

IFB No. 27-13 Addendum No. 2



SPRINGFIELD WATER AND SEWER COMMISSION
SPRINGFIELD, MASSACHUSETTS
PLANS AND SPECIFICATIONS FOR CONSTRUCTION OF
SPRINGFIELD RESERVOIR CULVERT REPLACEMENT
PROJECT
SWSC Invitation for Bids No. 27-13

ADDENDUM NO. 2

Friday, October 16, 2026

I. **GENERAL**

This is an addendum to the above IFB. Special attention should be given to this addendum to preserve the validity of any bids submitted in response to this request. All Addenda must be acknowledged by indicating receipt on page 2 of Section 00300, Forms for General Bid. Failure to acknowledge this Addendum may subject the Bidder to disqualification.

This Addendum consists of 3 pages and associated attachments.

This addendum is comprised of the following:

Modification to Specifications
Modifications to Drawings
Responses to Bidder Questions
Attachments

II. **MODIFICATIONS TO SPECIFICATIONS**

A. SECTION 01290 – Application and Certificates of Payment:

- a. Replace the entire section with Attachment A. The revised section corrects Bid Item numbering; includes clearing and grubbing, selective tree trimming, and tree removal under Bid Items 2 and 20; includes temporary HMA pavement under Bid Items 2 and 20; and establishes measurement and payment for permanent HMA binder and top courses by the ton under Bid Items 11 and 29.

B. SECTION 02740 – Bituminous Concrete Pavement

- a. Section added in Attachment B.

III. **MODIFICATIONS TO DRAWINGS**

Replace the following sheets with the Sheets in Attachment C:

A. G-002 – Legend and General Notes

- a. Added site-access control, signage, gate-operation, gate-attendant/spotter, and Contractor-responsibility requirements

B. C-103 – Proposed Conditions Plan – Culvert 1

- a. Added beginning and ending stationing and coordinate information for Culvert 1

C. C-106 – Proposed Conditions Plan – Culvert 2

- a. Added beginning and ending stationing and coordinate information for Culvert 2

IV. ANSWERS TO BIDDER QUESTIONS

Question 1: Can the lengths of both culverts be provided? The stationing is not listed for the beginning and end of each culvert.

Response 1: Both proposed culverts have an estimated installed length of approximately 26 linear feet. Revised Sheet C-103 identifies the limits of Culvert 1 from approximately Station 0+19.50 to Station 0+45.50. Revised Sheet C-106 identifies the limits of Culvert 2 from approximately Station 0+39 to Station 0+65. The revised sheets also provide coordinate information for the beginning and end of each culvert.

Question 2: During the assumed construction period of late fall/early winter, is there any vendor or subcontractor working for SWSC that will need access through the construction areas or reservoir roadway?

Response 2: No other vendors or contractors working for SWSC are expected to require access through the active construction areas. SWSC owns the property and retains authority over access to the reservoir site. SWSC, Engineer, and other authorized personnel may require periodic access, which will be coordinated with the Contractor. The Contractor shall coordinate its operations to safely accommodate authorized access.

Question 3: Would a 3-foot-wide by 3-foot-high inside-dimension culvert be an acceptable alternate to the 3-foot-wide by 2-foot-high culvert shown?

Response 3: No. The 3-foot-wide by 2-foot-high clear opening shown in the Contract Documents shall be provided. A 3-foot-wide by 3-foot-high culvert will not be accepted as an alternate.

Question 4: The precast supplier states that the 3-foot-wide by 2-foot-high culvert cannot be manufactured in one piece and would need to consist of a precast base with a U-shaped upper section. Is this configuration acceptable?

Response 4: The specified 3-foot by 2-foot four-sided precast box culvert shall remain the basis of bid. The Contractor shall submit manufacturer-prepared shop drawings, connection and joint details, and supporting structural calculations signed and sealed by a Professional Engineer registered in Massachusetts. Final acceptance will be subject to review of the required submittals and will not constitute grounds for additional payment or an extension of Contract Time. If the specified box cannot be procured, the Contractor may submit an alternate configuration for review. Any alternate shall maintain the specified clear opening, shall not affect the finished elevations of the pathway, and shall include sealed shop drawings, joint details, and structural calculations demonstrating compliance with all loading, watertightness, and durability requirements. Approval is not guaranteed and shall not result in additional cost or Contract Time.

Question 5: The plans show several trees to be removed and branches that may require pruning for excavator or crane access. How will this Work be paid for?

Response 5: Clearing and grubbing, including selective tree trimming and removal necessary to complete the Work, shall be included under the following applicable lump-sum Bid items:

Bid Item 2 – Culvert 1 – Miscellaneous Work

Bid Item 20 – Culvert 2 – Miscellaneous Work

The Work includes the selective cutting, trimming, and removal of trees and branches; removal of brush, stumps, and major roots; handling or stockpiling of wood designated to remain the property of SWSC; and lawful disposal of remaining cleared materials, as shown on the Drawings and specified in Section 02230. No additional payments are allowed for any additional trees deemed necessary for removal during construction. These shall be pre-approved by the SWSC and considered part of the contractor's means and methods.

Section 01290 has been revised and reissued with this addendum to update Bid item numbering, and revised measurement and payment requirements.

Question 6: During removal of the existing culvert and installation of the replacement, may the active construction area be closed to pedestrian access?

Response 6: Yes. Public access, including pedestrian and bicycle access, shall be prohibited within the active construction area.

SWSC retains authority over access to the reservoir property. The Contractor shall control and secure the active construction area and shall provide and maintain temporary barriers, fencing, barricades, and weather-resistant signage necessary to prevent unauthorized entry.

Signs shall be located, at a minimum, at the reservoir property entrance, the existing access gate, each pedestrian or bicycle approach to the Work, and each end of the active construction area. Signs shall include the following messages, as applicable:

“CONSTRUCTION AREA – NO UNAUTHORIZED ENTRY”

“NO PEDESTRIAN ACCESS”

“DANGER – CONSTRUCTION EQUIPMENT”

The Contractor shall supplement these measures at other locations directed by SWSC. Revised Sheet G-002 will include the applicable site-access-control and signage requirements.

Question 7: May the existing gate and boulders at the north-side entrance be removed to accommodate larger trucks and crane access?

Response 7: No. The existing gate and boulders shall not be removed or relocated.

The measured clear width of the existing gate opening is approximately 14 feet 2 inches. This dimension is provided for informational purposes. The Contractor remains responsible for verifying existing access conditions and selecting construction means, methods, vehicles, and equipment suitable for those conditions.

The gate may be opened when required for authorized construction access but shall not be left open unattended. Whenever the gate is open and Contractor vehicles or equipment are entering or leaving the property, the Contractor shall provide a designated gate attendant/spotter to control construction traffic, prevent unauthorized entry into the active construction area, and assist with safe vehicle movements. The gate shall be closed and secured following each use unless otherwise directed by SWSC.

All barriers, signage, access-control measures, gate attendants, and spotters required for the Work shall be considered incidental to the Contract Work, and no separate payment will be made.

Sincerely,



Edward J. Sweeney, Chief Procurement Officer
Springfield Water and Sewer Commission

END OF ADDENDUM NO. 2 (not including attachments)

Attachment A

SECTION 01290

APPLICATION AND CERTIFICATES FOR PAYMENT

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Definition and description of measurement and payment to be used for the Work
 - 2. Payment procedures
 - 3. Payment requests for stored materials
- B. Related Requirements
 - 1. Section 01295 - Schedule of Values

1.2 GENERAL

- A. The following paragraphs describe payment procedures for the work to be done under the respective items in the Bid Form.
- B. Each lump sum and unit price will be deemed to include an amount considered by the Contractor to be adequate to cover the Contractor's overhead and profit for each separately identified item.
- C. Except as provided for in Section 01295, no separate measurement or payment will be made for Work called for in Division 0 or Division 1 of the Contract Specifications, unless specifically covered under the Bid items listed below. All costs associated with this Work will be considered incidental to the Contract Bid price.
- D. Division 2 through Division 3 Work will be measured and paid for at the Contractor's unit Bid price or lump sum Bid price as indicated on the Bid form. Those payable Work items, and related prices as Bid, will be the basis for all compensation to the Contractor for Work performed under this Contract. Work not specifically included as a Bid item, but which is required to properly and satisfactorily complete the Work is considered ancillary and incidental to the Bid item Work, and payment for such Work is considered to be included in the values as Bid for payable items. Compensation for all unit Bid price Work will be made based on the measured quantity of Work under the appropriate Bid items.

1.3 CULVERT 1 - LUMP SUM ITEMS

- A. Each lump sum price stated in the Bid form shall constitute full compensation for all labor, equipment and materials necessary and required to complete the work specified under that particular item, and also all costs for doing related work as set forth in the Contract Documents or implied in carrying out their intent.
- B. Item 1 – Culvert 1 – Mobilization and Demobilization
 - 1. Measurement

- a. There will be no measurement for the mobilization and demobilization to the Site as this Work will be on a lump sum basis.
 - 2. Payment
 - a. Payment of the lump sum Bid price will be paid in two equal installments. The first installment will occur at the time the first payment requisition is submitted after the Contractor has initiated full-time construction activity. The second installment will be paid when the Contractor has completed all construction activity including final cleanup and punchlist items. In no case will the cost for these items exceed 5 percent of the subtotal price.
- C. Item 2 – Culvert 1 - Springfield Reservoir Culvert Replacement – Miscellaneous Work
- 1. Measurement
 - a. There will be no measurement of quantities for lump sum items. Periodic partial payments for this Work, included under the Agreement, shall be based on the percent completion of each work item listed in the Schedule of Values provided under Section 01295 estimated by the Contractor and approved by the Engineer.
 - 2. Payment
 - a. The lump sum payment shall be full compensation for furnishing all labor, materials, required signage, tools, equipment, and services necessary for the construction of the Springfield Reservoir Culvert Replacement, excluding Items 3 through 15, in its entirety as detailed in the Contract Documents.
 - b. This item includes clearing and grubbing, selective trimming, and removal of trees and vegetation required for the Culvert 1 Work, as shown on the Drawings and specified in Section 02230. It includes removal of associated brush, stumps, roots, limbs, and debris; stockpiling of wood designated by SWSC to remain its property; and lawful disposal of remaining cleared material. Removal of additional trees requires SWSC approval.
 - c. This item includes furnishing, placing, compacting, maintaining, removing, and lawfully disposing of temporary HMA pavement required during the 90-day settlement period. Temporary HMA pavement shall not be measured or paid for separately.
- D. Item 3 – Culvert 1 - Demolition
- 1. Measurement
 - a. There will be no measurement for demolition as this Work will be on a lump sum basis. Periodic partial payments for this Work, included under the Agreement, shall be based on the percent completion of demolition work as listed in the Schedule of Values provided under Section 01295 estimated by the Contractor and approved by the Engineer.
 - 2. Payment

- a. Payment of the lump sum Bid price will be full compensation for all labor, equipment and materials required for or incidental to the demolition Work. Demolition work includes but is not limited to the demolition of the existing culvert, stone walls, and associated items.
- E. Item 4 – Culvert 1 - Wetlands Restoration
 - 1. Measurement
 - a. There will be no measurement for wetlands restoration as this Work will be on a lump sum basis.
 - 2. Payment
 - a. Payment of the lump sum Bid price will be full compensation for all labor, equipment and materials required for or incidental to the wetlands restoration Work. Wetlands restoration work includes providing erosion control blankets in wetland restoration areas, wetland plantings and seed mixture, as well as associated permit requirements, as shown on the Drawings and outlined in Specification Section 02670.
 - b. Payments will be made on a monthly basis as a percentage of the lump sum Bid and the amount of Work for that particular month.
- F. Item 5 – Culvert 1 - Headwalls
 - 1. Measurement
 - a. There will be no measurement for the headwalls (both upstream and downstream ends) as this Work will be on a lump sum basis. Periodic partial payments for this Work, included under the Agreement, shall be based on the percent completion of the headwalls installation work as listed in the Schedule of Values provided under Section 01295 estimated by the Contractor and approved by the Engineer.
 - 2. Payment
 - a. Payment of the lump sum Bid price will be full compensation for all labor, equipment and materials required for or incidental to installing both headwalls as show on the Drawings and outlined in the Specifications.
- G. Item 6 – Culvert 1 – Stream Bypass
 - 1. Measurement
 - a. Measurement for stream bypass will be on a Lump Sum basis.
 - 2. Payment
 - a. Payment of the Bid price for stream bypass will be full compensation for all labor, equipment, and materials required for or incidental to bypassing the stream as shown on the drawings and outlined in the specifications.

1.4 CULVERT 1 - UNIT PRICE ITEMS

- A. Each unit price stated in the Bid form shall constitute full compensation for all labor, equipment and materials necessary and required to complete the Work specified under that particular item, and also all costs for doing related work as set forth in the Contract Documents or implied in carrying out their intent.
- B. Payment of the unit price items will only be made for the actual quantity of Work performed in accordance with the Contract Documents.
- C. Item 7 - Culvert 1 – 6-ft. W x 5 ft H Precast Concrete Box Culvert (w/stone lining)
 - 1. Measurement
 - a. Measurement for the installation of 6-foot wide by 5-foot high box culvert will be on a linear foot basis.
 - 2. Payment
 - a. Payment of the Bid price for 6-foot wide by 5-foot high box culvert will be full compensation for providing the culvert, including dewatering, temporary shoring (if necessary), excavation, backfilling and compaction for the culvert construction, and all labor, equipment, and materials required for or incidental to the Work.
- D. Item 8 – Culvert 1 - Ordinary Borrow
 - 1. Measurement
 - a. Measurement for ordinary borrow will be on a cubic yard basis. The depth of ordinary borrow will be actual depth placed in the completed Work, but in no case will this exceed the depth approved by the Engineer.
 - 2. Payment
 - a. Payment of the Bid price for ordinary borrow will be full compensation for furnishing, hauling, placing, spreading, and compacting, and includes all labor, equipment, and materials required for or incidental to the Work.
- E. Item 9 – Culvert 1 - Processed Gravel Borrow
 - 1. Measurement
 - a. Measurement for processed gravel borrow will be on a cubic yard basis. The depth of processed gravel borrow shall be the actual depth placed in the completed Work, but in no case shall this exceed the depth approved by the Engineer.
 - 2. Payment
 - a. Payment of the Bid price for processed gravel borrow will be full compensation for furnishing, hauling, placing, spreading, and compacting, and include all labor, equipment and materials required for or incidental to the Work.
- F. Item 10 – Culvert 1 – Road - Gravel Base, Compacted

1. Measurement
 - a. Measurement for road gravel base will be on a cubic yard basis. Measurement will be based on the actual compacted volume of the specified material placed within the lines and grades shown on the Drawings or approved by the Engineer.
2. Payment
 - a. Payment of the Bid price for road gravel base will be full compensation for furnishing, hauling, placing, spreading, and compacting, and includes all labor, equipment, and materials required for or incidental to the Work.

G. Item 11 – Culvert 1 - Road – Asphalt

1. Measurement
 - a. Permanent HMA binder course and top course will be measured by the ton. The measured quantity shall be the actual weight of permanent HMA incorporated into the accepted Work, based on certified plant delivery tickets. Delivery tickets shall identify the applicable culvert location and pavement course. Temporary HMA pavement shall not be included in the measured quantity under this item.
2. Payment
 - a. Payment at the applicable unit price per ton shall constitute full compensation for furnishing and delivering permanent HMA binder and top courses; preparing pavement surfaces; furnishing and applying tack coat and joint adhesive; placing, spreading, and compacting HMA; performing required testing; repairing pavement-core locations; and furnishing all labor, materials, tools, and equipment required or incidental to the Work.

H. Item 12 – Culvert 1 – Guard Rail

1. Measurement
 - a. Measurement for guard rail will be on a linear foot basis. The length of guard rail will be actual length provided, but in no case will this exceed the length approved by the Engineer.
2. Payment
 - a. Payment of the Bid price for guard rail will be full compensation for all labor, equipment, and materials required for or incidental to the Work.

I. Item 13 – Culvert 1 – Loam & Seed/Surface Restoration

1. Measurement

- a. Measurement for loam & seed/surface restoration will be on a square yard basis. Measurement will be based on the actual approved area restored, measured in square yards.
 - 2. Payment
 - a. Payment of the Bid price for loam & seed/surface restoration will be full compensation for all labor, equipment, and materials required for or incidental to the Work.
- J. Item 14 – Culvert 1 - Straw Wattles
- 1. Measurement
 - a. Measurement for straw wattles will be on a linear foot basis. The length of straw wattles will be the actual approved length of straw wattles and siltation fence measured in place by the Engineer.
 - 2. Payment
 - a. Payment of the Bid price for straw wattles will be full compensation for the installation and removal of the straw wattles, and the restoration of the area disturbed by their placement including all labor, equipment and materials required for or incidental to the Work.
- K. Item 15 – Culvert 1 - Rock Excavation
- 1. Measurement
 - a. Measurement for rock excavation will be on a cubic yard basis as measured in the field by the Engineer.
 - b. Rock with earth overburden shall be stripped of earth and exposed so that the rock can be profiled prior to removal. Excavation between the surface and the top of rock will be paid for under the lump sum item.
 - 2. Payment
 - a. Payment of the bid price for rock excavation will be full compensation for all excavation, backfill, compaction, removal and proper off-site disposal of the material, and all labor, equipment and materials required for or incidental to the work.
 - b. Boulders less than 1 cubic yard will be paid for as part of the miscellaneous work lump sum item and will not be paid for as part of rock excavation.
 - c. Payment for rock excavation will be at the bid price regardless of the depth at which it is encountered.
- L. Item 16 – Culvert 1 - Monthly Price Adjustment For Gasoline
- 1. Measurement
 - a. This Contract contains a price adjustment for gasoline. The value provided in the Bid Form is an allowance for budgeting purposes only.

The value is neither a limit nor a guarantee of payment. Payment to the Contractor for increases in the price of gasoline, or credits due to the Owner for decreases in the price of gasoline, will be determined in accordance with the following procedure.

- 1) The Base Price for gasoline for this Project is outlined in Section 00100, Instructions to Bidders.
 - 2) The price adjustment shall be based on the variance in price for gasoline from the Base Price to the Period Price and shall occur on a monthly basis.
 - 3) The Period Price shall be as published by the Massachusetts Department of Transportation for the calendar month in which the Work was completed.
 - 4) The price adjustment will be determined by multiplying the number of cubic yards of excavation, borrow, and asphalt paid during each one-month period by 0.15 gallons per cubic yard, multiplied by the variance in price between Base Price and Period Price of gasoline.
 - 5) The price adjustment will be paid only if the variance of the Period Price from the Base Price is 5 percent or more for a given month. The adjustment will be paid with no deduction of the 5 percent from either upward or downward adjustments.
- b. No price adjustments will be made for Work completed beyond the date of Final Completion.

M. Item 17 – Culvert 1 - Monthly Price Adjustment For Diesel Fuel

1. Measurement

- a. This Contract contains a price adjustment for diesel fuel. The value provided in the Bid Form is an allowance for budgeting purposes only. The value is neither a limit nor a guarantee of payment. Payment to the Contractor for increases in the price of diesel fuel, or credits due to the Owner for decreases in the price of diesel fuel, will be determined in accordance with the following procedure.
- 1) The Base Price for diesel fuel for this Project is outlined in Section 00100, Instructions to Bidders.
 - 2) The price adjustment shall be based on the variance in price for diesel fuel from the Base Price to the Period Price and shall occur on a monthly basis.
 - 3) The Period Price shall be as published by the Massachusetts Department of Transportation for the calendar month in which the Work was completed.
 - 4) The price adjustment will be determined by multiplying the number of cubic yards of excavation, borrow, and asphalt paid

during each one-month period by 0.29 gallons per cubic yard, and adding that to the tons of hot mix asphalt (as defined in the next paragraph) paid during each one-month period by 2.90 gallons per ton. The total number of gallons calculated shall then be multiplied by the variance in price between Base Price and Period Price of diesel fuel.

- 5) The price adjustment will be paid only if the variance of the Period Price from the Base Price is 5 percent or more for a given month. The adjustment will be paid with no deduction of the 5 percent from either upward or downward adjustments.

- b. No price adjustments will be made for Work completed beyond the date of Final Completion.

N. Item 18 – Culvert 1 - Monthly Price Adjustment For Portland Cement In Concrete

1. Measurement

- a. This Contract contains a price adjustment for Portland cement contained in cast-in-place concrete. The value provided in the Bid Form is an allowance for budgeting purposes only. The value is neither a limit nor a guarantee of payment. Payment to the Contractor for increases in the price of Portland cement, or credits due to the Owner for decreases in the price of Portland cement, will be determined in accordance with the following procedure.
 - 1) The Base Price for Portland cement for this Project is outlined in Section 00100, Instructions to Bidders.
 - 2) The price adjustment shall be based on the variance in price for the Portland cement component only of cast-in-place concrete from the Base Price to the Period Price. It shall not include transportation or other charges. The price adjustment shall occur on a monthly basis.
 - 3) The Period Price shall be as published by the Massachusetts Department of Transportation for the calendar month in which the Work was completed.
 - 4) The Contract price adjustment will be paid only for the Portland cement component of cast-in-place concrete paid under the following Items: Concrete Footings and Headwalls.
 - 5) For the aforementioned items subject to the Contract price adjustment, the Portland cement content of cast-in-place concrete mixtures shall be calculated based on 0.305 tons of Portland cement per cubic yard of cast-in-place concrete, regardless of actual Portland cement content of individual concrete mix designs.
 - 6) The price adjustment will be determined by multiplying the number of cubic yards of cast-in-place concrete paid during each one-month period by the Portland cement content, times the

variance in price between Base Price and Period Price of Portland cement.

- 7) The price adjustment will be paid only if the variance of the Period Price from the Base Price is 5 percent or more for a given month. The adjustment will be paid with no deduction of the 5 percent from either upward or downward adjustments.
- b. No price adjustments will be made for Work completed beyond the date of Final Completion.

1.5 CULVERT 2 – LUMP SUM ITEMS

A. Item 19 – Culvert 2 - Mobilization and Demobilization

1. Measurement

- a. There will be no measurement for the mobilization and demobilization to the Site as this Work will be on a lump sum basis.

2. Payment

- a. Payment of the lump sum Bid price will be paid in two equal installments. The first installment will occur at the time the first payment requisition is submitted after the Contractor has initiated full-time construction activity. The second installment will be paid when the Contractor has completed all construction activity including final cleanup and punchlist items. In no case will the cost for these items exceed 5 percent of the subtotal price.

B. Item 20 – Culvert 2 - Springfield Reservoir Culvert Replacement – Miscellaneous Work

1. Measurement

- a. There will be no measurement of quantities for lump sum items. Periodic partial payments for this Work, included under the Agreement, shall be based on the percent completion of each work item listed in the Schedule of Values provided under Section 01295 estimated by the Contractor and approved by the Engineer.

2. Payment

- a. The lump sum payment shall be full compensation for furnishing all labor, materials, required signage, tools, equipment, and services necessary for the construction of the Springfield Reservoir Culvert Replacement, excluding Items 21 through 33, in its entirety as detailed in the Contract Documents.
- b. This item includes clearing and grubbing, selective trimming, and removal of trees and vegetation required for the Culvert 2 Work, as shown on the Drawings and specified in Section 02230. It includes removal of associated brush, stumps, roots, limbs, and debris; stockpiling of wood designated by SWSC to remain its property; and

lawful disposal of remaining cleared material. Removal of additional trees requires SWSC approval.

- c. This item includes furnishing, placing, compacting, maintaining, removing, and lawfully disposing of temporary HMA pavement required during the 90-day settlement period. Temporary HMA pavement shall not be measured or paid for separately.

C. Item 21 – Culvert 2 - Demolition

1. Measurement

- a. There will be no measurement for demolition as this Work will be on a lump sum basis. Periodic partial payments for this Work, included under the Agreement, shall be based on the percent completion of demolition work as listed in the Schedule of Values provided under Section 01295 estimated by the Contractor and approved by the Engineer.

2. Payment

- a. Payment of the lump sum Bid price will be full compensation for all labor, equipment and materials required for or incidental to the demolition Work. Demolition work includes but is not limited to the demolition of the existing culvert, stone walls, and associated items.

D. Item 22 – Culvert 2 - Wetlands Restoration

1. Measurement

- a. There will be no measurement for wetlands restoration as this Work will be on a lump sum basis.

2. Payment

- a. Payment of the lump sum Bid price will be full compensation for all labor, equipment and materials required for or incidental to the wetlands restoration Work. Wetlands restoration work includes providing erosion control blankets in wetland restoration areas, wetland plantings and seed mixture, as well as associated permit requirements, as shown on the Drawings and outlined in Specification Section 02670.
- b. Payments will be made on a monthly basis as a percentage of the lump sum Bid and the amount of Work for that particular month.

E. Item 23 – Culvert 2 - Headwalls

1. Measurement

- a. There will be no measurement for the headwalls (both upstream and downstream ends) as this Work will be on a lump sum basis. Periodic partial payments for this Work, included under the Agreement, shall be based on the percent completion of the headwalls installation work as listed in the Schedule of Values provided under Section 01295 estimated by the Contractor and approved by the Engineer.

2. Payment

- a. Payment of the lump sum Bid price will be full compensation for all labor, equipment and materials required for or incidental to installing both headwalls as show on the Drawings and outlined in the Specifications.

F. Item 24 – Culvert 2 – Stream Bypass

1. Measurement

- a. Measurement for stream bypass will be on a Lump Sum basis.

2. Payment

- a. Payment of the Bid price for stream bypass will be full compensation for all labor, equipment, and materials required for or incidental to bypassing the stream as shown on the drawing and outlined in the specifications.

1.6 CULVERT 2 - UNIT PRICE ITEMS

- A. Each unit price stated in the Bid form shall constitute full compensation for all labor, equipment and materials necessary and required to complete the Work specified under that particular item, and also all costs for doing related work as set forth in the Contract Documents or implied in carrying out their intent.

- B. Payment of the unit price items will only be made for the actual quantity of Work performed in accordance with the Contract Documents.

C. Item 25 – Culvert 2 – 3-ft. W x 2 ft H Precast Concrete Box Culvert (no stone lining)

1. Measurement

- a. Measurement for the installation of 3-foot wide by 2-foot high box culvert will be on a linear foot basis.

2. Payment

- a. Payment of the Bid price for 3-foot wide by 2-foot high box culvert will be full compensation for providing the culvert, including dewatering, temporary shoring (if necessary), excavation, backfilling and compaction for the culvert construction, and all labor, equipment, and materials required for or incidental to the Work.

D. Item 26 – Culvert 2 - Ordinary Borrow

1. Measurement

- a. Measurement for ordinary borrow will be on a cubic yard basis. The depth of ordinary borrow will be actual depth placed in the completed Work, but in no case will this exceed the depth approved by the Engineer.

2. Payment

- a. Payment of the Bid price for ordinary borrow will be full compensation for furnishing, hauling, placing, spreading, and compacting, and includes all labor, equipment, and materials required for or incidental to the Work.

E. Item 27 – Culvert 2 - Processed Gravel Borrow

1. Measurement

- a. Measurement for processed gravel borrow will be on a cubic yard basis. The depth of processed gravel borrow shall be the actual depth placed in the completed Work, but in no case shall this exceed the depth approved by the Engineer.

2. Payment

- a. Payment of the Bid price for processed gravel borrow will be full compensation for furnishing, hauling, placing, spreading, and compacting, and include all labor, equipment and materials required for or incidental to the Work.

F. Item 28 – Culvert 2 – Road - Gravel Base

1. Measurement

- a. Measurement for road gravel base will be on a cubic yard basis. Measurement will be based on the actual compacted volume of the specified material placed within the lines and grades shown on the Drawings or approved by the Engineer.

2. Payment

- a. Payment of the Bid price for road gravel base will be full compensation for furnishing, hauling, placing, spreading, and compacting, and includes all labor, equipment, and materials required for or incidental to the Work.

G. Item 29 – Culvert 2 - Road – Asphalt

1. Measurement

- a. Permanent HMA binder course and top course will be measured by the ton. The measured quantity shall be the actual weight of permanent HMA incorporated into the accepted Work, based on certified plant delivery tickets. Delivery tickets shall identify the applicable culvert location and pavement course. Temporary HMA pavement shall not be included in the measured quantity under this item.

2. Payment

- a. Payment at the applicable unit price per ton shall constitute full compensation for furnishing and delivering permanent HMA binder and top courses; preparing pavement surfaces; furnishing and applying tack coat and joint adhesive; placing, spreading, and compacting HMA;

performing required testing; repairing pavement-core locations; and furnishing all labor, materials, tools, and equipment required or incidental to the Work.

H. Item 30 – Culvert 2 - Guard Rail

1. Measurement

- a. Measurement for guard rail will be on a linear foot basis. The length of guard rail will be actual length provided, but in no case will this exceed the length approved by the Engineer.

2. Payment

- a. Payment of the Bid price for guard rail will be full compensation for all labor, equipment, and materials required for or incidental to the Work.

I. Item 31 – Culvert 2 – Loam & Seed/Surface Restoration

1. Measurement

- a. Measurement for loam & seed/surface restoration will be on a square yard basis. Measurement will be based on the actual approved area restored, measured in square yards.

2. Payment

- a. Payment of the Bid price for loam & seed will be full compensation for furnishing, hauling, placing, spreading, and compacting, and includes all labor, equipment, and materials required for or incidental to the Work.

J. Item 32 – Culvert 2 - Straw Wattles

1. Measurement

- a. Measurement for straw wattles will be on a linear foot basis. The length of straw wattles will be the actual approved length of straw wattles and measured in place by the Engineer.

2. Payment

- a. Payment of the Bid price for straw wattles will be full compensation for the installation and removal of the straw wattles, and the restoration of the area disturbed by their placement including all labor, equipment and materials required for or incidental to the Work.

K. Item 33 – Culvert 2 - Rock Excavation

1. Measurement

- a. Measurement for rock excavation will be on a cubic yard basis as measured in the field by the Engineer.
- b. Rock with earth overburden shall be stripped of earth and exposed so that the rock can be profiled prior to removal. Excavation between the surface and the top of rock will be paid for under the lump sum item.

2. Payment

- a. Payment of the bid price for rock excavation will be full compensation for all excavation, backfill, compaction, removal and proper off-site disposal of the material, and all labor, equipment and materials required for or incidental to the work.
- b. Boulders less than 1 cubic yard will be paid for as part of the miscellaneous work lump sum item and will not be paid for as part of rock excavation.
- c. Payment for rock excavation will be at the bid price regardless of the depth at which it is encountered.

L. Item 34 – Culvert 2 - Monthly Price Adjustment For Gasoline

1. Measurement

- a. This Contract contains a price adjustment for gasoline. The value provided in the Bid Form is an allowance for budgeting purposes only. The value is neither a limit nor a guarantee of payment. Payment to the Contractor for increases in the price of gasoline, or credits due to the Owner for decreases in the price of gasoline, will be determined in accordance with the following procedure.
 - 1) The Base Price for gasoline for this Project is outlined in Section 00100, Instructions to Bidders.
 - 2) The price adjustment shall be based on the variance in price for gasoline from the Base Price to the Period Price and shall occur on a monthly basis.
 - 3) The Period Price shall be as published by the Massachusetts Department of Transportation for the calendar month in which the Work was completed.
 - 4) The price adjustment will be determined by multiplying the number of cubic yards of excavation, borrow, and asphalt paid during each one-month period by 0.15 gallons per cubic yard, multiplied by the variance in price between Base Price and Period Price of gasoline.
 - 5) The price adjustment will be paid only if the variance of the Period Price from the Base Price is 5 percent or more for a given month. The adjustment will be paid with no deduction of the 5 percent from either upward or downward adjustments.
- b. No price adjustments will be made for Work completed beyond the date of Final Completion.

M. Item 35 – Culvert 2 - Monthly Price Adjustment For Diesel Fuel

1. Measurement

- a. This Contract contains a price adjustment for diesel fuel. The value provided in the Bid Form is an allowance for budgeting purposes only. The value is neither a limit nor a guarantee of payment. Payment to the Contractor for increases in the price of diesel fuel, or credits due to the Owner for decreases in the price of diesel fuel, will be determined in accordance with the following procedure.
 - 1) The Base Price for diesel fuel for this Project is outlined in Section 00100, Instructions to Bidders.
 - 2) The price adjustment shall be based on the variance in price for diesel fuel from the Base Price to the Period Price and shall occur on a monthly basis.
 - 3) The Period Price shall be as published by the Massachusetts Department of Transportation for the calendar month in which the Work was completed.
 - 4) The price adjustment will be determined by multiplying the number of cubic yards of excavation, borrow, and asphalt paid during each one-month period by 0.29 gallons per cubic yard, and adding that to the tons of hot mix asphalt (as defined in the next paragraph) paid during each one-month period by 2.90 gallons per ton. The total number of gallons calculated shall then be multiplied by the variance in price between Base Price and Period Price of diesel fuel.
 - 5) The price adjustment will be paid only if the variance of the Period Price from the Base Price is 5 percent or more for a given month. The adjustment will be paid with no deduction of the 5 percent from either upward or downward adjustments.
- b. No price adjustments will be made for Work completed beyond the date of Final Completion.

N. Item 36 – Culvert 2 - Monthly Price Adjustment For Portland Cement In Concrete

1. Measurement

- a. This Contract contains a price adjustment for Portland cement contained in cast-in-place concrete. The value provided in the Bid Form is an allowance for budgeting purposes only. The value is neither a limit nor a guarantee of payment. Payment to the Contractor for increases in the price of Portland cement, or credits due to the Owner for decreases in the price of Portland cement, will be determined in accordance with the following procedure.
 - 1) The Base Price for Portland cement for this Project is outlined in Section 00100, Instructions to Bidders.
 - 2) The price adjustment shall be based on the variance in price for the Portland cement component only of cast-in-place concrete from the Base Price to the Period Price. It shall not include

transportation or other charges. The price adjustment shall occur on a monthly basis.

- 3) The Period Price shall be as published by the Massachusetts Department of Transportation for the calendar month in which the Work was completed.
 - 4) The Contract price adjustment will be paid only for the Portland cement component of cast-in-place concrete paid under the following Items: Concrete Footings and Headwalls.
 - 5) For the aforementioned items subject to the Contract price adjustment, the Portland cement content of cast-in-place concrete mixtures shall be calculated based on 0.305 tons of Portland cement per cubic yard of cast-in-place concrete, regardless of actual Portland cement content of individual concrete mix designs.
 - 6) The price adjustment will be determined by multiplying the number of cubic yards of cast-in-place concrete paid during each one-month period by the Portland cement content, times the variance in price between Base Price and Period Price of Portland cement.
 - 7) The price adjustment will be paid only if the variance of the Period Price from the Base Price is 5 percent or more for a given month. The adjustment will be paid with no deduction of the 5 percent from either upward or downward adjustments.
- b. No price adjustments will be made for Work completed beyond the date of Final Completion.

1.7 PAYMENT PROCEDURES

A. Informal submittal: Unless otherwise directed by the Engineer:

1. Make an informal submittal of request for payment by filling in, electronically (in Excel® format) pertinent portions of EJCDC C-620, Contractor's Application for Payment, plus continuation sheet or sheets.
2. Make this preliminary submittal to the Engineer at the last regular job meeting of each month.
3. Revise the preliminary submittal as approved by the Engineer and incorporate the approved payments into the formal submittal.

B. Formal submittal: Unless otherwise directed by the Engineer:

1. Make formal submittal of request for payment by filling in the agreed data, by typewriter or electronically on EJCDC C-620, Contractor's Application for Payment, plus continuation sheet or sheets.
2. Sign and notarize the Application for Payment.

3. Submit the original of the Application for Payment, plus six identical copies of the continuation sheet or sheets, to the Engineer.
4. The Engineer will compare the formal submittal with the approved informal submittal and, if acceptable, will sign the Contractor's Application for Payment, and present the Application to the Owner.
5. Provide a signed and notarized Certificate for Stored Materials and proof of storage in a dry, watertight, heated and insured warehouse facility.

C. Retainage

1. A 5% retainage amount shall be withheld from each Request for Payment.
2. The retainage amount may be lowered to 1% after Substantial Completion of the Project.
3. Upon completion of the project activities and after demobilization, the Contractor's last Request for Payment shall include the retainage amount.

1.8 PAYMENT REQUESTS FOR STORED MATERIALS

- A. No payment for materials stored off-site will be paid to the Contractor unless approved by the Owner.
- B. Requests for payment for stored materials shall be made in accordance with Section 00700 and shall be accompanied by the attached "Certificate for Stored Materials" form. Payment for stored materials shall not exceed the value actually paid by the Contractor for the stored materials as evidenced by the accompanying bill of sale, invoice, or other documentation. Final payment shall be made upon delivery to the project site and acceptance by the Engineer.
- C. Request for payments for stored materials on-site shall follow the same procedures and may be approved for the full paid amount if accepted by the Engineer.
- D. Partial payment requests for materials stored or so-called "engineering costs" by equipment manufacturers will not be allowed. All such costs shall be distributed proportionately among the various items of equipment/hardware to be furnished.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

J:\S\S2057 SWSC\062 - Ludlow Reservoir Culvert Replacements\Design\Specifications\Div 1\01290 - Application and Certificate for Payment.docx

CERTIFICATE FOR STORED MATERIALS_____
Tighe & Bond Project No.

We, _____, request payment for materials and/or equipment not incorporated in the work included under our firm's contract with _____ as listed below.

We hereby certify under penalty of perjury, that the materials not incorporated in the work have been delivered and are securely stored at the site or at _____ and that we have title to said materials free and clear of all Liens, as evidenced by the attached bill of sale, invoice, or other documentation.

We also certify that an inventory of said materials and/or equipment has been compiled for the purposes of this monthly partial payment request. This list of materials and/or equipment, including unit prices for said material not incorporated in the work for which payment is hereby requested, consisting of _____ pages and dated _____, is signed and attached hereto.

We acknowledge that payments made based on this request for materials and/or equipment not incorporated in the work does not relieve the contractor of its responsibility for furnishing all materials and equipment required for the satisfactory completion of the project pursuant to the contractual requirements.

We further certify that we can and will adequately protect said materials and/or equipment until they are incorporated in the work; that they meet the requirements of the specifications, and that they will be needed for incorporation in the work in the near future.

IN WITNESS WHEREOF, we, the said _____ h-
ereunto set our hand and seal this _____ day of _____, 20__.

Contractor's Firm Name

SIGNED, SEALED AND DELIVERED IN THE PRESENCE OF

By _____

Title _____

Notary Public

SCHEDULE OF STORED MATERIALS

Job No. _____
Contract No. _____
Contractor: _____
Location: _____

Date _____
Pay Estimate _____

Item	Description	Supplier/Manufacturer	Quantity Stored and not Incorporated	Unit \$	Certified Value

Signature: _____
Contractor's Principal

Total Amount Due for Stored Materials _____

Title: _____

Attachment B

SECTION 02740

HOT MIX ASPHALT (HMA) PAVEMENT

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Temporary HMA pavement during the required settlement period.
 - 2. Permanent HMA pavement restoration at Culverts 1 and 2, including binder and top courses, tack coat, pavement joints, placement, compaction, and testing, as shown on Sheets C-103, C-106, and C-502
- B. For the purposes of this Section, Hot Mix Asphalt (HMA) and bituminous concrete have the same meaning.
- C. Related Requirements
 - 1. Section 02315 – Excavation, Backfill, Compaction and Dewatering

1.2 REFERENCES

- A. Commonwealth of Massachusetts Department of Transportation – Highway Division "Standard Specifications for Highways and Bridges," Current Edition
- B. ASTM D2041 - Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
- C. AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing, Current Edition, as amended
- D. AASHTO M 320
- E. AASHTO T 96 – L.A. Abrasion Test
- F. AASHTO T 195 (Ross Count)
- G. AASHTO R 90 Sampling of Asphalt Materials
- H. AASHTO R 97 Sampling of Bituminous Paving Mixtures
- I. AASHTO M 81 Standard Specification for Cutback Asphalt (Rapid-Curing Type)
- J. AASHTO M 82 Standard Specification for Cutback Asphalt (Medium Curing Type)
- K. AASHTO R 26 Standard Practice for Certifying Suppliers of Performance-Graded Asphalt Binders

1.3 SUBMITTALS

- A. Submit the current MassDOT-approved Job Mix Formula (JMF) for each HMA mixture proposed for temporary and permanent pavement. Identify the mixture proposed for each pavement course.

- B. Submit certification that each proposed HMA production facility conforms to MassDOT Section M3.12.0 and is currently listed on the applicable MassDOT Qualified Construction Materials List.
- C. Submit product data for tack coat, joint adhesive, additives, and other asphalt products proposed for the Work.
- D. Submit a list of paving and compaction equipment proposed for the Work.
- E. Submit a project-specific paving and quality-control plan at least 15 days before paving. Include the proposed production facilities and mixtures, paving schedule and sequence, material transportation, surface preparation, placement procedures, compaction equipment and roller pattern, temperature monitoring, testing procedures, and cold-weather provisions, if applicable.
- F. Provide certified plant delivery tickets for each load of HMA delivered to the Project. Tickets shall identify the production facility, mixture designation, load weight, date, and loading and delivery times.
- G. Submit plant-produced test results for each HMA mixture placed, including asphalt content, aggregate gradation, and theoretical maximum density. Submit field density and pavement-core test results required by this Section.
- H. Provide aggregate source and test information, including sieve analyses and L.A. abrasion results, when requested by the Engineer.
- I. HMA materials shall not be incorporated into the Work until the required submittals have been reviewed by the Engineer.

1.4 QUALITY ASSURANCE

- A. Prior to placing permanent HMA, hold a pre-paving meeting at the Site. All parties directly involved in the preparation and placement of permanent HMA on the Project shall attend, including but not limited to: the paving subcontractor(s) project manager(s), QC representative, and crew foreman; the Contractor's Superintendent; and the Engineer, and Owner.
- B. Perform Work in accordance with Subsection 450: Hot Mix Asphalt Pavement, Massachusetts Department of Transportation – Highway Division "Standard Specifications for Highways and Bridges," Current Edition, as amended.
- C. Mixing Plant: Conform to Section M3.12.0: Hot Mix Asphalt Production Facility of Massachusetts Department of Transportation – Highway Division "Standard Specifications for Highways and Bridges," Current Edition, as amended.
- D. Quality Control Laboratory: Conform to M3.13.1: Contractor Quality Control Laboratory of Massachusetts Department of Transportation – Highway Division "Standard Specifications for Highways and Bridges," Current Edition, as amended.
- E. Obtain materials from the same source throughout.
- F. For each HMA mixture placed, obtain one representative sample of plant-produced HMA per paving day and test for asphalt content, theoretical maximum density, and aggregate gradation. Submit test results to the Engineer.

PART 2 PRODUCTS

2.1 MATERIALS

A. General

1. Bituminous materials shall conform to the requirements of these Specifications.
2. Hot poured joint sealers shall conform to M3.05.0 of the above referenced Massachusetts Department of Transportation – Highway Division “Standard Specifications for Highways and Bridges,” Current Edition, as amended.

B. Hot Mix Asphalt

1. Hot Mix Asphalt Paving shall conform to Table 450.10-1: HMA Pavement Courses & Mixture Types, as shown in Massachusetts Department of Transportation – Highway Division “Standard Specifications for Highways and Bridges,” Current Edition, as amended. The Contractor shall submit MassDOT-approved mixture designs appropriate for the specified 1½-inch top-course and 2-inch binder-course compacted lift thicknesses.
2. Bitumen delivered to the Project or to a mix plant must be accompanied by a proper certificate signed by the producer’s authorized representative. Shipments of material not accompanied by a certificate will not be accepted for use in the Work.
3. A particular paving plant may receive approval for two or more JMFs. However, per Project, only one JMF will be permitted to be used in a given calendar day.
4. If HMA may be furnished from more than one production facility, submit a separate MassDOT-approved JMF and plant certification for each facility. HMA shall not be supplied from more than one facility during the same paving day without prior approval by the Engineer.
5. HMA mixtures shall be composed of mineral aggregate, mineral filler (if required), bituminous material (PGAB), and reclaimed asphalt pavement (RAP). The above listed materials shall be proportioned and mixed to conform with the designated mixture ranges as shown in Table A of this Section.
 - 1) Asphalt content shall be determined by using the Superpave mixture design system and conforming to M3.06.04: Hot Mix Asphalt Mixture Design in Massachusetts Department of Transportation – Highway “Standard Specifications for Highways and Bridges,” Current Edition, as amended.
 - 2) The aggregate will be accepted in stockpile at the plant site.
 - 3) The bituminous material will be accepted on certification.
 - 4) Should a change of source materials be made, a new JMF must be provided.
 - 5) When unsatisfactory results or other conditions make it necessary, the Engineer may establish a new JMF.

6. Plants producing recycled mix shall be equipped so that they can properly proportion, blend and mix all components of a recycled mixture so that the end product is in conformance with the designated JMF.
7. The JMF shall bind the Contractor to furnish paving mixtures not only within the master ranges specified in the JMF, but also conforming to the exact formula set up for the project, within allowable tolerances as follows:

No. 4 and larger sieve	JMF Target $\pm$ 6.0%
No. 8 sieve	JMF Target $\pm$ 5.0%
No. 16 to No. 50 sieve (inclusive)	JMF Target $\pm$ 3.0%
No. 100 sieve	JMF Target $\pm$ 2.0%
Passing No. 200 sieve	JMF Target $\pm$ 1.0%
Asphalt Binder Content	JMF Target $\pm$ 0.3%

8. The use of RAP will be at the option of the Contractor, provided that the end product is in conformance with the designated JMF. The maximum allowable amount of RAP for base and intermediate courses shall be 20%. The maximum allowable amount of RAP for surface courses shall be 10%.
9. Coarse Aggregate
 - a. The coarse mineral aggregate shall be clean, crushed rock consisting of the angular fragments obtained by breaking and crushing shattered natural rock, free from a detrimental quantity of thin or elongated pieces, free from dirt or other objectionable materials, and shall have a percentage of wear, as determined by the Los Angeles Abrasion Test (AASHTO T 96), of not more than 30. It shall be surface dry and shall have a moisture content of not more than 0.5% after drying. The use of crushed gravel stone will not be permitted.
10. Fine Aggregate
 - a. 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
 - b. 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. When the primary source of material, passing the No. 200 sieve, is obtained from natural sand, these fines must be approved prior to use.
 - c. Stone sand shall be a processed material prepared from stone screenings to produce a consistently graded material conforming to specification requirements.

- d. The 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.
- e. The fine aggregate as delivered to the mixer shall meet the following requirements:

Sieve Designation	Percent Passing	
	Minimum	Maximum
3/8 in.	95	100
No. 8	70	95
No. 50	20	40
No. 200	2	16

- f. In the fine aggregate sieve analysis (passing No. 8), the amount between two successive sieves (No. 16, No. 30, No. 50 and No. 100) shall not exceed 33 % of the fine aggregate total.
- g. Plants that experience a large variation in the quality and gradation of their primary fine aggregate sources and have difficulty in consistently providing fine aggregate that conforms to the requirements of this specification, shall be equipped with an approved fine aggregate system for processing fine aggregate that will meet the requirements of this Section.

C. Reclaimed Asphalt Pavement (RAP)

- 1. Reclaimed Asphalt Pavement (RAP) shall consist of the material obtained from highways or streets by crushing, milling or planing existing pavements. This material shall be transported to the mix plant yard and processed through an approved crusher so that the resulting material will contain no particles larger than 1½ inches. The material shall be stockpiled on a free draining base and kept separate from the other aggregates. The material contained in the stockpiles shall have a reasonably uniform gradation from fine to coarse and shall not be contaminated by foreign materials.
- 2. Recycled asphalt shingles (RAS) shall consist of only the by-product materials obtained from the roofing materials obtained from the roofing shingle manufacturing process. Post-consumer shingle waste and re-roofing shingle scrap will not be allowed. 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.

D. Mineral Filler

- 1. Mineral filler shall consist of approved Portland Cement, limestone dust, hydrated lime, stone float or stone dust. Stone dust shall be produced from crushed ledge stone and shall be the product of a secondary crusher so processed as to deliver a product of uniform grading. Mineral filler shall completely pass a No. 50 sieve and at least 65% shall pass a No. 200 sieve.

E. Bituminous Materials

1. The asphalt cement for the mixture shall be the grade designated by the Engineer and shall conform to the requirements of M3.01.01 Standard Asphalt Binder Grade of the Massachusetts Department of Transportation – Highway Division “Standard Specifications for Highways and Bridges,” Current Edition, as amended. When required an approved anti-stripping additive conforming to M3.01.5 Asphalt Anti-Stripping Additive of the Massachusetts Department of Transportation – Highway Division “Standard Specifications for Highways and Bridges,” Current Edition, as amended, shall be added to the asphalt cement.
2. Tack coat shall consist of anionic emulsified asphalt, grade RS-1h or if supplied in 5-gallon buckets, grade RS-1, conforming to Section M3.03.0: Asphalt Emulsions and Section M3.03.1: Anionic Emulsified Asphalt of the Massachusetts Department of Transportation – Highway Division “Standard Specifications for Highways and Bridges,” Current Edition, as amended.
3. For any bituminous mixture containing RAP, submit in addition to the JMF, the amount and type of asphalt modifier to be added to the mixture to restore the asphalt properties of the RAP to a level that is reasonably consistent with the requirements of current specifications for new asphalt. The restored asphalt when recovered by the Abson Method from the recycled mixture shall have a minimum penetration at 77 degrees Fahrenheit of 50 and a maximum absolute viscosity at 140 degrees Fahrenheit of 800 pascal seconds.
4. Only Performance Graded Asphalt Binder (PGAB) grades PG 64-28 will be used as modifiers and shall meet the requirements of AASHTO M 320.

F. Pavement Sub-base

1. Processed gravel shall be in accordance with Section 02320.

G. Source Properties

1. Not more than 50% of the gravel material may be composed of recycled materials. Not more than 5% of the material may be recycled asphalt (RAP).
2. Gravel material shall be free of: glass, loam, roots, wood, or any other deleterious material.
3. The coarse aggregate shall have a percentage of wear, by LA Abrasion Test, of not more than 50%.

PART 3 EXECUTION**3.1 PAVING – GENERAL**

- A. Install bituminous concrete pavement in accordance with Subsection 450: Hot Mix Asphalt Pavement of the Massachusetts Department of Transportation – Highway Division "Standard Specifications for Highways and Bridges", Current Edition, as amended.
- B. Construct permanent roadway pavement at Culverts 1 and 2 in accordance with Sheet C-502. Provide 1½ inches of HMA top course over 2 inches of HMA binder course and 12 inches of processed gravel. Thicknesses shown are compacted thicknesses.

- C. Maintain pavement under this Contract during the guarantee period of one year and promptly (within 3 days of notice given by the Engineer) refill and repave areas which have settled or are otherwise unsatisfactory.
- D. All pavement thicknesses referred to herein are compacted thicknesses. Place sufficient mix to ensure that the specified thickness of pavement results.
- E. Paving operations shall be conducted so that there is no physical or thermal segregation of the hot mix asphalt material during transport or placement of the mix. Should segregation be observed by the Engineer, suspend paving operations immediately. The Engineer may reject material, which appears to be defective based on observation. Such rejected material shall not be used in the Work and shall be removed and replaced by the Contractor at no additional cost to the Owner.
- F. No permanent mixtures shall be placed when the surface temperature is below 40 degrees Fahrenheit, or when the material on which the mixtures are to be placed contains frost or is frozen.
- G. When the air temperature falls below 50 degrees Fahrenheit, extra precautions shall be taken in drying the aggregates, controlling the temperatures of the materials, and placing and compacting the mixtures.
- H. Regardless of temperature, no permanent mix conforming to the requirements of these specifications shall be placed between November 15 and April 1 of any year, unless otherwise approved by Owner and Engineer.
- I. Existing drainage patterns shall not be altered by the new pavement construction unless otherwise shown on the drawings.
- J. In no case will pavement be placed until the gravel base is dry and compacted to at least 95.0% maximum dry density at optimum moisture content. No permanent pavement will be placed on any surface that is not dry and free of standing water.
- K. Tack Coats
 - 1. Apply tack coat on the binder prior to placing the top course. The tack coat shall be RS-1 emulsion and shall be applied at a rate of 0.05 gallons per square yard on binder courses and streets to be overlaid.
 - 2. Perform a test pass with tack truck. Test pass shall be used to determine how long the tack coat needs to cure prior to beginning paving operations and for operator to adjust spray bar and nozzles as necessary. Tack shall be uniformly sprayed; "streaking" will not be allowed. Placement of top course shall not occur until the tack coat cures or "breaks," with color changing from brown to black.
- L. Temporary HMA
 - 1. Temporary HMA is defined on this Project as HMA that, after installation, will be completely removed and replaced with a permanent surface restoration as part of the Work. Temporary HMA shall have a minimum compacted thickness of 2 inches unless otherwise shown or approved by the Engineer.
 - 2. Place temporary HMA as soon as possible after the gravel base has been prepared, shaped and compacted.

3. Temporary Pavement Guarantee Period
 - a. No permanent paving shall proceed until the 90 day settlement period has elapsed since placement of any temporary pavement.
 4. Until such time as the final paving is performed, maintain all temporary HMA by filling any holes that may develop and by adding additional bituminous material to maintain the surface of the trench even with the adjacent pavement.
 5. No pavement used as temporary trench repair shall remain as part of a final or permanent repair.
- M. Top-course mixtures shall be designed at 4.0 percent air voids. In-place pavement density shall comply with Section 3.6, Acceptance. Additional asphalt content shall not be added solely to reduce in-place air voids.
- N. Breakdown rolling and intermediate rolling shall be completed prior to the HMA mat attaining a temperature of 200 degrees Fahrenheit. Finish rolling shall be completed prior to the HMA mat attaining a temperature of 150 degrees Fahrenheit. Roller and paver speeds shall be agreed upon with the Engineer prior to placing HMA to ensure mix temperature requirements will be met. If field conditions warrant, the Engineer may modify breakdown and intermediate roller temperature requirements as appropriate, but compaction and finish rolling shall still be completed by 150 degrees.
- O. Thermal segregation of the HMA shall be limited to a maximum of 20 degrees Fahrenheit.
- P. Cascading HMA material on the top of the finished mat with rakes or shovels will not be permitted. Coarse aggregate dislodged as a result of unavoidable hand work shall be removed from the surface prior to rolling.
- Q. Place and compact HMA materials by steel-wheeled rollers of sufficient weight to compact the HMA to 92.5% of the calculated Theoretical Maximum Density (TMD) in accordance with ASTM D2041.
- R. Along places not accessible with a roller, the paving mixture shall be thoroughly compacted with tampers. Such tampers shall not weigh less than 25 pounds and shall have a tamping face no more than 50 square inches in size. The surface of the mixture after compaction shall be smooth and true to the established line and grade.
- S. No vehicular traffic shall be permitted on the newly completed pavement until adequate stability has been attained and the material has cooled to below 140 degrees Fahrenheit or sufficiently to prevent distortion or loss of fines. HMA delivery trucks (loaded or empty) shall not be permitted on the newly completed pavement until the asphalt has cooled to below 90 degrees Fahrenheit.
- T. Following all paving, the area along the edge of all pavement shall be backed up with gravel, or loam and seed as required, so that it is flush with the adjacent paving within 7 days. Whenever possible, the final surface of the backup material shall slope away from the surface edge for drainage runoff. Contractor shall be responsible for maintenance of areas along the edges of new pavement in the occurrence of washouts or other disturbance and shall replace material as needed until areas are stabilized.

3.2 PAVING – BASE AND BINDER COURSE

- A. After the 90-day settlement period following placement of the temporary pavement has elapsed, remove the temporary pavement and prepare, shape, and compact the processed-gravel base. Following acceptance of the prepared base by the Engineer, proceed with construction of the permanent pavement section shown on Sheet C-502.
- B. Notify the Engineer at least 48 hours before beginning permanent paving at either culvert location so that impacts to site access and work hours can be coordinated.
- C. Sawcut existing pavement at the paving limits to form straight, sound, vertical edges. Clean and dry exposed pavement faces and apply joint adhesive before placing new HMA.
- D. Place the binder course as soon as practicable following acceptance of the processed-gravel base. Construct the binder course at the culvert locations and pathways shown on the Drawings to the required lines, grades, cross slopes, and compacted thicknesses.
- E. Protect and maintain the binder course until placement of the top course. Correct settlement, irregularities, damaged areas, and other defects by placing additional HMA or removing and replacing deficient material at no additional cost to the Owner.
- F. Before placing the top course, thoroughly clean the binder-course surface by sweeping and removing dirt, loose material, standing water, and other debris. The Engineer shall accept the binder-course surface before top-course placement.
- G. Following completion of the permanent pavement, back up pavement edges with gravel or loam and seed, as applicable, so that the adjacent surface is flush with the pavement edge. Complete this work within seven days of paving and grade the adjacent surface to promote drainage. Repair washouts or other disturbances and maintain the restored areas until stabilized.

3.3 TOP COURSE

- A. Following acceptance of the binder course, thoroughly clean the surface by sweeping and removing dirt, loose material, standing water, and other debris.
- B. Apply tack coat uniformly to the binder course in accordance with this Section. Apply joint adhesive to all sawcut vertical pavement faces before placing the top course.
- C. Place the HMA top course to the limits, lines, grades, cross slopes, and compacted thickness shown on Sheet C-502. Construct transitions to existing pavement smooth and flush, without abrupt changes in grade.
- D. Grade and compact the finished surface to provide a smooth, uniform roadway cross-section that maintains the required drainage pattern. The finished pavement shall not contain depressions, segregation, roller marks, open joints, or areas of standing water.
- E. Blend the finished top course smoothly into adjacent existing pavement and any utility covers or other structures encountered within the paving limits.
- F. Repair or replace pavement that does not meet the specified lines, grades, smoothness, density, thickness, or drainage requirements at no additional cost to the Owner.

3.4 QUALITY CONTROL

- A. Provide a written Quality Control Plan (QCP) for the project. As a minimum, the QCP shall contain the following information:
 - 1. QCP shall be contract specific, stating how the contractor proposes to control the materials, equipment, and construction operations including subcontractors and suppliers as well as production facilities and transportation modes to the project for the HMA pavement operations.
 - 2. The QCP shall be submitted no later than 15 days prior to commencing the paving operations.
 - 3. The QCP shall contain the name, telephone number, duties, and employer of all quality control personnel necessary to implement the QCP. A Quality Control Technician (QCT) shall be required. The person(s) responsible for conducting quality control and inspection activities to implement the QCP. There may be more than one QCT on a project.
 - 4. The Engineer may require the replacement of ineffective or unqualified equipment or Quality Control personnel. Construction operations may be required to stop until Quality Control corrective actions are taken.
- B. All roller operators shall use infrared pistol thermometers to measure the temperature of the mat during rolling operations.
- C. Provide third-party density testing during permanent paving. Testing frequency and locations shall be as directed by the Engineer, with a minimum of one density evaluation per pavement lift at each culvert.

3.5 MEASUREMENT AND PAYMENT

- A. Permanent HMA pavement shall be measured and paid for by the ton under Bid Items 11 and 29, based on certified plant delivery tickets, as specified in Section 01290.
- B. Temporary HMA pavement shall not be measured separately. Furnishing, placing, maintaining, removing, and disposing of temporary HMA pavement shall be included in the applicable Miscellaneous Work bid item for each culvert.
- C. Tack coat, joint adhesive, surface preparation, placement, compaction, testing, pavement-core repairs, and incidental work associated with permanent HMA pavement shall be included in the applicable unit prices under Bid Items 11 and 29.

3.6 ACCEPTANCE

- A. Determine the theoretical maximum density (TMD) for each HMA mixture placed each day using a representative sample of plant-produced HMA tested in accordance with ASTM D2041. TMD values established solely from the mix design will not be accepted for pavement acceptance.

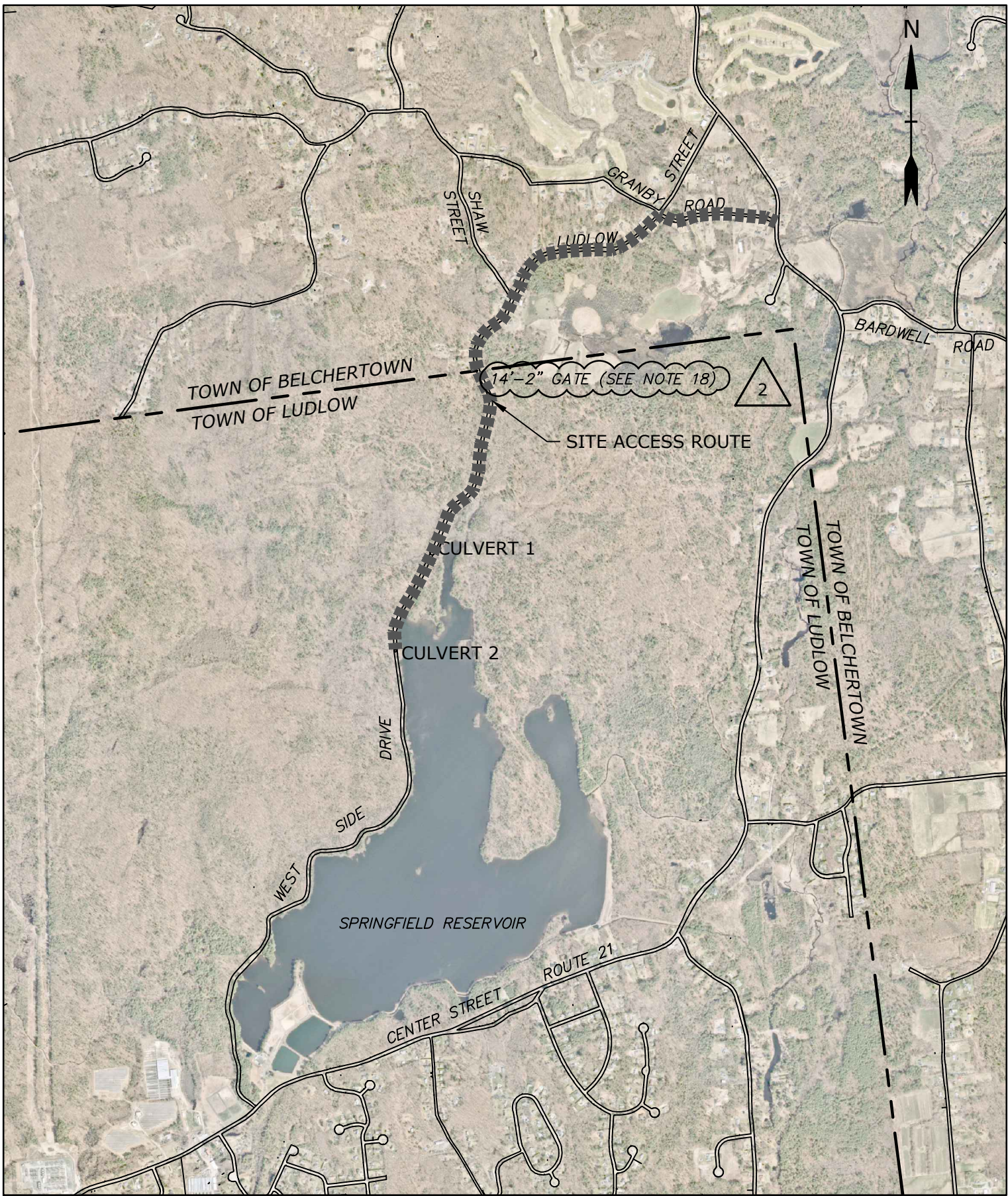
- B. Nuclear density testing may be used to establish roller patterns and monitor compaction during placement. Final acceptance shall be based on the bulk density of pavement cores.
- C. Unless otherwise directed by the Engineer, obtain one full-depth pavement core at each culvert at a location selected by the Engineer. Cores shall be taken no sooner than the day following placement of the top course. Separate and evaluate each pavement lift using the applicable daily production TMD.
- D. Allow cores to air dry for at least 24 hours before determining density. Oven drying will not be permitted. Repair core locations with approved HMA, properly compacted and finished flush with the surrounding pavement.
- E. Each HMA pavement lift shall have a density of at least 92.5 percent and not more than 97.0 percent of the applicable TMD. Pavement failing to meet these requirements shall be evaluated and repaired or replaced as directed by the Engineer at no additional cost to the Owner.

END OF SECTION

F:\Projects\S\S2057 SWSC\062 - Ludlow Reservoir Culvert
Replacements\Design\Specifications\Addenda\02740 - Bituminous Concrete Pavement.docx

Attachment C

Last Saved: 10/15/2026 10:15:19am By: A.Gordon
Plotted On: Oct 16, 2026 8:19am By: A.Gordon
Figure & Bond 13/524257 SWSC 002 - Ludlow Reservoir Culvert Replacement Drawings - Figures AutoCAD Sheet 52057-062, G-002.dwg



SITE ACCESS PLAN
SCALE 1" = 2000'

ABBREVIATIONS

AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
BVW	BORDERING VEGETATED WETLANDS
C/L	CENTERLINE
CMP	CORRUGATED METAL PIPE
CONC.	CONCRETE
ELEV	ELEVATION
HDPE	HIGH DENSITY POLYETHYLENE
INV	INVERT
MTN	MOUNTAIN
NAVD	NORTH AMERICAN VERTICAL DATUM
NTU	NEPHELOMETRIC TURBIDITY UNIT
PROP	PROPOSED
STA	STATION
WF	WETLAND FLAG

GENERAL NOTES:

- EXISTING CONDITIONS WERE DEVELOPED FROM THE DECEMBER 2023 TOPOGRAPHICAL SURVEY TITLED "EXISTING CONDITIONS, WEST SIDE DRIVE, SPRINGFIELD RESERVOIR, PLAN OF LAND IN LUDLOW, MA, PREPARED FOR TIGHE & BOND" BY SHERMAN AND FRYDRYK, A DIVISION OF HANCOCK SURVEY ASSOCIATES, INC.
- NORTH ARROW REFERENCES THE NORTH AMERICAN DATUM OF 1983, MASSACHUSETTS STATE PLANE MAINLAND COORDINATE SYSTEM.
- VERTICAL DATUM REFERENCES NAVD88 VERTICAL DATUM.
- WETLAND RESOURCE AREAS WERE DELINEATED BY A TIGHE & BOND WETLAND SCIENTIST ON DECEMBER 13, 2023, AND LOCATED BY SURVEY.
- LIGHT TEXT AND LINES INDICATE APPROXIMATE EXISTING CONDITIONS. BOLD TEXT AND LINES INDICATE PROPOSED WORK.
- PER MASSACHUSETTS LAW, CALL 1-888-DIG-SAFE, (1-888-344-7233) AND SWSC (413) 310-3501 PRIOR TO ANY UNDERGROUND EXCAVATION ON SITE. THE DIG-SAFE VERIFICATION NUMBER SHALL BE SUBMITTED TO SWSC PRIOR TO ANY EXCAVATION, DEMOLITION, AND REMOVAL OR CONSTRUCTION WORK.
- FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO CONSTRUCTION. IF FIELD CONDITIONS ARE OBSERVED THAT VARY SIGNIFICANTLY FROM THOSE SHOWN ON THESE DRAWINGS, IMMEDIATELY NOTIFY THE ENGINEER IN WRITING FOR RESOLUTION OF THE CONFLICTING INFORMATION.
- CONDUCT TEST PITS TO LOCATE EXISTING UTILITIES OR OTHER UNDERGROUND FEATURES AS NECESSARY, AND ONLY AS APPROVED BY OWNER.
- COMPLY WITH OSHA'S LATEST STANDARDS FOR EXCAVATION WORK. FOLLOW ALL REQUIREMENTS OF OSHA'S EXCAVATION STANDARDS INCLUDING, BUT NOT LIMITED TO, THE PROVISION FOR A COMPETENT PERSON ON SITE AND ANY REQUIRED DOCUMENTATION THAT MAY REQUIRE CERTIFICATION BY A PROFESSIONAL ENGINEER.
- ENSURE ALL UTILITIES CONTINUE TO FUNCTION PROPERLY IN THE AREAS UNDER CONSTRUCTION PRIOR TO THE TIME WHEN FINAL SYSTEM IS PUT INTO USE. LEAVE ALL PIPES AND STRUCTURES WITHIN THE LIMITS OF THIS CONTRACT IN A CLEAN AND OPERABLE CONDITION AT THE COMPLETION OF THE WORK. TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SAND AND SILT FROM DISTURBED AREAS FROM ENTERING THE SYSTEM. CONTRACTOR IS RESPONSIBLE FOR DAMAGE SUSTAINED TO ANY EXISTING UTILITIES AND IS RESPONSIBLE FOR REPAIRS THAT COMPLY WITH THE REQUIREMENTS OF THE SWSC, THE TOWN OF LUDLOW OR RESPECTIVE UTILITY COMPANY.
- 4" LOAM & HYDROSEED ALL DISTURBED AREAS UNLESS OTHERWISE SPECIFIED. OVER-EXCAVATE LOAM & SEED AREAS AS REQUIRED TO MEET GRADE. HYDROSEED ALL DISTURBED AREAS OUTSIDE OF PAVEMENT OR STREAMBED LIMITS.
- CONDUCT ALL CLEARING, GRADING, DRAINAGE, CONSTRUCTION, AND DEVELOPMENT IN STRICT ACCORDANCE WITH THE DRAWINGS.
- ACCOMPLISH ALL EXCAVATION SO THAT UNDERGROUND UTILITIES OR STRUCTURES ARE NOT DAMAGED. BE RESPONSIBLE FOR ANY DAMAGE INCURRED DURING EXCAVATION OPERATIONS, AND REPAIR ANY EXISTING PIPE OR UTILITY DAMAGED DURING CONSTRUCTION AT NO COST TO THE OWNER.
- THE CONSTRUCTION SITE AND ADJACENT PROPERTIES MUST BE ACCESSIBLE TO EMERGENCY VEHICLES AND COMMISSION VEHICLES AT ALL TIMES.
- PREPARE AND MAINTAIN AN EMERGENCY/CONTINGENCY PLAN RELATIVE TO STREAM DIVERSION/BYPASS MECHANISMS.
- COMPLY WITH THE EXCAVATION, BACKFILL, AND COMPACTION REQUIREMENTS OUTLINED IN SPECIFICATION SECTION 02315 FOR CULVERT AND HEADWALL CONSTRUCTION.
- SWSC RETAINS AUTHORITY OVER ACCESS TO THE RESERVOIR PROPERTY. THE CONTRACTOR SHALL CONTROL ACCESS TO THE ACTIVE CONSTRUCTION AREA AND PROVIDE AND MAINTAIN TEMPORARY BARRIERS, FENCING, BARRICADES, AND WEATHER-RESISTANT SIGNAGE NECESSARY TO PREVENT UNAUTHORIZED ENTRY. SIGNS SHALL BE LOCATED, AT A MINIMUM, AT THE RESERVOIR PROPERTY ENTRANCE, THE EXISTING ACCESS GATE, EACH PEDESTRIAN OR BICYCLE APPROACH TO THE WORK, AND EACH END OF THE ACTIVE CONSTRUCTION AREA. SIGNS SHALL INCLUDE THE FOLLOWING MESSAGES AS APPLICABLE: "CONSTRUCTION AREA - NO UNAUTHORIZED ENTRY," "NO PEDESTRIAN ACCESS," AND "DANGER - CONSTRUCTION EQUIPMENT".
- THE EXISTING GATE SHALL REMAIN IN PLACE AND SHALL BE OPERATED IN ACCORDANCE WITH SWSC'S ACCESS REQUIREMENTS. WHENEVER THE GATE IS OPEN FOR CONTRACTOR VEHICLES OR EQUIPMENT, THE CONTRACTOR SHALL PROVIDE A DESIGNATED GATE ATTENDANT/SPOTTER TO CONTROL CONSTRUCTION TRAFFIC, PREVENT UNAUTHORIZED ENTRY INTO THE ACTIVE CONSTRUCTION AREA, AND ASSIST WITH SAFE VEHICLE MOVEMENTS. THE GATE SHALL NOT BE LEFT OPEN UNATTENDED AND SHALL BE CLOSED AND SECURED FOLLOWING EACH USE UNLESS OTHERWISE DIRECTED BY SWSC.
- TREES TO BE REMOVED ARE SHOWN ON THE PLANS. REMOVAL OF ADDITIONAL TREES IF NECESSARY WILL REQUIRE THE APPROVAL OF THE OWNER.

LEGEND

	EXISTING CULVERT PIPE
	PROPOSED BOX CULVERT AND HEADWALLS
	PROPERTY LINE
	PROPOSED CONSTRUCTION BASELINE
	LIMIT OF WORK
	EXISTING EDGE OF ASPHALT ROAD
	EXISTING INTERMEDIATE CONTOURS
	EXISTING INDEX CONTOURS
	PROPOSED INTERMEDIATE CONTOURS
	PROPOSED INDEX CONTOURS
	EXISTING TREELINE
	EXISTING STONE WALL
	EXISTING LOGS
	EXISTING STONE RIPRAP
	TOP OF BANK (DELINEATED)
	LIMIT OF BORDERING VEGETATED WETLANDS (DELINEATED)
	PROPOSED COFFERDAM
	EROSION CONTROL BARRIER
	FEATURE TO BE REMOVED
	PROPOSED GUARDRAIL
	LIMIT OF CLEARING
	TREE TO BE REMOVED WITH STUMP
	TREE TO BE REMOVED STUMP TO REMAIN
	PROPOSED BITUMINOUS ROAD REPAIR
	PROPOSED EROSION CONTROL MATTING
	BENCHMARK



**ISSUED FOR
BID**

Springfield Reservoir Culvert Replacement

Springfield Water and Sewer Commission

Ludlow,
Massachusetts

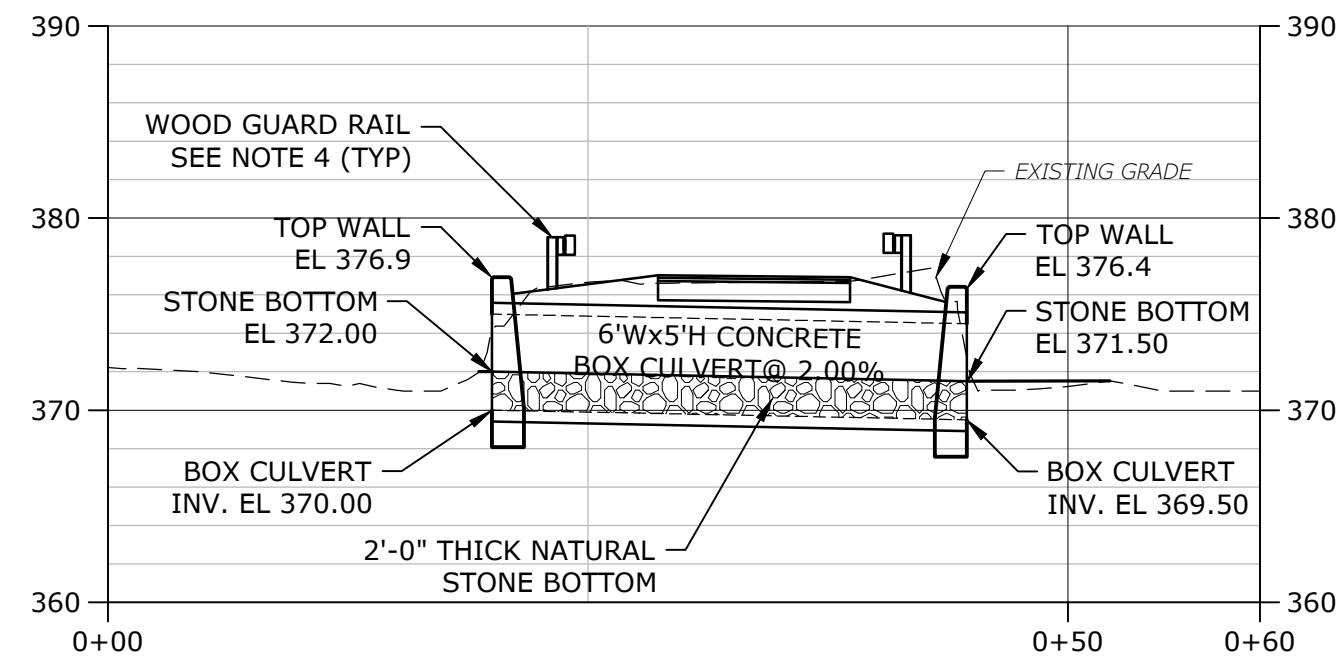
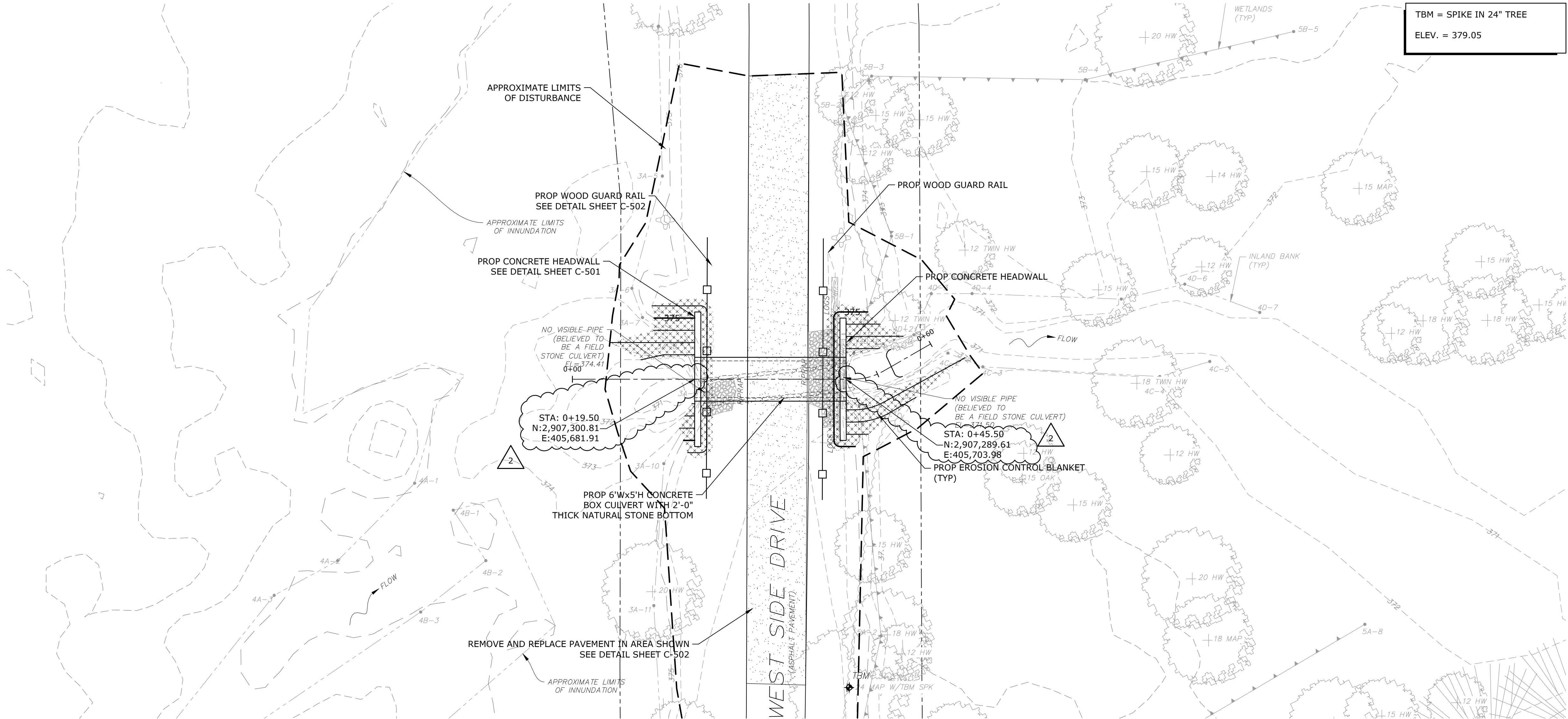
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1	09/26	Issued For Bidding
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DATE:	SEPTEMBER 2026	
FILE:	S2057-062_G-002.dwg	
DRAWN BY:	A. GORDON	
DESIGNED BY:	A. GORDON	
CHECKED BY:	M. MOFFATT	
APPROVED BY:	M. MOFFATT	

LEGEND AND GENERAL NOTES

SCALE: AS SHOWN

G-002

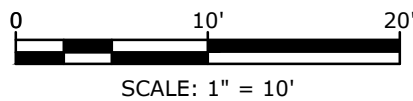
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Plotted On: Oct 16, 2026 5:19am By: A.Gordon
Tighe & Bond 13524257 Springfield Water and Sewer Commission - Culvert 1.dwg



CULVERT 1 PROFILE - STA: 0+00 TO 0+60

NOTE:

- LIMITS OF INUNDATION ARE AS OBSERVED IN DECEMBER 2023.
- ALL AREA SHOWN ON THIS SHEET LIES WITHIN THE 100-FOOT BUFFER ZONE.
- THERE ARE NO VISIBLE PIPES BENEATH THE EXISTING ROADWAY. REFER TO SPEC SECTION 02315 FOR EXCAVATION AND BACKFILL REQUIREMENTS.
- GUARD RAIL POSTS TO BE SPACED SO THAT POSTS CLEAR PROPOSED CULVERT.



ISSUED FOR BID

Springfield Reservoir Culvert Replacement

Springfield Water and Sewer Commission

Ludlow, Massachusetts

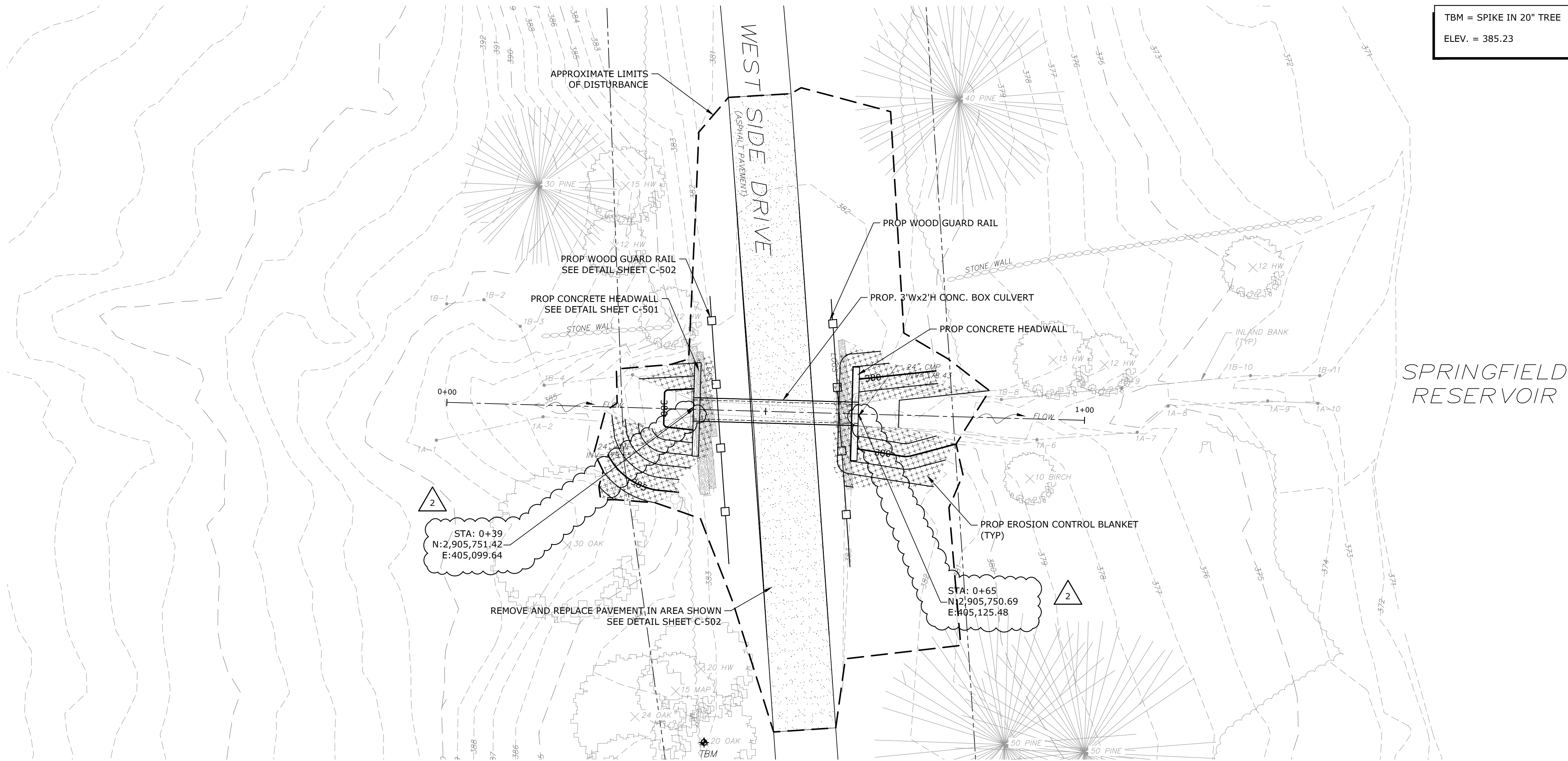
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1	09/26	Issued For Bidding
MARK	DATE	DESCRIPTION

PROJECT NO:	S2057-062
DATE:	SEPTEMBER 2026
FILE:	Proposed - Culvert 1.dwg
DRAWN BY:	A. GORDON
DESIGNED BY:	A. GORDON
CHECKED BY:	M. MOFFATT
APPROVED BY:	M. MOFFATT

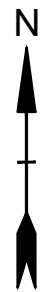
**PROPOSED CONDITIONS
PLAN - CULVERT 1**

SCALE: AS SHOWN

Last Saved: 10/15/2026 5:20am By: A.Gordon
Plotted On: Oct 16, 2026 5:20am By: A.Gordon
Tighe & Bond 13524257 Springfield Reservoir Culvert Replacement Drawings Figures AutoCAD Sheet Proposed - Culvert 2.dwg



TBM = SPIKE IN 20" TREE
ELEV. = 385.23



ISSUED FOR BID

Springfield Reservoir Culvert Replacement

Springfield Water and Sewer Commission

Ludlow, Massachusetts

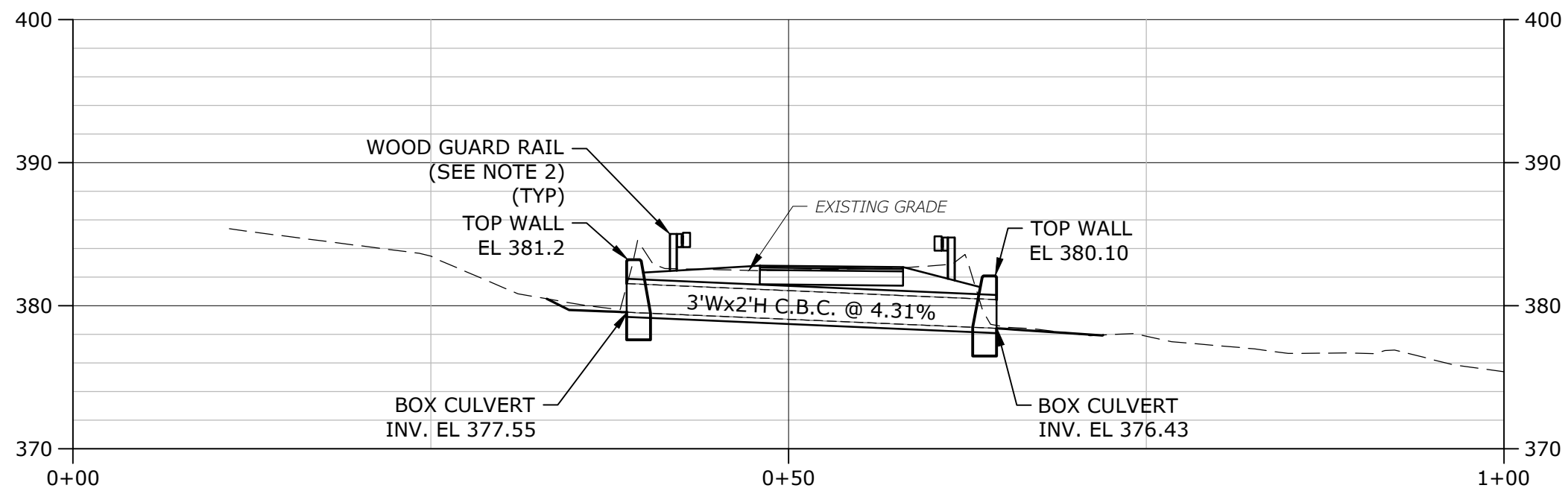
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1	09/26	Issued For Bidding
MARK	DATE	DESCRIPTION

PROJECT NO:	S2057-062
DATE:	SEPTEMBER 2026
FILE:	Proposed - Culvert 2.dwg
DRAWN BY:	A. GORDON
DESIGNED BY:	A. GORDON
CHECKED BY:	M. MOFFATT
APPROVED BY:	M. MOFFATT

PROPOSED CONDITIONS
PLAN - CULVERT 2

SCALE: AS SHOWN

C-106



CULVERT 2 PROFILE - STA: 0+00 TO 1+00

NOTE:

- ALL AREA SHOWN ON THIS SHEET LIES WITHIN THE 100-FOOT BUFFER ZONE.
- GUARD RAIL POSTS TO BE SPACED SO THAT POSTS CLEAR PROPOSED CULVERT.

