500					PERM.	205				
9-PUE-63	53	LEO J. SCANSAROLI & ADELLE M. SCANSAROLI	21750	500					PERM.	79				
9-TE-55	52,53	LEO J. SCANSAROLI & ADELLE M. SCANSAROLI	21750	500					TEMP.	1,095				GRADING, LOAM & SEED
9-TE-56	52,53	LEO J. SCANSAROLI & ADELLE M. SCANSAROLI	21750	500					TEMP.	1,133				GRADING, LOAM & SEED
9-HS-14	53,54	ALFONSO RAMIREZ	48770	252					PERM.	37			7,841	
9-PUE-22	53,54	ALFONSO RAMIREZ	48770	252					PERM.	440				
9-TE-57	53,54	ALFONSO RAMIREZ	48770	252					TEMP.	494				GRADING, LOAM & SEED
9-PUE-23	53,54	JUAN MENDEZ	41417	333					PERM.	446			6,534	
9-TE-59	53	JOHN P. DASSONI, VILMA R. DASSONI AND BRENDA DASSONI	36946	275					TEMP.	527				GRADING, LOAM & SEED, RECONSTRUCT WALK
9-TE-60	53	METROWEST HUMANE SOCIETY INC	24727 46925	484 152					TEMP.	1,190				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-HS-16	53	JAMES N. LOMBARDI & LISA M. LOMBARDI	23285	150					PERM.	57			30,000	
9-HS-17	54	JAMES N. LOMBARDI & LISA M. LOMBARDI	23285	150					PERM.	57				
9-TE-61	53,54	JAMES N. LOMBARDI & LISA M. LOMBARDI	23285	150					TEMP.	3,177				GRADING, LOAM & SEED
9-PUE-24	54	MENDEZ REAL ESTATE GROUP, LLC.	41530	150					PERM.	431			13,504	
9-HS-PUE-62	54	MENDEZ REAL ESTATE GROUP, LLC.	41530	150					PERM.	40				
9-HS-PUE-63	54	SUNNYSIDE REALTY NOMINEE TRUST	44485	0454					PERM.	40			17,860	
9-HS-PUE-64	54	SUNNYSIDE REALTY NOMINEE TRUST	44485	0454					PERM.	76				
9-PUE-62	54	SUNNYSIDE REALTY NOMINEE TRUST	44485	0454					PERM.	881				
9-TE-88	54	SUNNYSIDE REALTY NOMINEE TRUST	44485	0454					TEMP.	457				RECONSTRUCT PARKING LOT
9-PUE-26	54	US BANK TRUST, NA, AS TRUSTEE FOR LSF9 MASTER PARTICIPATION	69277	306					PERM.	209			4,356	
9-PUE-28	54	JOSE ALBERTO MONTEIRO SILVA & MELICIA RUBIA DE MENEZES FERREIRA DA COSTA	65737	141					PERM.	252			5,227	
9-PUE-61	54	QYANG PHAT & KIM CHEN DIEP	46541	122					PERM.	73			20,000	
9-TE-68	54	QYANG PHAT & KIM CHEN DIEP	46541	122					TEMP.	1,840				RECONSTRUCT PARKING LOT
9-TE-69	54	BAZAR PROPERTIES 6-8 DOUGLAS ROAD LLC	69468	384					TEMP.	464				GRADING, LOAM & SEED
9-TE-70	54	KATHLEEN C. MAHONEY	38556	302					TEMP.	441				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-TE-89	54	ROSS REALTY TRUST	52192	406					TEMP.	55				GRADING, LOAM & SEED
9-D-14	55	RIMARK, LLC				265273			PERM.	461			14,375	
9-D-12	55	GOIS HOLDINGS BOSTON LLC				245649			PERM.	955			1,685,772	
9-TE-91	55	GOIS HOLDINGS BOSTON LLC				245649			TEMP.	3,609				GRADING, LOAM & SEED

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	27	55
PROJECT FILE NO.	604123		

PRELIMINARY RIGHT OF WAY
PARCEL SUMMARY
SHEET 7 OF 7

604123_RWH\PARCEL SUM1.DWG Plotted on 26-Nov-19

Proposal No. 604123-111717

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***Attachment I* – 4d Submittal (Northern Long Eared Bats)**

Northern Long-Eared Bat 4(d) Rule Streamlined Consultation Form

Federal agencies should use this form for the optional streamlined consultation framework for the northern long-eared bat (NLEB). This framework allows federal agencies to rely upon the U.S. Fish and Wildlife Service's (USFWS) January 5, 2016, intra-Service Programmatic Biological Opinion (BO) on the final 4(d) rule for the NLEB for section 7(a)(2) compliance by: (1) notifying the USFWS that an action agency will use the streamlined framework; (2) describing the project with sufficient detail to support the required determination; and (3) enabling the USFWS to track effects and determine if reinitiation of consultation is required per 50 CFR 402.16.

This form is not necessary if an agency determines that a proposed action will have no effect to the NLEB or if the USFWS has concurred in writing with an agency's determination that a proposed action may affect, but is not likely to adversely affect the NLEB (i.e., the standard informal consultation process). Actions that may cause prohibited incidental take require separate formal consultation. Providing this information does not address section 7(a)(2) compliance for any other listed species.

Information to Determine 4(d) Rule Compliance:	**YES**	**NO**
1. Does the project occur wholly outside of the WNS Zone[1]?	☐	☒
2. Have you contacted the appropriate agency[2] to determine if your project is near known hibernacula or maternity roost trees?	☒	☐
3. Could the project disturb hibernating NLEBs in a known hibernaculum?	☐	☒
4. Could the project alter the entrance or interior environment of a known hibernaculum?	☐	☒
5. Does the project remove any trees within 0.25 miles of a known hibernaculum at any time of year?	☐	☒
6. Would the project cut or destroy known occupied maternity roost trees, or any other trees within a 150-foot radius from the maternity roost tree from June 1 through July 31.	☐	☒

You are eligible to use this form if you have answered yes to question #1 **or** yes to question #2 **and** no to questions 3, 4, 5 and 6. The remainder of the form will be used by the USFWS to track our assumptions in the BO.

Agency and Applicant[3] (Name, Email, Phone No.): Lead Agency: FHWA

Submitting Agency: MassDOT, Tim Dexter, timothy.dexter@state.ma.us, (857) 368-8794

Project Name: Ashland – 604123 - ASHLAND- RECONSTRUCTION ON ROUTE 126 (POND STREET), FROM THE FRAMINGHAM T.L. TO THE HOLLISTON T.L.

Project Location (include coordinates if known):
Pond Street / Route 126 from the Framingham town line (42.259529, -71.423870) to the Holliston town line (42.236127, -71.431378)

Basic Project Description (provide narrative below or attach additional information): The project limits are from the Framingham T.L. to the Holliston T.L., a distance of 1.7 miles. The project consists of miling and resurfacing with minor box widening. Traffic improvements at the intersection of Route 126 and Elliot Street entail signalization, stone masonry retaining wall construction, minor drainage

[1] http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/WNSZone.pdf
[2] See http://www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html
[3] If applicable - only needed for federal actions with applicants (e.g., for a permit, etc.) who are party to the consultation.

improvements, installation of granite curbing and edging, construction of sidewalks and the resetting of guardrail.. Up to 2.5 acre of tree trimming / clearing will be required at this project site for access, minor road widening, safety and line-of-site improvements, and for other project needs.

General Project Information	YES	NO
Does the project occur within 0.25 miles of a known hibernaculum?	☐	☒
Does the project occur within 150 feet of a known maternity roost tree?	☐	☒
Does the project include forest conversion[4]? (if yes, report acreage below)	☒	☐
Estimated total acres of forest conversion	2.5	
If known, estimated acres[5] of forest conversion from April 1 to October 31	*Not known*	
If known, estimated acres of forest conversion from June 1 to July 31[6]	*Not known*	
Does the project include timber harvest? (if yes, report acreage below)	☐	☒
Estimated total acres of timber harvest		
If known, estimated acres of timber harvest from April 1 to October 31		
If known, estimated acres of timber harvest from June 1 to July 31		
Does the project include prescribed fire? (if yes, report acreage below)	☐	☒
Estimated total acres of prescribed fire		
If known, estimated acres of prescribed fire from April 1 to October 31		
If known, estimated acres of prescribed fire from June 1 to July 31		
Does the project install new wind turbines? (if yes, report capacity in MW below)	☐	☒
Estimated wind capacity (MW)		

Agency Determination:

By signing this form, the action agency determines that this project may affect the NLEB, but that any resulting incidental take of the NLEB is not prohibited by the final 4(d) rule.

If the USFWS does not respond within 30 days from submittal of this form, the action agency may presume that its determination is informed by the best available information and that its project responsibilities under 7(a)(2) with respect to the NLEB are fulfilled through the USFWS January 5, 2016, Programmatic BO. The action agency will update this determination annually for multi-year activities.

The action agency understands that the USFWS presumes that all activities are implemented as described herein. The action agency will promptly report any departures from the described activities to the appropriate USFWS Field Office. The action agency will provide the appropriate USFWS Field Office with the results of any surveys conducted for the NLEB. Involved parties will promptly notify the appropriate USFWS Field Office upon finding a dead, injured, or sick NLEB.

Signature: _____ Date Submitted: 2/11/19

[4] Any activity that temporarily or permanently removes suitable forested habitat, including, but not limited to, tree removal from development, energy production and transmission, mining, agriculture, etc. (see page 48 of the BO).
[5] If the project removes less than 10 trees and the acreage is unknown, report the acreage as less than 0.1 acre.
[6] If the activity includes tree clearing in June and July, also include those acreage in April to October.

DOCUMENT A00831

ARMY CORPS OF ENGINEERS

GENERAL PERMIT

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DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

April 8, 2020

Regulatory Division
File Number: NAE-2020-00490

Massachusetts Department of Transportation – Highway Division
Attention: Susan McArthur
10 Park Plaza, Room 4260
Boston, Massachusetts 02116

Dear Ms. McArthur:

We have reviewed your application to permanently discharge 3,686 square feet of fill material below the Ordinary High Water (OHW) mark of four unnamed intermittent streams, and within vegetated wetlands, associated with the reconstruction of Route 126 (Pond Street) in Ashland, Massachusetts. The work includes roadway widening, addition of sidewalks, and stormwater improvements, and includes the following stream crossing work:

- Replacement of an existing 2'W x 2'H concrete box culvert with a new 2'W x 3'H concrete box culvert embedded 12" with natural material.

- Extension of an existing 2'W x 3'H concrete box culvert.

- Replacement of an existing 3'W x 2'H concrete box culvert with a new 3'W x 3'H concrete box culvert embedded 12" with natural material.

The project also includes 2,730 square feet of temporary impacts below OHW, and within vegetated wetlands, associated with construction access and potential dewatering behind the erosion and sedimentation controls. The work is shown on the enclosed plans titled "MASSACHUSETTS DEPARTMENT OF TRANSPORTATION HIGHWAY DIVISION PLAN AND PROFILE OF ROUTE 126 (POND STREET) IN THE TOWN OF ASHLAND MIDDLESEX COUNTY", on 21 sheets, and dated "REVISED: MARCH 19, 2020".

Based on the information that you have provided, we verify that the activity is authorized under General Permit # 10 of the enclosed April 16, 2018 Federal permit known as the Massachusetts General Permits (GPs).

Please review the enclosed GPs carefully, including the general conditions beginning on page 19, to be sure that you and whoever does the work understand its requirements. A copy of the GPs and this verification letter shall be available at the project site throughout the time the work is underway. Performing work within our jurisdiction that is not specifically authorized by this determination or failing to comply with any special condition provided above or all of the

terms and conditions of the GPs may subject you to the enforcement provisions of our regulations. You must perform this work in compliance with the terms and conditions of the GPs, and also in compliance with the following special conditions:

Your application indicates approximately 2.5 acres of tree clearing will occur as part of this project. If additional trees will be removed, you must notify this office in advance so we may reinitiate consultation regarding the northern long-eared bat.

This authorization requires you to complete and return the enclosed Work Start Notification Form to this office at least two weeks before the anticipated starting date. You must also complete and return the enclosed Compliance Certification Form within one month following the completion of the authorized work.

This authorization presumes that the work as described above and as shown on your plans noted above is in waters of the U.S.

This authorization expires on April 5, 2023. You must commence or be under contract to commence the work authorized herein by April 5, 2023, and complete the work by April 5, 2024. If not, you must contact this office to determine the need for further authorization before beginning or continuing the activity. We recommend that you contact us *before* this authorization expires to discuss reissuance. Please contact us immediately if you change the plans or construction methods for work within our jurisdiction. We must approve any changes before you undertake them.

This authorization does not obviate the need to obtain other Federal, State, or local authorizations required by law.

This authorization becomes valid only after the Massachusetts Department of Environmental Protection (MassDEP) issues or waives Water Quality Certification (WQC) as required under Section 401 of the Clean Water Act. In the event the MassDEP denies the 401 WQC, this determination becomes null and void. The address of the MassDEP regional office for your area is provided on page 47 of the enclosed MA GPs.

We continually strive to improve our customer service. In order for us to better serve you, we would appreciate your completing our Customer Service Survey located at http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey.

Please contact Dan Vasconcelos, of my staff, at (978) 318-8653 if you have any questions.

Sincerely,

Robert J. DeSista

Tammy R. Turley
Chief, Regulatory Division

cc:

Ed Reiner, U.S. EPA, Region 1, Boston, Massachusetts, reiner.ed@epa.gov
David Simmons, USFWS; david_simmons@fws.gov
MassDEP-WRP, Boston, Massachusetts; dep.waterways@mass.gov
Christopher Ross, MassDEP, Lakeville, Massachusetts, christopher.ross@state.ma.us
Conservation Commission, Ashland, Massachusetts, mdosanjos@ashlandmass.com
Susan McArthur, MassDOT – Highway Division, Boston, Massachusetts,
susan.mcarthur@state.ma.us
Melissa Lenker, MassDOT – Highway Division, Boston, Massachusetts,
melissa.lenker@state.ma.us

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

PLAN AND PROFILE OF

ROUTE 126 (POND STREET)

IN THE TOWN OF

ASHLAND

MIDDLESEX COUNTY

FEDERAL AID PROJECT NO.

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	1	327
PROJECT FILE NO.	604123		

TITLE SHEET & INDEX

THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 1988, AS AMENDED, THE SUPPLEMENTAL SPECIFICATIONS DATED APRIL 1, 2019, THE INTERIM SUPPLEMENTAL SPECIFICATIONS CONTAINED IN THIS CONTRACT, THE OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE LATEST MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS WITH MASSACHUSETTS AMENDMENTS AND THE STANDARD MUNICIPAL TRAFFIC CODE, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1996 CONSTRUCTION AND TRAFFIC STANDARD DETAILS (AS RELATES TO THE PAVEMENT MARKINGS DETAILS ONLY), THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK, THE PLANS AND THESE SPECIAL PROVISIONS, WILL GOVERN.

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3	GENERAL NOTES
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4	KEY PLAN (NOT INCLUDED IN THIS SUBMISSION)
5	BORING LOCATION PLAN (NOT INCLUDED IN THIS SUBMISSION)
6-12	BORING LOGS (NOT INCLUDED IN THIS SUBMISSION)
13-15	TYPICAL SECTIONS (NOT INCLUDED IN THIS SUBMISSION)
16-32	CONSTRUCTION PLANS (NOT INCLUDED IN THIS SUBMISSION)
33-68	CONSTRUCTION PROFILES (NOT INCLUDED IN THIS SUBMISSION)
69-85	CURB TIE PLANS (NOT INCLUDED IN THIS SUBMISSION)
86-88	GRADING PLANS (NOT INCLUDED IN THIS SUBMISSION)
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111-116	DRAINAGE SCHEDULE (NOT INCLUDED IN THIS SUBMISSION)
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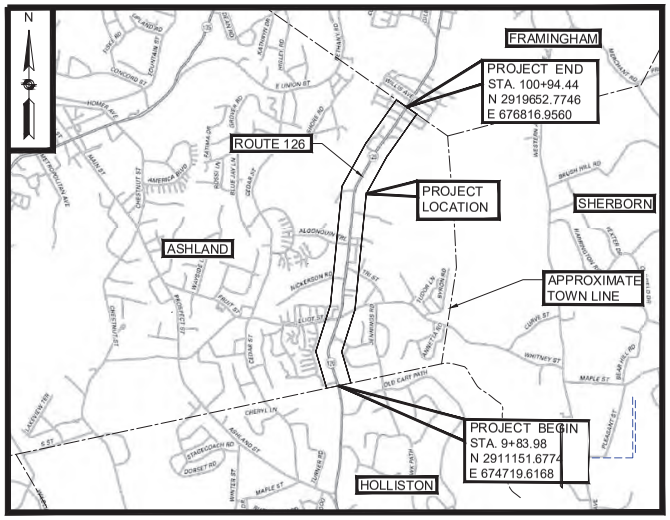
177-178	LIGHTING DETAILS (NOT INCLUDED IN THIS SUBMISSION)
179-186	LANDSCAPE PLANS (NOT INCLUDED IN THIS SUBMISSION)
187-188	LANDSCAPE AND WETLAND REPLICATION DETAILS
189	WETLAND REPLICATION PLANS
190	CONSTRUCTION DETAILS (NOT INCLUDED IN THIS SUBMISSION)
191-194	DRAINAGE DETAILS (NOT INCLUDED IN THIS SUBMISSION)
195-198	WHEELCHAIR RAMP AND DRIVEWAY DETAILS
199-204	WALL PLANS (NOT INCLUDED IN THIS SUBMISSION)
205-214	CULVERT DETAILS
215-327	CROSS SECTIONS (NOT INCLUDED IN THIS SUBMISSION)



LOCATION PLAN

2000 0 2000 4000

SCALE 1" = 4000'

LENGTH OF PROJECT = 9,110.46 FEET = 1.725 MILES

ACOE PLANS SHEET 1 OF 21

DESIGN DESIGNATION - ROUTE 126 (POND STREET)

DESIGN SPEED	45 MPH - Begin to 15+00, 36+00 to 81+00 40 MPH - 15+00 to 36+00, 81+00 to End	
	Framingham Town Line	South of Spyglass Hill Dr
ADT (2014)	17,730	12,100
ADT (2034)	19,590	13,370
K	7.8	8.1
D	53.4	55.3
T (PEAK HOUR)	6.7	8.9
T (AVERAGE DAY)	7.5	9.3
DHV	1,528	1,083
DDHV	816	599
FUNCTIONAL CLASSIFICATION	URBAN PRINCIPAL ARTERIAL	URBAN PRINCIPAL ARTERIAL

ACOE PCN SUBMISSION

DATE: JANUARY 31, 2020
REVISED: MARCH 19, 2020

DATE	DESCRIPTION	REV #
01/17/2020	100% SUBMISSION	2
10/5/2018	REVISED 75% SUBMISSION	1

GREEN INTERNATIONAL AFFILIATES, INC.
TRANSPORTATION · STRUCTURAL · WATER RESOURCES · CIVIL/SITE
239 LITTLETON ROAD, SUITE 3 WESTFORD, MA 01886
978.923.0400 | www.greenintl.com

massDOT Massachusetts Department of Transportation Highway Division

RECOMMENDED FOR APPROVAL

CHIEF ENGINEER DATE

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR DATE

APPROVED

HIGHWAY ADMINISTRATOR DATE

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Proposal No. 604123-111717

GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
JB	JB	JERSEY BARRIER
CB	CB	CATCH BASIN
		CATCH BASIN CURB INLET
FP	FP	FLAG POLE
GP	GP	GAS PUMP
MB	MB	MAIL BOX
		POST SQUARE
		POST CIRCULAR
WELL	WELL	WELL
EHH	EHH	ELECTRIC HANDHOLE
		FENCE GATE POST
GG	GG	GAS GATE
BHL #	BHL #	BORING HOLE
MW #	MW #	MONITORING WELL
TP #	TP #	TEST PIT
		HYDRANT
		LIGHT POLE
CO.BD.		COUNTY BOUND
		GPS POINT
		CABLE MANHOLE
		DRAINAGE MANHOLE
		ELECTRIC MANHOLE
		GAS MANHOLE
		MISC MANHOLE
		SEWER MANHOLE
		TELEPHONE MANHOLE
		WATER MANHOLE
MHB	MHB	MASSACHUSETTS HIGHWAY BOUND
MON		MONUMENT
SB		STONE BOUND
TB		TOWN OR CITY BOUND
		TRAVERSE OR TRIANGULATION STATION
TPL or GUY	TPL or GUY	TROLLEY POLE OR GUY POLE
HTP		TRANSMISSION POLE
UFB	UFB	UTILITY POLE W/ FIREBOX
UPDL	UPDL	UTILITY POLE WITH DOUBLE LIGHT
ULT	ULT	UTILITY POLE W / 1 LIGHT
UPL	UPL	UTILITY POLE
		BUSH
SIZE & TYPE		TREE
		STUMP
		SWAMP / MARSH
WG	WG	WATER GATE
PM	PM	PARKING METER
		OVERHEAD CABLE/WIRE
		CURBING
100 99		CONTOURS (ON-THE-GROUND SURVEY DATA)
100 99		CONTOURS (PHOTOGRAMMETRIC DATA)
		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND WATER MAIN (DOUBLE LINE 24 INCH AND OVER)
		BALANCED STONE WALL
		GUARD RAIL - STEEL POSTS
		GUARD RAIL - WOOD POSTS
		CHAIN LINK OR METAL FENCE
		WOOD FENCE
		HAY BALES/SILT FENCE
		TREE LINE
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		EDGE OF PAVEMENT
		LIMIT OF MICROMILLING AND OVERLAY
		BANK OF RIVER OR STREAM
		BORDER OF WETLAND
		100 FT WETLAND BUFFER
		200 FT RIVERFRONT BUFFER
		STATE HIGHWAY LAYOUT
		TOWN OR CITY LAYOUT
		COUNTY LAYOUT
		RAILROAD SIDELINE
		TOWN OR CITY BOUNDARY LINE
		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT
		SEDIMENT CONTROL BARRIER
		HAND HOLE FOR LIGHT POST

TRAFFIC SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
1	1	CONTROLLER PHASE ACTUATED
		TRAFFIC SIGNAL HEAD (SIZE AS NOTED)
		WIRE LOOP DETECTOR (6' x 6' TYP UNLESS OTHERWISE SPECIFIED)
		VIDEO DETECTION CAMERA
		MICROWAVE DETECTOR
		PEDESTRIAN PUSH BUTTON, SIGN (DIRECTIONAL ARROW AS SHOWN) AND SADDLE
	*	EMERGENCY PREEMPTION CONFIRMATION STROBE LIGHT
		VEHICULAR SIGNAL HEAD
		VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED
		FLASHING BEACON
		PEDESTRIAN SIGNAL HEAD, (TYPE AS NOTED OR AS SPECIFIED)
RRSG	RRSG	RAILROAD SIGNAL
OR		SIGNAL POST AND BASE (ALPHA-NUMERIC DESIGNATION NOTED)
	20'	MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)
		HIGH MAST POLE OR TOWER
		SIGN AND POST
		SIGN AND POST (2 POSTS)
	20'	MAST ARM WITH LUMINAIRE
		OPTICAL PRE-EMPTION DETECTOR
		CONTROL CABINET, GROUND MOUNTED
		CONTROL CABINET, POLE MOUNTED
		FLASHING BEACON CONTROL AND METER PEDESTAL
		LOAD CENTER ASSEMBLY
		PULL BOX 12"x12" (OR AS NOTED)
		ELECTRIC HANDHOLE 12"x24" (OR AS NOTED)
		TRAFFIC SIGNAL CONDUIT

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		PAVEMENT ARROW - WHITE
ONLY	ONLY	LEGEND "ONLY" - WHITE
	SL	STOP LINE - 12"
	CW	CROSSWALK
	SWL	SOLID WHITE LINE - 6"
	SYL	SOLID YELLOW LINE - 6"
	BWL	BROKEN WHITE LINE - 6" (10' LINE SEGMENT, 30' GAP)
	BYL	BROKEN YELLOW LINE - 6" (10' LINE SEGMENT, 30' GAP)
	DWL	DOTTED WHITE LINE - 6" (3' LINE SEGMENT, 9' GAP)
	DYL	DOTTED YELLOW LINE - 6" (3' LINE SEGMENT, 9' GAP)
	DWLEx	DOTTED WHITE LINE EXTENSION - 6" (2' LINE SEGMENT, 6' GAP)
	DWBLEx	DOTTED WHITE BICYCLE LINE EXTENSION - 6" (2' LINE SEGMENT, 2' GAP)
	DYLEx	DOTTED YELLOW LINE EXTENSION - 6" (2' LINE SEGMENT, 6' GAP)
	DBWL	DOUBLE WHITE LINE - 6"
	DBYL	DOUBLE YELLOW LINE - 6"
	SWGL	SOLID WHITE GORE LINE - 12"
	SYGL	SOLID YELLOW GORE LINE - 12"
	YL	YIELD LINE
		SLOTTED PAVEMENT MARKER TWO-WAY YELLOW/YELLOW

ABBREVIATIONS

GENERAL

AADT	ANNUAL AVERAGE DAILY TRAFFIC
ABAN	ABANDON
ADJ	ADJUST
APPROX.	APPROXIMATE
A.C.	ASPHALT CONCRETE
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE
BIT.	BITUMINOUS
BC	BOTTOM OF CURB
BD.	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCHMARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
BR.	BRIDGE
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CC	CEMENT CONCRETE
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CI	CURB INLET
CIP	CAST IRON PIPE
CLDI	CEMENT LINED DUCTILE IRON
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CSP	CORRUGATED STEEL PIPE
CO.	COUNTY
CONC	CONCRETE
CONT	CONTINUOUS
CONST	CONSTRUCTION
CR GR	CROWN GRADE
DHV	DESIGN HOURLY VOLUME
DI	DROP INLET
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DICL	DUCTILE IRON CEMENT-LINED
DW	STEADY DON'T WALK - PORTLAND ORANGE
DWY	DRIVEWAY
ELEV (or EL.)	ELEVATION
EMB	EMBANKMENT
EOP	EDGE OF PAVEMENT
EXIST (or EX)	EXISTING
EXC	EXCAVATION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FDN.	FOUNDATION
FLDSTN	FIELDSTONE
GAR	GARAGE
GD	GROUND
GG	GAS GATE
GI	GUTTER INLET
GIP	GALVANIZED IRON PIPE
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
HDW	HEADWALL
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HYD	HYDRANT
INV	INVERT
JCT	JUNCTION
L	LENGTH OF CURVE
LB	LEACH BASIN
LP	LIGHT POLE
LT	LEFT
MAX	MAXIMUM
MB	MAILBOX
MH	MANHOLE
MHB	MASSACHUSETTS HIGHWAY BOUND
MIN	MINIMUM
MRJ	MECHANICAL RESTRAINING JOINT
NIC	NOT IN CONTRACT
NO.	NUMBER
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
P.G.L.	PROFILE GRADE LINE
PI	POINT OF INTERSECTION
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE
PROJ	PROJECT
PROP	PROPOSED
PSB	PLANTABLE SOIL BORROW
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	2	327
PROJECT FILE NO.	604123		

LEGEND & ABBREVIATIONS

ABBREVIATIONS (cont.)

GENERAL

PVT	POINT OF VERTICAL TANGENCY
PVMT	PAVEMENT
PWW	PAVED WATER WAY
R	RADIUS OF CURVATURE
R&D	REMOVE AND DISPOSE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDWY	ROADWAY
REM	REMOVE
RET	RETAIN
RET WALL	RETAINING WALL
RMD	REMODEL
ROW	RIGHT OF WAY
RR	RAILROAD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RT	RIGHT
RTP	ROADWAY TREE PROTECTION
SB	STONE BOUND
SHLD	SHOULDER
SMH	SEWER MANHOLE
ST	STREET
STA	STATION
SSD	STOPPING SIGHT DISTANCE
SHLO	STATE HIGHWAY LAYOUT LINE
SW	SIDEWALK
T	TANGENT DISTANCE OF CURVE/TRUCK %
TAN	TANGENT
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SLOPE
TYP	TYPICAL
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
WCR	WHEEL CHAIR RAMP
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
X-SECT	CROSS SECTION

TRAFFIC SIGNAL ABBREVIATIONS

CAB	CABINET
CCVE	CLOSED CIRCUIT VIDEO EQUIPMENT
DW	STEADY UPRAISED HAND
FDW	FLASHING UPRAISED HAND
FR	FLASHING CIRCULAR RED
FRL	FLASHING RED LEFT ARROW
FRR	FLASHING RED RIGHT ARROW
FY	FLASHING CIRCULAR YELLOW
FYL	FLASHING YELLOW LEFT ARROW
FYR	FLASHING YELLOW RIGHT ARROW
G	STEADY CIRCULAR GREEN
GL	STEADY GREEN LEFT ARROW
GR	STEADY GREEN RIGHT ARROW
GSL	STEADY GREEN SLASH LEFT ARROW
GSR	STEADY GREEN SLASH RIGHT ARROW
GV	STEADY GREEN VERTICAL ARROW
OL	OVERLAP
PED	PEDESTRIAN
PTZ	PAN, TILT, ZOOM
R	STEADY CIRCULAR RED
RL	STEADY RED LEFT ARROW
RR	STEADY RED RIGHT ARROW
TR SIG	TRAFFIC SIGNAL
TSC	TRAFFIC SIGNAL CONDUIT
W	STEADY WALKING PERSON
Y	STEADY CIRCULAR YELLOW
YL	STEADY YELLOW LEFT ARROW

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Proposal No. 604123-111717

GENERAL NOTES

1. THE LOCATION OF THE EXISTING UTILITIES ARE SHOWN APPROXIMATE AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES AND SUBSURFACE STRUCTURES. THE CONTRACTOR IS RESPONSIBLE FOR MAKING FIELD INVESTIGATIONS AND OBTAINING INFORMATION FROM UTILITY COMPANIES AND INDIVIDUALS TO PINPOINT THE LOCATION AND ELEVATION OF ALL SUBSURFACE UTILITIES AND STRUCTURES. DIG-SAFE : TELEPHONE 1-888-344-7233
2. ALL UTILITY POLES REQUIRING RELOCATION ARE TO BE RELOCATED BY OTHERS.
3. ALL SIDEWALKS WITHIN THE LIMITS OF FULL-DEPTH CONSTRUCTION ARE TO BE CEMENT CONCRETE UNLESS OTHERWISE NOTED.
4. MINIMUM CLEAR PATH ON THE SIDEWALKS SHALL BE 4'-0" EXCLUDING THE SURFACE OF THE CURB.
5. WHEELCHAIR RAMPS AND DRIVEWAYS SHALL CONFORM TO THE CURRENT MASSDOT STANDARDS.
6. TRANSITION GRANITE CURB AT PROJECT LIMITS TO MATCH EXISTING ELEVATIONS (PAVEMENT OR EXISTING CURB).
7. THE CONTRACTOR SHALL RETAIN ALL CURBS, FENCES, WALLS, TREES, SHRUBS, POSTS, LANDSCAPE FEATURES, AND OTHER MISCELLANEOUS ITEMS WITHIN ABUTTING PROPERTIES, UNLESS OTHERWISE NOTED. WHEN RETAINING THOSE ITEMS IS NOT PRACTICAL IN THE OPINION OF THE ENGINEER, THE CONTRACTOR SHALL REMOVE, STOCKPILE, PROTECT AND RESET THE ITEMS. THE CONTRACTOR SHALL REPLACE ITEMS DAMAGED DURING REMOVAL, STOCKPILING, OR RESETTING DUE TO NEGLIGENCE, CARELESSNESS, OR MISHANDLING WITH EQUIVALENT NEW ITEMS AT NO COST TO THE OWNER.
8. ALL TREES WITHIN THE SLOPE LIMIT SHALL BE RETAINED AND PROTECTED UNLESS OTHERWISE NOTED.
9. ALL TREES CALLED OUT TO BE RETAINED WITH ROADWAY TREE PROTECTION SHALL BE PROTECTED USING TREE PROTECTION - INDIVIDUAL AND TREE PROTECTION - TEMPORARY FENCE.
10. CONTRACTOR SHALL PROTECT ALL PROPERTY MARKERS OF ABUTTERS.
11. TREATMENT OF SLOPE AREAS SHALL BE REPLACED IN KIND UNLESS OTHERWISE NOTED.
12. THE EXISTING CONDITIONS SHOWN ON THIS BASEMAP ARE THE RESULT OF AN ON THE GROUND INSTRUMENT SURVEY PERFORMED BETWEEN 4/15/2014 AND 12/19/2014 BY GREEN INTERNATIONAL AFFILIATES, INC. (GREEN). ADDITIONAL GROUND SURVEY WAS PERFORMED BETWEEN 1/30/2017 AND 4/27/2017, AND BETWEEN 2/21/18 AND 2/23/18 BY GREEN TO SUPPLEMENT EXISTING GROUND SURVEY.
12. HORIZONTAL AND VERTICAL CONTROL WAS ESTABLISHED WITH STATIC GPS VECTORS ON 4/17/2014 BY GREEN (SEE GREEN FIELD BOOK NO. 290-138). HORIZONTAL DATUM IS BASED ON THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM, VERTICAL DATUM IS NAVD88 (COMPUTED USING GEOID12A). THE UNIT OF MEASUREMENTS IS US SURVEY FEET.
13. WETLANDS WERE DELINEATED BY GREEN 4/18/2014, 4/29/2014, 2/22/18, 8/12/2019, 8/13/2019 AND 8/14/2019 IN ACCORDANCE WITH THE MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION AND FIELD LOCATED BY GREEN ON MAY 2014 AND AUGUST 2019..
14. THE RIGHT OF WAY LINES SHOWN ON THIS PLAN ARE THE DIRECT RESULT OF AN INSTRUMENT SURVEY PERFORMED ON THE GROUND BY GREEN INTERNATIONAL AFFILIATES, INC. WITH AN ERROR OF CLOSURE LESS THAN 1:15,000, AND FROM PLANS AND DEEDS OF RECORD. PRIVATE PROPERTY LINES ARE COMPILED FROM DEEDS AND PLANS AND SHOULD BE CONSIDERED APPROXIMATE.
15. THE SAID PARCELS SHOWN HERE ARE SUBJECT TO RIGHTS AND EASEMENTS AS CONTAINED IN THE VARIOUS DEEDS OF RECORD DESCRIBING SAID PREMISES. THE LOCATIONS AND EXTENT OF SAID RIGHTS AND EASEMENTS ARE NOT THE SUBJECT OF THIS SURVEY.

UTILITY NOTES:

1. ALL UNDERGROUND UTILITIES AS SHOWN WERE COMPILED USING FIELD SURVEY INFORMATION AND AVAILABLE RECORD INFORMATION. THE LOCATION OF EXISTING PIPES OR OTHER UNDERGROUND STRUCTURES OR PROPERTY LINES ARE NOT WARRANTED TO BE EXACT, NOR IS IT WARRANTED THAT ALL UNDERGROUND PIPES OR STRUCTURES ARE SHOWN. THE CONTRACTOR SHALL CALL "DIG SAFE" (1-888-344-7233) 72 HOURS (EXCLUDING SATURDAYS, SUNDAYS AND HOLIDAYS) PRIOR TO ANY EXCAVATION TO OBTAIN ACCURATE UTILITY LOCATIONS.
2. RECORD UTILITY INFORMATION FROM THE VARIOUS UTILITY COMPANIES AND PUBLIC AGENCIES ARE APPROXIMATE ONLY AND ACTUAL LOCATIONS MUST BE DETERMINED IN THE FIELD.
3. THE COMPLETION AND ACCURACY OF LATERAL UTILITY SERVICES IS NOT GUARANTEED AND MUST BE VERIFIED BY THE CONTRACTOR IN THE FIELD.
4. ALL UTILITY COMPANIES, PUBLIC AND PRIVATE MUST BE NOTIFIED, INCLUDING THOSE IN CONTROL OF UTILITIES NOT SHOWN ON THIS PLAN, (SEE CHAPTER 370, ACTS OF 1963, MASSACHUSETTS) PRIOR TO DESIGNING, EXCAVATING, BLASTING, INSTALLING, BACKFILLING, GRADING, PAVEMENT RESTORING OR REPAVING.
5. SUBSURFACE UTILITY LOCATIONS HAVE BEEN PLOTTED TO MEET UTILITY QUALITY LEVEL "C" AS DESCRIBED IN ASCE STANDARD 38-02 AND SUMMARIZED ON THIS SHEET. THE UNDERGROUND UTILITIES ARE SHOWN IN APPROXIMATE LOCATIONS BASED ON ABOVE-GROUND FIELD OBSERVATION AND EXISTING RECORD INFORMATION RECEIVED FROM UTILITY STAKE-HOLDERS.
6. INVERTS SHOWN ON PLAN ARE NOT GUARANTEED TO BE ACCURATE. DUE TO THE LIMITATIONS OF FIELD OBSERVATION AND SURVEY TECHNIQUES THE INVERTS ARE SHOWN AS APPROXIMATE ONLY AND SHALL NOT BE WARRANTED TO BE CORRECT. ADDITIONAL FIELD INVESTIGATION IS NECESSARY WHERE ACCURATE MEASUREMENTS ARE REQUIRED FOR DESIGN OF CRITICAL AREAS.
7. THE EXISTING CONDITIONS PLAN IS TO BE USED FOR THE SPECIFIED PROJECT ONLY AND IS NOT WARRANTED TO BE COMPLETE FOR ANY OTHER FUTURE PROJECTS.

SUMMARY OF UTILITY MAPPING QUALITY LEVELS:

THE FOLLOWING IS A SUMMARY OF THE SURVEY MAPPING LEVELS FOR UTILITIES AS DESCRIBED IN ASCE STANDARD 38-02, "STANDARD GUIDELINE FOR THE DEPICTION OF EXISTING SUBSURFACE UTILITY DATA". THESE GUIDELINES ARE MORE FULLY DESCRIBED IN THE ASCE STANDARD.

UTILITY QUALITY LEVEL A:
PRECISE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES OBTAINED BY THE ACTUAL EXPOSURE (OR VERIFICATION OF PREVIOUSLY EXPOSED AND SURVEYED UTILITIES) AND SUBSEQUENT MEASUREMENT OF SUBSURFACE UTILITIES, USUALLY AT A SPECIFIC POINT. MINIMALLY INTRUSIVE EXCAVATION EQUIPMENT IS TYPICALLY USED TO MINIMIZE THE POTENTIAL FOR UTILITY DAMAGE. A PRECISE HORIZONTAL AND VERTICAL LOCATION, AS WELL AS OTHER UTILITY ATTRIBUTES, IS SHOWN ON PLAN DOCUMENTS. ACCURACY IS TYPICALLY SET TO 15-MM VERTICAL AND TO APPLICABLE HORIZONTAL SURVEY AND MAPPING ACCURACY AS DEFINED OR EXPECTED BY THE PROJECT OWNER.

UTILITY QUALITY LEVEL B:
INFORMATION OBTAINED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF SUBSURFACE UTILITIES. QUALITY LEVEL B DATA SHOULD BE REPRODUCIBLE BY SURFACE GEOPHYSICS AT ANY POINT OF THEIR DEPICTION. THIS INFORMATION IS SURVEYED TO APPLICABLE TOLERANCES DEFINED BY THE PROJECT AND REDUCED ONTO PLAN DOCUMENTS.

UTILITY QUALITY LEVEL C:
INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE-GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGMENT IN CORRELATING THIS INFORMATION TO QUALITY LEVEL D INFORMATION.

UTILITY QUALITY LEVEL D:
INFORMATION DERIVED FROM EXISTING RECORDS OR ORAL RECOLLECTIONS.

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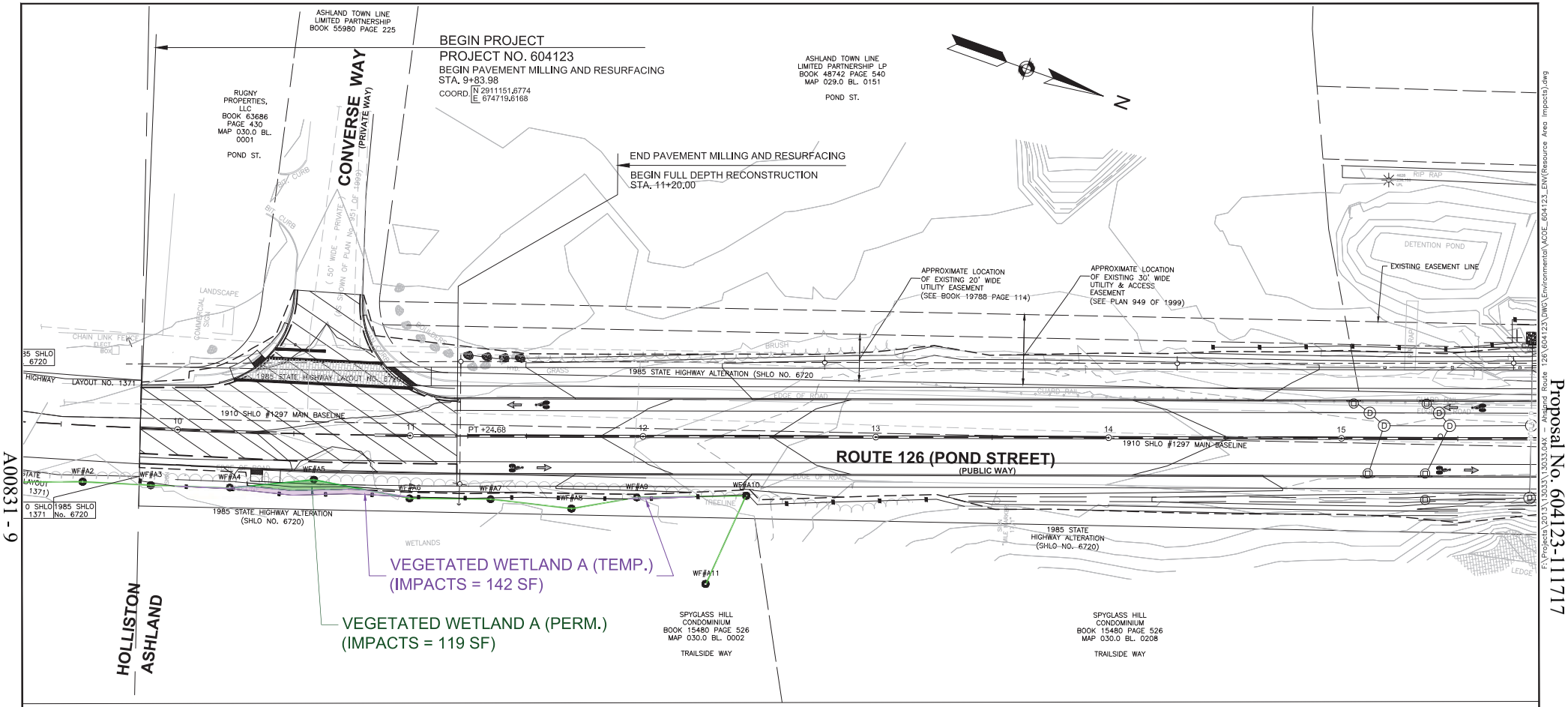
Proposal No. 604123-111717



LEGEND

- PERMANENT VEGETATED WETLAND IMPACT AREA
- TEMPORARY VEGETATED WETLAND IMPACT AREA
- VEGETATED WETLAND REPLICATION AREA
- PERMANENT BELOW OHW IMPACTS
- TEMPORARY BELOW OHW IMPACTS
- VEGETATED WETLAND LINE
- BANK/OHW
- COMPOST FILTER TUBES

40 0 40 80

SCALE IN FEET

TOTAL IMPACTS	
PERMANENT VEGETATED WETLAND IMPACT (SF)	2,963
TEMPORARY VEGETATED WETLAND IMPACT (SF)	2548
VEGETATED WETLAND REPLICATION AREA (SF)	4,110
PERMANENT BELOW OHW	723
TEMPORARY BELOW OHW	182

RESOURCE AREA IMPACTS

ASHLAND, MA

ROUTE 126 (POND STREET), MASSDOT PROJECT #604123

FROM HOLLISTON TOWN LINE TO FRAMINGHAM TOWN LINE

PREPARED BY:	PREPARED FOR:
GREEN INTERNATIONAL AFFILIATES, INC. CIVIL AND STRUCTURAL ENGINEERS 239 LITTLETON RD, WESTFORD, MA (978) 923-0400 24 ALBION RD, LINCOLN, RI (401) 305-7895	massDOT Massachusetts Department of Transportation Highway Division
SCALE: AS NOTED	PROJECT NO. 13033.04
DATE: 01/31/2020 REVISED: 03/11/2020	DRAWN BY: OF CHECKED BY: DS

ACOE PLANS SHEET 4 OF 21

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Proposal No. 604123-111717

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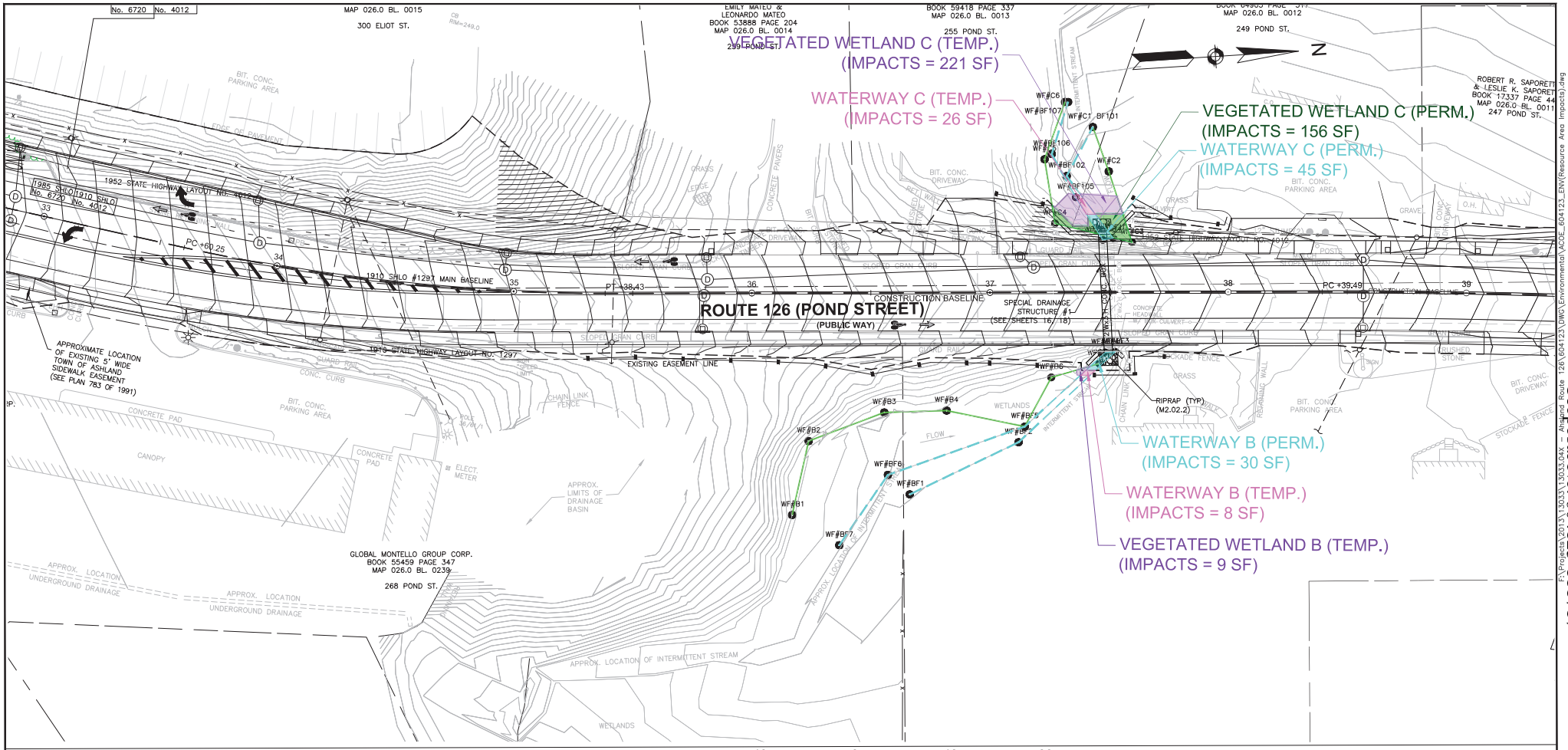


LEGEND

- PERMANENT VEGETATED WETLAND IMPACT AREA
- TEMPORARY VEGETATED WETLAND IMPACT AREA
- VEGETATED WETLAND REPLICATION AREA
- PERMANENT BELOW OHW IMPACTS
- TEMPORARY BELOW OHW IMPACTS
- VEGETATED WETLAND LINE
- BANK/OHW
- COMPOST FILTER TUBES

40 0 40 80

SCALE IN FEET
1" = 40'

RESOURCE AREA IMPACTS

ASHLAND, MA
ROUTE 126 (POND STREET), MASSDOT PROJECT #604123
FROM HOLLISTON TOWN LINE TO FRAMINGHAM TOWN LINE

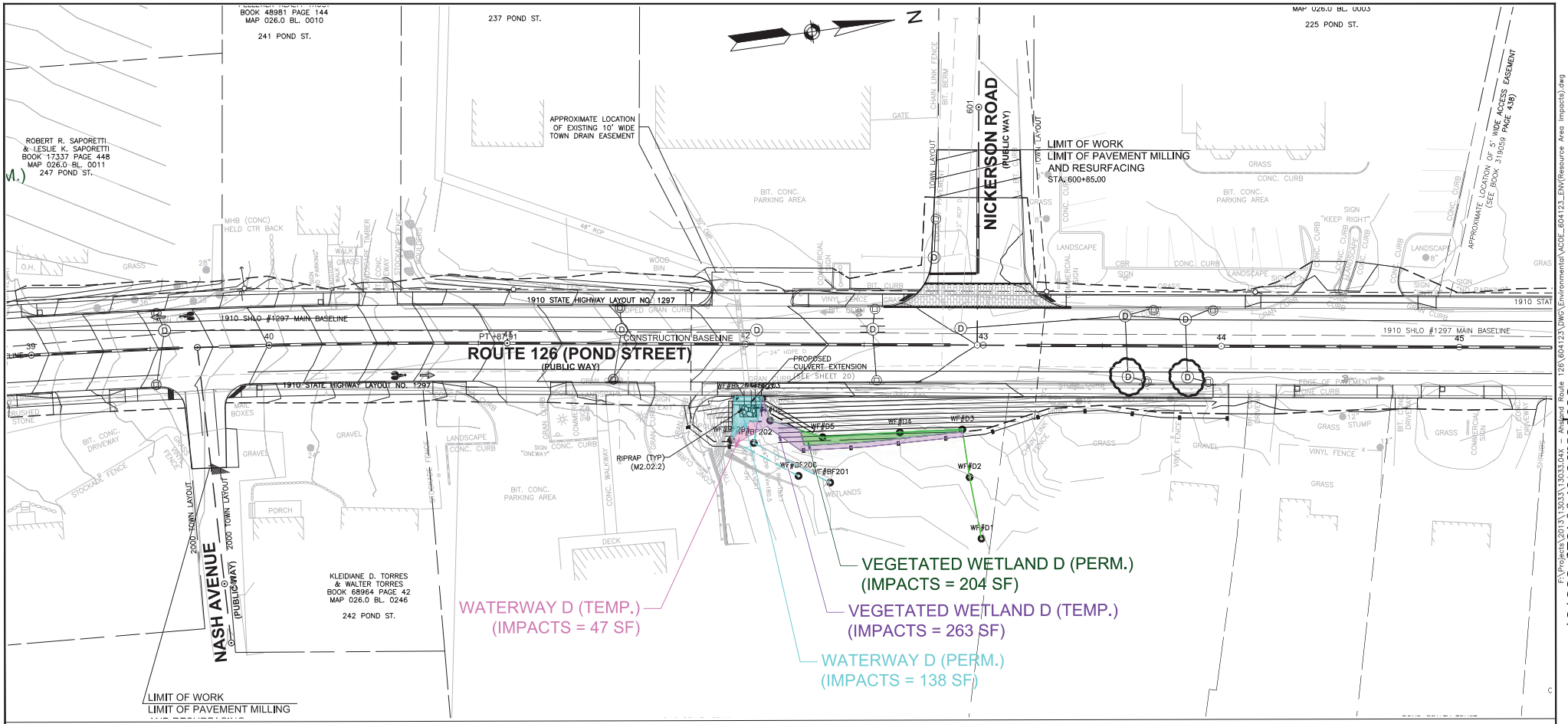
PREPARED BY:	PREPARED FOR:
GREEN INTERNATIONAL AFFILIATES, INC. CIVIL AND STRUCTURAL ENGINEERS 259 LITTLETON RD, WESTFORD, MA (978) 923-0400 24 ALBION RD, LINCOLN, RI (401) 305-7885	massDOT Massachusetts Department of Transportation Highway Division
SCALE: AS NOTED	PROJECT NO. 13033.04
DATE: 01/31/2020 REVISED: 03/11/2020	DRAWN BY: OF CHECKED BY: DS

ACOE PLANS SHEET 5 OF 21

A00831 - 10

Proposal No. 604123-111717

F:\Projects\2013\13033\13033.04X - Aligned Route 126\604123\DWG\Environmental\ACOE_604123_ENV(Resource Area Impacts).dwg



LEGEND

- PERMANENT VEGETATED WETLAND IMPACT AREA
- TEMPORARY VEGETATED WETLAND IMPACT AREA
- VEGETATED WETLAND REPLICATION AREA
- PERMANENT BELOW OHW IMPACTS
- TEMPORARY BELOW OHW IMPACTS
- VEGETATED WETLAND LINE
- BANK/OHW
- COMPOST FILTER TUBES

40 0 40 80

SCALE IN FEET
1" = 40'

RESOURCE AREA IMPACTS

ASHLAND, MA
ROUTE 126 (POND STREET), MASSDOT PROJECT #604123
FROM HOLLISTON TOWN LINE TO FRAMINGHAM TOWN LINE

PREPARED BY:	PREPARED FOR:
GREEN INTERNATIONAL AFFILIATES, INC. CIVIL AND STRUCTURAL ENGINEERS 239 LITTLETON RD. WESTFORD, MA (978) 923-0400 24 ALBION RD, LINCOLN, RI (401) 305-7895	massDOT Massachusetts Department of Transportation Highway Division
SCALE: AS NOTED	PROJECT NO. 13033.04
DATE: 01/31/2020 REVISED: 03/11/2020	DRAWN BY: OF CHECKED BY: DS

A00831 - 11

Proposal No. 604123-111717

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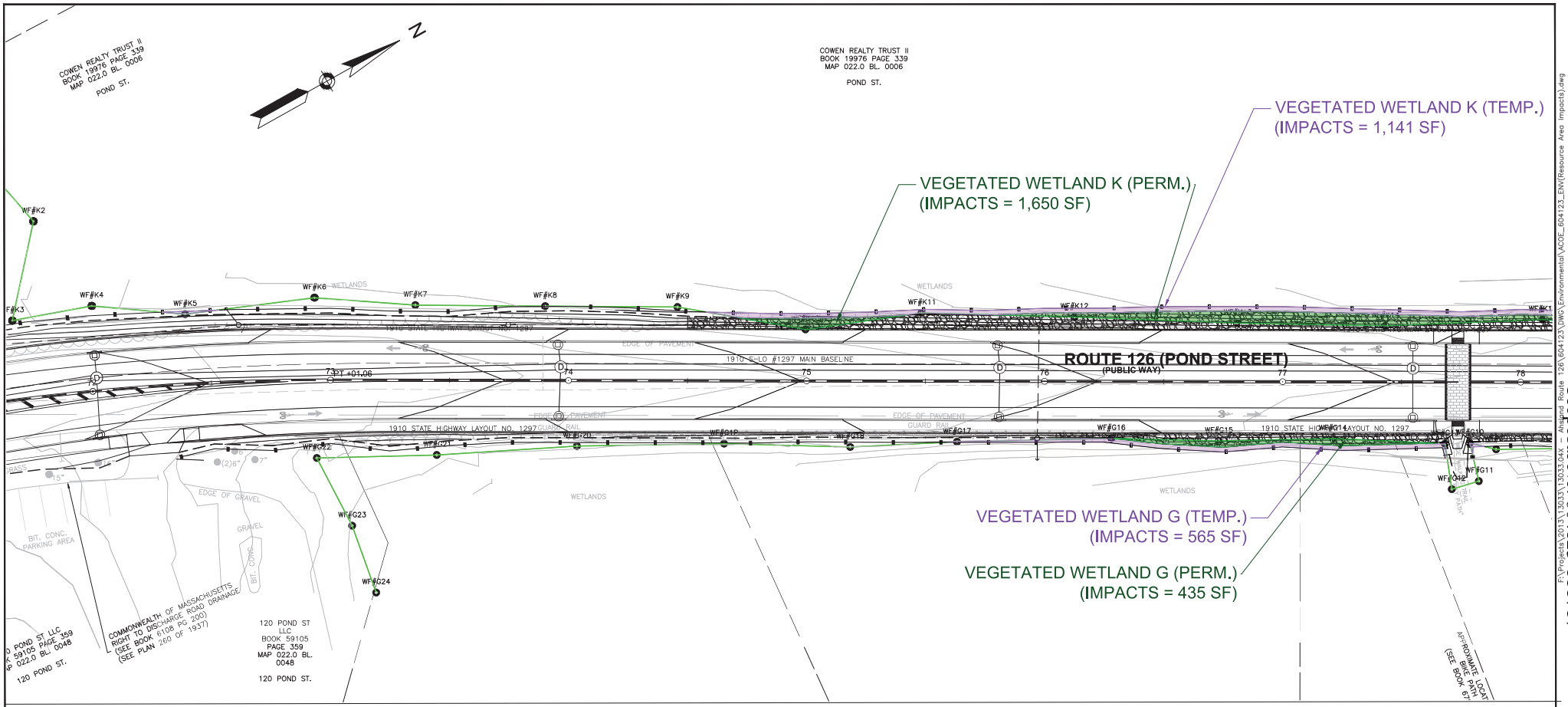

LEGEND

- PERMANENT VEGETATED WETLAND IMPACT AREA
- TEMPORARY VEGETATED WETLAND IMPACT AREA
- VEGETATED WETLAND REPLICATION AREA
- PERMANENT BELOW OHW IMPACTS
- TEMPORARY BELOW OHW IMPACTS
- VEGETATED WETLAND LINE
- BANK/OHW
- COMPOST FILTER TUBES

40 0 40 80

SCALE IN FEET
1" = 40'

RESOURCE AREA IMPACTS

ASHLAND, MA

ROUTE 126 (POND STREET), MASSDOT PROJECT #604123
FROM HOLLISTON TOWN LINE TO FRAMINGHAM TOWN LINE

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SCALE: AS NOTED	PROJECT NO. 13033.04
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ACOE PLANS SHEET 7 OF 21

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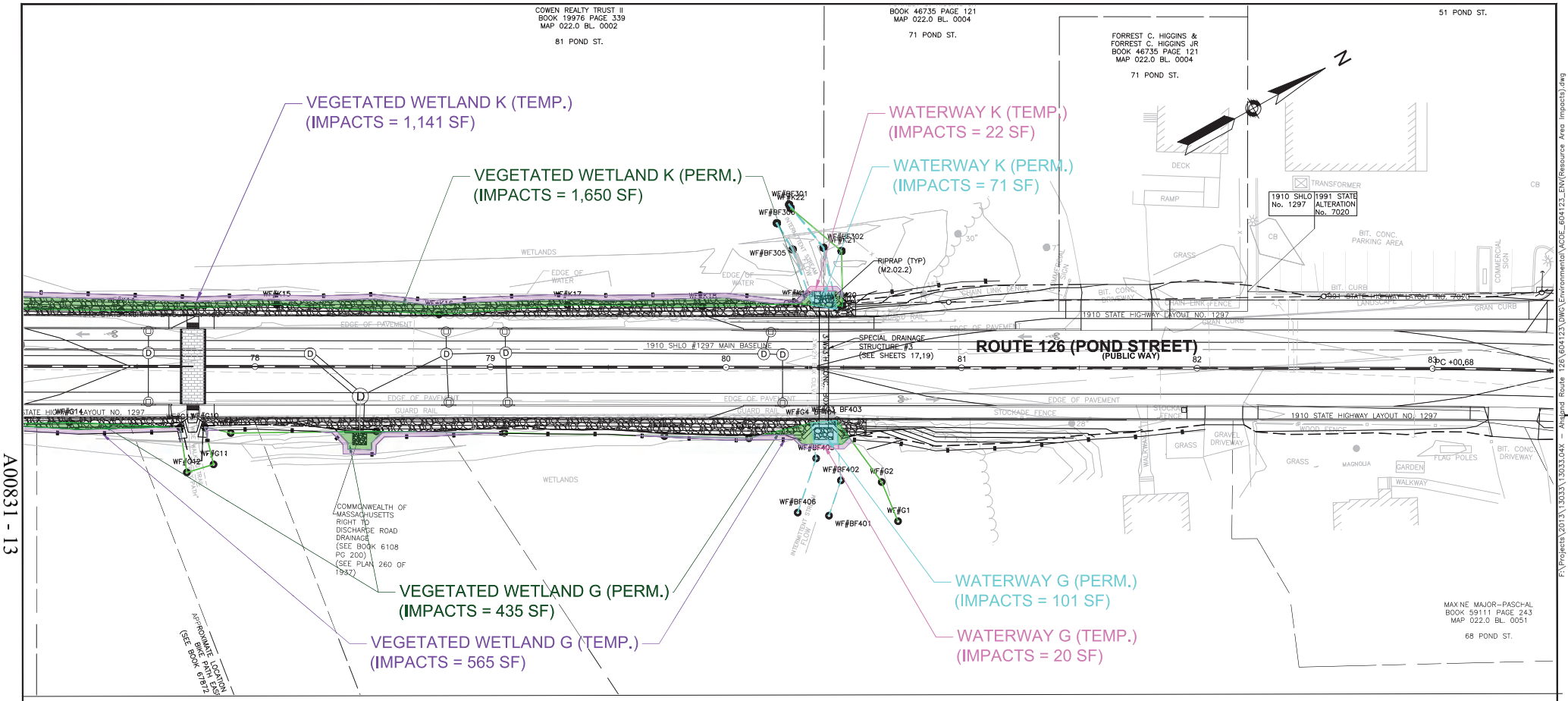
Proposal No. 604123-111717



LEGEND

- PERMANENT VEGETATED WETLAND IMPACT AREA
- TEMPORARY VEGETATED WETLAND IMPACT AREA
- VEGETATED WETLAND REPLICATION AREA
- PERMANENT BELOW OHW IMPACTS
- TEMPORARY BELOW OHW IMPACTS
- VEGETATED WETLAND LINE
- BANK/OHW
- COMPOST FILTER TUBES

40 0 40 80

SCALE IN FEET
1" = 40'

RESOURCE AREA IMPACTS

ASHLAND, MA
ROUTE 126 (POND STREET), MASSDOT PROJECT #604123
FROM HOLLISTON TOWN LINE TO FRAMINGHAM TOWN LINE

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DATE: 01/31/2020 REVISED: 03/11/2020	DRAWN BY: OF CHECKED BY: DS

ACOE PLANS SHEET 8 OF 21

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Proposal No. 604123-111717

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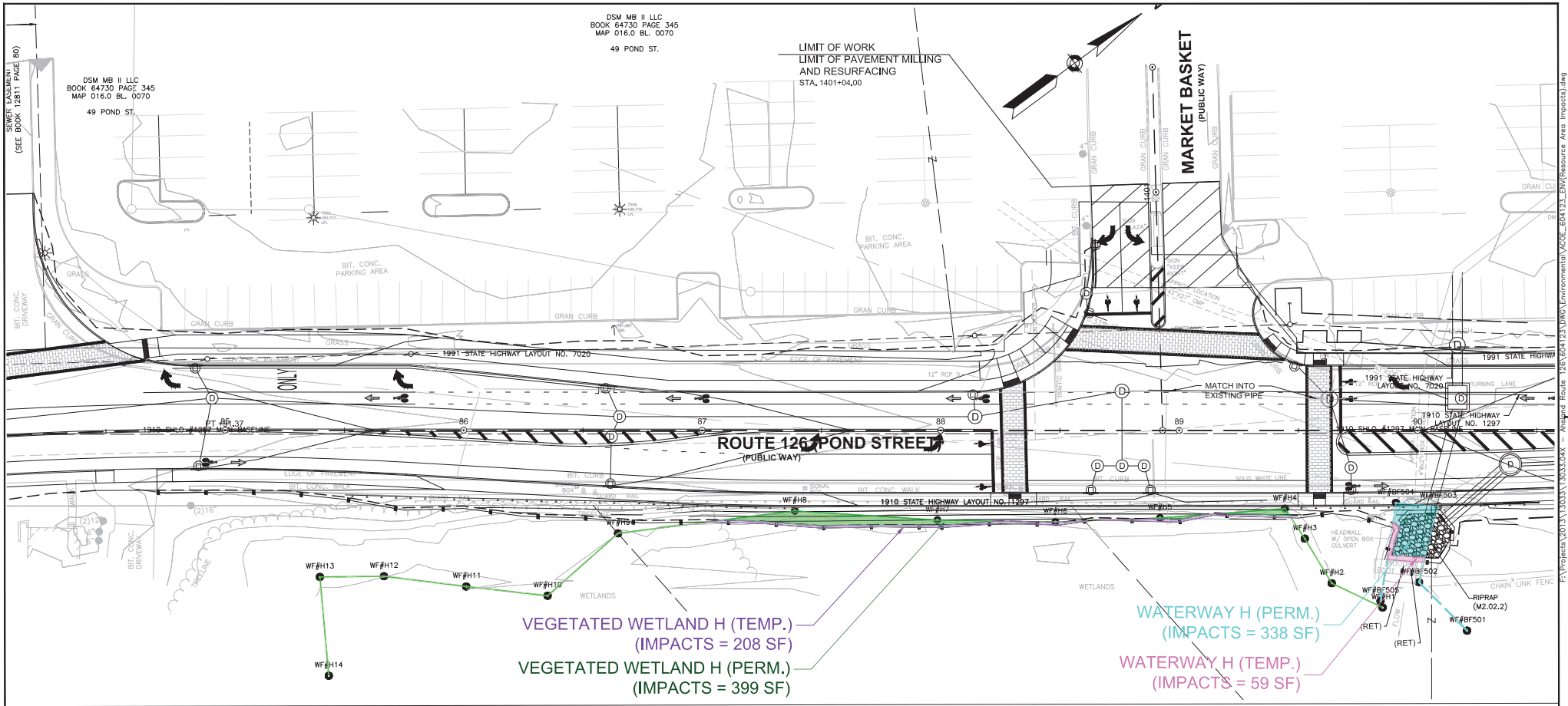

LEGEND

- PERMANENT VEGETATED WETLAND IMPACT AREA
- TEMPORARY VEGETATED WETLAND IMPACT AREA
- VEGETATED WETLAND REPLICATION AREA
- PERMANENT BELOW OHW IMPACTS
- TEMPORARY BELOW OHW IMPACTS
- VEGETATED WETLAND LINE
- BANK/OHW
- COMPOST FILTER TUBES

40 0 40 80

SCALE IN FEET
1" = 40'

RESOURCE AREA IMPACTS

ASHLAND, MA

ROUTE 126 (POND STREET), MASSDOT PROJECT #604123
FROM HOLLISTON TOWN LINE TO FRAMINGHAM TOWN LINE

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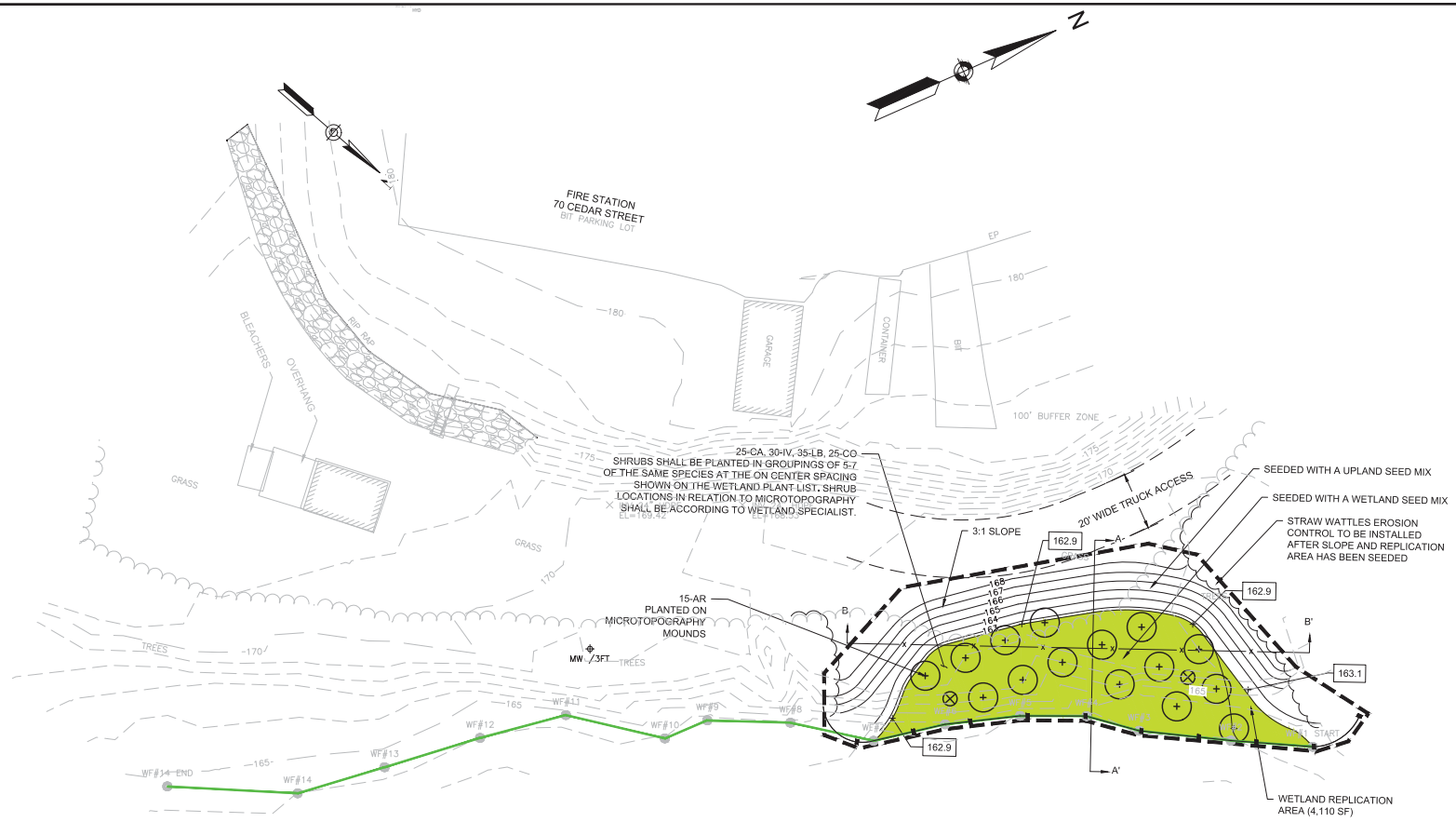
ACOE PLANS SHEET 9 OF 21



LEGEND

- PERMANENT VEGETATED WETLAND IMPACT AREA
- TEMPORARY VEGETATED WETLAND IMPACT AREA
- VEGETATED WETLAND REPLICATION AREA
- VEGETATED WETLAND LINE
- INTERMITTENT STREAM BANK
- COMPOST FILTER TUBES

40 0 40 80

SCALE IN FEET
1" = 40'

RESOURCE AREA IMPACTS

ASHLAND, MA
ROUTE 126 (POND STREET), MASSDOT PROJECT #604123
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WQC/ACOE PLANS SHEET 10 OF 21

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Proposal No. 604123-111717

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ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	189	327
PROJECT FILE NO.	604123		

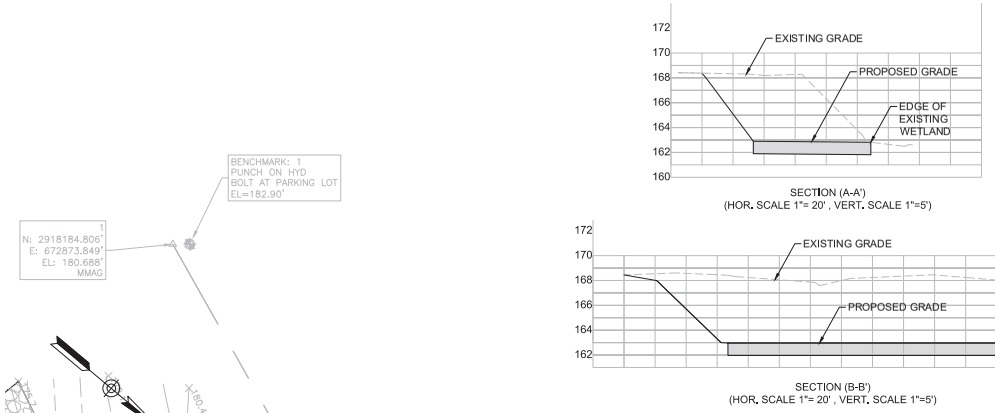
WETLAND REPLICATION PLAN
SHEET 1 OF 1

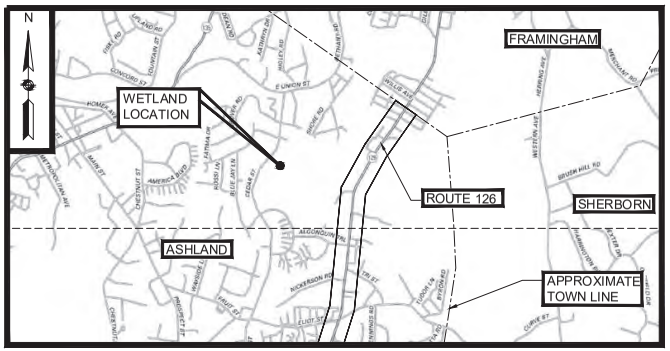
WETLAND REPLICATION AREA SEDIMENTATION AND EROSION CONTROL NOTES:

1. PRIOR TO STARTING ANY WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION & SEDIMENTATION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS IDENTIFIED IN ALL APPROVAL DOCUMENTS PERTAINING TO THIS PROJECT.
2. PERIODIC INSPECTION AND MAINTENANCE OF ALL SEDIMENT CONTROL STRUCTURES SHALL BE PROVIDED TO INSURE THAT THE INTENDED PURPOSE IS ACCOMPLISHED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SEDIMENT LEAVING THE LIMIT OF WORK. SEDIMENT CONTROL MEASURES SHALL BE IN WORKING CONDITION AT THE END OF EACH WORKING DAY.
3. ALL POINTS OF CONSTRUCTION INGRESS OR EGRESS WILL BE PROTECTED TO PREVENT TRACKING OF MUD ONTO PUBLIC WAYS.
4. AFTER ANY SIGNIFICANT RAINFALL, SEDIMENT CONTROL STRUCTURES SHALL BE INSPECTED FOR INTEGRITY. ANY DAMAGED DEVICES SHALL BE CORRECTED IMMEDIATELY.
5. ANY SEDIMENT TRACKED ONTO PAVED AREAS SHALL BE SWEPT AT THE END OF EACH WORKING DAY.
6. ALL DEBRIS GENERATED DURING SITE PREPARATION ACTIVITIES SHALL BE LEGALLY DISPOSED OF OFF-SITE.
7. AN EROSION CONTROL BARRIER SHALL BE INSTALLED AS SHOWN ON THE PLANS.
8. MEANS OF EROSION AND SEDIMENT PROTECTION AS NOTED ON THE DRAWINGS INDICATE THE MINIMUM PROVISIONS NECESSARY. ADDITIONAL MEANS OF PROTECTION SHALL BE PROVIDED BY THE CONTRACTOR AS REQUIRED FOR CONTINUED OR UNFORESEEN EROSION PROBLEMS, AT NO ADDITIONAL EXPENSE TO THE OWNER.

WETLAND REPLICATION AREA PLANTING NOTES AND CONSTRUCTION SEQUENCE:

1. CONTRACTOR SHALL COORDINATE WITH THE TOWN OF ASHLAND REGARDING ACCESS.
2. EROSION CONTROLS WILL BE INSTALLED ALONG THE EXISTING WETLAND BOUNDARY. THIS WILL ALLOW THE SITE CONTRACTOR TO PROPERLY TIE - IN PROPOSED CONTOURS AT THE EDGE OF THE EXISTING WETLAND.
3. UNDER THE DIRECTION OF THE WETLAND SPECIALIST, THE CONTRACTOR SHALL PROVIDE ROUGH GRADING (+/- 3 INCHES) WITHIN THE REPLICATION WETLAND. WETLAND MITIGATION GRADING IS SUBJECT TO MODIFICATION BASED ON ACTUAL SITE CONDITIONS. THE WETLAND SPECIALIST WILL INSPECT THE SUB-GRADE OF THE REPLICATION AREA TO ENSURE THAT THE PROPER HYDROLOGY AND MICROTOPOGRAPHY HAS BEEN ESTABLISHED.
4. PRIOR TO SOIL ADDITIONS AND/OR PLANTINGS, PROJECT SURVEYORS SHOULD VERIFY THAT GRADES HAVE BEEN ACHIEVED AS SHOWN ON THIS DRAWING.
5. PRIOR TO PLANTING, THE MITIGATION AREA SHOULD BE EXCAVATED APPROXIMATELY 1 FOOT BELOW THE FINISHED GRADE OF THE WETLAND MITIGATION AREA. FOLLOWING EXCAVATION OF THE MITIGATION AREA, A SOIL MIXTURE (NATURAL OR MANMADE) CONSISTING OF EQUAL VOLUMES OF ORGANIC (COMPOST) MATERIAL AND MINERAL SOIL MATERIAL SUCH AS A RICH LOAMY SAND (WITH A LOOSE FRIABLE CONSISTENCY) SHALL BE USED TO BRING THE EXCAVATED WETLAND MITIGATION AREA TO FINISHED GRADE. PRIOR TO USE, THE SOIL MIXTURE WILL BE ANALYZED BY A SOIL TESTING LABORATORY FOR TEXTURE AND NUTRIENTS. THE SELECTED CONTRACTOR WILL BE RESPONSIBLE FOR THIS COORDINATION. SEE SPECIAL PROVISION.
6. ESTIMATES OF SEASONAL HIGH GROUNDWATER (SHGW) SHALL BE DETERMINED IN THE FIELD AT THE TIME OF REPLICATION GRADING. THE FINISH GRADE OF THE WETLAND MITIGATION AREA SHALL BE SET SO THAT GROUNDWATER IS WITHIN 12" OF THE SURFACE FOR AT LEAST 14 CONSECUTIVE DAYS DURING THE GROWING SEASON.
7. PENDING SITE AND WEATHER CONDITIONS ALL PLANTINGS WILL TAKE PLACE IN SPRING (MAY 15-JUNE 15) OR FALL (SEPTEMBER 1 - NOVEMBER 1).
8. TREES PLANTED IN THE REPLICATION AREA SHALL BE LOCATED ON AREAS OF HIGHER ELEVATION (I.E., GRADED MOUNDS). TREES SHALL BE LOCATED IN THE FIELD BY THE WETLAND SPECIALIST.
9. 4" OF LOAM (WEED-FREE, FINE SANDY LOAM) AND A CONSERVATION/WILDLIFE SEED MIX WILL BE SPREAD THROUGHOUT THE GRADED 3:1 UPLAND SLOPES AND IN ALL OTHER AREAS DISTURBED BY THE CONTRACTOR AS SPECIFIED. LOAM, SEED MIXTURE AND SOURCE SHALL BE APPROVED BY THE WETLAND SPECIALIST.





LOCUS PLAN

LEGEND

- 4" LOAM BORROW AND CONSERVATION SEED MIX IN ALL DISTURBED UPLAND AND SLOPED AREAS
- WETLAND SOIL AND WETLAND SEED MIX
- LIMIT OF WORK
- STRAW WATTLES
- PROPOSED CONTOUR (168)
- EXISTING CONTOUR (170)
- COMPOST FILTER TUBE
- PROPOSED SPOT GRADE (163.3)
- TREE

ACOE PLANS SHEET 11 OF 21

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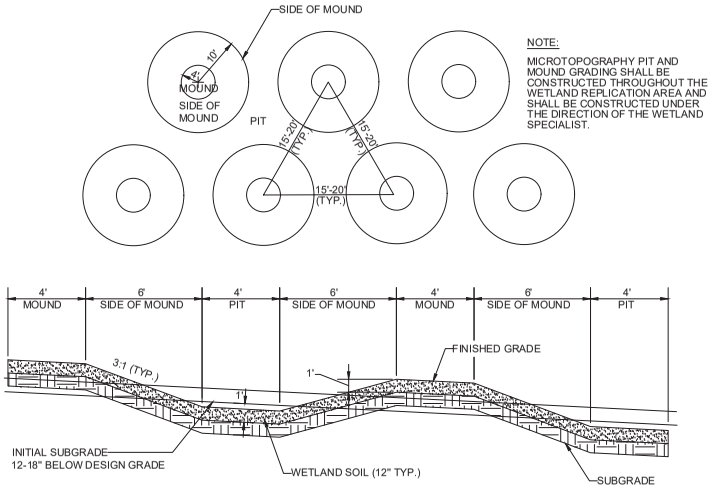
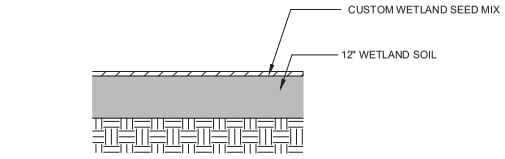
Proposal No. 604123-111717



1 WETLAND REPLICATION MICROTOPOGRAPHY

NOT TO SCALE



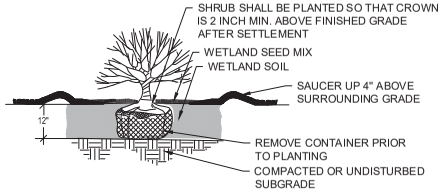
NOTES:
1. WETLAND SPECIALIST SHALL APPROVE GRADES PRIOR TO SOIL INSTALLATION.
2. SEE NON TIDAL WETLAND MITIGATION SPEC FOR SOIL AND PLANTING REQUIREMENTS.

3 WETLAND REPLICATION DETAIL

NOT TO SCALE

RAISE AND REPLANT ANY SHRUBS WHICH SETTLE MORE THAN 2 INCHES AFTER PLANTING & WATERING IN SHRUBS SHALL BE SET PLUMB

WATER BY FLOODING TWICE IN FIRST TWO HOURS AFTER PLANTING. WATER & MAINTAIN AS PER STANDARD SPECIFICATIONS



4 WETLAND SHRUB PLANTING

NOT TO SCALE

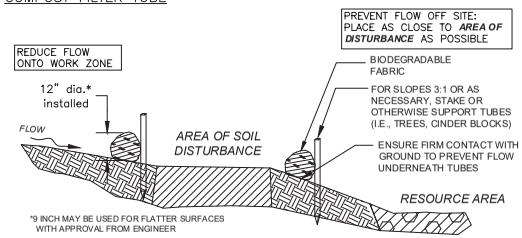
PLANT LIST - WETLAND REPLICATION TOTAL

KEY	QTY	WETLAND STATUS	BOTANICAL NAME	COMMON NAME	PLANT TYPE	PLANT SIZE	DENSITY/SPACING
AR	15	FAC	ACER RUBRUM	RED MAPLE	TREE	4-6' HT	RANDOM AT RAISED MOUNDS
CA	25	FAC	CLETHRA ALNIFOLIA	SWEET PEPPERBUSH	SHRUB	3-4' HT	5-6' ON CENTER
CO	25	FACW	CORNUS AMOMUM	SILKY DOGWOOD	SHRUB	3-4' HT	5-6' ON CENTER
IV	30	FACW	ILEX VERTICILATA	COMMON WINTERBERRY	SHRUB	3-4' HT	5-6' ON CENTER
LB	35	FACW	LINDERA BENZOIN	SPICEBUSH	SHRUB	3-4' HT	5-6' ON CENTER
	-	-	-	WETLAND SEEED MIX	HERBACEOUS	-	1LB/2,000 SF
	-	-	-	UPLAND/BUFFER SEED MIX	HERBACEOUS	-	1LB/2,000 SF

5 PLANT LIST WETLAND

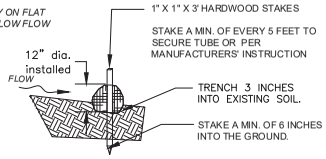
NOT TO SCALE

COMPOST FILTER TUBE

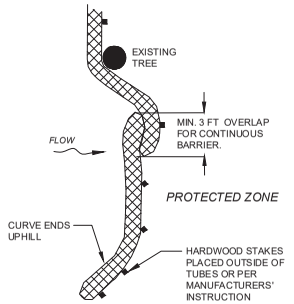


12 INCH STRAW WATTLE

TO BE USED ONLY ON FLAT SURFACES WITH LOW FLOW



SECTION



PLACE TUBE ALONG CONTOURS AND PERPENDICULAR TO FLOW.

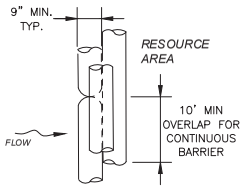
ADJUST LOCATION AS REQUIRED FOR OPTIMUM EFFECTIVENESS. DO NOT INSTALL IN WATERWAYS.

PLACE STAKES AS NEEDED TO SECURE TUBES IN PLACE.

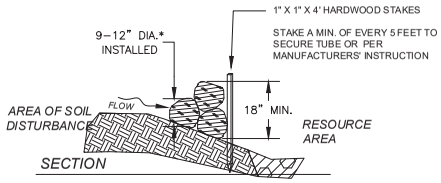
PLAN VIEW

SEDIMENT CONTROL BARRIERS - COMPOST FILTER TUBE & STRAW WATTLES

NOT TO SCALE



PLAN VIEW



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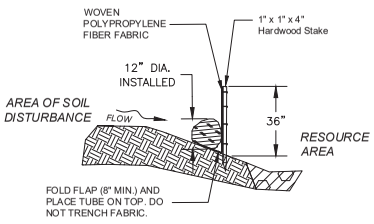

SECTION

COMPOST FILTER TUBE & SILT FENCE

NOT TO SCALE

COMPOST FILTER TUBE BERM (SLOPES 2:1 OR STEEPER)

NOT TO SCALE

2 SEDIMENT CONTROL BARRIERS - COMPOST FILTER TUBE & STRAW WATTLES

NOT TO SCALE

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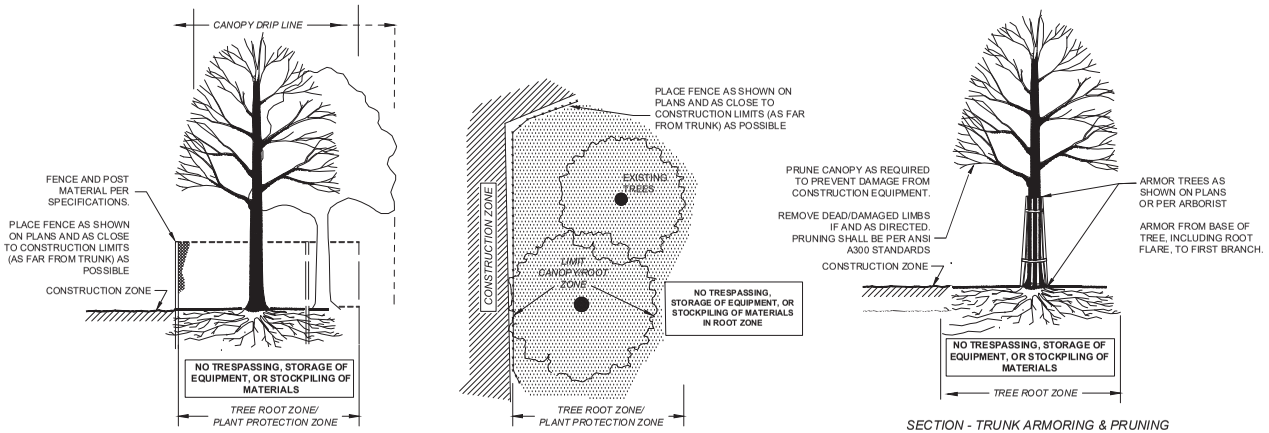
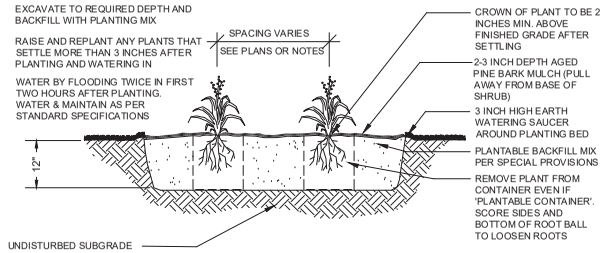
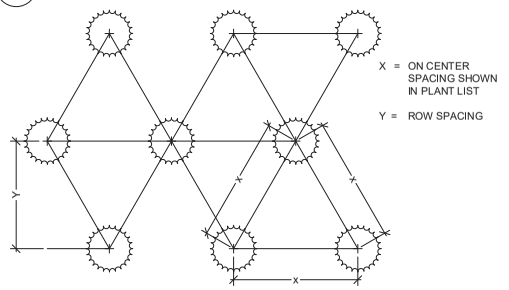
Proposal No. 604123-111717



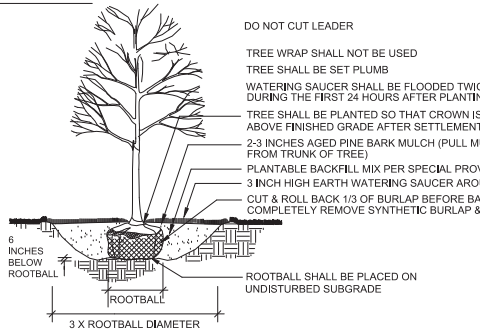
1 TREE PROTECTION DETAILS
NOT TO SCALE



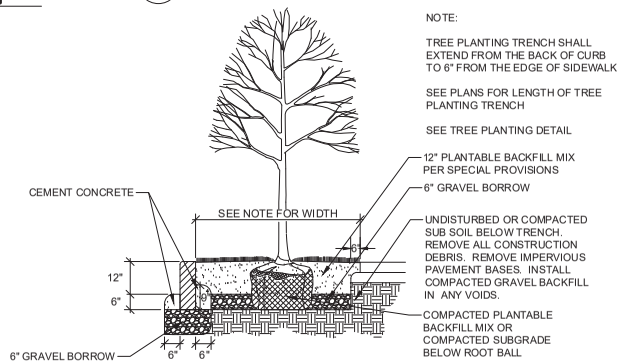
3 PERENNIAL AND ORNAMENTAL GRASS PLANTING
NOT TO SCALE



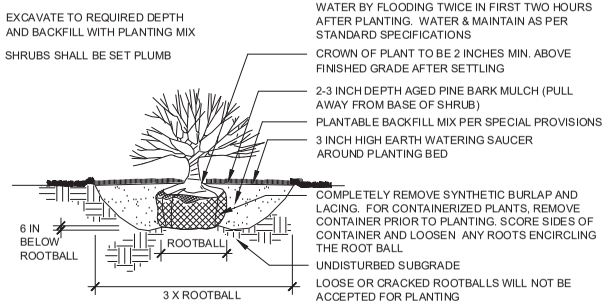
5 SHRUB, PERENNIAL AND ORNAMENTAL GRASS SPACING PLAN DETAIL
NOT TO SCALE



4 TREE PLANTING
NOT TO SCALE



6 TREE PLANTING TRENCH
NOT TO SCALE



2 SHRUB PLANTING
NOT TO SCALE

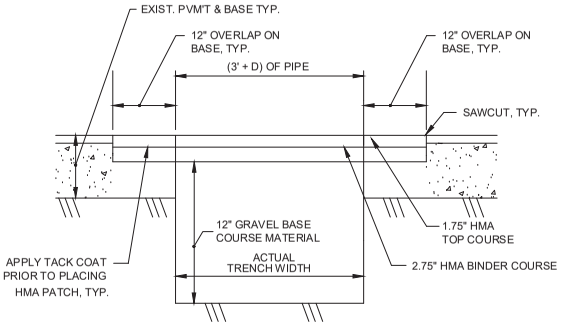
PLANT LIST - TOTAL FOR UPLAND

KEY	QTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS/ SPACING	ROOT
		DECIDUOUS TREES				
ARS	5	ACERXFREEDMANI 'ARMSTRONG'	ARMSTRONG FREEDMAN MAPLE	2-2.5" CAL.		B&B
ARK	2	ACER RUBRUM 'KARPICK'	KARPICK RED MAPLE	2-2.5" CAL.		B&B
BN	3	BETULA NIGRA	RIVER BIRCH	2-2.5" CAL.	SINGLE STEM	B&B
OV	3	OSTRYA VIRGINIANA	HOP HORNBEAM	2-2.5" CAL.	SINGLE STEM	B&B
CR	1	CORNUS 'RUTCAN' CONSTELLATION	CONSTELLATION DOGWOOD	1.5" CAL		CONT #15
GB	14	GINKGO BILOBA AUTUMN GOLD	AUTUMN GOLD GINKO	2-2.5" CAL.		B&B
GT	10	GLEDITSIA TRIACANTHOS 'SHADEMASTER'	SHADEMASTER HONEYLOCUST	2-2.5" CAL.		B&B
LSH	3	LIQUIDAMBAR STYRACIFLUA 'HAPDELL'	HAPPIDAZE FRUITLESS SWEET GUM	2-2.5" CAL.		B&B
MA	11	MALUS 'ADIRONDACK'	ADIRONDACK CRABAPPLE	2-2.5" CAL.		B&B
PC	9	PYRUS CALLERYANA ' CHANTICLEER'	CLEVELAND SELECT PEAR	2-2.5" CAL.		B&B
UAP	4	ULMNUS AMERICANA 'PRINCETON'	PRINCETON ELM	2-2.5" CAL.		B&B
		DECIDUOUS SHRUBS				
CP	33	COMPTONIA PEREGRINA	SWEETFERN	18-24" SP.	4' O.C.	CONT #3
RA	92	RHUS AROMATICA 'GRO-LOW'	GRO-LOW FRAGRANT SUMAC 2 GAL	18-24" SP.	3.5' O.C.	CONT #3
		EVERGREEN SHRUBS				
IC	4	ILEX CRENATA 'HETZII'	HETZ HOLLY	24-30" SP.	4' O.C.	CONT #5
JHB	18	JUNIPERUS HORIZONTALIS 'BAR HARBOR'	BAR HARBOR JUNIPER	18-24" SP.	3' O.C.	CONT #2
JHP	62	JUNIPERUS HORIZONTALIS PLUMOSA COMPACTA	COMPACT ANDORRA JUNIPER	18-24" SP.	3' O.C.	CONT #2
JSB	96	JUNIPEROUS SQUAMATA 'BLUE STAR'	BLUE STAR JUNIPER	12-18" SP.	18" O.C.	CONT #2
JSG	9	JUNIPERUS CHINESIS 'SEA GREEN'	SEA GREEN JUNIPER	2-2.5 FT	4' O.C.	CONT #5
		PERENNIALS AND GRASSES				
HH	48	HEMEROCALLIS HAPPY RETURNS	HAPPY RETURNS DAY LILLY	CONT #1	18" O.C.	
HP	90	HEMEROCALLIS PURPLE	PURPLE D'ORO DAY LILLY	CONT #1	18" O.C.	
HR	57	HEMEROCALLIS RED HOT RETURNS	RED HOT RETURNS DAY LILLY	CONT #1	18" O.C.	
NW	255	NEPETA RACEMOSA 'WALKERS LOW'	WALKERS LOW CAT MINT	CONT #1	18" O.C.	
PHM	131	PANICUM VIRGATUM 'HEAVY METAL'	HEAVY METAL SWITCH GRASS	CONT #2	18" O.C.	
PVS	71	PANICUM VIRGATUM 'SHENANDOAH'	SHENANDOAH SWITCH GRASS	CONT #2	18" O.C.	
PKR	124	PENNESETUM OREINTALE 'KARLY ROSE'	KARLEY ROSE FLOWERING FOUNTAIN GRASS	CONT #2	24" O.C.	

7 PLANT LIST TOTAL FOR PLAN
NOT TO SCALE

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	191	327
PROJECT FILE NO.	604123		

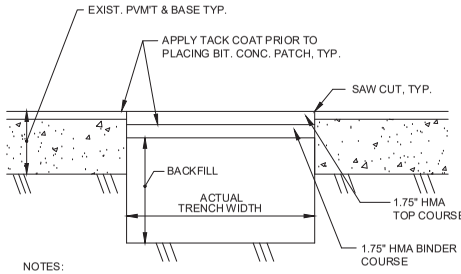
DRAINAGE & UTILITY DETAILS (1 OF 4)



NOTES:
1. PERMANENT PATCH IS TO BE USED ON SEWELL STREET.
2. MATCH EXISTING PAVEMENT ELEVATION.
3. PERMANENT HMA PATCH IS NOT REQUIRED WITHIN THE LIMITS OF FULL DEPTH RECONSTRUCTION, TEMPORARY HMA PATCH SHALL BE MAINTAINED UNTIL FULL DEPTH RECONSTRUCTION IS PERFORMED IN THESE AREAS.
4. PERMANENT PATCH TO BE PAID FOR UNDER ITEM 451.

1 PERMANENT HMA PATCH DETAIL

SCALE: NOT TO SCALE



NOTES:
1. PERMANENT HMA PATCH SHALL BE USED IN ALL AREAS THAT WILL BE MILLED & OVERLAID. PERMANENT HMA PATCH IS NOT REQUIRED WITHIN THE LIMITS OF FULL DEPTH RECONSTRUCTION, TEMPORARY HMA PATCH SHALL BE MAINTAINED UNTIL FULL DEPTH RECONSTRUCTION IS PERFORMED IN THESE AREAS.
2. TEMPORARY HMA PATCH IN AREAS THAT WILL BE SUBJECT TO FULL DEPTH CONSTRUCTION, IN-SITU MATERIAL MAY BE USED FOR BACKFILL.
3. PAVEMENT FOR TEMPORARY HMA PATCH SHALL BE PAID FOR UNDER ITEM 472.

2 TEMPORARY HMA PATCH DETAIL

SCALE: NOT TO SCALE

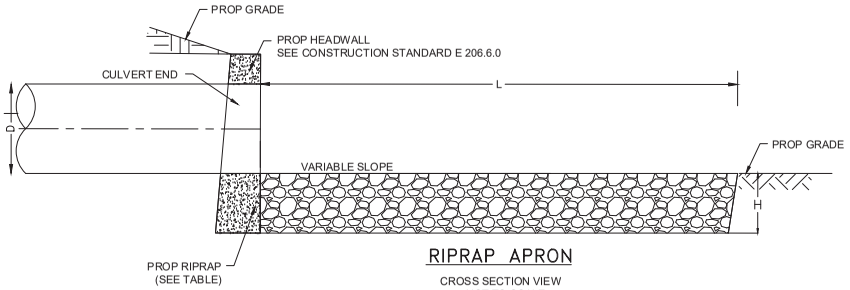
CULVERT SIZE D (INCHES)	LENGTH OF APRON L (FEET)	DEPTH OF APRON H (INCHES)	MASSDOT RIPRAP SIZE
30	12.5	24	M2.02.2
36	16	24	M2.02.2
42	21	30	M2.02.1
48	24	30	M2.02.1

SOURCE:

FHWA STANDARD DRAWING C251-50

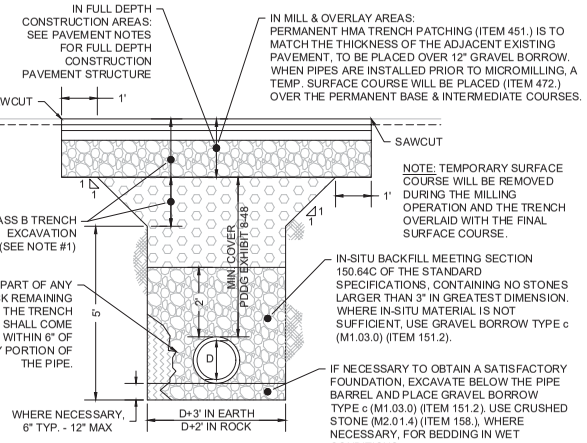
NOTES:

FOR PIPES 24" DIA. AND LESS, USE STONE PIPE ENDS MASSDOT STANDARD DETAIL E 206.7.0



RIPRAP APRON

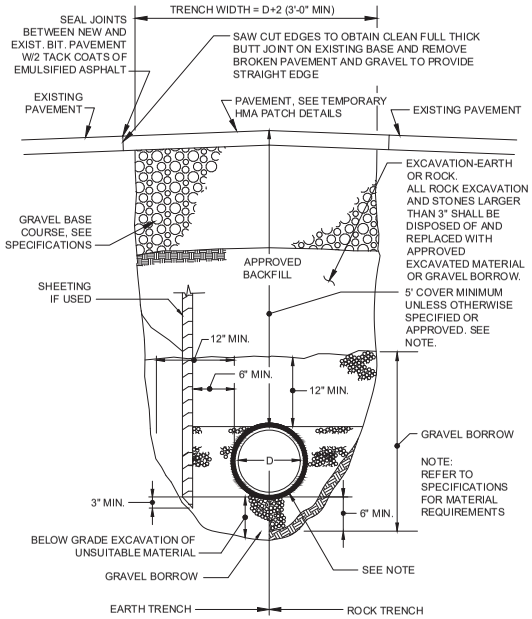
CROSS SECTION VIEW
NOT TO SCALE



NOTE:
1. CLASS B TRENCH EXCAVATION IS MEASURED FROM THE BOTTOM OF THE ROADWAY EXCAVATION OR EXISTING GROUND, WHICHEVER IS LOWER.
2. ALL BACKFILL IS TO BE PLACED AND COMPACTED IN 6" LAYERS.
3. REFER TO HMA PATCH DETAILS.
4. BACKFILL TRENCH TO A POINT 2' OVER THE PIPE USING NO STONES LARGER THAN 3" IN GREATEST DIMENSION.

3 TYPICAL TRENCH DRAIN DETAIL

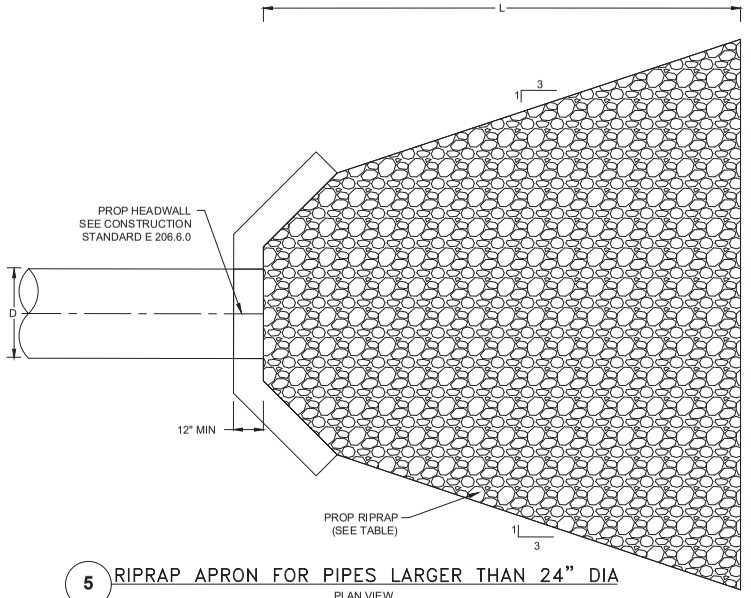
NOT TO SCALE



NOTE: FURNISH AND INSTALL CLOSED CELL GLASS INSULATION, 2" THICK FOAMGLASS ONE BY PITTSBURG CORNING OR EQUAL, WITH PITTWRAPP AA JACKETING BY PITTSBURG CORNING OR EQUAL WHEN WATER MAIN CANNOT BE INSTALLED AT OR BELOW THE REQUIRED BURIAL DEPTH OF FIVE (5) FEET

4 WATER TRENCH SECTION

NOT TO SCALE



5 RIPRAP APRON FOR PIPES LARGER THAN 24" DIA

PLAN VIEW
NOT TO SCALE

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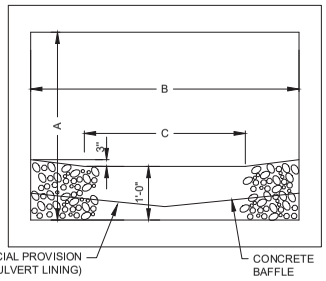
Proposal No. 604123-111717

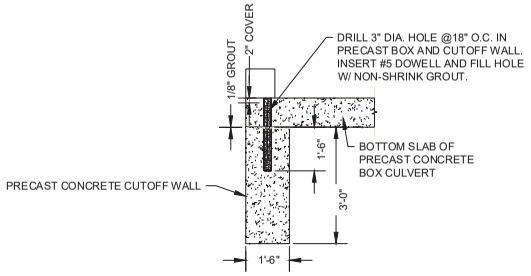


NOTES:
1. PAYMENT FOR BAFFLE WILL BE CONSIDERED INCIDENTAL IN THE COST OF THE PRECAST CULVERT.

11 CULVERT TYPICAL SECTION STA.37+50 & 80+40

NOT TO SCALE

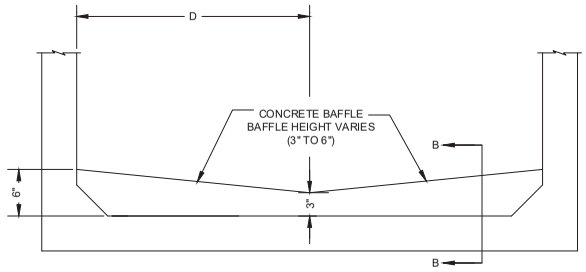
	DIMENSIONS (FT)			
	A	B	C	D
CULVERT 1 AT STA. 37+50	3	2	1	1
CULVERT 3 AT STA. 80+40	3	3	2	1.5



NOTES:
1. PAYMENT FOR CUTOFF WALL CONCRETE, REINFORCING STEEL, DOWEL AND NON-SHRINK GROUT SHALL BE INCLUDED IN THE COST OF THE PRECAST CULVERT.

12 CUTOFF WALL DETAIL

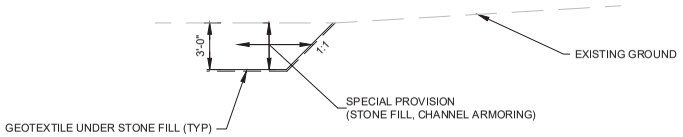
NOT TO SCALE



NOTES:
1.BAFFLES SHALL BE 6" DEEP (MAX).
2.BAFFLES TO BE PLACED EVERY 7' INCLUDING AT THE INLET AND OUTLET.

13 PRECAST CONCRETE BAFFLE DETAIL

NOT TO SCALE



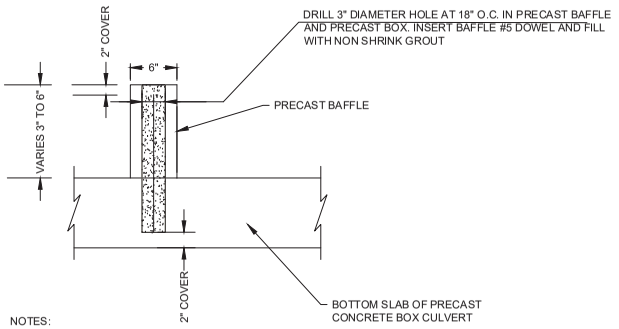
14 STREAM BED MATERIAL TRANSITION

NOT TO SCALE

STONE FILL GENERAL NOTES:
1. PRIOR TO PLACING MATERIALS, PREPARE SLOPE AS FOLLOWS:
   A. CUT OFF TREES AND EXISTING STUMPS TO GROUND LEVEL. LEAVE STUMPS & ROOTS BELOW GRADE IN PLACE.
   B. EXCAVATE VEGETATION (EXCEPT STUMPS) AND ORGANIC SOILS FROM SURFACE OF SLOPE.
   C. COMPACT SURFACE OF SLOPE (COMPACTION WITH EXCAVATOR BUCKET ACCEPTABLE).
   D. PLACE MATERIALS AS SHOWN ON THE DETAILS.
2. THE NATURAL STREAMBED MATERIAL SHALL CONSIST OF FIELD STONE OR NATURAL RIVER ROCK SIMILAR IN COLOR AND APPEARANCE TO IN-SITU NATIVE MATERIALS. CRUSHED STONE SHALL NOT BE PERMITTED. THE NATURAL STREAMBED MATERIAL SHALL APPROXIMATE THE FOLLOWING SIZE DISTRIBUTION; AMOUNT FINER THAN EACH LABORATORY SIEVE (SQUARE OPENINGS)(PERCENT BY WEIGHT):

SIEVE OPENING	PERCENT FINER
4-INCH	100%
3.5-INCH	85% - 95%
2.5-INCH	40% - 60%
1.25-INCH	25% - 35%
0.25-INCH	5% - 15%

3. THE CONTRACTOR SHALL INSTALL A 1' - 1'3" THICK LAYER OF STREAMBED MATERIAL WITHIN THE BOX, AS DEPICTED ON THE PLANS OR AS REQUIRED BY THE ENGINEER. THE MATERIAL SHALL BE INSTALLED DURING DEWATERED CONDITIONS AND IN ACCORDANCE WITH THE ENVIRONMENTAL PERMITS. MICROTOPOGRAPHY SHALL BE ESTABLISHED WITHIN THE CULVERT TO CREATE A LOW FLOW THALWEG THROUGHOUT THE STRUCTURE.



NOTES:
PAYMENT FOR BAFFLE AND #5 DOWEL WILL BE CONSIDERED INCIDENTAL IN THE COST OF THE PRECAST CULVERT.

15 SECTION B-B BAFFLE DETAIL

NOT TO SCALE

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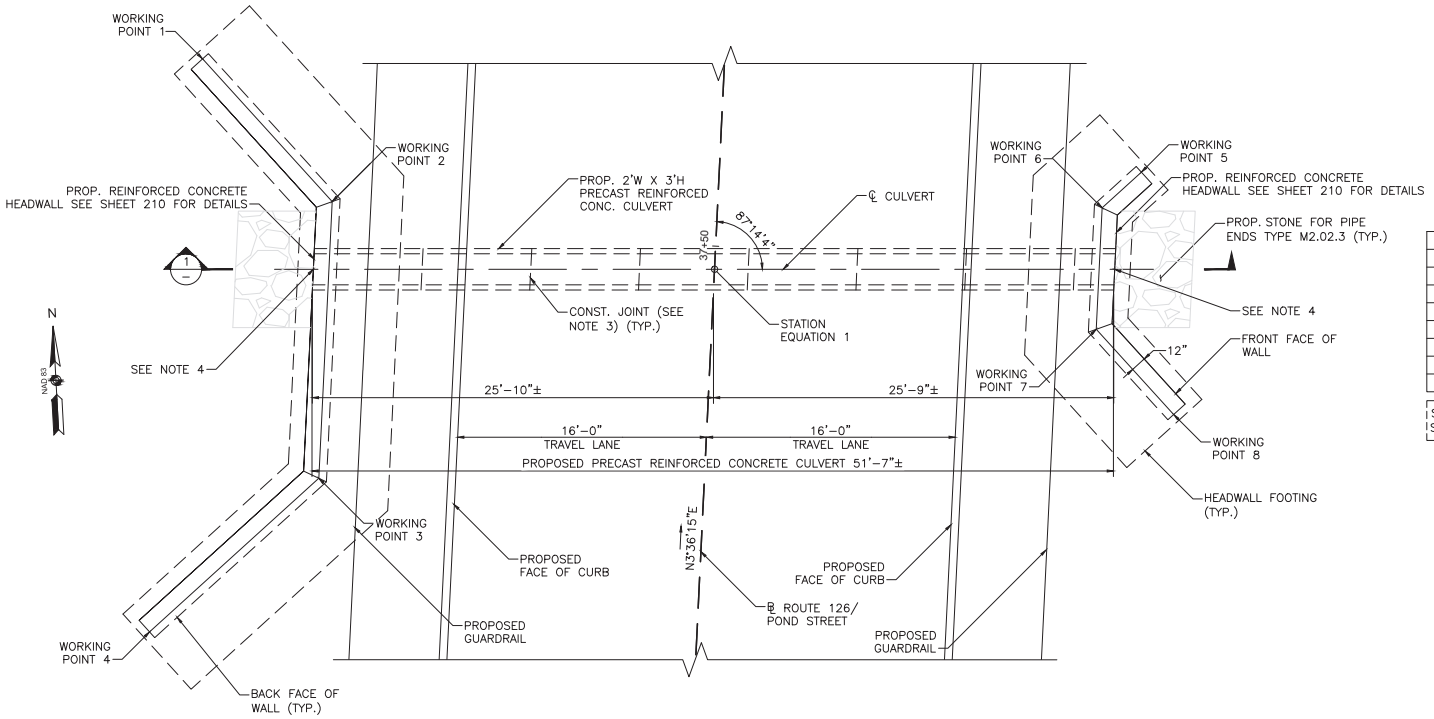
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	205	327
PROJECT FILE NO.	604123		

SPECIAL DRAINAGE STRUCTURE NO.1
PLAN & SECTION

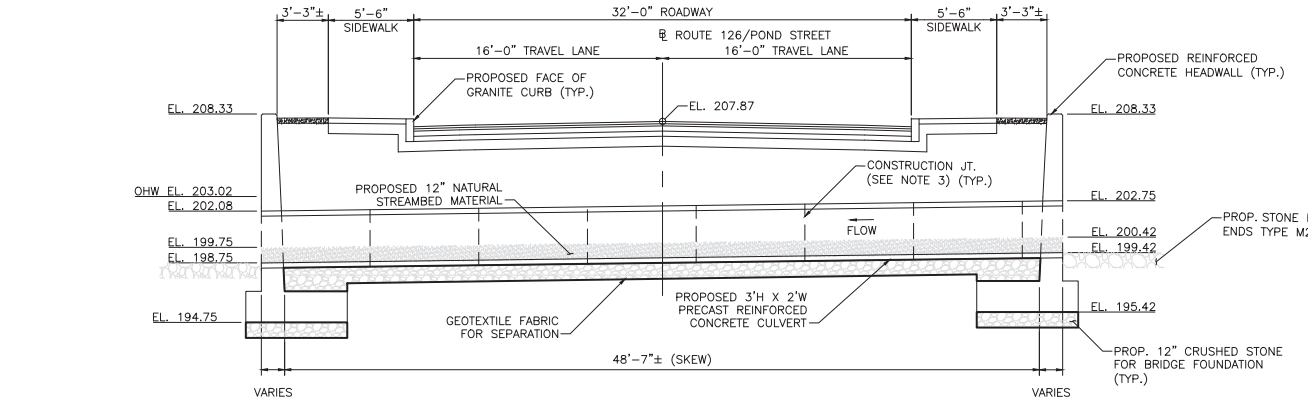


WORKING PT.	STA.	OFFSET R, FT	NORTHING	EASTING
1	37+60.45	-33.58	2913802.78	674835.05
2	37+51.67	-24.80	2913793.47	674843.26
3	37+33.84	-24.80	2913775.67	674842.14
4	37+23.43	-35.21	2913765.94	674831.10
5	37+56.08	27.15	2913794.59	674895.39
6	37+53.66	24.74	2913792.34	674892.83
7	37+45.63	24.24	2913784.35	674891.82
8	37+40.24	29.63	2913778.63	674896.86

STATION EQUATION 1: ROUTE 126 (POND STREET) CONSTRUCTION ℄ STA. 37+48.51 = CULVERT ℄

NOTE: SEE ACOE PLAN SHEET 5

SPECIAL DRAINAGE STRUCTURE NO. 1 PLAN
SCALE: 1/8" = 1'-0"



SECTION 1 – STA. 37+48.51 CULVERT (UPSTATION)
SCALE: 1/8" = 1'-0"

NOTES:

1. PROPOSED GUARDRAIL NOT SHOWN AT CULVERT SECTION SINCE ALL PROPOSED GUARDRAIL WILL SPAN OVER PROPOSED CULVERT SECTION.
2. SEE SHEETS 13 – 15 FOR TYPICAL APPROACH/ROADWAY CROSS SECTION AT CULVERT LOCATION.
3. PRECAST REINFORCED CONCRETE CULVERT CONSTRUCTION JOINT SPACING WILL VARY PER PRECASTER UP TO 7'-0" MAXIMUM SPACING.
4. FACE OF PRECAST REINFORCED CONCRETE CULVERT TO BE SKEWED AND WILL REQUIRE SPECIAL FABRICATION BE THE PRECASTER.

0 20 40 50 100
SCALE: 1" = 40'

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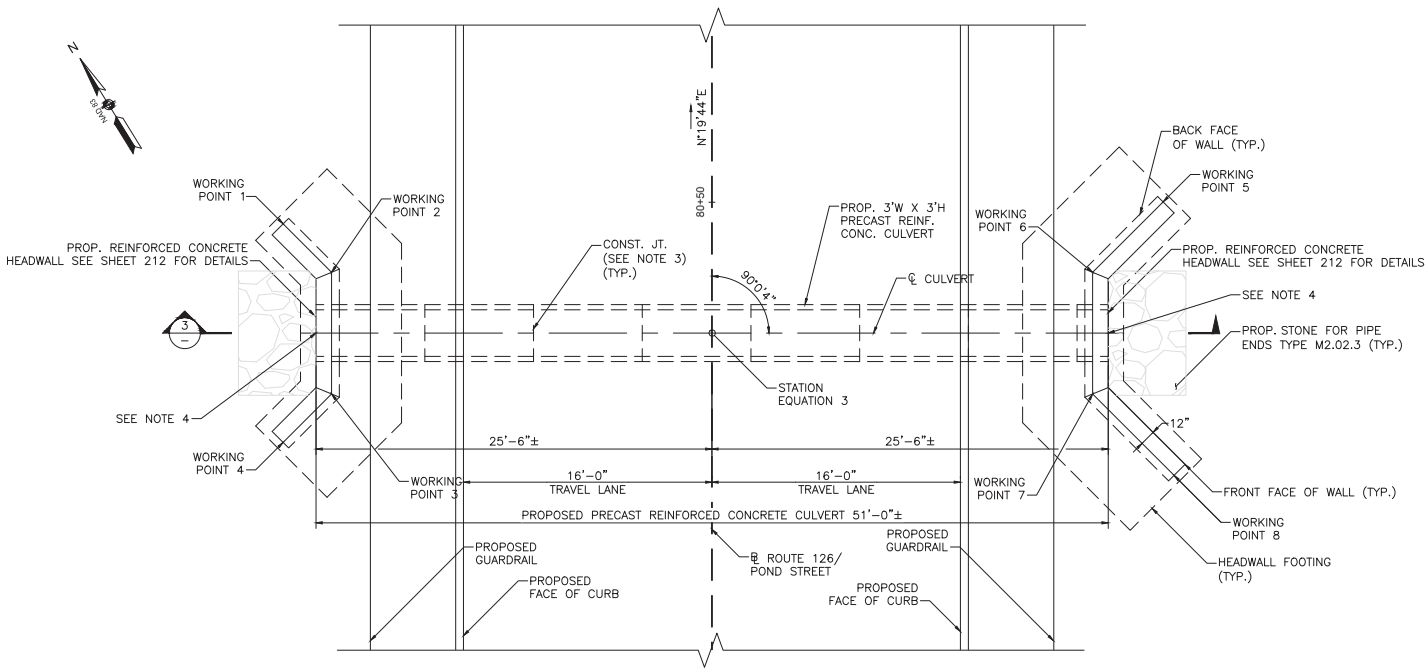
Proposal No. 604123-111717

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	207	327
PROJECT FILE NO.	604123		

SPECIAL DRAINAGE STRUCTURE NO.3
PLAN & SECTION

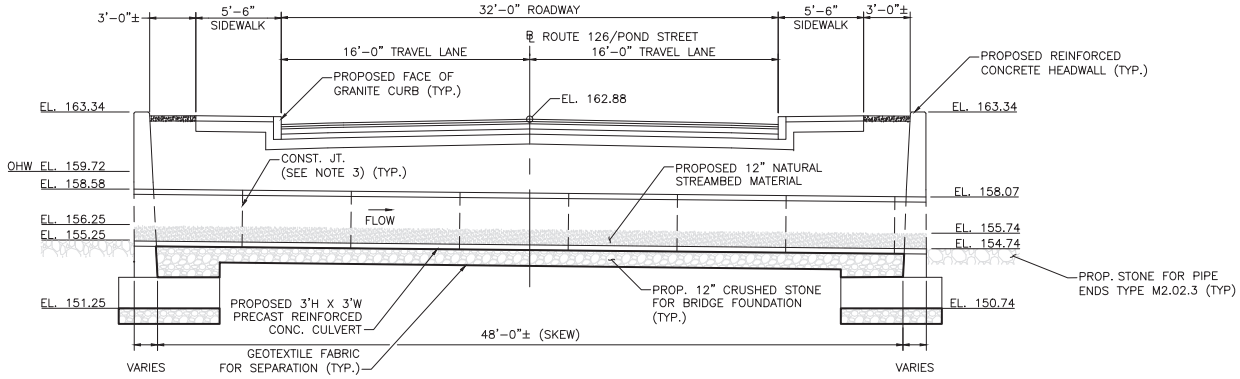


WORKING PT.	STA.	OFFSET R, FT	NORTHING	EASTING
1	80+48.61	-27.61	2917966.59	675657.52
2	80+45.48	-24.49	2917962.34	675658.71
3	80+37.66	-24.49	2917955.52	675654.88
4	80.34.62	-27.52	2917954.35	675650.74
5	80+50.02	29.05	2917940.07	675707.61
6	80+45.48	24.15	2917938.34	675701.43
7	80+37.66	24.15	2917931.51	675697.60
8	80+32.41	29.76	2917924.38	675699.60

STATION EQUATION 3: ROUTE 126 (POND STREET) CONSTRUCTION ℄ STA. 80+41.57 = CULVERT ℄

NOTE: SEE ACOE PLAN SHEET 8

SPECIAL DRAINAGE STRUCTURE NO.3 PLAN
SCALE: 1/8" = 1'–0"



SECTION 3 – STA. 80+41.57 CULVERT (UPSTATION)
SCALE: 1/8" = 1'–0"

NOTES:

1. PROPOSED GUARDRAIL NOT SHOWN AT CULVERT SECTION SINCE ALL PROPOSED GUARDRAIL WILL SPAN OVER PROPOSED CULVERT SECTION.
2. SEE SHEETS 13 – 15 FOR TYPICAL APPROACH/ROADWAY CROSS SECTION AT CULVERT LOCATION.
3. PRECAST REINFORCED CONCRETE CULVERT CONSTRUCTION JOINT SPACING WILL VARY PER PRECASTER UP TO 7'–0" MAXIMUM SPACING.
4. FACE OF PRECAST REINFORCED CONCRETE CULVERT TO BE SKEWED AND WILL REQUIRE SPECIAL FABRICATION BE THE PRECASTER.

0 20 40 50 100
SCALE: 1" = 40'

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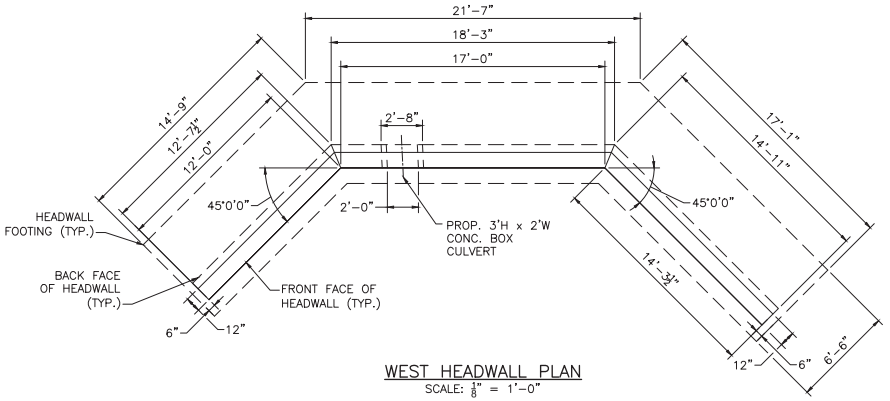
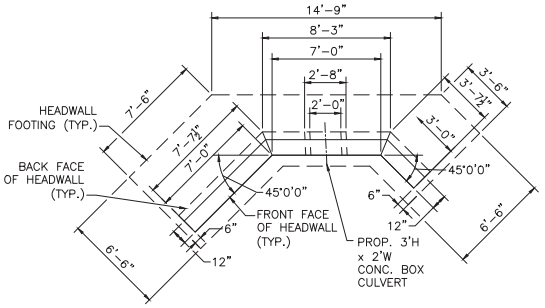
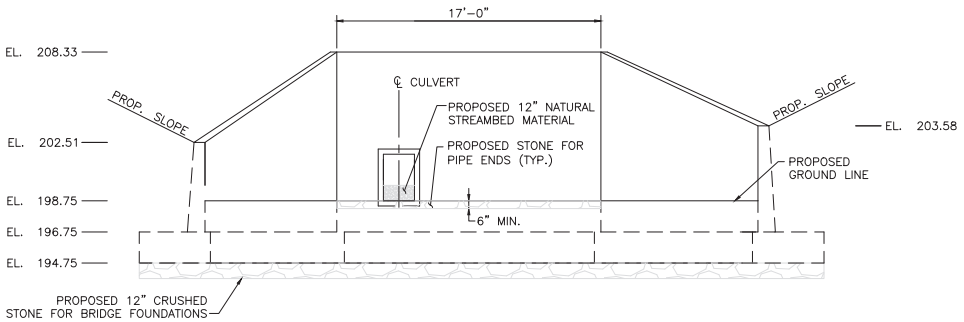
Proposal No. 604123-111717



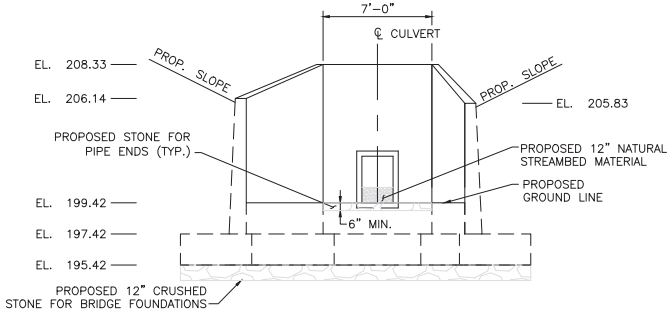
WEST HEADWALL PLAN
SCALE: 1/8" = 1'-0"



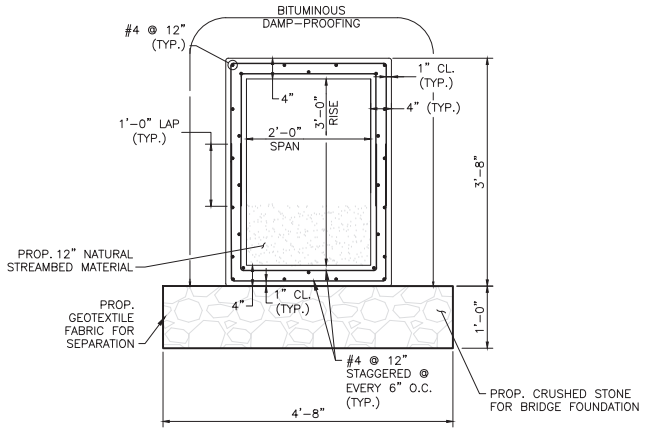
EAST HEADWALL PLAN
SCALE: 1/8" = 1'-0"



WEST HEADWALL ELEVATION
SCALE: 1/8" = 1'-0"



EAST HEADWALL ELEVATION
SCALE: 1/8" = 1'-0"



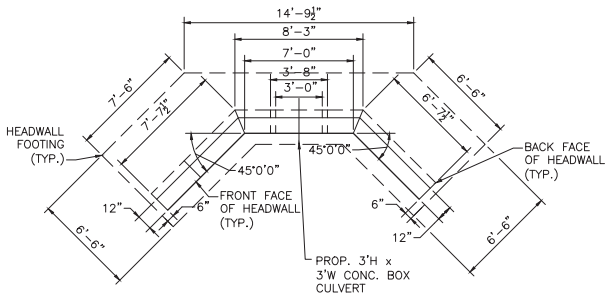
NOTES:
1. MAXIMUM FACTORED BEARING PRESSURE = 2.6 KSF.
2. TRANSVERSE REINFORCING SHALL BE PLACED NORMAL TO THE ℄ OF THE CULVERT.
3. PRECAST CONCRETE CULVERT TO BE 5000 PSI, ¾ INCH, 686 HP CEMENT CONCRETE.

CULVERT REINFORCEMENT DETAIL
SCALE: 1" = 0'-6"

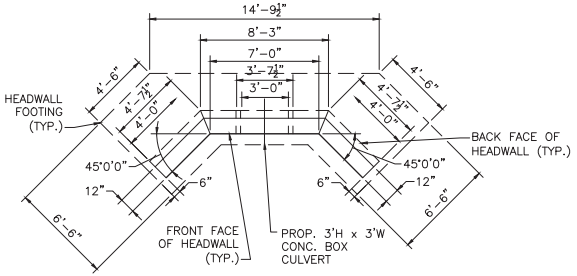
NOTES:
1. SEE SHEET 205 FOR GENERAL PLAN AND ELEVATION OF STRUCTURE.
2. SEE SHEET 214 FOR HEADWALL REINFORCEMENT DETAILS.

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	212	327
PROJECT FILE NO.	604123		

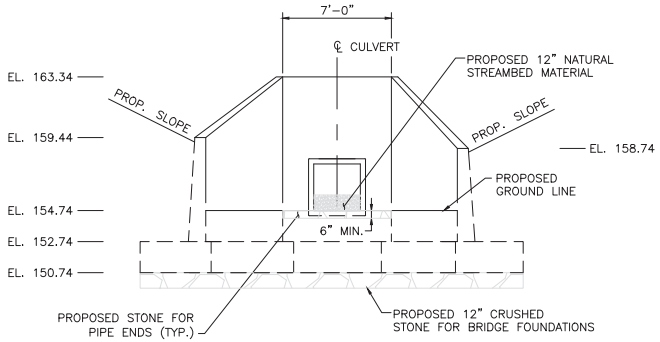
SPECIAL DRAINAGE STRUCTURE NO.3
DETAILS



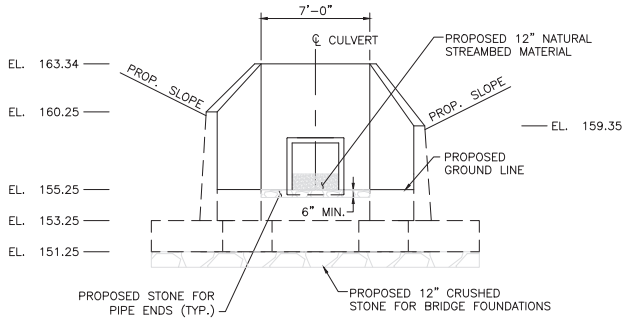
EAST CULVERT PLAN
SCALE: 1/8" = 1'-0"



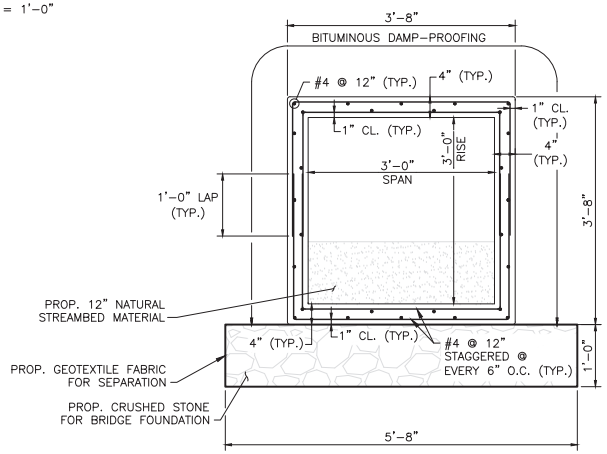
WEST CULVERT PLAN
SCALE: 1/8" = 1'-0"



EAST CULVERT ELEVATION
SCALE: 1/8" = 1'-0"



WEST CULVERT ELEVATION
SCALE: 1/8" = 1'-0"



NOTES:
1. MAXIMUM FACTORED BEARING PRESSURE = 2.02 KSF.
2. TRANSVERSE REINFORCING SHALL BE PLACED NORMAL TO THE ℄ OF THE CULVERT.
3. PRECAST CONCRETE CULVERT TO BE 5000 PSI, ¾ INCH, 686 HP CEMENT CONCRETE.

CULVERT REINFORCEMENT
SCALE: 1" = 0'-6"

NOTES:
1. SEE SHEET 207 FOR GENERAL PLAN AND ELEVATION OF STRUCTURE.
2. SEE SHEET 214 FOR HEADWALL REINFORCEMENT DETAILS.

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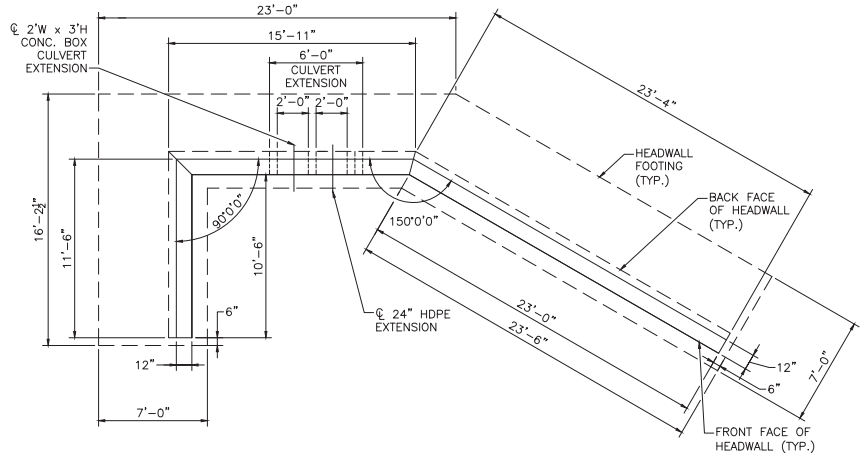
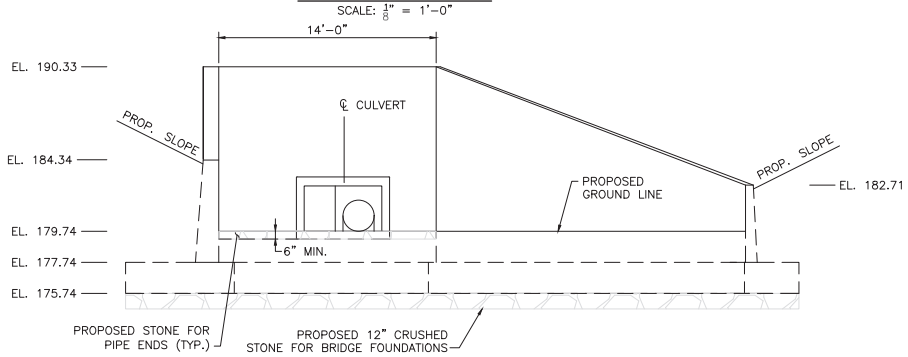


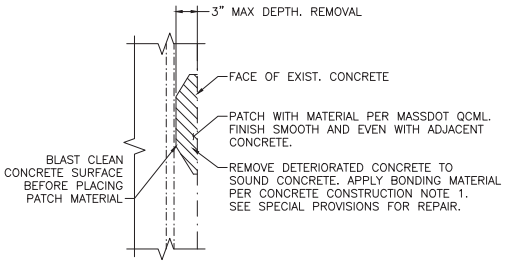
EAST HEADWALL PLAN

SCALE: 1/8" = 1'-0"



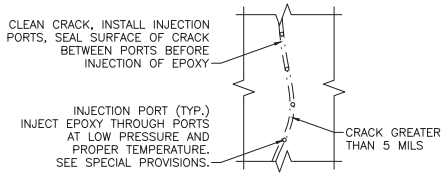
EAST HEADWALL ELEVATION

SCALE: 1/8" = 1'-0"



SPALL REPAIR DETAIL

NOT TO SCALE



CRACK REPAIR DETAIL

NOT TO SCALE

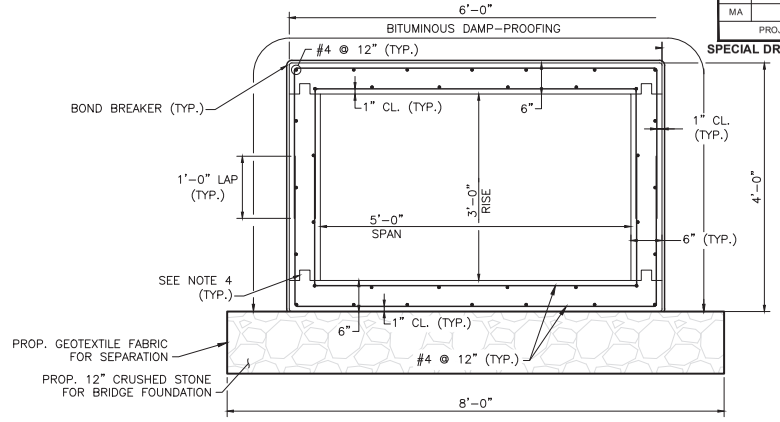
REPAIR DETAIL AT SPECIAL DRAINAGE STRUCTURE NO. 2

NOTE: SEE ACOE PLAN SHEET 6

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	211	327
PROJECT FILE NO.	604123		

SPECIAL DRAINAGE STRUCTURE NO.2 DETAILS



NOTES:
1. MAXIMUM FACTORED BEARING PRESSURE = 2.95 KSF.
2. TRANSVERSE REINFORCING SHALL BE PLACED NORMAL TO THE ℄ OF THE CULVERT.
3. CAST-IN-PLACE CONCRETE CULVERT TO BE 5000 PSI, ¾ INCH, 686 HP CEMENT CONCRETE.
4. CONSTRUCTION JOINT WITH 2" x 2" KEY.

CULVERT REINFORCEMENT

SCALE: 1" = 0'-6"

NOTES:

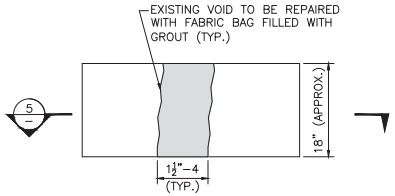
1. SEE SHEET 206 FOR GENERAL PLAN AND ELEVATION OF STRUCTURE.
2. SEE SHEET 214 FOR HEADWALL REINFORCEMENT DETAILS.
3. THE CONTRACTOR SHALL REPORT TO THE ENGINEER ANY DETERIORATION THAT EXCEED THE LIMITS SHOWN ON THE PLANS AND SHALL NOT CONTINUE WORK WITHOUT DIRECTIONS FROM THE ENGINEER.

REPAIRS TO DAMAGES BY CONTRACTOR:

IF DURING REMOVAL OF DETERIORATED CONCRETE, THE CONTRACTOR DAMAGES EXISTING REINFORCEMENT TO THE EXTENT REQUIRING REPLACEMENT, ANY ADDITIONAL CONCRETE REMOVAL, PATCHING MATERIAL, CLEANING EXISTING REINFORCING STEEL, AND FURNISHING AND INSTALLING REPLACEMENT REINFORCING STEEL SHALL BE AT THE CONTRACTOR'S EXPENSE.

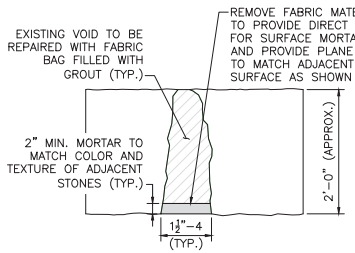
CONCRETE REPAIR NOTES:

1. IMMEDIATELY PRIOR TO PLACING NEW CONCRETE AGAINST EXISTING CONCRETE, CLEAN EXISTING SURFACES AND APPLY SPECIFIED BONDING COMPOUND AS APPROVED UNDER MASSDOT QCML.
2. REMOVAL OF EXISTING CONCRETE FOR REPAIRS SHALL BE INCLUDED IN THE ITEM NO. 997.2 SPECIAL DRAINAGE STRUCTURE NO. 2.
3. ALL EXISTING SURFACES THAT WILL HAVE NEW CONCRETE CAST AGAINST IT MUST BE ROUGHENED TO A MINIMUM AMPLITUDE OF ¼"±.
4. STONE WITH 1½" TO 4" GAP SHALL BE FILLED USING FABRIC BAGS WITH GROUT MATERIAL UNDER ITEM 989.222 REPAIR OF VOIDS IN MASONRY. THE CONTRACTOR SHALL ASSUME THAT 30 FABRIC BAGS WILL BE REQUIRED FOR STONE ARCH REPAIR.



TYPICAL VOID AT CULVERT WALL – ELEVATION

(VOID TO BE FILLED WITH GROUT BAG)
NOT TO SCALE

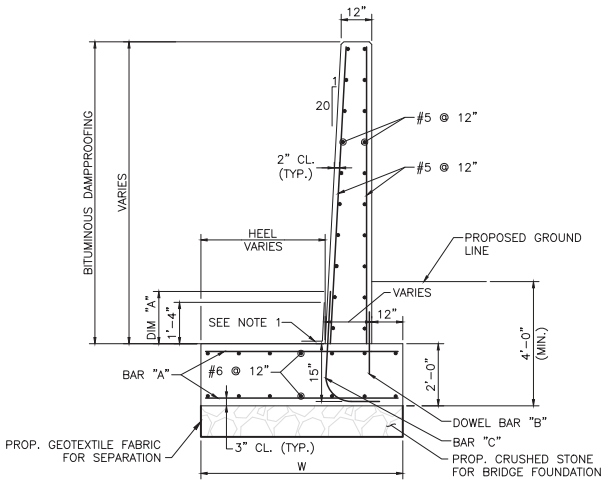


SECTION 5

NOT TO SCALE

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	214	327
PROJECT FILE NO.	604123		

HEADWALL & MISCELLANEOUS DETAILS



NOTES:

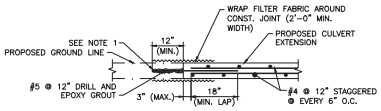
1. MEMBRANE WATERPROOFING AND 8"x16"x2", 4000 PSI, ¾ IN, 610 CEMENT CONCRETE BLOCKS LAID IN MORTAR OR OTHER WATERPROOFING PROTECTIVE COURSE, MIN. 2" THICK AS SPECIFIED IN MASSDOT STANDARD SPECIFICATIONS.
2. ALL CONCRETE SHALL BE 4000 PSI, 1½ IN, 565 CEMENT CONCRETE.
3. SEE TABLES BELOW FOR FACTORED BEARING PRESSURES AND FACTORED BEARING RESISTANCES FOR ALL WALL TYPES. FACTORED BEARING RESISTANCE IS THE PRODUCT OF THE NOMINAL BEARING RESISTANCE AND A RESISTANCE FACTOR OF 0.45.

TYPICAL HEADWALL SECTION

SCALE: 1" = 1'-0"

SUMMARY OF BEARING CAPACITIES			
WALL TYPE	MAXIMUM FACTORED BEARING PRESSURE (KSF)	CONTROLLING LOAD CASE	FACTORED BEARING RESISTANCE (KSF)
STA 37+50	2.14	STRENGTH I	4.1
STA 42+00	2.48	STRENGTH I	4.2
STA 80+40	1.97	STRENGTH I	4.7

HEADWALL DIMENSIONS AND REINFORCEMENT SUMMARY							
WALL TYPE	W	HEEL	BAR "A"	BAR "B"	BAR "B" LENGTH	BAR "C"	DIM "A"
STA 37+50	6'-6"	VARIES	#5 @ 12"	#5 @ 12"	2'-0"	#5 @ 12"	19"
STA 42+00	7'-0"	VARIES	#6 @ 12"	#6 @ 12"	2'-6"	#6 @ 12"	23"
STA 80+40	6'-6"	VARIES	#5 @ 12"	#5 @ 12"	2'-0"	#5 @ 12"	19"

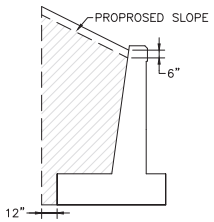


CONNECTION NOTES:

1. DOWEL IN #5 BARS AT 1'-0" MAX. SPACING HORIZONTALLY INTO CENTER OF WALL AND FILL HOLES WITH EPOXY GROUT.
2. ROUGHEN AND CLEAN EXISTING OR EXPOSED SURFACE AND COAT WITH TYPE A EPOXY BONDING COMPOUND IN ACCORDING WITH THE MANUFACTURER'S RECOMMENDATIONS.

TYPICAL CONNECTION DETAIL

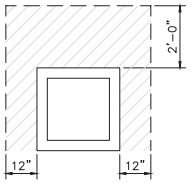
SCALE: ¾" = 1'-0"



NOTE:
HATCHED AREA INDICATES LIMITS OF GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES.

LIMITS OF GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES

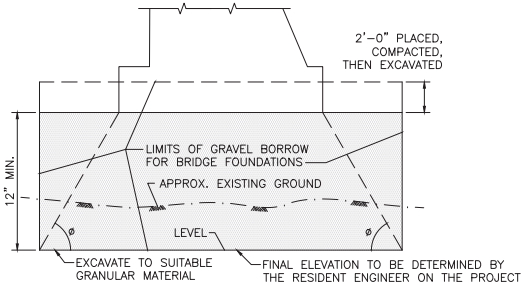
SCALE: 1" = 1'-0"



NOTE:
HATCHED AREA INDICATES LIMITS OF GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES.

LIMITS OF GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES

NOT TO SCALE



NOTES:

1. ø = 45° FOR DEPTH OF 5'-0" OR LESS.
   ø = 60° FOR DEPTH OVER 5'-0".
2. SAME TREATMENT IS TO BE USED AT ENDS OF WALLS.

LIMITS OF GRAVEL BORROW FOR BRIDGE FOUNDATIONS

NOT TO SCALE

A00831 - 26

Proposal No. 604123-111717

US Army Corps of Engineers ®
New England District

WORK-START NOTIFICATION FORM

(Minimum Notice: Two weeks before work begins)

****

* EMAIL TO: cenae-r@usace.army.mil; or *

* *

* MAIL TO: U.S. Army Corps of Engineers, New England District *

* Permits and Enforcement Branch *

* Regulatory Division *

* 696 Virginia Road *

* Concord, Massachusetts 01742-2751 *

****

Corps of Engineers Permit No. NAE-2020-00490 was issued to MassDOT – Highway Division and authorized the applicant to permanently discharge 3,686 square feet of fill material below the Ordinary High Water (OHW) mark of four unnamed intermittent streams, and within vegetated wetlands, associated with the reconstruction of Route 126 (Pond Street) in Ashland, Massachusetts. The work includes roadway widening, addition of sidewalks, and stormwater improvements, and includes the following stream crossing work:

- Replacement of an existing 2'W x 2'H concrete box culvert with a new 2'W x 3'H concrete box embedded 12" with natural material.
- Extension of an existing 2'W x 3'H concrete box culvert.
- Replacement of an existing 3'W x 2'H concrete box culvert with a new 3'W x 3'H concrete box embedded 12" with natural material.

The project also includes 2,730 square feet of temporary impacts below OHW, and within vegetated wetlands, associated with construction access and potential dewatering behind the erosion and sedimentation controls.

The people (e.g., contractor) listed below will do the work, and they understand the permit's conditions and limitations.

PLEASE PRINT OR TYPE

Name of Person/Firm: _____

Business Address: _____

_____

_____

Telephone Numbers: (____) _____ (____) _____

Proposed Work Dates: **Start:** _____ **Finish:** _____

Permittee/Agent Signature: _____ **Date:** _____

Printed Name: _____ **Title:** _____

Date Permit Issued: _____**Date Permit Expires:** _____

****

FOR USE BY THE CORPS OF ENGINEERS

PM: Vasconcelos **Submittals Required:** _____

Inspection Recommendation: _____

US Army Corps of Engineers ®
New England District

COMPLIANCE CERTIFICATION FORM

(Minimum Notice: Permittee must sign and return notification within one month of the completion of work.)

Permit Number: NAE-2020-00490

Project Manager: Vasconcelos

Name of Permittee: MassDOT – Highway Division

Permit Issuance Date: April 8, 2020

Please sign this certification and return it to our office upon completion of the activity and any mitigation required by the permit. You must submit this after the mitigation is complete, but not the mitigation monitoring, which requires separate submittals.

E-MAIL TO:	cenae-r@usace.army.mil; or	
MAIL TO:	Permits and Enforcement Branch A	
	U.S. Army Corps of Engineers, New England District	
	Regulatory Division	
	696 Virginia Road	
	Concord, Massachusetts 01742-2751	

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced permit was completed in accordance with the terms and conditions of the above referenced permit, and any required mitigation was completed in accordance with the permit conditions.

Signature of Permittee	Date
Printed Name	Date of Work Completion
( ) Telephone Number	( ) Telephone Number

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DOCUMENT A00840

MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

WATER QUALITY CERTIFICATE APPLICATION

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Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, Secretary & CEO
Thomas Tinlin, Acting Administrator

massDOT
Massachusetts Department of Transportation
Highway Division

February 19, 2020

Mr. Dan Vasconcelos
Regulatory Division, Department of the Army
New England District, Corps of Engineers
696 Virginia Road
Concord, Massachusetts 01742

Re: Application for Pre-Construction Notification
Route 126 (Pond Street)
Ashland, Massachusetts
MassDOT Project 604123

The Massachusetts Department of Transportation – Highway Division (MassDOT) respectfully submits this application for a Pre-Construction Notification (PCN) for roadway, safety, and drainage improvements on Route 126 (Pond Street) in the Town of Ashland under General Permit 1.

The project will include full-depth reconstruction of deteriorated roadway pavements, construction of new sidewalks to improve pedestrian safety, construction of subsurface drainage improvements to extend pavement life spans, and surface drainage improvements to improve safety by reducing stormwater ponding on reconstructed roadway pavements. Intersection improvements at Spyglass Hill Drive, Eliot Street, Algonquin Trail and James Road are also proposed. Three culverts will also be replaced as part of this project. These improvements will result in enhanced roadway safety for all roadway users including bicyclists, pedestrians, and vehicles.

The project will temporarily impact 2,730 square feet of Vegetated Wetland and permanently impact 3,686 square feet of Vegetated Wetland. Approximately 4,110 square feet of Vegetated Wetland will be replicated behind the Ashland Fire Department Headquarters. There are no impacts to Waters of the US proposed under this project, since all the waterways within the project limits are intermittent streams.

If you have questions or require additional information, please contact me at 857-368-8807 or at susan.mcarthur@state.ma.us. We look forward to working with you on this project.

Sincerely,

Susan McArthur

Susan McArthur
Wetlands Unit Supervisor
MassDOT, Highway Division

cc: Lawrence Cash, Massachusetts Department of Transportation
Christopher Ross, Massachusetts Department of Environmental Protection

Enclosures: Pre-Construction Notification Application

WATER QUALITY CERTIFICATE APPLICATION

Route 126 (Pond Street)
Ashland, Massachusetts

MassDOT Contract No. 604123



Prepared for

Massachusetts Department of Transportation

January 31, 2020

Prepared by

GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers

Building Strong Client Relationships Through Engineering Excellence

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ATTACHMENTS

Attachment A – Figures
Figure 1 - USGS Map
Figure 2 - Aerial Map
Figure 3 - Environmental Constraints Map
Attachment B – Wetland Delineation and Replication Report (Epsilon)
Attachment C – Order of Conditions (OOC)
Attachment D – Public Notice
Attachment E – Stormwater Report (bound separately)
Attachment F – WQC Submission Plans (bound separately)
Attachment G – Cultural Resource Coordination
Attachment H – ROW Parcel Summary Sheet/Abutters
Attachment I – 4d Submittal (Northern Long Eared Bats)

ENG FORM 4345

U.S. Army Corps of Engineers (USACE)

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

33 CFR 325. The proponent agency is CECW-CO-R.

Form Approved - OMB No. 0710-0003 Expires: 01-08-2018

The public reporting burden for this collection of information, OMB Control Number 0710-0003, is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR APPLICATION TO THE ABOVE EMAIL.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned. System of Record Notice (SORN). The information received is entered into our permit tracking database and a SORN has been completed (SORN #A1145b) and may be accessed at the following website: http://dpcld.defense.gov/Privacy/SORNsIndex/DOD-wide-SORN-Article-View/Article/570115/a1145b-ce.aspx

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First - Susan Middle - Last - McArthur	First - Danielle Middle - Last - Spicer
Company - Mass Department of Transportation - Highway Division	Company - Green International Affiliates, Inc.
E-mail Address - Susan.McArthur@dot.state.ma.us	E-mail Address - dspicer@greenintl.com
6. APPLICANT'S ADDRESS:	9. AGENT'S ADDRESS:
Address- 10 Park Plaza, Room 4260	Address- 239 Littleton Rd, Suite 3
City - Boston State - MA Zip - 02116 Country - USA	City - Westford State - MA Zip - 01886 Country - USA
7. APPLICANT'S PHONE NOs. w/AREA CODE	10. AGENTS PHONE NOs. w/AREA CODE
a. Residence b. Business 857-368-8807 c. Fax 857-368-0609	a. Residence b. Business 978-923-0400 x270 c. Fax

STATEMENT OF AUTHORIZATION

11. I hereby authorize, _____ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

_____ _____

SIGNATURE OF APPLICANT DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)

Route 126 (Pond Street) Proposed Roadway Reconstruction

13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
Beaverdam Brook, Waushakum Pond	Address Route 126 (Pond Street)
15. LOCATION OF PROJECT	City - Ashland State- MA Zip- 01721
Latitude: ◦N 41° 14' 50" N Longitude: ◦W 71° 25' 49" W	

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)

State Tax Parcel ID Municipality Ashland

Section - Township - Range -

17. DIRECTIONS TO THE SITE

The project is located at Route 126 (Pond Street) in the Town of Ashland, from the intersection of Framingham town line to the Holliston town line. The total project length is 1.7 miles.

18. Nature of Activity (Description of project, include all features)

The project will include full-depth reconstruction of deteriorated roadway pavements, construction of new sidewalks to improve pedestrian safety, construction of subsurface drainage improvements to extend pavement life spans, and surface drainage improvements to improve safety by reducing stormwater ponding on reconstructed roadway pavements. Intersection improvements at Spyglass Hill Drive, Eliot Street, Algonquin Trail and James Road are also proposed. Three culverts will also be replaced as part of this project.

The project will temporarily impact 2,730 square feet of Vegetated Wetland and permanently impact 3,686 square feet of Vegetated Wetland. Approximately 4,000 square feet of Vegetated Wetland will be replicated behind the Ashland Fire Department Headquarters. There are no impacts to Waters of the US proposed under this project because all the waterways within the project limits are intermittent streams.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

The purpose of the improvements is to enhance roadway safety for all roadway users including bicyclists, pedestrians, and vehicles.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

The construction of new sidewalk and full-depth roadway reconstruction to achieve a typical pavement width of 32 to 44 feet results in permanent (fill) and temporary impacts to Vegetated Wetlands.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards
Roadway fill (approximately 115 CY)		

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres 0.084 acres (3,686 SF) of permanent impact/fill

or

Linear Feet

23. Description of Avoidance, Minimization, and Compensation (see instructions)

To protect the wetland resource areas during construction, a combination of erosion and sediment control BMPs will be installed. Erosion control measures will be implemented as described in the Order of Conditions (OOC) and approved plans. Primary erosion control techniques proposed include compost filter tubes, sedimentation fence barriers, and street sweeping. The Contractor will have a stockpile of materials required to control erosion on-site to be used to supplement or repair erosion control devices. These materials will include, but are not limited to, compost filter tubes, sedimentation fence, silt sacks for catch basins, erosion control matting and crushed stone. The erosion controls will be maintained in good condition until on-site.

24. Is Any Portion of the Work Already Complete? ☐ Yes ☒ No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address- See Attachment H, ROW Parcel Summary

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
MassDEP	401 WQC Fill	X284907	2020-02-11	N/A	N/A
Ashland ConCom	OOC	95-931	2019-07-01	2019-12-09	

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

Susan McArthur — SIGNATURE OF APPLICANT

2020-02-19 — DATE

SIGNATURE OF AGENT — DATE

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

1.0 INTRODUCTION AND OVERVIEW

This Water Quality Certificate Application has been prepared for roadway, safety and drainage improvements on Route 126 (Pond Street) in the Town of Ashland, from the intersection of Framingham town line to the Holliston town line for a total project length of 1.7 miles. Intersection improvements at Spyglass Hill Drive and Pond Street, Eliot Street and Pond Street, Algonquin Trail and Pond Street, and James Road and Pond Street are also proposed. This project consists of maintenance and improvement of an existing roadway (including widening of less than a single lane, improvements to existing drainage systems, and repaving).

The project will include full-depth reconstruction of deteriorated roadway pavements, construction of new sidewalks to improve pedestrian safety, construction of subsurface drainage improvements to extend pavement life spans, and surface drainage improvements to improve safety by reducing stormwater ponding on reconstructed roadway pavements. Minor horizontal and vertical roadway alignment improvements are also proposed. Three culverts will also be replaced as part of this project. These improvements will result in enhanced safety of roadway for all roadway users including bicyclists, pedestrians, and vehicles.

The proposed work within Waters of the United States requires a Section 401 Water Quality Certification pursuant to 314 CMR 9.04(1) since the project will result in the loss of more than 5,000 square feet cumulatively of temporary and permanent Bordering Vegetated Wetland, an area subject to 310 CMR 10.00: Wetlands Protection which is also subject to 33 U.S.C. §1251 *et seq.* (1972), The Clean Water Act (CWA). Therefore, the Water Quality Certification application package is being submitted to the Department of Environmental Protection (DEP) in association with this project. The proposed work will not involve dredging, or placement of fill, in waterways. Since the project will result in cumulative impacts, both temporary and permanent, to over 5,000 square feet of wetlands, the proposed project will require filing of a Pre-Construction Notification (PCN) Form with Army Corps of Engineers (ACOE).

The Notice of Intent (NOI) was submitted to the Ashland Conservation Commission pursuant to the Massachusetts Wetlands Protection Act (WPA) Regulations and its implementing regulations 310 CMR 10.00 for work within Bordering Vegetated Wetland (BVW), Inland Bank, 200-foot Riverfront Area, the 100-foot Buffer Zone, and within Bordering Land Subject to Flooding (BLSF) (MassDEP File No. 95-931). An Order of Conditions (OOC) for the project was issued by the Ashland Conservation Commission on 12/23/2019 and is included in Attachment C to this Application.

The proposed works exceeds the activity thresholds described in 301 CMR 11.03(3)(b)1.d.; consequently, an Environmental Notification Form will be filed to initiate project review under MEPA by the Executive Office of Energy and Environmental Affairs.

2.0 EXISTING CONDITIONS

Pond Street is an Urban Principal Arterial, located southeast of Route 135 and west of Route 27, extending from the Framingham town line to the Holliston town line. Pond Street is located within a public right-of-way which is generally around 46 feet wide, but which widens around curves and intersections. Pavement widths vary from approximately 35 feet to 45 feet, but it is as wide as 58 feet at some intersections with turning lanes. The travel lanes are generally 12-14 feet wide with shoulders between 2 and 5 feet widths. There are no bicycle accommodations on the roadway, other than bicycle detection at signalized intersections, and limited pedestrian accommodations.

There are wetlands that exist either directly adjacent to Pond Street on both sides of the roadway or nearby. Runoff from the site currently discharges via a combination of closed drainage systems, "country drainage" off the pavement edges, or via gutter flow along the pavement edges in areas where the roadway is lower than the surrounding terrain. The site discharges to twenty distinct discharge points. The wetlands are identified as Wetlands "A" through "L" and can be seen on Figure 3, Environmental Constraints Map, in Attachment A to this Application.

Wetlands on the east/northeast side of the project are a part of the Beaverdam Brook watershed. Beaverdam Brook, on the east side of the road, is generally flowing north-northeast in the vicinity of the project. Wetlands on the northwestern side of the project are located within the Tributary to Waushakum Pond watershed. Both Waushakum Pond and Beaverdam Brook are parts of the major Concord River Watershed. There are four intermittent streams within the project area; no perennial streams are present within the limit of work. Tributary to Waushakum Pond is flowing approximately 150 feet east of the proposed replication area behind the Fire Station. Beaverdam Brook and Tributary to Waushakum Pond have not been assessed for water quality, however Waushakum Pond is classified as a Class "B" waterbody, which designates the waterway as suitable for swimming, boating, fish and wildlife habitat, irrigation and agricultural use, and industrial cooling and process use. Waushakum Pond is listed in the 303(d) list as a Category 5 water requiring a TMDL, for being impaired with phosphorus, aquatic plants (macrophytes), non-native aquatic plants, dissolved oxygen and turbidity.

3.0 PROPOSED CONDITIONS

The proposed project includes performing full-depth reconstruction of approximately 9,000 feet of roadway to achieve a typical pavement width of thirty-two (32) to forty-four (44) feet, including two 11-foot travel lanes and 5-foot shoulders/bicycle lanes on both sides of the road, and to address numerous substandard safety and drainage issues along the roadway. Continuous sidewalks are also proposed along both sides of the road for the entire project length. The new drainage systems will improve the quality of stormwater runoff and will overall maintain historic drainage patterns, distributing runoff to the existing discharge points. All work will be done in a manner that will limit the impacts to adjacent resource areas.

As part of the NOI Application hearing process, Green International Affiliates, Inc. performed evaluation and CCTV investigation of existing culverts and headwall openings along different stations of the project site. The inspection findings and recommendation were discussed with the Conservation Commission during the NOI hearing on November 4, 2019. Based on the results of the CCTV evaluation, culvert #1 at Sta. 37+50, culvert #3 at Sta. 80+40) and culvert #4 at Sta. 90+00 are proposed to be replaced as part of this project. Both culvert #1 (2'Wx2'H) and culvert #3 (3'Wx2'H) will be replaced respectively with 2'Wx3'H and 3'Wx3'H box culverts with flow baffles where the bottom 12" will be filled with a natural stream bed material. Both culvert #1 and #3 crossings connect wetlands on each side of the roadway, and as such, the Stream Crossing General Standards do not apply; however, the design still employs a natural stream bottom to provide wildlife with an improved crossing. The proposed culvert replacement at Sta. 90+00 (culvert #4) was not designed to comply with the Stream Crossing Standards, since it is collecting runoff from a closed drainage system and is not serving as a stream crossing.

The construction of subsurface and surface drainage improvements is necessary to extend pavement life spans and to improve safety by reducing stormwater ponding on reconstructed roadway pavements.

4.0 ANTICIPATED CONSTRUCTION SEQUENCE

Construction phasing will ultimately be determined by the project contractor. The construction phasing is assumed to generally be as follows:

Construction Sequence

1. Install erosion and sedimentation control measures.
2. Fence off, mobilize equipment and crews, prepare work area(s) and set up staging and storage area(s)
3. Set up traffic controls
4. Demolish pavement in sections along Route 126 (Pond Street)
5. Replace Culverts #1, #3 and #4 with precast box culverts with an equivalent capacity and dimensions as the existing ones and as specified in the details. Culvert #1 and #3 are proposed to have a natural stream bottom.
6. Construct new storm drains in sections along Route 126 (Pond Street)
7. Construct roadway base and binder pavements in sections along Route 126
8. Install new traffic signal equipment
9. Complete roadway construction and stripe new pavements
10. Install landscaping and grassed areas
11. Remove erosion and sedimentation controls and protective measures for vegetation indicated to remain.
12. Shift traffic to fully utilize new roadway

Equipment that is likely to be utilized for this project includes dump trucks, flatbed trucks, front-end loader(s), backhoe(s), skid steer(s), excavator, hoe rams, drilling rigs, concrete pumpers, air hammers, air compressor(s), and a crane. Equipment can be parked on roadway pavements off-limits for construction staging purposes. Staging equipment in Vegetated Wetland or Waterway resource areas overnight or on weekends shall be prohibited.

5.0 IMPACTS TO WATERS OF THE UNITED STATES

The project's resource area impacts will occur in Vegetated Wetlands, resulting from both permanent and temporary construction taking place along the Route 126 (Pond Street). There are no impacts to Waterways/LUW proposed under this project, since all the waterways within the project limits are intermittent streams.

The overall impacts to Vegetated Wetlands are summarized below:

Table 5.1: Vegetated Wetland Impacts

Wetland Area	Permanent Impacts (ft^2)	Temporary Impacts (ft^2)
Wetland A	119	142
Wetland B	30	17
Wetland C	201	248
Wetland D	338	294
Wetland G	536	588
Wetland K	1,721	1,167
Wetland H	741	274
Total	**3,686**	**2,730**

5.1 Permanent Vegetated Wetland Impacts

Extended areas of Vegetated Wetland are located along the Route 126 (Pond Street) throughout the project limits. Vegetated Wetland limits at times extend close to each side of the roadway. The project's purpose to provide roadway, safety and drainage improvements on Route 126 (Pond Street) will result in permanent impacts to Vegetated Wetland areas that can not be avoided. No Isolated Vegetated Wetlands are present in the vicinity of the project area.

The direct impacts to wetland resource areas associated with the project are associated with the reconstruction and minor widening of the roadway in select areas, the construction of new sidewalks, the construction of stone waterways located along Pond Street and the replacement of three culverts (See Table 5.1 for a summary of impacts). Resource areas are shown on Figure 3 – Environmental Constraints Map in Attachment A of this Application. To minimize the impacts to the wetland areas, proper erosion and sediment controls will be installed during construction. These impacts will be mitigated by constructing a wetland replication area. See Section 6.0 below for more detail.

5.2 Temporary Vegetated Wetland Impacts

Temporary disturbance to Vegetated Wetlands (2,730 square feet) will be required for installation of Erosion & Sediment Control Best Management Practices (BMPs). After the erosion controls have been removed the Vegetated Wetlands will be restored to preexisting conditions in accordance with the MassDOT Specification 755.35, INLAND WETLAND REPLICATION AREA, included in the Attachment B – Wetland Replication Plan for MassDOT Route 126 (Pond Street) Maintenance and Improvement Project (Epsilon) of this Application. In addition to the minimum control measures included in the plan set, a Stormwater Pollution Prevention Plan (SWPPP) for construction activities will be prepared by the Contractor for the site in compliance with the EPA's Construction General Permit. It will include measures to minimize exposed soil areas through work sequencing and temporary stabilization, and establish a permanent vegetative cover or other forms of stabilization as soon as practicable.

6.0 WETLAND REPLICATION/MITIGATION

The project has been designed to avoid wetland resource area impacts to the maximum extent practicable and will mitigate unavoidable resource area impacts in accordance with state regulations (Massachusetts

Wetland Protection Act regulations at 310 CMR 10.55(4)(b), and the Massachusetts Department of Environmental Protection's ("MassDEP") "Massachusetts Inland Wetland Replication Guidelines" (MassDEP, March 2002)).

To mitigate for total Vegetated Wetland losses (fill) of 3,686 square feet, a wetland replication area is proposed to be constructed on the parcel located at 70 Cedar Street behind the Ashland Fire Department Headquarters. The wetland replication area will equal approximately 4,000 square feet and will provide mitigation for the wetland losses at a ratio greater than 1:1.

The Wetland Replication Plan for MassDOT Route 126 (Pond Street) Maintenance and Improvement Project by Epsilon and the Order of Conditions (OOC) are included in Attachments B and C of this Application, providing detailed information regarding wetland impacts minimization and mitigation, the existing and proposed conditions, construction methods, and monitoring at the replication site.

7.0 SEDIMENTATION CONTROL MEASURES

To protect the wetland resource areas during construction, a combination of erosion and sediment control BMPs will be installed. Erosion control measures will be implemented as described in the Order of Conditions (OOC) and approved plans. Primary erosion control techniques proposed include compost filter tubes, sedimentation fence barriers, and street sweeping. The Contractor will have a stockpile of materials required to control erosion on-site to be used to supplement or repair erosion control devices. These materials will include, but are not limited to, compost filter tubes, sedimentation fence, silt sacks for catch basins, erosion control matting and crushed stone. The erosion controls will be maintained in good condition until on-site soils are stabilized. All areas will be permanently stabilized following the completion of construction work.

Please refer to the Order of Conditions (OOC) in the Attachment C for detailed information on sedimentation control measures proposed.

8.0 DEWATERING

It is anticipated that a NPDES Construction General Permit (CGP) will be required for the project; therefore, if dewatering is needed, all pumped effluent will be done in compliance with the dewatering requirements within the CGP. There will be no direct discharge of pumped water into any wetland, resource area, or closed drainage system.

9.0 STORMWATER MANAGEMENT

Please refer to the Stormwater Report included as Attachment E to this Application for detailed Stormwater Management measures proposed for this project.

10.0 FISHERIES AND WILDLIFE / NATURAL HERITAGE ENDANGERED SPECIES / VERNAL POOLS

There are no Fisheries and/or Natural Heritage and Endangered Species Program (NHESP) Priority Habitat or Estimated Habitat for any species of concern in proximity to the project area. The closest NHESP Priority Habitat of Rare Species (PH 1189) is located approximately 850 feet west of the northern project limit. There are no Certified Vernal Pools (CVPs) identified on MassGIS closer than 3,800 feet west of the southern

project limit. There are no Potential Vernal Pools (PVPs) closer than 1,500 feet of the project area. The MassDOT does not anticipate any portion of this project to negatively impact these vernal pools. The project is not located within or in close proximity to Areas of Critical Environmental Concern (ACECs) and Outstanding Resource Waters (ORWs). The closest Area of Critical Environmental Concern (ACEC) to the project site is the Cedar Swamp ACEC in the Town of Westborough, the limits of which are approximately 6 miles west of the project. The closest ORW to the project site is the Public Water Supply Watershed of the Reservoir No. 3 in the City of Framingham, the limits of which are approximately 3 miles northwest of the project. Please refer to Figure 3 – Environmental Constraints Map in Attachment A for details.

According to the Federally Listed Endangered and Threatened Species in Massachusetts, the Northern Long-eared Bat (*Myotis septentrionalis*) (NLEB) is a proposed Endangered Species located Statewide; however, this species is protected by the Massachusetts Natural Heritage and Endangered Species Program (NHESP). Review of their habitat on NHESP's website indicate that in warmer months they can be found in forested areas, specifically in clustered stands of large trees and in colder months they can be found in natural caves and abandoned mines. The closest recorded NLEB hibernaculum is located 8.5 miles east of the project site in the Town of Wellesley. Based on this information the proposed project is not located within habitat that would support the NLEB; therefore it can be assumed that this project will not result in any impacts to the NLEB.

11.0 ALTERNATIVE ANALYSIS

The intent of this project is to provide multi-modal accommodations for all types of roadway users by taking a Complete Streets approach. This includes providing accommodations for vehicular traffic, bicyclists, and pedestrians. The Proponent considered several options with respect to finding the best design solution to accommodate the intent of the project, while avoiding and minimizing impacts to the surrounding resource areas. An alternative to eliminate sidewalks or bicycle accommodating shoulders was not considered as this would defeat MassDOT's and the Town's reason to pursue this project, which is to improve safety for all users and provide a Complete Street.

Three alternatives have been identified and discussed below:

Alternative 1: No Build

The current roadway condition of Route 126 (Pond Street) in the Town of Ashland is deteriorated, with substandard pedestrian and bicycle accommodations. ADA accessible ramps are lacking, existing traffic signal equipment is obsolete, and pavement markings/signage do not meet the latest MUTCD standards. Flooding issues have also been reported in some locations. The no-build alternative would allow the corridor to remain in its existing state and deteriorate even more over time., The safety of vehicle operators, bicyclists, and pedestrians would continue to be a concern. This alternative would fail to achieve MassDOT's and the Town's objective to enhance the safety, traffic operations, aesthetic appeal, and business vitality along the corridor.

Alternative 2 (Preferred): Reduced Travel Lane Widths with No Guardrail Bench

While MassDOT requires 12-foot travel lanes and 8-foot shoulders for this classification of roadway, the 11-foot travel lanes and 5-foot shoulders currently proposed are the absolute minimums for providing a Complete Street. This design still provides a safe width for vehicular traffic and meets the minimum width for bicycle accommodations. This alternative further reduced impacts to adjacent wetlands by reducing/eliminating the usual bench behind the guardrail. Based on Standard Detail 400.1.5 of the

MassDOT October 2017 Standard Details, guardrail is allowed to be installed within a 2:1 slope so long as deep post guardrail is used. This alternative of 11-foot travel lanes, 5-foot shoulders, and reduced/eliminated guardrail bench is selected as the preferred alternative based on: still allowing the safe minimum widths of both the travel lanes and shoulders to provide a Complete Street; and the minimized impacts realized to the abutting wetlands due to the removal of the bench behind guardrails in the vicinity of the wetland areas.

This alternative was selected after considering every other option to reduce the permanent BVW impacts to below 5,000 square feet. As a result of this option, the permanent (direct impacts to wetlands) were reduced to 3,686 square feet, and the temporary impacts associated with the erosion and sediment controls were reduced to 2,730 square feet. The total combined reduction in impacts to surrounding BVWs when compared to Alternative 3 is 1,142 square feet.

Alternative 3: Reduced Travel Lane Widths with Bench

Alternative 3 was considered the preferred alternative at the earlier design stages since it also provided 11-foot travel lanes and 5-foot shoulders which were the absolute minimums for providing a Complete Street. Based on the previous Standard Detail 401.1.1 of the MassDOT December 2016 Standard Details, a 2-foot minimum bench behind the guardrail was required. In an attempt to minimize the impacts to the surrounding wetlands, this design considered a 1.5:1 slope in the area of wetland series K and G, where the majority of impacts occur. This alternative resulted in 4,556 square feet of permanent and 3,002 square feet of temporary impacts to BVWs, which is cumulatively 1,142 square feet more than the preferred alternative.

12.0 SPECIFICATIONS TO BE INCLUDED IN CONTRACT

- ☐ Demo
- ☒ Wetland Replication (ITEM 755.35 INLAND WETLAND REPLICATION AREA)
- ☐ Mussel Survey/Transplant Protocol
- ☐ Vegetation Survey/Transplant Protocol

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ATTACHMENTS

Attachment A – Figures:
- Figure 1 - USGS Map
- Figure 2 - Aerial Map
- Figure 3 - Environmental Constraints Map

Attachment B – Wetland Delineation and Replication Report (Epsilon)
Attachment C – Order of Conditions (OOC)
Attachment D – Public Notice
Attachment E – Stormwater Report (bound separately)
Attachment F – WQC Submission Plans (bound separately)
Attachment G – Cultural Resource Coordination
Attachment H – ROW Parcel Summary Sheet/Abutters
Attachment I – 4d Submittal (Northern Long Eared Bats)

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Attachment A – Figures

- Figure 1 - USGS Map
- Figure 2 - Aerial Map
- Figure 3 - Environmental Constraints Map

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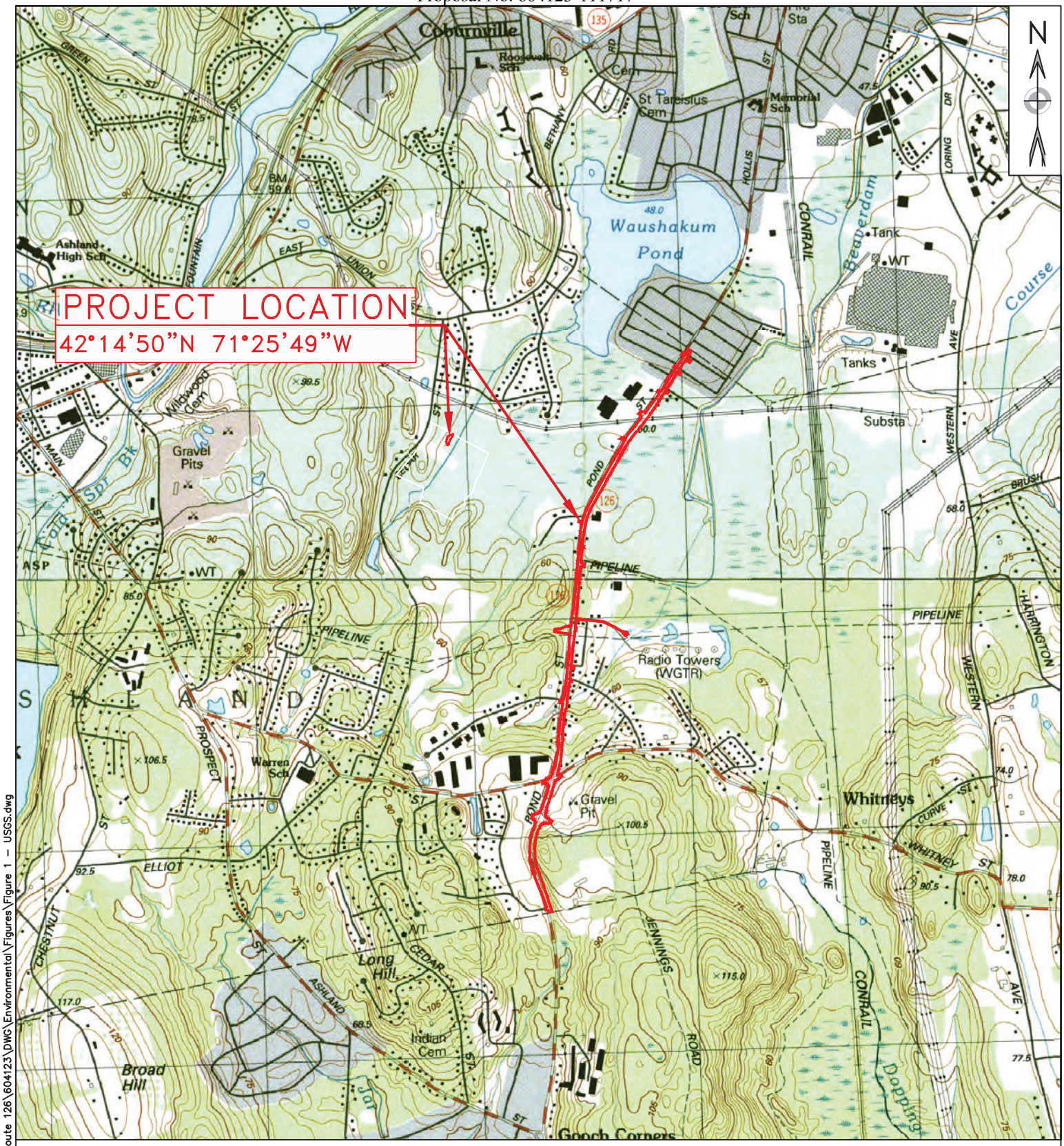

SCALE IN FEET

1000 0 1000 2000

ELEVATIONS IN METERS

USGS LOCUS MAP

RECONSTRUCTION ON ROUTE 126 (POND STREET)

FROM THE FRAMINGHAM TOWN LINE TO THE HOLLISTON TOWN LINE, ASHLAND, MA

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
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PREPARED FOR:
massDOT
Massachusetts Department of Transportation
Highway Division

SCALE: AS NOTED	PROJECT NO. 13033.044	FIGURE 1
DATE: 01/31/2020 REVISED:	DRAWN BY: EA CHECKED BY: DS	

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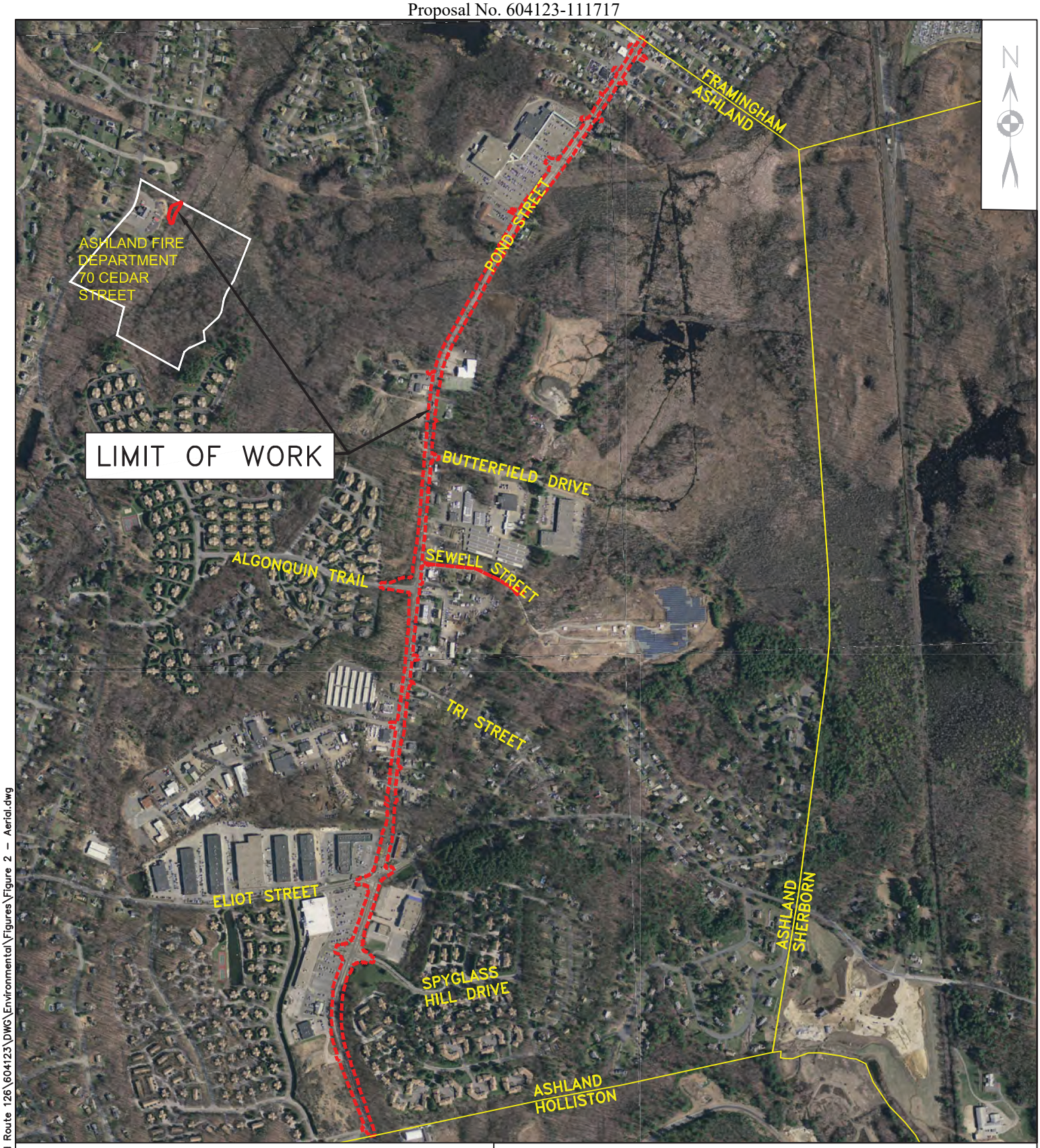

AERIAL LOCUS MAP

RECONSTRUCTION ON ROUTE 126 (POND STREET)

FROM THE FRAMINGHAM TOWN LINE TO THE HOLLISTON TOWN LINE, ASHLAND, MA

SCALE IN FEET

500 0 500 1000

NOTE: DATA TAKEN FROM MASSGIS

PREPARED BY:	PREPARED FOR:
GREEN INTERNATIONAL AFFILIATES, INC. CIVIL AND STRUCTURAL ENGINEERS 239 LITTLETON RD, WESTFORD, MA (978) 923-0400 24 ALBION RD, LINCOLN, RI (401) 305-7895	massDOT Massachusetts Department of Transportation Highway Division

SCALE: AS NOTED	PROJECT NO. 13033.044	FIGURE 2
DATE: 01/31/2020 REVISED:	DRAWN BY: EA/OF CHECKED BY: DS	

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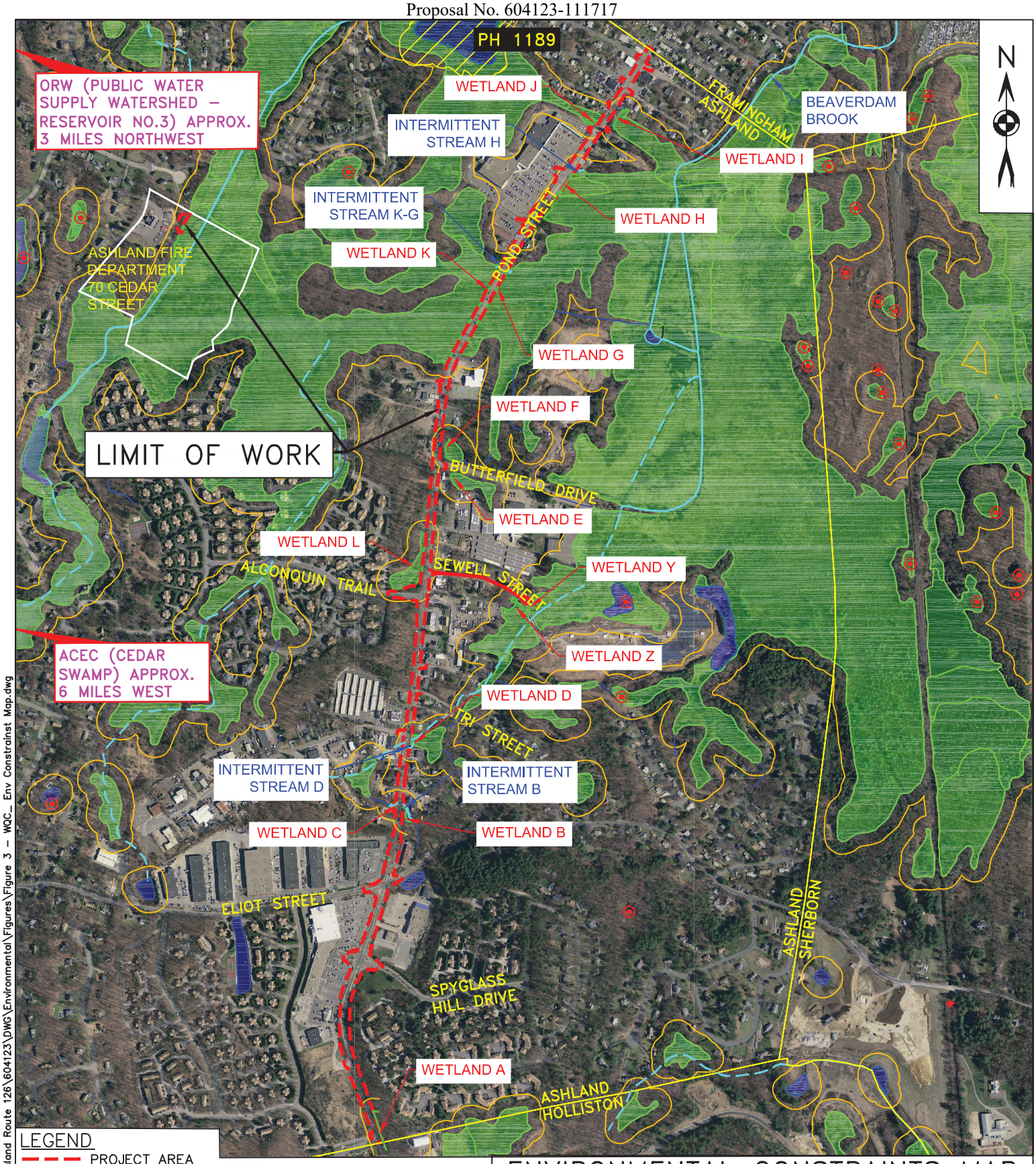

LEGEND

- PROJECT AREA
- NHESP ESTIMATED HABITATS OF RARE WILDLIFE
- NHESP PRIORITY HABITATS OF RARE WILDLIFE
- AREAS OF CRITICAL ENVIRONMENTAL CONCERN
- OUTSTANDING RESOURCE WATERS
- CERTIFIED VERNAL POOLS
- POTENTIAL VERNAL POOLS
- PERENNIAL STREAM
- INTERMITTENT STREAM
- VEGETATED WETLAND (BVW)
- HYDRAULIC CONNECTIONS
- 100-FT WETLAND BUFFER

SCALE IN FEET
500 0 500 1000
1" = 1000'
NOTE: DATA TAKEN FROM MASSGIS

ENVIRONMENTAL CONSTRAINTS MAP

RECONSTRUCTION ON ROUTE 126 (POND STREET)
FROM THE FRAMINGHAM TOWN LINE TO THE HOLLISTON TOWN LINE, ASHLAND, MA

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
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PREPARED FOR:
massDOT
Massachusetts Department of Transportation
Highway Division

SCALE: AS NOTED	PROJECT NO. 13033.044	FIGURE 3
DATE: 01/31/2020	DRAWN BY: OF	
REVISED:	CHECKED BY: DS	

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Attachment B – Wetland Replication Plan for MassDOT Route 126 (Pond Street) Maintenance and Improvement Project; MassDEP File No. 095-0931 (Epsilon)

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Epsilon ASSOCIATES INC.

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January 7, 2020

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Ashland Conservation Commission
101 Main Street, 2nd Floor
Ashland, MA 01721

Subject: Wetland Replication Plan for MassDOT Route 126 (Pond Street) Maintenance and Improvement Project; MassDEP File No. 095-0931

Dear Commissioners:

As requested by the Massachusetts Department of Transportation ("MassDOT"), Epsilon Associates, Inc. ("Epsilon") conducted a wetland delineation at 70 Cedar Street (Ashland Fire Department Headquarters) associated with proposed roadway maintenance and improvement work on Route 126 (Pond Street) in Ashland, MA. On December 12, 2019 Epsilon delineated a portion of the western edge of bordering vegetated wetland ("BVW") on land owned by the Town of Ashland. The BVW is associated with an unnamed perennial tributary to Waushakum Pond. More specifically, the delineation was conducted to help identify a wetland replication area for project related impacts located along Route 126 (Pond Street). Additional detail describing our findings and the wetland replication plan is provided in the balance of this report.

Existing Conditions – Proposed Wetland Replication Area & Reference Wetland

As mentioned above, uplands located along the western edge of BVW, located at 70 Cedar Street, were assessed for potential as a wetland replication area. The attached Figure 1 - USGS Site Location and Figure 2 - Aerial Site Location, located in Attachment A, generally depict the project site and the proposed wetland replication area. The adjacent delineated wetland system (see wetland flags WF-1 to WF-14) was used as a reference for the wetland replication plan. The wetland system is located to the east of the Ashland Fire Department Headquarters ("Fire Station"). The Fire Station is located on a residential street, with houses located to the north and west, and large forested upland and wetland areas located to the south and east.

The proposed wetland replication area is in uplands near the northern property boundary and immediately adjacent to the delineated BVW. The Wetland Replication Plan located in Attachment D depicts the location of the planned mitigation site. According to a topographic survey, conducted by others, existing elevations within the proposed wetland replication area range from approximately 162 to 168 feet. The property has multiple graded terraces from the existing wetland to the Fire Station. Uplands adjacent

to the existing wetland are comprised mainly of a nearly flat maintained grassy area, with a gravel access road utilized by the fire department for training purposes and storage. The existing gravel access is shown on Figure 1 (Attachment A). There is a steep slope that extends east to west from the existing wetland. Upland vegetation observed along this slope includes red oak (*Quercus rubra*), red maple, multiflora rose (*Rosa multiflora*), oriental bittersweet, honeysuckle (*Lonicera sp.*), white pine (*Pinus strobus*), and poison ivy (*Toxicodendron radicans*).

The existing wetland exhibits strong indicators of hydrology including standing water, high water table, drainage patterns, and microtopographic relief. The reference wetland had an abundance of hydrophytic vegetation, including red maple (*Acer rubrum*), winterberry (*Ilex verticillata*), spicebush (*Lindera benzoin*), silky dogwood (*Cornus amomum*), gray dogwood (*Cornus racemosa*), sensitive fern (*Onoclea sensibilis*), and cattail (*Typha latifolia*). Invasive plants observed within the reference wetland included oriental bittersweet (*Celastrus orbiculatus*), and multiflora rose. See Attachment B and C for representative site photographs and wetland determination data forms, respectively.

The proposed wetland replication site provides sufficient area for replication, and access to the site can be obtained from an existing access road, which loops behind the Fire Station. The existing access road will be maintained for future use by the Fire Station.

Wetland Resource Areas and Wetland Delineation Methodology

Vegetated wetlands were delineated in accordance with the U.S. Army Corps of Engineers *Wetland Delineation Manual* (USACE, 1987), the "Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, Version 2.0" (2012), the Massachusetts Wetlands Protection Act and implementing regulations (310 CMR 10.00), and the Massachusetts Department of Environmental Protection's handbook, *Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act* (MADEP, 1995). The state and federal delineation methodologies generally prescribe a multi-parameter approach, where hydrophytic vegetation and hydrology (including hydric soils) are reviewed in conjunction with one another when delineating a wetland edge.

Based on field observations and MassGIS data the following resource areas are located within the vicinity of the proposed wetland replication site:

- BVW,
- 200-foot Riverfront Area, and
- 100-Year Floodplain.

Wetland Replication

To mitigate for total BVW wetland losses (fill) of 3,686 square feet (sf), a wetland replication area will be constructed on the parcel located at 70 Cedar Street. The wetland replication area will equal approximately 4,000 sf. As noted above, the wetland

replication area will be located along the western edge of a BVW associated with an unnamed perennial tributary to Waushakum Pond. The amount of wetland that will be created will provide mitigation for the wetland losses at a ratio of approximately 1:1.

Details regarding the existing and proposed conditions, construction methods, and monitoring at this site is provided below and in the Wetland Replication Plan (Sheet 185) located in Attachment D.

Wetland Replication Design Considerations, Construction Approach and Sequencing

The BVW replication area described in this report has been designed in accordance with the Massachusetts Wetland Protection Act regulations at 310 CMR 10.55(4)(b), and the Massachusetts Department of Environmental Protection's ("MassDEP") "Massachusetts Inland Wetland Replication Guidelines" (MassDEP, March 2002). More specifically, the BVW replication area has been designed to function in a manner similar to BVW that will be lost with regard to surface area, groundwater and surface elevations, hydrology, and wetland plant species and soil types. The wetland replication also incorporates important wildlife habitat features into the design.

The wetland replication is one part of a larger construction Project associated with Route 126 (Pond Street). Portions of the work may be completed concurrent with similar activities throughout the site. Below is a summary of design considerations, construction approach and sequencing for the wetland replication. Design considerations and construction sequencing are subject to modification based on site conditions and scheduling of various project elements.

The proposed replication area will be cleared of trees, re-graded, supplemented with soil amendments, and planted with wetland vegetation and seeded with a native wetland seed mix. The following is a summary of measures that will be implemented to build and maintain the wetland mitigation area.

Design Considerations

In designing the wetland replication area that will replace the amount of wetland filled by the project, three wetland characteristics were considered. These included the depth to groundwater, types of soils that would be used, and the types of vegetation that would be planted there.

<u>Depth to Groundwater</u>

The replication area is designed at generally the same elevation as the adjacent existing wetland. Accordingly, hydrology in the created wetland areas is expected to function in a similar manner as that of the existing wetland. Groundwater flows will have an

unrestricted connection to the wetland replication area. The wetland replication site will be contiguous with the existing wetland community to the east with planned elevations of approximately 163 and 162 feet. At this elevation groundwater is expected to be between the finished surface of the replication area and no greater than 12 inches below the surface for 14 or more consecutive days during the growing season. Cross sections are included in the attached Wetland Replication Plan (Sheet 185) which show the horizontal configuration of the replication area, as well as the existing wetlands to the east.

Soils

The wetland replication area will have a minimum of 12 inches of an organic enriched A-Horizon over the excavated base elevation. The base elevation in the wetland replication area will be established so that the mean annual ground water elevation will be no greater than 12 inches below the surface for 14 or more consecutive days during the growing season. Micro-topography in the form of hummocks, pits and mounds, and similar features shall be constructed within the replaced soils. Final base grades shall be approved by the Wetland Specialist and Resident Engineer.

Common practice in building replacement wetland areas is to salvage and translocate soils from the filled wetland into the wetland replacement area. Suitable material excavated from the permanent impact site will be used within the wetland replication site to the extent practicable. If soil from the impacted wetland area is used, the soil shall be handled such that the original soil structure is preserved and shall not be compacted, screened, or otherwise processed. Wetland soil from the impacted wetland that is infested with invasive plant species shall not be used in the mitigation, unless approved by the Wetland Specialist.

If additional material is required, a manmade soil mixture consisting of equal volumes of organic (compost) and mineral material such as rich loamy sand with a loose to friable consistency will be used. Manufactured wetland soil shall consist of on-site borrow from the proposed replacement site thoroughly mixed with compost to achieve a target organic content of 10-12% by weight. Where empirical data are lacking, compost to soil ratio shall be 1:1 by volume. Off-site borrow may be used for mixing if approved in advance by the Wetland Specialist and the Resident Engineer.

No soil, compost, or other soil amendment imported to the work site shall contain seeds, roots, stems, or other viable parts of invasive plants. No soil or soil amendment shall be brought on site without approval of the material source by the Wetland Specialist and the Resident Engineer. Soils used in the replacement area shall be free of rocks greater than 4 inches in diameter.

No wood chips will be added to the manmade soil. Soil material will be spread in a manner that will minimize soil compaction in the wetland replication area.

The mitigation area side slopes will be top-dressed with approximately 4 inches of a loam borrow. The soil shall be weed free, uncontaminated, and shall not include any woodchips.

Incorporation of Coarse Woody Material

Trees adjacent to or within the wetland mitigation area may be left as snags for wildlife if they do not pose a fall hazard (i.e., are not near a roadway, building, etc.). Trees left as snags shall be directed by the Wetland Specialist or Landscape Architect. Woody material removed from the footprint of the replication area shall be saved and stockpiled for future incorporation. Woody material shall include tree trunks (logs) as well as stumps. Tree limbs and brush may also be included as directed. Woody material shall be placed in a deliberate and naturalistic manner. Dead or dying woody debris shall cover at least 15 to 20 percent of the ground throughout the mitigation site.

Vegetation

A mix of Palustrine Forested (PFO), Scrub-Shrub (PSS), and Emergent (PEM) community types will be encouraged in the replication area with a target coverage of 75% native species. Trees and shrubs selected for the wetland replication area will be healthy disease-free native (not cultivar) stock from a regional nursery. All plant material planted in the wetland replication area shall be guaranteed for one year following the date of final acceptance. Plant material that fails to become established within one year shall be replaced in-kind. Alternative species may be added to the landscape plan pending availability of plant species identified for use as approved by the Wetland Specialist.

The tree and shrub species selected are found in the surrounding wetlands and are suitable to the existing site conditions. The species identified in the table below have been selected for their wildlife value as potential nesting sites, protective cover habitat, and food sources. The species selected for the wetland replication area will be planted according to standard planting protocols and planting depths. All planted tree and shrub specimens shall be either bare root or potted and be inspected by the Wetland Specialist prior to placing the specimens in the wetland replication area.

The planting schedule is also provided in the attached Wetland Replication Plan (Sheet 185) (Attachment D). Trees planted in the replication area will be located along the fringe and areas of higher elevation (i.e., graded mounds). Shrubs planted in the mitigation area will be randomly placed in clusters of the same species. A cluster will consist of 3 to 5 specimens, spaced according to the planting schedule below. If soil conditions are found to be particularly soft or plantings are top-heavy, stakes and soft cables (i.e., wire with

rubber tubes at plant contact points) will be used to keep the plantings upright. If necessary, a two-foot radius of bark or wood chip mulch will be used around each planting cluster to reduce competition from herbaceous growth. As necessary, mulch will be applied to a depth of three inches though with only minimal coverage immediately adjacent to each root crown (i.e., saucer-shaped pattern around the planting: meristems not buried). Plantings will be watered-in immediately after planting, as necessary. Terrasorb, or similar, will be applied, as necessary, to each planting to reduce watering and ensure plants get the water they need. The planting arrangement is intended to simulate natural growth patterns and create cover habitat for birds and small mammals as the shrubs mature. Sweet pepperbush's habit of growing in dense colonies will also help to discourage growth of invasive species. As shown in the table below, a native wetland seed mix will provide a herbaceous layer that will further help prevent the establishment of invasive species. The seed mix and source shall be approved by the Wetland Specialist.

The 3:1 graded slope located around the perimeter of the wetland replication site will be seeded with a native conservation/wildlife mix. Typical species of this seed mixture are detailed below. As noted above, the seed mix and source shall be approved by the Wetland Specialist.

Wetland & Buffer Planting Schedule

Specimen	Wetland Status	Plant Type	Plant Size	Quantity	Density/Spacing
Red maple (*Acer rubrum*)	FAC	Tree	4-6' HT	15	Random at raised elevations
Sweet pepperbush (*Clethra alnifolia*)	FAC	Shrub	3–4' HT	25	5–6 ft. on center
Silky dogwood (Cornus *Amomum*)	FACW	Shrub	3–4' HT	25	5–6 ft. on center
Spicebush (*Lindera benzoin*)	FACW	Shrub	3-4' HT	35	5–6 ft. on center
Common Winterberry (*Ilex verticillata*)	FACW	Shrub	3–4' HT	30	5–6 ft. on center
Wetland seed mix[1]	-	Herbaceous	-		1 lb/2,000 sf
Upland/Buffer seed mix[2]	-	Herbaceous	-		1 lb/1,750 sf

[1] Wetland seed mix typical species: Fox Sedge (*Carex vulpinoidea*), Lurid Sedge (*Carex lurida*), Blunt Broom Sedge (*Carex scoparia*), Blue Vervain (*Verbena hastata*), Fowl Bluegrass (*Poa palustris*), Hop Sedge (*Carex lupulina*), Green Bulrush (*Scirpus atrovirens*), Creeping Spike Rush (*Eleocharis palustris*), Fringed Sedge (*Carex crinita*), Soft Rush (*Juncus effusus*), Spotted Joe Pye Weed (*Eupatorium maculatum*), Rattlesnake Grass (*Glyceria canadensis*), Swamp aster (*Aster puniceus*), Blueflag (*Iris versicolor*), Swamp Milkweed (*Asclepias incarnata*), Square stemmed Monkey Flower (*Mimulus ringens*).

[2] Conservation seed mix typical species: Virginia Wild Rye (*Elymus virginicus*), Little Bluestem (*Schizachyrium scoparium*), Big Bluestem (*Andropogon gerardii*), Red Fescue (*Festuca rubra*), Switch Grass (*Panicum virgatum*), Partridge Pea (*Chamaecrista fasciculata*), Panicledleaf Tick Trefoil (*Desmodium paniculatum*), Indian Grass (*Sorghastrum nutans*), Blue Vervain (*Verbena hastata*), Butterfly Milkweed (*Asclepias tuberosa*), Black Eyed Susan (*Rudbeckia hirta*), Common Sneezeweed (*Helenium autunale*), Heath Aster (*Asterpilosus/Symphyotrichum pilosum*), Early Goldenrod (*Solidago juncea*), Upland Bentgrass (*Agrostis perennans*).

The development of vegetation in the wetland replication area will be monitored during the first two growing seasons and/or in accordance with the Order of Conditions. Corrective measures may be implemented in the course of monitoring to ensure successful completion of the Project. As the planted specimens mature, the wetland trees and shrubs will provide nesting, cover, and food for wildlife in the area. A ground cover

of herbaceous species, including wetland grasses, sedges, rushes, and forbs, will become established as the herbaceous species flower and produce seeds.

Wetland Replication Construction Sequence

As previously noted, the wetland replication is one part of a larger construction project. Portions of the work may be completed concurrent with similar activities. Below is a general construction sequence for the wetland replication. This sequence is subject to modification based on site conditions and scheduling of various project elements.

1. Installation of Erosion Controls. Prior to commencement of construction activities in the wetland mitigation area all existing vegetation will be removed. Following removal, temporary erosion controls will be installed along the entire perimeter of the proposed wetland replication area.

2. Site Preparation. Following vegetation removal and installation of the erosion control barrier at the outer limits of the mitigation site, the site will be grubbed as necessary and all roots and stumps removed from the replication site. These may be stockpiled for use as woody debris within the replication area. Soils will then be excavated and removed from the site until a rough grade is achieved approximately six inches to 12 inches below estimated mean annual high groundwater.

3. Placement of Soils. Following rough grading (including microtopography) of the wetland replication area, it will be backfilled with 12 inches of suitable material excavated from the permanent work pad location and/or organically enriched manmade soils. To avoid compaction, heavy mechanical equipment will not be allowed in this area once the soils have been placed.

4. Incorporation of Coarse Woody Material. A supply of dead or dying woody debris (i.e., logs, stumps, limbs/brush) shall cover at least 15 to 20 percent of the ground throughout the mitigation site. These materials shall not include invasive species.

5. Vegetation Planting. Following placement of the wetland soils in the wetland replication area, wetland plants will then be installed. Upon final stabilization all erosion controls will be removed. Pending actual site and weather conditions all plantings will take place in spring (May 15–June 15) or fall (September 1–November 1).

6. Maintenance. As necessary following planting, the wetland replication area will be irrigated to insure successful establishment of newly planted vegetation.

Wetland Replication Monitoring

The wetland replication area will be monitored during the first two growing seasons and/or in accordance with the Order of Conditions following planting to evaluate the success of the wetland and monitor the area for invasive species. If any invasive species are found, they shall be uprooted and removed from the area by hand.

Two or three 3x3 meter (m) plots shall be permanently staked within the replication area. The vegetation community in these plots will be inventoried late in the growing season to determine the percent cover of hydrophytes growing in the replication area. Yearly monitoring reports shall be prepared summarizing the year's findings and providing recommendations to ensure the success of the replication effort. These reports are to be provided to MassDOT and the Conservation Commission. MassDOT shall undertake whatever efforts are necessary to ensure compliance with this plan. Groundwater elevations will be monitored in the wetland replication areas concurrent with vegetation monitoring. To monitor groundwater two shallow ground water monitoring wells will be installed in the replication area to a depth of three to four feet, as necessary. The wetland replication area will be monitored twice per growing season. Once in the mid to late spring and again during mid to late summer. The reports will provide details on the success standards described below.

- **The proposed vegetation diversity and/or density goals for woody plants from the Wetland Replication Plan (Sheet 185) are met.** The planting area will be monitored to assess whether the established plantings are healthy and vigorous and whether they provide a vegetated cover of at least 75% surface area.

- **The mitigation area will exhibit wetland hydrology indicators**. As meant here wetland indicators include primary indicators such as surface water, high water table, soil saturation and others for an adequate duration as detailed in the US Army Corps of Engineers, "Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region", January 2012.

The first year of monitoring will be the first year that the site has been through a full growing season after planting. For monitoring purposes, a growing season starts no later than May 31. If there are problems that need to be addressed and if the measures to correct them require prior approval from the Conservation Commission, the permittee will contact the Commission as soon as the need for corrective action is discovered.

Remedial measures will be implemented as necessary to attain the success standard described below within two growing seasons after completion of installation of the plantings.

Annual Wetland Monitoring Report Content

The wetland replication monitoring report will address the following:

- Consistency with success vegetation and hydrology success standards.
- Descriptions of the monitoring inspections that occurred since the last report.
- Descriptions of the remedial actions completed during the monitoring year to meet the two success standards, including such actions as removing debris, replanting, re-grading any areas, applying additional topsoil or soil amendments, etc.
- Descriptions of the general health and vigor of the planted specimens, prognosis for future survival, and diagnosis of cause(s) of morbidity or mortality.
- Percent cover and percent survival for each species of planted specimens.
- Observed wetland hydrology during spring and fall for the first two years.
- Recommended remedial measures to achieve or maintain achievement of the two success standards identified above.
- Representative photographs of the planting areas taken from the same locations for each monitoring event.

If you have any questions, please do not hesitate to contact Susan McArthur (MassDOT) at (857) 368-8807, susan.mcarthur@state.ma.us; or Matt Kelly (Epsilon) (978) 461-6237, mkelly@epsilonassociates.com.

Sincerely,
EPSILON ASSOCIATES, INC.



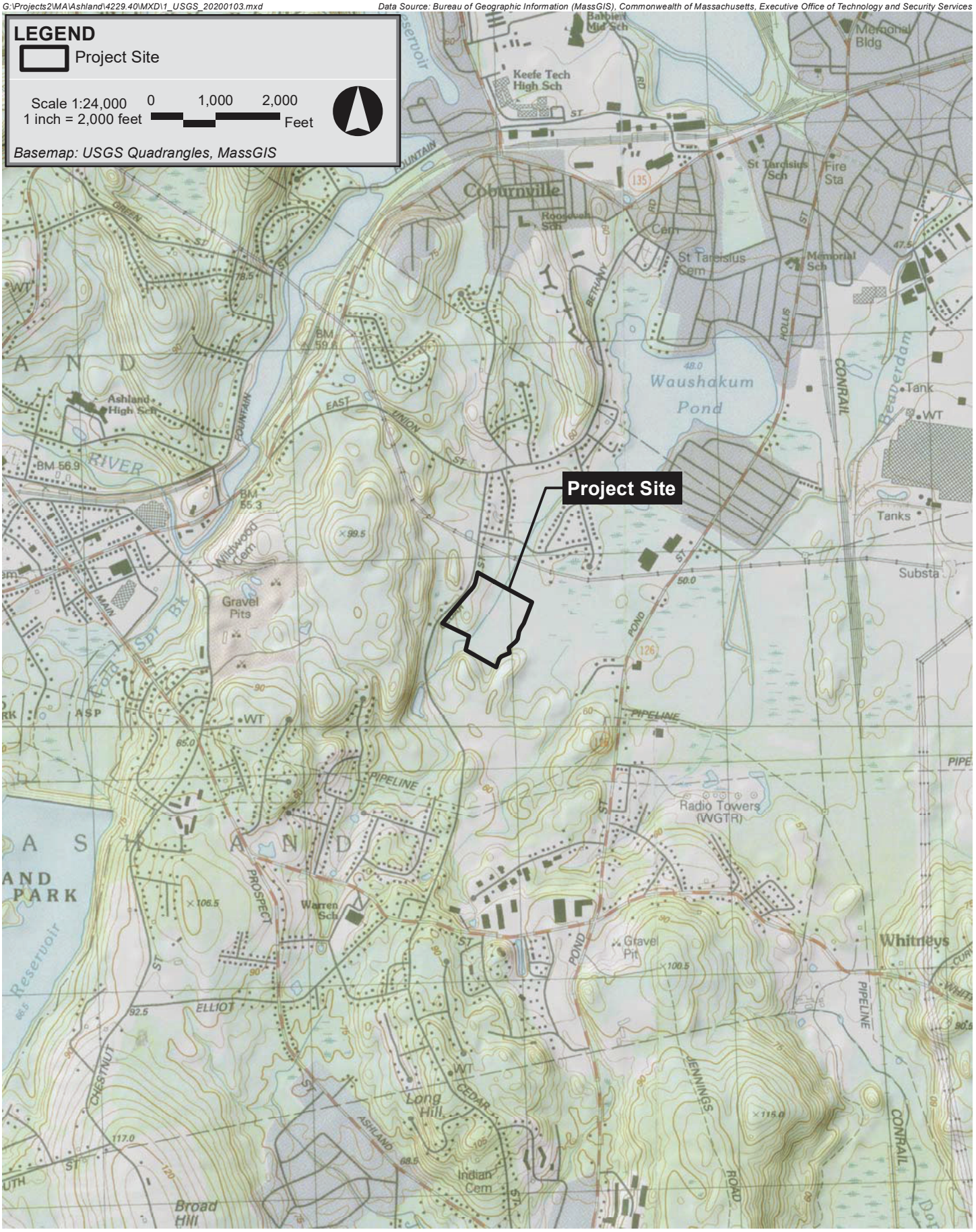
Matt Kelly
Senior Scientist

Attachment A

Figures

G:\Projects2\MA\Ashland\4229.40\MXD\1_USGS_20200103.mxd

Data Source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services



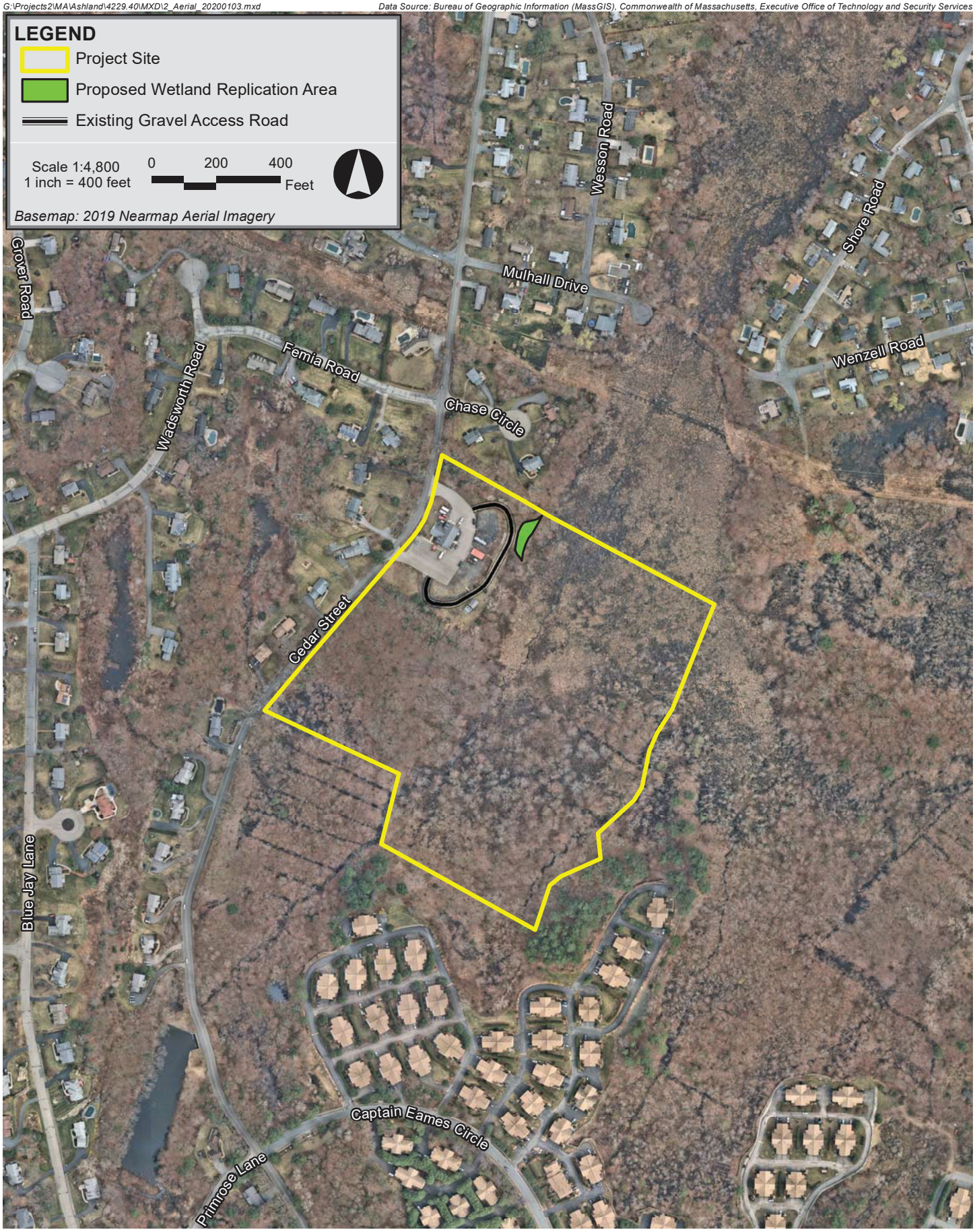
70 Cedar Street Ashland, Massachusetts

Epsilon Associates Inc.

Figure 1
USGS Locus Map

G:\Projects2\MA\Ashland\4229.40\MXD\2_Aerial_20200103.mxd

Data Source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services



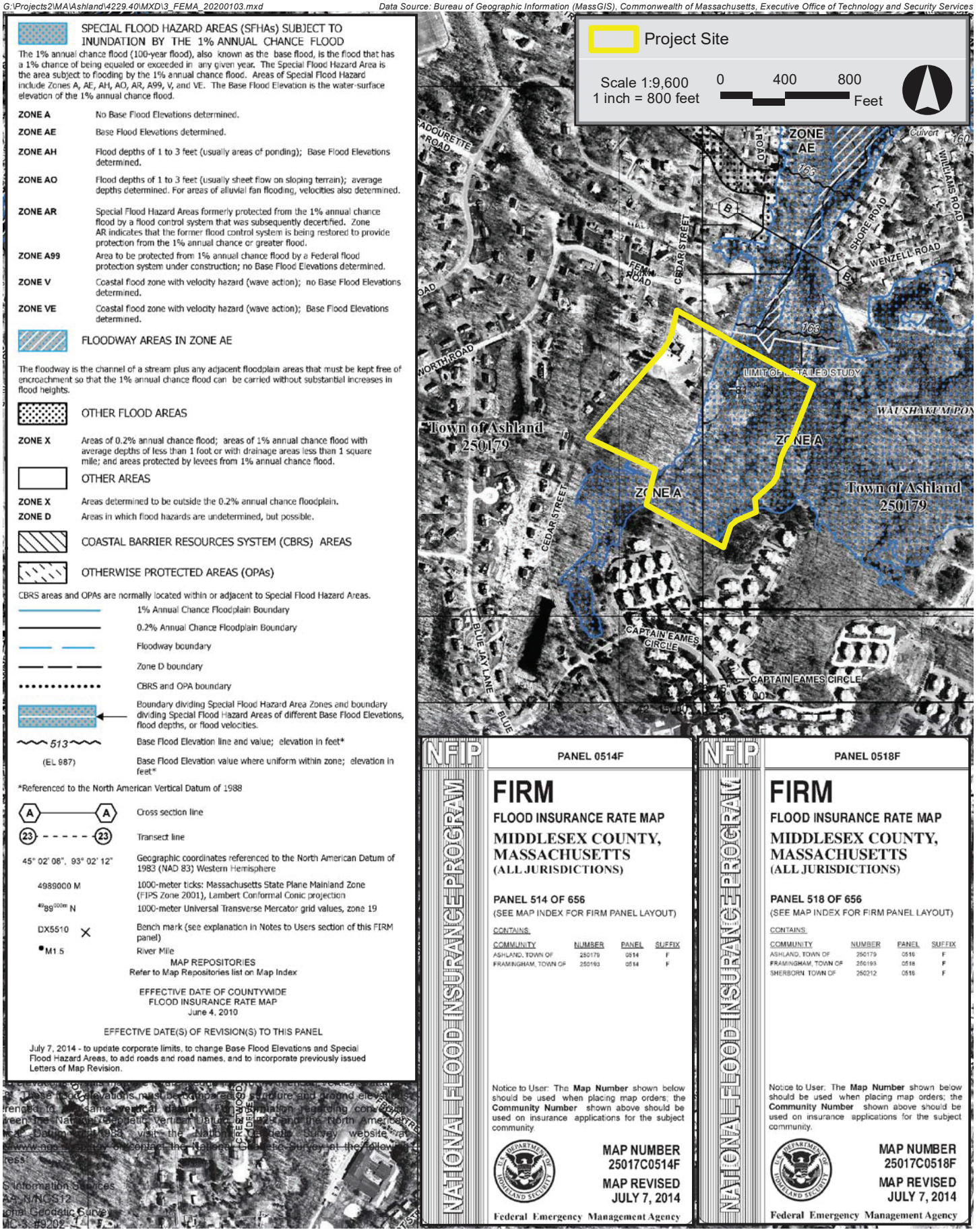
70 Cedar Street Ashland, Massachusetts

Epsilon Associates Inc.

Figure 2
Aerial Locus Map

G:\Projects2\MA\Ashland\4229.40\MXD\3_FEMA_20200103.mxd

Data Source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services



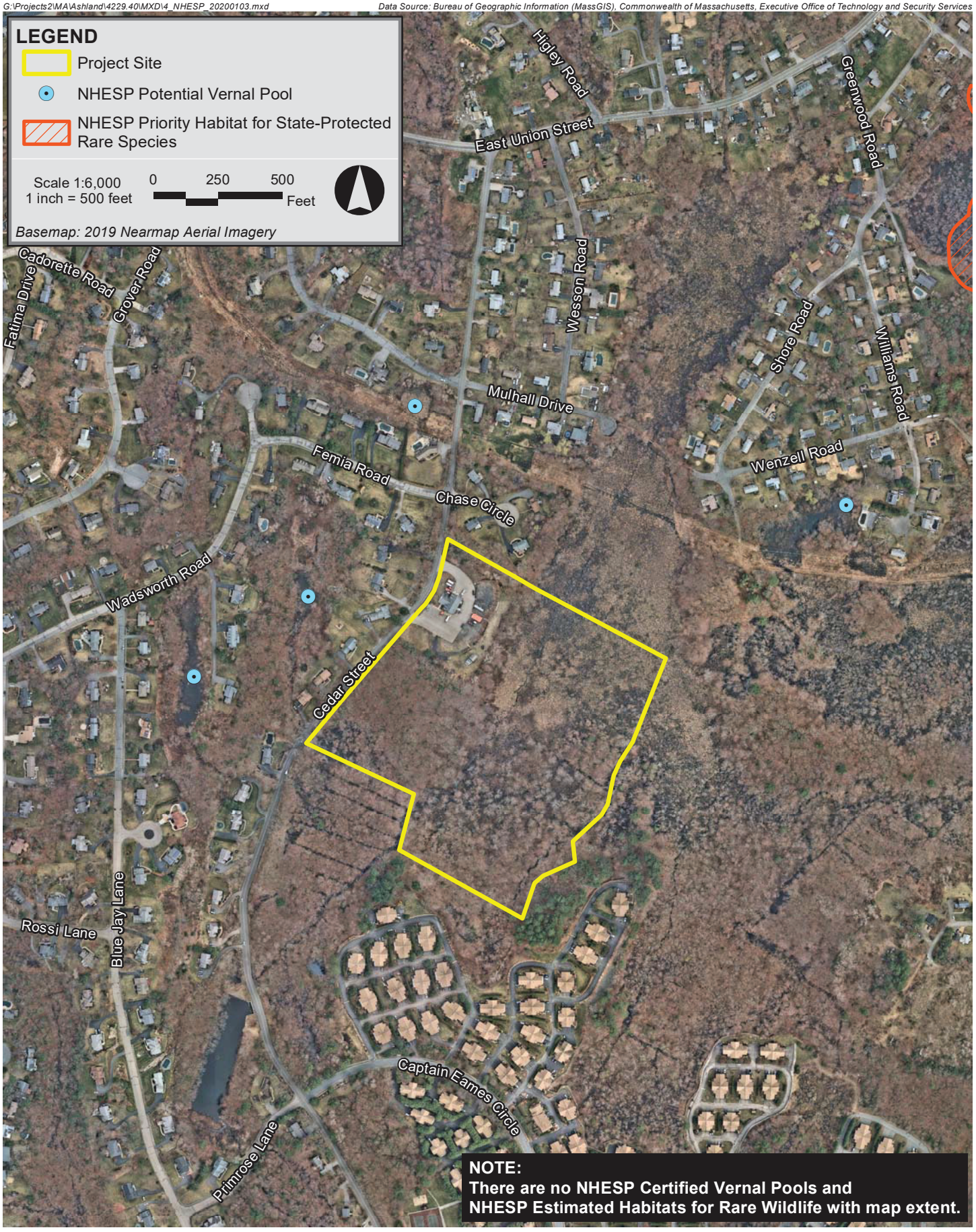
70 Cedar Street Ashland, Massachusetts

Epsilon Associates Inc.

Figure 3
FEMA Flood Zones

G:\Projects2\MA\Ashland\4229.40\MXD\4_NHESP_20200103.mxd

Data Source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services



70 Cedar Street Ashland, Massachusetts

Epsilon Associates Inc.

Figure 4

Natural Heritage and Endangered Species Program

Attachment B

Representative Site Photographs



Photo 1: View of the existing wetland facing south near wetland flags WF-2 and WF-3. The replication area will be located along the right side of the photo.



Photo 2: View of the existing wetland facing north near wetland flag WF-3. The wetland replication site will be located to the west along the left side of the photo.



Photo 3: A view of the proposed wetland replication site looking northeast from the Fire Station parking lot.

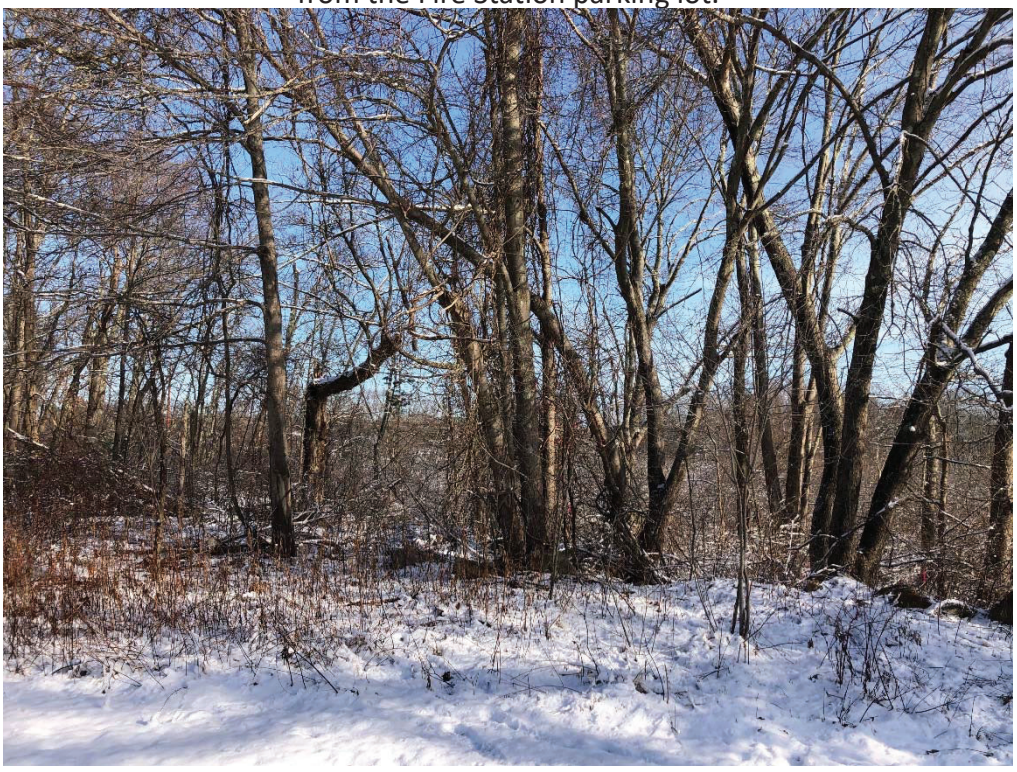


Photo 4: View of the proposed wetland replication site looking northeast from the Fire Station access road.



Photo 5: View southwest of the access road leading to the exercise building used by the Fire Department.



Photo 6: View northwest of the access road leading from the Fire Station parking lot.



Photo 7: View of existing gravel access road that leads from the Fire Station parking lot to the exercise grounds.



Photo 8: Soil profile of the wetland plot for the transect near WF-3.



Photo 9: Soil profile of the wetland plot for the transect near WF-7.



Photo 10: Soil profile of the wetland plot for the transect near WF-14.

Attachment C

Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 70 Cedar Street; Wetland Mitigation Area City/County: Ashland Sampling Date: 12/12/2019

Applicant/Owner: MassDOT State: MA Sampling Point: UPL-3

Investigator(s): Matt Kelly, Megan Kearns Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None

Slope (%): 2% Lat: 42.256031 Long: -71.437006 Datum: NAD83

Soil Map Unit Name: Deerfield loamy fine sand; 0 to 3 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ✓	Depth (inches): ____
Water Table Present?	Yes ____	No ✓	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No ✓	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: UPL-3

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus rubra	25	Y	FACU
2. Acer rubrum	20	Y	FAC
3.			
4.			
5.			
6.			
7.			
	45	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Rosa multiflora	15	Y	FACU
2. Lindera benzoin	8	N	FACW
3. Lonicera sp.	20	Y	FACU
4.			
5.			
6.			
7.			
	43	= Total Cover	
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	0	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1. Celastrus orbiculatus	15	Y	UPL
2.			
3.			
4.			
	15	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ Rapid Test for Hydrophytic Vegetation

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** _____ **No** ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: UPL-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6"	10YR 3/3	100					sandy loam	many fine roots
6-20"	10YR 2/2	100					sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

Soil pit was located along the slope. Soils were previously disturbed.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 70 Cedar Street; Wetland Mitigation Area City/County: Ashland Sampling Date: 12/12/2019

Applicant/Owner: MassDOT State: MA Sampling Point: WET-3

Investigator(s): Matt Kelly, Megan Kearns Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None

Slope (%): 2% Lat: 42.256031 Long: -71.437006 Datum: NAD83

Soil Map Unit Name: Deerfield loamy fine sand; 0 to 3 percent slopes NWI classification: PFO/PSS

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ____	**Is the Sampled Area within a Wetland?** **Yes ✓ No ____**
Hydric Soil Present?	Yes ✓ No ____	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes ✓ No ____	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ✓	Depth (inches): ____
Water Table Present?	Yes ✓	No ____	Depth (inches): 8"
Saturation Present? (includes capillary fringe)	Yes ✓	No ____	Depth (inches): 6"

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: WET-3

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	20	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	20	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Ilex verticillata	15	Y	FACW
2. Cornus racemosa	10	Y	FAC
3. Cornus amomum	5	N	FACW
4. Lindera benzoin	10	Y	FACW
5.			
6.			
7.			
	40	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Onoclea sensibilis	8	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	8	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1. Celastrus orbiculatus	15	Y	UPL
2.			
3.			
4.			
	15	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ Rapid Test for Hydrophytic Vegetation

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10"	10YR 2/1	100					organic	Oa
10-12"	10YR 5/2	100					loamy fine sand	
12-18"	10YR 4/2	95	10YR 6/2	5	D	M	loamy fine sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ✓ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

See Photo #8 for view of soil profile.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 70 Cedar Street; Wetland Mitigation Area City/County: Ashland Sampling Date: 12/12/2019

Applicant/Owner: MassDOT State: MA Sampling Point: UPL-7

Investigator(s): Matt Kelly, Megan Kearns Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None

Slope (%): 2% Lat: 42.255751 Long: -71.437186 Datum: NAD83

Soil Map Unit Name: Freetown muck, 0 to 1 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ✓	Depth (inches): ____
Water Table Present?	Yes ____	No ✓	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No ✓	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: UPL-7

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	10	Y	FAC
2. Quercus alba	25	Y	FACU
3.			
4.			
5.			
6.			
7.			
	35 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Lonicera sp.	15	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	15 = Total Cover		
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Celastrus orbiculatus	10	Y	UPL
2.			
3.			
4.			
	10 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ Rapid Test for Hydrophytic Vegetation

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: UPL-7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8"	10YR 5/4	100					loamy fine sand	
8-16"	10YR 5/4	90	10YR 4/6	10	C	M	loamy fine sand	discontinuous mottle lenses

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 70 Cedar Street; Wetland Mitigation Area City/County: Ashland Sampling Date: 12/12/2019

Applicant/Owner: MassDOT State: MA Sampling Point: WET-7

Investigator(s): Matt Kelly, Megan Kearns Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None

Slope (%): 1% Lat: 42.255751 Long: -71.437186 Datum:

Soil Map Unit Name: Freetown muck, 0 to 1 percent slopes NWI classification: PFO/PSS

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** **Yes ✓** **No ____**
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ✓	Depth (inches): ____
Water Table Present?	Yes ✓	No ____	Depth (inches): 12"
Saturation Present? (includes capillary fringe)	Yes ✓	No ____	Depth (inches): 12"

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: WET-7

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	15	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	15 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Ilex verticillata	30	Y	FACW
2. Rosa multiflora	15	Y	FACU
3. Lindera benzoin	15	Y	FACW
4.			
5.			
6.			
7.			
	60 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Symplocarpus foetidus	2	N	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	2 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Celastrus orbiculatus	15	Y	UPL
2.			
3.			
4.			
	15 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ Rapid Test for Hydrophytic Vegetation
- ✓ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET-7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4"	10YR 2/2	100					loamy fine sand	many fine roots (likely HTM)
4-15"	10YR 5/2	93	7.5YR 4/8	7	C	M	loamy fine sand	(likely HTM)
15-24+"	10YR 2/1	100					muck	buried Oa horizon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ✓ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** ___

Remarks:

The two horizons located within the top 15" are likely fill and disturbed.

Attachment D

Wetland Replication Plan

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	189	327
PROJECT FILE NO.	604123		

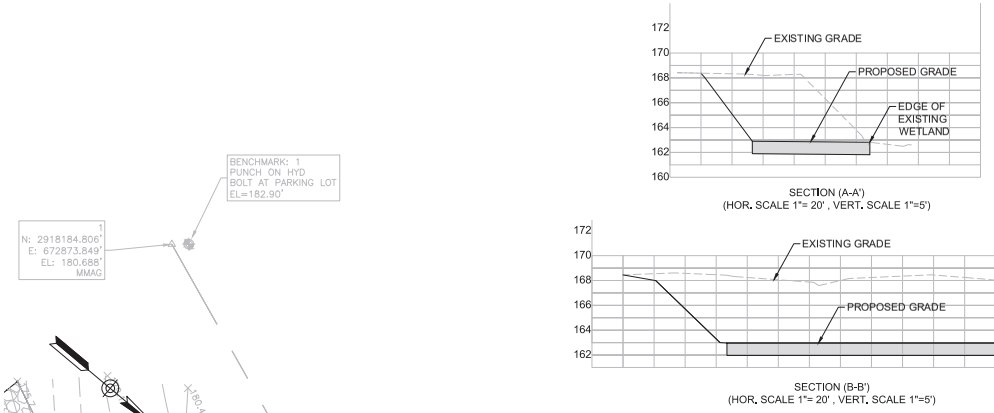
WETLAND REPLICATION PLAN
SHEET 1 OF 1

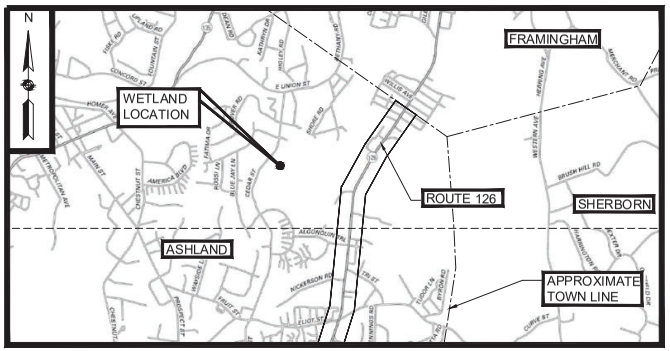
WETLAND REPLICATION AREA SEDIMENTATION AND EROSION CONTROL NOTES:

1. PRIOR TO STARTING ANY WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION & SEDIMENTATION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS IDENTIFIED IN ALL APPROVAL DOCUMENTS PERTAINING TO THIS PROJECT.
2. PERIODIC INSPECTION AND MAINTENANCE OF ALL SEDIMENT CONTROL STRUCTURES SHALL BE PROVIDED TO INSURE THAT THE INTENDED PURPOSE IS ACCOMPLISHED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SEDIMENT LEAVING THE LIMIT OF WORK. SEDIMENT CONTROL MEASURES SHALL BE IN WORKING CONDITION AT THE END OF EACH WORKING DAY.
3. ALL POINTS OF CONSTRUCTION INGRESS OR EGRESS WILL BE PROTECTED TO PREVENT TRACKING OF MUD ONTO PUBLIC WAYS.
4. AFTER ANY SIGNIFICANT RAINFALL, SEDIMENT CONTROL STRUCTURES SHALL BE INSPECTED FOR INTEGRITY. ANY DAMAGED DEVICES SHALL BE CORRECTED IMMEDIATELY.
5. ANY SEDIMENT TRACKED ONTO PAVED AREAS SHALL BE SWEPT AT THE END OF EACH WORKING DAY.
6. ALL DEBRIS GENERATED DURING SITE PREPARATION ACTIVITIES SHALL BE LEGALLY DISPOSED OF OFF-SITE.
7. AN EROSION CONTROL BARRIER SHALL BE INSTALLED AS SHOWN ON THE PLANS.
8. MEANS OF EROSION AND SEDIMENT PROTECTION AS NOTED ON THE DRAWINGS INDICATE THE MINIMUM PROVISIONS NECESSARY. ADDITIONAL MEANS OF PROTECTION SHALL BE PROVIDED BY THE CONTRACTOR AS REQUIRED FOR CONTINUED OR UNFORESEEN EROSION PROBLEMS, AT NO ADDITIONAL EXPENSE TO THE OWNER.

WETLAND REPLICATION AREA PLANTING NOTES AND CONSTRUCTION SEQUENCE:

1. CONTRACTOR SHALL COORDINATE WITH THE TOWN OF ASHLAND REGARDING ACCESS.
2. EROSION CONTROLS WILL BE INSTALLED ALONG THE EXISTING WETLAND BOUNDARY. THIS WILL ALLOW THE SITE CONTRACTOR TO PROPERLY TIE - IN PROPOSED CONTOURS AT THE EDGE OF THE EXISTING WETLAND.
3. UNDER THE DIRECTION OF THE WETLAND SPECIALIST, THE CONTRACTOR SHALL PROVIDE ROUGH GRADING (+/- 3 INCHES) WITHIN THE REPLICATION WETLAND. WETLAND MITIGATION GRADING IS SUBJECT TO MODIFICATION BASED ON ACTUAL SITE CONDITIONS. THE WETLAND SPECIALIST WILL INSPECT THE SUB-GRADE OF THE REPLICATION AREA TO ENSURE THAT THE PROPER HYDROLOGY AND MICROTOPOGRAPHY HAS BEEN ESTABLISHED.
4. PRIOR TO SOIL ADDITIONS AND/OR PLANTINGS, PROJECT SURVEYORS SHOULD VERIFY THAT GRADES HAVE BEEN ACHIEVED AS SHOWN ON THIS DRAWING.
5. PRIOR TO PLANTING, THE MITIGATION AREA SHOULD BE EXCAVATED APPROXIMATELY 1 FOOT BELOW THE FINISHED GRADE OF THE WETLAND MITIGATION AREA. FOLLOWING EXCAVATION OF THE MITIGATION AREA, A SOIL MIXTURE (NATURAL OR MANMADE) CONSISTING OF EQUAL VOLUMES OF ORGANIC (COMPOST) MATERIAL AND MINERAL SOIL MATERIAL SUCH AS A RICH LOAMY SAND (WITH A LOOSE FRIABLE CONSISTENCY) SHALL BE USED TO BRING THE EXCAVATED WETLAND MITIGATION AREA TO FINISHED GRADE. PRIOR TO USE, THE SOIL MIXTURE WILL BE ANALYZED BY A SOIL TESTING LABORATORY FOR TEXTURE AND NUTRIENTS. THE SELECTED CONTRACTOR WILL BE RESPONSIBLE FOR THIS COORDINATION. SEE SPECIAL PROVISION.
6. ESTIMATES OF SEASONAL HIGH GROUNDWATER (SHGW) SHALL BE DETERMINED IN THE FIELD AT THE TIME OF REPLICATION GRADING. THE FINISH GRADE OF THE WETLAND MITIGATION AREA SHALL BE SET SO THAT GROUNDWATER IS WITHIN 12" OF THE SURFACE FOR AT LEAST 14 CONSECUTIVE DAYS DURING THE GROWING SEASON.
7. PENDING SITE AND WEATHER CONDITIONS ALL PLANTINGS WILL TAKE PLACE IN SPRING (MAY 15-JUNE 15) OR FALL (SEPTEMBER 1 - NOVEMBER 1).
8. TREES PLANTED IN THE REPLICATION AREA SHALL BE LOCATED ON AREAS OF HIGHER ELEVATION (I.E., GRADED MOUNDS). TREES SHALL BE LOCATED IN THE FIELD BY THE WETLAND SPECIALIST.
9. 4" OF LOAM (WEED-FREE, FINE SANDY LOAM) AND A CONSERVATION/WILDLIFE SEED MIX WILL BE SPREAD THROUGHOUT THE GRADED 3:1 UPLAND SLOPES AND IN ALL OTHER AREAS DISTURBED BY THE CONTRACTOR AS SPECIFIED. LOAM, SEED MIXTURE AND SOURCE SHALL BE APPROVED BY THE WETLAND SPECIALIST.





LOCUS PLAN

LEGEND

- 4" LOAM BORROW AND CONSERVATION SEED MIX IN ALL DISTURBED UPLAND AND SLOPED AREAS
- WETLAND SOIL AND WETLAND SEED MIX
- LIMIT OF WORK
- STRAW WATTLES
- 168 PROPOSED CONTOUR
- 170 EXISTING CONTOUR
- COMPOST FILTER TUBE
- 163.3 PROPOSED SPOT GRADE
- TREE

A00840 - 62

Proposal No. 604123-111717

ITEM 755.35 INLAND WETLAND REPLICATION AREA Lump Sum

This special provision is specific to Project #604123.

The work under this item shall conform to the relevant provisions of Sections 120, 770, 771 of the Standard Specifications and the following:

The work under this item shall include furnishing material and the construction and maintenance of inland wetland replication areas as shown on the drawings and as required by the Engineer. Inland Wetland Replication Area shall hereafter be referred to as Replication Area. All work shall be in coordination with an approved Wetland Specialist.

Construction of tidal wetlands shall be as specified under the appropriate item for tidal wetland mitigation. Wetland Restoration shall be as specified under the appropriate item and compensated under that item.

Replication Area shall be constructed prior to wetland impacts unless otherwise approved by the Engineer. Construction schedule shall be appropriate to planting and seeding season (see below). Changes to this schedule will require written approval from the Engineer.

DESCRIPTION OF WORK

Construction of the Replication Area shall be completed as shown on the drawings at the following location(s):

Area: 70 Cedar Street, Ashland, MA (Ashland Fire Department)
Replication Area = 4,110 sf.

Replication Area shall be constructed to meet the requirements of all associated permits and certifications, including relevant performance standards of the Massachusetts Wetlands Protection Act (MGL C. 131, s40), Section 401 Water Quality Certification, and Section 404, U.S. Army Corps of Engineers General Permit.

The Contractor is responsible for protection and preservation of natural areas adjacent to the Replication Area both within and outside the project limits and for the duration of the contract. Damage to soils or vegetation due to sedimentation, compaction, trampling, vehicles, storage of materials, or other negligence shall be repaired to the satisfaction of the Engineer and at the Contractor's expense.

The Wetland Specialist overseeing the wetland construction work shall not be from the same company as that planting, seeding, or participating in any aspect of the wetland construction.

Wetland Restoration for the project shall be completed as shown on the drawings at the following location(s):

Wetland Restoration Area/s:
See plans for individual locations: = 2,730 sf.

SUBMITTALS - DOCUMENTS

Request for Conditional Acceptance: As specified below, a letter requesting Conditional Acceptance of the work and the site conditions shall be submitted to the Engineer.

Request for Certificate of Compliance (Partial or Full): As specified below, shall be submitted to the Engineer for distribution to appropriate regulatory agencies.

Monitoring Reports: Reports shall be submitted to the Engineer as specified below. Reports shall be compensated under Item 755.75 and 755.76.

SUBMITTALS - MATERIAL

Soil and Amendments

No soil, compost, or other soil amendment imported to the work site shall contain seeds, roots, stems, or other viable parts of invasive plants.

At least sixty (60) days prior to installation Contractor shall submit for approval all sources of soil and amendments, including compost, prior to ordering. Off-site sources shall be identified and available for inspection by the Wetland Specialist prior to transport of material to the site to verify that they are likely to be free of invasive plant species, including all viable plant parts.

Samples of tested and approved wetland soil and soil amendments will be required if requested by the Engineer.

Seed Mix

Certificate of Materials from the supplier shall be submitted 30 days prior to seeding and must be approved prior to ordering materials. Seed species listed on the certificate shall include ecotype region (i.e., *Asclepias incarnata*, PA Ecotype).

Seed tag from the bag of seed used shall be submitted to the Engineer at the time of seeding. Seed tag shall include ecotype region and species, shall match the Certificate of Materials, include the name of the supplier, and date material was sent.

Bill of lading or notarized Certificate of Compliance from the Supplier serving as proof of purchase shall be submitted if requested by the Engineer. Document shall include date of sale, quantity, lot number, and address of Supplier. This shall match the seed tag.

Plant Certification

Plant Certification shall be per the applicable requirements of Section 771, PLANTING TREES, SHRUBS AND GROUNDCOVER, of the latest edition of the Standard Special Provisions. The nursery source shall certify the provenance or origin of all plants.

Other Material: Submittals shall be per the respective item.

MATERIALS

Sediment Barrier

Sediment Barriers shall be per Item 767.121 except that no straw wattles with plastic netting shall be used in or near existing or proposed wetland. No sediment barriers with non-biodegradable fabric or photo-degradable fabrics may be used.

Erosion Control

Erosion control for slope and soil stabilization shall be Jute Mesh Erosion Control Fabric.

Sediment and erosion controls shall be compensated under the respective items.

Wetland Soil

Wetland soil for Replication Area may be either soil excavated from impacted wetland area or manufactured hydric soil.

If using soil from the impacted wetland area, soil shall be handled such that the original soil structure is preserved and shall not be compacted, screened, or otherwise processed.

Wetland soil from the impacted wetland that is infested with invasive plant species shall not be used in the Replication, unless approved by the Wetland Specialist. To the extent possible, that infested soil shall be disposed of within the project limits in an upland area or buried at least three feet deep.

Manufactured wetland soil shall consist of on-site borrow from the proposed replacement site thoroughly mixed with compost to achieve a target organic content of 10-12% by weight. Where empirical data are lacking, compost to soil ratio shall be 1:1 by volume. Off-site borrow may be used for mixing if approved in advance by the Engineer.

No soil or soil amendment shall be brought on site without approval of the material source by the Wetland Specialist and the Engineer. Soils used in the replacement area shall be free of rocks greater than 4 inches in diameter.

Specific to this project: upland areas above wetland area on the 70 Cedar Street site shall be included in this item. Four inches of loam borrow conforming to the applicable requirements of Section 751 LOAM BORROW shall be spread on slopes and any upland areas disturbed by construction. Source of the loam borrow shall be approved by the Wetland Specialist. Slopes and disturbed upland areas shall also be seeded with conservation seed mix, as specified here in and meeting the applicable requirements of Section 765 SEEDING .

Plants

Plant material shall conform to the applicable requirements of Section 771, PLANTING TREES, SHRUBS AND GROUNDCOVER, of the latest edition of the Standard Special Provisions.

Plants shall be straight native species, not cultivars. To the extent possible, plants shall originate from the applicable EPA Level III Ecoregion.

Plant species and sizes to be included in the Replication Area shall be:

- as specified on the plans.

Requests for substitutions shall be submitted in writing to the Engineer for review by the Wetland Specialist, MassDOT Landscape Architect, and, if required, the relevant regulatory agency at least thirty (30) days prior to planting. All proposed substitutes shall be in conformance with the requirements herein and suitable for the site conditions.

Transplanting and plant material collected from the wild is prohibited unless approved in writing by the Engineer. Plants shall be selected from certified nurseries that have been inspected by state and/or federal agencies.

Seed Mix

Seeding shall conform to the Standard Specifications SUBSECTION M6, ROADSIDE DEVELOPMENT MATERIALS.

Wetland Seed Mix typical species may include - Fox Sedge (*Carex vulpinoidea*), Lurid Sedge (*Carex lurida*), Blunt Broom Sedge (*Carex scoparia*), Blue Vervain (*Verbena hastata*), Fowl Bluegrass (*Poa palustris*), Hop Sedge (*Carex lupulina*), Green Bulrush (*Scirpus atrovirens*), Creeping Spike Rush (*Eleocharis palustris*), Fringed Sedge (*Carex crinita*), Soft Rush (*Juncus effusus*), Spotted Joe Pye Weed (*Eupatorium maculatum*), Rattlesnake Grass (*Glyceria canadensis*), Swamp aster (*Aster puniceus*), Blueflag (*Iris versicolor*), Swamp Milkweed (*Asclepias incarnata*), Square stemmed Monkey Flower (*Mimulus ringens*).

The proposed wetland seed mix will be applied at the recommended rate of approximately one pound per 2,000 square feet (18 pounds per acre).

Conservation Seed Mix typical species may include - Virginia Wild Rye (*Elymus virginicus*), Little Bluestem (*Schizachyrium scoparium*), Big Bluestem (*Andropogon gerardii*), Red Fescue (*Festuca rubra*), Switch Grass (*Panicum virgatum*), Partridge Pea (*Chamaecrista fasciculata*), Panicledleaf Tick Trefoil (*Desmodium paniculatum*), Indian Grass (*Sorghastrum nutans*), Blue Vervain (*Verbena hastata*), Butterfly Milkweed (*Asclepias tuberosa*), Black Eyed Susan (*Rudbeckia hirta*), Common Sneezeweed (*Helenium autunale*), Heath Aster (*Asterpilosus/Symphyotrichum pilosum*), Early Goldenrod (*Solidago juncea*), Upland Bentgrass (*Agrostis perennans*).

The proposed conservation seed mix will be applied at the recommended rate of approximately one pound per 1,750 square feet (25 pounds per acre).

Fertilizers shall not be used.

Water

The Contractor shall provide water and all equipment required at no extra cost. Water shall be suitable for irrigation and free from ingredients harmful to plants and wildlife. According to DEP

requirements, water from the adjacent water bodies or waterways shall not be utilized. It is the Contractor's responsibility to correct injury or damage due to the lack of water, too much water, or use of contaminated water.

Mulch/Topdressing for Seeding

Hydromulch shall be per the manufacturer's recommendations and shall be wood fiber or straw mulch only. Compost topdressing, if used, shall meet the material and submittal requirements of that item and shall be applied as specified below. Mulch or compost topdressing for seeding shall be incidental to this item.

CONSTRUCTION METHODS & SEQUENCE

SITE PREPARATION

Minimizing Damage

The Contractor shall plan and execute operations in a manner minimizing the amount of excavated and exposed fill or other foreign materials that could be washed or otherwise carried into Replication Area and nearby resource areas.

Construction of and access to the Replication Area shall minimize damage to existing vegetation and soils as specified herein. Damage to soils or vegetation shall be repaired to the satisfaction of the Engineer and at the Contractor's expense. If required for soil remediation, tilling and the addition of compost shall be at the Contractor's expense.

The Contractor shall use boards, mats, or other approved material as necessary, to protect existing and/or new wetlands from compaction due to heavy foot traffic or if equipment is required to travel over wetland soil. All labor and materials required for protection and preservation of site shall be incidental to this item.

Stockpiling of Soil

Stockpiling of soil, including hydric soil for replication, shall be outside the resource area and at least 100 feet from the edge of the wetland unless approved otherwise by the Engineer. Stockpiled soils shall be securely stabilized and contained. In the event that there is excess borrow, it shall be disposed of without additional compensation.

Sediment Barriers

Placement: Sediment barriers shall be installed along the downslope perimeter of Replication Area beginning and ending in the surrounding upland so that no excavated material or disturbed soil can enter adjacent wetlands or waters. Sediment barriers shall be in place and approved by the Engineer prior to excavation work. No work shall take place outside the barriers.

Maintenance: The Contractor shall ensure that all sediment barriers function as intended and at all times per the Special Provisions of those respective items. Barriers shall be inspected after each rainfall and at least daily during prolonged rainfall. The Contractor shall remove sediment deposits as necessary to maintain the filters in working condition at all times.

Upon completion of work, biodegradable compost filter tubes may remain in place to degrade over time. Wooden stakes shall be removed or left neatly and discretely on site.

Existing Trees

Tree protection shall be as shown or the plans or required by the Engineer. To protect root systems of existing trees, the limits of the Replication Area may be adjusted, but, the total area of replication required by all permits shall not be reduced. To the extent possible, limits shall be a minimum of 6 feet from trunks of existing trees. Access route may be adjusted as required.

Trees to be left as snags (upright dead or dying trees left for wildlife habitat) within or adjacent to the replication area shall be as shown on the plans or as directed by the Wetland Specialist or Landscape Architect and shall be marked prior to clearing. Trees that pose a potential fall hazard (i.e., are near a roadway) should have limbs and trunk cut such that the tree does not pose a fall hazard.

Woody debris in the form of cut trees, logs, and brush that shall be incorporated as shown on the plans or as directed by the Wetland Specialist or Landscape Architect shall be selected and marked by the Wetland Specialist and placed as specified below under Incorporation of Coarse Woody Debris.

All trees, stumps, or brush not specified to remain shall be removed. Materials shall not be stockpiled in the resource areas or buffer zone while awaiting disposal.

Work shall be coordinated with the Clearing or Tree Removal item and compensated under that Item.

PRE-CONSTRUCTION SITE WALK

Staking & Marking*:* The Contractor shall stake out Replication Area boundaries and the intended access route and set grade stakes for approval by the Wetland Specialist and Engineer. Following staking and demarcation of areas, the Engineer and Wetland Specialist shall approve or modify as necessary the limits of work, the access route, final location and configuration of replication, grade stake elevations, proposed location of sediment barriers, and review proposed construction methods.

Snags and Woody Debris*:* The Wetland Specialist will mark trees and select course woody debris to be retained for re-use.

Invasive Plants: As part of the initial site walk, the wetland to be impacted and the proposed replication site shall be inspected for the presence of invasive plants. If invasive plants are found they shall be addressed as described under Invasive Plants.

SOIL WORK

Final grades in the Replication Area shall meet the target elevations as shown on the Plans or as adjusted by the Wetland Specialist. If adjustments are required, a Request for Information (RFI)

shall be submitted to the Engineer for approval. Adjustments shall be documented and included in the As-Built plans (if required) and/or other applicable required documents.

Excavation & Grading of Sub-Grade

If suitable soils are not present at the required depth within the target elevations, the proposed wetland area shall be excavated to a depth of one (1) foot below proposed target elevations and backfilled with planting soil as described in the materials section.

Where the proposed wetland area is an extension of an existing wetland area, excavation shall begin at the limit of work shown on the plans and shall be a minimum depth of 12 inches below the adjacent wetland grade or as established by the Wetland Specialist.

Usable soil in the proposed wetland areas that must be removed for grades to conform to the proposed elevations shall be stripped and stockpiled in an approved location for reuse. Stockpiled soils shall be kept wet and not allowed to dry out. Procedures for maintaining appropriate moisture levels shall be documented by the Wetland Specialist in the monitoring reports.

Placement of Wetland Soil

Following excavation and grading of sub-grade, and after the sub-grade elevations are approved by the Wetland Specialist, the native wetland topsoil previously removed or manufactured soil shall be spread over the proposed wetland areas as shown on the plans and as directed by the Wetland Specialist.

Final Grading

The finished grade of the Replication Area shall be at an elevation that will provide a hydrologic connection between the Replication Area and adjacent resource areas. The hydrologic connection should be in keeping with restoring the intended function of the replacement wetland. The Contractor shall verify that this elevation is not at a level that could negatively alter the hydrology of an adjacent wetland. Microtopography shall be as shown on the plans or as adjusted by the Wetland Specialist. Final elevations and grading of wetland soil shall be approved by the Wetland Specialist and the Engineer.

To avoid compaction once soil has been placed, no heavy equipment shall travel across placed soil and no work shall occur in wet or moist soil. Soil that is compacted due to construction activities shall be replaced with hydric soil as specified herein and at the Contractor's expense.

Installation of Monitoring Wells

For wetlands over 1000 square feet, monitoring wells shall be installed in locations as shown on the Plans. Monitoring wells shall include data loggers. Data shall be collected by the Wetland Specialist and submitted with Monitoring Reports and as required by applicable permits. Wells shall be installed immediately following completion of construction of the wetland.

RESTORING VEGETATION

Incorporation of Coarse Woody Material

If specified within this contract or if directed by the Wetland Specialist or Landscape Architect, logs and coarse woody debris shall be incorporated into the Replication Area and/or adjacent upland buffer. Material shall be placed as shown on the plans or as directed following placement of wetland soil and prior to application of compost and/or seed. Woody material shall cover a minimum of 15-20 percent of the Replication Area, depending on whether it is a meadow or woodland wetland and how much wood is available from construction clearing. Where trees are cut for construction purposes, logs of a minimum length of 8 feet must comprise a minimum of 50% of the woody material left on site. Brush shall be included along with logs and stumps as directed. Woody material shall be placed in a deliberate and naturalistic manner.

Planting

Following placement of wetland soil and approval of final grade and conditions, Replication Area shall be planted. Planting shall conform to SECTION 771 PLANTING TREES, SHRUBS AND GROUNDCOVER of the Division I Standard Special Provisions and as amended below.

Planting Season shall be May 15-June 15 and September 1-November 1 unless approved following written request from the contractor.

Prior to planting, the Wetland Specialist shall approve the condition of the plant material and the method of installation and shall over see the planting work. Replication Area shall be planted in the dry and according to the planting details within the range of target elevations and at the spacing shown on the Plans. Unless otherwise noted on the Plans, final plant locations shall be determined on site and located with regard to expected hydrology, plant growth characteristics, habitat desired, and water protection.

Plant material shall be installed as soon as possible after delivery. Plants stored on-site prior to installation shall be stored in the shade and watered twice daily up until time of installation. Plants showing signs of stress or compromised health may be rejected by the Engineer or Wetland Specialist with replacement at the Contractor's expense.

Seeding

Following placement of wetland soil and planting (if included), the Replication Area shall be seeded using one of the following methods:

- Hand broadcast seed and straw mulch.
- Seeding with hydromulch per the Standard Specifications and per the manufacturer's directions.
- Hand broadcast seed with compost topdressing pneumatically applied at the same time to ensure light cover of soil over seed.

If required, seeding limits for different seed mixes shall be determined by the Wetland Specialist.

Seed tags shall be submitted with the Request for Conditional Acceptance.

POST CONSTRUCTION MAINTENANCE

Plants shall be watered as necessary to maintain healthy establishment. Plants that fail by September 1 after spring planting or by June 1 after fall planting shall be replaced at the Contractor's expense.

Seeding that fails to established shall be over-seeded as required by the Engineer. Excessive weed growth shall be cut prior to over-seeding. Cutting and over-seeding are incidental to this item.

Invasive Plants: Plant species listed as invasive by Massachusetts Invasive Plant Advisory Group (MIPAG) and the US Army Corp of Engineer's New England District shall be identified in the monitoring reports and corrective measures taken to remove them within the limits of the Replication Areas for the duration of the monitoring period.

- If invasive species are found growing within the replication area, following construction, they shall be uprooted and removed from the area by hand.

- If chemical treatment of invasive plants is necessary, the strategy for treatment shall be as determined under Items 102.3 Invasive Plant Management Strategy. That strategy shall be coordinated with the Wetland Specialist and all applicable permits and permitting agencies. Chemical application shall be per 102.33 Invasive Plant Management On-site and shall be for the duration of the contract.

- The strategy for chemical and/or manual removal shall be as directed by the Wetland Specialist and shall be incidental to this item.

CONDITIONAL ACCEPTANCE OF WORK

Conditional Acceptance shall indicate approval of the wetland construction work and agreement that work has been done according to plan or modified as approved and will initiate the start of the Monitoring period.

Upon completion of construction, the Contractor shall submit a Request for Conditional Acceptance. Request shall include documentation of pre-existing conditions and construction work as specified under Item 755.75.

Upon receipt of a Request for Conditional Acceptance, the Engineer, the Wetland Specialist and regulatory representative (if required) shall assess the replication and surrounding areas. The following conditions shall be included in the narrative and reviewed as part of the on-site assessment:

- The target elevations and hydrology for the Replication Area have been met and maintained. Areas that are too high or too low should be identified along with suggested corrective measures.
- Specified seed mix has been seeded. If inspected 30 or more days after seeding, seeded species in the wetland and adjacent upland shall show signs of good germination and healthy growth.
- Planted woody and herbaceous species meet specifications and are establishing well.

- Soils are stabilized and there is no sediment in the wetland and no channeling of slopes.
- There are no invasive plants visible in the replication area.

Upon approval of the work, MassDOT will issue a letter of Conditional Acceptance. If the replication work is not approved, MassDOT will issue a rejection letter requiring corrective actions.

CERTIFICATE OF COMPLIANCE

If required, a request for a Certificate of Compliance shall be prepared and submitted within 30 days following Conditional Acceptance. The Replication Area shall be surveyed and as-built Drawings prepared by the Contractor to accompany the Request.

The Request for Certificate of Compliance shall include the following:

- A brief narrative of the work on company letterhead signed by the Wetland Specialist. Narrative shall be in MS Word document and shall include substantive explanation that demonstrates compliance with EACH relevant permit condition. Narrative shall note variations from the originally permitted design.
- As-built Drawings signed by the Contractor's PE. As-built drawings shall show hydrologic conditions, status of plantings and seeding, and shall include a narrative and minimum of 4 photographs documenting site conditions. Plans should note variations from the originally permitted design.

  When required, drawings shall meet the Army Corp of Engineer's New England District's Compensatory Replication Guidance, including: scale in the range of 1"=20' to 1" = 100', contours at 1' intervals, spot elevations for intermediate elevations, and polygons outlining each wetland Replication area. The As-built Drawings shall be provided to the Engineer electronically in Portable Document Format (PDF). If requested by the Engineer, the Drawings shall be provided in printed paper format (11" x 17" sheets, unless otherwise directed). Drawings must be scalable.

- Other documents as required.

Work that does not meet the requirements specified above shall be addressed by the contractor at no extra cost.

FINAL ACCEPTANCE OF WORK

Following one full growing season, the Contractor shall submit a Request for Final Acceptance. Submittal shall include a brief narrative of conditions. Upon receiving the Request, the Engineer, Wetland Specialist and regulatory representative (if required) shall assess the Replication Area. The following conditions shall be inspected and approved for acceptance and payment.

- Hydrology is functioning as intended.
- Seeded species are establishing well and cover 100 percent of the area.
- No sediments have entered into wetland.
- Adjacent slopes are stabilized with desirable vegetation.
- Seeded species are establishing well and cover 100 percent of the area.

- All planted species (if included) are living and establishing well.
- There are no visible invasive plants.

If the mitigation work is not approved, MassDOT will issue a rejection letter requiring corrective action.

MONITORING REPORTS FOR REGULATORY COMPLIANCE

Monitoring after construction shall be conducted in accordance with the Order of Conditions.

Monitoring Reports shall be as follows or as required by the Order of Conditions:

- MassDEP: 1 spring inspection, and 1 fall inspection. The annual report shall be submitted by November 15.
- Conservation Commission: 1 spring inspection, and 1 fall inspection. The annual report shall be submitted by November 15.

Reports shall be completed and submitted by the Wetland Specialist as specified and compensated under item 755.76, Wetland Monitoring Reports.

Annual reports shall be submitted to the Engineer by November 15 for dispersal to the appropriate permitting agencies.

All regulatory requirements and the following, at a minimum, shall be met upon at each inspection:

- Hydrology is functioning as intended.
- Seeded species are establishing well and cover 100 percent of the area.
- No sediments have entered into wetland.
- Adjacent slopes are stabilized with desirable vegetation.
- All planted species (if included) are living and establishing well.
- There are no visible invasive plants.

If, at the end of the required monitoring period, the requirements have not been met, the Contractor shall provide corrective measures. All costs associated with corrective measures and plant replacement shall be incidental to this item.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 755.35 will be paid for at the Contract unit price per Lump Sum, which price shall include all labor, materials, equipment, submittals, maintenance, all required hydric soil, site preparation, grading, wetland seeding, mulching, watering, monitoring wells, as-built plans, request for Certificate of Compliance, and all incidental costs necessary to complete the work as required.

Payment shall be as follows:

- 60% upon Conditional Acceptance.
- 20% after receipt and acceptance of Certificate of Compliance by the Engineer and once all permit construction requirements have been met and approved.
- 20% upon Final Acceptance.

Attachment C – Order of Conditions (OOC)

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Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
95-931
MassDEP File #

eDEP Transaction #

Ashland
City/Town

A. General Information

Please note: this form has been modified with added space to accommodate the Registry of Deeds Requirements

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

1. From: Ashland
Conservation Commission

2. This issuance is for (check one): a. ☒ Order of Conditions b. ☐ Amended Order of Conditions

3. To: Applicant:

Susan
a. First Name

McArthur
b. Last Name

Massachusetts DOT
c. Organization

10 Park Plaza, Room 4260
d. Mailing Address

Boston
e. City/Town

MA
f. State

02116
g. Zip Code

4. Property Owner (if different from applicant):

a. First Name

b. Last Name

c. Organization

d. Mailing Address

e. City/Town

f. State

g. Zip Code

5. Project Location:

Route 126 (Pond Street)
a. Street Address

Ashland
b. City/Town

N/A
c. Assessors Map/Plat Number

d. Parcel/Lot Number

Latitude and Longitude, if known: 41d 14m 50s
d. Latitude

71 d 25 m 49s
e. Longitude

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
95-931
MassDEP File #

eDEP Transaction #

Ashland
City/Town

A. General Information (cont.)

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):

a. County | b. Certificate Number (if registered land)

c. Book | d. Page

7. Dates: July 1, 2019 (a. Date Notice of Intent Filed) | December 9, 2019 (b. Date Public Hearing Closed) | December 23, 2019 (c. Date of Issuance)

8. Final Approved Plans and Other Documents (attach additional plan or document references as needed):

Massachusetts Department of Transporation Highway Division: Route 126 (Pond Street)
a. Plan Title

Green International Affiliates
b. Prepared By

Paul Milewski (Civil No. 48166)
c. Signed and Stamped by

Various. See Attachment A
d. Final Revision Date

As noted on various sheets
e. Scale

NOI and Associated documents
f. Additional Plan or Document Title

7/ 1/ 2019
g. Date

B. Findings

1. Findings pursuant to the Massachusetts Wetlands Protection Act:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act (the Act). Check all that apply:

a. ☒ Public Water Supply
b. ☐ Land Containing Shellfish
c. ☒ Prevention of Pollution
d. ☒ Private Water Supply
e. ☒ Fisheries
f. ☒ Protection of Wildlife Habitat
g. ☒ Groundwater Supply
h. ☒ Storm Damage Prevention
i. ☒ Flood Control

2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

Approved subject to:

a. ☒ the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
95-931
MassDEP File #

eDEP Transaction #

Ashland
City/Town

B. Findings (cont.)

Denied because:

b. ☐ the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect the interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**

c. ☐ the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**

3. ☒ Buffer Zone Impacts: Shortest distance between limit of project disturbance and the wetland resource area specified in 310 CMR 10.02(1)(a) — 1 foot (a. linear feet)

Inland Resource Area Impacts: Check all that apply below. (For Approvals Only)

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. ☒ Bank	137 (perm) 48 (temp)	137 (perm) 48 (temp)	137 (perm) 48 (temp)	137 (perm) 48 (temp)
5. ☒ Bordering Vegetated Wetland	3,798 (perm) 2,904 (temp)	3,798 (perm) 2,904 (temp)	3,798 (perm) 2,904 (temp)	3,798 (perm) 2,904 (temp)
6. ☐ Land Under Waterbodies and Waterways	a. square feet	b. square feet	c. square feet	d. square feet
	e. c/y dredged	f. c/y dredged		
7. ☒ Bordering Land Subject to Flooding	1,240 a. square feet	1,240 b. square feet	1,240 c. square feet	1,240 d. square feet
Cubic Feet Flood Storage	395 e. cubic feet	395 f. cubic feet	395 g. cubic feet	395 h. cubic feet
8. ☐ Isolated Land Subject to Flooding	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9. ☐ Riverfront Area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	g. square feet	h. square feet	i. square feet	j. square feet

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
95-931
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City/Town

B. Findings (cont.)

Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)

	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. ☐ Land Under the Ocean	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
12. ☐ Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. ☐ Coastal Beaches	a. square feet	b. square feet	c. nourishment cu yd	d. nourishment cu yd
14. ☐ Coastal Dunes	a. square feet	b. square feet	c. nourishment cu yd	d. nourishment cu yd
15. ☐ Coastal Banks	a. linear feet	b. linear feet		
16. ☐ Rocky Intertidal Shores	a. square feet	b. square feet		
17. ☐ Salt Marshes	a. square feet	b. square feet	c. square feet	d. square feet
18. ☐ Land Under Salt Ponds	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
19. ☐ Land Containing Shellfish	a. square feet	b. square feet	c. square feet	d. square feet
20. ☐ Fish Runs	Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above			
	a. c/y dredged	b. c/y dredged		
21. ☐ Land Subject to Coastal Storm Flowage	a. square feet	b. square feet		
22. ☐ Riverfront Area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	g. square feet	h. square feet	i. square feet	j. square feet

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B. Findings (cont.)

* #23. If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c (BVW) or B.17.c (Salt Marsh) above, please enter the additional amount here.

23. ☐ Restoration/Enhancement *:

a. square feet of BVW | b. square feet of salt marsh

24. ☐ Stream Crossing(s):

a. number of new stream crossings | b. number of replacement stream crossings

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects.

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
   a. The work is a maintenance dredging project as provided for in the Act; or
   b. The time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
   c. If the work is for a Test Project, this Order of Conditions shall be valid for no more than one year.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order. An Order of Conditions for a Test Project may be extended for one additional year only upon written application by the applicant, subject to the provisions of 310 CMR 10.05(11)(f).
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on December 23, 2022, unless extended in writing by the Department.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.

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C. General Conditions Under Massachusetts Wetlands Protection Act

8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.

9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.

10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,

"Massachusetts Department of Environmental Protection" [or, "MassDEP"]

"File Number 95-931 "

11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.

12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.

13. The work shall conform to the plans and special conditions referenced in this order.

14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.

15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.

16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.

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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.

18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

19. The work associated with this Order (the "Project")
    (1) ☒ is subject to the Massachusetts Stormwater Standards
    (2) ☐ is NOT subject to the Massachusetts Stormwater Standards

    If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:

    a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

    b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:
    i. all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures;
    ii. as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;
    iii. any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;

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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

iv. all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;

v. any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement) for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following:

i.) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and

ii.) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 18(f) through 18(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.

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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

g) The responsible party shall:
1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions (if you need more space for additional conditions, please attach a text document):
See pages 9A through 9O.

20. For Test Projects subject to 310 CMR 10.05(11), the applicant shall also implement the monitoring plan and the restoration plan submitted with the Notice of Intent. If the conservation commission or Department determines that the Test Project threatens the public health, safety or the environment, the applicant shall implement the removal plan submitted with the Notice of Intent or modify the project as directed by the conservation commission or the Department.

Ashland Special Conditions
Findings of Fact
Route 126 (Pond Street)
Redevelopment Project

Approved Work:

Work shall consist of the redevelopment of Route 126 (Pond Street) to improve traffic flow, pedestrian safety, and the aesthetics to the corridor. The project will also increase commerce for the Town of Ashland. The project will achieve these goals by widening the roadway width to include two travel lanes at a width of 11 feet each. In addition, a five foot wide sidewalk will be installed, as well as a modular path of eight to ten feet in width.

Algonquin Trail will be realigned with Harvard Street and street lights will be added at this intersection. The intersection of Spy Glass Hill Drive, Pond Street, and the entrance to the Shaw's shopping plaza will be upgraded to a rotary. In addition, the intersection at Eliot Street will be improved by adding crosswalks.

Stormwater will be improved by adding deep sumps and hoods in existing catch basins. Currently, the existing catch basins are in a basin to basin connection, a process that is no longer allowed under current standards. The project will eliminate these connections. In addition, three existing culverts in Route 126 will be replaced. Of the three culverts, two of them will be replaced with a natural stream bottom. Finally, a drywell may be installed closer to Spy Glass Hill.

Work will take place in Bordering Vegetated Wetlands, Bordering Land Subject to Flooding, buffer zone, the 25' No Disturb Zone, and the 200 Foot Riverfront Area. Note that during the hearings, a system flagged by Algonquin Trail was determined by the Commission as not being a wetland system due to soil and vegetation observed on site during a site walk.

A replication area will need to be installed and will either be installed abutting the intersection of Pond Street and Butterfield Drive, or will be located behind the fire station at Cedar Street. Note that the wetland system behind the fire station has the same connection to the wetland systems being impacted by the project.

Note that final dates of plans and supporting documents is shown on Attachment A.

General Conditions:

All state conditions shall apply to this Order of Conditions. The following conditions for the Ashland Wetlands Protection Bylaw is stated between numbers from 21 to 45.

21. Administrative Conditions

a) The project proponent shall be responsible for the compliance with all conditions of this Order. If the property is transferred, this Order of Conditions shall apply to any successor in control or successor in interest of the property described in the Notice of Intent and referenced plans. The project proponent shall provide written verification of the transfer of this Order and understanding of the conditions by the new owner within 60 days of property transfer.

b) All work must conform to the referenced plan set for the project site. Any changes to the proposed project, relating to the location of proposed contours, limits of work, location of erosion control measures, or permanent or temporary alterations of regulated wetland resource areas shall be submitted to the Ashland Conservation Commission prior to the start of construction. The Ashland Conservation Commission shall determine if the proposed change warrants submission of a new Notice of Intent.

c) All other necessary local, state and federal permits shall be obtained prior to construction.

d) Pursuant to the 2000 Massachusetts Second Annual Session, Chapter 144, the Ashland Conservation Commission reserves the right to hire, at the applicant's expense, outside consultants to perform inspections and or project review to ensure compliance with appropriate federal, state and local laws and regulations, at any point between the filing of an application to the issuance of a Certificate of Compliance.

e) In the event of a discrepancy between the project plan and this Order of Conditions, the Order of Conditions shall prevail.

f) Copies of the construction site Stormwater Pollution Prevention Plan (SWPPP) and National Pollutant Discharge Elimination System (NPDES) reports shall be forwarded to the Ashland Conservation Commission prior to the start of construction activities.

g) The Ashland Conservation Commission's failure to discover or take action with respect to the proponent's compliance with any part of any condition does not constitute a waiver of rights to enforce this Order of Conditions.

h) Final construction plans, stamped by an engineer shall be submitted to the Conservation Commission or Agent of the Commission for review and approval.

22. Deed Recording—All restrictions imposed by this Order of Conditions shall continue in force until compliance with the conditions is certified by the issuance of a Certificate of Compliance and said Certificate has been recorded with the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property.

23. **Notification of Activity** - The applicant shall provide the Ashland Conservation Commission with written notification at least five (5) days, but not more than ten (10) days, before any activity commences on the project site. This applies to all project activities, including but not limited to, installation of erosion and sedimentation control measures.

24. **Right to Enter** — Members and agents of the Ashland Conservation Commission shall have the right to enter and inspect the premises to evaluate compliance with the conditions stated in this Order of Conditions, and may require the submittal of any data deemed necessary by the Commission for that evaluation. The Ashland Conservation Commission also reserves the right to require additional measures if determined necessary to protect resource areas and the interests of the Wetlands Protection Act as defined in M.G.L. Ch. 131 § 40 (310 CMR 10.00).

25. **Read and Post Order** — The developer or contractor responsible for the project's completion shall be notified of, and made responsible for reading and complying with, the requirements and conditions of this Order of Conditions. A copy of this Order and referenced plans shall be available at the site while activities regulated by this Order are being performed.

26. **Construction Sequence** - A construction sequence is to be submitted to the Commission for review and approval prior to construction activities.

27. **Erosion Controls**

    a) Prior to commencing **ANY** alteration activities, erosion and siltation control barriers shall be placed along the line depicted in the referenced plans. Prior to installation, the location of erosion and siltation control barriers shall be established by survey methods and staked. **The use of construction hay is prohibited by this Order of Conditions.**

    b) Sediment runoff is not permitted to leave the site. Perimeter erosion controls include but are not limited to silt fencing, silt socks, and straw bales, provided that they are installed per state and manufacturer standards. Untreated stormwater discharge into wetlands, public roadways, or stormwater systems may result in fines from the Conservation Commission or its Agent, and/or the Department of Public Works.

    c) Should the Ashland Conservation Commission determine additional erosion controls are needed, the developer or contractor shall immediately comply with the request from the Ashland Conservation Commission or its Agent.

    d) The limit of work for the project shall be the erosion control barrier as illustrated on the referenced plans. No temporary or permanent construction work, storage of materials, discarding of materials, or access by construction personnel or equipment shall occur beyond the limit of work as delineated by the erosion control barrier.

    e) All erosion control barriers shall be properly installed before any site work, including clearing, can proceed. Once the erosion controls are

installed, the Ashland Conservation Commission shall be notified and the site shall be inspected. Approval of the erosion control installation by the Ashland Conservation Commission or its agent is required before further site construction is initiated.

f) The erosion and siltation controls shall be maintained in a state of good repair until all disturbed areas have been permanently stabilized, or until a determination has been made by the Ashland Conservation Commission indicating that control measures are no longer necessary.

g) All erosion and siltation controls measures and structures are to be inspected daily and maintained as necessary by an Environmental Monitor. The contact information of the Environmental Monitor shall be forwarded to the Agent of the Commission. This information shall include the name of the Environmental Monitor, their company and title, their phone number and their address. In addition to the daily inspections of the erosion controls, an inspection shall be made after every rainfall event equal to or greater than .25" in a 24-hour period or greater than 1.0" per hour to ensure their integrity.

h) The areas of construction shall be left in a stable condition at the close of each construction day. Erosion and siltation controls shall be inspected at this time and repaired, maintained or reinforced as necessary.

i) A barrier of four (4) foot high orange plastic construction fencing, snow fencing or approved alternative shall be placed along the erosion control barrier to provide additional demarcation of the limit of work within 50 feet of any wetland resource area.

28. **Dry well**—prior to the preconstruction meeting, the Applicant shall confirm to the Conservation Commission or its Agent, if a dry well will be installed near Spyglass Hill Drive as stated in the Findings of the Fact for this Order of Conditions. Plans should be submitted to the Conservation Commission or its Agent prior to the preconstruction meeting.

29. **Survey and Plans**—Per the hearing held on December 9, 2019, with the Conservation Commission, a wetland delineation shall be performed at the system behind the fire station located at Cedar Street to determine if this location will be better than what is shown on approved plans at Butterflied Drive. The delineation report, and plans shall be submitted to the Conservation Commission to determine as soon as it is available. The determination shall be made by the Conservation Commission, in conjunction with the Applicant and its representatives. A hard copy of the plans shall be submitted to the Agent of the Commission for the file.

30. **CAD Files**—CAD files of final construction plans shall be submitted to the Conservation Agent, and to the Town's Project Engineer. In addition, final as-built plans shall be submitted in a pdf and CAD format. The CAD files must be georeferenced to NAD State Plane 83 feet.

31. **Preconstruction Meeting**

a. Prior to any work on the project site, the applicant shall request a pre-construction meeting between the developer, contractor, Erosion Control (assigned to the project in accordance with Conditions 32), the building inspector and members of the Ashland Conservation Commission or its agent. Meeting participants shall review in detail this Order of Conditions, the appropriate site plans, the Notice of Intent and other appropriate environmental protection documents and issues. The Conservation Agent or Ashland Conservation Commission shall be provided the name, telephone number and email address of the person who will be immediately responsible for supervision of all work on the project site and compliance with this Order of Conditions. The Conservation Agent or Ashland Conservation Commission shall be notified in the event that the site supervisor or contractor is changed.

b. Prior to the preconstruction meeting, that Applicant or his representative shall:

i. Install wetland flags with the flag numbers written on the flags

ii. Install stakes shall be installed outlining the erosion control line and shall be placed in accordance with the approved plans.

iii. Submit deed recording information to the Agent of the Commission as required in Condition number 9.

iv. Post a sign no bigger than two feet by two feet. The sign shall contain the DEP file number on it, and shall be posted along the roadway.

v. Submit the construction sequence shall be forwarded to the Conservation Commission (see condition Number 26)

32. Culvert Replacement—the culvert replacements shall take place during low flow periods and shall be constructed in accordance with the approved plans as outlined in Attachment A.

33. Replication

a) The wetland replication shall comply and conform to 310 CMR 10.55 (4) and with the DEP Guidance Document *Massachusetts Inland Wetland Replication Guidelines, Guidance No. BRP/DWM/WetG02-2, dated March 1, 2002.*

b) A qualified wetland scientist with experience in wetland replication (Wetland Monitor) and with a working knowledge of botany and hydrology shall supervise construction of the replication area. The contact information of the Wetland Monitor shall be forwarded to the Agent of the Commission. The contact information of the Wetland Monitor shall consist of their name, company name, title, phone number and e-mail address. The Wetland Monitor shall conduct monitoring of the replication area for the first two complete growing seasons following completion. Monitoring reports shall be submitted to the Ashland

Conservation Commission to demonstrate conformance with the appropriate Performance Standards (310 CMR 10.00). A Certificate of Compliance shall not be issued until the wetland replication area is in place and functioning and is verified by the ACC.

c) Alteration of regulated wetland resource areas, 25-foot no disturb area or the 100-foot buffer zone shall not proceed until the replication area has been excavated and prepared, according to design, and is ready to accept wetland soils.

d) The replication area shall utilize organic soils from the vegetated wetland fill area to the greatest extent possible. Preparation of the replication area shall entail bringing the grade down, leaving trees of 10-inch diameter breast height or greater in place, leaving boulders in place, and generally creating micro topography.

e) The soils for the replication area shall be amended with a mixture of equal volumes of organic and mineral materials. These materials shall be uncontaminated and shall not include any woodchips. The organic material used shall be well or partially decomposed; clean leaf compost is preferred. Mineral materials shall be predominately in the loam, loamy-sand to silty-loam texture range.

f) The applicant shall notify the ACC by telephone or by email upon completion of the excavation of the replication area and 48 hours prior to alteration of the vegetated wetland. The ACC may inspect and request verification of excavated elevations.

g) Once the replication area has been backfilled with wetland soils, planting shall be completed by the end of October of the construction year.

h) Planting of the replication areas shall not take place between November 1st and April 15th.

i) The Wetland Protection Act Regulations outlined in 310 CMR 10.55(4)(b)(6) require that at least 75 percent of the surface of the replacement area be re-established with indigenous wetland plant species within two (2) growing seasons. If monitoring data indicates that this objective cannot be met, a corrective action plan shall be submitted to the Ashland Conservation Commission for approval, and implemented under the supervision of a wetland specialist.

j) A 25-foot no disturb area shall be created and subsequently maintained around the wetland replication area.

k) The designated Wetland Monitor shall conduct weekly inspections during construction.

l) The Wetland Monitor shall be present and shall submit written reports to the ACC within one week of the inspection date of the following activities:

1. Before excavation or erosion control installation work begins to inspect site flagging;
2. During excavation of the altered area while soils and/or vegetation are being translocated the replication area;
3. To inspect excavated elevations and estimated post-construction ground water elevation for the replication area;
4. After each stage of grading work in the replication area is completed to inspect finished elevations;
5. After one growing season to observe vegetation development and regulatory compliance;
6. After two growing seasons to observe vegetation development and regulatory compliance;
7. After three growing seasons to observe vegetation development and regulatory compliance.

m) The Ashland Conservation Commission reserves the right to make a determination as to the success or failure of the wetland replication efforts and reserves the right to require additional replication.

34. Stockpiles—Soil stockpiles shall be a maximum of 20-feet high with a maximum 2:1 slope on all sides and be surrounded by temporary erosion controls within 3-ft of the base of the stockpile and down gradient of the stockpiles when not in use for more than 24-hrs. Soil Stockpiles shall be located at least 50-ft from any wetland, waterbody, drain inlet, or open channel. Stockpiled soil on site shall be stabilized by mulching or temporary vegetation if the stockpiles remain inactive for more than 14 days. All debris, fill and excavated material shall be stockpiled far enough away from designated wetlands and in a location or in a manner to prevent sediment from entering the wetlands via surface runoff.

35. Soil Stabilization — Seeding or sod shall permanently stabilize all disturbed soils. During construction, disturbed soils shall be temporarily stabilized by the use of invasive species-free mulch or spread straw, or other method approved by the U.S. Department of Agriculture or Natural Resources Conservation Service, and approved by the ACC. All disturbed areas shall be brought to final finished grade and either (a) loamed and seeded within fourteen (14) days of final grading accordance with NRCS guidelines for permanent stabilization or (b) stabilized in another manner approved by the ACC.

36. Landscaping—Landscaping specimens shall be native to the Northeast of the United States. No invasive or likely invasive species shall be planted within jurisdictional areas. If any changes are proposed to the landscaping plan (see Attachment A), a final landscaping plan shall be submitted to the Conservation Commission or its Agent for approval.

37. Catch Basins

a) Silt sacks, or approved equivalent, shall be installed on all new and existing functioning catch basins and drop inlets in the project area.

b) New and existing catch basins in the project area shall be equipped with 4-foot sumps and hooded outlets and shall be inspected and cleaned as per the Operations and Maintenance program outlined in the Notice of Intent.

c) Rims of all catch basins shall be set flush with pavement throughout the construction of the project.

38. **Remove Debris from Wetlands** — All man-made debris shall be removed from the wetlands and 25-foot No Disturb Zone and disposed of properly prior to requesting a Certificate of Compliance.

39. **Downstream Impacts** — The issuance of this Order of Conditions does not in any way imply nor certify that the site or downstream areas will not be subject to flooding, storm damage, or any other form of damage due to wetness.

40. **Request for Certificate of Compliance** — The applicant shall submit a written request for a Certificate of Compliance, together with an as-built plan and an affidavit prepared by a professional engineer or land surveyor registered in the Commonwealth of Massachusetts, stating that the site has been developed in accordance with the requirements of this Order of Conditions, based upon an on-site inspection and the referenced site plan. The affidavit shall state any deviations from the approved plans and this Order of Conditions.

The as-built plans shall include all components of the project including but not limited to stormwater structures and systems elevations and inverts. The Ashland Conservation Commission or its agent reserves the right to inspect the complete site before the issuance of a Certificate of Compliance. Upon receipt of a Certificate of Compliance, erosion controls shall be removed within 60 days. If a partial Certificate of Compliance is issued, there will be no additional fee if a full Certificate of Compliance is requested within six months.

Conditions to Extend in Perpetuity

41. **Stormwater Operations & Maintenance** Best management practices, outlined in the Stormwater Management Report, include maintenance and operations procedures which will apply to the site once the project is complete and ongoing. Maintenance and operations procedures associated with the site drainage structures will not require supplemental filings after the Certificate of Compliance is issued provided items noted below are followed. These practices are itemized on O& M Plans entitled: *Operations, and Maintenance Plan*, dated April 2019.

c. **Post Construction Routine Schedule**

The property's stormwater handling facilities must be inspected on a regular basis in order to comply with the project's wetlands permit. Routine inspections must be made during the months of May, August, November and February.

Deep Sump Catch Basins

Have all catch basins and area drains inspected quarterly and sumps cleaned or if greater than 1.5 feet of sediment has accumulated.

Water Quality Inlet Structures

The structures are to be inspected a minimum 4 times a year and cleaned when 18 inches of sediment and hydrocarbons are observed

Street Sweeping

Have all pavement machine swept four times annually during November to May. (by outside contractor.)

Landscaping

Inspect for diseased/dying trees, shrubs, ground cover and grass. Replace as required.

Inspect mulch beds. Supplement as required to provide 4" minimum depth (loose measure)

Rip Rap (Stone) Protection

Inspect stone protection on embankments, spillways, pipe outlets and elsewhere. Cut emerging young trees. Repair as required.

Stormwater Management Area

- Inspect fencing and locks. Repair as required.
- Inspect areas between forebay, water quality area, recharge area.
- Grassed areas are to be maintained on a regular basis during the growing season. Any grass clipping are to be removed from the site.
- Inspect water detention basin outlets.
- Inspect culvert to wetlands.
- Inspect and maintain vegetation in the constructed stormwater wetland and replant as needed
- Inspect forebay bottom. If accumulated silt is deeper than 12 inches over its full bottom area, have cleaned.

d. **Post Construction Non-routine Schedule**

Area Drains/Stormwater Management Area
Inspect after each significant rainfall (1/2" or more) for first six months after their construction to ensure surface vegetation is healthy, discharge devices are not blocked and banks are not eroding. Check all components after each major storm (more than 2" rainfall in 24 hours). Clean and repair as required.

42. **Snow Storage and Disposal** — All snow storage and disposal shall conform to the Department of Environmental Protection's Snow Disposal Guidelines. This condition shall remain in effect in perpetuity and shall not be released by a Certificate of Compliance.

43. **Emergency Release, Spills, or Other contamination Release-**the owner will provide for Ashland Conservation Commission review and approval prior to construction an Emergency Response Procedure for accidental release of contaminants. This procedure will include notification of the Ashland Fire Department for any uncontrolled release, maintenance of a site spill response kit suitable to clean up and contain a 40 gallon spill, and procedures for containment of any spill.

44. **Landscaping Waste** — No grass clippings, leaves or other landscaping waste may be deposited in any detention basin, forebay, wetland resource area or 25-foot no disturb area. This condition shall remain in effect in perpetuity and shall not be released by a Certificate of Compliance.

45. **Land disturbance-** The Applicant is responsible for disturbance of the property and any fill, soils, clay, or other natural or man-made debris that is brought on site. It is the responsibility of the applicant to ensure that all materials coming in are clean. All materials that are removed from the site shall be properly disposed of.

ATTACHMENT A

Final Dates of Plans and Supporting Documents

Plans

Plan Title	Sheet No.	Date
Massachusetts Department of Transportation: Highway Division Plan and Profile of Route 126 (Pond Street) in the town of Ashland Middlesex County	1	12/9/2019
Ashland Ma, Route 126 (Pond Street): Legend & Abbreviations	2	8/14/2018
Ashland Ma, Route 126 (Pond Street): General Notes	3	10/22/2019
Ashland Ma, Route 126 (Pond Street): Key Plan	4	8/14/2018
Ashland MA, Route 126 (Pond Street): Typical Section 1	11	8/17/2018
Ashland MA, Route 126 (Pond Street): Typical Section 2	12	8/17/2018
Ashland MA, Route 126 (Pond Street): Typical Section 3	13	8/17/2018
Ashland MA, Route 126 (Pond Street): Construction Plans (1 of 17)	14	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (2 of 17)	15	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (3 of 17)	16	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (4 of 17)	17	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (5 of 17)	18	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (6 of 17)	19	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (7 of 17)	20	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (8 of 17)	21	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (9 of 17)	22	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (10 of 17)	23	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (11 of 17)	24	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (12 of 17)	25	10/22/2019
Ashland Ma, Route 126 (Pond Street): Construction Plans (13 of 17)	26	10/22/2019

Ashland MA, Route 126 (Pond Street): Construction Plans (14 of 17)	27	10/22/2019
Ashland Ma, Route 126 (Pond Street): Construction Plans (15 of 17)	28	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (16 of 17)	29	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (17 of 17)	30	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (1 of 16)	31	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (2 of 16)	32	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (3 of 16)	33	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (4 of 16)	34	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (5 of 16)	35	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (6 of 16)	36	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (7 of 16)	37	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (8 of 16)	38	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (9 of 16)	39	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (10 of 16)	40	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (11 of 16)	41	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (12 of 16)	42	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (13 of 16)	43	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (14 of 16)	44	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (15 of 16)	45	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (16 of 16)	46	10/22/2019
Ashland MA, Route 126 (Pond Street): Converse Way Profile	47	10/22/2019
Ashland MA, Route 126 (Pond Street): Spyglass Hill Profile	48	10/22/2019
Ashland MA, Route 126 (Pond Street): Eliot Street Profile	49	10/22/2019

Ashland MA, Route 126 (Pond Street): Nash Avenue Profile	50	10/22/2019
Ashland MA, Route 126 (Pond Street): Nickerson Road Profile	51	10/22/2019
Ashland MA, Route 126 (Pond Street): Tri Street Profile	52	10/22/2019
Ashland MA, Route 126 (Pond Street): Tufts Street Profile	53	10/22/2019
Ashland MA, Route 126 (Pond Street): Algonquin Trial Profile	54	10/22/2019
Ashland MA, Route 126 (Pond Street): Harvard Street Profile	55	10/22/2019
Ashland MA, Route 126 (Pond Street): Sewell Street Profile	56	10/22/2019
Ashland MA, Route 126 (Pond Street): Butterfield Drive Profile	57	10/22/2019
Ashland MA, Route 126 (Pond Street): James Road Profile	58	10/22/2019
Ashland MA, Route 126 (Pond Street): Market Basket Driveway Profile	59	10/22/2019
Ashland MA, Route 126 (Pond Street): Walcott Road Profile	60	10/22/2019
Ashland MA, Route 126 (Pond Street): Rodman Road Profile	61	10/22/2019
Ashland MA, Route 126 (Pond Street): Greenhalge Road Profile	62	10/22/2019
Ashland MA, Route 126 (Pond Street): Washington Ave Profile	63	10/22/2019
Ashland MA, Route 126 (Pond Street): Douglas Road Profile	64	10/22/2019
Ashland MA, Route 126 (Pond Street): Waushakum Avenue Profile	65	10/22/2019
Ashland MA, Route 126 (Pond Street): Roundabout Profile	66	10/22/2019
Ashland MA, Route 126 (Pond Street): Drainage & Utility Plans (1 of 17)	92	10/22/2019
Ashland MA, Route 126 (Pond Street): Drainage & Utility Plans (2 of 17)	93	10/22/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (3 of 17)	94	11/18/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (4 of 17)	95	10/22/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (5 of 17)	96	11/18/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (6 of 17)	97	11/18/2019
Ashland Ma, Route 126 (Pond Street): Drainage and	98	10/22/2019

Utility Plan (7 of 17)		
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (8 of 17)	99	11/18/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (9 of 17)	100	10/22/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (10 of 17)	101	10/22/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (11 of 17)	102	10/22/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (12 of 17)	103	10/22/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (13 of 17)	104	11/18/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (14 of 17)	105	11/18/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (15 of 17)	106	11/18/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (16 of 17)	107	10/22/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (17 of 17)	108	10/22/2019
Ashland Ma, Route 126 (Pond Street): Landscape and Wetland Replication Details (1 of 2)	181	10/22/2019
Ashland Ma, Route 126 (Pond Street): Landscape and Wetland Replication Details (2 of 2)	182	10/22/2019
Ashland Ma, Route 126 (Pond Street): Wetland Replication Plan (Sheet 2 of 2)	185	11/18/2019
Ashland, MA. Route 126 (Pond Street): Construction Details	185	11/18/2019
Ashland, MA. Route 126 (Pond Street): Construction Details	186	10/22/2019
Ashland, MA. Route 126 (Pond Street): Drainage & Utility Details (1 of 4)	187	12/6/2019
Ashland Ma, Route 126 (Pond Street): Drainage & Utility Details (2 of 4)	188	12/6/2019
Ashland Ma, Route 126 (Pond Street): Drainage & Utility Details (3 of 4)	189	12/6/2019
Ashland Ma, Route 126 (Pond Street): Drainage & Utility Details (4 of 4)	190	12/6/2019

Documents:

Document Title	Description	Date
Notice of Intent: Route 126 (Pond Street) Ashland, Massachusetts	Mass DOT Contract No. 604123	7/1/2019
Stormwater Report: Route 126 (Pond Street): Ashland Massachusetts	Green International Affiliates , INC.	12/9/2019
USGS Locus Map	Figure 1	5/31/2017
Aerial Locus Map	Figure 2	5/31/2017
Soils Map	Figure 3	8/1/2017
FEMA Map	Figure 4	8/1/2017
Resource Area Map	Figure 5	10/8/2019
Route 126 (Pond Street): Existing Watershed Plan	Figure 6	10/15/2019
Route 126 (Pond Street): Proposed Watershed Plan	Figure 7	10/15/2019
Resource Area Impacts	Figure 8A	10/11/2019
Resource Area Impacts	Figure 8B	10/11/2019
Resource Area Impacts	Figure 8C	10/11/2019
Resource Area Impacts	Figure 8D	11/18/2019
Resource Area Impacts	Figure 8E	11/18/2019
Resource Area Impacts	Figure 8F	10/11/2019
Resource Area Impacts	Figure 8G	10/11/2019
Resource Area Impacts	Figure 8H	10/11/2019
Potential Wetland Replication Option	Figure 9	12/6/2019

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
95-931
MassDEP File #

eDEP Transaction #

Ashland
City/Town

D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? ☐ Yes ☒ No

2. The Ashland (Conservation Commission) hereby finds (check one that applies):

   a. ☐ that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:

   1. Municipal Ordinance or Bylaw _____ 2. Citation _____

   Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

   b. ☐ that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:

   Wetlands Protection Bylaw (1. Municipal Ordinance or Bylaw) c. 280 (2. Citation)

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.

   The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):

   Note that there is a local Wetlands Protection Bylaw within the Town of Ashland, but the Applicant only filed the Notice of Intent for the Wetlands Proteciton Act, and not the Wetlands Protection Bylaw.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
95-931
MassDEP File #

eDEP Transaction #

Ashland
City/Town

E. Signatures

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

12/23/2019
1. Date of Issuance

Please indicate the number of members who will sign this form.
This Order must be signed by a majority of the Conservation Commission.

4
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Signatures:

☐ by hand delivery on

Date

☑ by certified mail, return receipt requested, on

12/30/19
Date

F. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
95-931
MassDEP File #

eDEP Transaction #

Ashland
City/Town

G. Recording Information

Prior to commencement of work, this Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

Ashland
Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

Ashland
Conservation Commission

Please be advised that the Order of Conditions for the Project at:

Project Location | MassDEP File Number

Has been recorded at the Registry of Deeds of:

County | Book | Page

for: Property Owner

and has been noted in the chain of title of the affected property in:

Book | Page

In accordance with the Order of Conditions issued on:

Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

Request for Departmental Action Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

Provided by DEP

A. Request Information

1. Location of Project

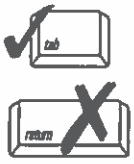
a. Street Address

b. City/Town, Zip

c. Check number

d. Fee amount

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



2. Person or party making request (if appropriate, name the citizen group's representative):

Name

Mailing Address

City/Town

State

Zip Code

Phone Number

Fax Number (if applicable)

3. Applicant (as shown on Determination of Applicability (Form 2), Order of Resource Area Delineation (Form 4B), Order of Conditions (Form 5), Restoration Order of Conditions (Form 5A), or Notice of Non-Significance (Form 6)):

Name

Mailing Address

City/Town

State

Zip Code

Phone Number

Fax Number (if applicable)

4. DEP File Number:

B. Instructions

1. When the Departmental action request is for (check one):

☐ Superseding Order of Conditions – Fee: $120.00 (single family house projects) or $245 (all other projects)

☐ Superseding Determination of Applicability – Fee: $120

☐ Superseding Order of Resource Area Delineation – Fee: $120

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

Request for Departmental Action Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

Provided by DEP

B. Instructions (cont.)

Send this form and check or money order, payable to the *Commonwealth of Massachusetts,* to:

Department of Environmental Protection
Box 4062
Boston, MA 02211

2. On a separate sheet attached to this form, state clearly and concisely the objections to the Determination or Order which is being appealed. To the extent that the Determination or Order is based on a municipal bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

3. Send a **copy** of this form and a **copy** of the check or money order with the Request for a Superseding Determination or Order by certified mail or hand delivery to the appropriate DEP Regional Office (see http://www.mass.gov/eea/agencies/massdep/about/contacts/).

4. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Attachment D – Public Notice

Public Notice

Massachusetts Department of Environmental Protection
Division of Wetlands and Waterways
Southeast Region
20 Riverside Drive
Lakeville, MA 02347

Pursuant to 33 U.S.C. 1341 M.G.L. c. 21 §§ 26 - 53, notice is given of a 401 Water Quality Certification application for discharge of fill for the reconstruction of Route 126 (Pond Street) in the Town of Ashland, MA, by the Massachusetts Department of Transportation – Highway Division, 10 Park Plaza, Room 4260, Boston, MA 02116. The project will include full-depth reconstruction of deteriorated roadway pavements and construction of new sidewalks, subsurface drainage improvements, and surface drainage improvements. The project also includes minor horizontal and vertical roadway alignment improvements and three culvert replacements. Additional information may be obtained from the Massachusetts Department of Transportation - Highway Division at the above address, Attention Susan McArthur, (857) 368-8807. Written comments should be sent to DEP, Division of Wetlands and Waterways, Attention Chris Ross, Southeast Region, 20 Riverside Drive, Lakeville, MA 02347 within 21 days of this notice. Any group of ten persons, any aggrieved person, or any governmental body or private organization with a mandate to protect the environment who submits written comments may appeal the Department's Certification. Failure to submit written comments before the end of the public comment period may result in the waiver of any right to an adjudicatory hearing.

Attachment E – Stormwater Report
(bound separately)

Attachment F –WQC Submission Plans
(bound separately)

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

PLAN AND PROFILE OF

ROUTE 126 (POND STREET)

IN THE TOWN OF

ASHLAND

MIDDLESEX COUNTY

FEDERAL AID PROJECT NO.

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	1	327
PROJECT FILE NO.	604123		

TITLE SHEET & INDEX

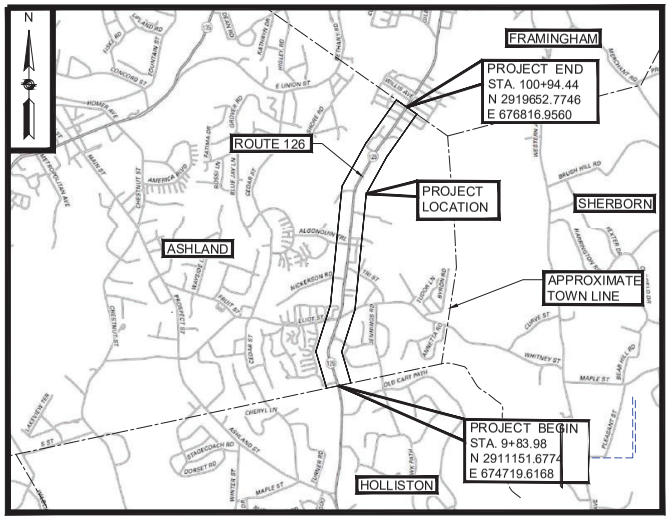
THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 1988, AS AMENDED, THE SUPPLEMENTAL SPECIFICATIONS DATED APRIL 1, 2019, THE INTERIM SUPPLEMENTAL SPECIFICATIONS CONTAINED IN THIS CONTRACT, THE OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE LATEST MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS WITH MASSACHUSETTS AMENDMENTS AND THE STANDARD MUNICIPAL TRAFFIC CODE, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1996 CONSTRUCTION AND TRAFFIC STANDARD DETAILS (AS RELATES TO THE PAVEMENT MARKINGS DETAILS ONLY), THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK, THE PLANS AND THESE SPECIAL PROVISIONS, WILL GOVERN.

A00840 - 110

Proposal No. 604123-111717

INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET & INDEX
2	LEGEND & ABBREVIATIONS
3	GENERAL NOTES
N/A	RESOURCE AREA IMPACTS (SHEETS 4-10 OF 18)
4	KEY PLAN (NOT INCLUDED IN THIS SUBMISSION)
5	BORING LOCATION PLAN (NOT INCLUDED IN THIS SUBMISSION)
6-12	BORING LOGS (NOT INCLUDED IN THIS SUBMISSION)
13-15	TYPICAL SECTIONS (NOT INCLUDED IN THIS SUBMISSION)
16-32	CONSTRUCTION PLANS (NOT INCLUDED IN THIS SUBMISSION)
33-68	CONSTRUCTION PROFILES (NOT INCLUDED IN THIS SUBMISSION)
69-85	CURB TIE PLANS (NOT INCLUDED IN THIS SUBMISSION)
86-88	GRADING PLANS (NOT INCLUDED IN THIS SUBMISSION)
89-93	BASELINE TIES AND SKETCHES (NOT INCLUDED IN THIS SUBMISSION)
94-110	DRAINAGE AND UTILITY PLANS (NOT INCLUDED IN THIS SUBMISSION)
111-116	DRAINAGE SCHEDULE (NOT INCLUDED IN THIS SUBMISSION)
117-132	PAVEMENT MARKING & SIGNING PLANS (NOT INCLUDED IN THIS SUBMISSION)
133	SIGN SUMMARY SHEETS (NOT INCLUDED IN THIS SUBMISSION)
134-139	TRAFFIC SIGNAL PLANS & SEQUENCE & TIMING PLANS
140-145	TRAFFIC SIGNAL DETAILS (NOT INCLUDED IN THIS SUBMISSION)
146-159	TEMPORARY TRAFFIC CONTROL PLANS (NOT INCLUDED IN THIS SUBMISSION)
160-176	LIGHTING PLANS (NOT INCLUDED IN THIS SUBMISSION)
177-178	LIGHTING DETAILS (NOT INCLUDED IN THIS SUBMISSION)
179-186	LANDSCAPE PLANS (NOT INCLUDED IN THIS SUBMISSION)
187-188	LANDSCAPE AND WETLAND REPLICATION DETAILS
189	WETLAND REPLICATION PLANS
190	CONSTRUCTION DETAILS (NOT INCLUDED IN THIS SUBMISSION)
191-194	DRAINAGE DETAILS (NOT INCLUDED IN THIS SUBMISSION)
195-198	WHEELCHAIR RAMP AND DRIVEWAY DETAILS
199-204	WALL PLANS (NOT INCLUDED IN THIS SUBMISSION)
205-214	CULVERT DETAILS
215-327	CROSS SECTIONS (NOT INCLUDED IN THIS SUBMISSION)



LOCATION PLAN

2000 0 2000 4000

SCALE 1" = 4000'

LENGTH OF PROJECT = 9,110.46 FEET = 1.725 MILES

WQC/ACOE PLANS SHEET 1 OF 18

DESIGN DESIGNATION - ROUTE 126 (POND STREET)

DESIGN SPEED	45 MPH - Begin to 15+00, 36+00 to 81+00 40 MPH - 15+00 to 36+00, 81+00 to End	
	Framingham Town Line	South of Spyglass Hill Dr
ADT (2014)	17,730	12,100
ADT (2034)	19,590	13,370
K	7.8	8.1
D	53.4	55.3
T (PEAK HOUR)	6.7	8.9
T (AVERAGE DAY)	7.5	9.3
DHV	1,528	1,083
DDHV	816	599
FUNCTIONAL CLASSIFICATION	URBAN PRINCIPAL ARTERIAL	URBAN PRINCIPAL ARTERIAL

WQC SUBMISSION

DATE: JANUARY 31, 2020

DATE	DESCRIPTION	REV #
01/17/2020	100% SUBMISSION	2
10/5/2018	REVISED 75% SUBMISSION	1

GREEN INTERNATIONAL AFFILIATES, INC.
TRANSPORTATION | STRUCTURAL | WATER RESOURCES | CIVIL/SITE
239 LITTLETON ROAD, SUITE 3 WESTFORD, MA 01886
978.923.0400 | www.greenintl.com

massDOT Massachusetts Department of Transportation Highway Division

RECOMMENDED FOR APPROVAL

CHIEF ENGINEER _____ DATE _____

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR _____ DATE _____

APPROVED

HIGHWAY ADMINISTRATOR _____ DATE _____

GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
JB	JB	JERSEY BARRIER
CB	CB	CATCH BASIN
		CATCH BASIN CURB INLET
FP	FP	FLAG POLE
GP	GP	GAS PUMP
MB	MB	MAIL BOX
		POST SQUARE
		POST CIRCULAR
WELL	WELL	WELL
EHH	EHH	ELECTRIC HANDHOLE
		FENCE GATE POST
GG	GG	GAS GATE
BHL #	BHL #	BORING HOLE
MW #	MW #	MONITORING WELL
TP #	TP #	TEST PIT
		HYDRANT
		LIGHT POLE
CO.BD.		COUNTY BOUND
		GPS POINT
		CABLE MANHOLE
		DRAINAGE MANHOLE
		ELECTRIC MANHOLE
		GAS MANHOLE
		MISC MANHOLE
		SEWER MANHOLE
		TELEPHONE MANHOLE
		WATER MANHOLE
MHB	MHB	MASSACHUSETTS HIGHWAY BOUND
MON		MONUMENT
SB		STONE BOUND
TB		TOWN OR CITY BOUND
		TRAVERSE OR TRIANGULATION STATION
TPL or GUY	TPL or GUY	TROLLEY POLE OR GUY POLE
HTP		TRANSMISSION POLE
UFB	UFB	UTILITY POLE W/ FIREBOX
UPDL	UPDL	UTILITY POLE WITH DOUBLE LIGHT
ULT	ULT	UTILITY POLE W / 1 LIGHT
UPL	UPL	UTILITY POLE
		BUSH
SIZE & TYPE		TREE
		STUMP
		SWAMP / MARSH
WG	WG	WATER GATE
PM	PM	PARKING METER
		OVERHEAD CABLE/WIRE
		CURBING
100 99		CONTOURS (ON-THE-GROUND SURVEY DATA)
100 99		CONTOURS (PHOTOGRAMMETRIC DATA)
		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND WATER MAIN (DOUBLE LINE 24 INCH AND OVER)
		BALANCED STONE WALL
		GUARD RAIL - STEEL POSTS
		GUARD RAIL - WOOD POSTS
		CHAIN LINK OR METAL FENCE
		WOOD FENCE
		HAY BALES/SILT FENCE
		TREE LINE
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		EDGE OF PAVEMENT
		LIMIT OF MICROMILLING AND OVERLAY
		BANK OF RIVER OR STREAM
		BORDER OF WETLAND
		100 FT WETLAND BUFFER
		200 FT RIVERFRONT BUFFER
		STATE HIGHWAY LAYOUT
		TOWN OR CITY LAYOUT
		COUNTY LAYOUT
		RAILROAD SIDELINE
		TOWN OR CITY BOUNDARY LINE
		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT
		SEDIMENT CONTROL BARRIER
		HAND HOLE FOR LIGHT POST

TRAFFIC SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
1	1	CONTROLLER PHASE ACTUATED
		TRAFFIC SIGNAL HEAD (SIZE AS NOTED)
		WIRE LOOP DETECTOR (6' x 6' TYP UNLESS OTHERWISE SPECIFIED)
		VIDEO DETECTION CAMERA
		MICROWAVE DETECTOR
		PEDESTRIAN PUSH BUTTON, SIGN (DIRECTIONAL ARROW AS SHOWN) AND SADDLE
	*	EMERGENCY PREEMPTION CONFIRMATION STROBE LIGHT
		VEHICULAR SIGNAL HEAD
		VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED
		FLASHING BEACON
		PEDESTRIAN SIGNAL HEAD, (TYPE AS NOTED OR AS SPECIFIED)
RRSG	RRSG	RAILROAD SIGNAL
OR		SIGNAL POST AND BASE (ALPHA-NUMERIC DESIGNATION NOTED)
	20'	MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)
		HIGH MAST POLE OR TOWER
		SIGN AND POST
		SIGN AND POST (2 POSTS)
	20'	MAST ARM WITH LUMINAIRE
		OPTICAL PRE-EMPTION DETECTOR
		CONTROL CABINET, GROUND MOUNTED
		CONTROL CABINET, POLE MOUNTED
		FLASHING BEACON CONTROL AND METER PEDESTAL
		LOAD CENTER ASSEMBLY
		PULL BOX 12"x12" (OR AS NOTED)
		ELECTRIC HANDHOLE 12"x24" (OR AS NOTED)
		TRAFFIC SIGNAL CONDUIT

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		PAVEMENT ARROW - WHITE
ONLY	ONLY	LEGEND "ONLY" - WHITE
	SL	STOP LINE - 12"
	CW	CROSSWALK
	SWL	SOLID WHITE LINE - 6"
	SYL	SOLID YELLOW LINE - 6"
BWL	BWL	BROKEN WHITE LINE - 6" (10' LINE SEGMENT, 30' GAP)
BYL	BYL	BROKEN YELLOW LINE - 6" (10' LINE SEGMENT, 30' GAP)
DWL	DWL	DOTTED WHITE LINE - 6" (3' LINE SEGMENT, 9' GAP)
DYL	DYL	DOTTED YELLOW LINE - 6" (3' LINE SEGMENT, 9' GAP)
DWLEx	DWLEx	DOTTED WHITE LINE EXTENSION - 6" (2' LINE SEGMENT, 6' GAP)
DWBLEx	DWBLEx	DOTTED WHITE BICYCLE LINE EXTENSION - 6" (2' LINE SEGMENT, 2' GAP)
DYLEx	DYLEx	DOTTED YELLOW LINE EXTENSION - 6" (2' LINE SEGMENT, 6' GAP)
	DBWL	DOUBLE WHITE LINE - 6"
	DBYL	DOUBLE YELLOW LINE - 6"
	SWGL	SOLID WHITE GORE LINE - 12"
	SYGL	SOLID YELLOW GORE LINE - 12"
	YL	YIELD LINE
		SLOTTED PAVEMENT MARKER TWO-WAY YELLOW/YELLOW

ABBREVIATIONS

GENERAL

AADT	ANNUAL AVERAGE DAILY TRAFFIC
ABAN	ABANDON
ADJ	ADJUST
APPROX.	APPROXIMATE
A.C.	ASPHALT CONCRETE
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE
BIT.	BITUMINOUS
BC	BOTTOM OF CURB
BD.	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCHMARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
BR.	BRIDGE
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CC	CEMENT CONCRETE
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CI	CURB INLET
CIP	CAST IRON PIPE
CLDI	CEMENT LINED DUCTILE IRON
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CSP	CORRUGATED STEEL PIPE
CO.	COUNTY
CONC	CONCRETE
CONT	CONTINUOUS
CONST	CONSTRUCTION
CR GR	CROWN GRADE
DHV	DESIGN HOURLY VOLUME
DI	DROP INLET
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DICL	DUCTILE IRON CEMENT-LINED
DW	STEADY DON'T WALK - PORTLAND ORANGE
DWY	DRIVEWAY
ELEV (or EL.)	ELEVATION
EMB	EMBANKMENT
EOP	EDGE OF PAVEMENT
EXIST (or EX)	EXISTING
EXC	EXCAVATION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FDN.	FOUNDATION
FLDSTN	FIELDSTONE
GAR	GARAGE
GD	GROUND
GG	GAS GATE
GI	GUTTER INLET
GIP	GALVANIZED IRON PIPE
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
HDW	HEADWALL
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HYD	HYDRANT
INV	INVERT
JCT	JUNCTION
L	LENGTH OF CURVE
LB	LEACH BASIN
LP	LIGHT POLE
LT	LEFT
MAX	MAXIMUM
MB	MAILBOX
MH	MANHOLE
MHB	MASSACHUSETTS HIGHWAY BOUND
MIN	MINIMUM
MRJ	MECHANICAL RESTRAINING JOINT
NIC	NOT IN CONTRACT
NO.	NUMBER
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
P.G.L.	PROFILE GRADE LINE
PI	POINT OF INTERSECTION
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE
PROJ	PROJECT
PROP	PROPOSED
PSB	PLANTABLE SOIL BORROW
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	2	327
PROJECT FILE NO.	604123		

LEGEND & ABBREVIATIONS

ABBREVIATIONS (cont.)

GENERAL

PVT	POINT OF VERTICAL TANGENCY
PVMT	PAVEMENT
PWW	PAVED WATER WAY
R	RADIUS OF CURVATURE
R&D	REMOVE AND DISPOSE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDWY	ROADWAY
REM	REMOVE
RET	RETAIN
RET WALL	RETAINING WALL
RMD	REMODEL
ROW	RIGHT OF WAY
RR	RAILROAD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RT	RIGHT
RTP	ROADWAY TREE PROTECTION
SB	STONE BOUND
SHLD	SHOULDER
SMH	SEWER MANHOLE
ST	STREET
STA	STATION
SSD	STOPPING SIGHT DISTANCE
SHLO	STATE HIGHWAY LAYOUT LINE
SW	SIDEWALK
T	TANGENT DISTANCE OF CURVE/TRUCK %
TAN	TANGENT
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SLOPE
TYP	TYPICAL
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
WCR	WHEEL CHAIR RAMP
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
X-SECT	CROSS SECTION

TRAFFIC SIGNAL ABBREVIATIONS

CAB	CABINET
CCVE	CLOSED CIRCUIT VIDEO EQUIPMENT
DW	STEADY UPRAISED HAND
FDW	FLASHING UPRAISED HAND
FR	FLASHING CIRCULAR RED
FRL	FLASHING RED LEFT ARROW
FRR	FLASHING RED RIGHT ARROW
FY	FLASHING CIRCULAR YELLOW
FYL	FLASHING YELLOW LEFT ARROW
FYR	FLASHING YELLOW RIGHT ARROW
G	STEADY CIRCULAR GREEN
GL	STEADY GREEN LEFT ARROW
GR	STEADY GREEN RIGHT ARROW
GSL	STEADY GREEN SLASH LEFT ARROW
GSR	STEADY GREEN SLASH RIGHT ARROW
GV	STEADY GREEN VERTICAL ARROW
OL	OVERLAP
PED	PEDESTRIAN
PTZ	PAN, TILT, ZOOM
R	STEADY CIRCULAR RED
RL	STEADY RED LEFT ARROW
RR	STEADY RED RIGHT ARROW
TR SIG	TRAFFIC SIGNAL
TSC	TRAFFIC SIGNAL CONDUIT
W	STEADY WALKING PERSON
Y	STEADY CIRCULAR YELLOW
YL	STEADY YELLOW LEFT ARROW

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Proposal No. 604123-111717

GENERAL NOTES

1. THE LOCATION OF THE EXISTING UTILITIES ARE SHOWN APPROXIMATE AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES AND SUBSURFACE STRUCTURES. THE CONTRACTOR IS RESPONSIBLE FOR MAKING FIELD INVESTIGATIONS AND OBTAINING INFORMATION FROM UTILITY COMPANIES AND INDIVIDUALS TO PINPOINT THE LOCATION AND ELEVATION OF ALL SUBSURFACE UTILITIES AND STRUCTURES. DIG-SAFE : TELEPHONE 1-888-344-7233
2. ALL UTILITY POLES REQUIRING RELOCATION ARE TO BE RELOCATED BY OTHERS.
3. ALL SIDEWALKS WITHIN THE LIMITS OF FULL-DEPTH CONSTRUCTION ARE TO BE CEMENT CONCRETE UNLESS OTHERWISE NOTED.
4. MINIMUM CLEAR PATH ON THE SIDEWALKS SHALL BE 4'-0" EXCLUDING THE SURFACE OF THE CURB.
5. WHEELCHAIR RAMPS AND DRIVEWAYS SHALL CONFORM TO THE CURRENT MASSDOT STANDARDS.
6. TRANSITION GRANITE CURB AT PROJECT LIMITS TO MATCH EXISTING ELEVATIONS (PAVEMENT OR EXISTING CURB).
7. THE CONTRACTOR SHALL RETAIN ALL CURBS, FENCES, WALLS, TREES, SHRUBS, POSTS, LANDSCAPE FEATURES, AND OTHER MISCELLANEOUS ITEMS WITHIN ABUTTING PROPERTIES, UNLESS OTHERWISE NOTED. WHEN RETAINING THOSE ITEMS IS NOT PRACTICAL IN THE OPINION OF THE ENGINEER, THE CONTRACTOR SHALL REMOVE, STOCKPILE, PROTECT AND RESET THE ITEMS. THE CONTRACTOR SHALL REPLACE ITEMS DAMAGED DURING REMOVAL, STOCKPILING, OR RESETTING DUE TO NEGLIGENCE, CARELESSNESS, OR MISHANDLING WITH EQUIVALENT NEW ITEMS AT NO COST TO THE OWNER.
8. ALL TREES WITHIN THE SLOPE LIMIT SHALL BE RETAINED AND PROTECTED UNLESS OTHERWISE NOTED.
9. ALL TREES CALLED OUT TO BE RETAINED WITH ROADWAY TREE PROTECTION SHALL BE PROTECTED USING TREE PROTECTION - INDIVIDUAL AND TREE PROTECTION - TEMPORARY FENCE.
10. CONTRACTOR SHALL PROTECT ALL PROPERTY MARKERS OF ABUTTERS.
11. TREATMENT OF SLOPE AREAS SHALL BE REPLACED IN KIND UNLESS OTHERWISE NOTED.
12. THE EXISTING CONDITIONS SHOWN ON THIS BASEMAP ARE THE RESULT OF AN ON THE GROUND INSTRUMENT SURVEY PERFORMED BETWEEN 4/15/2014 AND 12/19/2014 BY GREEN INTERNATIONAL AFFILIATES, INC. (GREEN). ADDITIONAL GROUND SURVEY WAS PERFORMED BETWEEN 1/30/2017 AND 4/27/2017, AND BETWEEN 2/21/18 AND 2/23/18 BY GREEN TO SUPPLEMENT EXISTING GROUND SURVEY.
12. HORIZONTAL AND VERTICAL CONTROL WAS ESTABLISHED WITH STATIC GPS VECTORS ON 4/17/2014 BY GREEN (SEE GREEN FIELD BOOK NO. 290-138). HORIZONTAL DATUM IS BASED ON THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM, VERTICAL DATUM IS NAVD88 (COMPUTED USING GEOID12A). THE UNIT OF MEASUREMENTS IS US SURVEY FEET.
13. WETLANDS WERE DELINEATED BY GREEN 4/18/2014, 4/29/2014, 2/22/18, 8/12/2019, 8/13/2019 AND 8/14/2019 IN ACCORDANCE WITH THE MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION AND FIELD LOCATED BY GREEN ON MAY 2014 AND AUGUST 2019..
14. THE RIGHT OF WAY LINES SHOWN ON THIS PLAN ARE THE DIRECT RESULT OF AN INSTRUMENT SURVEY PERFORMED ON THE GROUND BY GREEN INTERNATIONAL AFFILIATES, INC. WITH AN ERROR OF CLOSURE LESS THAN 1:15,000, AND FROM PLANS AND DEEDS OF RECORD. PRIVATE PROPERTY LINES ARE COMPILED FROM DEEDS AND PLANS AND SHOULD BE CONSIDERED APPROXIMATE.
15. THE SAID PARCELS SHOWN HERE ARE SUBJECT TO RIGHTS AND EASEMENTS AS CONTAINED IN THE VARIOUS DEEDS OF RECORD DESCRIBING SAID PREMISES. THE LOCATIONS AND EXTENT OF SAID RIGHTS AND EASEMENTS ARE NOT THE SUBJECT OF THIS SURVEY.

UTILITY NOTES:

1. ALL UNDERGROUND UTILITIES AS SHOWN WERE COMPILED USING FIELD SURVEY INFORMATION AND AVAILABLE RECORD INFORMATION. THE LOCATION OF EXISTING PIPES OR OTHER UNDERGROUND STRUCTURES OR PROPERTY LINES ARE NOT WARRANTED TO BE EXACT, NOR IS IT WARRANTED THAT ALL UNDERGROUND PIPES OR STRUCTURES ARE SHOWN. THE CONTRACTOR SHALL CALL "DIG SAFE" (1-888-344-7233) 72 HOURS (EXCLUDING SATURDAYS, SUNDAYS AND HOLIDAYS) PRIOR TO ANY EXCAVATION TO OBTAIN ACCURATE UTILITY LOCATIONS.
2. RECORD UTILITY INFORMATION FROM THE VARIOUS UTILITY COMPANIES AND PUBLIC AGENCIES ARE APPROXIMATE ONLY AND ACTUAL LOCATIONS MUST BE DETERMINED IN THE FIELD.
3. THE COMPLETION AND ACCURACY OF LATERAL UTILITY SERVICES IS NOT GUARANTEED AND MUST BE VERIFIED BY THE CONTRACTOR IN THE FIELD.
4. ALL UTILITY COMPANIES, PUBLIC AND PRIVATE MUST BE NOTIFIED, INCLUDING THOSE IN CONTROL OF UTILITIES NOT SHOWN ON THIS PLAN, (SEE CHAPTER 370, ACTS OF 1963, MASSACHUSETTS) PRIOR TO DESIGNING, EXCAVATING, BLASTING, INSTALLING, BACKFILLING, GRADING, PAVEMENT RESTORING OR REPAVING.
5. SUBSURFACE UTILITY LOCATIONS HAVE BEEN PLOTTED TO MEET UTILITY QUALITY LEVEL "C" AS DESCRIBED IN ASCE STANDARD 38-02 AND SUMMARIZED ON THIS SHEET. THE UNDERGROUND UTILITIES ARE SHOWN IN APPROXIMATE LOCATIONS BASED ON ABOVE-GROUND FIELD OBSERVATION AND EXISTING RECORD INFORMATION RECEIVED FROM UTILITY STAKE-HOLDERS.
6. INVERTS SHOWN ON PLAN ARE NOT GUARANTEED TO BE ACCURATE. DUE TO THE LIMITATIONS OF FIELD OBSERVATION AND SURVEY TECHNIQUES THE INVERTS ARE SHOWN AS APPROXIMATE ONLY AND SHALL NOT BE WARRANTED TO BE CORRECT. ADDITIONAL FIELD INVESTIGATION IS NECESSARY WHERE ACCURATE MEASUREMENTS ARE REQUIRED FOR DESIGN OF CRITICAL AREAS.
7. THE EXISTING CONDITIONS PLAN IS TO BE USED FOR THE SPECIFIED PROJECT ONLY AND IS NOT WARRANTED TO BE COMPLETE FOR ANY OTHER FUTURE PROJECTS.

SUMMARY OF UTILITY MAPPING QUALITY LEVELS:

THE FOLLOWING IS A SUMMARY OF THE SURVEY MAPPING LEVELS FOR UTILITIES AS DESCRIBED IN ASCE STANDARD 38-02, "STANDARD GUIDELINE FOR THE DEPICTION OF EXISTING SUBSURFACE UTILITY DATA". THESE GUIDELINES ARE MORE FULLY DESCRIBED IN THE ASCE STANDARD.

UTILITY QUALITY LEVEL A:
PRECISE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES OBTAINED BY THE ACTUAL EXPOSURE (OR VERIFICATION OF PREVIOUSLY EXPOSED AND SURVEYED UTILITIES) AND SUBSEQUENT MEASUREMENT OF SUBSURFACE UTILITIES, USUALLY AT A SPECIFIC POINT. MINIMALLY INTRUSIVE EXCAVATION EQUIPMENT IS TYPICALLY USED TO MINIMIZE THE POTENTIAL FOR UTILITY DAMAGE. A PRECISE HORIZONTAL AND VERTICAL LOCATION, AS WELL AS OTHER UTILITY ATTRIBUTES, IS SHOWN ON PLAN DOCUMENTS. ACCURACY IS TYPICALLY SET TO 15-MM VERTICAL AND TO APPLICABLE HORIZONTAL SURVEY AND MAPPING ACCURACY AS DEFINED OR EXPECTED BY THE PROJECT OWNER.

UTILITY QUALITY LEVEL B:
INFORMATION OBTAINED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF SUBSURFACE UTILITIES. QUALITY LEVEL B DATA SHOULD BE REPRODUCIBLE BY SURFACE GEOPHYSICS AT ANY POINT OF THEIR DEPICTION. THIS INFORMATION IS SURVEYED TO APPLICABLE TOLERANCES DEFINED BY THE PROJECT AND REDUCED ONTO PLAN DOCUMENTS.

UTILITY QUALITY LEVEL C:
INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE-GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGMENT IN CORRELATING THIS INFORMATION TO QUALITY LEVEL D INFORMATION.

UTILITY QUALITY LEVEL D:
INFORMATION DERIVED FROM EXISTING RECORDS OR ORAL RECOLLECTIONS.

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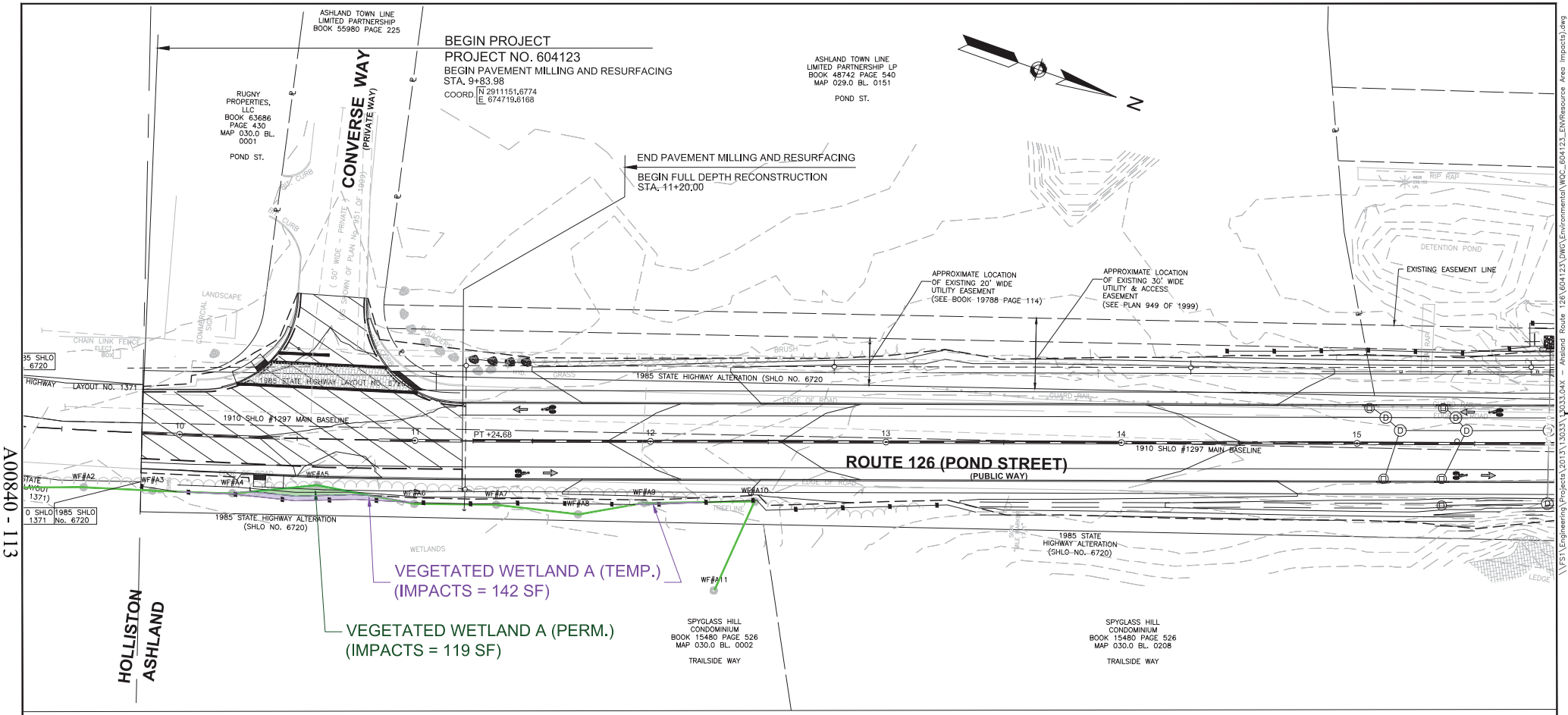

LEGEND

- PERMANENT VEGETATED WETLAND IMPACT AREA
- TEMPORARY VEGETATED WETLAND IMPACT AREA
- VEGETATED WETLAND REPLICATION AREA
- VEGETATED WETLAND LINE
- INTERMITTENT STREAM BANK
- COMPOST FILTER TUBES

40 0 40 80

SCALE IN FEET
1" = 40'

TOTAL IMPACTS	
PERMANENT VEGETATED WETLAND IMPACT (SF)	3,686
TEMPORARY VEGETATED WETLAND IMPACT (SF)	2,730
VEGETATED WETLAND REPLICATION AREA (SF)	4,110

RESOURCE AREA IMPACTS

ASHLAND, MA
ROUTE 126 (POND STREET), MASSDOT PROJECT #604123
FROM HOLLISTON TOWN LINE TO FRAMINGHAM TOWN LINE

PREPARED BY:	PREPARED FOR:
GREEN INTERNATIONAL AFFILIATES, INC. CIVIL AND STRUCTURAL ENGINEERS 239 LITTLETON RD, WESTFORD, MA (978) 923-0400 24 ALBION RD, LINCOLN, RI (401) 305-7595	massDOT Massachusetts Department of Transportation Highway Division
SCALE: AS NOTED	PROJECT NO. 13033.04
DATE: 01/31/2020 REVISED:	DRAWN BY: OF CHECKED BY: DS

WQC/ACOE PLANS SHEET 4 OF 18

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Proposal No. 604123-111717

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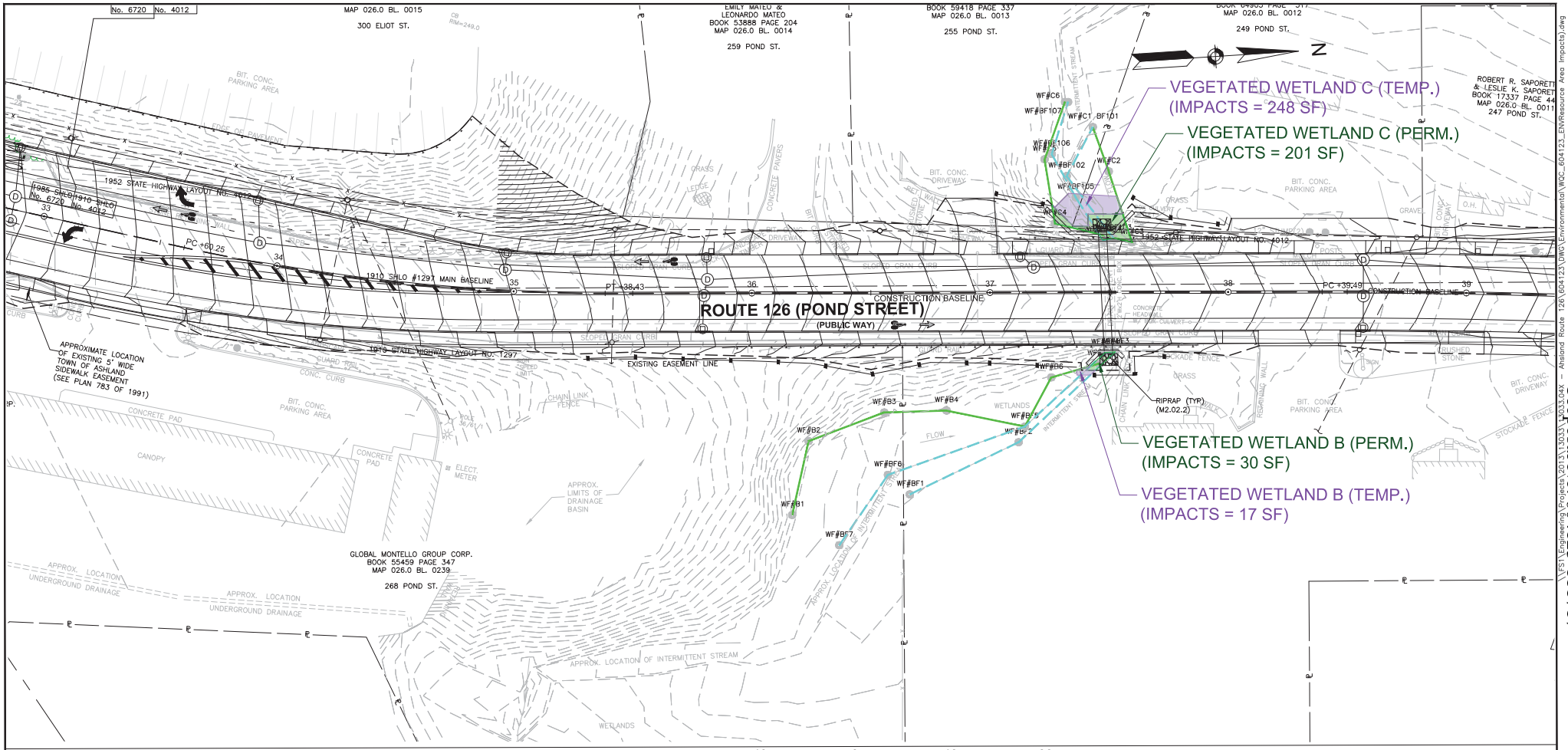

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RESOURCE AREA IMPACTS

ASHLAND, MA

ROUTE 126 (POND STREET), MASSDOT PROJECT #604123

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SCALE: AS NOTED	PROJECT NO. 13033.04
DATE: 01/31/2020 REVISED:	DRAWN BY: OF CHECKED BY: DS

WQC/ACOE PLANS SHEET 5 OF 18

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Proposal No. 604123-111717

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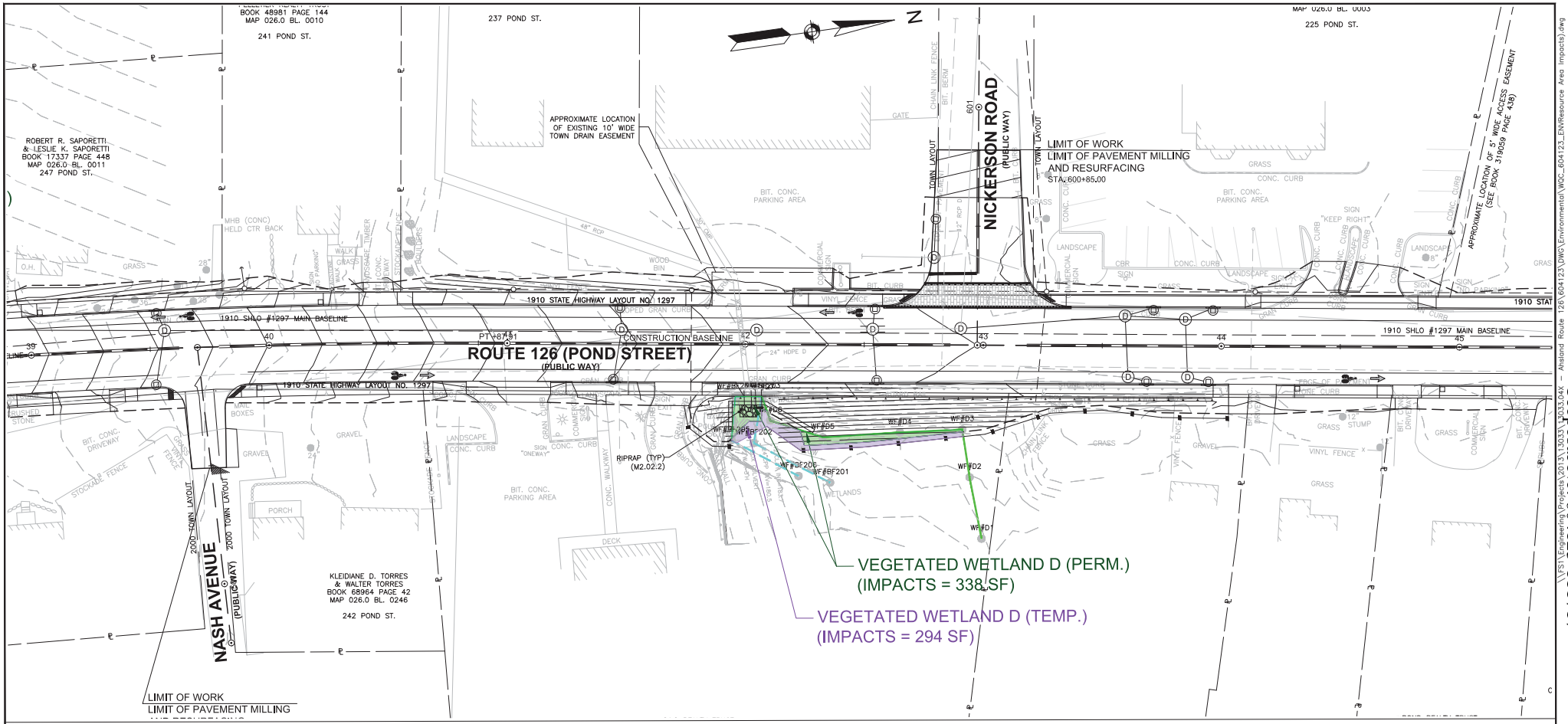

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WQC/ACOE PLANS SHEET 6 OF 18

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Proposal No. 604123-111717

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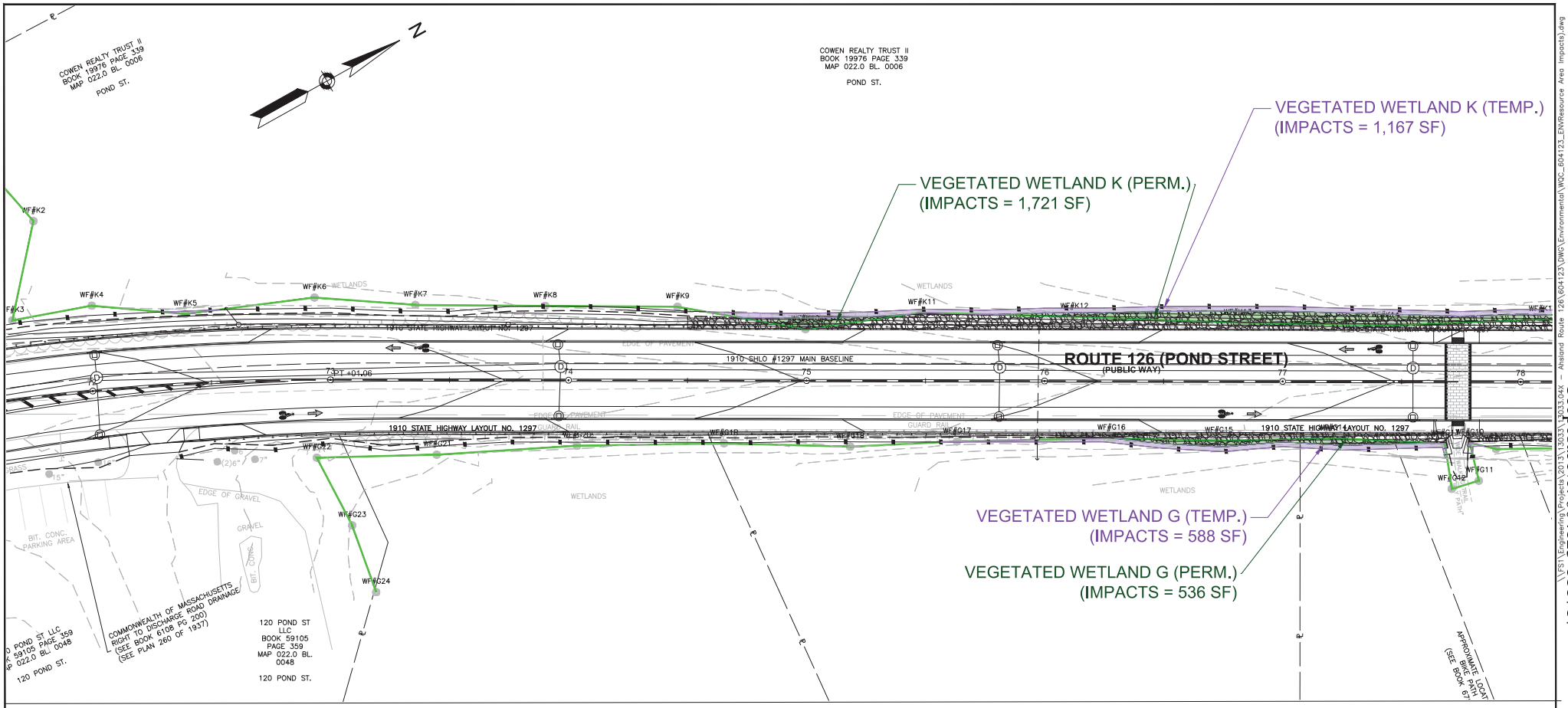

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WQC/ACOE PLANS SHEET 7 OF 18

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Proposal No. 604123-111717

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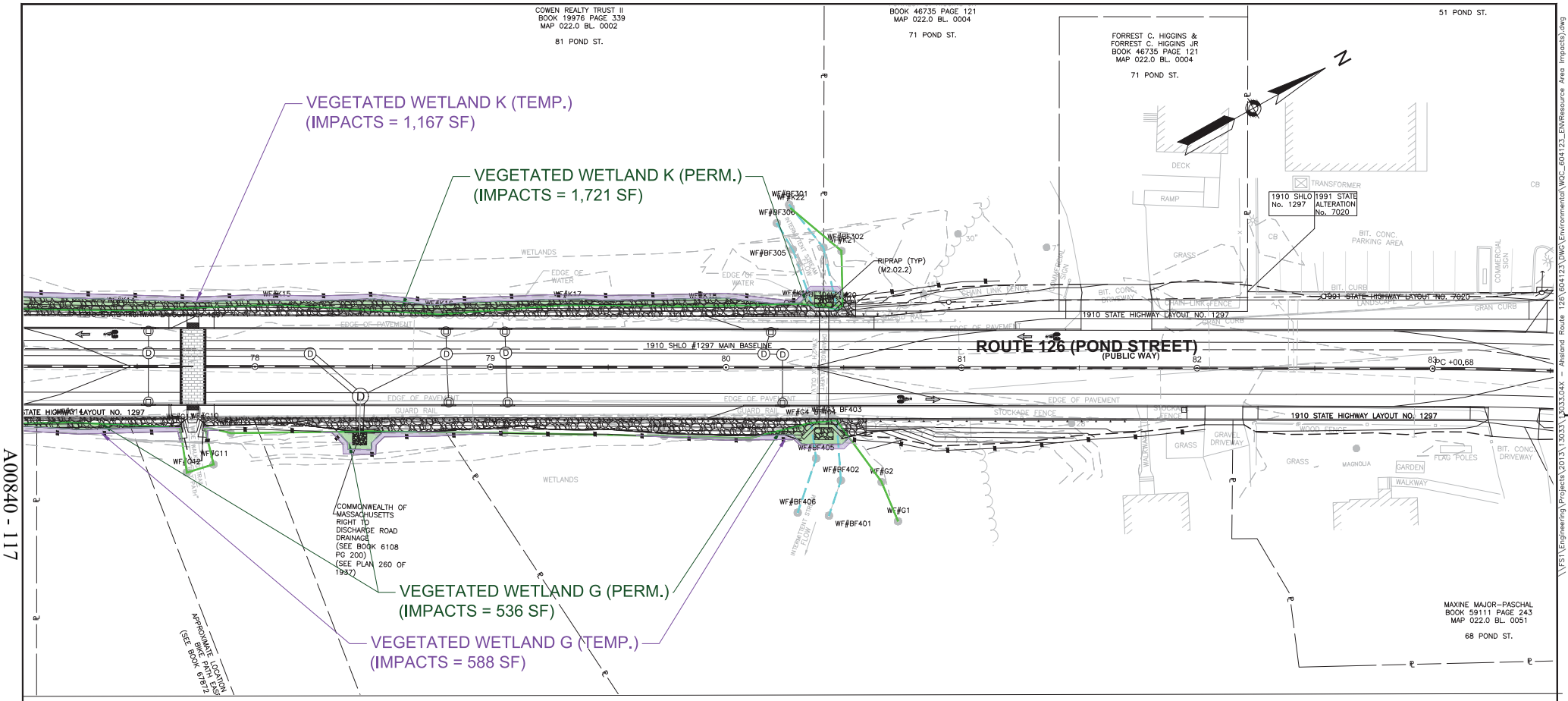

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WQC/ACOE PLANS SHEET 8 OF 18

Proposal No. 604123-111717
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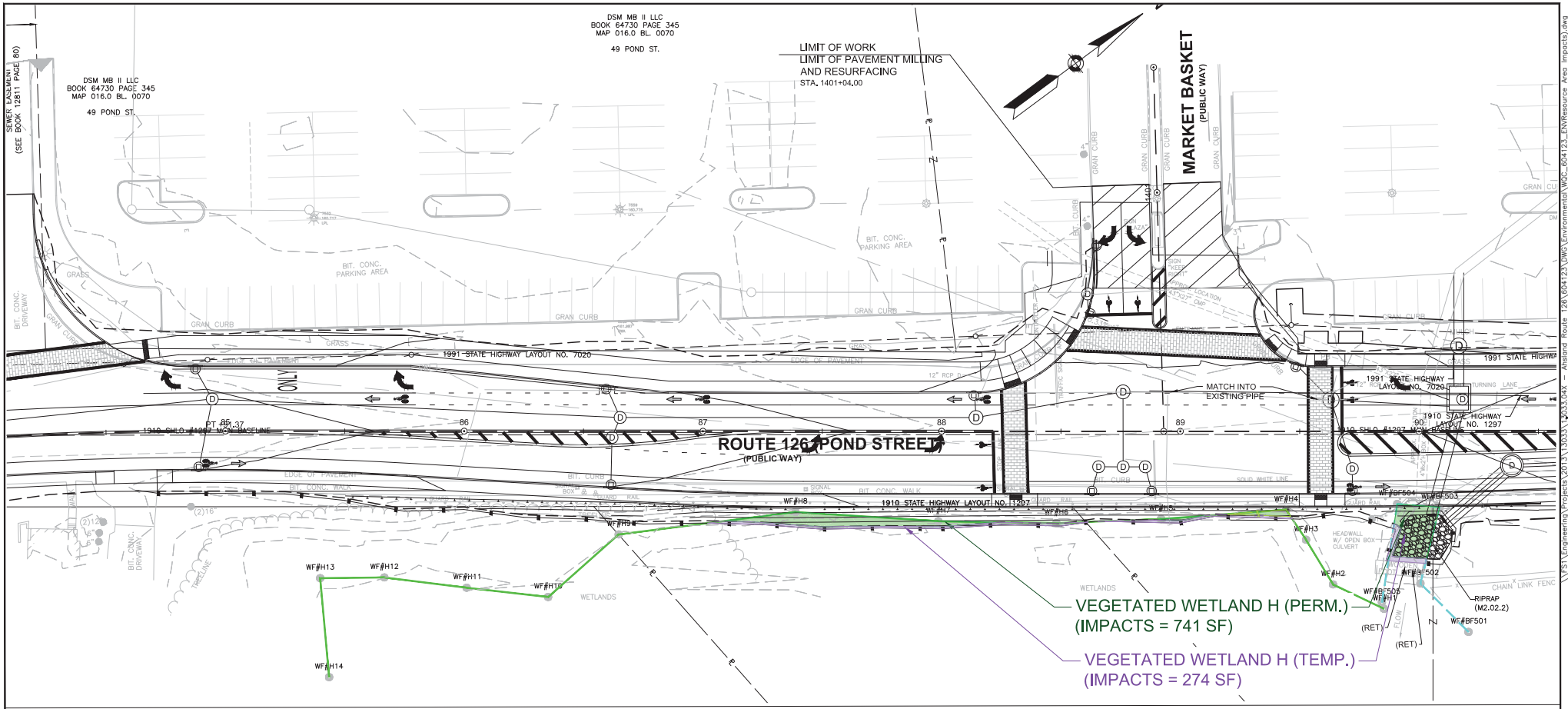


LEGEND

- PERMANENT VEGETATED WETLAND IMPACT AREA
- TEMPORARY VEGETATED WETLAND IMPACT AREA
- VEGETATED WETLAND REPLICATION AREA
- VEGETATED WETLAND LINE
- INTERMITTENT STREAM BANK
- COMPOST FILTER TUBES

40 0 40 80

SCALE IN FEET
1" = 40'

RESOURCE AREA IMPACTS

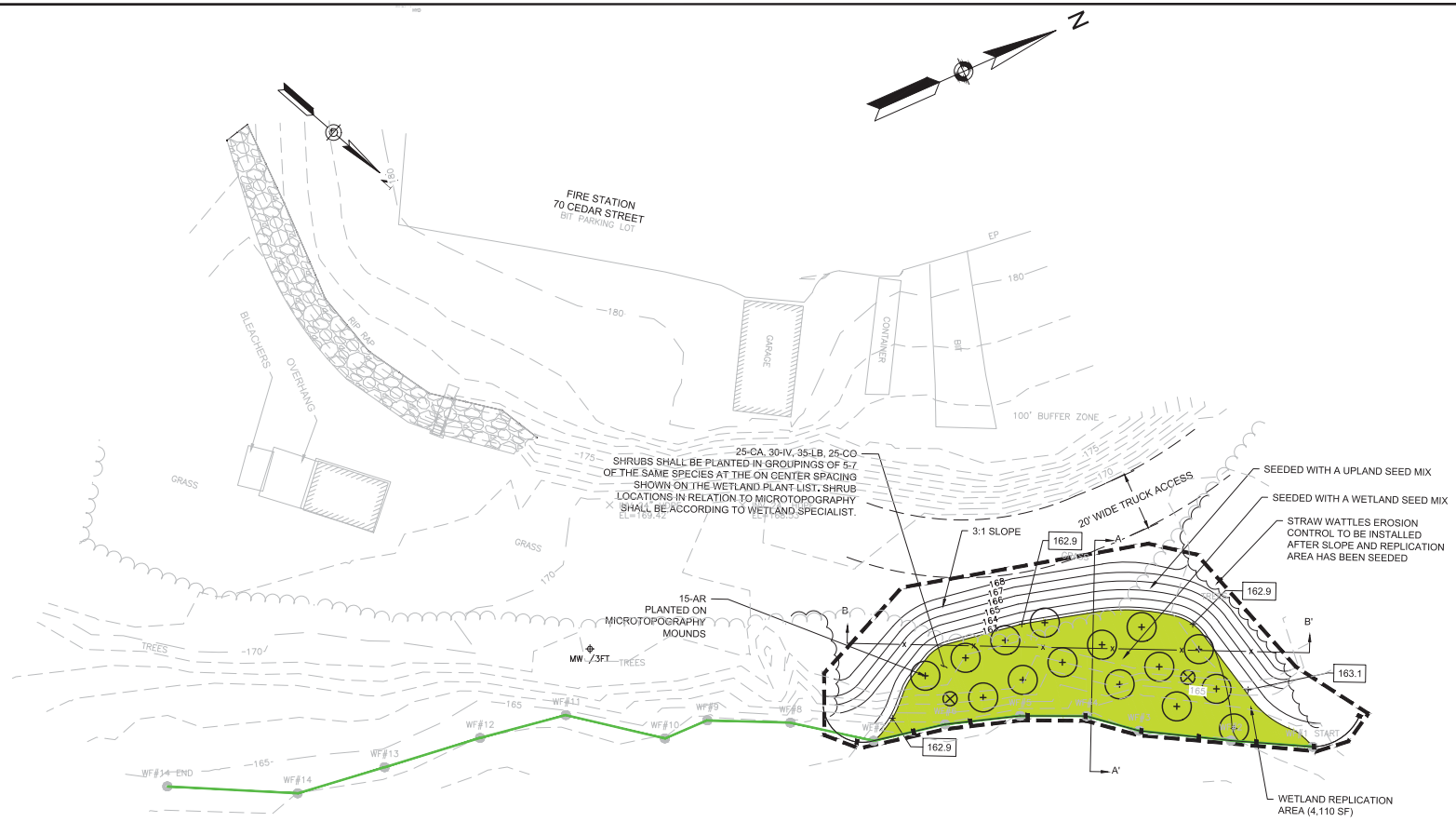
ASHLAND, MA

ROUTE 126 (POND STREET), MASSDOT PROJECT #604123
FROM HOLLISTON TOWN LINE TO FRAMINGHAM TOWN LINE

PREPARED BY:	PREPARED FOR:
GREEN INTERNATIONAL AFFILIATES, INC. CIVIL AND STRUCTURAL ENGINEERS 239 LITTLETON RD, WESTFORD, MA (978) 923-0400 24 ALBION RD, LINCOLN, RI (401) 305-7895	massDOT Massachusetts Department of Transportation Highway Division
SCALE: AS NOTED	PROJECT NO. 13033.04
DATE: 01/31/2020 REVISED:	DRAWN BY: OF CHECKED BY: DS

WQC/ACOE PLANS SHEET 9 OF 18

Proposal No. 604123-111717



LEGEND

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DATE: 01/31/2020 REVISED:	DRAWN BY: OF CHECKED BY: DS

WQC/ACOE PLANS SHEET 10 OF 18

Proposal No. 604123-111717
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ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	189	327
PROJECT FILE NO.	604123		

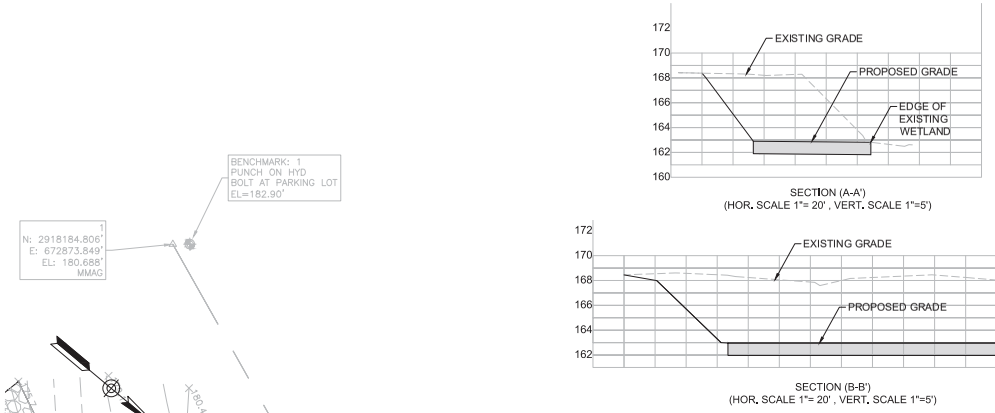
WETLAND REPLICATION PLAN
SHEET 1 OF 1

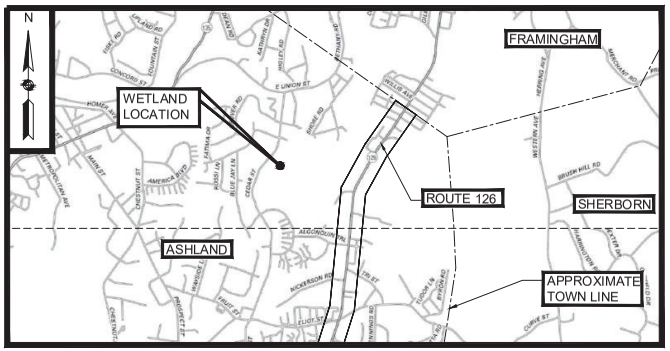
WETLAND REPLICATION AREA SEDIMENTATION AND EROSION CONTROL NOTES:

1. PRIOR TO STARTING ANY WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION & SEDIMENTATION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS IDENTIFIED IN ALL APPROVAL DOCUMENTS PERTAINING TO THIS PROJECT.
2. PERIODIC INSPECTION AND MAINTENANCE OF ALL SEDIMENT CONTROL STRUCTURES SHALL BE PROVIDED TO INSURE THAT THE INTENDED PURPOSE IS ACCOMPLISHED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SEDIMENT LEAVING THE LIMIT OF WORK. SEDIMENT CONTROL MEASURES SHALL BE IN WORKING CONDITION AT THE END OF EACH WORKING DAY.
3. ALL POINTS OF CONSTRUCTION INGRESS OR EGRESS WILL BE PROTECTED TO PREVENT TRACKING OF MUD ONTO PUBLIC WAYS.
4. AFTER ANY SIGNIFICANT RAINFALL, SEDIMENT CONTROL STRUCTURES SHALL BE INSPECTED FOR INTEGRITY. ANY DAMAGED DEVICES SHALL BE CORRECTED IMMEDIATELY.
5. ANY SEDIMENT TRACKED ONTO PAVED AREAS SHALL BE SWEPT AT THE END OF EACH WORKING DAY.
6. ALL DEBRIS GENERATED DURING SITE PREPARATION ACTIVITIES SHALL BE LEGALLY DISPOSED OF OFF-SITE.
7. AN EROSION CONTROL BARRIER SHALL BE INSTALLED AS SHOWN ON THE PLANS.
8. MEANS OF EROSION AND SEDIMENT PROTECTION AS NOTED ON THE DRAWINGS INDICATE THE MINIMUM PROVISIONS NECESSARY. ADDITIONAL MEANS OF PROTECTION SHALL BE PROVIDED BY THE CONTRACTOR AS REQUIRED FOR CONTINUED OR UNFORESEEN EROSION PROBLEMS, AT NO ADDITIONAL EXPENSE TO THE OWNER.

WETLAND REPLICATION AREA PLANTING NOTES AND CONSTRUCTION SEQUENCE:

1. CONTRACTOR SHALL COORDINATE WITH THE TOWN OF ASHLAND REGARDING ACCESS.
2. EROSION CONTROLS WILL BE INSTALLED ALONG THE EXISTING WETLAND BOUNDARY. THIS WILL ALLOW THE SITE CONTRACTOR TO PROPERLY TIE - IN PROPOSED CONTOURS AT THE EDGE OF THE EXISTING WETLAND.
3. UNDER THE DIRECTION OF THE WETLAND SPECIALIST, THE CONTRACTOR SHALL PROVIDE ROUGH GRADING (+/- 3 INCHES) WITHIN THE REPLICATION WETLAND. WETLAND MITIGATION GRADING IS SUBJECT TO MODIFICATION BASED ON ACTUAL SITE CONDITIONS. THE WETLAND SPECIALIST WILL INSPECT THE SUB-GRADE OF THE REPLICATION AREA TO ENSURE THAT THE PROPER HYDROLOGY AND MICROTOPOGRAPHY HAS BEEN ESTABLISHED.
4. PRIOR TO SOIL ADDITIONS AND/OR PLANTINGS, PROJECT SURVEYORS SHOULD VERIFY THAT GRADES HAVE BEEN ACHIEVED AS SHOWN ON THIS DRAWING.
5. PRIOR TO PLANTING, THE MITIGATION AREA SHOULD BE EXCAVATED APPROXIMATELY 1 FOOT BELOW THE FINISHED GRADE OF THE WETLAND MITIGATION AREA. FOLLOWING EXCAVATION OF THE MITIGATION AREA, A SOIL MIXTURE (NATURAL OR MANMADE) CONSISTING OF EQUAL VOLUMES OF ORGANIC (COMPOST) MATERIAL AND MINERAL SOIL MATERIAL SUCH AS A RICH LOAMY SAND (WITH A LOOSE FRIABLE CONSISTENCY) SHALL BE USED TO BRING THE EXCAVATED WETLAND MITIGATION AREA TO FINISHED GRADE. PRIOR TO USE, THE SOIL MIXTURE WILL BE ANALYZED BY A SOIL TESTING LABORATORY FOR TEXTURE AND NUTRIENTS. THE SELECTED CONTRACTOR WILL BE RESPONSIBLE FOR THIS COORDINATION. SEE SPECIAL PROVISION.
6. ESTIMATES OF SEASONAL HIGH GROUNDWATER (SHGW) SHALL BE DETERMINED IN THE FIELD AT THE TIME OF REPLICATION GRADING. THE FINISH GRADE OF THE WETLAND MITIGATION AREA SHALL BE SET SO THAT GROUNDWATER IS WITHIN 12" OF THE SURFACE FOR AT LEAST 14 CONSECUTIVE DAYS DURING THE GROWING SEASON.
7. PENDING SITE AND WEATHER CONDITIONS ALL PLANTINGS WILL TAKE PLACE IN SPRING (MAY 15-JUNE 15) OR FALL (SEPTEMBER 1 - NOVEMBER 1).
8. TREES PLANTED IN THE REPLICATION AREA SHALL BE LOCATED ON AREAS OF HIGHER ELEVATION (I.E., GRADED MOUNDS). TREES SHALL BE LOCATED IN THE FIELD BY THE WETLAND SPECIALIST.
9. 4" OF LOAM (WEED-FREE, FINE SANDY LOAM) AND A CONSERVATION/WILDLIFE SEED MIX WILL BE SPREAD THROUGHOUT THE GRADED 3:1 UPLAND SLOPES AND IN ALL OTHER AREAS DISTURBED BY THE CONTRACTOR AS SPECIFIED. LOAM, SEED MIXTURE AND SOURCE SHALL BE APPROVED BY THE WETLAND SPECIALIST.





LOCUS PLAN

LEGEND

- 4" LOAM BORROW AND CONSERVATION SEED MIX IN ALL DISTURBED UPLAND AND SLOPED AREAS
- WETLAND SOIL AND WETLAND SEED MIX
- LIMIT OF WORK
- STRAW WATTLES
- 168 PROPOSED CONTOUR
- 170 EXISTING CONTOUR
- COMPOST FILTER TUBE
- 163.3 PROPOSED SPOT GRADE
- TREE

WQC/ACOE PLANS SHEET 11 OF 18

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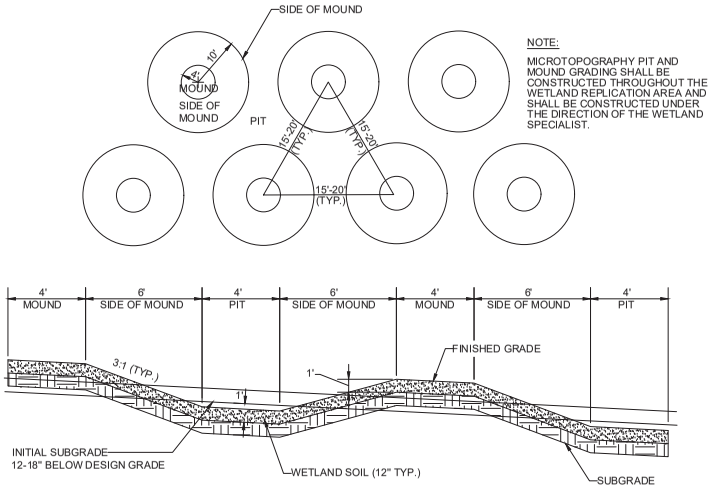
Proposal No. 604123-111717

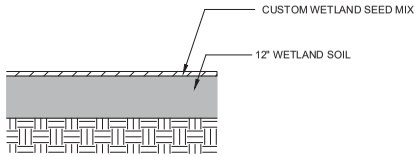


NOTE:

MICROTOPOGRAPHY PIT AND MOUND GRADING SHALL BE CONSTRUCTED THROUGHOUT THE WETLAND REPLICATION AREA AND SHALL BE CONSTRUCTED UNDER THE DIRECTION OF THE WETLAND SPECIALIST.

1 WETLAND REPLICATION MICROTOPOGRAPHY

NOT TO SCALE



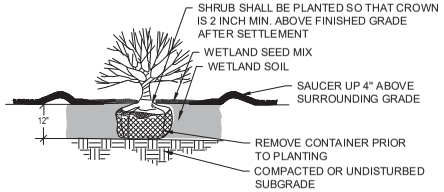
NOTES:
1. WETLAND SPECIALIST SHALL APPROVE GRADES PRIOR TO SOIL INSTALLATION.
2. SEE NON TIDAL WETLAND MITIGATION SPEC FOR SOIL AND PLANTING REQUIREMENTS.

3 WETLAND REPLICATION DETAIL

NOT TO SCALE

RAISE AND REPLANT ANY SHRUBS WHICH SETTLE MORE THAN 2 INCHES AFTER PLANTING & WATERING IN SHRUBS SHALL BE SET PLUMB

WATER BY FLOODING TWICE IN FIRST TWO HOURS AFTER PLANTING. WATER & MAINTAIN AS PER STANDARD SPECIFICATIONS



4 WETLAND SHRUB PLANTING

NOT TO SCALE

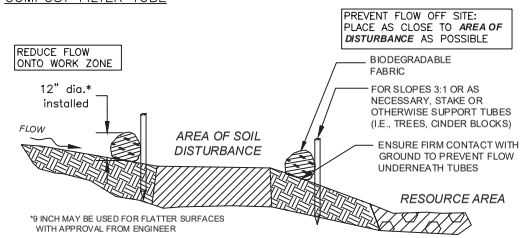
PLANT LIST - WETLAND REPLICATION TOTAL

KEY	QTY	WETLAND STATUS	BOTANICAL NAME	COMMON NAME	PLANT TYPE	PLANT SIZE	DENSITY/SPACING
AR	15	FAC	ACER RUBRUM	RED MAPLE	TREE	4-6' HT	RANDOM AT RAISED MOUNDS
CA	25	FAC	CLETHRA ALNIFOLIA	SWEET PEPPERBUSH	SHRUB	3-4' HT	5-6' ON CENTER
CO	25	FACW	CORNUS AMOMUM	SILKY DOGWOOD	SHRUB	3-4' HT	5-6' ON CENTER
IV	30	FACW	ILEX VERTICILATA	COMMON WINTERBERRY	SHRUB	3-4' HT	5-6' ON CENTER
LB	35	FACW	LINDERA BENZOIN	SPICEBUSH	SHRUB	3-4' HT	5-6' ON CENTER
	-	-	-	WETLAND SEEED MIX	HERBACEOUS	-	1LB/2,000 SF
	-	-	-	UPLAND/BUFFER SEED MIX	HERBACEOUS	-	1LB/2,000 SF

5 PLANT LIST WETLAND

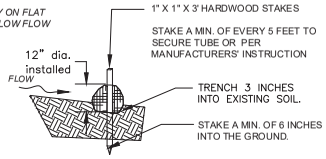
NOT TO SCALE

COMPOST FILTER TUBE

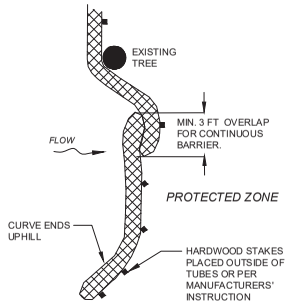


12 INCH STRAW WATTLE

TO BE USED ONLY ON FLAT SURFACES WITH LOW FLOW



SECTION



PLACE TUBE ALONG CONTOURS AND PERPENDICULAR TO FLOW.

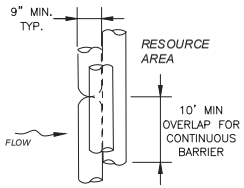
ADJUST LOCATION AS REQUIRED FOR OPTIMUM EFFECTIVENESS. DO NOT INSTALL IN WATERWAYS.

PLACE STAKES AS NEEDED TO SECURE TUBES IN PLACE.

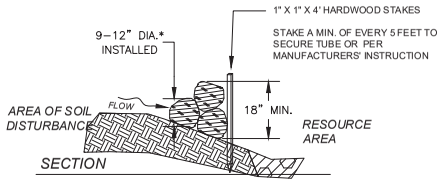
PLAN VIEW

SEDIMENT CONTROL BARRIERS - COMPOST FILTER TUBE & STRAW WATTLES

NOT TO SCALE



PLAN VIEW



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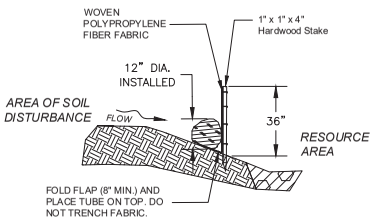


SECTION

COMPOST FILTER TUBE & SILT FENCE

NOT TO SCALE

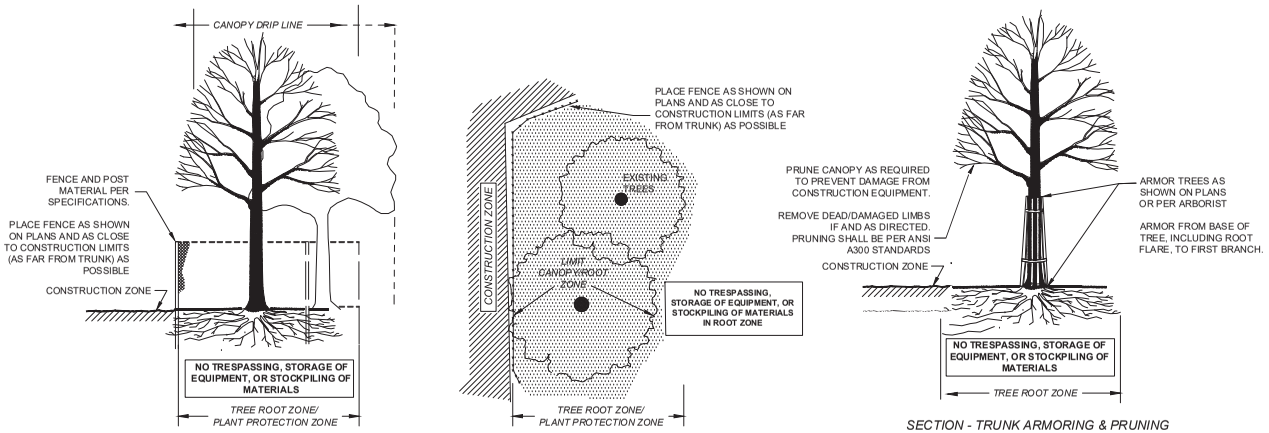
COMPOST FILTER TUBE BERM (SLOPES 2:1 OR STEEPER)

NOT TO SCALE

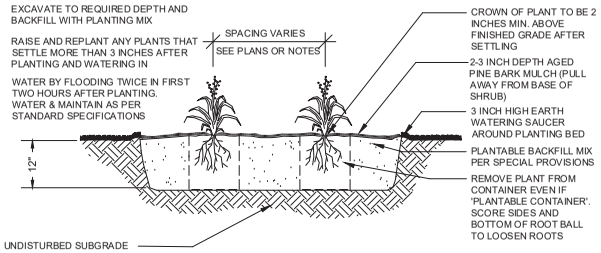
2 SEDIMENT CONTROL BARRIERS - COMPOST FILTER TUBE & STRAW WATTLES

NOT TO SCALE

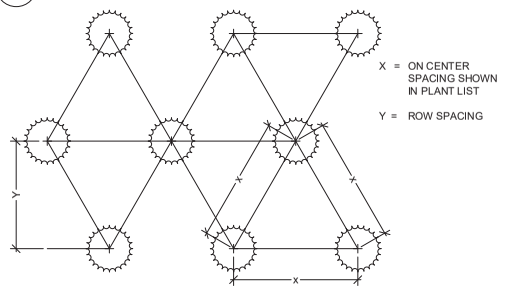
A00840 - 121
Proposal No. 604123-111717



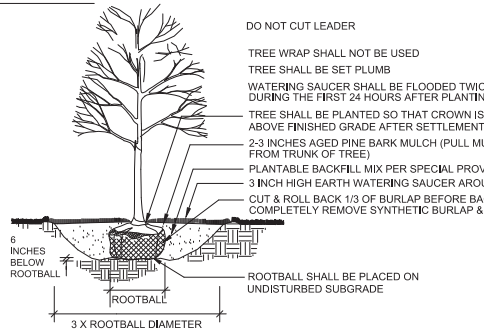
1 TREE PROTECTION DETAILS
NOT TO SCALE



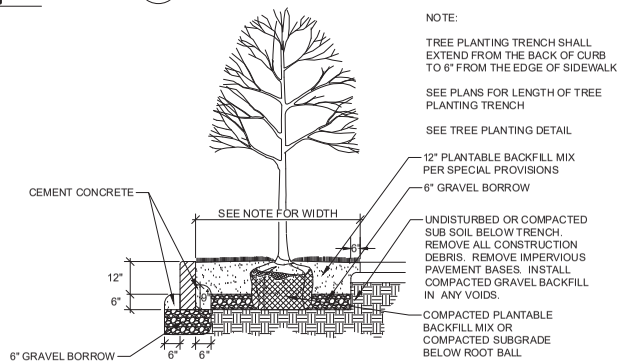
3 PERENNIAL AND ORNAMENTAL GRASS PLANTING
NOT TO SCALE



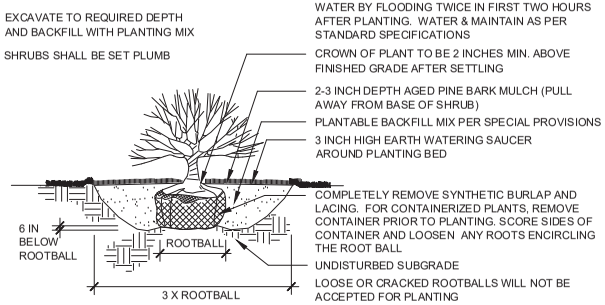
5 SHRUB, PERENNIAL AND ORNAMENTAL GRASS SPACING PLAN DETAIL
NOT TO SCALE



4 TREE PLANTING
NOT TO SCALE



6 TREE PLANTING TRENCH
NOT TO SCALE



2 SHRUB PLANTING
NOT TO SCALE

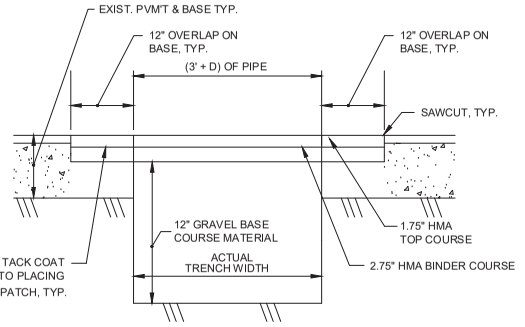
PLANT LIST - TOTAL FOR UPLAND

KEY	QTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS/ SPACING	ROOT
		DECIDUOUS TREES				
ARS	5	ACERXFREEDMANI 'ARMSTRONG'	ARMSTRONG FREEDMAN MAPLE	2-2.5" CAL.		B&B
ARK	2	ACER RUBRUM 'KARPICK'	KARPICK RED MAPLE	2-2.5" CAL.		B&B
BN	3	BETULA NIGRA	RIVER BIRCH	2-2.5" CAL.	SINGLE STEM	B&B
OV	3	OSTRYA VIRGINIANA	HOP HORNBEAM	2-2.5" CAL.	SINGLE STEM	B&B
CR	1	CORNUS 'RUTCAN' CONSTELLATION	CONSTELLATION DOGWOOD	1.5" CAL		CONT #15
GB	14	GINKGO BILOBA AUTUMN GOLD	AUTUMN GOLD GINKO	2-2.5" CAL.		B&B
GT	10	GLEDITSIA TRIACANTHOS 'SHADEMASTER'	SHADEMASTER HONEYLOCUST	2-2.5" CAL.		B&B
LSH	3	LIQUIDAMBAR STYRACIFLUA 'HAPDELL'	HAPPIDAZE FRUITLESS SWEET GUM	2-2.5" CAL.		B&B
MA	11	MALUS 'ADIRONDACK'	ADIRONDACK CRABAPPLE	2-2.5" CAL.		B&B
PC	9	PYRUS CALLERYANA ' CHANTICLEER'	CLEVELAND SELECT PEAR	2-2.5" CAL.		B&B
UAP	4	ULMNUS AMERICANA 'PRINCETON'	PRINCETON ELM	2-2.5" CAL.		B&B
		DECIDUOUS SHRUBS				
CP	33	COMPTONIA PEREGRINA	SWEETFERN	18-24" SP.	4' O.C.	CONT #3
RA	92	RHUS AROMATICA 'GRO-LOW'	GRO-LOW FRAGRANT SUMAC 2 GAL	18-24" SP.	3.5' O.C.	CONT #3
		EVERGREEN SHRUBS				
IC	4	ILEX CRENATA 'HETZII'	HETZ HOLLY	24-30" SP.	4' O.C.	CONT #5
JHB	18	JUNIPERUS HORIZONTALIS 'BAR HARBOR'	BAR HARBOR JUNIPER	18-24" SP.	3' O.C.	CONT #2
JHP	62	JUNIPERUS HORIZONTALIS PLUMOSA COMPACTA	COMPACT ANDORRA JUNIPER	18-24" SP.	3' O.C.	CONT #2
JSB	96	JUNIPEROUS SQUAMATA 'BLUE STAR'	BLUE STAR JUNIPER	12-18" SP.	18" O.C.	CONT #2
JSG	9	JUNIPERUS CHINESIS 'SEA GREEN'	SEA GREEN JUNIPER	2-2.5 FT	4' O.C.	CONT #5
		PERENNIALS AND GRASSES				
HH	48	HEMEROCALLIS HAPPY RETURNS	HAPPY RETURNS DAY LILLY	CONT #1	18" O.C.	
HP	90	HEMEROCALLIS PURPLE	PURPLE D'ORO DAY LILLY	CONT #1	18" O.C.	
HR	57	HEMEROCALLIS RED HOT RETURNS	RED HOT RETURNS DAY LILLY	CONT #1	18" O.C.	
NW	255	NEPETA RACEMOSA 'WALKERS LOW'	WALKERS LOW CAT MINT	CONT #1	18" O.C.	
PHM	131	PANICUM VIRGATUM 'HEAVY METAL'	HEAVY METAL SWITCH GRASS	CONT #2	18" O.C.	
PVS	71	PANICUM VIRGATUM 'SHENANDOAH'	SHENANDOAH SWITCH GRASS	CONT #2	18" O.C.	
PKR	124	PENNESETUM OREINTALE 'KARLY ROSE'	KARLEY ROSE FLOWERING FOUNTAIN GRASS	CONT #2	24" O.C.	

7 PLANT LIST TOTAL FOR PLAN
NOT TO SCALE

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	191	327
PROJECT FILE NO.	604123		

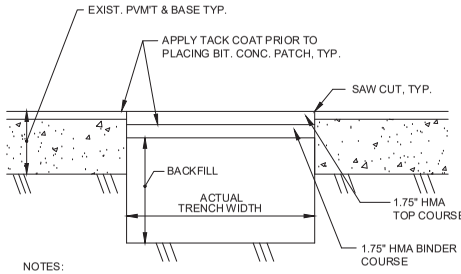
DRAINAGE & UTILITY DETAILS (1 OF 4)



NOTES:
1. PERMANENT PATCH IS TO BE USED ON SEWELL STREET.
2. MATCH EXISTING PAVEMENT ELEVATION.
3. PERMANENT HMA PATCH IS NOT REQUIRED WITHIN THE LIMITS OF FULL DEPTH RECONSTRUCTION, TEMPORARY HMA PATCH SHALL BE MAINTAINED UNTIL FULL DEPTH RECONSTRUCTION IS PERFORMED IN THESE AREAS.
4. PERMANENT PATCH TO BE PAID FOR UNDER ITEM 451.

1 PERMANENT HMA PATCH DETAIL

SCALE: NOT TO SCALE



NOTES:
1. PERMANENT HMA PATCH SHALL BE USED IN ALL AREAS THAT WILL BE MILLED & OVERLAID. PERMANENT HMA PATCH IS NOT REQUIRED WITHIN THE LIMITS OF FULL DEPTH RECONSTRUCTION, TEMPORARY HMA PATCH SHALL BE MAINTAINED UNTIL FULL DEPTH RECONSTRUCTION IS PERFORMED IN THESE AREAS.
2. TEMPORARY HMA PATCH IN AREAS THAT WILL BE SUBJECT TO FULL DEPTH CONSTRUCTION, IN-SITU MATERIAL MAY BE USED FOR BACKFILL.
3. PAVEMENT FOR TEMPORARY HMA PATCH SHALL BE PAID FOR UNDER ITEM 472.

2 TEMPORARY HMA PATCH DETAIL

SCALE: NOT TO SCALE

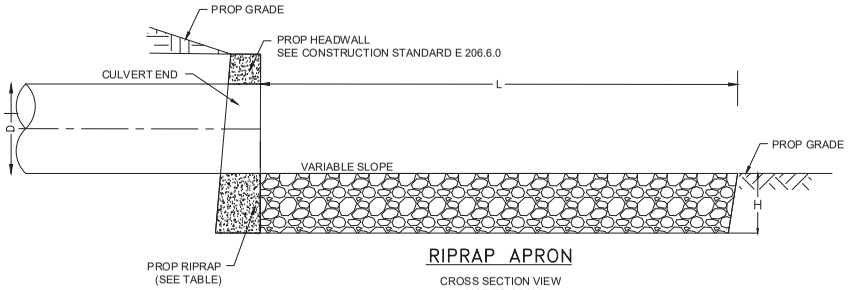
CULVERT SIZE D (INCHES)	LENGTH OF APRON L (FEET)	DEPTH OF APRON H (INCHES)	MASSDOT RIPRAP SIZE
30	12.5	24	M2.02.2
36	16	24	M2.02.2
42	21	30	M2.02.1
48	24	30	M2.02.1

SOURCE:

FHWA STANDARD DRAWING C251-50

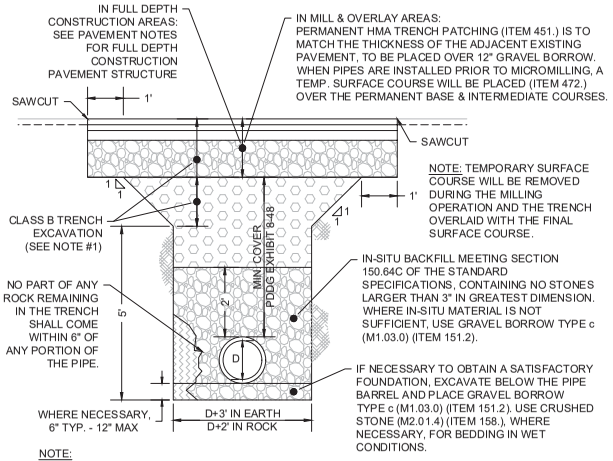
NOTES:

FOR PIPES 24" DIA. AND LESS, USE STONE PIPE ENDS MASSDOT STANDARD DETAIL E 206.7.0



RIPRAP APRON

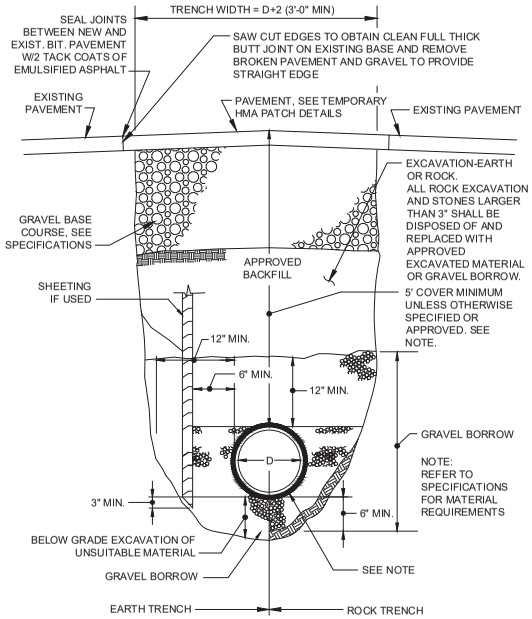
CROSS SECTION VIEW
NOT TO SCALE



NOTE:
1. CLASS B TRENCH EXCAVATION IS MEASURED FROM THE BOTTOM OF THE ROADWAY EXCAVATION OR EXISTING GROUND, WHICHEVER IS LOWER.
2. ALL BACKFILL IS TO BE PLACED AND COMPACTED IN 6" LAYERS.
3. REFER TO HMA PATCH DETAILS.
4. BACKFILL TRENCH TO A POINT 2' OVER THE PIPE USING NO STONES LARGER THAN 3" IN GREATEST DIMENSION.

3 TYPICAL TRENCH DRAIN DETAIL

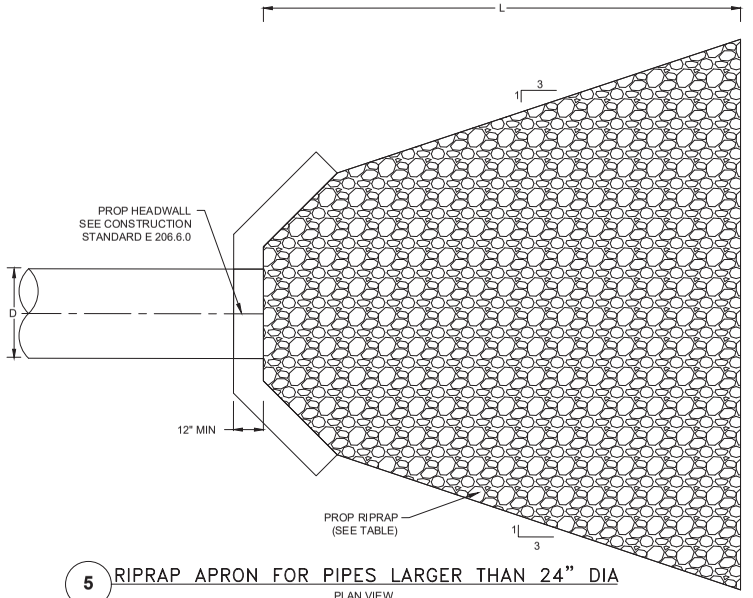
NOT TO SCALE



NOTE: FURNISH AND INSTALL CLOSED CELL GLASS INSULATION, 2" THICK FOAMGLASS ONE BY PITTSBURG CORNING OR EQUAL, WITH PITTWRAPP AA JACKETING BY PITTSBURG CORNING OR EQUAL WHEN WATER MAIN CANNOT BE INSTALLED AT OR BELOW THE REQUIRED BURIAL DEPTH OF FIVE (5) FEET

4 WATER TRENCH SECTION

NOT TO SCALE

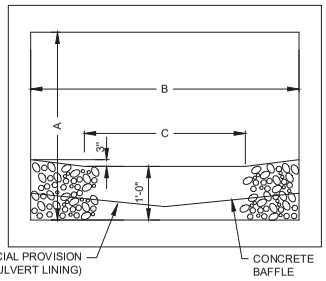


5 RIPRAP APRON FOR PIPES LARGER THAN 24" DIA

PLAN VIEW
NOT TO SCALE

A00840 - 123

Proposal No. 604123-111717

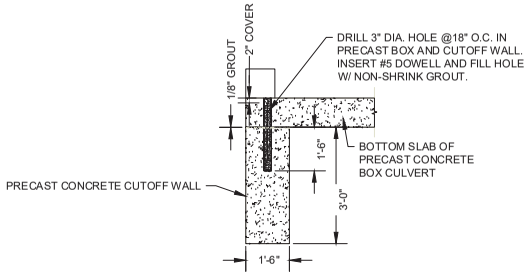


NOTES:
1. PAYMENT FOR BAFFLE WILL BE CONSIDERED INCIDENTAL IN THE COST OF THE PRECAST CULVERT.

11 CULVERT TYPICAL SECTION STA.37+50 & 80+40

NOT TO SCALE

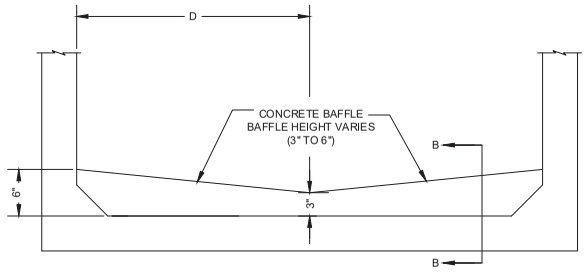
	DIMENSIONS (FT)			
	A	B	C	D
CULVERT 1 AT STA. 37+50	3	2	1	1
CULVERT 3 AT STA. 80+40	3	3	2	1.5



NOTES:
1. PAYMENT FOR CUTOFF WALL CONCRETE, REINFORCING STEEL, DOWEL AND NON-SHRINK GROUT SHALL BE INCLUDED IN THE COST OF THE PRECAST CULVERT.

12 CUTOFF WALL DETAIL

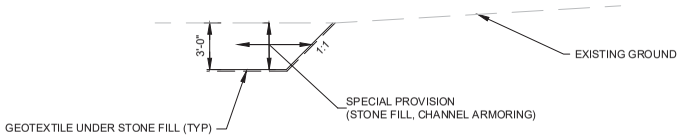
NOT TO SCALE



NOTES:
1.BAFFLES SHALL BE 6" DEEP (MAX).
2.BAFFLES TO BE PLACED EVERY 7' INCLUDING AT THE INLET AND OUTLET.

13 PRECAST CONCRETE BAFFLE DETAIL

NOT TO SCALE



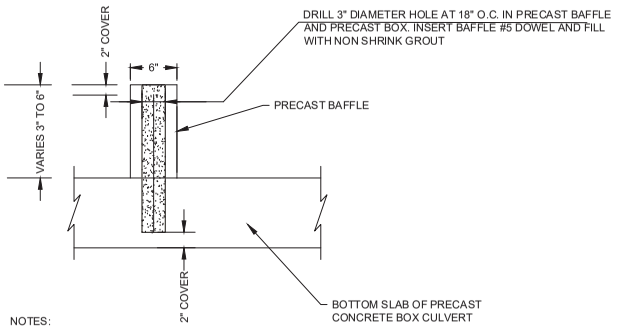
14 STREAM BED MATERIAL TRANSITION

NOT TO SCALE

STONE FILL GENERAL NOTES:
1. PRIOR TO PLACING MATERIALS, PREPARE SLOPE AS FOLLOWS:
   A. CUT OFF TREES AND EXISTING STUMPS TO GROUND LEVEL. LEAVE STUMPS & ROOTS BELOW GRADE IN PLACE.
   B. EXCAVATE VEGETATION (EXCEPT STUMPS) AND ORGANIC SOILS FROM SURFACE OF SLOPE.
   C. COMPACT SURFACE OF SLOPE (COMPACTION WITH EXCAVATOR BUCKET ACCEPTABLE).
   D. PLACE MATERIALS AS SHOWN ON THE DETAILS.
2. THE NATURAL STREAMBED MATERIAL SHALL CONSIST OF FIELD STONE OR NATURAL RIVER ROCK SIMILAR IN COLOR AND APPEARANCE TO IN-SITU NATIVE MATERIALS. CRUSHED STONE SHALL NOT BE PERMITTED. THE NATURAL STREAMBED MATERIAL SHALL APPROXIMATE THE FOLLOWING SIZE DISTRIBUTION; AMOUNT FINER THAN EACH LABORATORY SIEVE (SQUARE OPENINGS)(PERCENT BY WEIGHT):

SIEVE OPENING	PERCENT FINER
4-INCH	100%
3.5-INCH	85% - 95%
2.5-INCH	40% - 60%
1.25-INCH	25% - 35%
0.25-INCH	5% - 15%

3. THE CONTRACTOR SHALL INSTALL A 1' - 1'3" THICK LAYER OF STREAMBED MATERIAL WITHIN THE BOX, AS DEPICTED ON THE PLANS OR AS REQUIRED BY THE ENGINEER. THE MATERIAL SHALL BE INSTALLED DURING DEWATERED CONDITIONS AND IN ACCORDANCE WITH THE ENVIRONMENTAL PERMITS. MICROTOPOGRAPHY SHALL BE ESTABLISHED WITHIN THE CULVERT TO CREATE A LOW FLOW THALWEG THROUGHOUT THE STRUCTURE.



NOTES:
PAYMENT FOR BAFFLE AND #5 DOWEL WILL BE CONSIDERED INCIDENTAL IN THE COST OF THE PRECAST CULVERT.

15 SECTION B-B BAFFLE DETAIL

NOT TO SCALE

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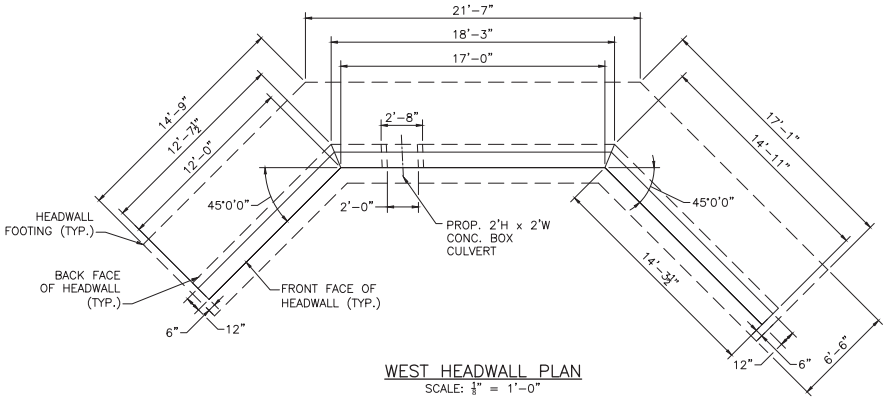
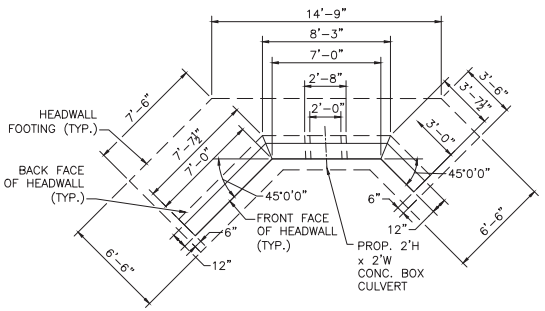
Proposal No. 604123-111717

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	210	327
PROJECT FILE NO.	604123		

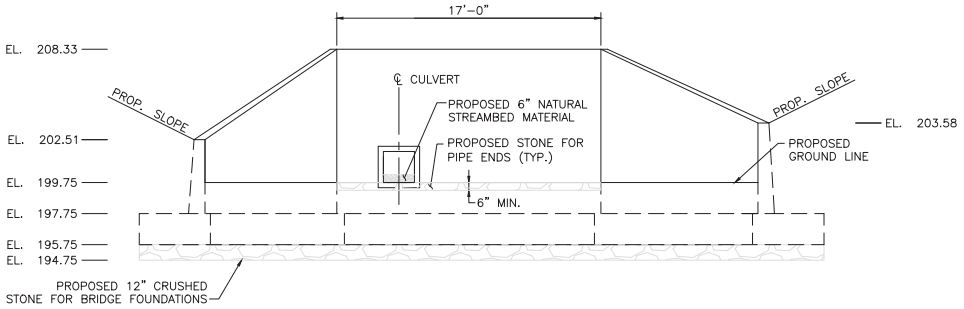
SPECIAL DRAINAGE STRUCTURE NO.1 DETAILS



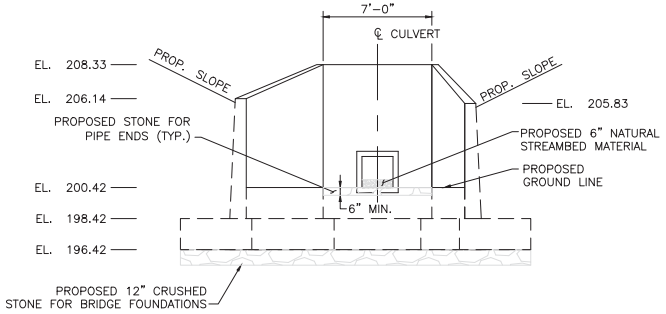
WEST HEADWALL PLAN
SCALE: ⅜" = 1'-0"



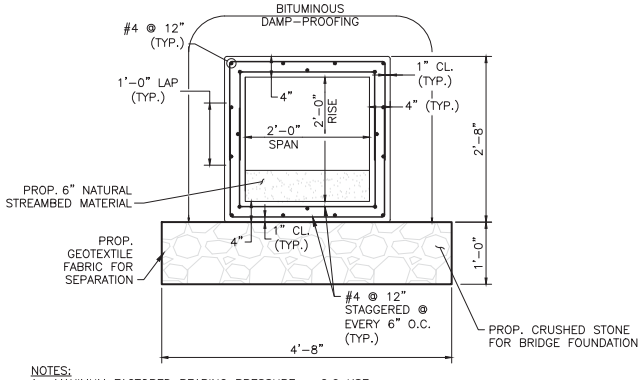
EAST HEADWALL PLAN
SCALE: ⅜" = 1'-0"



WEST HEADWALL ELEVATION
SCALE: ⅜" = 1'-0"



EAST HEADWALL ELEVATION
SCALE: ⅜" = 1'-0"



NOTES:
1. MAXIMUM FACTORED BEARING PRESSURE = 2.6 KSF.
2. TRANSVERSE REINFORCING SHALL BE PLACED NORMAL TO THE ℄ OF THE CULVERT.
3. PRECAST CONCRETE CULVERT TO BE 5000 PSI, ¾ INCH, 686 HP CEMENT CONCRETE.

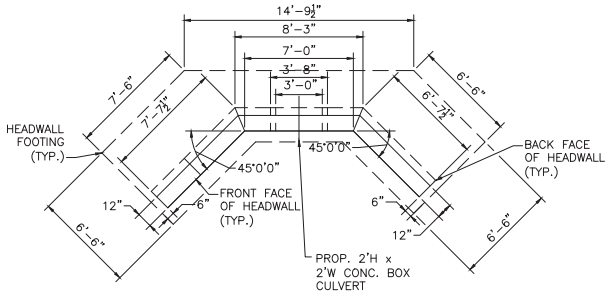
CULVERT REINFORCEMENT DETAIL
SCALE: ½" = 1'-0"

NOTES:

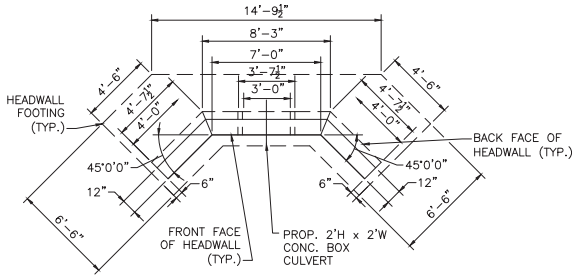
1. SEE SHEET 205 FOR GENERAL PLAN AND ELEVATION OF STRUCTURE.
2. SEE SHEET 214 FOR HEADWALL REINFORCEMENT DETAILS.

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	212	327
PROJECT FILE NO.	604123		

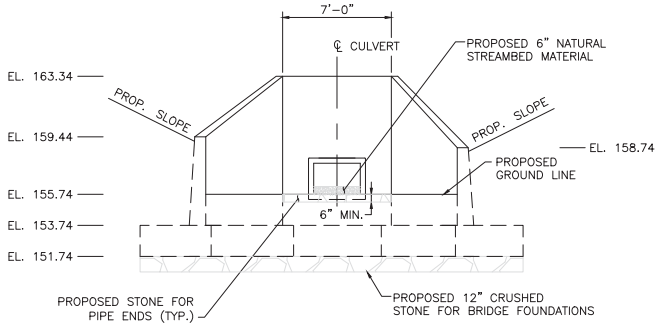
SPECIAL DRAINAGE STRUCTURE NO.3
DETAILS



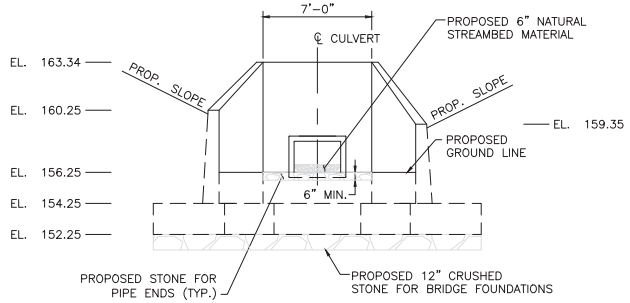
EAST CULVERT PLAN
SCALE: ⅛" = 1'-0"



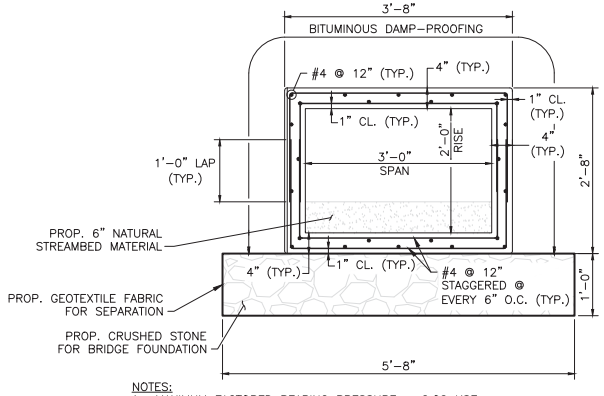
WEST CULVERT PLAN
SCALE: ½" = 1'-0"



EAST CULVERT ELEVATION
SCALE: ⅛" = 1'-0"



WEST CULVERT ELEVATION
SCALE: ½" = 1'-0"



NOTES:
1. MAXIMUM FACTORED BEARING PRESSURE = 2.02 KSF.
2. TRANSVERSE REINFORCING SHALL BE PLACED NORMAL TO THE ℄ OF THE CULVERT.
3. PRECAST CONCRETE CULVERT TO BE 5000 PSI, ¾ INCH, 686 HP CEMENT CONCRETE.

CULVERT REINFORCEMENT
SCALE: ½" = 1'-0"

NOTES:
1. SEE SHEET 207 FOR GENERAL PLAN AND ELEVATION OF STRUCTURE.
2. SEE SHEET 214 FOR HEADWALL REINFORCEMENT DETAILS.

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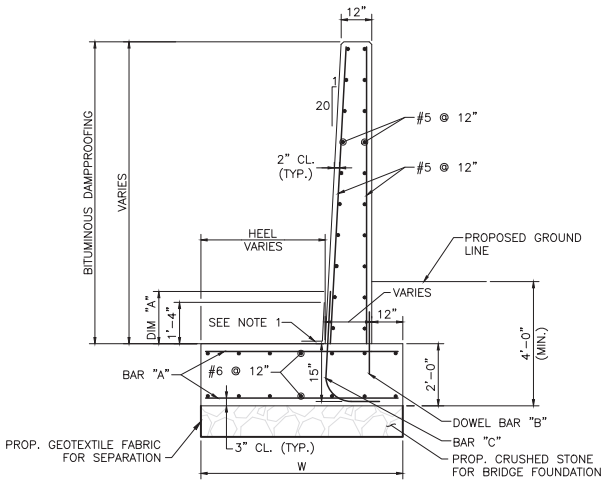
Proposal No. 604123-111717

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	214	327
PROJECT FILE NO.	604123		

HEADWALL & MISCELLANEOUS DETAILS

SUMMARY OF BEARING CAPACITIES			
WALL TYPE	MAXIMUM FACTORED BEARING PRESSURE (KSF)	CONTROLLING LOAD CASE	FACTORED BEARING RESISTANCE (KSF)
STA 37+50	2.14	STRENGTH I	4.1
STA 42+00	2.48	STRENGTH I	4.2
STA 80+40	1.97	STRENGTH I	4.7

HEADWALL DIMENSIONS AND REINFORCEMENT SUMMARY							
WALL TYPE	W	HEEL	BAR "A"	BAR "B"	BAR "B" LENGTH	BAR "C"	DIM "A"
STA 37+50	6'-6"	VARIES	#5 @ 12"	#5 @ 12"	2'-0"	#5 @ 12"	19"
STA 42+00	7'-0"	VARIES	#6 @ 12"	#6 @ 12"	2'-6"	#6 @ 12"	23"
STA 80+40	6'-6"	VARIES	#5 @ 12"	#5 @ 12"	2'-0"	#5 @ 12"	19"

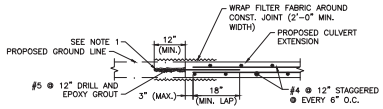


NOTES:

1. MEMBRANE WATERPROOFING AND 8"x16"x2", 4000 PSI, ¾ IN, 610 CEMENT CONCRETE BLOCKS LAID IN MORTAR OR OTHER WATERPROOFING PROTECTIVE COURSE, MIN. 2" THICK AS SPECIFIED IN MASSDOT STANDARD SPECIFICATIONS.
2. ALL CONCRETE SHALL BE 4000 PSI, 1½ IN, 565 CEMENT CONCRETE.
3. SEE TABLES BELOW FOR FACTORED BEARING PRESSURES AND FACTORED BEARING RESISTANCES FOR ALL WALL TYPES. FACTORED BEARING RESISTANCE IS THE PRODUCT OF THE NOMINAL BEARING RESISTANCE AND A RESISTANCE FACTOR OF 0.45.

TYPICAL HEADWALL SECTION

SCALE: 1" = 1'-0"

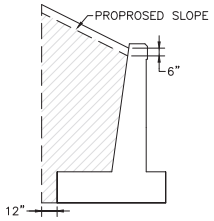


CONNECTION NOTES:

1. DOWEL IN #5 BARS AT 1'-0" MAX. SPACING HORIZONTALLY INTO CENTER OF WALL AND FILL HOLES WITH EPOXY GROUT.
2. ROUGHEN AND CLEAN EXISTING OR EXPOSED SURFACE AND COAT WITH TYPE A EPOXY BONDING COMPOUND IN ACCORDING WITH THE MANUFACTURER'S RECOMMENDATIONS.

TYPICAL CONNECTION DETAIL

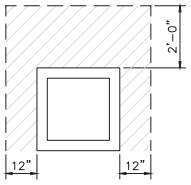
SCALE: 3" = 1'-0"



NOTE:
HATCHED AREA INDICATES LIMITS OF GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES.

LIMITS OF GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES

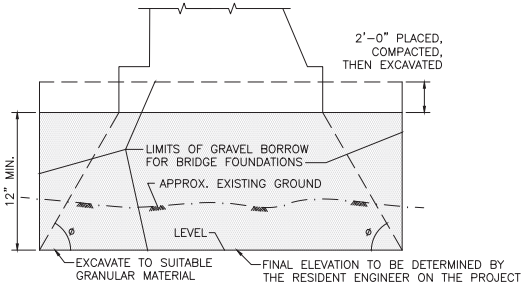
SCALE: 1" = 1'-0"



NOTE:
HATCHED AREA INDICATES LIMITS OF GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES.

LIMITS OF GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES

NOT TO SCALE



NOTES:

1. ø = 45° FOR DEPTH OF 5'-0" OR LESS.
   ø = 60° FOR DEPTH OVER 5'-0".
2. SAME TREATMENT IS TO BE USED AT ENDS OF WALLS.

LIMITS OF GRAVEL BORROW FOR BRIDGE FOUNDATIONS

NOT TO SCALE

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Proposal No. 604123-111717

***Attachment G* – Cultural Resource Coordination**

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, Secretary & CEO
Thomas Tinlin, Acting Administrator

MassDOT
Massachusetts Department of Transportation
Highway Division

September 20, 2017

RE: ASHLAND, MassDOT Project Number: 604123
Reconstruction on Rt. 126 (Pond St.) from Holliston Town Line to Framingham Town Line
Project Notification Form

Ms. Brona Simon
State Historic Preservation Officer
Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, MA 02125

Dear Ms. Simon:

Attached please find a Project Notification Form (PNF) for the above noted project. This project will be supported by federal funds but work in water will require a U.S. Army Corps of Engineers' permit. MassDOT is submitting the enclosed project information for your review in compliance with the Corps' permit requirements pertaining to Section 106 of the National Historic Preservation Act of 1966, as amended.

Please submit any written comments or concerns regarding properties of historical or cultural significance that may be affected by this project to Patricia A. Leavenworth, P.E., Chief Engineer, Massachusetts Department of Transportation, 10 Park Plaza, Boston, MA 02116-3973, Attn: Jeffrey Shrimpton. Please feel free to contact me (at 857-368-8826) if you have any questions regarding this project.

Sincerely,

M. Hafferty

Mary Hafferty
Historic Resources Specialist
Environmental Services

encs: PNF and attachments

Ten Park Plaza, Suite 4160, Boston, MA 02116
Tel: 617-973-7000, TDD: 617-973-7306
www.mass.gov/massdot

950 CMR: OFFICE OF THE SECRETARY OF THE COMMONWEALTH

APPENDIX A
MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD
BOSTON, MASS. 02125
617-727-8470, FAX: 617-727-5128

RC.57584
RECEIVED
SEP 22 2017
MASS. HIST. COM.

PROJECT NOTIFICATION FORM

Project Name: Reconstruction on Route 126 (Pond Street) (MassDOT# 604123)

Location /Address: Pond Street from Holliston Town Line to the Framingham Town Line

City/Town: Ashland, MA

Project Proponent

Name: Massachusetts Department of Transportation

Address: 10 Park Plaza

City/Town/Zip/Telephone: Boston, MA 02116 / T: 617-973-7000

After review of MHC files and the materials you submitted, it has been determined that this project is unlikely to affect significant historic or archaeological resources.

10/10/17
Date
Lindsay Sainsbury
Preservation Planner
Massachusetts Historical Commission

Agency license or funding for the project (list all licenses, permits, approvals, grants or other entitlements being sought from state and federal agencies).

Agency Name	Type of License or funding (specify)
Army Corps of Engineers	General permit, Section 404 of the Clean Water Act
Federal Highway Administration	Federal funding

Project Description (narrative):

This project will reconstruct the existing roadway (two lanes in each direction) to achieve uniform 11'-wide travel lanes, 5'-wide shoulders, and new 5'-wide sidewalks along both sides of the roadway. Selected segments of the sidewalks will be 10'-wide to accommodate a multi-use trail.

This project will incorporate a number of intersection improvements:

- The four-way intersection at Pond Street/Spyglass Hill Drive/Shaw's Driveway will have a new 130'-diameter roundabout installed in its center. New traffic medians and islands will be installed at the four intersection approaches to help channel traffic into the roundabout.
- The four-way intersection at Pond Street/Eliot Street will have new mast arm and steel post traffic signals installed, and the existing dedicated left-turn lanes will be retained. A new right-turn only lane will be installed for vehicles turning from Pond Street southbound onto Eliot Street.
- The intersections of Pond Street/Algonquin Trail and Pond Street/Harvard Street will be reconfigured into a four-way signalized intersection. The Algonquin Trail intersection approach will be relocated approximately 60' to the north to align it with the Pond Street/ Harvard Street intersection. Mast arm and street post traffic signals will be installed at the newly reconfigured intersection and new left-turn only lanes will be added to Pond Street to better access the side street approaches.
- Upgraded mast arm and steel post traffic signals will be installed at the Pond Street/Market Basket Driveway intersection.
- A new left-turn only lane will be added to Pond Street northbound and its intersection with James Road.
- Butterfield Drive's approach to Pond Street will be restriped, so it has left- and right-turn only lanes onto Pond Street.

All of the intersections listed above and the vast majority of the side street approach roadways will have new crosswalks installed as part of this project.

Related work within the project area will include: completing full-depth roadway reconstruction or cold planing and resurfacing; installing ADA compliant wheelchair ramps and bicycle ramps; building cemented stone masonry retaining walls in selected areas; removing and resetting highway guardrails and installing new guardrail as needed; installing drainage measures and upgrades to existing culverts; placing loam and seed and completing other landscape improvements; applying new pavement markings; and completing other incidental work as required. An Army Corps permit will be necessary to construct a 4,800 square foot wetlands replications area at the northeast corner of the Pond Street/Butterfield Drive intersection.

Does the project include demolition? If so, specify nature of demolition and describe the building(s) which are proposed for demolition.

n/a

Does the project include rehabilitation of any existing buildings? If so, specify nature of rehabilitation and describe the building(s) which are proposed for rehabilitation.

n/a

Does the project include new construction? If so, describe (attach plans and elevations if necessary).

n/a

To the best of your knowledge, are any historic or archaeological properties known to exist within the project's area of potential impact? If so, specify.

A review of the NRHP revealed no listed properties within or adjacent to the project area. A review of the Inventory of Historic and Archaeological Assets of the Commonwealth revealed three inventoried properties.
- Marconi's Restaurant (ASL.168), at 12 Pond Street, is a Contemporary Style restaurant that was constructed in 1956. The building has been altered with replacement windows and the permanent removal of sections of band windows; an intrusive handicap ramp that partially blocks the view of the façade; a remodeled façade entrance; and the loss of the original mid-century sign.
- The Reginald Rodman Janes House (ASL.169), at 19 Pond Street, is a simple 1.5-story tall, early-twentieth century vernacular house. It has a number of replacement windows and two additions.
- Harold C. Butterfield House (ASL.170), at 166 Pond Street, is a circa 1933 1.5-story tall vernacular cottage. The house is clad with synthetic siding and has replacement one-over-one sash windows.

A review of the archaeological base maps revealed two pre-contact archaeological sites within ½ mile of the project area: Step Rock Site (19-MD-873), which is located approximately 1,150' to the east of the Pond Street/Tufts Street intersection; and Fafard 1 Site (19-MD-703) and Fafard 2 Site (19-MD-704), which are located approximately 2,050' west of Pond Street/James Street intersection. The nearest historic archaeological sites, Workmen's Circle Camp (ASL.1), Bigelow-Cole Homestead (ASL.2), Bigelow's Mill, Dam, and Mill Pond (ASL.3), and Tin Can Factory (ASL.4), are located approximately 2,250' west of the Pond Street/Algonquin Trail intersection. An archaeological survey of the Workmen's Circle Area conducted in 1985 revealed two small, low-density sites (Fafard 1 and 2 Sites) and 10 isolated finds. All sites, both pre-contact and historic, were found to be extensively disturbed and no further testing was recommended. In 2002, an archaeological survey conducted in advance of the Pond Street Sewer Project revealed one pre-contact site (Step Rock Site). This site included one quartz flake and one rhyolite flake from plow zone

APPENDIX A (continued)

contexts mixed with a scatter of historic artifacts. No further survey was recommended. A site visit by MassDOT CRU staff on July 14, 2015 revealed that the area to be impacted by the proposed rotary consists of open, graded land. The proposed wetland replication area is a small graded area with secondary tree growth situated at the corner of Pond Street and Butterfield Drive. It is the opinion of the MassDOT Staff Archaeologist that little or no archaeological potential can be ascribed to the project area based on the results of past archaeological surveys in the immediate area, the limited scope of work and the effects of past roadway and drainage construction, grading and landscaping.

What is the total acreage of the project area?

Woodland	_____	acres	Productive Resources:		
Wetland	_____	acres	Agriculture	_____	acres
Floodplain	_____	acres	Forestry	_____	acres
Open Space	_____	acres	Mining/Extraction	_____	acres
Developed	_____	acres	Total Project Acreage	_____	acres

What is the acreage of the proposed new construction? _____ acres

What is the present land use of the project area?

Route 126 is developed with commercial businesses, retail shopping plazas, and a number of residences that are located adjacent to the roadway. There are also undeveloped wooded areas throughout the project area as well.

Please attach a copy of the section of the USGS quadrangle map which clearly marks the project location. This Project Notification Form has been submitted to the MHC in compliance with 950 CMR 71.00.

Signature of person submitting this form: M. Hafferty **Date:** 9/20/2019

Name: Mary Hafferty

Address: 10 Park Plaza

City/Town/Zip: Boston, MA 02116

Telephone: 857-368-8826

REGULATORY AUTHORITY

950 CMR 71.00: M.G.L. c. 9, §§ 26-27C as amended by St. 1988, c. 254.

CC:

Army Corps.



GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

Figure 1
Project Location
Route 126
Ashland, MA

From: Harwood, Jameson (DOT)
To: Robinson, David S (EEA)
Cc: Hafferty, Mary H. (DOT); Shrimpton, Jeffrey P. (DOT)
Subject: MassDOT Project #604123: Ashland Route 126 project notification
Date: Friday, December 13, 2019 8:49:03 AM
Attachments: Ashland -BUAR Highway Plans.pdf
Ashland Topo Map.pdf
Ashland -Tribal MHC Map.pdf
Ashland -Wetland Replication Area Photo.pdf
Ashland -Signed BUAR PNF & Cover Letter.pdf

David,

Please find attached the project notification package for the above referenced project. Please contact me if you have any questions.

Also, we are in the process of updating our notification cover letter. Some submittals may still list Patricia Leavenworth or David White as the contact for comments. All comments can be submitted directly to me at my email or by mail.

Thanks!
Jamie

Jameson M. Harwood – MassDOT Archaeologist
Archaeology / Contracts
MassDOT Environmental
10 Park Plaza – Room 4260
Boston, MA 02116
857-368-8799

The COMMONWEALTH OF MASSACHUSETTS
BOARD OF UNDERWATER ARCHAEOLOGICAL RESOURCES
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS
251 Causeway Street, Suite 800, Boston, MA 02114-2136
Tel. (617) 626-1014 Fax (617) 626-1240
www.mass.gov/orgs/board-of-underwater-archaeological-resources

December 31, 2019

David White
Acting Director
Environmental Services
Massachusetts Department of Transportation
10 Park Plaza
Boston, MA 02116
Attn: Jameson Harwood

RE: MassDOT Project #604123, Reconstruction on Rt. 126 (Pond St) from Holliston Town Line to Framingham Town Line, Ashland, MA

Dear Mr. White,

The staff of the Massachusetts Board of Underwater Archaeological Resources has reviewed the above-referenced project's Massachusetts Historical Commission (MHC) Project Notification Form (PNF) and accompanying maps, plans, and photographs. We offer the following comments.

The Board has conducted a preliminary review of its files, the MHC's MACRIS archaeological site inventory geospatial database, and secondary literature sources to identify known and potential submerged cultural resources in the proposed project area. No record of any underwater archaeological resources was found. Based on the results of this review and the PNF-described results of past archaeological surveys and the limited nature of the reconstruction project's impacts to within disturbed areas of past roadway and drainage construction, grading and landscaping, the Board expects that this project is unlikely to impact submerged cultural resources.

Should heretofore-unknown submerged cultural resources be encountered during the course of the project, the Board expects that the project's sponsor will take steps to limit adverse effects and notify the Board and the Massachusetts Historical Commission, as well as other appropriate agencies, immediately, in accordance with the Board's *Policy Guidance for the Discovery of Unanticipated Archaeological Resources*.

The Board appreciates the opportunity to provide these comments as part of the review process. Should you have any questions regarding this letter, please do not hesitate to contact me at the address above, by email at david.s.robinson@mass.gov, or by telephone at (617) 626-1014.

Sincerely,

David S. Robinson
Director

/dsr

Printed on Recycled Paper

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, MassDOT Secretary & CEO

massDOT
Massachusetts Department of Transportation

September 20, 2017

Ms. Ramona Peters
Tribal Historic Preservation Officer
Mashpee Wampanoag Tribe
483 Great Neck Road South
Mashpee, MA 02649

RE: ASHLAND, MassDOT Project Number: 604123
Reconstruction on Rt. 126 (Pond St.) from Holliston Town Line to Framingham Town Line
Project Notification Form

Dear Ms. Peters:

The enclosed project notification package has been submitted in accordance with the following:

- The U.S. Army Corps of Engineers consultation requirements

- The 2015 Memorandum of Understanding among FHWA, the Mashpee Wampanoag Tribe, and MassDOT regarding the initiation of consultation under Section 106

MassDOT requests that the Mashpee Wampanoag Tribal Historic Preservation Officer (THPO) review the enclosed materials at the THPO's earliest convenience and solicits any comments that the THPO wishes to make regarding this project. Written comments should be submitted to: David White, Acting Director, Environmental Services, Massachusetts Department of Transportation, 10 Park Plaza, Room 4260, Boston, MA 02116, Attn: Jameson Harwood.

If you have any questions concerning the project information, please feel free to contact Jameson Harwood at (857.368.8799).

Sincerely,

M. O'Hafferty

Mary Hafferty
Historic Resources Specialist
Environmental Services

Attachments: PNF/Project Plans/Locus Map/MACRIS map

Ten Park Plaza, Suite 4160, Boston, MA 02116
Tel: 857-368-4636, TTY: 857-368-0655
www.mass.gov/massdot

950 CMR: OFFICE OF THE SECRETARY OF THE COMMONWEALTH

APPENDIX A
MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD
BOSTON, MASS. 02125
617-727-8470, FAX: 617-727-5128

PROJECT NOTIFICATION FORM

Project Name: Reconstruction on Route 126 (Pond Street) (MassDOT# 604123)

Location /Address: Pond Street from Holliston Town Line to the Framingham Town Line

City/Town: Ashland, MA

Project Proponent

Name: Massachusetts Department of Transportation

Address: 10 Park Plaza

City/Town/Zip/Telephone: Boston, MA 02116 / T: 617-973-7000

Agency license or funding for the project (list all licenses, permits, approvals, grants or other entitlements being sought from state and federal agencies).

Agency Name	Type of License or funding (specify)
Army Corps of Engineers	General permit, Section 404 of the Clean Water Act
Federal Highway Administration	Federal funding

Project Description (narrative):

This project will reconstruct the existing roadway (two lanes in each direction) to achieve uniform 11'-wide travel lanes, 5'-wide shoulders, and new 5'-wide sidewalks along both sides of the roadway. Selected segments of the sidewalks will be 10'-wide to accommodate a multi-use trail.

This project will incorporate a number of intersection improvements:

- The four-way intersection at Pond Street/Spyglass Hill Drive/Shaw's Driveway will have a new 130'-diameter roundabout installed in its center. New traffic medians and islands will be installed at the four intersection approaches to help channel traffic into the roundabout.
- The four-way intersection at Pond Street/Eliot Street will have new mast arm and steel post traffic signals installed, and the existing dedicated left-turn lanes will be retained. A new right-turn only lane will be installed for vehicles turning from Pond Street southbound onto Eliot Street.
- The intersections of Pond Street/Algonquin Trail and Pond Street/Harvard Street will be reconfigured into a four-way signalized intersection. The Algonquin Trail intersection approach will be relocated approximately 60' to the north to align to align with the Pond Street/ Harvard Street intersection. Mast arm and street post traffic signals will be installed at the newly reconfigured intersection and new left-turn only lanes will be added to Pond Street to better access the side street approaches.
- Upgraded mast arm and steel post traffic signals will be installed at the Pond Street/Market Basket Driveway intersection.
- A new left-turn only lane will be added to Pond Street northbound and its intersection with James Road.
- Butterfield Drive's approach to Pond Street will be restriped, so it has left- and right-turn only lanes onto Pond Street.

All of the intersections listed above and the vast majority of the side street approach roadways will have new crosswalks installed as part of this project.

Related work within the project area will include the following construction activities: completing full-depth roadway reconstruction or cold planing and resurfacing; installing ADA compliant wheelchair ramps and bicycle ramps; building cemented stone masonry retaining walls in selected areas; removing and resetting highway guardrails and installing new guardrail as needed; installing drainage measures and upgrades to existing culverts; placing loam and seed and completing other landscape improvements; applying new pavement markings; and completing other incidental work as required. An Army Corps permit will be necessary to construct a 4,800 square foot wetlands replications area at the northeast corner of the Pond Street/Butterfield Drive intersection.

Does the project include demolition? If so, specify nature of demolition and describe the building(s) which are proposed for demolition.

n/a

Does the project include rehabilitation of any existing buildings? If so, specify nature of rehabilitation and describe the building(s) which are proposed for rehabilitation.

n/a

Does the project include new construction? If so, describe (attach plans and elevations if necessary).

n/a

To the best of your knowledge, are any historic or archaeological properties known to exist within the project's area of potential impact? If so, specify.

A review of the archaeological base maps revealed two pre-contact archaeological sites within ½ mile of the project area: Step Rock Site (19-MD-873), which is located approximately 1,150' to the east of the Pond Street/Tufts Street intersection; and Fafard 1 Site (19-MD-703) and Fafard 2 Site (19-MD-704), which are located approximately 2,050' west of Pond Street/James Street intersection. The nearest historic archaeological sites, Workmen's Circle Camp (ASL.1), Bigelow-Cole Homestead (ASL.2), Bigelow's Mill, Dam, and Mill Pond (ASL.3), and Tin Can Factory (ASL.4), are located approximately 2,250' west of the Pond Street/Algonquin Trail intersection. An archaeological survey of the Workmen's Circle Area conducted in 1985 revealed two small, low-density sites (Fafard 1 and 2 Sites) and 10 isolated finds. All sites, both pre-contact and historic, were found to be extensively disturbed and no further testing was recommended. In 2002, an archaeological survey conducted in advance of the Pond Street Sewer Project revealed one pre-contact site (Step Rock Site). This site included one quartz flake and one rhyolite flake from plow zone contexts mixed with a scatter of historic artifacts. No further survey was recommended. A site visit by MassDOT CRU staff on July 14, 2015 revealed that the area to be impacted by the proposed rotary consists of open, graded land. The proposed wetland replication area is a small graded area with secondary tree growth situated at the corner of Pond Street and Butterfield Drive. It is the opinion of the MassDOT Staff Archaeologist that little or no archaeological potential can be ascribed to the project area based on the results of past archaeological surveys in the immediate area, the limited scope of work and the effects of past roadway and drainage construction, grading and landscaping.

What is the total acreage of the project area?

950 CMR: OFFICE OF THE SECRETARY OF THE COMMONWEALTH

APPENDIX A (continued)

Woodland	_____	acres	Productive Resources:		
Wetland	_____	acres	Agriculture	_____	acres
Floodplain	_____	acres	Forestry	_____	acres
Open Space	_____	acres	Mining/Extraction	_____	acres
Developed	_____	acres	Total Project Acreage	_____	acres

What is the acreage of the proposed new construction? _____ acres

What is the present land use of the project area?

Route 126 is developed with commercial businesses, retail shopping plazas, and a number of residences that are located adjacent to the roadway. There are also undeveloped wooded areas throughout the project area as well.

Please attach a copy of the section of the USGS quadrangle map which clearly marks the project location.
This Project Notification Form has been submitted to the MHC in compliance with 950 CMR 71.00.

Signature of person submitting this form: M. Hafferty **Date:** 9/20/2017

Name: Mary Hafferty

Address: 10 Park Plaza

City/Town/Zip: Boston, MA 02116

Telephone: 857-368-8826

REGULATORY AUTHORITY

950 CMR 71.00: M.G.L. c. 9, §§ 26-27C as amended by St. 1988, c. 254.

CC:

Army Corps.

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, Secretary & CEO
Thomas Tinlin, Acting Administrator

MassDOT
Massachusetts Department of Transportation
Highway Division

September 20, 2017

Ms. Bettina Washington
Tribal Historic Preservation Officer
Wampanoag Tribe of Gay Head (Aquinnah)
20 Black Brook Road
Aquinnah, MA 02535

RE: ASHLAND, MassDOT Project Number: 604123
Reconstruction on Rt. 126 (Pond St.) from Holliston Town Line to Framingham Town Line
Project Notification Form

Dear Ms. Washington:

The enclosed project notification package has been submitted in accordance with the following:

- The U.S. Army Corps of Engineers consultation requirements.

- Federal Highway Administration requirements for the initiation of tribal consultation under Section 106.

MassDOT requests that the Tribal Historic Preservation Officer (THPO) for the Wampanoag Tribe of Gay Head (Aquinnah) review the enclosed materials at the THPO's earliest convenience and solicit any comments that the THPO wishes to make regarding this project. Written comments should be submitted to: David White, Acting Director, Environmental Services, Massachusetts Department of Transportation, 10 Park Plaza, Room 4260, Boston, MA 02116, Attn: Jameson Harwood.

If you have any questions concerning the project information, please feel free to contact Jameson Harwood at (857.368.8799).

Sincerely,

M. Hafferty

Mary Hafferty
Historic Resources Specialist
Environmental Services

Attachments: PNF/Project Plans/Locus Map/MACRIS map

Ten Park Plaza, Suite 4160, Boston, MA 02116
Tel: 857-368-4636, TTY: 857-368-0655
www.mass.gov/massdot

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APPENDIX A
MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD
BOSTON, MASS. 02125
617-727-8470, FAX: 617-727-5128

PROJECT NOTIFICATION FORM

Project Name: Reconstruction on Route 126 (Pond Street) (MassDOT# 604123)

Location /Address: Pond Street from Holliston Town Line to the Framingham Town Line

City/Town: Ashland, MA

Project Proponent

Name: Massachusetts Department of Transportation

Address: 10 Park Plaza

City/Town/Zip/Telephone: Boston, MA 02116 / T: 617-973-7000

Agency license or funding for the project (list all licenses, permits, approvals, grants or other entitlements being sought from state and federal agencies).

Agency Name	Type of License or funding (specify)
Army Corps of Engineers	General permit, Section 404 of the Clean Water Act
Federal Highway Administration	Federal funding

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APPENDIX A (continued)

Woodland	_____	acres	Productive Resources:		
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Please attach a copy of the section of the USGS quadrangle map which clearly marks the project location. This Project Notification Form has been submitted to the MHC in compliance with 950 CMR 71.00.

Signature of person submitting this form: M. Hafferty **Date:** 9/20/2017

Name: Mary Hafferty

Address: 10 Park Plaza

City/Town/Zip: Boston, MA 02116

Telephone: 857-368-8826

REGULATORY AUTHORITY

950 CMR 71.00: M.G.L. c. 9, §§ 26-27C as amended by St. 1988, c. 254.

CC:

Army Corps.

***Attachment H* – ROW Parcel Summary Sheet/Abutters**

PARCEL NO.	PLAN SHEET NO.	TITLEHOLDER	TITLE REFERENCE				AREA (S.F. +/-)						TOTAL PROPERTY AREA (S.F.)	REMARKS
			DEED BOOK	PAGE NO.	LCC NO.	CERT NO.	TAKEN		EASEMENT		TOTAL TAKEN	REMAINING		
							TOWN	STATE	TYPE	AREA				
9-1	39	RUGNY PROPERTIES, LLC	63686	430				120			120	10,989	11,109	
9-TE-1	39	RUGNY PROPERTIES, LLC	63886	430					TEMP.	380				GRADING, LOAM & SEED
9-2	39	ASHLAND TOWN LINE LIMITED PARTNERSHIP	55980	225				370			370	20213	20,583	
9-TE-71	39	ASHLAND TOWN LINE LIMITED PARTNERSHIP	55980	225					TEMP.	2,033				GRADING, LOAM & SEED, RECONSTRUCT PRIVATE WAY
9-3	39,40	ASHLAND TOWN LINE LIMITED PARTNERSHIP LP	48742	540				2,325			2,325	153,641	155,966	
9-PUE-S-50	39,40	ASHLAND TOWN LINE LIMITED PARTNERSHIP LP	48742	540					PERM.	2,849				
9-TE-2	39,40	ASHLAND TOWN LINE LIMITED PARTNERSHIP LP	48742	540					TEMP.	3,000				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY, CONSTRUCT WALL
9-69	39,40	VRS/LCB ASHLAND, LLC	63732	472				5,146			5,146	144,991	150,137	
9-PUE-S-51	39,40	VRS/LCB ASHLAND, LLC	63732	472					PERM.	327				
9-PUE-S-57	40	VRS/LCB ASHLAND, LLC	63732	472					PERM.	1,049				
9-D-13	40	VRS/LCB ASHLAND, LLC	63732	472					PERM.	159				
9-D-PUE-S-37	40	VRS/LCB ASHLAND, LLC	63732	472					PERM.	91				
9-TE-97	39,40	VRS/LCB ASHLAND, LLC	63732	472					TEMP.	4,970				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY, CONSTRUCT WALL
9-4	40	A.S.J. REALTY LLC	67704	397				465			465	65,474	65,939	
9-GR-PUE-S-29	40	A.S.J. REALTY LLC	67704	397					PERM.	632				
9-TE-3	40	A.S.J. REALTY LLC	67704	397					TEMP.	321				GRADING, LOAM & SEED, CONSTRUCT WALL
9-5	41	ASHLAND PLAZA (E&A) LLC	41551	250				771			8,202	438,288	446,490	
9-6	41,42	ASHLAND PLAZA (E&A) LLC	41551	250				657						
9-47	41	ASHLAND PLAZA (E&A) LLC	41551	250				6,564						
9-48-T	42	ASHLAND PLAZA (E&A) LLC	41551	250			210							
9-HS-1	41	ASHLAND PLAZA (E&A) LLC	41551	250					PERM.	224				
9-PUE-1	41,42	ASHLAND PLAZA (E&A) LLC	41551	250					PERM.	2,486				
9-PUE-S-31	40,41	ASHLAND PLAZA (E&A) LLC	41551	250					PERM.	473				
9-PUE-46	41	ASHLAND PLAZA (E&A) LLC	41551	250					PERM.	82				
9-WM-3	42	ASHLAND PLAZA (E&A) LLC	41551	250					PERM.	67				
9-TE-4	41	ASHLAND PLAZA (E&A) LLC	41551	250					TEMP.	7,892				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY, STRIPING
9-TE-5	42	ASHLAND PLAZA (E&A) LLC	41551	250					TEMP.	372				GRADING, LOAM & SEED
9-50	41	SPYGLASS HILL CONDOMINIUM	15480	526				155			213	767,750	767,963	
9-7-T	41	SPYGLASS HILL CONDOMINIUM	15480	526			58							
9-W-1	40,41	SPYGLASS HILL CONDOMINIUM	15480	526					PERM.	1,452				
9-TE-6	40,41	SPYGLASS HILL CONDOMINIUM	15480	526					TEMP.	6,337				GRADING, LOAM & SEED
9-TE-98	41	SPYGLASS HILL CONDOMINIUM	15480	526					TEMP.	1,640				GRADING, LOAM & SEED
9-70	41	310 POND STREET LLC	70581	465				192			347	200,867	201,214	
9-71	42	310 POND STREET LLC	70581	465				66						
9-8-T	41	310 POND STREET LLC	70581	465			89							
9-PUE-48	42	310 POND STREET LLC	70581	465					PERM.	147				
9-TE-86	42	310 POND STREET LLC	70581	465					TEMP.	655				GRADING, LOAM & SEED
9-TE-101	42	310 POND STREET LLC	70581	465					TEMP.	541				GRADING, LOAM & SEED, INSTALLATION OF TRAFFIC SIGNAL EQUIPMENT
9-TE-105	41	310 POND STREET LLC	70581	465					TEMP.	1,346				GRADING, LOAM & SEED
9-TE-106	42	310 POND STREET LLC	70581	465					TEMP.	1,429				RECONSTRUCT DRIVEWAY, INSTALLATION OF TRAFFIC SIGNAL
9-9	41	SV EXPANSION LLC	73734	336				447			447	38,011	38,458	
9-D-16	41,42	SV EXPANSION LLC	73734	336					PERM.	1,332				
9-TE-7	41	SV EXPANSION LLC	73734	336					TEMP.	875				GRADING, LOAM & SEED
9-TE-102	42	SV EXPANSION LLC	73734	336					TEMP.	523				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-10	42,43	300 ELIOT LLC	67162	35				1,762			1,958	195,369	197,327	
9-50-T	42	300 ELIOT LLC	67162	35			196							
9-HS-PUE-W-2	42	300 ELIOT LLC	67162	35					PERM.	61				
9-PUE-W-2	42,43	300 ELIOT LLC	67162	35					PERM.	6,542				
9-TE-79	42,43	300 ELIOT LLC	67162	35					TEMP.	16,967				WALL CONSTRUCTION, GRADING LOAM & SEED

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	21	55
PROJECT FILE NO.	604123		

PRELIMINARY RIGHT OF WAY
PARCEL SUMMARY
SHEET 1 OF 7

604123_RWY\PARCEL SUM1.DWG Plotted on 26-Nov-19

Proposal No. 604123-111717

A00840 - 145

PARCEL NO.	PLAN SHEET NO.	TITLEHOLDER	TITLE REFERENCE				AREA (S.F. +/-)						TOTAL PROPERTY AREA (S.F.)	REMARKS
			DEED BOOK	PAGE NO.	LCC NO.	CERT NO.	TAKEN		EASEMENT		TOTAL TAKEN	REMAINING		
							TOWN	STATE	TYPE	AREA				
9-GR-4	43	GLOBAL MONTELLO GROUP CORP.	55459	347					PERM.	158			74,923	
9-PUE-37	43	GLOBAL MONTELLO GROUP CORP.	55459	347					PERM.	110				
9-E-2	42	GLOBAL MONTELLO GROUP CORP.	55459	347					PERM.	220				
9-E-1-T	42	GLOBAL MONTELLO GROUP CORP.	55459	347					PERM.	545				
9-HS-15-T	42	GLOBAL MONTELLO GROUP CORP.	55459	347					PERM.	60				
9-TE-9	42,43	GLOBAL MONTELLO GROUP CORP.	55459	347					TEMP.	5,060				GRADING, LOAM & SEED
9-TE-84	43	GLOBAL MONTELLO GROUP CORP.	55459	347					TEMP.	1,371				GRADING, LOAM & SEED
9-TE-80	43	EMILY MATEO & LEONARDO MATEO	53888	204					TEMP.	295				GRADING, LOAM & SEED
9-PUE-4	43	G&D LLC.	59418	337					PERM.	202			30,928	
9-D-PUE-S-38	43	G&D LLC.	59418	337					PERM.	483				
9-TE-11	43	G&D LLC.	59418	337					TEMP.	833				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-D-PUE-S-5	43	JAMES C. CRAM, JR.	64905	317					PERM.	280			40,946	
9-PUE-38	43	JAMES C. CRAM, JR.	64905	317					PERM.	538				
9-PUE-S-59	43	JAMES C. CRAM, JR.	64905	317					PERM.	138				
9-S-3	43	JAMES C. CRAM, JR.	64905	317					PERM	142				
9-TE-12	43	JAMES C. CRAM, JR.	64905	317					TEMP.	1,219				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-PUE-6	43,44	ROBERT R. SAPORETTI & LESLIE K. SAPORETTI	17337	448					PERM.	644			10,890	
9-TE-13	43,44	ROBERT R. SAPORETTI & LESLIE K. SAPORETTI	17337	448					TEMP.	519				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-13	43,44	IRPINA LIVING TRUST	52953	401				141			141	63,859	64,000	
9-D-GR-1	43	IRPINA LIVING TRUST	52953	401					PERM.	350				
9-GR-7	43	IRPINA LIVING TRUST	52953	401					PERM.	183				
9-GR-8	43	IRPINA LIVING TRUST	52953	401					PERM.	105				
9-TE-14	43,44	IRPINA LIVING TRUST	52953	401					TEMP.	3,241				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-PUE-8	44	PELLETIER REALTY TRUST	48981	144					PERM.	659			17,673	
9-TE-81	44	PELLETIER REALTY TRUST	48981	144					TEMP.	324				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-15	44	PELLETIER REALTY TRUST	48981	142				224			705	42,855	43,560	
9-51-T	44	PELLETIER REALTY TRUST	48981	142			481							
9-PUE-9	44	PELLETIER REALTY TRUST	48981	142					PERM.	1,326				
9-TE-16	44	PELLETIER REALTY TRUST	48981	142					TEMP.	1,258				GRADING, LOAM & SEED
9-17	44,45	GAZARD 225 POND STREET LLC	60871	575				86			86	37,256	37,342	
9-PUE-11	44,45	GAZARD 225 POND STREET LLC	60871	575					PERM.	1,801				
9-TE-18	44,45	GAZARD 225 POND STREET LLC	60871	575					TEMP.	1,083				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-18	44	KLEIDIANE D. TORRES & WALTER TORRES	68964	42				222			222	10,778	11,000	
9-HS-3	44	KLEIDIANE D. TORRES & WALTER TORRES	68964	42					PERM.	95				
9-TE-19	44	KLEIDIANE D. TORRES & WALTER TORRES	68964	42					TEMP.	1,135				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	22	55
PROJECT FILE NO.	604123		

PRELIMINARY RIGHT OF WAY
PARCEL SUMMARY
SHEET 2 OF 7

604123_RWH\PARCEL SUM1.DWG Plotted on 26-Nov-19

Proposal No. 604123-111717

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PARCEL NO.	PLAN SHEET NO.	TITLEHOLDER	TITLE REFERENCE				AREA (S.F. +/-)						TOTAL PROPERTY AREA (S.F.)	REMARKS
			DEED BOOK	PAGE NO.	LCC NO.	CERT NO.	TAKEN		EASEMENT		TOTAL TAKEN	REMAINING		
							TOWN	STATE	TYPE	AREA				
9-19	44	S&G REALTY TRUST	46439	544				365			365	58,005	58,370	
9-D-GR-S-6	44	S&G REALTY TRUST	46439	544					PERM.	1,254				
9-GR-S-15	44	S&G REALTY TRUST	46439	544					PERM.	1,431				
9-WM-1	44	S&G REALTY TRUST	46439	544					PERM.	60				
9-TE-87	44	S&G REALTY TRUST	46439	544					TEMP.	1,659				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-20	44	THE HAPPINESS REALTY TRUST	65247	360				130			130	33,770	33,900	
9-GR-3	44	THE HAPPINESS REALTY TRUST	65247	360					PERM.	584				
9-TE-21	44	THE HAPPINESS REALTY TRUST	65247	360					TEMP.	1,074				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-21	44,45	DEREK T. MAYERHOFER & BETH M. MAYERHOFER	63365	596				72			72	12,723	12,795	
9-TE-22	44,45	DEREK T. MAYERHOFER & BETH M. MAYERHOFER	63365	596					TEMP.	786				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-24	44,45	POND REALTY TRUST	47751	87				75			75	13,225	13,300	
9-TE-23	44,45	POND REALTY TRUST	47751	87					TEMP.	851				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-25	45	CHARLES E. BAKSTRAN JR & BETSY N. BAKSTRAN	12985	378				91			91	11,258	11,349	
9-TE-26	45	CHARLES E. BAKSTRAN JR & BETSY N. BAKSTRAN	12985	378					TEMP.	1,090				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-22	45	GAZARD 221 POND STREET, LLC	60871	571				135			135	29,992	30,127	
9-PUE-12	45	GAZARD 221 POND STREET, LLC	60871	571					PERM.	976				
9-TE-24	45	GAZARD 221 POND STREET, LLC	60871	571					TEMP.	335				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-23	45,46	HALF MOON VILLAGE CONDOMINIUM	25109	259				3,428			3,428	545,732	549,160	
9-D-PUE-6	46	HALF MOON VILLAGE CONDOMINIUM	25109	259					PERM.	211				
9-PUE-13	45,46	HALF MOON VILLAGE CONDOMINIUM	25109	259					PERM.	3,480				
9-PUE-49	46	HALF MOON VILLAGE CONDOMINIUM	25109	259					PERM.	1,145				
9-TE-25	46	HALF MOON VILLAGE CONDOMINIUM	25109	259					TEMP.	1,714				GRADING, LOAM & SEED, RECONSTRUCT PRIVATE WAY
9-TE-77	45	HALF MOON VILLAGE CONDOMINIUM	25109	259					TEMP.	485				GRADING, LOAM & SEED
9-67	46	ASHLAND OPEN SPACE TRUST	62585	369				1,287			6,371	79,747	86,118	
9-68-T	46	ASHLAND OPEN SPACE TRUST	62585	369			146							
9-69-T	46	ASHLAND OPEN SPACE TRUST	62585	369			4,938							
9-HS-PUE-61	46	ASHLAND OPEN SPACE TRUST	62585	369					PERM.	457				
9-TE-103	46	ASHLAND OPEN SPACE TRUST	62585	369					TEMP.	8,136				GRADING, LOAM & SEED, RECONSTRUCT PRIVATE WAY
9-49	46,47	VILLAGE OF WESTERLY CONDOMINIUM TRUST	62585	365				3,281			8,884	540,192	549,076	
9-53-T	46	VILLAGE OF WESTERLY CONDOMINIUM TRUST	62585	365			5,603							
9-D-HS-GR-1-T	46	VILLAGE OF WESTERLY CONDOMINIUM TRUST	62585	365					PERM.	721				
9-GR-S-1-T	46	VILLAGE OF WESTERLY CONDOMINIUM TRUST	62585	365					PERM.	1,937				
9-D-GR-PUE-S-36	46,47	VILLAGE OF WESTERLY CONDOMINIUM TRUST	62585	365					PERM.	2,844				
9-GR-PUE-S-39	46,47	VILLAGE OF WESTERLY CONDOMINIUM TRUST	62585	365					PERM.	987				
9-HS-PUE-6	48	VILLAGE OF WESTERLY CONDOMINIUM TRUST	62585	365					PERM.	60				
9-PUE-41	47,48	VILLAGE OF WESTERLY CONDOMINIUM TRUST	62585	365					PERM.	4,137				
9-TE-76	46,47	VILLAGE OF WESTERLY CONDOMINIUM TRUST	62585	365					TEMP.	3,467				GRADING, LOAM & SEED, RECONSTRUCT PRIVATE WAY
9-26	45	AUSSIE LLC	59128	364				141			141	25,359	25,500	
9-PUE-58	45	AUSSIE LLC	59128	364					PERM.	422				
9-TE-27	45	AUSSIE LLC	59128	364					TEMP.	1,074				GRADING, PARKING LOT STRIPING

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STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
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PARCEL SUMMARY
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604123_RWH\PARCEL SUM1.DWG Plotted on 26-Nov-19

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PARCEL NO.	PLAN SHEET NO.	TITLEHOLDER	TITLE REFERENCE				AREA (S.F. +/-)						TOTAL PROPERTY AREA (S.F.)	REMARKS
			DEED BOOK	PAGE NO.	LCC NO.	CERT NO.	TAKEN		EASEMENT		TOTAL TAKEN	REMAINING		
							TOWN	STATE	TYPE	AREA				
9-27	45	OLSEN FAMILY INVESTMENT TRUST	42012	310				100			100	19,900	20,000	
9-HS-4	45	OLSEN FAMILY INVESTMENT TRUST	42012	310					PERM.	88				
9-TE-28	45	OLSEN FAMILY INVESTMENT TRUST	42012	310					TEMP.	887				GRADING, PARKING LOT STRIPING
9-28	45,46	KWC REAL ESTATE, LLC	69223	93				152			152	29,848	30,000	
9-WM-2	45,46	KWC REAL ESTATE, LLC	69223	93					PERM.	60				
9-TE-29	45,46	KWC REAL ESTATE, LLC	69223	93					TEMP.	1,272				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-E-3	46	HESS REALTY LLC	63745	433					PERM.	203			35,000	
9-HS-5	46	HESS REALTY LLC	63745	433					PERM.	60				
9-TE-30	46	HESS REALTY LLC	63745	433					TEMP.	2,395				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-30	46	V. SARDINHA REALTY TRUST	63532	408				334			334	19,666	20,000	
9-TE-31	46	V. SARDINHA REALTY TRUST	63532	408					TEMP.	1,326				GRADING, LOAM & SEED
9-31	46,47	JEFFREY R. HORN	14415	319				569			569	14,431	15,000	
9-TE-32	46,47	JEFFREY R. HORN	14415	319					TEMP.	1,011				GRADING, LOAM & SEED
9-32	47	158 POND STREET REALTY TRUST	45872	596				200			200	64,700	64,900	
9-PUE-40	47	158 POND STREET REALTY TRUST	45872	596					PERM.	132				
9-TE-33	47	158 POND STREET REALTY TRUST	45872	596					TEMP.	940				GRADING, LOAM & SEED
9-TE-99	47	158 POND STREET REALTY TRUST	45872	596					TEMP.	184				GRADING, LOAM & SEED
9-33	47	162 POND STREET REALTY TRUST	28560	543				148			148	269,052	269,200	
9-TE-34	47	162 POND STREET REALTY TRUST	28560	543					TEMP.	2,262				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-E-34	47	158 POND STREET REALTY TRUST	28560	536					PERM.	36			30,001	
9-TE-35	47,48	158 POND STREET REALTY TRUST	28560	536					TEMP.	2,123				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-PUE-14	48	ENGELO NASIOS & EVAGELIA NASIOS	9254	418					PERM.	1,853			32,234	
9-PUE-15	48,49	V & P REALTY TRUST	16593	408					PERM.	1,260			35,284	
9-TE-37	48,49	V & P REALTY TRUST	16593	408					TEMP.	1,123				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-PUE-59	48	NSTAR GAS COMPANY	12120 44110	408 93					PERM.	108			10,000	
9-TE-38	48	NSTAR GAS COMPANY	12120 44110	408 93					TEMP.	644				GRADING, LOAM & SEED
9-TE-100	48	NSTAR GAS COMPANY	12120 44110	408 93					TEMP.	421				GRADING, LOAM & SEED

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STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	24	55
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PARCEL NO.	PLAN SHEET NO.	TITLEHOLDER	TITLE REFERENCE				AREA (S.F. +/-)						TOTAL PROPERTY AREA (S.F.)	REMARKS
			DEED BOOK	PAGE NO.	LCC NO.	CERT NO.	TAKEN		EASEMENT		TOTAL TAKEN	REMAINING		
							TOWN	STATE	TYPE	AREA				
9-70-T	48	ASHLAND BUTTERFIELD DRIVE ASSOCIATES LLC	66681	440			46				46	1,205,695	1,205,741	
9-D-GR-PUE-S-11	50	ASHLAND BUTTERFIELD DRIVE ASSOCIATES LLC	66681	440					PERM.	345				
9-GR-S-14	50	ASHLAND BUTTERFIELD DRIVE ASSOCIATES LLC	66681	440					PERM.	1,517				
9-GR-PUE-S-44	50	ASHLAND BUTTERFIELD DRIVE ASSOCIATES LLC	66681	440					PERM.	54				
9-GR-S-6	50,51	ASHLAND BUTTERFIELD DRIVE ASSOCIATES LLC	66681	440					PERM.	306				
9-GR-HS-S-7	50	ASHLAND BUTTERFIELD DRIVE ASSOCIATES LLC	66681	440					PERM.	54				
9-HS-8	48	ASHLAND BUTTERFIELD DRIVE ASSOCIATES LLC	66681	440					PERM.	62				
9-GR-PUE-S-56	48	ASHLAND BUTTERFIELD DRIVE ASSOCIATES LLC	66681	440					PERM.	603				
9-TE-47	50	ASHLAND BUTTERFIELD DRIVE ASSOCIATES LLC	66681	440					TEMP.	547				GRADING, LOAM & SEED
9-TWLR-1	48	ASHLAND BUTTERFIELD DRIVE ASSOCIATES LLC	66681	440					TEMP.	11,979				GRADING, LOAM & SEED, REPLICATE WETLANDS
9-TE-93	50,51	ASHLAND BUTTERFIELD DRIVE ASSOCIATES LLC	66681	440					TEMP.	69				GRADING, LOAM & SEED
9-HS-7	48	ALGONQUIN GAS TRANSMISSION COMPANY	8420	357					PERM.	60			14,857	
9-PUE-60	48	ALGONQUIN GAS TRANSMISSION COMPANY	8420	357					PERM.	95				
9-TE-39	48	ALGONQUIN GAS TRANSMISSION COMPANY	8420	357					TEMP.	829				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-35	49	J & A REALTY TRUST	62930 62930	189 191				101			101	56,242	56,343	
9-PUE-WM-4	48	J & A REALTY TRUST	62930 62930	189 191					PERM.	214				
9-PUE-64	48,49	J & A REALTY TRUST	62930 62930	189 191					PERM.	74				
9-PUE-65	49	J & A REALTY TRUST	62930 62930	189 191					PERM.	74				
9-TE-41	48,49	J & A REALTY TRUST	62930 62930	189 191					TEMP.	3,647				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-PUE-16	49	KYROMINA LLC	66135	593					PERM.	1,082			31,799	
9-TE-42	49	KYROMINA LLC	66135	593					TEMP.	685				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-TE-73	49	KYROMINA LLC	66135	593					TEMP.	1,169				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-60	49,50,51	COWEN REALTY TRUST II	19976	339				4,548			4,548	534,289	538,837	
9-D-S-8	51	COWEN REALTY TRUST II	19976	339					PERM.	97				
9-PUE-42	49	COWEN REALTY TRUST II	19976	339					PERM.	93				
9-PUE-43	49	COWEN REALTY TRUST II	19976	339					PERM.	88				
9-S-1	50,51	COWEN REALTY TRUST II	19976	339					PERM.	1,452				
9-TE-92	49,50,51	COWEN REALTY TRUST II	19976	339					TEMP.	6,427				GRADING, LOAM & SEED
9-36	49	120 POND ST LLC	59105	359				1,639			1,639	172,601	174,240	
9-GR-PUE-S-8	49,50	120 POND ST LLC	59105	359					PERM.	904				
9-HS-9	49	120 POND ST LLC	59105	359					PERM.	62				
9-TE-44	49,50	120 POND ST LLC	59105	359					TEMP.	161				GRADING, LOAM & SEED
9-TE-96	49	120 POND ST LLC	59105	359					TEMP.	3,748				GRADING, LOAM & SEED
9-GR-PUE-S-40	50	JAROLD REALTY TRUST	19359	240					PERM.	54			174,240	
9-GR-PUE-S-41	50	JAROLD REALTY TRUST	19359	240					PERM.	54				
9-GR-S-2	50	JAROLD REALTY TRUST	19359	240					PERM.	1,119				
9-TE-94	50	JAROLD REALTY TRUST	19359	240					TEMP.	242				GRADING, LOAM & SEED

ASHLAND
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STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	25	55
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PARCEL SUMMARY
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PARCEL NO.	PLAN SHEET NO.	TITLEHOLDER	TITLE REFERENCE				AREA (S.F. +/-)						TOTAL PROPERTY AREA (S.F.)	REMARKS
			DEED BOOK	PAGE NO.	LCC NO.	CERT NO.	TAKEN		EASEMENT		TOTAL TAKEN	REMAINING		
							TOWN	STATE	TYPE	AREA				
9-GR-S-13	50	TOWN OF ASHLAND	27584 54289	352 215					PERM.	969			43,560	
9-GR-PUE-S-42	50	TOWN OF ASHLAND	27584 54289	352 215					PERM.	54				
9-GR-PUE-S-43	50	TOWN OF ASHLAND	27584 54289	352 215					PERM.	54				
9-GR-S-4	50	TOWN OF ASHLAND	27584 54289	352 215					PERM.	1,034				
9-GR-HS-S-6	50	TOWN OF ASHLAND	27584 54289	352 215					PERM.	54				
9-GR-PUE-S-47	50	TOWN OF ASHLAND	27584 54289	352 215					PERM.	164				
9-TE-46	50	TOWN OF ASHLAND	27584 54289	352 215					TEMP.	210				GRADING, LOAM & SEED
9-TE-85	50	TOWN OF ASHLAND	27584 54289	352 215					TEMP.	311				GRADING, LOAM & SEED
9-41	51	FORREST C. HIGGINS & FORREST C. HIGGINS JR	46735	121				931			931	44,977	45,908	
9-D-S-9	51	FORREST C. HIGGINS & FORREST C. HIGGINS JR	46735	121					PERM.	107				
9-PUE-S-1	51	FORREST C. HIGGINS & FORREST C. HIGGINS JR	46735	121					PERM.	1,107				
9-TE-95	51	FORREST C. HIGGINS & FORREST C. HIGGINS JR	46735	121					TEMP.	1,020				GRADING, LOAM & SEED
9-PUE-S-2	51	JKY REALTY LLC	54927	535					PERM.	536			78,408	
9-TE-49	51	JKY REALTY LLC	54927	535					TEMP.	264				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-E-4	51,52	DSM MB II LLC	64730	345					PERM.	852			945,252	
9-E-5	52	DSM MB II LLC	64730	345					PERM.	73				
9-E-6	53	DSM MB II LLC	64730	345					PERM.	5				
9-HS-13	52,53	DSM MB II LLC	64730	345					PERM.	50				
9-PUE-20	52	DSM MB II LLC	64730	345					PERM.	1,738				
9-PUE-21	52,53	DSM MB II LLC	64730	345					PERM.	4,241				
9-TE-52	52, 53	DSM MB II LLC	64730	345					TEMP.	6,674				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-TE-72	51,52	DSM MB II LLC	64730	345					TEMP.	4,307				GRADING, LOAM & SEED
9-TE-75	53	DSM MB II LLC	64730	345					TEMP.	2,250				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-GR-S-7	51	JEFF-WILL CAMBRIDGE LLC	69425	170					PERM.	4,543			789,743	
9-GR-PUE-S-45	51	JEFF-WILL CAMBRIDGE LLC	69425	170					PERM.	54				
9-GR-PUE-S-46	51	JEFF-WILL CAMBRIDGE LLC	69425	170					PERM.	36				
9-GR-PUE-S-48	51	JEFF-WILL CAMBRIDGE LLC	69425	170					PERM.	46				
9-D-GR-S-10	51	JEFF-WILL CAMBRIDGE LLC	69425	170					PERM.	254				
9-TE-50	51	JEFF-WILL CAMBRIDGE LLC	69425	170					TEMP.	590				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-TE-83	51	MAXINE MAJOR-PASCHAL	59111	243					TEMP.	1,454				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-GR-9	52	BECK ASHLAND FARM LLC	69424	544					PERM.	114			154,202	
9-TE-51	51,52	BECK ASHLAND FARM LLC	69424	544					TEMP.	383				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-TE-53	52	BECK ASHLAND FARM LLC	69424	544					TEMP.	612				GRADING, LOAM & SEED
9-64	52	NSTAR ELECTRIC COMPANY	10829 69817	254 135				167			167	55,590	55,757	
9-GR-S-10	52	NSTAR ELECTRIC COMPANY	10829 69817	254 135					PERM.	1,332				
9-GR-HS-S-12	52	NSTAR ELECTRIC COMPANY	10829 69817	254 135					PERM.	72				
9-TE-54	52	NSTAR ELECTRIC COMPANY	10829 69817	254 135					TEMP.	1,816				GRADING, LOAM & SEED

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STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	26	55
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PARCEL SUMMARY
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PARCEL NO.	PLAN SHEET NO.	TITLEHOLDER	TITLE REFERENCE				AREA (S.F. +/-)						TOTAL PROPERTY AREA (S.F.)	REMARKS
			DEED BOOK	PAGE NO.	LCC NO.	CERT NO.	TAKEN		EASEMENT		TOTAL TAKEN	REMAINING		
							TOWN	STATE	TYPE	AREA				
9-68	52	LEO J. SCANSAROLI & ADELLE M. SCANSAROLI	21750	500				592			592	55,165	55,757	
9-D-15	52,53	LEO J. SCANSAROLI & ADELLE M. SCANSAROLI	21750	500					PERM.	803				
9-D-GR-S-11	52,53	LEO J. SCANSAROLI & ADELLE M. SCANSAROLI	21750	500					PERM.	198				
9-GR-S-11	52,53	LEO J. SCANSAROLI & ADELLE M. SCANSAROLI	21750	500					PERM.	109				
9-GR-S-12	52,53	LEO J. SCANSAROLI & ADELLE M. SCANSAROLI	21750	500					PERM.	205				
9-PUE-63	53	LEO J. SCANSAROLI & ADELLE M. SCANSAROLI	21750	500					PERM.	79				
9-TE-55	52,53	LEO J. SCANSAROLI & ADELLE M. SCANSAROLI	21750	500					TEMP.	1,095				GRADING, LOAM & SEED
9-TE-56	52,53	LEO J. SCANSAROLI & ADELLE M. SCANSAROLI	21750	500					TEMP.	1,133				GRADING, LOAM & SEED
9-HS-14	53,54	ALFONSO RAMIREZ	48770	252					PERM.	37			7,841	
9-PUE-22	53,54	ALFONSO RAMIREZ	48770	252					PERM.	440				
9-TE-57	53,54	ALFONSO RAMIREZ	48770	252					TEMP.	494				GRADING, LOAM & SEED
9-PUE-23	53,54	JUAN MENDEZ	41417	333					PERM.	446			6,534	
9-TE-59	53	JOHN P. DASSONI, VILMA R. DASSONI AND BRENDA DASSONI	36946	275					TEMP.	527				GRADING, LOAM & SEED, RECONSTRUCT WALK
9-TE-60	53	METROWEST HUMANE SOCIETY INC	24727 46925	484 152					TEMP.	1,190				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-HS-16	53	JAMES N. LOMBARDI & LISA M. LOMBARDI	23285	150					PERM.	57			30,000	
9-HS-17	54	JAMES N. LOMBARDI & LISA M. LOMBARDI	23285	150					PERM.	57				
9-TE-61	53,54	JAMES N. LOMBARDI & LISA M. LOMBARDI	23285	150					TEMP.	3,177				GRADING, LOAM & SEED
9-PUE-24	54	MENDEZ REAL ESTATE GROUP, LLC.	41530	150					PERM.	431			13,504	
9-HS-PUE-62	54	MENDEZ REAL ESTATE GROUP, LLC.	41530	150					PERM.	40				
9-HS-PUE-63	54	SUNNYSIDE REALTY NOMINEE TRUST	44485	0454					PERM.	40			17,860	
9-HS-PUE-64	54	SUNNYSIDE REALTY NOMINEE TRUST	44485	0454					PERM.	76				
9-PUE-62	54	SUNNYSIDE REALTY NOMINEE TRUST	44485	0454					PERM.	881				
9-TE-88	54	SUNNYSIDE REALTY NOMINEE TRUST	44485	0454					TEMP.	457				RECONSTRUCT PARKING LOT
9-PUE-26	54	US BANK TRUST, NA, AS TRUSTEE FOR LSF9 MASTER PARTICIPATION	69277	306					PERM.	209			4,356	
9-PUE-28	54	JOSE ALBERTO MONTEIRO SILVA & MELICIA RUBIA DE MENEZES FERREIRA DA COSTA	65737	141					PERM.	252			5,227	
9-PUE-61	54	QYANG PHAT & KIM CHEN DIEP	46541	122					PERM.	73			20,000	
9-TE-68	54	QYANG PHAT & KIM CHEN DIEP	46541	122					TEMP.	1,840				RECONSTRUCT PARKING LOT
9-TE-69	54	BAZAR PROPERTIES 6-8 DOUGLAS ROAD LLC	69468	384					TEMP.	464				GRADING, LOAM & SEED
9-TE-70	54	KATHLEEN C. MAHONEY	38556	302					TEMP.	441				GRADING, LOAM & SEED, RECONSTRUCT DRIVEWAY
9-TE-89	54	ROSS REALTY TRUST	52192	406					TEMP.	55				GRADING, LOAM & SEED
9-D-14	55	RIMARK, LLC				265273			PERM.	461			14,375	
9-D-12	55	GOIS HOLDINGS BOSTON LLC				245649			PERM.	955			1,685,772	
9-TE-91	55	GOIS HOLDINGS BOSTON LLC				245649			TEMP.	3,609				GRADING, LOAM & SEED

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	27	55
PROJECT FILE NO.	604123		

PRELIMINARY RIGHT OF WAY
PARCEL SUMMARY
SHEET 7 OF 7

604123_RWH\PARCEL SUM1.DWG Plotted on 26-Nov-19

Proposal No. 604123-111717

A00840 - 151

***Attachment I* – 4d Submittal (Northern Long Eared Bats)**

Northern Long-Eared Bat 4(d) Rule Streamlined Consultation Form

Federal agencies should use this form for the optional streamlined consultation framework for the northern long-eared bat (NLEB). This framework allows federal agencies to rely upon the U.S. Fish and Wildlife Service's (USFWS) January 5, 2016, intra-Service Programmatic Biological Opinion (BO) on the final 4(d) rule for the NLEB for section 7(a)(2) compliance by: (1) notifying the USFWS that an action agency will use the streamlined framework; (2) describing the project with sufficient detail to support the required determination; and (3) enabling the USFWS to track effects and determine if reinitiation of consultation is required per 50 CFR 402.16.

This form is not necessary if an agency determines that a proposed action will have no effect to the NLEB or if the USFWS has concurred in writing with an agency's determination that a proposed action may affect, but is not likely to adversely affect the NLEB (i.e., the standard informal consultation process). Actions that may cause prohibited incidental take require separate formal consultation. Providing this information does not address section 7(a)(2) compliance for any other listed species.

Information to Determine 4(d) Rule Compliance:	**YES**	**NO**
1. Does the project occur wholly outside of the WNS Zone[1]?	☐	☒
2. Have you contacted the appropriate agency[2] to determine if your project is near known hibernacula or maternity roost trees?	☒	☐
3. Could the project disturb hibernating NLEBs in a known hibernaculum?	☐	☒
4. Could the project alter the entrance or interior environment of a known hibernaculum?	☐	☒
5. Does the project remove any trees within 0.25 miles of a known hibernaculum at any time of year?	☐	☒
6. Would the project cut or destroy known occupied maternity roost trees, or any other trees within a 150-foot radius from the maternity roost tree from June 1 through July 31.	☐	☒

You are eligible to use this form if you have answered yes to question #1 **or** yes to question #2 **and** no to questions 3, 4, 5 and 6. The remainder of the form will be used by the USFWS to track our assumptions in the BO.

Agency and Applicant[3] (Name, Email, Phone No.): Lead Agency: FHWA

Submitting Agency: MassDOT, Tim Dexter, timothy.dexter@state.ma.us, (857) 368-8794

Project Name: Ashland – 604123 - ASHLAND- RECONSTRUCTION ON ROUTE 126 (POND STREET), FROM THE FRAMINGHAM T.L. TO THE HOLLISTON T.L.

Project Location (include coordinates if known):
Pond Street / Route 126 from the Framingham town line (42.259529, -71.423870) to the Holliston town line (42.236127, -71.431378)

Basic Project Description (provide narrative below or attach additional information): The project limits are from the Framingham T.L. to the Holliston T.L., a distance of 1.7 miles. The project consists of miling and resurfacing with minor box widening. Traffic improvements at the intersection of Route 126 and Elliot Street entail signalization, stone masonry retaining wall construction, minor drainage

[1] http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/WNSZone.pdf
[2] See http://www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html
[3] If applicable - only needed for federal actions with applicants (e.g., for a permit, etc.) who are party to the consultation.

improvements, installation of granite curbing and edging, construction of sidewalks and the resetting of guardrail.. Up to 2.5 acre of tree trimming / clearing will be required at this project site for access, minor road widening, safety and line-of-site improvements, and for other project needs.

General Project Information	YES	NO
Does the project occur within 0.25 miles of a known hibernaculum?	☐	☒
Does the project occur within 150 feet of a known maternity roost tree?	☐	☒
Does the project include forest conversion[4]? (if yes, report acreage below)	☒	☐
Estimated total acres of forest conversion	2.5	
If known, estimated acres[5] of forest conversion from April 1 to October 31	*Not known*	
If known, estimated acres of forest conversion from June 1 to July 31[6]	*Not known*	
Does the project include timber harvest? (if yes, report acreage below)	☐	☒
Estimated total acres of timber harvest		
If known, estimated acres of timber harvest from April 1 to October 31		
If known, estimated acres of timber harvest from June 1 to July 31		
Does the project include prescribed fire? (if yes, report acreage below)	☐	☒
Estimated total acres of prescribed fire		
If known, estimated acres of prescribed fire from April 1 to October 31		
If known, estimated acres of prescribed fire from June 1 to July 31		
Does the project install new wind turbines? (if yes, report capacity in MW below)	☐	☒
Estimated wind capacity (MW)		

Agency Determination:

By signing this form, the action agency determines that this project may affect the NLEB, but that any resulting incidental take of the NLEB is not prohibited by the final 4(d) rule.

If the USFWS does not respond within 30 days from submittal of this form, the action agency may presume that its determination is informed by the best available information and that its project responsibilities under 7(a)(2) with respect to the NLEB are fulfilled through the USFWS January 5, 2016, Programmatic BO. The action agency will update this determination annually for multi-year activities.

The action agency understands that the USFWS presumes that all activities are implemented as described herein. The action agency will promptly report any departures from the described activities to the appropriate USFWS Field Office. The action agency will provide the appropriate USFWS Field Office with the results of any surveys conducted for the NLEB. Involved parties will promptly notify the appropriate USFWS Field Office upon finding a dead, injured, or sick NLEB.

Signature: _____ Date Submitted: 2/11/19

[4] Any activity that temporarily or permanently removes suitable forested habitat, including, but not limited to, tree removal from development, energy production and transmission, mining, agriculture, etc. (see page 48 of the BO).
[5] If the project removes less than 10 trees and the acreage is unknown, report the acreage as less than 0.1 acre.
[6] If the activity includes tree clearing in June and July, also include those acreage in April to October.

DOCUMENT A00841

MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

WATER QUALITY CERTIFICATE

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Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

One Winter Street Boston, MA 02108 • 617-292-5500

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Kathleen A. Theoharides
Secretary

Martin Suuberg
Commissioner

May 14, 2020

MassDOT – Highway Division
Ten Park Plaza, Room 4260
Boston, MA 02116
Attn: Susan McArthur

TRANSMITTAL # X284907
Project Number: 604123
Wetlands File No: NE 95-931

RE: WATER QUALITY CERTIFICATION
Application for: BRP WW 11
MINOR FILL AND EXCAVATION PROJECTS – ROARWAY PROJECT

AT: Route 126 (Pond Street)
ASHLAND
Shawsheen River Watershed

Dear Ms. McArthur:

The Department of Environmental Protection ("MassDEP") has reviewed your application for a Water Quality Certification (WQC), as referenced above. In accordance with the provisions of MGL Ch. 21, §§26-53 and Section 401 of the Federal Clean Water Act as amended (33 U.S.C. §1251 et seq.), it has been determined there is reasonable assurance the proposed project will be conducted in a manner which will not violate applicable water quality standards (314 CMR 4.00) and other applicable requirements of state law.

The proposed project entails full depth reconstruction of deteriorated roadway pavements, construction of new sidewalks, and construction of subsurface drainage improvements to Route 126. Intersection improvements at Spyglass Hill Drive, Eliot Street, Algonquin Trail and James Road are also proposed. In addition, three (3) culverts will be replaced.

This information is available in alternate format. Contact Michelle Waters-Ekanem, Director of Diversity/Civil Rights at 617-292-5751.
TTY# MassRelay Service 1-800-439-2370
MassDEP Website: www.mass.gov/dep

Printed on Recycled Paper

In consultation with the Ashland Conservation Commission during the public hearing process (Wetlands File No. NE 95-931) it was agreed upon that culvert #1 (Sta. 37+50), culvert #3 (Sta. 80+40) and culvert 4 (Sta. 90+00) would be replaced. Both culverts #1 and #3 will be replaced with larger culverts with flow baffles to allow for placement of 12-inches of natural streambed material in the bottom of the culverts. Culvert #4 was not designed to comply with the Stream Crossing Standards as the culvert collects runoff from a closed drainage system.

Approximately 9000-feet (1.7 miles) of full depth reconstruction will occur. Wetland impacts associated with the project will result in cumulative impacts of 6,416 ft^2 of Bordering Vegetated Wetland (BVW) of which 3,686 ft^2 will be permanent and 2,730 ft^2 will be temporary. The wetland impacts will occur in seven (7) locations as shown below.

Wetland Area	Permanent Impacts (ft^2)	Temporary Impacts (ft^2)
Wetland A	119	142
Wetland B	30	17
Wetland C	201	248
Wetland D	338	294
Wetland G	536	588
Wetland K	1,721	1,167
Wetland H	741	274
Total	**3,686**	**2,730**

To mitigate the permanent loss of 3,686 ft^2 of BVW a 4,110 ft^2 wetland replication area will be constructed at 70 Cedar Street behind the Ashland Fire Station. The wetland replication area shall be constructed and monitored in accordance with Replication Plan developed by Epsilon Associate Inc. signed by Matt Kelly, dated January 7, 2020. The BVW that will be temporarily impacted is to be restored upon completion of construction.

Based on a review of information provided by the applicant, MassDEP finds that this project complies with the standards described under 314 CMR 9.06. Public notice was provided in The Metro West Daily News on February 14, 2020 and the Environmental Monitor on February 26, 2020. The Department did not receive any public comments during the public comment periods which ended on March 6, 2020 and March 16, 2020 respectively.

Therefore, based on information currently in the record, the Department grants a 401 Water Quality Certification for this project subject to the following conditions to maintain water quality, to minimize impact on waters and wetlands, and to ensure compliance with appropriate state law. The Department further certifies in accordance with 314 CMR 9.00 that there is reasonable assurance the project or activity will be conducted in a manner which will not violate applicable water quality standards (314 CMR 4.00) and other applicable requirements of state law. Finally, the Department has determined that upon satisfying the conditions and mitigation requirements of this approval, the project provides a level of water quality necessary to protect existing uses and accordingly finds that the project to be implemented satisfies the Surface Water Quality Standards at 314 CMR 4.00.

Those special conditions that require direct submittals to MassDEP for either review or review and approval are denoted by the following notation (Submittal) at the end of the condition. In addition, those conditions with the (Submittal) designation shall be included in the Special Provisions and reviewed at the District Pre-Construction Conference.

1. This project could result in a violation of the water quality standards adopted by MassDEP's Division of Water Pollution Control. Therefore, reasonable care and diligence shall be taken by the applicant to ensure that the proposed activity will not violate Inland Water Class B criteria [314 CMR 4.05 (4) (a) and (5)].

2. Prior to the start of work, MassDOT shall provide MassDEP with an electronic copy the 100% Design Plans. **(Submittal)**

3. Prior to start of work, the applicant shall provide MassDEP with the name, address and phone number(s) of the person responsible for ensuring that all work complies with the conditions of this Water Quality Certification. **(Submittal)**

4. Any proposed changes, alterations or amendment request as well as any required submittals shall be sent by email to Christopher.ross@mass.gov. **(Submittal)**

5. All work shall be performed in accordance with the following documents and plans:

   - Application for Water Quality Certificate dated February 11, 2020, Transmittal Form # X2824907 with attachments.

   - Plan entitled: "Massachusetts Department of Transportation Highway Division Plan and Profile of Route 126 (Pond Street) In the of Wetland Replication Plan" Sheet o 1 of 1; Undated.

   - Letter from Epsilon Associates, Inc. to the Ashland Conservation Commission dated January 7, 2020 regarding "Wetland Replication Plan for MassDOT Route 126 (Pond Street) Maintenance and Improvement Project; MassDEP File No. NE 95-931."

   - Specification entitled: "Inland Wetland Replication Area" ITEM 755.35.

6. Prior to commencement of construction adequate erosion control measures shall be installed to protect all wetland resource areas. Erosion control measures may consist of, but are not limited to silt fence, staked hay bales, silt curtains/booms, silt bags, compost filter tubes, etc.

7. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify MassDEP, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary.

8. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by MassDEP pursuant to this Certification.

9. A stockpile of erosion control materials shall be kept on-site at all times for emergency and routine replacement. The materials may include but are not limited to silt fence, hay bales, stone riprap, filter dikes, compost filter tubes or any other devices planned for use during construction.

10. It is the responsibility of the contractor to assure that all wetland resource areas are adequately protected with erosion and sedimentation controls. Additional erosion and sedimentation control barriers beyond that which is shown on the plan may be required.

11. No more than 3,686 ft^2 of cumulative impacts to Bordering Vegetated Wetland (BVW) shall occur with 3,686 ft^2 of permanent impacts and 2,730 ft^2 of temporary impacts to BVW.

12. A 4,110 ft^2 wetland replication area shall be constructed as proposed at 70 Cedar Street behind the fire station. The Replication Area shall be constructed and monitored in accordance with the referenced letter from Epsilon Associates, Inc and Specification ITEM-755.35.

13. Upon completion of construction and once areas have been stabilized all non-biodegradable erosion control barriers shall be removed.

14. Compost filter tubes that are encased in non-biodegradable material(s) shall be sliced and non-biodegradable material(s) removed.

15. No Special Condition set forth herein shall be constructed or operate to prohibit the Department from taking enforcement against MassDOT or its contractors for failure to comply with the terms and requirements of this 401 Water Quality Certification.

16. No activity authorized by this Water Quality Certification may begin prior to the expiration of the 21-day appeal period or until a final decision is issued by MassDEP if an appeal is filed.

Failure to comply with this Certification is grounds for enforcement, including civil and criminal penalties, under MGL Ch. 21 §42, MGL Ch. 21A §16, or other possible actions/penalties as authorized by the General Laws of the Commonwealth.

This Certification does not relieve the applicant of the obligation to comply with other appropriate state or federal statutes or regulations.

NOTICE OF APPEAL RIGHTS

A) Appeal Rights and Time Limits

Certain persons shall have a right to request an adjudicatory hearing concerning certifications by MassDEP when an application is required: (a) the applicant or property owner; (b) any person aggrieved by the decision who has submitted written comments during the public comment period; any ten (10) persons of the Commonwealth pursuant to M.G.L. c.30A where a group member has submitted written comments during the public comment period; or (d) any governmental body or private organization with a mandate to protect the environment which has submitted written comments during the public comment period. Any person aggrieved, any ten (10) persons of the Commonwealth, or a governmental body or private organization with a mandate to protect the environment may appeal without having submitted written comments during the public comment period only when the claim is based on new substantive issues arising from material changes to the scope or impact of the activity and not apparent at the time of public notice. To request an adjudicatory hearing pursuant to M.G.L. c.30A, § 10, a Notice of Claim must be made in writing, provided that the request is made by certified mail or hand delivery to MassDEP, with the appropriate filing fee specified within 310 CMR 4.10 along with a DEP Fee Transmittal Form within twenty-one (21) days from the date of issuance of this Certificate, and addressed to:

Case Administrator
Department of Environmental Protection
One Winter Street, 2nd Floor
Boston, MA 02108

A copy of the request shall at the same time be sent by certified mail or hand delivery to the Department of Environmental Protection at:

Department of Environmental Protection
Commissioner's Office
One Winter Street, 2nd Floor
Boston, MA 02108

B) Contents of Hearing Request

A Notice of Claim for Adjudicatory Hearing shall comply with MassDEP's Rules for Adjudicatory Proceedings, 310 CMR 1.01(6), and shall contain the following information pursuant to 314 CMR 9.10(3):

(a) the 401 Certification Transmittal Number;
(b) the complete name of the applicant and address of the project;
(c) the complete name, address, and fax and telephone numbers of the party filing the request, and, if represented by counsel or other representative, the name, fax and telephone numbers, and address of the attorney;
(d) if claiming to be a party aggrieved, the specific facts that demonstrate that the party satisfies the definition of "aggrieved person" found at 314 CMR 9.02;
(e) a clear and concise statement that an adjudicatory hearing is being requested;
(f) a clear and concise statement of (1) the facts which are grounds for the proceedings, (2) the objections to this Certificate, including specifically the manner in which it is alleged to be

inconsistent with the MassDEP's Water Quality Regulations, 314 CMR 9.00, and (3) the relief sought through the adjudicatory hearing, including specifically the changes desired in the final written Certification; and

(g) a statement that a copy of the request has been sent by certified mail or hand delivery to the applicant, the owner (if different from the applicant), the conservation commission of the city or town where the activity will occur, the Department of Environmental Management (when the certificate concerns projects in Areas of Critical Environmental Concern), the public or private water supplier where the project is located (when the certificate concerns projects in Outstanding Resource Waters), and any other entity with responsibility for the resource where the project is located.

C) Filing Fee and Address

The hearing request along with a DEP Fee Transmittal Form and a valid check or money order payable to the Commonwealth of Massachusetts in the amount of one hundred dollars ($100) must be mailed to:

Commonwealth of Massachusetts
Department of Environmental Protection
Commonwealth Master Lockbox
PO Box 4062
Boston, MA 02211

The request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver. The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority. MassDEP may waive the adjudicatory hearing filing fee pursuant to 310 CMR 4.06(2) for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file an affidavit setting forth the facts believed to support the claim of undue financial hardship together with the hearing request as provided above.

Should you have any questions relative to this permit, please contact me at 508 946 2813.

Very truly yours,

Christopher Ross
MassDot Project Manager

cc: Ashland Conservation Commission
101 Main Street
Ashland, MA 01721

Ecc DEP-NERO-Rachel Freed
ACOE-Dan Vasconcelos
DOT-Melissa Lenker

DOCUMENT A00860

MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

NOTICE OF INTENT

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NOTICE OF INTENT

Route 126 (Pond Street)
Ashland, Massachusetts

MassDOT Contract No. 604123



Prepared for

Massachusetts Department of Transportation

July 1, 2019

Prepared by

GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers

Building Strong Client Relationships Through Engineering Excellence

GREEN INTERNATIONAL AFFILIATES, INC.
239 LITTLETON ROAD, SUITE 3, WESTFORD, MA 01886
TEL (978) 923-0400 FAX (978) 923-0033

July 1, 2019

Ms. Maeghan Dos Anjos, Conservation Agent
Ashland Town Hall
101 Main Street
Ashland, MA 01721

Subject: **Route 126 (Pond Street)**
Proposed Roadway Reconstruction
Ashland, MA
MassDOT File No. 604123
Notice of Intent Submittal

Dear Ms. Dos Anjos:

On behalf of the Massachusetts Department of Transportation (MassDOT) Highway Division, Green International Affiliates, Inc. is pleased to submit the enclosed Notice of Intent (NOI) application pursuant to the Massachusetts Wetlands Protection Act (WPA) and 310 CMR 10.00, which is administered by the Ashland Conservation Commission. This NOI Application has been prepared for roadway improvements for Route 126 (Pond Street) in Ashland, Massachusetts, from the Framingham town line to the Holliston town line.

This Notice of Intent (NOI) is being submitted to the Ashland Conservation Commission pursuant to the Massachusetts Wetlands Protection Act (WPA) Regulations and its implementing regulations 310 CMR 10.00 for work within the Bordering Vegetated Wetland (BVW), the Bank, the 100-foot Buffer Zone and within Bordering Land Subject to Flooding (BLSF). The project parcel has eleven (11) discrete Bordering Vegetated Wetlands (BVW) resource areas adjacent to the roadway.

This NOI is being submitted for the purpose of receiving an Order of Conditions under the Massachusetts WPA for the proposed work within these resource areas. The project continues to be categorized as a "Redevelopment" project under the Massachusetts Stormwater Management Standards and thus needs to meet the Stormwater Standards to the maximum extent practicable.

This Project meets the criteria of the Limited Project provisions of the WPA listed in the 310 CMR 10.53(3)(f): *Maintenance and improvement of existing public roadways, but limited to widening less than a single lane, adding shoulders, correcting substandard intersections, and improving inadequate drainage systems.*

Ms. Maeghan Dos Anjos
July 1, 2019

As a state agency, MassDOT must provide notice of the time and place of the Notice of Intent hearing in a newspaper of general circulation in the Town. However, as stated in 310 CMR 10.05(4)(b), projects proposed by MassDOT Highway Division do not require individual abutter notification. State transportation projects proposed by the Division are not subjects to local bylaws, including local wetland bylaws, due to the need for such projects to operate as components of a statewide transportation system, consistent across municipal boundaries.

The following items are included with this submission:

8 copies of the NOI Application with Forms, Locus Map, Narrative, Stormwater Checklist, Stormwater Management Report, 11"x17" plan sets
Two (2) full-size (24"x36") plan sets

We are also emailing a PDF file of the submittal materials to conservation@ashlandmass.com as requested on the Commission's Applicant Checklist.

As required by regulations, one (1) copy of the above submittal is being provided concurrently to the Massachusetts DEP Northeast Region Office.

We respectfully request that this project be placed on the Conservation Commission agenda for the hearing scheduled on July 22, 2019. Should you have any questions regarding this submittal, please do not hesitate to contact me.

Sincerely,
Green International Affiliates, Inc.

Marc Caufield

Marc Caufield, P.E.
Senior Environmental Engineer

cc: DEP – Northeast Region
Susan McArthur – MassDOT

MC/of

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NOTICE OF INTENT FORMS

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Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Ashland
City/Town

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.





Note: Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

A. General Information

1. Project Location (**Note:** electronic filers will click on button to locate project site):

Route 126 (Pond Street) — a. Street Address
Ashland — b. City/Town
01721 — c. Zip Code

Latitude and Longitude:
41° 14' 50" N — d. Latitude
71° 25' 49" W — e. Longitude

N/A — f. Assessors Map/Plat Number
N/A — g. Parcel /Lot Number

2. Applicant:

Susan — a. First Name
McArthur — b. Last Name
Massachusetts Department of Transportation Highway Division — c. Organization
10 Park Plaza, Room 4260 — d. Street Address
Boston — e. City/Town
MA — f. State
02116 — g. Zip Code
857-368-8807 — h. Phone Number
857-368-0609 — i. Fax Number
Susan.McArthur@dot.state.ma.us — j. Email Address

3. Property owner (required if different from applicant): ☐ Check if more than one owner

a. First Name
b. Last Name
Massachusetts Department of Transportation Highway Division — c. Organization
10 Park Plaza, Room 4260 — d. Street Address
Boston — e. City/Town
MA — f. State
02116 — g. Zip Code
h. Phone Number
i. Fax Number
j. Email address

4. Representative (if any):

Danielle — a. First Name
Spicer — b. Last Name
Green International Affiliates, Inc. — c. Company
239 Littleton Road, Suite 3 — d. Street Address
Westford — e. City/Town
MA — f. State
01886 — g. Zip Code
(978) 923-0400 — h. Phone Number
(978) 923-0033 — i. Fax Number
dspicer@greenintl.com — j. Email address

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form):

$1,050 — a. Total Fee Paid
$512.50 — b. State Fee Paid
$537.50 — c. City/Town Fee Paid

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A. General Information (continued)

6. General Project Description:

Safety improvements, repair of deteriorated roadway, and replacement and installation of new storm drainage systems. (See Project Description in Section 1 of the NOI report for complete project narrative).

7a. Project Type Checklist: (Limited Project Types see Section A. 7b.)

1. ☐ Single Family Home
2. ☐ Residential Subdivision
3. ☐ Commercial/Industrial
4. ☐ Dock/Pier
5. ☐ Utilities
6. ☐ Coastal engineering Structure
7. ☐ Agriculture (e.g., cranberries, forestry)
8. ☒ Transportation
9. ☐ Other

7b. Is any portion of the proposed activity eligible to be treated as a limited project (including Ecological Restoration Limited Project) subject to 310 CMR 10.24 (coastal) or 310 CMR 10.53 (inland)?

1. ☒ Yes ☐ No If yes, describe which limited project applies to this project. (See 310 CMR 10.24 and 10.53 for a complete list and description of limited project types)

310 CMR 10.53(3)(f). See narrative for full description.
2. Limited Project Type

If the proposed activity is eligible to be treated as an Ecological Restoration Limited Project (310 CMR10.24(8), 310 CMR 10.53(4)), complete and attach Appendix A: Ecological Restoration Limited Project Checklist and Signed Certification.

8. Property recorded at the Registry of Deeds for:

Middlesex
a. County

b. Certificate # (if registered land)

N/A
c. Book

N/A
d. Page Number

B. Buffer Zone & Resource Area Impacts (temporary & permanent)

1. ☐ Buffer Zone Only – Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.
2. ☒ Inland Resource Areas (see 310 CMR 10.54-10.58; if not applicable, go to Section B.3, Coastal Resource Areas).

Check all that apply below. Attach narrative and any supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☒ Bank	83 (perm.); 37 (temp.) 1. linear feet	0 2. linear feet
b. ☒ Bordering Vegetated Wetland	4,507 (perm.); 3,306 (temp.) 1. square feet	4,960 2. square feet
c. ☐ Land Under Waterbodies and Waterways	1. square feet 3. cubic yards dredged	2. square feet

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. ☒ Bordering Land Subject to Flooding	1,240 (perm) 1. square feet 395 3. cubic feet of flood storage lost	0 2. square feet 0 4. cubic feet replaced
e. ☐ Isolated Land Subject to Flooding	1. square feet 2. cubic feet of flood storage lost	3. cubic feet replaced
f. ☐ Riverfront Area	1. Name of Waterway (if available) - **specify coastal or inland**	

2. Width of Riverfront Area (check one):

☐ 25 ft. - Designated Densely Developed Areas only

☐ 100 ft. - New agricultural projects only

☐ 200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project: _____ square feet

4. Proposed alteration of the Riverfront Area:

a. total square feet _____ b. square feet within 100 ft. _____ c. square feet between 100 ft. and 200 ft. _____

5. Has an alternatives analysis been done and is it attached to this NOI? ☐ Yes ☐ No

6. Was the lot where the activity is proposed created prior to August 1, 1996? ☐ Yes ☐ No

3. ☐ Coastal Resource Areas: (See 310 CMR 10.25-10.35)

Note: for coastal riverfront areas, please complete **Section B.2.f**. above.

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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

Check all that apply below. Attach narrative and supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. ☐ Land Under the Ocean	1. square feet 2. cubic yards dredged	
c. ☐ Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. ☐ Coastal Beaches	1. square feet	2. cubic yards beach nourishment
e. ☐ Coastal Dunes	1. square feet	2. cubic yards dune nourishment

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
f. ☐ Coastal Banks	1. linear feet	
g. ☐ Rocky Intertidal Shores	1. square feet	
h. ☐ Salt Marshes	1. square feet	2. sq ft restoration, rehab., creation
i. ☐ Land Under Salt Ponds	1. square feet 2. cubic yards dredged	
j. ☐ Land Containing Shellfish	1. square feet	
k. ☐ Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above 1. cubic yards dredged	
l. ☐ Land Subject to Coastal Storm Flowage	1. square feet	

4. ☐ Restoration/Enhancement

If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please enter the additional amount here.

a. square feet of BVW

b. square feet of Salt Marsh

5. ☐ Project Involves Stream Crossings

a. number of new stream crossings

b. number of replacement stream crossings

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C. Other Applicable Standards and Requirements

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section C and complete Appendix A: Ecological Restoration Limited Project Checklists – Required Actions (310 CMR 10.11).

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the *Massachusetts Natural Heritage Atlas* or go to http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm.

a. ☐ Yes ☒ No

If yes, include proof of mailing or hand delivery of NOI to:

Natural Heritage and Endangered Species Program
Division of Fisheries and Wildlife
1 Rabbit Hill Road
Westborough, MA 01581

2017 MassGIS Map
b. Date of map

If *yes*, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18). To qualify for a streamlined, 30-day, MESA/Wetlands Protection Act review, please complete Section C.1.c, and include requested materials with this Notice of Intent (NOI); *OR* complete Section C.2.f, if applicable. *If MESA supplemental information is not included with the NOI, by completing Section 1 of this form, the NHESP will require a separate MESA filing which may take up to 90 days to review (unless noted exceptions in Section 2 apply, see below).*

c. Submit Supplemental Information for Endangered Species Review*

1. ☐ Percentage/acreage of property to be altered:

(a) within wetland Resource Area _____ percentage/acreage

(b) outside Resource Area _____ percentage/acreage

2. ☐ Assessor's Map or right-of-way plan of site

2. ☐ Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work **

(a) ☐ Project description (including description of impacts outside of wetland resource area & buffer zone)

(b) ☐ Photographs representative of the site

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/). Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

** MESA projects may not be segmented (321 CMR 10.16). The applicant must disclose full development plans even if such plans are not required as part of the Notice of Intent process.

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C. Other Applicable Standards and Requirements (cont'd)

(c) ☐ MESA filing fee (fee information available at http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_fee_schedule.htm). Make check payable to "Commonwealth of Massachusetts - NHESP" and ***mail to NHESP*** at above address

*Projects altering **10 or more acres** of land, also submit:*

(d) ☐ Vegetation cover type map of site

(e) ☐ Project plans showing Priority & Estimated Habitat boundaries

(f) OR Check One of the Following

1. ☐ Project is exempt from MESA review.
Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_exemptions.htm; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2. ☐ Separate MESA review ongoing.
a. NHESP Tracking # _____ b. Date submitted to NHESP _____

3. ☐ Separate MESA review completed.
Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

3. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?

a. ☒ Not applicable – project is in inland resource area only b. ☐ Yes ☐ No

If yes, include proof of mailing, hand delivery, or electronic delivery of NOI to either:

South Shore - Cohasset to Rhode Island border, and the Cape & Islands:

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
1213 Purchase Street – 3rd Floor
New Bedford, MA 02740-6694
Email: DMF.EnvReview-South@state.ma.us

North Shore - Hull to New Hampshire border:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930
Email: DMF.EnvReview-North@state.ma.us

Also if yes, the project may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office. For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional Office.

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City/Town

C. Other Applicable Standards and Requirements (cont'd)

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?

   a. ☐ Yes ☒ No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.

   b. ACEC

5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?

   a. ☐ Yes ☒ No

6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?

   a. ☐ Yes ☒ No

7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?

   a. ☒ Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:

      1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)

      2. ☒ A portion of the site constitutes redevelopment

      3. ☐ Proprietary BMPs are included in the Stormwater Management System.

   b. ☐ No. Check why the project is exempt:

      1. ☐ Single-family house

      2. ☐ Emergency road repair

      3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section D and complete Appendix A: Ecological Restoration Notice of Intent – Minimum Required Documents (310 CMR 10.12).

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

Online Users: Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department.

1. ☒ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)

2. ☒ Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.

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D. Additional Information (cont'd)

3. ☒ Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.

4. ☒ List the titles and dates for all plans and other materials submitted with this NOI.

See Attached List
a. Plan Title

Green International Affiliates, Inc
b. Prepared By

Paul Milewski, P.E.
c. Signed and Stamped by

d. Final Revision Date

As shown on each plan
e. Scale

f. Additional Plan or Document Title

7/1/2019
g. Date

5. ☐ If there is more than one property owner, please attach a list of these property owners not listed on this form.

6. ☐ Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.

7. ☐ Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.

8. ☒ Attach NOI Wetland Fee Transmittal Form

9. ☒ Attach Stormwater Report, if needed.

E. Fees

1. ☐ Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

2. Municipal Check Number

3. Check date

4. State Check Number

5. Check date

6. Payor name on check: First Name

7. Payor name on check: Last Name

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Provided by MassDEP:

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F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

Susan McArthur — 1. Signature of Applicant

6/13/2019 — 2. Date

3. Signature of Property Owner (if different)

4. Date

Danielle Spicer — 5. Signature of Representative (if any)

6/27/2019 — 6. Date

For Conservation Commission:
Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:
One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:
If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

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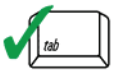
NOI Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.





A. Applicant Information

1. Location of Project:

Route 126 (Pond Street)	Ashland
a. Street Address	b. City/Town
	$1,050.00
c. Check number	d. Fee amount

2. Applicant Mailing Address:

Susan	McArthur
a. First Name	b. Last Name

Massachusetts Department of Transportation Highway Division
c. Organization

10 Park Plaza, Room 4260
d. Mailing Address

Boston	MA	02116
e. City/Town	f. State	g. Zip Code

857-368-8807	857-368-0609	Susan.McArthur@dot.state.ma.us
h. Phone Number	i. Fax Number	j. Email Address

3. Property Owner (if different):

a. First Name	b. Last Name

Massachusetts Department of Transportation Highway Division
c. Organization

10 Park Plaza, Room 4260
d. Mailing Address

Boston	MA	02116
e. City/Town	f. State	g. Zip Code

h. Phone Number	i. Fax Number	j. Email Address

B. Fees

To calculate filing fees, refer to the category fee list and examples in the instructions for filling out WPA Form 3 (Notice of Intent).

Fee should be calculated using the following process & worksheet. ***Please see Instructions before filling out worksheet.***

Step 1/Type of Activity: Describe each type of activity that will occur in wetland resource area and buffer zone.

Step 2/Number of Activities: Identify the number of each type of activity.

Step 3/Individual Activity Fee: Identify each activity fee from the six project categories listed in the instructions.

Step 4/Subtotal Activity Fee: Multiply the number of activities (identified in Step 2) times the fee per category (identified in Step 3) to reach a subtotal fee amount. Note: If any of these activities are in a Riverfront Area in addition to another Resource Area or the Buffer Zone, the fee per activity should be multiplied by 1.5 and then added to the subtotal amount.

Step 5/Total Project Fee: Determine the total project fee by adding the subtotal amounts from Step 4.

Step 6/Fee Payments: To calculate the state share of the fee, divide the total fee in half and subtract $12.50. To calculate the city/town share of the fee, divide the total fee in half and add $12.50.

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B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
Category 3 (c) - road construction not crossing or driveway	1	$1,050	$1,050

Step 5/Total Project Fee: $1,050

Step 6/Fee Payments:

Total Project Fee:	$1,050 (a. Total Fee from Step 5)
State share of filing Fee:	$512.50 (b. 1/2 Total Fee **less $**12.50)
City/Town share of filling Fee:	$537.50 (c. 1/2 Total Fee **plus** $12.50)

C. Submittal Requirements

a.) Complete pages 1 and 2 and send with a check or money order for the state share of the fee, payable to the Commonwealth of Massachusetts.

Department of Environmental Protection
Box 4062
Boston, MA 02211

b.) **To the Conservation Commission:** Send the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and the city/town fee payment.

To MassDEP Regional Office (see Instructions): Send a copy of the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and a **copy** of the state fee payment. (E-filers of Notices of Intent may submit these electronically.)

1.0 PROJECT DESCRIPTION

This Notice of Intent Application has been prepared for roadway, safety and drainage improvements on Route 126 (Pond Street) in the Town of Ashland, from the intersection of Framingham town line to the Holliston town line for a total project length of 1.7 miles. Intersection improvements at Spyglass Hill Drive and Pond Street, Eliot Street and Pond Street, Algonquin Trail and Pond Street, and James Road and Pond Street are also proposed. This project consists of maintenance and improvement of an existing roadway (including widening of less than a single lane, improvements to existing drainage systems and repaving). As the proposed project is a roadway project, which is increasing in impervious area by less than one lane, it is therefore categorized as a "Redevelopment Project" under the Massachusetts Stormwater Management Standards. The project is therefore designed to meet the Standards to the maximum extent practicable. A stormwater report is attached demonstrating the compliance of the project with the ten state stormwater standards.

The project will include full-depth reconstruction of deteriorated roadway pavements, construction of new sidewalks to improve pedestrian safety, construction of subsurface drainage improvements to extend pavement life spans, and surface drainage improvements to improve safety by reducing stormwater ponding on reconstructed roadway pavements. Minor horizontal and vertical roadway alignment improvements are also proposed. In all, these improvements will result in enhanced safety of roadway for all roadway users including bicyclists, pedestrians, and vehicles.

This Notice of Intent (NOI) is being submitted to the Ashland Conservation Commission pursuant to the Massachusetts Wetlands Protection Act (WPA) Regulations and its implementing regulations 310 CMR 10.00 for work within the Bordering Vegetated Wetland (BVW), the 100-foot Buffer Zone and within the Bordering Land Subject to Flooding (BLSF). As a MassDOT Highway Division project, MassDOT is not subject to local wetlands bylaws or regulations and abutters notification is not required per 310 CMR 10.05(4)(b). As a state agency, MassDOT must provide notice of the time and place of the Notice of Intent hearing in a newspaper of general circulation in the Town.

Limited Project Provisions

This Project meets the criteria of the Limited Project provisions of the WPA listed in the 310 CMR 10.53(3)(f): *Maintenance and improvement of existing public roadways, but limited to widening less than a single lane, adding shoulders, correcting substandard intersections, and improving inadequate drainage systems.*

1.1 EXISTING CONDITIONS

Pond Street is an Urban Principal Arterial, located southeast of Route 135 and west of Route 27, extending from the Framingham town line to the Holliston town line. Pond Street is located within a public right-of-way which is generally around 46 feet wide, but which widens around curves and intersections. Pavement widths vary from approximately 35 feet to 45 feet, but it is as wide as 58 feet at some intersections with turning lanes. The travel lanes are generally 12-14 feet wide with shoulders between 2 and 5 feet. There are no bicycle accommodations on the roadway other than bicycle detection at signalized intersections, and limited pedestrian accommodations.

There are wetlands that exist either directly adjacent to Pond Street on both sides of the roadway or nearby. Runoff from the site currently discharges via a combination of closed drainage systems, "country

drainage" off the pavement edges, or via gutter flow along the pavement edges in areas where the roadway is lower than the surrounding terrain. The site discharges to twenty distinct discharge points. There are two private treatment systems, three drainage basins, three culverts, six wetland discharge points, and six natural low points within the limit of work where stormwater leaves the project site. The wetlands are identified as Wetlands "A" through "L" and can be seen on Figure 5, Protected Resource Areas Map.

1.2 PROPOSED CONDITIONS

The proposed project includes performing full-depth reconstruction of approximately 9,000 feet of roadway to achieve a typical pavement width of thirty-two (32) to forty-four (44) feet, including two 11-foot travel lanes and 5-foot shoulders/bicycle lanes on both sides of the road and to address numerous substandard safety and drainage issues along the roadway. Continuous sidewalks are also proposed along both sides of the road for the entire project length. The new drainage systems will improve the quality of stormwater runoff and will overall maintain the historic drainage patterns, distributing runoff to the existing discharge points. All work will be done in a manner that will limit the impacts to adjacent resource areas.

1.3 PROJECT PLAN LIST

The following plan sheets are included with this Notice of Intent in Appendix E :

Sheet	Title	Prepared by	Date
1	Title Sheet & Index	Green International Affiliates, Inc	07/01/2019
2	Legend & Abbreviations	Green International Affiliates, Inc	07/01/2019
3	General Notes	Green International Affiliates, Inc	07/01/2019
4	Key Plan	Green International Affiliates, Inc	07/01/2019
14-30	Construction Plans	Green International Affiliates, Inc	07/01/2019
181-182	Landscape & Wetland Replication Details	Green International Affiliates, Inc	07/01/2019
183-184	Wetland Replication Plans	Green International Affiliates, Inc	07/01/2019
185	Construction Details	Green International Affiliates, Inc	07/01/2019
186	Drainage Details	Green International Affiliates, Inc	07/01/2019

2.0 RESOURCE AREAS

2.1 WETLAND RESOURCE AREAS

The wetland Resource Areas on the Project Site are regulated under Federal, State and Local regulatory programs including:

- Section 404 of the Clean Water Act (CWA) which is administered by the U.S. Army Corps of Engineers (ACOE)
- Section 401 of the CWA which is overseen by the Massachusetts Department of Environmental Protection (DEP)
- Massachusetts Wetlands Protection Act (WPA) and 310 CMR 10.00 which is administered by the Local Conservation Commission or (upon appeal) by DEP

Since the project will result in a cumulative loss of over 5,000 square feet of both temporary and permanent wetlands, the proposed project will require filing of a Pre-Construction Notification (PCN) Form with Army Corps of Engineers (ACOE) and a Water Quality Certification (WQC) Form with Massachusetts Department of Environmental Protection (MassDEP).

There are several wetland resource areas that directly abut the eastern and western portions of the roadway. These areas are identified on the attached Figure 5, Protected Resource Areas, attached to this application.

The following sections describe jurisdictional areas associated with the project:

2.1.1 Bordering Vegetated Wetlands (BVW)

A delineation of the wetland boundaries in the vicinity of the project site was completed by Green in April 2014 in accordance with the methodology outlined in the Regulations at 310 CMR 10.55 and the DEP handbook *Delineating Bordering Vegetated Wetlands Under Massachusetts Wetlands Protection Act*. Hydrophytic vegetation was based upon the *US Fish and Wildlife Service National List of Plant Species That Occur in Wetlands*, as well as all plant species listed in the Act. Wetland hydrology includes hydric soils, which were determined based upon the interagency document *Field Indicators for Identifying Hydric Soils in New England*. This methodology is consistent with the three-parameter approach required for the delineation of federal wetlands as outlined in the Corps of Engineers *Wetland Delineation Manual*. These wetlands are identified as Wetlands “A” through “L” and are depicted on Figure 5, Resource Areas Map, and are described in further detail in Appendix A.

2.1.2 Buffer Zone

The 100-foot Buffer Zone (established through 310 CMR 10.02) is a 100-foot offset from the BVW line. While there is a 100-foot buffer zone associated with the bank of an intermittent stream, all intermittent stream banks are located within wetlands. Therefore, the 100-foot buffer zones are offset from the BVW line. In the vicinity of the project site the Buffer Zone consists of wooded, landscaped, and developed areas. Portions of Pond Street are located within the Buffer Zone. No buildings are proposed as part of this project, but the addition of the sidewalk along both sides of the roadway will result in the limit of the

sidewalk being closer to the wetland under proposed conditions. The limited space within the roadway Right-of-Way (ROW) prohibits the addition of the sidewalk to be located within the existing limits of pavement. Treatment of stormwater runoff from the sidewalk and roadway will be improved over existing conditions.

2.1.3 Bank

There are several intermittent streams within the project limit, which have an associated Bank.

2.1.4 Bordering Land Subject to Flooding (BLSF)

Per the Flood Insurance Rate Maps (FIRM) for the Town of Ashland, Massachusetts, Middlesex County, Panels 25017C0631F and 25017C0518F dated July 7, 2014, a portion of the project at the northern end of Pond Street is located within the 100-year flood plain. The flood plain area is shown on Figure 4 – FEMA Map. The Flood Insurance Study, by the Federal Management Agency and last revised on July 6, 2016, includes a detailed study of the project area, showing the 100-year floodplain elevations in the project vicinity. Beaver Dam Brook, on the east side of the road, has a 100-year flood elevation of 156.8 feet (NAVD 88). A portion of the Tributary to Waushakum Pond, on the west side of Pond Street, has a 100-year flood elevation of 159.4 feet (NAVD88) at the northern limits of the project; however, the majority of the area within BLSF on the west side of Pond Street is within a Zone A (no base flood determined). There is an existing 3'x2' cross culvert that runs beneath Route 126 at approximate station 80+50 where the base flood elevation of 156.8 is established on the eastern side of Route 126; therefore, we have assumed it is also this elevation on the western side within the Zone A area.

2.1.5 Riverfront Area

There are several intermittent streams within the project limits. However, there are no perennial streams in the vicinity of the project area, so there is no Riverfront Area associated with the project.

2.2 PROJECT IMPACTS

The project has been designed to avoid wetland resource area impacts to the maximum extent practicable and will mitigate unavoidable resource area impacts in accordance with state regulations.

2.2.1 Resource Areas Impacts

There are direct impacts to wetland resource areas associated with the project. These impacts are associated with the relocation of Algonquin Trail to provide intersection improvements, the reconstruction and minor widening of the roadway in select areas, the construction of new sidewalks, and the construction of stone waterways located along Pond Street. Replication of the impacted wetland resource area is discussed in detail below. New pipe outlets will be constructed at multiple discharge points, discharging into resource areas as shown on Figure 5. In an effort to minimize the impact to the wetland area buffer zone, proper erosion and sediment controls will be installed during construction.

Most temporary impacts to wetland resources and bank will be caused by the construction activities and will be avoided through the implementation of erosion and sediment control measures.

Temporary disturbance to BVW (3,306 square feet) and bank (37 linear feet) will be required for installation of Erosion & Sediment Control BMPs. After the erosion controls have been removed the BVWs will be restored to preexisting conditions in accordance with the MassDOT Specification 755.3, NON-TIDAL

WETLAND MITIGATION AREAS, included as Appendix C, for wetland restoration. In addition to the minimum control measures included in the plan set, a Stormwater Pollution Prevention Plan (SWPPP) for construction activities will be prepared by the Contractor for the site in compliance with the EPA's Construction General Permit. It will include measures to minimize exposed soil areas through sequencing and temporary stabilization and establish a permanent vegetative cover or other forms of stabilization as soon as practicable.

Bordering Vegetated Wetland

There are BVW areas along both sides of Route 126 for the length of the project. The construction of new sidewalk and full-depth roadway reconstruction to achieve a typical pavement width of 32 to 44 feet results in permanent and temporary impacts to 8 wetland areas along the road, as described in Table 1 below.

Table 1: Permanent Wetland Impacts

Wetland Area	Permanent Impacts (ft^2)	Temporary Impacts (ft^2)
Wetland A	247	291
Wetland B	38	63
Wetland C	113	67
Wetland D	362	182
Wetland L	1,442	459
Wetland G	81	432
Wetland K	1,697	1,264
Wetland H	527	548
Total	**4,507**	**3,306**

These disturbances to BVW cannot be avoided. The following section describes how the proposed work within BVW meets the performance standards:

The proposed work will comply with General Performance Standards in accordance with 310 CMR 10.55 (4)(b),(d) and (e). The 310 CMR 10.55 (4)(c) Standard does not apply to this project as the impacts are more than 500 SF.

In compliance with 310 CMR 10.55 (4)(d), the proposed project will not have any *"… adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures established under 310 CMR 10.59."* The project site is not located within an area designated as Priority or Estimated Habitat of Rare Species by the Natural Heritage & Endangered Species Program (NHESP) 2017 Maps. No Certified or Potential Vernal Pools are located in this area of the City (see Figure 5).

In compliance with 310 CMR 10.55 (4)(e), the proposed project is not located within an Area of Critical Environmental Concern (ACEC), therefore, proposed work will "*not destroy or otherwise impair any portion of a Bordering Vegetated Wetland that is within an Area of Critical Environmental Concern designated by the Secretary of Energy and Environmental Affairs under M.G.L. c. 21A, § 2(7) and 301 CMR 12.00: Areas of Critical Environmental Concern*."

A replacement area with an area of 4,960 square feet is proposed and designed in accordance with 310 CMR 10.55 (4)(b) provisions as summarized below:

1. *Replacement areas (replication areas) must be equal in total size to lost BVW area;*

   As shown on the plans, two replication areas are proposed. The first, located at the realigned intersection of Route 126 and Algonquin Trail, has an area of 1,290 square feet. The second replication area, located at the intersection of Route 126 and Butterfield Drive, has an area of 3,670 square feet. Together, these two replication areas have a total area of 4,960 square feet, greater than the 4,507 square feet wetland area that will be permanently impacted by the project activities.

2. *The surface/ground water elevations of the replacement must approximate those that characterized the lost BVW areas;*

   The replication area proposed at Algonquin Trail that will be connected to Wetland L will be at the same elevation as Wetland L. The replication area proposed at Butterfield Drive will match the elevation of Wetland F.

3. *Replication areas are to be configured and located, with respect to inland bank, in a similar manner as was the case for lost BVW areas;*

   The overall horizontal configuration and location of the replacement areas with respect to the bank are similar to the lost areas.

4. *Replication areas must have an unrestricted hydraulic connection to the same waterways and/or waterbodies as the lost areas;*

   The proposed replication area at Algonquin Trail will have an unrestricted hydraulic connection to Wetland L via a new 3'x2' box culvert under Algonquin Trail. The bottom 6" of the proposed culvert will be embedded with natural streambed material to provide a natural environment (see MassDOT Item Specification 997.5 in Appendix C – Special Provisions). The proposed replication area at Butterfield Drive is immediately adjacent to Wetland F; therefore, it has an unrestricted hydraulic connection to Wetland F. Both wetland replication areas were deemed to be most feasible areas for replication within the project limits that also meet the WPA regulations.

5. *Replication areas are to be located within the same reach of waterway or general areas of waterbody, as lost BVW areas;*

   The replication areas are generally located within the same reach of waterway as the lost BVW areas.

6. *In the replication areas, indigenous plant species shall be used to reestablish the vegetation cover of the new BVW areas such that a 75% cover of these areas is attained within two (2) growing seasons. During the period of reestablishment, any exposed soil must be stabilized in accordance with U.S. Soil Conservation Service methods;*

   Indigenous plant species are proposed to reestablish vegetation, as shown on the plans. Any exposed soil will be stabilized in accordance with U.S. Soil Conservation Service methods.

7. *General Performance Standards for BVW areas must be addressed in a manner consistent with those of other resource areas described in 310 CMR 10.*

   The proposed work will comply with General Performance Standards to BVW areas.

Bank

The proposed project activities will permanently impact approximately 83 linear feet of bank associated with intermittent streams within the project limits. These activities consist of roadway widening and

extending of proposed headwalls. The permanent and temporary impacts to the Bank are summarized in Table 2 below.

Table 2: Impacts to Bank

Wetland Area	Permanent Impacts (LF)	Temporary Impacts (LF)
Wetland B	10	10
Wetland D	23	5
Wetland G	7	5
Wetland H	34	17
Wetland K	9	0
Total	**83**	**37**

As shown above, no section of Bank will have impacts of 50 LF or greater. Because of the existing characteristics, landscape context, and minimal disturbance to Bank, the proposed work is not expected to impair wildlife habitat functions. Impacts to wildlife are expected to be negligible and are expected to be offset by the proposed mitigation.

Bordering Lands Subject to Flooding (BLSF)

The proposed project activities will permanently impact approximately 1,240 square feet of BLSF, due to proposed road widening and extending of proposed headwalls. There are two small areas, where the proposed improvements will result in less than a foot of increase to Base Flood Elevation (BFE) as a result of proposed fills:

- Sta 90+00 on the east side of Pond Street (Route 126) across from the Market Basket public way has an established 100-year Base Flood Elevation of 156.8 feet, associated with the Beaver Dam Brook. The construction activities in this area will result in filling of approximately 89 cubic feet between the elevations 156.1 – 156.8 feet. The Beaver Dam Brook BLSF area at this location and elevation is approximately 8 acres, resulting in an increase of 0.00026 feet, which is negligible.

- Sta. 94+50 – 95+40 on the west side of Pond Street (Route 126) south of the Pond Street/Rodman Road intersection has an established 100-year Base Flood Elevation of 159.4 feet, associated with a portion of the Tributary to Waushakum Pond. The construction activities in this area will result in filling of approximately 306 cubic feet between elevations 158.8 – 159.4 feet. The Tributary to Waushakum Pond BLSF area at this location and elevation is approximately 10 acres, resulting in an increase of 0.00068 feet, which is negligible.

Since all improvements within this area result in less than a foot of increase to the BFE over existing conditions and will not cause an increase or contribute incrementally to an increase in the horizontal extent and level of flood waters during peak flows to both the Beaver Dam Brook system and the Waushakum Pond system, compensatory flood storage is not provided.

Buffer Zone

A portion of the site is located within the 100-foot Buffer Zone to the BVW and intermittent stream banks. Erosion and sediment control Best Management Practices (BMPs) will be installed during construction to protect adjacent resource areas, which will temporarily impact the buffer zones. These BMPs ensure the

land disturbance within the Buffer Zone does not negatively impact resource areas and will secure the protection of those interests.

2.2.2 Stormwater Management

Stormwater management for this project has been designed in compliance with the Stormwater Management Standards as outlined in 310 CMR 10.05(6)(k) through (q) and defined in detail in the DEP's Stormwater Management Handbook. The project has been designed to improve upon existing stormwater conditions while minimizing impacts to nearby resource areas from both the construction and operation of the proposed project. A full Stormwater Management Report documenting compliance with the DEP's Stormwater Management Standards, including required calculations and description of methodology, is attached as Appendix F to this report.

2.2.3 Rare Species

The project site is not located within an area designated as a Priority Habitat of Rare Species or Estimated Habitat of Rare Wildlife by the Natural Heritage & Endangered Species Program (NHESP) 2017 Maps. There are no Certified or Potential Vernal Pools in the vicinity of the project area.

2.2.4 Water Quality

Per MassGIS online data mapping, the project site is not located within an Outstanding Resource Water (ORW). (See Figure 5).

2.2.5 Area of Critical Environmental Concern

Per MassGIS online data mapping, the project site is not located within an Area of Critical Environmental Concern (ACEC). (See Figure 5).

2.3 Project Mitigation Measures

2.3.1 Construction Mitigation Measures

Erosion and Sediment Control

To protect the resource areas during construction, a combination of erosion and sediment control BMPs will be installed as shown on the attached plan set. The erosion controls will be maintained in good condition until on-site soils are stabilized. All areas will be permanently stabilized following the completion of construction work. For additional information on erosion and sediment controls, please see the attached Stormwater Management Report in Appendix F of this report.

Trench Dewatering

It is anticipated that a NPDES Construction General Permit (CGP) will be required for the project; therefore, if trench dewatering is needed, all pumped effluent will be done in compliance with the dewatering requirements within the CGP. There will be no direct discharge of pumped water into any wetland, resource area, or closed drainage system.

2.3.2 Wetland Mitigation

Wetland mitigation is required and the wetland impact mitigation measures are discussed in details above under item 2.2.1 Direct Impacts to Bordering Vegetated Wetland.

APPENDICIES

Appendix A – Wetlands Delineation Report with Data Forms
Appendix B – Photos
Appendix C – Special Provisions
Appendix D – Figures
Appendix E – Drawings for NOI Submission (Bound Separately)
Appendix F – Stormwater Management Report
(Bound Separately)

APPENDIX A

WETLANDS DELINEATION REPORT WITH DATA FORMS

GREEN INTERNATIONAL AFFILIATES, INC.
239 LITTLETON ROAD, SUITE 3 WESTFORD, MA 01886
TEL: (978) 923-0400 FAX: (978) 399-0033

Project Name: Reconstruction on Route 126 (Pond Street), Ashland, MA
Project Number: Green No. 13033.04X
Subject: **Wetlands Summary**

A total of twelve wetland resource areas (Wetlands A through K) were delineated in April 2014. All of the wetlands include Bordering Vegetated Wetlands (BVW), and Wetlands B, C, D, G, H and K also include the Banks of intermittent streams. According to the USGS topographical maps, there are no perennial streams in the project area. Wetlands G and K are associated with a floodplain immediately adjacent to Route 126. Brief wetland descriptions are provided below. For the most part wetland boundaries are formed by the steep roadway embankments, although some confirmatory data forms are attached.

Wetland A: Small wetland generally dominated by red maple and slippery elm, with standing water.

Wetland B: Dominated by red maple (*Acer rubrum*) and slippery elm (*Ulmus rubra*) with a skunk cabbage (*Symplocarpus foetidus*) understory. Includes and intermittent stream. Hydrologically connected to Wetland C.

Wetland C: Shrub wetland typically dominated by elderberry (*Sambucus canadensis*) and skunk cabbage (*Symplocarpus foetidus*). Includes and intermittent stream that is hydrologically connected to Wetland B.

Wetland D: Small urbanized wetland with stands of *Phragmites* as well as red maple (*Acer rubrum*), speckled alder (*Alnus incana*) and skunk cabbage (*Symplocarpus foetidus*). A wall forms one side of the wetland.

Wetland E: Generally dominated by red maple (*Acer rubrum*) with an understory of blueberry (*Vaccinium corymbosum*), white pine (*Pinus strobus*), tussock sedge (*Carex stricta*), cinnamon fern (*Osmunda cinnamomea*) and sensitive fern (*Onoclea sensibilis*). Appears to be connected to Wetland F under Butterfield Drive.

Wetland F: Small urbanized wetland with stands of *Phragmites* as well as red maple (*Acer rubrum*), blueberry (*Vaccinium corymbosum*), cinnamon fern (*Osmunda cinnamomea*) and poison ivy (*Toxicodendron radicans*). Construction was occurring along one edge. Appears to be connected to Wetland E under Butterfield Drive.

Wetland G: A long wetland that includes the Bay Circuit Trail and that has areas of uncontrolled runoff from adjacent land uses. Dominant species include *Phragmites*, red maple (*Acer rubrum*), honeysuckle (*Diervilla lonicera*), alder (*Alnus incana*), winterberry (*Ilex verticillata*), cinnamon fern (*Osmunda cinnamomea*), skunk cabbage (*Symplocarpus foetidus*), Japanese knotweed (*Fallopia japonica*). Old wetland flags were observed. An intermittent stream was delineated. This stream connects to Wetland G.

Wetland H: This wetland is mostly dominated by cattail (*Typha latifolia*) in the overhead easement, with an intermittent stream at the north end.

Wetland I: This small wetland is typically dominated by red maple (*Acer rubrum*), slippery elm (*Ulmus rubra*), cottonwood (*Populus deltoides*), multiflora rose (*Rosa multiflora*), silky dogwood (*Cornus amomum*) and Japanese knotweed (*Fallopia japonica*).

Wetland J: This wetland could possibly be an old stormwater management facility. It is dominated by open water with *Phragmites*, pin oak (*Quercus palustris*), willow (*Salix discolor*), silky dogwood (*Cornus amomum*) and multiflora rose (*Rosa multiflora*) along the edges.

Wetland K: Wetland K is hydrologically connected to Wetland G across Route 126 at the north end. The area has seasonally flooded areas of standing water. Plant species observed are similar to those for Wetland G.

Wetland L: This long wetland is possibly isolated. It is dominated by elm (*Ulmus rubra*), red maple (*Acer rubrum*), shadbush (*Amelanchier canadensis*) and blueberry (*Vaccinium corymbosum*).

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: Town of Ashland Prepared by: AMG, BPR Project location: Ashland Rt 126 DEP File #: _____

Check all that apply:

☐ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
☒ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
☐ Method other than dominance test used (attach additional information)

Section I. Vegetation Observation Plot Number: A-9 UPLAND Transect Number: _____ Date of Delineation: 4/29/2014

A. Sample Layer and Plant Species	B. Percent Cover (or basal area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Tree				
Spruce	50		y	
Shrub				
Black cherry	25		y	
Vines				
Asiatic bittersweet	10		y	

* Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus *Sphagnum*; plants listed as FAC, FAC+, FACW-, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion:
Number of dominant wetland indicator plants: 0 **Number of dominant non-wetland indicator plants:** 3

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? NO

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent. *MA DEP; 3/95*

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Proposal No. 604123-111717

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? **yes** no

title/date: Web Soil Suvrye accessed 4-1-2017

map number:

soil type mapped: Canton Fine Sandy Lome 15-25%

hydric soil inclusions:

Are field observations consistent with soil survey yes **no**

Remarks:

2. Soil Description

Horizon	Depth (inches)	Matrix Color	Mottles Color
	0-8	10 YR 2/1	
	8-12	10 YR 4/4	

Remarks:

3. Other:

Conclusion: Is soil hydric? yes **no**

Other Indicators of Hydrology: (check all that apply and describe)

- ☐ Site inundated: _____
- ☐ Depth to free water in observation hole: _____
- ☐ Depth to soil saturation in observation hole: _____
- ☐ Water marks: _____
- ☐ Drift Lines: _____
- ☐ Sediment deposits: _____
- ☐ Drainage patterns in BVW: _____
- ☐ Oxidized rhizospheres: _____
- ☐ Water-stained leaves: _____
- ☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other): _____

_____

- ☐ Other: _____

Vegetation and Hydrology Conclusion

	YES	NO
Number of wetland indicator plants ≥ number of non-wetland indicator plants	☐	☒
Wetland hydrology present: hydric soil present	☐	☒
other indicators of hydrology present	☐	☒
Sample locations is in a BVW	☐	☒

Submit this form with the Request for Determination of Applicability or Notice of Intent.

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: Town of Ashland Prepared by: AMG, BPR Project location: Ashland Rt 126 DEP File #: _____

Check all that apply:

☐ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
☒ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
☐ Method other than dominance test used (attach additional information)

Section I. Vegetation Observation Plot Number: A-9 WETLAND Transect Number: Date of Delineation: 4/29/2014

A. Sample Layer and Plant Species	B. Percent Cover (or basal area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Tree				
Red maple	98		y	
Slippery elm	25		y	
Pin oak	10			
Shrub				
Black cherry	50		y	
Red maple	5			
Herbs				
Skunk cabbage	5		y	
Vines				
Asiatic bittersweet	3			

* Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus *Sphagnum*; plants listed as FAC, FAC+, FACW-, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion:
Number of dominant wetland indicator plants: 3 **Number of dominant non-wetland indicator plants:** 1

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? YES

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent. *MA DEP; 3/95*

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Proposal No. 604123-111717

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? **yes** no

title/date: Web Soil Survey Accessed 4/1/2017

map number:

soil type mapped: Canton Fine Sand Loam 15-25%

hydric soil inclusions:

Are field observations consistent with soil survey yes **no**

Remarks:

2. Soil Description

Horizon	Depth (inches)	Matrix Color	Mottles Color
	0-10	10 YR 2/1	
	10-14	10 YR 3/3, sandy	
	14-24	10 YR 4/2, saturated	

Remarks:

3. Other:

Conclusion: Is soil hydric? **yes** no

Other Indicators of Hydrology: (check all that apply and describe)

- ☐ Site inundated: _____
- ☐ Depth to free water in observation hole: _____
- ☒ Depth to soil saturation in observation hole: 12 inches_____
- ☐ Water marks: _____
- ☐ Drift Lines: _____
- ☐ Sediment deposits: _____
- ☐ Drainage patterns in BVW: _____
- ☐ Oxidized rhizospheres: _____
- ☐ Water-stained leaves: _____
- ☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other): _____

_____

- ☐ Other: _____

Vegetation and Hydrology Conclusion

	YES	NO
Number of wetland indicator plants ≥ number of non-wetland indicator plants	☒	☐
Wetland hydrology present: hydric soil present	☒	☐
other indicators of hydrology present	☒	☐
Sample locations is in a BVW	☒	☐

Submit this form with the Request for Determination of Applicability or Notice of Intent.

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: Town of Ashland Prepared by: AMG, BPR Project location: Ashland Rt 126 DEP File #: _____

Check all that apply:

☐ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
☒ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
☐ Method other than dominance test used (attach additional information)

Section I. Vegetation Observation Plot Number: K-18 UPLAND Transect Number: _____ Date of Delineation: 4/29/2014

A. Sample Layer and Plant Species	B. Percent Cover (or basal area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Tree				
Red maple	50		y	
White pine	20		y	
Red oak	20		y	
Shrub				
Buckthorn	30		y	
White pine	10			

* Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus *Sphagnum*; plants listed as FAC, FAC+, FACW-, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion:
Number of dominant wetland indicator plants: 2 **Number of dominant non-wetland indicator plants:** 2

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants?

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent. *MA DEP; 3/95*

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Proposal No. 604123-111717

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? **yes** no

title/date: Web Soil Survey accessed 4-1-2017

map number:

soil type mapped: Udorthents, wet substratum

hydric soil inclusions:

Are field observations consistent with soil survey yes **no**

Remarks:

2. Soil Description

Horizon	Depth (inches)	Matrix Color	Mottles Color
	0-8	10 YR 4/6	
	8-16	10 YR 3/4	

Remarks:

3. Other:

Conclusion: Is soil hydric? yes **no**

Other Indicators of Hydrology: (check all that apply and describe)

- ☐ Site inundated: _____
- ☐ Depth to free water in observation hole: _____
- ☐ Depth to soil saturation in observation hole: _____
- ☐ Water marks: _____
- ☐ Drift Lines: _____
- ☐ Sediment deposits: _____
- ☐ Drainage patterns in BVW: _____
- ☐ Oxidized rhizospheres: _____
- ☐ Water-stained leaves: _____
- ☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other): _____

_____

- ☐ Other: _____

Vegetation and Hydrology Conclusion

	YES	NO
Number of wetland indicator plants ≥ number of non-wetland indicator plants	☐	☐
Wetland hydrology present: hydric soil present	☐	☒
other indicators of hydrology present	☐	☒
Sample locations is in a BVW	☐	☒

Submit this form with the Request for Determination of Applicability or Notice of Intent.

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: Town of Ashland Prepared by: AMG, BPR Project location: Ashland Rt 126 DEP File #: _____

Check all that apply:

☐ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
☒ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
☐ Method other than dominance test used (attach additional information)

Section I. Vegetation Observation Plot Number: K-18 WETLAND Transect Number: Date of Delineation: 4/29/2014

A. Sample Layer and Plant Species	B. Percent Cover (or basal area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Tree				
Red maple	90		y	
Shrub				
Blueberry	75		y	
Spicebush	25		y	
White pine	3		n	
Herbs			n	
Skunk cabbage	3			

* Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus *Sphagnum*; plants listed as FAC, FAC+, FACW-, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion:
Number of dominant wetland indicator plants: 3 **Number of dominant non-wetland indicator plants:** 0

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? YES

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent. *MA DEP; 3/95*

A00860 - 45

Proposal No. 604123-111717

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? **yes** no

title/date: Web Soil Survey accessed 4-1-2017

map number:

soil type mapped:

hydric soil inclusions:

Are field observations consistent with soil survey **yes** no

Remarks:

2. Soil Description

Horizon	Depth (inches)	Matrix Color	Mottles Color
	0-12	10 YR 2/1	
	12-18+	10 YR 5/2	10 YR 5/6 >5%

Remarks:

3. Other:

Conclusion: Is soil hydric? **yes** no

Other Indicators of Hydrology: (check all that apply and describe)

- ☐ Site inundated: _____
- ☐ Depth to free water in observation hole: _____
- ☒ Depth to soil saturation in observation hole: 8 inches
- ☐ Water marks: _____
- ☐ Drift Lines: _____
- ☐ Sediment deposits: _____
- ☒ Drainage patterns in BVW: _____
- ☐ Oxidized rhizospheres: _____
- ☐ Water-stained leaves: _____
- ☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other): _____

_____

- ☐ Other: _____

Vegetation and Hydrology Conclusion

	YES	NO
Number of wetland indicator plants ≥ number of non-wetland indicator plants	☒	☐
Wetland hydrology present: hydric soil present	☒	☐
other indicators of hydrology present	☒	☐
Sample locations is in a BVW	☒	☐

Submit this form with the Request for Determination of Applicability or Notice of Intent.

APPENDIX B

PHOTOS

Route 126 (Pond Street) Proposed Roadway Reconstruction
Ashland, MA
Green Project No. 13033.044

GREEN INTERNATIONAL AFFILIATES, INC.

Photo Log – April and September 2017



Photo 01 – STA. 16+00 LT, LOOKING WESTERLY AT DETENTION BASIN



Photo 02 – STA. 31+00 RT, LOOKING EASTERLY AT HEADWALL INTO DRAINAGE BASIN



Photo 03 – STA. 31+88 RT, LOOKING EASTERLY AT HEADWALL INTO DRAINAGE BASIN



Photo 04 – STA. 34+97 RT, LOOKING EASTERLY HEADWALL INTO DRAINAGE BASIN



Photo 05 – STA. 37+50 LT, LOOKING WESTERLY AT WETLAND “C” CULVERT OUTLET



Photo 06 – STA. 53+70 LT, LOOKING NORTHERLY AT WETLAND “L”



Photo 06 – STA. 55+70 LT, LOOKING WESTERLY AT WETLAND "L"



Photo 07 – STA. 64+00 RT, LOOKING NORTHERLY AT WETLAND "F" FROM BUTTERFIELD DRIVE



Photo 08 – STA. 90+00 RT, LOOKING WESTERLY AT WETLAND “H” CULVERT

APPENDIX C

SPECIAL PROVISIONS

ITEM 755.3 NON-TIDAL WETLAND MITIGATION AREAS LUMP SUM

Work under this item shall conform to the relevant provisions of Sections 120, 770, 771 and the following:

The work under this Item includes the furnishing of all labor, transportation, equipment, and materials required for protection, construction, and maintenance of Non-Tidal Wetland Mitigation Areas as compensation for proposed impacts to existing wetlands. Tasks include erosion controls, excavation, fine grading, soil and soil amendments as needed, planting, maintenance and removals as shown on the Plans.
The construction and re-vegetation of the replacement areas shall be in accordance with the Plans and Cross Sections and as directed by the Wetland Specialist. Limits of replacement and proposed plantings shown on the plans are approximate and may require adjustment in the field to accommodate actual conditions.

DESCRIPTION OF WORK
To ensure that no loss of wetland function results from the proposed project, Non-Tidal Wetland Mitigation Area(s) characterized by Bordering Vegetated Wetlands (BVW) shall be replicated through constructed wetlands and/or restored by planting in existing wetland areas shown on the Plans. Non-Tidal Wetland Mitigation Areas shall hereafter be referred to as Mitigation Areas. The following minimum area requirements shall be met for each area shown on the Plans.

Replication:
BVW replication area 1 = 3,670 sf.
BVW replication area 2 = 1,290 sf.
BVW Restoration (temporary impacts) = 3,306 sf.

Mitigation Areas shall be constructed to meet the requirements of permits and certifications including relevant performance standards of the Massachusetts Wetlands Protection Act (MGL C. 131, s40) and U.S. Army Corps of Engineers.

The Contractor shall be responsible for protection and preservation of natural areas adjacent to the Mitigation Areas both within and outside of the project limits for the duration of the contract period. Access to Mitigation Areas shall be clearly defined in order to minimize damage to existing vegetation and soils. The Contractor shall use duck boards or mats, as necessary, to minimize impacts from foot paths or construction equipment. All labor and materials required for protection and preservation of site shall be incidental to this item.

Damage to soils or vegetation due to trampling, vehicles, storing of materials, debris, or negligence shall be repaired to the satisfaction of the Engineer and at the Contractor’s expense.

RELATED ITEMS:

The following tasks related to work within the Mitigation Areas shall be paid for under these separate items.

ITEM 755.7 WETLAND SPECIALIST

The Contractor shall retain a qualified Wetland Specialist as per Item 755.7 WETLAND SPECIALIST to coordinate and oversee work under this item. Work performed by the Wetland Specialist shall be paid for under Item 755.7. The Wetland Specialist shall report directly to the Resident Engineer and work independently of the wetland contractor

SUBMITTALS:

Photographic Documentation: Prior to any disturbance, clear and legible digital photographs with date and time stamps shall be taken of the existing site conditions including existing wetlands to be impacted, all proposed wetland mitigation sites and reference/model wetland areas, typically an adjacent undisturbed wetland. These shall be submitted to the Engineer on CD or DVD format.

Contractor shall submit the following for approval by the Engineer in consult with the MassDOT Landscape Architect at least sixty (60) days prior to installation. The Contractor shall be responsible for making all submittals to the Engineer in a timely and complete manner.

Soil and soil amendments: Contractor shall submit for approval all sources of soil and other amendments including compost prior to ordering. Off-site sources shall be identified and available for inspection by the Wetland Specialist prior to transport of material to the site to verify that they are likely to be free of invasive plant species including all viable plant parts.

Plants: Confirmation of availability, source of plant material and certification of provenance from the nursery supplier.

Seed: Source, certification of compliance and certification of provenance from supplier shall be submitted and approved prior to ordering materials.

Compost Filter Tubes: Product literature and samples of all material including compost fill.

Samples:

Cut sheets for erosion controls
Sample(s) of soils and soil amendments tested and accepted, if needed.

MATERIALS
All materials are incidental to this item unless specified otherwise.

Erosion Controls:
Compost Filter Tubes:
Materials shall conform to the requirements of Section 751 and 767 of the Standard Specifications, Plans, and the following:

Fill material for the filter tubes shall be compost meeting M1.06.0, except that no manure or bio-solids shall be used. In addition, no kiln-dried wood or construction debris shall be allowed. Particle size analysis: 98% shall pass through a 3 inch (75mm) sieve; 30-50% shall pass 3/8 inches (10mm) sieve.

Tubes for compost filters shall be a minimum of 12 inches (300 mm), a maximum of 18” (450mm) in diameter, and shall be jute mesh or approved biodegradable material. Additional tubes may be used at the direction of the Engineer.

As shown in the drawing details, the 1 foot (0.2 meters) wide by 2 inch (50 mm) deep wedge of compost spread along the top of the filter tube shall be incidental to this item.

Stakes for anchors shall be nominal 2" x 2" untreated hardwood stakes.

Planting Soil:

Wetland soil for wetland restoration or replacement may be either soil excavated from impacted wetland area or manufactured hydric soil. If using soil from the impacted wetland area, soil shall not be compacted or grubbed. If the proposed mitigation site is in an area free of invasive species, wetland soil from the impacted wetland that is infested with invasive plant species shall not be used so as to avoid bringing invasive species to a new location. If the mitigation is adjacent to the infested area, wetland soils from the impacted site may be used as they will inevitably spread into the mitigation site. Manufactured wetland soil shall consist of on-site borrow from the proposed replacement site thoroughly mixed with compost to achieve a target organic content of 10-12% by weight. Where empirical data are lacking, compost to soil ratio shall be 1:1 by volume. Off-site borrow may be used for mixing if approved in advance by the Engineer per these Special Provisions.

No soil, compost, or other soil amendment imported to the work site shall contain seeds, roots, stems, or other viable parts of invasive plants. No soil or soil amendment shall be brought on site without prior approval of the material source. Soils used in the replacement area should be free of rocks greater than 4 inches (100 mm) in diameter.

Wetland soils for mitigation area shall be stockpiled outside resource areas and stored at least 100 feet from the edge of the wetland. Precautions shall be taken as necessary to prevent erosion of the stockpiled material. In the event there is excess borrow, it shall be disposed of without additional compensation.

Compost Topsoil:
Compost shall be compost meeting the requirements for Organic Soil Additives, Section M 1.06.0 of the Standard Specifications and the following:

No kiln-dried wood or construction debris shall be allowed.

Organic matter content shall be minimum 30 percent (dry weight basis) as determined by ASTM D2974 (method A) Standard Test Methods for Moisture, Ash and Organic Matter of Peat and Other Organic Soils.

Moisture content shall be 40-60 percent as measured by ASTM D2216 Standard Test Method for Laboratory Determination of Water Content of Soil and Rock and ASTM D2974 (cited above).

Plant Material:
Plants in Mitigation Areas shall conform to SECTION 771 PLANTING TREES, SHRUBS AND GROUNDCOVER of the Division I Standard Special Provisions and as amended below.

Plant species and sizes shall be as follows:

PLANT LIST - WETLAND REPLICATION TOTAL

KEY	QTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS/ SPACING	ROOT
		DECIDUOUS TREES				
BN	2	BETULA NIGRA	RIVER BIRDH	2-2.5" CAL.	SINGLE STEM	B&B
OV	3	OSTRYA VIRGINIANA	HOP HORNBEAM	2-2.5" CAL.	SINGLE STEM	B&B
NS	3	NYSSA SILVATICA	TUPELO	1-1.5" CAL		15 GALLON CONT.
QB	5	QUERCUS BICOLOR	SWAMP WHITE OAK	1-1.5" CAL		15 GALLON CONT.
		DECIDUOUS SHRUBS				
CA	21	CORNUS AMOMUM	SILKY DOGWOOD	1 GALLON CONT.	2' O.C.	1 GALLON CONT.
IV	20	ILEX VERTICILATA	WINTERBERRY	1 GALLON CONT.	2' O.C.	1 GALLON CONT.
IVM	2	ILEX VERTICILATA -MALE	MALE WINTERBERRY	1 GALLON CONT.	2' O.C.	1 GALLON CONT.
VC	30	VACCINIUM CORYMBOSUM	HIGHBUSH BLUEBERRY	1 GALLON CONT.	2' O.C.	1 GALLON CONT.
VR	22	VIBURNUM RECOGNITUM	NORTHERN ARROWWOOD	1 GALLON CONT.	2' O.C.	1 GALLON CONT.

All plant material shall be species native to the region. As per current recommendations by the NOAA Restoration Center and the EPA Ecoregion Assessment, in order to maintain genetic diversity, only native species of seed and plants from the EPA Level III Ecoregion of the project area shall be used for ecosystem restoration. The EPA Level III Ecoregions of Massachusetts are Ecoregion 84 Atlantic Coastal Pine Barrens which encompasses Barnstable, Dukes, Nantucket and Plymouth Counties. Ecoregion 59 Northeastern Coastal Zone encompasses the remainder of Massachusetts. The current EPA map, Ecoregions of the Continental United States, is available through the following link: ftp://ftp.epa.gov/wed/ecoregions/us/Eco_Level_III_US.pdf
The nursery source shall certify that the provenance, or origin, of the seed from which the plants were produced is from the applicable EPA Level III Ecoregion.

Transplants and plant material collected from the wild is prohibited unless approved in writing by the MassDOT Landscape Architect and Wetland Specialist. Plant materials shall be selected from certified nurseries that have been inspected by state and/or federal agencies. Nursery inspection certificates shall be furnished to the Engineer upon request.

No plants shall be installed until the Wetland Specialist approves the condition of the plant material and the process of installation.

Water:
Plant material shall be saturated with fresh water before delivery, upon delivery to the site and twice daily up to time of installation. The Contractor shall provide water and all equipment required at no extra cost. Water shall be suitable for irrigation and free from ingredients harmful to plants and wildlife. According to DEP requirements, water from the adjacent water body shall not be utilized. It is the Contractor's responsibility to correct injury or damage due to the lack of water, too much water or use of contaminated water.

Requests for substitutions shall be submitted in writing to the Engineer for review by the MassDOT Landscape Architect at least ninety (90) days prior to planting. The Contractor shall submit a list of nurseries that were contacted and unable to supply the species as shown on the Plans. All proposed substitutes shall be in conformance with the requirements herein and suitable for the site conditions.

Seed Mix:
Seed in the Mitigation Areas shall conform the Standard Specifications as amended by the 2010 Standard Special Provisions, SUBSECTION M6, ROADSIDE DEVELOPMENT MATERIALS and as amended herein.

BOTANICAL NAME	COMMON NAME	PERCENTAGE
Carex vulpinoidea	Fox Sedge	25%
Elymus virginicus	Virginia Wildrye	25%
Carex lurida	Lurid (Shallow) Sedge	12%
Carex lupulina	Hop Sedge	6%
Verbena hastata	Blue Vervain	4%
Juncus effusus	Soft Rush	3%
Carex comosa	Cosmos (Bristly) Sedge	3%
Aster umbellatus (Doellingeria umbellate)	Flat Topped White Aster	3%
Aster prenanthoides (Symphyotrichum p.)	Zigzag Aster	3%
Scirpus atrovirens	Green Bulrush	3%
Helenium autumnale	Common sneezeweed	2%
Zizia aurea	Golden Alexanders	2%
Ludwigia alternifolia	Seedbox	2%
Lobelia siphilitica	Great Blue Lobelia	1%
Aster puniceus (Symphyotrichum puniceum)	Purplestem Aster	1%
Vernonia gigantea (V. altissima)	Giant Ironweed	1%
Scirpus cyperinus	Woolgrass	1%
Eupatorium perfoliatum	Boneset	1%
Euthamia graminifolia (Solidago g.)	Grassleaf Goldenrod	1%
Asclepias incarnata	Swamp Milkweed	1%
	Total:	100%

Seeding rate shall be 20 lbs. per acre or 0.5 lbs. per 1,000 square feet. All species shall be of a local ecotype meeting the EPA Level III Ecoregion requirements as described in the Plant Materials section.

Fertilizer and soil amendments shall not be used for seeding in Mitigation Areas.

METHODS

Site Preparation:

Prior to an initial site meeting, the Contractor shall stake out Mitigation Area boundaries and set grade stakes in the field. Prior to start of work, the Contractor shall walk the site with the Engineer, Wetland Specialist, and MassDOT Landscape Architect for an initial site meeting. The purpose of the meeting is to verify limits of work, locations and installation of Phase 1 erosion controls, proposed construction methods, and grade stake elevations.

Erosion and Sediment Control:

The Contractor shall plan and execute operations in a manner minimizing the amount of excavated and exposed fill or other foreign materials that could be washed or otherwise carried into Mitigation Areas and nearby wetland resource areas. The Engineer and Wetland Specialist shall inspect and approve erosion and sediment control measures prior to excavation work. Erosion controls shall be in place prior to any construction activities.

Compost Filter Tubes shall serve as temporary erosion control during construction until establishment of erosion control seeding. Compost Filter Tubes shall also act as a limit of work barrier.

Where restoration requires planting in existing grade to fill in among existing vegetation, disturbance to existing soils will be minimal and erosion controls may not be necessary around these restoration planting areas.

Erosion controls shall be installed along the downslope perimeter of Mitigation Areas beginning and ending in the surrounding upland so that no excavated material or disturbed soil can enter adjacent wetlands or waters.

The Contractor shall remove sediment deposits as necessary to maintain the filters in working condition. The Contractor shall maintain erosion controls in a functional condition at all times, including inspections after each rainfall and at least daily during prolonged rainfall and shall immediately correct all deficiencies including replacing compost filter tubes as needed.

Upon final acceptance of seeding, the compost filter tubes shall be cut open, compost spread evenly over the soil surface a maximum depth of 2-inches and the composted area shall be seeded with same seed mix used in the surrounding area. Stakes, ropes and other non-biodegradable materials shall be removed and disposed of offsite by the Contractor. Existing vegetation disturbed by erosion control installation and removals shall be replanted as directed by the Engineer.

Excavation and Grading:

Final grades in the Mitigation Areas shall conform to target elevations as shown on the Plans and as approved by the Wetland Specialist. Restoration areas shall conform to existing and/or adjacent grades.

Mitigation Areas shall be staked and grades set for approval by the Wetland Specialist prior to excavation. To the extent possible, limits shall be a minimum of 6 feet from trunk of trees. Actual limits of mitigation areas may be adjusted in the field to protect root systems of existing trees. However, the total area of Wetland Mitigation required by all permits shall not be reduced.

Mitigation area shall be covered with 2-inch layer of Compost Topsoil to provide compost mulch for erosion control and better seed establishment. Typically, hydraulic application equipment will be required for this item, unless otherwise permitted by the Engineer, in writing.

Note: To avoid compaction, once soil has been placed, no heavy equipment shall travel across placed soil. Do not work with wet or moist soils. Work that results in compaction of soils shall result in replacement of wetland soils at no additional cost to the contract.

It is the Contractor's responsibility to identify existing areas of established invasive plants and notify the Engineer and Wetland Specialist of the condition. Soil containing invasive plant material shall be excavated and disposed of off-site at an approved facility.

All cut trees, stumps, brush, wrack or vegetation not specified to remain shall be removed from Mitigation Areas unless directed otherwise by the Engineer. Materials shall not to be stockpiled in the resource areas or buffer zone while awaiting disposal.

Sequence and execution of work shall ensure minimal compaction and heavy equipment moving over placed planting soil. If heavy equipment is required to travel over existing wetland soils, wood mats shall be placed to minimize impacts. Upon acceptance of final grades, no heavy equipment shall travel across mitigation areas or adjacent wetland resource areas.

The finished grade shall be at an elevation that will provide a hydrologic connection between the replacement area and adjacent resource areas. The hydrologic connection should be in keeping with restoring the intended function of the replacement wetland. The Contractor shall verify that this elevation is not at a level that could alter the hydrology of an adjacent wetland.

Mitigation Area Planting:

Planting in Mitigation Areas shall conform to SECTION 771 PLANTING TREES, SHRUBS AND GROUNDCOVER of the Division I Standard Special Provisions and as amended below.

Planting shall be overseen by the Wetland Specialist. Mitigation Areas shall be planted in the dry and according to the planting details within the range of target elevations and at the spacing shown on the Plans. If Mitigation Area includes more than one planting zone, the Wetland Specialist shall flag out limits prior to planting. Plants shall be installed. Discrepancies shall be resolved by the Engineer in consultation with the Wetland Specialist and MassDOT Landscape Design Section.

Plant material shall be installed as soon as possible after delivery. Plants stored on-site prior to installation shall be maintained in acceptable condition as described in materials section. Plants showing signs of stress or compromised health may be rejected by the Engineer or Wetland Specialist with replacement at the Contractor's expense.

Mitigation Performance Standards:

The Contractor shall fulfill the following minimum Mitigation Performance Standards for the Mitigation Areas within a Planting Guarantee Period of two (2) full growing seasons. Monitoring shall be performed by the Wetland Specialist according to Item 755.7 WETLAND SPECIALIST.

1. The target elevations for Mitigation Areas and planting types have been met and maintained. A minimum of 90 percent of each wetland mitigation area must meet desired hydrology. Areas that are too high or too low should be identified along with suggested corrective measures.
2. Establish at least 80 percent uniform cover of the intended herbaceous wetland plant community.
3. Establish at least 95 percent of woody plants installed.

Plant species listed as invasive by Massachusetts Invasive Plant Advisory Group (MIPAG) and the USACE – New England District shall be identified as such in the monitoring reports and corrective measures taken to control them within the limits of the Mitigation Areas for the duration of the Planting Guarantee Period.

If at the end of the Planting Guarantee Period, the Mitigation Performance Standards have not been met according to the monitoring report, the Contractor shall provide corrective measures and install replacement plant material to achieve the required establishment. All costs associated with achieving the Mitigation Performance Standards through the Planting Guarantee Period shall be incidental to this item.

As-Built Drawings:

Following acceptance of the planting by MassDOT, as-built drawings of the Wetland Mitigation Areas shall be surveyed and prepared by the Contractor for use by the Wetland Specialist as per the USACE - New England District's Compensatory Mitigation Guidance. As-built drawings shall be prepared at a clearly legible scale including 1-ft. contours and polygons outlining each wetland mitigation area. The as-built drawings shall serve to confirm that area requirements have been met and as the base map for mitigation monitoring. The as-built drawings

shall be provided in printed paper format (full size 24"x36" sheets, unless otherwise directed) as well as Portable Document Format (e.g., Adobe PDF) and AutoCAD files on compact disk. As-built drawings shall be completed within 30 days of acceptance of initial wetland mitigation planting.

Monitoring and Maintenance:

Monitoring shall be performed by the Wetland Specialist in order to ensure compliance with the Mitigation Performance Standards. Monitoring methods and report content shall conform to the Wetland Mitigation Report as approved by the regulatory agencies. The monitoring schedule shall be as per Item 755.7 WETLAND SPECIALIST. Work performed by the Wetland Specialist shall be according to and paid for under Item 755.7 WETLAND SPECIALIST.

Based on monitoring results and as directed by the Engineer in consult with the MassDOT Landscape Design Section, the Contractor shall make corrective measures to achieve compliance with the Mitigation Performance Standards. All plants not showing satisfactory evidence of establishment during the Planting Guarantee Period shall be replaced within the appropriate planting window. Unsatisfactory plants shall be removed and replaced along with dead and missing plants. All maintenance shall be incidental to this item.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Method of Measurement

Measurement for this item shall be by lump sum, installed, approved, and maintained in place.

Basis of Payment

Within 10 days of the award of the contract, the Contractor shall submit, in duplicate, for approval by the Engineer, a schedule of quantities and unit prices for the major components of the Mitigation Areas as listed on the following table. The cost of labor and materials for any item not listed but required to complete the work under this item shall be considered incidental to the item and no further compensation will be allowed.

[Designer to complete the following quantity information for Lump Sum subtotal, as applicable.]

Item Component	Quantity BVW	Unit	Unit Price	Amount
Compost Filter Tubes	195	FT		
Excavation (Base Only)	216	CY		
Wetland Planting soil	185	CY		
Compost Topsoil	31	CY		
Bordering Vegetated Wetland Seeding	556	SY		
Plant Common Name		EA		
River Birch, *Betula nigra,* B&B, 2-2.5" CAL,	2	EA		
Hop Hornbeam, *Ostrya virginiana,* B&B, 2-2.5" CAL,	3	EA		

Tupelo, *Nyssa sylvatica,* 1-1.5" CAL, 15 gallon container	3	EA		
Swamp White Oak, *Quercus bicolor,* 1-1.5" CAL, 15 gallon container	5	EA		
Silky Dogwood, *Cornus amomum,* 1 gallon container	21	EA		
Winterberry, *Ilex verticilata* 1 gallon container	20	EA		
Winterberry, *Ilex verticilata* - male 1 gallon container	2	EA		
High bush Blueberry, *Vaccininum corymbosum,* 1 gallon container	30	EA		
Northern Arrowwood, *Viburnum recognitum,* 1 gallon container	22	EA		

Such payment shall be considered full compensation for all labor, tools, equipment, materials, travel and incidentals necessary to complete the work as described herein and in a manner satisfactory to the Engineer.

PAYMENT SCHEDULE
75 percent paid upon acceptance of initial planting
25 percent paid at end of second growing season.

ITEM 997.5 SPECIAL DRAINAGE STRUCTURE NO.5 LUMP SUM

The work under this Item shall consist of furnishing all labor, materials, tools and equipment and the performance of all work required to furnish and install the 36"Wx24"H precast concrete box culvert at Sta. 900+85 (Algonquin Trail), the cast-in-place Headwalls, and riprap as shown on the plans. Two 6" baffles, one at each end of the cuvlert, shall be provided along the bottom to retain the natural streambed material.

The manufacturer shall submit evidence at the request of the Engineer showing that he has successfully completed work of similar magnitude prior to being approved as the source of the material for this work. The manufacturing process shall be closely supervised by experienced plant personnel and records of plastic and concrete strength shall be kept and submitted to the Engineer for control.

MATERIALS

Materials shall meet the requirements specified in the following subsections of Division III, Materials Specifications of the Standard Specifications:

Cement Concrete	M4.02
Epoxy Coated Reinforcing Bars	M8.01.7
Stone for Pipe Ends	M2.02.3
Crushed Stone	M2.01.3
Geotextile Fabric	M9.50.0

The precast box culvert (36"Wx24"H) shall be reinforced concrete and shall be manufactured in accordance with ASTM C76 standard specifications for reinforced concrete culvert. The culvert shall be designed to support an HS-20 (32,000 lbs.) truck axle load and dead load from earth cover over the top of the culvert as shown on the plans, and shall conform to all applicable AASHTO Specifications.

The Contractor shall submit shop drawings and structural calculations stamped by an Engineer registered in the Commonwealth of Massachusetts for approval as specified in Section 5.02 of the Standard Specifications. The shop drawings shall show the size and location of all inserts and openings as shown on the Plans.

Existing utility locations shall be verified in the field prior to starting this work. The Contractor shall provide the Engineer with a plan showing existing utility locations and elevations prior to undertaking this work.

All costs shall be incidental and be paid for under the lump sum price.

The work under this item shall consist of installation of natural streambed material within the bottom of the culvert to provide a natural streambed for aquatic organisms. The natural streambed construction material is to be placed within the bottom 6" of the culvert with baffles on each end, as depicted on the plans.

The intent of this item is to ensure a natural streambed within the culvert, to provide fisheries and wildlife habitat enhancement as part of the wetland replication area and natural wetlands. The natural streambed material shall be comprised of the stones 4 inches and under, that shall meet the following gradation:

Sieve opening	Percent by Mass Passing Through
4”	95
2”	55 – 65
¾”	30 – 45
#4	0 – 5

Partially angular rock is preferred over round and shall be able to lock together to prevent movement during high flows. Crushed Stone will not be accepted for any components. The inlet/outlet elevations of the proposed culvert shall match the proposed plans.

CONSTRUCTION OF SPECIAL DRAINAGE STRUCTURE

Work shall include installing new culvert and installation of new cast-in-place headwalls.

The precast concrete box culvert shall be constructed as shown on the Plans.

All precast units shall be carefully loaded, hauled, stored and erected to prevent damage. They shall be erected by experienced workmen, true to the lines and grades as shown on the Plans or directed by the Engineer. Any members superficially damaged during shipment or erection shall be rejected and shall be repaired by experienced workmen. Units badly damaged shall be rejected and shall be replaced with new units at no additional cost to the Owner. The Engineer shall be the sole judge of this damage. No holes shall be cut or drilled in the field without written approval of the Engineer.

CONTROL OF WATER

The Contractor shall submit a plan for management of surface and groundwater flow and potential sedimentation thereof during the installation period to the Engineer and Ashland Conservation Commission for approval prior to any work. Contractor to control surface and groundwater through the duration of the project including the stabilization period after completion of construction activities and as per the Ashland Conservation Commission.

METHOD OF MEASUREMENT

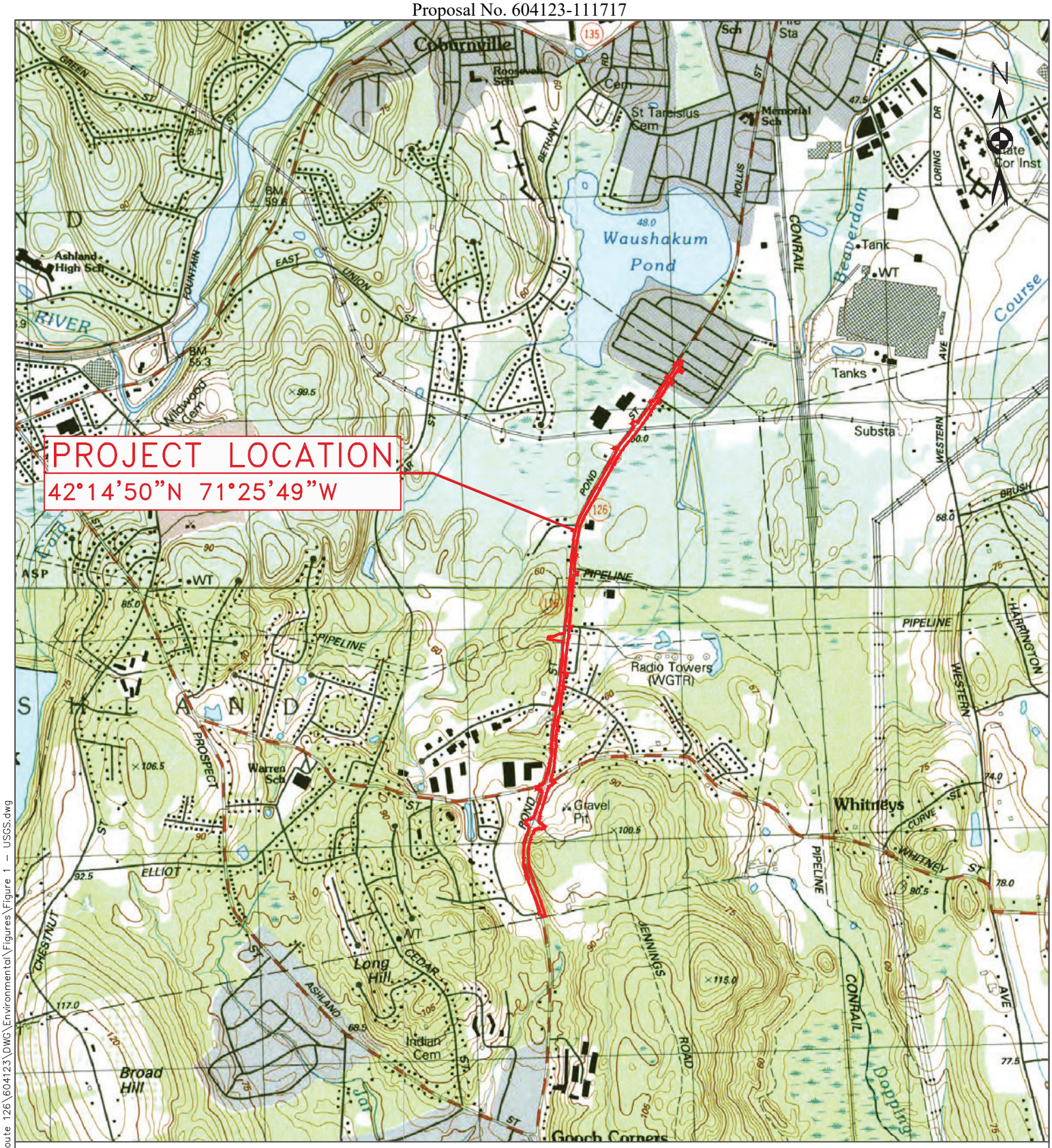
Work for this item shall be paid on a lump sum basis for all work as shown on the plans, including installation of new cast-in-place headwalls and connection to proposed culvert andcontrol of water.

BASIS OF PAYMENT

This Item will be paid for at the contract unit price per lump sum installed and completed in place. The 6” embedded natural streambed material within the box culvert shall be included as an incidental expense and part of the lump sum. The Special Drainage Structure lump sum price shall include full compensation for all labor, materials, tools and equipment, removal, delivery and disposal at an approved landfill, the cost for approvals, testing, transportation, and other incidental expenses necessary to complete this Item.

APPENDIX D

FIGURES



SCALE IN FEET

1000 0 1000 2000

ELEVATIONS IN METERS

USGS LOCUS MAP

RECONSTRUCTION ON ROUTE 126 (POND STREET)

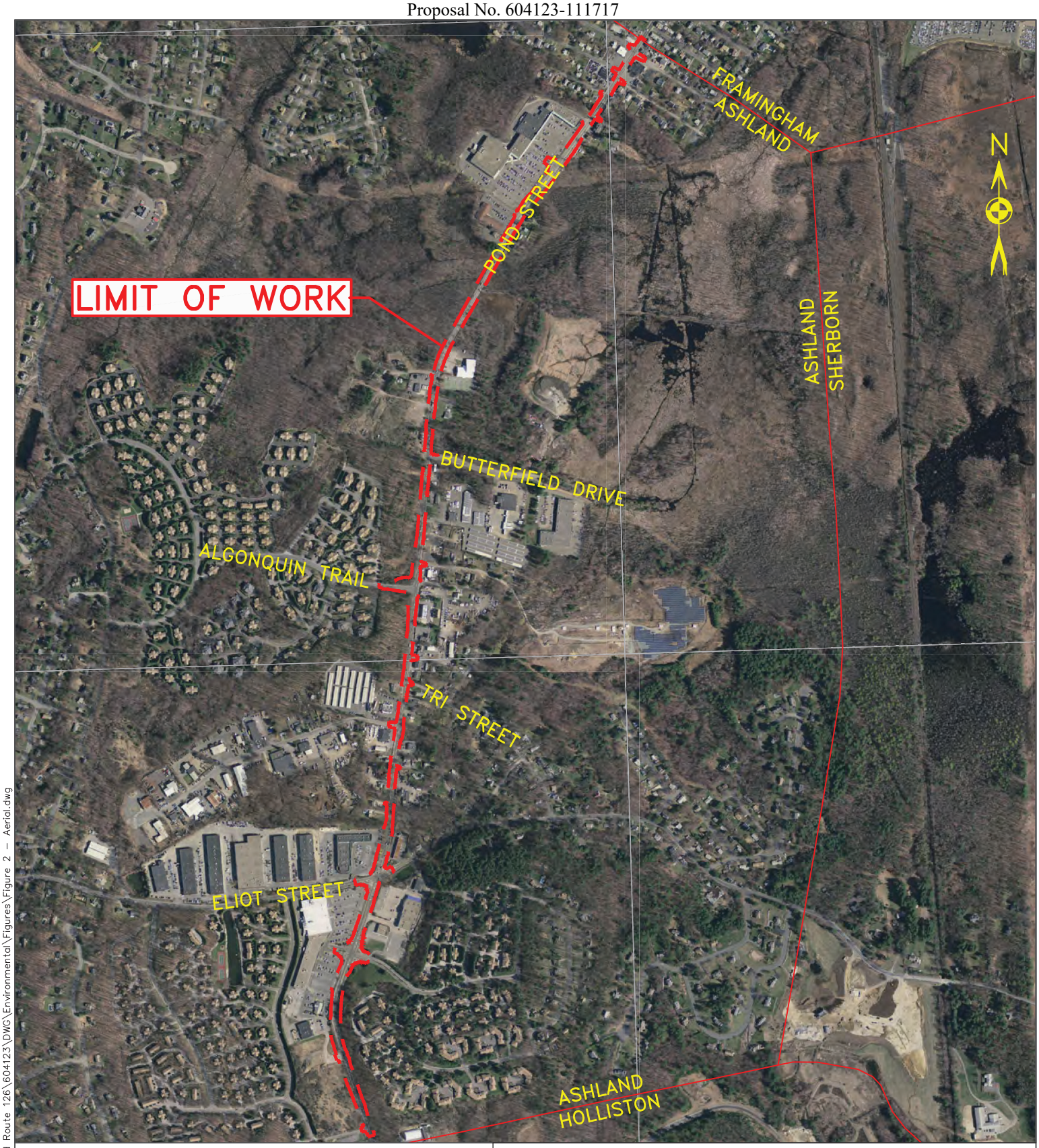
FROM THE FRAMINGHAM TOWN LINE TO THE HOLLISTON TOWN LINE, ASHLAND, MA

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS
239 LITTLETON RD, WESTFORD, MA (978) 923-0400
24 ALBION RD, LINCOLN, RI (401) 305-7895

PREPARED FOR:
massDOT
Massachusetts Department of Transportation
Highway Division

SCALE: AS NOTED	PROJECT NO. 13033.044	FIGURE 1
DATE: 05/31/2017	DRAWN BY: EA	
REVISED:	CHECKED BY: DS	

F:\Projects\2013\13033\13033.04X - Ahsland Route 126\604123\DWG\Environmental\Figures\Figure 1 - USGS.dwg



F:\Projects\2013\13033\13033.04X - Ahsland Route 126\604123\DWG\Environmental\Figures\Figure 2 - Aerial.dwg

SCALE IN FEET

500 0 500 1000

NOTE: DATA TAKEN FROM MASSGIS

AERIAL LOCUS MAP

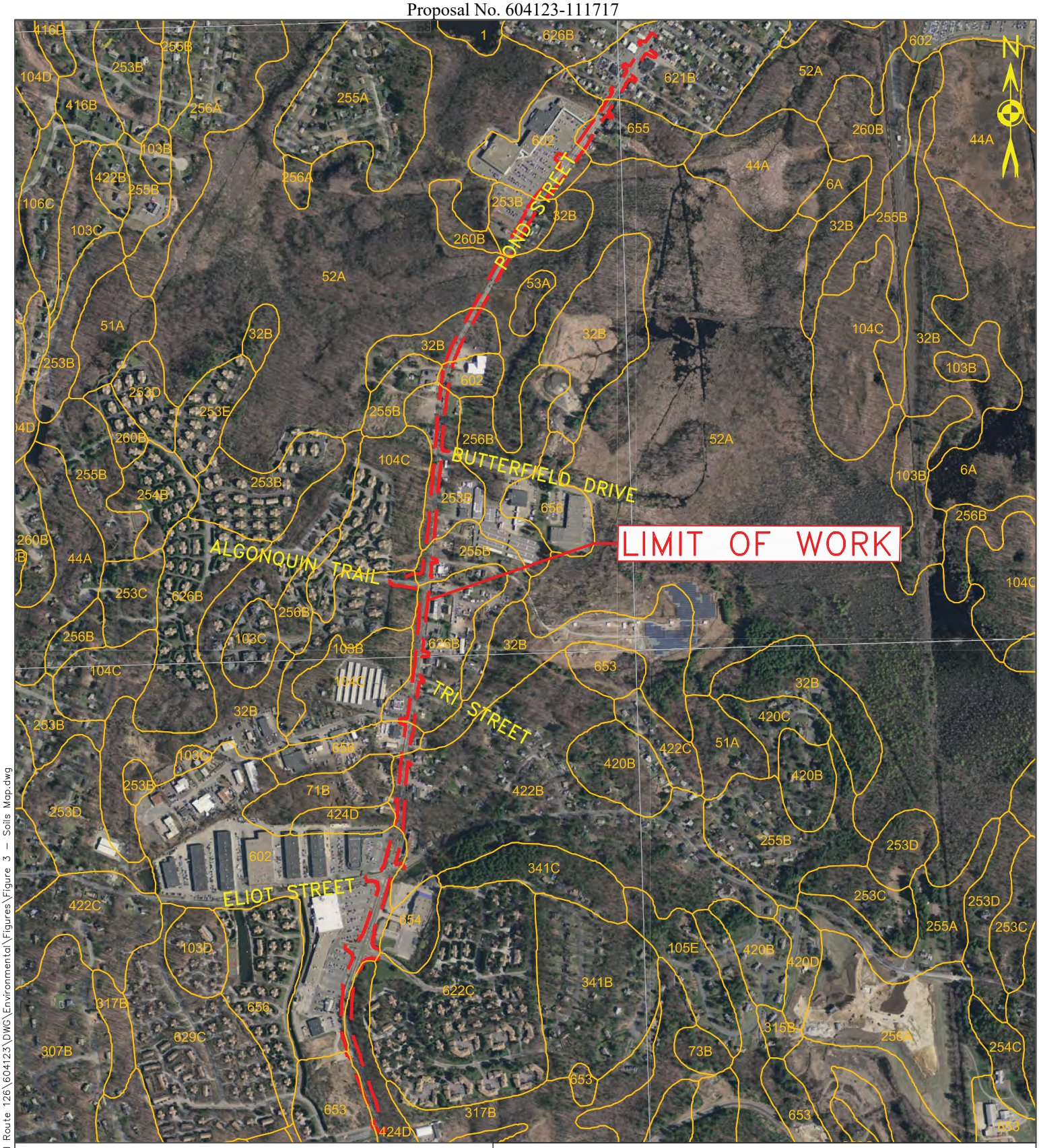
RECONSTRUCTION ON ROUTE 126 (POND STREET)

FROM THE FRAMINGHAM TOWN LINE TO THE HOLLISTON TOWN LINE, ASHLAND, MA

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS
239 LITTLETON RD, WESTFORD, MA (978) 923-0400
24 ALBION RD, LINCOLN, RI (401) 305-7895

PREPARED FOR:
massDOT
Massachusetts Department of Transportation
Highway Division

SCALE: AS NOTED	PROJECT NO. 13033.044	FIGURE 2
DATE: 05/31/2017	DRAWN BY: EA	
REVISED:	CHECKED BY: DS	



NOTE:
DATA TAKEN FROM MASSGIS

SCALE IN FEET

500 0 500 1000

1" = 1000'

SOILS MAP

RECONSTRUCTION ON ROUTE 126 (POND STREET)

FROM THE FRAMINGHAM TOWN LINE TO THE HOLLISTON TOWN LINE, ASHLAND, MA

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS
239 LITTLETON RD, WESTFORD, MA (978) 923-0400
24 ALBION RD, LINCOLN, RI (401) 305-7895

PREPARED FOR:
massDOT
Massachusetts Department of Transportation
Highway Division

SCALE: AS NOTED	PROJECT NO. 13033.044	FIGURE 3
DATE: 06/01/2017	DRAWN BY: EA	
REVISED:	CHECKED BY: DS	

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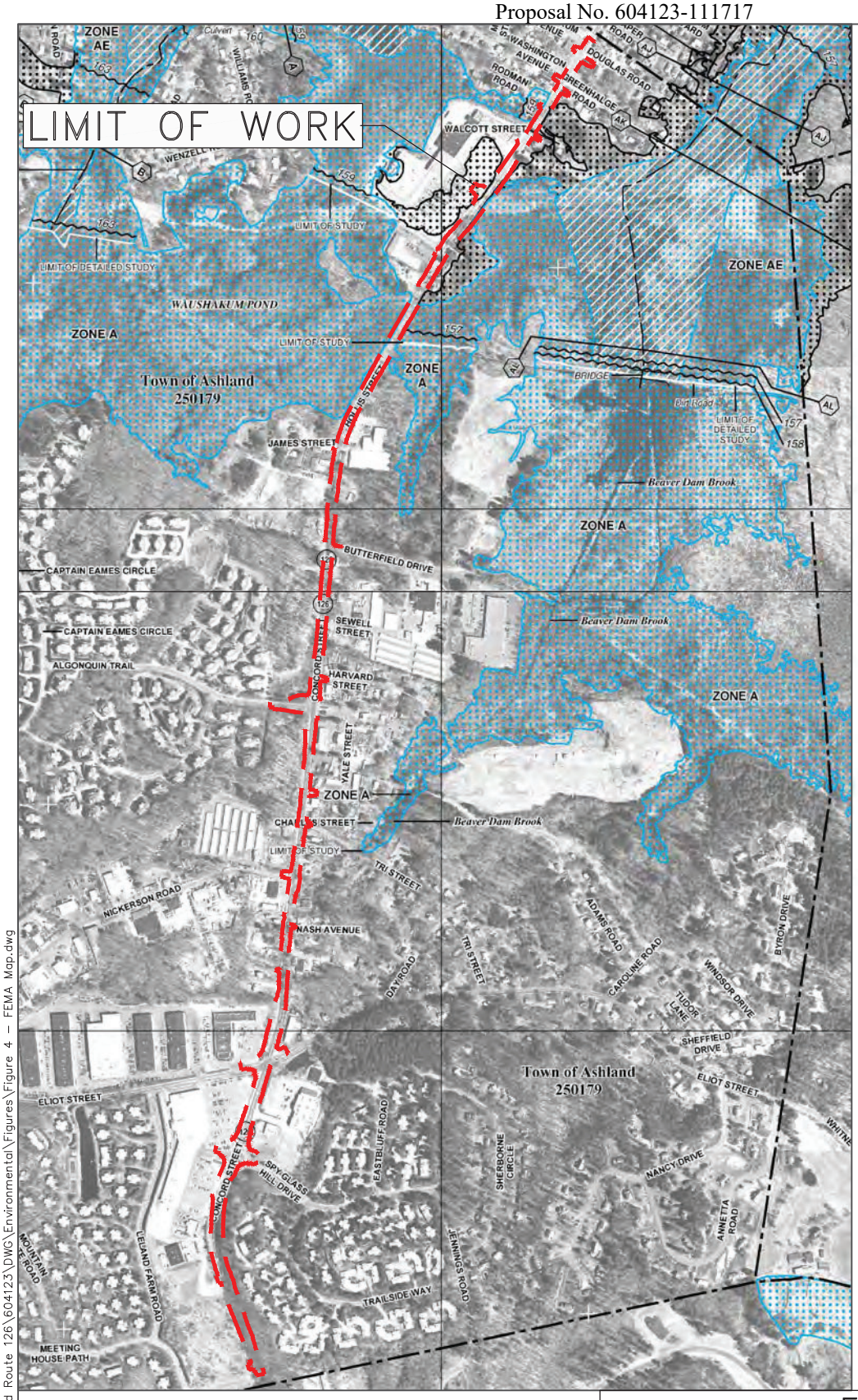

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equalled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance Floodplain Boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 4969000 M — 1000-meter ticks: Massachusetts State Plane Mainland Zone (FIPS Zone 2001), Lambert Conformal Conic projection
- 5489000 N — 1000-meter Universal Transverse Mercator grid values, zone 19
- DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
June 4, 2010

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

July 7, 2014 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to add roads and road names, and to incorporate previously issued Letters of Map Revision

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

NOTE:
THE FLOOD ZONE DATA SHOWN IS TAKEN FROM THE FEDERAL INSURANCE RATE MAPS (FIRM) FOR THE TOWN OF ASHLAND, MA. (FIRM COMMUNITY PANELS 25017C0631F AND 25017C0518F, DATED 07/07/2014.)

SCALE IN FEET

500 0 500 1000

1" = 1000'

FEMA MAP

RECONSTRUCTION ON ROUTE 126 (POND STREET)

FROM THE FRAMINGHAM TOWN LINE TO THE HOLLISTON TOWN LINE, ASHLAND, MA

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS
239 LITTLETON RD, WESTFORD, MA (978) 923-0400
24 ALBION RD, LINCOLN, RI (401) 305-7895

PREPARED FOR:
massDOT
Massachusetts Department of Transportation
Highway Division

SCALE: AS NOTED	PROJECT NO. 13033.044	FIGURE 4
DATE: 06/01/2017	DRAWN BY: EA	
REVISED:	CHECKED BY: DS	

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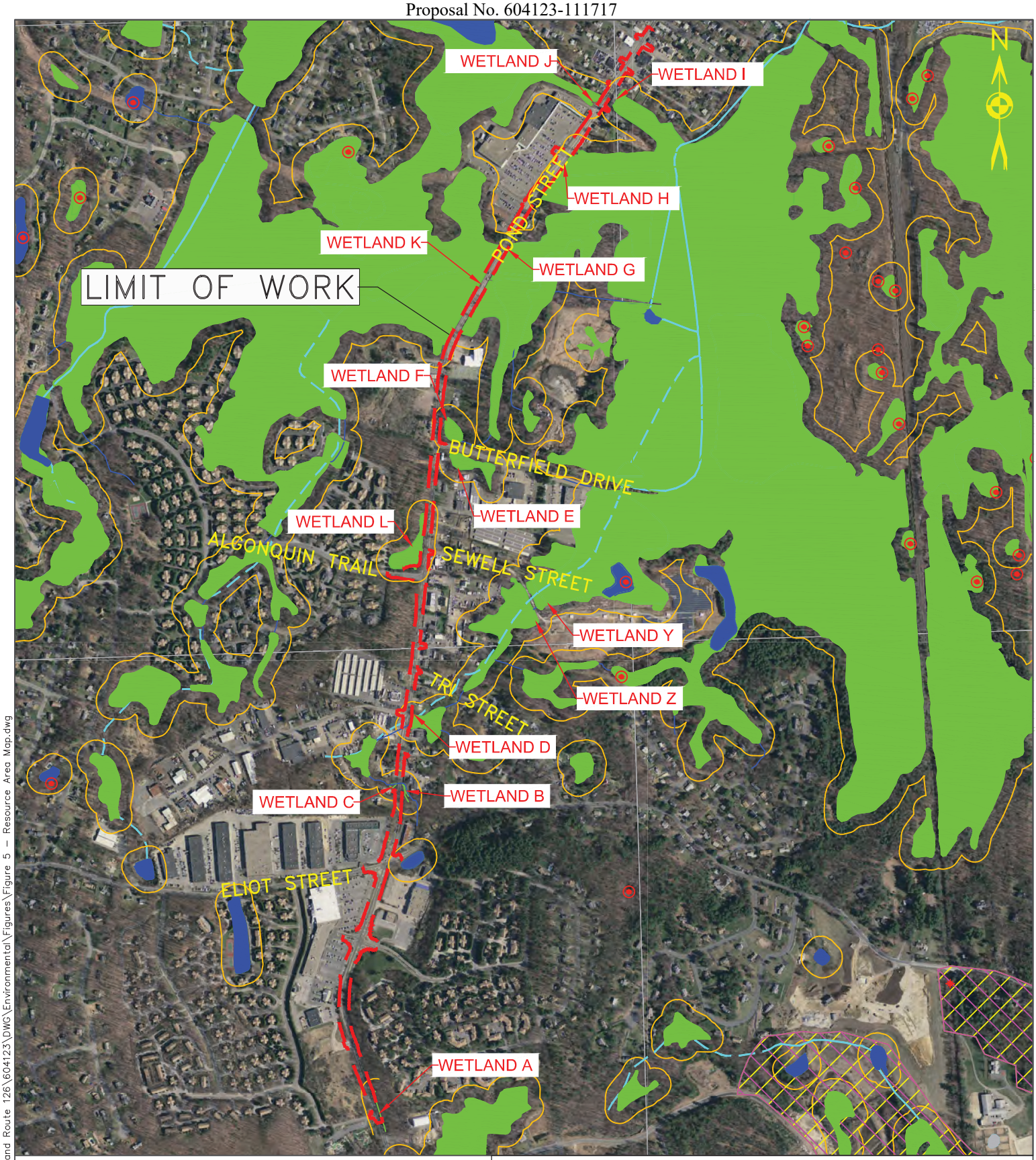

PROJECT AREA
NHESP ESTIMATED HABITATS OF RARE WILDLIFE
NHESP PRIORITY HABITATS OF RARE WILDLIFE
CERTIFIED VERNAL POOLS
POTENTIAL VERNAL POOLS
PERENNIAL STREAM
INTERMITTENT STREAM

WETLAND
HYDRAULIC CONNECTIONS
100-FT WETLAND BUFFER

SCALE IN FEET
500 0 500 1000
1" = 1000'
NOTE: DATA TAKEN FROM MASSGIS

RESOURCE AREA MAP

RECONSTRUCTION ON ROUTE 126 (POND STREET)
FROM THE FRAMINGHAM TOWN LINE TO THE HOLLISTON TOWN LINE, ASHLAND, MA

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
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24 ALBION RD, LINCOLN, RI (401) 305-7895

PREPARED FOR:
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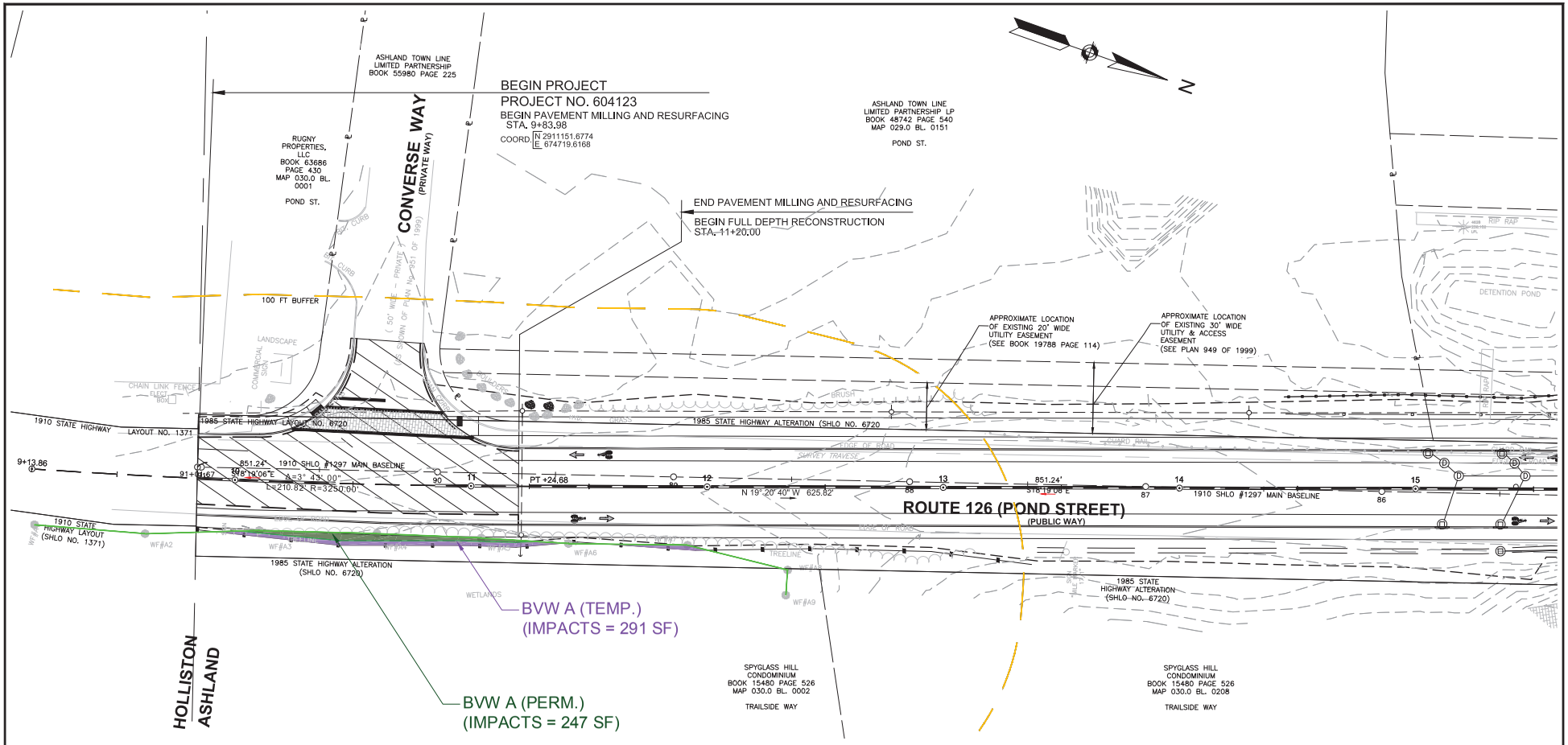
Massachusetts Department of Transportation
Highway Division

SCALE: AS NOTED	PROJECT NO. 13033.044
DATE: 06/01/17	DRAWN BY: EA
REVISED: 03/14/18	CHECKED BY: DS

FIGURE 5

F:\Projects\2013\13033\13033.04X - Ahsland Route 126\604123\DWG\Environmental\Figures\Figure 5 - Resource Area Map.dwg



LEGEND

- PERMANENT BVW IMPACT AREA
- TEMPORARY BVW IMPACT AREA
- BVW REPLICATION AREA
- BLSF IMPACT AREA
- BORDERING VEGETATED WETLAND (BVW)
- 100-FOOT BVW BUFFER
- BANK (INTERMITTENT STREAM)
- PERMANENT BANK IMPACT (INTERMITTENT STREAM)
- TEMPORARY BANK IMPACT (INTERMITTENT STREAM)
- 100-YEAR FLOODPLAIN (BLSF) LINE

20 0 20 40
SCALE IN FEET
1" = 20'

TOTAL AREA	
PERMANENT BVW IMPACT AREA (SF)	4507.00
TEMPORARY WETLAND IMPACT AREA (2') (SF)	3306.00
PERMANENT BANK IMPACT (LF)	83.00
TEMPORARY BANK IMPACTS (LF)	37.00
BLSF IMPACT (SF)	1240.00

RESOURCE AREA IMPACTS

ASHLAND, MA

ROUTE 126 (POND STREET), MASSDOT PROJECT #604123
FROM HOLLISTON TOWN LINE TO FRAMINGHAM TOWN LINE

PREPARED BY:
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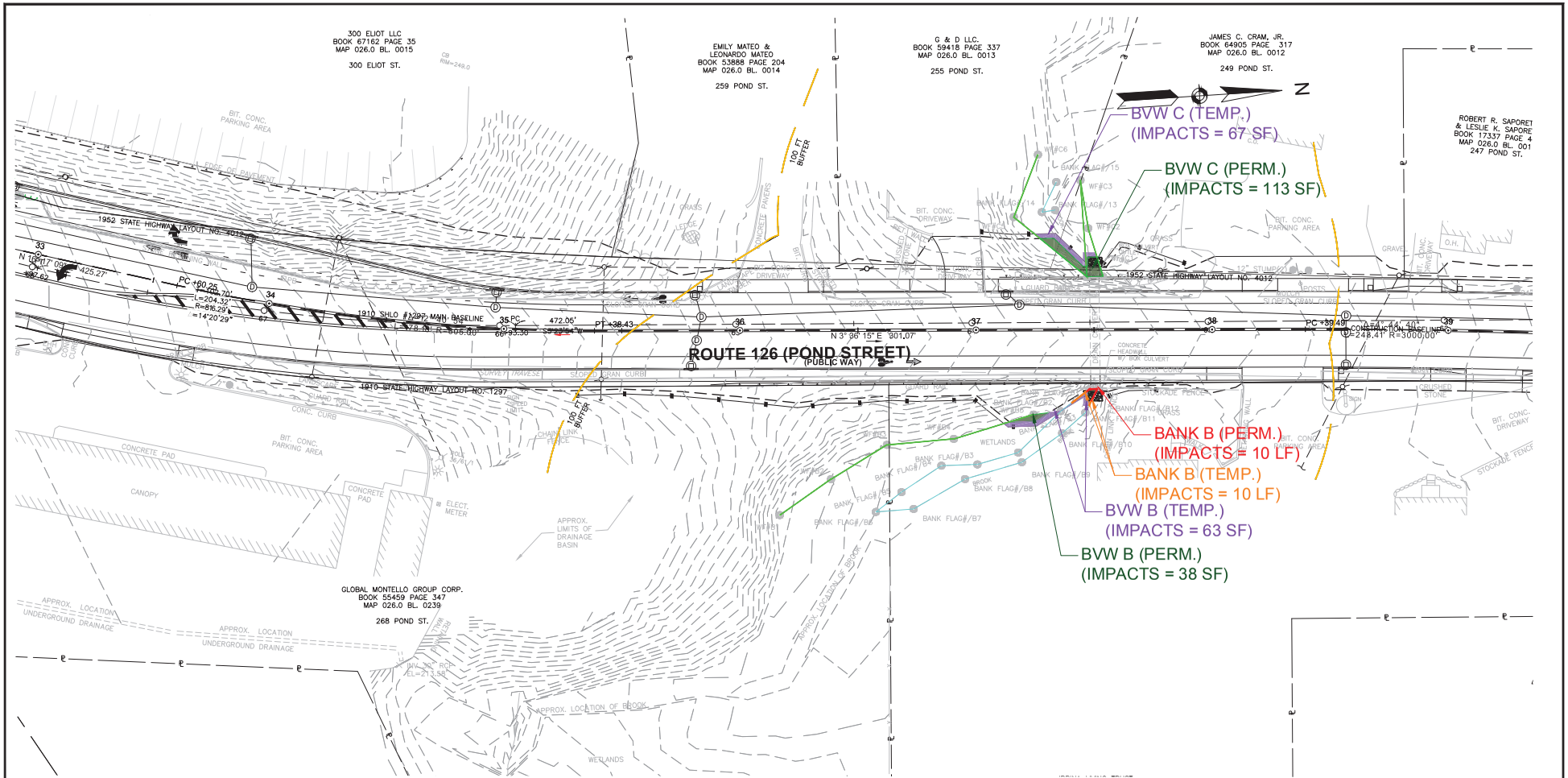
CIVIL AND STRUCTURAL ENGINEERS
239 LITTLETON RD, WESTFORD, MA (978) 923-0400
24 ALBION RD, LINCOLN, RI (401) 305-7895

PREPARED FOR:
massDOT
Massachusetts Department of Transportation
Highway Division

SCALE: AS NOTED | PROJECT NO. 13033.04
DATE: 04/04/2019 | DRAWN BY: OF
REVISED: 06/14/2019 | CHECKED BY: DS

FIGURE 8A

604123_ENV(WETLAND IMPACTS)_REV052419.DWG Plotted on 10-Nov-2017 9:18 AM



LEGEND

- PERMANENT BVW IMPACT AREA
- TEMPORARY BVW IMPACT AREA
- BVW REPLICATION AREA
- BLSF IMPACT AREA
- BORDERING VEGETATED WETLAND (BVW)
- 100-FOOT BVW BUFFER
- BANK (INTERMITTENT STREAM)
- PERMANENT BANK IMPACT (INTERMITTENT STREAM)
- TEMPORARY BANK IMPACT (INTERMITTENT STREAM)
- 100-YEAR FLOODPLAIN (BLSF) LINE

20 0 20 40
SCALE IN FEET
1" = 20'

RESOURCE AREA IMPACTS

ASHLAND, MA

ROUTE 126 (POND STREET), MASSDOT PROJECT #604123
FROM HOLLISTON TOWN LINE TO FRAMINGHAM TOWN LINE

PREPARED BY:
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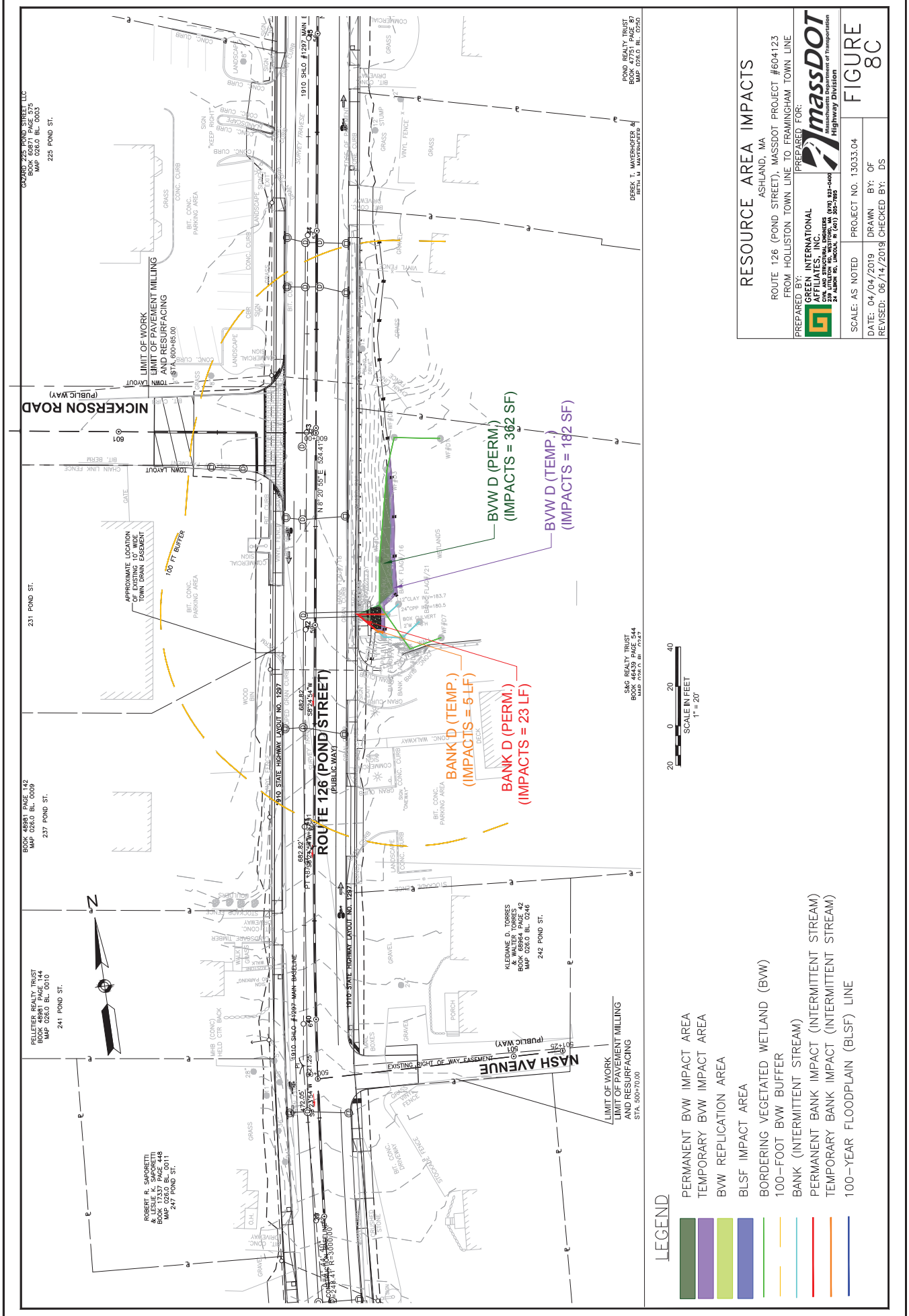
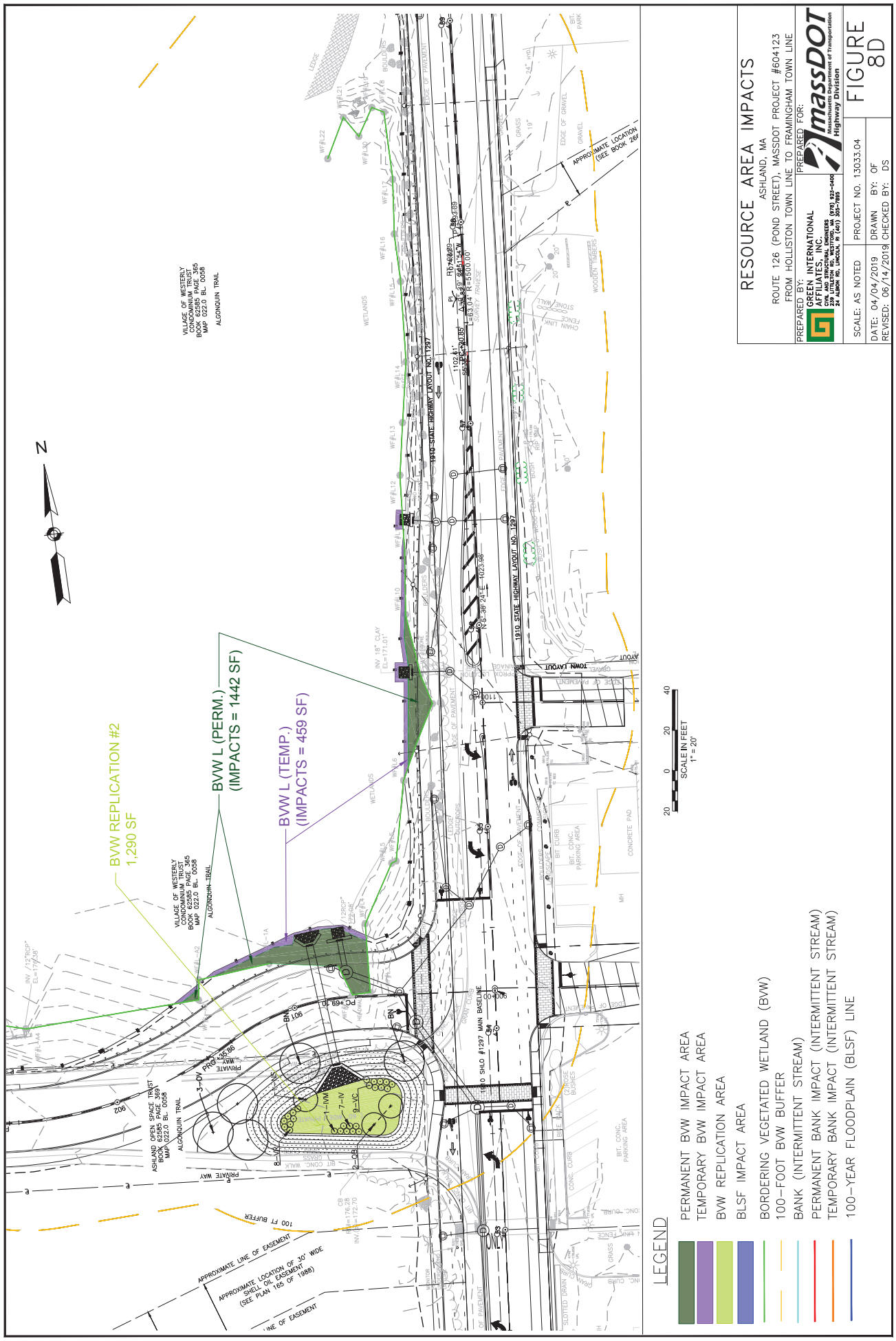
CIVIL AND STRUCTURAL ENGINEERS
239 LITTLETON RD, WESTFORD, MA (978) 923-0400
24 ALBION RD, LINCOLN, RI (401) 305-7895

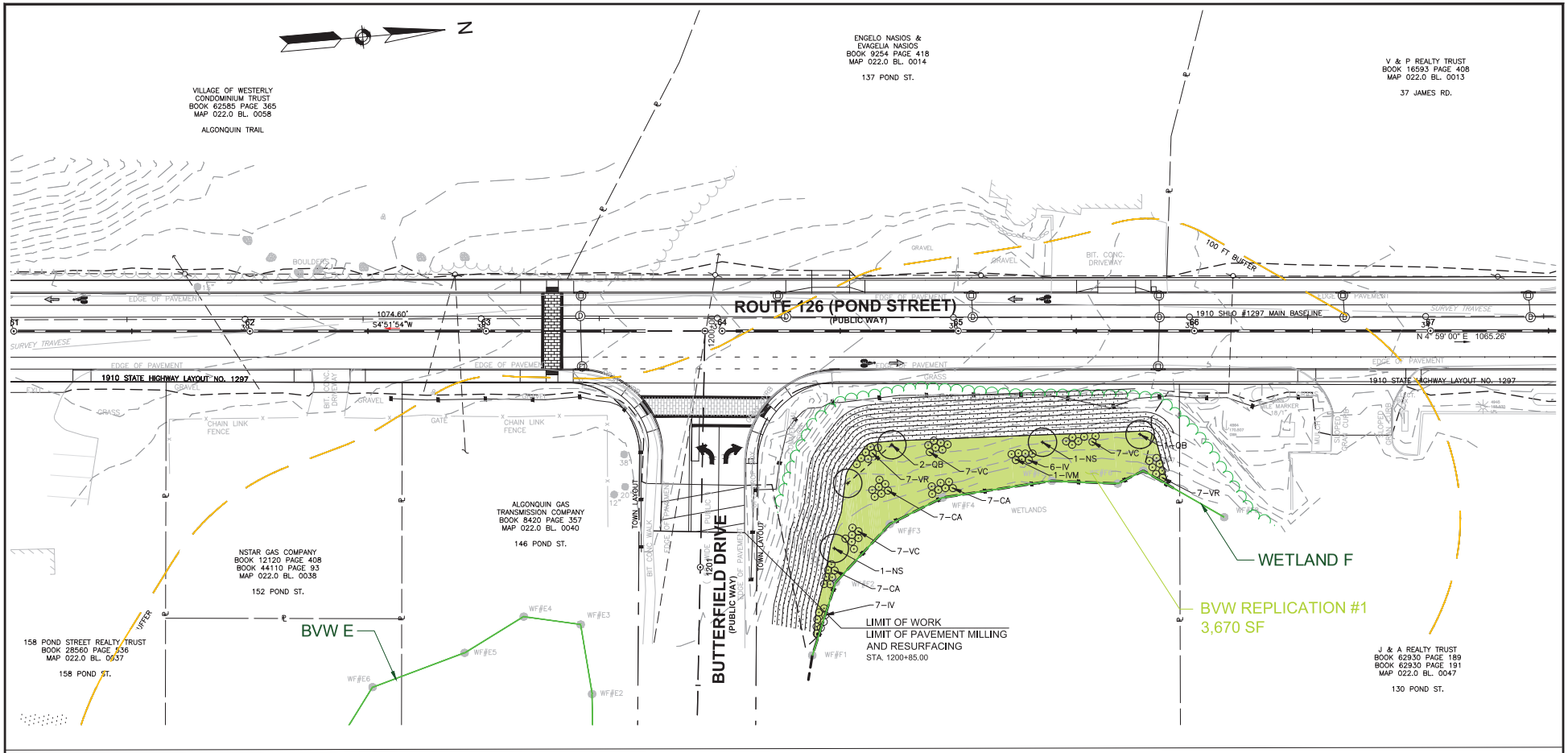
PREPARED FOR:
massDOT
Massachusetts Department of Transportation
Highway Division

SCALE: AS NOTED	PROJECT NO. 13033.04	FIGURE 8B
DATE: 04/04/2019 REVISED: 06/14/2019	DRAWN BY: OF CHECKED BY: DS	

604123_ENV(WETLAND IMPACTS)_REV052419.DWG Plotted on 10-Nov-2017 9:18 AM


RESOURCE AREA IMPACTS
ASHLAND, MA
ROUTE 126 (POND STREET), MASSDOT PROJECT #604123
FROM HOLLISTON TOWN LINE TO FRAMINGHAM TOWN LINE
PREPARED BY: GREEN INTERNATIONAL AFFILIATES, INC.
PREPARED FOR: massDOT
SCALE: AS NOTED
PROJECT NO. 13033.04
DATE: 04/04/2019
DRAWN BY: OF
REVISED: 06/14/2019
CHECKED BY: DS
FIGURE 8C
LEGEND
PERMANENT BVW IMPACT AREA
TEMPORARY BVW IMPACT AREA
BVW REPLICATION AREA
BLSF IMPACT AREA
BORDERING VEGETATED WETLAND (BVW)
100-FOOT BVW BUFFER
BANK (INTERMITTENT STREAM)
PERMANENT BANK IMPACT (INTERMITTENT STREAM)
TEMPORARY BANK IMPACT (INTERMITTENT STREAM)
100-YEAR FLOODPLAIN (BLSF) LINE
BVW D (PERM.) (IMPACTS = 382 SF)
BVW D (TEMP.) (IMPACTS = 192 SF)
BANK D (TEMP.) (IMPACTS = 5 LF)
BANK D (PERM.) (IMPACTS = 23 LF)
ROUTE 126 (POND STREET)
NICKERSON ROAD
NASH AVENUE
SCALE IN FEET
1" = 20'


BVW REPLICATION #2
1,290 SF
BVW L (PERM.)
(IMPACTS = 1442 SF)
BVW L (TEMP.)
(IMPACTS = 459 SF)
N
SCALE IN FEET
1" = 20'
LEGEND
PERMANENT BVW IMPACT AREA
TEMPORARY BVW IMPACT AREA
BVW REPLICATION AREA
BLSF IMPACT AREA
BORDERING VEGETATED WETLAND (BVW)
100-FOOT BVW BUFFER
BANK (INTERMITTENT STREAM)
PERMANENT BANK IMPACT (INTERMITTENT STREAM)
TEMPORARY BANK IMPACT (INTERMITTENT STREAM)
100-YEAR FLOODPLAIN (BLSF) LINE
1910 STATE HIGHWAY LAYOUT NO. 1297
TOWN LAYOUT
VILLAGE OF WESTERLY CONDOMINIUM TRUST
BOOK 62585 PAGE 365
MAP 022.0 BL. 0058
ALGONQUIN TRAIL
ASHLAND OPEN SPACE TRUST
BOOK 62585 PAGE 1693
MAP 022.0 BL. 0058
PRIVATE WAY
100 FT BUFFER
APPROXIMATE LOCATION OF 30' WIDE SHELL OIL EASEMENT (SEE PLAN 165 OF 1988)
APPROXIMATE LINE OF EASEMENT
APPROXIMATE LOCATION (SEE BOOK 26
1910 SHLO #1297 MAIN BASELINE
WETLANDS
EDGE OF PAVEMENT
EDGE OF GRAVEL
BIT. CONC. PARKING AREA
CONCRETE PAD
CHAIN LINK FENCE
STONE WALL
WOODEN TIMBERS
BOULDERS
GRASS
MH
CB
SMH
BIT. CONC. CURB
CONC. CURB
SLOTTED DRAIN
BIT. CONC. WALK
RESOURCE AREA IMPACTS
ASHLAND, MA
ROUTE 126 (POND STREET), MASSDOT PROJECT #604123
FROM HOLLISTON TOWN LINE TO FRAMINGHAM TOWN LINE
PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS
PREPARED FOR:
massDOT
Massachusetts Department of Transportation
Highway Division
SCALE: AS NOTED
PROJECT NO. 13033.04
FIGURE 8D
DATE: 04/04/2019
DRAWN BY: OF
REVISED: 06/14/2019
CHECKED BY: DS



LEGEND

- PERMANENT BVW IMPACT AREA
- TEMPORARY BVW IMPACT AREA
- BVW REPLICATION AREA
- BLSF IMPACT AREA
- BORDERING VEGETATED WETLAND (BVW)
- 100-FOOT BVW BUFFER
- BANK (INTERMITTENT STREAM)
- PERMANENT BANK IMPACT (INTERMITTENT STREAM)
- TEMPORARY BANK IMPACT (INTERMITTENT STREAM)
- 100-YEAR FLOODPLAIN (BLSF) LINE

20 0 20 40
SCALE IN FEET
1" = 20'

RESOURCE AREA IMPACTS

ASHLAND, MA

ROUTE 126 (POND STREET), MASSDOT PROJECT #604123
FROM HOLLISTON TOWN LINE TO FRAMINGHAM TOWN LINE

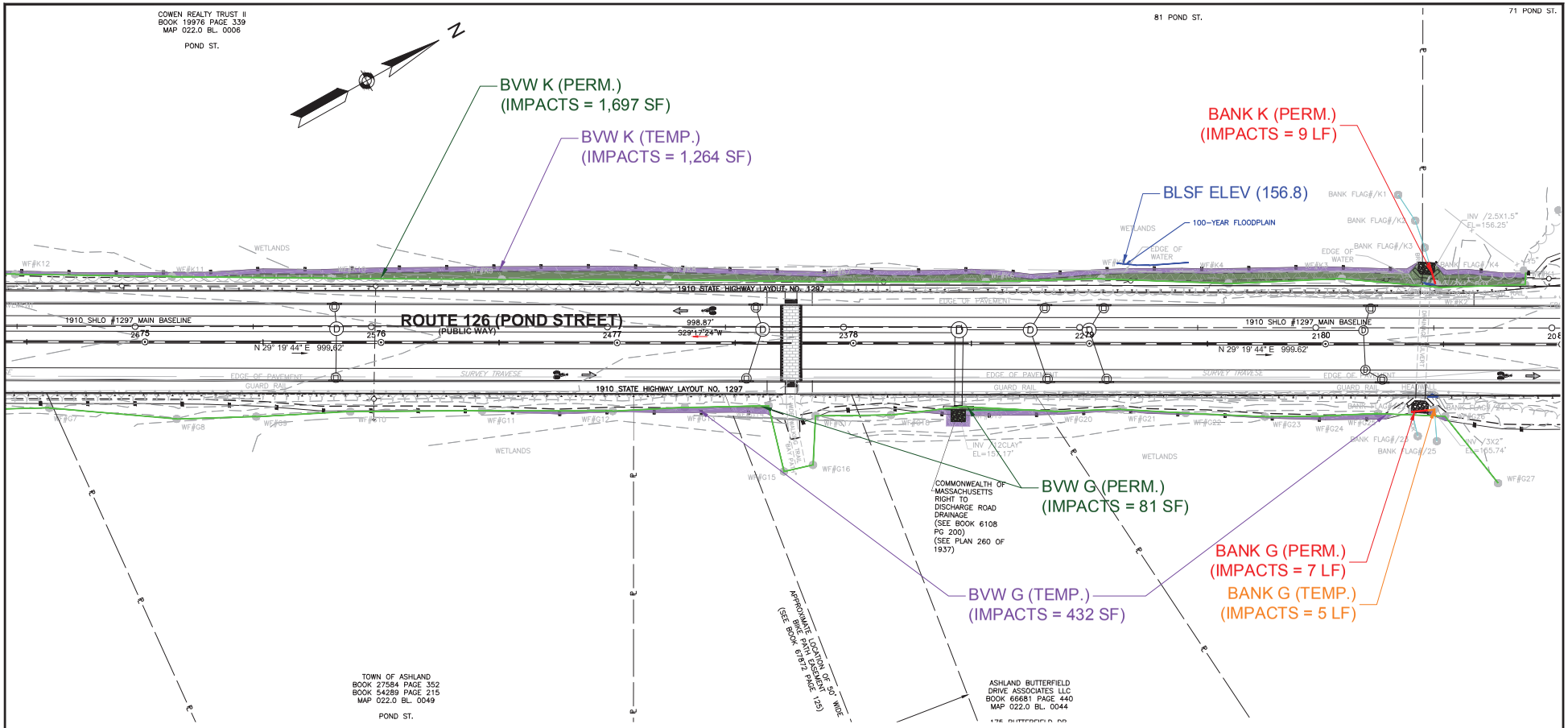
PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS
239 LITTLETON RD. WESTFORD, MA (978) 923-0400
24 ALBION RD. LINCOLN, RI (401) 305-7895

PREPARED FOR:
massDOT
Massachusetts Department of Transportation
Highway Division

SCALE: AS NOTED	PROJECT NO. 13033.04
DATE: 04/04/2019	DRAWN BY: OF
REVISED: 06/14/2019	CHECKED BY: DS

FIGURE 8E

604123_ENV(WETLAND IMPACTS)_REV052419.DWG Plotted on 10-Nov-2017 9:18 AM



LEGEND

- PERMANENT BVW IMPACT AREA
- TEMPORARY BVW IMPACT AREA
- BVW REPLICATION AREA
- BLSF IMPACT AREA
- BORDERING VEGETATED WETLAND (BVW)
- 100-FOOT BVW BUFFER
- BANK (INTERMITTENT STREAM)
- PERMANENT BANK IMPACT (INTERMITTENT STREAM)
- TEMPORARY BANK IMPACT (INTERMITTENT STREAM)
- 100-YEAR FLOODPLAIN (BLSF) LINE

RESOURCE AREA IMPACTS

ASHLAND, MA

ROUTE 126 (POND STREET), MASSDOT PROJECT #604123

FROM HOLLISTON TOWN LINE TO FRAMINGHAM TOWN LINE

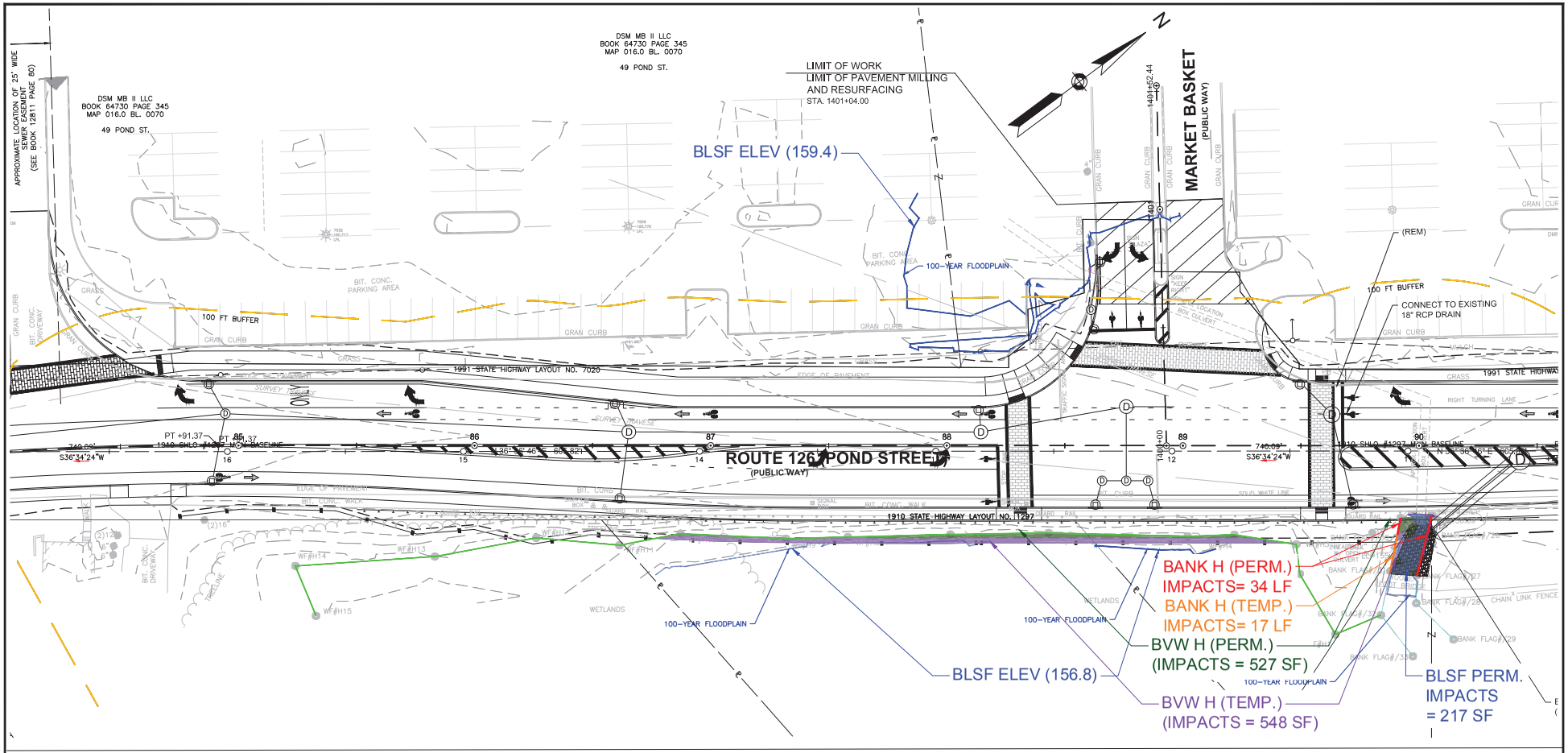
PREPARED BY: GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS
239 LITTLETON RD, WESTFORD, MA (978) 923-0400
24 ALBION RD, LINCOLN, RI (401) 305-7895

PREPARED FOR: massDOT Massachusetts Department of Transportation Highway Division

SCALE: AS NOTED	PROJECT NO. 13033.04	FIGURE 8F
DATE: 04/04/2019	DRAWN BY: OF	
REVISED: 06/14/2019	CHECKED BY: DS	

604123_ENV(WETLAND IMPACTS)_REV052419.DWG Plotted on 10-Nov-2017 9:18 AM

Proposal No. 604123-111717



LEGEND

- PERMANENT BVW IMPACT AREA
- TEMPORARY BVW IMPACT AREA
- BVW REPLICATION AREA
- BLSF IMPACT AREA (PERMANENT)
- BORDERING VEGETATED WETLAND (BVW)
- 100-FOOT BVW BUFFER
- BANK (INTERMITTENT STREAM)
- PERMANENT BANK IMPACT (INTERMITTENT STREAM)
- TEMPORARY BANK IMPACT (INTERMITTENT STREAM)
- 100-YEAR FLOODPLAIN (BLSF) LINE

20 0 20 40
SCALE IN FEET
1" = 20'

RESOURCE AREA IMPACTS

ASHLAND, MA
ROUTE 126 (POND STREET), MASSDOT PROJECT #604123
FROM HOLLISTON TOWN LINE TO FRAMINGHAM TOWN LINE

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS
239 LITTLETON RD, WESTFORD, MA (978) 923-0400
24 ALBION RD, LINCOLN, RI (401) 305-7895

PREPARED FOR:
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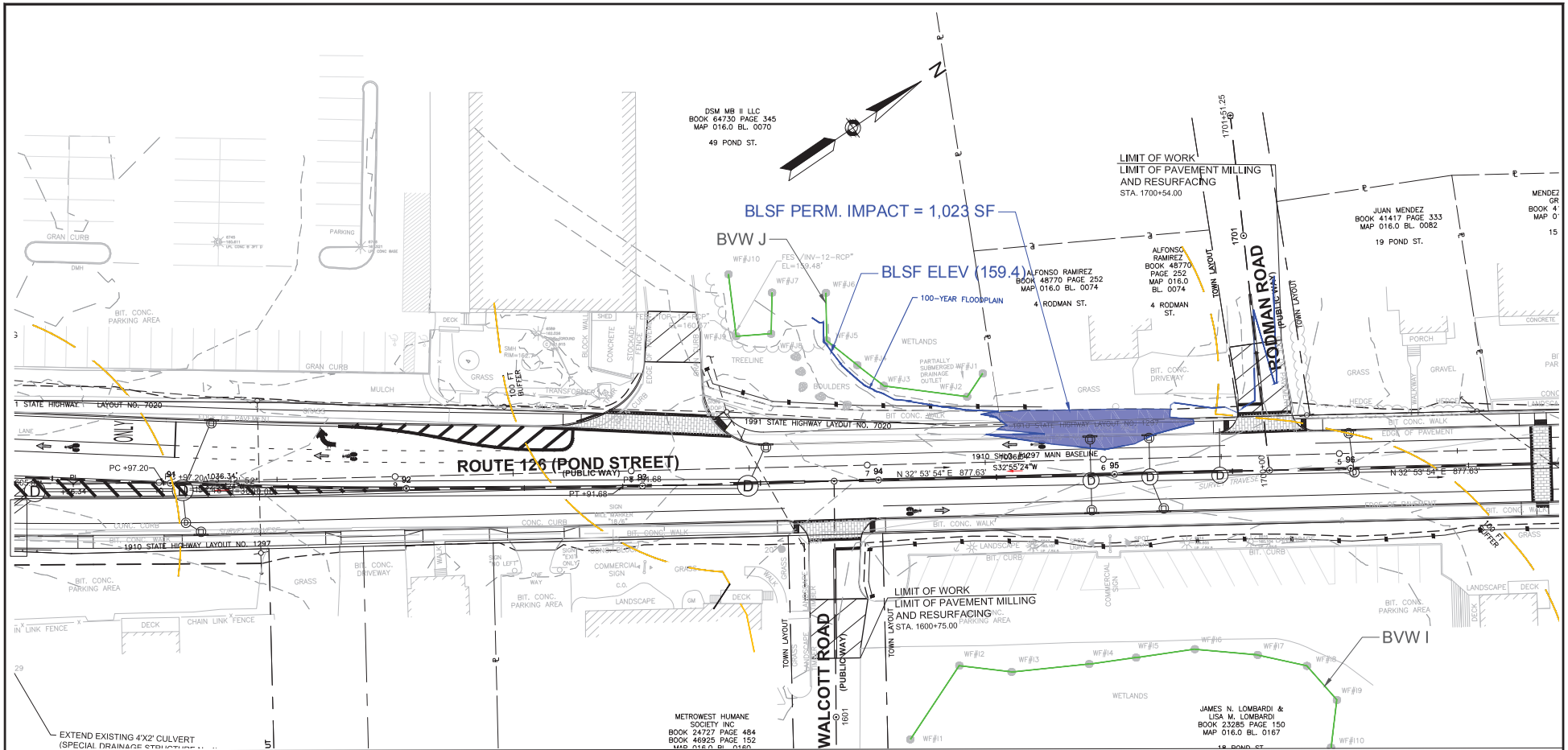
Massachusetts Department of Transportation
Highway Division

SCALE: AS NOTED	PROJECT NO. 13033.04
DATE: 04/04/2019 REVISED: 06/14/2019	DRAWN BY: OF CHECKED BY: DS

FIGURE 8G

A00860 - 93

Proposal No. 604123-111717



LEGEND

- PERMANENT BVW IMPACT AREA
- TEMPORARY BVW IMPACT AREA
- BVW REPLICATION AREA
- BLSF IMPACT AREA (PERMANENT)
- BORDERING VEGETATED WETLAND (BVW)
- 100-FOOT BVW BUFFER
- BANK (INTERMITTENT STREAM)
- PERMANENT BANK IMPACT (INTERMITTENT STREAM)
- TEMPORARY BANK IMPACT (INTERMITTENT STREAM)
- 100-YEAR FLOODPLAIN (BLSF) LINE

20 0 20 40
SCALE IN FEET
1" = 20'

RESOURCE AREA IMPACTS

ASHLAND, MA

ROUTE 126 (POND STREET), MASSDOT PROJECT #604123
FROM HOLLISTON TOWN LINE TO FRAMINGHAM TOWN LINE

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS
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PREPARED FOR:
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Massachusetts Department of Transportation
Highway Division

SCALE: AS NOTED	PROJECT NO. 13033.04	FIGURE 8H
DATE: 04/04/2019 REVISED: 06/14/2019	DRAWN BY: OF CHECKED BY: DS	

604123_ENV(WETLAND IMPACTS)_REV052419.DWG Plotted on 10-Nov-2017 9:18 AM

APPENDIX E

STORMWATER MANAGEMENT REPORT

APPENDIX F

DRAWINGS FOR NOI SUBMISSION (BOUND SEPARATELY)

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

PLAN AND PROFILE OF

ROUTE 126 (POND STREET)

IN THE TOWN OF

ASHLAND

MIDDLESEX COUNTY

FEDERAL AID PROJECT NO. NFA

NOI SUBMISSION - 7/1/2019
REVISED 10/22/2019, 12/09/2019

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	1	311
PROJECT FILE NO. 604123			

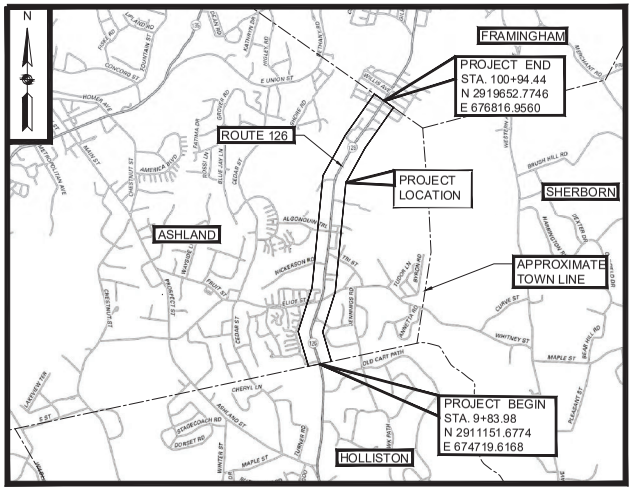
TITLE SHEET & INDE□

604123_HDGI(TITLE).DWG 28-Nov-2017

THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 1988, AS AMENDED, THE SUPPLEMENTAL SPECIFICATIONS DATED APRIL 1, 2019, THE INTERIM SUPPLEMENTAL SPECIFICATIONS CONTAINED IN THIS CONTRACT, THE OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE LATEST MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS WITH MASSACHUSETTS AMENDMENTS AND THE STANDARD MUNICIPAL TRAFFIC CODE, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1996 CONSTRUCTION AND TRAFFIC STANDARD DETAILS (AS RELATES TO THE PAVEMENT MARKINGS DETAILS ONLY), THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK, THE PLANS AND THESE SPECIAL PROVISIONS, WILL GOVERN.

INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET & INDEX
2	LEGEND & ABBREVIATIONS
3	GENERAL NOTES
4	KEY PLAN
5	BORING LOCATION PLAN (NOT INCLUDED IN NOI)
6-10	BORING LOGS (NOT INCLUDED IN NOI)
11-13	TYPICAL SECTIONS
14-30	CONSTRUCTION PLANS
31-66	CONSTRUCTION PROFILES
67-83	CURB TIE PLANS (NOT INCLUDED IN NOI)
84-86	GRADING PLANS (NOT INCLUDED IN NOI)
87-91	BASELINE TIES AND SKETCHES (NOT INCLUDED IN NOI)
92-108	DRAINAGE AND UTILITY PLANS
109-114	DRAINAGE SCHEDULE (NOT INCLUDED IN NOI)
115-130	PAVEMENT MARKING & SIGNING PLANS (NOT INCLUDED IN NOI)
131	SIGN SUMMARY SHEETS (NOT INCLUDED IN NOI)
132-137	TRAFFIC SIGNAL PLANS (NOT INCLUDED IN NOI)
138-143	TRAFFIC SIGNAL DETAILS (NOT INCLUDED IN NOI)
144-155	TEMPORARY TRAFFIC CONTROL PLANS (NOT INCLUDED IN NOI)
156-172	LIGHTING PLANS (NOT INCLUDED IN NOI)
173-174	LIGHTING DETAILS (NOT INCLUDED IN NOI)
175-182	LANDSCAPE PLANS (NOT INCLUDED IN NOI)
183-184	LANDSCAPE AND WETLAND REPLICATION DETAILS
185	WETLAND REPLICATION PLANS
186	CONSTRUCTION DETAILS
187-190	DRAINAGE DETAILS
191-194	WHEELCHAIR RAMP AND DRIVEWAY DETAILS (NOT INCLUDED IN NOI)
195-200	WALL PLANS (NOT INCLUDED IN NOI)
201-311	CROSS SECTIONS (NOT INCLUDED IN NOI)



LOCATION PLAN

2000 0 2000 4000

SCALE 1" □ 2000'

LENGTH OF PROJECT □ 9,110.46 FEET □ 1.725 MILES

DESIGN DESIGNATION - ROUTE 126 (POND STREET)

DESIGN SPEED	45 MPH - Be□n to 15+00, 36+00 to 81+00 40 MPH - 15+00 to 36+00, 81+00 to End	
	Fra□n□a□ To□n Line	So□□o□S□□□la□□Hll Dr
ADT (2014)	17,730	12,100
ADT (2034)	19,590	13,370
K	7.8	8.1
D	53.4	55.3
T (PEAK HOUR)	6.7	8.9
T (AVERAGE DAY)	7.5	9.3
DHV	1,528	1,083
DDHV	816	599
FUNCTIONAL CLASSIFICATION	URBAN PRINCIPAL ARTERIAL	URBAN PRINCIPAL ARTERIAL

COMMONWEALTH OF MASSACHUSETTS
PAUL G. MILEWSKI
CIVIL
No. 48166
REGISTERED PROFESSIONAL ENGINEER
12-9-19

DATE	DESCRIPTION	REV #
10/5/2018	REVISED 75% SUBMISSION	1

massDOT Highway Division

RE□OMMENDED FOR APPRO□AL

□HIEF ENGINEER DATE

GREEN INTERNATIONAL AFFILIATES, INC.
TRANSPORTATION | STRUCTURAL | WATER RESOURCES | CIVIL/SITE
239 LITTLETON ROAD, SUITE 3 WESTFORD, MA 01886
978.923.0400 | □□□.□reen□nt□.□□

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGH□AY ADMINISTRATION

APPRO□ED□

DI□ISION ADMINISTRATOR DATE

APPRO□ED

HIGH□AY ADMINISTRATOR DATE

A00860 - 101

Proposal No. 604123-111717

GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
JB	JB	JERSEY BARRIER
CB	CB	CATCH BASIN
		CATCH BASIN CURB INLET
FP	FP	FLAG POLE
GP	GP	GAS PUMP
MB	MB	MAIL BOX
		POST SQUARE
		POST CIRCULAR
WELL	WELL	WELL
EHH	EHH	ELECTRIC HANDHOLE
		FENCE GATE POST
GG	GG	GAS GATE
BHL #	BHL #	BORING HOLE
MW #	MW #	MONITORING WELL
TP #	TP #	TEST PIT
		HYDRANT
		LIGHT POLE
CO.BD.		COUNTY BOUND
		GPS POINT
Ⓒ	Ⓒ	CABLE MANHOLE
Ⓓ	Ⓓ	DRAINAGE MANHOLE
Ⓔ	Ⓔ	ELECTRIC MANHOLE
Ⓖ	Ⓖ	GAS MANHOLE
Ⓜ	Ⓜ	MISC MANHOLE
Ⓢ	Ⓢ	SEWER MANHOLE
Ⓣ	Ⓣ	TELEPHONE MANHOLE
Ⓦ	Ⓦ	WATER MANHOLE
MHB	MHB	MASSACHUSETTS HIGHWAY BOUND
MON		MONUMENT
SB		STONE BOUND
TB		TOWN OR CITY BOUND
		TRAVERSE OR TRIANGULATION STATION
TPL or GUY	TPL or GUY	TROLLEY POLE OR GUY POLE
HTP		TRANSMISSION POLE
UFB	UFB	UTILITY POLE W/ FIREBOX
UPDL	UPDL	UTILITY POLE WITH DOUBLE LIGHT
ULT	ULT	UTILITY POLE W / 1 LIGHT
UPL	UPL	UTILITY POLE
		BUSH
SIZE & TYPE		TREE
		STUMP
		SWAMP / MARSH
WG	WG	WATER GATE
PM	PM	PARKING METER
		OVERHEAD CABLE/WIRE
		CURBING
100 99		CONTOURS (ON-THE-GROUND SURVEY DATA)
100 99		CONTOURS (PHOTOGRAMMETRIC DATA)
		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND WATER MAIN (DOUBLE LINE 24 INCH AND OVER)
		BALANCED STONE WALL
		GUARD RAIL - STEEL POSTS
		GUARD RAIL - WOOD POSTS
		CHAIN LINK OR METAL FENCE
		WOOD FENCE
		HAY BALES/SILT FENCE
		TREE LINE
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		EDGE OF PAVEMENT
		LIMIT OF MICROMILLING AND OVERLAY
		BANK OF RIVER OR STREAM
		BORDER OF WETLAND
		100 FT WETLAND BUFFER
		200 FT RIVERFRONT BUFFER
		STATE HIGHWAY LAYOUT
		TOWN OR CITY LAYOUT
		COUNTY LAYOUT
		RAILROAD SIDELINE
		TOWN OR CITY BOUNDARY LINE
		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT
		COMPOST FILTER TUBES
		HAND HOLE FOR LIGHT POST

TRAFFIC SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
1	1	CONTROLLER PHASE ACTUATED
		TRAFFIC SIGNAL HEAD (SIZE AS NOTED)
		WIRE LOOP DETECTOR (6' □6' TYP UNLESS OTHERWISE SPECIFIED)
		VIDEO DETECTION CAMERA
		MICROWAVE DETECTOR
		PEDESTRIAN PUSH BUTTON, SIGN (DIRECTIONAL ARROW AS SHOWN) AND SADDLE
		EMERGENCY PREEMPTION CONFIRMATION STROBE LIGHT
		VEHICULAR SIGNAL HEAD
		VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED
		FLASHING BEACON
		PEDESTRIAN SIGNAL HEAD, (TYPE AS NOTED OR AS SPECIFIED)
RRSG	RRSG	RAILROAD SIGNAL
OR		SIGNAL POST AND BASE (ALPHA-NUMERIC DESIGNATION NOTED)
	W	MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)
		HIGH MAST POLE OR TOWER
		SIGN AND POST
		SIGN AND POST (2 POSTS)
	W	MAST ARM WITH LUMINAIRE
		OPTICAL PRE-EMPTION DETECTOR
		CONTROL CABINET, GROUND MOUNTED
		CONTROL CABINET, POLE MOUNTED
		FLASHING BEACON CONTROL AND METER PEDESTAL
		LOAD CENTER ASSEMBLY
		PULL BOX 12"□12" (OR AS NOTED)
		ELECTRIC HANDHOLE 12"□24" (OR AS NOTED)
		TRAFFIC SIGNAL CONDUIT

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		PAVEMENT ARROW - WHITE
ONLY	ONLY	LEGEND "ONLY" - WHITE
	SL	STOP LINE - 12"
	CW	CROSSWALK
	SWL	SOLID WHITE LINE - 6"
	SYL	SOLID YELLOW LINE - 6"
	BWL	BROKEN WHITE LINE - 6" (10' LINE SEGMENT, 30' GAP)
	BYL	BROKEN YELLOW LINE - 6" (10' LINE SEGMENT, 30' GAP)
	DWL	DOTTED WHITE LINE - 6" (3' LINE SEGMENT, 9' GAP)
	DYL	DOTTED YELLOW LINE - 6" (3' LINE SEGMENT, 9' GAP)
	DWLE□	DOTTED WHITE LINE EXTENSION - 6" (2' LINE SEGMENT, 6' GAP)
	DWBLE□	DOTTED WHITE BICYCLE LINE EXTENSION - 6" (2' LINE SEGMENT, 2' GAP)
	DYLE□	DOTTED YELLOW LINE EXTENSION - 6" (2' LINE SEGMENT, 6' GAP)
	DBWL	DOUBLE WHITE LINE - 6"
	DBYL	DOUBLE YELLOW LINE - 6"
	SWGL	SOLID WHITE GORE LINE - 12"
	SYGL	SOLID YELLOW GORE LINE - 12"
	YL	YIELD LINE
		SLOTTED PAVEMENT MARKER TWO-WAY YELLOW/YELLOW

ABBREVIATIONS

GENERAL

AADT	ANNUAL AVERAGE DAILY TRAFFIC
ABAN	ABANDON
ADJ	ADJUST
APPROX.	APPROXIMATE
A.C.	ASPHALT CONCRETE
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE
BIT.	BITUMINOUS
BC	BOTTOM OF CURB
BD.	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCHMARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
BR.	BRIDGE
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CC	CEMENT CONCRETE
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CI	CURB INLET
CIP	CAST IRON PIPE
CLDI	CEMENT LINED DUCTILE IRON
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CSP	CORRUGATED STEEL PIPE
CO.	COUNTY
CONC	CONCRETE
CONT	CONTINUOUS
CONST	CONSTRUCTION
CR GR	CROWN GRADE
DHV	DESIGN HOURLY VOLUME
DI	DROP INLET
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DW	STEADY DON'T WALK - PORTLAND ORANGE
DWY	DRIVEWAY
ELEV (or EL.)	ELEVATION
EMB	EMBANKMENT
EOP	EDGE OF PAVEMENT
EXIST (or EX)	EXISTING
EXC	EXCAVATION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FDN.	FOUNDATION
FLDSTN	FIELDSTONE
GAR	GARAGE
GD	GROUND
GG	GAS GATE
GI	GUTTER INLET
GIP	GALVANIZED IRON PIPE
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
HDW	HEADWALL
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HYD	HYDRANT
INV	INVERT
JCT	JUNCTION
L	LENGTH OF CURVE
LB	LEACH BASIN
LP	LIGHT POLE
LT	LEFT
MAX	MAXIMUM
MB	MAILBOX
MH	MANHOLE
MHB	MASSACHUSETTS HIGHWAY BOUND
MIN	MINIMUM
NIC	NOT IN CONTRACT
NO.	NUMBER
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
P.G.L.	PROFILE GRADE LINE
PI	POINT OF INTERSECTION
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE
PROJ	PROJECT
PROP	PROPOSED
PSB	PLANTABLE SOIL BORROW
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
PVMT	PAVEMENT

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	2	308
PROJECT FILE NO.	604123		

LEGEND & A□□RE□IATIONS
RE□ISED □14□2□1□

ABBREVIATIONS (□ont.)

GENERAL

PWW	PAVED WATER WAY
R	RADIUS OF CURVATURE
R&D	REMOVE AND DISPOSE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDWY	ROADWAY
REM	REMOVE
RET	RETAIN
RET WALL	RETAINING WALL
RMD	REMODEL
ROW	RIGHT OF WAY
RR	RAILROAD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RT	RIGHT
RTP	ROADWAY TREE PROTECTION
SB	STONE BOUND
SHLD	SHOULDER
SMH	SEWER MANHOLE
ST	STREET
STA	STATION
SSD	STOPPING SIGHT DISTANCE
SHLO	STATE HIGHWAY LAYOUT LINE
SW	SIDEWALK
T	TANGENT DISTANCE OF CURVE/TRUCK %
TAN	TANGENT
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SLOPE
TYP	TYPICAL
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
WCR	WHEEL CHAIR RAMP
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
X-SECT	CROSS SECTION

TRAFFIC SIGNAL ABBREVIATIONS

CAB	CABINET
CCVE	CLOSED CIRCUIT VIDEO EQUIPMENT
DW	STEADY UPRAISED HAND
FDW	FLASHING UPRAISED HAND
FR	FLASHING CIRCULAR RED
FRL	FLASHING RED LEFT ARROW
FRR	FLASHING RED RIGHT ARROW
FY	FLASHING CIRCULAR YELLOW
FYL	FLASHING YELLOW LEFT ARROW
FYR	FLASHING YELLOW RIGHT ARROW
G	STEADY CIRCULAR GREEN
GL	STEADY GREEN LEFT ARROW
GR	STEADY GREEN RIGHT ARROW
GSL	STEADY GREEN SLASH LEFT ARROW
GSR	STEADY GREEN SLASH RIGHT ARROW
GV	STEADY GREEN VERTICAL ARROW
OL	OVERLAP
PED	PEDESTRIAN
PTZ	PAN, TILT, ZOOM
R	STEADY CIRCULAR RED
RL	STEADY RED LEFT ARROW
RR	STEADY RED RIGHT ARROW
TR SIG	TRAFFIC SIGNAL
TSC	TRAFFIC SIGNAL CONDUIT
W	STEADY WALKING PERSON
Y	STEADY CIRCULAR YELLOW
YL	STEADY YELLOW LEFT ARROW

Plotted on: 22-O-13-2019 4:08 PM
604123_HD02(LEGEND).DWG

Plotted on: 22-Oct-2019 4:08 PM
604123_H003\GENERAL NOTES.DWG

GENERAL NOTES

1. THE LOCATION OF THE EXISTING UTILITIES ARE SHOWN APPROXIMATE AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES AND SUBSURFACE STRUCTURES. THE CONTRACTOR IS RESPONSIBLE FOR MAKING FIELD INVESTIGATIONS AND OBTAINING INFORMATION FROM UTILITY COMPANIES AND INDIVIDUALS TO PINPOINT THE LOCATION AND ELEVATION OF ALL SUBSURFACE UTILITIES AND STRUCTURES. DIG-SAFE : TELEPHONE 1-888-344-7233
2. ALL UTILITY POLES REQUIRING RELOCATION ARE TO BE RELOCATED BY OTHERS.
3. ALL SIDEWALKS WITHIN THE LIMITS OF FULL-DEPTH CONSTRUCTION ARE TO BE CEMENT CONCRETE UNLESS OTHERWISE NOTED.
4. MINIMUM CLEAR PATH ON THE SIDEWALKS SHALL BE 4'-0" EXCLUDING THE SURFACE OF THE CURB.
5. WHEELCHAIR RAMPS AND DRIVEWAYS SHALL CONFORM TO THE CURRENT MASSDOT STANDARDS.
6. TRANSITION GRANITE CURB AT PROJECT LIMITS TO MATCH EXISTING ELEVATIONS (PAVEMENT OR EXISTING CURB).
7. THE CONTRACTOR SHALL RETAIN ALL CURBS, FENCES, WALLS, TREES, SHRUBS, POSTS, LANDSCAPE FEATURES, AND OTHER MISCELLANEOUS ITEMS WITHIN ABUTTING PROPERTIES, UNLESS OTHERWISE NOTED. WHEN RETAINING THOSE ITEMS IS NOT PRACTICAL IN THE OPINION OF THE ENGINEER, THE CONTRACTOR SHALL REMOVE, STOCKPILE, PROTECT AND RESET THE ITEMS. THE CONTRACTOR SHALL REPLACE ITEMS DAMAGED DURING REMOVAL, STOCKPILING, OR RESETTING DUE TO NEGLIGENCE, CARELESSNESS, OR MISHANDLING WITH EQUIVALENT NEW ITEMS AT NO COST TO THE OWNER.
8. ALL TREES WITHIN THE SLOPE LIMIT SHALL BE RETAINED AND PROTECTED UNLESS OTHERWISE NOTED.
9. CONTRACTOR SHALL PROTECT ALL PROPERTY MARKERS OF ABUTTERS.
10. TREATMENT OF SLOPE AREAS SHALL BE REPLACED IN KIND UNLESS OTHERWISE NOTED.
11. THE EXISTING CONDITIONS SHOWN ON THIS BASEMAP ARE THE RESULT OF AN ON THE GROUND INSTRUMENT SURVEY PERFORMED BETWEEN 4/15/2014 AND 12/19/2014 BY GREEN INTERNATIONAL AFFILIATES, INC. (GREEN). ADDITIONAL GROUND SURVEY WAS PERFORMED BETWEEN 1/30/2017 AND 4/27/2017, AND BETWEEN 2/21/18 AND 2/23/18 BY GREEN TO SUPPLEMENT EXISTING GROUND SURVEY.
12. HORIZONTAL AND VERTICAL CONTROL WAS ESTABLISHED WITH STATIC GPS VECTORS ON 4/17/2014 BY GREEN (SEE GREEN FIELD BOOK NO. 290-138). HORIZONTAL DATUM IS BASED ON THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM, VERTICAL DATUM IS NAVD88 (COMPUTED USING GEOID12A). THE UNIT OF MEASUREMENTS IS US SURVEY FEET.
13. WETLANDS WERE DELINEATED BY GREEN 4/18/2014, 4/29/2014, AND 2/22/18 IN ACCORDANCE WITH THE MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION AND FIELD LOCATED BY GREEN ON MAY 2014.
14. THE RIGHT OF WAY LINES SHOWN ON THIS PLAN ARE THE DIRECT RESULT OF AN INSTRUMENT SURVEY PERFORMED ON THE GROUND BY GREEN INTERNATIONAL AFFILIATES, INC. WITH AN ERROR OF CLOSURE LESS THAN 1:15,000, AND FROM PLANS AND DEEDS OF RECORD. PRIVATE PROPERTY LINES ARE FROM GIS INFORMATION AND SHOULD BE CONSIDERED APPROXIMATE.
15. THE SAID PARCELS SHOWN HERE ARE SUBJECT TO RIGHTS AND EASEMENTS AS CONTAINED IN THE VARIOUS DEEDS OF RECORD DESCRIBING SAID PREMISES. THE LOCATIONS AND EXTENT OF SAID RIGHTS AND EASEMENTS ARE NOT THE SUBJECT OF THIS SURVEY.

UTILITY NOTES:

1. ALL UNDERGROUND UTILITIES AS SHOWN WERE COMPILED USING FIELD SURVEY INFORMATION AND AVAILABLE RECORD INFORMATION. THE LOCATION OF EXISTING PIPES OR OTHER UNDERGROUND STRUCTURES OR PROPERTY LINES ARE NOT WARRANTED TO BE EXACT, NOR IS IT WARRANTED THAT ALL UNDERGROUND PIPES OR STRUCTURES ARE SHOWN. THE CONTRACTOR SHALL CALL "DIG SAFE" (1-888-344-7233) 72 HOURS (EXCLUDING SATURDAYS, SUNDAYS AND HOLIDAYS) PRIOR TO ANY EXCAVATION TO OBTAIN ACCURATE UTILITY LOCATIONS.
2. RECORD UTILITY INFORMATION FROM THE VARIOUS UTILITY COMPANIES AND PUBLIC AGENCIES ARE APPROXIMATE ONLY AND ACTUAL LOCATIONS MUST BE DETERMINED IN THE FIELD.
3. THE COMPLETION AND ACCURACY OF LATERAL UTILITY SERVICES IS NOT GUARANTEED AND MUST BE VERIFIED BY THE CONTRACTOR IN THE FIELD.
4. ALL UTILITY COMPANIES, PUBLIC AND PRIVATE MUST BE NOTIFIED, INCLUDING THOSE IN CONTROL OF UTILITIES NOT SHOWN ON THIS PLAN, (SEE CHAPTER 370, ACTS OF 1963, MASSACHUSETTS) PRIOR TO DESIGNING, EXCAVATING, BLASTING, INSTALLING, BACKFILLING, GRADING, PAVEMENT RESTORING OR REPAVING.
5. SUBSURFACE UTILITY LOCATIONS HAVE BEEN PLOTTED TO MEET UTILITY QUALITY LEVEL "C" AS DESCRIBED IN ASCE STANDARD 38-02 AND SUMMARIZED ON THIS SHEET. THE UNDERGROUND UTILITIES ARE SHOWN IN APPROXIMATE LOCATIONS BASED ON ABOVE-GROUND FIELD OBSERVATION AND EXISTING RECORD INFORMATION RECEIVED FROM UTILITY STAKE-HOLDERS.
6. INVERTS SHOWN ON PLAN ARE NOT GUARANTEED TO BE ACCURATE. DUE TO THE LIMITATIONS OF FIELD OBSERVATION AND SURVEY TECHNIQUES THE INVERTS ARE SHOWN AS APPROXIMATE ONLY AND SHALL NOT BE WARRANTED TO BE CORRECT. ADDITIONAL FIELD INVESTIGATION IS NECESSARY WHERE ACCURATE MEASUREMENTS ARE REQUIRED FOR DESIGN OF CRITICAL AREAS.
7. THE EXISTING CONDITIONS PLAN IS TO BE USED FOR THE SPECIFIED PROJECT ONLY AND IS NOT WARRANTED TO BE COMPLETE FOR ANY OTHER FUTURE PROJECTS.

SUMMARY OF UTILITY MAPPING QUALITY LEVELS:

THE FOLLOWING IS A SUMMARY OF THE SURVEY MAPPING LEVELS FOR UTILITIES AS DESCRIBED IN ASCE STANDARD 38-02, "STANDARD GUIDELINE FOR THE DEPICTION OF EXISTING SUBSURFACE UTILITY DATA". THESE GUIDELINES ARE MORE FULLY DESCRIBED IN THE ASCE STANDARD.

UTILITY QUALITY LEVEL A:
PRECISE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES OBTAINED BY THE ACTUAL EXPOSURE (OR VERIFICATION OF PREVIOUSLY EXPOSED AND SURVEYED UTILITIES) AND SUBSEQUENT MEASUREMENT OF SUBSURFACE UTILITIES, USUALLY AT A SPECIFIC POINT. MINIMALLY INTRUSIVE EXCAVATION EQUIPMENT IS TYPICALLY USED TO MINIMIZE THE POTENTIAL FOR UTILITY DAMAGE. A PRECISE HORIZONTAL AND VERTICAL LOCATION, AS WELL AS OTHER UTILITY ATTRIBUTES, IS SHOWN ON PLAN DOCUMENTS. ACCURACY IS TYPICALLY SET TO 15-MM VERTICAL AND TO APPLICABLE HORI ONTAL SURVEY AND MAPPING ACCURACY AS DEFINED OR EXPECTED BY THE PROJECT OWNER.

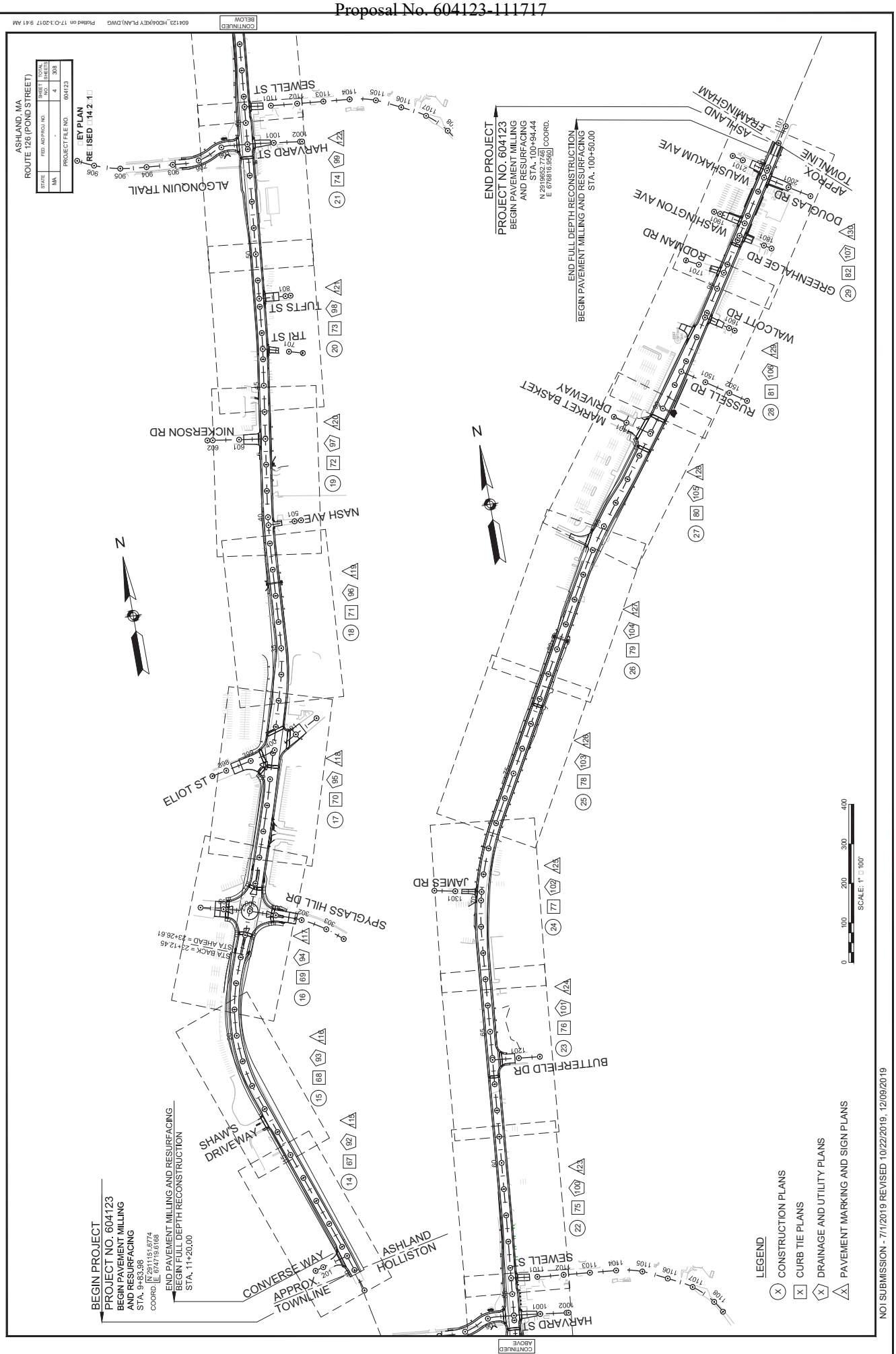
UTILITY QUALITY LEVEL B:
INFORMATION OBTAINED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF SUBSURFACE UTILITIES. QUALITY LEVEL B DATA SHOULD BE REPRODUCIBLE BY SURFACE GEOPHYSICS AT ANY POINT OF THEIR DEPICTION. THIS INFORMATION IS SURVEYED TO APPLICABLE TOLERANCES DEFINED BY THE PROJECT AND REDUCED ONTO PLAN DOCUMENTS.

UTILITY QUALITY LEVEL C:
INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE-GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGMENT IN CORRELATING THIS INFORMATION TO QUALITY LEVEL D INFORMATION.

UTILITY QUALITY LEVEL D:
INFORMATION DERIVED FROM EXISTING RECORDS OR ORAL RECOLLECTIONS.

A00860 - 103

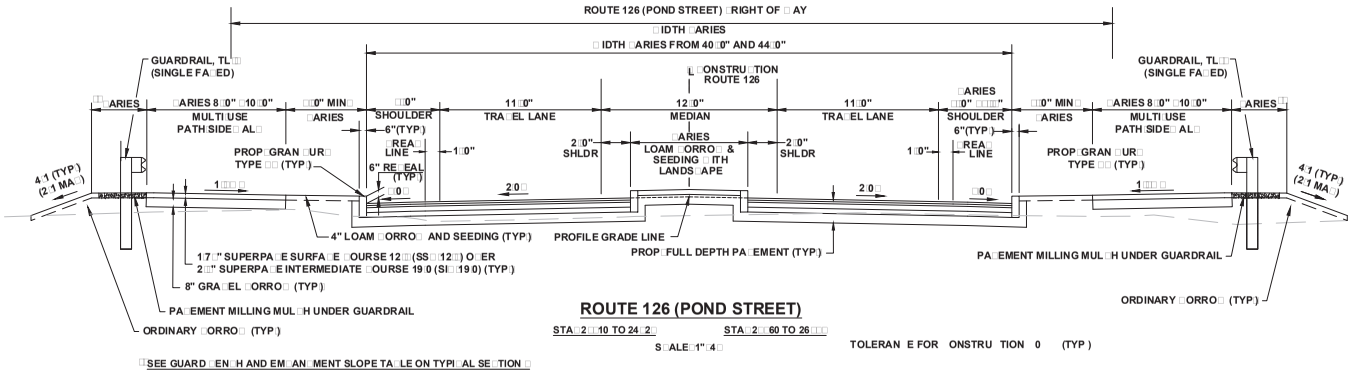
Proposal No. 604123-111717


ASHLAND, MA
ROUTE 126 (POND STREET)
KEY PLAN
RE: ISED 14 2 1
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 4 | 308
PROJECT FILE NO. 604123
BEGIN PROJECT
PROJECT NO. 604123
BEGIN PAVEMENT MILLING
AND RESURFACING
STA. 9+83.98
COORD. N 2911151.6774
E 674719.6168
END PAVEMENT MILLING AND RESURFACING
BEGIN FULL DEPTH RECONSTRUCTION
STA. 11+20.00
END PROJECT
PROJECT NO. 604123
BEGIN PAVEMENT MILLING
AND RESURFACING
STA. 100+94.44
N 2910995.7777
E 676816.9568
END FULL DEPTH RECONSTRUCTION
BEGIN PAVEMENT MILLING AND RESURFACING
STA. 100+50.00
CONTINUED BELOW
CONTINUED ABOVE
SEWELL ST
HARVARD ST
ALGONQUIN TRAIL
TUFTS ST
TRI ST
NICKERSON RD
NASH AVE
ELIOT ST
SPYGLASS HILL DR
STA BACK = 23+12.45
STA AHEAD = 23+26.61
SHAW'S DRIVEWAY
CONVERSE WAY
APPROX. TOWNLINE
ASHLAND
HOLLISTON
JAMES RD
BUTTERFIELD DR
MARKET BASKET DRIVEWAY
RUSSELL RD
WALCOTT RD
RODMAN RD
GREENHALGE RD
WASHINGTON AVE
WASHAKUM AVE
DOUGLAS RD
APPROX. TOWNLINE
ASHLAND
FRAMINGHAM
N
SCALE: 1" = 100'
0
100
200
300
400
LEGEND
CONSTRUCTION PLANS
CURB TIE PLANS
DRAINAGE AND UTILITY PLANS
PAVEMENT MARKING AND SIGN PLANS
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019, 12/09/2019
604123_HD04KEY PLAN).DWG Plotted on 17-Oct-2017 9:41 AM

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	11	308
PROJECT FILE NO. 604123			

TYPICAL SECTION 1
REVISED 8/17/2018



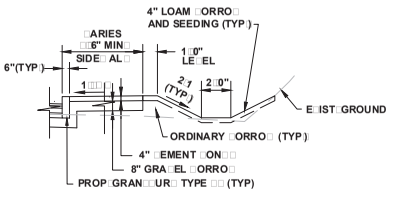
ROUTE 126 (POND STREET)

STA 2+10 TO 24+2
STA 2+60 TO 26+

SCALE: 1" = 4'

TOLERANCE FOR CONSTRUCTION 0 (TYP)

SEE GUARDRAIL END AND EMBANKMENT SLOPE TABLE ON TYPICAL SECTION

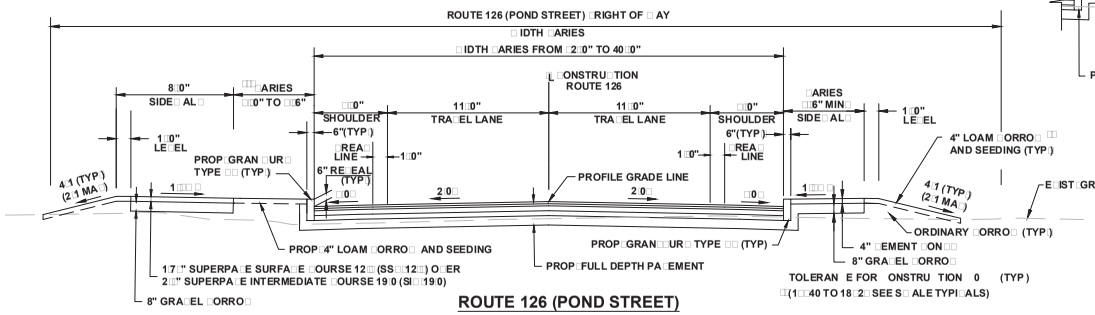


TOLERANCE FOR CONSTRUCTION 0 (TYP)

ROUTE 126 (POND STREET)
GRASS SWALE TYPICAL SECTION

STA 1+40 TO 1+60 RT
STA 16+00 TO 17+80 RT

SCALE: 1" = 4'

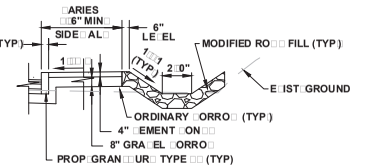


TOLERANCE FOR CONSTRUCTION 0 (TYP)
(1+40 TO 18+2 SEE SCALE TYPICALS)

ROUTE 126 (POND STREET)

STA 11+20 TO 2+10
BUFFER 6"
STA 81+2 TO 84+0
BUFFER 0'-0"

SCALE: 1" = 4'

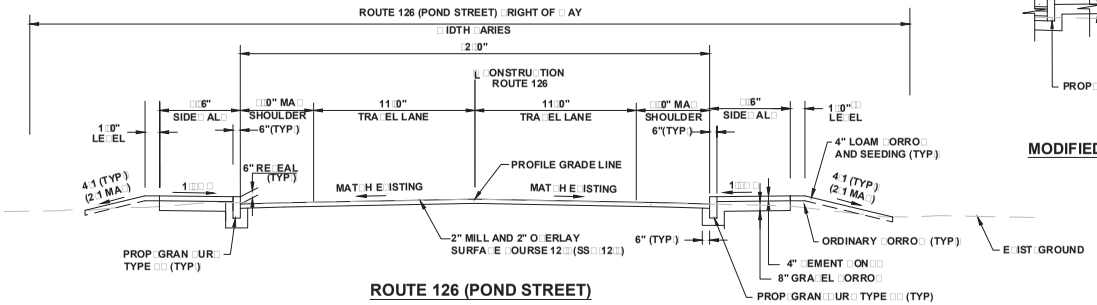


TOLERANCE FOR CONSTRUCTION 0 (TYP)

ROUTE 126 (POND STREET)
MODIFIED ROCK FILL SCALE TYPICAL SECTION

STA 1+00 TO 16+00 RT
STA 17+8 TO 18+2 RT

SCALE: 1" = 4'



ROUTE 126 (POND STREET)

STA 9+8 TO 11+20
STA 100+0 TO 100+94

SCALE: 1" = 4'

TOLERANCE FOR CONSTRUCTION 0 (TYP)
6" SIDE BENCH STA 10+00 RT TO STA 11+00 RT

PAVEMENT NOTES

PROPOSED FULL DEPTH PAVEMENT AND WIDENING

SURFACE — 4.2" SUPERPAVE (1.7" SUPERPAVE SURFACE COURSE 12.5 (SS-12.5) OVER 2.5" SUPERPAVE INTERMEDIATE COURSE 19.0 (SI-19.0))

BASE — 4.5" SUPERPAVE BASE COURSE 7.0 (SS-7.0) PLACED IN ONE COURSE

SUBBASE — 4" DENSE GRADED CRUSHED STONE SUBBASE FOR LEVELING OVER 8" GRAVEL BORROW

ASPHALT EMULSION FOR TACK COAT (RS-1) AT 0.08 GAL/SY OVER NEW AND SMOOTH BASE AND INTERMEDIATE COURSES

PROPOSED PAVEMENT MILLING & PAVEMENT RESURFACING

SURFACE — 2" PAVEMENT MILLING TO MEET PROPOSED GRADING

2" SUPERPAVE SURFACE COURSE 12.5 (SS-12.5)

ASPHALT EMULSION FOR TACK COAT (RS-1) AT 0.09 GAL/SY OVER MILLED SURFACE

PROPOSED HOT MIX ASPHALT MULTI-USE PATH / HOT MIX ASPHALT DRIVEWAY

SURFACE COURSE — 1.7" SUPERPAVE SURFACE COURSE 12.5 (SS-12.5) OVER 2.5" SUPERPAVE INTERMEDIATE COURSE 19.0 (SI-19.0)

BASE COURSE — 8" GRAVEL BORROW

PROPOSED CEMENT CONCRETE SIDEWALK / WHEELCHAIR RAMP

SURFACE — 4" CEMENT CONCRETE

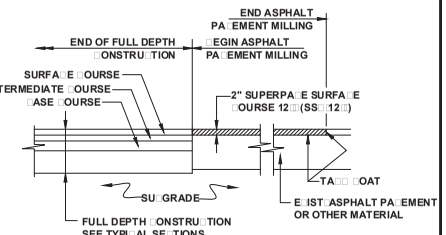
FOUNDATION — 8" GRAVEL BORROW

PROPOSED HMA DRIVEWAY AND SLOPE PAVING

SURFACE — 1.7" SUPERPAVE SURFACE COURSE 12.5 (SS-12.5) OVER 2.5" SUPERPAVE INTERMEDIATE COURSE 19.0 (SI-19.0)

SUBBASE — 8" GRAVEL BORROW

NOTE:
TACK COAT SHALL BE APPLIED BETWEEN PAVEMENT LAYERS AT A RATE OF 0.08 GALLONS PER SQUARE YARD AND ON MILLED SURFACES AT A RATE OF 0.09 GALLONS PER SQUARE YARD.

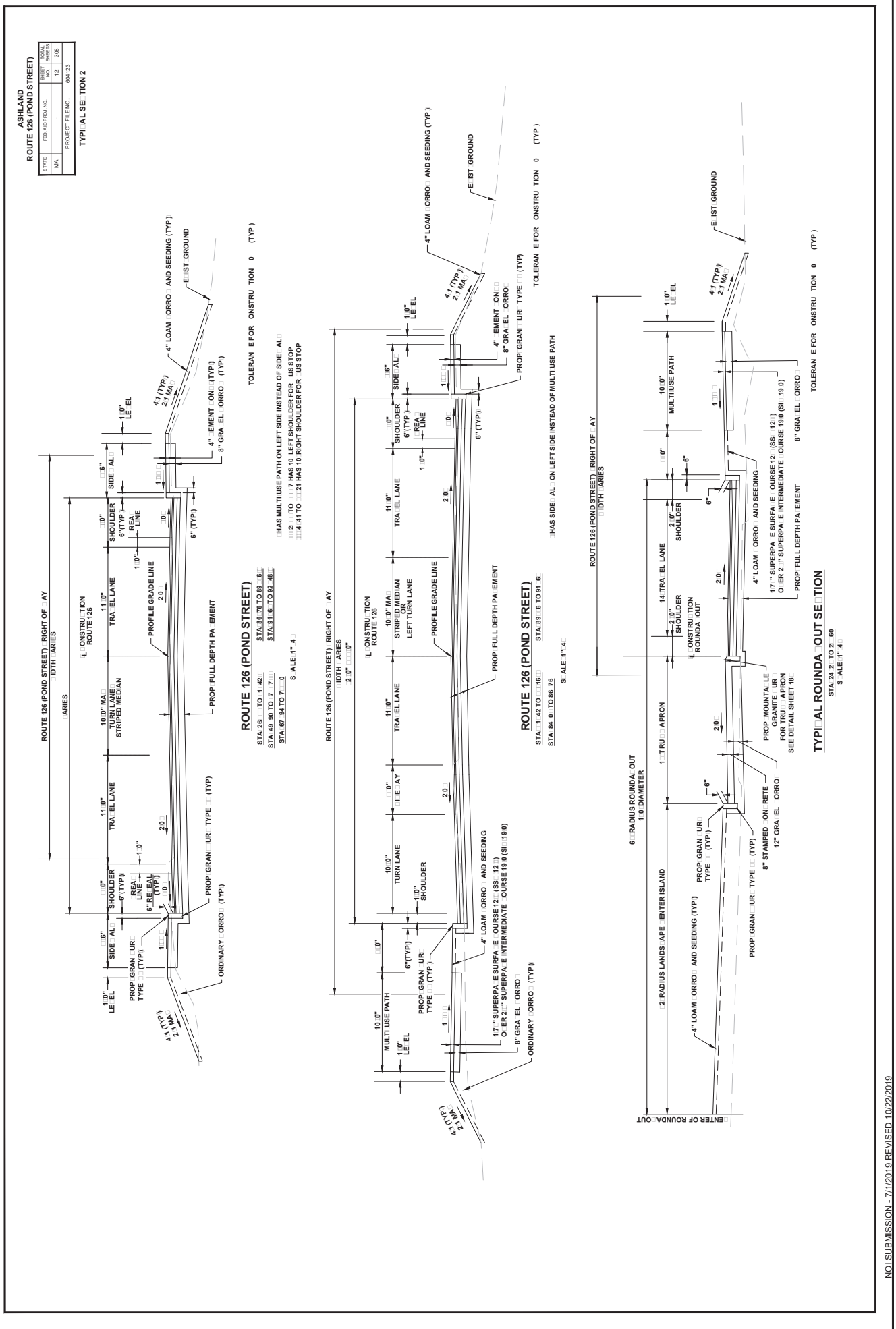


TYPICAL TRANSITION DETAIL

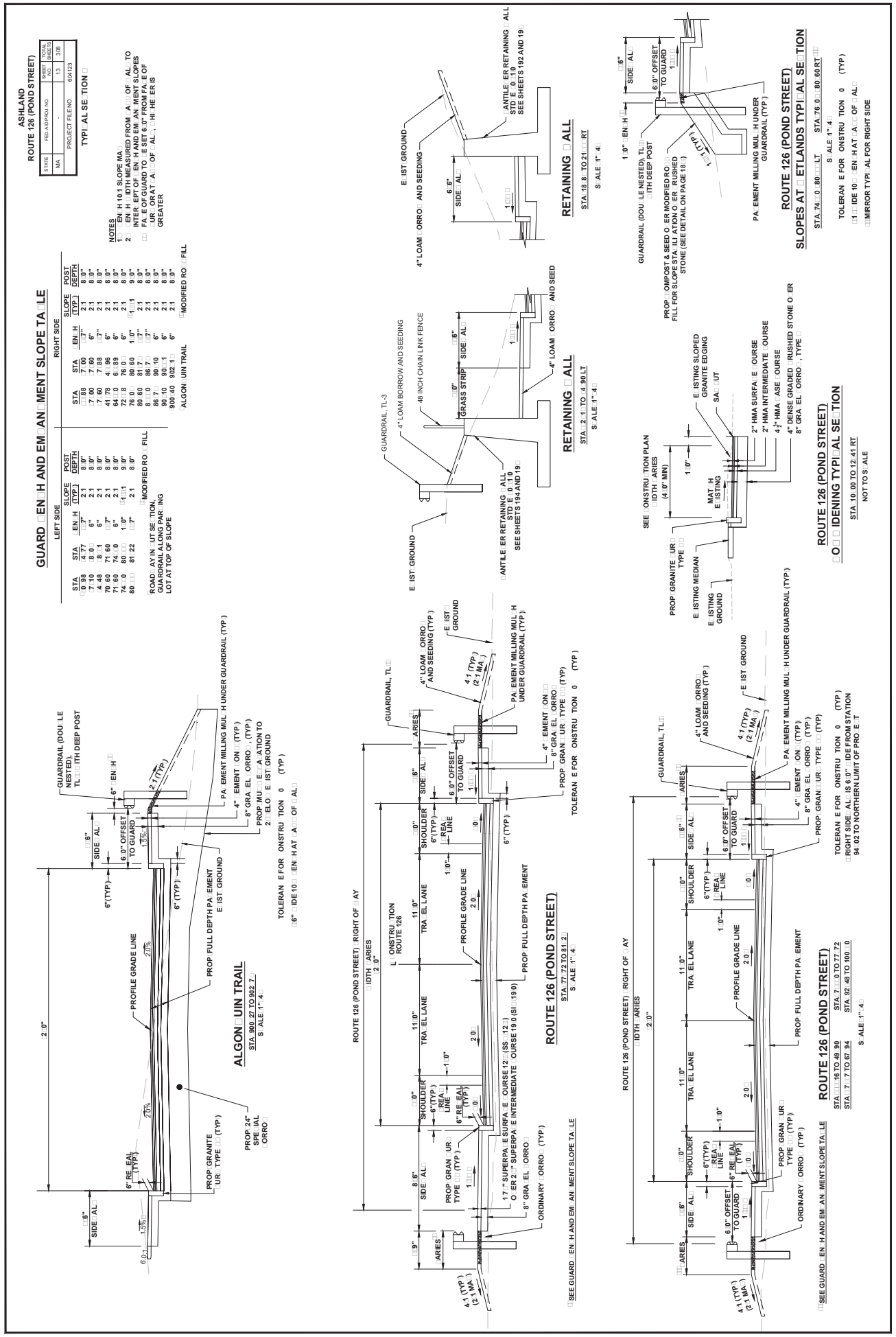
NOT TO SCALE

Proposal No. 604123-111717

604123_H007(TYP-SECTIONS).DWG 6-Dec-2017



NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

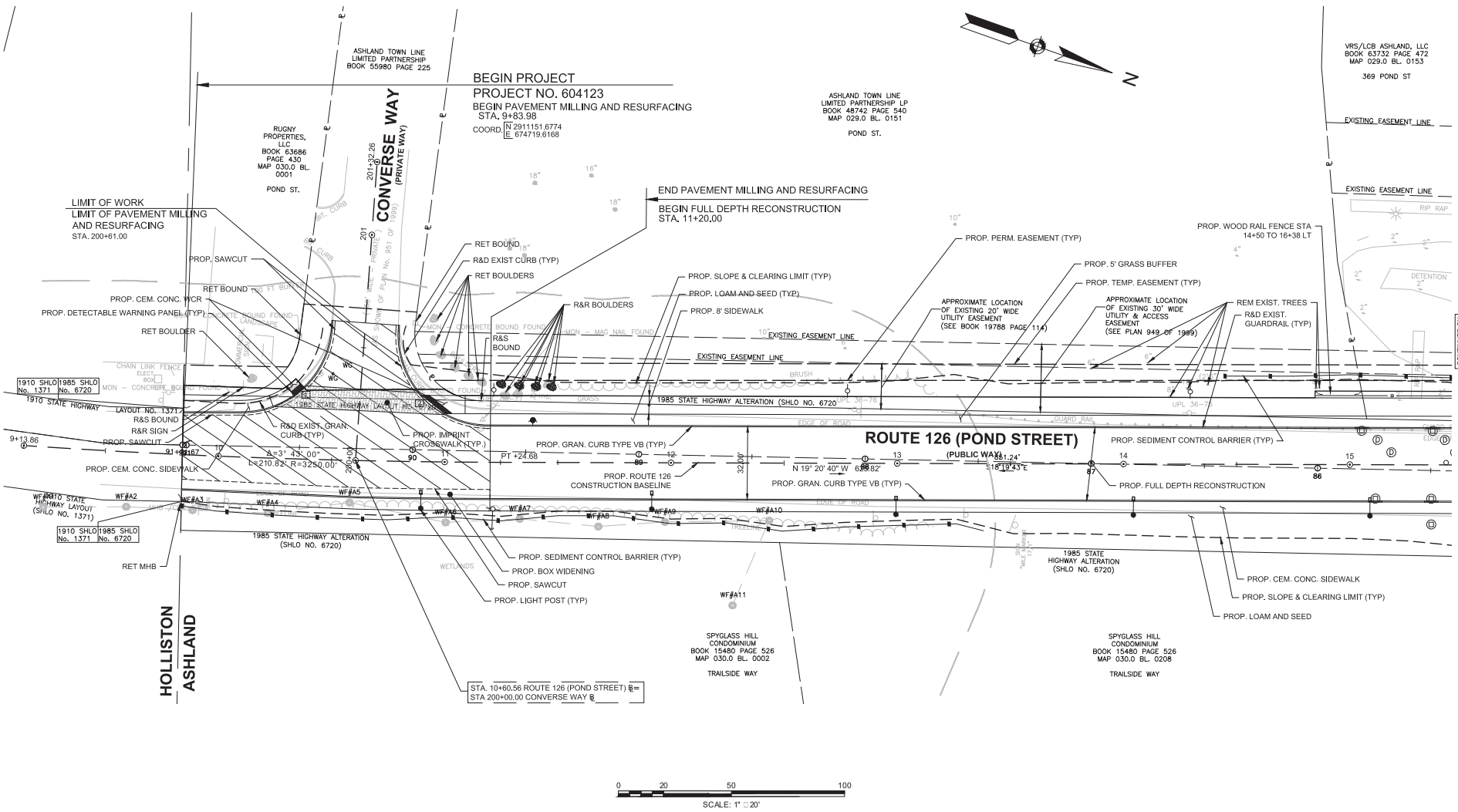

604123_HD07(TYP-SECTIONS).DWG 6-Dec-2017
ASHLAND
ROUTE 126 (POND STREET)
STATE FED.AID PROJ. NO. SHEET NO. TOTAL SHEETS
MA - 13 308
PROJECT FILE NO. 604123
TYPICAL SECTION
GUARD RAIL AND EMBANKMENT SLOPE TABLE
LEFT SIDE
STA STA RAIL HT SLOPE (TYP.) POST DEPTH
0+98 4+77 LT 2:1 8'-0"
7+10 8+01 6" 2:1 8'-0"
4+48 8+14 6" 2:1 8'-0"
70+60 71+60 LT 2:1 8'-0"
71+60 74+00 6" 2:1 8'-0"
74+40 76+00 1'-0" 1:1 9'-0"
80+00 81+22 LT 2:1 8'-0"
ROAD AY IN UT SECTION
GUARDRAIL ALONG PARKING
LOT AT TOP OF SLOPE
MODIFIED ROCK FILL
RIGHT SIDE
STA STA RAIL HT SLOPE (TYP.) POST DEPTH
7+88 7+00 LT 2:1 8'-0"
7+60 7+60 6" 2:1 8'-0"
7+88 LT 2:1 8'-0"
4+96 6" 2:1 8'-0"
6+89 6" 2:1 8'-0"
7+76+0 6" 1:1 9'-0"
80+60 1'-0" 1:1 9'-0"
81+7 LT 2:1 8'-0"
86+7 90+10 6" 2:1 8'-0"
90+10 90+40 1 6" 2:1 8'-0"
900+40 902+1 6" 2:1 8'-0"
ALGONQUIN TRAIL
MODIFIED ROCK FILL
NOTES
1. RAIL HEIGHT 10:1 SLOPE MAY VARY.
2. RAIL HEIGHT MEASURED FROM TOP OF RAIL TO INTERSECTION OF RAIL HEIGHT AND EMBANKMENT SLOPES
FACE OF GUARD TO FACE SET 6'-0" FROM FACE OF GUARD RAIL AT TOP OF SLOPE OR AT TOE OF SLOPE, WHICHEVER IS GREATER
TYPICAL SECTION
GUARDRAIL (DOUBLE NESTED), TL WITH DEEP POST
6" SIDE SLOPE
6'-0" OFFSET TO GUARD RAIL
6" EMBANKMENT
6"(TYP.)
2:1 (TYP.)
PAVEMENT MILLING MULCH UNDER GUARDRAIL (TYP.)
4" PAVEMENT ON
8" GRAVEL BORROW (TYP.)
PROP MULCH EXCAVATION TO 2" BELOW EXIST GROUND
6" (TYP.)
PROFILE GRADE LINE
2.0%
PROP FULL DEPTH PAVEMENT
EXIST GROUND
1.5%
6" REVEAL (TYP.)
PROP GRANITE CURB TYPE (TYP.)
PROP 24" SPECIAL CURB
ALGONQUIN TRAIL
STA 800+27 TO 902+7
SCALE 1"=4'
TOLERANCE FOR ONSTRUCTION 0 (TYP.)
6" WIDE 10 MAT AT OF SLOPE
GUARDRAIL, TL
4" LOAM AND SEEDING (TYP.)
EXIST GROUND
4:1 (TYP.) (2:1 MAX.)
PAVEMENT MILLING MULCH UNDER GUARDRAIL (TYP.)
4" PAVEMENT ON
8" GRAVEL BORROW
PROP GRANITE CURB TYPE (TYP.)
TOLERANCE FOR ONSTRUCTION 0 (TYP.)
ROUTE 126 (POND STREET) RIGHT OF WAY
WIDTH VARIES
2'-0"
CONSTRUCTION ROUTE 126
11'-0" TRAVEL LANE
1'-0"
SHOULDER 6"(TYP.)
REAL LINE
0"
6" REVEAL (TYP.)
8'-6" SIDE SLOPE
PROP GRANITE CURB TYPE (TYP.)
17" SUPERPAVE SURFACE COURSE 12.5 (SS 12.5)
2" SUPERPAVE INTERMEDIATE COURSE 19.0 (SI 19.0)
8" GRAVEL BORROW
ORDINARY BORROW (TYP.)
PROFILE GRADE LINE
2.0%
PROP FULL DEPTH PAVEMENT
ROUTE 126 (POND STREET)
STA 77+72 TO 81+2
SCALE 1"=4'
SEE GUARDRAIL AND EMBANKMENT SLOPE TABLE
ROUTE 126 (POND STREET)
STA 16+49.90 TO 67+94
STA 7+0 TO 77+72
STA 92+48 TO 100+0
SCALE 1"=4'
GUARDRAIL, TL
4" LOAM AND SEEDING (TYP.)
4:1 (TYP.) (2:1 MAX.)
EXIST GROUND
PAVEMENT MILLING MULCH UNDER GUARDRAIL (TYP.)
4" PAVEMENT ON
8" GRAVEL BORROW (TYP.)
PROP GRANITE CURB TYPE (TYP.)
TOLERANCE FOR ONSTRUCTION 0 (TYP.)
RIGHT SIDE SLOPE IS 6:0" WIDE FROM STATION 94+02 TO NORTHERN LIMIT OF PROJECT
SCALE 1"=4'
RETAINING WALL
STA 2+10 TO 4+90 LT
SCALE 1"=4'
GUARDRAIL, TL-3
4" LOAM BORROW AND SEEDING
48 INCH CHAIN LINK FENCE
EXIST GROUND
0" GRASS STRIP
6" SIDE SLOPE
4" LOAM BORROW AND SEED
ANTILEVER RETAINING WALL STD E 0.10
SEE SHEETS 194 AND 195
RETAINING WALL
STA 2+10 TO 4+90 LT
SCALE 1"=4'
EXIST GROUND
4" LOAM BORROW AND SEEDING
6" SIDE SLOPE
6" 6" SLOPE
ANTILEVER RETAINING WALL STD E 0.10
SEE SHEETS 192 AND 193
RETAINING WALL
STA 18+8 TO 21+
SCALE 1"=4'
SEE CONSTRUCTION PLAN WIDTH VARIES (4'-0" MIN)
1'-0"
PROP GRANITE CURB TYPE
EXISTING MEDIAN
EXISTING GROUND
MAT WIDTH EXISTING
EXISTING SLOPED GRANITE EDGING
SAWCUT
2" HMA SURFACE COURSE
2" HMA INTERMEDIATE COURSE
4½" HMA BASE COURSE
4" DENSE GRADED CRUSHED STONE OVER 8" GRAVEL BORROW, TYPE
ROUTE 126 (POND STREET)
SLOPES AT WETLANDS TYPICAL SECTION
STA 74+0 80 LT STA 76+0 80 RT
SCALE 1"=4'
TOLERANCE FOR ONSTRUCTION 0 (TYP.)
1 IDE 10 EMBANKMENT OF AL
MIRROR TYPICAL FOR RIGHT SIDE
GUARDRAIL (DOUBLE NESTED), TL WITH DEEP POST
6" SIDE SLOPE
6'-0" OFFSET TO GUARD RAIL
1'-0"
4:1 (TYP.)
PROP COMPOST & SEED OVER MODIFIED ROCK FILL FOR SLOPE STA ILLUSTRATION OVERRUSHED STONE (SEE DETAIL ON PAGE 18.1)
PAVEMENT MILLING MULCH UNDER GUARDRAIL (TYP.)
ROUTE 126 (POND STREET)
SLOPES AT WETLANDS TYPICAL SECTION
STA 10+00 TO 12+41 RT
NOT TO SCALE

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	14	308
PROJECT FILE NO.	604123		

□ONSTRU□TION PLANS (1 OF 1□)

HIGHWAY GUARD DETAILS	TRAFFIC SIGNAL CONDUIT	WATER SUPPLY ALTERATIONS	DRAINAGE DETAILS
NONE	NONE	NONE	SEE SHEET NO. 92



FOR PROFILE:
SEE SHEET NO. 31

NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

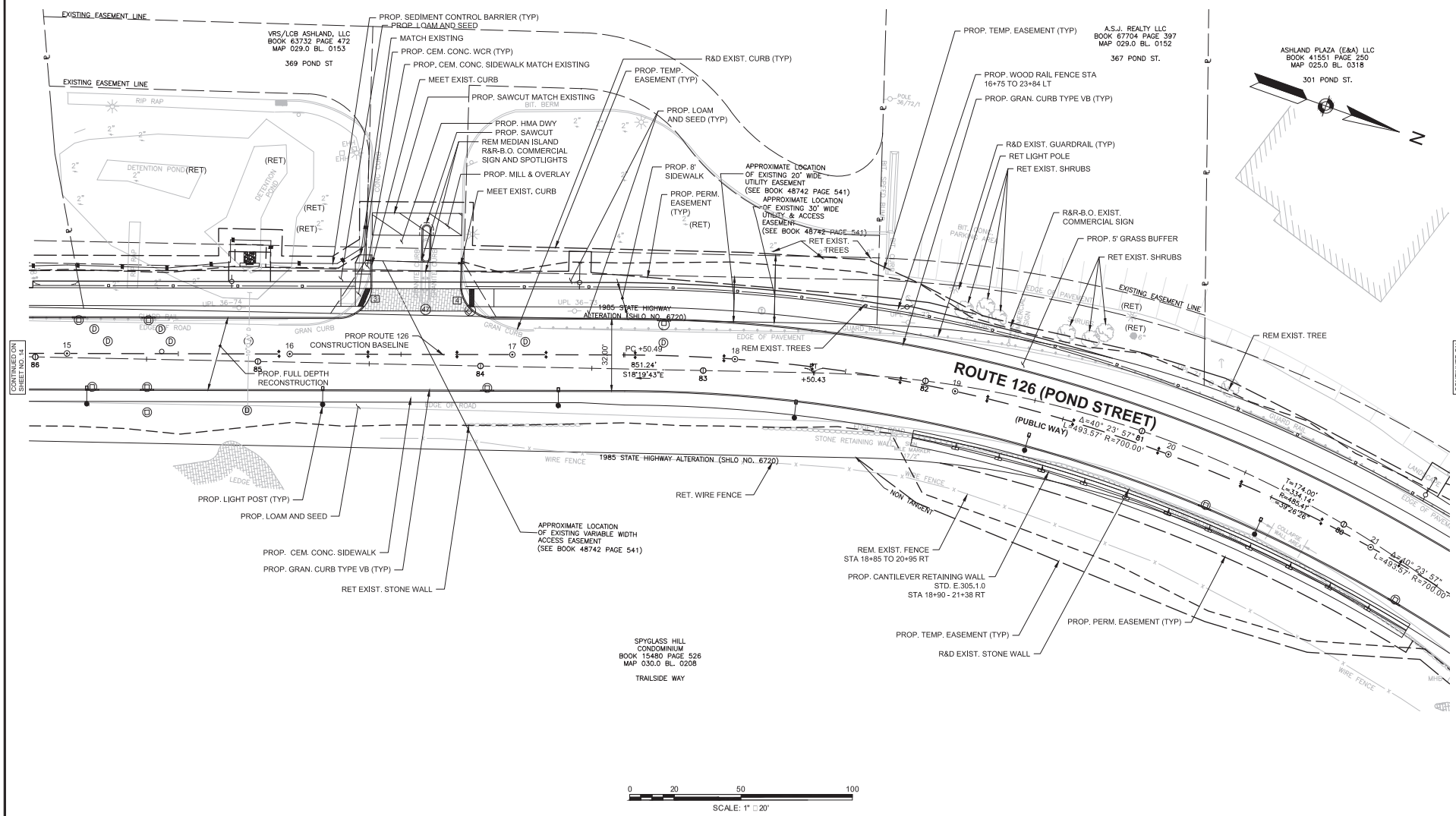
604123_HD08(CONSTRUCTION PLANS).DWG Plotted on 16-Mar-2018 3:55 PM

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	15	308
PROJECT FILE NO.	604123		

□ONSTRU□TION PLANS (2 OF 1□)

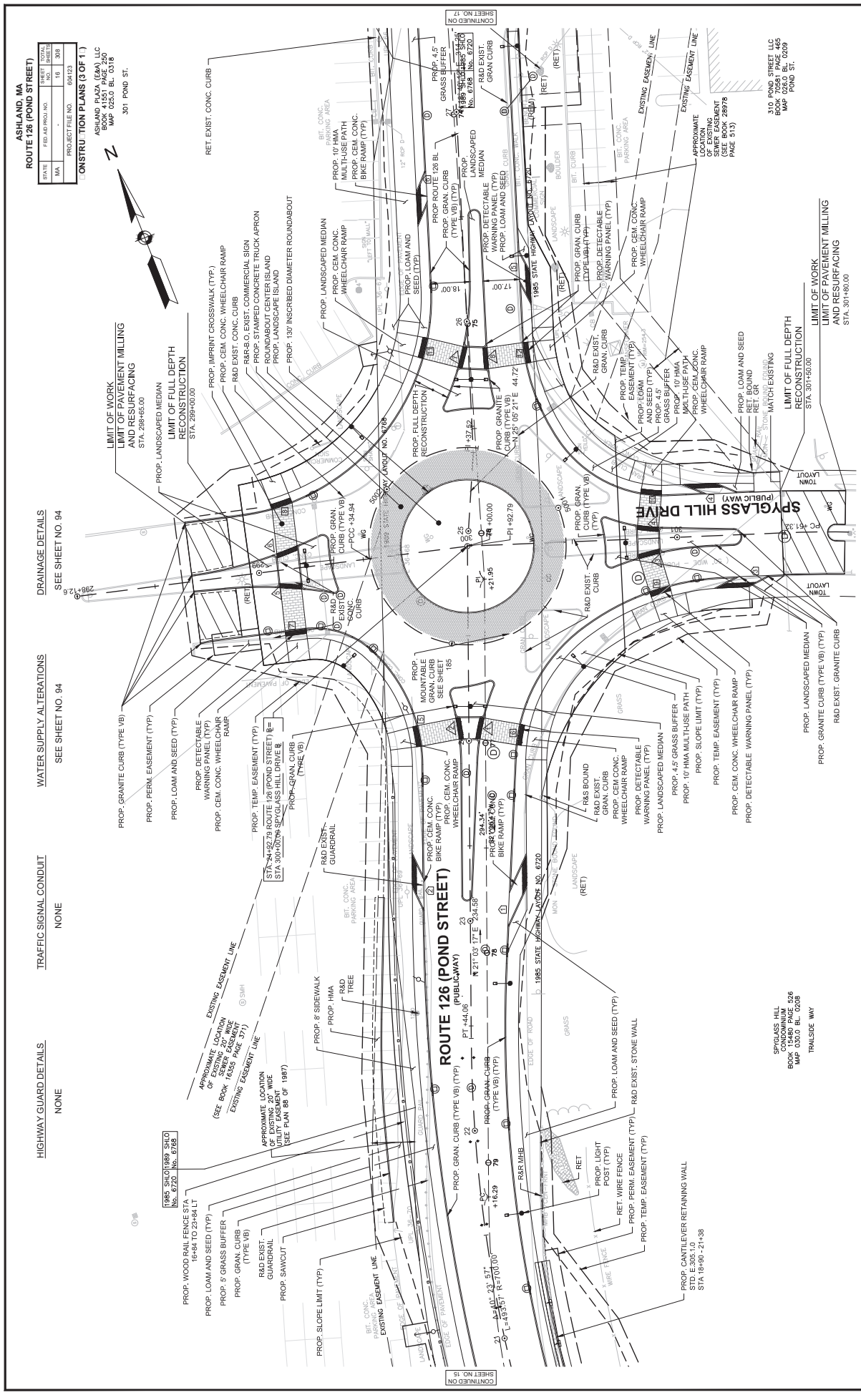
HIGHWAY GUARD DETAILS	TRAFFIC SIGNAL CONDUIT	WATER SUPPLY ALTERATIONS	DRAINAGE DETAILS
NONE	NONE	NONE	SEE SHEET NO. 93

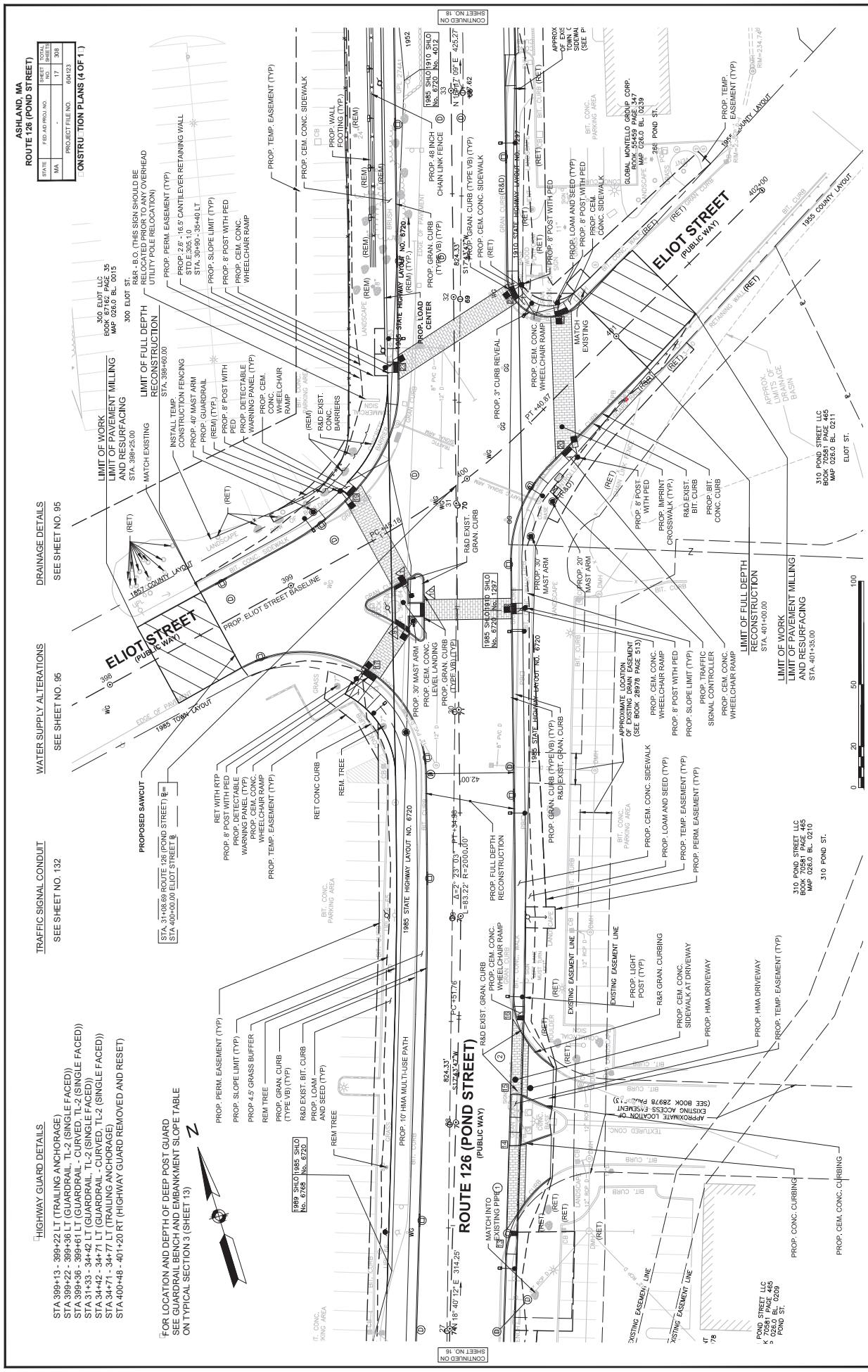


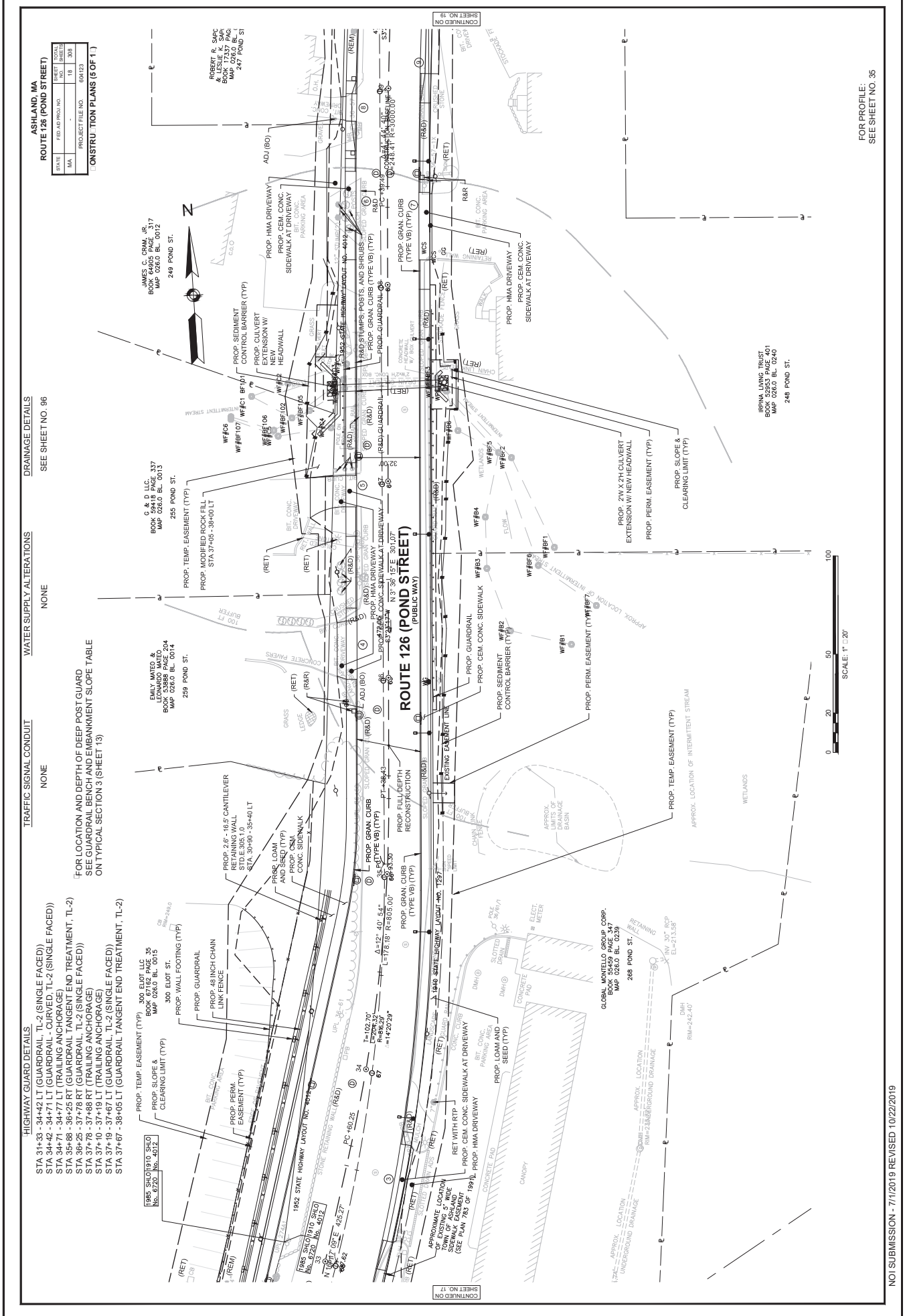
FOR PROFILE:
SEE SHEET NO. 32

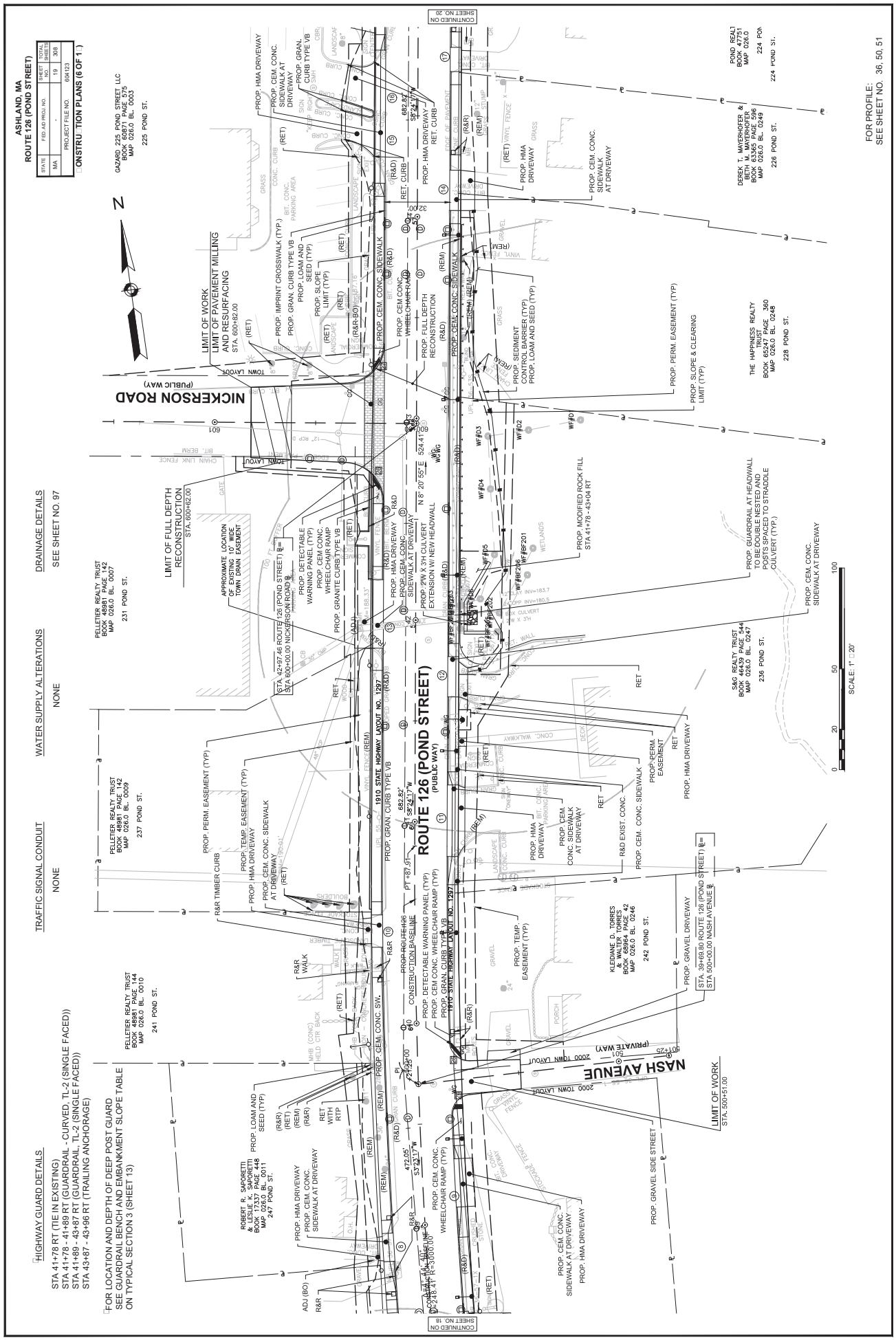
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

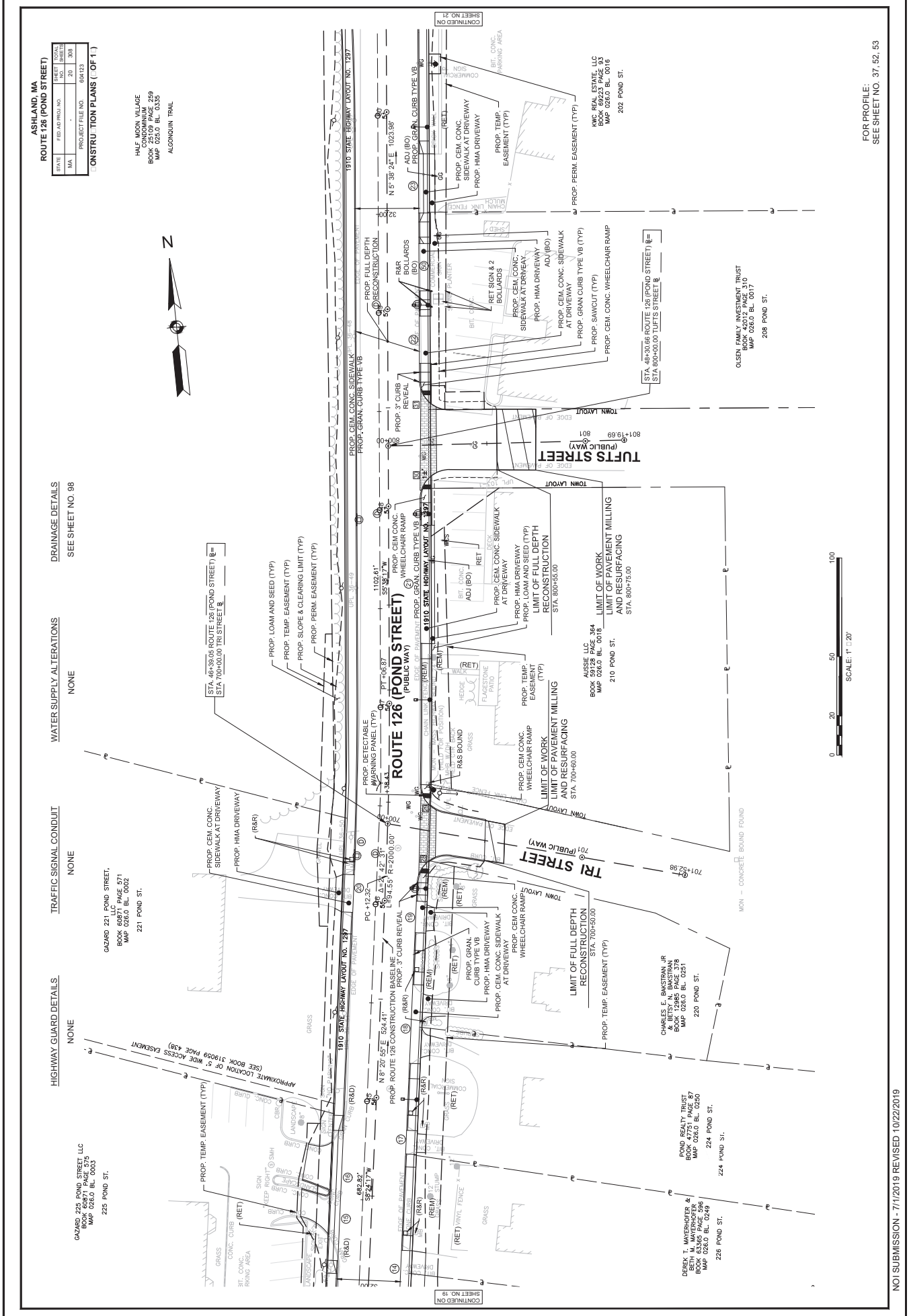
604123_HD08(CONSTRUCTION PLANS).DWG Plotted on 16-Mar-2018 3:55 PM

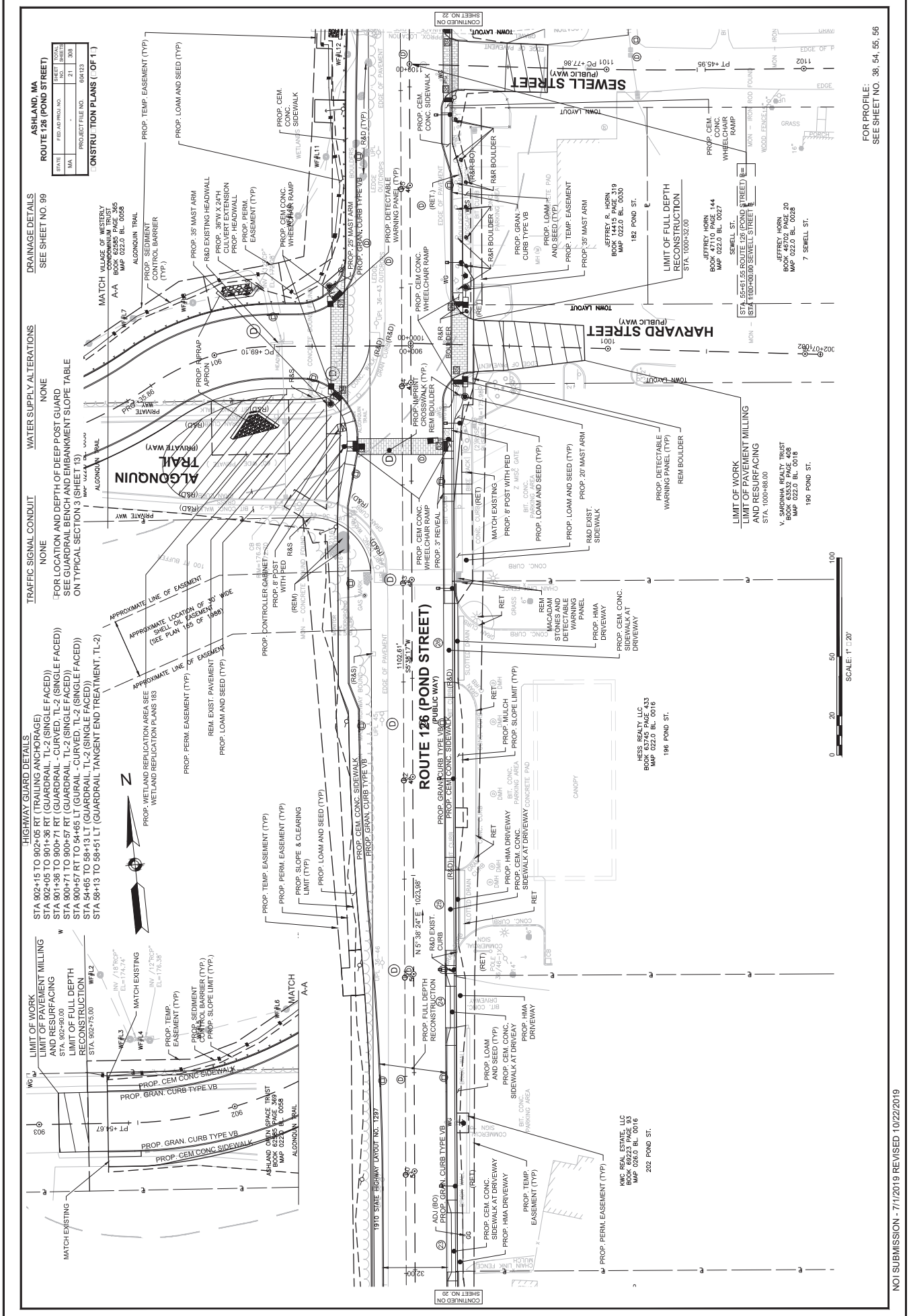

ASHLAND, MA
ROUTE 126 (POND STREET)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 16 | 308
PROJECT FILE NO. 604123
CONSTRUCTION PLANS (3 OF 1)
HIGHWAY GUARD DETAILS
NONE
TRAFFIC SIGNAL CONDUIT
NONE
WATER SUPPLY ALTERATIONS
SEE SHEET NO. 94
DRAINAGE DETAILS
SEE SHEET NO. 94
ROUTE 126 (POND STREET)
(PUBLIC WAY)
SPYGLASS HILL DRIVE
(PUBLIC WAY)
LIMIT OF WORK
LIMIT OF PAVEMENT MILLING AND RESURFACING
STA. 298+65.00
LIMIT OF FULL DEPTH RECONSTRUCTION
STA. 299+00.00
LIMIT OF FULL DEPTH RECONSTRUCTION
STA. 301+50.00
LIMIT OF WORK
LIMIT OF PAVEMENT MILLING AND RESURFACING
STA. 301+80.00
FOR PROFILE:
SEE SHEET NO. 33 & 48
SCALE: 1" = 20'
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

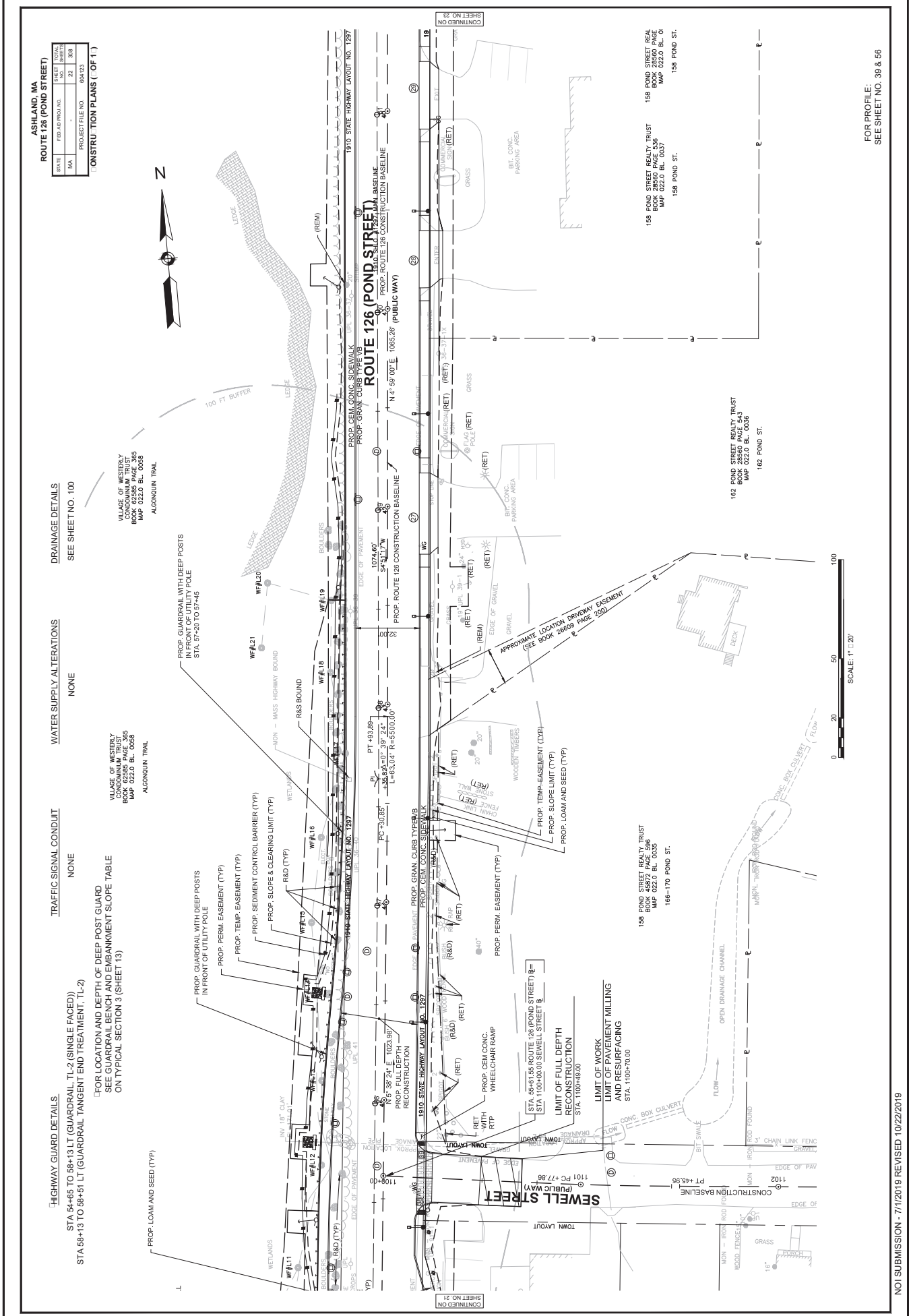

ASHLAND, MA
ROUTE 126 (POND STREET)
CONSTRUCTION PLANS (4 OF 1)
HIGHWAY GUARD DETAILS
TRAFFIC SIGNAL CONDUIT
WATER SUPPLY ALTERATIONS
DRAINAGE DETAILS
SEE SHEET NO. 132
SEE SHEET NO. 95
SEE SHEET NO. 95
ROUTE 126 (POND STREET)
(PUBLIC WAY)
ELIOT STREET
(PUBLIC WAY)
LIMIT OF WORK
LIMIT OF PAVEMENT MILLING AND RESURFACING
LIMIT OF FULL DEPTH RECONSTRUCTION
1985 STATE HIGHWAY LAYOUT NO. 6720
1985 TOWN LAYOUT
1857 COUNTY LAYOUT
1955 COUNTY LAYOUT
PROP. ELIOT STREET BASELINE
PROPOSED SAWCUT
STA. 31+08.69 ROUTE 126 (POND STREET)
STA 400+00.00 ELIOT STREET
FOR LOCATION AND DEPTH OF DEEP POST GUARD
SEE GUARDRAIL BENCH AND EMBANKMENT SLOPE TABLE
ON TYPICAL SECTION 3 (SHEET 13)
STA 399+13 - 399+22 LT (TRAILING ANCHORAGE)
STA 399+22 - 399+36 LT (GUARDRAIL, TL-2 (SINGLE FACED))
STA 399+36 - 399+61 LT (GUARDRAIL - CURVED, TL-2 (SINGLE FACED))
STA 31+33 - 34+42 LT (GUARDRAIL, TL-2 (SINGLE FACED))
STA 34+42 - 34+71 LT (GUARDRAIL - CURVED, TL-2 (SINGLE FACED))
STA 34+71 - 34+77 LT (TRAILING ANCHORAGE)
STA 400+48 - 401+20 RT (HIGHWAY GUARD REMOVED AND RESET)
CONTINUED ON SHEET NO. 18
FOR PROFILE: SEE SHEET NO. 34 & 49
SCALE: 1" = 20'
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019


ASHLAND, MA
ROUTE 126 (POND STREET)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 18 | 308
PROJECT FILE NO. 604123
CONSTRUCTION PLANS (5 OF 1)
HIGHWAY GUARD DETAILS
STA 31+33 - 34+42 LT (GUARDRAIL, TL-2 (SINGLE FACED))
STA 34+42 - 34+71 LT (GUARDRAIL - CURVED, TL-2 (SINGLE FACED))
STA 34+71 - 34+77 LT (TRAILING ANCHORAGE)
STA 35+88 - 36+25 RT (GUARDRAIL TANGENT END TREATMENT, TL-2)
STA 36+25 - 37+78 RT (GUARDRAIL, TL-2 (SINGLE FACED))
STA 37+10 - 37+19 LT (TRAILING ANCHORAGE)
STA 37+19 - 37+67 LT (GUARDRAIL, TL-2 (SINGLE FACED))
STA 37+67 - 38+05 LT (GUARDRAIL TANGENT END TREATMENT, TL-2)
TRAFFIC SIGNAL CONDUIT
NONE
WATER SUPPLY ALTERATIONS
NONE
DRAINAGE DETAILS
SEE SHEET NO. 96
FOR LOCATION AND DEPTH OF DEEP POST GUARD
SEE GUARDRAIL BENCH AND EMBANKMENT SLOPE TABLE
ON TYPICAL SECTION 3 (SHEET 13)
ROUTE 126 (POND STREET)
(PUBLIC WAY)
1952 STATE HIGHWAY LAYOUT NO. 4012
1940 STATE HIGHWAY LAYOUT NO. 7257
1985 SHLO(910) SHLO No. 6720 No. 4012
EMILY MATEO & LEONARDO MATEO BOOK 53888 PAGE 204 MAP 026.0 BL. 0014 259 POND ST.
G & D LLC. BOOK 59418 PAGE 337 MAP 026.0 BL. 0013 255 POND ST.
JAMES C. CRAM, JR. BOOK 64905 PAGE 317 MAP 026.0 BL. 0012 249 POND ST.
ROBERT R. SAPC & LESLIE K. SAPC BOOK 72337 PAGE 0 MAP 026.0 BL. 0011 247 POND ST.
IRPINA LIVING TRUST BOOK 62953 PAGE 401 MAP 026.0 BL. 0240 248 POND ST.
GLOBAL MONTELLO GROUP CORP. BOOK 55459 PAGE 347 MAP 026.0 BL. 0239 268 POND ST.
300 ELIOT LLC. BOOK 67182 PAGE 35 MAP 026.0 BL. 0015 300 ELIOT ST.
PROP. 2.5' - 16.5' CANTILEVER RETAINING WALL STD.E.305.10 STA. 30+90 - 35+40 LT
PROP. 2'W X 2'H CULVERT EXTENSION W/ NEW HEADWALL
PROP. PERM. EASEMENT (TYP)
PROP. SLOPE & CLEARING LIMIT (TYP)
PROP. TEMP. EASEMENT (TYP)
PROP. MODIFIED ROCK FILL STA.37+05 - 38+00 LT
PROP. SEDIMENT CONTROL BARRIER (TYP)
PROP. CULVERT EXTENSION W/ NEW HEADWALL
PROP. HMA DRIVEWAY
PROP. CEM. CONC. SIDEWALK AT DRIVEWAY
PROP. GRAN. CURB (TYPE VB) (TYP)
PROP. GUARDRAIL
PROP. CEM. CONC. SIDEWALK
PROP. HMA DRIVEWAY
PROP. FULL DEPTH RECONSTRUCTION
PROP. LOAM AND SEED (TYP)
PROP. WALL FOOTING (TYP)
PROP. GUARDRAIL
PROP. 48 INCH CHAIN LINK FENCE
RET WITH RTP
PROP. CEM. CONC. SIDEWALK AT DRIVEWAY
PROP. HMA DRIVEWAY
APPROXIMATE LOCATION OF EXISTING 5' WIDE TOWN (HIGHLAND) SIDEWALK EASEMENT (SEE PLAN 783 OF 1991)
EXISTING EASEMENT LINE
APPROX. LOCATION OF INTERMITTENT STREAM
WETLANDS
APPROX. LOCATION UNDERGROUND DRAINAGE
PROP. TEMP. EASEMENT (TYP)
PROP. PERM. EASEMENT (TYP)
PROP. SLOPE & CLEARING LIMIT (TYP)
PROP. R&R STUMPS, POSTS, AND SHRUBS
PROP. GRAN. CURB (TYPE VB) (TYP)
PROP. GUARDRAIL
PROP. GRAN. CURB (TYPE VB) (TYP)
PROP. HMA DRIVEWAY
PROP. CEM. CONC. SIDEWALK AT DRIVEWAY
PROP. SEDIMENT CONTROL BARRIER (TYP)
PROP. GUARDRAIL
PROP. CEM. CONC. SIDEWALK
PROP. PERM. EASEMENT (TYP)
PROP. TEMP. EASEMENT (TYP)
PROP. SLOPE & CLEARING LIMIT (TYP)
PROP. 2'W X 2'H CULVERT EXTENSION W/ NEW HEADWALL
PROP. PERM. EASEMENT (TYP)
PROP. SLOPE & CLEARING LIMIT (TYP)
PROP. HMA DRIVEWAY
PROP. CEM. CONC. SIDEWALK AT DRIVEWAY
PROP. GRAN. CURB (TYPE VB) (TYP)
PROP. GUARDRAIL
PROP. GRAN. CURB (TYPE VB) (TYP)
PROP. LOAM AND SEED (TYP)


ASHLAND, MA
ROUTE 126 (POND STREET)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 19 | 308
PROJECT FILE NO. 604123
CONSTRUCTION PLANS (6 OF 1)
HIGHWAY GUARD DETAILS
STA 41+78 RT (TIE IN EXISTING)
STA 41+78 - 41+89 RT (GUARDRAIL - CURVED, TL-2 (SINGLE FACED))
STA 41+89 - 43+87 RT (GUARDRAIL, TL-2 (SINGLE FACED))
STA 43+87 - 43+96 RT (TRAILING ANCHORAGE)
FOR LOCATION AND DEPTH OF DEEP POST GUARD SEE GUARDRAIL BENCH AND EMBANKMENT SLOPE TABLE ON TYPICAL SECTION 3 (SHEET 13)
TRAFFIC SIGNAL CONDUIT
NONE
WATER SUPPLY ALTERATIONS
NONE
DRAINAGE DETAILS
SEE SHEET NO. 97
ROUTE 126 (POND STREET)
(PUBLIC WAY)
1910 STATE HIGHWAY LAYOUT NO. 1297
NICKERSON ROAD
(PUBLIC WAY)
NASH AVENUE
(PRIVATE WAY)
LIMIT OF WORK
LIMIT OF PAVEMENT MILLING AND RESURFACING
STA. 600+82.00
LIMIT OF FULL DEPTH RECONSTRUCTION
STA. 600+62.00
LIMIT OF WORK
STA. 500+51.00
CONTINUED ON SHEET NO. 20
CONTINUED ON SHEET NO. 18
FOR PROFILE: SEE SHEET NO. 36, 50, 51
SCALE: 1" = 20'
GAZZARD 225 POND STREET, LLC BOOK 60871 PAGE 575 MAP 026.0 BL. 0003 225 POND ST.
PELLETIER REALTY TRUST BOOK 48981 PAGE 142 MAP 026.0 BL. 0007 231 POND ST.
PELLETIER REALTY TRUST BOOK 48981 PAGE 142 MAP 026.0 BL. 0008 237 POND ST.
PELLETIER REALTY TRUST BOOK 48981 PAGE 144 MAP 026.0 BL. 0010 241 POND ST.
ROBERT R. SAPORETTI & LESLIE K. SAPORETTI BOOK 17337 PAGE 448 MAP 026.0 BL. 0011 247 POND ST.
KLEIDANE D. TORRES & MARIE TORRES BOOK 68964 PAGE 42 MAP 026.0 BL. 0246 242 POND ST.
S&G REALTY TRUST BOOK 46439 PAGE 544 MAP 026.0 BL. 0247 236 POND ST.
THE HAPPINESS REALTY TRUST BOOK 65247 PAGE 360 MAP 026.0 BL. 0248 228 POND ST.
DEREK T. MAYERHOFER & BETH M. MAYERHOFER BOOK 63155 PAGE 186 MAP 026.0 BL. 0249 226 POND ST.
POND REALTY BOOK 47751 MAP 026.0 224 POND ST.
PROP. HMA DRIVEWAY
PROP. CEM. CONC. SIDEWALK AT DRIVEWAY
PROP. GRAN. CURB TYPE VB
PROP. LOAM AND SEED (TYP)
PROP. SLOPE LIMIT (TYP)
PROP. IMPRINT CROSSWALK (TYP.)
PROP. CEM CONC. SIDEWALK
PROP. CEM CONC. WHEELCHAIR RAMP
PROP. FULL DEPTH RECONSTRUCTION
PROP. SEDIMENT CONTROL BARRIER (TYP)
PROP. LOAM AND SEED (TYP)
PROP. PERM. EASEMENT (TYP)
PROP. SLOPE & CLEARING LIMIT (TYP)
PROP. MODIFIED ROCK FILL STA 41+78 - 43+04 RT
PROP. GUARDRAIL AT HEADWALL TO BE DOUBLE NESTED AND POSTS SPACED TO STRADDLE CULVERT (TYP.)
PROP. 2'W X 3'H CULVERT EXTENSION W/ NEW HEADWALL
PROP. HMA DRIVEWAY
PROP. CEM CONC. SIDEWALK AT DRIVEWAY
PROP. DETECTABLE WARNING PANEL (TYP)
PROP. CEM CONC. WHEELCHAIR RAMP (TYP)
PROP. GRAN. CURB TYPE VB
PROP. GRAVEL DRIVEWAY
PROP. GRAVEL SIDE STREET
PROP. TEMP. EASEMENT
PROP. PERM. EASEMENT
R&R TIMBER CURB
R&R WALK
R&D EXIST. CONC.
PROP. CEM. CONC. SIDEWALK
PROP. HMA DRIVEWAY
PROP. CEM. CONC. SIDEWALK AT DRIVEWAY
PROP. CEM. CONC. SW.
PROP. GRAN. CURB TYPE VB
PROP. ROUTE 126 CONSTRUCTION BASELINE
PROP. CEM. CONC. WHEELCHAIR RAMP (TYP)
PROP. DETECTABLE WARNING PANEL (TYP)
PROP. GRAN. CURB TYPE VB
PROP. TEMP. EASEMENT (TYP)
PROP. HMA DRIVEWAY
PROP. CEM. CONC. SIDEWALK AT DRIVEWAY
PROP. PERM. EASEMENT (TYP)
PROP. TEMP. EASEMENT (TYP)
PROP. HMA DRIVEWAY
PROP. CEM. CONC. SIDEWALK AT DRIVEWAY
PROP. GRAN. CURB TYPE VB
PROP. DETECTABLE WARNING PANEL (TYP)
PROP. CEM CONC. WHEELCHAIR RAMP
PROP. GRANITE CURB TYPE VB
APPROXIMATE LOCATION OF EXISTING 10' WIDE TOWN DRAIN EASEMENT
STA. 42+97.46 ROUTE 126 (POND STREET) ℄
STA 800+00.00 NICKERSON ROAD ℄
TOWN LAYOUT
2000 TOWN LAYOUT
N 8° 20' 55" E 524.41'
S 3° 24' 17" W 882.82'
S 3° 24' 17" W 472.05'
S 3° 24' 17" W 187.97'
R=3000.00'
L=248.41'
Δ=4°44'41"
WF#01
WF#02
WF#03
WF#04
WF#05
WF#BF201
WF#BF202
WF#BF203
WF#BF204
WF#BF205
WF#BF206
WETLANDS
BOX CULVERT 2W X 3H
INV=183.7
INV=180.5
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019


ASHLAND, MA
ROUTE 126 (POND STREET)
CONSTRUCTION PLANS (- OF 1)
HIGHWAY GUARD DETAILS
NONE
TRAFFIC SIGNAL CONDUIT
NONE
WATER SUPPLY ALTERATIONS
NONE
DRAINAGE DETAILS
SEE SHEET NO. 98
ROUTE 126 (POND STREET)
TRI STREET
TUFTS STREET
1910 STATE HIGHWAY LAYOUT NO. 1287
PROP. GRAN. CURB TYPE VB
PROP. CEM. CONC. SIDEWALK
PROP. HMA DRIVEWAY
PROP. LOAM AND SEED (TYP)
PROP. TEMP. EASEMENT (TYP)
PROP. SLOPE & CLEARING LIMIT (TYP)
PROP. PERM. EASEMENT (TYP)
LIMIT OF WORK
LIMIT OF PAVEMENT MILLING AND RESURFACING
STA. 800+75.00
LIMIT OF FULL DEPTH RECONSTRUCTION
STA. 800+55.00
PROP. CEM. CONC. WHEELCHAIR RAMP
PROP. DETECTABLE WARNING PANEL (TYP)
PROP. 3" CURB REVEAL
PROP. FULL DEPTH RECONSTRUCTION
PROP. SAWCUT (TYP)
PROP. CEM. CONC. WHEELCHAIR RAMP
PROP. ROUTE 126 CONSTRUCTION BASELINE
PROP. PERM. EASEMENT (TYP)
PROP. TEMP. EASEMENT (TYP)
PROP. GRAN. CURB TYPE VB
PROP. CEM. CONC. SIDEWALK AT DRIVEWAY
PROP. HMA DRIVEWAY
PROP. CEM. CONC. SIDEWALK
PROP. CEM. CONC. WHEELCHAIR RAMP
PROP. LOAM AND SEED (TYP)
PROP. TEMP. EASEMENT (TYP)
PROP. SLOPE & CLEARING LIMIT (TYP)
PROP. PERM. EASEMENT (TYP)
PROP. 3" CURB REVEAL
PROP. FULL DEPTH RECONSTRUCTION
PROP. SAWCUT (TYP)
PROP. CEM. CONC. WHEELCHAIR RAMP
PROP. GRAN. CURB TYPE VB (TYP)
PROP. CEM. CONC. SIDEWALK AT DRIVEWAY
PROP. HMA DRIVEWAY
ADJ (BO)
R&R BOLLARDS (BO)
RET SIGN & 2 BOLLARDS
PROP. CEM. CONC. SIDEWALK AT DRIVEWAY
PROP. HMA DRIVEWAY
PROP. TEMP. EASEMENT (TYP)
PROP. PERM. EASEMENT (TYP)
PROP. CEM. CONC. SIDEWALK AT DRIVEWAY
PROP. HMA DRIVEWAY
PROP. GRAN. CURB TYPE VB
ADJ (BO)
PROP. GRAN. CURB TYPE VB
PROP. CEM. CONC. SIDEWALK
PROP. HMA DRIVEWAY
PROP. GRAN. CURB TYPE VB
PROP. CEM. CONC. SIDEWALK AT DRIVEWAY


ASHLAND, MA
ROUTE 126 (POND STREET)
CONSTRUCTION PLANS (OF 1)
PROJECT FILE NO. 604123
TOTAL SHEETS 308
SHEET NO. 21
FED. AID PROJ. NO. -
STATE MA
HIGHWAY GUARD DETAILS
STA 902+15 TO 902+05 RT (TRAILING ANCHORAGE)
STA 902+05 TO 901+36 RT (GUARDRAIL, TL-2 (SINGLE FACED))
STA 901+36 TO 900+71 RT (GUARDRAIL - CURVED, TL-2 (SINGLE FACED))
STA 900+71 TO 900+57 RT (GUARDRAIL, TL-2 (SINGLE FACED))
STA 900+57 RT TO 54+65 LT (GURAIL - CURVED, TL-2 (SINGLE FACED))
STA 54+65 TO 58+13 LT (GUARDRAIL, TL-2 (SINGLE FACED))
STA 58+13 TO 58+51 LT (GUARDRAIL TANGENT END TREATMENT, TL-2)
TRAFFIC SIGNAL CONDUIT
NONE
WATER SUPPLY ALTERATIONS
NONE
FOR LOCATION AND DEPTH OF DEEP POST GUARD
SEE GUARDRAIL BENCH AND EMBANKMENT SLOPE TABLE
ON TYPICAL SECTION 3 (SHEET 13)
DRAINAGE DETAILS
SEE SHEET NO. 99
LIMIT OF WORK
LIMIT OF PAVEMENT MILLING AND RESURFACING
STA. 902+90.00
LIMIT OF FULL DEPTH RECONSTRUCTION
STA. 902+75.00
MATCH EXISTING
MATCH A-A
MATCH A-A
ROUTE 126 (POND STREET)
(PUBLIC WAY)
SEWELL STREET
(PUBLIC WAY)
HARVARD STREET
(PUBLIC WAY)
ALGONQUIN TRAIL
(PRIVATE WAY)
PROP. WETLAND REPLICATION AREA SEE WETLAND REPLICATION PLANS 183
PROP. TEMP. EASEMENT (TYP)
PROP. PERM. EASEMENT (TYP)
PROP. SLOPE & CLEARING LIMIT (TYP)
PROP. LOAM AND SEED (TYP)
PROP. GRAN. CURB TYPE VB
PROP. CEM CONC. SIDEWALK
PROP. SEDIMENT CONTROL BARRIER (TYP.)
PROP. SLOPE LIMIT (TYP.)
PROP. FULL DEPTH RECONSTRUCTION
PROP. CEM. CONC. SIDEWALK AT DRIVEWAY
PROP. HMA DRIVEWAY
PROP. MULCH
PROP. CONTROLLER CABINET
PROP. 8' POST WITH PED
PROP. 3' REVEAL
PROP. 20' MAST ARM
PROP. 35' MAST ARM
PROP. 25' MAST ARM
PROP. 38'W X 24'H LUMINAIRE EXTENSION POLE W/ OVERHANG
PROP. PERM. EASEMENT
PROP. DETECTABLE WARNING PANEL (TYP.)
PROP. CEM CONC. WHEELCHAIR RAMP
PROP. IMPRINT CROSSWALK (TYP.)
PROP. GRAN. CURB TYPE VB
PROP. LOAM AND SEED (TYP)
PROP. 36"-43" OUTCROPS
PROP. CEM. CONC. SIDEWALK
PROP. CEM. CONC. WHEELCHAIR RAMP
PROP. APRON
PROP. RIPRAP
PROP. SEDIMENT CONTROL BARRIER (TYP.)
PROP. DETECTABLE WARNING PANEL
REM BOULDER
R&R BOULDER
R&D EXIST. SIDEWALK
R&D EXIST. CURB
REM. EXIST. PAVEMENT
REM MACADAM STONES AND DETECTABLE WARNING PANEL
APPROXIMATE LINE OF EASEMENT
APPROXIMATE LOCATION OF 30' WIDE SHELL OIL EASEMENT (SEE PLAN 165 OF 1988)
N 5° 38' 24" E 1023.98'
S 5° 38' 17" W 1102.61'
TOWN LAYOUT
LIMIT OF FULL DEPTH RECONSTRUCTION
STA. 1000+32.00
LIMIT OF WORK
LIMIT OF PAVEMENT MILLING AND RESURFACING
STA. 1000+88.00
STA. 55+61.55 ROUTE 126 (POND STREET)
STA. 1100+00.00 SEWELL STREET
FOR PROFILE:
SEE SHEET NO. 38, 54, 55, 56
CONTINUED ON SHEET NO. 22
CONTINUED ON SHEET NO. 20
1910 STATE HIGHWAY LAYOUT NO. 1297
JEFFREY R. HORN BOOK 14415 PAGE 319 MAP 022.0 BL. 0030 182 POND ST.
JEFFREY HORN BOOK 47110 PAGE 144 MAP 022.0 BL. 0027 SEWELL ST.
JEFFREY HORN BOOK 46702 PAGE 20 MAP 022.0 BL. 0028 7 SEWELL ST.
V. SARDINHA REALTY TRUST BOOK 63552 PAGE 408 MAP 022.0 BL. 0018 190 POND ST.
HESS REALTY LLC BOOK 63745 PAGE 433 MAP 022.0 BL. 0016 196 POND ST.
KWC REAL ESTATE, LLC BOOK 69223 PAGE 193 MAP 026.0 BL. 0016 202 POND ST.
ASHLAND OPEN SPACE TRUST BOOK 62285 PAGE 369 MAP 022.0 BL. 0058
VILLAGE OF WESTERLY CONDOMINIUM TRUST BOOK 62585 PAGE 366 MAP 022.0 BL. 0038
SCALE: 1" = 20'
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019


ASHLAND, MA
ROUTE 126 (POND STREET)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 22 | 308
PROJECT FILE NO. 604123
CONSTRUCTION PLANS (OF 1)
HIGHWAY GUARD DETAILS
STA 54+65 TO 58+13 LT (GUARDRAIL, TL-2 (SINGLE FACED))
STA 58+13 TO 58+51 LT (GUARDRAIL TANGENT END TREATMENT, TL-2)
FOR LOCATION AND DEPTH OF DEEP POST GUARD SEE GUARDRAIL BENCH AND EMBANKMENT SLOPE TABLE ON TYPICAL SECTION 3 (SHEET 13)
TRAFFIC SIGNAL CONDUIT
NONE
WATER SUPPLY ALTERATIONS
NONE
DRAINAGE DETAILS
SEE SHEET NO. 100
ROUTE 126 (POND STREET)
1910 STATE HIGHWAY LAYOUT NO. 1297
SEWELL STREET (PUBLIC WAY)
PROP. ROUTE 126 CONSTRUCTION BASELINE
PROP. GUARDRAIL WITH DEEP POSTS IN FRONT OF UTILITY POLE
PROP. CEM. CONC. SIDEWALK
PROP. GRAN. CURB TYPE 7B
PROP. TEMP. EASEMENT (TYP)
PROP. PERM. EASEMENT (TYP)
PROP. SEDIMENT CONTROL BARRIER (TYP)
PROP. SLOPE & CLEARING LIMIT (TYP)
PROP. LOAM AND SEED (TYP)
PROP. SLOPE LIMIT (TYP)
PROP. TEMP. EASEMENT (TYP)
PROP. FULL DEPTH RECONSTRUCTION
PROP. CEM.CONC. WHEELCHAIR RAMP
LIMIT OF FULL DEPTH RECONSTRUCTION
STA. 1100+49.00
LIMIT OF WORK
LIMIT OF PAVEMENT MILLING AND RESURFACING
STA. 1100+70.00
APPROXIMATE LOCATION DRIVEWAY EASEMENT (SEE BOOK 26609 PAGE 290)
VILLAGE OF WESTERLY CONDOMINIUM TRUST BOOK 62585 PAGE 365 MAP 022.0 BL. 0058
ALGONQUIN TRAIL
158 POND STREET REALTY TRUST BOOK 45572 PAGE 596 MAP 022.0 BL. 0035
166-170 POND ST.
158 POND STREET REALTY TRUST BOOK 28560 PAGE 536 MAP 022.0 BL. 0037
158 POND ST.
162 POND STREET REALTY TRUST BOOK 28560 PAGE 543 MAP 022.0 BL. 0036
162 POND ST.
CONTINUED ON SHEET NO. 21
CONTINUED ON SHEET NO. 23
FOR PROFILE: SEE SHEET NO. 39 & 56
SCALE: 1" = 20'
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019
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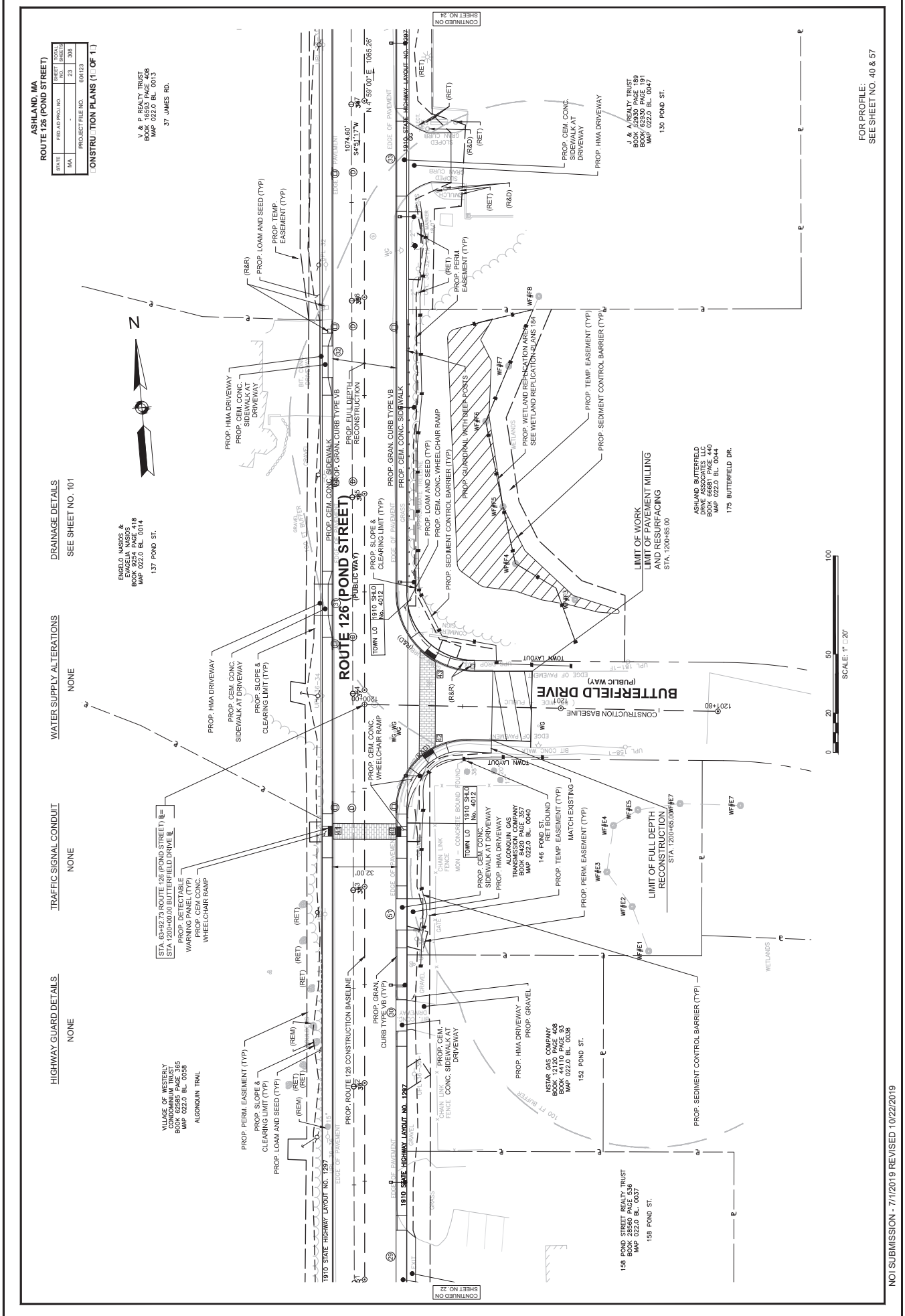

ASHLAND, MA
ROUTE 126 (POND STREET)
CONSTRUCTION PLANS (1 OF 1)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 23 | 308
PROJECT FILE NO. 604123
HIGHWAY GUARD DETAILS
NONE
TRAFFIC SIGNAL CONDUIT
NONE
WATER SUPPLY ALTERATIONS
NONE
DRAINAGE DETAILS
SEE SHEET NO. 101
ROUTE 126 (POND STREET)
(PUBLIC WAY)
BUTTERFIELD DRIVE
(PUBLIC WAY)
1910 STATE HIGHWAY LAYOUT NO. 1297
CONSTRUCTION BASELINE
STA. 63+92.73 ROUTE 126 (POND STREET) ℄=
STA 1200+00.00 BUTTERFIELD DRIVE ℄
LIMIT OF WORK
LIMIT OF PAVEMENT MILLING AND RESURFACING
STA. 1200+85.00
LIMIT OF FULL DEPTH RECONSTRUCTION
STA. 1200+65.00
PROP. ROUTE 126 CONSTRUCTION BASELINE
PROP. FULL DEPTH RECONSTRUCTION
PROP. GRAN. CURB TYPE VB
PROP. CEM. CONC. SIDEWALK
PROP. SLOPE & CLEARING LIMIT (TYP)
PROP. LOAM AND SEED (TYP)
PROP. TEMP. EASEMENT (TYP)
PROP. PERM. EASEMENT (TYP)
PROP. SEDIMENT CONTROL BARRIER (TYP)
PROP. QUADRAIL WITH BEEP POSTS
PROP. WETLAND REPLICATION AREA SEE WETLAND REPLICATION PLANS 164
PROP. HMA DRIVEWAY
PROP. CEM. CONC. SIDEWALK AT DRIVEWAY
PROP. CEM. CONC. WHEELCHAIR RAMP
PROP. DETECTABLE WARNING PANEL (TYP)
PROP. GRAVEL
MATCH EXISTING
TOWN LO 1910 SHLO No. 4012
ENGELO NASIOS & EVAGELIA NASIOS
BOOK 9254 PAGE 418
MAP 022.0 BL. 0014
137 POND ST.
V. & P. REALTY TRUST
BOOK 16593 PAGE 408
MAP 022.0 BL. 0013
37 JAMES RD.
J. & J. REALTY TRUST
BOOK 28301 PAGE 189
BOOK 62930 PAGE 191
MAP 022.0 BL. 0047
130 POND ST.
ASHLAND BUTTERFIELD DRIVE ASSOCIATES LLC
BOOK 66681 PAGE 440
MAP 022.0 BL. 0044
175 BUTTERFIELD DR.
VILLAGE OF WESTERLY CONDOMINIUM TRUST
BOOK 44555 PAGE 365
MAP 022.0 BL. 0058
ALGONQUIN TRAIL
NSTAR GAS COMPANY
BOOK 12120 PAGE 408
BOOK 44410 PAGE 353
MAP 022.0 BL. 0038
152 POND ST.
158 POND STREET REALTY TRUST
BOOK 28560 PAGE 536
MAP 022.0 BL. 0037
158 POND ST.
ALGONQUIN GAS TRANSMISSION COMPANY
BOOK 8420 PAGE 357
MAP 022.0 BL. 0040
146 POND ST.
RET BOUND
WETLANDS
100 FT BUFFER
CONTINUED ON SHEET NO. 24
CONTINUED ON SHEET NO. 22
FOR PROFILE: SEE SHEET NO. 40 & 57
SCALE: 1" = 20'
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

HIGHWAY GUARD DETAILS

STA 70+60 - 70+69 LT (TRAILING ANCHORAGE)
STA 70+69 - 80+85 LT (GUARDRAIL, TL-2 (SINGLE FACED))
STA 72+38 - 72+40 RT (TRAILING ANCHORAGE)
STA 72+40 - 72+52 RT (GUARDRAIL - CURVED, TL-2 (SINGLE FACED))
STA 72+52 - 77+61 RT (GUARDRAIL, TL-2 (SINGLE FACED))

FOR LOCATION AND DEPTH OF DEEP POST GUARD SEE GUARDRAIL BENCH AND EMBANKMENT SLOPE TABLE ON TYPICAL SECTION 3 (SHEET 13)

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

NONE

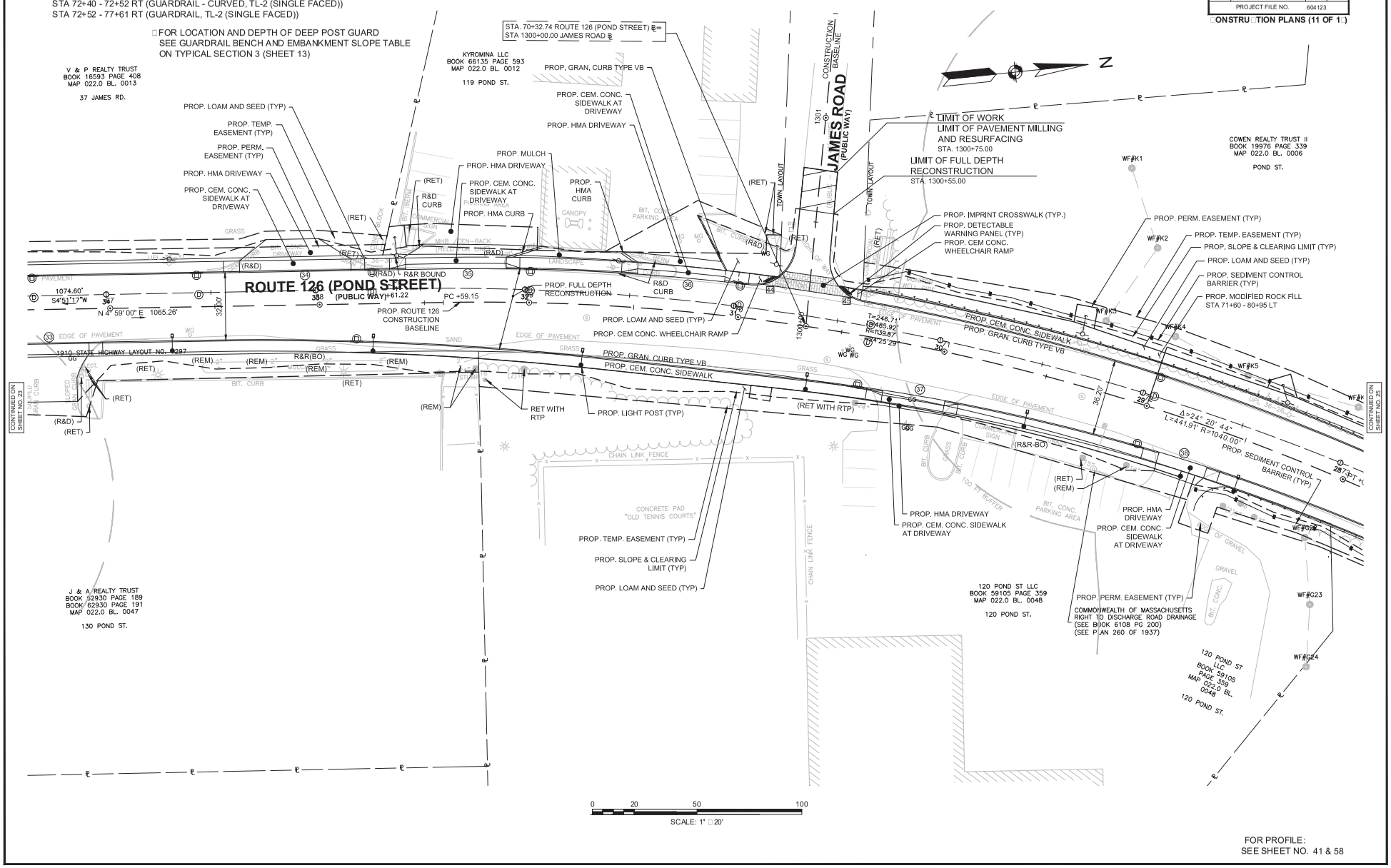
DRAINAGE DETAILS

SEE SHEET NO. 102

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	24	308
PROJECT FILE NO.	604123		

CONSTRUCTION PLANS (11 OF 1)



FOR PROFILE:
SEE SHEET NO. 41 & 58

NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

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ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	25	308
PROJECT FILE NO.	604123		

CONSTRUCTION PLANS (12 OF 1□)

HIGHWAY GUARD DETAILS

STA 70+69 - 80+85 LT (GUARDRAIL, TL-2 (SINGLE FACED))
STA 80+85 - 81+22 LT (GUARDRAIL FLARED END TREATMENT, TL-2)
STA 72+51 - 77+61 RT (GUARDRAIL, TL-2 (SINGLE FACED))
STA 77+61 - 77+70 RT (TRAILING ANCHORAGE)
STA 77+78 - 78+15 RT (GUARDRAIL TANGENT END TREATMENT, TL-2)
STA 78+15 - 81+61 RT (GUARDRAIL, TL-2 (SINGLE FACED))
STA 81+61 - 81+70 RT (TRAILING ANCHORAGE)

FOR LOCATION AND DEPTH OF DEEP POST GUARD
SEE GUARDRAIL BENCH AND EMBANKMENT SLOPE TABLE
ON TYPICAL SECTION 3 (SHEET 13)

TRAFFIC SIGNAL CONDUIT

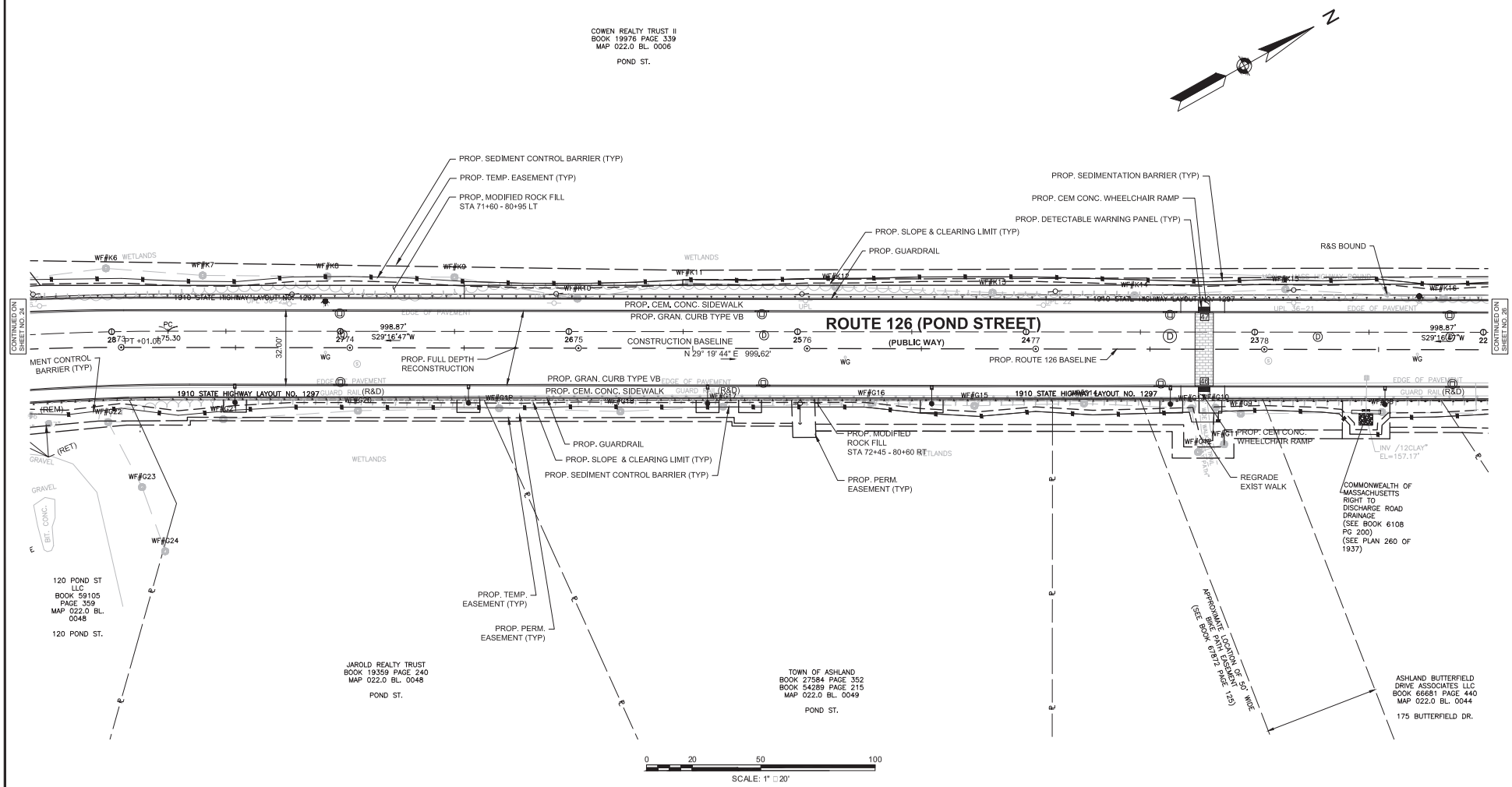
NONE

WATER SUPPLY ALTERATIONS

NONE

DRAINAGE DETAILS

SEE SHEET NO. 103



FOR PROFILE:
SEE SHEET NO. 42

NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

A00860 - 119

Proposal No. 604123-111717

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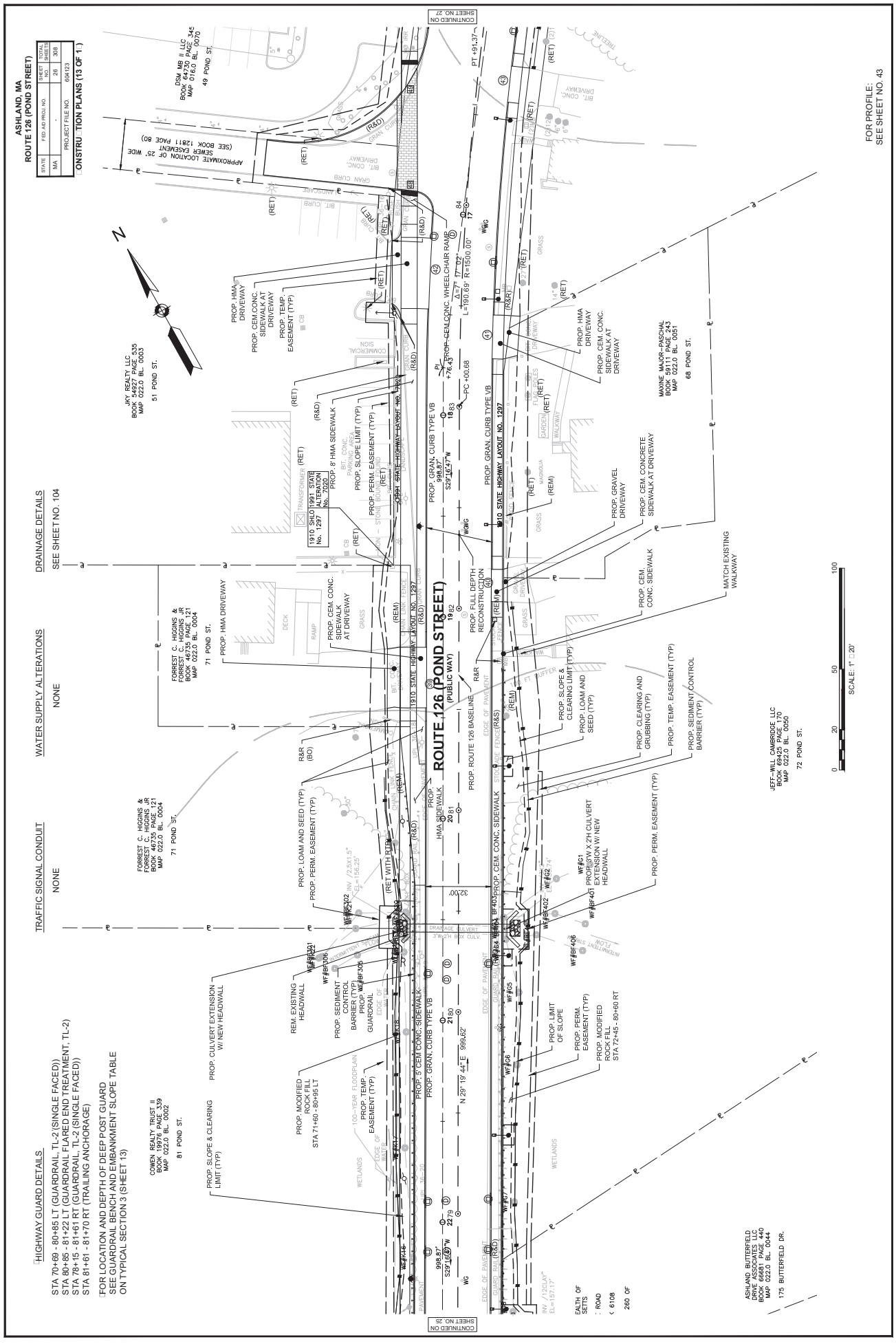

ASHLAND, MA
ROUTE 126 (POND STREET)
CONSTRUCTION PLANS (13 OF 1)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 26 | 308
PROJECT FILE NO. 604123
HIGHWAY GUARD DETAILS
STA 70+69 - 80+85 LT (GUARDRAIL, TL-2 (SINGLE FACED))
STA 80+85 - 81+22 LT (GUARDRAIL FLARED END TREATMENT, TL-2)
STA 78+15 - 81+61 RT (GUARDRAIL, TL-2 (SINGLE FACED))
STA 81+61 - 81+70 RT. (TRAILING ANCHORAGE)
FOR LOCATION AND DEPTH OF DEEP POST GUARD
SEE GUARDRAIL BENCH AND EMBANKMENT SLOPE TABLE
ON TYPICAL SECTION 3 (SHEET 13)
TRAFFIC SIGNAL CONDUIT
NONE
WATER SUPPLY ALTERATIONS
NONE
DRAINAGE DETAILS
SEE SHEET NO. 104
ROUTE 126 (POND STREET)
(PUBLIC WAY)
1910 STATE HIGHWAY LAYOUT NO. 1297
PROP. ROUTE 126 BASELINE
PROP. GRAN. CURB TYPE VB
PROP. 5' CEM CONC. SIDEWALK
PROP. 8' HMA SIDEWALK
PROP. CEM. CONC. SIDEWALK AT DRIVEWAY
PROP. HMA DRIVEWAY
PROP. CEM.CONC. SIDEWALK AT DRIVEWAY
PROP. TEMP. EASEMENT (TYP)
PROP. SLOPE LIMIT (TYP)
PROP. PERM. EASEMENT (TYP)
PROP. FULL DEPTH RECONSTRUCTION
PROP. GRAN. CURB TYPE VB
PROP. GRAVEL DRIVEWAY
PROP. CEM. CONCRETE SIDEWALK AT DRIVEWAY
PROP. CEM. CONC. SIDEWALK
MATCH EXISTING WALKWAY
PROP. LOAM AND SEED (TYP)
PROP. SLOPE & CLEARING LIMIT (TYP)
PROP. CLEARING AND GRUBBING (TYP)
PROP. TEMP. EASEMENT (TYP)
PROP. SEDIMENT CONTROL BARRIER (TYP)
PROP. CULVERT EXTENSION W/ NEW HEADWALL
REM. EXISTING HEADWALL
PROP. MODIFIED ROCK FILL STA 71+60 - 80+95 LT
PROP. SEDIMENT CONTROL BARRIER (TYP)
PROP. GUARDRAIL
PROP. LIMIT OF SLOPE
PROP. PERM. EASEMENT (TYP)
PROP. MODIFIED ROCK FILL STA 72+45 - 80+60 RT
PROP. 36"X 20' CMP
PROP. 24"X 20' CMP
PROP. 18"X 20' CMP
PROP. 12"X 20' CMP
PROP. 6"X 20' CMP
PROP. 4' DRAINAGE MANHOLE
PROP. 6"X 2'H CULVERT EXTENSION W/ NEW HEADWALL
PROP. 12"X 2'H CULVERT EXTENSION W/ NEW HEADWALL
PROP. 18"X 2'H CULVERT EXTENSION W/ NEW HEADWALL
PROP. 24"X 2'H CULVERT EXTENSION W/ NEW HEADWALL
PROP. 36"X 2'H CULVERT EXTENSION W/ NEW HEADWALL
PROP. 4' DRAINAGE MANHOLE
PROP. 6"X 2'H CULVERT
PROP. 12"X 2'H CULVERT
PROP. 18"X 2'H CULVERT
PROP. 24"X 2'H CULVERT
PROP. 36"X 2'H CULVERT

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	27	308
PROJECT FILE NO.	604123		

CONSTRUCTION PLANS (14 OF 1)

HIGHWAY GUARD DETAILS

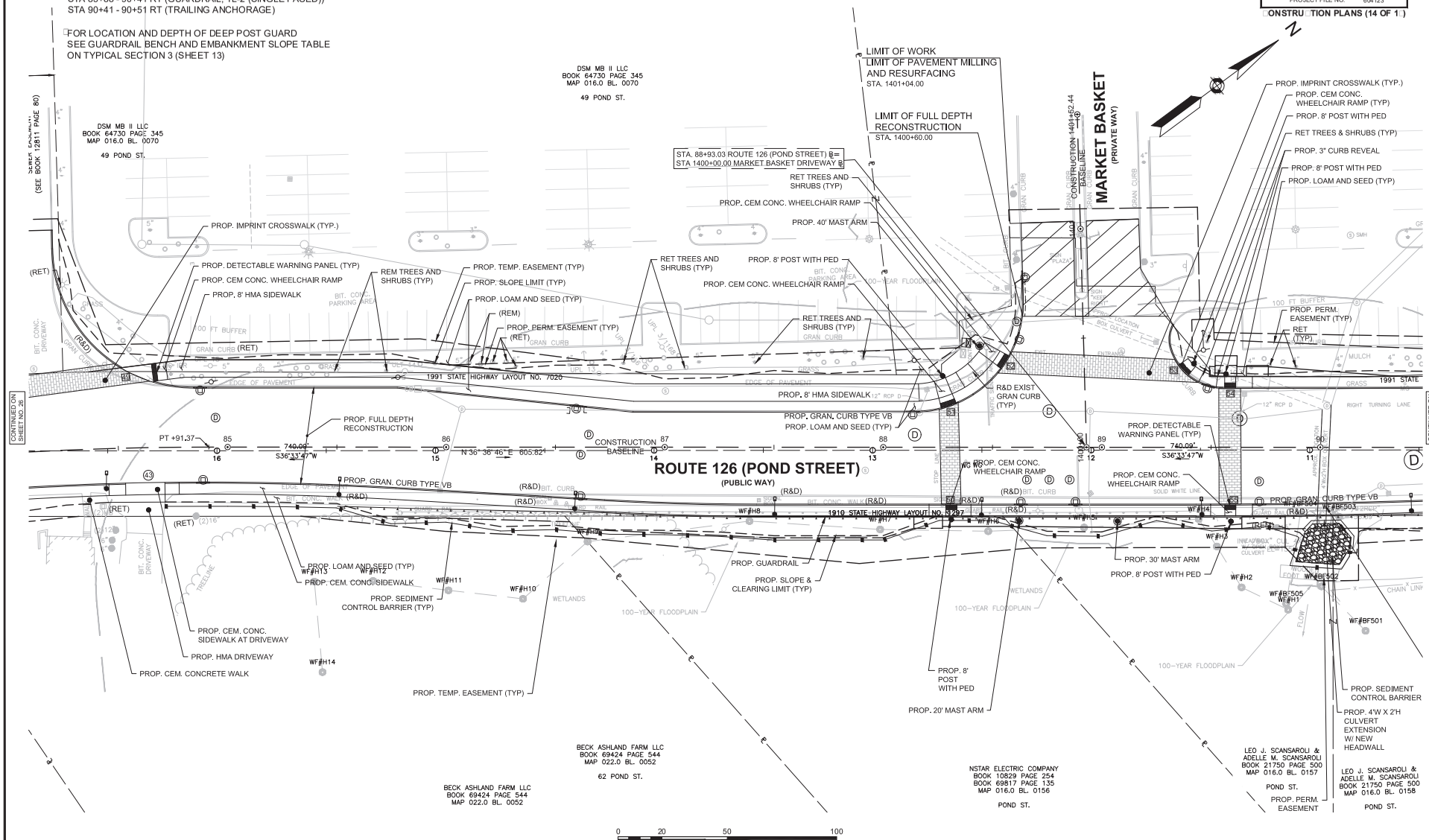
STA 85+50 - 85+88 RT (GUARDRAIL TANGENT END TREATMENT, TL-2)
STA 85+88 - 90+41 RT (GUARDRAIL, TL-2 (SINGLE FACED))
STA 90+41 - 90+51 RT (TRAILING ANCHORAGE)

FOR LOCATION AND DEPTH OF DEEP POST GUARD
SEE GUARDRAIL BENCH AND EMBANKMENT SLOPE TABLE
ON TYPICAL SECTION 3 (SHEET 13)

TRAFFIC SIGNAL CONDUIT
NONE

WATER SUPPLY ALTERATIONS
NONE

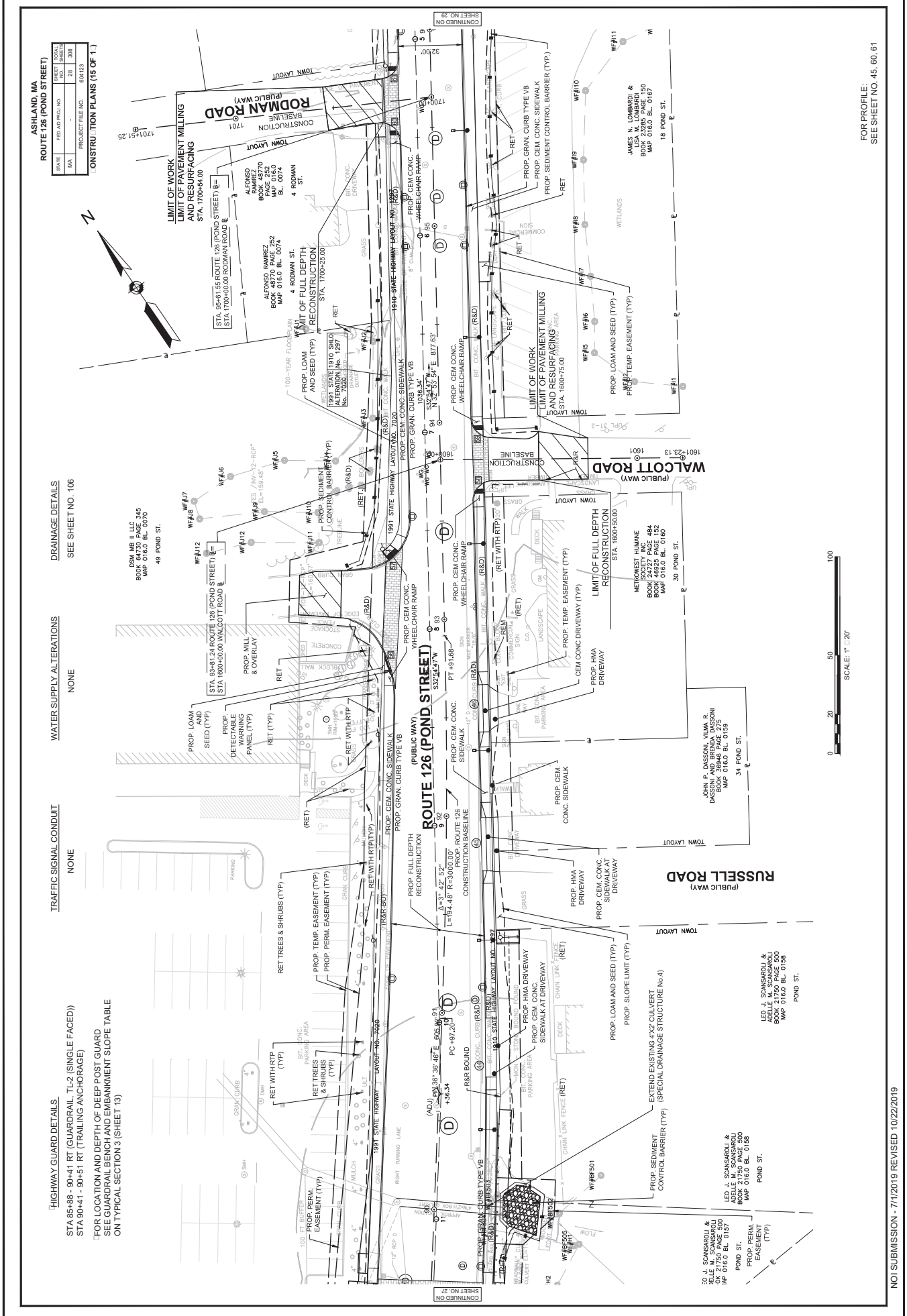
DRAINAGE DETAILS
SEE SHEET NO. 105



FOR PROFILE:
SEE SHEET NO. 44 & 59

NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

604123_HD08(CONSTRUCTION PLANS).DWG Plotted on 16-Mar-2018 3:55 PM


ASHLAND, MA
ROUTE 126 (POND STREET)
CONSTRUCTION PLANS (15 OF 1)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 28 | 308
PROJECT FILE NO. 604123
HIGHWAY GUARD DETAILS
STA 85+88 - 90+41 RT (GUARDRAIL, TL-2 (SINGLE FACED))
STA 90+41 - 90+51 RT (TRAILING ANCHORAGE)
FOR LOCATION AND DEPTH OF DEEP POST GUARD SEE GUARDRAIL BENCH AND EMBANKMENT SLOPE TABLE ON TYPICAL SECTION 3 (SHEET 13)
TRAFFIC SIGNAL CONDUIT
NONE
WATER SUPPLY ALTERATIONS
NONE
DRAINAGE DETAILS
SEE SHEET NO. 106
LIMIT OF WORK
LIMIT OF PAVEMENT MILLING AND RESURFACING
STA. 1700+54.00
LIMIT OF FULL DEPTH RECONSTRUCTION
STA. 1700+25.00
LIMIT OF WORK
LIMIT OF PAVEMENT MILLING AND RESURFACING
STA. 1600+75.00
LIMIT OF FULL DEPTH RECONSTRUCTION
STA. 1600+50.00
ROUTE 126 (POND STREET)
(PUBLIC WAY)
RODMAN ROAD
(PUBLIC WAY)
WALCOTT ROAD
(PUBLIC WAY)
RUSSELL ROAD
(PUBLIC WAY)
1991 STATE HIGHWAY LAYOUT NO. 7020
1910 STATE HIGHWAY LAYOUT NO. 1282
STA. 95+61.55 ROUTE 126 (POND STREET) ℄
STA 1700+00.00 RODMAN ROAD ℄
STA. 93+81.24 ROUTE 126 (POND STREET) ℄
STA 1600+00.00 WALCOTT ROAD ℄
PROP. FULL DEPTH RECONSTRUCTION
PROP. ROUTE 126 CONSTRUCTION BASELINE
PROP. CEM. CONC. SIDEWALK
PROP. CEM CONC. WHEELCHAIR RAMP
PROP. GRAN. CURB TYPE VB
PROP. CEM. CONC. SIDEWALK AT DRIVEWAY
PROP. HMA DRIVEWAY
PROP. CEM CONC DRIVEWAY
PROP. TEMP. EASEMENT (TYP)
PROP. PERM. EASEMENT (TYP)
PROP. SEDIMENT CONTROL BARRIER (TYP)
PROP. SLOPE LIMIT (TYP)
PROP. LOAM AND SEED (TYP)
PROP. LOAM AND SEED
PROP. DETECTABLE WARNING PANEL (TYP)
PROP. MILL & OVERLAY
PROP. GRAN. CURB TYPE VB TRANSITION
EXTEND EXISTING 4'X2' CULVERT (SPECIAL DRAINAGE STRUCTURE No.4)
RET WITH RTP (TYP)
RET TREES & SHRUBS (TYP)
RET TREES & SHRUBS
RET
RET (TYP)
RET WITH RTP
(RET WITH RTP)
(RET)
(R&D)
R&R BOUND
PC +97.20
PT +91.68
PROP. 1600+00.00
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PROP. 1700+54.00
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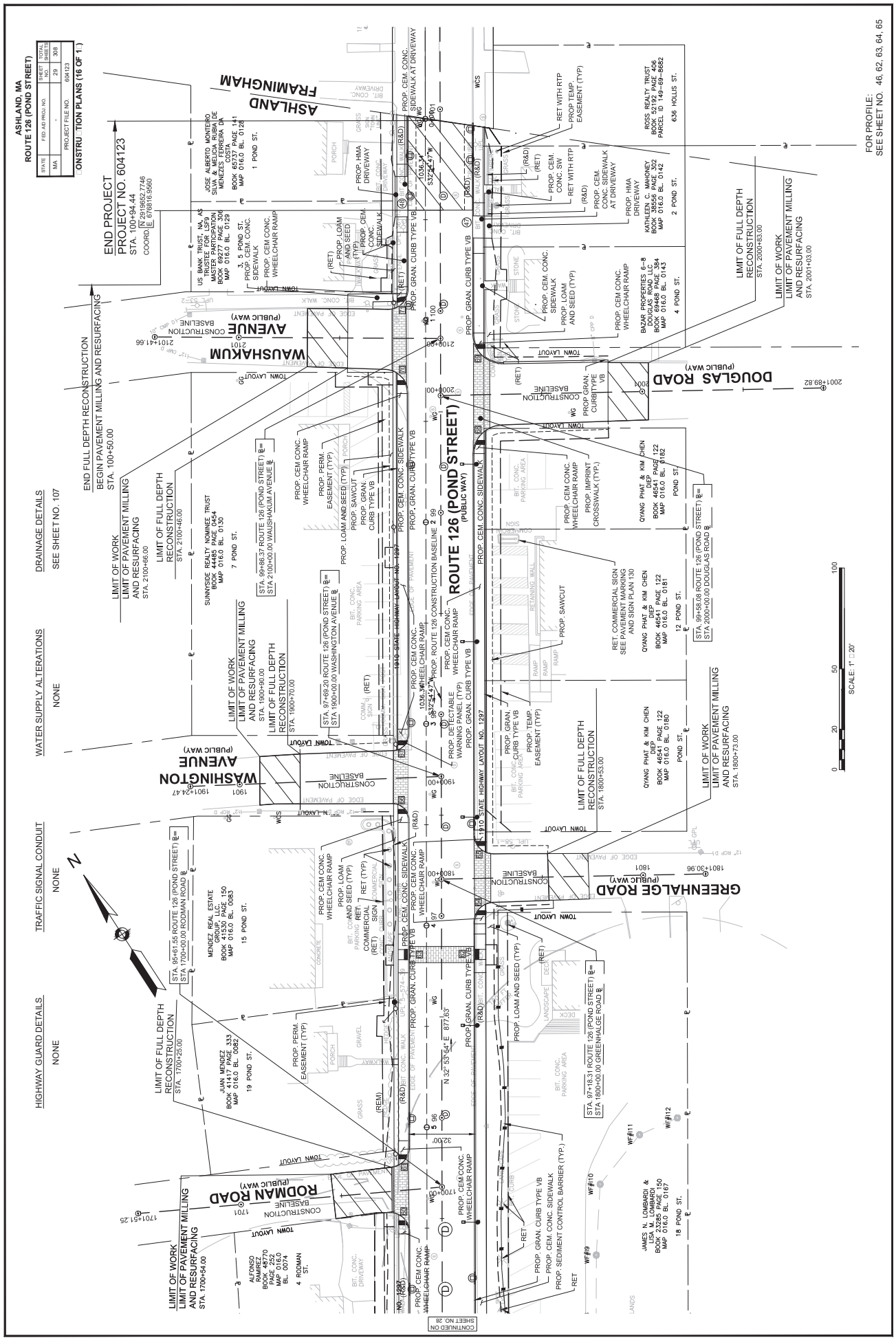
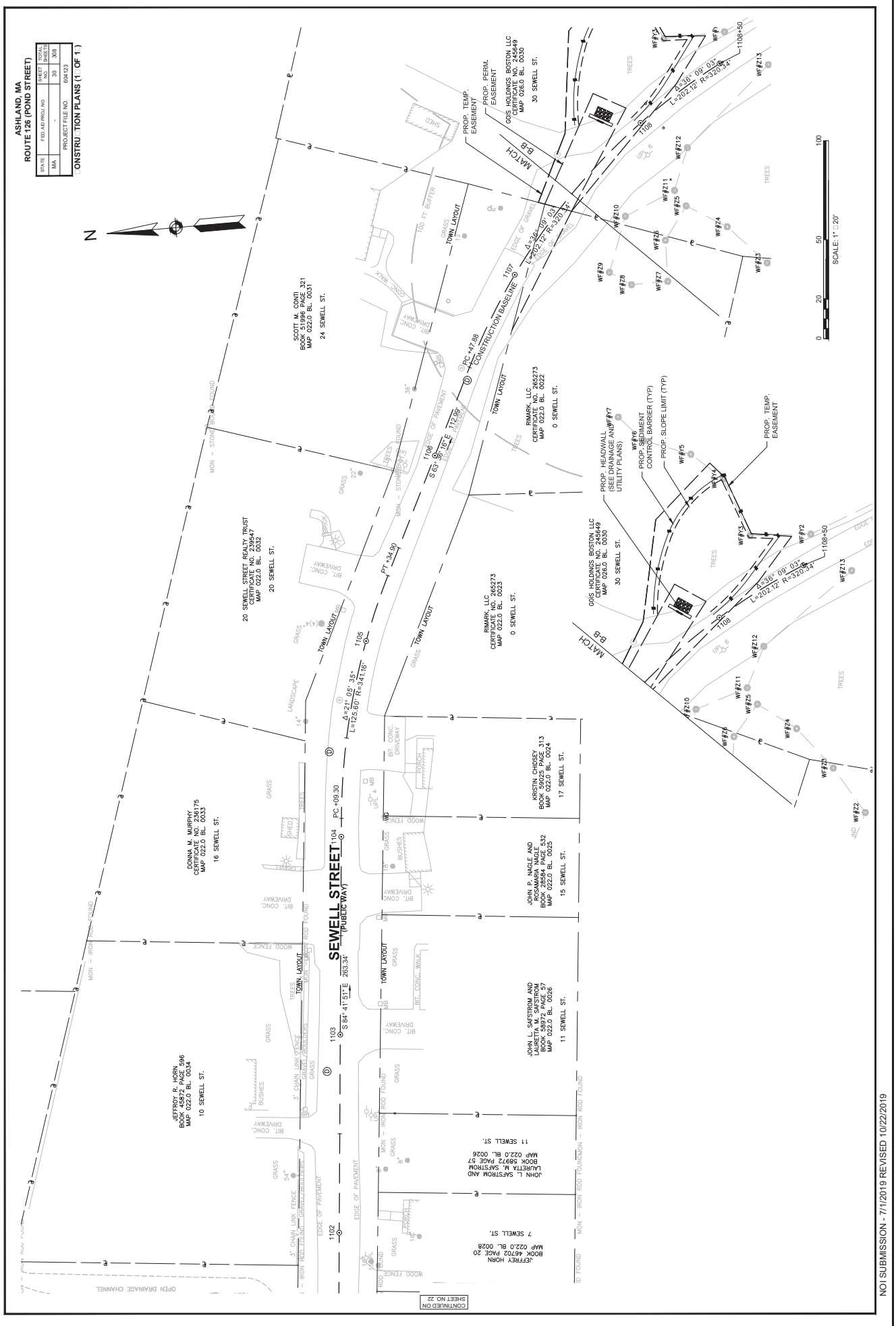

ASHLAND, MA
ROUTE 126 (POND STREET)
CONSTRUCTION PLANS (16 OF 1)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 29 | 308
PROJECT FILE NO. 604123
END PROJECT
PROJECT NO. 604123
STA. 100+94.44
COORD. N 2919652.7746
E 676816.9560
END FULL DEPTH RECONSTRUCTION
BEGIN PAVEMENT MILLING AND RESURFACING
STA. 100+50.00
HIGHWAY GUARD DETAILS
NONE
TRAFFIC SIGNAL CONDUIT
NONE
WATER SUPPLY ALTERATIONS
NONE
DRAINAGE DETAILS
SEE SHEET NO. 107
ROUTE 126 (POND STREET)
(PUBLIC WAY)
WAUSHAKUM AVENUE
(PUBLIC WAY)
WASHINGTON AVENUE
(PUBLIC WAY)
DOUGLAS ROAD
(PUBLIC WAY)
GREENHALGE ROAD
(PUBLIC WAY)
RODMAN ROAD
(PUBLIC WAY)
ASHLAND
FRAMINGHAM
LIMIT OF WORK
LIMIT OF PAVEMENT MILLING
AND RESURFACING
STA. 1700+54.00
LIMIT OF FULL DEPTH
RECONSTRUCTION
STA. 1700+25.00
LIMIT OF WORK
LIMIT OF PAVEMENT MILLING
AND RESURFACING
STA. 1800+73.00
LIMIT OF FULL DEPTH
RECONSTRUCTION
STA. 1800+53.00
LIMIT OF WORK
LIMIT OF PAVEMENT MILLING
AND RESURFACING
STA. 1900+70.00
LIMIT OF FULL DEPTH
RECONSTRUCTION
STA. 1900+46.00
LIMIT OF WORK
LIMIT OF PAVEMENT MILLING
AND RESURFACING
STA. 2100+86.00
LIMIT OF FULL DEPTH
RECONSTRUCTION
STA. 2100+46.00
LIMIT OF WORK
LIMIT OF PAVEMENT MILLING
AND RESURFACING
STA. 2001+03.00
LIMIT OF FULL DEPTH
RECONSTRUCTION
STA. 2000+83.00
FOR PROFILE:
SEE SHEET NO. 46, 62, 63, 64, 65
CONTINUED ON SHEET NO. 28
SCALE: 1" = 20'
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019
604123_HD08(CONSTRUCTION PLANS).DWG Plotted on 18-Mar-2019 3:55 PM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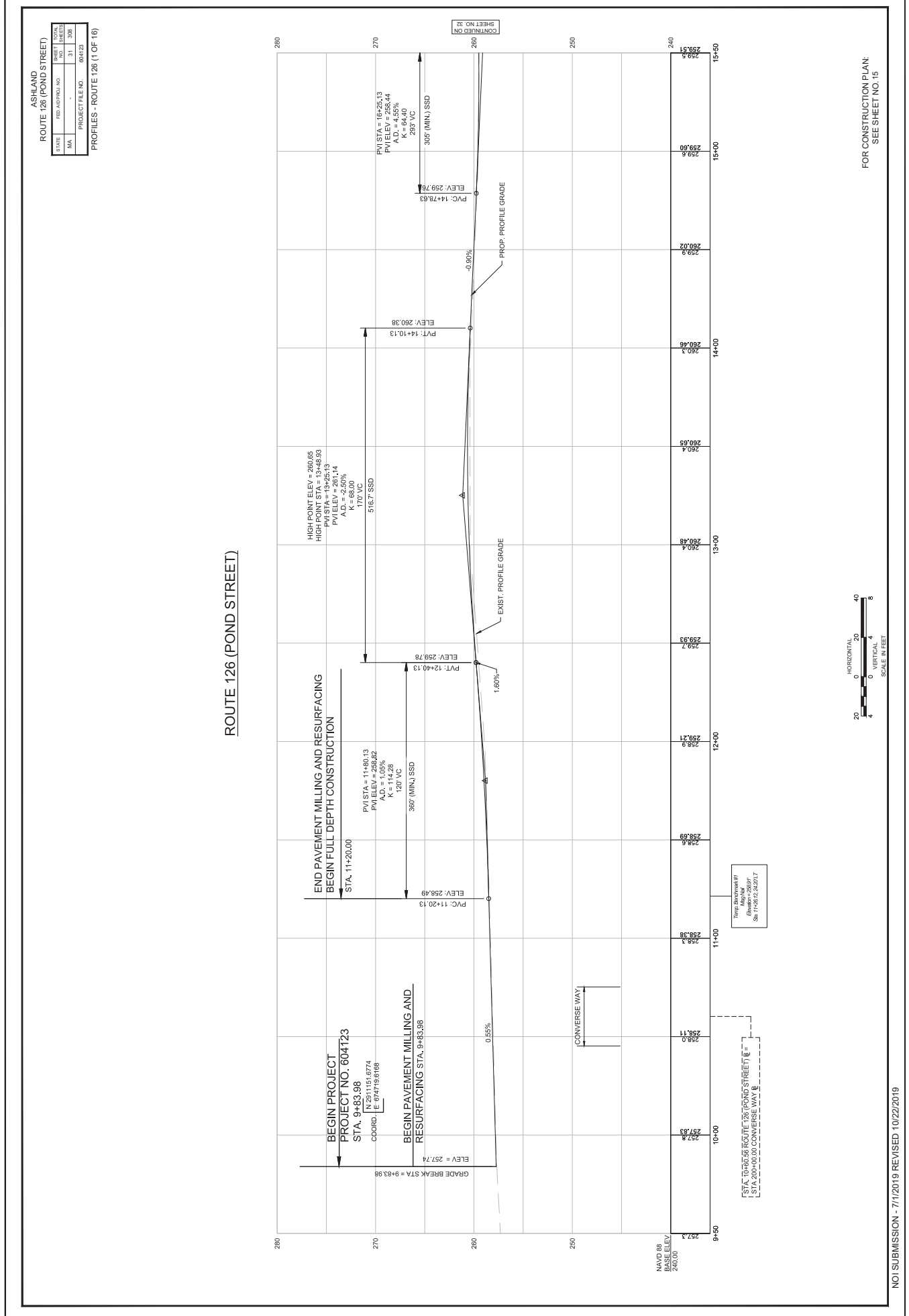
ASHLAND, MA
ROUTE 126 (POND STREET)
STATE
FED. AID PROJ. NO.
SHEET NO.
TOTAL SHEETS
MA
-
30
308
PROJECT FILE NO.
604123
CONSTRUCTION PLANS (1 OF 1)
N
SCALE: 1" = 20'
SEWELL STREET
(PUBLIC WAY)
PC +09.30
PT +34.90
PC +47.88
CONSTRUCTION BASELINE
MATCH B-B
TOWN LAYOUT
SCOTT M. CONTI
BOOK 51996 PAGE 321
MAP 022.0 BL. 0031
24 SEWELL ST.
20 SEWELL STREET REALTY TRUST
CERTIFICATE NO. 239547
MAP 022.0 BL. 0032
20 SEWELL ST.
DONNA M. MURPHY
CERTIFICATE NO. 236175
MAP 022.0 BL. 0033
16 SEWELL ST.
JEFFREY R. HORN
BOOK 45872 PAGE 596
MAP 022.0 BL. 0034
10 SEWELL ST.
RIMARK, LLC
CERTIFICATE NO. 265273
MAP 022.0 BL. 0022
0 SEWELL ST.
RIMARK, LLC
CERTIFICATE NO. 265273
MAP 022.0 BL. 0023
0 SEWELL ST.
KRISTIN CHIDSEY
BOOK 59025 PAGE 313
MAP 022.0 BL. 0024
17 SEWELL ST.
JOHN P. NAGLE AND
ROSAMARIA NAGLE
BOOK 28584 PAGE 532
MAP 022.0 BL. 0025
15 SEWELL ST.
JOHN L. SAFSTROM AND
LAURETTA M. SAFSTROM
BOOK 58972 PAGE 57
MAP 022.0 BL. 0026
11 SEWELL ST.
JOHN L. SAFSTROM AND
LAURETTA M. SAFSTROM
BOOK 58972 PAGE 57
MAP 022.0 BL. 0026
11 SEWELL ST.
JEFFREY HORN
BOOK 46702 PAGE 20
MAP 022.0 BL. 0028
7 SEWELL ST.
GOIS HOLDINGS BOSTON LLC
CERTIFICATE NO. 245649
MAP 026.0 BL. 0030
30 SEWELL ST.
PROP. TEMP. EASEMENT
PROP. PERM. EASEMENT
PROP. HEADWALL (SEE DRAINAGE AND UTILITY PLANS)
PROP. SEDIMENT CONTROL BARRIER (TYP)
PROP. SLOPE LIMIT (TYP)
PROP. TEMP. EASEMENT
CONTINUED ON SHEET NO. 22
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019


604123_H009(PROFILES).DWG Plotted on 17-Oct-2017 4:44 PM
ASHLAND
ROUTE 126 (POND STREET)
STATE | FED. ADPROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 31 | 308
PROJECT FILE NO. 604123
PROFILES - ROUTE 126 (1 OF 16)
ROUTE 126 (POND STREET)
CONTINUED ON SHEET NO. 32
BEGIN PROJECT
PROJECT NO. 604123
STA. 9+83.98
COORD. N 2911514774
E 694719.9768
BEGIN PAVEMENT MILLING AND RESURFACING STA. 9+83.98
GRADE BREAK STA = 9+83.98
ELEV = 257.74
0.55%
CONVERSE WAY
END PAVEMENT MILLING AND RESURFACING
BEGIN FULL DEPTH CONSTRUCTION
STA. 11+20.00
PVC: 11+20.13
ELEV: 258.49
PVI STA = 11+80.13
PVI ELEV = 258.82
A.D. = 1.05%
K = 114.28
120' VC
360' (MIN.) SSD
PVT: 12+40.13
ELEV: 259.78
1.60%
HIGH POINT ELEV = 260.65
HIGH POINT STA = 13+48.93
PVI STA = 13+25.13
PVI ELEV = 261.14
A.D. = -2.50%
K = 68.00
170' VC
516.7' SSD
EXIST. PROFILE GRADE
PVT: 14+10.13
ELEV: 260.38
-0.90%
PROP. PROFILE GRADE
PVC: 14+78.63
ELEV: 259.76
PVI STA = 16+25.13
PVI ELEV = 258.44
A.D. = 4.55%
K = 64.40
293' VC
305' (MIN.) SSD
Temp. Benchmark #1
Mag. Nail
Elevation = 258.91'
Sta. 11+26.12, 24.20' LT
STA. 10+60.56 ROUTE 126 (POND STREET) @ =
STA. 200+00.00 CONVERSE WAY @
NAVD 88
BASE ELEV
240.00
HORIZONTAL
VERTICAL
SCALE IN FEET
FOR CONSTRUCTION PLAN:
SEE SHEET NO. 15
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

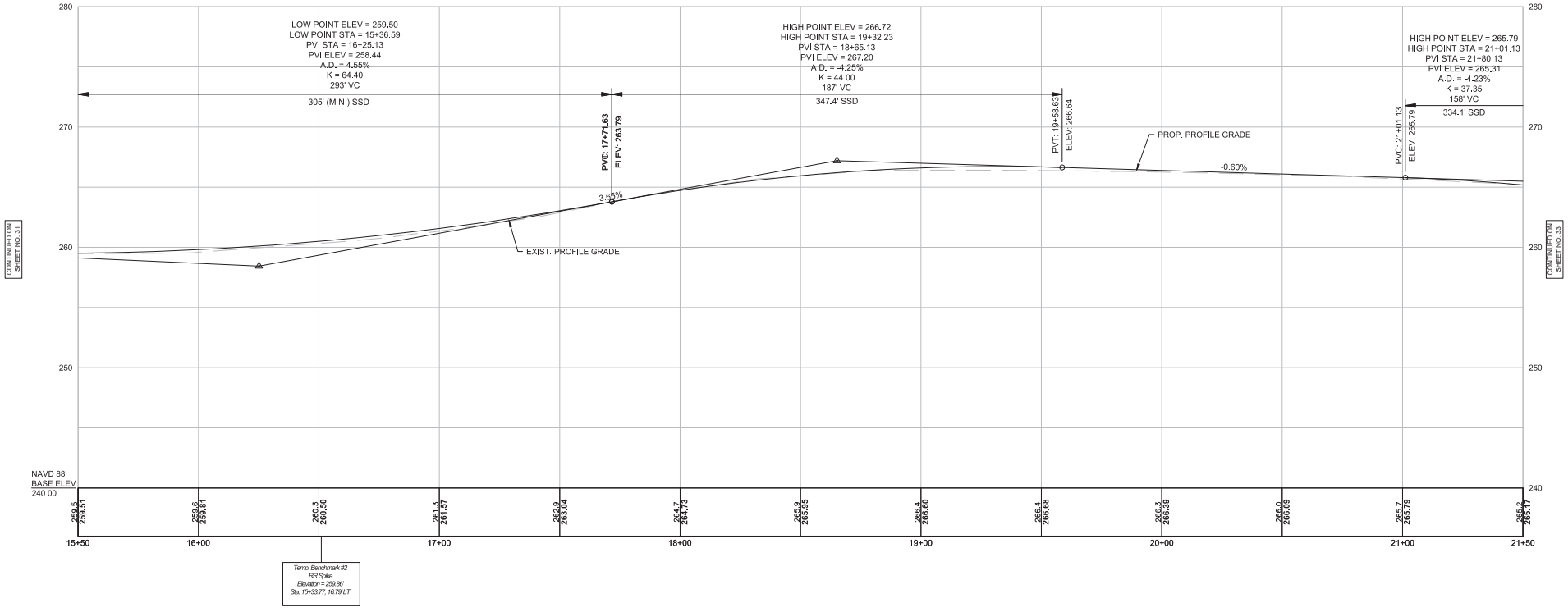
ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	32	308
PROJECT FILE NO.	604123		

PROFILES - ROUTE 126 (2 OF 16)

604123_HDS\PROFILES.DWG Plotted on 17-OCT-2017 4:44 PM

ROUTE 126 (POND STREET)



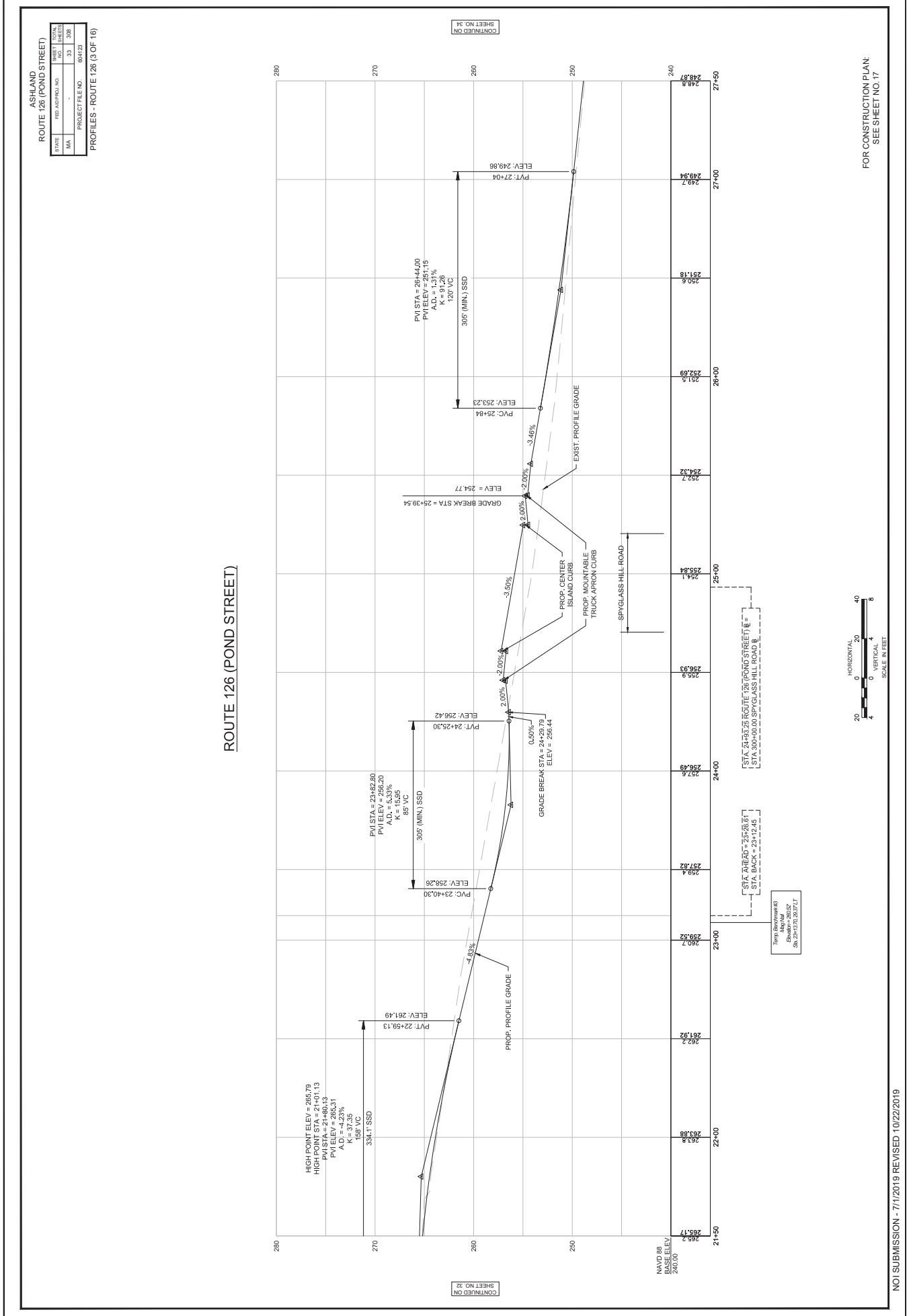
HORIZONTAL
20 0 20 40
4 0 4 8
VERTICAL
SCALE IN FEET

FOR CONSTRUCTION PLAN:
SEE SHEET NO. 16

NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

A00860 - 126

Proposal No. 604123-111717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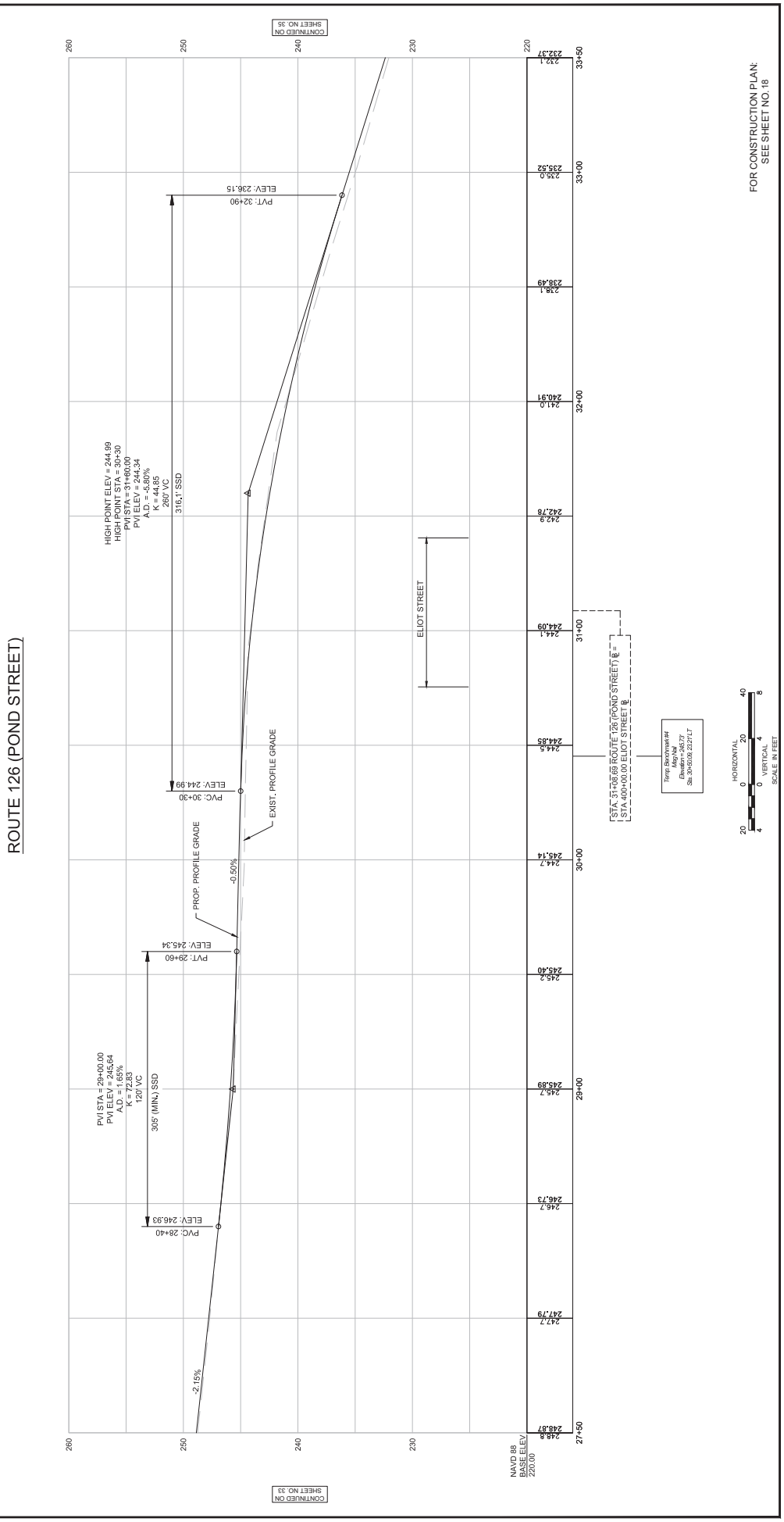
ASHLAND
ROUTE 126 (POND STREET)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 33 | 308
PROJECT FILE NO. 604123
PROFILES - ROUTE 126 (3 OF 16)
ROUTE 126 (POND STREET)
CONTINUED ON SHEET NO. 34
CONTINUED ON SHEET NO. 32
NAVD 88 BASE ELEV 240.00
HIGH POINT ELEV = 265.79
HIGH POINT STA = 21+01.13
PVI STA = 21+80.13
PVI ELEV = 265.31
A.D. = -4.23%
K = 37.35
158' VC
334.1' SSD
PVT: 22+59.13
ELEV: 261.49
PROP. PROFILE GRADE
-4.82%
PVI STA = 23+82.80
PVI ELEV = 256.20
A.D. = 5.33%
K = 15.95
85' VC
305' (MIN.) SSD
PVC: 23+40.30
ELEV: 258.26
PVT: 24+25.30
ELEV: 256.42
0.50%
GRADE BREAK STA = 24+29.79
ELEV = 256.44
2.00%
-3.50%
PROP. CENTER ISLAND CURB
PROP. MOUNTABLE TRUCK APRON CURB
SPYGLASS HILL ROAD
GRADE BREAK STA = 25+39.54
ELEV = 254.77
EXIST. PROFILE GRADE
-2.00%
-3.46%
PVI STA = 26+44.00
PVI ELEV = 251.15
A.D. = 1.31%
K = 91.58
120' VC
305' (MIN.) SSD
PVC: 25+84
ELEV: 253.23
PVT: 27+04
ELEV: 249.86
STA. 24+93.25 ROUTE 126 (POND STREET) ℄ =
STA. 300+00.00 SPYGLASS HILL ROAD ℄
STA. AHEAD = 23+26.61
STA. BACK = 23+12.45
Temp Benchmark#3
Mag Nail
Elev=260.35'
Sta.23+13.70, 29.37'LT
HORIZONTAL
SCALE IN FEET
VERTICAL
FOR CONSTRUCTION PLAN:
SEE SHEET NO. 17
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

604123_H009(PROFILES).DWG Plotted on 17-Oct-2017 4:44 PM

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	34	308
PROJECT FILE NO. 604123			

PROFILES - ROUTE 126 (4 OF 16)



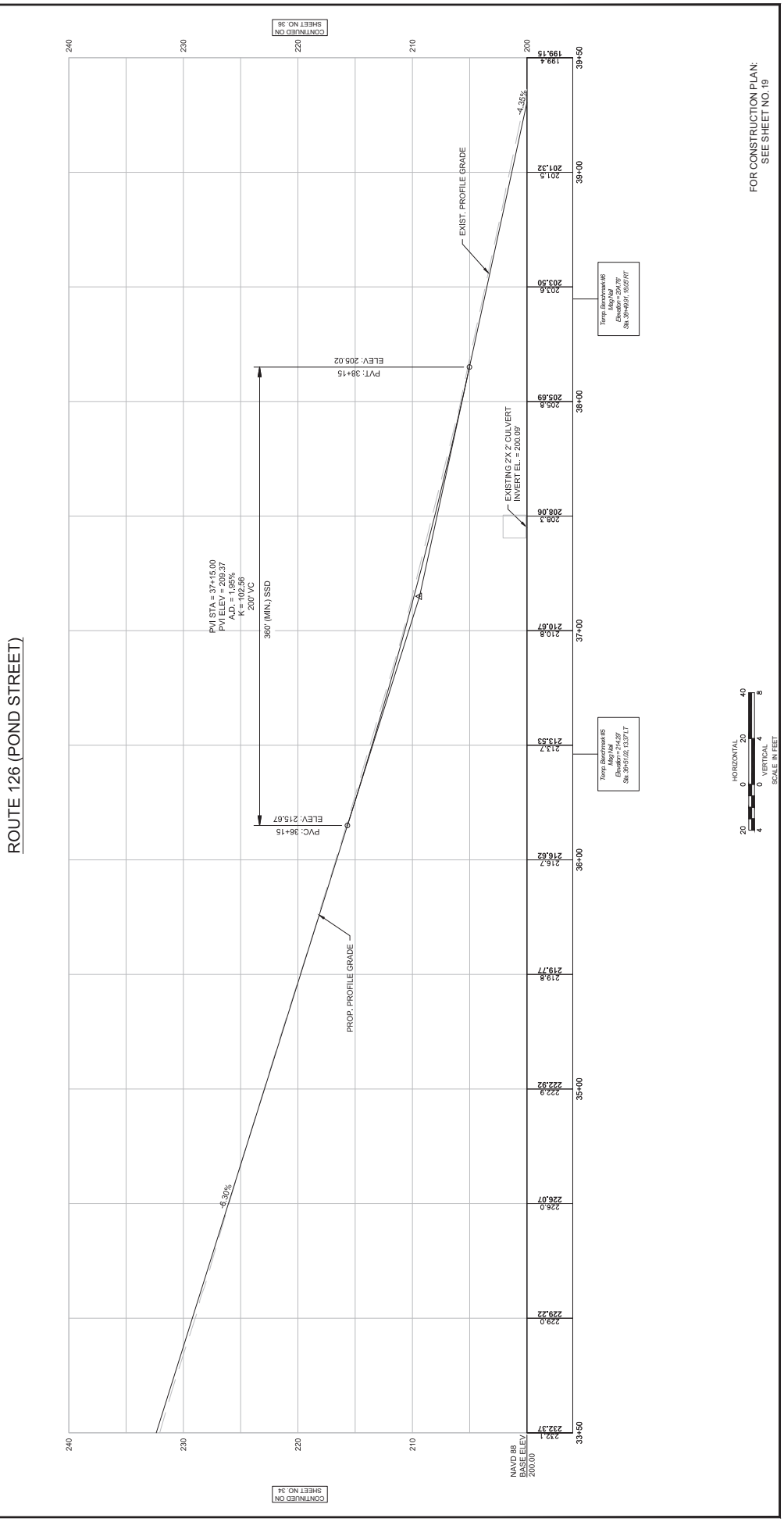
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

604123_H009(PROFILES).DWG Plotted on 17-OCT-2017 4:44 PM

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	35	308
PROJECT FILE NO.		604123	

PROFILES - ROUTE 126 (5 OF 16)



NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

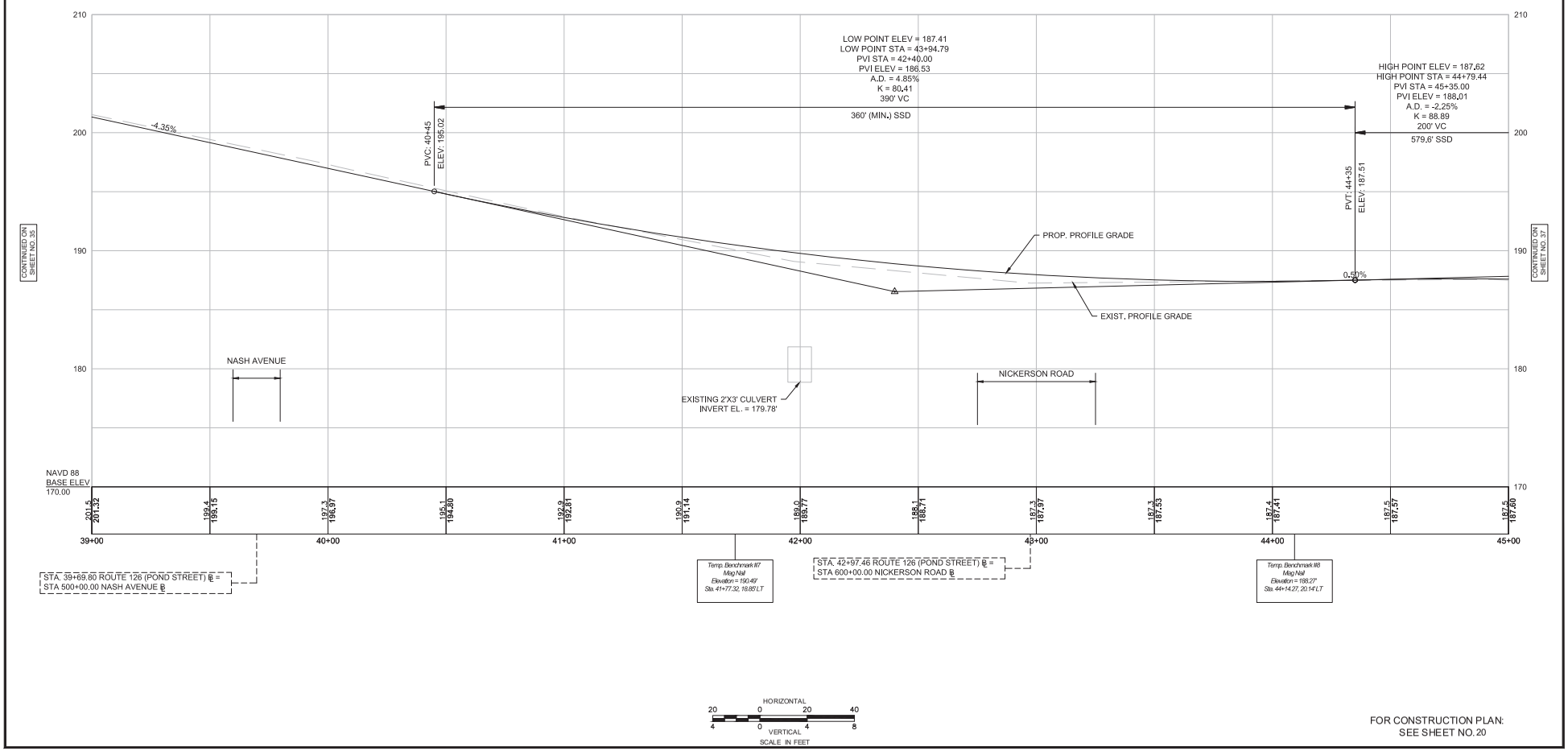
ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	36	308
PROJECT FILE NO.	604123		

PROFILES - ROUTE 126 (6 OF 16)

604123_HD09(PROFILES).DWG Plotted on 17-Oct-2017 4:44 PM

ROUTE 126 (POND STREET)



FOR CONSTRUCTION PLAN:
SEE SHEET NO. 20

NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

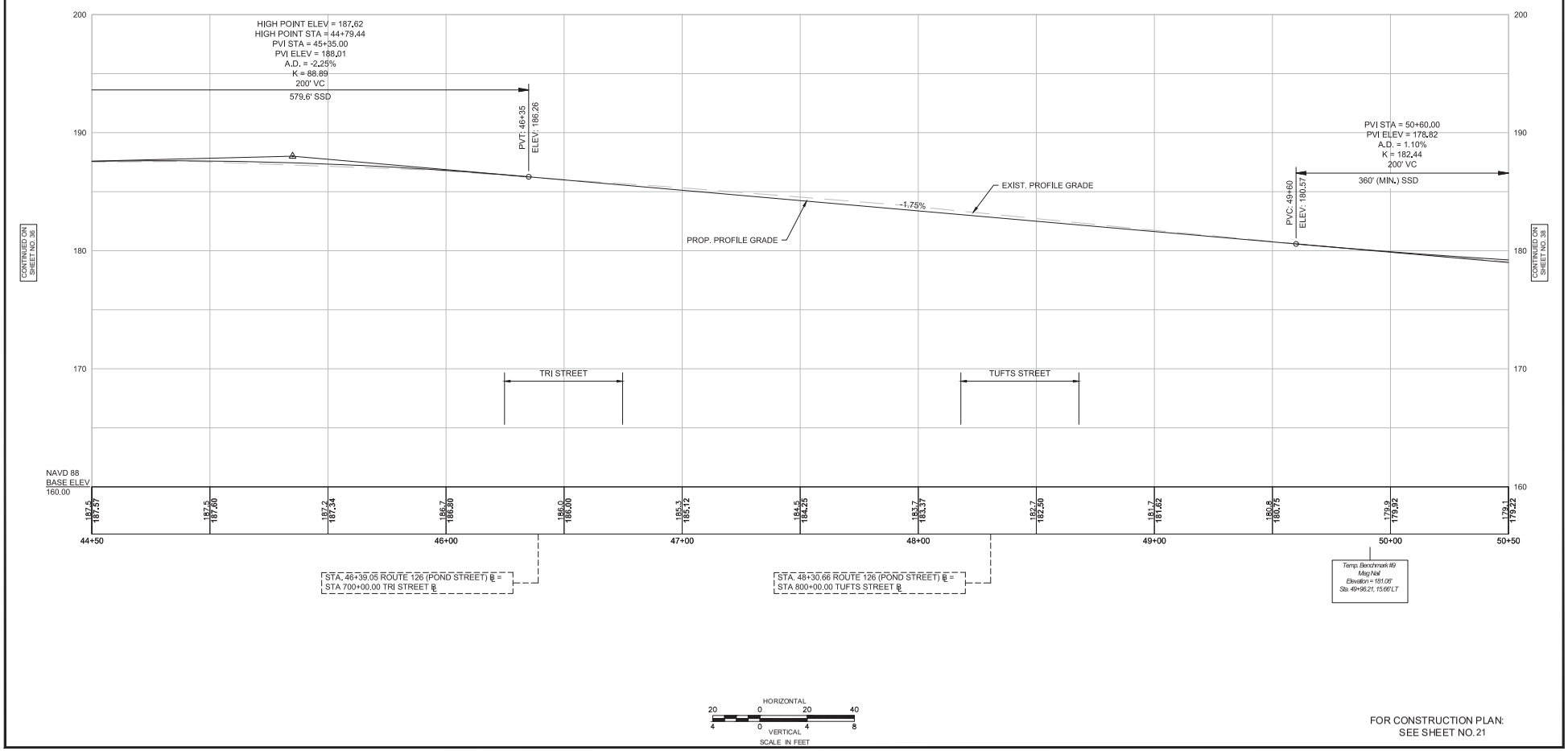
ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	37	308
PROJECT FILE NO.	604123		

PROFILES - ROUTE 126 (7 OF 16)

604123_HD09(PROFILES).DWG Plotted on 17-Oct-2017 4:44 PM

ROUTE 126 (POND STREET)



FOR CONSTRUCTION PLAN:
SEE SHEET NO. 21

NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

604123_HD09(PROFILES).DWG Plotted on 17-Oct-2017 4:44 PM

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. ADPROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	39	308
PROJECT FILE NO.		604123	

PROFILES - ROUTE 126 (9 OF 16)

ROUTE 126 (POND STREET)

CONTINUED ON SHEET NO. 38

HIGH POINT ELEV = 179.59
HIGH POINT STA = 61+65.75
PVI STA = 62+00.00
PVI ELEV = 180.37
A.D. = -3.13%
K = 70.37
220' VC
455.2' SSD

PVC: 60+90
ELEV: 179.18

PROP. PROFILE GRADE

1.08%

EXIST. PROFILE GRADE

PVT: 57+80
ELEV: 175.85

LOW POINT ELEV = 175.18
LOW POINT STA = 56+55.57
PVI STA = 56+80.00
PVI ELEV = 174.77
A.D. = 1.70%
K = 115.60
200' VC
360' (MIN.) SSD

PVC: 55+80
ELEV: 175.42

SEWELL STREET

STA. 55+61.55 ROUTE 126 (POND STREET) ℄ =
STA. 900+00.00 SEWELL STREET ℄

CONTINUED ON SHEET NO. 37

NAVD 88
BASE ELEV
160.00

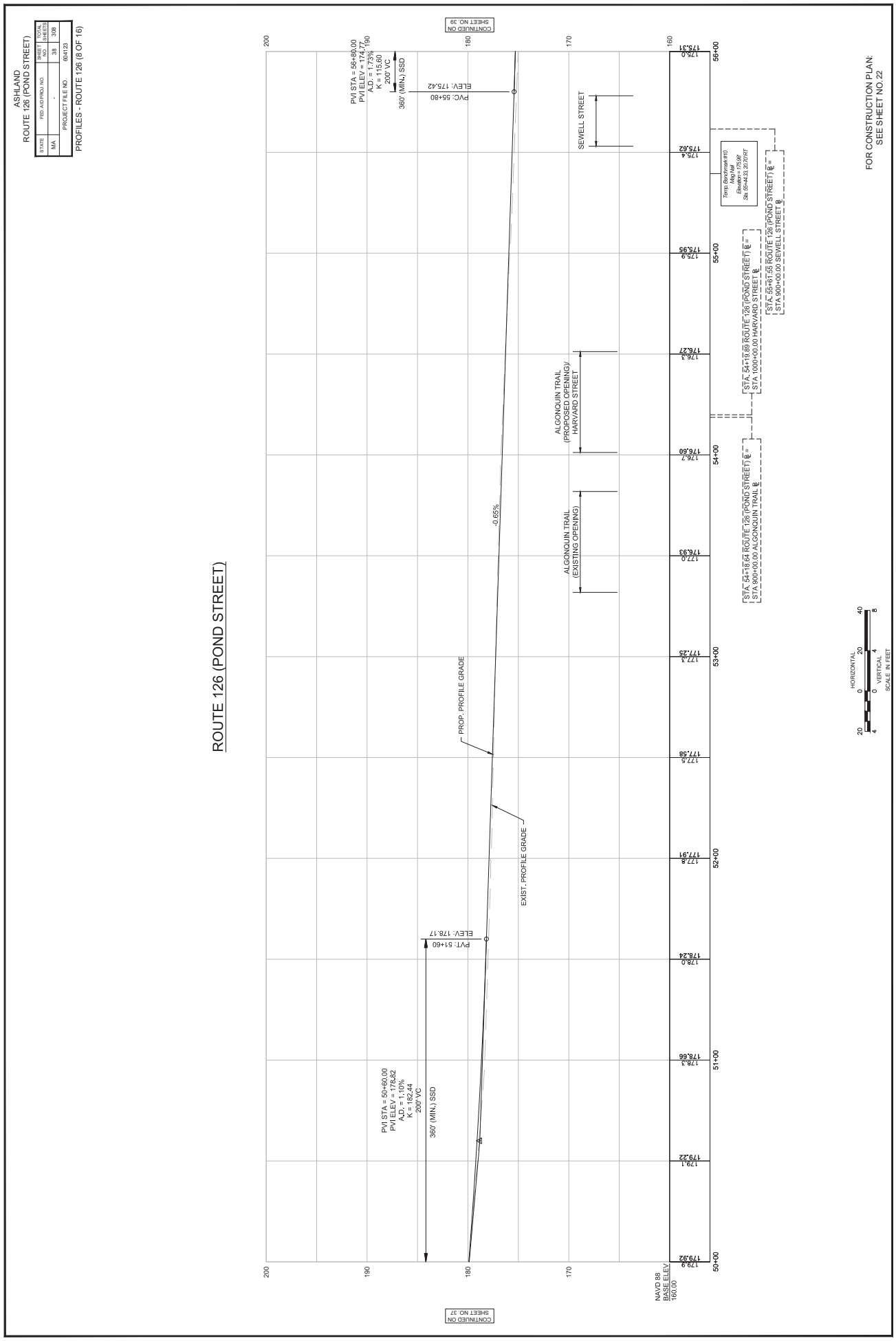
200	190	180	170	160
179.57	179.4	179.28	178.75	178.8
178.21	178.2	177.68	177.7	177.14
177.2	176.60	176.6	176.06	176.1
175.56	175.6	175.26	175.1	175.18
175.1	175.51	175.0	174.62	174.4

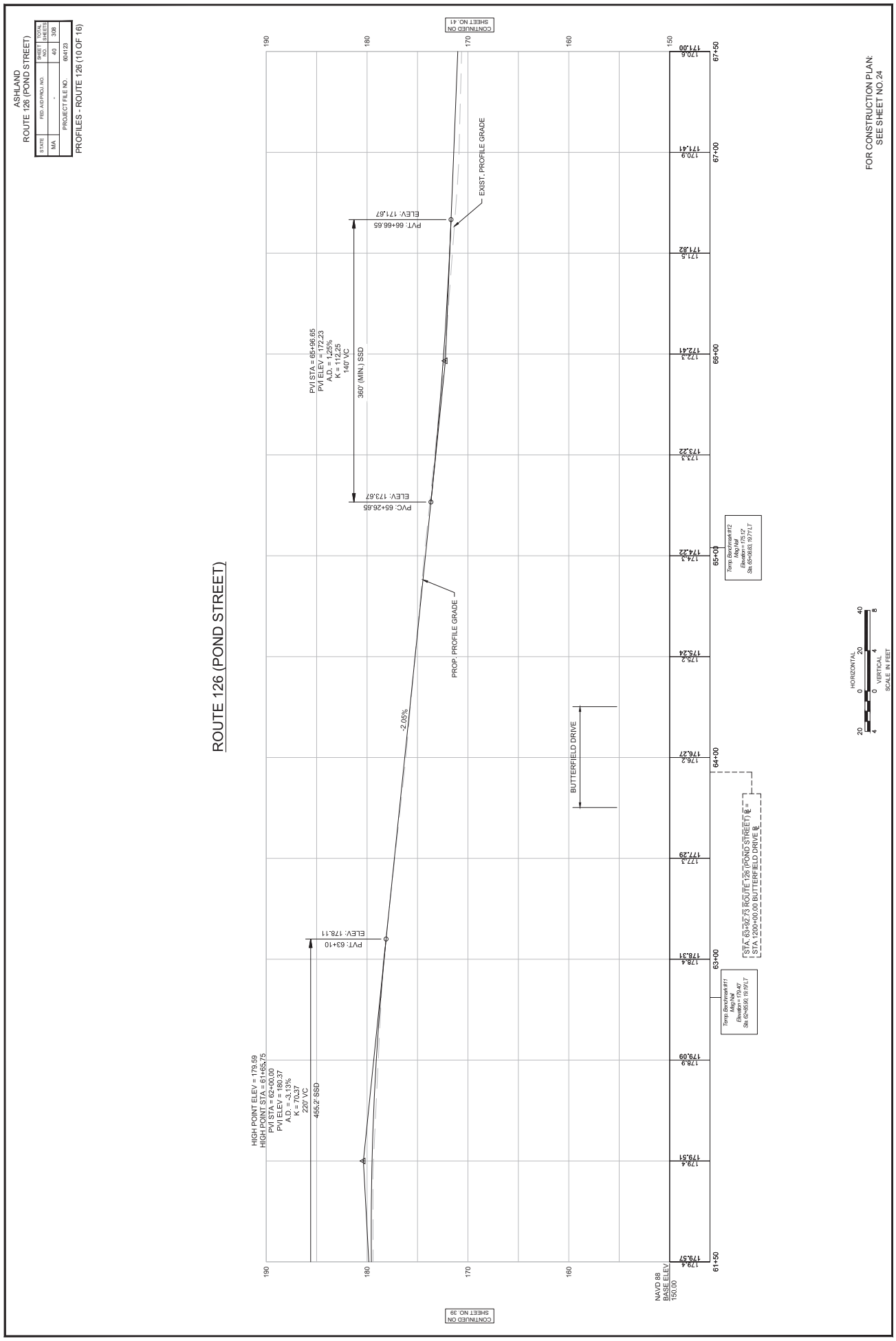
55+50	57+00	58+00	59+00	60+00	61+00	61+50

HORIZONTAL
0 20 40
VERTICAL
0 4 8
SCALE IN FEET

FOR CONSTRUCTION PLAN:
SEE SHEET NO. 22

NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019


604123_H009(PROFILES).DWG Plotted on 17-Oct-2017 4:44 PM
ASHLAND
ROUTE 126 (POND STREET)
STATE | FED. ADPROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 38 | 308
PROJECT FILE NO. 604123
PROFILES - ROUTE 126 (8 OF 16)
ROUTE 126 (POND STREET)
CONTINUED ON SHEET NO. 38
CONTINUED ON SHEET NO. 37
PVI STA = 56+80.00
PVI ELEV = 174.77
A.D. = 1.73%
K = 115.60
200' VC
360' (MIN.) SSD
PVC: 55+80
ELEV: 175.42
PVI STA = 50+60.00
PVI ELEV = 178.82
A.D. = 1.10%
K = 182.44
200' VC
360' (MIN.) SSD
PVT: 51+60
ELEV: 178.17
-0.65%
PROP. PROFILE GRADE
EXIST. PROFILE GRADE
SEWELL STREET
ALGONQUIN TRAIL (PROPOSED OPENING)
HARVARD STREET
ALGONQUIN TRAIL (EXISTING OPENING)
Temp. Benchmark #10
Magnail
Elevation = 175.58'
Sta. 55+44.23, 10.70'RT
STA. 54+18.64 ROUTE 126 (POND STREET) ℄ =
STA 900+00.00 ALGONQUIN TRAIL ℄
STA. 54+19.89 ROUTE 126 (POND STREET) ℄ =
STA 1000+00.00 HARVARD STREET ℄
STA. 55+61.55 ROUTE 126 (POND STREET) ℄ =
STA 900+00.00 SEWELL STREET ℄
NAVD 88
BASE ELEV
160.00
50+00
51+00
52+00
53+00
54+00
55+00
56+00
HORIZONTAL
VERTICAL
SCALE IN FEET
FOR CONSTRUCTION PLAN:
SEE SHEET NO. 22
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019


ASHLAND
ROUTE 126 (POND STREET)
STATE | FED. ADTPROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 40 | 308
PROJECT FILE NO. 604123
PROFILES - ROUTE 126 (10 OF 16)
ROUTE 126 (POND STREET)
CONTINUED ON SHEET NO. 41
CONTINUED ON SHEET NO. 39
EXIST. PROFILE GRADE
PROP. PROFILE GRADE
BUTTERFIELD DRIVE
-2.05%
PVT: 66+66.65
ELEV.: 171.67
PVC: 65+26.65
ELEV.: 173.67
PVI STA = 65+96.65
PVI ELEV = 172.23
A.D. = 1.25%
K = 112.25
140' VC
360' (MIN.) SSD
PVT: 63+10
ELEV.: 178.11
HIGH POINT ELEV = 179.59
HIGH POINT STA = 61+55.75
PVI STA = 62+00.00
PVI ELEV = 180.37
A.D. = -3.13%
K = 70.37
220' VC
455.2' SSD
Temp. Benchmark #11
Mag Nail
Elevation = 170.40'
Sta. 62+45.60, 19.19'LT
Temp. Benchmark #12
Mag Nail
Elevation = 171.12'
Sta. 65+68.83, 19.71'LT
STA. 63+92.73 ROUTE 126 (POND STREET) ℄ =
STA. 1200+00.00 BUTTERFIELD DRIVE ℄
NAVD 88
BASE ELEV
150.00
HORIZONTAL
VERTICAL
SCALE IN FEET
FOR CONSTRUCTION PLAN:
SEE SHEET NO. 24
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019
604123_H009(PROFILES).DWG Plotted on 17-Oct-2017 4:44 PM

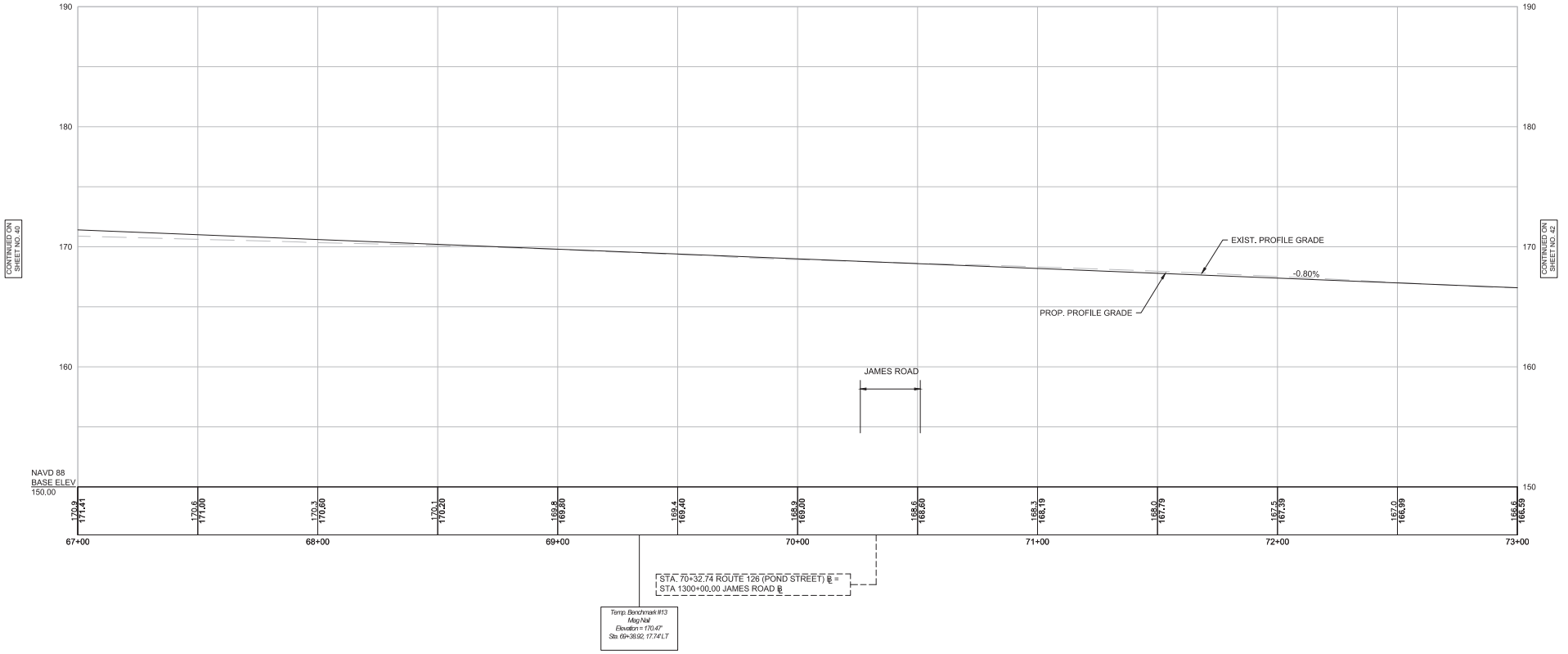
ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	41	308
PROJECT FILE NO. 604123			

PROFILES - ROUTE 126 (11 OF 16)

604123_HDS\PROFILES.DWG Plotted on 17-Oct-2017 4:44 PM

ROUTE 126 (POND STREET)



FOR CONSTRUCTION PLAN:
SEE SHEET NO. 25

NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

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Proposal No. 604123-111717

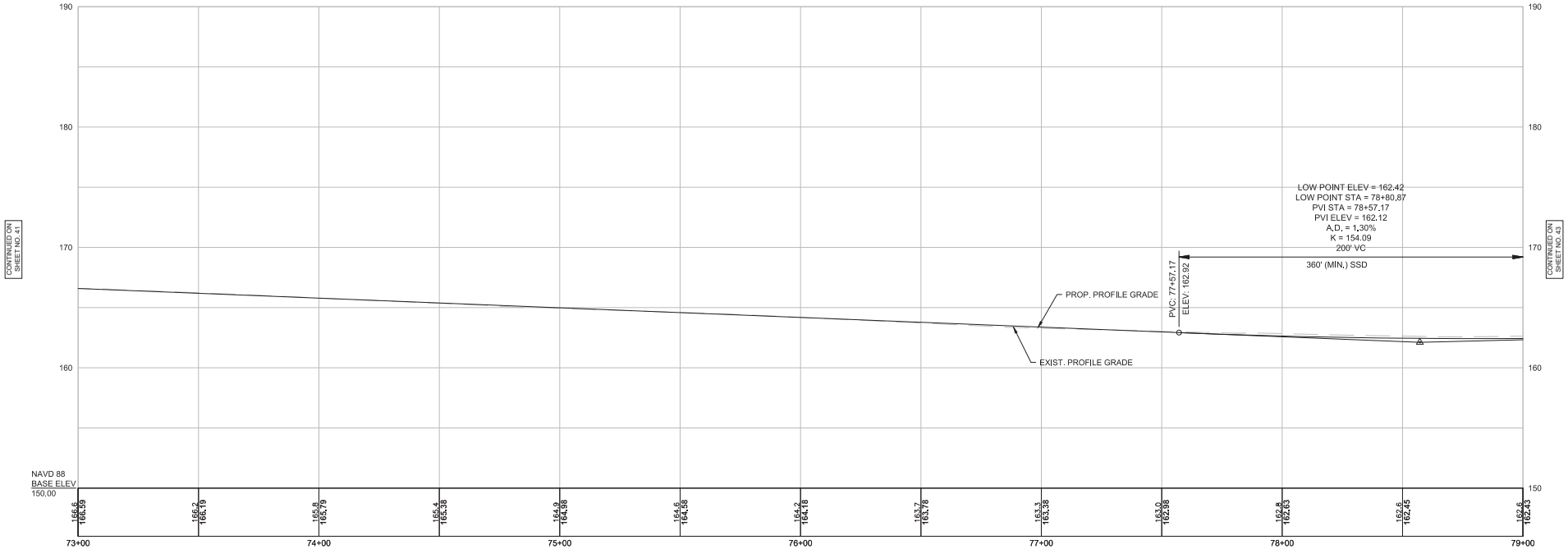
ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	42	308
PROJECT FILE NO.	604123		

PROFILES - ROUTE 126 (12 OF 16)

604123_HDS\PROFILES.DWG Plotted on 17-Oct-2017 4:44 PM

ROUTE 126 (POND STREET)



HORIZONTAL
20 0 20 40
4 0 4 8
VERTICAL
SCALE IN FEET

FOR CONSTRUCTION PLAN:
SEE SHEET NO. 26

NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

Proposal No. 604123-111717

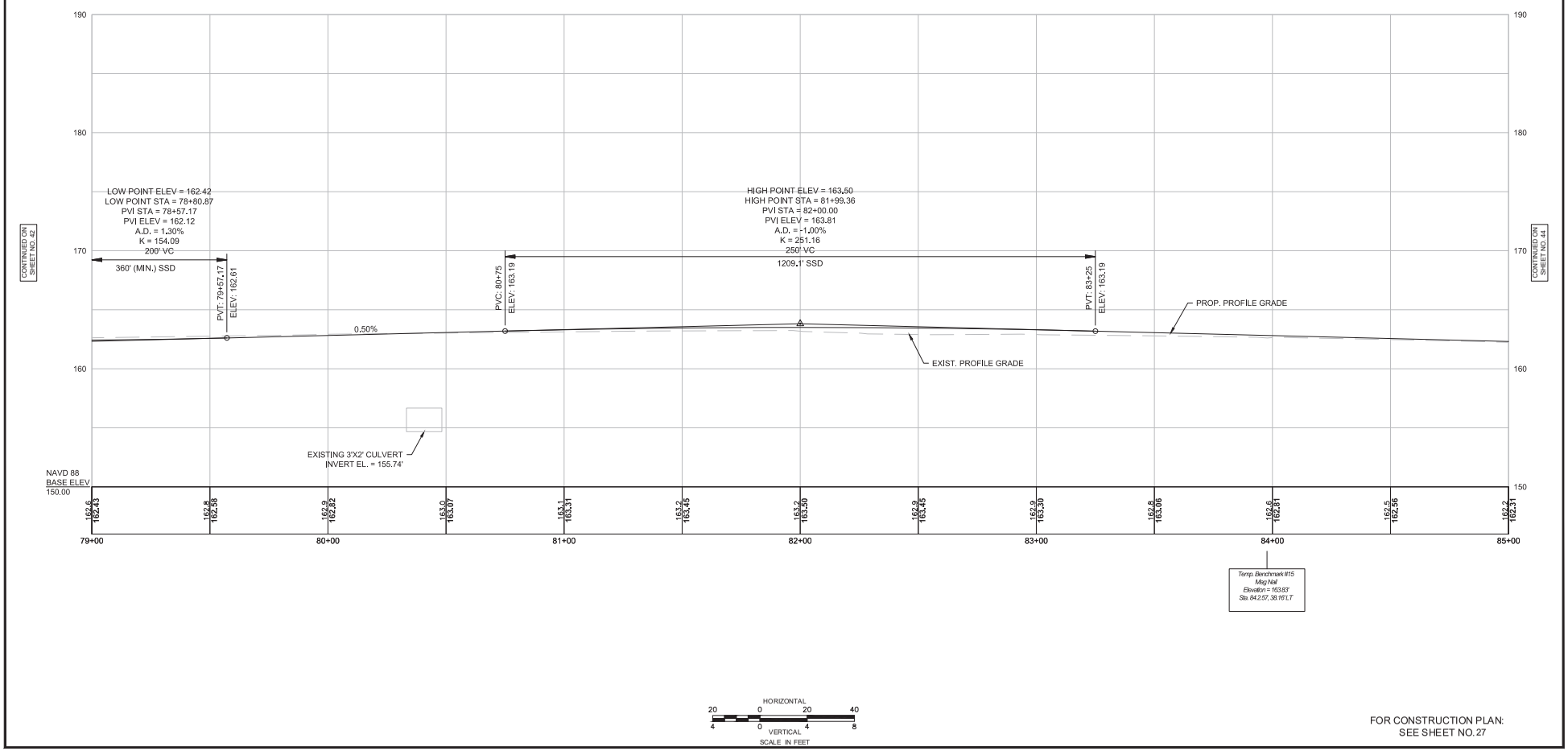
ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	43	308
PROJECT FILE NO.	604123		

PROFILES - ROUTE 126 (13 OF 16)

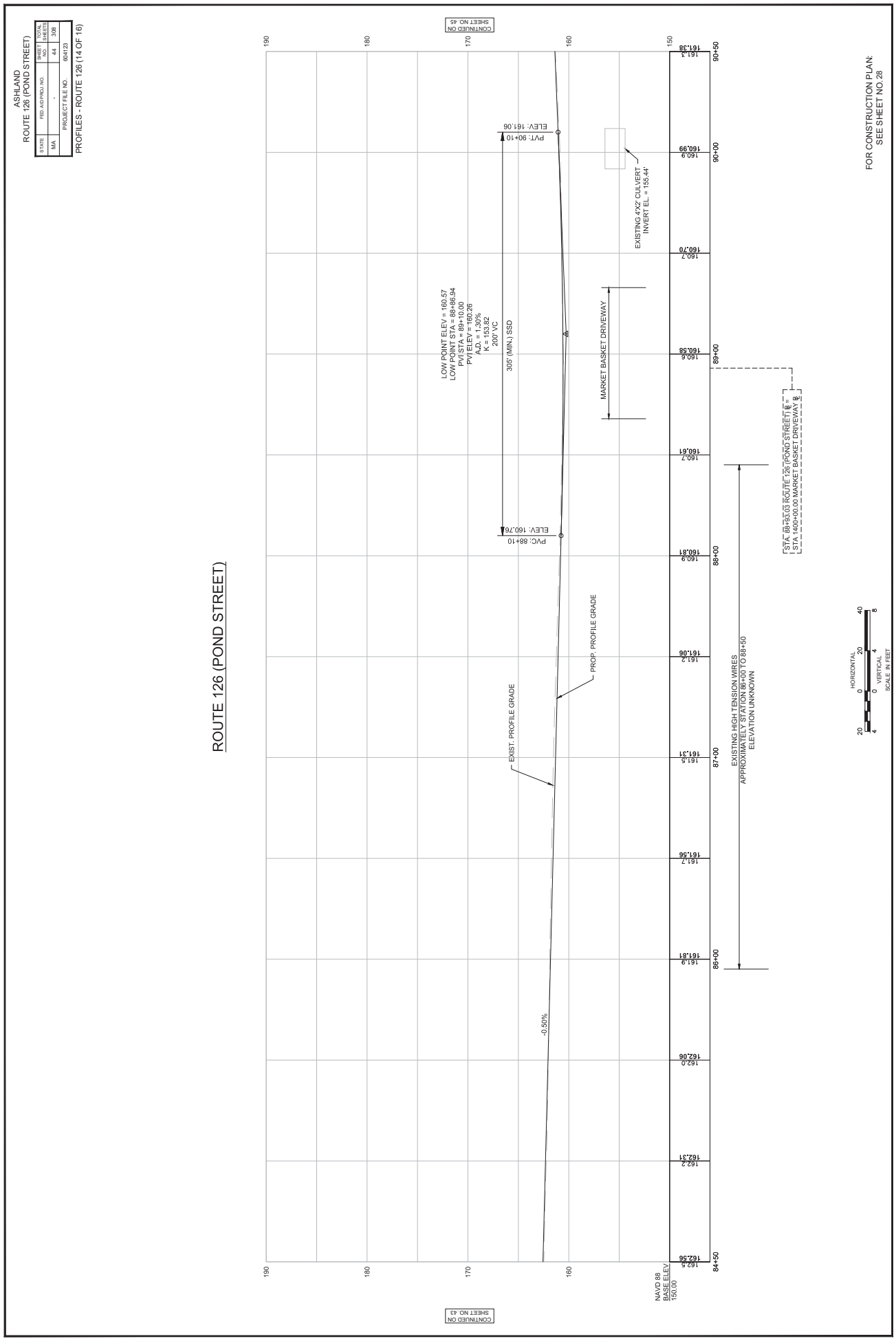
604123_HD09(PROFILES).DWG Plotted on 17-Oct-2017 4:44 PM

ROUTE 126 (POND STREET)



FOR CONSTRUCTION PLAN:
SEE SHEET NO. 27

NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019


604123_H009(PROFILES).DWG Plotted on 17-Oct-2017 4:44 PM
ASHLAND
ROUTE 126 (POND STREET)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 44 | 308
PROJECT FILE NO. 604123
PROFILES - ROUTE 126 (14 OF 16)
ROUTE 126 (POND STREET)
CONTINUED ON SHEET NO. 45
CONTINUED ON SHEET NO. 43
NAVD 88 BASE ELEV 150.00
PVT: 90+10
ELEV.: 161.06
PVC: 88+10
ELEV.: 160.76
LOW POINT ELEV = 160.57
LOW POINT STA = 88+86.94
PVI STA = 89+10.00
PVI ELEV = 160.26
A.D. = 1.30%
K = 153.82
200' VC
305' (MIN.) SSD
EXISTING 4'X2' CULVERT
INVERT EL. = 155.44'
MARKET BASKET DRIVEWAY
PROP. PROFILE GRADE
EXIST. PROFILE GRADE
-0.50%
EXISTING HIGH TENSION WIRES
APPROXIMATELY STATION 86+00 TO 88+50
ELEVATION UNKNOWN
STA. 88+93.03 ROUTE 126 (POND STREET) ℄ =
STA 1400+00.00 MARKET BASKET DRIVEWAY ℄
HORIZONTAL
VERTICAL
SCALE IN FEET
FOR CONSTRUCTION PLAN:
SEE SHEET NO. 28
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

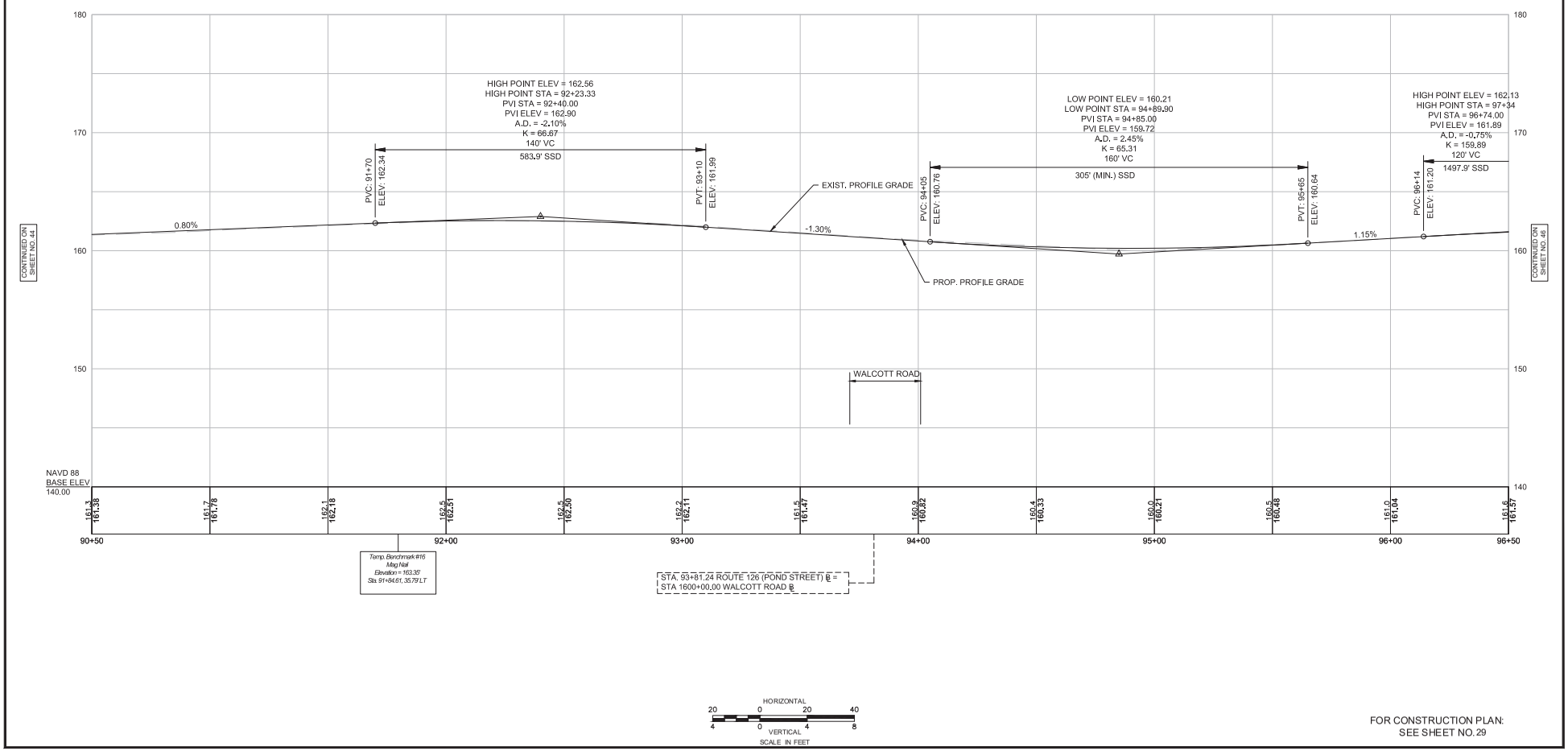
ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	45	308
PROJECT FILE NO.	604123		

PROFILES - ROUTE 126 (15 OF 16)

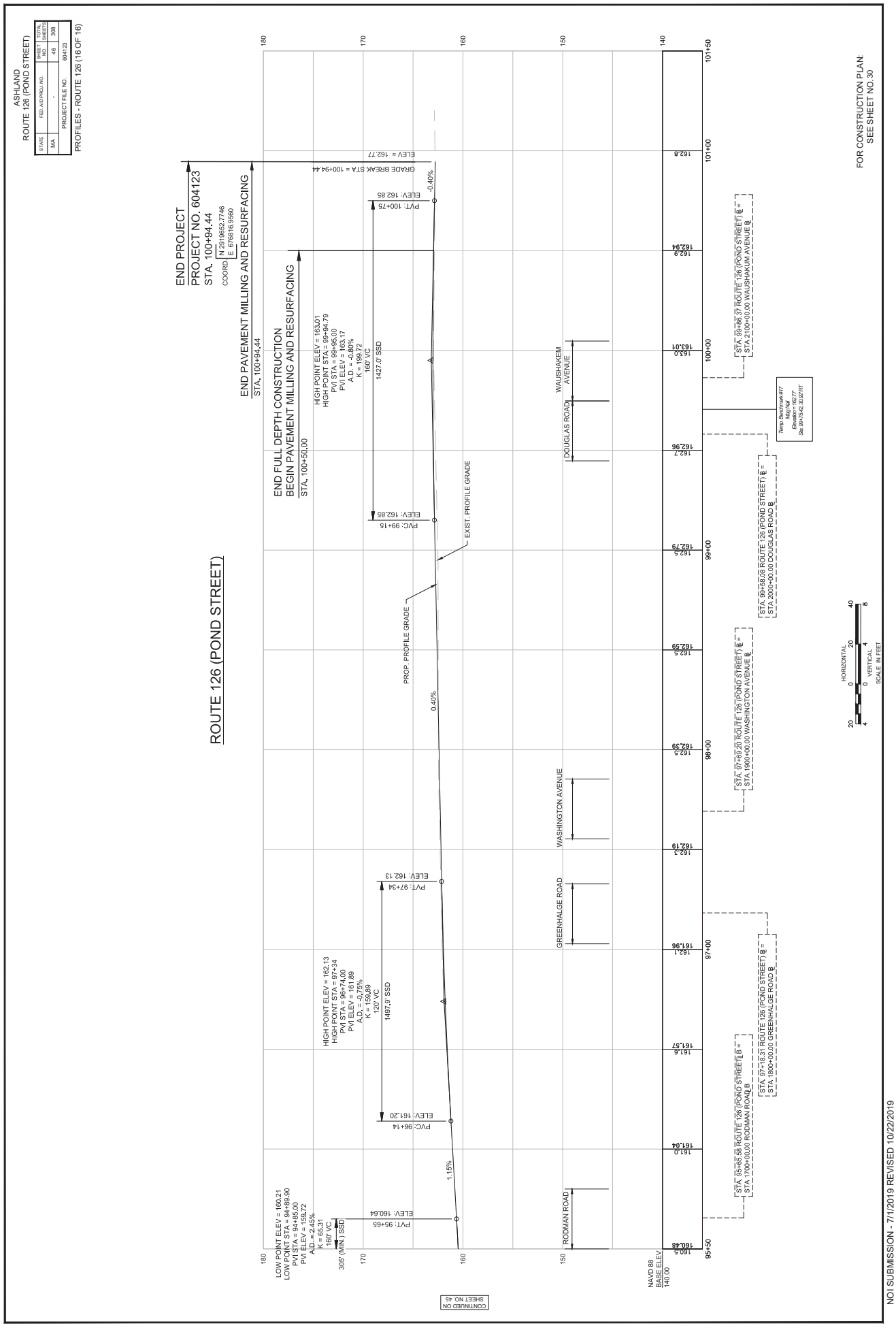
604123_HD09(PROFILES).DWG Plotted on 17-Oct-2017 4:44 PM

ROUTE 126 (POND STREET)



FOR CONSTRUCTION PLAN:
SEE SHEET NO. 29

NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019


ASHLAND
ROUTE 126 (POND STREET)
PROFILES - ROUTE 126 (16 OF 16)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 46 | 308
PROJECT FILE NO. 604123
END PROJECT
PROJECT NO. 604123
STA. 100+94.44
COORD N 2919652.7746
E 678816.9560
END PAVEMENT MILLING AND RESURFACING
STA. 100+94.44
END FULL DEPTH CONSTRUCTION
BEGIN PAVEMENT MILLING AND RESURFACING
STA. 100+50.00
ROUTE 126 (POND STREET)
GRADE BREAK STA = 100+94.44
ELEV = 162.77
-0.40%
PVT: 100+75
ELEV: 162.85
HIGH POINT ELEV = 163.01
HIGH POINT STA = 99+94.79
PVI STA = 99+95.00
PVI ELEV = 163.17
A.D. = -0.80%
K = 199.72
160' VC
1427.0' SSD
PVC: 99+15
ELEV: 162.85
EXIST. PROFILE GRADE
PROP. PROFILE GRADE
0.40%
PVT: 97+34
ELEV: 162.13
HIGH POINT ELEV = 162.13
HIGH POINT STA = 97+34
PVI STA = 96+74.00
PVI ELEV = 161.89
A.D. = -0.75%
K = 159.89
120' VC
1497.9' SSD
PVC: 96+14
ELEV: 161.20
1.15%
PVT: 95+65
ELEV: 160.64
LOW POINT ELEV = 160.21
LOW POINT STA = 94+99.90
PVI STA = 94+85.00
PVI ELEV = 159.72
A.D. = 2.45%
K = 65.31
160' VC
305' (MIN.) SSD
CONTINUED ON SHEET NO. 45
NAVD 88
BASE ELEV
140.00
RODMAN ROAD
GREENHALGE ROAD
WASHINGTON AVENUE
DOUGLAS ROAD
WAUSHAKEM AVENUE
STA. 95+65.58 ROUTE 126 (POND STREET) ℄ =
STA. 1700+00.00 RODMAN ROAD ℄
STA. 97+18.31 ROUTE 126 (POND STREET) ℄ =
STA. 1800+00.00 GREENHALGE ROAD ℄
STA. 97+69.20 ROUTE 126 (POND STREET) ℄ =
STA. 1900+00.00 WASHINGTON AVENUE ℄
STA. 99+58.08 ROUTE 126 (POND STREET) ℄ =
STA. 2000+00.00 DOUGLAS ROAD ℄
STA. 99+86.37 ROUTE 126 (POND STREET) ℄ =
STA. 2100+00.00 WAUSHAKUM AVENUE ℄
Terra Berzinski #17
May Hall
Bridgewater, 02377
Sta. 99+52, 10.22 RT
HORIZONTAL
VERTICAL
SCALE IN FEET
FOR CONSTRUCTION PLAN:
SEE SHEET NO. 30
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019
604123_HD09(PROFILES).DWG Plotted on 17-Oct-2017 4:44 PM

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	47	308
PROJECT FILE NO. 604123			

CONVERSE WAY PROFILE

604123_HDS\PROFILES.DWG Plotted on 17-OCT-2017 4:44 PM

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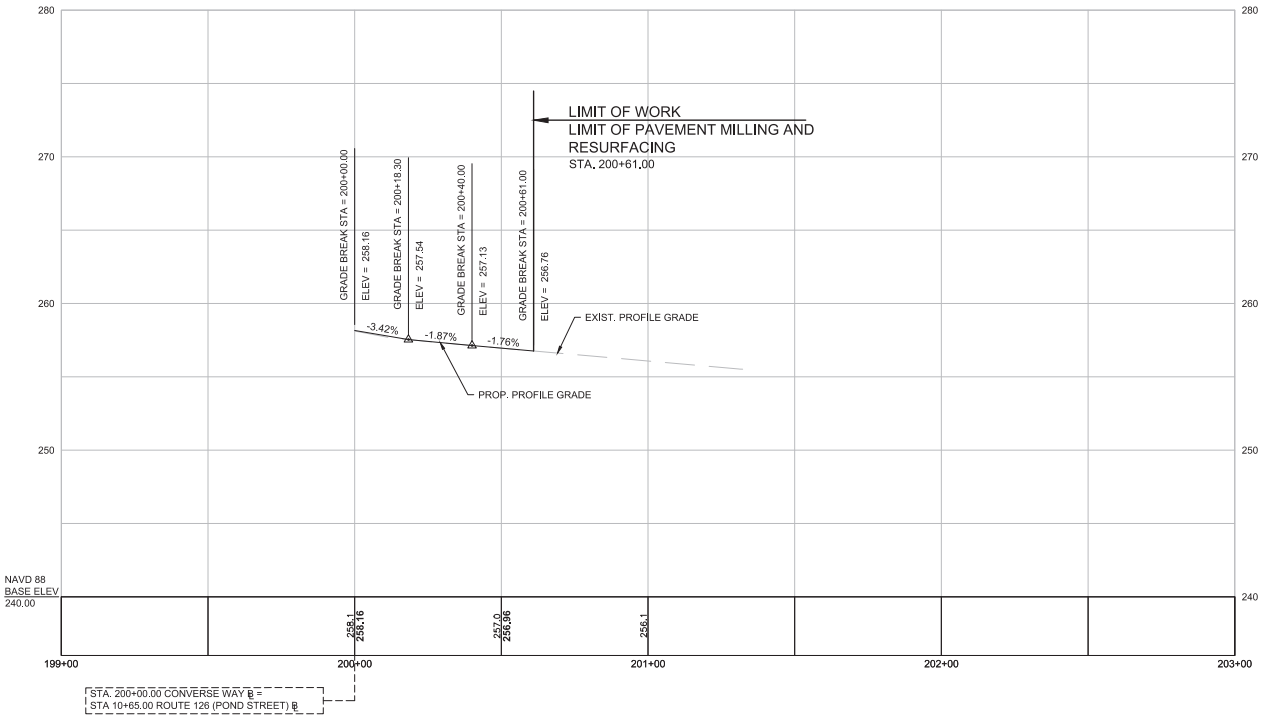
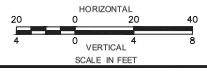
CONVERSE WAY



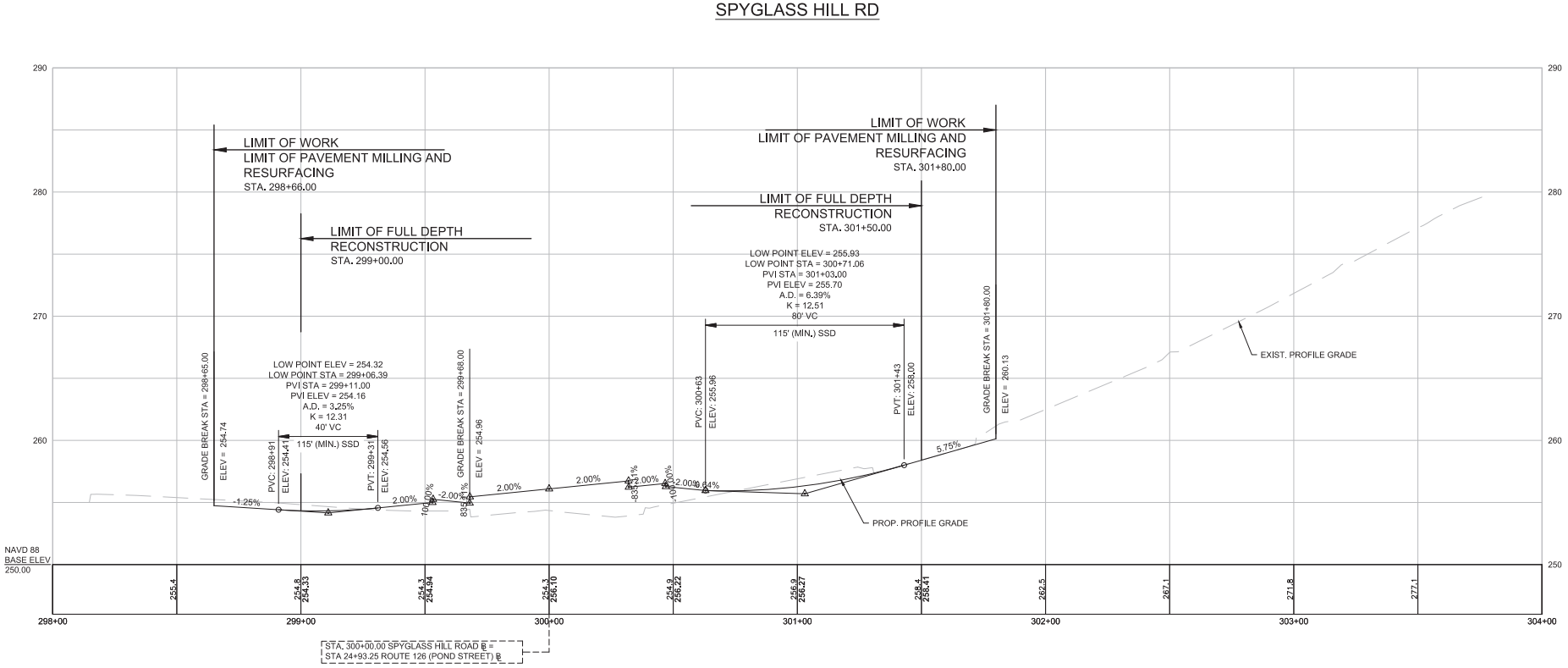


FOR CONSTRUCTION PLAN:
SEE SHEET NO. 15

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	48	308
PROJECT FILE NO. 604123			

SPYGLASS HILL ROAD PROFILE



HORIZONTAL
20 0 20 40
VERTICAL
4 0 4 8
SCALE IN FEET

FOR CONSTRUCTION PLAN:
SEE SHEET NO. 16

NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

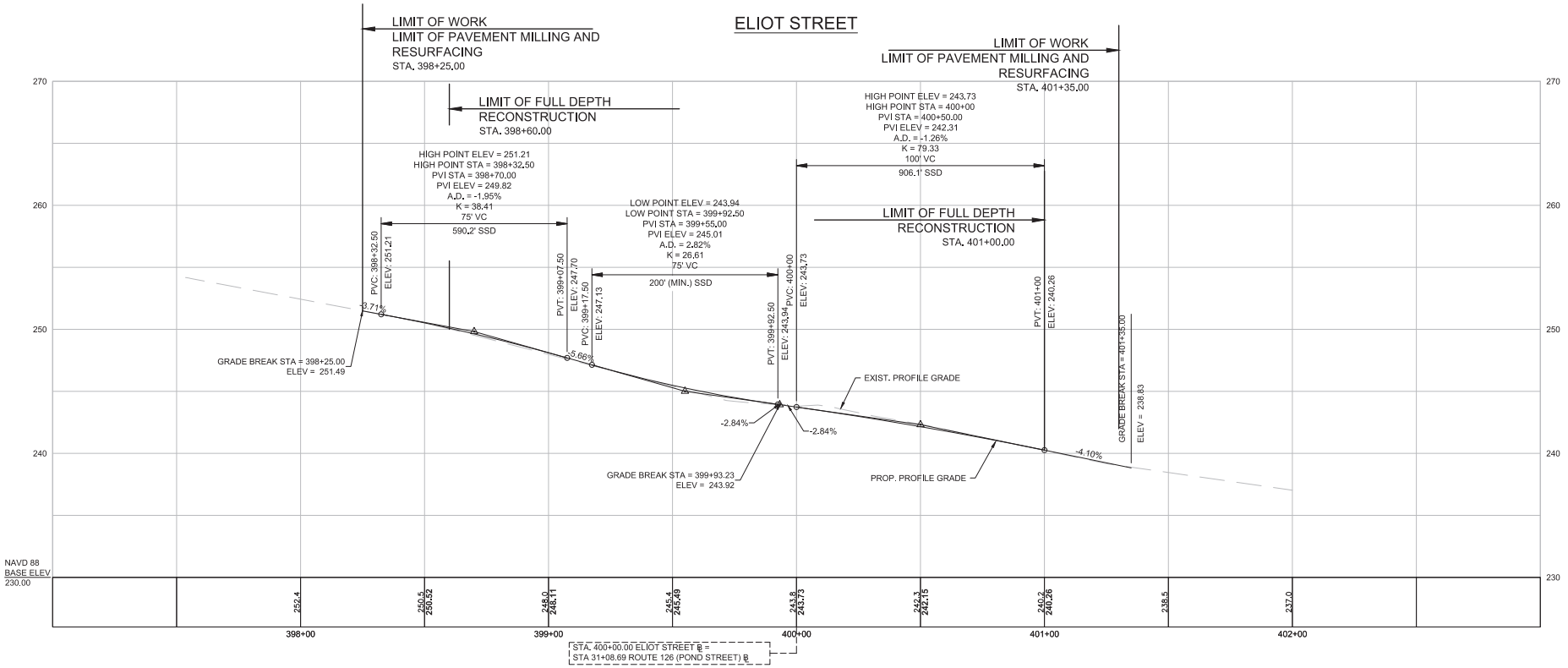
604123_HDS\PROFILES.DWG Plotted on 17-Oct-2017 4:44 PM

Proposal No. 604123-111717

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	49	308
PROJECT FILE NO.	604123		

ELIOT STREET PROFILE



HORIZONTAL
20 0 20 40
4 0 4 8
VERTICAL
SCALE IN FEET

FOR CONSTRUCTION PLAN:
SEE SHEET NO. 17

NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

604123_HDS\PROFILES.DWG Plotted on 17-Oct-2017 4:44 PM

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Proposal No. 604123-111717

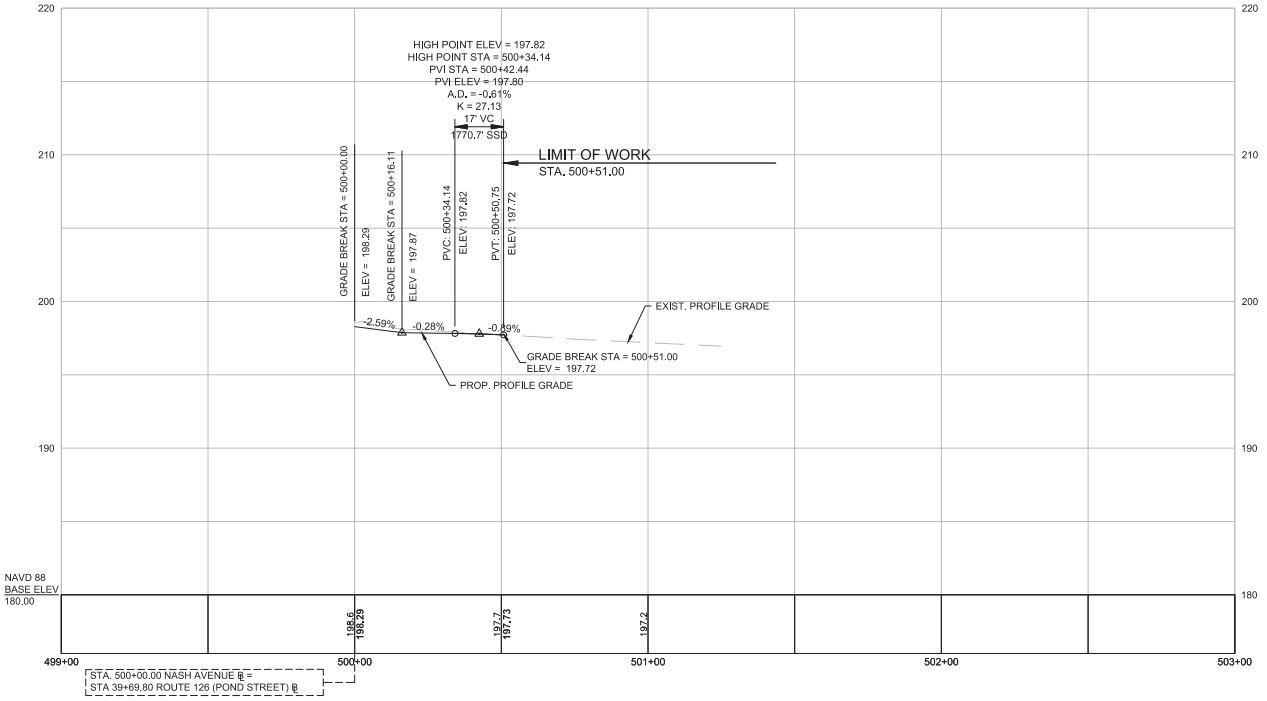
ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	50	308
PROJECT FILE NO. 604123			

NASH AVENUE PROFILE

604123_HDS\PROFILES.DWG Plotted on 17-Oct-2017 4:44 PM

NASH AVE



HORIZONTAL
20 0 20 40
4 0 4 8
VERTICAL
SCALE IN FEET

FOR CONSTRUCTION PLAN:
SEE SHEET NO. 19

Proposal No. 604123-111717

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	51	308
PROJECT FILE NO.	604123		

NICKERSON ROAD PROFILE

604123_HDS\PROFILES.DWG Plotted on 17-Oct-2017 4:44 PM

Proposal No. 604123-111717

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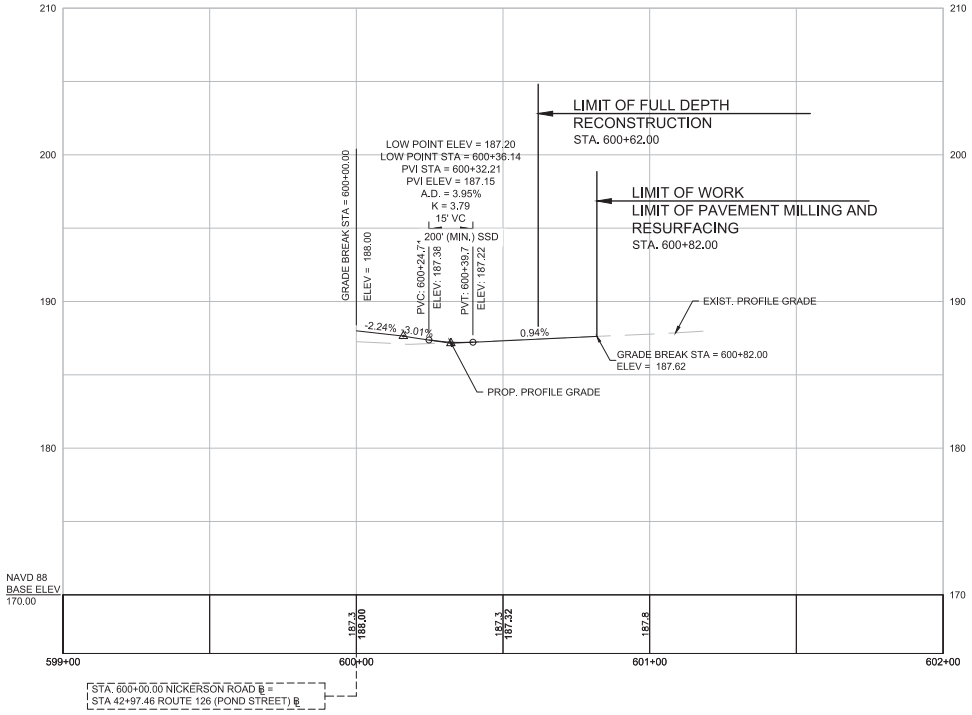
NICKERSON RD



HORIZONTAL
20 0 20 40
4 0 4 8
VERTICAL
SCALE IN FEET

FOR CONSTRUCTION PLAN:
SEE SHEET NO. 19

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	52	308
PROJECT FILE NO. 604123			

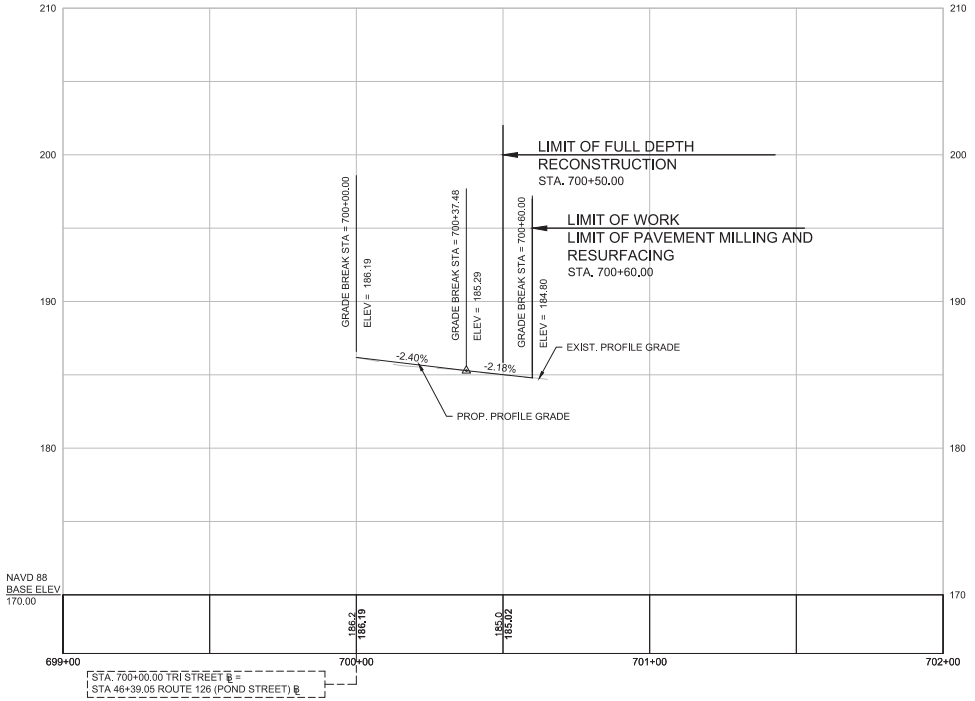
TRI STREET PROFILE

604123_HDS\PROFILES.DWG Plotted on 17-Oct-2017 4:44 PM

Proposal No. 604123-111717

A00860 - 146

TRI STREET



HORIZONTAL
20 0 20 40
4 0 4 8
VERTICAL
SCALE IN FEET

FOR CONSTRUCTION PLAN:
SEE SHEET NO. 20

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	53	308
PROJECT FILE NO. 604123			

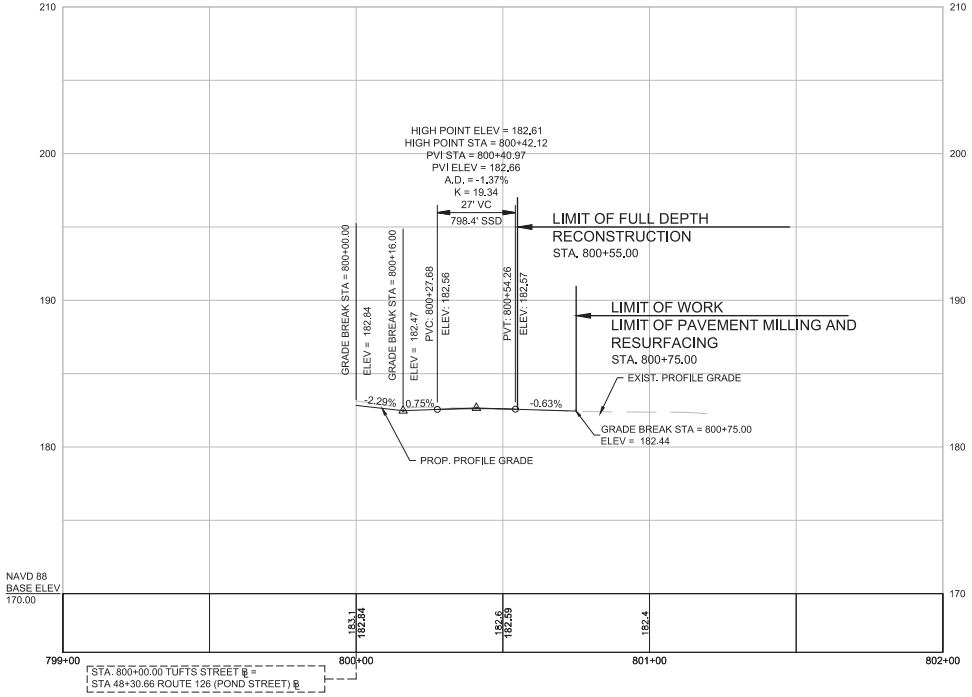
TUFTS STREET PROFILE

604123_HDS\PROFILES.DWG Plotted on 17-OCT-2017 4:44 PM

Proposal No. 604123-111717

A00860 - 147

TUFTS STREET



HORIZONTAL
20 0 20 40
4 0 4 8
VERTICAL
SCALE IN FEET

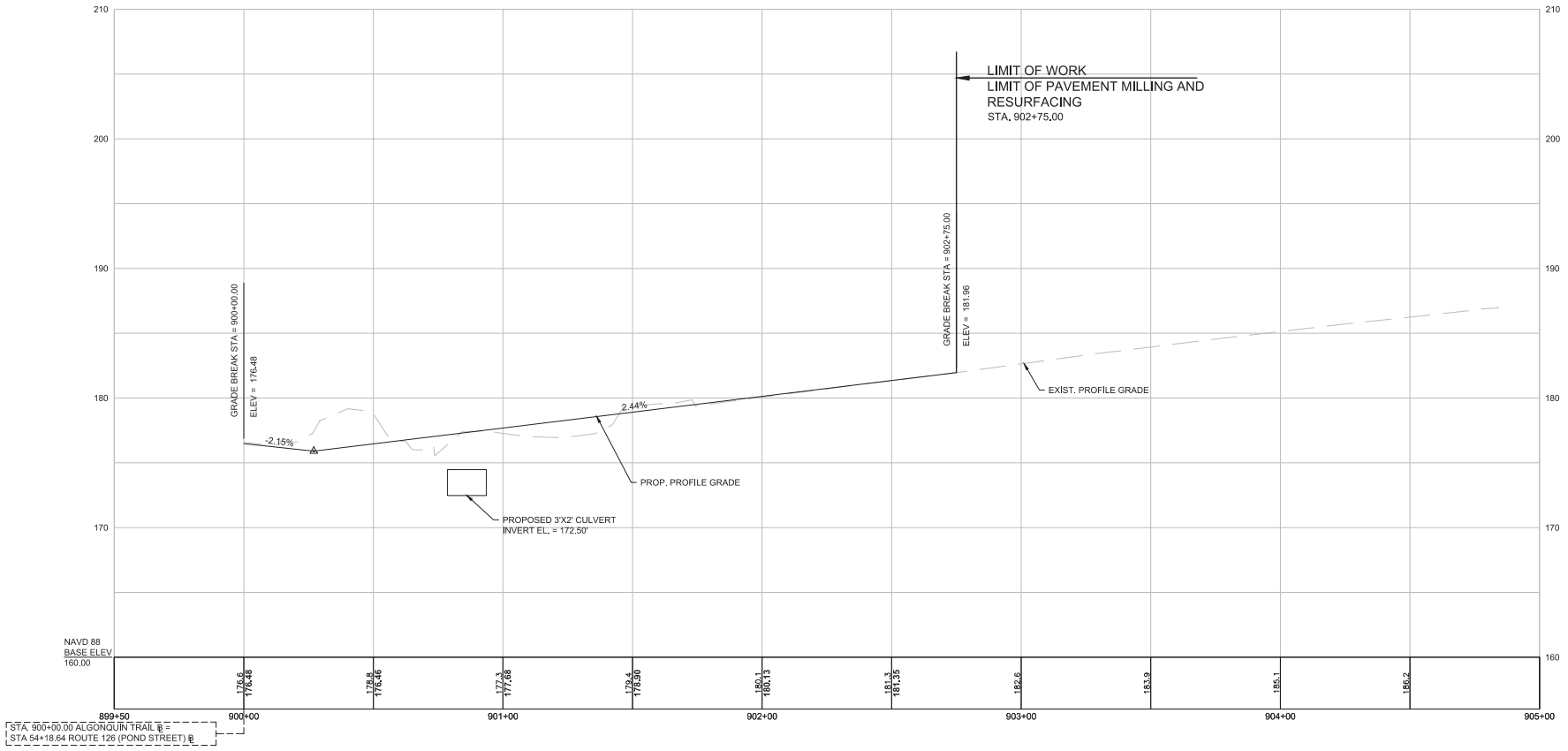
FOR CONSTRUCTION PLAN:
SEE SHEET NO. 20

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	54	308
PROJECT FILE NO.	604123		

ALGONQUIN TRAIL PROFILE

ALGONQUIN TRAIL



HORIZONTAL
20 0 20 40
4 0 4 8
VERTICAL
SCALE IN FEET

FOR CONSTRUCTION PLAN:
SEE SHEET NO. 21

NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

604123_HDS\PROFILES.DWG Plotted on 17-Oct-2017 4:44 PM

Proposal No. 604123-111717

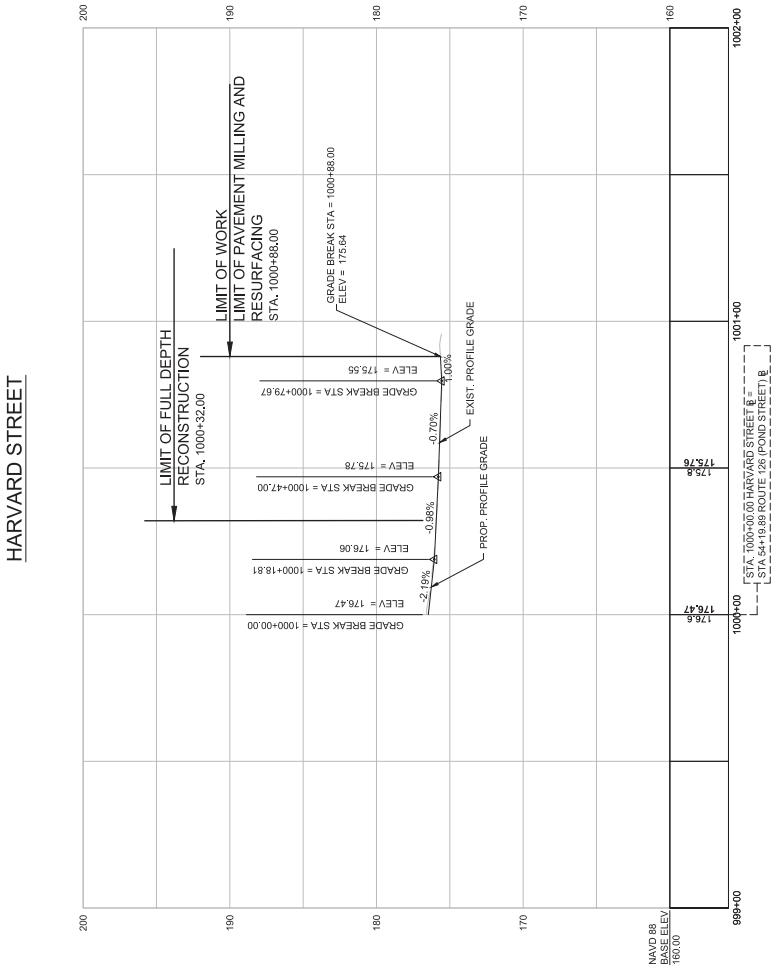
A00860 - 148

604123_HD09(PROFILES).DWG Plotted on 17-Oct-2017 4:44 PM

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	55	308
PROJECT FILE NO.		604123	

HARVARD STREET PROFILE



FOR CONSTRUCTION PLAN:
SEE SHEET NO. 21

NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	56	308
PROJECT FILE NO. 604123			

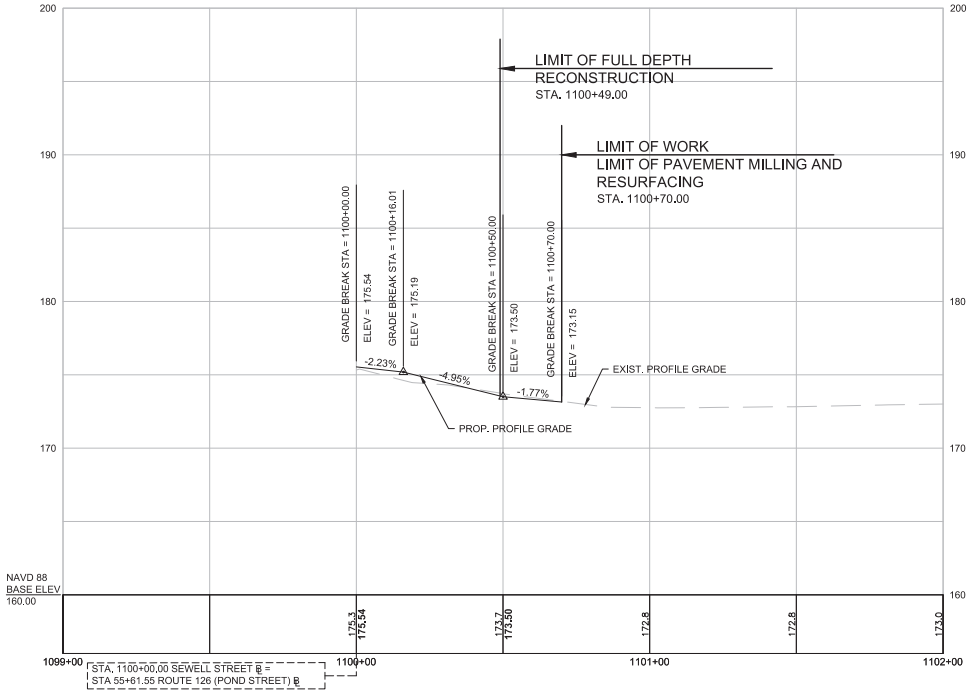
SEWELL STREET PROFILE

604123_HDS\PROFILES.DWG Plotted on 17-Oct-2017 4:44 PM

Proposal No. 604123-111717

A00860 - 150

SEWELL STREET



HORIZONTAL
20 0 20 40
4 0 4 8
VERTICAL
SCALE IN FEET

FOR CONSTRUCTION PLAN:
SEE SHEET NO. 22

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	57	308
PROJECT FILE NO. 604123			

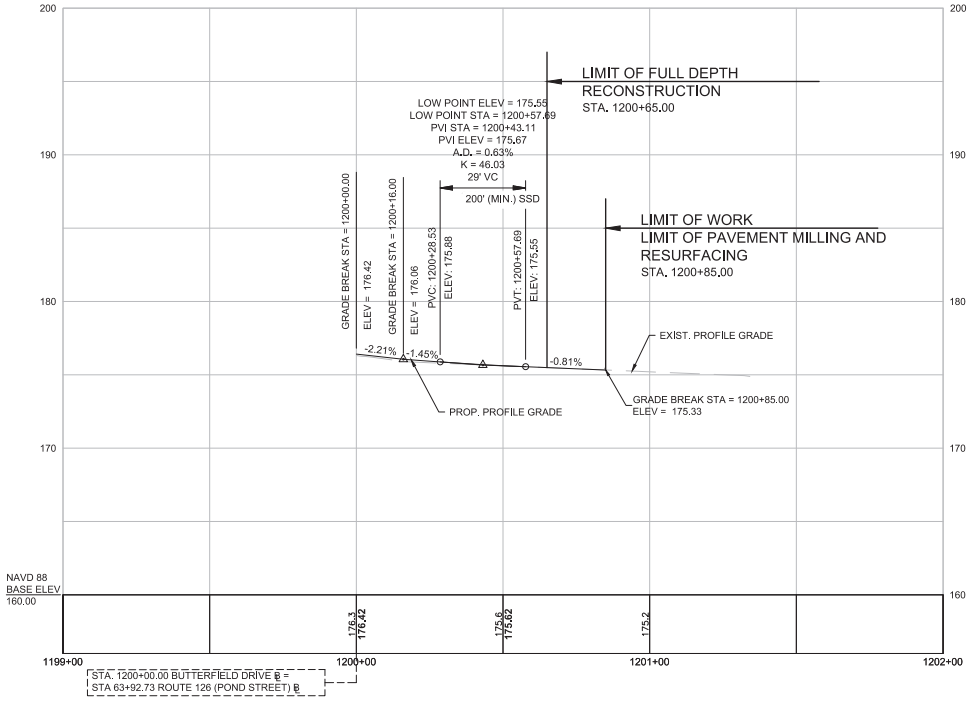
BUTTERFIELD DRIVE PROFILE

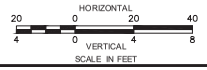
604123_HDS\PROFILES.DWG Plotted on 17-Oct-2017 4:44 PM

Proposal No. 604123-111717

A00860 - 151

BUTTERFIELD DRIVE





FOR CONSTRUCTION PLAN:
SEE SHEET NO. 23

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	58	308
PROJECT FILE NO. 604123			

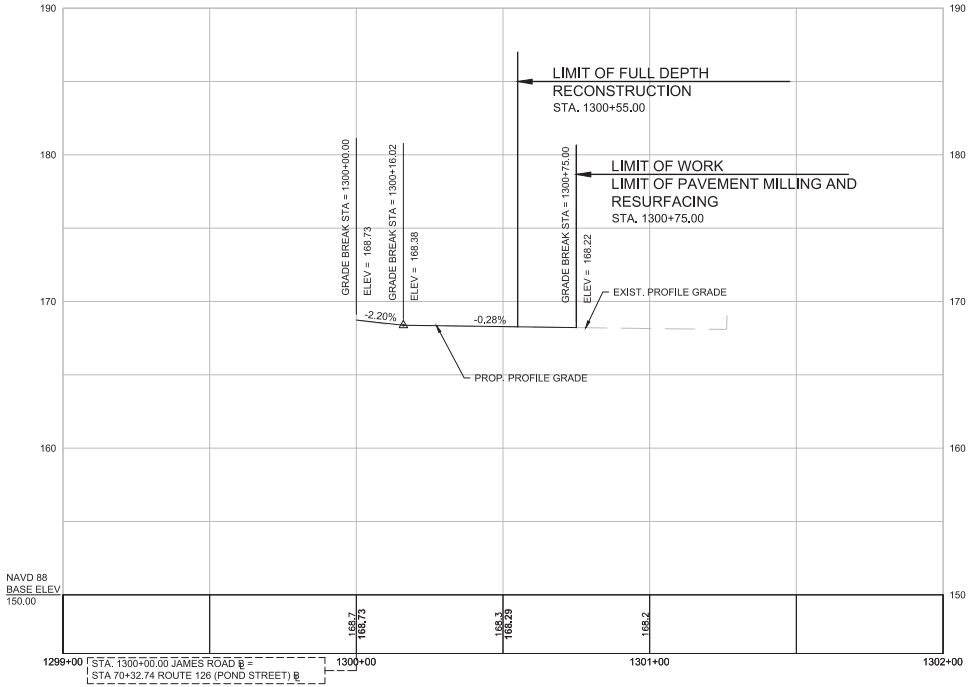
JAMES ROAD PROFILE

604123_HDS\PROFILES.DWG Plotted on 17-Oct-2017 4:44 PM

Proposal No. 604123-111717

A00860 - 152

JAMES ROAD



HORIZONTAL
20 0 20 40
4 0 4 8
VERTICAL
SCALE IN FEET

FOR CONSTRUCTION PLAN:
SEE SHEET NO. 42

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	59	308
PROJECT FILE NO.	604123		

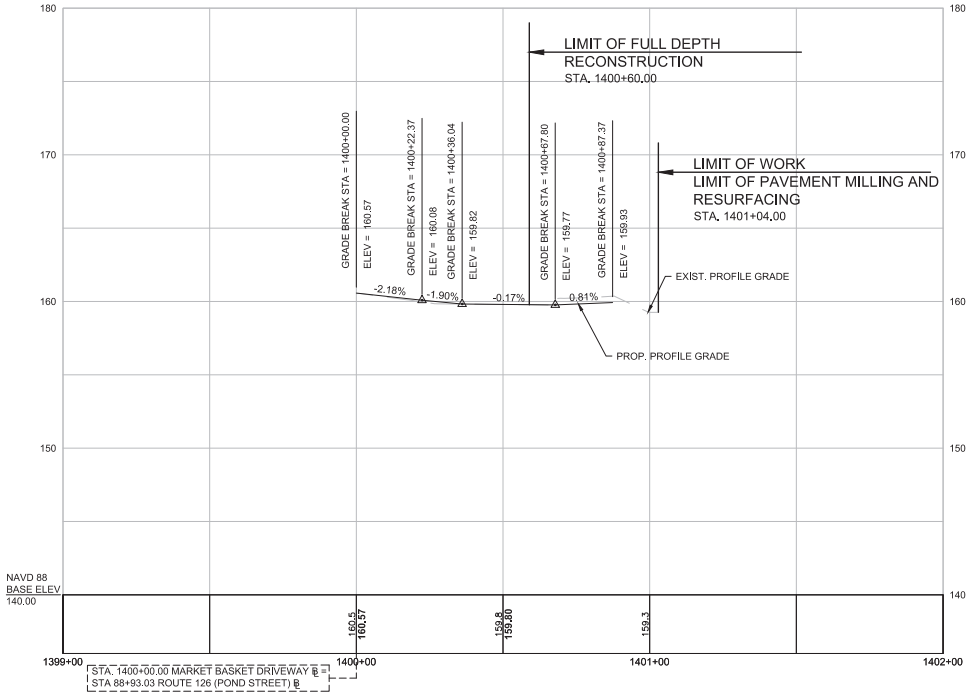
MARKET BASKET DRIVEWAY PROFILE

604123_HDS\PROFILES.DWG Plotted on 17-Oct-2017 4:44 PM

Proposal No. 604123-111717

A00860 - 153

MARKET BASKET DRIVEWAY



HORIZONTAL
20 0 20 40
4 0 4 8
VERTICAL
SCALE IN FEET

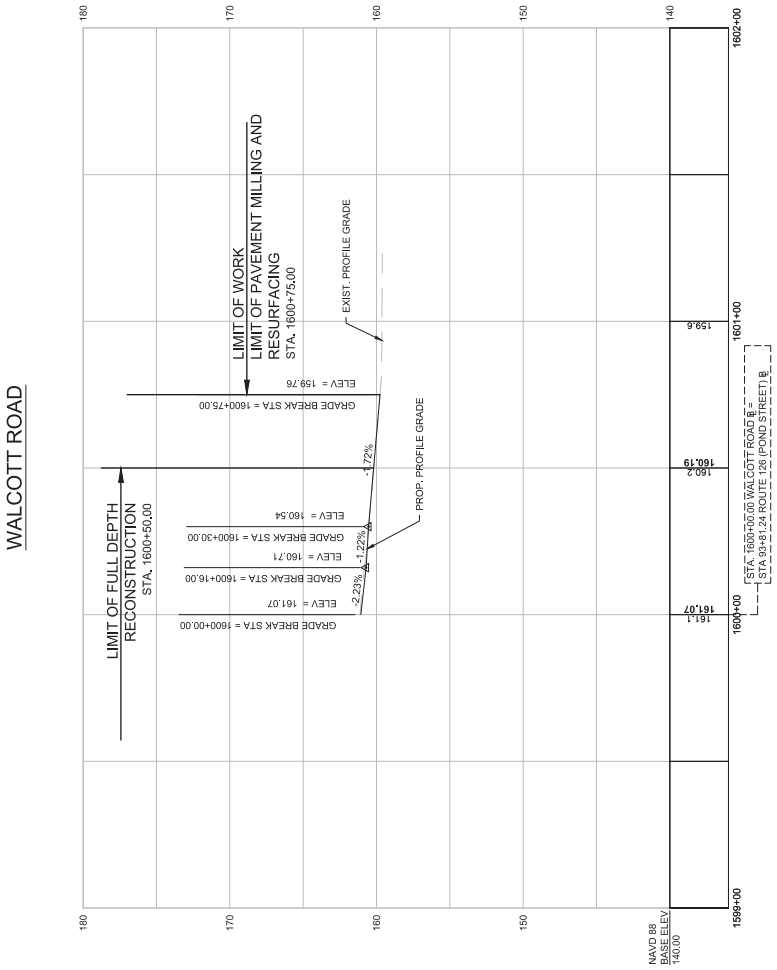
FOR CONSTRUCTION PLAN:
SEE SHEET NO. 27

604123_H009(PROFILES).DWG Plotted on 17-Oct-2017 4:44 PM

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	60	308
	PROJECT FILE NO.	604123	

WALCOTT ROAD PROFILE



FOR CONSTRUCTION PLAN:
SEE SHEET NO. 28

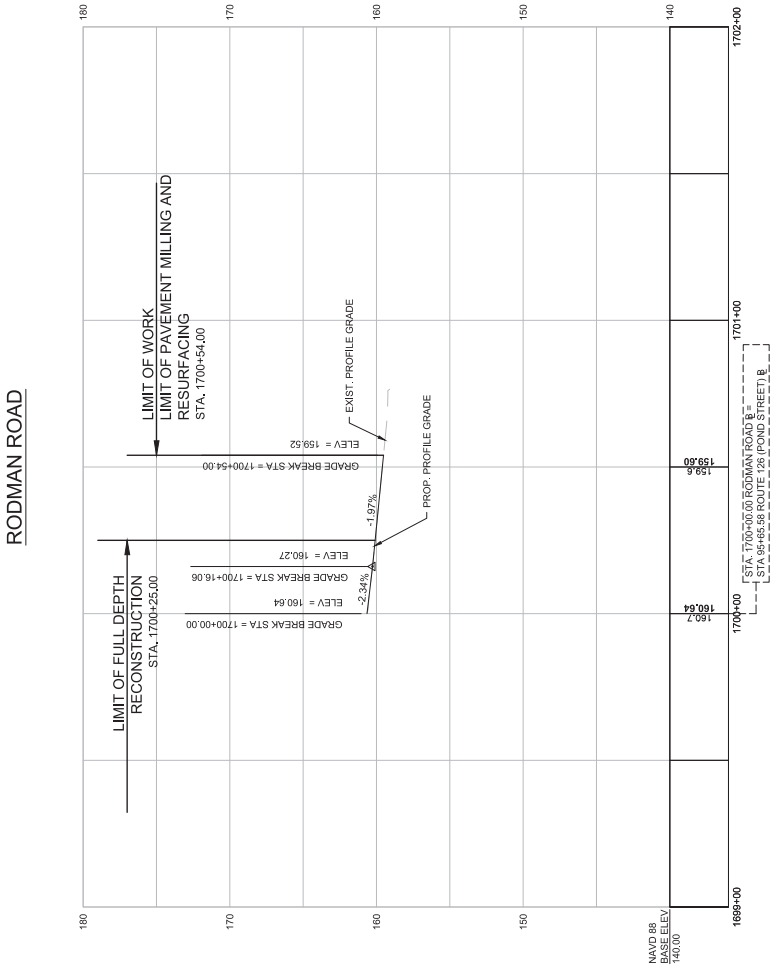
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

604123_H009(PROFILES).DWG Plotted on 17-OCT-2017 4:44 PM

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	61	308
	PROJECT FILE NO.	604123	

RODMAN ROAD PROFILE





FOR CONSTRUCTION PLAN:
SEE SHEET NO. 28

NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	62	308
PROJECT FILE NO. 604123			

GREENHALGE ROAD PROFILE

604123_HDS\PROFILES.DWG Plotted on 17-OCT-2017 4:44 PM

Proposal No. 604123-111717

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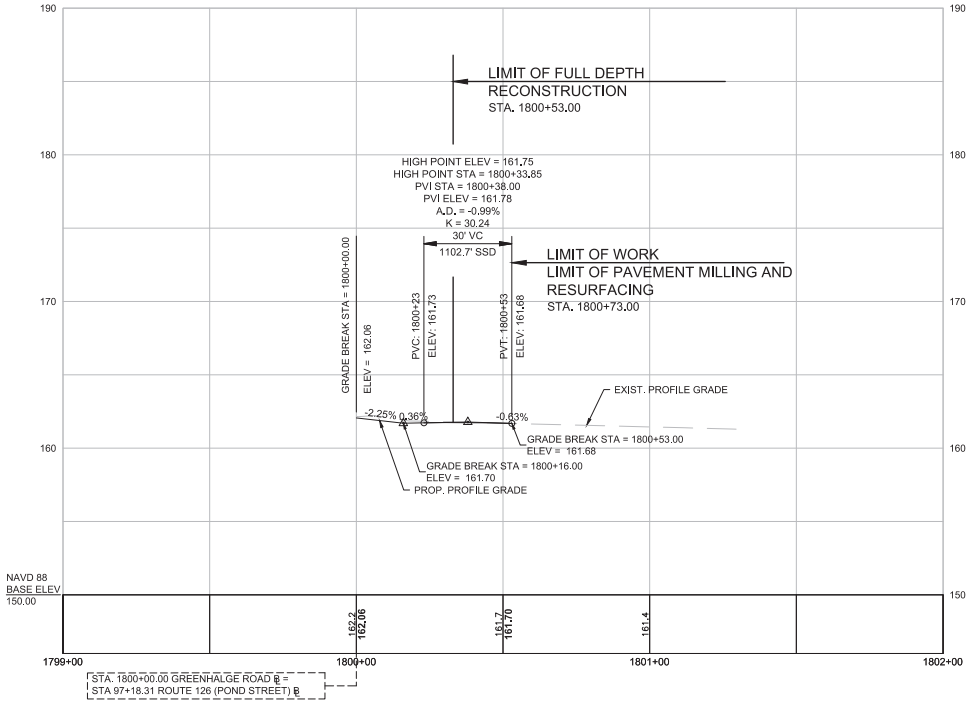
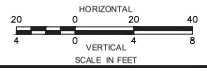
GREENHALGE ROAD





FOR CONSTRUCTION PLAN:
SEE SHEET NO. 29

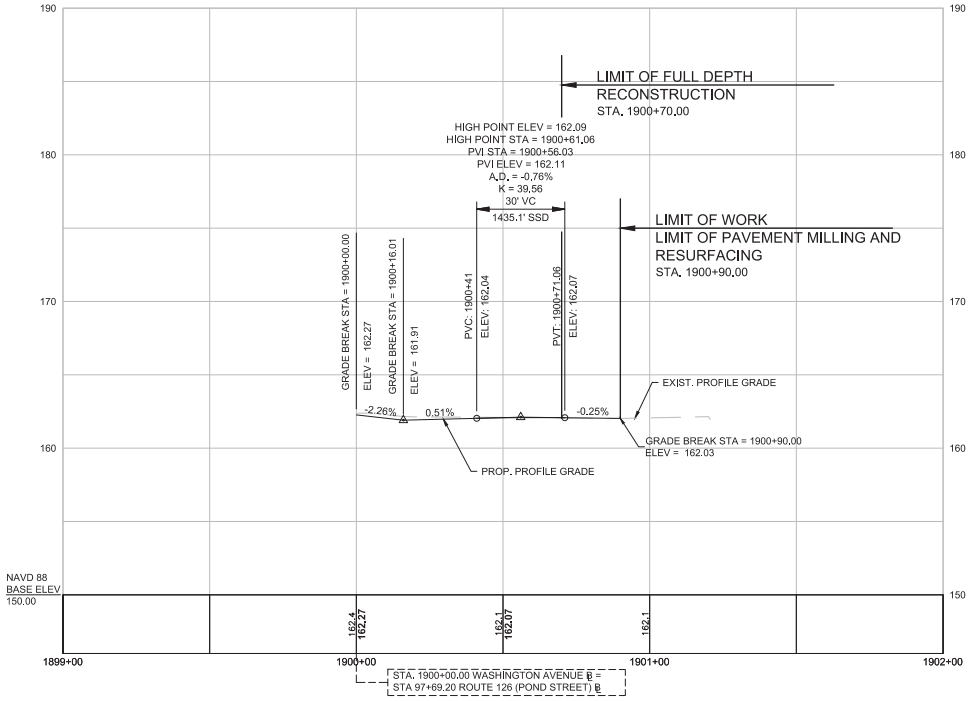
ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	63	308
PROJECT FILE NO. 604123			

WASHINGTON AVENUE PROFILE

604123_HDS\PROFILES.DWG Plotted on 17-Oct-2017 4:44 PM

WASHINGTON AVENUE



HORIZONTAL
20 0 20 40
4 0 4 8
VERTICAL
SCALE IN FEET

FOR CONSTRUCTION PLAN:
SEE SHEET NO. 29

A00860 - 157

Proposal No. 604123-111717

NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	64	308
PROJECT FILE NO. 604123			

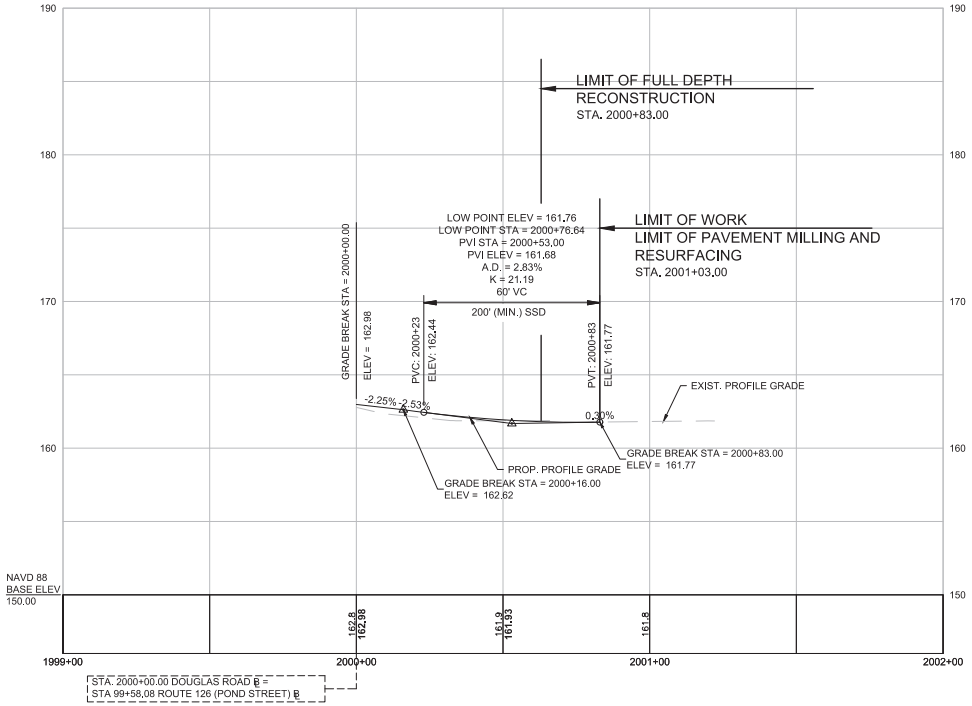
DOUGLAS ROAD PROFILE

604123_HDS\PROFILES.DWG Plotted on 17-OCT-2017 4:44 PM

Proposal No. 604123-111717

A00860 - 158

DOUGLAS ROAD



HORIZONTAL
20 0 20 40
4 0 4 8
VERTICAL
SCALE IN FEET

FOR CONSTRUCTION PLAN:
SEE SHEET NO. 29

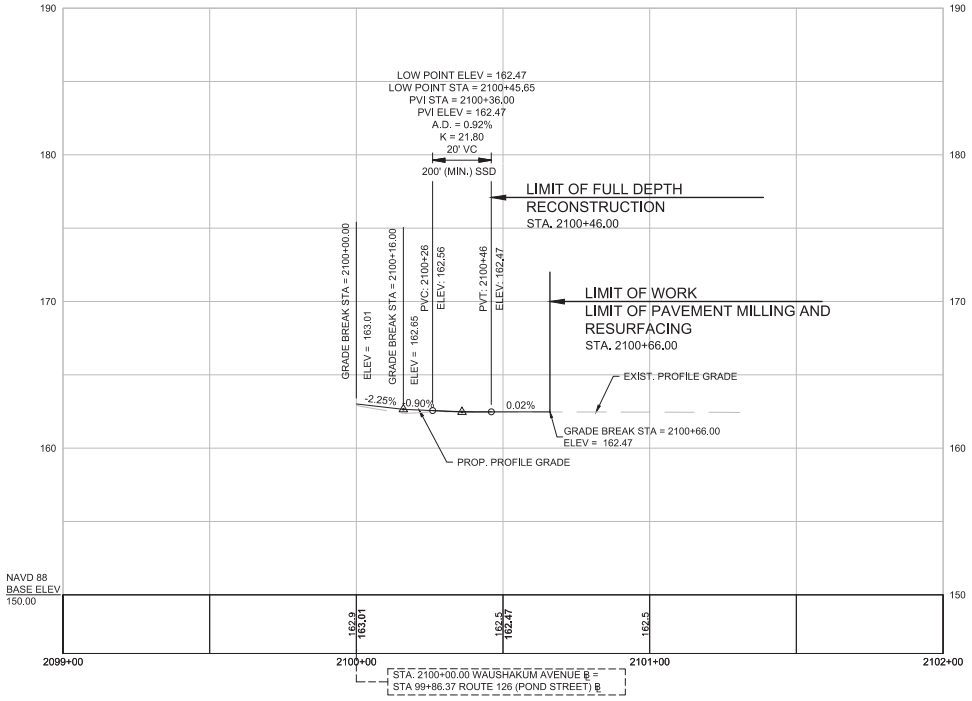
ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	65	308
PROJECT FILE NO.	604123		

WAUSHAKUM AVENUE PROFILE

604123_HDS\PROFILES.DWG Plotted on 17-OCT-2017 4:44 PM

WAUSHAKUM AVENUE



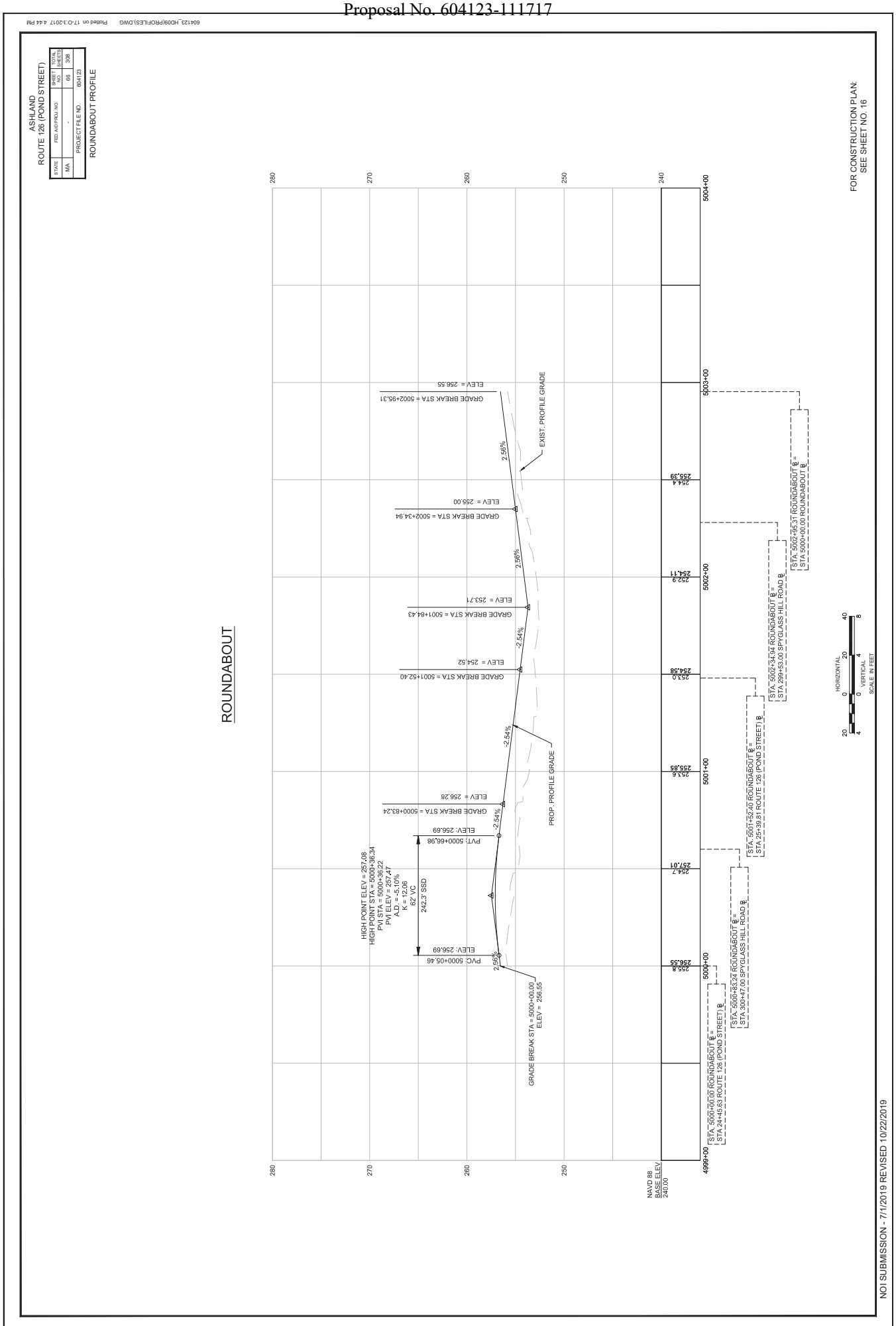
HORIZONTAL
20 0 20 40
4 0 4 8
VERTICAL
SCALE IN FEET

FOR CONSTRUCTION PLAN:
SEE SHEET NO. 29

A00860 - 159

Proposal No. 604123-111717

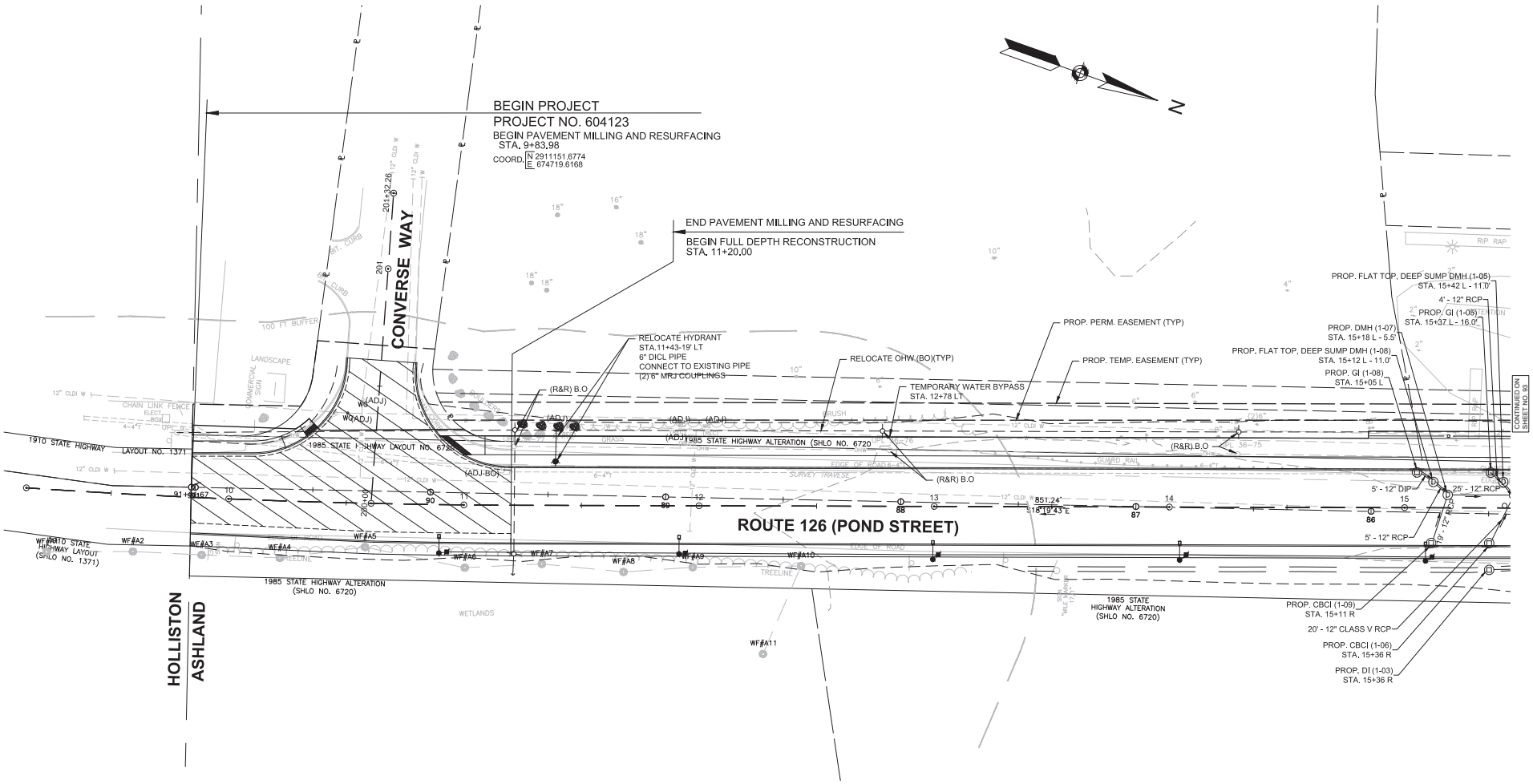
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019


604123_H009(PROFILES).DWG Plotted on 17-Oct-2017 4:44 PM
ASHLAND
ROUTE 126 (POND STREET)
STATE
MA
FED. AID PROJ. NO.
-
PROJECT FILE NO.
604123
SHEET NO.
66
TOTAL SHEETS
308
ROUNDABOUT PROFILE
ROUNDABOUT
HIGH POINT ELEV = 257.08
HIGH POINT STA = 5000+36.34
PVI STA = 5000+83.22
PVI ELEV = 257.47
A.D. = -5.10%
K = 12.06
62' VC
242.3' SSD
PVT: 5000+66.98
ELEV: 256.69
PVC: 5000+05.46
ELEV: 256.69
GRADE BREAK STA = 5000+00.00
ELEV = 256.55
GRADE BREAK STA = 5000+83.24
ELEV = 256.28
GRADE BREAK STA = 5001+52.40
ELEV = 254.52
GRADE BREAK STA = 5001+84.43
ELEV = 253.71
GRADE BREAK STA = 5002+34.94
ELEV = 255.00
GRADE BREAK STA = 5002+95.31
ELEV = 256.55
-2.54%
2.56%
PROP. PROFILE GRADE
EXIST. PROFILE GRADE
NAVD 88
BASE ELEV
240.00
280
270
260
250
240
4999+00
5000+00
5001+00
5002+00
5003+00
5004+00
255.8
256.55
257.01
254.7
257.0
254.58
253.6
255.85
252.9
254.11
254.4
255.39
STA. 5000+00.00 ROUNDABOUT ℄ =
STA 24+45.63 ROUTE 126 (POND STREET) ℄
STA. 5000+83.24 ROUNDABOUT ℄ =
STA 300+47.00 SPYGLASS HILL ROAD ℄
STA. 5001+52.40 ROUNDABOUT ℄ =
STA 25+39.81 ROUTE 126 (POND STREET) ℄
STA. 5002+34.94 ROUNDABOUT ℄ =
STA 299+53.00 SPYGLASS HILL ROAD ℄
STA. 5002+95.31 ROUNDABOUT ℄ =
STA 5000+00.00 ROUNDABOUT ℄
HORIZONTAL
VERTICAL
SCALE IN FEET
20
0
20
40
4
0
4
8
FOR CONSTRUCTION PLAN:
SEE SHEET NO. 16
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	92	308
PROJECT FILE NO.	604123		

DRAINAGE AND UTILITY PLANS (1 OF 1)



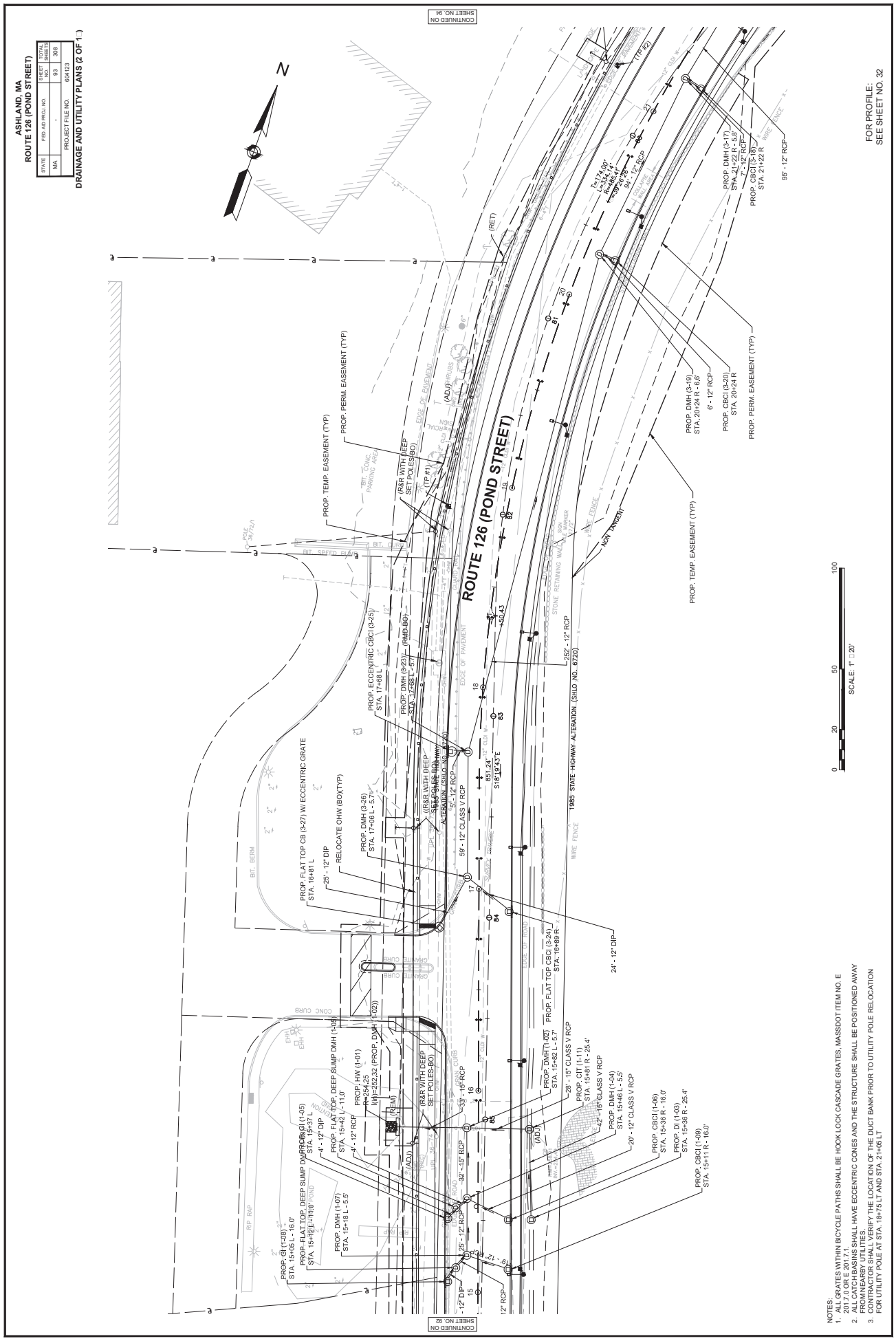
0 20 50 100
SCALE: 1" = 20'

NOTES:
1. ALL GRATES WITHIN BICYCLE PATHS SHALL BE HOOK LOCK CASCADE GRATES, MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.

FOR PROFILE:
SEE SHEET NO. 31

NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

604123_HD13\DRAINAGE&UTIL.DWG Plotted on 12-Mar-2018 8:03 AM

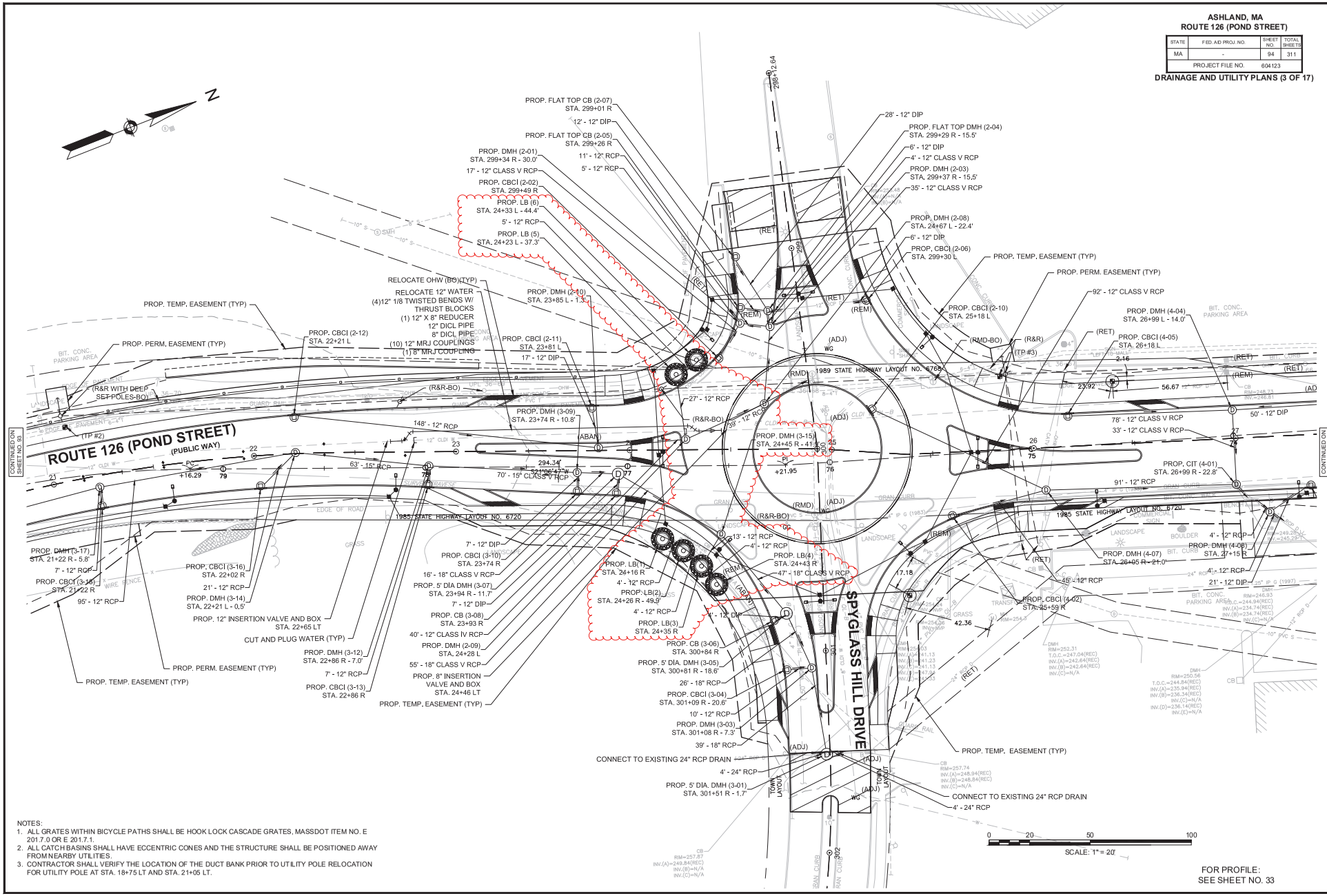

ASHLAND, MA
ROUTE 126 (POND STREET)
DRAINAGE AND UTILITY PLANS (2 OF 11)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 93 | 308
PROJECT FILE NO. 604123
ROUTE 126 (POND STREET)
1985 STATE HIGHWAY ALTERATION (SHLO NO. 6720)
CONTINUED ON SHEET NO 94
CONTINUED ON SHEET NO 92
FOR PROFILE: SEE SHEET NO. 32
SCALE: 1" = 20'
NOTES:
1. ALL GRATES WITHIN BICYCLE PATHS SHALL BE HOOK LOCK CASCADE GRATES, MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.
3. CONTRACTOR SHALL VERIFY THE LOCATION OF THE DUCT BANK PRIOR TO UTILITY POLE RELOCATION FOR UTILITY POLE A1 STA. 16+75 LT AND STA. 21+05 LT
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

A00860 - 163

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	94	311
PROJECT FILE NO.	604123		

DRAINAGE AND UTILITY PLANS (3 OF 17)

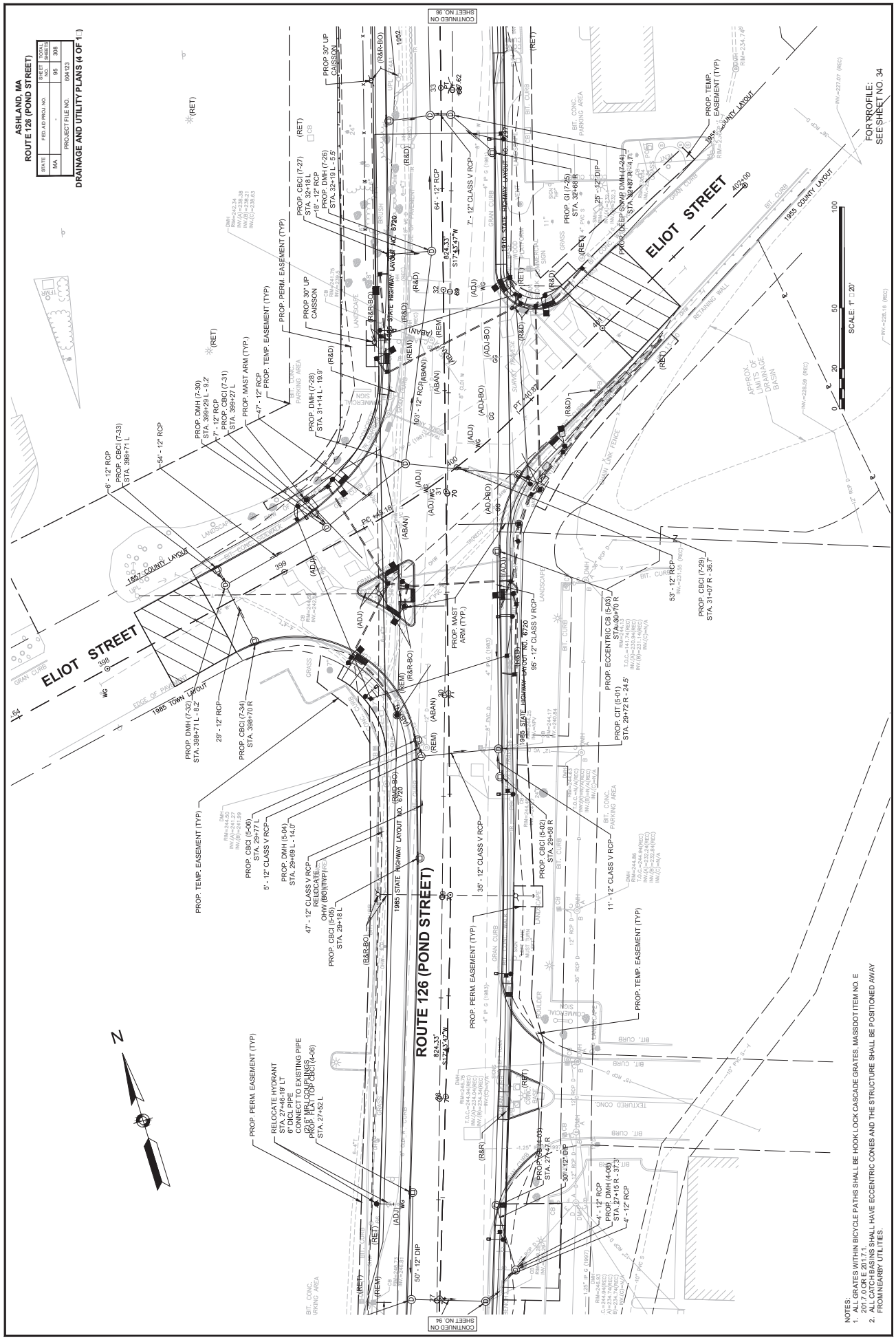


NOTES:
1. ALL GRATES WITHIN BICYCLE PATHS SHALL BE HOOK LOCK CASCADE GRATES, MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.
3. CONTRACTOR SHALL VERIFY THE LOCATION OF THE DUCT BANK PRIOR TO UTILITY POLE RELOCATION FOR UTILITY POLE AT STA. 18+75 LT AND STA. 21+05 LT.

NOI SUBMISSION - 7/1/2019, REVISED NOI SUBMISSION - 11/18/2019

604123_HD13\DRAINAGE&UTIL.DWG Plotted on 12-Mar-2018 8:03 AM

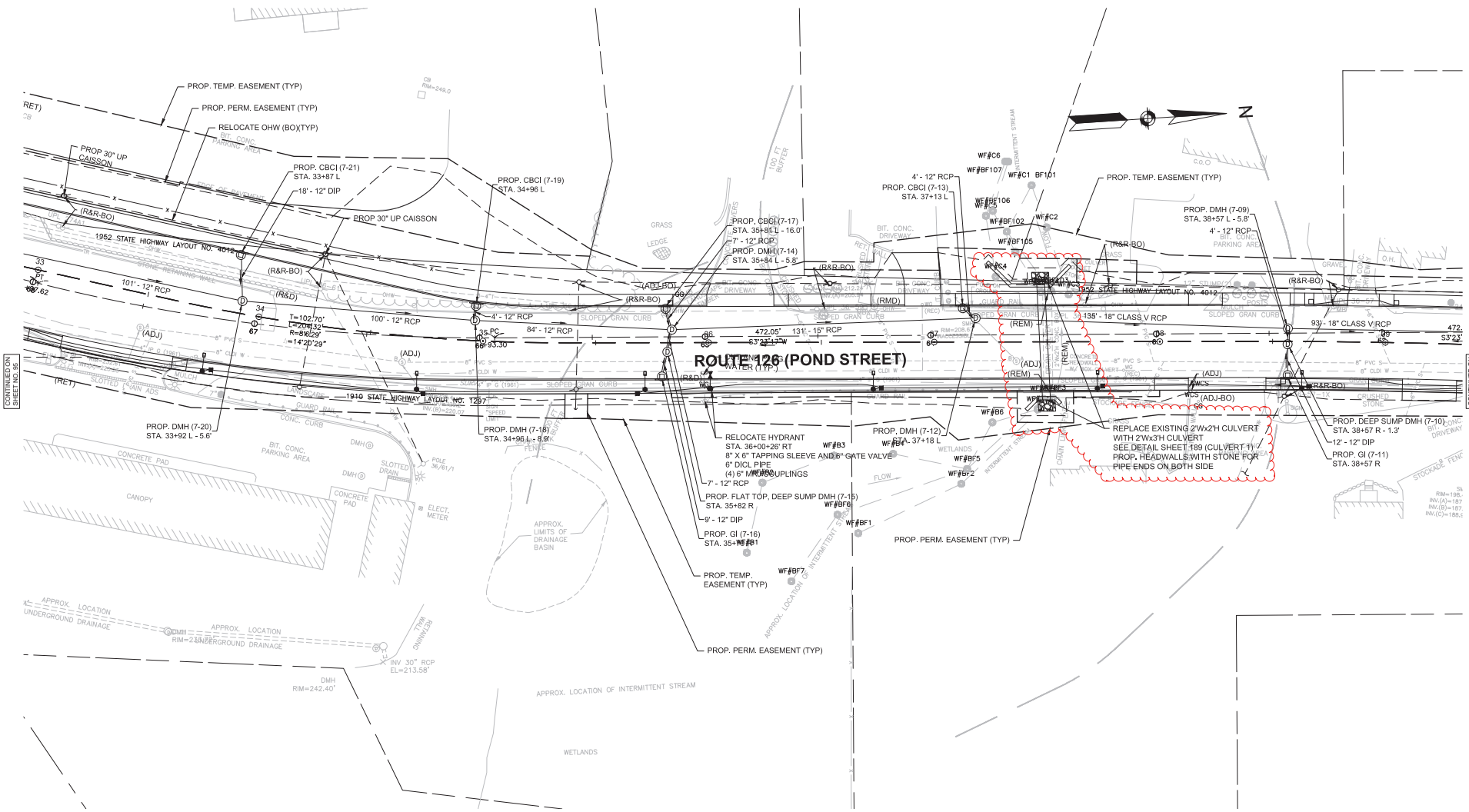
Proposal No. 604123-111717


ASHLAND, MA
ROUTE 126 (POND STREET)
DRAINAGE AND UTILITY PLANS (4 OF 11)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 9S | 308
PROJECT FILE NO. 604123
ROUTE 126 (POND STREET)
ELIOT STREET
1857 COUNTY LAYOUT
1985 TOWN LAYOUT
1985 STATE HIGHWAY LAYOUT NO. 8720
1955 COUNTY LAYOUT
1910 - STATE HIGHWAY LAYOUT NO. 8720
PROP. 30" UP CAISSON
PROP. PERM. EASEMENT (TYP)
PROP. TEMP. EASEMENT (TYP)
PROP. MAST ARM (TYP)
PROP. ECCENTRIC CB (5-03) STA. 30+70 R
PROP. CIT (5-01) STA. 29+72 R - 24.5'
PROP. CBCI (7-29) STA. 31+07 R - 36.7'
PROP. DEEP SUMP DMH (7-24) STA. 32+87 R -4.7'
PROP. GI (7-25) STA. 32+68 R
PROP. CBCI (7-27) STA. 32+18 L
PROP. DMH (7-26) STA. 32+19 L - 5.5'
PROP. DMH (7-28) STA. 31+14 L - 19.9'
PROP. DMH (7-30) STA. 399+29 L - 9.2'
PROP. CBCI (7-31) STA. 399+27 L
PROP. MAST ARM (TYP.)
PROP. CBCI (7-33) STA. 398+71 L
PROP. DMH (7-32) STA. 398+71 L - 8.2'
PROP. CBCI (7-34) STA. 398+70 R
PROP. DMH (5-04) STA. 29+69 L - 14.0'
PROP. CBCI (5-05) STA. 29+77 L
PROP. CBCI (5-06) STA. 29+16 L
PROP. CBCI (5-02) STA. 29+58 R
PROP. DMH (4-08) STA. 27+15 R - 37.3'
PROP. CBCI (4-07) STA. 27+47 R
PROP. CBCI (4-06) STA. 27+52 L
RELOCATE HYDRANT STA. 27+46 - 39' LT
6" DI CL. PIPE
CONNECT TO EXISTING PIPE
(2) 6" MJ COUPLINGS
PROP. FLAT TOP CBCI (4-06) STA. 27+52 L
PROP. TEMP. EASEMENT (TYP)
PROP. PERM. EASEMENT (TYP)
CONTINUED ON SHEET NO. 96
CONTINUED ON SHEET NO. 94
FOR PROFILE: SEE SHEET NO. 34
SCALE: 1" = 20'
NOTES:
1. ALL GRATES WITHIN BICYCLE PATHS SHALL BE HOOK LOCK CASCADE GRATES. MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	96	311
PROJECT FILE NO.	604123		

DRAINAGE AND UTILITY PLANS (5 OF 17)



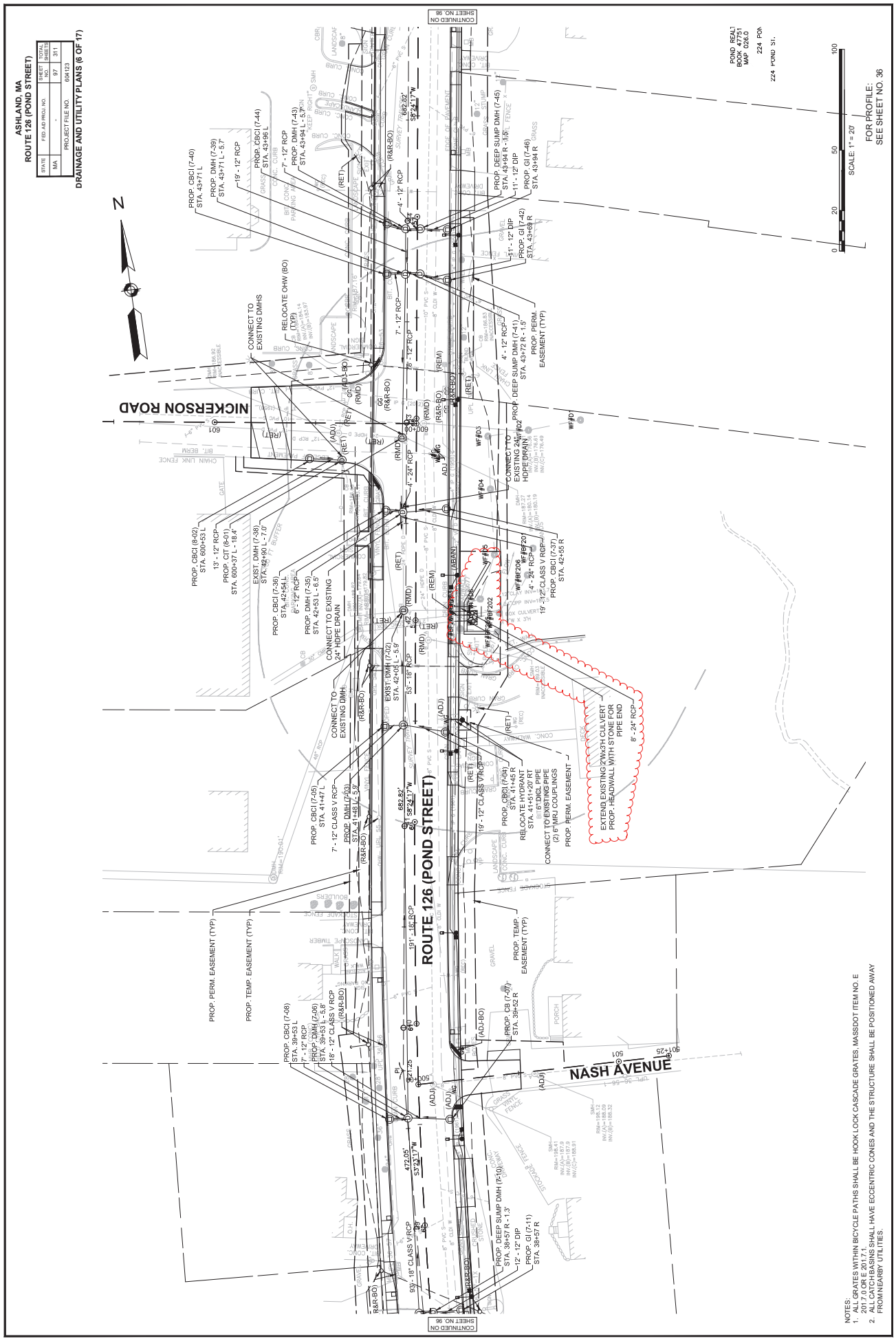
NOTES:
1. ALL GRATES WITHIN BICYCLE PATHS SHALL BE HOOK LOCK CASCADE GRATES, MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.

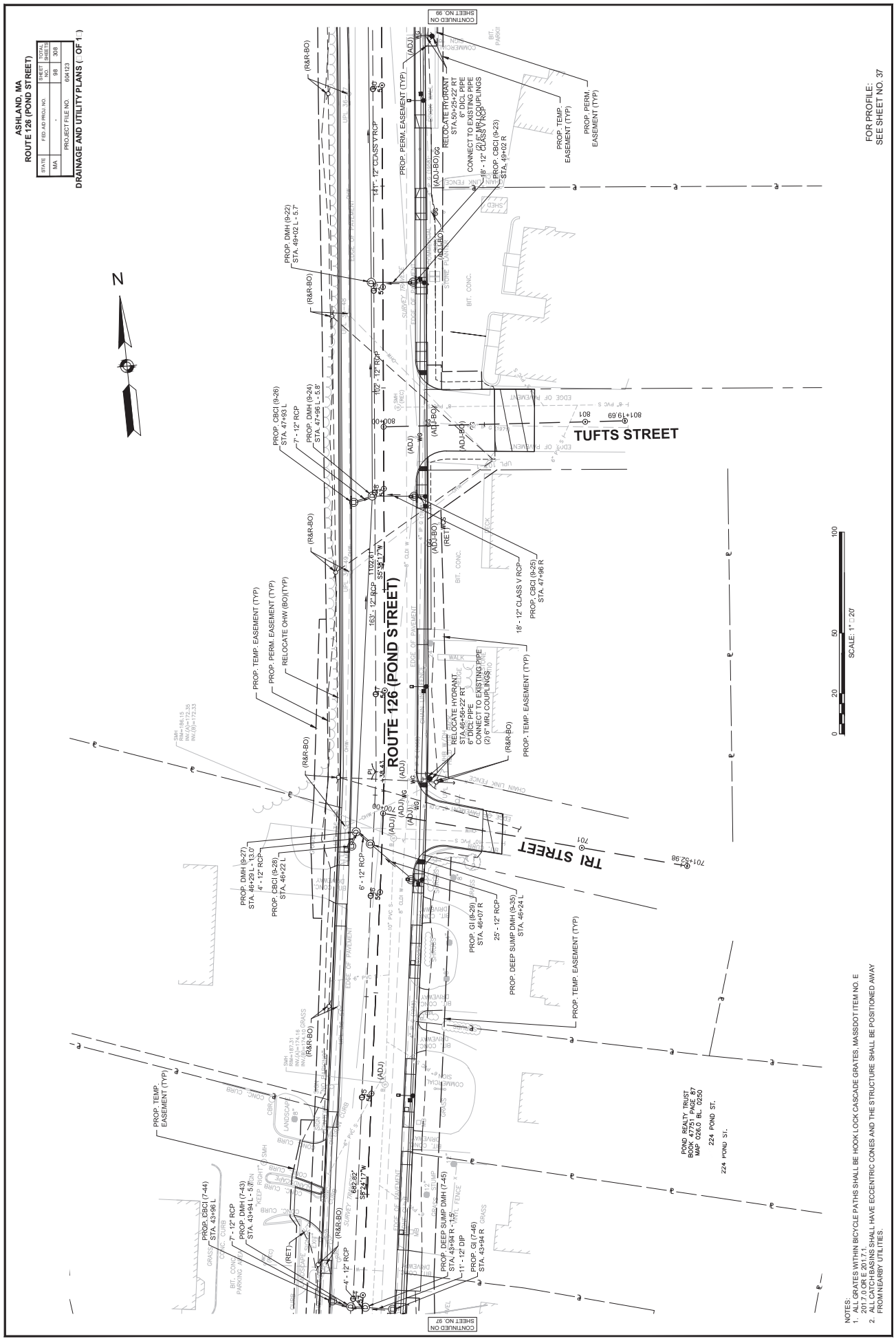
0 20 50 100
SCALE: 1" = 20'

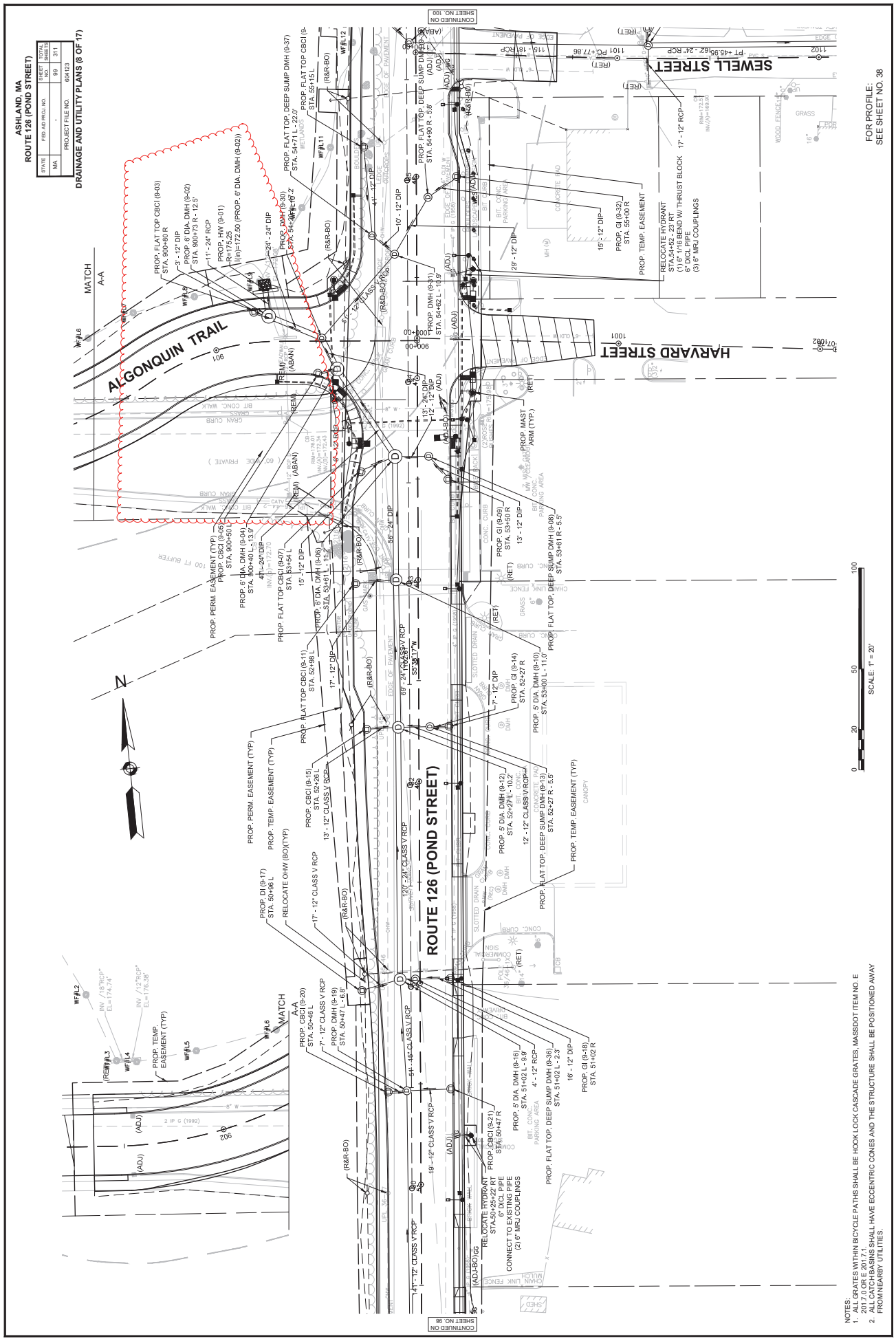
FOR PROFILE:
SEE SHEET NO. 35

NOI SUBMISSION - 7/1/2019, REVISED NOI SUBMISSION - 11/18/2019

604123_HD13(DRAINAGE&UTIL).DWG Plotted on 12-Mar-2018 8:03 AM


ASHLAND, MA
ROUTE 126 (POND STREET)
DRAINAGE AND UTILITY PLANS (6 OF 17)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 97 | 311
PROJECT FILE NO. 604123
ROUTE 126 (POND STREET)
NICKERSON ROAD
NASH AVENUE
CONTINUED ON SHEET NO. 98
CONTINUED ON SHEET NO. 96
FOR PROFILE: SEE SHEET NO. 36
SCALE: 1" = 20'
NOTES:
1. ALL GRATES WITHIN BICYCLE PATHS SHALL BE HOOK LOCK CASCADE GRATES, MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.
NOI SUBMISSION - 7/1/2019, REVISED NOI SUBMISSION - 11/18/2019

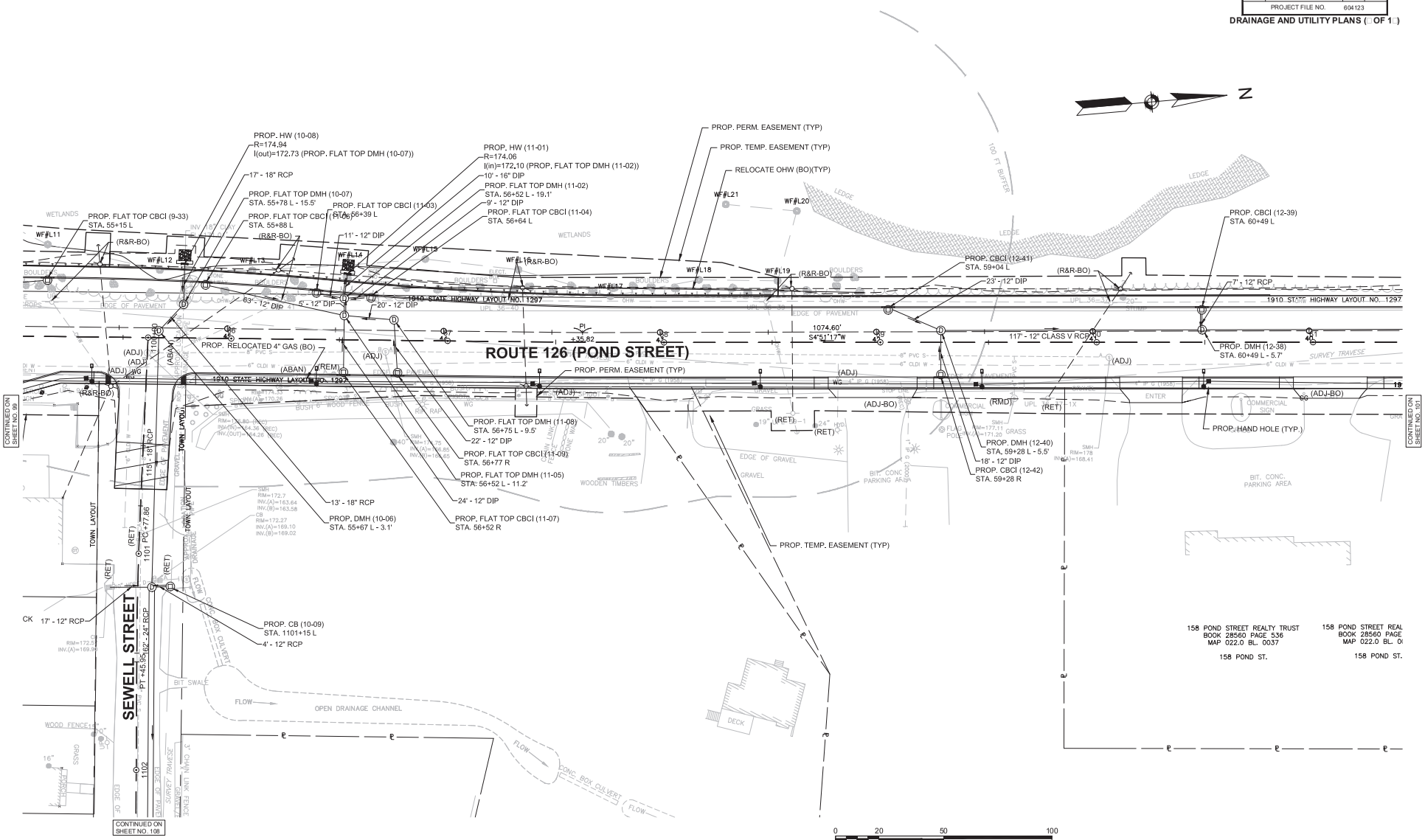

ASHLAND, MA
ROUTE 126 (POND STREET)
DRAINAGE AND UTILITY PLANS (_ OF 11)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 98 | 308
PROJECT FILE NO. 604123
604123_HD13DRAINAGESUTIL.DWG Plotted on 12-Mar-2018 8:03 AM
N
SCALE: 1" = 20'
0
20
50
100
ROUTE 126 (POND STREET)
TUFTS STREET
TRI STREET
CONTINUED ON SHEET NO. 99
CONTINUED ON SHEET NO. 97
FOR PROFILE: SEE SHEET NO. 37
PROP. CBCI (9-26) STA. 47+93 L
7' - 12" RCP
PROP. DMH (9-24) STA. 47+96 L - 5.8'
PROP. DMH (9-22) STA. 49+02 L - 5.7'
PROP. CBCI (9-23) STA. 49+02 R
18' - 12" CLASS V RCP
PROP. CBCI (9-25) STA. 47+88 R
PROP. TEMP. EASEMENT (TYP)
PROP. PERM. EASEMENT (TYP)
RELOCATE OHW (BO)(TYP)
RELOCATE HYDRANT STA.46+56+22' RT 6" DICL PIPE CONNECT TO EXISTING PIPE (2) 6" MRJ COUPLINGS
PROP. DMH (9-27) STA. 46+29 L - 13.0' 4' - 12" RCP
PROP. CBCI (9-28) STA. 46+22 L
6' - 12" RCP
PROP. GI (9-29) STA. 46+07 R
25' - 12" RCP
PROP. DEEP SUMP DMH (9-35) STA. 46+24 L
PROP. CBCI (7-44) STA. 43+96 L
7' - 12" RCP
PROP. DMH (7-43) STA. 43+94 L - 5.8'
4' - 12" RCP
PROP. DEEP SUMP DMH (7-45) STA. 43+94 R - 1.5'
11' - 12" DIP
PROP. GI (7-46) STA. 43+94 R
POND REALTY TRUST BOOK 47751 PAGE 87 MAP 026.0 BL. 0250
224 POND ST.
NOTES:
1. ALL GRATES WITHIN BICYCLE PATHS SHALL BE HOOK LOCK CASCADE GRATES. MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019


ASHLAND, MA
ROUTE 126 (POND STREET)
DRAINAGE AND UTILITY PLANS (8 OF 17)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 99 | 311
PROJECT FILE NO. 604123
ROUTE 126 (POND STREET)
ALGONQUIN TRAIL
SEWELL STREET
HARVARD STREET
MATCH A-A
FOR PROFILE: SEE SHEET NO. 38
CONTINUED ON SHEET NO. 100
CONTINUED ON SHEET NO. 98
SCALE: 1" = 20'
NOTES:
1. ALL GRATES WITHIN BICYCLE PATHS SHALL BE HOOK LOCK CASCADE GRATES, MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.
NOI SUBMISSION - 7/1/2019, REVISED NOI SUBMISSION - 11/18/2019

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	100	308
PROJECT FILE NO.	604123		

DRAINAGE AND UTILITY PLANS (□ OF 1□)



NOTES:
1. ALL GRATES WITHIN BICYCLE PATHS SHALL BE HOOK LOCK CASCADE GRATES, MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.

FOR PROFILE:
SEE SHEET NO. 39

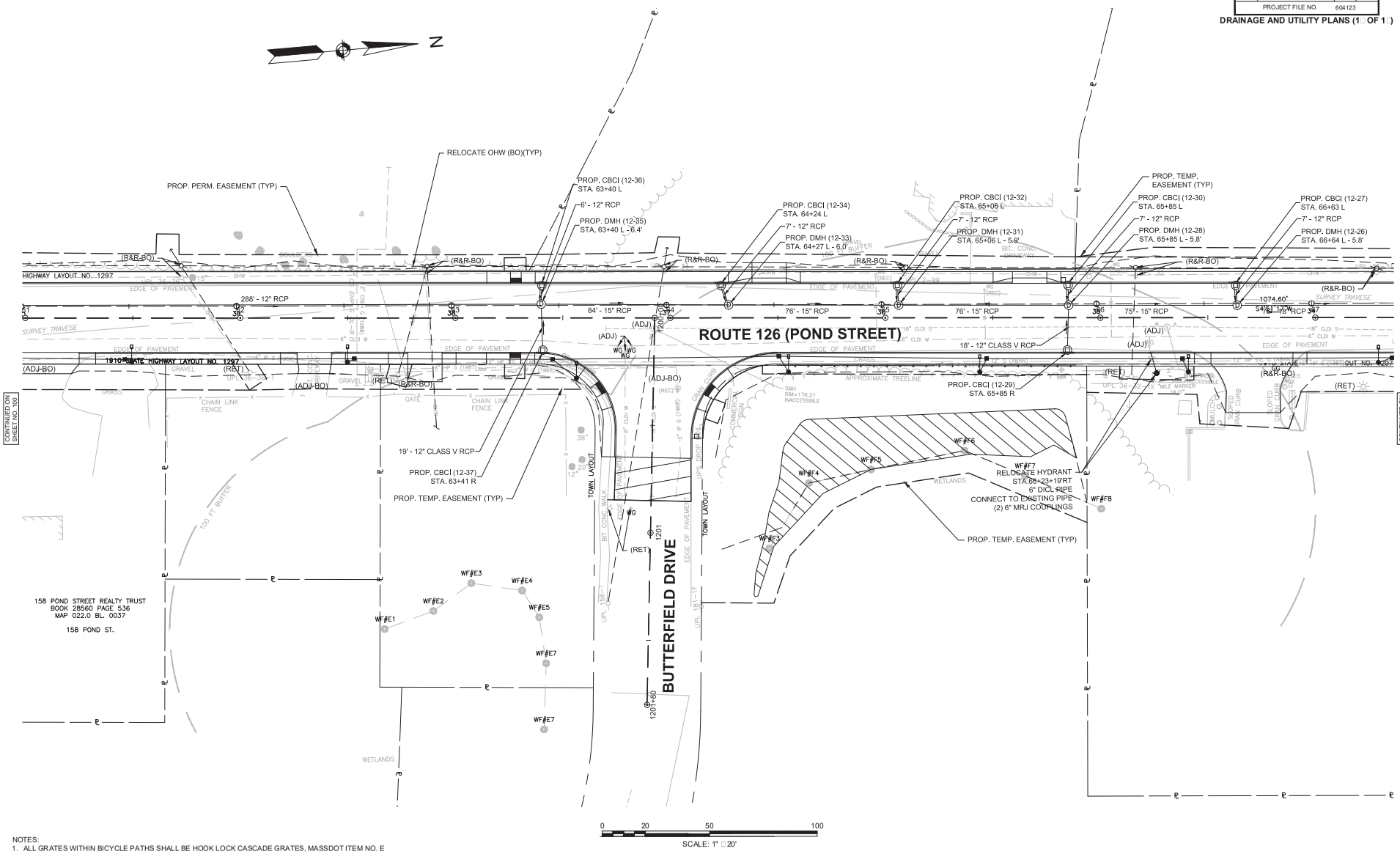
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

604123_HD13(DRAINAGE&UTIL).DWG Plotted on 12-Mar-2018 8:03 AM

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	101	308
PROJECT FILE NO.	604123		

DRAINAGE AND UTILITY PLANS (1□ OF 1□)

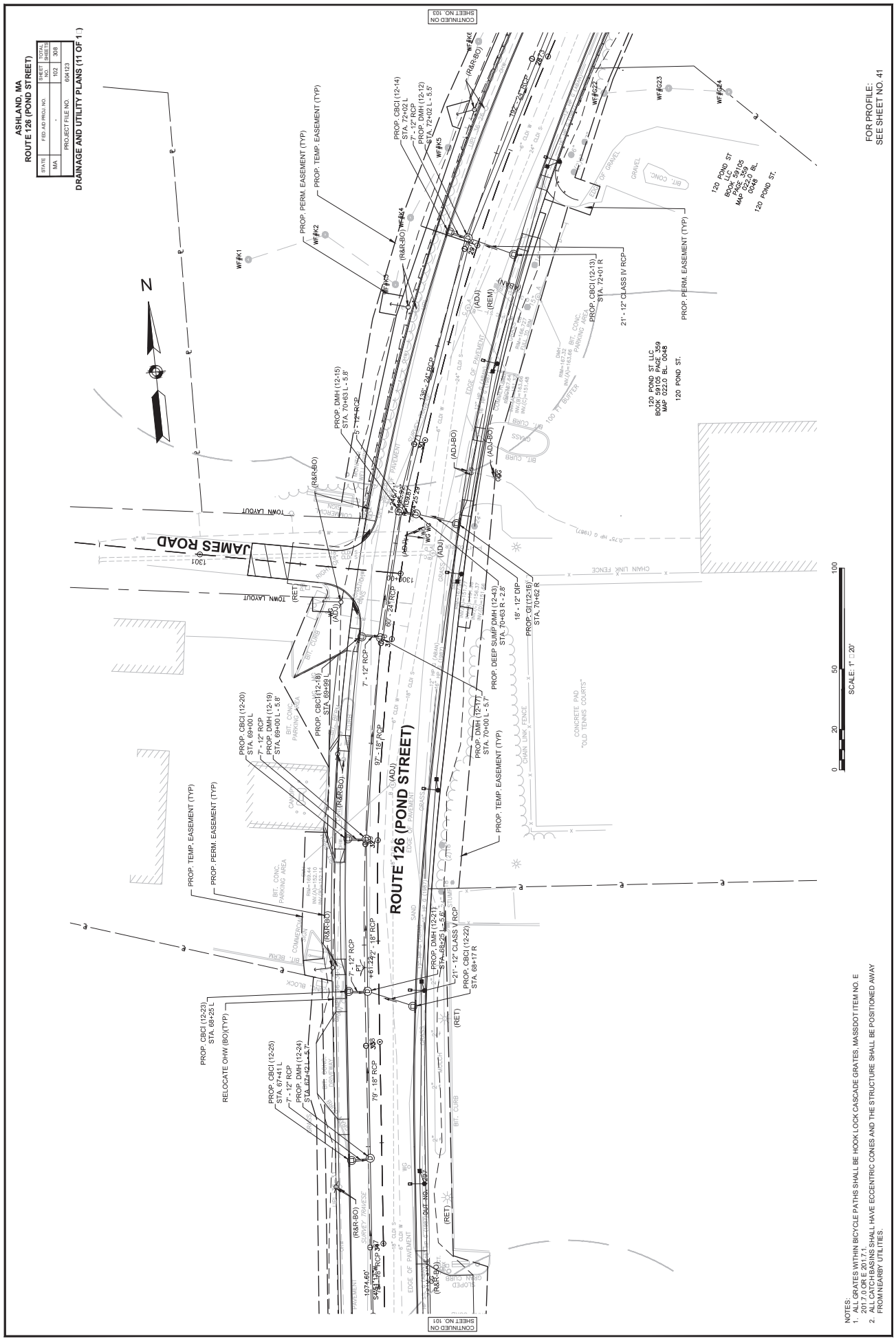


NOTES:
1. ALL GRATES WITHIN BICYCLE PATHS SHALL BE HOOK LOCK CASCADE GRATES, MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.

FOR PROFILE:
SEE SHEET NO. 40

NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

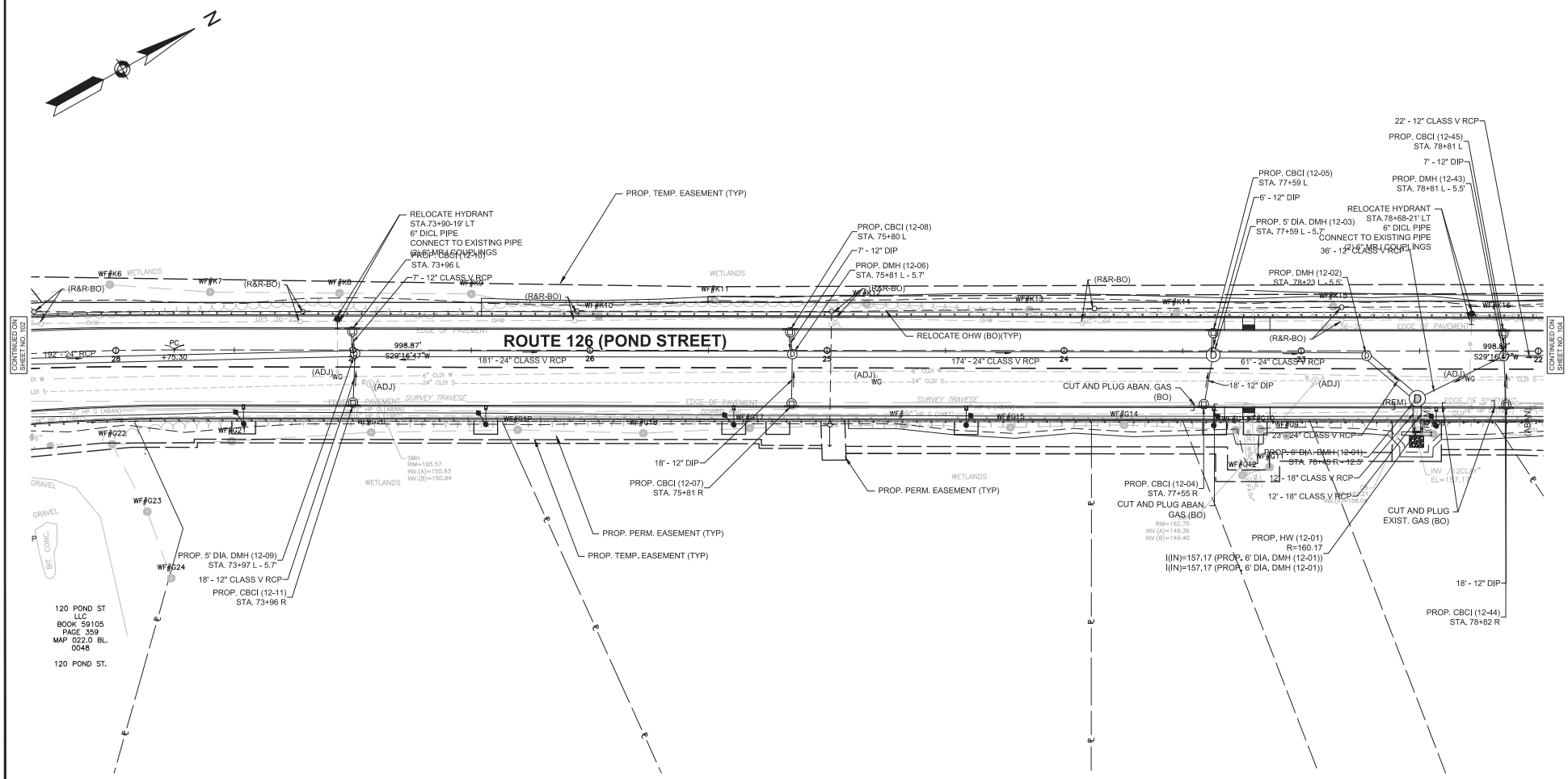
604123_HD13(DRAINAGE&UTIL).DWG Plotted on 12-Mar-2018 8:03 AM


ASHLAND, MA
ROUTE 126 (POND STREET)
DRAINAGE AND UTILITY PLANS (11 OF 11)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 102 | 308
PROJECT FILE NO. 604123
ROUTE 126 (POND STREET)
JAMES ROAD
TOWN LAYOUT
CONTINUED ON SHEET NO. 103
CONTINUED ON SHEET NO. 101
FOR PROFILE: SEE SHEET NO. 41
SCALE: 1" = 20'
NOTES:
1. ALL GRATES WITHIN BICYCLE PATHS SHALL BE HOOK LOCK CASCADE GRATES, MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	103	308
PROJECT FILE NO.	604123		

DRAINAGE AND UTILITY PLANS (12 OF 1□)

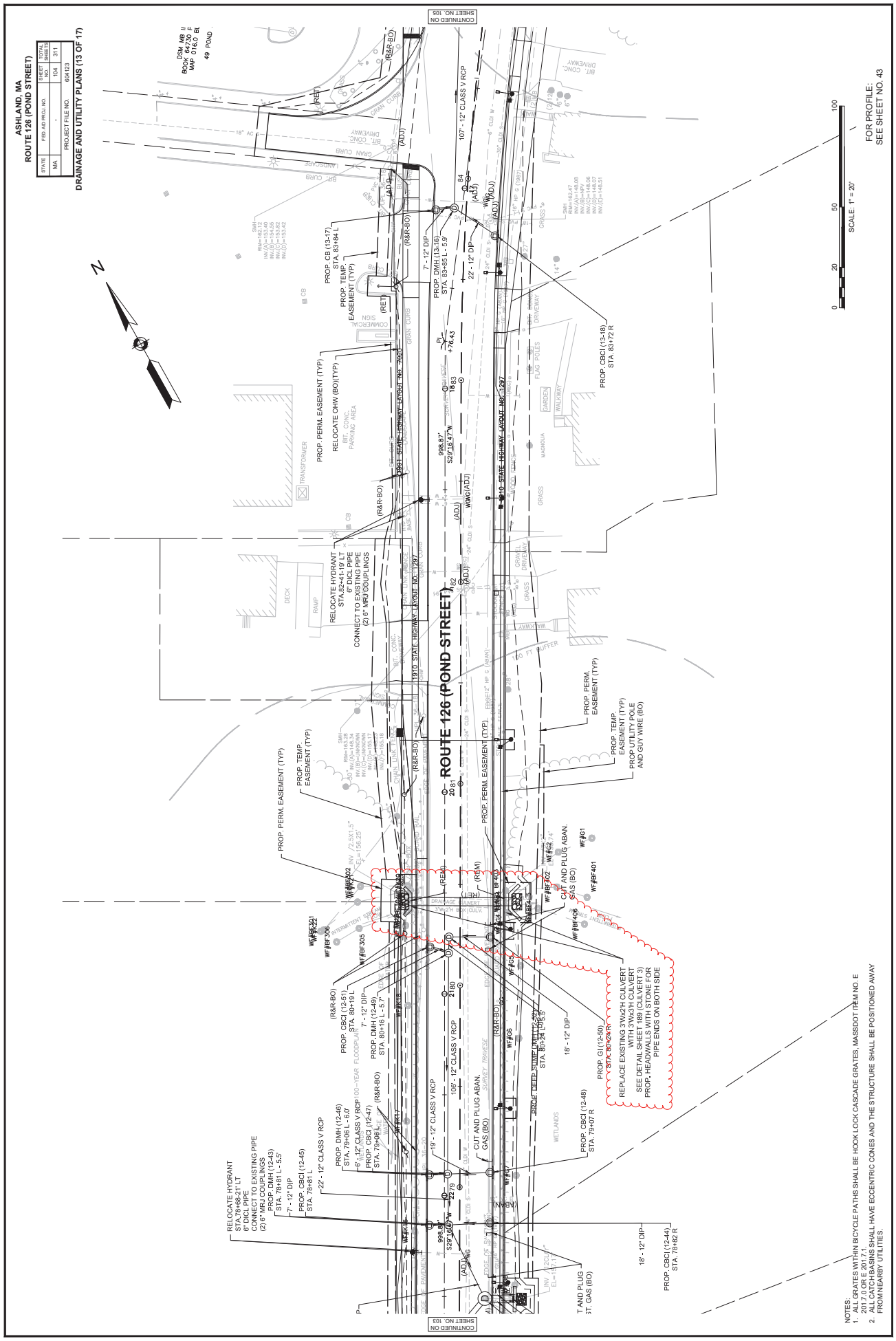


NOTES:
1. ALL GRATES WITHIN BICYCLE PATHS SHALL BE HOOK LOCK CASCADE GRATES, MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.

FOR PROFILE:
SEE SHEET NO. 42

NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

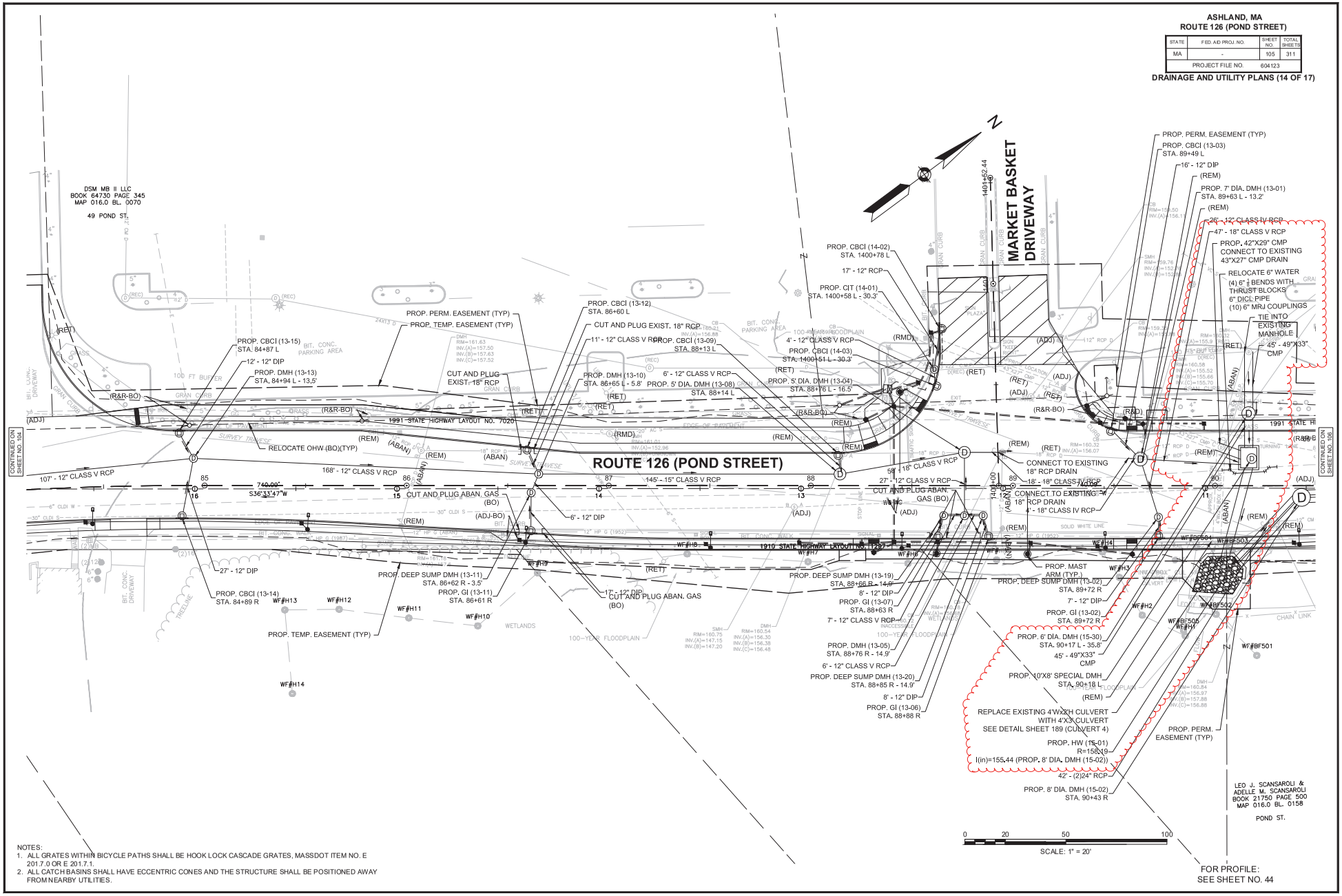
604123_HD13(DRAINAGE&UTIL).DWG Plotted on 12-Mar-2018 8:03 AM


ASHLAND, MA
ROUTE 126 (POND STREET)
DRAINAGE AND UTILITY PLANS (13 OF 17)
ROUTE 126 (POND STREET)
FOR PROFILE: SEE SHEET NO. 43
SCALE: 1" = 20'
NOTES:
1. ALL GRATES WITHIN BICYCLE PATHS SHALL BE HOOK LOCK CASCADE GRATES, MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.
NOI SUBMISSION - 7/1/2019, REVISED NOI SUBMISSION - 11/18/2019

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	105	311
PROJECT FILE NO.	604123		

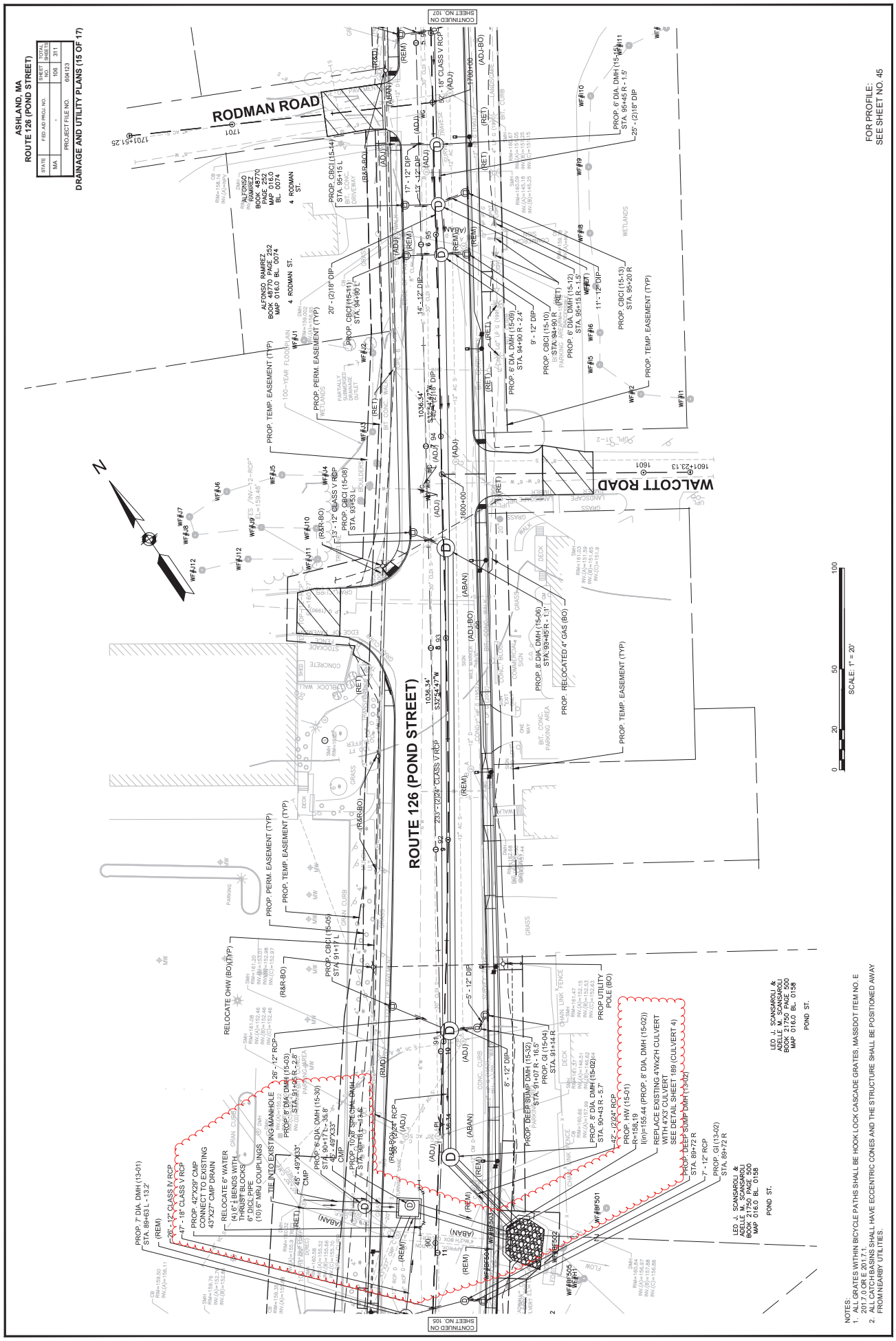
DRAINAGE AND UTILITY PLANS (14 OF 17)

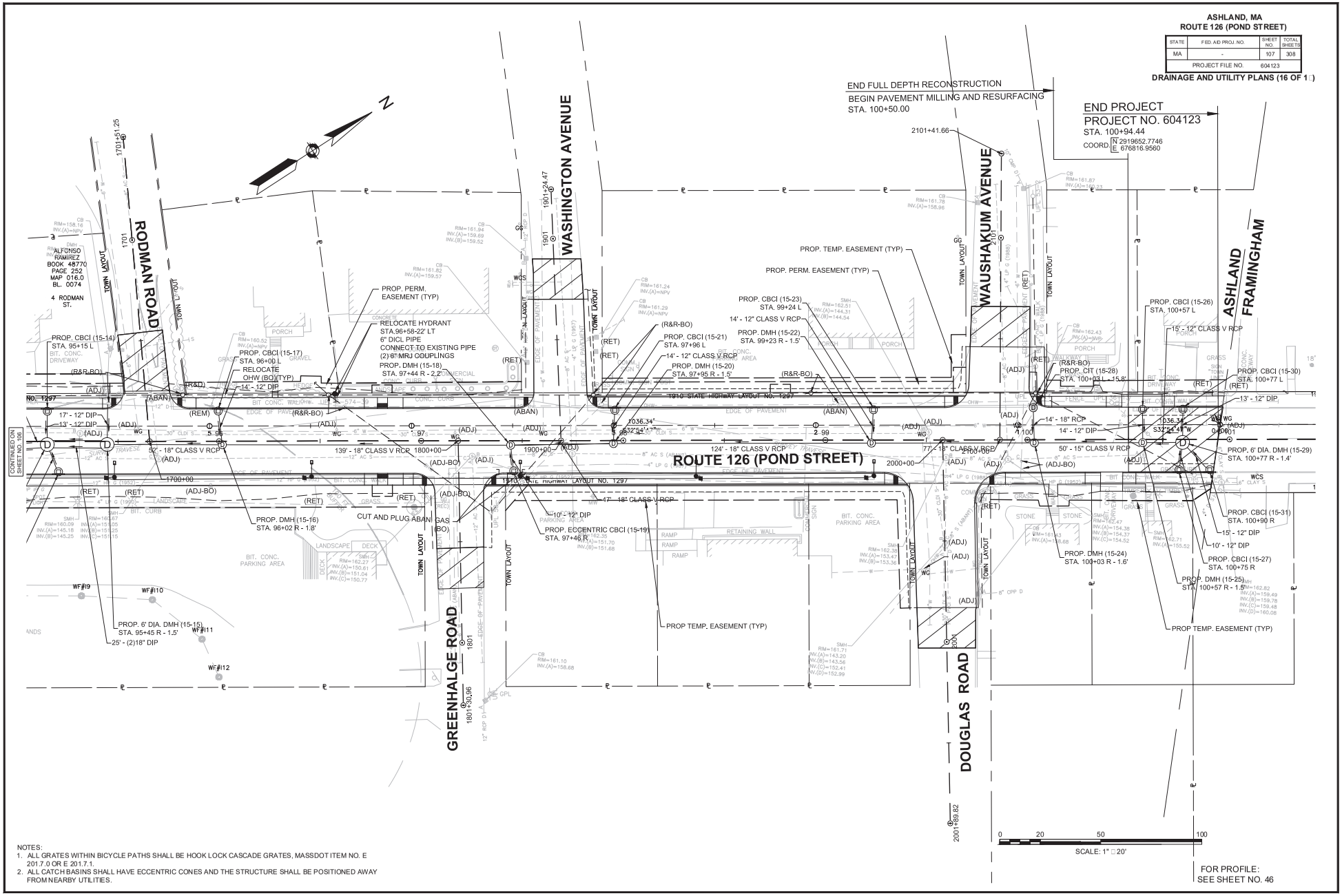


NOTES:
1. ALL GRATES WITHIN BICYCLE PATHS SHALL BE HOOK LOCK CASCADE GRATES, MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.

NOI SUBMISSION - 7/1/2019, REVISED NOI SUBMISSION - 11/18/2019

604123_HD13(DRAINAGE&UTIL).DWG Plotted on 12-Mar-2018 8:03 AM


ASHLAND, MA
ROUTE 126 (POND STREET)
DRAINAGE AND UTILITY PLANS (15 OF 17)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 106 | 311
PROJECT FILE NO. 604123
ROUTE 126 (POND STREET)
RODMAN ROAD
WALCOTT ROAD
CONTINUED ON SHEET NO. 107
CONTINUED ON SHEET NO. 105
FOR PROFILE: SEE SHEET NO. 45
SCALE: 1" = 20'
NOTES:
1. ALL GRATES WITHIN BICYCLE PATHS SHALL BE HOOK LOCK CASCADE GRATES, MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.
NOI SUBMISSION - 7/1/2019, REVISED NOI SUBMISSION - 11/18/2019



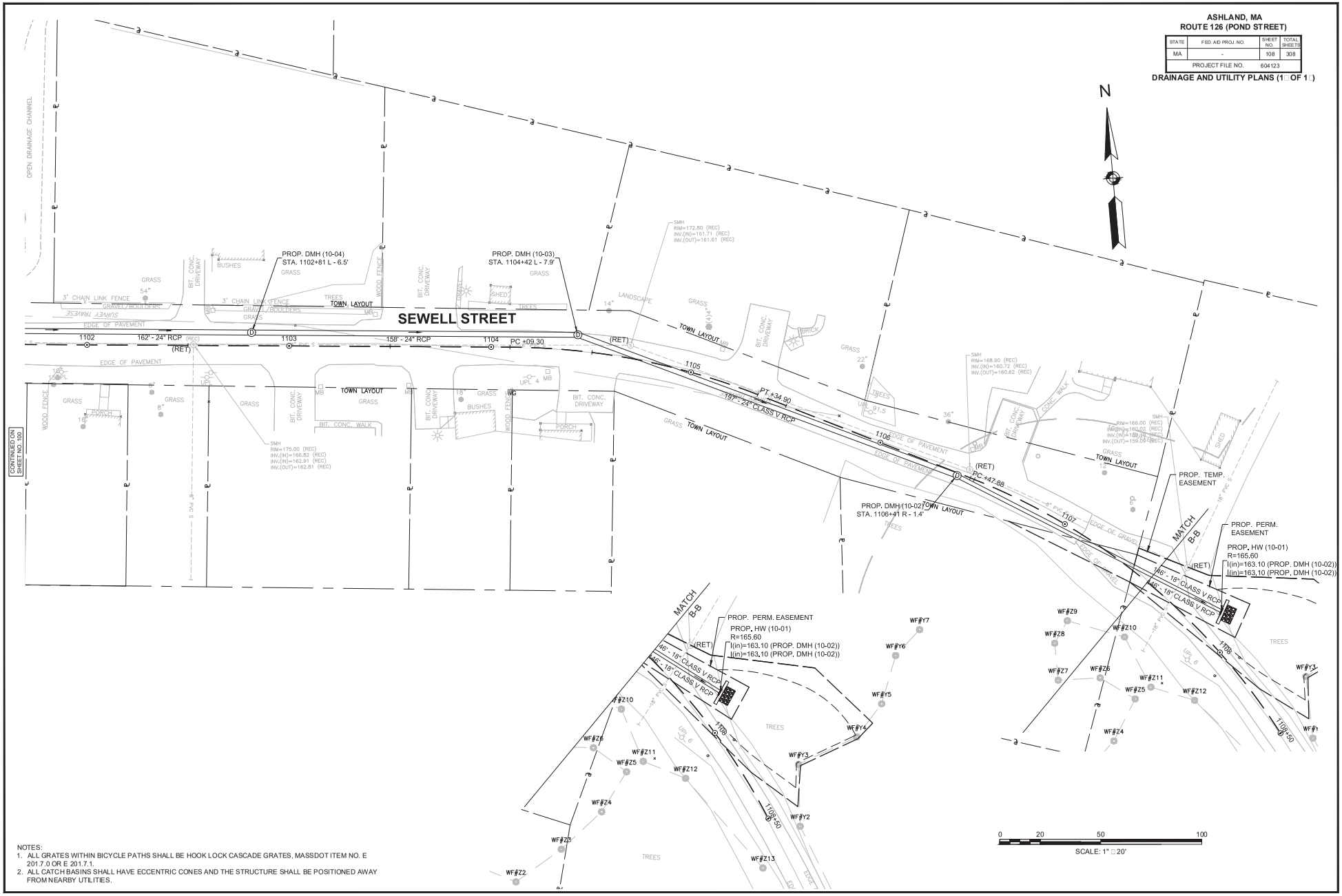
NOTES:
1. ALL GRATES WITHIN BICYCLE PATHS SHALL BE HOOK LOCK CASCADE GRATES, MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.

NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	108	308
PROJECT FILE NO.	604123		

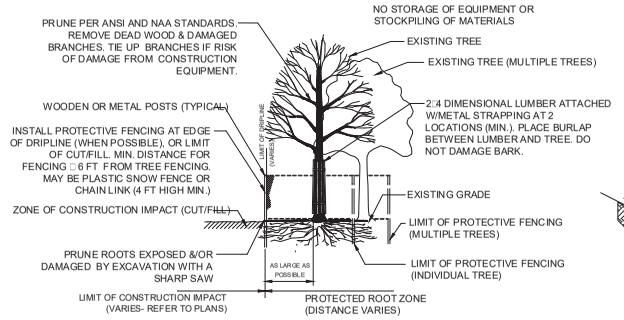
DRAINAGE AND UTILITY PLANS (1□ OF 1□)



NOTES:
1. ALL GRATES WITHIN BICYCLE PATHS SHALL BE HOOK LOCK CASCADE GRATES, MASSDOT ITEM NO. E 201.7.0 OR E 201.7.1.
2. ALL CATCH BASINS SHALL HAVE ECCENTRIC CONES AND THE STRUCTURE SHALL BE POSITIONED AWAY FROM NEARBY UTILITIES.

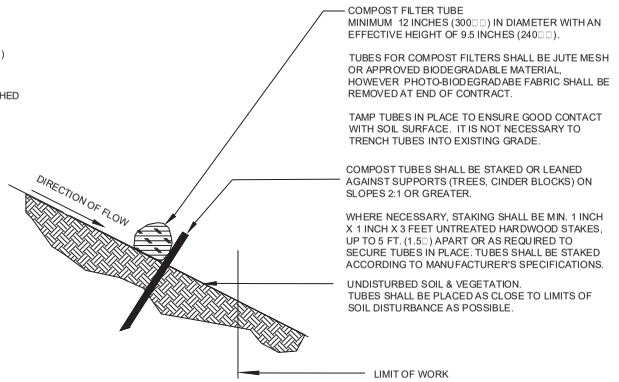
NOI SUBMISSION - 7/1/2019 REVISED 10/22/2019

604123_HD13(DRAINAGE&UTIL).DWG Plotted on 12-Mar-2018 8:03 AM

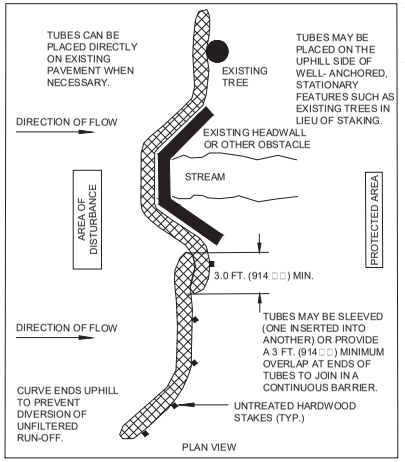


NOTE:
CONTRACTOR SHALL DO ALL WORK WITHIN THE DRIP LINE OF EXISTING TREES TO BE PROTECTED BY HAND. FOLLOWING ANY REQUIRED EXCAVATION, TEMPORARY FENCE SHALL BE INSTALLED BETWEEN THE PROPOSED WORK AND THE TREE. THE FENCE SHALL BE LOCATED AT THE EDGE OF PROPOSED CONSTRUCTION AND AS CLOSE TO THE DRIP LINE AS POSSIBLE.

1 TREE PROTECTION FENCE
NOT TO SCALE



2 COMPOST FILTER TUBE DETAIL
NOT TO SCALE



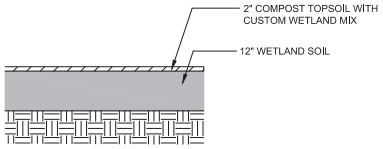
ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	181	308
PROJECT FILE NO.	604123		

LANDS□APE AND □ETLAND REPLI□ATION DETAILS (1 OF 2)

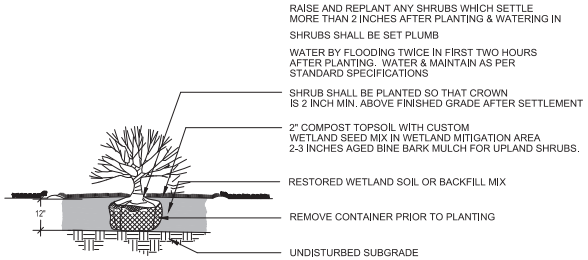
GENERAL NOTES:
1. PROVIDE A MINIMUM TUBE DIAMETER OF 12 INCHES (300□□) FOR SLOPES UP TO 50 FEET (15.24□) IN LENGTH WITH A SLOPE RATIO OF 3H:1V OR STEEPER. LONGER SLOPES OF 3H:1V MAY REQUIRE LARGER TUBE DIAMETER OR ADDITIONAL COURSING OF FILTER TUBES TO CREATE A FILTER BERM. REFER TO MANUFACTURER'S RECOMMENDATIONS FOR SITUATIONS WITH LONGER OR STEEPER SLOPES.
2. INSTALL TUBES ALONG CONTOURS AND PERPENDICULAR TO SHEET OR CONCENTRATED FLOW.
3. TUBE LOCATION MAY BE SHIFTED TO ADJUST TO LANDSCAPE FEATURES, BUT SHALL PROTECT UNDISTURBED AREA AND VEGETATION TO MAXIMUM EXTENT POSSIBLE.
4. DO NOT INSTALL IN PERENNIAL, EPHEMERAL OR INTERMITTENT STREAMS.
5. ADDITIONAL TUBES SHALL BE USED AT THE DIRECTION OF THE ENGINEER.
6. ADDITIONAL STAKING SHALL BE USED AT THE DIRECTION OF THE ENGINEER.

20150226_Ma□DOT_re□7



NOTE:
1. WETLAND SPECIALIST SHALL APPROVE GRADES PRIOR TO SOIL INSTALLATION.
2. SEE NON TIDAL WETLAND MITIGATION SPEC FOR SOIL AND PLANTING REQUIREMENTS.

3 WETLAND REPLICATION DETAIL
NOT TO SCALE



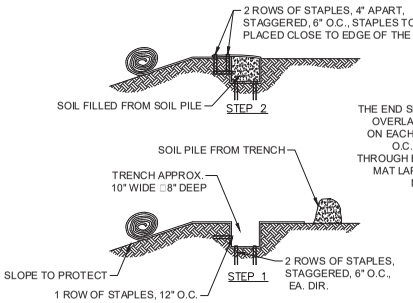
NOTE:
SEE COMPOST TOPSOIL SPEC.

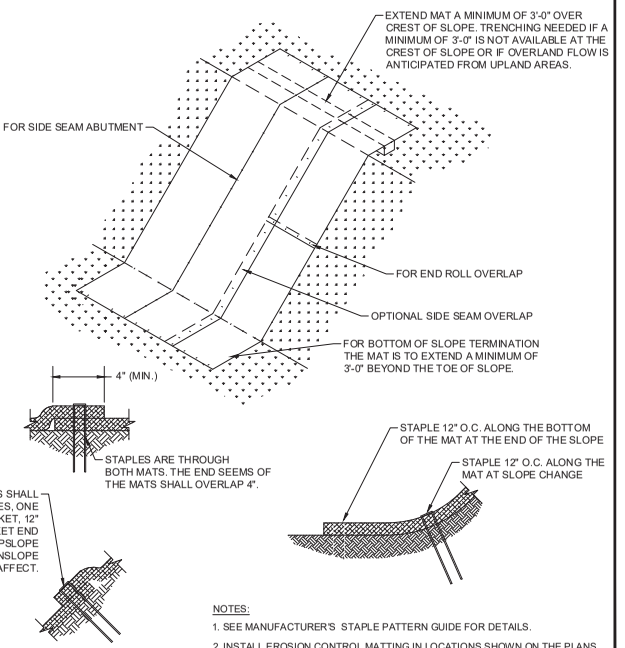
4 WETLAND SHRUB PLANTING
NOT TO SCALE

PLANT LIST - WETLAND REPLICATION TOTAL

□EY	□TY	□OTANI□AL NAME	□OMMON NAME	SI□E	REMAR□S□	ROOT
					SPA□ING	
		DE□IDUOUS TREES				
BN	2	BETULA NIGRA	RIVER BIRDH	2-2.5" CAL.	SINGLE STEM	B&B
OV	3	OSTRYA VIRGINIANA	HOP HORNBEAM	2-2.5" CAL.	SINGLE STEM	B&B
NS	3	NYSSA SILVATICA	TUPELO	1-1.5" CAL		15 GALLON CONT.
QB	5	QUERCUS BICOLOR	SWAMP WHITE OAK	1-1.5" CAL		15 GALLON CONT.
		DE□IDUOUS SHRU□S				
CA	21	CORNUS AMOMUM	SILKY DOGWOOD	1 GALLON CONT.	2' O.C.	1 GALLON CONT.
IV	20	ILEX VERTICILATA	WINTERBERRY	1 GALLON CONT.	2' O.C.	1 GALLON CONT.
IVM	2	ILEX VERTICILATA -MALE	MALE WINTERBERRY	1 GALLON CONT.	2' O.C.	1 GALLON CONT.
VC	23	VACCINIUM CORYMBOSUM	HIGHBUSH BLUEBERRY	1 GALLON CONT.	2' O.C.	1 GALLON CONT.
VR	22	VIBURNUM RECOGNITUM	NORTHERN ARROWWOOD	1 GALLON CONT.	2' O.C.	1 GALLON CONT.

5 PLANTLIST WETLAND
NOT TO SCALE





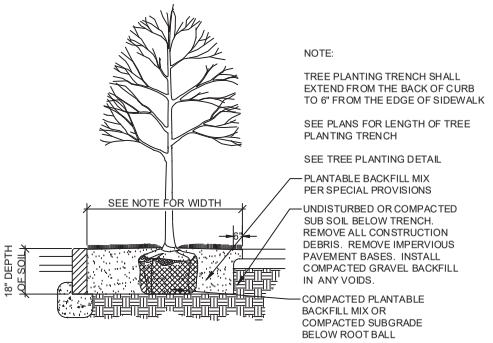
NOTES:
1. SEE MANUFACTURER'S STAPLE PATTERN GUIDE FOR DETAILS.
2. INSTALL EROSION CONTROL MATTING IN LOCATIONS SHOWN ON THE PLANS.
3. AREAS WITH EROSION CONTROL MATS SHALL BE SEEDED.
4. STAPLES SHALL BE BIODEGRADABLE
5. EROSION CONTROL MATS SHALL BE BIODEGRADABLE.

6 EROSION CONTROL MATTING
NOT TO SCALE

604123_H024\CONSTRUCTION DETAILS.DWG Plotted on 20-Dec-2017 11:12 AM

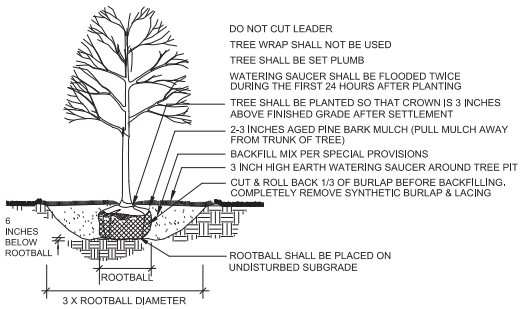
Proposal No. 604123-111717

604123_H024\CONSTRUCTION DETAILS.DWG Plotted on 20-De□-2017 11:12 AM



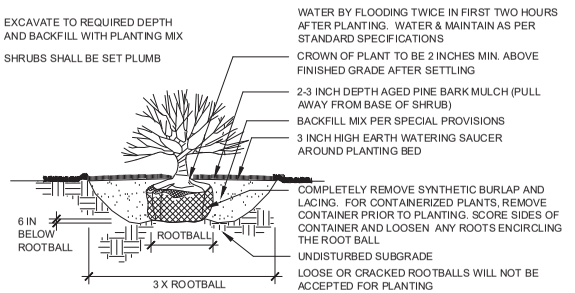
1 TREE PLANTING TRENCH

NOT TO SCALE



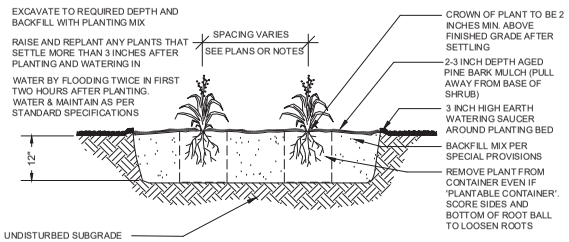
2 TREE PLANTING

NOT TO SCALE



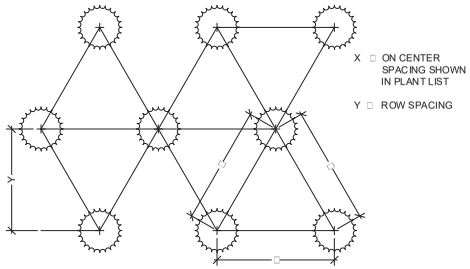
3 SHRUB PLANTING

NOT TO SCALE



4 PERENNIAL AND ORNAMENTAL GRASS PLANTING

NOT TO SCALE



5 SHRUB, PERENNIAL AND ORNAMENTAL GRASS SPACING PLAN DETAIL

NOT TO SCALE

PLANT LIST - TOTAL FOR UPLAND

□EY	□TY	□OTANI□AL NAME	□OMMON NAME	SI□E	REMAR□S□	ROOT
					SPA□ING	
		DE□IDUOUS TREES				
ARS	5	ACERXFREEDMANI 'ARMSTRONG'	ARMSTRONG FREEDMAN MAPLE	2-2.5" CAL.		B&B
ARK	2	ACER RUBRUM 'KARPICK'	KARPICK RED MAPLE	2-2.5" CAL.		B&B
CR	1	CORNUS 'RUTCAN' CONSTELLATION	CONSTELLATION DOGWOOD	1.5" CAL.		CONT #15
GB	14	GINKGO BILOBA 'AUTUMN GOLD	AUTUMN GOLD GINKO	2-2.5" CAL.		B&B
GT	10	GLEDITSIA TRIACANTHOS 'SHADEMASTER'	SHADEMASTER HONEYLOCUST	2-2.5" CAL.		B&B
LSH	3	LIQUIDAMBAR STYRACIFLUA 'HAPDELL'	HAPPIDAZE FRUITLESS SWEET GUM	2-2.5" CAL.		B&B
MA	11	MALUS 'ADIRONDACK'	ADIRONDACK CRABAPPLE	2-2.5" CAL.		B&B
PC	9	PYRUS CALLERYANA ' CHANTICLEER'	CLEVELAND SELECT PEAR	2-2.5" CAL.		B&B
UAP	4	ULMNUS AMERICANA 'PRINCETON'	PRINCETON ELM	2-2.5" CAL.		B&B
		DE□IDUOUS SHRU□S				
CP	33	COMPTONIA PEREGRINA	SWEETFERN	18-24" SP.	4' O.C.	CONT #3
RA	92	RHUS AROMATICA 'GRO-LOW'	GRO-LOW FRAGRANT SUMAC 2 GAL	18-24" SP.	3.5' O.C.	CONT #3
		E□ERGREEN SHRU□S				
IC	4	ILEX CRENATA 'HETZII'	HETZ HOLLY	24-30" SP.	4' O.C.	CONT #5
JHB	18	JUNIPERUS HORIZONTALIS 'BAR HARBOR'	BAR HARBOR JUNIPER	18-24" SP.	3' O.C.	CONT #2
JHP	62	JUNIPERUS HORIZONTALIS PLUMOSA COMPACTA	COMPACT ANDORRA JUNIPER	18-24" SP.	3' O.C.	CONT #2
JSB	96	JUNIPEROUS SQUAMATA 'BLUE STAR'	BLUE STAR JUNIPER	12-18" SP.	18" O.C.	CONT #2
JSG	9	JUNIPERUS CHINESIS 'SEA GREEN'	SEA GREEN JUNIPER	2-2.5 FT	4' O.C.	CONT #5
		PERENNIALS AND GRASSES				
HH	48	HEMEROCALLIS HAPPY RETURNS	HAPPY RETURNS DAY LILLY	CONT #1	18" O.C.	
HP	90	HEMEROCALLIS PURPLE	PURPLE D'ORO DAY LILLY	CONT #1	18" O.C.	
HR	57	HEMEROCALLIS RED HOT RETURNS	RED HOT RETURNS DAY LILLY	CONT #1	18" O.C.	
NW	255	NEPETA RACEMOSA 'WALKERS LOW'	WALKERS LOW CAT MINT	CONT #1	18" O.C.	
PHM	131	PANICUM VIRGATUM 'HEAVY METAL'	HEAVY METAL SWITCH GRASS	CONT #2	18" O.C.	
PVS	71	PANICUM VIRGATUM 'SHENANDOAH'	SHENANDOAH SWITCH GRASS	CONT #2	18" O.C.	
PKR	124	PENNESETUM OREINTALE 'KARLY ROSE'	KARLEY ROSE FLOWERING FOUNTAIN GRASS	CONT #2	24" O.C.	

6 PLANTLIST TOTAL FOR PLAN

NOT TO SCALE

A00860 - 179

Proposal No. 604123-111717

A00860 - 180

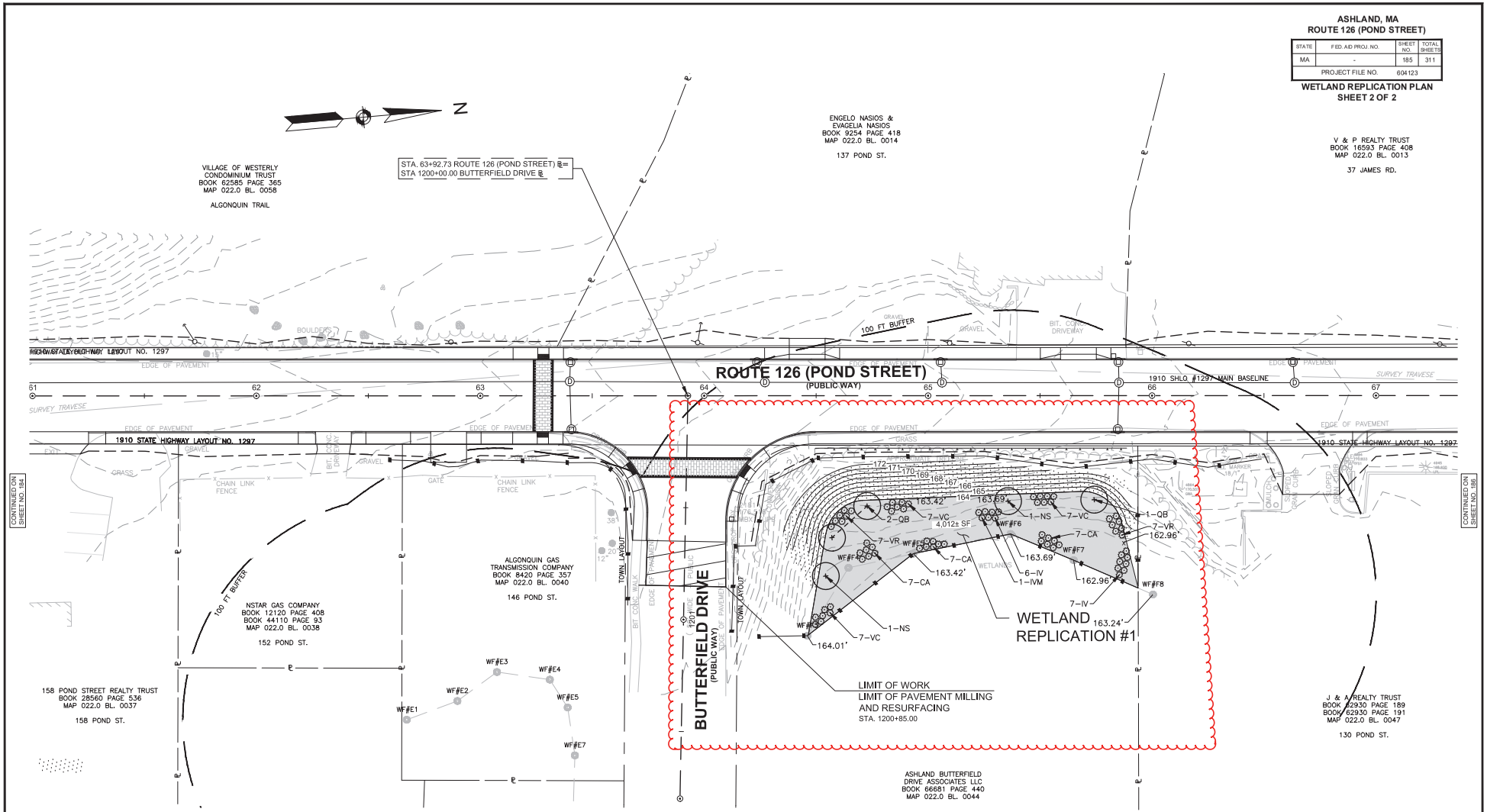
Proposal No. 604123-111717

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	185	311
PROJECT FILE NO.	604123		

WETLAND REPLICATION PLAN
SHEET 2 OF 2

604123_H25(WETLAND REPLICATION).DWG Plotted on 10-Nov-2017 9:18 AM



LEGEND

- 4" LOAM BORROW EROSION CONTROL FABRIC AND WILDFLOWER SEED MIX
- WETLAND SOIL, COMPOST TOP SOIL AND WETLAND SEED MIX
- 170 — PROPOSED CONTOUR
- 170 — EXISTING CONTOUR
- COMPOST FILTER TUBE
- 1097.7 — PROPOSED SPOT GRADE
- SHRUB MASS
- TREE

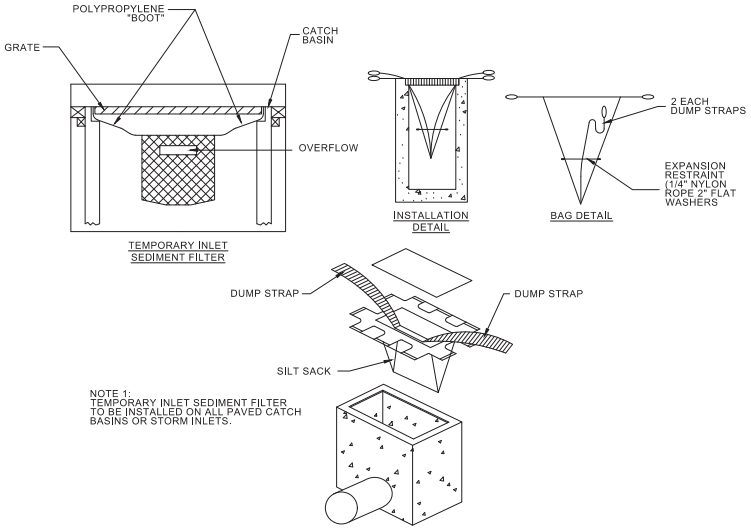
PLANT LIST

KEY	QTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS/ SPACING	ROOT
		DECIDUOUS TREES				
NS	2	NYSSA SILVATICA	TUPELO	1-1.5" CAL		15 GALLON
QB	3	QUERCUS BICOLOR	SWAMP WHITE OAK	1-1.5" CAL		15 GALLON
		DECIDUOUS SHRUBS				
CA	21	CORNUS AMOMUM	SILKY DOGWOOD	1 GALLON CONT.	2' O.C.	1 GALLON CONT.
IV	13	ILEX VERTICILATA	WINTERBERRY	1 GALLON CONT.	2' O.C.	1 GALLON CONT.
IVM	1	ILEX VERTICILATA -MALE	MALE WINTERBERRY	1 GALLON CONT.	2' O.C.	1 GALLON CONT.
VC	21	VACCINIUM CORYMBOSUM	HIGHBUSH BLUEBERRY	1 GALLON CONT.	2' O.C.	1 GALLON CONT.
VR	14	VIBURNUM RECOGNITUM	NORTHERN ARROWWOOD	1 GALLON CONT.	2' O.C.	1 GALLON CONT.

NOI SUBMISSION - 7/1/2019, REVISED NOI SUBMISSION - 11/18/2019

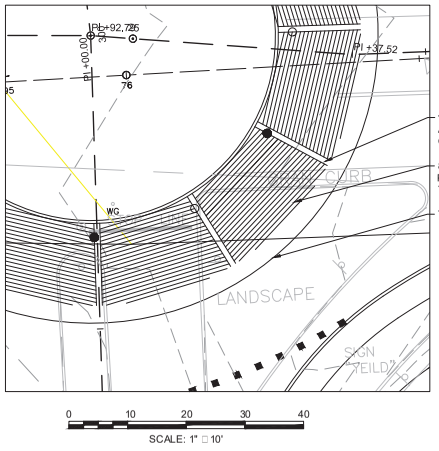
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	185	308
PROJECT FILE NO. 604123			

CONSTRUCTION DETAILS



INLET PROTECTION SILT SACK

NOT TO SCALE



0 10 20 30 40

SCALE: 1" = 10'

LEGEND:

- EXPANSION JOINT
- CONTRACTION JOINT

12" x 12" SLATE STONE, 12" WIDE PATTERNED ACCENT STRIPS AT RADIAL EXPANSION AND CONTRACTION JOINTS

8" x 8" RUNNING BOND GRANITE BLOCK PATTERN. PATTERN SHALL BE TANGENT TO ROUNDABOUT CURB.

TYPE T100 GRANITE CURB

NOTE:

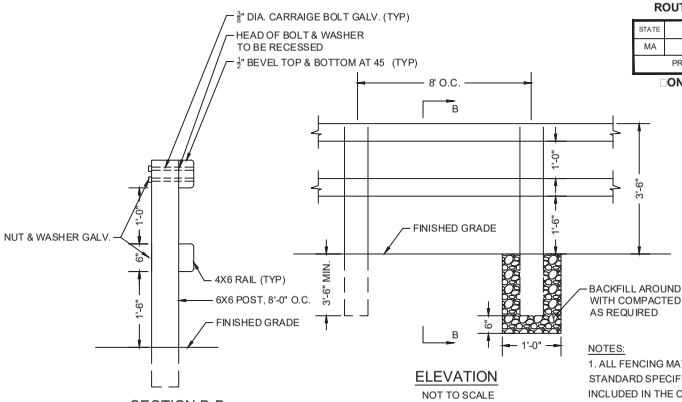
1. SUBMIT SCALED SHOP DRAWING SHOWING PATTERN PLACEMENT IN RELATION TO EXPANSION, CONTRACTION, AND SCORE JOINTS.

2. ALL JOINTS SHALL FALL AT BREAKS BETWEEN BLOCKS IN THE PATTERN.

3. STAMPED CONCRETE SHALL BE INTEGRAL COLORED CONCRETE WITH COLOR HARDENER AS PER SPECIAL PROVISION.

ROUNDABOUT APRON DETAIL

NOT TO SCALE



SECTION B-B

NOT TO SCALE

ELEVATION

NOT TO SCALE

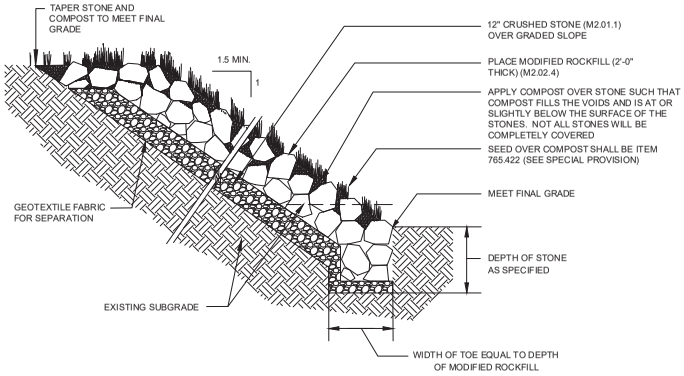
WOOD RAIL FENCE

NOT TO SCALE

NOTES:

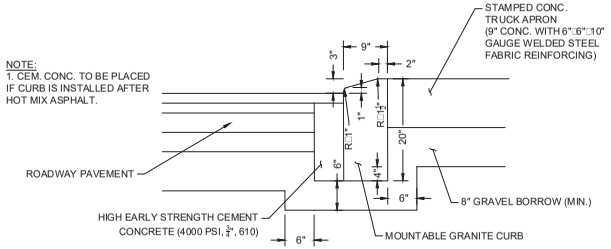
1. ALL FENCING MATERIAL SHALL CONFORM TO THE STANDARD SPECIFICATIONS & SPECIAL PROVISIONS INCLUDED IN THE CONTRACT DOCUMENTS.

2. MOUNTING OF UPPER RAIL IS SHOWN ON SECTION B-B. MOUNT LOWER RAIL SIMILARLY.



COMPOST AND SEED OVER MODIFIED ROCK FILL

NOT TO SCALE



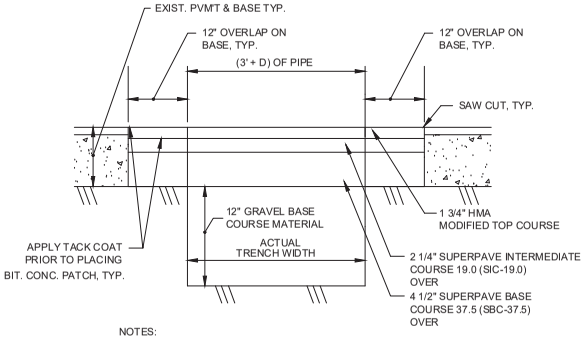
MOUNTABLE GRANITE CURB FOR TRUCK APRON

NOT TO SCALE

604123_H324\CONSTRUCTION DETAILS.DWG Plotted on 20-Dec-2017 11:12 AM

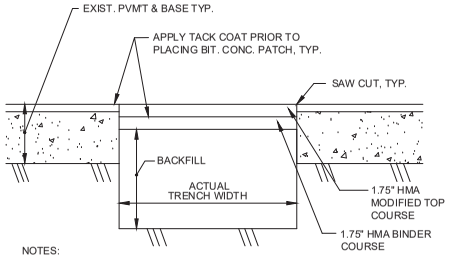
Proposal No. 604123-111717

604123_HD26(DRAINAGE DETAILS).DWG Plotted on 21-Mar-2018 10:28 AM



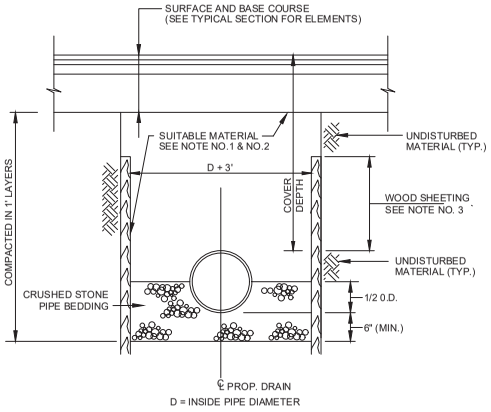
NOTES:
1. MATCH EXISTING PAVEMENT ON HOOVER ROAD.
2. PERMANENT HMA PATCH SHALL BE USED IN ALL AREAS THAT WILL BE MILLED & OVERLAID. PERMANENT HMA PATCH IS NOT REQUIRED WITHIN THE LIMITS OF FULL DEPTH RECONSTRUCTION, TEMPORARY HMA PATCH SHALL BE MAINTAINED UNTIL FULL DEPTH RECONSTRUCTION IS PERFORMED IN THESE AREAS.
3. MODIFIED TOP COURSE FOR PERMANENT PATCH TO BE PAID FOR UNDER ITEM 472. HMA FOR MISCELLANEOUS WORK. INTERMEDIATE AND BASE COURSES TO BE PAID UNDER ITEM 451. HMA FOR PATCHING.

1 PERMANENT HMA PATCH DETAIL
SCALE: NOT TO SCALE



NOTES:
1. PERMANENT HMA PATCH SHALL BE USED IN ALL AREAS THAT WILL BE MILLED & OVERLAID. PERMANENT HMA PATCH IS NOT REQUIRED WITHIN THE LIMITS OF FULL DEPTH RECONSTRUCTION, TEMPORARY HMA PATCH SHALL BE MAINTAINED UNTIL FULL DEPTH RECONSTRUCTION IS PERFORMED IN THESE AREAS.
2. TEMPORARY HMA PATCH IN AREAS THAT WILL BE SUBJECT TO FULL DEPTH CONSTRUCTION, IN-SITU MATERIAL MAY BE USED FOR BACKFILL.
3. PAVEMENT FOR TEMPORARY HMA PATCH SHALL BE PAID FOR UNDER ITEM 472. HOT MIX ASPHALT FOR MISCELLANEOUS WORK.

2 TEMPORARY HMA PATCH DETAIL
SCALE: NOT TO SCALE

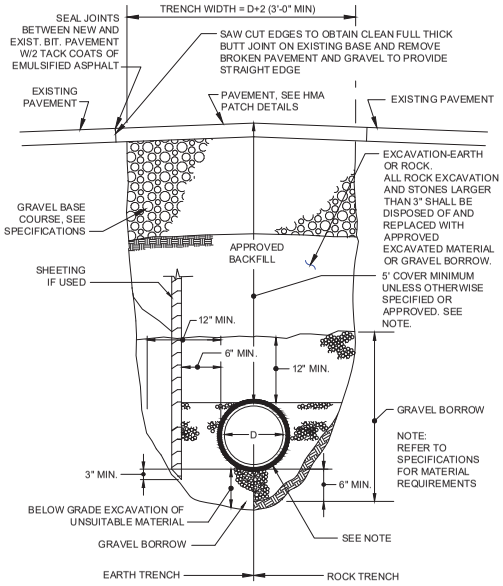


D = INSIDE PIPE DIAMETER

TRENCH NOTES:

1. NO STONE LARGER THAN 2" IS IN CONTACT WITH THE PIPE.
2. USE CONTROLLED DENSITY FILL WHEN TRENCH IS LOCATED WITHIN EXISTING PAVEMENT THAT WILL BE OPEN TO TRAFFIC AT THE COMPLETION OF WORK DAY.
3. IF REQUIRED, WHERE WOOD SHEETING IS PLACED ALONGSIDE THE PIPE AND EXTENDS BELOW MID-DIAMETER, IT SHALL BE CUT OFF AND LEFT-IN-PLACE TO AN ELEVATION NOT LESS THAN 1' ABOVE THE TOP OF THE PIPE AND AT LEAST 3' BELOW FINISHED GRADE.

3 TYPICAL TRENCH DRAIN DETAIL
NOT TO SCALE



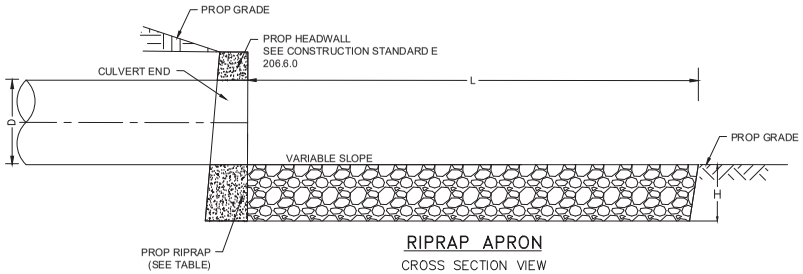
NOTE: FURNISH AND INSTALL CLOSED CELL GLASS INSULATION, 2" THICK FOAMGLASS ONE BY PITTSBURG CORNING OR EQUAL, WITH PITTWRAPP AA JACKETING BY PITTSBURG CORNING OR EQUAL WHEN WATER MAIN CANNOT BE INSTALLED AT OR BELOW THE REQUIRED BURIAL DEPTH OF FIVE (5) FEET

4 WATER TRENCH SECTION
NOT TO SCALE

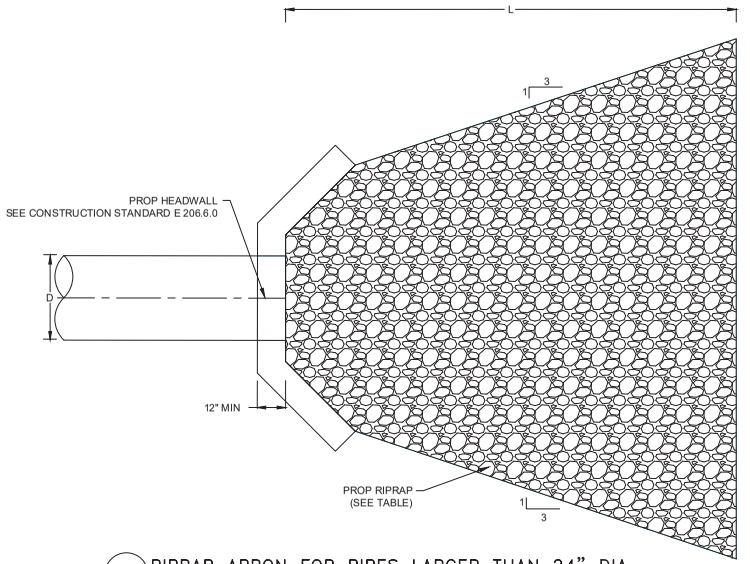
CULVERT SIZE D (INCHES)	LENGTH OF APRON L (FEET)	DEPTH OF APRON H (INCHES)	MASSDOT RIPRAP SIZE
30	12.5	24	M2.02.2
36	16	24	M2.02.2
42	21	30	M2.02.1
48	24	30	M2.02.1

SOURCE:
1. FHWA STANDARD DRAWING C251-50

NOTES:
1. FOR PIPES 24" DIA. AND LESS, USE STONE PIPE ENDS MASSDOT STANDARD DETAIL E 206.7.0



RIPRAP APRON
CROSS SECTION VIEW
NOT TO SCALE



5 RIPRAP APRON FOR PIPES LARGER THAN 24" DIA
PLAN VIEW
NOT TO SCALE

A00860 - 182
Proposal No. 604123-111717

604123_HD26\DRAINAGE DETAILS.DWG Plotted on 21-Mar-2018 10:28 AM

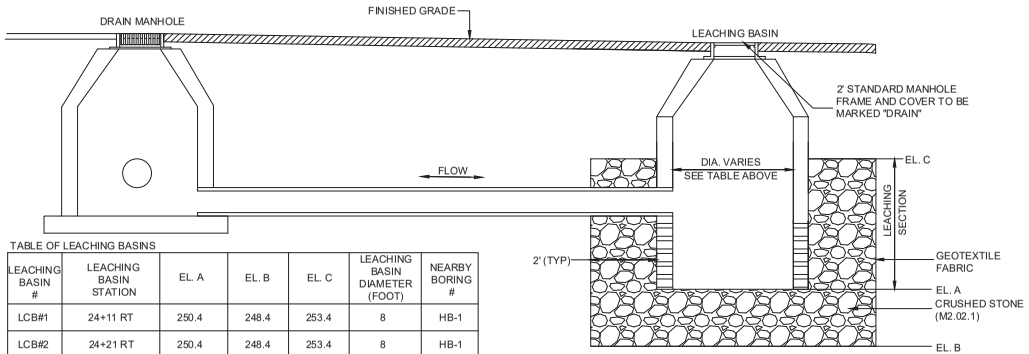


TABLE OF LEACHING BASINS

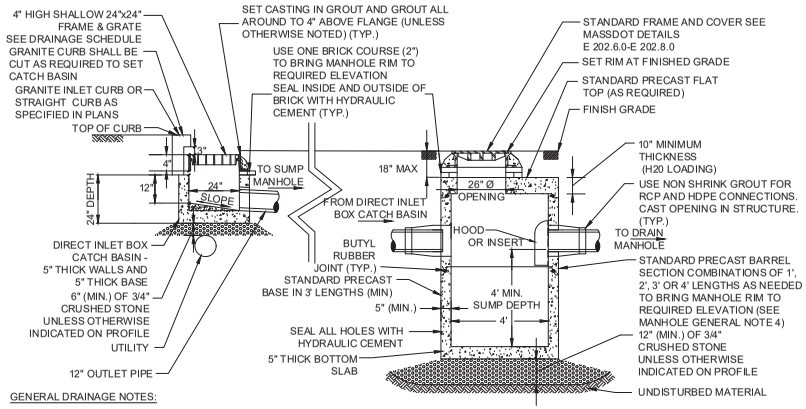
LEACHING BASIN #	LEACHING BASIN STATION	EL. A	EL. B	EL. C	LEACHING BASIN DIAMETER (FOOT)	NEARBY BORING #
LCB#1	24+11 RT	250.4	248.4	253.4	8	HB-1
LCB#2	24+21 RT	250.4	248.4	253.4	8	HB-1
LCB#3	24+30 RT	250.4	248.4	253.4	8	HB-1
LCB#4	24+39 RT	250.4	248.4	253.4	8	HB-1
LCB#5	24+24 LT	247.5	245.5	252.7	8	HB-2
LCB#5	24+24 LT	247.5	245.5	252.7	8	HB-2

NOTES:
1. ALL DIMENSIONS AND ELEVATIONS ARE IN FEET.
2. REFER TO DRAINAGE SCHEDULE FOR RIM, INLET AND OUTLET ELEVATIONS.

NOTE:
SEE MASSDOT DETAIL E 205.2.0 FOR STANDARD CONCRETE LEACHING BASIN DETAIL

6 TYPICAL DRAIN MANHOLE/LEACHING BASIN CONNECTION DETAIL

SCALE: NOT TO SCALE

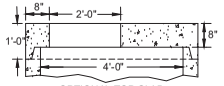


GENERAL DRAINAGE NOTES:

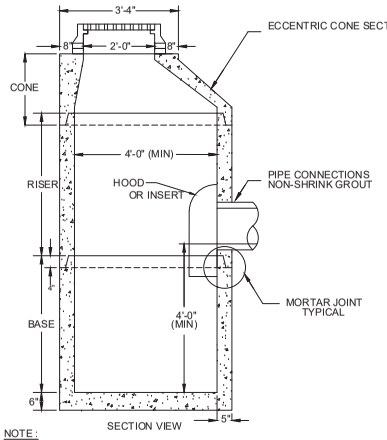
1. COMPACTED ¾" CRUSHED STONE SHALL BE PLACED TO A MINIMUM DEPTH OF 12" BENEATH ALL NEW MANHOLES AND 6" BENEATH NEW GUTTER INLETS.
2. COMPACTED ¾" CRUSHED STONE SHALL BE PLACED TO A MINIMUM DEPTH OF 6" BELOW THE INVERT OF ALL DRAINAGE PIPES UP TO THE SPRING LINE OF THE PROPOSED PIPE, AS SHOWN IN THE TYPICAL PIPE TRENCH DETAIL (SEE THIS SHEET).
3. ALL OFFSETS TO THE GUTTER INLETS ARE TO THE BACK CENTER OF THE GRATE. THE LOCATION AND ORIENTATION OF THE BELOW GRADE STRUCTURE SHALL BE FIELD COORDINATED BY THE CONTRACTOR TO AVOID CONFLICTS WITH EXISTING UTILITIES.
4. ALL STRUCTURES SHOULD HAVE ECCENTRIC CONES UNLESS THEY ARE FLAT SLABS OR AS OTHERWISE DIRECTED BY THE ENGINEER.
5. ALL STRUCTURES SHALL MEET HS-25 LOADING.
6. ALL STRUCTURES TO BE MANUFACTURED TO MEET OR EXCEED ASTM C-478 AND AASHTO M199 SPECS.
7. ALL REINFORCING FOR EACH STRUCTURE SHALL CONFORM TO ASTM A-185 AND BE PLACED AS PER ASTM C-478.
8. ALL CONCRETE TO BE 4000 PSI (MINIMUM) CEMENT PER ASTM C-478.
9. BUTYL RUBBER JOINT SEALANT PER ASTM C-990 AND AASHTO M-198. WATERPROFFING PER CONTRACT SPECS.

7 GUTTER INLET AND DEEP SUMP MANHOLE

NOT TO SCALE



OPTIONAL TOP SLAB

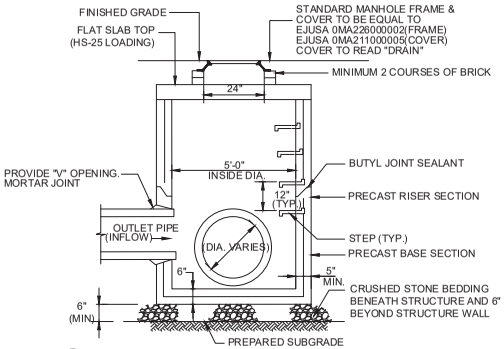


SECTION VIEW

NOTE:
1. CONCRETE: 4,000PSI MINIMUM AFTER 28 DAYS.
2. REINFORCED STEEL CONFORMS TO LATEST ASTM A185 SPEC. 0.12 SQ. IN/LINEAL FT. AND 0.12 SQ. IN. (BOTH WAYS) BASE BOTTOM.
3. H-20 DESIGN LOADING PER AASHTO HS-20-44; ASTM C478 SPEC FOR "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS."
4. BASED ON ACTUAL FIELD CONDITIONS; THE CONTRACTOR SHALL DETERMINE WHICH TYLE OF TOP SECTION SHOULD BE USED.

8 ECCENTRIC CATCH BASIN DETAIL

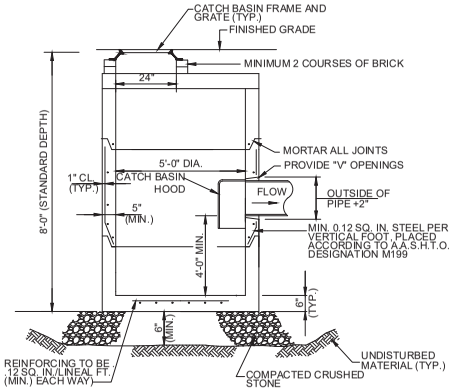
NOT TO SCALE



9 FLAT TOP SLAB DRAIN MANHOLE DETAIL

NOT TO SCALE

NOTE: USE FLAT TOP SLAB DRAIN MANHOLE WHERE NEEDED.



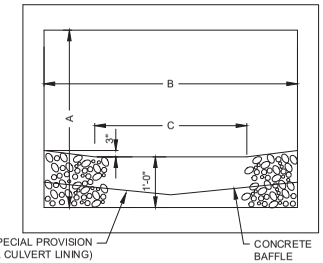
NOTE: USE FLAT TOP SLAB CATCH BASIN WHERE NEEDED.

10 FLAT TOP SLAB CATCH BASIN

NOT TO SCALE

Proposal No. 604123-111717

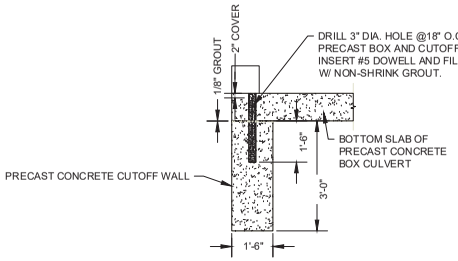
604123_HD26\DRAINAGE DETAILS.DWG Plotted on 21-Mar-2018 10:28 AM



NOTES:
1. PAYMENT FOR BAFFLE WILL BE CONSIDERED INCIDENTAL IN THE COST OF THE PRECAST CULVERT.

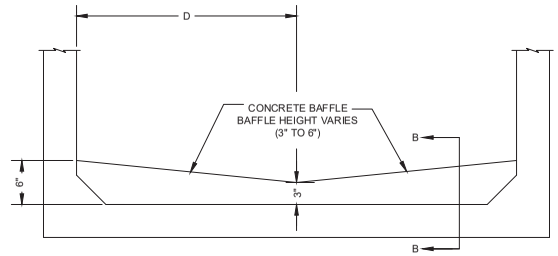
11 CULVERT TYPICAL SECTION STA.37+50 & 80+40
NOT TO SCALE

	DIMENSIONS (FT)			
	A	B	C	D
CULVERT 1 AT STA. 37+50	3	2	1	1
CULVERT 3 AT STA. 80+40	3	3	2	1.5



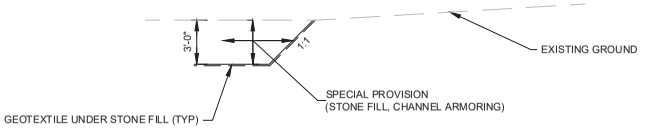
NOTES:
1. PAYMENT FOR CUTOFF WALL CONCRETE, REINFORCING STEEL, DOWEL AND NON-SHRINK GROUT SHALL BE INCLUDED IN THE COST OF THE PRECAST CULVERT.

12 CUTOFF WALL DETAIL
NOT TO SCALE



NOTES:
1.BAFFLES SHALL BE 6" DEEP (MAX).
2.BAFFLES TO BE PLACED EVERY 7' INCLUDING AT THE INLET AND OUTLET.

13 PRECAST CONCRETE BAFFLE DETAIL
NOT TO SCALE



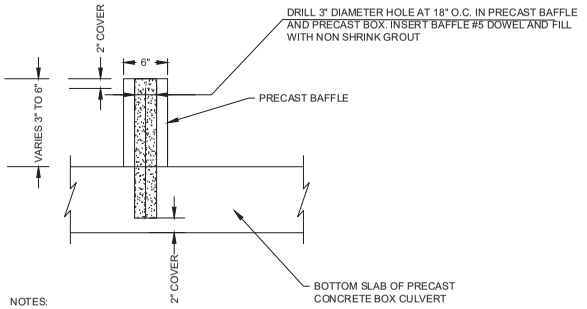
14 STREAM BED MATERIAL TRANSITION
NOT TO SCALE

STONE FILL GENERAL NOTES:
1. PRIOR TO PLACING MATERIALS, PREPARE SLOPE AS FOLLOWS:
   A. CUT OFF TREES AND EXISTING STUMPS TO GROUND LEVEL. LEAVE STUMPS & ROOTS BELOW GRADE IN PLACE.
   B. EXCAVATE VEGETATION (EXCEPT STUMPS) AND ORGANIC SOILS FROM SURFACE OF SLOPE.
   C. COMPACT SURFACE OF SLOPE (COMPACTION WITH EXCAVATOR BUCKET ACCEPTABLE).
   D. PLACE MATERIALS AS SHOWN ON THE DETAILS.

2. THE NATURAL STREAMBED MATERIAL SHALL CONSIST OF FIELD STONE OR NATURAL RIVER ROCK SIMILAR IN COLOR AND APPEARANCE TO IN-SITU NATIVE MATERIALS. CRUSHED STONE SHALL NOT BE PERMITTED. THE NATURAL STREAMBED MATERIAL SHALL APPROXIMATE THE FOLLOWING SIZE DISTRIBUTION; AMOUNT FINER THAN EACH LABORATORY SIEVE (SQUARE OPENINGS)(PERCENT BY WEIGHT):

SIEVE OPENING	PERCENT FINER
4-INCH	100%
3.5-INCH	85% - 95%
2.5-INCH	40% - 60%
1.25-INCH	25% - 35%
0.25-INCH	5% - 15%

3. THE CONTRACTOR SHALL INSTALL A 1' - 1'3" THICK LAYER OF STREAMBED MATERIAL WITHIN THE BOX, AS DEPICTED ON THE PLANS OR AS REQUIRED BY THE ENGINEER. THE MATERIAL SHALL BE INSTALLED DURING DEWATERED CONDITIONS AND IN ACCORDANCE WITH THE ENVIRONMENTAL PERMITS. MICROTOPOGRAPHY SHALL BE ESTABLISHED WITHIN THE CULVERT TO CREATE A LOW FLOW THALWEG THROUGHOUT THE STRUCTURE.

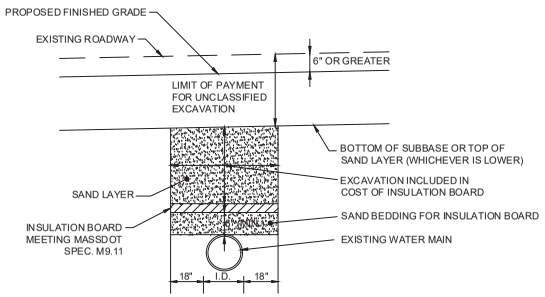


NOTES:
PAYMENT FOR BAFFLE AND #5 DOWEL WILL BE CONSIDERED INCIDENTAL IN THE COST OF THE PRECAST CULVERT.

15 SECTION B-B BAFFLE DETAIL
NOT TO SCALE

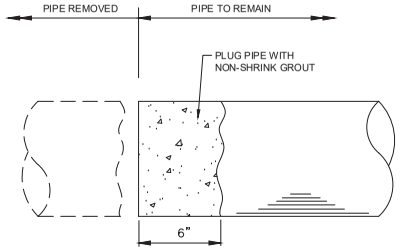
A00860 - 184
Proposal No. 604123-111717

604123_HD26(DRAINAGE DETAILS).DWG Plotted on 21-Mar-2018 10:28 AM



16 TYPICAL WATER PIPE INSULATION BOARD DETAIL

NOT TO SCALE

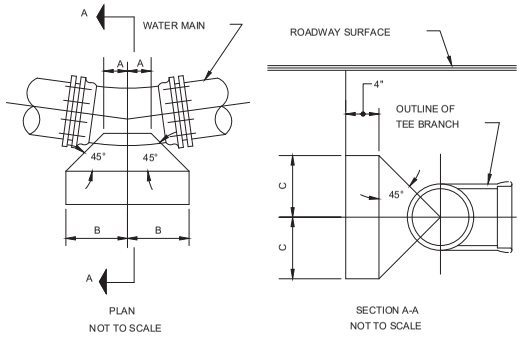


18 TYPICAL PIPE PLUGGING DETAIL

NOT TO SCALE

NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING UTILITY LOCATIONS PRIOR TO FINALIZING WATER MAIN LAYOUT. EXACT LAYOUT OF THE NEW WATER MAIN, VALVES, AND FITTINGS SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER.
2. INSTALL MECHANICAL THRUST RESTRAINT AT ALL MECHANICAL JOINTS, BENDS, TEES, CROSSES, COUPLINGS, AND HYDRANTS.
3. MECHANICAL RESTRAINT JOINTS SHALL BE USED FOR THE PROPOSED 8" WATER MAIN SEGMENT ON THE SIDE OF THE BRIDGE. THIS SEGMENT NEEDS TO BE FULLY EXTENDED BEFORE PRESSURIZING TO AVOID DAMAGE TO THE PARAPET WALL AND UTILITY BRACKETS.
4. REMOVE AND DISPOSE OFF-SITE, ANY ABANDONED WATER MAIN OR SERVICES APPEARING IN THE SAME TRENCH AS PROPOSED WATER MAIN, HYDRANTS, AND SERVICES AT NO ADDITIONAL COST TO THE OWNER.
5. THE WATER MAIN WORK SHALL INCLUDE CONSTRUCTION OF CONCRETE THRUST BLOCKS AT ALL BELOW GRADE BENDS. CONCRETE THRUST BLOCKS SHALL BE OF THE MINIMUM SIZE AS SHOWN ON THE TABLE (SEE THRUST BLOCK DETAIL) AND ALLOW 48 HOURS FOR CURING BEFORE PRESSURIZING THE LINE . CONSTRUCT THRUST BLOCKS AGAINST UNDISTURBED SOIL. WRAP FITTINGS WITH POLYETHYLENE PRIOR TO CONSTRUCTING THRUST BLOCKS. NO JOINTS SHALL BE COVERED WITH CONCRETE.
6. ALL PIPE SHALL BE CEMENT LINED DUCTILE IRON (C.L.D.I.) MECHANICAL JOINT, THICKNESS CLASS 52 INSULATED PIPE. WEIGHT, CLASS, MANUFACTURER'S MARK, YEAR OF PRODUCTION, AND "D.I." OR "DUCTILE" SHALL BE CAST OR STAMPED ON EACH SECTION OF PIPE. PIPE ATTACHED TO THE BRIDGE DECK SHALL BE ENCASED IN 24" STEEL SLEEVE WITH SPACERS.
7. DE-CHLORINATION OF WATER USED FOR DISINFECTION OF THE NEW WATER MAINS SHALL BE REQUIRED. APPROPRIATE LEAKAGE TESTING SHALL BE PROVIDED FOR PROPOSED WATER LINE. SEE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.
8. CONTRACTOR SHALL MODIFY INSTALLATION OF INSULATION AS REQUIRED TO PROVIDE COMPLETE THERMAL PROTECTION OF EXPANSION JOINTS WHILE ALLOWING FOR FULL RANGE OF MOVEMENT.
9. ALL EXPOSED PORTIONS OF THE WATER MAIN, AND BURIED PORTIONS LESS THAN 5' BELOW GRADE, ARE TO BE INSULATED AS DESCRIBED IN THE SPECIFICATIONS. INSULATION NOT SHOWN FOR CLARITY PURPOSES, BUT SHALL BE PROVIDED AS REQUIRED.



HORIZONTAL THRUST BLOCK SCHEDULE
TABLE OF DIMENSIONS IN INCHES

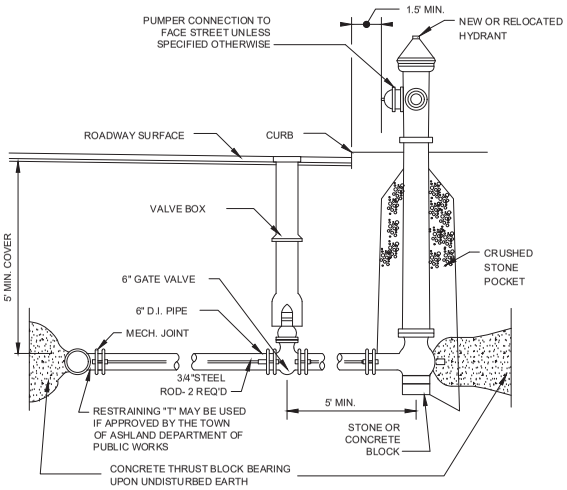
	A	B	C
6", 8" BEND			
11 1/4°, 22 1/2°	6"	10"	10"
45°	6"	14"	14"
90°	9"	19"	19"
10", 12" BEND			
11 1/4°, 22 1/2°	6"	14"	14"
45°	6"	20"	20"
90°	9"	27	27
TEE (BRANCH)/CAP			
6"	6"	15"	15"
8"	9"	16"	16"
10"	9"	19"	19"
12"	9"	23"	23"

NOTE : REFER TO SPECIFICATIONS FOR MATERIAL REQUIREMENTS

SUBJECT TO FIELD MODIFICATION BY ENGINEER

17 THRUST BLOCK DETAIL

NOT TO SCALE



19 FIRE HYDRANT DETAIL

NOT TO SCALE

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DOCUMENT A00861

MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

ORDER OF CONDITIONS

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Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
95-931
MassDEP File #

eDEP Transaction #

Ashland
City/Town

A. General Information

Please note: this form has been modified with added space to accommodate the Registry of Deeds Requirements

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

1. From: Ashland
Conservation Commission

2. This issuance is for (check one): a. ☒ Order of Conditions b. ☐ Amended Order of Conditions

3. To: Applicant:

Susan
a. First Name

McArthur
b. Last Name

Massachusetts DOT
c. Organization

10 Park Plaza, Room 4260
d. Mailing Address

Boston
e. City/Town

MA
f. State

02116
g. Zip Code

4. Property Owner (if different from applicant):

a. First Name

b. Last Name

c. Organization

d. Mailing Address

e. City/Town

f. State

g. Zip Code

5. Project Location:

Route 126 (Pond Street)
a. Street Address

Ashland
b. City/Town

N/A
c. Assessors Map/Plat Number

d. Parcel/Lot Number

Latitude and Longitude, if known: 41d 14m 50s
d. Latitude

71 d 25 m 49s
e. Longitude

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
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Provided by MassDEP:
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Ashland
City/Town

A. General Information (cont.)

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):

a. County | b. Certificate Number (if registered land)

c. Book | d. Page

7. Dates: July 1, 2019 (a. Date Notice of Intent Filed) | December 9, 2019 (b. Date Public Hearing Closed) | December 23, 2019 (c. Date of Issuance)

8. Final Approved Plans and Other Documents (attach additional plan or document references as needed):

Massachusetts Department of Transporation Highway Division: Route 126 (Pond Street)
a. Plan Title

Green International Affiliates
b. Prepared By

Paul Milewski (Civil No. 48166)
c. Signed and Stamped by

Various. See Attachment A
d. Final Revision Date

As noted on various sheets
e. Scale

NOI and Associated documents
f. Additional Plan or Document Title

7/ 1/ 2019
g. Date

B. Findings

1. Findings pursuant to the Massachusetts Wetlands Protection Act:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act (the Act). Check all that apply:

a. ☒ Public Water Supply
b. ☐ Land Containing Shellfish
c. ☒ Prevention of Pollution
d. ☒ Private Water Supply
e. ☒ Fisheries
f. ☒ Protection of Wildlife Habitat
g. ☒ Groundwater Supply
h. ☒ Storm Damage Prevention
i. ☒ Flood Control

2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

Approved subject to:

a. ☒ the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

Massachusetts Department of Environmental Protection
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B. Findings (cont.)

Denied because:

b. ☐ the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect the interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**

c. ☐ the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**

3. ☒ Buffer Zone Impacts: Shortest distance between limit of project disturbance and the wetland resource area specified in 310 CMR 10.02(1)(a) — 1 foot (a. linear feet)

Inland Resource Area Impacts: Check all that apply below. (For Approvals Only)

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. ☒ Bank	137 (perm) 48 (temp)	137 (perm) 48 (temp)	137 (perm) 48 (temp)	137 (perm) 48 (temp)
5. ☒ Bordering Vegetated Wetland	3,798 (perm) 2,904 (temp) a. square feet	3,798 (perm) 2,904 (temp) b. square feet	3,798 (perm) 2,904 (temp) c. square feet	3,798 (perm) 2,904 (temp) d. square feet
6. ☐ Land Under Waterbodies and Waterways	e. c/y dredged	f. c/y dredged		
7. ☒ Bordering Land Subject to Flooding	1,240 a. square feet	1,240 b. square feet	1,240 c. square feet	1,240 d. square feet
Cubic Feet Flood Storage	395 e. cubic feet	395 f. cubic feet	395 g. cubic feet	395 h. cubic feet
8. ☐ Isolated Land Subject to Flooding	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9. ☐ Riverfront Area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	g. square feet	h. square feet	i. square feet	j. square feet



Massachusetts Department of Environmental Protection
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B. Findings (cont.)

Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)

	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. ☐ Land Under the Ocean	a. square feet c. c/y dredged	b. square feet d. c/y dredged		
12. ☐ Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. ☐ Coastal Beaches	a. square feet	b. square feet	c. cu yd nourishment	d. cu yd nourishment
14. ☐ Coastal Dunes	a. square feet	b. square feet	c. cu yd nourishment	d. cu yd nourishment
15. ☐ Coastal Banks	a. linear feet	b. linear feet		
16. ☐ Rocky Intertidal Shores	a. square feet	b. square feet		
17. ☐ Salt Marshes	a. square feet	b. square feet	c. square feet	d. square feet
18. ☐ Land Under Salt Ponds	a. square feet c. c/y dredged	b. square feet d. c/y dredged		
19. ☐ Land Containing Shellfish	a. square feet	b. square feet	c. square feet	d. square feet
20. ☐ Fish Runs	Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above			
	a. c/y dredged	b. c/y dredged		
21. ☐ Land Subject to Coastal Storm Flowage	a. square feet	b. square feet		
22. ☐ Riverfront Area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	g. square feet	h. square feet	i. square feet	j. square feet

Massachusetts Department of Environmental Protection
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Provided by MassDEP:
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Ashland
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B. Findings (cont.)

* #23. If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c (BVW) or B.17.c (Salt Marsh) above, please enter the additional amount here.

23. ☐ Restoration/Enhancement *:

a. square feet of BVW | b. square feet of salt marsh

24. ☐ Stream Crossing(s):

a. number of new stream crossings | b. number of replacement stream crossings

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects.

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
   a. The work is a maintenance dredging project as provided for in the Act; or
   b. The time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
   c. If the work is for a Test Project, this Order of Conditions shall be valid for no more than one year.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order. An Order of Conditions for a Test Project may be extended for one additional year only upon written application by the applicant, subject to the provisions of 310 CMR 10.05(11)(f).
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on December 23, 2022, unless extended in writing by the Department.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.

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C. General Conditions Under Massachusetts Wetlands Protection Act

8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.

9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.

10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,

"Massachusetts Department of Environmental Protection" [or, "MassDEP"]

"File Number 95-931 "

11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.

12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.

13. The work shall conform to the plans and special conditions referenced in this order.

14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.

15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.

16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.

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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.

18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

19. The work associated with this Order (the "Project")
    (1) ☒ is subject to the Massachusetts Stormwater Standards
    (2) ☐ is NOT subject to the Massachusetts Stormwater Standards

    If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:

    a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

    b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:
    i. all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures;
    ii. as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;
    iii. any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;

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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

iv. all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;

v. any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement) for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following:

i.) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and

ii.) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 18(f) through 18(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.

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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

g) The responsible party shall:
1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions (if you need more space for additional conditions, please attach a text document):
See pages 9A through 9O.

20. For Test Projects subject to 310 CMR 10.05(11), the applicant shall also implement the monitoring plan and the restoration plan submitted with the Notice of Intent. If the conservation commission or Department determines that the Test Project threatens the public health, safety or the environment, the applicant shall implement the removal plan submitted with the Notice of Intent or modify the project as directed by the conservation commission or the Department.

Ashland Special Conditions
Findings of Fact
Route 126 (Pond Street)
Redevelopment Project

Approved Work:

Work shall consist of the redevelopment of Route 126 (Pond Street) to improve traffic flow, pedestrian safety, and the aesthetics to the corridor. The project will also increase commerce for the Town of Ashland. The project will achieve these goals by widening the roadway width to include two travel lanes at a width of 11 feet each. In addition, a five foot wide sidewalk will be installed, as well as a modular path of eight to ten feet in width.

Algonquin Trail will be realigned with Harvard Street and street lights will be added at this intersection. The intersection of Spy Glass Hill Drive, Pond Street, and the entrance to the Shaw's shopping plaza will be upgraded to a rotary. In addition, the intersection at Eliot Street will be improved by adding crosswalks.

Stormwater will be improved by adding deep sumps and hoods in existing catch basins. Currently, the existing catch basins are in a basin to basin connection, a process that is no longer allowed under current standards. The project will eliminate these connections. In addition, three existing culverts in Route 126 will be replaced. Of the three culverts, two of them will be replaced with a natural stream bottom. Finally, a drywell may be installed closer to Spy Glass Hill.

Work will take place in Bordering Vegetated Wetlands, Bordering Land Subject to Flooding, buffer zone, the 25' No Disturb Zone, and the 200 Foot Riverfront Area. Note that during the hearings, a system flagged by Algonquin Trail was determined by the Commission as not being a wetland system due to soil and vegetation observed on site during a site walk.

A replication area will need to be installed and will either be installed abutting the intersection of Pond Street and Butterfield Drive, or will be located behind the fire station at Cedar Street. Note that the wetland system behind the fire station has the same connection to the wetland systems being impacted by the project.

Note that final dates of plans and supporting documents is shown on Attachment A.

General Conditions:

All state conditions shall apply to this Order of Conditions. The following conditions for the Ashland Wetlands Protection Bylaw is stated between numbers from 21 to 45.

21. Administrative Conditions

a) The project proponent shall be responsible for the compliance with all conditions of this Order. If the property is transferred, this Order of Conditions shall apply to any successor in control or successor in interest of the property described in the Notice of Intent and referenced plans. The project proponent shall provide written verification of the transfer of this Order and understanding of the conditions by the new owner within 60 days of property transfer.

b) All work must conform to the referenced plan set for the project site. Any changes to the proposed project, relating to the location of proposed contours, limits of work, location of erosion control measures, or permanent or temporary alterations of regulated wetland resource areas shall be submitted to the Ashland Conservation Commission prior to the start of construction. The Ashland Conservation Commission shall determine if the proposed change warrants submission of a new Notice of Intent.

c) All other necessary local, state and federal permits shall be obtained prior to construction.

d) Pursuant to the 2000 Massachusetts Second Annual Session, Chapter 144, the Ashland Conservation Commission reserves the right to hire, at the applicant's expense, outside consultants to perform inspections and or project review to ensure compliance with appropriate federal, state and local laws and regulations, at any point between the filing of an application to the issuance of a Certificate of Compliance.

e) In the event of a discrepancy between the project plan and this Order of Conditions, the Order of Conditions shall prevail.

f) Copies of the construction site Stormwater Pollution Prevention Plan (SWPPP) and National Pollutant Discharge Elimination System (NPDES) reports shall be forwarded to the Ashland Conservation Commission prior to the start of construction activities.

g) The Ashland Conservation Commission's failure to discover or take action with respect to the proponent's compliance with any part of any condition does not constitute a waiver of rights to enforce this Order of Conditions.

h) Final construction plans, stamped by an engineer shall be submitted to the Conservation Commission or Agent of the Commission for review and approval.

22. Deed Recording—All restrictions imposed by this Order of Conditions shall continue in force until compliance with the conditions is certified by the issuance of a Certificate of Compliance and said Certificate has been recorded with the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property.

23. **Notification of Activity** - The applicant shall provide the Ashland Conservation Commission with written notification at least five (5) days, but not more than ten (10) days, before any activity commences on the project site. This applies to all project activities, including but not limited to, installation of erosion and sedimentation control measures.

24. **Right to Enter** — Members and agents of the Ashland Conservation Commission shall have the right to enter and inspect the premises to evaluate compliance with the conditions stated in this Order of Conditions, and may require the submittal of any data deemed necessary by the Commission for that evaluation. The Ashland Conservation Commission also reserves the right to require additional measures if determined necessary to protect resource areas and the interests of the Wetlands Protection Act as defined in M.G.L. Ch. 131 § 40 (310 CMR 10.00).

25. **Read and Post Order** — The developer or contractor responsible for the project's completion shall be notified of, and made responsible for reading and complying with, the requirements and conditions of this Order of Conditions. A copy of this Order and referenced plans shall be available at the site while activities regulated by this Order are being performed.

26. **Construction Sequence -** A construction sequence is to be submitted to the Commission for review and approval prior to construction activities.

27. **Erosion Controls**

    a) Prior to commencing **ANY** alteration activities, erosion and siltation control barriers shall be placed along the line depicted in the referenced plans. Prior to installation, the location of erosion and siltation control barriers shall be established by survey methods and staked. **The use of construction hay is prohibited by this Order of Conditions.**

    b) Sediment runoff is not permitted to leave the site. Perimeter erosion controls include but are not limited to silt fencing, silt socks, and straw bales, provided that they are installed per state and manufacturer standards. Untreated stormwater discharge into wetlands, public roadways, or stormwater systems may result in fines from the Conservation Commission or its Agent, and/or the Department of Public Works.

    c) Should the Ashland Conservation Commission determine additional erosion controls are needed, the developer or contractor shall immediately comply with the request from the Ashland Conservation Commission or its Agent.

    d) The limit of work for the project shall be the erosion control barrier as illustrated on the referenced plans. No temporary or permanent construction work, storage of materials, discarding of materials, or access by construction personnel or equipment shall occur beyond the limit of work as delineated by the erosion control barrier.

    e) All erosion control barriers shall be properly installed before any site work, including clearing, can proceed. Once the erosion controls are

installed, the Ashland Conservation Commission shall be notified and the site shall be inspected. Approval of the erosion control installation by the Ashland Conservation Commission or its agent is required before further site construction is initiated.

f) The erosion and siltation controls shall be maintained in a state of good repair until all disturbed areas have been permanently stabilized, or until a determination has been made by the Ashland Conservation Commission indicating that control measures are no longer necessary.

g) All erosion and siltation controls measures and structures are to be inspected daily and maintained as necessary by an Environmental Monitor. The contact information of the Environmental Monitor shall be forwarded to the Agent of the Commission. This information shall include the name of the Environmental Monitor, their company and title, their phone number and their address. In addition to the daily inspections of the erosion controls, an inspection shall be made after every rainfall event equal to or greater than .25" in a 24-hour period or greater than 1.0" per hour to ensure their integrity.

h) The areas of construction shall be left in a stable condition at the close of each construction day. Erosion and siltation controls shall be inspected at this time and repaired, maintained or reinforced as necessary.

28. Dry well—prior to the preconstruction meeting, the Applicant shall confirm to the Conservation Commission or its Agent, if a dry well will be installed near Spyglass Hill Drive as stated in the Findings of the Fact for this Order of Conditions. Plans should be submitted to the Conservation Commission or its Agent prior to the preconstruction meeting.

29. Survey and Plans—Per the hearing held on December 9, 2019, with the Conservation Commission, a wetland delineation shall be performed at the system behind the fire station located at Cedar Street to determine if this location will be better than what is shown on approved plans at Butterflied Drive. The delineation report, and plans shall be submitted to the Conservation Commission to determine as soon as it is available. The determination shall be made by the Conservation Commission, in conjunction with the Applicant and its representatives. A hard copy of the plans shall be submitted to the Agent of the Commission for the file.

30. CAD Files—CAD files of final construction plans shall be submitted to the Conservation Agent, and to the Town's Project Engineer. In addition, final as-built plans shall be submitted in a pdf and CAD format. The CAD files must be georeferenced to NAD State Plane 83 feet.

31. Preconstruction Meeting

a. Prior to any work on the project site, the applicant shall request a pre-construction meeting between the developer, contractor, Erosion Control (assigned to the project in accordance with Conditions 32), the building inspector and members of the Ashland Conservation Commission or its

agent. Meeting participants shall review in detail this Order of Conditions, the appropriate site plans, the Notice of Intent and other appropriate environmental protection documents and issues. The Conservation Agent or Ashland Conservation Commission shall be provided the name, telephone number and email address of the person who will be immediately responsible for supervision of all work on the project site and compliance with this Order of Conditions. The Conservation Agent or Ashland Conservation Commission shall be notified in the event that the site supervisor or contractor is changed.

b. Prior to the preconstruction meeting, that Applicant or his representative shall:

i. Install wetland flags with the flag numbers written on the flags

ii. Install stakes shall be installed outlining the erosion control line and shall be placed in accordance with the approved plans.

iii. Submit deed recording information to the Agent of the Commission as required in Condition number 9.

iv. Post a sign no bigger than two feet by two feet. The sign shall contain the DEP file number on it, and shall be posted along the roadway.

v. Submit the construction sequence shall be forwarded to the Conservation Commission (see condition Number 26)

32. Culvert Replacement—the culvert replacements shall take place during low flow periods and shall be constructed in accordance with the approved plans as outlined in Attachment A.

33. Replication

a) The wetland replication shall comply and conform to 310 CMR 10.55 (4) and with the DEP Guidance Document *Massachusetts Inland Wetland Replication Guidelines, Guidance No. BRP/DWM/WetG02-2, dated March 1, 2002.*

b) A qualified wetland scientist with experience in wetland replication (Wetland Monitor) and with a working knowledge of botany and hydrology shall supervise construction of the replication area. The contact information of the Wetland Monitor shall be forwarded to the Agent of the Commission. The contact information of the Wetland Monitor shall consist of their name, company name, title, phone number and e-mail address. The Wetland Monitor shall conduct monitoring of the replication area for the first two complete growing seasons following completion. Monitoring reports shall be submitted to the Ashland Conservation Commission to demonstrate conformance with the appropriate Performance Standards (310 CMR 10.00). A Certificate of Compliance shall not be issued until the wetland replication area is in place and functioning and is verified by the ACC.

c) Alteration of regulated wetland resource areas, 25-foot no disturb area or the 100-foot buffer zone shall not proceed until the replication area has been excavated and prepared, according to design, and is ready to accept wetland soils.

d) The replication area shall utilize organic soils from the vegetated wetland fill area to the greatest extent possible. Preparation of the replication area shall entail bringing the grade down, leaving trees of 10-inch diameter breast height or greater in place, leaving boulders in place, and generally creating micro topography.

e) The soils for the replication area shall be amended with a mixture of equal volumes of organic and mineral materials. These materials shall be uncontaminated and shall not include any woodchips. The organic material used shall be well or partially decomposed; clean leaf compost is preferred. Mineral materials shall be predominately in the loam, loamy-sand to silty-loam texture range.

f) The applicant shall notify the ACC by telephone or by email upon completion of the excavation of the replication area and 48 hours prior to alteration of the vegetated wetland. The ACC may inspect and request verification of excavated elevations.

g) Once the replication area has been backfilled with wetland soils, planting shall be completed by the end of October of the construction year.

h) Planting of the replication areas shall not take place between November 1st and April 15th.

i) The Wetland Protection Act Regulations outlined in 310 CMR 10.55(4)(b)(6) require that at least 75 percent of the surface of the replacement area be re-established with indigenous wetland plant species within two (2) growing seasons. If monitoring data indicates that this objective cannot be met, a corrective action plan shall be submitted to the Ashland Conservation Commission for approval, and implemented under the supervision of a wetland specialist.

j) A 25-foot no disturb area shall be created and subsequently maintained around the wetland replication area, except within the areas that are previously disturbed (i.e. the existing access road).

k) The designated Wetland Monitor shall conduct weekly inspections during construction.

l) The Wetland Monitor shall be present and shall submit written reports to the ACC within one week of the inspection date of the following activities:

1. Before excavation or erosion control installation work begins to inspect site flagging;
2. During excavation of the altered area while soils and/or vegetation are being translocated the replication area;

3. To inspect excavated elevations and estimated post-construction ground water elevation for the replication area;
4. After each stage of grading work in the replication area is completed to inspect finished elevations;
5. After one growing season to observe vegetation development and regulatory compliance;
6. After two growing seasons to observe vegetation development and regulatory compliance;

m) The Ashland Conservation Commission reserves the right to make a determination as to the success or failure of the wetland replication efforts and reserves the right to require additional replication.

34. Stockpiles—Soil stockpiles shall be a maximum of 20-feet high with a maximum 2:1 slope on all sides and be surrounded by temporary erosion controls within 3-ft of the base of the stockpile and down gradient of the stockpiles when not in use for more than 24-hrs. Soil Stockpiles shall be located at least 50-ft from any wetland, waterbody, drain inlet, or open channel. Stockpiled soil on site shall be stabilized by mulching or temporary vegetation if the stockpiles remain inactive for more than 14 days. All debris, fill and excavated material shall be stockpiled far enough away from designated wetlands and in a location or in a manner to prevent sediment from entering the wetlands via surface runoff.

35. Soil Stabilization — Seeding or sod shall permanently stabilize all disturbed soils. During construction, disturbed soils shall be temporarily stabilized by the use of invasive species-free mulch or spread straw, or other method approved by the U.S. Department of Agriculture or Natural Resources Conservation Service, and approved by the ACC. All disturbed areas shall be brought to final finished grade and either (a) loamed and seeded within fourteen (14) days of final grading accordance with NRCS guidelines for permanent stabilization or (b) stabilized in another manner approved by the ACC.

36. Landscaping—Landscaping specimens shall be native to the Northeast of the United States. No invasive or likely invasive species shall be planted within jurisdictional areas. If any changes are proposed to the landscaping plan (see Attachment A), a final landscaping plan shall be submitted to the Conservation Commission or its Agent for approval.

37. Catch Basins

a) Silt sacks, or approved equivalent, shall be installed on all new and existing functioning catch basins and drop inlets in the project area.

b) New and existing catch basins in the project area shall be equipped with 4-foot sumps and hooded outlets and shall be inspected and cleaned as per the Operations and Maintenance program outlined in the Notice of Intent.

c) Rims of all catch basins shall be set flush with pavement throughout the construction of the project.

38. **Remove Debris from Wetlands** — All man-made debris shall be removed from the wetlands and 25-foot No Disturb Zone and disposed of properly prior to requesting a Certificate of Compliance.

39. **Downstream Impacts** — The issuance of this Order of Conditions does not in any way imply nor certify that the site or downstream areas will not be subject to flooding, storm damage, or any other form of damage due to wetness.

40. **Request for Certificate of Compliance** — The applicant shall submit a written request for a Certificate of Compliance, together with an as-built plan and an affidavit prepared by a professional engineer or land surveyor registered in the Commonwealth of Massachusetts, stating that the site has been developed in accordance with the requirements of this Order of Conditions, based upon an on-site inspection and the referenced site plan. The affidavit shall state any deviations from the approved plans and this Order of Conditions.

    The as-built plans shall include all components of the project including but not limited to stormwater structures and systems elevations and inverts. The Ashland Conservation Commission or its agent reserves the right to inspect the complete site before the issuance of a Certificate of Compliance. Upon receipt of a Certificate of Compliance, erosion controls shall be removed within 60 days. If a partial Certificate of Compliance is issued, there will be no additional fee if a full Certificate of Compliance is requested within six months.

Conditions to Extend in Perpetuity

41. **Stormwater Operations & Maintenance** Best management practices, outlined in the Stormwater Management Report, include maintenance and operations procedures which will apply to the site once the project is complete and ongoing. Maintenance and operations procedures associated with the site drainage structures will not require supplemental filings after the Certificate of Compliance is issued provided items noted below are followed. These practices are itemized on O& M Plans entitled: *Operations, and Maintenance Plan*, dated April 2019.

    a. **Post Construction Routine Schedule**

    The property's stormwater handling facilities must be inspected on a regular basis in order to comply with the project's wetlands permit. Routine inspections must be made during the months of May, August, November and February.

    Deep Sump Catch Basins

    Have all catch basins and area drains inspected annually, and sumps cleaned if greater than 50% sump depth of sediment accumulation.

    Street Sweeping

    Have all pavement swept annually as needed from November to May.

Landscaping

Inspect for diseased/dying trees, shrubs, ground cover and grass. Replace as required.

Inspect mulch beds. Supplement as required to provide 4" minimum depth (loose measure)

Rip Rap (Stone) Protection

Inspect stone protection on embankments, spillways, pipe outlets and elsewhere. Cut emerging young trees. Repair as required.

Stormwater Management Area

- Inspect fencing and locks. Repair as required.
- Inspect areas between forebay, water quality area, recharge area.
- Grassed areas are to be maintained on a regular basis during the growing season. Any grass clipping are to be removed from the site.
- Inspect water detention basin outlets.
- Inspect culvert to wetlands.
- Inspect and maintain vegetation in the constructed stormwater wetland and replant as needed
- Inspect forebay bottom. If accumulated silt is deeper than 12 inches over its full bottom area, have cleaned.

b. **Post Construction Non-routine Schedule**

Area Drains/Stormwater Management Area
Inspect after each significant rainfall (1/2" or more) for first six months after their construction to ensure surface vegetation is healthy, discharge devices are not blocked and banks are not eroding. Check all components after each major storm (more than 2" rainfall in 24 hours). Clean and repair as required.

42. **Snow Storage and Disposal** — All snow storage and disposal shall conform to the Department of Environmental Protection's Snow Disposal Guidelines. This condition shall remain in effect in perpetuity and shall not be released by a Certificate of Compliance.
43. **Emergency Release, Spills, or Other contamination Release-**the owner will provide for Ashland Conservation Commission review and approval prior to construction an Emergency Response Procedure for accidental release of contaminants. This procedure will include notification of the Ashland Fire Department for any uncontrolled release, maintenance of a site spill response kit suitable to clean up and contain a 40 gallon spill, and procedures for containment of any spill.
44. **Landscaping Waste** — No grass clippings, leaves or other landscaping waste may be deposited in any detention basin, forebay, wetland resource area or 25-

foot no disturb area. This condition shall remain in effect in perpetuity and shall not be released by a Certificate of Compliance.

45. **Land disturbance**- The Applicant is responsible for disturbance of the property and any fill, soils, clay, or other natural or man-made debris that is brought on site. It is the responsibility of the applicant to ensure that all materials coming in are clean. All materials that are removed from the site shall be properly disposed of.

ATTACHMENT A

Final Dates of Plans and Supporting Documents

Plans

Plan Title	Sheet No.	Date
Massachusetts Department of Transportation: Highway Division Plan and Profile of Route 126 (Pond Street) in the town of Ashland Middlesex County	1	12/9/2019
Ashland Ma, Route 126 (Pond Street): Legend & Abbreviations	2	8/14/2018
Ashland Ma, Route 126 (Pond Street): General Notes	3	10/22/2019
Ashland Ma, Route 126 (Pond Street): Key Plan	4	8/14/2018
Ashland MA, Route 126 (Pond Street): Typical Section 1	11	8/17/2018
Ashland MA, Route 126 (Pond Street): Typical Section 2	12	8/17/2018
Ashland MA, Route 126 (Pond Street): Typical Section 3	13	8/17/2018
Ashland MA, Route 126 (Pond Street): Construction Plans (1 of 17)	14	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (2 of 17)	15	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (3 of 17)	16	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (4 of 17)	17	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (5 of 17)	18	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (6 of 17)	19	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (7 of 17)	20	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (8 of 17)	21	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (9 of 17)	22	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (10 of 17)	23	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (11 of 17)	24	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (12 of 17)	25	10/22/2019
Ashland Ma, Route 126 (Pond Street): Construction Plans (13 of 17)	26	10/22/2019

Ashland MA, Route 126 (Pond Street): Construction Plans (14 of 17)	27	10/22/2019
Ashland Ma, Route 126 (Pond Street): Construction Plans (15 of 17)	28	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (16 of 17)	29	10/22/2019
Ashland MA, Route 126 (Pond Street): Construction Plans (17 of 17)	30	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (1 of 16)	31	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (2 of 16)	32	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (3 of 16)	33	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (4 of 16)	34	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (5 of 16)	35	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (6 of 16)	36	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (7 of 16)	37	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (8 of 16)	38	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (9 of 16)	39	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (10 of 16)	40	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (11 of 16)	41	10/22/2019
Ashland MA, Route 126 (Pond Street): Profiles- Route 126 (12 of 16)	42	10/22/2019
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Ashland MA, Route 126 (Pond Street): Converse Way Profile	47	10/22/2019
Ashland MA, Route 126 (Pond Street): Spyglass Hill Profile	48	10/22/2019
Ashland MA, Route 126 (Pond Street): Eliot Street Profile	49	10/22/2019

Ashland MA, Route 126 (Pond Street): Nash Avenue Profile	50	10/22/2019
Ashland MA, Route 126 (Pond Street): Nickerson Road Profile	51	10/22/2019
Ashland MA, Route 126 (Pond Street): Tri Street Profile	52	10/22/2019
Ashland MA, Route 126 (Pond Street): Tufts Street Profile	53	10/22/2019
Ashland MA, Route 126 (Pond Street): Algonquin Trial Profile	54	10/22/2019
Ashland MA, Route 126 (Pond Street): Harvard Street Profile	55	10/22/2019
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Ashland MA, Route 126 (Pond Street): Butterfield Drive Profile	57	10/22/2019
Ashland MA, Route 126 (Pond Street): James Road Profile	58	10/22/2019
Ashland MA, Route 126 (Pond Street): Market Basket Driveway Profile	59	10/22/2019
Ashland MA, Route 126 (Pond Street): Walcott Road Profile	60	10/22/2019
Ashland MA, Route 126 (Pond Street): Rodman Road Profile	61	10/22/2019
Ashland MA, Route 126 (Pond Street): Greenhalge Road Profile	62	10/22/2019
Ashland MA, Route 126 (Pond Street): Washington Ave Profile	63	10/22/2019
Ashland MA, Route 126 (Pond Street): Douglas Road Profile	64	10/22/2019
Ashland MA, Route 126 (Pond Street): Waushakum Avenue Profile	65	10/22/2019
Ashland MA, Route 126 (Pond Street): Roundabout Profile	66	10/22/2019
Ashland MA, Route 126 (Pond Street): Drainage & Utility Plans (1 of 17)	92	10/22/2019
Ashland MA, Route 126 (Pond Street): Drainage & Utility Plans (2 of 17)	93	10/22/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (3 of 17)	94	11/18/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (4 of 17)	95	10/22/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (5 of 17)	96	11/18/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (6 of 17)	97	11/18/2019
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Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (9 of 17)	100	10/22/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (10 of 17)	101	10/22/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (11 of 17)	102	10/22/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (12 of 17)	103	10/22/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (13 of 17)	104	11/18/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (14 of 17)	105	11/18/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (15 of 17)	106	11/18/2019
Ashland Ma, Route 126 (Pond Street): Drainage and Utility Plan (16 of 17)	107	10/22/2019
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Ashland Ma, Route 126 (Pond Street): Landscape and Wetland Replication Details (1 of 2)	181	10/22/2019
Ashland Ma, Route 126 (Pond Street): Landscape and Wetland Replication Details (2 of 2)	182	10/22/2019
Ashland Ma, Route 126 (Pond Street): Wetland Replication Plan (Sheet 2 of 2)	185	11/18/2019
Ashland, MA. Route 126 (Pond Street): Construction Details	185	11/18/2019
Ashland, MA. Route 126 (Pond Street): Construction Details	186	10/22/2019
Ashland, MA. Route 126 (Pond Street): Drainage & Utility Details (1 of 4)	187	12/6/2019
Ashland Ma, Route 126 (Pond Street): Drainage & Utility Details (2 of 4)	188	12/6/2019
Ashland Ma, Route 126 (Pond Street): Drainage & Utility Details (3 of 4)	189	12/6/2019
Ashland Ma, Route 126 (Pond Street): Drainage & Utility Details (4 of 4)	190	12/6/2019

Documents:

Document Title	**Description**	**Date**
Notice of Intent: Route 126 (Pond Street) Ashland, Massachusetts	Mass DOT Contract No. 604123	7/1/2019
Stormwater Report: Route 126 (Pond Street): Ashland Massachusetts	Green International Affiliates , INC.	12/9/2019
USGS Locus Map	Figure 1	5/31/2017
Aerial Locus Map	Figure 2	5/31/2017
Soils Map	Figure 3	8/1/2017
FEMA Map	Figure 4	8/1/2017
Resource Area Map	Figure 5	10/8/2019
Route 126 (Pond Street): Existing Watershed Plan	Figure 6	10/15/2019
Route 126 (Pond Street): Proposed Watershed Plan	Figure 7	10/15/2019
Resource Area Impacts	Figure 8A	10/11/2019
Resource Area Impacts	Figure 8B	10/11/2019
Resource Area Impacts	Figure 8C	10/11/2019
Resource Area Impacts	Figure 8D	11/18/2019
Resource Area Impacts	Figure 8E	11/18/2019
Resource Area Impacts	Figure 8F	10/11/2019
Resource Area Impacts	Figure 8G	10/11/2019
Resource Area Impacts	Figure 8H	10/11/2019
Potential Wetland Replication Option	Figure 9	12/6/2019

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
95-931
MassDEP File #

eDEP Transaction #

Ashland
City/Town

D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? ☐ Yes ☒ No

2. The Ashland (Conservation Commission) hereby finds (check one that applies):

   a. ☐ that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:

   1. Municipal Ordinance or Bylaw _____ 2. Citation _____

   Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

   b. ☐ that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:

   Wetlands Protection Bylaw (1. Municipal Ordinance or Bylaw) c. 280 (2. Citation)

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.

   The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):

   Note that there is a local Wetlands Protection Bylaw within the Town of Ashland, but the Applicant only filed the Notice of Intent for the Wetlands Proteciton Act, and not the Wetlands Protection Bylaw.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
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MassDEP File #

eDEP Transaction #

Ashland
City/Town

E. Signatures

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

12/23/2019
1. Date of Issuance

Please indicate the number of members who will sign this form.
This Order must be signed by a majority of the Conservation Commission.

4
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Signatures:

☐ by hand delivery on

Date

☑ by certified mail, return receipt requested, on

12/30/19
Date

F. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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eDEP Transaction #

Ashland
City/Town

G. Recording Information

Prior to commencement of work, this Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

Ashland
Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

Ashland
Conservation Commission

Please be advised that the Order of Conditions for the Project at:

Project Location | MassDEP File Number

Has been recorded at the Registry of Deeds of:

County | Book | Page

for: Property Owner

and has been noted in the chain of title of the affected property in:

Book | Page

In accordance with the Order of Conditions issued on:

Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

Request for Departmental Action Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

Provided by DEP

A. Request Information

1. Location of Project

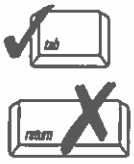
a. Street Address

b. City/Town, Zip

c. Check number

d. Fee amount

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



2. Person or party making request (if appropriate, name the citizen group's representative):

Name

Mailing Address

City/Town

State

Zip Code

Phone Number

Fax Number (if applicable)

3. Applicant (as shown on Determination of Applicability (Form 2), Order of Resource Area Delineation (Form 4B), Order of Conditions (Form 5), Restoration Order of Conditions (Form 5A), or Notice of Non-Significance (Form 6)):

Name

Mailing Address

City/Town

State

Zip Code

Phone Number

Fax Number (if applicable)

4. DEP File Number:

B. Instructions

1. When the Departmental action request is for (check one):

☐ Superseding Order of Conditions – Fee: $120.00 (single family house projects) or $245 (all other projects)

☐ Superseding Determination of Applicability – Fee: $120

☐ Superseding Order of Resource Area Delineation – Fee: $120

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

Request for Departmental Action Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

Provided by DEP

B. Instructions (cont.)

Send this form and check or money order, payable to the *Commonwealth of Massachusetts,* to:

Department of Environmental Protection
Box 4062
Boston, MA 02211

2. On a separate sheet attached to this form, state clearly and concisely the objections to the Determination or Order which is being appealed. To the extent that the Determination or Order is based on a municipal bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

3. Send a **copy** of this form and a **copy** of the check or money order with the Request for a Superseding Determination or Order by certified mail or hand delivery to the appropriate DEP Regional Office (see http://www.mass.gov/eea/agencies/massdep/about/contacts/).

4. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

DOCUMENT A00880

massDOT
Massachusetts Department of Transportation

Contractor COVID-19 Guidelines Compliance Checklist:

Contract Number: _____ City/Town: _____

Contract Description: _____

Contractor Name: _____

YES	NO	N/A		
☐	☐	☐	1.	Has the COVID-19 Guidelines and Procedures for all Construction Sites and Workers at all Public Work bulletin been posted in a location for workers to observe?
☐	☐	☐	2.	Have all required PPE been made available to all on site personnel? Have all personnel been instructed on the best practices for the use of PPE prior to the start of the work shift?
☐	☐	☐	3.	Have handwashing instructions been posted on the project site?
☐	☐	☐	4.	For site specific project locations have wash stations been installed? (NOTE: For various location/district wide projects wash stations are not required. For those projects the contractor must provide disinfecting wipes and liquid hand sanitizer)
☐	☐	☐	5.	Has a procedure been established for workers to certify their health to their supervisor prior to the start of each shift, and identified the responsible person on site to manage this provision?
☐	☐	☐	6.	Has signage been posted to prohibit unauthorized visitors to enter the MassDOT and contractor field offices?
☐	☐	☐	7.	Have jobsite cleaning and decontamination procedures been established? Have these been shared with contractor/subcontractor employees?
☐	☐	☐	8.	Have jobsite cleaning and decontamination procedures been established for all areas of the site including trailers, gates, equipment, vehicles, etc. and have they been posted at each entry point to the site, and throughout the project site?

massDOT
Massachusetts Department of Transportation

Contractor COVID-19 Guidelines
Compliance Checklist:

YES	NO	N/A		
☐	☐	☐	9.	Has a "No Congregation" policy been put into effect that states that individuals must implement social distancing by maintaining a minimum distance of 6-feet from other individuals?
☐	☐	☐	10.	Are all meetings being held via electronic means, and any required on-site meetings being done following social distancing practices including limiting attendance to 10 persons?
☐	☐	☐	11.	Are individual crew meetings/tailgate talks being held outdoors and following social distancing requirements?
☐	☐	☐	12.	Are all restroom and porta-potty stations being sanitized consistent with guidance, and are these locations provided with soap, hand sanitizers and paper towels?
☐	☐	☐	13.	Have all field office common areas been cleaned in the last 24 hours; and soap, hand sanitizer, and paper towels provided?
☐	☐	☐	14.	Have workers been instructed to bring food from home and practice appropriate hygiene while eating on lunch and at breaks including social distancing?
☐	☐	☐	15.	Have employees been instructed about appropriate personal hygiene and about staying home when either they or a family member is feeling sick?
☐	☐	☐	16.	Are all employees driving to the work site/ parking area in a single occupant vehicle?
☐	☐	☐	17.	Are all employees utilizing the proper PPE for conditions where required social distancing is not achievable? This includes those cases where workers are in the same vehicle to perform work activities (i.e. traffic setups).

massDOT
Massachusetts Department of Transportation

Contractor COVID-19 Guidelines Compliance Checklist:

I hereby certify that the responses indicated on this document are accurate and that all the necessary actions have taken place on this day to comply with the COVID-19 Guidelines as issued by MassDOT

Name: _____

Signature:

Name: _____ **Date:** _____

Printed:

Position: _____

Printed:

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DOCUMENT A00890

TOWN OF ASHLAND
CHAPTER 326 – SEWERS

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Chapter 326

SEWERS

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Floor Drain and Underground Injection Control Regulations

[HISTORY: Adopted by the Town of Ashland Department of Public Services (Water and Sewer Division) 1991 (now Department of Public Works). Amendments noted where applicable.]

GENERAL REFERENCES

Plumbing — See Ch. 218.
Septic systems — See Ch. 300.
Sewage disposal — See Ch. 303.
Wastewater treatment plants — See Ch. 307.
Street excavations — See Ch. 330.
Water — See Ch. 334.
Fees — See Ch. A352.

ARTICLE I
Definitions

§ 326-1. Terms defined.

Unless the context specifically indicates otherwise, the meanings of terms in this chapter shall be as follows:

APPROVAL TO CONNECT — Prior to actual connection between the sanitary building drain and the sanitary building sewer, an approval to connect shall be required from the DPW. This approval will only be considered just prior to final connection, upon completion of testing and inspection by the Superintendent. **[Amended 10-18-2000 ATM, Art. 14]**

BOD (denoting "biochemical oxygen demand") — The quantity of oxygen utilized in the biochemical oxidation of organic matter under standard laboratory procedure in five (5) days at twenty degrees Celsius (20° C.), expressed in milligrams per liter.

COD (denoting "chemical oxygen demand") — The quantity of oxygen utilized in the chemical oxidation of organic matter with a strong chemical oxidant, expressed in milligrams per liter as determined under standard laboratory procedure.

COMPATIBLE POLLUTANT — A substance that is amenable to removal in substantial amounts by the wastewater treatment plant. "Compatible pollutants" include, but are not limited to, coliform bacteria, suspended solids and those that exert BOD.

CONSTRUCTION STANDARDS AND RULES AND REGULATIONS FOR PUBLIC SEWER MAINS AND SANITARY BUILDING SEWERS — Referred to hereinafter as "Construction Standards and Rules and Regulations."

CONTRACTOR — A person, partnership or corporation which has been actively engaged in work associated with construction, rehabilitation or repair of sewer facilities and which has sufficient equipment, labor and resources to construct the proposed work.

DEVELOPER — The owner of record of a subdivision or a parcel of property or owner of record of a single lot upon which a new dwelling or structure is to be constructed, hereinafter referred to as the "applicant."

DPW — The Department of Public Works of the Town of Ashland, Massachusetts, hereinafter referred to as "town" or "DPW." **[Amended 10-18-2000 ATM, Art. 14]**

ENGINEER — The consulting engineer or firm employed by the DPW for review of design and construction proceedings. **[Amended 10-18-2000 ATM, Art. 14]**

EXCESSIVE — More than the limits established in these regulations or of such magnitude that, in the judgment of the DPW, may cause damage to any facility, may be harmful to the

treatment plant to the degree required to meet the Federal Water Pollution Control Act of 1972, Public Law 92-500, may create any hazard in the receiving waters, may exceed the capacity of the Massachusetts Water Resources Authority (MWRA) sewerage system or may otherwise endanger life, limb or public property or may constitute a public nuisance.

FLOATABLE OIL — Oil, fat or grease in a physical state such that it will separate by gravity from wastewater by treatment in an approved pretreatment facility.

GARAGE — Any building wherein is kept or stored one (1) or more vehicles, including, among others, a public or private garage, carport, motor vehicle repair shop or paint shop, service station, lubritorium, car wash or any building used for similar purposes.

GARBAGE — Solid wastes from the domestic and commercial preparation, cooking and dispensing of food and from the handling, storage and sale of produce.

INCOMPATIBLE POLLUTANT — A substance that is not amenable to removal in substantial amounts by a wastewater treatment plant. "Incompatible pollutants" include, but are not limited to, toxic metals and persistent organics and toxic biocumulative organics.

INDIVIDUAL HOMEOWNER — The owner of record of an existing dwelling for which a sanitary building sewer is to be installed, hereinafter referred to as "applicant."

INDUSTRIAL USER — Any user identified in the Standard Industrial Classification Manual of the United States Office of Management and Budget, as amended and supplemented, under the following divisions:

A. Division A: Agriculture, Forestry and Fishing.

B. Division B: Mining.

C. Division D: Manufacturing.

D. Division E: Transportation, Communication, Electric, Gas and Sanitary Service.

E. Division I: Services.

INDUSTRIAL WASTES — The wastes from industrial manufacturing processes, trade or business, and shall include solid, liquid or gaseous wastes or wastewater resulting from industrial or manufacturing processes or discharged from a commercial, governmental or institutional facility or from the development, recovery or processing of natural resources.

LICENSED PIPELAYER — The person, partnership or corporation authorized by the DPS to perform this type of work and responsible for the actual construction of the addition, repair or alteration to the municipal sewerage system.

NATURAL OUTLET — Any outlet into a watercourse, pond, ditch, lake or other body of surface or ground water.

PERMIT TO CONSTRUCT SEWER LINES — Required prior to installation of any exterior piping systems which will eventually connect to the Ashland municipal sewerage system and applied for in the name of the licensed pipelayer and the individual homeowner or developer. Application shall be accompanied by a nonrefundable fee as set by the Department of Public Services, a layout of the proposed construction, a copy of the

certificate of insurance, a copy of the state and local highway opening permit and a performance bond of five thousand dollars ($5,000), if applicable, and other pertinent data further detailed in the following sections of this chapter.

PERSON — Any individual, firm, company, association, society, corporation, partnership, group or any political subdivision of the commonwealth.

pH — The logarithm of the reciprocal of the weight of hydrogen ions in moles per liter of solution.

PLANNING BOARD AGENT — The authorized representative of the Ashland Planning Board (P.B. Agent).

PROPERLY SHREDDED GARBAGE — The wastes from the preparation, cooking and dispensing of foods that have been shredded to such a degree that all particles will be carried freely under the flow conditions normally prevailing in public sewers, with no particle greater than one-half (½) inch in any dimension.

PUBLIC SEWER — A sewer in which all owners of abutting properties have equal rights and which is controlled by the Ashland DPS.

PUBLIC SEWER MAIN — Any system of sewer pipe, eight (8) inches or larger in diameter, servicing more than one (1) building or dwelling, constructed within a public or private way or easement or under authority of a special permit or license, which will eventually become a part of the municipal sewer system, such as developments, etc.

SANITARY BUILDING DRAIN — The pipe within the building or structure extending to a point ten (10) feet beyond the exterior side of the foundation wall, conveying the discharge of wastewater (sewage).

SANITARY BUILDING SEWER — The pipe extending from a point ten (10) feet beyond the exterior face of the foundation wall to the public sewer main, conveying the discharge of wastewater (sewage).

SANITARY SEWAGE — Liquid and water-carried human and domestic wastes from residences, commercial buildings, industrial plants and institutions, exclusive of ground- , storm- and surface waters, roof and surface runoff, uncontaminated cooling water and noncontact industrial process waters and exclusive of industrial wastes.

SANITARY SEWER — A sewer which carries sanitary sewage and industrial waste.

SEWAGE — A combination of the water-carried wastes from residences, business buildings, institutions and industrial establishments.

SEWAGE TREATMENT PLANT — Any arrangement of devices and structures used for treating wastewater, industrial wastes or sludge.

SEWAGE WORKS — All facilities for collecting, pumping, treating and disposing of sewage.

SEWER — A pipe or conduit for carrying sewage.

SLUG — Any discharge of water, sewage or industrial waste which, in concentration of any given constituent or in quantity of flow, exceeds for any period of duration longer than

fifteen (15) minutes more than five (5) times the average twenty-four-hour concentration of flows during normal operation and which may adversely affect the sewerage system.

STATE SEWER SYSTEM EXTENSION OR CONNECTION PERMIT — A state water pollution control sewer extension or connection permit is required for any main line extension or system change in use or flow on main line systems with a valid permit. In addition, any new service connection to an existing permitted main line requires a permit if the discharge is to exceed two thousand (2,000) gallons per day. Any existing permitted service connection planning a change in use or flow must reapply, and any service connection existing prior to May 10, 1979, which is planning an increase in discharge greater than two thousand (2,000) gallons per day over existing discharge must apply for a new permit.

STORM DRAIN — A sewer which carries storm- and surface waters and drainage, but excludes sewage and industrial wastes, other than uncontaminated cooling water.

SUPERINTENDENT — The authorized representative of the DPS.

SUSPENDED SOLIDS — Solids that either float on the surface of or are in suspension in water, sewage or other liquids and which are removable by laboratory filtering.

TOWN — The Town of Ashland, Massachusetts.

WATERCOURSE — A channel in which a flow of water occurs, either continuously or intermittently.

§ 326-2. Word usage.

"Shall" is mandatory; "may" is permissive.

ARTICLE II
General Construction Requirements

§ 326-3. Permit required.

No person shall uncover, make any connection with or opening into, use, alter or disturb any public sewer main or appurtenance thereof without first obtaining a written permit from the DPS. Any person proposing a new discharge into the system or a substantial change in the volume or character of pollutants that are being discharged into the system shall notify the DPS at least forty-five (45) days prior to the proposed change or connection followed by a forty-eight-hour notice prior to start of work.

§ 326-4. Cost of installation and connection.

All costs and expenses incidental to the installation and connection of the sanitary building sewer shall be borne by the individual homeowner or developer. The owner or developer shall indemnify the Town of Ashland from any loss or damage that may, directly or indirectly, be occasioned by his installation of the sanitary building sewer.

§ 326-5. Each building to have own sewer.

A separate and independent sanitary building sewer shall be provided for every building, unless written permission has been obtained from the DPS to do otherwise.

§ 326-6. Use of existing pipes.

Existing sanitary building sewer pipes may be used to connect buildings only if they meet all requirements of Ashland's Construction Standards and Rules and Regulations for sewer use in the Town of Ashland, Massachusetts.

§ 326-7. Maintenance and repair.

The owner (applicant) shall be responsible for maintaining and repairing of the sanitary building drain and sewer from inside of the foundation wall to the public sewer main in the street.

§ 326-8. Licensed pipelayers.

A. Licenses to perform work such as installation of sanitary building sewers and public sewer mains or work in relation thereto will be issued only to experienced and competent licensed pipelayers. A fee as set by the Department of Public Services must accompany all applications for licenses. Licenses must be renewed each calendar year, and request for renewal must be accompanied by a fee as set by the Department of Public Services. A complete set of Construction Standards and Rules and Regulations will be supplied with each license renewal.

B. This license fee is separate and distinct from any other application fees outlined previously.

C. Insurance.

   (1) Pipelayers doing work hereunder shall maintain minimum insurance coverage as follows:

      (a) Public liability: fifty thousand/one hundred thousand dollars ($50,000/$100,000).

      (b) Property damage liability: fifty thousand/one hundred thousand dollars ($50,000/$100,000).

   (2) Certificates of insurance acceptable to the DPS shall be filed with the Superintendent prior to the commencement of the work. These certificates shall contain a provision that coverages afforded under the policies will not be canceled unless at least fifteen (15) days' prior written notice has been given the DPS.

D. The DPS reserves the authority to revoke the license of any pipelayer if, in the opinion of the DPS, his construction methods or materials are not in strict compliance with the Construction Standards and Rules and Regulations of the town.

§ 326-9. Performance guaranties.

A. Licensed pipelayer proposing to construct an extension to an existing public sewer main, a sanitary building sewer or any other work in relation thereto which will be done within the limits of the Town of Ashland roadway takings, easements or other land under the control of the Town of Ashland, Massachusetts, shall be required to submit with the application for permit to construct sewer lines a performance bond, payable to the Town of Ashland, Massachusetts, in the amount of five thousand dollars ($5,000) for each permit.

B. The performance bond shall remain the property of the town for a period of three hundred sixty-five (365) calendar days from the date of final construction inspection and approval by the DPS. If, during this period, the Superintendent determines that an unsatisfactory condition exists at the construction site related to the licensed pipelayer's operation, the licensed pipelayer shall be immediately notified. Failure of the licensed pipelayer to respond and correct the unsatisfactory condition within a forty-eight-hour period shall be grounds for the DPS to revoke the pipelayer's license and to arrange for the work to be completed by others. All costs in relation to this repair work shall be deducted from the performance bond, and costs exceeding the amount deposited shall be billed directly to the licensed pipelayer.

C. At the expiration of this retention period, the licensed pipelayer shall submit a written request to the DPS for release of the performance bond.

§ 326-10. Permits and approval to connect.

A. For residential and commercial discharges, a permit to construct sewer lines shall be required for construction of the sanitary building sewer, extension of the public sewer main or any other work in relation thereto. The Department of Public Services, Water and Sewer Division, must be notified forty-eight (48) hours prior to actual connection to the system, and the approval to connect will only be considered upon completion of the construction, with the exception of the actual connection, testing, inspection by the Superintendent and when approval to connect is granted by the Massachusetts Division of Water Pollution Control (WPC), if applicable.

B. A state WPC sewer system extension or connection permit is required for any main line extensions or changes in use or flow on main line systems with a valid permit. In addition, any new service connection to an existing permitted main line requires a permit if the discharge is to exceed two thousand (2,000) gallons per day. Any existing permitted service connection planning a change in use or flow must reapply, and any service connection existing prior to May 10, 1979, which is planning an increase in discharge greater than two thousand (2,000) gallons per day over existing discharge must apply for a new permit.

C. For industrial discharges, a separate sewer use discharge permit application must be submitted by the owner, approved by the DPS and also the Massachusetts Water Resources Authority (MWRA) and the Division of Water Pollution Control, prior to submittal of the application for permit to construct sewer lines. An approval to connect shall also be required as stated above.

D. The licensed pipelayer shall be responsible for obtaining all required permits, state and local, as specified by the construction standards for the Town of Ashland. In the event that a state agency or the MWRA enacts additional permit requirements for sewer use, the licensed pipelayer shall be responsible for the additional permits.

E. For residential developments and subdivisions whose sewer mains are to be constructed, Planning Board approved drawings must be submitted with the application. If Planning Board approval is not necessary, plans must be submitted to the DPS by a registered professional engineer, and no public sewer main construction may proceed prior to approval of the application.

F. Within developments or subdivisions, a permit shall be required for the public sewer main construction, and also separate permits shall be required for each sanitary building sewer proposed.

G. Applications for permit to construct sewer lines shall be accompanied by a general layout plan showing the building location and proposed route of the service for approval by the Superintendent.

H. All applications shall be submitted in the name of the individual homeowner or developer and the licensed pipelayer.

I. A nonrefundable fee as set by the Department of Public Services shall be submitted with each application for a permit to construct sewer lines, and permits shall be issued for a period of ninety (90) days, after which time they become null and void.

J. Permits to construct sewer lines shall be subject to revocation at the discretion of the DPS, if, in its opinion, the Ashland Construction Standards and Rules and Regulations are not being strictly adhered to.

K. Permits shall be required for all repair work to the public sewer main or sanitary building sewer, and no permit shall be issued, except in cases of emergency, to dig up or make an excavation in a public way until the applicant files with the Superintendent, contacts Dig-Safe and submits copies of the notices to public utility companies for accurate field locations as required by M.G.L.A. C. 82, § 40.

L. In general, permits for work to be done between November 15 and April 15 will not be issued except under extreme hardship conditions. Permits shall not be transferable, and a change in ownership of a parcel of land to be serviced or a change in the licensed pipelayer shall require a new permit.

M. Sewer use charges shall commence on the date of issue of the permit to construct sewer lines.

§ 326-11. Private developments or subdivisions.

A. The developer shall provide plans and profiles of the proposed work, drawn by a registered professional engineer, using a scale of forty (40) feet to the inch for plan view and forty (40) feet to the inch horizontal and four (4) feet or six (6) feet to the inch vertical for profile. Three (3) copies of plans and profiles of each street or section thereof will be

submitted to the DPS, two (2) of which shall be given to the engineer as submittals for approval of the proposed work.

B. No changes in plans or profiles will be permitted without prior approval of the Superintendent. The developer and licensed pipelayer shall construct the sewer and appurtenances in conformity with the plans and profiles, as approved, and in agreement with these standards. The work shall be done under the observation of the Planning Board Agent (P.B. Agent). A preconstruction meeting with the Superintendent, P.B. Agent, developer and licensed pipelayer in attendance shall be held before material is ordered or work begins.

C. All materials used for construction of the sewage system on the project shall be in strict compliance with these standards and are subject to initial approval by the P.B. Agent and final approval by the Superintendent.

D. The developer shall submit five (5) copies of shop drawings and details of proposed equipment or method of installation for approval by the Superintendent. Defective materials shall be removed from the work and from the job site as soon as notification is received from the Superintendent or the P.B. Agent listing the unacceptable material. Such material shall be replaced by acceptable material from the same or other suppliers.

E. Workmanship on the project shall be subject to approval by the P.B. Agent, and no work may start prior to notification of the Superintendent and the P.B. Agent.

F. Testing and final inspection shall be conducted under the observation of the Superintendent, who shall issue final approval.

G. The developer and his licensed pipelayer shall conform to state and local laws, rules and regulations and the instructions of the DPS and the Superintendent.

H. The developer shall obtain all permits and licenses required by federal, state or local governmental authorities and shall notify Dig-Safe and any underground utility agencies not covered under Dig-Safe of the proposed construction to enable them to mark out their pipes, conduits and other structures and shall notify the Superintendent and the P.B. Agent at least forty-eight (48) hours prior to start of work, after all approvals and permits have been obtained.

I. Upon completion of the construction, including service connections at least to the side line of the roadway layout and backfilling and compaction to road subgrade, the developer or the licensed pipelayer shall be required to conduct an air-pressure test, in the presence of the Superintendent or his agent, as detailed in the Construction Standards and Rules and Regulations of the town. The developer or the licensed pipelayer shall also provide manpower to assist the Superintendent in a visual inspection prior to final acceptance of the line. Methods for repair and replacement of unacceptable construction or damaged material shall be submitted to the Superintendent for approval prior to start of repair work. On PVC public sewer main installations a deflection test must also be conducted.

J. The developer or the licensed pipelayer will supervise and direct the work and will be responsible for the means, methods, techniques, sequences and procedures of construction. The developer or the licensed pipelayer will employ and maintain on the work a qualified supervisor or superintendent who shall have been designated, in writing, by the developer

as the developer's representative at the site. The supervisor shall have full authority to act on behalf of the developer, and all communications given to the supervisor shall be as binding as if given to the developer. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the work.

K. No individual or group of individuals representing the town shall be responsible for the construction means, controls, techniques, sequences, procedures or construction safety.

L. Record (as-built) drawings, obtained and paid for by the applicant, shall be required on all public sewer main construction and shall show both a 40 scale plan view and a profile section, as detailed above, on three-mil Mylar, twenty-two by thirty-four (22 x 34) inches in size. These record drawings shall be prepared by a registered professional engineer and shall, at a minimum, show a plan and profile view, with accurate location and grade of public sewer main, road profile, station of wyes and a minimum of three (3) ties to the sanitary building sewer at the edge of the roadway taking with the depth to the top of the pipe, including location of connection at the building. All roads and easement locations through which sewer is to be laid shall be at the proposed subgrade elevation before pipeline construction starts. The licensed pipelayer or developer is responsible for setting the sewer grades and shall supply all engineering design, field layout, grades, supervision and data for the record drawings, as detailed above. Record drawings must be submitted and approved prior to approval to connect.

ARTICLE III
Construction Methods and Materials

§ 326-12. Work in public ways.

A. Permits.

(1) Highway permit. The licensed pipelayer shall be required to obtain a highway opening permit prior to any excavations within a public way.

(2) State highway permit. When making a sewer connection in a state highway, the necessary permits from the Massachusetts Department of Public Works must be obtained prior to the issuance of a permit to construct sewer lines. All work shall then be done in accordance with the requirements set forth in the permit issued by the Massachusetts Department of Public Works. Any cost in connection therewith shall be borne by the licensed pipelayer.

B. Protection of excavation. All excavation and backfilling shall be done in accordance with these detailed standards herein and in compliance with the highway opening permit. All excavations and obstructions shall be adequately barricaded and protected at all times to provide public safety to the satisfaction of the DPS, an authorized representative of the Highway Division and the Police and Fire Chiefs.

C. Protection of property. Power shovels, bulldozers, loaders, trucks and other equipment shall not be operated on or across sidewalks, berms, curbs, etc., until protection, such as planking or other approved means, has been provided. All damage resulting from the licensed pipelayer's operations shall be repaired by the licensed pipelayer.

D. Resurfacing.

(1) Resurfacing material. Asphaltic concrete and associated materials shall be in compliance with the Massachusetts Department of Public Works Standard Specifications for Highways and Bridges, Section 460, M3.11.00, Class I, Type I-1.

(2) Temporary resurfacing. Asphaltic concrete temporary resurfacing, two-inch depth, shall be required on all excavations within roadway areas and shall be maintained by the licensed pipelayer for a period of three (3) months or until ordered replaced by an authorized representative of the Highway Division.

(3) Permanent resurfacing. Bituminous concrete permanent resurfacing shall be required on all excavations within roadway areas. Depth and type of mix shall be determined by the DPS or an authorized representative of the Highway Division. Prior to placement of permanent resurfacing, edges of existing pavement shall be cut to neat parallel lines and all loose pavement and temporary resurfacing shall be removed to a depth to allow placement of permanent surfacing. Existing edges of pavement shall be coated with RS-1, and sand shall be applied on the surface of the joint.

(4) Failure of the licensed pipelayer to respond to the request of an authorized representative of the Highway Division to complete the work of maintaining temporary resurfacing or to apply permanent resurfacing may result in the revoking of his license.

(5) In the event that the public sewer main or sanitary building sewer crosses existing concrete pavement, sidewalks or driveways, the temporary bituminous patch shall be removed after three (3) months and the paved surface shall be restored with cement concrete pavement, three thousand (3,000) pounds per square inch design mix.

§ 326-13. Excavations.

A. Lines of excavation. The licensed pipelayer shall make all excavations in earth and rock necessary or incidental to construct and inspect the proposed work as shown on the approved construction drawings.

B. Type of excavation. All excavations shall be by open cut, except as otherwise permitted by the Superintendent, and shall be of sufficient width to allow for thorough compaction of the refill material and for the inspection of the work.

C. Field location. It shall be the licensed pipelayer's responsibility to contact Dig-Safe for accurate field locations prior to construction. The licensed pipelayer shall be familiar with and comply with all Massachusetts General Laws relating to excavations, such as M.G.L.A. C. 82, § 40.

D. Underground facilities. It shall be the licensed pipelayer's responsibility to contact all utility companies, the Highway Division, the Water and Sewer Division and any other agency which may have underground facilities within the construction area for accurate field locations prior to construction, and the licensed pipelayer shall mark the location of such utilities so that they may be avoided in the operation of the excavating equipment.

Excavation by hand tools shall be used where required to prevent damage to existing utility lines or other structures.

E. Discharge. The licensed pipelayer shall provide suitable temporary channels for the flow of all watercourses and shall hold the town harmless against all claims for damages growing out of obstruction to the flow in sewers, drains or gutters or because of injury to gas, water or other pipes or conduits or fixtures relating to the same, and he shall give sufficient notice to the proprietors of such pipes or fixtures in time to permit them to cooperate in protecting their property.

F. Ledge measurement. Where ledge rock is encountered, the licensed pipelayer shall take accurate measurements relating the top surface of the ledge to the proposed invert of the pipe or the bottom of other structures. This information shall be recorded and made available to his engineer for use in completing the record drawings.

G. Explosives. The removal of ledge shall be accomplished by licensed individuals, and the licensed pipelayer shall obtain the necessary permits before the blasting occurs. The handling, storage and use of explosives shall be in accordance with the requirements of M.G.L.A. C. 148, §§ 10 to 27, inclusive, latest revisions or additions thereto. The licensed pipelayer shall furnish and place any blasting mats as may be required to perform the work safely.

H. Trench support. The licensed pipelayer shall furnish and place such sheeting and bracing as may be required to perform the work safely and shall leave in place, if ordered by the Superintendent, that portion necessary to maintain the base fill material and the walls of the excavation during and after the backfilling process has been completed. The use of a steel support box may be used in place of sheeting and bracing.

I. Excavation below grade. The licensed pipelayer shall remove unsuitable foundation material under the pipelines and refill it with bank gravel, screened gravel or concrete, as ordered by the Superintendent. Sheeting, if necessary, to contain the refill material shall be furnished, installed and left in place at the order of the Superintendent.

J. Control of water. Dewatering of the area in which work will be done, including pump station sites, will be the responsibility of the licensed pipelayer, using pumps of sufficient capacity to lower the water table in the immediate trench area to a level below excavation.

K. Existing pavement. Trench excavation in existing public ways shall be subject to the requirements of the Construction Standards and Rules and Regulations of the town. Excavation in streets having an improved pavement shall be preceded by cutting the existing pavement to ensure that pavement beyond the trench limits will not be disturbed. Before resurfacing, the edges of the pavement shall be inspected and recut if found to be broken or ragged. The licensed pipelayer shall furnish all materials and do all the work necessary to restore the paved surface to its original condition, with depth and type of mix to be determined by the authorized representative of the Highway Division. The work shall be subject to inspection and approval of the authorized representative of the Highway Division.

§ 326-14. Backfilling.

A. General. The trenches and other excavations shall be backfilled as soon as possible after laying the pipe or the completion of other structures. No backfilling shall be done until the Superintendent has inspected the work.

B. Placement. The area below the pipe and extending to six (6) inches above the crown of PVC pipe and D.I. pipe shall be backfilled with compacted granular material, as specified under pipe laying, and thoroughly tamped by light tampers as placed. The remainder of the side fill to a minimum depth of twenty-four (24) inches above the top of pipe shall be a select, fine ordinary borrow material, approved for such use by the Superintendent, placed in twelve-inch layers and compacted by hand tamping. No stones larger than three (3) inches across the largest dimension will be allowed within this stratum of backfill.

C. Compaction.

(1) The remainder of backfill to the surface of the ground or to the bottom of the gravel subbase in roadway locations shall be ordinary borrow, approved by the Superintendent, placed in twelve-inch layers and thoroughly compacted by mechanical rammers or vibrators. No rock larger than twelve (12) inches in diameter will be allowed within this stratum of backfill, and all voids within rock backfill must be completely filled. Alternate methods for compaction within this stratum presented by the licensed pipelayer will be considered by the Superintendent, and the licensed pipelayer shall be required to demonstrate to the Superintendent's satisfaction that his proposed method of compaction will produce the intended results for the various conditions and materials encountered.

(2) Alternate compaction. Approval of this alternative method of compaction will not relieve the licensed pipelayer of his responsibilities in regard to maintenance of settled trenches. The responsibility for proper bedding of the pipe shall be the licensed pipelayer's, and pipe failures due to improper bedding or compaction shall be removed and replaced.

D. Subbase. For trenches within roadways, the top eighteen (18) inches of backfill shall be bank gravel, placed and compacted during backfilling operation. The licensed pipelayer shall fine grade the gravel surface, apply dust control treatment and maintain the surface in a condition which will allow normal vehicular traffic until temporary resurfacing is installed.

§ 326-15. Pipe materials.

A. PVC pipe. Pipe and fittings for main sewer pipe may be polyvinyl chloride (PVC) made by a manufacturer of established reputation, meeting the requirements of ASTM-D-3033 or D-3034-77 or the latest revision thereto, with a pipe diameter to wall thickness ratio (SDR) of thirty-five (35). Maximum pipe length shall be thirteen (13) feet with elastomeric ring, bell and spigot style joint, meeting the requirements of ASTM-D3212-76 or the latest revision thereto.

B. Laterals. Pipe and fittings for laterals shall be polyvinyl chloride (PVC), six (6) inches in size and meeting the same requirements as for the main pipe. Fittings shall be molded

one-piece construction, and a PVC cap, designed for use on the bell end of the pipe, shall be used where necessary.

C. Force mains. Pipe for sewer force mains shall be ductile iron (D.I.) push-on joint, meeting the requirements of ANSI A21.51-76 (AWWA C151-76) or the latest revision thereto, thickness Class 52, within the immediate area of the pump station. Force mains beyond the limits of the pump station shall be Class 50, cement-lined, tar-coated and sealed.

D. Fittings. Fittings for ductile iron pipe shall be manufactured of ductile iron, mechanical joint, all bell, compact design, rated for three hundred fifty (350) pounds per square inch. Fittings shall meet or exceed the requirements of ANSI-A21.53-1984 and shall be cast with the following identifying designations: Class C153, pressure rating three hundred fifty (350), opening diameter, manufacturer's identification, country where cast, degree of bend and D.I. or ductile. Ductile iron fittings that are not presently manufactured to the compact design but are manufactured to meet or exceed the requirements of ANSI A21.10-1971 (AWWA C110-7) standard for cast-iron fittings, or the latest revision thereto may be utilized. Mechanical joints for fittings shall meet or exceed the requirements of ANSI A21.11 (AWWA C111), including bituminous-coated glands, rubber ring and T-head bolts.

E. Retainer glands. Retainer glands for all ductile iron main bends shall be cast of high-strength ductile iron and fitted with cap joint, square head and double-heat-treated-steel set screws. The quantity of screws shall be as recommended by the manufacturer of the gland.

F. D.I. gravity sewer pipe. In areas where ductile iron gravity sewer pipe is required, i.e., shallow trenches three and five-tenths (3.5) feet or less or depths greater than thirteen and zero-tenths (13.0) feet in the immediate area of water supplies or recreational areas, the licensed pipelayer shall furnish and install Class 50 ductile iron pipe and ductile iron tees or wyes for sanitary building sewer connections, with mechanical joints. A mechanical joint plug or cap shall be furnished and installed on the lateral at the roadway taking line to allow air testing of the system. Alternative materials will be considered for shallow or deep trench conditions, if appropriate design data and installation methodology is submitted to substantiate the choice of materials.

G. Sanitary building sewer connections. Wyes shall be required for all sanitary building sewer connections to the public sewer main and shall be the same type of material and manufacture as the pipe. Connections to an existing public sewer main shall be accomplished by the use of a cast-iron saddle with stainless steel strap and bolts.

§ 326-16. Public sewer main installation.

A. Alignment. The licensed pipelayer shall provide such engineering services as may be required to ensure that the pipelines are constructed in accordance with the approved drawings. Engineering services provided by the developer or licensed pipelayer shall include the establishment of lines and the setting of grades. Pipe installed which does not conform to the approved drawings shall be removed and reinstalled at the developer's or licensed pipelayer's expense. Laser beam aligning equipment will be permitted on sewer main construction if the licensed pipelayer demonstrates that the equipment and operators can produce the required line and grade of the public sewer main.

B. Handling. All pipe shall be handled carefully to avoid injury to workmen, other structures or to the pipe itself. Only equipment or methods approved by the Superintendent shall be employed in handling pipe. Pipe or fittings damaged for whatever reason shall be removed from the job site immediately.

C. Protection of pipe. If PVC pipe is used, care shall be taken to stack the pipe properly and, if stored for a period exceeding sixty (60) days exposed to the ultraviolet rays of the sun, pipe shall be covered with canvas or other opaque material, and provision for the circulation of air beneath the covering shall be provided.

D. Condition of pipe. PVC pipe must be straight barrel, and deflection prior to installation is not to exceed one-sixteenth (1/16) inch per two-foot length. Pipe not meeting this requirement shall not be installed and shall be removed from the construction site.

E. Trench bottom. All pipe shall be laid on a stable foundation to prevent settlement. If soft or unsatisfactory material is found at grade, it shall be removed and replaced with other material to provide an adequate foundation.

F. Bedding. In general, the bottom of the trench shall be excavated to a depth of four (4) inches below the bottom of the pipe barrel for PVC pipe and D.I. pipe placed for all gravity mains, force mains and laterals. The granular bedding shall be washed screened gravel or crushed stone, ranging in size from one-half (1/2) to one (1) inch. After the pipe has been set to line and grade, additional granular material of the same size and characteristics shall be lightly tamped in place to an elevation equal to a point six (6) inches above the crown of PVC pipe. The granular material around the pipe shall also be placed the full width of the trench, as excavated, or to the inside surfaces of the sheeting which is required to contain the foundation material in unstable trenches.

G. Backfilling. Material for backfilling to a point twenty-four (24) inches above the crown of the pipe shall be select borrow, containing no large stones, loam, clay or other substances unsuitable for backfill material. Select borrow shall be placed in layers suitably tamped to the side limits of the trench as excavated. Material from a point twenty-four (24) inches above the crown of the pipe to a point eighteen (18) inches below subgrade, within roadway locations, shall be ordinary borrow, placed in layers and thoroughly tamped. No rock fragment larger than twelve (12) inches in diameter will be permitted within this section of backfill. The top eighteen (18) inches of the trench shall be backfilled with road grade bank gravel which, when compacted in place, will form a suitable foundation for the base course of road surfacing.

H. Rock trenches. Similar bedding shall be provided in rock trenches, except that there shall be six (6) inches clear under the pipe to the rock surface and nine (9) inches clear on each side. Under no circumstances will the pipe be permitted to bear directly on the rock.

I. Jointing. Polyvinyl chloride (PVC) pipe shall be bell-and-spigot-type joint, with elastomeric ring supplied by the pipe manufacturer. Immediately prior to jointing, the spigot, bell and gasket shall be thoroughly cleaned and a lubricant supplied by the pipe manufacturer applied. Extreme care shall be exercised during the jointing process to ensure that the pipe is in the correct position within the bell. Pullers or other types of mechanical equipment shall not be allowed, preventing the possibility of splitting or deforming the joint.

J. Ductile iron pipe shall be push-on-type joint with rubber gasket. Prior to assembly, the bell and spigot shall be cleaned of foreign matter and a lubricant applied. Cut sections of pipe shall have the spigot end filed to a slight taper to prevent damage to the gasket. The pipe shall be aligned both horizontally and vertically and forced into position with deflection, if necessary, accomplished after the joint is assembled and within the manufacturer's allowable tolerances.

K. Maintenance of pipe. Care shall be taken by the licensed pipelayer to exclude mud and/or water containing dirt from entering the pipelines. Temporary plugs shall be installed, and the licensed pipelayer shall weight the pipes or backfill if inspection has been made to prevent flotation from water in the trench.

L. Ductile iron (D.I.) fittings shall be mechanical-joint type. Prior to assembly all foreign matter shall be removed from the bell and spigot and the gland and gasket placed and the spigot carefully inserted into the bell. The joint shall be assembled and bolts tightened in an altering sequence to a final torque of seventy-five (75) to ninety (90) foot-pounds. Deflection shall be accomplished after the joint is assembled.

§ 326-17. Sanitary building sewer installation.

A. General. Sanitary building sewers will not be allowed to have more than two (2) angle points or a total angular deviation of one hundred eighty degrees (180°) unless granted variance by the Superintendent. Cleanouts shall be constructed as shown on the attached drawings[1] and shall consist of a wye, forty-five-degree, horizontal bend PVC piping and a cast-iron cap and a rubber insert with stainless steel clamps to provide an absolutely watertight installation. Under certain circumstances, manholes may be used in place of cleanouts, if approved by the Superintendent.

B. Backwater valves are to be installed as shown on the attached drawings for each sanitary building sewer installation.[2] The backwater valve shall be six (6) inches in size and constructed of PVC with solvent-welded joints to six-inch SDR 35 PVC sewer pipe.

C. Special conditions. Sanitary building sewers in excess of one hundred (100) feet in length are subject to review by the Superintendent and other requirements as may be found necessary to assure a functional connection.

D. Excavation and backfill shall be typical as detailed for main sewer installation, and no backfilling shall be permitted until the Superintendent has inspected and approved the installation.

E. Pipe elevation. All sanitary building sewer pipe shall be laid to a minimum slope of one-fourth (¼) inch per foot unless otherwise approved by the Superintendent. The sanitary building sewer should be brought to the building on a uniform slope and at an elevation appropriate to the connection with the existing sanitary building drain. In any building in

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[1] **Editor's Note: Said drawings are on file in the Town Clerk's office, the Department of Public Services, the Planning Office and the office of the Building Inspector and may be examined there during regular business hours.**

[2] **Editor's Note: Said drawings are on file in the Town Clerk's office, the Department of Public Services, the Planning Office and the office of the Building Inspector and may be examined there during regular office hours.**

which the building drain is too low to permit gravity flow to the public sewer, sanitary sewage carried by such building drain may be lifted by an approved means and discharged to the sanitary building sewer.

F. Existing septic system. Sanitary building sewers connected to existing septic system piping shall be made on the building side of the septic tank and the tank or cesspool pumped dry and removed or refilled with approved material. Connection to existing pipe shall be accomplished with rubber adaptor couplings and stainless steel clamps, designed specifically for the type of application intended.

G. Additional connections. No direct or indirect connection will be allowed between the sanitary building sewer and roof drains, foundation drains, cellar drains, sump pump or other sources of surface runoff groundwater.

H. Approval to connect. Actual connection of the sanitary building drain (wastewater plumbing) to the sanitary building sewer may not be accomplished prior to an approval to connect from the DPS. An additional fee as set by the Department of Public Services for existing structures or for new structures must be submitted with the permit application for each tap to be made by the contractor. If a sanitary building sewer must be connected directly to the public sewer main, the licensed pipelayer shall carefully excavate, dewater and expose the main, supply the cast-iron saddle with a stainless steel retainer strap and conduct the actual tapping to the main under the Superintendent's supervision.

§ 326-18. Chimneys.

A. General. Chimneys shall be constructed at locations required by the depth of the sewer main and as approved by the Superintendent. The chimney may consist of a PVC tee or ninety-degree saddle, forty-five-degree PVC bend, PVC riser pipe with field cut end, a PVC adapter and a ninety-degree PVC elbow. The entire assembly is to be encased in Class B concrete, reinforced as shown on the standard drawing. At the top of the chimney, a PVC tee may be substituted for the ninety-degree elbow if the chimney is to serve dual use.

B. Sonotube. The use of a twenty-four-inch diameter sonotube for a vertical concrete form will be permitted. Form work for the concrete section at the main sewer will be constructed to the lines shown on the standard drawing. In constructing the concrete encasement, forms shall be placed so that the weight of the chimney shall bear directly on the foundation material and not on the sewer main. A flexible joint, approved by the Superintendent, shall be installed a minimum distance of twenty-four (24) inches from the vertical face of the concrete.

C. Precast chimneys. The contractor may option to use a precast chimney, which shall be constructed similar to that as specified for a cast-in-place unit. The precast unit shall consist of six-inch PVC pipe encased in concrete, cast in vertical sections, with O-ring neoprene gaskets and a noncorrosive mechanical clamping mechanism. The unit shall straddle the sewer main, carrying the weight of the unit directly to the trench. The unit shall consist of a base section and a top section, with an intermediate section varying in height from one (1) foot to four (4) feet. The top and bottom sections shall contain a neoprene water stop around PVC fitting to prevent entry of groundwater.

§ 326-19. Force mains.

A. Type of pipe. Force mains may be ductile iron push-on joint pipe, furnished and installed by the licensed pipelayer, from lift and pump stations to point of discharge. D.I. pipe shall be Class 52, cement-lined, tar-coated and sealed, with mechanical joint fittings installed with concrete thrust blocks and retainer glands.

B. Combination trenches. In combination trenches, gravity sewer and force main, the force main shall be laid on a shelf excavated in the side of the trench with the main (gravity) sewer, with a minimum cover of four (4) feet six (6) inches. If, because of the depth of cut of the gravity sewer or material encountered, the excavation of a shelf proves to be impractical, the developer shall excavate separate adjacent trenches for the two (2) pipes.

C. Joints. Mechanical joints shall be made up using a torque wrench set at seventy-five (75) foot-pounds, with the nuts and bolts tightened in an alternating sequence. Jointing of ductile iron pipe shall be typical as detailed in § 326-16, Public sewer main installation.

§ 326-20. Pumping stations.

All plans for sewage pumping or ejector stations proposed for use shall be submitted to the DPS for approval prior to ordering, purchase or installation. Three (3) sets of plans shall be submitted to the DPS, two (2) sets to be transferred to the engineer for review and the final set for the DPS file.

§ 326-21. Manholes.

A. Construction. Manholes shall be constructed of reinforced precast concrete monolithic base sections, barrel sections and dome sections and shall meet the applicable requirements of ASTM Specification C478-7OT, latest revision, design based upon H-20 loadings. All manholes delivered to the site must be approved by the Superintendent. In general, reasons for rejection will include, but not be limited to, porous or cracked walls, misformed joints and pipe connectors which vary more than one (1) inch from those indicated on the plans. Rejected manholes shall be removed from the site by the licensed pipelayer.

B. Preliminary inspection. All precast manhole sections shall be delivered to the construction site without exterior coatings. Upon on-site approval by the Superintendent, the licensed pipelayer shall apply, by roller or brush, a heavy application of emulsified asphalt waterproofing compound.

C. Pipe-to-manhole connection shall be made with a flexible rubber boot and stainless steel clamp. The flexible rubber boot pipe-to-manhole connector shall be installed during manufacture of precast manhole sections and shall include a stainless steel screw clamp designed specifically for use on the size and type of pipe utilized on the project. If PVC pipe is used, a continuous bead of silicone shall be applied to the inside of the boot at the clamp location prior to installation of the pipe.

D. Manhole installation. The licensed pipelayer shall excavate to a depth of six (6) inches below the bottom of the manhole base, compact and fine grade and install washed screened gravel subbase material. The base section shall be placed to grade and the pipes connected.

Pipes shall extend approximately one (1) inch inside the interior wall, with clamps on the connector tightened and mortar troweled on the inside face of the manhole-to-pipe connection.

E. Inverts and table shall be constructed of red clay brick with mortar joints. Care shall be taken in construction of brick inverts that the width of the invert shall be slightly larger than the inside diameter of the larger of the pipes entering the manhole wall. Bricks shall be laid in a full bed of mortar with push joints, and all brick shall be thoroughly wet immediately before laying.

F. Mortar shall be made of one (1) part of portland cement and two (2) parts of clean fine sand, well mixed and tempered. Water shall be clean and free from impurities affecting its value. Sand and cement shall be first thoroughly mixed dry and only enough water added to make the mortar uniform and workable. No greater quantity of mortar is to be prepared than is required for immediate use and it shall be constantly worked until used. Any mortar that has once set shall not be tempered and used in the work.

G. Red clay brick for table, invert and grade adjusting courses shall be hard burned of uniform Grade B. Red clay brick shall be laid with all joints completely filled with mortar and the inside and outside faces covered with mortar and troweled smooth. The maximum height allowable for grade adjustment of the manhole frame with the brick masonry shall be twelve (12) inches.

H. Manhole joints. The joint between the base section and the barrel section shall be brushed clean and a strip of butyl rubber shall be placed completely around the joint prior to placement of the barrel section. Once the barrel section has been placed, a timber shall be placed across the top of the section and a controlled downward pressure shall be applied with the hydraulic excavating machine to the complete joint. The same method shall be used in making the joints between the remaining barrel section and dome section. Precast concrete flat slab top sections shall be used if height limitations prohibit the use of a dome section.

I. Manhole steps shall be aluminum alloy 6061 T6, extruded, safety-type, cast in place, twelve (12) inches on center, in the barrel and dome sections, and the portion of the step imbedded in concrete, plus two (2) inches, shall be coated with aluminum oxide. Steps may also be constructed of continuous grade 60 steel bar, three-eighths (⅜) inch outside diameter, molded within polypropylene plastic with a safety tread surface. All interior steps shall be installed during manhole manufacture.

J. Manhole table. The table shall be constructed at an elevation even with the top of the pipe and shall slope up toward side walls. Inverts shall be constructed in a manner to provide smooth flow through manholes, with no sharp turns or projecting portions of brick. Bottom sections of straight line manhole inverts may be constructed using one-half (½) section of pipe cut longitudinally and carefully set to grade, upon approval of the Superintendent. The half-pipe section must be securely braced during installation of concrete fill around the invert to prevent flotation. Brick for inverts shall be placed on edge and laid flat for table.

K. Sealing of joints. Once the manhole has been assembled and prior to backfill, hydraulic cement shall be applied to all lift holes and manhole joints, including exterior boot-to-manhole joint.

L. Backfilling. Once the vacuum test has been completed, select ordinary borrow shall be backfilled around the manhole, with no stone larger than three (3) inches within eighteen (18) inches of the concrete wall. Material shall be placed leveled and compacted in twelve-inch lifts.

M. Castings. Cast-iron frames and covers shall meet the requirements of ASTM Specification for Grey Iron Castings, Cast Iron Class 20. All castings shall be clean and without blow holes, sand holes or defects of any kind. Plugging of such holes will be cause for rejection, and the castings shall not vary more than five percent (5%) from the weight calculated for the cubic content indicated by the shop drawings, with iron at four hundred fifty (450) pounds per cubic foot. The acceptance of any casting varying more than five percent (5%) will be at the option of the Superintendent.

N. Casting preparation. The cast-iron manhole frames and covers shall be carefully cleaned of all rust, dirt and scale, and while free and clean from rust shall be given a full coat of coal tar pitch varnish applied hot and satisfactory in quality to the Superintendent. The finish of the castings as delivered shall be satisfactory to the Superintendent, and any rusted or uncovered surfaces shall be the cause of rejection of the castings until the same have been refinished.

O. Casting fit. Manhole covers must fit the frames with clearances as shown on the standard drawing. The underside of the cover and upper side of the lip of the frame must present parallel plane surfaces, and at these points of contact, the frames and covers must be machined to prevent the covers from rocking in the frames under traffic conditions. Covers shall bear evenly on the frames for the entire circumference and be interchangeable with other frames. Frames shall be set upon a full bed of mortar, and the mortar shall be brought up alongside of the frame to provide a watertight joint.

P. Casting manufacturer. Standard frames and covers shall be as manufactured by LeBaron Foundry Company, Model LT-101, Mechanics Iron Foundry Company, Model K 6004, or C.M. White Iron Works, Model R-258, and, in general, be eight (8) inches in height with a twenty-two-inch clear opening.

Q. Watertight castings. Watertight frames and covers shall be as manufactured by LeBaron Foundry Company, Model LBW 268-2, Type BW, C.M. White Iron Works or Mechanics Iron Foundry Company, or equal. In general, the frame shall be eight (8) inches high with a twenty-two-inch clear opening, complete with interior cover, locking bar and sealed seating surfaces. Watertight frames and covers shall be used where required by the design approved by the DPS. Frames shall be set upon a full bed of mortar, and mortar shall be brought up alongside of the frame to provide a watertight joint.

R. Drop inlet. Manhole drop inlets, if approved, shall be constructed utilizing standard SDR 35 PVC sewer pipe and fittings, as shown on the detail drawings located in the Appendix.[3] The piping shall be connected to the manhole utilizing the rubber boots, fully assembled and then encased in concrete, carrying concrete to stable base at trench bottom. A brick dam shall be placed in upper pipe to prevent overflow, which can be easily removed to service pipe. The size of the horizontal pipe shall match the incoming pipe. The use of a

[3] **Editor's Note: The Appendix is on file in the Town Clerk's office, the Department of Public Services, the Planning Office and the office of the Building Inspector and may be examined there during regular office hours.**

drop inlet at the manhole will not be approved without submittal of data justifying the necessity of a drop inlet rather than a direct inlet.

S. General. The maximum allowable distance between manholes shall be no greater than three hundred (300) feet. All manholes constructed shall be tested as detailed in § 326-22.

§ 326-22. Testing.

A. General. Gravity sewer mains, both polyvinyl chloride (PVC) and ductile iron (D.I.), including sanitary building sewers from the main to the side line of the roadway layout, shall be air-tested for leakage after backfilling and compaction to road subgrade has been completed. The equipment and method used to conduct the air test will be subject to prior approval by the Superintendent.

B. Test guidelines. All testing shall be done by an individual or company experienced and equipped in this type of work. A certification of the test results shall be required for each section between manholes, with the stationing corresponding to the submitted plans. The Superintendent shall be notified forty-eight (48) hours in advance of testing. At no time shall construction proceed further than two thousand (2,000) feet from the last section tested.

C. Gravity main test. In general, a section between two (2) manholes shall be isolated by inflatable plugs. Air shall be introduced into the pipeline to an internal pressure four (4) pounds per square inch gauge greater than the average back pressure of the groundwater or an increase of four hundred thirty-four thousandths (.434) pounds per square inch for each foot of water above the top of the pipe. After stabilizing the pressure at three and five-tenths (3.5) pounds per square inch gauge, plus the adjustment to compensate for the exterior head of water, the air line shall be disconnected and the pressure drop, if any, observed. The line shall be termed acceptable if the time required, in minutes, for the pressure to reduce to the allowable residual pressure is not less than one (1) minute per inch diameter. The licensed pipelayer shall supply all equipment and labor necessary to assist the Superintendent in this test.

Air-Testing Chart

Groundwater Above Pipe (feet)	Pressure Adjustment (pounds per square inch)	Initial Pressure (pounds per square inch)	Stabilized Pressure (pounds per square inch)	Allowable Residual Pressure (pounds per square inch)
0.0	0.0	4.0	3.5	2.5
1.0	0.43	4.43	3.93	2.93
2.0	0.87	4.87	4.37	3.37
3.0	1.30	5.30	4.80	3.80
4.0	1.74	5.74	5.24	4.24
5.0	2.17	6.17	5.67	4.67
6.0	2.60	6.60	6.10	5.10

NOTE: Elapsed time for pressure to reduce to the allowable pressure should not be less than one and zero-tenths (1.0) minute per inch diameter of the particular pipe being tested.

D. Unacceptable pipe. The licensed pipelayer shall submit to the Superintendent a record of the location and cause of each leak encountered, along with his method for replacement or repair prior to completion of the work after completion of repair. A second test shall be made to determine the acceptability of the work after the completion of repair. In general, pipe which fails the air test shall be replaced, but under certain circumstances, upon approval of the Superintendent, a stainless steel band-type clamp, designed for pressure service, may be used. The minimum width of the clamp shall be fifteen (15) inches, and band and bolts shall be stainless steel.

E. Cleanup. A visual inspection by the Superintendent shall also be required on all main sewer pipe installed, and the interior of the sewer pipeline shall be thoroughly cleaned from construction debris or foreign matter. Bulkheads shall be installed at the outlet side of the manholes sufficient to prevent the wash of mud or dirt into the completed section of pipeline and, upon completion of the entire line, shall be left free and clear of such debris and the bulkheads removed.

F. Deflection test. All PVC main line pipe shall be checked for deflection after backfilling and compaction is complete, but at no time shall construction proceed further than two thousand (2,000) linear feet from the last section tested. The pipeline to be checked shall be thoroughly cleaned and plugged. A mandrel shall be pulled through the pipe to check overall deflection, and the pipe through which a mandrel cannot be pulled without extreme force shall be considered failed. The mandrel shall have an outside diameter seven percent (7%) less than the pipe inside diameter and shall be supplied by the pipe manufacturer for this purpose. Pipe which has deflected more than seven percent (7%) shall be excavated and replaced or backfill around the pipe compacted to provide adequate support and the pipe retested. Deflection shall be computed by multiplying the amount of deflection (nominal diameter less minimum diameter when measured) by one hundred (100) and dividing by the nominal diameter of the pipe.

G. Television inspection. All main line pipe shall be television-tested upon completion of backfilling and compaction. This testing shall be done by a company specializing in this type of work, with a minimum of three (3) years' experience. The camera shall be drawn through the pipe, with a color image projected upon a color video screen, which includes a distance meter. Photographs of all defects, faults, imperfections, points of infiltration, etc., shall be taken and submitted to the Superintendent in duplicate. A written report shall also be submitted in duplicate, broken into sections between manholes, including stations of all manholes, wyes, imperfections, defects, faults, points of filtration, horizontal or vertical misalignment of pipe, condition of manholes, etc.

H. Force main and siphon test.

(1) Ductile iron force main and siphon pipe shall be tested hydraulically, by slowly filling the line with water and expelling the air at the discharge end of the force main and all points of high elevation along the force main. The discharge end shall then be plugged and blocked and the hydrostatic pressure increased to one and five-tenths (1.5) times the working pressure. Each section of pipeline shall be slowly filled with water with the specified test pressure measured at the point of lowest elevation. The amount of water added to the line to maintain this pressure within five (5) pounds per square

inch shall be metered, and if the amount added exceeds the amount determined by the formula below, the test shall be considered a failure.

$$L = (S \times D \times P^{0.5})/133{,}200$$

Where:

L = Allowance leakage in gallons per hour.
S = The length of pipe tested in feet.
D = The nominal diameter of the pipe in inches.
P = The average test pressure during the leakage test in pounds per square inch.

(2) The licensed pipelayer shall locate the leak or leaks and, after obtaining prior approval as to method and materials for making the repair from the Superintendent, shall repair the leak(s) until the line meets the testing approval criteria.

I. Manhole vacuum test.

(1) The licensed pipelayer shall conduct a vacuum test on all manholes prior to backfilling. All openings shall be plugged with hydraulic cement, and suitable plugs shall be inserted in pipes. All equipment and manpower for the test shall be supplied by the licensed pipelayer and equipment shall be manufactured for that purpose. An initial vacuum of ten (10) inches Hg shall be drawn. The test time shall be determined by that time required for the pressure to drop from ten (10) inches mercury to nine (9) inches mercury. Allowable test times are given below:

Depth of Manhole (feet)	Minimum Test Time
0 to 10	1 minute
10.1 to 15	1 minute 15 seconds
15.1 to 25	1 minute 30 seconds

(2) Vacuum test failure. Manholes which fail to meet the above minimum test times shall be repaired using methods approved by the Superintendent. Manholes shall then be retested using the vacuum test. Following a second vacuum test failure, it shall be uncovered, disassembled, reconstructed or replaced as directed by the Superintendent. The manhole shall be retested by the vacuum test.

§ 326-23. Miscellaneous structures and materials.

A. General. Approval drawings shall be submitted by the developer or licensed pipelayer for all structures or appurtenances which shall eventually be connected to the municipal sewer system, such as pump or ejector station, auxiliary power units for station, etc. Drawings for special sewer construction, such as inverted siphons, culverts or stream crossings, drain crossings, railroad or state highway crossings, etc., shall also be submitted for approval.

B. Bank gravel furnished and placed by the licensed pipelayer shall consist of inert material that is hard durable stone and coarse sand, free from loam and clay, surface coatings and deleterious materials, and shall meet or exceed the specifications for gravel borrow listed

under Section M1.03.0 of the 1973 Massachusetts Department of Public Works Standard Specifications for Highways and Bridges or the latest revision thereto.

C. Washed screen gravel furnished and placed by the licensed pipe layer shall be washed and graded bank-run gravel or crushed stone ranging in size from one-half (½) inch to one (1) inch and shall be hard, durable and reasonably free from flat or laminated particles so as to furnish a free-draining gravel base for sewer construction or other foundation as directed by the Superintendent.

D. Ordinary borrow furnished and placed by the licensed pipelayer shall be material suitable for trench refill, as approved by the Superintendent, conducive to compaction by the method of consolidation approved for use on the project, free of stones larger than twelve (12) inches in diameter, free from loam and clay, surface coatings and deleterious materials and meeting or exceeding state Department of Public Works Classification M1.01.0.

E. Concrete masonry shall be used for thrust blocking, foundation material, pipe cradles, half-section or full-section, manhole drop inlet or chimney encasement or as otherwise directed by the Superintendent. Concrete shall be mixed using portland cement, crushed stone and clean hard sand with enough clean water to ensure proper mixing. Concrete may be job mixed or ready mixed, a nominal one-to-two-and-five-tenths-to-five mix, and shall contain not less than four and five-tenths (4.5) bags of cement per cubic yard. Steel reinforcement indicated on standard sewer construction drawing[4] shall be deformed bars of approved type and structural quality free from dirt or rust and shall be bent as required and accurately placed with depth of cover not less than two (2) inches.

ARTICLE IV
Use of Public Sewers

§ 326-24. Use required.

A. It shall be unlawful for any person to place, deposit or permit to be deposited in any manner on public or private property within the town or in any area under the jurisdiction of said town any human or animal excrement, garbage or other objectionable waste.

B. It shall be unlawful to discharge to any natural outlet within the Town of Ashland or in any area under the jurisdiction of said town any sewage or other polluted waters except where suitable treatment has been provided in accordance with subsequent provisions of Article IV.

C. Except as hereinafter provided, it shall be unlawful to construct or maintain any privy, privy vault, septic tank, cesspool or other facility intended or used for the disposal of sewage. (See § 326-25.)

D. The owners of all houses, buildings or properties used for human occupancy, employment, recreation or other purposes, situated within the town and abutting on any street, alley or right-of-way in which there is located a public sanitary sewer of the town, are hereby required, at their expense, to install suitable toilet facilities therein and to connect such

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4 **Editor's Note: Said drawings are on file in the Town Clerk's office, the Department of Public Services, the Planning Office and the office of the Building Inspector and may be examined there during regular office hours.**

facilities directly to the proper public sewer in accordance with the provisions of this chapter, within ninety (90) days after date of official notice to do so, provided that said public sewer is within one hundred (100) feet of the property line, unless prevented by topographical or other reasons.

§ 326-25. Private sewage disposal.

A. Where a public sanitary sewer is not available under the provisions of § 326-24D, the building sewer shall be connected to a private sewage disposal system complying with the requirements of the Board of Health of the Town of Ashland.

B. No septage shall be discharged into the sanitary sewer system unless in conformance with the permit granted to the Town of Ashland by the MWRA. In no case shall septage containing industrial or incompatible wastes be discharged into the sanitary sewer system. As of July 1, 1984, no septage which originates outside of the MWRA shall be accepted for disposal into the sanitary sewer system.

C. Fines. **[Added 5-26-1993 ATM by Art. 8]**

(1) Failure to maintain grease traps. Fine: one hundred dollars ($100) per violation.

(2) Illegally connected sump pumps [360CRM 10.006(2)]. Fine: one hundred dollars ($100) per day.

§ 326-26. Building sewers and connections.

A. No authorized person shall uncover, make any connections with or opening into, use, alter or disturb any public sewer or appurtenance thereof without first obtaining a written permit to construct sewer lines from the DPS. All the work related to the installation of sanitary building sewers and the connection to the public sewers shall be performed by persons licensed by the Ashland DPS.

B. Service connections; permits; fees.

(1) There are two (2) classes of service connections: for residential and commercial service and for service to establishments producing industrial wastes. In either case, the owner or his agent shall make an application on a special form furnished by the town. The application for permit to construct sewer lines[5] shall be supplemented by plans, specifications or other information considered pertinent in the judgment of the DPS. (See § 326-10 for applicable permits.) Connection and inspection fees shall be as set by the Department of Public Services.

(2) One (1) copy of the permit shall be available for inspection at all times at the site of the work.

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[5] **Editor's Note: Said application for permit to construct sewer lines is on file in the Town Clerk's office, the Department of Public Services, the Planning Office and the office of the Building Inspector and may be examined there during regular office hours.**

C. All costs and expense incident to the installation and connection of the sanitary building sewer shall be borne by the owner. The owner shall indemnify the town from any loss or damage that may, directly or indirectly, be occasioned by the installation of the sanitary building sewer.

D. A separate and independent sanitary building sewer shall be provided for every building, except where one building stands at the rear of another on an interior lot and no private sewer is available or can be constructed to the rear sanitary building through an adjoining alley, court, yard or driveway. The building sewer from the front building may be extended to the rear building, if approved by the DPS.

E. Old building sewers or portions thereof may be used in connection with new buildings only when they are found, on examination and test by the DPS, to meet all requirements of this chapter. At the discretion of the DPS, the owner may be required to conduct, at his expense, an internal television inspection of the existing sewer to verify the condition and suitability of the same.

F. Where possible, the sanitary building sewer shall be brought from the street (public sewer main) to the building at an elevation below the basement floor. In all buildings in which any building drain is too low to permit gravity flow to the public sewer, sanitary sewage carried by such building drain shall be lifted by an approved means and discharged to the sanitary building sewer.

G. The size, slope, alignment, materials of construction of a sanitary building sewer and the methods to be used in excavating, placing of the pipe, jointing, testing and backfilling the trench shall all conform to the requirements of the Building and Plumbing Codes[6] and the latest edition of the construction standards for the Town of Ashland.

H. The size and slope of the sanitary building sewer shall be subject to the approval of the DPS, but in no event shall the diameter be less than six (6) inches. The slope of such six-inch pipe shall not be less than one-fourth (¼) inch per foot, unless otherwise permitted.

I. The applicant for the sanitary building sewer permit shall notify the DPS when the building sewer is ready for inspection and connection to the public sewer. The connection shall be made by the applicant, using materials supplied by the applicant under the supervision of the Superintendent.

J. All excavations for sanitary building sewer installation shall be adequately guarded with barricades and lights so as to protect the public from hazard. Streets, sidewalks, parkways and other public property disturbed in the course of the work shall be restored in a manner satisfactory to the town.

K. In summary:

(1) All work to construct both public sewer mains or sanitary building sewers shall be performed by a licensed pipelayer.

(2) All construction work shall be performed in compliance with the Ashland construction standards.

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6 **Editor's Note: See Ch. 98, Building Construction, and Ch. 218, Plumbing.**

H. The size and slope of the sanitary building sewer shall be subject to the approval of the DPW, but in no event shall the diameter be less than six (6) inches. The slope of such six-inch pipe shall not be less than one-fourth (¼) inch per foot, unless otherwise permitted. **[Amended 10-18-2000 ATM, Art. 14]**

I. The applicant for the sanitary building sewer permit shall notify the DPW when the building sewer is ready for inspection and connection to the public sewer. The connection shall be made by the applicant, using materials supplied by the applicant under the supervision of the Superintendent. **[Amended 10-18-2000 ATM, Art. 14]**

J. All excavations for sanitary building sewer installation shall be adequately guarded with barricades and lights so as to protect the public from hazard. Streets, sidewalks, parkways and other public property disturbed in the course of the work shall be restored in a manner satisfactory to the town.

K. In summary:

(1) All work to construct both public sewer mains or sanitary building sewers shall be performed by a licensed pipelayer.

(2) All construction work shall be performed in compliance with the Ashland construction standards.

(3) All applications for sewer connections shall be accompanied by detailed design plans and computations which shall include definitive and profile plans (for industrial, commercial and multifamily residential uses).

(4) Approval to connect sewers shall be obtained from the DPW prior to any physical connection to a public sewer main. (See construction standards.[1]) **[Amended 10-18-2000 ATM, Art. 14]**

(5) A performance bond shall be required for all sewer construction. (See construction standards.[2])

(6) Detailed as-built plans may be required, in some cases, at the discretion of the DPW. All expenses thereto shall be borne by the user/applicant. **[Amended 10-18-2000 ATM, Art. 14]**

§ 326-27. Incorporation of other standards. [Updated 9-10-2001]

The MWRA rules and regulations covering discharge of sewage, drainage, substances or wastes of the MWRA are hereby made a part of this chapter.[3] In the event that federal or state agencies enact or promulgate laws or regulations more stringent than these regulations or those of the MWRA, the federal or state requirements shall take precedence.

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1 **Editor's Note: See Articles II and III of this chapter.**

2 **Editor's Note: See Articles II and III of this chapter.**

3 **Editor's Note: The Floor Drain and Underground Injection Control (UIC) Regulations are included at the end of this chapter.**

§ 326-28. Protection from damage.

A. No authorized person shall maliciously, willfully or negligently break, damage, destroy, uncover, deface or tamper with any structure, appurtenance or equipment which is a part of the sewage works. Any person violating this provision shall be subject to immediate arrest under charge of disorderly conduct.

B. Each user shall provide protection from any discharges, including accidental discharges, in violation of these regulations. Users shall notify the DPW and the MWRA immediately upon discharging wastes in violation of these regulations in order for countermeasures to be taken by the town and MWRA to minimize damages to the sanitary sewerage system and receiving waters. This notification shall be followed, within fifteen (15) days of the date of occurrence, by a detailed written statement to the DPW and MWRA describing the causes for the accidental discharge and the measures being taken to prevent future occurrence. Such notification will not relieve users of liability for any expense, loss or damage to the sanitary sewerage system or for any fines imposed on the MWRA.**[Amended 10-18-2000 ATM, Art. 14]**

§ 326-29. Power and authority of inspectors.

A. The DPW and other duly authorized employees of the town bearing proper credentials and identification shall be permitted to enter all properties for the purpose of inspection, observation, measurement, sampling and testing in accordance with the provisions of this chapter. The DPW or its representatives shall have no authority to inquire into any processes, including metallurgical, chemical, oil, refining, ceramic, paper or other industries, beyond that point having a direct bearing on the kind and source of discharge to the sewers or waterways. **[Amended 10-18-2000 ATM, Art. 14]**

B. While performing the necessary work on private properties referred to in Subsection A above, the DPW or duly authorized employees of the town shall observe all safety rules applicable to the premises established by the company and the company shall be held harmless for injury or death to the town employees and the town shall indemnify the company against loss or damage to its property by town employees and against liability claims and demands for personal injury or property damage asserted against the company and growing out of the gauging and sampling operation, except as such may be caused by negligence or failure of the company to maintain safe conditions as required in § 326-27. **[Amended 10-18-2000 ATM, Art. 14]**

C. The Superintendent and other duly authorized employees of the town bearing proper credentials and identification shall be permitted to enter all private properties through which the town holds a duly negotiated easement for the purposes of, but not limited to, inspection, observation, measurement, sampling, repair and maintenance of any portion of the sewage works lying within said easement. All entry and subsequent work, if any, on said easement, shall be done in full accordance with the terms of the duly negotiated easement pertaining to the private property involved.

ARTICLE V
Enforcement

§ 326-30. Violations and penalties.

A. Any person found to be violating any provision of this chapter (except § 326-28) shall be served by the town with written notice stating the nature of the violation and providing a reasonable time limit for the satisfactory correction thereof. The offender shall, within the period of time stated in such notice, permanently cease all violations.

B. Any person who shall continue any violation beyond the time limit provided for in Subsection A shall be guilty of a misdemeanor and, on conviction thereof, shall be fined in the amount not exceeding one hundred dollars ($100) for each violation. Each day in which any such violation shall continue shall be deemed a separate offense.

C. Any person violating any of the provisions of this chapter shall become liable to the town for any expense, loss or damage occasioned by the town by reason of such violation.

ARTICLE VI
Severability; Fees; When Effective

§ 326-31. Severability.

A. All ordinances or parts of ordinances in conflict herewith are hereby repealed.

B. The validity of any section, clause, sentence or provision of this chapter shall not affect the validity of any other part of this chapter which can be given effect without such invalid part or parts.

§ 326-32. Fees. [Amended 10-18-2000 ATM, Art. 14]

A. Sewer fees as of July 1, 1989, shall be as set by the Department of Public Works.

§ 326-33. When effective.

This chapter shall be in full force and effect from and after its passage, approval, recording and publication, as provided by law.

SEWERS

Town of Ashland
FLOOR DRAIN AND UNDERGROUND INJECTION CONTROL (UIC) REGULATIONS
[Adopted 9-10-2001]

Section 1. PURPOSE OF REGULATION

Whereas:

- floor drains in industrial and commercial facilities are often tied to a system leading to a leaching structure (e.g. dry well, cesspool, leach field) or a septic system; and
- poor management practices and accidental and/or intentional discharges may lead petroleum and other toxic or hazardous materials into these drainage systems in facilities managing these products; and
- improper maintenance or inappropriate use of these systems may allow the passage of contaminants or pollutants entering the drain to discharge from the leaching structure or septic system to the ground; and
- discharges of hazardous wastes and other pollutants to floor drains leading to leaching structures and septic systems have repeatedly threatened surface and ground water quality throughout Massachusetts; and surface and ground water resources in the Town of Ashland contributes to the town's drinking water supplies; and
- improper maintenance of grease traps contribute to possible surcharging, sanitary sewer overflows, and increased maintenance efforts the Town of Ashland adopts the following regulations, under its authority as specified in Section II, as a preventative measure for the purposes of:
- preserving and protecting the Town of Ashland's drinking water resources from discharges of pollutants to the ground via floor drains, and
- minimizing the threat of economic losses to the Town due to such discharges.

Section II. SCOPE OF AUTHORITY

The Town of Ashland Department of Public Works enforces the following regulation pursuant to authorization granted by 310 CMR 22.21(2), 310 CMR 27.001, 310 CMR 30.000, 310 CMR 40.000, 360 CMR 10:016 and 248 CMR 2.00. The regulation shall apply, as specified herein, to all applicable facilities, existing and new, within the Town of Ashland.

Section III. DEFINITIONS

For the purpose of this regulation, the following words and phrases shall have the following meanings:

Commercial and Industrial Facility: A public or private establishment where the principal use is the supply, sale, and/or manufacture of services, products, or information, including but not limited to: manufacturing, processing, or other industrial operations; service or retail establishments; printing and publishing establishments; research and development facilities; small or large quantity generators of hazardous waste; laboratories; hospitals.

Department: The Massachusetts Department of Environmental Protection; Massachusetts Water Resources Authority and Board of State Examiners of Plumbers and Gas Fitters.

Discharge: The accidental or intentional disposal, deposit, injection, dumping, spilling, leaking, incineration, or placing of toxic or hazardous material or waste upon or into any land or water so that such hazardous waste or any constituent thereof may enter the land or waters of the Commonwealth, Discharge includes, without limitation, leakage of such materials from failed or discarded containers or storage systems and disposal of such materials into any on-site leaching structure or sewage disposal system.

Floor Drain: An intended drainage point on a floor constructed to be otherwise impervious which serves as the point of entry into any subsurface drainage, treatment, disposal, containment, or other plumbing system.

Grease Trap: A watertight structure located on a building sewer before a septic tank in which grease and oils are separated from other solid and liquid constituents of sewage and accumulated in accordance with 310 CMR 15.230; or a device designed and installed so as to separate and retain deleterious, hazardous, or undesirable matter from normal wastes while permitting normal sewage liquid wastes to discharge into the sanitary sewer system.

Leaching Structure: Any subsurface structure through which a fluid that is introduced will pass and enter the environment, including but not limited to, dry wells, leaching catch basins, cesspools, leach fields, and oil/water separators that are not water-tight.

Oil/Water Separator: A device designed and installed so as to separate arid retain petroleum based oil or grease, flammable wastes as well as sand and particles from normal wastes while permitting normal sewage or liquid wastes to discharge into the drainage system by gravity. Other common names for such systems include MDC traps, gasoline and sand traps, grit and oil separators, grease traps, and interceptors.

Toxic or Hazardous Material: Any substance or mixture or physical, chemical, or infectious characteristics posing a significant, actual, or potential hazard to water supplies or other hazards to human health if such substance or mixture were discharged to land or water of the Town of Ashland. Toxic or hazardous materials include, without limitation, synthetic organic chemicals, petroleum products, heavy metals, radioactive or infectious wastes, acids and alkalis, and all substances defined as Toxic or Hazardous under Massachusetts General Law (MGL) Chapter 21C and 21E or Massachusetts Hazardous Waste regulations (310 CMR 30.000), and also include such products as solvents, thinners, and pesticides in quantities greater than normal household use.

Use of Toxic or Hazardous Material: The handling, generation, treatment, storage, or management of toxic or hazardous materials.

Section IV. PROHIBITIONS

With the exception of discharges that have received (or have applied and will receive) a Department issued permit prior to the effective date of this regulation, no floor drain(s) shall be allowed to discharge, with or without pretreatment (such as an oil/water separator), to the ground, a leaching structure, or septic system loan industrial or commercial facility if such floor drain is located in either:

A. An industrial or commercial process area,

B. A petroleum, toxic, or hazardous materials and/or waste storage area, or

C. A leased facility without either A or B of this section, but in which the potential for a change of use of the property to a use which does have either A or B is, in the opinion of the Department of Public Works or its agent, sufficient to warrant the elimination of the ground discharge at the present.

Section V. REQUIREMENTS FOR EXISTING FACILITIES

A. The owner of a facility in operation prior to the effective date of this regulation with a prohibited (as defined under Section IV) floor drain system shall:

1. Disconnect and plug all applicable inlets to and outlets from (where possible) applicable leaching structures, oil/water separators, and/or septic systems;

2. Remove all existing sludge in oil/water separators, septic systems, and where accessible, leaching structures. Any sludge determined to be hazardous waste shall be disposed of in accordance with state hazardous waste regulations (310 CMR 30.000). Remedial activity involving any excavation and/or soil or groundwater sampling must be performed in accordance with appropriate Department policies;

3. Alter the floor drain system so that the floor drain shall be either:

a. Connected to a holding tank that meets all applicable requirements of Department policies and regulations, with hauling records submitted to the Ashland Department of Public Works at the time of hauling;

b. Connected to a municipal sanitary sewer line, if available, with all applicable Department and local permits being obtained and all Department, Massachusetts Water Resources Authority, and local standard being complied with; or

c. Permanently sealed. Any facility sealing a drain shall be required to submit for approval to the Department of Public Works a hazardous waste management plan detailing the means of collecting, storing, and disposing any hazardous waste generated by the facility, including any spill or other discharge of hazardous materials or waste.

B. Any oil/water separator remaining in use shall be monitored weekly, cleaned not less than every 90 days, and restored to proper conditions after cleaning so as to ensure proper functioning. Records of the hauling of the removed contents of the separator shall be submitted to the Department of Public Works at the time of hauling.

C. Compliance with all provisions of this regulation must be accomplished in a manner consistent with Massachusetts Plumbing, Building, and fire code requirements.

D. Upon complying with one of the options listed under Section V.A.3., the owner/operator of the facility shall notify the Department of the closure of said system by filing the Department's UIC Notification Form which may be obtained by calling 617/292-5770 with the Department, and sending a copy to the Ashland Department of Public Works.

E. All grease traps shall comply with the Commonwealth of Massachusetts Regulations, 310 CMR 15, "The State Environmental Code Title V: Minimum Requirements For The Subsurface Disposal Of Sanitary Sewage," 360 CMR, rules and regulations for the Massachusetts Water Resources Authority, and 248 CMR 2.00 "Uniform State Plumbing Code."

Section VI. EFFECTIVE DATES FOR ALL FACILITIES

The effective date of this regulation is the date posted on the front page of the regulation, which shall be identical to the date of adoption of the regulation.

A. Existing Facilities:

1. Owners/Operators of a facility affected by this regulation shall comply with all of its provisions within 120 days of the effective date;

2. All applicable discharges to the leaching structures and septic systems shall be discontinued immediately through temporary isolation or sealing of the floor drain.

B. New Facilities:

1. As of the effective date of the regulation, all new construction and/or applicable change or use within the Town of Ashland shall comply with the provisions of this regulation.

2. Certification of conformance with the provisions of this regulation by the Department of Public Works shall be required prior to issuance of construction and occupancy permits.

3. The use of any new oil/water separator shall comply with the same requirements as for the existing systems, as specified above in Section V.B.

4. The use of any new grease trap shall comply with the same requirements as for existing systems, as specified in Section V.E.

Section VII. PENALTIES

Failure to comply with provisions of this regulation will result in the levy of fines of not less than $200.00 but not more than $1000.00. Each day's failure to comply with the provisions of this regulation shall constitute a separate violation.

Section VIII. SEVERABILITY

Each provision of the regulation shall be construed as separate to the end that, if any provision, or sentence, clause or phase thereof, shall be held invalid for any reason, the remainder of that section and all other sections shall continue in full force and effect.

MAST ARM
FOUNDATION DESIGN

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Mast Arm Foundation Design

for

Massachusetts Department of Transportation – Highway Division

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Project File No. 604123

Proposed Mast Arms MA-1 to MA-6

for

Route 126 (Pond Street)

Ashland, Massachusetts



Date: 04/15/2020

Prepared for:
Green International Affiliates, Inc.
239 Littleton Road, Suite 3
Westford, Massachusetts 01886
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Prepared by:
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LAMSON ENGINEERING CORPORATION
437 Cherry Street, Room # 109, Newton, Massachusetts 02465
Phone: 617-558-0101

April 15, 2020

Memorandum

Subject: MassDOT Project File Number: 604123
Mast Arm Foundation Design for Mast Arms MA-1 to MA-6
Route 126 (Pond Street), Ashland, MA

We have performed mast arm foundation design for Mast Arm No. MA-1 to MA-6 for the referenced project along Route 126 (Pond Street), Ashland, Massachusetts.

Based on the information obtained from Borings B-1, B-3, B-4, and B-7; Mast Arm No. MA-1 to MA-5 can be supported by 3'-6" diameter drilled shaft socketed 3'-0" into bedrock. If bedrock is encountered above 12' below the top of the drilled shaft, the total embedment depth (soil + rock) need not exceed 12'-0". If bedrock is not encountered 12' below the top of the drilled shaft, drilled shaft should be embedded 12'-0" into soil.

Based on the information obtained from Boring B-9, Mast Arm No. MA-6 can be supported by 3'-6" diameter drilled shaft embedded 12'-0" into soil.

For detail summary of each mast arm type, see Summary on Page 1 of the calculations.

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LAMSON ENGINEERING CORPORATION			Final Page No.: 1	
Project:	Route 126, Ashland	Job No.:	Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by: JJL	Date: 4/2020	
Detail:	Summary	Checked by: WD	Date: 4/2020	

Summary of Drilled Shaft Resistance

For 3.5' diameter drilled shaft:

Mast Arm Foundation - Drilled Shaft Resistance							
Mast Arm	Foundation Type	Reference Boring Number	Nominal Vertical Resistance (kips)	Factored Vertical Resistance (kips)	Factored Vertical Load (kips)	Design Drilled Shaft Soil Embedment Depth, L_s (ft)	Design Drilled Shaft Rock Socket Length, L_R (ft)
MA-1	Drilled Shaft socketed into bedrock or embeded into soil (Note 2)	B-1	3289 (Note 3)	1702 (Note 3)	21.1	12.0	3.0
MA-2	Drilled Shaft socketed into bedrock or embeded into soil (Note 2)	B-3	3289 (Note 3)	1702 (Note 3)	21.5	12.0	3.0
MA-3	Drilled Shaft socketed into bedrock or embeded into soil (Note 2)	B-3	3289 (Note 3)	1702 (Note 3)	23.1	12.0	3.0
MA-4	Drilled Shaft socketed into bedrock or embeded into soil (Note 2)	B-7	3289 (Note 3)	1702 (Note 3)	11.7	12.0	3.0
MA-5	Drilled Shaft socketed into bedrock or embeded into soil (Note 2)	B-4	3289 (Note 3)	1702 (Note 3)	19.7	12.0	3.0
MA-6	Drilled Shaft embeded into soil	B-9	163.3	83.5	24.2	12.0	-

Notes:

1. Water table was assumed to be at the top of drilled shaft for each mast arm foundation.

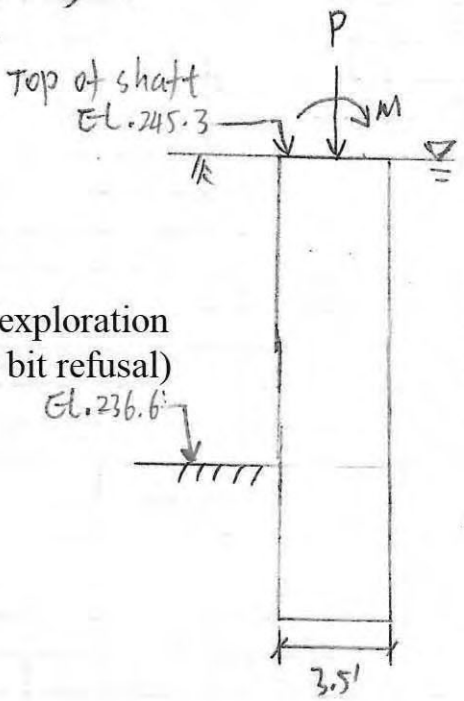
2. If bedrock is encountered above 12' below the top of the drilled shaft, 3'-0" sock socket is required for the drilled shaft but the total embedment depth (soil + rock) shall not exceed 12'-0". If bedrock is not encountered above 12' below the top of the drilled shaft, drilled shaft can be embeded 12'-0" into soil.

3. The nominal and factored vertical resistance is based on drilled shaft socketed 3'-0" into bedrock. Uniaxial compressive strength of rock is assumed to be 4000 psi (concrete) for conservative.

LAMSON ENGINEERING CORPORATION			Final Page No: 2	
Project: Route 126, Ashland		Job No:	Preliminary Sheet No:	
Subject: Mast Arm Foundation		Prepared by: JJL	Date:	10/2019
Detail: MA-1		Checked by: WD	Date:	10/2019

MA-1 Foundation

Based on Boring B-1



Medium Dense Sand

$\phi = 32°$

$\gamma = 120$ pcf

LAMSON ENGINEERING CORPORATION				Final Page No.:	3
Project:	Route 126, Ashland	Job No.:		Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by:	JJL	Date:	10/2019
Detail:	MA-1	Checked by:	WD	Date:	10/2019

Determine Unfactored Horizontal Loads

Effective angle of internal friction ϕ'_f	=	32	degree
Friction angle between fill and wall, δ	=	17	degree
Angle of fill to the horizontal, β	=	0	degree
Angle of back of wall to the horizontal, θ	=	90	degree

Lateral Earth Pressure (EH)

Active pressure coefficient, K_a

$$= \frac{\sin^2(\theta + \phi'_f)}{\sin^2\theta \sin(\theta - \delta)\left[1 + \sqrt{\frac{\sin(\phi'_f + \delta)\sin(\phi'_f - \beta)}{\sin(\theta - \delta)\sin(\theta + \beta)}}\right]^2}$$

$$= 0.277$$

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Project:	Route 126, Ashland	Job No.:	Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by: JJL		Date: 10/2019
Detail:	MA-1	Checked by: WD		Date: 10/2019

Drilled Shaft Vertical Resistance

Based on B-1

φ_s = side resistance factor
= 0.55

φ_p = tip resistance factor
= 0.50 (2017 AASHTO Table 10.5.5.2.4-1)

D = Diameter of Shaft
= 3.5 ft

L_R = Rock socket length
= 3 ft

Side Resistance

q_s = unit shaft side resistance

$$= Cp_a\sqrt{\frac{q_u}{p_a}}$$

where,

P_a = Atmospheric pressure
= 2.12 ksf

q_u = uniaxial compressive strength of rock
= 576 ksf (use f'c = 4000 psi)

C = Regression coefficient
= 1.0 for normal conditions

q_s = 34.9 ksf

A_s = Drilled shaft side area
= 33.0 ft^2

R_s = $q_s A_s$
= 1152.7 kips

LAMSON ENGINEERING CORPORATION			Final Page No.: 5	
Project:	Route 126, Ashland	Job No.:	Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by: JJL		Date: 10/2019
Detail:	MA-1	Checked by: WD		Date: 10/2019

Tip Resistance

For conservative, assume random joint condition

q_p = unit shaft tip resistance

$$= A + q_u \left[m_b \left(\frac{A}{q_u} \right) + S \right]^a$$

in which,

$$A = \sigma'_{vb} + q_u \left[m_b \left(\frac{\sigma'_{vb}}{q_u} \right) + S \right]^a$$

σ'_{vb} = vertical effective stress at the socket bearing elevation
= (0.12 - 0.0624) x 9 + 0.170 x 3
= 1.028 ksf

$$s = e^{\left(\frac{GSI-100}{9-3D}\right)}$$

$$a = \frac{1}{2} + \frac{1}{6}\left(e^{\frac{-GSI}{15}} - e^{\frac{-20}{3}}\right)$$

$$m_b = m_i e^{\left(\frac{GSI-100}{28-14D}\right)}$$

Where,

GSI = Geological strength index (2017 AASHTO Figure 10.4.6.4-1)
= 25 (For conservative, based on seamy, fractured granite)

e = 2.718 (natural log base)

D = disturbance factor
= 0 (for rock coring method)

m_i = 32 (for granite) (2017 AASHTO Table 10.4.6.4-1)

Thus,

LAMSON ENGINEERING CORPORATION			Final Page No.: 6	
Project:	Route 126, Ashland	Job No.:	Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by: JJL		Date: 10/2019
Detail:	MA-1	Checked by: WD		Date: 10/2019

s = 0.00024

a = 0.531

m_b = 2.198

Then,

A = 32.3

Therefore,

q_p = 222.1 ksf

A_p = Drilled shaft tip area
= 9.6 ft^2

R_p = $q_p A_p$
= 2136.6 kips

Nominal Drilled Shaft Resistance

R_n = $R_p + R_s$
= 3289 kips

Factored Drilled Shaft Resistance

R_R = $\varphi_p R_p + \varphi_s R_s$
= 1702 kips

From Green, Group Load III

Factored vertical Load = 2281 lb
= 2 kips < 1702.3 kips
OK

Weight of Drilled Shaft = 0.15 x (π 3.5^2) / 4 x (3 + 8.7)
= 16.9 kips

Total Factored Vertical Load = 2 + 1.25 x 16.9
= 21.1 kips < 1702.3 kips
OK

LAMSON ENGINEERING CORPORATION			Final Page No.: 7	
Project:	Route 126, Ashland	Job No.:	Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by: JJL		Date: 10/2019
Detail:	MA-1	Checked by: WD		Date: 10/2019

Drilled Shaft Lateral Resistance

From Green, Group Load II, Load Case 1

Max. moment = 56591 lb-ft
at shaft top, M_u = 56.6 k-ft

φ_{ave} = Average angle of internal friction of soil, degree
= 32

K_a = Active earth pressure coefficient
= 0.277

D = Diameter of Shaft
= 3.5 ft

H = Distance from finish grade to design grade, ft
= 8.7 ft

γ_{ave} = Average unit weight of soil above top of shaft (kcf)
= 0.12

γ'_{ave} = Average effective unit weight of soil below top of shaft (kcf)
= 0.0576

$P_{a1} = 0.5\, K_a\, \gamma'_{ave}\, D\, (H)^2$
= 2.11 kips

Earth Load F.S. = 1.5

Factored horizontal earth load = 1.5 x 2.11
= 3.17 kips

Factored Active earth moment = 3.17 x (8.7/3 + 3)
at shaft tip, M_a = 18.70 k-ft

$\phi_i^{'}$ = the instantaneous friction angle of the rock mass (degrees)

$$\phi_i^{'} = \tan^{-1}\left\{4h\cos^2\left[30 + 0.33\sin^{-1}\left(h^{\frac{-3}{2}}\right)\right] - 1\right\}^{\frac{-1}{2}}$$

LAMSON ENGINEERING CORPORATION				Final Page No.:	8
Project:	Route 126, Ashland	Job No.:		Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by:	JJL	Date:	10/2019
Detail:	MA-1	Checked by:	WD	Date:	10/2019

ϕ_i = 59.00 degrees

$$h = 1 + \frac{16(m\sigma_n^{'} + sq_u)}{(3m^2 q_u)}$$

h = 1.0231

q_u = Unconfined compressive strength of rock core (ksf)
= 576 ksf (For conservative, use concrete f'c = 4000 psi)

σ'_n = effective normal stress (ksf)
= (0.12 - 0.0624) x 9 + 0.170 x 3
= 1.028 ksf

s,m = fractured rock mass parameters, for granite (assume fair rock)
s = 0.00009
m = 0.458 (AASHTO 2012 Table 10.4.6.4-4)

S_m = Shear strength of rock mass (ksf)

$$= (\cot\phi_i^{'} - \cos\phi_i^{'})m\frac{q_u}{8}$$

= 2.83 ksf

L_R = Design Rock Socket Length
= 3.0 ft

D = Drilled shaft diameter
= 3.5 ft

β' = Angle of the bedrock (degrees)
= 0

$$P_p = \frac{S_m L_R(L_R + \sqrt{2}D)}{(1 - Tan\beta')}$$

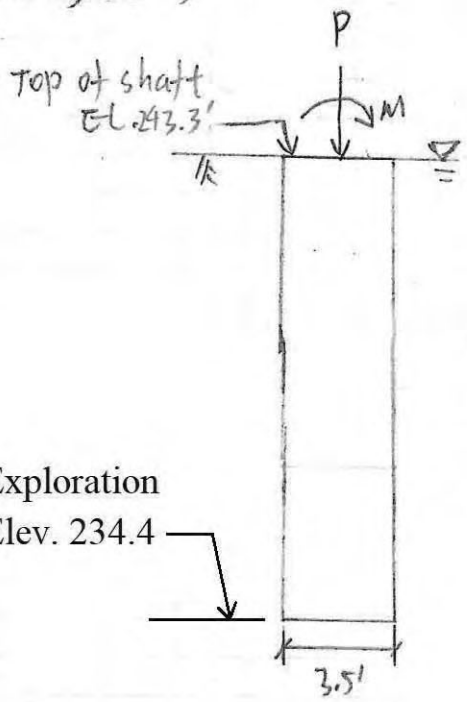
= 67.49 kips

Resistance Moment of the rock = 67.49 x 1.0 $M_u + M_a$
at shaft tip, M_p = 101.2 k-ft > 75.3 k-ft OK

LAMSON ENGINEERING CORPORATION			Final Page No: 9	
Project: Route 126, Ashland	Job No:		Preliminary Sheet No:	
Subject: Mast Arm Foundation	Prepared by:	JJL	Date:	10/2019
Detail: MA-2	Checked by:	WD	Date:	10/2019

MA-2 Foundation

Based on Boring B-3



Very Dense Sand & Boulder

$\phi = 38°$

$\gamma = 130$ pcf (lowered the ϕ & γ due to loose layer at the top)

LAMSON ENGINEERING CORPORATION				Final Page No.:	10
Project:	Route 126, Ashland	Job No.:		Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by:	JJL	Date:	10/2019
Detail:	MA-2	Checked by:	WD	Date:	10/2019

Determine Unfactored Horizontal Loads

Effective angle of internal friction ϕ'_f	=	38	degree
Friction angle between fill and wall, δ	=	17	degree
Angle of fill to the horizontal, β	=	0	degree
Angle of back of wall to the horizontal, θ	=	90	degree

Lateral Earth Pressure (EH)

Active pressure coefficient, K_a

$$= \frac{\sin^2(\theta + \phi'_f)}{\sin^2\theta \sin(\theta - \delta)\left[1 + \sqrt{\frac{\sin(\phi'_f + \delta)\sin(\phi'_f - \beta)}{\sin(\theta - \delta)\sin(\theta + \beta)}}\right]^2}$$

$$= 0.218$$

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Project:	Route 126, Ashland	Job No.:	Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by: JJL		Date: 10/2019
Detail:	MA-2	Checked by: WD		Date: 10/2019

Drilled Shaft Vertical Resistance

Based on B-3

φ_s = side resistance factor
= 0.55

φ_p = tip resistance factor
= 0.50 (2017 AASHTO Table 10.5.5.2.4-1)

D = Diameter of Shaft
= 3.5 ft

L_R = Rock socket length
= 3 ft

Side Resistance

q_s = unit shaft side resistance

$$= Cp_a\sqrt{\frac{q_u}{p_a}}$$

where,

P_a = Atmospheric pressure
= 2.12 ksf

q_u = uniaxial compressive strength of rock
= 576 ksf (use f'c = 4000 psi)

C = Regression coefficient
= 1.0 for normal conditions

q_s = 34.9 ksf

A_s = Drilled shaft side area
= 33.0 ft^2

R_s = $q_s A_s$
= 1152.7 kips

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Project:	Route 126, Ashland	Job No.:	Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by: JJL		Date: 10/2019
Detail:	MA-2	Checked by: WD		Date: 10/2019

Tip Resistance

For conservative, assume random joint condition

q_p = unit shaft tip resistance

$$= A + q_u \left[m_b \left(\frac{A}{q_u} \right) + S \right]^a$$

in which,

$$A = \sigma'_{vb} + q_u \left[m_b \left(\frac{\sigma'_{vb}}{q_u} \right) + S \right]^a$$

σ'_{vb} = vertical effective stress at the socket bearing elevation
= (0.12 - 0.0624) x 9 + 0.170 x 3
= 1.028 ksf

$$s = e^{\left(\frac{GSI-100}{9-3D}\right)}$$

$$a = \frac{1}{2} + \frac{1}{6}\left(e^{\frac{-GSI}{15}} - e^{\frac{-20}{3}}\right)$$

$$m_b = m_i e^{\left(\frac{GSI-100}{28-14D}\right)}$$

Where,

GSI = Geological strength index (2017 AASHTO Figure 10.4.6.4-1)
= 25 (For conservative, based on seamy, fractured granite)

e = 2.718 (natural log base)

D = disturbance factor
= 0 (for rock coring method)

m_i = 32 (for granite) (2017 AASHTO Table 10.4.6.4-1)

Thus,

LAMSON ENGINEERING CORPORATION			Final Page No.: 13	
Project:	Route 126, Ashland	Job No.:	Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by: JJL		Date: 10/2019
Detail:	MA-2	Checked by: WD		Date: 10/2019

s = 0.00024

a = 0.531

m_b = 2.198

Then,

A = 32.3

Therefore,

q_p = 222.1 ksf

A_p = Drilled shaft tip area
= 9.6 ft^2

R_p = $q_p A_p$
= 2136.6 kips

Nominal Drilled Shaft Resistance

R_n = $R_p + R_s$
= 3289 kips

Factored Drilled Shaft Resistance

R_R = $\varphi_p R_p + \varphi_s R_s$
= 1702 kips

From Green, Group Load III

Factored vertical Load = 2730 lb
= 3 kips < 1702.3 kips
OK

Weight of Drilled Shaft = 0.15 x (π 3.5^2) / 4 x (3 + 8.9)
= 17.2 kips

Total Factored Vertical Load = 3 + 1.25 x 17.2
= 21.5 kips < 1702.3 kips
OK

LAMSON ENGINEERING CORPORATION			Final Page No.: 14	
Project:	Route 126, Ashland	Job No.:	Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by: JJL		Date: 10/2019
Detail:	MA-2	Checked by: WD		Date: 10/2019

Drilled Shaft Lateral Resistance

From Green, Group Load II, Load Case 1

Max. moment = 59032 lb-ft
at shaft top, M_u = 59.0 k-ft

φ_{ave} = Average angle of internal friction of soil, degree
= 38

K_a = Active earth pressure coefficient
= 0.218

D = Diameter of Shaft
= 3.5 ft

H = Distance from finish grade to design grade, ft
= 8.9 ft

γ_{ave} = Average unit weight of soil above top of shaft (kcf)
= 0.13

γ'_{ave} = Average effective unit weight of soil below top of shaft (kcf)
= 0.0676

$P_{a1} = 0.5\, K_a\, \gamma'_{ave}\, D\, (H)^2$
= 2.04 kips

Earth Load F.S. = 1.5

Factored horizontal earth load = 1.5 x 2.04
= 3.06 kips

Factored Active earth moment = 3.06 x (8.9/3 + 3)
at shaft tip, M_a = 18.28 k-ft

$\phi_i^{'}$ = the instantaneous friction angle of the rock mass (degrees)

$$\phi_i^{'} = \tan^{-1}\left\{4h\cos^2\left[30 + 0.33\sin^{-1}\left(h^{\frac{-3}{2}}\right)\right] - 1\right\}^{\frac{-1}{2}}$$

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Project:	Route 126, Ashland	Job No.:		Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by:	JJL	Date:	10/2019
Detail:	MA-2	Checked by:	WD	Date:	10/2019

ϕ_i = 59.00 degrees

$$h = 1 + \frac{16(m\sigma_n^{'} + sq_u)}{(3m^2 q_u)}$$

h = 1.0231

q_u = Unconfined compressive strength of rock core (ksf)
= 576 ksf (For conservative, use concrete f'c = 4000 psi)

σ'_n = effective normal stress (ksf)
= (0.12 - 0.0624) x 9 + 0.170 x 3
= 1.028 ksf

s,m = fractured rock mass parameters, for granite (assume fair rock)
s = 0.00009
m = 0.458 (AASHTO 2012 Table 10.4.6.4-4)

S_m = Shear strength of rock mass (ksf)

$$= (\cot\phi_i^{'} - \cos\phi_i^{'}) m \frac{q_u}{8}$$

= 2.83 ksf

L_R = Design Rock Socket Length
= 3.0 ft

D = Drilled shaft diameter
= 3.5 ft

β' = Angle of the bedrock (degrees)
= 0

$$P_p = \frac{S_m L_R (L_R + \sqrt{2}D)}{(1 - Tan\beta')}$$

= 67.49 kips

Resistance Moment of the rock = 67.49 x 1.0 $M_u + M_a$
at shaft tip, M_p = 101.2 k-ft > 77.3 k-ft OK

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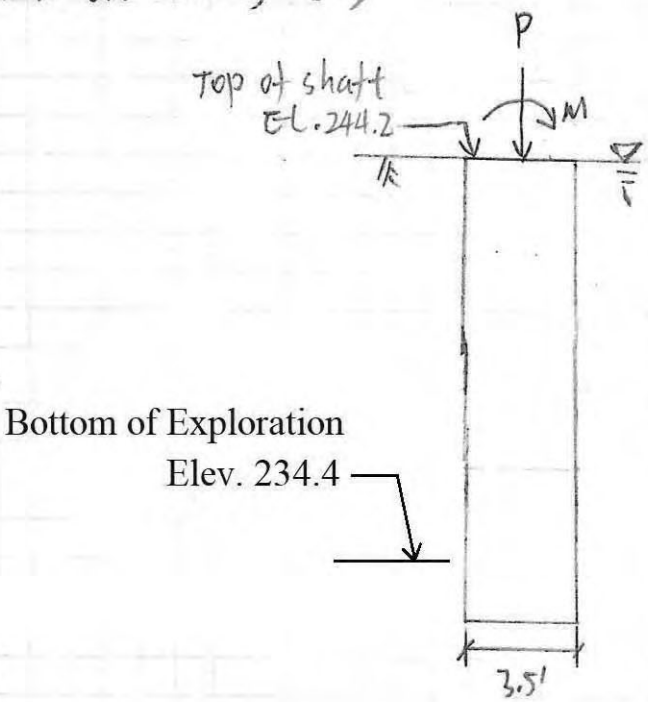
Subject: Mast Arm Foundation	Prepared by:	JJL	Date:	10/2019
Detail: MA-3	Checked by:	WD	Date:	10/2019

MA-3 Foundation

Based on Boring B-3



Very Dense Sand & Boulder

$\phi = 38°$

$\gamma = 130$ pcf (lower ϕ & γ due to loose layer at the top)

LAMSON ENGINEERING CORPORATION				Final Page No.:	17
Project:	Route 126, Ashland	Job No.:		Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by:	JJL	Date:	10/2019
Detail:	MA-3	Checked by:	WD	Date:	10/2019

Determine Unfactored Horizontal Loads

Effective angle of internal friction ϕ'_f	=	38	degree
Friction angle between fill and wall, δ	=	17	degree
Angle of fill to the horizontal, β	=	0	degree
Angle of back of wall to the horizontal, θ	=	90	degree

Lateral Earth Pressure (EH)

Active pressure coefficient, K_a

$$= \frac{\sin^2(\theta + \phi'_f)}{\sin^2\theta \sin(\theta - \delta)\left[1 + \sqrt{\frac{\sin(\phi'_f + \delta)\sin(\phi'_f - \beta)}{\sin(\theta - \delta)\sin(\theta + \beta)}}\right]^2}$$

$$= 0.218$$

LAMSON ENGINEERING CORPORATION			Final Page No.: 18	
Project:	Route 126, Ashland	Job No.:	Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by: JJL		Date: 10/2019
Detail:	MA-3	Checked by: WD		Date: 10/2019

Drilled Shaft Vertical Resistance

Based on B-3

φ_s = side resistance factor
= 0.55

φ_p = tip resistance factor
= 0.50 (2017 AASHTO Table 10.5.5.2.4-1)

D = Diameter of Shaft
= 3.5 ft

L_R = Rock socket length
= 3 ft

Side Resistance

q_s = unit shaft side resistance

$$= Cp_a\sqrt{\frac{q_u}{p_a}}$$

where,

P_a = Atmospheric pressure
= 2.12 ksf

q_u = uniaxial compressive strength of rock
= 576 ksf (use f'c = 4000 psi)

C = Regression coefficient
= 1.0 for normal conditions

q_s = 34.9 ksf

A_s = Drilled shaft side area
= 33.0 ft^2

R_s = $q_s A_s$
= 1152.7 kips

LAMSON ENGINEERING CORPORATION			Final Page No.: 19	
Project:	Route 126, Ashland	Job No.:	Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by: JJL		Date: 10/2019
Detail:	MA-3	Checked by: WD		Date: 10/2019

Tip Resistance

For conservative, assume random joint condition

q_p = unit shaft tip resistance

$$= A + q_u \left[m_b \left(\frac{A}{q_u} \right) + S \right]^a$$

in which,

$$A = \sigma'_{vb} + q_u \left[m_b \left(\frac{\sigma'_{vb}}{q_u} \right) + S \right]^a$$

σ'_{vb} = vertical effective stress at the socket bearing elevation
= (0.12 - 0.0624) x 9 + 0.170 x 3
= 1.028 ksf

$$s = e^{\left(\frac{GSI-100}{9-3D}\right)}$$

$$a = \frac{1}{2} + \frac{1}{6}\left(e^{\frac{-GSI}{15}} - e^{\frac{-20}{3}}\right)$$

$$m_b = m_i e^{\left(\frac{GSI-100}{28-14D}\right)}$$

Where,

GSI = Geological strength index (2017 AASHTO Figure 10.4.6.4-1)
= 25 (For conservative, based on seamy, fractured granite)

e = 2.718 (natural log base)

D = disturbance factor
= 0 (for rock coring method)

m_i = 32 (for granite) (2017 AASHTO Table 10.4.6.4-1)

Thus,

LAMSON ENGINEERING CORPORATION			Final Page No.: 20	
Project:	Route 126, Ashland	Job No.:	Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by: JJL		Date: 10/2019
Detail:	MA-3	Checked by: WD		Date: 10/2019

s = 0.00024

a = 0.531

m_b = 2.198

Then,

A = 32.3

Therefore,

q_p = 222.1 ksf

A_p = Drilled shaft tip area
= 9.6 ft^2

R_p = $q_p A_p$
= 2136.6 kips

Nominal Drilled Shaft Resistance

R_n = $R_p + R_s$
= 3289 kips

Factored Drilled Shaft Resistance

R_R = $\varphi_p R_p + \varphi_s R_s$
= 1702 kips

From Green, Group Load III

Factored vertical Load = 2235 lb
= 2 kips < 1702.3 kips
OK

Weight of Drilled Shaft = 0.15 x (π 3.5^2) / 4 x (3 + 9.8)
= 18.5 kips

Total Factored Vertical Load = 2 + 1.25 x 18.5
= 23.1 kips < 1702.3 kips
OK

LAMSON ENGINEERING CORPORATION			Final Page No.: 21	
Project:	Route 126, Ashland	Job No.:	Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by: JJL		Date: 10/2019
Detail:	MA-3	Checked by: WD		Date: 10/2019

Drilled Shaft Lateral Resistance

From Green, Group Load II, Load Case 1

Max. moment = 56860 lb-ft
at shaft top, M_u = 56.9 k-ft

φ_{ave} = Average angle of internal friction of soil, degree
= 38

K_a = Active earth pressure coefficient
= 0.218

D = Diameter of Shaft
= 3.5 ft

H = Distance from finish grade to design grade, ft
= 9.8 ft

γ_{ave} = Average unit weight of soil above top of shaft (kcf)
= 0.13

γ'_{ave} = Average effective unit weight of soil below top of shaft (kcf)
= 0.0676

$P_{a1} = 0.5\, K_a\, \gamma'_{ave}\, D\, (H)^2$
= 2.48 kips

Earth Load F.S. = 1.5

Factored horizontal earth load = 1.5 x 2.48
= 3.72 kips

Factored Active earth moment = 3.72 x (9.8/3 + 3)
at shaft tip, M_a = 23.28 k-ft

$\phi_i^{'}$ = the instantaneous friction angle of the rock mass (degrees)

$$\phi_i^{'} = \tan^{-1}\left\{4h\cos^2\left[30 + 0.33\sin^{-1}\left(h^{\frac{-3}{2}}\right)\right] - 1\right\}^{\frac{-1}{2}}$$

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Project:	Route 126, Ashland	Job No.:		Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by:	JJL	Date:	10/2019
Detail:	MA-3	Checked by:	WD	Date:	10/2019

ϕ_i = 59.00 degrees

$$h = 1 + \frac{16(m\sigma_n^{'} + sq_u)}{(3m^2 q_u)}$$

h = 1.0231

q_u = Unconfined compressive strength of rock core (ksf)
= 576 ksf (For conservative, use concrete f'c = 4000 psi)

σ'_n = effective normal stress (ksf)
= (0.12 - 0.0624) x 9 + 0.170 x 3
= 1.028 ksf

s,m = fractured rock mass parameters, for granite (assume fair rock)
s = 0.00009
m = 0.458 (AASHTO 2012 Table 10.4.6.4-4)

S_m = Shear strength of rock mass (ksf)

$$= (\cot\phi_i^{'} - \cos\phi_i^{'})m\frac{q_u}{8}$$

= 2.83 ksf

L_R = Design Rock Socket Length
= 3.0 ft

D = Drilled shaft diameter
= 3.5 ft

β' = Angle of the bedrock (degrees)
= 0

$$P_p = \frac{S_m L_R(L_R + \sqrt{2}D)}{(1 - Tan\beta')}$$

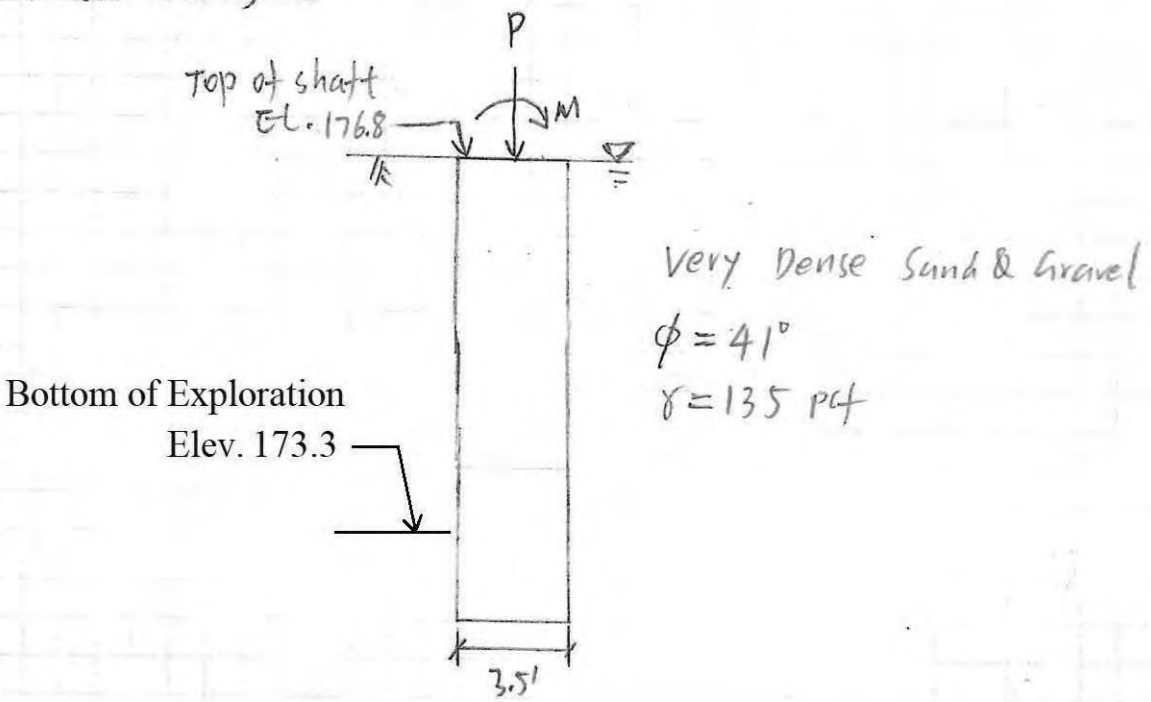
= 67.49 kips

Resistance Moment of the rock at shaft tip, M_p = 67.49 x 1.0 = 101.2 k-ft > $M_u + M_a$ = 80.1 k-ft OK

LAMSON ENGINEERING CORPORATION			Final Page No: 23	
Project: Route 126, Ashland	Job No:		Preliminary Sheet No:	
Subject: Mast Arm Foundation	Prepared by:	JJL	Date:	10/2019
Detail: MA-4	Checked by:	WD	Date:	10/2019

MA-4 Foundation

Based on Boring B-7



LAMSON ENGINEERING CORPORATION				Final Page No.:	24
Project:	Route 126, Ashland	Job No.:		Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by:	JJL	Date:	10/2019
Detail:	MA-4	Checked by:	WD	Date:	10/2019

Determine Unfactored Horizontal Loads

Effective angle of internal friction ϕ'_f	=	41	degree
Friction angle between fill and wall, δ	=	17	degree
Angle of fill to the horizontal, β	=	0	degree
Angle of back of wall to the horizontal, θ	=	90	degree

Lateral Earth Pressure (EH)

Active pressure coefficient, K_a

$$= \frac{\sin^2(\theta + \phi'_f)}{\sin^2\theta \sin(\theta - \delta)\left[1 + \sqrt{\frac{\sin(\phi'_f + \delta)\sin(\phi'_f - \beta)}{\sin(\theta - \delta)\sin(\theta + \beta)}}\right]^2}$$

$$= 0.192$$

LAMSON ENGINEERING CORPORATION			Final Page No.: 25
Project:	Route 126, Ashland	Job No.:	Preliminary Sheet No.:
Subject:	Mast Arm Foundation	Prepared by: JJL	Date: 10/2019
Detail:	MA-4	Checked by: WD	Date: 10/2019

Drilled Shaft Vertical Resistance

Based on B-7

φ_s = side resistance factor
= 0.55

φ_p = tip resistance factor
= 0.50 (2017 AASHTO Table 10.5.5.2.4-1)

D = Diameter of Shaft
= 3.5 ft

L_R = Rock socket length
= 3 ft

Side Resistance

q_s = unit shaft side resistance

$$= Cp_a\sqrt{\frac{q_u}{p_a}}$$

where,

P_a = Atmospheric pressure
= 2.12 ksf

q_u = uniaxial compressive strength of rock
= 576 ksf (use f'c = 4000 psi)

C = Regression coefficient
= 1.0 for normal conditions

q_s = 34.9 ksf

A_s = Drilled shaft side area
= 33.0 ft^2

R_s = $q_s A_s$
= 1152.7 kips

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Subject:	Mast Arm Foundation	Prepared by: JJL		Date: 10/2019
Detail:	MA-4	Checked by: WD		Date: 10/2019

Tip Resistance

For conservative, assume random joint condition

q_p = unit shaft tip resistance

$$= A + q_u \left[m_b \left(\frac{A}{q_u} \right) + S \right]^a$$

in which,

$$A = \sigma'_{vb} + q_u \left[m_b \left(\frac{\sigma'_{vb}}{q_u} \right) + S \right]^a$$

σ'_{vb} = vertical effective stress at the socket bearing elevation
= (0.12 - 0.0624) x 9 + 0.170 x 3
= 1.028 ksf

$$s = e^{\left(\frac{GSI-100}{9-3D}\right)}$$

$$a = \frac{1}{2} + \frac{1}{6}\left(e^{\frac{-GSI}{15}} - e^{\frac{-20}{3}}\right)$$

$$m_b = m_i e^{\left(\frac{GSI-100}{28-14D}\right)}$$

Where,

GSI = Geological strength index (2017 AASHTO Figure 10.4.6.4-1)
= 25 (For conservative, based on seamy, fractured granite)

e = 2.718 (natural log base)

D = disturbance factor
= 0 (for rock coring method)

m_i = 32 (for granite) (2017 AASHTO Table 10.4.6.4-1)

Thus,

LAMSON ENGINEERING CORPORATION			Final Page No.: 27	
Project:	Route 126, Ashland	Job No.:	Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by: JJL		Date: 10/2019
Detail:	MA-4	Checked by: WD		Date: 10/2019

s = 0.00024

a = 0.531

m_b = 2.198

Then,

A = 32.3

Therefore,

q_p = 222.1 ksf

A_p = Drilled shaft tip area
= 9.6 ft^2

R_p = $q_p A_p$
= 2136.6 kips

Nominal Drilled Shaft Resistance

R_n = $R_p + R_s$
= 3289 kips

Factored Drilled Shaft Resistance

R_R = $\varphi_p R_p + \varphi_s R_s$
= 1702 kips

From Green, Group Load III

Factored vertical Load = 2217 lb
= 2 kips

Weight of Drilled Shaft = 0.15 x (π 3.5^2) / 4 x (3 + 3.5)
= 9.4 kips

Total Factored Vertical Load = 2 + 1.25 x 9.4
= 11.7 kips < 1702.3 kips
OK

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Project:	Route 126, Ashland	Job No.:	Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by: JJL		Date: 10/2019
Detail:	MA-4	Checked by: WD		Date: 10/2019

Drilled Shaft Lateral Resistance

From Green, Group Load II, Load Case 1

Max. moment = 45840 lb-ft
at shaft top, M_u = 45.8 k-ft

φ_{ave} = Average angle of internal friction of soil, degree
= 41

K_a = Active earth pressure coefficient
= 0.192

D = Diameter of Shaft
= 3.5 ft

H = Distance from finish grade to design grade, ft
= 3.5 ft

γ_{ave} = Average unit weight of soil above top of shaft (kcf)
= 0.135

γ'_{ave} = Average effective unit weight of soil below top of shaft (kcf)
= 0.0726

$P_{a1} = 0.5\, K_a\, \gamma'_{ave}\, D\, (H)^2$
= 0.30 kips

Earth Load F.S. = 1.5

Factored horizontal earth load = 1.5 x 0.3
= 0.45 kips

Factored Active earth moment = 0.45 x (3.5/3 + 3)
at shaft tip, M_a = 1.87 k-ft

$\phi_i^{'}$ = the instantaneous friction angle of the rock mass (degrees)

$$\phi_i^{'} = \tan^{-1}\left\{4h\cos^2\left[30 + 0.33\sin^{-1}\left(h^{\frac{-3}{2}}\right)\right] - 1\right\}^{\frac{-1}{2}}$$

LAMSON ENGINEERING CORPORATION			Final Page No.: 29	
Project:	Route 126, Ashland	Job No.:	Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by: JJL		Date: 10/2019
Detail:	MA-4	Checked by: WD		Date: 10/2019

ϕ_i = 59.00 degrees

$$h = 1 + \frac{16(m\sigma_n^{'} + sq_u)}{(3m^2 q_u)}$$

h = 1.0231

q_u = Unconfined compressive strength of rock core (ksf)
= 576 ksf (For conservative, use concrete f'c = 4000 psi)

σ'_n = effective normal stress (ksf)
= (0.12 - 0.0624) x 9 + 0.170 x 3
= 1.028 ksf

s,m = fractured rock mass parameters, for granite (assume fair rock)
s = 0.00009
m = 0.458 (AASHTO 2012 Table 10.4.6.4-4)

S_m = Shear strength of rock mass (ksf)

$$= (\cot\phi_i^{'} - \cos\phi_i^{'})m\frac{q_u}{8}$$

= 2.83 ksf

L_R = Design Rock Socket Length
= 3.0 ft

D = Drilled shaft diameter
= 3.5 ft

β' = Angle of the bedrock (degrees)
= 0

$$P_p = \frac{S_m L_R(L_R + \sqrt{2}D)}{(1 - Tan\beta')}$$

= 67.49 kips

Resistance Moment of the rock at shaft tip, M_p = 67.49 x 1.0 = 101.2 k-ft > $M_u + M_a$ = 47.7 k-ft OK

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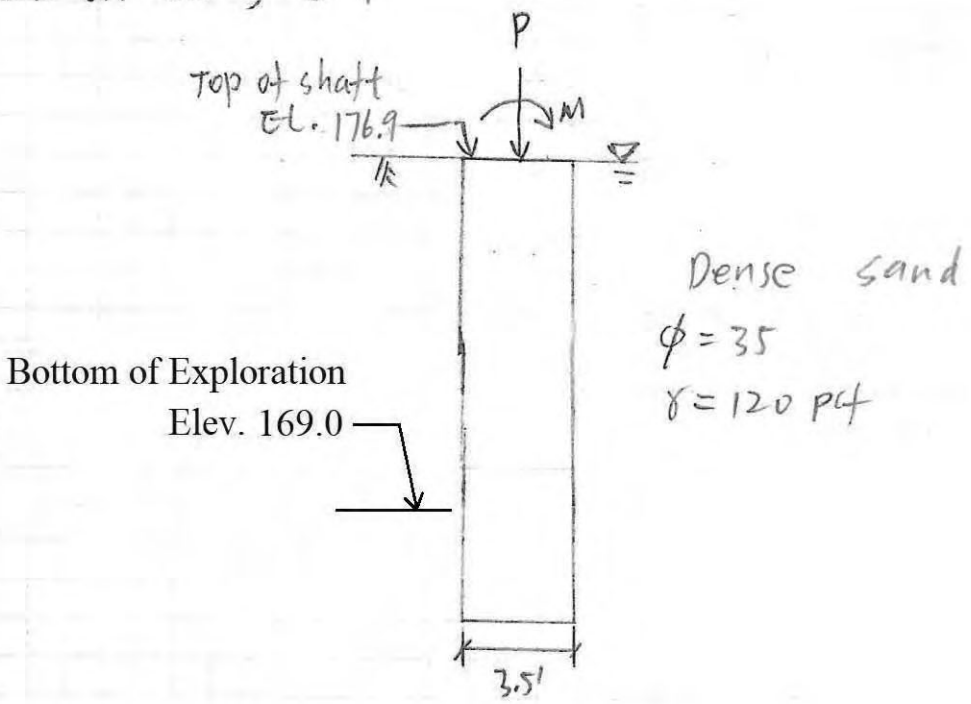
Project: Route 126, Ashland	Job No:		Preliminary Sheet No:	
Subject: Mast Arm Foundation	Prepared by: JJL		Date:	10/2019
Detail: MA-5	Checked by: WD		Date:	10/2019

MA-5 Foundation

Based on Boring B-4



LAMSON ENGINEERING CORPORATION				Final Page No.:	31
Project:	Route 126, Ashland	Job No.:		Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by:	JJL	Date:	10/2019
Detail:	MA-5	Checked by:	WD	Date:	10/2019

Determine Unfactored Horizontal Loads

Effective angle of internal friction ϕ'_f	=	35	degree
Friction angle between fill and wall, δ	=	17	degree
Angle of fill to the horizontal, β	=	0	degree
Angle of back of wall to the horizontal, θ	=	90	degree

Lateral Earth Pressure (EH)

Active pressure coefficient, K_a

$$= \frac{\sin^2(\theta + \phi'_f)}{\sin^2\theta \sin(\theta - \delta)\left[1 + \sqrt{\frac{\sin(\phi'_f + \delta)\sin(\phi'_f - \beta)}{\sin(\theta - \delta)\sin(\theta + \beta)}}\right]^2}$$

$$= 0.246$$

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Project:	Route 126, Ashland	Job No.:	Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by: JJL		Date: 10/2019
Detail:	MA-5	Checked by: WD		Date: 10/2019

Drilled Shaft Vertical Resistance

Based on B-4

φ_s = side resistance factor
= 0.55

φ_p = tip resistance factor
= 0.50 (2017 AASHTO Table 10.5.5.2.4-1)

D = Diameter of Shaft
= 3.5 ft

L_R = Rock socket length
= 3 ft

Side Resistance

q_s = unit shaft side resistance

$$= Cp_a\sqrt{\frac{q_u}{p_a}}$$

where,

P_a = Atmospheric pressure
= 2.12 ksf

q_u = uniaxial compressive strength of rock
= 576 ksf (use f'c = 4000 psi)

C = Regression coefficient
= 1.0 for normal conditions

q_s = 34.9 ksf

A_s = Drilled shaft side area
= 33.0 ft^2

R_s = $q_s A_s$
= 1152.7 kips

LAMSON ENGINEERING CORPORATION			Final Page No.: 33	
Project:	Route 126, Ashland	Job No.:	Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by: JJL		Date: 10/2019
Detail:	MA-5	Checked by: WD		Date: 10/2019

Tip Resistance

For conservative, assume random joint condition

q_p = unit shaft tip resistance

$$= A + q_u \left[m_b \left(\frac{A}{q_u} \right) + S \right]^a$$

in which,

$$A = \sigma'_{vb} + q_u \left[m_b \left(\frac{\sigma'_{vb}}{q_u} \right) + S \right]^a$$

σ'_{vb} = vertical effective stress at the socket bearing elevation
= (0.12 - 0.0624) x 9 + 0.170 x 3
= 1.028 ksf

$$s = e^{\left(\frac{GSI-100}{9-3D}\right)}$$

$$a = \frac{1}{2} + \frac{1}{6}\left(e^{\frac{-GSI}{15}} - e^{\frac{-20}{3}}\right)$$

$$m_b = m_i e^{\left(\frac{GSI-100}{28-14D}\right)}$$

Where,

GSI = Geological strength index (2017 AASHTO Figure 10.4.6.4-1)
= 25 (For conservative, based on seamy, fractured granite)

e = 2.718 (natural log base)

D = disturbance factor
= 0 (for rock coring method)

m_i = 32 (for granite) (2017 AASHTO Table 10.4.6.4-1)

Thus,

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Project:	Route 126, Ashland	Job No.:	Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by: JJL		Date: 10/2019
Detail:	MA-5	Checked by: WD		Date: 10/2019

s = 0.00024

a = 0.531

m_b = 2.198

Then,

A = 32.3

Therefore,

q_p = 222.1 ksf

A_p = Drilled shaft tip area
= 9.6 ft^2

R_p = $q_p A_p$
= 2136.6 kips

Nominal Drilled Shaft Resistance

R_n = $R_p + R_s$
= 3289 kips

Factored Drilled Shaft Resistance

R_R = $\varphi_p R_p + \varphi_s R_s$
= 1702 kips

From Green, Group Load III

Factored vertical Load = 3017 lb
= 3 kips

Weight of Drilled Shaft = 0.15 x (π 3.5^2) / 4 x (3 + 7.9)
= 15.7 kips

Total Factored Vertical Load = 3 + 1.25 x 15.7
= 19.7 kips < 1702.3 kips
OK

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Project:	Route 126, Ashland	Job No.:	Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by: JJL		Date: 10/2019
Detail:	MA-5	Checked by: WD		Date: 10/2019

Drilled Shaft Lateral Resistance

From Green, Group Load II, Load Case 1

Max. moment = 61491 lb-ft
at shaft top, M_u = 61.5 k-ft

φ_{ave} = Average angle of internal friction of soil, degree
= 35

K_a = Active earth pressure coefficient
= 0.246

D = Diameter of Shaft
= 3.5 ft

H = Distance from finish grade to design grade, ft
= 7.9 ft

γ_{ave} = Average unit weight of soil above top of shaft (kcf)
= 0.125

γ'_{ave} = Average effective unit weight of soil below top of shaft (kcf)
= 0.0626

P_{a1} = $0.5\, K_a\, \gamma'_{ave}\, D\, (H)^2$
= 1.68 kips

Earth Load F.S. = 1.5

Factored horizontal earth load = 1.5 x 1.68
= 2.52 kips

Factored Active earth moment = 2.52 x (7.9/3 + 3)
at shaft tip, M_a = 14.21 k-ft

$\phi_i^{'}$ = the instantaneous friction angle of the rock mass (degrees)

$$\phi_i^{'} = \tan^{-1}\left\{4h\cos^2\left[30 + 0.33\sin^{-1}\left(h^{\frac{-3}{2}}\right)\right] - 1\right\}^{\frac{-1}{2}}$$

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Project:	Route 126, Ashland	Job No.:		Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by:	JJL	Date:	10/2019
Detail:	MA-5	Checked by:	WD	Date:	10/2019

ϕ_i = 59.00 degrees

$$h = 1 + \frac{16(m\sigma_n^{'} + sq_u)}{(3m^2 q_u)}$$

h = 1.0231

q_u = Unconfined compressive strength of rock core (ksf)
= 576 ksf (For conservative, use concrete f'c = 4000 psi)

σ'_n = effective normal stress (ksf)
= (0.12 - 0.0624) x 9 + 0.170 x 3
= 1.028 ksf

s,m = fractured rock mass parameters, for granite (assume fair rock)
s = 0.00009
m = 0.458 (AASHTO 2012 Table 10.4.6.4-4)

S_m = Shear strength of rock mass (ksf)

$$= (\cot\phi_i^{'} - \cos\phi_i^{'})m\frac{q_u}{8}$$

= 2.83 ksf

L_R = Design Rock Socket Length
= 3.0 ft

D = Drilled shaft diameter
= 3.5 ft

β' = Angle of the bedrock (degrees)
= 0

$$P_p = \frac{S_m L_R(L_R + \sqrt{2}D)}{(1 - Tan\beta')}$$

= 67.49 kips

Resistance Moment of the rock at shaft tip, M_p = 67.49 x 1.0 = 101.2 k-ft > $M_u + M_a$ = 75.7 k-ft OK

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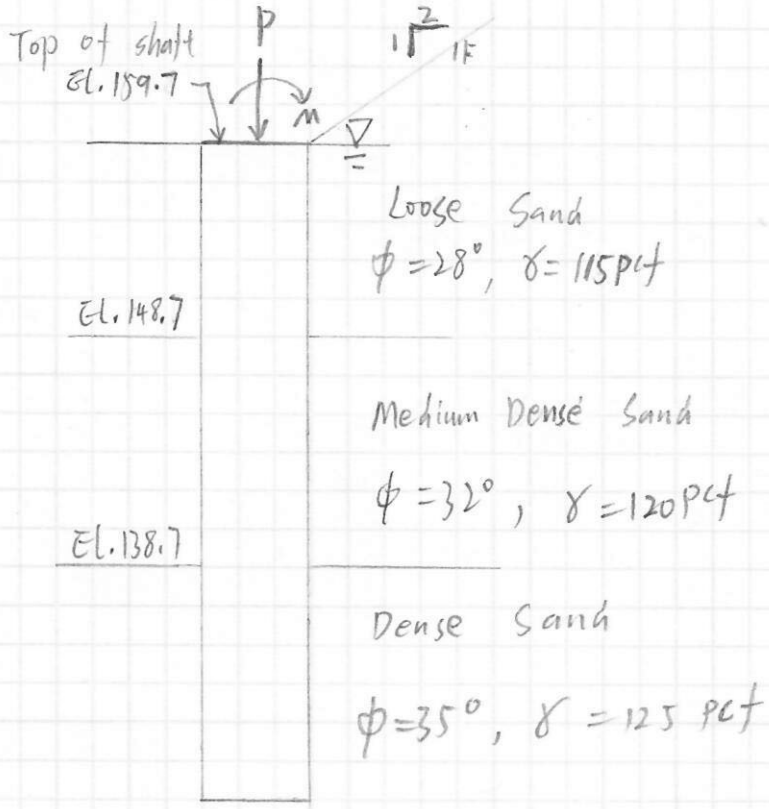
Project: Route 126, Ashland	Job No:	Preliminary Sheet No:	
Subject: Mast Arm Foundation	Prepared by: JJL	Date:	10/2019
Detail: MA-6	Checked by: WD	Date:	10/2019

MA-6 Foundation

Based on Boring B-9



Average N1 = 23

$\Rightarrow$

use $\phi_{ave} = 32°$

$\gamma_{ave} = 120$ pcf

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Project:	Route 126, Ashland	Job No.:		Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by:	JJL	Date:	10/2019
Detail:	Corrected *SPT* blow count	Checked by:	WD	Date:	10/2019

B-9

Water table = 0.0 ft γ_w 0.0624 kcf

γ_{avg} 0.12 kcf

Depth ft	σ'_v ksf	C_N	N blows/ft	$N1 = C_N N$ blows/ft	Remark
1	0.058	2.000	4	8	Average N_{60} = 10
5	0.288	1.650	4	7	
10	0.576	1.418	11	16	
15	0.864	1.282	19	24	
20	1.152	1.186	37	44	
25	1.440	1.112	35	39	
			Average N1	23	

For example

Depth = 20 ft

C_N = $0.77 \log_{10} (40 / \sigma'_v)$ < 2 (AASHTO 10.4.6.2.4-1)

σ'_v = vertical effective stress (ksf)

= 30 ft x (0.12 - 0.0624) kcf

= 1.440 ksf

C_N = $0.77 \log_{10} (40 / 1.44)$

= 1.112 < 2

N = uncorrected *SPT* blow count (blows/ft.)

= 35 blows /ft

$N1$ = $C_N N$

= 1.051 x 120 ≤ 100 blows/ft

= 39 blows/ft < 100 blows/ft

$N1$ = 39 blows/ft

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Project:	Route 126, Ashland	Job No.:		Preliminary Sheet No.:	
Subject:	Mast Arm Foundation	Prepared by:	JJL	Date:	10/2019
Detail:	MA-6	Checked by:	WD	Date:	10/2019

Determine Unfactored Horizontal Loads

Effective angle of internal friction ϕ'_f	=	32	degree
Friction angle between fill and wall, δ	=	17	degree
Angle of fill to the horizontal, β	=	27	degree
Angle of back of wall to the horizontal, θ	=	90	degree

Lateral Earth Pressure (EH)

Active pressure coefficient, K_a

$$= \frac{\sin^2(\theta + \phi'_f)}{\sin^2\theta \sin(\theta - \delta)\left[1 + \sqrt{\frac{\sin(\phi'_f + \delta)\sin(\phi'_f - \beta)}{\sin(\theta - \delta)\sin(\theta + \beta)}}\right]^2}$$

$$= 0.453$$

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Subject:	Mast Arm Foundation	Prepared by: JJL		Date: 10/2019
Detail:	MA-6	Checked by: WD		Date: 10/2019

Drilled Shaft Vertical Resistance

Based on Boring B-9

φ_s = side resistance factor
= 0.55

φ_p = tip resistance factor
= 0.50 (AASHTO Table 10.5.5.2.4-1)

Side Resistance

q_s = shaft resistance
= $\beta\sigma_v'$

$$\beta = \left(1-\sin\varphi_f'\right)\left(\frac{\sigma_p'}{\sigma_v'}\right)^{\sin\varphi_f'}\tan\varphi_f'$$

φ_f' = friction angle of soil layer
= 32 degree

σ'_v = vertical effective stress at soil layer mid-depth

σ'_p = effective vertical preconsolidation stress
= $0.47P_a(N_{60})^m$ for sands

where,

P_a = 2.12 ksf

m = 0.8 for silty sand to sandy silts

D = Drilled shaft diameter
= 3.5 ft

L = Length of soil contributing to side resistance, (ft)

A_s = area of shaft side surface

L_S = Length of Drilled Shaft
= 12 ft

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z (ft)	σ'_v (ksf)	N_{60}	σ'_p (ksf)	β	q_s (ksf)	L (ft)	A_s (ft^2)	R_s (kips)
6	0.3	10	6.29	1.37	0.5	7.0	76.97	36.3
							Total	36.3

Note:
The top 5 feet of the drilled shaft for soil side resistance was not considered in the vertical resistance calculations. Per AASHTO 10.8.3.5.1b

Tip Resistance

- for $N_{60} \le 50$

$$q_p = 1.2N_{60} \quad \le \quad 60 \text{ ksf}$$

- for $N_{60} > 50$

$$q_p = 0.59\left[N_{60}\left(\frac{p_a}{\sigma'_v}\right)\right]^{0.8}\sigma'_v \quad \le \quad 60 \text{ ksf}$$

Since the tip of drilled shaft is on the layer of medium dense fine sand material, N_{60} = 11

q_p = 13.20 ksf

D = Drilled shaft diameter
= 3.5 ft

A_p = area of shaft tip
= 3.14159 x 3.0 ^ 2 / 4 = 9.62 ft^2

R_p = q_p x A_p
= 127.0 kips

R_R = $\varphi_p R_p + \varphi_s R_s$
= 83.5 kips

From Green, Group Load III

Factored vertical Load = 2547 lb
= 3 kips

Weight of Drilled Shaft = 0.15 x (π 3.5^2) / 4 x 12
= 17.3 kips

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Subject:	Mast Arm Foundation	Prepared by: JJL		Date: 10/2019
Detail:	MA-6	Checked by: WD		Date: 10/2019

Total Factored Vertical Load = 3 + 1.25 x 17.3
= 24.2 kips < 83.5 kips
OK

Drilled Shaft Lateral Resistance

From Green, Group Load II, Load Case 1

Max. moment = 59032 lb-ft
at shaft top, M_u = 59.0 k-ft

Required Drilled Shaft Length, L_s = 12.00 ft D = 3.5 ft

φ_{ave} = Average angle of internal friction of soil, degree
= 32

β = Maximum angle of the sloping backfill, degree
= 27 (2H:1V))

Per AASHTO Table 3.11.5.3-1:

δ = friction angle between wall and backfill, degree
= 17

Per AASHTO Fig. 3.11.5.4-2:

K_p = Coefficient of passive earth pressure
= 5.67

K_a = Design lateral earth coefficient
= 0.453

D = Drilled shaft diameter
= 3.5 ft

H = Distance from finish grade to design grade, ft
= 0.00 ft

γ_{ave} = Average unit weight of soil (kcf)
= 0.120

γ'_{ave} = Average effective unit weight of soil (kcf)
= 0.0576

LAMSON ENGINEERING CORPORATION			Final Page No.: 43
Project:	Route 126, Ashland	Job No.:	Preliminary Sheet No.:
Subject:	Mast Arm Foundation	Prepared by: JJL	Date: 10/2019
Detail:	MA-6	Checked by: WD	Date: 10/2019

P_{a1} = $0.5\ K_a\ \gamma'_{ave}\ D\ (H)^2$

= 0.00 k

P_{a2} = $0.5K_aL_sD(2\gamma_{ave}H+\gamma'_{ave}L_s)$

= 6.58 k

L_{a2} = Distance between design grade and P_{a2}, (ft)

= $\frac{L_s\left[\gamma'_{ave}H+(2/3)\gamma'_{ave}L_s\right]}{\left(2\gamma'_{ave}H+\gamma'_{ave}L_s\right)}$

= 8.0 ft

Factored Active earth moment at shaft tip, M_a = $1.5 \times [\ P_{a1} \times (\ L_s - 2H/3) + P_{a2} \times (L_s - L_{a2}\ )]$

= 39.45 k-ft (Strength I)

P_p = $1.5\ K_p\ \gamma'_{ave}\ L_s^2\ D$

= 246.90 k

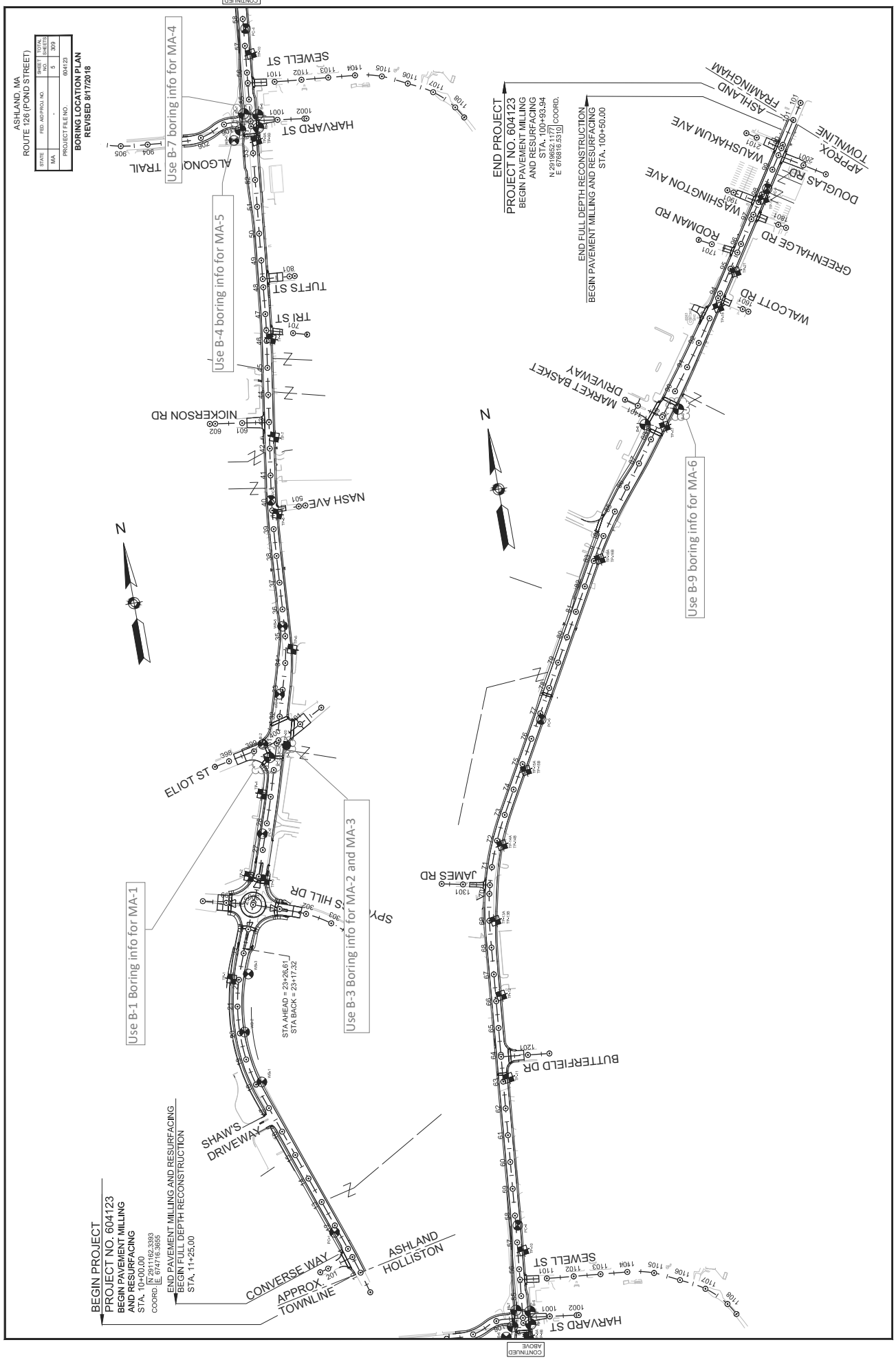
Resistance Moment of the soil at shaft tip, M_p = $P_p \times L_s/3$ = 987.6 k-ft > $M_a + M_u$ = 98.5 k-ft OK

Appendix 1
Applicable Boring Information

Index

- Boring Location Plan
- Applicable Boring Logs for Borings B-1, B-3, B-4, B-7, and B-9.

Note: Lamson Engineering was not involved in the monitoring of these borings.


ASHLAND, MA
ROUTE 126 (POND STREET)
BORING LOCATION PLAN
REVISED 8/17/2018
Use B-7 boring info for MA-4
Use B-4 boring info for MA-5
Use B-1 Boring info for MA-1
Use B-3 Boring info for MA-2 and MA-3
Use B-9 boring info for MA-6
BEGIN PROJECT
PROJECT NO. 604123
BEGIN PAVEMENT MILLING
AND RESURFACING
STA. 10+00.00
END PAVEMENT MILLING AND RESURFACING
BEGIN FULL DEPTH RECONSTRUCTION
STA. 11+25.00
END PROJECT
PROJECT NO. 604123
BEGIN PAVEMENT MILLING
AND RESURFACING
STA. 100+93.94
END FULL DEPTH RECONSTRUCTION
BEGIN PAVEMENT MILLING AND RESURFACING
STA. 100+50.00
REVISED - 10/5/2018
SEWELL ST
HARVARD ST
ALGONQUIN TRAIL
TUFTS ST
TRI ST
NICKERSON RD
NASH AVE
ELIOT ST
SPY'S HILL DR
STA AHEAD = 23+26.61
STA BACK = 23+17.32
SHAW'S DRIVEWAY
CONVERSE WAY
APPROX. TOWNLINE
ASHLAND
HOLLISTON
JAMES RD
BUTTERFIELD DR
MARKET BASKET DRIVEWAY
WALCOTT RD
GREENHALGE RD
RODMAN RD
WASHINGTON AVE
WAUSHAKUM AVE
DOUGLAS RD
APPROX. TOWNLINE
ASHLAND
FRAMINGHAM
CONTINUED BELOW
CONTINUED ABOVE

Geologic - Earth Exploration, Inc.
7 Sherwood Drive
TEL 508 384 4434
Norfolk, MA 02056
FAX 508 384 4452

CLIENT: Green International
PROJECT: Route 126 Improvements
LOCATION: Ashland, MA

BORING #: B-1
PAGE 1 OF 1

		CASING	SAMPLER	CORE BARREL
File #:	17171			
Date Started:	10/19/17	TYPE	HW	SS	
Date Completed:	10/20/17	SIZE	3"	24"	
Driller:	D.Jacobs	HAMMER	140#	140#	---
Site Rep.:		FALL	30"	30"	---

Surface Elevation:
Station:
Groundwater level readings
Date Depth
Date Depth

Depth ft	Sample No.	Depth ft	Pen. in	Rec. in	Blows/6"	Sample Description
	S-1	0.0-2.0	24	6	3-7-5-4	S-1 Wet loose gray fine SAND, some Gravel
5	S-2	4.0-6.0	24	5	7-9-9-14	S-2 Wet loose gray fine SAND, large Gravel
10	S-3	9.0-9.0	0	0	120/0"	S-3 Rock at 9.0', Roller bit refusal Bottom of exploration at 9.0'
15						
20						
25						
30						

Ground Surface to _____ used _____ then _____

Proportions Used		Cohesive Consistency Blows/ft				Cohesionless Density Blows/ft		Sample Type
Trace	0 to 10%	0-2	Very Soft	9-15	Stiff	0-10	Loose	UP = Fixed Piston
Little	10 to 20%	3-4	Soft	16-30	V-Stiff	10-30	M-Dense	UT = Shelby Tube
Some	20 to 35%	5-8	M-Stiff	31+	Hard	30-50	Dense	OE = Open End Rod
And	35 to 50%					50+	V-Dense	* = 300# hammer

Notes:
1. The stratification lines represent the approximate boundary between soil types. The transition may be gradual.
2. Water level readings were made in the drill hole during or at the completion of drilling. The water level may fluctuate over time.

Remarks: NOTE: All soil descriptions are made in the field by the Drilling Foreman. No laboratory analyses were performed for this purpose.

BL ALL 17171 GIA_ASHLAND_MA.GPJ GEOLOGIC.GDT 11/29/17

Geologic - Earth Exploration, Inc.
7 Sherwood Drive
TEL 508 384 4434
Norfolk, MA 02056
FAX 508 384 4452

CLIENT: Green International
PROJECT: Route 126 Improvements
LOCATION: Ashland, MA

BORING #: B-3
PAGE 1 OF 1

File #: 17171
Date Started: 10/19/17
Date Completed: 10/19/17
Driller: D.Jacobs
Site Rep.:

	CASING	SAMPLER	CORE BARREL
TYPE	HW	SS	
SIZE	3"	24"	
HAMMER	140#	140#	---
FALL	30"	30"	---

Surface Elevation:
Station:
Groundwater level readings
Date Depth
Date Depth

Depth ft	Sample No.	Sample Depth ft	Pen. in	Rec. in	Blows/6"	Sample Description
	S-1	0.0-2.0	24	4	1-2-2-3	S-1 Moist loose brown MULCH and coarse SAND
5	S-2	4.0-4.2	2	2	120/2"	S-2 Moist very dense tan coarse SAND and STONE Roller bit refusal at 4.5' Cored 5 feet of different size boulders to 9.5'
10						Bottom of exploration at 9.5'
15						
20						
25						
30						

Ground Surface to _____ used _____ then _____

Proportions Used		Cohesive Consistency Blows/ft				Cohesionless Density Blows/ft		Sample Type
Trace	0 to 10%	0-2	Very Soft	9-15	Stiff	0-10	Loose	UP = Fixed Piston
Little	10 to 20%	3-4	Soft	16-30	V-Stiff	10-30	M-Dense	UT = Shelby Tube
Some	20 to 35%	5-8	M-Stiff	31+	Hard	30-50	Dense	OE = Open End Rod
And	35 to 50%					50+	V-Dense	* = 300# hammer

Notes:
1. The stratification lines represent the approximate boundary between soil types. The transition may be gradual.
2. Water level readings were made in the drill hole during or at the completion of drilling. The water level may fluctuate over time.

Remarks: NOTE: All soil descriptions are made in the field by the Drilling Foreman. No laboratory analyses were performed for this purpose.

BL ALL 17171 GIA_ASHLAND_MA.GPJ GEOLOGIC.GDT 11/29/17

Geologic - Earth Exploration, Inc.
7 Sherwood Drive
TEL 508 384 4434
Norfolk, MA 02056
FAX 508 384 4452

CLIENT: Green International
PROJECT: Route 126 Improvements
LOCATION: Ashland, MA

BORING #: B-4
PAGE 1 OF 1

		CASING	SAMPLER	CORE BARREL
File #:	17171			
Date Started:	10/23/17	TYPE	HW	SS	
Date Completed:	10/23/17	SIZE	3"	24"	
Driller:	D.Jacobs	HAMMER	140#	140#	---
Site Rep.:		FALL	30"	30"	---

Surface Elevation:
Station:
Groundwater level readings
Date Depth
Date Depth

Depth ft	Sample No.	Depth ft	Pen. in	Rec. in	Blows/6"	Sample Description
	S-1	0.0-2.0	24	12	9-15-14-10	S-1 Dry medium dense brown fine TOP SOIL, trace Gravel
5	S-2	4.0-6.0	24	8	13-14-18-36	S-2 Moist dense brown fine SAND, little Sit Drilled down from 6.5' - 7.5' confirmed Rock
						Bottom of exploration at 7.5'
10						
15						
20						
25						
30						

Ground Surface to _____ used _____ then _____

Proportions Used		Cohesive Consistency Blows/ft				Cohesionless Density Blows/ft		Sample Type
Trace	0 to 10%	0-2	Very Soft	9-15	Stiff	0-10	Loose	UP = Fixed Piston
Little	10 to 20%	3-4	Soft	16-30	V-Stiff	10-30	M-Dense	UT = Shelby Tube
Some	20 to 35%	5-8	M-Stiff	31+	Hard	30-50	Dense	OE = Open End Rod
And	35 to 50%					50+	V-Dense	* = 300# hammer

Notes:
1. The stratification lines represent the approximate boundary between soil types. The transition may be gradual.
2. Water level readings were made in the drill hole during or at the completion of drilling. The water level may fluctuate over time.

Remarks: NOTE: All soil descriptions are made in the field by the Drilling Foreman. No laboratory analyses were performed for this purpose.

BL ALL 17171 GIA_ASHLAND_MA.GPJ GEOLOGIC.GDT 11/29/17

Geologic - Earth Exploration, Inc.
7 Sherwood Drive
TEL 508 384 4434
Norfolk, MA 02056
FAX 508 384 4452

CLIENT: Green International
PROJECT: Route 126 Improvements
LOCATION: Ashland, MA

BORING #: B-7
PAGE 1 OF 1

		CASING	SAMPLER	CORE BARREL
File #:	17171			
Date Started:	10/25/17	TYPE	HW	SS	
Date Completed:	10/25/17	SIZE	3"	24"	
Driller:	D.Jacobs	HAMMER	140#	140#	---
Site Rep.:		FALL	30"	30"	---

Surface Elevation:
Station:
Groundwater level readings
Date Depth
Date Depth

Depth ft	Sample No.	Depth ft	Pen. in	Rec. in	Blows/6"	Sample Description
0	S-1	0.0-2.0	24	4	120/4"	S-1 Dry very dense gray coarse SAND and GRAVEL Weathered Rock from 4.0' to 5.0', Roller bit to 5.5'
5						Bottom of exploration at 5.5'
10						
15						
20						
25						
30						

Ground Surface to _____ used _____ then _____

Proportions Used		Cohesive Consistency Blows/ft				Cohesionless Density Blows/ft		Sample Type
Trace	0 to 10%	0-2	Very Soft	9-15	Stiff	0-10	Loose	UP = Fixed Piston
Little	10 to 20%	3-4	Soft	16-30	V-Stiff	10-30	M-Dense	UT = Shelby Tube
Some	20 to 35%	5-8	M-Stiff	31+	Hard	30-50	Dense	OE = Open End Rod
And	35 to 50%					50+	V-Dense	* = 300# hammer

Notes:
1. The stratification lines represent the approximate boundary between soil types. The transition may be gradual.
2. Water level readings were made in the drill hole during or at the completion of drilling. The water level may fluctuate over time.

Remarks:

BL ALL 17171 GIA_ASHLAND_MA.GPJ GEOLOGIC.GDT 11/29/17

Geologic - Earth Exploration, Inc.

7 Sherwood Drive
TEL 508 384 4434
Norfolk, MA 02056
FAX 508 384 4452

CLIENT: Green International
PROJECT: Route 126 Improvements
LOCATION: Ashland, MA

BORING #: B-9
PAGE 1 OF 1

		CASING	SAMPLER	CORE BARREL
File #:	17171	TYPE: HW	SS	
Date Started:	10/23/17	SIZE: 3"	24"	
Date Completed:	10/23/17	HAMMER: 140#	140#	---
Driller:	D.Jacobs	FALL: 30"	30"	---
Site Rep.:				

Surface Elevation:
Station:
Groundwater level readings
Date Depth
Date Depth

Depth ft	Sample No.	Depth ft	Pen. in	Rec. in	Blows/6"	Sample Description
	S-1	0.0-2.0	24	5	2-1-3-3	S-1 Dry loose dark brown fine TOP SOIL
5	S-2	4.0-6.0	24	2	1-2-2-2	S-2 Wet loose dark brown fine SOIL, some Gravel
10	S-3	9.0-11.0	24	4	1-4-7-9	S-3 Wet medium dense gray coarse and fine SAND
15	S-4	14.0-16.0	24	0	11-10-9-10	S-4 No Recovery
20	S-5	19.0-21.0	24	24	12-17-20-17	S-5 Wet dense gray fine SAND, some Gravel
25	S-6	24.0-26.0	24	16	13-15-20-17	S-6 Wet dense gray fine SAND, some Gravel
						Bottom of exploration at 26.0'
30						

Ground Surface to _____ used _____ then _____

Proportions Used		Cohesive Consistency Blows/ft				Cohesionless Density Blows/ft		Sample Type
Trace	0 to 10%	0-2	Very Soft	9-15	Stiff	0-10	Loose	UP = Fixed Piston
Little	10 to 20%	3-4	Soft	16-30	V-Stiff	10-30	M-Dense	UT = Shelby Tube
Some	20 to 35%	5-8	M-Stiff	31+	Hard	30-50	Dense	OE = Open End Rod
And	35 to 50%					50+	V-Dense	* = 300# hammer

Notes:
1. The stratification lines represent the approximate boundary between soil types. The transition may be gradual.
2. Water level readings were made in the drill hole during or at the completion of drilling. The water level may fluctuate over time.

Remarks:

BL ALL 17171 GIA_ASHLAND_MA.GPJ GEOLOGIC.GDT 11/29/17

Appendix 2

Reference Information from Green International Affiliates, Inc

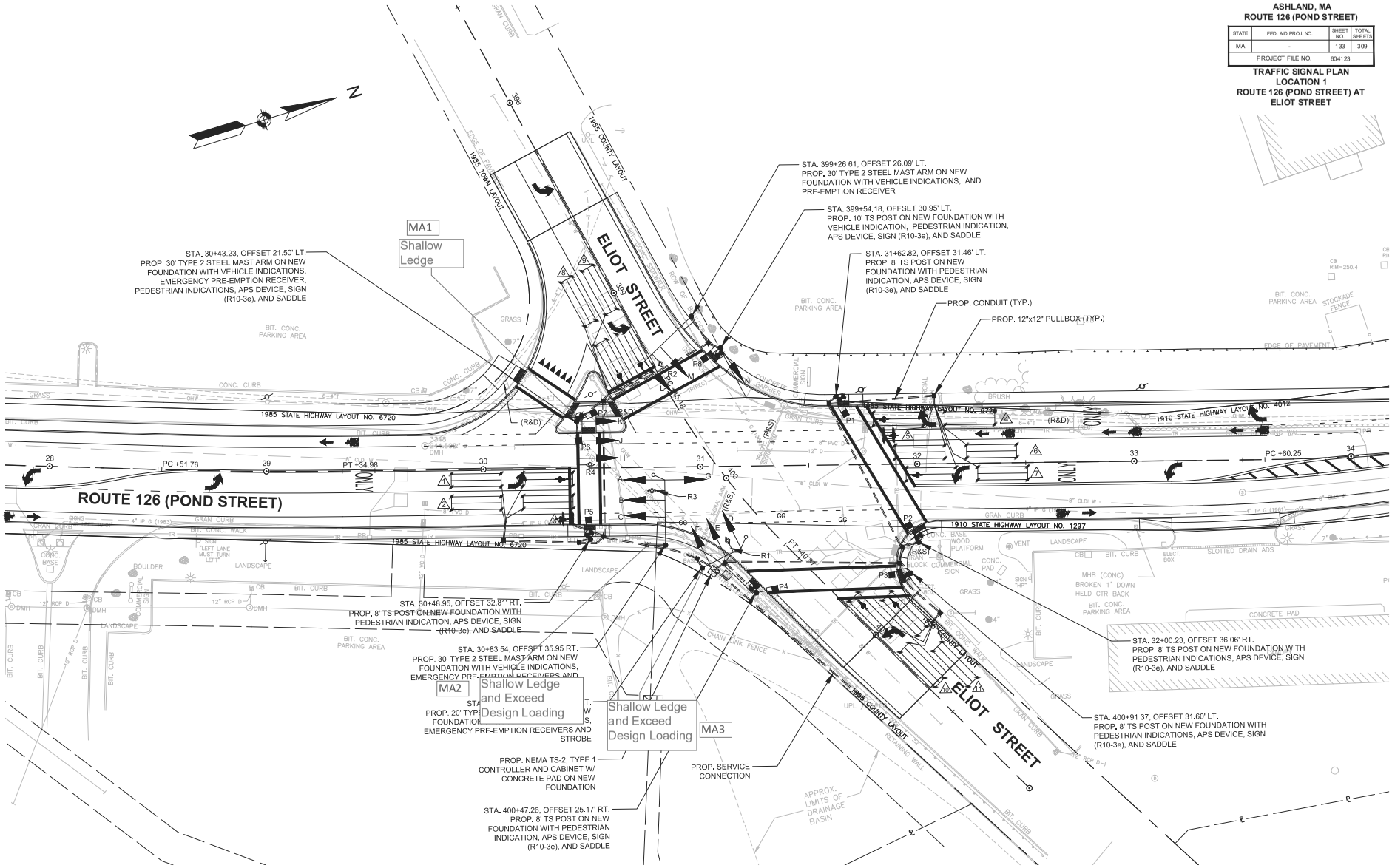
Index

- Plan sheets (4 sheets)
- Boring Logs (5 sheets)
- Boring Elevation and Coordinates (1 sheet)
- Mast Arm Loads (6 sheets)

ASHLAND, MA
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	133	309
PROJECT FILE NO.	604123		

TRAFFIC SIGNAL PLAN
LOCATION 1
ROUTE 126 (POND STREET) AT ELIOT STREET

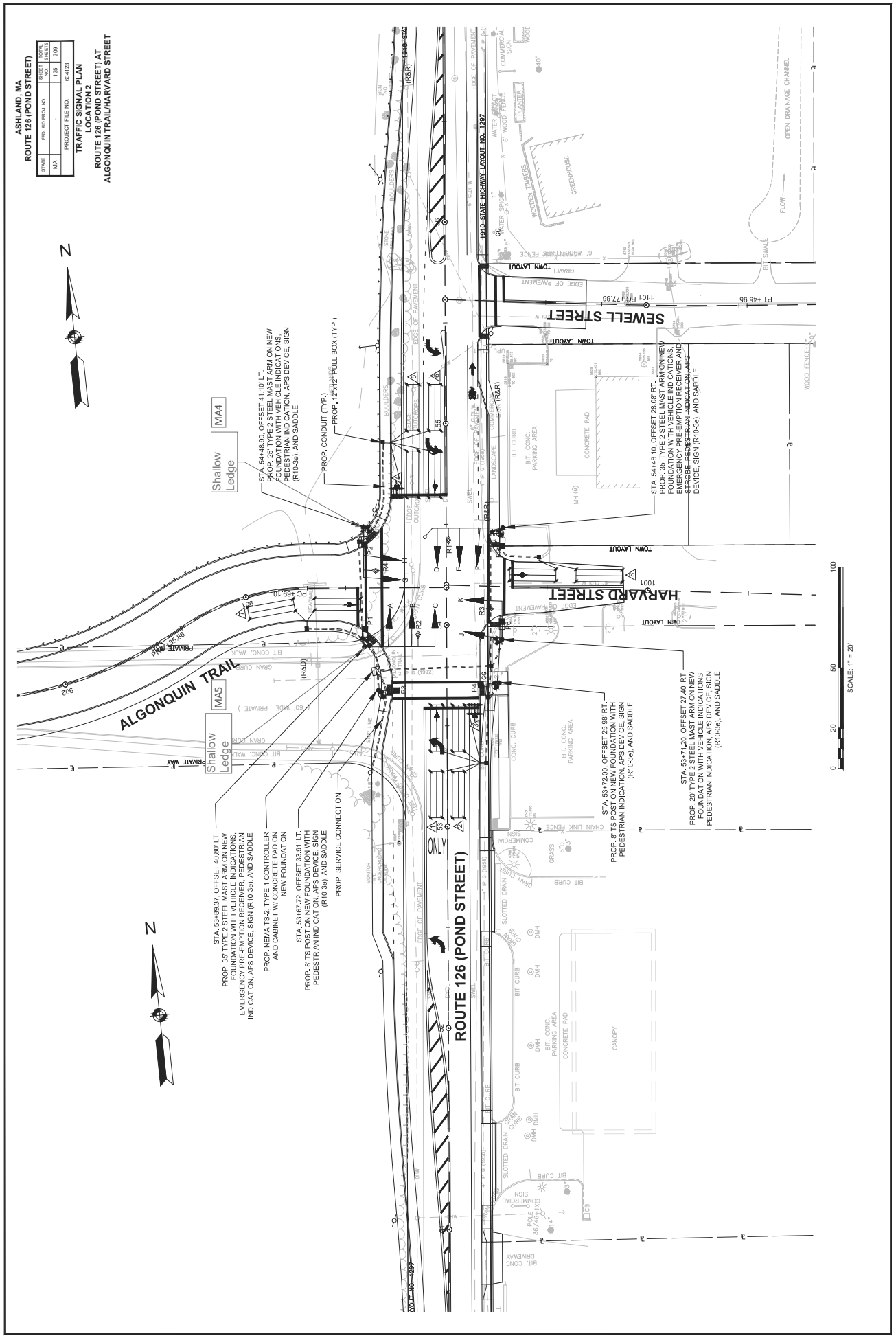


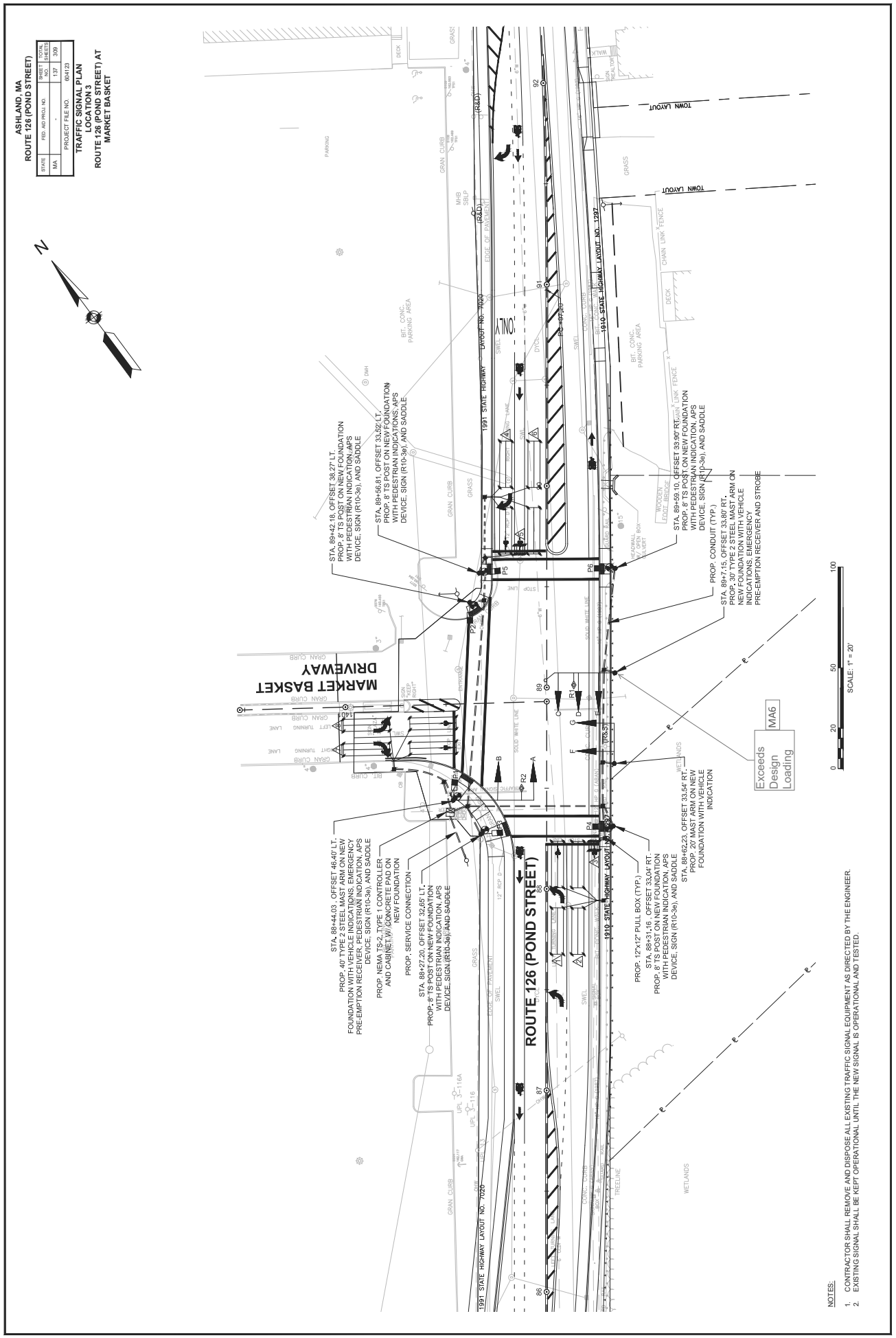
NOTES:

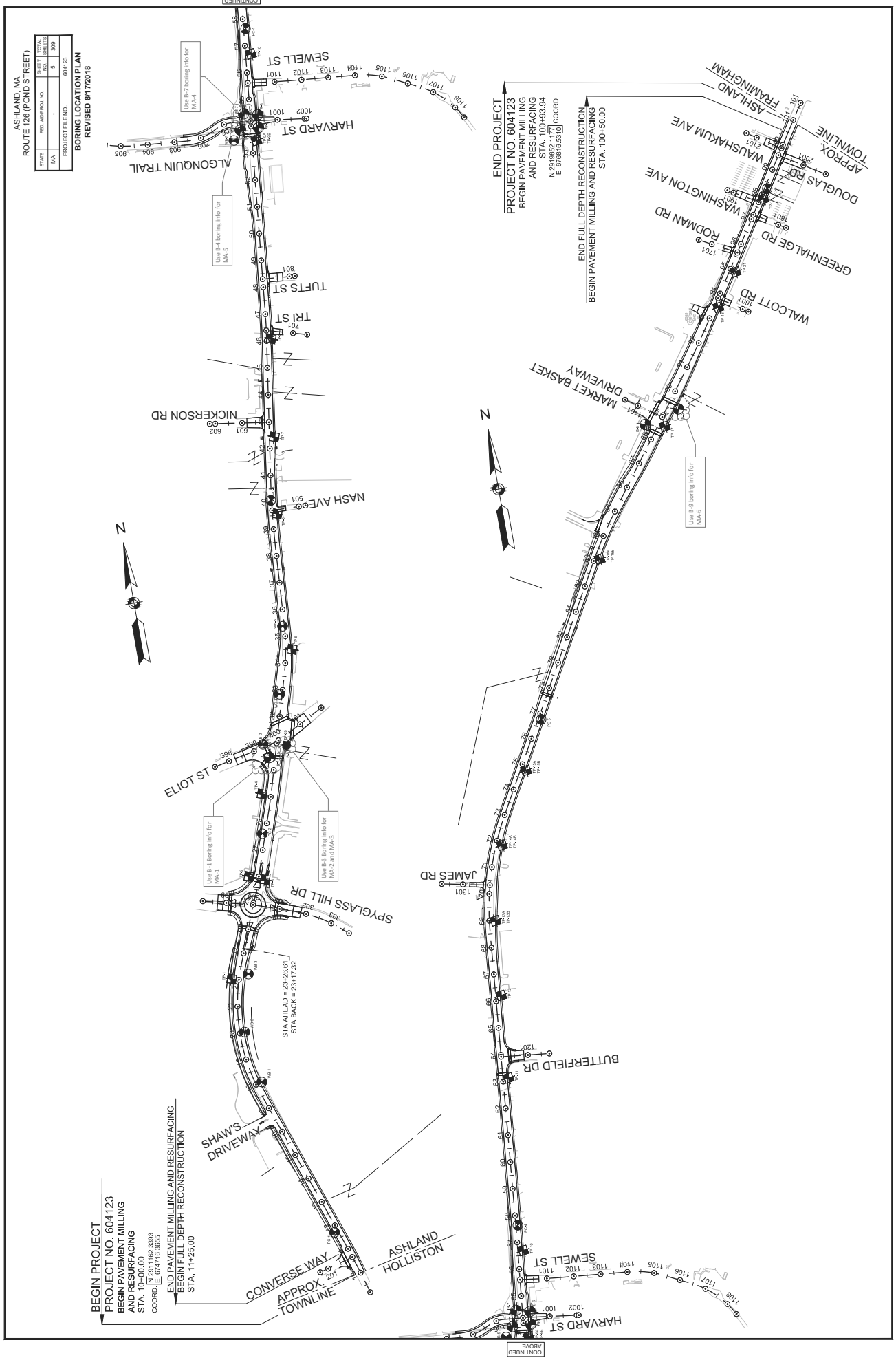
1. CONTRACTOR SHALL REMOVE AND DISPOSE ALL EXISTING TRAFFIC SIGNAL EQUIPMENT AS DIRECTED BY THE ENGINEER.
2. EXISTING SIGNAL SHALL BE KEPT OPERATIONAL UNTIL THE NEW SIGNAL IS OPERATIONAL AND TESTED.
3. INSTALL QUEUE DETECTOR FOR POND STREET NORTHBOUND APPROACH AT STA 26+25.

0 20 50 100
SCALE: 1" = 20'

604123_TR01(TRSIGNALPLANS).DWG Plotted on 18-Oct-2017 10:41 AM


ASHLAND, MA
ROUTE 126 (POND STREET)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 1.35 | 309
PROJECT FILE NO. 604123
TRAFFIC SIGNAL PLAN
LOCATION 2
ROUTE 126 (POND STREET) AT
ALGONQUIN TRAIL/HARVARD STREET
ROUTE 126 (POND STREET)
ALGONQUIN TRAIL
SEWELL STREET
HARVARD STREET
PRIVATE WAY
1910 STATE HIGHWAY LAYOUT NO. 1297
TOWN LAYOUT
MA4
MA5
Shallow Ledge
STA. 54+48.90, OFFSET 41.10' LT.
PROP. 25' TYPE 2 STEEL MAST ARM ON NEW FOUNDATION WITH VEHICLE INDICATIONS, PEDESTRIAN INDICATION, APS DEVICE, SIGN (R10-3e), AND SADDLE
PROP. CONDUIT (TYP.)
PROP. 12"x12" PULL BOX (TYP.)
STA. 54+48.10, OFFSET 28.08' RT., PROP. 35' TYPE 2 STEEL MAST ARM ON NEW FOUNDATION WITH VEHICLE INDICATIONS, EMERGENCY PRE-EMPTION RECEIVER AND STROBE, PEDESTRIAN INDICATION, APS DEVICE, SIGN (R10-3e), AND SADDLE
STA. 53+72.00, OFFSET 25.98' RT.- PROP. 8' TS POST ON NEW FOUNDATION WITH PEDESTRIAN INDICATION, APS DEVICE, SIGN (R10-3e), AND SADDLE
STA. 53+71.20, OFFSET 27.40' RT. PROP. 20' TYPE 2 STEEL MAST ARM ON NEW FOUNDATION WITH VEHICLE INDICATIONS, PEDESTRIAN INDICATION, APS DEVICE, SIGN (R10-3e), AND SADDLE
STA. 53+89.37, OFFSET 40.80' LT. PROP. 35' TYPE 2 STEEL MAST ARM ON NEW FOUNDATION WITH VEHICLE INDICATIONS, EMERGENCY PRE-EMPTION RECEIVER, PEDESTRIAN INDICATION, APS DEVICE, SIGN (R10-3e), AND SADDLE
PROP. NEMA TS-2, TYPE 1 CONTROLLER AND CABINET W/ CONCRETE PAD ON NEW FOUNDATION
STA. 53+67.72, OFFSET 33.81' LT. PROP. 8' TS POST ON NEW FOUNDATION WITH PEDESTRIAN INDICATION, APS DEVICE, SIGN (R10-3e), AND SADDLE
PROP. SERVICE CONNECTION
SCALE: 1" = 20'
N


ASHLAND, MA
ROUTE 126 (POND STREET)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 1.37 | 309
PROJECT FILE NO. 604123
TRAFFIC SIGNAL PLAN
LOCATION 3
ROUTE 126 (POND STREET) AT MARKET BASKET
604123_TR01(TRSIGNALPLANS).DWG Plotted on 18-OCT-2017 10:41 AM
N
ROUTE 126 (POND STREET)
MARKET BASKET DRIVEWAY
1991 STATE HIGHWAY LAYOUT NO. 7026
1910 STATE HIGHWAY LAYOUT NO. 1297
TOWN LAYOUT
STA. 88+44.03 , OFFSET 46.40' LT.
PROP. 40' TYPE 2 STEEL MAST ARM ON NEW FOUNDATION WITH VEHICLE INDICATIONS, EMERGENCY PRE-EMPTION RECEIVER, PEDESTRIAN INDICATION, APS DEVICE, SIGN (R10-3e), AND SADDLE
PROP. NEMA TS-2, TYPE 1 CONTROLLER AND CABINET W/ CONCRETE PAD ON NEW FOUNDATION
PROP. SERVICE CONNECTION
STA. 88+27.20, OFFSET 32.65' LT.
PROP. 8' TS POST ON NEW FOUNDATION WITH PEDESTRIAN INDICATION, APS DEVICE, SIGN (R10-3e), AND SADDLE
STA. 89+42.18, OFFSET 38.27' LT.
PROP. 8' TS POST ON NEW FOUNDATION WITH PEDESTRIAN INDICATION, APS DEVICE, SIGN (R10-3e), AND SADDLE
STA. 89+56.91, OFFSET 33.59' LT.
PROP. 8' TS POST ON NEW FOUNDATION WITH PEDESTRIAN INDICATIONS, APS DEVICE, SIGN (R10-3e), AND SADDLE
STA. 89+59.10, OFFSET 89.99' RT.
PROP. 8' TS POST ON NEW FOUNDATION WITH PEDESTRIAN INDICATION, APS DEVICE, SIGN (R10-3e), AND SADDLE
PROP. CONDUIT (TYP.)
STA. 89+7.15, OFFSET 33.80' RT.
PROP. 30' TYPE 2 STEEL MAST ARM ON NEW FOUNDATION WITH VEHICLE INDICATIONS, EMERGENCY PRE-EMPTION RECEIVER AND STROBE
STA. 88+62.23, OFFSET 33.54' RT.
PROP. 20' MAST ARM ON NEW FOUNDATION WITH VEHICLE INDICATION
PROP. 12"x12" PULL BOX (TYP.)
STA. 88+31.16 , OFFSET 33.04' RT.
PROP. 8' TS POST ON NEW FOUNDATION WITH PEDESTRIAN INDICATION, APS DEVICE, SIGN (R10-3e), AND SADDLE
Exceeds Design Loading
MA6
SCALE: 1" = 20'
NOTES:
1. CONTRACTOR SHALL REMOVE AND DISPOSE ALL EXISTING TRAFFIC SIGNAL EQUIPMENT AS DIRECTED BY THE ENGINEER.
2. EXISTING SIGNAL SHALL BE KEPT OPERATIONAL UNTIL THE NEW SIGNAL IS OPERATIONAL AND TESTED.


ASHLAND, MA
ROUTE 126 (POND STREET)
STATE
MA
FED. AID PROJ. NO.
-
SHEET NO.
5
TOTAL SHEETS
309
PROJECT FILE NO.
604123
BORING LOCATION PLAN
REVISED 8/17/2018
604123_HD03(BORING PLANS).DWG Plotted on 3-Oct-2018 6:47 AM
CONTINUED BELOW
SEWELL ST
HARVARD ST
ALGONQUIN TRAIL
Use B-7 boring info for MA-4
Use B-4 boring info for MA-5
TUFTS ST
TRI ST
NICKERSON RD
NASH AVE
ELIOT ST
Use B-1 Boring info for MA-1
Use B-3 Boring info for MA-2 and MA-3
SPYGLASS HILL DR
STA AHEAD = 23+26.61
STA BACK = 23+17.32
SHAW'S DRIVEWAY
BEGIN PROJECT
PROJECT NO. 604123
BEGIN PAVEMENT MILLING AND RESURFACING
STA. 10+00.00
COORD. N 2911162.3393 E 674716.3655
END PAVEMENT MILLING AND RESURFACING
BEGIN FULL DEPTH RECONSTRUCTION
STA. 11+25.00
CONVERSE WAY
APPROX. TOWNLINE
ASHLAND
HOLLISTON
END PROJECT
PROJECT NO. 604123
BEGIN PAVEMENT MILLING AND RESURFACING
STA. 100+93.94
N 2919652.1177 E 676816.5310 COORD.
END FULL DEPTH RECONSTRUCTION
BEGIN PAVEMENT MILLING AND RESURFACING
STA. 100+50.00
ASHLAND
FRAMINGHAM
APPROX. TOWNLINE
WAUSHAKUM AVE
DOUGLAS RD
WASHINGTON AVE
RODMAN RD
GREENHALGE RD
WALCOTT RD
MARKET BASKET DRIVEWAY
Use B-9 boring info for MA-6
JAMES RD
BUTTERFIELD DR
SEWELL ST
HARVARD ST
CONTINUED ABOVE
REVISED - 10/5/2018

Boring Log — **LAMSON ENGINEERING CORPORATION**
437 Cherry Street, #109, Newton, Massachusetts 02465
Phone: (617) 558-0101 E-Mail: Lamsoneng@msn.com

Boring No. WB-1 (Wall Boring) Page 1/1
Scale: 1" = 5'

City/Town: Ashland | Bridge No.: - | Project File No.: 604123 | Contract No.: -
Location: Route 126 (Pond Street) | Date & Time Started: 10/11/17 9:30 pm | Total Hours:
Groundwater Depth (Feet): - Date & Time: - | Date & Time Completed: 10/12/17 4:00 am | 6.5
Coordinates: N 2,911,924 E 674,478 | Ground Elevation (Feet): 263.5' | Inspector's Name: Weijie Dong
Drilling Company: Geologic Exploration, Inc. | Driller's Name: Damien Jacobs | Helper's Name: Keith Eastwood / John Boyd

Sample Number	Depth Range (Feet)	Blow Counts per 6 Inches / Coring Times Minute Per Foot	Recovery (Inches)	Field Description	Strata Changes
				Asphalt	10"
S-1	1' - 3'	14 48 57 69	15"	Dry, very dense, brown, FINE SAND, some fine gravel, trace coarse sand.	
S-2	4' - 4'5"	120/5"	4"	Dry, very dense, brown, FINE TO COARSE SAND, trace inorganic silt.	4'5"
				Cobbles 4'5"	5'7"
				Sand & Gravel from Wash. Top of Bedrock	
				Rollerbit to 8' and begin coring	
C-1	8' - 13'	6 8 8 7 8	21"	Hard, pinkish/gray, moderately fractured, GRANITE. Recovery = 35%, RQD = 7"/60" = 12% - Jammed at 13', poor recovery.	
C-2	13' - 18'	15 19 25 50 45	35"	Hard, pinkish/gray, GRANITE. Recovery = 58%, RQD = 35"/60" = 58% - Lost rest of bedrock down the hole.	
				Bottom of Exploration at 18'	18'

Notes:

Light Tower: 1 | Signs: 4 | Cones: 25

Protective Device Stand: - Box: - | Well Depth: - Solid Pipe: - | Stick Up Pipe: - Screen Pipe: -

Penetration Resistance (N) Guide:

Cohesionless Soils (Sands, Gravels)		Cohesive Soils (Silts, Clays)	
Relative Density	Penetration Resistance	Consistency	Penetration Resistance
Very Loose	0 - 4	Very Soft	0 - 2
Loose	4 - 10	Soft	2 - 4
Medium Dense	10 - 30	Medium Stiff	4 - 8
Dense	30 - 50	Stiff	8 - 15
Very Dense	Over 50	Very Stiff	15 - 30
		Hard	Over 30

N=Sum of Second and Third 6" Blow Counts

Terms Used for Second Entry of Descriptions: and = 40-50%, some = 10-40%, trace = 10% or less

Type of Drill Rig: Scout
Hammer Weight: 300lb Fall: 24"
Casing Types: HW NW
Size: 4" 3"
Depth: 4' 8'
Sampler Type: S/S Size: 1⅜" ID
Automatic Hammer Weight:
Safety Hammer Weight: Fall: 30"
Donut Hammer Weight: 140lb
Core Barrel Type: NX Size: 2.15" ID

WB–1
SCALE: 1/16" = 1'–0"

Boring Log — **LAMSON ENGINEERING CORPORATION**
437 Cherry Street, #109, Newton, Massachusetts 02465
Phone: (617) 558-0101 E-Mail: Lamsoneng@msn.com

Boring No. WB-2 (Wall Boring) Page 1/1
Scale: 1" = 5'

City/Town: Ashland | Bridge No.: - | Project File No.: 604123 | Contract No.: -
Location: Route 126 (Pond Street) | Date & Time Started: 10/12/17 9:30 pm | Total Hours:
Groundwater Depth (Feet): - Date & Time: - | Date & Time Completed: 10/13/17 2:00 am | 4.5
Coordinates: N 2,912,118 E 674,447 | Ground Elevation (Feet): 265.3' | Inspector's Name: Weijie Dong
Drilling Company: Geologic Exploration, Inc. | Driller's Name: Damien Jacobs | Helper's Name: Keith Eastwood / John Boyd

Sample Number	Depth Range (Feet)	Blow Counts per 6 Inches / Coring Times Minute Per Foot	Recovery (Inches)	Field Description	Strata Changes
				Asphalt	10"
S-1	1' - 2'	61 75	12"	Dry, very dense, brown, FINE SAND, some fine gravel, trace coarse sand.	
				Top of Bedrock	3'6"
				Rollerbit to 4' and begin coring	
C-1	4' - 9'	7 9 13 15 15	60"	Hard, pinkish/gray, GRANITE. Recovery = 100%, RQD = 60"/60" = 100%	
C-2	9' - 14'	12 15 15 16 16	60"	Hard, pinkish/gray, GRANITE. Recovery = 100%, RQD = 60"/60" = 100%	
				Bottom of Exploration at 14'	14'

Notes:

Light Tower: 1 | Signs: 4 | Cones: 25

Protective Device Stand: - Box: - | Well Depth: - Solid Pipe: - | Stick Up Pipe: - Screen Pipe: -

Penetration Resistance (N) Guide:

Cohesionless Soils (Sands, Gravels)		Cohesive Soils (Silts, Clays)	
Relative Density	Penetration Resistance	Consistency	Penetration Resistance
Very Loose	0 - 4	Very Soft	0 - 2
Loose	4 - 10	Soft	2 - 4
Medium Dense	10 - 30	Medium Stiff	4 - 8
Dense	30 - 50	Stiff	8 - 15
Very Dense	Over 50	Very Stiff	15 - 30
		Hard	Over 30

N=Sum of Second and Third 6" Blow Counts

Terms Used for Second Entry of Descriptions: and = 40-50%, some = 10-40%, trace = 10% or less

Type of Drill Rig: Scout
Hammer Weight: 300lb Fall: 24"
Casing Types: NW
Size: 3"
Depth: 4'
Sampler Type: S/S Size: 1⅜" ID
Automatic Hammer Weight:
Safety Hammer Weight: Fall: 30"
Donut Hammer Weight: 140 lb
Core Barrel Type: NX Size: 2.15" ID

WB–2
SCALE: 1/16" = 1'–0"

Boring Log — **LAMSON ENGINEERING CORPORATION**
437 Cherry Street, #109, Newton, Massachusetts 02465
Phone: (617) 558-0101 E-Mail: Lamsoneng@msn.com

Boring No. WB-3 (Wall Boring) Page 1/1
Scale: 1" = 5'

City/Town: Ashland | Bridge No.: - | Project File No.: 604123 | Contract No.: -
Location: Route 126 (Pond Street) | Date & Time Started: 10/13/17 9:30 pm | Total Hours:
Groundwater Depth (Feet): - Date & Time: - | Date & Time Completed: 10/14/17 3:00 am | 5.5
Coordinates: N 2,912,328 E 674,498 | Ground Elevation (Feet): 263.2' | Inspector's Name: Weijie Dong
Drilling Company: Geologic Exploration, Inc. | Driller's Name: Damien Jacobs | Helper's Name: Keith Eastwood / John Boyd

Sample Number	Depth Range (Feet)	Blow Counts per 6 Inches / Coring Times Minute Per Foot	Recovery (Inches)	Field Description	Strata Changes
				Asphalt	10"
S-1	1' - 3'	34 37 40 47	17"	Dry, very dense, brown, FINE SAND, trace fine gravel.	
S-2	4' - 6'	42 63 54 72	10"	Dry, very dense, brown, FINE SAND, trace fine gravel.	
S-3	9' -9'4"	120/4"	4"	Dry, very dense, brown, FINE SAND, some fine gravel, trace inorganic silt.	9'4"
				Top of Bedrock	
				Rollerbit to 11' and begin coring	
C-1	11' - 16'	15 15 25 12 15	60"	Hard, pinkish/gray, slightly fractured, GRANITE. Recovery = 100%, RQD = 40"/60" = 67%	
C-2	16' - 21'	16 16 17 20 32	60"	Hard, pinkish/gray, slightly fractured, GRANITE. Recovery = 100%, RQD = 48"/60" = 80%	
				Bottom of Exploration at 21'	21'

Notes:

Light Tower: 1 | Signs: 4 | Cones: 25

Protective Device Stand: - Box: - | Well Depth: - Solid Pipe: - | Stick Up Pipe: - Screen Pipe: -

Penetration Resistance (N) Guide:

Cohesionless Soils (Sands, Gravels)		Cohesive Soils (Silts, Clays)	
Relative Density	Penetration Resistance	Consistency	Penetration Resistance
Very Loose	0 - 4	Very Soft	0 - 2
Loose	4 - 10	Soft	2 - 4
Medium Dense	10 - 30	Medium Stiff	4 - 8
Dense	30 - 50	Stiff	8 - 15
Very Dense	Over 50	Very Stiff	15 - 30
		Hard	Over 30

N=Sum of Second and Third 6" Blow Counts

Terms Used for Second Entry of Descriptions: and = 40-50%, some = 10-40%, trace = 10% or less

Type of Drill Rig: Scout
Hammer Weight: 300lb Fall: 24"
Casing Types: NW
Size: 3"
Depth: 11'
Sampler Type: S/S Size: 1⅜" ID
Automatic Hammer Weight:
Safety Hammer Weight: Fall: 30"
Donut Hammer Weight: 140 lbs
Core Barrel Type: NX Size: 2.15" ID

WB–3
SCALE: 1/16" = 1'–0"

BORING NOTES:

1. LOCATION OF BORINGS SHOWN ON THE PLANS THUS: WB–#, B–#.
2. BORINGS ARE TAKEN FOR PURPOSE OF DESIGN AND SHOW CONDITIONS AT BORINGS POINTS ONLY, BUT DO NOT NECESSARILY SHOW THE NATURE OF THE MATERIALS TO BE ENCOUNTERED DURING CONSTRUCTION.
3. WATER LEVELS SHOWN ON THE BORING LOGS WERE OBSERVED AT THE TIME OF TAKING BORINGS AND DO NOT NECESSARILY SHOW THE TRUE GROUND WATER LEVEL.
4. FIGURES IN COLUMNS INDICATE NUMBER OF BLOWS REQUIRED TO DRIVE A 1⅜" I.D. SPLIT SPOON SAMPLER 6" USING A 140 POUND WEIGHT FALLING 30".
5. BORING SAMPLES ARE STORED AT A STORAGE FACILITY LOCATED ON ROUTE 114 (219 WINTHROP AVE.) IN LAWRENCE, MA. THE CONTRACTOR MAY EXAMINE THE SOIL AND ROCK SAMPLES BY CONTACTING THE MASSDOT GEOTECHNICAL SECTION AT 10 PARK PLAZA, BOSTON, MA.
6. ALL BORINGS WERE MADE IN OCTOBER 2017.
7. BORINGS WERE MADE BY GEOLOGIC EARTH EXPLORATION, INC., 7 SHERWOOD DRIVE, NORFOLK, MA 02056 AT 508–384–4434.
8. THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 IS USED THROUGHOUT.

A00891 - 61
F:\Projects\12013\13033\13033.046 - Ashland Route 126\604123\DWG\Current Design\604123 HD01602 (Boring Logs).dwg
604123 HD01602 (BORING LOGS).DWG Plotted on 21-Mar-2018 9:58 AM
Proposal No. 604123-111717 ADDENDUM NO. 3, AUGUST 14, 2020

ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	7	309
PROJECT FILE NO.	604123		

BORING LOGS 2 OF 5

MassDOT — Boring Log

LAMSON ENGINEERING CORPORATION
437 Cherry Street, #109, Newton, Massachusetts 02465
Phone: (617) 558-0101 E-Mail: Lamsoneng@msn.com

Boring No. WB-4 (Wall Boring) Page 1/1
Scale: 1" = 5'

City/Town: Ashland | Bridge No.: - | Project File No.: 604123 | Contract No.: -
Location: Route 126 (Pond Street) | Date & Time Started: 10/16/17 9:30 pm | Total Hours:
Groundwater Depth (Feet): - Date & Time: - | Date & Time Completed: 10/17/17 4:00 am | 6.5
Coordinates: *N 2,913,332 *E 674,793 | Ground Elevation (Feet): *237.2 | Inspector's Name: Weijie Dong
Drilling Company: Geologic Exploration, Inc. | Driller's Name: Damien Jacobs | Helper's Name: Keith Eastwood / Will Betts

Sample Number	Depth Range (Feet)	Blow Counts per 6 Inches / Coring Times Minute Per Foot	Recovery (inches)	Field Description	Strata Changes
				Asphalt	10"
S-1	1' - 2'2"	5 98 50/2"	5"	Dry, very dense, dark brown, FINE SAND, trace fine gravel, trace inorganic silt.	
S-2	4' - 6'	21 21 25 86	9"	Dry, dense, brown, FINE SAND, trace fine to medium gravel, trace inorganic silt.	
				Top of Bedrock	6'
				Rollerbit to 8' and begin coring	
C-1	8' - 13'	8 7 12 18 25	50"	Hard, gray, moderately fractured, GRANITE. Recovery = 83%, RQD = 35"/60" = 58%	
C-2	13' - 15'6"	15 18 15/6"	30"	Hard, gray, highly fractured, GRANITE. Recovery = 100%, RQD = 10"/30" = 33%	
					15'6"
				Bottom of Exploration at 15'6"	
				- Terminated at 15'6" due to machine malfunction, could not advance any further.	

Notes:
* Move boring approximately 11' East of original location due to underground utilities. Coordinates and elevation are estimated.

Light Tower: 1 | Signs: 4 | Cones: 25
Protective Device Stand: - Box: - | Well Depth: - Solid Pipe: - | Stick Up Pipe: - Screen Pipe: -

Penetration Resistance (N) Guide: | Type of Drill Rig: Scout

Cohesionless Soils (Sands, Gravels)		Cohesive Soils (Silts, Clays)	
Relative Density	Penetration Resistance	Consistency	Penetration Resistance
Very Loose	0 - 4	Very Soft	0 - 2
Loose	4 - 10	Soft	2 - 4
Medium Dense	10 - 30	Medium Stiff	4 - 8
Dense	30 - 50	Stiff	8 - 15
Very Dense	Over 50	Very Stiff	15 - 30
		Hard	Over 30

N=Sum of Second and Third 6" Blow Counts
Terms Used for Second Entry of Descriptions: and = 40-50%, some = 10-40%, trace = 10% or less

Hammer Weight: 300lb Fall: 24"
Casing Types: NW
Size: 3" Depth: 8'
Sampler Type: S/S Size: 1⅜" ID
Automatic Hammer Weight:
Safety Hammer Weight: Fall: 30"
Donut Hammer Weight: 140 lb
Core Barrel Type: NX Size: 2.15" ID

WB–4
SCALE: ⅜" = 1'–0"

213.8 (10/19/17)

MassDOT — Boring Log

LAMSON ENGINEERING CORPORATION
437 Cherry Street, #109, Newton, Massachusetts 02465
Phone: (617) 558-0101 E-Mail: Lamsoneng@msn.com

Boring No. WB-5 (Wall Boring) Page 1/1
Scale: 1" = 5'

City/Town: Ashland | Bridge No.: - | Project File No.: 604123 | Contract No.: -
Location: Route 126 (Pond Street) | Date & Time Started: 10/18/17 9:30 pm | Total Hours:
Groundwater Depth (Feet): 6'5" Date & Time: 10/19/17 12:25 am | Date & Time Completed: 10/19/17 12:45 am | 2.25
Coordinates: N 2,913,579 E 674,848 | Ground Elevation (Feet): 220.2 | Inspector's Name: Weijie Dong
Drilling Company: Geologic Exploration, Inc. | Driller's Name: Damien Jacobs | Helper's Name: Keith Eastwood / Will Betts

Sample Number	Depth Range (Feet)	Blow Counts per 6 Inches / Coring Times Minute Per Foot	Recovery (inches)	Field Description	Strata Changes
				Asphalt	10"
S-1	1' - 1'8"	48 72/2"	6"	Dry, very dense, dark brown, FINE SAND, trace fine gravel, trace inorganic silt.	
S-2	4' - 5'7"	14 34 103 40/1"	10"	Dry, very dense, brown, FINE SAND, some inorganic silt, trace fine to medium gravel.	
S-3	9' - 11'	32 55 45 6"	10"	Moist, very dense, brown, FINE SAND, some inorganic silt, trace fine to medium gravel.	
S-4	14' - 14'3"	120/3"	0"	No Recovery	14'3"
				Cobbles & Boulders	17'
S-5	19' - 19'5"	120/5"	3"	Wet, very dense, brown, FINE SAND AND FINE TO MEDIUM GRAVEL, some inorganic silt.	
				Possible Top of Bedrock	21'
				Rollerbit to 22' and terminate.	22'
				Bottom of Exploration at 22'	

Notes:

Light Tower: 1 | Signs: 4 | Cones: 25
Protective Device Stand: - Box: - | Well Depth: - Solid Pipe: - | Stick Up Pipe: - Screen Pipe: -

Penetration Resistance (N) Guide: | Type of Drill Rig: Scout

Cohesionless Soils (Sands, Gravels)		Cohesive Soils (Silts, Clays)	
Relative Density	Penetration Resistance	Consistency	Penetration Resistance
Very Loose	0 - 4	Very Soft	0 - 2
Loose	4 - 10	Soft	2 - 4
Medium Dense	10 - 30	Medium Stiff	4 - 8
Dense	30 - 50	Stiff	8 - 15
Very Dense	Over 50	Very Stiff	15 - 30
		Hard	Over 30

N=Sum of Second and Third 6" Blow Counts
Terms Used for Second Entry of Descriptions: and = 40-50%, some = 10-40%, trace = 10% or less

Hammer Weight: 300lb Fall: 24"
Casing Types: NW
Size: 3" Depth: 19'
Sampler Type: S/S Size: 1⅜" ID
Automatic Hammer Weight:
Safety Hammer Weight: Fall: 30"
Donut Hammer Weight: 140 lb
Core Barrel Type: - Size: -

WB–5
SCALE: ⅜" = 1'–0"

MassDOT — Boring Log

LAMSON ENGINEERING CORPORATION
437 Cherry Street, #109, Newton, Massachusetts 02465
Phone: (617) 558-0101 E-Mail: Lamsoneng@msn.com

Boring No. B-2 (Wall Boring) Page 1/1
Scale: 1" = 5'

City/Town: Ashland | Bridge No.: - | Project File No.: 604123 | Contract No.: -
Location: Route 126 (Pond Street) | Date & Time Started: 10/17/17 9:30 pm | Total Hours:
Groundwater Depth (Feet): - Date & Time: - | Date & Time Completed: 10/18/17 3:45 am | 6.25
Coordinates: N 2,913,170 E 674,690 | Ground Elevation (Feet): 247.2 | Inspector's Name: Weijie Dong
Drilling Company: Geologic Exploration, Inc. | Driller's Name: Damien Jacobs | Helper's Name: Keith Eastwood / Will Betts

Sample Number	Depth Range (Feet)	Blow Counts per 6 Inches / Coring Times Minute Per Foot	Recovery (inches)	Field Description	Strata Changes
				Asphalt	10"
S-1	1' - 3'	27 28 27 23	14"	Dry, very dense, brown, FINE SAND, trace fine gravel, trace inorganic silt.	
					3'10"
				Boulder	5'8"
S-2	6' - 6'9"	56 64/5"	9"	Dry, very dense, brown, FINE TO COARSE SAND, some fine gravel, trace inorganic silt.	
S-3	9' - 9'5"	120/5"	3"	Moist, very dense, brown, FINE SAND AND FINE TO MEDIUM GRAVEL, some inorganic silt.	9'5"
				Cobbles 9'11"	
S-4	14' - 14'4"	120/4"	4"	Moist, very dense, brown, FINE SAND AND FINE TO MEDIUM GRAVEL, some inorganic silt.	
				Top of Bedrock	16'9"
				Rollerbit to 17' and begin coring	
C-1	17' - 22'	8 10 12 11 12	60"	Hard, gray, slightly fractured, GRANITE. Recovery = 100%, RQD = 47"/60" = 78%	
C-2	22 - 27'	11 12 11 15 12	58"	Hard, gray, slightly fractured, GRANITE. Recovery = 93%, RQD = 44"/60" = 73%	
					27'
				Bottom of Exploration at 27'	

Notes:

Light Tower: 1 | Signs: 4 | Cones: 25
Protective Device Stand: - Box: - | Well Depth: - Solid Pipe: - | Stick Up Pipe: - Screen Pipe: -

Penetration Resistance (N) Guide: | Type of Drill Rig: Scout

Cohesionless Soils (Sands, Gravels)		Cohesive Soils (Silts, Clays)	
Relative Density	Penetration Resistance	Consistency	Penetration Resistance
Very Loose	0 - 4	Very Soft	0 - 2
Loose	4 - 10	Soft	2 - 4
Medium Dense	10 - 30	Medium Stiff	4 - 8
Dense	30 - 50	Stiff	8 - 15
Very Dense	Over 50	Very Stiff	15 - 30
		Hard	Over 30

N=Sum of Second and Third 6" Blow Counts
Terms Used for Second Entry of Descriptions: and = 40-50%, some = 10-40%, trace = 10% or less

Hammer Weight: 300lb Fall: 24"
Casing Types: NW
Size: 3" Depth: 17'
Sampler Type: S/S Size: 1⅜" ID
Automatic Hammer Weight:
Safety Hammer Weight: Fall: 30"
Donut Hammer Weight: 140 lb
Core Barrel Type: NX Size: 2.15" ID

B–2
SCALE: ⅜" = 1'–0"

BORING NOTES:

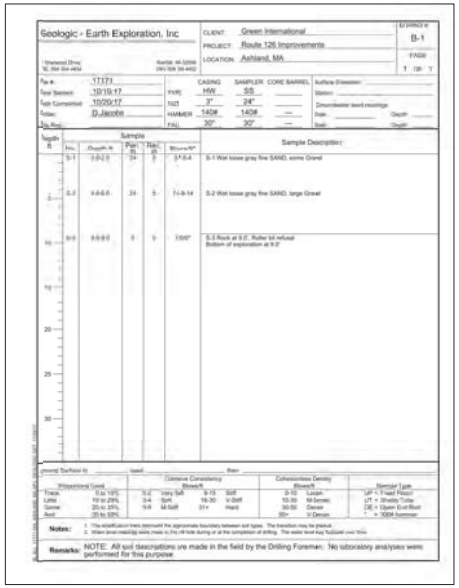
SEE SHEET 6 FOR BORING NOTES.

A00891 - 62

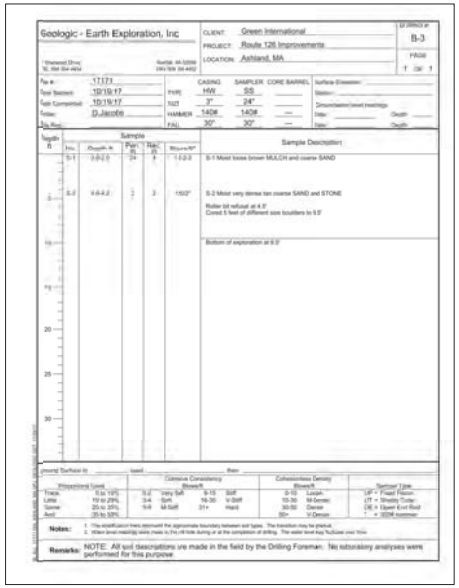
F:\Projects\12015\13033\13033.046 - Ashland Route 126\604123\DWG\Current Design\604123 H2018402 (Boring Logs).dwg

604123 H2018402 (BORING LOGS).DWG Plotted on 21-Mar-2018 9:58 AM

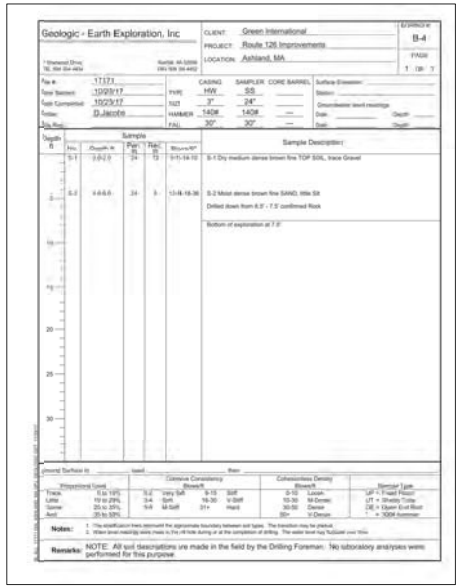
Proposal No. 604123-111717 ADDENDUM NO. 3, AUGUST 14, 2020



B-1
SCALE: N.T.S.



B-3
SCALE: N.T.S.



B-4
SCALE: N.T.S.

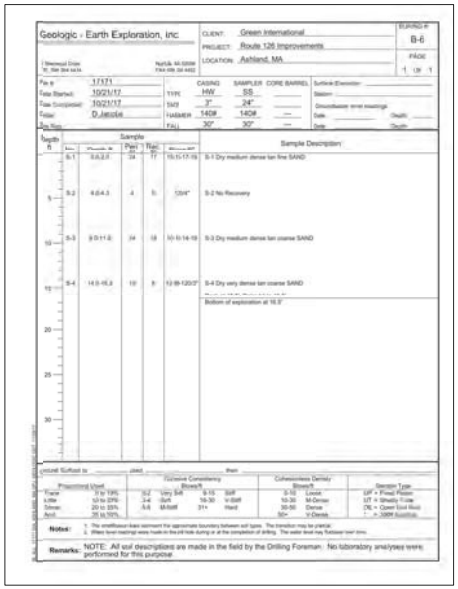
BORING NOTES:

SEE SHEET 6 FOR BORING NOTES.

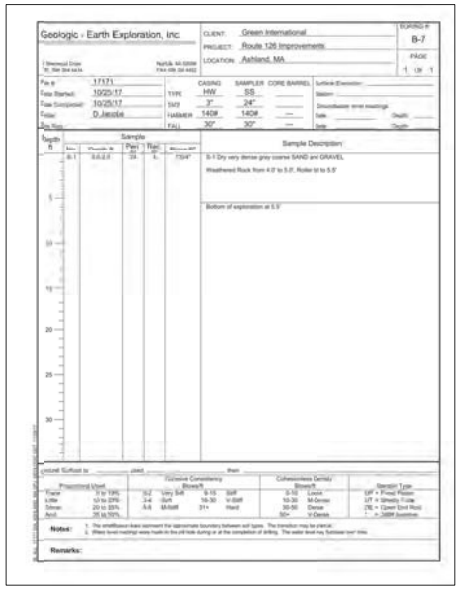
Proposal No. 604123-111717 ADDENDUM NO. 3, AUGUST 14, 2020
A00891 - 63
4-Dec-2017 SMG\SGS\TSN\BB\BD\DGH E21969



B–5
SCALE: N.T.S.



B–6
SCALE: N.T.S.



B–7
SCALE: N.T.S.

BORING NOTES:

SEE SHEET 6 FOR BORING NOTES.

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Proposal No. 604123-111717 ADDENDUM NO. 3, AUGUST 14, 2020

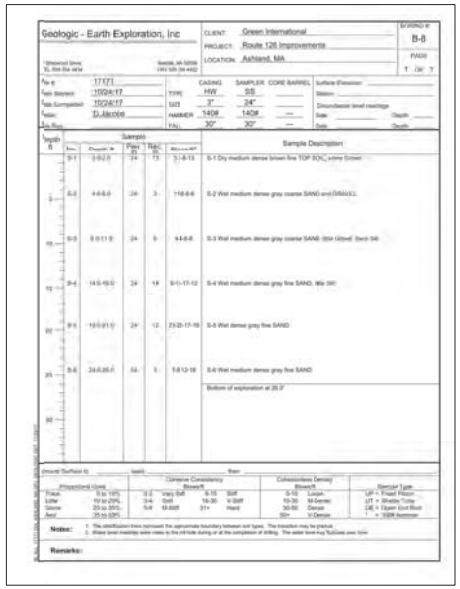
4-24-2017
SMG\SGS\TSN\BB\BDB\DGH E21909

604123_HD03(BORING LOGS).DWG 6-Dec-2017

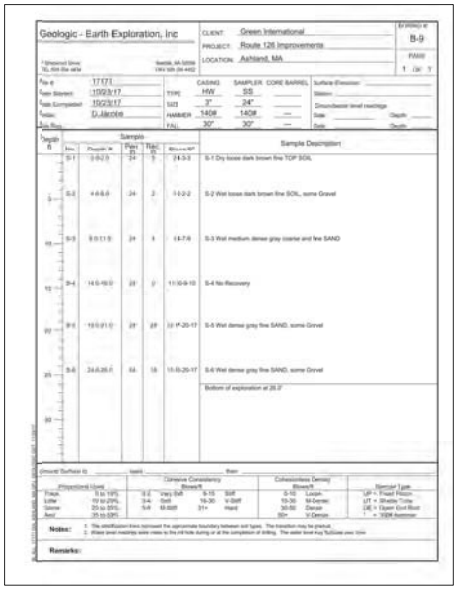
ASHLAND
ROUTE 126 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	10	309
	PROJECT FILE NO.	604123	

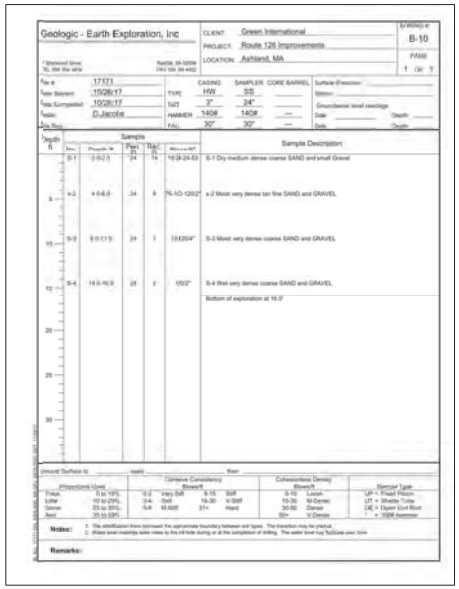
BORING LOGS 5 OF 5



B–8
SCALE: N.T.S.



B–9
SCALE: N.T.S.



B–10
SCALE: N.T.S.

BORING NOTES:

SEE SHEET 6 FOR BORING NOTES.

	Mast Arm Coordinate		
Mast Arm	**x**	**y**	**Proposed elevation of mast arm**
MA-1	674714.362	2913105.673	245.34'
MA-2	674780.810	2913128.251	243.25'
MA-3	674795.871	2913141.349	244.22'
MA-5	675013.517	2915422.445	176.86'
MA-4	675019.074	2915481.719	176.81'
MA-6	676183.912	2918646.335	159.65'

	Boring Coordinate		
Boring #	**x**	**y**	**Existing elevation of boring location**
B1	674712.047	2913105.416	245.57'
B3	674783.517	2913137.133	243.88'
B4	675015.466	2915420.100	176.54'
B7	675038.430	2915477.548	178.26'
B9	676209.643	2918673.574	157.65'

GREEN INTERNATIONAL AFFILIATES, INC.
Civil & Structural Engineers
239 Littleton Road, Suite 3
WESTFORD, MA 01886
(978) 923-0400 (978) 399-0033 (Fax)

JOB	13033.04X - ASHLAND, ROUTE 126		
SHEET NO.		OF	
CALCULATED BY	HD	DATE	07/19
CHECKED BY	BK	DATE	10/19
SCALE	MAST ARM 1 LOADS		

8.0 LOAD COMBINATIONS

FORCE	GROUP LOAD I	GROUP LOAD II		GROUP LOAD III	
	D	D + W		D + ICE + 0.5W	
		LOAD CASE 1	LOAD CASE 2	LOAD CASE 1	LOAD CASE 2
SHEAR ABOUT X, V_X (LB)	0.00	678.71	610.84	205.57	185.01
SHEAR ABOUT Z, V_Z (LB)	0.00	3393.56	2036.13	1027.86	616.71
AXIAL FORCE, P_Y (LB)	1573.11	1573.11	1573.11	2280.65	2280.65
MOMENT ABOUT X, M_X (FT-LB)	9.45	56590.92	33958.33	16626.00	10000.64
MOMENT ABOUT Y, M_Y (FT-LB)	0.00	27536.26	16521.76	7250.82	4350.49
MOMENT ABOUT Z, M_Z (FT-LB)	6795.51	18111.80	16980.17	14663.78	14332.51

FORCE	GROUP LOAD IV - FATIQUE			
	GALLOPING	NATURAL WIND GUST		TRUCK INDUCED GUST
		LOAD CASE 1	LOAD CASE 2	
SHEAR ABOUT X, V_X (LB)	0.00	97.96	88.16	0.00
SHEAR ABOUT Z, V_Z (LB)	0.00	489.80	293.88	0.00
AXIAL FORCE, P_Y (LB)	797.34	0.00	0.00	462.92
MOMENT ABOUT X, M_X (FT-LB)	148.84	7910.27	4746.16	8577.83
MOMENT ABOUT Y, M_Y (FT-LB)	0.00	3464.91	2078.95	0.00
MOMENT ABOUT Z, M_Z (FT-LB)	8051.81	1582.05	1423.85	3595.25

Note: Loads shown include 5% increase to account for miscellaneous connections, pre-emp devices, and strobes light.

GREEN INTERNATIONAL AFFILIATES, INC.
Civil & Structural Engineers
239 Littleton Road, Suite 3
WESTFORD, MA 01886
(978) 923-0400 (978) 399-0033 (Fax)

JOB	13033.04X - ASHLAND, ROUTE 126		
SHEET NO.		OF	
CALCULATED BY	HD	DATE	07/19
CHECKED BY	BK	DATE	10/19
SCALE	MAST ARM 2 LOADS		

8.0 LOAD COMBINATIONS

FORCE	GROUP LOAD I	GROUP LOAD II		GROUP LOAD III	
	D	D + W		D + ICE + 0.5W	
		LOAD CASE 1	LOAD CASE 2	LOAD CASE 1	LOAD CASE 2
SHEAR ABOUT X, V_X (LB)	0.00	641.03	576.93	208.75	187.88
SHEAR ABOUT Z, V_Z (LB)	0.00	3205.14	1923.08	1043.75	626.25
AXIAL FORCE, P_Y (LB)	1907.36	1907.36	1907.36	2729.82	2729.82
MOMENT ABOUT X, M_X (FT-LB)	9.00	59031.69	35422.62	18394.65	11060.64
MOMENT ABOUT Y, M_Y (FT-LB)	0.00	54501.83	32701.10	14468.23	8680.94
MOMENT ABOUT Z, M_Z (FT-LB)	18628.50	30433.04	29252.59	34564.43	34197.73

FORCE	GROUP LOAD IV - FATIQUE			
	GALLOPING	NATURAL WIND GUST		TRUCK INDUCED GUST
		LOAD CASE 1	LOAD CASE 2	
SHEAR ABOUT X, V_X (LB)	0.00	98.68	88.81	0.00
SHEAR ABOUT Z, V_Z (LB)	0.00	493.39	296.03	0.00
AXIAL FORCE, P_Y (LB)	670.12	0.00	0.00	489.81
MOMENT ABOUT X, M_X (FT-LB)	141.75	8705.47	5223.28	9876.41
MOMENT ABOUT Y, M_Y (FT-LB)	0.00	6972.94	4183.76	0.00
MOMENT ABOUT Z, M_Z (FT-LB)	15322.58	1741.09	1566.99	7052.14

Note: Loads shown include 5% increase to account for miscellaneous connections, pre-emp devices, and strobes light.

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Proposal No. 604123-111717
ADDENDUM NO. 3, AUGUST 14, 2020
MA-2

GREEN INTERNATIONAL AFFILIATES, INC.
Civil & Structural Engineers
239 Littleton Road, Suite 3
WESTFORD, MA 01886
(978) 923-0400 (978) 399-0033 (Fax)

JOB	13033.04X - ASHLAND, ROUTE 126		
SHEET NO.		OF	
CALCULATED BY	HD	DATE	07/19
CHECKED BY	BK	DATE	10/19
SCALE	MAST ARM 3 LOADS		

8.0 LOAD COMBINATIONS

FORCE	GROUP LOAD I	GROUP LOAD II		GROUP LOAD III	
	D	D + W		D + ICE + 0.5W	
		LOAD CASE 1	LOAD CASE 2	LOAD CASE 1	LOAD CASE 2
SHEAR ABOUT X, V_X (LB)	0.00	620.07	558.06	190.98	171.88
SHEAR ABOUT Z, V_Z (LB)	0.00	3100.35	1860.21	954.90	572.94
AXIAL FORCE, P_Y (LB)	1462.05	1462.05	1462.05	2234.82	2234.82
MOMENT ABOUT X, M_X (FT-LB)	9.00	56859.98	34119.59	16579.66	9971.64
MOMENT ABOUT Y, M_Y (FT-LB)	0.00	29497.21	17698.33	7619.10	4571.46
MOMENT ABOUT Z, M_Z (FT-LB)	7539.44	18909.64	17772.62	16513.07	16182.67

FORCE	GROUP LOAD IV - FATIQUE			
	GALLOPING	NATURAL WIND GUST		TRUCK INDUCED GUST
		LOAD CASE 1	LOAD CASE 2	
SHEAR ABOUT X, V_X (LB)	0.00	90.80	81.72	0.00
SHEAR ABOUT Z, V_Z (LB)	0.00	454.02	272.41	0.00
AXIAL FORCE, P_Y (LB)	750.08	0.00	0.00	406.97
MOMENT ABOUT X, M_X (FT-LB)	141.75	7900.67	4740.40	8179.24
MOMENT ABOUT Y, M_Y (FT-LB)	0.00	3674.84	2204.90	0.00
MOMENT ABOUT Z, M_Z (FT-LB)	9423.42	1580.13	1422.12	3826.95

Note: Loads shown include 5% increase to account for miscellaneous connections, pre-emp devices, and strobes light.

A00891 - 69
Proposal No. 604123-111717
ADDENDUM NO. 3, AUGUST 14, 2020
MA-3

GREEN INTERNATIONAL AFFILIATES, INC.
Civil & Structural Engineers
239 Littleton Road, Suite 3
WESTFORD, MA 01886
(978) 923-0400 (978) 399-0033 (Fax)

JOB	13033.04X - ASHLAND, ROUTE 126		
SHEET NO.		OF	
CALCULATED BY	HD	DATE	07/19
CHECKED BY	BK	DATE	10/19
SCALE	MAST ARM 4 LOADS		

8.0 LOAD COMBINATIONS

FORCE	GROUP LOAD I	GROUP LOAD II		GROUP LOAD III	
	D	D + W		D + ICE + 0.5W	
		LOAD CASE 1	LOAD CASE 2	LOAD CASE 1	LOAD CASE 2
SHEAR ABOUT X, V_X (LB)	0.00	521.15	459.85	173.15	153.73
SHEAR ABOUT Z, V_Z (LB)	0.00	2605.76	1563.46	865.75	519.45
AXIAL FORCE, P_Y (LB)	1588.54	1588.54	1588.54	2216.79	2216.79
MOMENT ABOUT X, M_X (FT-LB)	9.00	45840.42	28181.79	14605.60	8941.90
MOMENT ABOUT Y, M_Y (FT-LB)	0.00	31603.96	19030.13	8548.51	5144.66
MOMENT ABOUT Z, M_Z (FT-LB)	10478.36	19644.64	18761.71	19491.30	19208.12

FORCE	GROUP LOAD IV - FATIQUE			
	GALLOPING	NATURAL WIND GUST		TRUCK INDUCED GUST
		LOAD CASE 1	LOAD CASE 2	
SHEAR ABOUT X, V_X (LB)	0.00	81.53	73.38	0.00
SHEAR ABOUT Z, V_Z (LB)	0.00	407.64	244.58	0.00
AXIAL FORCE, P_Y (LB)	569.71	0.00	0.00	430.68
MOMENT ABOUT X, M_X (FT-LB)	141.75	6872.53	4123.52	8367.84
MOMENT ABOUT Y, M_Y (FT-LB)	0.00	4104.52	2462.71	0.00
MOMENT ABOUT Z, M_Z (FT-LB)	9789.89	1374.51	1237.05	4841.08

Note: Loads shown include 5% increase to account for miscellaneous connections, pre-emp devices, and strobes light.

GREEN INTERNATIONAL AFFILIATES, INC.
Civil & Structural Engineers
239 Littleton Road, Suite 3
WESTFORD, MA 01886
(978) 923-0400 (978) 399-0033 (Fax)

JOB	13033.04X - ASHLAND, ROUTE 126		
SHEET NO.		OF	
CALCULATED BY	HD	DATE	07/19
CHECKED BY	BK	DATE	10/19
SCALE	MAST ARM 5 LOADS		

8.0 LOAD COMBINATIONS

FORCE	GROUP LOAD I	GROUP LOAD II		GROUP LOAD III	
	D	D + W		D + ICE + 0.5W	
		LOAD CASE 1	LOAD CASE 2	LOAD CASE 1	LOAD CASE 2
SHEAR ABOUT X, V_X (LB)	0.00	685.40	607.67	230.23	185.98
SHEAR ABOUT Z, V_Z (LB)	0.00	3427.00	2056.20	1151.17	626.95
AXIAL FORCE, P_Y (LB)	2194.82	2194.82	2194.82	3017.37	3017.37
MOMENT ABOUT X, M_X (FT-LB)	9.00	61491.03	37572.16	19926.80	10859.62
MOMENT ABOUT Y, M_Y (FT-LB)	0.00	56915.04	34221.88	15762.38	7242.90
MOMENT ABOUT Z, M_Z (FT-LB)	20409.46	32705.87	31509.93	34974.24	34202.13

FORCE	GROUP LOAD IV - FATIQUE			
	GALLOPING	NATURAL WIND GUST		TRUCK INDUCED GUST
		LOAD CASE 1	LOAD CASE 2	
SHEAR ABOUT X, V_X (LB)	0.00	108.53	97.68	0.00
SHEAR ABOUT Z, V_Z (LB)	0.00	542.67	325.60	0.00
AXIAL FORCE, P_Y (LB)	531.34	0.00	0.00	573.43
MOMENT ABOUT X, M_X (FT-LB)	141.75	9395.91	5637.54	11268.12
MOMENT ABOUT Y, M_Y (FT-LB)	0.00	7556.11	4533.67	0.00
MOMENT ABOUT Z, M_Z (FT-LB)	10265.60	1879.18	1691.26	8564.59

Note: Loads shown include 5% increase to account for miscellaneous connections, pre-emp devices, and strobes light.

GREEN INTERNATIONAL AFFILIATES, INC.
Civil & Structural Engineers
239 Littleton Road, Suite 3
WESTFORD, MA 01886
(978) 923-0400 (978) 399-0033 (Fax)

JOB	13033.04X - ASHLAND, ROUTE 126		
SHEET NO.		OF	
CALCULATED BY	HD	DATE	07/19
CHECKED BY	BK	DATE	10/19
SCALE	MAST ARM 6 LOADS		

8.0 LOAD COMBINATIONS

FORCE	GROUP LOAD I	GROUP LOAD II		GROUP LOAD III	
	D	D + W		D + ICE + 0.5W	
		LOAD CASE 1	LOAD CASE 2	LOAD CASE 1	LOAD CASE 2
SHEAR ABOUT X, V_X (LB)	0.00	641.03	576.93	208.75	187.88
SHEAR ABOUT Z, V_Z (LB)	0.00	3205.14	1923.08	1043.75	626.25
AXIAL FORCE, P_Y (LB)	1817.36	1817.36	1817.36	2546.67	2546.67
MOMENT ABOUT X, M_X (FT-LB)	9.00	59031.69	35422.62	18394.65	11060.64
MOMENT ABOUT Y, M_Y (FT-LB)	0.00	47019.17	28211.50	12708.58	7625.15
MOMENT ABOUT Z, M_Z (FT-LB)	15102.50	26907.04	25726.59	27144.69	26777.99

FORCE	GROUP LOAD IV - FATIQUE			
	GALLOPING	NATURAL WIND GUST		TRUCK INDUCED GUST
		LOAD CASE 1	LOAD CASE 2	
SHEAR ABOUT X, V_X (LB)	0.00	98.68	88.81	0.00
SHEAR ABOUT Z, V_Z (LB)	0.00	493.39	296.03	0.00
AXIAL FORCE, P_Y (LB)	670.12	0.00	0.00	489.81
MOMENT ABOUT X, M_X (FT-LB)	141.75	8705.47	5223.28	9876.41
MOMENT ABOUT Y, M_Y (FT-LB)	0.00	6115.58	3669.35	0.00
MOMENT ABOUT Z, M_Z (FT-LB)	12919.66	1741.09	1566.99	6567.55

Note: Loads shown include 5% increase to account for miscellaneous connections, pre-emp devices, and strobes light.

PAVEMENT CORES

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-Page 1

5 Richardson Lane, Stoneham, MA 02180 781-438-7755 (Voice) 781-438-6216 (Fax)

Soil Testing Results - Transmittal Report

Distribution Copy

Report Date 12-11-2014
Report No. 1
Job Number 18014
Project Road Improvements, Ashland, MA

Contractor Green International Affiliates, Inc.

Sample Submitted By

Sample No. 728

☐ **Our Representative:**
Date Submitted: 12/03/2014
☒ **Other:** Wing C. Wong P.E. of Green International

Source of Sample

☒ **On-Site Existing @ location:** Pavement core #2
☐ **Off-Site Borrow from:**

Proposed Use: Pavement base

Material Submitted As:

☐ **Structural/Granular Fill:**
☐ **Ordinary Borrow:** MHD M1.01.0 (Shall be approved by the Architect)
☒ **Gravel Borrow:** MHD M1.03.0 Type: B
☐ **Processed Gravel For Base Course:** MHD M1.03.1
☐ **Sand Borrow:** MHD M1.04.0 Type:
☐ **Reclaimed Pavement Borrow for Base Course:** MHD M1.11.0
☐ **Crushed Stone:** MHD M2.01.0
☐ **Dense Graded Crushed Stone for Base Course:** MHD M2.01.7
☐ **Common Borrow:**
☐ **Drainage Fill:**
☐ **Other:**

Requested Testing

☐ **Atterberg Limits** ☒ **Gradation Analysis** ☐ **Hydrometer**
☐ **Modified Proctor** ☐ **Permeability** ☒ **Wash Sieve Analysis**
☐ **Other:**

Material Classification: Silty sand with gravel

Project Specification Conformance Results

☐ **Does conform:**
☒ **Does NOT conform:** MHD M1.03.0 gravel borroe type B.
☐ **Marginally does not* conform...Basis:**

☐ **No Specifications provided to our office.**
☐ **Specifications provided to our office but sample not submitted to a specific use.**
☐ **Sample submitted without indication of intended use and without specifications.**

GENERAL REMARKS:

REVIEWED BY: Geotechnical Department

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Soil Testing Results - Transmittal Report

Distribution Copy

Report Date	12-11-2014
Report No.	1
Job Number	18014
Project	Road Improvements, Ashland, MA
Contractor	Green International Affiliates, Inc.

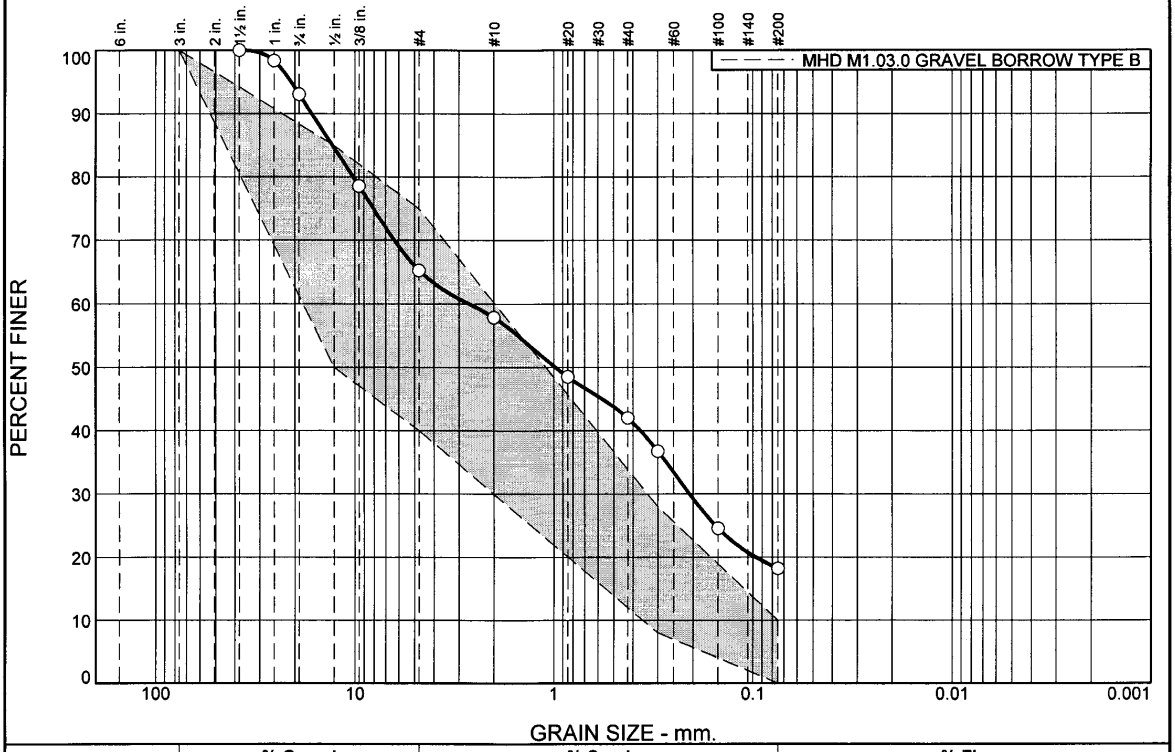
cc: Green Internationl Affiliates Wing Wong

UTS of Massachusetts, Inc.
5 Richardson Lane, Stoneham, MA 02180 781-438-7755 (Voice) 781-438-6216 (Fax)

Report Date 12-11-2014
Report No. 1
Job Number 18014
Project Road Improvements, Ashland, MA

Attachment

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.9	27.8	7.4	15.9	23.8	18.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5"	100.0		
1"	98.3		
3/4"	93.1		
3/8"	78.6		
#4	65.3	40.0 - 75.0	
#10	57.9		
#20	48.5		
#40	42.0		
#50	36.8	8.0 - 28.0	X
#100	24.6		
#200	18.2	0.0 - 10.0	X

* MHD M1.03.0 GRAVEL BORROW TYPE B

Material Description
F-M SAND, AND GRAVEL, LITTLE SILT

Atterberg Limits
PL= NP LL= NV PI= NP

Coefficients
D_{90}= 16.4629 D_{85}= 12.9394 D_{60}= 2.6359
D_{50}= 0.9804 D_{30}= 0.2080 D_{15}=
D_{10}= C_u= C_c=

Classification
USCS= SM AASHTO= A-1-b

Remarks

Source of Sample: PAVEMENT CORE #2
Sample Number: 728
Date:

UTS OF MASSACHUSETTS, INC.
5 Richardson Lane
Stoneham, MA 02180

Client: GREEN INTERNATIONAL AFFILIATES, INC.
Project: ASHLAND ROAD IMPROVEMENTS, ASHLAND, MA
Project No: **Figure**

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Soil Testing Results - Transmittal Report

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Report Date 12-11-2014
Report No. 2
Job Number 18014
Project Road Improvements, Ashland, MA

Contractor Green International Affiliates, Inc.

Sample Submitted By

Sample No. 730

☐ **Our Representative:**

Date Submitted: 12/03/2014

☒ **Other:** Wing C. Wong, P.E. of Green international

Source of Sample

☒ **On-Site Existing @ location:** Pavement core #4
☐ **Off-Site Borrow from:**

Proposed Use: Pavement base

Material Submitted As:

☐ **Structural/Granular Fill:**
☐ **Ordinary Borrow:** MHD M1.01.0 (Shall be approved by the Architect)
☒ **Gravel Borrow:** MHD M1.03.0 Type: B
☐ **Processed Gravel For Base Course:** MHD M1.03.1
☐ **Sand Borrow:** MHD M1.04.0 Type:
☐ **Reclaimed Pavement Borrow for Base Course:** MHD M1.11.0
☐ **Crushed Stone:** MHD M2.01.0
☐ **Dense Graded Crushed Stone for Base Course:** MHD M2.01.7
☐ **Common Borrow:**
☐ **Drainage Fill:**
☐ **Other:**

Requested Testing

☐ **Atterberg Limits** ☒ **Gradation Analysis** ☐ **Hydrometer**
☐ **Modified Proctor** ☐ **Permeability** ☒ **Wash Sieve Analysis**
☐ **Other:**

Material Classification: Silty sand with gravel

Project Specification Conformance Results

☐ **Does conform:**
☒ **Does NOT conform:** MHD M1.03.0 gravel borrow type B.
☐ **Marginally does not* conform...Basis:**

☐ **No Specifications provided to our office.**
☐ **Specifications provided to our office but sample not submitted to a specific use.**
☐ **Sample submitted without indication of intended use and without specifications.**

GENERAL REMARKS:

REVIEWED BY: Geotechnical Department

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Soil Testing Results - Transmittal Report

Distribution Copy

Report Date	12-11-2014
Report No.	2
Job Number	18014
Project	Road Improvements, Ashland, MA
Contractor	Green International Affiliates, Inc.

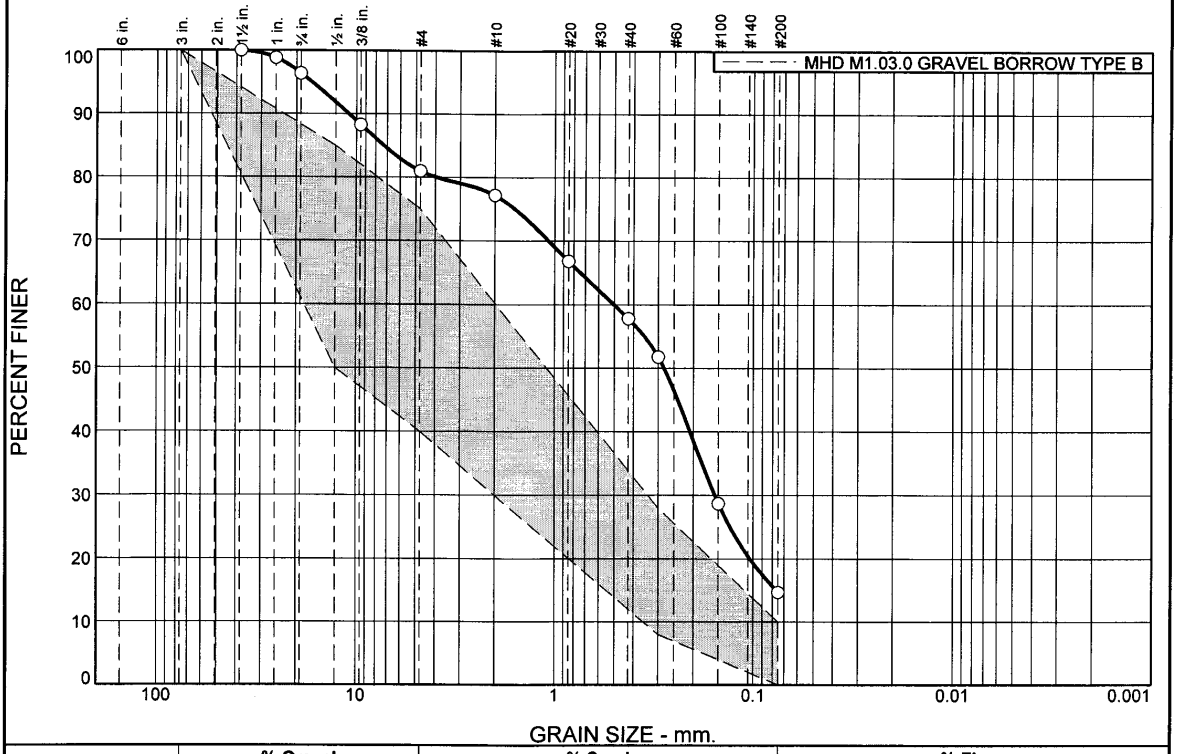
cc: Green Internationl Affiliates Wing Wong

UTS of Massachusetts, Inc.
5 Richardson Lane, Stoneham, MA 02180 781-438-7755 (Voice) 781-438-6216 (Fax)

Report Date 12-11-2014
Report No. 2
Job Number 18014
Project Road Improvements, Ashland, MA

Attachment

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.6	15.4	3.8	19.3	43.2	14.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5"	100.0		
1"	98.8		
3/4"	96.4		
3/8"	88.3		
#4	81.0	40.0 - 75.0	X
#10	77.2		
#20	66.8		
#40	57.9		
#50	51.8	8.0 - 28.0	X
#100	28.7		
#200	14.7	0.0 - 10.0	X

* MHD M1.03.0 GRAVEL BORROW TYPE B

Material Description
F-M SAND, LITTLE GRAVEL, LITTLE SILT

Atterberg Limits
PL= NP LL= NV PI= NP

Coefficients
D_{90}= 10.9190 D_{85}= 7.2501 D_{60}= 0.4999
D_{50}= 0.2807 D_{30}= 0.1565 D_{15}= 0.0764
D_{10}= C_u= C_c=

Classification
USCS= SM AASHTO= A-2-4(0)

Remarks

Source of Sample: PAVEMENT CORE #4
Sample Number: 730

Date: 12/11/2014

UTS OF MASSACHUSETTS, INC.
5 Richardson Lane
Stoneham, MA 02180

Client: GREEN INTERNATIONAL AFFILIATES, INC.
Project: ASHLAND ROAD IMPROVEMENTS, ASHLAND, MA

Project No: **Figure**

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Page 1

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Soil Testing Results - Transmittal Report

Distribution Copy

Report Date 12-11-2014
Report No. 3
Job Number 18014
Project Road Improvements, Ashland, MA

Contractor Green International Affiliates, Inc.

Sample Submitted By

Sample No. 729

☐ **Our Representative:**

Date Submitted: 12/03/2014

☒ **Other:** Wing C. Wong, P.E. of Green International

Source of Sample

☒ **On-Site Existing @ location:** Pavement core #3
☐ **Off-Site Borrow from:**

Proposed Use: Pavement base

Material Submitted As:

☐ **Structural/Granular Fill:**
☐ **Ordinary Borrow:** MHD M1.01.0 (Shall be approved by the Architect)
☒ **Gravel Borrow:** MHD M1.03.0 Type: B
☐ **Processed Gravel For Base Course:** MHD M1.03.1
☐ **Sand Borrow:** MHD M1.04.0 Type:
☐ **Reclaimed Pavement Borrow for Base Course:** MHD M1.11.0
☐ **Crushed Stone:** MHD M2.01.0
☐ **Dense Graded Crushed Stone for Base Course:** MHD M2.01.7
☐ **Common Borrow:**
☐ **Drainage Fill:**
☐ **Other:**

Requested Testing

☐ **Atterberg Limits** ☒ **Gradation Analysis** ☐ **Hydrometer**
☐ **Modified Proctor** ☐ **Permeability** ☒ **Wash Sieve Analysis**
☐ **Other:**

Material Classification: Silty sand with gravel

Project Specification Conformance Results

☐ **Does conform:**
☒ **Does NOT conform:** MHD M1.03.0 gravel borrow type B.
☐ **Marginally does not* conform...Basis:**

☐ **No Specifications provided to our office.**
☐ **Specifications provided to our office but sample not submitted to a specific use.**
☐ **Sample submitted without indication of intended use and without specifications.**

GENERAL REMARKS:

REVIEWED BY: Geotechnical Department

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Soil Testing Results - Transmittal Report

Distribution Copy

Report Date	12-11-2014
Report No.	3
Job Number	18014
Project	Road Improvements, Ashland, MA
Contractor	Green International Affiliates, Inc.

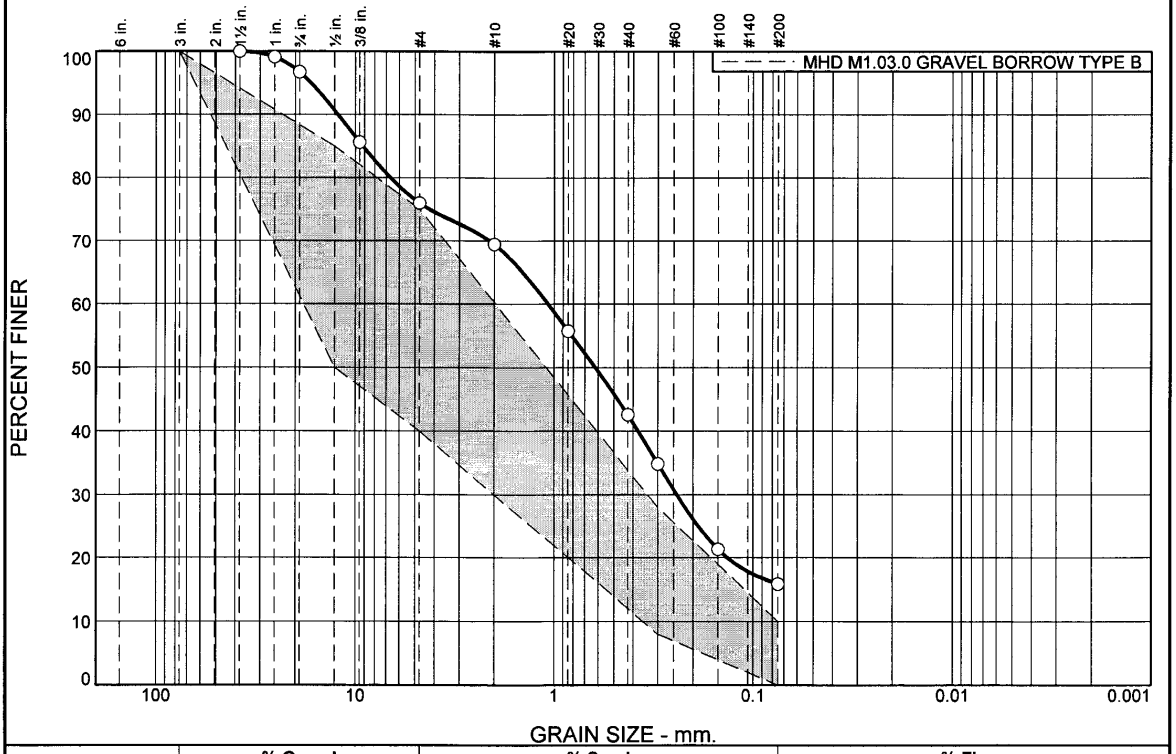
cc: Green Internationl Affiliates Wing Wong

UTS of Massachusetts, Inc.
5 Richardson Lane, Stoneham, MA 02180 781-438-7755 (Voice) 781-438-6216 (Fax)

Report Date 12-11-2014
Report No. 3
Job Number 18014
Project Road Improvements, Ashland, MA

Attachment

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.3	20.7	6.5	26.9	26.7	15.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5"	100.0		
1"	99.1		
3/4"	96.7		
3/8"	85.6		
#4	76.0	40.0 - 75.0	X
#10	69.5		
#20	55.8		
#40	42.6		
#50	34.9	8.0 - 28.0	X
#100	21.3		
#200	15.9	0.0 - 10.0	X

* MHD M1.03.0 GRAVEL BORROW TYPE B

Material Description
F-M SAND, SOME GRAVEL, LITTLE SILT

Atterberg Limits
PL= NP LL= NV PI= NP

Coefficients
D_{90}= 12.2271 D_{85}= 9.1770 D_{60}= 1.0710
D_{50}= 0.6200 D_{30}= 0.2410 D_{15}=
D_{10}= C_u= C_c=

Classification
USCS= SM AASHTO= A-1-b

Remarks

Source of Sample: PAVEMENT CORE #3
Sample Number: 729 **Date:**

UTS OF MASSACHUSETTS, INC.
5 Richardson Lane
Stoneham, MA 02180

Client: GREEN INTERNATIONAL AFFILIATES, INC.
Project: ASHLAND ROAD IMPROVEMENTS, ASHLAND, MA
Project No: **Figure**

Of Massachusetts
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-Page 1

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Soil Testing Results - Transmittal Report

Distribution Copy

Report Date 12-23-2014
Report No. 4
Job Number 18014
Project Road Improvements, Ashland, MA

Contractor Green International Affiliates, Inc.

Sample Submitted By

Sample No. 787

- ☐ **Our Representative:**
- ☒ **Other:** Wing Wong of Green International

Date Submitted: 12/17/2014

Source of Sample

- ☒ **On-Site Existing @ location:** Pavement core #1
- ☐ **Off-Site Borrow from:**

Proposed Use: Pavement base

Material Submitted As:

- ☐ **Structural/Granular Fill:**
- ☐ **Ordinary Borrow:** MHD M1.01.0 (Shall be approved by the Architect)
- ☒ **Gravel Borrow:** MHD M1.03.0 Type: B
- ☐ **Processed Gravel For Base Course:** MHD M1.03.1
- ☐ **Sand Borrow:** MHD M1.04.0 Type:
- ☐ **Reclaimed Pavement Borrow for Base Course:** MHD M1.11.0
- ☐ **Crushed Stone:** MHD M2.01.0
- ☐ **Dense Graded Crushed Stone for Base Course:** MHD M2.01.7
- ☐ **Common Borrow:**
- ☐ **Drainage Fill:**
- ☐ **Other:**

Requested Testing

- ☐ **Atterberg Limits**
- ☒ **Gradation Analysis**
- ☐ **Hydrometer**
- ☐ **Modified Proctor**
- ☐ **Permeability**
- ☒ **Wash Sieve Analysis**
- ☐ **Other:**

Material Classification: Silty sand with gravel

Project Specification Conformance Results

- ☐ **Does conform:**
- ☒ **Does NOT conform:** MHD M1.03.0 gravel borrow type B.
- ☐ **Marginally does not* conform...Basis:**
- ☐ **No Specifications provided to our office.**
- ☐ **Specifications provided to our office but sample not submitted to a specific use.**
- ☐ **Sample submitted without indication of intended use and without specifications.**

GENERAL REMARKS:

REVIEWED BY: Geotechnical Department



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Soil Testing Results - Transmittal Report

Distribution Copy

Report Date	12-23-2014
Report No.	4
Job Number	18014
Project	Road Improvements, Ashland, MA
Contractor	Green International Affiliates, Inc.

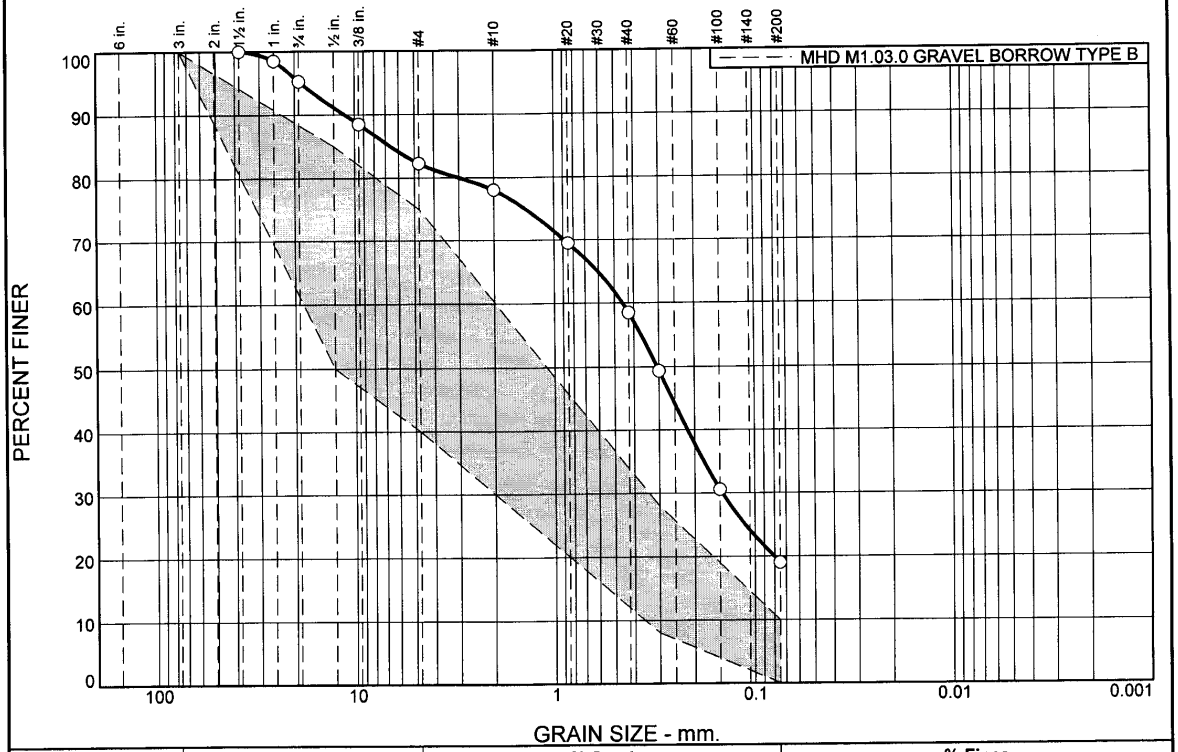
cc: Green Internationl Affiliates Wing Wong

UTS of Massachusetts, Inc.
5 Richardson Lane, Stoneham, MA 02180 781-438-7755 (Voice) 781-438-6216 (Fax)

Report Date 12-23-2014
Report No. 4
Job Number 18014
Project Road Improvements, Ashland, MA

Attachment

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.7	13.0	4.3	19.5	39.4	19.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5"	100.0		
1"	98.5		
3/4"	95.3		
3/8"	88.5		
#4	82.3	40.0 - 75.0	X
#10	78.0		
#20	69.5		
#40	58.5		
#50	49.3	8.0 - 28.0	X
#100	30.6		
#200	19.1	0.0 - 10.0	X

* MHD M1.03.0 GRAVEL BORROW TYPE B

Material Description
F-M SAND, LITTLE SILT, LITTLE GRAVEL

Atterberg Limits
PL= NP LL= NV PI= NP

Coefficients
D_{90}= 11.1792 D_{85}= 6.6082 D_{60}= 0.4545
D_{50}= 0.3070 D_{30}= 0.1461 D_{15}=
D_{10}= C_u= C_c=

Classification
USCS= SM AASHTO= A-2-4(0)

Remarks

Source of Sample: PAVEMENT CORE #1
Sample Number: 787

Date: 12/23/2014

UTS OF MASSACHUSETTS, INC.
5 Richardson Lane
Stoneham, MA 02180

Client: GREEN INTERNATIONAL AFFILIATES, INC.
Project: ASHLAND ROAD IMPROVEMENTS, ASHLAND, MA

Project No: 18014 **Figure**

Of Massachusetts
"The Construction Testing People"

5 Richardson Lane, Stoneham, MA 02180 781-438-7755 (Voice) 781-438-6216 (Fax)

Soil Testing Results - Transmittal Report

Distribution Copy

Report Date 12-23-2014
Report No. 5
Job Number 18014
Project Road Improvements, Ashland, MA
Contractor Green International Affiliates, Inc.

Sample Submitted By

Sample No. 788

☐ **Our Representative:**
Date Submitted: 12/17/2014
☒ **Other:** Wing Wong of Green International

Source of Sample

☒ **On-Site Existing @ location:** Pavement core #5
☐ **Off-Site Borrow from:**

Proposed Use: Pavement base

Material Submitted As:

☐ **Structural/Granular Fill:**
☐ **Ordinary Borrow:** MHD M1.01.0 (Shall be approved by the Architect)
☒ **Gravel Borrow:** MHD M1.03.0 Type: B
☐ **Processed Gravel For Base Course:** MHD M1.03.1
☐ **Sand Borrow:** MHD M1.04.0 Type:
☐ **Reclaimed Pavement Borrow for Base Course:** MHD M1.11.0
☐ **Crushed Stone:** MHD M2.01.0
☐ **Dense Graded Crushed Stone for Base Course:** MHD M2.01.7
☐ **Common Borrow:**
☐ **Drainage Fill:**
☐ **Other:**

Requested Testing

☐ **Atterberg Limits** ☒ **Gradation Analysis** ☐ **Hydrometer**
☐ **Modified Proctor** ☐ **Permeability** ☒ **Wash Sieve Analysis**
☐ **Other:**

Material Classification: Silty sand with gravel

Project Specification Conformance Results

☐ **Does conform:**
☒ **Does NOT conform:** MHD M1.03.0 gravel borrow type B.
☐ **Marginally does not* conform...Basis:**

☐ **No Specifications provided to our office.**
☐ **Specifications provided to our office but sample not submitted to a specific use.**
☐ **Sample submitted without indication of intended use and without specifications.**

GENERAL REMARKS:

REVIEWED BY: Geotechnical Department



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Soil Testing Results - Transmittal Report

Distribution Copy

Report Date	12-23-2014
Report No.	5
Job Number	18014
Project	Road Improvements, Ashland, MA
Contractor	Green International Affiliates, Inc.

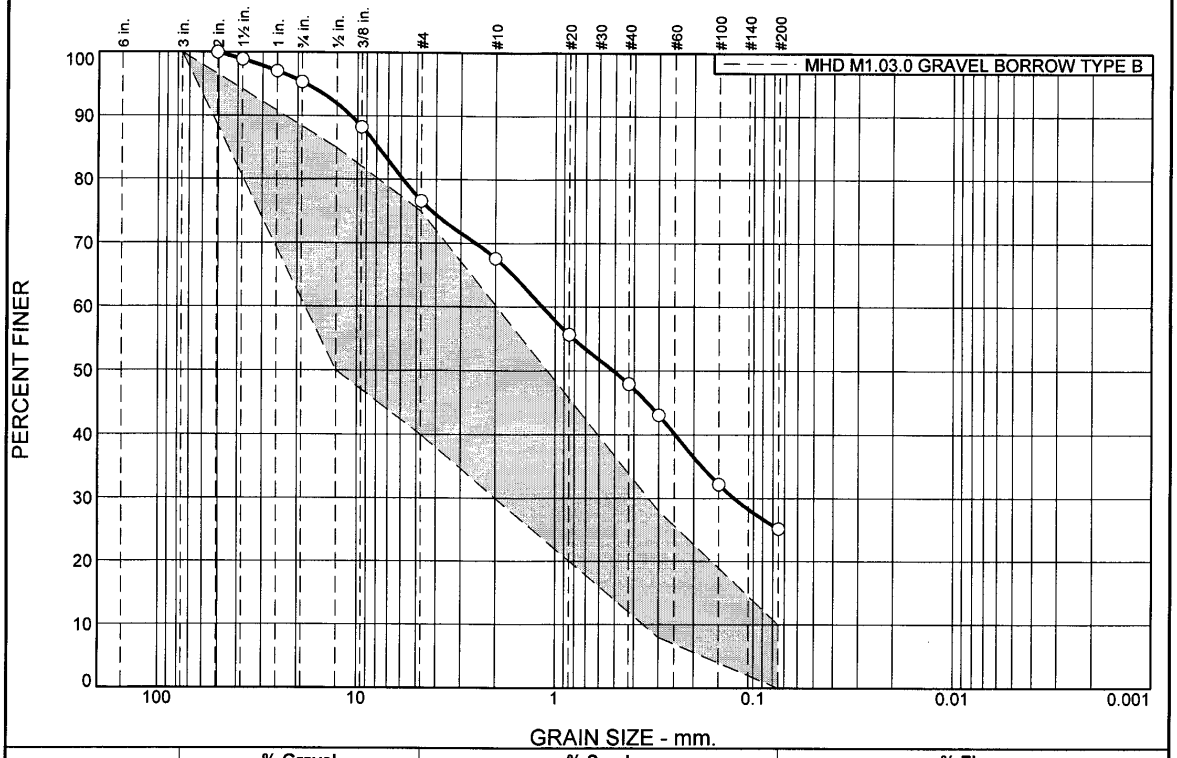
cc: Green Internationl Affiliates Wing Wong

UTS of Massachusetts, Inc.
5 Richardson Lane, Stoneham, MA 02180 781-438-7755 (Voice) 781-438-6216 (Fax)

Report Date 12-23-2014
Report No. 5
Job Number 18014
Project Road Improvements, Ashland, MA

Attachment

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.7	18.7	8.9	19.8	22.7	25.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100.0		
1.5"	98.9		
1"	97.1		
3/4"	95.3		
3/8"	88.3		
#4	76.6	40.0 - 75.0	X
#10	67.7		
#20	55.7		
#40	47.9		
#50	43.1	8.0 - 28.0	X
#100	32.2		
#200	25.2	0.0 - 10.0	X

* MHD M1.03.0 GRAVEL BORROW TYPE B

Material Description
F-M SAND, SOME SILT, SOME GRAVEL

Atterberg Limits
PL= NP LL= NV PI= NP

Coefficients
D_{90}= 10.7844 D_{85}= 7.8008 D_{60}= 1.1576
D_{50}= 0.5091 D_{30}= 0.1255 D_{15}=
D_{10}= C_u= C_c=

Classification
USCS= SM AASHTO= A-1-b

Remarks

Source of Sample: PAVEMENT CORE #5
Sample Number: 788

Date: 12/23/2014

UTS OF MASSACHUSETTS, INC.
5 Richardson Lane
Stoneham, MA 02180

Client: GREEN INTERNATIONAL AFFILIATES, INC.
Project: ASHLAND ROAD IMPROVEMENTS, ASHLAND, MA
Project No: 18014 **Figure**

Of Massachusetts
"The Construction Testing People"

5 Richardson Lane, Stoneham, MA 02180 781-438-7755 (Voice) 781-438-6216 (Fax)

Soil Testing Results - Transmittal Report

Distribution Copy

Report Date 12-23-2014
Report No. 6
Job Number 18014
Project Road Improvements, Ashland, MA

Contractor Green International Affiliates, Inc.

Sample Submitted By

Sample No. 789

☐ **Our Representative:**
Date Submitted: 12/17/2014
☒ **Other:** Wing Wong of Green International

Source of Sample

☒ **On-Site Existing @ location:** Pavement core #6
☐ **Off-Site Borrow from:**

Proposed Use: Pavement base

Material Submitted As:

☐ **Structural/Granular Fill:**
☐ **Ordinary Borrow:** MHD M1.01.0 (Shall be approved by the Architect)
☒ **Gravel Borrow:** MHD M1.03.0 Type: B
☐ **Processed Gravel For Base Course:** MHD M1.03.1
☐ **Sand Borrow:** MHD M1.04.0 Type:
☐ **Reclaimed Pavement Borrow for Base Course:** MHD M1.11.0
☐ **Crushed Stone:** MHD M2.01.0
☐ **Dense Graded Crushed Stone for Base Course:** MHD M2.01.7
☐ **Common Borrow:**
☐ **Drainage Fill:**
☐ **Other:**

Requested Testing

☐ **Atterberg Limits** ☒ **Gradation Analysis** ☐ **Hydrometer**
☐ **Modified Proctor** ☐ **Permeability** ☒ **Wash Sieve Analysis**
☐ **Other:**

Material Classification: Silty sand with gravel

Project Specification Conformance Results

☐ **Does conform:**
☒ **Does NOT conform:** MHD M1.03.0 gravel borrow type B.
☐ **Marginally does not* conform...Basis:**

☐ **No Specifications provided to our office.**
☐ **Specifications provided to our office but sample not submitted to a specific use.**
☐ **Sample submitted without indication of intended use and without specifications.**

GENERAL REMARKS:

REVIEWED BY: Geotechnical Department



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Of Massachusetts
"The Construction Testing People"

5 Richardson Lane, Stoneham, MA 02180 781-438-7755 (Voice) 781-438-6216 (Fax)

Soil Testing Results - Transmittal Report

Distribution Copy

Report Date	12-23-2014
Report No.	6
Job Number	18014
Project	Road Improvements, Ashland, MA
Contractor	Green International Affiliates, Inc.

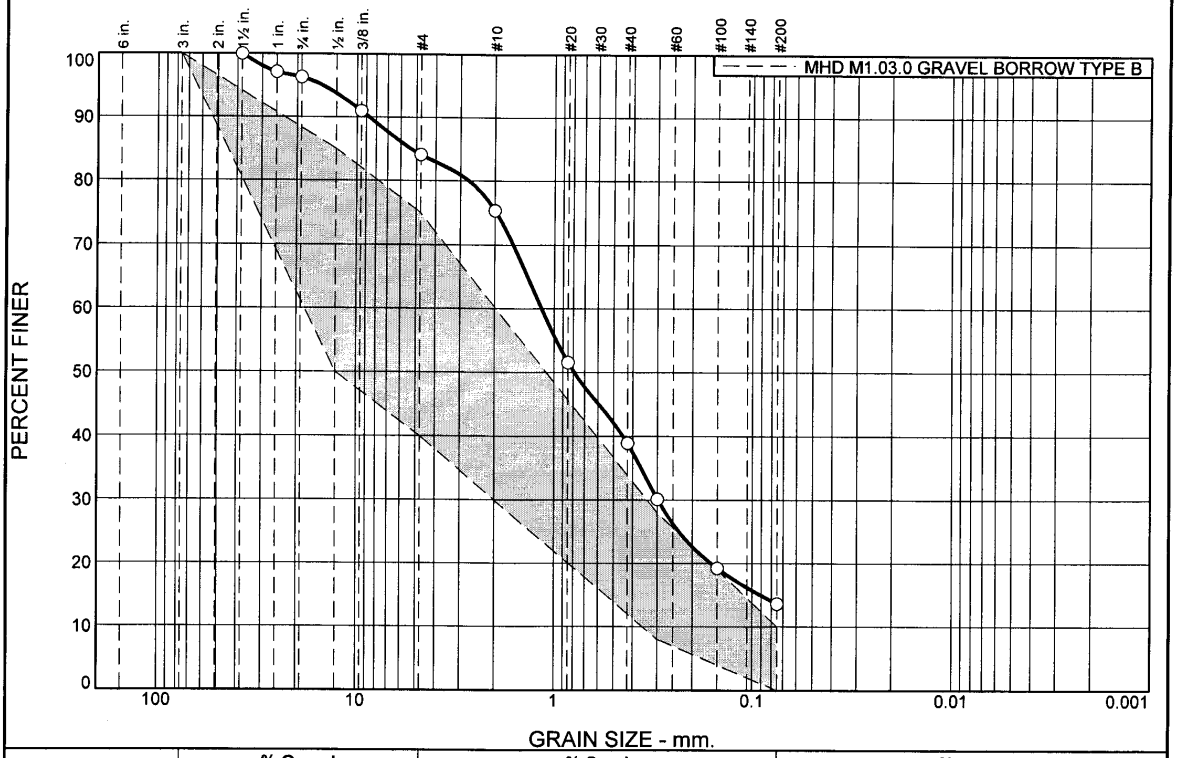
cc: Green Internationl Affiliates Wing Wong

UTS of Massachusetts, Inc.
5 Richardson Lane, Stoneham, MA 02180 781-438-7755 (Voice) 781-438-6216 (Fax)

Report Date 12-23-2014
Report No. 6
Job Number 18014
Project Road Improvements, Ashland, MA

Attachment

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.7	12.2	8.7	36.5	25.3	13.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5"	100.0		
1"	97.1		
3/4"	96.3		
3/8"	91.0		
#4	84.1	40.0 - 75.0	X
#10	75.4		
#20	51.5		
#40	38.9		
#50	30.1	8.0 - 28.0	X
#100	19.3		
#200	13.6	0.0 - 10.0	X

* MHD M1.03.0 GRAVEL BORROW TYPE B

Material Description
F-M SAND, LITTLE GRAVEL, LITTLE SILT

Atterberg Limits
PL= NP LL= NV PI= NP

Coefficients
D_{90}= 8.6756 D_{85}= 5.3126 D_{60}= 1.1576
D_{50}= 0.7917 D_{30}= 0.2986 D_{15}= 0.0910
D_{10}= C_u= C_c=

Classification
USCS= SM AASHTO= A-1-b

Remarks

Source of Sample: PAVEMENT CORE #6
Sample Number: 789

Date: 12/23/2014

UTS OF MASSACHUSETTS, INC.
5 Richardson Lane
Stoneham, MA 02180

Client: GREEN INTERNATIONAL AFFILIATES, INC.
Project: ASHLAND ROAD IMPROVEMENTS, ASHLAND, MA
Project No: 18014 **Figure**

Client Name	New England Boring Contractors PO Box 165 Derry, NH 03038	Sheet 1 of 1	**Boring No.** BC-2
Green International Affiliates		NHB JOB NUMBER: 31041	
City/Town: Ashland, MA		PROJECT NAME: Route 126 Reconstruction	

Location: Pond Street/Rt. 126	Date & Time Started	Date & Time Completed	Total Hours Worked
Ground Water: Not encountered	12/3/2014	12/17/2014	8
DRILLER: Jerry Voight	HELPER: Albert Sabo		
Ground Elevation: 181 feet	Inspector's Name (Print): Mehmet	Inspector's Company: Green Int. Affiliates	

Sample Number	Depth Range (Feet)	Blow Counts per 6 Inches 0-6	6-12	12-18	18-24	Recovery (inches)	Field Description	Strata Changes
S-1	0' - 9"	82	100/3"			8"	**Dry, very dense, grey, GRAVEL, fine to coarse sand, silt.	
S-2	2' - 2'9"	43	100/3"			8"	Dry, dense, frey, GRAVEL, fine to coarse sand, silt, color change from grey to light brown sand.	2'
S-3	3.5' - 4'	100/6"				5"	Dry, very dense, light brown, GRAVEL, fine to coarse sand, silt.	4'
							Bottom of Exploration	

Remarks: **10" depth asphalt core.

Not to scale

AUGER SIZE: 3.25" H.S.A.

CASING SIZE: N/A

SPLIT SPOON SIZE: 2"

DRILL RIG TYPE: B-53

Penetration Resistance (N) Guide

Cohesionless Soils (Sands, Gravels)		Cohesive Soils (Silts, Clays)	
Relative Density	Penetration Resistance	Consistency	Penetration Resistance
Very Loose	0 - 4	Very Soft	0 - 2
Loose	4 - 10	Soft	2 - 4
Medium Dense	10 - 30	Medium Stiff	4 - 8
Dense	30 - 50	Stiff	8 - 15
Very Dense	Over 50	Very Stiff	15 - 30
		Hard	Over 30

N = Sum of Second and Third 6" Blow Counts

Terms Used for Second Entry of Descriptions: and = 40-50%, some = 10-40%, trace = 10% or less

Client Name	New England Boring Contractors PO Box 165 Derry, NH 03038	Sheet 1 of 1	**Boring No.** BC-3
Green International Affiliates		NHB JOB NUMBER: 31041	
City/Town: Ashland, MA		PROJECT NAME: Route 126 Reconstruction	

Location: Pond Street/Rt. 126	Date & Time Started	Date & Time Completed	Total Hours Worked
Ground Water: Not encountered	12/3/2014	12/17/2014	8
DRILLER: Jerry Voight	HELPER: Albert Sabo		
Ground Elevation: 181 feet	Inspector's Name (Print): Mehmet	Inspector's Company: Green Int. Affiliates	

Sample Number	Depth Range (Feet)	Blow Counts per 6 Inches 0-6	6-12	12-18	18-24	Recovery (inches)	Field Description	Strata Changes
S-1	0' - 2'	39	42	44	40	.5"	**Dry, dense, dary grey, GRAVEL, fine to coarse sand.	
S-2	2' - 3'9"	37	35	46	100/3"	11"	Dry, dense, grey, GRAVEL, fine to coarse sand, silt.	
S-3	4' - 5'4"	43	86	100/4"		10"	Dry, very dense, grey, GRAVEL, fine to coarse sand, silt.	

Remarks: **10" depth asphalt core.

Not to scale

AUGER SIZE: 3.25" H.S.A.

CASING SIZE: N/A

SPLIT SPOON SIZE: 2"

DRILL RIG TYPE: B-53

Penetration Resistance (N) Guide

Cohesionless Soils (Sands, Gravels)		Cohesive Soils (Silts, Clays)	
Relative Density	Penetration Resistance	Consistency	Penetration Resistance
Very Loose	0 - 4	Very Soft	0 - 2
Loose	4 - 10	Soft	2 - 4
Medium Dense	10 - 30	Medium Stiff	4 - 8
Dense	30 - 50	Stiff	8 - 15
Very Dense	Over 50	Very Stiff	15 - 30
		Hard	Over 30

N = Sum of Second and Third 6" Blow Counts

Terms Used for Second Entry of Descriptions: and = 40-50%, some = 10-40%, trace = 10% or less

Client Name	New England Boring Contractors PO Box 165 Derry, NH 03038	Sheet 1 of 1	**Boring No.** BC-4
Green International Affiliates		NHB JOB NUMBER: 31041	
City/Town: Ashland, MA		PROJECT NAME: Route 126 Reconstruction	

Location: Pond Street/Rt. 126	Date & Time Started	Date & Time Completed	Total Hours Worked
Ground Water: Not encountered	12/3/2014	12/17/2014	8
DRILLER: Jerry Voight	HELPER: Albert Sabo		
Ground Elevation: 181 feet	Inspector's Name (Print): Mehmet	Inspector's Company: Green Int. Affiliates	

Sample Number	Depth Range (Feet)	Blow Counts per 6 Inches 0-6	6-12	12-18	18-24	Recovery (inches)	Field Description	Strata Changes
S-1	0' - 2'	46	35	44	20	18"	**Dry, very dense, brown/grey, GRAVEL, coarse to fine sand, silt.	
S-2	2' - 4'	10	22	16	17	16"	Dry, medium dense, brown, FINE SAND, trace of silt.	
S-3	4' - 6'	7	11	13	15	17"	Dry, medium dense, light tan, FINE SAND, trace of silt.	6'
							Bottom of Exploration	

Remarks: **10" depth asphalt core.

Not to scale

AUGER SIZE: 3.25" H.S.A.

CASING SIZE: N/A

SPLIT SPOON SIZE: 2"

DRILL RIG TYPE: B-53

Penetration Resistance (N) Guide

Cohesionless Soils (Sands, Gravels)		Cohesive Soils (Silts, Clays)	
Relative Density	Penetration Resistance	Consistency	Penetration Resistance
Very Loose	0 - 4	Very Soft	0 - 2
Loose	4 - 10	Soft	2 - 4
Medium Dense	10 - 30	Medium Stiff	4 - 8
Dense	30 - 50	Stiff	8 - 15
Very Dense	Over 50	Very Stiff	15 - 30
		Hard	Over 30

N = Sum of Second and Third 6" Blow Counts

Terms Used for Second Entry of Descriptions: and = 40-50%, some = 10-40%, trace = 10% or less

Client Name	New England Boring Contractors PO Box 165 Derry, NH 03038	Sheet 1 of 1	**Boring No.** PC-1
Green International Affiliates		NHB JOB NUMBER: 31041	
City/Town: Ashland, MA		PROJECT NAME: Route 126 Reconstruction	

Location: Pond Street/Rt. 126	Date & Time Started	Date & Time Completed	Total Hours Worked
Ground Water: Not encountered	12/3/2014	12/17/2014	8
DRILLER: Tim Sabo	HELPER:		
Ground Elevation: 181 feet	Inspector's Name (Print): Mehmet	Inspector's Company: Green Int. Affiliates	

Sample Number	Depth Range (Feet)	Blow Counts per 6 Inches 0-6	6-12	12-18	18-24	Recovery (inches)	Field Description	Strata Changes
S-1	0' - 2'	36	24	31	21	8"	**Dry, very dense, brown, FINE SAND, trace of coarse sand, trace of gravel, little silt.	
S-2	2' - 4'	19	18	19	17	0"	No recovery.	
S-3	4' - 6'	17	18	17	13	14"	Dry, dense, light brown, FINE SAND, trace of silt.	6'
							Bottom of Exploration	

Remarks: **12" depth asphalt core.

Not to scale

AUGER SIZE: N/A

CASING SIZE: 4" I.D.

SPLIT SPOON SIZE: 2"

DRILL RIG TYPE: B-53

Penetration Resistance (N) Guide

Cohesionless Soils (Sands, Gravels)		Cohesive Soils (Silts, Clays)	
Relative Density	Penetration Resistance	Consistency	Penetration Resistance
Very Loose	0 - 4	Very Soft	0 - 2
Loose	4 - 10	Soft	2 - 4
Medium Dense	10 - 30	Medium Stiff	4 - 8
Dense	30 - 50	Stiff	8 - 15
Very Dense	Over 50	Very Stiff	15 - 30
		Hard	Over 30

N = Sum of Second and Third 6" Blow Counts

Terms Used for Second Entry of Descriptions: and = 40-50%, some = 10-40%, trace = 10% or less

Client Name	New England Boring Contractors PO Box 165 Derry, NH 03038	Sheet 1 of 1	**Boring No.** PC-5
Green International Affiliates		NHB JOB NUMBER: 31041	
City/Town: Ashland, MA		PROJECT NAME: Route 126 Reconstruction	

Location: Pond Street/Rt. 126	Date & Time Started	Date & Time Completed	Total Hours Worked
Ground Water: Not encountered	12/3/2014	12/17/2014	8
DRILLER: Tim Sabo	HELPER:		
Ground Elevation: 181 feet	Inspector's Name (Print): Mehmet	Inspector's Company: Green Int. Affiliates	

Sample Number	Depth Range (Feet)	Blow Counts per 6 Inches 0-6	6-12	12-18	18-24	Recovery (inches)	Field Description	Strata Changes
S-1	0' - 2'	21	17	22	21	10"	**Dry, dense, brown, FINE SAND, trace of medium to coarse sand,	
							trace of fine gravel, little silt.	
S-2	2' - 4'	21	14	12	13	11"	Dry, dense, brown, FINE SAND, trace of medium to coarse sand,	
							trace of fine gravel, little silt, traces of fine cobble.	
S-3	4' - 6'	21	29	17	15	14"	Dry, dense, brown, FINE SAND, trace of medium to coarse sand,	
							trace of fine gravel, silt, trace of fine cobble, 9" layer of black material.	6'
							Bottom of Exploration	

Remarks: **4" depth asphalt core.
Not to scale

AUGER SIZE: N/A

CASING SIZE: 4" I.D.

SPLIT SPOON SIZE: 2"

DRILL RIG TYPE: B-53

Penetration Resistance (N) Guide

Cohesionless Soils (Sands, Gravels)		Cohesive Soils (Silts, Clays)	
Relative Density	Penetration Resistance	Consistency	Penetration Resistance
Very Loose	0 - 4	Very Soft	0 - 2
Loose	4 - 10	Soft	2 - 4
Medium Dense	10 - 30	Medium Stiff	4 - 8
Dense	30 - 50	Stiff	8 - 15
Very Dense	Over 50	Very Stiff	15 - 30
		Hard	Over 30

N = Sum of Second and Third 6" Blow Counts

Terms Used for Second Entry of Descriptions: and = 40-50%, some = 10-40%, trace = 10% or less

Client Name	New England Boring Contractors PO Box 165 Derry, NH 03038	Sheet 1 of 1	**Boring No.** PC-6
Green International Affiliates		NHB JOB NUMBER: 31041	
City/Town: Ashland, MA		PROJECT NAME: Route 126 Reconstruction	
Location: Pond Street/Rt. 126	Date & Time Started	Date & Time Completed	Total Hours Worked
Ground Water: Not encountered	12/3/2014	12/17/2014	8
DRILLER: Tim Sabo	HELPER:		
Ground Elevation: 181 feet	Inspector's Name (Print): Mehmet	Inspector's Company: Green Int. Affiliates	

Sample Number	Depth Range (Feet)	Blow Counts per 6 Inches 0-6	6-12	12-18	18-24	Recovery (inches)	Field Description	Strata Changes
S-1	0' - 2'	10	13	14	18	12"	**Dry, medium dense, brown, FINE SAND, trace of medium to coarse sand, little silt, trace of fine gravel.	
S-2	2' - 4'	11	10	16	14	16"	Dry, medium dense, brown, FINE TO COARSE SAND, trace of silt, trace of fine gravel.	
S-3	4' - 6'	20	24	21	26	14"	Dry, dense, brown, FINE SAND, some silt, bottom 2" very fine sand and silt.	6'
							Bottom of Exploration	

Remarks: **14" depth asphalt core.
Not to scale

AUGER SIZE: N/A

CASING SIZE: 4" I.D.

SPLIT SPOON SIZE: 2"

DRILL RIG TYPE: B-53

Penetration Resistance (N) Guide

Cohesionless Soils (Sands, Gravels)		Cohesive Soils (Silts, Clays)	
Relative Density	Penetration Resistance	Consistency	Penetration Resistance
Very Loose	0 - 4	Very Soft	0 - 2
Loose	4 - 10	Soft	2 - 4
Medium Dense	10 - 30	Medium Stiff	4 - 8
Dense	30 - 50	Stiff	8 - 15
Very Dense	Over 50	Very Stiff	15 - 30
		Hard	Over 30

N = Sum of Second and Third 6" Blow Counts

Terms Used for Second Entry of Descriptions: and = 40-50%, some = 10-40%, trace = 10% or less

SUBSURFACE UTILITY EXCAVATION PLANS

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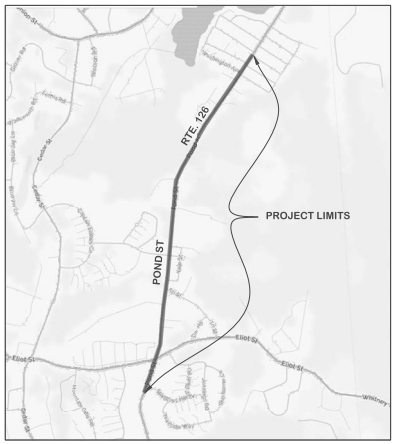
ASHLAND, MA
ROUTE 125 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	1	18
PROJECT FILE NO.	604123		

SUE PLAN

SUBSURFACE UTILITY ENGINEERING PLAN
MASSDOT POND ST, RTE 126
ASHLAND, MA

PREPARED FOR
GREEN INTERNATIONAL AFFILIATES, INC.
239 LITTLETON ROAD, SUITE 3
WESTFORD, MA 01886



LOCUS PLAN
NOT TO SCALE

INDEX OF SHEETS	SHEET NO.
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SUE SHEET No. 2	5
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SUE SHEET No. 4	7
SUE SHEET No. 5	8
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SUE SHEET No. 11	14
SUE SHEET No. 12	15
SUE SHEET No. 13	16
SUE SHEET No. 14	17
SUE SHEET No. 15	18

OVERLAND ENGINEERING, LLC
100 HALLET ST, BOSTON, MA 02124
617 265 4547

August 26, 2019

6100UTL01.DWG Plotted on 30-Aug-2019 11:25 AM

A00893 - 3

Proposal No. 604123-111717 ADDENDUM NO. 6, AUGUST 28, 2020

OVERLAND LEGEND

QUALITY LEVEL "A" INFORMATION

VACUUM EXCAVATION DATA POINT QL-A

QUALITY LEVEL "B" INFORMATION

- CS QL-B — COMBINED SEWER QL-B
- CTV QL-B — CABLE TELEVISION QL-B
- SD QL-B — DRAIN QL-B
- E QL-B — ELECTRICAL QL-B
- FA QL-B — FIRE ALARM QL-B
- G QL-B — GAS QL-B
- S QL-B — SEWER QL-B
- ST QL-B — STEAM QL-B
- T QL-B — TELECOMMUNICATIONS QL-B
- TR QL-B — TRAFFIC QL-B
- UAIR QL-B — UNDERGROUND AIR PRODUCTS QL-B: CO2, NO2, ETC.
- U QL-B — UNKNOWN TRACE SIGNAL QL-B
- W QL-B — WATER QL-B

QUALITY LEVEL "C" INFORMATION

- CS QL-C — COMBINED SEWER QL-C
- CTV QL-C — CABLE TELEVISION QL-C
- SD QL-C — DRAIN QL-C
- E QL-C — ELECTRICAL QL-C
- FA QL-C — FIRE ALARM QL-C
- G QL-C — GAS QL-C
- S QL-C — SEWER QL-C
- ST QL-C — STEAM QL-C
- T QL-C — TELECOMMUNICATIONS QL-C
- TR QL-C — TRAFFIC QL-C
- UAIR QL-C — UNDERGROUND AIR PRODUCTS QL-C: CO2, NO2, ETC.
- U QL-C — UNKNOWN TRACE SIGNAL QL-C
- W QL-C — WATER QL-C
- OHE—T—TV(C) — OVERHEAD ELECTRIC - TELEPHONE - CABLE
- OHE—T(C) — OVERHEAD ELECTRIC - TELEPHONE
- OHE—TV(C) — OVERHEAD ELECTRIC - CABLE
- OHE(C) — OVERHEAD ELECTRIC
- OHT—TV(C) — OVERHEAD TELEPHONE - CABLE
- OHT(C) — OVERHEAD TELEPHONE
- OHTV(C) — OVERHEAD CABLE

QUALITY LEVEL "D" INFORMATION

- CS QL-D — COMBINED SEWER QL-D
- CTV QL-D — CABLE TELEVISION QL-D
- SD QL-D — DRAIN QL-D
- E QL-D — ELECTRICAL QL-D
- FA QL-D — FIRE ALARM QL-D
- G QL-D — GAS QL-D
- S QL-D — SEWER QL-D
- ST QL-D — STEAM QL-D
- T QL-D — TELECOMMUNICATIONS QL-D
- TR QL-D — TRAFFIC QL-D
- UAIR QL-D — UNDERGROUND AIR PRODUCTS QL-D: CO2, NO2, ETC.
- W QL-D — WATER QL-D

LAND BASE

- EXISTING BUILDINGS & RELATED STRUCTURES
- BRIDGE ABUTMENTS
- MAJOR CONTOUR
- MINOR CONTOUR
- MISC. DETAILS / EDGE OF PAVEMENT
- CHAINLINK OR WOOD FENCE
- STEEL GUARD RAIL OR WROUGHT IRON FENCE
- PROPERTY LINE
- TOP OF CURBS / BACK OF SIDEWALKS
- RETAINING / STONE WALLS

SUE PLAN NOMENCLATURE

- EOI OR EOI — END OF INFORMATION
- (R) — RECORD INFORMATION
- QL–X | QL–X — CHANGE IN QUALITY LEVEL
- SUE PROJECT LIMITS

IP	IRON PIPE
CI	CAST IRON
SFM	SEWER FORCE MAIN
FO	FIBER OPTIC
PVC	POLYVINYL CHLORIDE
SW	SALT WATER
HW	HOT WATER
CND	CONDENSATE
MH	MANHOLE
T	TELEPHONE
E	ELECTRIC
W	WATER
S	SEWER
ST	STEAM
U	UNKNOWN
UAIR	UNDERGROND AIR
(ABAND.)	ABANDONED
CH	CHIMNEY
SUMP	BOTTOM OF MH STRUCTURE
	NOTE CALLOUT

OVERLAND SYMBOLS LEGEND (QL-C) INFORMATION

CABLE TV FACILITIES
- CABLE HAND HOLE
- CABLE MANHOLE
- CABLE PEDESTAL

DRAIN FACILITIES
- AREA DRAIN
- CATCH BASIN
- CATCH BASIN ROUND
- CATCH BASIN D-GRATE
- DRAIN CLEAN OUT
- DRAIN LAMP HOLE
- DROP INLET
- DRAIN MANHOLE
- DRAIN LEACHING BASIN

ELECTRICAL FACILITIES
- ELECTRICAL HAND HOLE
- ELECTRICAL METER PIT
- ELECTRICAL CONTROL BOX
- ELECTRICAL MANHOLE
- ELECTRICAL CABINET
- ELECTRICAL PEDESTAL
- GUIDE ANCHOR
- MBTA MANHOLE
- ELECTRICAL PTC TEST BOX
- UTILITY POLE NO LIGHTS
- LIGHT POLE NO UTILITIES
- UTILITY LIGHT POLE

FIRE FACILITIES
- FIRE PULL BOX
- FIRE MANHOLE
- FIRE ALARM HANDHOLE

GAS FACILITIES
- GAS DIVISION GATE
- GAS GATE CIRCULAR
- GAS GATE SERVICE PIPE
- GAS METER PIT
- GAS REGULATOR PIT
- GAS SACRIFICIAL ANODE
- GAS TEST BOX
- GAS VENT
- GAS DRIP
- GAS GATE SQUARE

LAND BASE FACILITIES
- BOLLARD
- SOIL BORING
- COAL HOLE
- USPS MAIL BOX
- OBSERVATION WELL
- PARKING METER
- SHRUB
- SIGN
- TREE

POLICE FACILITIES
- POLICE PULL BOX
- POLICE HANDHOLE

SEWER FACILITIES
- COMBINED SEWER LAMP HOLE
- COMBINED SEWER MANHOLE
- SEWER MANHOLE
- SEWER LAMP HOLE
- SEWER VENT

STEAM FACILITIES
- STEAM REGULATOR PIT
- STEAM MANHOLE
- STEAM VALVE

SURVEY CONTROL
- BENCH MARK
- STONE BOUND
- CAT CONTROL POINT
- CROSS CUT
- DRILL HOLE
- IRON PIPE
- LEAD PLUG W/ BRASS TAC
- MASS. GEODETIC DISK
- PARKER KALON NAIL

TELEPHONE & TRAFFIC FACILITIES
- TELEPHONE HAND HOLE
- TELEPHONE MANHOLE
- TELEPHONE CABINET
- TELEPHONE BOOTH
- TELEPHONE PEDESTAL
- TRAFFIC LOOP DETECTOR
- TRAFFIC CONTROL BOX
- TRAFFIC HAND HOLE
- TRAFFIC SIGNAL POLE

UNKNOWN FACILITIES
- UNKNOWN GATE VALVE
- MANHOLE UNKNOWN

WATER FACILITIES
- AIR COCK
- BUTTERFLY VALVE
- WATER CHECK VALVE
- FIRE HYDRANT
- LOWRY HYDRANT
- WATER METER PIT
- WATER PITOMETER
- WATER POST INDICATOR VALVE
- WATER STAND PIPE
- WATER DIVISION GATE
- WATER GATE
- WATER GATE IRRE PIPE
- WATER GATE SERVICE PIPE
- WATER SACRIFICAL ANODE
- WATER TEST BOX
- WATER VENT
- WATER MANHOLE
- BUTTERFLY VALVE CHAMBER

Subsurface Utility Engineering Notes:

1. This plan was prepared in conformance with the American Society of Civil Engineers standard CI/ASCE 38-02 "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data".
2. OVERLAND will only warrant the existence or nonexistence of utility lines based on quality level A information. QL "A" information is only valid within the visible limits of the test hole.
3. OVERLAND will advance a vacuum test hole until a condition of practical refusal for vacuum excavation is reached. Practical refusal is defined as any of the following conditions occurring: Encountering a utility, bedrock, water table, rocks/cobbles, condition of hole instability or reaching a depth of 8'.
4. Below ground structures, unless dimensioned, are symbolic only.
5. Prior to excavation utility owners shall review and approve this drawing.
6. This drawing is prepared in color. Reproduction may alter the information contained hear in. OVERLAND does not warrant the information contained hear in following reproduction.
7. Use or reuse of this drawing by parties not directly contracted with OVERLAND is prohibited without prior written permission.
8. Base mapping/survey control is shown for information purposes only and is not warranted by OVERLAND.
9. OVERLAND recommends that all existing utilities near proposed construction activities be located by vacuum excavation (quality level A) prior to any excavation (if not already located by vacuum excavation).

Utility Quality Level Information Index (see ASCE/CI 38-02):

QUALITY LEVEL D: "QL D". Utility information plotted on the drawing based solely on record information, individual recollections or the existence of utility service. It shall be noted that all information shown (other than at test hole locations, see QL A below), including but not limited to a utilities size, capacity, material composition, condition or service status shall be considered QL D even though the utility may be plotted and labeled as QL C or QL B.

QUALITY LEVEL C: "QL C". Utility information obtained and categorized as QL D, plotted to correlate with surface utility features which have been field verified, survey located and accurately transposed onto the design/construction documents. Included in this category aerial utility information and utility depiction's, which in the professional opinion of the subsurface utility engineer, represent the most probable approximate horizontal location, type and/or existence of a utility.

QUALITY LEVEL B: "QL B". Utility information derived by establishing the approximate surface horizontal location of a utility using electronic methods. Said information is subsequently field survey located and accurately reduced onto the design/construction documents.

QUALITY LEVEL A: "QL A". Utility information which has been visually verified, survey located (both horizontally and vertically) and accurately reduced onto the design/construction documents. This is typically shown as test hole or other dimensioned information.

ASHLAND, MA
ROUTE 125 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	2	18
PROJECT FILE NO.	604123		

SUE PLAN

SUE General Notes:

1. Certain utilities shown have been traced on the ground using electronic designation techniques. Designation, or electronic utility location, is defined as the surface location of a utility line based on electronic geophysical prospecting techniques and is approximate in relation to the actual location of the possible utility.
2. Certain utilities shown have been taken from available record information. These utilities may not have been verified. (See Note #4 below.)
3. All existing designated utilities near proposed construction should be exactly located using Non-Destructive Air-Vacuum Excavation, if not already located by Air-Vacuum Excavation (See Quality Level A above).
4. Unless Non-Destructive Air-Vacuum Excavation is utilized at a particular location, OVERLAND does not guarantee the existence or non-existance of utility lines
5. At locations, where OVERLAND is directed to perform Non-Destructive Air-Vacuum Excavation, the test hole is advanced until a condition of practical refusal for Air-Vacuum Excavation is reached or hole is advanced to a depth of 8.0' (eight feet). Practical refusal being defined as encountering a utility, bedrock, water table, large rocks/ cobbles, suspected hazardous materials or a condition of hole instability.
6. Where OVERLAND is directed to perform Non-Destructive Air-Vacuum Excavation to confirm the non-existance of utilities, OVERLAND will only report non-existance of utilities within the visible limits of the excavation. OVERLAND is not responsible for ensuring that work by others is performed at the same location as the Air-Vacuum Excavation Hole.
7. Below ground structures unless otherwise depicted are symbolic only.
8. Prior to any excavating, OVERLAND recommends that all utility owners should review this drawing for accuracy and completeness.

General Project Notes:

1. Mapping provided by:
   Green International Affiliates, Inc.
   239 Littleton Road, Suite 3
   Westford, MA 01886

2. Horizontal and vertical survey control provided by:
   Green International Affiliates, Inc.
   239 Littleton Road, Suite 3
   Westford, MA 01886

6100UTL01.DWG Plotted on 30-Aug-2019 11:25 AM

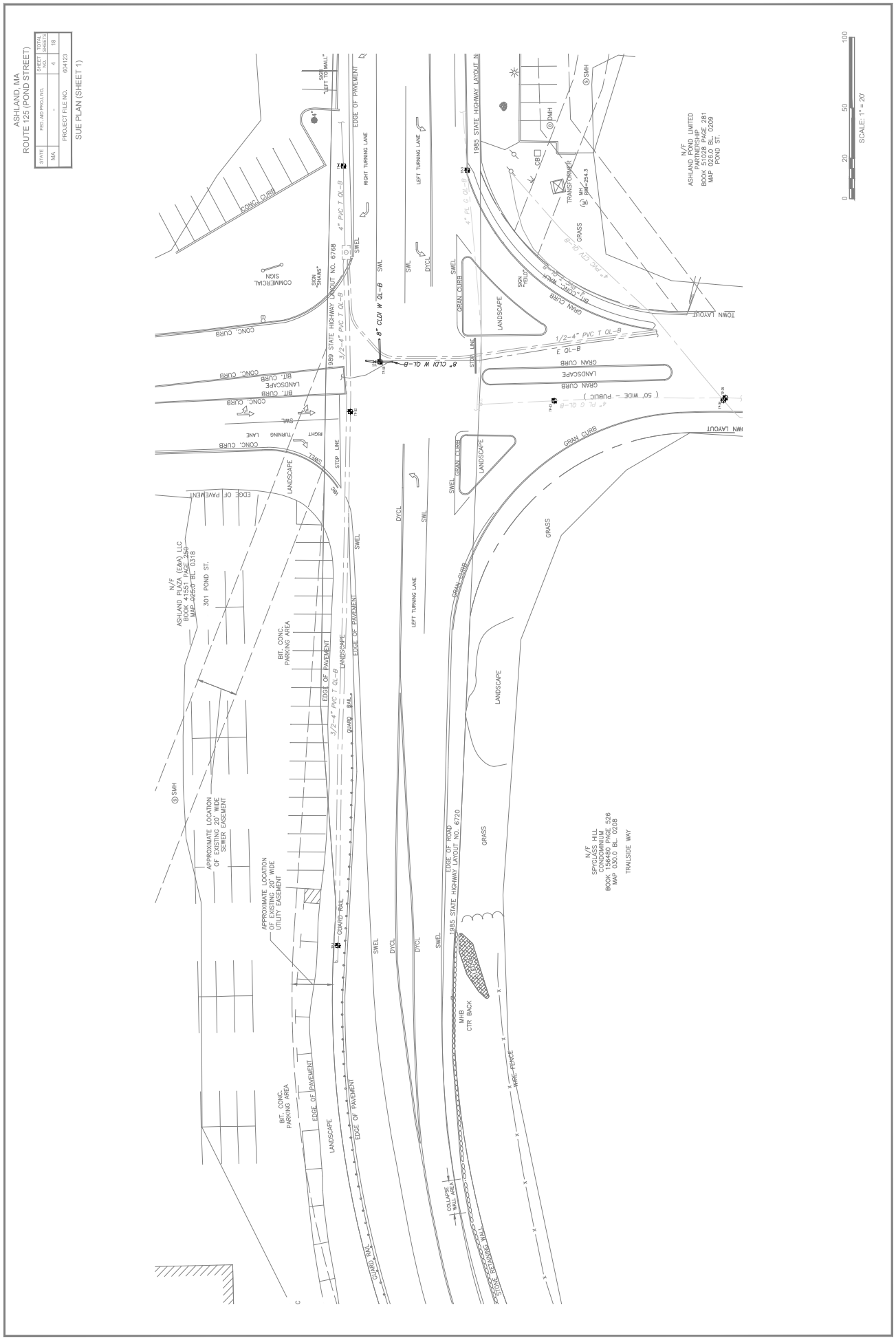
Proposal No. 604123-111717 ADDENDUM NO. 6, AUGUST 28, 2020

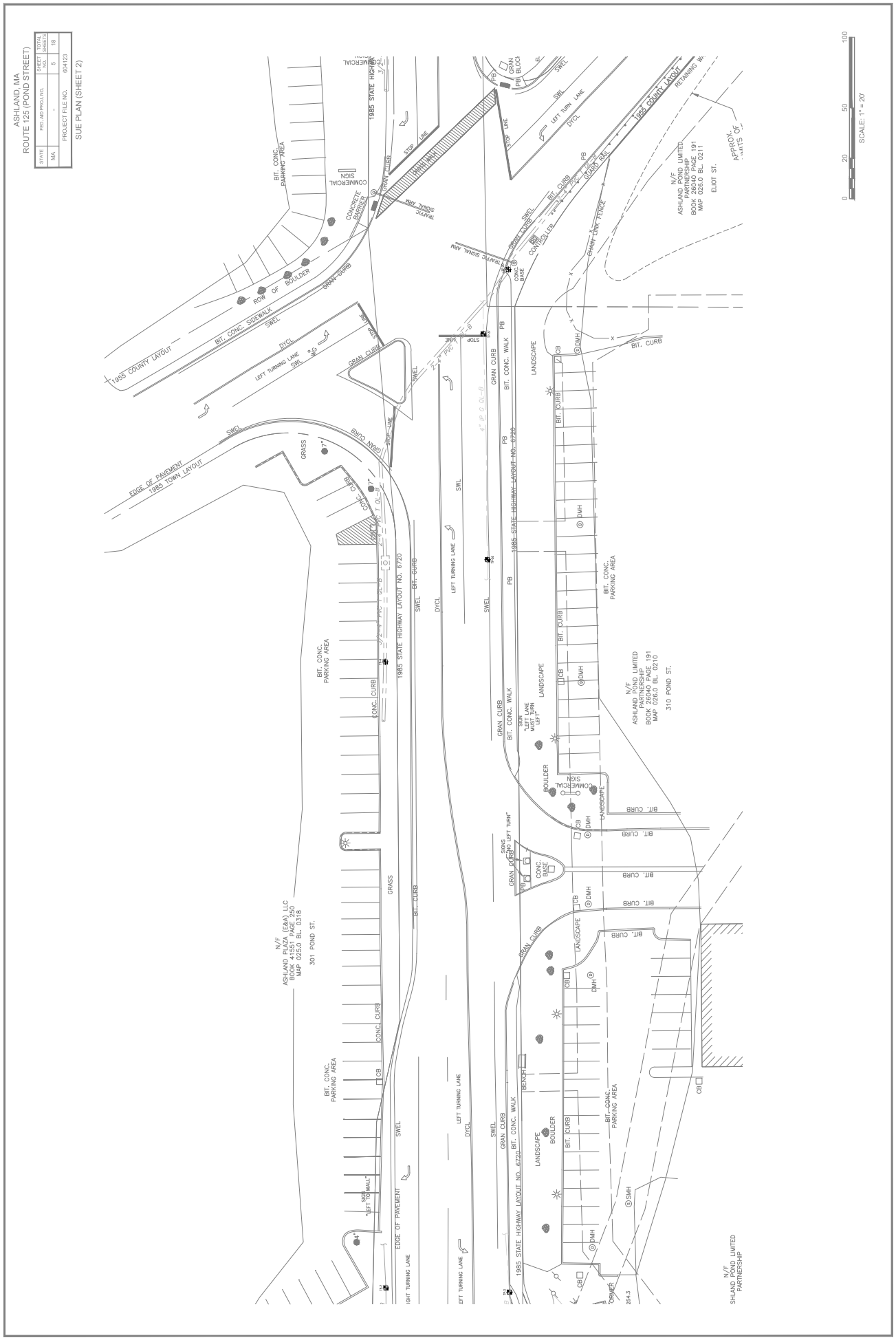
6100UTL01.DWG Plotted on 30-Aug-2019 11:30 AM

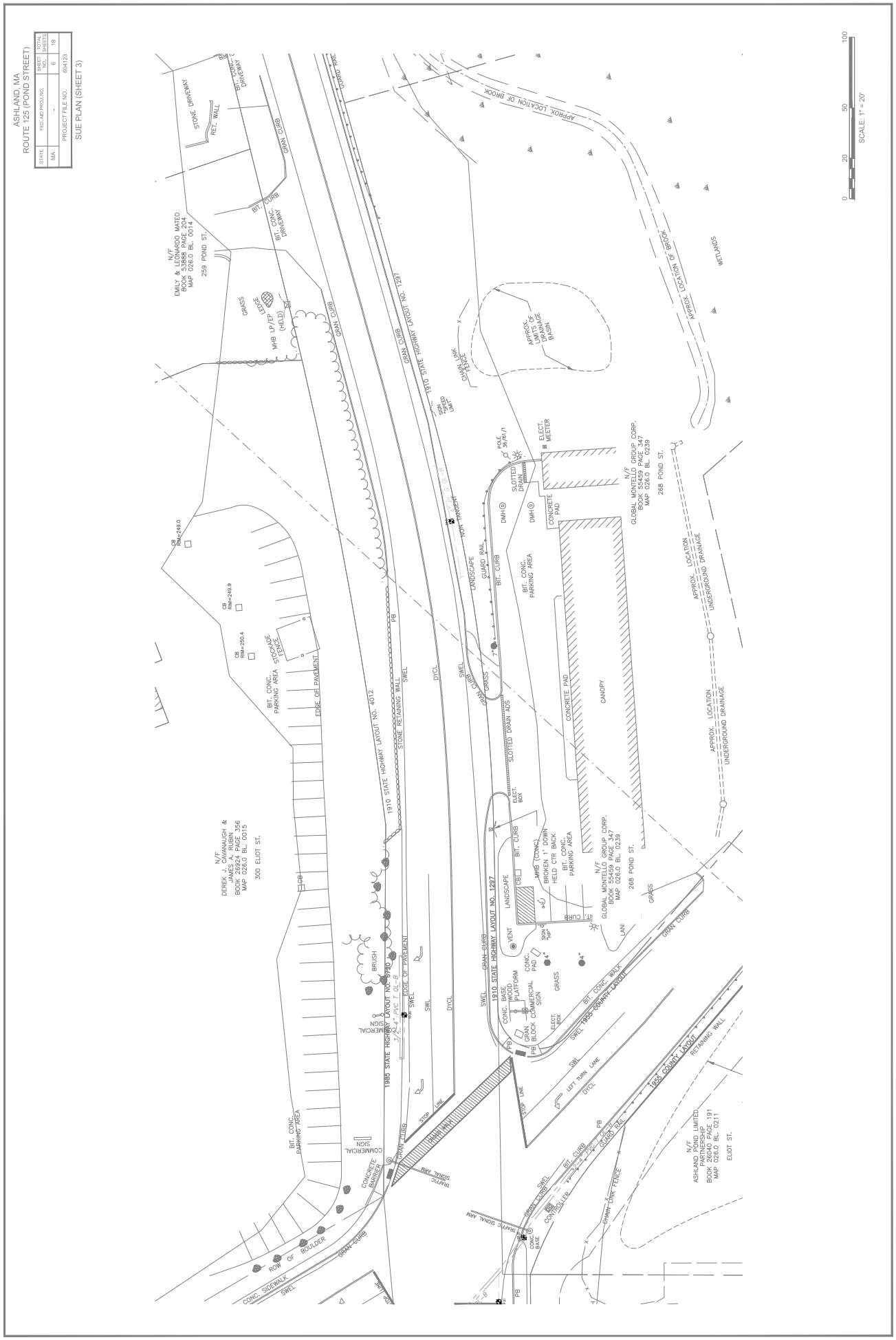
TEST HOLE DATA TABLE

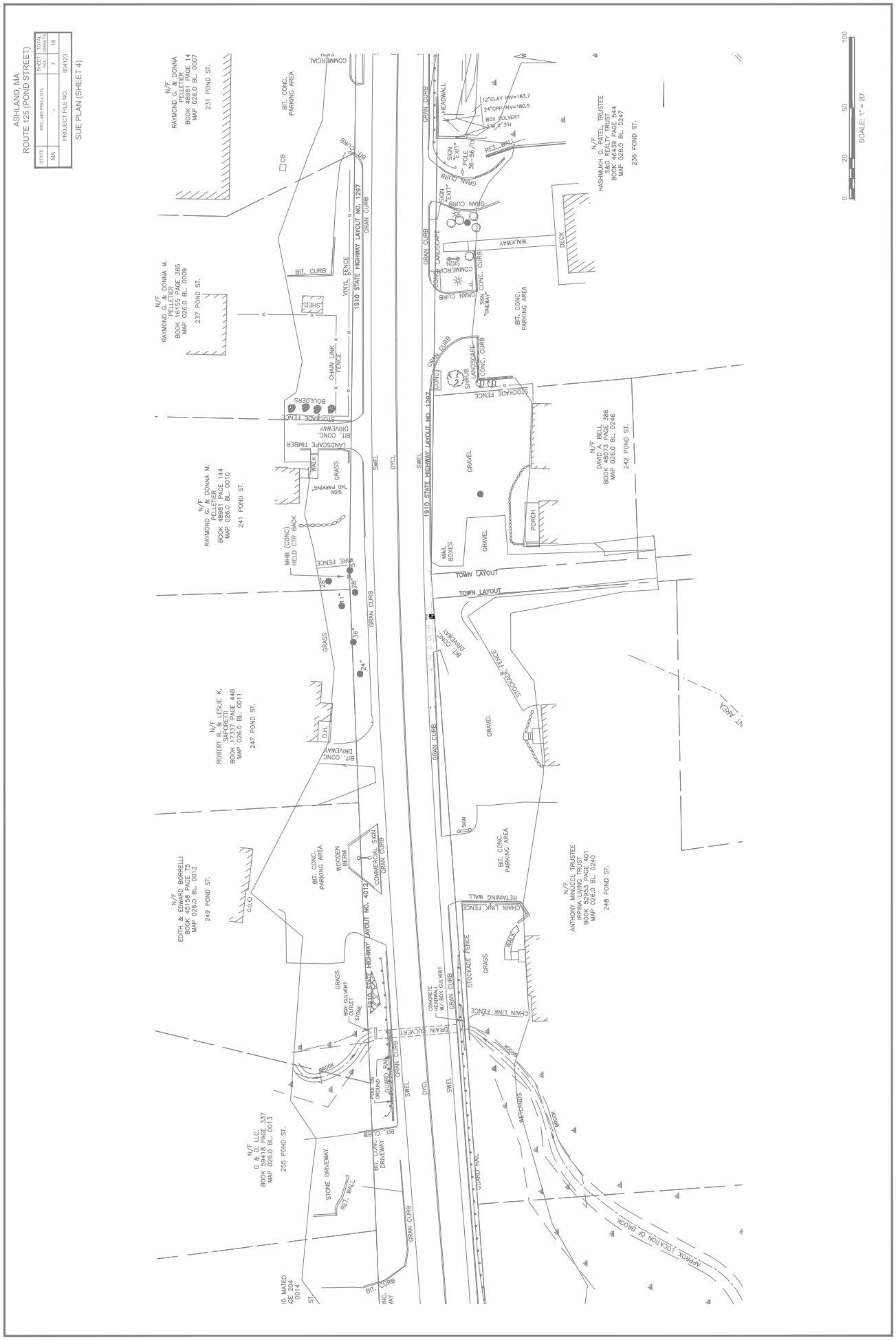
TEST HOLE NO.	ROADWAY	NORTHING	EASTING	UTILITY TYPE	UTILITY OWNER	UTILITY CONDITION	SIZE (in.) Record +/-	OBSERVED MATERIAL TYPE	DEPTH TO TOP (ft)	TOP ELEV. OF UTILITY (ft)	SURF. ELEV. (ft)	MISC. NOTES
1	POND ST - RTE 126	2912320.38	674433.87	TELECOM	VERIZON	NOD	3/2 - 4.0	PVC	5.3	258.53	263.83	1.5 FOOT WIDE CONDUIT RUN. ELEVATION MEASURED FROM TOP OF WOOD STAKE.
2	POND ST - RTE 126	2912684.52	674563.00	TELECOM	VERIZON	NOD	4.0	PVC	2.9	250.92	253.82	
3	POND ST - RTE 126	2912662.51	674620.23	GAS	NATIONAL GRID	NOD	4.0	PLASTIC	2.8	249.11	251.91	
4	POND ST - RTE 126	2912977.79	674664.24	TELE	VERIZON	NOD	3/2 - 4.0	PVC	3.6	244.33	247.93	
5	POND ST - RTE 126	2913488.68	674867.77	GAS	NATIONAL GRID	NOD	4.0	PLASTIC	4.1	222.85	226.95	
6	POND ST - RTE 126	2913993.50	674901.24	GAS	NATIONAL GRID	NOD	4.0	PLASTIC	3.4	195.51	198.91	
7	POND ST - RTE 126	2914276.52	674940.23	GAS	NATIONAL GRID	NOD	4.0	PLASTIC	3.0	185.39	188.39	
8	POND ST - RTE 126	2914638.40	674991.76	GAS	NATIONAL GRID	NOD	4.0	IRON PIPE	3.5	182.88	186.38	
9A	POND ST - RTE 126	2915373.32	675068.95	GAS	NATIONAL GRID	NOD	4.0	IRON PIPE	3.4	173.12	176.52	
9B	POND ST - RTE 126	2915373.85	675065.52	WATER	TOWN OF ASHLAND	NOD	8.0	IRON PIPE	5.5	171.13	176.63	
10	POND ST - RTE 126	2915694.06	675101.35	GAS	NATIONAL GRID	NOD	4.0	IRON PIPE	3.8	170.87	174.67	
11	POND ST - RTE 126	2916335.38	675159.11	GAS	EVERSOURCE	NOD	12.0	IRON PIPE	4.0	173.45	177.45	
12	POND ST - RTE 126	2916641.87	675185.32	GAS	EVERSOURCE	NOD	12.0	IRON PIPE	4.2	167.62	171.82	
13A	POND ST - RTE 126	2916918.51	675213.43	GAS	EVERSOURCE	NOD	16.0	STEEL	3.0	166.50	169.50	
13B	POND ST - RTE 126	2916919.18	675211.13	GAS	EVERSOURCE	NOD	12.0	IRON PIPE	4.5	164.88	169.38	
14A	POND ST - RTE 126	2917191.16	675286.55	GAS	EVERSOURCE	NOD	16.0	STEEL	4.0	162.95	166.95	
14B	POND ST - RTE 126	2917192.11	675284.73	GAS	EVERSOURCE	NOD	12.0	IRON PIPE	4.0	162.95	166.95	
15A	POND ST - RTE 126	2917449.53	675422.23	GAS	EVERSOURCE	NOD	16.0	STEEL	3.4	161.07	164.47	
15B	POND ST - RTE 126	2917449.85	675420.37	GAS	EVERSOURCE	NOD	12.0	IRON PIPE	4.4	160.33	164.73	
16A	POND ST - RTE 126	2918174.59	675828.66	GAS	EVERSOURCE	NOD	16.0	STEEL	3.0	159.70	162.70	
16B	POND ST - RTE 126	2918175.93	675826.74	GAS	EVERSOURCE	NOD	12.0	IRON PIPE	3.6	159.01	162.61	
17	POND ST - RTE 126	2918619.22	676152.21	GAS	EVERSOURCE	NOD	12.0	IRON PIPE	4.0	156.32	160.32	
18	POND ST - RTE 126	2919020.67	676424.65	GAS	EVERSOURCE	NOD	12.0	IRON PIPE	2.6	158.82	161.42	
19	POND ST - RTE 126	2919388.23	676659.97	GAS	NATIONAL GRID	NOD	4.0	PLASTIC	3.2	159.23	162.43	
20	POND ST - RTE 126	2913141.50	674785.52	TELECOM	VERIZON	NOD	2/1 - 4.0	PVC	3.3	240.43	243.73	1.0 FOOT WIDE CONDUIT RUN
21	POND ST - RTE 126	2919138.80	676509.68	GAS	EVERSOURCE	NOD	12.0	IRON PIPE	4.7	154.73	159.43	
30	POND ST - RTE 126	2911658.67	674529.10	TELECOM	VERIZON	NOD	3/2 - 4.0	PVC	3.6	255.45	259.05	NON ENCASED DUCT BANK (DEPTH 1.0+/-)
31	POND ST - RTE 126	2911812.25	674475.49	TELECOM	VERIZON	NOD	3/2 - 4.0	PVC	6.2	254.64	260.84	NON ENCASED DUCT BANK (DEPTH 1.0+/-)
32	POND ST - RTE 126	2912568.33	674526.29	TELECOM	VERIZON	NOD	3/2 - 4.0	PVC	3.5	250.91	254.41	NON ENCASED DUCT BANK (DEPTH 1.0+/-)
33	POND ST - RTE 126	2912540.34	674623.60	GAS	EVERSOURCE	NOD	4.0	PLASTIC	3.2	252.09	255.29	MEDIUM (INTERMEDIATE) PRESSURE
34	POND ST - RTE 126	2912513.21	674702.95	CTV	COMCAST	NOD	4.0	PVC	1.8	256.34	258.14	NON ENCASED
35	POND ST - RTE 126	2912514.04	674704.18	GAS	EVERSOURCE	NOD	4.0	PLASTIC	3	255.30	258.3	MEDIUM (INTERMEDIATE) PRESSURE
36	POND ST - RTE 126	2913008.98	674728.71	GAS	EVERSOURCE	NOD	4.0	PLASTIC	2.1	242.53	244.63	MEDIUM (INTERMEDIATE) PRESSURE
37	POND ST - RTE 126	2913115.47	674763.35	GAS	EVERSOURCE	NOD	4.0	PLASTIC	2.3	242.02	244.32	MEDIUM (INTERMEDIATE) PRESSURE
38	POND ST - RTE 126	2913265.13	674765.57	TELECOM	VERIZON	NOD	3/2 - 4.0	PVC	3.2	236.79	239.99	NON ENCASED DUCT BANK (DEPTH 1.0+/-)
39	POND ST - RTE 126	2914414.34	674958.75	GAS	EVERSOURCE	NOD	4.0	PLASTIC	4.2	183.35	187.55	MEDIUM (INTERMEDIATE) PRESSURE
40	POND ST - RTE 126	2916278.05	675152.35	GAS	EVERSOURCE	NOD	12.0	COATED STEEL	5.6	172.60	178.2	EXTRA HIGH PRESSURE
41	POND ST - RTE 126	2916479.80	675172.92	GAS	EVERSOURCE	NOD	16.0	COATED STEEL	2.9	171.74	174.64	HIGH PRESSURE LINE
42	POND ST - RTE 126	2916661.67	675188.84	GAS	EVERSOURCE	NOD	16.0	COATED STEEL	3.2	168.45	171.65	HIGH PRESSURE LINE
43	POND ST - RTE 126	2916745.99	675195.39	GAS	EVERSOURCE	NOD	16.0	COATED STEEL	2.8	167.83	170.63	HIGH PRESSURE LINE
44	POND ST - RTE 126	2917076.89	675246.97	GAS	EVERSOURCE	NOD	16.0	COATED STEEL	3.7	164.54	168.24	HIGH PRESSURE LINE
45	POND ST - RTE 126	2917770.47	675599.66	GAS	EVERSOURCE	NOD	16.0	COATED STEEL	4.5	157.61	162.11	HIGH PRESSURE LINE
46	POND ST - RTE 126	2918634.17	676163.47	GAS	EVERSOURCE	NOD	12.0	COATED STEEL	3.9	156.38	160.28	HIGH PRESSURE LINE
47	POND ST - RTE 126	2918821.81	676298.62	GAS	EVERSOURCE	NOD	12.0	COATED STEEL	3	158.48	161.48	HIGH PRESSURE LINE
48	POND ST - RTE 126	2919352.94	676644.72	GAS	EVERSOURCE	NOD	12.0	COATED STEEL	3.6	158.38	161.98	HIGH PRESSURE LINE
49	POND ST - RTE 126	2916275.41	675153.48	GAS	EVERSOURCE	NOD	4.0	COATED STEEL	3	175.11	178.11	MEDIUM (INTERMEDIATE) PRESSURE
50	POND ST - RTE 126	2912586.85	674548.34	WATER	TOWN OF ASHLAND	NOD	8.0	IRON PIPE	5.5	248.46	253.96	8" PVC CONNECTED TO TEE

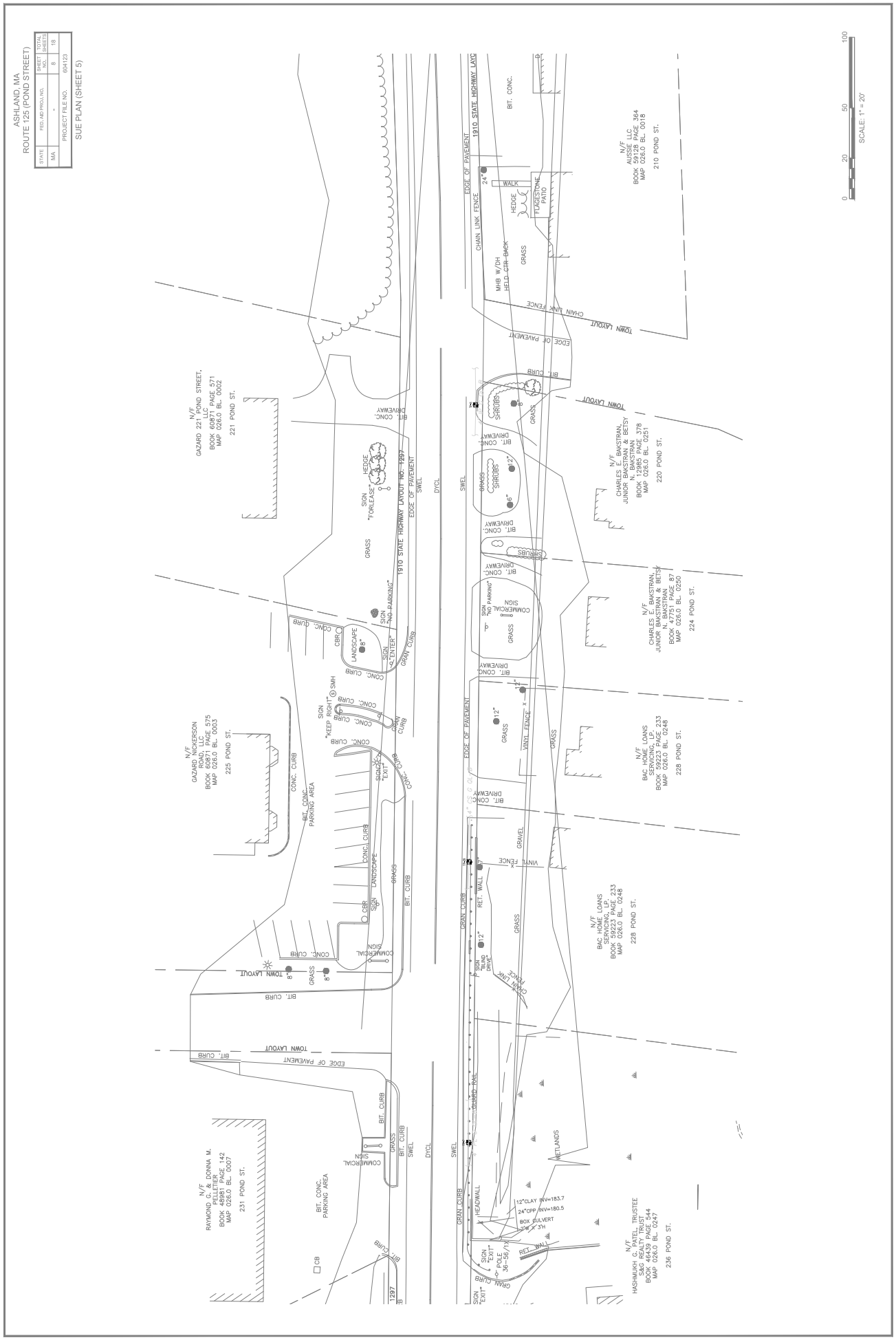
NOD = "NO OBSERVED DEFICIENCIES"

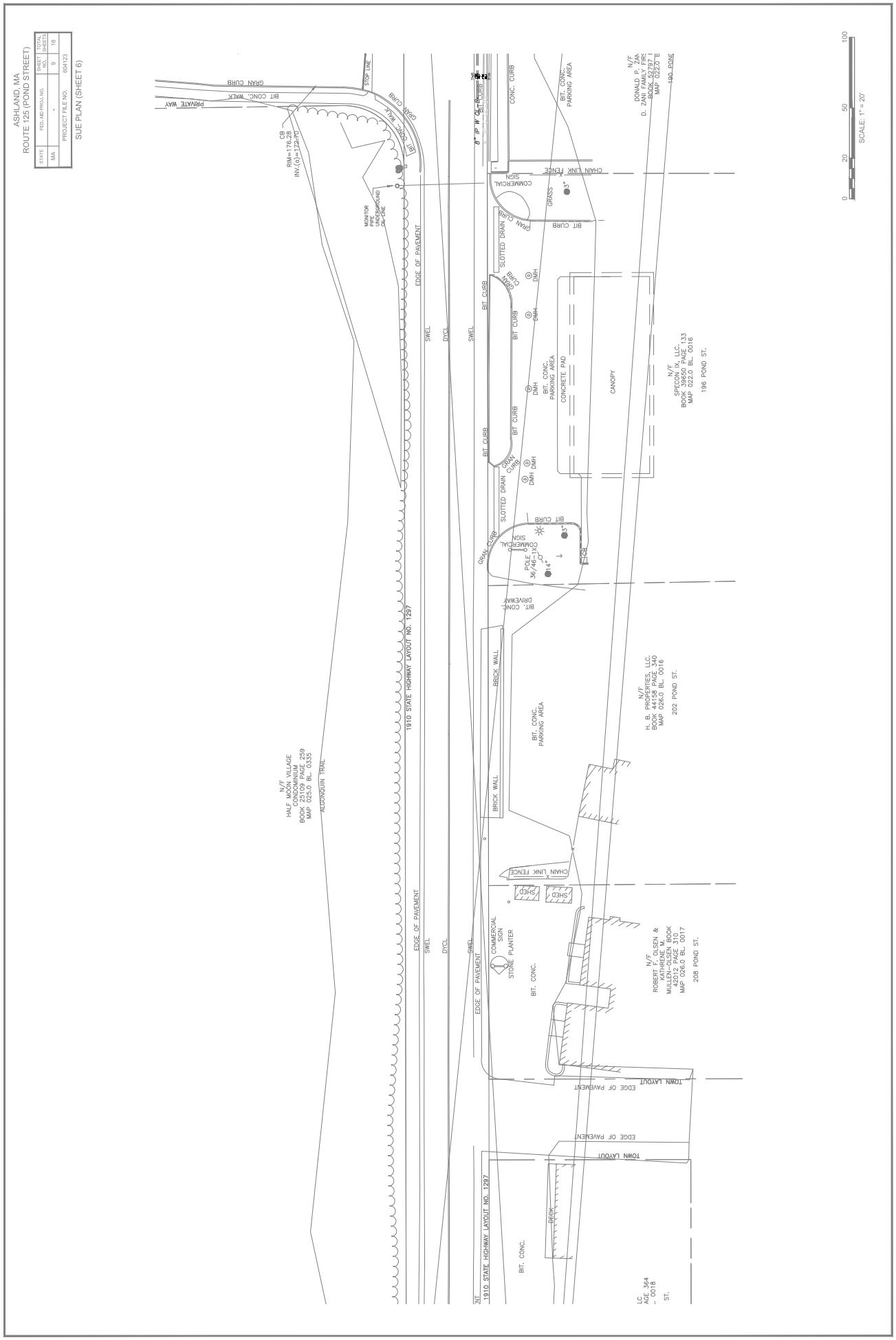

ASHLAND, MA
ROUTE 125 (POND STREET)
STATE
MA
FED. AID PROJ. NO.
-
SHEET NO.
4
TOTAL SHEETS
18
PROJECT FILE NO.
604123
SUE PLAN (SHEET 1)
SCALE: 1" = 20'
N/F
ASHLAND POND LIMITED PARTNERSHIP
BOOK 51028 PAGE 281
MAP 026.0 BL. 0209
POND ST.
N/F
ASHLAND PLAZA (E&A) LLC
BOOK 41551 PAGE 250
MAP 025.0 BL. 0318
301 POND ST.
N/F
SPYGLASS HILL CONDOMINIUM
BOOK 156480 PAGE 526
MAP 030.0 BL. 0208
TRAILSIDE WAY
1985 STATE HIGHWAY LAYOUT NO. 6720
1989 STATE HIGHWAY LAYOUT NO. 6768
EDGE OF PAVEMENT
RIGHT TURNING LANE
LEFT TURNING LANE
LANDSCAPE
GRAN CURB
GRASS
TOWN LAYOUT
BIT. CONC. PARKING AREA
APPROXIMATE LOCATION OF EXISTING 20' WIDE SEWER EASEMENT
APPROXIMATE LOCATION OF EXISTING 20' WIDE UTILITY EASEMENT
GUARD RAIL
STONE RETAINING WALL
COLLAPSE WALL AREA
WIRE FENCE
MHB CTR BACK
TRANSFORMER
COMMERCIAL SIGN
SIGN "SHAWS"
SIGN "YELD"
SIGN "LEFT TO MALL"
STOP LINE
SWL
DYCL
CONC. CURB
BIT. CURB
8" CLDI W QL-B
3/2-4" PVC T QL-B
1/2-4" PVC T QL-B
4" PVC CTV QL-B
4" PL G QL-B
(50' WIDE - PUBLIC)
SMH
DMH
CB

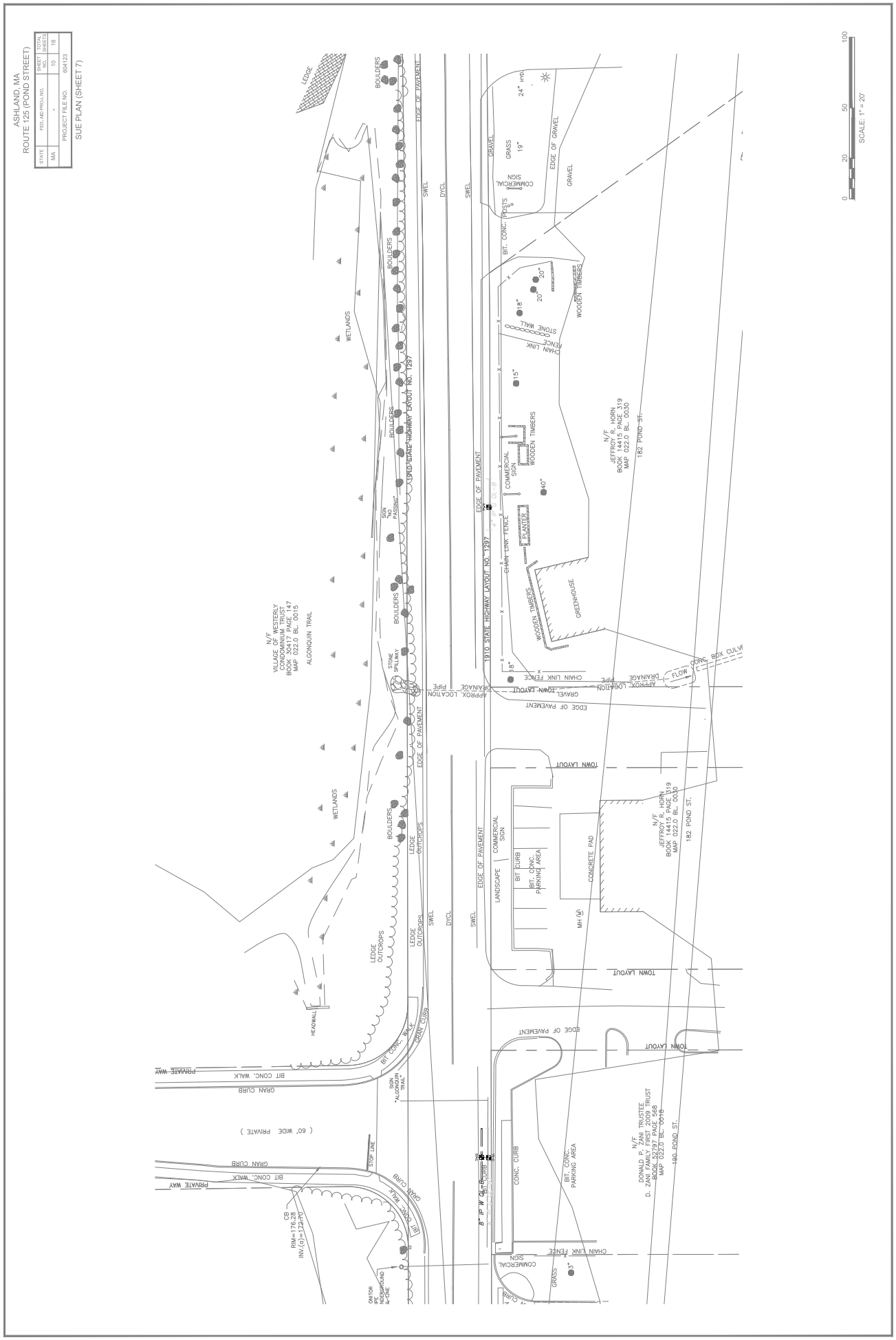

ASHLAND, MA
ROUTE 125 (POND STREET)
STATE
MA
FED. AID PROJ. NO.
-
SHEET NO.
5
TOTAL SHEETS
18
PROJECT FILE NO.
604123
SUE PLAN (SHEET 2)
SCALE: 1" = 20'
0
20
50
100
1955 COUNTY LAYOUT
1985 STATE HIGHWAY LAYOUT NO. 6720
1985 TOWN LAYOUT
EDGE OF PAVEMENT
BIT. CONC. PARKING AREA
BIT. CONC. SIDEWALK
BIT. CONC. WALK
LEFT TURNING LANE
LANDSCAPE
BOULDER
GRASS
CONC. CURB
GRAN CURB
BIT. CURB
CONC. BASE
CONCRETE BARRIER
COMMERCIAL SIGN
TRAFFIC SIGNAL ARM
STOP LINE
CHAIN LINK FENCE
GUARD RAIL
RETAINING WALL
N/F
ASHLAND POND LIMITED PARTNERSHIP
BOOK 26040 PAGE 191
MAP 026.0 BL. 0211
ELIOT ST.
N/F
ASHLAND POND LIMITED PARTNERSHIP
BOOK 26040 PAGE 191
MAP 026.0 BL. 0210
310 POND ST.
N/F
ASHLAND PLAZA (E&A) LLC
BOOK 41551 PAGE 250
MAP 025.0 BL. 0318
301 POND ST.
N/F
ASHLAND POND LIMITED PARTNERSHIP

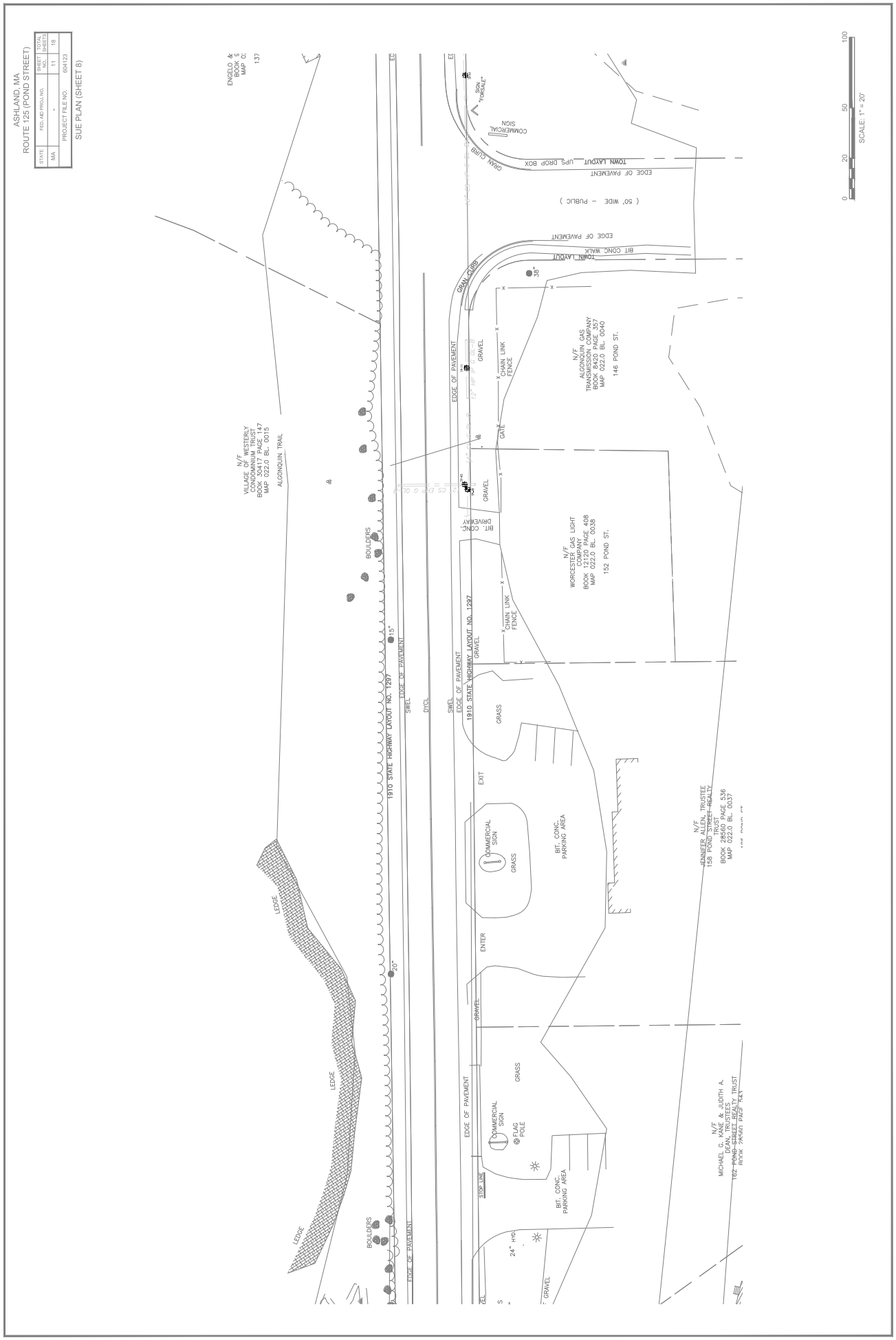

ASHLAND, MA
ROUTE 125 (POND STREET)
STATE
MA
FED. AID PROJ. NO.
-
SHEET NO.
6
TOTAL SHEETS
18
PROJECT FILE NO.
604123
SUE PLAN (SHEET 3)
SCALE: 1" = 20'
0
20
50
100
N/F
EMILY & LEONARDO MATEO
BOOK 53888 PAGE 204
MAP 026.0 BL. 0014
259 POND ST.
N/F
GLOBAL MONTELLO GROUP CORP.
BOOK 55459 PAGE 347
MAP 026.0 BL. 0239
268 POND ST.
N/F
DEREK J. CAVANAUGH &
JAMES A. RUBIN
BOOK 26924 PAGE 356
MAP 026.0 BL. 0015
300 ELIOT ST.
N/F
ASHLAND POND LIMITED
PARTNERSHIP
BOOK 26040 PAGE 191
MAP 026.0 BL. 0211
ELIOT ST.
1910 STATE HIGHWAY LAYOUT NO. 1297
1910 STATE HIGHWAY LAYOUT NO. 4012
1985 STATE HIGHWAY LAYOUT NO. 6720
1955 COUNTY LAYOUT
APPROX. LOCATION OF BROOK
WETLANDS
APPROX. LOCATION UNDERGROUND DRAINAGE
APPROX. LIMITS OF DRAINAGE BASIN
CHAIN LINK FENCE
STONE DRIVEWAY
RET. WALL
GRAN CURB
BIT. CURB
BIT. CONC. DRIVEWAY
GRASS
EDGE
MHB LP/EP (HELD)
CB RIM=249.0
CB RIM=249.9
CB RIM=250.4
STOCKADE FENCE
EDGE OF PAVEMENT
BIT. CONC. PARKING AREA
STONE RETAINING WALL
SWEL
DYCL
SLOTTED DRAIN ADS
LANDSCAPE
GUARD RAIL
BIT. CURB
CONCRETE PAD
CANOPY
ELECT. BOX
MHB (CONC) BROKEN 1' DOWN HELD CTR BACK
VENT
CONC. PAD
CONC. BASE
WOOD PLATFORM
COMMERCIAL SIGN
GRAN BLOCK
BRUSH
BIT. CONC. WALK
LEFT TURN LANE
STOP LINE
TRAFFIC SIGNAL ARM
CONCRETE BARRIER
ROW OF BOULDER
CONC. SIDEWALK
CONTROLLER
CHAIN LINK FENCE
RETAINING WALL

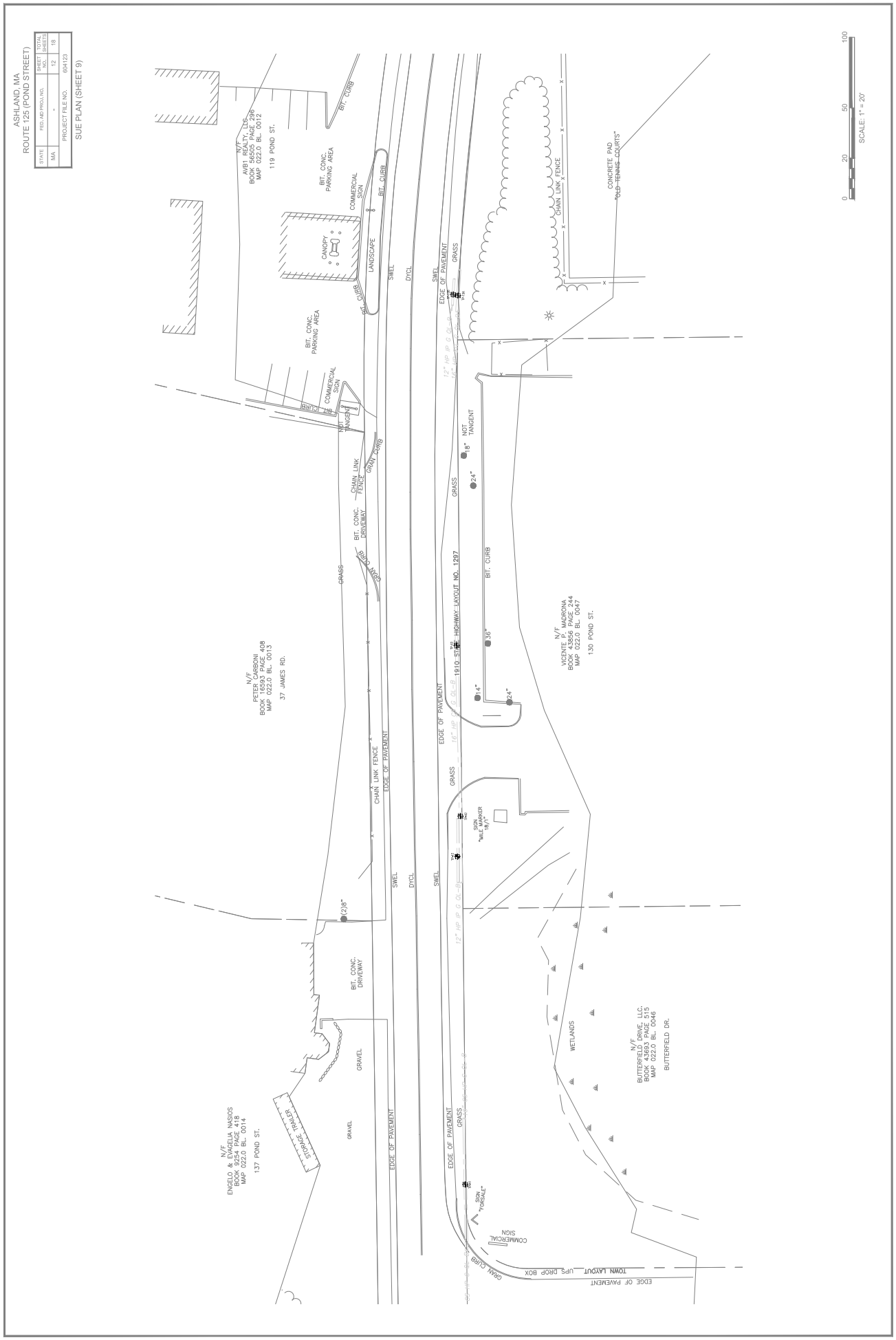

ASHLAND, MA
ROUTE 125 (POND STREET)
STATE
FED. AID PROJ. NO.
SHEET NO.
TOTAL SHEETS
MA
-
7
18
PROJECT FILE NO.
604123
SUE PLAN (SHEET 4)
SCALE: 1" = 20'
1910 STATE HIGHWAY LAYOUT NO. 1297
1910 STATE HIGHWAY LAYOUT NO. 4012
N/F RAYMOND G. & DONNA PELLETIER BOOK 48981 PAGE 14 MAP 026.0 BL. 0007 231 POND ST.
N/F RAYMOND G. & DONNA M. PELLETIER BOOK 16155 PAGE 365 MAP 026.0 BL. 0009 237 POND ST.
N/F RAYMOND G. & DONNA M. PELLETIER BOOK 48981 PAGE 144 MAP 026.0 BL. 0010 241 POND ST.
N/F ROBERT R. & LESLIE K. SAPORETTI BOOK 17337 PAGE 448 MAP 026.0 BL. 0011 247 POND ST.
N/F EDITH & EDWARD BORRELLI BOOK 45158 PAGE 75 MAP 026.0 BL. 0012 249 POND ST.
N/F G & D, LLC. BOOK 59418 PAGE 337 MAP 026.0 BL. 0013 255 POND ST.
N/F HASHMUKH G. PATEL, TRUSTEE S&G REALTY TRUST BOOK 46439 PAGE 544 MAP 026.0 BL. 0247 236 POND ST.
N/F DAVID A. BELL BOOK 48073 PAGE 386 MAP 026.0 BL. 0246 242 POND ST.
N/F ANTHONY MINUCCI, TRUSTEE IRPINA LIVING TRUST BOOK 52953 PAGE 401 MAP 026.0 BL. 0240 248 POND ST.
BIT. CONC. PARKING AREA
GRAN CURB
VINYL FENCE
CHAIN LINK FENCE
STOCKADE FENCE
BOULDERS
LANDSCAPE TIMBER
BIT. CONC. DRIVEWAY
GRASS
GRAVEL
PORCH
MAIL BOXES
TOWN LAYOUT
WIRE FENCE
WOODEN BERM
COMMERCIAL SIGN
RETAINING WALL
DRAIN CULVERT
GUARD RAIL
STONE DRIVEWAY
RET. WALL
APPROX. LOCATION OF BROOK
WETLANDS
BROOK
SWEL
DYCL
HEADWALL
12"CLAY INV=183.7
24"CPP INV=180.5
BOX CULVERT
WALKWAY
DECK
SHED
SIGN "NO PARKING"
MHB (CONC) HELD CTR BACK
BIT. CONC. DRIVEWAY
CONCRETE HEADWALL W/ BOX CULVERT
BOX CULVERT OUTLET STONE
POLE ON GROUND
BIT. CURB
CB
O.H.
c.o.o

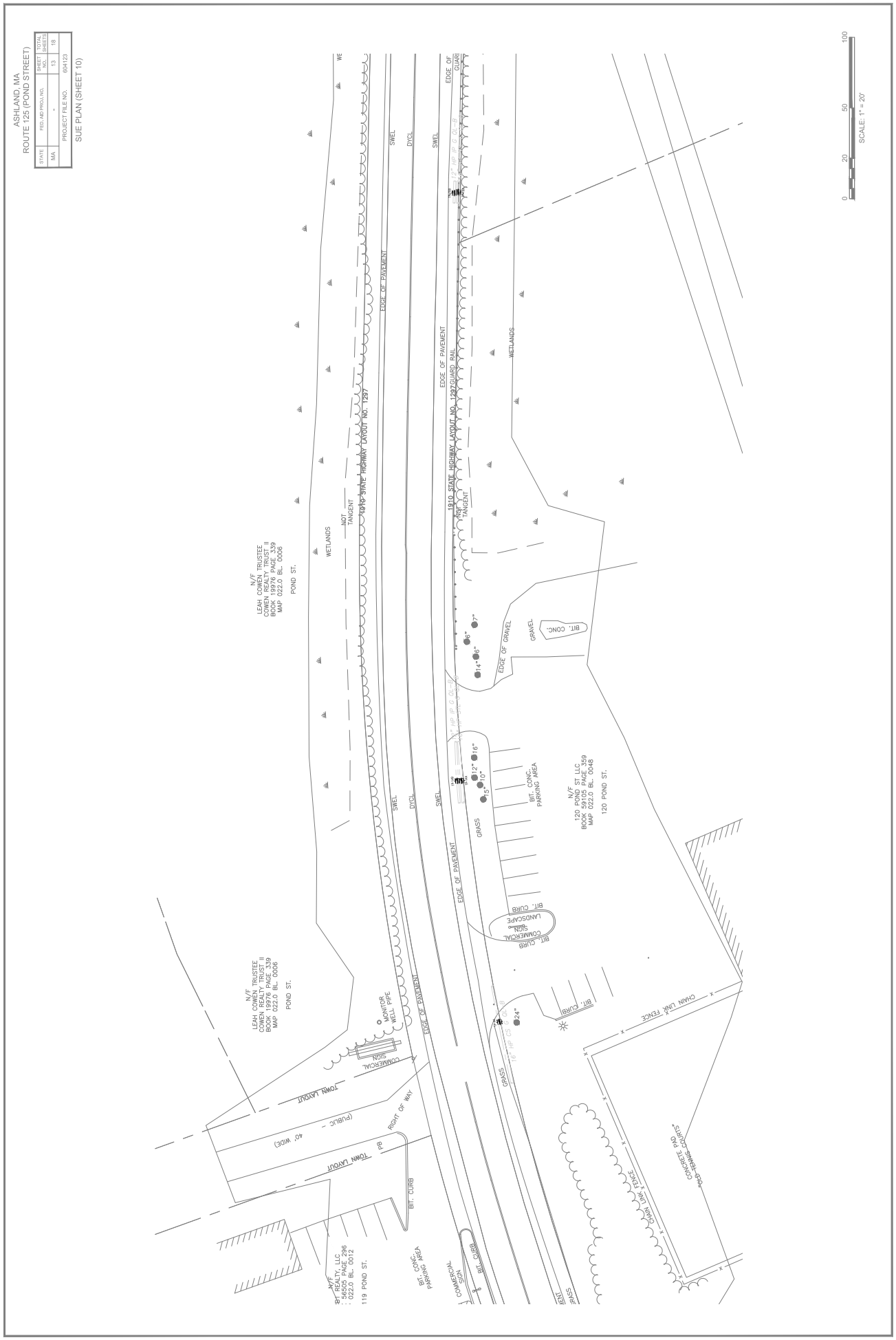

ASHLAND, MA
ROUTE 125 (POND STREET)
STATE
FED. AID PROJ. NO.
SHEET NO.
TOTAL SHEETS
MA
-
8
18
PROJECT FILE NO.
604123
SUE PLAN (SHEET 5)
SCALE: 1" = 20'
N/F
AUSSIE LLC
BOOK 59128 PAGE 364
MAP 026.0 BL. 0018
210 POND ST.
N/F
GAZARD 221 POND STREET, LLC
BOOK 60871 PAGE 571
MAP 026.0 BL. 0002
221 POND ST.
N/F
CHARLES E. BAKSTRAN, JUNIOR BAKSTRAN & BETSY N. BAKSTRAN
BOOK 12985 PAGE 378
MAP 026.0 BL. 0251
220 POND ST.
N/F
CHARLES E. BAKSTRAN, JUNIOR BAKSTRAN & BETSY N. BAKSTRAN
BOOK 47751 PAGE 87
MAP 026.0 BL. 0250
224 POND ST.
N/F
GAZARD NICKERSON ROAD, LLC
BOOK 60871 PAGE 575
MAP 026.0 BL. 0003
225 POND ST.
N/F
BAC HOME LOANS SERVICING, LP.
BOOK 59223 PAGE 233
MAP 026.0 BL. 0248
228 POND ST.
N/F
BAC HOME LOANS SERVICING, LP.
BOOK 59223 PAGE 233
MAP 026.0 BL. 0248
228 POND ST.
N/F
RAYMOND G. & DONNA M. PELLETIER
BOOK 48981 PAGE 142
MAP 026.0 BL. 0007
231 POND ST.
N/F
HASHMUKH G. PATEL, TRUSTEE S&G REALTY TRUST
BOOK 46439 PAGE 544
MAP 026.0 BL. 0247
236 POND ST.
1910 STATE HIGHWAY LAYOUT NO. 1297
EDGE OF PAVEMENT
TOWN LAYOUT
CHAIN LINK FENCE
BIT. CONC.
BIT. CURB
GRAN CURB
SWEL
DYCL
GRASS
SHRUBS
HEDGE
FLAGESTONE PATIO
WALK
MHB W/DH
HELD CTR BACK
SIGN "FORLEASE"
SIGN "NO PARKING"
SIGN "ENTER"
SIGN "KEEP RIGHT"
SIGN "EXIT"
SIGN "BLIND DRIVE"
COMMERCIAL SIGN
LANDSCAPE
CONC. CURB
BIT. CONC. PARKING AREA
VINYL FENCE
GRAVEL
RET. WALL
HEADWALL
WETLANDS
12"CLAY INV=183.7
24"CPP INV=180.5
BOX CULVERT
POLE 36-56/1X
CB
CBR
1297

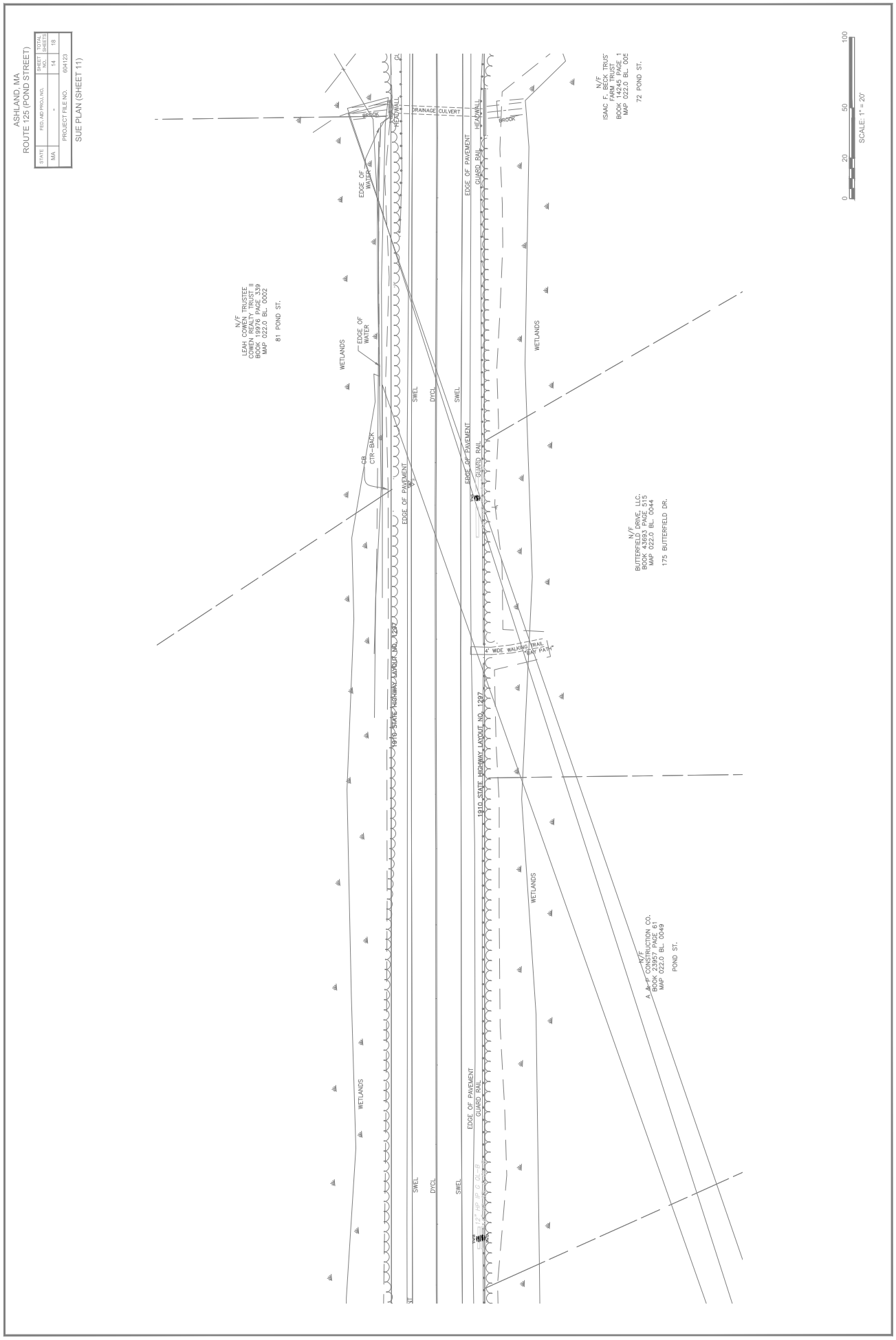

ASHLAND, MA
ROUTE 125 (POND STREET)
SUE PLAN (SHEET 6)
SCALE: 1" = 20'
1910 STATE HIGHWAY LAYOUT NO. 1297
EDGE OF PAVEMENT
SWEL
DYCL
BIT CURB
GRAN CURB
SLOTTED DRAIN
CONCRETE PAD
CANOPY
BIT. CONC. PARKING AREA
BIT. CONC. DRIVEWAY
BRICK WALL
CHAIN LINK FENCE
COMMERCIAL SIGN
STONE PLANTER
SHED
TOWN LAYOUT
ALGONQUIN TRAIL
N/F HALF MOON VILLAGE CONDOMINIUM BOOK 25109 PAGE 259 MAP 025.0 BL. 0335
N/F H. B. PROPERTIES, LLC. BOOK 44158 PAGE 340 MAP 026.0 BL. 0016 202 POND ST.
N/F ROBERT F. OLSEN & KATHRENE M. MULLEN-OLSEN BOOK 42012 PAGE 310 MAP 026.0 BL. 0017 208 POND ST.
N/F SPECON IX, LLC. BOOK 39650 PAGE 133 MAP 022.0 BL. 0016 196 POND ST.
N/F DONALD P. ZANI D. ZANI FAMILY FIRE BOOK 52797 MAP 022.0 BL. 0016 190 POND ST.
CB RIM=176.28 INV.(a)=172.70
MONITOR PIPE UNDERGROUND OIL LINE
STOP LINE
PRIVATE WAY
BIT CONC. WALK
GRAN CURB
CONC. CURB
BIT. CONC. PARKING AREA
DMH
POLE 36/46-1X
GRASS
DECK

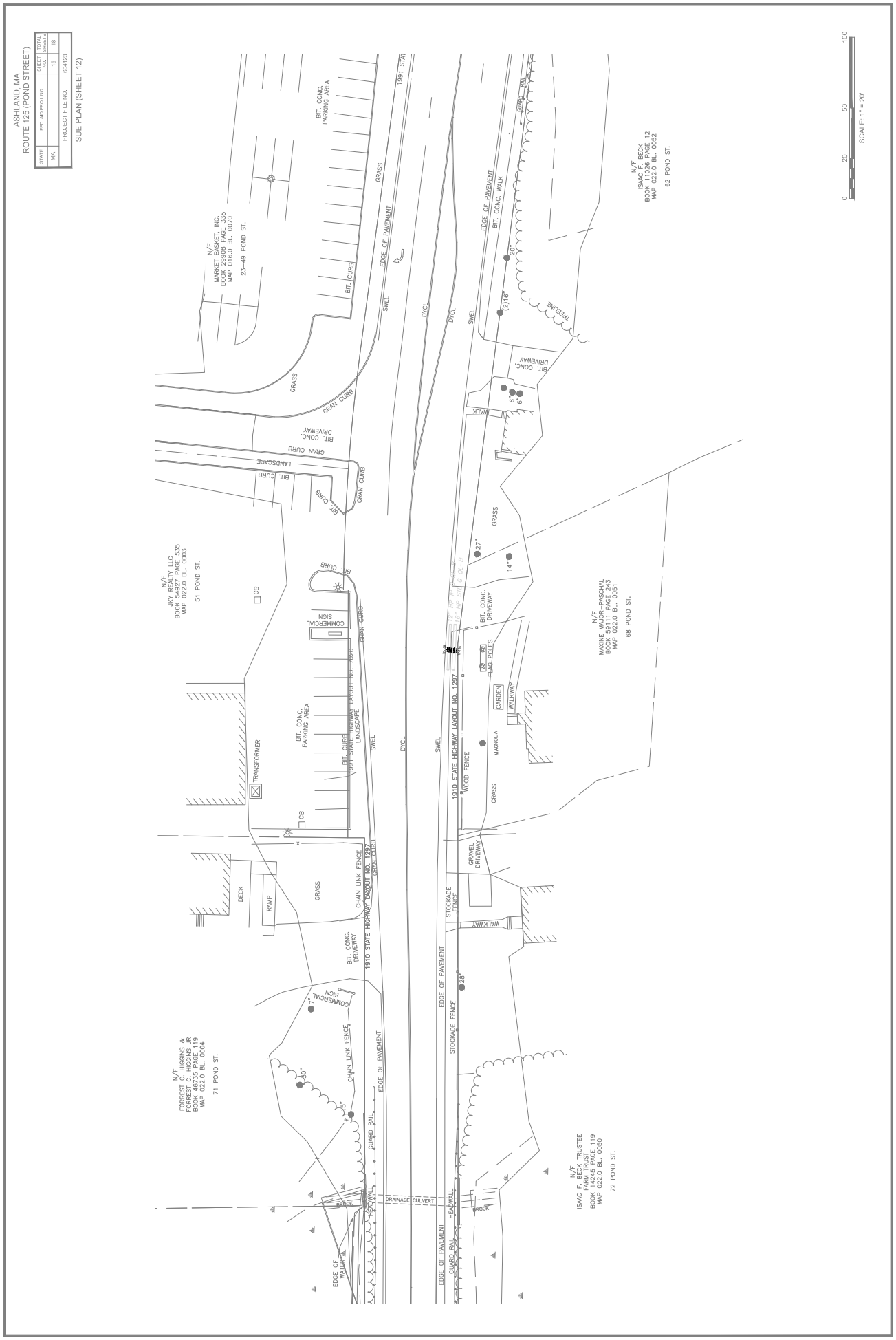

ASHLAND, MA
ROUTE 125 (POND STREET)
STATE
MA
FED. AID PROJ. NO.
-
SHEET NO.
10
TOTAL SHEETS
18
PROJECT FILE NO.
604123
SUE PLAN (SHEET 7)
SCALE: 1" = 20'
N/F
VILLAGE OF WESTERLY
CONDOMINIUM TRUST
BOOK 30417 PAGE 147
MAP 022.0 BL. 0015
ALGONQUIN TRAIL
N/F
JEFFROY R. HORN
BOOK 14415 PAGE 319
MAP 022.0 BL. 0030
182 POND ST.
N/F
DONALD P. ZANI TRUSTEE
D. ZANI FAMILY FIRST 2009 TRUST
BOOK 52797 PAGE 568
MAP 022.0 BL. 0016
190 POND ST.
1910 STATE HIGHWAY LAYOUT NO. 1297
EDGE OF PAVEMENT
WETLANDS
BOULDERS
LEDGE OUTCROPS
GRAVEL
GRASS
COMMERCIAL SIGN
BIT. CONC. POSTS
WOODEN TIMBERS
STONE WALL
CHAIN LINK FENCE
PLANTER
GREENHOUSE
CONCRETE PAD
LANDSCAPE
BIT CURB
BIT. CONC. PARKING AREA
CONC. CURB
BIT CONC. WALK
GRAN CURB
PRIVATE WAY
(60' WIDE PRIVATE)
STOP LINE
HEADWALL
SWEL
DYCL
TOWN LAYOUT
APPROX. LOCATION
DRAINAGE PIPE
FLOW
CONC. BOX CULVE
CB
RIM=176.28
INV.(a)=172.70
8" IP W OL
SIGN "ALGONQUIN TRAIL"
SIGN "NO PASSING"
STONE SPILLWAY
EDGE OF GRAVEL
24" HYD.

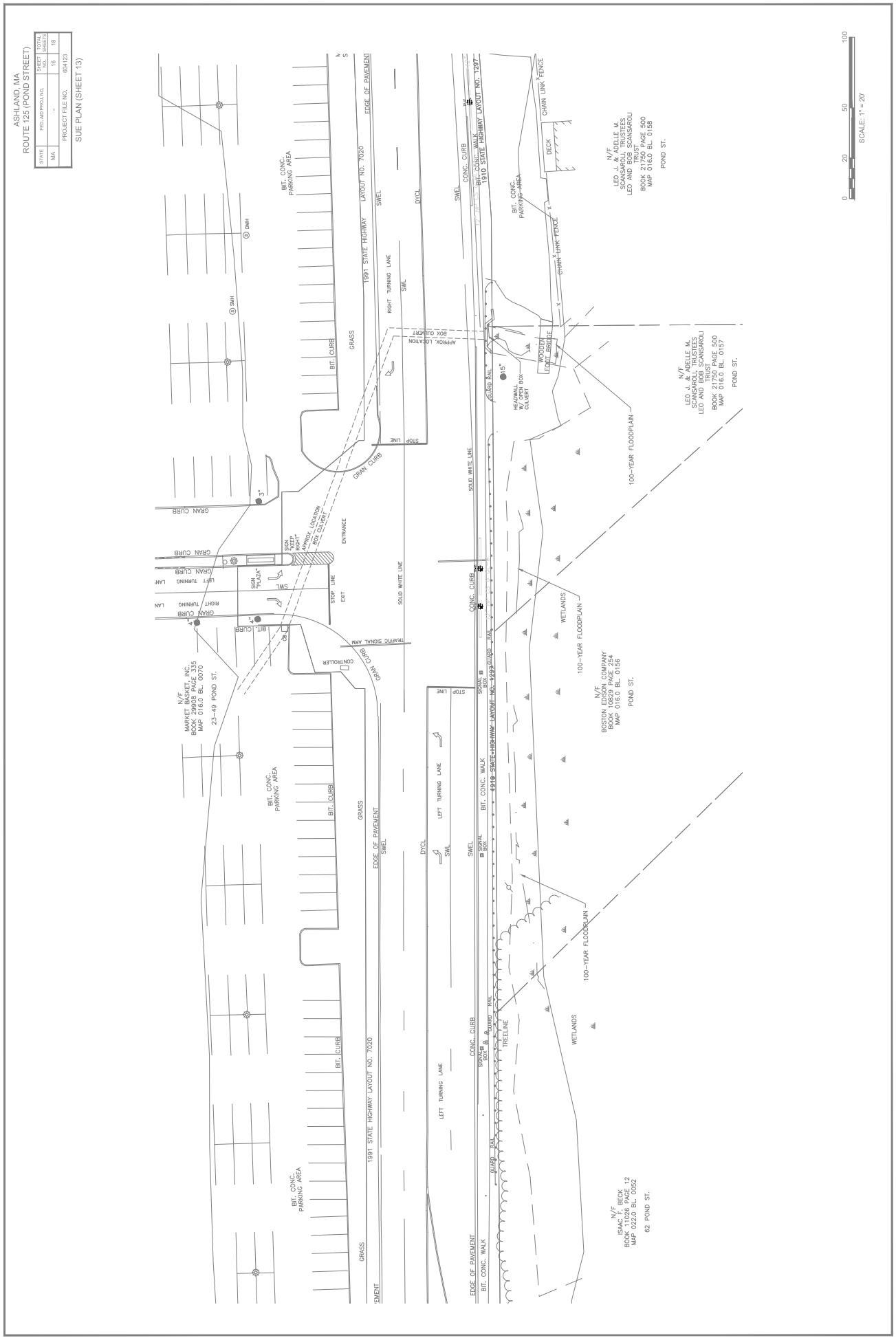

ASHLAND, MA
ROUTE 125 (POND STREET)
STATE
MA
FED. AID PROJ. NO.
-
SHEET NO.
11
TOTAL SHEETS
18
PROJECT FILE NO.
604123
SUE PLAN (SHEET 8)
SCALE: 1" = 20'
0
20
50
100
N/F
VILLAGE OF WESTERLY
CONDOMINIUM TRUST
BOOK 30417 PAGE 147
MAP 022.0 BL. 0015
ALGONQUIN TRAIL
N/F
ALGONQUIN GAS
TRANSMISSION COMPANY
BOOK 8420 PAGE 357
MAP 022.0 BL. 0040
146 POND ST.
N/F
WORCESTER GAS LIGHT
COMPANY
BOOK 12120 PAGE 408
MAP 022.0 BL. 0038
152 POND ST.
N/F
JENNIFER ALLEN, TRUSTEE
158 POND STREET REALTY
TRUST
BOOK 28560 PAGE 536
MAP 022.0 BL. 0037
N/F
MICHAEL G. KANE & JUDITH A.
DEAN, TRUSTEES
162 POND STREET REALTY TRUST
BOOK 28560 PAGE 543
1910 STATE HIGHWAY LAYOUT NO. 1297
EDGE OF PAVEMENT
SWEL
DYCL
GRAVEL
GRASS
CHAIN LINK FENCE
GATE
BIT. CONC. DRIVEWAY
BIT. CONC. PARKING AREA
COMMERCIAL SIGN
FLAG POLE
EXIT
ENTER
STOP LINE
BOULDERS
LEDGE
15"
20"
24" HYD.
38"
GRAN CURB
TOWN LAYOUT
UPS DROP BOX
EDGE OF PAVEMENT
(50' WIDE - PUBLIC)
BIT CONC WALK
SIGN "FORSALE"
COMMERCIAL SIGN

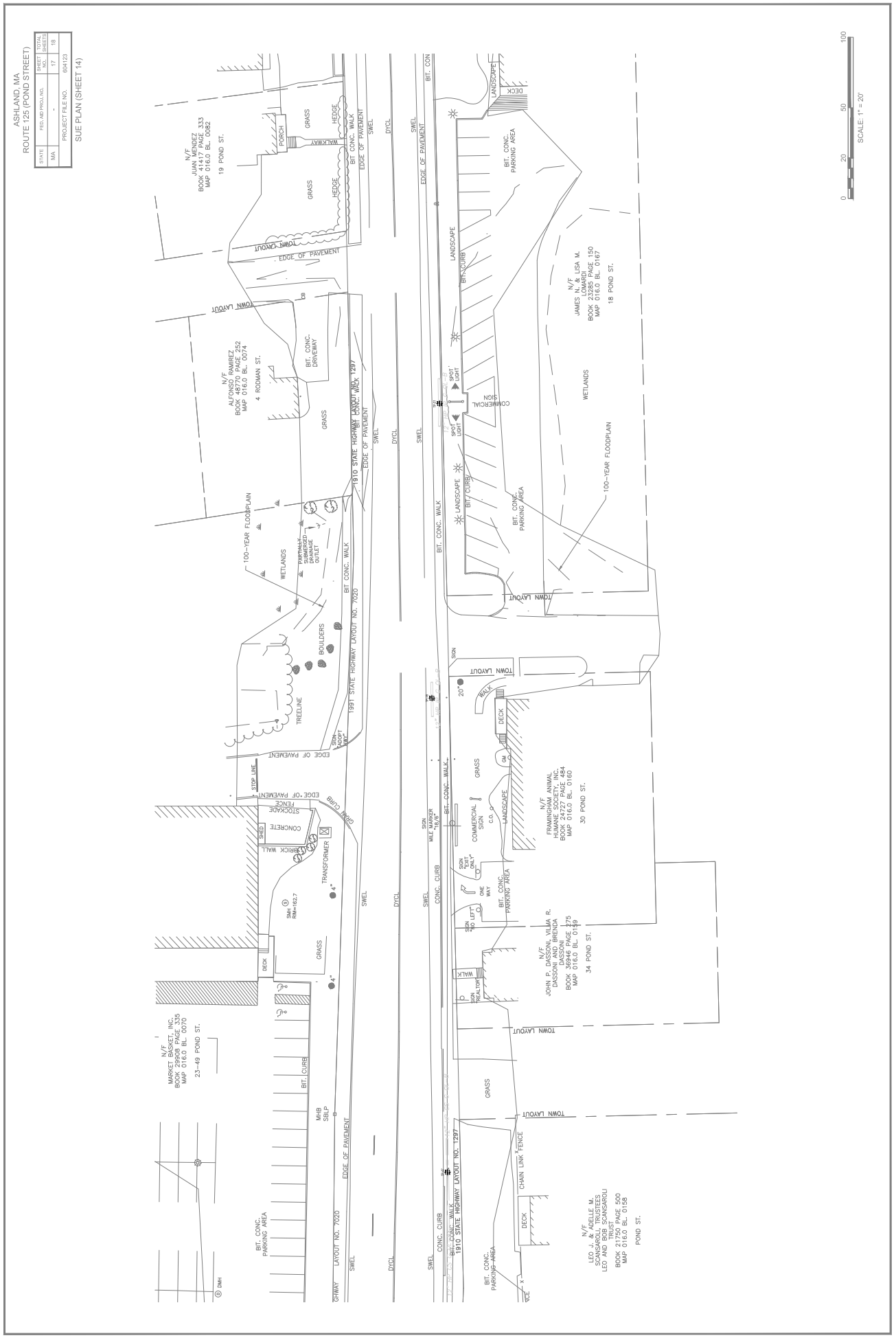

ASHLAND, MA
ROUTE 125 (POND STREET)
STATE
MA
FED. AID PROJ. NO.
-
SHEET NO.
12
TOTAL SHEETS
18
PROJECT FILE NO.
604123
SUE PLAN (SHEET 9)
SCALE: 1" = 20'
N/F
AVB1 REALTY, LLC
BOOK 56505 PAGE 296
MAP 022.0 BL. 0012
119 POND ST.
BIT. CONC. PARKING AREA
COMMERCIAL SIGN
CANOPY
LANDSCAPE
BIT. CURB
SWEL
DYCL
EDGE OF PAVEMENT
GRASS
CHAIN LINK FENCE
CONCRETE PAD
"OLD TENNIS COURTS"
NOT TANGENT
GRAN CURB
BIT. CONC. DRIVEWAY
N/F
PETER CARBONI
BOOK 16593 PAGE 408
MAP 022.0 BL. 0013
37 JAMES RD.
1910 STATE HIGHWAY LAYOUT NO. 1297
N/F
VICENTE P. MADRONA
BOOK 43856 PAGE 244
MAP 022.0 BL. 0047
130 POND ST.
SIGN
"MILE MARKER 18/1"
(2)8"
BIT. CONC. DRIVEWAY
GRAVEL
STORAGE TRAILER
N/F
ENGELO & EVAGELIA NASIOS
BOOK 9254 PAGE 418
MAP 022.0 BL. 0014
137 POND ST.
WETLANDS
N/F
BUTTERFIELD DRIVE, LLC.
BOOK 43693 PAGE 515
MAP 022.0 BL. 0046
BUTTERFIELD DR.
SIGN
"FORSALE"
COMMERCIAL SIGN
TOWN LAYOUT
UPS DROP BOX
EDGE OF PAVEMENT

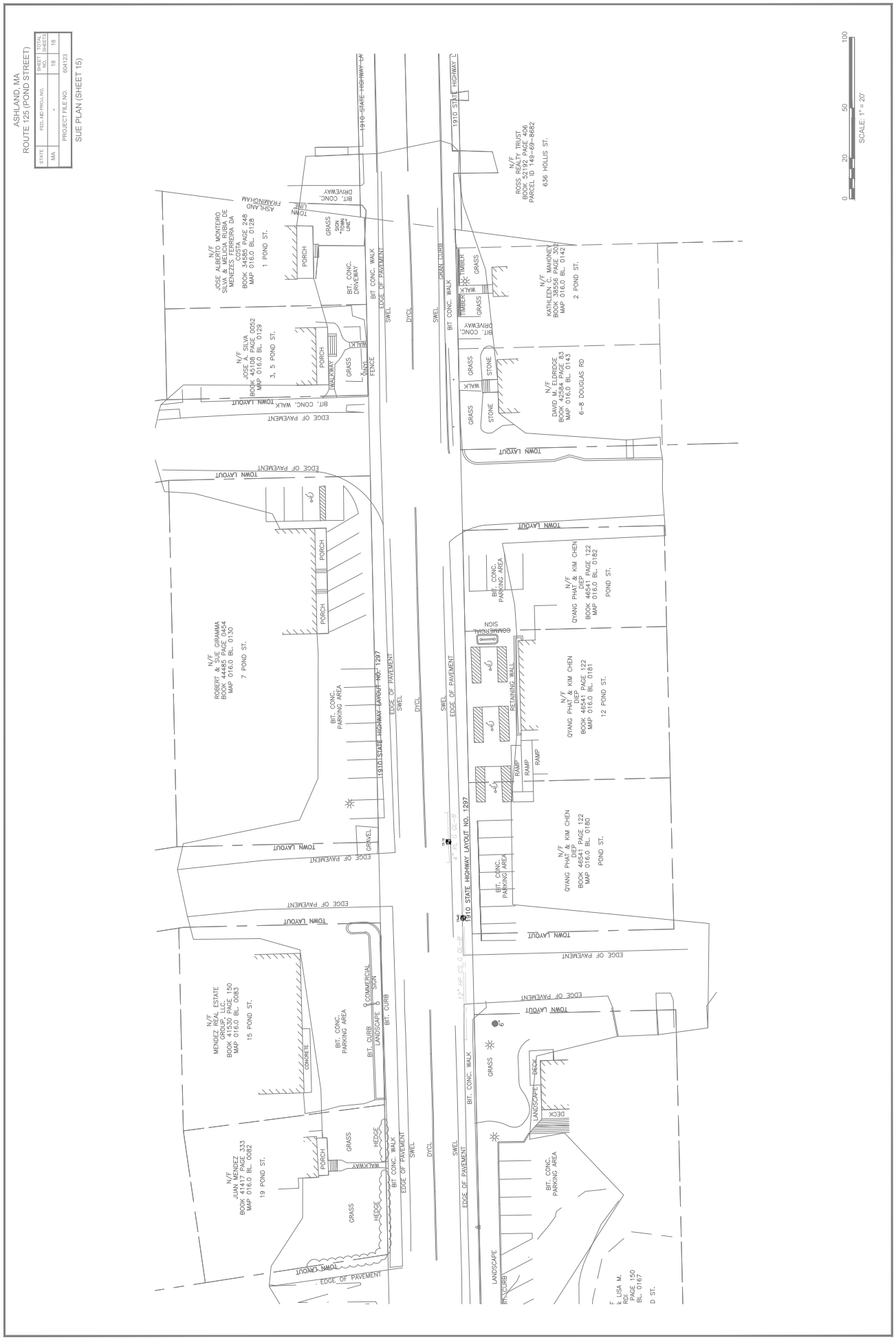

ASHLAND, MA
ROUTE 125 (POND STREET)
SUE PLAN (SHEET 10)
STATE
FED. AID PROJ. NO.
SHEET NO.
TOTAL SHEETS
MA
-
13
18
PROJECT FILE NO.
604123
SCALE: 1" = 20'
0
20
50
100
1910 STATE HIGHWAY LAYOUT NO. 1297
EDGE OF PAVEMENT
GUARD RAIL
WETLANDS
GRAVEL
BIT. CONC.
EDGE OF GRAVEL
BIT. CONC. PARKING AREA
GRASS
BIT. CURB
LANDSCAPE
SIGN
COMMERCIAL
MONITOR WELL PIPE
TOWN LAYOUT
(PUBLIC - 40' WIDE)
RIGHT OF WAY
CHAIN LINK FENCE
CONCRETE PAD
POND ST.
N/F
LEAH COWEN TRUSTEE
COWEN REALTY TRUST II
BOOK 19976 PAGE 339
MAP 022.0 BL. 0006
N/F
120 POND ST LLC
BOOK 59105 PAGE 359
MAP 022.0 BL. 0048
120 POND ST.
N/F
BT REALTY, LLC
BOOK 56505 PAGE 296
MAP 022.0 BL. 0012
119 POND ST.
SWEL
DYCL
NOT TANGENT


ASHLAND, MA
ROUTE 125 (POND STREET)
SUE PLAN (SHEET 11)
STATE
FED. AID PROJ. NO.
SHEET NO.
TOTAL SHEETS
MA
-
14
18
PROJECT FILE NO.
604123
SCALE: 1" = 20'
0
20
50
100
N/F
LEAH COWEN TRUSTEE
COWEN REALTY TRUST II
BOOK 19976 PAGE 339
MAP 022.0 BL. 0002
81 POND ST.
N/F
ISAAC F. BECK TRUS'
FARM TRUST
BOOK 14146 PAGE 1
MAP 022.0 BL. 006
72 POND ST.
N/F
BUTTERFIELD DRIVE, LLC.
BOOK 43693 PAGE 515
MAP 022.0 BL. 0044
175 BUTTERFIELD DR.
N/F
A & F CONSTRUCTION CO.
BOOK 23957 PAGE 61
MAP 022.0 BL. 0049
POND ST.
1910 STATE HIGHWAY LAYOUT NO. 1297
EDGE OF PAVEMENT
GUARD RAIL
EDGE OF WATER
WETLANDS
SWEL
DYCL
BROOK
DRAINAGE CULVERT
HEADWALL
CB
CTR-BACK
4' WIDE WALKING TRAIL
PEAT PATH


ASHLAND, MA
ROUTE 125 (POND STREET)
STATE
MA
FED. AID PROJ. NO.
-
SHEET NO.
15
TOTAL SHEETS
18
PROJECT FILE NO.
604123
SUE PLAN (SHEET 12)
SCALE: 1" = 20'
N/F
MARKET BASKET, INC.
BOOK 29908 PAGE 335
MAP 016.0 BL. 0070
23-49 POND ST.
N/F
ISAAC F. BECK
BOOK 11026 PAGE 12
MAP 022.0 BL. 0052
62 POND ST.
N/F
JKY REALTY LLC
BOOK 54927 PAGE 535
MAP 022.0 BL. 0003
51 POND ST.
N/F
MAXINE MAJOR-PASCHAL
BOOK 59111 PAGE 243
MAP 022.0 BL. 0051
68 POND ST.
N/F
FORREST C. HIGGINS &
FORREST C. HIGGINS JR
BOOK 46735 PAGE 119
MAP 022.0 BL. 0004
71 POND ST.
N/F
ISAAC F. BECK TRUSTEE
FARM TRUST
BOOK 14245 PAGE 119
MAP 022.0 BL. 0050
72 POND ST.
1991 STATE HIGHWAY LAYOUT NO. 7020
1910 STATE HIGHWAY LAYOUT NO. 1297
BIT. CONC. PARKING AREA
BIT. CONC. DRIVEWAY
BIT. CONC. WALK
GRASS
GRAN CURB
LANDSCAPE
BIT. CURB
EDGE OF PAVEMENT
SWEL
DYCL
TREELINE
GUARD RAIL
WALK
COMMERCIAL SIGN
TRANSFORMER
CB
DECK
RAMP
CHAIN LINK FENCE
WOOD FENCE
STOCKADE FENCE
GRAVEL DRIVEWAY
FLAG POLES
GARDEN
WALKWAY
MAGNOLIA
DRAINAGE CULVERT
HEADWALL
BROOK
EDGE OF WATER


ASHLAND, MA
ROUTE 125 (POND STREET)
SUE PLAN (SHEET 13)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 16 | 18
PROJECT FILE NO. 604123
SCALE: 1" = 20'
1991 STATE HIGHWAY LAYOUT NO. 7020
1918 STATE HIGHWAY LAYOUT NO. 1297
EDGE OF PAVEMENT
BIT. CONC. PARKING AREA
BIT. CURB
GRASS
SWEL
DYCL
CONC. CURB
BIT. CONC. WALK
GUARD RAIL
STOP LINE
SOLID WHITE LINE
GRAN CURB
ENTRANCE
EXIT
LEFT TURNING LANE
RIGHT TURNING LANE
RIGHT TURN SLIP
TRAFFIC SIGNAL ARM
CONTROLLER
SIGN "PLAZA"
SIGN "STOP"
APPROX. LOCATION BOX CULVERT
HEADWALL W/ CAPPED BOX CULVERT
WOODEN FOOT BRIDGE
CHAIN LINK FENCE
DECK
SIGNAL BOX
DMH
SMH
TREELINE
WETLANDS
100-YEAR FLOODPLAIN
N/F MARKET BASKET INC. BOOK 29808 PAGE 335 MAP 016.0 BL. 0070 23-49 POND ST.
N/F BOSTON EDISON COMPANY BOOK 10829 PAGE 254 MAP 016.0 BL. 0156 POND ST.
N/F LEO J. & ADELLE M. SCANSAROLI, TRUSTEES LEO AND BOB SCANSAROLI TRUST BOOK 21750 PAGE 500 MAP 016.0 BL. 0158 POND ST.
N/F LEO J. & ADELLE M. SCANSAROLI, TRUSTEES LEO AND BOB SCANSAROLI TRUST BOOK 21750 PAGE 500 MAP 016.0 BL. 0157 POND ST.
N/F ISAAC E. PECK BOOK 11026 PAGE 12 MAP 022.0 BL. 0052 62 POND ST.


ASHLAND, MA
ROUTE 125 (POND STREET)
SUE PLAN (SHEET 14)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 17 | 18
PROJECT FILE NO. 604123
SCALE: 1" = 20'
1910 STATE HIGHWAY LAYOUT NO. 1297
1991 STATE HIGHWAY LAYOUT NO. 7020
EDGE OF PAVEMENT
BIT. CONC. WALK
BIT. CURB
LANDSCAPE
BIT. CONC. PARKING AREA
WETLANDS
100-YEAR FLOODPLAIN
TOWN LAYOUT
N/F JUAN MENDEZ BOOK 41417 PAGE 333 MAP 016.0 BL. 0082 19 POND ST.
N/F ALFONSO RAMIREZ BOOK 48770 PAGE 252 MAP 016.0 BL. 0074 4 ROMAN ST.
N/F JAMES N. & LISA M. LOMARDI BOOK 23285 PAGE 150 MAP 016.0 BL. 0167 18 POND ST.
N/F FRAMINGHAM ANIMAL HUMANE SOCIETY, INC. BOOK 24727 PAGE 484 MAP 016.0 BL. 0160 30 POND ST.
N/F JOHN P. DASSONI, VILMA R. DASSONI AND BRENDA DASSONI BOOK 36948 PAGE 175 MAP 016.0 BL. 0139 34 POND ST.
N/F LEO J. & ADELLE M. SCANSAROLI TRUSTEES LEO AND BOB SCANSAROLI TRUST BOOK 21702 PAGE 500 MAP 016.0 BL. 0158 POND ST.
N/F MARKET BASKET, INC. BOOK 29908 PAGE 335 MAP 016.0 BL. 0070 23-49 POND ST.


ASHLAND, MA
ROUTE 125 (POND STREET)
STATE
MA
FED. AID PROJ. NO.
-
SHEET NO.
18
TOTAL SHEETS
18
PROJECT FILE NO.
604123
SUE PLAN (SHEET 15)
SCALE: 1" = 20'
N/F
ROSS REALTY TRUST
BOOK 52192 PAGE 406
PARCEL ID 149-69-8682
636 HOLLIS ST.
N/F
JOSE ALBERTO MONTEIRO
SILVA & MELICA RUBIA DE
MENEZES FERREIRA DA
COSTA
BOOK 34585 PAGE 248
MAP 016.0 BL. 0128
1 POND ST.
N/F
JOSE A. SILVA
BOOK 45108 PAGE 0052
MAP 016.0 BL. 0129
3, 5 POND ST.
N/F
KATHLEEN C. MAHONEY
BOOK 38556 PAGE 302
MAP 016.0 BL. 0142
2 POND ST.
N/F
DAVID M. ELDRIDGE
BOOK 42584 PAGE 83
MAP 016.0 BL. 0143
6-8 DOUGLAS RD
N/F
ROBERT & SUE GIRAMMA
BOOK 44485 PAGE 0454
MAP 016.0 BL. 0130
7 POND ST.
N/F
QYANG PHAT & KIM CHEN
DIEP
BOOK 46541 PAGE 122
MAP 016.0 BL. 0182
POND ST.
N/F
QYANG PHAT & KIM CHEN
DIEP
BOOK 46541 PAGE 122
MAP 016.0 BL. 0181
12 POND ST.
N/F
QYANG PHAT & KIM CHEN
DIEP
BOOK 46541 PAGE 122
MAP 016.0 BL. 0180
POND ST.
N/F
MENDEZ REAL ESTATE
GROUP, LLC.
BOOK 41530 PAGE 150
MAP 016.0 BL. 0083
15 POND ST.
N/F
JUAN MENDEZ
BOOK 41417 PAGE 333
MAP 016.0 BL. 0082
19 POND ST.
1910 STATE HIGHWAY LAYOUT NO. 1297
BIT. CONC. WALK
EDGE OF PAVEMENT
TOWN LAYOUT
SWEL
DYCL
GRAN CURB
BIT. CONC. PARKING AREA
BIT. CONC. DRIVEWAY
BIT. CURB
LANDSCAPE
COMMERCIAL SIGN
RETAINING WALL
RAMP
PORCH
GRASS
STONE
WALK
WALKWAY
HEDGE
DECK
CONCRETE
GRAVEL
TIMBER
FENCE
ASHLAND FRAMINGHAM
TOWN LINE
SIGN "TOWN LINE"

ASHLAND, MA
ROUTE 125 (POND STREET)

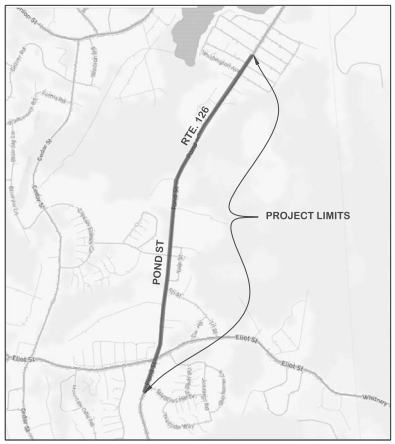
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	1	18
PROJECT FILE NO.	604123		

SUE PLAN

6100UTL01.DWG Plotted on 12-Jun-2017 3:19 PM

SUBSURFACE UTILITY ENGINEERING PLAN
MASSDOT POND ST, RTE 126
ASHLAND, MA

PREPARED FOR
GREEN INTERNATIONAL AFFILIATES, INC.
239 LITTLETON ROAD, SUITE 3
WESTFORD, MA 01886



LOCUS PLAN
NOT TO SCALE

INDEX OF SHEETS	SHEET NO.
COVER - C1	1
LEGEND & NOTES - L1	2
TEST HOLE DATA TABLE	3
SUE SHEET No. 1	4
SUE SHEET No. 2	5
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SUE SHEET No. 12	15
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SUE SHEET No. 14	17
SUE SHEET No. 15	18

BSI ENGINEERING, INC.
100 HALLET ST, BOSTON, MA 02124
617 265 4200

June 12, 2017

A00893 - 21

Proposal No. 604123-111717 ADDENDUM NO. 6, AUGUST 28, 2020

BSIE LEGEND

QUALITY LEVEL "A" INFORMATION

VACUUM EXCAVATION DATA POINT QL-A

QUALITY LEVEL "B" INFORMATION

COMBINED SEWER QL-B
CABLE TELEVISION QL-B
DRAIN QL-B
ELECTRICAL QL-B
FIRE ALARM QL-B
GAS QL-B
SEWER QL-B
STEAM QL-B
TELECOMMUNICATIONS QL-B
TRAFFIC QL-B
UNDERGROUND AIR PRODUCTS QL-B: CO2, NO2, ETC.
UNKNOWN TRACE SIGNAL QL-B
WATER QL-B

QUALITY LEVEL "C" INFORMATION

COMBINED SEWER QL-C
CABLE TELEVISION QL-C
DRAIN QL-C
ELECTRICAL QL-C
FIRE ALARM QL-C
GAS QL-C
SEWER QL-C
STEAM QL-C
TELECOMMUNICATIONS QL-C
TRAFFIC QL-C
UNDERGROUND AIR PRODUCTS QL-C: CO2, NO2, ETC.
UNKNOWN TRACE SIGNAL QL-C
WATER QL-C
OVERHEAD ELECTRIC - TELEPHONE - CABLE
OVERHEAD ELECTRIC - TELEPHONE
OVERHEAD ELECTRIC - CABLE
OVERHEAD ELECTRIC
OVERHEAD TELEPHONE - CABLE
OVERHEAD TELEPHONE
OVERHEAD CABLE

QUALITY LEVEL "D" INFORMATION

COMBINED SEWER QL-D
CABLE TELEVISION QL-D
DRAIN QL-D
ELECTRICAL QL-D
FIRE ALARM QL-D
GAS QL-D
SEWER QL-D
STEAM QL-D
TELECOMMUNICATIONS QL-D
TRAFFIC QL-D
UNDERGROUND AIR PRODUCTS QL-D: CO2, NO2, ETC.
WATER QL-D

LAND BASE

EXISTING BUILDINGS & RELATED STRUCTURES
BRIDGE ABUTMENTS
MAJOR CONTOUR
MINOR CONTOUR
MISC. DETAILS / EDGE OF PAVEMENT
CHAINLINK OR WOOD FENCE
STEEL GUARD RAIL OR WROUGHT IRON FENCE
PROPERTY LINE
TOP OF CURBS / BACK OF SIDEWALKS
RETAINING / STONE WALLS

SUE PLAN NOMENCLATURE

OR EOI — END OF INFORMATION
(R) — RECORD INFORMATION
QL–X | QL–X — CHANGE IN QUALITY LEVEL
SUE PROJECT LIMITS
IP — IRON PIPE
CI — CAST IRON
SFM — SEWER FORCE MAIN
FO — FIBER OPTIC
PVC — POLYVINYL CHLORIDE
SW — SALT WATER
HW — HOT WATER
CND — CONDENSATE
MH — MANHOLE
T — TELEPHONE
E — ELECTRIC
W — WATER
S — SEWER
ST — STEAM
U — UNKNOWN
UAIR — UNDERGROND AIR
(ABAND.) — ABANDONED
CH — CHIMNEY
SUMP — BOTTOM OF MH STRUCTURE
NOTE CALLOUT

WATER FACILITIES

AIR COCK
BUTTERFLY VALVE
WATER CHECK VALVE
FIRE HYDRANT
LOWRY HYDRANT
WATER METER PIT
WATER PITOMETER
WATER POST INDICATOR VALVE
WATER STAND PIPE
WATER DIVISION GATE
WATER GATE
WATER GATE FIRE PIPE
WATER GATE SERVICE PIPE
WATER SACRIFICAL ANODE
WATER TEST BOX
WATER VENT
WATER MANHOLE
BUTTERFLY VALVE CHAMBER

BSIE SYMBOLS LEGEND (QL-C) INFORMATION

CABLE TV FACILITIES

CABLE HAND HOLE
CABLE MANHOLE
CABLE PEDESTAL

DRAIN FACILITIES

AREA DRAIN
CATCH BASIN
CATCH BASIN ROUND
CATCH BASIN O-GRATE
DRAIN CLEAN OUT
DRAIN LAMP HOLE
DROP INLET
DRAIN MANHOLE
DRAIN LEACHING BASIN

ELECTRICAL FACILITIES

ELECTRICAL HAND HOLE
ELECTRICAL METER PIT
ELECTRICAL CONTROL BOX
ELECTRICAL MANHOLE
ELECTRICAL CABINET
ELECTRICAL PEDESTAL
GUIDE ANCHOR
MBTA MANHOLE
ELECTRICAL PTC TEST BOX
UTILITY POLE NO LIGHTS
LIGHT POLE NO UTILITIES
UTILITY LIGHT POLE

FIRE FACILITIES

FIRE PULL BOX
FIRE MANHOLE
FIRE ALARM HANDHOLE

GAS FACILITIES

GAS DIVISION GATE
GAS GATE CIRCULAR
GAS GATE SERVICE PIPE
GAS METER PIT
GAS REGULATOR PIT
GAS SACRIFICIAL ANODE
GAS TEST BOX
GAS VENT
GAS DRIP
GAS GATE SQUARE

LAND BASE FACILITIES

BOLLARD
SOIL BORING
COAL HOLE
USPS MAIL BOX
OBSERVATION WELL
PARKING METER
SHRUB
SIGN
TREE

POLICE FACILITIES

POLICE PULL BOX
POLICE HANDHOLE

SEWER FACILITIES

COMBINED SEWER LAMP HOLE
COMBINED SEWER MANHOLE
SEWER MANHOLE
SEWER LAMP HOLE
SEWER VENT

STEAM FACILITIES

STEAM REGULATOR PIT
STEAM MANHOLE
STEAM VALVE

SURVEY CONTROL

BENCH MARK
STONE BOUND
CAT CONTROL POINT
CROSS CUT
DRILL HOLE
IRON PIPE
LEAD PLUG W/ BRASS TAC
MASS, GEODETIC DISK
PARKER KALON NAIL

TELEPHONE & TRAFFIC FACILITIES

TELEPHONE HAND HOLE
TELEPHONE MANHOLE
TELEPHONE CABINET
TELEPHONE BOOTH
TELEPHONE PEDESTAL
TRAFFIC LOOP DETECTOR
TRAFFIC CONTROL BOX
TRAFFIC HAND HOLE
TRAFFIC SIGNAL POLE

UNKNOWN FACILITIES

UNKNOWN GATE VALVE
MANHOLE UNKNOWN

Subsurface Utility Engineering Notes:

1. This plan was prepared in conformance with the American Society of Civil Engineers standard CI/ASCE 38-02 "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data".
2. BSIE will only warrant the existence or nonexistence of utility lines based on quality level A information. QL "A" information is only valid within the visible limits of the test hole.
3. BSIE will advance a vacuum test hole until a condition of practical refusal for vacuum excavation is reached. Practical refusal is defined as any of the following conditions occurring: Encountering a utility, bedrock, water table, rocks/cobbles, condition of hole instability or reaching a depth of 8'.
4. Below ground structures, unless dimensioned, are symbolic only.
5. Prior to excavation utility owners shall review and approve this drawing.
6. This drawing is prepared in color. Reproduction may alter the information contained hear in. BSIE does not warrant the information contained hear in following reproduction.
7. Use or reuse of this drawing by parties not directly contracted with BSIE is prohibited without prior written permission.
8. Base mapping/survey control is shown for information purposes only and is not warranted by BSIE.
9. BSIE recommends that all existing utilities near proposed construction activities be located by vacuum excavation (quality level A) prior to any excavation (if not already located by vacuum excavation).

Utility Quality Level Information Index (see ASCE/CI 38-02):

QUALITY LEVEL D: "QL D". Utility information plotted on the drawing based solely on record information, individual recollections or the existence of utility service. It shall be noted that all information shown (other than at test hole locations, see QL A below), including but not limited to a utilities size, capacity, material composition, condition or service status shall be considered QL D even though the utility may be plotted and labeled as QL C or QL B.

QUALITY LEVEL C: "QL C". Utility information obtained and categorized as QL D, plotted to correlate with surface utility features which have been field verified, survey located and accurately transposed onto the design/construction documents. Included in this category aerial utility information and utility depiction's, which in the professional opinion of the subsurface utility engineer, represent the most probable approximate horizontal location, type and/or existence of a utility.

QUALITY LEVEL B: "QL B". Utility information derived by establishing the approximate surface horizontal location of a utility using electronic methods. Said information is subsequently field survey located and accurately reduced onto the design/construction documents.

QUALITY LEVEL A: "QL A". Utility information which has been visually verified, survey located (both horizontally and vertically) and accurately reduced onto the design/construction documents. This is typically shown as test hole or other dimensioned information.

ASHLAND, MA
ROUTE 125 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	2	18
PROJECT FILE NO.	604123		

SUE PLAN

SUE General Notes:

1. Certain utilities shown have been traced on the ground using electronic designation techniques. Designation, or electronic utility location, is defined as the surface location of a utility line based on electronic geophysical prospecting techniques and is approximate in relation to the actual location of the possible utility.
2. Certain utilities shown have been taken from available record information. These utilities may not have been verified. (See Note #4 below.)
3. All existing designated utilities near proposed construction should be exactly located using Non-Destructive Air-Vacuum Excavation, if not already located by Air-Vacuum Excavation (See Quality Level A above).
4. Unless Non-Destructive Air-Vacuum Excavation is utilized at a particular location, BSIE does not guarantee the existence or non-existance of utility lines
5. At locations, where BSIE is directed to perform Non-Destructive Air-Vacuum Excavation, the test hole is advanced until a condition of practical refusal for Air-Vacuum Excavation is reached or hole is advanced to a depth of 8.0' (eight feet). Practical refusal being defined as encountering a utility, bedrock, water table, large rocks/ cobbles, suspected hazardous materials or a condition of hole instability.
6. Where BSIE is directed to perform Non-Destructive Air-Vacuum Excavation to confirm the non-existance of utilities, BSIE will only report non-existance of utilities within the visible limits of the excavation. BSIE is not responsible for ensuring that work by others is performed at the same location as the Air-Vacuum Excavation Hole.
7. Below ground structures unless otherwise depicted are symbolic only.
8. Prior to any excavating, BSIE recommends that all utility owners should review this drawing for accuracy and completeness.

General Project Notes:

1. Mapping provided by:
Green International Affiliates, Inc.
239 Littleton Road, Suite 3
Westford, MA 01886

2. Horizontal and vertical survey control provided by:
Green International Affiliates, Inc.
239 Littleton Road, Suite 3
Westford, MA 01886

6100UTL01.DWG Plotted on 12-Jun-2017 3:19 PM

ASHLAND, MA
ROUTE 125 (POND STREET)

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	3	18
PROJECT FILE NO.	604123		

SUE PLAN

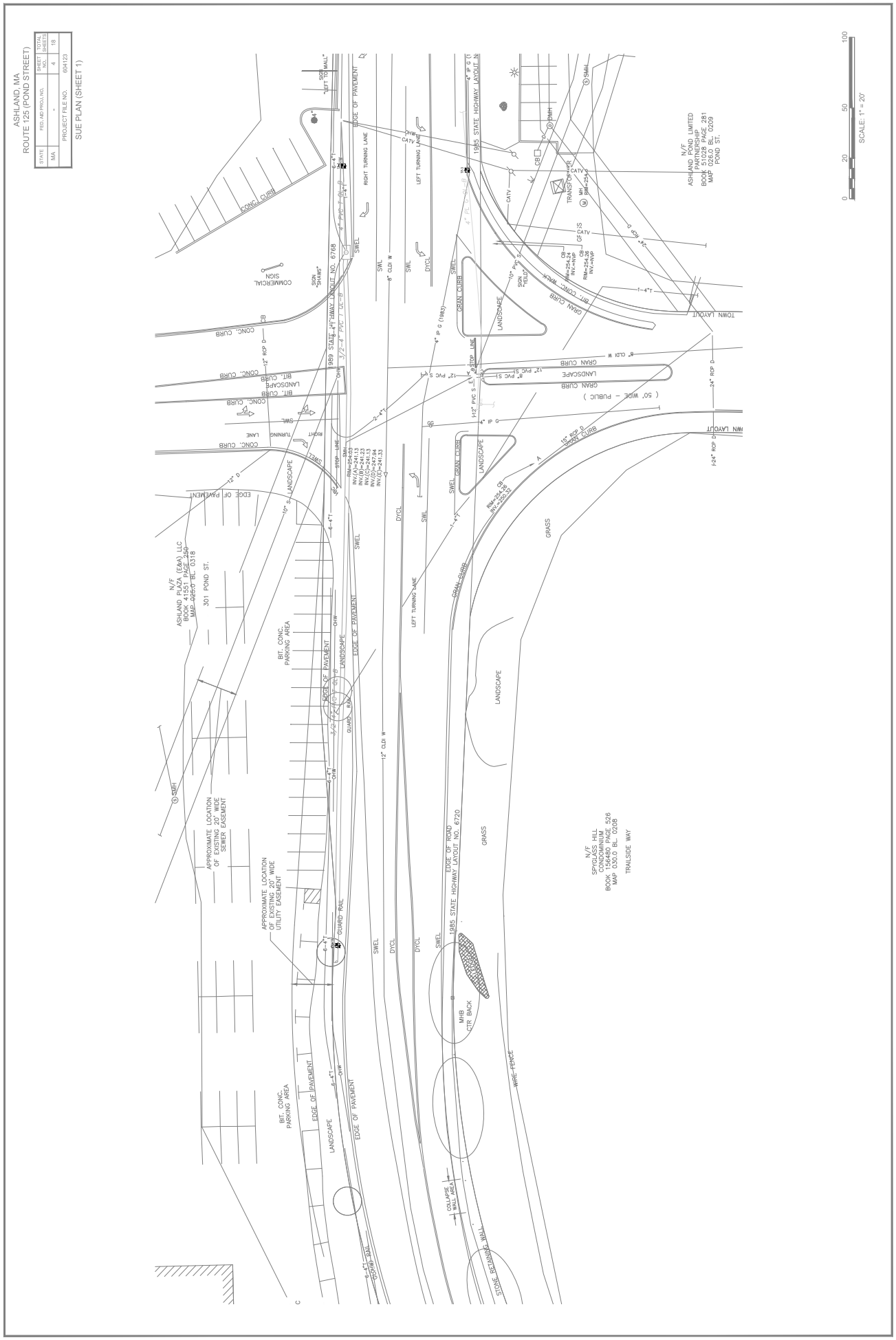
6100UTL01.DWG Plotted on 12-Jun-2017 3:19 PM

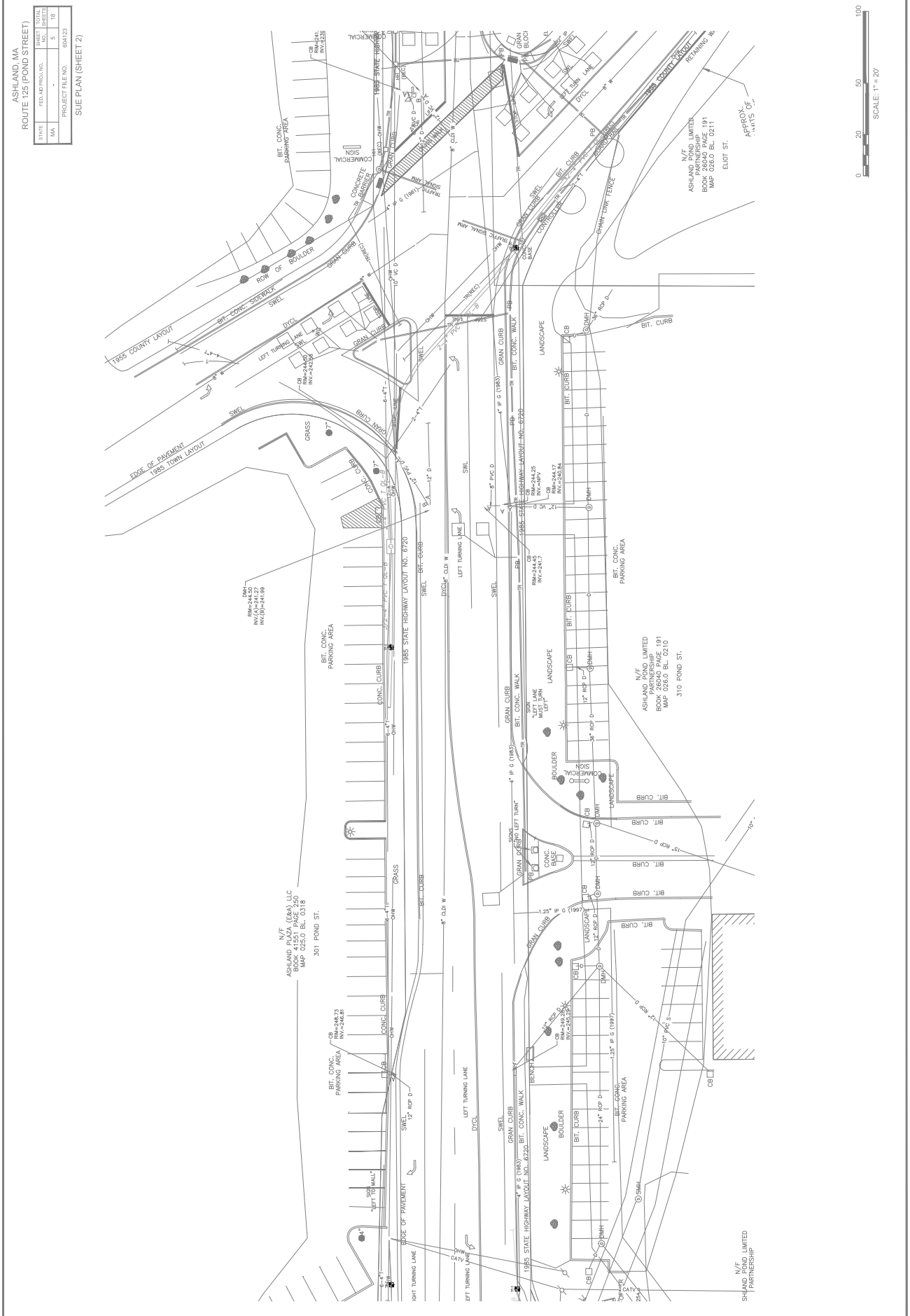
TEST HOLE DATA TABLE

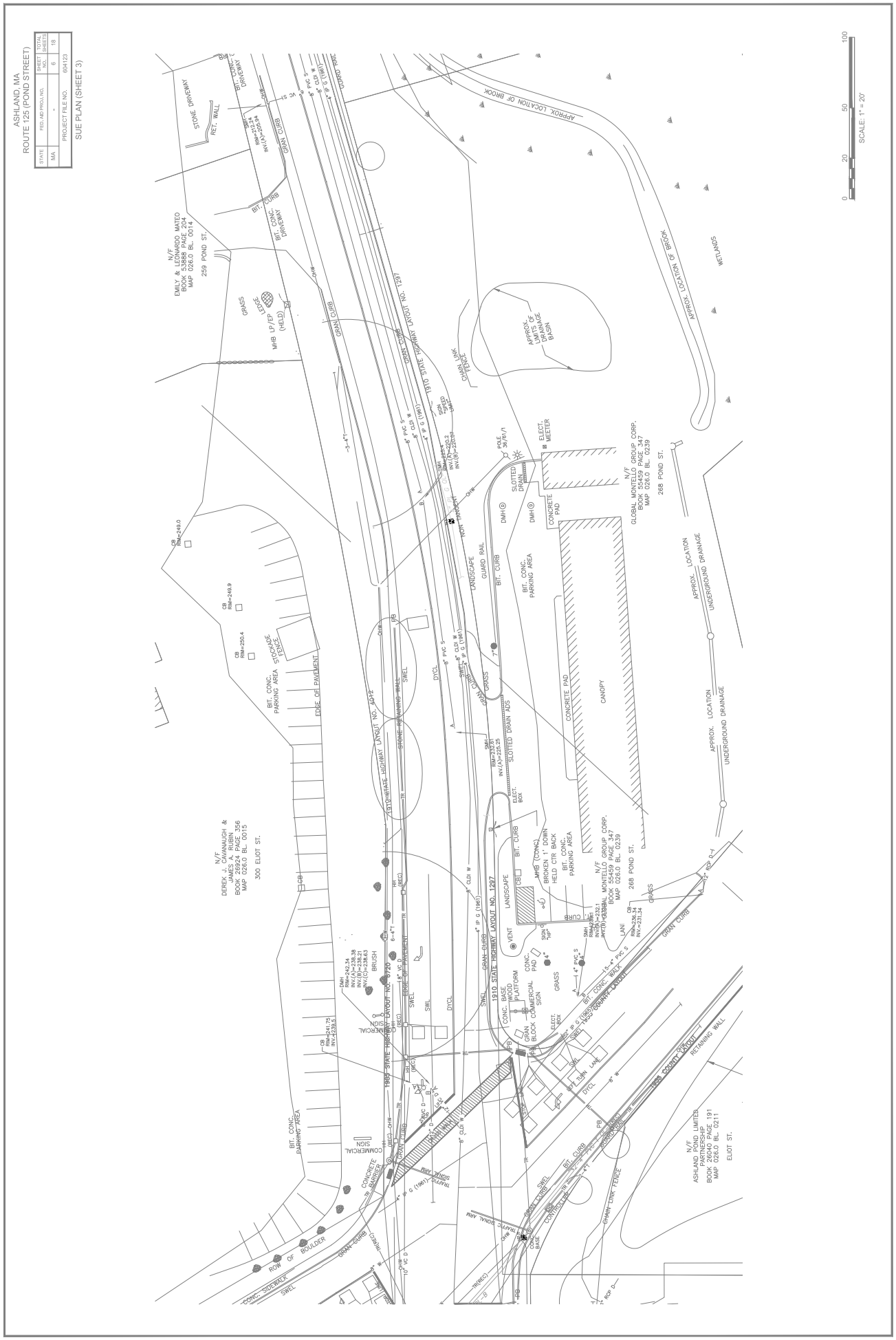
TEST HOLE NO.	ROADWAY	NORTHING	EASTING	UTILITY TYPE	UTILITY OWNER	UTILITY CONDITION	SIZE (in.) Record +/-	OBSERVED MATERIAL TYPE	DEPTH TO TOP (ft)	TOP ELEV. OF UTILITY (ft)	SURF. ELEV. (ft)	MISC. NOTES
1	POND ST - RTE 126	2912320.38	674433.87	TELECOM	VERIZON	NOD	3/2 - 4.0	PVC	5.3	258.53	263.83	1.5 FOOT WIDE CONDUIT RUN. ELEVATION MEASURED FROM TOP OF WOOD STAKE.
2	POND ST - RTE 126	2912684.52	674563.00	TELECOM	VERIZON	NOD	4.0	PVC	2.9	250.92	253.82	
3	POND ST - RTE 126	2912662.51	674620.23	GAS	NATIONAL GRID	NOD	4.0	PLASTIC	2.8	249.11	251.91	
4	POND ST - RTE 126	2912977.79	674664.24	TELE	VERIZON	NOD	3/2 - 4.0	PVC	3.6	244.33	247.93	
5	POND ST - RTE 126	2913488.68	674867.77	GAS	NATIONAL GRID	NOD	4.0	PLASTIC	4.1	222.85	226.95	
6	POND ST - RTE 126	2913993.50	674901.24	GAS	NATIONAL GRID	NOD	4.0	PLASTIC	3.4	195.51	198.91	
7	POND ST - RTE 126	2914276.52	674940.23	GAS	NATIONAL GRID	NOD	4.0	PLASTIC	3.0	185.39	188.39	
8	POND ST - RTE 126	2914638.40	674991.76	GAS	NATIONAL GRID	NOD	4.0	IRON PIPE	3.5	182.88	186.38	
9A	POND ST - RTE 126	2915373.32	675068.95	GAS	NATIONAL GRID	NOD	4.0	IRON PIPE	3.4	173.12	176.52	
9B	POND ST - RTE 126	2915373.85	675065.52	WATER	TOWN OF ASHLAND	NOD	8.0	IRON PIPE	5.5	171.13	176.63	
10	POND ST - RTE 126	2915694.06	675101.35	GAS	NATIONAL GRID	NOD	4.0	IRON PIPE	3.8	170.87	174.67	
11	POND ST - RTE 126	2916335.38	675159.11	GAS	ALGONQUIN GAS TRANSMISSION	NOD	12.0	IRON PIPE	4.0	173.45	177.45	
12	POND ST - RTE 126	2916641.87	675185.32	GAS	ALGONQUIN GAS TRANSMISSION	NOD	12.0	IRON PIPE	4.2	167.62	171.82	
13A	POND ST - RTE 126	2916818.51	675213.43	GAS	ALGONQUIN GAS TRANSMISSION	NOD	16.0	STEEL	3.0	166.50	169.50	
13B	POND ST - RTE 126	2916919.18	675211.13	GAS	ALGONQUIN GAS TRANSMISSION	NOD	12.0	IRON PIPE	4.5	164.88	169.38	
14A	POND ST - RTE 126	2917191.16	675286.55	GAS	ALGONQUIN GAS TRANSMISSION	NOD	16.0	STEEL	4.0	162.95	166.95	
14B	POND ST - RTE 126	2917192.11	675284.73	GAS	ALGONQUIN GAS TRANSMISSION	NOD	12.0	IRON PIPE	4.0	162.95	166.95	
15A	POND ST - RTE 126	2917449.53	675422.23	GAS	ALGONQUIN GAS TRANSMISSION	NOD	16.0	STEEL	3.4	161.07	164.47	
15B	POND ST - RTE 126	2917449.85	675420.37	GAS	ALGONQUIN GAS TRANSMISSION	NOD	12.0	IRON PIPE	4.4	160.33	164.73	
16A	POND ST - RTE 126	2918174.59	675828.66	GAS	ALGONQUIN GAS TRANSMISSION	NOD	16.0	STEEL	3.0	159.70	162.70	
16B	POND ST - RTE 126	2918175.93	675826.74	GAS	ALGONQUIN GAS TRANSMISSION	NOD	12.0	IRON PIPE	3.6	159.01	162.61	
17	POND ST - RTE 126	2918619.22	676152.21	GAS	ALGONQUIN GAS TRANSMISSION	NOD	12.0	IRON PIPE	4.0	156.32	160.32	
18	POND ST - RTE 126	2919020.67	676424.65	GAS	ALGONQUIN GAS TRANSMISSION	NOD	12.0	IRON PIPE	2.6	158.82	161.42	
19	POND ST - RTE 126	2919388.23	676659.97	GAS	NATIONAL GRID	NOD	4.0	PLASTIC	3.2	159.23	162.43	
20	POND ST - RTE 126	2913141.50	674785.52	TELECOM	VERIZON	NOD	2/1 - 4.0	PVC	3.3	240.43	243.73	1.0 FOOT WIDE CONDUIT RUN
21	POND ST - RTE 126	2919138.80	676509.68	GAS	ALGONQUIN GAS TRANSMISSION	NOD	12.0	IRON PIPE	4.7	154.73	159.43	

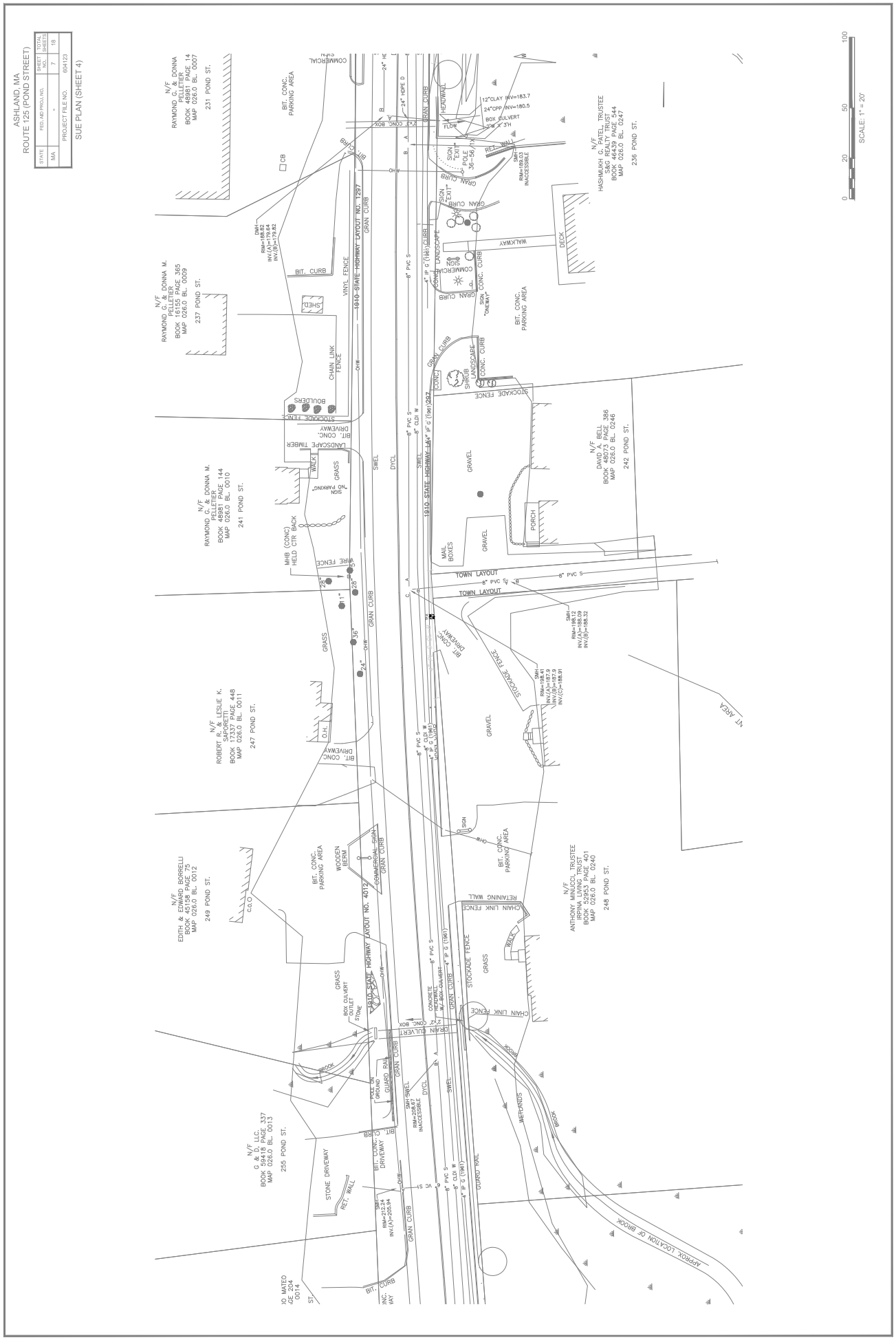
NOD = "NO OBSERVED DEFICIENCIES"

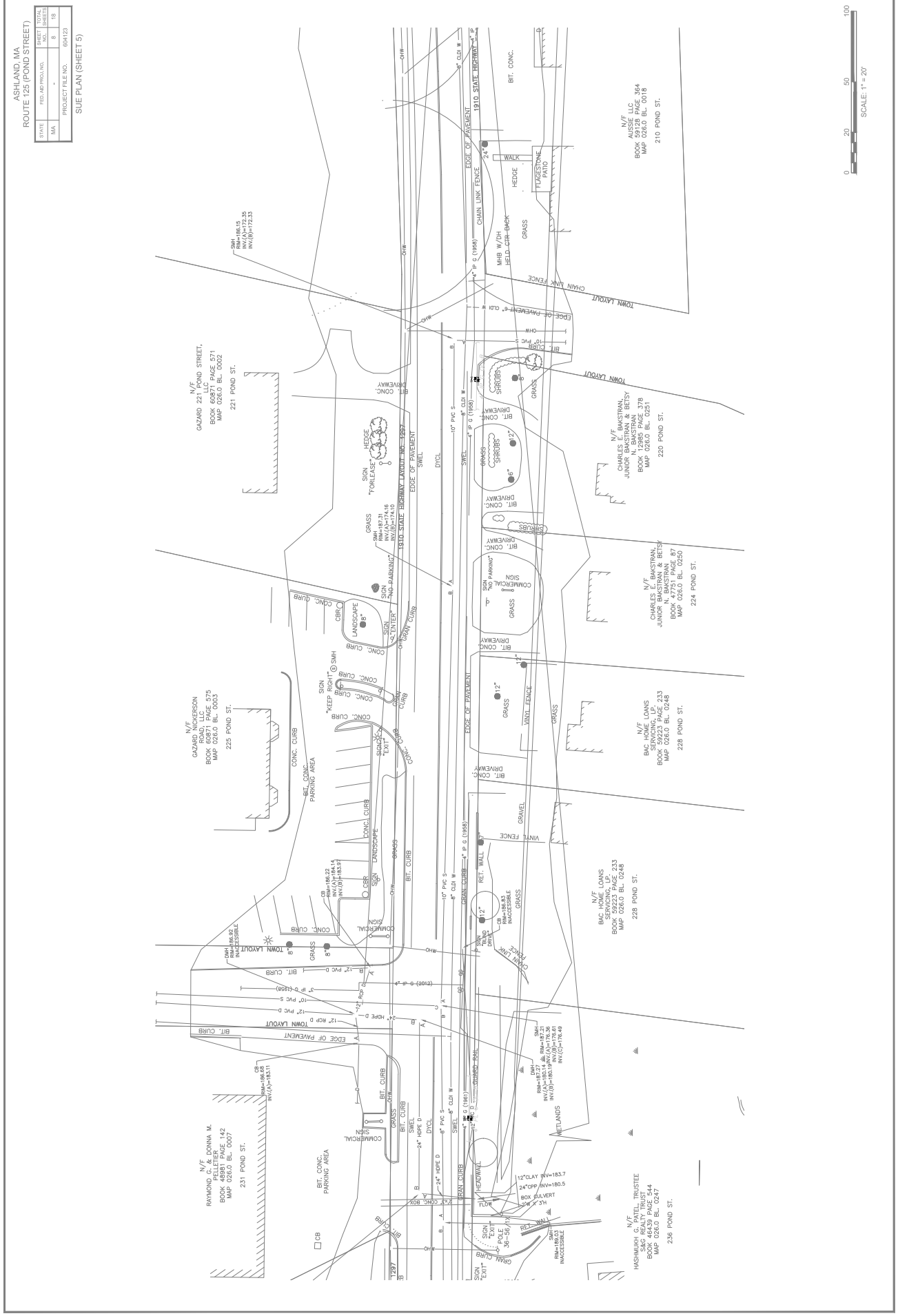
Proposal No. 604123-111717 ADDENDUM NO. 6, AUGUST 28, 2020


ASHLAND, MA
ROUTE 125 (POND STREET)
STATE
MA
FED. AID PROJ. NO.
-
SHEET NO.
4
TOTAL SHEETS
18
PROJECT FILE NO.
604123
SUE PLAN (SHEET 1)
SCALE: 1" = 20'
N/F
ASHLAND POND LIMITED PARTNERSHIP
BOOK 51028 PAGE 281
MAP 026.0 BL. 0209
POND ST.
N/F
ASHLAND PLAZA (E&A) LLC
BOOK 41551 PAGE 250
MAP 025.0 BL. 0318
301 POND ST.
N/F
SPYGLASS HILL CONDOMINIUM
BOOK 156480 PAGE 526
MAP 030.0 BL. 0208
TRAILSIDE WAY
APPROXIMATE LOCATION OF EXISTING 20' WIDE SEWER EASEMENT
APPROXIMATE LOCATION OF EXISTING 20' WIDE UTILITY EASEMENT
BIT. CONC. PARKING AREA
EDGE OF PAVEMENT
LANDSCAPE
GRASS
GRAN CURB
CONC. CURB
TOWN LAYOUT
1985 STATE HIGHWAY LAYOUT NO. 6768
1985 STATE HIGHWAY LAYOUT NO. 6720
RIGHT TURNING LANE
LEFT TURNING LANE
COMMERCIAL SIGN
GUARD RAIL
WIRE FENCE
STONE RETAINING WALL
COLLAPSE WALL AREA
MHB CTR BACK
(50' WIDE - PUBLIC)


ASHLAND, MA
ROUTE 125 (POND STREET)
STATE
MA
FED. AID PROJ. NO.
-
SHEET NO.
5
TOTAL SHEETS
18
PROJECT FILE NO.
604123
SUE PLAN (SHEET 2)
SCALE: 1" = 20'
N/F
ASHLAND POND LIMITED PARTNERSHIP
BOOK 26040 PAGE 191
MAP 026.0 BL. 0211
ELIOT ST.
N/F
ASHLAND POND LIMITED PARTNERSHIP
BOOK 26040 PAGE 191
MAP 026.0 BL. 0210
310 POND ST.
N/F
ASHLAND PLAZA (E&A) LLC
BOOK 41551 PAGE 250
MAP 025.0 BL. 0318
301 POND ST.
1955 COUNTY LAYOUT
1985 STATE HIGHWAY LAYOUT NO. 6720
EDGE OF PAVEMENT
1985 TOWN LAYOUT
BIT. CONC. PARKING AREA
BIT. CONC. WALK
LANDSCAPE
BOULDER
GRASS
CONC. CURB
BIT. CURB
GRAN CURB
LEFT TURNING LANE
CHAIN LINK FENCE
COMMERCIAL SIGN
ROW OF BOULDER
BIT. CONC. SIDEWALK
SWEL
DYCL
CONC. BASE
BENCH
CATV


ASHLAND, MA
ROUTE 125 (POND STREET)
SUE PLAN (SHEET 3)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 6 | 18
PROJECT FILE NO. 604123
SCALE: 1" = 20'
1910 STATE HIGHWAY LAYOUT NO. 1297
1933 STATE HIGHWAY LAYOUT NO. 6720
1958 COUNTY LAYOUT
N/F EMILY & LEONARDO MATEO BOOK 33589 PAGE 204 MAP 026.0 BL. 0014 259 POND ST.
N/F DEREK J. CHANAUGH & JAMES A. RUBIN BOOK 26924 PAGE 356 MAP 026.0 BL. 0015 300 ELIOT ST.
N/F GLOBAL MONTELLO GROUP CORP. BOOK 55459 PAGE 347 MAP 026.0 BL. 0239 268 POND ST.
N/F ASHLAND POND LIMITED PARTNERSHIP BOOK 26040 PAGE 191 MAP 026.0 BL. 0211 ELIOT ST.
APPROX. LOCATION OF BROOK
WETLANDS
APPROX. LOCATION OF DRAINAGE BASIN
APPROX. LOCATION UNDERGROUND DRAINAGE
STONE DRIVEWAY
RET. WALL
BIT. CONC. DRIVEWAY
GRAN. CURB
BIT. CURB
EDGE
WHB UP/FP (HELD)
GRASS
CHAIN LINK FENCE
BIT. CONC. PARKING AREA
STOCKADE FENCE
EDGE OF PAVEMENT
STONE RETAINING WALL
GUARD RAIL
LANDSCAPE
SLOTTED DRAIN
CONCRETE PAD
CANOPY
ELECT. METER
POLE 36/61/1
DMH
CB
SMH
VENT
CONC. BASE
WOOD PLATFORM
GRAN BLOCK COMMERCIAL SIGN
BROKEN 1' DOWN HELD CTR BACK
CONC. PAD
GRASS
BRUSH
TREE
RETAINING WALL
CONCRETE BARRIER
TRAFFIC SIGNAL ARM
ROW OF BOULDER
CONC. SIDEWALK
CHAIN LINK FENCE
CONTROL LINE
TURN LANE
DYCL
SWEL
GRAN CURB
BIT. CONC. PARKING AREA
COMMERCIAL SIGN


ASHLAND, MA
ROUTE 125 (POND STREET)
SUE PLAN (SHEET 4)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 7 | 18
PROJECT FILE NO. 604123
SCALE: 1" = 20'
1910 STATE HIGHWAY LAYOUT NO. 1297
1910 STATE HIGHWAY LAYOUT NO. 4012
TOWN LAYOUT
N/F RAYMOND G. & DONNA M. PELLETIER BOOK 48981 PAGE 14 MAP 026.0 BL. 0007 231 POND ST.
N/F RAYMOND G. & DONNA M. PELLETIER BOOK 16155 PAGE 365 MAP 026.0 BL. 0009 237 POND ST.
N/F RAYMOND G. & DONNA M. PELLETIER BOOK 48981 PAGE 144 MAP 026.0 BL. 0010 241 POND ST.
N/F ROBERT R. & LESLIE K. SAVORETTI BOOK 17737 PAGE 448 MAP 026.0 BL. 0011 247 POND ST.
N/F EDITH & EDWARD BORRELLI BOOK 45158 PAGE 75 MAP 026.0 BL. 0012 249 POND ST.
N/F G & D, LLC BOOK 48418 PAGE 337 MAP 026.0 BL. 0013 255 POND ST.
N/F DAVID A. BELL BOOK 48073 PAGE 386 MAP 026.0 BL. 0246 242 POND ST.
N/F ANTHONY MINUCCI, TRUSTEE ANTHONY LIVING TRUST BOOK 52953 PAGE 401 MAP 026.0 BL. 0240 248 POND ST.
N/F HASHMUKH C. PATEL, TRUSTEE SAGI REALTY TRUST BOOK 46439 PAGE 544 MAP 026.0 BL. 0247 236 POND ST.
BIT. CONC. PARKING AREA
GRAVEL
GRASS
STOCKADE FENCE
CHAIN LINK FENCE
VINYL FENCE
WOODEN BERM
RETAINING WALL
WETLANDS
BROOK
APPROX. LOCATION OF BROOK
GUARD RAIL
GRAN CURB
BIT. CURB
BIT. CONC. DRIVEWAY
STONE DRIVEWAY
MAIL BOXES
PORCH
DECK
SHED
WALKWAY
SIGN
CB
DMH
SMH
MHB (CONC) HELD CTR BACK
12"CLAY INV=183.7
24"CPP INV=180.5
BOX CULVERT 2'W X 1'H
24" HDPE
8" PVC S
4" IP G (TIMB)
6" CDN W
TOWN LAYOUT
1910 STATE HIGHWAY LAYOUT NO. 1297
1910 STATE HIGHWAY LAYOUT NO. 4012


ASHLAND, MA
ROUTE 125 (POND STREET)
STATE
MA
FED. AID PROJ. NO.
-
SHEET NO.
8
TOTAL SHEETS
18
PROJECT FILE NO.
604123
SUE PLAN (SHEET 5)
SCALE: 1" = 20'
N/F
AUSSIE LLC
BOOK 59128 PAGE 364
MAP 026.0 BL. 0018
210 POND ST.
N/F
GAZARD 221 POND STREET, LLC
BOOK 60871 PAGE 571
MAP 026.0 BL. 0002
221 POND ST.
N/F
CHARLES E. BAKSTRAN, JUNIOR BAKSTRAN & BETSY N. BAKSTRAN
BOOK 12985 PAGE 378
MAP 026.0 BL. 0251
220 POND ST.
N/F
CHARLES E. BAKSTRAN, JUNIOR BAKSTRAN & BETSY N. BAKSTRAN
BOOK 47751 PAGE 87
MAP 026.0 BL. 0250
224 POND ST.
N/F
GAZARD NICKERSON ROAD, LLC
BOOK 60871 PAGE 575
MAP 026.0 BL. 0003
225 POND ST.
N/F
BAC HOME LOANS SERVICING, LP.
BOOK 59223 PAGE 233
MAP 026.0 BL. 0248
228 POND ST.
N/F
BAC HOME LOANS SERVICING, LP.
BOOK 59223 PAGE 233
MAP 026.0 BL. 0248
228 POND ST.
N/F
RAYMOND G. & DONNA M. PELLETIER
BOOK 48981 PAGE 142
MAP 026.0 BL. 0007
231 POND ST.
N/F
HASHMUKH G. PATEL, TRUSTEE S&G REALTY TRUST
BOOK 46439 PAGE 544
MAP 026.0 BL. 0247
236 POND ST.
1910 STATE HIGHWAY
EDGE OF PAVEMENT
TOWN LAYOUT
CHAIN LINK FENCE
BIT. CONC.
BIT. CURB
CONC. CURB
GRAVEL
VINYL FENCE
WETLANDS
HEADWALL
RET. WALL
GRAN CURB
SIGN "FORLEASE"
SIGN "NO PARKING"
SIGN "ENTER"
SIGN "KEEP RIGHT"
SIGN "EXIT"
SIGN "BLIND DRIVE"
SIGN "EXIT"
SIGN "EXIT"
SIGN "BOX CULVERT"
SIGN "POLE 36-56"
12"CLAY INV=183.7
24"CPP INV=180.5
BOX CULVERT
LANDSCAPE
COMMERCIAL SIGN
BIT. CONC. PARKING AREA
CONC. CURB
GRASS
SHRUBS
HEDGE
FLAGESTONE PATIO
WALK
MHB W/DH
HELD CTR BACK
DYCL
SWEL
CB
SMH
RIM=186.15
INV(A)=172.35
INV(B)=172.33
RIM=187.31
INV(A)=174.16
INV(B)=174.10
RIM=186.22
INV(A)=184.14
INV(B)=183.97
RIM=186.83
INACCESSIBLE
RIM=186.92
INACCESSIBLE
RIM=186.68
INV(A)=183.11
RIM=187.27
INV(A)=180.14
INV(B)=180.19
RIM=187.21
INV(A)=176.36
INV(B)=176.61
INV(C)=176.49
RIM=189.03
INACCESSIBLE
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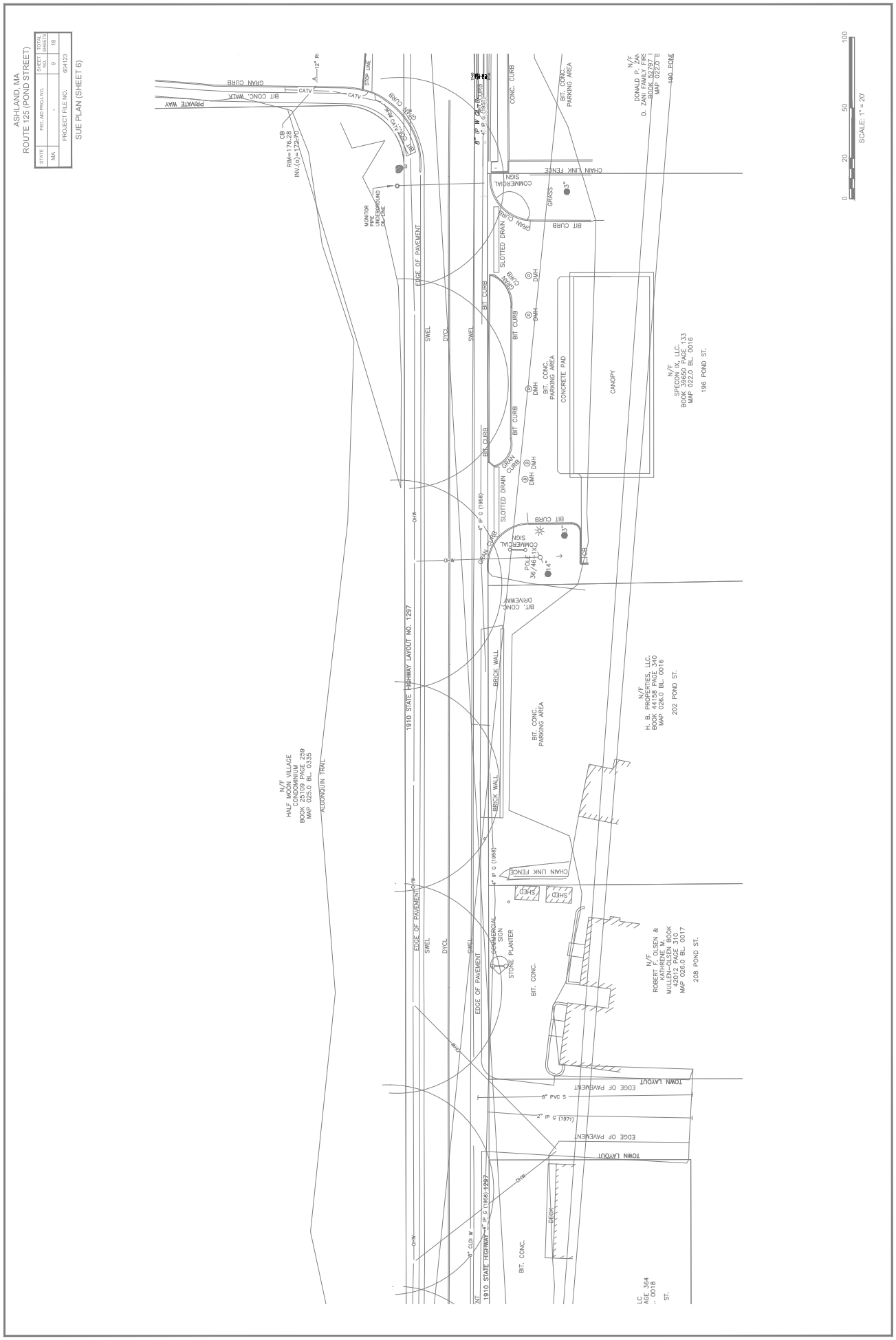
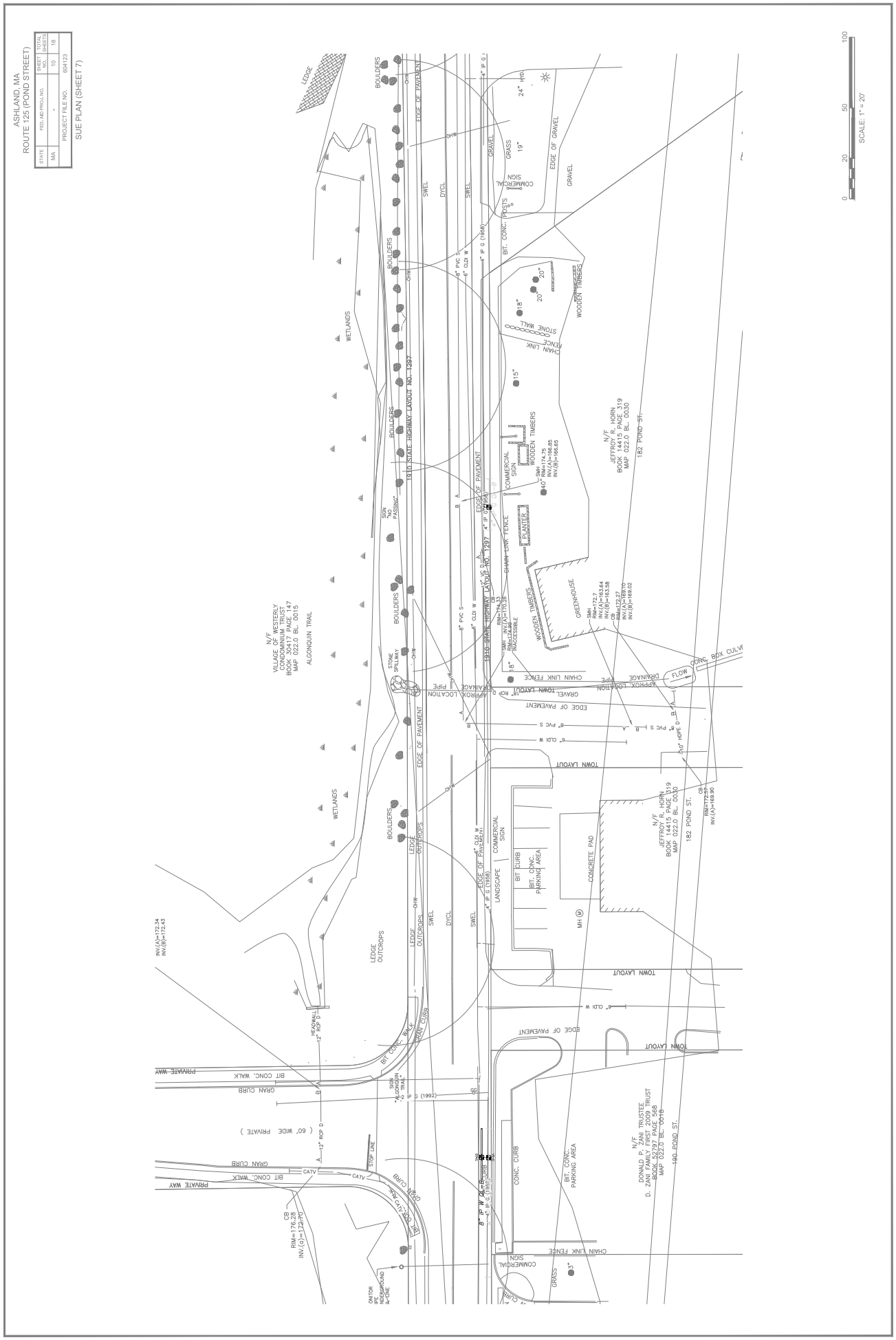
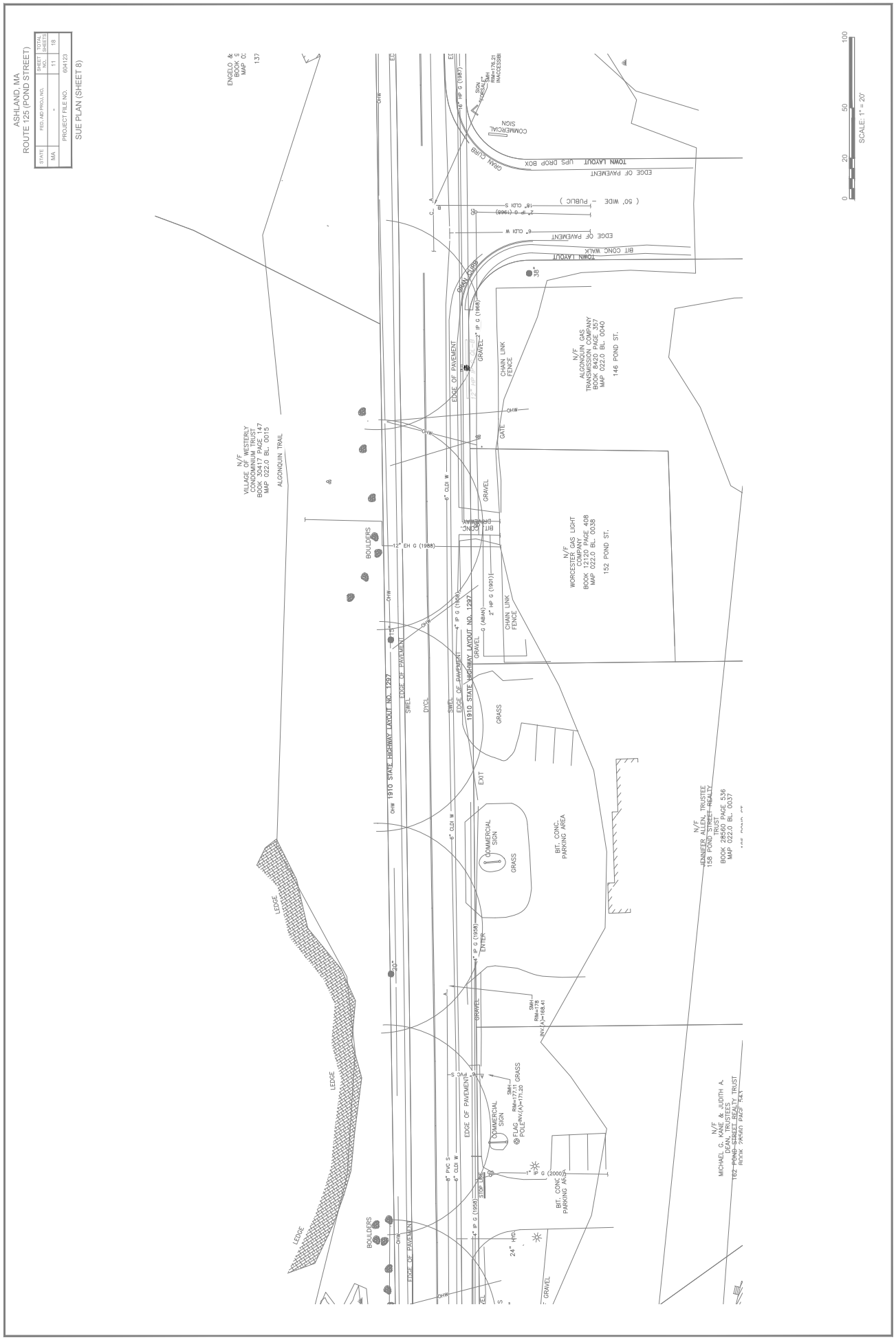
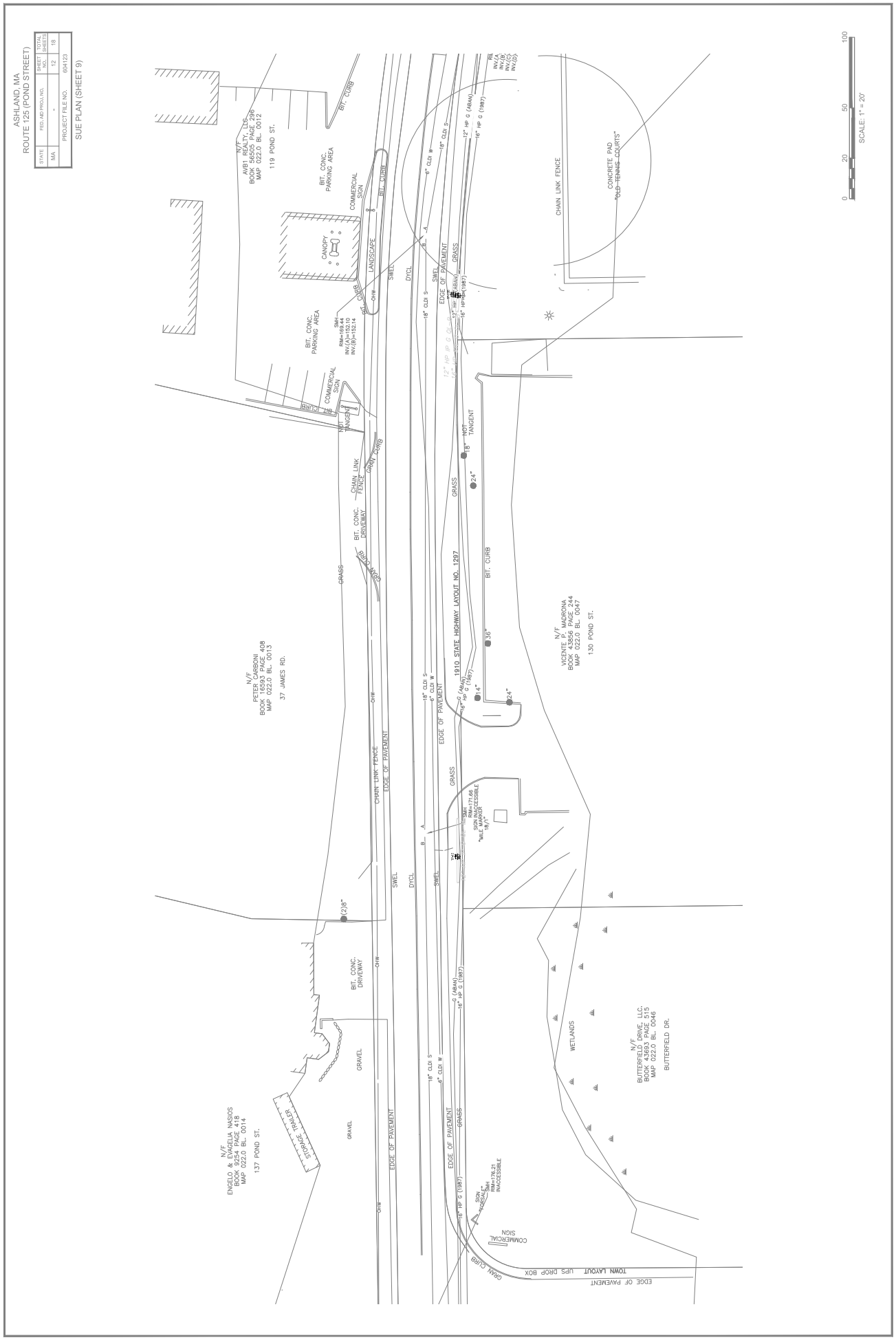
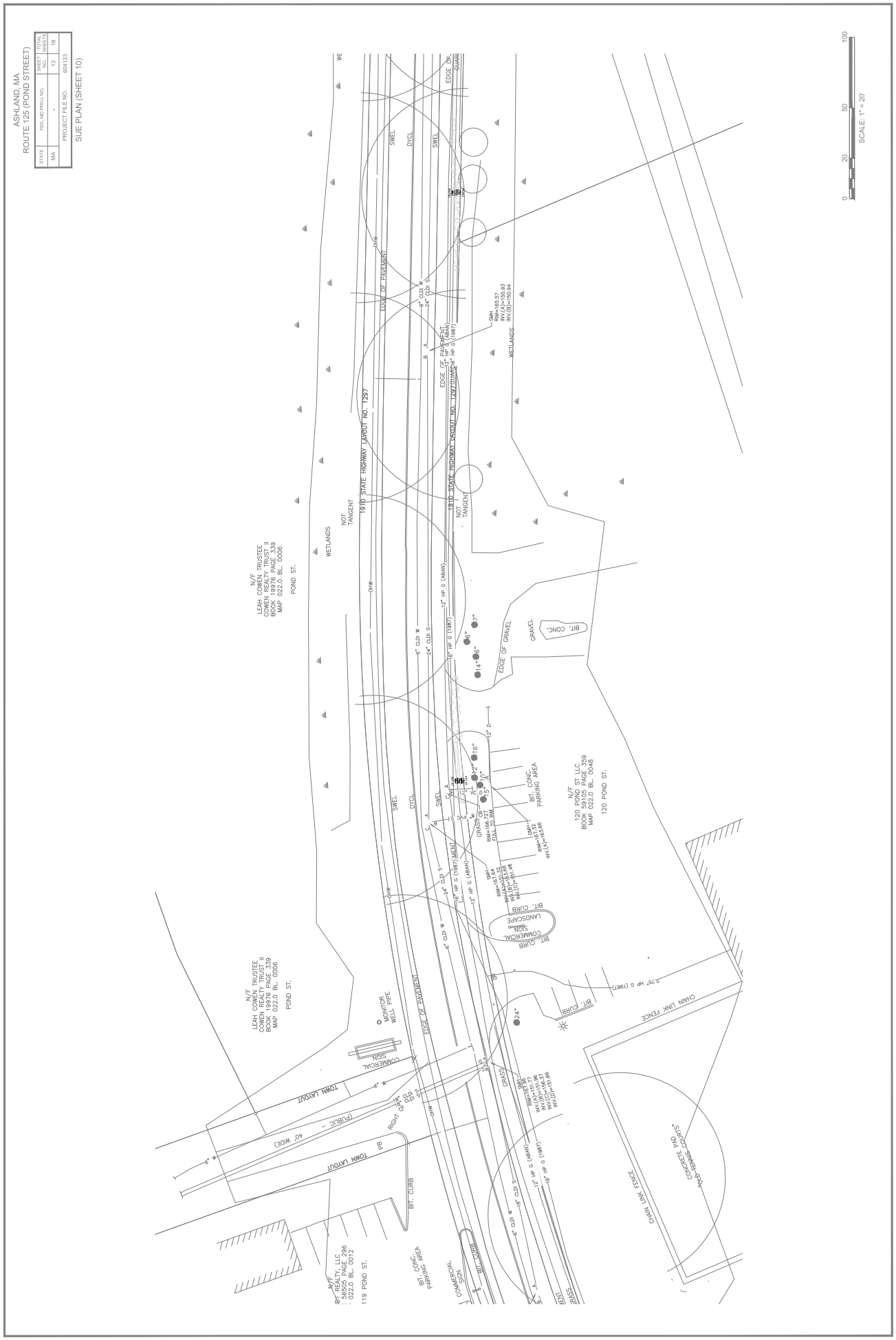
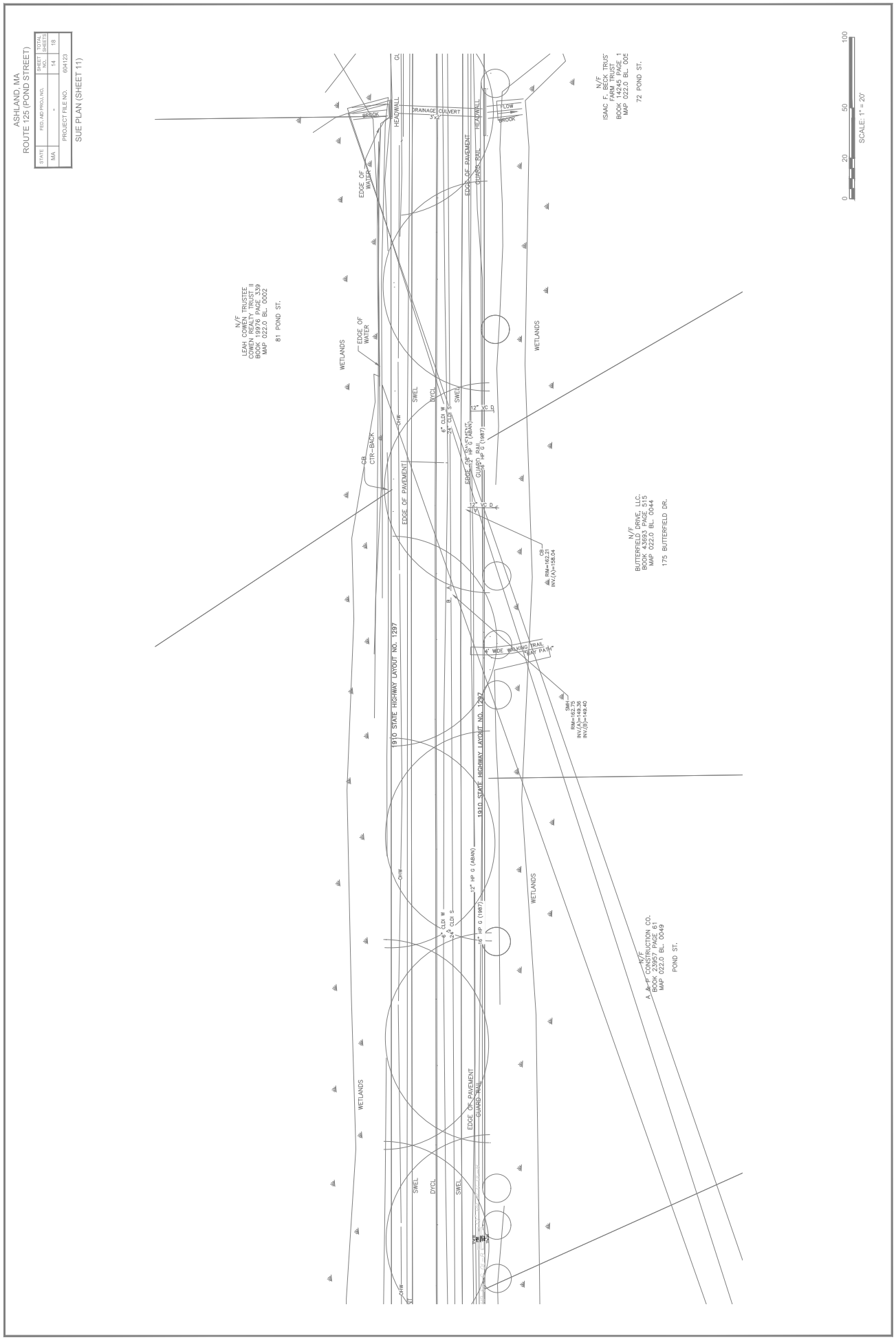

ASHLAND, MA
ROUTE 125 (POND STREET)
SUE PLAN (SHEET 6)
SCALE: 1" = 20'
N/F
HALF MOON VILLAGE
CONDOMINIUM
BOOK 25109 PAGE 259
MAP 025.0 BL. 0335
N/F
SPECON IX, LLC.
BOOK 39650 PAGE 133
MAP 022.0 BL. 0016
196 POND ST.
N/F
H. B. PROPERTIES, LLC.
BOOK 44158 PAGE 340
MAP 026.0 BL. 0016
202 POND ST.
N/F
ROBERT F. OLSEN &
KATHRENE M.
MULLEN-OLSEN BOOK
42012 PAGE 310
MAP 026.0 BL. 0017
208 POND ST.
1910 STATE HIGHWAY LAYOUT NO. 1297
EDGE OF PAVEMENT
BIT. CONC.
CANOPY
CONCRETE PAD
BIT. CONC. PARKING AREA
CHAIN LINK FENCE
COMMERCIAL SIGN
STONE PLANTER
SHED
BRICK WALL
ALGONQUIN TRAIL
TOWN LAYOUT
PRIVATE WAY
GRAN CURB
BIT CONC. WALK
BIT CURB
SLOTTED DRAIN
GRASS
DMH
SWEL
DYCL
CONC. CURB
STOP LINE
CB
RIM=176.28
INV.(a)=172.70
MONITOR PIPE UNDERGROUND OIL LINE
POLE 36/46-1X
BIT. CONC. DRIVEWAY
DECK

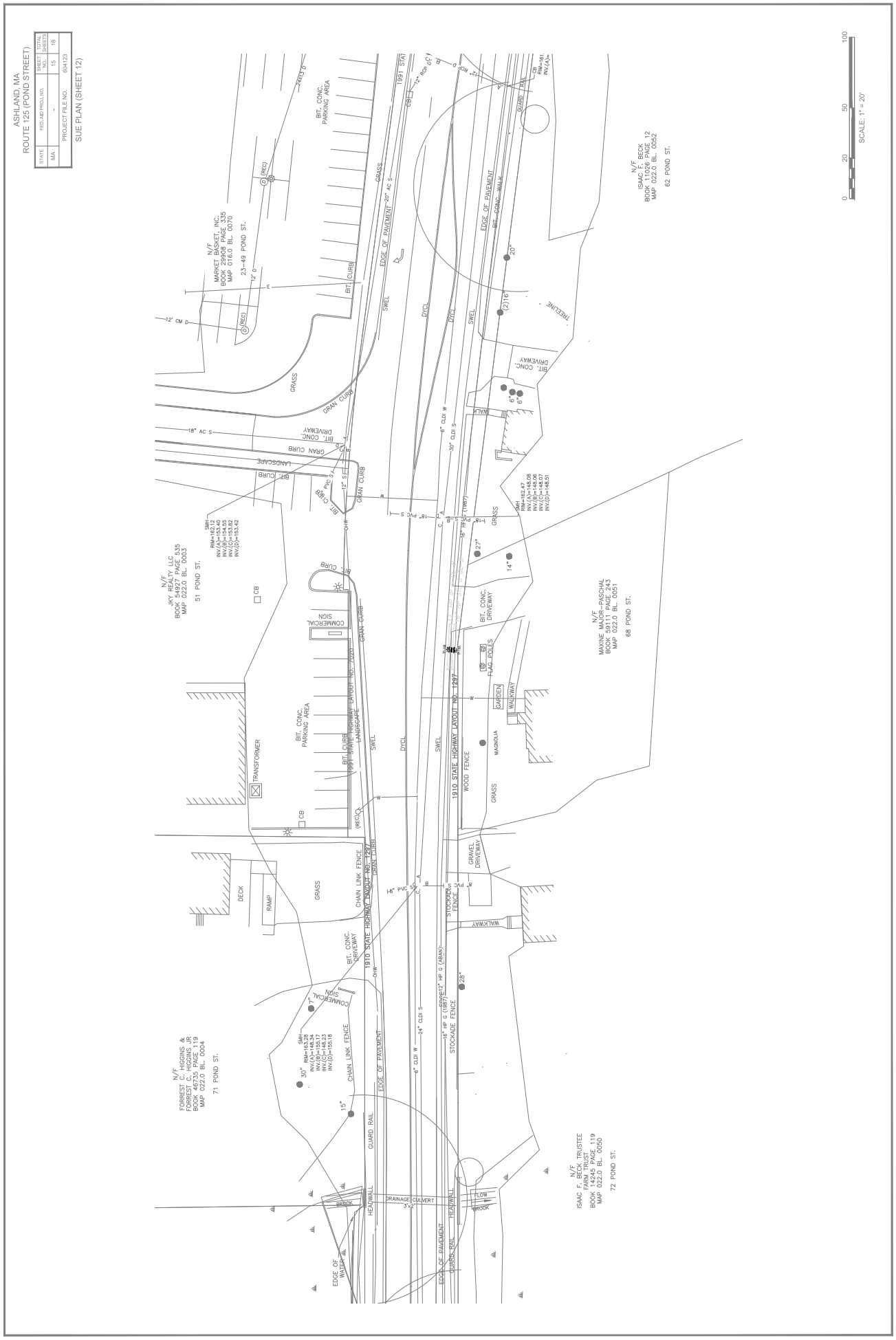

ASHLAND, MA
ROUTE 125 (POND STREET)
STATE
MA
FED. AID PROJ. NO.
-
SHEET NO.
10
TOTAL SHEETS
18
PROJECT FILE NO.
604123
SUE PLAN (SHEET 7)
SCALE: 1" = 20'
N/F
VILLAGE OF WESTERLY
CONDOMINIUM TRUST
BOOK 30417 PAGE 147
MAP 022.0 BL. 0015
ALGONQUIN TRAIL
N/F
JEFFROY R. HORN
BOOK 14415 PAGE 319
MAP 022.0 BL. 0030
182 POND ST.
N/F
DONALD P. ZANI TRUSTEE
D. ZANI FAMILY FIRST 2009 TRUST
BOOK 52797 PAGE 568
MAP 022.0 BL. 0016
190 POND ST.
1910 STATE HIGHWAY LAYOUT NO. 1297
EDGE OF PAVEMENT
WETLANDS
BOULDERS
LEDGE OUTCROPS
GRAVEL
GRASS
CHAIN LINK FENCE
WOODEN TIMBERS
STONE WALL
COMMERCIAL SIGN
PLANTER
GREENHOUSE
CONCRETE PAD
BIT. CONC. PARKING AREA
BIT. CURB
LANDSCAPE
CONC. CURB
BIT. CONC. WALK
GRAN CURB
PRIVATE WAY
(60' WIDE PRIVATE)
STOP LINE
TOWN LAYOUT
EDGE OF GRAVEL
SWEL
DYCL
CB
RIM=176.28
INV.(a)=172.70

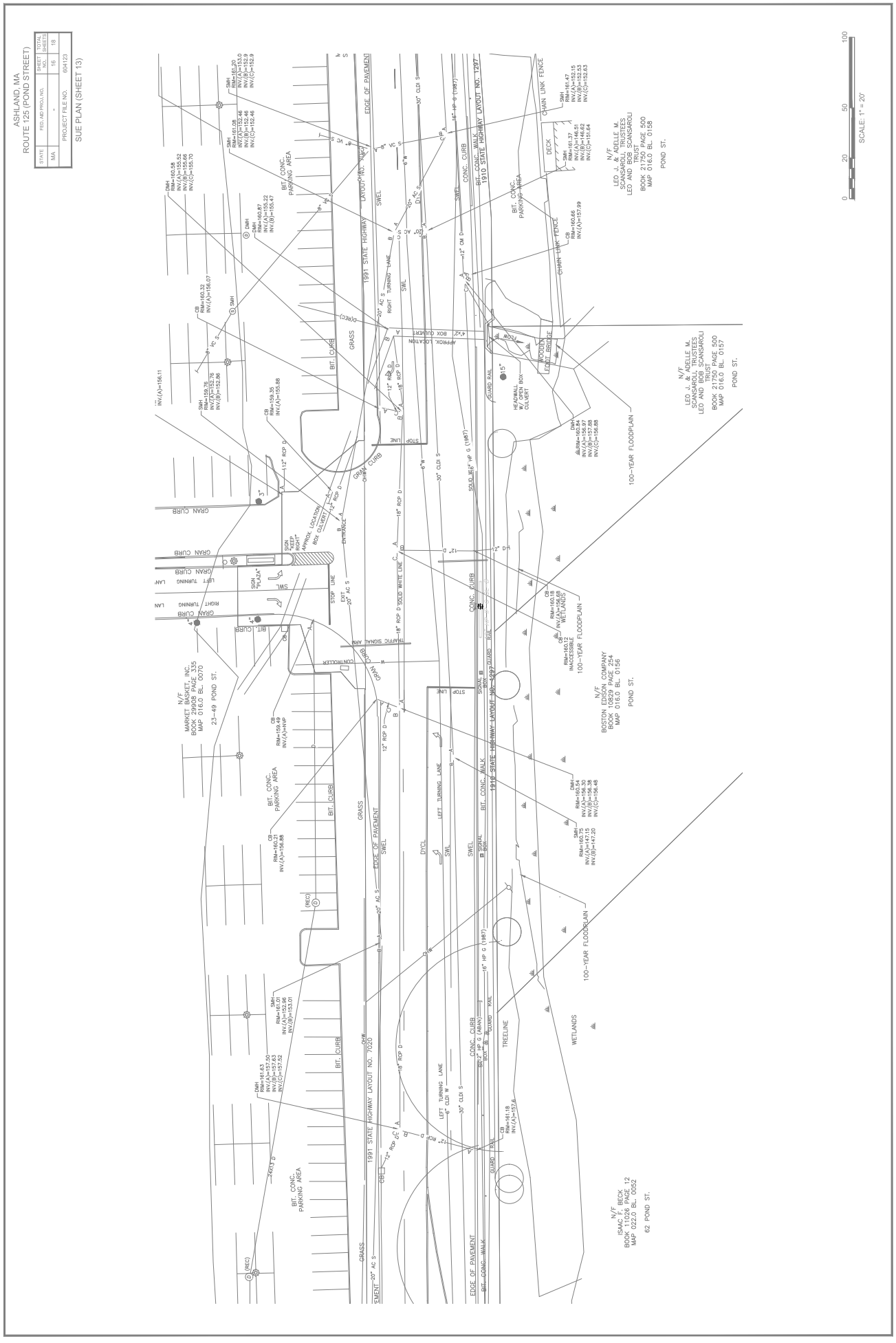

ASHLAND, MA
ROUTE 125 (POND STREET)
STATE
MA
FED. AID PROJ. NO.
-
SHEET NO.
11
TOTAL SHEETS
18
PROJECT FILE NO.
604123
SUE PLAN (SHEET 8)
SCALE: 1" = 20'
N/F
VILLAGE OF WESTERLY
CONDOMINIUM TRUST
BOOK 30417 PAGE 147
MAP 022.0 BL. 0015
ALGONQUIN TRAIL
N/F
ALGONQUIN GAS
TRANSMISSION COMPANY
BOOK 8420 PAGE 357
MAP 022.0 BL. 0040
146 POND ST.
N/F
WORCESTER GAS LIGHT
COMPANY
BOOK 12120 PAGE 408
MAP 022.0 BL. 0038
152 POND ST.
N/F
JENNIFER ALLEN, TRUSTEE
158 POND STREET REALTY
TRUST
BOOK 28560 PAGE 536
MAP 022.0 BL. 0037
N/F
MICHAEL G. KANE & JUDITH A.
DEAN, TRUSTEES
162 POND STREET REALTY TRUST
BOOK 28560 PAGE 543
1910 STATE HIGHWAY LAYOUT NO. 1297
EDGE OF PAVEMENT
BOULDERS
LEDGE
GRASS
GRAVEL
CHAIN LINK FENCE
GATE
BIT. CONC. PARKING AREA
COMMERCIAL SIGN
EXIT
ENTER
GRAN. CURB
TOWN LAYOUT
BIT. CONC. WALK
EDGE OF PAVEMENT
UPS DROP BOX
COMMERCIAL SIGN
(50' WIDE - PUBLIC)
ENGELO & BOOK 9 MAP 0 137


ASHLAND, MA
ROUTE 125 (POND STREET)
SUE PLAN (SHEET 9)
STATE
FED. AID PROJ. NO.
SHEET NO.
TOTAL SHEETS
MA
-
12
18
PROJECT FILE NO.
604123
SCALE: 1" = 20'
0
20
50
100
N/F AVB1 REALTY LLC BOOK 4853 PAGE 298 MAP 022.0 BL. 0012 119 POND ST.
BIT. CONC. PARKING AREA
COMMERCIAL SIGN
CANOPY
LANDSCAPE
BIT. CURB
CHAIN LINK FENCE
CONCRETE PAD "OLD TENNIS COURTS"
EDGE OF PAVEMENT
GRASS
SWEL
DYCL
SMH RIM=169.44 INV.(A)=151.0 INV.(B)=152.14
12" HP C (ABAN)
16" HP C (1987)
18" CLDI S
6" CLDI W
N/F PETER CARBON BOOK 4853 PAGE 408 MAP 022.0 BL. 0013 37 JAMES RD.
BIT. CONC. DRIVEWAY
CHAIN LINK FENCE
ASPH. CURB
1910 STATE HIGHWAY LAYOUT NO. 1297
HDT. TANGENT
8"
24"
36"
11.4"
N/F VICENTE P. MADRONA BOOK 4853 PAGE 344 MAP 022.0 BL. 0047 130 POND ST.
SMH RIM=171.66 INV.(A)=INACCESSIBLE "MILE MARKER 18/1"
(2)18"
GRAVEL
WETLANDS
N/F ENGELO & EVAGELIA NASIOS BOOK 9254 PAGE 418 MAP 022.0 BL. 0014 137 POND ST.
STORAGE TRAILER
N/F BUTTERFIELD DRIVE, LLC. BOOK 4853 PAGE 515 MAP 022.0 BL. 0046 BUTTERFIELD DR.
SMH RIM=176.21 INVACCESSIBLE
SIGN "ROSSLEY"
TOWN LAYOUT
UPS DROP BOX
EDGE OF PAVEMENT
GRASS
COMMERCIAL SIGN


ASHLAND, MA
ROUTE 125 (POND STREET)
STATE
MA
FED. AID PROJ. NO.
-
SHEET NO.
13
TOTAL SHEETS
18
PROJECT FILE NO.
604123
SUE PLAN (SHEET 10)
SCALE: 1" = 20'
0
20
50
100
1910 STATE HIGHWAY LAYOUT NO. 1297
NOT TANGENT
EDGE OF PAVEMENT
WETLANDS
EDGE OF GRAVEL
GRAVEL
BIT. CONC.
BIT. CONC. PARKING AREA
BIT. CURB
LANDSCAPE
SIGN
COMMERCIAL
MONITOR WELL PIPE
TOWN LAYOUT
(PUBLIC - 40' WIDE)
RIGHT OF WAY
CHAIN LINK FENCE
CONCRETE PAD
"BASKETBALL COURTS"
N/F
LEAH COWEN TRUSTEE
COWEN REALTY TRUST II
BOOK 19976 PAGE 339
MAP 022.0 BL. 0006
POND ST.
N/F
120 POND ST LLC
BOOK 59105 PAGE 359
MAP 022.0 BL. 0048
120 POND ST.
N/F
BT REALTY, LLC
BOOK 56505 PAGE 296
MAP 022.0 BL. 0012
119 POND ST.
GRASS
GAS
SWEL
DYCL
OHW
EDGE OF PAVEMENT
12" HP G (ABAN)
12" HP G (1987)
6" CLDI W
24" CLDI S
8" PVC
16" PVC
12" D
SMH
RIM=165.57
INV(A)=155.93
INV(B)=150.94
GRASS CB
RIM=166.72
INV(A)=161.82
RIM=167.26
INV(A)=156.96
INV(B)=156.71
INV(C)=156.69


ASHLAND, MA
ROUTE 125 (POND STREET)
STATE
MA
FED. AID PROJ. NO.
-
SHEET NO.
14
TOTAL SHEETS
18
PROJECT FILE NO.
604123
SUE PLAN (SHEET 11)
N/F
LEAH COWEN TRUSTEE
COWEN REALTY TRUST II
BOOK 19976 PAGE 339
MAP 022.0 BL. 0002
81 POND ST.
N/F
ISAAC F. BECK TRUST
FARM TRUST
BOOK 14245 PAGE 1
MAP 022.0 BL. 005
72 POND ST.
N/F
BUTTERFIELD DRIVE, LLC.
BOOK 43693 PAGE 515
MAP 022.0 BL. 0044
175 BUTTERFIELD DR.
N/F
A & P CONSTRUCTION CO.
BOOK 23957 PAGE 61
MAP 022.0 BL. 0049
POND ST.
1910 STATE HIGHWAY LAYOUT NO. 1297
WETLANDS
EDGE OF PAVEMENT
EDGE OF WATER
HEADWALL
DRAINAGE CULVERT
GUARD RAIL
SWEL
DYCL
CB
CTR-BACK
4' WIDE WALKING TRAIL
SCALE: 1" = 20'
0
20
50
100


ASHLAND, MA
ROUTE 125 (POND STREET)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 15 | 18
PROJECT FILE NO. 604123
SUE PLAN (SHEET 12)
SCALE: 1" = 20'
0 20 50 100
N/F MARKET BASKET, INC. BOOK 20068 PAGE 335 MAP 016.0 BL. 0070 23-49 POND ST.
N/F ISAAC F. BECK BOOK 1705 PAGE 12 MAP 022.0 BL. 0052 62 POND ST.
N/F JKY REALTY LLC BOOK 54927 PAGE 535 MAP 022.0 BL. 0003 51 POND ST.
N/F MAXINE MAJOR-PASCHAL BOOK 5511 PAGE 43 MAP 022.0 BL. 0051 68 POND ST.
N/F FORREST C. HIGGINS & FORREST C. HIGGINS JR BOOK 4835 PAGE 119 MAP 022.0 BL. 0004 71 POND ST.
N/F ISAAC F. BECK TRUSTEE FARM TRUST BOOK 14245 PAGE 119 MAP 022.0 BL. 0050 72 POND ST.
1910 STATE HIGHWAY LAYOUT NO. 7297
1991 STATE HIGHWAY LAYOUT NO. 7021
BIT. CONC. PARKING AREA
BIT. CONC. DRIVEWAY
GRAVEL DRIVEWAY
BIT. CONC. DRIVEWAY
BIT. CONC. SIDEWALK
GRASS
LANDSCAPE
GRAN CURB
BIT. CURB
EDGE OF PAVEMENT
GUARD RAIL
CHAIN LINK FENCE
STOCKADE FENCE
WOOD FENCE
TREELINE
DECK
RAMP
TRANSFORMER
COMMERCIAL SIGN
FLAG POLES
GARDEN
WALKWAY
BROOK
HEADWALL
DRAINAGE CULVERT
FLOW
EDGE OF WATER
SMH
CB
DHW
SWEL
DYCL
CLDI
18" AC S
12" CM D
12" S
18" PVC S
6" CLDI W
30" CLDI S
24" CLDI S
16" HP G (ABAN)
12" HP G (ABAN)
27"
14"
28"
30"
15"
6"
20"
(2)16"


ASHLAND, MA
ROUTE 125 (POND STREET)
STATE
FED. AID PROJ. NO.
SHEET NO.
TOTAL SHEETS
MA
-
16
18
PROJECT FILE NO. 604123
SUE PLAN (SHEET 13)
SCALE: 1" = 20'
N/F
LEO J. & ADELLE M. SCANSAROLI, TRUSTEES
LEO AND BOB SCANSAROLI TRUST
BOOK 21750 PAGE 500
MAP 016.0 BL. 0158
POND ST.
N/F
LEO J. & ADELLE M. SCANSAROLI, TRUSTEES
LEO AND BOB SCANSAROLI TRUST
BOOK 21750 PAGE 500
MAP 016.0 BL. 0157
POND ST.
N/F
MARKET BASKET, INC.
BOOK 29908 PAGE 335
MAP 016.0 BL. 0070
23-49 POND ST.
N/F
BOSTON EDISON COMPANY
BOOK 10829 PAGE 254
MAP 016.0 BL. 0156
POND ST.
N/F
ISAAC F. BECK
BOOK 11026 PAGE 12
MAP 022.0 BL. 0052
62 POND ST.
1991 STATE HIGHWAY LAYOUT NO. 7020
1910 STATE HIGHWAY LAYOUT NO. 1297
100-YEAR FLOODPLAIN
WETLANDS
TREELINE
BIT. CONC. PARKING AREA
BIT. CURB
GRASS
EDGE OF PAVEMENT
CONC. CURB
CHAIN LINK FENCE
DECK
GUARD RAIL
HEADWALL W/ OPEN BOX CULVERT
APPROX. LOCATION BOX CULVERT
STOP LINE
SOLID WHITE LINE
LEFT TURNING LANE
RIGHT TURNING LANE
TRAFFIC SIGNAL ARM
CONTROLLER
SIGNAL BOX
SIGN "KEEP RIGHT"
SIGN "PLAZA"
SIGN "LEFT TURNING LANE"
SIGN "RIGHT TURNING LANE"
SIGN "EXIT"
SIGN "ENTRANCE"
SWL
DYCL
GRAN CURB
SMH
CB
DMH
RIM=160.58
INV.(A)=155.52
INV.(B)=155.66
INV.(C)=155.70
RIM=160.87
INV.(A)=155.22
INV.(B)=155.47
RIM=160.32
INV.(A)=156.07
RIM=159.76
INV.(A)=152.76
INV.(B)=152.86
RIM=159.35
INV.(A)=155.88
RIM=160.21
INV.(A)=156.88
RIM=159.49
INV.(A)=NVP
RIM=161.01
INV.(A)=152.96
INV.(B)=153.01
RIM=161.63
INV.(A)=157.50
INV.(B)=157.63
INV.(C)=157.52
RIM=161.18
INV.(A)=157.6
RIM=160.54
INV.(A)=156.30
INV.(B)=156.38
INV.(C)=156.48
RIM=160.75
INV.(A)=147.15
INV.(B)=147.20
RIM=160.12
INACCESSIBLE
RIM=160.18
INV.(A)=156.68
RIM=160.84
INV.(A)=156.97
INV.(B)=157.88
INV.(C)=156.88
RIM=160.66
INV.(A)=157.99
RIM=161.47
INV.(A)=152.15
INV.(B)=152.53
INV.(C)=152.63
RIM=161.37
INV.(A)=146.51
INV.(B)=146.62
INV.(C)=151.64
INV.(A)=156.11
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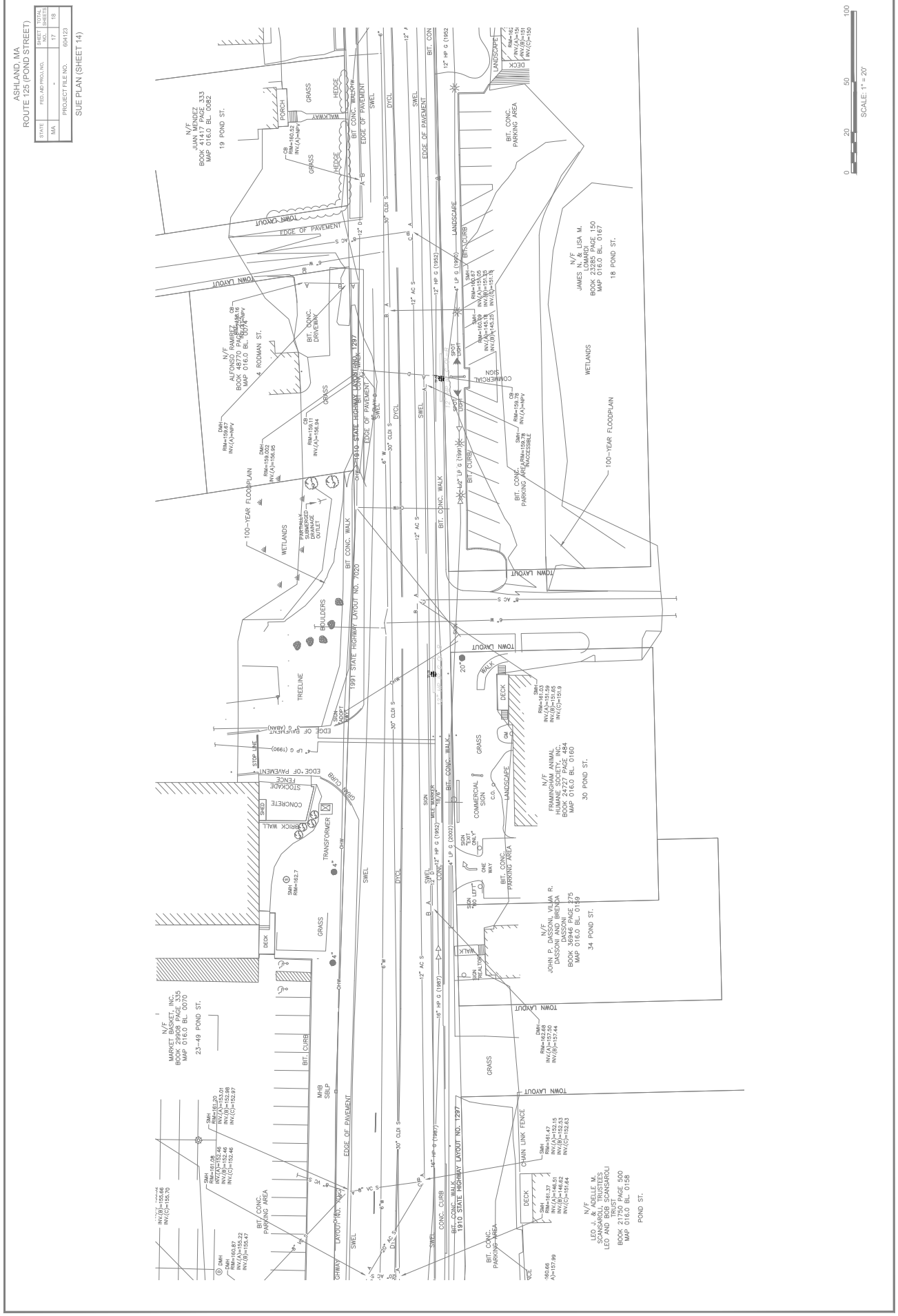
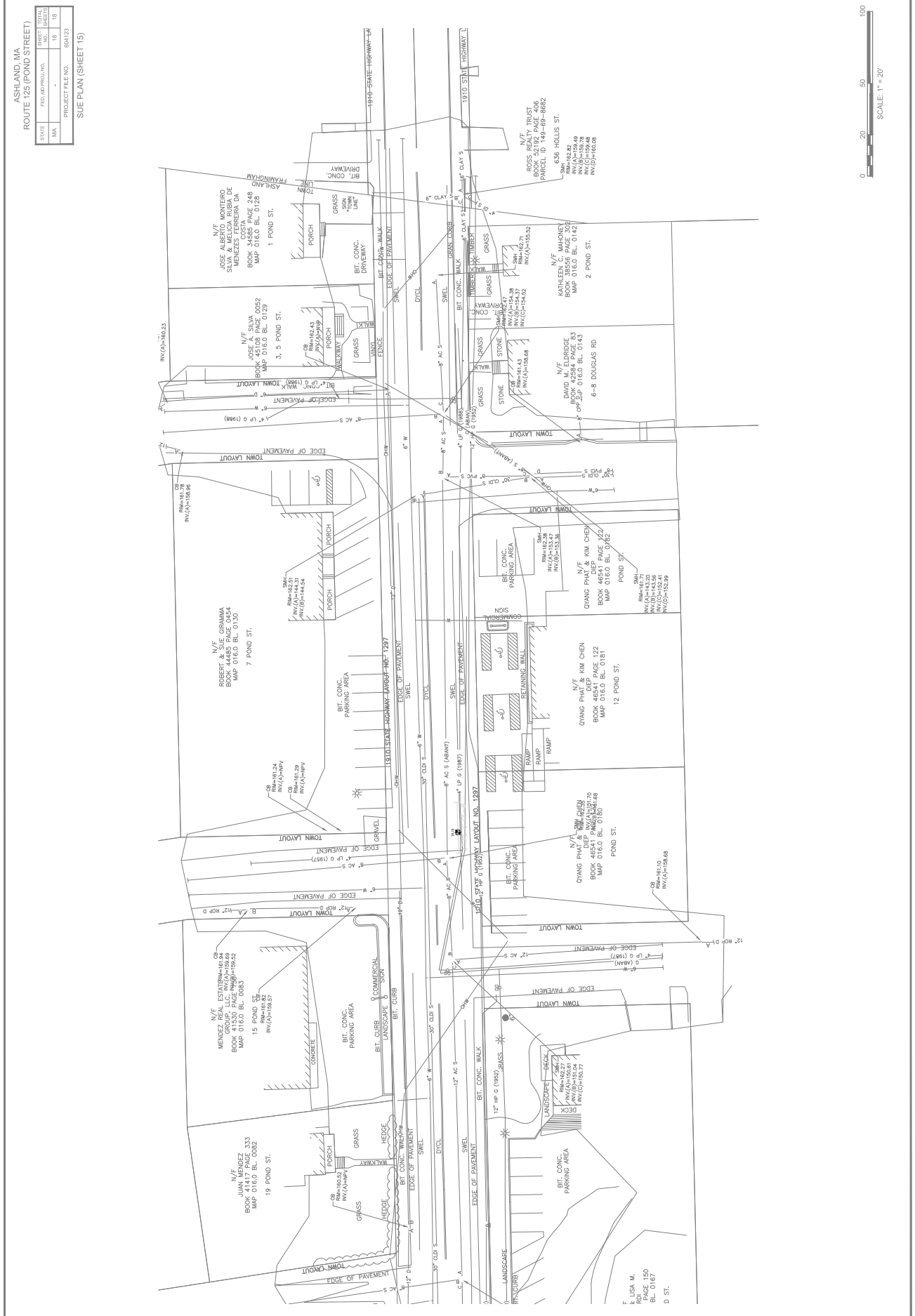

ASHLAND, MA
ROUTE 125 (POND STREET)
SUE PLAN (SHEET 14)
STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS
MA | - | 17 | 18
PROJECT FILE NO. 604123
SCALE: 1" = 20'
0 20 50 100
N/F JUAN MENDEZ BOOK 41417 PAGE 333 MAP 016.0 BL. 0082 19 POND ST.
N/F ALFONSO RAMIREZ BOOK 48770 PAGE 236 MAP 016.0 BL. 0074 4 RODMAN ST.
N/F JAMES N. & LISA M. LOMARDI BOOK 23285 PAGE 150 MAP 016.0 BL. 0167 18 POND ST.
N/F MARKET BASKET, INC. BOOK 29908 PAGE 335 MAP 016.0 BL. 0070 23-49 POND ST.
N/F FRAMINGHAM ANIMAL HUMANE SOCIETY, INC. BOOK 24727 PAGE 484 MAP 016.0 BL. 0160 30 POND ST.
N/F JOHN P. DASSONI, VILMA R. DASSONI AND BRENDA DASSONI BOOK 36948 PAGE 175 MAP 016.0 BL. 0139 34 POND ST.
N/F LEO J. & ADELLE M. SCANSAROLI LIVING TRUST LEO AND BOB SCANSAROLI TRUST BOOK 21770 PAGE 500 MAP 016.0 BL. 0158 POND ST.
1991 STATE HIGHWAY LAYOUT NO. 7050
1910 STATE HIGHWAY LAYOUT NO. 1297
100-YEAR FLOODPLAIN
WETLANDS
BIT. CONC. PARKING AREA
BIT. CONC. WALK
BIT. CURB
TOWN LAYOUT
EDGE OF PAVEMENT
GRASS
HEDGE
TREELINE
BOULDERS
CHAIN LINK FENCE
STOCKADE FENCE
BRICK WALL
CONCRETE
DECK
LANDSCAPE
COMMERCIAL SIGN
TRANSFORMER
STREET SIGN
STOP LINE
ROADWAY LAYOUT (NO. UNK.)
ROMAN ST.
POND ST.


ASHLAND, MA
ROUTE 125 (POND STREET)
STATE
MA
FED. AID PROJ. NO.
-
SHEET NO.
18
TOTAL SHEETS
18
PROJECT FILE NO.
604123
SUE PLAN (SHEET 15)
SCALE: 1" = 20'
N/F
JOSE ALBERTO MONTEIRO
SILVA & MELICIA RUBIA DE
MENEZES FERREIRA DA
COSTA
BOOK 34585 PAGE 248
MAP 016.0 BL. 0128
1 POND ST.
N/F
JOSE A. SILVA
BOOK 45108 PAGE 0052
MAP 016.0 BL. 0129
3, 5 POND ST.
N/F
ROBERT & SUE GIRAMMA
BOOK 44485 PAGE 0454
MAP 016.0 BL. 0130
7 POND ST.
N/F
MENDEZ REAL ESTATE
GROUP, LLC.
BOOK 41530 PAGE 158
MAP 016.0 BL. 0083
15 POND ST.
N/F
JUAN MENDEZ
BOOK 41417 PAGE 333
MAP 016.0 BL. 0082
19 POND ST.
N/F
ROSS REALTY TRUST
BOOK 52192 PAGE 406
PARCEL ID 149-69-8682
636 HOLLIS ST.
N/F
KATHLEEN C. MAHONEY
BOOK 38556 PAGE 302
MAP 016.0 BL. 0142
2 POND ST.
N/F
DAVID M. ELDRIDGE
BOOK 42584 PAGE 83
MAP 016.0 BL. 0143
6-8 DOUGLAS RD
N/F
QYANG PHAT & KIM CHEN
DIEP
BOOK 46541 PAGE 122
MAP 016.0 BL. 0182
POND ST.
N/F
QYANG PHAT & KIM CHEN
DIEP
BOOK 46541 PAGE 122
MAP 016.0 BL. 0181
12 POND ST.
N/F
QYANG PHAT & KIM CHEN
DIEP
BOOK 46541 PAGE 122
MAP 016.0 BL. 0180
POND ST.
1910 STATE HIGHWAY LAYOUT NO. 1297
BIT. CONC. PARKING AREA
BIT. CONC. WALK
BIT. CONC. DRIVEWAY
EDGE OF PAVEMENT
TOWN LAYOUT
PORCH
GRASS
STONE
RETAINING WALL
RAMP
COMMERCIAL SIGN
LANDSCAPE
DECK
HEDGE
WALKWAY
CONCRETE
GRAVEL
BIT. CURB
SWEL
DYCL
CLAY S
6" CLAY
8" AC S
12" AC S
30" CLDI S
6" W
12" HP G (1952)
4" LP G (1987)
8" AC S (ABANT)
12" RCP D
12" HP G (1952)

DOCUMENT B00420

PROPOSAL

ASHLAND

For: **Roadway Reconstruction and Related Work along Route 126 (Pond Street)**

COMMONWEALTH OF MASSACHUSETTS

LOCATION

The work referred to herein is in the Town of Ashland in Middlesex County, in the Commonwealth of Massachusetts, and is shown by the locus map (Document 00331) in the Proposal Pamphlet, the work locations extend as follows:

Pond Street (Route 126)

Beginning – Station 9+83.98 ±
Ending – Station 100+94.44 ±

The contract prices shall include the furnishing of all materials (except as otherwise herein specified), the performing of all the labor requisite or proper, the providing of all necessary machinery, tools, apparatus and other means of construction, the doing of all the abovementioned work in the manner set forth, described and shown in the specifications and on the drawings for the work, and in the form of contract, and the completion thereof within **1150 CALENDAR DAYS** upon receipt of a Notice to Proceed, except that if the completion date falls between December 1 and March 15 then the same number of days beyond December 1st will be extended after March 15th.

The Work of this project is described by the following Items and quantities.

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massDOT Massachusetts Department of Transportation Highway Division

CMS Contract Management System

Project # 604123 **Contract # 111717**

Location : ASHLAND

Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).

ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
100.	1	SCHEDULE OF OPERATIONS - FIXED PRICE $95000 AT Ninety Five Thousand Dollars LUMP SUM	$95,000.00	$95,000.00
101.	2	CLEARING AND GRUBBING AT _____ PER ACRE		
102.1	500	TREE TRIMMING AT _____ PER FOOT		
102.3	16	CONTROL OF INVASIVE PLANTS EXISTING ON SITE AT _____ PER HOUR		
102.33	6	INVASIVE PLANT MANAGEMENT STRATEGY AT _____ PER HOUR		
102.511	12	TREE PROTECTION – ARMORING & PRUNING AT _____ EACH		
102.521	725	TREE AND PLANT PROTECTION FENCE AT _____ PER FOOT		
103.	12	TREE REMOVED - DIAMETER UNDER 24 INCHES AT _____ EACH		
104.	6	TREE REMOVED - DIAMETER 24 INCHES AND OVER AT _____ EACH		

Project # 604123 Contract # 111717				
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
105.	5	STUMP REMOVED AT _____ EACH		
120.	27,500	EARTH EXCAVATION AT _____ PER CUBIC YARD		
121.	1,000	CLASS A ROCK EXCAVATION AT _____ PER CUBIC YARD		
123.	550	MUCK EXCAVATION AT _____ PER CUBIC YARD		
140.	1,120	BRIDGE EXCAVATION AT _____ PER CUBIC YARD		
141.	9,340	CLASS A TRENCH EXCAVATION AT _____ PER CUBIC YARD		
141.1	30	TEST PIT FOR EXPLORATION AT _____ PER CUBIC YARD		
142.	1,250	CLASS B TRENCH EXCAVATION AT _____ PER CUBIC YARD		
144.	750	CLASS B ROCK EXCAVATION AT _____ PER CUBIC YARD		

Project # 604123	Contract # 111717			
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
146.	42	DRAINAGE STRUCTURE REMOVED AT _____ EACH		
150.1	640	SPECIAL BORROW AT _____ PER CUBIC YARD		
151.	16,500	GRAVEL BORROW AT _____ PER CUBIC YARD		
151.1	325	GRAVEL BORROW FOR BRIDGE FOUNDATION AT _____ PER CUBIC YARD		
151.2	5,100	GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES AT _____ PER CUBIC YARD		
154.	10	SAND BORROW AT _____ PER CUBIC YARD		
156.	1,750	CRUSHED STONE AT _____ PER TON		
156.1	100	CRUSHED STONE FOR BRIDGE FOUNDATIONS AT _____ PER TON		
170.	56,700	FINE GRADING AND COMPACTING - SUBGRADE AREA AT _____ PER SQUARE YARD		

❺ ADDENDUM NO. 5, AUGUST 27, 2020

Project # 604123	Contract # 111717			
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
180.01	1	ENVIRONMENTAL HEALTH AND SAFETY PROGRAM AT _____ LUMP SUM		
180.02	400	PERSONAL PROTECTION LEVEL C UPGRADE AT _____ PER HOUR		
180.03	400	LICENSED SITE PROFESSIONAL SERVICES AT _____ PER HOUR		
181.11	50	DISPOSAL OF UNREGULATED SOIL AT _____ PER TON		
181.12	100	DISPOSAL OF REGULATED SOIL - IN-STATE FACILITY AT _____ PER TON		
181.13	100	DISPOSAL OF REGULATED SOIL - OUT-OF-STATE FACILITY AT _____ PER TON		
181.14	20	DISPOSAL OF HAZARDOUS WASTE AT _____ PER TON		
182.21	1	ASBESTOS REMOVAL PERMITS AT _____ LUMP SUM		
❺ 182.22	515	REMOVAL OF ASBESTOS PIPE AT _____ PER FOOT		

Project # 604123	Contract # 111717			
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
183.1	5,000	TREATMENT OF CONTAMINATED GROUNDWATER AT _____ PER GALLON		
183.2	500	DISPOSAL OF GRANULAR ACTIVATED CARBON AT _____ PER POUND		
184.1	5	DISPOSAL OF TREATED WOOD PRODUCTS AT _____ PER TON		
201.3	118	SPECIAL CATCH BASIN AT _____ EACH		
202.	82	MANHOLE AT _____ EACH		
202.11	1	SPECIAL MANHOLE (10 FT X 8 FT) AT _____ LUMP SUM		
202.2	4	MANHOLE (9 TO 14 FOOT DEPTH) AT _____ EACH		
202.5	10	MANHOLE (5 FT DIAMETER) AT _____ EACH		
202.6	6	MANHOLE (6 FT DIAMETER) AT _____ EACH		

❺ADDENDUM NO. 5, AUGUST 27, 2020

Project # 604123	Contract # 111717			
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
202.8	4	MANHOLE (8 FT DIAMETER) AT _____ EACH		
202.9	17	DEEP SUMP MANHOLE AT _____ EACH		
204.11	17	GUTTER INLET - SPECIAL AT _____ EACH		
205.	6	LEACHING BASIN AT _____ EACH		
209.1	2	DROP INLET, TYPE DF AT _____ EACH		
❺ 220.	285	DRAINAGE STRUCTURE ADJUSTED AT _____ EACH		
220.3	6	DRAINAGE STRUCTURE CHANGE IN TYPE AT _____ EACH		
220.5	3	DRAINAGE STRUCTURE REMODELED AT _____ EACH		
220.7	35	SANITARY STRUCTURE ADJUSTED AT _____ EACH		

Project # 604123	Contract # 111717			
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
220.8	8	SANITARY STRUCTURE REMODELED AT _____ EACH		
221.	137	FRAME AND COVER AT _____ EACH		
222.1	135	FRAME AND GRATE - MASSDOT CASCADE TYPE AT _____ EACH		
222.2	2	FRAME AND GRATE - MASSDOT DROP INLET AT _____ EACH		
223.2	41	FRAME AND GRATE (OR COVER) REMOVED AND DISCARDED AT _____ EACH		
224.12	135	12 INCH HOOD AT _____ EACH		
227.3	60	REMOVAL OF DRAINAGE STRUCTURE SEDIMENT AT _____ PER CUBIC YARD		
227.31	720	REMOVAL OF DRAINAGE PIPE SEDIMENT AT _____ PER FOOT		
232.4	50	43 X 27 INCH ACCM PIPE-ARCH 12 GAGE AT _____ PER FOOT		

Project # 604123	Contract # 111717			
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
232.5	41	50 X 31 INCH ACCM PIPE-ARCH 12 GAGE AT _____ PER FOOT		
238.12	1,200	12 INCH DUCTILE IRON PIPE AT _____ PER FOOT		
238.16	10	16 INCH DUCTILE IRON PIPE AT _____ PER FOOT		
238.24	130	24 INCH DUCTILE IRON PIPE AT _____ PER FOOT		
241.12	2,500	12 INCH REINFORCED CONCRETE PIPE AT _____ PER FOOT		
241.15	475	15 INCH REINFORCED CONCRETE PIPE AT _____ PER FOOT		
241.18	880	18 INCH REINFORCED CONCRETE PIPE AT _____ PER FOOT		
241.24	1,000	24 INCH REINFORCED CONCRETE PIPE AT _____ PER FOOT		
244.12	1,900	12 INCH REINFORCED CONCRETE PIPE CLASS V AT _____ PER FOOT		

❺ADDENDUM NO. 5, AUGUST 27, 2020

Project # 604123	**Contract # 111717**			
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
244.15	500	15 INCH REINFORCED CONCRETE PIPE CLASS V AT _____ PER FOOT		
244.18	1,750	18 INCH REINFORCED CONCRETE PIPE CLASS V AT _____ PER FOOT		
244.24	1,170	24 INCH REINFORCED CONCRETE PIPE CLASS V AT _____ PER FOOT		
258.	110	STONE FOR PIPE ENDS AT _____ PER SQUARE YARD		
❺ 303.06	460	6 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT) AT _____ PER FOOT		
❺ 303.08	20	8 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT) AT _____ PER FOOT		
303.12	420	12 INCH DUCTILE IRON WATER PIPE (MECHANICAL JOINT) AT _____ PER FOOT		
309.	2,600	DUCTILE IRON FITTINGS FOR WATER PIPE AT _____ PER POUND		
347.075	70	3/4 INCH COPPER TUBING TYPE K AT _____ PER FOOT		

❺ADDENDUM NO. 5, AUGUST 27, 2020

Project # 604123 **Contract # 111717**

Location : ASHLAND

Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).

ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
347.1	70	1 INCH COPPER TUBING TYPE K AT _____ PER FOOT		
347.125	70	1-1/4 INCH COPPER TUBING TYPE K AT _____ PER FOOT		
347.15	70	1-1/2 INCH COPPER TUBING TYPE K AT _____ PER FOOT		
347.2	70	2 INCH COPPER TUBING TYPE K AT _____ PER FOOT		
❺ 349.06	4	6 INCH GATE VALVE AT _____ EACH		
349.12	1	12 INCH GATE VALVE AT _____ EACH		
357.06	11	6 INCH GATE BOX AT _____ EACH		
❺ 358.	132	GATE BOX ADJUSTED AT _____ EACH		
363.075	5	3/4 INCH CORPORATION COCK AT _____ EACH		

❺ADDENDUM NO. 5, AUGUST 27, 2020

Project # 604123	Contract # 111717			
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
363.1	5	1 INCH CORPORATION COCK AT _____ EACH		
363.125	5	1-1/4 INCH CORPORATION COCK AT _____ EACH		
363.15	5	1-1/2 INCH CORPORATION COCK AT _____ EACH		
363.175	5	1-3/4 INCH CORPORATION COCK AT _____ EACH		
363.2	5	2 INCH CORPORATION COCK AT _____ EACH		
367.12	2	12 INCH CAST IRON PLUG AT _____ EACH		
❺ 371.06	24	6 INCH COUPLING AT _____ EACH		
❺ 371.08	3	8 INCH COUPLING AT _____ EACH		
❺ 371.12	7	12 INCH COUPLING AT _____ EACH		

❺ ITEM 370.1 - DELETED

❺ADDENDUM NO. 5, AUGUST 27, 2020

Project # 604123	Contract # 111717			
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
373.	1,325	WATER PIPE INSULATION BOARD AT _____ PER FOOT		
❺ 375.06	6	6 INCH INSERTION VALVE AND BOX AT _____ EACH		
375.08	1	8 INCH INSERTION VALVE AND BOX AT _____ EACH		
375.12	2	12 INCH INSERTION VALVE AND BOX AT _____ EACH		
376.2	13	HYDRANT - REMOVED AND RESET AT _____ EACH		
376.5	1	HYDRANT - ADJUSTED AT _____ EACH		
381.	9	SERVICE BOX AT _____ EACH		
381.3	44	SERVICE BOX ADJUSTED AT _____ EACH		
402.	4,800	DENSE GRADED CRUSHED STONE FOR SUB-BASE AT _____ PER CUBIC YARD		

❺ADDENDUM NO. 5, AUGUST 27, 2020

Project # 604123 **Contract # 111717**

Location : ASHLAND

Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).

ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
❺ 415.3	3,380	PAVEMENT MICRO MILLING AT _____ PER SQUARE YARD		
440.	195,000	CALCIUM CHLORIDE FOR ROADWAY DUST CONTROL AT _____ PER POUND		
443.	220	WATER FOR ROADWAY DUST CONTROL AT _____ PER 1000 GALLONS		
❺ 450.23	4,620	SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5) AT _____ PER TON		
450.32	6,175	SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC - 19.0) AT _____ PER TON		
450.42	11,000	SUPERPAVE BASE COURSE - 37.5 (SBC - 37.5) AT _____ PER TON		
❺ 451.	135	HMA FOR PATCHING AT _____ PER TON		
452.	7,500	ASPHALT EMULSION FOR TACK COAT AT _____ PER GALLON		
453.	11,000	HMA JOINT SEALANT AT _____ PER FOOT		

Project # 604123	**Contract # 111717**			
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
472.	1,600	ASPHALT MIXTURES FOR TEMPORARY WORK AT _____ PER TON		
482.5	140	SAWCUTTING ASPHALT PAVEMENT FOR BOX WIDENING AT _____ PER FOOT		
506.	16,250	GRANITE CURB TYPE VB - STRAIGHT AT _____ PER FOOT		
506.1	1,200	GRANITE CURB TYPE VB - CURVED AT _____ PER FOOT		
507.	310	TYPE T100 GRANITE CURB AT _____ PER FOOT		
509.	1,215	GRANITE TRANSITION CURB FOR WHEELCHAIR RAMPS - STRAIGHT AT _____ PER FOOT		
509.1	625	GRANITE TRANSITION CURB FOR WHEELCHAIR RAMPS - CURVED AT _____ PER FOOT		
514.	95	GRANITE CURB INLET - STRAIGHT AT _____ EACH		
515.	20	GRANITE CURB INLET - CURVED AT _____ EACH		

Project # 604123	**Contract # 111717**			
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
531.	45	TIMBER CURB AT _____ PER FOOT		
580.	70	CURB REMOVED AND RESET AT _____ PER FOOT		
594.	7,200	CURB REMOVED AND DISCARDED AT _____ PER FOOT		
620.12	3,565	GUARDRAIL, TL-2 (SINGLE FACED) AT _____ PER FOOT		
620.32	270	GUARDRAIL - CURVED, TL-2 (SINGLE FACED) AT _____ PER FOOT		
627.1	12	TRAILING ANCHORAGE AT _____ EACH		
627.82	6	GUARDRAIL TANGENT END TREATMENT, TL-2 AT _____ EACH		
627.92	2	GUARDRAIL FLARED END TREATMENT, TL-2 AT _____ EACH		
630.	75	HIGHWAY GUARD REMOVED AND RESET AT _____ PER FOOT		

Project # 604123	**Contract # 111717**			
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
630.2	3,000	HIGHWAY GUARD REMOVED AND DISCARDED AT _____ PER FOOT		
655.3	875	WOOD RAIL FENCE AT _____ PER FOOT		
669.	750	FENCE REMOVED AND STACKED AT _____ PER FOOT		
697.1	182	SILT SACK AT _____ EACH		
698.3	1,400	GEOTEXTILE FABRIC FOR SEPARATION AT _____ PER SQUARE YARD		
701.	7,200	CEMENT CONCRETE SIDEWALK AT _____ PER SQUARE YARD		
701.1	1,250	CEMENT CONCRETE SIDEWALK AT DRIVEWAYS AT _____ PER SQUARE YARD		
701.2	1,000	CEMENT CONCRETE WHEELCHAIR RAMP AT _____ PER SQUARE YARD		
701.31	425	STAMPED CEMENT CONCRETE PAVEMENT AT _____ PER SQUARE YARD		

Project # 604123	**Contract # 111717**			
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
702.	900	HOT MIX ASPHALT WALK SURFACE AT _____ PER TON		
703.9	12,750	IMPRINT CROSSWALK SYSTEM AT _____ PER SQUARE FOOT		
704.2	45	GRAVEL FOR DRIVEWAYS AT _____ PER SQUARE YARD		
705.1	1	FLAGSTONE WALK REMOVED AND RESET AT _____ PER SQUARE YARD		
711.	5	BOUND REMOVED AND RESET AT _____ EACH		
712.	9	BOUND REMOVED AND STACKED AT _____ EACH		
715.	18	RURAL MAIL BOX REMOVED AND RESET AT _____ EACH		
720.	15	BOULDERS REMOVED AND RESET AT _____ EACH		
740.	38	ENGINEERS FIELD OFFICE AND EQUIPMENT (TYPE A) AT _____ PER MONTH		

Project # 604123	**Contract # 111717**			
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
748.	1	MOBILIZATION AT _____ LUMP SUM		
751.	2,125	LOAM BORROW AT _____ PER CUBIC YARD		
751.2	250	PLANTING TRENCH SOIL AT _____ PER CUBIC YARD		
751.7	935	COMPOST TOPSOIL AT _____ PER SQUARE YARD		
755.35	1	INLAND WETLAND REPLICATION AREA AT _____ LUMP SUM		
755.75	40	WETLAND SPECIALIST AT _____ PER HOUR		
755.76	1	WETLAND MONITORING AT _____ LUMP SUM		
756.	1	NPDES STORMWATER POLLUTION PREVENTION PLAN AT _____ LUMP SUM		
765.	15,300	SEEDING AT _____ PER SQUARE YARD		

Project # 604123	**Contract # 111717**			
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
765.422	935	SEEDING-MID-HEIGHT UPLAND NATIVE MIX - FULL SUN AT _____ PER SQUARE YARD		
767.121	13,300	SEDIMENT CONTROL BARRIER AT _____ PER FOOT		
767.6	10	AGED PINE BARK MULCH AT _____ PER CUBIC YARD		
767.77	935	COMPOSTED MULCH OVER MODIFIED ROCK AT _____ PER SQUARE YARD		
767.9	3,400	MATTING FOR EROSION CONTROL AT _____ PER SQUARE YARD		
769.	3,800	PAVEMENT MILLING MULCH UNDER GUARD RAIL AT _____ PER FOOT		
775.027	4	ELM - 'PRINCETON' 2-2.5 INCH CAL AT _____ EACH		
775.035	3	HOPHORNBEAM - AMERICAN 2-2.5 INCH CALIPER AT _____ EACH		
775.431	10	LOCUST - HONEY - 'SHADEMASTER' 2-2.5 INCH CALIPER AT _____ EACH		

Project # 604123 **Contract # 111717**

Location : ASHLAND

Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).

ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
776.523	5	MAPLE - RED - 'ARMSTRONG' 2-2.5 INCH CALIPER AT _____ EACH		
776.529	2	MAPLE – RED- 'KARPICK' 2-2.5 INCH CAL AT _____ EACH		
777.679	3	SWEETGUM-'HAPDELL' 2-2.5 INCH CAL AT _____ EACH		
778.025	14	GINGKO-AUTUMN GOLD 2-2.5 INCH CAL AT _____ EACH		
778.167	3	BIRCH – RIVER 'HERITAGE' SINGLE STEM AT _____ EACH		
778.409	11	CRABAPPLE-ADIRONDACK 2.5-3 INCH CAL AT _____ EACH		
780.181	1	DOGWOOD-'CONSTELLATION' 1.5 INCH CAL AT _____ EACH		
782.423	9	PEAR - CALLERY - 'CHANTICLEER' 2-2.5 INCH CALIPER AT _____ EACH		
785.587	4	HOLLY - JAPANESE - 'HETZ' 24-30 INCH AT _____ EACH		

Project # 604123	Contract # 111717			
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
786.031	62	JUNIPER - ANDORRA 18-24 INCH AT _____ EACH		
786.083	18	JUNIPER-'BAR HARBOR' 18-24 INCH SPREAD AT _____ EACH		
786.099	96	JUNIPER-'BLUE STAR' 12-18 INCH SPREAD AT _____ EACH		
786.473	9	JUNIPER-'SEA GREEN' 24-30 INCH SPREAD AT _____ EACH		
794.337	92	SUMAC-FRAGRANT-'GRO-LOW' 18-24 INCH SPREAD AT _____ EACH		
794.805	33	SWEETFERN 2 GALLON AT _____ EACH		
796.433	124	FOUNTAIN GRASS-'KARLEY ROSE' 1 GALLON AT _____ EACH		
796.457	131	SWITCH GRASS-HEAVY METAL' 1 GALLON AT _____ EACH		
796.459	71	SWITCH GRASS-'SHENENDOAH' 1 GALLON AT _____ EACH		

Project # 604123	**Contract # 111717**			
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
796.727	255	CATMINT-'WALKERS LOW' 1 GALLON AT _____ EACH		
796.753	48	DAYLILLY-'HAPPY RETURNS' 1 GALLON AT _____ EACH		
796.757	90	DAYLILLY-'PURPLE RETURNS' 1 GALLON AT _____ EACH		
796.761	57	DAYLILLY-'RED HOT RETURNS' 1 GALLON AT _____ EACH		
804.3	13,050	3 INCH ELECTRICAL CONDUIT TYPE NM - PLASTIC -(UL) AT _____ PER FOOT		
811.27	104	ELECTRIC HANDHOLE - (MUNICIPAL STANDARD) AT _____ EACH		
811.31	35	PULL BOX 12 X 12 INCHES - SD2.031 AT _____ EACH		
812.16	82	LIGHT FOUNDATION - CONCRETE AT _____ EACH		
812.17	17	DEEP LIGHT FOUNDATION - CONCRETE AT _____ EACH		

Project # 604123	**Contract # 111717**			
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
812.20	2	LIGHTING LOAD CENTER FOUNDATION AT _____ EACH		
813.30	45,500	WIRE TYPE 7 NO. 10 GENERAL PURPOSE AT _____ PER FOOT		
813.33	16,500	WIRE TYPE 7 NO. 4 GENERAL PURPOSE AT _____ PER FOOT		
813.34	86,900	WIRE TYPE 7 NO. 2 GENERAL PURPOSE AT _____ PER FOOT		
813.35	600	WIRE TYPE 7 NO. 1 GENERAL PURPOSE AT _____ PER FOOT		
813.399	99	SPLICE AND EXTENSION FROM HANDHOLE TO LIGHTING FIXTURES AT _____ EACH		
813.81	1	SERVICE CONNECTION (UNDERGROUND) AT _____ LUMP SUM		
815.1	1	TRAFFIC CONTROL SIGNAL LOCATION NO. 1 AT _____ LUMP SUM		
815.2	1	TRAFFIC CONTROL SIGNAL LOCATION NO. 2 AT _____ LUMP SUM		

Project # 604123	**Contract # 111717**			
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
815.3	1	TRAFFIC CONTROL SIGNAL LOCATION NO. 3 AT _____ LUMP SUM		
816.80	1	TRAFFIC CONTROL SIGNAL REMOVED AND STACKED AT _____ LUMP SUM		
816.801	1	TRAFFIC CONTROL SIGNAL REMOVED AND STACKED AT _____ LUMP SUM		
821.50	71	LIGHT POLE AND SINGLE PENDANT LUMINAIRE W/ 8' ARM AND BANNER ARM AT _____ EACH		
821.51	13	LIGHT POLE AND SINGLE PENDANT LUMINAIRE W/ 12' ARM AND BANNER ARM AT _____ EACH		
821.52	11	LIGHT POLE ARM AND SINGLE PENDANT LUMINAIRE W/ 4' ARM AND BANNER ARM AT _____ EACH		
821.53	4	LIGHT POLE AND DOUBLE PENDANT LUMINAIRE AND BANNER ARM AT _____ EACH		

Project # 604123	**Contract # 111717**			
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
823.61	1	HIGHWAY LIGHTING LOAD CENTER NO.1 AT _____ LUMP SUM		
823.62	1	HIGHWAY LIGHTING LOAD CENTER NO.2 AT _____ LUMP SUM		
824.211	1	RECTANGULAR RAPID FLASHING BEACON (AC POWERED) AT _____ LUMP SUM		
824.221	1	RECTANGULAR RAPID FLASHING BEACON (SOLAR), LOC. NO. 1 AT _____ LUMP SUM		
824.222	1	RECTANGULAR RAPID FLASHING BEACON (SOLAR), LOC. NO. 2 AT _____ LUMP SUM		
824.223	1	RECTANGULAR RAPID FLASHING BEACON (SOLAR), LOC. NO. 3 AT _____ LUMP SUM		
824.224	1	RECTANGULAR RAPID FLASHING BEACON (SOLAR), LOC. NO. 4 AT _____ LUMP SUM		
824.225	1	RECTANGULAR RAPID FLASHING BEACON (SOLAR), LOC. NO. 5 AT _____ LUMP SUM		
824.226	1	RECTANGULAR RAPID FLASHING BEACON (SOLAR), LOC. NO. 6 AT _____ LUMP SUM		

Project # 604123	**Contract # 111717**			
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
824.227	1	RECTANGULAR RAPID FLASHING BEACON (SOLAR), LOC. NO. 7 AT _____ LUMP SUM		
832.	640	WARNING-REGULATORY AND ROUTE MARKER - ALUMINUM PANEL (TYPE A) AT _____ PER SQUARE FOOT		
833.5	90	DEMOUNTABLE REFLECTORIZED DELINEATOR - GUARD RAIL AT _____ EACH		
833.7	21	DELINEATION FOR GUARD RAIL TERMINI AT _____ EACH		
847.1	103	SIGN SUP (N/GUIDE)+RTE MKR W/1 BRKWAY POST ASSEMBLY - STEEL AT _____ EACH		
850.41	840	ROADWAY FLAGGER AT _____ PER HOUR		
851.1	510	TRAFFIC CONES FOR TRAFFIC MANAGEMENT AT _____ PER DAY		
852.	866	SAFETY SIGNING FOR TRAFFIC MANAGEMENT AT _____ PER SQUARE FOOT		
852.11	1,500	TEMPORARY PEDESTRIAN BARRICADE AT _____ PER FOOT		

❺ADDENDUM NO. 5, AUGUST 27, 2020

Project # 604123	Contract # 111717			
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
852.12	16	TEMPORARY PEDESTRIAN CURB RAMP AT _____ EACH		
853.1	10	PORTABLE BREAKAWAY BARRICADE TYPE III AT _____ EACH		
❺ 853.2	1,800	TEMPORARY BARRIER (TL-2) AT _____ PER FOOT		
❺ 853.21	1,800	TEMPORARY BARRIER REMOVED AND RESET AT _____ PER FOOT		
❺ 853.501	11	TEMPORARY IMPACT ATTENUATOR REMOVED AND RESET AT _____ EACH		
❺ 853.63	7	TEMPORARY IMPACT ATTENUATOR UNIDIRECTIONAL, REDIRECTIVE (TL-3) AT _____ EACH		
853.8	80	TEMPORARY ILLUMINATION FOR WORK ZONE AT _____ PER DAY		
854.016	53,650	TEMPORARY PAVING MARKINGS - 6 INCH (PAINTED) AT _____ PER FOOT		
854.1	4,000	PAVEMENT MARKING REMOVAL AT _____ PER SQUARE FOOT		

Project # 604123	Contract # 111717			
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
856.	1,600	ARROW BOARD AT _____ PER DAY		
856.12	3,100	PORTABLE CHANGEABLE MESSAGE SIGN AT _____ PER DAY		
859.	48,000	REFLECTORIZED DRUM AT _____ PER DAY		
864.04	2,065	PAVEMENT ARROWS AND LEGENDS REFLECTORIZED WHITE (THERMOPLASTIC) AT _____ PER SQUARE FOOT		
864.35	40	SLOTTED PAVEMENT MARKER TWO-WAY YELLOW/YELLOW AT _____ EACH		
866.106	22,000	6 INCH REFLECTORIZED WHITE LINE (THERMOPLASTIC) AT _____ PER FOOT		
866.112	4,000	12 INCH REFLECTORIZED WHITE LINE (THERMOPLASTIC) AT _____ PER FOOT		
867.106	27,000	6 INCH REFLECTORIZED YELLOW LINE (THERMOPLASTIC) AT _____ PER FOOT		
867.112	4,500	12 INCH REFLECTORIZED YELLOW LINE (THERMOPLASTIC) AT _____ PER FOOT		

❺ADDENDUM NO. 5, AUGUST 27, 2020

Project # 604123 **Contract # 111717**

Location : ASHLAND

Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).

ITEM #	QUANTITY	ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	AMOUNT
874.	8	STREET NAME SIGN AT _____ EACH		
874.1	4	STREET SIGN REMOVED AND RESET AT _____ EACH		
874.2	9	TRAFFIC SIGN REMOVED AND RESET AT _____ EACH		
874.41	45	TRAFFIC SIGN REMOVED AND DISCARDED AT _____ EACH		
901.	15	4000 PSI, 1.5 INCH, 565 CEMENT CONCRETE AT _____ PER CUBIC YARD		
❺ 903.	15	3000 PSI, 1.5 INCH, 470 CEMENT CONCRETE AT _____ PER CUBIC YARD		
910.	250	STEEL REINFORCEMENT FOR STRUCTURES AT _____ PER POUND		
945.011	2	30 INCH UTILITY POLE CAISSON AT _____ EACH		
945.102	55	DRILLED SHAFT EXCAVATION 3.5 FOOT DIAMETER AT _____ PER FOOT		

❺ADDENDUM NO. 5, AUGUST 27, 2020

Project # 604123	**Contract # 111717**			
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
945.202	15	ROCK SOCKET EXCAVATION 3.5 FOOT DIAMETER AT _____ PER FOOT		
945.502	60	DRILLED SHAFT 3.5 FOOT DIAMETER AT _____ PER FOOT		
953.31	1	EXCAVATION SUPPORT SYSTEM SPECIAL DRAINAGE STRUCTURE NO. 1 AT _____ LUMP SUM		
953.32	1	EXCAVATION SUPPORT SYSTEM SPECIAL DRAINAGE STRUCTURE NO. 2 AT _____ LUMP SUM		
953.33	1	EXCAVATION SUPPORT SYSTEM SPECIAL DRAINAGE STRUCTURE NO. 3 AT _____ LUMP SUM		
953.34	1	EXCAVATION SUPPORT SYSTEM SPECIAL DRAINAGE STRUCTURE NO. 4 AT _____ LUMP SUM		
986.1	935	MODIFIED ROCKFILL AT _____ PER SQUARE YARD		
991.11	1	CONTROL OF WATER - SPECIAL DRAINAGE STRUCTURE NO. 1 AT _____ LUMP SUM		
991.12	1	CONTROL OF WATER - SPECIAL DRAINAGE STRUCTURE NO. 2 AT _____ LUMP SUM		

❺ ITEM 983.1 - DELETED

❺ADDENDUM NO. 5, AUGUST 27, 2020

Project # 604123	Contract # 111717			
Location : ASHLAND				
Description : Roadway Reconstruction and Related Work along Route 126 (Pond Street).				
ITEM #	**QUANTITY**	**ITEM WITH UNIT BID PRICE WRITTEN IN WORDS**	**UNIT PRICE**	**AMOUNT**
991.13	1	CONTROL OF WATER - SPECIAL DRAINAGE STRUCTURE NO. 3 AT _____ LUMP SUM		
991.14	1	CONTROL OF WATER - SPECIAL DRAINAGE STRUCTURE NO. 4 AT _____ LUMP SUM		
992.33	1	COORDINATION AND SUPPORT OF GAS MAINS AT CULVERTS AT _____ LUMP SUM		
996.01	1	WALL STRUCTURE, WALL NO. 1 AT _____ LUMP SUM		
996.02	1	WALL STRUCTURE, WALL NO. 2 AT _____ LUMP SUM		
997.1	1	SPECIAL DRAINAGE STRUCTURE NO. 1 AT _____ LUMP SUM		
997.2	1	SPECIAL DRAINAGE STRUCTURE NO. 2 AT _____ LUMP SUM		
997.3	1	SPECIAL DRAINAGE STRUCTURE NO. 3 AT _____ LUMP SUM		
997.4	1	SPECIAL DRAINAGE STRUCTURE NO. 4 AT _____ LUMP SUM		
❺ **Total Qty:**	841,362			

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DOCUMENT B00853

SCHEDULE OF PARTICIPATION BY DISADVANTAGED BUSINESS ENTERPRISES (DBES)

PRIME BIDDER: _____

DATE OF BID OPENING: _____ PROJECT NO: 604123

FEDERAL AID PROJECT NO: CMQ-003S(390), STP-003S(390) & TAP-003S(390)

PROJECT LOCATION: ASHLAND

Name, Address, and Phone Number(s) of DBE	Name of Activity	(a)† DBE Contractor Activity Amount *Construction Work*	(b) DBE Other Business Amount *Services, Supplies, Material*	(c) Total amount eligible for credit under rules in Section 6 of Document 00719 - DBE Special Provisions
Total Bid Amount	TOTALS:	$	$	$
$	DBE Percentage of Total Bid:	%	%	%

†*Column (a) must be at least one-half of the DBE participation goal. Attach additional sheets as necessary.*

Is MassDOT Document B00855 (Joint Check Approval) being submitted for any of the above? ☐ Yes ☐ No ☐ Not Known at This Time

Will any of the contractors listed above be using a third party (i.e. manufacturer) to deliver materials or perform any portion of work by a third party? ☐ Yes ☐ No

CERTIFICATION: I HEREBY DECLARE, TO THE BEST OF MY KNOWLEDGE, THAT **I HAVE READ THE SPECIAL PROVISIONS FOR PARTICIPATION BY DISADVANTAGED BUSINESS ENTERPRISES - DOCUMENT 00719.** BOTH THIS SCHEDULE AND THE RELEVANT AND ACCOMPANYING LETTER(S) OF INTENT ARE IN FULL COMPLIANCE WITH THE PROVISIONS OF, AND IN ACCORDANCE WITH, TITLE 49 CODE OF FEDERAL REGULATIONS, PART 26 (49 CFR Part 26).

SIGNATURE: _____ DATE: _____

NAME AND TITLE (*PRINT*): _____

EMAIL ADDRESS: _____ TEL NO: _____

*** END OF DOCUMENT ***

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DOCUMENT B00854

DISADVANTAGED BUSINESS ENTERPRISES (DBE) PARTICIPATION
LETTER OF INTENT
(To be completed by the DBE – Page 1 of 2)

TO: _____ (Prime Bidder)

FROM: _____ (DBE Firm)

RE: PROJECT NO: 604123 FEDERAL AID PROJECT NO: CMQ/STP/TAP-003S(390)

PROJECT LOCATION: ASHLAND

DATE OF BID OPENING: _____

I, _____, authorized signatory of the above-referenced DBE firm hereby declare:
Print Name

1. My company is currently certified as a Disadvantaged Business Enterprise (DBE) by the Massachusetts Supplier Diversity Office ("SDO"), formerly known as the State Office of Minority and Women Business Assistance (SOMWBA), as a: (check all applicable, see Section 1 of the Special Provisions For Participation By Disadvantaged Business Enterprises, MassDOT Document 00719 additional guidance is available at Title 49, Code of Federal Regulations, Part 26.55 (49 CFR Part 26.55)):

   ( ) CONTRACTOR ( ) REGULAR DEALER ( ) BROKER
   ( ) MANUFACTURER ( ) TRUCKING OPERATIONS ( ) PROFESSIONAL SERVICES

2. My firm has the ability to manage, supervise and perform the activity described on page 2 of this Letter of Intent. If you are awarded the contract, my company intends to enter into a contract with your firm to perform the items of work or other activity described on the following sheet for the prices indicated.

3. There have been no changes affecting the ownership, control or independence of my company since my last certification review on _____ ___, 20___. If any such change is planned or occurs prior to my company's completion of this proposed work, I will give prior written notification to your firm and to the Massachusetts Department of Transportation ("MassDOT") Office of Civil Rights and SDO.

4. I have read the MassDOT proposal for the Project which may be entitled "Project Contract Documents and Special Provisions" or the draft "Contract" which includes MassDOT Document 00719, and acknowledge that my company will comply with that document and the requirements of 49 CFR Part 26.

5. For the purpose of obtaining subcontractor approval from MassDOT, my firm will provide to you:

   A. ***The following construction work:***
      (i) a resume, stating the qualifications and experience, of the superintendent or foreperson who will supervise on site-work;
      (ii) a list of equipment owned or leased by my firm for use on this project; and
      (iii) a list of all projects (public or private) upon which my firm is currently performing, is committed to perform, or intends to make a commitment to perform. I shall also include, for each project: the name and telephone number of a contact person for the contracting authority, person, or organization; the dollar value of the work; a description of the work; and my firm's work schedule for the project.

   B. ***The following services, materials or supplies***:
      (i) a written agreement and invoices for the materials or supplies, and any other documents evidencing the terms of providing such items;
      (ii) information concerning brokers fees and commissions for providing services or materials; and
      (iii) a statement concerning whether my firm intends or will be required to use a joint check arrangement; and any other documents that may be required by MassDOT.

_____ Date _____
DBE Company Authorized Signature

DISADVANTAGED BUSINESS ENTERPRISES (DBE) PARTICIPATION
LETTER OF INTENT
(To be completed by the DBE – Page 2 of 2)

DATE OF BID OPENING: _____

PROJECT NUMBER: 604123

FEDERAL AID PROJECT NUMBER: CMQ-003S(390), STP-003S(390) & TAP-003S(390)

PROJECT LOCATION: ASHLAND

PRIME BIDDER: _____

DBE COMPANY NAME: _____

Item number if applicable	NAICS Code	Description of Activity with notations such as Services, or Brokerage, Installation Only, Material Only, or Complete	Quantity	Unit Price	Amount
			TOTAL AMOUNT:		

Please give full explanations, attach additional sheets if necessary.

I HEREBY VERIFY THAT _____ WILL SOLELY
(DBE company name)
PERFORM THE WORK, OR PROVIDE THE SERVICES OR MATERIALS, AS DESCRIBED ABOVE.

DBE AUTHORIZED SIGNATURE: _____

NAME AND TITLE (PRINT): _____

TELEPHONE NUMBER: _____ FAX NUMBER: _____

EMAIL ADDRESS: _____

Rev'd 9/20/19

*** END OF DOCUMENT ***

DOCUMENT B00855

DBE JOINT CHECK ARRANGEMENT APPROVAL FORM

(to be submitted by Prime Contractor)

Contract No: 111717 **Project No:** 604123 **Federal Aid No:** CMQ/STP/TAP-003S(390)

Location: Ashland

Project Description: Roadway Reconstruction and Related Work along Route 126 (Pond Street)

We have received the attached request for the use of a joint check arrangement from _____, a DBE on the above- referenced Contract and _____, a Material Supplier/Vendor for the subject Contract. The DBE has complied with the requirements of 49 CFR Part 26.55(c)(1). In particular, the DBE has:

- a written agreement with the material supplier/vendor;
- applied for credit with the subject material supplier and has supplied the vendor's response;
- shown that it will place all orders to the subject material supplier/vendor;
- made and retains all decision-making responsibilities concerning the materials; and
- provided a Joint Check Agreement that is acceptable to MassDOT;

As the Contractor for the Project, we agree to issue joint checks (made payable to the Material Supplier/Vendor and the DBE) for payment of sums due pursuant to invoices from the Supplier/Vendor and DBE.

Contractor:

_____ _____
Company Name Signature
Duly Authorized

_____
Printed Name

_____ _____
Date Title

Subcontractor:

_____ _____
Company Name Signature
Duly Authorized

_____
Printed Name

_____ _____
Date Title

*** END OF DOCUMENT ***

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DOCUMENT B00856

JOINT VENTURE AFFIDAVIT

(All Firms)

- All Information Requested By This Schedule Must Be Answered. Additional Sheets May Be Attached.
- If, there is any change in the information submitted, the Joint Venture parties must inform MassDOT Pre-Qualifications Office (and, if one of the companies is a DBE, the Director of Contract Compliance, Office of Civil Rights) *prior* to such change, in writing, either directly or through the Prime Contractor if the Joint Venture is a subcontractor.
- If the Joint Venture Entity will be the bidder on a prime Contract, it must bid and submit all required documents (insurance, worker's compensation, bonds, etc.) in the name of the Joint Venture Entity.

I. Name of Joint Venture: _____

Type of Entity if applicable (Corp., LLC): _____ Filing State: _____

Address of joint venture: _____

_____

Phone No(s) for JV Entity: _____ E-mail: _____

Contact Person(s) _____

Tax ID/EIN of Joint Venture: _____ Vendor Code: _____

II. Identify each firm or party to the Joint Venture:

Name of Firm: _____

Address: _____

Phone: _____ E-mail: _____

Contact person(s) _____

Name of Firm: _____

Address: _____

Phone: _____ E-mail: _____

Contact Person(s) _____

III. Describe the role(s) of the each party to the Joint Venture:

_____

_____

IV. Attach a copy of the Joint Venture Agreement. The proposed Joint Venture Agreement should include specific details including, but not limited to: (1) the contributions of capital and equipment; (2) work items to be performed by each company's forces, (3) work items to be performed under the supervision of any DBE Venturer; (4) the commitment of management, supervisory and operative personnel employed by the DBE to be dedicated to the performance of the Project; and (5) warranty, guaranty, and indemnification clauses.

V. Attach any applicable Corporate or LLC Votes, Authorizations, etc.

VI. Ownership of the Joint Venture:

A. What is the percentage(s) of each company's ownership in the Joint Venture?

ownership percentage(s): _____

ownership percentage(s): _____

B. Specify percentages for each of the following (provide narrative descriptions and other detail as applicable):

1. Sharing of profit and loss: _____

2. Capital contributions:

(a) Dollar amounts of initial contribution: _____

(b) Dollar amounts of anticipated on-going contributions: _____

(c) Contributions of equipment (specify types, quality and quantities of equipment to be provided by each firm): _____

_____

4. Other applicable ownership interests, including ownership options or other agreements, which restrict or limit ownership and/or control:

_____

_____

5. Provide copies of all other written agreements between firms concerning bidding and operation of this Project or projects or contracts.

6. Identify all current contracts and contracts completed during the past two (2) years by either of the Joint Venture partners to this Joint Venture:

_____

_____

VII. Control of and Participation in the Joint Venture. Identify by name and firm those individuals who are, or will be, responsible for and have the authority to engage in the following management functions and policy decisions. (Indicate any limitations to their authority such as dollar limits and co-signatory requirements.):

A. Joint Venture check signing:

_____

_____

B. Authority to enter Contracts on behalf of the Joint Venture:

_____

_____

C. Signing, co-signing and/or collateralizing loans:

_____

_____

D. Acquisition of lines of credit:

E. Acquisition and indemnification of payment and performance bonds:

F. Negotiating and signing labor agreements:

G. Management of contract performance. *(Identify by name and firm only)*:

1. Supervision of field operations:
2. Major purchases:
3. Estimating:
4. Engineering:

VIII. Financial Controls of Joint Venture:

A. Which firm and/or individual will be responsible for keeping the books of account?

B. Identify the "Managing Partner," if any, and describe the means and measure of their compensation:

C. What authority does each firm have to commit or obligate the other to insurance and bonding companies, financing institutions, suppliers, subcontractors, and/or other parties participating in the performance of this Contract or the work of this Project?

IX. Personnel of Joint Venture: State the approximate number of personnel (by trade) needed to perform the Joint Venture's work under this Contract. Indicate whether they will be employees of the majority firm, DBE firm, or the Joint Venture.

	Firm 1 (number)	Firm 2 (number)	Joint Venture (number)
Trade			
Professional			
Administrative/Clerical			
Unskilled Labor			

Will any personnel proposed for this Project be employees of the Joint Venture?: _____

If so, who: _____

A. Are any proposed Joint Venture employees currently employed by either firm?

Employed by Firm 1: _____ Employed by firm 2 _____

B. Identify by name and firm the individual who will be responsible for Joint Venture hiring: ____

_____

X. Additional Information. Please state any material facts and additional information pertinent to the control and structure of this Joint Venture.

_____

_____

XI. AFFIDAVIT OF JOINT VENTURE PARTIES. The undersigned affirm that the foregoing statements and attached documents are correct and include all material information necessary to identify and explain the terms and operations of our Joint Venture and the intended participation of each firm in the undertaking. Further, the undersigned covenant and agree to provide to MassDOT current, complete and accurate information regarding actual Joint Venture work, payments, and any proposed changes to any provisions of the Joint Venture, or the nature, character of each party to the Joint Venture. We understand that any material misrepresentation will be grounds for terminating any Contract awarded and for initiating action under Federal or State laws concerning false statements.

Firm 1	Firm 2
Signature Duly Authorized	Signature Duly Authorized
Printed Name and Title	Printed Name and Title
Date	Date

*** END OF DOCUMENT ***