

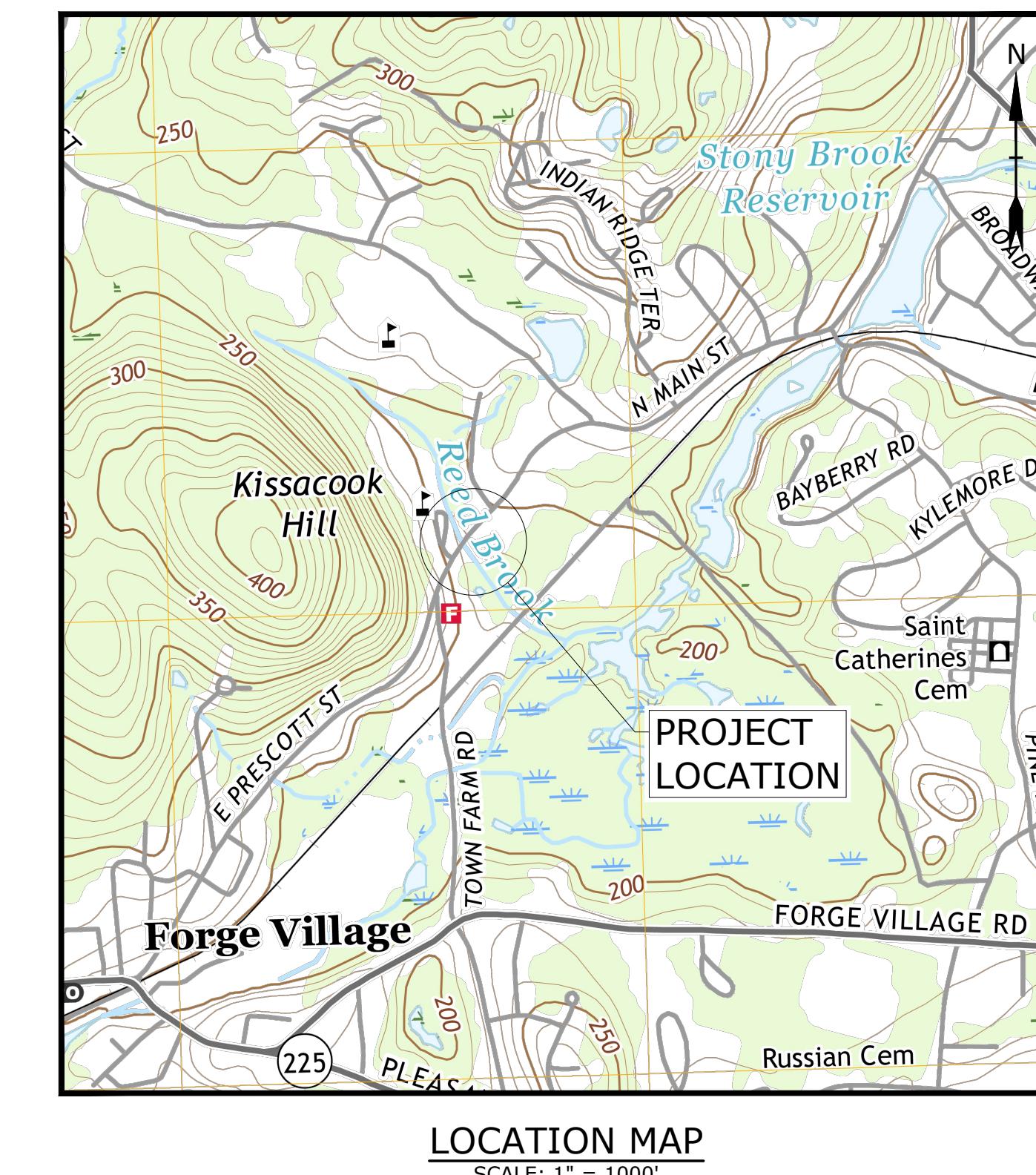
TOWN OF WESTFORD, MASSACHUSETTS

EAST PRESCOTT STREET & NORTH MAIN STREET

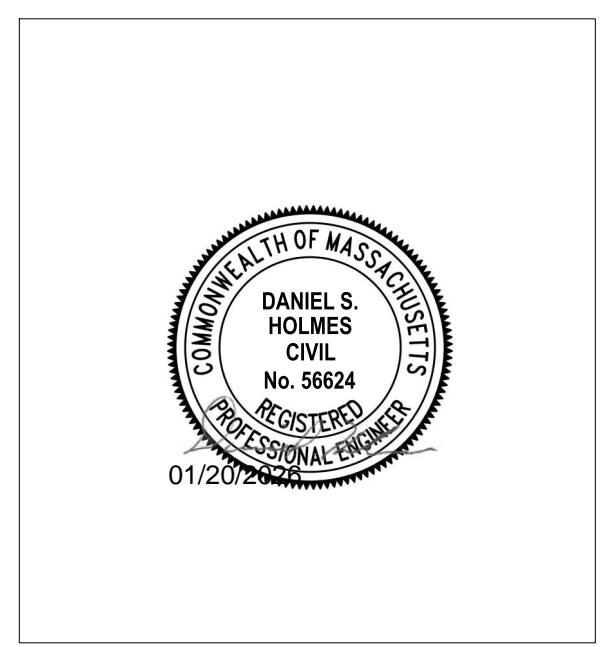
OVER REED BROOK CULVERT REPLACEMENT

JANUARY 2026

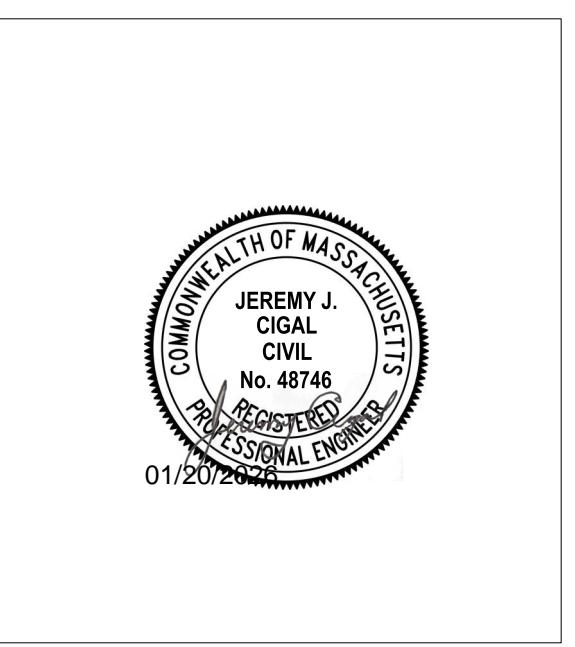
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17	WATERMAIN DETAILS



PREPARED BY:
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PREPARED FOR:
TOWN OF WESTFORD
DEPARTMENT OF PUBLIC WORKS
PAUL STARRATT, PE, TOWN ENGINEER
KYLE FOX, DIRECTOR OF PUBLIC WORKS



WESTFORD
MASSACHUSETTS

COMPLETE SET 17 SHEETS

SURFACE RESTORATION

- ALL PAVEMENT DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AT NO ADDITIONAL COST TO THE OWNER.
- PROTECT PROJECT FEATURES (E.G., WALLS, FENCES, MAIL BOXES, SIGNS, SIDEWALKS, CURBING, STAIRS, UTILITY POLES, GUY WIRES, WALKWAYS, TREES, ETC.) FROM DAMAGE DURING CONSTRUCTION, INCLUDING PROVIDING TEMPORARY SUPPORTS, WHEN APPROPRIATE.
- IF REMOVAL OF PROJECT FEATURES IS REQUIRED IN ORDER TO PERFORM THE PROPOSED WORK, REMOVE THOSE SITE FEATURES ONLY UPON APPROVAL OF ENGINEER. REPLACE ALL REMOVED PROJECT FEATURES; NEW ITEMS SHALL BE EQUAL OR BETTER IN QUALITY AND CONDITION TO THE ITEMS REMOVED.
- EXISTING SURVEY MONUMENTS DISTURBED BY THE CONTRACTOR SHALL BE REPLACED BY A LAND SURVEYOR LICENSED IN THE STATE IN WHICH THE WORK IS PERFORMED AT NO ADDITIONAL COST TO THE OWNER.
- COORDINATE THE ADJUSTMENT OF EXISTING UTILITY STRUCTURES WITH EACH RESPONSIBLE UTILITY OWNER PRIOR TO RECONSTRUCTION AND/OR PAVING OPERATIONS. RAISE ALL STRUCTURES TO FINISHED GRADES PRIOR TO THE END OF THE CONSTRUCTION SEASON AND PRIOR TO FINISHED PAVING.
- REPAIR DISTURBED PAVED SURFACES AT THE END OF EACH WORK WEEK, UNLESS OTHERWISE APPROVED/REQUIRED BY THE OWNER.
- TRANSFER ALL TEMPORARY BENCHMARKS, AS NECESSARY.
- RESTORE ALL AREAS DISTURBED BY THE CONTRACTOR BEYOND THE PROJECT LIMITS TO ORIGINAL CONDITIONS AT NO ADDITIONAL COST TO THE OWNER.
- REGRADE ALL UNPAVED AREAS DISTURBED BY THE WORK AS REQUIRED. REPAIR/REPLACE PAVED SURFACES DISTURBED BY THE WORK IN-KIND, UNLESS OTHERWISE NOTED. RESTORE SURFACES TO EXISTING OR PROPOSED CONDITIONS AS INDICATED ON THE DRAWINGS.

DRAINAGE SYSTEM IMPROVEMENT

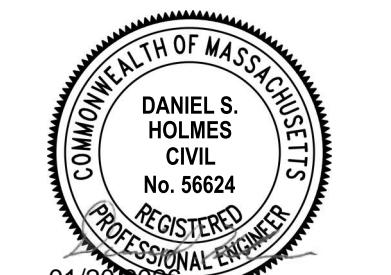
- LOCATIONS OF PROPOSED STORM DRAINS AND STRUCTURES ARE APPROXIMATE AND MAY BE ADJUSTED DURING CONSTRUCTION AFTER INVESTIGATIVE WORK. FINAL STORM DRAIN LOCATIONS, AND ASSOCIATED STRUCTURES, WILL BE DETERMINED IN THE FIELD BY THE ENGINEER.
- ADJUSTMENTS TO THE PROPOSED STORM DRAIN LAYOUTS AND ELEVATIONS SHALL NOT BE CONSIDERED CAUSE FOR ADDITIONAL PAYMENTS. THE CONTRACTOR SHALL NOT MAKE PROPOSED STORM DRAIN LAYOUT AND ELEVATION ADJUSTMENTS WITHOUT APPROVAL FROM THE ENGINEER.
- Maintain operation of drainage system during construction. Provide bypass pumping of drainage flows and/or temporary connections, as necessary.

WATER MAIN NOTES

- PROPOSED WATER MAINS SHALL BE PROVIDED IN ACCORDANCE WITH THE OWNER'S STANDARDS, AS SPECIFIED, AND AS SHOWN ON THE DRAWINGS. WHERE THERE IS A CONFLICT BETWEEN THE OWNER'S STANDARDS AND THE DRAWINGS AND SPECIAL PROVISIONS, THE OWNER'S STANDARDS SHALL GOVERN.
- HORIZONTAL AND VERTICAL LOCATION OF WATER MAINS MAY BE MODIFIED TO FIT EXISTING FIELD CONDITIONS, UPON APPROVAL OF THE ENGINEER.
- MINIMUM DEPTH OF COVER OVER PROPOSED WATER MAIN SHALL BE 5 FEET, UNLESS OTHERWISE NOTED OR APPROVED BY THE ENGINEER.
- ALL BELOW GRADE VALVES AND FITTINGS SHALL HAVE MECHANICAL JOINT (MJ) ENDS. RESTRAIN ALL VALVE AND FITTING JOINTS WITH RETAINER GLANDS. WHERE CALLED OUT ON THE DRAWINGS PRECAST CONCRETE THRUST BLOCKS SHALL BE USED IN ADDITION TO RESTRAINED JOINTS.
- WHERE A COUPLING IS CALLED FOR ON THE DRAWINGS TO CONNECT A PROPOSED WATER MAIN TO AN EXISTING WATER MAIN PROVIDE A SOLID SLEEVE, IF POSSIBLE. RESTRAIN SLEEVE TO PIPES WITH RETAINER GLANDS. IF OUTSIDE DIAMETER OF EXISTING WATER MAIN DOES NOT ALLOW INSTALLATION OF SOLID SLEEVE, PROVIDE RESTRAINING TYPE TRANSITION COUPLING.
- SLEEVES, NIPPLES, AND ACCESSORIES NECESSARY FOR CONNECTION BETWEEN EXISTING AND PROPOSED PIPES MAY NOT BE SHOWN ON THE DRAWINGS. PROVIDE ITEMS NECESSARY FOR CONNECTING TO EXISTING MAINS AND MAKE CONNECTIONS AS INDICATED IN THE CONTRACT DOCUMENTS AT NO ADDITIONAL COST TO THE OWNER.
- RESTRAIN PIPE JOINTS IN ACCORDANCE WITH "MINIMUM RESTRAINED LENGTHS FOR DI PIPE" TABLE ON THE DRAWINGS.
- MAINTAIN A MINIMUM HORIZONTAL DISTANCE OF 10 FEET BETWEEN THE PROPOSED WATER MAIN AND ANY EXISTING OR PROPOSED SANITARY SEWER OR STORM DRAIN. WHEN CONDITIONS PREVENT THIS, A LESSER DISTANCE WILL BE ALLOWED IF: A.) THE WATER MAIN IS IN A SEPARATE TRENCH OR B.) THE PROPOSED WATER MAIN IS LOCATED IN THE SAME TRENCH TO ONE SIDE ON A BENCH OF UNDISTURBED EARTH WITH AT LEAST 12 INCHES, AND PREFERABLY 18 INCHES, HORIZONTAL SEPARATION BETWEEN THE EDGES OF THE SEWER/DRAIN PIPE AND THE WATER MAIN. IN EITHER CASE, THE BOTTOM OF THE WATER MAIN SHALL BE 18 INCHES ABOVE THE CROWN OF THE SEWER/DRAIN PIPE.
- WATER MAINS CROSSING SEWERS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18 INCHES BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF THE SEWER. IT IS PREFERRED THAT THE WATER MAIN CROSS ABOVE THE SEWER. AT CROSSINGS, ONE FULL LENGTH OF WATER PIPE SHALL BE LOCATED SO BOTH JOINTS WILL BE AS FAR FROM THE SEWER AS POSSIBLE.
- WHERE THE PROPOSED WATER MAIN IS TO BE INSTALLED BELOW A DRAIN PIPE, MAINTAIN A MINIMUM OF 18 INCHES BETWEEN THE BOTTOM OF THE STORM DRAIN AND THE CROWN OF THE WATER MAIN.
- OPERATION OF EXISTING VALVES SHALL BE BY THE WATER DISTRIBUTION SYSTEM OWNER, UNLESS OTHERWISE AUTHORIZED. COORDINATE OPERATION OF VALVES WITH THE WATER DISTRIBUTION SYSTEM OWNER.
- THE WATER DISTRIBUTION SYSTEM OWNER DOES NOT GUARANTEE A TIGHT SHUTDOWN OF ITS EXISTING VALVES. THE CONTRACTOR IS RESPONSIBLE FOR CONTROL OF LEAKAGE AND DISPOSAL OF WATER UP TO 100 GALLONS PER MINUTE.
- COORDINATE THE ACTIVATION AND DEACTIVATION OF WATER MAINS WITH THE WATER DISTRIBUTION SYSTEM OWNER.
- REMOVE AND DISPOSE OF VALVE BOXES ON WATER MAIN TO BE ABANDONED, UNLESS DIRECTED OTHERWISE.
- COVER EACH FIRE HYDRANT TAKEN OUT OF SERVICE WITH A NON-DEGRADABLE BAG SECURELY TIED. IMMEDIATELY NOTIFY FIRE DEPARTMENT WHEN HYDRANTS ARE TAKEN OUT OF SERVICE.
- THE OWNER SHALL HAVE FIRST RIGHT OF REFUSAL TO ANY VALVES, VALVE BOXES, HYDRANTS, AND ANY OTHER ITEMS REMOVED FROM THEIR SYSTEM. COORDINATE WITH OWNER WITH DELIVERY LOCATION, OTHERWISE THE CONTRACTOR SHALL PROPERLY DISPOSE OF ALL REMOVED ITEMS.

GEOTECHNICAL DESIGN PARAMETERS:

- MINIMUM EMBEDMENT FOR FROST PROTECTION FOR FOOTINGS FOUNDED ON SOIL = 4 FEET BELOW ADJACENT GROUND SURFACE.
- ALLOWABLE BEARING PRESSURE FOR FOUNDATIONS ON SOIL = 4 KIPS PER SQUARE FOOT.
- THE WINGWALL DESIGNER SHALL PREPARE CALCULATIONS THAT VERIFY THE APPLIED BEARING PRESSURE IS LESS THAN THE ALLOWABLE BEARING PRESSURE BASED ON THE FINAL WINGWALL FOUNDATION DIMENSIONS AND EMBEDMENT.
- MAXIMUM ALLOWABLE SETTLEMENT = 1.5 INCHES TOTAL
- MINIMUM BACKFILL UNIT WEIGHT = 130 POUNDS PER CUBIC FOOT (PCF)
- MAXIMUM BACKFILL ANGLE OF INTERNAL FRICTION = 32 DEGREE
- MINIMUM LATERAL EARTH PRESSURES FOR RESTRAINED CULVERT SIDE WALLS:
 - STATIC =
 - 61 POUNDS PER CUBIC FOOT PER FOOT (PCF/FT) AS AN EQUIVALENT FLUID PRESSURE (ABOVE GROUNDWATER)
 - 32 POUNDS PER CUBIC FOOT PER FOOT (PCF/FT) AS AN EQUIVALENT FLUID PRESSURE (BELOW GROUNDWATER)
 - SURCHARGE: HORIZONTAL FORCE FROM THE PRESSURE DISTRIBUTION PRODUCED BY THE AASHTO HL-93 VEHICULAR LIVE LOAD, UNIFORMLY DISTRIBUTED OVER THE HEIGHT OF THE WALL
 - SEISMIC =
 - 30 POUNDS PER CUBIC FOOT PER FOOT (PCF/FT) AS AN EQUIVALENT FLUID PRESSURE
- MINIMUM LATERAL EARTH PRESSURES FOR UNRESTRAINED WING WALLS:
 - STATIC =
 - 36 PCF/FT AS AN EQUIVALENT FLUID PRESSURE, 200 PSF/FT MINIMUM (ABOVE GROUNDWATER)
 - 19 PCF/FT AS AN EQUIVALENT FLUID PRESSURE, 200 PSF/FT MINIMUM (BELOW GROUNDWATER)
 - SURCHARGE: HORIZONTAL FORCE FROM THE PRESSURE DISTRIBUTION PRODUCED BY THE AASHTO HL-93 VEHICULAR LIVE LOAD, UNIFORMLY DISTRIBUTED OVER THE HEIGHT OF THE WALL. THE DESIGN SHALL ACCOUNT FOR SLOPING GROUND SURFACE ABOVE THE WALLS.
 - SEISMIC =
 - 47 POUNDS PER CUBIC FOOT PER FOOT (PSF/FT) AS AN EQUIVALENT FLUID PRESSURE

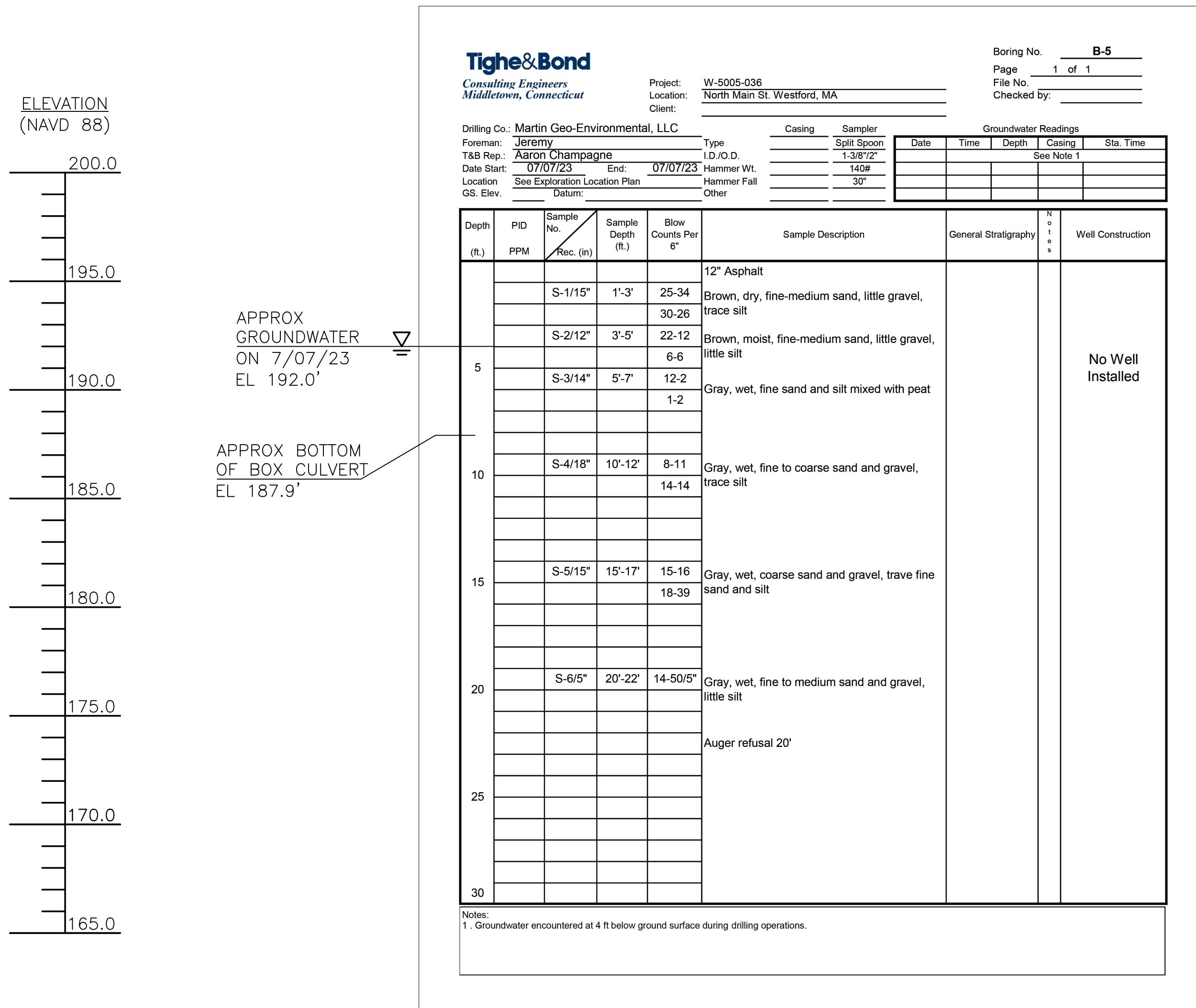


East Prescott Street & North Main Street Culvert Replacement

Westford
Department of
Public Works

Westford, MA

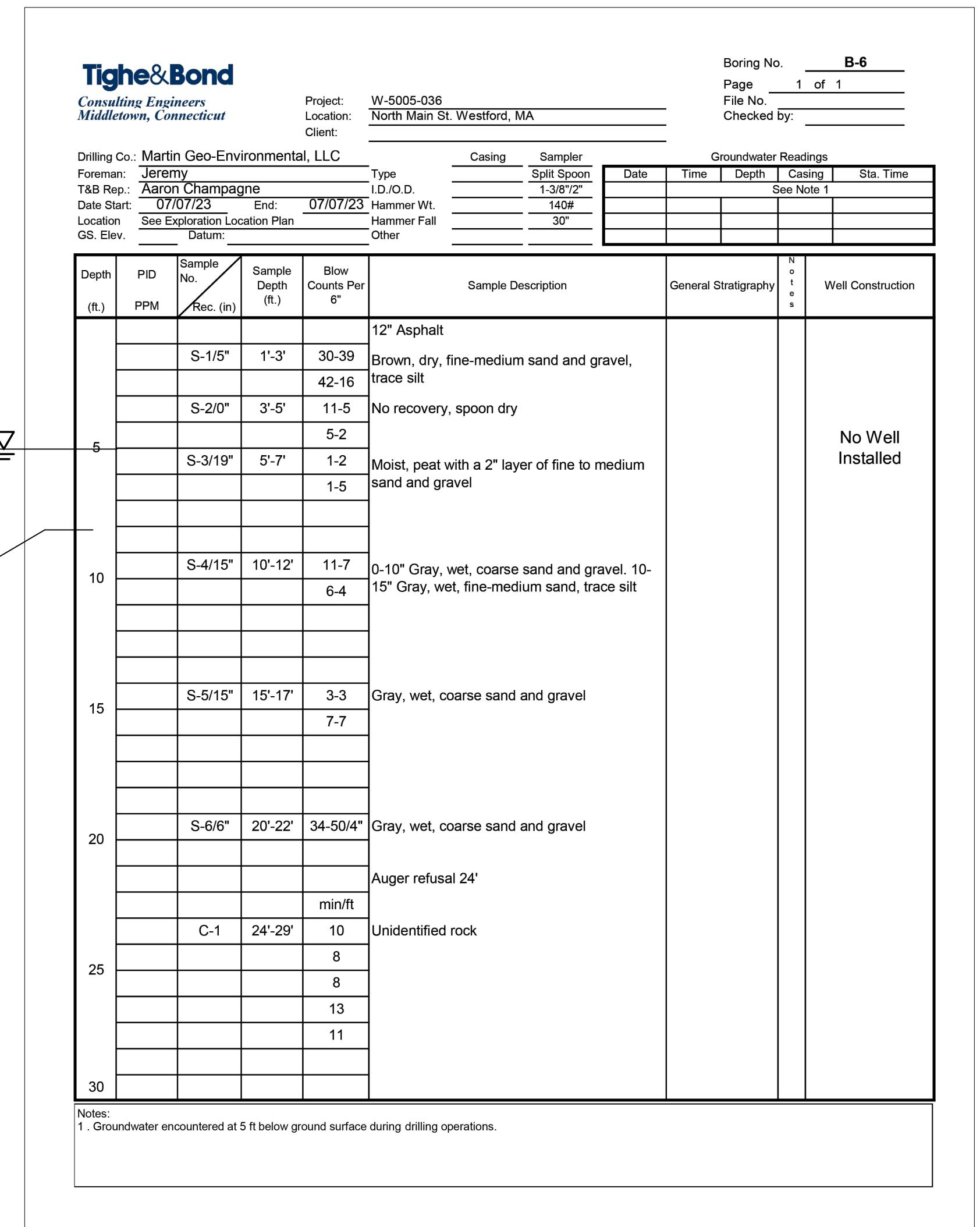
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PROJECT NO:	W5005-036	
DATE:	JANUARY 2026	
FILE:	W5005-036_03_GENERAL.dwg	
DRAWN BY:	JHM	
DESIGNED/CHECKED BY:	SDS/JJC	
APPROVED BY:	DSH	
GENERAL NOTES (SHEET 2 OF 2)		
SCALE:	NO SCALE	
SHEET 3 OF 17		



BORING B-5 (1 OF 1)

BORING NOTES:

- LOCATION OF BORINGS SHOWN ON SHEET 5  THUS:
- BORINGS WERE TAKEN FOR PURPOSE OF DESIGN AND SHOW CONDITIONS AT BORING POINTS ONLY, BUT DO NOT NECESSARILY SHOW THE NATURE OF MATERIALS TO BE ENCOUNTERED DURING CONSTRUCTION.
- WATER LEVELS SHOWN ON THE BORING LOGS WERE OBSERVED AT THE TIME OF DRILLING. FIELD CONDITIONS WILL VARY BASED ON TIME OF YEAR AND RAIN EVENTS.
- FIGURES IN COLUMNS INDICATE NUMBER OF BLOWS REQUIRED TO DRIVE A 1 3/8" I.D. SPLIT SPOON SAMPLER 6" USING A 140 POUND WEIGHT FALLING 30'.
- BORING SAMPLES ARE STORED AT TIGHE & BOND'S OFFICE, 53 SOUTHPHAMPTON ROAD, WESTFIELD, MA 01085. THE CONTRACTOR MAY EXAMINE THE SOIL AND ROCK SAMPLES BY CONTACTING THE DESIGN ENGINEER.
- ALL BORINGS WERE DRILLED IN JULY 2023.
- BORINGS WERE DRILLED BY MARTIN GEO ENVIRONMENTAL LLC. OF BELCHERTOWN, MA.
- THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 IS USED THROUGHOUT.
- THE SURFACE ELEVATION ON EACH BORING LOG IS THE ELEVATION OF THE EXISTING GROUND AT THE TIME THE BORING WAS DRILLED.
- ENGINEERING JUDGEMENT WAS EXERCISED IN PREPARING THE SUBSURFACE INFORMATION PRESENTED HEREIN. ANALYSIS AND INTERPRETATION OF SUBSURFACE DATA WAS PERFORMED FOR DESIGN AND ESTIMATING PURPOSES. PRESENTATION OF THE INFORMATION IN THE CONTRACT IS INTENDED TO PROVIDE THE CONTRACTOR ACCESS TO THE SAME DATA AVAILABLE TO THE OWNER. THE SUBSURFACE INFORMATION IS PRESENTED IN GOOD FAITH AND IS NOT INTENDED AS A SUBSTITUTE FOR PERSONAL INVESTIGATION, INDEPENDENT INTERPRETATION, INDEPENDENT ANALYSIS OR JUDGEMENT BY THE CONTRACTOR.



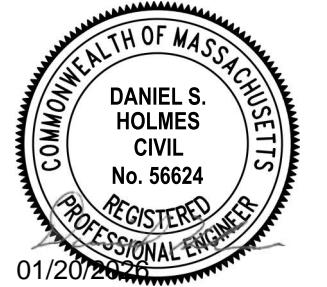
BORING B-6 (1 OF 1)

East Prescott Street & North Main Street Culvert Replacement

Westford
Department of
Public Works

Westford, MA

MARK	DATE	DESCRIPTION
PROJECT NO:	W5005-036	
DATE:	JANUARY 2026	
FILE:	W5005-036-BORING.dwg	
DRAWN BY:	JHM	
DESIGNED/CHECKED BY:	SDS/JJC	
APPROVED BY:	DSH	
BORING LOGS		
SCALE:	NO SCALE	
SHEET 4 OF 17		



East Prescott Street & North Main Street Culvert Replacement

Westford Department of Public Works

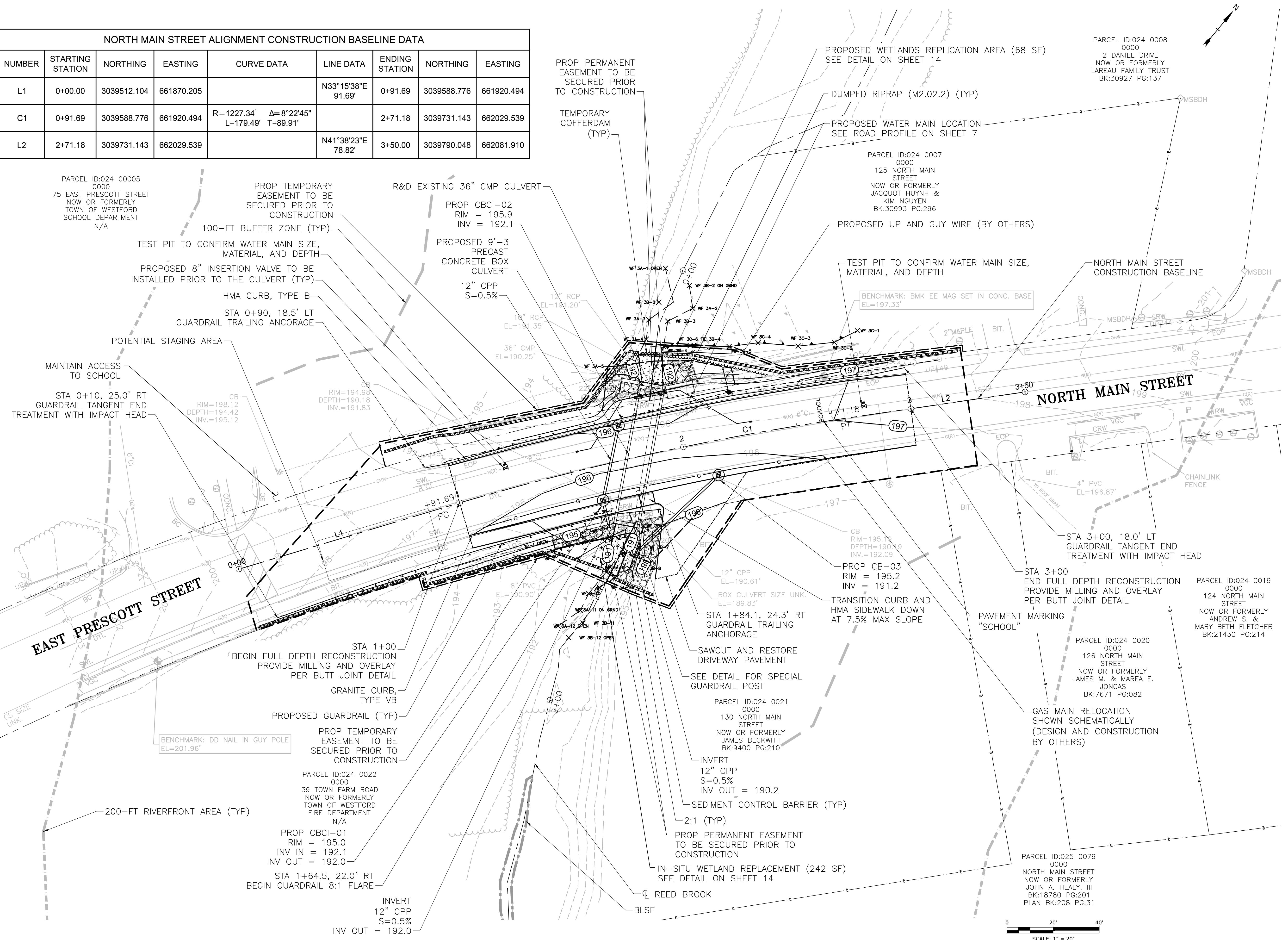
Westford, MA

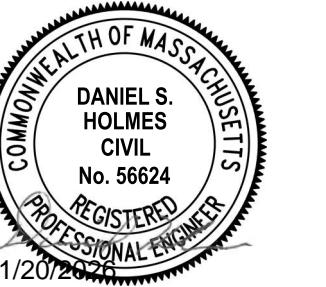
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DATE:		JANUARY 2026
FILE:		W5005-036-CIVIL.dwg
DRAWN BY:		JHM
DESIGNED/CHECKED BY:		SDS/JJC
APPROVED BY:		DSH
SITE PLAN		
SCALE:		1" = 20'
SHEET 6 OF 17		

SHEET 6 OF 17

SITE PLAN

NORTH MAIN STREET ALIGNMENT CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L1	0+00.00	3039512.104	661870.205		N33°15'38"E 91.69'	0+91.69	3039588.776	661920.494
C1	0+91.69	3039588.776	661920.494	R=1227.34' Δ=8°22'45" L=179.49' T=89.91'		2+71.18	3039731.143	662029.539
L2	2+71.18	3039731.143	662029.539		N41°38'23"E 78.82'	3+50.00	3039790.048	662081.910



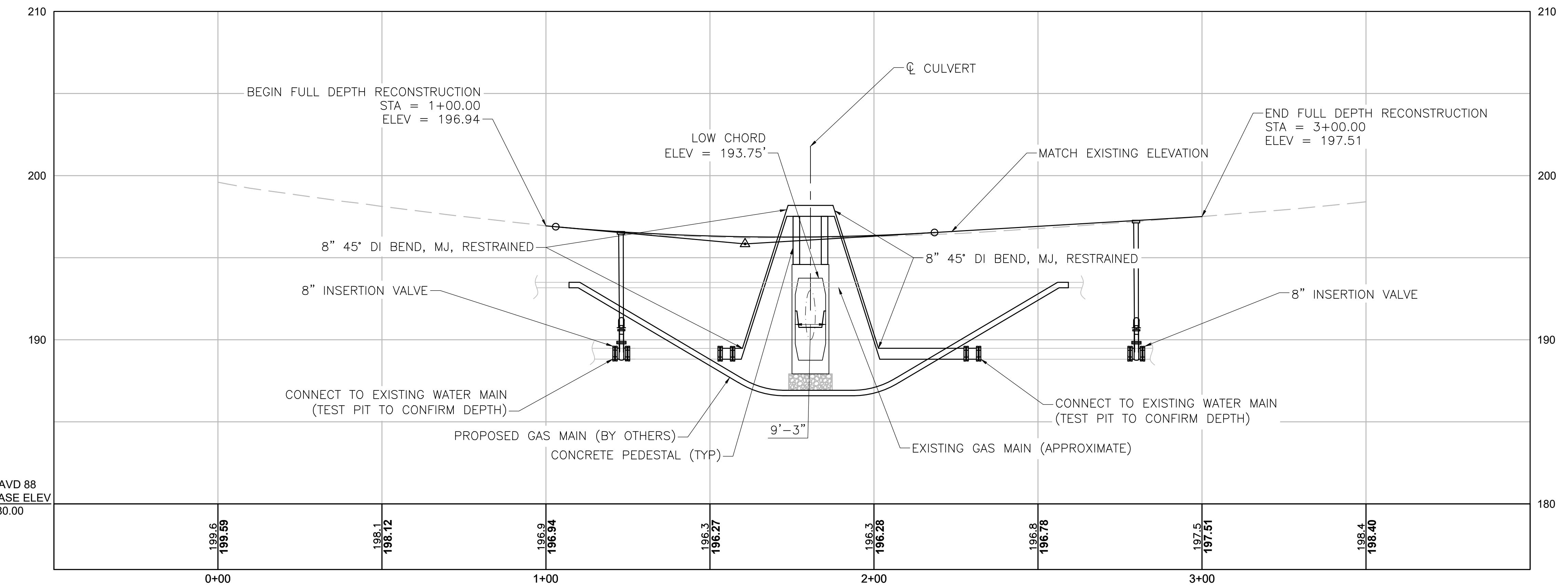


East Prescott Street & North Main Street Culvert Replacement

Westford Department of Public Works

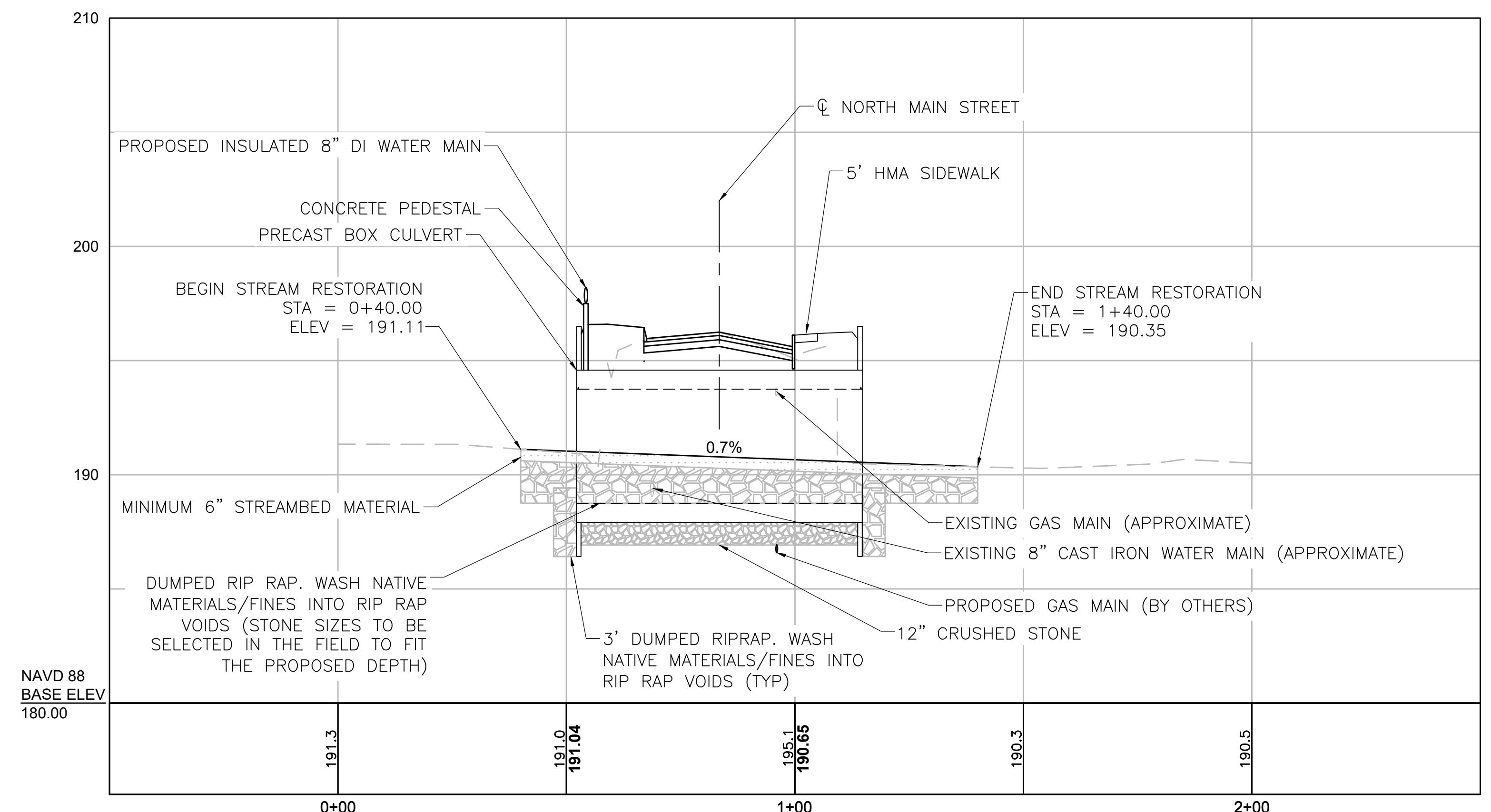
Westford, MA

MARK	DATE	DESCRIPTION
PROJECT NO:	W5005-036	
DATE:	JANUARY 2026	
FILE:	W5005-036-CIVIL.dwg	
DRAWN BY:	JHM	
DESIGNED/CHECKED BY:	SDS/JJC	
APPROVED BY:	DSH	
PROFILES		
SCALE:	AS SHOWN	



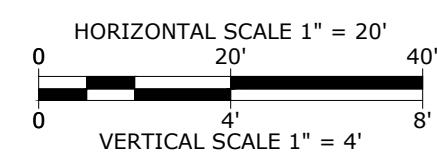
NORTH MAIN STREET PROFILE

HORIZ: 1" = 20' VERT: 1" = 4'



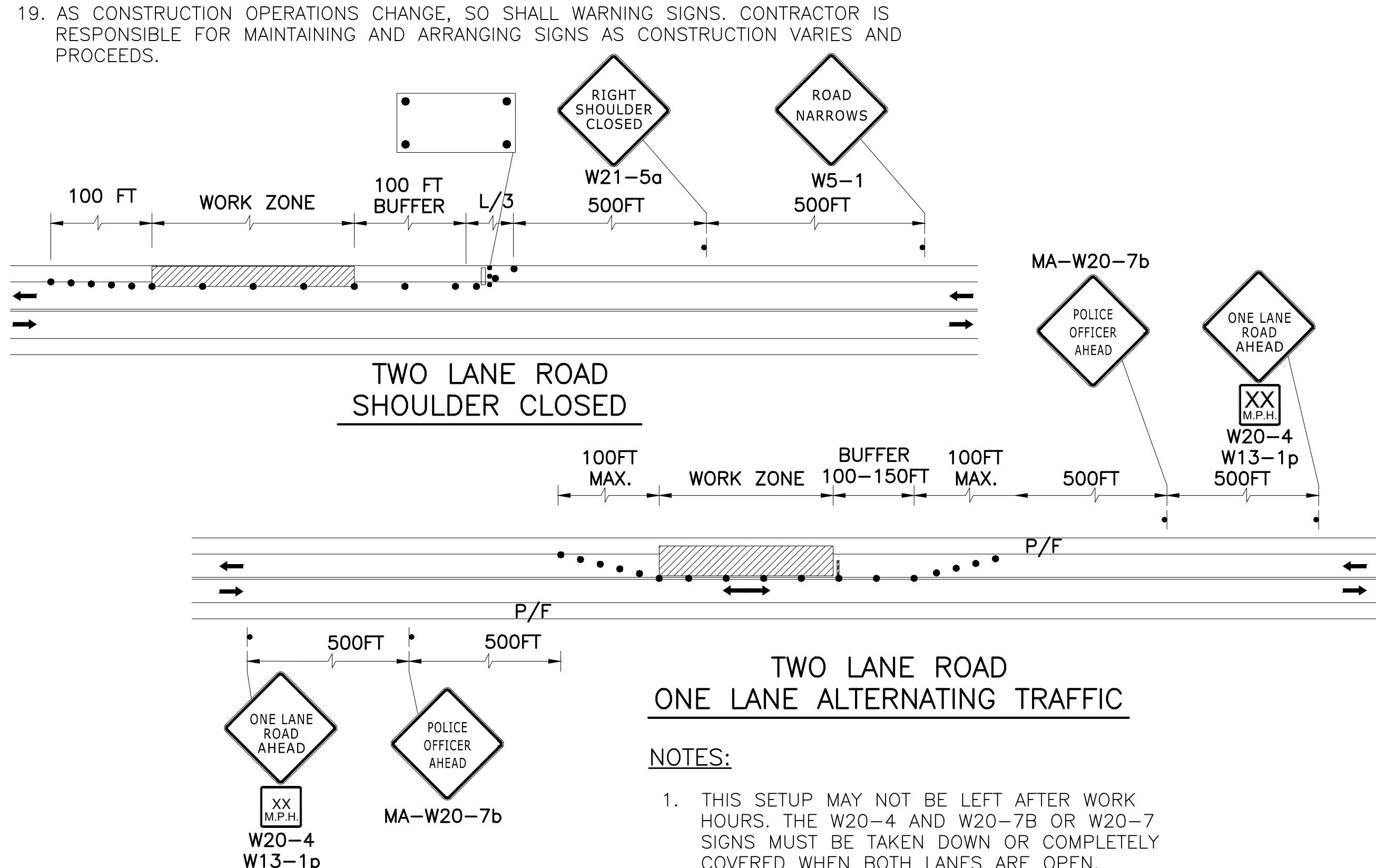
REED BROOK PROFILE

HORIZ: 1" = 20' VERT: 1" = 4'



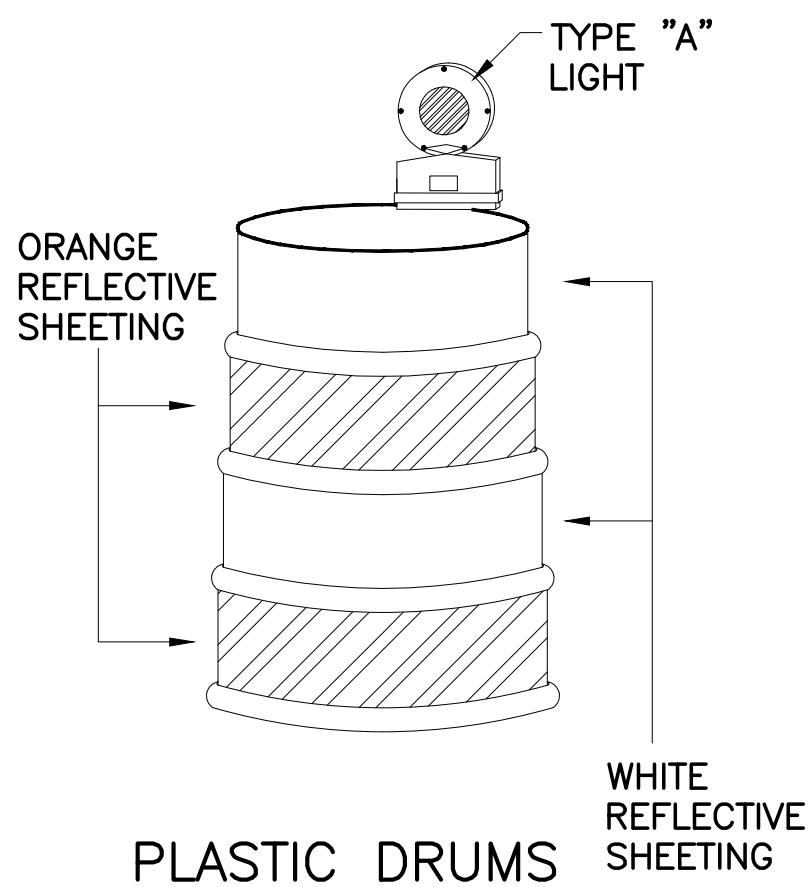
NOTES:

- ALL TEMPORARY TRAFFIC CONTROL WORK SHALL CONFORM TO THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND ALL REVISIONS.
- ALL SIGN LEGENDS, BORDERS, AND MOUNTING SHALL BE IN ACCORDANCE WITH THE MUTCD.
- TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.
- TEMPORARY CONSTRUCTION SIGNING, BARRICADES, AND ALL OTHER NECESSARY WORK ZONE TRAFFIC CONTROL DEVICES SHALL BE REMOVED FROM THE HIGHWAY OR COVERED WHEN THEY ARE NOT REQUIRED FOR CONTROL OF TRAFFIC.
- SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY, CHANNELIZING DEVICES, BARRIERS, AND CRASH ATTENUATORS MUST PASS THE CRITERIA SET FORTH IN NCHRP REPORT 350, "RECOMMENDED PROCEDURES FOR THE SAFETY PERFORMANCE EVALUATION OF HIGHWAY FEATURES" AND/OR "MANUAL FOR ASSESSING SAFETY HARDWARE" (MASH).
- 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 CONDUIT INSTALLATION, EXISTING PAVEMENT EXCAVATION, TEMPORARY DRIVEWAY PAVEMENT PLACEMENT, AND SIMILAR OPERATIONS.
- PORTABLE CHANGEABLE MESSAGE SIGNS SHALL BE IN PLACE 14 DAYS PRIOR TO THE START OF ANY WORK TO PROVIDE ADVANCE NOTICE OF ROAD WORK.
- THE FIRST FIVE PLASTIC DRUMS OF A TAPER SHALL BE MOUNTED WITH TYPE A LIGHTS.
- THE ADVISORY SPEED LIMIT, IF REQUIRED, SHALL BE DETERMINED BY THE ENGINEER.
- MAXIMUM SPACING OF TRAFFIC DEVICES IN A TAPER (DRUMS OR CONES) IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.
- MINIMUM LANE WIDTH IS TO BE 11 FEET UNLESS OTHERWISE SHOWN. MINIMUM LANE WIDTH TO BE MEASURED FROM THE EDGE OF DRUMS OR MEDIAN BARRIER.
- ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.
- PORTABLE CHANGEABLE MESSAGE SIGNS SHALL BE PROVIDED ON NORTH MAIN STREET AT BOTH ENDS OF THE PROJECT LIMITS.
- DURING ALL CONSTRUCTION ACTIVITIES ON THE ROADWAYS, ONE LANE ALTERNATING TRAFFIC FLOW SHALL BE MAINTAINED.
- FULL ROADWAY WIDTH MUST BE RETURNED AT THE END OF EACH WORK DAY.
- THE NUMBER OF POLICE OFFICERS AT ANY LOCATION IS TO BE DETERMINED BY THE TOWN OF WESTORD.
- ONE LANE TRAFFIC FLOW SHALL BE REQUIRED DURING ALL OPERATIONS WHICH REDUCE DRIVE LANE(S) LESS THAN 12'.
- HALF WIDTH CONSTRUCTION METHODS SHALL BE UTILIZED FOR ROAD EXCAVATION, BASE PREPARATION, AND PAVING OPERATIONS.
- AS CONSTRUCTION OPERATIONS CHANGE, SO SHALL WARNING SIGNS. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING AND ARRANGING SIGNS AS CONSTRUCTION VARIES AND PROCEEDS.



LEGEND:

- REFLECTORIZED PLASTIC DRUM OR 36" CONE
- P/F POLICE/FLAGGER DETAIL
- TYPE III BARRICADE
- CHANGEABLE MESSAGE SIGN
- ARROW BOARD
- WORK ZONE
- DIRECTION OF TRAFFIC
- IMPACT ATTENUATOR
- MEDIAN BARRIER
- MEDIAN BARRIER WITH WARNING LIGHTS
- WORK VEHICLE
- TRUCK MOUNTED ATTENUATOR
- TRAFFIC OR PEDESTRIAN SIGNAL
- SIGN



NOTES:

- DRUM DESIGN AND APPLICATION SHALL BE AS PER THE CURRENT EDITION OF THE MUTCD.
- DRUMS SHALL BE APPROXIMATELY 36" IN HEIGHT, HAVING A MINIMUM WALL THICKNESS OF 3/32" AND A MINIMUM DIAMETER OF 18" REGARDLESS OF ORIENTATION.
- DRUM MATERIAL MUST BE APPROVED UV RESISTANT, LOW DENSITY, IMPACT RESISTANT, LINEAR POLYETHYLENE (OR APPROVED EQUIVALENT).
- Sheeting shall be approved orange and white type IV reflectorized sheeting conforming to M9.30.0.
- ALL DRUMS SHALL BE WELL MAINTAINED INCLUDING REMOVAL OF DUST OR ROAD FILM, SO AS NOT TO REDUCE REFLECTIVE EFFICIENCY. WHEN A DRUM LOSES TARGET VALUE IT SHALL BE REPLACED.
- STORE UNUSED DRUMS IN ONE LOCATION, AWAY FROM ALL TRAFFIC, OR REMOVE FROM SITE ENTIRELY.

FORMULAS FOR DETERMINING TAPER LENGTHS

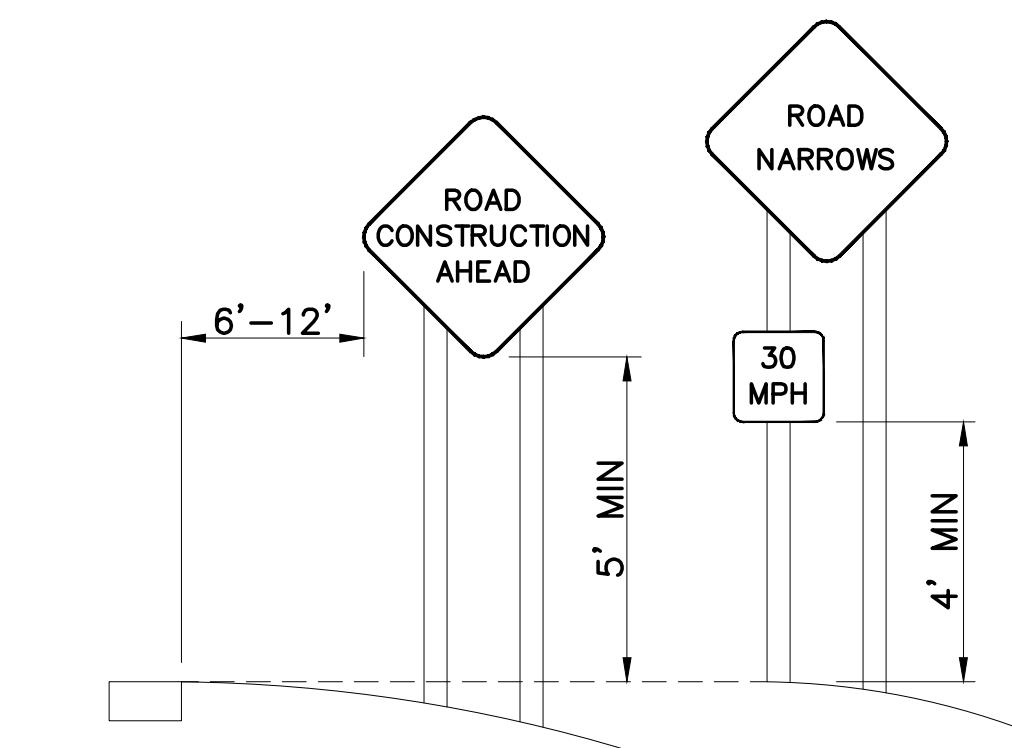
SPEED LIMIT (S)	TAPER LENGTH (L) FEET
40 MPH OR LESS	$L = \frac{WS^2}{60}$
45 MPH OR MORE	$L = WS$

WHERE:

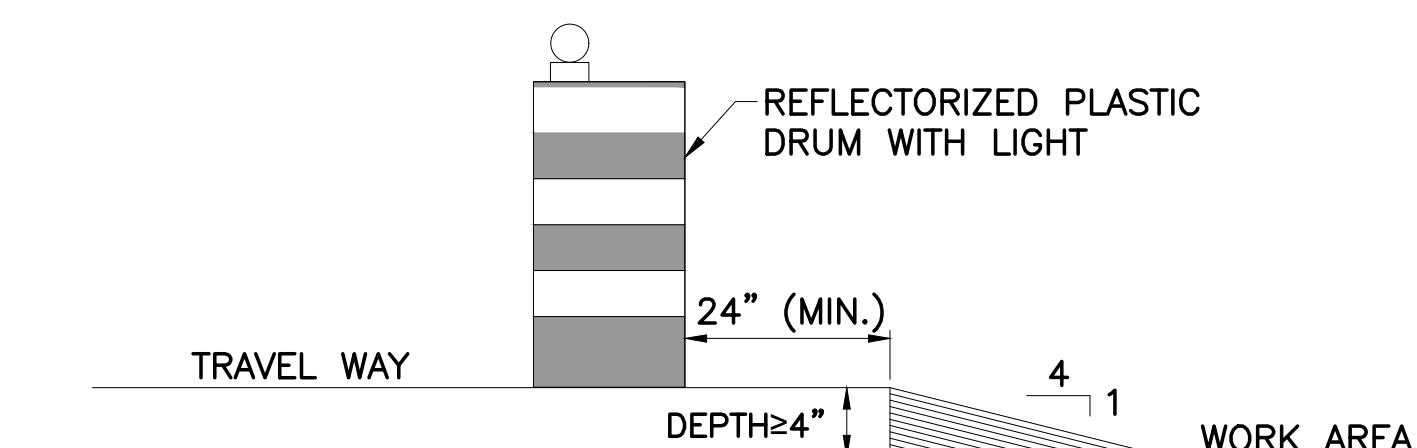
L = TAPER LENGTH IN FEET

W = WIDTH OF OFFSET IN FEET

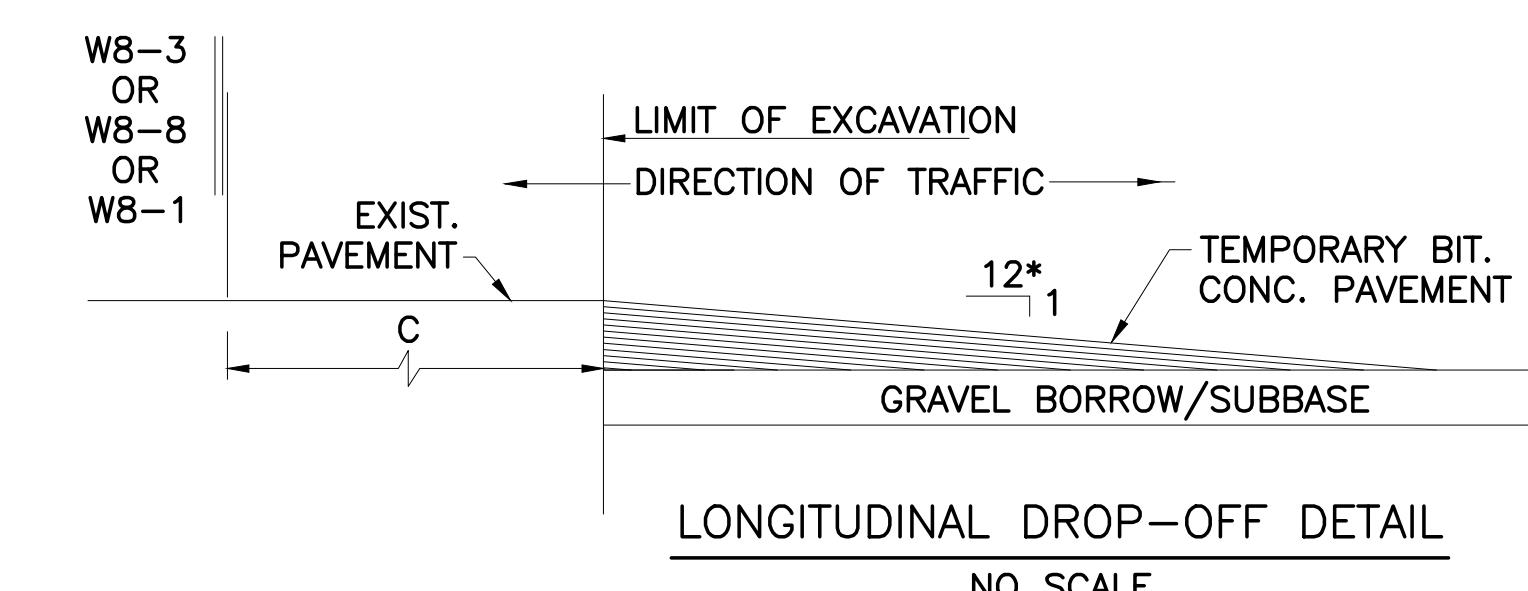
S = POSTED SPEED LIMIT, OR OFF-PEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED IN MPH



TYPICAL INSTALLATION OF PROJECT SIGNS



LATERAL DROP-OFF DETAILS



* - INCREASE SLOPE RATIO FOR HIGHER SPEEDS

LATERAL AND LONGITUDINAL DROP-OFF DETAILS

SIGN LEGEND					
CODE	DESCRIPTION	SIZE	AREA	NO.	TOTAL AREA
W20-4	ONE LANE ROAD AHEAD	36"x36"	9 SF	2	18 SF
MA-W20-7b	POLICE OFFICER AHEAD	36"x36"	9 SF	2	18 SF
W5-1	ROAD NARROWS	36"x36"	9 SF	1	9 SF
W21-5a	RIGHT SHOULDER CLOSED	36"x36"	9 SF	1	9 SF
					TOTAL = 54 SF

East Prescott Street & North Main Street Culvert Replacement

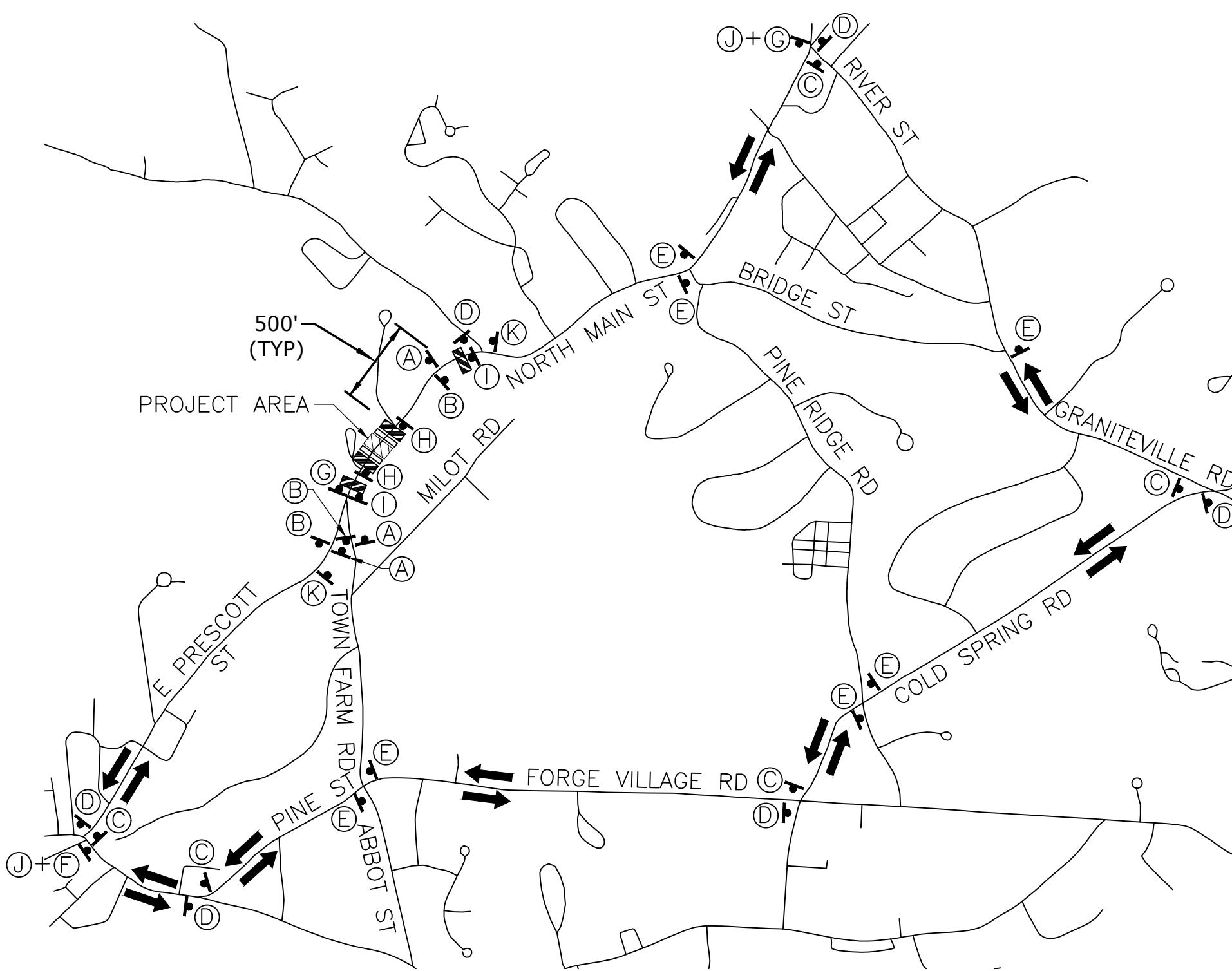
Westford Department of Public Works

Westford, MA

MARK	DATE	DESCRIPTION
PROJECT NO:	W5005-036	
DATE:	JANUARY 2026	
FILE:	W5005-036-TTCP.dwg	
DRAWN BY:	JHM	
DESIGNED/CHECKED BY:	SDS/JJC	
APPROVED BY:	DSH	
TEMPORARY TRAFFIC CONTROL PLAN		
SCALE:	NO SCALE	

TEMPORARY TRAFFIC CONTROL NOTES

- ALL TEMPORARY TRAFFIC CONTROL WORK SHALL CONFORM TO THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND ALL REVISIONS, UNLESS SUPERCEDED BY THESE PLANS.
- ALL SIGN LEGENDS, BORDERS, AND MOUNTING SHALL BE IN ACCORDANCE WITH THE MUTCD.
- TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.
- TAPER FORMULA:
 $L = S \times W$ FOR SPEED > OR = 45
 $L = (S \times S \times W)/60$ FOR SPEED < 45
- TEMPORARY CONSTRUCTION SIGNING, BARRICADES, AND ALL OTHER NECESSARY WORK ZONE TRAFFIC CONTROL DEVICES SHALL BE REMOVED FROM THE HIGHWAY OR COVERED WHEN THEY ARE NOT REQUIRED FOR CONTROL OF TRAFFIC.
- SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY, CHANNELIZING DEVICES, BARRIERS, AND CRASH ATTENUATORS MUST PASS THE CRITERIA SET FORTH IN NCHRP REPORT 350, "RECOMMENDED PROCEDURES FOR THE SAFETY PERFORMANCE EVALUATION OF HIGHWAY FEATURES" AND/OR "MANUAL FOR ASSESSING SAFETY HARDWARE" (MASH).
- 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 CONDUIT INSTALLATION, EXISTING PAVEMENT EXCAVATION, TEMPORARY DRIVEWAY PAVEMENT PLACEMENT, AND SIMILAR OPERATIONS.
- THE ADVISORY SPEED LIMIT, IF REQUIRED, SHALL BE DETERMINED BY THE ENGINEER.
- DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
- MAXIMUM SPACING OF TRAFFIC DEVICES IN A TAPER (DRUMS OR CONES) IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.
- MINIMUM LANE WIDTH IS TO BE 11 FEET UNLESS OTHERWISE SHOWN. MINIMUM LANE WIDTH TO BE MEASURED FROM THE EDGE OF DRUMS OR MEDIAN BARRIER.
- ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.

**ADVANCED WARNING SIGNING**

NOT TO SCALE

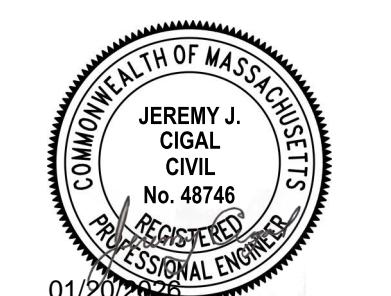
LEGEND

- SIGN**
- TYPE III BARRICADE**
- WORK AREA**
- DIRECTION OF TRAFFIC**
- CONCRETE JERSEY BARRIERS**

TOWN	ROAD	CASE	DETAIL	DETAIL ISSUE DATE
WESTFORD	NORTH MAIN STREET	CONES & DRUMS	CONES & DRUMS DWG NO. 851.1.1	JAN 2025
WESTFORD	NORTH MAIN STREET	TYPE III BARRICADE	TYPE III BARRICADE DWG NO. 851.2.1	JAN 2025

TEMPORARY CONSTRUCTION SIGN LEGEND										
I.D. NUMBER	SIGN CODE	SIZE OF SIGN (IN)		UNIT AREA IN SQ. FT.	TEXT *	COLOR			NUMBER OF SIGNS REQUIRED	AREA IN SQ. FT.
		WIDTH	HEIGHT			BACK-GROUND	LEGEND	BORDER		
(A)	W20-1a	36	36	9		FLUORESCENT ORANGE	BLACK	BLACK	3	27
(B)	G20-2	36	18	4.5		FLUORESCENT ORANGE	BLACK	BLACK	3	13.5
(C)	M4-9R	30	24	5		FLUORESCENT ORANGE	BLACK	BLACK	5	25
(D)	M4-9L	30	24	5		FLUORESCENT ORANGE	BLACK	BLACK	6	30
(E)	M4-9V	30	24	5		FLUORESCENT ORANGE	BLACK	BLACK	7	35
(F)	M4-10R	48	18	6		FLUORESCENT ORANGE	BLACK	BLACK	1	6
(G)	M4-10L	48	18	6		FLUORESCENT ORANGE	BLACK	BLACK	2	12
(H)	R11-2	48	30	10		WHITE	BLACK	BLACK	2	20
(I)	R11-4	60	30	12.5		WHITE	BLACK	BLACK	2	25
(J)	CUSTOM	60	30	12.5		WHITE	BLACK	BLACK	2	25
(K)	M4-8a	24	18	3		FLUORESCENT ORANGE	BLACK	BLACK	2	6
						TOTALS		35	224.5	

* FOR ALL TEMPORARY CONSTRUCTION SIGNS, SEE
 MUTCD DECEMBER 2023 11TH EDITION, 2024
 STANDARD HIGHWAY SIGNS AND SECTION M4.30.0
 TYPE III OF THE MASSDOT STANDARD SPECIFICATION
 FOR TEXT DIMENSIONS AND COLOR.



East Prescott Street & North Main Street Culvert Replacement

Westford
Department of
Public Works

Westford, MA

PROJECT NO: W5005-036
DATE: JANUARY 2026
FILE: W5005-036-TTCP.dwg

DRAWN BY: JHM
DESIGNED/CHECKED BY: SDS/JJC
APPROVED BY: DSH

DETOUR PLAN

SCALE: NO SCALE

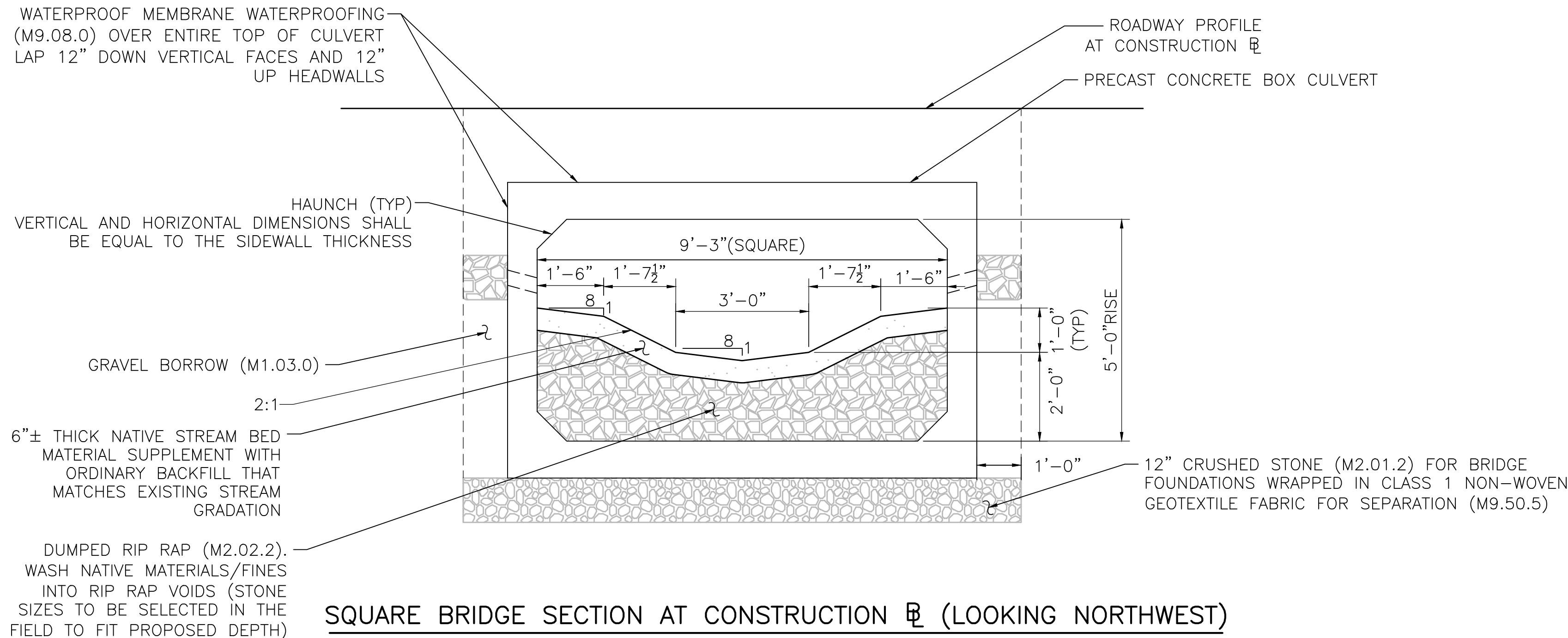
SHEET 9 OF 17



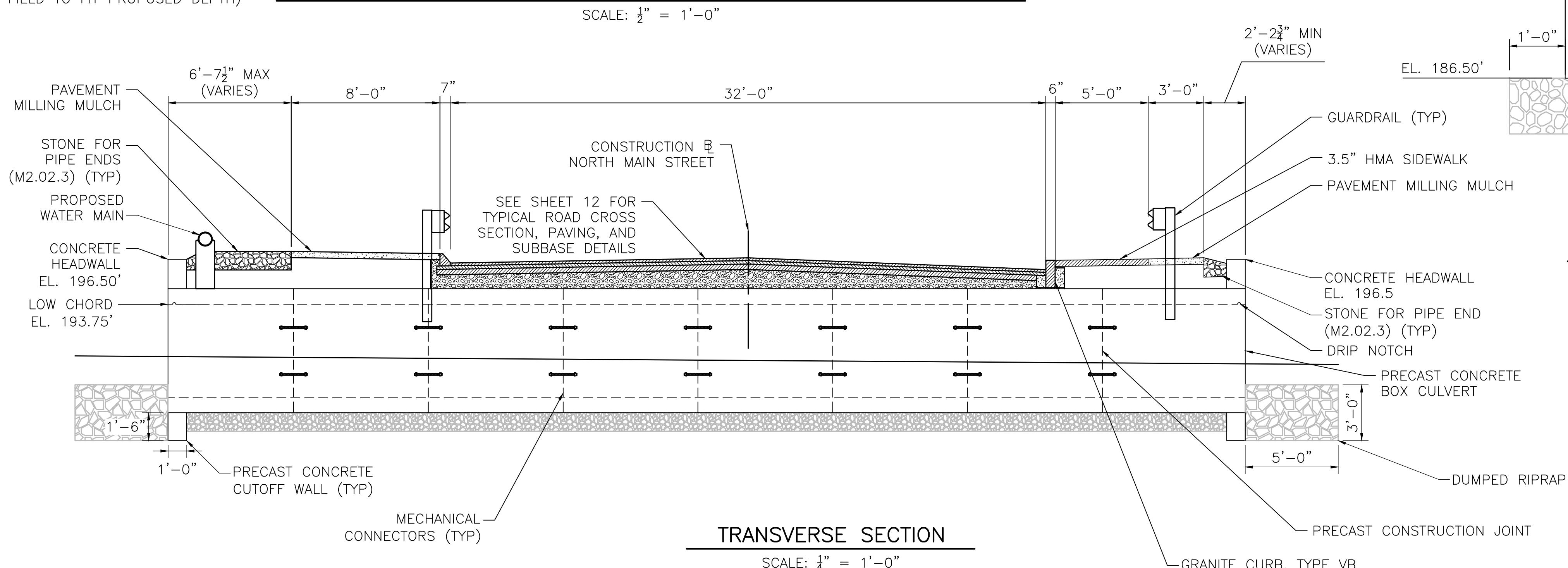
East Prescott Street & North Main Street Culvert Replacement

Westford Department of Public Works

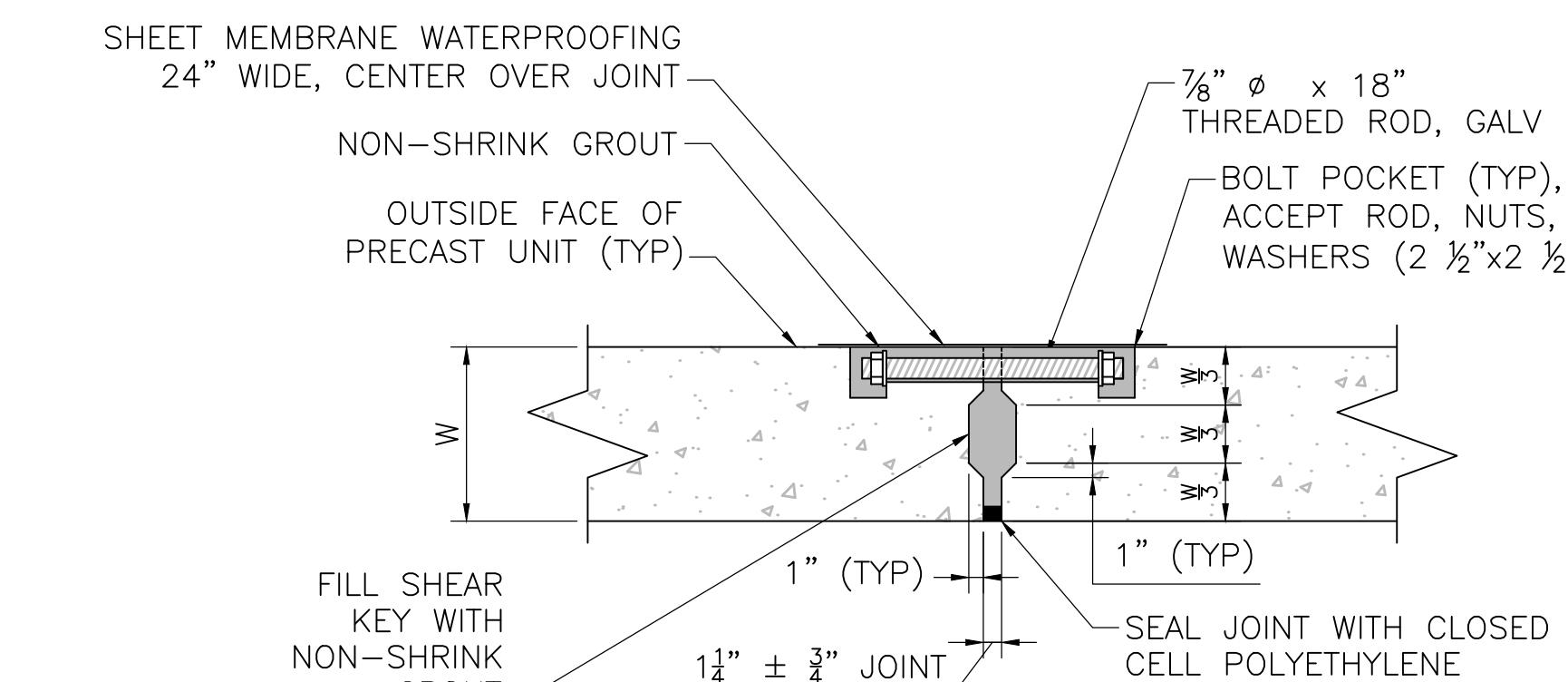
Westford, MA



SQUARE BRIDGE SECTION AT CONSTRUCTION B (LOOKING NORTHWEST)

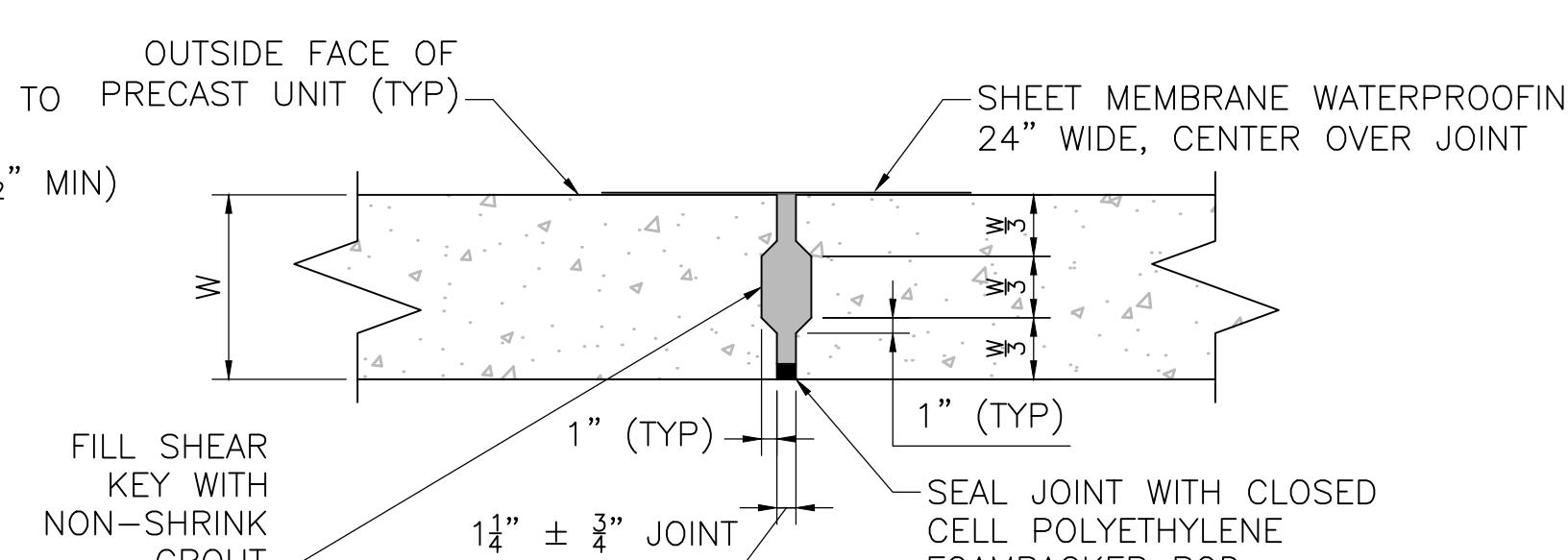


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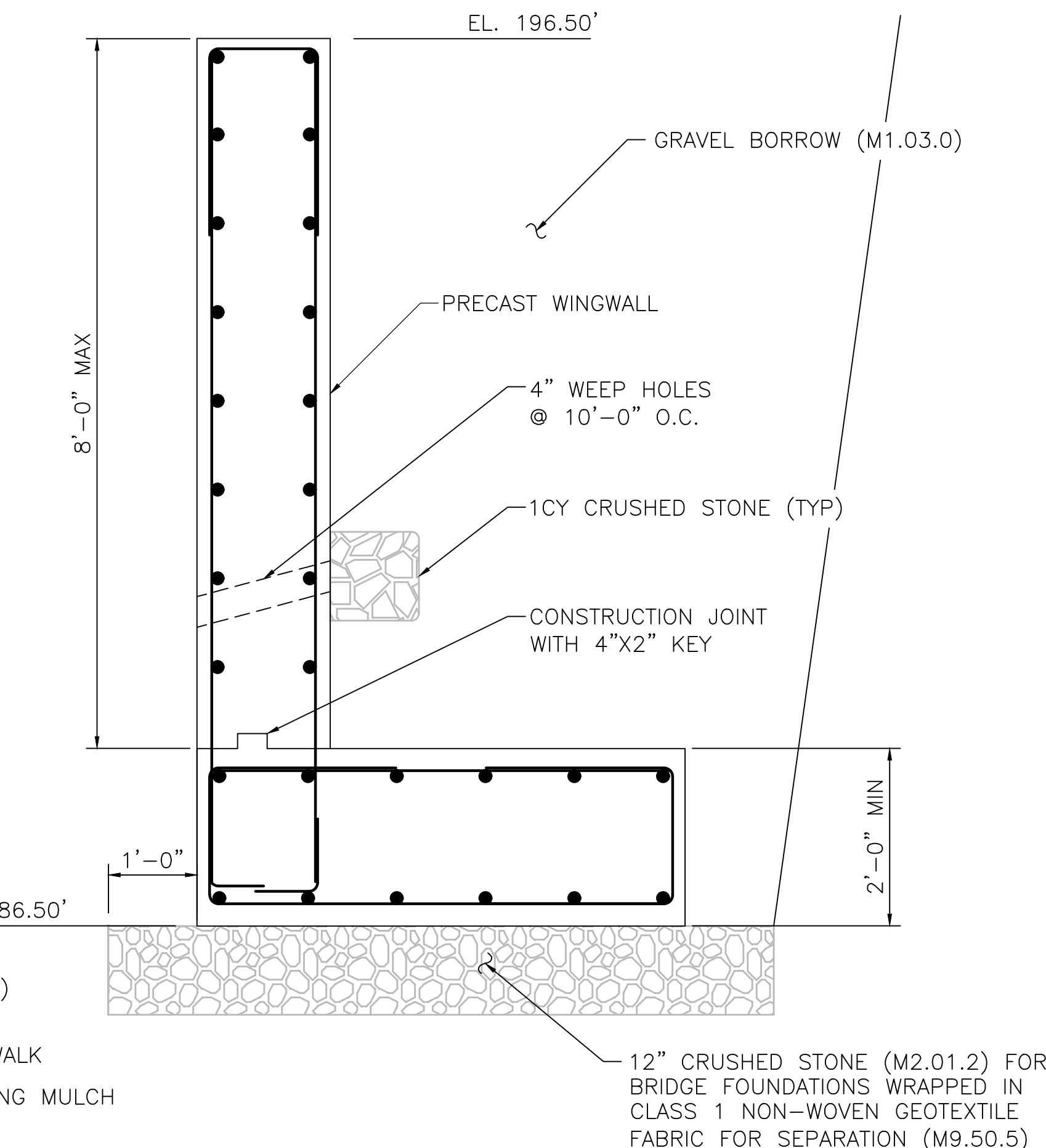
MECHANICAL JOINT

NOT TO SCALE



SEAL JOINT

NOT TO SCALE

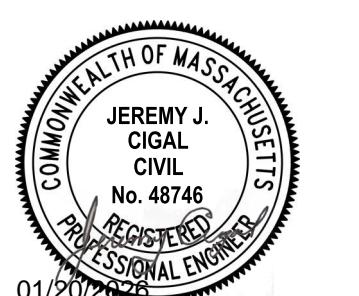


TYPICAL WINGWALL

NOTES:

1. FINAL DIMENSIONS AND REINFORCING OF PRECAST CONCRETE WINGWALL SHALL BE PER FABRICATOR.
2. PROVIDE DAMPROOFING ON ALL BURIED SECTIONS OF CONCRETE.

MARK	DATE	DESCRIPTION
PROJECT NO:	W5005-036	
DATE:	JANUARY 2026	
FILE:	W5005-036-CULVERT DETAIL.dwg	
DRAWN BY:	JHM	
DESIGNED/CHECKED BY:	SDS/JJC	
APPROVED BY:	DSH	
CULVERT DETAILS		
SCALE:	AS SHOWN	
SHEET 10 OF 17		

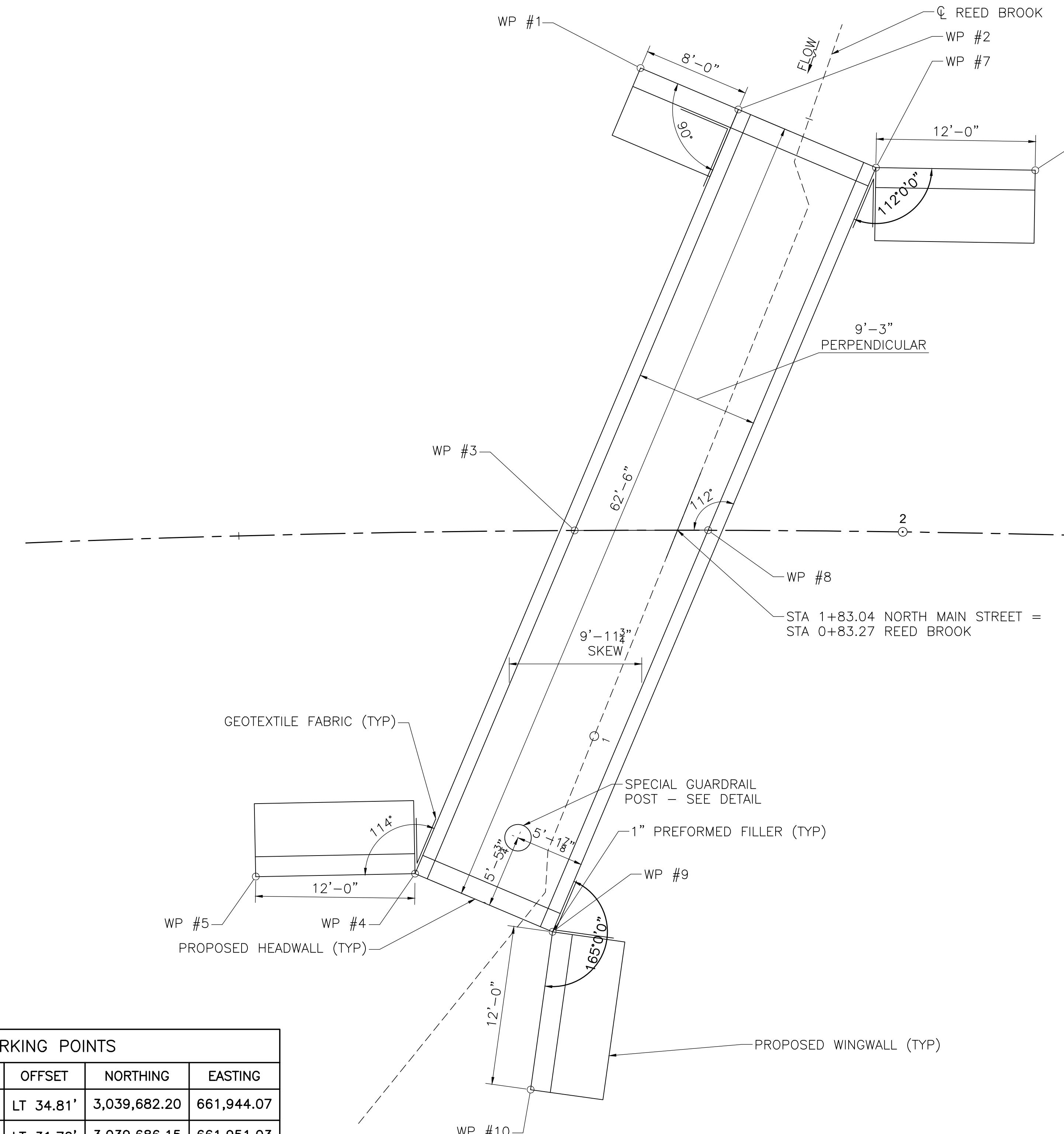


East Prescott Street & North Main Street Culvert Replacement

Westford Department of Public Works

Westford, MA

WORKING POINTS				
WORKING POINT	STATION	OFFSET	NORTHING	EASTING
WP #1	1+80.31	LT 34.81'	3,039,682.20	661,944.07
WP #2	1+87.49	LT 31.70'	3,039,686.15	661,951.03
WP #3	1+75.29	0.00'	3,039,657.06	661,968.69
WP #4	1+62.86	RT 25.72'	3,039,631.79	661,981.88
WP #5	1+50.60	RT 25.69'	3,039,622.14	661,974.76
WP #6	2+09.38	LT 27.42'	3,039,701.10	661,968.27
WP #7	1+97.64	LT 27.41'	3,039,691.70	661,960.82
WP #8	1+85.34	0.00'	3,039,665.05	661,974.79
WP #9	1+73.41	RT 30.22'	3,039,637.35	661,991.66
WP #10	1+71.61	RT 42.09'	3,039,628.80	662,000.09

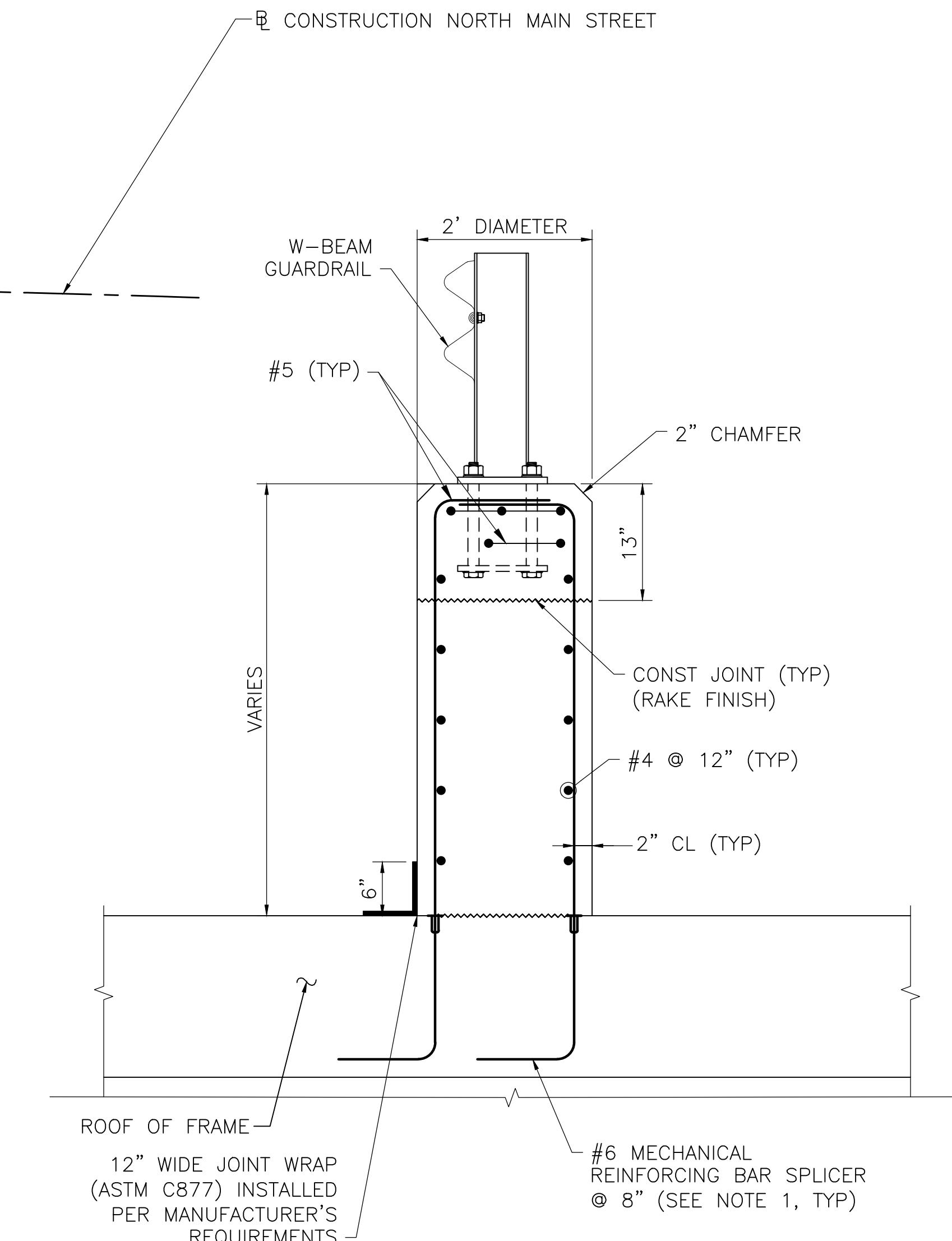


CULVERT LAYOUT PLAN

SCALE: $\frac{3}{16}$ = 1'-0"

NOTES:

1. INFORMATION IN THIS TABLE IS BASED ON CONCEPTUAL DESIGN LAYOUT AND GEOMETRY. CONTRACTOR TO CONFIRM WORKING POINTS TO BE CONSISTENT WITH CONTRACTOR'S FINAL DESIGN



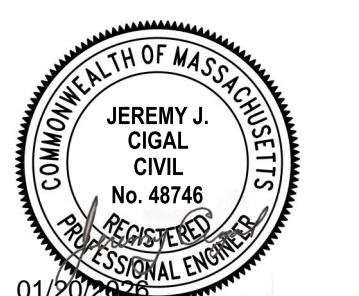
HEADWALL NOTES:

1. THE CONTRACTOR MAY SUBSTITUTE EXTENDED #6 HOOPS FOR THE MECHANICAL REINFORCING BAR SPLICERS AND THREADED REBARS AS SHOWN.
2. FRAME REINFORCEMENT SHALL BE DESIGNED BY CONTRACTOR AND IS NOT SHOWN FOR CLARITY.
3. DESIGN FRAME TO FRAME CONNECTIONS TO RESIST AASHTO LRFD TL-2 CRASH LOADING.

SPECIAL GUARDRAIL POST DETAIL

NOT TO SCALE

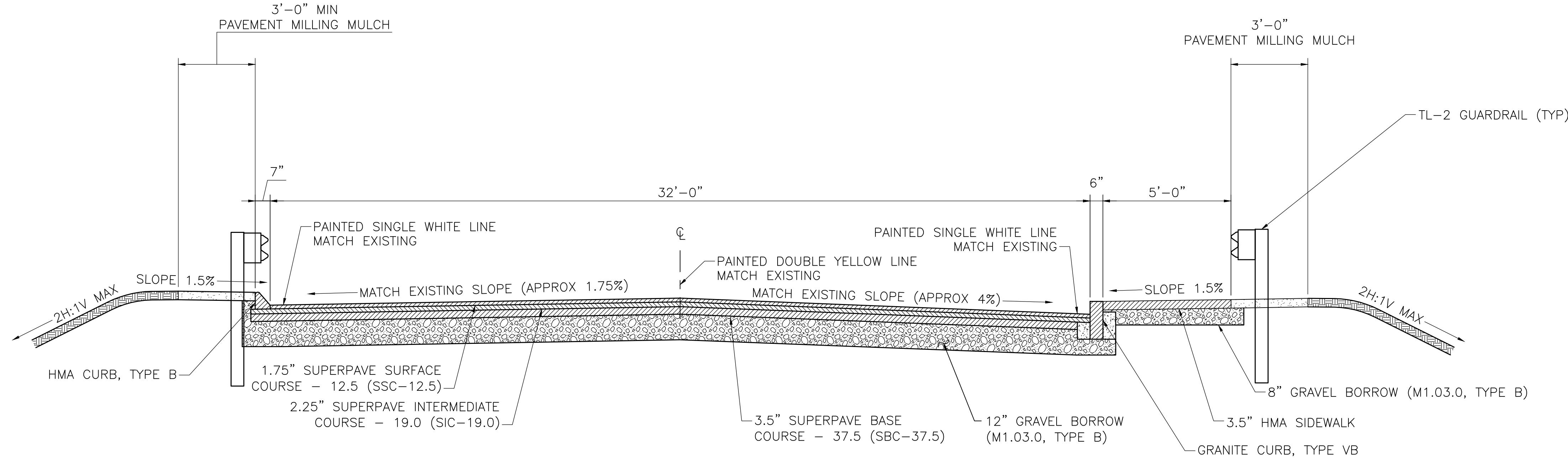
MARK	DATE	DESCRIPTION
PROJECT NO:	W5005-036	
DATE:	JANUARY 2026	
FILE:	W5005-036-CULVERT DETAIL.dwg	
DRAWN BY:	JHM	
DESIGNED/CHECKED BY:	SDS/JJC	
APPROVED BY:	DSH	
CULVERT LAYOUT PLAN		
SCALE:	AS SHOWN	
SHEET 11 OF 17		



East Prescott Street & North Main Street Culvert Replacement

Westford Department of Public Works

Westford, MA

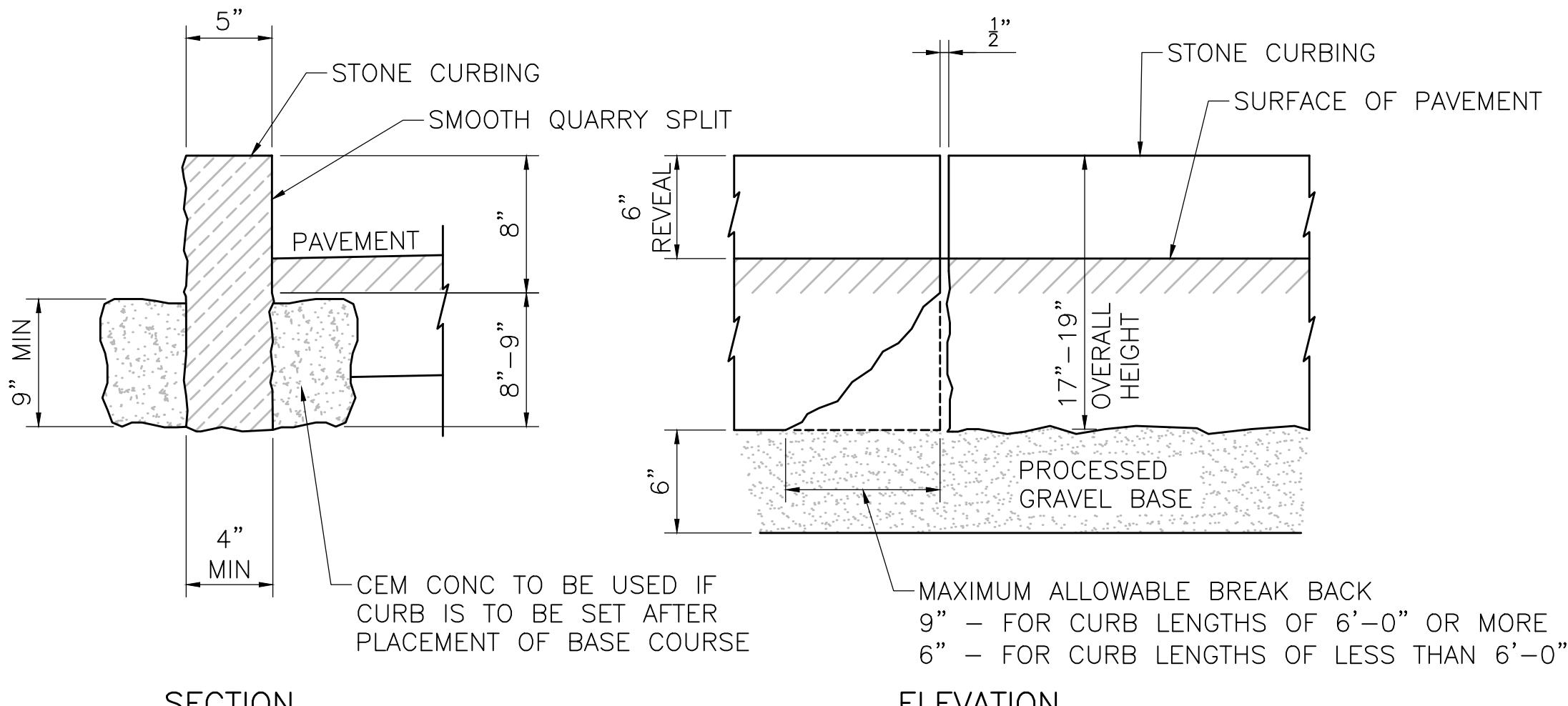
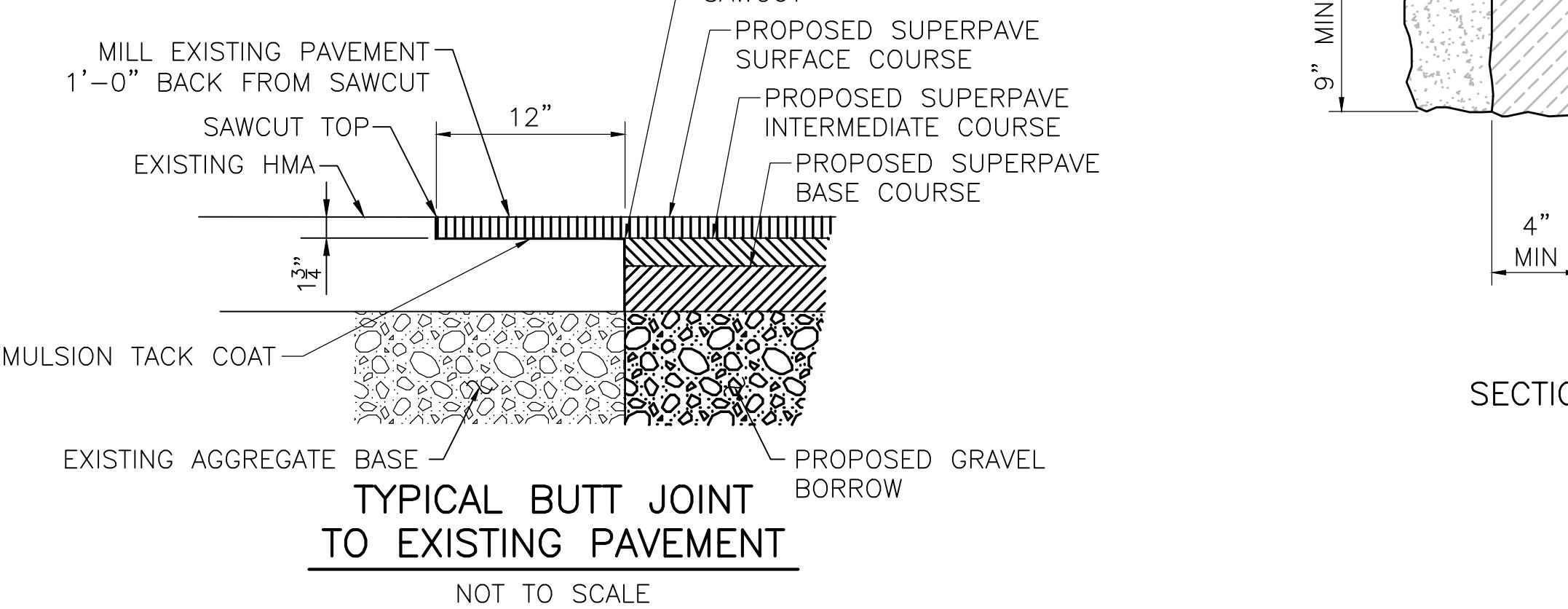


NOTES:

1. PROVIDE REFLECTORIZED PAVEMENT MARKINGS TO MATCH EXISTING. REPLACE STRIPPING IN KIND.

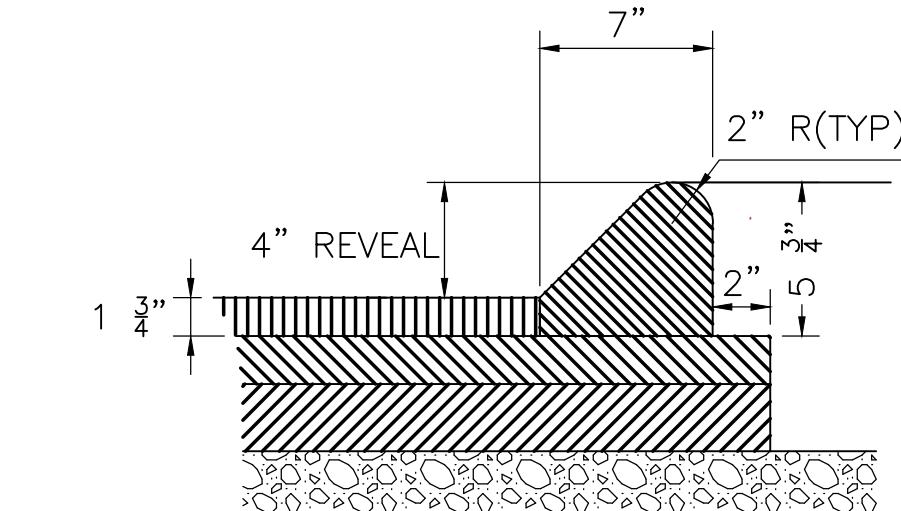
NORTH MAIN STREET TYPICAL SECTION

SCALE: $\frac{3}{8}$ " = 1'-0"



GRANITE CURB

NOT TO SCALE



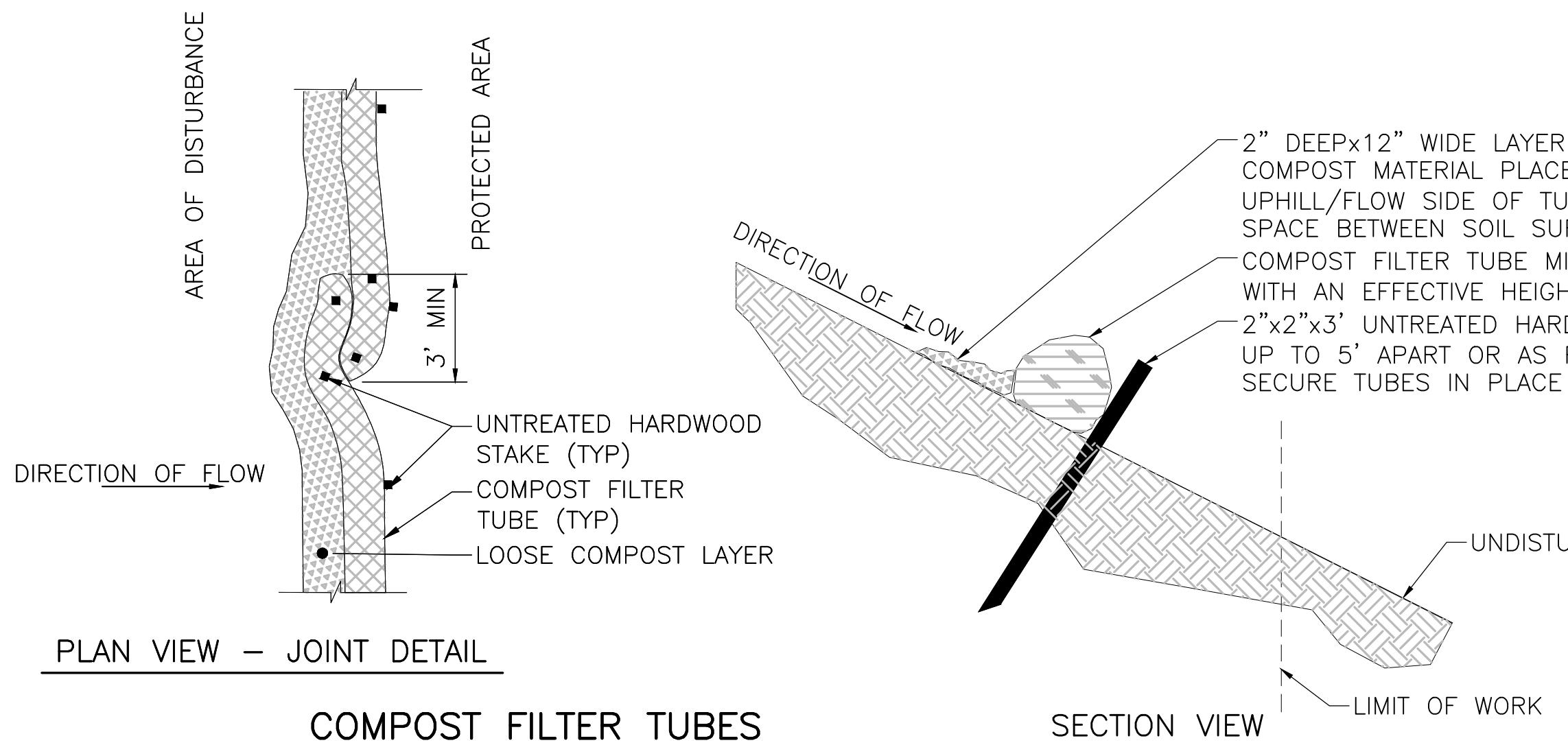
HMA CURB, TYPE B

NOT TO SCALE

MARK	DATE	DESCRIPTION
PROJECT NO:	W5005-036	
DATE:	JANUARY 2026	
FILE:	W5005-036-CONSTR. DETAILS.dwg	
DRAWN BY:	JHM	
DESIGNED/CHECKED BY:	SDS/JJC	
APPROVED BY:	DSH	
ROADWAY SECTIONS AND DETAILS		
SCALE:	AS SHOWN	
SHEET 12 OF 17		

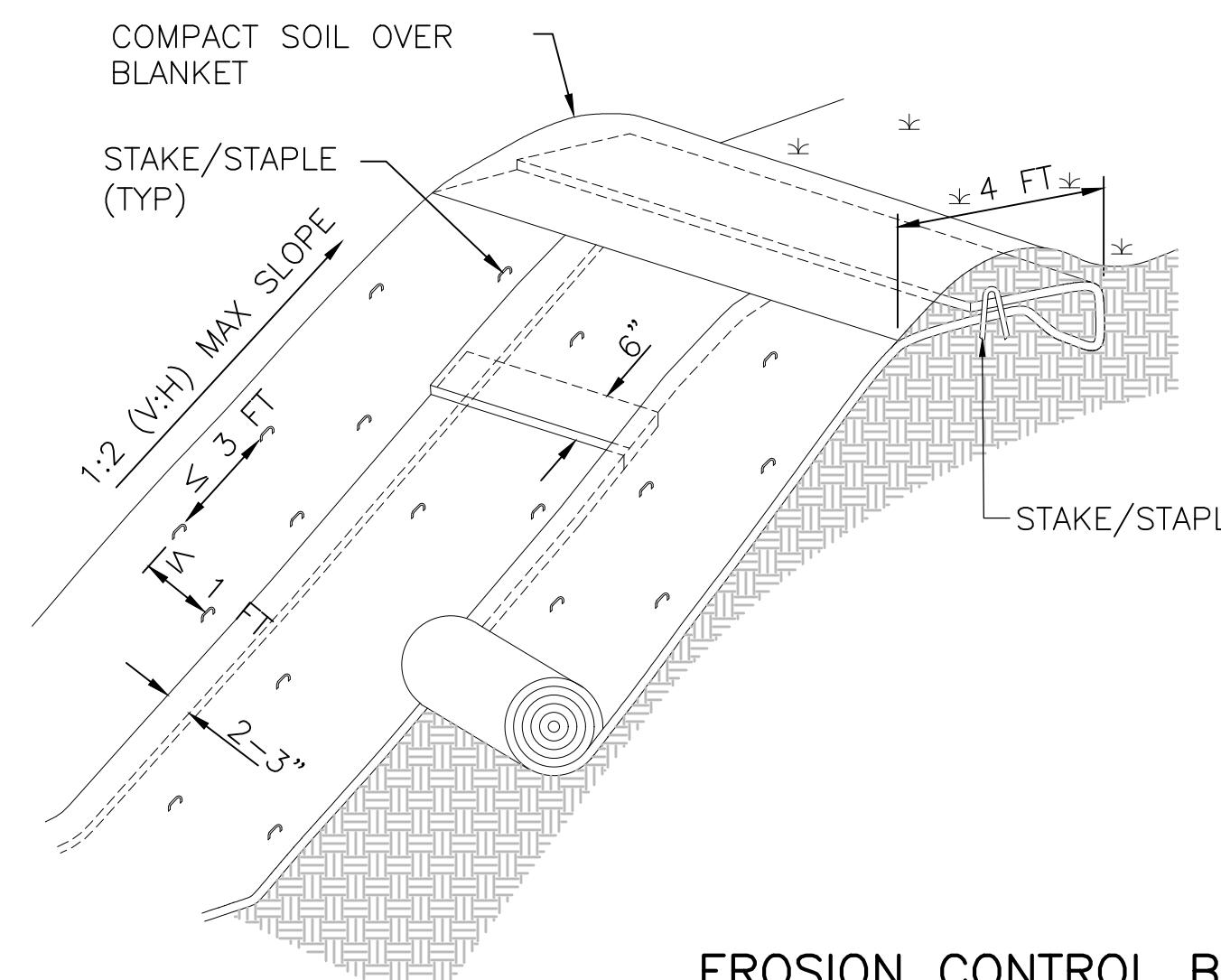
COMPOST FILTER TUBE NOTES:

1. PROVIDE A MINIMUM TUBE DIAMETER OF 12" FOR SLOPES UP TO 50' 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 SITUATION WITH LONGER SLOPES OR STEEPER SLOPES.
2. INSTALL TUBES ALONG CONTOURS AND PERPENDICULAR TO SHEET OR CONCENTRATED FLOW.
3. DO NOT INSTALL IN PERENNIAL, Ephemeral OR INTERMITTENT STREAMS.
4. CONFIGURE TUBES AROUND EXISTING SITE FEATURES TO MINIMIZE SITE DISTURBANCE AND MAXIMIZE CAPTURE AREA OF STORMWATER RUN-OFF.
5. TUBES FOR COMPOST FILTERS SHALL BE JUTE MESH OR APPROVED BIODEGRADABLE MATERIAL. ADDITIONAL TUBES SHALL BE USED AT THE DIRECTION OF THE ENGINEER.
6. TAMP TUBES IN PLACE TO ENSURE GOOD CONTACT WITH SOIL SURFACE. IT IS NOT NECESSARY TO TRENCH TUBES INTO EXISTING GRADE.
7. WHEN STAKING IS NOT POSSIBLE, SUCH AS WHEN TUBES MUST BE PLACED ON PAVEMENT, HEAVY CONCRETE OR CINDER BLOCKS CAN BE USED BEHIND TUBES UP TO 5' APART OR AS REQUIRED TO SECURE TUBES IN PLACE.
8. PROVIDE 3' MINIMUM OVERLAP AT ENDS OF TUBES TO JOIN IN A CONTINUOUS BARRIER AND MINIMIZE UNIMPEDED FLOW.
9. STAKE JOINING TUBES SNUGLY AGAINST EACH OTHER TO PREVENT UNFILTERED FLOW BETWEEN THEM.
10. SECURE ENDS OF TUBES WITH STAKES SPACED 18" APART THROUGH TOPS OF TUBES.

**PLAN VIEW - JOINT DETAIL****COMPOST FILTER TUBES**

NOT TO SCALE

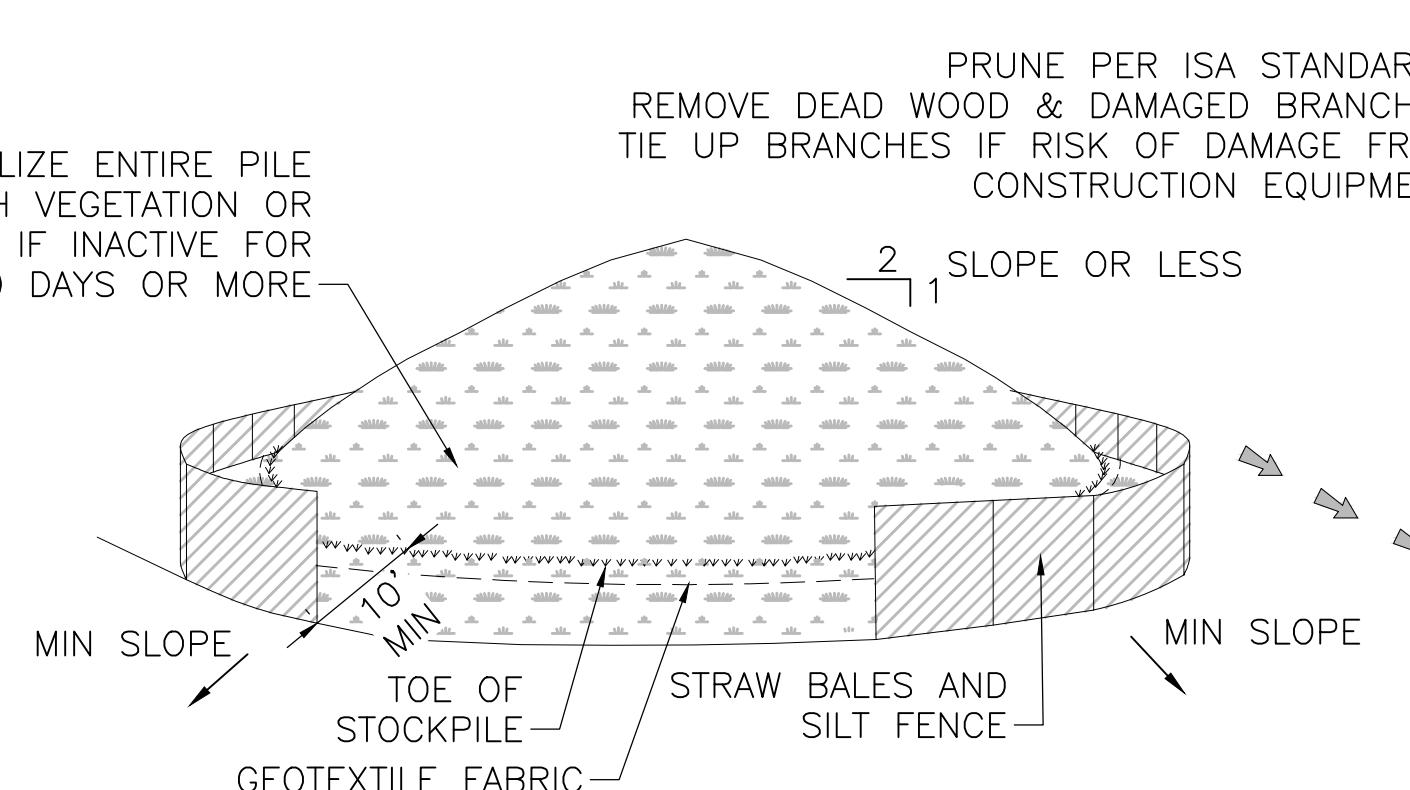
Last Saved: 1/12/2026 3:34 PM By: AChampagne - Acampagne & need brook culvert replacement(Drawings)AutoCAD (North main streetSheetW5005-036-CONSTR. DETAILS.dwg)

**EROSION CONTROL BLANKET**

NOT TO SCALE

EROSION CONTROL NOTES:

1. ALL EROSION CONTROL MEASURES SHOWN, SPECIFIED AND REQUIRED BY THE ENGINEER SHALL BE INSTALLED PRIOR TO ANY CONSTRUCTION OR IMMEDIATELY UPON REQUEST. MAINTAIN ALL SUCH CONTROL MEASURES UNTIL FINAL SURFACE TREATMENTS ARE IN PLACE AND/OR UNTIL PERMANENT VEGETATION IS ESTABLISHED.
2. A PRE-CONSTRUCTION MEETING WITH THE WESTFORD CONSERVATION COMMISSION AND THE ENGINEER IS REQUIRED. THE EROSION CONTROL MEASURES ARE TO BE REVIEWED BY THE COMMISSION PRIOR TO COMMENCEMENT OF CONSTRUCTION.
3. MAINTAIN AN ADDITIONAL SUPPLY OF EROSION CONTROL MEASURES THROUGHOUT THE CONSTRUCTION PERIOD.
4. PRIOR TO STARTING WORK, CLEARLY STAKE WORK LIMIT LINE(S). DO NOT DISTURB VEGETATION AND TOPSOIL BEYOND THE NEW LIMIT LINE. COORDINATE WITH THE ENGINEER THE LOCATIONS FOR THE TEMPORARY STOCKPILING OF TOPSOIL DURING CONSTRUCTION.
5. SIDE SLOPES, AND DISTURBED VEGETATED AREAS, SHALL BE A MAXIMUM GRADE OF 2:1 COMPACTED, STABILIZED, LOAMED AND SEDED AS SHOWN ON DRAWINGS. SIDE SLOPES SHALL BE IMMEDIATELY FINE GRADED AND SEDED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
6. SILT TRAPPED AT BARRIERS SHALL BE REMOVED AND DISPOSED OF IN UPLAND AREAS OUTSIDE BUFFER ZONES. MATERIALS DEPOSITED IN ANY TEMPORARY SETTLING BASIN SHALL BE REMOVED AT THE COMPLETION OF THE PROJECT. ALL DISTURBED AREAS SHALL BE RESTORED.
7. INSTALL EROSION CONTROLS AT THE EDGE OF NEW WORK. EROSION CONTROLS SHALL ACT AS LIMIT OF WORK LINE TO HELP ENSURE THAT EQUIPMENT DOES NOT DISTURB ADJACENT PROPERTIES.
8. ADDITIONAL EROSION CONTROLS MAY BE REQUIRED TO LIMIT SEDIMENTS FROM DISCHARGING TO ADJACENT PROPERTIES OR WATERWAYS.
9. PROPERLY STABILIZE AND PROTECT TEMPORARY STOCKPILES OF MATERIALS RELATED TO THE CONSTRUCTION ACTIVITIES TO LIMIT MOVEMENT OF MATERIAL ONTO ADJACENT PARCELS, OR INTO THE STREAM.
10. STABILIZE THE AREAS OF CONSTRUCTION ACTIVITIES AT THE CLOSE OF EACH CONSTRUCTION DAY. CHECK EROSION CONTROLS AT THIS TIME AND MAINTAIN OR REINFORCE IF NECESSARY.
11. PROTECT NEW WORK FROM FLOODING. PROPERLY SLOPE GRADING IN THE AREAS SURROUNDING ALL EXCAVATIONS TO LIMIT WATER FROM RUNNING INTO THE EXCAVATED AREA OR TO ADJACENT PROPERTIES. UPON COMPLETION OF THE WORK, RESTORE ALL AREAS IN A SATISFACTORY MANNER.
12. ALL SILT-LADEN WATER MUST BE SETTLED OR FILTERED TO REMOVE ALL SEDIMENTS PRIOR TO RELEASE TO AN UPLAND AREA, IN A SEDIMENTATION OR FILTER BAG LOCATED DOWN GRADIENT.
13. DEWATER AS NECESSARY TO KEEP CONSTRUCTION AREAS FREE OF WATER, DISCHARGE WATER FROM DEWATERING TO APPROPRIATE UPLAND LOCATION AND WITHOUT SEDIMENT (SEE DEWATERING REQUIREMENTS).
14. AT THE END OF EACH WORK DAY, ANY SEDIMENTS TRACKED ONTO PUBLIC RIGHTS-OF-WAY BEYOND THE PROJECT LIMITS SHALL BE REMOVED.

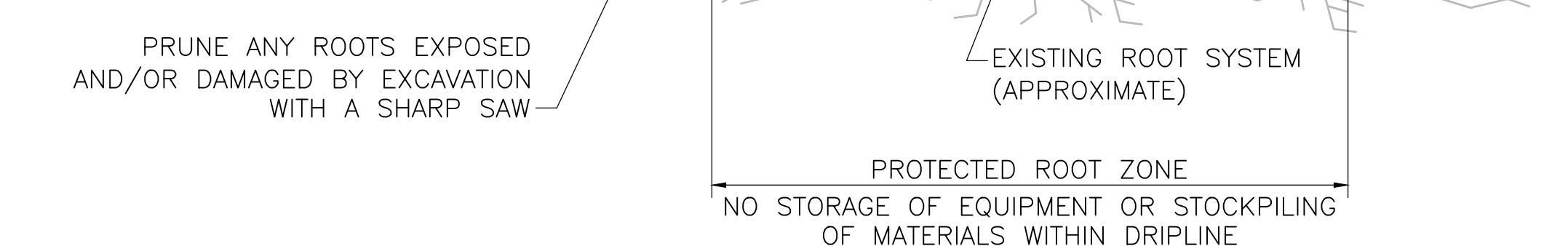
**INSTALLATION NOTES:**

1. TEMPORARY WEAVE JUTE NET EROSION CONTROL BLANKET OVER 6" LOAM & SEED. IN ALL LOCATIONS WITH A 3:1 SLOPE OR STEEPER, SEED MIX AS SHOWN IN TABLE BELOW.
2. EROSION CONTROL BLANKET SHOULD BE INSTALLED VERTICALLY DOWNSLOPE.
3. STAKES/STAPLES SHOULD BE PLACED NO MORE THAN 3 FT APART VERTICALLY, AND 1 FT APART HORIZONTALLY.
4. SLOPE SURFACE SHOULD BE FREE OF STICKS, ROCKS, AND OTHER OBSTRUCTIONS.
5. BLANKETS SHOULD BE ROLLED OUT LOOSELY AND STAKED/STAPLED TO MAINTAIN DIRECT SOIL CONTACT. DO NOT STRETCH THE BLANKETS.

SOIL STOCKPILING

NOT TO SCALE

PRUNE ANY ROOTS EXPOSED AND/OR DAMAGED BY EXCAVATION WITH A SHARP SAW

**TREE PROTECTION FOR EXISTING TREE**

NOT TO SCALE



East Prescott Street & North Main Street Culvert Replacement

Westford Department of Public Works

Westford, MA

MARK	DATE	DESCRIPTION
PROJECT NO:	W5005-036	
DATE:	JANUARY 2026	
FILE:	W5005-036-CONSTR. DETAILS.dwg	
DRAWN BY:	JHM	
DESIGNED/CHECKED BY:	SDS/JJC	
APPROVED BY:	DSH	
EROSION CONTROL DETAILS		
SCALE:	NO SCALE	
SHEET 13 OF 17		

IN-SITU WETLAND RESTORATION NOTES:

1. STABILIZATION OF DISTURBED AREAS OR NEW SOIL SHALL BE IMPLEMENTED WITHIN 14 DAYS AFTER GRADING OR CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED. APPROPRIATE VEGETATIVE SOIL STABILIZATION IS TO BE USED TO MINIMIZE EROSION. TEMPORARY OR PERMANENT VEGETATIVE COVER IS TO BE ESTABLISHED IN ACCORDANCE WITH THE PROJECT PLANS AND SPECIFICATIONS, USING HYDRO-SEEDING, BROADCASTING, OR OTHER APPROVED TECHNIQUES.
2. TREES AND SHRUBS SHOULD BE PLANTED FIRST AND THEN SEEDING WITH THE SPECIFIED SEED MIX (TABLE 1).
3. TREES AND SHRUB SPECIES PLANTING SUBSTITUTIONS MAY BE REQUIRED BASED ON THE AVAILABILITY OF NATIVE MATERIAL. SUBSTITUTIONS SHALL BE APPROVED BY A WETLAND SCIENTIST OR ENGINEER OVERSEEING THE RESTORATION.
4. MAINTAIN VEGETATED SURFACES, INCLUDING WATER, AND RE-SEEDING UNTIL ESTABLISHED CONDITIONS ARE MET AND UNTIL THE END OF THE CONTRACTUAL MAINTENANCE PERIOD.
5. SEED MIX SPECIFIED IN TABLE 1 SHALL BE APPLIED BASED ON THE APPLICATION RATE SPECIFIED BY THE SUPPLIER.
6. THE IN-SITU WETLAND RESTORATION AREAS SHALL BE MULCHED WITH WEED FREE STRAW FOLLOWING SEEDING.
7. AREAS WHERE WETLAND TOPSOIL IS SIGNIFICANTLY DISTURBED OR REMOVED ENTIRELY, WETLAND TOPSOIL FOR WETLAND REPLACEMENT AREAS SHALL CONSIST OF A MIXTURE OF EQUAL VOLUMES OF CLEAN, WEED AND SEED FREE ORGANIC AND MINERAL MATERIALS. WELL-DECOMPOSED CLEAN LEAF COMPOST SHALL BE USED AS A SOIL AMENDMENT TO ACHIEVE THE ORGANIC STANDARD. WOOD CHIPS, PEAT MOSS, AND PEAT MOSS BY-PRODUCTS SHALL NOT BE USED AS ORGANIC AMENDMENTS. SUPPLEMENTAL TOPSOIL IN WETLAND REPLACEMENT AREAS SHALL HAVE A MINIMUM ORGANIC CARBON CONTENT OF 4-12% (7 TO 21% ORGANIC MATTER) ON A DRY WEIGHT BASIS. MATCH EXISTING GRADE.



TABLE 1
Seed Mix¹ for Application to Bank and Wetland Restoration Areas and for Wetland Replacement

Common Name	Botanical Name ²	Indicator Status ³
Fox Sedge	<i>Carex vulpinoidea</i>	OBL
Blunt Broom Sedge	<i>Carex scoparia</i>	FACW
Lurid Sedge	<i>Carex lurida</i>	OBL
Hop Sedge	<i>Carex lupulina</i>	OBL
Fowl Bluegrass	<i>Poa palustris</i>	FACW
Beggar Ticks	<i>Bidens frondosa</i>	FACW
Green Bulrush	<i>Scirpus atrovirens</i>	OBL
Swamp Milkweed	<i>Asclepias incarnata</i>	OBL
Fringed Sedge	<i>Carex crinita</i>	OBL
New York Ironweed	<i>Vernonia noveboracensis</i>	FACW
Soft Rush	<i>Juncus effusus</i>	OBL
Starved/Calico Aster	<i>Aster lateriflorus</i> (<i>Sympyotrichum lateriflorum</i>)	FAC
Blue Flag	<i>Iris versicolor</i>	OBL
American Mannagrass	<i>Glyceria grandis</i>	OBL
Square Stemmed Monkey Flower	<i>Mimulus ringens</i>	OBL
Spotted Joe Pye Weed	<i>Eupatorium maculatum</i> (<i>Eutrochium maculatum</i>)	OBL

¹ New England Wetmix (Wetland Seed Mix) Species Composition (New England Wetland Plants, Inc.)

² This list was adapted from the New England Wetland Plants, Inc. information sheet as of October 10, 2020.

³ Indicator status is based on the USDA NRCS Plants Database.

TABLE 2
Native Shrubs for Wetland Mitigation Along Boutwell Brook

Common Name	Scientific Name	Size ²	Number of Plantings
Silky Dogwood	<i>Cornus amomum</i>	3' - 4'	3
Meadowsweet	<i>Spirea alba</i>	3' - 4'	4
Northern Arrow-wood	<i>Viburnum dentatum</i>	3' - 4'	3
Wild Raisin	<i>Viburnum nudum</i>	3' - 4'	2

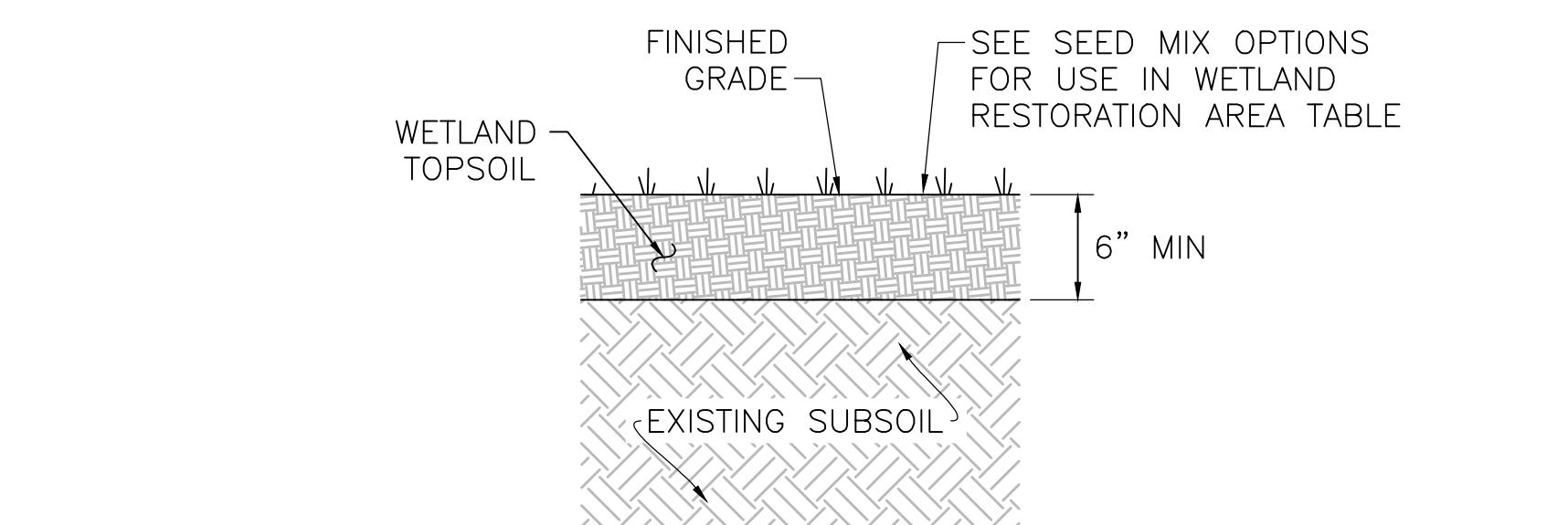
¹ Shrubs to be selected from the species listed in this table based on the availability of native nursery stock at the time of installation.

² Minimum size (height) at time of installation.

East Prescott Street & North Main Street Culvert Replacement

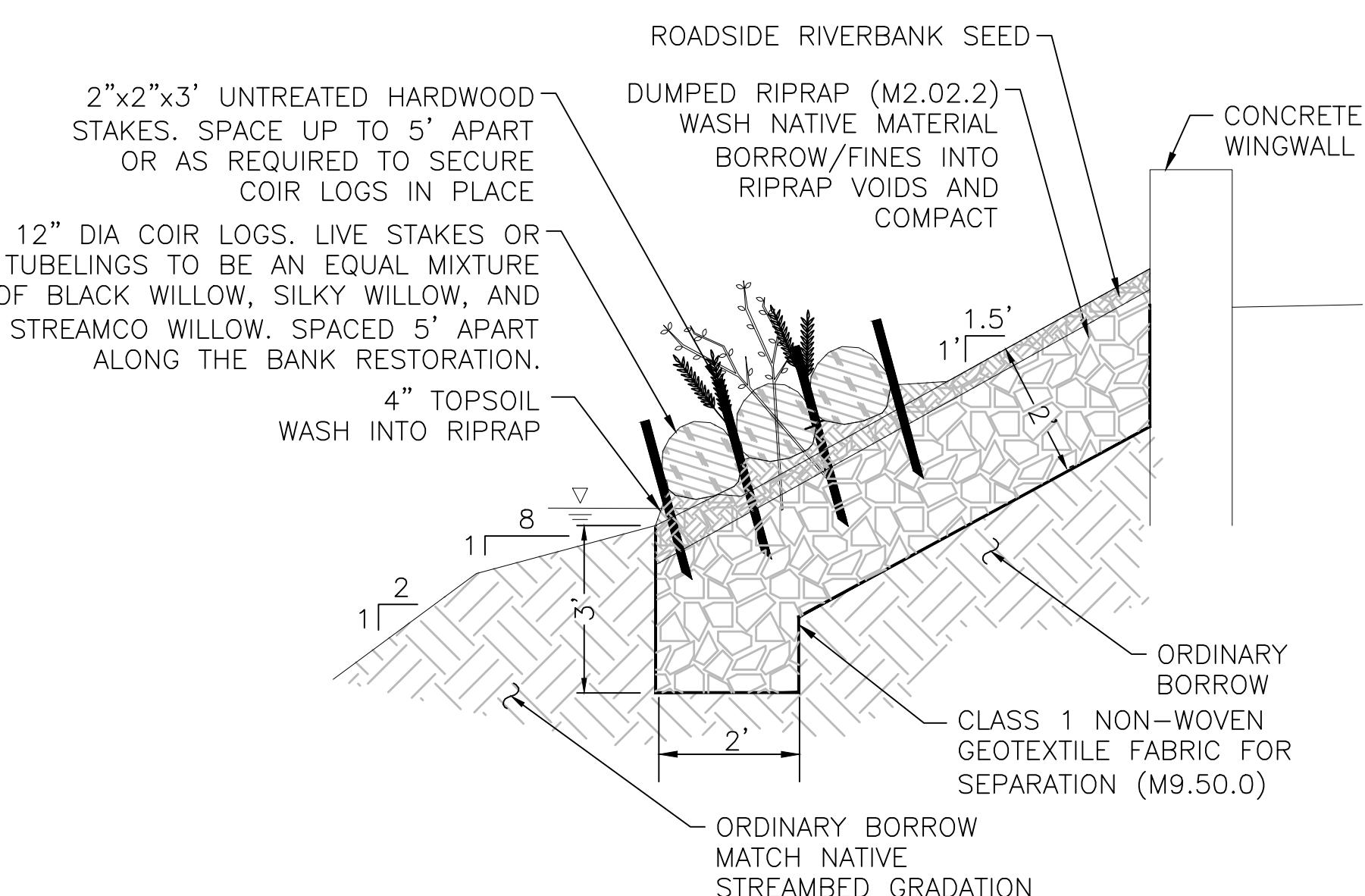
Westford Department of Public Works

Westford, MA



WETLAND TOPSOIL FOR INLAND WETLAND REPLACEMENT AREA

NOT TO SCALE



RIPRAP SLOPE STABILIZATION

NOT TO SCALE

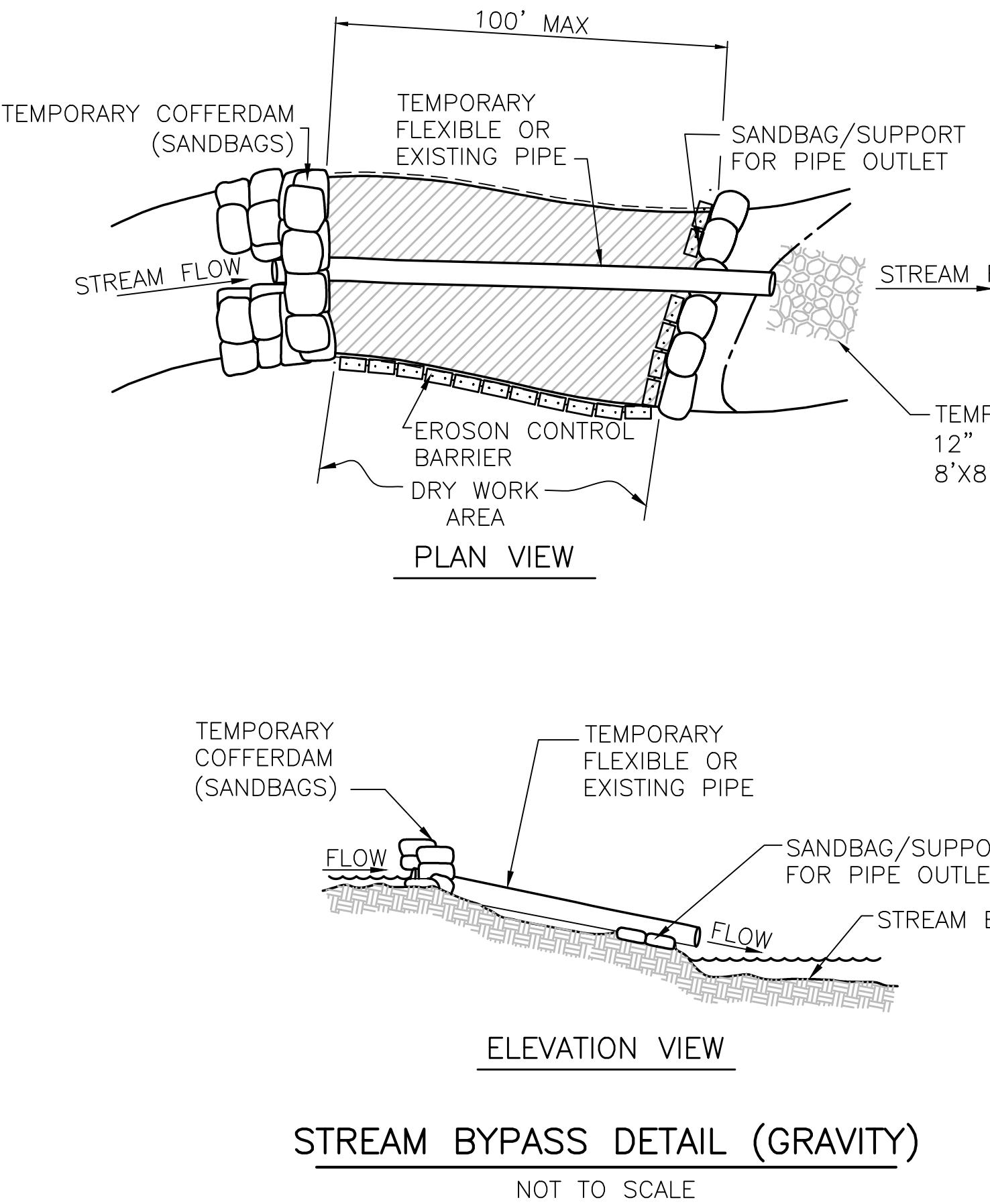
MARK	DATE	DESCRIPTION
PROJECT NO:	W5005-036	
DATE:	JANUARY 2026	
FILE:	W5005-036-CONSTR. DETAILS.dwg	
DRAWN BY:	JHM	
DESIGNED/CHECKED BY:	SDS/JJC	
APPROVED BY:	DSH	
WETLAND REPLACEMENT AND SLOPE DETAILS		
SCALE:	NO SCALE	
SHEET 14 OF 17		



East Prescott Street & North Main Street Culvert Replacement

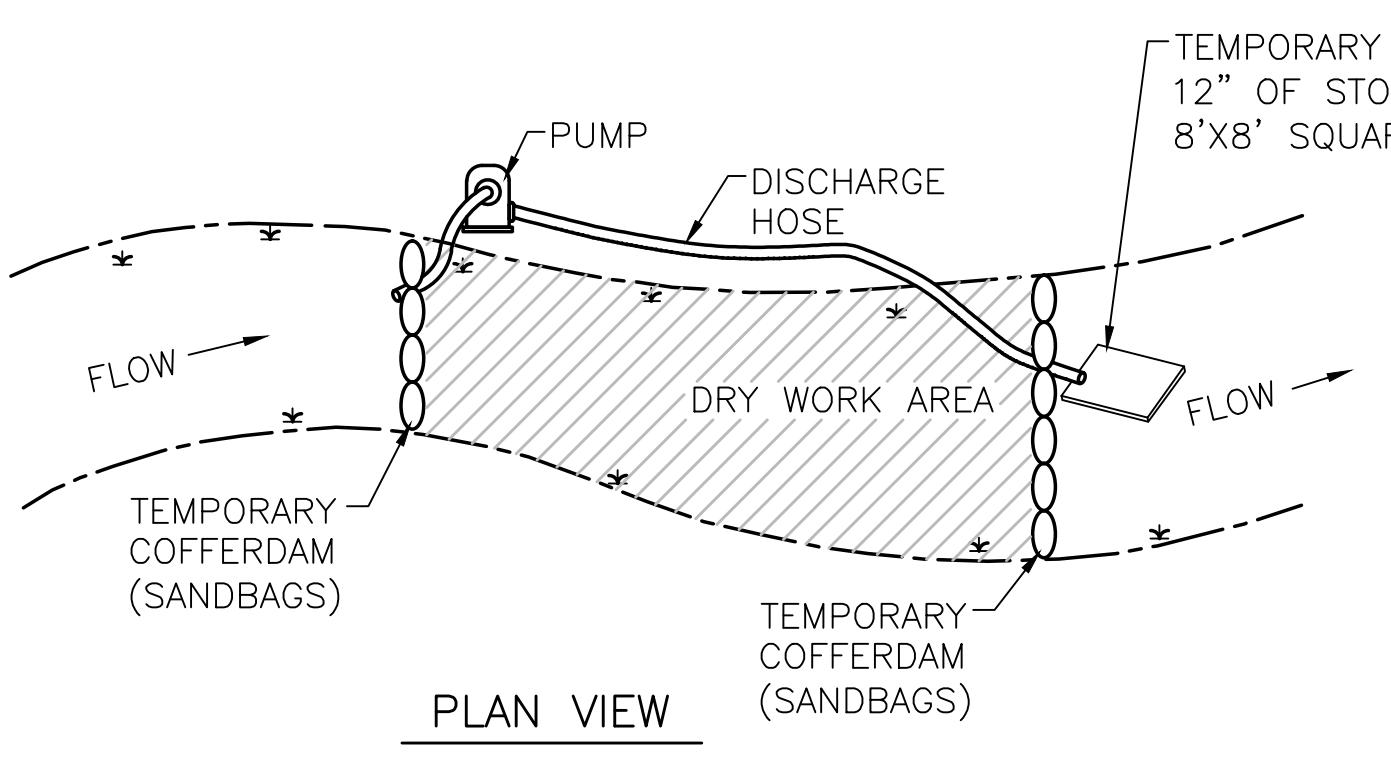
Westford
Department of
Public Works

Westford, MA



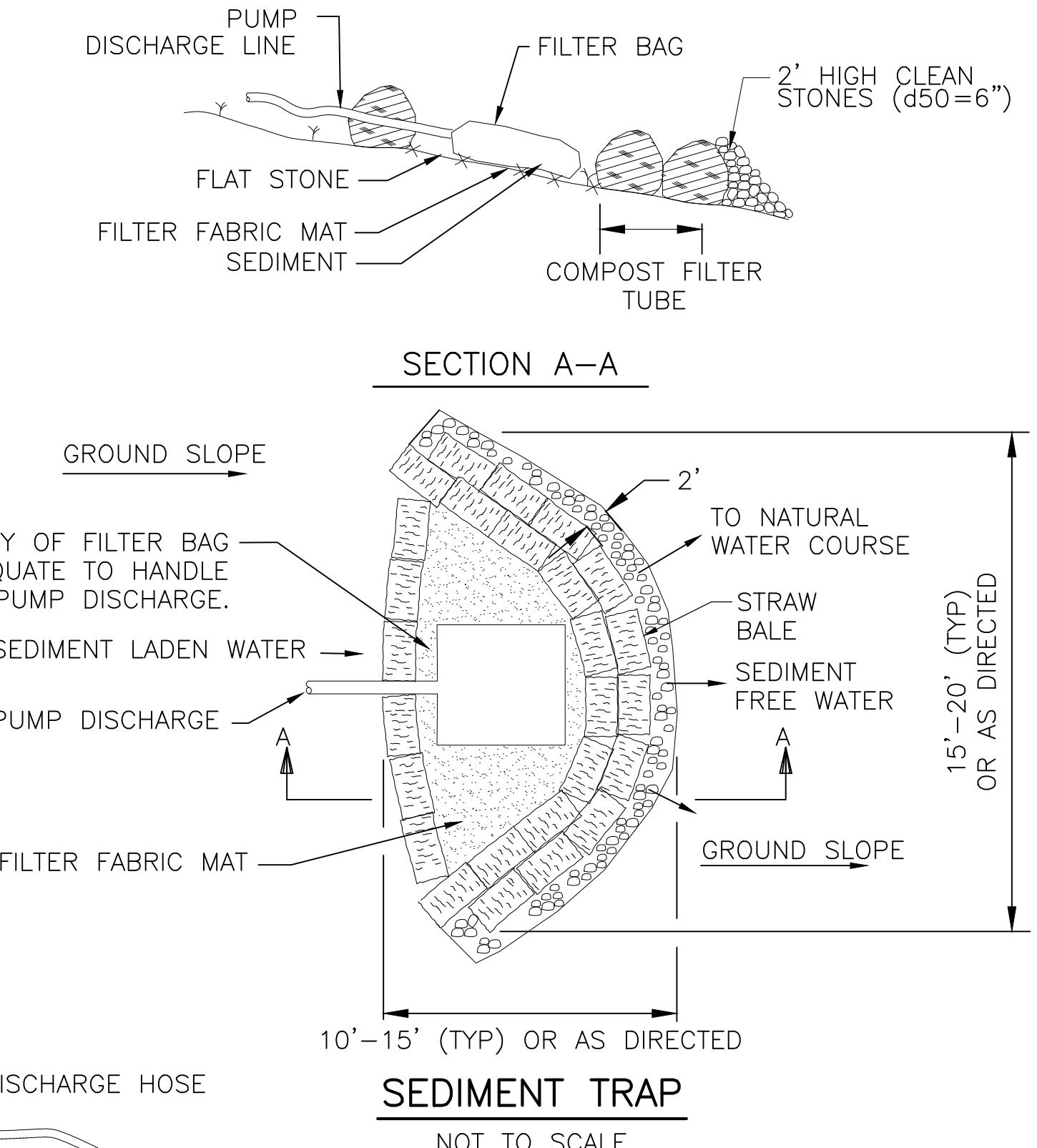
STREAM BYPASS DETAIL (GRAVITY)

NOT TO SCALE



STREAM BYPASS DETAIL (PUMPED)

NOT TO SCALE



SEDIMENT TRAP

NOT TO SCALE

NOTES:
1. DEWATERING EQUIPMENT SHALL REMAIN WITHIN THE PERMANENTLY IMPACTED AREAS.
2. DISCHARGE HOSE SHALL NOT CROSS THE STREAM AT ANY LOCATION

COFFERDAM AND DEWATERING

NOT TO SCALE

DEWATERING REQUIREMENTS:

PREPARE A DEWATERING PLAN TO ADDRESS THE FOLLOWING CONCERNs AND ADHERE TO THE FOLLOWING REQUIREMENTS:

1. IF THE WATER TABLE IS INTERCEPTED DURING EXCAVATION, WATER COLLECTED IN THE TRENCH SHALL BE PUMPED OUT SO THAT THE WORK CAN BE PERFORMED "IN THE DRY." PROVIDE ADEQUATELY SIZED DEWATERING EQUIPMENT WITH 100% BACKUP AND SEDIMENTATION/EROSION CONTROL STRUCTURES AS DETAILED ON THE CONTRACT DRAWINGS TO ENSURE CONSTRUCTION "IN THE DRY" AND ADEQUATELY PROTECT ADJACENT WETLAND AREAS AND WATERWAYS.
2. ALL GROUNDWATER REMOVED (PUMPED) FROM THE TRENCH EXCAVATION AND DISCHARGED SHALL BE A "CLEAN DISCHARGE." PROVIDE WHATEVER DEVICES ARE REQUIRED TO ACHIEVE THE "CLEAN DISCHARGE." IF THE OWNER'S REPRESENTATIVE DETERMINES THE PUMPED DISCHARGE IS CLEAN (LESS THAN 50 NTU), THE FLOW CAN BE DIRECTED TO AN UPLAND AREA. IF THE OWNER'S REPRESENTATIVE DETERMINES THAT THE FLOW IS NOT CLEAN, DIRECT THAT FLOW TO ONE OR MORE FILTRATION DEVICES FOR THE PURPOSE OF SUBSTANTIALLY REMOVING SUSPENDED SOLIDS FROM THE WATER. THE FILTRATION DEVICES SHALL BE AS SHOWN ON THE DRAWINGS OR APPROVED ALTERNATES SUGGESTED BY THE CONTRACTOR, OR AS REQUIRED BY THE LOCAL PERMITS.
3. OBTAIN ALL NECESSARY STATE AND LOCAL PERMITS RELATING TO DEWATERING ACTIVITIES.
4. DEWATERING DISCHARGE LOCATIONS ARE TO BE REVIEWED AND APPROVED BY THE OWNER'S REPRESENTATIVE.
5. ANY PROPOSED DEWATERING AND SHORING PROCEDURES SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AND ACCEPTANCE. THE DEWATERING/WATER CONTROL AND SHORING/TEMPORARY EARTH SUPPORT SHALL BE DESIGNED AND STAMPED BY A REGISTERED PROFESSIONAL ENGINEER IN THE COMMONWEALTH OF MASSACHUSETTS.

MARK	DATE	DESCRIPTION
PROJECT NO:	W5005-036	
DATE:	JANUARY 2026	
FILE:	W5005-036-CONSTR. DETAILS.dwg	
DRAWN BY:	JHM	
DESIGNED/CHECKED BY:	SDS/JJC	
APPROVED BY:	DSH	

WATER CONTROL DETAILS

SCALE: NO SCALE

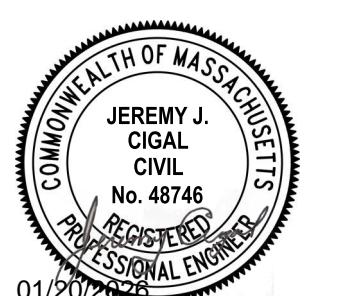
SHEET 15 OF 17

WATER CONTROL SEQUENCING:

1. INSTALL A TEMPORARY COFFERDAM UPSTREAM OF THE EXISTING CULVERT PRIOR TO REMOVAL OF THE EXISTING CULVERT. PROVIDE BYPASS FLUME PIPE OR PUMP, SIZE AND PROVIDE A FLUME PIPE OR PUMP WITH ADEQUATE CAPACITY TO ACCOMMODATE STREAM FLOWS AS INDICATED IN THE WATER CONTROL NOTES. SUBMIT AN EMERGENCY CONTINGENCY PLAN FOR A STORM EVENT GREATER THAN THE 2-YEAR STORM.
2. EXCAVATE AND DEWATER FOR CULVERT INSTALLATION, REMOVE AND DISPOSE EXISTING CULVERT, PLACE CRUSHED STONE TO GRADE, INSTALL CULVERT, FOLLOWED BY SITE RESTORATION. AT NO POINT SHOULD THE STREAM FLOW OVER NEWLY EXCAVATED EARTH OR OVER AREAS THAT DO NOT HAVE THE FINISHED SURFACE TREATMENT.
3. STREAM DIVERSION MAY BE REMOVED AFTER ALL SURFACES HAVE BEEN PROTECTED AND CULVERT IS INSTALLED.

WATER CONTROL NOTES:

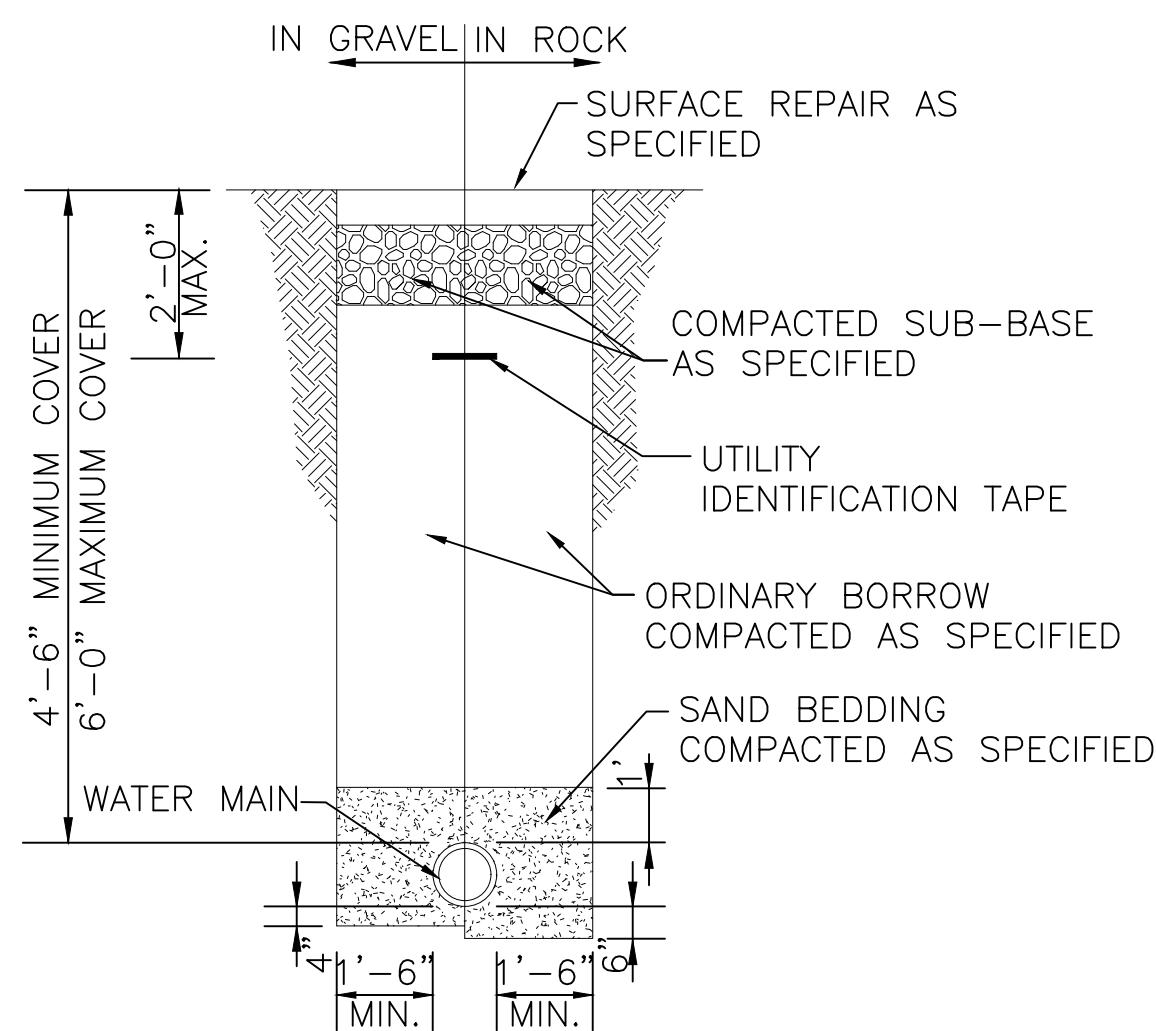
1. THE ISOLATED WORK AREA WITHIN THE COFFERDAMS MAY BE DEWATERED AS NEEDED TO PERFORM WORK IN THE DRY. ALL WORK MUST BE PERFORMED IN THE DRY. ANY DEWATERING ACTIVITIES SHALL BE PERFORMED USING A DISCHARGE HOSE, FILTER BAG, AND SEDIMENT TRAP (SHOWN ON THIS SHEET).
2. PRIOR TO BEGINNING ANY CONSTRUCTION IN THE STREAM, SUBMIT TO THE OWNER A WORK SEQUENCE INDICATING ANTICIPATED COFFERDAM LOCATIONS, OR ALTERNATE SYSTEM. WORK SHALL ONLY BE PERFORMED DURING LOW FLOW CONDITIONS.
3. THE COFFERDAM WORK MAY BE MODIFIED TO ADDRESS THE CONTRACTOR'S SEQUENCE OF CONSTRUCTION, WITH THE APPROVAL OF THE OWNER.
4. TEMPORARY COFFERDAMS (SAN BAG, JERSEY BARRIER, WATER FILLED BARRIER OR EQUIVALENT; USE OF UNCONSOLIDATED MATERIALS STRICTLY PROHIBITED) WILL BE INSTALLED TO MAINTAIN A DRY WORK AREA DURING CONSTRUCTION ACTIVITIES AND TO LIMIT SEDIMENTATION AS A RESULT OF THE PROPOSED WORK. THE WORK AREA LOCATED WITHIN THE COFFERDAMS SHALL BE DEWATERED. THE COFFERDAMS WILL BE LOCATED WITHIN THE STREAM TO ALLOW INSTALLATION OF BRIDGE FOOTINGS AND FOUNDATIONS AND IN OTHER LOCATIONS WHERE DEWATERING NEAR THE STREAM IS REQUIRED.
5. WATER CONTROLS SHOULD BE DESIGNED FOR A 2-YEAR STORM (PEAK FLOW 25 CFS). PRIOR TO COMMENCING WORK SUBMIT TO THE ENGINEER DRAWINGS AND CALCULATIONS, STAMPED BY A PROFESSIONAL ENGINEER IN THE STATE OF MASSACHUSETTS, INDICATING THE CONTRACTOR'S METHOD FOR CONTROL OF WATER. THE SUBMITTAL SHALL INCLUDE PROPOSED IMPACT AREAS, RESTORATION METHODS, FLOW RATES, DEWATERING METHODS AND A DETAILED SCHEDULE FOR THE CONTROL OF WATER.



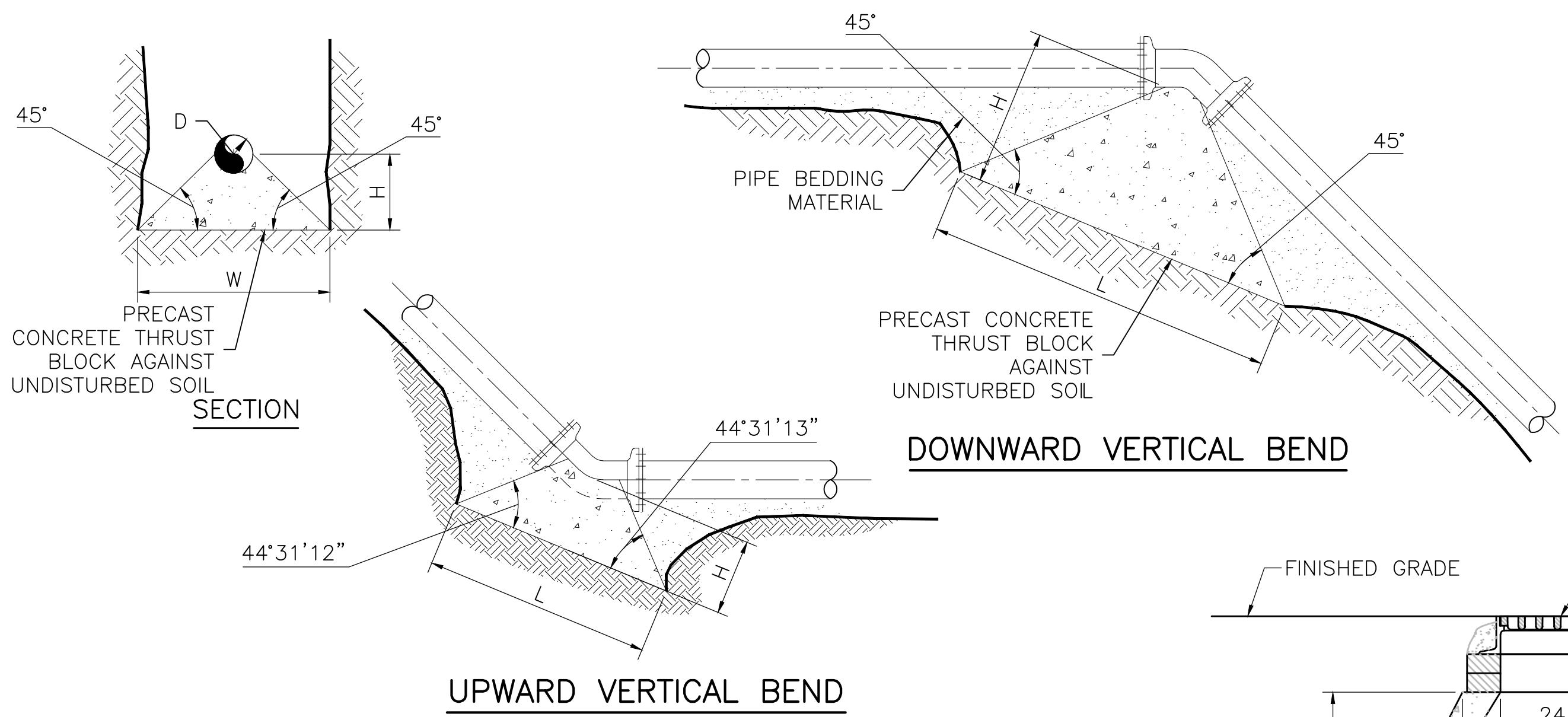
East Prescott Street & North Main Street Culvert Replacement

Westford Department of Public Works

Westford, MA



TYPICAL WATER MAIN TRENCH



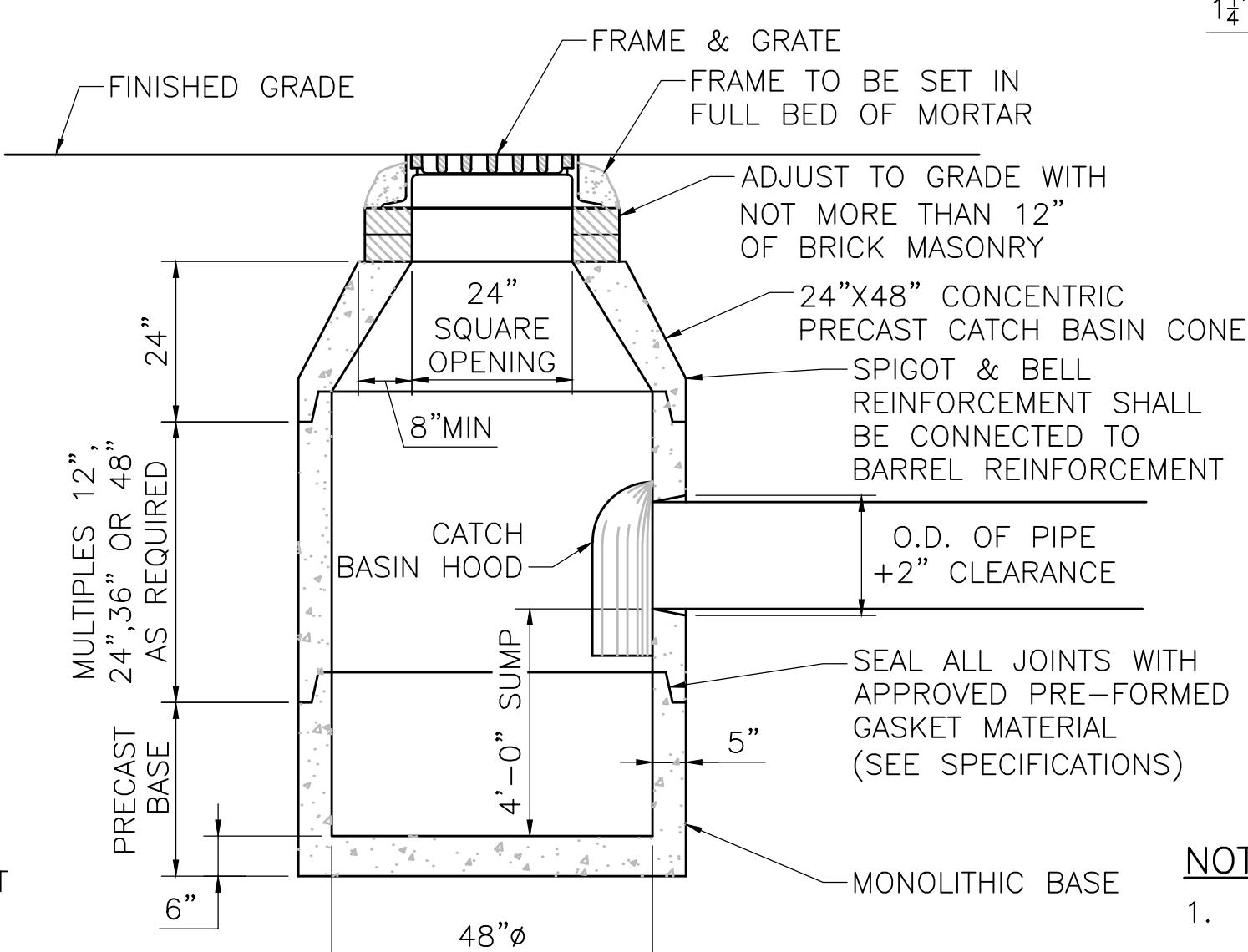
CONCRETE THRUST BLOCK										
UPWARD VERTICAL BENDS				DOWNWARD VERTICAL BENDS						
D	BEARING AREA (S.F.)	"L"	"H"	"W"	VOLUME (C.F.)	BEARING AREA (S.F.)	"L"	"H"	"W"	VOLUME (C.F.)
8	4.9	2.7	1.8	0.9	4.4	1.3	6.0	3.0	5.0	90.9

* THE WIDTH OF THE BLOCK (W) IS ASSUMED TO BE THE WIDTH OF THE TRENCH.

NOTES:

1. DIMENSIONS SHOWN WERE CALCULATED BASED ON A 200 PSI INTERNAL PIPE PRESSURE, SOIL BEARING LOADS OF 3,000 PSF, AND A 45° BEND.
2. CONCRETE THRUST BLOCKS SHALL BE CONSTRUCTED OF PRECAST CONCRETE MATERIAL PLACED AGAINST UNDISTURBED SOIL.
3. DIMENSIONS L, W, & H MAY BE ADJUSTED TO MEET FIELD CONDITIONS, PROVIDED THE BEARING AREA AND VOLUME REMAIN UNCHANGED.

CONCRETE THRUST BLOCK FOR VERTICAL BENDS



NOTES:

1. SEAL JOINT BETWEEN PIPE AND CATCH BASIN WITH GROUT.

PRECAST CONCRETE CATCH BASIN

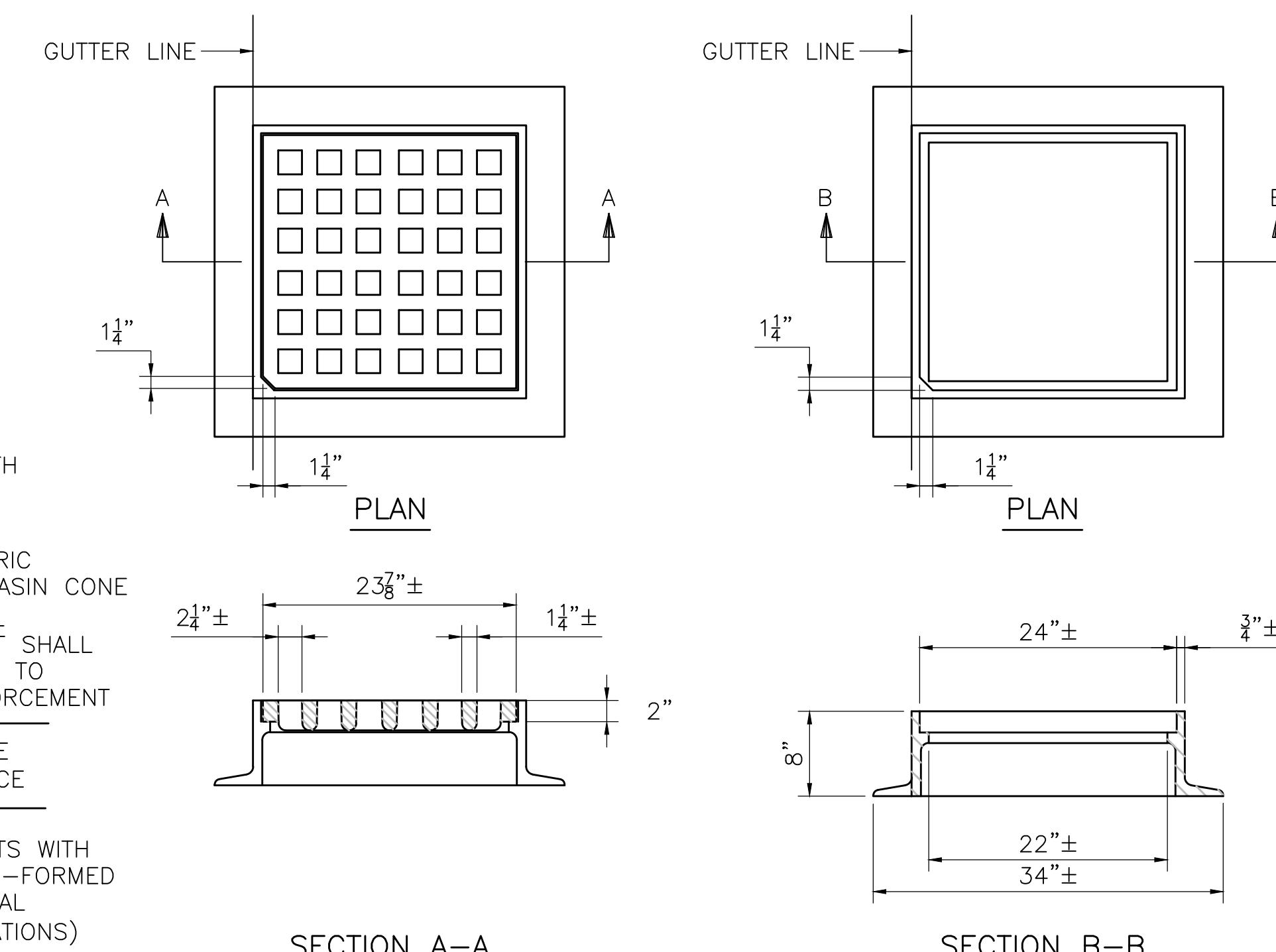
NOT TO SCALE

SIZE (IN.)	FITTING	MINIMUM RESTRAINED LENGTH, FT. (1)
8	90° BEND	26
8	45° BEND	11
8	22 1/2° BEND	5
8	11 1/4° BEND	3
8	DEAD END/VALVE	65
8	45° VERTICAL UP BEND	27
8	45° VERTICAL DOWN BEND	6
8	8"x8" TEE	65
8	8"x12" TEE	92

MINIMUM RESTRAINED LENGTHS FOR DI PIPE

NOTES:

1. MINIMUM RESTRAINED LENGTH IS BASED ON DIPRA RESTRAINED LENGTH CALCULATOR, LATEST EDITION.
2. THE FOLLOWING CONDITIONS APPLY:
 - SOIL TYPE: SAND SILT
 - MAX. PRESSURE: 200 psi
 - TRENCH TYPE: 4
 - BURIED DEPTH: 5'
3. THE MINIMUM RESTRAINED LENGTHS SHOWN ARE SUBJECT TO RECALCULATION BASED ON FIELD CONDITIONS.



NOTES:

1. MINIMUM WEIGHT OF GRATE - 190 LBS.
2. MATERIAL - CAST IRON, SEE SPECIFICATIONS.

CATCH BASIN GRATE

NOT TO SCALE

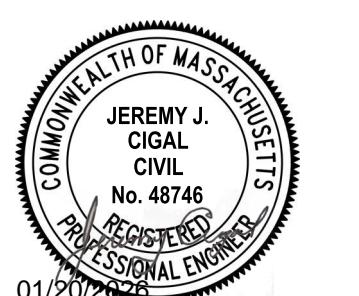
NOTES:

1. MINIMUM FRAME WEIGHT: 4 FLANGE - 295± LBS
2. MATERIAL - CAST IRON, SEE SPECIFICATIONS.
3. FOR ADDITIONAL INFORMATION SEE MHD 2016.0

CATCH BASIN FRAME

NOT TO SCALE

MARK	DATE	DESCRIPTION
PROJECT NO:	W5005-036	
DATE:	JANUARY 2026	
FILE:	W5005-036-CULVERT DETAIL.dwg	
DRAWN BY:	JHM	
DESIGNED/CHECKED BY:	SDS/JJC	
APPROVED BY:	DSH	
UTILITY DETAILS		
SCALE:	NO SCALE	
SHEET 16 OF 17		



East Prescott Street & North Main Street Culvert Replacement

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