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**GUNTLOW & ASSOCIATES, INC.**

**ADDENDUM #1**

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**TO:** BIDDER  
**FROM:** ANDRE-ANNE CHENAILLE  
**SUBJECT:** WHITMAN ROAD CULVERT REPLACEMENT PROJECT  
**DATE:** 8 APRIL 2026  
**CC:** TOWN OF HANCOCK

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The following addendum items shall be reviewed and incorporated into the bid proposals. **The bid date is hereby extended by two (2) weeks to Wednesday May 6, 2026 at 11:00 am.** Bids will be received at Guntlow & Associates, Inc., 55 North Street Williamstown, MA.

Bidders shall acknowledge receipt of addenda in the Bid Form.

1) The following information is clarification of conflicting cost amounts for liquidated damages, listed in Section 6.01 of the Bid Form and Section 4.03 of the Standard Form of Agreement.

*Modification in Section 4.03 of the Standard Form of Agreement shall read: "...Contractor shall pay OWNER **\$500** for each day that expires after the time specified in paragraph 4.02 for Substantial Completion until the Work is substantially completed. After Substantial Completion, if CONTRACTOR shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by OWNER, CONTRACTOR shall pay OWNER **\$500** for each day that expires after the time specified in paragraph 4.02 for completion and readiness for final payment until the Work is completed and ready for final payment."*

2) This project does not require MassDOT Prequalification.

3) Project plans have been revised and reorganized and are attached to this addendum. The following are notable revisions to be aware of:

- Additional details have been provided regarding the bridge rail and highway guardrail installation. A Guardrail Layout Plan has been added to Sheet 5, as well as additional guardrail details added to Sheet 7.
- Due to the potential for unstable soil under the culvert alignment, the Engineer is requiring the Contractor to coordinate with the Owner at least 48 hours in advance to have the Engineer present during excavation of the culvert subgrade for review and approval. The subgrade shall be proof rolled with a minimum 5 ton vibratory roller at least 6 passes. For base bid purposes, the Contractor shall assume an over-excavation of subgrade resulting in 2' of compacted structural fill below the concrete culvert. Any adjustments to this base bid scope as required by the Engineer in the field shall be modified to the contract by change order using supplemental unit prices. See Note 3 under Geotechnical Report Considerations on Sheet 3.
- Sheets 2, 9, and 10 did not change as part of this revision.

4) An Addendum to the Geotechnical Report is included with this Addendum and shall be considered a part of the contract documents. The original Geotechnical Report is included in the original contract documents.

5) Requests for information (RFI) or clarification shall be received by end-of-day Wednesday April 22, 2026 and will be answered in an addendum issued thereafter.

This completes addendum #1.

GIFFORD ENGINEERING  
*Geotechnical & Geoenvironmental Services*

April 8, 2026

Guntflow & Associates  
Attn: Mr. Charlie Labatt, PE  
55 North St  
Williamstown, MA 01267

Re: Second Addendum to Geotechnical Engineering Report for New Box Culvert on Whitman Rd in Hancock, MA, File No. 2474

Gentlemen:

This addendum is a supplement to our original geotechnical engineering report dated January 30, 2025 and addendum report updated March 12, 2026. The updated report was in part a response to comments made on the project permit plans by the Massachusetts DOT and an appendix addressing factored bearing resistance per Mass DOT Bridge Manual. Their geotechnical related concerns include the presence of a layer of peat in an offset boring B-3, which was not along the alignment of the new culvert. A second comment was discussed during a conference call we had with DOT and Guntflow personnel and myself on April 2, 2026. DOT personnel are requesting the Factored Bearing Pressure under the culvert per the Bridge Manual.

The peat layer was not encountered in B-1 which was advanced along the proposed alignment but to investigate the presence of peat along the alignment, the geotechnical engineer will be on site to observe the excavation to the culvert subgrade, about 9 feet below the top of pavement. He will observe a proof roll of the excavation subgrade with a minimum 5 ton vibratory roller making at least 6 passes. If necessary, he will have contractor excavate test pits to search for peat. If encountered, it will be completely removed and replaced with controlled structural fill or lean concrete. If peat is not encountered, the test pits will be backfilled with controlled fill then proof rolled again.

There is a comment regarding low blow counts (2 and 3 per 6 inches, 4 to 6 blows per foot) at B-1 at a depth of 6 to 8 feet. The comment continues that: "This indicates highly compressible soils with low bearing strength that is not suitable for directly supporting a culvert."

Section 3/C5 of the Guntflow plans show the Culvert Cross Section. The pre excavation vertical pressure or stress on the soil at the culvert bottom is: 9 feet times 120 pcf equals 1080 psf.

The post culvert placement stress on the same culvert bottom is:

1. 2 feet of concrete (top and bottom) times 150 pcf equals 300 psf
2. 10 inch concrete 2 walls thickness 10/12 times 150 pcf times 6 feet tall equals 1500 divided by 17.67 feet equals 85 psf
3. 2 feet of backfill soil in the culvert times 110 pcf equals 220 psf
4. 4 feet of water (fully flooded) times 62.4 pcf equals 250 psf

TOTAL PRESSURE 855 psf

According to AASHTO Design Guidelines, the HL 93 loading is understood to include 2 axles at 32 kips and the front axle 8 kips for a total of 72 kips. A 32 kip axle situated on top of the culvert wall

adds 32 divided by 10 feet (axle length) equals 3.2 klf and divided by 8.83 feet (half the width of the culvert) equals 362 psf. Add this to the 855 psf equals 1217 psf. Finally, the net increase in bearing pressure equals 1217 minus 1080 equals 137 psf.

Assuming that the location of the culvert has experienced similar traffic loading in the past, the soils are preconditioned to support similar loads as those acting down the wall of the culvert, the worst case. Certainly, loose sand with blow counts of 4 to 6 can support a net bearing pressure increase of 137 psf with virtually no settlement. Apply a factor of safety of 3 to this net increase of 137 psf equals 411 psf, which is about 20 percent of the maximum net allowable bearing capacity of 2000 psf recommended in the geotechnical report.

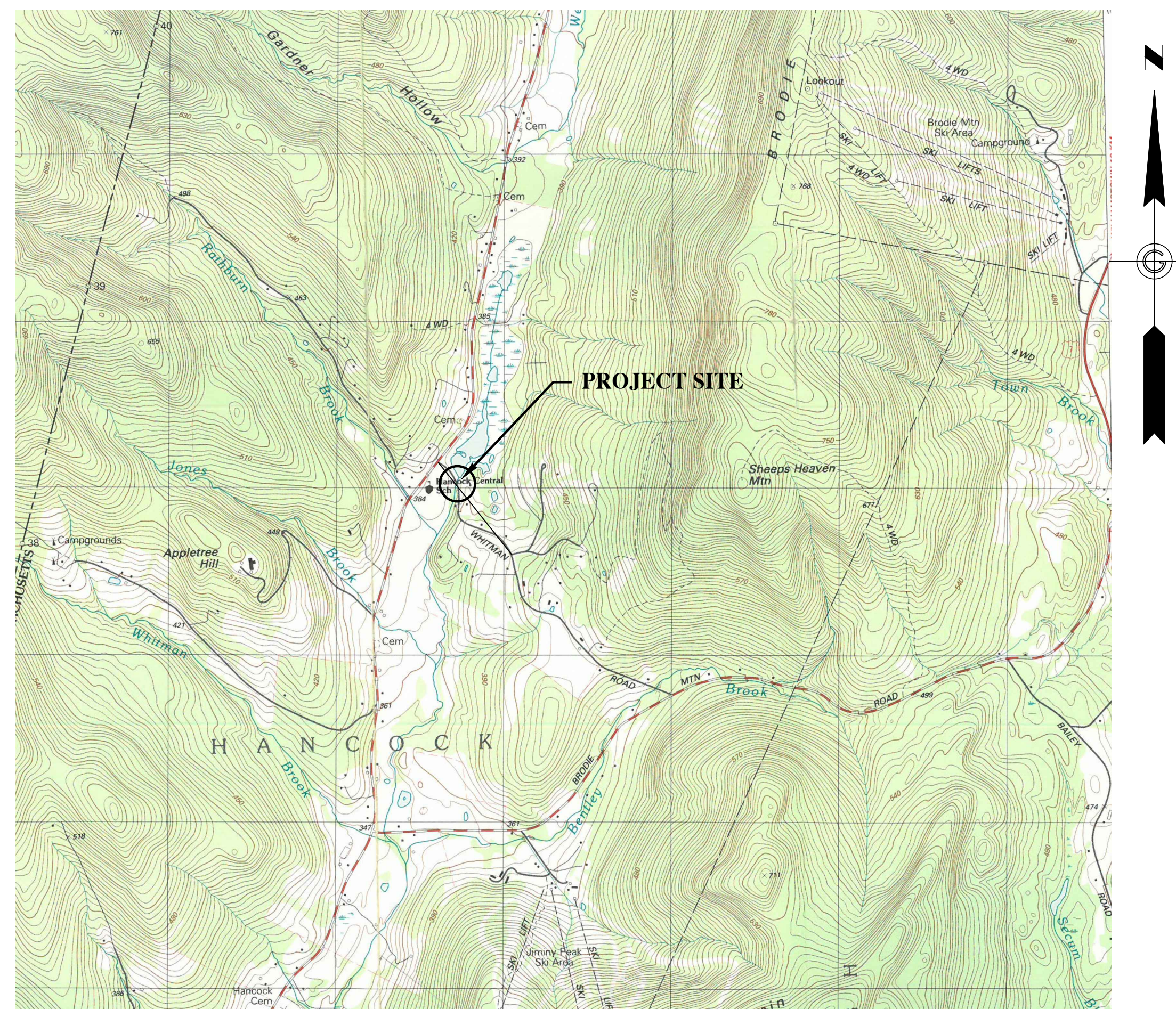
If I can be of further assistance in this matter, please contact me.

Truly yours,  
Gifford Engineering LLC

Gregory P Gifford PhD PE  
President

cc Mr. Vincent Guntlow, PE, Guntlow & Associates

*Town of Hancock, MA*  
**Whitman Road Culvert Replacement Project**  
*Kinderhook Creek*  
*Hancock, Massachusetts*



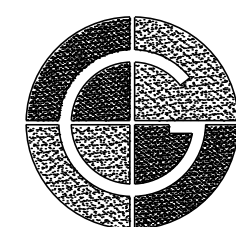
**Prepared for:**

Town of Hancock  
 3650 Hancock Road  
 PO Box 1084  
 Hancock, Massachusetts

**Date:**

March 13, 2026  
 Revision 1: April 8, 2026

**Prepared By:**

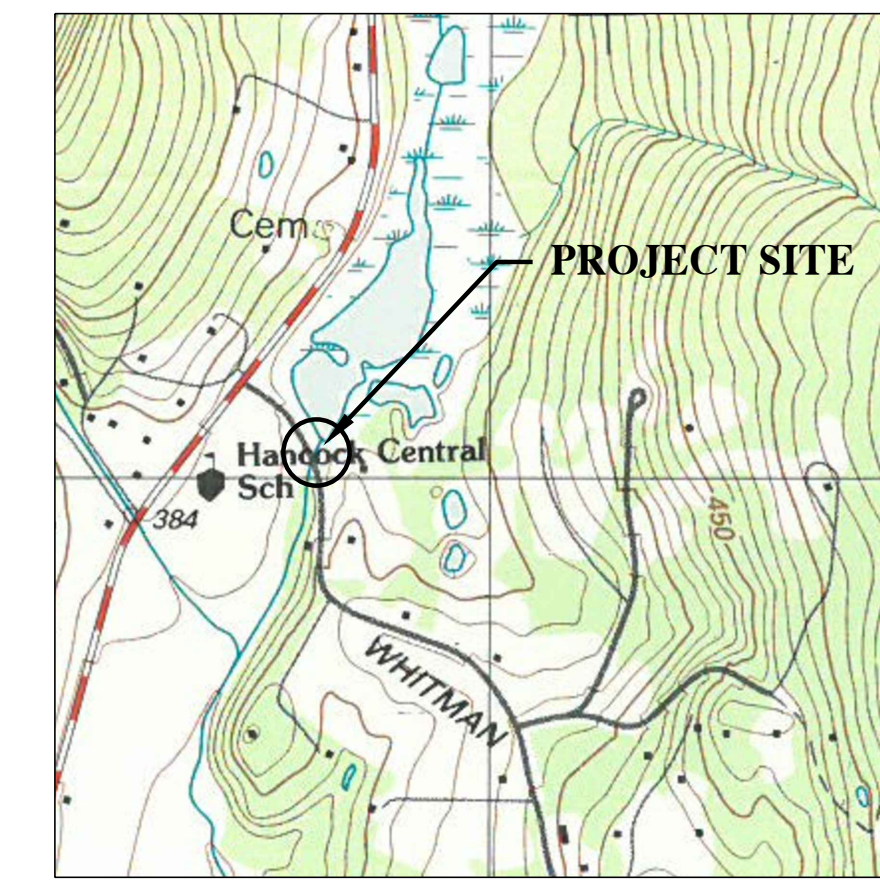
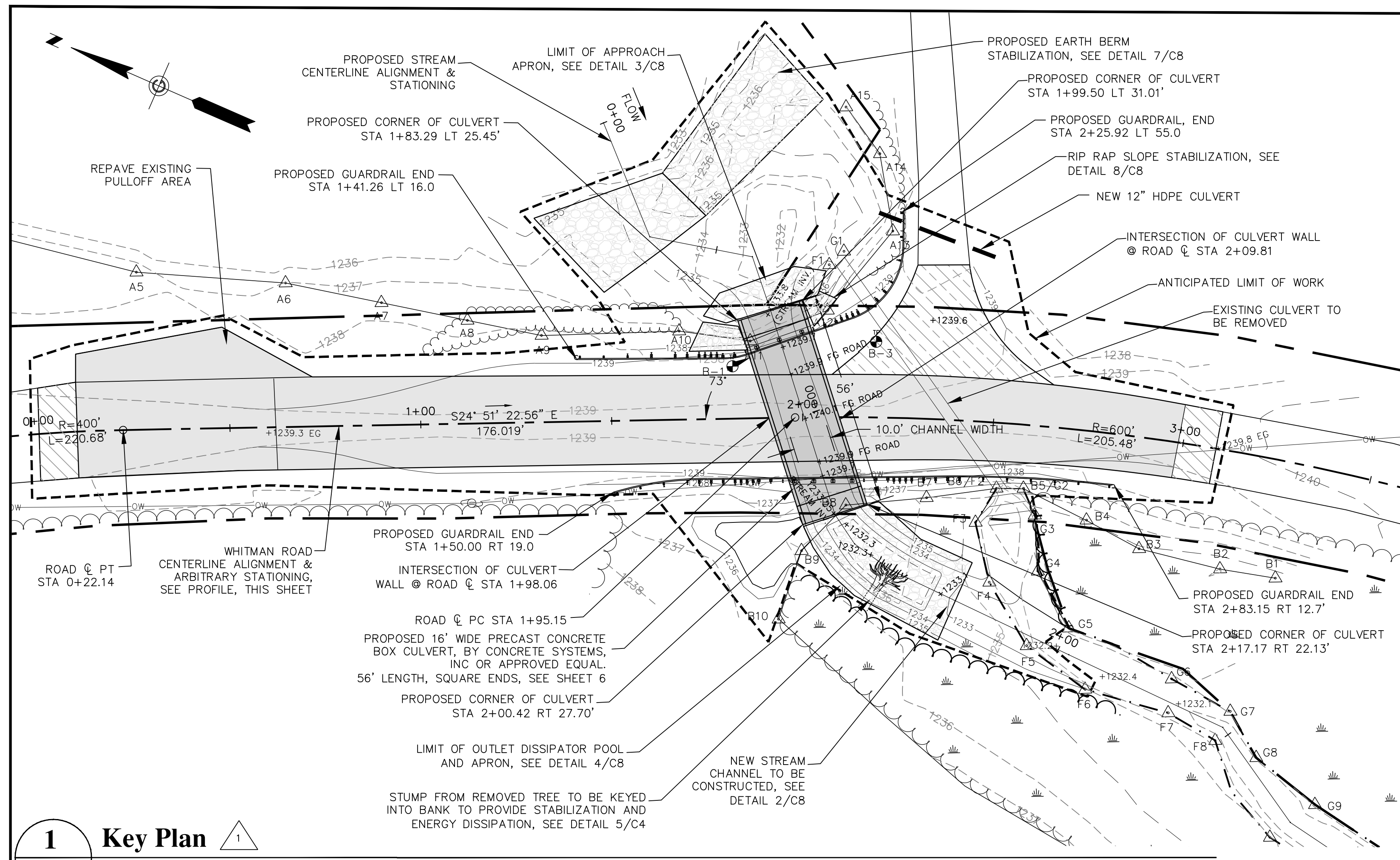


GUNTLOW & ASSOCIATES, INC.  
 ENGINEERS • SURVEYORS ARCHITECTS

55 NORTH STREET  
 WILLIAMSTOWN, MA. 01267  
 413-458-2198  
 413-458-2712 FAX

**Sheet Index**

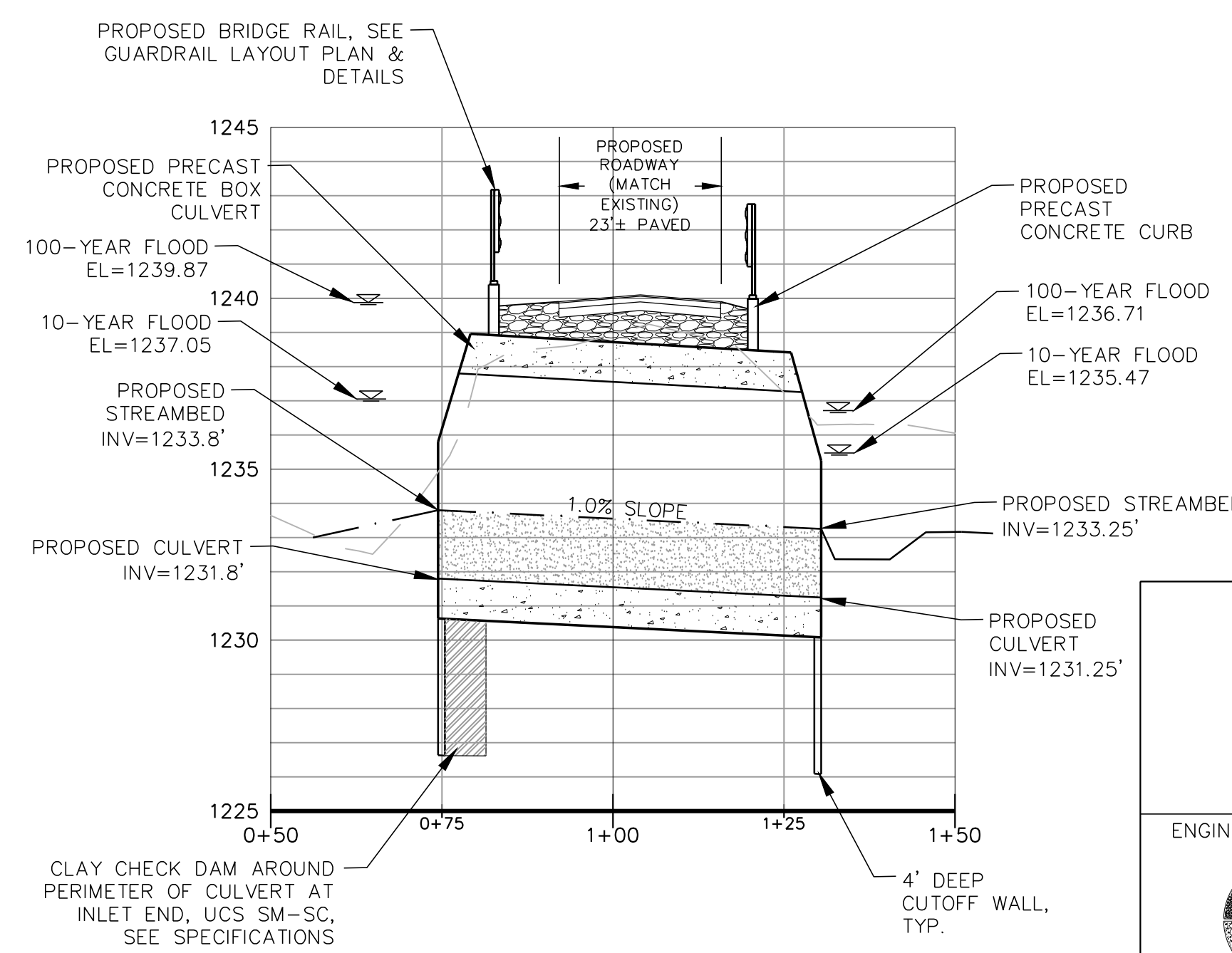
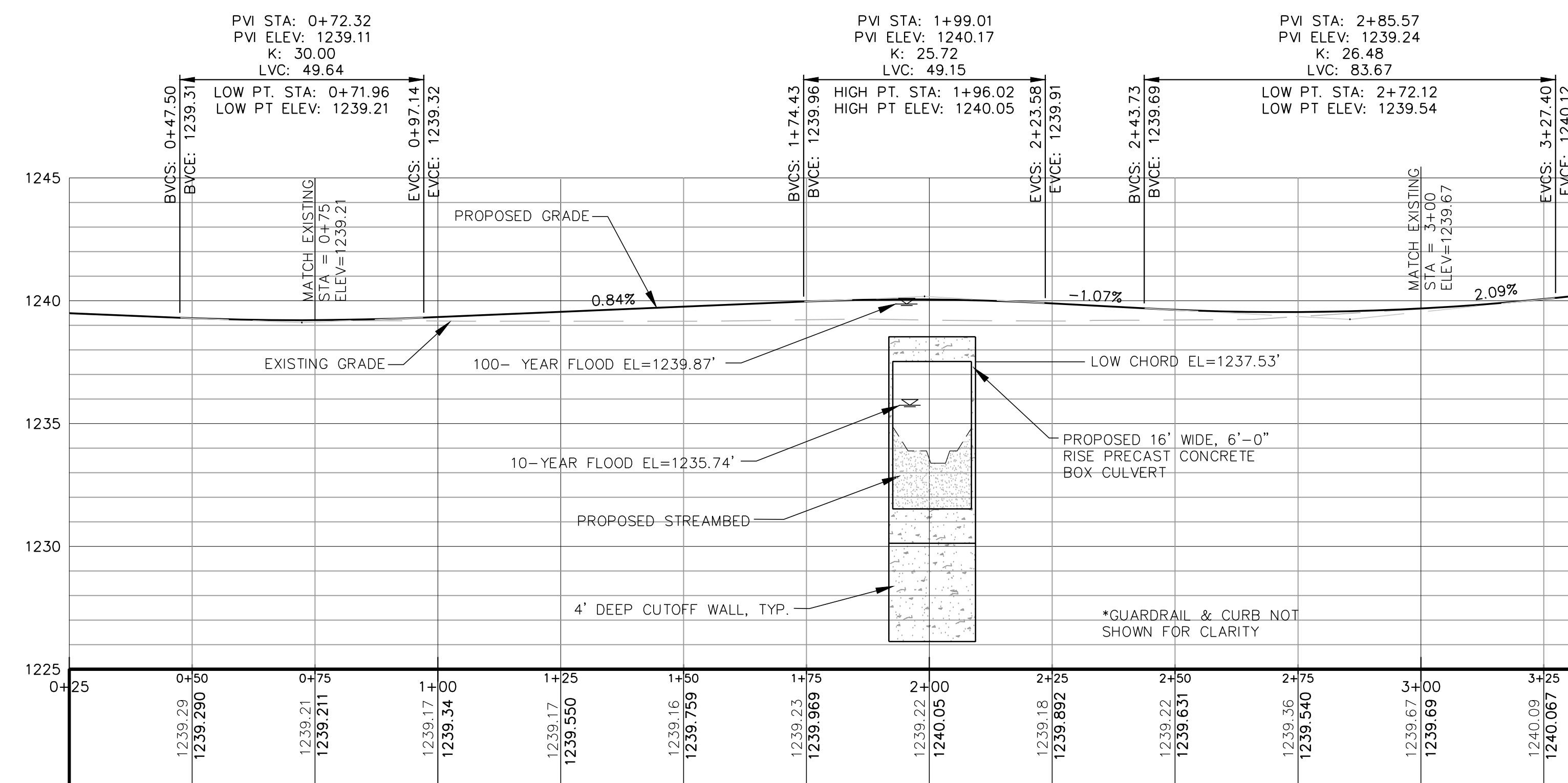
Sheet No.	Description
1	Title Sheet
2	General Notes
3	Boring Logs
4	Existing Condition/Preparation Plans
5	Proposed Conditions & Culvert Cross Sections
6	Box Culvert Layout & Design Parameters
7	Guardrail Details
8	Misc. Site Details
9	Misc. Site Plans
10	Traffic Management & Site Details



PROJECT INFORMATION	
PROJECT FILE NO.:	N/A
PROJECT DESCRIPTION:	WHITMAN ROAD CULVERT REPLACEMENT
BRIDGE DESIGN LOADING:	H-19.3
SURVEY BY:	GUNTLOW & ASSOCIATES, INC.
ELEVATION REFERENCE:	NAVD88
BENCH MARK:	CHRISNIK NAIL IN U-POLE #2, ELEV=1240.10

# Sheet Index

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### Chapter 85 Section 35 Review and Approval

IN ACCORDANCE AND COMPLIANCE WITH THE REQUIREMENTS OF CHAPTER 85 SECTION 35 OF THE MASSACHUSETTS GENERAL LAWS, THE CONTRACTOR SHALL SUBMIT TO THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION ALL CONSTRUCTION DRAWINGS AND DESIGN CALCULATIONS THAT SHALL BE USED TO FABRICATE AND CONSTRUCT THE STRUCTURE DENOTED ON THESE PLANS FOR REVIEW AND APPROVAL. THIS APPROVAL SHALL CONSTITUTE THE FINAL APPROVAL AS STIPULATED BY CHAPTER 85 SECTION 35 OF THE MASSACHUSETTS GENERAL LAWS.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ADEQUACY AND ACCURACY THEREOF AND SHALL NOT COMMENCE ANY FABRICATION UNTIL THEY HAVE MADE THE REQUIRED MEASUREMENTS ON THE ACTUAL STRUCTURE AND THE SUBMITTED SHOP DRAWINGS HAVE BEEN APPROVED BY THE ENGINEER. SHOP DRAWINGS SHALL STATE THAT THE EXISTING DIMENSIONS, ANGLES, ELEVATIONS AND FIELD CONDITIONS HAVE BEEN FIELD VERIFIED BY THE CONTRACTOR.

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS REQUIRED FOR THE PROPER PERFORMANCE OF THE WORK. FIELD CONDITIONS MAY EXIST WHICH DEVIATE FROM THE TYPICAL AND THEORETICAL DIMENSIONS SHOWN ON THE PLANS. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR FABRICATION AND FIT OF THEIR WORK.

COMMONWEALTH OF MASSACHUSETTS  
MassDOT, Highway Division  
**CONCEPTUAL DESIGN IS ACCEPTABLE TO MASSDOT FOR CONTRACTING**  
STATE BRIDGE ENGINEER \_\_\_\_\_ DATE \_\_\_\_\_

APRIL 8, 2026	REVISION #1-ADDENDUM #1
MARCH 13, 2026	ISSUED FOR BRIDGE DIVISION REVIEW

ENGINEER OF RECORD  
  
GUNTLOW & ASSOCIATES, INC.  
ENGINEERS • SURVEYORS • ARCHITECTS  
55 NORTH STREET  
WILLIAMSTOWN, MA 01267  
413-458-2198  
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PROPOSED CULVERT  
HANCOCK  
WHITMAN ROAD  
OVER KINDERHOOK CREEK  
MASSACHUSETTS DEPARTMENT OF TRANSPORTATION  
HIGHWAY DIVISION  
10 PARK PLAZA BOSTON, MASS  
STATE BRIDGE ENGINEER \_\_\_\_\_ CHIEF ENGINEER \_\_\_\_\_

## General Notes

1. TOPOGRAPHICAL BASE PLAN PREPARED FROM LAND SURVEY PERFORMED BY GUNTLOW & ASSOCIATES, INC. IN NOVEMBER 2024 AND GPS INFORMATION. THE DATUM IS MASSACHUSETTS STATE PLANE AND NAVD 1988.
2. WORK SHALL NOT PROCEED WITHOUT WRITTEN APPROVAL FROM THE TOWN OF HANCOCK.
3. LOCATIONS OF UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY, BASED ONLY ON AVAILABLE RECORD DATA. ADDITIONAL UTILITIES MAY EXIST. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL CALL "DIG SAFE" AT 811 AND HAVE ALL UTILITIES MARKED ON THE GROUND. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY HIS/HER FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES. WORK SHALL NOT PROCEED WITHOUT WRITTEN APPROVAL FROM THE TOWN OF HANCOCK.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR A THOROUGH SITE EXAMINATION TO DETERMINE THE EXTENT OF DEMOLITION NECESSARY TO PREPARE THE SITE FOR CONSTRUCTION AND SHALL VERIFY ALL ITEMS TO BE DEMOLISHED OR SALVAGED WITH THE CONTRACTOR PRIOR TO BEGINNING WORK. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE FIELD.
5. CARE SHALL BE TAKEN NOT TO DAMAGE ANY ITEMS DESIGNATED TO REMAIN; REPAIR OR REPLACEMENT OF DAMAGED ITEMS DESIGNATED TO REMAIN SHALL BE AT THE CONTRACTORS' EXPENSE.
6. THE CONTRACTOR SHALL PROTECT EXISTING TREES TO REMAIN WITH WOOD BOARD TRUNK PROTECTION AND SNOW FENCING.
7. THE CONTRACTOR SHALL COORDINATE ALL CONSTRUCTION ACTIVITIES WITH THE ENGINEER, OWNER AND TOWN AS APPLICABLE. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE FIELD.
8. EROSION CONTROL MEASURES SHALL CONFORM TO THE DETAILS AND NOTES RELATING TO EROSION CONTROL.
9. PURSUANT TO MASSACHUSETTS GENERAL LAWS, CHAPTER 82A, THE CONTRACTOR WILL BE RESPONSIBLE FOR OBTAINING THE NECESSARY TRENCH EXCAVATION PERMIT FROM THE TOWN OF HANCOCK IF APPLICABLE. ALL TRENCH RELATED WORK SHALL BE IN CONFORMANCE TO THE APPLICABLE SECTIONS OF MASSACHUSETTS GENERAL LAW.
10. CONTRACTOR TO COORDINATE LOCATION AND SIZE OF STAGING AND LAY DOWN AREAS ON SITE WITH OWNER AND APPLICANT.
11. CONTRACTOR TO MAINTAIN NORMAL WORK HOURS BETWEEN 7AM AND 5PM OR AS SET FORTH BY THE TOWN OF HANCOCK.
12. RETURN ALL DISTURBED AREAS TO ORIGINAL OR BETTER CONDITION. FINE GRADE, SEED AND MULCH OR FINISH AS SHOWN ON THE PLANS, ALL DISTURBED AREAS.
13. ALL BACKFILL SHALL BE COMPACTED TO AT LEAST 95% OF THE OPTIMUM DENSITY AS MEASURED BY THE MODIFIED PROCTOR PROCEDURE.
14. IF THERE ARE REVISIONS TO APPROVED PLANS, THE CONTRACTOR SHALL SUBMIT THESE CHANGES TO THE ENGINEER OF RECORD AND MASSDOT FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.

## Erosion Control Requirements

1. NO VEGETATION SHALL BE CLEARED FROM THE WORK AREA UNTIL IMMEDIATELY PRIOR TO COMMENCEMENT OF WORK TO AVOID UNNECESSARY EROSION.
2. APPROPRIATE EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO AND DURING THE PHASES OF CONSTRUCTION TO ADEQUATELY PREVENT SEDIMENT FROM LEAVING THE WORK SITE.
3. ALL WORK IN AREAS SUBJECT TO EROSION SHALL BE PERFORMED IN A TIMELY MANNER AFFECTING AS SMALL AN AREA AS THE WORK ALLOWS.
4. AREAS TYPICALLY REQUIRING EROSION CONTROL MEASURES INCLUDE: THE TOE OF THE EXCAVATIONS, SLOPES, FILLS AND STOCKPILES, CHECK DAMS IN DRAINAGE SWALES, DITCHES, ETC., AND SILTATION BARRIERS AROUND STORM DRAIN INLET STRUCTURES.
5. SILTATION BASINS SHALL BE CONSTRUCTED FOR THE PURPOSE OF SETTLING OUT SEDIMENT IN ANY DE-WATERING DISCHARGE.
6. SHOULD PRESENT EROSION CONTROL MEASURES BE JUDGED INADEQUATE, ADDITIONAL MEASURES SHALL BE INCORPORATED AS DIRECTED BY THE ENGINEER.
7. THE AREAS OF CONSTRUCTION SHALL REMAIN IN A STABLE CONDITION AT THE CLOSE OF EACH CONSTRUCTION DAY. EROSION AND SEDIMENT CONTROL DEVICES SHALL BE INSPECTED AFTER EACH STORM EVENT AND REPAIRED OR REPLACED AS NECESSARY. ANY ACCUMULATED SILT ADJACENT TO EROSION BARRIERS SHALL BE REMOVED.
8. AN ADDITIONAL STOCKPILE OF EROSION CONTROL MATERIALS IS TO BE STORED ON-SITE IN AN AREA THAT ALLOWS RETRIEVING EROSION CONTROL MATERIALS READILY OBTAINABLE. THE AMOUNT OF STORED EROSION CONTROL MATERIALS IS NOT TO BE LESS THAN 15% OF MATERIALS USED FOR THE ENTIRE PROJECT. STORED MATERIALS ARE TO BE MADE UP OF SIMILAR MATERIALS USED DURING INITIAL INSTALLATION.
9. ALL EQUIPMENT ON THE PROJECT WILL BE MAINTAINED IN A CLEAN AND WELL-FUNCTIONING STATE TO AVOID OR MINIMIZE CONTAMINATION FROM AUTOMOTIVE FLUIDS. ALL EQUIPMENT SHALL BE CHECKED DAILY FOR LEAKS. ANY LEAKING HYDRAULIC LINES, CYLINDERS, OR ANY OTHER COMPONENTS SHALL BE REPAIRED IMMEDIATELY. EQUIPMENT TRAFFIC ON SITE SHALL BE MINIMIZED INsofar AS POSSIBLE.
10. ALL DISTURBED AREAS WILL BE SEEDED AND MULCHED UPON COMPLETION OF WORK.
11. WORK SHALL CONFORM TO THE CONDITIONS AND APPROVED PLANS OF THE HANCOCK CONSERVATION COMMISSION.

## Sequence of Construction:

1. PRIOR TO BEGINNING CONSTRUCTION, EROSION CONTROL BARRIERS SHALL BE INSTALLED DOWNGRADIENT OF WORK AREAS, SLOPES, AS SHOWN ON, BUT NOT LIMITED TO THIS PLAN.
2. EROSION CONTROL SHALL CONSIST OF SILT SOCK TYPE BARRIERS STAKED AS SHOWN ON DETAIL. AN ADDITIONAL STOCKPILE OF EROSION CONTROL MATERIALS IS TO BE STORED ON-SITE IN AN AREA THAT ALLOWS RETRIEVING EROSION CONTROL MATERIALS READILY OBTAINABLE. THE AMOUNT OF STORED EROSION CONTROL MATERIALS IS NOT TO BE LESS THAN 15% OF MATERIALS USED FOR THE ENTIRE PROJECT. STORED MATERIALS ARE TO BE MADE UP OF SIMILAR MATERIALS USED DURING INITIAL PRODUCTION. ADDITIONAL EROSION CONTROL MEASURES SHALL BE INSTALLED, AS REQUIRED BY THE SITE CONDITIONS AND/OR ENGINEER. THE CONTRACTOR WILL INFORM ALL WORKERS ABOUT THE PROVISIONS OF THE EROSION AND SEDIMENT CONTROL PLAN AND SEEK THEIR COOPERATION IN AVOIDING THE DISTURBANCE OF THESE CONTROL MEASURES. ALL EROSION CONTROL AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED AND REPAIRED AT THE END OF EACH WORKING DAY AND AFTER EACH STORM EVENT.
3. APPROPRIATE TRAFFIC CONTROL BARRIERS SHALL BE INSTALLED AT BOTH ENDS OF ROAD DURING HOURS OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE A TRAFFIC MANAGEMENT PLAN TO THE OWNER, FIRE CHIEF AND ENGINEER FOR APPROVAL PRIOR TO IMPLEMENTATION. IT IS ANTICIPATED THE ROAD WILL BE CLOSED EACH SIDE OF THE MAIN WORK AREA FOR A DURATION OF TIME.
4. ADJACENT STREETS AND PAVED SITE AREAS SHALL BE KEPT FREE FROM DIRT BY SWEEPING, AS REQUIRED, TO PREVENT/REDUCE TRACKING OR DUST OFFSITE FROM CONSTRUCTION VEHICLES AND ACTIVITIES.
5. INSTALL PHASE 1 SAND BAG COFFER DAMS TO DEWATER THE WORK AREA.
6. CLEAR AND GRUB AS SHOWN ON THE PLANS. SAVE TREE BUTT LOGS WITH ROOT BALLS FOR STREAM BANK CONSTRUCTION.
7. EXCAVATE AND PREPARE FOR THE NEW CULVERT INSTALLATION.
8. INSTALL NEW CULVERT TOEWALL, SECTIONS, AND WINGWALLS.
9. IF CULVERT IS A "TOP LID" STYLE, INSTALL NEW STREAM CROSS SECTION WITHIN THE CULVERT AT THIS TIME AND THEN INSTALL TOP LIDS TO COMPLETE CULVERT INSTALLATION.
10. BACKFILL CULVERT SECTIONS AS REQUIRED.
11. CONSTRUCT NEW DOWNSTREAM CONNECTION FROM CULVERT TO EXISTING STREAM AND RELATED WETLAND MITIGATION AREA.
12. CONSTRUCT NEW UPSTREAM CONNECTION FROM CULVERT TO POND.
13. REMOVE ADJACENT ROADWAY AREAS TO BE REPLACED AS A PART OF THIS PROJECT.
14. PARTIALLY REMOVE SANDBAG COFFER DAM TO ALLOW WATER TO FLOW IN NEW STREAM CHANNEL. SLOWLY. ONCE STREAM FLOW IS STABILIZED, REMOVE PHASE 1 COFFER DAM AND START TO INSTALL PHASE 2 COFFER DAM IN FRONT OF EXISTING CULVERT.
15. EXCAVATE AND REMOVE EXISTING CULVERT, BACKFILL, COMPACT SOIL AND GRAVEL TO PROPOSED PAVEMENT SUBGRADE.
16. INSTALL GRAVEL BASE AND THE PAVEMENT BINDER COURSE AS SOON AS PRACTICAL TO FURTHER REDUCE EROSION POTENTIAL.
17. INSTALL REQUIRED PLANTINGS FOR RIVER AND WETLAND RESTORATION.
18. INSTALL GUARD RAILS WHERE SHOWN ON THE PLANS.
19. INSTALL TOP COURSE PAVING AND STRIPING.
20. REMOVE EROSION CONTROL MEASURES ONCE VEGETATION HAS BEEN ADEQUATELY ESTABLISHED AND INSPECTED AND APPROVED BY ENGINEER AND CONSERVATION COMMISSION.

## Box Culvert Specifications

1. SHAPE: THE SECTION IS A FOUR SIDED BOX SECTION WITH OPEN ENDS TO BE MONOLITHICALLY CAST OF REINFORCED CONCRETE. THE INSIDE SURFACES SHALL BE SMOOTH SO AS NOT TO RESTRICT FLOW THROUGH THE COMPLETED INSTALLATION. CHAMFERED 45° FILLETS (EITHER 8" OR 12") SHALL BE MONOLITHICALLY CAST IN ALL FOUR INSIDE CORNERS.
2. SIZE: INTERNAL DIMENSIONS OF 16'-0" WIDE BY 6' HIGH AND 55'-11 1/2" IN TOTAL LENGTH WITH TAPERED END SECTIONS. THE ROOF AND FLOOR THICKNESS SHALL BE 14", AND THE SIDEWALL SHALL BE 10" MIN OR AS REQUIRED TO PROVIDE NECESSARY DESIGN LOAD NEEDS. ALL ROOF SLAB REINFORCEMENT SHALL BE EPOXY COATED.
3. CULVERT JOINT: EACH JOINT SECTION SHALL HAVE A MALE AND FEMALE END WITH NOT LESS THAN 1'-1/2" OVERLAP. EACH SECTION SHALL HAVE ONE PREPLACED 1" DIAMETER NEOPRENE GASKET CEMENTED TO JOINT SURFACE.
4. SUBMITTAL: SHOP DRAWINGS AND CALCULATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL SHOWING REINFORCEMENT SIZE AND LOCATION. DRAWINGS SHALL BE STAMPED BY A MASSACHUSETTS REGISTERED PROFESSIONAL ENGINEER AND ACCOMPANIED BY DESIGN CALCULATIONS. SUBMIT THREE (3) SETS WITH A CERTIFICATE OF DESIGN STATING THAT THE DESIGN MEETS THE LOADING REQUIREMENTS FOR THE PROPOSED PROJECT. THE CALCULATIONS SHALL BE PREPARED IN ACCORDANCE WITH THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION (AASHTO) OFFICIALS LRFD BRIDGE DESIGN SPECIFICATIONS, 10TH EDITION, 2024; FOR HL-93 LOADING, AND THE MASSACHUSETTS DEPARTMENT OF TRANSPORTION BRIDGE MANUAL. DESIGN COMPUTATIONS SHALL BE IN ENGLISH UNITS AND SHALL CONSIDER ALL LOADING AS APPROPRIATE DURING FABRICATION, SHIPMENT, ERECTION, CONSTRUCTION, AND AFTER COMPLETION OF CONSTRUCTION BASED UPON THESE CONSTRUCTION DRAWINGS.
5. INSPECTION: THE QUALITY OF MATERIALS, THE PROCESS OF MANUFACTURE, AND THE FINISHED BOX SECTIONS SHALL BE SUBJECT TO INSPECTION BY THE ENGINEER AND PURCHASER.
6. DELIVERY: THE BOX CULVERT SUPPLIER SHALL PROVIDE DELIVERY OF THE BOX CULVERT SECTIONS, TOE WALLS AND THE WINGWALLS TO THE JOB SITE. THE DELIVERY OF THE PRODUCTS SHALL BE COORDINATED WITH THE OWNER AND CONTRACTOR. THE CONTRACTOR SHALL PROVIDE A CRANE FOR THE UNLOADING AND SETTING OF THE PRECAST PRODUCTS. THE BOX CULVERT SUPPLIER SHALL PROVIDE THE USE OF ANY REQUIRED YOLK, SLINGS, CABLES, LIFTING ANCHORS, ETC. REQUIRED FOR UNLOADING AND SETTING.
7. DESIGN CRITERIA:  
DESIGN SPECIFICATION: AASHTO HL-93 LOAD FACTOR DESIGN METHOD  
DESIGN SPEED: 25 MPH  
MATERIAL PROPERTIES: STEEL REINFORCEMENT - ASTM A615, GRADE 60  
EPOXY COATED STEEL REINFORCEMENT - ASTM A775 (FOR ROOF SLAB AND HEADWALLS)  
CONCRETE MINIMUM COMPRESSIVE STRENGTH - 5000 PSI @ 28 DAYS  
2" MINIMUM COVER OVER ALL REINFORCEMENT  
4 - 8% ENTRAINED AIR  
SOIL DATA: UNIT WEIGHT - 120 LB/FT<sup>3</sup>  
RATIO OF LATERAL TO VERTICAL PRESSURE - 0.33  
EXTERNAL WATER TABLE - AT 3' ABOVE BOX INVERT  
SOIL BEARING CAPACITY - 2000 PSF  
LOADING DATA: LOAD FACTOR: AASHTO "LRFD BRIDGE DESIGN SPECIFICATIONS"  
HIGHWAY / TRUCK AXLE LOAD RATING - AASHTO HL-93  
EARTH COVER - 0 MINIMUM, 2' MAXIMUM
8. TOLERANCES:  
A. INTERNAL DIMENSIONS: SPAN=16'-0" ±1/2"  
RISE= 6'-0" ±1/2"  
B. WALL THICKNESS= ± 1/4"  
C. ROOF AND BASE THICKNESS= ± 1/2"  
D. VARIATION OF LAYING LENGTHS OF OPPOSITE SURFACES NOT TO BE MORE THAN 1/2"  
E. LENGTH OF SECTION: ± 1/2"  
F. VARIATIONS IN THE REQUIRED SPACING OF THE REINFORCEMENT STEEL SHALL NOT BE MORE THAN 2" AND ARE NOT CUMULATIVE  
G. REINFORCEMENT COVER + 1/4", -0"
9. DATE: THE DATE SHALL BE PLACED ON THE ENDS OF THE TWO TOP SLAP END SECTIONS. A SHEET SHOWING SIZE AND CHARACTER OF NUMERALS WILL BE FURNISHED. THE DATE USED SHALL BE THE LATEST YEAR OF CONTRACT COMPLETION.

## Construction in Wetlands, Resource Areas and Buffer Zones

1. REGULATED WETLANDS AND BUFFER ZONES ARE AS DEFINED BY M.G.L. CH. 131, SEC. 40 WETLANDS PROTECTION ACT AND AS SHOWN ON THE PLANS.
2. AS SHOWN ON THE PLANS, SEDIMENT CONTROL BARRIERS SHALL BE INSTALLED PRIOR TO BEGINNING OF CONSTRUCTION AND MAINTAINED THROUGH COMPLETION, OR UNTIL VEGETATION HAS STABILIZED DISTURBED AREAS AND REMOVAL OF SUCH BARRIERS IS APPROVED BY THE ENGINEER OR LANDSCAPE ARCHITECT.
3. ALL EXCAVATED SOILS TO BE REMOVED FROM THE WORK SITE SHALL BE CAST AWAY FROM THE WETLANDS, WETLAND RESOURCE AREAS, AND/OR BUFFER ZONE.
4. UNLESS OTHERWISE NOTED ON THE PLANS, ORIGINAL GRADE SHALL BE RESTORED UPON COMPLETION OF THE WORK.
5. ALL DISTURBED AREAS SHALL BE FINISHED GRADED, LOAMED AND SEEDED WITHIN ONE WEEK OF FINAL GRADING.
6. ANY TEMPORARY CULVERTS, SWALES, DITCHES, ETC. CONSTRUCTED TO DIVERT FLOW OR RUNOFF SHALL NOT CAUSE NOTICEABLE SILTATION OR EROSION TO OCCUR. SHOULD SILTATION OCCUR, WORK SHALL STOP AND ADDITIONAL EROSION CONTROL MEASURES SHALL BE INSTALLED.
7. ONLY TEMPORARY STOCKPILING OF ERODIBLE MATERIALS WITHIN THE RIVERFRONT AREA OR BUFFER ZONE IS ALLOWED, OR WITHIN APPROVED DESIGNATED AREAS IF NECESSARY.
8. ACCUMULATED SEDIMENT BEHIND BARRIERS SHALL BE REMOVED AND DISPOSED OUTSIDE OF THE WETLAND, WETLAND RESOURCE AREA, AND BUFFER ZONE.
9. THERE SHALL BE NO TRANSFER AND/OR STORAGE OF FUEL WITHIN THE WETLAND AND BUFFER ZONE, OR WITHIN 100' OF WETLAND RESOURCE AREAS, UNLESS OTHERWISE APPROVED.
10. NO EQUIPMENT SHALL BE PARKED WITHIN THE WETLANDS OR WITHIN 100' OF RESOURCE AREAS OTHER THAN DURING CONSTRUCTION OPERATIONS.
11. WHEN CONSTRUCTION IS REQUIRED ACROSS A WETLAND IT SHALL BE SCHEDULED WHEN PRECIPITATION IS NOT FORECAST AND GROUNDWATER IS LOW.
12. NOTIFY THE CONSERVATION COMMISSION AT LEAST 48 HOURS PRIOR TO STARTING CONSTRUCTION.
13. WETLAND DELINEATIONS PERFORMED IN THE FIELD BY GUNTLOW & ASSOCIATES, INC. IN SPRING 2024.
14. COMPLIANCE BY THE CONTRACTOR WITH THESE PLANS, SPECIFICATIONS, PERMITS IS REQUIRED. THE "ORDER OF CONDITIONS" SHALL BE CONSIDERED PART OF THE SPECIFICATIONS OF THIS PROJECT.
15. ALL WORK SHALL BE PERFORMED "IN THE DRY". INSTALL AND MAINTAIN COFFER DAMS EACH END OF WORK. AFTER OPENING NEW STREAM TO FLOW, INSTALL PHASE 2 UPSTREAM COFFER DAM AND ALLOW STREAM TO DEWATER BEFORE INSTALLING DOWNSTREAM COFFER DAM.
16. WATER QUALITY IN THE RIVER SHOULD BE OF HIGHEST PRIORITY. GREAT CARE SHOULD BE TAKEN TO PROTECT THE ADJACENT RESOURCE AREAS FROM SILTATION AND SEDIMENTATION
17. WHEN DEEMED STABLE, ALL EROSION AND SEDIMENTATION CONTROLS SHALL BE REMOVED AND PROPERLY DISPOSED OF UPON COMPLETION OF THE PROJECT

SEISMIC DESIGN CRITERIA	
DESIGN RETURN PERIOD:	2,475
SD1	0.184
SD2	0.109
SITE CLASS	D
SEISMIC DESIGN CATEGORY (SDC)	B

HYDRAULIC DESIGN FLOOD (HDF) DATA	
DRAINAGE AREA (SQ. MILES)	1.68
HDF DISCHARGE (C.F.S.)	219
HDF FREQUENCY (YEARS)	10
HDF VELOCITY (F.P.S.)	1.54
HDF ELEVATION (FEET, NAVD, UPSTREAM)	1237.06
BASE (100-YEAR) FLOOD DATA	
BASE FLOOD DISCHARGE (C.F.S.)	611
BASE FLOOD ELEVATION (FEET, NAVD, UPSTREAM)	1239.87
SCOUR DESIGN FLOOD (SDF) EVENT DATA	
SDF EVENT FREQUENCY (YEARS)	25
SDF TOTAL SCOUR DEPTH AT ABUTMENT (FEET)	4.85
SCOUR CHECK FLOOD (SCF) EVENT DATA	
SCF EVENT FREQUENCY (YEARS)	50
SCF TOTAL SCOUR DEPTH (FEET)	5.48
FLOOD OF RECORD	
DISCHARGE (C.F.S.)	N/A
FREQUENCY (IF KNOWN, YEARS)	N/A
MAXIMUM ELEVATION (FEET, NAVD)	N/A
DATE (MM/YYYY)	N/A
HISTORY OF ICE FLOES	N/A
EVIDENCE OF SCOUR AND EROSION	N/A

COMMONWEALTH OF MASSACHUSETTS	
MossDOT, Highway Division	
<b>CONCEPTUAL DESIGN IS ACCEPTABLE TO MASSDOT FOR CONTRACTING</b>	
STATE BRIDGE ENGINEER	DATE

## Hydraulic Design Summary:

1. DESIGN FLOWS FOR THE CULVERT ARE BASED ON NRCS TR-55 METHOD AND USING 24HR RAINFALL DATA FOR THE SITE FROM EXTREME PRECIPITATION DATA BY CORNELL UNIVERSITY.
2. DESIGN FLOWS ARE AS FOLLOWS:  
2YR - 89 CFS  
10YR - 219 CFS  
25YR - 340 CFS  
50YR - 460 CFS  
100YR - 611 CFS
3. USING INLET CONTROL NOMOGRAPH CHART 8B FOR CONCRETE BOX CULVERTS ADAPTED BY BUREAU OF PUBLIC ROADS, JAN 1963, THE FOLLOWING HEADWATER DEPTHS AND CAPACITIES WERE CALCULATED FOR A 16' WIDE CULVERT WITH INTERIOR HEIGHT OF BOX (D) = 3.8' (AVERAGE WITH NATURAL STREAM SUBSTRATE IN PLACE):  
A. 10 YR, 219 CFS, RESULTING IN Hw/D=0.73, THEREFORE Hw=2.77' AT INLET.  
B. 25 YR, 340 CFS, RESULTING IN Hw/D=1.04, THEREFORE Hw=3.95' AT INLET.  
C. MAXIMUM CAPACITY AT THE INSTALLATION SITE BASED ON A MAXIMUM Hw/D=1.4 BEFORE ROAD OVERTOPS RESULTS IN CULVERT CAPACITY OF 520 CFS.

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SHEET 2 OF 10 SHEETS BRIDGE NO. H-05-016 (CY3)	

Boring #1

PROJECT NAME: New Box Culvert										FILE NO.: 2474									
BORING NO.: B-1										CASING SAMPLER CORE BARREL									
CLIENT: Guntlow & Associates										TYPE: HSA SS									
SITE LOCATION: Whitman Rd, Hancock, MA 01267										SIZE I.D.: 4.25" 1.375"									
BORING LOCATION: See Location Diagram										HAMMER W.T.: 140#									
SURFACE ELEVATION: See Location Diagram										HAMMER FALL: 30"									
DEPTH	NO.	DEPTH RANGE	SAMPLE BLOWS PER 6" ON SAMPLER				REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS									
			0-6	6-12	12-18	18-24													
5	S-1	0.0' - 2.0'	10	11	10	9	1.4'		Brown/grey, moist, medium dense, Sand, little Gravel, trace Silt, SP, native with rock fragments. Similar except wet.										
	S-2	2.0' - 4.0'	6	17	9	5	1.2'	4'											
	S-3	4.0' - 6.0'	6	5	2	4	0.8'		Grey/brown, wet, loose, Sand, some Gravel, trace Silt and Clay, SM with rock fragments.										
	S-4	6.0' - 8.0'	3	3	2	3	0.6'	9'											
10	S-5	10.0' - 12.0'	3	5	4	4	0.8'		Silver/grey, wet, loose, very fine Sand and Silt, little Gravel and Clay, silky texture, SM, with rock fragments.										
15	S-6	15.0' - 17.0'	3	5	7	6	0.9'	18'	Similar.										
20	S-7	20.0' - 22.0'	4	9	9	11	1.5'	24'	Grey/brown, wet, medium dense, Sand, little Silt, trace Gravel, SM.										
25	S-8	25.0' - 27.0'	6	13	14	18	1.4'	29'	Grey/brown, wet, medium dense, nonplastic Silt, some Sand, trace Gravel and Clay, ML.										
30	S-9	30.0' - 32.0'	9	12	19	25	1.6'	32'	Grey, wet, dense, Sand and Silt, trace Gravel, SM.										
									End of boring at 32 feet.										

BOTTOM OF PROPOSED CULVERT ELEV=1230.63

BOTTOM OF PROPOSED CUTOFF WALL ELEV=1226.63

Boring #3

PROJECT NAME: New Box Culvert										FILE NO.: 2474									
BORING NO.: B-3										CASING SAMPLER CORE BARREL									
CLIENT: Guntlow & Associates										TYPE: HSA SS									
SITE LOCATION: Whitman Rd, Hancock, MA 01267										SIZE I.D.: 4.25" 1.375"									
BORING LOCATION: See Location Diagram										HAMMER W.T.: 140#									
SURFACE ELEVATION: See Location Diagram										HAMMER FALL: 30"									
DEPTH	NO.	DEPTH RANGE	SAMPLE BLOWS PER 6" ON SAMPLER				REC.	COL. A	STRATA CHANGE	FIELD CLASSIFICATION AND REMARKS									
			0-6	6-12	12-18	18-24													
5	S-1	0.0' - 2.0'	9	13	9	6	1.5'		Brown/grey, moist, medium dense, Sand, little Gravel, trace Silt, SP, native with rock fragments.										
	S-2	2.0' - 4.0'	6	6	5	5	1.0'	2'											
	S-3	4.0' - 6.0'	4	2	6	2	0.8'	4'	Brown/grey, wet at 3 feet, medium dense, nonplastic Silt and Sand, trace Gravel, ML.										
	S-4	6.0' - 8.0'	2	2	4	2	1.1'	6'	Grey, wet, loose, Sand, and Silt, trace Gravel, SM.										
10	S-5	10.0' - 12.0'	WOH	2	1	2	0.4'	9'	Grey, wet, soft, Silt, some Clay, trace Sand and Gravel, ML.										
15	S-6	15.0' - 17.0'	3	3	4	4	1.7'	13'	Grey, wet, loose, nonplastic Silt and Sand, trace Gravel, ML.										
20	S-7	20.0' - 22.0'	9	11	10	11	1.3'	18'	Grey, wet, medium dense, Sand, little Gravel and Silt, SM.										
25	S-8	25.0' - 26.0'	10	14	19	50/0.1'	1.3'		Similar.										
30	S-9	30.0' - 30.7	29	50/0.2'			0.3'	32'	Similar.										
									End of boring at 32 feet.										

BOTTOM OF PROPOSED CULVERT ELEV=1230.63

BOTTOM OF PROPOSED CUTOFF WALL ELEV=1226.63

GIFFORD ENGINEERING  
Geotechnical & Geoenvironmental Services

LABORATORY TEST RESULTS  
New Box Culvert  
Whitman Road, Hancock, MA 01267  
File No. 2474

COMMONWEALTH OF MASSACHUSETTS  
MassDOT, Highway Division  
CONCEPTUAL DESIGN IS ACCEPTABLE  
TO MASSDOT FOR CONTRACTING

STATE BRIDGE ENGINEER \_\_\_\_\_ DATE \_\_\_\_\_

Grain Size Distribution ASTM D 421, D 422 & D 1140

Size/Sieve	Percent Passing by Weight	Percent Passing by Weight
No. 4	B-1 47.4%	B-3 20'-22" 89.9%
No. 10	59.8%	78.3%
No. 20	47.7%	58.6%
No. 40	36.5%	42.1%
No. 100	24.6%	23.4%
No. 200	19.8%	17.3%
Natural Moisture	17.9%	15.4%

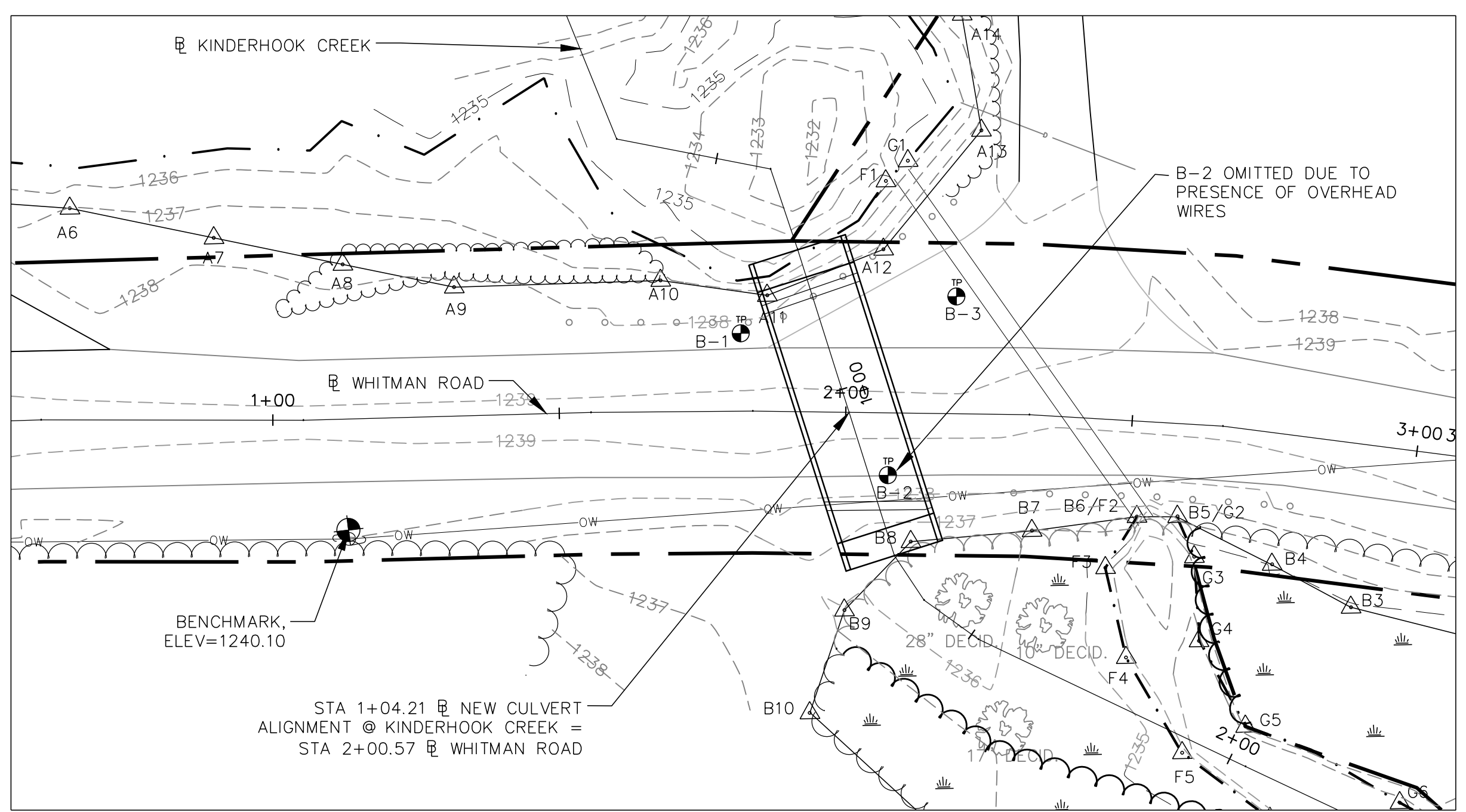
3 Lab Test Results  
C3 Not to Scale

Geotechnical Report Considerations:

- THE GEOTECH REPORT WAS PRODUCED BY GIFFORD ENGINEERING, MARCH 2026
- THE CULVERT FOUNDATION SUBGRADE SHOULD BE PROOF ROLLED WITH A MINIMUM 5-TON STATIC WEIGHT VIBRATORY ROLLER MAKING AT LEAST 6 PASSES. THE PROOF ROLL SHOULD BE OBSERVED BY THE GEOTECHNICAL ENGINEER WHO WILL JUDGE SUITABILITY OF THE SOILS FOR SUPPORT OF THE STRUCTURE. SEE GEOTECH REPORT FOR ALTERNATIVE STABILIZATION OF SUBGRADE IF CONDITIONS ARE SOFTER OR WETTER THAN ANTICIPATED.
  - SOIL BEARING CAPACITY: 2000 PSF. EARTHQUAKE SITE CLASS: D (SEE GEOTECH REPORT FOR DESIGN VALUES)
  - A LAYER OF PEAT WAS OBSERVED BETWEEN 6'-9' WITHIN BORING #3 OUTSIDE OF THE PROPOSED CULVERT ALIGNMENT. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER AT LEAST 48 HOURS IN ADVANCE TO HAVE THE ENGINEER PRESENT DURING EXCAVATION OF THE CULVERT SUBGRADE FOR REVIEW AND APPROVAL. THE SUBGRADE SHALL BE PROOF ROLLED WITH A MINIMUM 5 TON VIBRATORY ROLLER AT LEAST 6 PASSES. FOR BASE BID PURPOSES, THE CONTRACTOR SHALL ASSUME AN OVER-EXCAVATION OF SUBGRADE RESULTING IN 2' OF COMPACTED STRUCTURAL FILL BELOW THE CONCRETE CULVERT. ANY ADJUSTMENTS TO THIS BASE BID SCOPE AS REQUIRED BY THE ENGINEER IN THE FIELD SHALL BE MODIFIED TO THE CONTRACT BY CHANGE ORDER USING SUPPLEMENTAL UNIT PRICES.

1 Boring Log, Boring #1  
C3 Not to Scale

2 Boring Log, Boring #3  
C3 Not to Scale

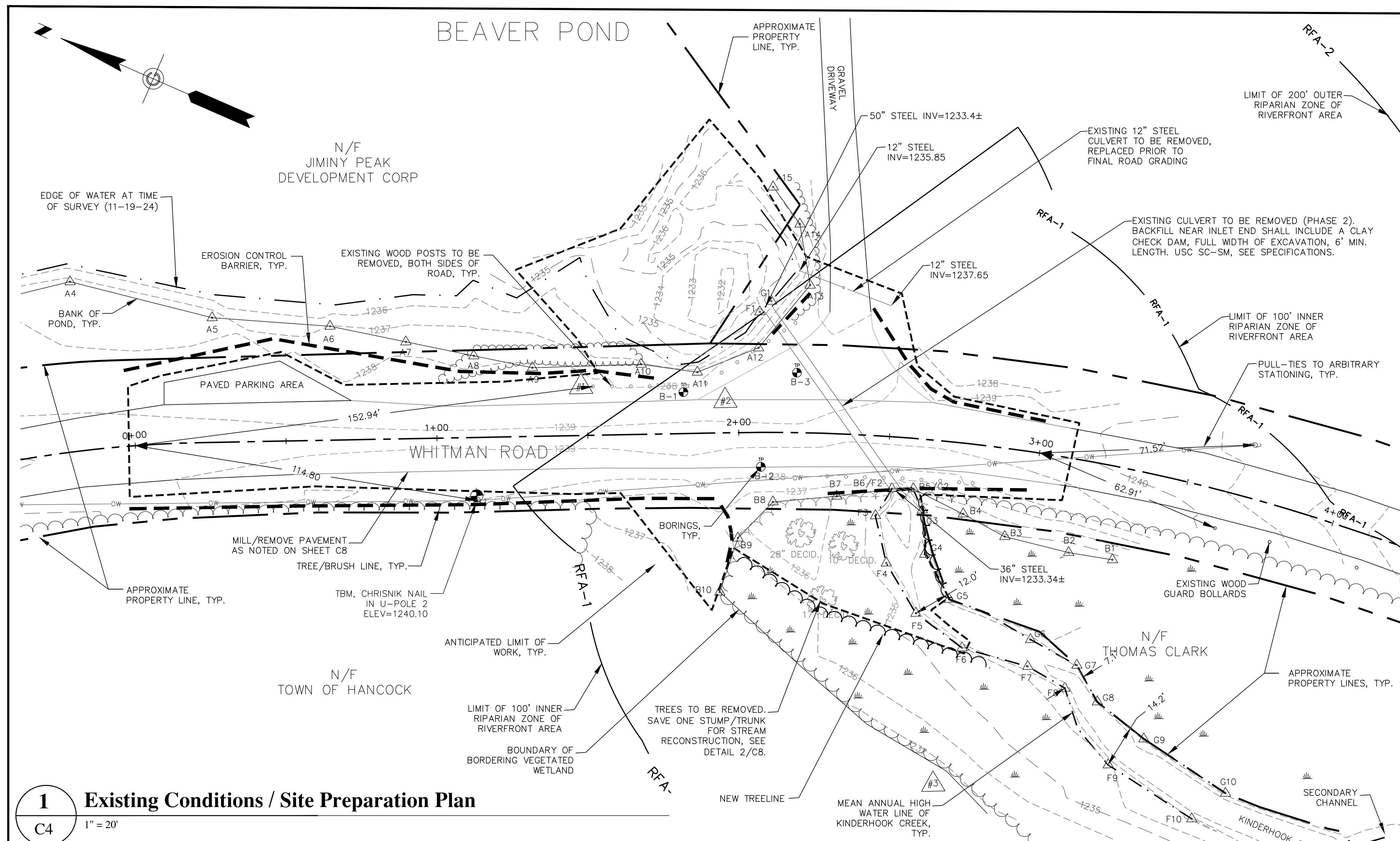


BORING LOCATIONS (FEET)					
BORING	NORTHING	EASTING	STATION	OFFSET	SURFACE ELEV.
1	3040453.1527	172119.5301	1+81	14' LT	1238.2
3	3040421.3234	172140.5833	2+19	20' LT	1238.6

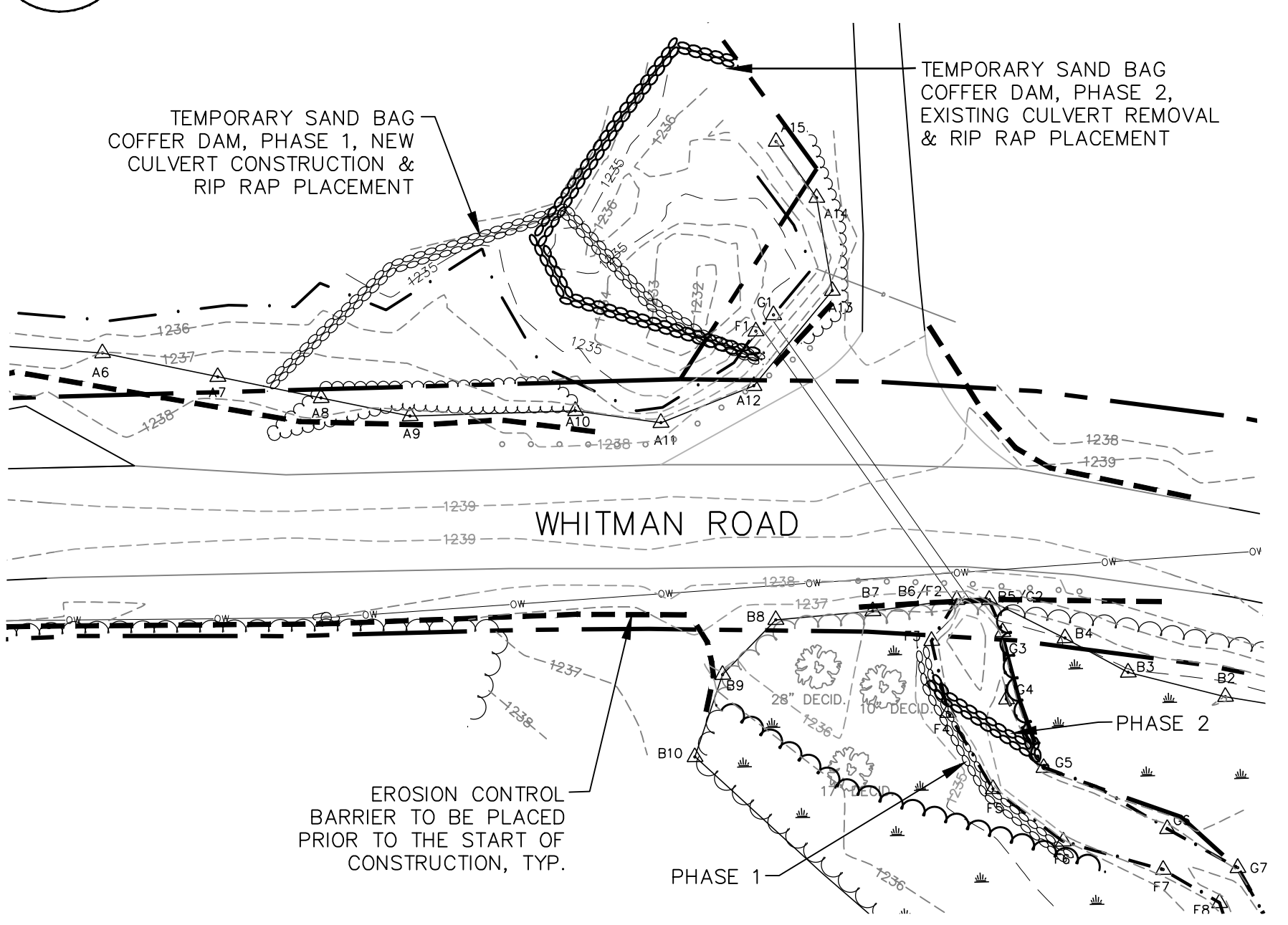
- Boring Notes**
- LOCATION OF BORINGS ARE SHOWN THUS: [Symbol]
  - SEE THE BORING LOCATIONS TABLE FOR THE SPECIFIED HIGHEST BOTTOM ELEVATION (H.B.E.) OF EACH BORING.
  - BORINGS SHALL EXTEND TO THE SPECIFIED HIGHEST BOTTOM ELEVATION OR TO REFUSAL BELOW THE H.B.E., WHICHEVER IS DEEPER.
  - SHOULD BEDROCK BE ENCOUNTERED AT OR ABOVE THE SPECIFIED HIGHEST BOTTOM ELEVATION, THE BORING SHALL BE CONTINUED AS A ROCK CORE BORING FOR A DEPTH OF 10', THEN TERMINATED.
  - BENCHMARK: CHRISNIK NAIL IN U-POLE #2 ON SOUTH SIDE OF WHITMAN ROAD, STA 1+12.70, 19' RT. ELEVATION=1240.10.
  - BORINGS ARE LOCATED FROM THE BASELINE OF WHITMAN ROAD.
  - ADDITIONAL BORINGS MAY BE REQUESTED BY THE ENGINEER, IF NECESSARY.

4 Boring Diagram  
C3 1"=20'

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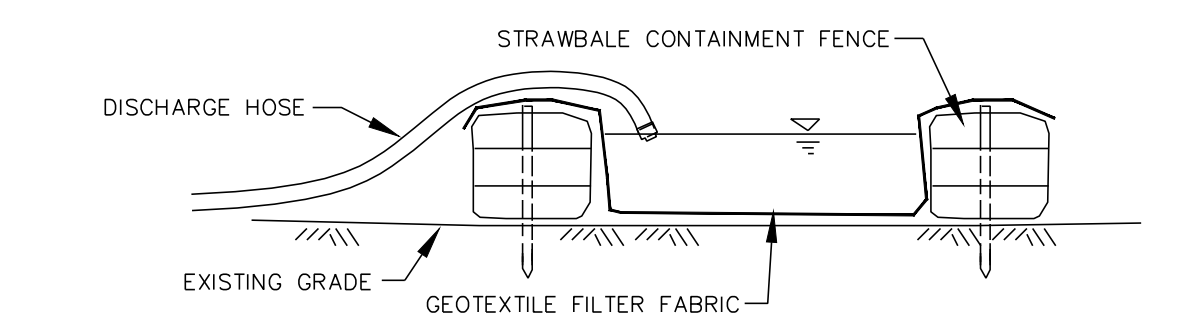
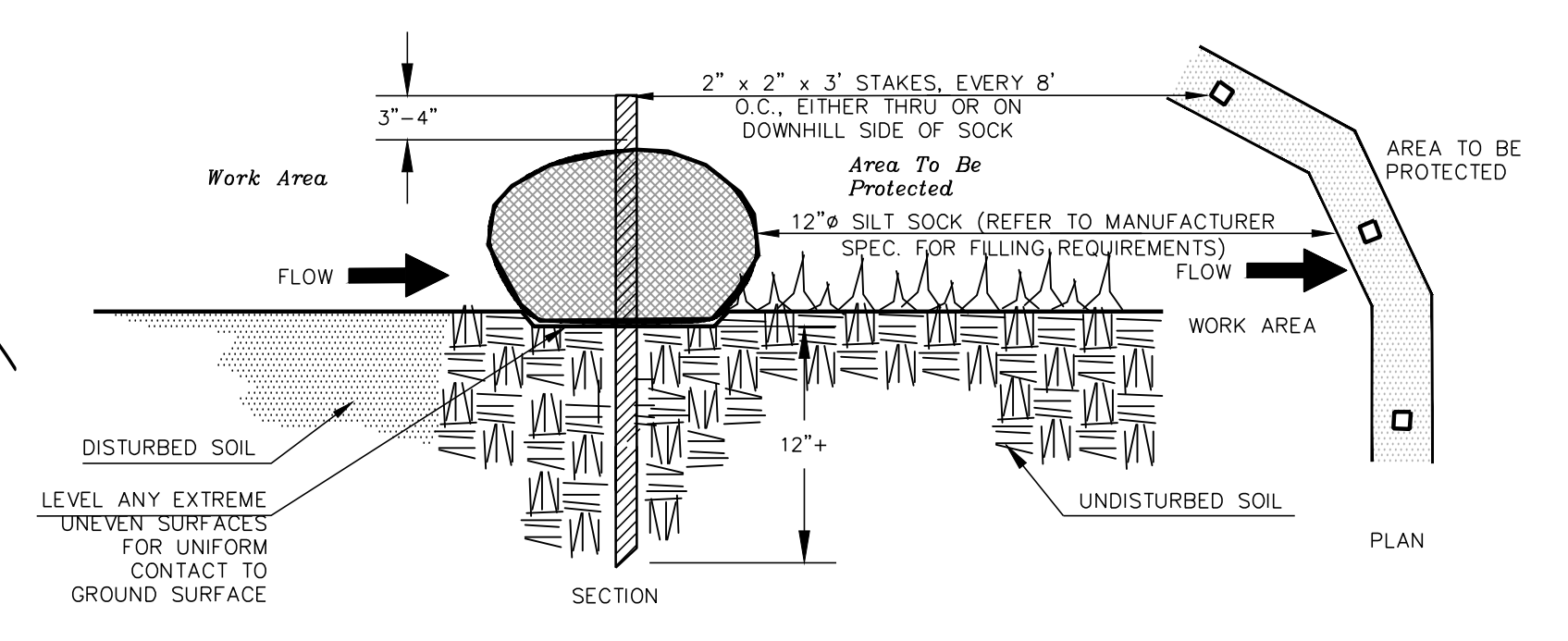


**1 Existing Conditions / Site Preparation Plan**  
C4 1" = 20'



**2 Erosion Control/Coffer Dam Plan**  
C4 1" = 30'

**3 Erosion Control Barrier - Silt Sock / Wattle Detail**  
C4 Not to Scale



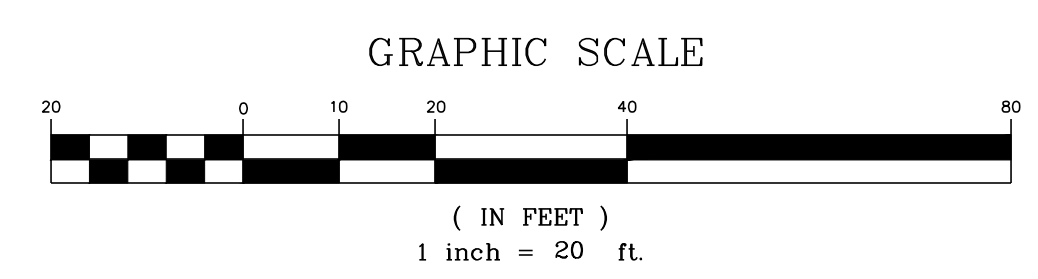
**General Dewatering Notes:**

- > THIS CONTAINMENT AREA IS FOR DEWATERING EXCAVATION AREAS.
- > DEWATER PRIOR TO EXCAVATION.
- > DO NOT DEWATER OR BYPASS STREAMS WITH PUMPS OR THIS DETAIL.
- > STREAM SHALL BE ISOLATED FROM THE WORK AREA BY SAND BAG COFFER DAMS
- > COLLECT CONSTRUCTION DRAINAGE FROM GROUNDWATER, STORMS, AND LEAKS AND TREAT TO REMOVE SEDIMENT.
- > USE DOWNSTREAM SEDIMENT CONTROL SUMP TO COLLECT WATER THAT SEEPS OUT OF THE CONSTRUCTION AREA.
- > SILTATION BASINS SHALL BE CONSTRUCTED FOR THE PURPOSE OF SETTLING OUT SEDIMENT IN THE DEWATERING DISCHARGE.

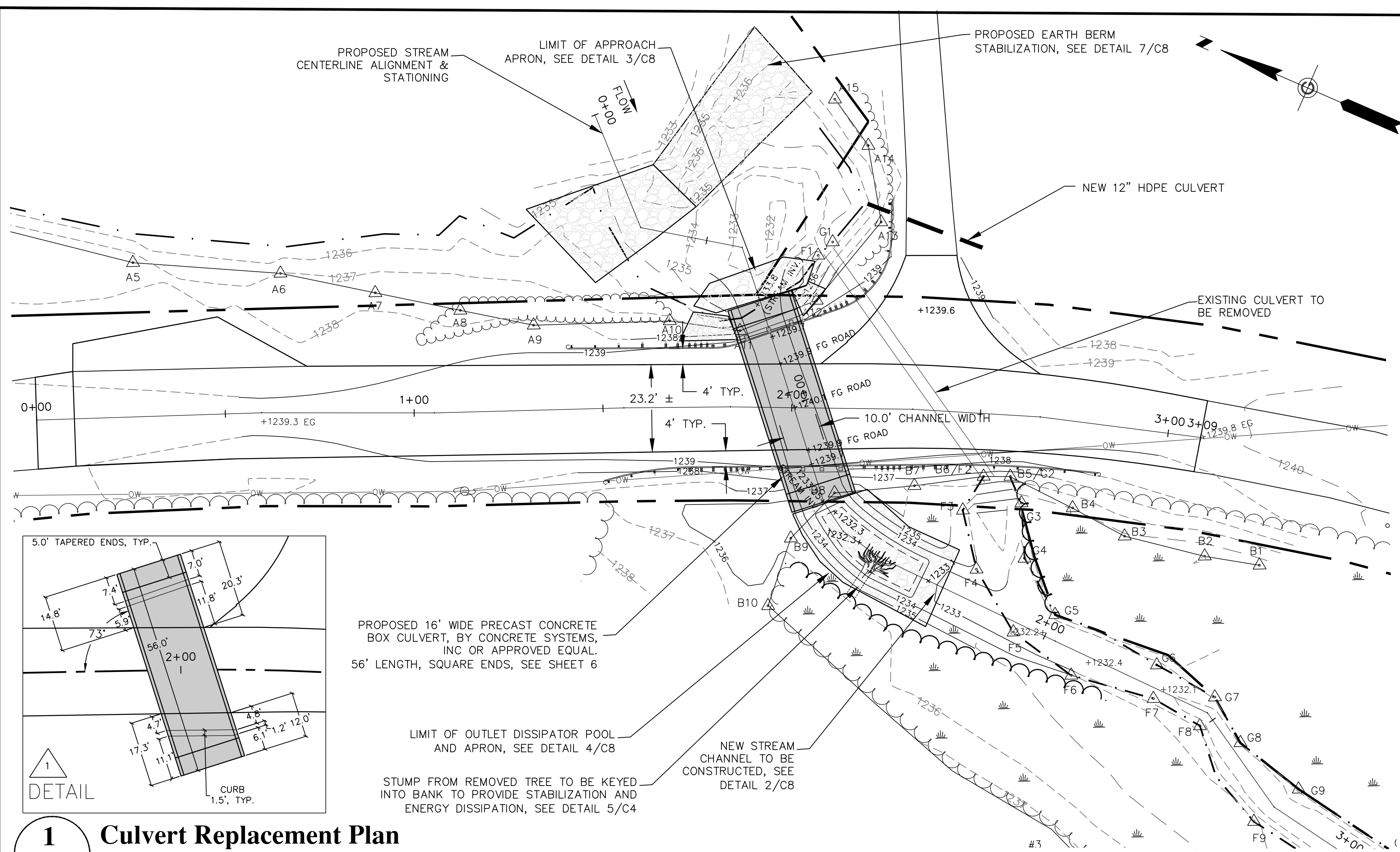
**4 Dewatering Discharge Containment Detail**  
C4 Not to Scale

**Control Point & Stationing Coordinates**

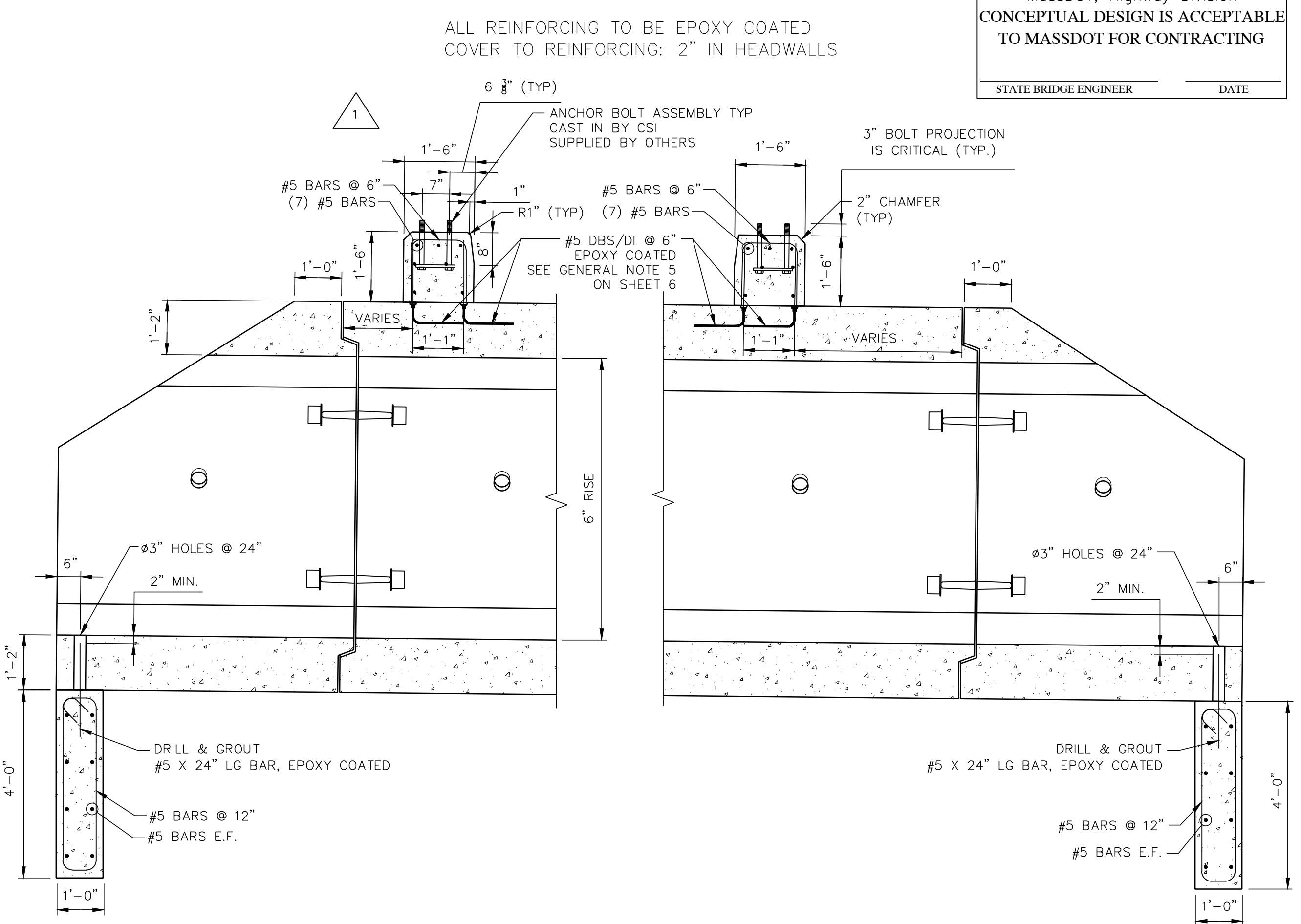
POINT	NORTHING	EASTING	ELEV
#1	3040659.7587	172021.2255	1238.85
#2	3040439.4543	172122.6289	1238.57
#3	3040325.2286	172034.2340	1237.97
#300	3040484.9750	172107.4580	1238.49
#301	3040784.3590	171884.1891	1243.13
0+00	3040612.1783	172030.0090	
3+00	3040337.0642	172148.6014	



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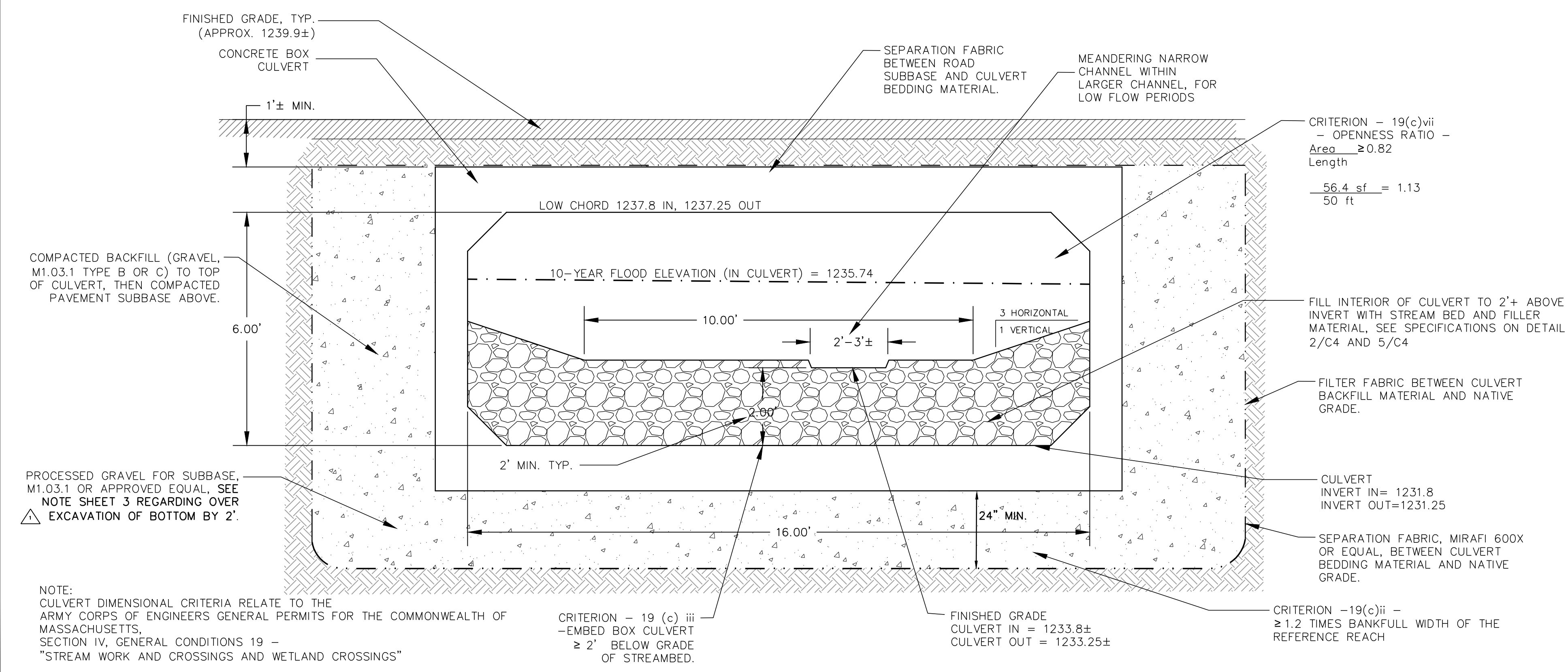


**1 Culvert Replacement Plan**  
 C5 1" = 20'

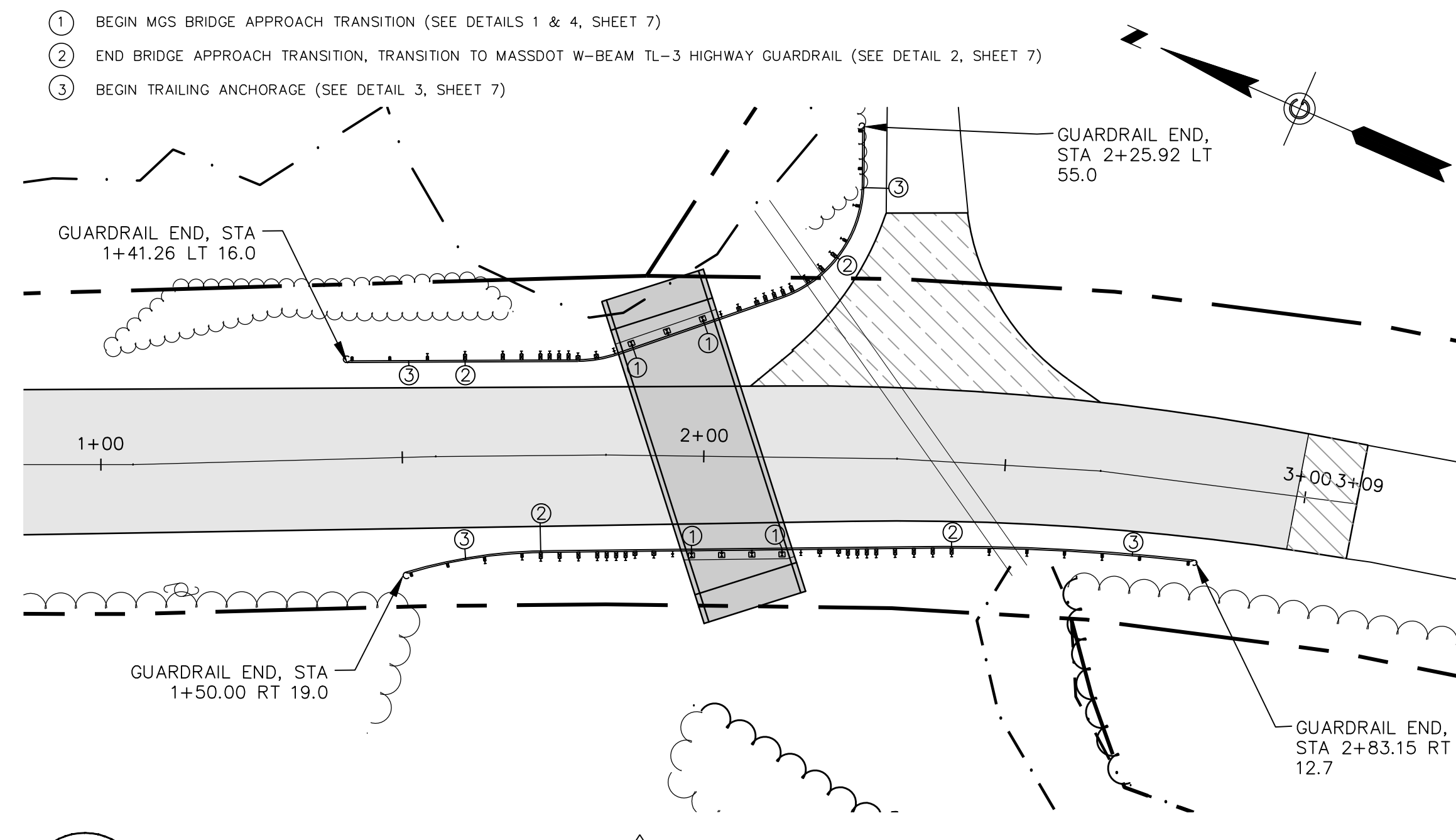


**2 Inlet End Section View (A)**  
 C5 1/2" = 1'-0"

**3 Outlet End Section View (B)**  
 C5 1/2" = 1'-0"

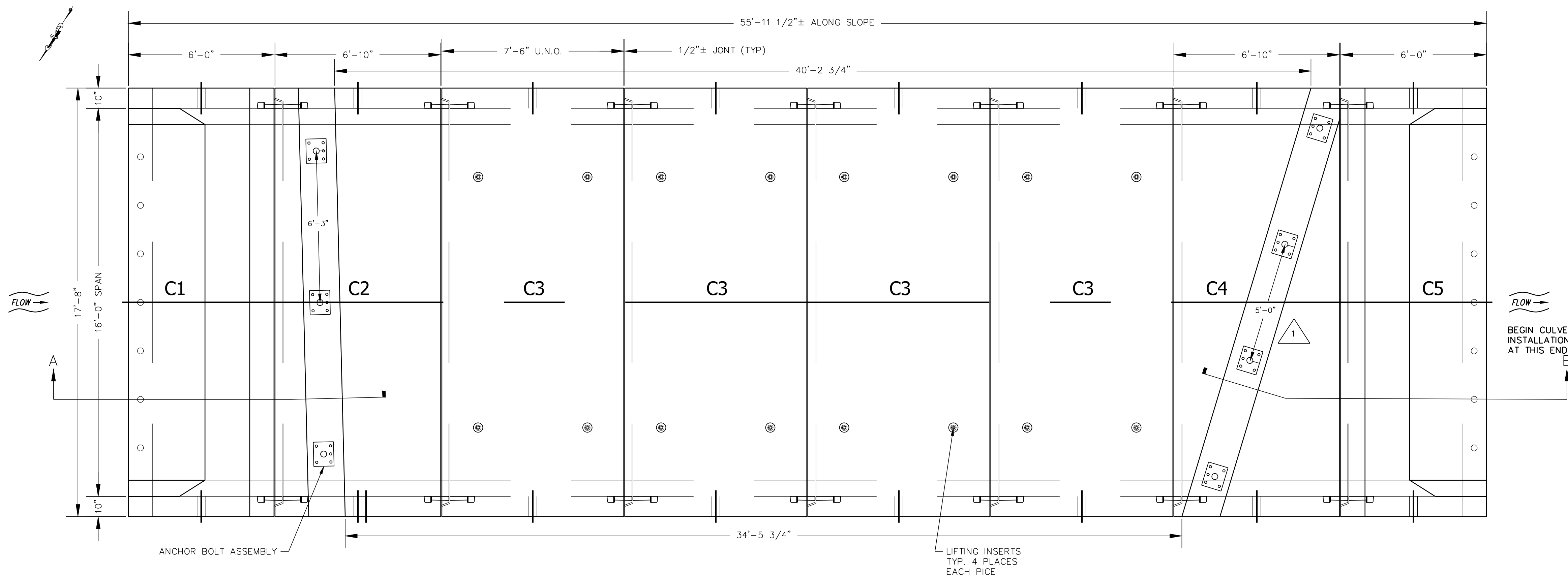


**4 Culvert Cross Section**  
 C5 1" = 2'



**5 Guardrail Layout Plan**  
 C5 1" = 20'

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- GENERAL NOTES:
- REFERENCE STANDARDS:  
AASHTO "LRFD BRIDGE DESIGN SPECIFICATIONS"  
ASTM C1577
  - DESIGN PARAMETERS  
LIVE LOAD: HL-93  
EARTH COVER: 1.58'±  
CONCRETE: DESIGN STRENGTH  $f'_c = 5000$  PSI HP  
UNIT WEIGHT = 150 PCF  
REINFORCING: ASTM A615 (REBAR) OR 60, EPOXY COATED (ASTM A775)  
SOIL UNIT WEIGHT = 120 PCF  
MINIMUM LATERAL PRESSURE 60 PCF  
MAXIMUM LATERAL PRESSURE 30 PCF  
COVER TO REINFORCING: 2" U.N.O.
  - DIMENSIONS INCLUDE A 1/2" JOINT CREEP PER JOINT, OVERALL CULVERT LENGTH WILL VARY SLIGHTLY DEPENDING ON INSTALLATION.
  - NO DAMPPROOFING OR WATERPROOFING SUPPLIED BY CSI.
  - DBS ARE DOWEL BAR SPLICERS AND DI ARE DOWEL INS.
  - HEADWALLS DESIGNED FOR TL-3 IMPACT LOAD.
  - ALL PIECES TO BE MARKED WITH SPAN & RISE, DATE OF MANUFACTURE, AND MANUFACTURER TIME & TRADEMARK.

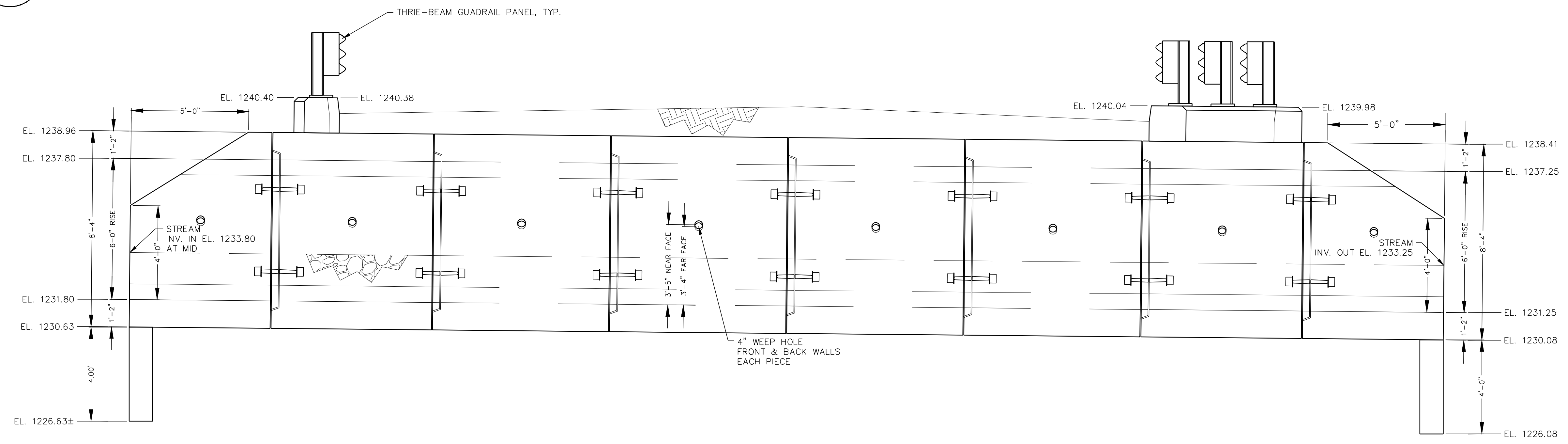
PIECE SCHEDULE (MX-FA5000HPSCC)			
MARK	QTY	LENGTH	WEIGHT
C1	2	6.00'	8.42 17.05 TONS
C2*	1	6.83'	14.66 29.69 TONS
C3	4	7.50'	14.48 29.31 TONS
C4*	1	6.83'	14.66 29.69 TONS
C5	1	6.00'	8.04 16.28 TONS
CW1	2	17.67'	2.62 5.31 TONS

\*WEIGHT INCLUDES MONOLITHIC HEADWALL

COMMONWEALTH OF MASSACHUSETTS  
MassDOT, Highway Division  
CONCEPTUAL DESIGN IS ACCEPTABLE  
TO MASSDOT FOR CONTRACTING

STATE BRIDGE ENGINEER \_\_\_\_\_ DATE \_\_\_\_\_

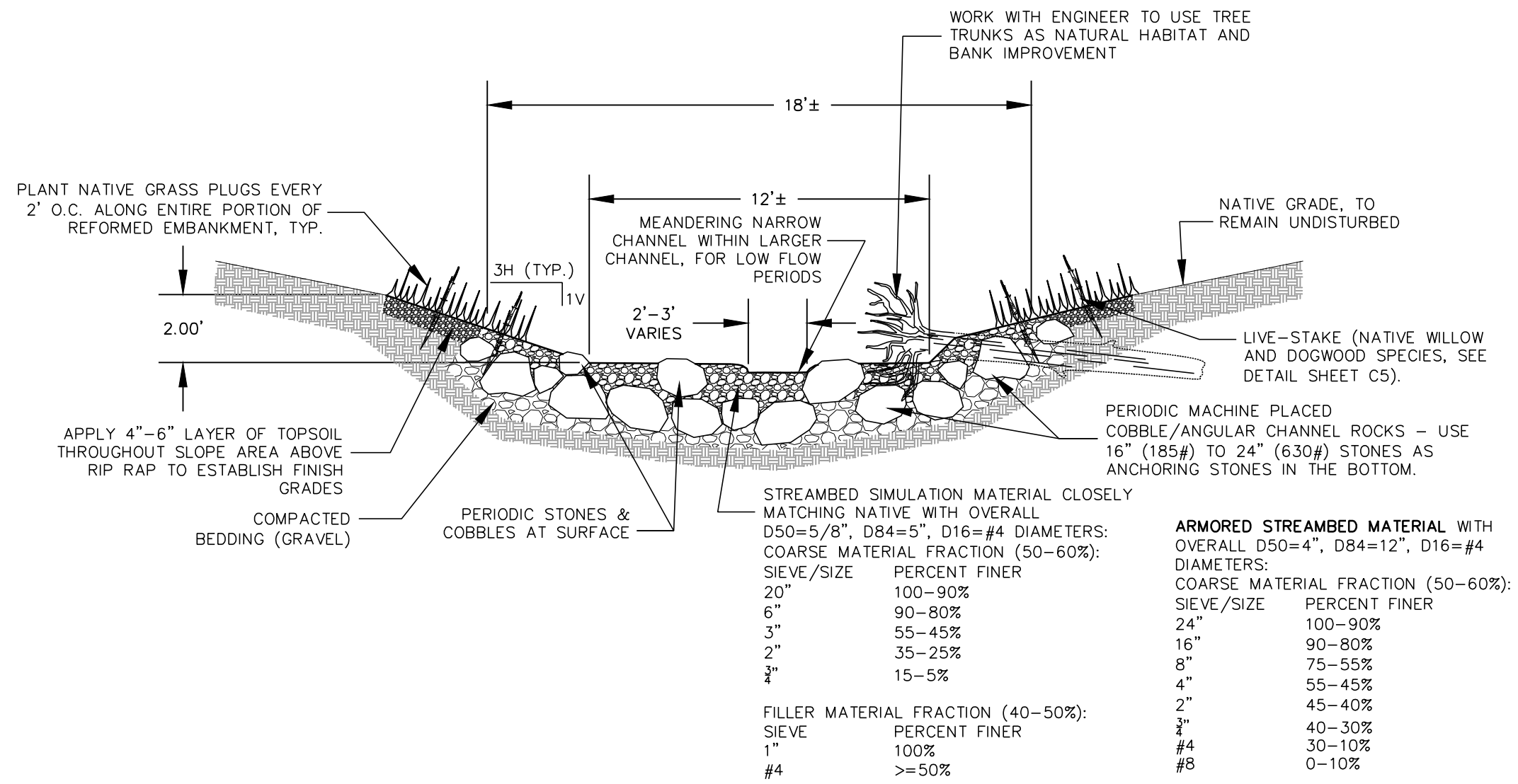
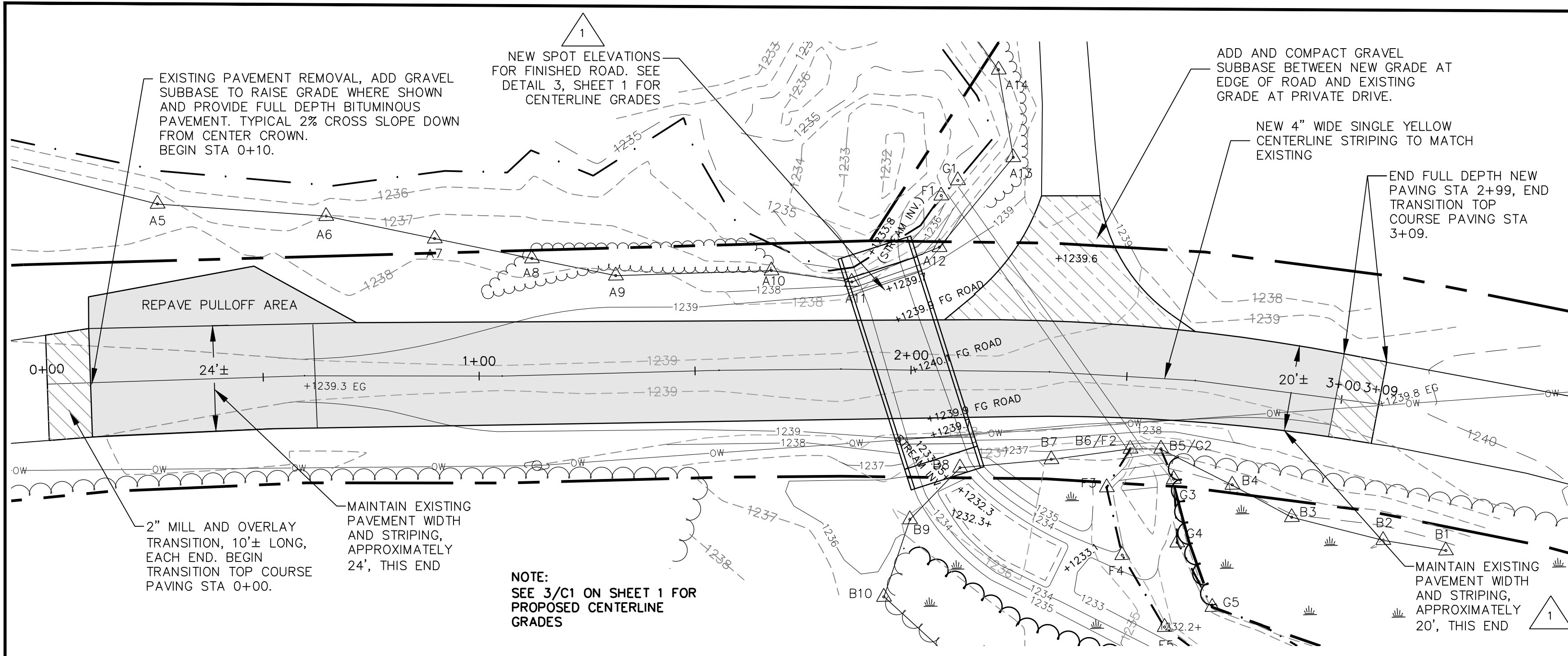
**1 Culvert Plan View**  
C6 3/8"=1'-0"



**2 Culvert Side Elevation - Looking South**  
C6 3/8"=1'-0"

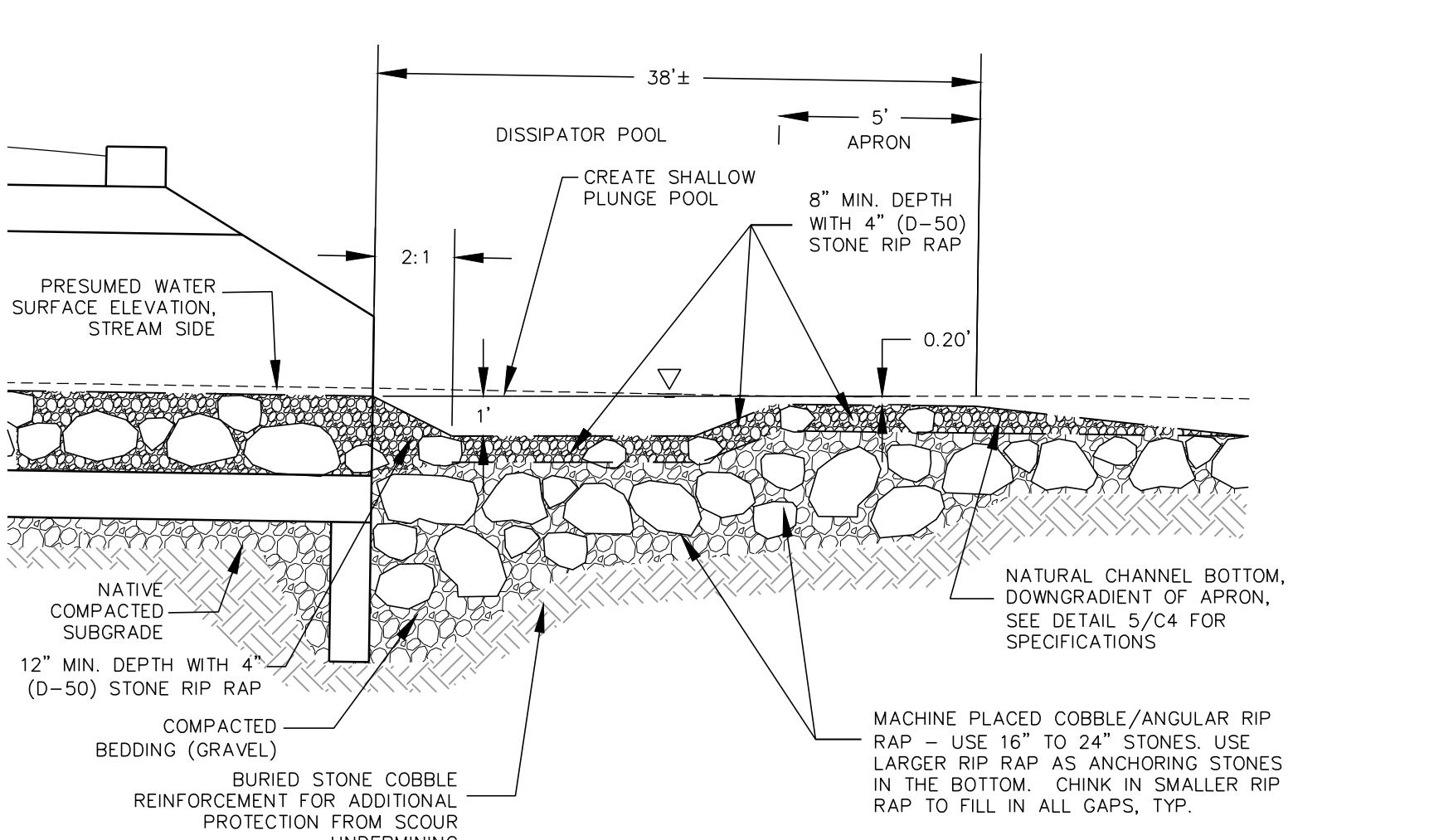
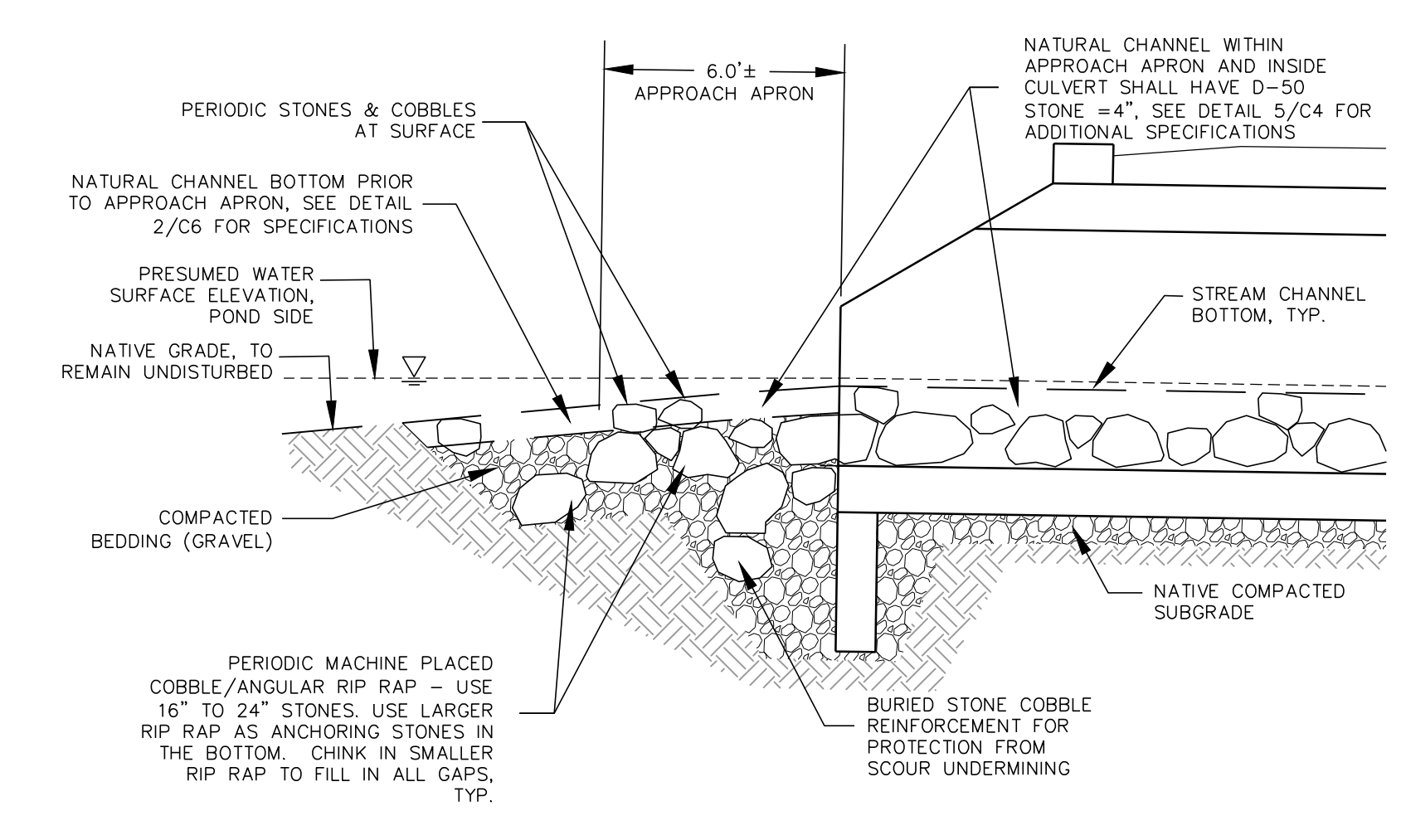
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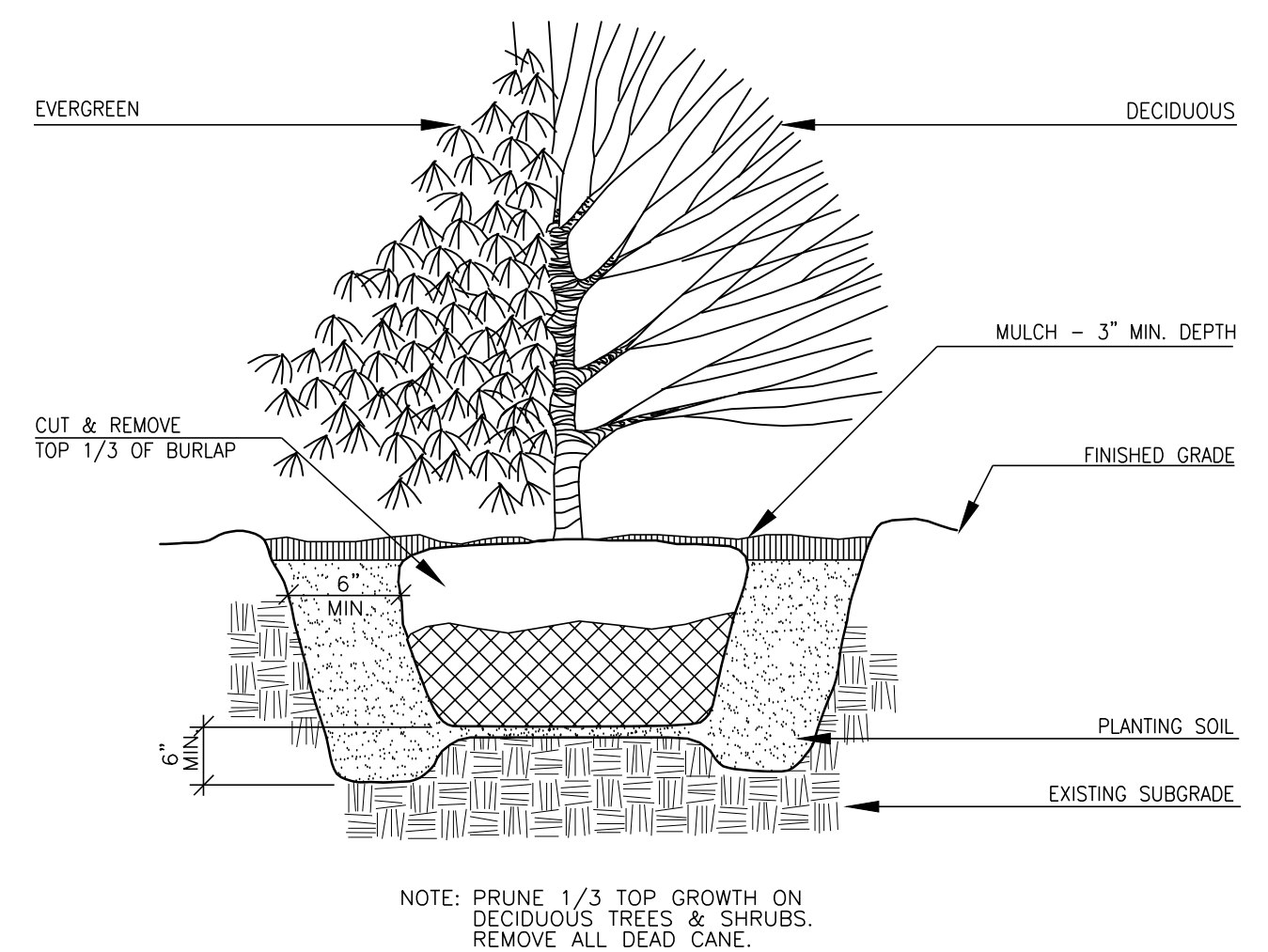
**1 Road Paving Plan**  
C8 Scale: 1"=20'

**2 New Stream Cross Section**  
C8 Not to Scale

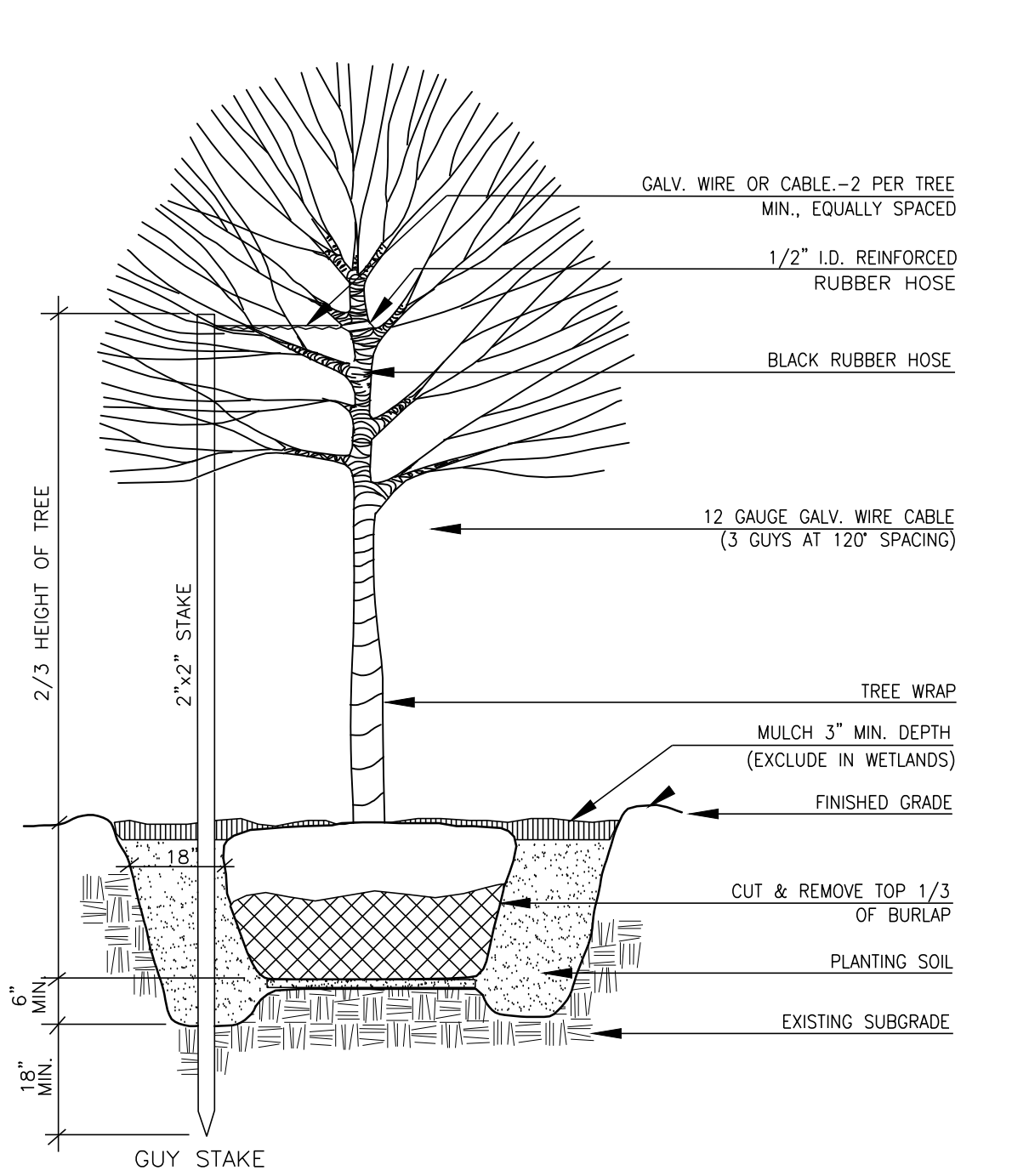


**3 Culvert Inlet Channel Profile**  
C8 Not to Scale

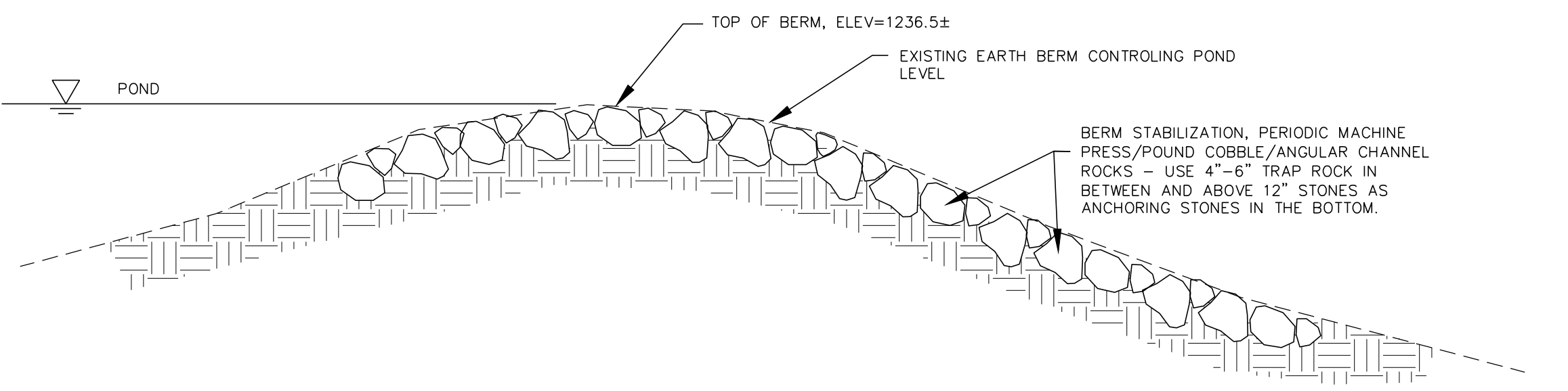
**4 Culvert Outlet Channel Profile**  
C8 Not to Scale



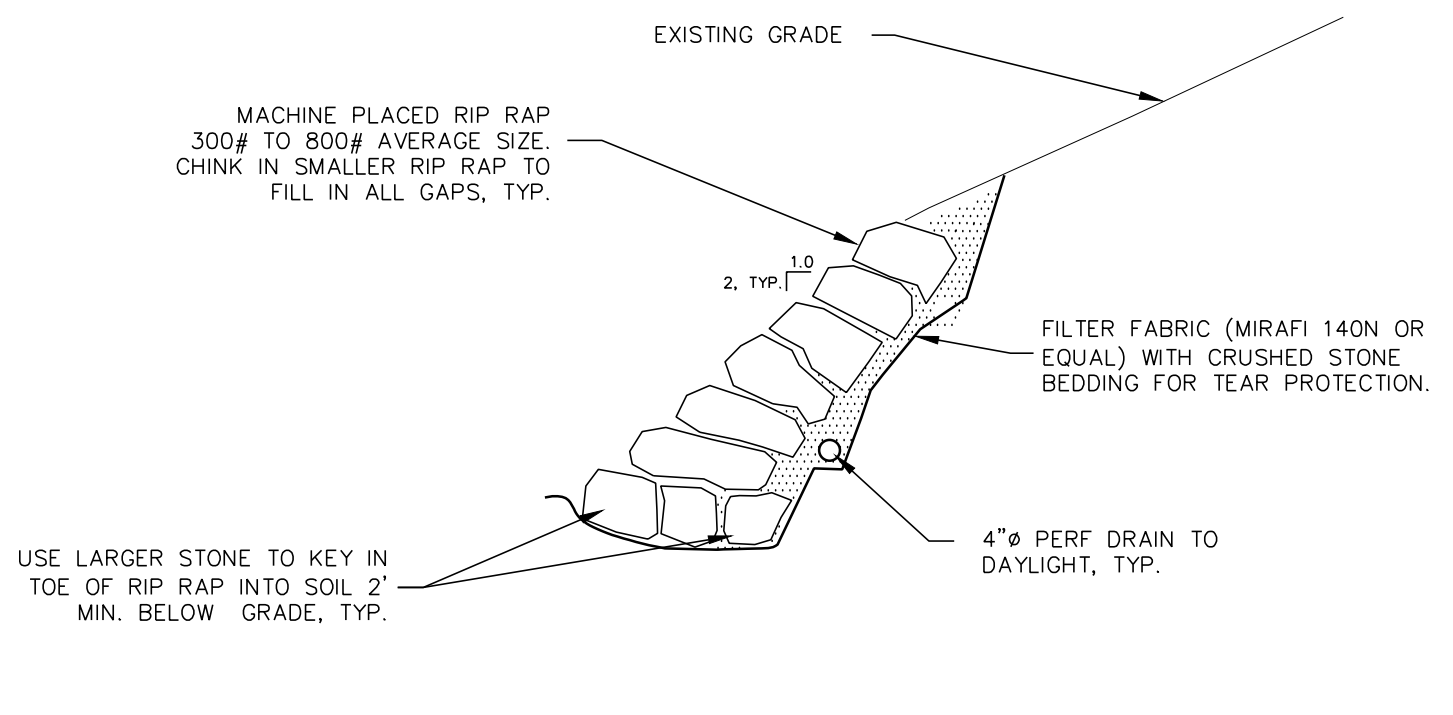
**5 Typical Shrub Planting**  
C8 Not to Scale



**6 Typical Tree Planting**  
C8 Not to Scale



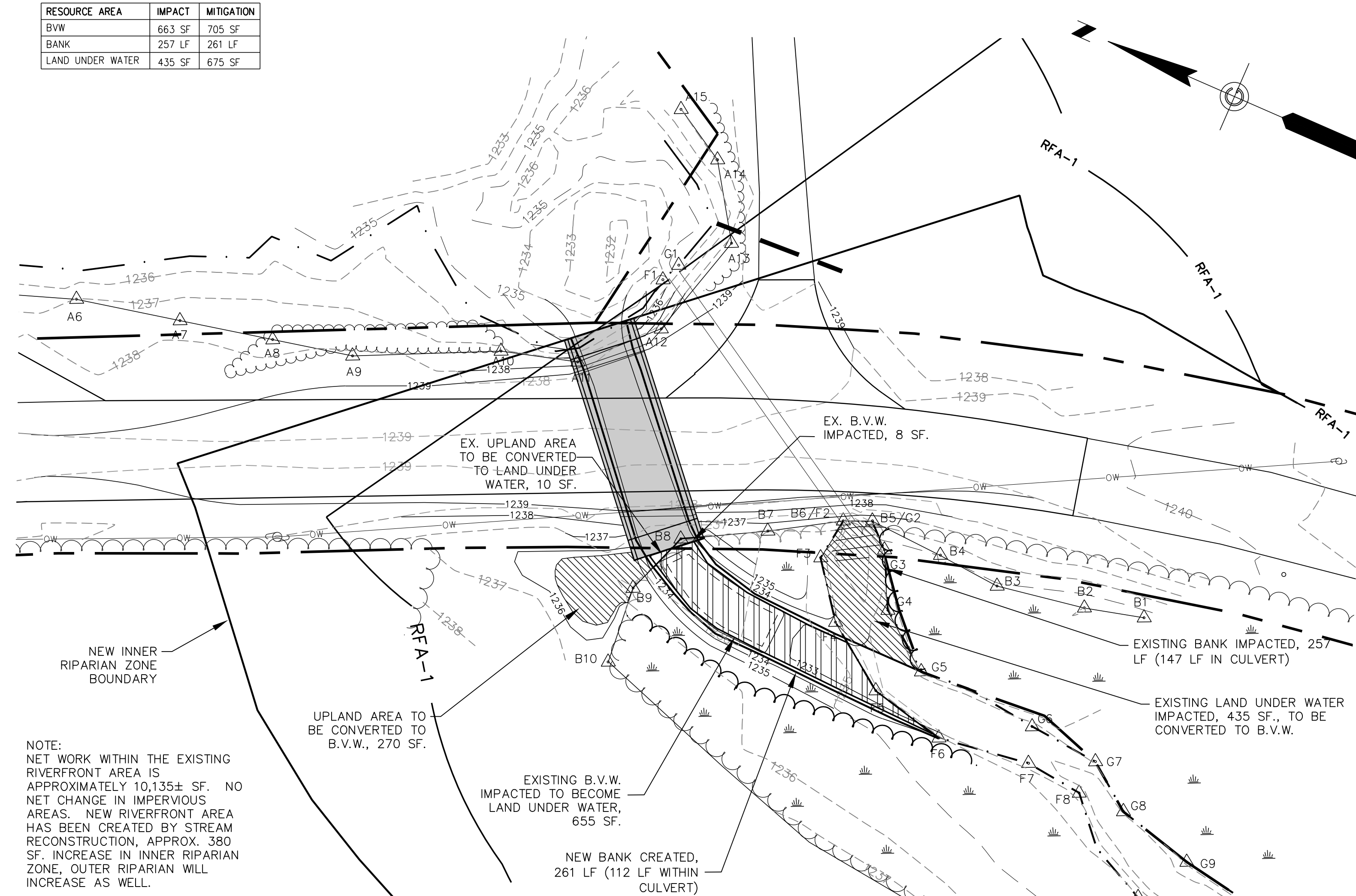
**7 Existing Berm Stabilization Detail**  
C8 Not to Scale



**8 Rip Rap Slope Stabilization Detail**  
C8 Not to Scale

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SHEET 8 OF 10 SHEETS BRIDGE NO. H-05-016 (CY3)	

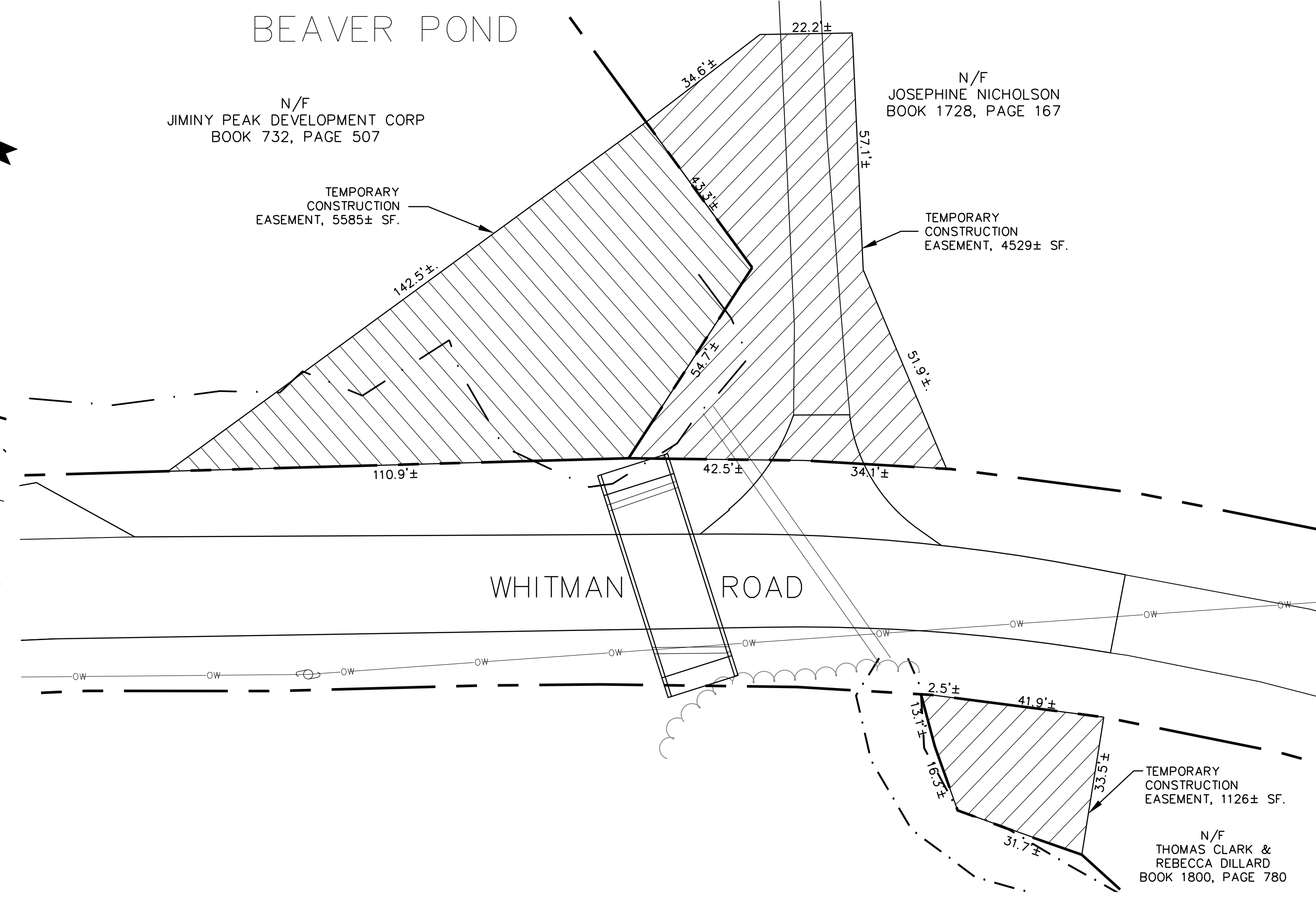
RESOURCE AREA	IMPACT	MITIGATION
BVW	663 SF	705 SF
BANK	257 LF	261 LF
LAND UNDER WATER	435 SF	675 SF



NOTE:  
NET WORK WITHIN THE EXISTING RIVERFRONT AREA IS APPROXIMATELY 10,135± SF. NO NET CHANGE IN IMPERVIOUS AREAS. NEW RIVERFRONT AREA HAS BEEN CREATED BY STREAM RECONSTRUCTION, APPROX. 360 SF. INCREASE IN INNER RIPARIAN ZONE, OUTER RIPARIAN WILL INCREASE AS WELL.

### 1 Resource Area Impacts and Mitigation Tabulation Plan

C9 1" = 20'



### 2 Temporary Construction Easement Plan

C9 1" = 20'

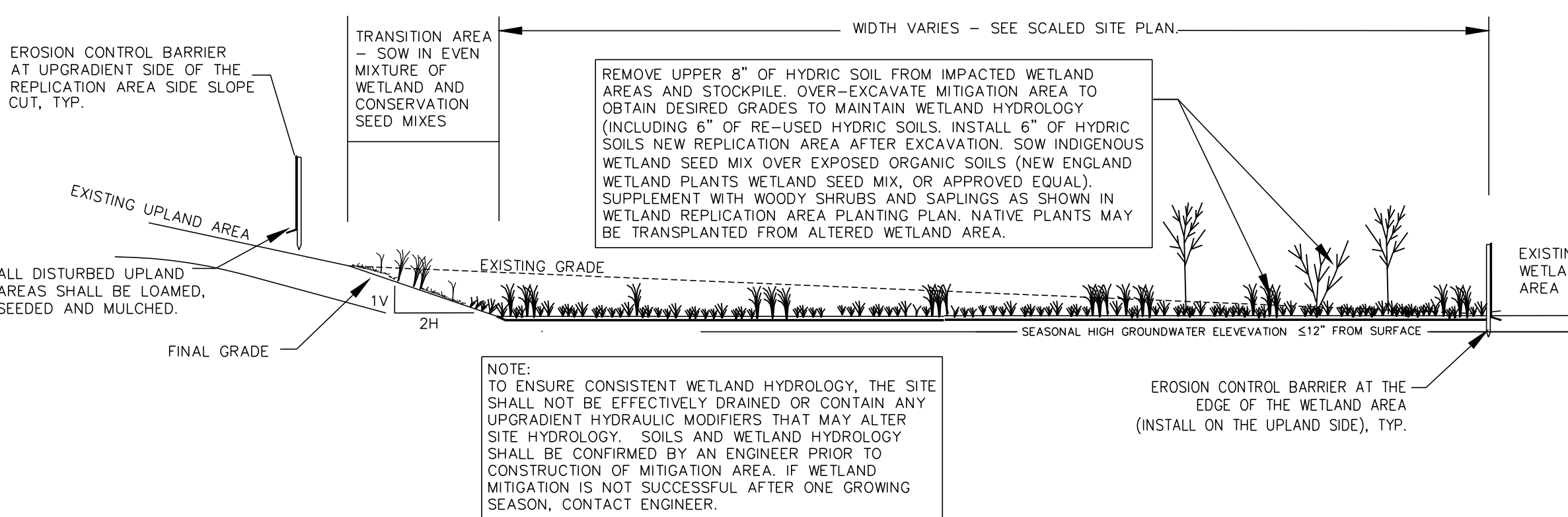
#### New England Wetmix (Wetland Seed Mix)

THE NEW ENGLAND WETMIX (WETLAND SEED MIX) CONTAINS A WIDE VARIETY OF NATIVE SEEDS THAT ARE SUITABLE FOR MOST WETLAND RESTORATION SITES THAT ARE NOT PERMANENTLY FLOODED. ALL SPECIES ARE BEST SUITED TO MOIST GROUND AS FOUND IN MOST WET MEADOWS, SCRUB SHRUB, OR FORESTED WETLAND RESTORATION AREAS. THE MIX IS WELL SUITED FOR DETENTION BASIN BORDERS AND THE BOTTOM OF DETENTION BASINS NOT GENERALLY UNDER STANDING WATER. THE SEEDS WILL NOT GERMINATE UNDER INUNDATED CONDITIONS. IF PLANTED DURING THE FALL MONTHS, THE SEED MIX WILL GERMINATE THE FOLLOWING SPRING. DURING THE FIRST SEASON OF GROWTH, SEVERAL SPECIES WILL PRODUCE SEEDS AFTER THE SECOND GROWING SEASON. NOT ALL SPECIES WILL GROW IN ALL WETLAND SITUATIONS. THIS MIX IS COMPRISED OF THE WETLAND SPECIES MOST LIKELY TO GROW IN CREATED/RESTORED WETLANDS AND SHOULD PRODUCE MORE THAN 75% GROUND COVER IN TWO FULL GROWING SEASONS.

THE WETLAND SEEDS IN THIS MIX CAN BE SOWN BY HAND, WITH A HAND HELD SPREADER, OR HYDRO-SEEDED ON LARGE OR HARD TO REACH SITES. LIGHTLY RAKE TO INSURE GOOD SEED TO SOIL CONTACT. SEEDING CAN TAKE PLACE ON FROZEN SOIL AS THE FREEZING AND THAWING WEATHER OF LATE FALL AND LATE WINTER WILL WORK THE SEED INTO THE SOIL. IF SPRING CONDITIONS ARE DRIER THAN USUAL WATERING MAY BE REQUIRED. IF SOWING DURING THE SUMMER MONTHS SUPPLEMENTAL WATERING WILL LIKELY BE REQUIRED UNTIL GERMINATION. A LIGHT MULCH OF CLEAN, WEED FREE STRAW IS RECOMMENDED.

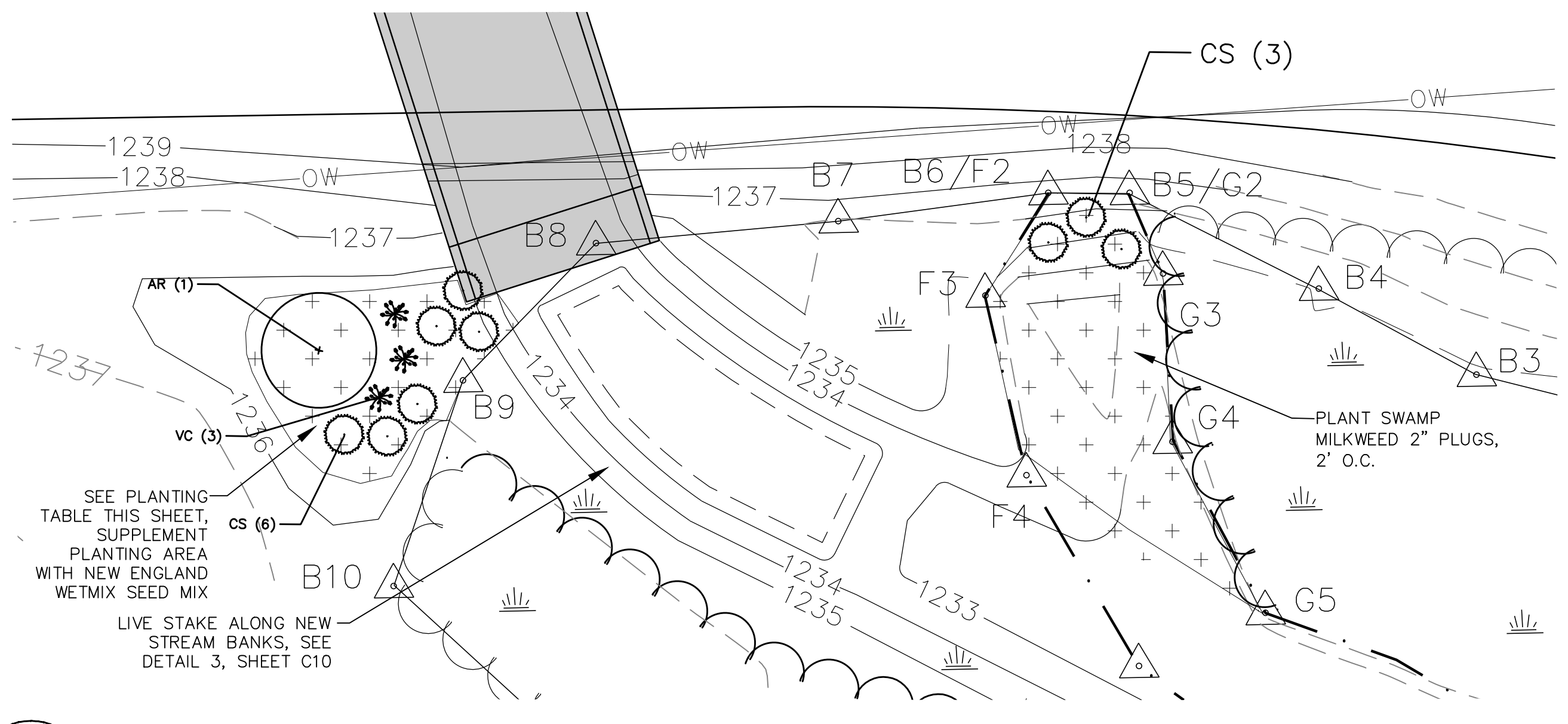
APPLICATION RATE: 1 LB./2500 SQ. FT.  
18 LBS./ACRE  
PRICE: \$135/BULK POUND

SPECIES: FOX SEDGE (CAREX VULPINOIDEA), LURID SEDGE (CAREX LURIDA), BLUNT BROOM SEDGE (CAREX SCOPARIA), BLUE VERVAIN (VERBENA HASTATA), FOWL BLUEGRASS (POA PALUSTRIS), HOP SEDGE (CAREX LUPULINA), GREEN BULRUSH (SCIRPUS ATROVIRENS), CREEPING SPIKE RUSH (ELEOCHARIS PALUSTRIS), FRINGED SEDGE (CAREX CRINITA), SOFT RUSH (JUNCUS EFFUSUS), SPOTTED JOE PYE WEED (EUPATORIUM MACULATUM), RATTLESNAKE GRASS (GLYCERIA CANADENSIS), SWAMP ASTER (ASTER PUNICEUS), BLUEFLAG (IRIS VERSICOLOR), SWAMP MILKWEED (ASCLEPIAS INCARNATA), SQUARE STEMMED MONKEY FLOWER (MIMULUS RINGENS).



### 3 Typical Cross Section Through Wetland Replication Area

C9 Not to Scale



### 4 Detailed Mitigation Planting Plan

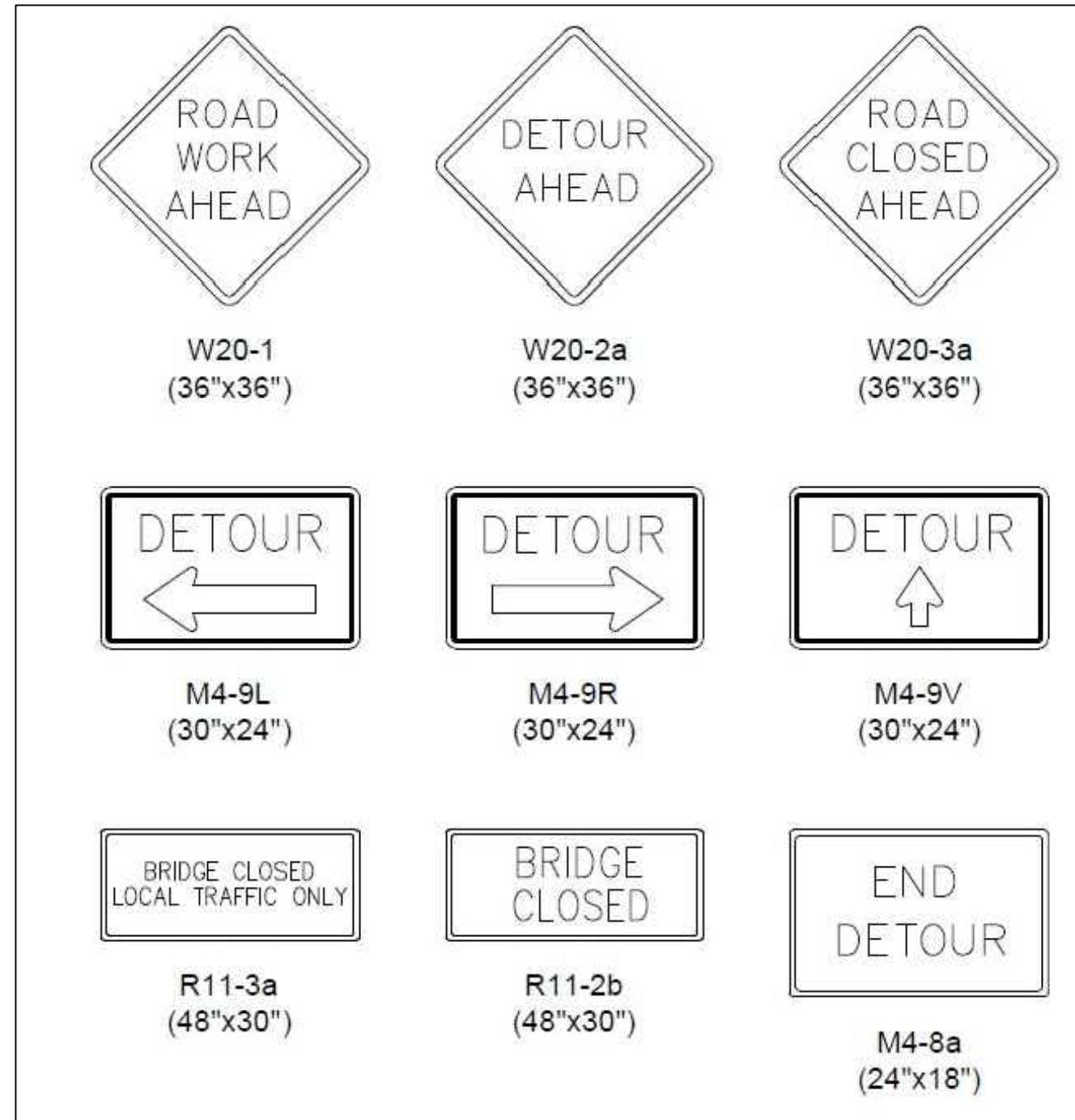
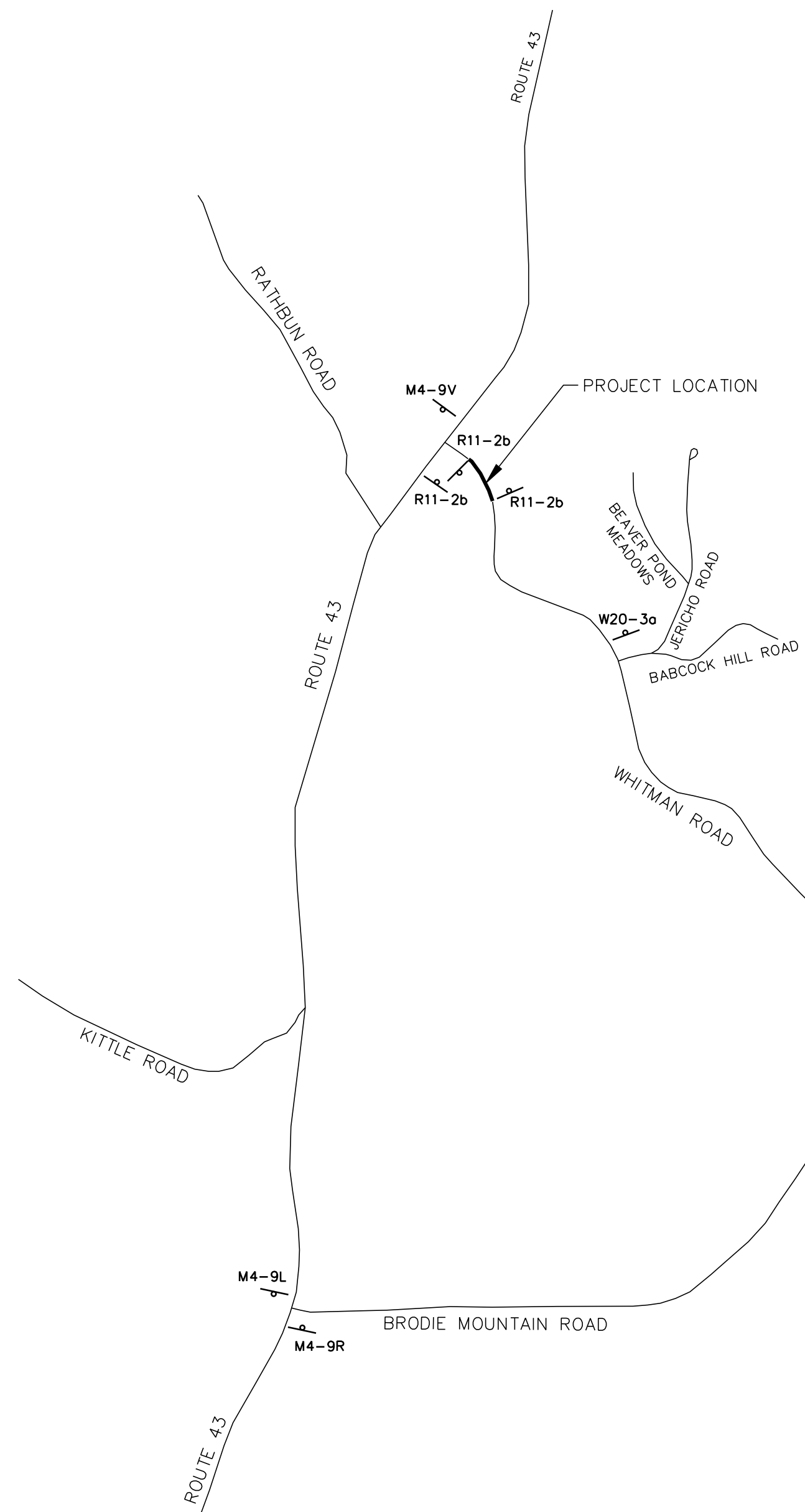
C9 1" = 10'

#### Wetland Replication Plant List

SEED WETLAND REPLICATION AREA WITH NEW ENGLAND WETMIX WETLAND SEED MIX (NEW ENGLAND WETLAND PLANTS) AND SUPPLEMENT WITH THE FOLLOWING PLANTINGS AS SHOWN ON SHEET C7:

KEY	QTY	BOTANICAL NAME	COMMON NAME	SIZE	NOTES
AI	100	ASCLEPIAS INCARNATA	SWAMP MILKWEED	2" PLUG @ 2' OC	OBL
AR	1	ACER RUBRUM	RED MAPLE	4'-6"	FAC
CS	9	CORNUS SERICEA	RED-OSIER DOGWOOD	3'-4' @ 6' OC	FACW
VC	3	VACCINIUM CORYMBOSUM	HIGHBUSH BLUEBERRY	2'-3' @ 5' OC	FACW

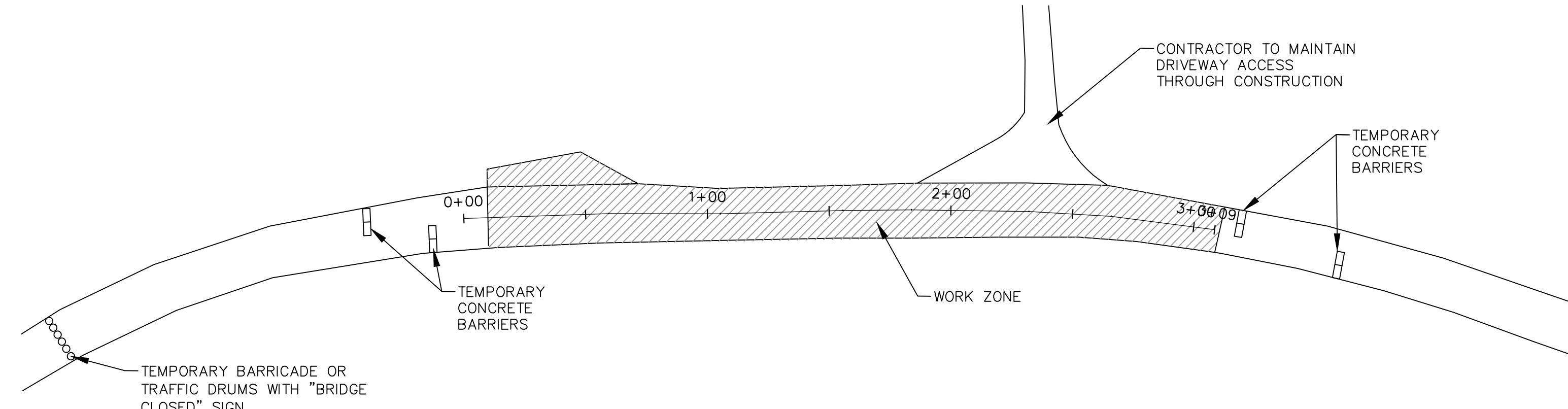
APRIL 8, 2026	△ REV 1: ADDENDUM #1
MARCH 13, 2026	ISSUED FOR BRIDGE DIVISION REVIEW
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	



GENERAL NOTES:  
 1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL PROPOSED PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) IN THE FIELD SUCH THAT VEHICULAR AND PEDESTRIAN TRAFFIC IS NOT IMPEDED. LOCATION OF PCMS UNITS ON PRIVATE PROPERTY SHALL NOT BE PERMITTED WITHOUT PRIOR APPROVAL FROM THE OWNER.  
 2. PCMS UNITS SHALL BE INSTALLED 2 WEEKS PRIOR TO CONSTRUCTION AND SHALL READ "WHITMAN ROAD ROADWORK BEGINS X/XX/XXXX". PCMS UNITS SHALL BE REMOVED AT THE START OF CONSTRUCTION.

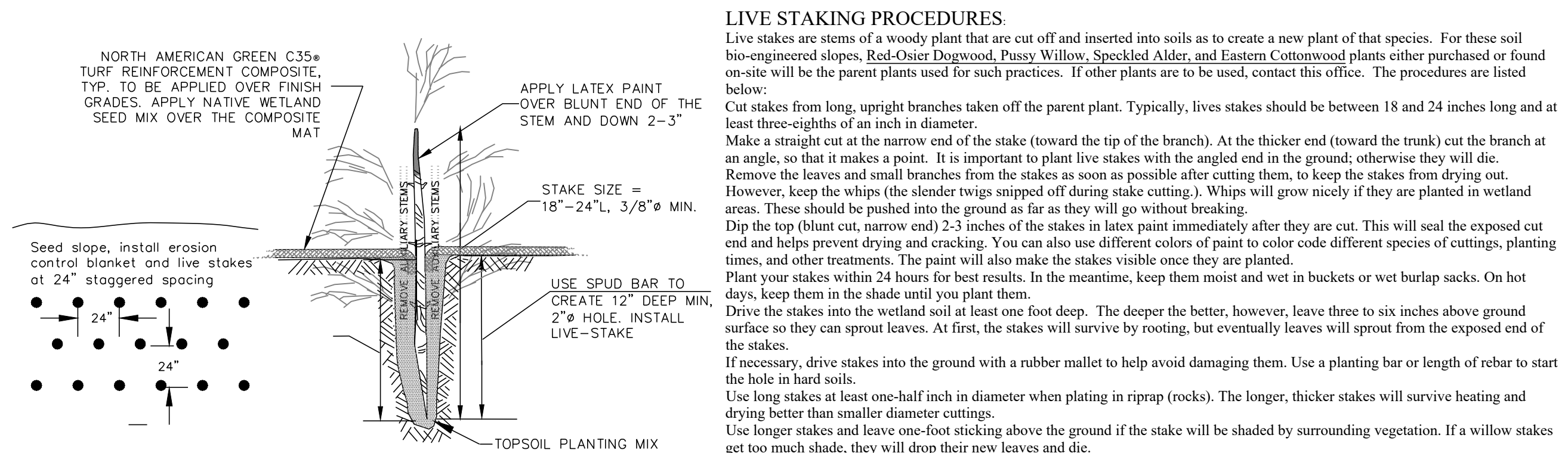
**1 Work Zone Advance Signage & Detour Plan**

C10 1" = 1000'



**2 Bridge Closure Detail**

C10 1" = 40'



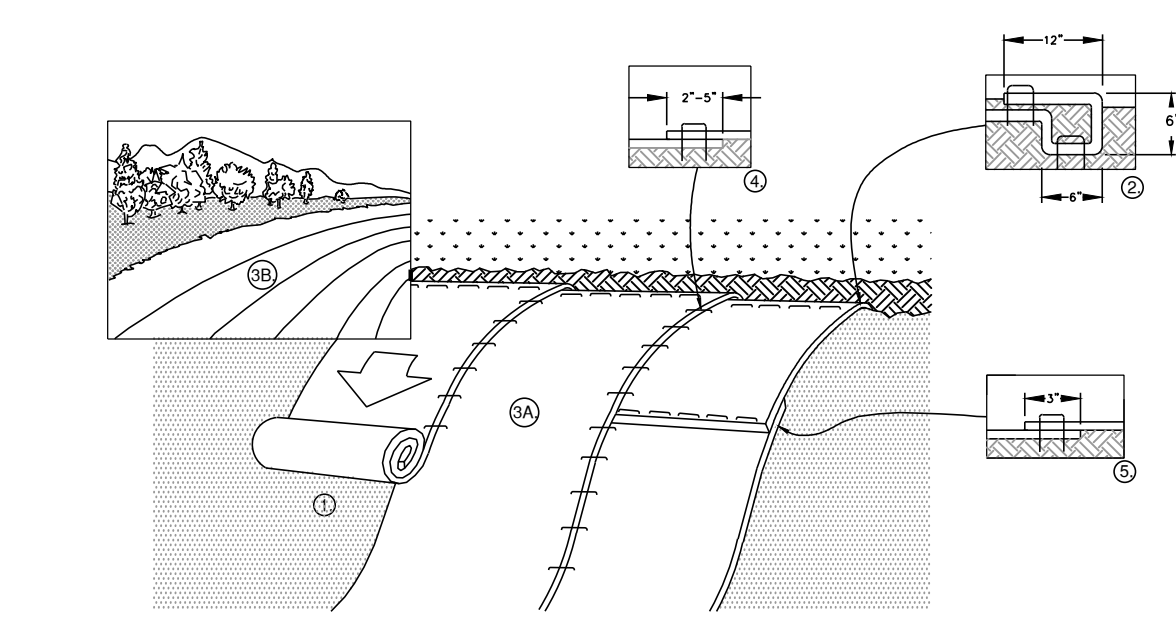
**3 Live-Stake Detail**

C10 Not to Scale

**LIVE STAKING PROCEDURES:**  
 Live stakes are stems of a woody plant that are cut off and inserted into soils as to create a new plant of that species. For these soil bio-engineered slopes, Red-Osier Dogwood, Pussy Willow, Speckled Alder, and Eastern Cottonwood plants either purchased or found on-site will be the parent plants used for such practices. If other plants are to be used, contact this office. The procedures are listed below:  
 Cut stakes from long, upright branches taken off the parent plant. Typically, live stakes should be between 18 and 24 inches long and at least three-eighths of an inch in diameter.  
 Make a straight cut at the narrow end of the stake (toward the tip of the branch). At the thicker end (toward the trunk) cut the branch at an angle, so that it makes a point. It is important to plant live stakes with the angled end in the ground, otherwise they will die. Remove the leaves and small branches from the stakes as soon as possible after cutting them, to keep the stakes from drying out. However, keep the whips (the slender twigs snipped off during stake cutting). Whips will grow nicely if they are planted in wetland areas. These should be pushed into the ground as far as they will go without breaking.  
 Dip the top (blunt cut, narrow end) 2-3 inches of the stakes in latex paint immediately after they are cut. This will seal the exposed cut end and helps prevent drying and cracking. You can also use different colors of paint to color code different species of cuttings, planting times, and other treatments. The paint will also make the stakes visible once they are planted.  
 Plant your stakes within 24 hours for best results. In the meantime, keep them moist and wet in buckets or wet burlap sacks. On hot days, keep them in the shade until you plant them.  
 Drive the stakes into the wetland soil at least one foot deep. The deeper the better, however, leave three to six inches above ground surface so they can sprout leaves. At first, the stakes will survive by rooting, but eventually leaves will sprout from the exposed end of the stakes.  
 If necessary, drive stakes into the ground with a rubber mallet to help avoid damaging them. Use a planting bar or length of rebar to lift the hole in hard soils.  
 Use long stakes at least one-half inch in diameter when plating in riprap (rocks). The longer, thicker stakes will survive heating and drying better than smaller diameter cuttings.  
 Use longer stakes and leave one-foot sticking above the ground if the stake will be shaded by surrounding vegetation. If a willow stake get too much shade, they will drop their new leaves and die.  
 The best time to plant live stakes is during the dormant season. In Berkshire County, this is roughly from the beginning of November through the end of March. Live stakes can also be planted during the growing season, especially at sites that will remain moist, although survival rates will be lower. Some species, other than the ones suggested, may require the bottom ends of cuttings to be soaked or dipped in a solution of plant rooting hormone before planting to speed up growth.

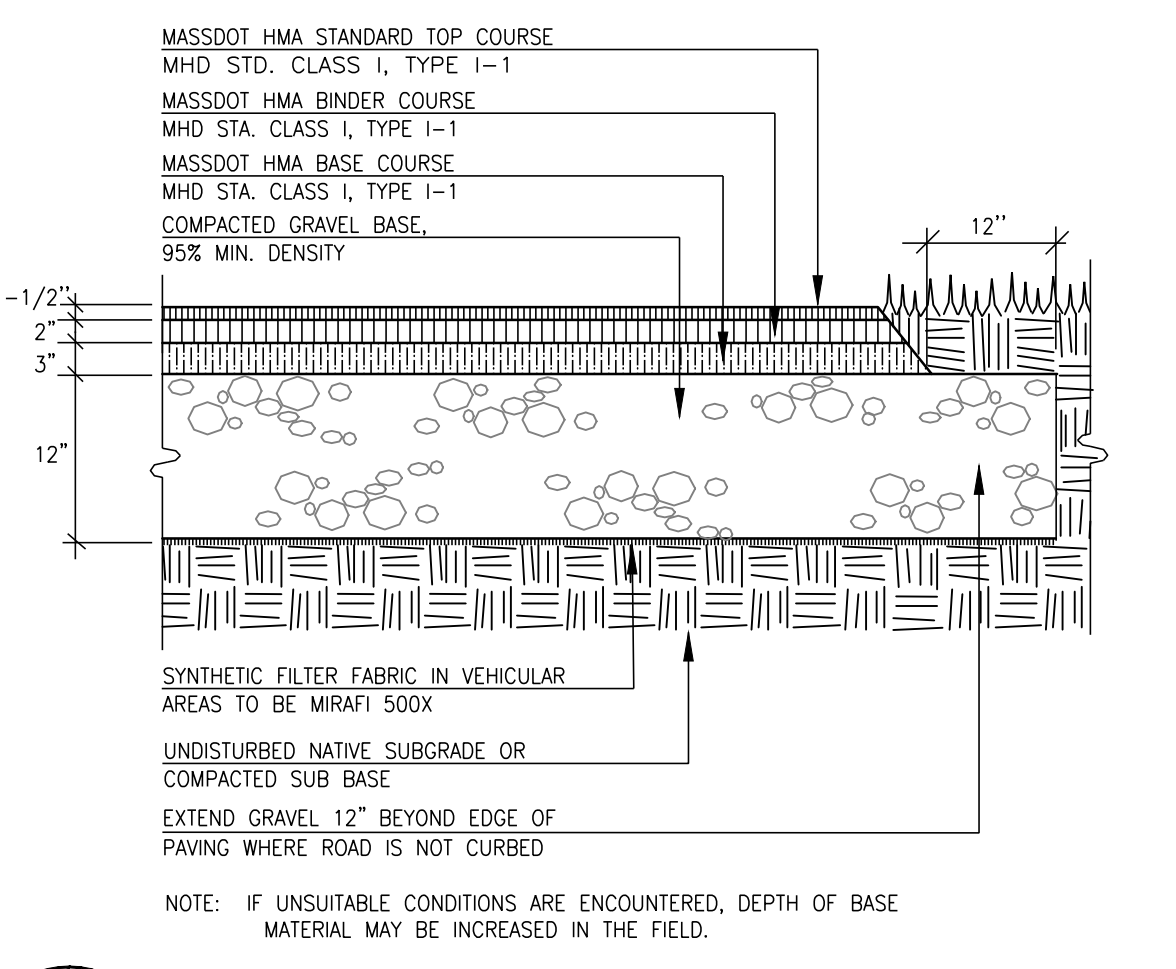
**INSTALLATION NOTES:**

- ROLLED EROSION CONTROL BLANKETS (RECB) SHALL BE NORTH AMERICAN GREEN C125BN (100% COCONUT FIBER MATRIX WITH WOVEN BIODEGRADABLE NETS) OR APPROVED EQUAL.
  - PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
  - BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
  - ROLL THE BLANKETS (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING OPTIONAL DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
  - THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2"-5" OVERLAP DEPENDING ON BLANKET TYPE. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH ON THE PREVIOUSLY INSTALLED BLANKET.
  - CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH.
- NOTE: \*IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.



**4 Rolled Erosion Control Blanket Detail**

C10 Not to Scale



**5 Bituminous Concrete Pavement**

C10 Not to Scale

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