

GENERAL NOTES

PRE-CONSTRUCTION MEETING AND CONSTRUCTION COMMENCEMENT:

- All construction methods and materials shall conform to the Construction Standards and Specifications of Roanoke County, the Western Virginia Water Authority, and the Virginia Department of Transportation.
- Stormwater Management Agreements with an attached 8 1/2" x 11" or 8 1/2" x 14" plat must be approved and recorded prior to the pre-construction meeting.
- Once all required items are submitted to Roanoke County, the developer must contact the Development Review Coordinator to indicate that a pre-construction meeting needs to be scheduled. The pre-construction meeting will be scheduled with the owner/developer two (2) working days later.
- All land disturbing projects that require approval of an erosion and sediment control plan, grading or clearing permit shall require that the applicant provide the name of an individual who will be responsible for land disturbing activities and that this individual hold a Responsible Land Disturber (RLD) Certificate from the Department of Environmental Quality. The Responsible Land Disturber can be anyone from the Project team that is certified by the Commonwealth of Virginia to be in charge of carrying out the land disturbing activity for the project.
- It is the responsibility of the owner/developer to notify the certified Responsible Land Disturber and the Utility Contractor to attend the pre-construction meeting.
- The Development Review Coordinator will schedule the pre-construction meeting with the County Review Engineer, the County Inspector, and the Western Virginia Water Authority and the Town of Vinton personnel if applicable.
- An approved set of plans, Storm Water Pollution Prevention Plan (SWPPP), VSMP coverage letter, and all permits must be available at the construction site at all times.
- The developer and/or contractor shall supply all utility companies with copies of approved plans, advising them that all grading and installation shall conform to approved plans.
- The project engineer will inform the owner/developer verbally and in writing of the County's obligation to perform inspections on site. Everyone in the meeting will be required to sign a pre-construction checklist indicating their knowledge of Roanoke County's obligation to perform inspections on site.
- The Erosion Control Permit or Combined Erosion Control & VSMP Permit is given to the developer at the pre-construction meeting.
- Notify Roanoke County prior to beginning installation of ESC measures. The County will inspect initial installations to ensure compliance with approved plan prior to start of grading. The developer SHALL contact the project inspector 24 hours before beginning any grading or construction on the property.
- County inspectors must inspect storm drain / stormwater management / BMP installations during the process of installation. Please contact the site inspector 24 hours in advance.
- All work shall be subject to inspection by Roanoke County, the Western Virginia Water Authority and the Virginia Department of Transportation Inspectors.
- Contractors shall notify utilities of proposed construction at least two (2), but not more than ten (10) working days in advance. Area public utilities may be notified thru "Miss Utility": 1-800-552-7001 or VA 811.
- The 100 year Floodway shall be staked prior to any construction.
- Grade stakes shall be set for all curb and gutter, culvert, sanitary sewer and storm sewer at all times of construction.
- Roanoke County shall be notified when a spring is encountered during construction.
- Construction debris shall be containerized in accordance with the Virginia Litter Control Act. No less than one litter receptacle shall be provided on site.
- The contractor shall provide adequate means of cleaning mud from trucks and/or other equipment prior to entering public streets or rights of ways. It is the contractors responsibility to insure that the streets are in a clean, mud and dust free condition at all times.
- Plan approval in no way relieves the developer or contractors of the responsibilities contained within the erosion and sediment control or stormwater management policies.
- Field construction shall honor proposed drainage divides as shown on plans.
- Field corrections shall be approved by the Roanoke County and/or the Western Virginia Water Authority and the Professional of Record, prior to such construction.
- The developer or contractor shall supply the County and the Western Virginia Water Authority with correct As-Built plans before final acceptance.

VIRGINIA DEPARTMENT OF TRANSPORTATION:

- Plan approval by Roanoke County does not guarantee issuance of any permits by the Virginia Department of Transportation.
- A permit must be obtained from the Virginia Department of Transportation, Salem Residency Office prior to construction in the highway right-of-way.
- The preliminary pavement designs should be based on a predicted sub-grade CBR value of 7.0 and with a Resiliency Factor (RF) of 2.0 as shown in the current edition of the Virginia Department of Transportation Pavement Design Guide for Subdivision and Secondary Roads. The sub-grade soil is to be tested by an independent laboratory and the results submitted to the Virginia Department of Transportation prior to base construction. Should the sub-grade CBR value and/or the RF value be less than the predicted values, additional base material will be required in accordance with Departmental specifications. Refer to the same manual as the number and locations of the required soil samples to be tested. All pavement designs shall be submitted to the Department for review and approval. The sub-grade shall be approved by the Virginia Department of Transportation prior to placement of the base. Base shall be approved by the Virginia Department of Transportation for depth, template, and compaction before the surface is applied.
- Standard guardrail with safety end sections may be required on fills or in areas where hazards exist as deemed necessary. After completion of rough grading operations, the County Engineer and Virginia Department of Transportation shall be contacted to schedule a field review. Where guard rail is warranted, the standard shoulder width shall be provided and the guard rail shall be installed in accordance with the current edition of the VDOT Road and Bridge Standards as part of the development.
- Standard street and traffic control signs shall be erected at each intersection by the developer prior to final street acceptance.
- All traffic devices shall be in accordance with current edition of the "Manual on Uniform Traffic Control Devices" (MUTCD).
- All unsuitable material shall be removed from the construction limits of the roadway before placing embankment.

See Sheet N/A for Stormwater Site Statistics Table.
See Sheet N/A for New BMP Information Table.



COUNTY OF ROANOKE, VA

NAME OF DEVELOPMENT	RESTORATION OF WOLF CREEK PHASE II	I, <u>EMILY DARR BROWN</u> , OWNER/DEVELOPER, AM AWARE OF THE SITE DESIGN REQUIREMENTS IMPOSED BY THIS SITE DEVELOPMENT PLAN, ALL REVISIONS THEREOF, AND OTHER APPLICABLE ROANOKE COUNTY CODES AND ORDINANCES.
MAGISTERIAL DISTRICT(S)	VINTON	I HEREBY CERTIFY THAT I AGREE TO COMPLY WITH THESE REQUIREMENTS SHOWN ON THIS COVER SHEET UNLESS MODIFIED IN ACCORDANCE WITH LOCAL LAW.
OWNER (name, address, telephone)	COUNTY OF ROANOKE, 5204 BERNARD DRIVE, ROANOKE, VA 24018-0798, 540.772.2083 ATTN: DAVID HENDERSON, COUNTY ENGINEER	
DEVELOPER (name, address, telephone)	COUNTY OF ROANOKE, 5204 BERNARD DRIVE, ROANOKE, VA 24018-0798, 540.772.2083 ATTN: DAVID HENDERSON, COUNTY ENGINEER	
ENGINEER, ARCHITECT OR SURVEYOR (name, address, telephone)	EMILY DARR BROWN, PE, FREESE AND NICHOLS, INC. 531 N LIBERTY ST, WINSTON-SALEM, NC 27101 336.899.9803	
TAX MAP NO(S)	061.01-01-03.06-0000 AND 061.02-01-55.60-0000	

WATER AND SEWER NOTES

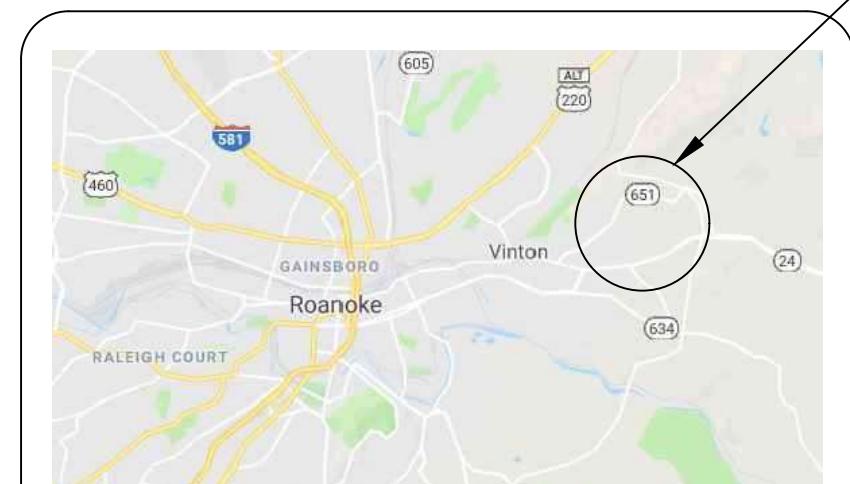
PRIVATE UTILITIES

- All construction methods and materials shall conform to the latest edition of the Design and Construction Standards and Specifications of the Western Virginia Water Authority (WVWA) available at www.westernvirginiawater.org or by contacting the authority at 540-853-5700. The project shall also comply with the governing jurisdiction's standards and other agency standards (e.g. VDOT, DEQ, DCR, VDH, etc.) where applicable.
- A minimum cover of three (3) feet is required on all WVWA water and sewer lines.
- All existing utilities may not be shown in their exact locations. The contractor shall notify Miss Utility and shall verify location and elevation of all underground utilities in the areas of construction prior to starting work.
- Please show all WVWA water and sewer utilities on any development plan.
- The location of existing utilities across or along the line of proposed work are not necessarily shown on the plans and where shown are only approximately correct. The contractor shall on his own initiative and at no extra cost, locate all underground lines and structures and pothole as necessary. The contractor shall be responsible for any damage to underground structures. All damage incurred to existing utilities during construction shall be repaired at the contractor's expense.
- Plan approval by the WVWA does not remove the contractor's responsibility to remove or relocate any existing conflicts found during construction.
- The contractor shall maintain a minimum of 18" clearance vertical and two (2) feet minimum horizontally from the outside of pipe to outside of pipe with all other underground utilities. Where this cannot be achieved, additional measures in accordance with the WVWA standards shall be enforced.
- All utility grade adjustments shall be in accordance with WVWA standards and are the responsibility of the contractor.
- Field changes shall be submitted by the engineer of record to the locality and approved by the WVWA.

Western Virginia Water Authority

Availability letter number: N/A

PROJECT EXTENTS



Vicinity Map

LEGEND

Property Line	
Right-of-way	
Centerline	
Minimum Building Line	
Existing Storm Sewer	
Existing Sanitary Sewer	
Existing Water Main	
Existing Contour	
Proposed Contour	
Proposed Drainage Divide	
Proposed Limits of Clearing	
Proposed Storm Sewer	
Proposed Sanitary Sewer	
Proposed Water Main	

The Project Engineer shall provide electronic copies of the approved plans to the Development Review Coordinator within 5 working days of the pre-construction meeting.

The notes on this sheet shall not be modified.

T-1.....COUNTY COVER SHEET
T-2.....TITLE SHEET
T-3.....DATA POINT TABLES
C-1 THRU C-4.....PLAN AND PROFILE, STA 1+00 TO STA 15+56
DT-1 THRU DT-6.....GENERAL DETAILS
DT-7 THRU DT-8.....PLANTING PLAN
DT-9.....TYPICAL SECTIONS
CS-1 THRU CS-6.....DETAILED CROSS SECTIONS, STA 1+00 TO STA 15+50
EC-1 THRU EC-4.....EROSION CONTROL PLAN VIEWS
EC-5.....EROSION CONTROL NOTES AND LEGEND
EC-6 THRU EC-8.....EROSION CONTROL DETAILS

Sheet Index

SURVEY INFORMATION

Horizontal and vertical control surveys were performed in year: 2022

By: H&B SURVEYING AND MAPPING, LLC, 614 MOOREVILLE PARK DR, RICHMOND, VA 23236 VA #002617

All vertical elevations must be referenced to the National Geodetic Vertical Datum of 1988.

All horizontal elevations must be referenced to the North American Datum of 1983.

Horizontal Datum: NAD 83 Vertical Datum: NAVD 88

Source of topographic mapping is dated APRIL 13, 2022

Boundary was performed by MAPPING, LLC dated: JUNE 7, 2022

Benchmark Information: CONTINUALLY OPERATING REFERENCE STATION (CORS) "LS04"

MEASURED THROUGH GPS OBSERVATION USING RTK REAL TIME NETWORK CORRECTION

The professional seal and signature certifies the boundary survey and topographic mapping to be accurate and correct.

QUANTITY & COST ESTIMATE					
ITEM	QUANTITY	UNIT	UNIT PRICE	COST	BONDABLE
CLEARING AND GRUBBING		AC			
EXCAVATION		C.Y.			
EMBANKMENT		C.Y.			
CURB INLET DI-		EA			
CURB INLET DI-		EA			
MANHOLE MH-		EA			
MANHOLE MH-		EA			
-IN, CONCRETE PIPE, CLASS III		LF			
-IN, CONCRETE PIPE, CLASS IV		LF			
-IN, C.M. CULVERT		LF			
-IN, C.M. CULVERT		LF			
BOX CULVERT		LS			
PAVED SWALE		LF			
RIPRAP - CLASS		SF			
PERMANENT GRASS SWALE		LF			
-IN, CONCRETE ENDWALL, EW-		EA			
-IN, END SECTION ES-		EA			
HEADER CURB & GUTTER - CG-		LF			
CURB & GUTTER - CG-		LF			
VALLEY GUTTER		EA			
GRAVEL BASE		SY			
GRAVEL SHOULDER		SY			
SURFACE TREATMENT		SY			
-IN, BIT. CONC., TYPE B-		SY			
-IN, BIT. CONC., TYPE S-		SY			
-IN, BASE MATERIAL		C.Y.			
-IN, SUBBASE MATERIAL		C.Y.			
TRAFFIC BARRICADE		BA			
8" WATER LINE		LF			
6" WATER LINE		LF			
FIRE HYDRANT ASSEMBLIES		EA			
BLOW OFFS W/ VAULT, FRAME & COVER		EA			
-IN, GATE VALVES, W/ VAULT, FRAME & COVER		EA			
-IN, GATE VALVES, W/ VAULT, FRAME & COVER		EA			
8" SANITARY SEWER		LF			
STANDARD MANHOLE W/ FRAME & COVER		EA			
SAMPLING MANHOLE/PORT		EA			
LANDSCAPING		LS			
AMENITIES (INCLUDING BUT NOT LIMITED TO TRAILS, ETC...)		LS			
STORMWATER MANAGEMENT		LS			
AS-BUILT PLANS (STORM SEWER SYSTEMS)		LS			
AS-BUILT PLANS (STORMWATER MANAGEMENT)		LS			
10% CONTINGENCY					
ESTIMATED TOTAL					

BY SEALING THE PLANS, THE DESIGN PROFESSIONAL HEREBY CERTIFIES THAT THE FOREGOING ESTIMATE REFLECTS THE CURRENT IMPROVEMENT COSTS OF THIS PROJECT.

FREESE AND NICHOLS
531 NORTH LIBERTY STREET
WINSTON-SALEM, NC 27101
864.506.1465 TEL
VA LICENSE # 0407007129
Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

Emily D. Brown
EMILY DARR BROWN
PROFESSIONAL ENGINEER
8/26/2024
CITY OF ROANOKE, VIRGINIA
COUNTY OF ROANOKE, VIRGINIA
PROFESSIONAL ENGINEER
Emily D. Brown
EMILY DARR BROWN
PROFESSIONAL ENGINEER
8/26/2024

ISSUED FOR
REVIEW

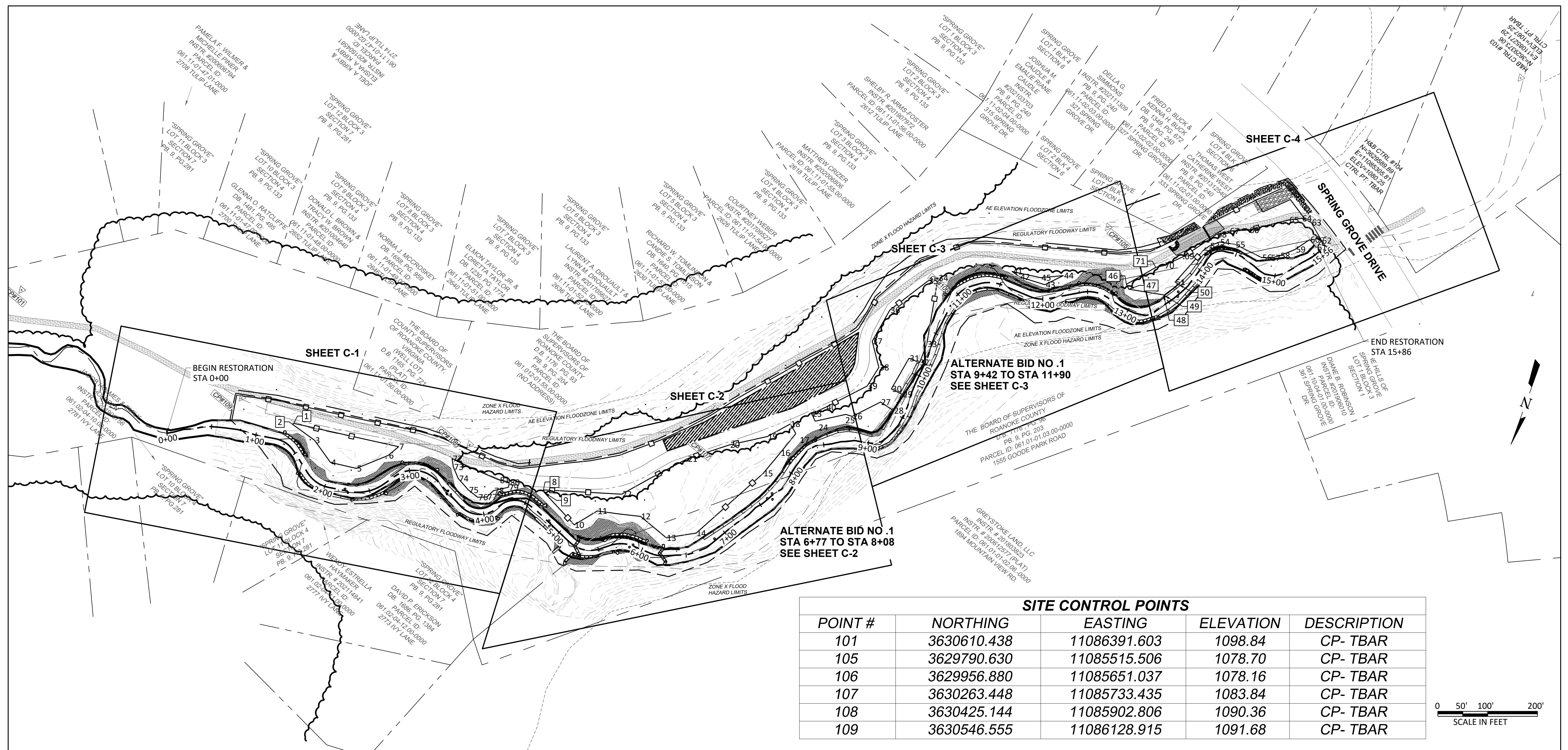
Restoration of
Wolf Creek
Phase II
Spring Grove Dr
Vinton, Virginia

SHEET
1
OF
30

RESTORATION OF WOLF CREEK PHASE II ROANOKE COUNTY, VA (PROJECT PLAN SHEETS)

Clearing, grading, erosion control, stream restoration, drainage, landscaping and other improvements as noted on the plans. This work will include all items necessary to construct the stream, and associated structures with the associated landscaping, plantings, seeding and live staking.

RECEIVING STREAM: WOLF CREEK



SITE CONTROL POINTS

SITE CONTROL POINTS				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
101	3630610.438	11086391.603	1098.84	CP- TBAR
105	3629790.630	11085515.506	1078.70	CP- TBAR
106	3629956.880	11085651.037	1078.16	CP- TBAR
107	3630263.448	11085733.435	1083.84	CP- TBAR
108	3630425.144	11085902.806	1090.36	CP- TBAR
109	3630546.555	11086128.915	1091.68	CP- TBAR

0 50' 100' 200'
A horizontal scale bar with tick marks at 0, 50', 100', and 200'. The first 50' segment is filled with a solid black color, while the remaining 150' are represented by a thin white line.

SCALE IN FEET

TITLE SHEET

TITLE SHEET

KED BMD

VERIFY SCALE	Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.	FILE NAME	TITLE SHT.dwg	CHECK
0				

1

ISSUED FOR REVIEW

SEQ.

TREE PROTECTION COORDINATES

TREE PROTECTION - POINT TABLE		
PNT	NORTHING	EASTING
1	3630531.27	11086066.87
2	3630532.99	11086067.44
3	3630530.99	11086037.34
4	3630538.52	11086008.22
5	3630525.35	11085982.06
6	3630491.73	11085964.23
7	3630477.12	11085961.65
8	3630411.46	11085808.44
9	3630413.14	11085805.76
10	3630419.44	11085757.64
11	3630391.33	11085747.95
12	3630365.44	11085707.39
13	3630365.44	11085670.52
14	3630340.37	11085648.57
15	3630242.57	11085633.93
16	3630212.95	11085633.93
17	3630188.59	11085626.85
18	3630181.49	11085645.83
19	3630208.19	11085656.33
20	3630242.07	11085682.55
21	3630283.65	11085708.56
22	3630359.97	11085739.15
23	3630157.71	11085634.84
24	3630164.91	11085619.97
25	3630139.99	11085602.40
26	3630131.44	11085598.73
27	3630099.26	11085584.92
28	3630097.41	11085567.90
29	3630077.19	11085571.93
30	3630080.42	11085584.94
31	3630042.05	11085591.67
32	3630038.47	11085580.12
33	3630017.39	11085586.65
34	3629953.49	11085623.83
35	3629963.04	11085630.14
36	3630014.84	11085641.92
37	3630053.60	11085634.86
38	3630071.06	11085610.77
39	3630095.11	11085607.52
40	3630142.47	11085627.70
41	3629895.74	11085565.65

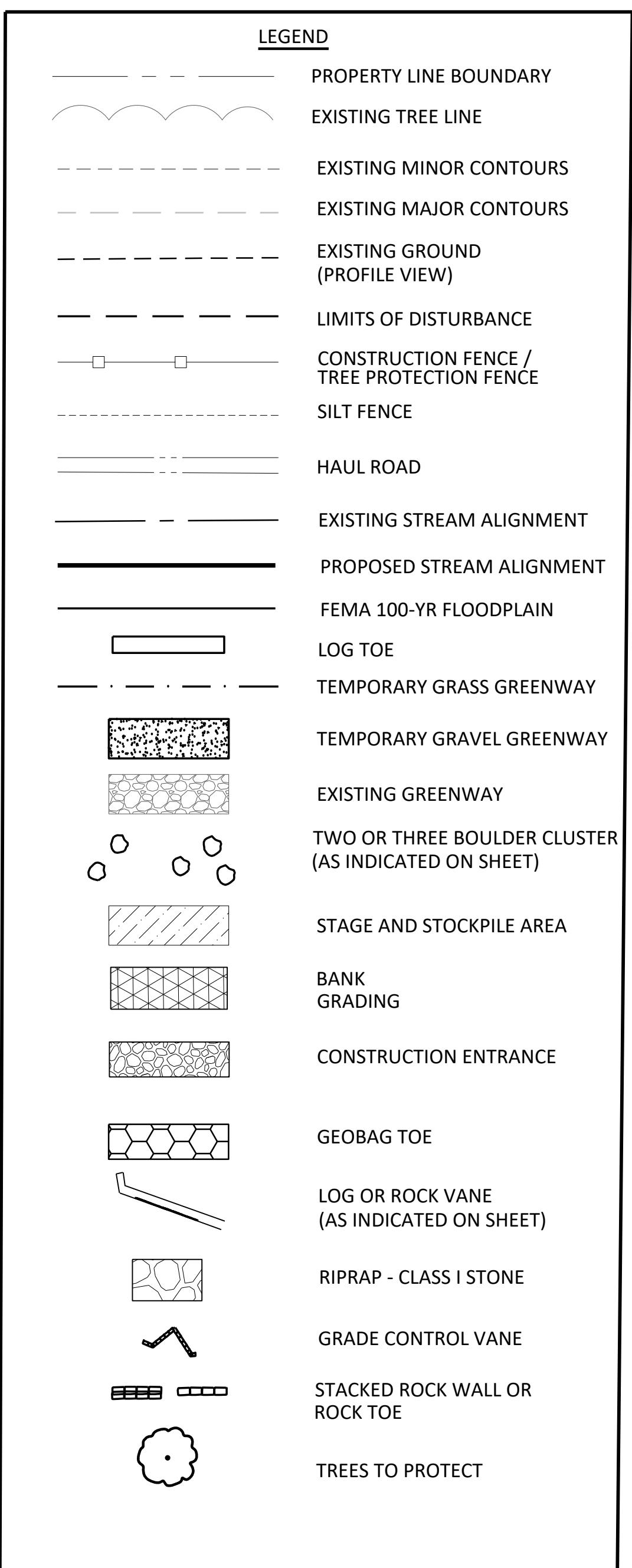
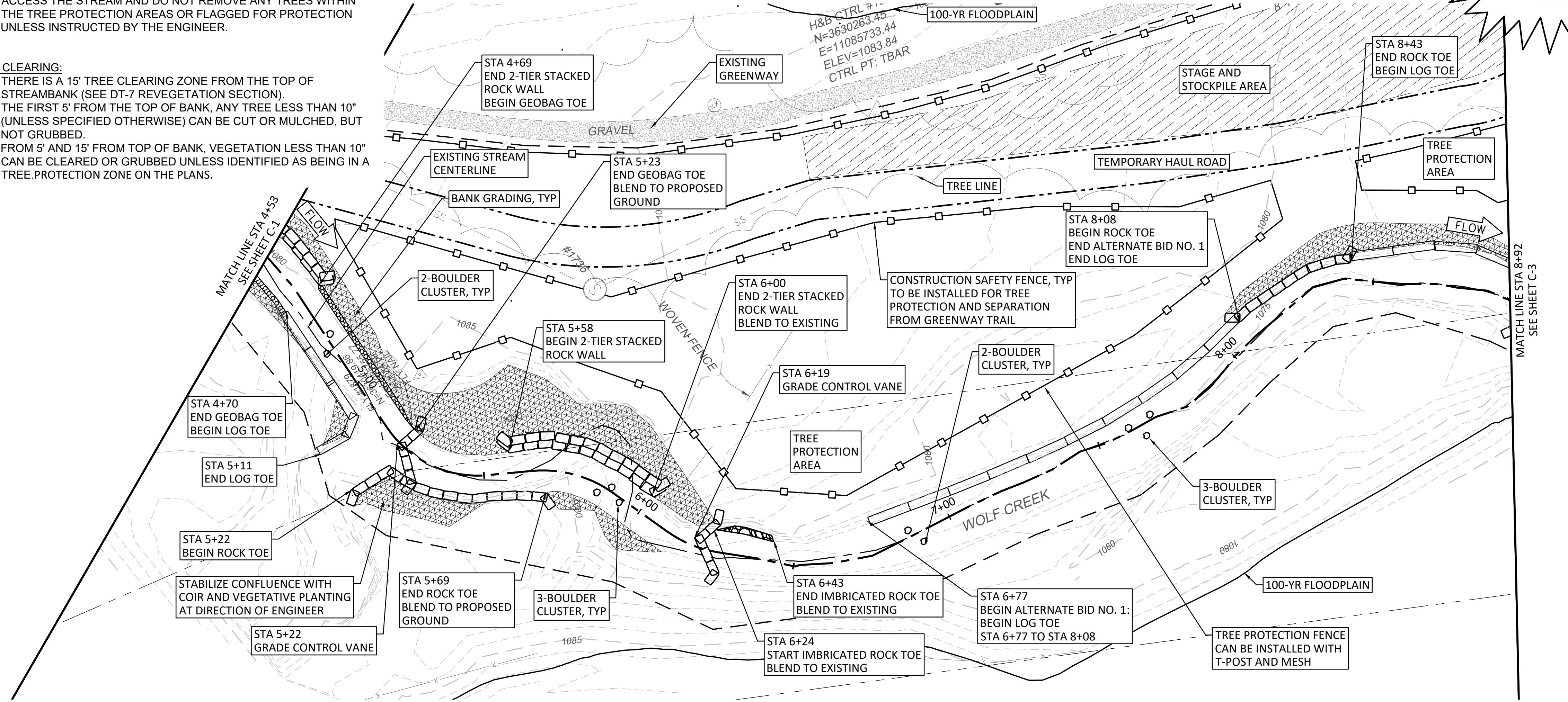
PROPOSED CHANNEL HORIZONTAL ALIGNMENT DATA

STATION	ALIGNMENT POINT	CURVE/TANGENT LENGTH	RADIUS	TANGENT BEARING	DELTA ANGLE	CHORD LENGTH	NORTHING	EASTING	CENTER POINT NORTHING	CENTER POINT EASTING
0+00.0'	PT	7.23'		S40° 22' 06.92"E			11086167.38	3630629.2		
0+07.23'	PT	11.81'		S35° 40' 46.13"E			11086162.7	3630623.694		
0+19.04'	PT	10.35'		S47° 02' 19.47"E			11086155.81	3630614.098		
0+29.39'	PT	8.74'		S38° 27' 37.54"E			11086148.24	3630607.044		
0+38.13'	PT	7.75'		S42° 43' 27.42"E			11086142.8	3630600.201		
0+45.88'	PT	9.52'		S54° 22' 27.77"E			11086137.55	3630594.51		
0+55.40'	PT	9.35'		S55° 49' 40.19"E			11086129.81	3630588.965		
0+64.75'	PT	13.97'		S57° 09' 03.85"E			11086122.07	3630583.712		
0+78.72'	PT	11.62'		S64° 44' 01.80"E			11086110.24	3630576.27		
0+90.35'	PT	8.22'		S70° 17' 14.07"E			11086099.73	3630571.308		
0+98.56'	PT	14.89'		S61° 03' 43.37"E			11086091.99	3630568.536		
1+13.45'	PT	8.51'		S61° 01' 43.30"E			11086078.97	3630561.333		
1+21.96'	PC	24.96'	30.67'		046.6188 (d)	24.28'	11086071.52	3630557.211	11086056.66	3630584.047
1+46.92'	PT	28.71'		N72° 21' 09.04"W			11086047.36	3630554.816		
1+75.63'	PC	29.08'	36.00'		046.2815 (d)	28.30'	11086020	3630563.521	11086009.09	3630529.215
2+04.71'	PT	22.61'		S61° 21' 57.57"W			11085991.84	3630560.812		
2+27.32'	PC	41.04'	50.00'		047.0291 (d)	39.90'	11085971.99	3630549.978	11085995.95	3630506.093
2+68.36'	PT	13.54'		S14° 20' 12.66"W			11085947.51	3630518.474		
2+81.90'	PC	51.71'	35.68'		083.0402 (d)	47.30'	11085944.16	3630505.359	11085909.59	3630514.193
3+33.60'	PT	37.99'		N82° 37' 22.62"W			11085905.01	3630478.812		
3+71.60'	PC	46.10'	29.11'		090.7412 (d)	41.43'	11085867.34	3630483.69	11085863.6	3630454.821
4+17.70'	PT	0.57'		S06° 38' 09.07"W			11085834.68	3630458.185		
4+18.27'	PC	36.55'	26.20'		079.9272 (d)	33.65'	11085834.62	3630457.618	11085808.59	3630460.646
4+54.82'	PT	10.40'		S86° 33' 47.16"E			11085810.16	3630434.495		
4+65.21'	PT	37.36'		N85° 49' 11.21"W			11085799.79	3630433.872		
5+02.58'	PT	13.66'		N86° 46' 37.69"W			11085762.52	3630436.595		
5+16.23'	PC	34.82'	32.72'		060.9668 (d)	33.20'	11085748.89	3630437.363	11085747.05	3630404.694
5+51.05'	PT	13.41'		S32° 15' 21.93"W			11085719.38	3630422.157		
5+64.46'	PC	25.65'	36.00'		040.8232 (d)	25.11'	11085712.22	3630410.819	11085681.78	3630430.032
5+90.11'	PT	20.24'		S73° 04' 45.47"W			11085692.26	3630395.591		
6+10.34'	PC	16.69'	36.00'		026.5580 (d)	16.54'	11085672.89	3630389.7	11085683.37	3630355.259
6+27.03'	PT	12.07'		S46° 31' 16.52"E			11085658.6	3630381.382		
6+39.10'	PT	11.42'		S49° 44' 05.73"E			11085649.84	3630373.076		
6+50.52'	PT	1.45'		S18° 52' 58.60"W			11085641.13	3630365.695		
6+51.98'	PT	10.20'		S34° 23' 39.34"W			11085640.66	3630364.32		
6+62.17'	PT	11.96'		S26° 56' 35.64"W			11085634.9	3630355.905		
6+74.13'	PT	9.64'		S10° 55' 30.94"W			11085629.48	3630345.244		
6+83.77'	PT	11.40'		S10° 43' 11.54"W			11085627.65	3630335.777		
6+95.17'	PT	12.35'		S10° 07' 04.63"W			11085625.53	3630324.581		
7+07.52'	PT	9.79'		S12° 36' 07.12"W			11085623.36	3630312.42		
7+17.31'	PT	7.57'		S16° 08' 03.29"W			11085621.22	3630302.864		
7+24.89'	PT	9.18'		S13° 24' 07.05"W			11085619.12	3630295.59		
7+34.07'	PT	9.96'		S04° 40' 37.76"W			11085616.99	3630286.659		
7+44.02'	PT	8.51'		S19° 48' 45.13"W			11085616.18	3630276.735		
7+52.54'	PT	8.44'		S11° 07' 07.64"W			11085613.3	3630268.726		
7+60.98'	PT	8.27'		S08° 12' 19.03"W			11085611.67	3630260.445		
7+69.25'	PT	9.85'		S19° 15' 20.28"W			11085610.49	3630252.261		
7+79.10'	PT	9.18'		S02° 46' 18.09"E			11085607.24	3630242.		

NOTES:
 1. FEMA FIS MAP # 51161C0186G
 2. CONTRACTOR SHALL CONTACT VIRGINIA 811 PRIOR TO CONSTRUCTION AND OBTAIN TICKET.
 3. CONSTRUCTION FENCING SHALL BE PLACED AROUND ALL TREES TO BE PROTECTED PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
 4. DISTURB ONLY THE ACCESS AREAS NOTED ON THE PLANS TO ACCESS THE STREAM AND DO NOT REMOVE ANY TREES WITHIN THE TREE PROTECTION AREAS OR FLAGGED FOR PROTECTION UNLESS INSTRUCTED BY THE ENGINEER.

TREE CLEARING:

1. THERE IS A 15' TREE CLEARING ZONE FROM THE TOP OF STREAMBANK (SEE DT-7 REVEGETATION SECTION).
2. THE FIRST 5' FROM THE TOP OF BANK, ANY TREE LESS THAN 10" (UNLESS SPECIFIED OTHERWISE) CAN BE CUT OR MULCHED, BUT NOT GRUBBED.
3. FROM 5' AND 15' FROM TOP OF BANK, VEGETATION LESS THAN 10" CAN BE CLEARED OR GRUBBED UNLESS IDENTIFIED AS BEING IN A TREE PROTECTION ZONE ON THE PLANS.



Freeze and Nichols, Inc. I0407007129
 COMMISSIONED BY
 Emily D. Brown
 CMA2024040407
 Lic. No. 0402065407
 8/26/2024
 Virginia Registered Engineering Firm #0407007129

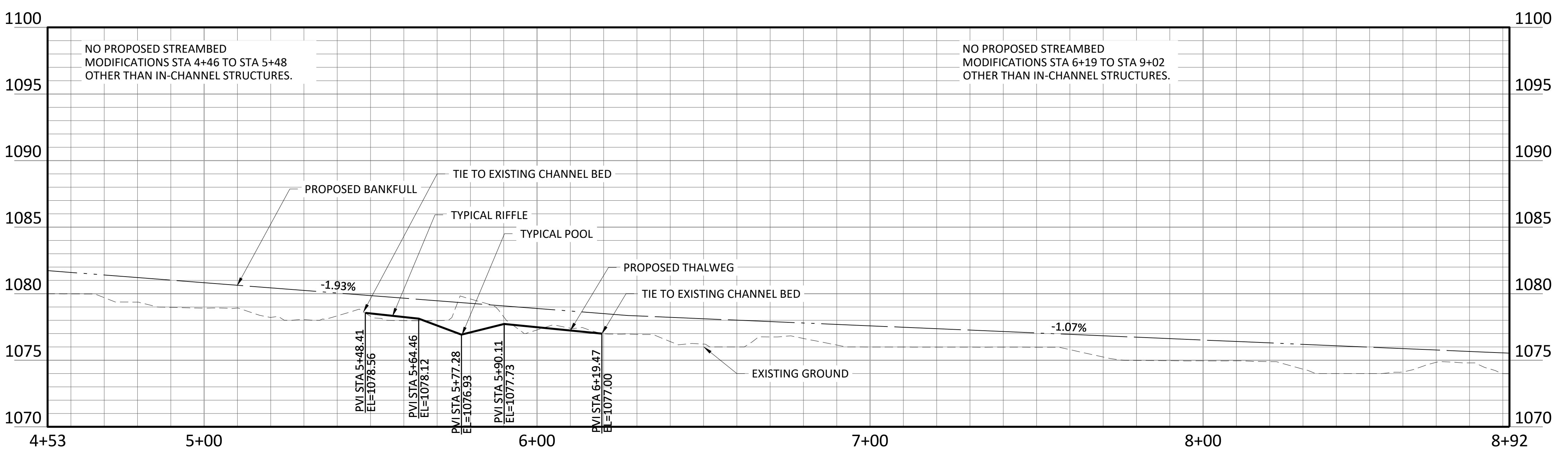
FREEZE and NICHOLS
 531 North Liberty Street
 Winston-Salem, NC 27101
 Phone - (336) 790-6744
 Web - www.freeze.com

CIVIL
PLAN AND PROFILE
STA 4+50 TO STA 9+00

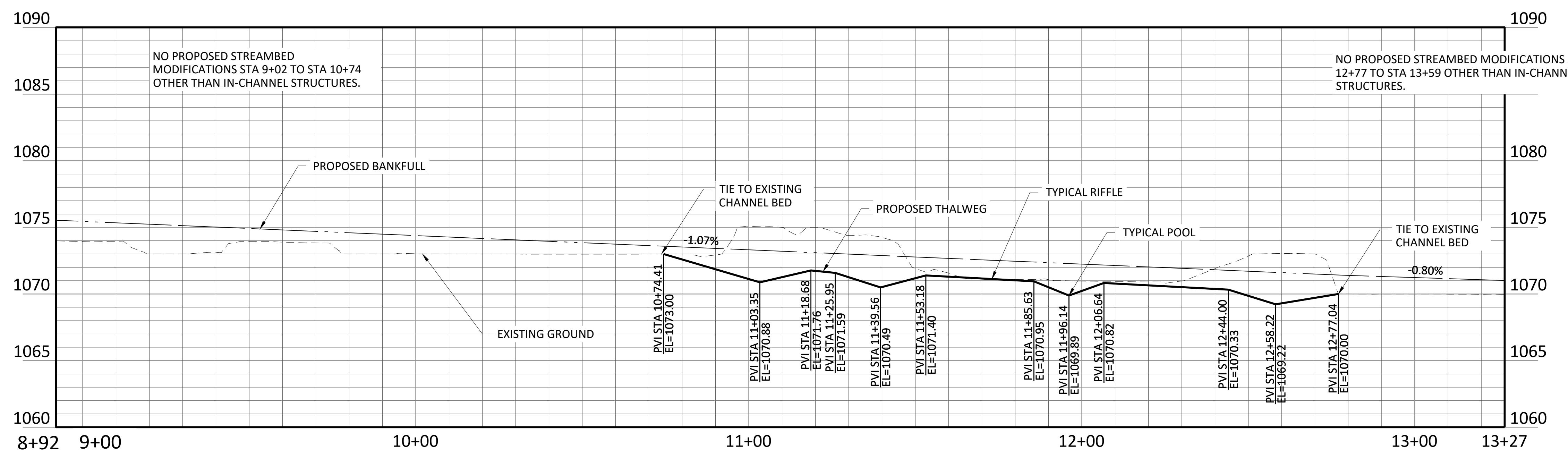
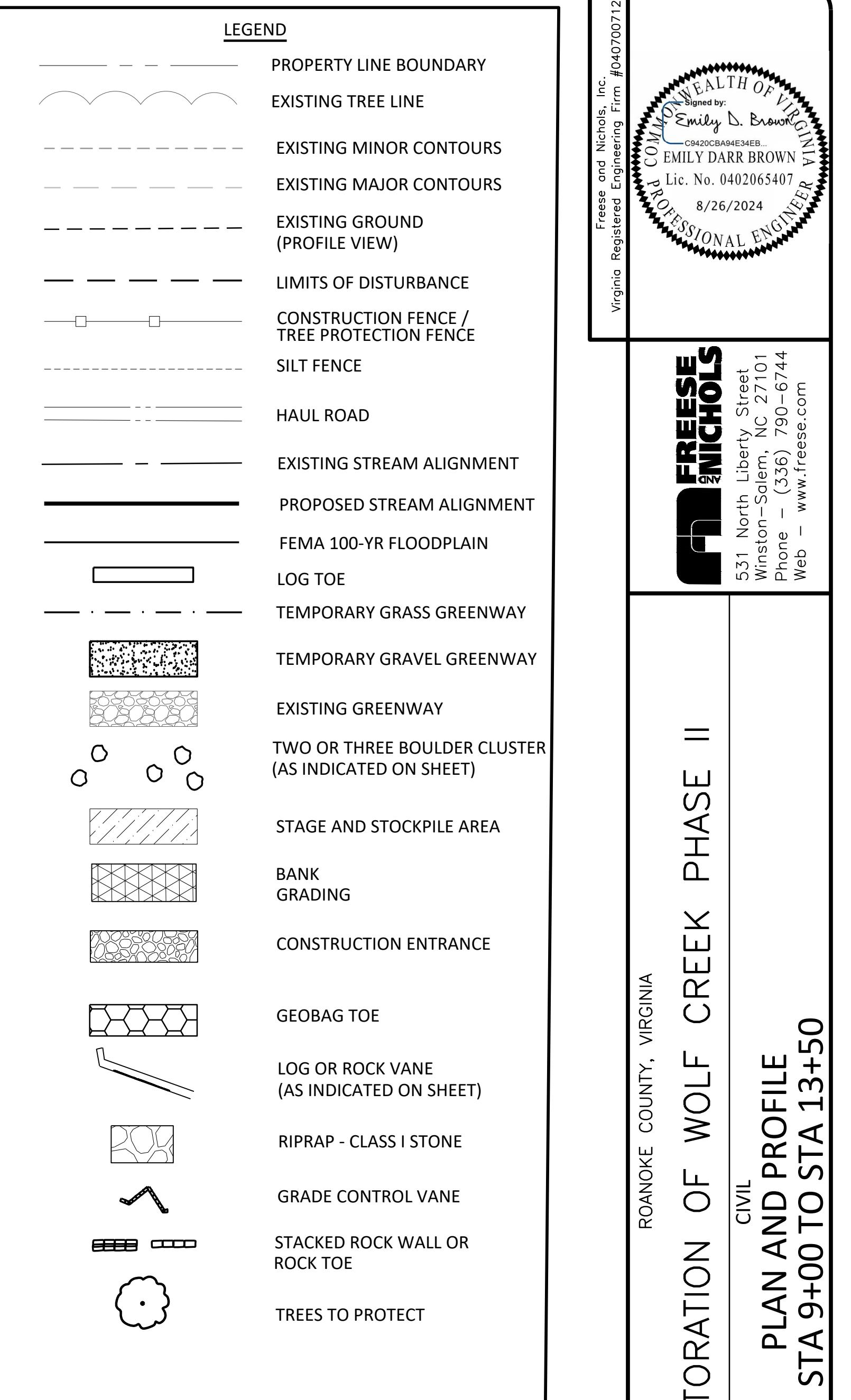
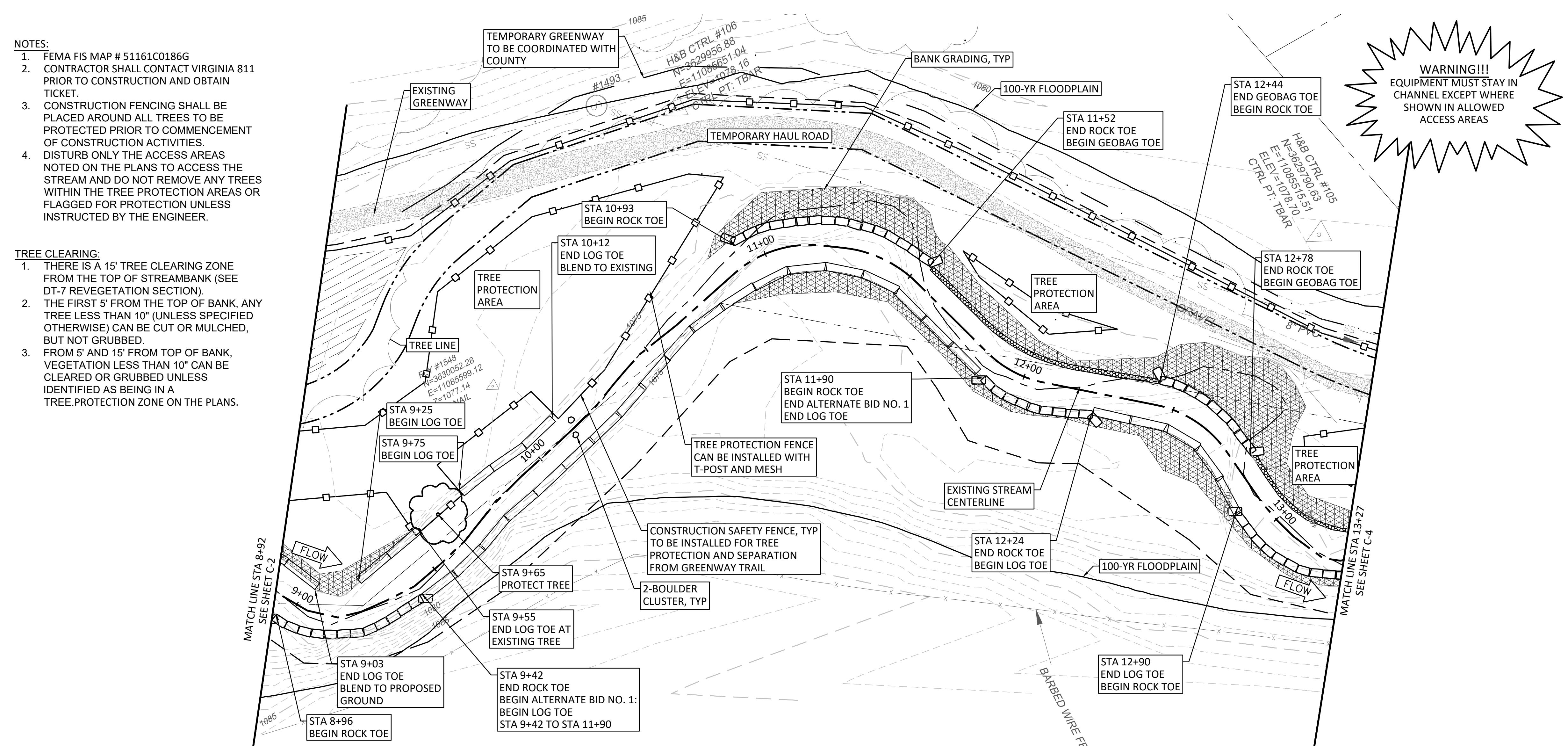
ROANOKE COUNTY, VIRGINIA

RESTORATION OF WOLF CREEK PHASE II

NO.	ISSUE	BY	DATE	PLAN JOB NO.	REV'D
				RNC 19551	
				DATE 2/8/2023	
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				BMD	
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0 20' 40'
SCALE IN FEET

C-3

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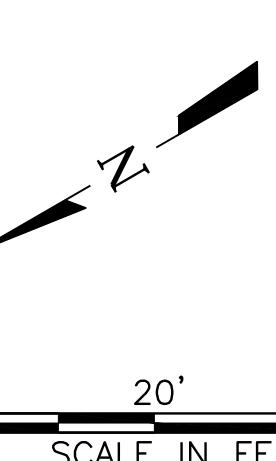
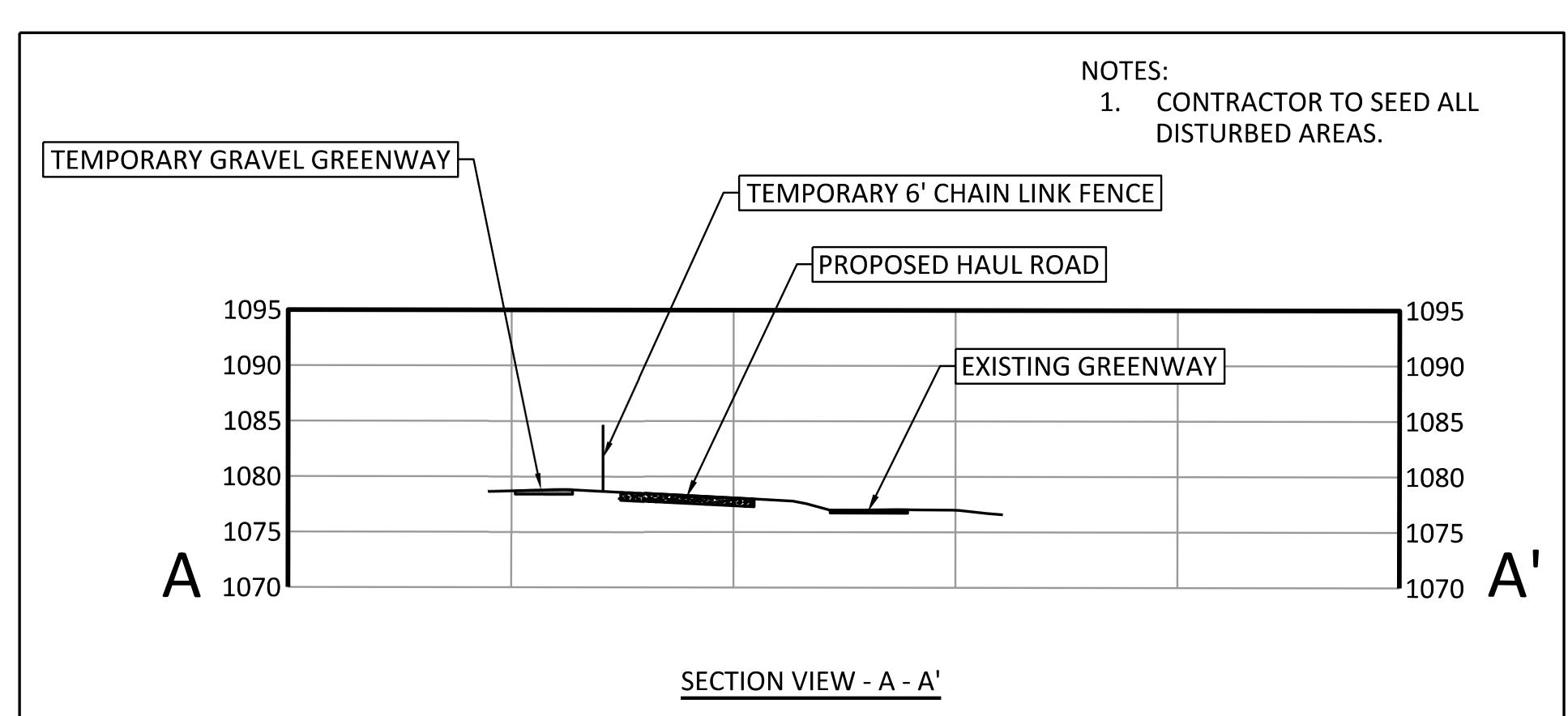
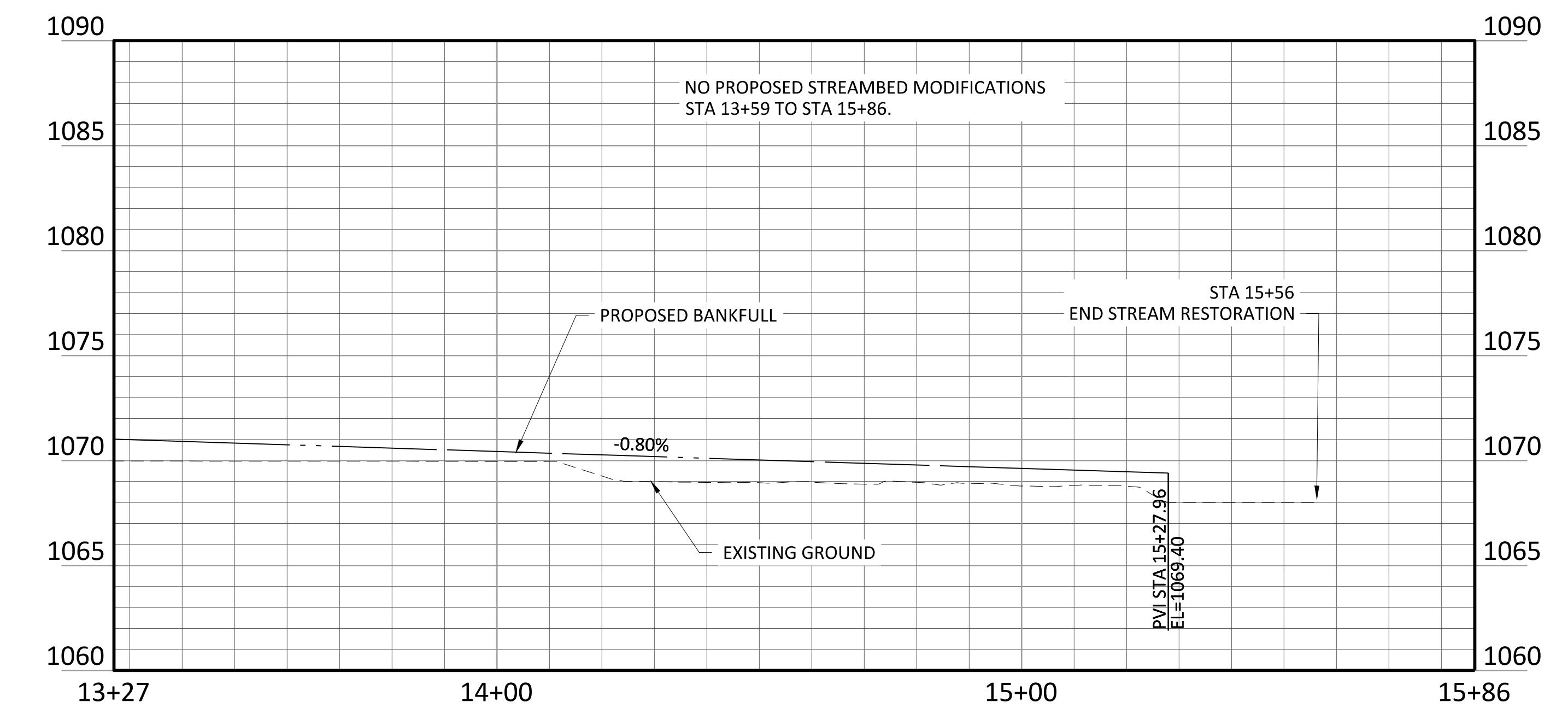
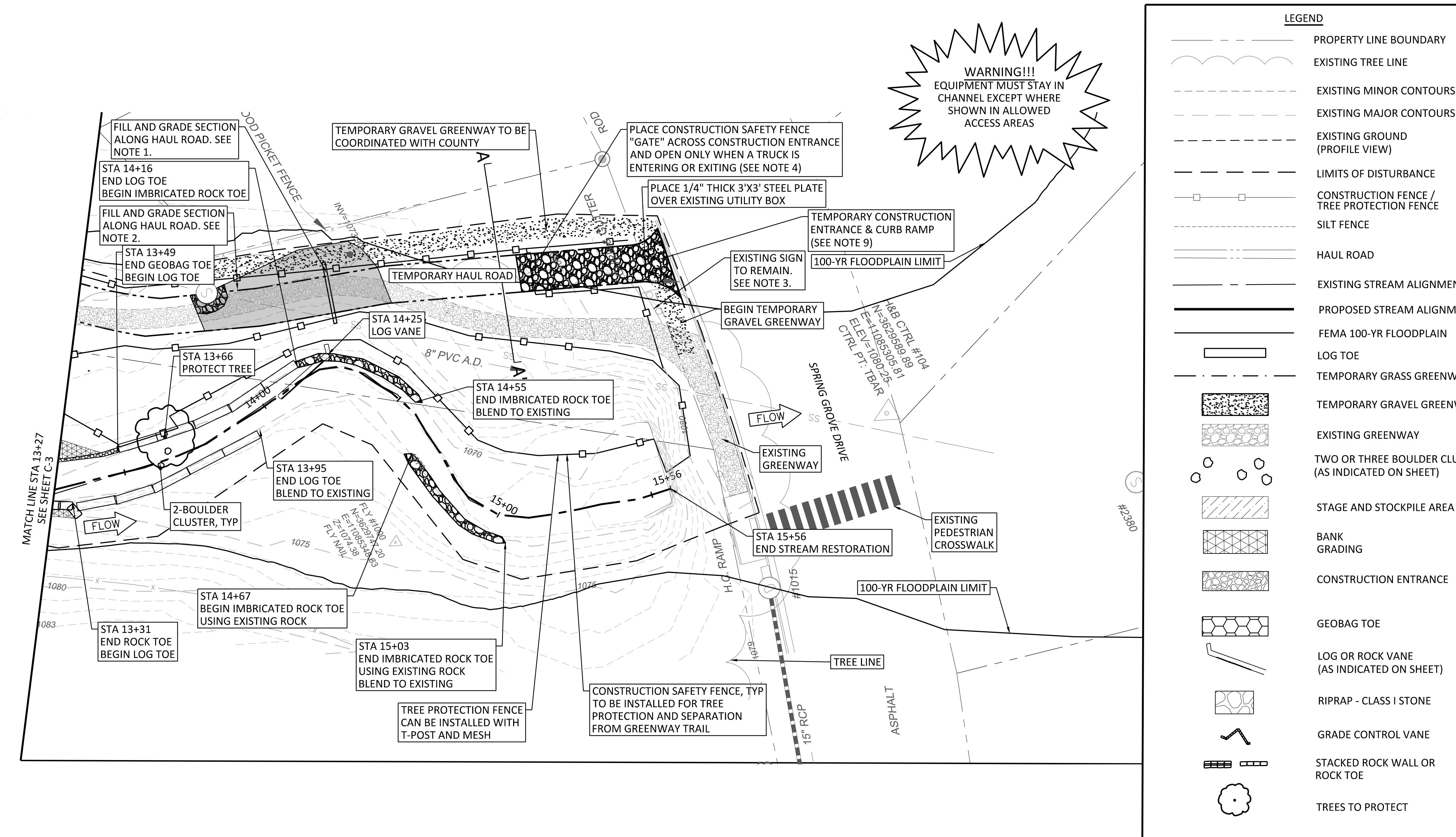
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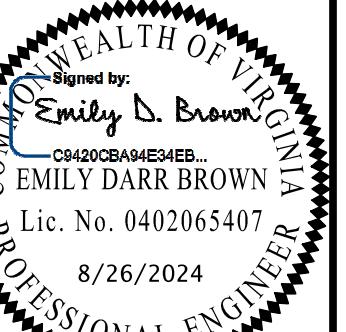
1. CONTRACTOR TO FILL AND GRADE SECTION OF TEMPORARY HAUL ROAD. INSTALL A 12" HDPE IN EXISTING LOW SPOT TO CONVEY WATER ACROSS THE HAUL ROAD. ENSURE 2' OF COVER AND POSITIVE DRAINAGE TOWARDS THE CREEK.
2. FILL HAUL ROAD GRADE TO BE FLUSH WITH SS MANHOLE WITH MIN 3' DIAMETER GRAVEL JACKET. RESTORE GREENWAY TO EXISTING CONDITIONS POST-CONSTRUCTION.
3. EXISTING GREENWAY SIGN TO REMAIN. CONTRACTOR TO REPAIR AND REPLACE SIGNAGE IF DAMAGED.
4. 6' CHAIN LINK FENCE SHALL BE CONSTRUCTED FROM SPRING GROVE DRIVE TO SANITARY SEWER MANHOLE (STA 13+94, LT 57.66) AS SHOWN ON THE PLANS. FROM STA 13+94, LT 57.66 TO STA 0+71 , CONSTRUCTION SAFETY FENCE SHALL BE CONSTRUCTED TO SEPARATE PEDESTRIAN AREA FROM CONSTRUCTION AREA.
5. FEMA FIS MAP # 51161C0186G
6. CONTRACTOR SHALL CONTACT VIRGINIA 811 PRIOR TO CONSTRUCTION AND OBTAIN TICKET.
7. CONSTRUCTION FENCING SHALL BE PLACED AROUND ALL TREES TO BE PROTECTED PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
8. DISTURB ONLY THE ACCESS AREAS NOTED ON THE PLANS TO ACCESS THE STREAM AND DO NOT REMOVE ANY TREES WITHIN THE TREE PROTECTION AREAS OR FLAGGED FOR PROTECTION UNLESS INSTRUCTED BY THE ENGINEER.
9. CONTRACTOR TO LOCATE CONSTRUCTION ENTRANCE AND CHAIN LINK FENCE IMMEDIATELY WEST OF EXISTING FIBER OPTIC ACCESS AND SHALL AVOID IMPACTS OR BLOCKING ACCESS TO THE FIBER OPTIC ACCESS BOX.

TREE CLEARING:

1. THERE IS A 15' TREE CLEARING ZONE FROM THE TOP OF STREAMBANK (SEE DT-7 REVEGETATION SECTION).
2. THE FIRST 5' FROM THE TOP OF BANK, ANY TREE LESS THAN 10" (UNLESS SPECIFIED OTHERWISE) CAN BE CUT OR MULCHED, BUT NOT GRUBBED.
3. FROM 5' AND 15' FROM TOP OF BANK, VEGETATION LESS THAN 10" CAN BE CLEARED OR GRUBBED UNLESS IDENTIFIED AS BEING IN A TREE PROTECTION ZONE ON THE PLANS.

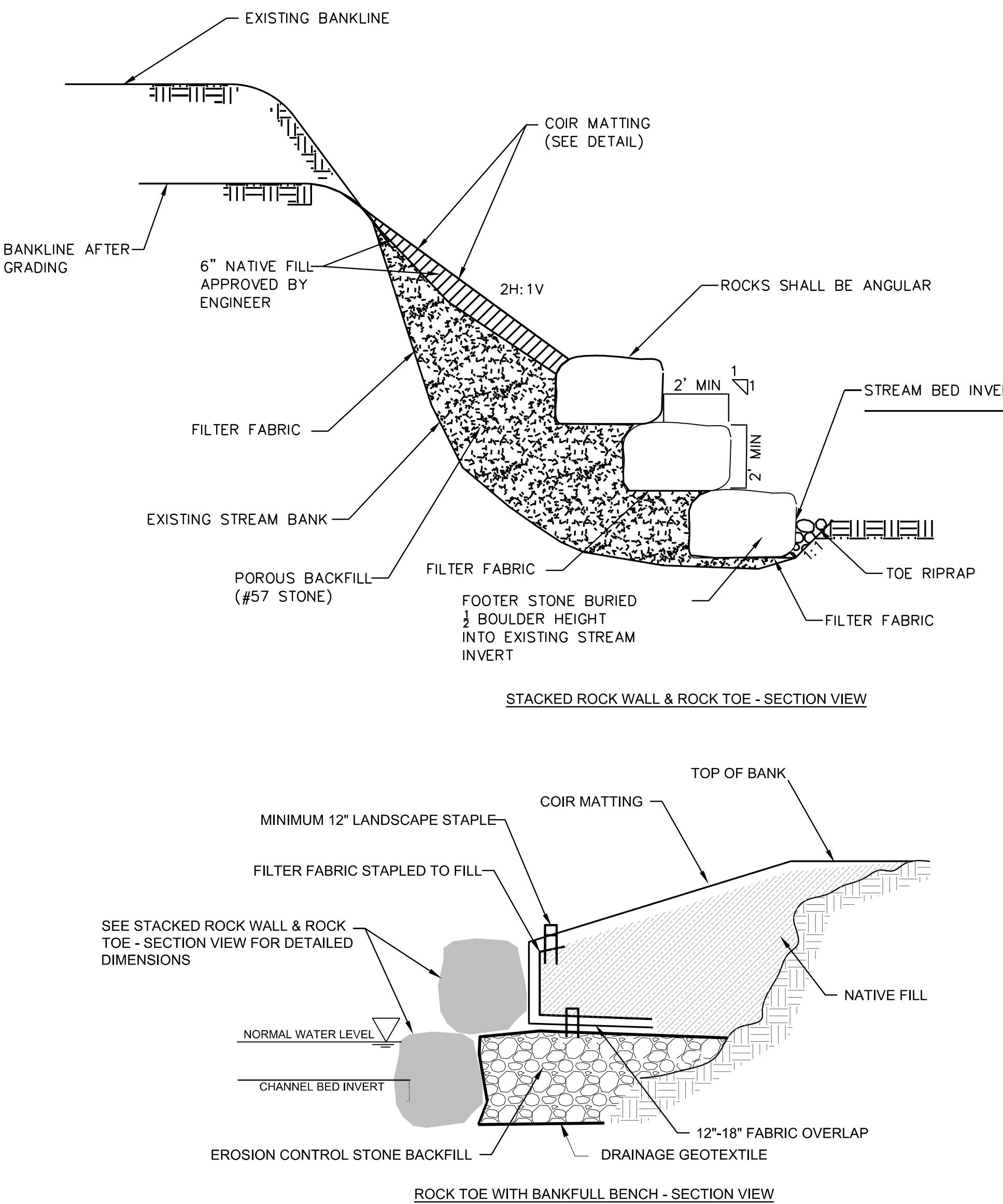


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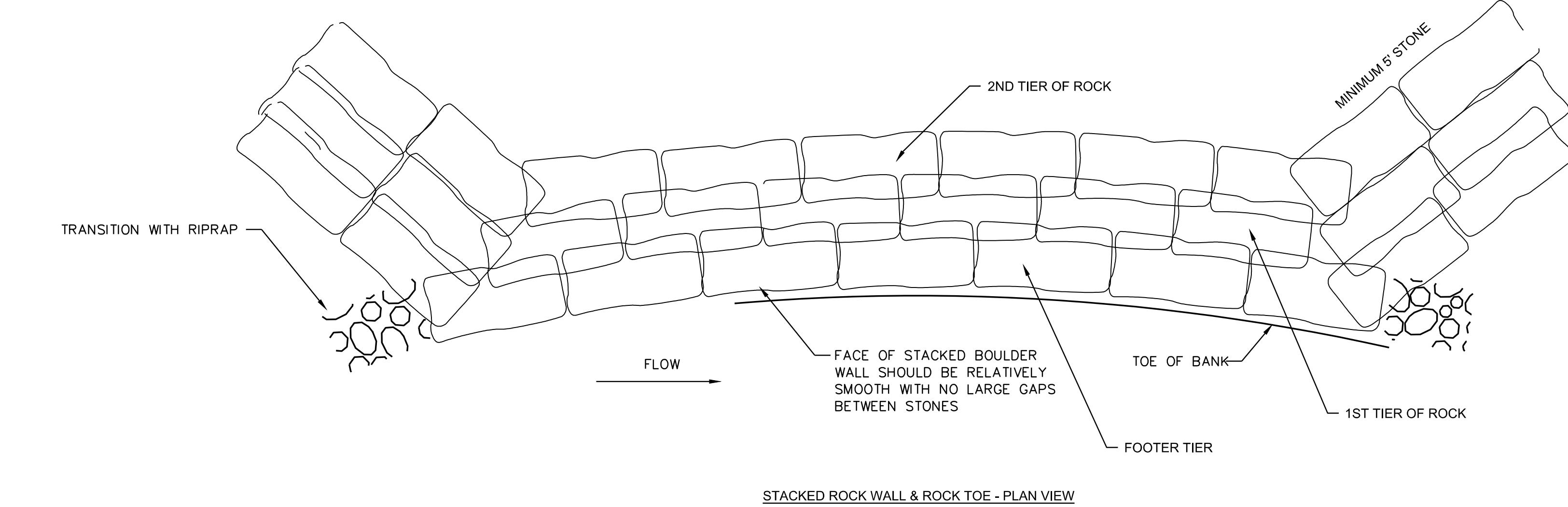
Virginia Registered Engineering Firm #0407007129

The seal is circular with a black border containing the text "COMMONWEALTH OF VIRGINIA" at the top and "PROFESSIONAL ENGINEER" at the bottom. In the center, it says "SIGNED BY" above the name "Emily D. Brown" and "C9420CBA94E34EB..." below it. At the bottom, it includes "EMILY DARR BROWN" and "Lic. No. 0402065407". The date "8/26/2024" is also present at the bottom.



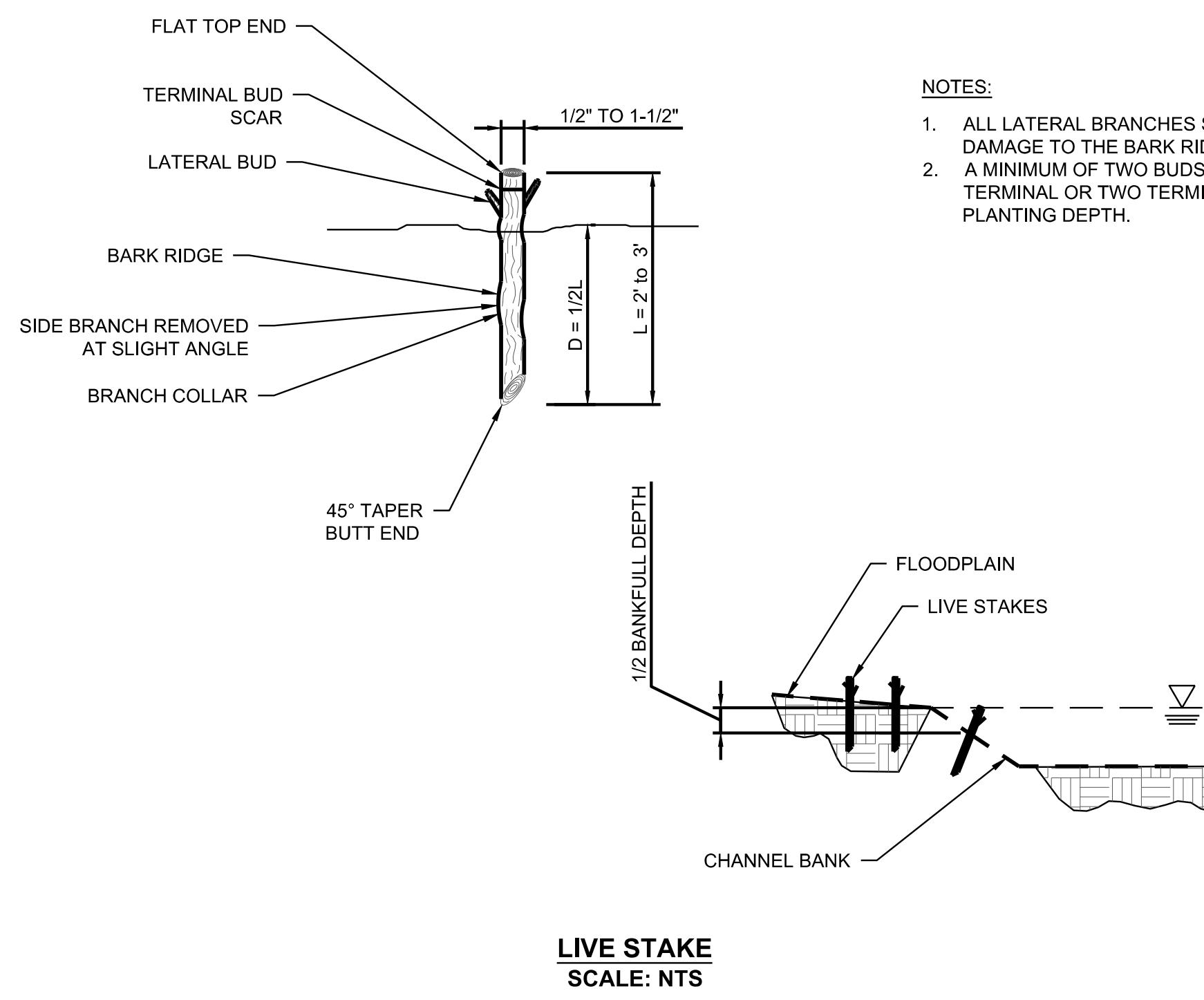
NOTES:

1. STACKED ROCK WALL SHALL HAVE 2 TIERS ABOVE THE FOOTER TIER AND ROCK TOE SHALL HAVE 1 TIER ABOVE THE FOOTER TIER.
2. STACKED ROCK WALL CAN BE STACKED WITH A SLOPE BETWEEN 0.5:1 (H:V) AND 2:1 (H:V) STEEP.
3. STANDARD BOULDER SIZE IS 4'(L) X 3'(W) X 2'(H)
4. BANKS SHALL NOT BE OVER-EXCAVATED FOR CONSTRUCT OF ROCK TOEOR ROCK WALL. ROCK TOE AND ROCK WALL SHALL BE INSTALLED ON FACE OF BANK.



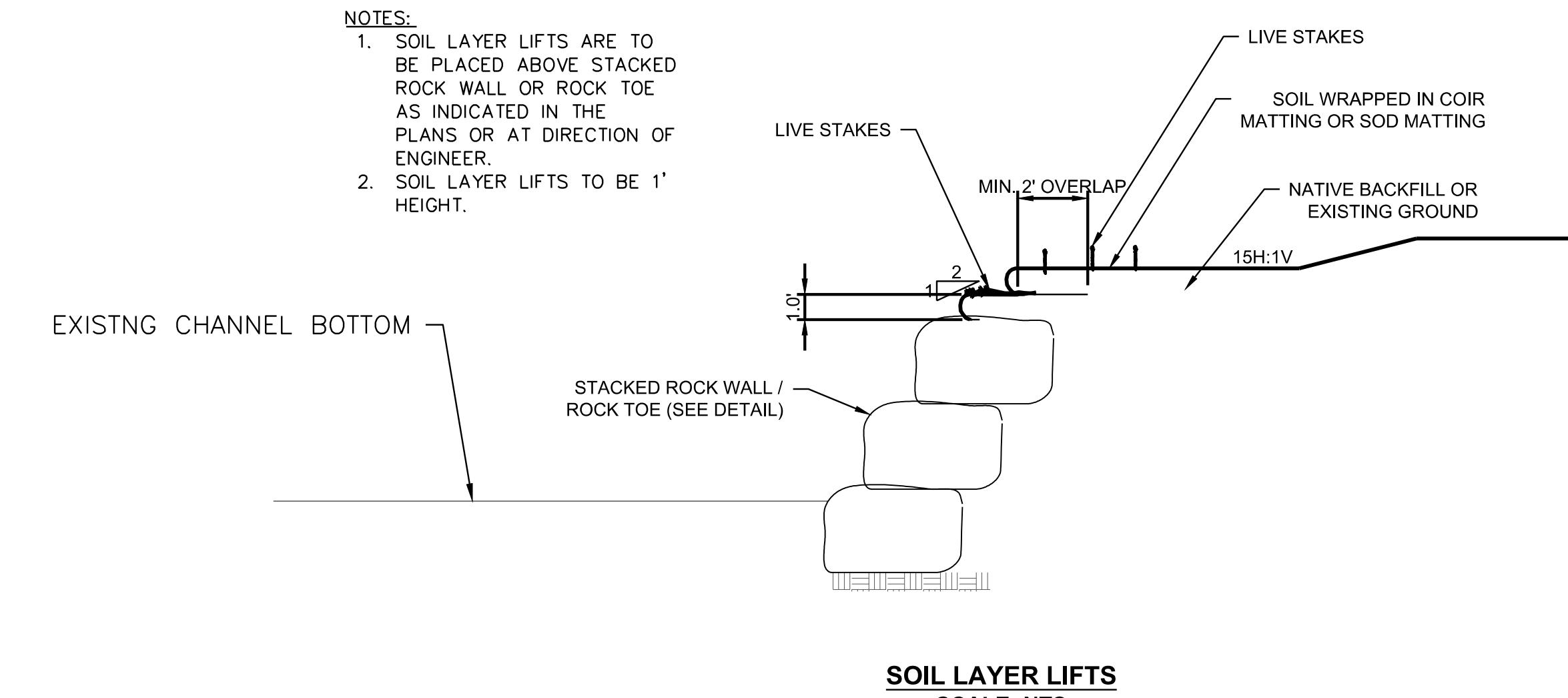
STACKED ROCK WALL & ROCK TOE PROTECT

SCALE: NTS



NOTES:

1. ALL LATERAL BRANCHES SHALL BE TRIMMED TO PREVENT DAMAGE TO THE BARK RIDGE AND BRANCH COLLAR.
2. A MINIMUM OF TWO BUDS (ONE LATERAL PLUS ONE TERMINAL OR TWO TERMINAL) SHALL BE ABOVE THE PLANTING DEPTH.



SOIL LAYER LIFTS

SCALE: NTS

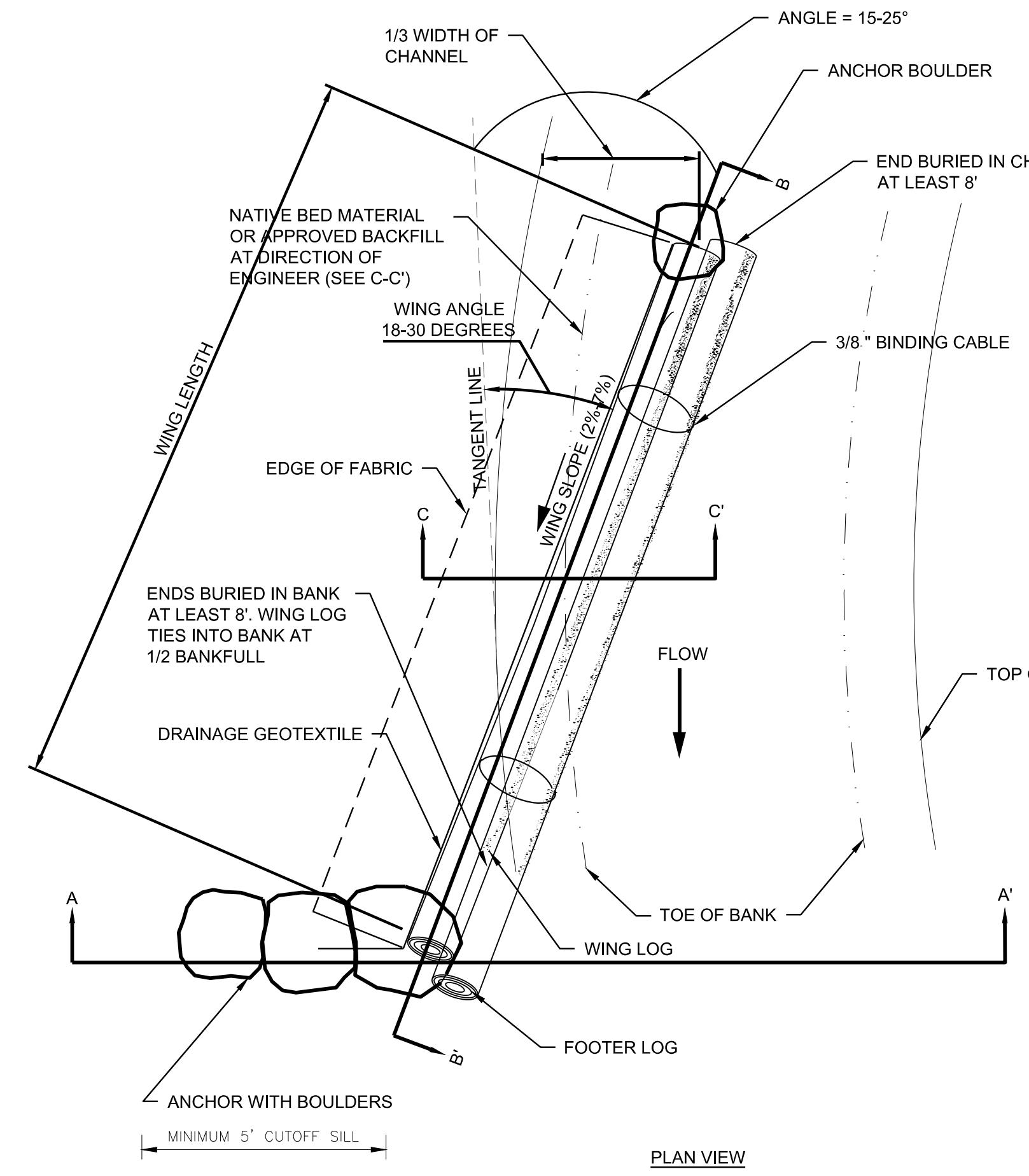
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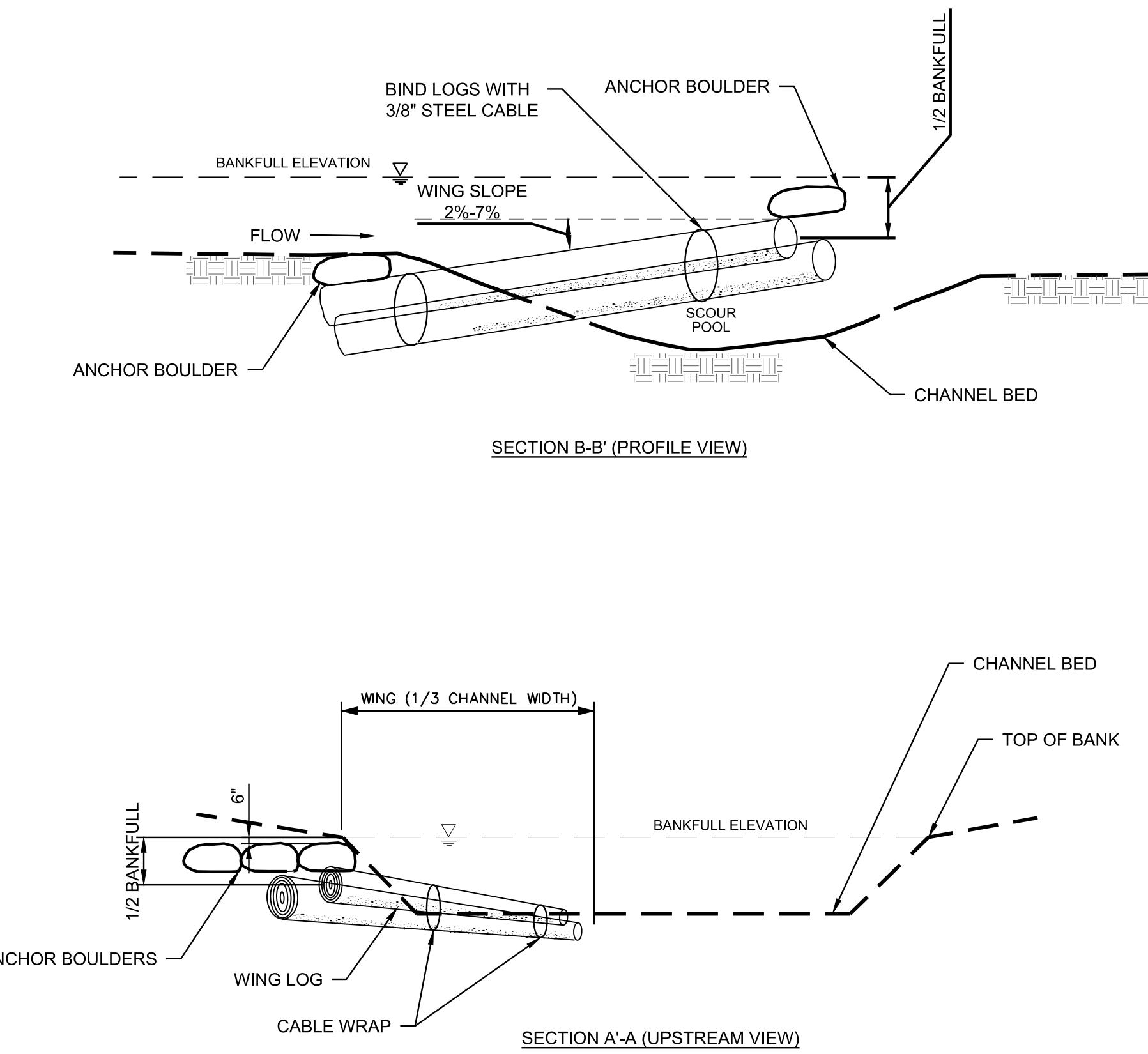
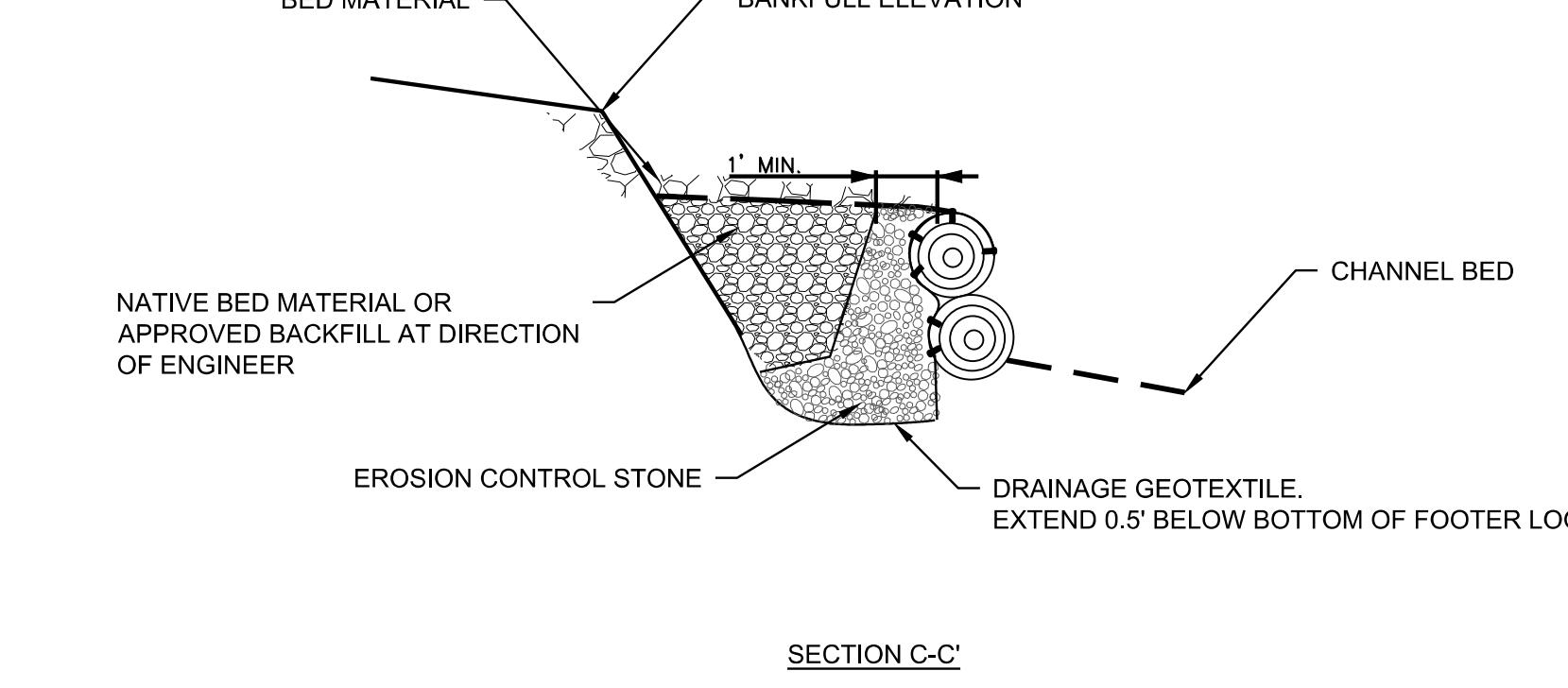
OPERATION OF WOLF CREEK PHASE II

DETAILS

Q. 9 OF 30



LOG OR ROCK VANE
SCALE: NTS



RESTORATION OF WOLF CREEK PHASE II

ROANOKE COUNTY, VIRGINIA

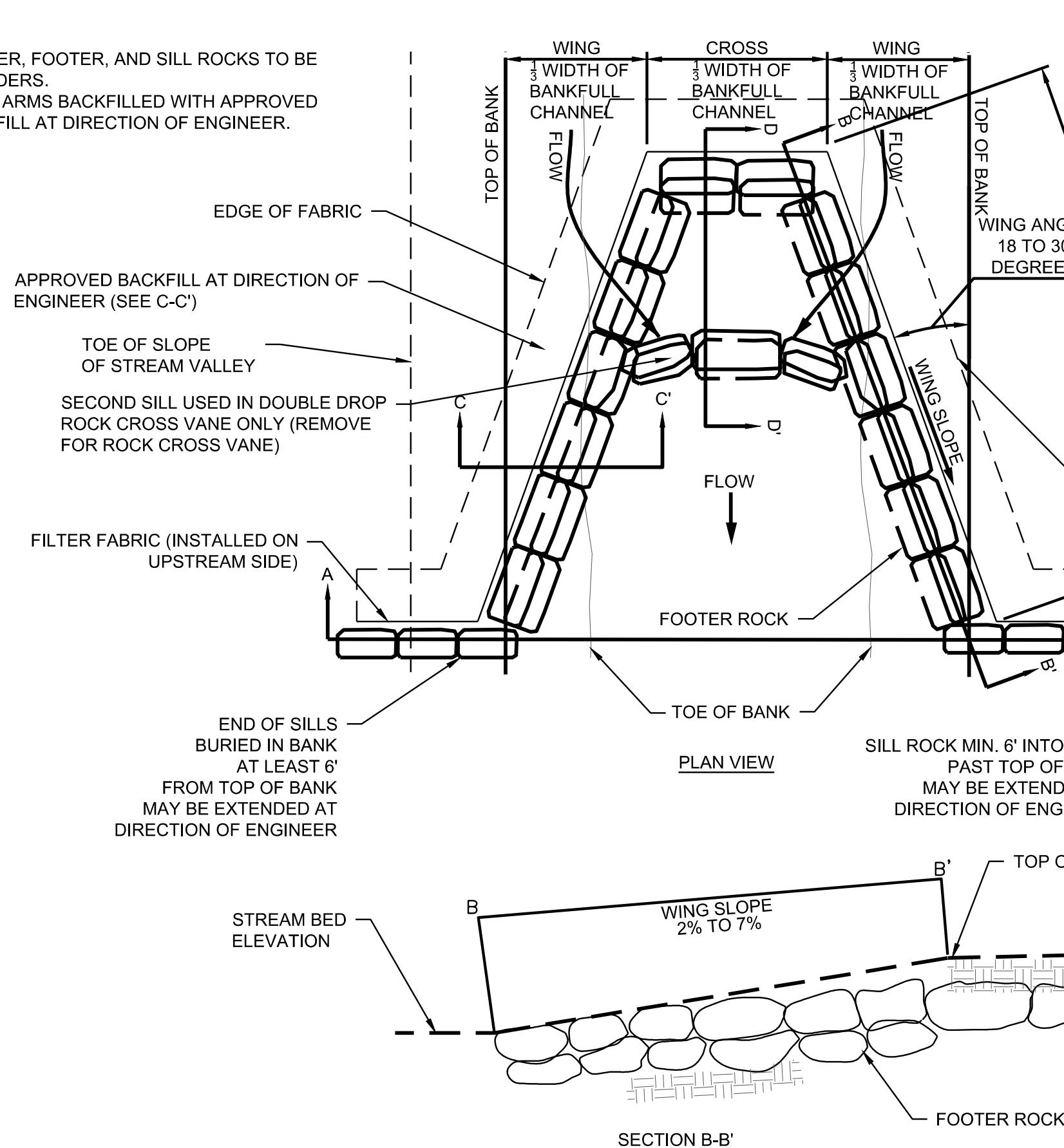
GENERAL DETAILS

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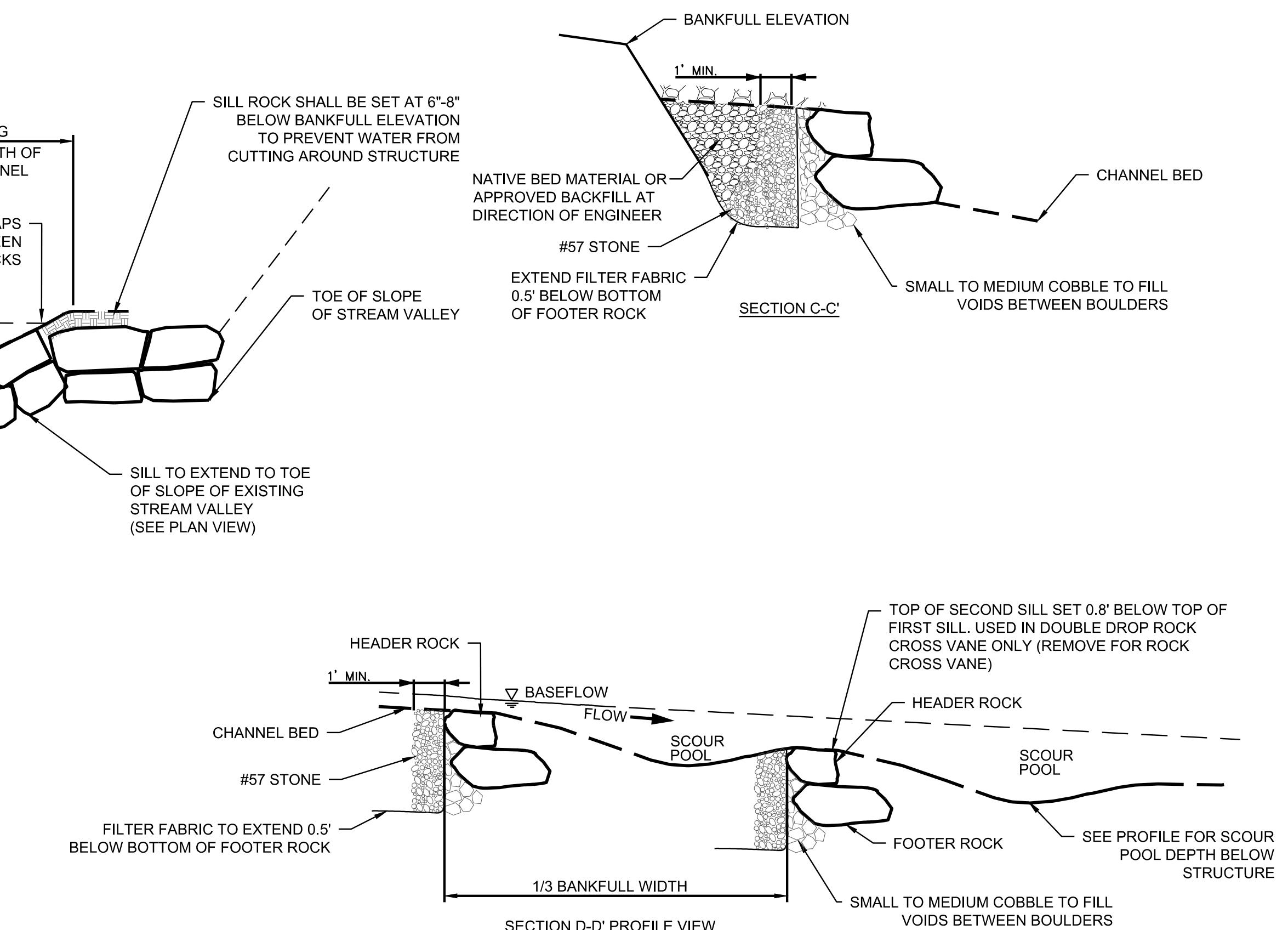
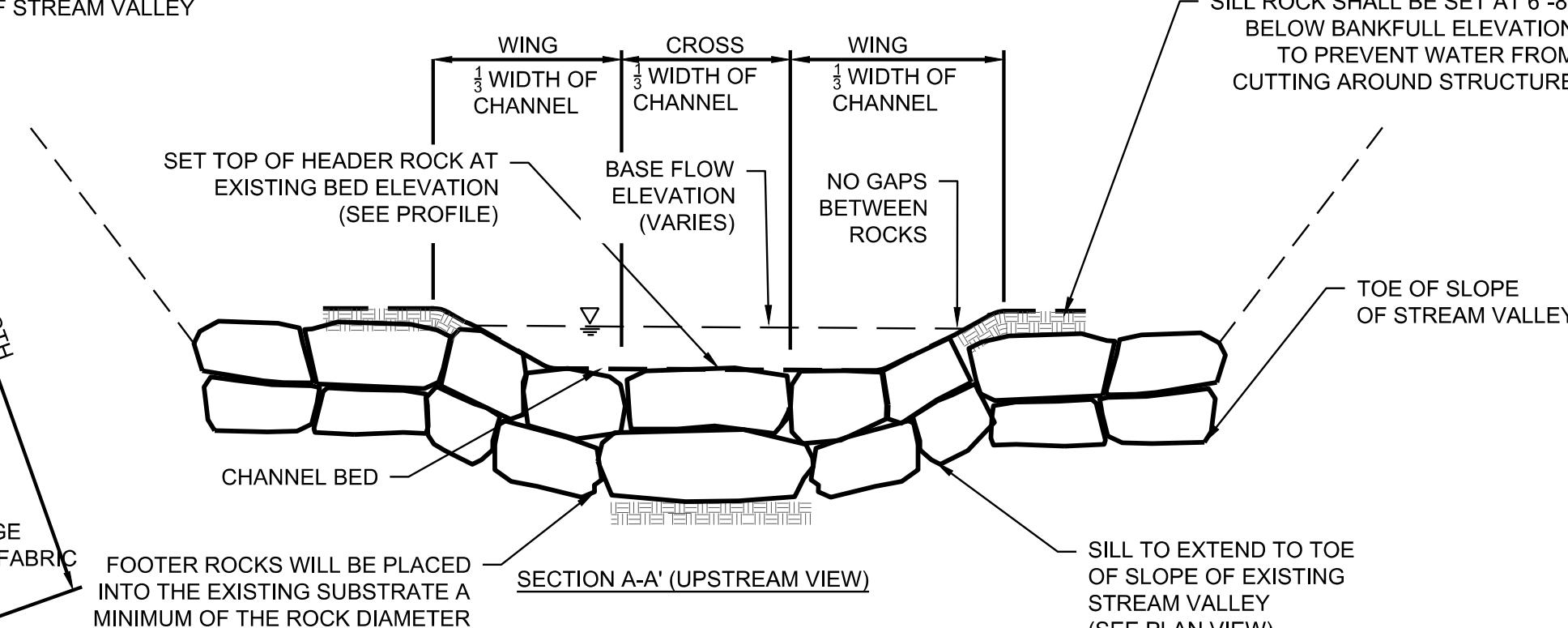
FRESEE and NICHOLS

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Phone: (336) 790-6744
Web: www.freese.com

State of
Virginia
COMMISSION
of
PROFESSIONAL ENGINEERS
and
ARCHITECTS
Emily D. Brown
C420200ANMSEB
EMILY DARR BROWN
Lic. No. 0402065407
8/26/2024



DOUBLE DROP ROCK CROSS OR ROCK CROSS VANE
SCALE: NTS

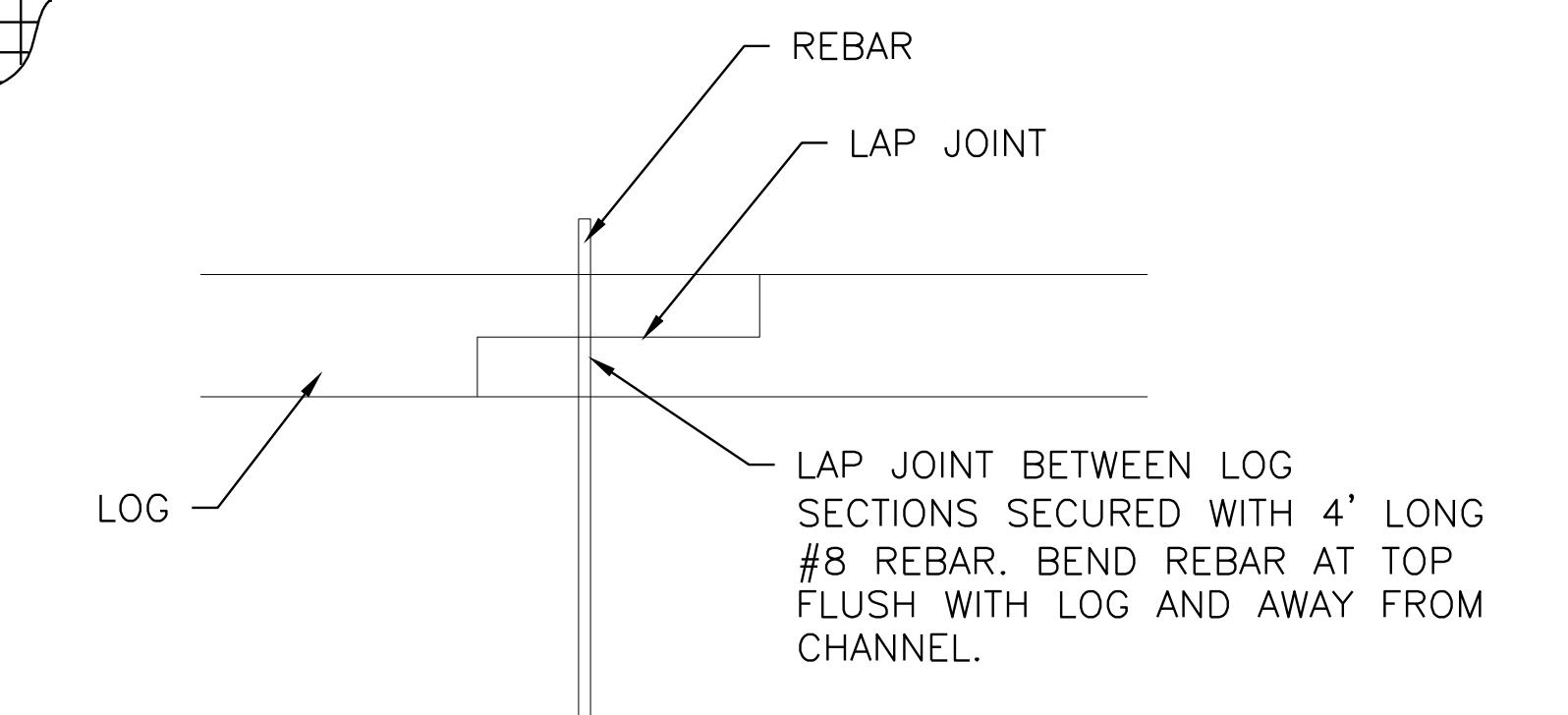
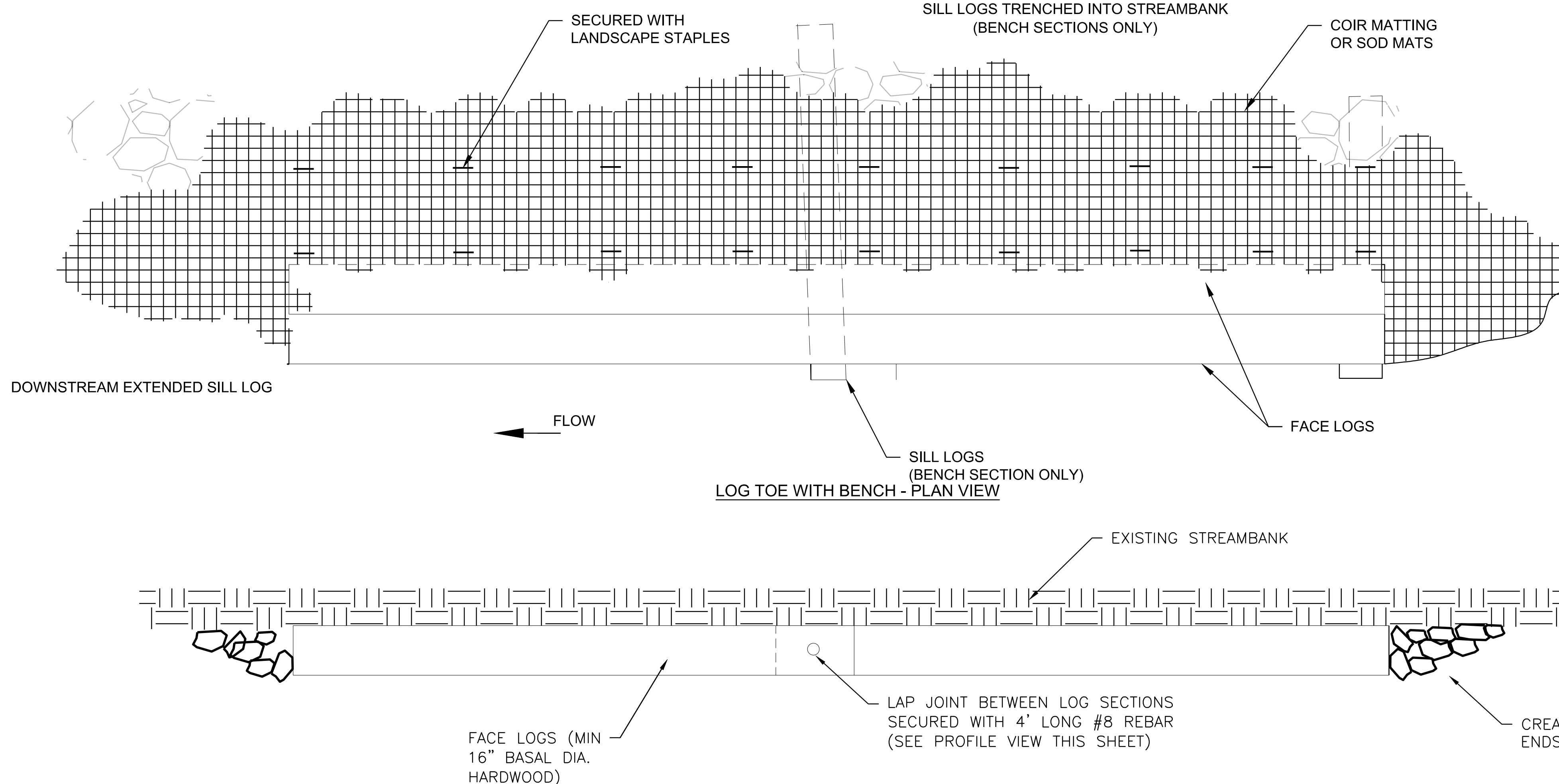
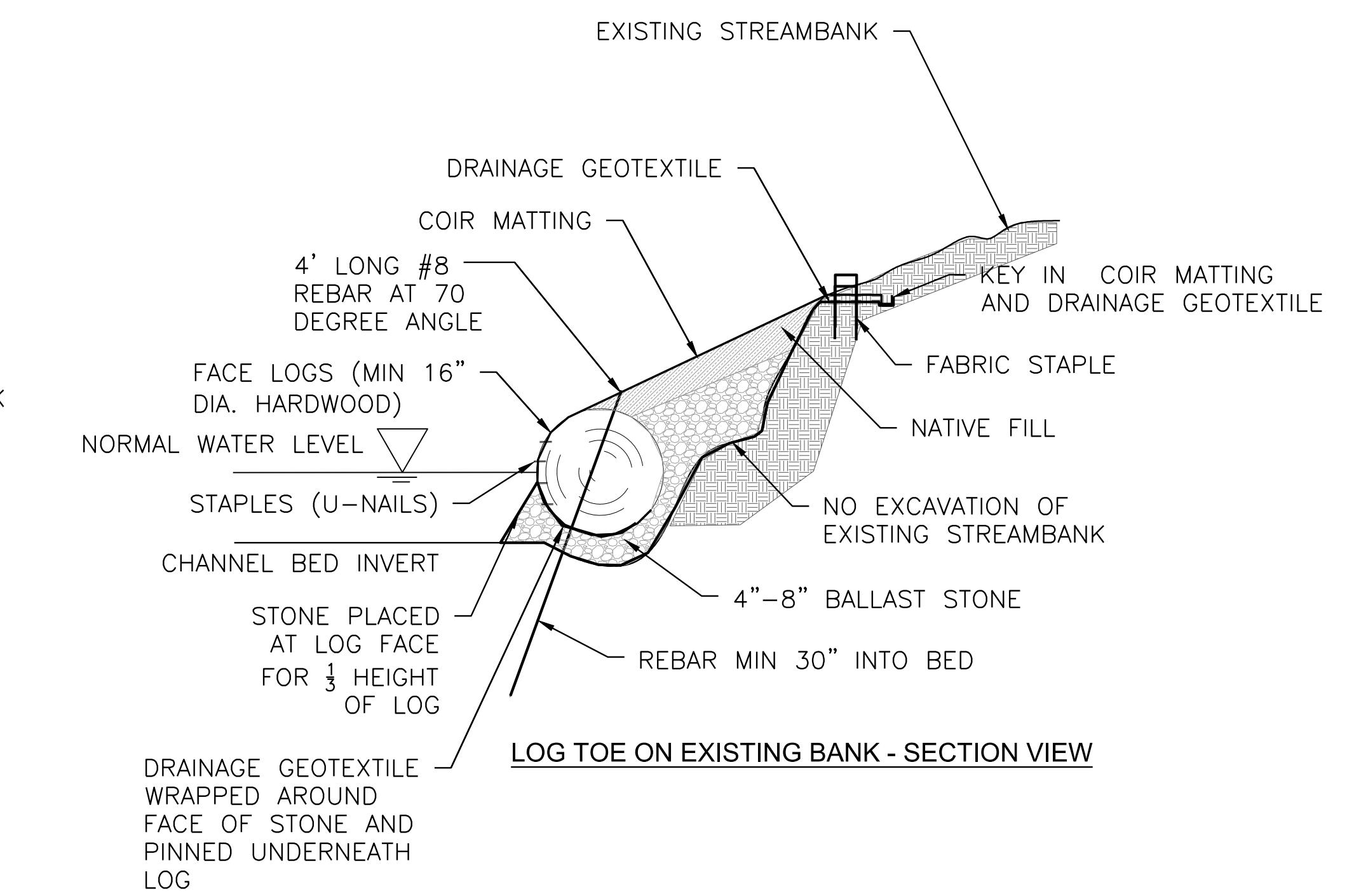
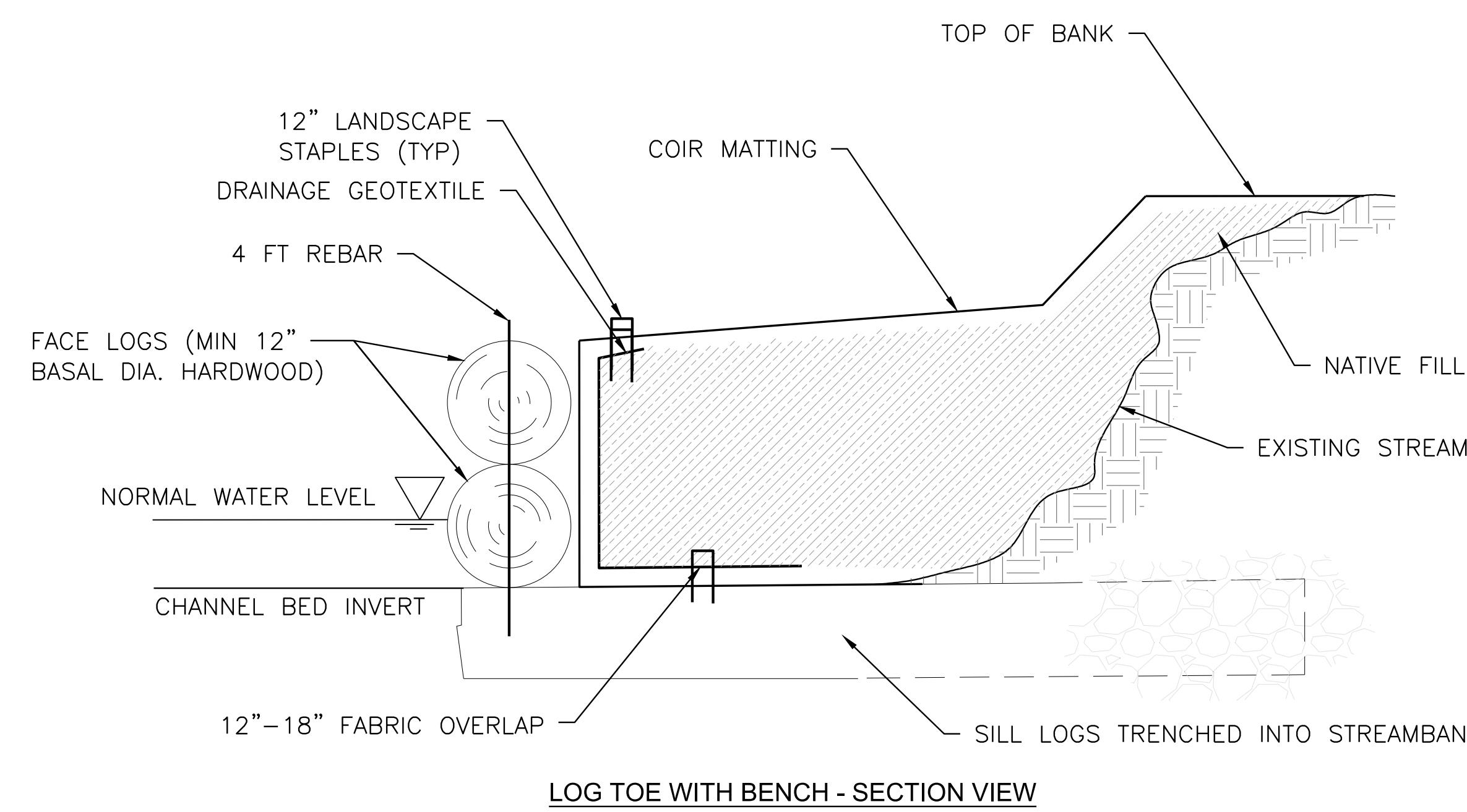


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DT-3

10 OF 30



CREATE SMOOTH TRANSITION INTO EXISTING BANK AT ENDS OF LOG TOE USING VDOT CLASS I RIPRAP

GENERAL DETAILS

RESTORATION OF WOLF CREEK PHASE II

ROANOKE COUNTY, VIRGINIA

DETAILS

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DT-4

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Commonwealth of Virginia
State of Virginia
Engineering Firm #4407007129
Signed by:
Emily D. Brown
EMILY DARR BROWN
Lic. No. 0402065407
8/26/2024
Virginia Registered Professional Engineer

FREESE and NICHOLS
531 North Liberty Street
Winston-Salem, NC 27101
Phone: (336) 790-6744
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NOT

1. VANE ARMS BACKFILLED WITH NATIVE BED MATERIAL OR APPROVED BACKFILL AT DIRECTION OF ENGINEER.

BED MATERIAL

BANKFULL ELEVATION

NATIVE BED MATERIAL OR APPROVED BACKFILL (NATIVE STREAMBED STONE PREFERRED)

1' MIN.

FILTER FABRIC TO EXTEND 0.5' BELOW BOTTOM OF FOOTER ROCK

CHANNEL

EROSION CONTROL STONE

SURGE STONE

SECTION C-C'

FOOTER ROCKS WILL BE PLACED INTO THE EXISTING SUBSTRATE A MINIMUM OF THE ROCK DIAMETER

SECTION A-A' (UPSTREAM VI

SILL ROCKS EXTEND ACROSS
CHANNEL AT BED ELEVATION
EXTEND INTO BANK MIN OF 8'
PAST TOP OF BANK

SILL ROCK SHALL
SET AT 6"-8" BE
BANKFULL ELEVATE
TO PREVENT WATER
FROM CUTTING ARE
STRUCTURE

The diagram illustrates a dry stone wall header joint. At the top, a header stone is shown resting on two wall faces. The text 'E FLOW' and 'VATION' (partially cut off) is on the left, and 'RIES)' is on the right. Below the header, a cross-section shows the wall thickness divided into three equal sections: 'WING', 'CROSS', and 'WING'. The 'CROSS' section is labeled $\frac{1}{3}$ WIDTH OF CHANNEL. A note on the left says 'SET TOP OF HEADER ROCK AT PROPOSED BED ELEVATION'. The bottom part shows the wall bed with a header stone resting on the top of the wall. A vertical line with a plumb bob symbol is positioned in the center. The text 'CHANNEL BED' is at the bottom left. Arrows point from the text labels to the corresponding parts of the wall and cross-section.

A cross-section diagram labeled 'SECTION B-B'' showing a river bank. The top of the bank is labeled 'TOP OF BANK' with a vertical line and arrow. The side of the bank is labeled 'WING SLOPE (2%-7%)'. The base of the bank is labeled 'FOOTER ROCK' with a line pointing to a layer of irregular shapes representing rock. The stream bed elevation is indicated by a dashed line labeled 'STREAM BED ELEVATION'.

This diagram illustrates a cross-section of a rock revetment structure, specifically labeled D-D'. The structure is built on a 'CHANNEL BED' and reaches a 'BANKFULL ELEVATION' indicated by a dashed line with a triangle symbol. A flow arrow points from right to left. The revetment features a central 'HEADER ROCK' and a 'FOOTER ROCK' at the base. Between these rocks, there is a 'POOL' of water. The revetment is constructed with a grid of stones. A layer of 'EROSION CONTROL STONE' is shown above the grid. A 'DRAINAGE GEOTEXTILE' is used to extend the revetment 0.5' below the bottom of the 'FOOTER ROCK'. A dimension line indicates a minimum thickness of '1' MIN.' for this geotextile layer. 'SURGE STONE TO FILL Voids BETWEEN BOULDERS' is shown filling the spaces between the large boulders at the base.

ROCK GRADE CONTROL VA

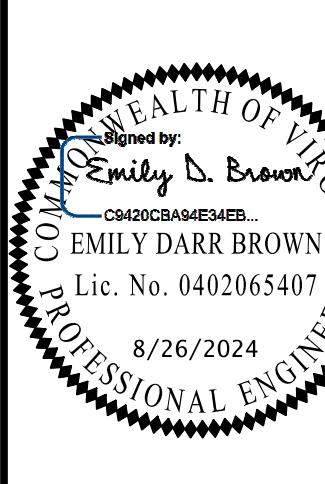
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RESTORATION OF WOLF CREEK GENERAL DETAILS

ROANOKE COUNTY, VIRGINIA

RESTORATION OF WOLF CREEK PHASE II
ROANOKE COUNTY, VIRGINIA

GENERAL DETAILS



Seal of the Commonwealth of Virginia Professional Engineer. The seal is circular with a serrated outer edge. The text "COMMONWEALTH OF VIRGINIA" is at the top and "PROFESSIONAL ENGINEER" is at the bottom. In the center, it says "EMILY DARR BROWN" and "Lic. No. 0402065407". At the bottom, it says "8/26/2024". A blue rectangular box contains the signature "Emily D. Brown" and the license number "C9420CBA94E34EB...". The word "SIGNED" is written above the signature.

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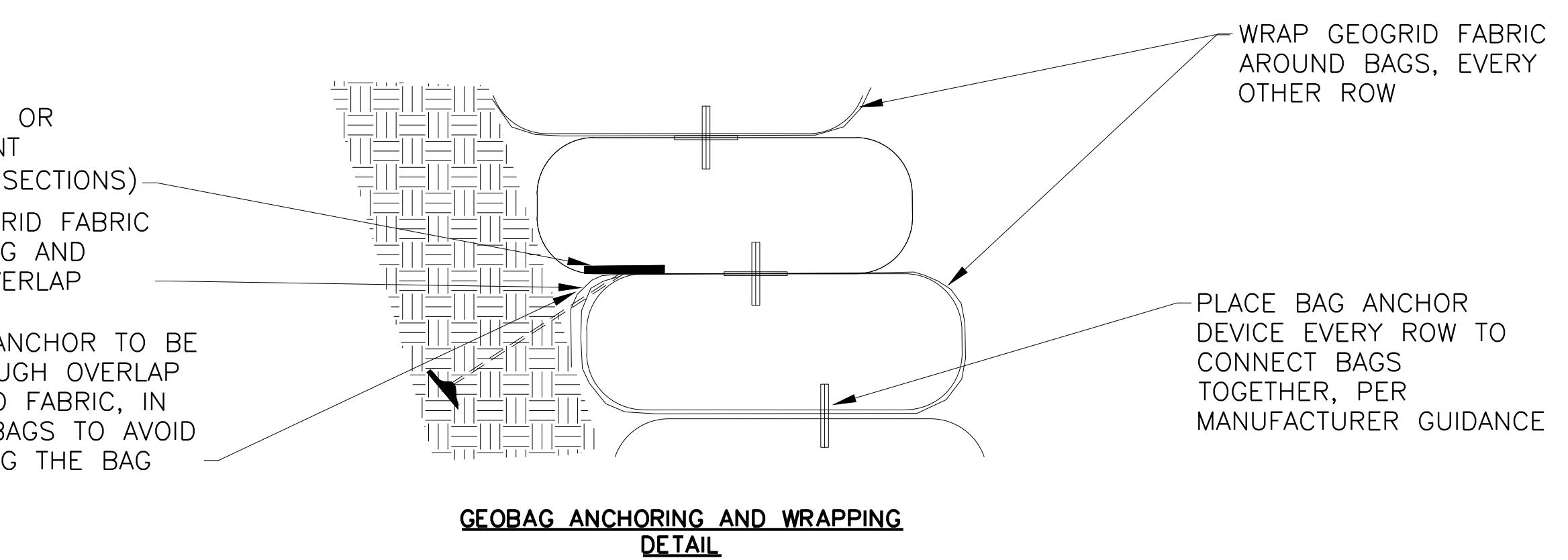
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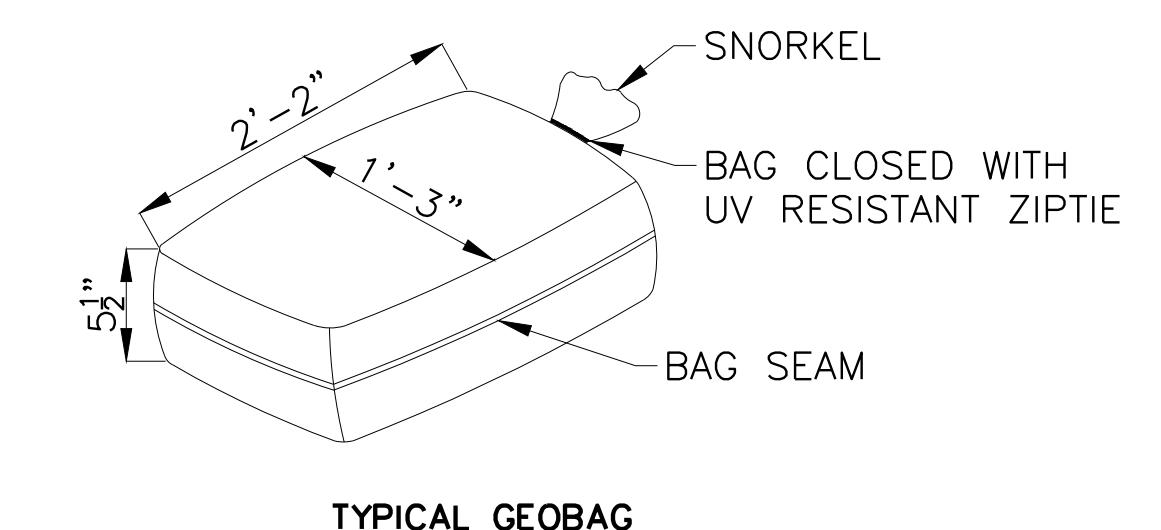
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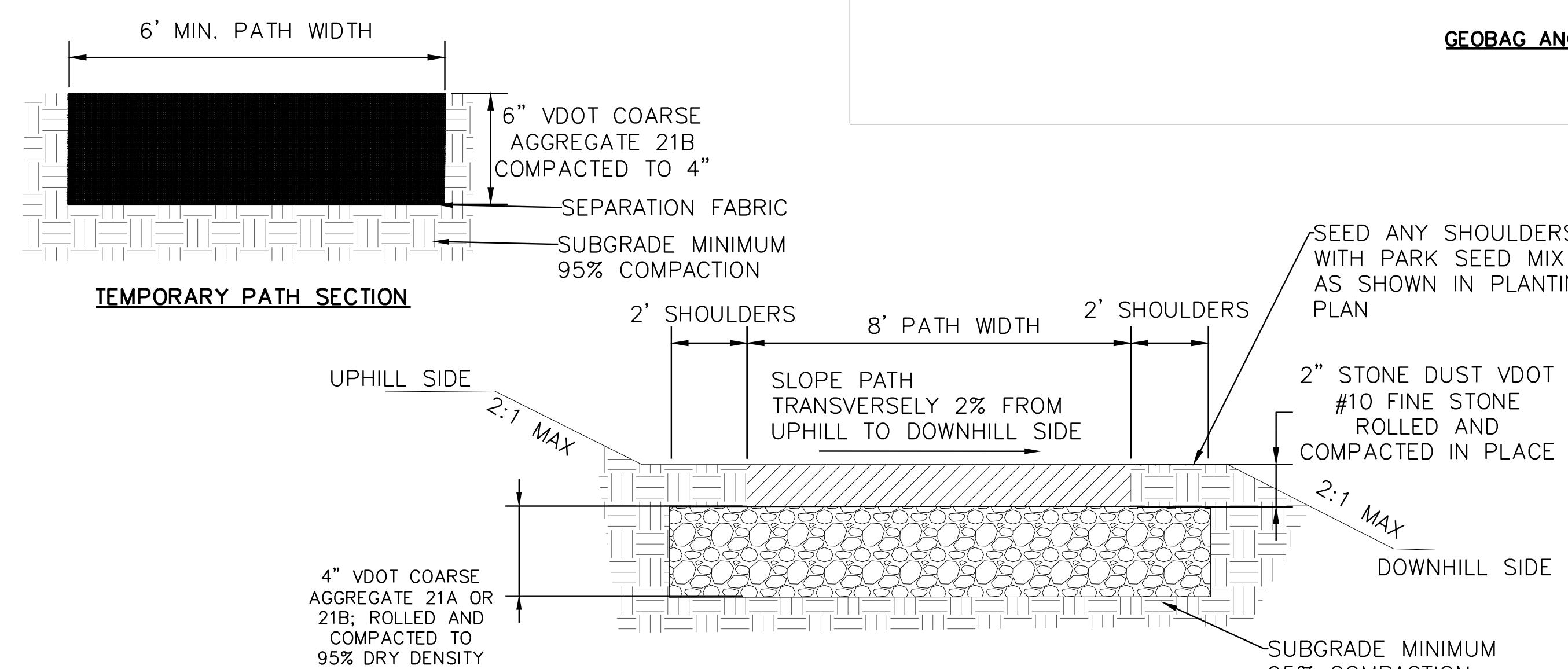
1. GRADE AREA OF INSTALLATION AS SHOWN ON PLAN REMOVE ALL ROCKS AND OTHER OBSTRUCTIONS SO THE MATERIAL WILL HAVE DIRECT CONTACT WITH SOIL.
2. BAGS ARE TO BE FILLED ONSITE WITH MODERATE DRAINED MATERIAL TO BE APPROVED BY ENGINEER. FOLLOW BAG FILLING PROCEDURE FROM ENVIROLOK, FLEX MSE, DELTALOK OR APPROVED EQUIVALENT.
3. GEOBAG WALL LAYERS SHOULD BE SOLID AND UNIFORM. FLATTEN GEOBAGS WITH HAND TAMPER OR EQUIVALENT AFTER PLACEMENT AND BEFORE PROCEEDING WITH CINCHING, TWINING, AND STAKING.
4. APPLY VERTICAL BAG STABILIZER ACCORDING TO INSTALLATION INSTRUCTIONS FROM ENVIROLOK, FLEX MSE, DELTALOK OR APPROVED EQUIVALENT.
5. TIGHTEN VERTICAL BAG STABILIZER THROUGHOUT THE CINCHING AND TWINING PROCESS. REFER TO MANUFACTURER INSTALLATION INSTRUCTIONS.
6. APPLY SEED AND VEGETATION ACCORDING TO WALL SYSTEM MANUFACTURER'S INSTRUCTIONS.
7. GEOBAGS WILL BE BUILT IN A MANNER THAT BLEND WITH EXISTING BACKSLOPE. A MINIMUM OF 6 LIFTS (~3FT ABOVE ROCK WALL) AT ~1.5:1 (H: V) SLOPE UNLESS OTHERWISE SPECIFIED ON PLANS. MORE BACKSLOPES MAY BE NEEDED AT THE TOP OF THE WALL TO ENSURE A SMOOTH SLOPE.



GEOBAG ANCHORING AND WRAP DETAIL



TYPICAL GEOBAG



STANDARD PATH SECTION NOTATION

STANDARD PATH SECTION NOTES:

1. STONE BASE SHALL BE PLACED IN TWO LIFTS OF NO MORE THAN 3" EACH.
2. CONTRACTOR TO ENSURE A MINIMUM OF 95% COMPACTION OF THE SUB-GRADE PRIOR TO STONE PLACEMENT.
3. CONTRACTOR TO PROVIDE CROSS SLOPE IN DIRECTION OF NATURAL GRADE TO MAINTAIN SHEET FLOW ACROSS

TEMPORARY GREENWAY NOTE

1. SKIM GRASS AND PLACE SEPARATION FABRIC.
2. PLACE 6" OF VDOT 21 B STONE, COMPACT TO 4".
3. AT END OF PROJECT, REMOVE TEMPORARY STONE AND MATTING. REWORK TO FINISHED GRADE AND SEED WHILE PERMANENT SEEDING MIX IS REQUIRED.

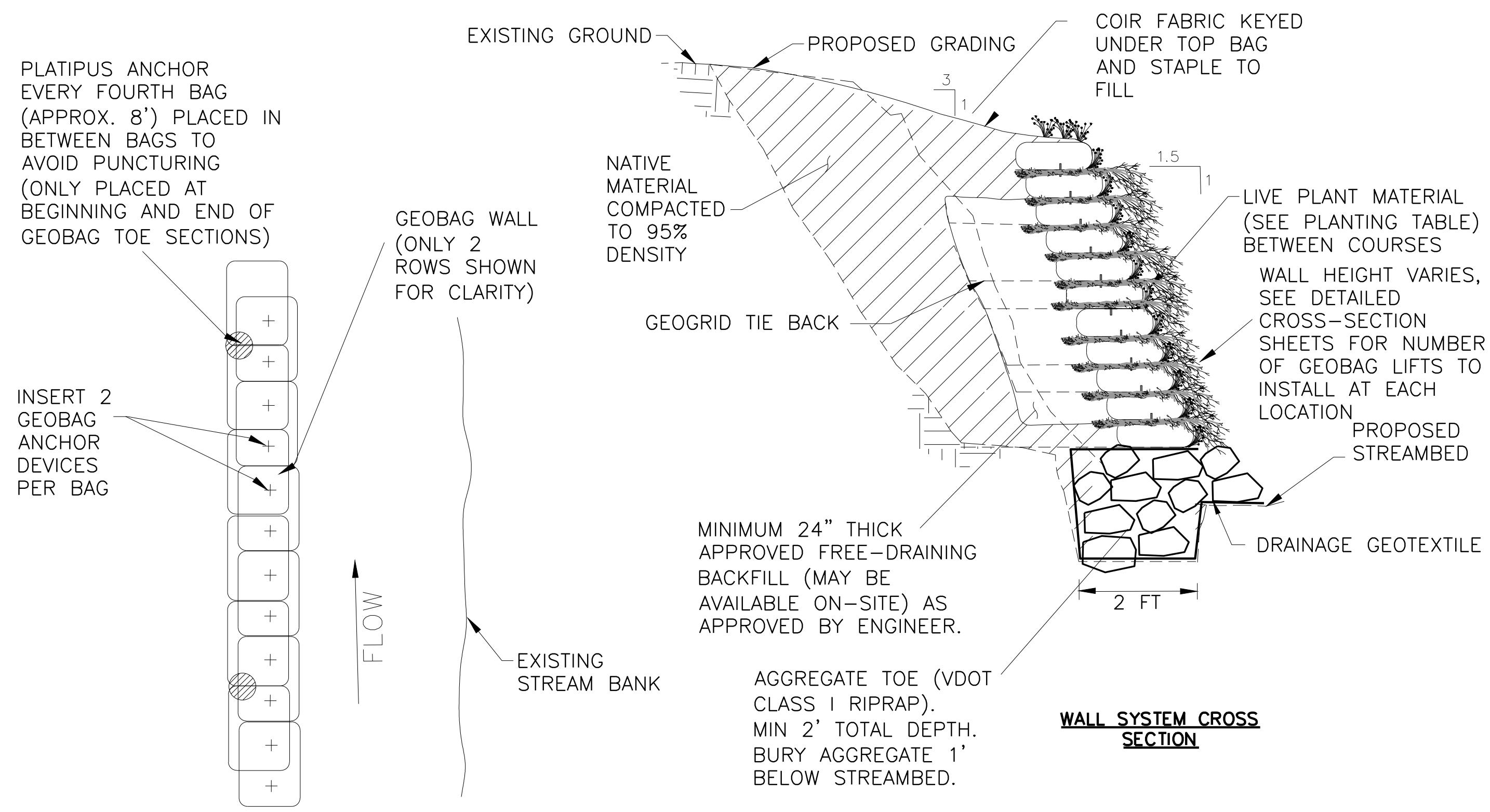
PERMANENT GREENWAY NOTES

PERMANENT GREENWAY NOTES:

1. TRAIL SHOULD BE EXCAVATED PRIOR TO INSTALLATION OF STONE SO THAT FINAL TRAIL SURFACE GRADE MATCHES ORIGINAL GRADE. FINAL TRAIL SHALL NOT BE LOWER THAN GRADE.
2. PLACE 4" OF GRADED COARSE AGGREGATE VDOT 21A OR 21B, ROLLED AND COMPACTED TO 95% MAX. DRY DENSITY. COVER WITH 2" OF FINE #10 STONE, ROLLED AND COMPACTED. AT LEAST 6% OF SURFACE STONE MUST BE ABLE TO PASS THROUGH A #200 SIEVE.
3. THE TRAIL SHALL BE CROWNED TO DRAIN WATER AT 2% OR OUTSLOPED AT 2%.
4. EXCAVATED MATERIAL MAY BE USED TO BACKFILL EDGES AND DRESS SMOOTH.
5. MAXIMUM TRAIL GRADE SHALL BE 5%.

GREENWAY STANDARD PATH SECTION
PERMANENT AND TEMPORARY PATHS

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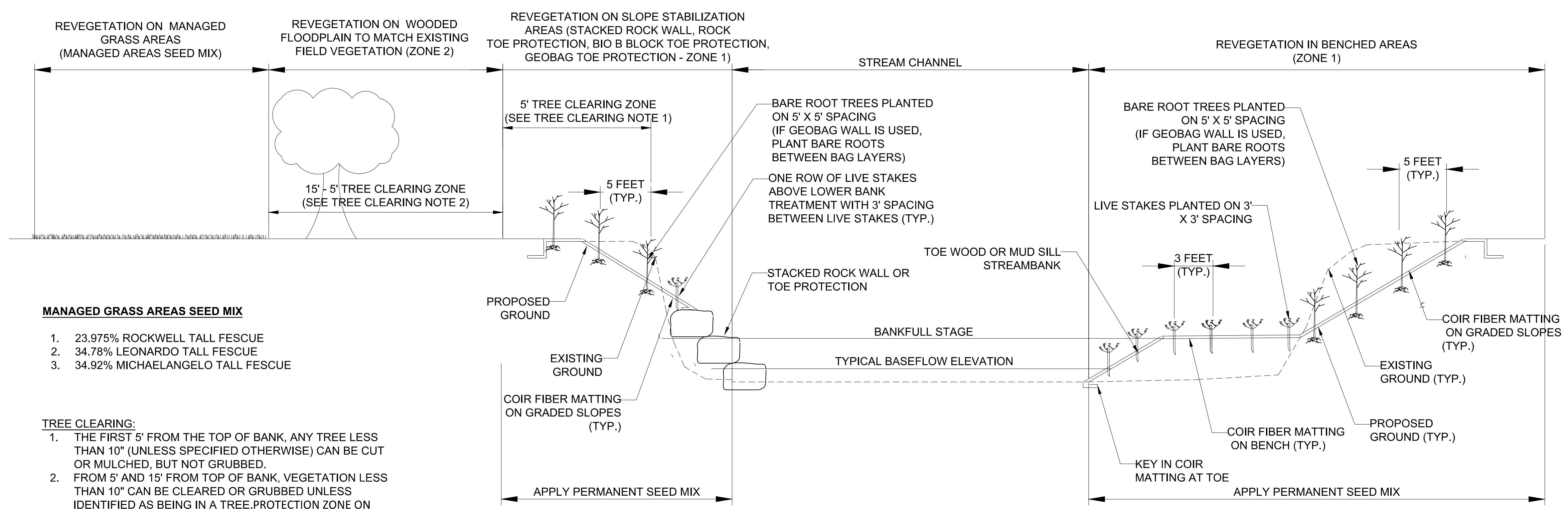


GEOBAG WALL SYSTEM – FILL SECTIONS

ENVIROLOK, FLEX MSE, DELTALOK OR EQUIVALENT

NOT TO SCALE

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REVEGETATION SECTION

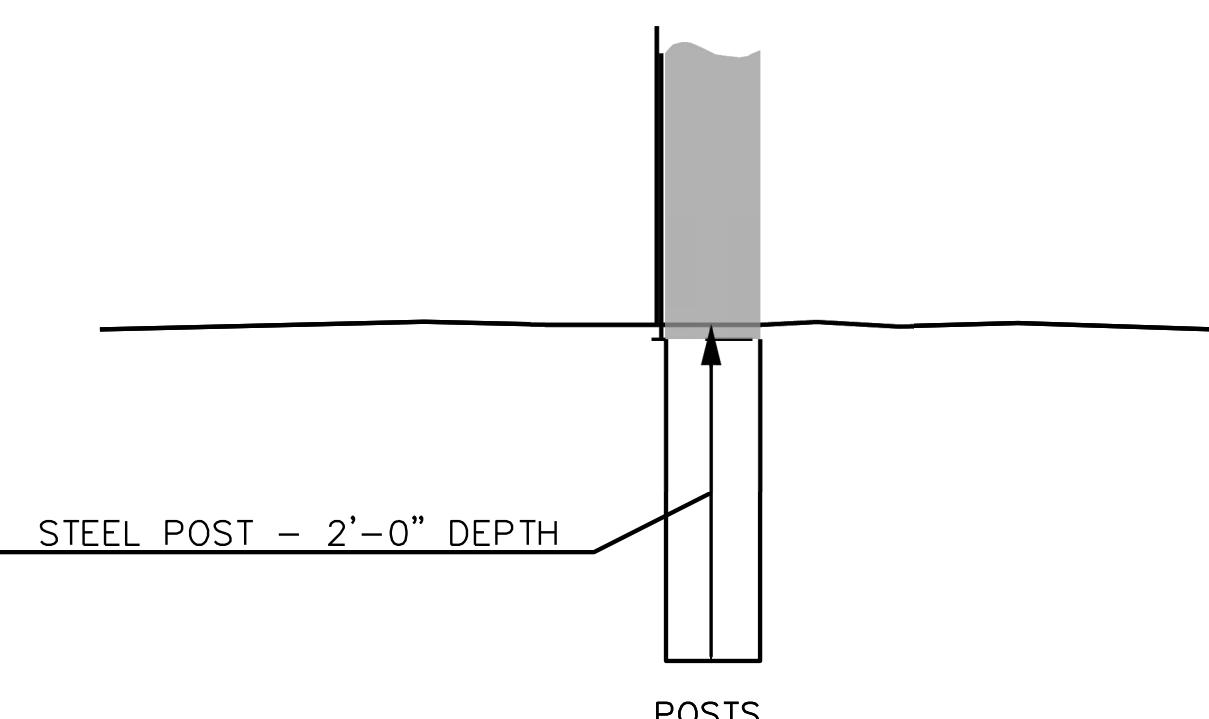
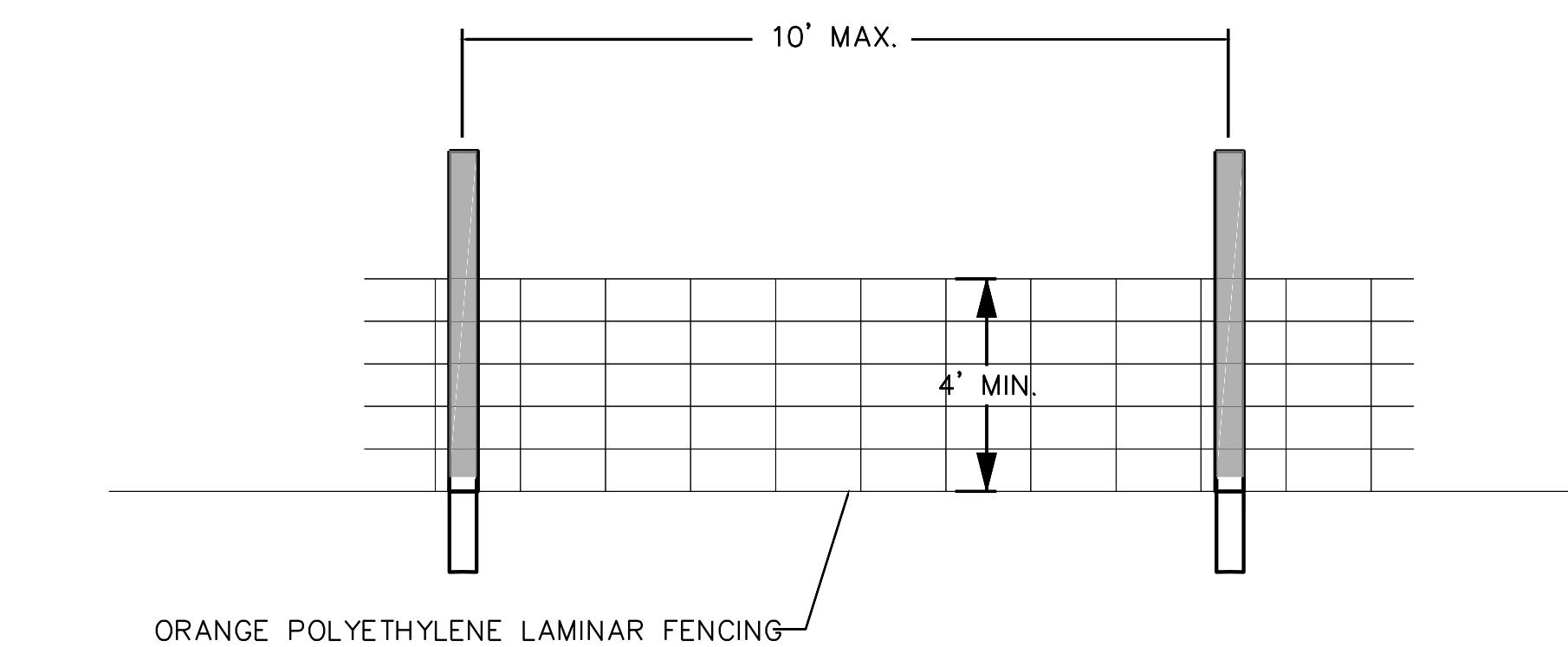
SCALE: NTS

NOTES:

1. THE LEFT SIDE OF THIS SECTION SHOWS PLANTING APPROACH TO BE APPLIED FOR STREAMBANKS WHERE TOE PROTECTION OR STACKED ROCK WALL ARE TO BE USED ON THE LOWER BANK WITH GRADING OR GEOBAG WALL ON THE UPPER BANK.
2. THE RIGHT SIDE OF THIS SECTION SHOWS PLANTING APPROACH TO BE APPLIED WHERE A BENCH OR POINT TO CREATE A BENCH WITH GRADING
3. IF CROSS-SECTIONS SHOW NO GRADING OR OTHER TREATMENT ON PARTS OF THE EXISTING STREAMBANKS (UPPER BANK, LOWER BANK OR BOTH) THEN EXISTING VEGETATION IS TO REMAIN UNDISTURBED.
4. SEE PLANT LIST FOR SPECIES AND SIZE.
5. CONTRACTOR MUST ACHIEVE 80% SURVIVAL AFTER ONE GROWING SEASON.
6. IF REPLANTING IS REQUIRED, WARRANTY SHALL EXTEND BY ANOTHER YEAR FROM DATE OF PLANTING.

NOTES:

1. STEEL POSTS SHALL BE 5'-0" IN HEIGHT AND BE OF THE SELF-FASTENER ANGLE STEEL TYPE.
2. WOOD POST SHALL BE 6'-0" IN HEIGHT AND 3" MINIMUM IN DIAMETER.



CONSTRUCTION SAFETY FENCE/TREE PROTECTION FENCE

SCALE: NTS

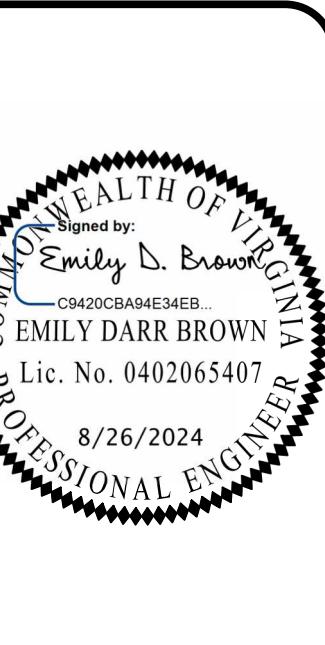
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Winston-Salem, NC 27101
Phone: (336) 790-6744
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WOODY PLANTING							
Zone 1 - Imbricated Rock (78.0 linear feet)							
Planting Stock	Scientific Name	Common Name	Stratum	Wetland Indicator Status*	Base Bid	Additive Bid #1	Remarks
LIVE STAKES	<i>Salix sericea</i>	Silky willow	Shrub	OBL	5	5	Live stakes, minimum of 4-ft long, planted on 2-ft centers through the face and top of each block, species randomly distributed.
	<i>Cornus amomum</i>	Silky dogwood	Shrub	FACW	5	5	
Zone 1 - Toe Protection Areas (710.0 linear feet)							
Planting Stock	Scientific Name	Common Name	Stratum	Wetland Indicator Status*	Base Bid	Additive Bid #1	Remarks
LIVE STAKES	<i>Alnus serrulata</i>	Smooth alder	Shrub	OBL	501	293	Live stakes, minimum of 4-ft long, placed 1 stem per geobag, alternating between geobag rows and with species randomly distributed.
	<i>Salix sericea</i>	Silky willow	Shrub	OBL	559	351	
	<i>Cephalanthus occidentalis</i>	Buttonbush	Shrub	OBL	466	258	
	<i>Cornus amomum</i>	Silky dogwood	Shrub	FACW	477	269	
Zone 2 - Riparian Area (23427.0 square feet, 0.54 acres)							
Planting Stock	Scientific Name	Common Name	Stratum	Wetland Indicator Status*	Base Bid	Additive Bid #1	Remarks
BARE ROOT	<i>Liriodendron tulipifera</i>	Yellow Poplar	Overstory	FACU	60	60	Planted on 8-ft centers, with species randomly distributed.
	<i>Betula nigra</i>	River Birch	Overstory	FACW	60	60	
	<i>Carpinus caroliniana</i>	American Hornbeam	Shrub	FAC	40	40	
	<i>Celtis occidentalis</i>	Common Hackberry	Overstory	FACU	60	60	
	<i>Diospyros virginiana</i>	Common Persimmon	Shrub	FAC	40	40	
	<i>Platanus occidentalis</i>	American Sycamore	Overstory	FACW	81	81	
	<i>Virburnum dentatum</i>	Southern arrowwood	Shrub	FAC	60	60	

*2020 National Wetland Plant List v3.5, Eastern Mountains and Piedmont

WOODY PLANT LIST

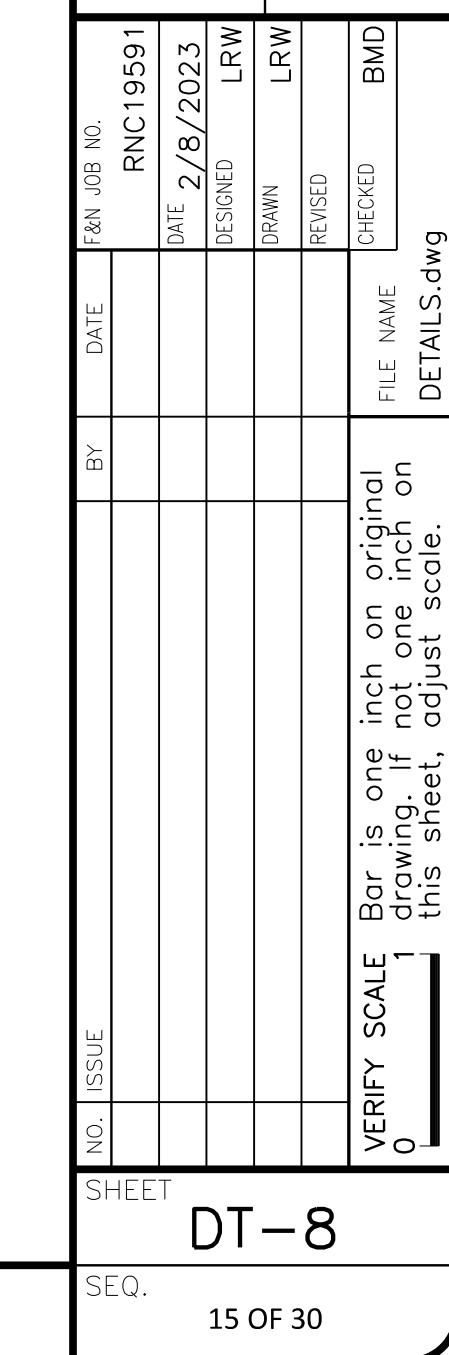
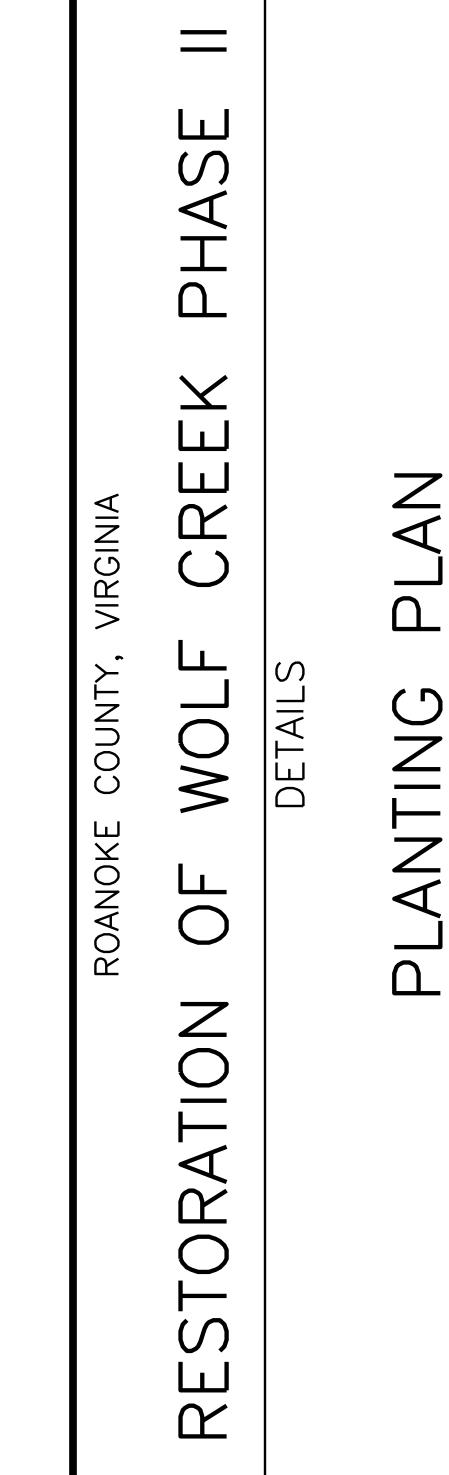
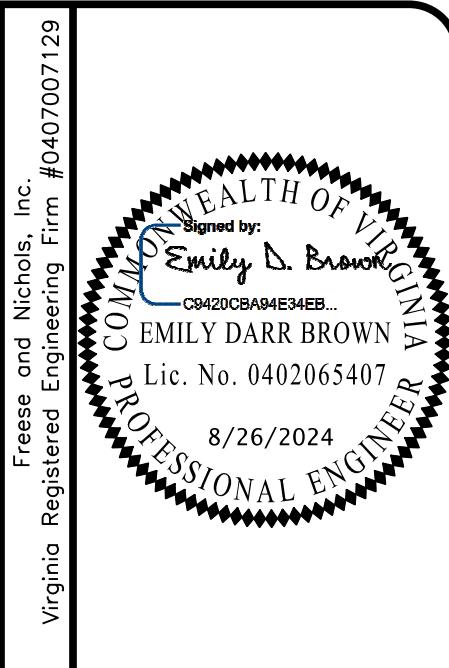
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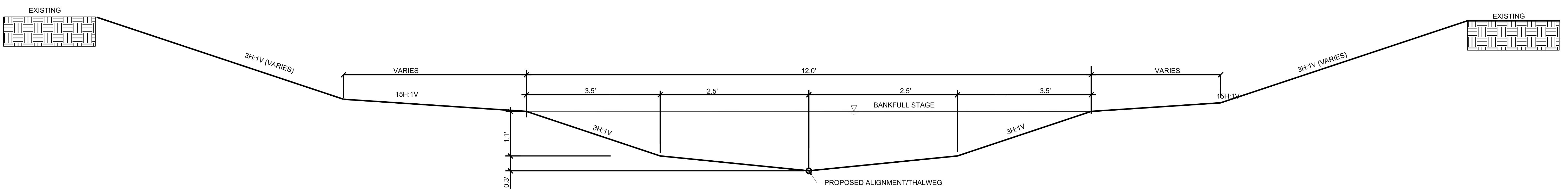
1. THIS PLANTING SCHEDULE ONLY APPLIES TO RESTORED STREAM BANK, BENCHES, AND OTHER RESTORED AREAS OF STREAM.
2. FOR PERMANENT SEEDING IN OTHER DISTURBED AREAS, SEE "MANAGED GRASS AREAS" PLANTING MIX.

MANAGED GRASS AREAS

1. 23.975% ROCKWELL TALL FESCUE
2. 34.78% LEONARDO TALL FESCUE
3. 34.92% MICHAELANGELO TALL FESCUE

HERBACEOUS PLANTING			
Zone 1 and Zone 2 Area (51435.0 square feet, 1.18 acres)			
TEMPORARY SEEDING	Warm Season (May 1 - Aug 15) - German Millet		Apply at 40 lbs/acre to all disturbed areas
	Cool Season (Aug 15 - May 1) - Virginia Rye		
PERMANENT SEEDING	Scientific Name	Common Name	% by Weight
	<i>Andropogon gerardii</i>	Big bluestem	18
	<i>Bidens aristosa</i>	Bidens	3
	<i>Carex vulpinoidea</i>	Fox sedge	11
	<i>Chamaecrista fasciata</i>	Partridge pea	14
	<i>Desmodium canadense</i>	Showy tick trefoil	5
	<i>Elymus virginicus</i>	Virginia wildrye	35
	<i>Schizachyrium scoparium</i>	Little bluestem	14
Managed Grass Areas (21698.6 square feet, 0.50 acres)			
TEMPORARY SEEDING	Warm Season (May 1 - Aug 15) - German Millet		Apply at 40 lbs/acre to all disturbed areas
	Cool Season (Aug 15 - May 1) - Virginia Rye		
PERMANENT SEEDING	23.975% Rockwell Tall Fescue, 34.78% Leonardo Tall Fescue, 34.92% Michaelangelo Tall Fescue (requires approval from Roanoke County Department of Parks, Recreation and Tourism)		Apply at recommended rate

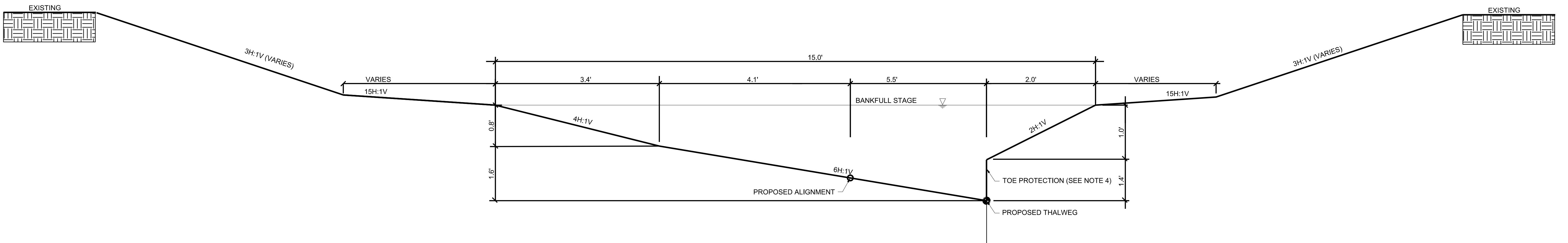
HERBACEOUS PLANT LIST



NO

1. POOL TYPICAL FOR RIGHT MEANDER SHOW MIRROR SECTION FOR LEFT MEANDERS.
2. RIFFLE CROSS-SECTION TYPICALLY OCCURS MID-RIFFLE AND POOL CROSS-SECTION AT THE MID-POOL. CHANNEL DEPTH AND SIDE SLOPES VARY ALONG TRANSITION FROM POOL CROSS-SECTION TO RIFFLE CROSS-SECTION. REFER TO PROPOSED PROFILE FOR DEPTHS, BANKFULL ELEVATION TO THALWEG ELEVATION.
3. SEE DETAILED CROSS-SECTION SHEETS FOR VARIATION IN SLOPES AND WIDTHS.
3. SEE DETAILED CROSS-SECTION SHEETS FOR TOE PROTECTION TYPES AND EXTENT.

TYPICAL RIFFLE CROSS-SECT
SCALE: NTS



TYPICAL POOL CROSS-SECTION
SCALE: NTS

ROANOKE COUNTY, VIRGINIA

RESTORATION OF WOLF CREEK

CIVIL

TYPIICAL SECTION

**FREESE
AND
NICHOLS**

531 North Libert
Winston-Salem,
Phone - (336)
Web - www.free

Frerese and Nichols, Inc.
Virginia Registered Engineering Firm #0407007129

Signed by:
Emily D. Brown
C9420CBA94E34EB...

EMILY DARR BROWN
Lic. No. 0402065407

8/26/2024

Emily D. Brown
C9420CBA94E34EB...

DOAVER COUNTY VIRGINIA

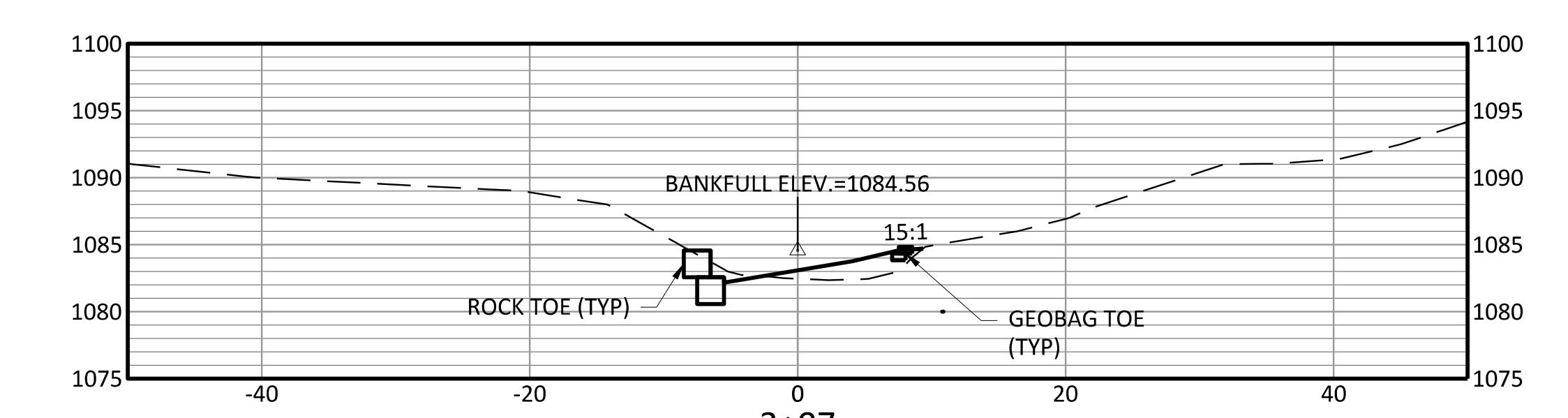
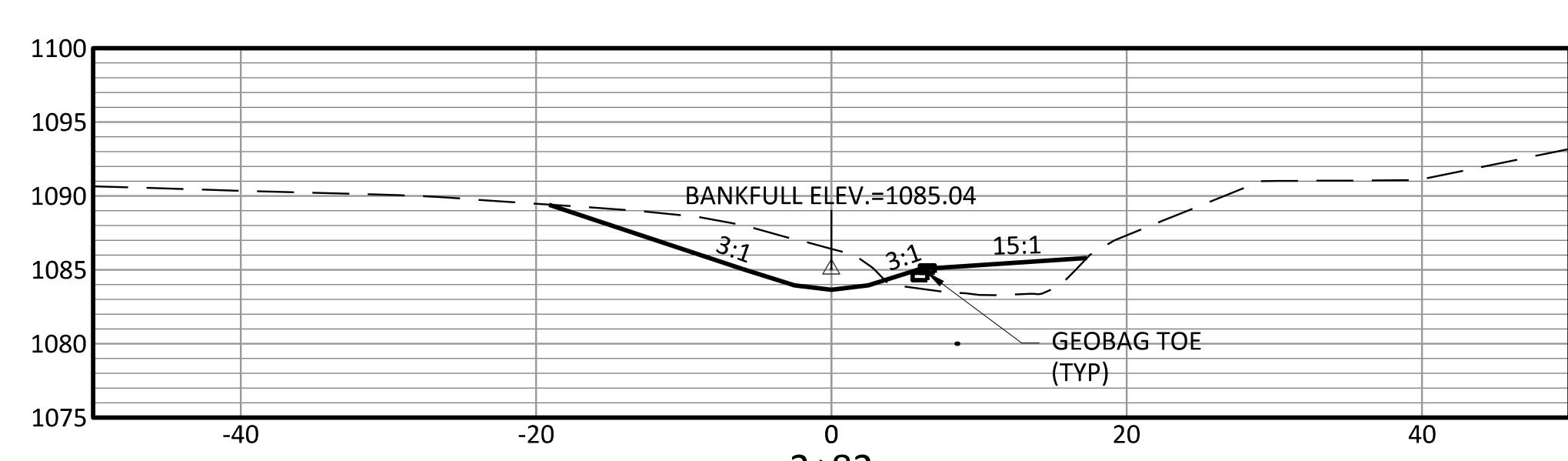
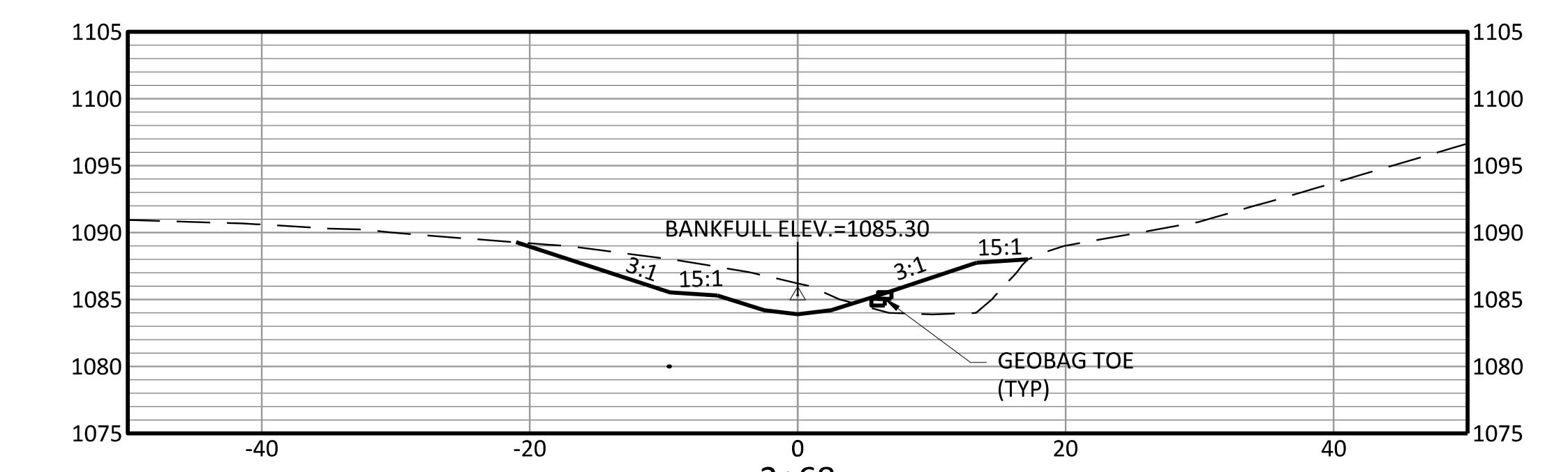
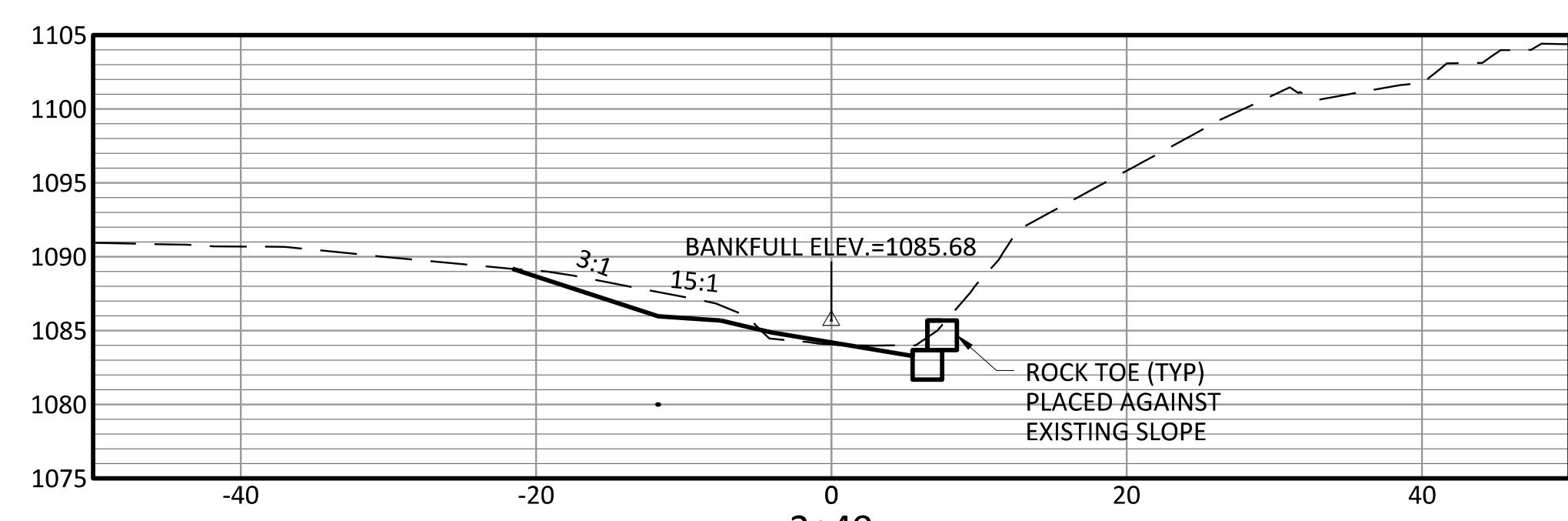
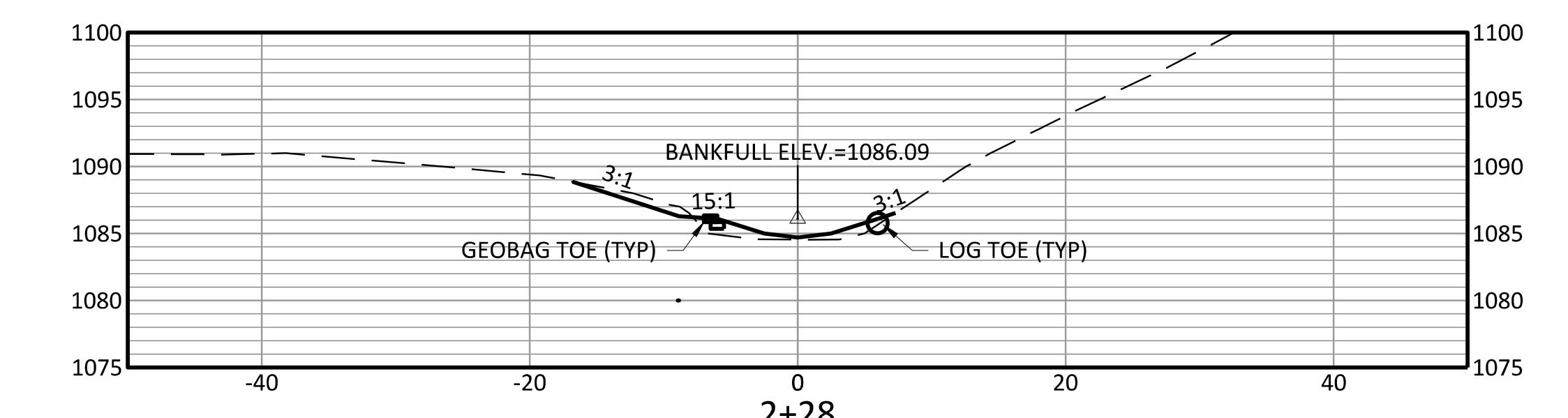
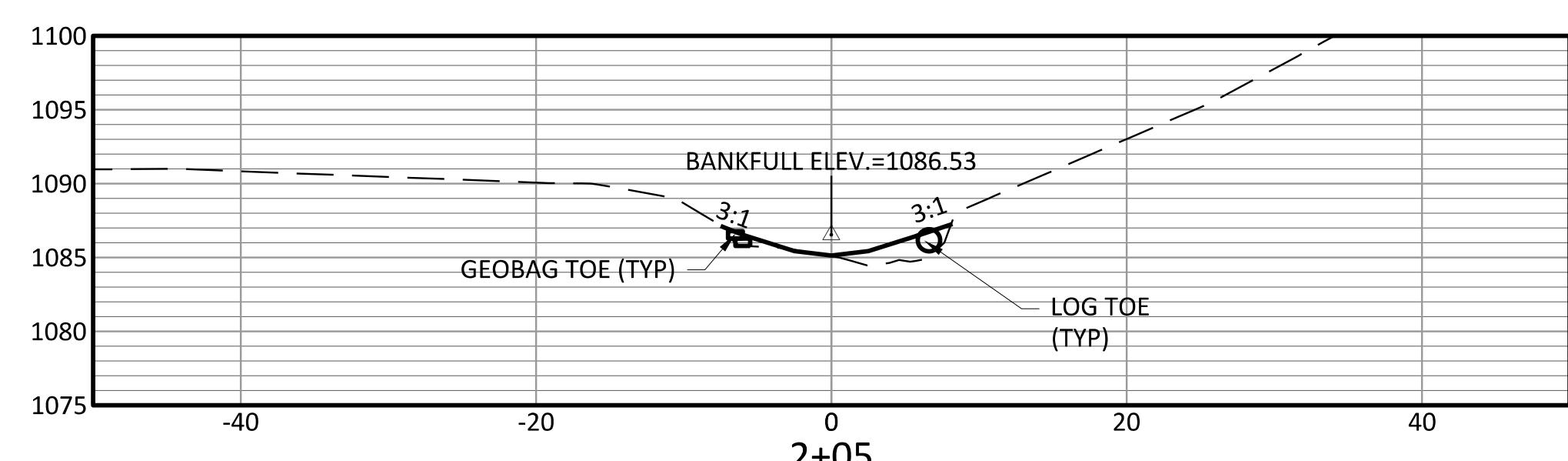
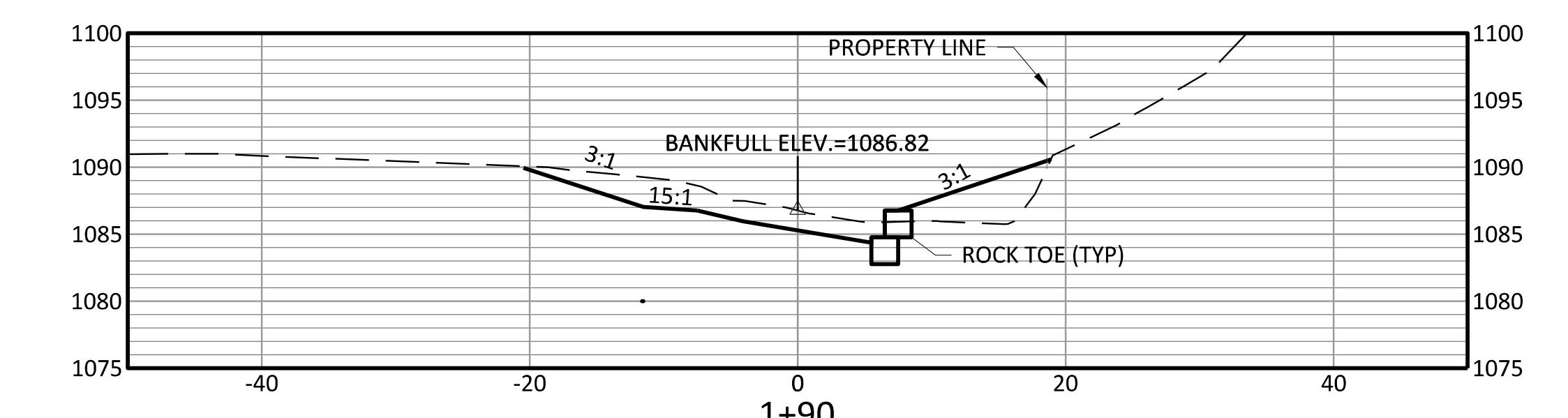
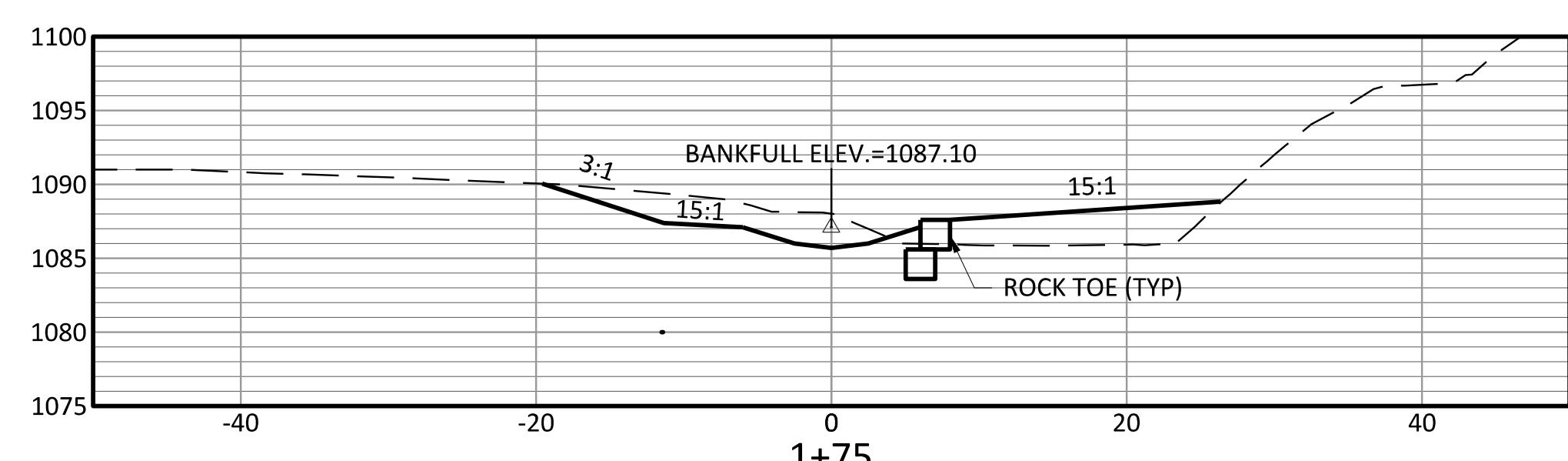
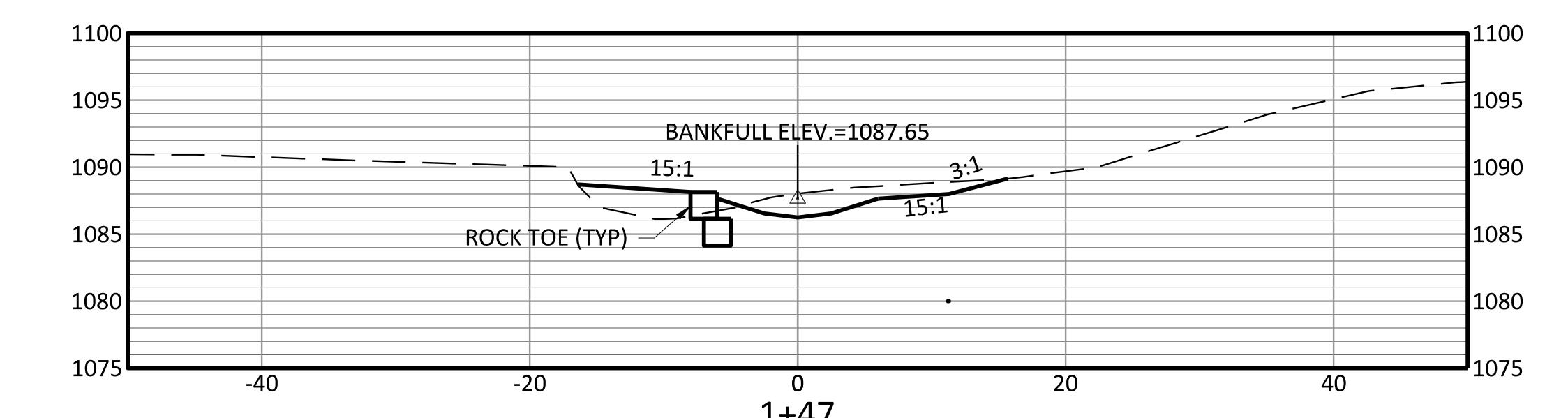
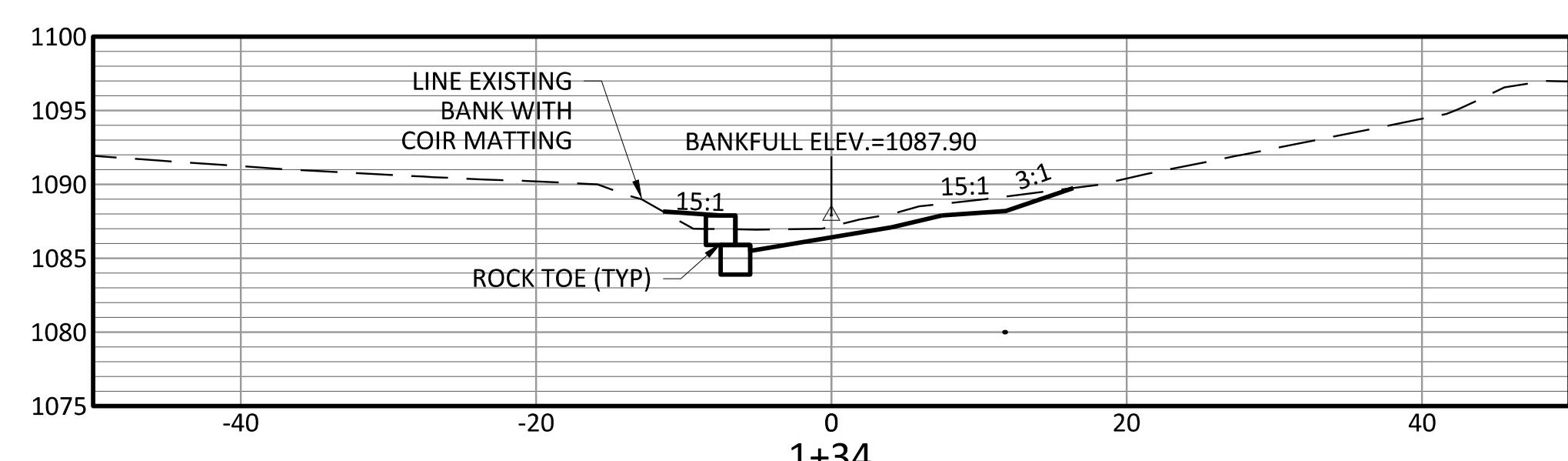
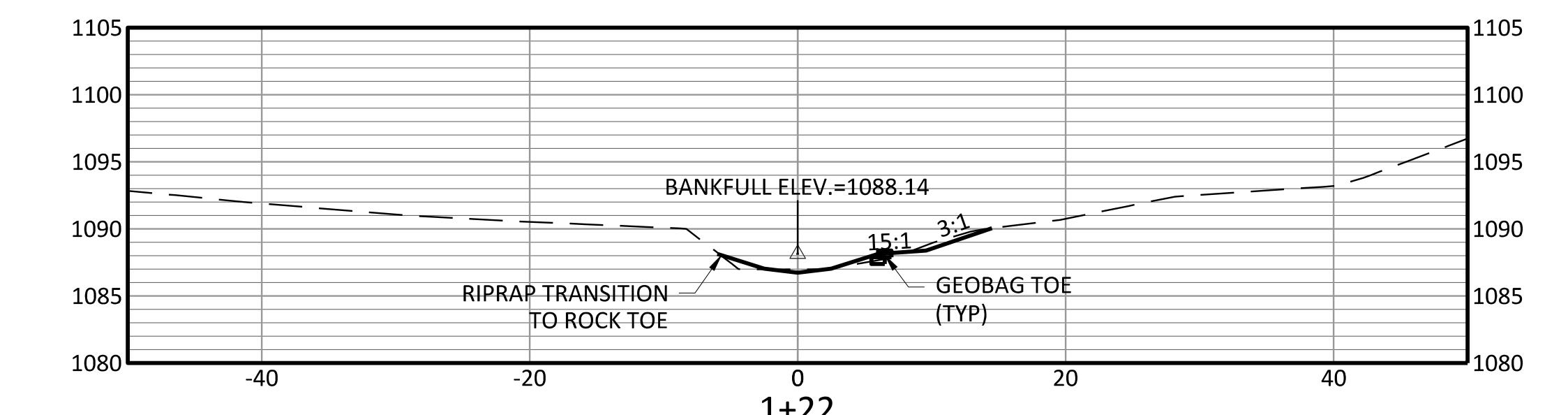
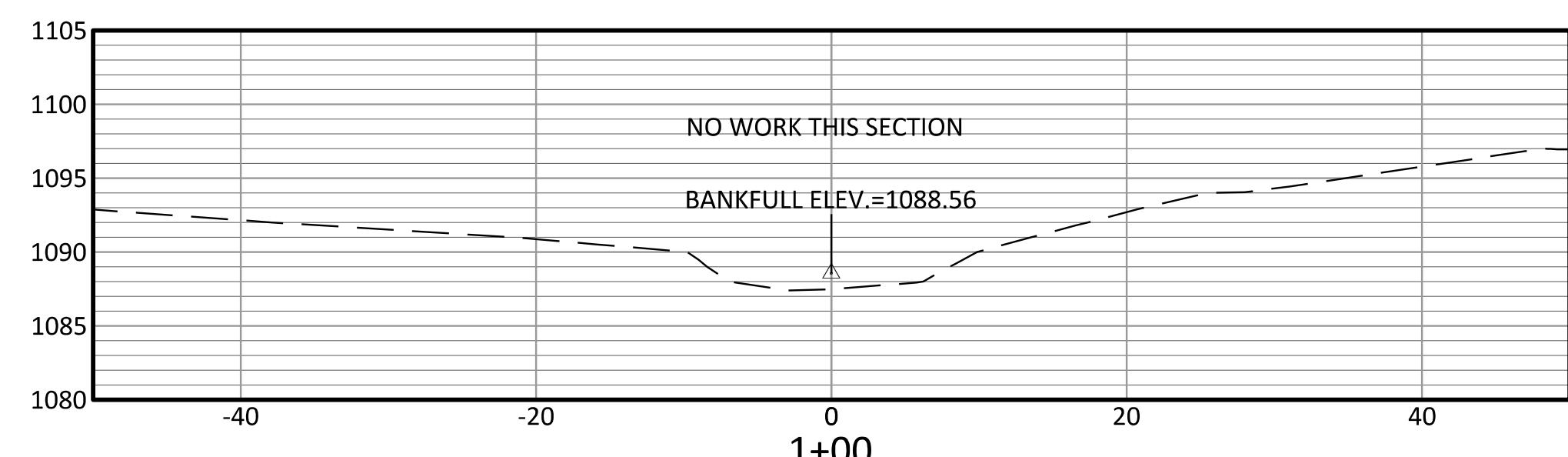
WOLF CREEK COUNTY, VIRGINIA

WOLI

TYPIICAL SECTIONS

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				DATE	2/8/2023
				DESIGNED	BMD
				DRAWN	EMD
				REV/SED	
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0	1			CHECKED	BMD
DETAILS.dwg					
SHEET					
DT-9					
SEQ.					
16 OF 30					

ISSUED FOR REVIEW



Freese and Nichols, Inc. #1407007129
8/26/2024
EMILY D. BROWN
EMILY DARR BROWN
LIC. NO. 0402065407
Virginia Registered Engineering Firm

EMILY D. BROWN
EMILY DARR BROWN
LIC. NO. 0402065407
8/26/2024
Virginia Registered Engineering Firm



531 North Liberty Street
Winston-Salem, NC 27101
Phone: (336) 790-6744
Web: www.freese.com

RESTORATION OF WOLF CREEK PHASE II
DETAILED CROSS SECTIONS
STA 1+00 TO STA 3+07

ROANOKE COUNTY, VIRGINIA

LEGEND
EXISTING GROUND PROFILE ALONG ALIGNMENT
PROPOSED GROUND

NOTE:

1. ALL GRADED SLOPES SHALL BE LINED WITH COIR MATTING PER THE DETAIL.
2. ALL STACKED ROCK WALL AND ROCK TOE SHALL BE BLENDED TO EXISTING GROUND AT TOP OF ROCK TO LIMIT EROSION AT TOP OF WALL.
3. PLACE SINGLE COIR WRAPPED LIFT ABOVE STACKED ROCK WALL AS REQUIRED.
4. SEE PLAN VIEW SHEETS FOR PROPOSED BENCH WIDTHS AND BLENDING.

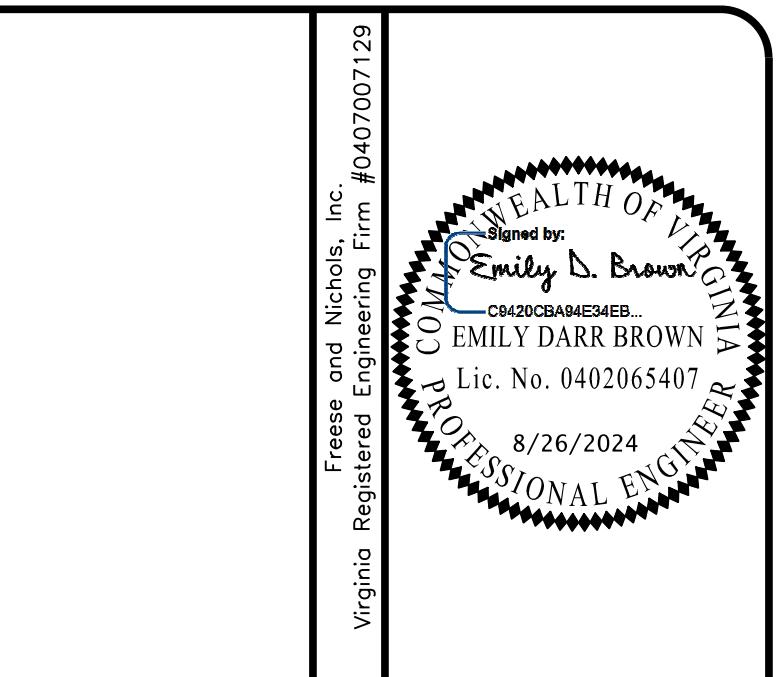
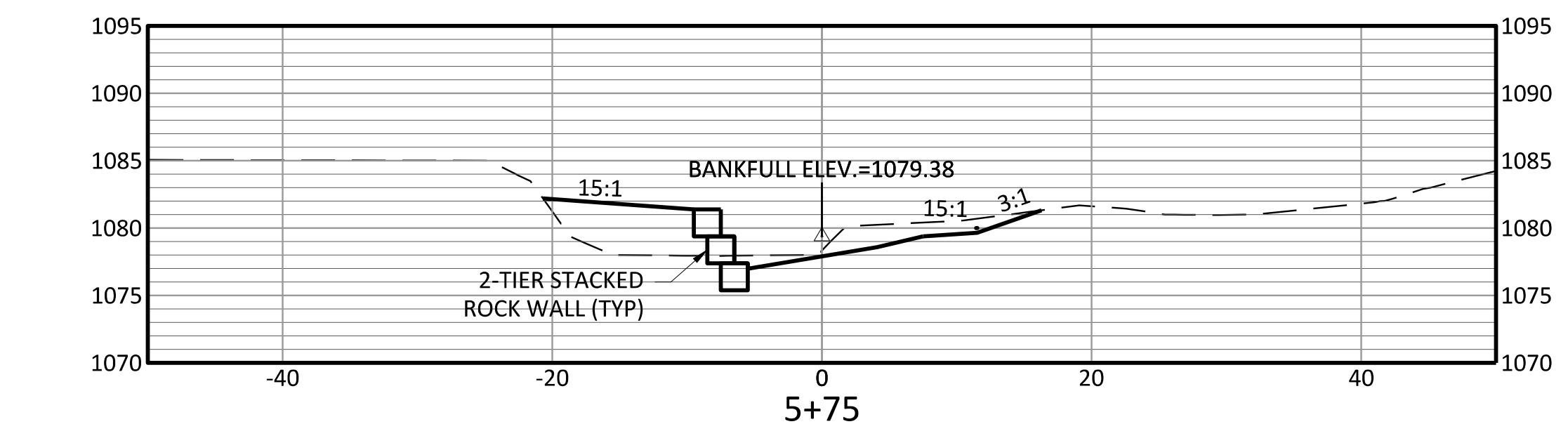
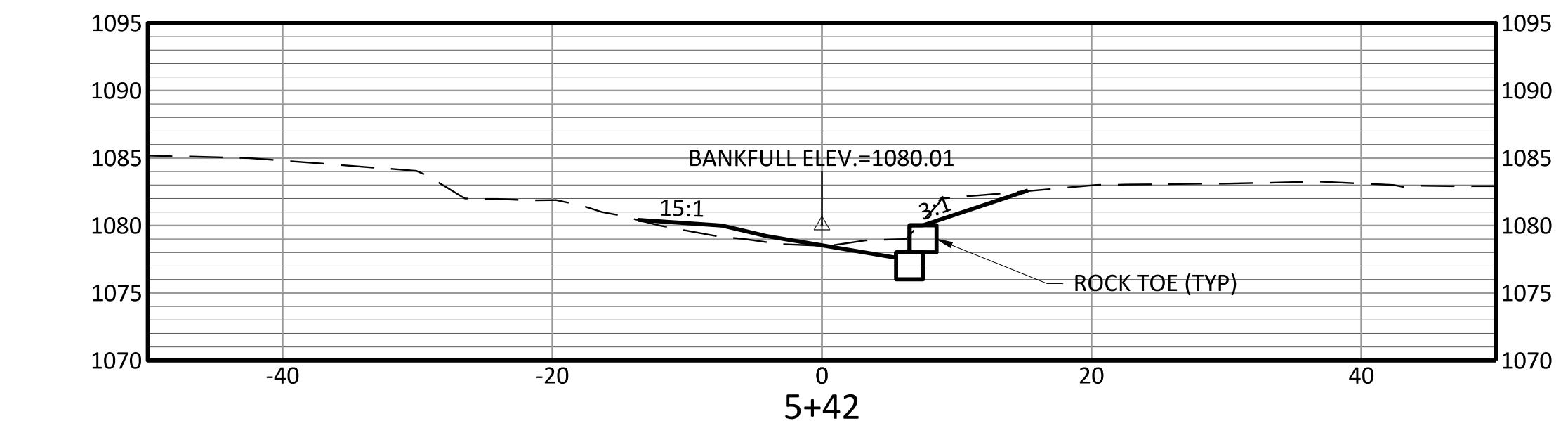
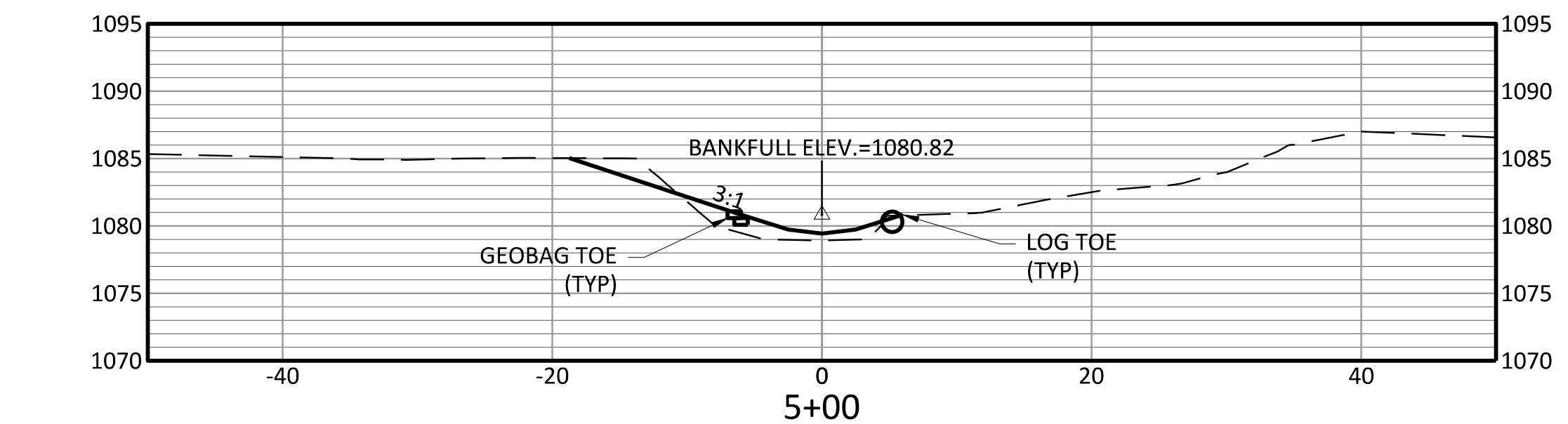
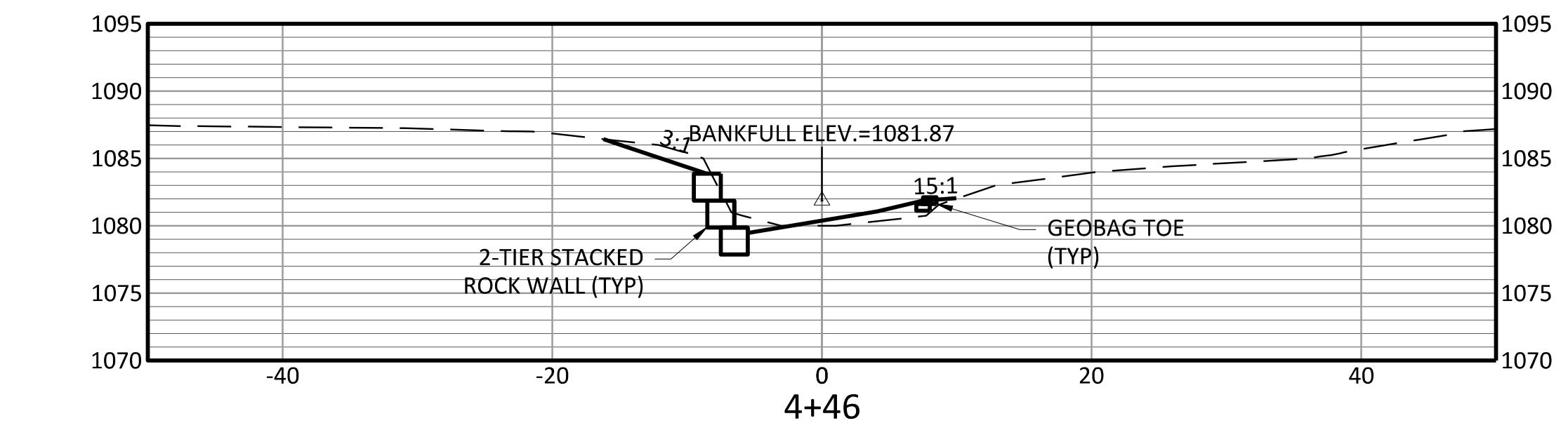
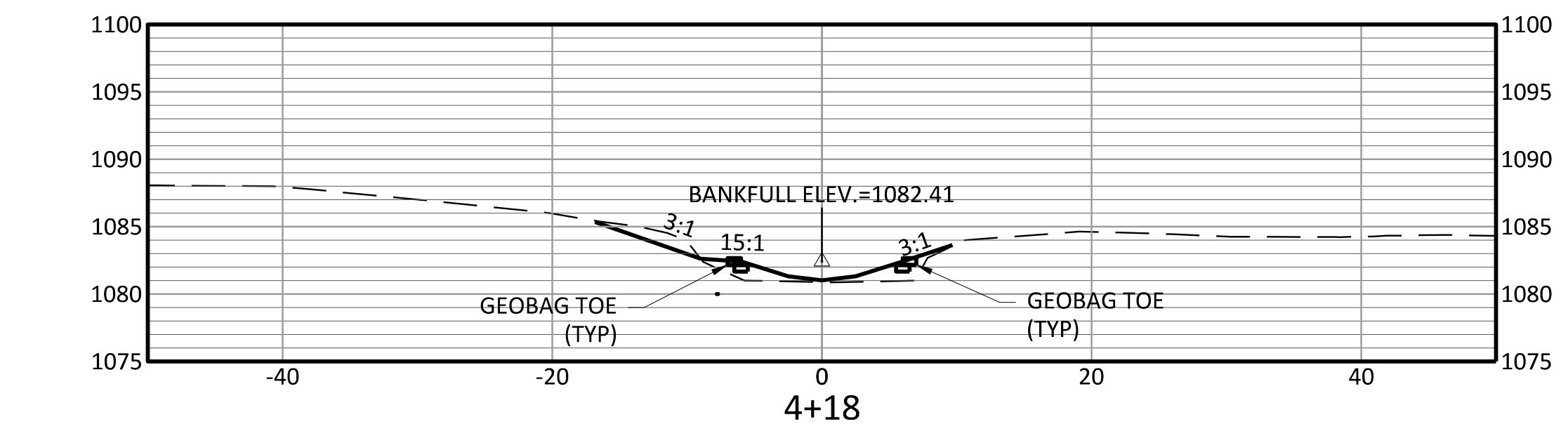
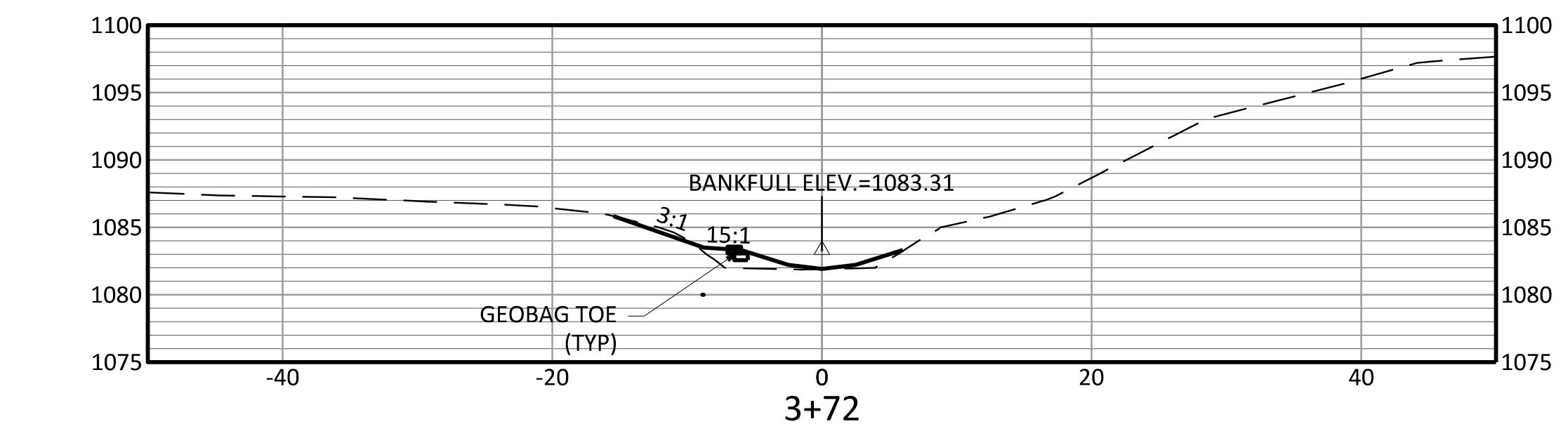
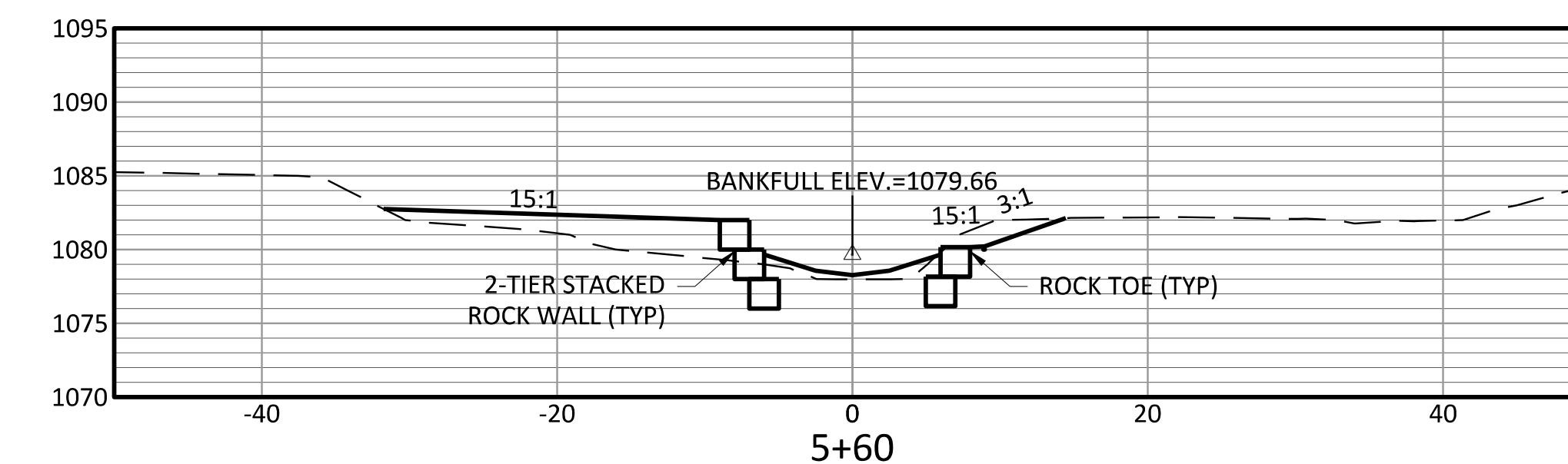
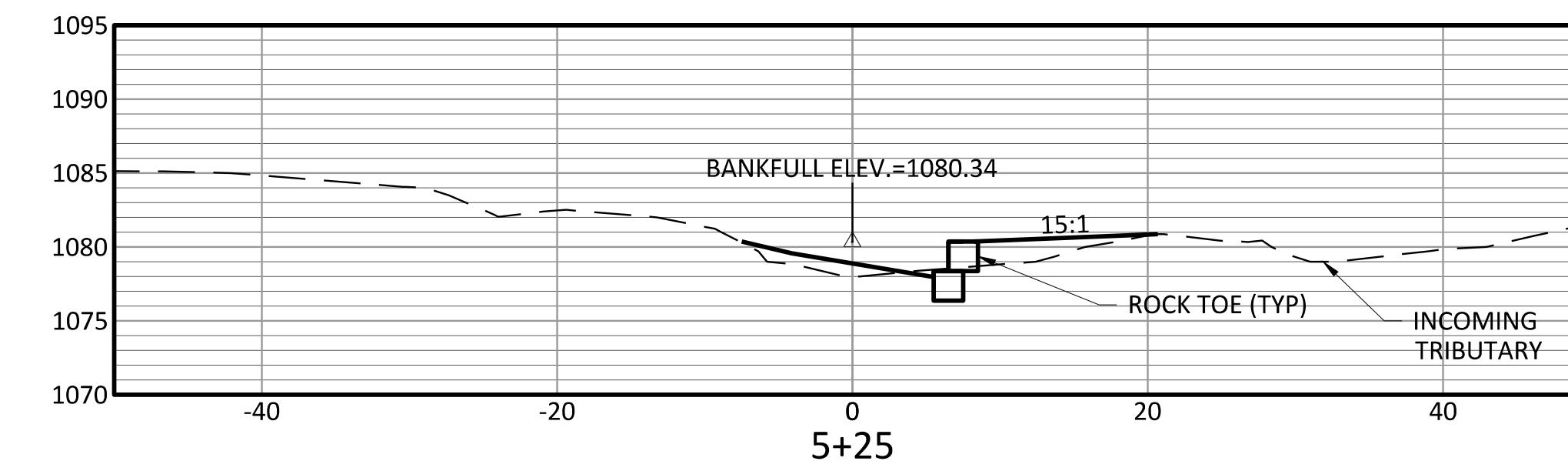
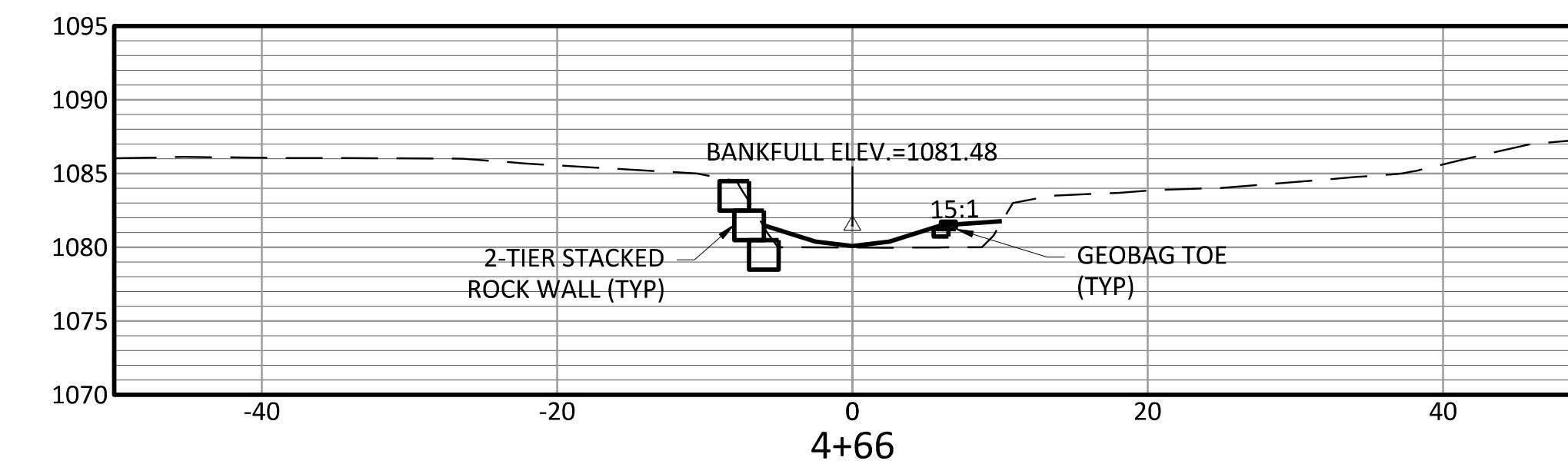
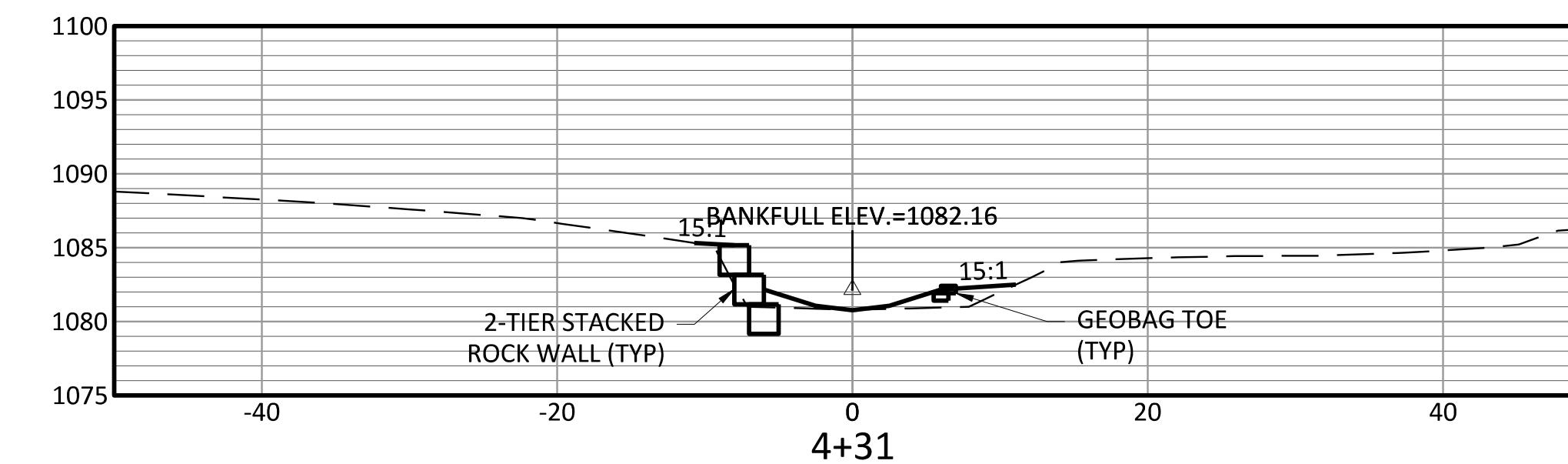
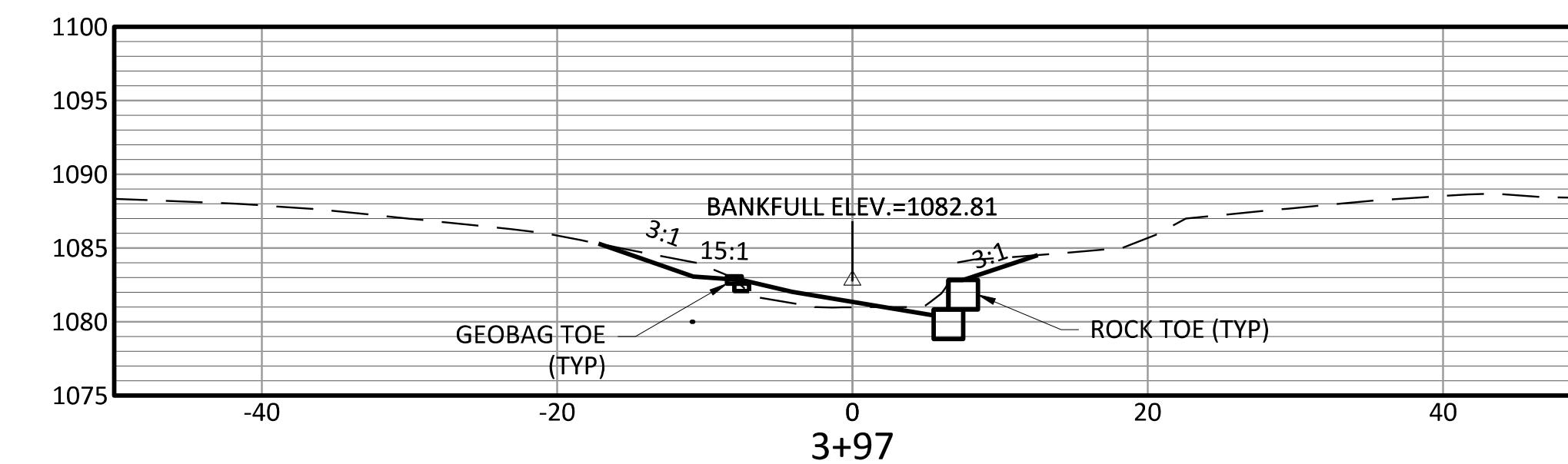
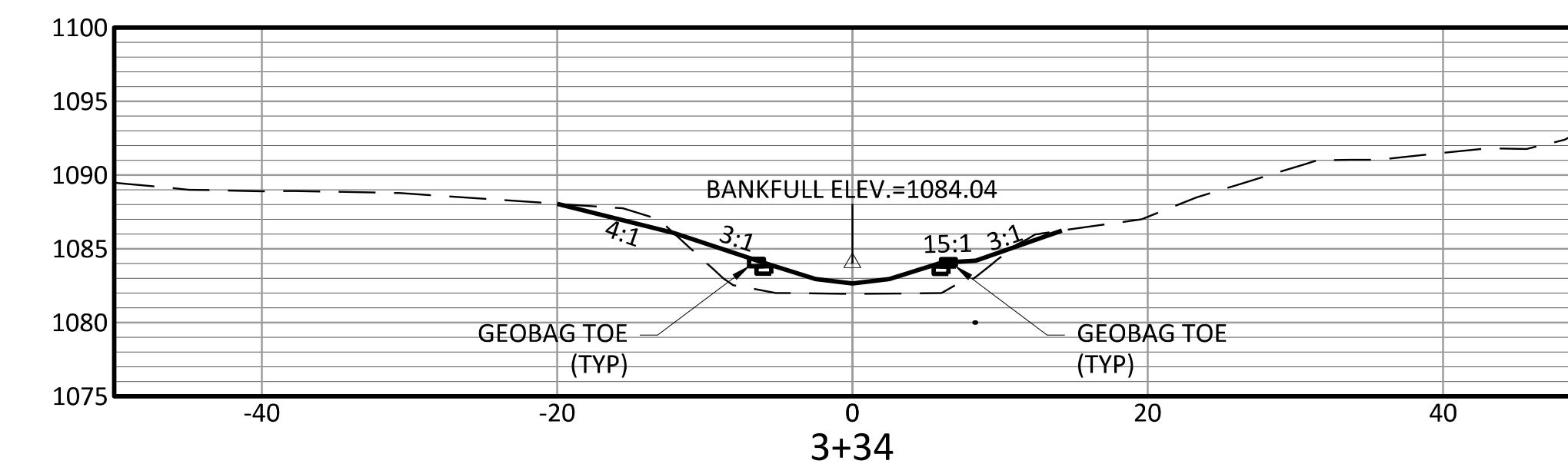
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			RNC19591	2/8/2023						

0 10' 20'
SCALE IN FEET

CS-1

ISSUED FOR REVIEW

SEQ. 17 OF 30

531 North Liberty Street
Winston-Salem, NC 27101
Phone: (336) 790-6744
Web: www.freeze.com

RESTORATION OF WOLF CREEK PHASE II
DETAILED CROSS SECTIONS
STA 3+34 TO STA 5+75

ROANOKE COUNTY, VIRGINIA

LEGEND
 - - - EXISTING GROUND PROFILE ALONG ALIGNMENT
 — PROPOSED GROUND

NOTE:

1. ALL GRADED SLOPES SHALL BE LINED WITH COIR MATTING PER THE DETAIL.
2. ALL STACKED ROCK WALL AND ROCK TOE SHALL BE BLENDED TO EXISTING GROUND AT TOP OF ROCK TO LIMIT EROSION AT TOP OF WALL.
3. PLACE SINGLE COIR WRAPPED LIFT ABOVE STACKED ROCK WALL AS REQUIRED.
4. SEE PLAN VIEW SHEETS FOR PROPOSED BENCH WIDTHS AND BLENDING.

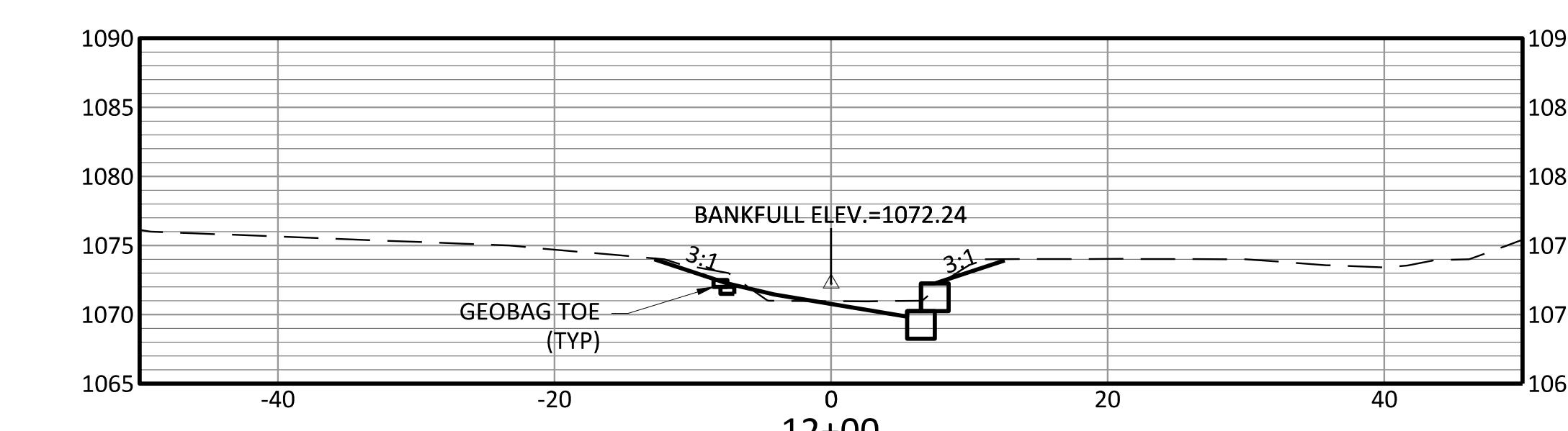
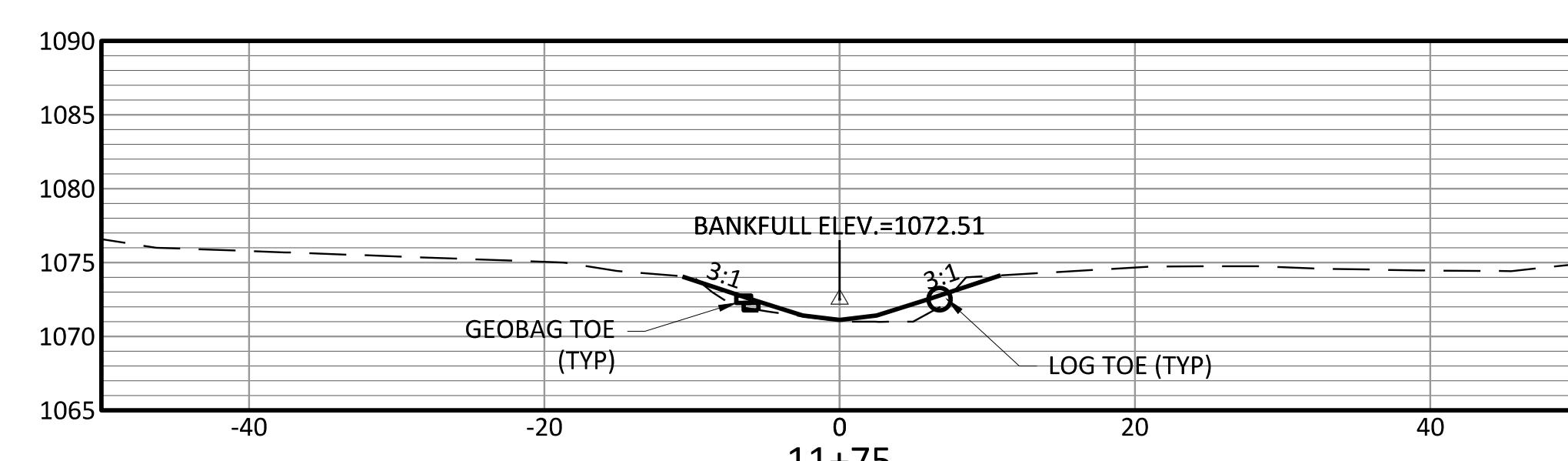
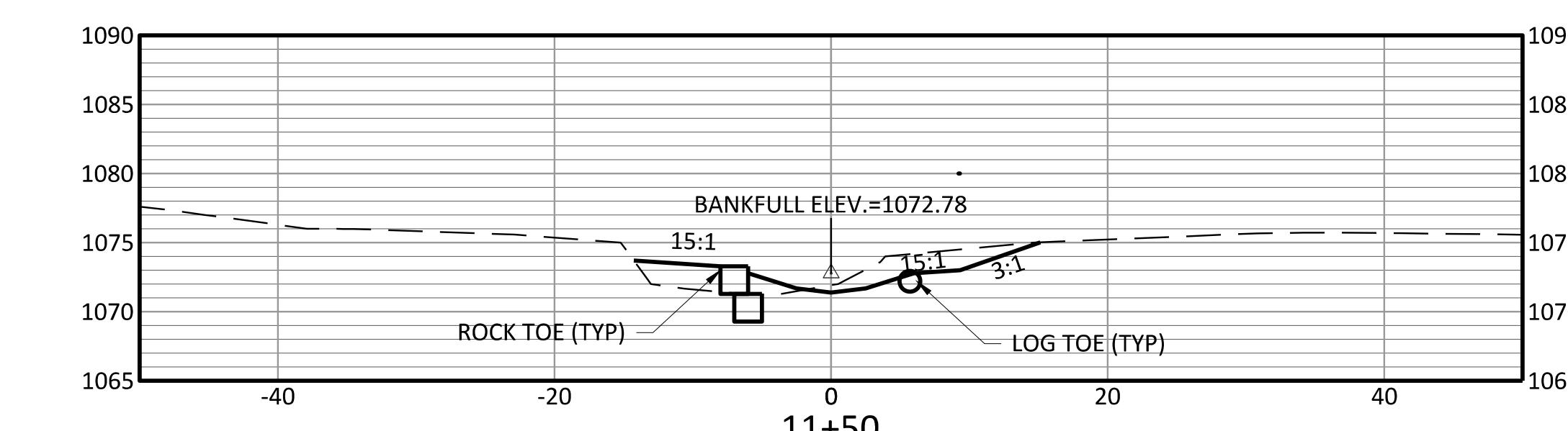
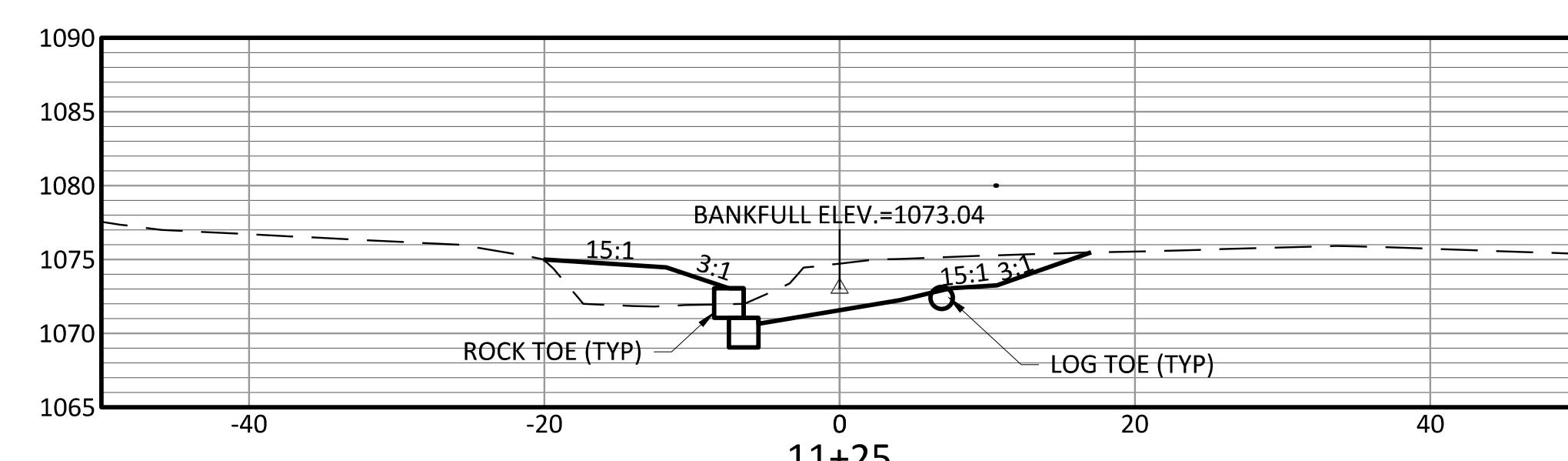
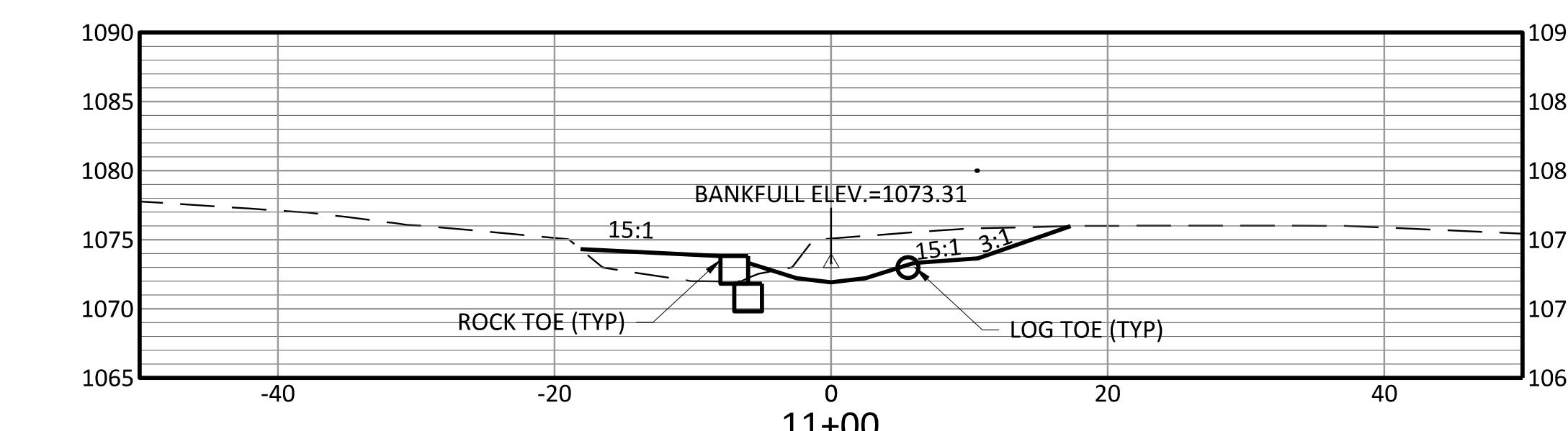
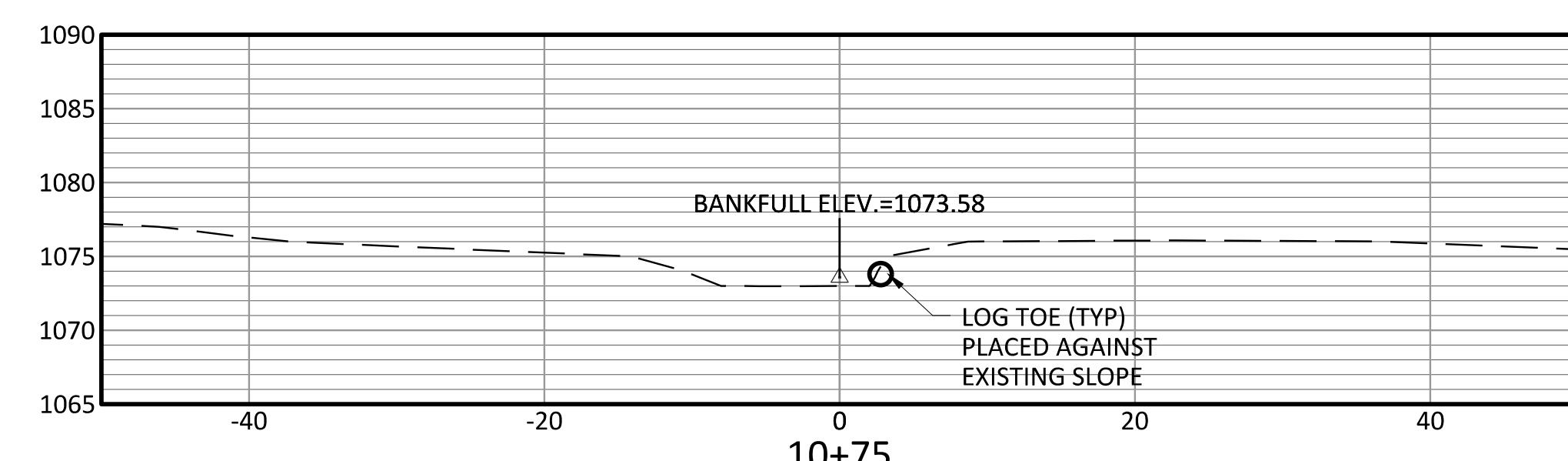
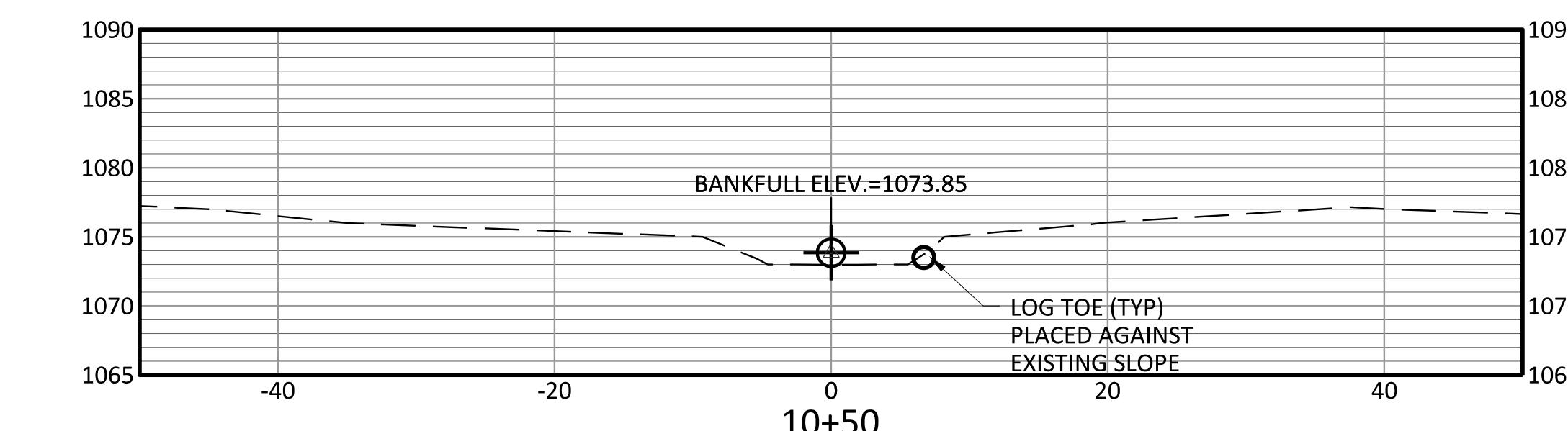
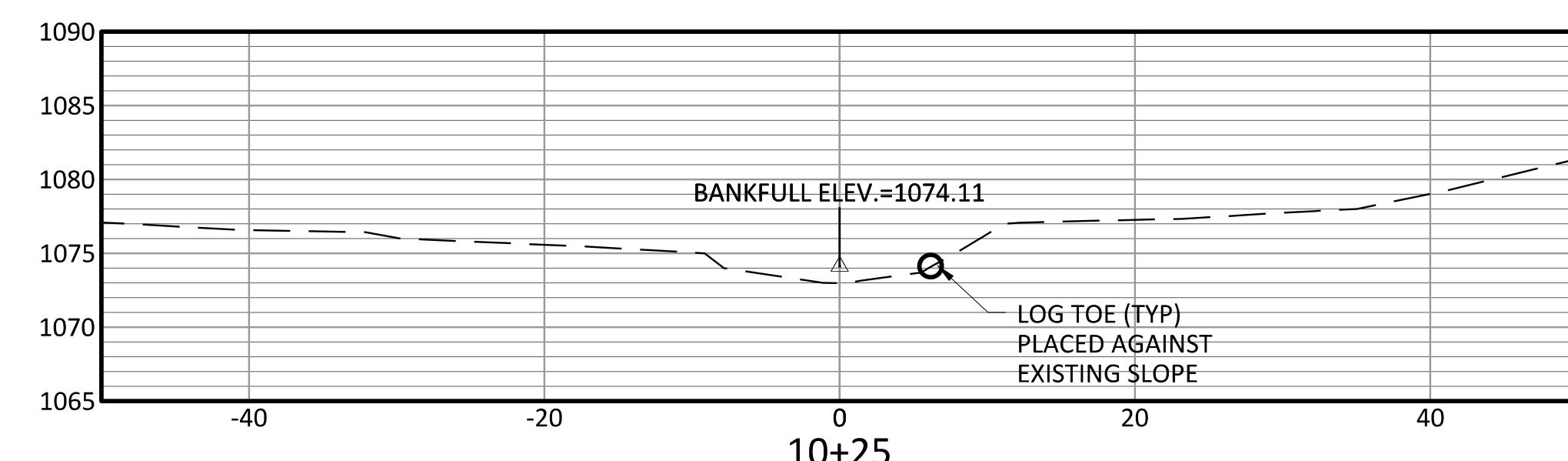
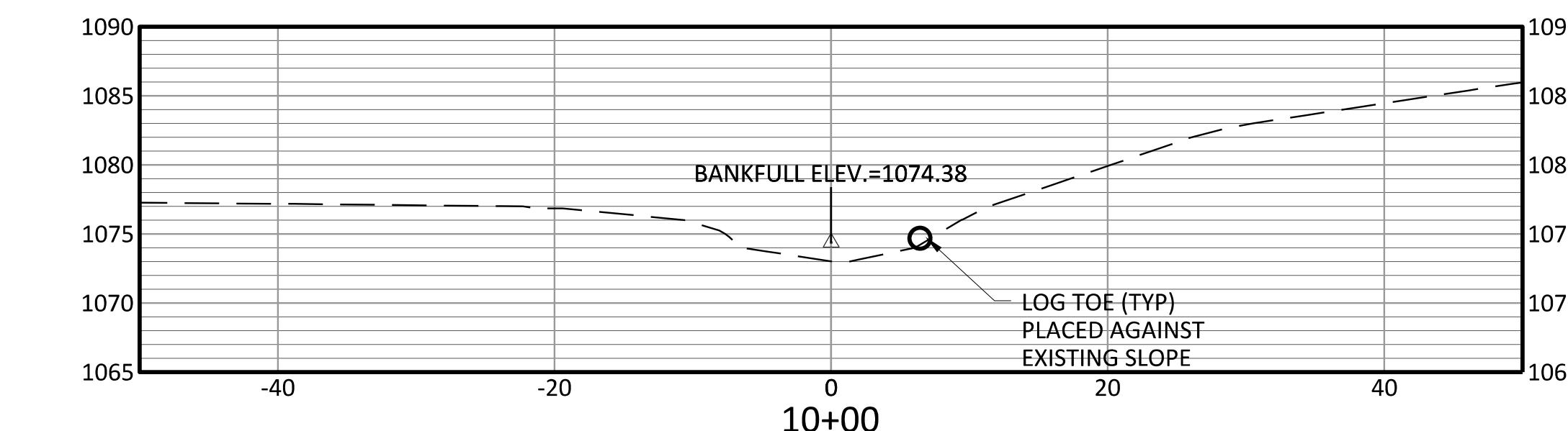
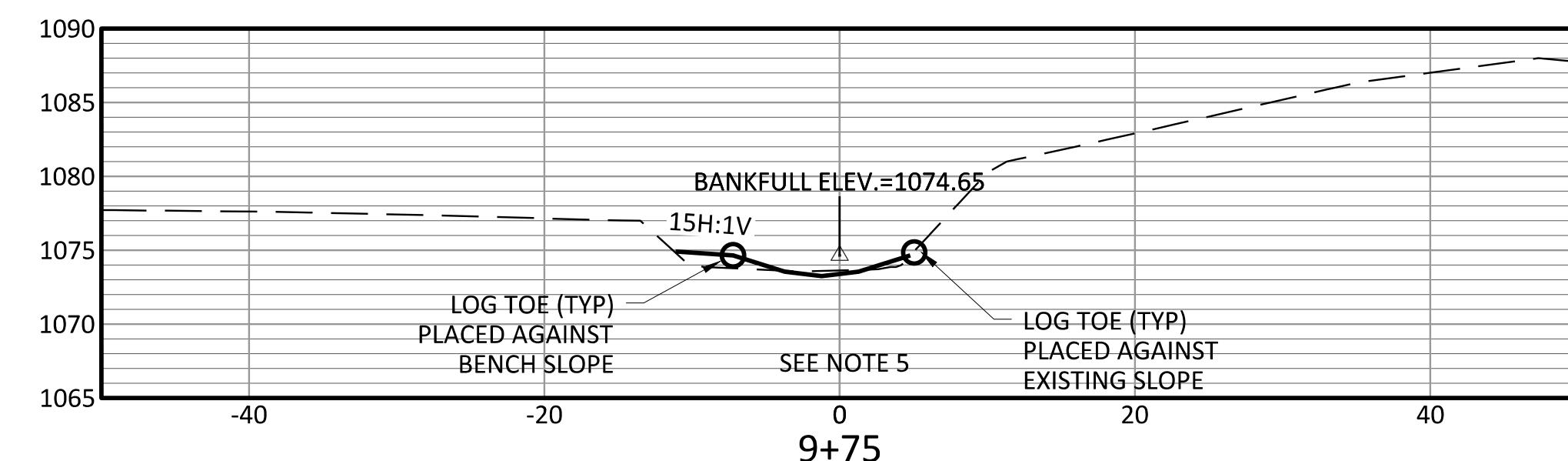
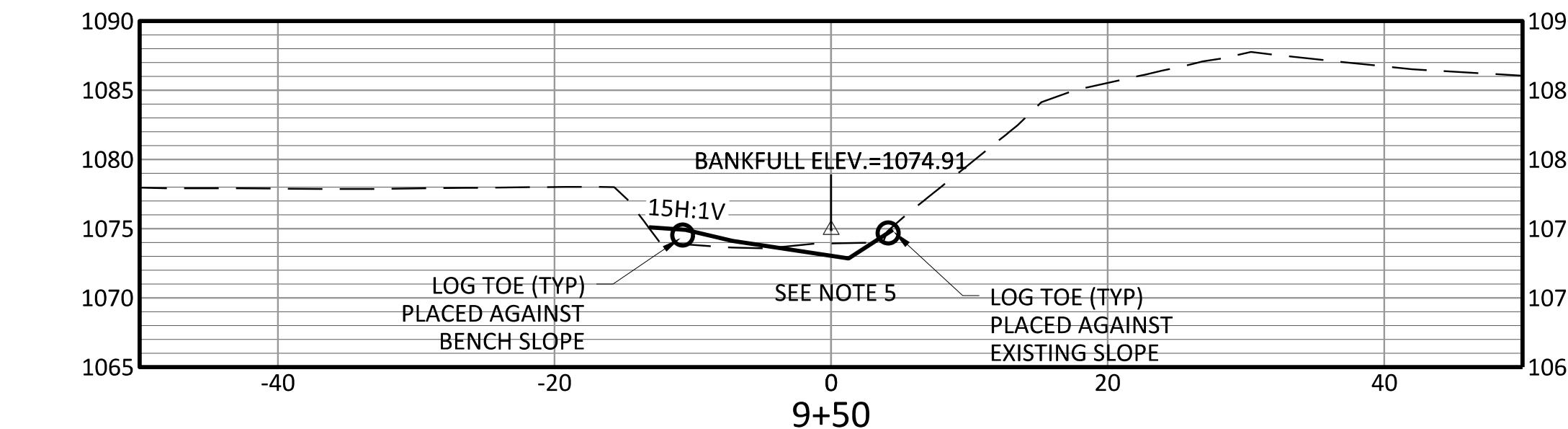
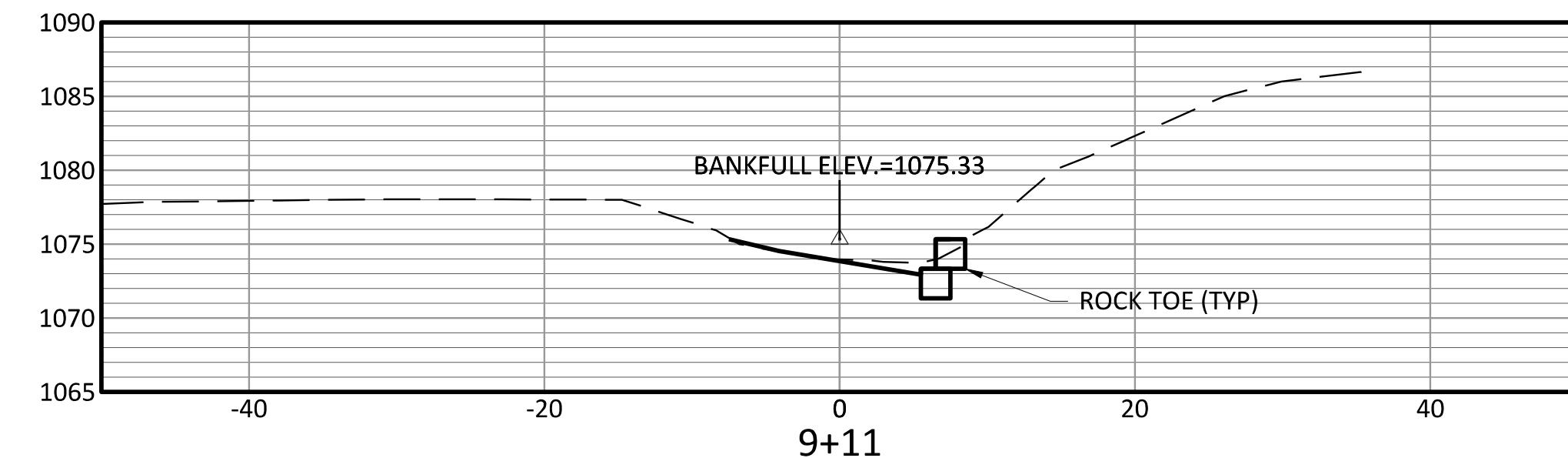
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			DESIGNED	LRW
			DRAWN	
			REVIEWED	
			FILE NAME	CROSS_SECTIONS.dwg

0 10' 20'
SCALE IN FEET

CS-2

ISSUED FOR REVIEW

SEQ. 18 OF 30



RESTORATION OF WOLF CREEK PHASE II

SECTION OF WOLF CREEK F
DETAILED CROSS SECTIONS
STA 9+11 TO STA 12+00

**FREEESE
&
NICHOLS**

Signed by:
Emily D. Brown
C9420CBA94E34EB...
EMILY DARR BROWN
Lic. No. 0402065407
8/26/2024
PROFESSIONAL ENGINEER

LEGEND

EXISTING GROUND PROFILE
ALONG ALIGNMENT

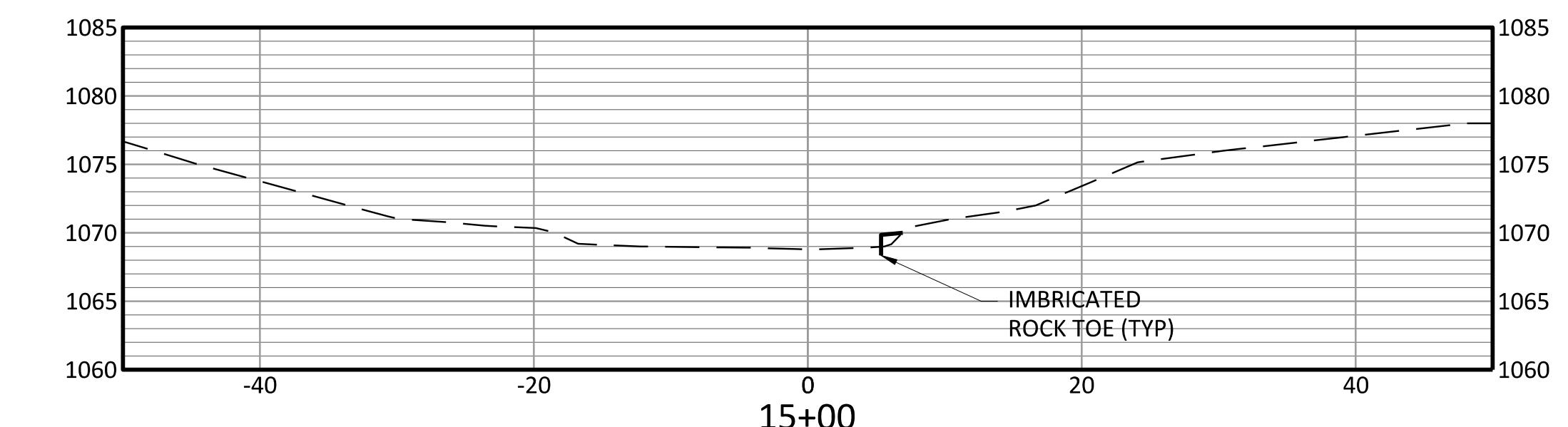
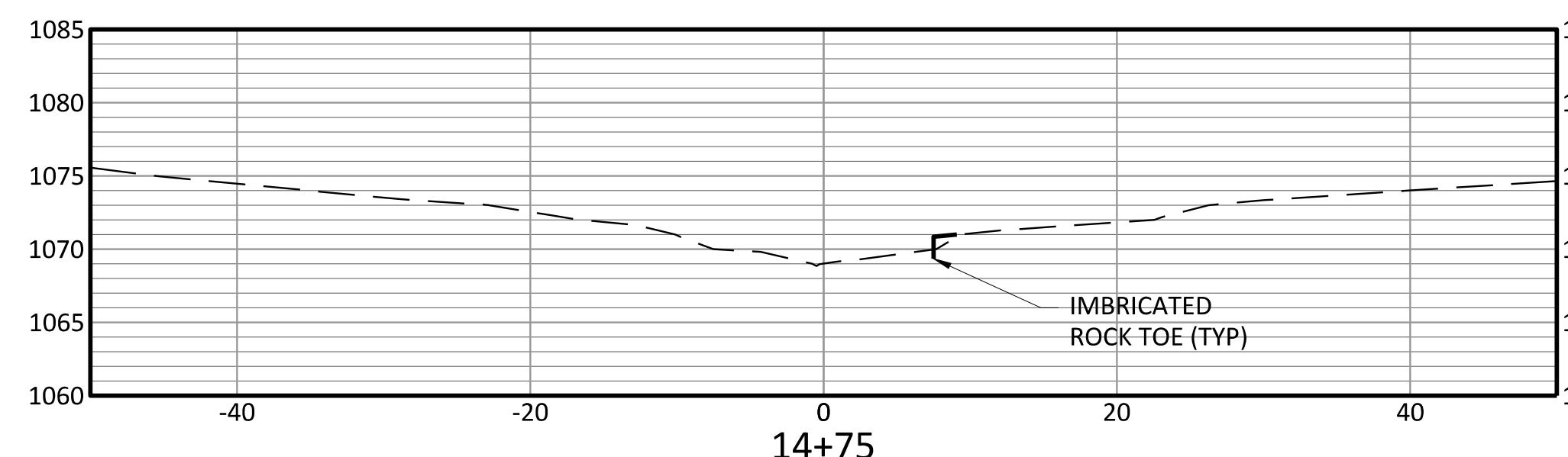
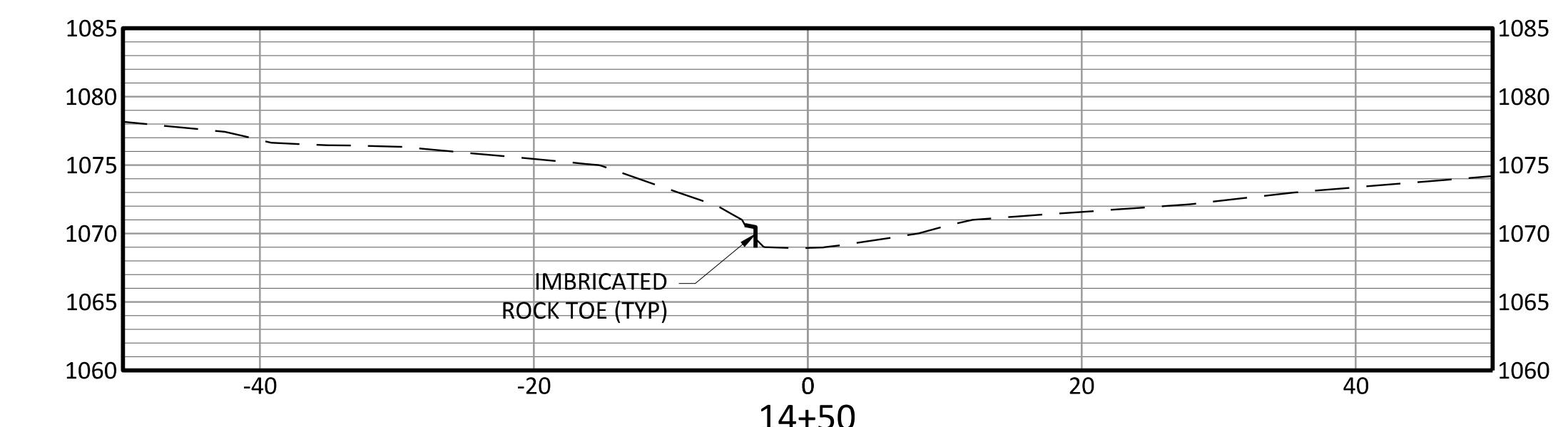
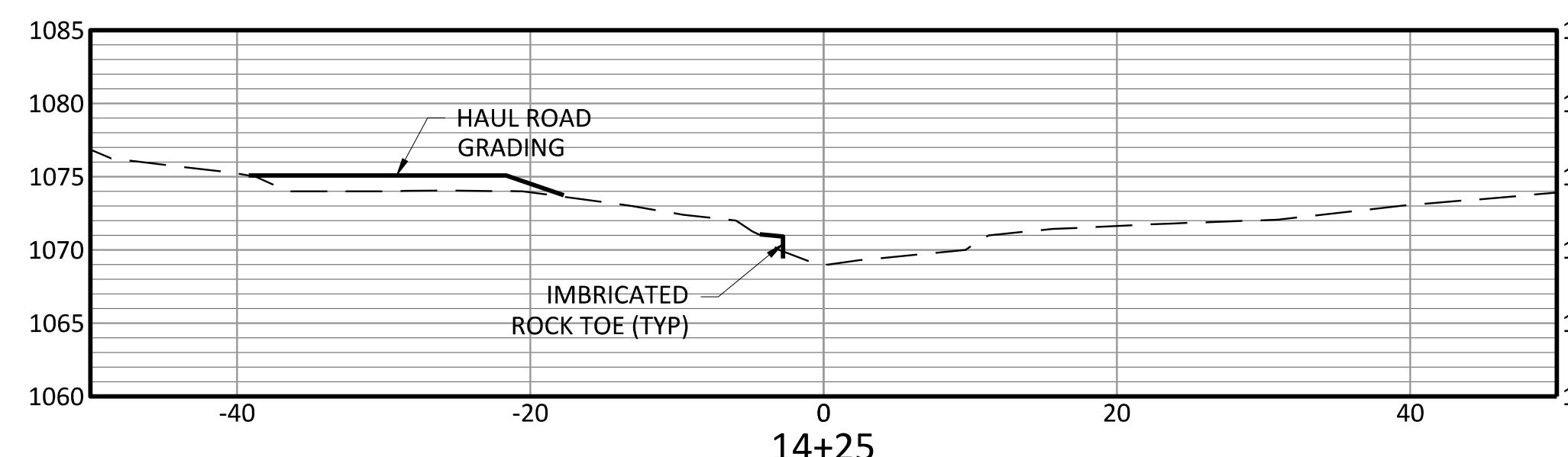
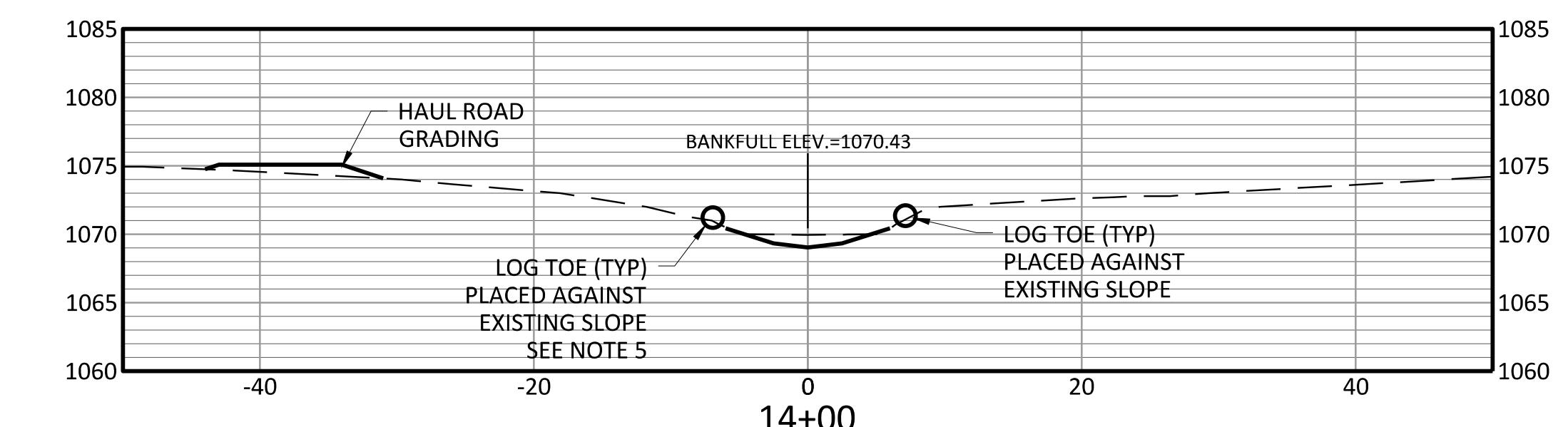
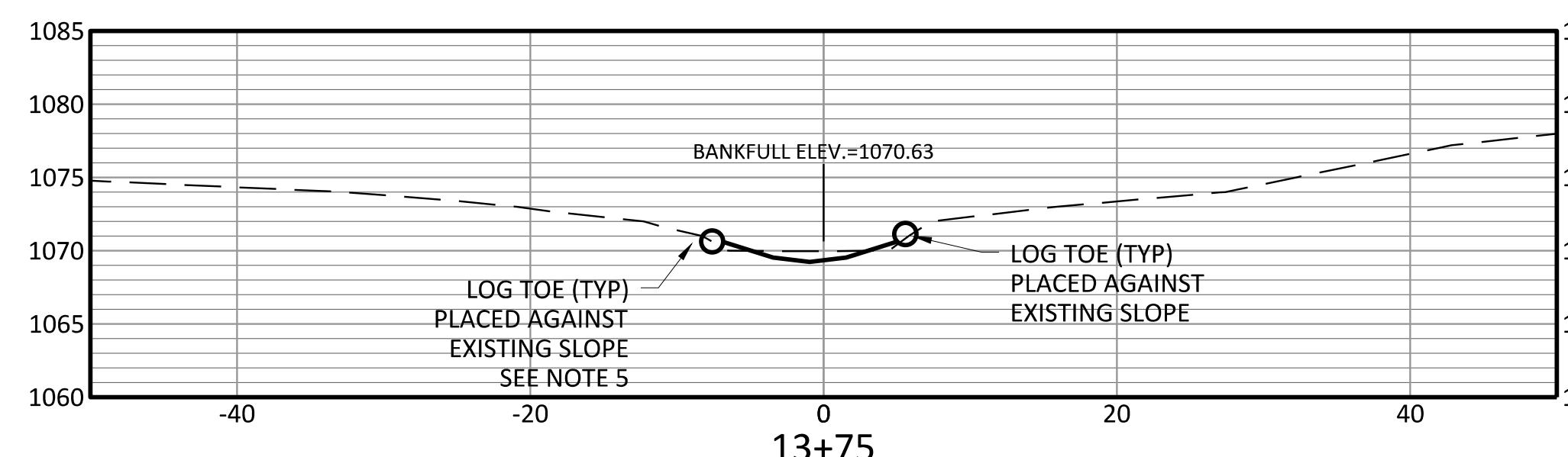
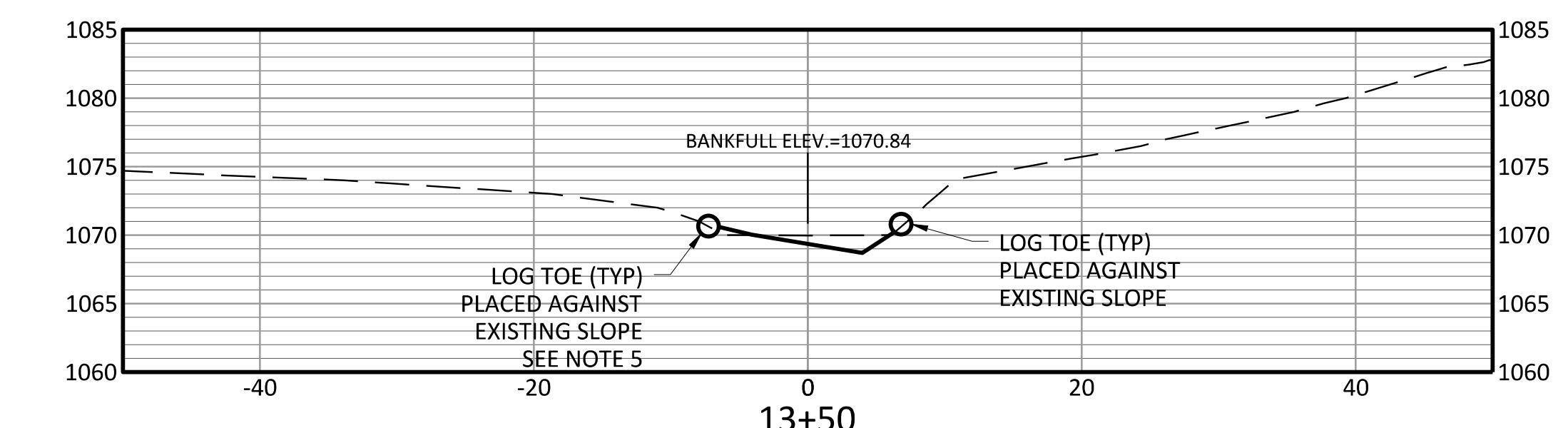
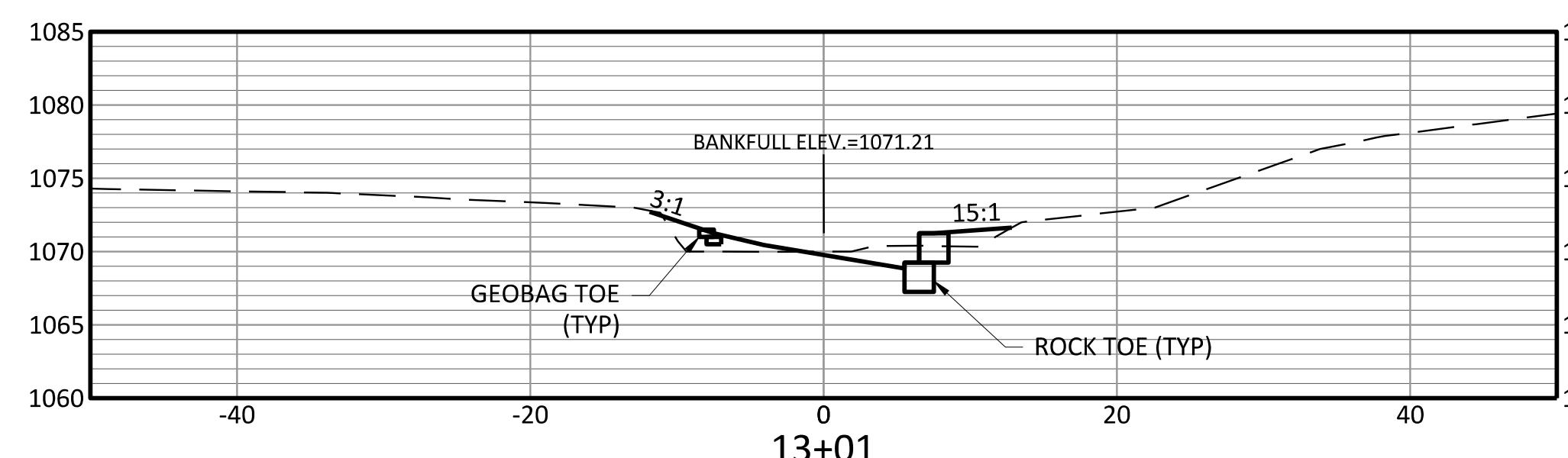
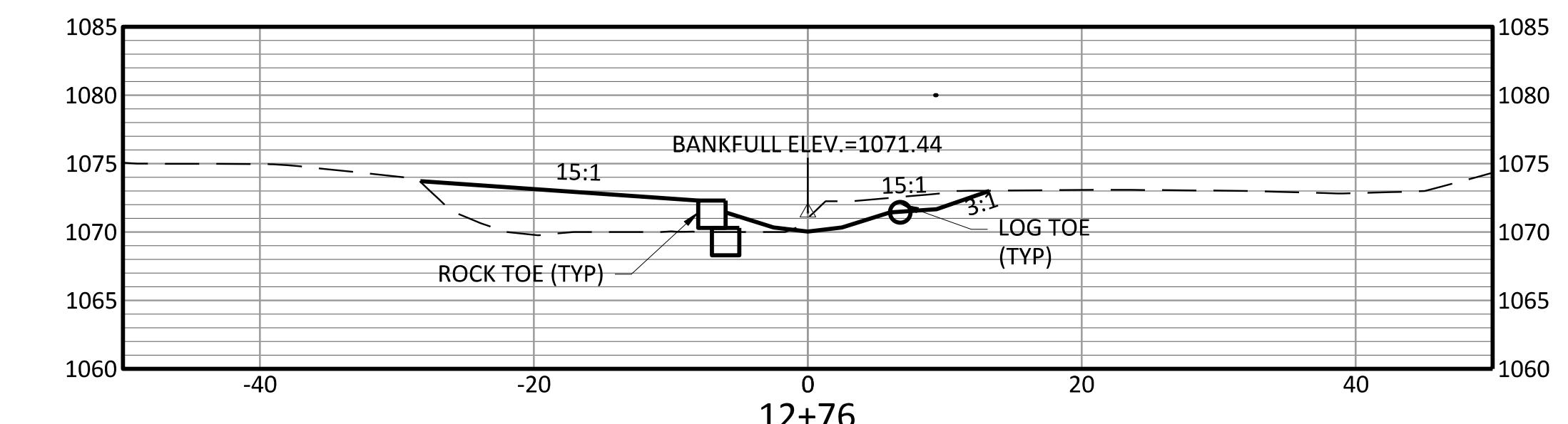
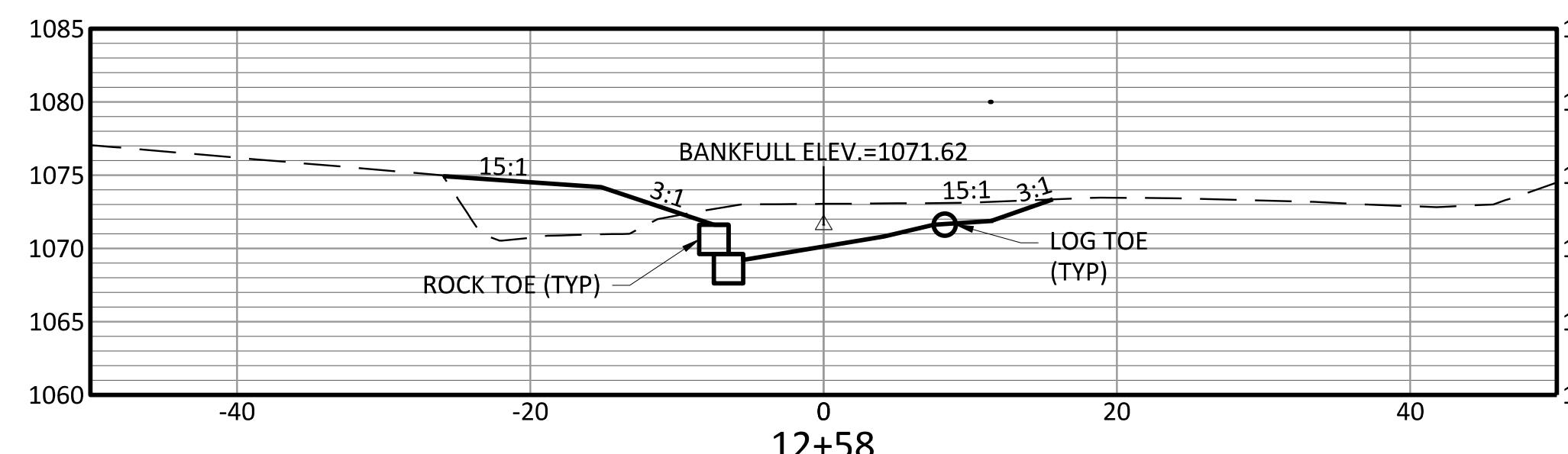
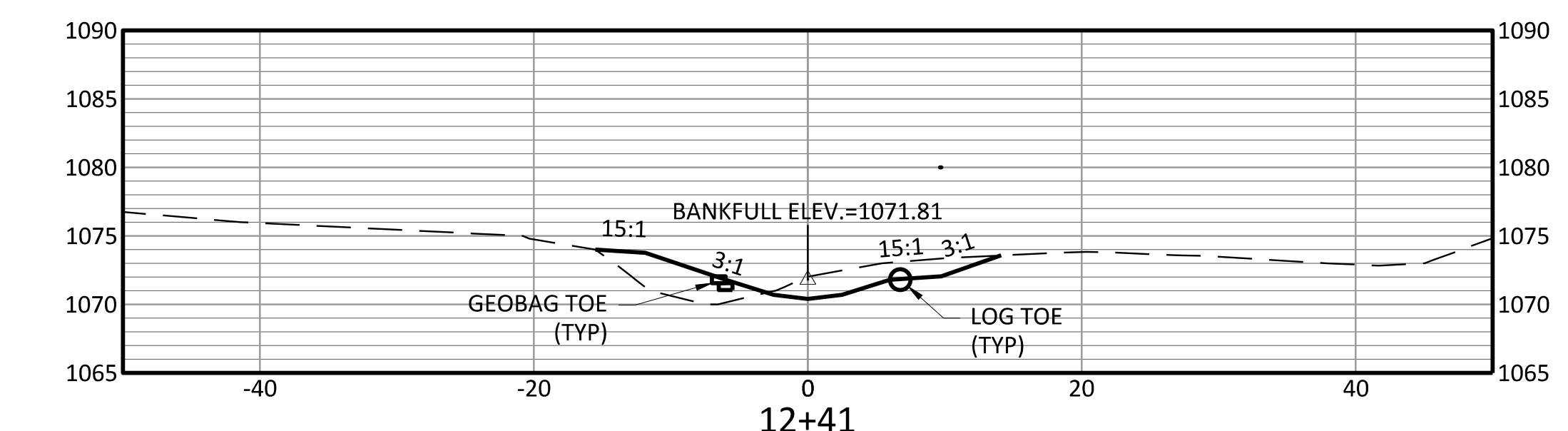
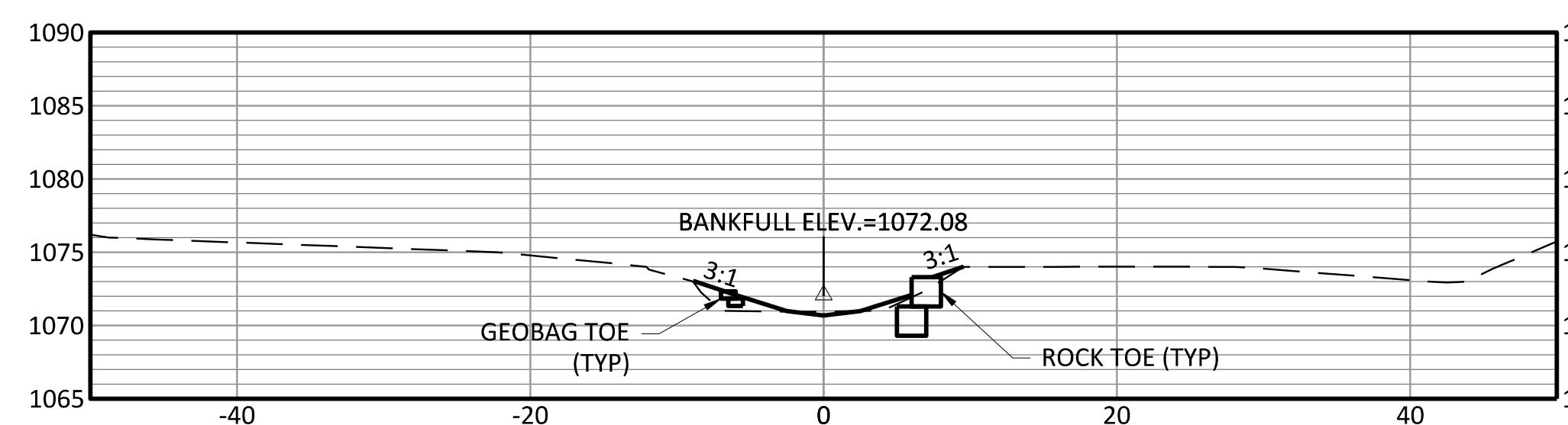
PROPOSED GROUND

NOTE:

1. ALL GRADED SLOPES SHALL BE LINED WITH COIR MATTING PER THE DETAIL.
2. ALL STACKED ROCK WALL AND ROCK TOE SHALL BE BLENDED TO EXISTING GROUND AT TOP OF ROCK TO LIMIT EROSION AT TOP OF WALL.
3. PLACE SINGLE COIR WRAPPED LIFT ABOVE STACKED ROCK WALL AS REQUIRED.
4. SEE PLAN VIEW SHEETS FOR PROPOSED BENCH WIDTHS AND BLENDING.
5. SECTION MAY NOT REFLECT ACTUAL FIELD CONDITIONS. DESIGN INTENT IS TO INCORPORATE A STABLE CHANNEL PLANFORM WITH LOG TOE AT THE TOE OF SLOPE. IF OVERLY WIDE, INCORPORATE A BENCH ALONG THE LEFT BANK BEHIND LOG TOE AT THE DIRECTION OF THE ENGINEER.

A horizontal scale bar with two black segments. The first segment is labeled '10' above it. The second segment is labeled '20' above it. Below the segments, the text 'SCALE IN FEET' is written in a bold, sans-serif font.

ISSUED FOR REVIEW



LEGEND

EXISTING GROUND PROFILE
ALONG ALIGNMENT

PROPOSED GROUND

ROANOKE COUNTY, VIRGINIA

RESTORATION OF WOLF CREEK PHASE II

DETAILED CROSS SECTIONS

STA 12+15 TO STA 15+00

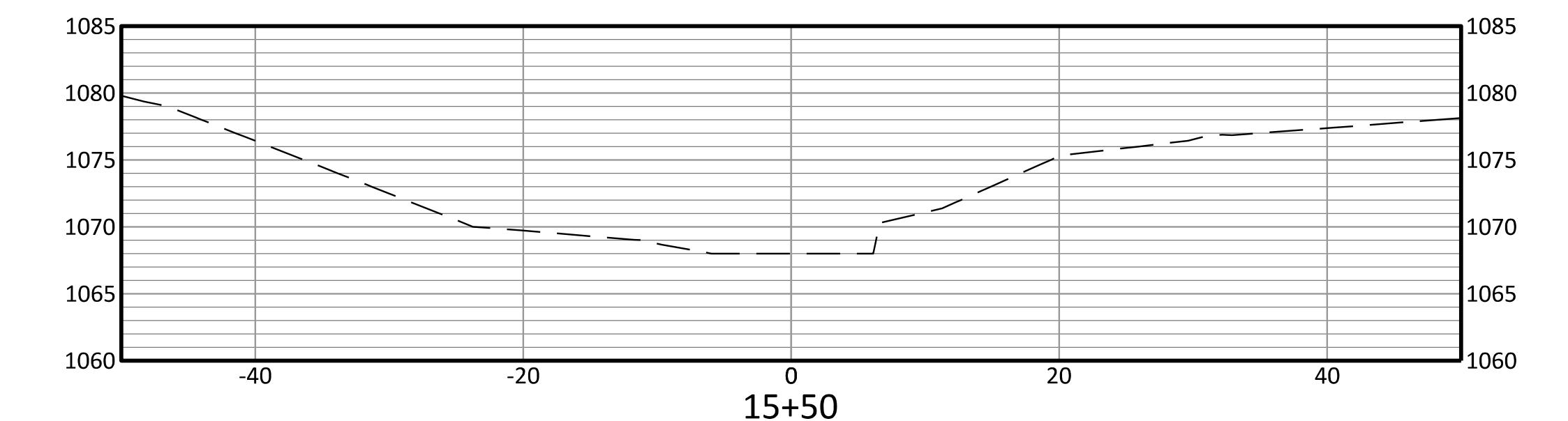
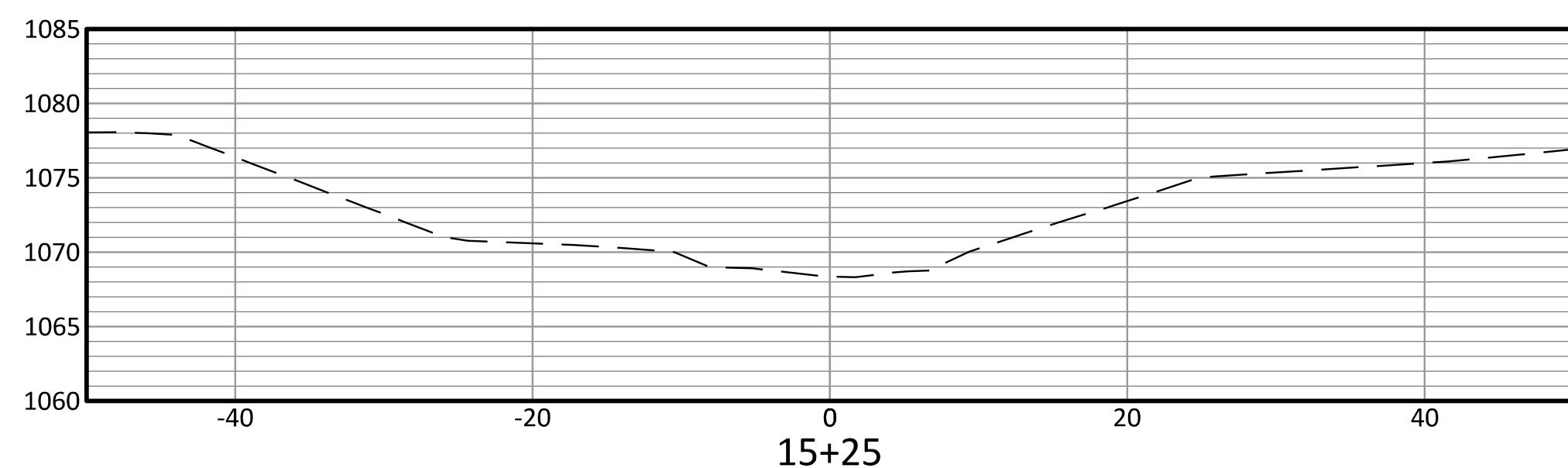
NOTE:

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 SCALE IN FEET	NO. <input type="text"/> SHEET CS-5	VERI <input type="text"/>
ED FOR REVIEW		SEQ. <input type="text"/> 21 OF 30

ISSUED FOR REVIEW

21 OF 30



LEGEND

- Existing Ground Profile Along Alignment
- Proposed Ground

NOTE:

1. ALL GRADED SLOPES SHALL BE LINED WITH COIR MATTING PER THE DETAIL.
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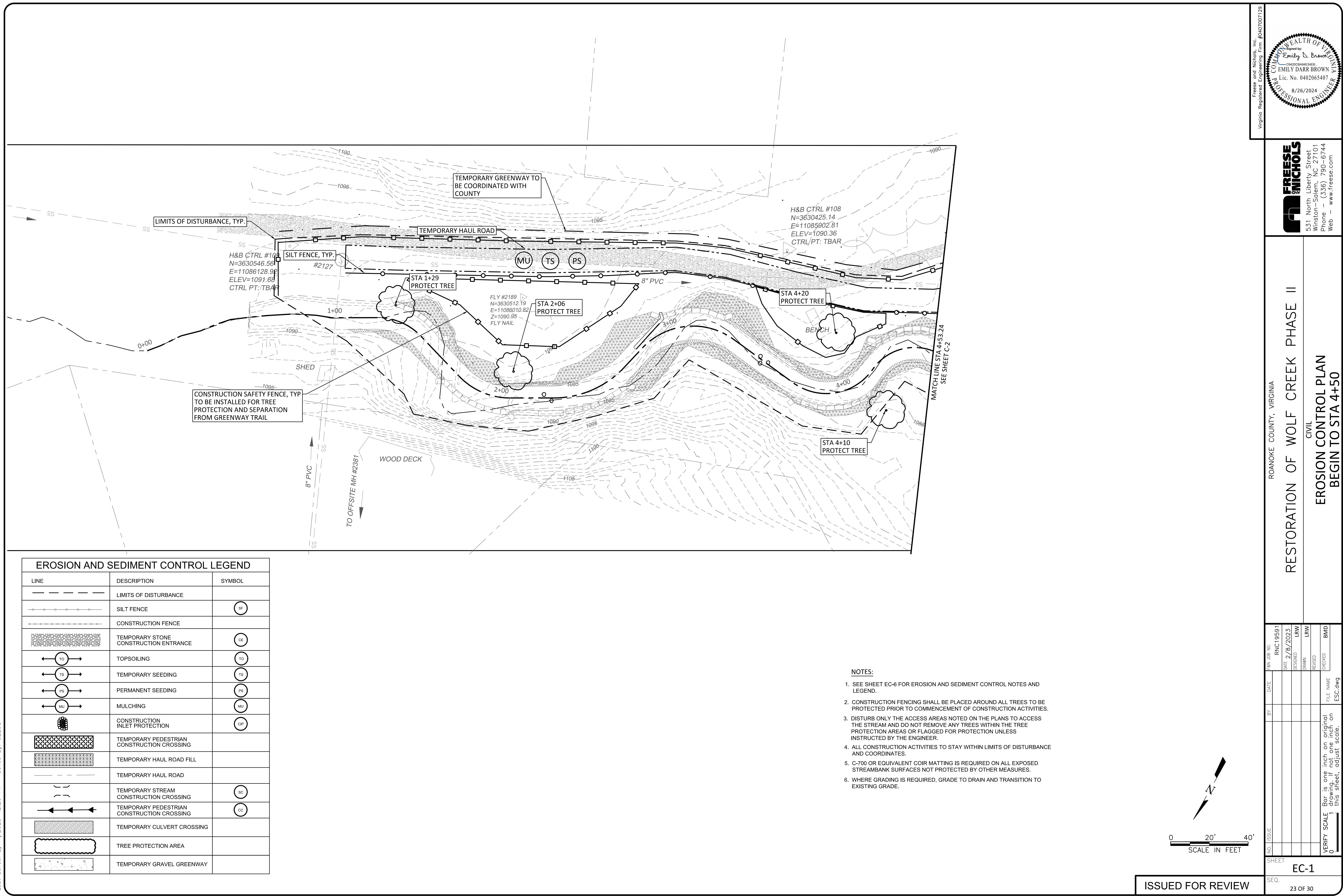
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SCALE IN FEET

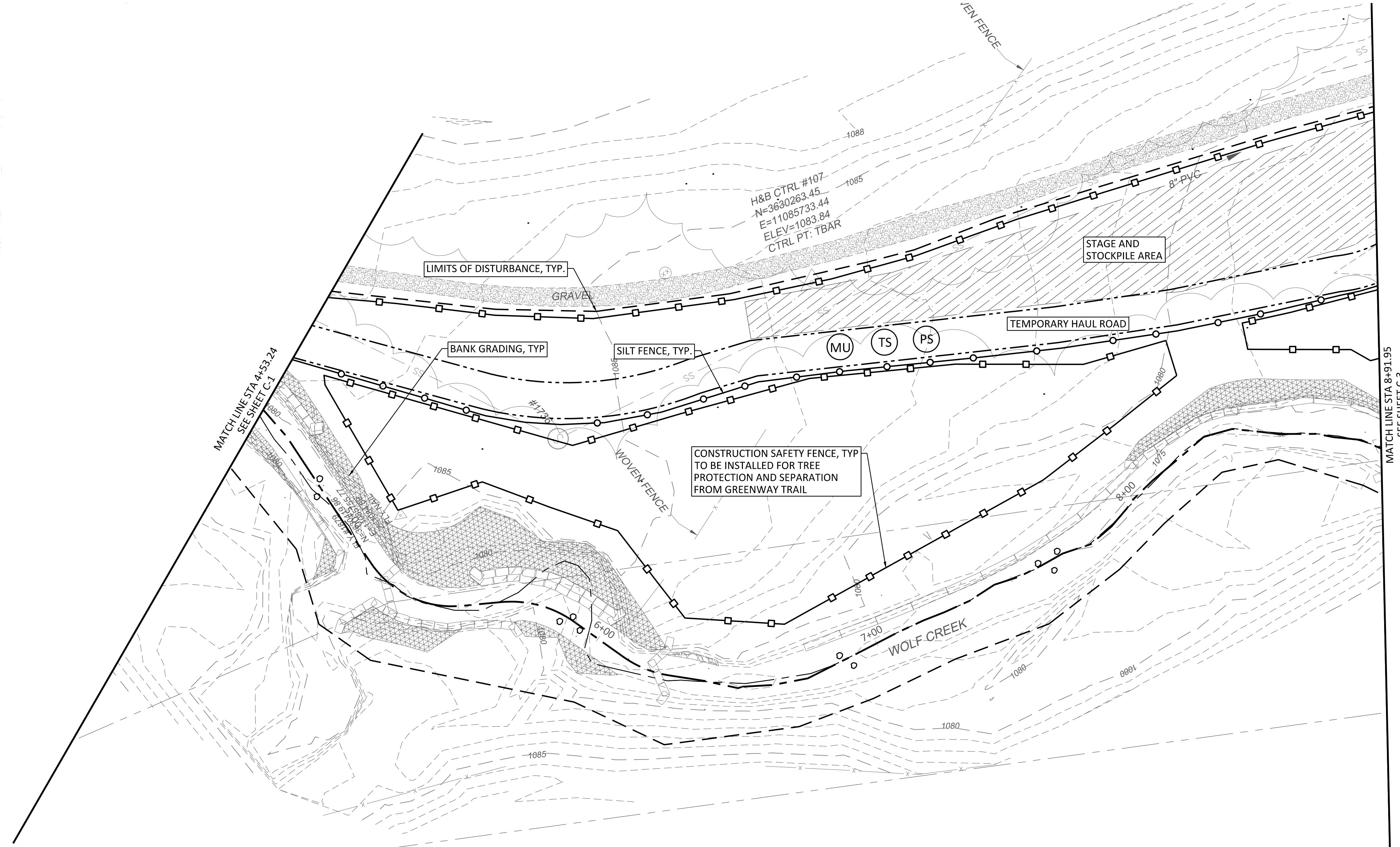
CS-6

ISSUED FOR REVIEW

SEQ. 22 OF 30

Freeze and Nichols, Inc. #140707129
COMMISSIONED BY
EMILY D. BROWN
CROSS SECTION DRAWINGS
8/26/2024
Virginia Registered Engineering Firm #140707129
531 North Liberty Street
Winston-Salem, NC 27101
Phone: (336) 790-6744
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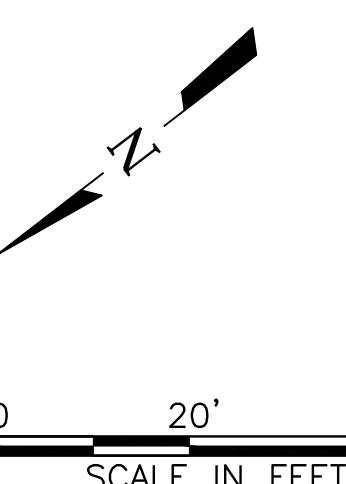




EROSION AND SEDIMENT CONTROL LEGEND		
LINE	DESCRIPTION	SYMBOL
— — — — —	LIMITS OF DISTURBANCE	
○ ○ ○ ○ ○ ○ ○	SILT FENCE	(SF)
— — — — — — —	CONSTRUCTION FENCE	
████████████████████	TEMPORARY STONE CONSTRUCTION ENTRANCE	(CE)
← (TO) →	TOPSOILING	(TO)
← (TS) →	TEMPORARY SEEDING	(TS)
← (PS) →	PERMANENT SEEDING	(PS)
○ (MU) →	MULCHING	(MU)
████████████████████	CONSTRUCTION INLET PROTECTION	(CIP)
████████████████████	TEMPORARY PEDESTRIAN CONSTRUCTION CROSSING	
████████████████████	TEMPORARY HAUL ROAD FILL	
— — — — — — —	TEMPORARY HAUL ROAD	
— (SC) —	TEMPORARY STREAM CONSTRUCTION CROSSING	(SC)
— (CC) —	TEMPORARY PEDESTRIAN CONSTRUCTION CROSSING	(CC)
████████████████████	TEMPORARY CULVERT CROSSING	
████████████████████	TREE PROTECTION AREA	
████████████████████	TEMPORARY GRAVEL GREENWAY	

NOTES:

- SEE SHEET EC-6 FOR EROSION AND SEDIMENT CONTROL NOTES AND LEGEND.
- CONSTRUCTION FENCING SHALL BE PLACED AROUND ALL TREES TO BE PROTECTED PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
- DISTURB ONLY THE ACCESS AREAS NOTED ON THE PLANS TO ACCESS THE STREAM AND DO NOT REMOVE ANY TREES WITHIN THE TREE PROTECTION AREAS OR FLAGGED FOR PROTECTION UNLESS INSTRUCTED BY THE ENGINEER.
- ALL CONSTRUCTION ACTIVITIES TO STAY WITHIN LIMITS OF DISTURBANCE AND COORDINATES.
- C-700 OR EQUIVALENT COIR MATTING IS REQUIRED ON ALL EXPOSED STREAMBANK SURFACES NOT PROTECTED BY OTHER MEASURES.
- WHERE GRADING IS REQUIRED, GRADE TO DRAIN AND TRANSITION TO EXISTING GRADE.



EC-2

SEQ.

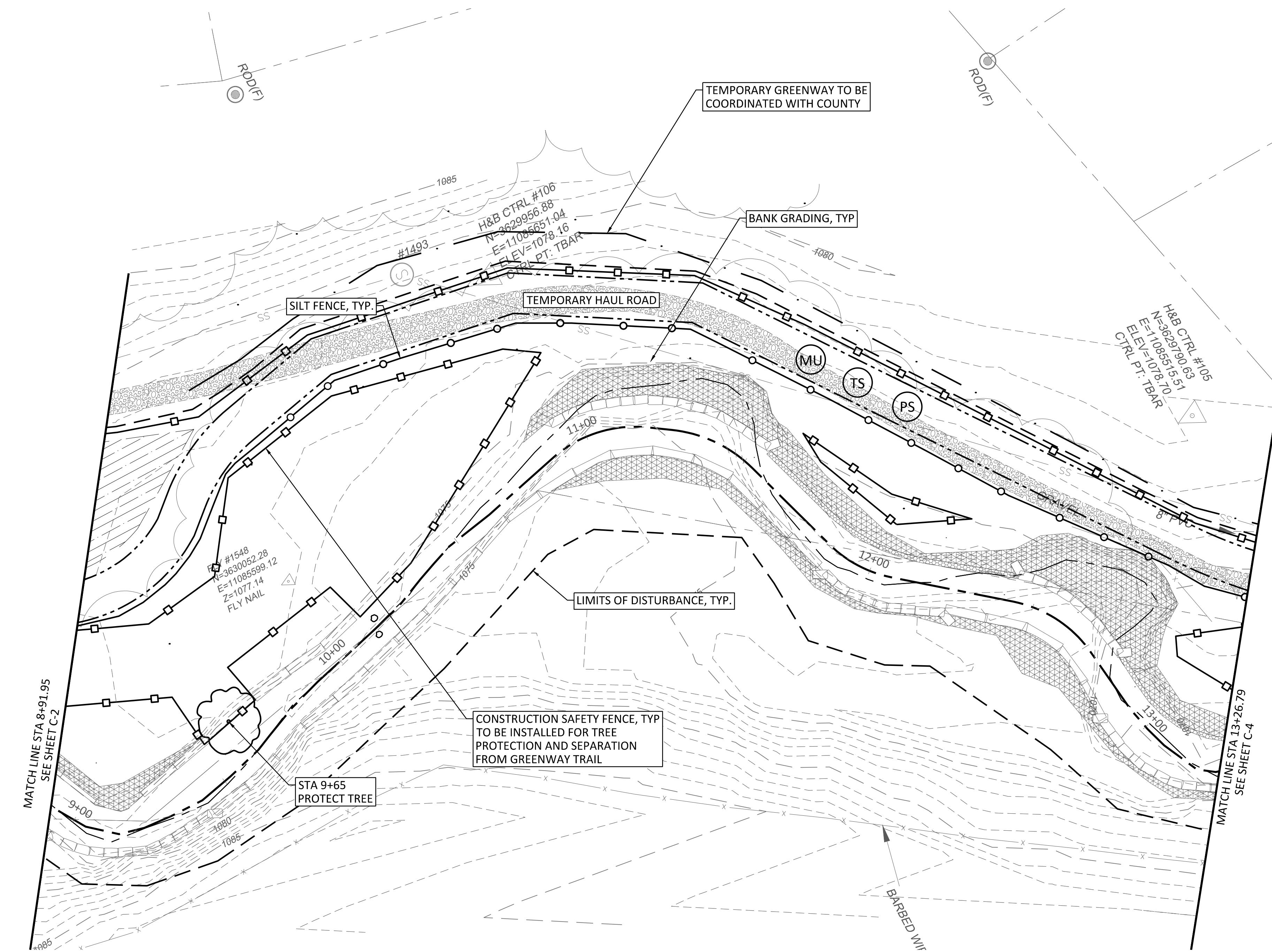
ISSUED FOR REVIEW

24 OF 30

EROSION CONTROL PLAN
STA 4+50 TO STA 9+00

FREESE & NICHOLS
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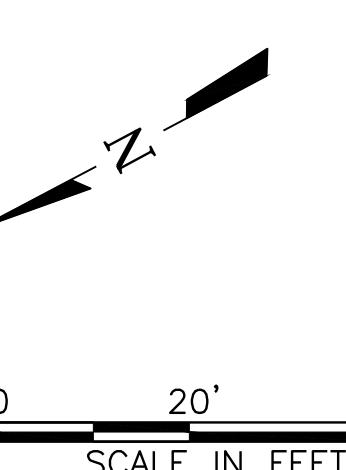
Freeze and Nichols, Inc. #0407007129
COMPLETED
by
Emily D. Brown
EMILY DARR BROWN
LIC. NO. 0402065407
8/26/2024
Virginia Registered Engineering Firm #0407007129



EROSION AND SEDIMENT CONTROL LEGEND		
LINE	DESCRIPTION	SYMBOL
-----	LIMITS OF DISTURBANCE	
.....	SILT FENCE	SF
.....	CONSTRUCTION FENCE	CF
.....	TEMPORARY STONE CONSTRUCTION ENTRANCE	TC
↔ TO	TOPSOILING	TO
↔ TS	TEMPORARY SEEDING	TS
↔ PS	PERMANENT SEEDING	PS
↔ MU	MULCHING	MU
.....	CONSTRUCTION INLET PROTECTION	CIP
.....	TEMPORARY PEDESTRIAN CONSTRUCTION CROSSING	CC
.....	TEMPORARY HAUL ROAD FILL	
.....	TEMPORARY HAUL ROAD	
↔ CC	TEMPORARY STREAM CONSTRUCTION CROSSING	SC
↔ CC	TEMPORARY PEDESTRIAN CONSTRUCTION CROSSING	CC
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EC-3

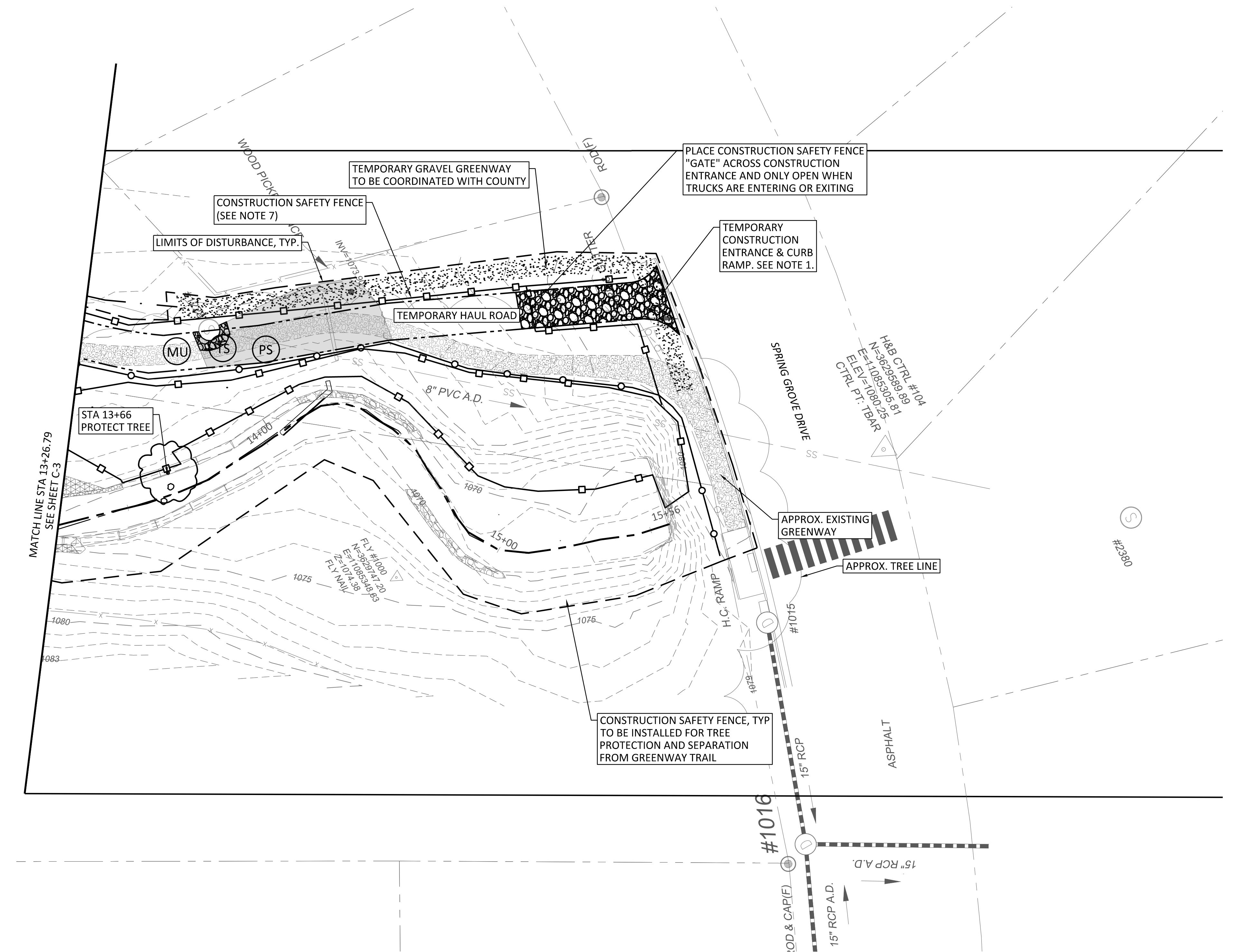
SEQ.

ISSUED FOR REVIEW

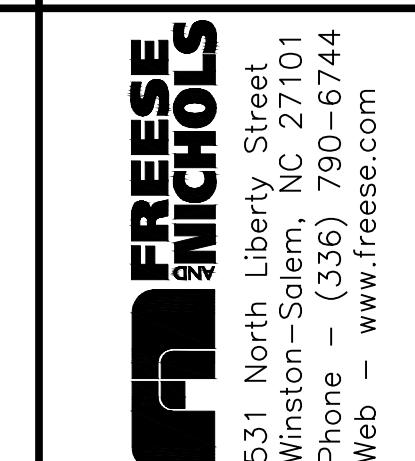
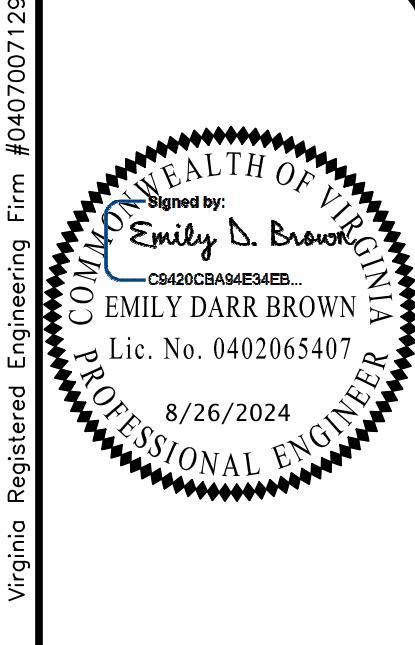
25 OF 30

Frerese and Nichols, Inc. #0407007129
 COMPLIANT
 WITH
 THE
 COMMONWEALTH
 OF VIRGINIA
 PROFESSIONAL ENGINEER
 Licensure Law
 8/26/2024

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<p>ACAD Rel: 24.2s (LMS Tech) Filename: N:\SW\Drawings\EC NOTES_LEGEND.dwg Last Saved: 7/16/2023 3:20 PM Saved By: 02298</p> <p>EROSION AND SEDIMENT CONTROL NOTES:</p> <p>THE PURPOSE OF THE EROSION CONTROL MEASURES SHOWN ON THESE PLANS SHALL BE TO PRECLUDE THE TRANSPORT OF ALL WATERBORNE SEDIMENTS RESULTING FROM CONSTRUCTION ACTIVITIES FROM ENTERING ONTO ADJACENT PROPERTIES OR STATE WATERS. IF FELT INSPECTION REVEALS THE INADEQUACY OF THE PLAN TO CONFINE SEDIMENT TO THE PROJECT SITE, APPROPRIATE MODIFICATIONS WILL BE MADE TO CORRECT ANY PLAN DEFICIENCIES.</p> <p>1. PLAN APPROVAL IN NO WAY RELIEVES THE CONTRACTOR OF THE RESPONSIBILITIES CONTAINED WITHIN THE EROSION AND SEDIMENT CONTROL POLICIES.</p> <p>2. ALL SOIL EROSION & SEDIMENT CONTROL MEASURES SHALL BE ACCOMPLISHED IN STRICT ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS CONTAINED IN THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION.</p> <p>3. FOR THE EROSION CONTROL KEY SYMBOLS SHOWN ON THE PLANS, REFER TO THE VIRGINIA UNIFORM CODING SYSTEM FOR EROSION AND SEDIMENT CONTROL PRACTICES CONTAINED IN THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK. THE CONTRACTOR SHALL BE THOROUGHLY FAMILIAR WITH ALL APPLICABLE MEASURES CONTAINED THEREIN WHICH MAY BE PERTINENT TO THIS PROJECT.</p> <p>4. ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS SHALL BE PROTECTED BY A TEMPORARY CONSTRUCTION ENTRANCE TO PREVENT TRACKING OF MUD ONTO PUBLIC RIGHT-OF-WAYS. AN ENTRANCE PERMIT FROM VDOT IS REQUIRED PRIOR TO ANY CONSTRUCTION ACTIVITIES WITHIN STATE RIGHT-OF-WAYS.</p> <p>5. ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES AS SHOWN ON THE PLAN, NOT LOCATED IN PROPOSED FILL OR EXCAVATION AREAS, SHALL BE CONSTRUCTED PRIOR TO ALL OTHER LAND DISTURBANCE. THE CONTRACTOR SHALL ARRANGE AN ON-SITE PRECONSTRUCTION CONFERENCE WITH THE ROANOKE COUNTY DEVELOPMENT INSPECTOR.</p> <p>6. MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE ACCOMPLISHED IN ACCORDANCE WITH PROCEDURES APPROVED BY THE STATE OF VIRGINIA. MAINTENANCE WILL INCLUDE THE REPAIR OF MEASURES DAMAGED BY ANY SUBCONTRACTOR, INCLUDING THOSE OF THE PUBLIC UTILITY COMPANIES. AT THE PRECONSTRUCTION MEETING, THE CONTRACTOR WILL SUPPLY THE COUNTY OF ROANOKE WITH THE NAME OF THE INDIVIDUAL WHO WILL BE RESPONSIBLE FOR ENSURING MAINTENANCE OF INSTALLED MEASURES ON A DAILY BASIS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LEAVE THE SITE ADEQUATELY PROTECTED AGAINST EROSION, SEDIMENTATION, OR ANY DAMAGE TO ANY ADJACENT PROPERTY AT THE END OF EACH DAY'S WORK.</p> <p>7. SURFACE FLOWS OVER CUT AND FILL SLOPES SHALL BE CONTROLLED BY EITHER REDIRECTING FLOWS FROM TRANSVERSING THE SLOPES OR BY INSTALLING MECHANICAL DEVICES TO SAFELY LOWER WATER DOWNSLOPE WITHOUT CAUSING EROSION. IN NO CASE DURING CONSTRUCTION SHALL WATER RUNOFF BE DIVERTED OR ALLOWED TO FLOW TO LOCATIONS WHERE ADEQUATE PROTECTION HAS NOT BEEN PROVIDED.</p> <p>8. THE APPROVING AUTHORITY MAY ADD TO, DELETE, RELOCATE, CHANGE, OR OTHERWISE MODIFY CERTAIN EROSION AND SEDIMENT CONTROL MEASURES WHERE FIELD CONDITIONS ARE ENCOUNTERED THAT WARRANT SUCH MODIFICATIONS.</p> <p>9. SEDIMENT CONTROL MEASURES MAY REQUIRE MINOR FIELD ADJUSTMENTS AT THE TIME OF CONSTRUCTION TO ENSURE THEIR INTENDED PURPOSE ARE ACCOMPLISHED. APPROVAL FROM CONSULTING ENGINEER AND ROANOKE COUNTY WILL BE REQUIRED FOR ALL DEVIATIONS FROM THE APPROVED PLANS.</p>	<p>EROSION AND SEDIMENT CONTROL NARRATIVE</p> <p>PROJECT DESCRIPTION: THE PURPOSE OF THIS PROJECT IS FOR THE CONSTRUCTION OF THE RESTORATION OF WOLF CREEK ALONG THE WOLF CREEK GREENWAY. WOLF CREEK WILL BE IMPROVED TO DECREASE THE AMOUNT OF STREAM BANK EROSION AND NUTRIENT LOADING OCCURRING IN THE CREEK AND PROTECT THE ADJACENT PARK. THE LIMIT OF DISTURBANCE IS 2.08 ACRES AND A VSMP PERMIT AND SWPP HAVE BEEN PREPARED FOR THE PROJECT.</p> <p>EXISTING SITE CONDITIONS: THE EXISTING SITE IS A STREAM THAT RUNS ALONG WOLF CREEK GREENWAY. THE CREEK SHOWS SIGNS OF EXTREME EROSION ALONG THE BANKS BORDERING THE GREENWAY. THE CREEK FLOWS SOUTHWEST WHERE IT FLOWS INTO ROANOKE RIVER DOWNSTREAM. THE ADJACENT GREENWAY DRAINAGE FLOWS INTO THE CREEK BY SHEET FLOW ALONG THE PROJECT.</p> <p>ADJACENT PROPERTY: THE CREEK FLOWS ALONG WOLF CREEK GREENWAY, AND IS BORDERED BY RESIDENTIAL PROPERTIES, TO THE NORTH AND SOUTH. THE CREEK FLOWS TO THE SOUTHWEST THROUGH THE END OF THE PROJECT.</p> <p>OFF-SITE AREAS: THE G.C. SHALL NOTIFY ROANOKE COUNTY OF ANY FILL OR BORROW AREAS ASSOCIATED WITH THE PROJECT PRIOR TO TRANSPORT OF ANY MATERIAL. AN ESC PLAN OR MEASURES MAY BE REQUIRED FOR THESE AREAS.</p> <p>SOILS: THE SURFACE OF ROANOKE COUNTY AND THE CITIES OF ROANOKE AND SALEM, VIRGINIA AS PREPARED BY THE UNITED STATES DEPARTMENT OF AGRICULTURE IDENTIFIES THE ON-SITE SOILS AS SODIN LOAM CLASS C, HAYESVILLE-URBAN LAND COMPLEX CLASS C, AND HAYESVILLE FINE SANDY LOAM CLASS D.</p> <p>CRITICAL EROSION AREAS: THE ENTIRE SITE IS A CRITICAL EROSION AREA. THE G.C. SHALL ENSURE THAT SEDIMENT SHOULD BE HAULED OFF-SITE.</p> <p>EROSION AND SEDIMENT CONTROL MEASURES: UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE CONSTRUCTED AND MAINTAINED ACCORDING TO THE MINIMUM STANDARDS AND SPECIFICATIONS OF THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, THIRD EDITION" (VESCH). THE MINIMUM STANDARDS OF THE VESCH SHALL BE ADHERED TO UNLESS OTHERWISE DIRECTED BY THE LOCAL PROGRAM ADMINISTRATOR.</p> <p>STRUCTURAL</p> <p>CONSTRUCTION ENTRANCE-STD: 3.02... A STONE PAD, LOCATED AT POINTS OF VEHICULAR INGRESS AND EGRESS ON THE CONSTRUCTION SITE, TO REDUCE THE SOIL TRANSPORTED ONTO PUBLIC ROADS AND OTHER PAVED AREAS.</p> <p>SILT FENCE-STD: 3.05... A TEMPORARY BARRIER CONSTRUCTED ALONG THE PERIMETER OF THE DISTURBED AREA AS REQUIRED TO INTERCEPT AND DETAIN SEDIMENT.</p> <p>CULVERT INLET PROTECTION-STD: 3.08... A SEDIMENT FILTER LOCATED AT THE INLET TO STORM SEWER CULVERTS TO PREVENT SEDIMENT FROM ENTERING, ACCUMULATING IN AND BEING TRANSFERRED BY A CULVERT.</p> <p>TEMPORARY CULVERT CROSSING-STD: 3.24... A TEMPORARY STRUCTURAL SPAN INSTALLED ACROSS A FLOWING WATERCOURSE FOR USE BY CONSTRUCTION TRAFFIC. STRUCTURES MAY INCLUDE BRIDGES, ROUND PIPES, PIPE ARCHES, OR OVAL PIPES TO PREVENT SEDIMENT GENERATED BY CONSTRUCTION TRAFFIC FROM GETTING SEDIMENT IN RUNOFF.</p> <p>SPECIAL SEDIMENT BAG... A TEMPORARY SETTLING AND FILTERING DEVICE FOR WATER WHICH IS DISCHARGED FOR DEWATERING ACTIVITIES TO FILTER SEDIMENT-LADEN WATER PRIOR TO THE WATER BEING DISCHARGED OFF-SITE.</p> <p>PUMP-AROUND/DIVERSION... A TEMPORARY PUMPING SETUP TO DIVERT WATER AROUND IN-CHANNEL WORK TO PREVENT WATER FROM BECOMING SEDIMENT-LADEN.</p>	<p>EROSION AND SEDIMENT CONTROL MAINTENANCE SCHEDULE:</p> <p>IN GENERAL, ALL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CHECKED DAILY AND AFTER EACH SIGNIFICANT RAINFALL. THE FOLLOWING ITEMS WILL BE CHECKED IN PARTICULAR:</p> <ol style="list-style-type: none"> 1. THE CONSTRUCTION ENTRANCE WILL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OF MUD ONTO PUBLIC ROADS-OF-WAY. THIS WILL REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR THE WASHING AND REWORKING OF EXISTING SITES AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY STRUCTURES USED TO TRAP SEDIMENT. ALL MATERIAL SPILLED, DROPPED, WASHED, OR TRACKED FROM VEHICLES ONTO ROADWAYS OR INTO STORM DRAINS WILL BE REMOVED IMMEDIATELY. 2. THE SILT FENCE BARRIER WILL BE CHECKED REGULARLY FOR UNDERMINING OR DEGRADATION OF THE FABRIC. SEDIMENT SHALL BE REMOVED WHEN THE LEVEL OF SEDIMENT DEPOSITION REACHES HALF WAY TO THE TOP OF THE BARRIER. 3. GRATE AND CURB INLET PROTECTIONS SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED. SEDIMENT SHALL BE REMOVED AND THE INLET PROTECTIONS SHALL BE RESTORED TO ITS ORIGINAL DIMENSIONS. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT WILL NOT ERODE. INLET PROTECTION SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE REMAINING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED. 4. OUTLET PROTECTION SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED. 5. ALL SOIL STABILIZATION BLANKETS AND MATTING SHALL BE INSPECTED PERIODICALLY FOLLOWING INSTALLATION, PARTICULARLY AFTER RAINSTORMS TO CHECK FOR EROSION AND UNDERMINING. ANY DISLOCATION OR FAILURE SHOULD BE REPAIRED IMMEDIATELY. IF WASHOUTS OR BREAKAGE OCCURS, REINSTALL THE MATERIAL AFTER REPAIRING DAMAGE TO THE SLOPE OR DITCH. CONTINUE TO MONITOR THESE AREAS UNTIL WHICH TIME THEY BECOME PERMANENTLY STABILIZED; AT THAT TIME AN ANNUAL INSPECTION SHALL BE ADEQUATE. 6. TEMPORARY AND PERMANENT SEDIMENT AREAS SHALL BE INSPECTED TO DETERMINE IF AREAS ARE PRESENT WHERE PLANTS HAVE NOT GERMINATED OR HAVE DIED. THESE AREAS MUST BE RESEED IMMEDIATELY TO PREVENT EROSION DAMAGE. 7. ALL MULCHES AND SOIL COVERINGS SHALL BE INSPECTED PERIODICALLY (PARTICULARLY AFTER RAINSTORMS) TO CHECK FOR EROSION, WHERE EROSION IS OBSERVED IN MULCHED AREAS, ADDITIONAL MULCH SHOULD BE APPLIED. INSPECTIONS SHALL TAKE PLACE UP UNTIL GRASSES ARE FIRMLY ESTABLISHED. 																														
<p>Virginia Erosion and Sediment Control Plan Minimum Standards (MS) Checklist</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;">Yes</th> <th style="width: 5%;">N/A</th> <th style="width: 90%;">4VAC50-30-40 Minimum Standards</th> <th style="width: 10%;">Describe how MS is addressed on plan</th> </tr> </thead> <tbody> <tr> <td>X</td> <td></td> <td>MS16: Underground utility lines shall be installed in accordance with the following standards in addition to other applicable criteria: <ul style="list-style-type: none"> a. No more than 500 linear feet of trench may be opened at one time. b. Excavated material shall be placed on the uphill side of trenches. c. Effluent from dewatering operations shall be filtered or passed through an approved sediment trapping device, or both, and discharged in a manner that does not adversely affect flowing streams or off-site property. d. Material used for backfilling trenches shall be properly compacted in order to minimize erosion and promote stabilization. e. Restabilization shall be accomplished in accordance with this chapter. f. Applicable safety chapters shall be complied with. </td> <td>N/A</td> </tr> <tr> <td>X</td> <td></td> <td>MS17: Where construction vehicle access routes intersect paved or public roads, provisions shall be made to minimize the transport of sediment by vehicular tracking onto the paved surface. Where sediment is transported onto a paved or public road surface, the road surface shall be cleaned thoroughly at the end of each day. Sediment shall be removed from the roads by shoveling or sweeping and transported to a sediment control disposal area. Street washing shall be allowed only after sediment is removed in this manner. This provision shall apply to individual development lots as well as to larger land-disturbing activities.</td> <td>SHOWN ON SHEETS EC-1, EC-3 AND EC-4</td> </tr> <tr> <td>X</td> <td></td> <td>MS18: All temporary erosion and sediment control measures shall be removed within 30 days after final site stabilization or after the temporary measures are no longer needed, unless otherwise authorized by the VESCP authority. Trapped sediment and the disturbed soil areas resulting from the disposition of temporary measures shall be permanently stabilized to prevent further erosion and sedimentation.</td> <td>ADDRESSED IN THE EROSION AND SEDIMENT CONTROL NARRATIVE AND NOTES THIS SHEET</td> </tr> <tr> <td>X</td> <td></td> <td>MS19: Properties and waterways downstream from development sites shall be protected from sediment deposition, erosion and damage due to increases in volume, velocity and peak flow rate of stormwater runoff for the stated frequency storm of 24-hour duration in accordance with the following standards and criteria. Stream restoration and relocation projects that incorporate natural channel design concepts are not man-made channels and shall be exempt from any flow rate capacity and velocity requirements for natural or man-made channels: <ul style="list-style-type: none"> a. Concentrated stormwater runoff leaving a development site shall be discharged directly into an adequate natural or man-made receiving channel, pipe or storm sewer system. For those sites where runoff is discharged into a pipe or pipe system, downstream stability analyses at the outfall of the pipe or pipe system shall be performed. b. Adequacy of all channels and pipes shall be verified in the following manner: <ol style="list-style-type: none"> 1) The applicant shall demonstrate that the total drainage area to the point of analysis within the channel is one hundred times greater than the contributing drainage area of the project in question; 2) (a) Natural channels shall be analyzed by the use of a two-year storm to verify that stormwater will not overtop channel banks nor cause erosion of channel bed or banks. (b) All previously constructed man-made channels shall be analyzed by the use of a ten-year storm to verify that stormwater will not overtop its banks and by the use of a two-year storm to demonstrate that stormwater will not cause erosion of channel bed or banks; and (c) Pipes and storm sewer systems shall be analyzed by the use of a ten-year storm to verify that stormwater will be contained within the pipe or system. c. If existing natural receiving channels or previously constructed man-made channels or pipes are not adequate, the applicant shall: <ol style="list-style-type: none"> 1) Improve the channels to a condition where a ten-year storm will not overtop the banks and a two-year storm will not cause erosion to the bed or banks; or 2) Improve the pipe or pipe system to a condition where the ten-year storm is contained within the appurtenances; 3) Develop a site design that will not cause the pre-development peak runoff rate from a two-year storm to increase when runoff outfalls into a natural channel or will not cause the predevelopment peak runoff rate from a ten-year storm to increase when runoff outfalls into a manmade channel; or 4) Provide a combination of channel improvement, stormwater detention or other measures which is satisfactory to the VESCP authority to prevent downstream erosion. d. The applicant shall provide evidence of permission to make the improvements. e. All hydrologic analyses shall be based on the existing watershed characteristics and the ultimate development condition of the subject project. f. If the applicant chooses an option that includes stormwater detention, he shall obtain approval from the VESCP of a plan for maintenance of the detention facilities. The plan shall set forth the maintenance requirements of the facility and the person responsible for performing the maintenance. g. Outfall from a detention facility shall be discharged to a receiving channel, and energy dissipators shall be placed at the outfall of all detention facilities as necessary to provide a stabilized transition from the facility to the receiving channel. h. All on-site channels must be verified to be adequate. i. Increased volumes of sheet flows that may cause erosion or sedimentation on adjacent property shall be diverted to a stable outlet, adequate channel, pipe or pipe system, or to a detention facility. j. In applying these stormwater management criteria, individual lots or parcels in a residential, commercial or industrial development shall not be considered to be separate development projects. Instead, the development, as a whole, shall be considered to be a single development project. Hydrologic parameters that reflect the ultimate development condition shall be used in all engineering calculations. k. All measures used to protect properties and waterways shall be employed in a manner which minimizes impacts on the physical, chemical and biological integrity of rivers, streams and other waters of the state. l. Any plan approved prior to July 1, 2014, that provides for stormwater management that addresses any flow rate capacity and velocity requirements for natural or man-made channels shall satisfy the flow rate capacity and velocity requirements for natural or man-made channels if the practices are designed to detain the water quality volume and to release it over 48 hours; ii. detain and release over a 24-hour period the expected rainfall resulting from the one year, 24-hour storm; and iii. reduce the allowable peak flow rate resulting from the 1.5, 2, and 10-year, 24-hour storms to a level that is less than or equal to the peak flow rate from the site assuming it was in a good forested condition, achieved through multiplication of the forested peak flow rate by a reduction factor that is equal to the runoff volume from the site when it was in a good forested condition divided by the runoff volume from the site in its proposed condition, and shall be exempt from any flow rate capacity and velocity requirements for natural or man-made channels as defined in any regulations promulgated pursuant to § 10.1-562 or 10.1-570 of the Act. m. For plans approved on and after July 1, 2014, the flow rate capacity and velocity requirements of § 10.1-561 A of the Act and this subsection shall be satisfied by compliance with water quantity requirements in the Stormwater Management Act (§ 10.1-603.2 et seq. of the Code of Virginia) and attendant regulations, unless such land-disturbing activities are in accordance with 4VAC50-40-48 of the Virginia Stormwater Management Program (V SMP) Permit Regulations. n. Compliance with the water quantity minimum standards set out in 4VAC50-60-66 of the Virginia Stormwater Management Program (V SMP) Permit Regulations shall be deemed to satisfy the requirements of Minimum Standard 19. </td> <td>N/A</td> </tr> </tbody> </table>			Yes	N/A	4VAC50-30-40 Minimum Standards	Describe how MS is addressed on plan	X		MS16: Underground utility lines shall be installed in accordance with the following standards in addition to other applicable criteria: <ul style="list-style-type: none"> a. 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All hydrologic analyses shall be based on the existing watershed characteristics and the ultimate development condition of the subject project. f. If the applicant chooses an option that includes stormwater detention, he shall obtain approval from the VESCP of a plan for maintenance of the detention facilities. The plan shall set forth the maintenance requirements of the facility and the person responsible for performing the maintenance. g. Outfall from a detention facility shall be discharged to a receiving channel, and energy dissipators shall be placed at the outfall of all detention facilities as necessary to provide a stabilized transition from the facility to the receiving channel. h. All on-site channels must be verified to be adequate. i. Increased volumes of sheet flows that may cause erosion or sedimentation on adjacent property shall be diverted to a stable outlet, adequate channel, pipe or pipe system, or to a detention facility. j. In applying these stormwater management criteria, individual lots or parcels in a residential, commercial or industrial development shall not be considered to be separate development projects. Instead, the development, as a whole, shall be considered to be a single development project. Hydrologic parameters that reflect the ultimate development condition shall be used in all engineering calculations. k. All measures used to protect properties and waterways shall be employed in a manner which minimizes impacts on the physical, chemical and biological integrity of rivers, streams and other waters of the state. l. Any plan approved prior to July 1, 2014, that provides for stormwater management that addresses any flow rate capacity and velocity requirements for natural or man-made channels shall satisfy the flow rate capacity and velocity requirements for natural or man-made channels if the practices are designed to detain the water quality volume and to release it over 48 hours; ii. detain and release over a 24-hour period the expected rainfall resulting from the one year, 24-hour storm; and iii. reduce the allowable peak flow rate resulting from the 1.5, 2, and 10-year, 24-hour storms to a level that is less than or equal to the peak flow rate from the site assuming it was in a good forested condition, achieved through multiplication of the forested peak flow rate by a reduction factor that is equal to the runoff volume from the site when it was in a good forested condition divided by the runoff volume from the site in its proposed condition, and shall be exempt from any flow rate capacity and velocity requirements for natural or man-made channels as defined in any regulations promulgated pursuant to § 10.1-562 or 10.1-570 of the Act. m. For plans approved on and after July 1, 2014, the flow rate capacity and velocity requirements of § 10.1-561 A of the Act and this subsection shall be satisfied by compliance with water quantity requirements in the Stormwater Management Act (§ 10.1-603.2 et seq. of the Code of Virginia) and attendant regulations, unless such land-disturbing activities are in accordance with 4VAC50-40-48 of the Virginia Stormwater Management Program (V SMP) Permit Regulations. n. Compliance with the water quantity minimum standards set out in 4VAC50-60-66 of the Virginia Stormwater Management Program (V SMP) Permit Regulations shall be deemed to satisfy the requirements of Minimum Standard 19. 	N/A										
Yes	N/A	4VAC50-30-40 Minimum Standards	Describe how MS is addressed on plan																													
X		MS16: Underground utility lines shall be installed in accordance with the following standards in addition to other applicable criteria: <ul style="list-style-type: none"> a. No more than 500 linear feet of trench may be opened at one time. b. Excavated material shall be placed on the uphill side of trenches. c. Effluent from dewatering operations shall be filtered or passed through an approved sediment trapping device, or both, and discharged in a manner that does not adversely affect flowing streams or off-site property. d. Material used for backfilling trenches shall be properly compacted in order to minimize erosion and promote stabilization. e. Restabilization shall be accomplished in accordance with this chapter. f. Applicable safety chapters shall be complied with. 	N/A																													
X		MS17: Where construction vehicle access routes intersect paved or public roads, provisions shall be made to minimize the transport of sediment by vehicular tracking onto the paved surface. Where sediment is transported onto a paved or public road surface, the road surface shall be cleaned thoroughly at the end of each day. Sediment shall be removed from the roads by shoveling or sweeping and transported to a sediment control disposal area. Street washing shall be allowed only after sediment is removed in this manner. This provision shall apply to individual development lots as well as to larger land-disturbing activities.	SHOWN ON SHEETS EC-1, EC-3 AND EC-4																													
X		MS18: All temporary erosion and sediment control measures shall be removed within 30 days after final site stabilization or after the temporary measures are no longer needed, unless otherwise authorized by the VESCP authority. Trapped sediment and the disturbed soil areas resulting from the disposition of temporary measures shall be permanently stabilized to prevent further erosion and sedimentation.	ADDRESSED IN THE EROSION AND SEDIMENT CONTROL NARRATIVE AND NOTES THIS SHEET																													
X		MS19: Properties and waterways downstream from development sites shall be protected from sediment deposition, erosion and damage due to increases in volume, velocity and peak flow rate of stormwater runoff for the stated frequency storm of 24-hour duration in accordance with the following standards and criteria. Stream restoration and relocation projects that incorporate natural channel design concepts are not man-made channels and shall be exempt from any flow rate capacity and velocity requirements for natural or man-made channels: <ul style="list-style-type: none"> a. Concentrated stormwater runoff leaving a development site shall be discharged directly into an adequate natural or man-made receiving channel, pipe or storm sewer system. For those sites where runoff is discharged into a pipe or pipe system, downstream stability analyses at the outfall of the pipe or pipe system shall be performed. b. 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<p>RESTORATION OF WOLF CREEK PHASE II</p> <p>CIVIL EROSION CONTROL NOTES AND LEGEND</p> <p>ROANOKE COUNTY, VIRGINIA</p>																																
<p>ACAD Rel: 24.2s (LMS Tech)</p> <p>File Name: N:\SW\Drawings\EC NOTES_LEGEND.dwg</p> <p>Last Saved: 7/16/2023 3:20 PM Saved By: 02298</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">No.</th> <th style="width: 10%;">ISSUE</th> <th style="width: 10%;">FAC. JOB NO.</th> <th style="width: 10%;">RNC: 19591</th> <th style="width: 10%;">DATE</th> <th style="width: 10%;">2/8/2023</th> <th style="width: 10%;">DESIGNED</th> <th style="width: 10%;">BMD</th> <th style="width: 10%;">DRAWN</th> <th style="width: 10%;">ECD</th> <th style="width: 10%;">REVIEWED</th> <th style="width: 10%;">CHECKED</th> <th style="width: 10%;">BMD</th> <th style="width: 10%;">FILE NAME</th> <th style="width: 10%;">EC NOTES-LEGEND.dwg</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> </tr> </tbody> </table>	No.	ISSUE	FAC. JOB NO.	RNC: 19591	DATE	2/8/2023	DESIGNED	BMD	DRAWN	ECD	REVIEWED	CHECKED	BMD	FILE NAME	EC NOTES-LEGEND.dwg	1															<p>VERIFICATION: Bar is one inch on original drawing, if not, one inch on this sheet, adjust scale.</p> <p>SEQ. 0</p> <p>EC-5</p> <p>ISSUED FOR REVIEW</p> <p>27 OF 30</p>
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COMMISSIONED BY
EMILY D. BROWN
LIC. NO. 0402065407
8/26/2024
Virginia Registered Professional Engineer

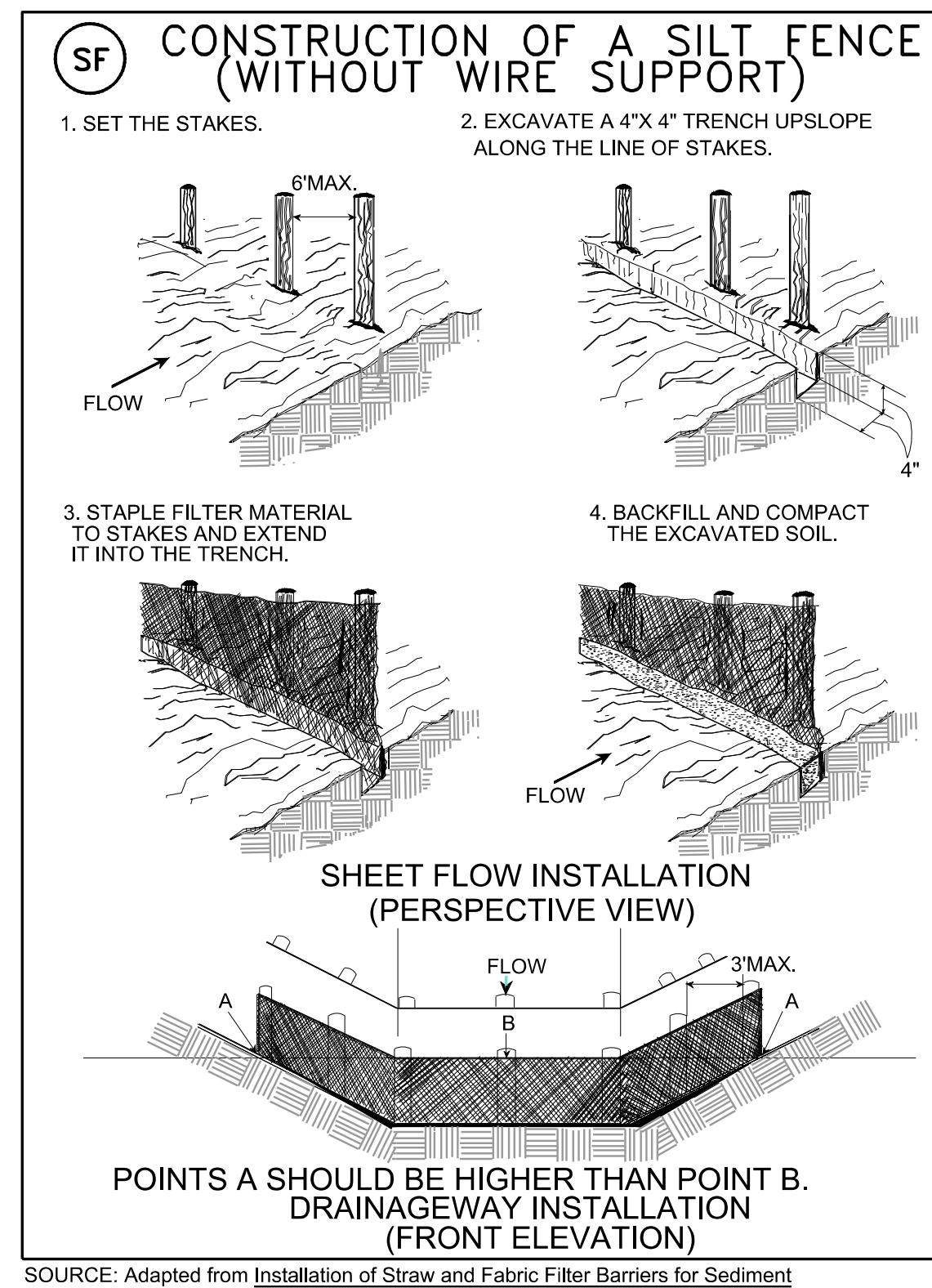


PLATE. 3.05-2

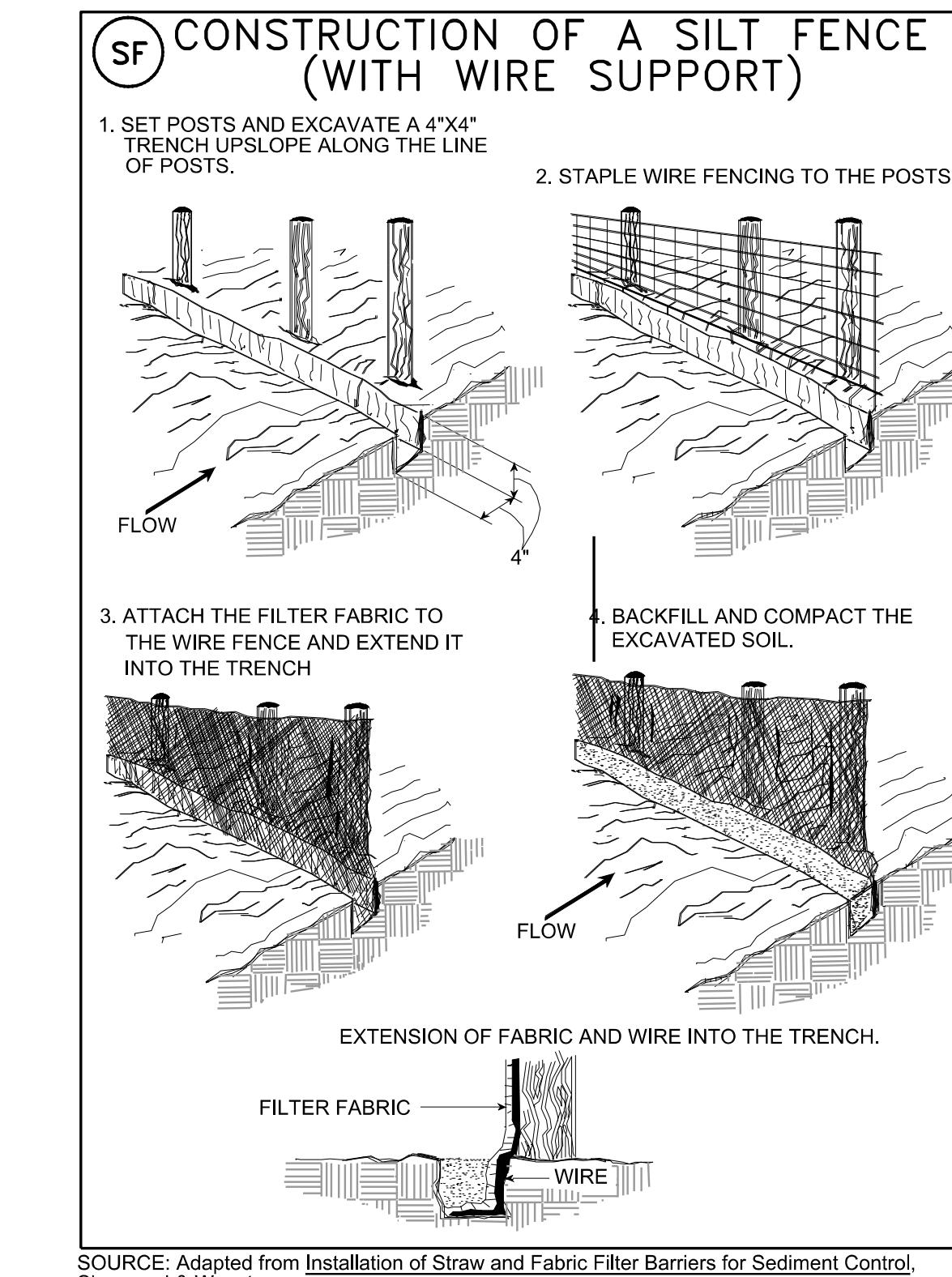


PLATE. 3.05-1

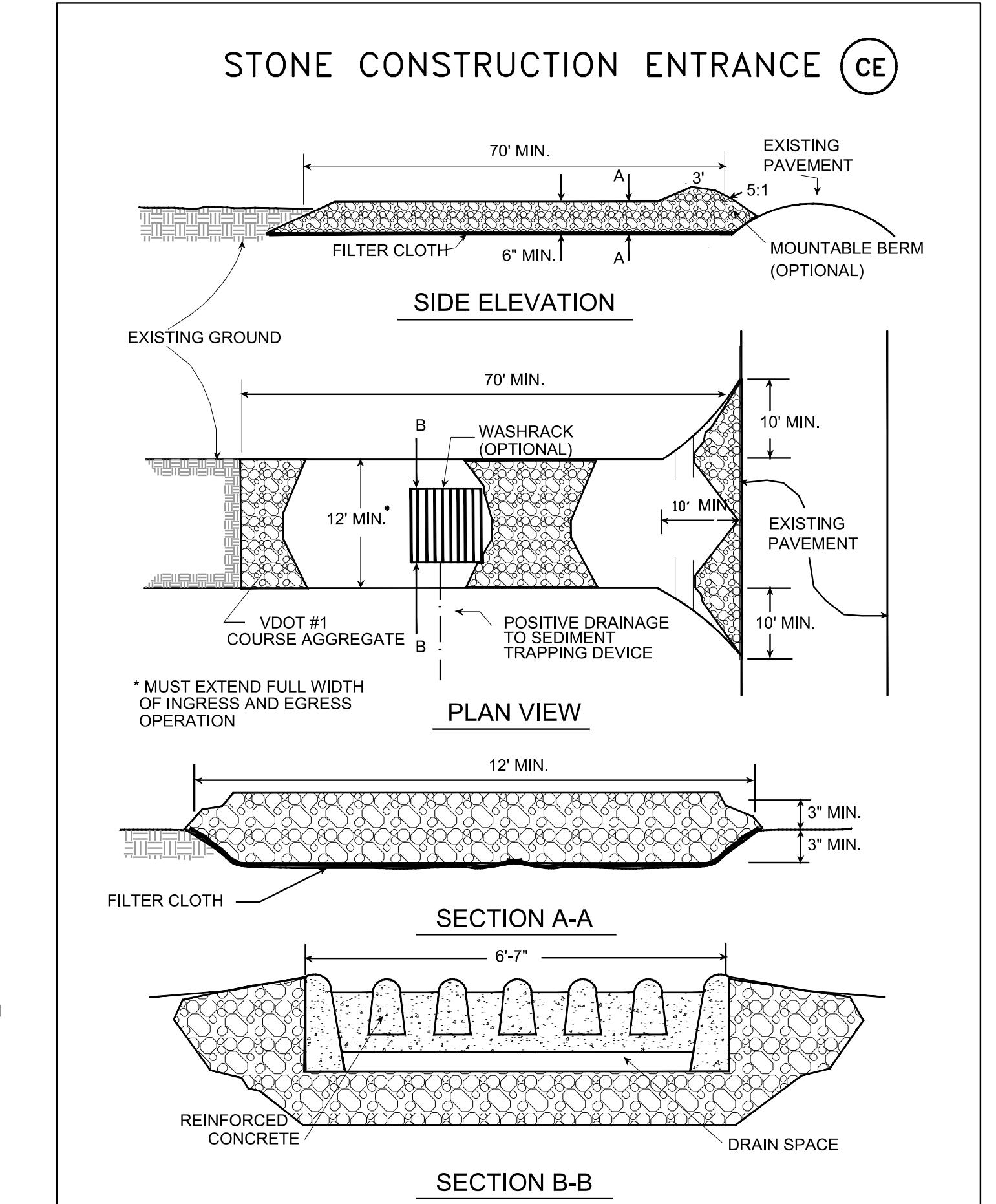


Plate 3.02-1

GENERAL EROSION AND SEDIMENT CONTROL NOTES

1. ALL SOIL EROSION & SEDIMENT CONTROL MEASURES SHALL BE ACCOMPLISHED IN STRICT ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS CONTAINED IN THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION.
2. THE APPROVING AUTHORITY MAY ADD TO, DELETE, RELOCATE, CHANGE, OR OTHERWISE MODIFY CERTAIN EROSION AND SEDIMENT CONTROL MEASURES WHERE FIELD CONDITIONS ARE ENCOUNTERED THAT WARRANT SUCH MODIFICATIONS.
3. ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES AS SHOWN ON THE PLAN SHALL BE PLACED IN ADVANCE OF THE WORK BEING PERFORMED, AS FAR AS PRACTICAL.
4. IN NO CASE DURING CONSTRUCTION SHALL WATER RUNOFF BE DIVERTED OR ALLOWED TO FLOW TO LOCATIONS WHERE ADEQUATE PROTECTION HAS NOT BEEN PROVIDED.
5. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LEAVE THE SITE ADEQUATELY PROTECTED AGAINST EROSION, SEDIMENTATION, OR ANY DAMAGE TO ANY ADJACENT PROPERTY AT THE END OF EACH DAY'S WORK.
6. FOR THE EROSION CONTROL KEY SYMBOLS SHOWN ON THE PLANS, REFER TO THE VIRGINIA UNIFORM CODING SYSTEM FOR EROSION AND SEDIMENT CONTROL PRACTICES CONTAINED IN THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION. THESE SYMBOLS AND KEYS ARE TO BE UTILIZED ON ALL EROSION CONTROL PLANS SUBMITTED TO ROANOKE COUNTY.

PS PERMANENT SEEDING MIXTURE

REFER TO THE HERBACEOUS PLANTING TABLE ON DT-8

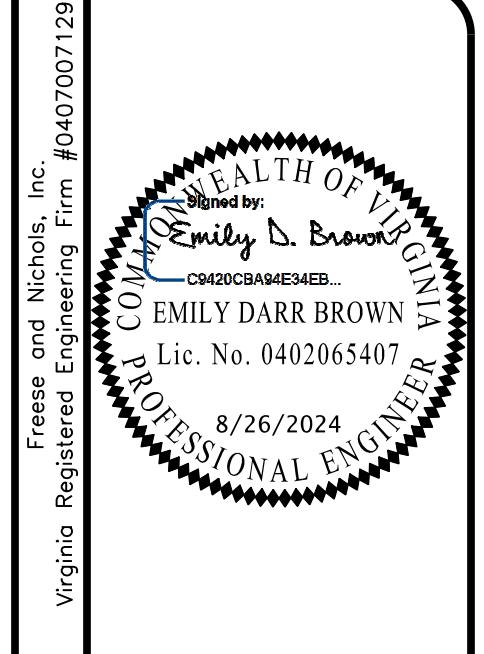
LIME: 140 LB / 1000 SF PULVERIZED AGRICULTURAL LIMESTONE
 FERTILIZER: 5-20-10 @ 25 LB / 1000 SF
 35-0-0 @ 7 LB / 1000 SF

MULCH: IF FREQUENT SHADING BE USED OVER ALL SEEDED AREAS AND SHALL BE APPLIED IN ACCORDANCE WITH SECTION 4.7 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION.

SOIL CONDITIONING:
 INCORPORATION OF LIME AND FERTILIZER, SELECTION OF CERTIFIED SEED, MULCHING, MAINTENANCE OF NEW SEEDLINGS, AND RESEEDING SHALL BE IN ACCORDANCE WITH SPECIFICATIONS CONTAINED WITHIN THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION. ADDITIONAL SEEDING TO BE PERFORMED AS REQUIRED BY THE INSPECTOR.

SEED APPLICATION: APPLY SEED UNIFORMLY WITH A CYCLONE SEEDER, DRILL, CULTIPACKER SEEDER, OR HYDROSEEDER ON A FIRM, FRIABLE, SEEDBED. MAXIMUM SEEDING DEPTH SHALL BE 1/4 INCH.

DISTURBED AREA TO BE PLANTED = 2.968 AC. = 129,286 SQ. FT.



FREESE
and NICHOLS

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Winston-Salem, NC 27101
Phone: (336) 790-6744
Web: www.freense.com

RESTORATION OF WOLF CREEK PHASE II

CIVIL
EROSION CONTROL
EROSION CONTROL DETAILS

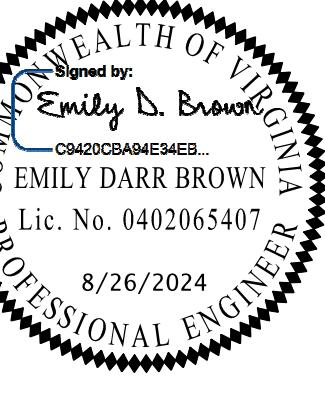
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VERIFY SCALE Bar is one inch on original drawing, if not one inch on this sheet, adjust scale.

EC-6

ISSUED FOR REVIEW

28 OF 30



Virginia Registered Engineering Firm #0407007129

COMMONWEALTH OF VIRGINIA
PROFESSIONAL ENGINEER
SIGNED BY: Emily D. Brown
C9420CBA94E34EB...
EMILY DARR BROWN
Lic. No. 0402065407
8/26/2024

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RESTORATION OF WOLF CREEK PHASE II

ON OF WOLF CREEK EROSION CONTROL DEPARTMENT

RESTORATION ER

RNC19591	DATE	2/8/2023
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	REVISED	CHECKED
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EEET
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29 OF 30

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The diagram illustrates a cross-section of a stone impervious dike. The structure is a trapezoidal embankment with a thick, upper layer of irregular stones labeled 'SURGE STONE'. Below this is a thinner layer labeled 'EROSION CONTROL STONE'. The base of the dike is labeled 'BASE OF STREAM'. On the left, a vertical line is labeled 'TOP OF BANK'. An arrow at the top indicates the direction of 'FLOW' moving upwards. The entire structure is labeled 'STONE IMPERVIOUS DIKE' at the bottom.

The diagram illustrates a temporary structure for crossing a stream. A pump hose is connected to a pump at the bottom left and runs along the ground surface to a discharge point. A 10'x10' non-woven geotextile bag with a minimum flow rate of 80 gal/min/s is placed over the pump hose at the discharge point. The discharge point is directed into a stream. The stream bed is covered with 8" of erosion control stone. The surrounding area is labeled 'EXISTING GROUND' and 'FLOOD PLAIN'. The discharge point is labeled 'DRAINAGE GEOTEXTILE'.

10'x10' NON-WOVEN GEOTEXTILE BAG WITH A MINIMUM FLOW RATE OF 80 GAL/MIN/SF

EXISTING GROUND

PUMP HOSE

DRAINAGE GEOTEXTILE

8" OF EROSION CONTROL STONE

ENSURE STABILIZED DISCHARGE TO CREEK

FLOOD PLAIN

STREAM

SPECIAL STILLING BASIN
SCALE: NTS

The diagram illustrates a cross-section of a stream bank protection. The base is labeled 'STREAM BED'. The bank is constructed of a permeable geotextile fabric (hatched pattern) and a permeable stone or aggregate layer (hexagonal pattern). A vertical dimension line indicates a height of '1' foot from the stream bed to the top of the stone layer. A horizontal dimension line indicates a minimum distance of '3' MIN.' between the top of the stone layer and the 'TOP OF BANK'. The top of the bank is marked with a hatched pattern. A vertical dimension line on the right side of the bank indicates a height of '1 2' feet from the stream bed to the top of the bank.

The diagram illustrates the cross-section of a Stone Impervious Dike. The top horizontal line represents the ground surface, with a vertical dimension of 3' MIN. A 2' MIN. vertical dimension is shown between the ground surface and the top of the stone wall. The stone wall is composed of a grid of hexagonal cells. The bottom horizontal line represents the base of the dike. A vertical dimension of 1' MIN. is shown between the base and the bottom of the stone wall. The stone wall is topped with a layer of Erosion Control Stone. The base of the dike is reinforced with Surge Stone. A layer of Impervious Fabric is positioned between the stone wall and the surge stone. Arrows indicate 'FLOW' moving through the dike structure. The diagram is labeled with 'STONE IMPERVIOUS DIKE PROFILE' at the bottom.

The diagram illustrates a sandbag dike structure. The top part shows a cross-section with labels: 'IMPERVIOUS FABRIC' at the top, 'SURGE STONE' on the left, 'FLOW' indicating water movement, 'CHANNEL BOTTOM' at the bottom, and 'SANDBAGS' forming the main wall. A vertical dimension line indicates a '3' MIN.' height for the sandbag wall. A horizontal dimension line indicates a '2' MIN.' distance from the top of the sandbags to the 'SECURE IMPERVIOUS FABRIC UNDER TOP LAYER OF SANDBAGS'. The bottom part shows a side view of the sandbag wall, with 'SANDBAGS' labeled on the right. A note at the bottom left states: 'THE STRUCTURE SHALL BE USED FOR DIVERTING AND PUMPING ONLY. THE STRUCTURE SHALL BE RELOCATED OR REMOVED ONCE PUMPING/DIVERTING IS COMPLETE.'

SANDBAG IMPERVIOUS
DIKE PROFILE

THE STRUCTURE SHALL BE USED FOR
DIVERTING AND PUMPING ONLY. THE
STRUCTURE SHALL BE RELOCATED OR
REMOVED ONCE PUMPING/DIVERTING IS
COMPLETE.

VARIABLES

CONSTRUCTION AREA (250' MAX)
(LOCATION VARIES WITHIN THE PUMP AROUND AREA)

IMPERVIOUS DIKE

STREAM Q

MAIN PUMP (BASEFLOW)

SEDIMENT PUMP AS REQUIRED

IMPERVIOUS DIKE SEE DETAIL

SPECIAL STILLING BASIN SEE DETAIL THIS SHEET

OUTFALL ONTO SURGE STONE OR BEDROCK

PERVIOUS TURBIDITY CURTAIN LOCATED AT A MINIMUM OF 100 FT DOWNSTREAM OF WORK AREA

NOTE:

1. CHANNEL SHALL BE MATTED WITH COIR FIBER MATTING PRIOR TO THE CLOSE OF EACH WORK DAY.

PUMP-AROUND DIVERSION PLANVIEW

PUMP-AROUND/PIPE DIVERSION

SCALE: NTS

IMPERVIOUS DIKE SCALE: NTS

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