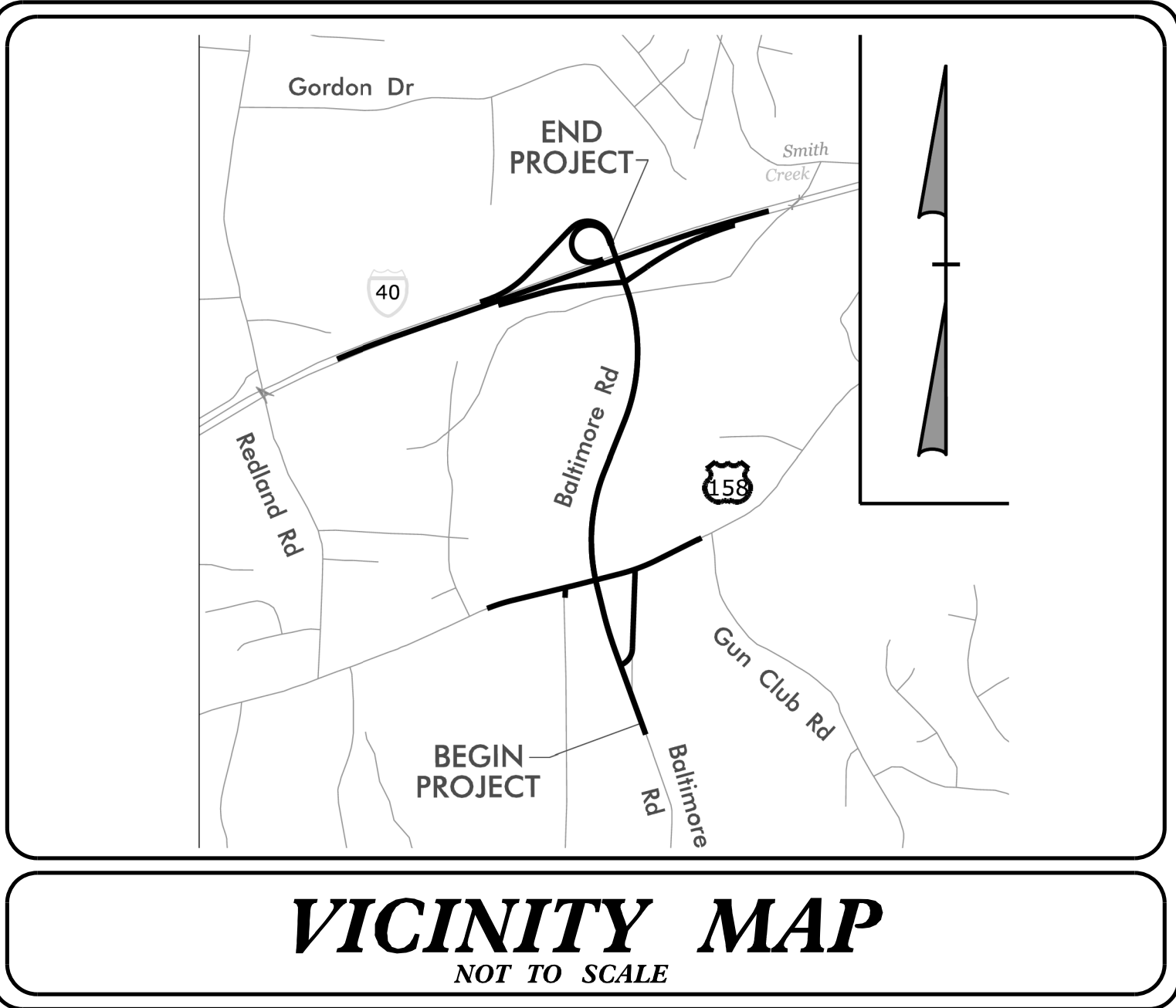


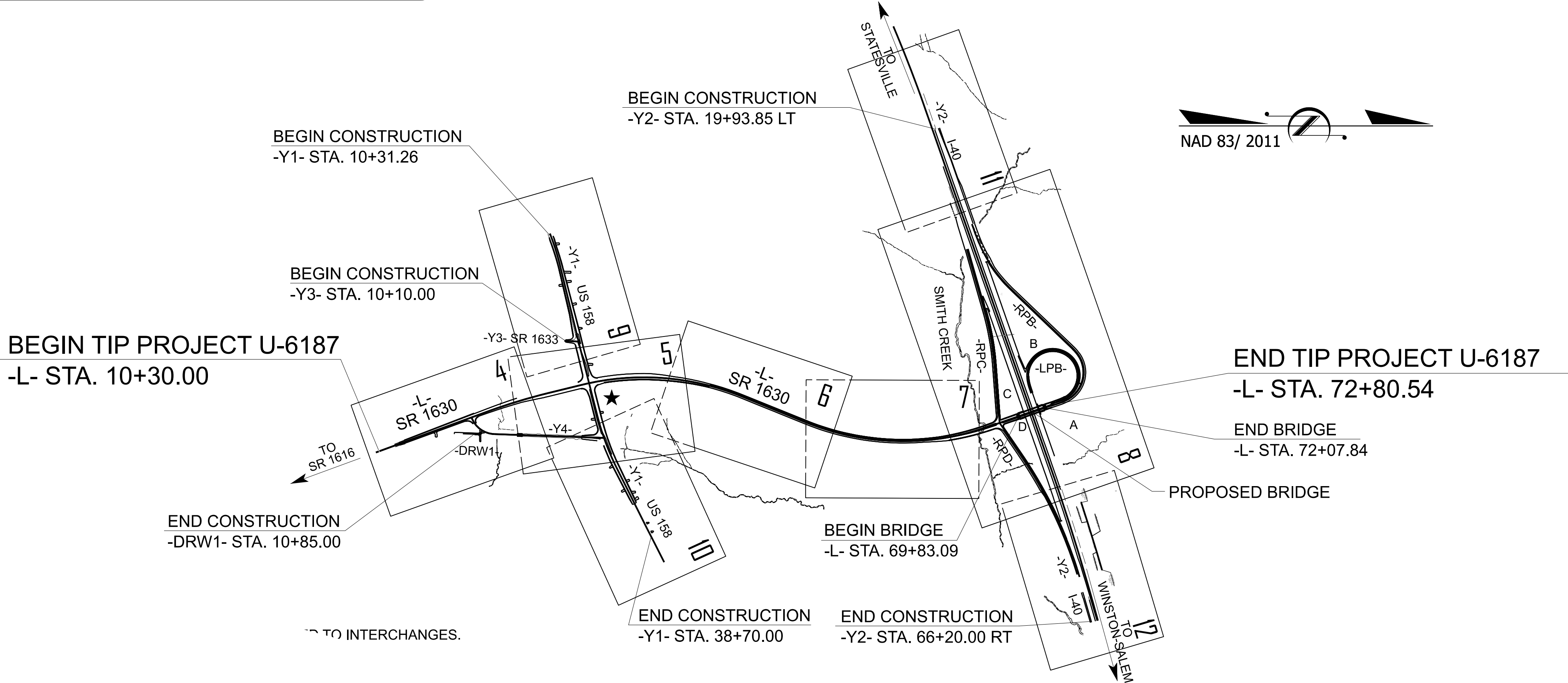
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N.C.	U-6187	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
48647.1.1		PE	

TIP PROJECT: U-6187

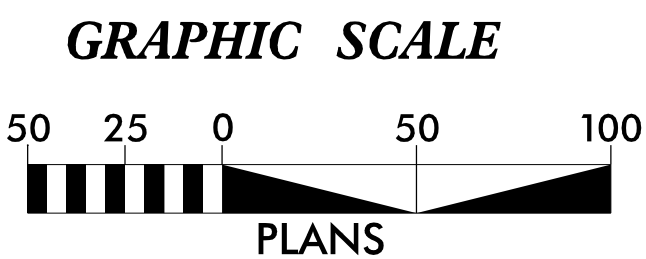


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL
DAVIE COUNTY

LOCATION: *REALIGNMENT AND EXTENSION OF SR 1630
(BALTIMORE ROAD) FROM SOUTH OF US 158
TO A NEW INTERCHANGE AT I-40*
TYPE OF WORK: *GRADING, PAVING, DRAINAGE, AND STRUCTURES*



THIS PROJECT CONTAINS
EROSION CONTROL PLANS
FOR CLEARING AND
GRUBBING PHASE OF
CONSTRUCTION.



THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY
WITH THE REGULATIONS SET FORTH BY THE
NCG-010000 GENERAL STORMWATER CONSTRUCTION PERMIT
ISSUED BY THE NORTH CAROLINA DEPARTMENT OF
ENVIRONMENTAL QUALITY DIVISION OF ENERGY,
MINERAL, AND LAND RESOURCES.



VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606



Prepared in the Office of:
VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

ERIC BERGER, PE
NAME

4036
LEVEL III CERTIFICATION NO.

Roadway Standard Drawings

The "Roadway Standard Drawings"- Roadway Design Unit - N. C.
Department of Transportation - Raleigh, N. C., dated January 2024
and the latest revision thereto are applicable to this project and by
reference hereby are considered a part of these plans.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

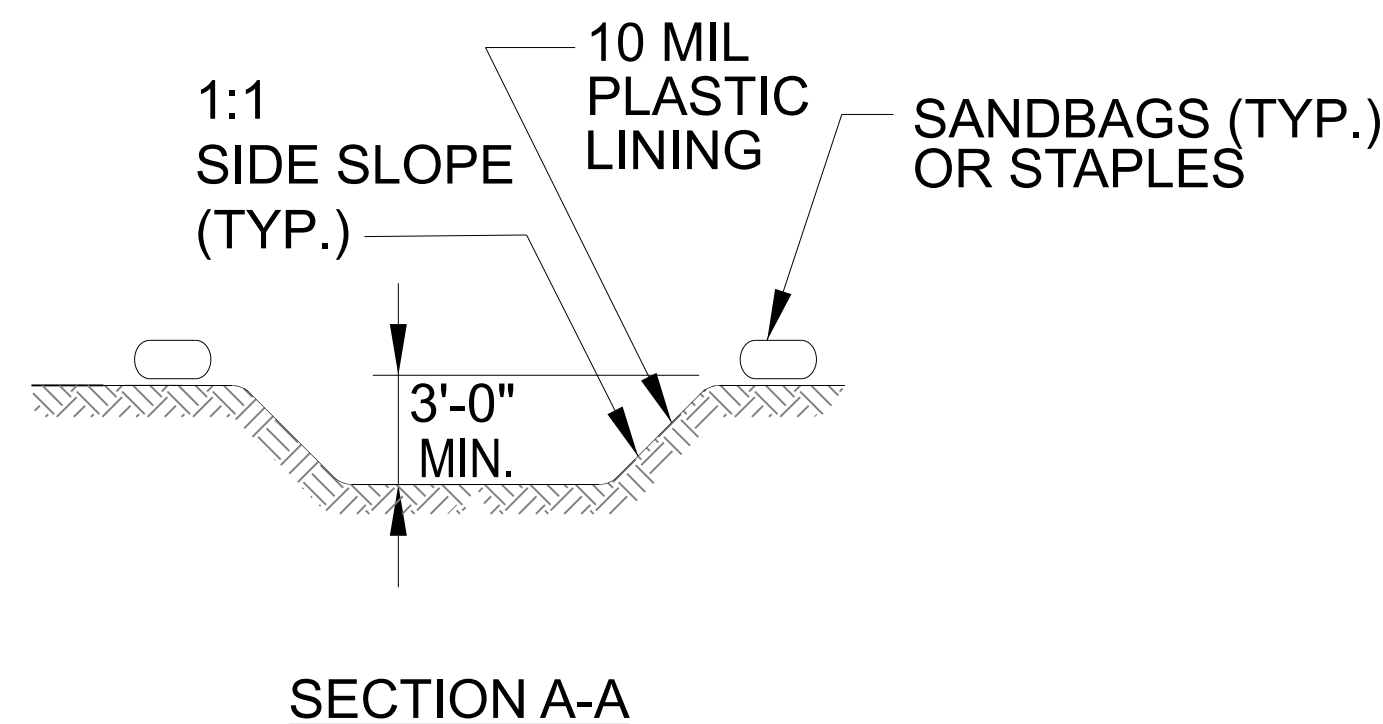
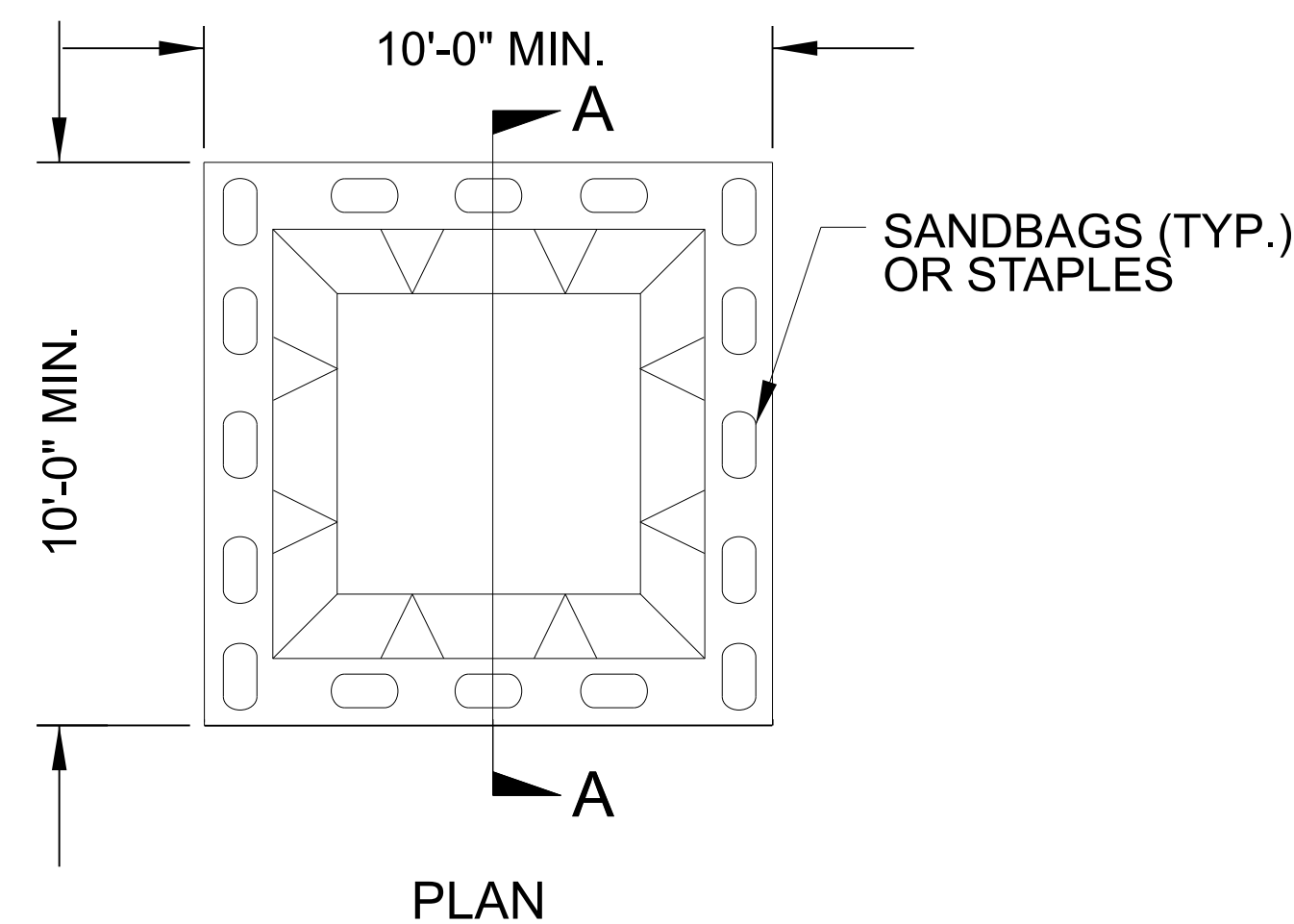
PROJECT REFERENCE NO.	SHEET NO.
U-6187	EC-2
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

EROSION & SEDIMENT CONTROL LEGEND

Std. #	Description	Symbol	Std. #	Description	Symbol
1605.01	Temporary Silt Fence		1633.01	Temporary Rock Silt Check Type A	
1606.01	Special Sediment Control Fence		1633.02	Temporary Rock Silt Check Type B	
1622.01	Temporary Berms and Slope Drains		1633.03	Temporary Rock Silt Check Type A with Excelsior Matting and Flocculant	
1630.02	Silt Basin Type B		1634.01	Temporary Rock Sediment Dam Type A	
1630.03	Temporary Silt Ditch		1634.02	Temporary Rock Sediment Dam Type B	
1630.04	Stilling Basin		1635.01	Rock Pipe Inlet Sediment Trap Type A	
1630.05	Temporary Diversion		1635.02	Rock Pipe Inlet Sediment Trap Type B	
1630.06	Special Stilling Basin		1636.01	Excelsior Wattle Check	
1630.07	Skimmer Basin		1636.01	Excelsior Wattle Check with Flocculant	
1630.08	Tiered Skimmer Basin		1636.01	Coir Fiber Wattle Check	
1630.09	Earthen Dam with Skimmer		1636.01	Coir Fiber Wattle Check with Flocculant	
	Infiltration Basin		1636.02	Silt Fence Excelsior Wattle Break	
	Rock Inlet Sediment Trap:			Silt Fence Coir Fiber Wattle Break	
1632.01	Type A		1636.03	Excelsior Wattle Barrier	
1632.02	Type B		1636.03	Coir Fiber Wattle Barrier	
1632.03	Type C				

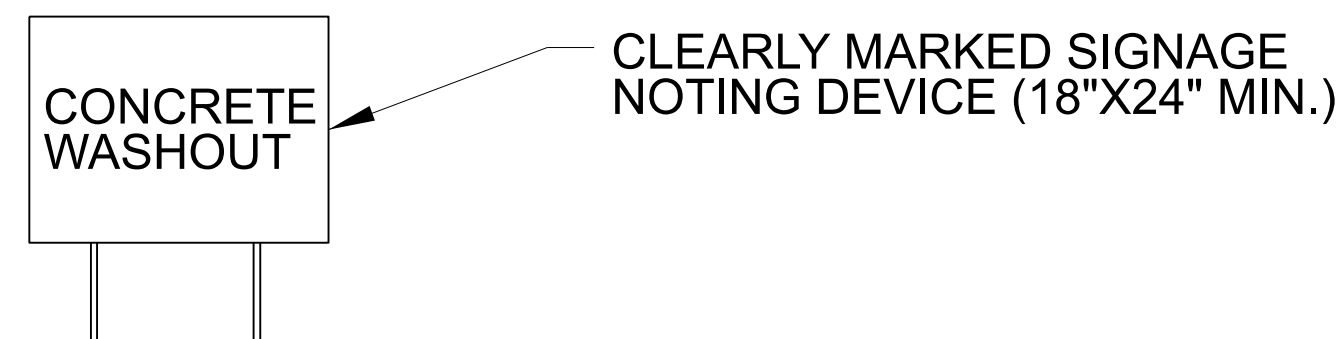
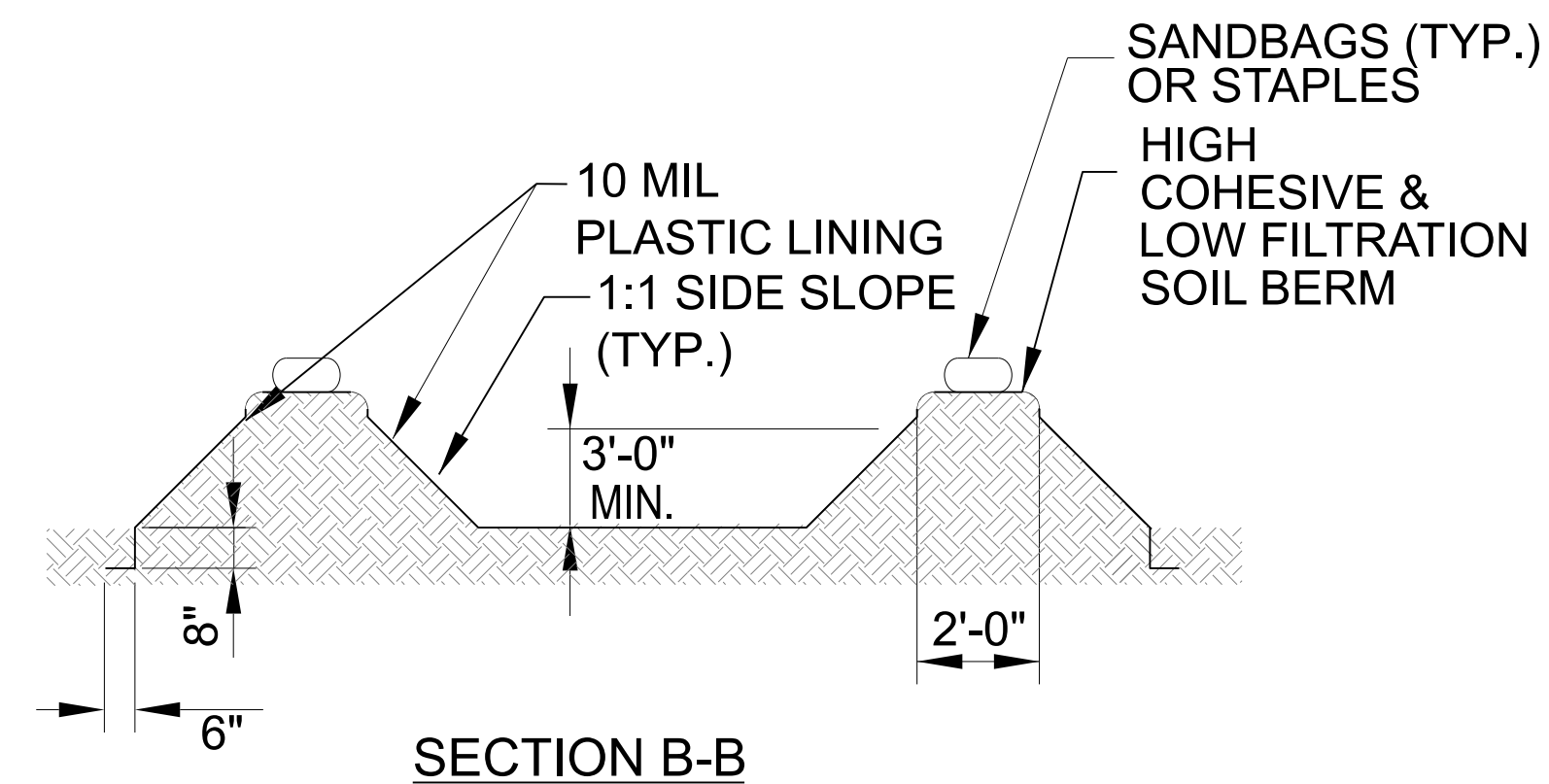
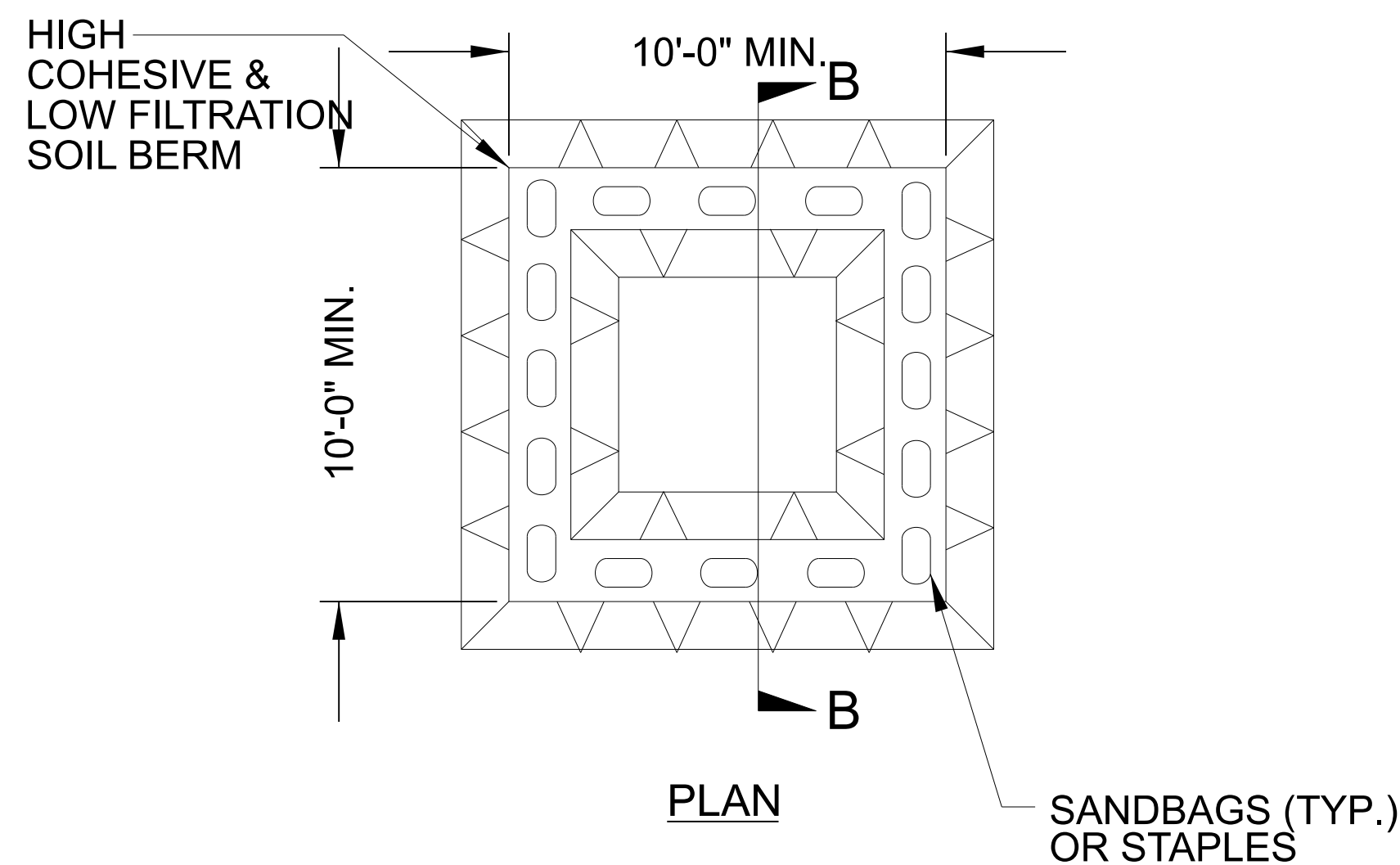
ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER

PROJECT REFERENCE NO.	SHEET NO.
<i>U-6187</i>	<i>EC-2A</i>
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



BELOW GRADE WASHOUT STRUCTURE
NOT TO SCALE

- NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD
 2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.
 3. CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY MARKED WITH SIGNAGE NOTING DEVICE.



ABOVE GRADE WASHOUT STRUCTURE
NOT TO SCALE

- NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD
 2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.
 3. CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY MARKED WITH SIGNAGE NOTING DEVICE.

PROJECT REFERENCE NO.	SHEET NO.
U-6187	EC-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 TO 4:1	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH WITH SLOPES STEEPER THAN 4:1. 7 DAYS FOR PERIMETER DIKES, SWALES, DITCHES PERIMETER SLOPES, AND HQW ZONES
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	7 DAYS FOR PERIMETER DIKES, SWALES, DITCHES PERIMETER SLOPES, AND HQW ZONES

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
<i>U-6187</i>	<i>EC-3A</i>
ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER	

SOIL STABILIZATION SUMMARY SHEET

EXCELSIOR MATTING FOR EROSION CONTROL

STRAW MATTING FOR EROSION CONTROL

[illegible][illegible]

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
<i>U-6187</i>	<i>EC-3B</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SOIL STABILIZATION SUMMARY SHEET

FILL SLOPE MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	L	15+85	26+15	RT	4335
4	Y4	10+50	12+10	LT	395
4	Y4	12+25	15+10	LT	1010
4	Y4	10+30	11+30	RT	310
4	Y4	12+40	14+20	RT	825
5	L	15+85	25+00	LT	3495
5	L	17+45	18+80	RT	385
5	L	19+50	24+80	RT	2070
7	L	59+05	69+74	LT	7500
7	L	59+05	69+74	RT	7955
8	Y2	25+50	50+20	LT	2660
8	LPB	13+00	15+20	LT	1790
8	RPB	16+50	23+00	RT	3885
8	RPB	15+15	30+90	LT	12540
8	LPB	10+10	22+10	RT	4930
8	RPC	20+70	25+30	LT	3255
8	RPC	20+00	25+89	RT	4000
8	RPD	17+75	25+32	RT	4550
8	L	72+09	73+04	LT	220
8	L	72+09	73+04	RT	210
10	Y1	30+00	33+11	RT	6460
			STRAW SUBTOTAL		5020
			EXCELSIOR SUBTOTAL		880
			FILL SLOPE SUBTOTAL		72780
			MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER		48455
				TOTAL	127135
				SAY	127135

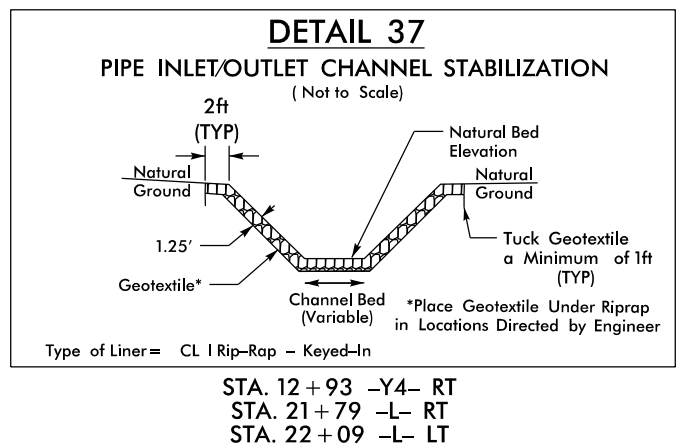
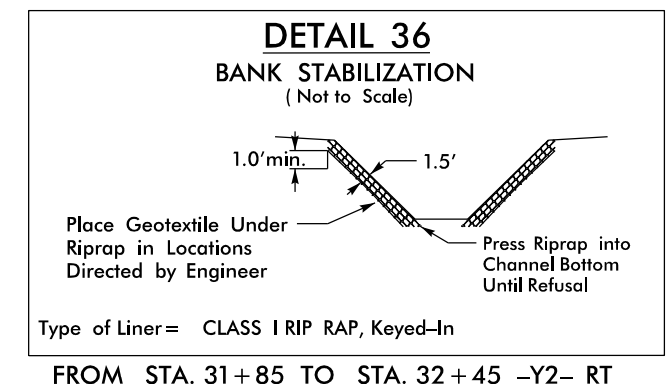
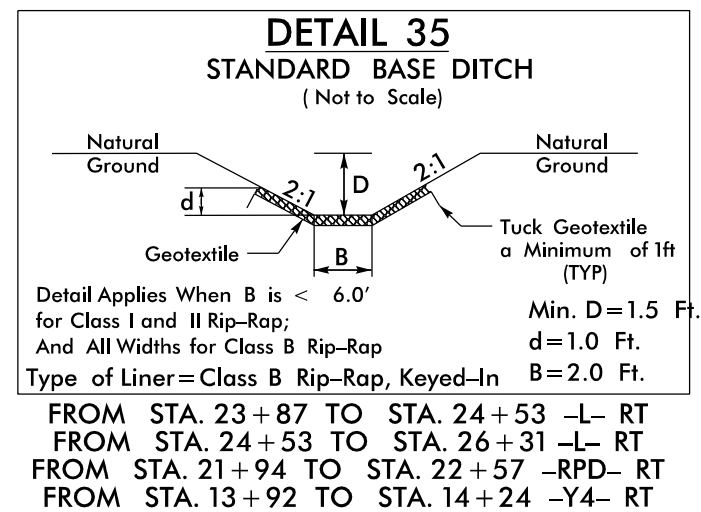
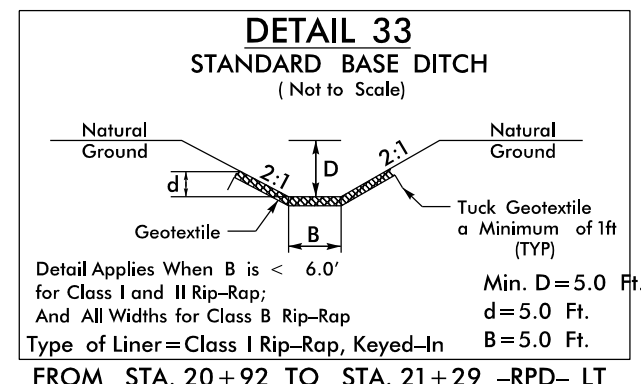
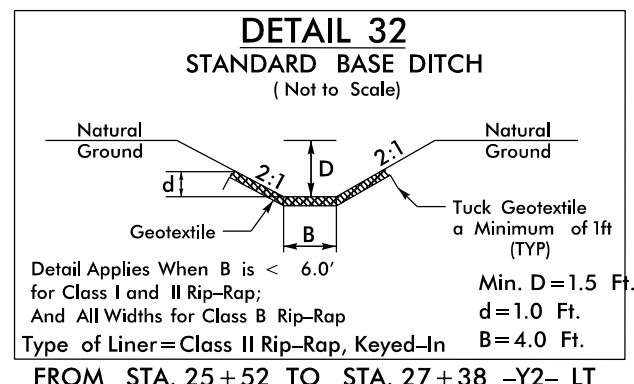
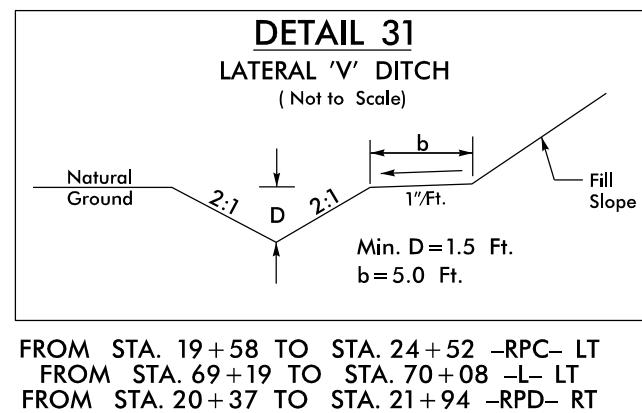
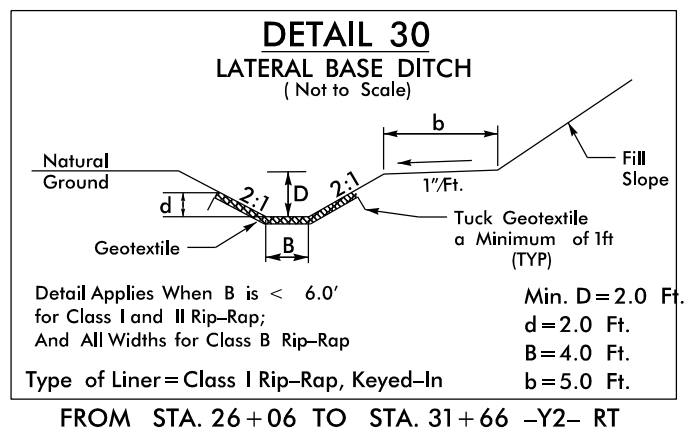
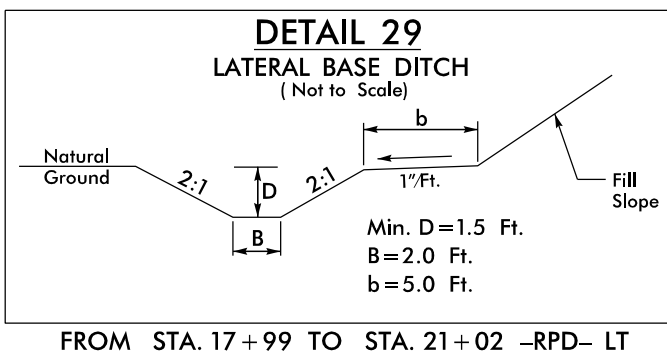
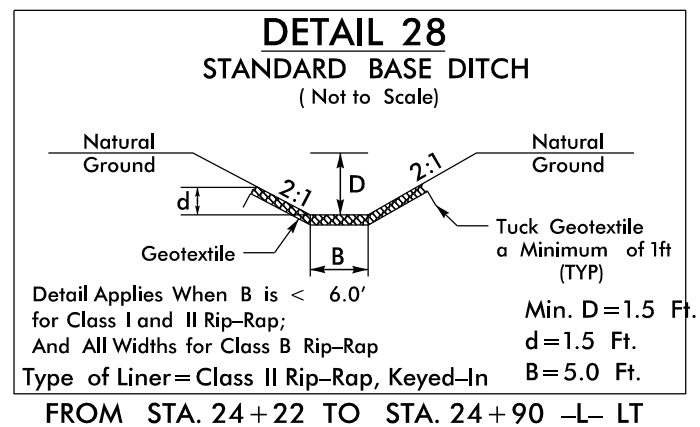
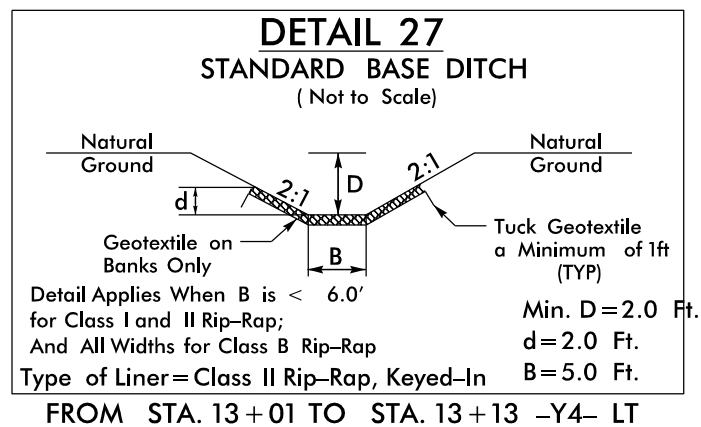
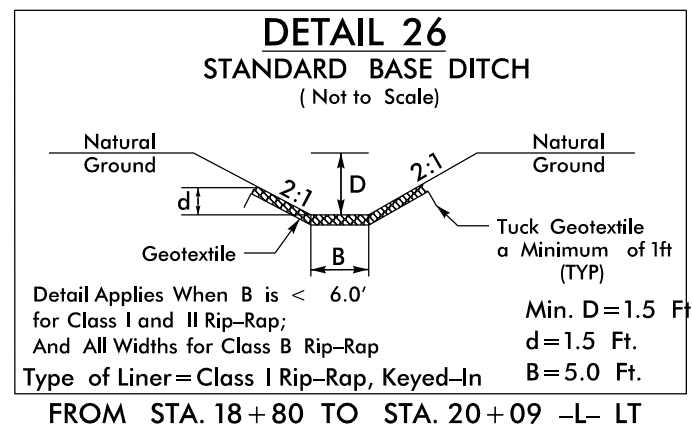
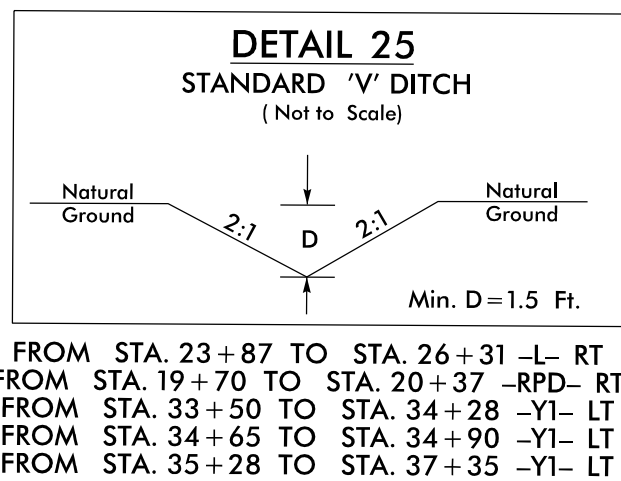
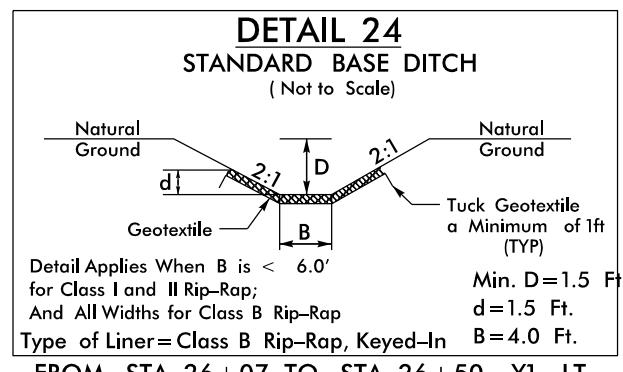
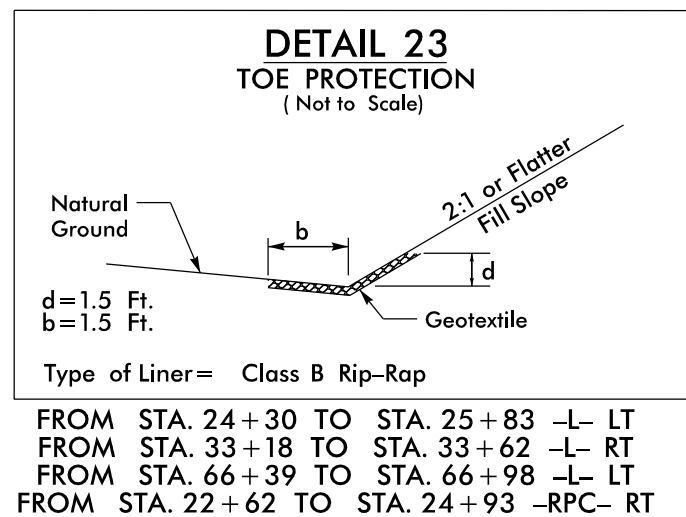
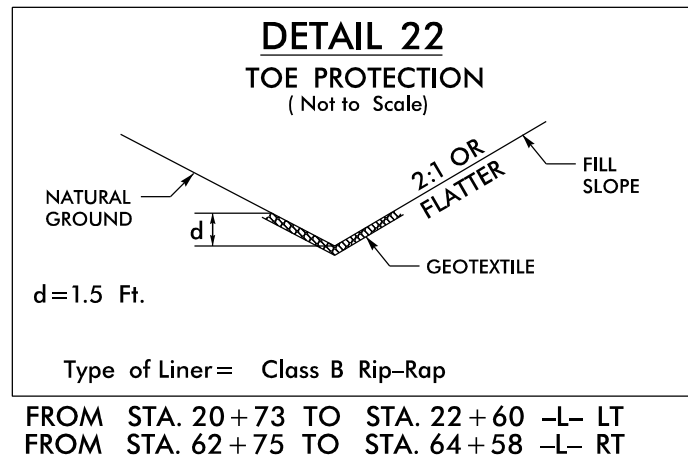
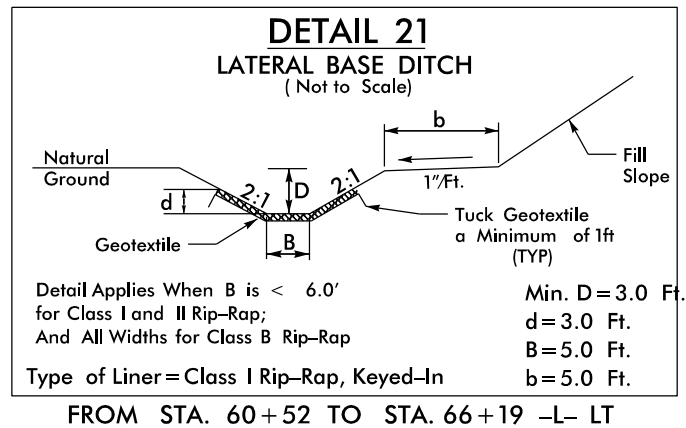
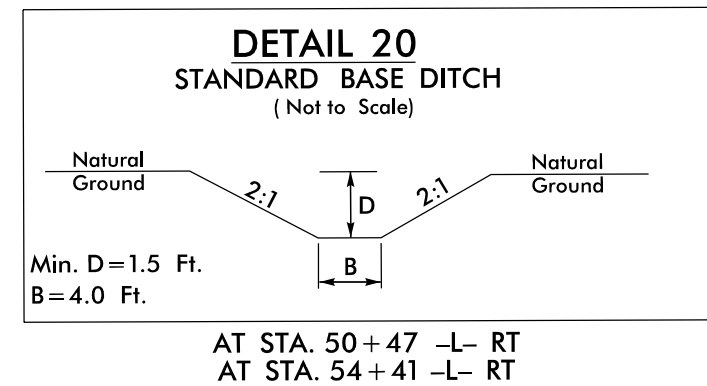
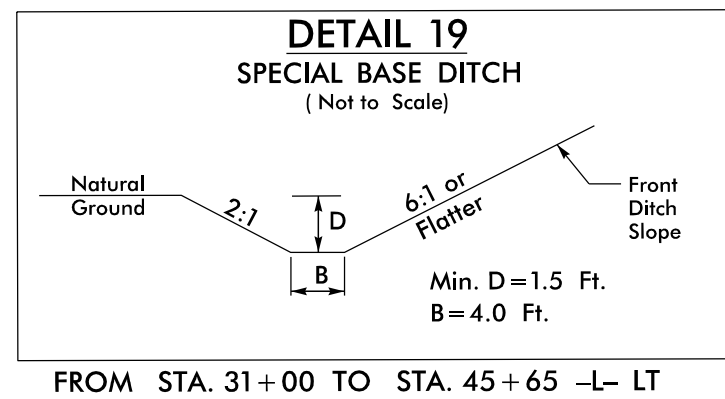
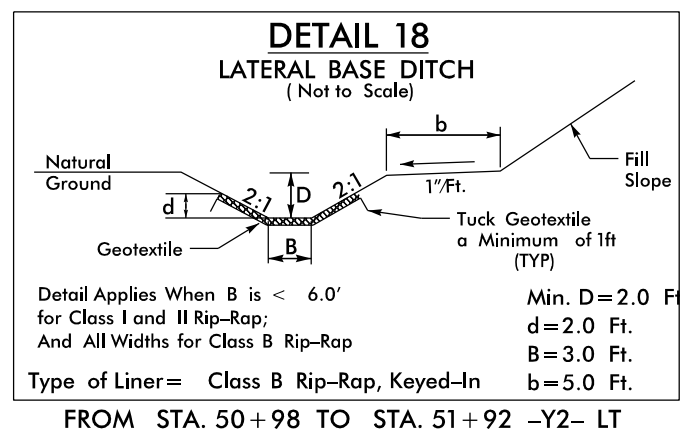
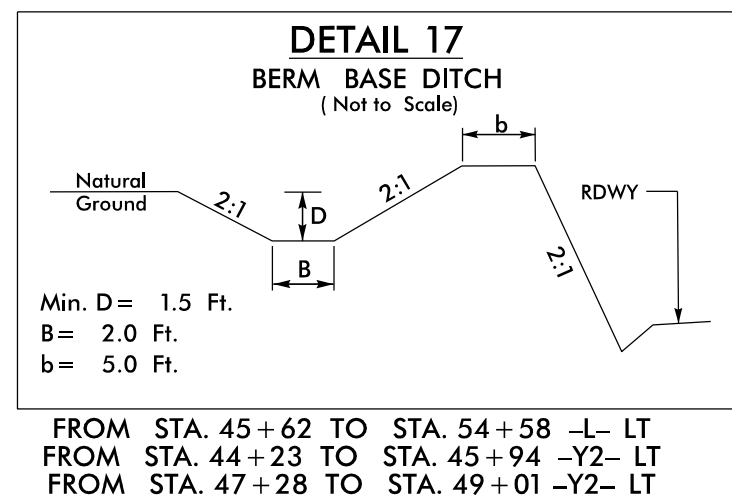
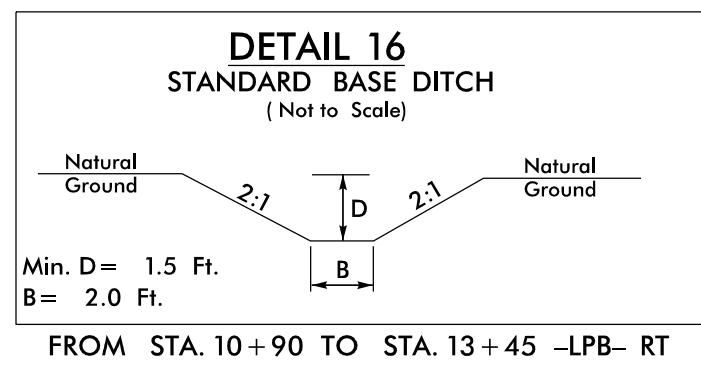
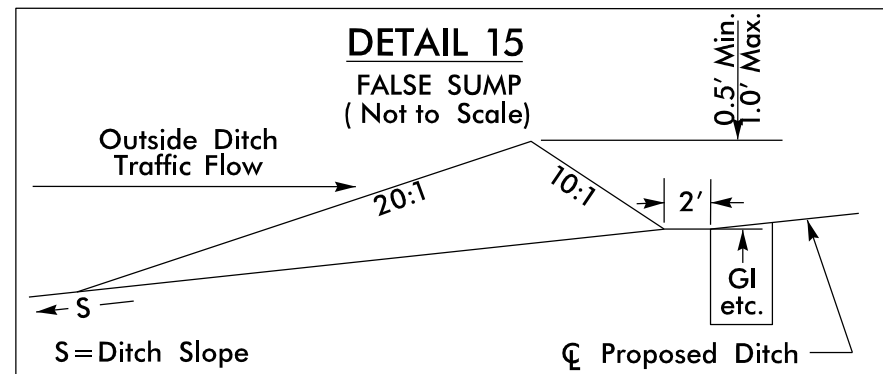
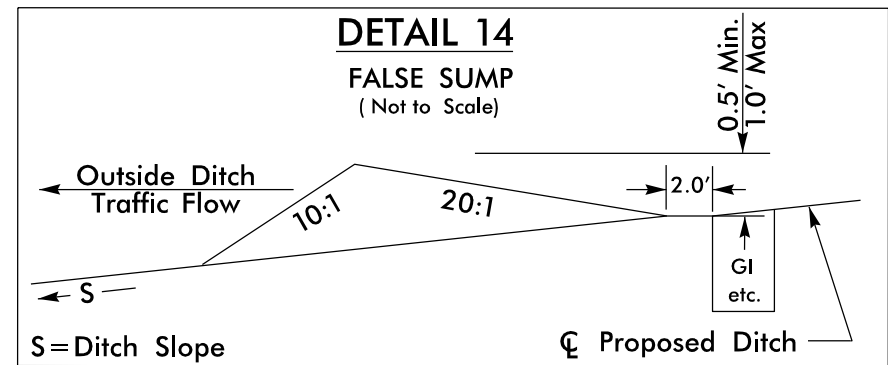
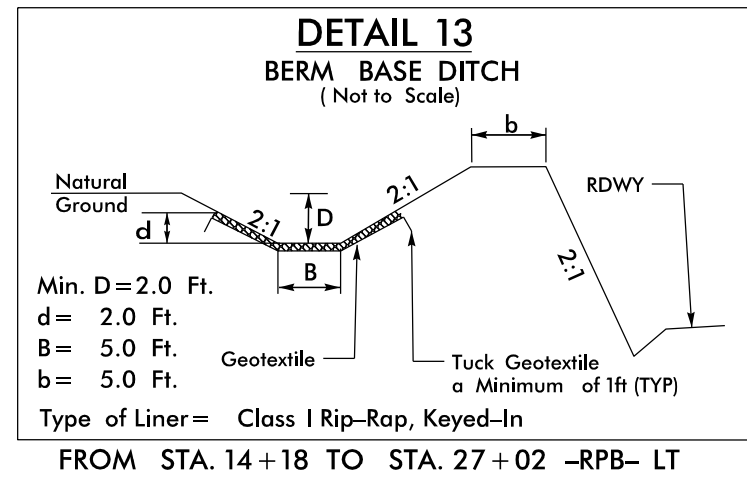
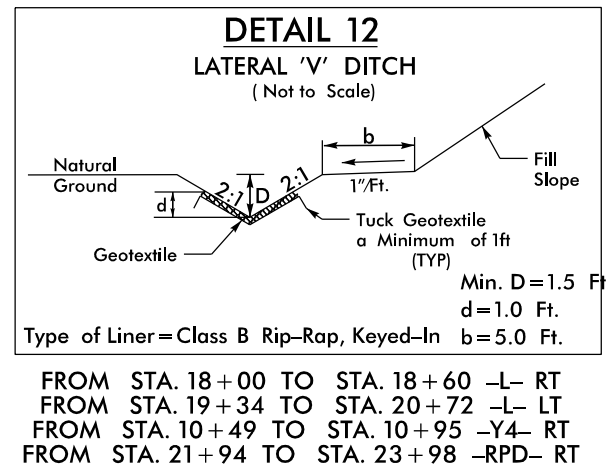
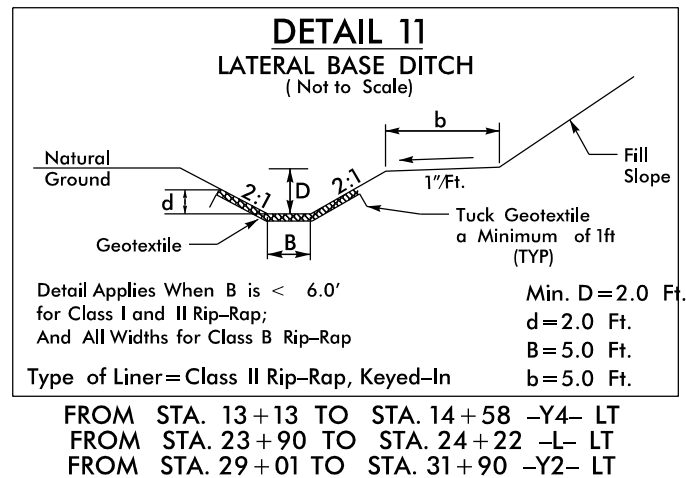
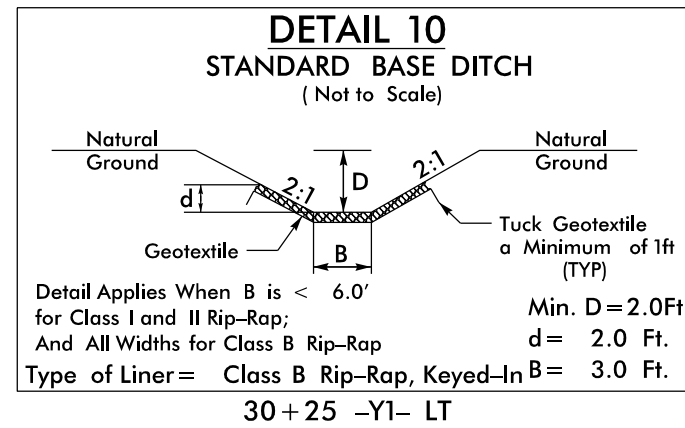
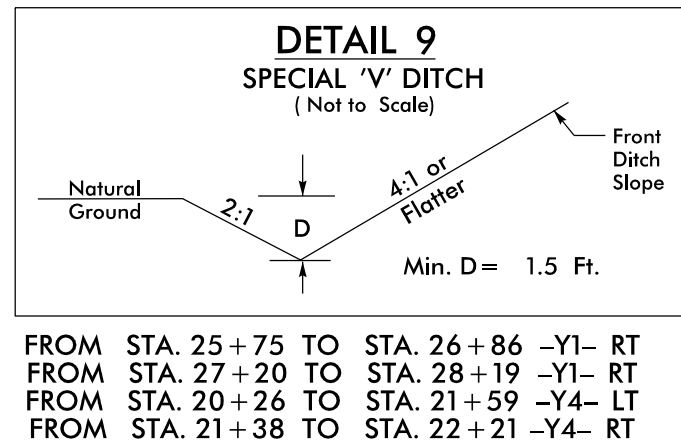
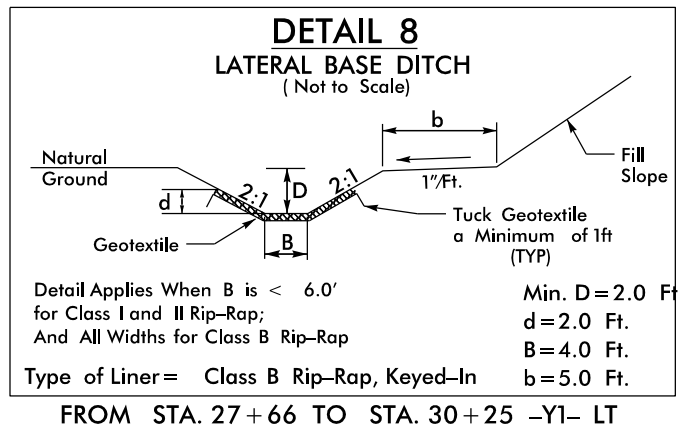
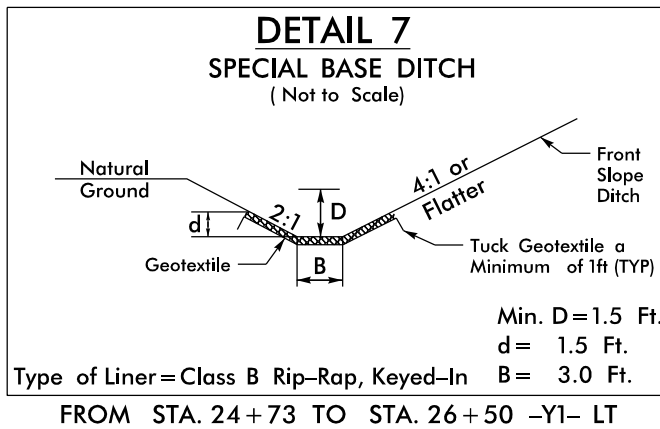
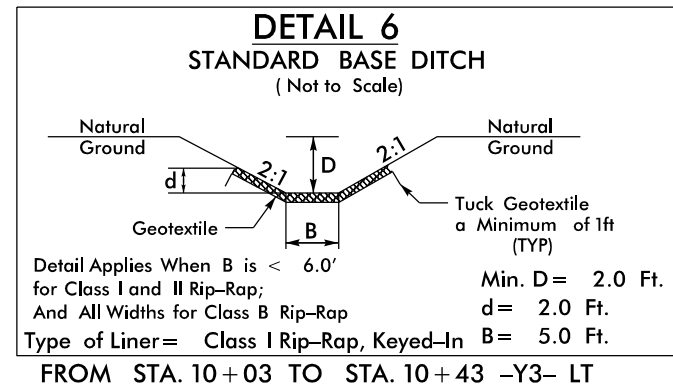
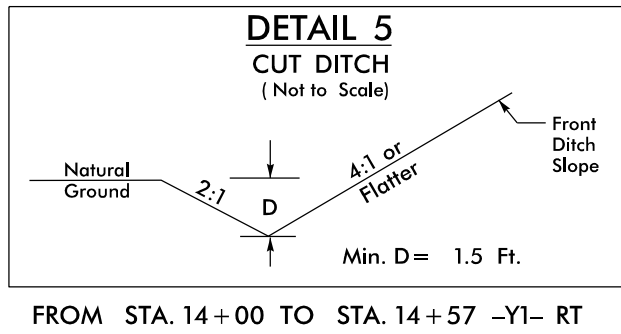
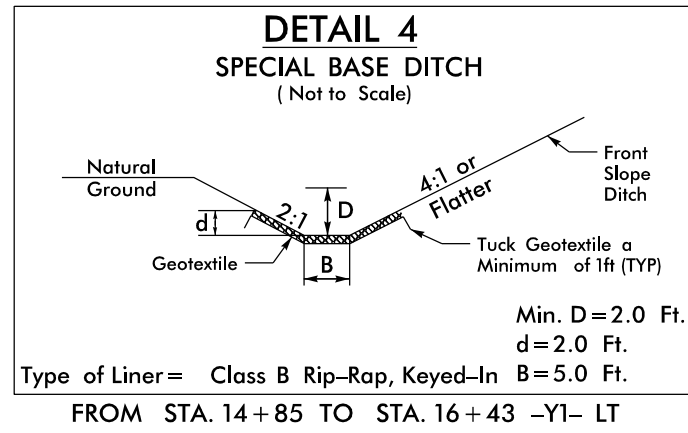
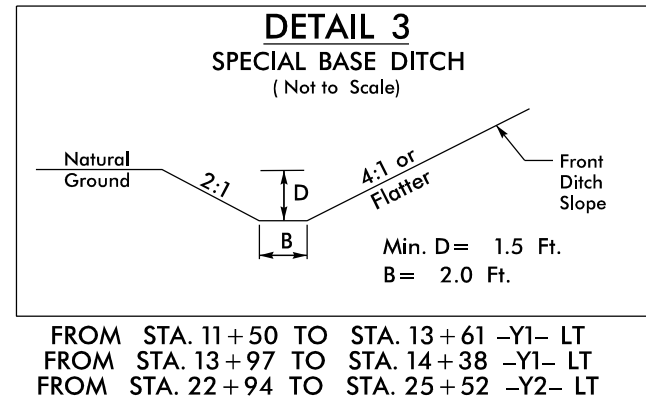
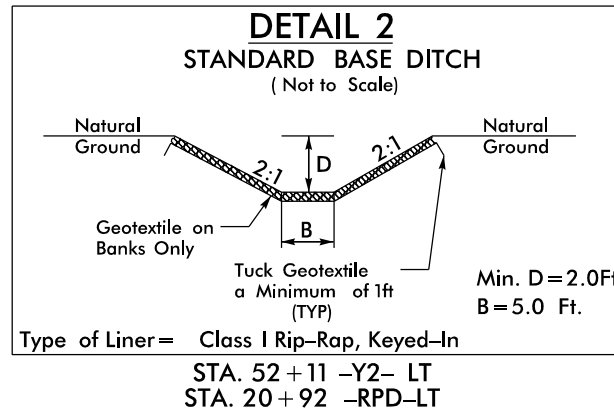
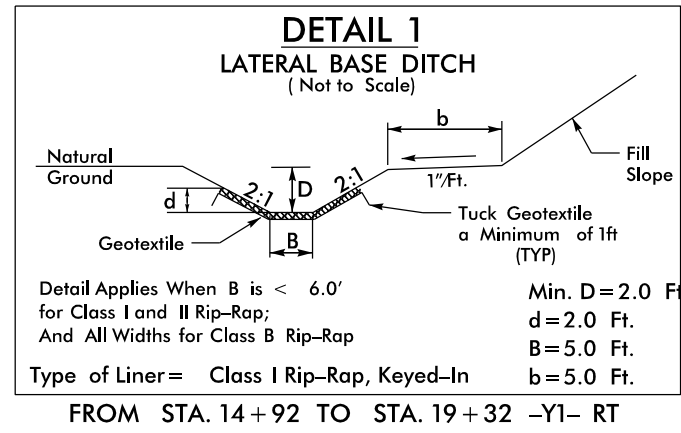
FILL SLOPE MATTING FOR EROSION CONTROL

[illegible]

DRAINAGE DETAILS

(NOT TO SCALE)

PROJECT REFERENCE NO.	SHEET NO.
U-6187	EC-3C/CONST.2D-1
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 04

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B
AND TEMPORARY ROCK SILT CHECKS TYPE - A AT
DRAINAGE OUTLETS.

STANDARD BASE DITCH
W/ CLASS I RIP RAP
SEE DETAIL 26
EST 410 TONS
EST 650 SY GEOTEXTILE
SLOPE = 5.4%

LATERAL 'V' DITCH
W/ CLASS B RIP RAP
SEE DETAIL 12

TOE PROTECTION
SEE DETAIL 22

LATERAL BASE DITCH
W/ CLASS II RIP RAP
SEE DETAIL 11

CLASS I RIP RAP
EST 2 TONS
EST 3 SY GEOTEXTILE
SEE DETAIL 37

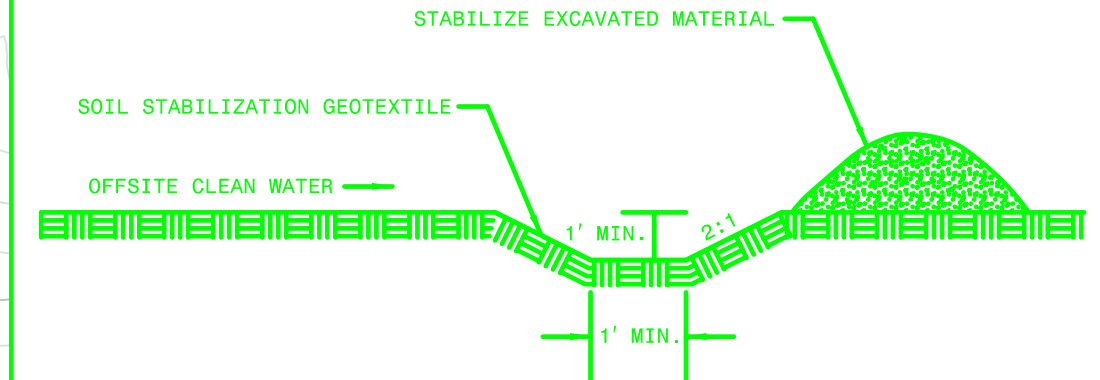
CLASS B RIP RAP
EST 2 TONS
EST 7 SY GEOTEXTILE

20+00

15+00

MATCH LINE -L- STA 24+00.00 SEE SHEET 05

CLEAN WATER DIVERSION
→ CWD → → CWD → → CWD → → CWD → → CWD
(Not to Scale)



74 x 37 x 3
1.5 inch Skimmer
with 1,500 inch
Orifice Diameter
17 ft. weir
ID 4.2

CLASS I RIP RAP
LENGTH = 18 FT.
EST 33 TONS
EST 52 SY GEOTEXTILE
SEE DETAIL 37

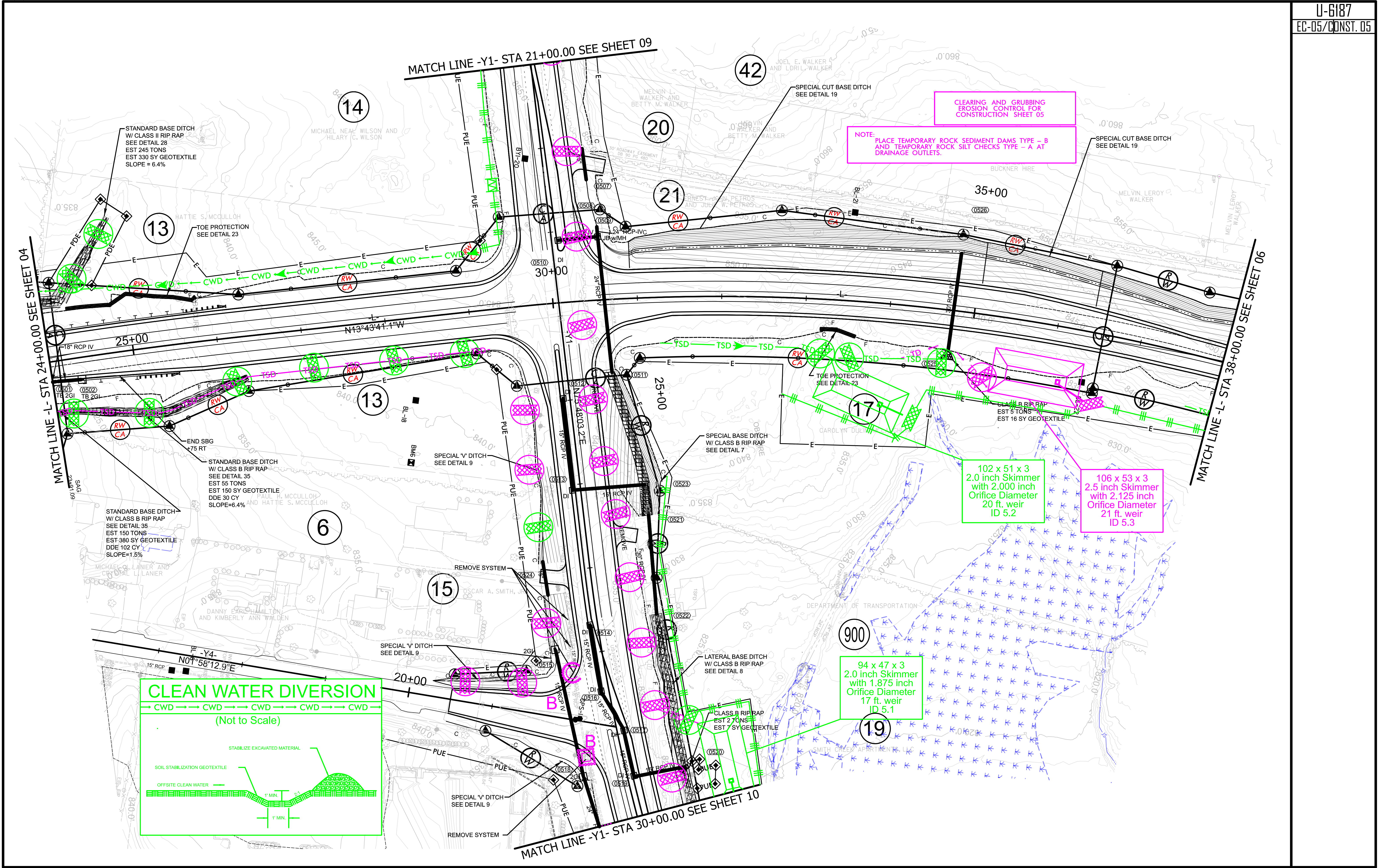
STANDARD BASE DITCH
W/ CLASS B RIP RAP
SEE DETAIL 35
EST 11 TONS
EST 35 SY GEOTEXTILE
EST 16 CY DDE
SLOPE = 4.2%

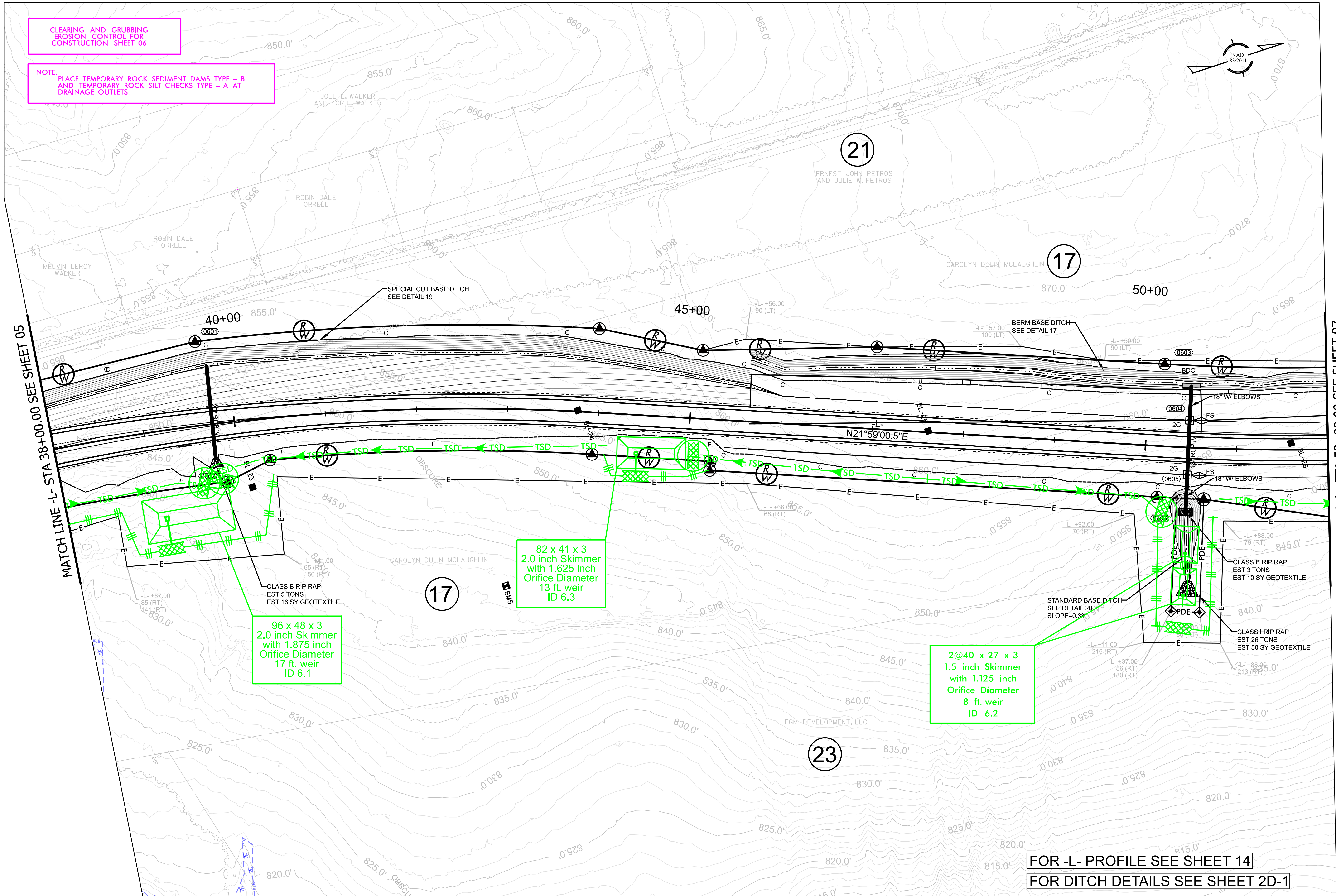
136 x 68 x 3
3.0 inch Skimmer
with 2,625 inch
Orifice Diameter
35 ft. weir
ID 4.1

PROJECT REFERENCE NO.	SHEET NO.
U-6187	EC-04A/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

1. CONSTRUCT/INSTALL SPECIAL STILLING BASIN(S).
2. INSTALL IMPERVIOUS DIKS A,B,C & D AND UTILIZE PUMP AROUND OPERATIONS THROUGH EXISTING PIPE AS NEEDED.
3. EXTEND EXISTING 54" RCP AND COMPLETE UP AND DOWNSTREAM CHANNEL WORK.
4. REMOVE IMPERVIOUS DIKS A,B,C & D AND DIRECT FLOW THROUGH EXTENDED PIPE.
5. COMPLETE ROADWAY.



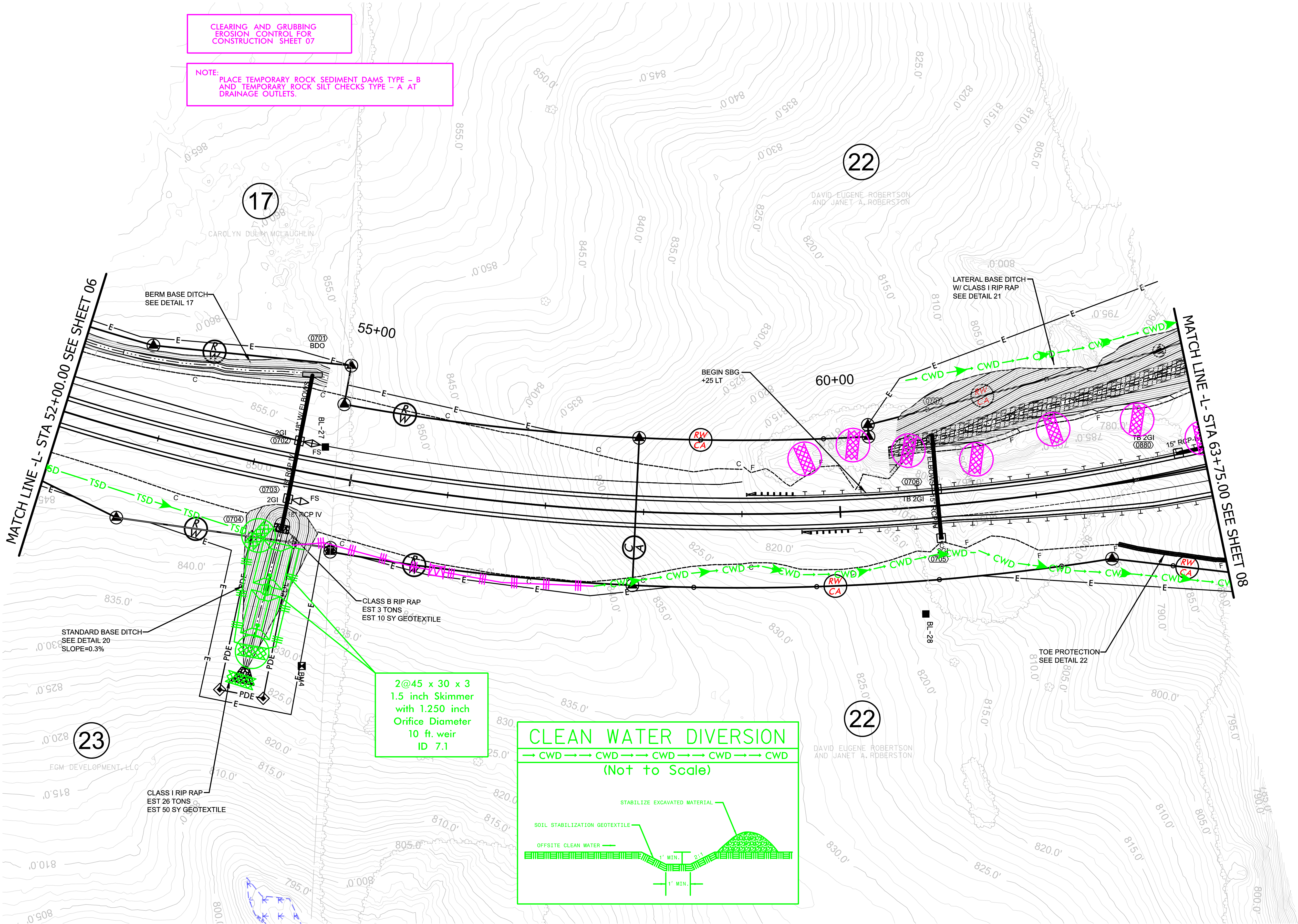




FOR -L- PROFILE SEE SHEET 14
FOR DITCH DETAILS SEE SHEET 2D-1

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 07

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B
AND TEMPORARY ROCK SILT CHECKS TYPE - A AT
DRAINAGE OUTLETS.



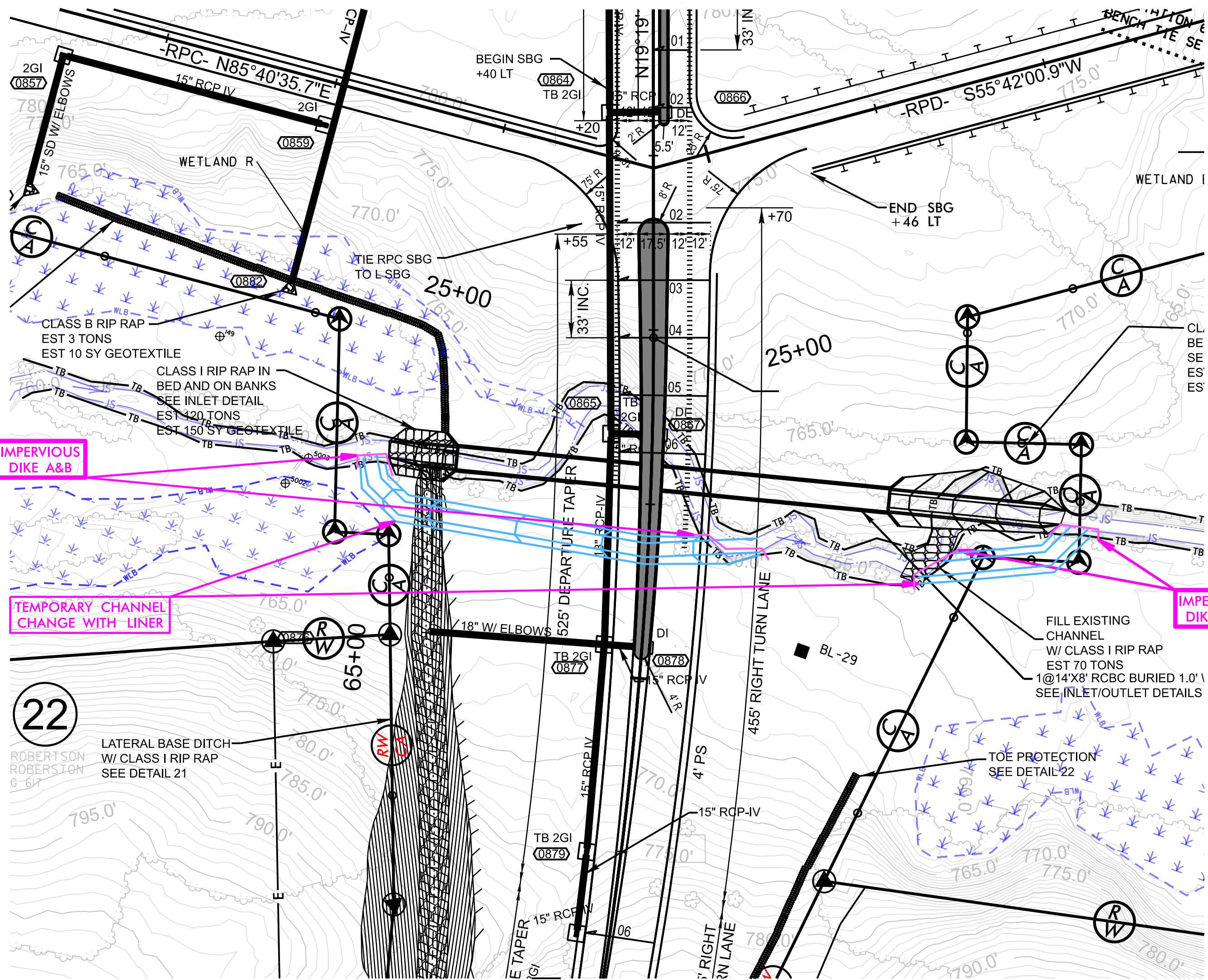
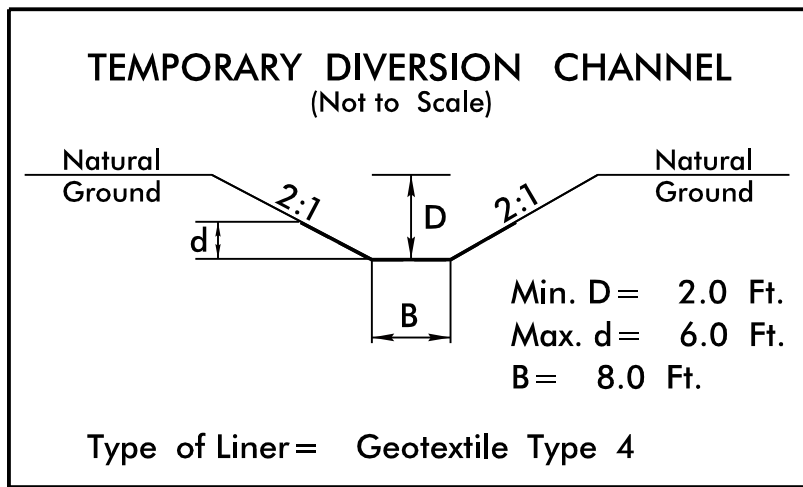


CULVERT CONSTRUCTION SEQUENCE STA. 66+15.5 -L-

PROJECT REFERENCE NO.	SHEET NO.
U-6187	EC-08A/CONST.08
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

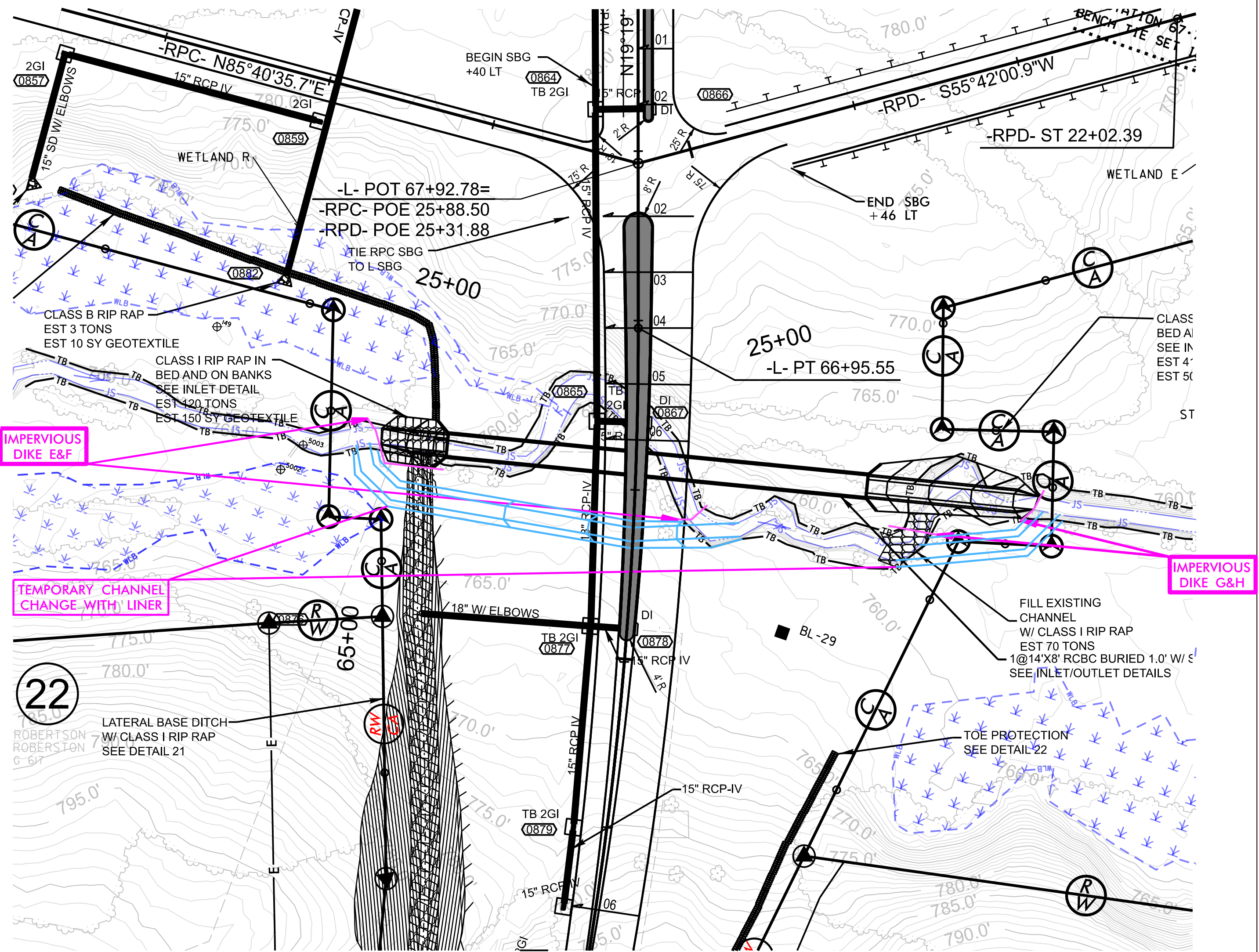
PHASE I

1. CONSTRUCT/INSTALL SPECIAL STILLING BASIN(S).
2. INSTALL IMPERVIOUS DIKES A,B,C & D AND CONSTRUCT TEMPORARY CHANNEL IN THE DRY UTILIZING PUMP AROUND OPERATIONS AS NEEDED.
3. MAINTAIN FLOW IN EXISTING CHANNEL.
4. BEGIN PHASE II.



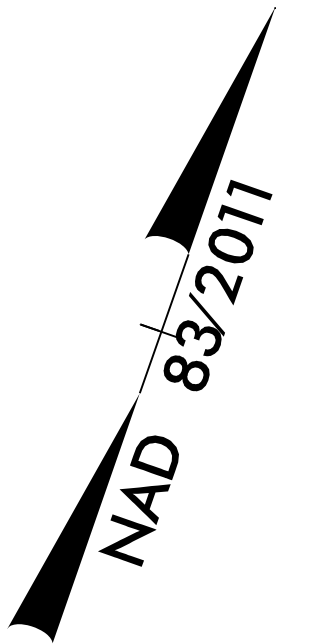
PHASE II

1. INSTALL IMPERVIOUS DIKES E,F,G & H AND REMOVE IMPERVIOUS DIKES A,B,C AND D TO DIRECT WATER INTO THE TEMPORARY CHANNEL.
2. INSTALL PROPOSED 14'X8' RCBC AND INLET/OUTLET CHANNEL WORK IN THE DRY UTILIZING PUMP AROUND OPERATIONS AS NEEDED.
2. REMOVE REMAINING IMPERVIOUS DIKES AND TEMPORARY CHANNEL TO ALLOW WATER TO FLOW THROUGH 14'X8' RCBC.
3. COMPLETE ROADWAY.



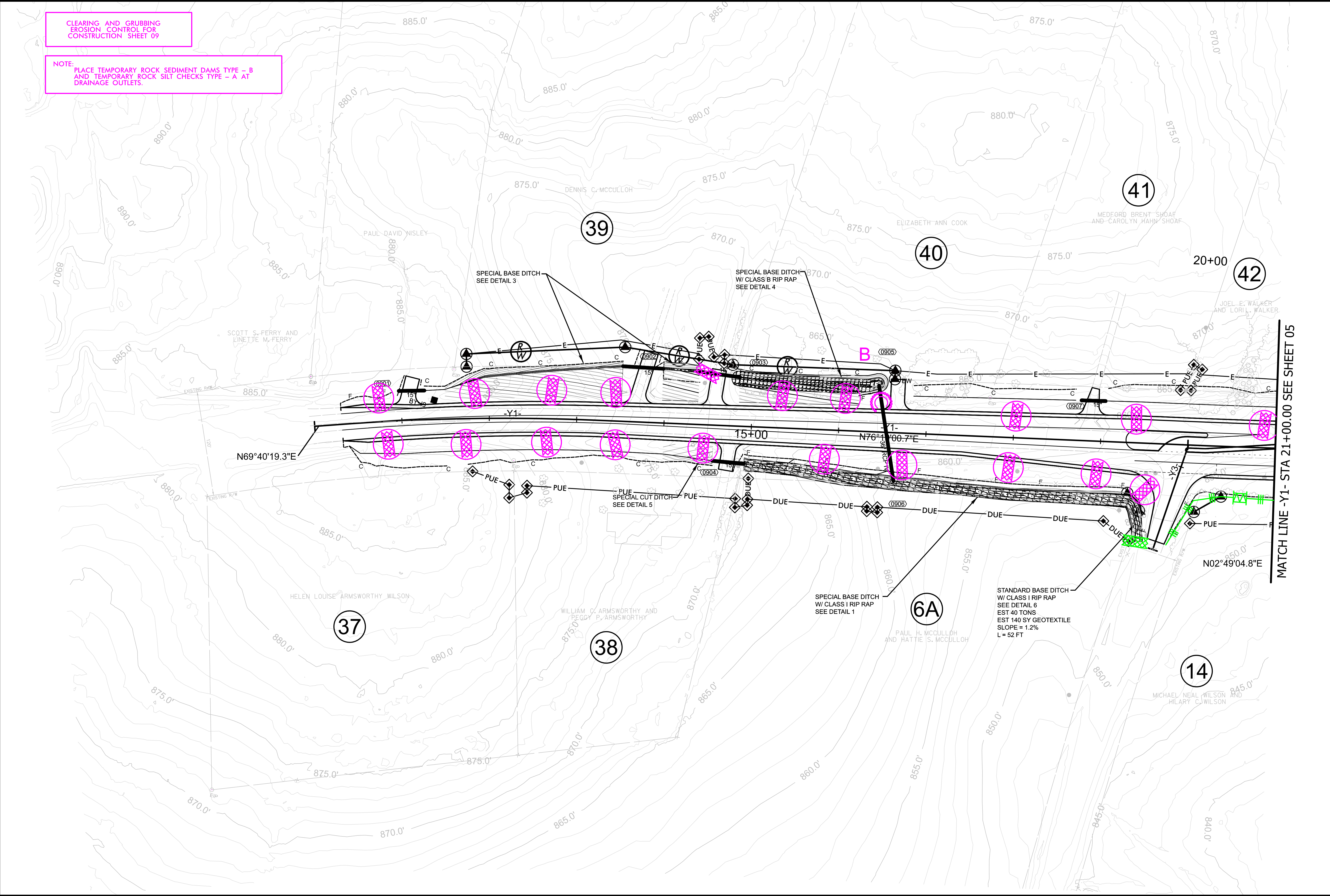
PROJECT REFERENCE NO.	SHEET NO.
<i>U-6187</i>	<i>EC-08B/CONST.08</i>
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

1. CONSTRUCT/INSTALL SPECIAL STILLING BASIN(S).
2. INSTALL IMPERVIOUS DIKES A,B,C & D AND TEMPORARY 24" PIPES.
3. EXTEND EXISTING 6'X6' RCBC WITH 6'X7' RCBC AND UP AND DOWNSTREAM CHANNEL WORK.
4. REMOVE IMPERVIOUS DIKES A,B,C & D, TEMPORARY 24" PIPES AND DIRECT FLOW THROUGH EXTENDED CULVERT.
5. COMPLETE ROADWAY.

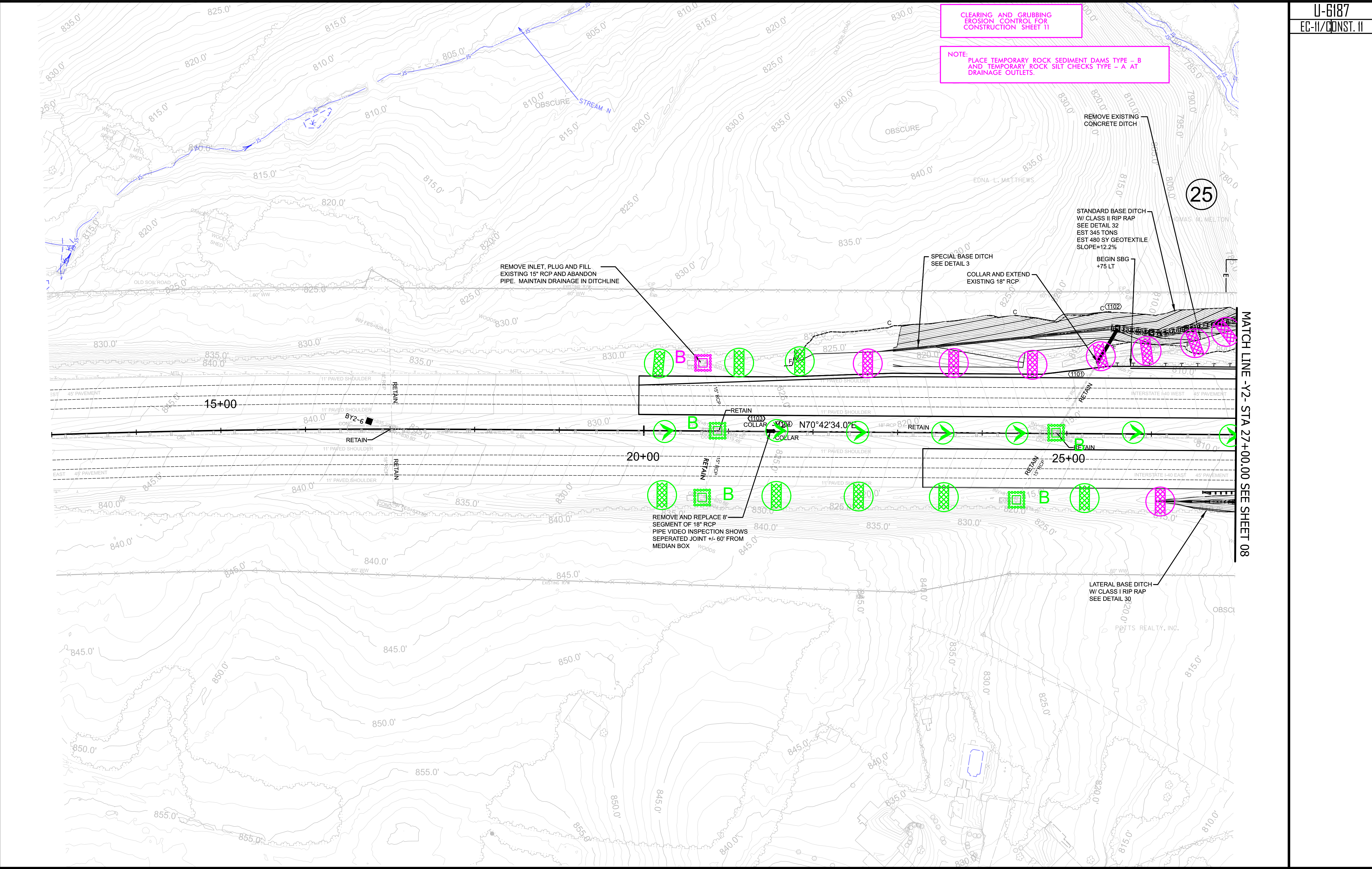


CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 09

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B
AND TEMPORARY ROCK SILT CHECKS TYPE - A AT
DRAINAGE OUTLETS.

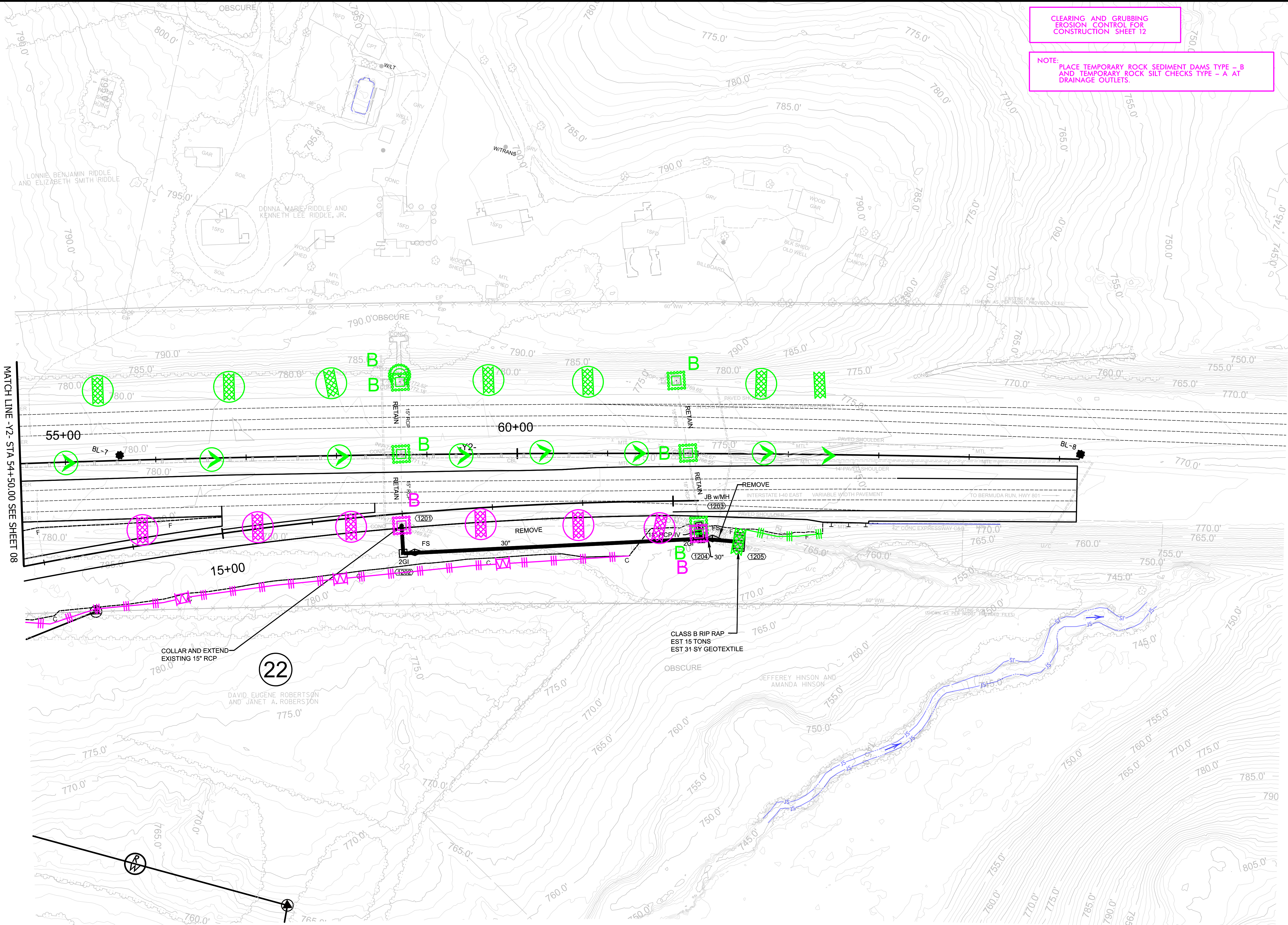


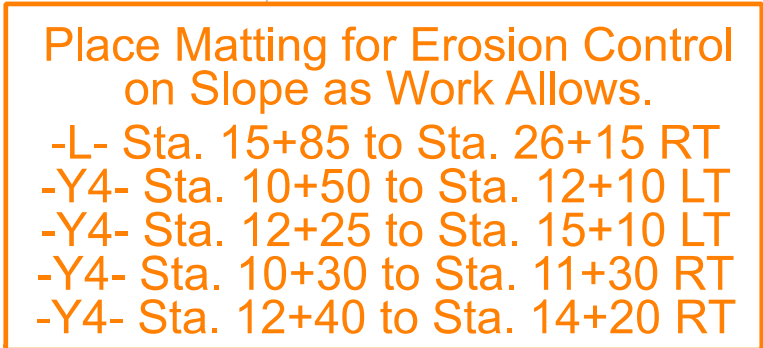


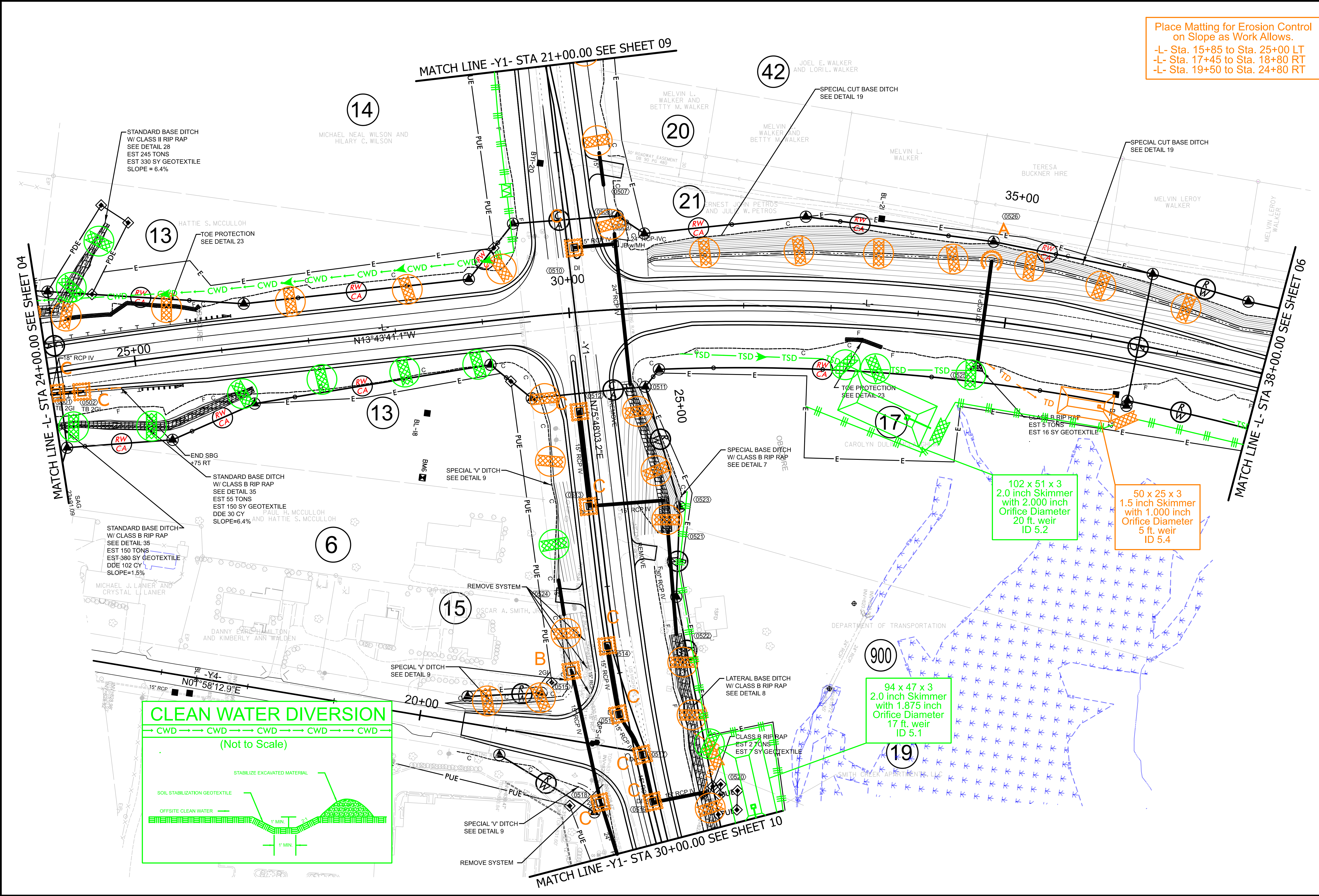


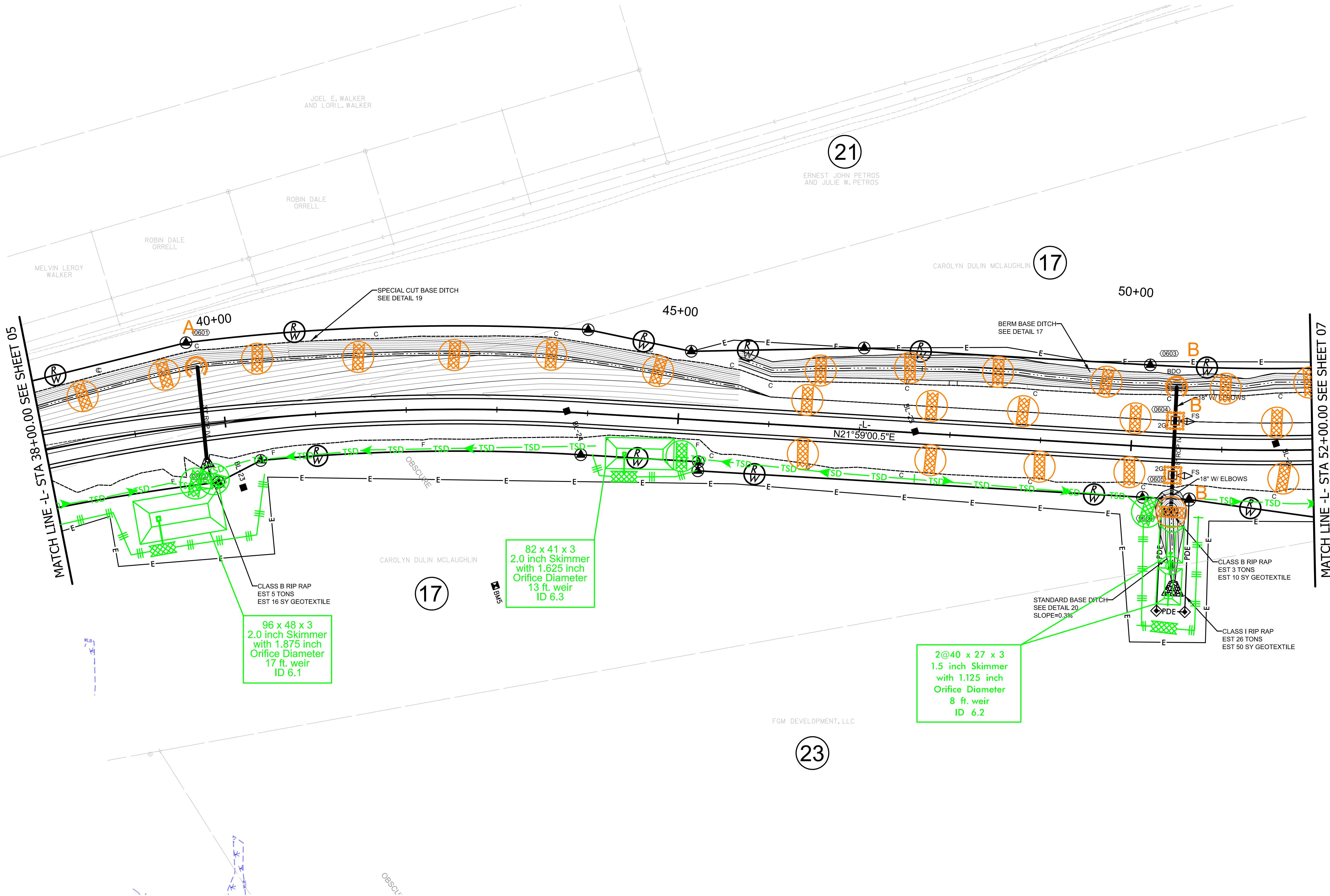
CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 12

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B
AND TEMPORARY ROCK SILT CHECKS TYPE - A AT
DRAINAGE OUTLETS.









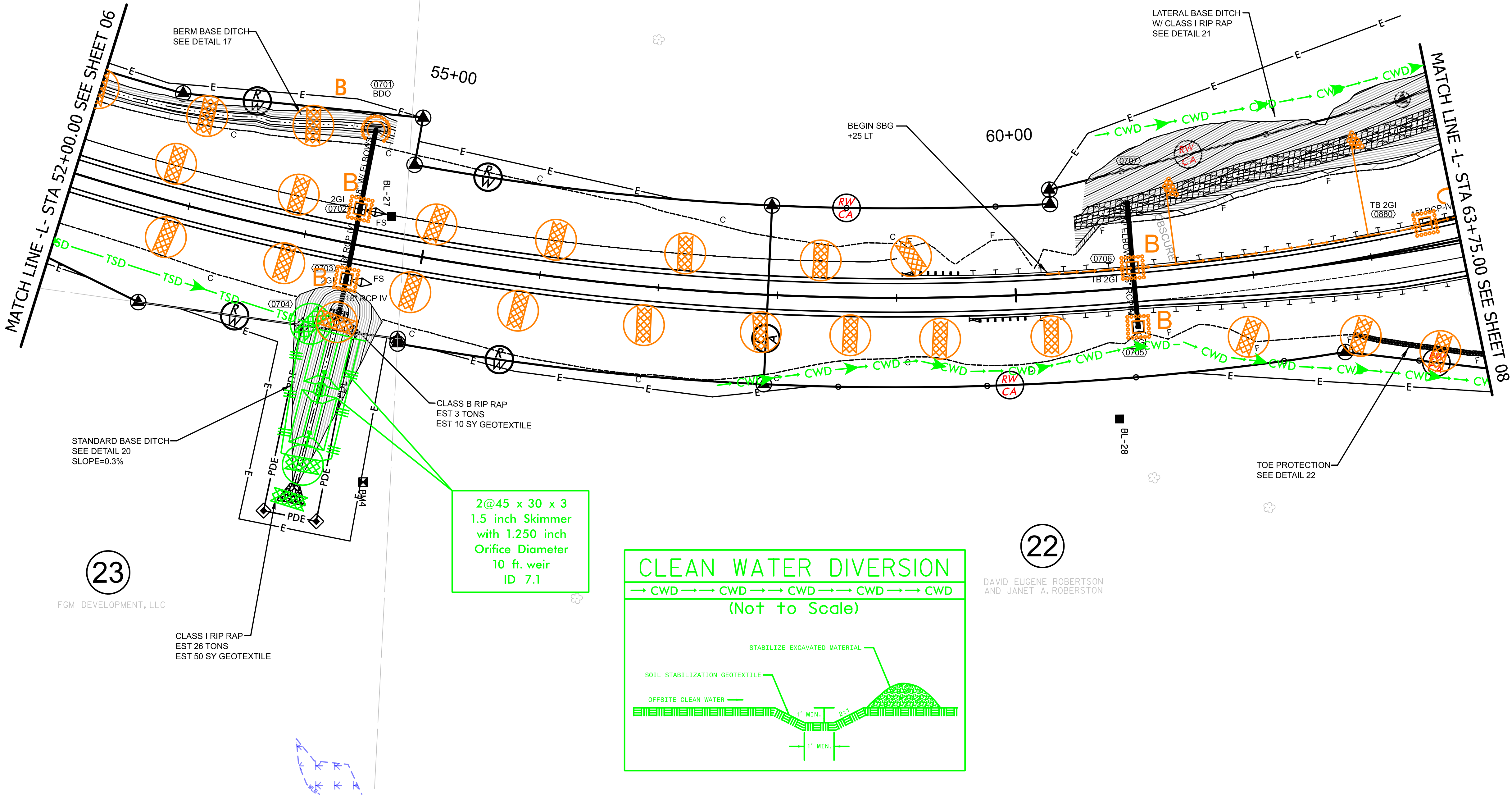
Place Matting for Erosion Control
on Slope as Work Allows.
-L- Sta. 59+05 to Sta. 69+74 LT
-L- Sta. 59+05 to Sta. 69+74 RT

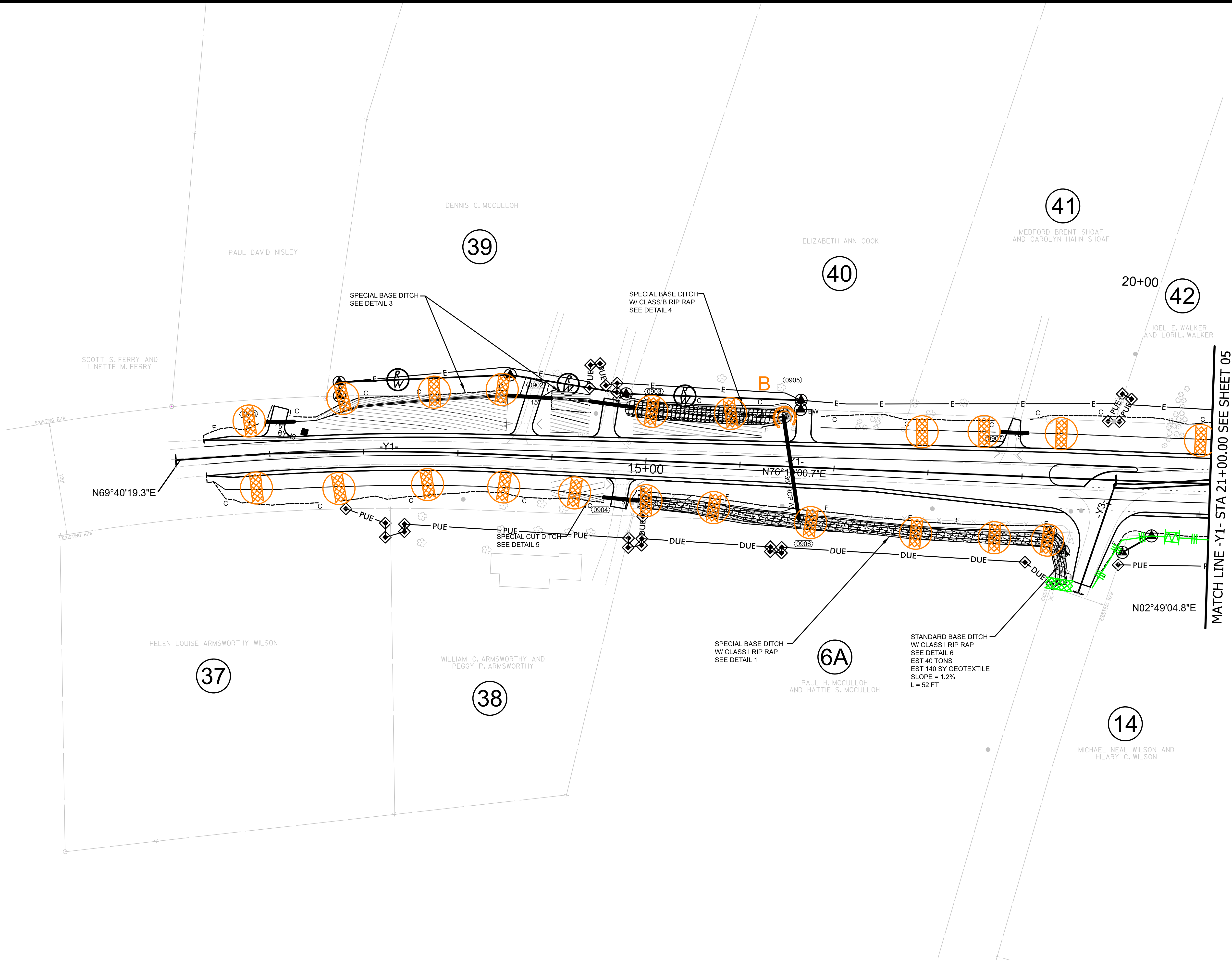
17

CAROLYN DULIN MCLAUGHLIN

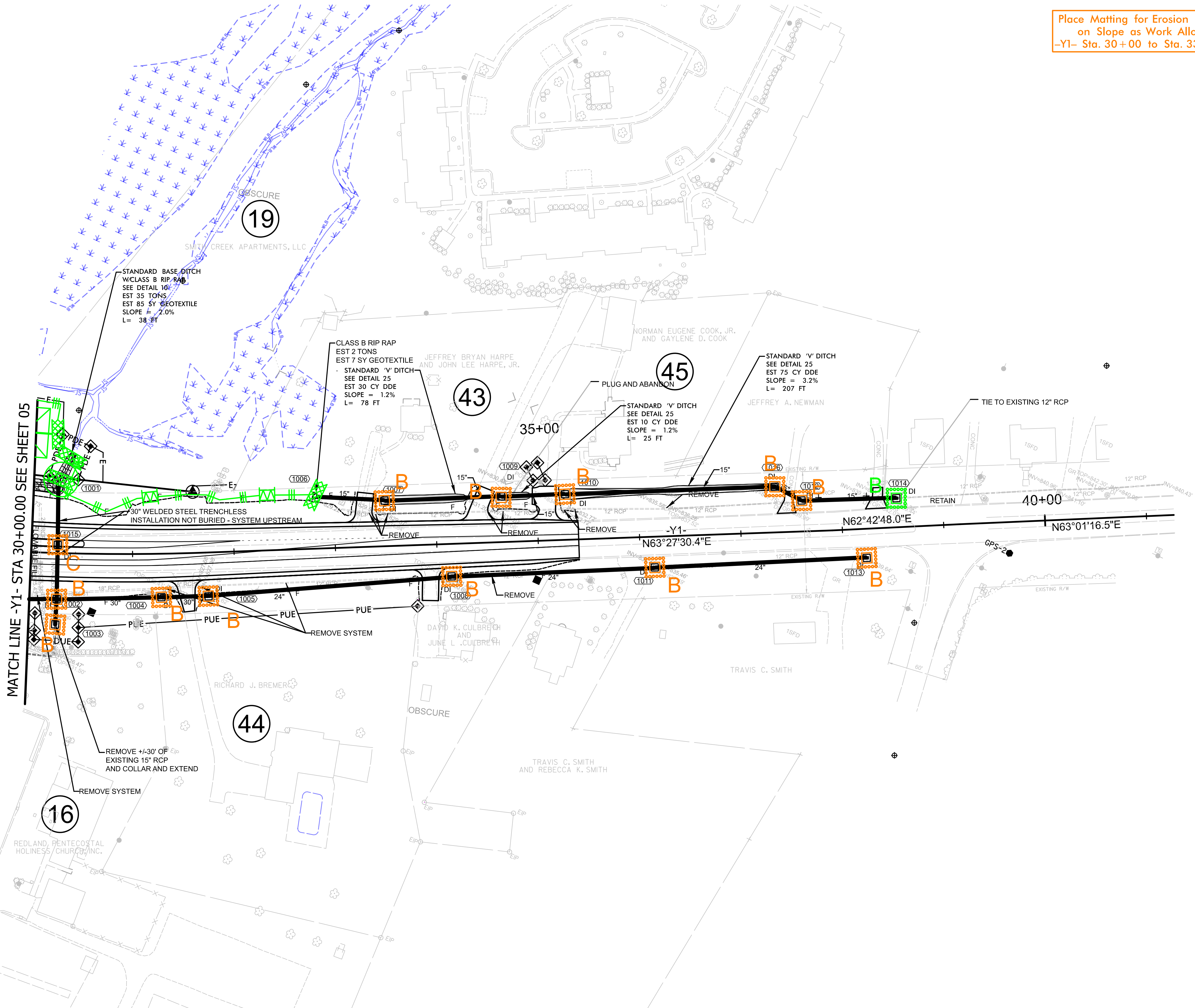
22

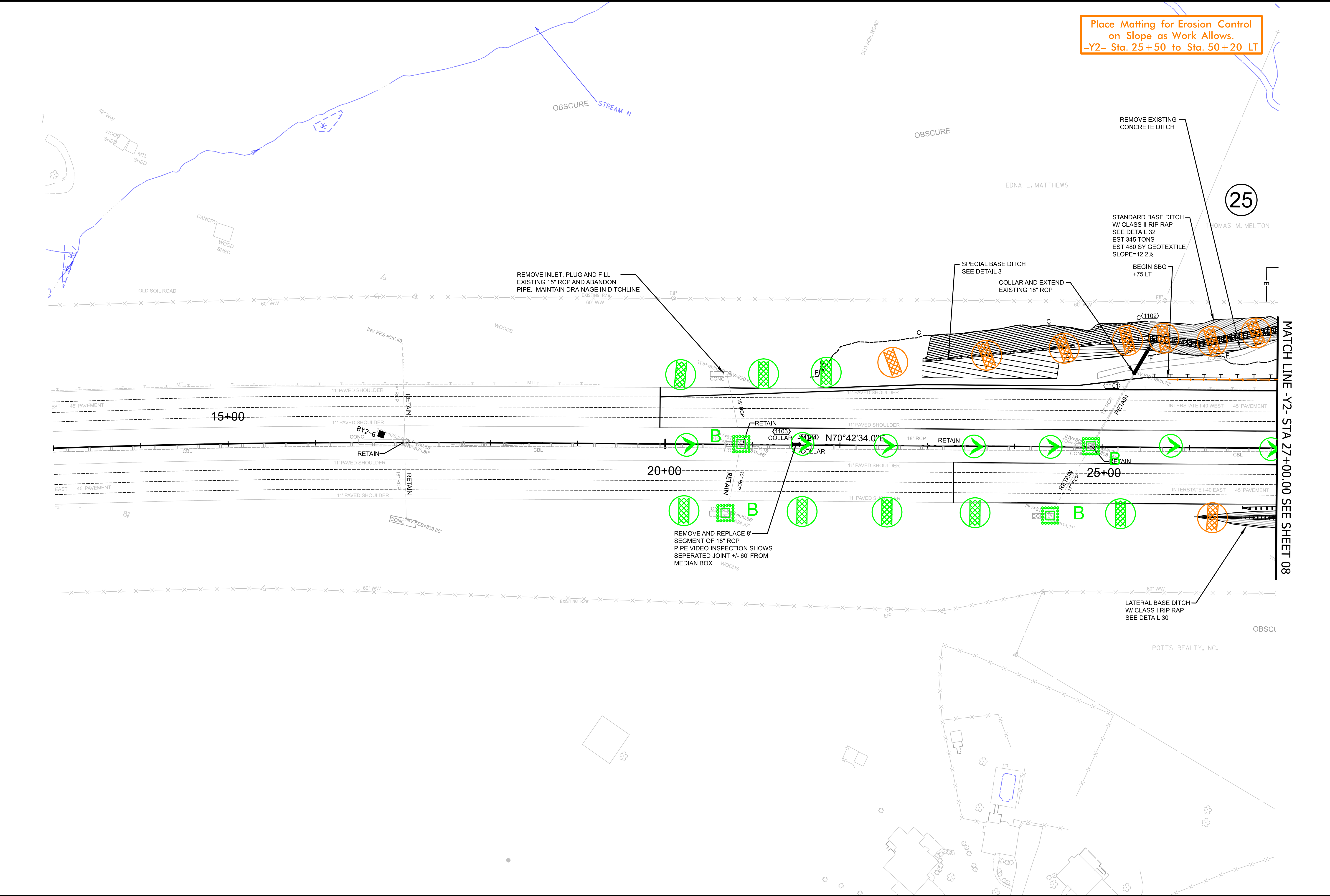
DAVID EUGENE ROBERTSON
AND JANET A. ROBERTSON

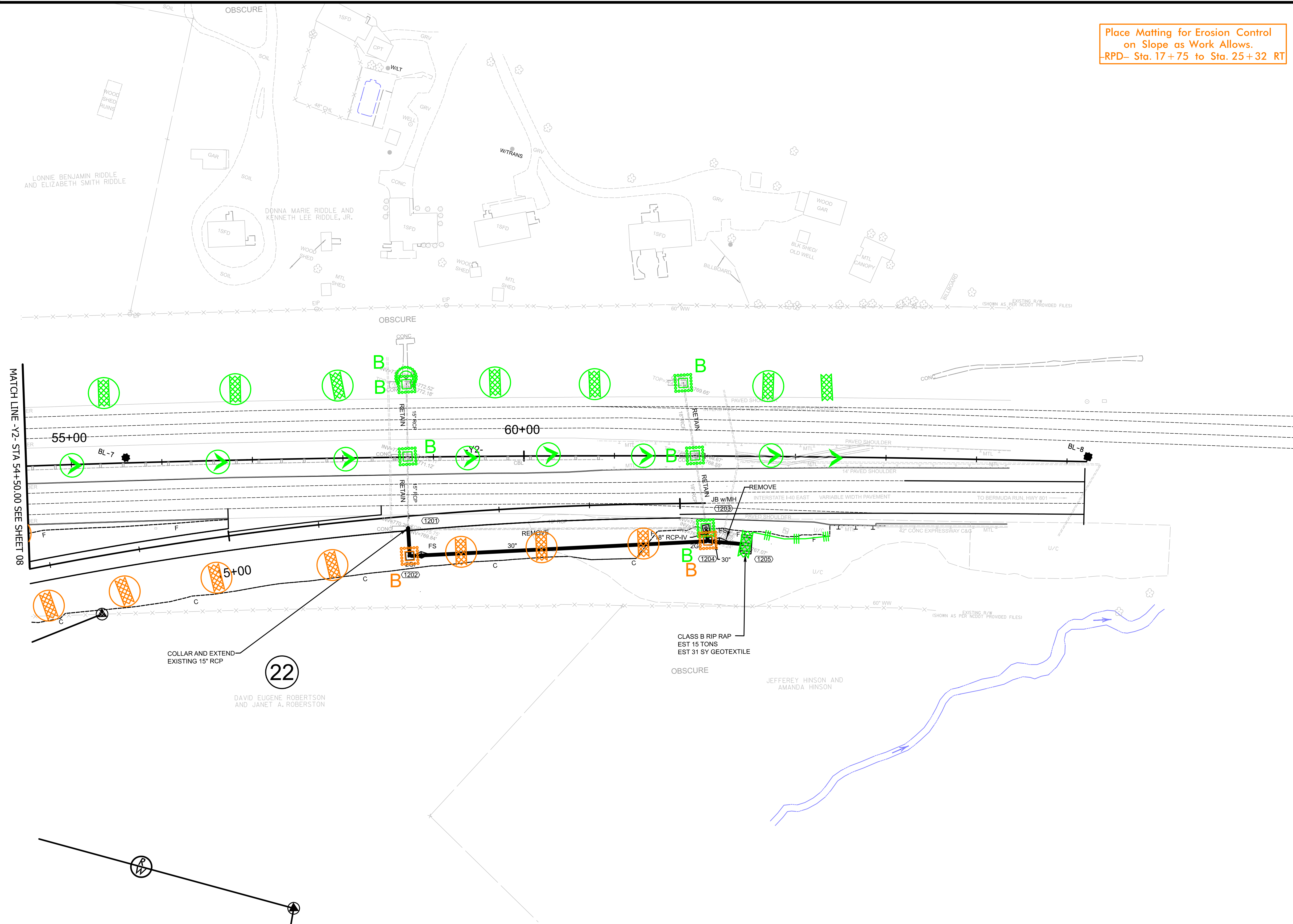




Place Matting for Erosion Control
on Slope as Work Allows.
-Y1- Sta. 30+00 to Sta. 33+11 LT







09/08/99

TIP PROJECT: U-6187

CONTRACT: C205093

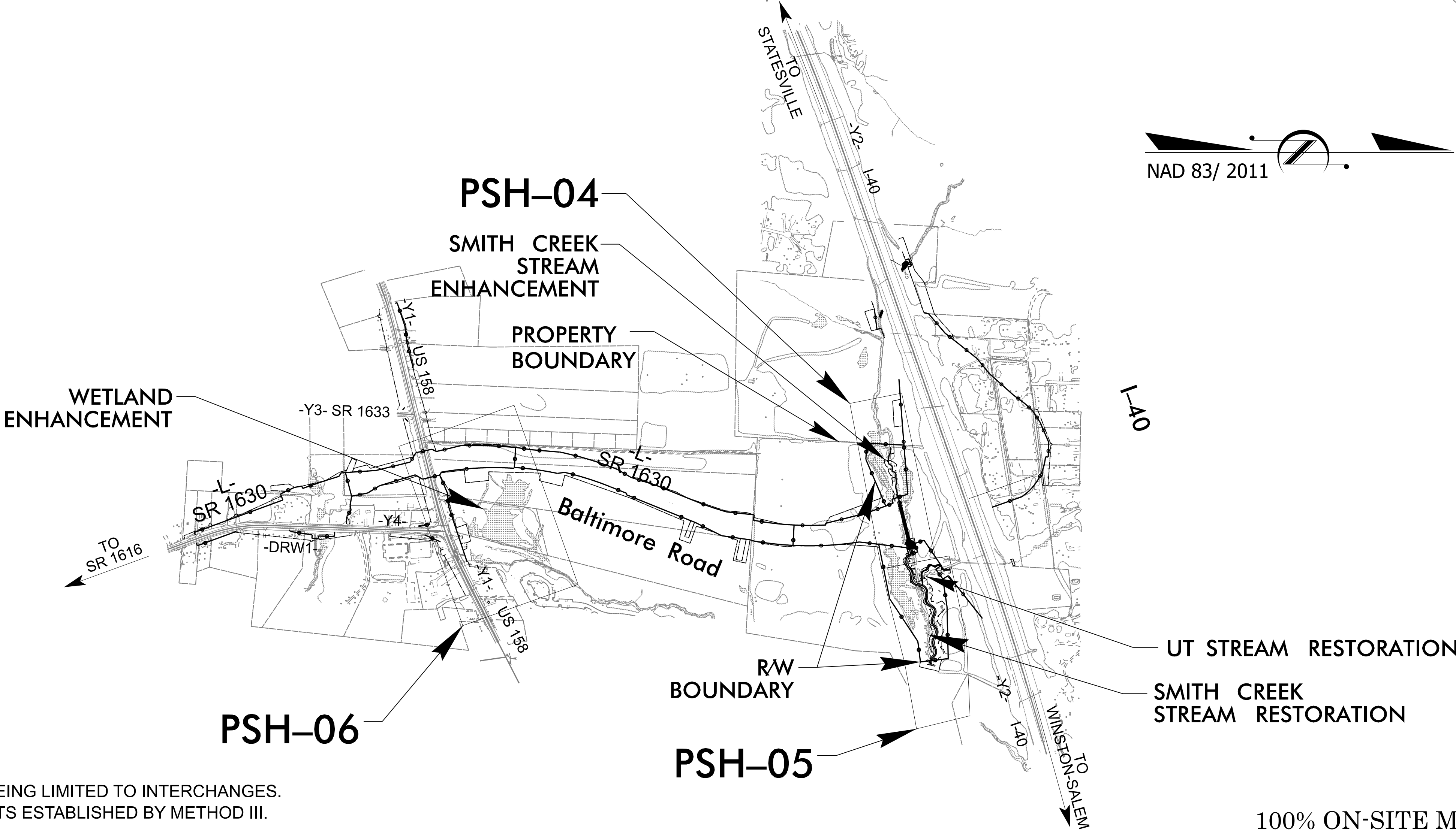
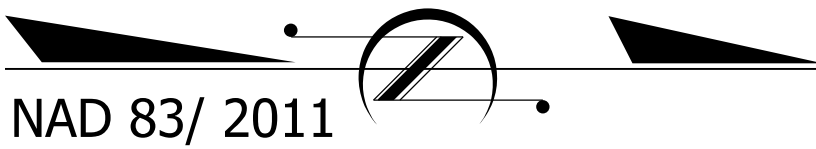
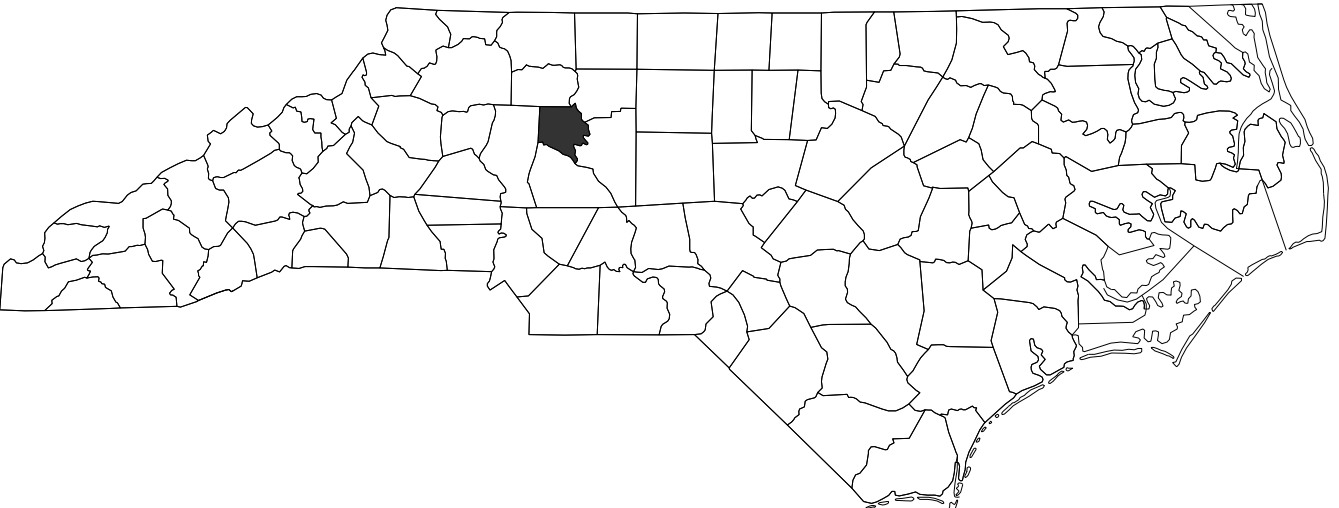
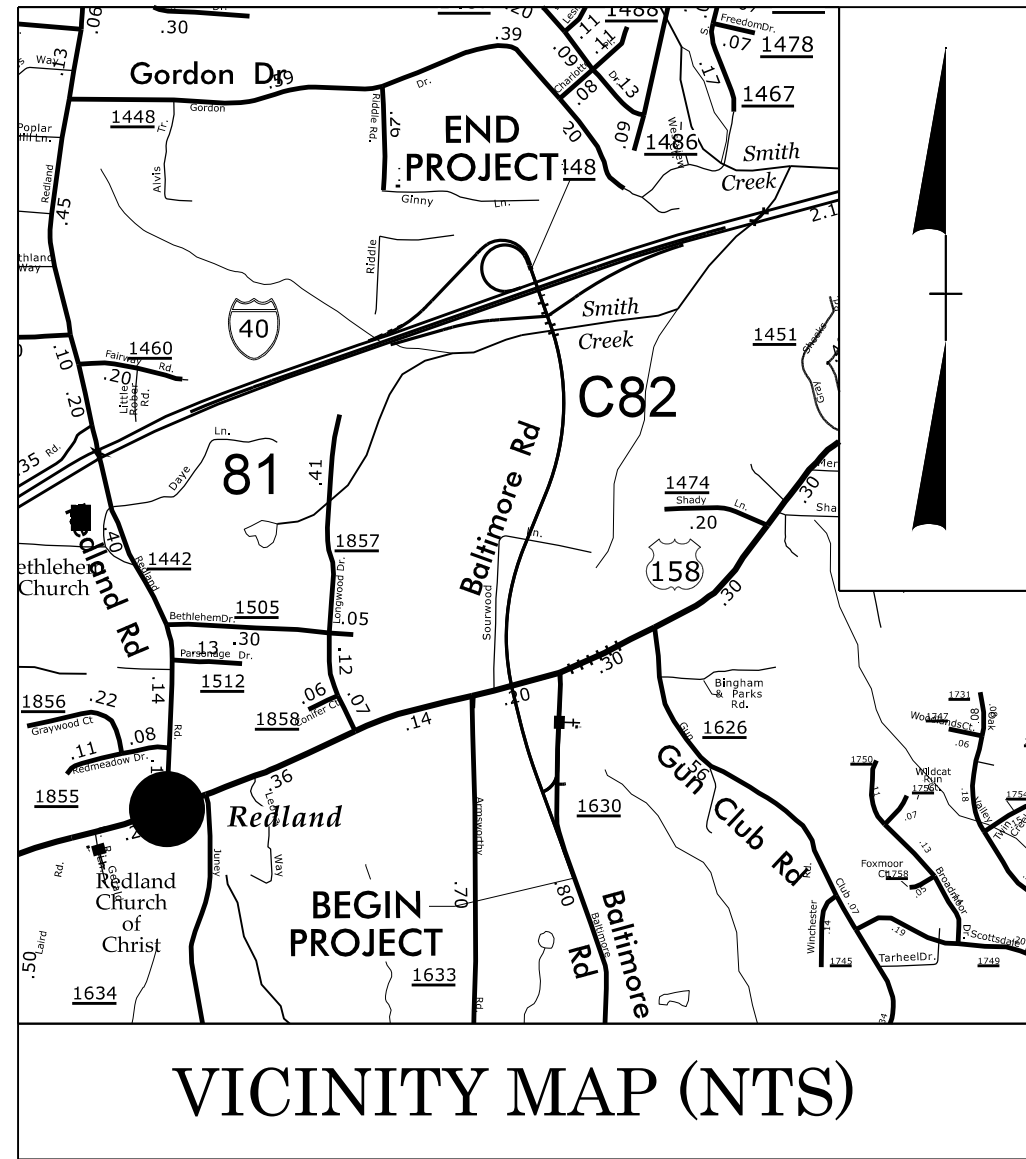
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR ON-SITE MITIGATION REPAIR
DAVIE COUNTY

LOCATION: *REALIGNMENT AND EXTENSION OF SR 1630
(BALTIMORE ROAD) FROM SOUTH OF US 158
TO A NEW INTERCHANGE AT I-40*

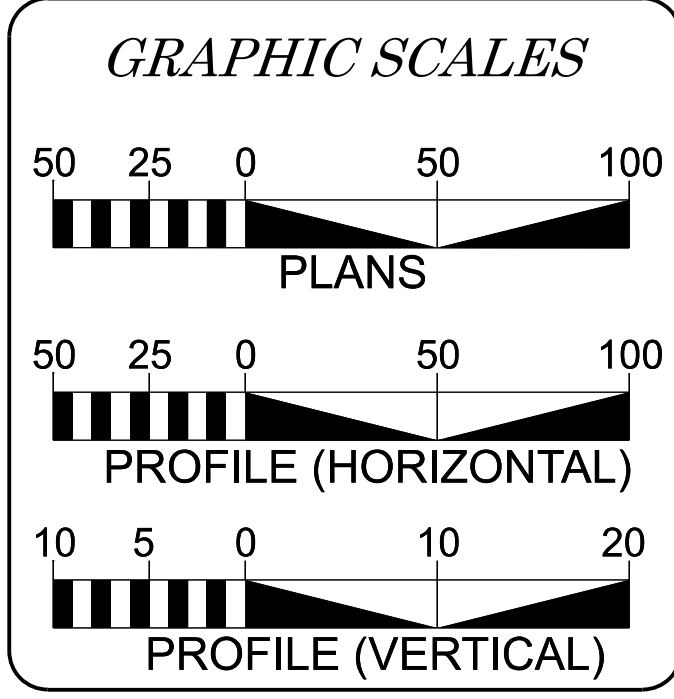
TYPE OF WORK: *STREAM AND WETLAND RESTORATION*

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-6187	OSM-1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
48647.1.1		PE	
48647.2.2		UTIL.	
48647.2.3		R/W	
48647.3.1		CONST.	



THIS PROJECT IS NOT WITHIN A MUNICIPAL BOUNDARY.
THIS IS A CONTROL OF ACCESS PROJECT WITH ACCESS TO I-40 BEING LIMITED TO INTERCHANGES.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

100% ON-SITE MITIGATION PLANS



PROJECT LENGTH

STREAM ENHANCEMENT:
SMITH CREEK R1 = 480 LF

STREAM RESTORATION:
SMITH CREEK R2 = 1,084 LF

UT = 355 LF

NCDOT Contact: RYAN C. NEWCOMB, PE
Prepared in the Office of:

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MAY 31, 2024

LETTING DATE:
OCTOBER 21, 2025

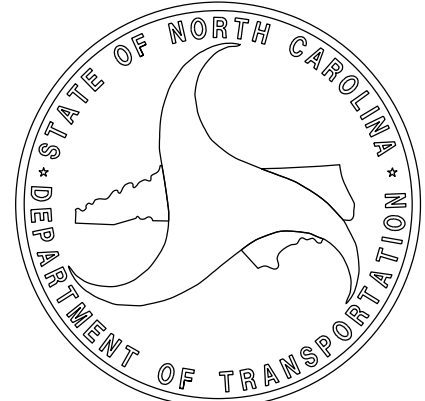
Miranda Salzler, PE
PROJECT ENGINEER

Thomas Culpepper, EI
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

Miranda Salzler, PE
SIGNATURE

P.E.



GENERAL NOTES

1. This project shall be built under the January 2024 Roadway Standards Drawing and Specifications.

2. This plan is based on the principles of natural channel design.

3. Proposed constructed stream features and structures shown on these plans are shown in their approximate location and shall be field located and dimensioned to insure proper channel dimension.

4. All elevations shown on these plans are referenced to a NAVD 88 datum.

5. The location of all equipment and material staging areas, haul roads, access points, limits of silt fencing, construction staging areas and construction access roads are shown as approximate on plans. Limits and locations will be coordinated as directed by the Engineer.

6. Highly visible safety fencing will be installed along wetlands as directed by the Engineer. Flagging will also be installed around trees not to be disturbed, as shown on plans.

7. Boulders will be staged in construction staging areas upon delivery.

8. Construction activities shall progress downstream, unless otherwise noted on these plans or as directed by the Engineer.

9. Equipment will remain outside of channel for construction unless the channel has been dewatered. Utilization of a pump around operation will be required when making the tie-in's of any work that has to be done within the water course.

10. All mechanized equipment operated in or near the stream or its tributaries shall be inspected regularly and maintained to prevent contamination of stream waters from fuels, lubricants, hydraulic fluids or other toxic materials. Any equipment repairs, maintenance or refueling activities shall not be done while the equipment is in the stream or its tributaries.

11. Contractor to utilize or dispose of all waste material as directed by the Engineer and in accordance with all federal, state, and local regulations.

12. All appropriately sized on-site trees removed during the stream restoration construction to be used on-site for log vanes, footer logs, etc., where feasible and as directed by the Engineer. Contractor shall stockpile suitable woody material for construction of in-stream structures separate from wasted material inside the stockpile areas.

13. All disturbed areas will be seeded immediately, as specified in the project specifications.

14. Apply temporary and permanent seed and coir fiber matting to bankfull bench and cut banks daily as excavation progresses. Coir fiber matting will be keyed into the top of slope and at the ends of each mat to prevent undercutting from sheet flow. Additional silt fencing may be necessary, as directed by the Engineer.

15. Unless otherwise directed by the Engineer, a 50-foot minimum width permanently vegetated buffer shall be planted on each side of channel.

16. Unless otherwise directed by the Engineer, where feasible, when beginning construction on a given reach, where clearing is required, use the following sequence:

a. Stockpile as specified on the plans.

b. Remove larger trees that can be used on-site for footer logs, log vanes or floodplain habitat structures and stockpile as specified on the plans.

c. Remove remaining vegetation and dispose of or stockpile as specified on the plans.

d. Remove topsoil and stockpile as specified on the plans.

e. Remove remaining soil materials as required and stockpile as specified on the plans.

17. Existing non-native vegetation within the right of way will be removed as specified in the project specifications.

18. Construction staging areas to be of adequate size to provide safe and organized storage for boulders and logs to be used for in-stream structures, mulch, topsoil and other soil material as well as all other related construction materials and equipment.

19. Construction personnel should park all vehicles within the limits of the designated construction staging areas. All other construction equipment and vehicles should be parked within the construction staging areas when not in use.

20. Contractor to be responsible for repairs to any damage to existing utilities, including but not limited to, overhead and underground utilities, curb and gutter, pavement, sidewalks, storm drainage systems, sanitary sewer systems or fencing. Any required repairs to be made in accordance with any and all applicable state and or local municipality or utility agency standards.

21. Contractor shall keep all topsoil stockpiled on site separately from other soil materials.

CONSTRUCTION SEQUENCE

1. Staging areas, stockpile areas, construction entrances and access roads will be identified and approximately located according to the Construction Documents. Variances will be allowed, assuming both the Contractor and Engineer verbally agree.

2. Construction entrances will be installed for access to the property in accordance with the roadway design plans and at the discretion of the Engineer.

3. The Contractor will install silt fencing, as noted on the Erosion Control Plans, at applicable staging and stockpile areas.

4. The proposed stream alignment and structure locations will be staked for Smith Creek (-P. SMITHCREEK-) and its unnamed tributary (-P. UT-). Staking will be restricted to riffle elevations only, to establish and maintain grade for the entire system. Pools will be excavated once structures are installed.

5. The Contractor will install temporary stream crossings on an as-needed basis only, pending agreement between both the Engineer and Contractor once implementation begins.

6. The Contractor will begin stockpiling materials in designated staging areas. The project will be divided into 5 distinct sections. Upon approval from the Engineer, sections may be constructed in a different sequence than indicated below or concurrently. General details associated with all sections include:

a. Special stilling basins will be used to filter the groundwater and placed within areas of newly excavated channel that are offline from the existing flow. These bags will be utilized as the Engineer deems necessary per BMPs.

b. At the end of each working day, the Contractor will be responsible for the application of temporary and permanent seed mixes, as applicable, to the newly established stream banks and disturbed areas. Coir fiber matting for stream restoration will be installed on top of the seed according to the Construction Documents .

c. Excavated material that is stockpiled, will follow erosion and sediment control guidelines as they relate to material storage and stockpiling.

d. All remaining disturbed areas are to be seeded and covered according to the Construction Documents.

e. Geotextile Fabric Type II will be constructed to impede any erosion of the channel and streambanks by the water diverted from the pumping-around procedure.

7. Boulders and materials used for stream structures will be delivered through the primary construction entrance and stockpiled in appropriate areas.

8. This project will require pumping for all channels during construction. Work will proceed in a manner that is most conducive with site conditions.

9. Generally, offline channels will be constructed and stabilized prior to connections with the existing flow pattern. Once the new channel is fully stabilized, all excavated material will be placed in segments of the existing channel that are to be abandoned. When feasible, the bed material will be transferred between the existing channel to the new channel.

10. Large trees and vegetated banks shall not be disturbed as much as practicable in areas noted on the plans or identified by the Engineer.

Section 1: Smith Creek Stations 10+00 to 14+80 +/- -P. SMITHCREEK-

11. The Contractor will excavate the proposed Smith Creek Reach 1 floodplain bench based on the typical sections. Water will be diverted by a pump and impervious dike and directed through flexible hose, where necessary, to minimize erosion and sedimentation during grading procedures. If the Engineer identifies the need to dewater the stream due to benching back the banks, implement a pump-around operation. Existing pipes shall be removed as indicated on plans.

12. All remaining disturbed areas between Smith Creek Reach 1 Stations 10+00 to 14+80 are to be seeded and mulched according to the Construction Documents.

13. Install culvert per roadway erosion control sheet EC-8A, “Culvert Construction Sequence Sta. 66+15.5 -L-”

Section 2: Smith Creek Stations 18+00 to 21+00 +/- -P. SMITHCREEK-

14. The Contractor will excavate the proposed Smith Creek channel based on the typical sections. Structures will be installed according to the details presented in the Construction Documents and initial grading will be completed to riffle and drop structure elevations only. Pools will be established once structures and channel alignments have been completed. Water will be diverted by a pump and impervious dike and directed through flexible hose where necessary, to minimize erosion and sedimentation during connection procedures. Once the new channel is fully stabilized, the water can be diverted from the existing channel, and all excavated material will be placed in segments of the existing channel that are to be abandoned. Existing pipes shall be removed as indicated on plans.

15. A stream plug will be installed along the existing channel at (-P. SMITHCREEK-) Station 21+25 +/-, just downstream with the existing confluence of the UT.

16. All remaining disturbed areas between Smith Creek Stations 18+00 and 21+00 are to be seeded and mulched according to the Construction Documents.

Section 3: UT Stations 10+00 to 12+85 +/- -P. UT-

17. Before construction on this section, 66” welded steel pipe is to be installed as shown on PSH 08 of the roadway plans.

18. The Contractor will excavate the -P. UT- channel based on the typical sections. Structures will be installed according to the details presented in the Construction Documents and initial grading will be completed to riffle elevations only. Pools will be established once structures and channel alignments have been completed. Water will be diverted by a pump and impervious dike and directed through flexible hose, where necessary, to minimize erosion and sedimentation during connection procedures. Once the new channel is fully stabilized, the water can be diverted from the existing channel, and all excavated material will be placed in segments of the existing channel that are to be abandoned. Existing pipes shall be removed as indicated on plans.

19. A stream plug will be installed along the existing channel at (-P. UT-) Station 10+30 +/-.

20. All remaining disturbed areas between UT Stations 10+00 and 12+85 +/- are to be seeded and mulched according to the Construction Documents.

Section 4: Smith Creek Stations 21+00 to 28+12 (End Construction) +/- -P. SMITH CREEK-

21. The Contractor will excavate the proposed Smith Creek channel based on the typical sections. Structures will be installed according to the details presented in the Construction Documents and initial grading will be completed to riffle elevations only. Water will be diverted by a pump and impervious dike and directed through flexible hose, where necessary, to minimize erosion and sedimentation during connection procedures. Once the new channel is fully stabilized, all excavated material will be placed in segments of the existing channel that are to be abandoned. Pools will be established once structures and channel alignments have been completed. Tie into existing stream at 28+12 (-P. SMITHCREEK-).

22. Stream plugs will be installed along the existing channels at (-P. SMITHCREEK -) Stations 21+75 +/- and (-P. UT-) 12+85+/-

23. All remaining disturbed areas between Smith Creek Stations 21+00 and 28+12 are to be seeded and mulched according to the Construction Documents.

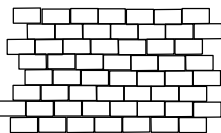
Section 5: Headwater Wetland

24. The Contractor will remove the 2@24” RCP and stockpiled 3@ 24” HDPE pipes and level existing mounds to aid in the reestablishment of wetlands on the NCDOT parcel north of US-158. These areas of existing mounds and designated on the construction documents. Grading may occur within potential wetland footprint of up to 6 inches. Site to be bush-hogged, ripped with 12” shank ripper, and disced for reforestation preparation.

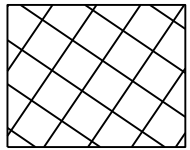
Index of Sheets

Sheet Number	Description
OSM-01	Title Sheet
OSM-01A	Index of Sheets, General notes, Construction Sequencing, and Stream Symbols
OSM-01B	Plan Sheet Symbols
OSM-02A	Typical Sections 1
OSM-02B	Typical Sections 2
OSM-02C	Stream Crossing Detail, Coir Fiber Matting Detail
OSM-02D	Boulder Rock and Roll Riffle Detail
OSM-02E	Rock Cross Vane Detail, Stream Plug
OSM-02F	Rock Sill Detail, Boulder Toe Protection Detail, Constructed Riffle Detail, Flood Plain Interceptor Detail
OSM-02G	Brush Toe Stabilization Detail
OSM-02H	Example of Pump-Around Operation
OSM-02i	Morphological Table
OSM-02J	Structure Invert Table
OSM-03	Quantities
OSM-04	Plan/Profile Sheet
OSM-05	Plan/Profile Sheet
OSM-06	Wetland Enhancement Plan Sheet
OSM-X-01 TO X-06	Cross Section Sheets

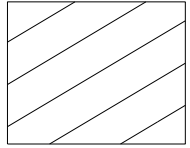
STREAM SYMBOLS



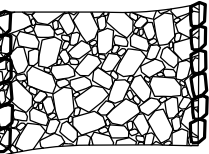
STREAM CROSSING - TYPE II



FILL IN EXISTING CHANNEL



STREAM PLUG



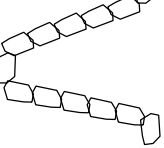
CONSTRUCTED RIFFLE



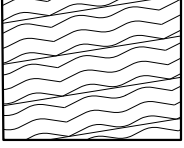
ROCK SILL



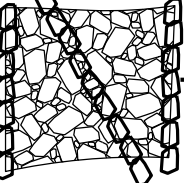
BOULDER TOE (ON STREAM BANKS)



ROCK CROSS VANE



BRUSH TOE STABILIZATION



ROCK AND ROLL RIFFLE



FLOODPLAIN INTERCEPTOR

U-6187

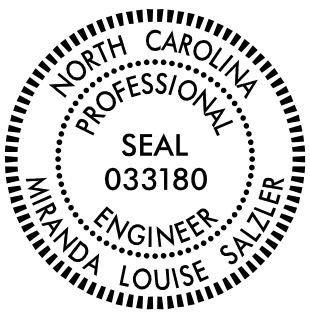
OSM-01A

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DAVIE COUNTY



ENVIRONMENTAL ANALYSES UNIT

HYDRAULIC DESIGN
ENGINEER



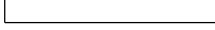
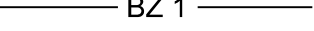
PREPARED BY


VHB Engineering, Inc., P.C. (C-3705)
540 Main Campus Drive, Suite 500
Fayetteville, NC 27806

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

Note: Not to Scale

BOUNDARIES AND PROPERTY:

State Line	
County Line	
Township Line	
City Line	
Reservation Line	
Property Line	
Existing Iron Pin (EIP)	
Computed Property Corner	
Existing Concrete Monument (ECM)	
Parcel / Sequence Number	
Existing Fence Line	
Proposed Woven Wire Fence	
Proposed Chain Link Fence	
Proposed Barbed Wire Fence	
Existing Wetland Boundary	
Proposed Wetland Boundary	
Existing Endangered Animal Boundary	
Existing Endangered Plant Boundary	
Existing Historic Property Boundary	
Known Contamination Area: Soil	
Potential Contamination Area: Soil	
Known Contamination Area: Water	
Potential Contamination Area: Water	
Contaminated Site: Known or Potential	
BUILDINGS AND OTHER CULTURE:	
Gas Pump Vent or U/G Tank Cap	
Sign	
Well	
Small Mine	
Foundation	
Area Outline	
Cemetery	
Building	
School	
Church	
Dam	
HYDROLOGY:	
Stream or Body of Water	
Hydro, Pool or Reservoir	
Jurisdictional Stream	
Buffer Zone 1	
Buffer Zone 2	
Flow Arrow	
Disappearing Stream	
Spring	
Wetland	
Proposed Lateral, Tail, Head Ditch	
False Sump	

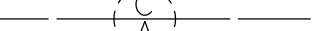
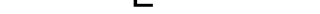
STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

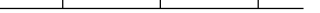
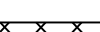
RAILROADS:

Standard Gauge	
RR Signal Milepost	
Switch	
RR Abandoned	
RR Dismantled	

RIGHT OF WAY & PROJECT CONTROL:

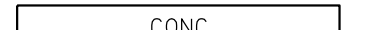
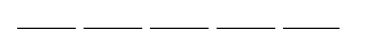
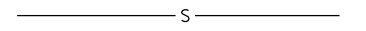
Primary Horiz Control Point	
Primary Horiz and Vert Control Point	
Secondary Horiz and Vert Control Point	
Vertical Benchmark	
Existing Right of Way Monument	
Proposed Right of Way Monument (Rebar and Cap)	
Proposed Right of Way Monument (Concrete)	
Existing Permanent Easement Monument	
Proposed Permanent Easement Monument (Rebar and Cap)	
Existing C/A Monument	
Proposed C/A Monument (Rebar and Cap)	
Proposed C/A Monument (Concrete)	
Existing Right of Way Line	
Proposed Right of Way Line	
Existing Control of Access Line	
Proposed Control of Access Line	
Proposed ROW and CA Line	
Existing Easement Line	
Proposed Temporary Construction Easement	
Proposed Temporary Drainage Easement	
Proposed Permanent Drainage Easement	
Proposed Permanent Drainage/Utility Easement	
Proposed Permanent Utility Easement	
Proposed Temporary Utility Easement	
Proposed Aerial Utility Easement	

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	
Existing Curb	
Proposed Slope Stakes Cut	
Proposed Slope Stakes Fill	
Proposed Curb Ramp	
Existing Metal Guardrail	
Proposed Guardrail	
Existing Cable Guiderail	
Proposed Cable Guiderail	
Equality Symbol	
Pavement Removal	
VEGETATION:	
Single Tree	
Single Shrub	
Hedge	

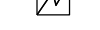
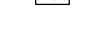
Woods Line	
Orchard	
Vineyard	

EXISTING STRUCTURES:

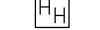
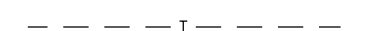
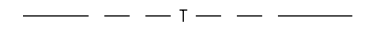
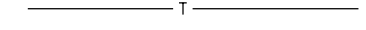
MAJOR:	
Bridge, Tunnel or Box Culvert	
Bridge Wing Wall, Head Wall and End Wall	
MINOR:	
Head and End Wall	
Pipe Culvert	
Footbridge	
Drainage Box: Catch Basin, DI or JB	
Paved Ditch Gutter	
Storm Sewer Manhole	
Storm Sewer	

UTILITIES:

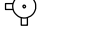
** SUE - Subsurface Utility Engineering
LOS - Level of Service - A,B,C or D (Accuracy)*

POWER:	
Existing Power Pole	
Proposed Power Pole	
Existing Joint Use Pole	
Proposed Joint Use Pole	
Power Manhole	
Power Line Tower	
Power Transformer	
U/G Power Cable Hand Hole	
H-Frame Pole	
U/G Power Line Test Hole (SUE - LOS A)*	
U/G Power Line (SUE - LOS B)*	
U/G Power Line (SUE - LOS C)*	
U/G Power Line (SUE - LOS D)*	

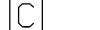
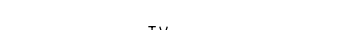
TELEPHONE:

Existing Telephone Pole	
Proposed Telephone Pole	
Telephone Manhole	
Telephone Pedestal	
Telephone Cell Tower	
U/G Telephone Cable Hand Hole	
U/G Telephone Test Hole (SUE - LOS A)*	
U/G Telephone Cable (SUE - LOS B)*	
U/G Telephone Cable (SUE - LOS C)*	
U/G Telephone Cable (SUE - LOS D)*	
U/G Telephone Conduit (SUE - LOS B)*	
U/G Telephone Conduit (SUE - LOS C)*	
U/G Telephone Conduit (SUE - LOS D)*	
U/G Fiber Optics Cable (SUE - LOS B)*	
U/G Fiber Optics Cable (SUE - LOS C)*	
U/G Fiber Optics Cable (SUE - LOS D)*	

WATER:

Water Manhole	
Water Meter	
Water Valve	
Water Hydrant	
U/G Water Line Test Hole (SUE - LOS A)*	
U/G Water Line (SUE - LOS B)*	
U/G Water Line (SUE - LOS C)*	
U/G Water Line (SUE - LOS D)*	
Above Ground Water Line	

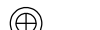
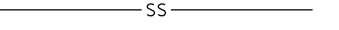
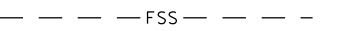
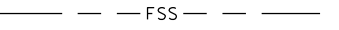
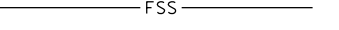
TV:

TV Pedestal	
TV Tower	
U/G TV Cable Hand Hole	
U/G TV Test Hole (SUE - LOS A)*	
U/G TV Cable (SUE - LOS B)*	
U/G TV Cable (SUE - LOS C)*	
U/G TV Cable (SUE - LOS D)*	
U/G Fiber Optic Cable (SUE - LOS B)*	
U/G Fiber Optic Cable (SUE - LOS C)*	
U/G Fiber Optic Cable (SUE - LOS D)*	

GAS:

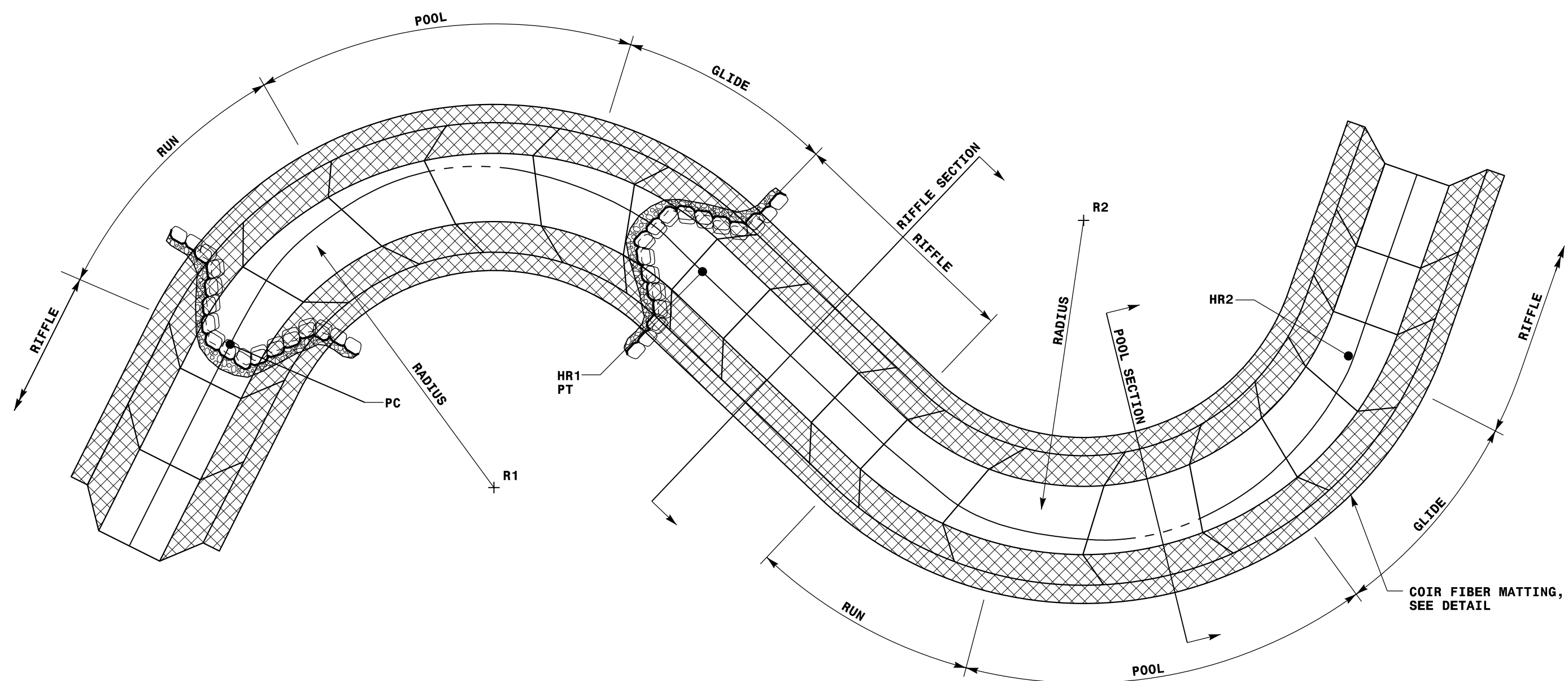
Gas Valve	
Gas Meter	
U/G Gas Line Test Hole (SUE - LOS A)*	
U/G Gas Line (SUE - LOS B)*	
U/G Gas Line (SUE - LOS C)*	
U/G Gas Line (SUE - LOS D)*	
Above Ground Gas Line	

SANITARY SEWER:

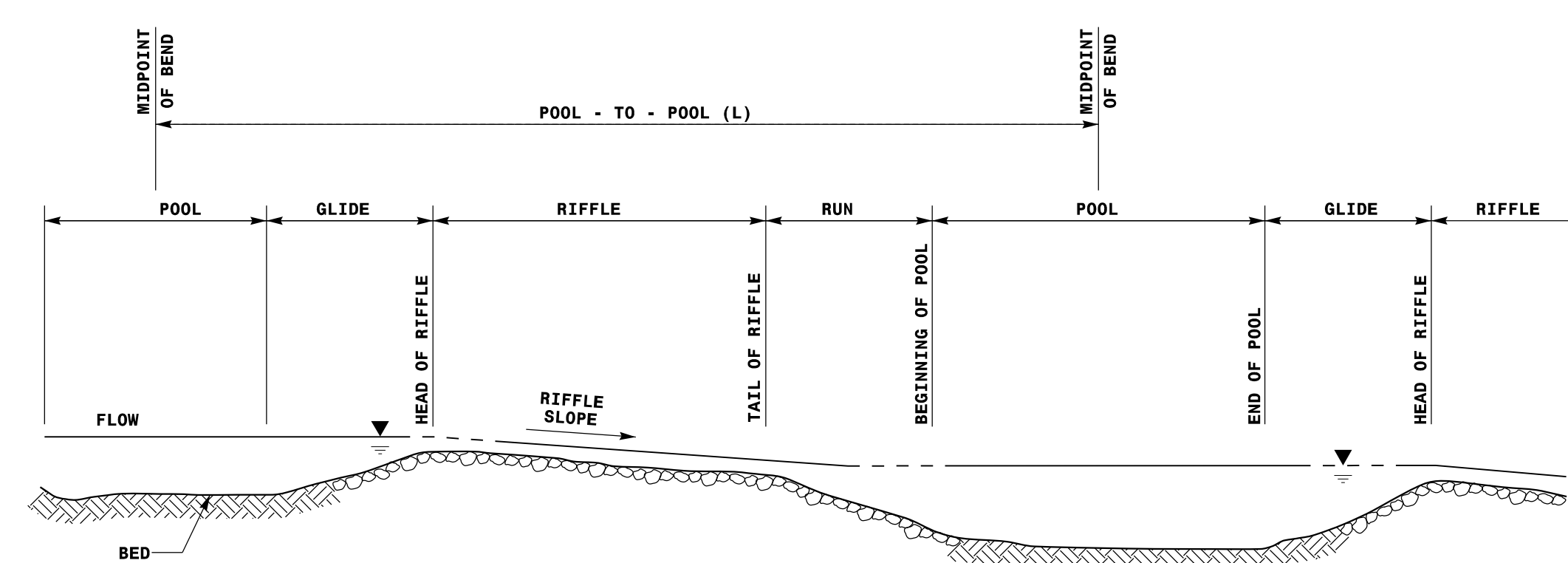
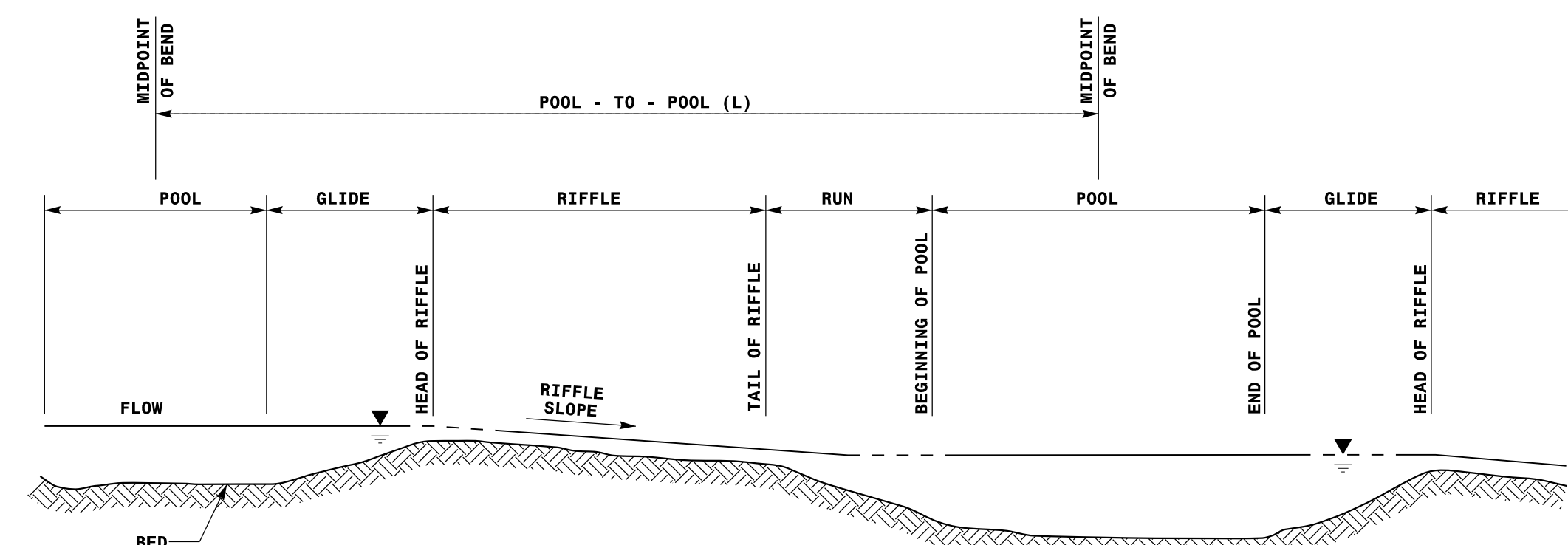
Sanitary Sewer Manhole	
Sanitary Sewer Cleanout	
U/G Sanitary Sewer Line	
Above Ground Sanitary Sewer	
SS Force Main Line Test Hole (SUE - LOS A)*	
SS Force Main Line (SUE - LOS B)*	
SS Force Main Line (SUE - LOS C)*	
SS Force Main Line (SUE - LOS D)*	

MISCELLANEOUS:

Utility Pole	
Utility Pole with Base	
Utility Located Object	
Utility Traffic Signal Box	
Utility Unknown U/G Line (SUE - LOS B)*	
U/G Tank; Water, Gas, Oil	
Underground Storage Tank, Approx. Loc.	
A/G Tank; Water, Gas, Oil	
Geoenvironmental Boring	
Abandoned According to Utility Records	
End of Information	

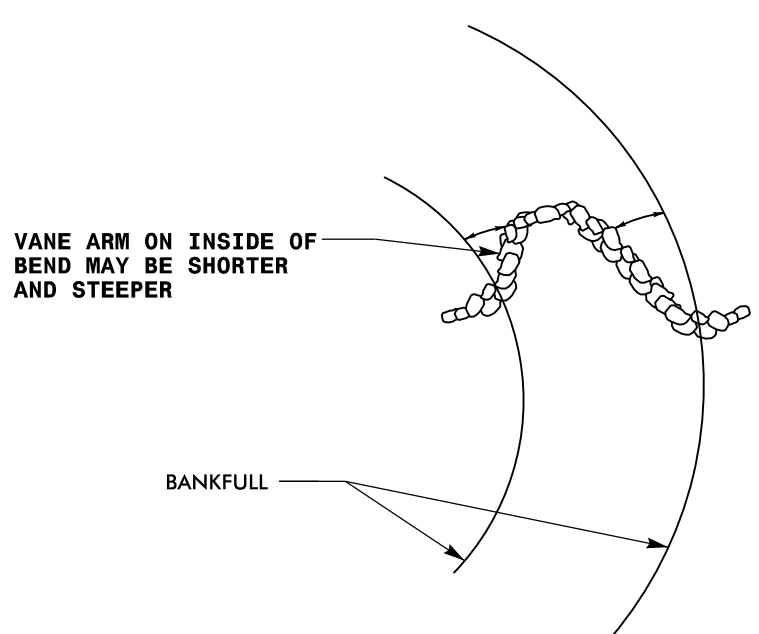


TYPICAL PLAN

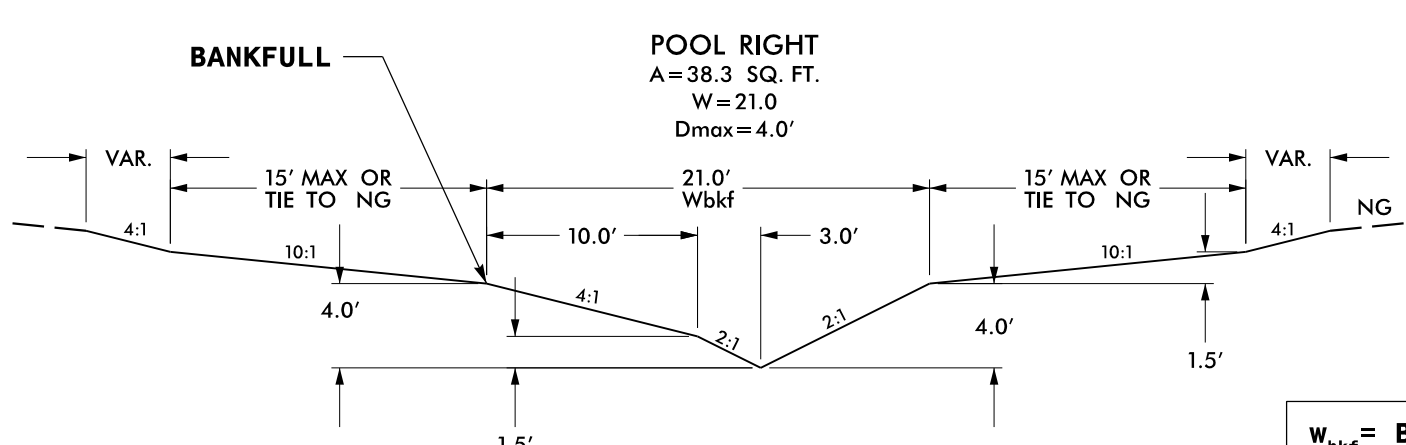
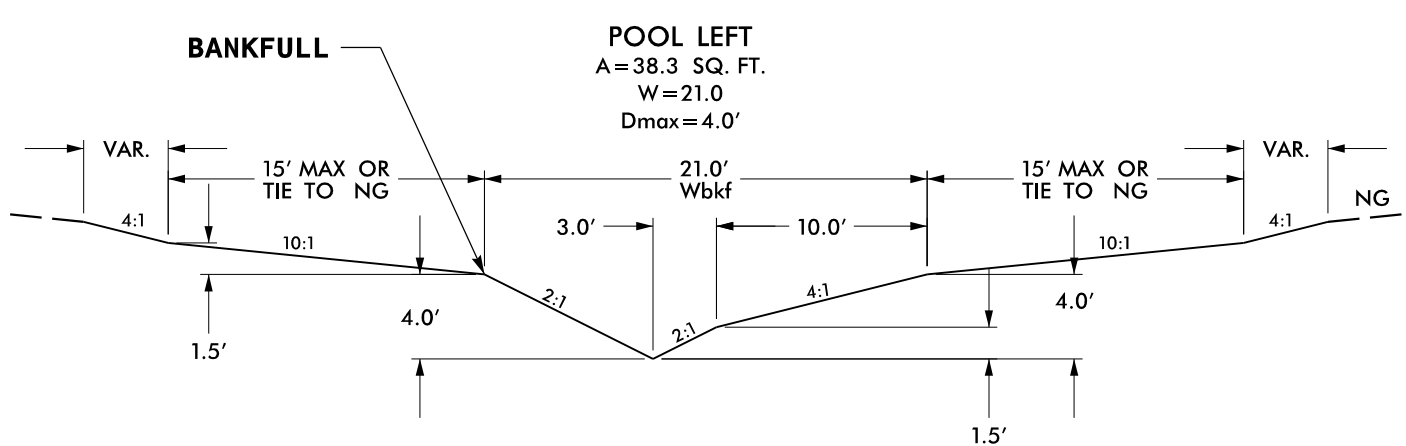
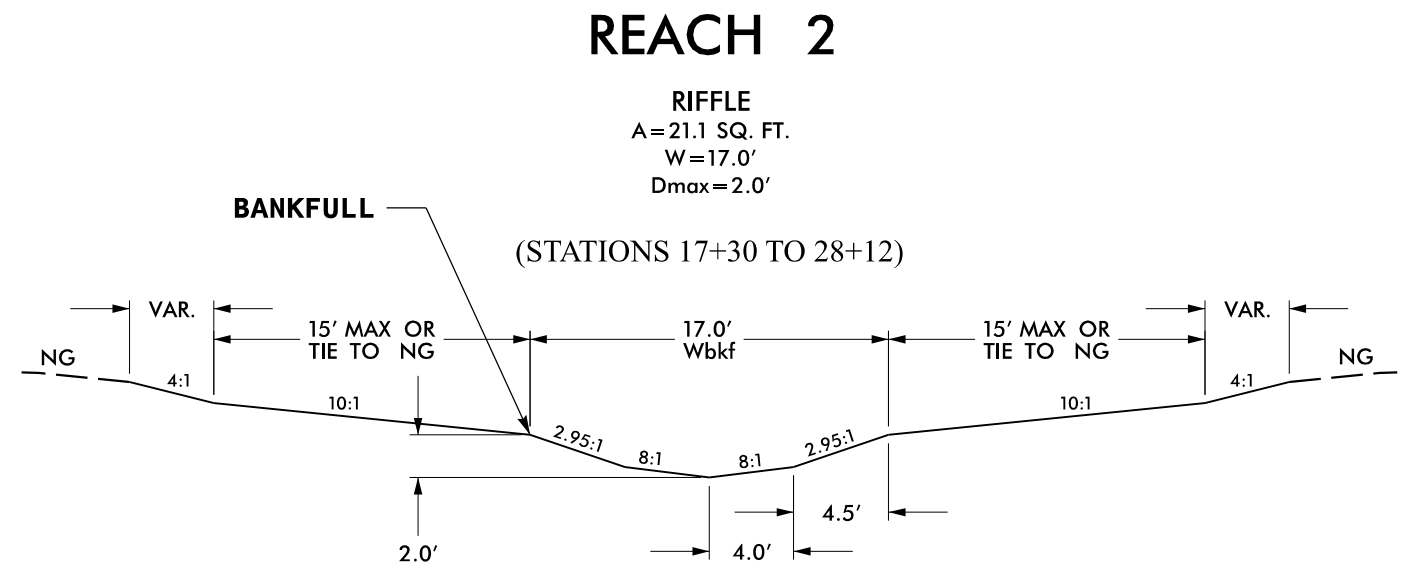
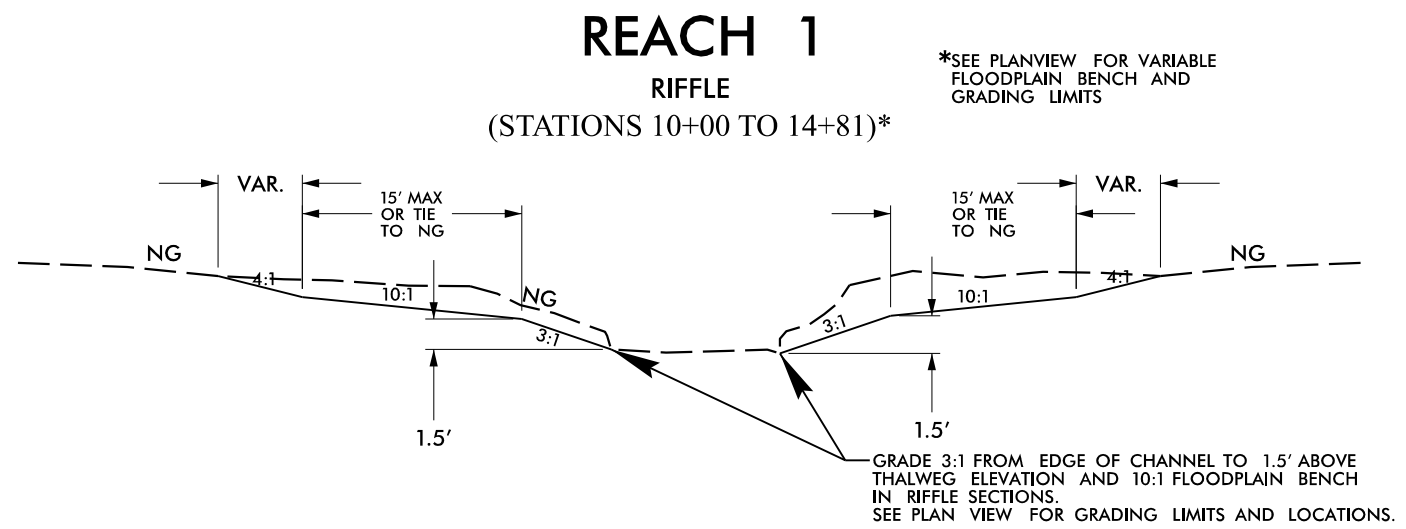


TYPICAL PROFILE FOR ARMORED RIFFLE SECTION

CHANNEL TYPICAL DETAIL - SMITH CREEK



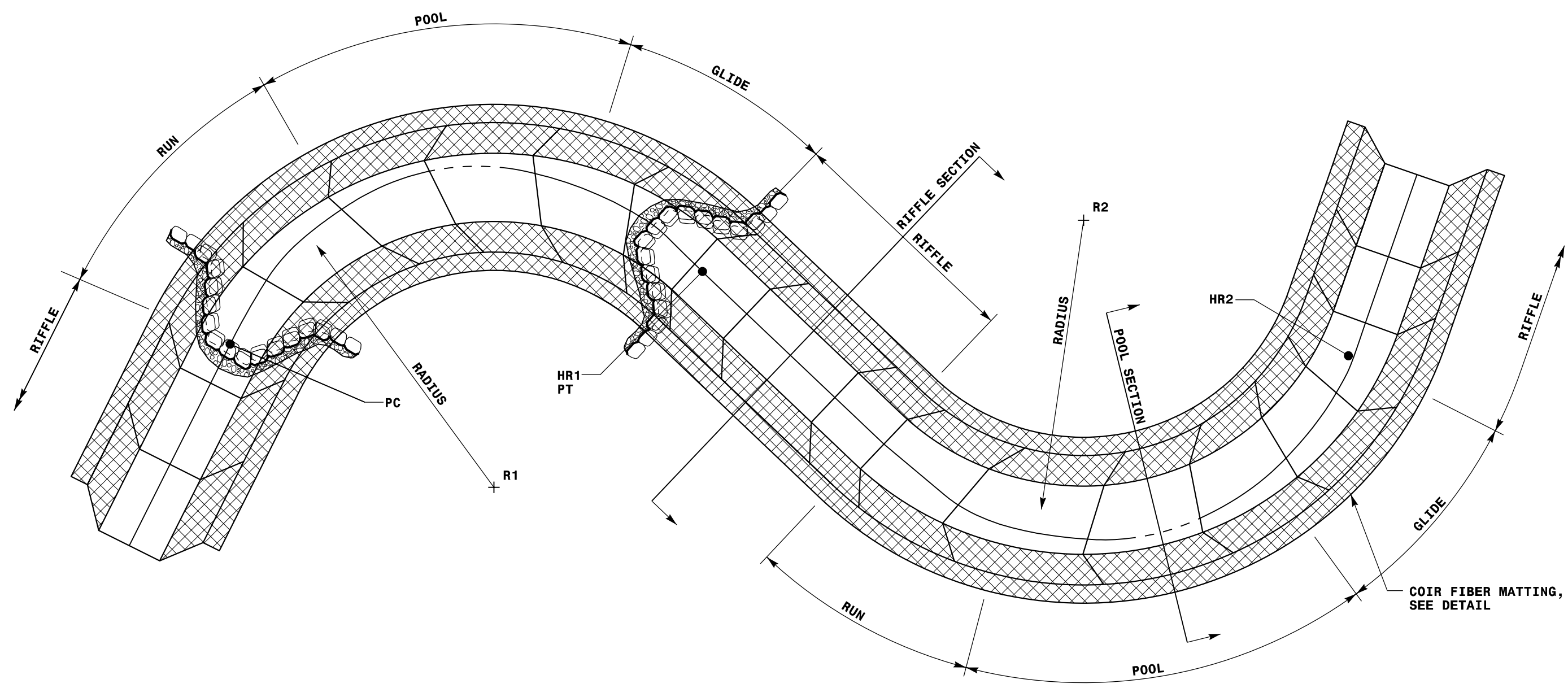
CROSS VANE CONSTRUCTION
IN MEANDER-BEND
PLAN VIEW



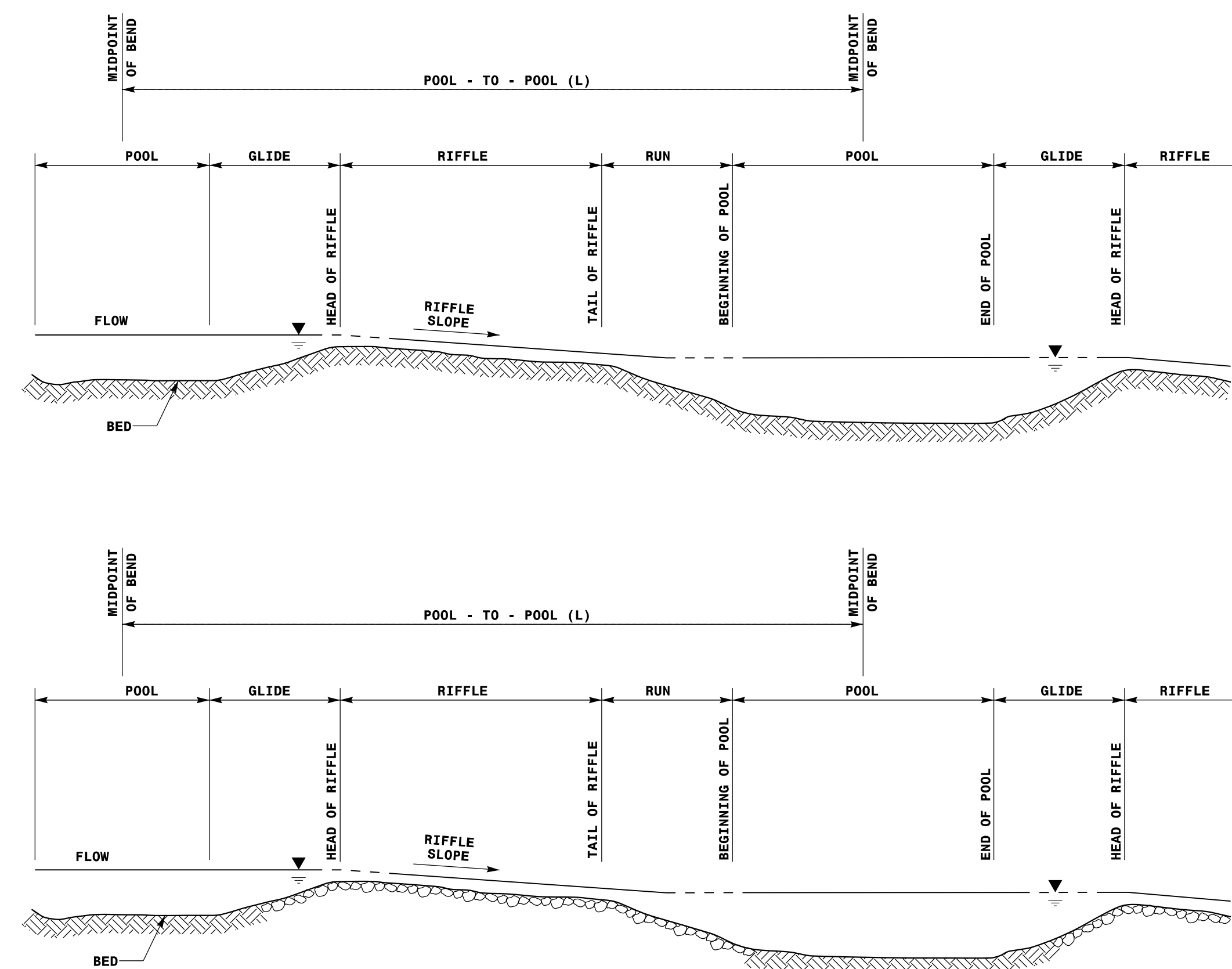
W_{bkf} = BANKFULL WIDTH
D_{max} = MAXIMUM DEPTH
W_b = BOTTOM WIDTH
W_{fpa} = FLOOD PRONE AREA WIDTH

CROSS-SECTION DIMENSIONS								
REACH	RIFFLE				POOL			
	W _{bkf}	D _{max}	W _b	W _{fpa}	W _{bkf}	D _{max}	W _b	W _{fpa}
Sta. 17+30 - Sta. 28+18	17.0'	2.0'	8.0'	50.0'	21.0'	4.0'	6.0'	71.0'

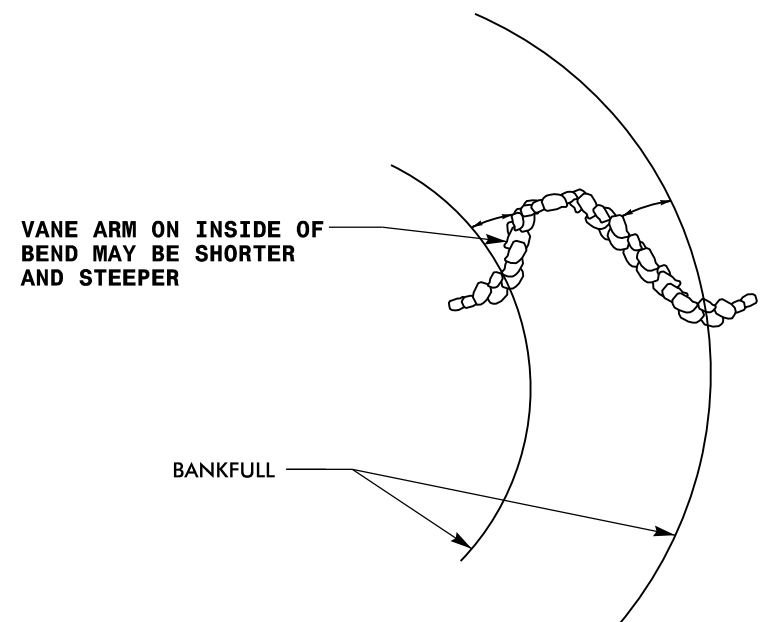
STATION -P_SMITHCREEK-	FEATURE
18+50.00	RIFFLE
19+55.00	RIFFLE
20+16.00	CONSTRUCTED RIFFLE
21+05.00	CONSTRUCTED RIFFLE
22+22.00	RIFFLE
23+15.00	RIFFLE
24+05.00	CONSTRUCTED RIFFLE
24+80.00	RIFFLE
26+56.00	RIFFLE
27+60.00	RIFFLE



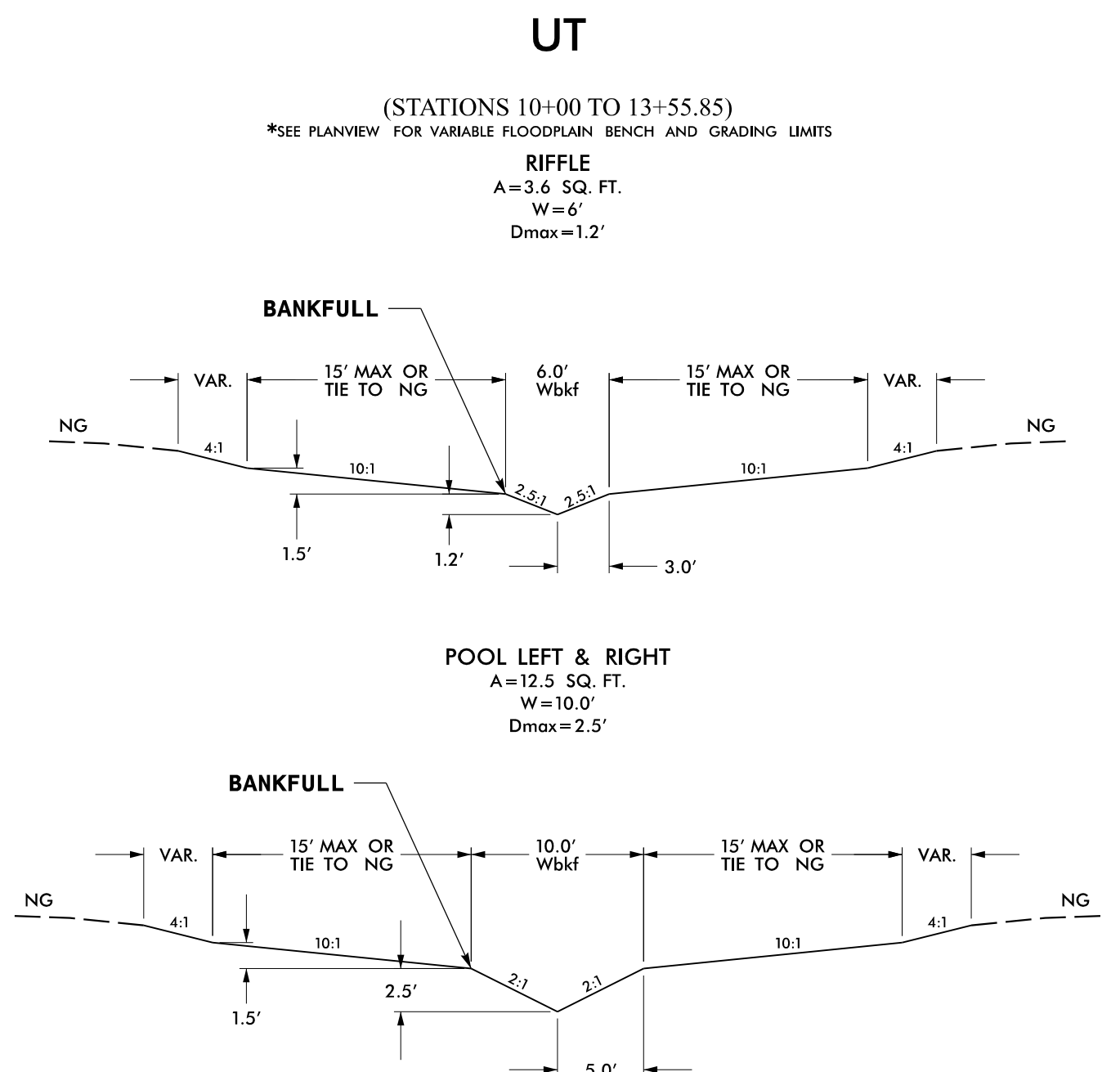
TYPICAL PLAN



TYPICAL PROFILE FOR ARMORED RIFFLE SECTION



CROSS VANE CONSTRUCTION
IN MEANDER-BEND
PLAN VIEW



W_{bkf} = BANKFULL WIDTH
 D_{max} = MAXIMUM DEPTH
 W_b = BOTTOM WIDTH
 W_{fpa} = FLOOD PRONE AREA WIDTH

CROSS-SECTION DIMENSIONS								
REACH	RIFFLE				POOL			
	W_{bkf}	D_{max}	W_b	W_{fpa}	W_{bkf}	D_{max}	W_b	W_{fpa}
Sta. 10+00 - Sta. 13+56	6.0'	1.2'	0.0'	30.0'	10.0'	2.5'	0.0'	48.0'

STATION -P_UT-	FEATURE
10+63.00	RIFFLE
11+10.00	RIFFLE
11+45.00	CONSTRUCTED RIFFLE
11+86.00	RIFFLE
12+20.00	CONSTRUCTED RIFFLE
12+68.00	CONSTRUCTED RIFFLE
13+25.00	CONSTRUCTED RIFFLE

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DEPARTMENT OF TRANSPORTATION
DAVIE COUNTY



ENVIRONMENTAL ANALYSES UNIT

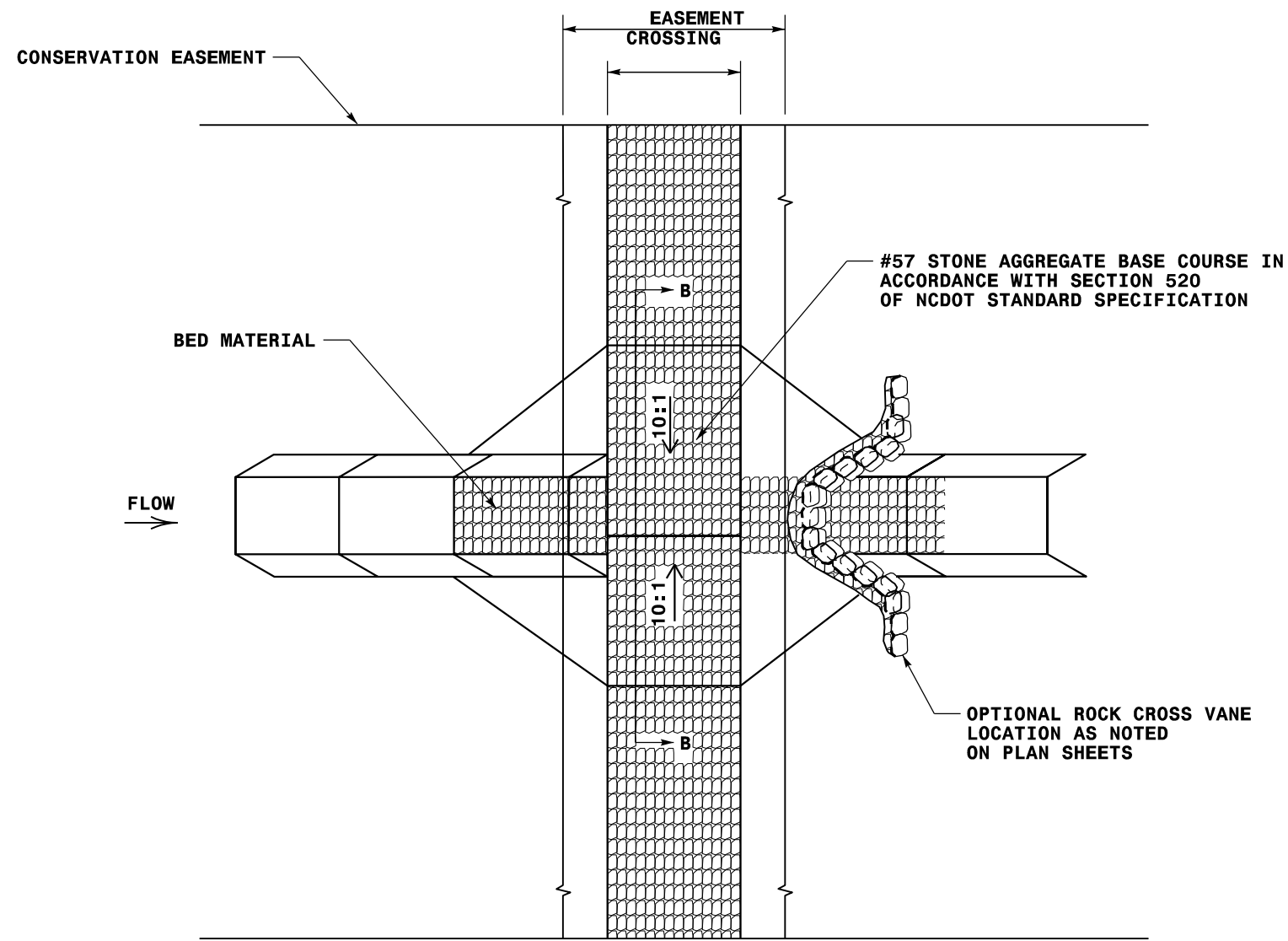
HYDRAULIC DESIGN
ENGINEER



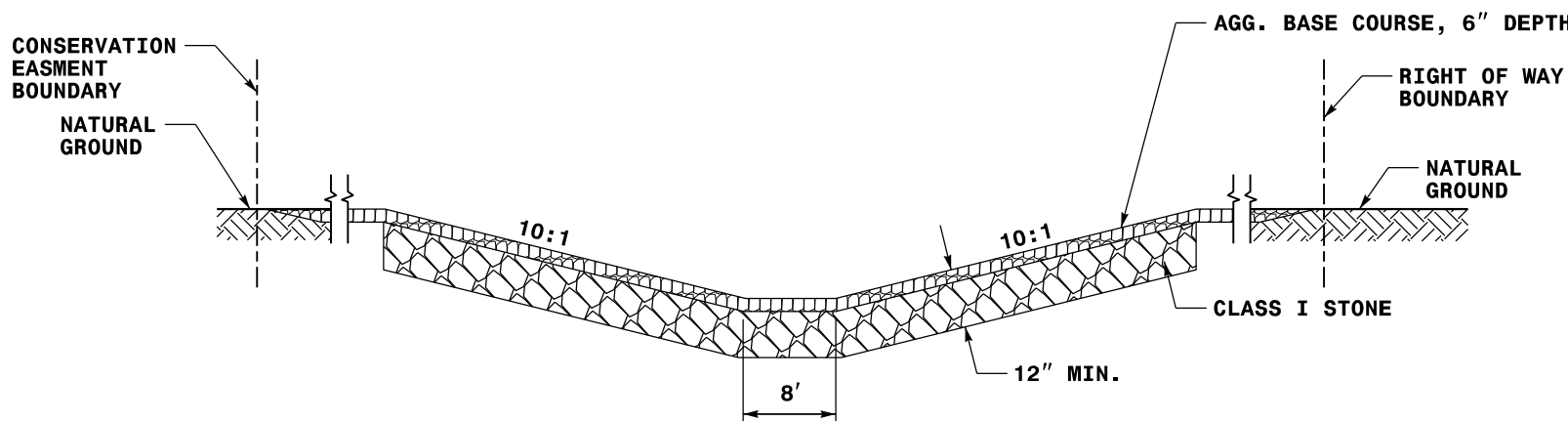
PREPARED BY



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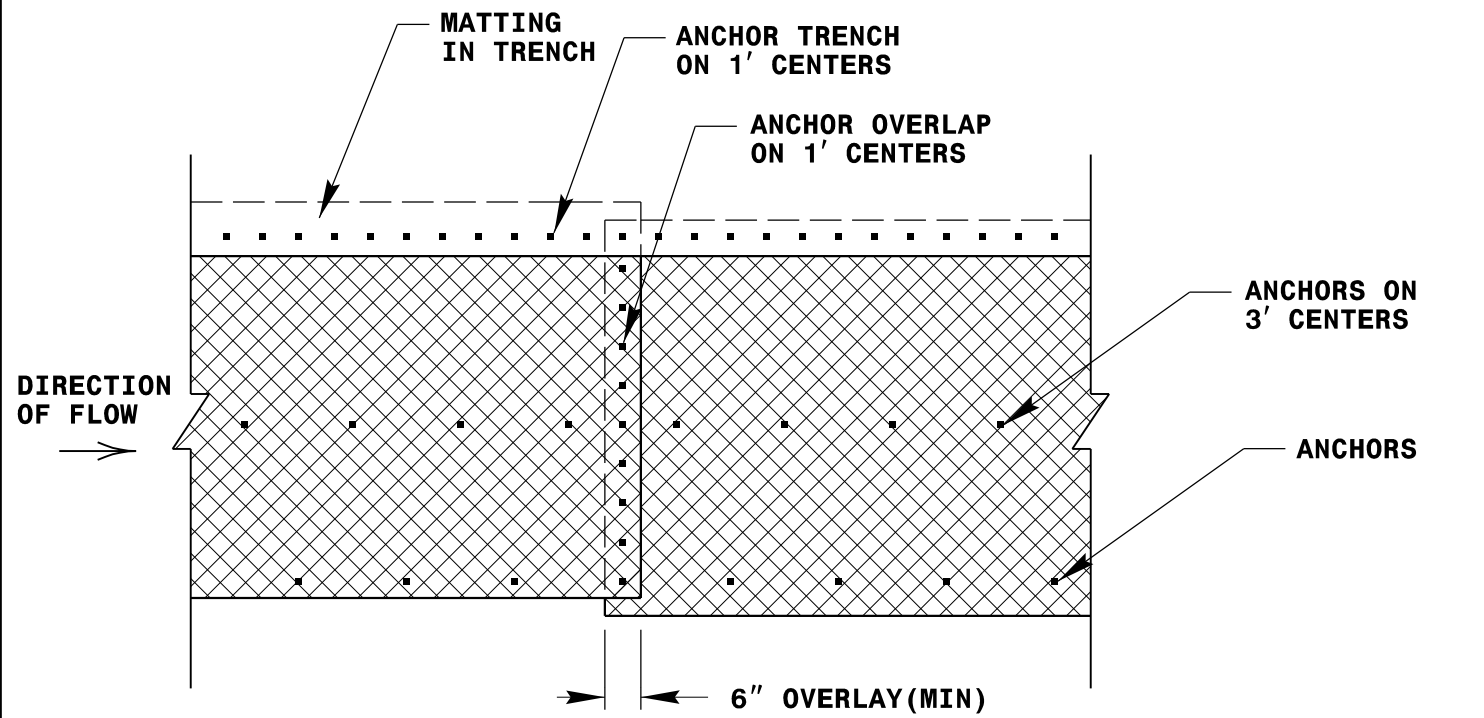


PLAN VIEW

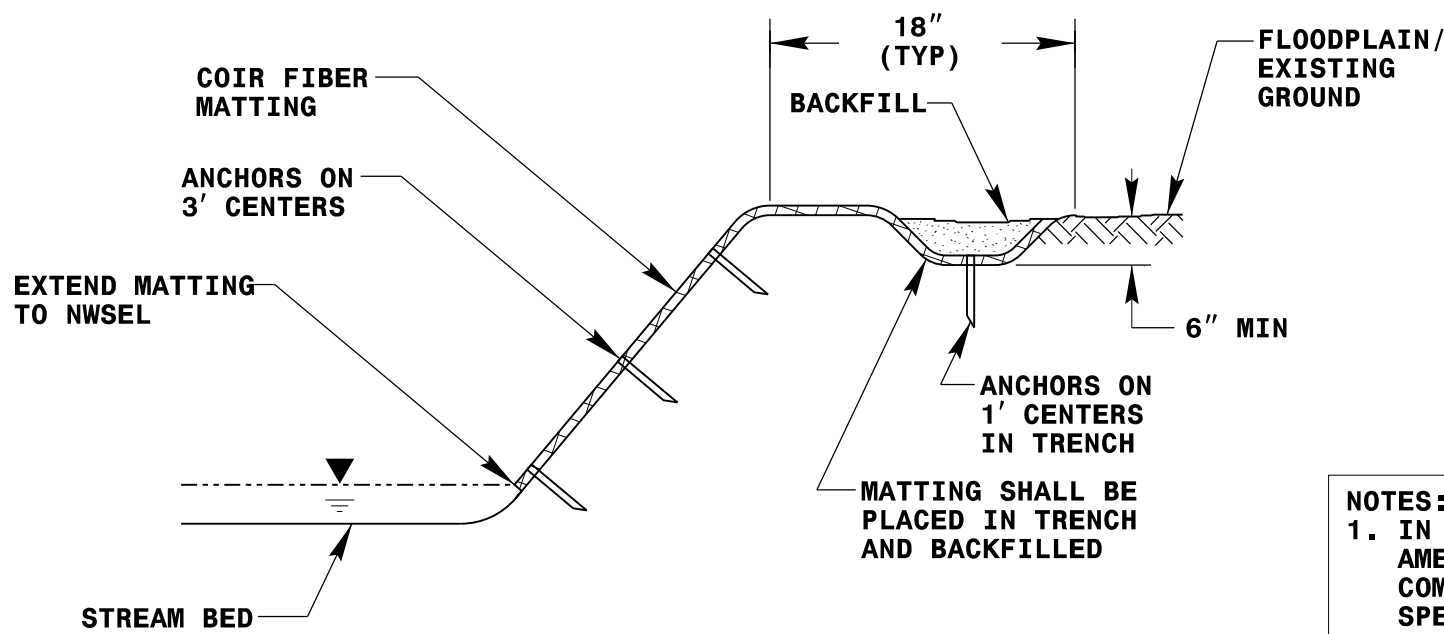


SECTION B-B

STREAM CROSSING DETAIL - TYPE II
NOT TO SCALE



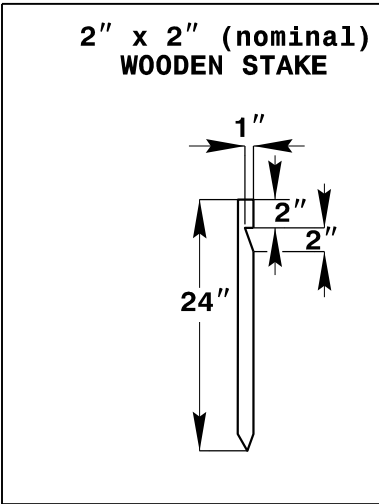
PLAN VIEW



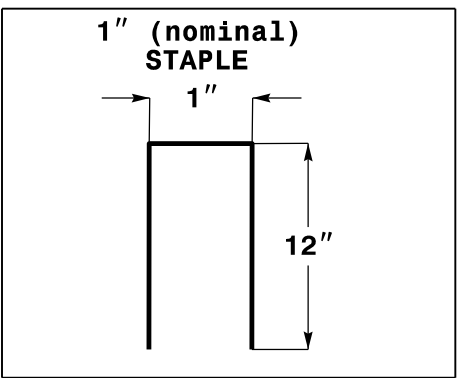
TYPICAL CROSS SECTION

COIR FIBER MATTING FOR STREAM RESTORATION DETAIL

NOT TO SCALE



ANCHOR OPTION-
FOR STREAMBANKS ONLY



ANCHOR OPTION-
FOR BRUSH TOE
STABILIZATION ONLY

- NOTES:
1. IN AREAS TO BE MATTED, ALL SEEDING, SOIL AMENDMENTS, AND SOIL PREPARATION MUST BE COMPLETED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS PRIOR TO PLACEMENT OF COIR FIBER MATTING.
 2. STAPLES MAY BE USED IN PLACE OF WOODEN STAKES ONLY ON BRUSH TOE STABILIZATION AS DIRECTED BY THE ENGINEER.

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DAVIE COUNTY



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SEAL

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ENGINEER

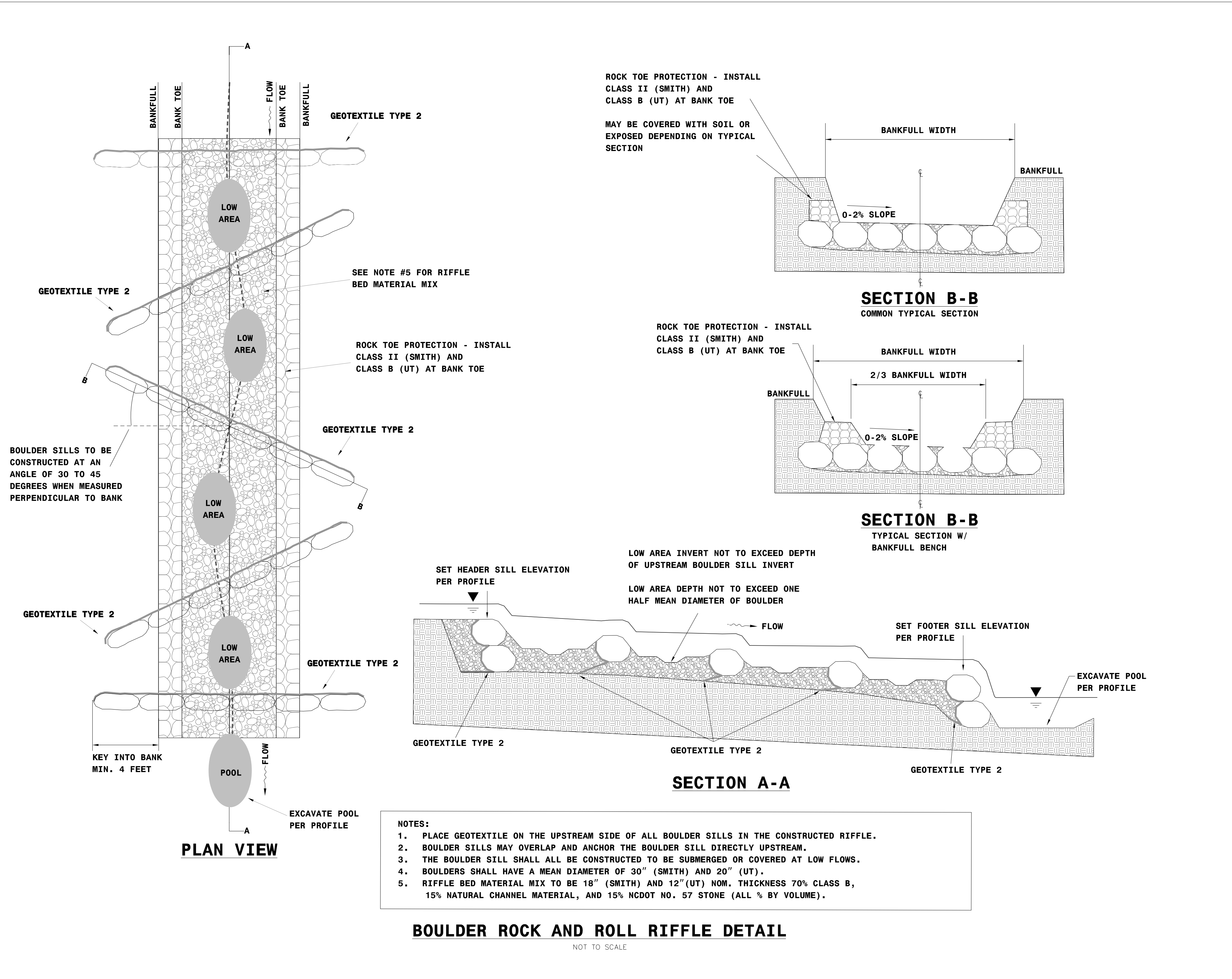
WANDA LOUISE SALTER

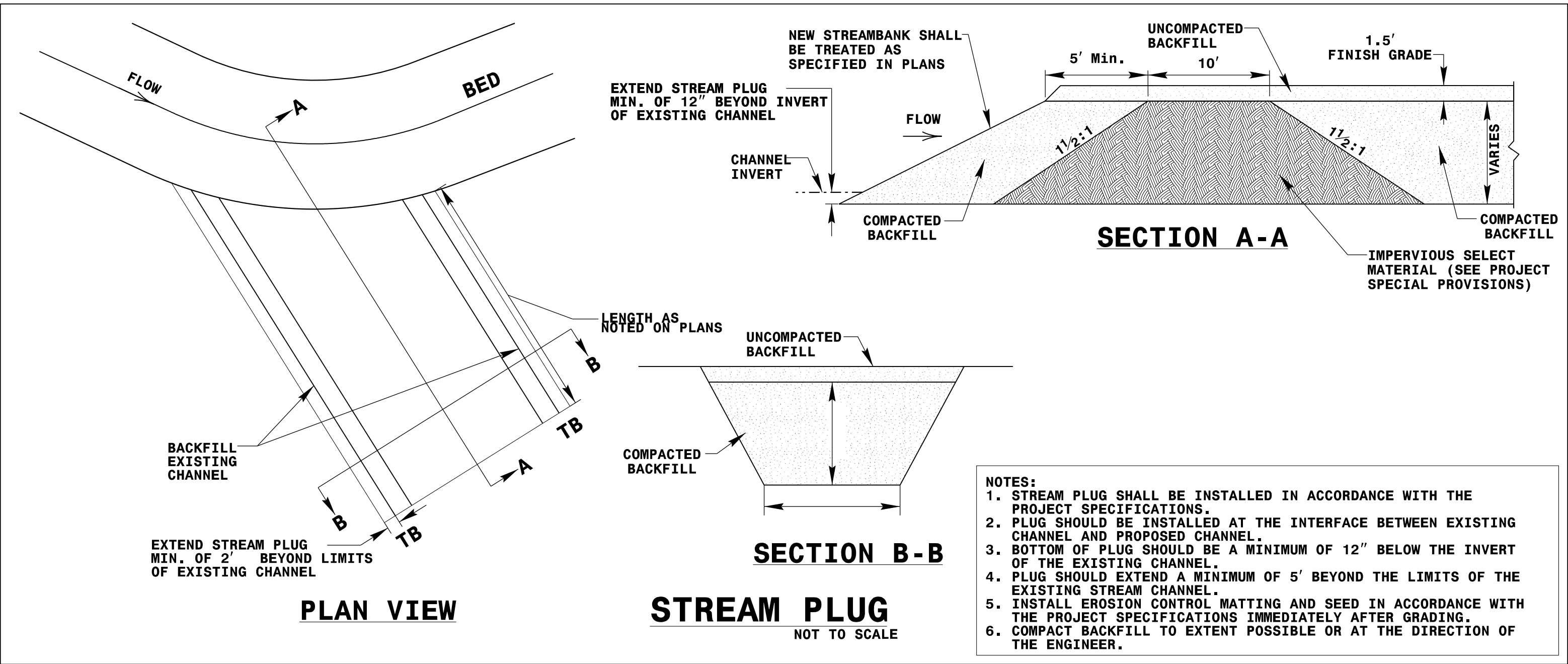
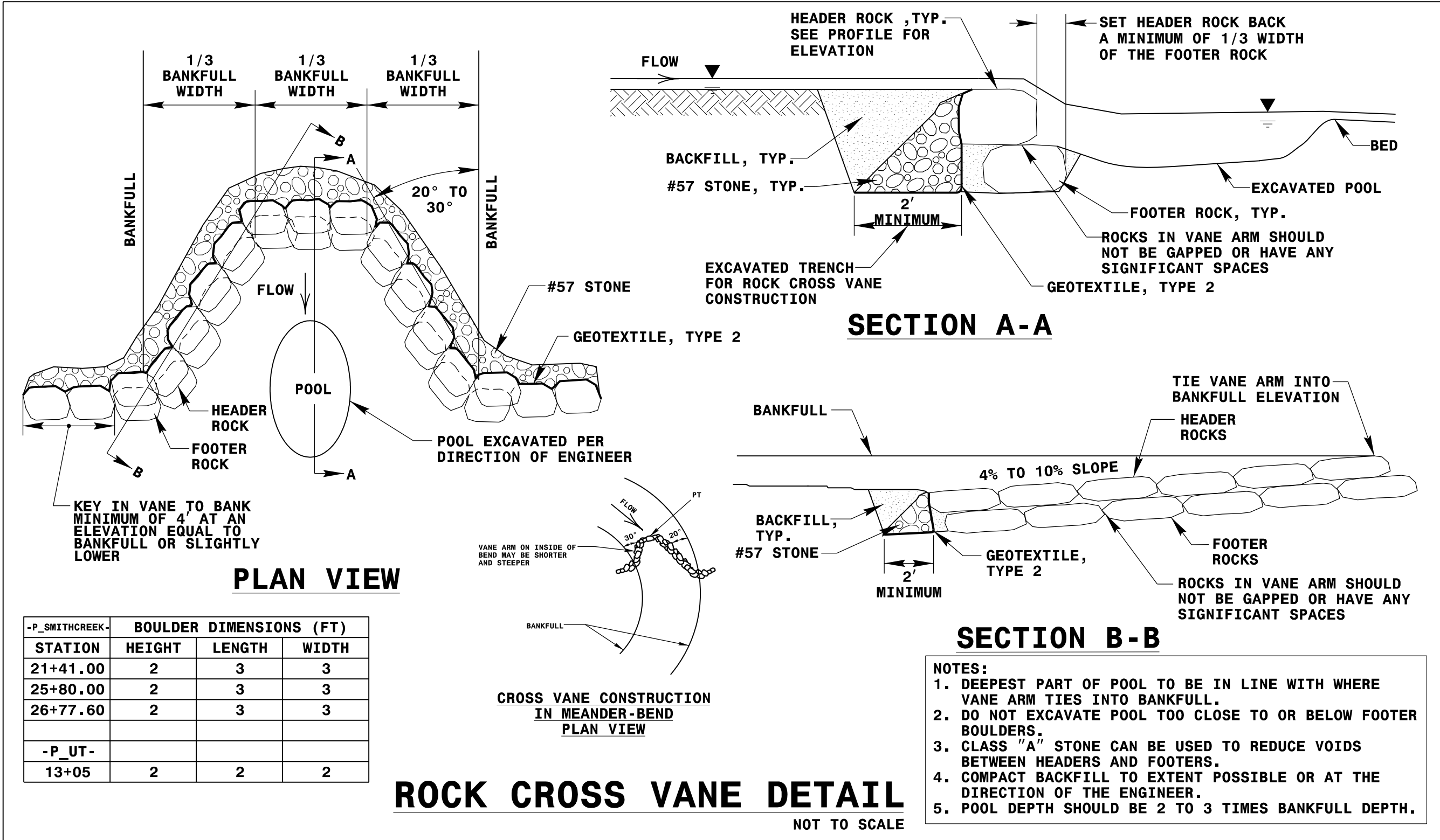
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ENGINEER

WANDA LOUISE SALTER

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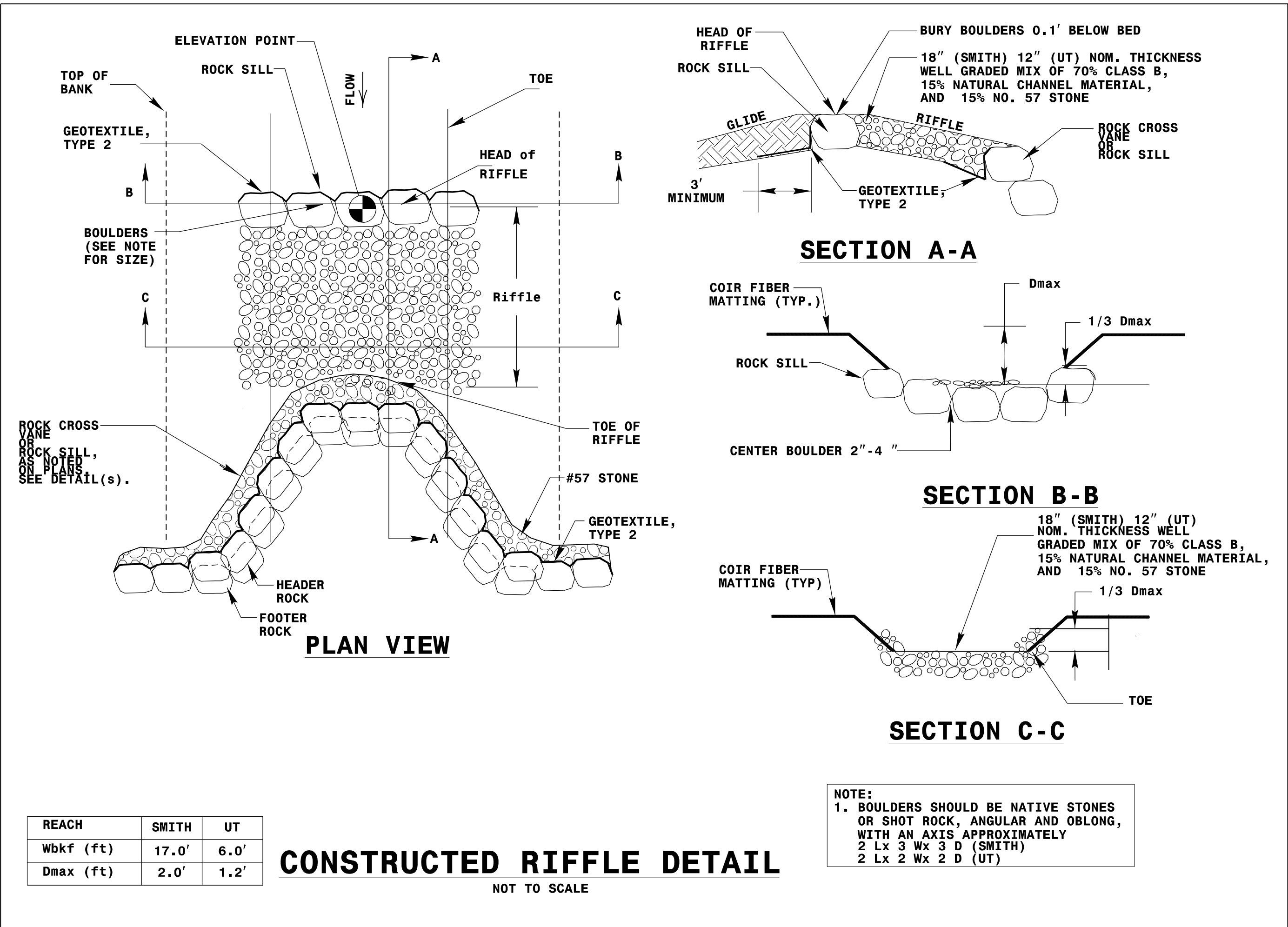
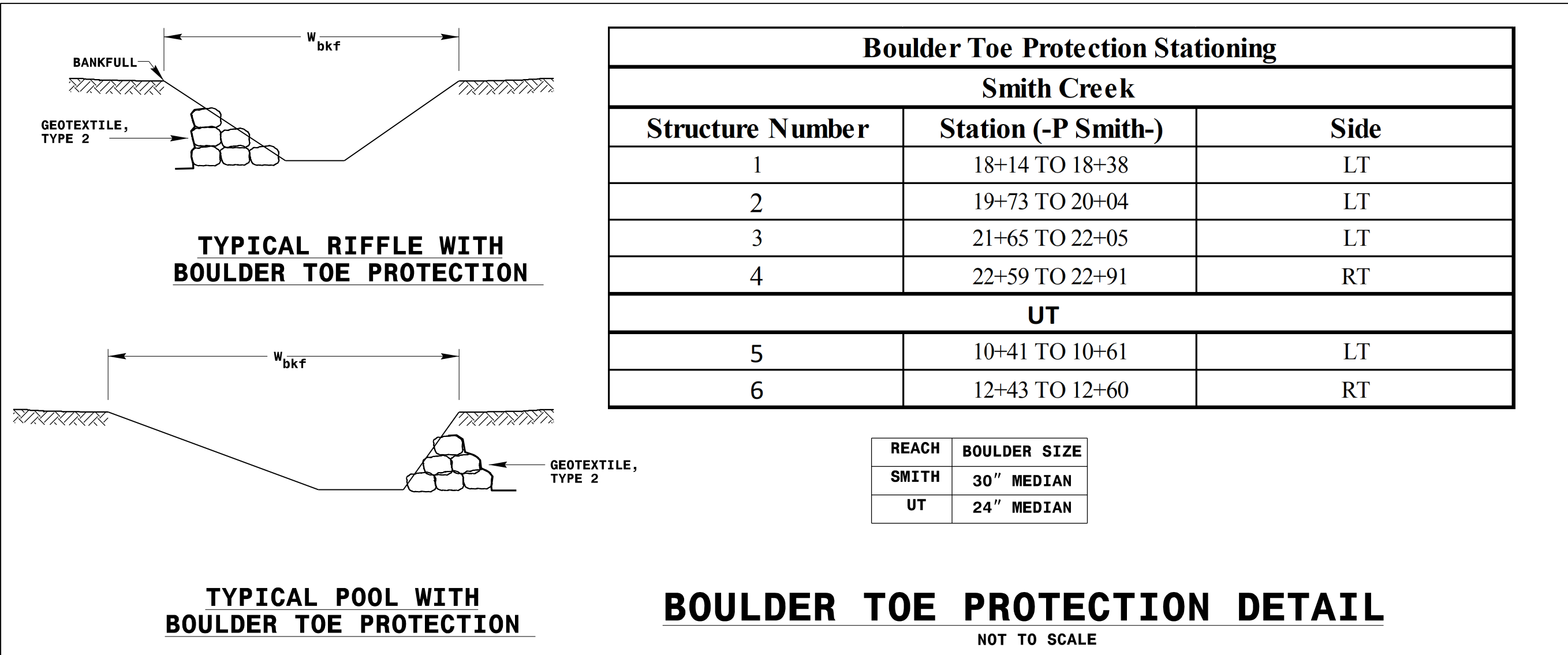
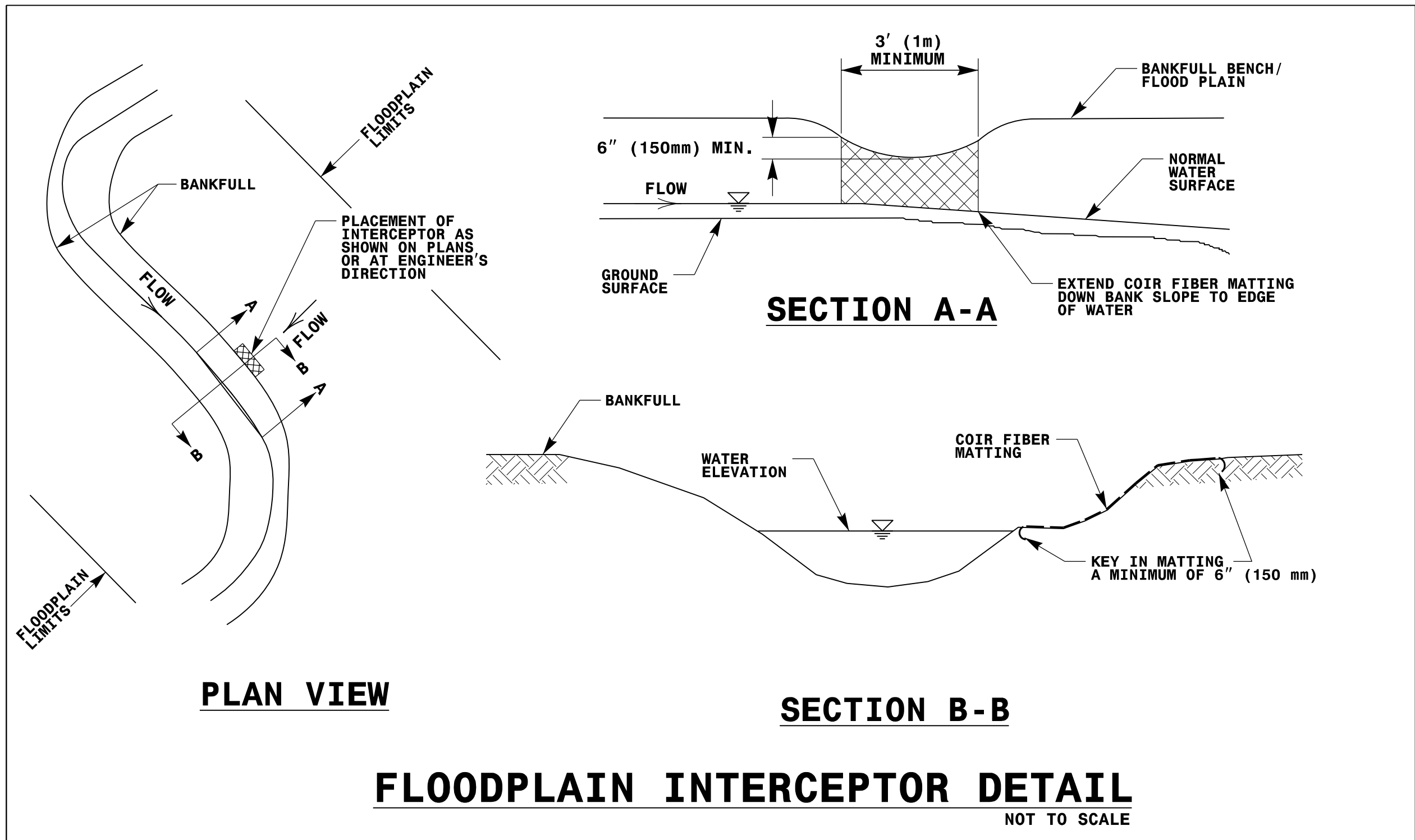
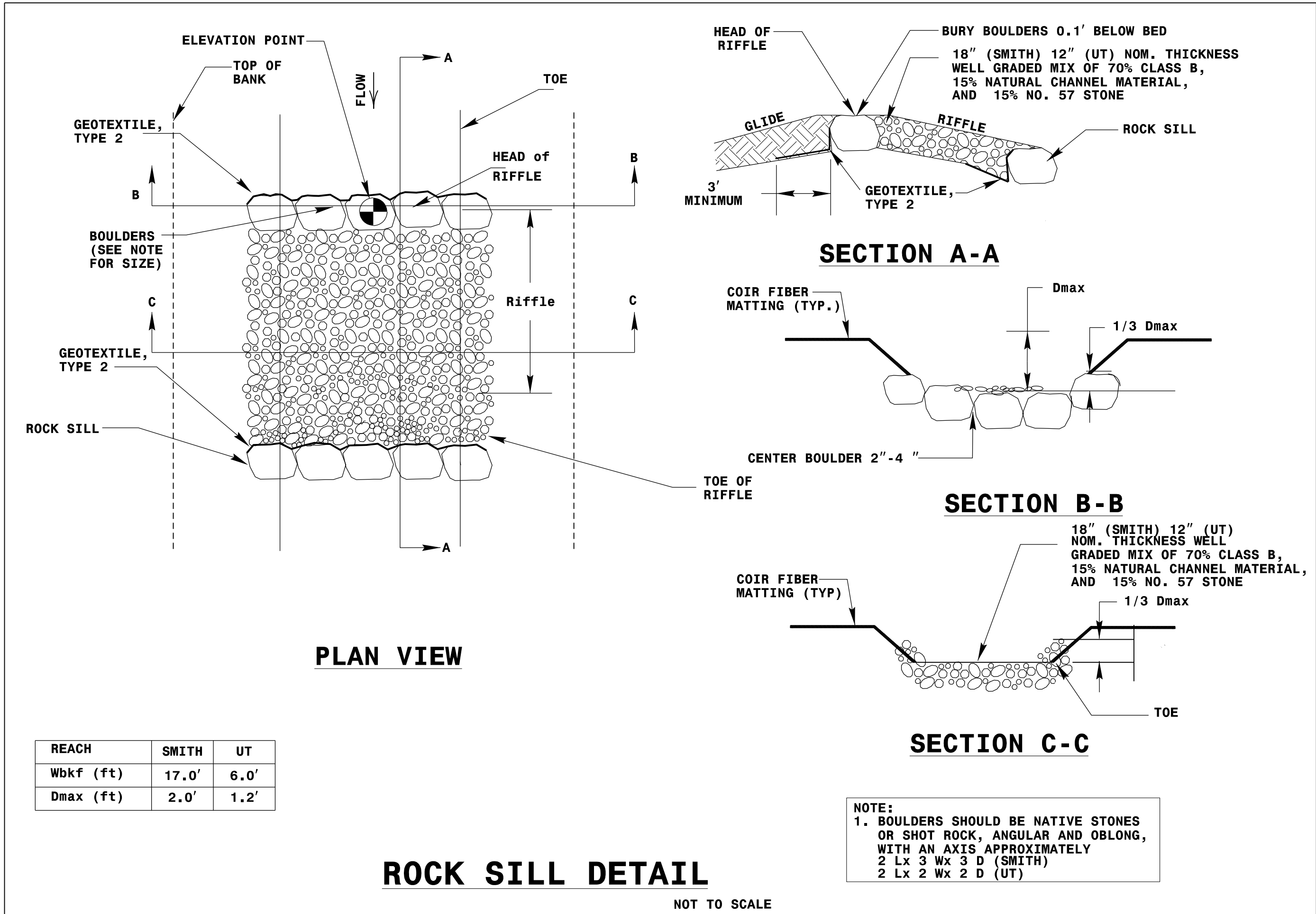
vhb

VHB Engineering NC, P.C. (C-3705)

940 Main Campus Drive, Suite 500

Raleigh, NC 27606

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Constructed Riffle Stationing		
Smith Creek		
Structure Number	Station (-P Smith-)	Type
1	20+16 TO 20+36	Rock and Roll
2	21+04 TO 21+41	Constructed Riffle
3	24+04 TO 24+30	Constructed Riffle
4	27+59 TO 27+76	Constructed Riffle
UT		
5	10+00 TO 10+25	Constructed Riffle
6	11+45 TO 11+59	Constructed Riffle
7	12+20 TO 12+39	Rock and Roll
8	12+69 TO 12+90	Constructed Riffle
9	13+25 TO 13+46	Constructed Riffle

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NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DAVIE COUNTY

ENVIRONMENTAL ANALYSES UNIT
HYDRAULIC DESIGN
ENGINEER

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ENGINEER
SEAL
033180
DAVID LOUISE SMITH

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VHB Engineering NC, P.C. (C-3705)
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Raleigh, NC 27606

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