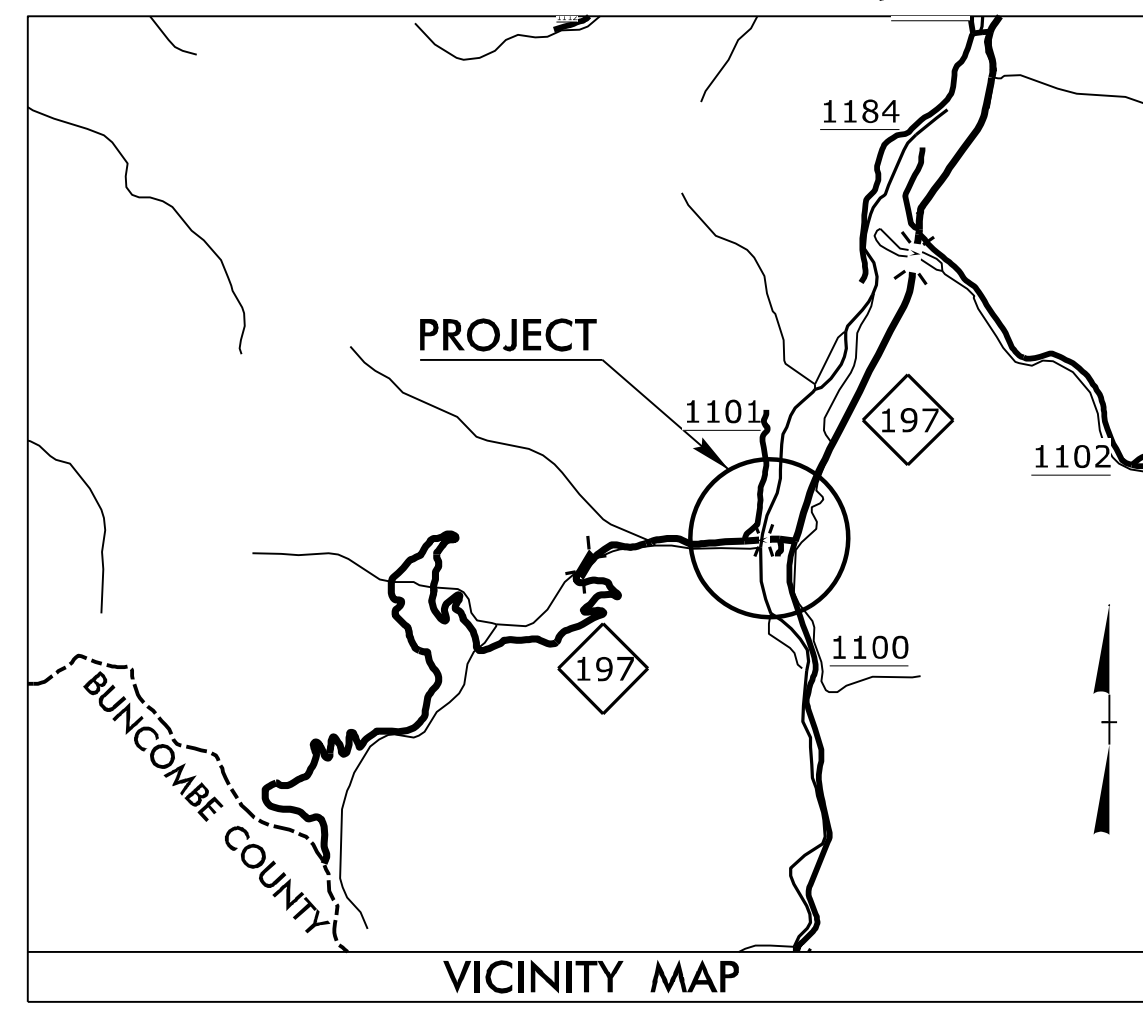


09.08/19

**TIP PROJECT: 17613.1100015**

**CONTRACT: DM000357**

See Sheet 1A For Index of Sheets  
See Sheet 1B For Conventional Symbols



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

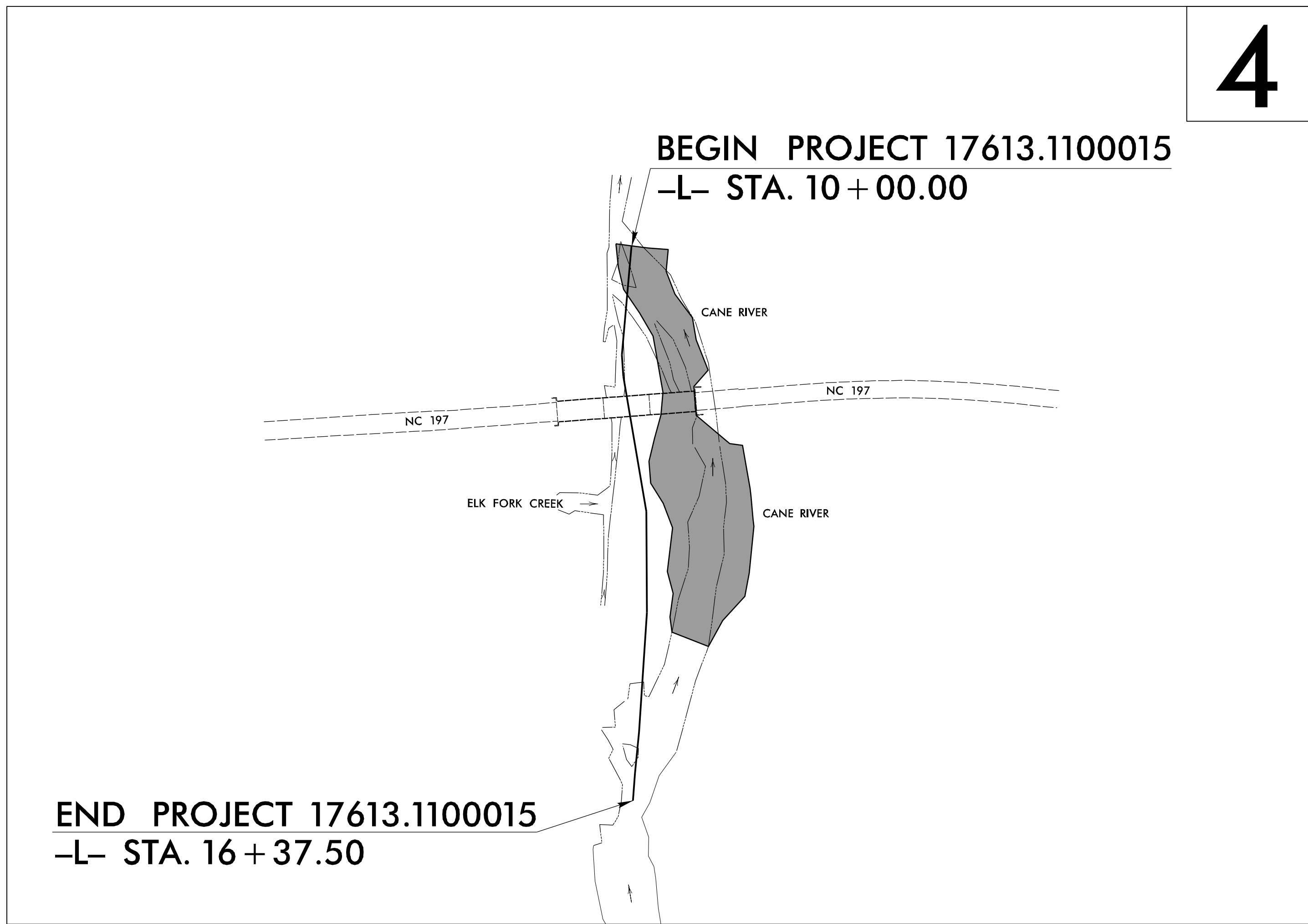
**PLAN FOR EMBANKMENT REPAIR AT BRIDGE NO. 40  
YANCEY COUNTY**

**LOCATION: NC 197 - 680' WEST OF INTERSECTION  
WITH SR 1100 (EWART WILSON ROAD)**

**TYPE OF WORK: EMBANKMENT REPAIR**

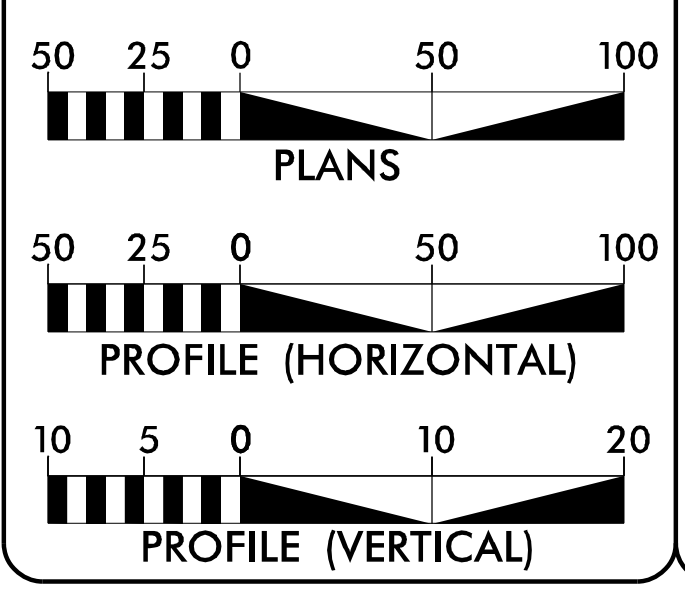
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17613.1100015	1	
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	

**4**



DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

**GRAPHIC SCALES**



**DESIGN DATA**

**PROJECT LENGTH**

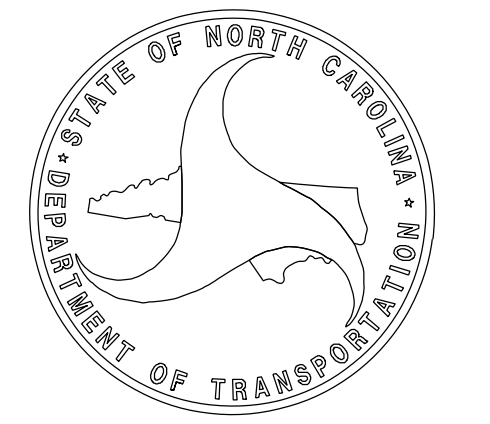
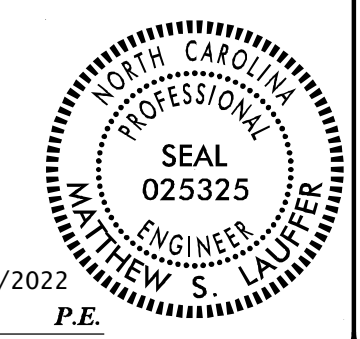
PROJECT TYPE	LENGTH
EMBANKMENT REPAIR	APPROX. 450 LF

Prepared in the Office of:  
**DIVISION OF HIGHWAYS**  
1000 Birch Ridge Dr., Raleigh NC, 27610

2018 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE:	MATTHEW LAUFFER, PE PROJECT ENGINEER
LETTING DATE:	DAVID WEBB, PE PROJECT DESIGN ENGINEER
	APRIL 6, 2022

**HYDRAULICS ENGINEER**

Matthew S. Lauffer  
02/24/2022  
P.E.



24-FEB-2022 12:37  
R:\Roadway\Proj\19900040\_Rdy\_11sh.dgn  
\$\$\$\$\$SERNAME\$\$\$\$\$

PROJECT REFERENCE NO.	SHEET NO.
17613.1100015	1A
HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 025325 MOORE ENGINEERS 02/24/2022	

**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

# INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2D-1	PERMANENT SURFACE WATER IMPACTS
2G-1	EMBANKMENT STABILIZATION DETAIL
3B-1	SUMMARY OF QUANTITIES
4 THRU 5	PLAN AND PROFILE SHEET
RF-1 THRU RF-2	STREAMBANK REFORESTATION DETAIL SHEET
X-1 THRU X-8	CROSS-SECTIONS

# STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS CONVENTIONAL PLAN SHEET SYMBOLS

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	⑫③
Existing Fence Line	-x-x-x-
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	---S---
Potential Contamination Area: Soil	---S---
Known Contamination Area: Water	---W---
Potential Contamination Area: Water	---W---
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	-----

### 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	AATUR
End of Information	E.O.I.

8/17/99

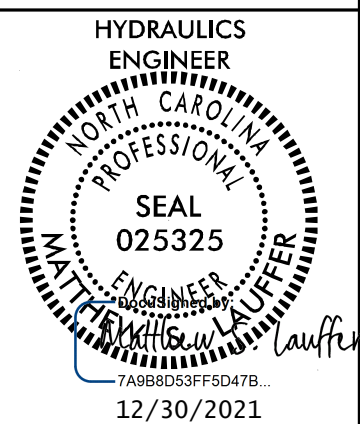
REVISIONS

21 DEC 2021 14:58  
R:\Projects\17613.1100015\9900040\_Rdu\_psh\_2D-1.dgn  
\$\$\$\$

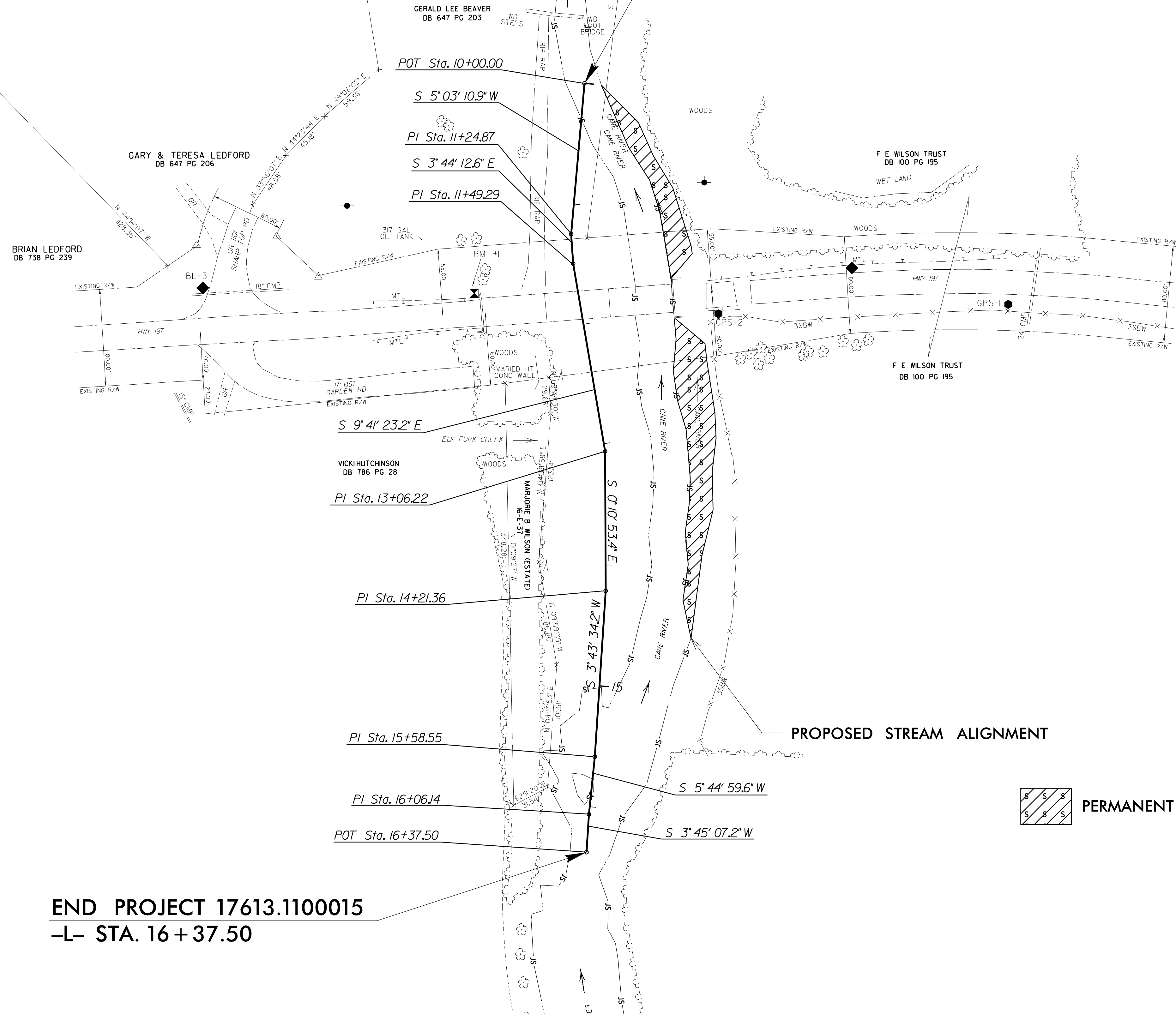
PROPOSED STREAM ALIGNMENT

BEGIN PROJECT 17613.1100015  
-L- STA. 10 + 00.00

NAD 83 / NA 2011

PROJECT REFERENCE NO. 17613.1100015	SHEET NO. 2D-1
RW SHEET NO.	
HYDRAULICS ENGINEER  SEAL 025325 MATTHEW LAUFFER 12/30/2021	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

BL-4

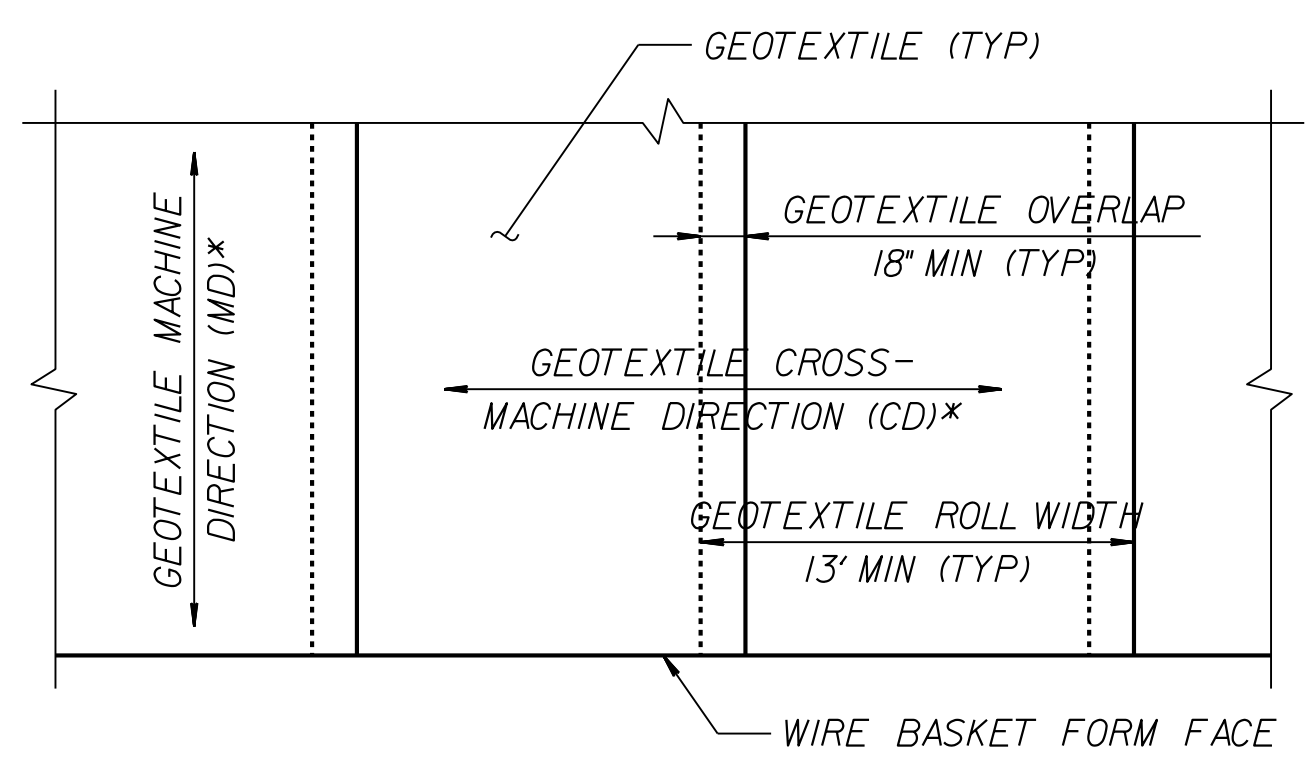


PROPOSED STREAM ALIGNMENT

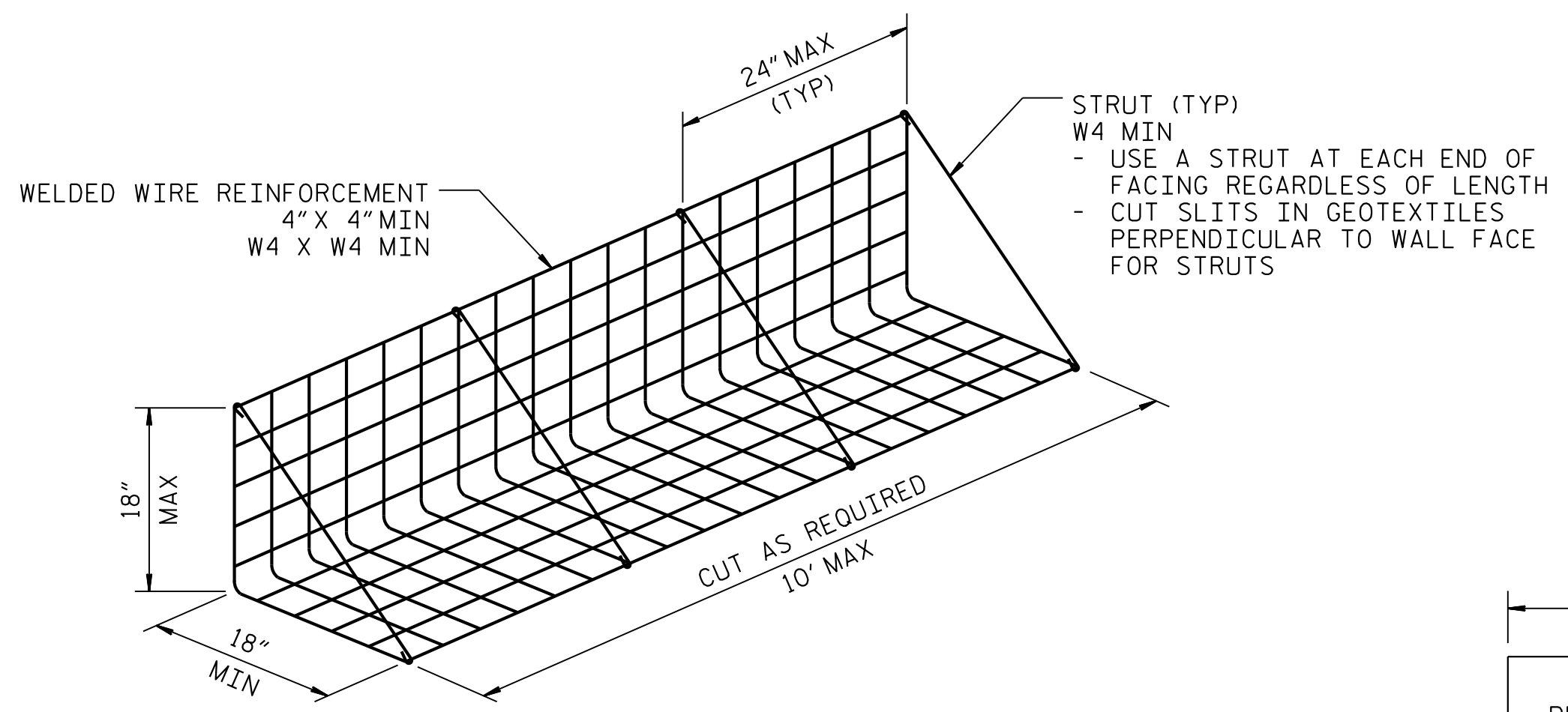
 PERMANENT SW IMPACTS

END PROJECT 17613.1100015  
-L- STA. 16 + 37.50

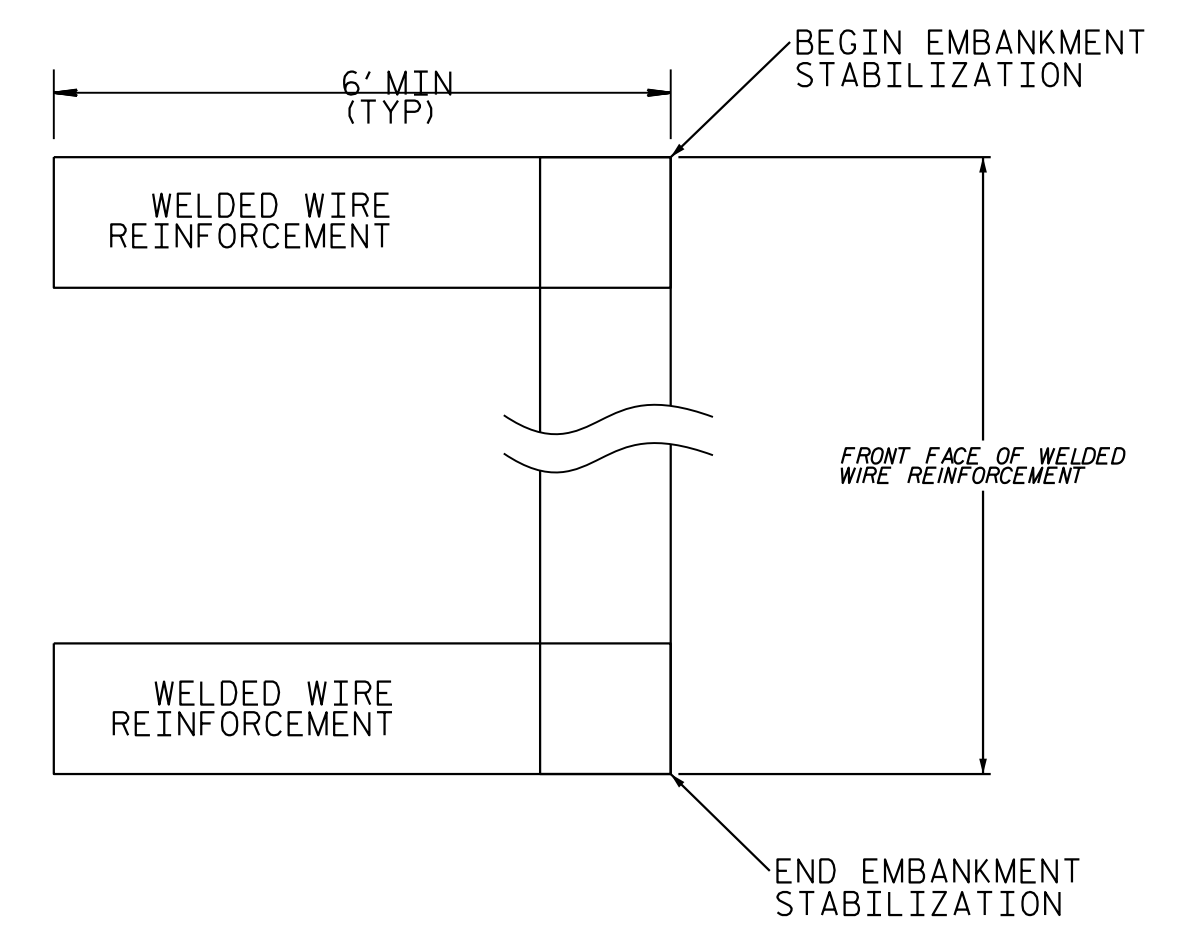
FOR -L- PROFILE, SEE SHEET 5



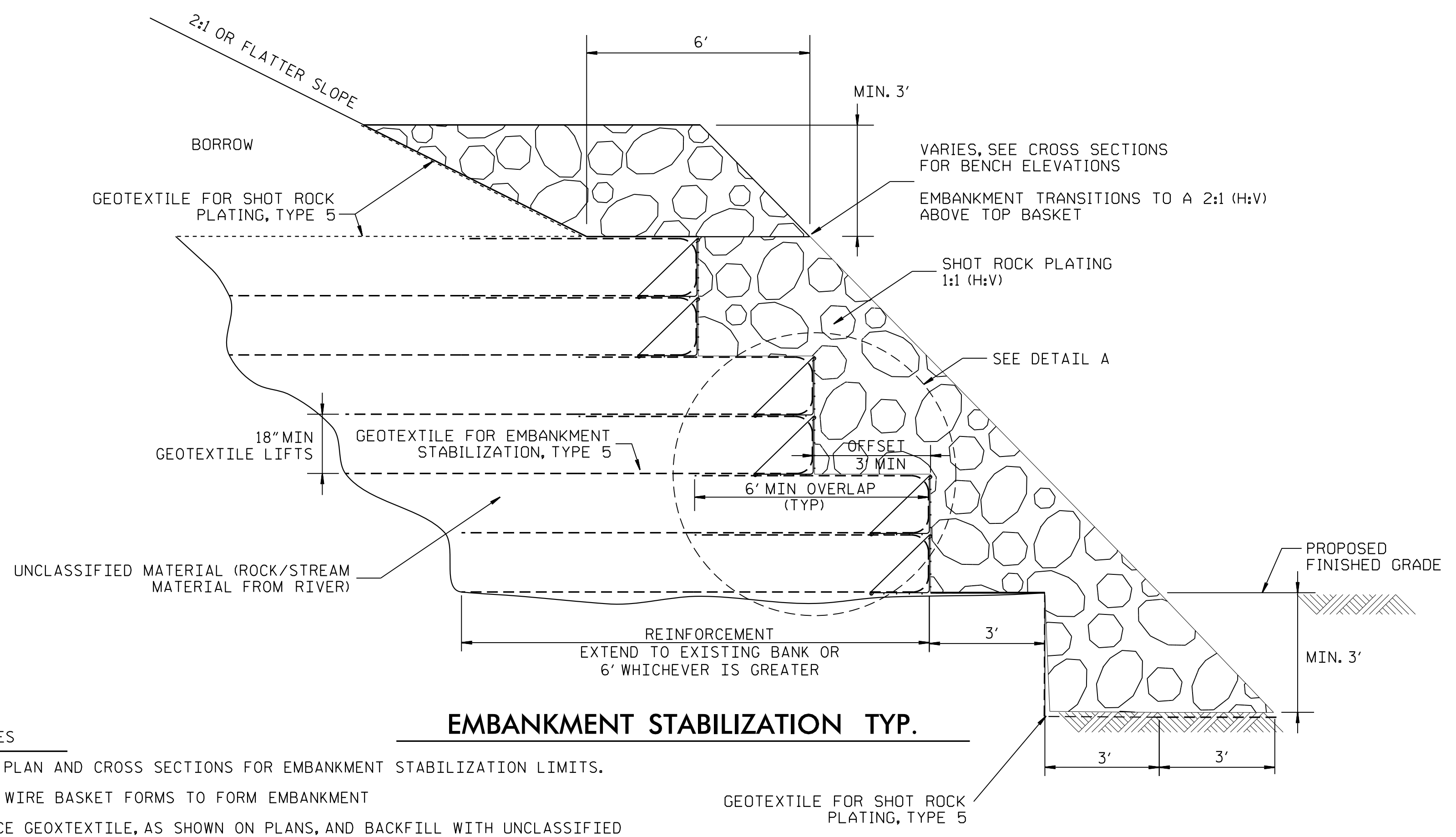
**TYPE 5, GEOTEXTILE PLACEMENT**  
(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)



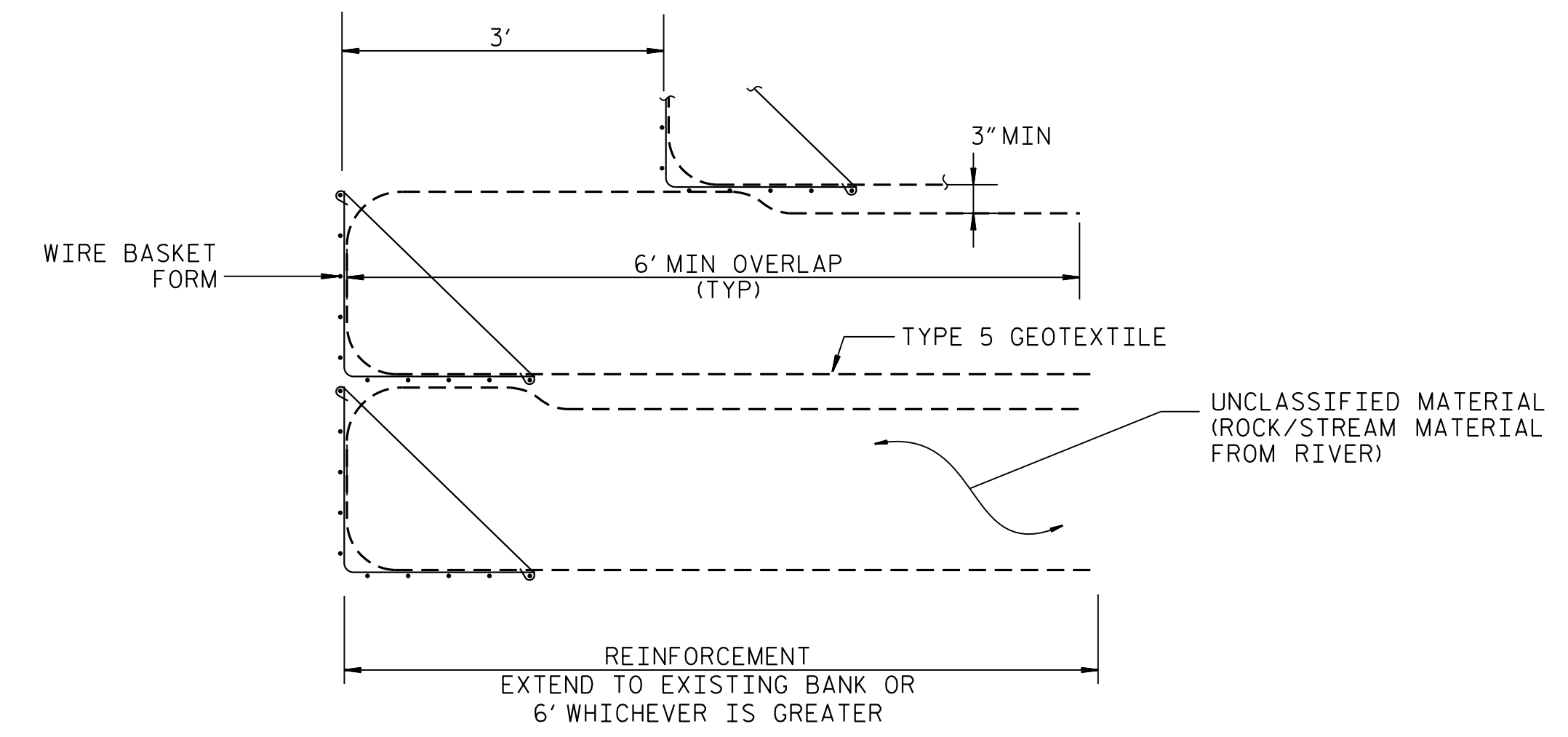
**WIRE BASKET FORMS**



**TERMINATION DETAIL**



**EMBANKMENT STABILIZATION TYP.**

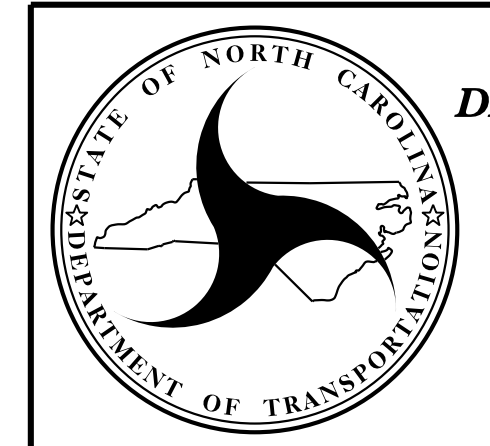


**DETAIL A**

**NOTES**

- SEE PLAN AND CROSS SECTIONS FOR EMBANKMENT STABILIZATION LIMITS.
- USE WIRE BASKET FORMS TO FORM EMBANKMENT
- PLACE GEOXTEXTILE, AS SHOWN ON PLANS, AND BACKFILL WITH UNCLASSIFIED MATERIAL CONSISTING OF ROCK/SAND FROM STREAM BED WITH MAXIMUM AGGREGATE SIZE OF 12 INCHES.
- AT THE TOP OF EACH LIFT, WRAP GEOXTEXTILE BACK 6 FEET
- ONCE THE EMBANKMENT HAS BEEN CONSTRUCTED, PLACE SHOT ROCK PLATING WITH THE LARGER ROCKS CLOSER TO STREAM SIDE.
- SHOT ROCK PLATING TO CONSIST OF THE FOLLOWING APPROXIMATE SIZES:  
 60% SHOT ROCK 3-4 FT ALONG ONE AXIS  
 30% 6"-18" ALONG ONE AXIS  
 10% 2"-6" ALONG ONE AXIS

PREPARED BY: MHS/SCC	DATE: 2/9/22
REVIEWED BY: SCC	DATE: 2/9/22



**NORTH CAROLINA**  
**DEPARTMENT OF TRANSPORTATION**  
**DIVISION OF HIGHWAYS**

**GEOTECHNICAL**  
**ENGINEERING UNIT**

**EMBANKMENT STABILIZATION**

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

**STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS**

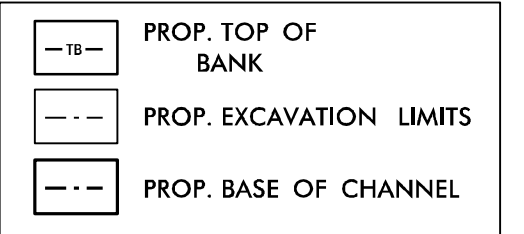
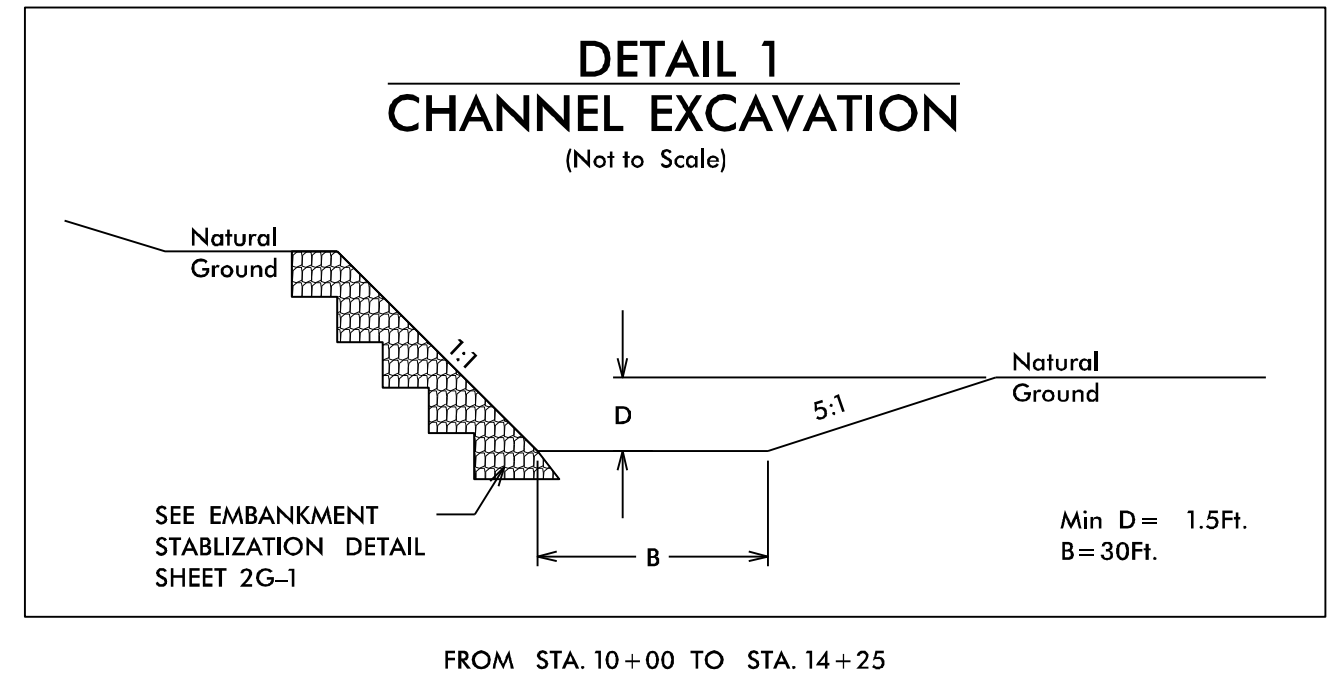
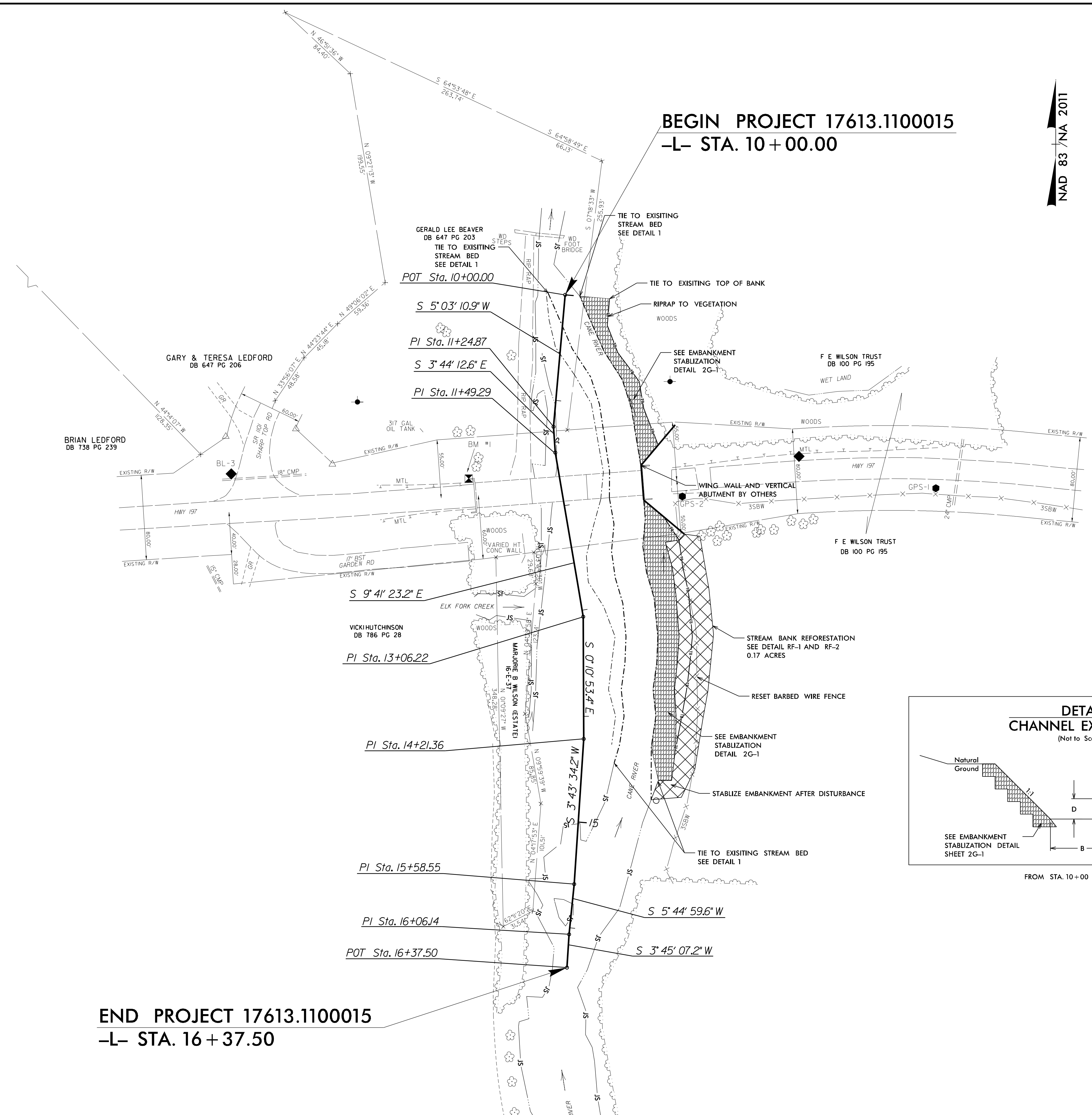
**SUMMARY OF QUANTITIES**

Description	Quantity	Unit
Lump Sum Grading	1	LS
Cut*	4900 CY	
Fill*	2800 CY	
Borrow-Fill	350 CY	
Embankment Stabilization	3300	SF
Fill*	1300 CY	
Shot Rock Plating	2400	tons
Streambank Reforestation	0.17	Acres
Barbed Wire Fence	550	LF
*Unclassified Material (Rock/Stream Material from River)		

NAD 83 / NA 2011

**BEGIN PROJECT 17613.1100015  
-L- STA. 10 + 00.00**

**END PROJECT 17613.1100015  
-L- STA. 16 + 37.50**



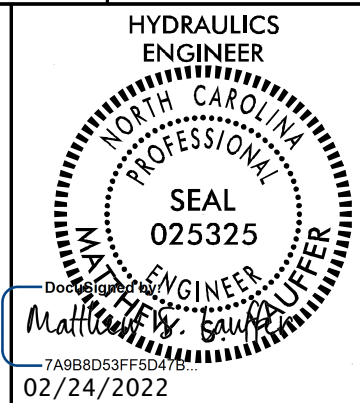
FOR -L- PROFILE, SEE SHEET 5

REVISIONS

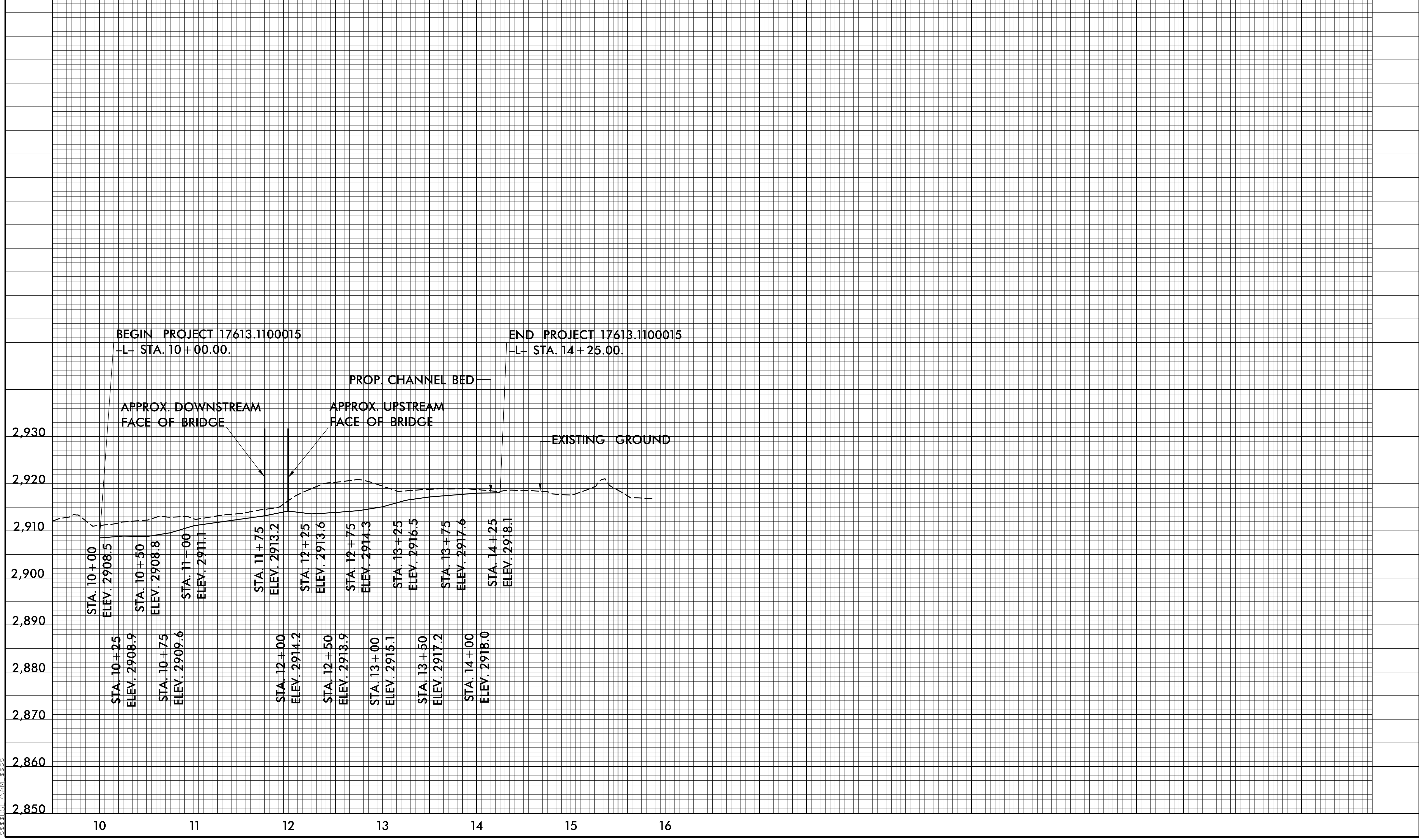
BL-4

8/17/99  
23-FEB-2022 14:51  
P:\Projects\17613.1100015\17613.1100015\_Rdu\_psh\_4.dgn  
M:\Projects\17613.1100015\17613.1100015.dgn

5/14/99  
27\_FEB\_2022\_07:15  
R:\FEB\_2022\_PC\9900040\_Rdu\_psh\_5.dgn  
\$\$\$\$\$SYSTRNAME\$\$\$\$\$

PROJECT REFERENCE NO. 17613.1100015	SHEET NO. 5
	

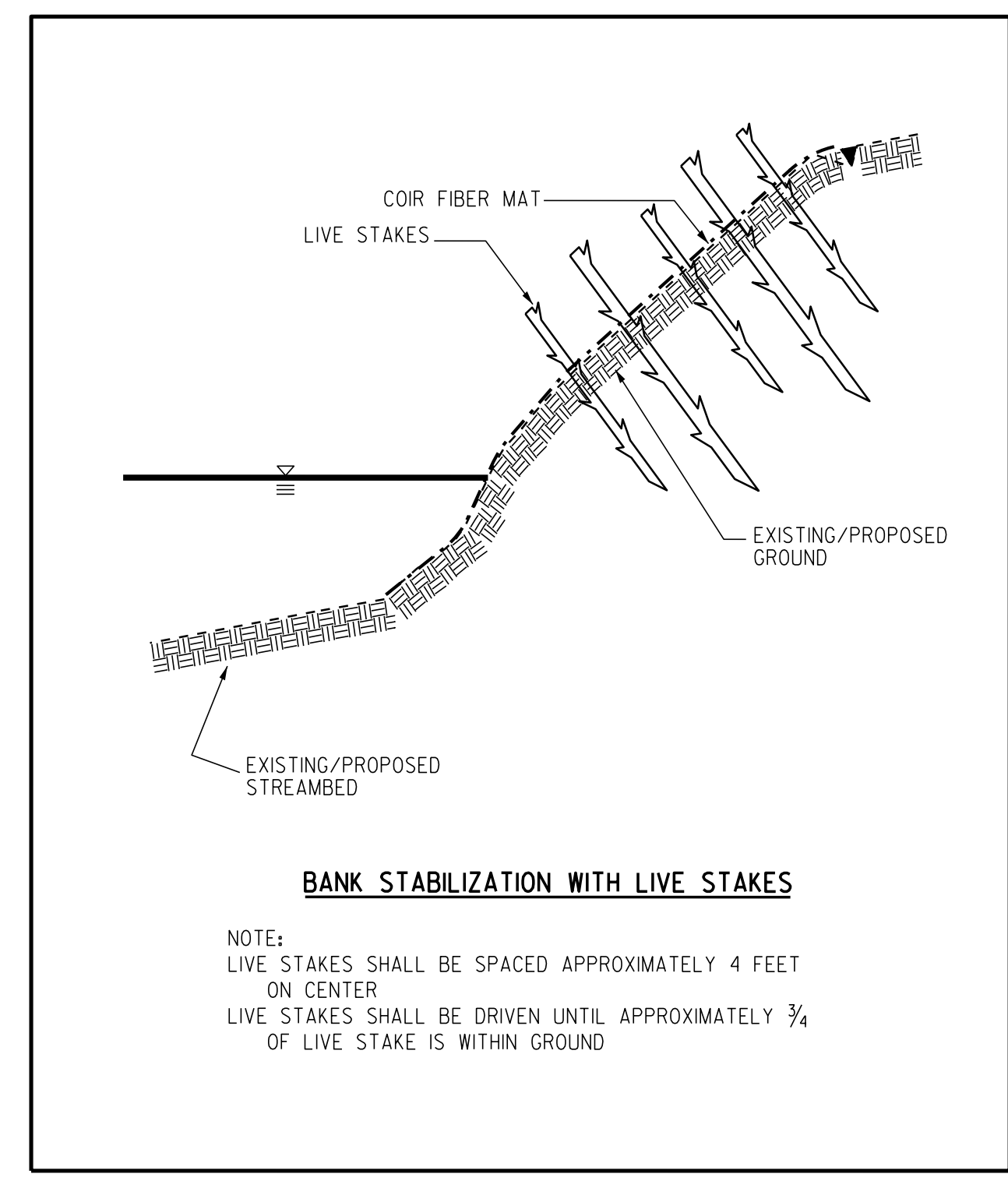
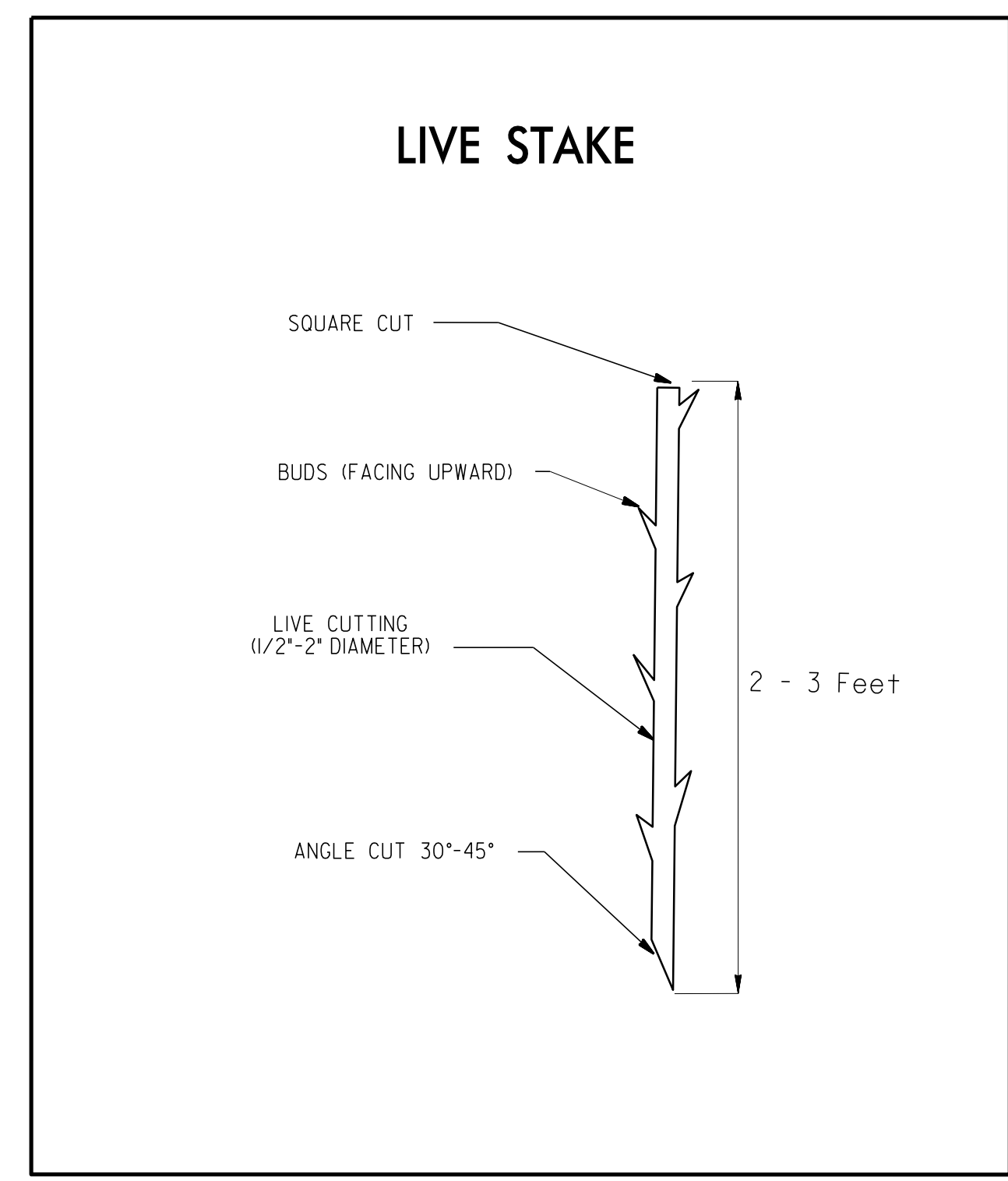
**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**



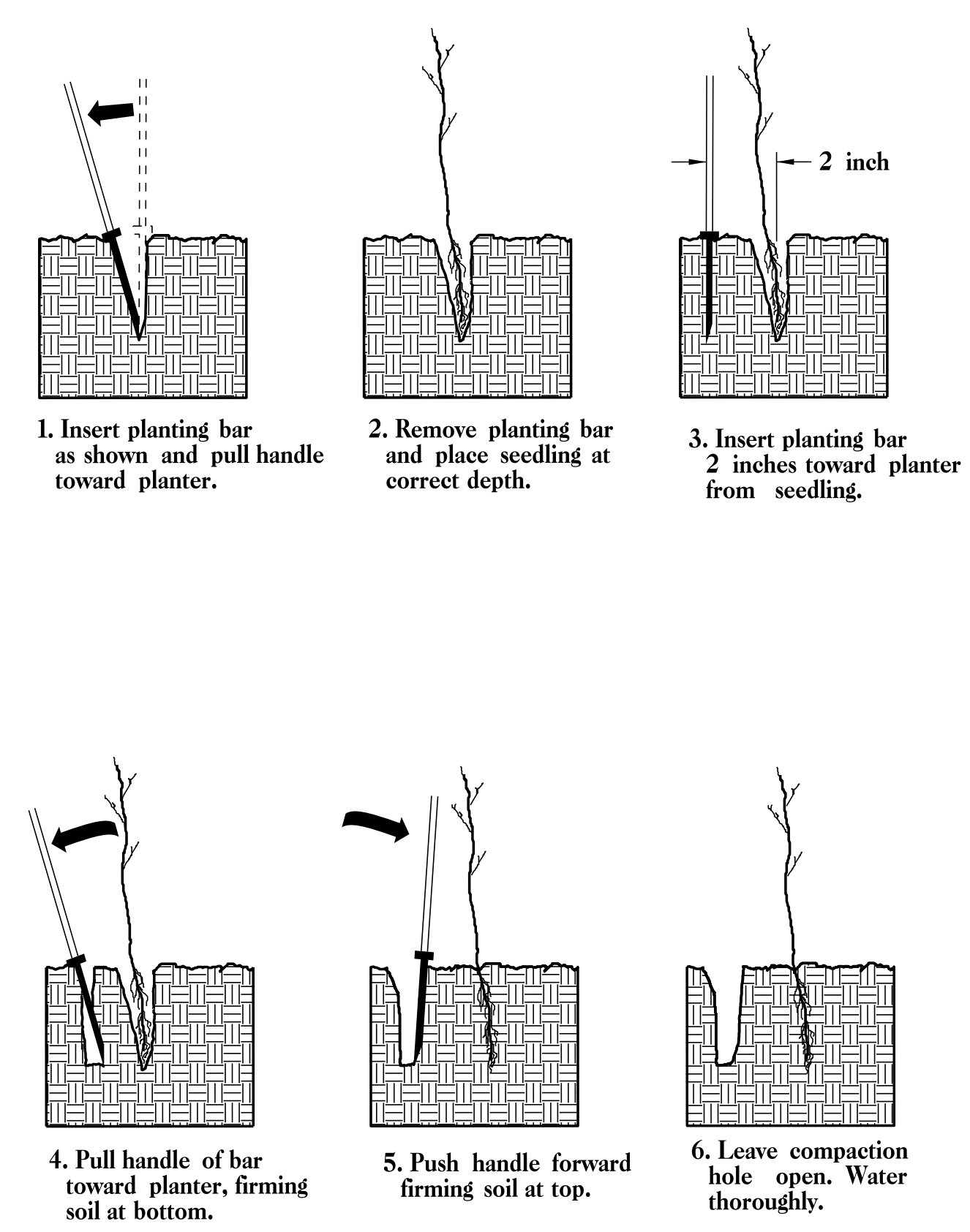


# PLANTING DETAILS

## LIVE STAKES PLANTING DETAIL

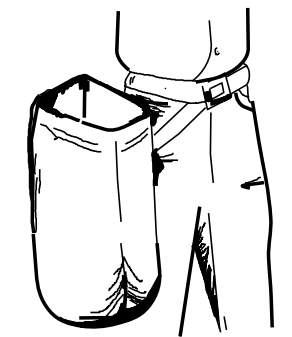


## BAREROOT PLANTING DETAIL DIBBLE PLANTING METHOD USING THE KBC PLANTING BAR

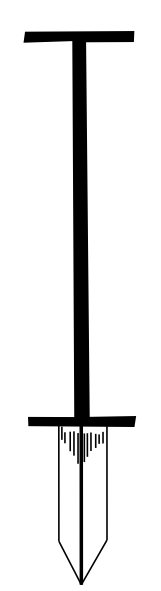


### PLANTING NOTES:

**PLANTING BAG**  
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.



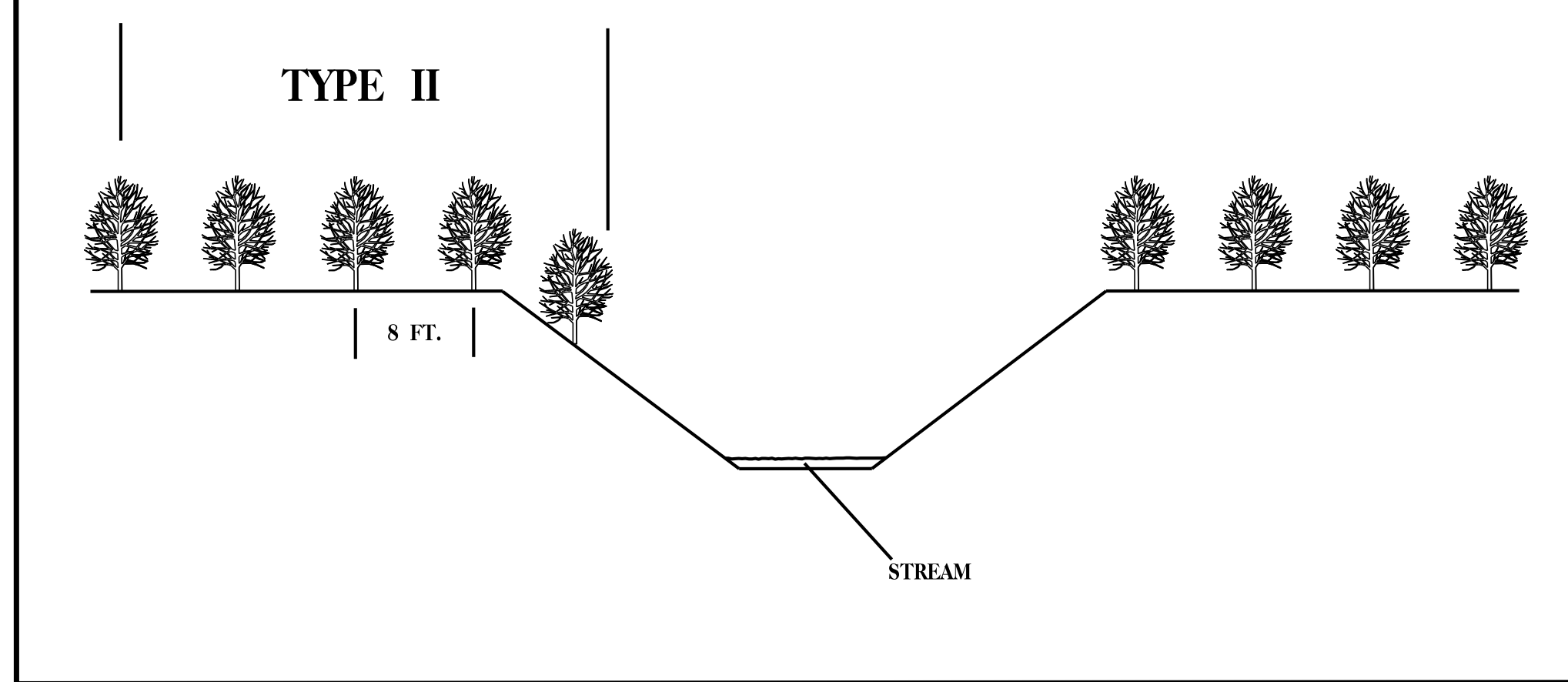
**KBC PLANTING BAR**  
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.



**ROOT PRUNING**  
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

- TYPE 2 STREAMBANK REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.
- NOTE: TYPE 2 STREAMBANK REFORESTATION SHALL BE PAID FOR AS "STREAMBANK REFORESTATION"

## STREAMBANK REFORESTATION TYPICAL

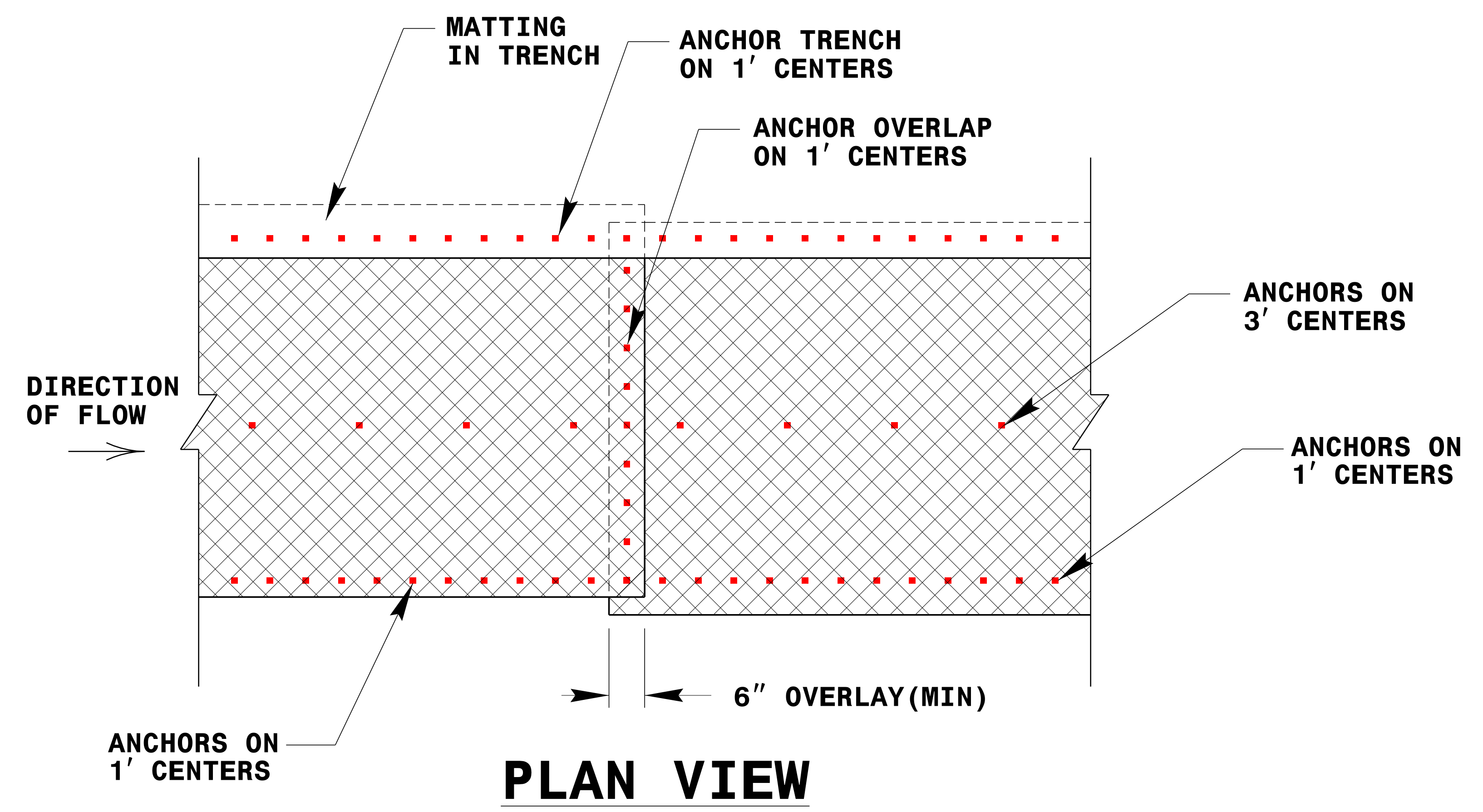


### STREAMBANK REFORESTATION

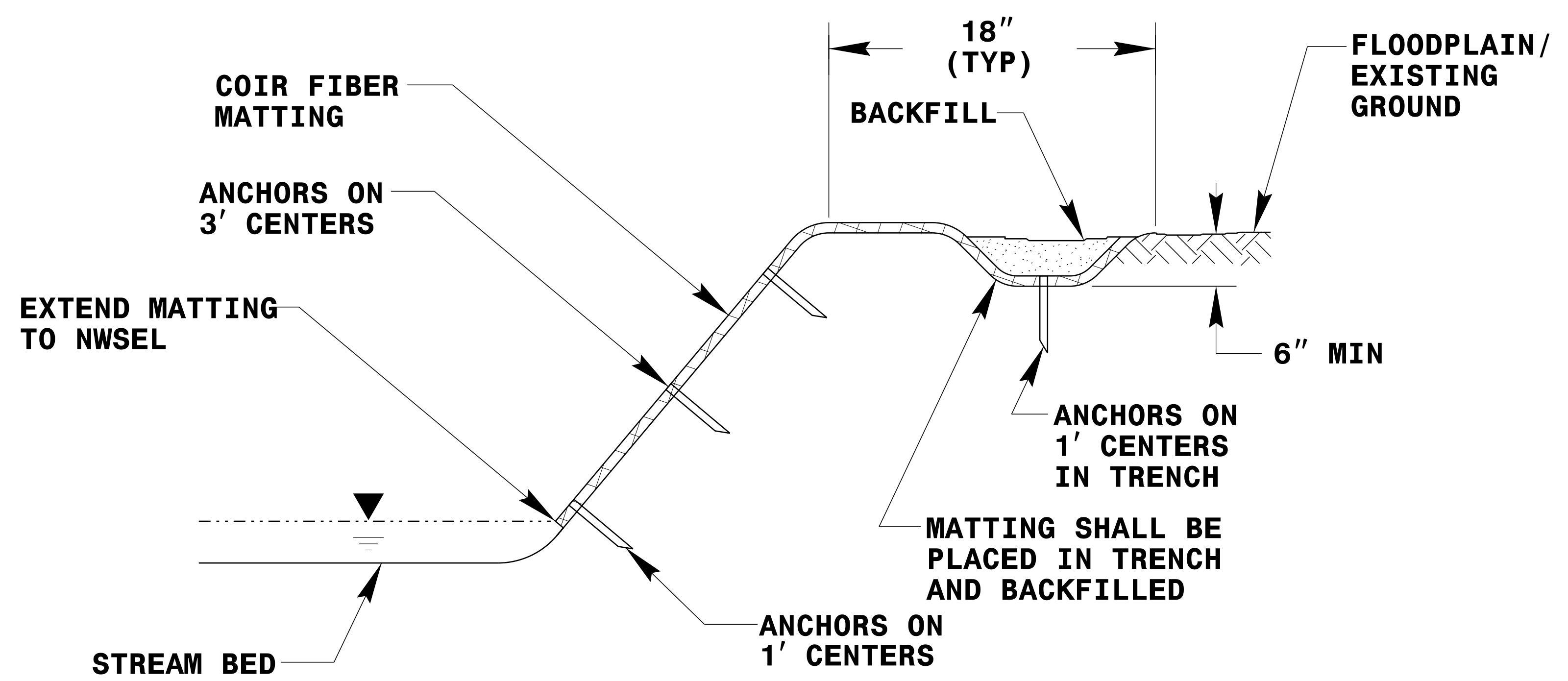
MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

TYPE 2		
25% ALNUS SERRULATA	TAG ALDER	12 in - 18 in BR
25% CEPHALANTHUS OCCIDENTALIS	BUTTONBUSH	12 in - 18 in BR
25% SAMBUCUS CANADENSIS	ELDERBERRY	12 in - 18 in BR
25% CORNUS AMOMUM	SILKY DOGWOOD	12 in - 18 in BR

- SEE PLAN SHEETS FOR AREAS TO BE PLANTED



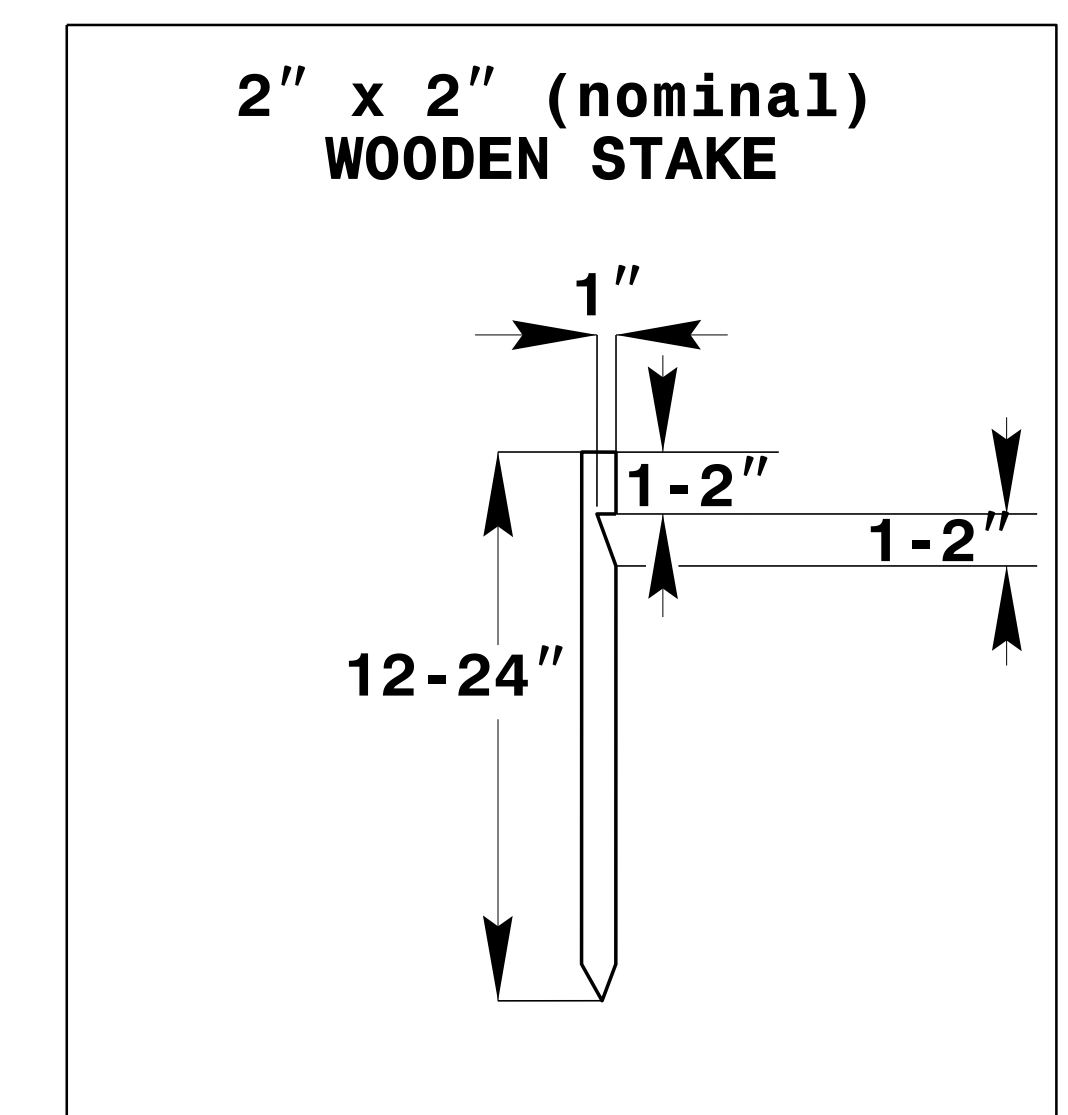
**PLAN VIEW**



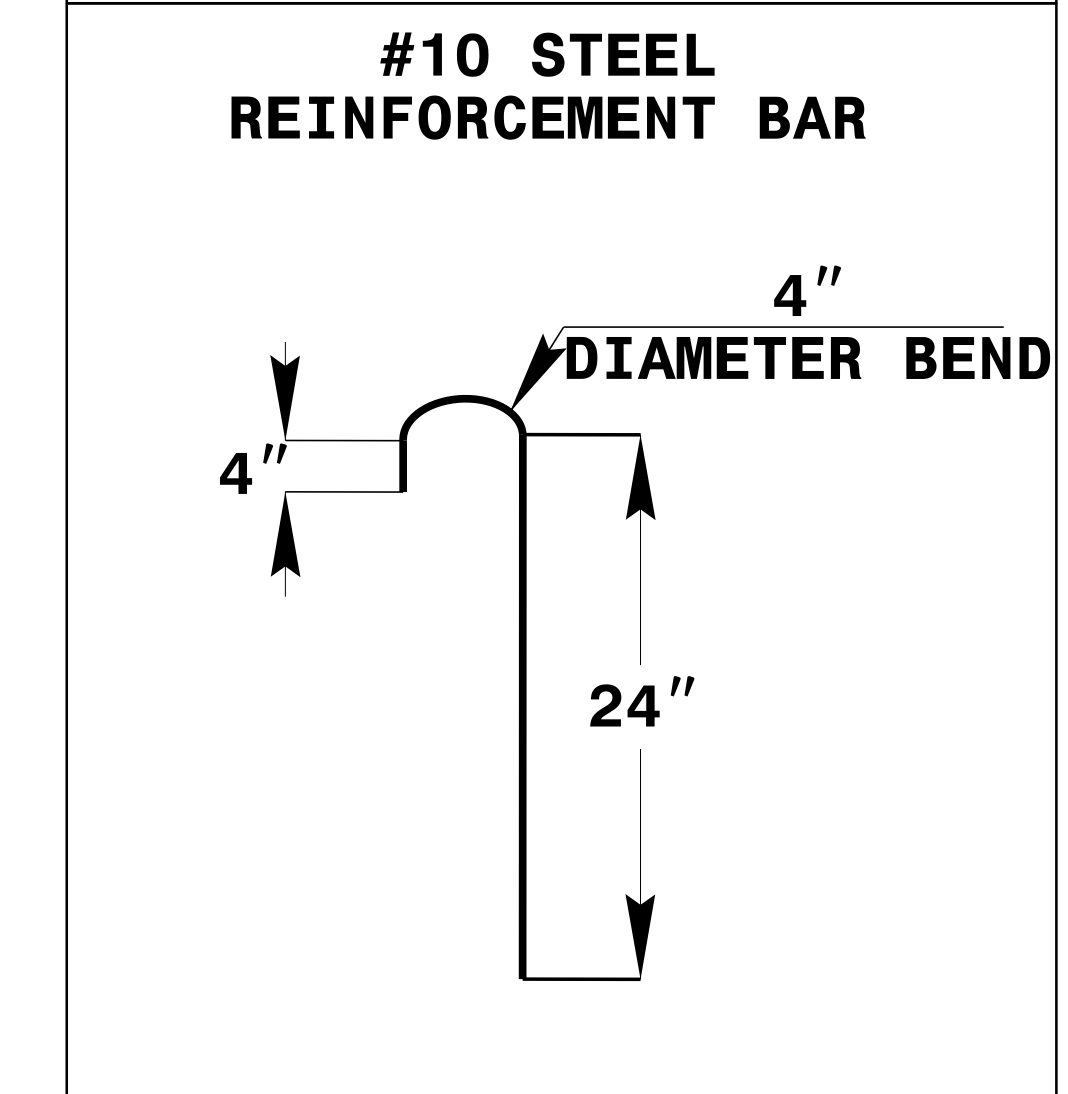
**TYPICAL CROSS SECTION**

**COIR FIBER MATTING DETAIL**

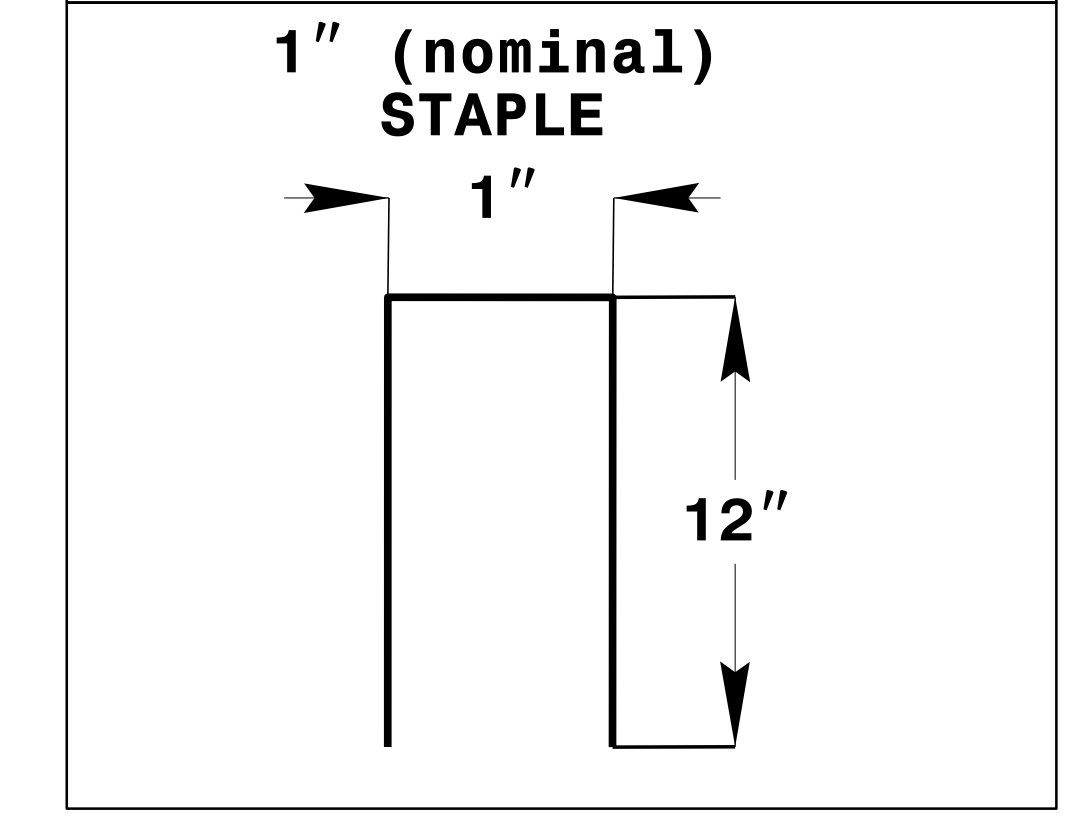
NOT TO SCALE



**2" x 2" (nominal) WOODEN STAKE**



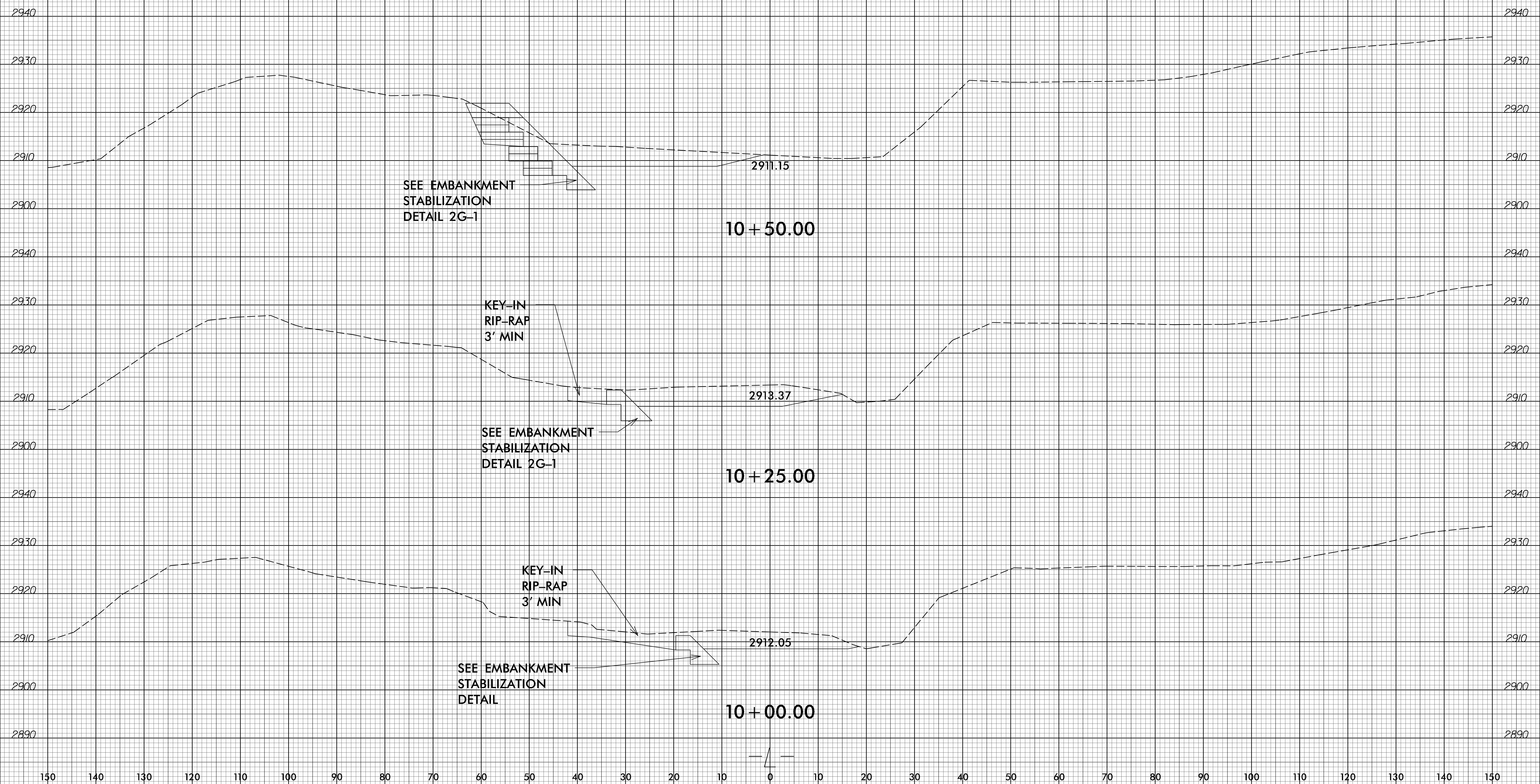
**#10 STEEL REINFORCEMENT BAR**



**1" (nominal) STAPLE**

**ANCHOR OPTIONS**

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



SEE EMBANKMENT  
STABILIZATION  
DETAIL 2G-1

10 + 50.00

KEY-IN  
RIP-RAP  
3' MIN

10 + 25.00

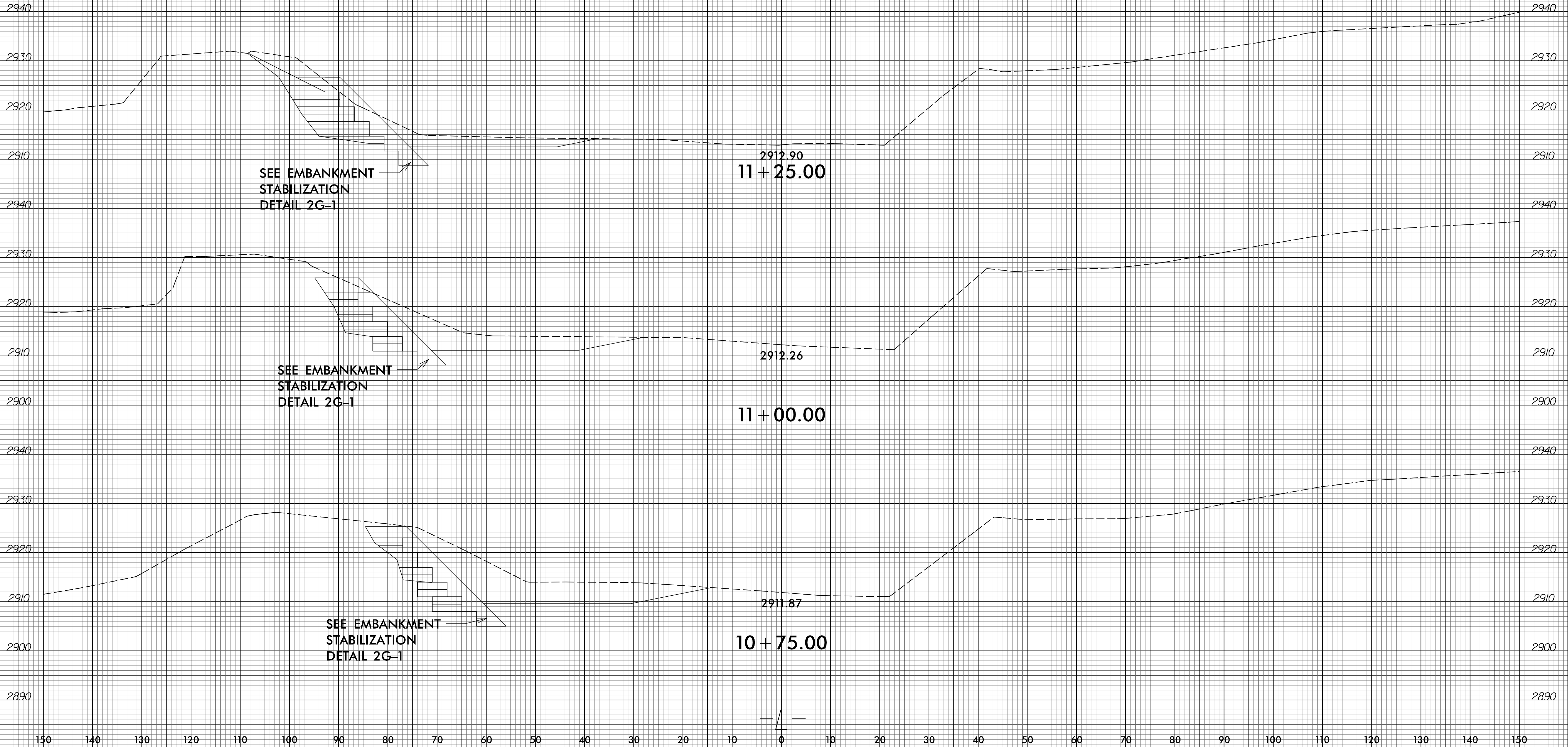
SEE EMBANKMENT  
STABILIZATION  
DETAIL 2G-1

KEY-IN  
RIP-RAP  
3' MIN

10 + 00.00

SEE EMBANKMENT  
STABILIZATION  
DETAIL

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



SEE EMBANKMENT  
STABILIZATION  
DETAIL 2G-1

2912.90  
11 + 25.00

SEE EMBANKMENT  
STABILIZATION  
DETAIL 2G-1

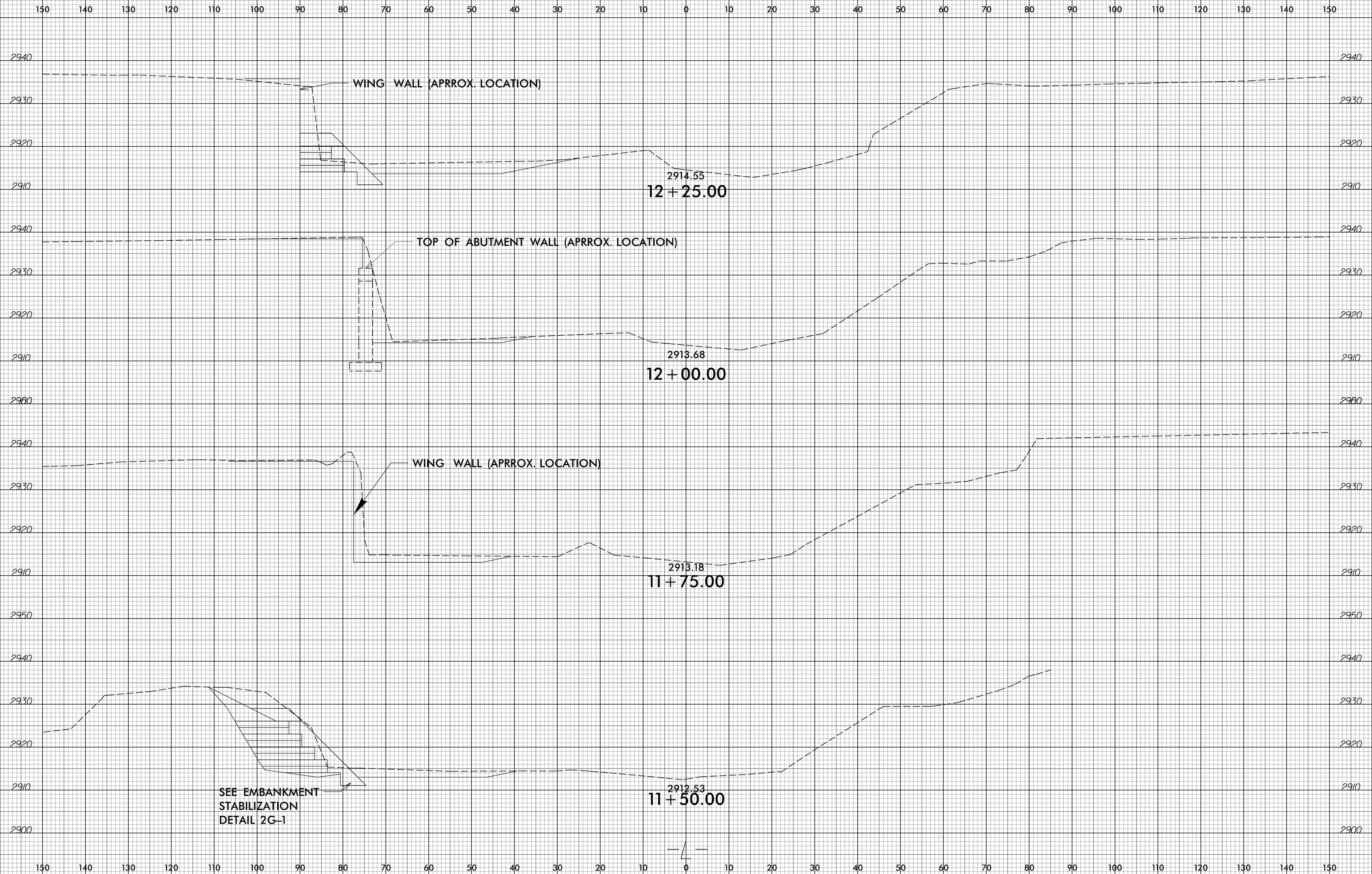
2912.26

11 + 00.00

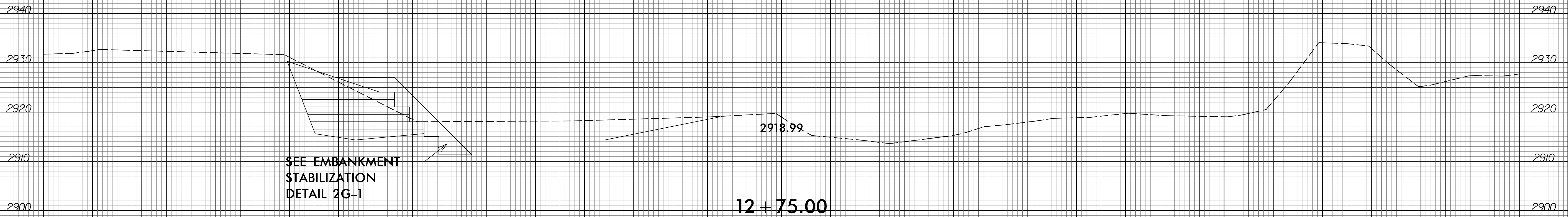
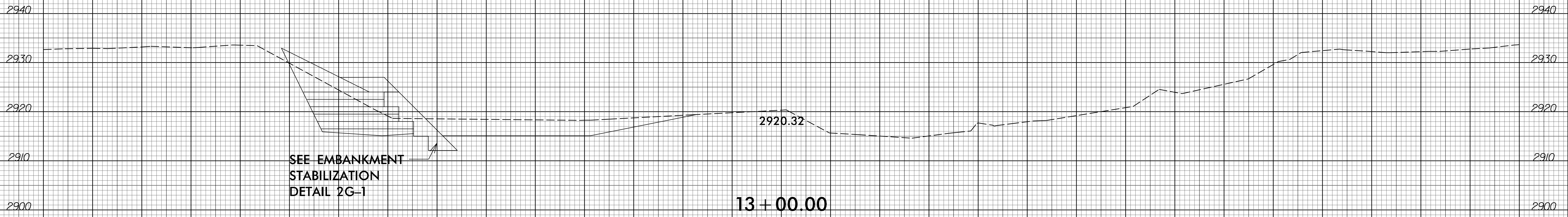
SEE EMBANKMENT  
STABILIZATION  
DETAIL 2G-1

2911.87

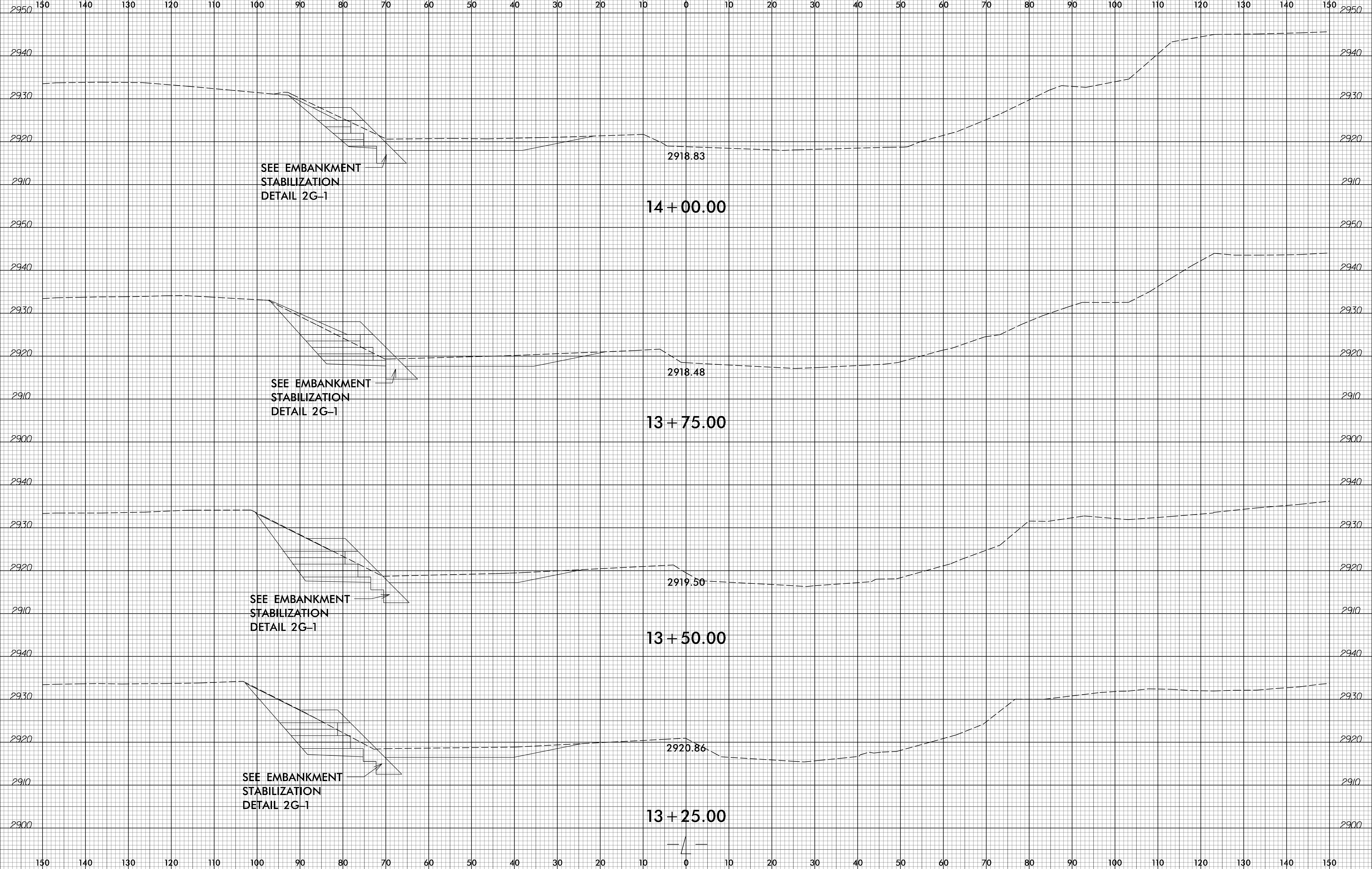
10 + 75.00



150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



SEE EMBANKMENT  
STABILIZATION  
DETAIL 2G-1

14 + 00.00

SEE EMBANKMENT  
STABILIZATION  
DETAIL 2G-1

13 + 75.00

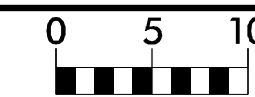
SEE EMBANKMENT  
STABILIZATION  
DETAIL 2G-1

13 + 50.00

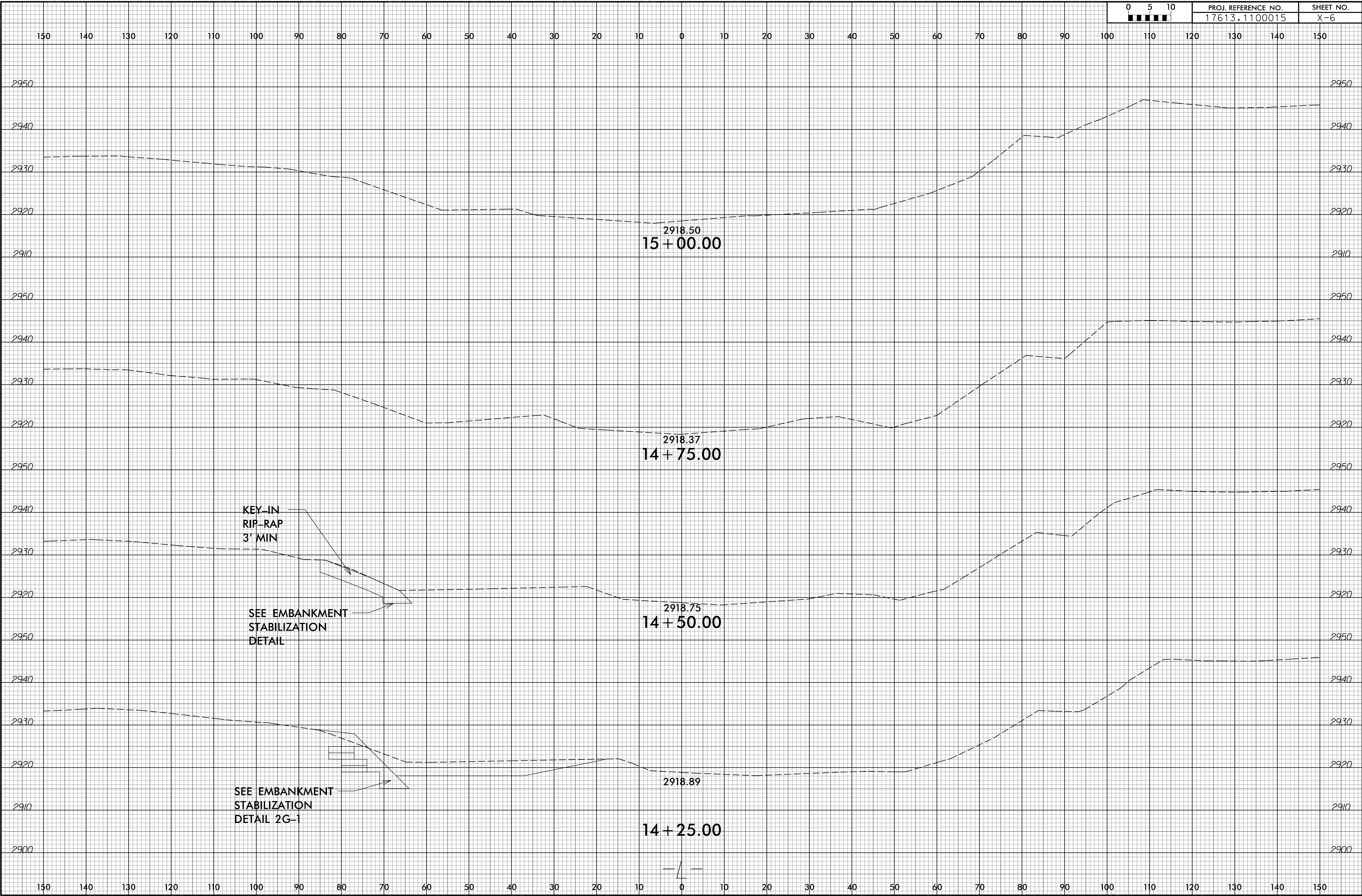
SEE EMBANKMENT  
STABILIZATION  
DETAIL 2G-1

13 + 25.00

6/23/16



PROJ. REFERENCE NO.	SHEET NO.
17613.1100015	X-6



23-FEB-2022 15:12  
 I:\PROJECTS\17613.1100015\17613.1100015.dgn  
 17613.1100015.dwg



