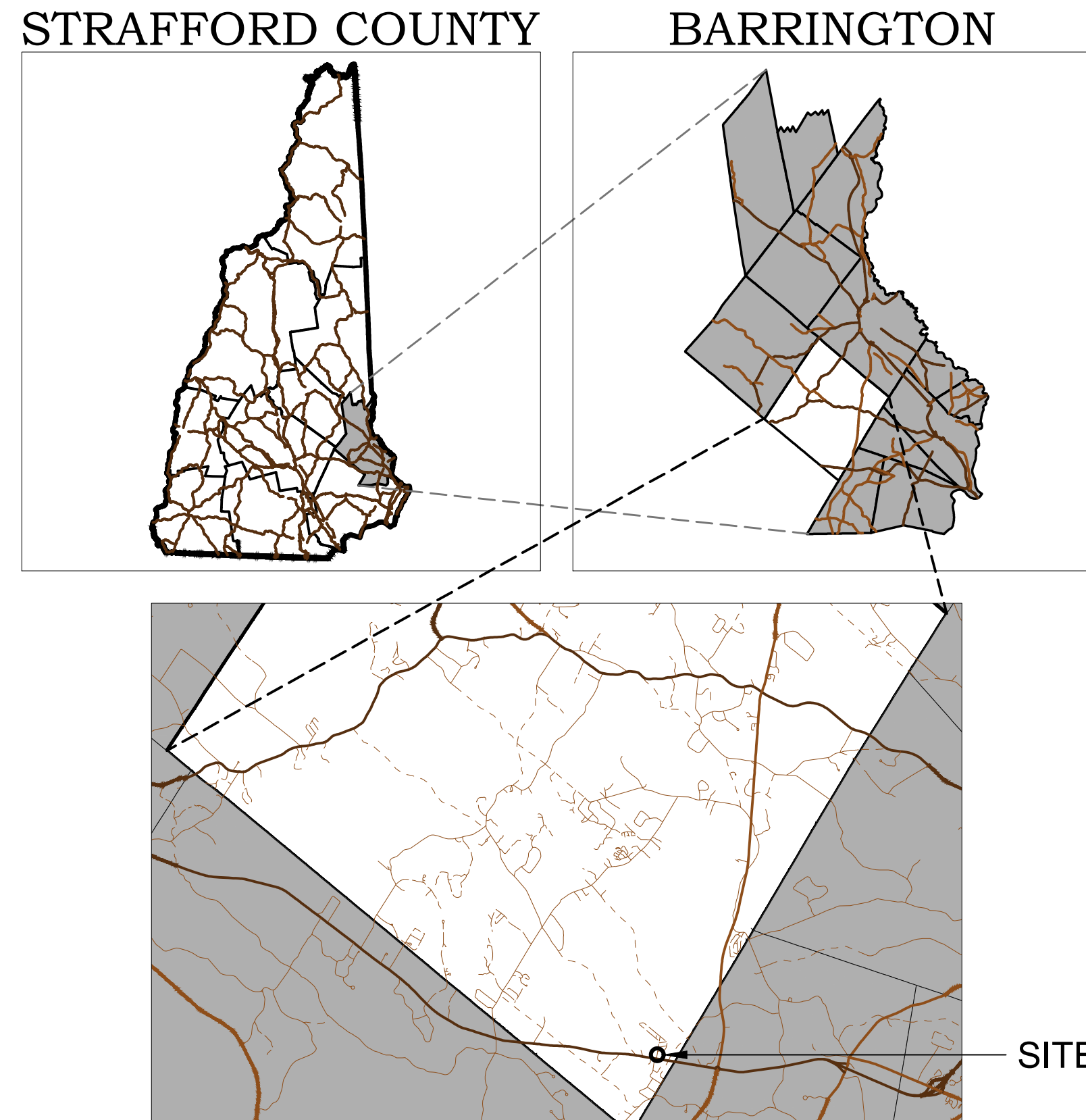


GEOMORPHIC CULVERT REPLACEMENT CONSTRUCTION SHEETS

THE INTERSECTION OF TOPAZ ROAD AND OYSTER RIVER IN BARRINGTON, NEW HAMPSHIRE



VICINITY MAP
NOT TO SCALE



EXISTING CULVERT OUTLET
NOT TO SCALE

LIST OF SHEETS

NO	SHEET ID	SHEET TITLE
1.	NOTES	PROJECT NOTES
2.	X-PLAN	EXISTING SITE PLAN
3.	P-PLAN	PROPOSED SITE PLAN
4.	P-TEMP	TEMPORARY ACCESS ROAD PLAN
5.	P-ENS	EROSION CONTROL & FLOW DIVERSION
6.	P-PLANT	PLANTING PLAN
7.	PROF	PROFILE
8.	XSEC	CROSS SECTIONS
9.	D-XS	STREAM & BRIDGE CROSS SECTION DETAILS
10.	D-LV	LOG CROSS VANE SEQUENCE & NOTES
11.	D-LV-US	UPSTREAM LOG CROSS VANE SPECS
12.	D-LV-DS	DOWNSTREAM LOG CROSS VANE SPECS
13.	D-BRDG	PREFABRICATED BRIDGE DETAILS

NOTES

1. THE PROJECT IS IN A LOCAL VERTICAL DATUM, ABOUT 55 FEET LOWER THAN NAVD88.
2. REFER TO THE ACCOMPANYING BID DOCUMENTATION FOR SUPPLEMENTAL INFORMATION.
3. REFER TO THE WETLAND PERMIT FOR SUPPLEMENTAL CONSTRUCTION CONDITIONS, CONSTRAINTS, AND REQUIREMENTS.



GENERAL NOTES

1. PROJECT CONTACTS INCLUDE:
 - 1.1. ENGINEER (STREAMWORKS, PLLC)
TOM BALLESTERO
603-767-4975 OR
JOEL BALLESTERO
970-556-7552
 - 1.2. APPLICANT AND PRIMARY LANDOWNER (EMERALD ACRES COOPERATIVE, INC)
LORI WINGATE
603-556-8340
 - 1.3. PROJECT MANAGEMENT (THE NATURE CONSERVANCY)
MATTHEW THORNE
603-230-9216
2. WETLAND DELINEATION WAS:
 - 2.1. PERFORMED ORIGINALLY IN JUNE OF 2012 BY:
DAMON BURT
FRAGGLE ROCK ENVIRONMENTAL SERVICES
NH CWS #163; CPESC #3213
 - 2.2. RECERTIFIED IN APRIL OF 2022 BY:
PETE STECKLER
THE NATURE CONSERVANCY
NH CWS #254
3. ALL COORDINATES ARE REFERENCED TO A LOCAL DATUM, NOT TIED TO GLOBAL COORDINATES
4. EXISTING SURVEY ELEVATIONS SHOWN ON THESE PLAN SHEETS ARE LOWER THAN NAVD88 BY ABOUT 55 FEET – PLEASE NOTE THAT ELEVATIONS SHOWN ON THESE PLAN SHEETS MAY BE DIFFERENT THAN OTHER DOCUMENTS AND DATA SOURCES.
5. DUE TO FUNDING SOURCES, THIS PROJECT MUST BE COMPLETED THIS YEAR (2023).
6. TO MINIMIZE IMPACTS TO AQUATIC SPECIES OF CONCERN, CONSTRUCTION CANNOT BEGIN UNTIL AFTER JUNE 1, AND IS RECOMMENDED TO OCCUR DURING THE TYPICAL LOW-FLOW MONTHS (JUNE TO OCTOBER).

CONSTRUCTION NOTES

7. IMMEDIATELY PRIOR TO CONSTRUCTION, CONTACT NH FISH AND GAME. THEY WILL COME AND REMOVE AQUATIC SPECIES FROM THE CONSTRUCTION AREA, WHICH SHALL BE DONE THE SAME DAY THAT FLOW DIVERSION IS INSTALLED, AND THE STREAM WITHIN THE CONSTRUCTION AREA SHALL BE CUT OFF TO AQUATIC ACCESS.
8. PRIOR TO CONSTRUCTION, THE OVERHEAD WIRES AND UTILITY POLES SHALL BE MOVED AND/OR INSULATED; CONTRACTOR MUST COORDINATE WITH UTILITY COMPANY.
9. THE CONSTRUCTION SEQUENCE IN THESE SHEETS IS A GENERAL GUIDELINE; ULTIMATELY THE SEQUENCE WILL BE DETERMINED USING INPUT FROM THE SELECTED CONTRACTOR TO BEST MATCH THEIR ABILITIES AND AVAILABILITY. THE METHODS USED AND FINAL SEQUENCE SHALL REQUIRE THE APPROVAL OF THE ENGINEERS AND PERMITTING AGENTS.
10. STOCKPILE MATERIALS TO BE REUSED DURING CLEARING, GRUBBING, AND EXCAVATION. THESE MATERIALS ARE EXPECTED TO INCLUDE TREES AND LARGE BOULDERS. ALL MATERIALS TO BE REUSED ARE SUBJECT TO ENGINEER APPROVAL PRIOR TO USE.
11. STAGING AND STOCKPILE AREAS SHOWN ON THESE PLANS ARE CONCEPTUAL. STAGING AND STOCKPILE AREAS ARE THE RESPONSIBILITY OF THE CONTRACTOR TO BEST SUIT THE SEQUENCE AND TIMING PLANNED.
12. ALL STAGING AND STOCKPILING LOCATIONS USED MUST BE FULLY REMOVABLE, HAVE APPROPRIATE SEDIMENT CONTROL MEASURES, AND SHALL NOT REQUIRE UNNECESSARY CLEARING OF VEGETATION.
13. ALTERATIONS TO THE DESIGN SHOWN ON THESE PLANS SHALL BE PREAPPROVED BY BOTH THE ENGINEERS AND PERMITTING AGENTS. SMALL ALTERATIONS MAY BE MADE AT THE DISCRETION OF THE SUPERVISING ENGINEER.
14. TO MINIMIZE GRADING LIMITS AND EXCAVATED MATERIAL, ROCK RETAINING WALLS ARE PLANNED TO ACT AS WING WALLS, REUSING EXISTING BOULDERS FROM THE INLET AND OUTLET.
15. THE PROPOSED STRUCTURE SHOWN ON THESE PLANS IS A 39 FEET LONG, 32 FEET WIDE PREFABRICATED STEEL BRIDGE SKEWED 24 DEGREES. IT IS DELIVERED IN SECTIONS AND ASSEMBLED ON SITE. IT INCLUDES DECK MATERIAL WITH A PRE-PANEL LAMINATE, AND ALL REQUIRED FASTENERS.
16. THIS STRUCTURE WAS DESIGNED FOR ANOTHER PROJECT, THE SPECIFICATIONS AND DETAILS FOR WHICH ARE PROVIDED ON SHEET D-BRDG. THE MANUFACTURER FOR THIS STRUCTURE WAS:
ADM WELDING AND FABRICATION
37 BROADHEAD ST., WARREN, PA 16365-3302
(814) 723-7227
17. SPECIFIC TO THE PROPOSED STRUCTURE SHOWN, ABUTMENTS AND FOOTERS HAVE BEEN DESIGNED, MADE FROM PREFABRICATED CONCRETE BLOCKS. THE ABUTMENT BLOCKS ARE 3'x3' WITHOUT A DEFINED INDIVIDUAL LENGTH, THOUGH THE OVERALL LENGTH OF THE ABUTMENT MUST BE 2 FEET LONGER THAN THE BRIDGE END WIDTH, STACKED AS NECESSARY, FASTENED TOGETHER, AND TO THE FOOTER BLOCKS. THE FOOTER BLOCKS ARE 5'x5' BLOCKS WITHOUT DEFINED INDIVIDUAL LENGTHS, THOUGH THE FOOTER LENGTH MUST BE AT LEAST 2 FEET LONGER THAN THE ABUTMENT LENGTH AND FASTENED TOGETHER.
18. ULTIMATELY, THE FINAL STRUCTURE MAY BE SELECTED BY THE CONTRACTOR, SUBJECT TO APPROVAL BY THE PROJECT ENGINEER. ANY STRUCTURE SELECTED MUST BE AT LEAST 35.5 FEET WIDE (IN LINE WITH THE STREAM), PROVIDE A MINIMUM SPAN PERPENDICULAR TO THE STREAM OF 31.5 FEET, PROVIDE A MINIMUM FINAL RISE ABOVE THE STREAM INVERT OF 6 FEET, HAVE AT LEAST 150 SQUARE FEET OF TOTAL FLOWABLE AREA, AND AT LEAST 60 SQUARE FEET OF FLOWABLE AREA AT A 3-FOOT DEPTH ABOVE THE STREAM INVERT.
19. ANY PROPOSED STRUCTURE OTHER THAN SHOWN ON THESE PLANS SHALL HAVE FINAL STRUCTURE METRICS, SPECIFICATIONS, CONSTRUCTION METHODS, AND MATERIALS DEFINED BY THE MANUFACTURER, WITH THE STRUCTURE MEETING THE MINIMUM SPECIFICATIONS STATED.
20. GRADING AT THE INLET AND THE OUTLET TO THE PROPOSED CROSSING IS TIGHT, REQUIRING HEADWALLS, WINGWALLS, OR END SECTIONS. EXISTING BOULDERS MAY BE REUSED FOR THIS, BUT THE FINAL PLAN IS THE RESPONSIBILITY OF THE CONTRACTOR SUBJECT TO APPROVAL BY THE ENGINEER.
21. TEMPORARY ROAD CONSTRUCTION METHODS, MEANS, AND MATERIALS MAY BE DEFINED BY THE CONTRACTOR, BUT MUST BE ABLE TO:
 - 21.1. ALLOW ORDINARY (PERSONAL VEHICLES, DELIVERY VANS, OIL TRUCKS, SCHOOL BUSESSES, ETC.) AND EMERGENCY VEHICLE ACCESS TO THE COMMUNITY
 - 21.2. BE CAPABLE OF CONVEYING THE 10-YR FLOW (A FLOWABLE AREA OF ~48 SQUARE FEET) WITHOUT OVERTOPPING
 - 21.3. BE FULLY REMOVABLE UPON DECONSTRUCTION
22. THE TEMPORARY ROAD AND CULVERTS (TWO 3-FEET TALL, 8-FEET WIDE BOX CULVERTS) SHOWN ON THESE PLANS ARE SIZED TO CARRY THE 10-YEAR EVENT (~300 CFS) WITHOUT OVERTOPPING THE TEMPORARY ROAD.
23. THE TEMPORARY ROAD MAY BE ONE OR TWO LANES, THOUGH APPROPRIATE TRAFFIC CONTROL IS REQUIRED.
24. TRAFFIC CONTROL IS THE RESPONSIBILITY OF THE CONTRACTOR, SUBJECT TO APPROVAL BY THE PROJECT ENGINEERS.
25. PROCURING THE STREAMBED BACKFILL MATERIAL IS THE RESPONSIBILITY OF THE CONTRACTOR. A PARTICLE SIZE DISTRIBUTION OF THE MATERIAL MUST BE PROVIDED FOR REVIEW AND APPROVAL OF THE ENGINEER PRIOR TO INSTALLATION.

26. THERE WILL BE APPROXIMATELY 320 cy STREAMBED BACKFILL FOR THE PROJECT.
27. BACKFILL MATERIAL SHALL BE THOROUGHLY MIXED. THE GRADATION HAS BEEN SIZED TO MINIMIZE VOIDS, AND SEPARATION WILL OCCUR DURING TRANSPORT. WHEN POSSIBLE, MATERIAL SHOULD BE MIXED ON SITE THOUGH IT MAY BE MIXED OFF SITE SO LONG AS IT IS MIXED AGAIN UPON PLACEMENT IN THE STREAM.
28. THE PLACED STREAMBED BACKFILL MAY REQUIRE FLUSHING WITH WATER TO FURTHER FILL VOIDS WITH FINER MATERIAL IF NOT MIXED PROPERLY WHEN SET.
29. ALL STREAMBED BACKFILL MATERIAL SHALL MIMIC NATURAL SEDIMENTS – ROUNDER WITH NO SHARP EDGES
30. CONSTRUCTION OF ALL STREAM RELATED ACTIVITIES SHALL BE SUPERVISED BY A STREAM RESTORATION ENGINEER; NO IN-STREAM WORK SHALL TAKE PLACE WITHOUT ONE PRESENT.

EROSION CONTROL & FLOW DIVERSION NOTES


31. EROSION CONTROL SHALL BE PLACED AT ALL DOWNHILL/DOWNSTREAM LIMITS OF DISTURBED AREAS.
32. EROSION CONTROL SHALL CONSIST OF 1 FT DIAMETER (MINIMUM) BIODEGRADABLE FILTER SOCK INSTALLED TO MANUFACTURER'S SPECIFICATIONS
33. EROSION CONTROL AND FLOW DIVERSION SHALL BE INSPECTED AT THE BEGINNING OF EACH DAY. ANY REPAIRS MUST BE MADE PRIOR TO RESUMING CONSTRUCTION.
34. SEDIMENTS DEPOSITED IN THE SETTLING BASINS SHALL BE REMOVED AND DISPOSED OF OFFSITE AT THE END OF EACH WEEK, OR WHEN THEY ACCUMULATE TO A DEPTH OF 6 in.
35. ALL MATERIAL TRAPPED BY EROSION CONTROL MEASURES SHALL BE REMOVED AND DISPOSED OF OFFSITE.
36. EROSION CONTROL MEASURES PROPOSED CONSIST OF COMPOST SOCK. OTHER MEASURES MAY BE IMPLEMENTED, BUT ARE SUBJECT TO APPROVAL FROM THE ENGINEER AND PERMITTING AGENTS.
37. CONCEPTUAL PLANS FOR FLOW DIVERSION SHOWN IN THIS SHEET SET ARE AN EXAMPLE, AND ARE ULTIMATELY THE DISCRETION OF THE CONTRACTOR TO ENSURE THE BEST METHOD IS EMPLOYED DURING SELECT PHASES OF THE PROJECT ACCORDING TO SITE CONDITIONS AND CONTRACTOR ABILITY.
38. FINAL FLOW CONTROL MEASURES ARE SUBJECT TO REVIEW AND APPROVAL BY THE ENGINEER AND REGULATORY AGENTS.
39. WEATHER SHALL BE MONITORED CLOSELY DURING THE DURATION OF CONSTRUCTION, PROPERLY PREPARING FOR LARGE PRECIPITATION/FLOW EVENTS BY ENHANCING FLOW CONTROL AND/OR STABILIZING THE SITE.
40. FLOW DIVERSION FOR DAILY OPERATIONS MUST HAVE THE CAPACITY TO PASS ORDINARY FLOWS UP TO 1 CFS (450 gpm).
41. ORDINARY FLOWS AT THE SITE DURING THE SUMMER MONTHS (JUNE THROUGH OCTOBER) ARE ESTIMATED TO BE BETWEEN 0.1 AND 1 CFS (45 TO 450 GPM)
42. WATER PUMPED FROM UPSTREAM MAY OUTLET DOWNSTREAM DIRECTLY SO LONG AS IT IS CLEAN AND CLEAR.
43. WATER PUMPED DIRECTLY FROM THE CONSTRUCTION AREA VIA A SUMP MUST BE TREATED BEFORE DISCHARGING DOWNSTREAM. METHODS FOR TREATMENT ARE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL INCLUDE PRIMARY TREATMENT (FRAC TANK, CLARIFIER, CUSTOM SETTLING TANKS) AND FINAL TREATMENT (FILTER BAG OR SIMILAR AT OUTLET), SUBJECT TO APPROVAL BY THE ENGINEER.
44. FLOW DIVERTED FROM UPSTREAM SHALL HAVE OUTLET PROTECTION MEASURES USED TO ENSURE CONCENTRATED OUTFLOW DOES NOT CAUSE EROSION; ALL FLOW FROM DIVERSION MUST BE CLEAR WATER.
45. FLOW DIVERSION PLAN SHALL ALSO INCLUDE EMERGENCY CAPACITY, SHOULD A LARGER EVENT OCCUR, CAPABLE OF PASSING 10 CFS.
46. PUMPS USED FOR FLOW DIVERSION MAY BE POWERED BY ANY MEANS. THE PROJECT IS IN A RESIDENTIAL NEIGHBORHOOD, SO USE OF LOUD PUMPS AND/OR GENERATORS (ESPECIALLY OVERNIGHT) MUST COMPLY WITH LOCAL NOISE ORDINANCES.

PLANTING NOTES

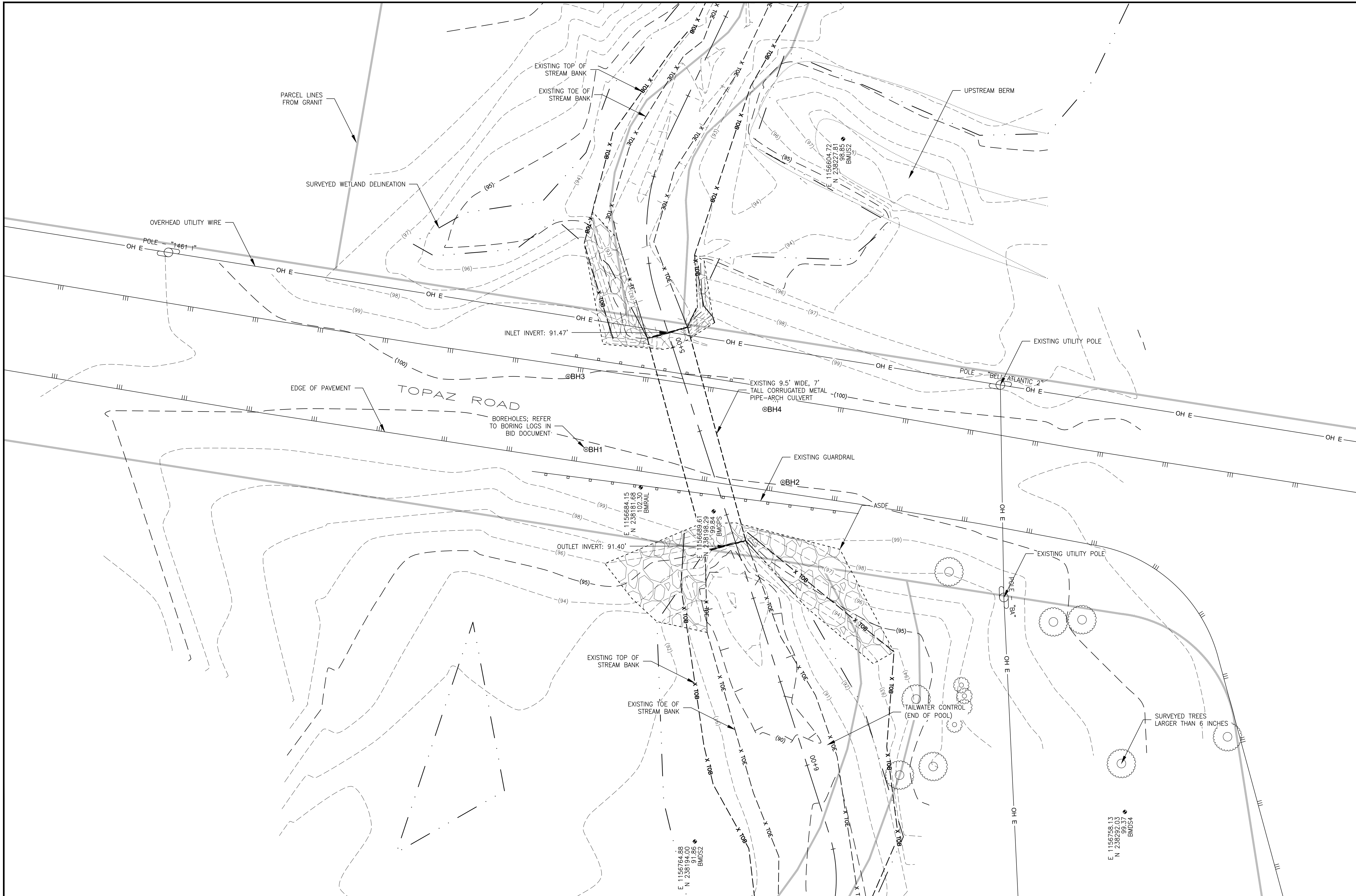
47. INVASIVE SPECIES SHALL BE FLAGGED PRIOR TO CONSTRUCTION. PRIOR TO FULL CLEARING AND GRUBBING, ALL INVASIVES SHALL BE REMOVED IN FULL AND DISPOSED OF (OR DESTROYED) OFFSITE.
48. UPLAND AREAS (THOSE OUTSIDE OF FLOODPLAINS AND WETLANDS) SHALL BE STABILIZED USING ENTIRELY BIODEGRADABLE MATERIALS (STRAW, STRAW/JUTE MAT/BLANKET [90Z/SY OR GREATER], SOD STAPLES, HYDROSEEDING, ETC)
49. UPLAND AREAS SHALL BE VEGETATED WITH A NATIVE, RIPARIAN CONSERVATION SEED MIX APPROPRIATE TO THE PROJECT LOCATION AT A RATE SPECIFIED BY THE SEED MANUFACTURER, PLACED BY HAND, MECHANICALLY, OR HYDROSEED. FINAL SEED MIX IS SUBJECT TO ENGINEER APPROVAL.
50. PERIODS OF DROUGHT SHALL NECESSITATE WATERING OF THE SITE AT LEAST TWICE PER WEEK. SEEDED LANDS SHALL BE MAINTAINED WET UNTIL VEGETATION HAS REACHED A HEIGHT OF 2 INCHES.
51. WETLAND/LOWLAND AREAS AND FLOODPLAINS SHALL BE SEEDED WITH A RIPARIAN BUFFER MIX WITH NATIVE SPECIES APPROPRIATE TO THE PROJECT LOCATION AT A RATE SPECIFIED BY THE MANUFACTURER, PLACED BY HAND, MECHANICALLY, OR HYDROSEED. FINAL SEED MIX IS SUBJECT TO ENGINEER APPROVAL.
52. WETLAND/LOWLAND AREAS AND FLOODPLAINS (TO THE STREAM BANKS) SHALL BE STABILIZED USING A BIODEGRADABLE COIR NET WOVEN WITH COIR YARN AT APPROXIMATE 0.75"x0.75" SPACING (APPROXIMATELY 50% OPEN AREA, 18.5 OZ/SY) AND SECURED INTO GROUND USING BIODEGRADABLE STAKES/STAPLES.
53. FLOODPLAINS TO THE STREAM BANKS SHALL ALSO BE VEGETATED WITH LIVESTAKES AT AN AVERAGE RATE OF 1 LIVESTAKE EVERY 10 SQUARE FEET, PLACED IN A HETEROGENEOUS, RANDOM FASHION (NOT ON A GRID).
54. LIVESTAKES SHALL BE SOAKED IN WATER FOR A MINIMUM OF 2 WEEKS PRIOR TO INSTALLATION.
55. LIVESTAKES MAY CONSIST OF, BUT ARE NOT LIMITED TO: RED OSIER DOGWOOD (*Cornus stolonifera*), SILKY DOGWOOD (*Cornus amomum*), AMERICAN PUSSY WILLOW (*Salix discolor*), AND SPECKLED ALDER (*Alnus incana*). OTHER SPECIES MAY BE PROPOSED, AND ARE SUBJECT TO ENGINEER APPROVAL.
56. SEEDED LANDS SHALL HAVE AT LEAST 75% COVERAGE AFTER THE FIRST YEAR. BARE SPOTS SHALL REQUIRE SUPPLEMENTAL SEEDING.
57. LIVESTAKES SHALL HAVE A 75% SURVIVAL AFTER THE FIRST YEAR
 - 57.1. IF THIS SUCCESS IS NOT ACHIEVED, SUBSEQUENT PLANTINGS MUST BE PERFORMED TO ACHIEVE THE SUCCESS RATE
 - 57.2. ALTERNATIVELY, OR ADDITIONALLY, THE CONTRACTOR MAY USE MORE THAN THE SPECIFIED LIVESTAKE PLANTING DENSITY, AND SURVIVAL RATES IN SUBSEQUENT YEARS MAY BE LESS THAN 75%, SO LONG AS THE SURVIVAL IS EQUIVALENT TO 75% THE AMOUNT CALCULATED BY THE PLANTING RATE AND THE CONSTRUCTED AREA (APPROXIMATED IN THE BID DOCUMENT).

GENERAL CONSTRUCTION SEQUENCE

- A. CONTACT DIGSAFE TO IDENTIFY BURIED INFRASTRUCTURE.
- B. CONTACT ANY UTILITY COMPANIES TO HAVE THEIR UTILITIES MOVED AND/OR PROTECTED.
- C. CONTACT NH FISH AND GAME TO SET A DATE TO BEGIN PROJECT AND REMOVE AQUATIC SPECIES
- D. CLEAR AND GRUB THE EXISTING SITE, STOCKPILING MATERIALS TO BE REUSED. OPTIONAL REMOVAL OF THE UPSTREAM-LEFT EARTHEN BERM, REGRADING AREA INTO WETLANDS.
- E. INSTALL INITIAL FLOW DIVERSION MEASURES TO PUMP WATER AROUND THE ROAD TO A DOWNSTREAM LOCATION.
- F. INSTALL THE TEMPORARY ROAD AND CULVERTS.
- G. CLOSE THE PRIMARY ROAD AND INSTALL TRAFFIC CONTROL MEASURES.
- H. REMOVE AND DISPOSE OF THE EXISTING CULVERT, EXCAVATING TO THE LIMITS NECESSARY TO INSTALL THE PROPOSED STRUCTURE.
- I. INSTALL PROPOSED SUBGRADE AND ABUTMENTS, LEAVING ROOM TO CONSTRUCT THE STREAM THROUGH THE PROPOSED STRUCTURE
- J. INSTALL UPSTREAM LOG VANE, WING WALLS, AND STREAM.
- K. GRADE THE STREAM CHANNEL THROUGH THE PROPOSED STRUCTURE, AND TIE IN THE BANKS AT THE UPSTREAM END AS SHOWN ON THE PLANS.
- L. FINISH INSTALLING THE PROPOSED STRUCTURE, GUARDRAILS, AND PRIMARY ROAD.
- M. DECONSTRUCT AND UNINSTALL THE TEMPORARY ROAD.
- N. CONSTRUCT DOWNSTREAM WING WALLS, LOG VANE, AND STREAM.
- O. SEED AND VEGETATE ALL DISTURBED LANDS.
- P. REMOVE AND DISPOSE OF ALL EROSION CONTROL MEASURES. REINSTALL ALL UTILITIES AS NECESSARY.

DESIGNED BY: JCB, TPB	DRAWN BY: JCB	CHECKED BY: TPB	DATE: 13 FEB 2023
			
NOTES:			
DATE:			
REVISION #:			
PROJECT NOTES			
CONSTRUCTION SHEET SET			
EMERALD ACRES CULVERT REPLACEMENT			
TOPAZ RD & OYSTER R., BARRINGTON NH			
SHEET TITLE:	PROJECT NOTES		
SHEET SET:	CONSTRUCTION SHEET SET		
PROJECT NAME:	EMERALD ACRES CULVERT REPLACEMENT		
PROJECT LOCATION:	TOPAZ RD & OYSTER R., BARRINGTON NH		
SHEET ID:	NOTES		
SHEET NUMBER:	01 OF 13		





DESIGNED BY: JCB, TPB
 DRAWN BY: JCB
 CHECKED BY: TPB
 DATE: 13 FEB 2023



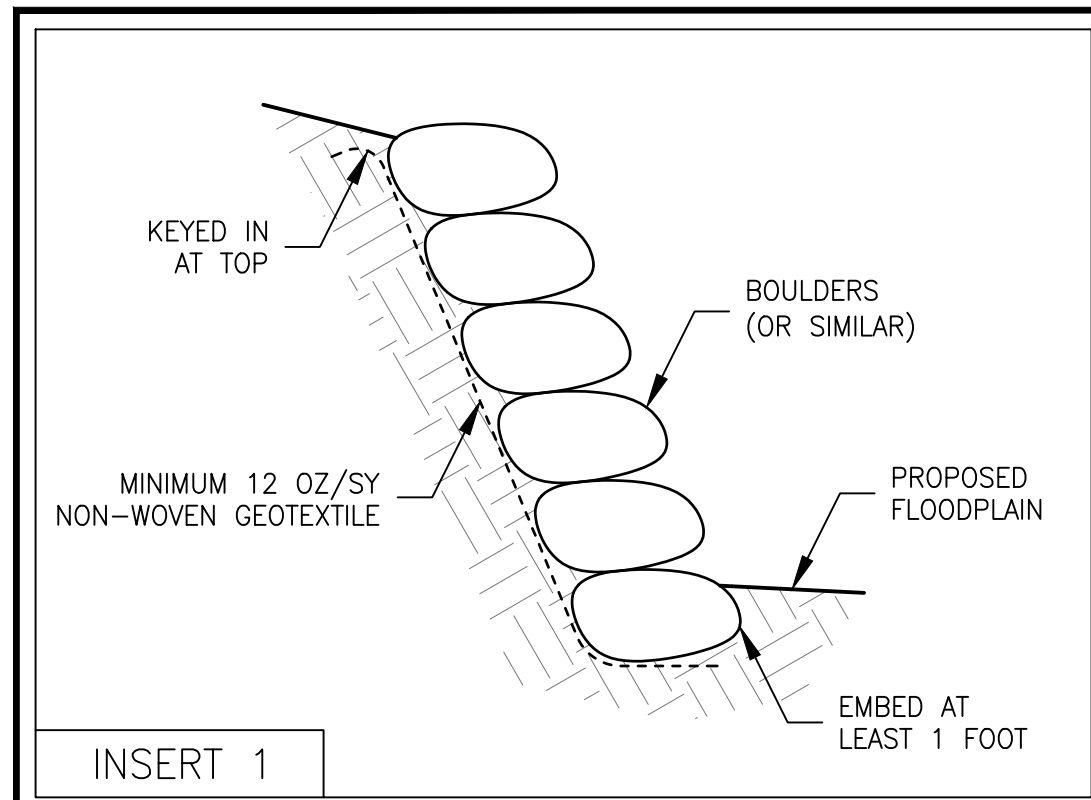
REVISION #	DATE	NOTES

EXISTING SITE PLAN
 CONSTRUCTION SHEET SET
 EMERALD ACRES CULVERT REPLACEMENT
 TOPAZ RD & OYSTER R., BARRINGTON NH

SHEET TITLE: EXISTING SITE PLAN
 SHEET SET: CONSTRUCTION SHEET SET
 PROJECT NAME: EMERALD ACRES CULVERT REPLACEMENT
 PROJECT LOCATION: TOPAZ RD & OYSTER R., BARRINGTON NH

SCALE: 1" = 10'

SHEET ID: X-PLAN
 SHEET NUMBER: 02 OF 13



DESIGNED BY: JCB, TPB
 DRAWN BY: JCB
 CHECKED BY: TPB
 DATE: 13 FEB 2023



REVISION #	DATE	NOTES

PROPOSED SITE PLAN
 CONSTRUCTION SHEET SET
 EMERALD ACRES CULVERT REPLACEMENT
 TOPAZ RD & OYSTER R., BARRINGTON NH

SHEET ID: **P-PLAN**
 SHEET NUMBER: **03** OF **13**

SCALE: 1" = 8'



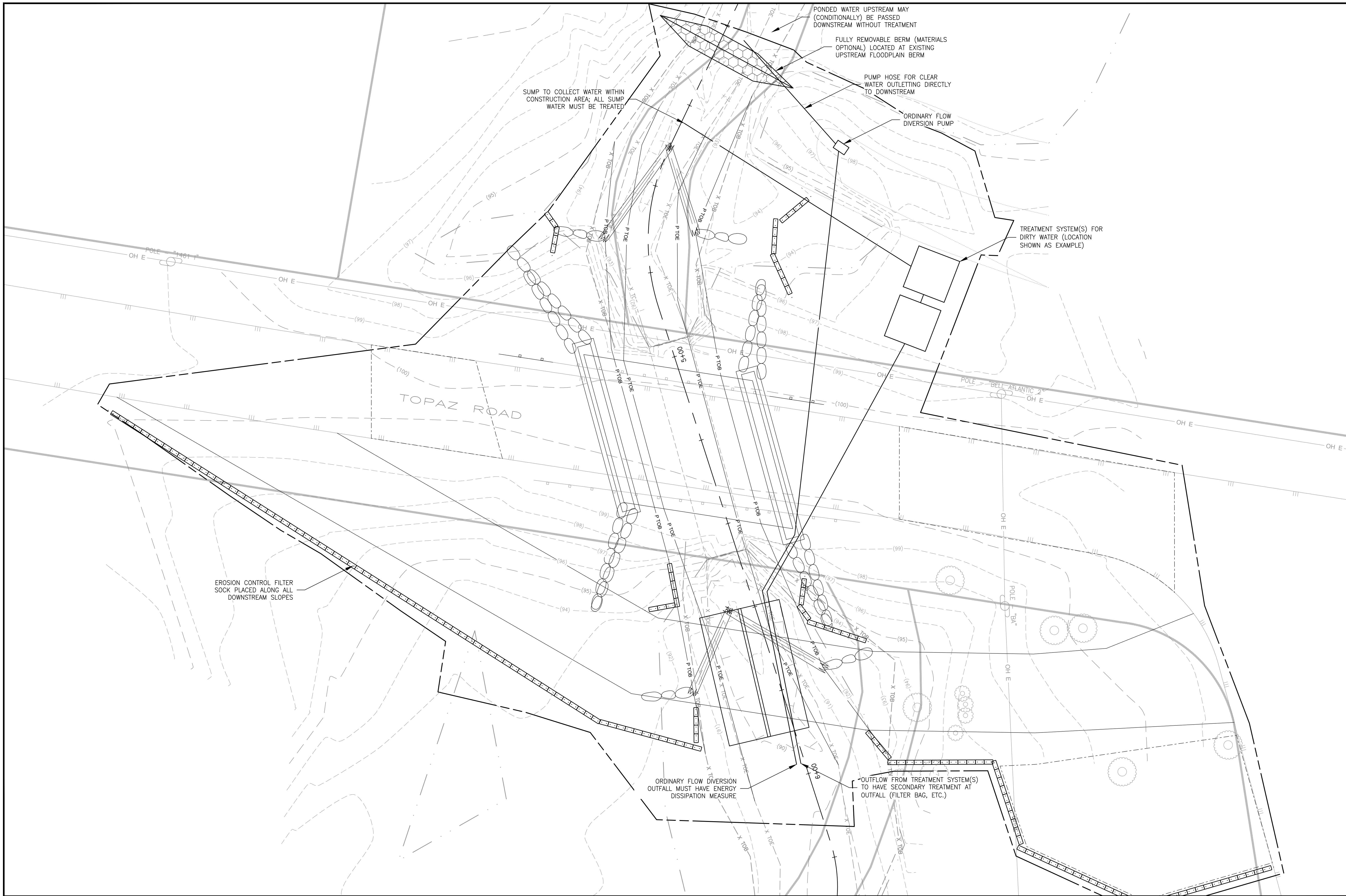
DESIGNED BY:	JCB, TPB
DRAWN BY:	JCB
CHECKED BY:	TPB
DATE:	13 FEB 2023
NOTES:	
REVISION #:	
DATE:	

TEMPORARY ACCESS ROAD PLAN
 CONSTRUCTION SHEET SET
 EMERALD ACRES CULVERT REPLACEMENT
 TOPAZ RD & OYSTER R., BARRINGTON NH

SHEET TITLE: **TEMPORARY ACCESS ROAD PLAN**
 SHEET SET: **CONSTRUCTION SHEET SET**
 PROJECT NAME: **EMERALD ACRES CULVERT REPLACEMENT**
 PROJECT LOCATION: **TOPAZ RD & OYSTER R., BARRINGTON NH**

SCALE: 1" = 10'

SHEET ID: **P-TEMP**
 SHEET NUMBER: **04 OF 13**



DESIGNED BY:	JCB, TPB
DRAWN BY:	JCB
CHECKED BY:	TPB
DATE:	13 FEB 2023

NOTES:	
REVISION #:	
DATE:	

SHEET TITLE:
EROSION CONTROL AND FLOW DIVERSION

SHEET SET:
CONSTRUCTION SHEET SET

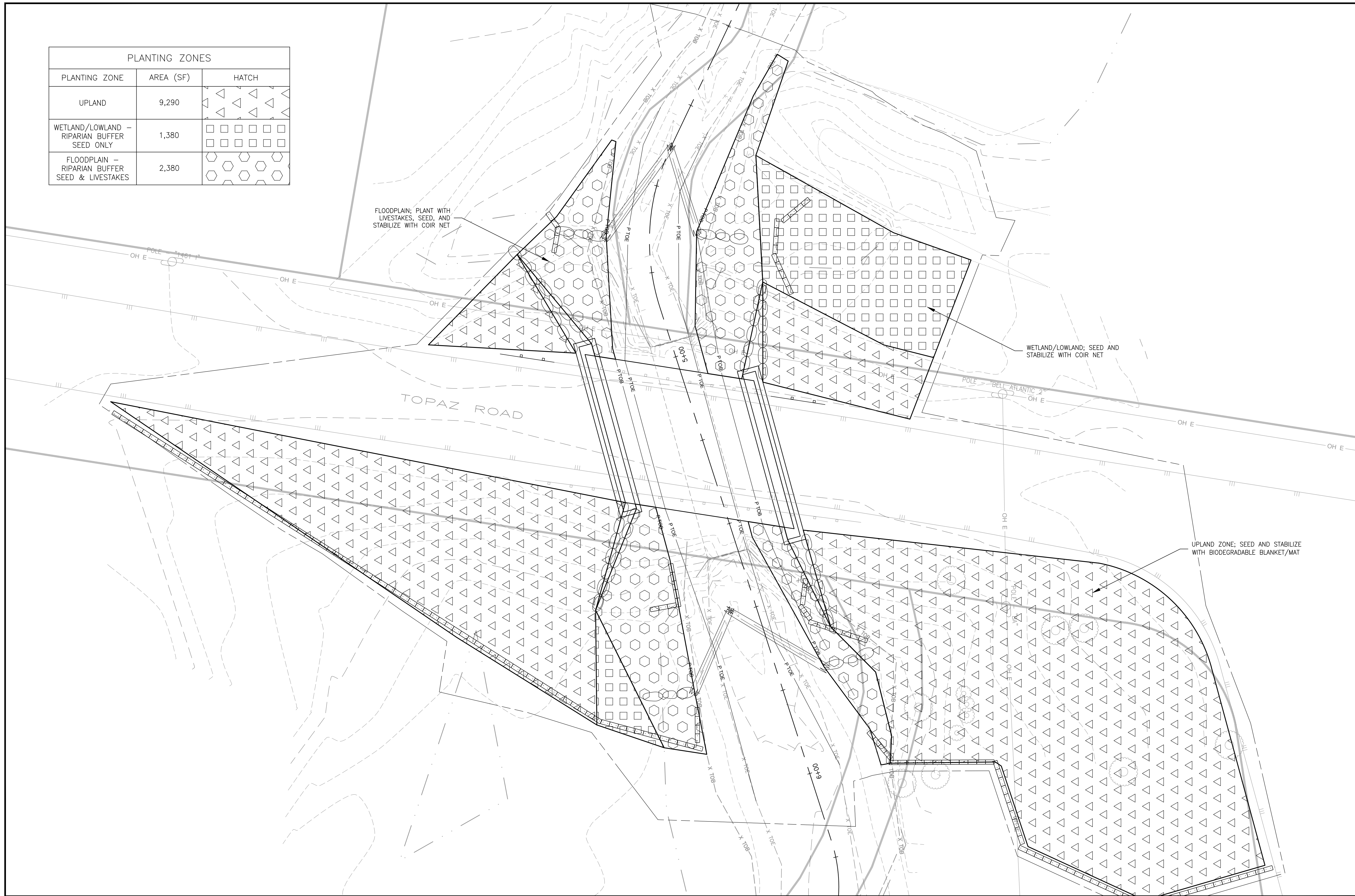
PROJECT NAME:
EMERALD ACRES CULVERT REPLACEMENT

PROJECT LOCATION:
TOPAZ RD & OYSTER R., BARRINGTON NH

SCALE: 1" = 10'

SHEET ID:	P-ENS
SHEET NUMBER:	05 OF 13

PLANTING ZONES		
PLANTING ZONE	AREA (SF)	HATCH
UPLAND	9,290	
WETLAND/LOWLAND - RIPARIAN BUFFER SEED ONLY	1,380	
FLOODPLAIN - RIPARIAN BUFFER SEED & LIVESTAKES	2,380	



DESIGNED BY:	JCB, TPB
DRAWN BY:	JCB
CHECKED BY:	TPB
DATE:	13 FEB 2023

treamworks

NOTES:	
REVISION #:	
DATE:	

PLANTING PLAN

CONSTRUCTION SHEET SET

EMERALD ACRES CULVERT REPLACEMENT

TOPAZ RD & OYSTER R., BARRINGTON NH

SHEET TITLE:

SHEET SET:

PROJECT NAME:

PROJECT LOCATION:

SCALE: 1" = 10'

SHEET ID:

P-PLANT

SHEET NUMBER:

06 OF **13**

DESIGNED BY: JCB, TPB
DRAWN BY: JCB
CHECKED BY: TPB
DATE: 13 FEB 2023



105
100
95
90
85

REPLACE EXISTING ROAD IN-KIND, MATCHING ELEVATIONS AND GRADES; MINOR ADJUSTMENTS TO SHOULDER GRADING AT PROPOSED STRUCTURE MAY BE NECESSARY

EXISTING 9.5' WIDE, 7' TALL PIPE ARCH CULVERT

PREFABRICATED BRIDGE

TEMPORARY CULVERTS BELOW TEMPORARY ROAD SHOWN HERE FOR EXAMPLE; FINAL STRUCTURE(S) ARE THE RESPONSIBILITY OF THE CONTRACTOR

TEMPORARY ROAD GRADING SHOWN HERE IS FOR EXAMPLE; FINAL MATERIALS AND SPECIFICATIONS ARE THE RESPONSIBILITY OF THE CONTRACTOR

LEFT TOP OF BANK (PROJECTION)
RIGHT TOP OF BANK (PROJECTION)

PROJECTION OF UPSTREAM CROSS VANE LEFT ARM HEADER LOG

Station=4+70.0
Elev = 92.980

PROJECTION OF UPSTREAM CROSS VANE RIGHT ARM HEADER LOG

Station=4+71.9
Elev = 92.900

EXISTING GROUND ALONG CENTERLINE

Station=4+50.8
Elev = 91.730

PROPOSED STREAM THALWEG (CHANNEL BOTTOM): NOTE: THE LINE SHOWN HERE DOES NOT REPRESENT THE SURFACE ALONG THE CENTERLINE; IT IS A PROJECTION OF THE THALWEG

Station=4+61.3
Elev = 90.643

PROJECTION OF UPSTREAM CROSS VANE RIGHT ARM FOOTER LOG

PROJECTION OF UPSTREAM CROSS VANE LEFT ARM FOOTER LOG

Station=4+99.5
Elev = 91.025

Station=5+03.0
Elev = 90.983

Station=5+38.8
Elev = 90.558

PROPOSED FOOTER SHOWN HERE HAS BEEN DESIGNED FOR THE BRIDGE AS SHOWN IN THESE PLANS

Station=5+59.1
Elev = 90.310

PROJECTION OF DOWNSTREAM CROSS VANE LEFT ARM FOOTER LOG

Station=5+74.1
Elev = 91.550

PROJECTION OF DOWNSTREAM CROSS VANE RIGHT ARM HEADER LOG

PROJECTION OF DOWNSTREAM CROSS VANE LEFT ARM HEADER LOG

Station=5+77.9
Elev = 91.550

Station=5+67.6
Elev = 89.173

PROJECTION OF DOWNSTREAM CROSS VANE RIGHT ARM FOOTER LOG

4+20

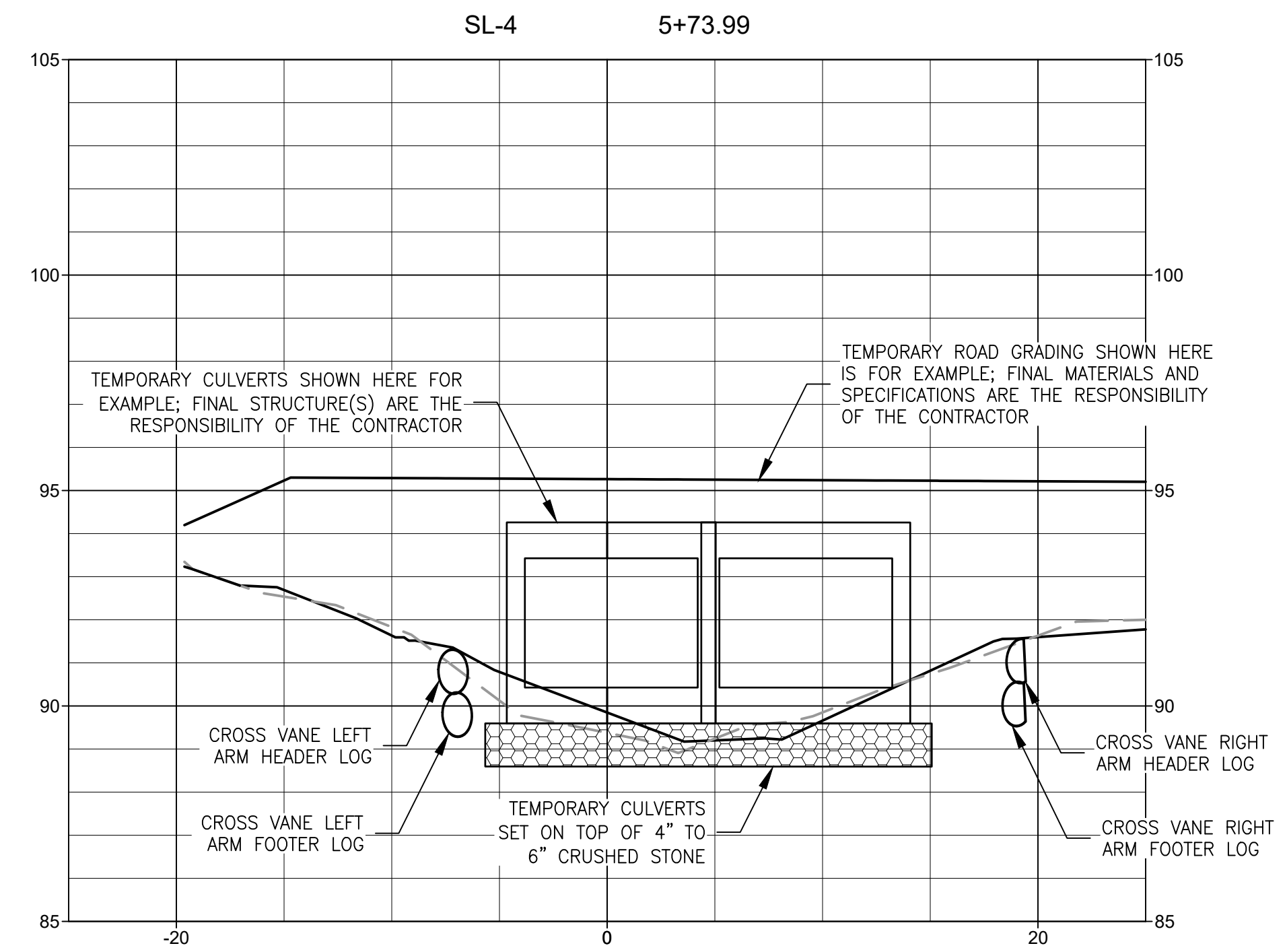
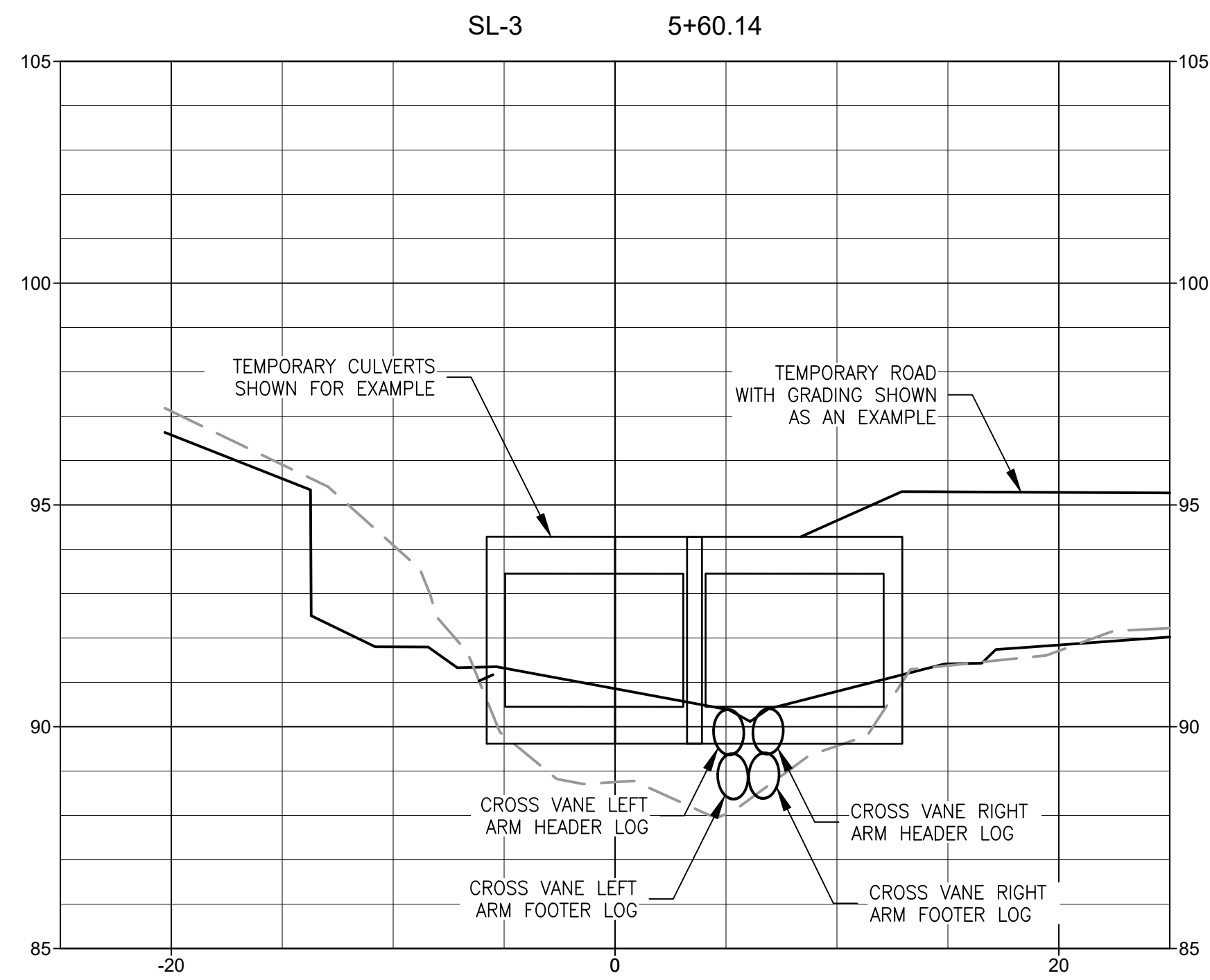
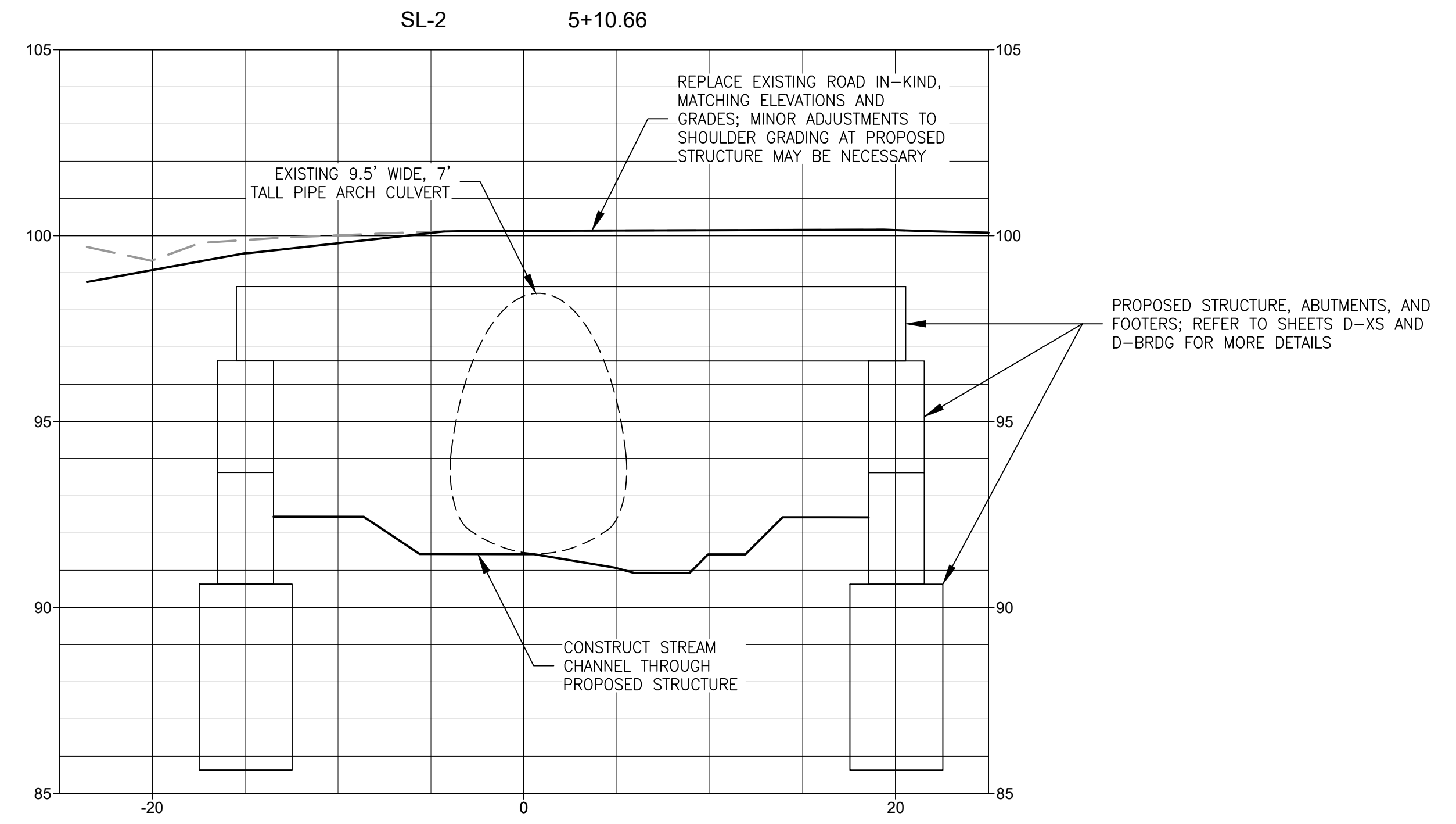
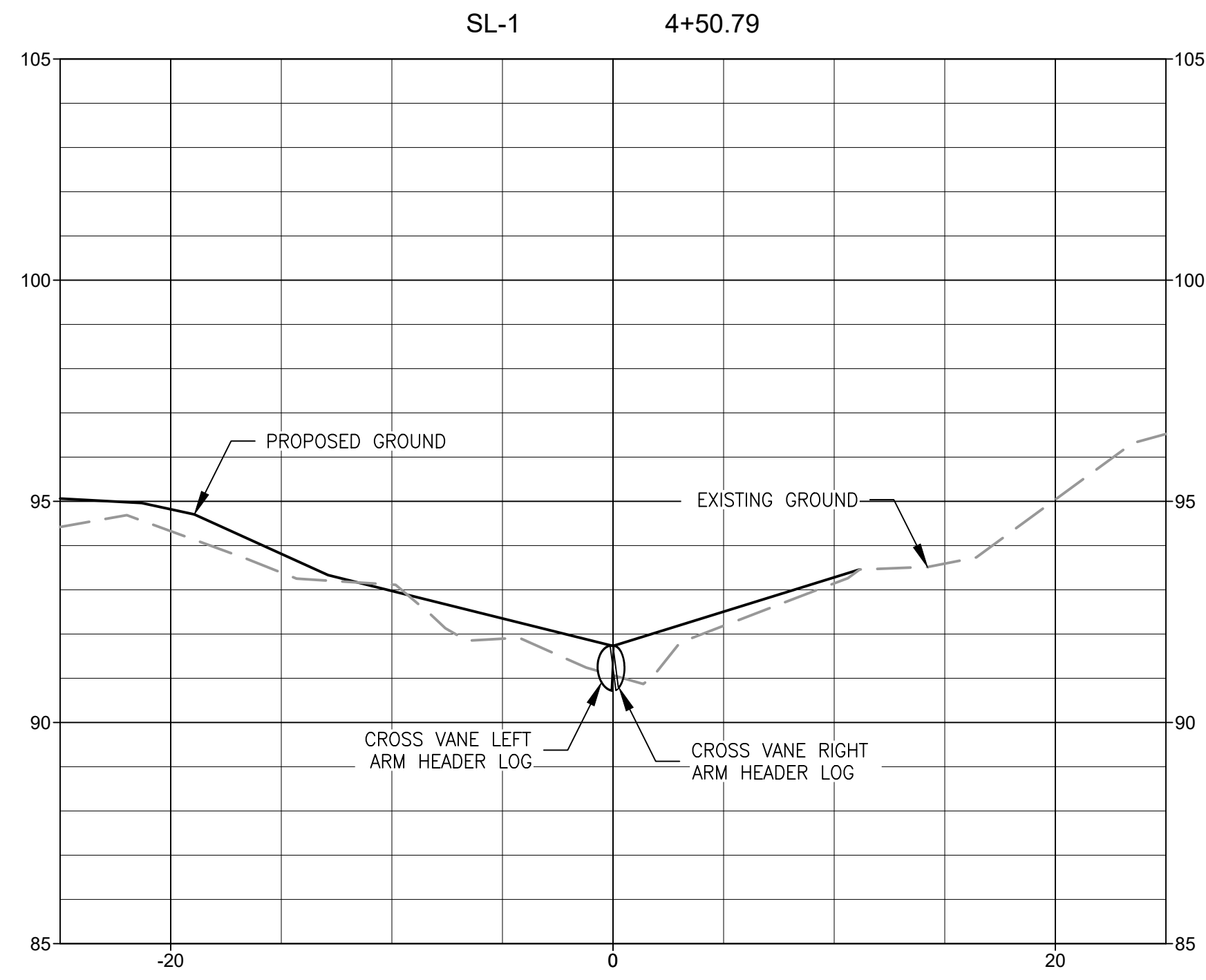
5+00

6+00

SHEET TITLE: PROFILE
SHEET SET: CONSTRUCTION SHEET SET
PROJECT NAME: EMERALD ACRES CULVERT REPLACEMENT
PROJECT LOCATION: TOPAZ RD & OYSTER R., BARRINGTON NH

4:1 VERTICAL EXAGGERATION
VERTICAL SCALE: 1" = 1.5'
HORIZONTAL SCALE: 1" = 6'

SHEET ID: PROF
SHEET NUMBER: 07 OF 13



DESIGNED BY: JCB, TPB
 DRAWN BY: JCB
 CHECKED BY: TPB
 DATE: 13 FEB 2023



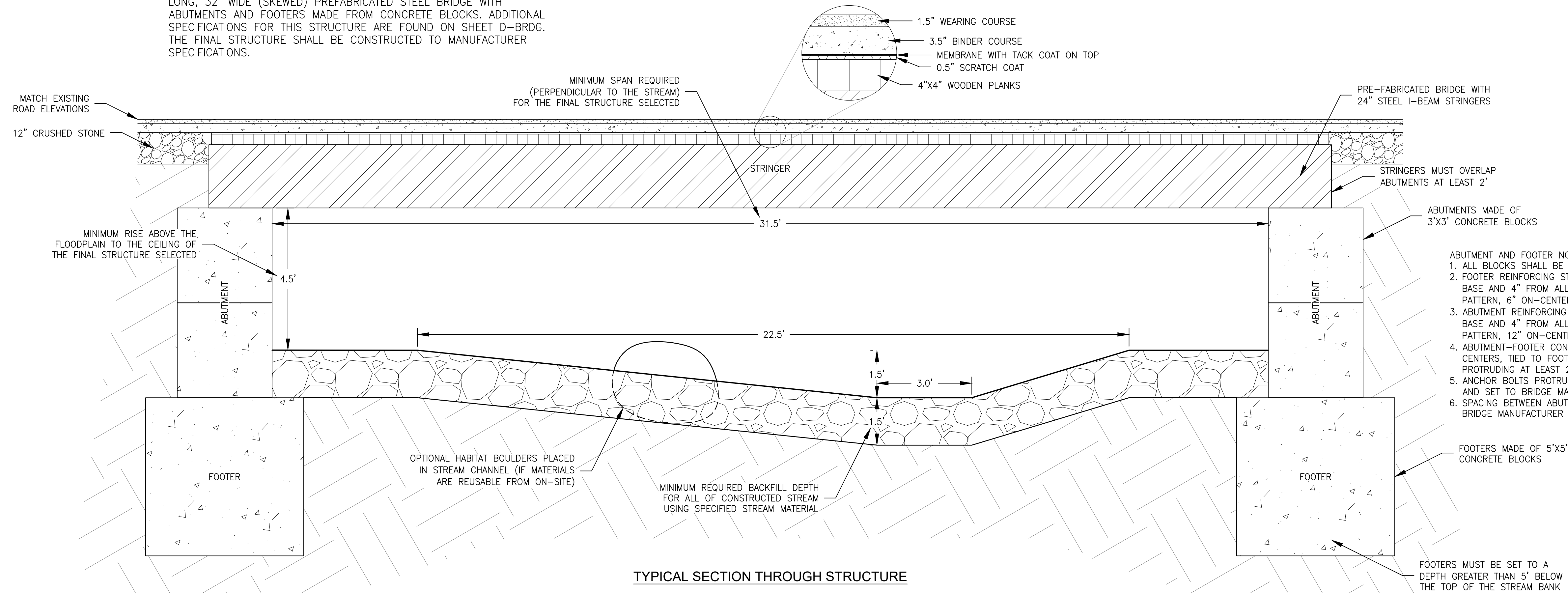
REVISION #	DATE	NOTES

SHEET TITLE: CROSS SECTIONS
 SHEET SET: CONSTRUCTION SHEET SET
 PROJECT NAME: EMERALD ACRES CULVERT REPLACEMENT
 PROJECT LOCATION: TOPAZ RD & OYSTER R., BARRINGTON NH

2:1 VERTICAL EXAGGERATION
 VERTICAL SCALE: 1" = 2'
 HORIZONTAL SCALE: 1" = 6'

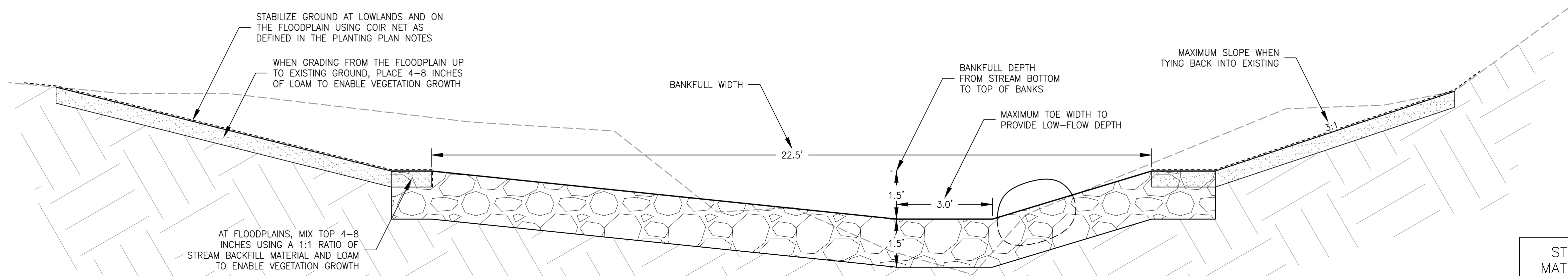
SHEET ID: XSEC
 SHEET NUMBER: 08 OF 13

*AS SHOWN IN THESE PLANS, THE PROPOSED STRUCTURE IS A 39' LONG, 32' WIDE (SKEWED) PREFABRICATED STEEL BRIDGE WITH ABUTMENTS AND FOOTERS MADE FROM CONCRETE BLOCKS. ADDITIONAL SPECIFICATIONS FOR THIS STRUCTURE ARE FOUND ON SHEET D-BRDG. THE FINAL STRUCTURE SHALL BE CONSTRUCTED TO MANUFACTURER SPECIFICATIONS.



TYPICAL SECTION THROUGH STRUCTURE

- ABUTMENT AND FOOTER NOTES:
1. ALL BLOCKS SHALL BE OF MINIMUM 4,500 psi CONCRETE
 2. FOOTER REINFORCING STEEL: 3/4" (#6 REBAR), 2" OFF BASE AND 4" FROM ALL SIDES IN A CROSS-HATCHED PATTERN, 6" ON-CENTERS
 3. ABUTMENT REINFORCING STEEL: 3/4" (#6 REBAR), 2" OFF BASE AND 4" FROM ALL SIDES IN A CROSS-HATCHED PATTERN, 12" ON-CENTERS
 4. ABUTMENT-FOOTER CONNECTION: L-BARS, ON 6" CENTERS, TIED TO FOOTER REINFORCING STEEL, PROTRUDING AT LEAST 2' INTO THE ABUTMENT
 5. ANCHOR BOLTS PROTRUDING FROM ABUTMENT SURFACE AND SET TO BRIDGE MANUFACTURER'S TEMPLATE
 6. SPACING BETWEEN ABUTMENTS TO BE DICTATED BY BRIDGE MANUFACTURER



TYPICAL STREAM SECTION

*ACTUAL DIMENSIONS AND METRICS WILL VARY WHEN GRADING THE CONSTRUCTED STREAM BACK TO EXISTING CHANNEL

STREAM BACKFILL MATERIAL GRADATION	
SIZE (IN)	% PASSING
12	85
9	60
6	42.5
2	6

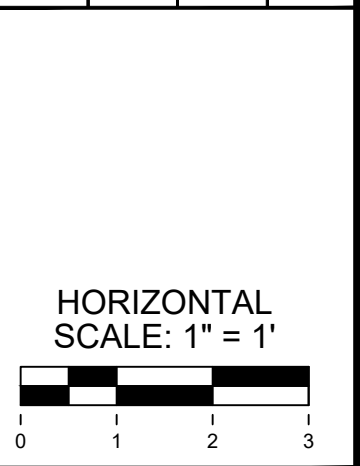
*MATERIAL GRADATION IS APPROXIMATELY EQUAL TO A 1:1 MIXTURE OF:
 -NHDOT CLASS C STONE FILL AND
 -AN EVEN MIX 6"-15" OF STONE

DESIGNED BY: JCB, TPB
 DRAWN BY: JCB
 CHECKED BY: TPB
 DATE: 13 FEB 2023

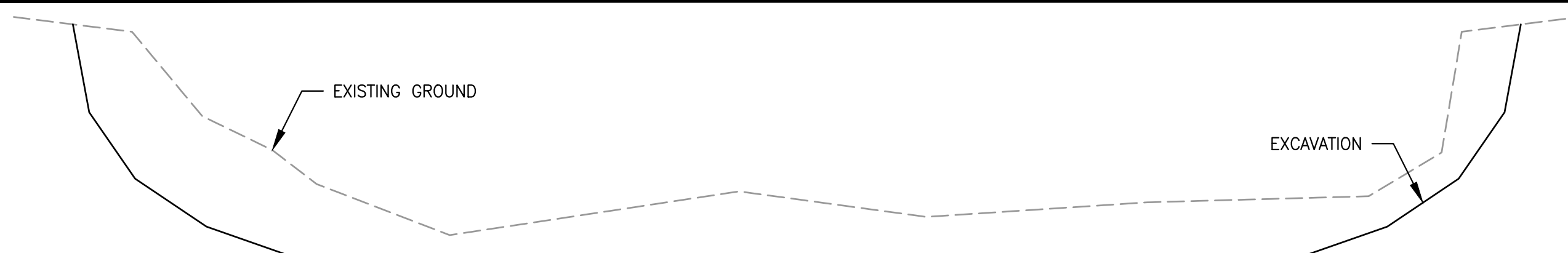


REVISION #	DATE	NOTES

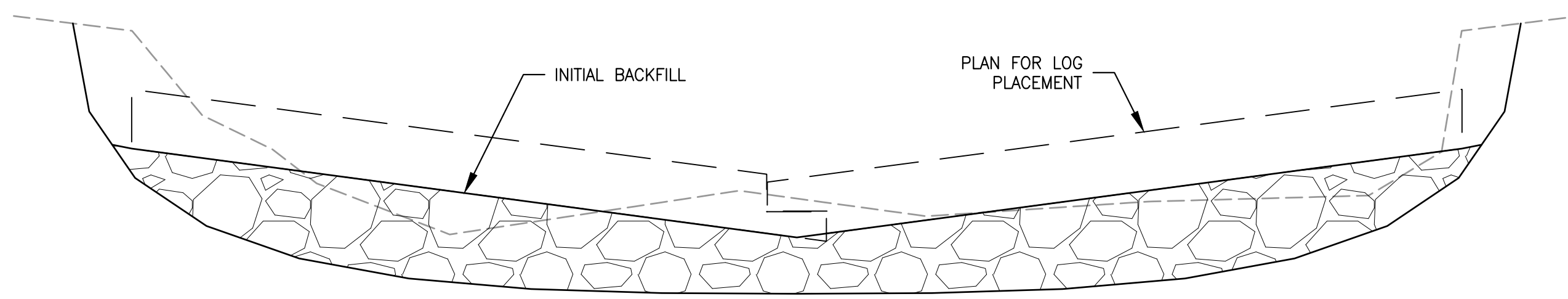
SHEET TITLE: **STREAM & BRIDGE CROSS SECTION DETAILS**
 SHEET SET: **CONSTRUCTION SHEET SET**
 PROJECT NAME: **EMERALD ACRES CULVERT REPLACEMENT**
 PROJECT LOCATION: **TOPAZ RD & OYSTER R., BARRINGTON NH**



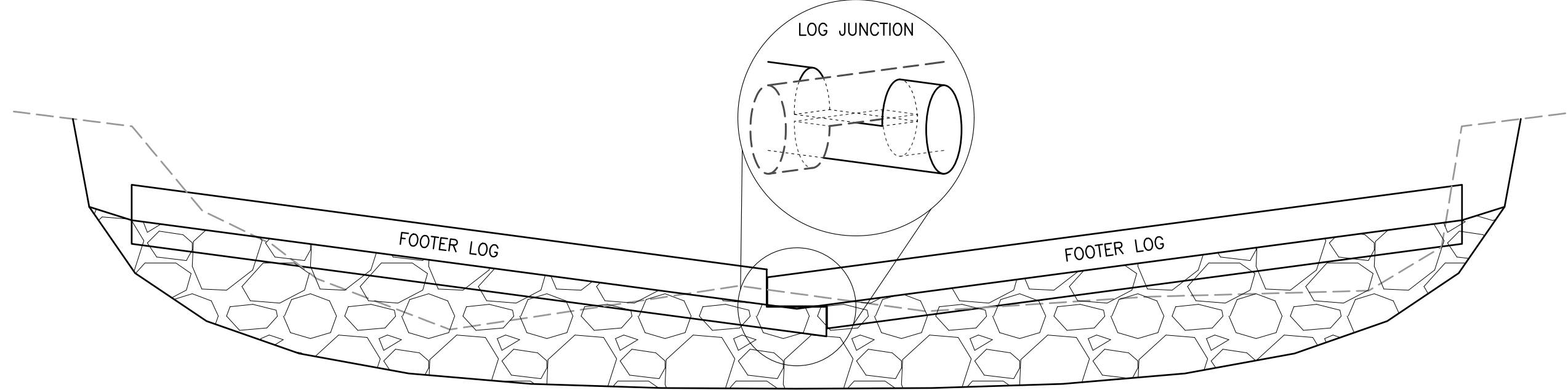
SHEET ID: **D-XS**
 SHEET NUMBER: **09** OF **13**



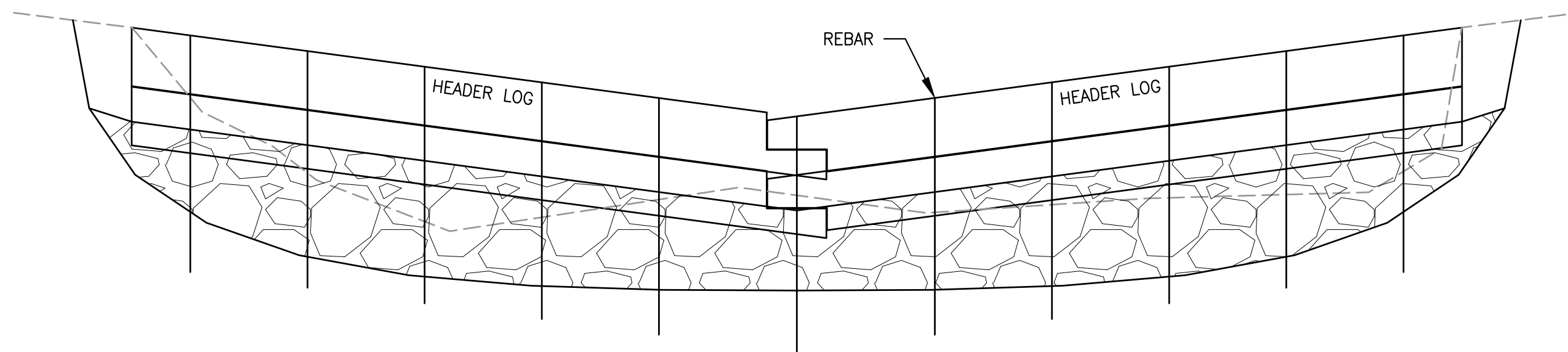
STEP 1
 MEASURE EACH LOG TO BE USED AND CUT TO LENGTH, ENSURING EACH MEETS THE MINIMUM DIAMETER. OVER-EXCAVATE A HOLE FOR THE LOG VANE ARMS AND THE DOWNSTREAM POOL TO A DEPTH EQUAL OR GREATER THAN THE REQUIRED BACKFILL DEPTH, MAKING SURE TO ACCOUNT FOR THE LOG DIAMETERS.



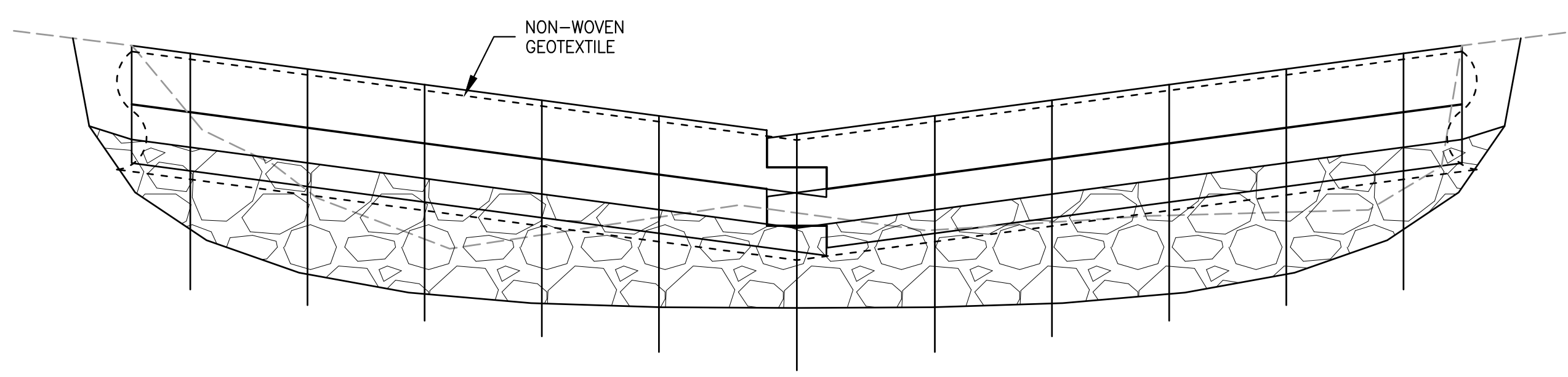
STEP 2
 BACKFILL WITH STREAMBED MATERIAL, CONCENTRATING ALONG THE LENGTH THE VANE ARMS WILL BE PLACED. MEASURE THE LOGS TO BE USED SO THE MATERIAL CAN BE PLACED AT THE GRADE NECESSARY TO SUPPORT THE FOOTER LOGS, WHICH WILL SUPPORT THE HEADER LOGS TO THEIR CORRECT ELEVATIONS.



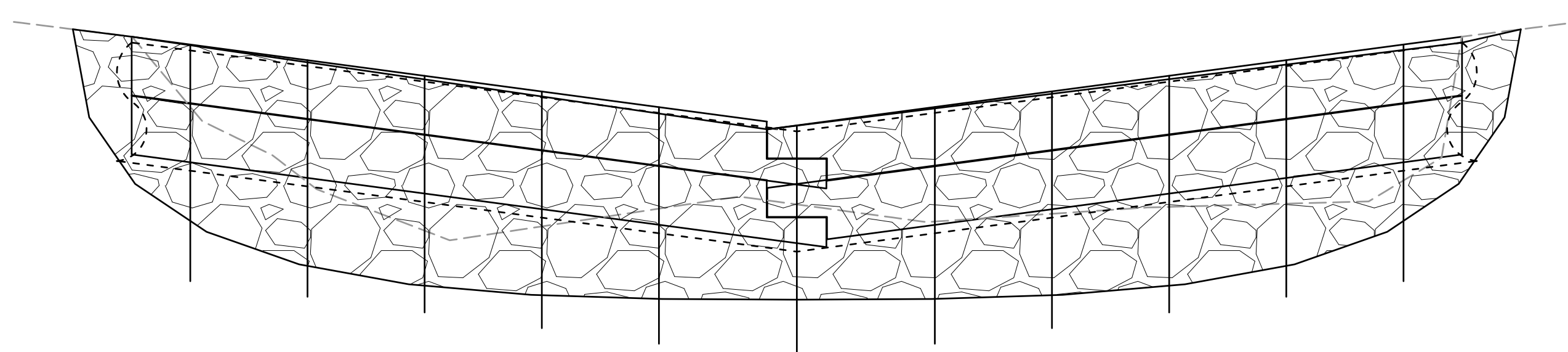
STEP 3
 SET ONE FOOTER LOG IN PLACE SPATIALLY AND ADJUST EACH END (SHIM WITH MATERIAL TO RAISE, PRESS DOWN WITH EXCAVATOR TO LOWER) UNTIL ELEVATIONS ARE APPROPRIATE TO SUPPORT HEADER LOG. MARK THE JUNCTION LOCATION AND NOTCH THE LOG WITH A CHAINSAW. LOOSELY LAY THE OTHER FOOTER LOG IN PLACE, CUT THE NOTCH, AND SET IT TO FINAL ELEVATION IN THE SAME MANNER. BACKFILL AROUND THE LOGS SLOWLY TO HELP LOCK THEM IN PLACE. ENSURE VOIDS ARE LOOSELY FILLED BELOW THE LOGS MANUALLY (SHOVEL) WITHOUT AFFECTING THEIR PLACEMENT. LEAVE ROOM UPSTREAM (DO NOT OVERFILL) FOR GEOTEXTILE SKIRT TO BE PLACED (STEP 5).



STEP 4
 PLACE ONE HEADER LOG ATOP FOOTER LOG AND CHECK ELEVATIONS. SECURE THE LOG TO THE FOOTER LOG USING REBAR HAMMERED THROUGH PRE-DRILLED HOLES. MARK THE JUNCTION LOCATION AND NOTCH THE LOG. SET THE NEXT HEADER LOG IN PLACE IN SIMILAR FASHION, WITH THE FINAL PIECE OF REBAR HAMMERED THROUGH THE JUNCTION OF ALL FOUR LOGS. MINOR ADJUSTMENTS TO FINISHED ELEVATIONS MAY BE MADE BY SHAVING LOGS USING A CHAINSAW.



STEP 5
 FASTEN SPECIFIED NON-WOVEN GEOTEXTILE, ALONG THE UPSTREAM SIDE OF THE HEADER LOGS TO ACT AS A SKIRT, ENSURING IT WILL REMAIN UNSEEN AFTER FINAL GRADING IS PLACED. ENSURE THERE ARE NO GAPS ALONG THE LENGTH OF THE SKIRT AND LOOSELY PUSH IT INTO GAPS IN THE VANE ARMS TO REDUCE THE RISK OF VOIDS WHEN BACKFILLING. LAY THE SKIRT UPSTREAM AND SHOVE THE END INTO THE BED MATERIAL WITH THE TIP OF A SHOVEL.

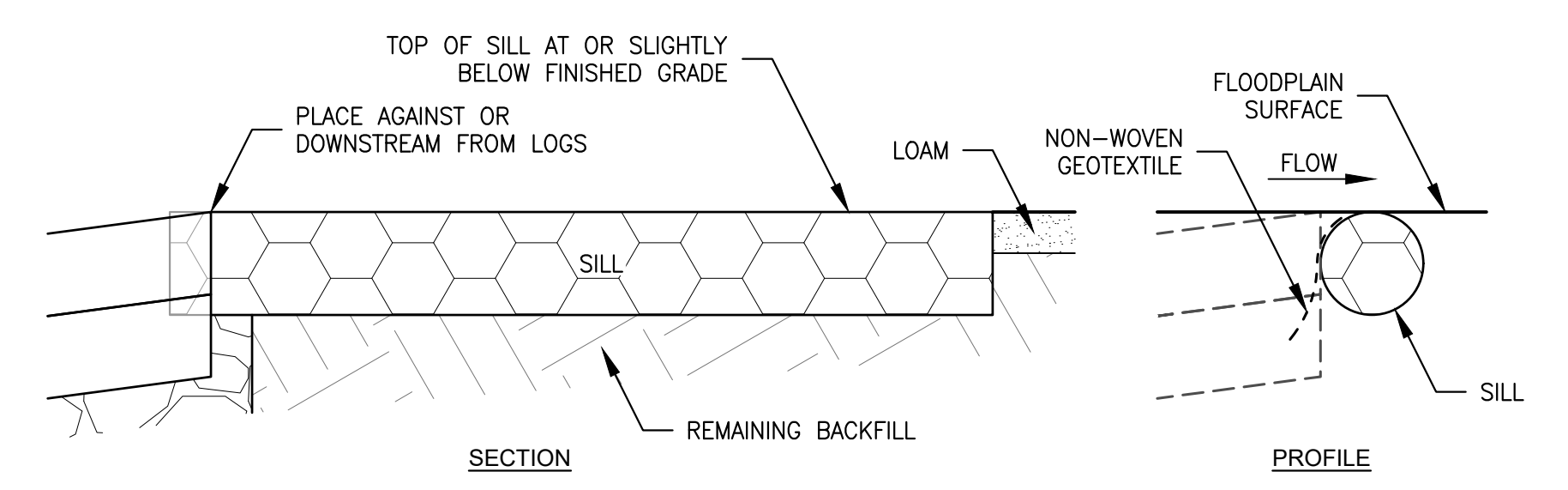


STEP 6
 SLOWLY BACKFILL THE REMAINING MATERIAL, ENSURING TO FILL VOIDS AT BOTH SIDES OF THE VANE ARMS, WITHOUT ALTERING THE LOG PLACEMENT. UPSTREAM BACKFILL IS SET NEARLY TO THE TOP OF THE HEADER LOG WHILE DOWNSTREAM FILL SHOULD BEGIN BELOW THE MIDPOINT OF THE HEADER LOG - FULLY BURYING THE FOOTER LOG - AND GRADE DOWN INTO THE DOWNSTREAM POOL. MANUALLY CHINK THE JUNCTION WITH SMALL ROCKS AND PERFORM FINE GRADING BY SHOVEL AS NECESSARY. IF SPECIFIED, WASH IN THE MATERIAL TO HELP LOCK IN THE SEDIMENTS.

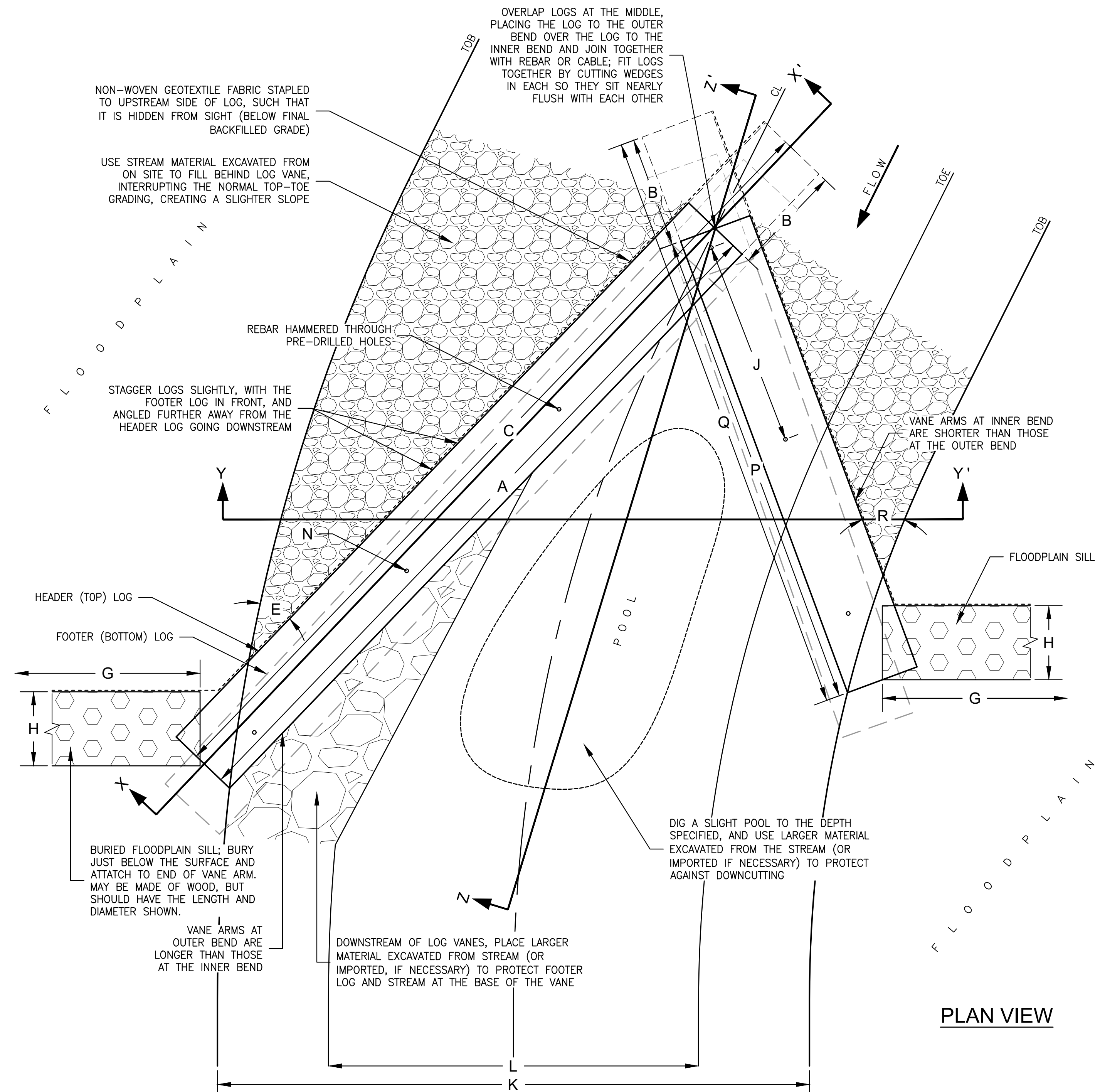
LOG CROSS VANE NOTES:

- CONSTRUCTION OF LOG CROSS VANES MUST BE SUPERVISED BY A QUALIFIED STREAM RESTORATION PROFESSIONAL.
- LOG CROSS VANES ARE CONSTRUCTED SUCH THAT THEY APPEAR (HYDRAULICALLY) LIKE A V SHAPE WITH THE UPSTREAM JUNCTION SET AT THE STREAM BOTTOM AND THE VANE ARMS ANGLED UP TO THE BANKS ON EITHER SIDE. THIS SLIGHTLY CONSTRICTS THE STREAM CROSS SECTION, PROTECTING THE BANKS, PREVENTING DOWNWARD EROSION (HEADCUT), MAINTAINING A POOL DOWNSTREAM, ALLOWING SEDIMENT TRANSPORT, AND PROVIDING A NARROW NOTCH FOR LOW-FLOW DEPTHS AND AQUATIC PASSABILITY.
- WHEN CONSTRUCTING THE LOG CROSS VANES, THE LOGS WILL OVERLAP, FITTED TOGETHER, AND JOINED AT THE CENTER OF THE 'V' SHAPE FORMED BY THE LOGS AT THE THALWEG OF THE STREAM. A SMALL LENGTH OF THE LOGS WILL BE BURIED UPSTREAM FROM THE JOINT, INTO THE STREAM BED.
- ALL LOGS SHALL:
 - BE MADE OF A HARDWOOD SPECIES APPROVED BY THE ENGINEER
 - BE ALMOST COMPLETELY STRAIGHT
 - BE FREE OF LIMBS AND SNAGS, AND
 - HAVE A MINIMUM DIAMETER AS DEFINED IN THE CROSS VANE DETAILS.
- LOGS FELLED ON SITE MAY BE USED, AND ENCOURAGED TO DO SO. ANY LOGS FELLED ON SITE SHALL BE STOCKPILED FOR INSPECTION BY THE FIELD ENGINEER. IF ANY LOGS DO NOT MEET THESE REQUIREMENTS, LOGS MUST BE ORDERED WHICH SATISFY THE METRICS SPECIFIED.
- UNUSABLE SPECIES OF LOGS FELLED ON SITE MAY BE USED FOR THE FLOODPLAIN SILLS.
- OPTIONALLY, LOGS USED MAY BE PLANED ON OPPOSITE SIDES TO CREATE FLAT SURFACES WHICH FIT TOGETHER WELL AND HAVE MORE UNIFORM DIMENSIONS (SIMILAR TO LOGS USED TO BUILD A LOG CABIN), SO LONG AS THE DIMENSION BETWEEN THE PLANED SIDES MEETS OR EXCEEDS THE MINIMUM DIAMETER SPECIFIED.
- LOG CROSS VANES MAY BE CONSTRUCTED WITH OR WITHOUT A FOOTER LOG BELOW THE HEADER LOG, AS NECESSARY, BASED ON THE REQUIRED STREAMBED BACKFILL DEPTH AND/OR ANTICIPATED SCOUR.
- FOOTER LOGS ARE SET BELOW HEADER LOGS, AND PLACED SLIGHTLY DOWNSTREAM (IN FRONT) SUCH THAT THE HEADER LOG RESTS JUST UPSTREAM (BEHIND) THE TOP OF THE FOOTER LOG. THIS HELPS THE STRUCTURE RESIST FORCES ACTING ON IT DURING HIGHER FLOWS.
- LOGS ARE JOINED AT THE CENTER OF THE 'V' BY HALVING A NOTCH IN EACH HEADER/FOOTER PAIR AND SETTING ONE ATOP THE OTHER. THEY ARE SECURED TOGETHER AT THE JUNCTION USING REBAR HAMMERED THROUGH A PRE-DRILLED HOLE.
- EACH VANE ARM HAS THE HEADER AND FOOTER LOGS FURTHER SECURED TOGETHER USING REBAR HAMMERED THROUGH PRE-DRILLED HOLES AT A MAXIMUM SPACING DEFINED IN THE CROSS VANE DETAILS.
- PRE-DRILLED HOLES FOR REBAR SHALL BE MADE USING A DRILL BIT ONE SIZE SMALLER THAN THE SPECIFIED REBAR DIAMETER.
- REBAR SHALL BE HAMMERED INTO THE LOGS FLUSH WITH THE TOP OF THE LOG SO IT IS UNSEEN AND DOES ACT AS A SNAG.
- AFTER SETTING AND SECURING THE LOGS FOR THE CROSS VANE, NON-WOVEN GEOTEXTILE IS STAPLED TO THE UPSTREAM (BACK) SIDE OF THE HEADER LOG, BEHIND THE TOP OF THE LOGS SUCH THAT IT DOES NOT SHOW WHEN FINISHED GRADING IS COMPLETED.
- PREFERABLY, THIS IS DONE WITH A SINGLE LENGTH OF MATERIAL ALONG THE ENTIRE CROSS VANE, THOUGH MAY BE DONE IN SECTIONS SO LONG AS THERE IS PLENTY OF OVERLAP.
- NON-WOVEN GEOTEXTILE IS PLACED TO ENSURE GAPS ARE FILLED BETWEEN THE LOGS AND JOINTS TO PREVENT AGAINST EROSION AND TRAP FINES TO HELP IMBRICATION.
- NON-WOVEN GEOTEXTILE SHALL HAVE A MINIMUM WEIGHT OF 4 oz/sy.
- NON-WOVEN GEOTEXTILE SHALL BE PRESSED INTO GAPS BETWEEN VANE ARMS TO REDUCE VOID AREAS, THEN LAID BACK (UPSTREAM) ALONG THE FLOOR OF THE EXCAVATED HOLE SO THEY ARE BURIED BY BACKFILL MATERIAL.
- FOOTER LOGS ARE ENTIRELY BURIED WHEN FINAL GRADING IS COMPLETE. THE DOWNSTREAM FACE (FRONT) OF THE HEADER LOGS IS EXPOSED, WITH BACKFILL MATERIAL FROM THE DOWNSTREAM POOL GRADED UP TO THE LOWER HALF OF THE HEADER LOGS. THE TOP OF THE HEADER LOGS ARE EXPOSED, THOUGH THE LOGS ARE OTHERWISE COMPLETELY BURIED UPSTREAM.
- BACKFILLING BEHIND AND IN FRONT OF THE CROSS VANE ARMS SHOULD BE DONE SLOWLY TO ENSURE GAPS ARE FILLED AND VANE ARMS DO NOT MOVE DURING PLACEMENT.
- UNLESS OTHERWISE STATED, EACH ARM OF THE CROSS VANE SHALL BE ACCOMPANIED BY A SILL, EXTENDING FROM THE BANK END OF HEADER LOG ARMS INTO THE BANK. THIS HELPS PREVENT AGAINST EROSION AT THE BANK LEADING TO AN AVULSION AROUND THE CROSS VANE.
- THE SILLS SHALL BE MADE OF MATERIALS AND TO THE DIMENSIONS STATED IN THE CROSS VANE DETAILS.
- SILLS SHALL BE FASTENED TO THE VANE ARMS IN A MANNER APPROPRIATE TO THE SILL MATERIAL, AND SHALL HAVE A SIMILAR NON-WOVEN GEOTEXTILE SKIRT UPSTREAM FROM THE SILL.
- SILLS ARE BURIED IN THE GROUND, WITH THE TOP SET AT OR SLIGHTLY BELOW THE FINISHED FLOODPLAIN GRADING.

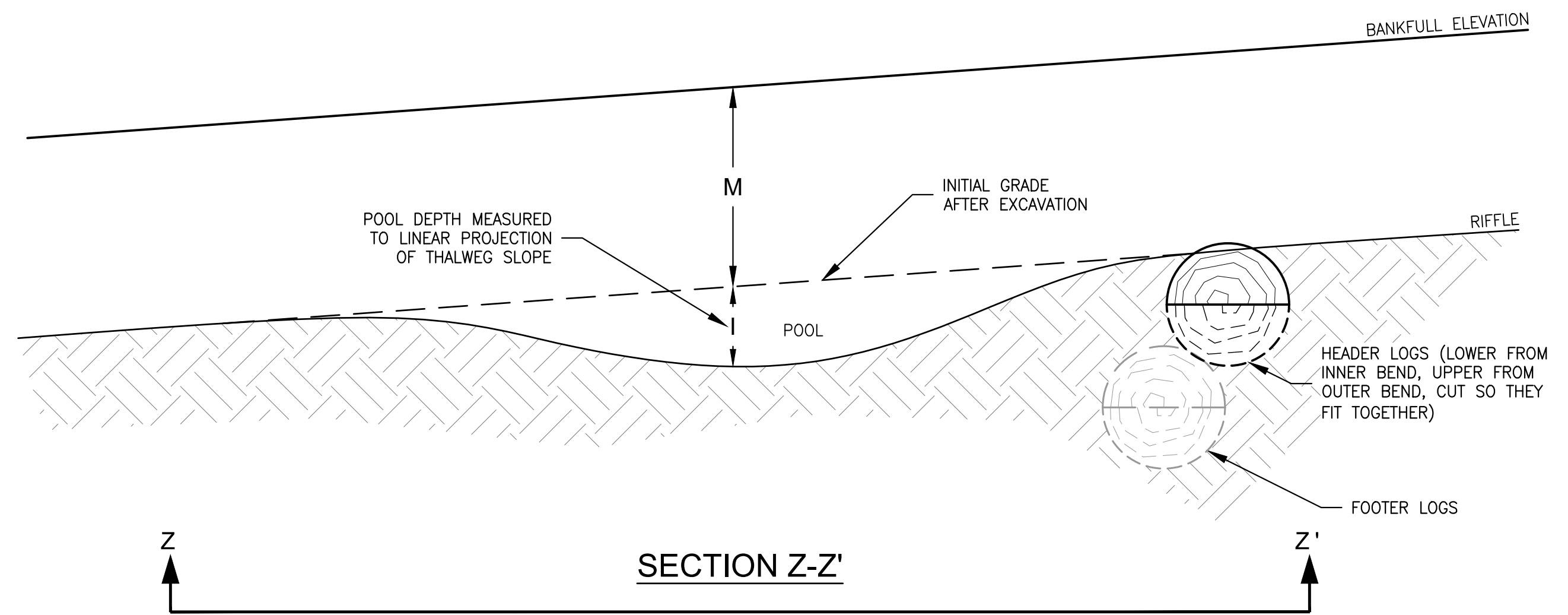
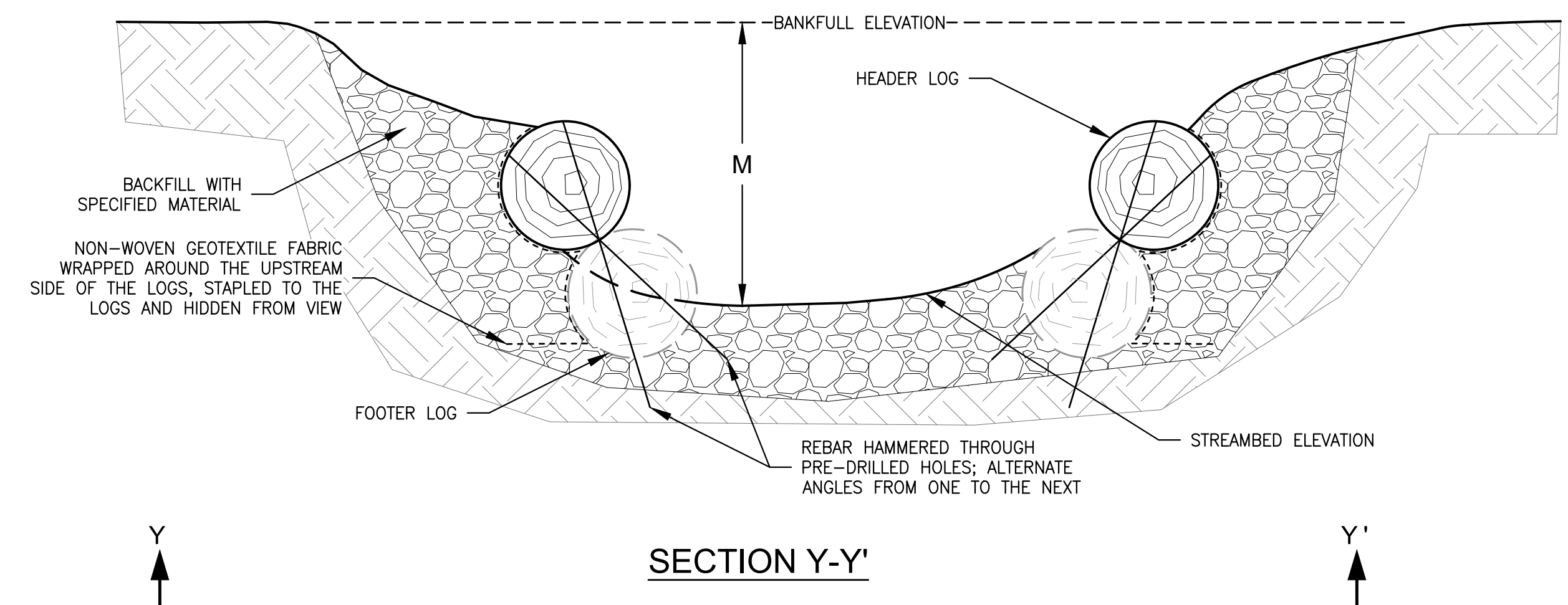
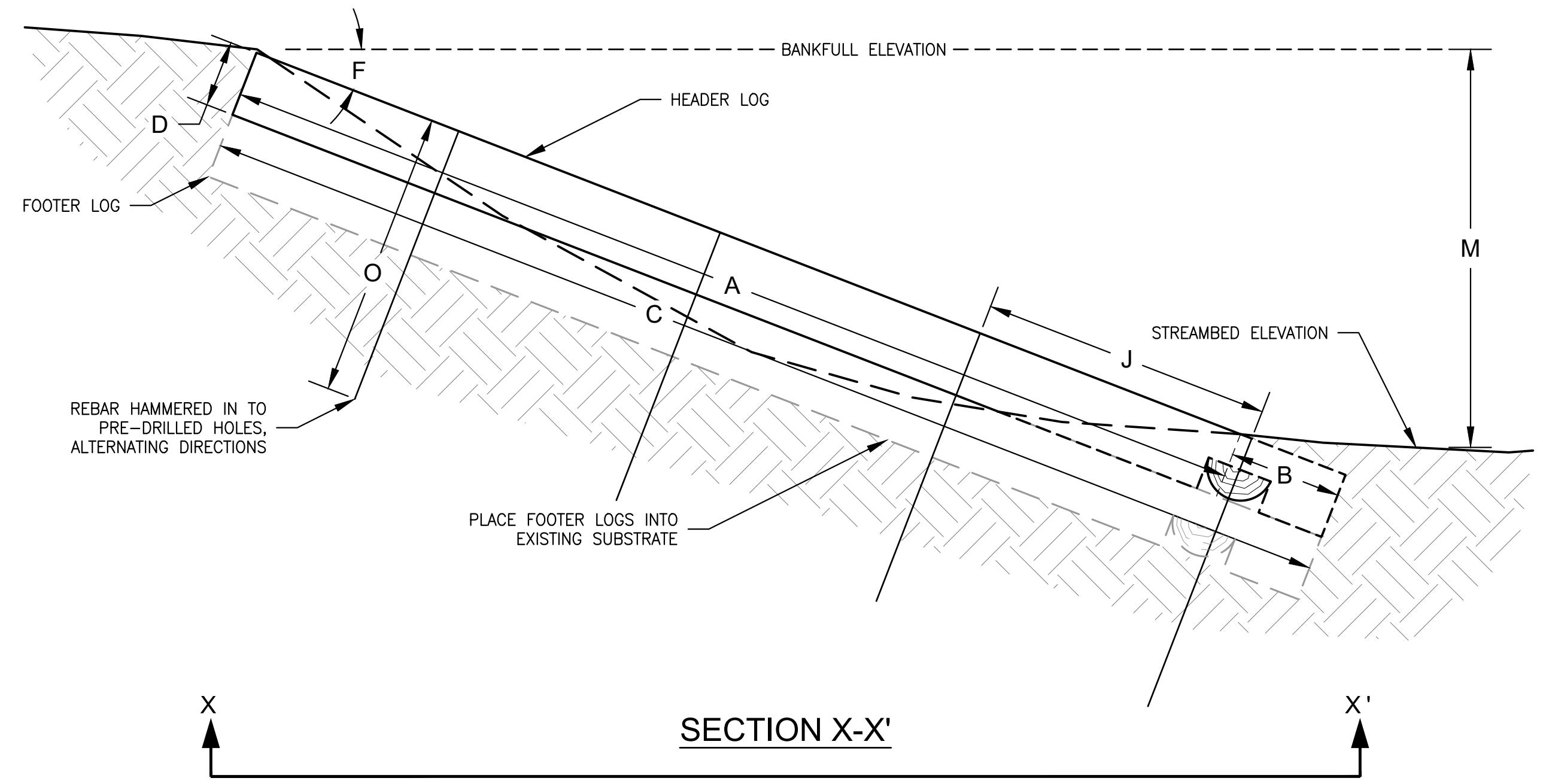
SILL DETAILS



DESIGNED BY: JCB, TPB	DRAWN BY: JCB	CHECKED BY: TPB	DATE: 13 FEB 2023
NOTES:	DATE:	REVISION #:	
LOG CROSS VANE SEQUENCE & NOTES			
CONSTRUCTION SHEET SET			
PROJECT NAME: EMERALD ACRES CULVERT REPLACEMENT			
PROJECT LOCATION: TOPAZ RD & OYSTER R., BARRINGTON NH			
SHEET ID: D-LV			
SHEET NUMBER: 10 OF 13			



PLAN VIEW



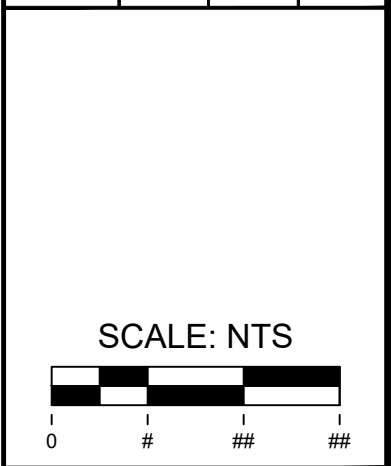
LOG CROSS VANE DESIGN METRICS			
ID	DESIGN PARAMETER	DESIGN VALUE	UNITS
A	EXPOSED LONG LOG LENGTH	25.0	FT
B	TOTAL LONG LOG ARM LENGTH	27.0	FT
C	MINIMUM BURIED LOG LENGTH	2.0	FT
D	MINIMUM LOG DIAMETER	1.0	FT
E	LONG LOG BANK ANGLE	30	DEG
F	LONG, SHORT LOG PROFILE SLOPE	4.68, 6.25	%
G	SILL LENGTH	10.0	FT
H	SILL DIAMETER	1.25	FT
I	DUG POOL DEPTH	1.25	FT
J	MAXIMUM REBAR SPACING	3.0	FT
K	BANKFULL WIDTH	20.7	FT
L	BANK TOE WIDTH	11.6	FT
M	BANKFULL DEPTH	1.50	FT
N	MINIMUM REBAR DIAMETER	0.75	IN
O	REBAR LENGTH	4.0	FT
P	EXPOSED SHORT LOG LENGTH	20.0	FT
Q	TOTAL SHORT LOG ARM LENGTH	22.0	FT
R	SHORT LOG BANK ANGLE	33	DEG

DESIGNED BY: JCB, TPB
 DRAWN BY: JCB
 CHECKED BY: TPB
 DATE: 13 FEB 2023

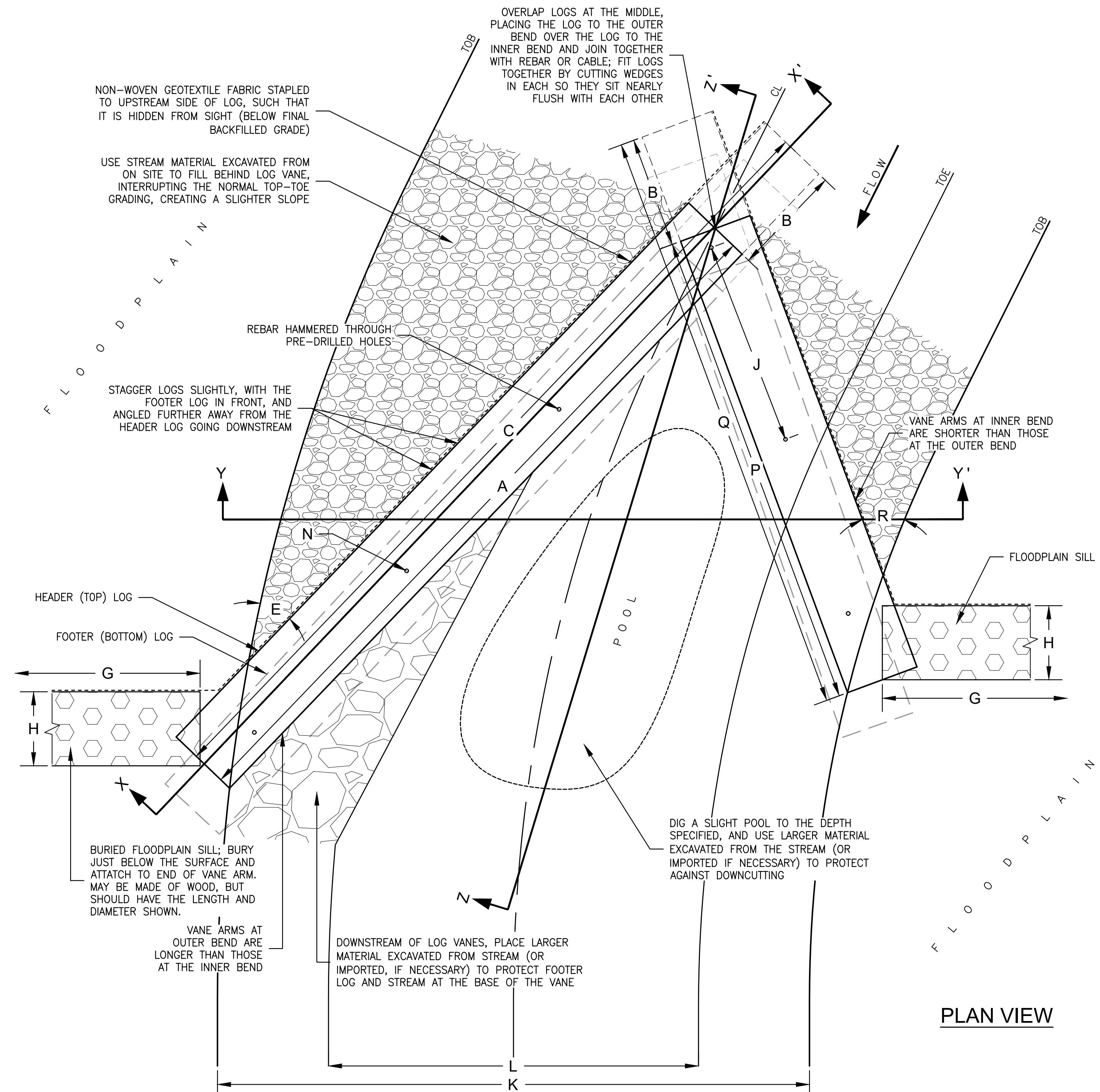


REVISION #	DATE	NOTES

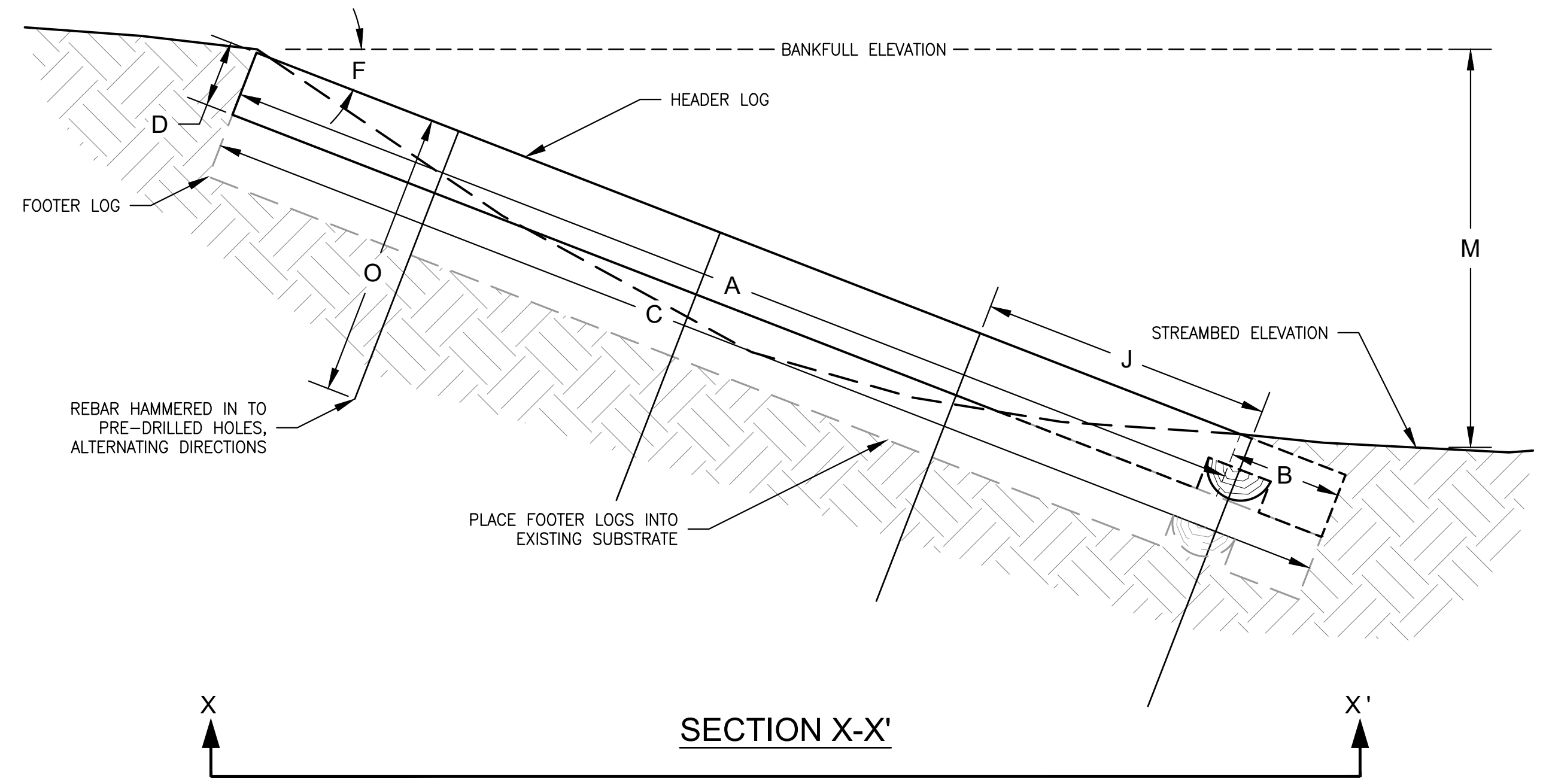
SHEET TITLE: **UPSTREAM LOG CROSS VANE SPECS**
 SHEET SET: **CONSTRUCTION SHEET SET**
 PROJECT NAME: **EMERALD ACRES CULVERT REPLACEMENT**
 PROJECT LOCATION: **TOPAZ RD & OYSTER R., BARRINGTON NH**



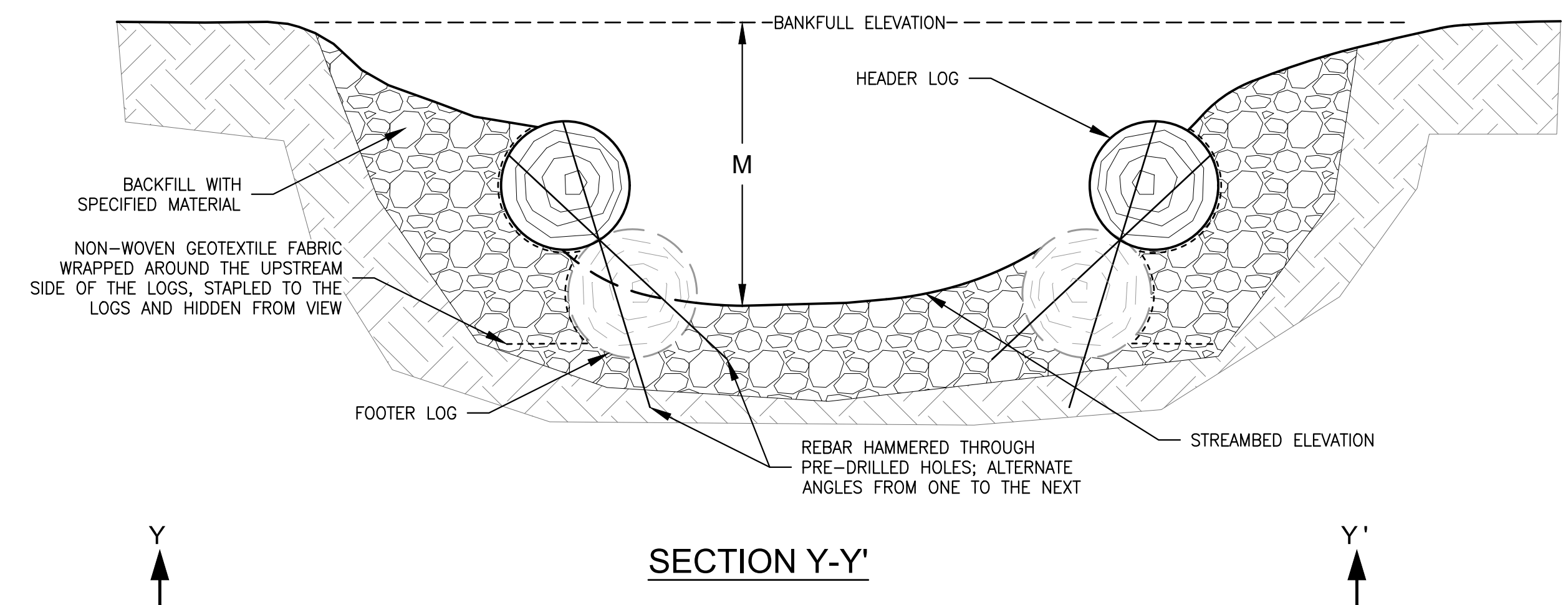
SHEET ID: **D-LV-US**
 SHEET NUMBER: **11 OF 13**



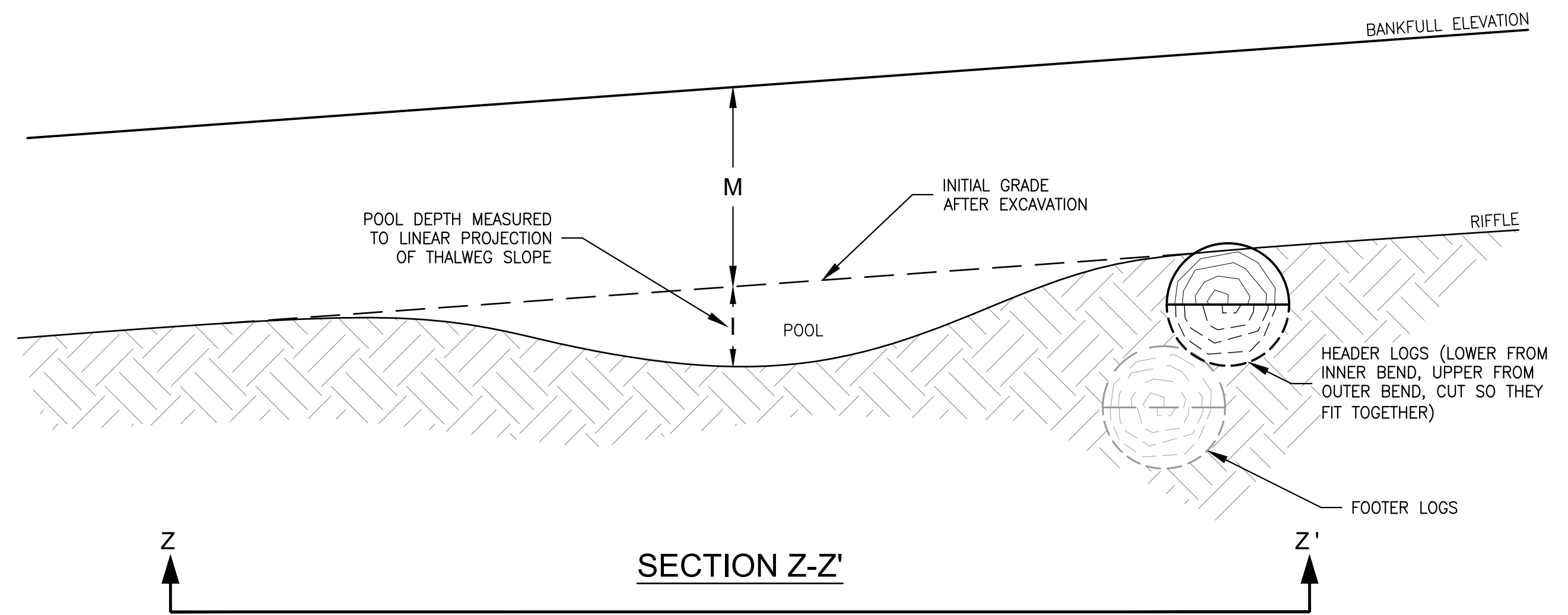
PLAN VIEW



SECTION X-X'



SECTION Y-Y'



SECTION Z-Z'

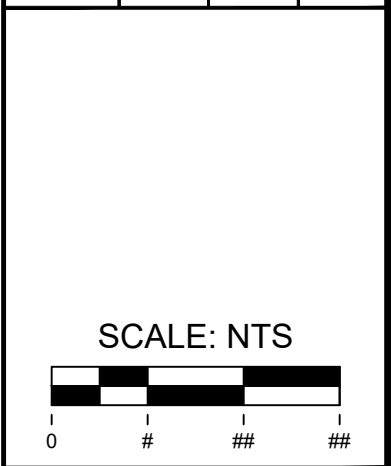
LOG CROSS VANE DESIGN METRICS			
ID	DESIGN PARAMETER	DESIGN VALUE	UNITS
A	EXPOSED LONG LOG LENGTH	25.0	FT
B	TOTAL LONG LOG ARM LENGTH	27.0	FT
C	MINIMUM BURIED LOG LENGTH	2.0	FT
D	MINIMUM LOG DIAMETER	1.0	FT
E	LONG LOG BANK ANGLE	30	DEG
F	LONG, SHORT LOG PROFILE SLOPE	4.96, 6.20	%
G	SILL LENGTH	10.0	FT
H	SILL DIAMETER	1.25	FT
I	DUG POOL DEPTH	1.25	FT
J	MAXIMUM REBAR SPACING	3.0	FT
K	BANKFULL WIDTH	30.1	FT
L	BANK TOE WIDTH	15.5	FT
M	BANKFULL DEPTH	1.50	FT
N	MINIMUM REBAR DIAMETER	0.75	IN
O	REBAR LENGTH	4.0	FT
P	EXPOSED SHORT LOG LENGTH	20.0	FT
Q	TOTAL SHORT LOG ARM LENGTH	22.0	FT
R	SHORT LOG BANK ANGLE	34	DEG

DESIGNED BY: JCB, TPB
 DRAWN BY: JCB
 CHECKED BY: TPB
 DATE: 13 FEB 2023



REVISION #	DATE	NOTES

SHEET TITLE: **DOWNSTREAM LOG CROSS VANE SPECS**
 SHEET SET: **CONSTRUCTION SHEET SET**
 PROJECT NAME: **EMERALD ACRES CULVERT REPLACEMENT**
 PROJECT LOCATION: **TOPAZ RD & OYSTER R., BARRINGTON NH**



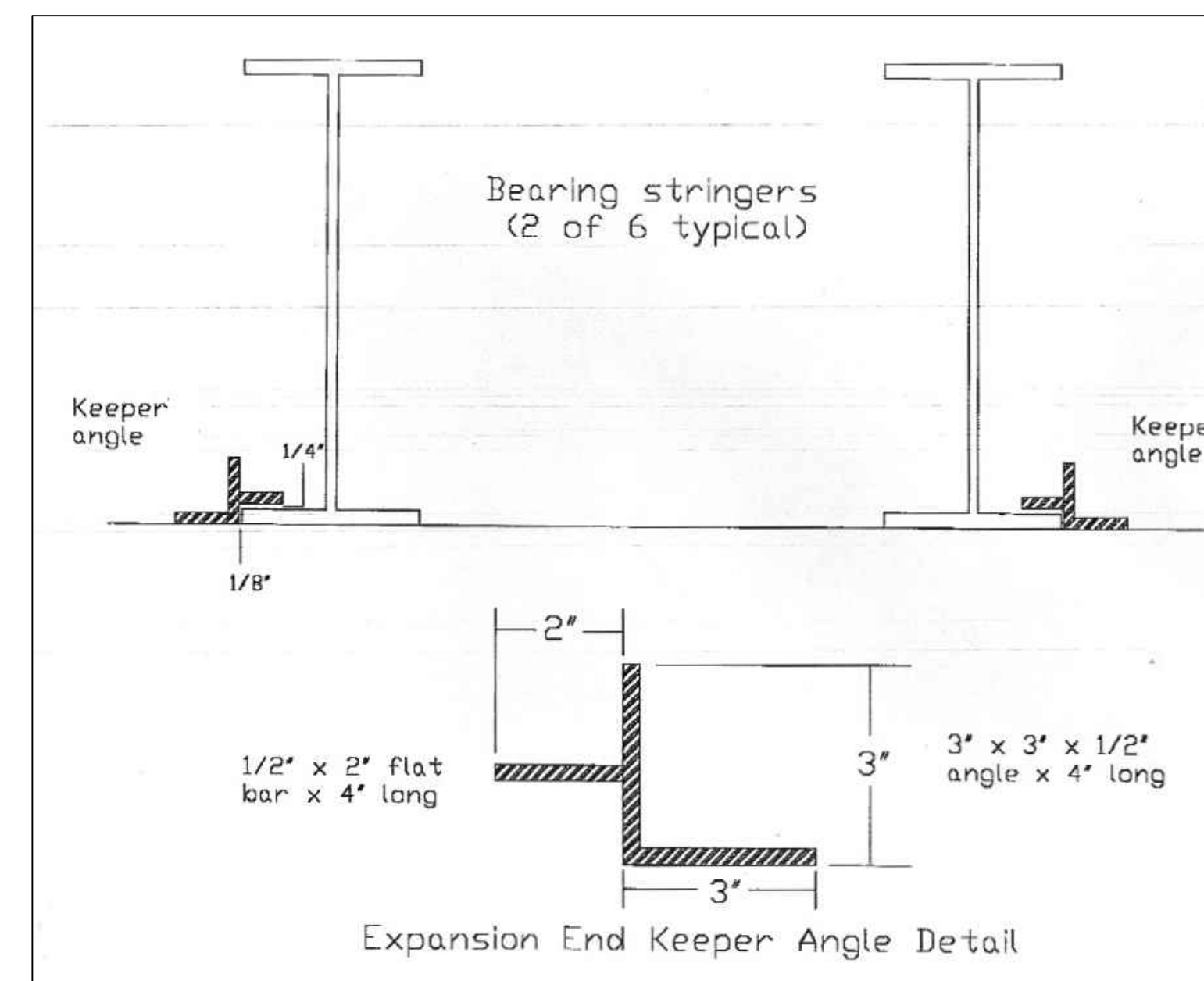
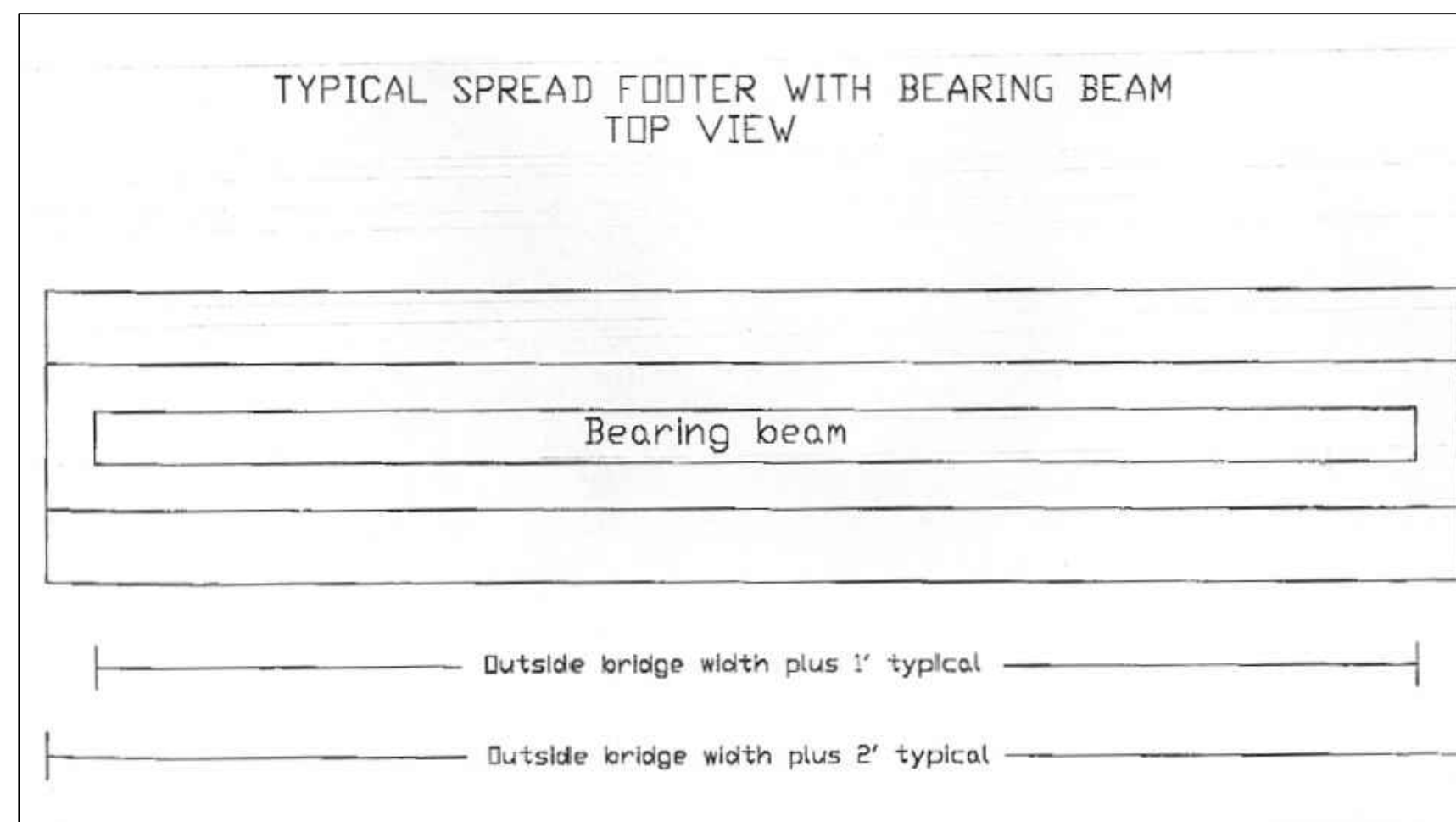
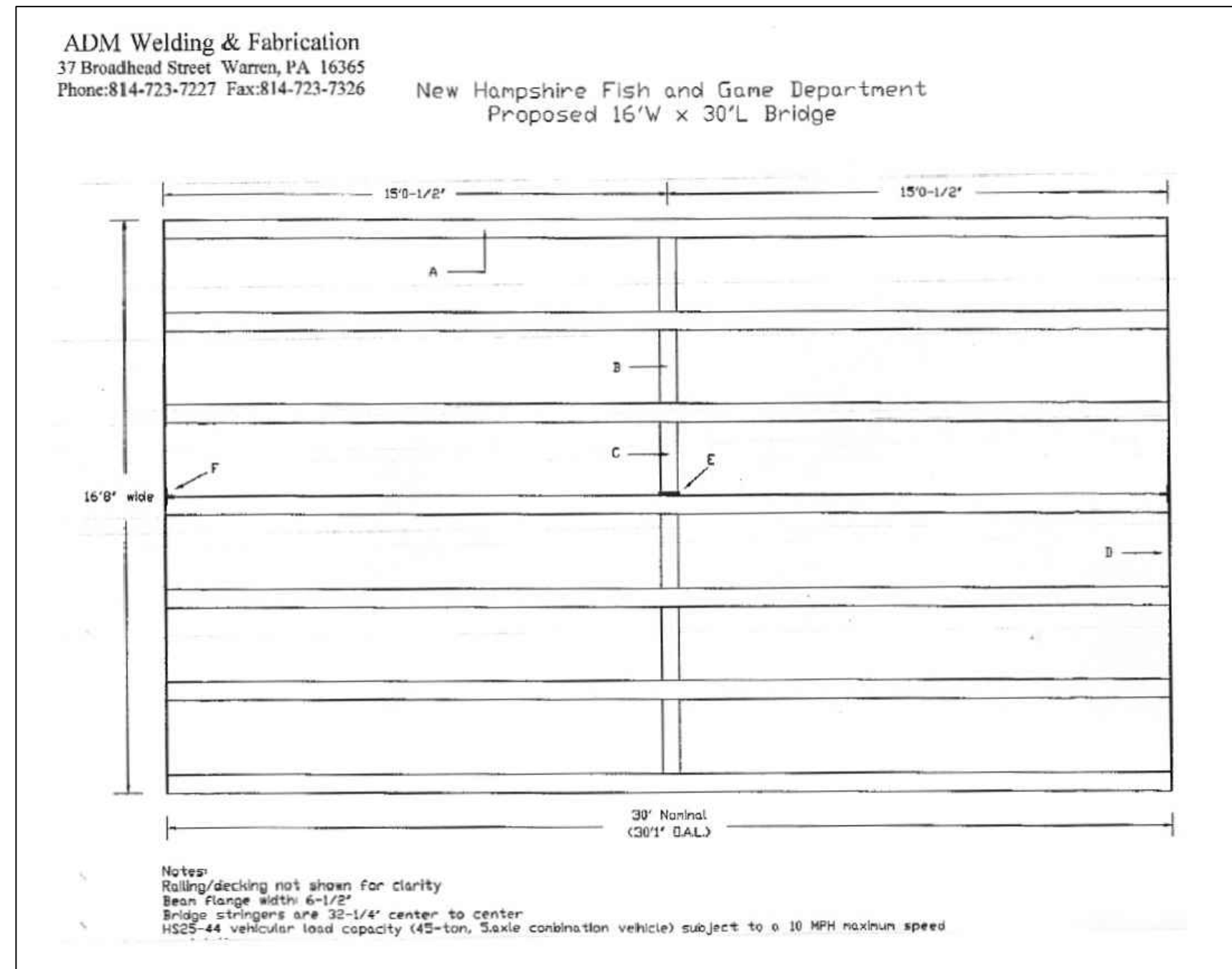
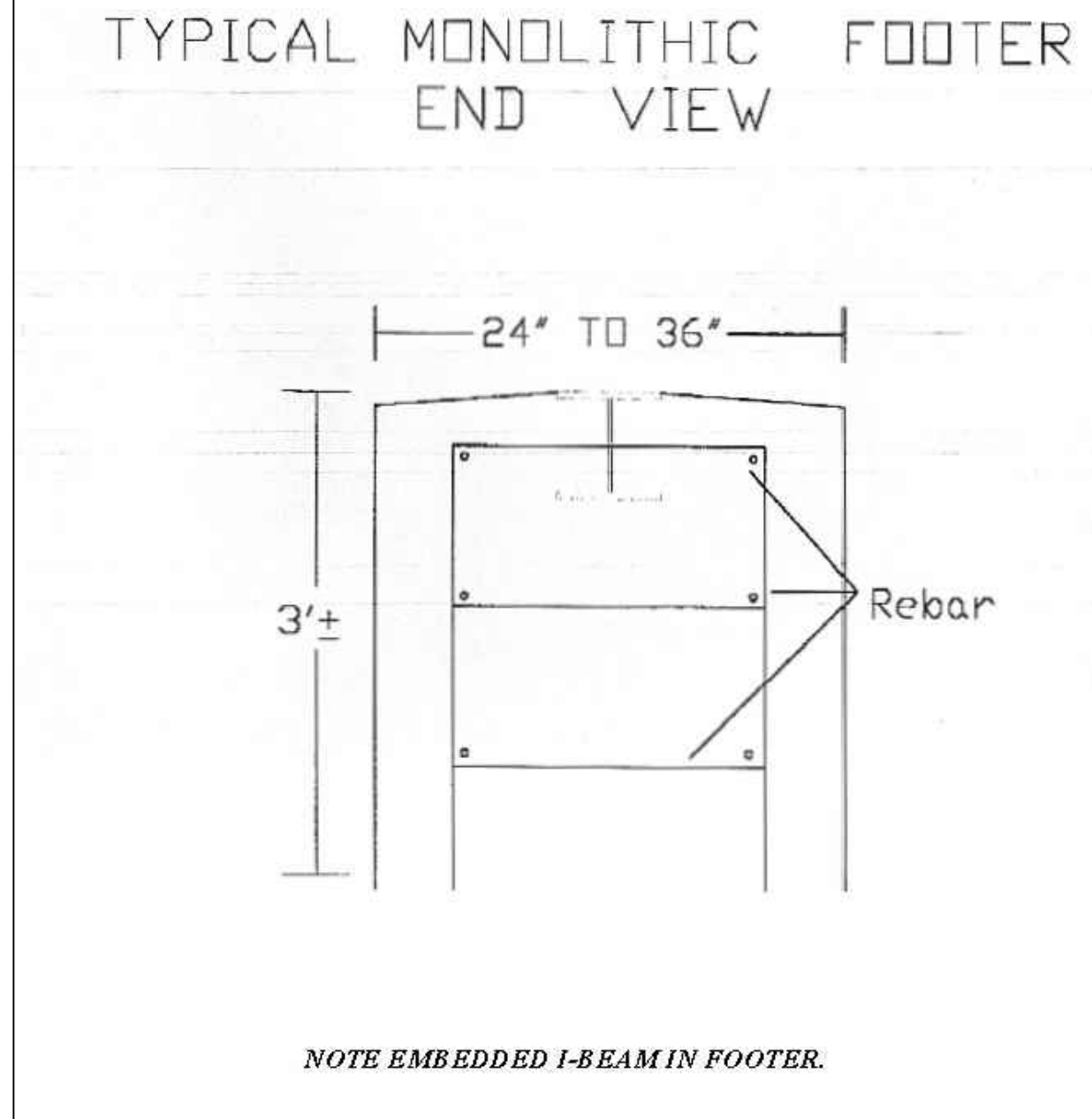
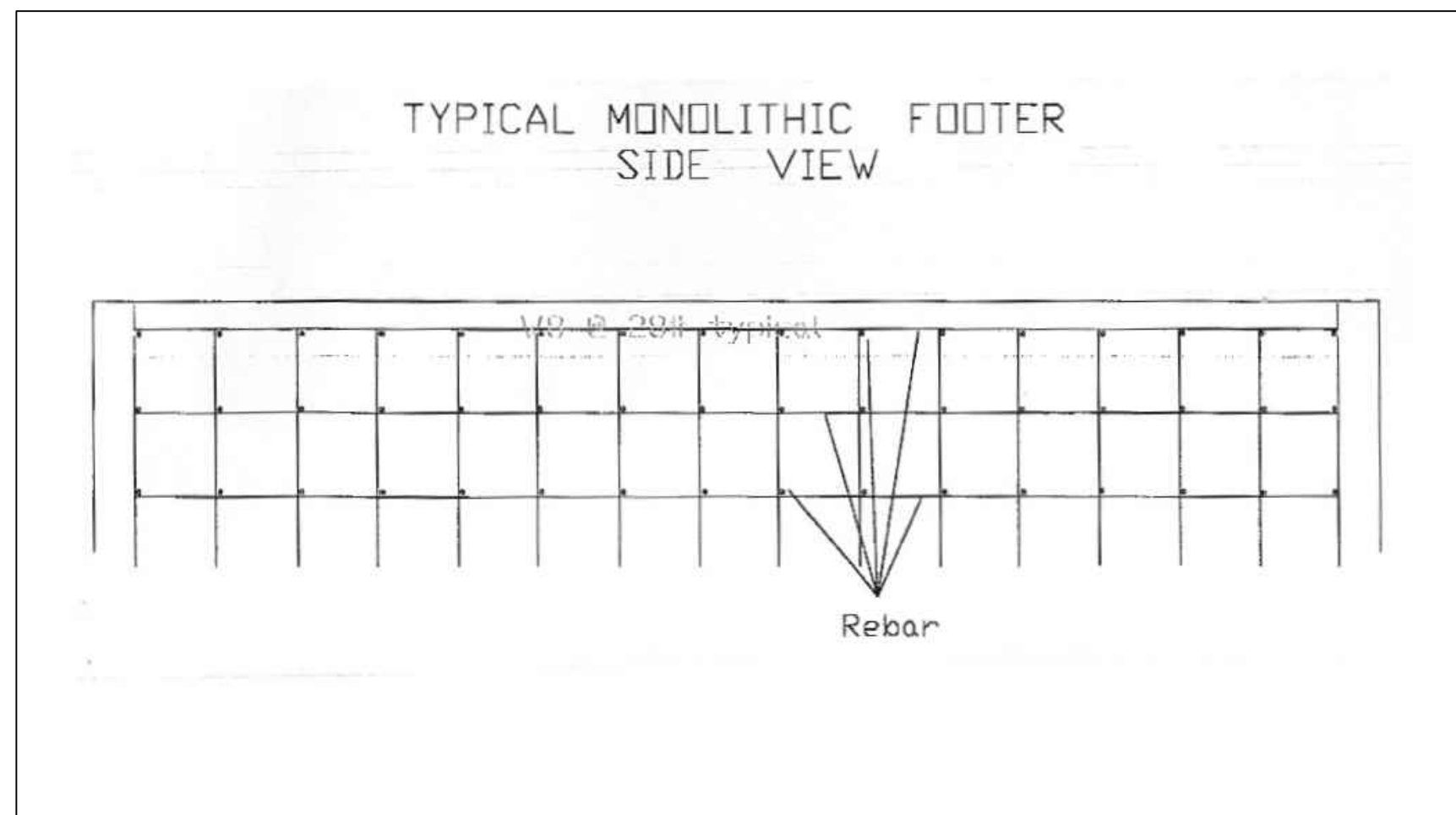
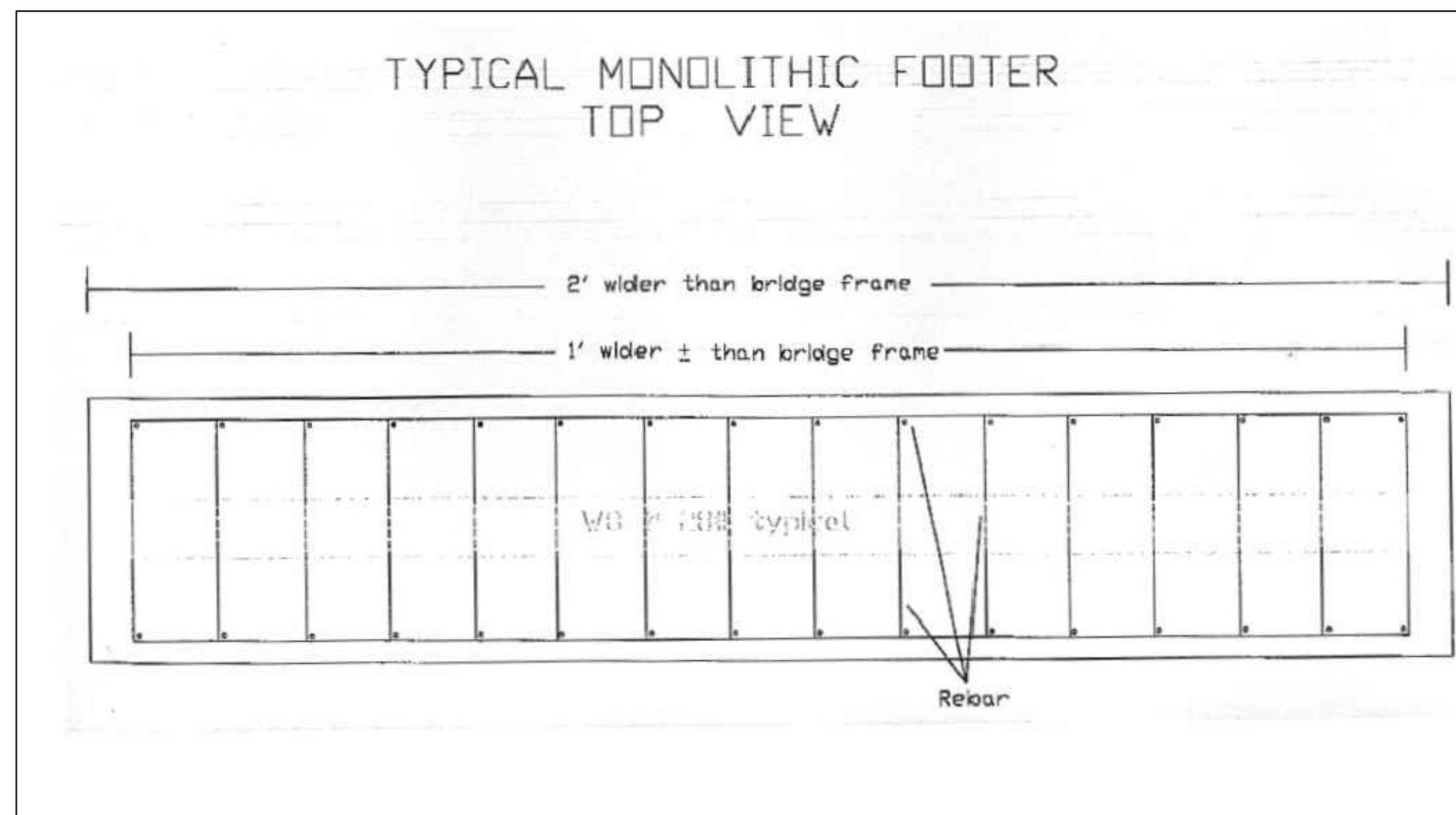
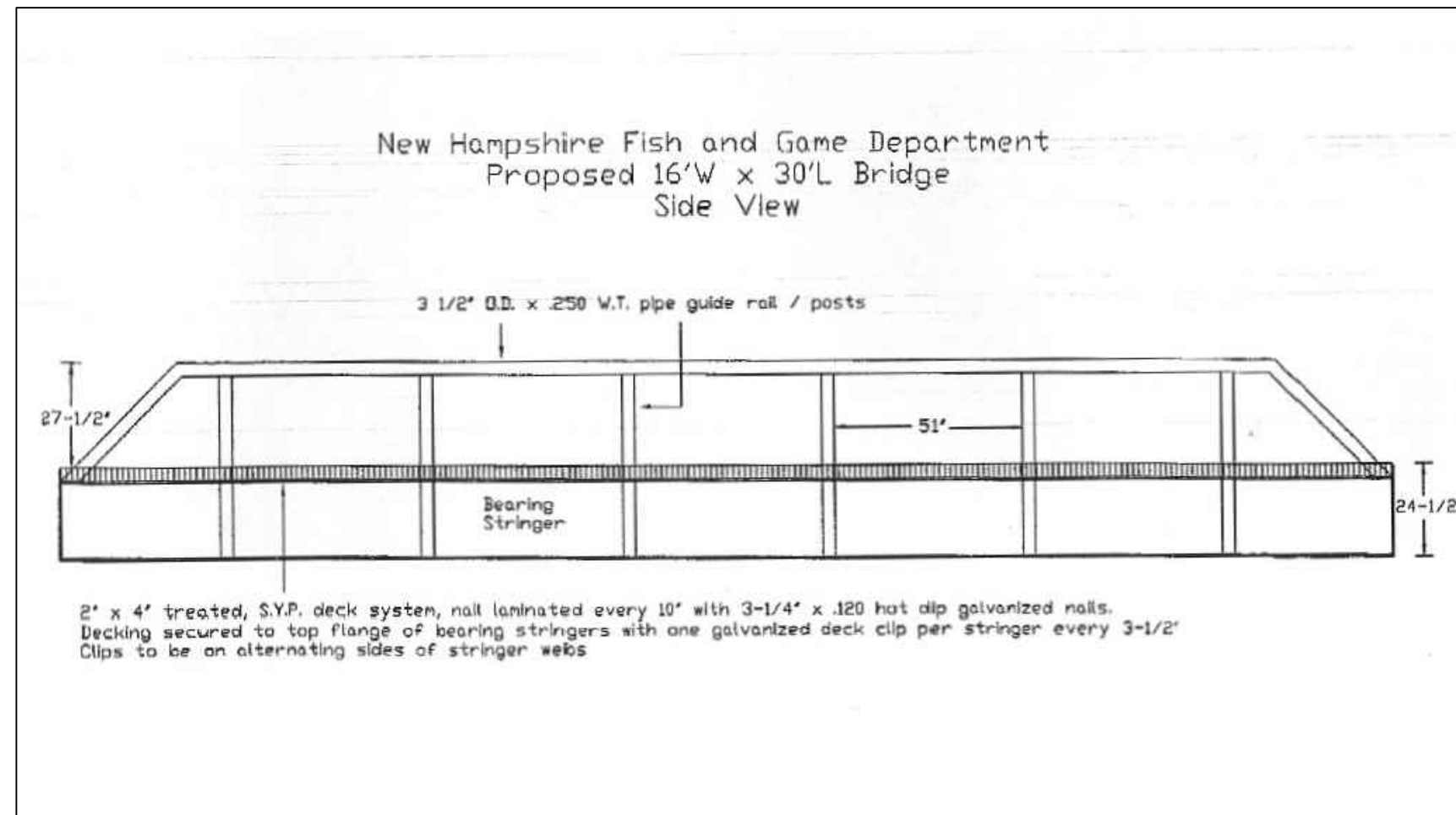
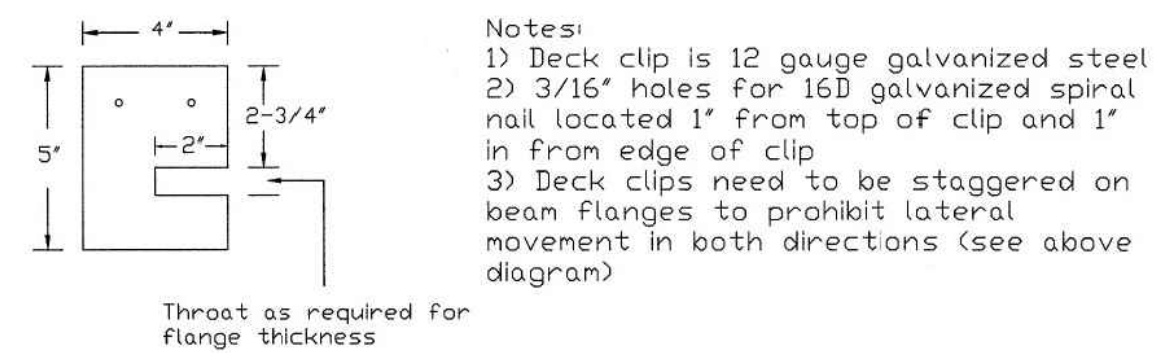
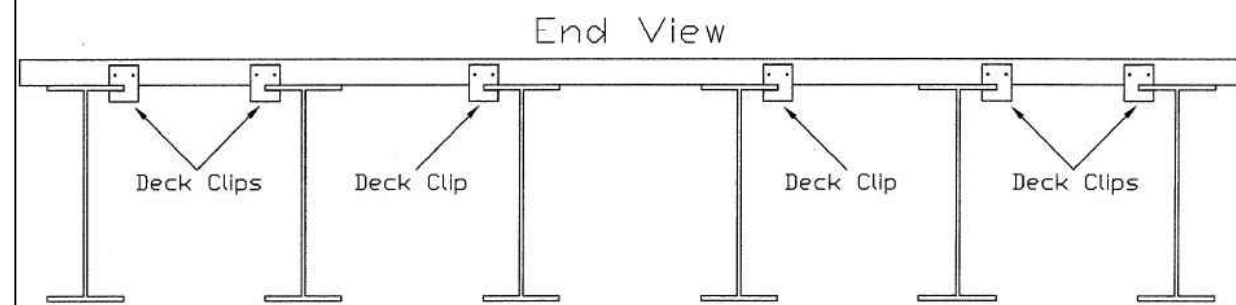
SHEET ID: **D-LV-DS**
 SHEET NUMBER: **12 OF 13**

*NOTE: THE SPECIFICATIONS AND DETAILS SHOWN HERE ARE FOR A PREFABRICATED BRIDGE DESIGN ON A SEPARATE PROJECT, AND ARE SHOWN HERE FOR REFERENCE.

Prefabricated Bridge Information

- 1) The bridge is fabricated in modular sections that are typically 6 - 8' wide x overall structure length. This allows for legal transport without permitting. The sections are typically offloaded and set in place with a crane or large excavator with sufficient capacity. The sections bolt together longitudinally. For a 40' long structure there would be approximately 30 bolts per section. A 26' wide structure would have four modular sections.
- 2) The prefabricated bridge will provide a standard "strong post" system that is shop-installed and drilled to accept standard galvanized W-rail. The W-rail is that from the existing structure.
- 3) The bridge manufacturer supplies the deck material and "pre-panel" it to facilitate field installation by a local contractor. The material is a treated Southern Yellow Pine and the bridge fabricator nail laminates it into panels approximately 3-1/2' W (linear feet) x bridge width. The bridge manufacturer supplies the necessary hardware to attach the deck system (next figure). It will take approximately four hours to install the deck system on a 26' W x 40' L bridge with a 4-person labor crew and machine (with operator) capable of lifting and placing the 800# panels.

Deck Clip Diagram



DESIGNED BY:	JCB, TPB
DRAWN BY:	JCB
CHECKED BY:	TPB
DATE:	13 FEB 2023
REVISION #:	DATE:
NOTES:	
SHEET TITLE: PREFABRICATED BRIDGE DETAILS	
SHEET SET: CONSTRUCTION SHEET SET	
PROJECT NAME: EMERALD ACRES CULVERT REPLACEMENT	
PROJECT LOCATION: TOPAZ RD & OYSTER R., BARRINGTON NH	
SCALE: N/A	
SHEET ID: D-BRDG	
SHEET NUMBER: 13 OF 13	