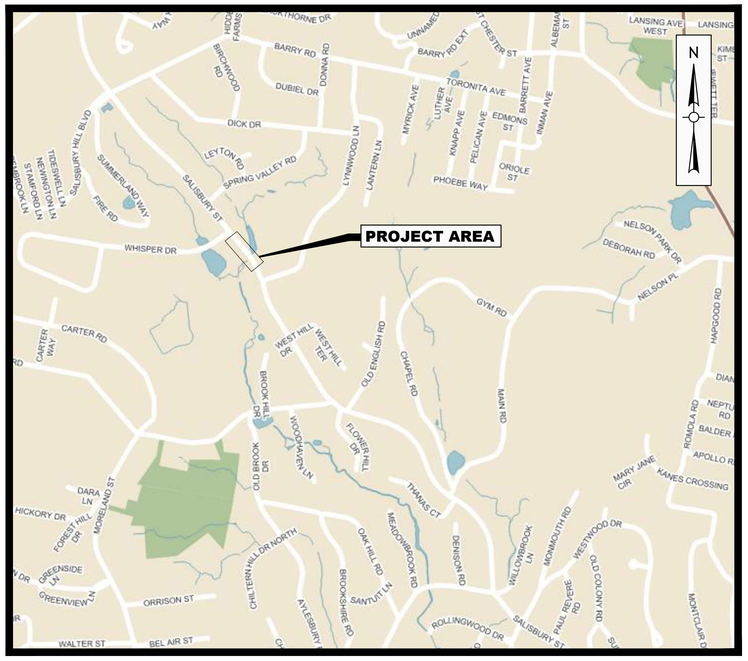
CITY OF WORCESTER, MASSACHUSETTS

DEPARTMENT OF PUBLIC WORKS & PARKS

SALISBURY STREET CULVERT REPLACEMENT



LOCUS MAP
NOT TO SCALE

DRAWING INDEX

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CONTRACT NO. S25-4
BID # 8491-J6

The City *of* Worcester

ERIC D. BATISTA, CITY MANAGER
JOHN WESTERLING, COMMISSIONER OF PUBLIC WORKS

COMMONWEALTH OF MASSACHUSETTS
SCOTT R. BRUSO
STRUCTURAL
No. 48061
REGISTERED PROFESSIONAL ENGINEER

2025.07.16 15:26:24-04'00'

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Issued Date:

JULY 2025

811 Know what's below. Call before you dig.

Issued For:

BID DOCUMENTS

GENERAL NOTES

1. TOPOGRAPHICAL INFORMATION BASED ON AN ON THE GROUND SURVEY PERFORMED BY WESTON & SAMPSON PE, LS LA, PC. ON DECEMBER 9, 2021.
2. HORIZONTAL DATUM IS MASSACHUSETTS STATE PLANE COORDINATE SYSTEM (MAINLAND NAD83) AND VERTICAL DATUM IS NORTH AMERICAN VERTICAL DATUM (NAVD) 1988.
3. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. THE CONTRACTOR SHALL DIG TEST PITS WITH THE LOCATIONS BEING APPROVED BY THE ENGINEER PRIOR TO COMMENCEMENT OF WORK TO EXACTLY LOCATE EXISTING UTILIITES.
4. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.
5. THE CONTRACTOR SHALL COORDINATE WITH EVERSOURCE AND MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY OWNER. ANY ALTERATIONS SHALL BE INCIDENTAL TO THE PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR THE TEMPORARY SUPPORT OF ALL UTILITIES TO REMAIN IN PLACE AND SHALL DESCRIBE IN WRITING, TO THE SATISFACTION OF THE ENGINEER, HIS METHOD OF TEMPORARY SUPPORT.
6. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
7. THE TERM "PROPOSED (PROP)" INDICATES WORK TO BE CONSTRUCTED USING NEW MATERIALS OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE AND RESET (R&R)".
8. ALL EXISTING STATE, COUNTY AND TOWN LOCATION LINES AND PRIVATE PROPERTY LINES HAVE BEEN ESTABLISHED FROM AVAILABLE INFORMATION AND THEIR EXACT LOCATIONS ARE NOT GUARANTEED.
9. ALL EXCESS MATERIAL FROM ROADWAY RECONSTRUCTION OR THE EXCAVATION PROCESS SHALL BE REUSED ON SITE OR REMOVED FROM THE SITE AND DISPOSED OF IN A LEGAL AND PROPER MANNER.
10. THE CONTRACTOR SHALL CALL DIGSAFE AT 1-888-344-7233 AT LEAST 72 HOURS PRIOR TO EXCAVATING AT ANY LOCATION, SATURDAYS, AND HOLIDAYS EXCLUDED. A COPY OF THE DIGSAFE PROJECT REFERENCE NUMBER(S) SHALL BE GIVEN TO THE TOWN PRIOR TO EXCAVATION.
11. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HIRE A PROFESSIONAL LAND SURVEYOR REGISTERED IN THE COMMONWEALTH OF MASSACHUSETTS FOR ALL LAYOUT WORK INCLUDING BASELINE LAYOUT. LAYOUT SHALL INCLUDE ALL PROPOSED WORK AS SHOWN IN THE CONTRACT DOCUMENTS, OR AS REQUIRED BY THE ENGINEER OR CITY. ONCE LAID OUT, ALL PROPOSED WORK SHALL BE DEEMED ACCEPTABLE BY THE ENGINEER OR CITY PRIOR TO ANY COMMENCEMENT OF WORK. ANY AND ALL WORK RELATED TO THE CONSTRUCTION LAYOUT SHALL BE INCIDENTAL TO THE PROJECT. THE CONTRACTOR'S SURVEYOR SHALL LOCATE CURRENT HORIZONTAL AND VERTICAL CONTROL POINTS AND CREATE ALTERNATE CONTROL POINTS OUTSIDE OF THE CONSTRUCTION ZONE. RESETTING OF CONTROL DUE TO CONSTRUCTION OPERATION WILL BE CONSIDERED INCIDENTAL TO THE PROJECT.
12. JOINTS BETWEEN HOT MIX ASPHALT TRENCH PAVEMENT AND SAWCUT EXISTING PAVEMENT SHALL BE SEALED WITH HOT MIX ASPHALT JOINT SEALANT.
13. IF DEEMED NECESSARY DUE TO THE WORK, THE CONTRACTOR SHALL COORDINATE WITH THE MUNICIPAL HIGHWAY DEPARTMENT, FIRE DEPARTMENTS, AND THE ENGINEERS FOR APPROVAL OF SHUTTING DOWN ANY EXISTING WATER MAINS AND SHALL ALSO OBTAIN APPROVAL FOR DISRUPTING ANY EXISTING SEWER FLOWS.
14. THE CONTRACTOR SHALL BE AWARE THAT ONLY CITY PERSONNEL ARE ALLOWED TO OPERATE WATER GATES AND HYDRANTS. ANY REQUESTS TO OPERATE THE GATES SHALL BE COORDINATED THROUGH THE ENGINEER.
15. THE EXISTING GAS MAIN LOCATIONS ARE SHOWN IN AN APPROXIMATE LOCATION. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE GAS COMPANY PRIOR TO COMMENCEMENT OF ANY WORK AND CONFIRMING SIZES, TYPES OF GAS LINES, AND EXACT LOCATIONS OR CHANGE OF PIPE TYPE. ALL COORDINATION AND ARRANGEMENTS WITH THE UTILITY COMPANIES SHALL BE INCIDENTAL TO THE PROJECT. ANY DELAY IN WORK DUE TO CONFLICTS WITH THE PROPOSED WORK AND ACTUAL LOCATION OF EXISTING GAS MAIN SHALL BE INCIDENTAL TO THE PROJECT.
16. THE CONTRACTOR SHALL COORDINATE ANY WORK FOR THE PROJECT WITH ALL ADJACENT/CONCURRENT PROJECTS AND CONTRACTORS.
17. PRIOR TO COMMENCEMENT OF WORK, THE CONTRACTOR SHALL INSTALL INLET SEDIMENT CONTROL BAGS IN ALL CATCH BASINS, WITHIN OR ADJACENT TO THE PROJECT LIMITS. THE CONTRACTOR SHALL MAINTAIN INLET SEDIMENT CONTROL BAGS, SILT FENCE AND COMPOST FILTER TUBES AS SHOWN ON THE PLANS THROUGHOUT THE DURATION OF THE PROJECT AND REMOVE AT THE COMPLETION OF THE PROJECT.
18. ANY GRASS AREAS DISTURBED BY THE WORK SHALL BE RESTORED WITH LOAM AND SEED.
19. ANY LANDSCAPED AREAS DISTURBED BY THE WORK SHALL BE RESTORED TO EXISTING CONDITIONS WITH EXISTING OR NEW GROUND COVER MATERIALS AS DIRECTED BY THE ENGINEER. ANY PLANTS, SHRUBS, OR FLOWERS DISTURBED BY THE WORK SHALL BE RESET TO EXISTING CONDITIONS OR REPLACED WITH NEW PLANTS, SHRUBS, OR FLOWERS AS DIRECTED BY THE ENGINEER. ALL WORK TO RESTORE LANDSCAPE AREAS, NEW GROUND COVER MATERIALS, NEW PLANTS, NEW SHRUBS, OR NEW FLOWERS REQUIRED BY THE ENGINEER SHALL BE INCIDENTAL TO THE PROJECT.
20. CONTRACTOR TO COORDINATE WITH UTILITY POLE OWNERS IN AREAS WHERE UNDERGROUND UTILITY WORK IS WITHIN CLOSE PROXIMITY AND POSSIBLE UTILITY POLE SHORING IS REQUIRED WHILE INSTALLING PROPOSED UTILITIES.
21. RAISE AND ADJUST FRAMES AND GRATES, FRAMES AND COVERS AND GATE BOXES PRIOR TO PAVEMENT OVERLAY.
22. DRAINAGE ELEVATIONS ARE PROVIDED FOR DESIGN PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY LOCATIONS OF EXISTING UTILITIES THAT MAY CONFLICT WITH THE PROPOSED DRAINAGE BY TEST PIT. ANY FIELD ADJUSTMENTS REQUIRED WILL BE MADE AS APPROVED BY THE ENGINEER. THE DRAINAGE STRUCTURES SHALL BE ORDERED ONLY AFTER THE CONTRACTOR VERIFIES ELEVATIONS FOR THE CONSTRUCTIBILITY OF THE DRAINAGE SYSTEM. ANY FIELD ADJUSTMENTS TO LINE & GRADE UP TO A DEPTH OF 5' SHALL BE INCLUDED IN THE COST OF THE PIPE. PIPE EXCAVATION GREATER THAN 5' WILL BE PAID UNDER CLASS B TRENCH EXCAVATION.
23. SHOULD THE CONTRACTOR DETERMINE THAT DUE TO WEATHER OR CONDITIONS BEYOND THEIR CONTROL WORK WOULD NEED TO BE CANCELED, THE CONTRACTOR SHALL PROVIDE THE TRAFFIC CONTROL OFFICER AND ENGINEER A MINIMUM OF 1-HOUR NOTICE. IF THE 1-HOUR CANCELLATION IS NOT PROVIDED THE CONTRACTOR SHALL PAY FOR POLICE DETAIL TIME AT THE PREVAILING RATE ESTABLISHED BY THE WORCESTER POLICE DEPARTMENT.

GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
CB	CB	CATCH BASIN
BHL #	BHL #	BORING HOLE
MW #	MW #	MONITORING WELL
TP #	TP #	TEST PIT
TOB#		TOP OF BANK
BVW#		BORDERING WETLAND VEGETATION
		IRON PIN / IRON ROD
		HYDRANT
		DRAINAGE MANHOLE
		SEWER MANHOLE
		WATER VALVE
		UTILITY POLE
		SHRUB / BUSH
		TREE
		SIGN
OHU	OHW	OVERHEAD CABLE/WIRE
		CURBING
	100	CONTOURS
D		UNDERGROUND DRAIN PIPE
G	G	UNDERGROUND GAS MAIN
S	S	UNDERGROUND SEWER MAIN
W	W	UNDERGROUND WATER MAIN
		WOOD FENCE
		TREE LINE
		SEDIMENT CONTROL BARRIER
		SAWCUT LINE
		LIMIT OF EDGE OF PAVEMENT OR MILL & OVERLAY
		EDGE OF STREAM
		BORDER OF WETLAND
		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
SWL	SWL	SOLID WHITE LINE
DBYL	DBYL	DOUBLE YELLOW LINE
	SL	STOP LINE

ABBREVIATIONS

GENERAL

ABAN	ABANDON
ADJ	ADJUST
APPROX.	APPROXIMATE
AC	ASBESTOS CEMENT
BIT	BITUMINOUS
BC	BOTTOM OF CURB
BD.	BOUND
BL (or ℄)	BASELINE
BLDG	BUILDING
BM	BENCHMARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
BR.	BRIDGE
CB	CATCH BASIN
CC	CEMENT CONCRETE
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CI	CURB INLET
CIP	CAST IRON PIPE
C.I.T.	CHANGE IN TYPE
CL	CENTERLINE
CLF	CHAIN LINK FENCE
CLDI	CEMENT-MORTAR LINED DUCTILE IRON PIPE
CMP	CORRUGATED METAL PIPE
CO.	COUNTY
CONC	CONCRETE
CONT	CONTINUOUS
CONST	CONSTRUCTION
CR GR	CROWN GRADE
CTE	CONNECT TO EXISTING
DH	DRILL HOLE
DHV	DESIGN HOURLY VOLUME
DIA	DIAMETER
DI	DUCTILE IRON PIPE
DMH	DRAINAGE MANHOLE
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
FE	FLARED END
FLDSTN	FIELDSTONE
GG	GAS GATE
GI	GUTTER INLET
GR	GUARDRAIL
GRAN	GRANITE
GRAV	GRAVEL
HDPE	HIGH DENSITY POLYETHYLENE
HDW	HEADWALL
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HYD	HYDRANT
INT.	INTERNAL
INV	INVERT
IPF	IRON PIN FOUND
L	LENGTH OF CURVE
LP	LIGHT POLE
LT	LEFT
MAX	MAXIMUM
MB	MAILBOX
MH	MANHOLE
MIN	MINIMUM
MSRW	MASONRY RETAINING WALL
MW	MONITORING WELL
NIC	NOT IN CONTRACT
NO.	NUMBER
N.T.S.	NOT TO SCALE
OHW	ORDINARY HIGH WATER
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PERM	PERMANENT
P.G.L.	PROFILE GRADE LINE
PL	PLASTIC
PI	POINT OF INTERSECTION
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE
PROJ	PROJECT
PROP	PROPOSED
PROT	PROTECT
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVATURE
PVC	POLYVINYL CHLORIDE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
PVMT	PAVEMENT

ABBREVIATIONS (cont.)

GENERAL

R	RADIUS OF CURVATURE
RB	REBAR / IRON PIPE
R&D	REMOVE AND DISPOSE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDWY	ROADWAY
REM	REMOVE
RET	RETAIN
RET WALL	RETAINING WALL
RIM	RIM ELEVATION
ROE	RIGHT OF ENTRY
ROW	RIGHT OF WAY
RR	RAILROAD
R&D	REMOVE AND DISCARD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RT	RIGHT
SB	STONE BOUND
SHLD	SHOULDER
SMH	SEWER MANHOLE
SPEC	SPECIFICATIONS
ST	STREET
STA	STATION
SSD	STOPPING SIGHT DISTANCE
SHLO	STATE HIGHWAY LAYOUT LINE
SW	SIDEWALK
SWTU	STORMWATER TREATMENT UNIT
T	TANGENT DISTANCE OF CURVE
TAN	TANGENT
TEMP	TEMPORARY
TC	TOP OF CURB
TOB	TOP OF BANK
TOS	TOP OF SLOPE
TP	TEST PIT
TYP	TYPICAL
UG	UNDERGROUND
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
VCP	VITRIFIED CLAY PIPE
VGC	VERTICAL GRANITE CURB
WF	WETLAND FLAG
WG	WATER GATE
WM	WATER METER/WATER MAIN
WW	WALKWAY
W/	WITH
X-SECT	CROSS SECTION

Project:
SALISBURY STREET CULVERT REPLACEMENT
WORCESTER, MA 01609

WORCESTER
A TOWN JUNE 14, 1722 A CITY FEBY. 29, 1848

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Revisions:

No.	Date	Description

COA:

Seal:
COMMONWEALTH OF MASSACHUSETTS
SCOTT R. BRUSO
STRUCTURAL
No. 48061
REGISTERED PROFESSIONAL ENGINEER
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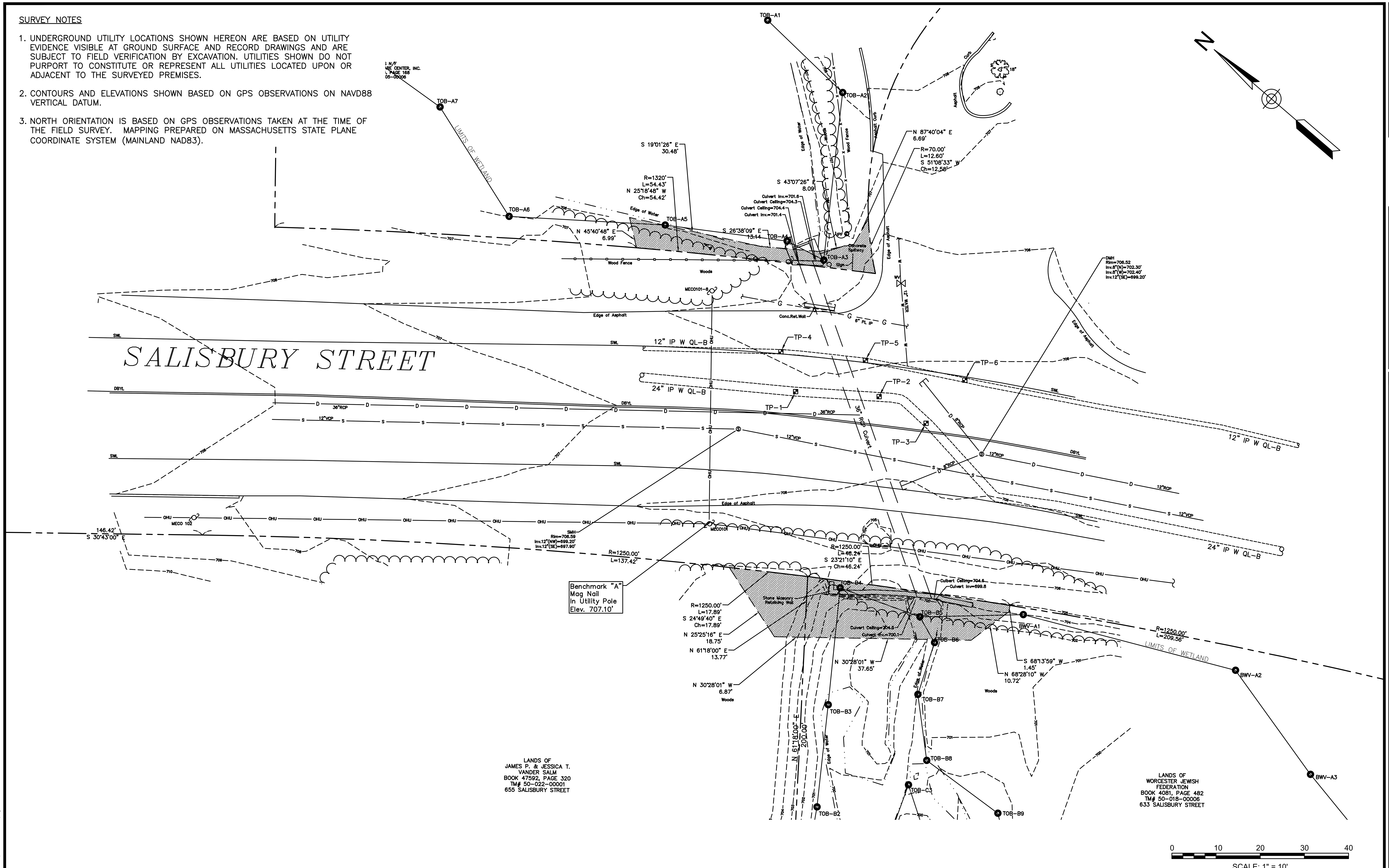
Reviewed By:	RP/JWS
Approved By:	SRB
W&S Project No.:	ENG22-0381
W&S File No.:	

Drawing Title:
GENERAL NOTES & LEGEND

Sheet Number:
C-1

SURVEY NOTES

1. UNDERGROUND UTILITY LOCATIONS SHOWN HEREON ARE BASED ON UTILITY EVIDENCE VISIBLE AT GROUND SURFACE AND RECORD DRAWINGS AND ARE SUBJECT TO FIELD VERIFICATION BY EXCAVATION. UTILITIES SHOWN DO NOT PURPORT TO CONSTITUTE OR REPRESENT ALL UTILITIES LOCATED UPON OR ADJACENT TO THE SURVEYED PREMISES.
2. CONTOURS AND ELEVATIONS SHOWN BASED ON GPS OBSERVATIONS ON NAVD88 VERTICAL DATUM.
3. NORTH ORIENTATION IS BASED ON GPS OBSERVATIONS TAKEN AT THE TIME OF THE FIELD SURVEY. MAPPING PREPARED ON MASSACHUSETTS STATE PLANE COORDINATE SYSTEM (MAINLAND NAD83).



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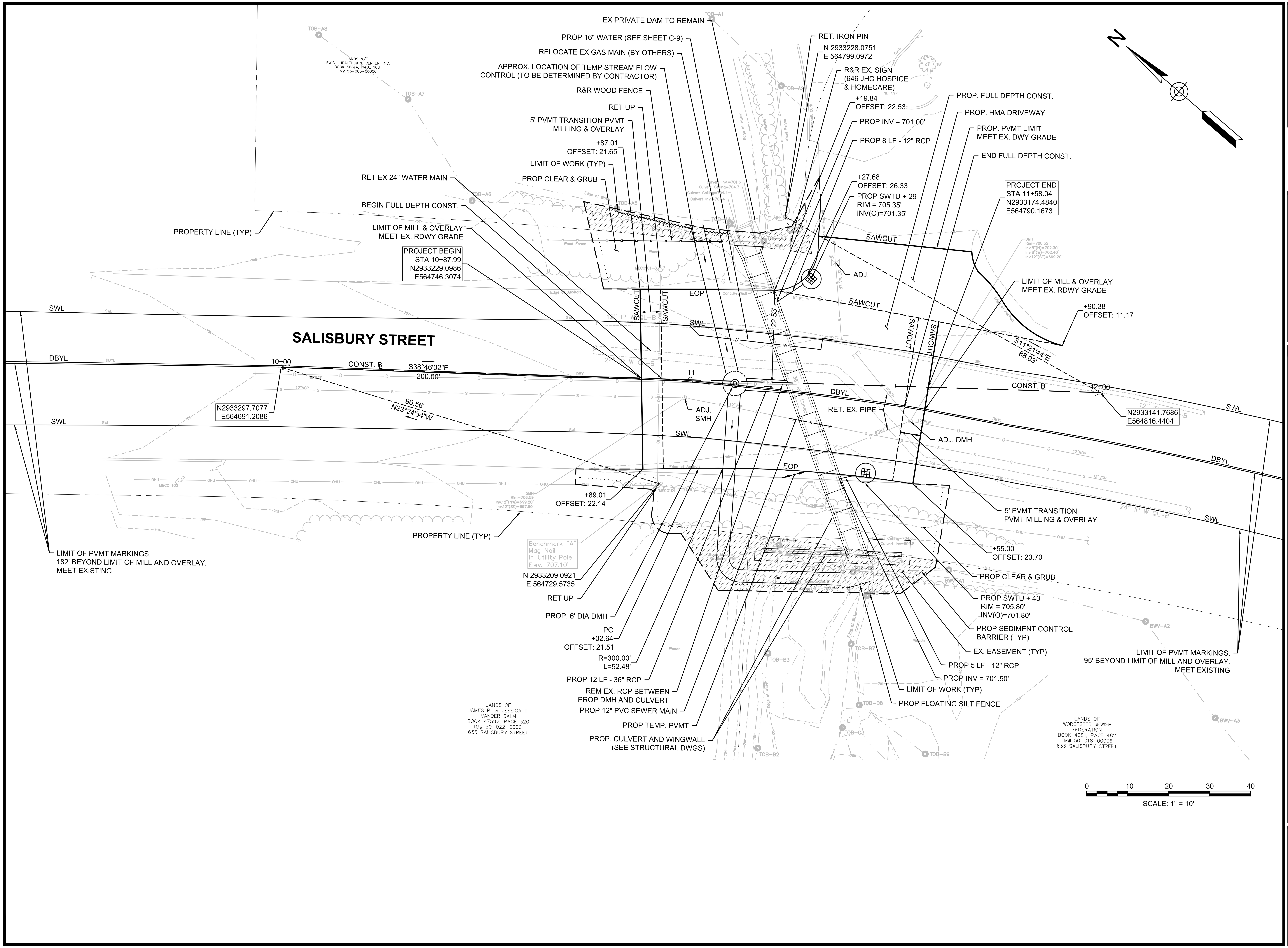
Drawing Title:
EXISTING CONDITIONS PLAN

Sheet Number:
C-2


EX PRIVATE DAM TO REMAIN
PROP 16" WATER (SEE SHEET C-9)
RELOCATE EX GAS MAIN (BY OTHERS)
APPROX. LOCATION OF TEMP STREAM FLOW CONTROL (TO BE DETERMINED BY CONTRACTOR)
R&R WOOD FENCE
RET UP
5' PVMT TRANSITION PVMT MILLING & OVERLAY
+87.01 OFFSET: 21.65
LIMIT OF WORK (TYP)
PROP CLEAR & GRUB
RET EX 24" WATER MAIN
BEGIN FULL DEPTH CONST.
LIMIT OF MILL & OVERLAY MEET EX. RDWY GRADE
PROJECT BEGIN STA 10+87.99 N2933229.0986 E564746.3074
PROPERTY LINE (TYP)
LANDS N/F JEWISH HEALTHCARE CENTER, INC. BOOK 58814, PAGE 168 TM# 55-005-00006
RET. IRON PIN N 2933228.0751 E 564799.0972
R&R EX. SIGN (646 JHC HOSPICE & HOMECARE)
+19.84 OFFSET: 22.53
PROP INV = 701.00'
PROP 8 LF - 12" RCP
+27.68 OFFSET: 26.33
PROP SWTU + 29 RIM = 705.35' INV(O)=701.35'
PROP. FULL DEPTH CONST.
PROP. HMA DRIVEWAY
PROP. PVMT LIMIT MEET EX. DWY GRADE
END FULL DEPTH CONST.
PROJECT END STA 11+58.04 N2933174.4840 E564790.1673
SAWCUT
ADJ.
LIMIT OF MILL & OVERLAY MEET EX. RDWY GRADE
+90.38 OFFSET: 11.17
SWL
DBYL
SALISBURY STREET
10+00
CONST. ℄
S38°46'02"E 200.00'
11
96.56' N23°24'34"W
N2933297.7077 E564691.2086
EOP
22.53'
S11°21'44"E 88.03'
CONST. ℄
12+00
N2933141.7686 E564816.4404
ADJ. SMH
RET. EX. PIPE
ADJ. DMH
5' PVMT TRANSITION PVMT MILLING & OVERLAY
+89.01 OFFSET: 22.14
PROPERTY LINE (TYP)
LIMIT OF PVMT MARKINGS. 182' BEYOND LIMIT OF MILL AND OVERLAY. MEET EXISTING
Benchmark "A" Mag Nail In Utility Pole Elev. 707.10'
N 2933209.0921 E 564729.5735
RET UP
PROP. 6' DIA DMH
PC +02.64 OFFSET: 21.51
R=300.00' L=52.48'
PROP 12 LF - 36" RCP
REM EX. RCP BETWEEN PROP DMH AND CULVERT
PROP 12" PVC SEWER MAIN
PROP TEMP. PVMT
PROP. CULVERT AND WINGWALL (SEE STRUCTURAL DWGS)
+55.00 OFFSET: 23.70
PROP CLEAR & GRUB
PROP SWTU + 43 RIM = 705.80' INV(O)=701.80'
PROP SEDIMENT CONTROL BARRIER (TYP)
EX. EASEMENT (TYP)
PROP 5 LF - 12" RCP
PROP INV = 701.50'
LIMIT OF WORK (TYP)
PROP FLOATING SILT FENCE
LIMIT OF PVMT MARKINGS. 95' BEYOND LIMIT OF MILL AND OVERLAY. MEET EXISTING
LANDS OF JAMES P. & JESSICA T. VANDER SALM BOOK 47592, PAGE 320 TM# 50-022-00001 655 SALISBURY STREET
LANDS OF WORCESTER JEWISH FEDERATION BOOK 4081, PAGE 482 TM# 50-018-00006 633 SALISBURY STREET
0 10 20 30 40
SCALE: 1" = 10'

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WORCESTER, MA 01609

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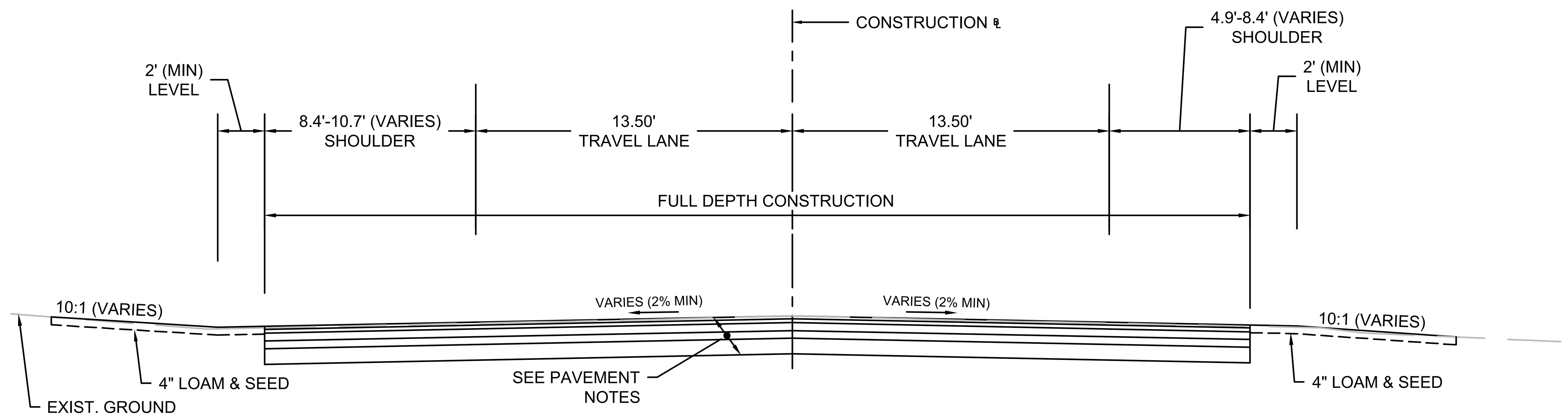
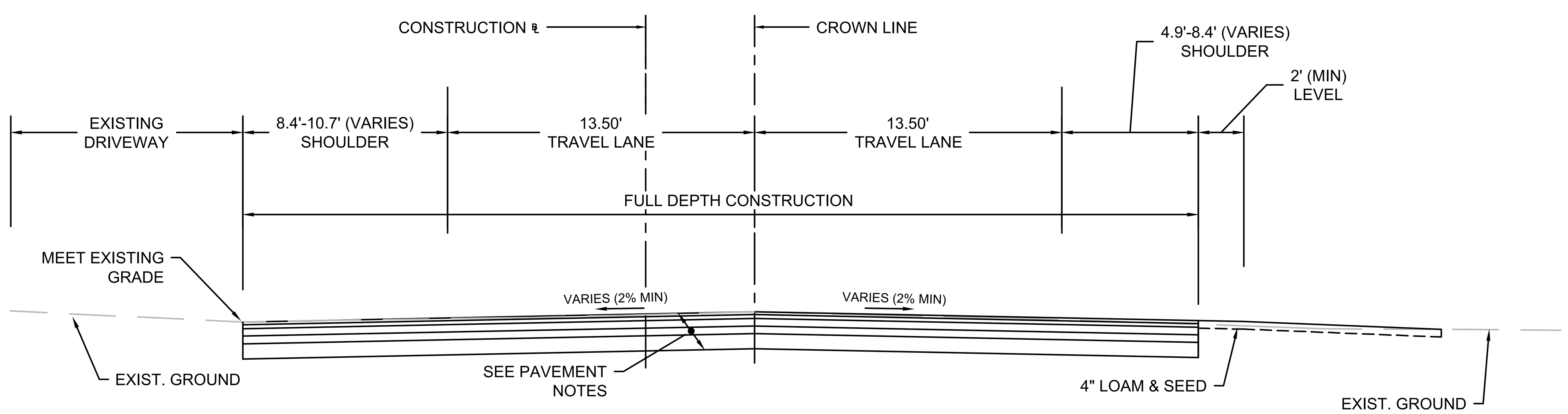
W&S Project No.: ENG22-0381
W&S File No.:

Drawing Title: ROADWAY CONSTRUCTION PLAN

Sheet Number: C-3



TYPICAL SECTION - SALISBURY STREET
STA 10+93 TO STA 11+30
NOT TO SCALE



TYPICAL SECTION - SALISBURY STREET
STA 11+30 TO 11+53
NOT TO SCALE

PAVEMENT NOTES

PAVEMENT MILLING AND OVERLAY:

1½" SUPERPAVE (9.5MM LEVEL 2) OVER
ASPHALT EMULSION FOR TACK COAT OVER
1½" GRINDING AND MILLING

ROADWAY FULL DEPTH RECONSTRUCTION:

1½" SUPERPAVE (9.5MM LEVEL 2) OVER
ASPHALT EMULSION FOR TACK COAT OVER
2½" SUPERPAVE (12.5MM LEVEL 3) OVER
ASPHALT EMULSION FOR TACK COAT OVER
4" SUPERPAVE (19MM LEVEL 2) OVER
4" DENSE GRADED CRUSHED STONE OVER
8" GRAVEL BORROW, TYPE B

PROPOSED PAVEMENT OVER CULVERT

1½" SUPERPAVE (9.5MM LEVEL 2) OVER
ASPHALT EMULSION FOR TACK COAT OVER
1½" SUPERPAVE (12.5MM LEVEL 3) OVER
4" (MIN.) DENSE GRADED CRUSHED STONE

HOT MIX ASPHALT DRIVEWAY

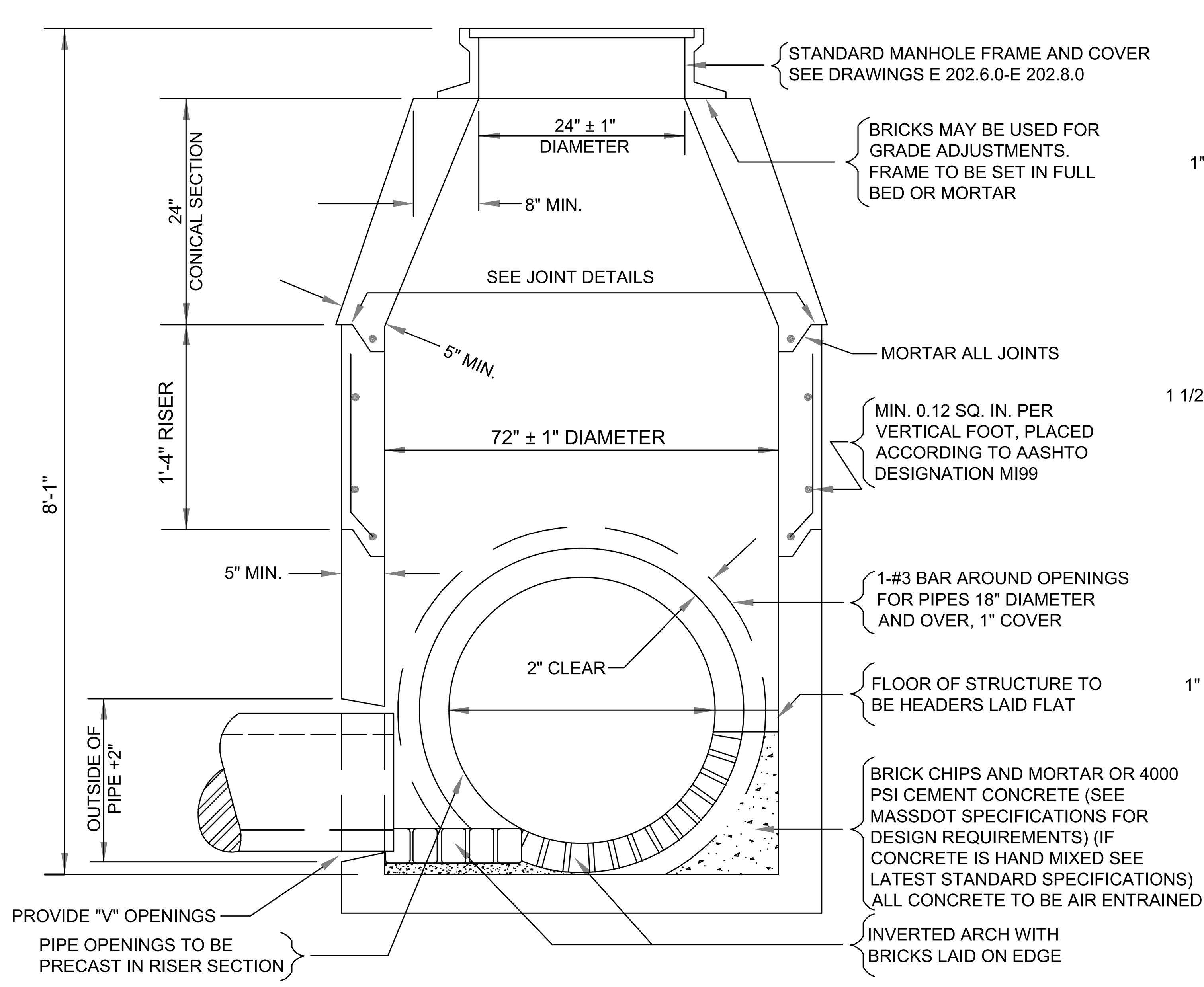
1½" SUPERPAVE (9.5MM LEVEL 2) OVER
ASPHALT EMULSION FOR TACK COAT OVER
2½" SUPERPAVE (12.5MM LEVEL 3) OVER
8" GRAVEL BORROW, TYPE B

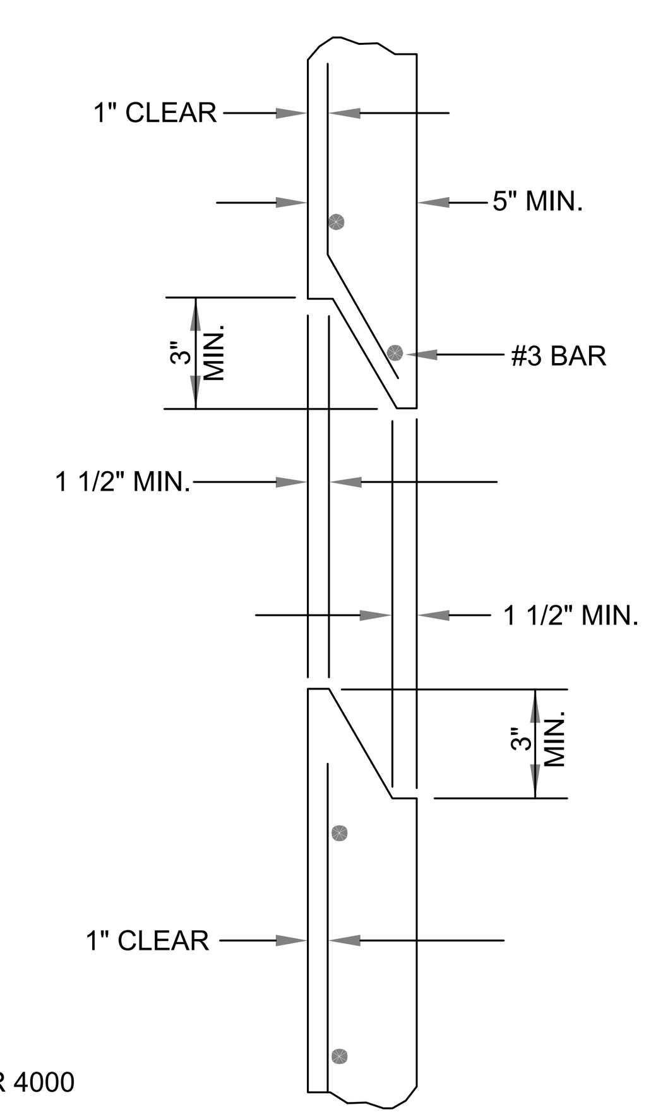
TEMPORARY PAVEMENT WIDENING:

1½" SUPERPAVE (9.5MM LEVEL 2) OVER
ASPHALT EMULSION FOR TACK COAT OVER
2½" SUPERPAVE (12.5MM LEVEL 3) OVER
12" GRAVEL BORROW, TYPE B

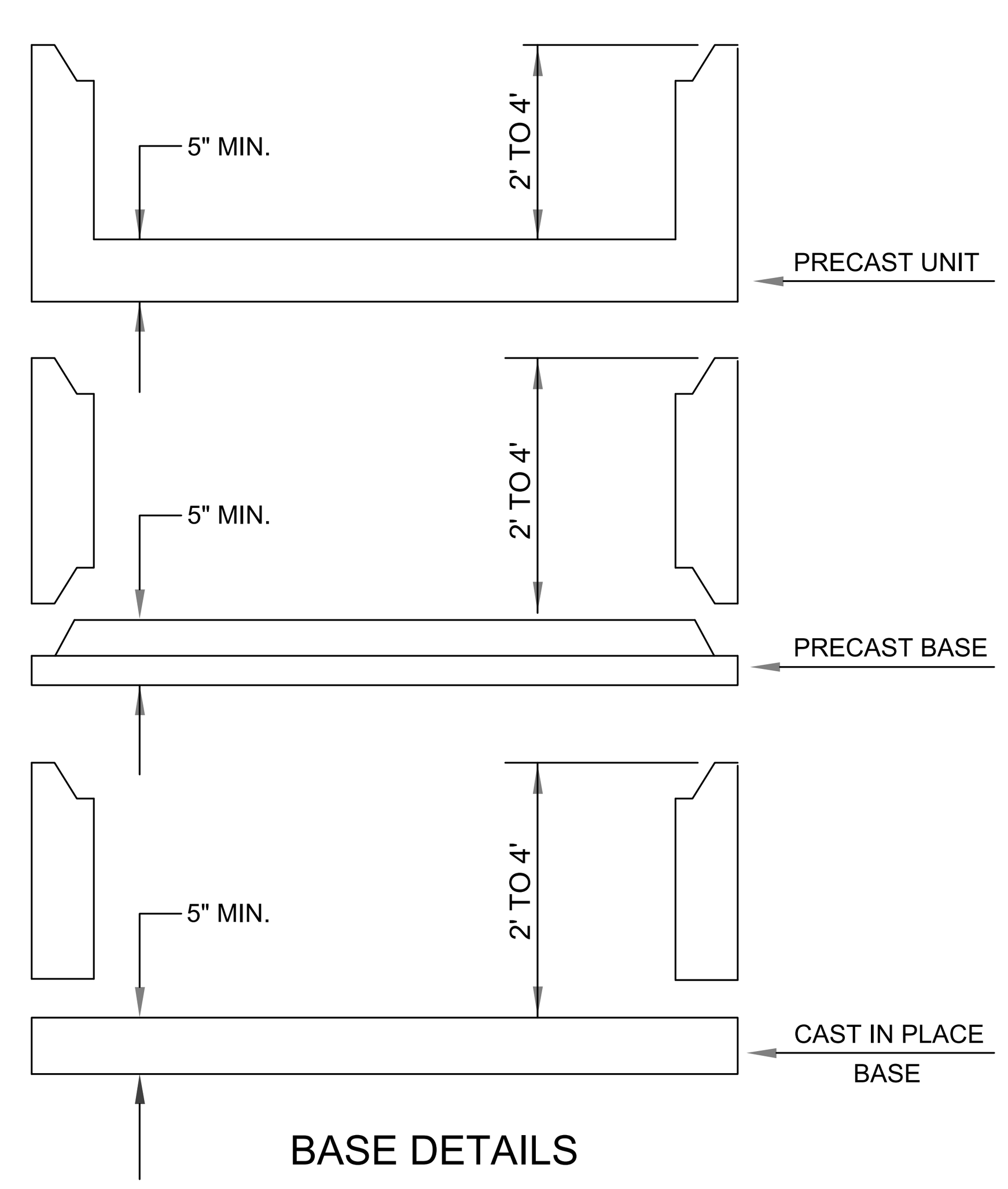
TACK COAT SHALL BE APPLIED AT RATE OF 0.09 GALLON PER YARD OVER MILLED SURFACES AND 0.08 GALLON PER SQUARE YARD OVER SMOOTH PAVED SURFACES.

*TOLERANCE FOR CONSTRUCTION ±0.5%





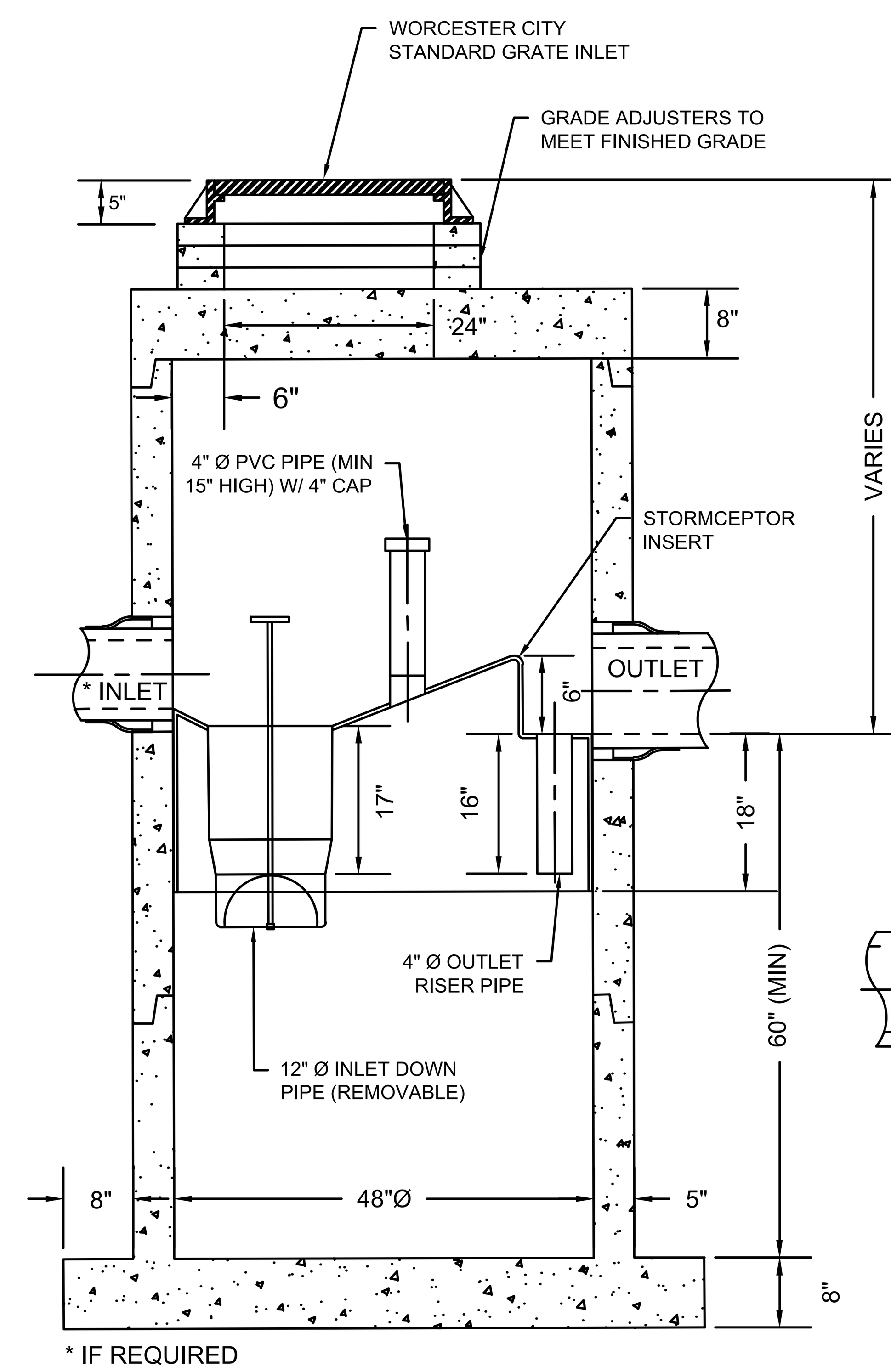
JOINT DETAILS



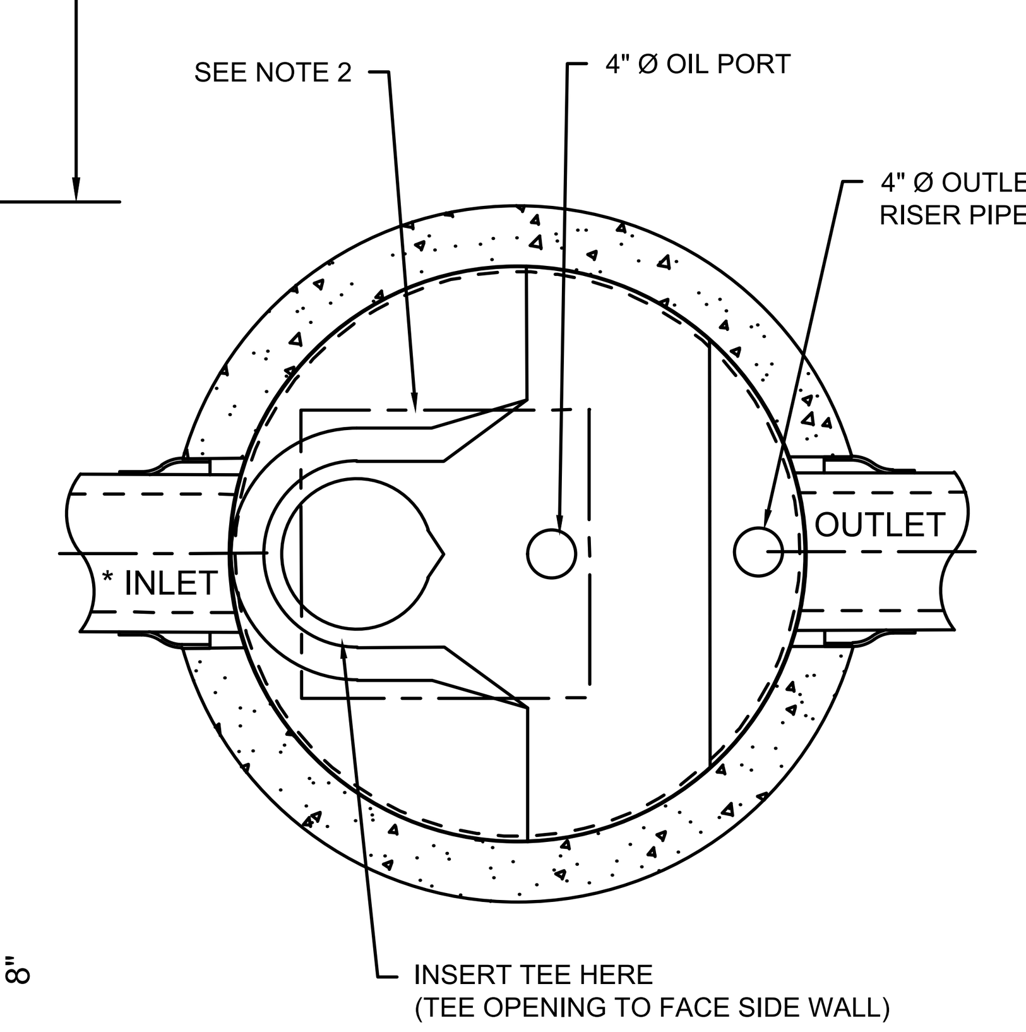
BASE DETAILS

NOTE:
1. FOR DESCRIPTIONS, MATERIALS AND CONSTRUCTION METHODS, SEE LATEST STANDARD SPECIFICATIONS.

1 6' DIA MANHOLE
SCALE: N.T.S.



SECTION THROUGH CHAMBER



PLAN VIEW

NOTES:
1. THE USE OF FLEXIBLE CONNECTIONS IS RECOMMENDED AT THE INLET AND OUTLET WHERE APPLICABLE.
2. THE COVER SHOULD BE POSITIONED OVER THE OUTLET DROP PIPE AND THE OIL PORT.

2 STORMWATER TREATMENT UNIT (SWTU)
SCALE: N.T.S.

Project:
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WORCESTER, MA 01609

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Revisions:

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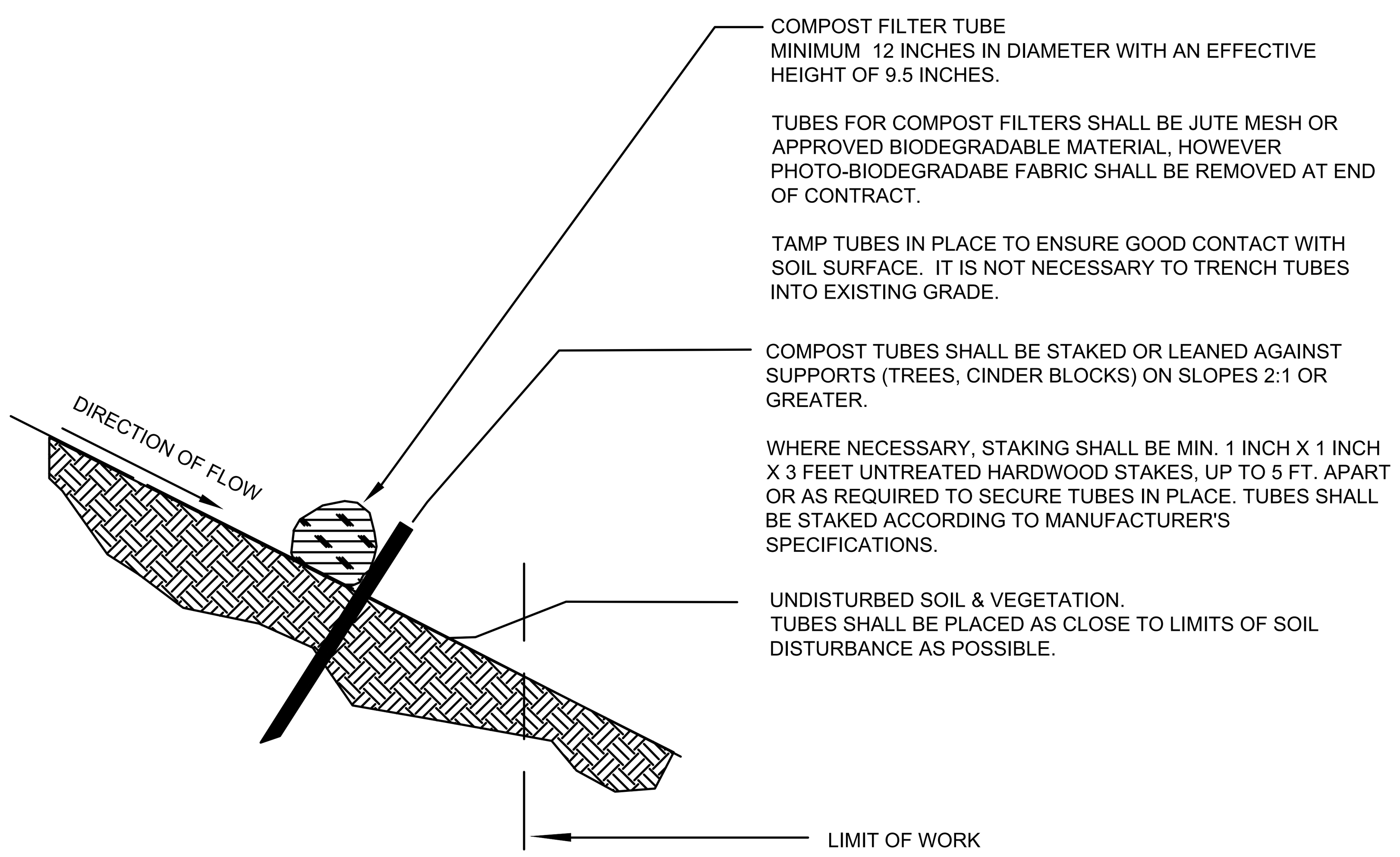
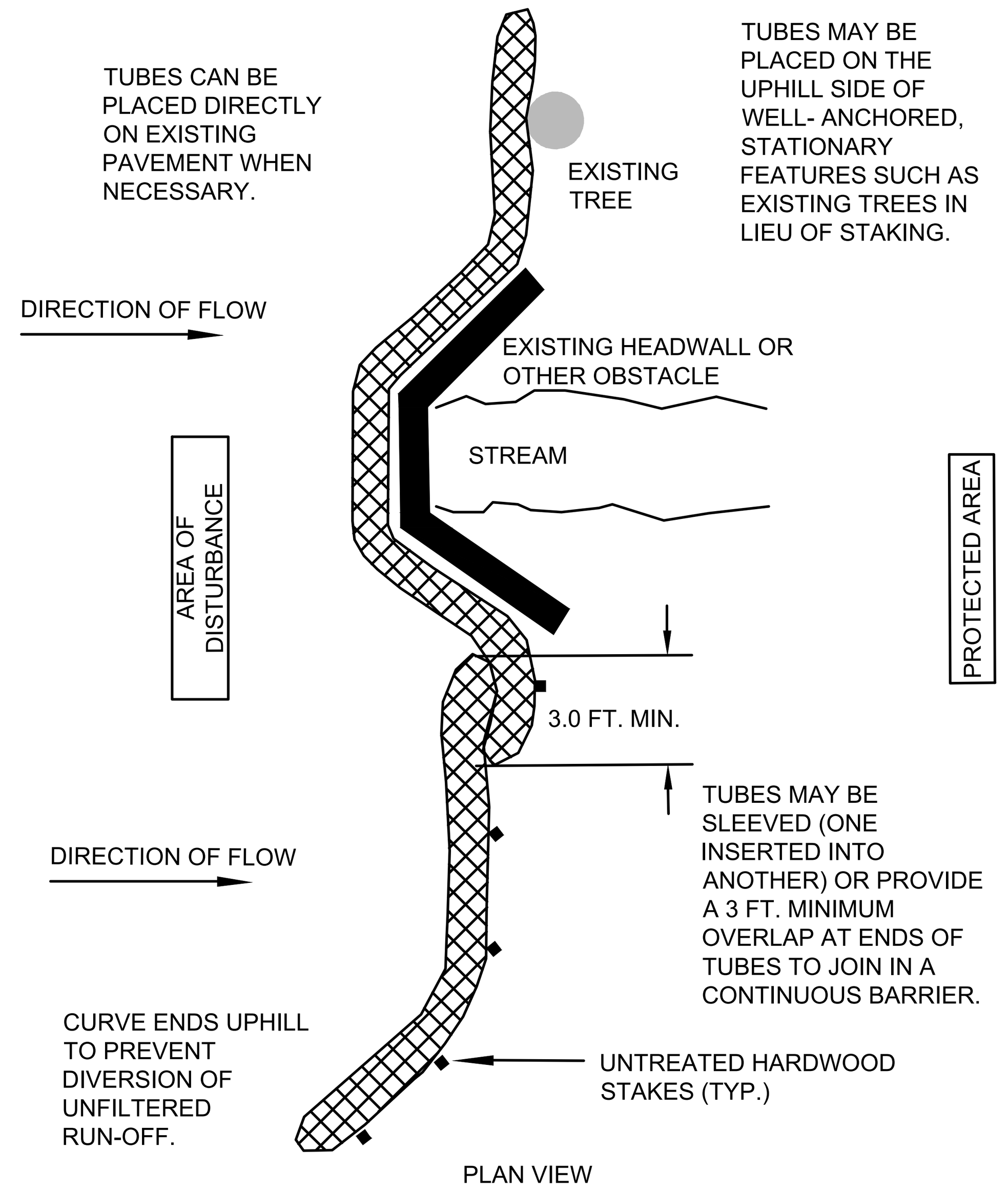
Drawing Title:
CONSTRUCTION
DETAILS 1

Sheet Number:
C-4

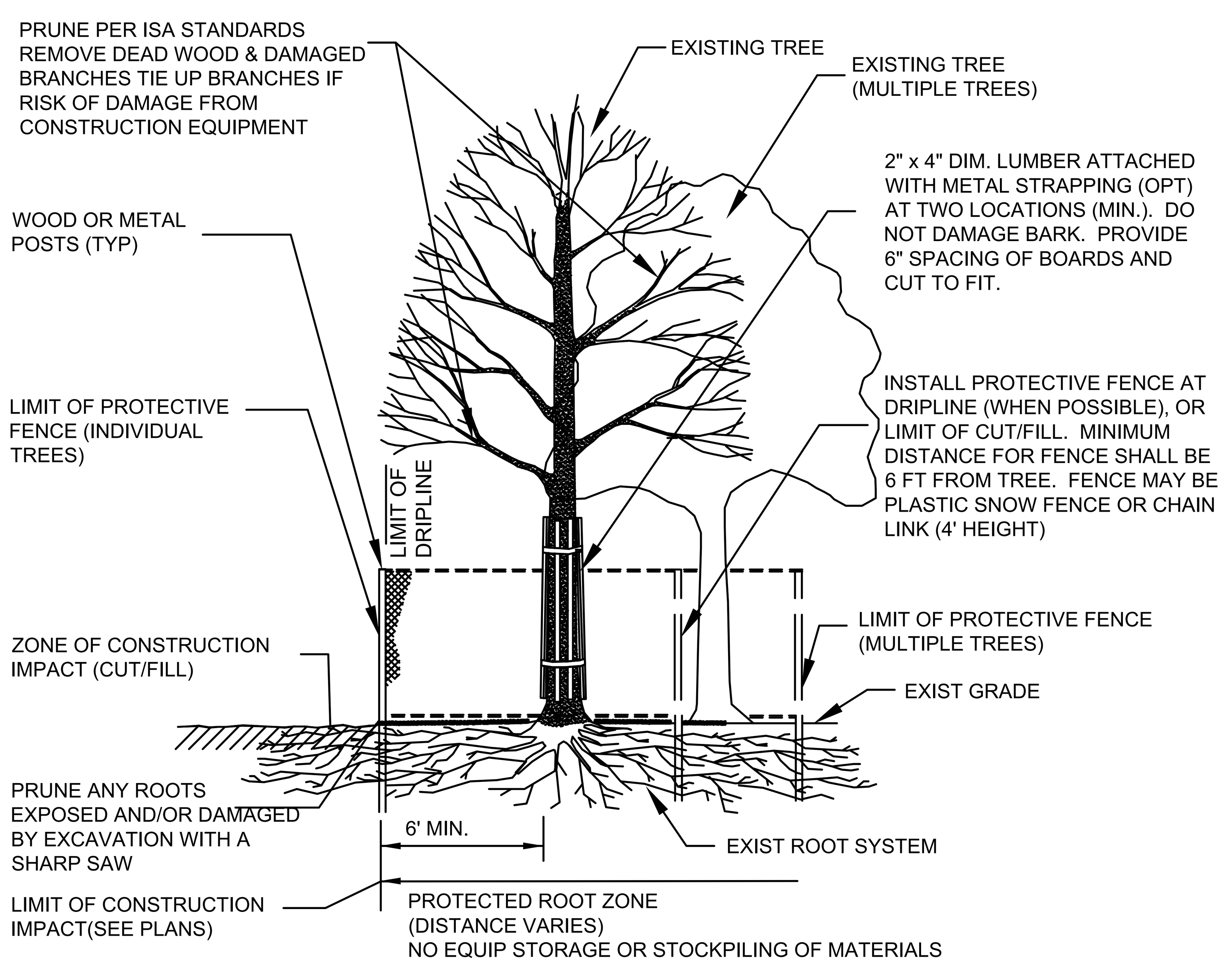
GENERAL NOTES:

1. PROVIDE A MINIMUM TUBE DIAMETER OF 12 INCHES FOR SLOPES UP TO 50 FEET 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.



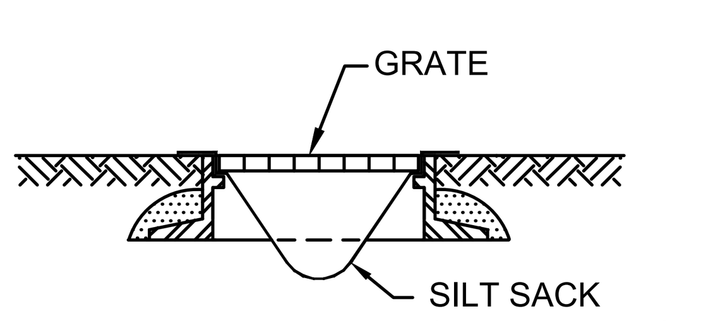


1 SEDIMENT CONTROL BARRIER - SINGLE COMPOST FILTER TUBE
SCALE: N.T.S.



NOTE: THIS DETAIL APPLIES TO THE TREES TO BE PROTECTED WITHIN LIMIT OF WORK

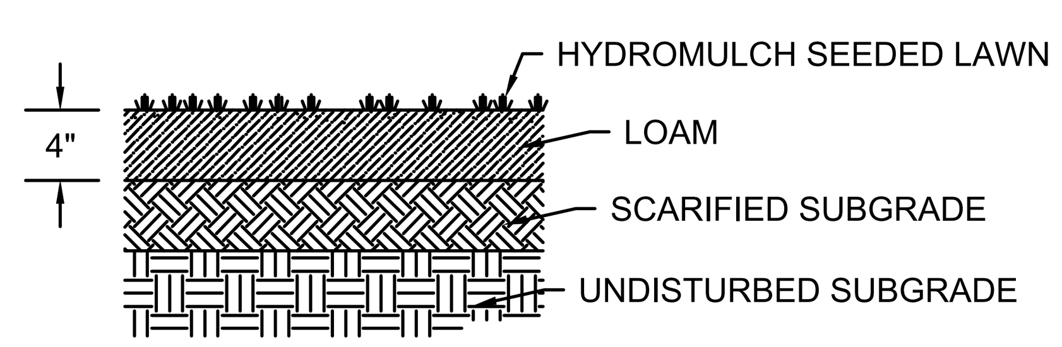
2 EXISTING TREE PROTECTION
SCALE: N.T.S.



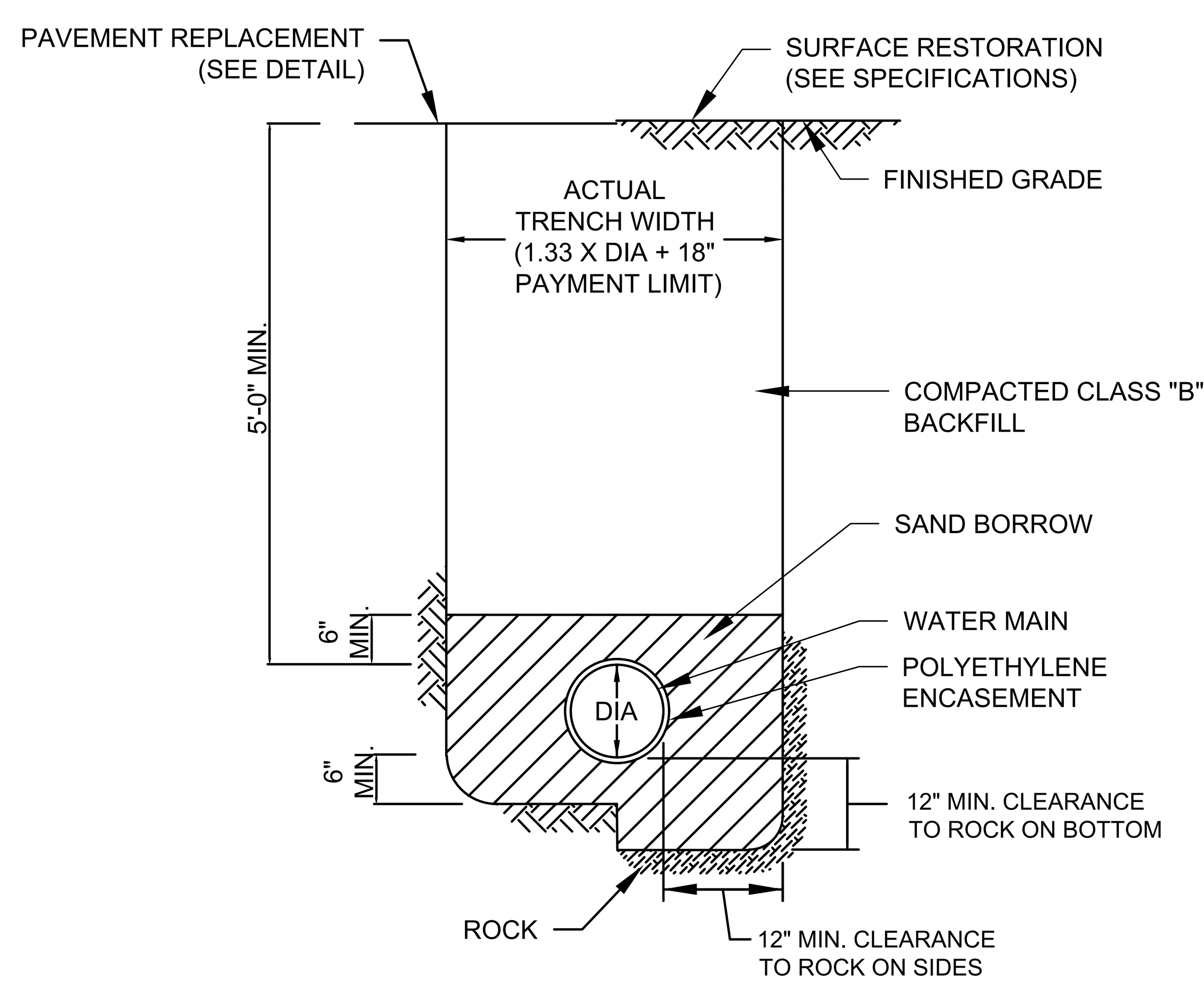
NOTES:

1. INSTALL SILT SACK IN ALL EXISTING AND PROPOSED CATCH BASINS, GUTTER INLETS, AND ALL CURB INLETS PRIOR TO COMMENCEMENT OF WORK AND MAINTAIN UNTIL END OF WORK.
2. SILT SACK SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS. CLEANING AND REPLACEMENT SHALL BE PERFORMED AS NEEDED.

3 CATCH BASIN PROTECTION DETAIL
SCALE: N.T.S.



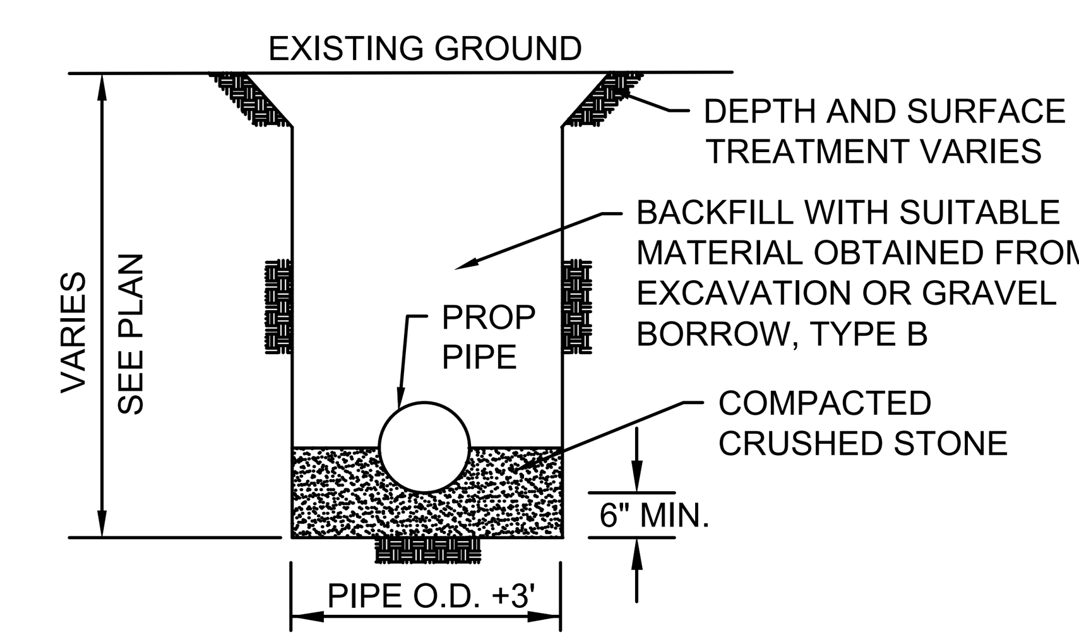
4 LOAM & SEED
SCALE: N.T.S.



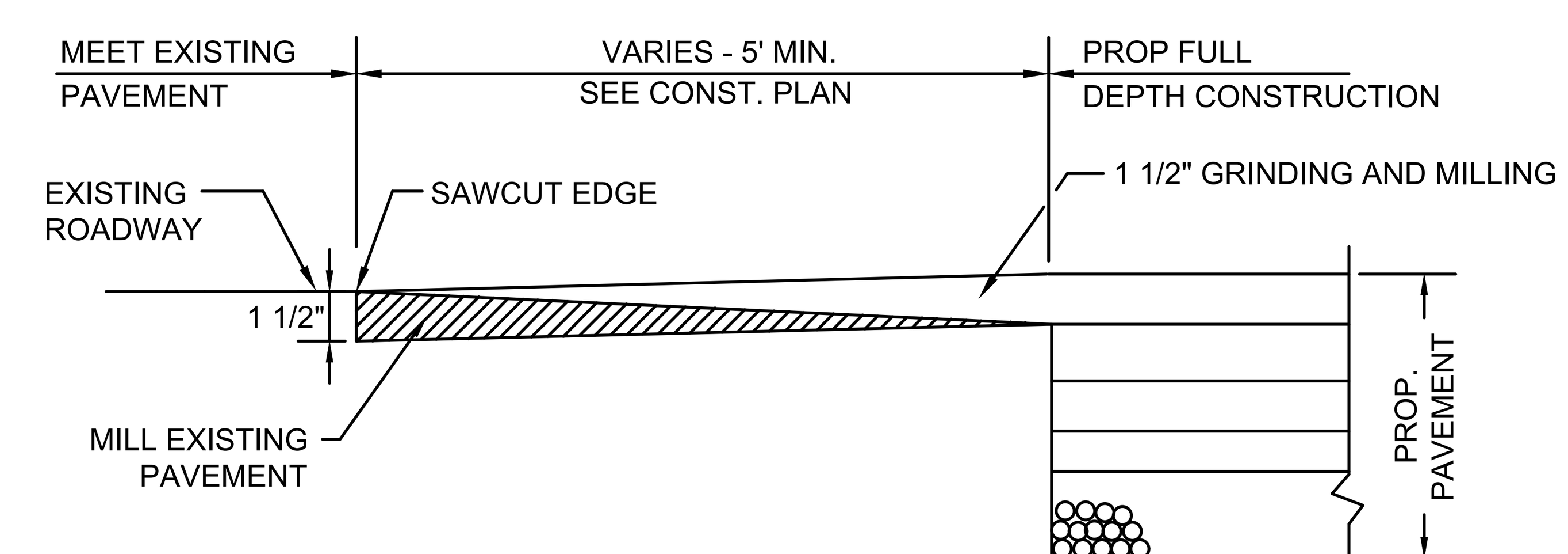
5 WATER MAIN TRENCH DETAIL
SCALE: N.T.S.

NOTES:

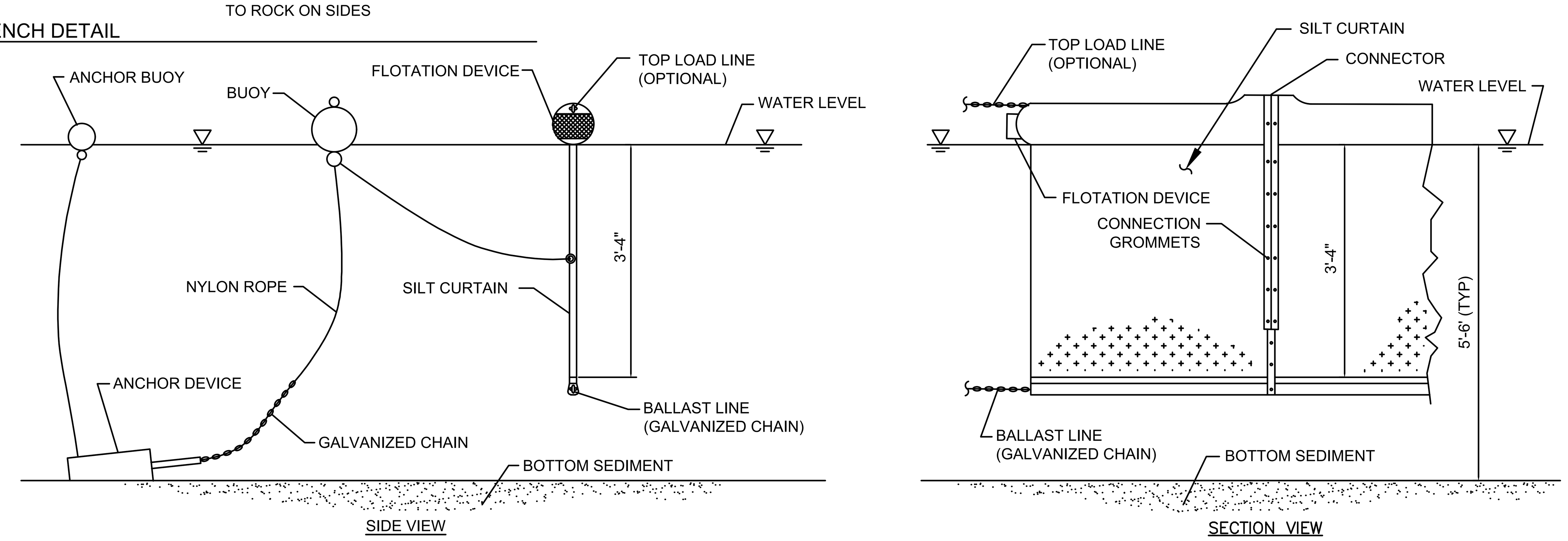
1. EROSION CONTROL MEASURES SHALL BE INCORPORATED IN THE SEQUENCE OF CONSTRUCTION TO PREVENT SEDIMENT LADEN WATER FROM LEAVING THE SITE.
2. AREAS SUBJECT TO EROSION SHALL BE MINIMIZED IN TERMS OF TIME AND AREA.
3. IN GENERAL, WORK REQUIRING EROSION CONTROL INCLUDES EXCAVATIONS, FILLS, DRAINAGE, SWALES AND DITCHES, ROUGH AND FINISH GRADING, AND STOCKPILING OF EARTH.
4. DO NOT DISTURB VEGETATION AND TOPSOIL BEYOND THE PROPOSED LIMIT OF EROSION CONTROL BARRIER.
5. TEMPORARY SILT CONTROLS SHALL BE PLACED AS SHOWN ON THE PLAN. PERMANENTLY STABILIZE EACH COMPLETED SEGMENT OF CONSTRUCTION.
6. THE CONTRACTOR SHALL REMOVE TEMPORARY SILT CONTROLS AND ALL ACCUMULATED SILT AND DEBRIS AFTER COMPLETION OF CONSTRUCTION OPERATIONS.
7. SILT CONTROLS SHALL BE IN PLACE AT ALL TIMES DURING CONSTRUCTION.
8. THE CONTRACTOR SHALL REMOVE AND LEGALLY DISPOSE OF ALL SILT AND DEBRIS FROM EACH DRAINAGE STRUCTURE UPON COMPLETION OF THE PROJECT.
9. OBJECTS AND/OR AREAS DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED TO THEIR ORIGINAL CONDITION.
10. ALL DISTURBED AREAS SHALL BE RESTORED TO EXISTING GRADE. INSPECTION SHALL BE FREQUENT AND REPAIR OR REPLACEMENT SHALL BE MADE AS NEEDED.
11. SILT CONTROLS SHALL BE REMOVED UPON THE SATISFACTORY COMPLETION OF ALL WORK SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
12. SITE PERIMETER SHALL HAVE COMPOST FILTER TUBES INSTALLED AT THE LIMIT OF WORK.
13. SEDIMENT CONTROL BARRIER SHALL BE PAID FOR UNDER PAY ITEM 171.



6 DRAINAGE TRENCH
SCALE: N.T.S.



7 PROPOSED PAVEMENT TRANSITION (LONGITUDINAL SECTION)
SCALE: N.T.S.



NOTE: FLOATING SILT FENCE SHALL BE PAID FOR UNDER PAY ITEM 171.

8 FLOATING SILT FENCE
SCALE: N.T.S.

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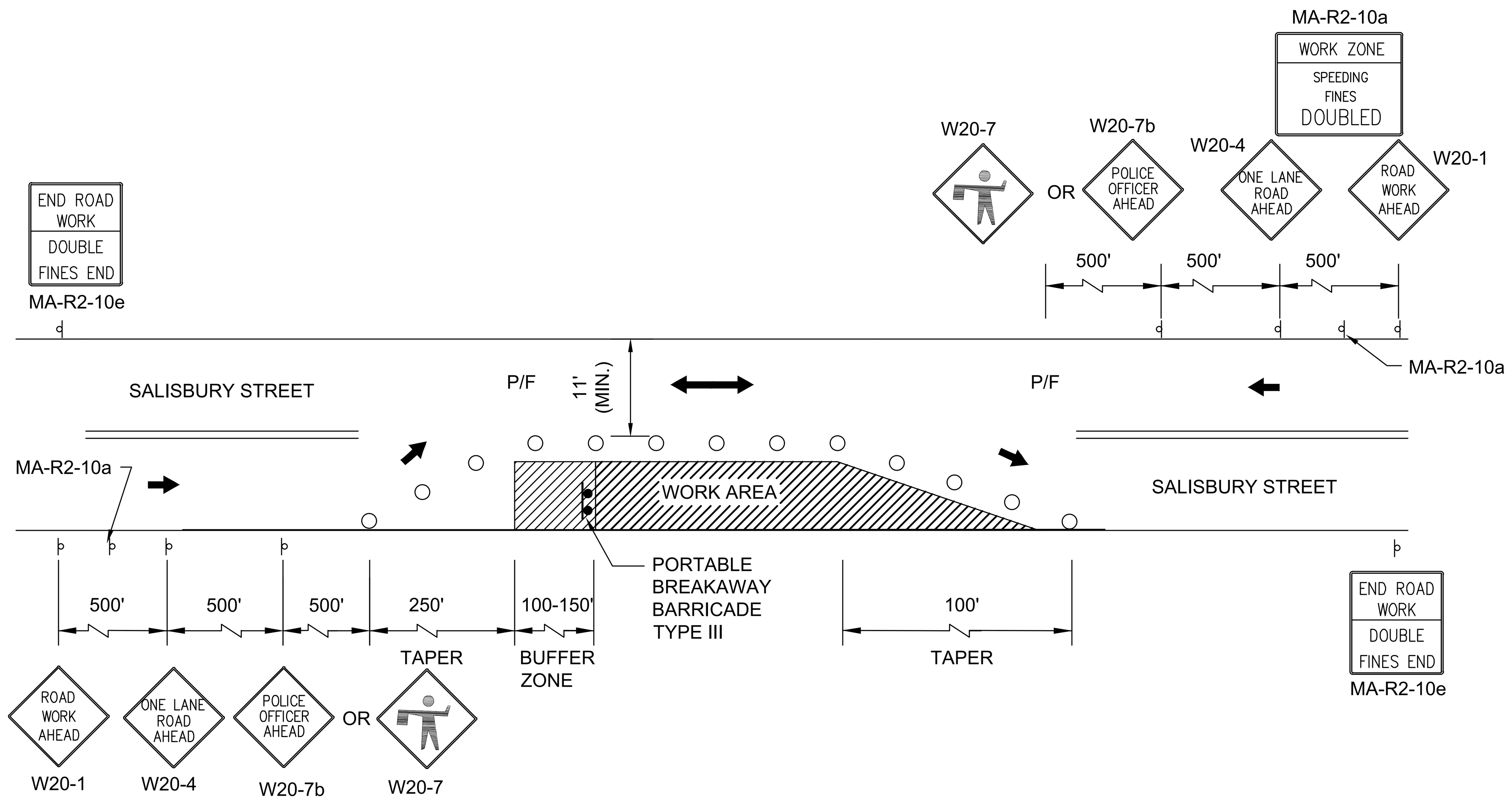
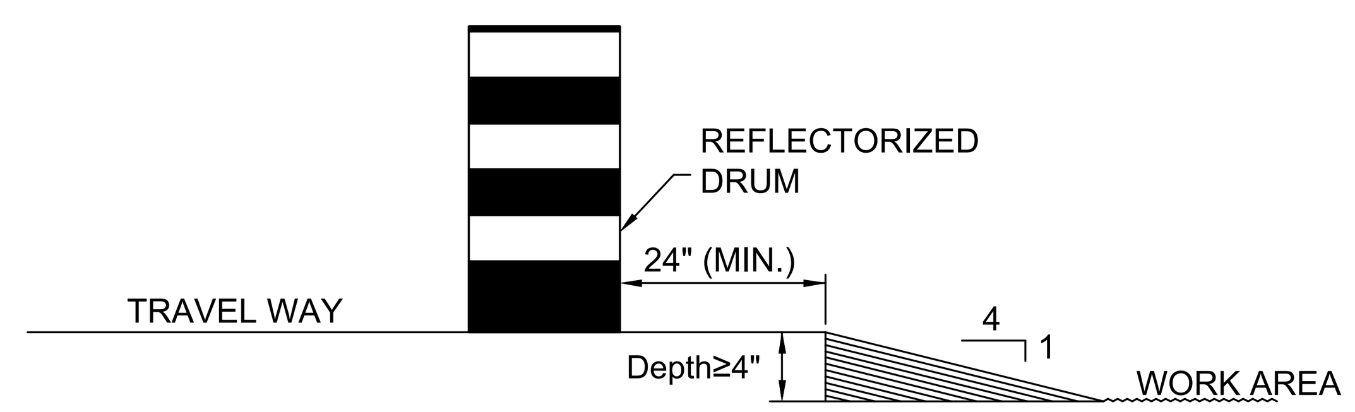
CONSTRUCTION DETAILS 2

Sheet Number:
C-5



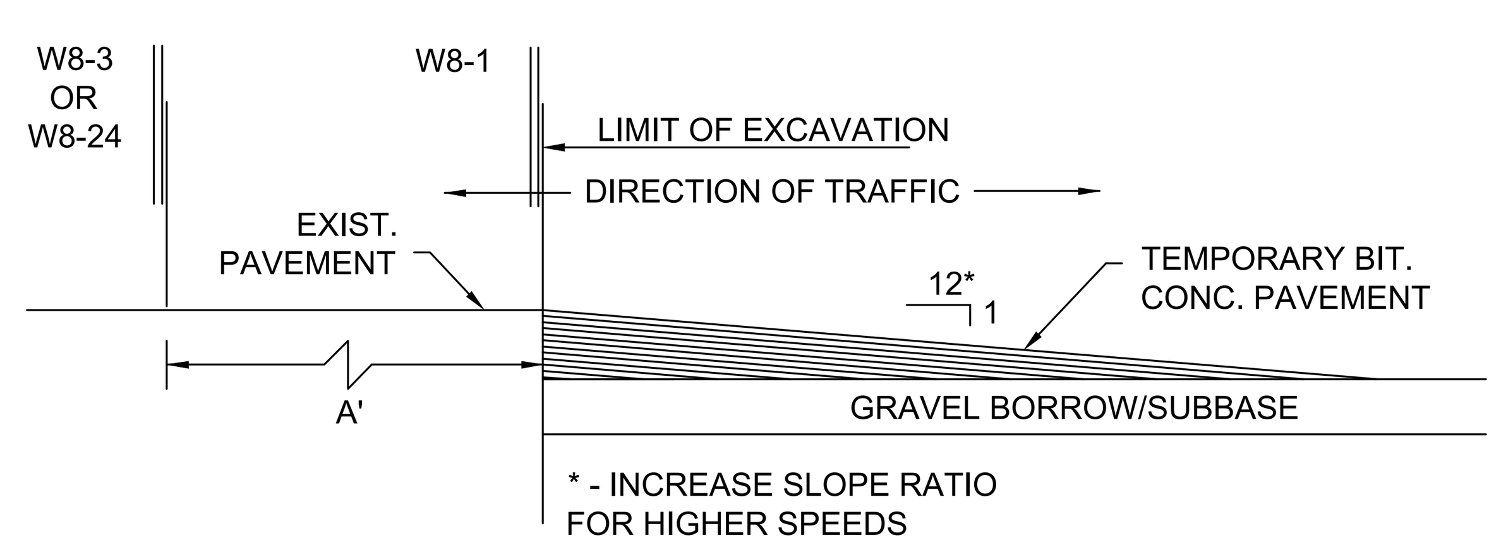
PARTIAL LANE CLOSURE - SHORT TERM DAY TIME WORK

NOT TO SCALE



LATERAL DROP-OFF DETAIL

NOT TO SCALE



SUGGESTED WORK ZONE WARNING SIGN SPACING

ROAD TYPE	DISTANCE BETWEEN SIGNS **		
	A	B	C
LOCAL OR LOW VOLUME ROADWAYS*	350	350	350
MOST OTHER ROADWAYS*	500	500	500
FREEWAYS AND EXPRESSWAYS*	1,000	1,500	2,640

* ROAD TYPE TO BE DETERMINED BY MASSDOT OFFICE OF TRANSPORTATION PLANNING.

** DISTANCES ARE SHOWN IN FEET. THE COLUMN HEADINGS A, B, AND C ARE THE DIMENSIONS SHOWN IN THE DETAIL/ TYPICAL SETUP FIGURES. THE A DIMENSION IS THE DISTANCE FROM THE TRANSITION OR POINT OF RESTRICTION TO THE FIRST SIGN. THE B DIMENSION IS THE DISTANCE BETWEEN THE FIRST AND SECOND SIGNS. THE C DIMENSION IS THE DISTANCE BETWEEN THE SECOND AND THIRD SIGNS. (THE "THIRD" SIGN IS THE FIRST ONE TYPICALLY ENCOUNTERED BY A DRIVER APPROACHING A TEMPORARY TRAFFIC CONTROL (TTC) ZONE.)

THE "THIRD" SIGN ABOVE IS TYPICALLY REFERRED TO AS AN "ADVANCE WARNING" SIGN ON THE TTCP SETUPS. THESE ADVANCE WARNING SIGNS ARE LOCATED PRIOR TO THE PROJECT LIMITS ON ALL APPROACHES (i.e. THE W20-1 SERIES (ROAD WORK XX FT) SIGNS), AND USUALLY REMAIN FOR THE DURATION OF THE PROJECT. ADDITIONAL SIGNS (i.e. "RIGHT LANE CLOSED 1 MILE" AND "LEFT LANE CLOSED 1 MILE") HAVE BEEN SHOWN IN SOME FIGURES AS EXAMPLES OF REINFORCEMENT SIGN PLACEMENT BUT ARE USED IN RARE OCCASIONS.

THE FIRST AND SECOND WARNING SIGNS ABOVE ARE REFERRED TO AS THE OPERATIONAL (DAY-TO-DAY) WORK ZONE SIGNS AND MAY BE MOVED DEPENDING ON WHERE THE SPECIFIC ROADWAY WORK FOR THAT DAY IS LOCATED.

MA-R2-10a SIGNS SHALL BE PLACED BETWEEN THE SECOND AND THIRD SIGNS AS DESCRIBED ABOVE.

MA-R2-10a, MA-R2-10e, AND W20-1 SERIES SIGNS ARE TO BE INCLUDED ON ALL DETAILS/TYPICAL SETUPS.

NOTES:

1. PLACEMENT OF ALL CONSTRUCTION SIGNS, DRUMS, BARRICADES, TRAFFIC DEVICES AND THE SHAPE, SIZE & COLOR OF ALL TEMPORARY TRAFFIC SIGNS SHALL CONFORM WITH THE LATEST EDITION OF MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND AMENDMENTS.
2. TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.
3. ADVANCE WARNING SIGN PLACEMENT AND TAPER LENGTH SHALL BE ADJUSTED ACCORDING TO STREET CONDITIONS AND DRIVEWAY OPENINGS.
4. ALL DRUMS SHALL BE APPROXIMATELY PLACED AND RELOCATED AS NECESSARY TO MAINTAIN ADEQUATE ABUTTER ACCESS AT ALL TIMES.
5. THE CONTRACTOR SHALL NOTIFY EACH ABUTTER AT LEAST 24 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OF ACCESS, SUCH AS EXISTING PAVEMENT EXCAVATION, TEMPORARY DRIVEWAY PAVEMENT PLACEMENT AND SIMILAR OPERATIONS.
6. NONESSENTIAL TRAFFIC CONTROL DEVICES SHALL BE COVERED OR REMOVED DURING NON-WORKING HOURS.
7. PEDESTRIANS SHALL BE PROVIDED WITH ACCESS AND SAFE PASSAGE THROUGH THE TEMPORARY TRAFFIC CONTROL ZONE AT ALL TIMES.
8. ADVISORY SPEED PLATES (W13-1) IF REQUIRED, SHALL BE DETERMINED BY THE ENGINEER.
9. MAINTAIN ONE LANE (MIN. 11' WIDTH) AT ALL TIMES DURING CONSTRUCTION.
10. DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
11. MAXIMUM SPACING OF TRAFFIC DEVICES IN A TAPER (DRUMS OR CONES) IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.
12. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.

TAPER LENGTH CRITERIA FOR TEMPORARY TRAFFIC CONTROL ZONES

TYPE OF TAPER	TAPER LENGTH (L)*
MERGING TAPER	AT LEAST L
SHIFTING TAPER	AT LEAST 0.5L
SHOULDER TAPER	AT LEAST 0.33L
ONE–LANE, TWO–WAY TRAFFIC TAPER	50 FT MIN. 100 FT MAX.
DOWNSTREAM TAPER	50 FT MIN. 100 FT MAX. PER LANE

FORMULAS FOR DETERMINING TAPER LENGTHS

SPEED LIMIT (S)	TAPER LENGTH (L) FEET
40 MPH OR LESS	$L = \frac{WS^2}{60}$
45 MPH OR MORE	L= WS

WHERE: L = TAPER LENGTH IN FEET

W = WIDTH OF OFFSET IN FEET

S = POSTED SPEED LIMIT, OR OFF-PEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICAPATED OPERATING SPEED IN MPH

TEMPORARY TRAFFIC SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	NOTES
	WIDTH	HEIGHT		
MA-R2-10a	48"	36"	WORK ZONE SPEEDING FINES DOUBLED	PLACE SIGN BETWEEN FIRST AND SECOND ADVANCED WARNING SIGN OR AS DIRECTED BY THE ENGINEER
MA-R2-10e	36"	48"	END ROAD WORK DOUBLE FINES END	
R10-6	36"	48"	STOP HERE ON RED	
W1-4L	36"	36"		
W1-4R	36"	36"		
W3-3	36"	36"		BLACK LEGEND ON FLUORESCENT ORANGE BACKGROUND
W8-1	36"	36"	BUMP	
W13-1p	18"	18"	XX M.P.H.	ADVISORY SPEED LIMIT AS DETERMINED BY THE ENGINEER
W8-15	36"	36"	GROOVED PAVEMENT	
W8-24	36"	36"	STEEL PLATE AHEAD	
W20-1	36"	36"	ROAD WORK AHEAD	
W20-4	36"	36"	ONE LANE ROAD AHEAD	
W20-7	36"	36"		
W20-7b	36"	36"	POLICE OFFICER AHEAD	

LEGEND

- REFLECTORIZED CHANNELIZING DEVICE
- REFLECTORIZED DRUM
- TRAFFIC FLOW DURING CONSTRUCTION
- NORMAL TRAFFIC FLOW
- P/F POLICE/FLAGGER DETAIL
- PORTABLE BREAKAWAY BARRICADE TYPE III
- TEMPORARY IMPACT ATTENUATOR
- TEMPORARY SIGNAL
- CONSTRUCTION SIGN
- WORK AREA
- N.T.S. NOT TO SCALE
- ARROW BOARD
- TEMPORARY PRECAST PORTABLE CONCRETE BARRIER W/WARNING LIGHTS
- SL STOP LINE

Project: SALISBURY STREET CULVERT REPLACEMENT WORCESTER, MA 01609

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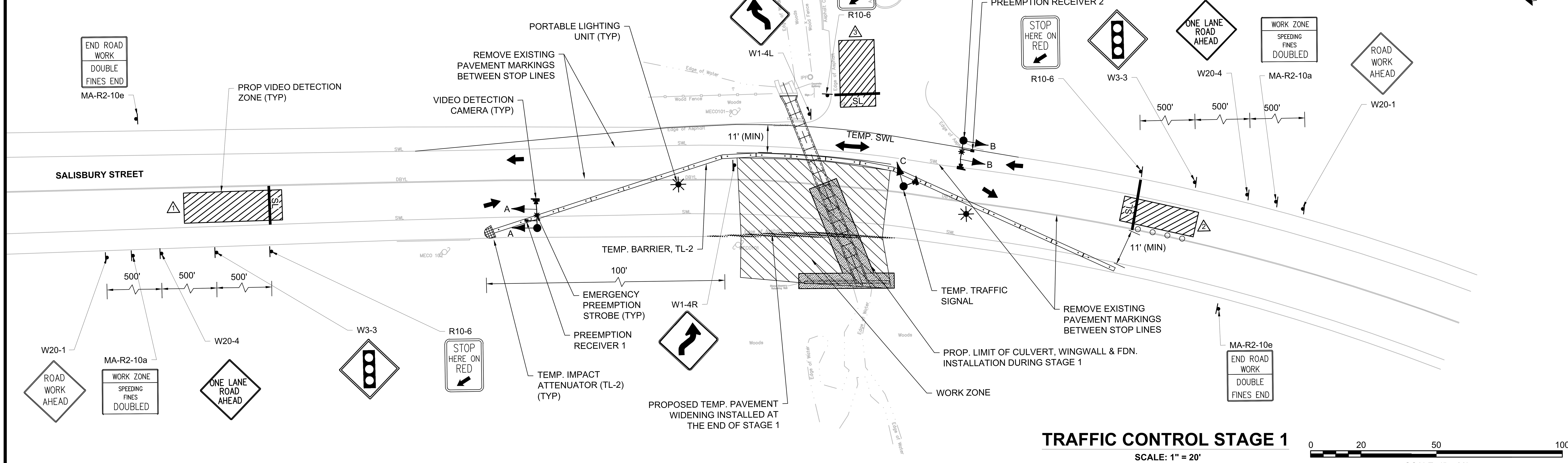
W&S Project No.:	ENG22-0381
W&S File No.:	

Drawing Title: TEMPORARY TRAFFIC CONTROL PLAN 1

Sheet Number: C-6

TRAFFIC SYMBOLS

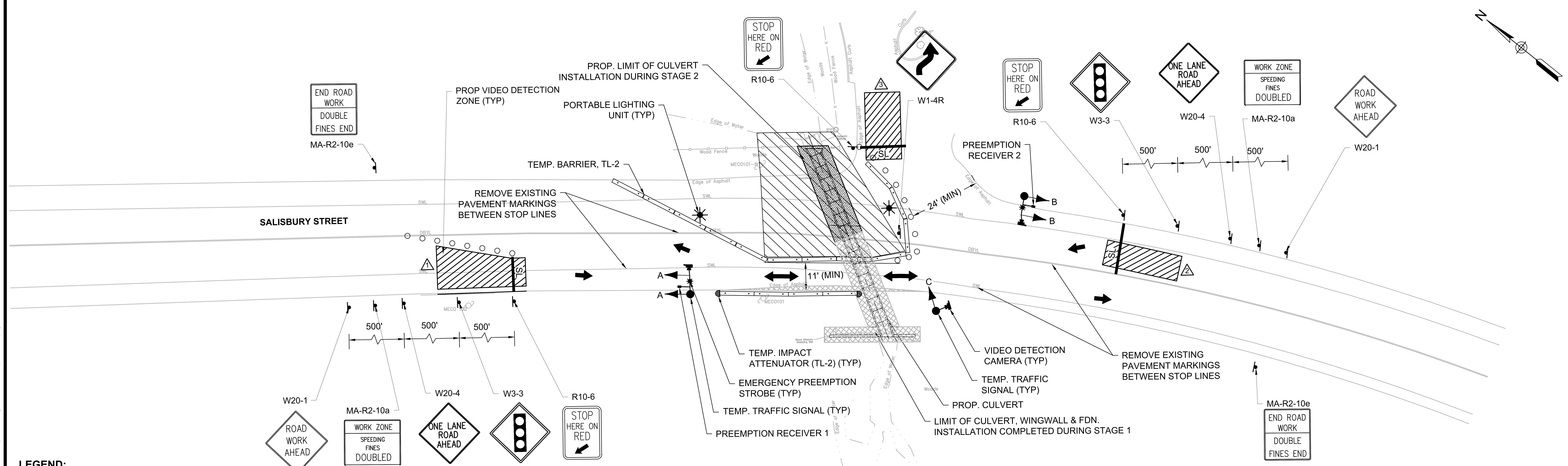
PROPOSED	DESCRIPTION
(symbol)	VIDEO DETECTION CAMERA
(symbol)	EMERGENCY PREEMPTION CONFIRMATION STROBE LIGHT
(symbol)	OPTICAL PRE-EMPTION DETECTOR



TRAFFIC CONTROL STAGE 1

SCALE: 1" = 20'

0 20 50 100
SCALE: 1" = 20'



LEGEND:

Symbol	Description	Symbol	Description
(hatch)	WORK ZONE	(hatch)	TEMPORARY PAVEMENT WIDENING
(hatch)	PROPOSED WORK LIMITS	(hatch)	WORK COMPLETED DURING STAGE 1

TRAFFIC CONTROL STAGE 2

SCALE: 1" = 20'

0 20 50 100
SCALE: 1" = 20'

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WORCESTER, MA 01609

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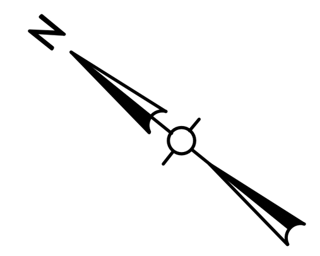
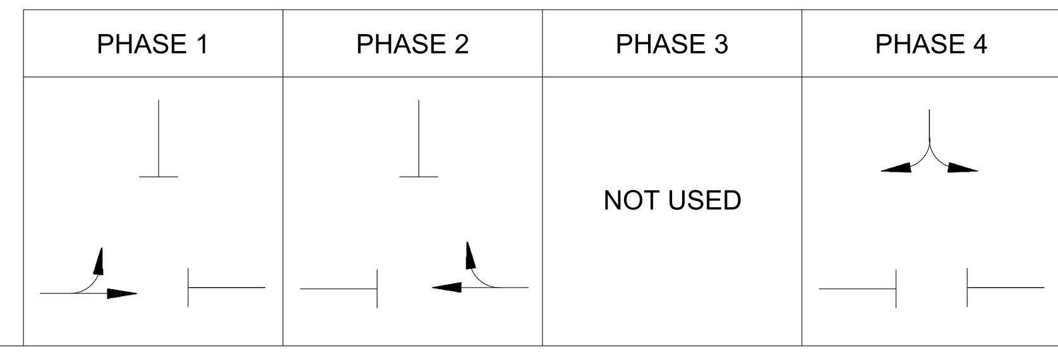
TEMPORARY TRAFFIC CONTROL PLAN 2

Sheet Number:
C-7

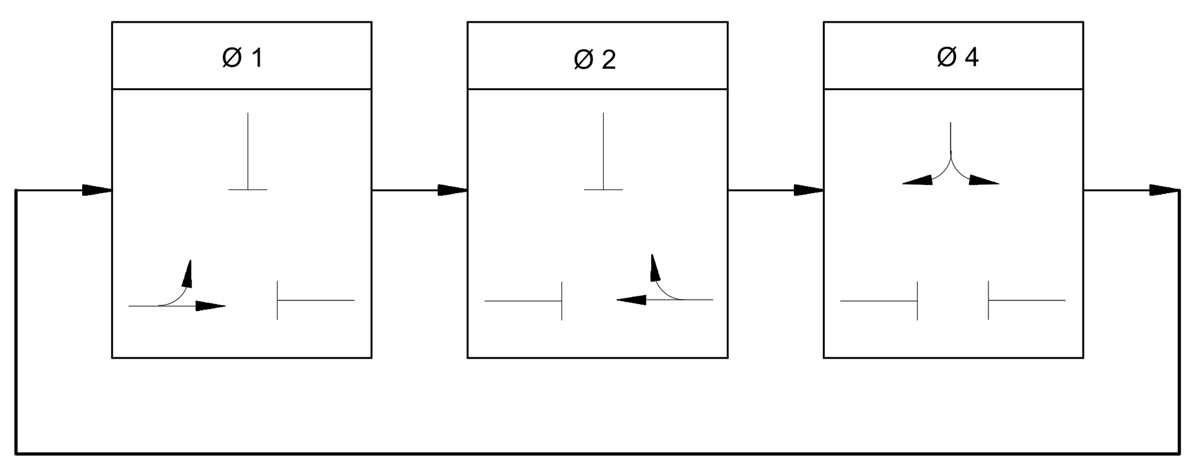




SEQUENCE AND TIMING FOR FULL ACTUATED CONTROL (ISOLATED)															
STREET	**DIRECTION**	**HOUSINGS**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**FLASH OPER.**
SALISBURY STREET	EASTBOUND	A	G	Y	R	R	R	R				R	R	R	FR
SALISBURY STREET	WESTBOUND	B	R	R	R	G	Y	R				R	R	R	FR
DRIVEWAY	SOUTHBOUND	C	R	R	R	R	R	R				G	Y	R	FR
TIMING IN SECONDS															
MINIMUM GREEN (INITIAL)			8			8						6			EMERGENCY ONLY
PASSAGE TIME (VEHICLE)			3			3						3			
MAXIMUM 1 (ALL TIMES OF DAY)			25			25						10			
MAXIMUM 2															
YELLOW CLEARANCE				3			3						3		
RED CLEARANCE					12.5			12.5						11	
WALK (W)															
PEDESTRIAN CLEARANCE															
RECALL			**NONE**			**NONE**						**NONE**			
MEMORY															

PAY ITEM	QUANTITY	MAJOR ITEMS REQUIRED ITEM
ITEM 816.81	1	CONTROLLER NEMA 8 PHASE TS2
	3	PORTABLE TEMPORARY TRAFFIC SIGNALS
	5	1 WAY, 3 SECTION, SIGNAL HOUSING (12" LED)
	2	EMERGENCY PREEMPTION RECEIVER - SINGLE CHANNEL
	2	EMERGENCY PREEMPTION STROBE LIGHT
	1	EMERGENCY PREEMPTION PHASE SELECTOR
	3	VIDEO DETECTION CAMERA
		Plus all necessary duct, cable, labor, miscellaneous
		material and equipment to complete the installation.

PREFERENTIAL PHASING SEQUENCE



VIDEO DETECTOR DATA

DETECTOR NUMBER	DETECTOR ZONE SIZE	Ø CALLED	MODE A=PULSE B=PRES.	DELAY TIME	EXT. TIME
1	VIDEO 6'x50'	Ø1	B	-	-
2	VIDEO 6'x50'	Ø2	B	-	-
3	VIDEO 6'x50'	Ø4	B	-	-

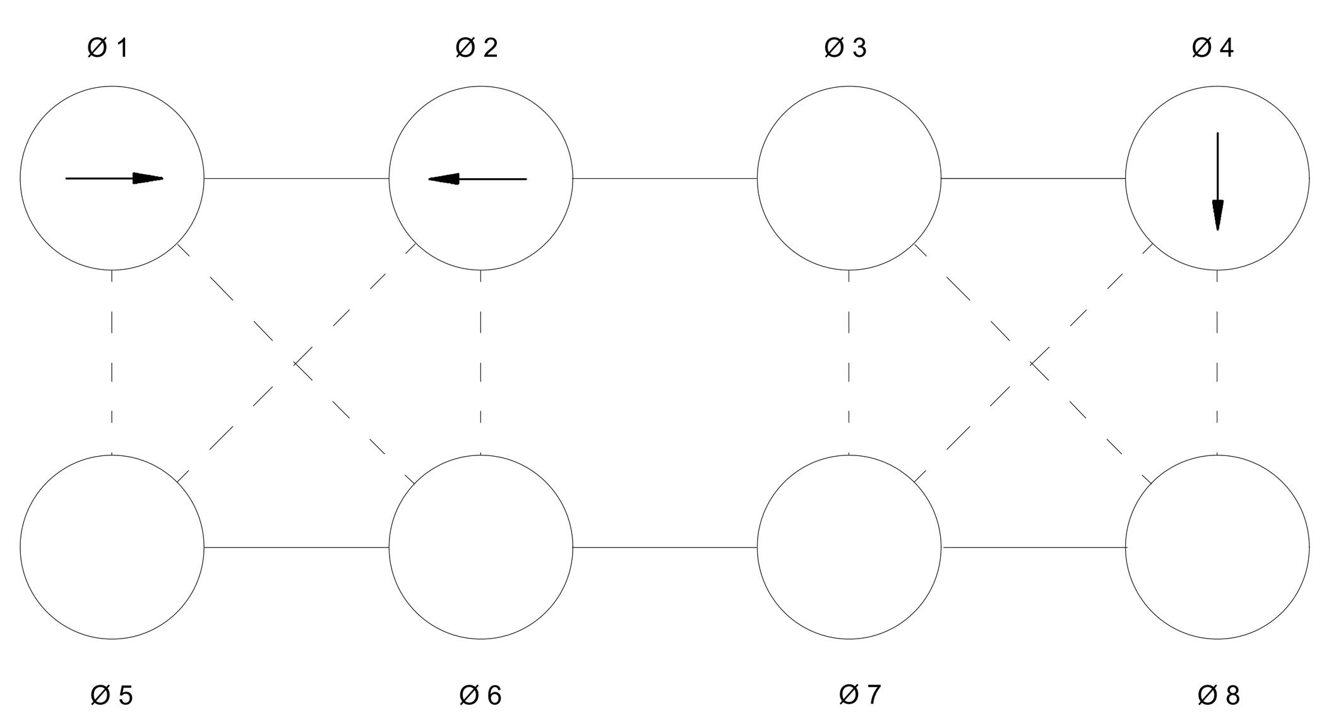
FIRE PREEMPTION SCHEDULE

APPROACH	PREEMPTION PHASE DETECTOR	PHASE CALLED
EASTBOUND	1	Ø1
WESTBOUND	2	Ø2

EMERGENCY VEHICLE PREEMPTION OPERATION:

1. 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.
2. PREEMPTION SIGNALS FROM MULTIPLE APPROACHES SHALL BE SERVICED ON A FIRST DETECTED FIRST SERVED BASIS.
3. IN RESPONSE TO A PREEMPTION SIGNAL RECEIVED AT AN INTERSECTION BY AN OPTICAL DETECTOR, THE CONTROLLER SHALL TIME THE CLEARANCE INTERVALS OF THE ACTIVE PHASE (IF DIFFERENT THAT TO BE SERVICED) AND ADVANCE TO AND/OR HOLD IN EMERGENCY VEHICLE PREEMPTION PHASE UNTIL PREEMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME CLEARANCES AND SIMILARLY SERVICE OTHER EMERGENCY VEHICLE PREEMPTION SEQUENCES IN THE ORDER RECEIVED (IF RECEIVED) OTHERWISE, RESUME NORMAL PREFERENTIAL PHASE SEQUENCE.
4. PREEMPTION MINIMUM GREENS SHALL BE SIX SECONDS.
5. NORMAL CLEARANCES SHALL BE PROVIDED ON PHASES THAT ARE TERMINATED BY PREEMPTION DEMAND.
6. ACTUAL TIMMING FOR PREEMPTION SHALL BE DETERMINED IN THE FIELD IN COORDINATION WITH THE FIRE DEPARTMENT AND SHALL BE APPROVED BY MHD PRIOR TO OPERATION.

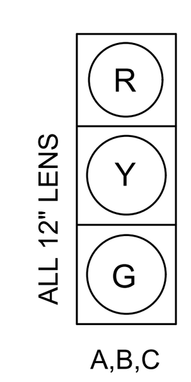
NEMA DUAL RING PHASING NOTES



NOTES:

1. PHASES ASSOCIATED BY A SOLID LINE SHALL NOT OPERATE CONCURRENTLY.
2. THROUGH MOVEMENTS MAY INCLUDE RIGHT TURNS.

SIGNAL IDENTIFICATION



NOTES:

1. ALL SIGNALS SHALL HAVE CUT AWAY VISORS.
2. ALL SIGNALS SHALL HAVE 12" LED WITH 5" LOUVERED BACK PLATES.
3. ALL BACK PLATES SHALL HAVE A 3" RETROREFLECTIVE BORDER

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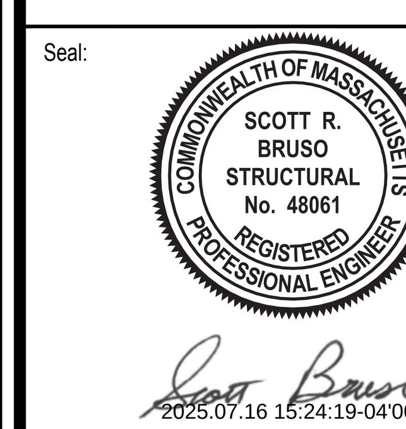

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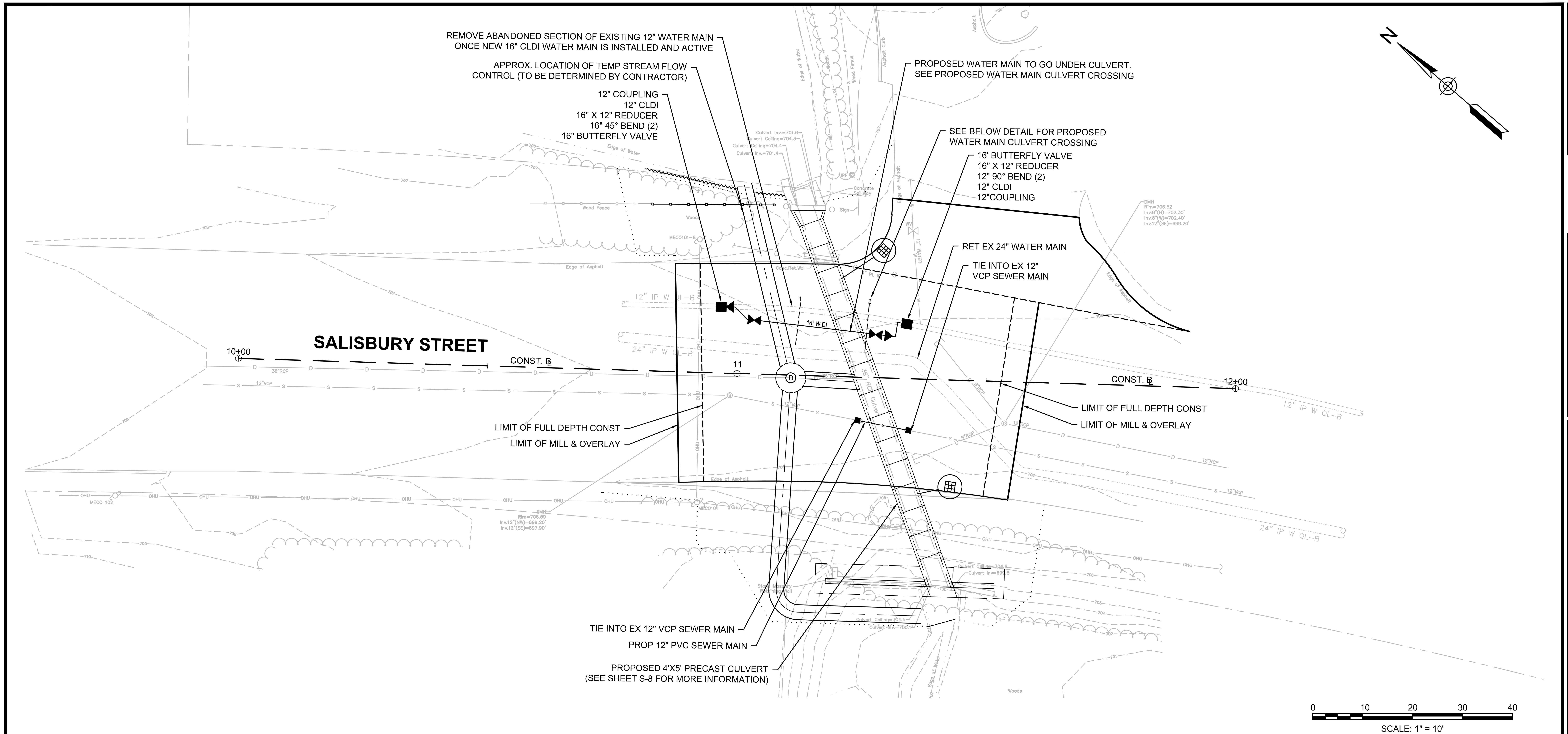
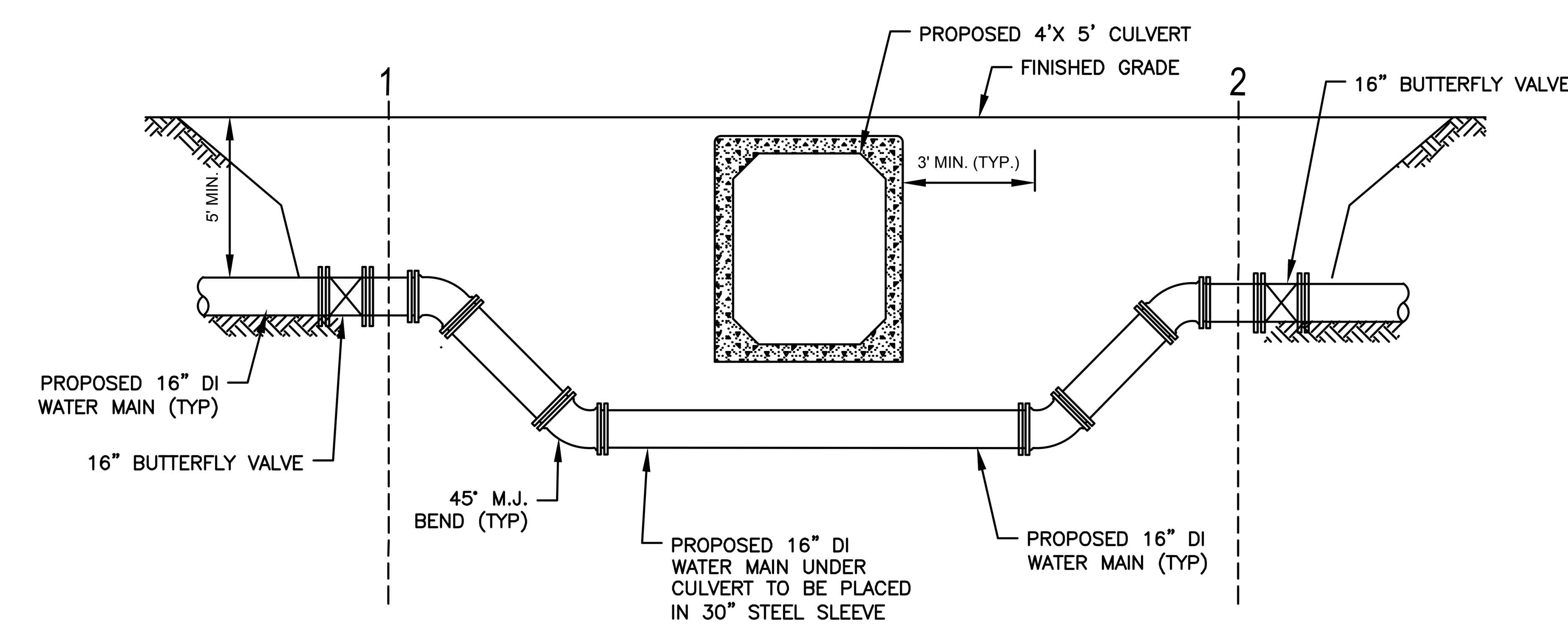
Drawn By: CTC
Reviewed By: RP/JWS
Approved By: SRB

W&S Project No.: ENG22-0381
W&S File No.:

Drawing Title:
TEMPORARY TRAFFIC CONTROL PLAN PHASING

Sheet Number:
C-8





PROPOSED WATER MAIN CULVERT CROSSING

N.T.S.

NOTES:

1. 16-INCH WATER MAIN SHALL BE ENCASED WITH V-BIO POLYETHYLENE.
2. CONTRACTOR TO PRESSURE TEST AND DISINFECT NEW 16" WATER MAIN PRIOR TO COMPLETING TIE-IN TO EXISTING 12" WATER MAIN. CONTRACTOR TO PROVIDE ALL EQUIPMENT AND MATERIALS NECESSARY TO DO THE WORK OF PRESSURE TESTING AND DISINFECTION.
3. WATER MAIN TO BE INSTALLED WITH A MINIMUM OF 18" SEPARATION BETWEEN TOP OF MAIN AND BOTTOM OF CRUSHED STONE LAYER UNDER PROPOSED CULVERT.
4. FULLY RESTRAIN ALL JOINTS THROUGH TIE-IN TO EXISTING MAIN. CONTRACTOR TO SUBMIT ON PROPOSED JOIN RESTRAINT METHOD.
5. CONTRACTOR TO SLEEVE SECTION OF MAIN BELOW CULVERT IN STEEL SLEEVE. CONTRACTOR TO FILL ANNULAR SPACE BETWEEN SLEEVE AND WATER MAIN. CONTRACTOR TO SUBMIT ON PROPOSED FILL MATERIAL AND SLEEVE FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.

NOTES:

1) ALL PROPOSED WATER MAIN SHALL BE CEMENT LINED ZINC COATED DUCTILE IRON PIPE.
2) ALL PROPOSED WATER MAIN, VALVES AND APPURTENANCES SHALL BE POLYETHYLENE ENCASED.
3) ALL NEW WATER MAIN MUST BE INSTALLED TO A DEPTH OF 5 FEET MINIMUM AND 8 FOOT MAXIMUM OF COVER AS MEASURED FROM THE TOP OF PIPE TO FINISH GRADE UNLESS OTHERWISE NOTED ON THE PLANS.
4) THE EXISTING WATER PIPE, VALVES AND APPURTENANCES TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE PROPERLY DISPOSED OF AT NO ADDITIONAL COST TO THE CITY. SEE CITY OF WORCESTER DEPARTMENT OF PUBLIC WORKS & PARKS "STANDARD CONSTRUCTION SPECIFICATIONS & DETAILS" SECTION 300 FOR ADDITIONAL INFORMATION.
5) SEE CITY OF WORCESTER DEPARTMENT OF PUBLIC WORKS & PARKS "STANDARD CONSTRUCTION SPECIFICATIONS AND DETAILS" FOR MORE INFORMATION ON WATER MAIN AND OTHER APPLICABLE DETAILS ASSOCIATED WITH EARTHWORK, WATER, PAVEMENT AND TRAFFIC MANAGEMENT REQUIREMENTS.
6) CONTRACTOR TO SEQUENCE WATER MAIN INSTALLATION, TESTING, AND TIE-IN TO LIMIT SHUTDOWN OF EXISTING WATER MAIN TO SINGLE SHUTDOWN FOR TIE-IN PRIOR TO CULVERT REPLACEMENT.

\\wse03.local\wse\Projects\MA\worcester ma\2220381 salisbury street culvert design\CAD\Bid Set DWG\HD\WATER RELOCATION.dwg

Project:
SALISBURY STREET CULVERT REPLACEMENT
WORCESTER, MA 01609

Weston & Sampson
Weston & Sampson Engineers, Inc.
427 Main Street, Suite 400
Worcester, MA 01608
978.532.1900 800.SAMPSON
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Consultants:

Revisions:

No.	Date	Description

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Seal: COMMONWEALTH OF MASSACHUSETTS SCOTT R. BRUSO STRUCTURAL No. 48061 REGISTERED PROFESSIONAL ENGINEER
2025.07.16 15:24:05-04'00'

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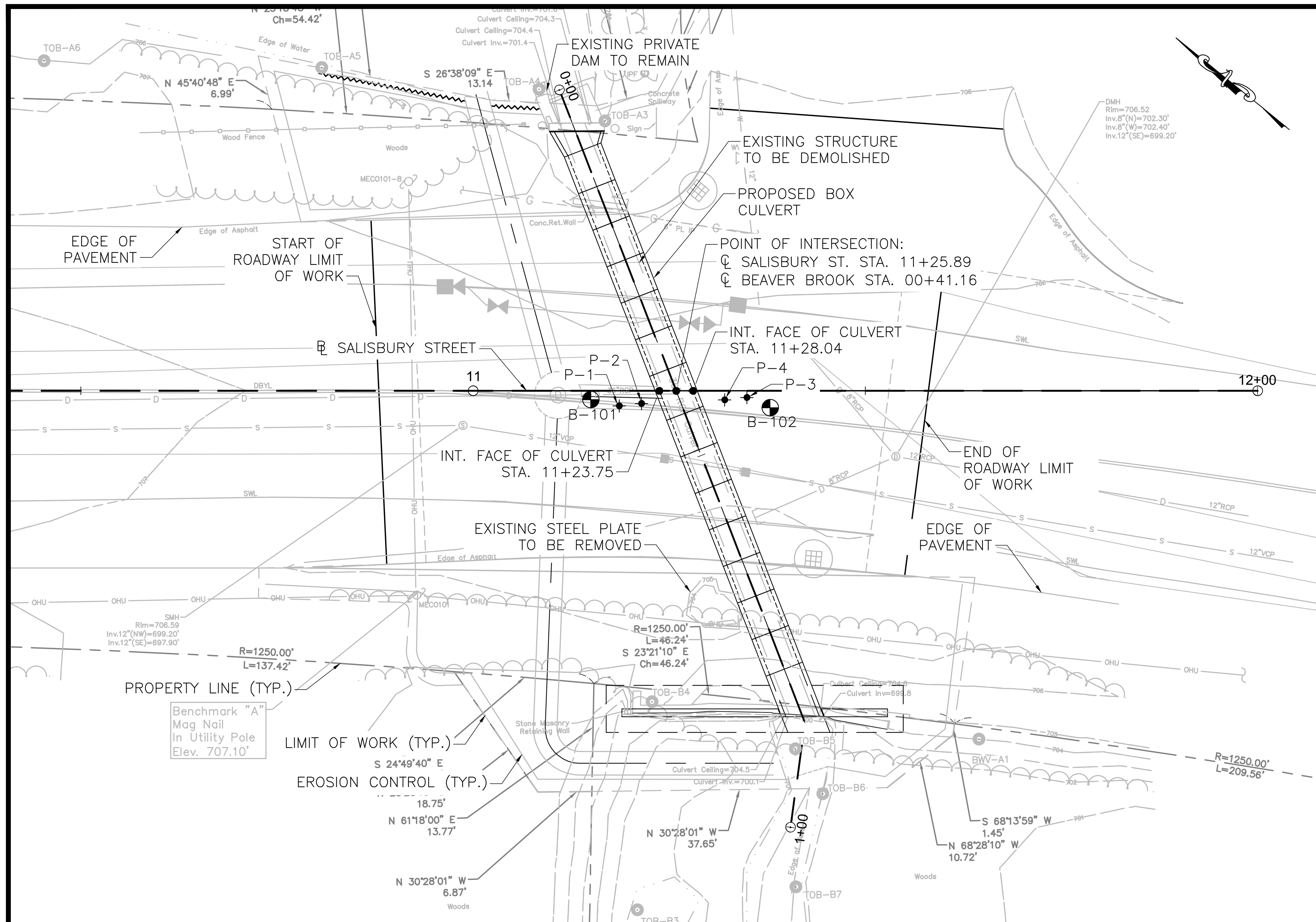
Reviewed By:	SEC
Approved By:	MDW
W&S Project No.:	ENG22-0381
W&S File No.:	

Drawing Title: WATER MAIN RELOCATION PLAN

Sheet Number: C-9

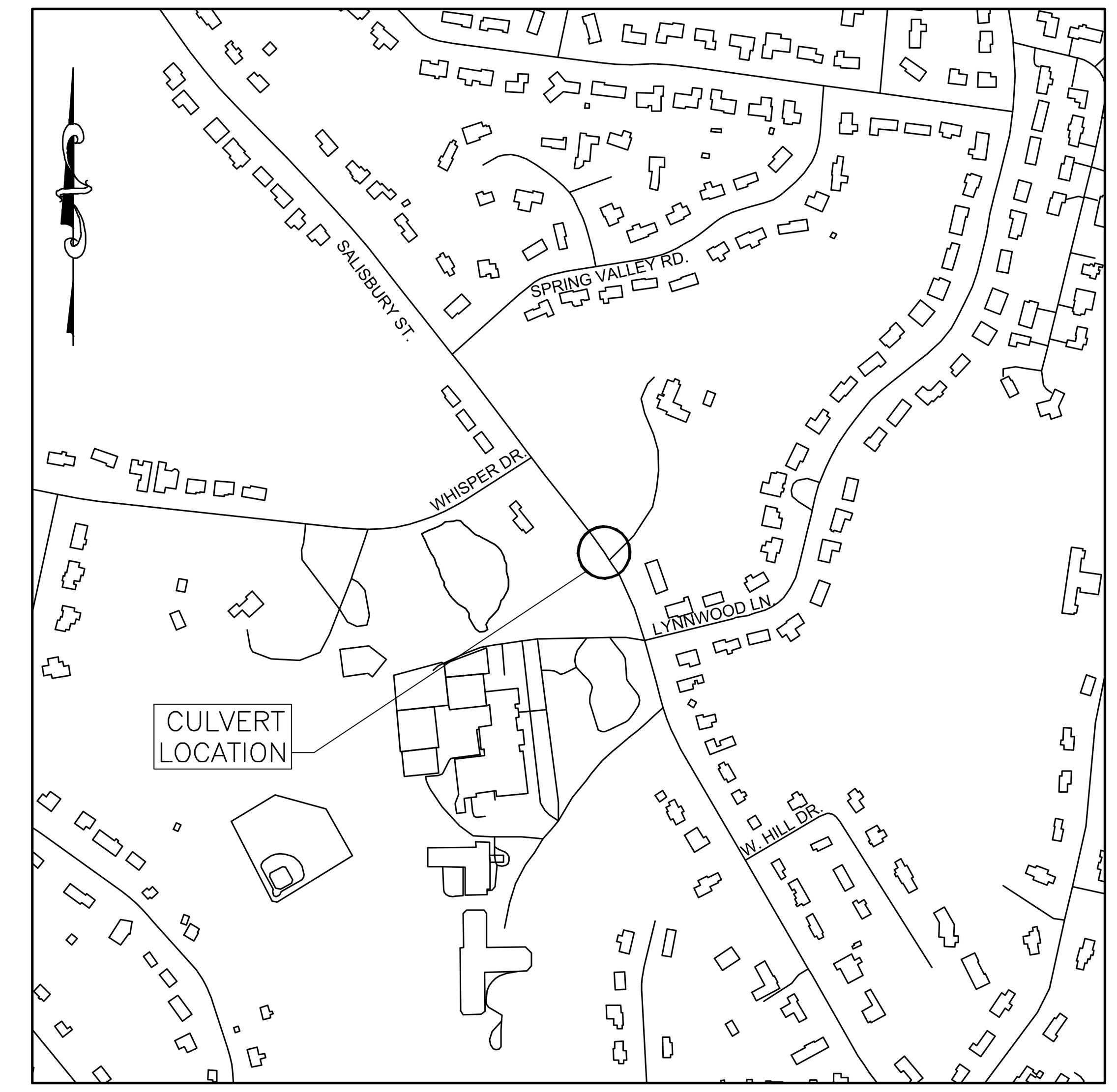


KEY PLAN

SCALE: 1" = 10'

SHEET LIST TABLE

SHEET NUMBER	SHEET TITLE
S-1	KEY PLAN AND PROFILES
S-2	GENERAL NOTES
S-3	BORING LOGS 1
S-4	BORING LOGS 2
S-5	BORING LOGS 3
S-6	GENERAL PLAN
S-7	ELEVATIONS
S-8	LONGITUDINAL SECTION
S-9	CULVERT AND WINGWALL DETAILS

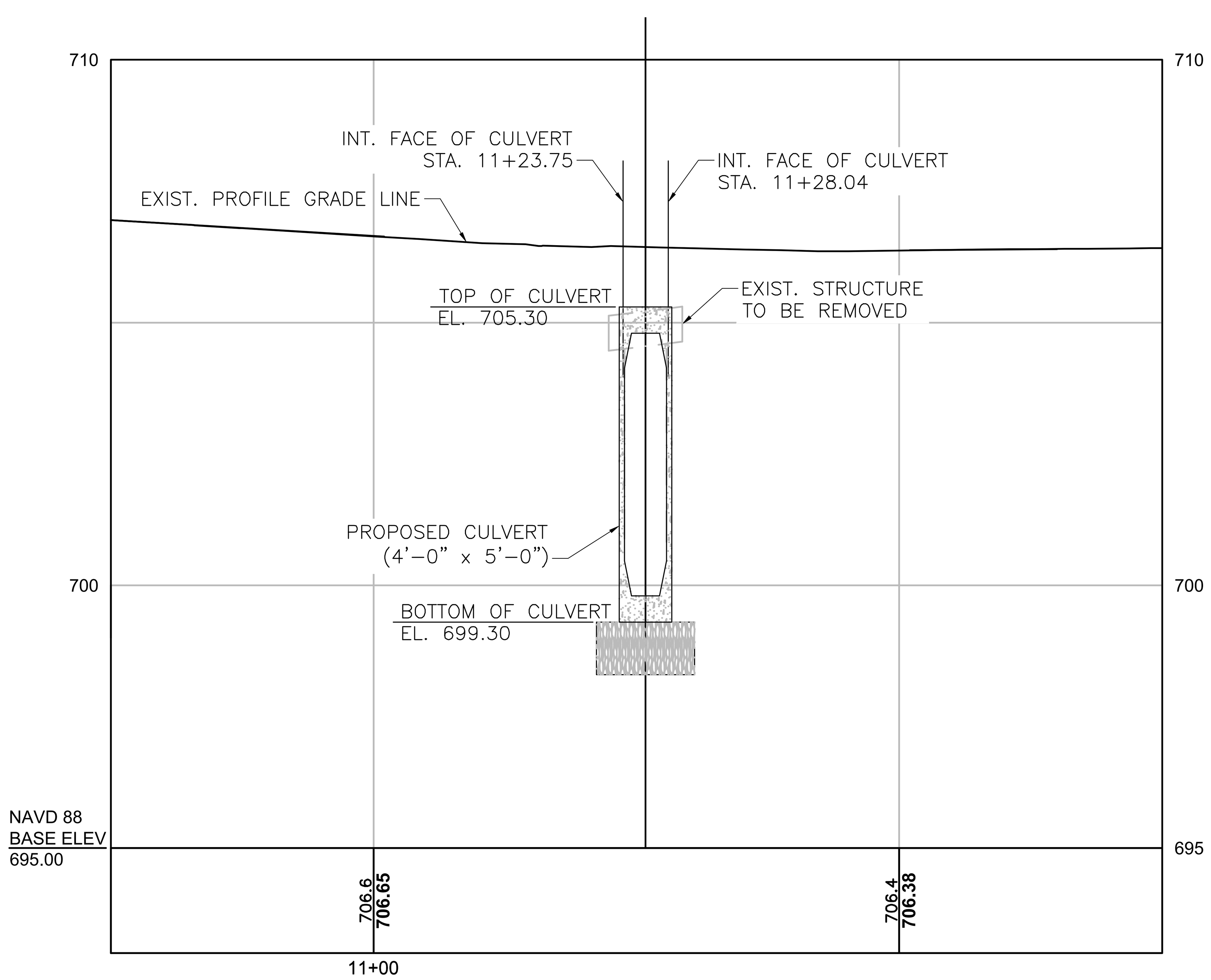


LOCUS

SCALE: 1" = 500'

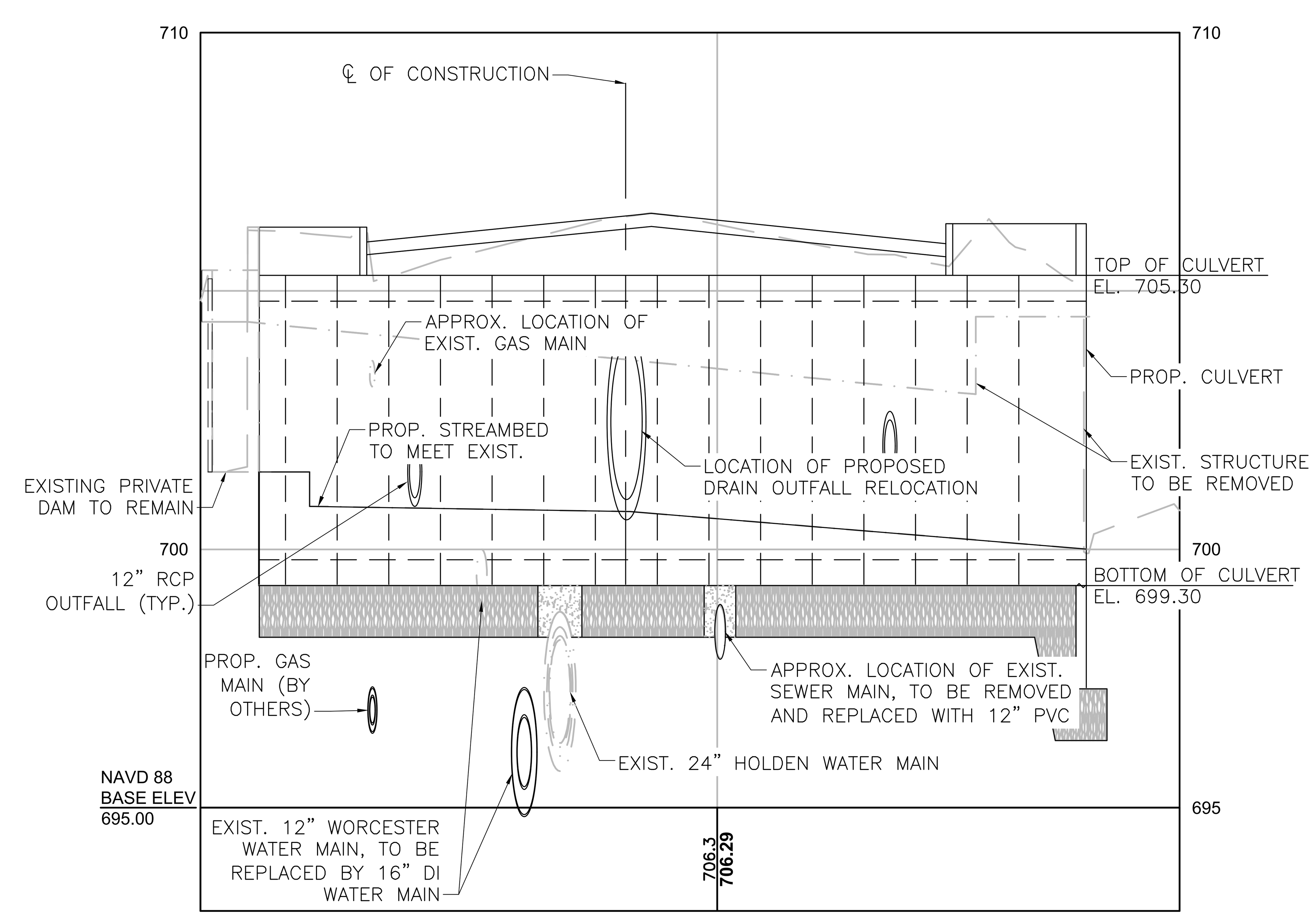
ESTIMATED QUANTITIES
(NOT GUARANTEED)

ITEM	QUANTITY
CLASS "B" ROCK EXCAVATION AND DISPOSAL	60 CY
GRAVEL BORROW	115 CY
DENSE GRADED CRUSHED STONE	40 CY
CRUSHED STONE 3/4 INCH	50 CY
CLASS A TRENCH EXCAVATION	360 CY
SUPERPAVE 9.5 MM LEVEL 2	30 TON
SUPERPAVE 12.5 MM LEVEL 3	40 TON
GEOTEXTILE FABRIC FOR PERMANENT EROSION CONTROL	1600 SY
NATURAL STREAMBED MATERIAL	40 CY
4000 PSI, 1.5 INCH, 565 CEMENT CONCRETE	10 CY
4000 PSI, 3/4 INCH, 610 CEMENT CONCRETE	10 CY
TEMPORARY CONTROL OF WATER	1 LS
PRECAST CONCRETE BOX CULVERT, 4'-0" x 5'-0", HEADWALLS AND WINGWALLS	1 LS



PROFILE – SALISBURY STREET

HORIZONTAL SCALE: 1" = 10'
VERTICAL SCALE: 1" = 2'



PROFILE – BEAVER BROOK

HORIZONTAL SCALE: 1" = 10'
VERTICAL SCALE: 1" = 2'

Project:
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Approved By:	SRB
W&S Project No.:	ENG22-0381
W&S File No.:	

Drawing Title:
KEY PLAN AND PROFILE

Sheet Number:
S-1

GENERAL NOTES

DESIGN:

IN ACCORDANCE WITH THE 2020 AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS LRFD BRIDGE DESIGN SPECIFICATIONS FOR HL-93 LOADING.

BENCHMARK:

MAG NAIL SET UP IN UTILITY POLE, ELEVATION 707.10'.

ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988.

SURVEY:

ELECTRONIC SURVEY BY WESTON & SAMPSON PE, LS, LA, PC ON DECEMBER 9, 2021. WETLAND FLAGGING WAS PERFORMED BY WESTON & SAMPSON ON APRIL 28, 2022.

SCALES:

SCALES NOTED ON THE PLANS ARE NOT APPLICABLE TO REDUCED SIZE PRINTS. DIVIDE SCALES BY 2 FOR HALF-SIZE PRINTS (A3).

FOUNDATIONS:

FOUNDATIONS MAY BE ALTERED, IF NECESSARY, TO SUIT CONDITIONS ENCOUNTERED DURING CONSTRUCTION, WITH APPROVAL OF THE ENGINEER.

UNSUITABLE MATERIAL:

ALL UNSUITABLE MATERIAL SHALL BE REMOVED WITHIN THE LIMITS OF THE FOUNDATIONS OF THE STRUCTURE, AS DIRECTED BY THE ENGINEER.

CONCRETE:

ALL CONCRETE SHALL BE 5000 PSI HP CONCRETE, EXCEPT AS NOTED BELOW:
FOOTINGS SHALL BE 5000 PSI HP EARLY STRENGTH CONCRETE.

REINFORCEMENT:

REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M31 GRADE 60. UNLESS OTHERWISE NOTED ON THE CONSTRUCTION DRAWINGS, ALL BARS SHALL BE LAPPED AS FOLLOWS:

MODIFICATION CONDITION	#4 BARS	#5 BARS	#6 BARS
1. NONE	16"	19"	23"
2. 12" OF CONCRETE BELOW BAR	20"	25"	30"
3. COATED BARS, COVER < $3d_b$, OR CLEAR SPACING < $6d_b$	23"	29"	34"
4. COATED BARS, ALL OTHER CASES	18"	23"	27"
5. CONDITION 2. AND 3.	26"	32"	39"
6. CONDITION 2. AND 4.	24"	30"	36"

ALL OTHER BARS SHALL BE LAPPED AS SHOWN ON THE CONSTRUCTION DRAWINGS.

MEMBRANE WATERPROOFING:

ALL MEMBRANE WATERPROOFING USED ON BRIDGE DECKS SHALL BE MEMBRANE WATERPROOFING FOR BRIDGE DECKS - SPRAY APPLIED.

UTILITES:

LOCATIONS OF EXISTING UTILITES SHOWN ARE APPROXIMATE. THE CONTRACTOR SHALL LOCATE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE.

Project:
SALISBURY STREET CULVERT REPLACEMENT
WORCESTER, MA 01609

WORCESTER
A TOWN JUNE 14, 1722 A CITY FEBY. 29, 1848

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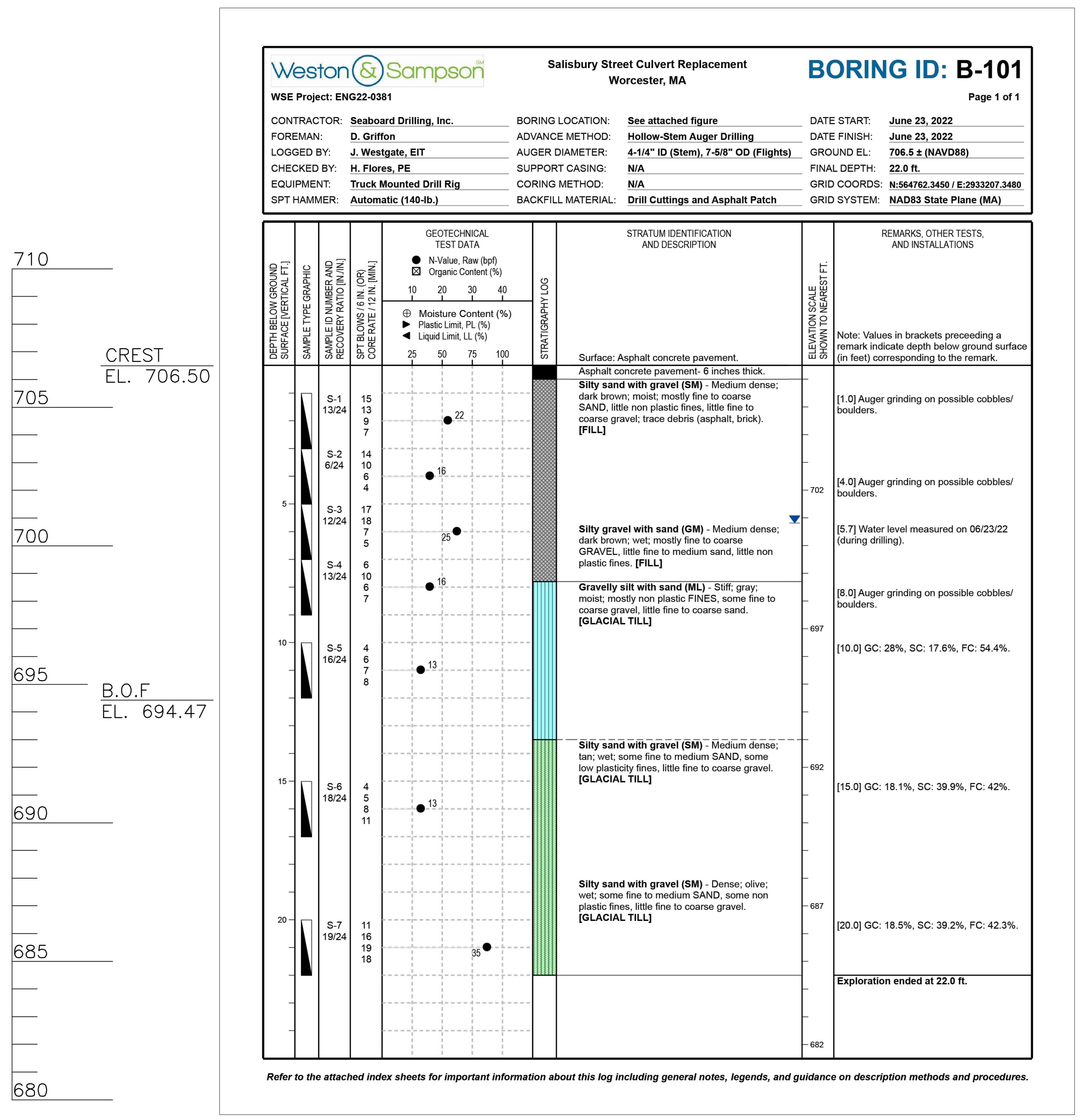
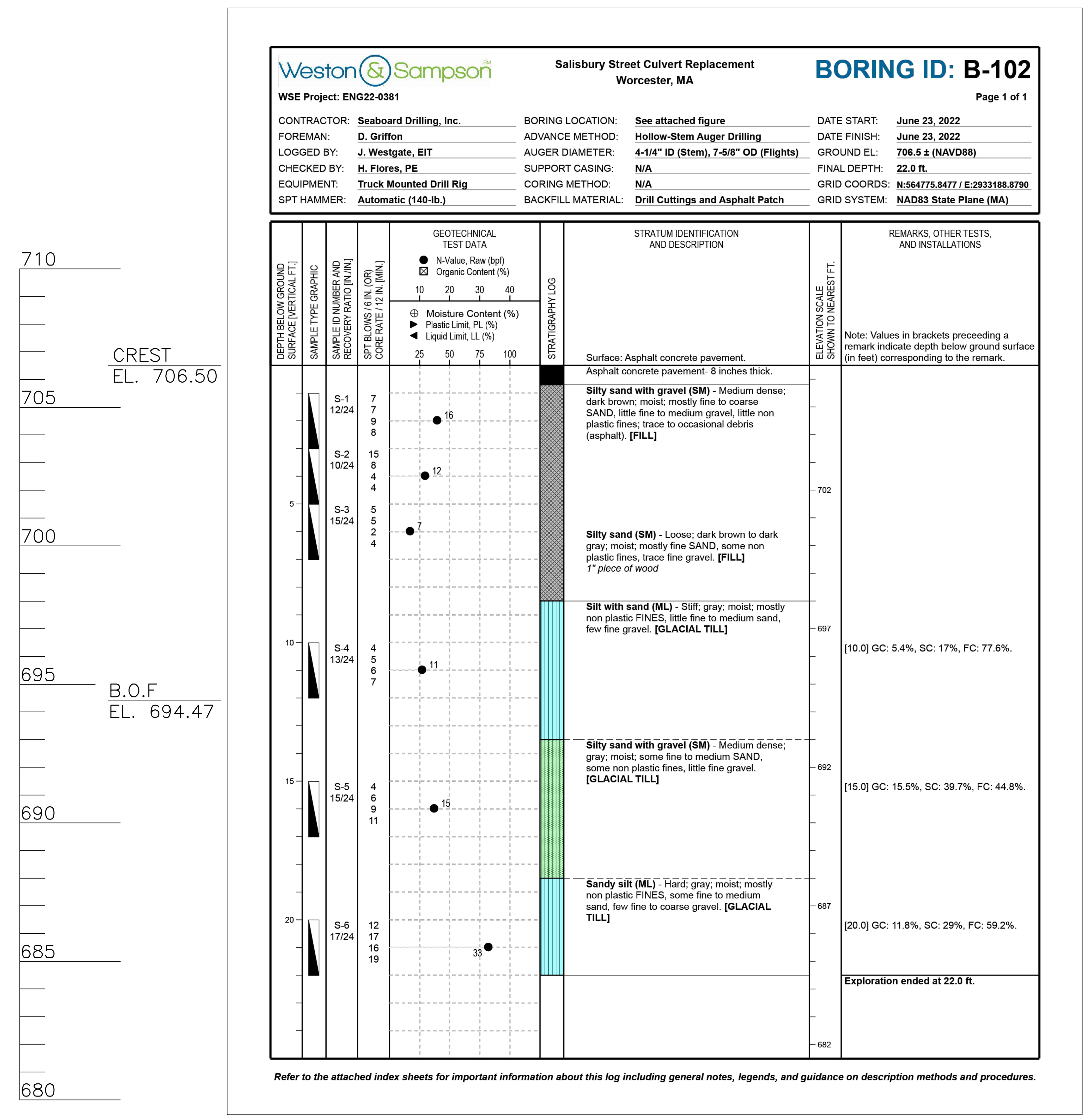
W&S File No.:

Drawing Title:
GENERAL NOTES

Sheet Number:
S-2


710
705
CREST
EL. 706.50
700
695
B.O.F
EL. 694.47
690
685
680
Weston & Sampson
Salisbury Street Culvert Replacement
Worcester, MA
BORING ID: B-101
WSE Project: ENG22-0381
Page 1 of 1
CONTRACTOR: Seaboard Drilling, Inc.
FOREMAN: D. Griffon
LOGGED BY: J. Westgate, EIT
CHECKED BY: H. Flores, PE
EQUIPMENT: Truck Mounted Drill Rig
SPT HAMMER: Automatic (140-lb.)
BORING LOCATION: See attached figure
ADVANCE METHOD: Hollow-Stem Auger Drilling
AUGER DIAMETER: 4-1/4" ID (Stem), 7-5/8" OD (Flights)
SUPPORT CASING: N/A
CORING METHOD: N/A
BACKFILL MATERIAL: Drill Cuttings and Asphalt Patch
DATE START: June 23, 2022
DATE FINISH: June 23, 2022
GROUND EL: 706.5 ± (NAVD88)
FINAL DEPTH: 22.0 ft.
GRID COORDS: N:564762.3450 / E:2933207.3480
GRID SYSTEM: NAD83 State Plane (MA)
DEPTH BELOW GROUND SURFACE [VERTICAL FT.]
SAMPLE TYPE GRAPHIC
SAMPLE ID NUMBER AND RECOVERY RATIO [IN./IN.]
SPT BLOWS / 6 IN. (OR) CORE RATE / 12 IN. [MIN.]
GEOTECHNICAL TEST DATA
N-Value, Raw (bpf)
Organic Content (%)
10 20 30 40
Moisture Content (%)
Plastic Limit, PL (%)
Liquid Limit, LL (%)
25 50 75 100
STRATIGRAPHY LOG
STRATUM IDENTIFICATION AND DESCRIPTION
ELEVATION SCALE SHOWN TO NEAREST FT.
REMARKS, OTHER TESTS, AND INSTALLATIONS
Surface: Asphalt concrete pavement.
Note: Values in brackets preceeding a remark indicate depth below ground surface (in feet) corresponding to the remark.
Asphalt concrete pavement- 6 inches thick.
Silty sand with gravel (SM) - Medium dense; dark brown; moist; mostly fine to coarse SAND, little non plastic fines, little fine to coarse gravel; trace debris (asphalt, brick). [FILL]
[1.0] Auger grinding on possible cobbles/ boulders.
S-1 13/24 15 13 9 7 22
S-2 6/24 14 10 6 4 16
[4.0] Auger grinding on possible cobbles/ boulders.
702
5
S-3 12/24 17 18 7 5 25
Silty gravel with sand (GM) - Medium dense; dark brown; wet; mostly fine to coarse GRAVEL, little fine to medium sand, little non plastic fines. [FILL]
[5.7] Water level measured on 06/23/22 (during drilling).
S-4 13/24 6 10 6 7 16
Gravelly silt with sand (ML) - Stiff; gray; moist; mostly non plastic FINES, some fine to coarse gravel, little fine to coarse sand. [GLACIAL TILL]
[8.0] Auger grinding on possible cobbles/ boulders.
697
10
S-5 16/24 4 6 7 8 13
[10.0] GC: 28%, SC: 17.6%, FC: 54.4%.
Silty sand with gravel (SM) - Medium dense; tan; wet; some fine to medium SAND, some low plasticity fines, little fine to coarse gravel. [GLACIAL TILL]
692
15
S-6 18/24 4 5 8 11 13
[15.0] GC: 18.1%, SC: 39.9%, FC: 42%.
Silty sand with gravel (SM) - Dense; olive; wet; some fine to medium SAND, some non plastic fines, little fine to coarse gravel. [GLACIAL TILL]
687
20
S-7 19/24 11 16 19 18 35
[20.0] GC: 18.5%, SC: 39.2%, FC: 42.3%.
Exploration ended at 22.0 ft.
682
Refer to the attached index sheets for important information about this log including general notes, legends, and guidance on description methods and procedures.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Weston & Sampson
Salisbury Street Culvert Replacement
Worcester, MA
BORING ID: B-102
WSE Project: ENG22-0381
Page 1 of 1
CONTRACTOR: Seaboard Drilling, Inc.
FOREMAN: D. Griffon
LOGGED BY: J. Westgate, EIT
CHECKED BY: H. Flores, PE
EQUIPMENT: Truck Mounted Drill Rig
SPT HAMMER: Automatic (140-lb.)
BORING LOCATION: See attached figure
ADVANCE METHOD: Hollow-Stem Auger Drilling
AUGER DIAMETER: 4-1/4" ID (Stem), 7-5/8" OD (Flights)
SUPPORT CASING: N/A
CORING METHOD: N/A
BACKFILL MATERIAL: Drill Cuttings and Asphalt Patch
DATE START: June 23, 2022
DATE FINISH: June 23, 2022
GROUND EL: 706.5 ± (NAVD88)
FINAL DEPTH: 22.0 ft.
GRID COORDS: N:564775.8477 / E:2933188.8790
GRID SYSTEM: NAD83 State Plane (MA)
DEPTH BELOW GROUND SURFACE [VERTICAL FT.]
SAMPLE TYPE GRAPHIC
SAMPLE ID NUMBER AND RECOVERY RATIO [IN./IN.]
SPT BLOWS / 6 IN. (OR) CORE RATE / 12 IN. [MIN.]
GEOTECHNICAL TEST DATA
N-Value, Raw (bpf)
Organic Content (%)
10 20 30 40
Moisture Content (%)
Plastic Limit, PL (%)
Liquid Limit, LL (%)
25 50 75 100
STRATIGRAPHY LOG
STRATUM IDENTIFICATION AND DESCRIPTION
ELEVATION SCALE SHOWN TO NEAREST FT.
REMARKS, OTHER TESTS, AND INSTALLATIONS
Surface: Asphalt concrete pavement.
Note: Values in brackets preceeding a remark indicate depth below ground surface (in feet) corresponding to the remark.
Asphalt concrete pavement- 8 inches thick.
Silty sand with gravel (SM) - Medium dense; dark brown; moist; mostly fine to coarse SAND, little fine to medium gravel, little non plastic fines; trace to occasional debris (asphalt). [FILL]
S-1 12/24 7 7 9 8 16
S-2 10/24 15 8 4 4 12
702
5
S-3 15/24 5 5 2 4 7
Silty sand (SM) - Loose; dark brown to dark gray; moist; mostly fine SAND, some non plastic fines, trace fine gravel. [FILL]
1" piece of wood
Silt with sand (ML) - Stiff; gray; moist; mostly non plastic FINES, little fine to medium sand, few fine gravel. [GLACIAL TILL]
697
10
S-4 13/24 4 5 6 7 11
[10.0] GC: 5.4%, SC: 17%, FC: 77.6%.
Silty sand with gravel (SM) - Medium dense; gray; moist; some fine to medium SAND, some non plastic fines, little fine gravel. [GLACIAL TILL]
692
15
S-5 15/24 4 6 9 11 15
[15.0] GC: 15.5%, SC: 39.7%, FC: 44.8%.
Sandy silt (ML) - Hard; gray; moist; mostly non plastic FINES, some fine to medium sand, few fine to coarse gravel. [GLACIAL TILL]
687
20
S-6 17/24 12 17 16 19 33
[20.0] GC: 11.8%, SC: 29%, FC: 59.2%.
Exploration ended at 22.0 ft.
682
Refer to the attached index sheets for important information about this log including general notes, legends, and guidance on description methods and procedures.

BORING/PROBE NOTES:

1. LOCATION OF BORING SHOWN ON THE PLAN THUS BB
2. LOCATION OF PROBES SHOWN ON THE PLAN THUS P-1, P-2, ...
3. BORINGS AND PROBES ARE TAKEN FOR PURPOSE OF DESIGN AND SHOW CONDITIONS AT BORING POINTS AND PROBE POINTS ONLY, BUT DO NOT NECESSARILY SHOW THE NATURE OF THE MATERIALS TO BE ENCOUNTERED DURING CONSTRUCTION.
4. 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.
5. FIGURES IN COLUMNS INDICATE NUMBER OF BLOWS REQUIRED TO DRIVE A 2" I.D. SPLIT SPOON SAMPLER 24" USING A 140 POUND WEIGHT FALLING 30".
6. ALL BORINGS WERE MADE IN JUNE 2022. ALL PROBES WERE MADE IN JUNE 2022.
7. BORINGS AND PROBES WERE MADE BY SEABOARD DRILLING, INC. (649 MEADOW ST. CHICOPEE, MA 01013)
8. THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 IS USED THROUGHOUT.

Project:
SALISBURY STREET CULVERT REPLACEMENT
WORCESTER, MA 01609

WORCESTER TOWN JUNE 14, 1722 A CITY FEBY. 29, 1848

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Approved By:	SRB
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W&S File No.:	

Drawing Title:
BORING LOGS 1

Sheet Number:
S-3

710
CREST
EL. 706.50
705
700

Weston & Sampson | Salisbury Street Culvert Replacement
Worcester, MA | **BORING ID: P-1**

WSE Project: ENG22-0381 — Page 1 of 1

CONTRACTOR:	Seaboard Drilling, Inc.	BORING LOCATION:	See attached figure	DATE START:	June 23, 2022
FOREMAN:	D. Griffon	ADVANCE METHOD:	Hollow-Stem Auger Drilling	DATE FINISH:	June 23, 2022
LOGGED BY:	J. Westgate, EIT	AUGER DIAMETER:	4-1/4" ID (Stem), 7-5/8" OD (Flights)	GROUND EL:	706.5 ± (NAVD88)
CHECKED BY:	H. Flores, PE	SUPPORT CASING:	N/A	FINAL DEPTH:	3.1 ft. (Refusal)
EQUIPMENT:	Truck Mounted Drill Rig	CORING METHOD:	N/A	GRID COORDS:	N:564764 ± / E:2933204 ±
SPT HAMMER:	Automatic (140-lb.)	BACKFILL MATERIAL:	Drill Cuttings and Asphalt Patch	GRID SYSTEM:	NAD83 State Plane (MA)

DEPTH BELOW GROUND SURFACE [VERTICAL FT.]	SAMPLE TYPE GRAPHIC	SAMPLE ID NUMBER AND RECOVERY RATIO [IN./IN.]	STRATIGRAPHY LOG	STRATUM IDENTIFICATION AND DESCRIPTION	ELEVATION SCALE SHOWN TO NEAREST FT.	REMARKS, OTHER TESTS, AND INSTALLATIONS
				Surface: Asphalt concrete pavement.		Note: Values in brackets preceeding a remark indicate depth below ground surface (in feet) corresponding to the remark.
				Asphalt concrete pavement- 7 inches thick.		
				Refer to B-101 for soil conditions.		Auger grinding on possible cobbles/ boulders.
						Auger grinding on possible cobbles/ boulders.
						Exploration terminated at 3.1 ft on possible culvert wall
5					702	
10					697	
15					692	
20					687	
					682	

Refer to the attached index sheets for important information about this log including general notes, legends, and guidance on description methods and procedures.

710
CREST
EL. 706.50
705
700

Weston & Sampson | Salisbury Street Culvert Replacement
Worcester, MA | **BORING ID: P-2**

WSE Project: ENG22-0381 — Page 1 of 1

CONTRACTOR:	Seaboard Drilling, Inc.	BORING LOCATION:	See attached figure	DATE START:	June 23, 2022
FOREMAN:	D. Griffon	ADVANCE METHOD:	Hollow-Stem Auger Drilling	DATE FINISH:	June 23, 2022
LOGGED BY:	J. Westgate, EIT	AUGER DIAMETER:	4-1/4" ID (Stem), 7-5/8" OD (Flights)	GROUND EL:	706.5 ± (NAVD88)
CHECKED BY:	H. Flores, PE	SUPPORT CASING:	N/A	FINAL DEPTH:	0.8 ft. (Refusal)
EQUIPMENT:	Truck Mounted Drill Rig	CORING METHOD:	N/A	GRID COORDS:	N:564766 ± / E:2933202 ±
SPT HAMMER:	Automatic (140-lb.)	BACKFILL MATERIAL:	Drill Cuttings and Asphalt Patch	GRID SYSTEM:	NAD83 State Plane (MA)

DEPTH BELOW GROUND SURFACE [VERTICAL FT.]	SAMPLE TYPE GRAPHIC	SAMPLE ID NUMBER AND RECOVERY RATIO [IN./IN.]	STRATIGRAPHY LOG	STRATUM IDENTIFICATION AND DESCRIPTION	ELEVATION SCALE SHOWN TO NEAREST FT.	REMARKS, OTHER TESTS, AND INSTALLATIONS
				Surface: Asphalt concrete pavement.		Note: Values in brackets preceeding a remark indicate depth below ground surface (in feet) corresponding to the remark.
				Asphalt concrete pavement- 7 inches thick.		
				Refer to B-101 for soil conditions.		**Exploration terminated at 0.8 ft on possible culvert wall**
5					702	
10					697	
15					692	
20					687	
					682	

Refer to the attached index sheets for important information about this log including general notes, legends, and guidance on description methods and procedures.

BORING/PROBE NOTES:

1. FOR BORING/PROBE NOTES, SEE SHEET S-3.

Project:
SALISBURY STREET CULVERT REPLACEMENT
WORCESTER, MA 01609

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W&S File No.:	

Drawing Title:
BORING LOGS 2

Sheet Number:
S-4

BORING ID: P-3

Weston & Sampson — Salisbury Street Culvert Replacement, Worcester, MA

WSE Project: ENG22-0381 — Page 1 of 1

CONTRACTOR:	Seaboard Drilling, Inc.	BORING LOCATION:	See attached figure	DATE START:	June 23, 2022
FOREMAN:	D. Griffon	ADVANCE METHOD:	Hollow-Stem Auger Drilling	DATE FINISH:	June 23, 2022
LOGGED BY:	J. Westgate, EIT	AUGER DIAMETER:	4-1/4" ID (Stem), 7-5/8" OD (Flights)	GROUND EL:	706.5 ± (NAVD88)
CHECKED BY:	H. Flores, PE	SUPPORT CASING:	N/A	FINAL DEPTH:	2.1 ft. (Refusal)
EQUIPMENT:	Truck Mounted Drill Rig	CORING METHOD:	N/A	GRID COORDS:	N:564775 ± / E:2933192 ±
SPT HAMMER:	Automatic (140-lb.)	BACKFILL MATERIAL:	Drill Cuttings and Asphalt Patch	GRID SYSTEM:	NAD83 State Plane (MA)

DEPTH BELOW GROUND SURFACE [VERTICAL FT.]	SAMPLE TYPE GRAPHIC	SAMPLE ID NUMBER AND RECOVERY RATIO [IN./IN.]	STRATIGRAPHY LOG	STRATUM IDENTIFICATION AND DESCRIPTION	ELEVATION SCALE SHOWN TO NEAREST FT.	REMARKS, OTHER TESTS, AND INSTALLATIONS
				Surface: Asphalt concrete pavement. Asphalt concrete pavement- 8 inches thick. Refer to B-102 for soil conditions.		Note: Values in brackets preceeding a remark indicate depth below ground surface (in feet) corresponding to the remark. **Exploration terminated at 2.1 ft on possible culvert wall**
5					702	
10					697	
15					692	
20					687	
					682	

Refer to the attached index sheets for important information about this log including general notes, legends, and guidance on description methods and procedures.

710 — 705 — 700

CREST EL. 706.50

BORING ID: P-4

Weston & Sampson — Salisbury Street Culvert Replacement, Worcester, MA

WSE Project: ENG22-0381 — Page 1 of 1

CONTRACTOR:	Seaboard Drilling, Inc.	BORING LOCATION:	See attached figure	DATE START:	June 23, 2022
FOREMAN:	D. Griffon	ADVANCE METHOD:	Hollow-Stem Auger Drilling	DATE FINISH:	June 23, 2022
LOGGED BY:	J. Westgate, EIT	AUGER DIAMETER:	4-1/4" ID (Stem), 7-5/8" OD (Flights)	GROUND EL:	706.5 ± (NAVD88)
CHECKED BY:	H. Flores, PE	SUPPORT CASING:	N/A	FINAL DEPTH:	1.0 ft. (Refusal)
EQUIPMENT:	Truck Mounted Drill Rig	CORING METHOD:	N/A	GRID COORDS:	N:564773 ± / E:2933194 ±
SPT HAMMER:	Automatic (140-lb.)	BACKFILL MATERIAL:	Drill Cuttings and Asphalt Patch	GRID SYSTEM:	NAD83 State Plane (MA)

DEPTH BELOW GROUND SURFACE [VERTICAL FT.]	SAMPLE TYPE GRAPHIC	SAMPLE ID NUMBER AND RECOVERY RATIO [IN./IN.]	STRATIGRAPHY LOG	STRATUM IDENTIFICATION AND DESCRIPTION	ELEVATION SCALE SHOWN TO NEAREST FT.	REMARKS, OTHER TESTS, AND INSTALLATIONS
				Surface: Asphalt concrete pavement. Asphalt concrete pavement- 7 inches thick. Refer to B-102 for soil conditions.		Note: Values in brackets preceeding a remark indicate depth below ground surface (in feet) corresponding to the remark. **Exploration terminated at 1.0 ft on possible culvert wall**
5					702	
10					697	
15					692	
20					687	
					682	

Refer to the attached index sheets for important information about this log including general notes, legends, and guidance on description methods and procedures.

710 — 705 — 700

CREST EL. 706.50

BORING/PROBE NOTES:

1. FOR BORING/PROBE NOTES, SEE SHEET S-3.

Project: SALISBURY STREET CULVERT REPLACEMENT WORCESTER, MA 01609

WORCESTER A TOWN JUNE 14, 1722 A CITY FEBY. 29, 1848

Weston & Sampson Engineers, Inc.
427 Main Street, Suite 400
Worcester, MA 01608
978.532.1900 800.SAMPSON
www.westonandsampson.com

Consultants:

Revisions:

No.	Date	Description

COA:

Seal: COMMONWEALTH OF MASSACHUSETTS SCOTT R. BRUSO STRUCTURAL No. 48061 REGISTERED PROFESSIONAL ENGINEER

2025.07.16 15:22:40-04'00'

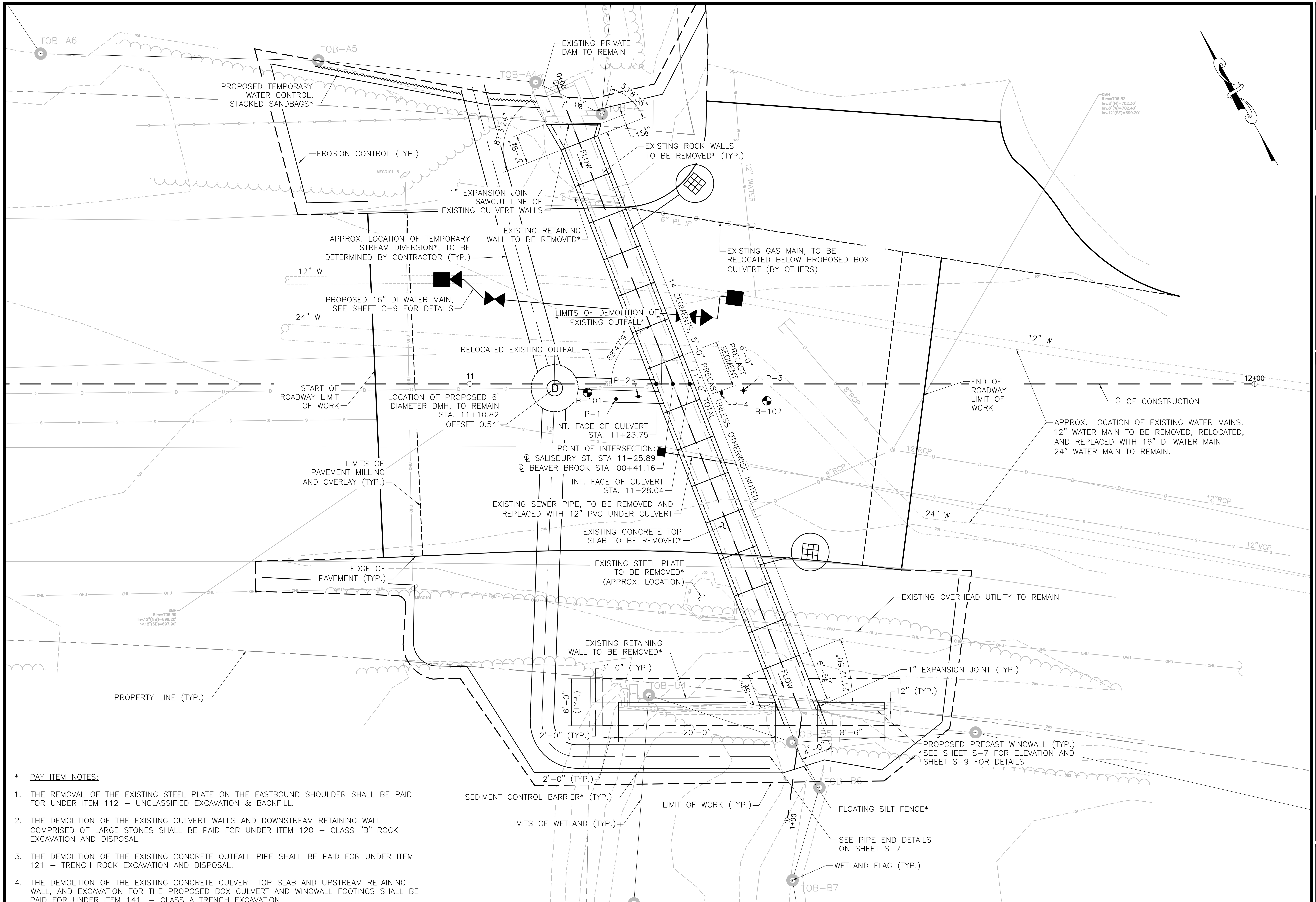
Issued For: BID DOCUMENTS

Scale: NO SCALE

Date:	7 / 23 / 2025
Drawn By:	BMG
Reviewed By:	RPM
Approved By:	SRB
W&S Project No.:	ENG22-0381
W&S File No.:	

Drawing Title: BORING LOGS 3

Sheet Number: S-5



GENERAL PLAN
SCALE: 3/16" = 1'-0"

* PAY ITEM NOTES:

1. THE REMOVAL OF THE EXISTING STEEL PLATE ON THE EASTBOUND SHOULDER SHALL BE PAID FOR UNDER ITEM 112 – UNCLASSIFIED EXCAVATION & BACKFILL.
2. THE DEMOLITION OF THE EXISTING CULVERT WALLS AND DOWNSTREAM RETAINING WALL COMPRISED OF LARGE STONES SHALL BE PAID FOR UNDER ITEM 120 – CLASS "B" ROCK EXCAVATION AND DISPOSAL.
3. THE DEMOLITION OF THE EXISTING CONCRETE OUTFALL PIPE SHALL BE PAID FOR UNDER ITEM 121 – TRENCH ROCK EXCAVATION AND DISPOSAL.
4. THE DEMOLITION OF THE EXISTING CONCRETE CULVERT TOP SLAB AND UPSTREAM RETAINING WALL, AND EXCAVATION FOR THE PROPOSED BOX CULVERT AND WINGWALL FOOTINGS SHALL BE PAID FOR UNDER ITEM 141. – CLASS A TRENCH EXCAVATION.
5. THE SEDIMENT CONTROL BARRIER AND FLOATING SILT FENCE SHALL BOTH BE PAID FOR UNDER ITEM 171 – INSTALLATION AND MAINTENANCE OF EROSION CONTROLS.
6. THE TEMPORARY STREAM DIVERSION PIPE AND STACKED SANDBAGS SHALL BOTH BE PAID FOR UNDER ITEM 991.1 – TEMPORARY CONTROL OF WATER.

Project:
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WORCESTER, MA 01609

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No.	Date	Description

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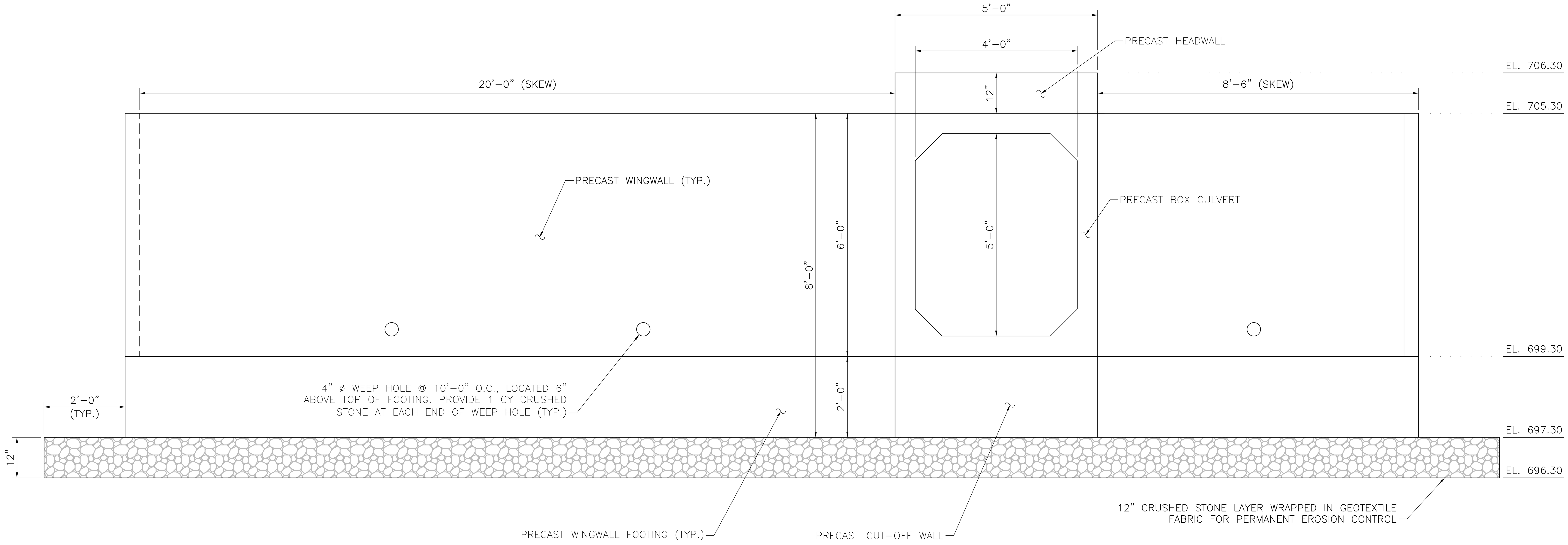
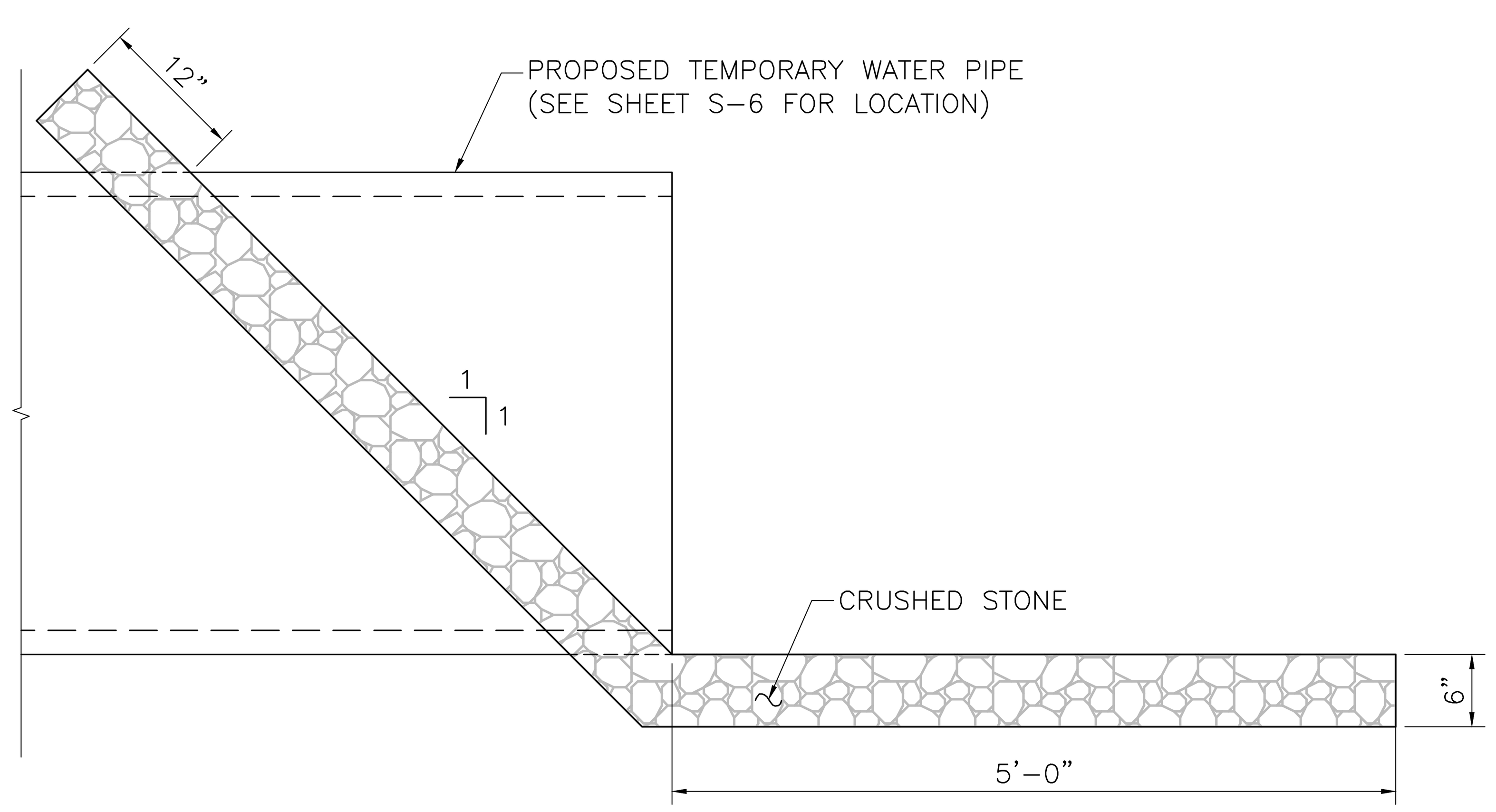
Drawing Title: GENERAL PLAN

Sheet Number: S-6



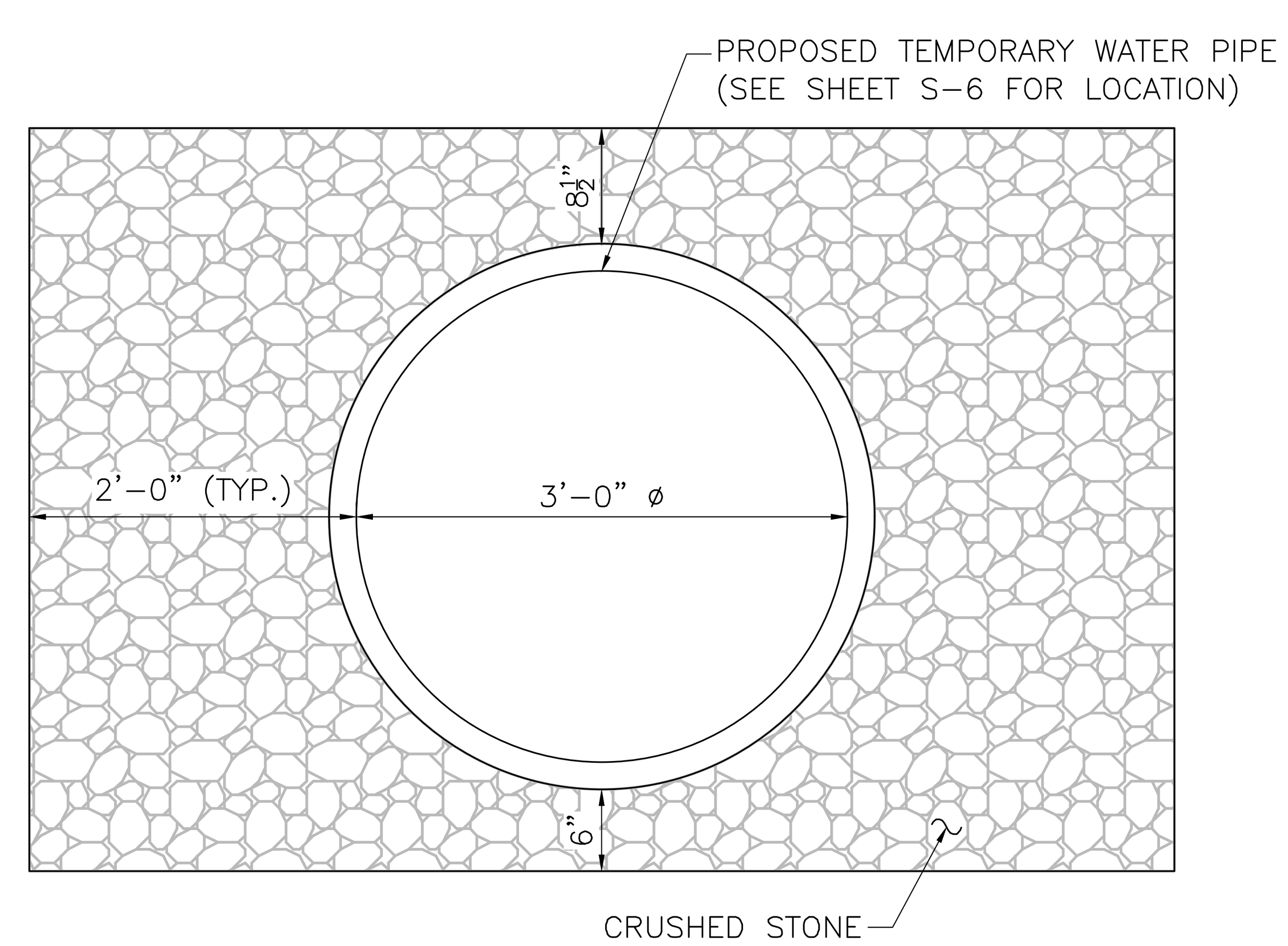
SOUTH ELEVATION

SCALE: ¾" = 1'-0"



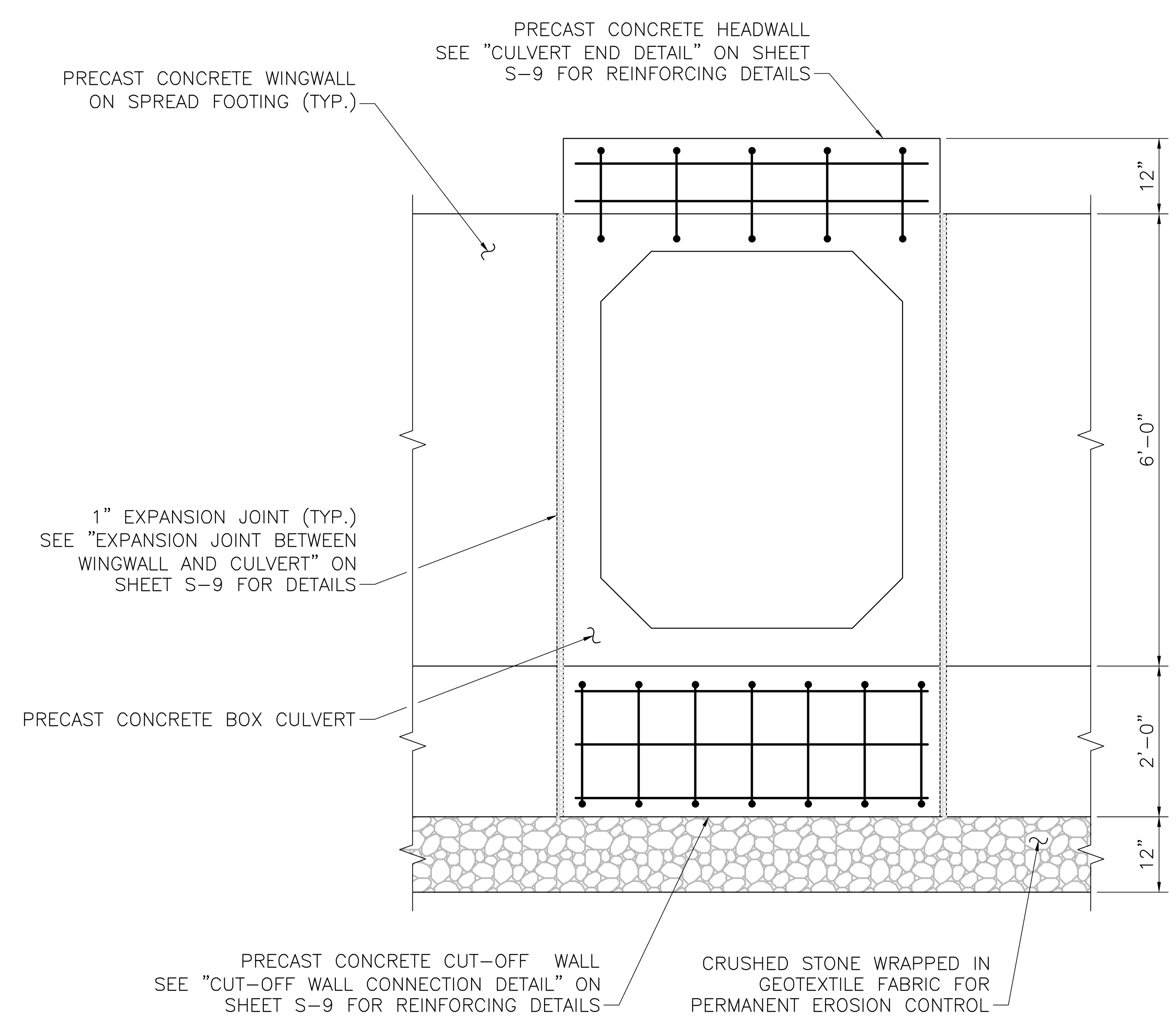
PIPE END SIDE ELEVATION

SCALE: 1" = 1'-0"



PIPE END SECTION

SCALE: 1" = 1'-0"



CULVERT END REINFORCING DETAIL

SCALE: ¾" = 1'-0"

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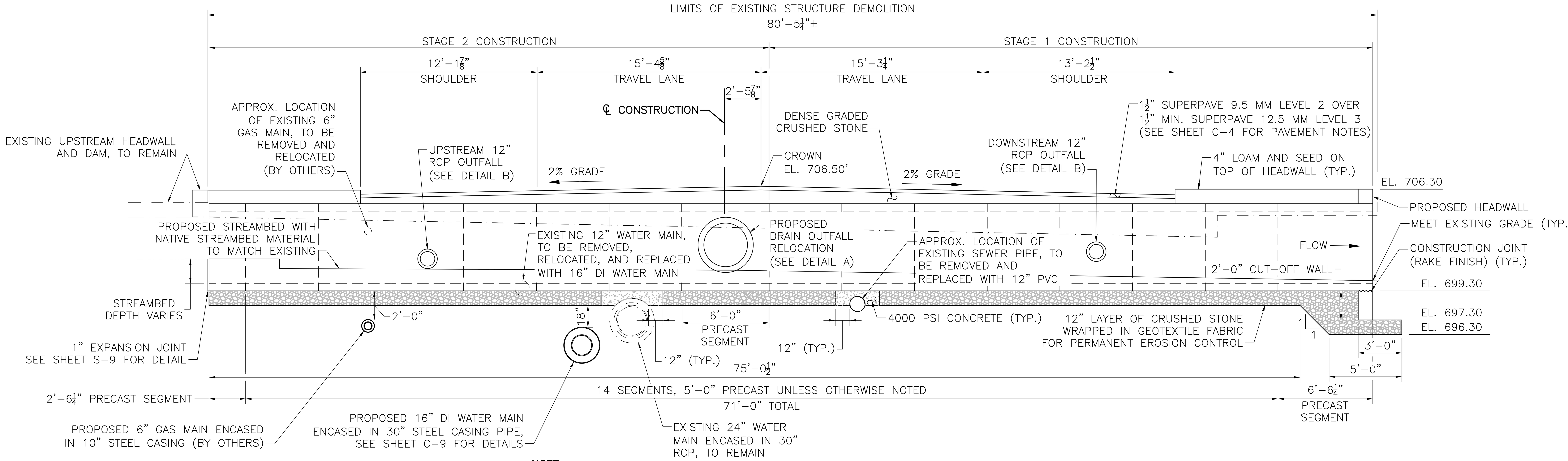
W&S File No.:

Drawing Title:
ELEVATIONS

Sheet Number:
S-7

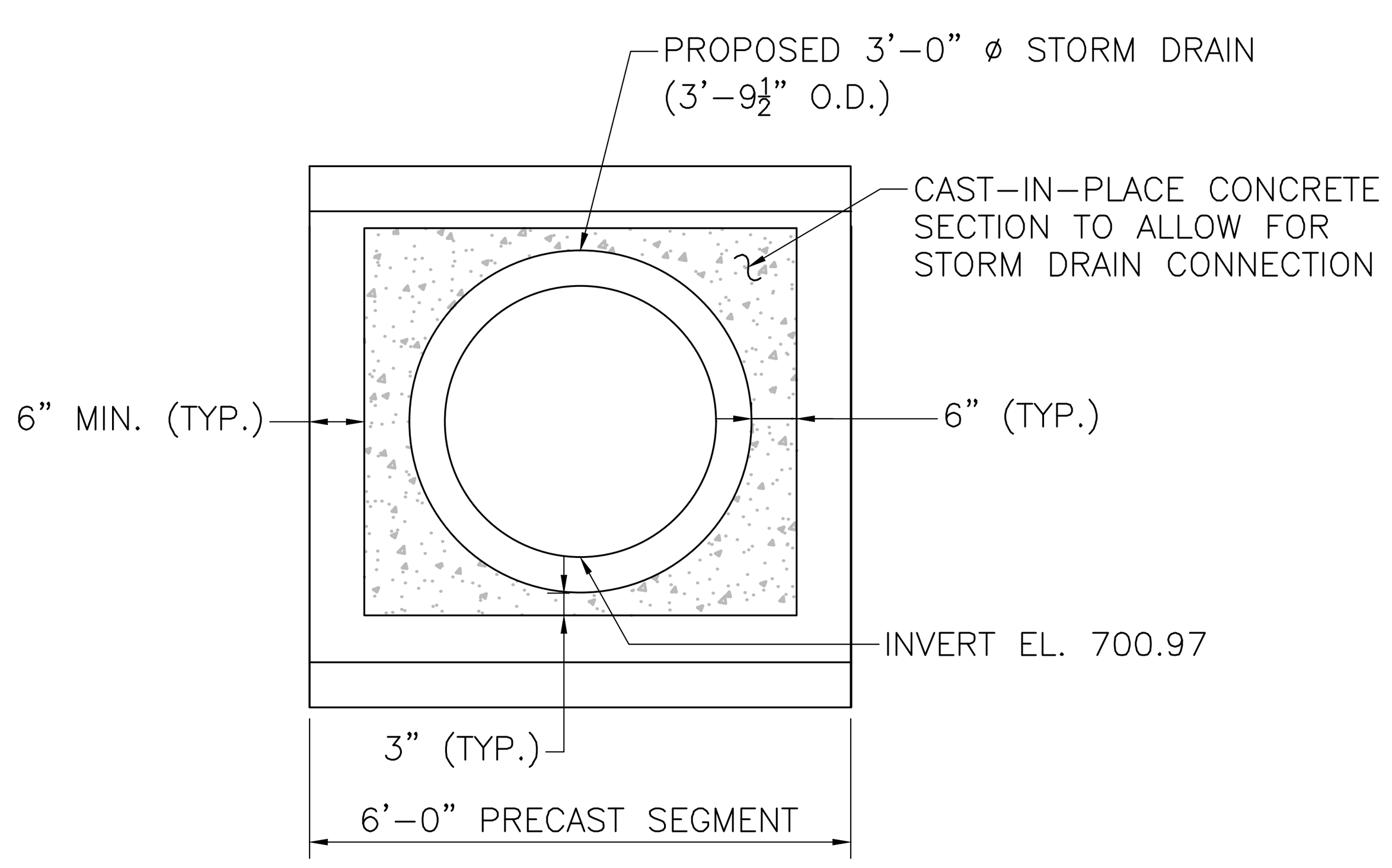


NOTE:

TRAVEL LANE AND SHOULDER WIDTH DIMENSIONS ARE TAKEN AT THE ℄ OF PROPOSED CULVERT. DIMENSIONS VARY, REFER TO HIGHWAY DRAWINGS.

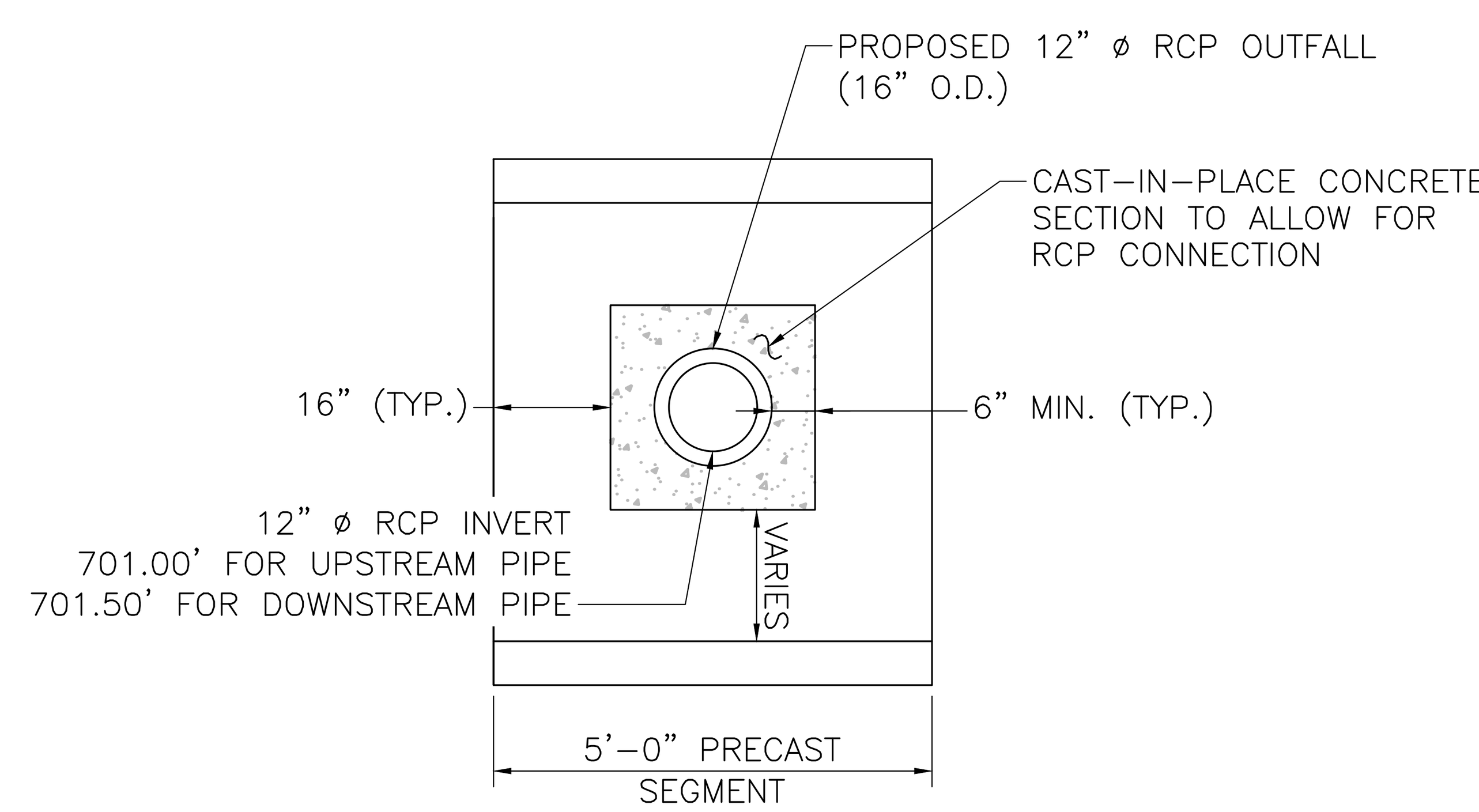
LONGITUDINAL SECTION (LOOKING EAST)

SCALE: $\frac{1}{4}$" = 1'-0"



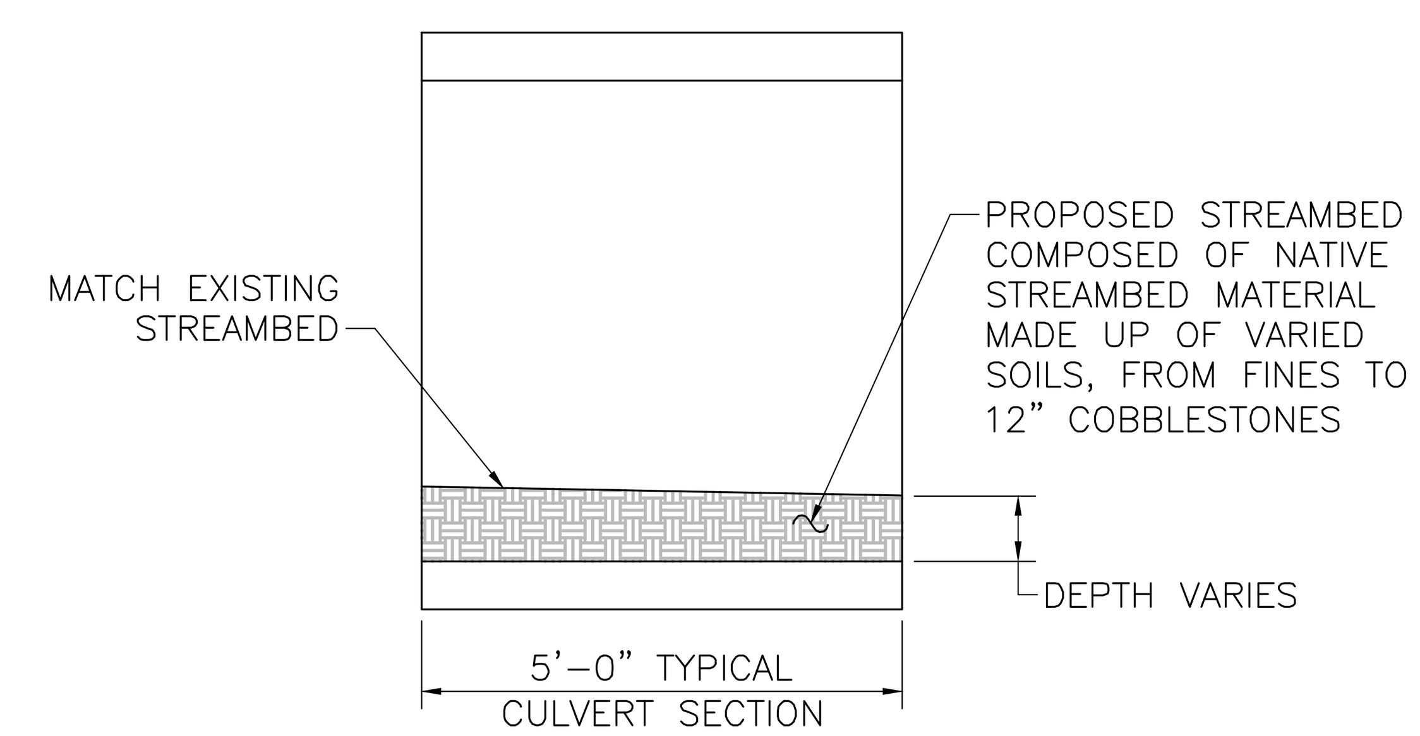
DETAIL A / –

SCALE: $\frac{1}{2}$" = 1'-0"



DETAIL B / –

SCALE: $\frac{1}{2}$" = 1'-0"



STREAMBED DETAIL

SCALE: $\frac{1}{2}$" = 1'-0"

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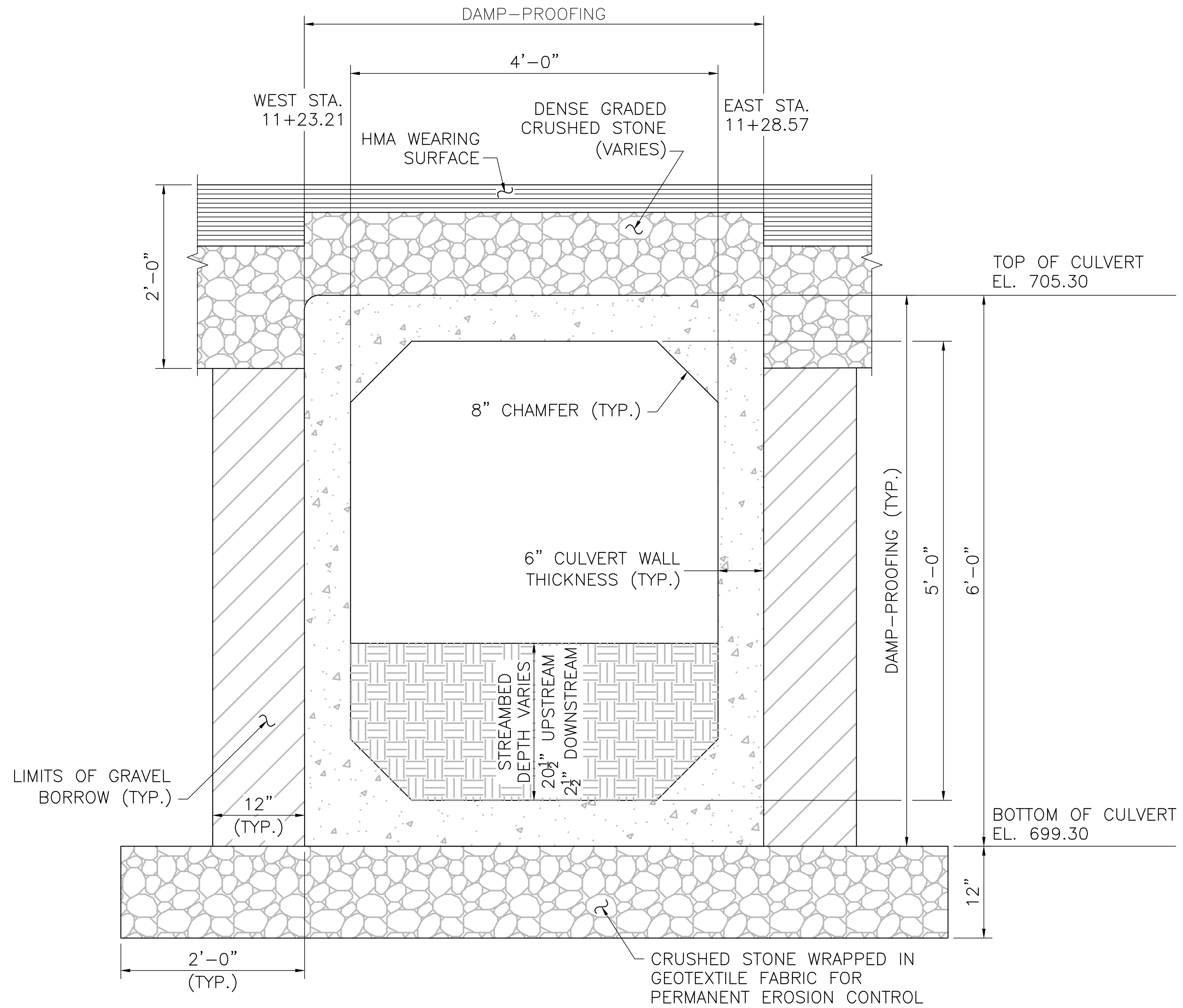
Drawing Title:

LONGITUDINAL SECTION

Sheet Number:

S-8

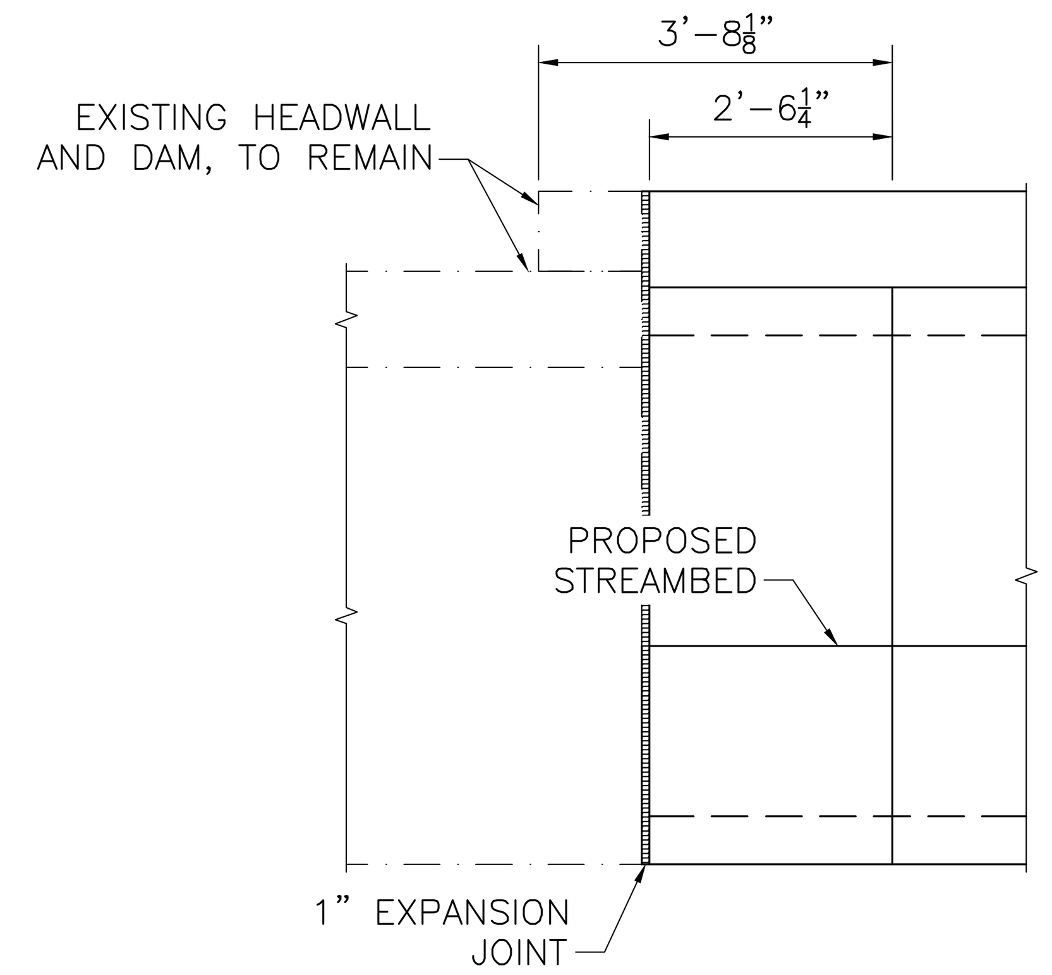


NOTE:

PRECAST CULVERT SECTION FABRICATION AND ERECTION TOLERANCES SHALL BE ±¼".

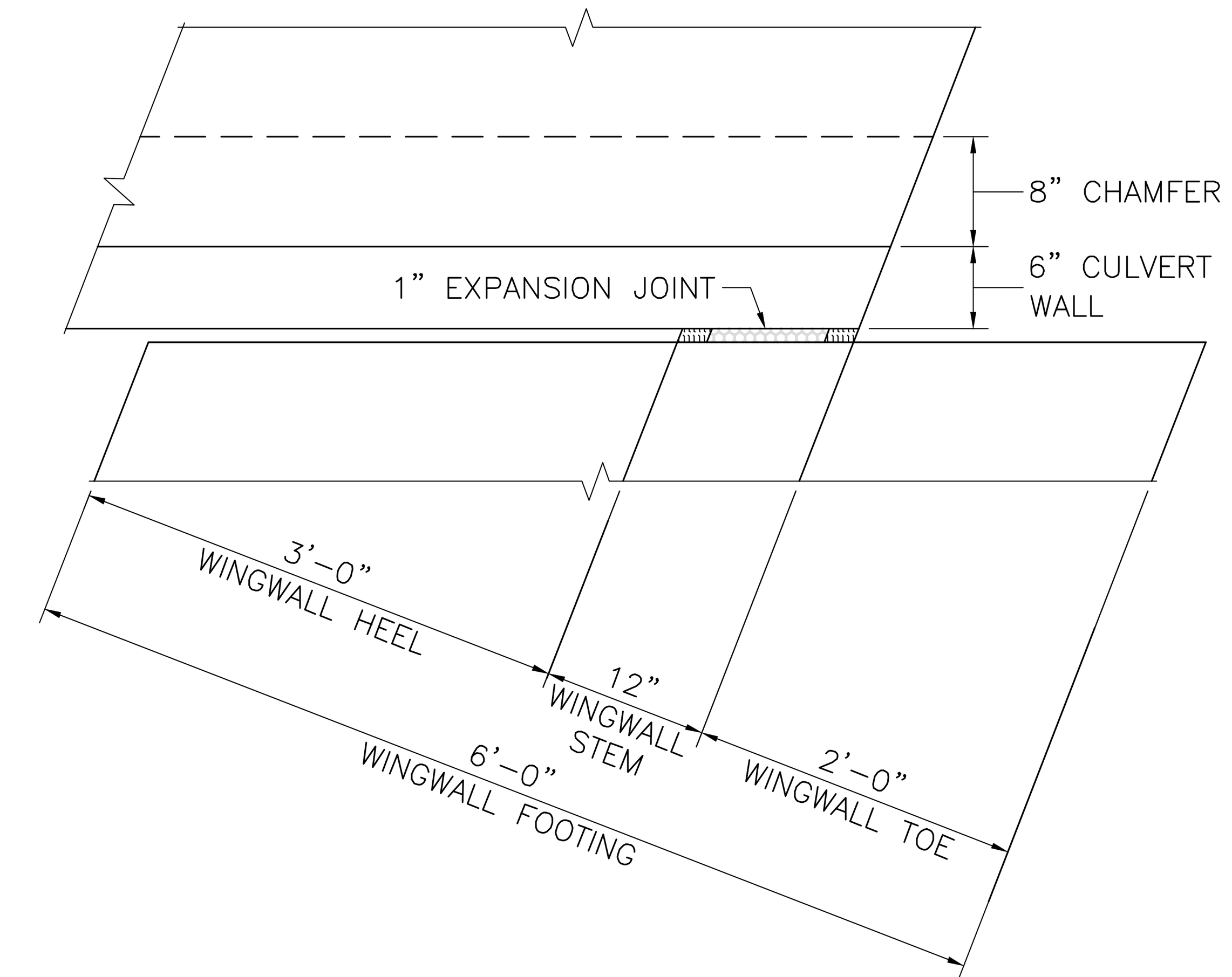
CULVERT CROSS SECTION

SCALE: 1" = 1'-0"



LONGITUDINAL SECTION AT UPSTREAM END OF CULVERT

SCALE: ½" = 1'-0"

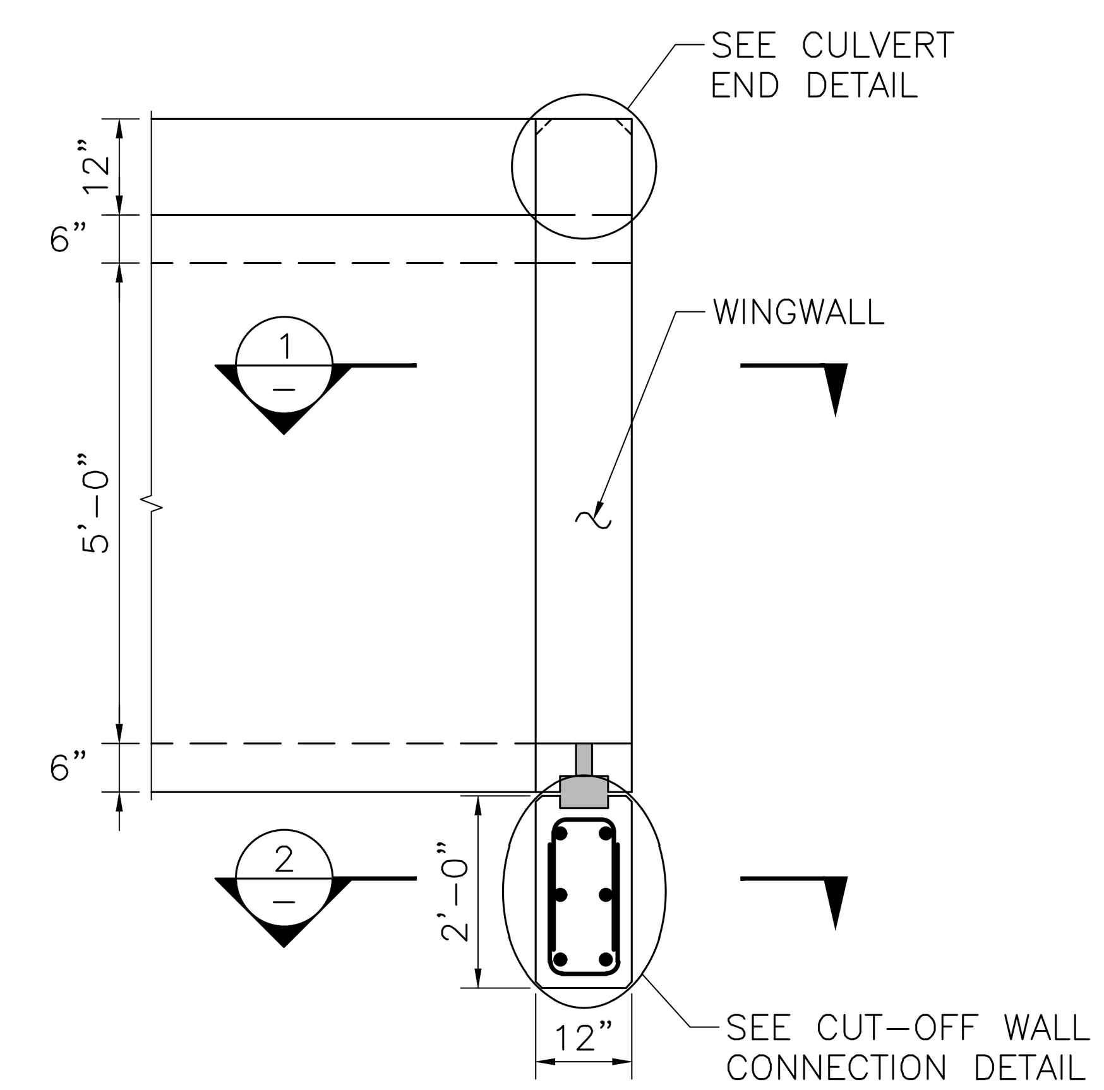


NOTE:

CULVERT REINFORCEMENT IS NOT SHOWN FOR CLARITY.

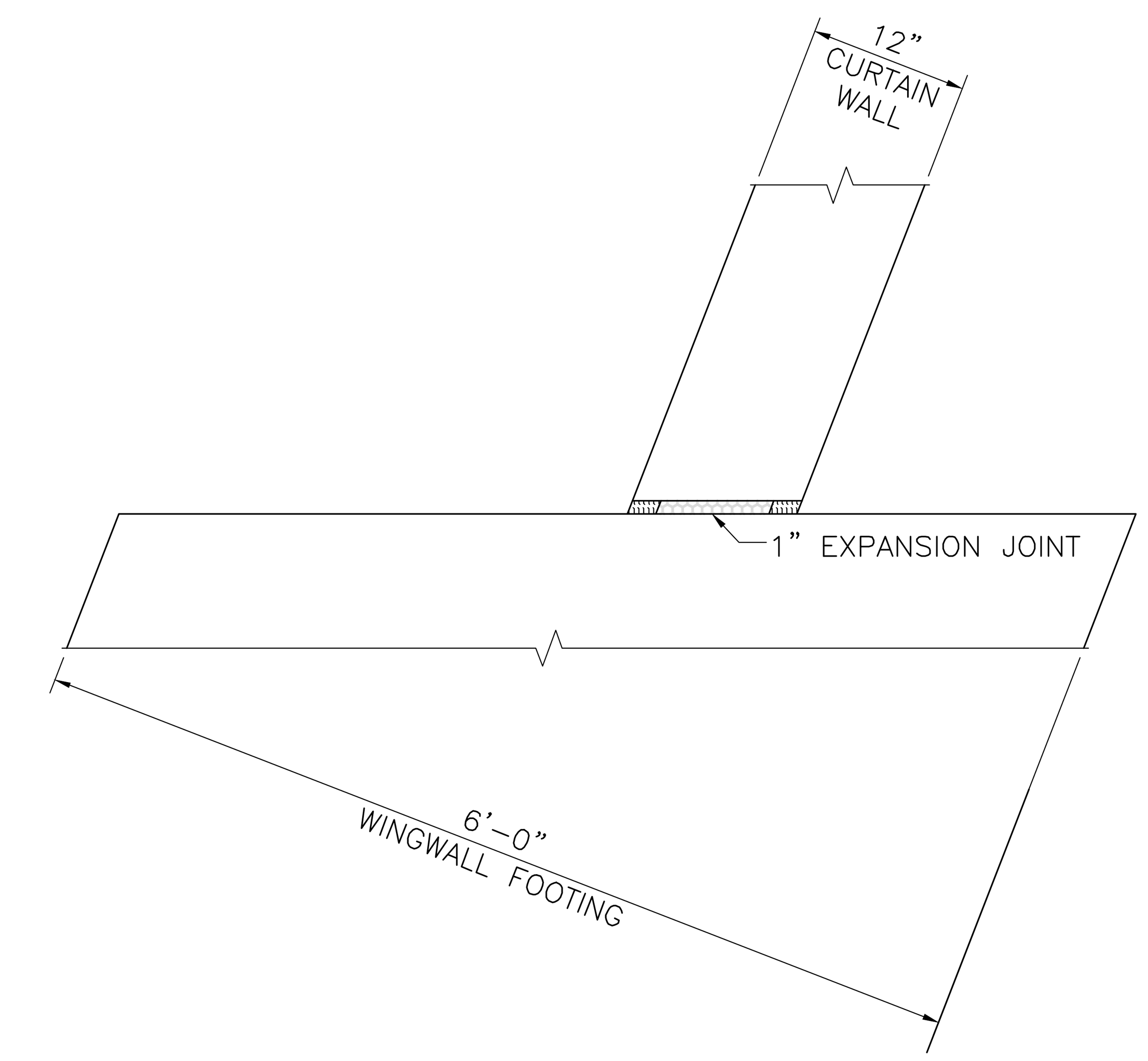
SECTION 1

SCALE: 1" = 1'-0"



LONGITUDINAL SECTION AT DOWNSTREAM END OF CULVERT

SCALE: ½" = 1'-0"

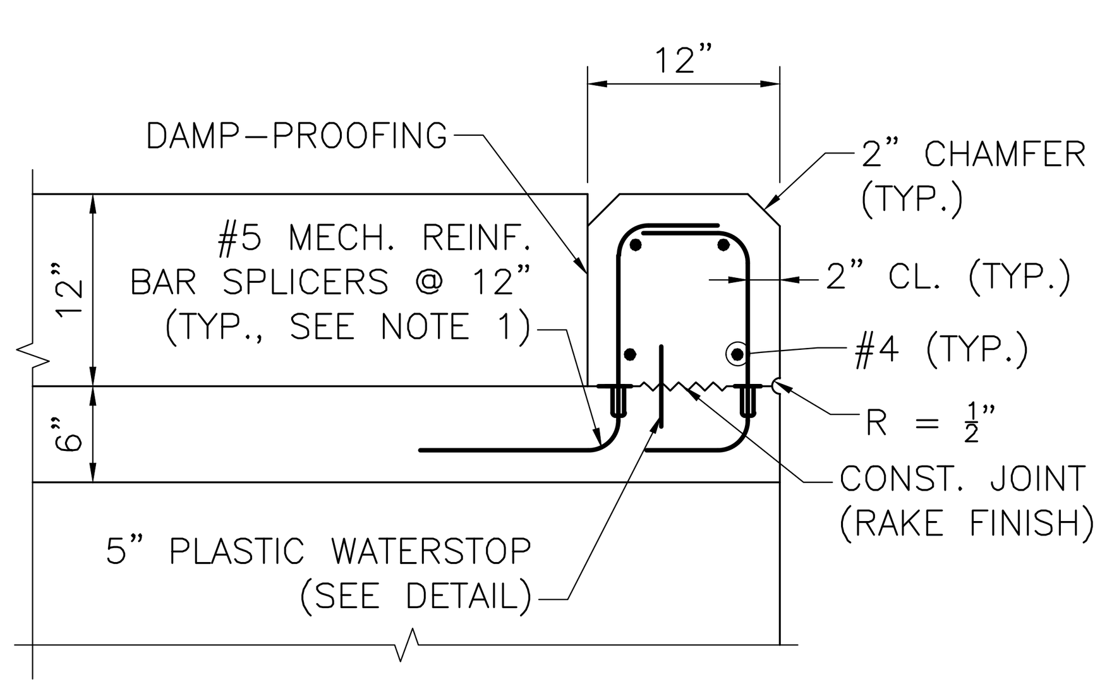


NOTE:

CULVERT REINFORCEMENT IS NOT SHOWN FOR CLARITY.

SECTION 2

SCALE: 1" = 1'-0"

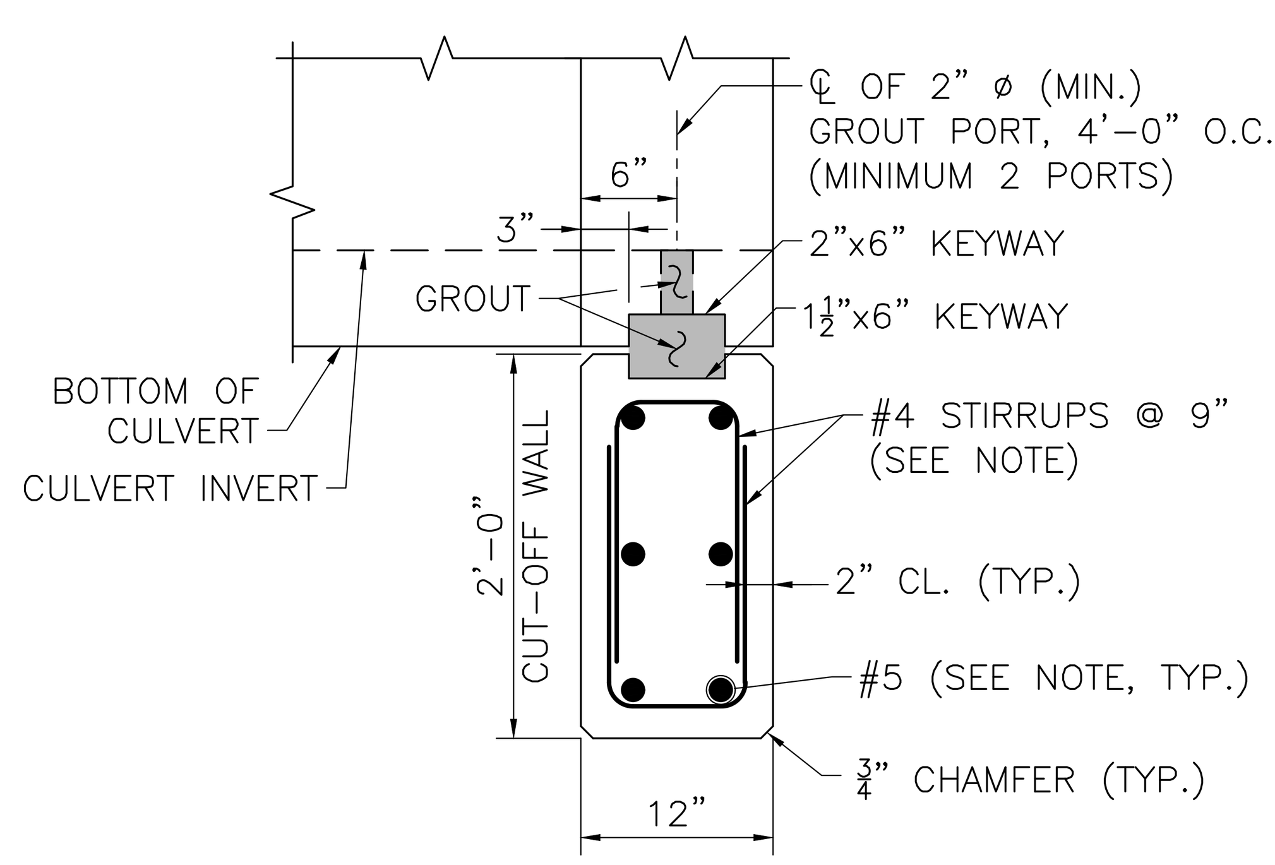


NOTES:

1. THE CONTRACTOR MAY SUBSTITUTE #5 ⎍ DOWELS, FOR MECHANICAL REINFORCING BAR SPLICERS AND THREADED REBARS.
2. CULVERT REINFORCEMENT IS NOT SHOWN FOR CLARITY.

CULVERT END DETAIL

SCALE: 1" = 1'-0"

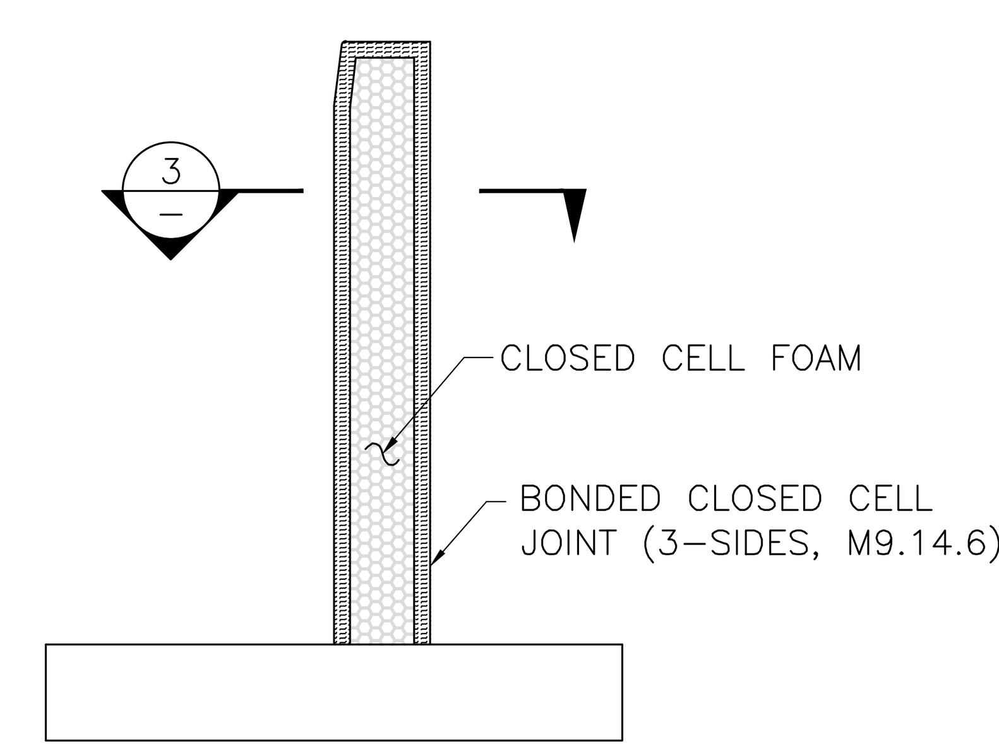


NOTE:

REINFORCEMENT SHOWN IS PRELIMINARY. CONTRACTOR TO DETERMINE FINAL REINFORCEMENT.

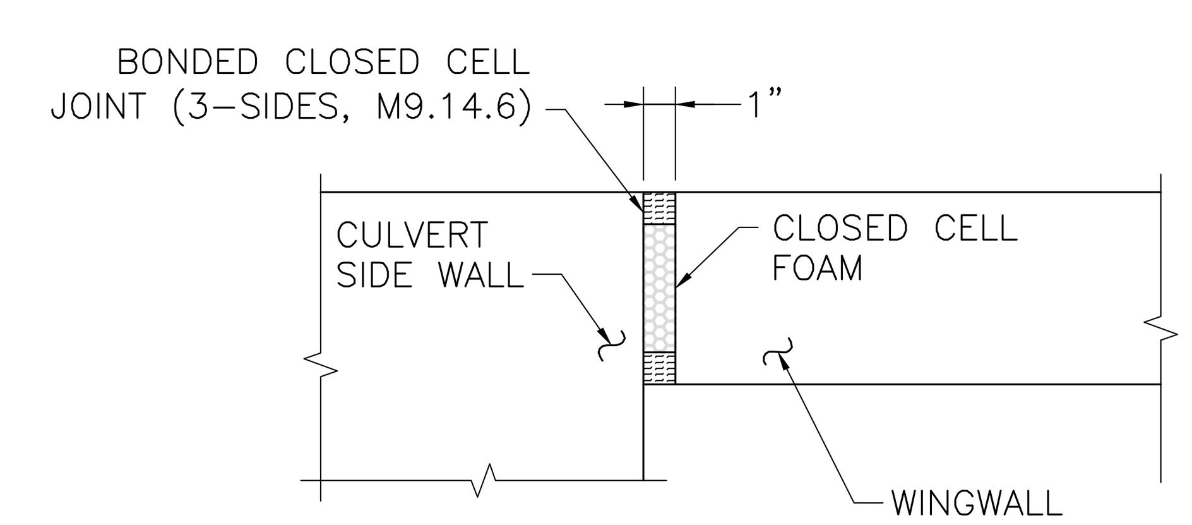
CUT-OFF WALL CONNECTION DETAIL

SCALE: 1" = 1'-0"



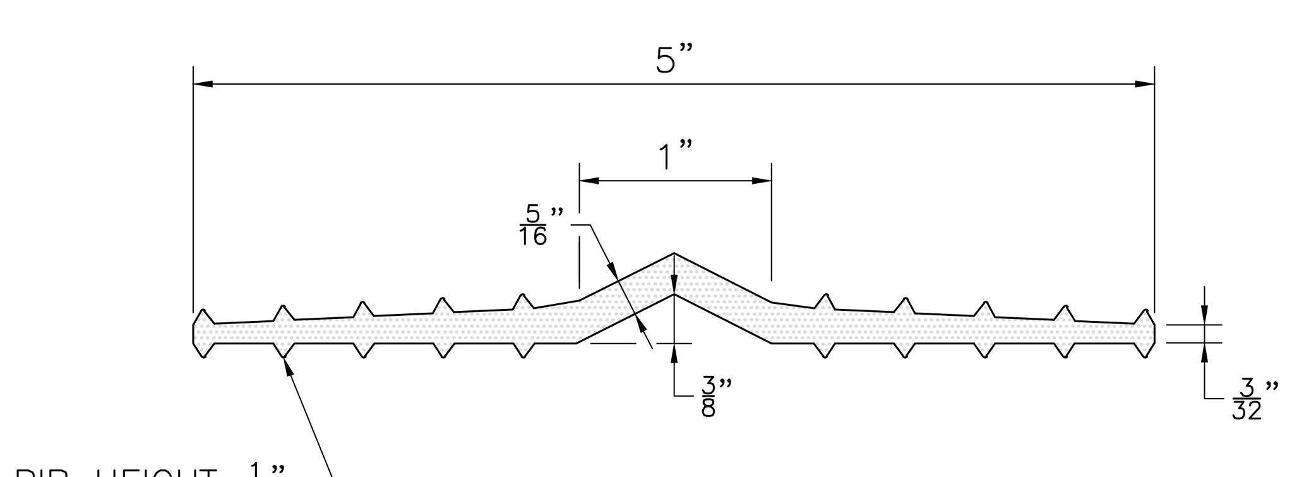
EXPANSION JOINT DETAIL

SCALE: ½" = 1'-0"



SECTION 3

SCALE: 1" = 1'-0"



5" WATERSTOP

NOT TO SCALE

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CULVERT AND WINGWALL DETAILS

Sheet Number:
S-9