

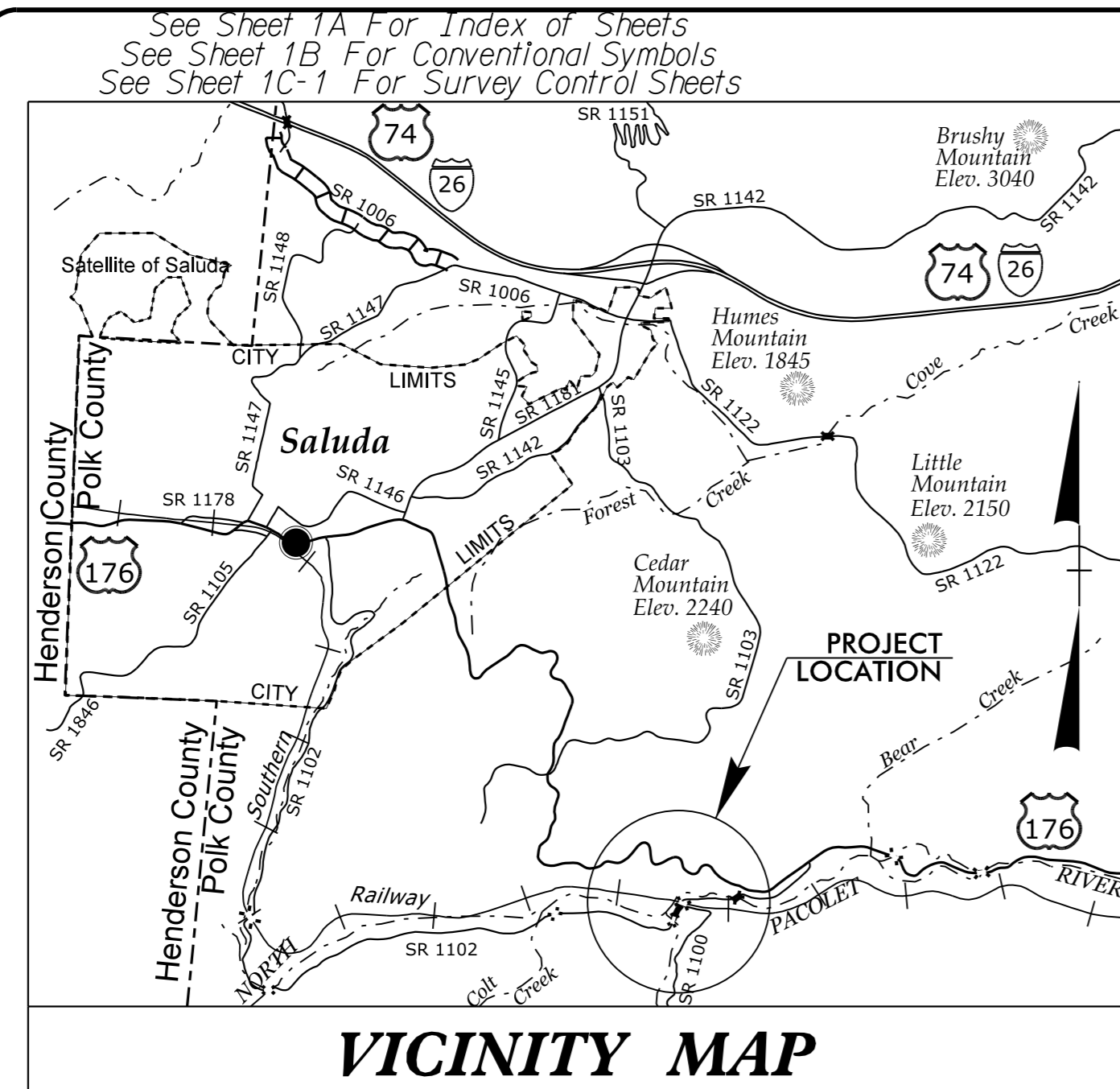
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with their signature on that page.**

**This file or an individual page
shall not be considered a certified document.**

09/08/09

CONTRACT: DN004489 **TIP PROJECT: B-4792**



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
POLK COUNTY

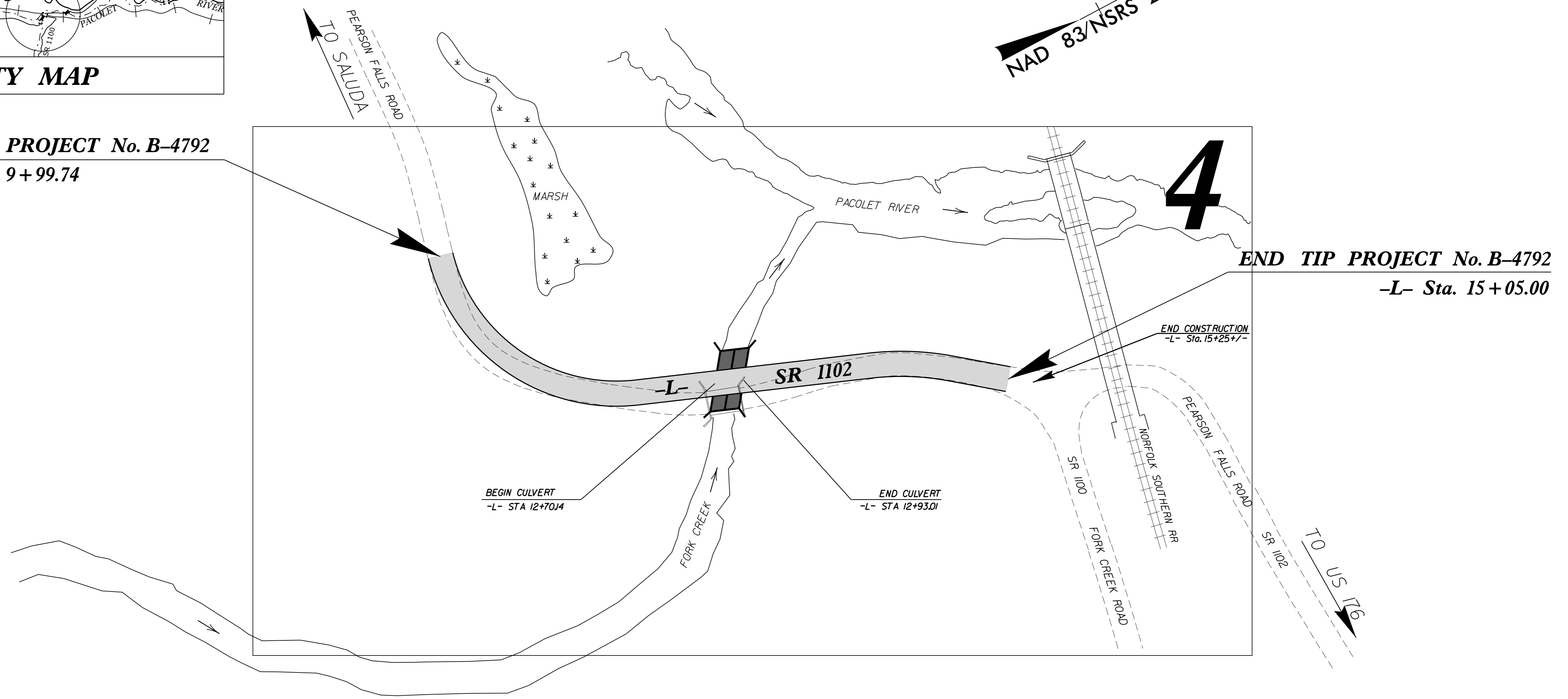
LOCATION: BRIDGE No. 4 OVER FORK CREEK (SMALL BRANCH OF PACOLET RIVER) ON SR 1102

TYPE OF WORK: GRADING, PAVING, DRAINAGE, CULVERT

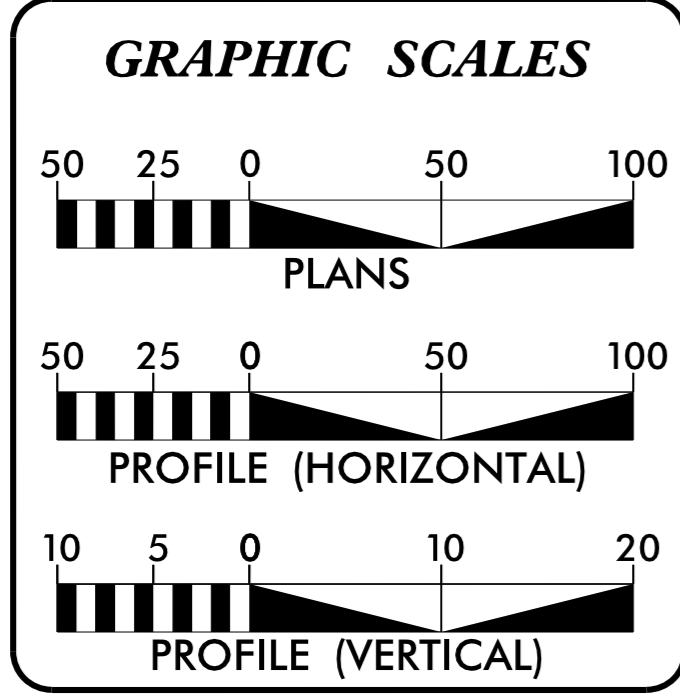
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4792	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
38562.1.1	BRZ-1102(5)	PE	
38562.2.1	BRZ-1102(5)	ROW /UTL.	
38562.3.1	BRZ-1102(5)	CONSTR.	



BEGIN TIP PROJECT No. B-4792
-L- PC Sta. 9+99.74



THIS IS NOT A CONTROL OF ACCESS PROJECT



DESIGN DATA

ADT 2014 =	100
ADT 2035 =	200
K =	25 %
D =	55 %
T =	19 % *
V =	25 MPH
* TTST =	1% DUAL 18%
FUNC CLASS =	LOCAL
SUBREGIONAL TIER	

PROJECT LENGTH

LENGTH ROADWAY T.I.P. PROJECT B-4792	=	0.092 MI
LENGTH STRUCTURE T.I.P. PROJECT B-4792	=	0.004 MI
TOTAL LENGTH T.I.P. PROJECT B-4792	=	0.096 MI

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

2012 STANDARD SPECIFICATIONS	RIGHT OF WAY DATE:	LETTING DATE:
	APRIL 21, 2015	MAY 10, 2016

KEVIN E. MOORE, PE
PROJECT ENGINEER

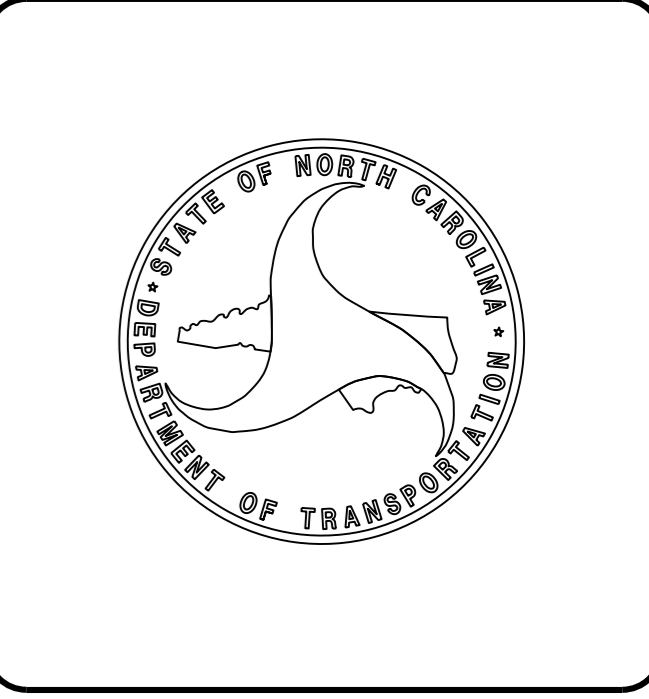
STEVEN D. KENDALL, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

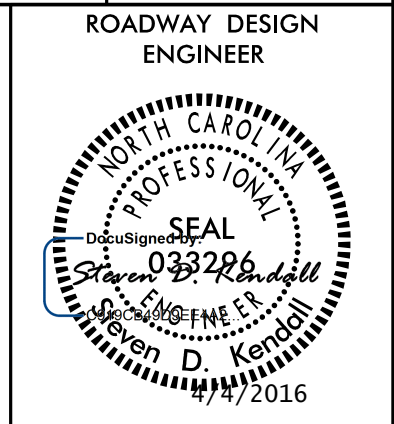
DocuSigned by:
Stephen R. Morgan
1029641E3FC1415...
4/4/2016

ROADWAY DESIGN ENGINEER

DocuSigned by:
Steven D. Kendall
C919C840D9EE4A2...
4/4/2016



B.17/99



SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
2A-1 THRU 2A-2	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
2C-1	MODIFIED SHOULDER BERM GUTTER DETAIL
2G-1 THRU 2G-4	TEMPORARY SHORING DETAILS
3	SUMMARY OF QUANTITIES
3B-1 THRU 3B-2	SUMMARY OF DRAINAGE QUANTITIES SUMMARY OF GUARDRAIL, EARTHWORK SUMMARY, ASPHALT PAVEMENT REMOVAL SUMMARY, SUMMARY OF SUBSURFACE DRAINAGE, SHOULDER BERM GUTTER SUMMARY, SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION AND SUMMARY OF MILLING
4	PLAN SHEET
	PROFILE SHEET
TMP-1 THRU TMP-9	TRANSPORTATION MANAGEMENT PLANS
PMP-1	PAVEMENT MARKING PLANS
EC-1 THRU EC-6	EROSION CONTROL PLANS
RF-1	REFORESTATION PLANS
SIGN-1	SIGNING PLANS
UD-1 THRU UD-2	UTILITIES BY OTHERS PLANS
X1A	CROSS-SECTION TITLE SHEET
X-2 THRU X-11	CROSS-SECTIONS
C-1 THRU C-13	CULVERT PLANS

GENERAL NOTES: 2012 SPECIFICATIONS
EFFECTIVE: 01-17-2012
REVISED: 10-31-2014

GRADING AND SURFACING OR RESURFACING AND WIDENING:
THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD 11.

SUPERELEVATION:
ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:
ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01

UNDERDRAINS:
UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.03 AT LOCATIONS DIRECTED BY THE ENGINEER.

GUARDRAIL:
THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

TEMPORARY SHORING:
SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

UTILITIES:
UTILITY OWNERS ON THIS PROJECT ARE Duke Power (Aerial) and RiverStreet Networks, formerly TDS Telecom (Under and above ground telephone lines)
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:
ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT IN ACCORDANCE WITH SECTION 801 OF THE 2012 NORTH CAROLINA STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

EFF. 01-17-2012
REV. 10-30-2012

2012 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2012 are applicable to this project and by reference hereby are considered a part of these plans:

STD. NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
815.03	Pipe Underdrain and Blind Drain
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
876.02	Guide for Rip Rap at Pipe Outlets

03 NOV 2015 15:39
R:\Roadway\B4792\Redy_tsh.dgn

12/05/11

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

Table listing symbols for boundaries and property: State Line, County Line, Township Line, City Line, Reservation Line, Property Line, Existing Iron Pin, Property Corner, Property Monument, 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, Known Soil Contamination: Area or Site, Potential Soil Contamination: Area or Site.

BUILDINGS AND OTHER CULTURE:

Table listing symbols for 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:

Table listing symbols for 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:

Table listing symbols for railroads: Standard Gauge, RR Signal Milepost, Switch, RR Abandoned, RR Dismantled.

RIGHT OF WAY:

Table listing symbols for right of way: Baseline Control Point, Existing Right of Way Marker, Existing Right of Way Line, Proposed Right of Way Line, Proposed Right of Way Line with Iron Pin and Cap Marker, Proposed Right of Way Line with Concrete or Granite R/W Marker, Proposed Control of Access Line with Concrete CA Marker, Existing Control of Access, Proposed Control of Access, 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, Proposed Permanent Easement with Iron Pin and Cap Marker.

ROADS AND RELATED FEATURES:

Table listing symbols for 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:

Table listing symbols for vegetation: Single Tree, Single Shrub, Hedge, Woods Line.

Table listing symbols for orchard and vineyard.

EXISTING STRUCTURES:

Table listing symbols for 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:

Table listing symbols for utilities: 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, Recorded U/G Power Line, Designated U/G Power Line (S.U.E.*); TELEPHONE: Existing Telephone Pole, Proposed Telephone Pole, Telephone Manhole, Telephone Booth, Telephone Pedestal, Telephone Cell Tower, U/G Telephone Cable Hand Hole, Recorded U/G Telephone Cable, Designated U/G Telephone Cable (S.U.E.*), Recorded U/G Telephone Conduit, Designated U/G Telephone Conduit (S.U.E.*), Recorded U/G Fiber Optics Cable, Designated U/G Fiber Optics Cable (S.U.E.*).

WATER:

Table listing symbols for water: Water Manhole, Water Meter, Water Valve, Water Hydrant, Recorded U/G Water Line, Designated U/G Water Line (S.U.E.*), Above Ground Water Line.

TV:

Table listing symbols for TV: TV Satellite Dish, TV Pedestal, TV Tower, U/G TV Cable Hand Hole, Recorded U/G TV Cable, Designated U/G TV Cable (S.U.E.*), Recorded U/G Fiber Optic Cable, Designated U/G Fiber Optic Cable (S.U.E.*).

GAS:

Table listing symbols for gas: Gas Valve, Gas Meter, Recorded U/G Gas Line, Designated U/G Gas Line (S.U.E.*), Above Ground Gas Line.

SANITARY SEWER:

Table listing symbols for sanitary sewer: Sanitary Sewer Manhole, Sanitary Sewer Cleanout, U/G Sanitary Sewer Line, Above Ground Sanitary Sewer, Recorded SS Forced Main Line, Designated SS Forced Main Line (S.U.E.*).

MISCELLANEOUS:

Table listing symbols for miscellaneous: Utility Pole, Utility Pole with Base, Utility Located Object, Utility Traffic Signal Box, Utility Unknown U/G Line, U/G Tank; Water, Gas, Oil, Underground Storage Tank, Approx. Loc., A/G Tank; Water, Gas, Oil, Geoenvironmental Boring, U/G Test Hole (S.U.E.*), Abandoned According to Utility Records, End of Information.

SURVEY CONTROL SHEET B-4792 -PRELIMINARY-

-PRELIMINARY- ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	09+99.74	-14.00	551192.4158	1006783.1377
L	09+99.74	-50.00	551227.3178	1006791.9612
L	12+07.83	-50.00	551284.1686	1006902.5212
L	13+94.26	-50.00	551457.7596	1006970.5158
L	13+94.26	-28.44	551449.8970	1006990.5910
L	13+00.00	43.65	551335.8374	1007023.3374
L	13+00.00	55.00	551331.6979	1007033.9056
L	12+50.00	55.00	551285.1420	1007015.6699
L	12+50.00	43.41	551289.3690	1007004.8783

PRELIMINARY -L-

TYPE	STATION	NORTH	EAST
POT	9+51.71	551190.8118	1006733.1464
PC	09+99.74	551178.8427	1006779.7069
PT	12+07.83	551265.9329	1006949.0772
PC	13+94.26	551439.5239	1007017.0717
PT	14+58.58	551495.0441	1007049.0758
PC	15+03.88	551530.4812	1007077.2958
PT	15+66.31	551584.5464	1007107.9963
POT	15+94.40	551610.8346	1007117.9023

**NCDOT BASELINE STATION B4792 -BL-1
LOCALIZED PROJECT COORDINATES**
N = 551229.6990
E = 1006515.5930
ELEV. = 1492.95'

**NCDOT BASELINE STATION B4792 -BY2-7
LOCALIZED PROJECT COORDINATES**
N = 551696.6960
E = 1006814.1250
ELEV. = 1491.46'

**NCDOT BASELINE STATION GPS B4792 G-101
LOCALIZED PROJECT COORDINATES**
N = 551711.6330
E = 1006890.2900
ELEV. = 1486.53'

**NCDOT BASELINE STATION B4792 -BL-2
LOCALIZED PROJECT COORDINATES**
N = 551157.9010
E = 1006850.3830
ELEV. = 1492.78'

**NCDOT BASELINE STATION B4792 -BL-3
LOCALIZED PROJECT COORDINATES**
N = 551302.2220
E = 1006990.7000
ELEV. = 1484.16'

**NCDOT BASELINE STATION B4792 -BL-4
LOCALIZED PROJECT COORDINATES**
N = 551569.0970
E = 1007082.5790
ELEV. = 1473.50'

**NCDOT BASELINE STATION B4792 -BL-5
LOCALIZED PROJECT COORDINATES**
N = 551665.5710
E = 1007178.5510
ELEV. = 1472.68'

**NCDOT BASELINE STATION B4792 -BY2-8
LOCALIZED PROJECT COORDINATES**
N = 551561.4110
E = 1007248.2320
ELEV. = 1486.07'

**NCDOT BASELINE STATION B4792 -BY1-6
LOCALIZED PROJECT COORDINATES**
N = 551491.2410
E = 1007373.9170
ELEV. = 1484.34'

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	BL-1	551229.6990	1006515.5930	1492.95	OUTSIDE PROJECT LIMITS	
2	BL-2	551157.9010	1006850.3830	1492.78	10+66.63	20.40 RT
3	BL-3	551302.2220	1006990.7000	1484.16	12+56.80	25.52 RT
4	BL-4	551569.0970	1007082.5790	1473.50	15+40.67	16.83 LT
5	BL-5	551665.5710	1007178.5510	1472.68	OUTSIDE PROJECT LIMITS	

BY1 POINT	DESC.	NORTH	EAST	ELEVATION	EY1 STATION	OFFSET
44	BY1-44	551569.0970	1007082.5790	1473.50	OUTSIDE PROJECT LIMITS	
6	BY1-6	551491.2410	1007373.9170	1484.34	OUTSIDE PROJECT LIMITS	

BY2 POINT	DESC.	NORTH	EAST	ELEVATION	EY2 STATION	OFFSET
7	BY2-7	551696.6960	1006814.1250	1491.46	OUTSIDE PROJECT LIMITS	
8	BY2-8	551561.4110	1007248.2320	1486.07	13+51.54	17.20 RT

 BM1 ELEVATION = 1487.14
 N 551238 E 1006575
 BL STATION 5+56.00 21 LEFT
 SPIKE SET IN BASE OF 24" SYCAMORE TREE

 BM2 ELEVATION = 1476.67
 N 551501 E 1007018
 BL STATION 12+40.00 39 LEFT
 SPIKE SET IN BASE OF 24" POPLAR TREE

 BM3 ELEVATION = 1475.75
 N 551626 E 1007320
 BY1 STATION 7+14.00 117 LEFT
 SPIKE SET IN BASE OF 3 PRONG SYCAMORE TREE

-PRELIMINARY- ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	11+59.00	-50.00	551257.0084	1006886.1347
L	11+92.00	-80.00	551288.7144	1006871.6678
L	13+94.26	-50.00	551457.7596	1006970.5158
L	14+05.00	-80.00	551482.2832	1006948.2975
L	14+42.00	-29.72	551498.3528	1007014.6515

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "GPS 101" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 551711.633(++) EASTING: 1006890.290(++) ELEVATION: 1486.53(++)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: .999880177

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS 101" TO -L- L STATION 09+99.74 IS
 S 11 43 31.42 W 544.15'

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
 VERTICAL DATUM USED IS NAVD 88

NOTES:

- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/](https://connect.ncdot.gov/resources/location/)
 THE FILES TO BE FOUND ARE AS FOLLOWS:
 B4792_LS_CONTROL.TXT
 SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- © INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
 PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

GEOID MODEL: GEOID 03
 NOTE: DRAWING NOT TO SCALE

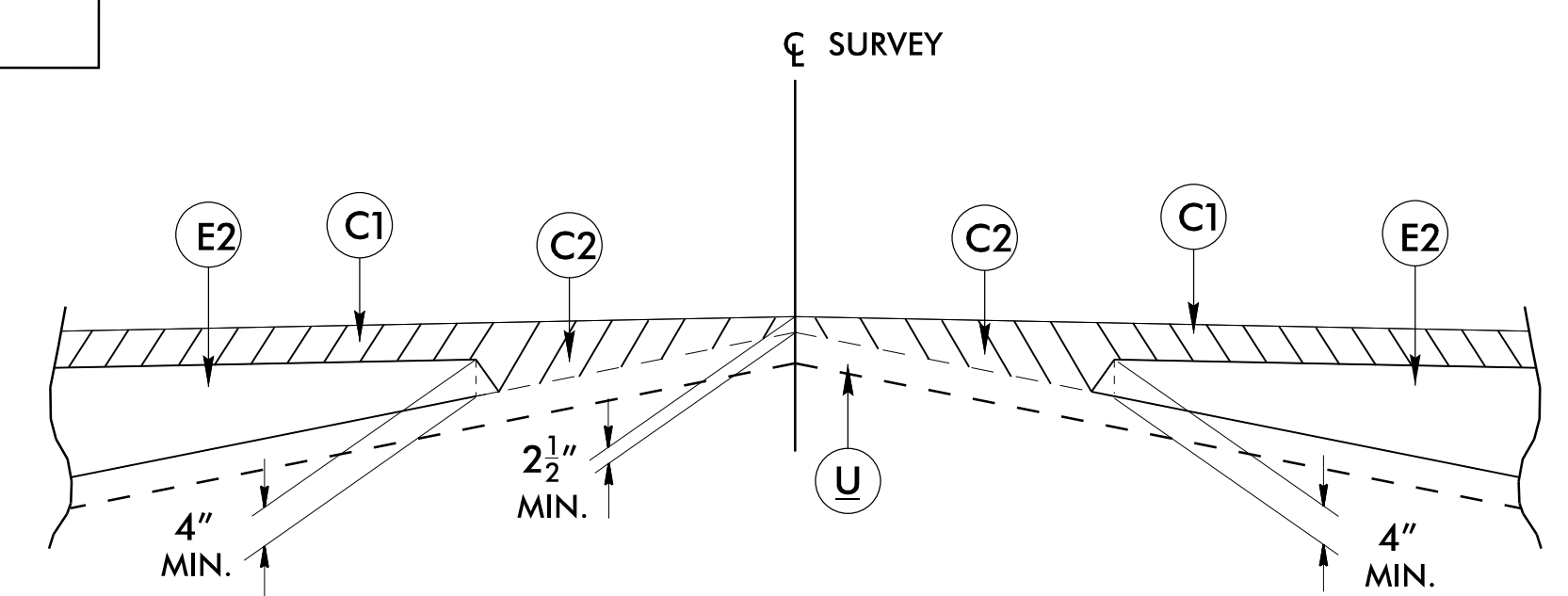
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 \$\$\$\$ USER NAME \$\$\$

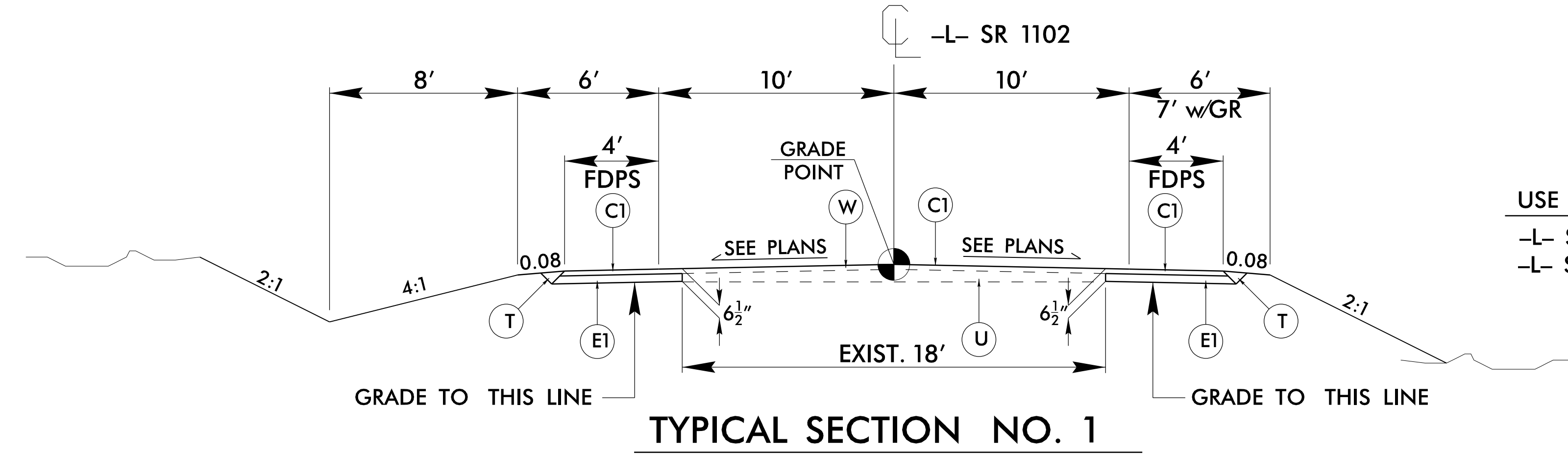
PAVEMENT SCHEDULE

C1	PROP. APPROX. 2.5" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	R2	PORTABLE CONCRETE BARRIER
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.	T	EARTH MATERIAL.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.	W	WEDGING
R1	MODIFIED SHOULDER BERM GUTTER	NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.	

PROJECT REFERENCE NO. B-4792	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER <i>Steven D. Kendall</i>	PAVEMENT DESIGN ENGINEER <i>Mark S. Morrison</i>
4/4/2016	4/4/2016

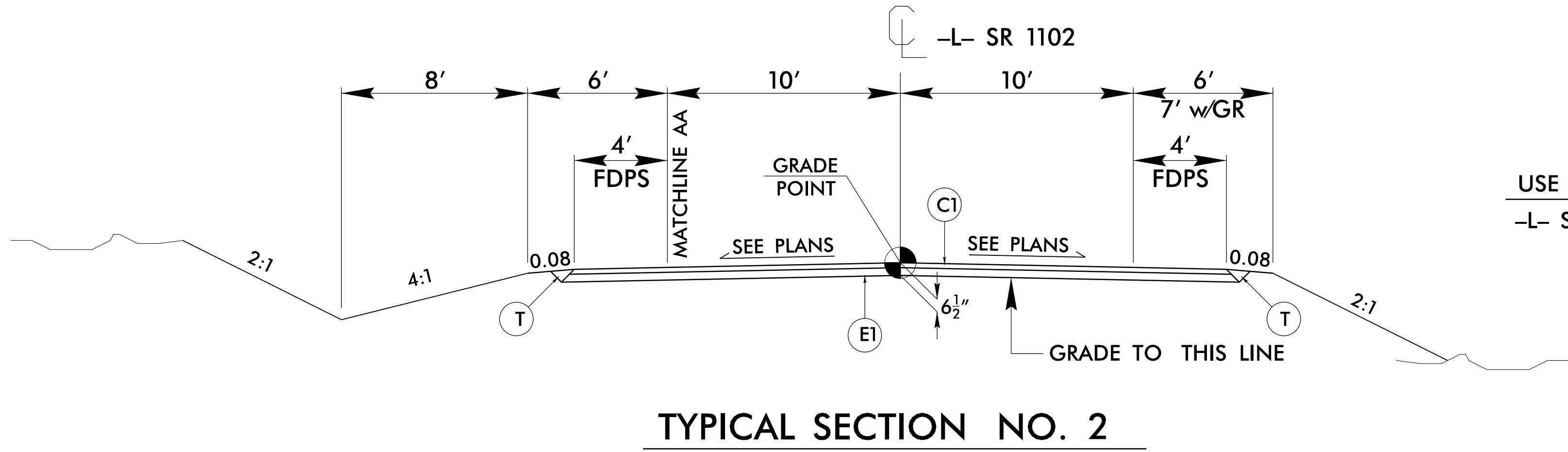


Wedging Detail



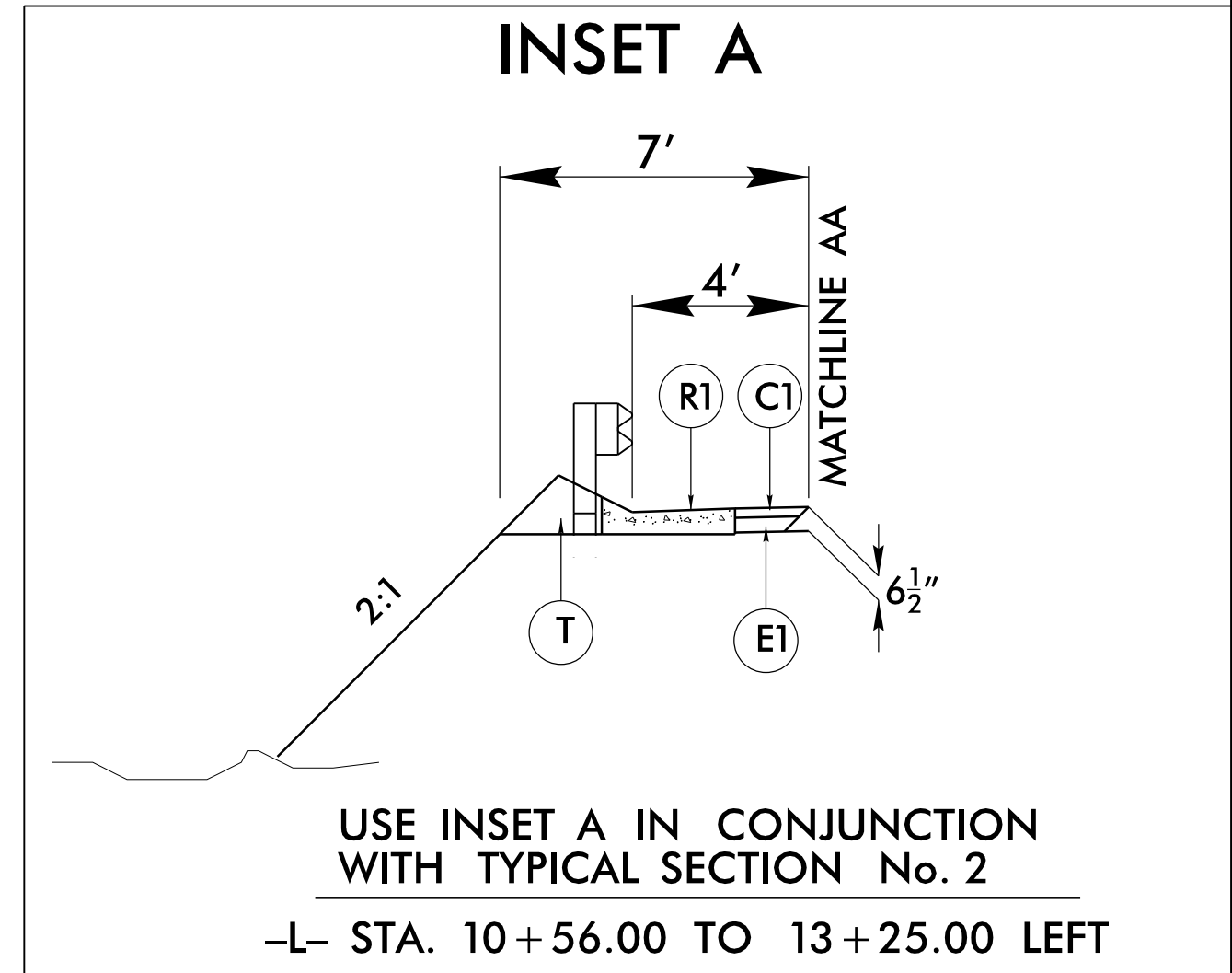
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
 -L- STA. 9+99.74 TO 10+56.00
 -L- STA. 14+50.00 TO 15+05.00



TYPICAL SECTION NO. 2

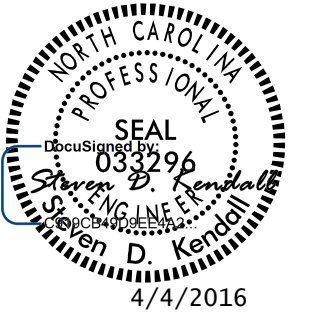
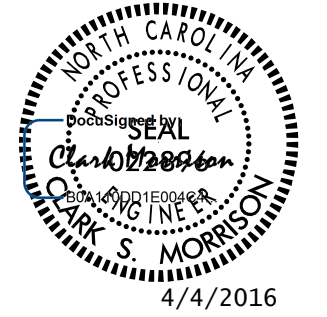
USE TYPICAL SECTION NO. 2
 -L- STA. 10+56.00 TO 14+50.00

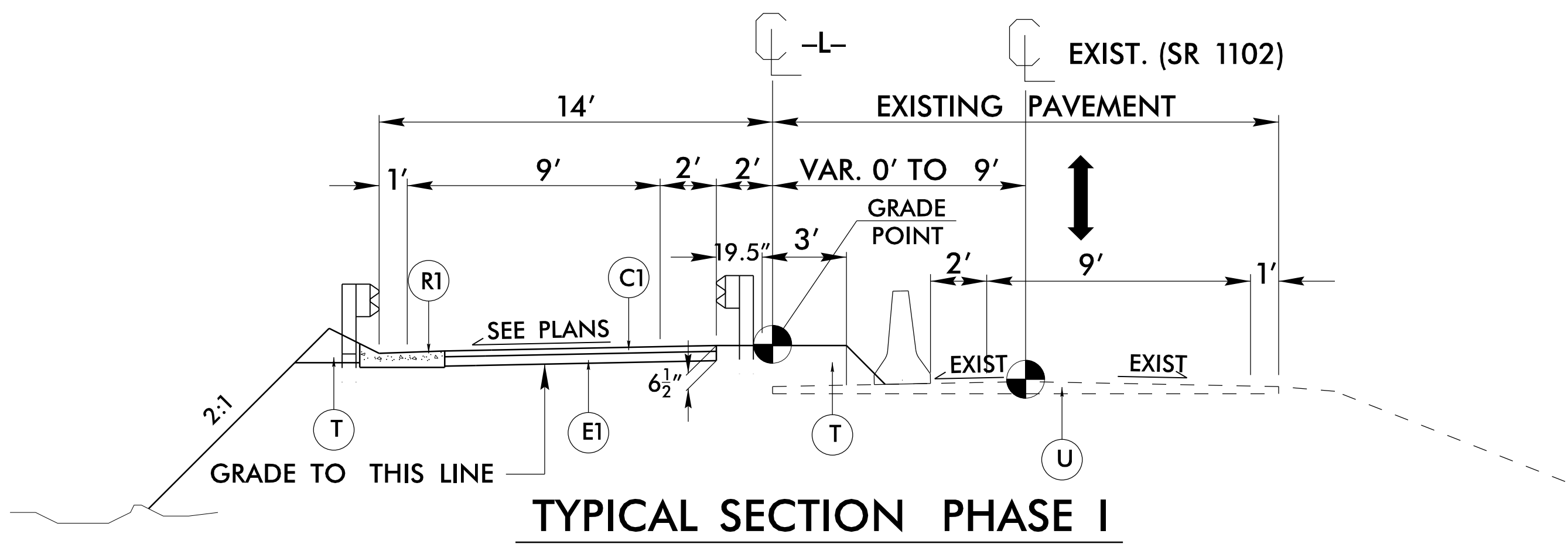


USE INSET A IN CONJUNCTION WITH TYPICAL SECTION No. 2
 -L- STA. 10+56.00 TO 13+25.00 LEFT

6/2/2016
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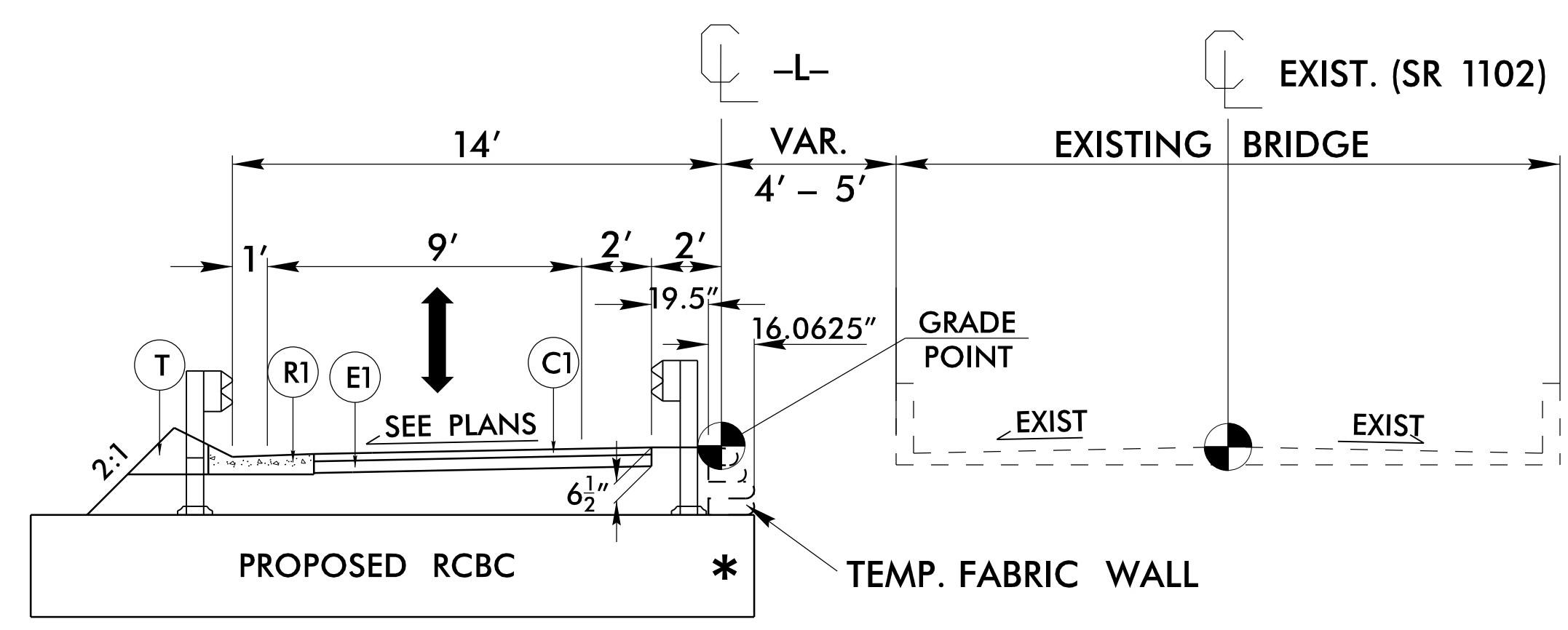
PHASING FOR CULVERT CONSTRUCTION

PROJECT REFERENCE NO. B-4792	SHEET NO. 2A-2
ROADWAY DESIGN ENGINEER 	PAVEMENT DESIGN ENGINEER 
4/4/2016	4/4/2016



TYPICAL SECTION PHASE I

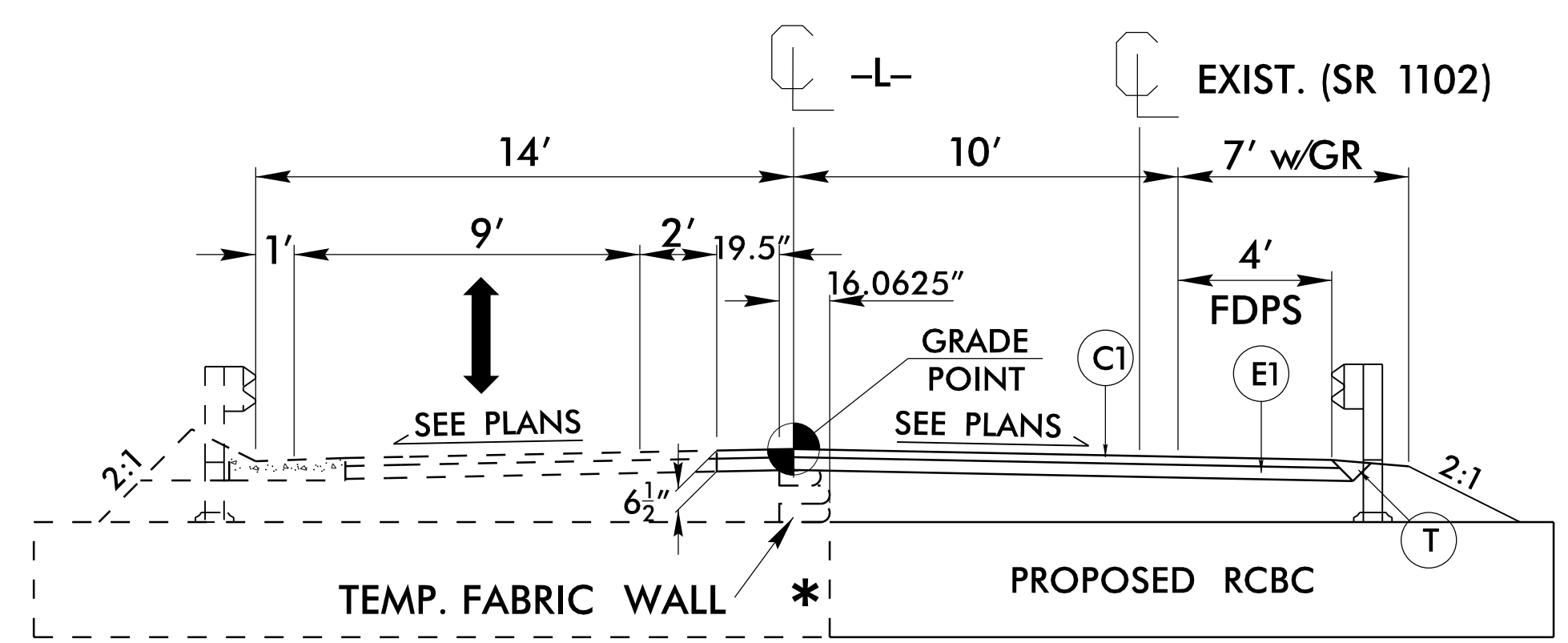
- PHASE I**
- SHIFT TRAFFIC INTO ONE-LANE PATTERN ON NB LANE
 - CONSTRUCT SOUTHBOUND LANE



TYPICAL SECTION PHASE II

* CONSTRUCTION JOINT
SEE CULVERT PLANS

- PHASE II**
- CONSTRUCT CULVERT (PHASE I)
 - SHIFT TRAFFIC INTO ONE-LANE PATTERN ON SB LANE
 - REMOVE EXISTING STRUCTURE



TYPICAL SECTION PHASE III

* CONSTRUCTION JOINT
SEE CULVERT PLANS

- PHASE III**
- CONSTRUCT CULVERT (PHASE II)
 - CONSTRUCT NORTHBOUND LANE
 - SEE SHEET 2 FOR FINAL TYPICAL

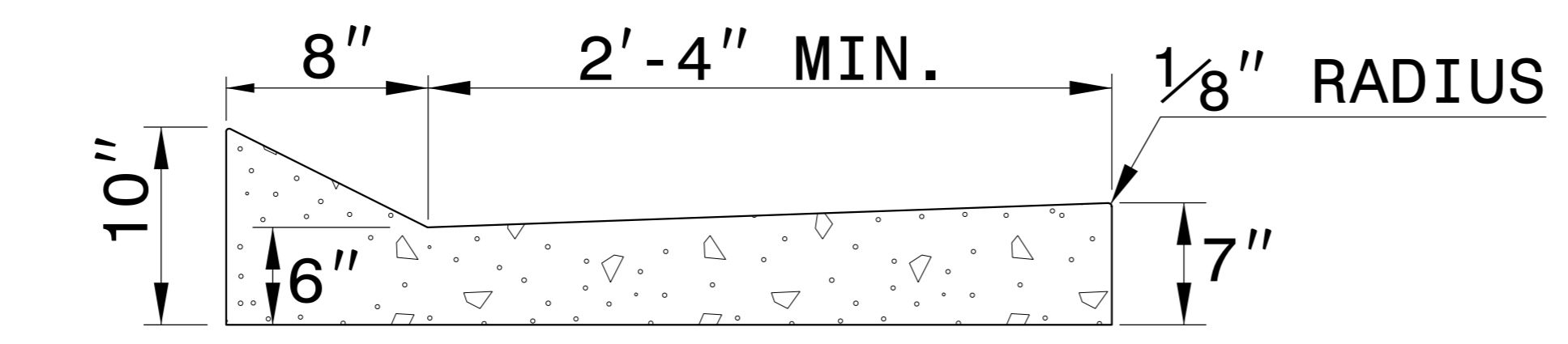
PAVEMENT SCHEDULE

C1	2.5" SF9.5A
C2	VAR. SF9.5A
E1	4" B25.0B
E2	VAR. B25.0B
R1	MODIFIED SBG
R2	CONC. BARRIER
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

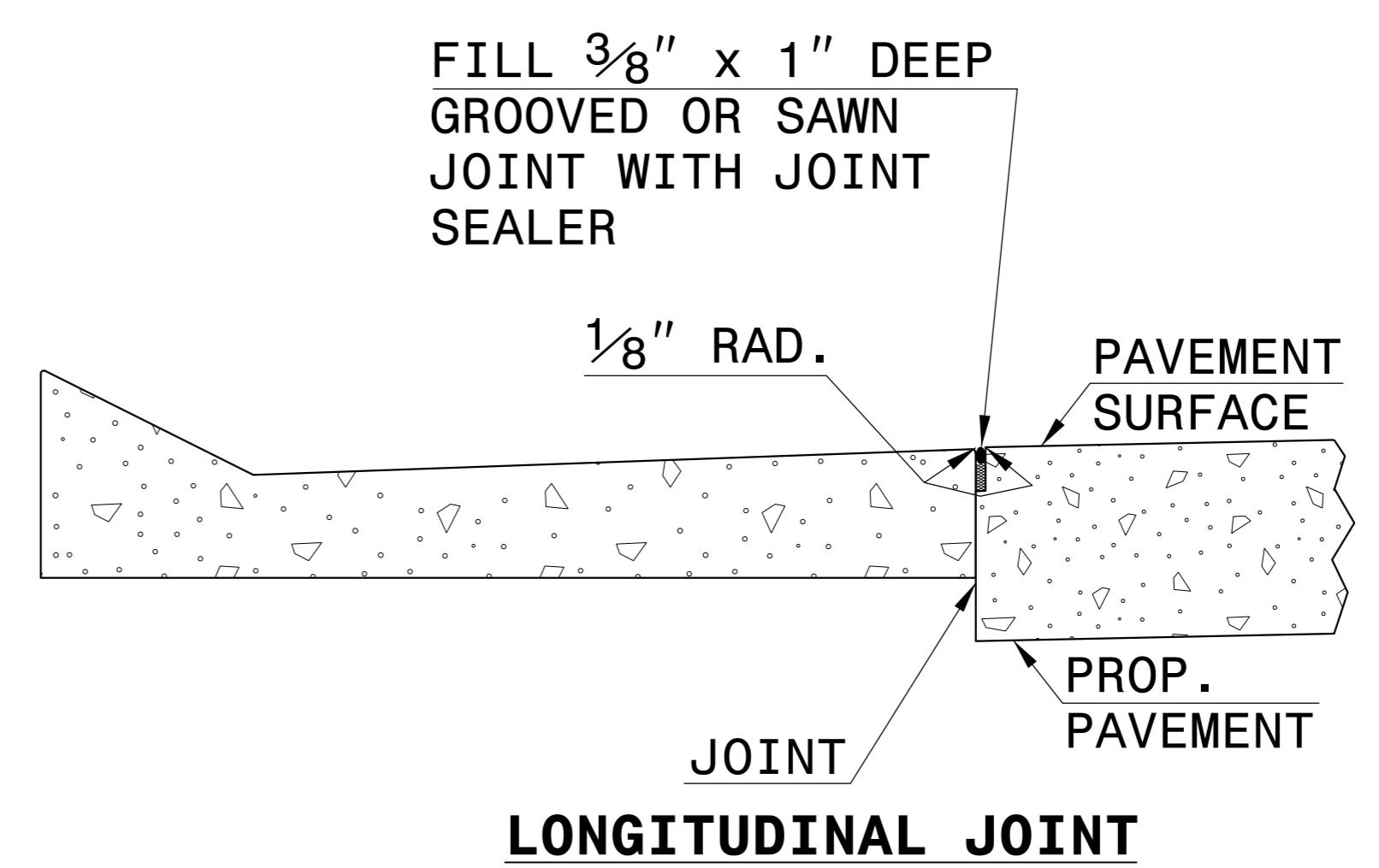
ENGLISH DETAIL DRAWING FOR
MODIFIED SHOULDER BERM GUTTER

SHEET OF
846D01

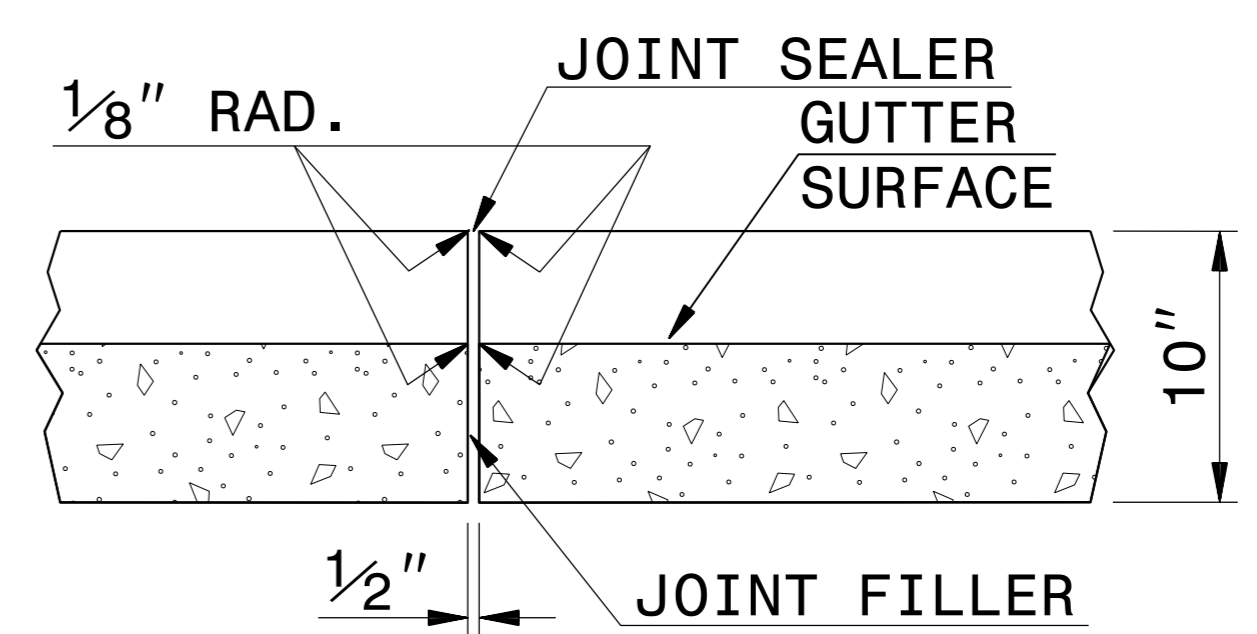


MODIFIED SHOULDER BERM GUTTER

- GENERAL NOTES:
- PLACE CONTRACTION JOINTS AT 10' INTERVALS, EXCEPT THAT A 15' SPACING MAY BE USED WHEN A MACHINE IS USED OR WHEN SATISFACTORY SUPPORT FOR THE FACE FORM CAN BE OBTAINED WITHOUT THE USE OF TEMPLATES AT 10' INTERVALS.
 - JOINT SPACING MAY BE ALTERED IF REQUIRED BY THE ENGINEER.
 - CONTRACTION JOINTS MAY BE INSTALLED WITH THE USE OF TEMPLATES OR FORMED BY OTHER APPROVED METHODS. CONSTRUCT NON-TEMPLATE FORMED JOINTS A MIN. OF 1 1/2" DEEP.
 - FILL ALL CONSTRUCTION JOINTS WITH JOINT FILLER AND SEALER.
 - SPACE EXPANSION JOINTS AT 90' INTERVALS AND ADJACENT TO ALL RIGID OBJECTS.



LONGITUDINAL JOINT



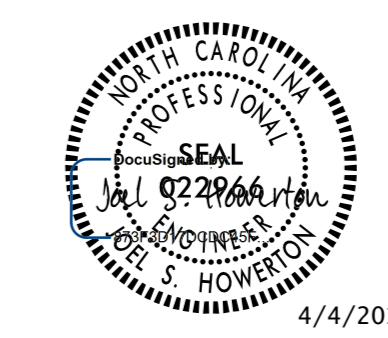
TRANSVERSE EXPANSION JOINT IN CURB AND GUTTER

SECTION VIEW OF JOINTS

STATE OF NORTH CAROLINA
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RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
MODIFIED SHOULDER BERM GUTTER

SHEET OF
846D01



4/4/2016


CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

ORIGINAL BY: kkempf DATE: 11/13/08
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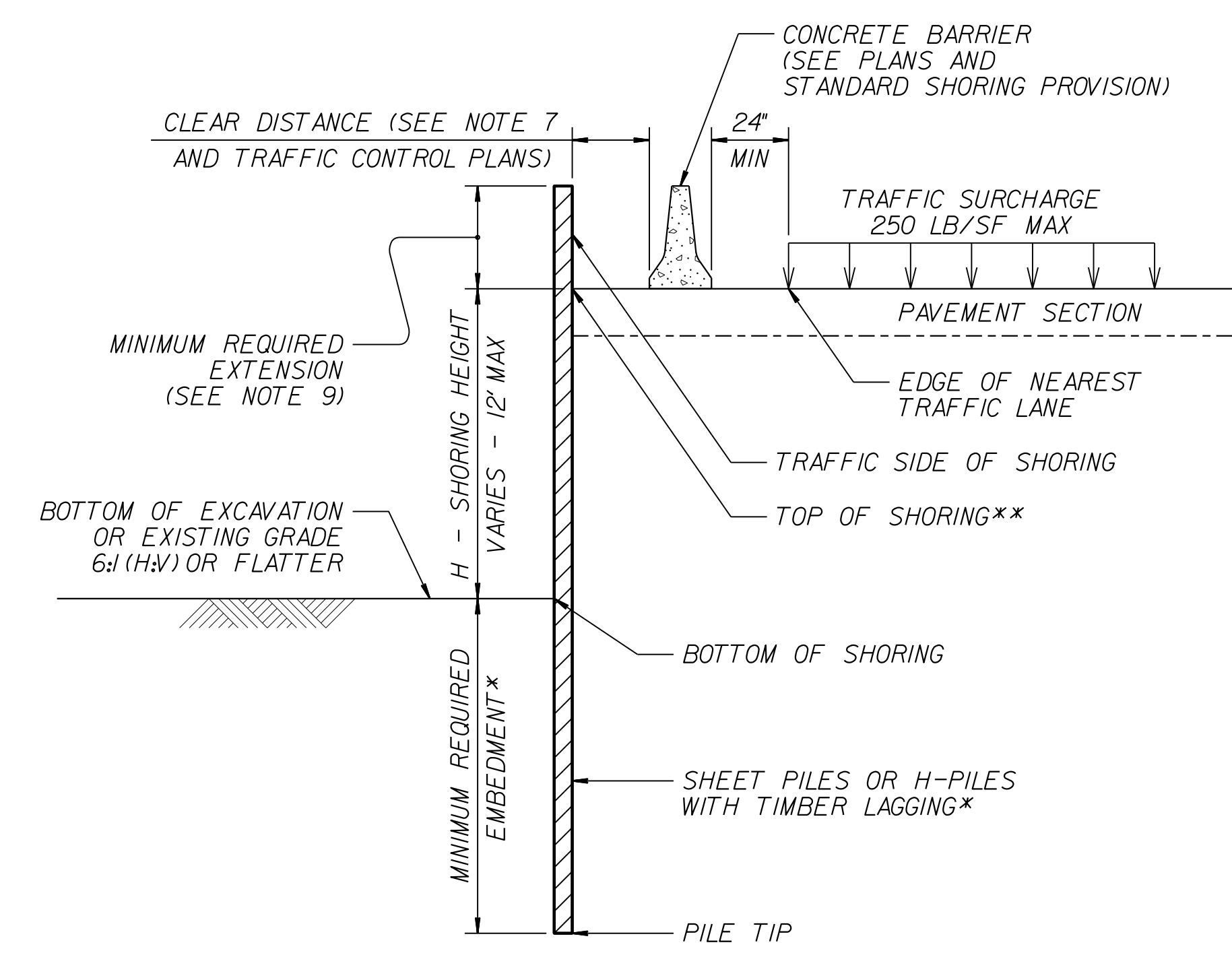
846D01.dwg
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kkempf

PROJECT REFERENCE NO. B-4792		SHEET NO. 2G-1
GEOTECHNICAL ENGINEER  SEAL 02246 SCOTT A. HADDEN ENGINEER		ENGINEER
DocuSigned by: Scott A. Hadden 11/9/2015 F780C45899FC403 SIGNATURE		DATE

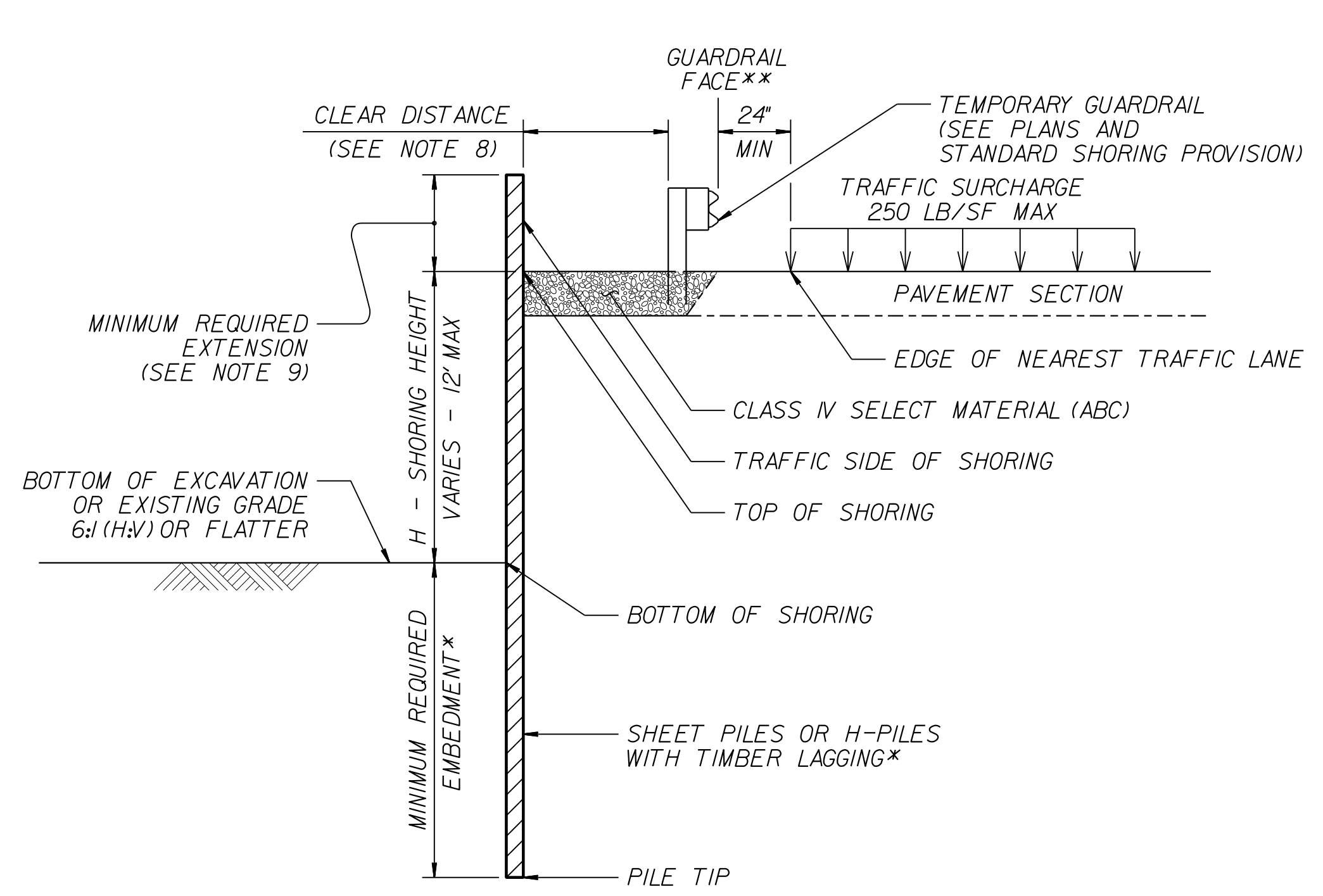
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN ³ /FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)			MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN ³ /FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)		
				HP 10x42	HP 12x53	HP 14x73			HP 10x42	HP 12x53	HP 14x73
GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP	< 6	11.5	4.5	11.5	11.5	11.5	16.0	12.0	13.0	13.0	13.0
	7	13.0	7.0	13.0	13.0	13.0	17.0	14.5	14.5	14.5	14.5
	8	15.0	10.0	--	15.0	15.0	18.0	17.0	--	15.5	15.5
	9	17.0	14.0	--	17.0	17.0	19.0	20.0	--	17.0	17.0
	10	18.5	19.5	--	--	18.5	20.0	23.5	--	--	18.5
	11	20.5	26.0	--	--	--	21.0	28.0	--	--	20.0
12	22.5	33.0	--	--	--	22.0	33.0	--	--	21.5	
GROUNDWATER ELEVATION BELOW PILE TIP	< 6	7.5	3.0	8.0	8.0	8.0	11.0	10.0	9.5	9.5	9.5
	7	8.5	4.5	9.5	9.5	9.5	12.0	12.0	10.5	10.5	10.5
	8	10.0	6.5	10.5	10.5	10.5	12.5	14.0	11.5	11.5	11.5
	9	11.0	9.5	--	12.0	12.0	13.5	16.5	--	12.5	12.5
	10	12.5	13.0	--	--	13.5	14.0	19.5	--	13.5	13.5
	11	13.5	17.0	--	--	14.5	15.0	22.5	--	--	14.5
12	15.0	21.5	--	--	16.0	16.0	25.5	--	--	15.5	

- NOTES:**
- AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING AS NOTED IN THE PLANS.
 - FOR STANDARD TEMPORARY SHORING, SEE STANDARD SHORING PROVISION.
 - STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
 UNIT WEIGHT, $\gamma = 120 \text{ LB/CF}$
 FRICTION ANGLE, $\phi = 30 \text{ DEGREES}$
 COHESION, $c = 0 \text{ LB/SF}$
 - DO NOT USE STANDARD TEMPORARY SHORING IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
 - DO NOT USE STANDARD TEMPORARY SHORING WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS WITHIN THE EMBEDMENT DEPTH.
 - USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, USE "GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP" FOR GROUNDWATER CONDITION. DO NOT USE STANDARD TEMPORARY SHORING IF GROUNDWATER IS ABOVE BOTTOM OF SHORING.
 - AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN THE MINIMUM REQUIRED FOR CONCRETE BARRIER, SET BARRIER NEXT TO AND UP AGAINST TRAFFIC SIDE OF PILES AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
 - AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN 4' FOR TEMPORARY GUARDRAIL, ATTACH GUARDRAIL TO TRAFFIC SIDE OF PILES AS SHOWN IN THE PLANS AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
 - MINIMUM REQUIRED EXTENSION IS 6" FOR "SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT" AND 32" FOR "SURCHARGE CASE WITH TRAFFIC IMPACT".
 - MINIMUM REQUIRED EMBEDMENT FOR H-PILES WITH TIMBER LAGGING IS BASED ON DRIVEN H-PILES AT MAXIMUM 6' SPACING. AT THE CONTRACTOR'S OPTION, EMBEDMENT DEPTHS MAY BE REDUCED BY 25% FOR DRILLED-IN H-PILES.
 - SUBMIT A "STANDARD TEMPORARY SHORING SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY SHORING CONSTRUCTION. UP TO 3 SHORING LOCATIONS MAY BE INCLUDED ON EACH FORM. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM:
connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
 - CONTACT THE ENGINEER IF PILES DO NOT ATTAIN THE MINIMUM REQUIRED EMBEDMENT.

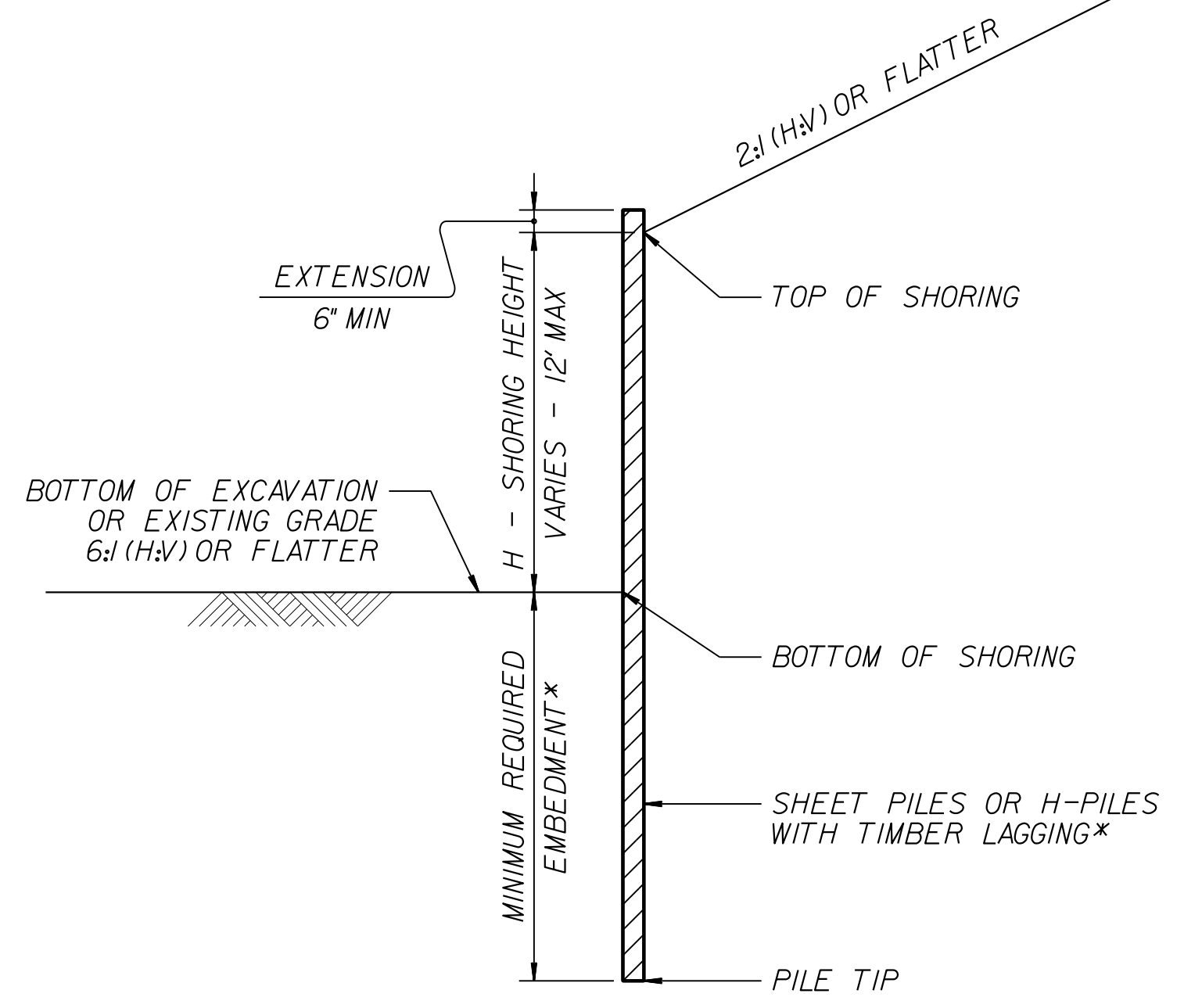
MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS
***DO NOT USE H-PILES WITH TIMBER LAGGING FOR GROUNDWATER CONDITION, SHORING HEIGHT AND H-PILE SIZE SHOWN IF MINIMUM REQUIRED EMBEDMENT IS "--".**



CONCRETE BARRIER
****TOP OF SHORING = EDGE OF PAVEMENT**

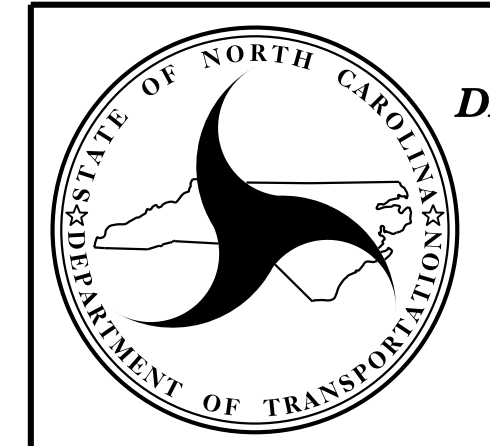


TEMPORARY GUARDRAIL
****GUARDRAIL FACE = EDGE OF PAVEMENT**




STANDARD TEMPORARY SHORING (SLOPE CASE)
***SEE TABLE ABOVE.**

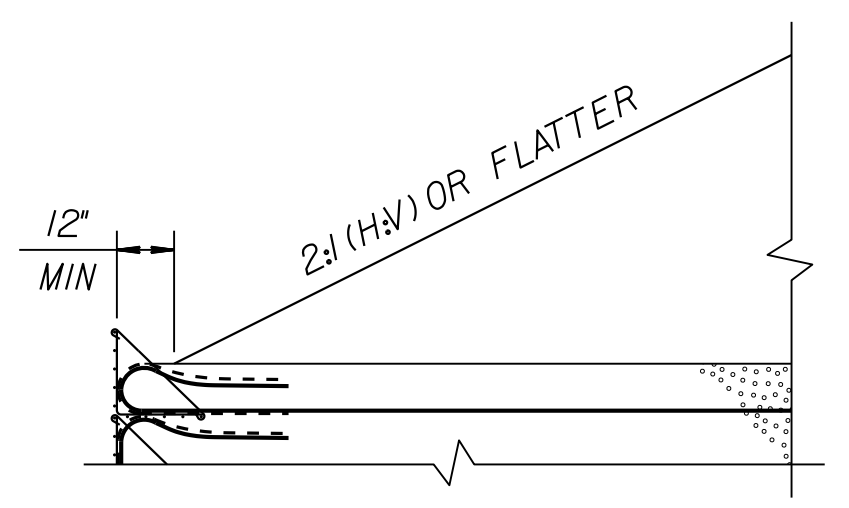
STANDARD TEMPORARY SHORING (SURCHARGE CASE)
***SEE TABLE ABOVE.**



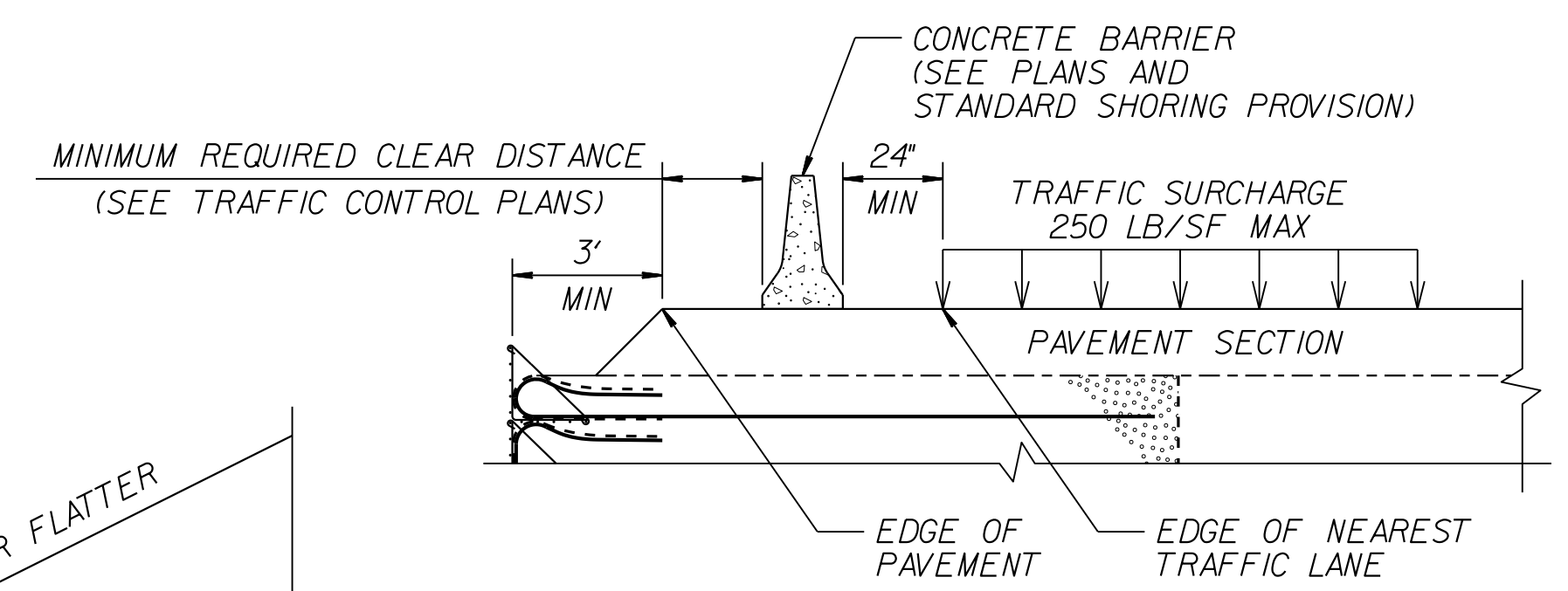
NORTH CAROLINA
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 DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.01
STANDARD TEMPORARY SHORING

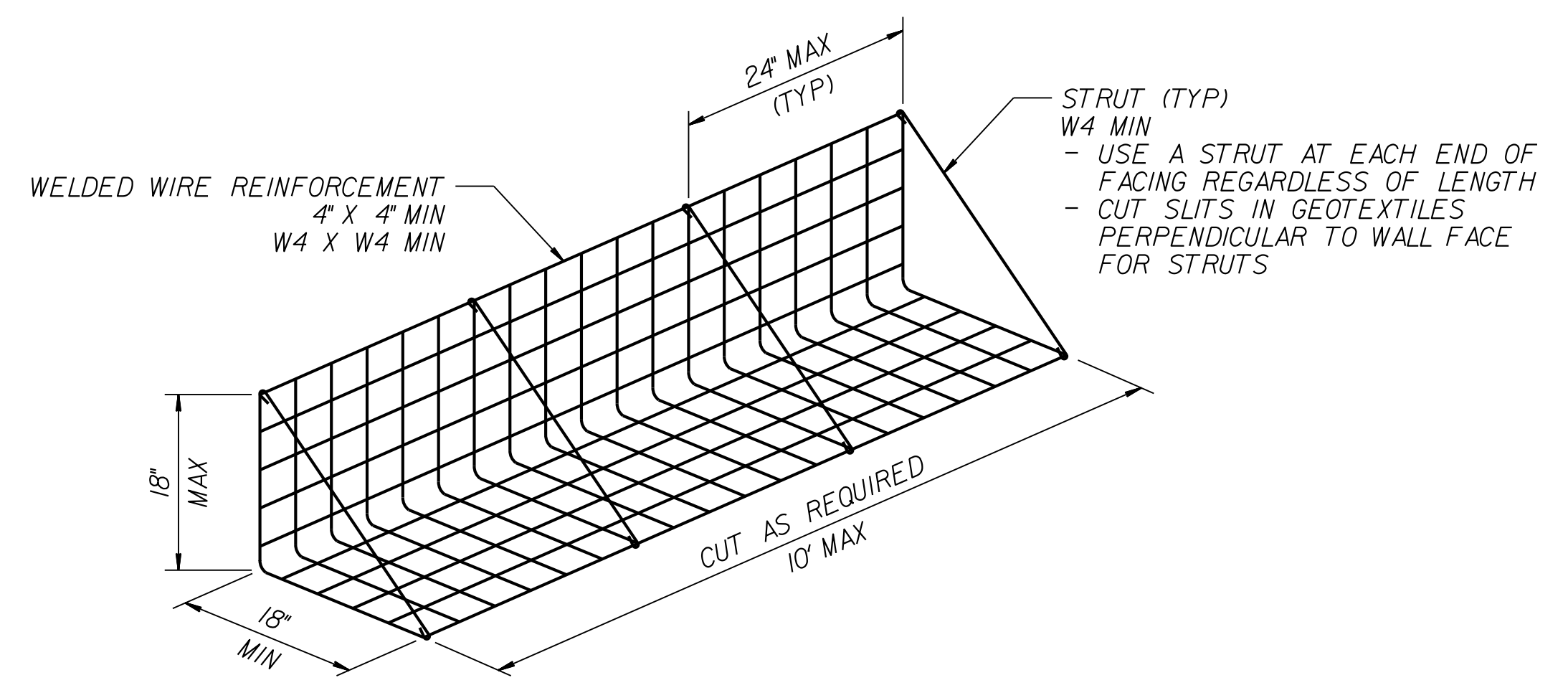
PROJECT REFERENCE NO. B-4792	SHEET NO. 2G-2
GEOTECHNICAL ENGINEER  DocuSigned by: Scott A. Hadden 11/9/2015 SIGNATURE DATE	ENGINEER SIGNATURE DATE



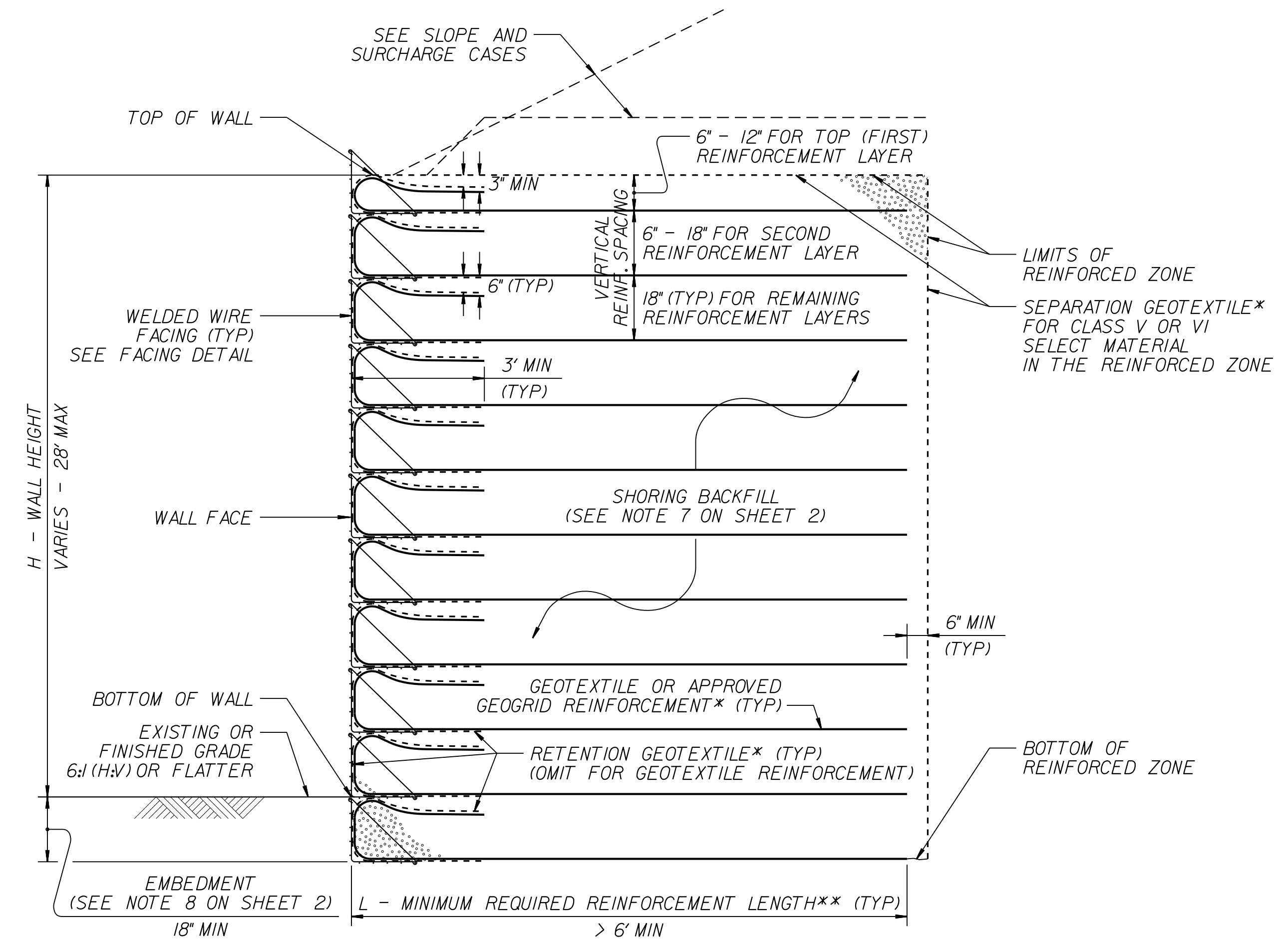
SLOPE CASE



SURCHARGE CASE

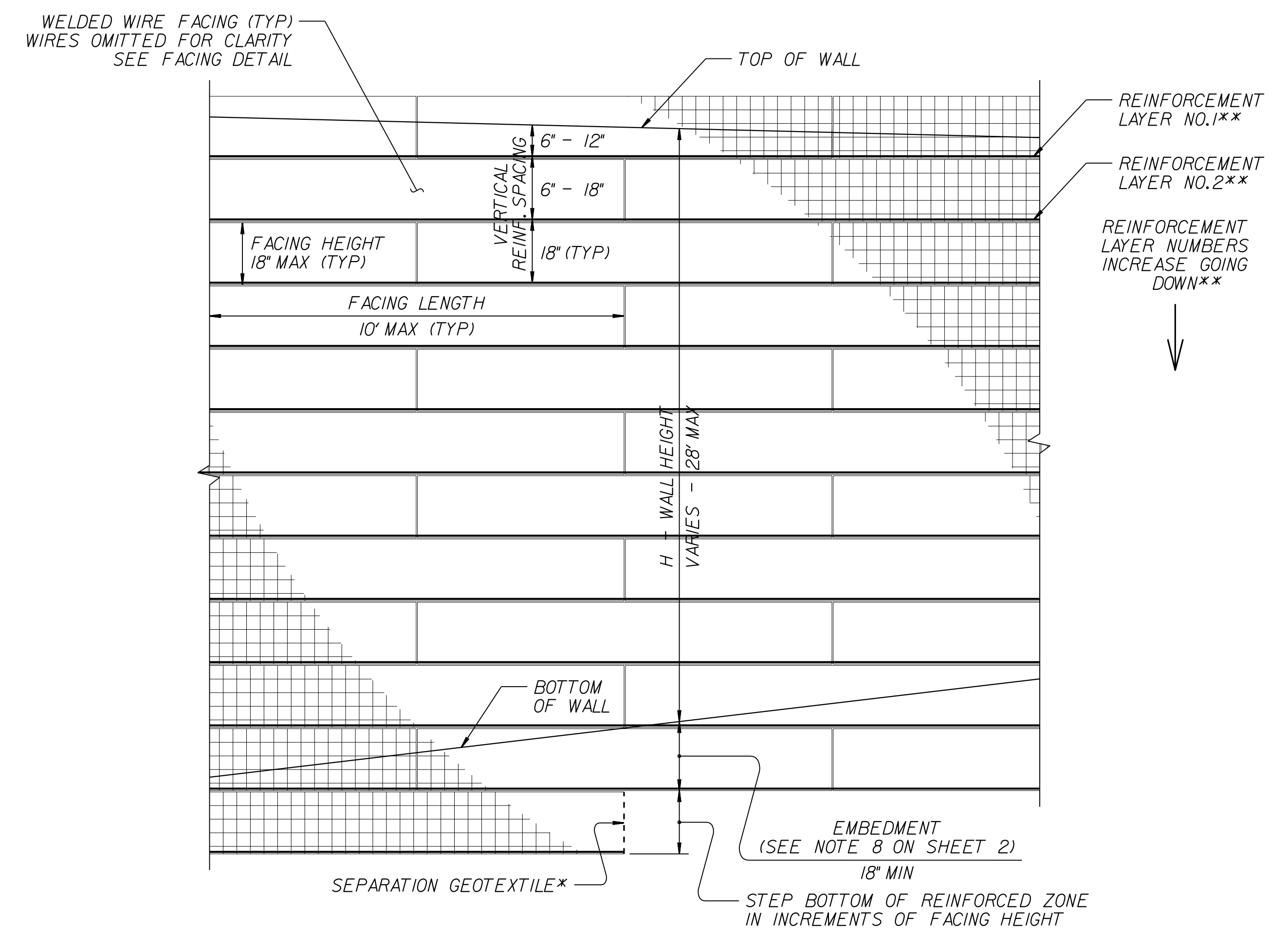


FACING DETAIL



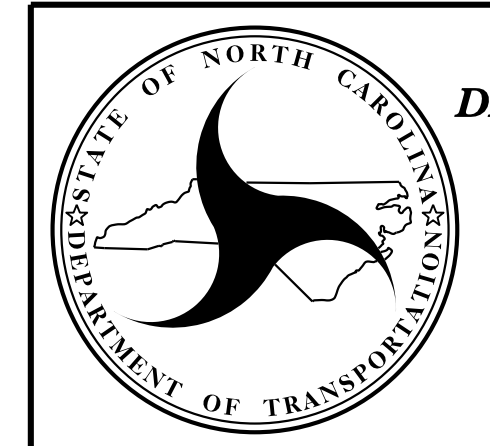
STANDARD TEMPORARY WALL

(FOR STANDARD TEMPORARY WALLS ON STRUCTURES, SEE TEMPORARY WALL ON STRUCTURE DETAIL ON SHEET 2.)
 *SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
 **SEE REINFORCEMENT TABLES ON SHEET 3.



STANDARD TEMPORARY WALL - PARTIAL ELEVATION

*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
 **SEE REINFORCEMENT TABLES ON SHEET 3.




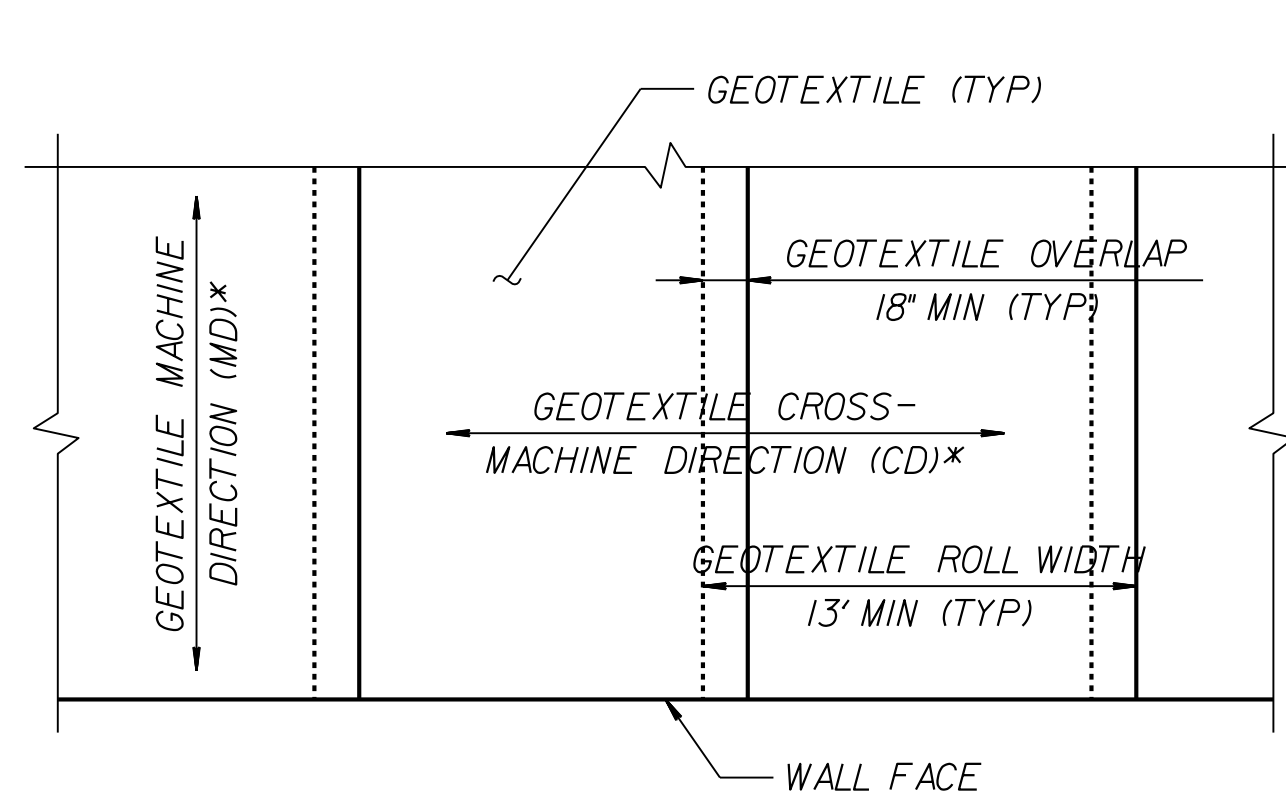
**NORTH CAROLINA
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 DIVISION OF HIGHWAYS**

**GEOTECHNICAL
 ENGINEERING UNIT**

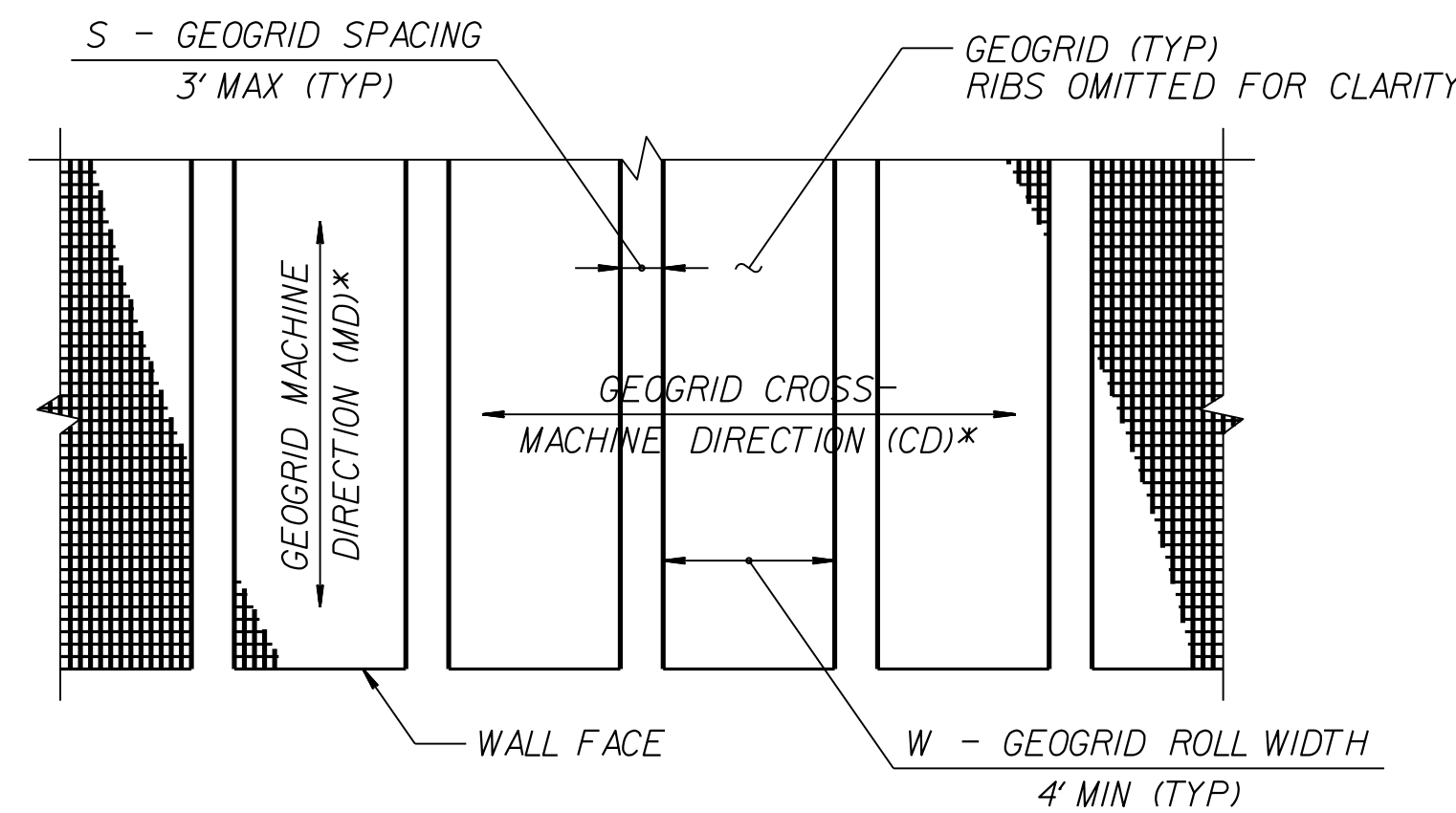
STANDARD DETAIL NO. 1801.02

**STANDARD
 TEMPORARY WALL
 SHEET 1 OF 3**

PROJECT REFERENCE NO. B-4792		SHEET NO. 2G-3
GEOTECHNICAL ENGINEER  DocuSigned by: Scott A. Hidden 11/9/2015		ENGINEER
SIGNATURE		DATE



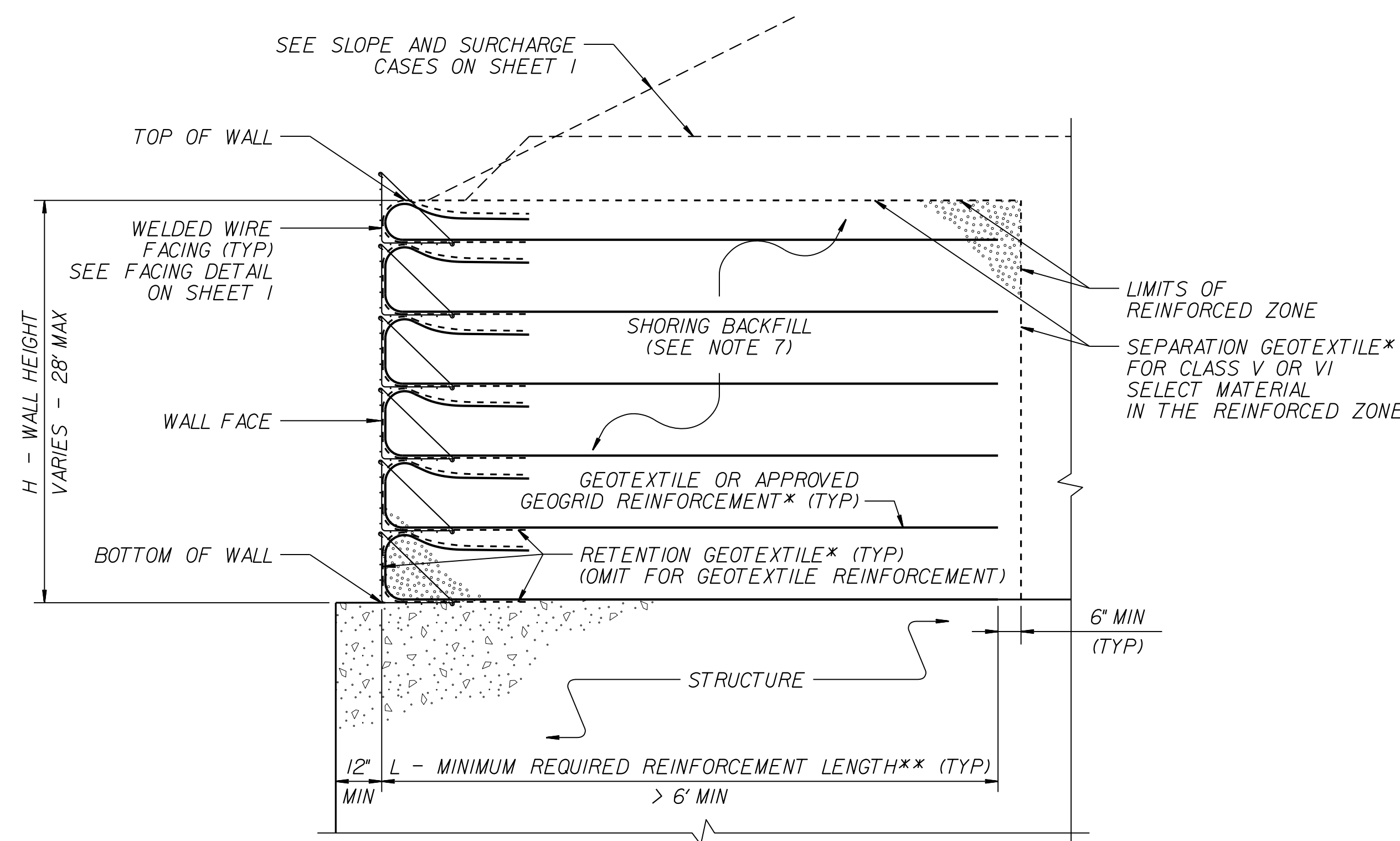
GEOTEXTILE PLACEMENT
(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)



GEOGRID PLACEMENT
(80% COVERAGE MIN FOR GEOGRID REINFORCEMENT - $\frac{W}{W+S} \times 100 \geq 80\%$, SEE NOTE 11)

GEOSYNTHETIC PLACEMENT DETAILS

(PLAN VIEW)
*SEE NOTE 12.



TEMPORARY WALL ON STRUCTURE DETAIL

*SEE GEOSYNTHETIC PLACEMENT DETAILS.
**SEE REINFORCEMENT TABLES ON SHEET 3.

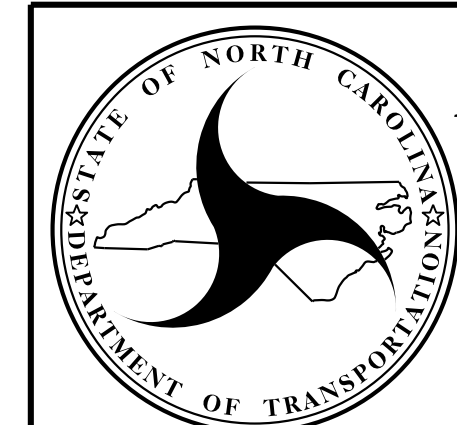
NOTES:

- AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY WALLS AS NOTED IN THE PLANS.
- FOR STANDARD TEMPORARY WALLS, SEE STANDARD SHORING PROVISION.
- STANDARD TEMPORARY WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
UNIT WEIGHT, $\gamma = 120$ LB/CF
FRICTION ANGLE, $\phi = 30$ DEGREES
COHESION, $c = 0$ LB/SF
- DO NOT USE STANDARD TEMPORARY WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
- DO NOT USE STANDARD TEMPORARY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW TEMPORARY WALLS.
- USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, ASSUME GROUNDWATER DEPTH IS LESS THAN 7' BELOW BOTTOM OF REINFORCED ZONE. DO NOT USE STANDARD TEMPORARY WALLS IF GROUNDWATER IS ABOVE BOTTOM OF REINFORCED ZONE.
- DO NOT USE A-2-4 SOIL FOR STANDARD TEMPORARY WALLS AROUND CULVERTS OR IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS FOR SLOPE CASES. DO NOT USE CLASS VI SELECT MATERIAL IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS WITH GEOTEXTILE REINFORCEMENT.
- EMBEDMENT IS NOT REQUIRED FOR STANDARD TEMPORARY WALLS ON STRUCTURES OR ROCK AS DETERMINED BY THE ENGINEER.
- DO NOT USE MORE THAN 4 DIFFERENT REINFORCEMENT STRENGTHS FOR EACH STANDARD TEMPORARY WALL.
- GEOGRIDS ARE TYPICALLY APPROVED FOR ULTIMATE TENSILE STRENGTHS IN THE MACHINE DIRECTION (MD) AND CROSS-MACHINE DIRECTION (CD) OR SHORT-TERM DESIGN STRENGTHS FOR A 3-YEAR DESIGN LIFE IN THE MD BASED ON MATERIAL TYPE. THE LIST OF APPROVED GEOGRIDS WITH DESIGN STRENGTHS IS AVAILABLE FROM: connect.ncdot.gov/resources/Materials/Pages/SoilsLaboratory.aspx DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SHORING BACKFILL AS FOLLOWS:

MATERIAL TYPE	SHORING BACKFILL
BORROW	A-2-4 SOIL
FINE AGGREGATE	CLASS II, TYPE I OR CLASS III SELECT MATERIAL
COARSE AGGREGATE	CLASS V OR VI SELECT MATERIAL

IF THE WEBSITE DOES NOT LIST A SHORT-TERM DESIGN STRENGTH FOR AN APPROVED GEOGRID, USE A SHORT-TERM DESIGN STRENGTH EQUAL TO THE ULTIMATE TENSILE STRENGTH DIVIDED BY 3.5 FOR THE GEOGRID REINFORCEMENT.

- FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
- AT THE CONTRACTOR'S OPTION, REINFORCEMENT MAY BE INSTALLED WITH THE MD PARALLEL TO THE WALL FACE IF BOTH OF THE FOLLOWING CONDITIONS OCCUR:
- W (REINFORCEMENT ROLL WIDTH) \geq (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND
- REINFORCEMENT STRENGTH IN CD \geq MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
- SUBMIT A "STANDARD TEMPORARY WALL SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY WALL CONSTRUCTION. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM: connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
- DO NOT PLACE SHORING BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
- FOR STANDARD TEMPORARY WALLS WITH PILE FOUNDATIONS IN THE REINFORCED ZONE, DRIVE PILES THROUGH REINFORCEMENT AFTER CONSTRUCTING TEMPORARY WALLS.
- DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
- CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
- FOR STANDARD TEMPORARY WALLS WITH INTERIOR ANGLES LESS THAN 90 DEGREES, WRAP GEOSYNTHETICS AT ACUTE CORNERS AS DIRECTED BY THE ENGINEER.
- FOR STANDARD TEMPORARY WALLS WITH TOP OF WALL WITHIN 5' OF FINISHED GRADE, REMOVE TOP FACING AND INCORPORATE TOP REINFORCEMENT LAYER INTO FILL WHEN PLACING FILL IN FRONT OF WALL.




NORTH CAROLINA
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GEOTECHNICAL
ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD
TEMPORARY WALL
SHEET 2 OF 3

PROJECT REFERENCE NO. B-4792	SHEET NO. 2G-4
GEOTECHNICAL ENGINEER  ENGINEER	ENGINEER
DocuSigned by: Scott A. Hidden 11/9/2015 F:\30458563\SCOTT.A.HIDDEN SIGNATURE DATE	SIGNATURE DATE

SLOPE OR SURCHARGE CASE	GROUNDWATER DEPTH BELOW BOTTOM OF REINFORCED ZONE (SEE NOTE 6 ON SHEET 2) (FT)	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)	H - WALL HEIGHT (FT)																									
			< 4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
SLOPE CASE	> 0	CLASS II, TYPE I, CLASS III, CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	8	9	11	12	13	13	14	15	16	17	18	19	20	21	22	23	24	24	25	26	27	27	
SURCHARGE CASE	> 0 TO 7 FOR H < 20' > 0 TO 10 FOR H ≥ 20'	ALL SHORING BACKFILL TYPES	6	7	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	17	17	18	19	19	20	21	22	
		A-2-4 SOIL	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16	17	18	18	19	20	20	21	
		CLASS II, TYPE I OR CLASS III SELECT MATERIAL	6	6	7	7	8	8	9	10	10	11	11	12	12	13	14	15	15	16	16	17	17	18	18	19	20	
	> 7 FOR H < 20' > 10 FOR H ≥ 20'	CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	7	7	8	8	9	9	10	10	11	12	13	13	14	14	15	15	16	17	17	18	19	19	

L - MINIMUM REQUIRED REINFORCEMENT LENGTH (FT)
(FOR ALL REINFORCEMENT TYPES)

WALL HEIGHT (H) + EMBEDMENT (FT)	NUMBER OF REINFORCEMENT LAYERS*
2.5 - 4	3
4 - 5.5	4
5.5 - 7	5
7 - 8.5	6
8.5 - 10	7
10 - 11.5	8
11.5 - 13	9
13 - 14.5	10
14.5 - 16	11
16 - 17.5	12
17.5 - 19	13
19 - 20.5	14
20.5 - 22	15
22 - 23.5	16
23.5 - 25	17
25 - 26.5	18
26.5 - 28	19
28 - 29.5	20

*BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 1.

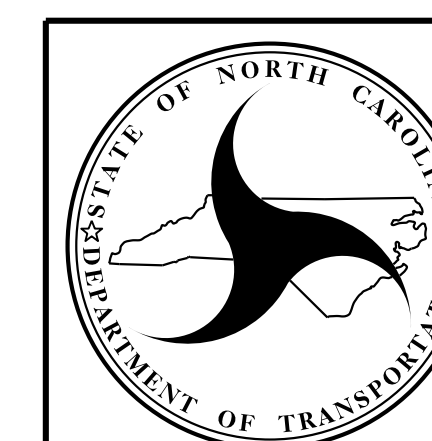
REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL	A-2-4 SOIL	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL
1	2400	2400	2400	2400	2400
2	2400	2400	2400	2400	2400
3	2400	2400	2400	2400	2400
4	2400	2400	2500	2400	2400
5	2500	2400	3000	2400	2400
6	3000	2400	3500	2800	2400
7	3500	2700	4000	3200	2600
8	4000	3100	4500	3600	2900
9	4500	3500	5000	4000	3200
10	5000	3900	5500	4400	3500
11	5500	4300	6000	4800	3800
12	6000	4700	6500	5200	4100
13	6500	5100	7000	5600	4400
14	7000	5400	7500	6000	4700
15	7500	5800	8000	6400	5000
16	8000	6200	8500	6800	5300
17	8500	6600	9000	7200	5600
18	9000	7000	9500	7600	5900
19	9500	7400	10000	8000	6200
20	10000	7800	10500	8400	6500

**GEOTEXTILE REINFORCEMENT
ULTIMATE TENSILE STRENGTH (LB/FT)**

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL	A-2-4 SOIL	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL
1	240	200	340	290	240
2	380	310	520	430	350
3	530	420	700	570	460
4	690	550	870	720	570
5	860	690	1050	860	680
6	1030	830	1220	1000	790
7	1200	970	1400	1150	900
8	1370	1110	1580	1290	1010
9	1550	1240	1750	1430	1120
10	1720	1380	1930	1580	1230
11	1890	1520	2100	1720	1340
12	2060	1660	2280	1860	1450
13	2240	1800	2450	2010	1560
14	2410	1940	2630	2150	1670
15	2580	2080	2800	2290	1780
16	2750	2220	2980	2440	1890
17	2930	2360	3160	2580	2000
18	3100	2500	3330	2720	2110
19	3270	2640	3510	2860	2220
20	3440	2780	3690	3000	2330

**GEOGRID REINFORCEMENT
SHORT-TERM DESIGN STRENGTH (LB/FT)**
(SEE NOTE 10 ON SHEET 2.)

MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD
(SEE NOTE 9 ON SHEET 2.)
*SEE PARTIAL ELEVATION ON SHEET 1 FOR REINFORCEMENT LAYER NUMBERING.



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**GEOTECHNICAL
ENGINEERING UNIT**

STANDARD DETAIL NO. 1801.02

STANDARD
TEMPORARY WALL
SHEET 3 OF 3

4-104-06

COMPUTED BY: J.H. PATEL DATE: 4-25-2014
CHECKED BY: T.A. HARRIS DATE: 4-25-2014

PROJECT REFERENCE NO. B-4792
SHEET NO. 3B-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUB-REGIONAL & REGIONAL
LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)

NOTE: Invert Elevations are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".

Main table with columns for STATION, LOCATION, STRUCTURE NO., TOP ELEVATION, INVERT ELEVATION, SLOPE CRITICAL, DRAINAGE PIPE, C.S. PIPE, R.C. PIPE (CLASS III), R.C. PIPE (CLASS IV), ENDWALLS, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES AND HOOD, CONCRETE TRANSITIONAL SECTION, CORR. STEEL ELBOWS NO. & SIZE, CONC. COLLARS CL. "B" C.Y. STD. 840.72, CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71, PIPE REMOVAL LIN.FT., and REMARKS.

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

TEMPORARY GUARDRAIL SUMMARY

Table for TEMPORARY GUARDRAIL SUMMARY with columns for SURVEY LINE, BEG. STA., END STA., LOCATION, LENGTH, WARRANT POINT, "N" DIST. FROM E.O.L., TOTAL SHOULDER WIDTH, FLARE LENGTH, W, ANCHORS, IMPACT ATTENUATOR TYPE 350, SINGLE FACED GUARDRAIL, REMOVE EXISTING GUARDRAIL, REMOVE AND STOCKPILE EXISTING GUARDRAIL, and REMARKS.

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY

Table for GUARDRAIL SUMMARY with columns for SURVEY LINE, BEG. STA., END STA., LOCATION, LENGTH, WARRANT POINT, "N" DIST. FROM E.O.L., TOTAL SHOULDER WIDTH, FLARE LENGTH, W, ANCHORS, IMPACT ATTENUATOR TYPE 350, SINGLE FACED GUARDRAIL, REMOVE EXISTING GUARDRAIL, REMOVE AND STOCKPILE EXISTING GUARDRAIL, and REMARKS.

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4/04/06

COMPUTED BY: J.H. PATEL DATE: 4-25-2014
 CHECKED BY: T.A. HARRIS DATE: 4-25-2014

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

PROJECT REFERENCE NO. B-4792
 SHEET NO. 3B-2

SUMMARY OF SUBSURFACE DRAINAGE

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	DRAIN TYPE* UD/BD/SD	LF
CONTINGENCY				SD	100
				TOTAL:	100

*UD = UNDERDRAIN
 *BD = BLIND DRAIN
 *SD = SUBSURFACE DRAIN

SUMMARY OF EARTHWORK

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
PHASE I					
-L LT- 9+99.74	-L LT- 12+80.00	4	1,410	1,406	
-L LT- 12+81.60	-L LT- 15+05.00	6	222	216	
PHASE 1 SUBTOTALS:		10	1,632	1,622	
PHASE II					
-L RT- 9+99.74	-L RT- 12+80.00	247	214		33
-L RT- 12+81.60	-L RT- 15+05.00	493	49		444
PHASE 2 SUBTOTALS:		740	263		477
PROJECT SUBTOTALS		750	1,895	1,622	477
LOSS DUE TO CLEAR. & GRUB.					
WASTE IN LIEU OF BORROW					
REPLACE TOPSOIL IN BORROW PIT				81	
GRAND TOTALS:		750		1,703	477
SAY:		750		1,710	

UNDERCUT EXCAVATION = 100 CU. YD.
 SHALLOW UNDERCUT = 100 CU. YD.
 SELECT GRANULAR MATERIAL = 100 CU. YD.

Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

Note: "Quantities are approximate only. The Resident Engineer will re-cross-section the work accurately when the project is staked out. These cross-section notes will be used in computing the final quantities for which the contractor will be paid."

Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Shoulder Borrow, Fine Grading, Clearing and Grubbing, Breaking of Existing Pavement, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	SQ. YD.
PHASE I				
-L-	10+56.00	12+22.00	LT	85.66
-L-	13+32.00	14+50.00	LT	86.55
PHASE II				
-L-	10+00.00	12+61.00	RT	363.84
-L-	12+89.00	14+50.00	RT	233.67
TOTAL:				769.73
SAY:				770

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
-L-	10+56.00	13+25.00	257.00
TOTAL:			257.00
SAY:			260

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

SURVEY LINE	STATION	STATION	Aggregate Type ASU/AST	Aggregate Thickness INCHES	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU		100	190	150		
				TOTAL:	100	190	150		

*ASU = AGGREGATE SUBGRADE
 *AST = AGGREGATE STABILIZATION

SUMMARY OF VARIABLE 0" TO 2.5" MILLING

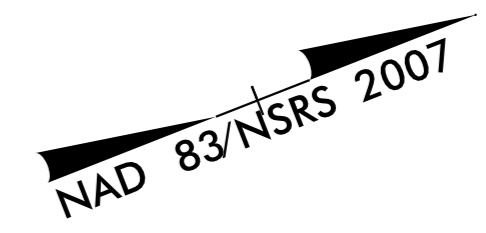
SURVEY LINE	STATION	STATION	LOCATION	SQ. YD.
-L-	9+99.74	10+56.00	CL	109.13
-L-	14+50.00	15+05.00	CL	117.83
TOTAL:				226.95
SAY:				230

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PROJECT REFERENCE NO. B-4792	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER SEAL 033296 Sharon D. Kendall 4/4/2016	HYDRAULICS ENGINEER SEAL 022100 Sharon R. Morlock 4/4/2016

BEGIN TIP PROJECT No. B-4792
-L- PC Sta. 9+99.74

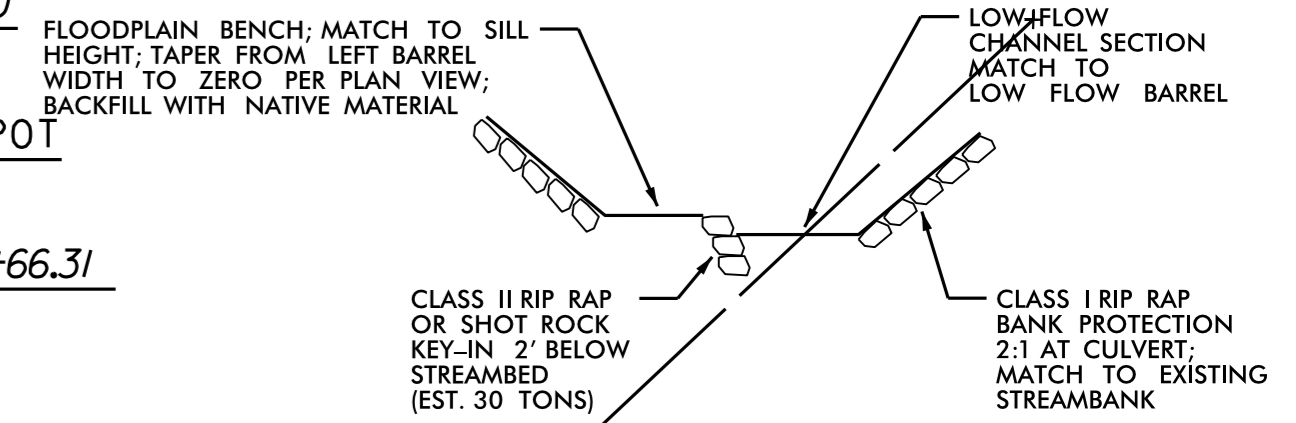
END PROJECT B-4792
-L- Sta. 15+05.00



PARCEL 3 NOTE: THE PROPERTY AREA LOCATED ON THE NORTHWEST SIDE OF SR 102 IS PROTECTED BY MEANS OF A CONSERVATION EASEMENT HELD BY THE N.C. CLEAN WATER MANAGEMENT TRUST FUND (CWMTF) AS FOUND RECORDED IN D.B. 262 - PG. 792, TRACT 2.

PI Sta	PI Sta	PI Sta
11+26.68	14+26.66	15+35.35
$\Delta = 82' 47" 44" (LT)$	$\Delta = 17' 08" 30" (RT)$	$\Delta = 17' 53" 02.3" (LT)$
$D = 39' 47" 19.4"$	$D = 26' 38" 57.1"$	$D = 28' 38" 52.4"$
$L = 208.09'$	$L = 64.32'$	$L = 62.43'$
$T = 126.94'$	$T = 32.40'$	$T = 31.47'$
$R = 144.00'$	$R = 215.00'$	$R = 200.00'$

FLOODPLAIN BENCHING DETAIL
UPSTREAM AND DOWNSTREAM OF CULVERT
LOOKING DOWNSTREAM



SEE SHEETS 4-A AND 4-B FOR CULVERT PHASING DESIGNS
SEE SHEETS C-1 THRU C-13 FOR CULVERT STRUCTURE PLANS

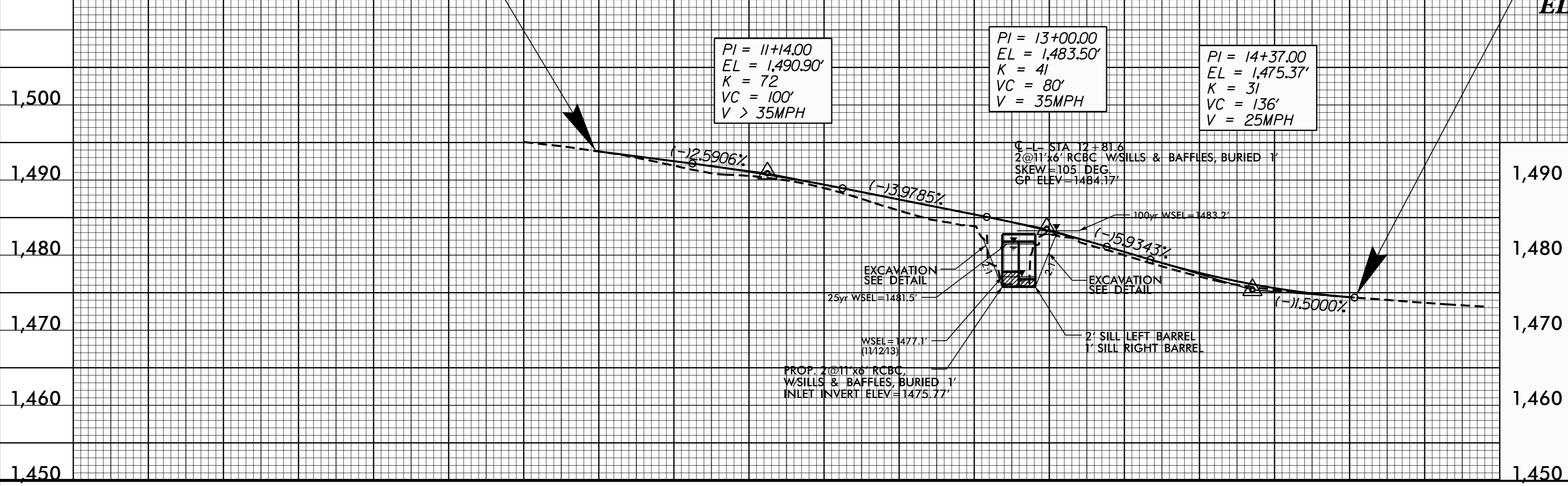
-L- (SR 1102 PEARSON FALLS RD.)

CULVERT HYDRAULIC DATA

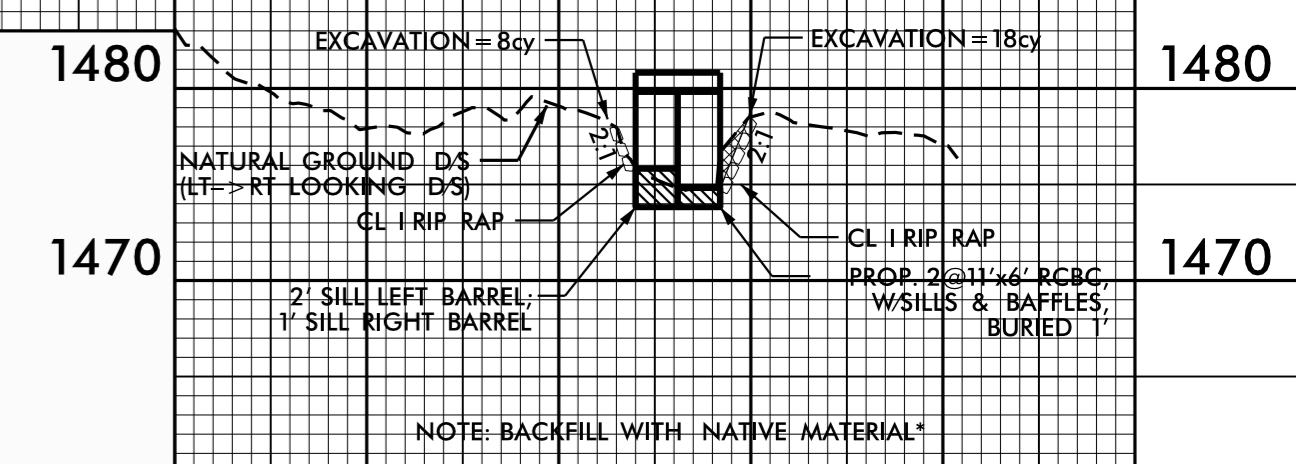
DESIGN DISCHARGE	= 650	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 1,481.5	FT
BASE DISCHARGE	= 950	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 1,483.2	FT
OVERTOPPING DISCHARGE	= 900	CFS
OVERTOPPING FREQUENCY	= 50+	YRS
OVERTOPPING ELEVATION	= 1,483+/-	FT

BEGIN GRADE
-L- PC STA. 9+99.74
ELEV. = 1,493.86'

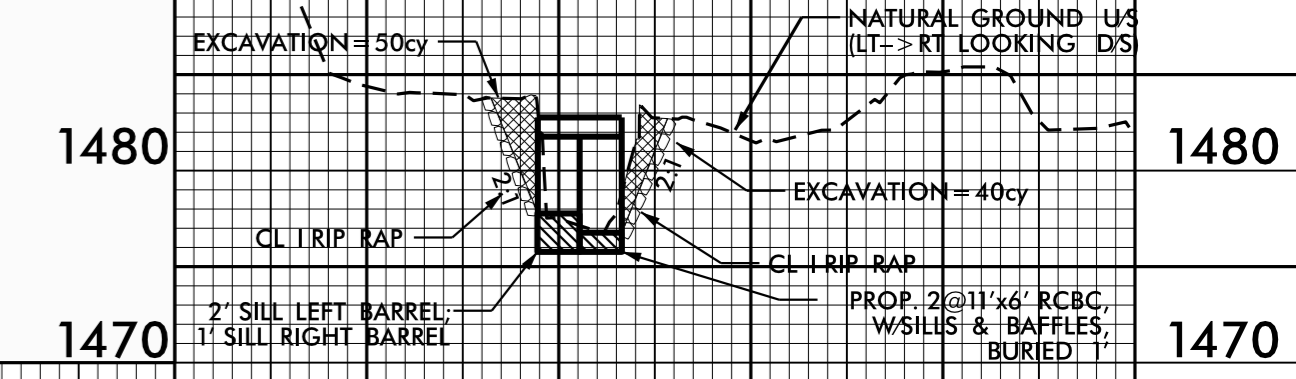
END GRADE
-L- STA. 15+05.00
ELEV. = 1,474.35'



CULVERT OUTLET TYPICAL CHANNEL SECTION DOWNSTREAM



CULVERT INLET TYPICAL CHANNEL SECTION UPSTREAM



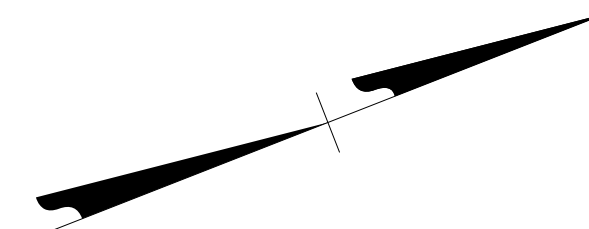
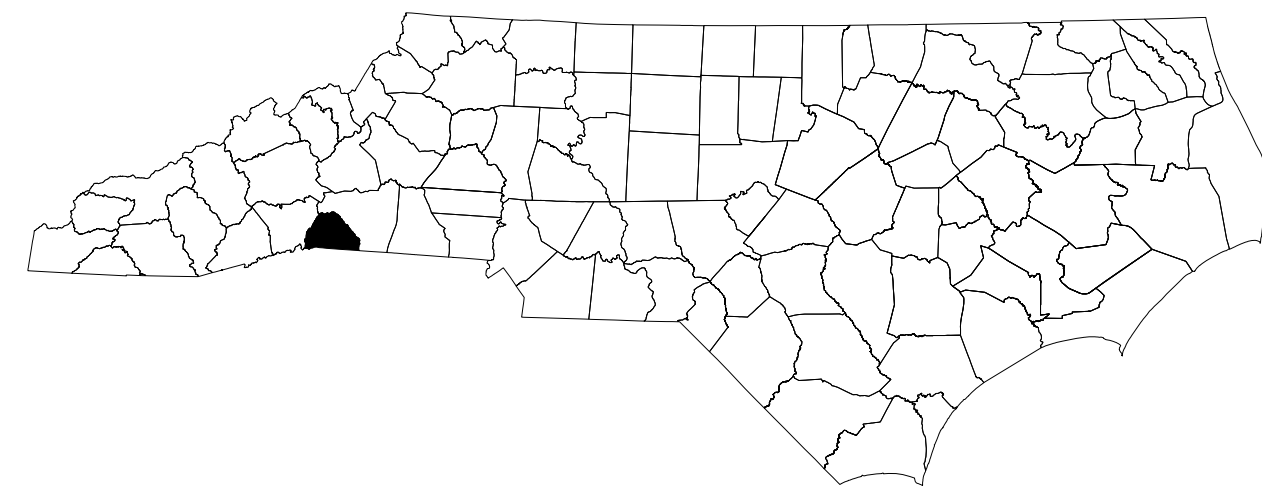
* NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

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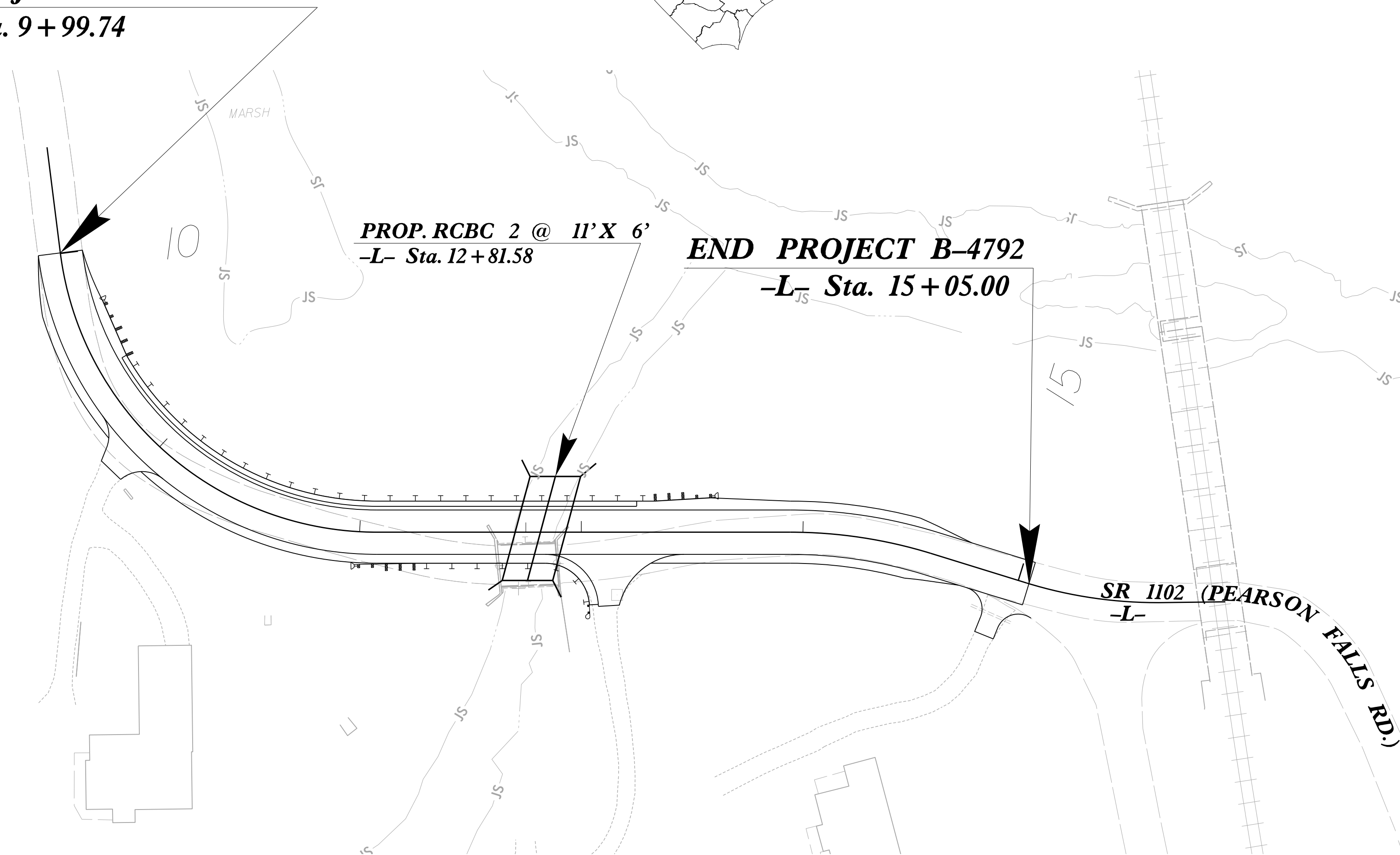
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

POLK COUNTY



BEGIN PROJECT No. B-4792
-L- PC Sta. 9+99.74



PROP. RCBC 2 @ 11' X 6'
-L- Sta. 12+81.58

END PROJECT B-4792
-L- Sta. 15+05.00

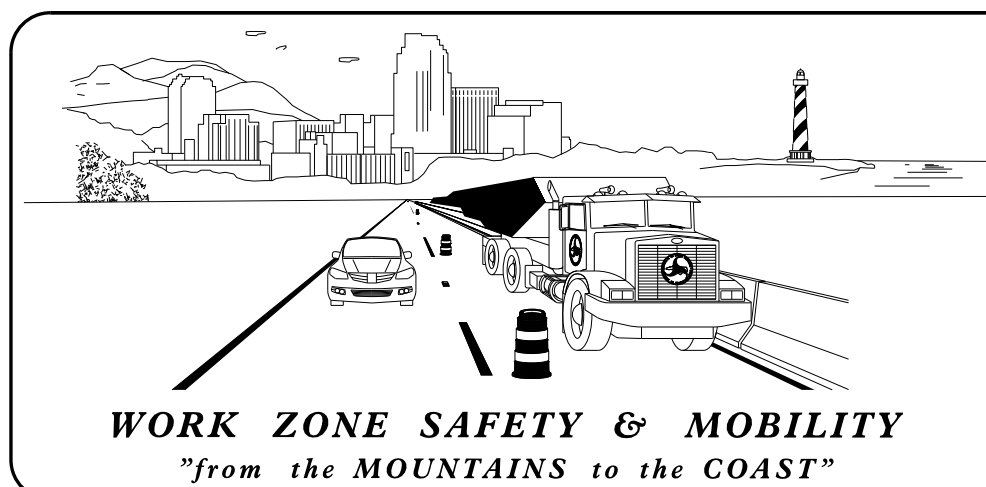
LOCATION: REPLACEMENT OF BRIDGE NO. 4 OVER FORK CREEK
(A SMALL BRANCH OF PACOLET RIVER) ON SR 1102.

SHEET NO.	TITLE
TMP-1	TITLE SHEET AND INDEX OF SHEETS
TMP-2	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, LEGEND AND MANAGEMENT STRATEGIES
TMP-3	GENERAL NOTES
TMP-4	PHASING
TMP-5	TEMPORARY SHORING NOTES
TMP-6	TEMPORARY TRAFFIC CONTROL DETAIL- PHASE 1
TMP-7	TEMPORARY TRAFFIC CONTROL DETAIL- PHASE 2
TMP-8	SPECIAL PROVISION
TMP-9	PORTABLE CONCRETE BARRIER AT TEMPORARY SHORING DETAIL

SHEET NO.
TMP-1

TIP PROJECT: B-4792

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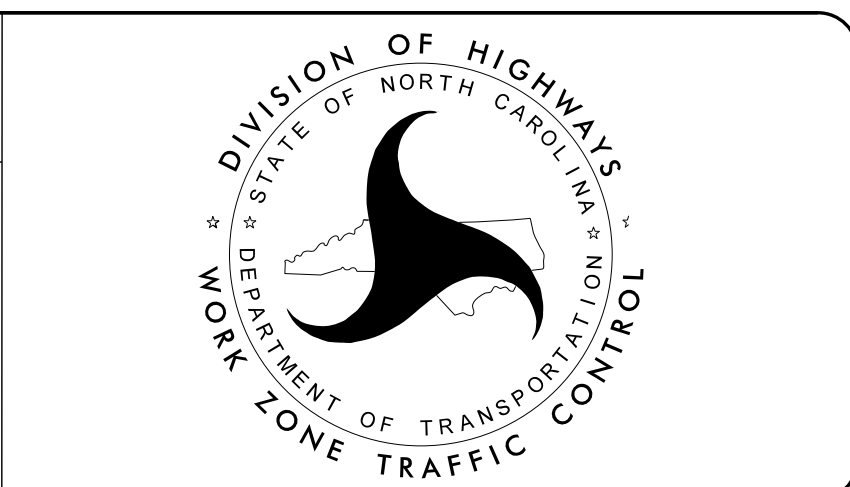
N.C.D.O.T. WORK ZONE TRAFFIC CONTROL
1561 MAIL SERVICE CENTER (MSC) RALEIGH, NC 27699-1561
750 N. GREENFIELD PARKWAY, GARNER, NC 27529 (DELIVERY)
PHONE: (919) 773-2800 FAX: (919) 771-2745

STATE TRAFFIC MANAGEMENT ENGINEER

TRAFFIC CONTROL PROJECT ENGINEER

TRAFFIC CONTROL PROJECT DESIGN ENGINEER

TRAFFIC CONTROL DESIGN ENGINEER



APPROVED: _____
DATE: _____

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1160.01	TEMPORARY CRASH CUSHION
1165.01	WORK VEHICLE LIGHTING SYSTEMS AND TMA DELINEATION
1170.01	PORTABLE CONCRETE BARRIER
1180.01	SKINNY - DRUM
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO LANE AND MULTILANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - (PERMANENT AND TEMPORARY)
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

MANAGEMENT STRATEGIES

CONSTRUCTION

REMOVE AND REPLACE EXISTING STRUCTURE AND APPROACHES ALONG THE EXISTING ROADWAY ALIGNMENT AS SHOWN IN THE CONSTRUCTION PLANS.

TMP DESIGN PARAMETERS

DURING THE STAGED CONSTRUCTION, SR 1102 TRAFFIC WILL BE PLACED IN A ONE-LANE TWO-WAY PATTERN ON THE EXISTING ROADWAY USING A PORTABLE TRAFFIC SIGNAL SYSTEM.

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- TEMPORARY SHORING

WORK AREA

REMOVAL

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- TUBULAR MARKER
- DRUM
- SKINNY DRUM
- TEMPORARY CRASH CUSHION
- FLASHING ARROW PANEL (TYPE C)
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED IMPACT ATTENUATOR (TMIA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY PAVEMENT MARKING

24" WHITE STOP BAR

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

SIGNALS

- EXISTING
- PROPOSED
- TEMPORARY

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

PAVEMENT MARKERS

- CRYSTAL/CRYSTAL
- CRYSTAL/RED
- YELLOW/YELLOW

PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

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	APPROVED: _____ DATE: _____			LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, LEGEND AND MANAGEMENT STRATEGIES

GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRE OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

LANE AND SHOULDER CLOSURE REQUIREMENTS

- A) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.
- B) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.01 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.
- C) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO A DIVIDED FACILITY AND WITHIN 10 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

- D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.
- E) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.

PAVEMENT EDGE DROP OFF REQUIREMENTS

- F) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:

BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.

- G) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) 100 FT IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

- H) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

- I) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
- J) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.
- K) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 100 FT IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC BARRIER

- L) INSTALL TEMPORARY BARRIER ACCORDING TO THE TRANSPORTATION MANAGEMENT PLANS A MAXIMUM OF TWO (2) WEEKS PRIOR TO BEGINNING WORK IN ANY LOCATION. ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION PROCEED IN A CONTINUOUS MANNER TO COMPLETE THE PROPOSED WORK IN THAT LOCATION UNLESS OTHERWISE STATED IN THE TRANSPORTATION MANAGEMENT PLANS OR AS DIRECTED BY THE ENGINEER.

DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE.

ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION AND NO WORK IS PERFORMED BEHIND THE TEMPORARY BARRIER FOR A PERIOD LONGER THAN TWO (2) MONTHS, REMOVE /RESET TEMPORARY BARRIER AT NO COST TO THE DEPARTMENT UNLESS OTHERWISE STATED IN THE TRANSPORTATION MANAGEMENT PLANS, TEMPORARY BARRIER IS PROTECTING A HAZARD, OR AS DIRECTED BY THE ENGINEER.

INSTALL TEMPORARY BARRIER WITH THE TRAFFIC FLOW BEGINNING WITH THE UPSTREAM SIDE OF TRAFFIC. REMOVE TEMPORARY BARRIER AGAINST THE TRAFFIC FLOW BEGINNING WITH THE DOWNSTREAM SIDE OF TRAFFIC.

INSTALL AND SPACE DRUMS NO GREATER THAN TWICE THE POSTED SPEED LIMIT (MPH) TO CLOSE OR KEEP THE SECTION OF THE ROADWAY CLOSED UNTIL THE TEMPORARY BARRIER CAN BE PLACED OR AFTER THE TEMPORARY BARRIER IS REMOVED.

- M) PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER AT ALL TIMES DURING THE INSTALLATION AND REMOVAL OF THE BARRIER BY EITHER A TRUCK MOUNTED ATTENUATOR (MAXIMUM 72 HOURS) OR A TEMPORARY CRASH CUSHION.


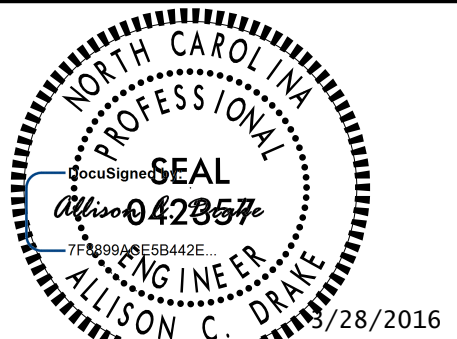

PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER FROM ONCOMING TRAFFIC AT ALL TIMES BY A TEMPORARY CRASH CUSHION UNLESS THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER IS OFFSET FROM ONCOMING TRAFFIC AS FOLLOWS OR AS SHOWN IN THE PLANS: (SEE ALSO 1101.05)

POSTED SPED LIMIT	MINIMUM OFFSET
40 OR LESS	15 FT
45 - 50	20 FT
55	25 FT
60 MPH OR HIGHER	30 FT

TRAFFIC CONTROL DEVICES

- N) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES), AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.
- O) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

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	APPROVED: _____ DATE: _____			GENERAL NOTES
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PHASING


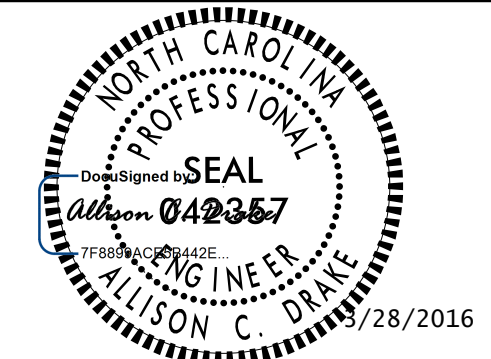

PHASE I

- STEP 1: PRIOR TO CONSTRUCTION, INSTALL WORK ZONE ADVANCE WARNING SIGNS ALONG SR 1102 (PEARSON FALLS RD.), AS SHOWN ON ROADWAY STANDARD DRAWING NO. 1101.01, SHEET 3 OF 3.
- STEP 2: AWAY FROM TRAFFIC, USE FLAGGER OPERATIONS TO COMPLETE THE FOLLOWING AS SHOWN ON ROADWAY STANDARD DRAWING NO. 1101.02, SHEET 14 OF 15 AND SHEET TMP-6:
 - INSTALL PORTABLE CONCRETE BARRIER AND TEMPORARY CRASH CUSHIONS IN THE LOCATIONS SHOWN ON PHASE I DETAIL, SHEET TMP-6.
 - INSTALL THE PORTABLE TRAFFIC SIGNAL SYSTEM, DRUMS, TEMPORARY PAINT STOP BARS, AND STATIONARY CONSTRUCTION ZONE SIGNING SHOWN ON PHASE I DETAIL, SHEET TMP-6.
- STEP 3: AWAY FROM TRAFFIC, ACTIVATE THE PORTABLE TRAFFIC SIGNAL SYSTEM AND SHIFT TRAFFIC INTO A ONE-LANE, TWO-WAY PATTERN. INSTALL TEMPORARY SHORING AND TEMPORARY FABRIC WALL BEHIND THE PORTABLE CONCRETE BARRIER IN LOCATIONS SHOWN ON PHASE I DETAIL, SHEET TMP-6.
- STEP 4: AWAY FROM TRAFFIC, CONSTRUCT -L- AND STAGE 1 OF THE PROPOSED CULVERT AND ROADWAY APPROACHES IN THE LOCATIONS SHOWN ON THE PHASE I DETAIL, SHEET TMP-6 UP TO, BUT NOT INCLUDING, THE FINAL LAYER OF SURFACE COURSE. INSTALL PERMANENT GUARDRAIL ALONG THE LEFT SIDE OF -L- AS SHOWN ON THE PHASE I DETAIL, SHEET TMP-6.
- STEP 5: AWAY FROM TRAFFIC, INSTALL TEMPORARY GUARDRAIL ALONG -L- AS SHOWN ON THE PHASE II DETAIL, SHEET TMP-7. REMOVE PORTABLE CONCRETE BARRIER AND TEMPORARY CRASH CUSHIONS.

PHASE II

- STEP 1: AWAY FROM TRAFFIC, COMPLETE THE FOLLOWING AS SHOWN ON ROADWAY STANDARD DRAWING NO. 1101.02, SHEET 14 OF 15 AND SHEET TMP-7:
 - RESET DRUMS IN THE LOCATIONS SHOWN ON PHASE II DETAIL, SHEET TMP-7.
 - SHIFT -L- TRAFFIC ONTO THE NEWLY CONSTRUCTED SECTION OF THE PROPOSED ROADWAY AND CULVERT INTO A ONE-LANE, TWO-WAY PATTERN.
- STEP 2: UTILIZING THE PORTABLE TRAFFIC SIGNAL SYSTEM, REMOVE THE EXISTING BRIDGE, AND CONSTRUCT THE REMAINDER OF THE PROPOSED CULVERT AND ROADWAY APPROACHES BEHIND THE DRUMS AND TEMPORARY GUARDRAIL.
- STEP 3: AWAY FROM TRAFFIC, PLACE THE FINAL LAYER OF SURFACE COURSE AND FINAL PAVEMENT MARKINGS, USING FLAGGER OPERATIONS AS NEEDED. UPON COMPLETION OF PROPOSED CULVERT AND ROADWAY APPROACHES, REMOVE ALL TRAFFIC CONTROL DEVICES, OBLITERATE ANY CONFLICTING PAVEMENT MARKINGS, AND OPEN SR 1102 TO FINAL TRAFFIC PATTERN.

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TEMPORARY SHORING NOTES

October 16, 2015
38562.1.1 (B-4792)
Page 2

Shoring Location No. 1

FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

DESIGN TEMPORARY SHORING FROM STATION 12+29.00 -L- +/-, .5 FT. RT., TO STATION 12+63.00 -L- +/-, 3.8 FT RT., FOR THE FOLLOWING ASSUMED SOIL PARAMETERS AND GROUNDWATER ELEVATION:

- UNIT WEIGHT (γ) = 120 LB/CF
- FRICTION ANGLE (ϕ) = 30 DEGREES
- COHESION (c) = 0 LB/SF
- GROUNDWATER ELEVATION = 1477 FT

LIMITED SUBSURFACE INFORMATION IS AVAILABLE IN THE VICINITY OF TEMPORARY SHORING FROM STATION 12+29.00 -L- +/-, .5 FT. RT., TO STATION 12+63.00 -L- +/-, 3.8 FT RT. THE INFORMATION PROVIDED FOR TEMPORARY SHORING DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION.

DRIVEN PILING FOR TEMPORARY SHORING FROM STATION 12+29.00 -L- +/-, .5 FT. RT., TO STATION 12+63.00 -L- +/-, 3.8 FT MAY NOT PENETRATE BELOW ELEVATION 1465 FT DUE TO OBSTRUCTIONS, VERY DENSE OR HARD SOIL, BOULDERS OR WEATHERED OR HARD ROCK.

AT THE CONTRACTOR'S OPTION, USE STANDARD SHORING FOR TEMPORARY SHORING STATION 12+29.00 -L- +/-, .5 FT. RT., TO STATION 12+63.00 -L- +/-, 3.8 FT. SEE STANDARD DETAIL NO. 1801.01 FOR STANDARD TEMPORARY SHORING AND 1801.02 FOR STANDARD TEMPORARY WALLS.

Shoring Location No. 2

FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

DESIGN TEMPORARY SHORING FROM STATION 12+87.00 -L- +/-, 3.4 FT. RT., TO STATION 13+19.00 -L- +/-, .5 FT RT., FOR THE FOLLOWING ASSUMED SOIL PARAMETERS AND GROUNDWATER ELEVATION:

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Page 3

- UNIT WEIGHT (γ) = 120 LB/CF
- FRICTION ANGLE (ϕ) = 30 DEGREES
- COHESION (c) = 0 LB/SF
- GROUNDWATER ELEVATION = 1477 FT

LIMITED SUBSURFACE INFORMATION IS AVAILABLE IN THE VICINITY OF TEMPORARY SHORING FROM STATION 12+87.00 -L- +/-, 3.4 FT. RT., TO STATION 13+19.00 -L- +/-, .5 FT RT. THE INFORMATION PROVIDED FOR TEMPORARY SHORING DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION.

AT THE CONTRACTOR'S OPTION, USE STANDARD SHORING FOR TEMPORARY SHORING STATION 12+87.00 -L- +/-, 3.4 FT. RT., TO STATION 13+19.00 -L- +/-, .5 FT RT. SEE STANDARD DETAIL NO. 1801.01 FOR STANDARD TEMPORARY SHORING AND 1801.02 FOR STANDARD TEMPORARY WALLS.

Shoring Location No. 3

FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.



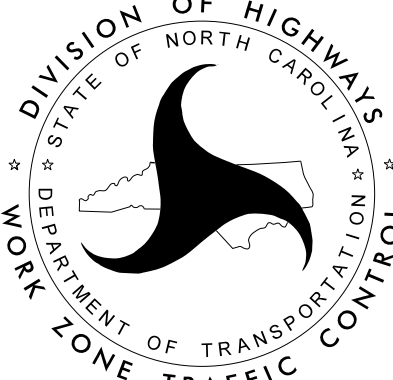
DESIGN TEMPORARY SHORING FROM STATION 12+61.00 -L- +/-, .5 FT RT, TO STATION 12+89.00 -L- +/-, .5 FT RT., FOR THE FOLLOWING ASSUMED SOIL PARAMETERS AND GROUNDWATER ELEVATION:

- UNIT WEIGHT (γ) = 120 LB/CF
- FRICTION ANGLE (ϕ) = 30 DEGREES
- COHESION (c) = 0 LB/SF
- GROUNDWATER ELEVATION = 1477 FT

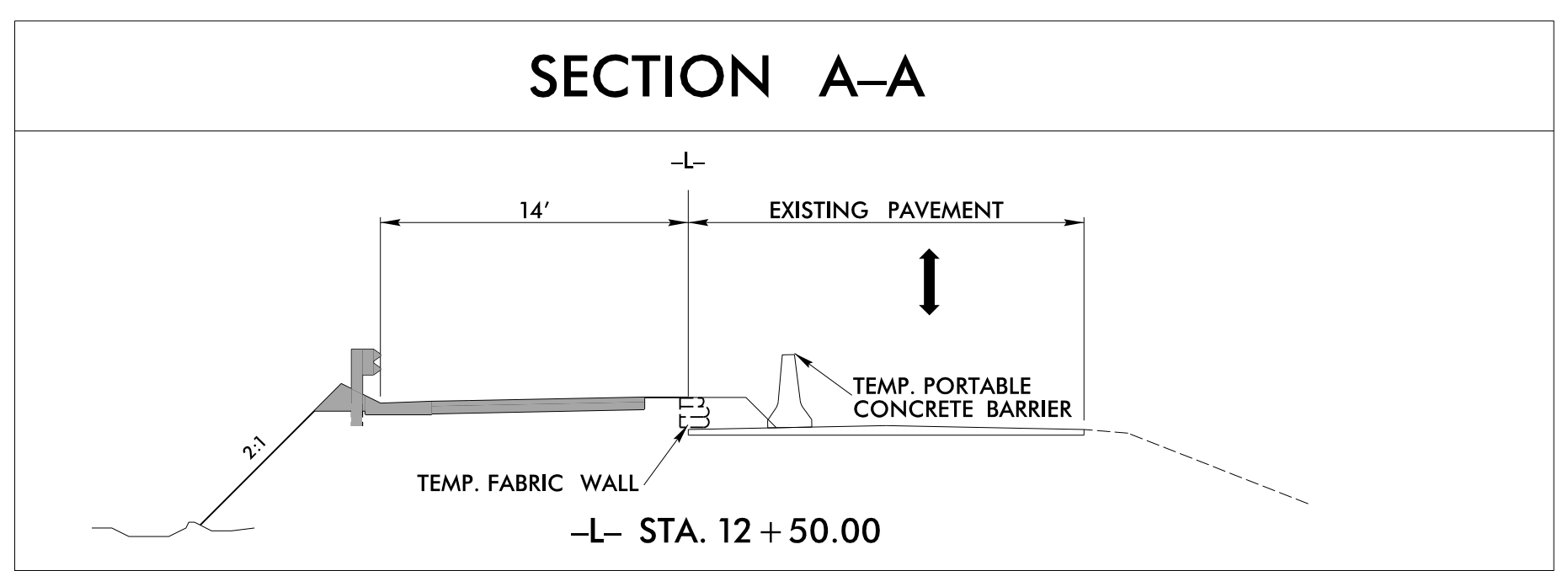
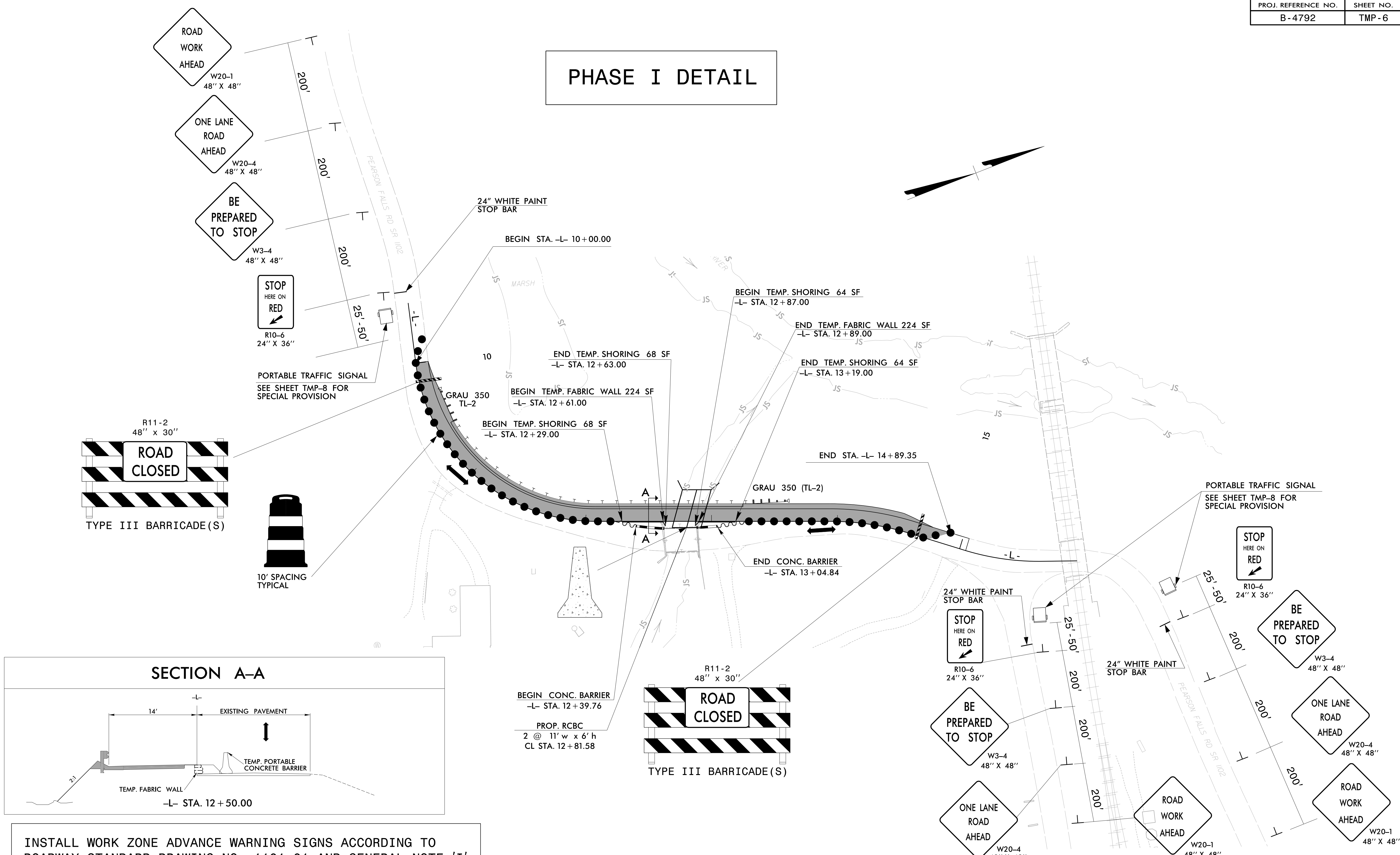
LIMITED SUBSURFACE INFORMATION IS AVAILABLE IN THE VICINITY OF TEMPORARY SHORING FROM STATION 12+61.00 -L- +/-, .5 FT RT, TO STATION 12+89.00 -L- +/-, .5 FT RT. THE INFORMATION PROVIDED FOR TEMPORARY SHORING DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION.

AT THE CONTRACTOR'S OPTION, USE STANDARD SHORING FOR TEMPORARY SHORING STATION 12+61.00 -L- +/-, .5 FT RT, TO STATION 12+89.00 -L- +/-, .5 FT RT. SEE STANDARD DETAIL NO. 1801.02 FOR STANDARD TEMPORARY WALLS.

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	APPROVED: _____ DATE: _____ 		TEMPORARY SHORING
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PHASE I DETAIL

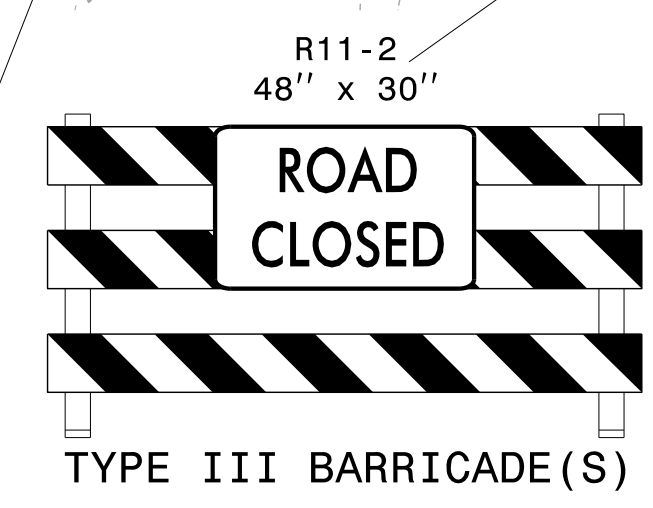
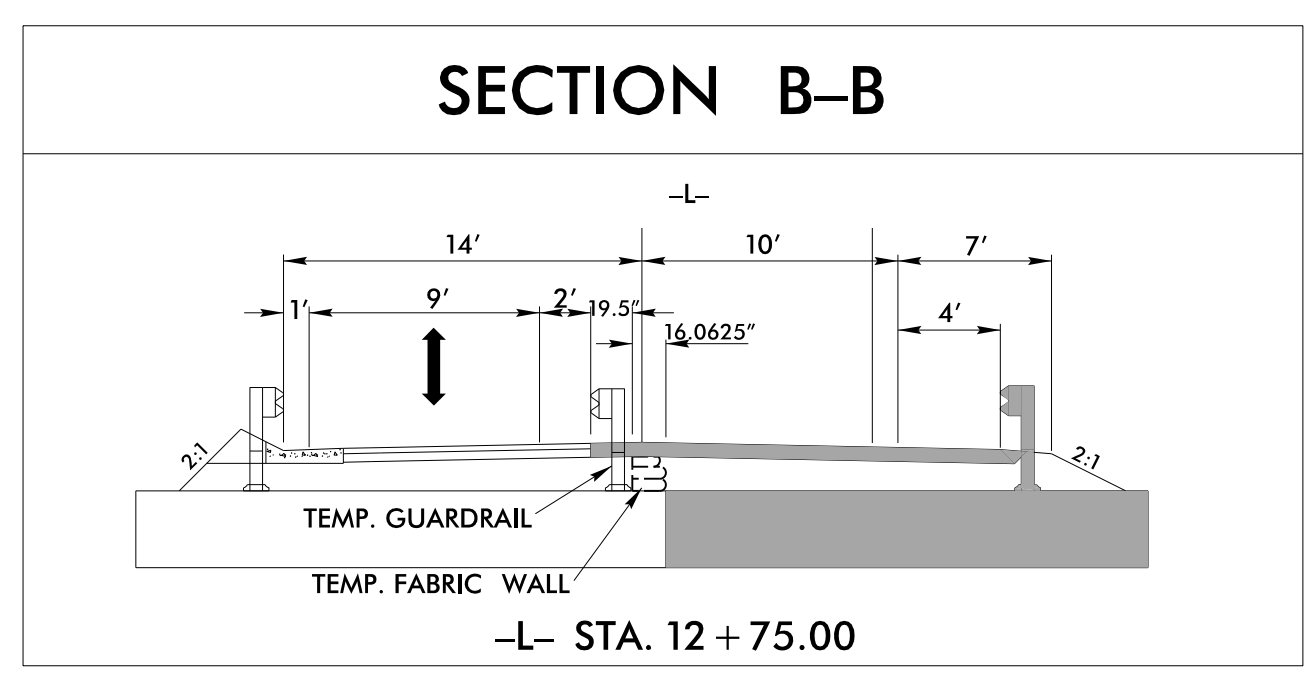
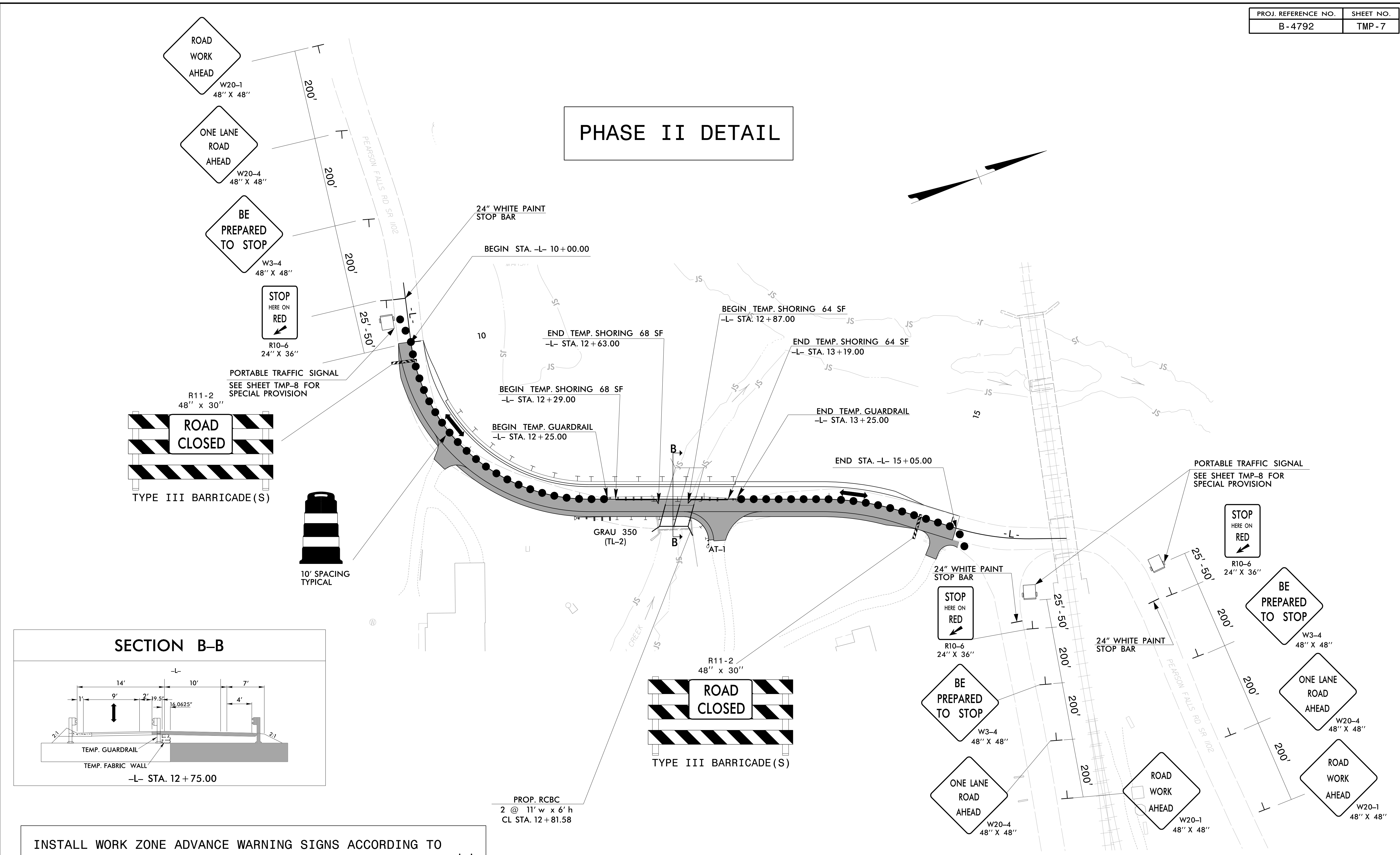


INSTALL WORK ZONE ADVANCE WARNING SIGNS ACCORDING TO ROADWAY STANDARD DRAWING NO. 1101.01 AND GENERAL NOTE 'I'. UTILIZE ROADWAY STANDARD DRAWING NO. 1101.02, SHEET 14 OF 15 FOR OPERATIONS REQUIRING A TEMPORARY LANE CLOSURE AS IDENTIFIED IN GENERAL NOTES 'C' AND 'D'. SEE ROADWAY DESIGN PLANS FOR MOT TYPICAL SECTIONS. USE ANCHORED PORTABLE CONCRETE BARRIER ACROSS EXISTING BRIDGE AND PROPOSED CULVERT AND WITHIN 20' OF THE APPROACHES TO BOTH.

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	APPROVED: _____ DATE: _____			TEMPORARY TRAFFIC CONTROL DETAIL
	<p>3/28/2016</p>			

PHASE II DETAIL



INSTALL WORK ZONE ADVANCE WARNING SIGNS ACCORDING TO ROADWAY STANDARD DRAWING NO. 1101.01 AND GENERAL NOTE 'I'. UTILIZE ROADWAY STANDARD DRAWING NO. 1101.02, SHEET 14 OF 15 FOR OPERATIONS REQUIRING A TEMPORARY LANE CLOSURE AS IDENTIFIED IN GENERAL NOTES 'C' AND 'D'. SEE ROADWAY DESIGN PLANS FOR NOT TYPICAL SECTIONS. BOLT TEMPORARY GUARDRAIL TO PROPOSED CULVERT IN AREA OF EXISTING BRIDGE AND WITHIN 20' OF THE APPROACHES.

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	<p>3/28/2016</p>			

**PORTABLE TRAFFIC SIGNAL SYSTEM
SPECIAL PROVISION**

TIP Number **TS-102** *County* **County**

16. PORTABLE TRAFFIC SIGNAL SYSTEM

16.1. DESCRIPTION

Furnish, install, place in operation, repair, maintain, relocate, and remove portable traffic signal systems. Comply with the provisions of Section 1700 of the 2012 *Standard Specifications for Roads and Structures*.

16.2. MATERIALS

Furnish material, equipment, and hardware under this section that is pre-approved on the ITS and Signals QPL.

Provide a complete portable traffic signal system that is totally mobile and capable of being relocated as traffic conditions demand. Design the system for operation both with and without an external power source. Furnish two signal control trailers with two vehicle signal heads per trailer and one operator unit for each portable traffic signal system. Furnish transmitters, generators, batteries, controls, back-up systems and all other components necessary to operate the system.

Ensure each system meets the physical display and operational requirements of conventional traffic signals as specified in PART IV of the *Manual on Uniform Traffic Control Devices (MUTCD)* and the *North Carolina Supplement to the MUTCD* in effect on the date of advertisement.

Used equipment will be acceptable if the equipment is in good working condition. Contractor retains ownership of the portable traffic signal systems.

Provide yellow 12-inch aluminum or polycarbonate vehicle signal heads with 10-inch tunnel visors, backplates and Light Emitting Diode (LED) modules. Provide aluminum signal heads and backplates listed on the Department's Qualified Products List (QPL) for traffic signal equipment. Provide polycarbonate signal heads and visors that comply with the provisions pertaining to Signal Heads within these *Project Special Provisions* with the following exceptions:

Fabricate signal head housings, end caps, and visors from virgin polycarbonate material. Provide U.V. stabilized polycarbonate plastic with a minimum thickness of 0.1 ± 0.01 inches that is highway yellow (Federal Standard 595C, Color Chip 13538). Ensure the color is incorporated into the plastic material before molding the signal head housings and end caps. Ensure the plastic formulation provides the following physical properties in the assembly (tests may be performed on separately molded specimens):

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TIP Number **TS-103** *County* **County**

Test	Required	Method
Specific Gravity	1.17 minimum	ASTM D 792
Vicat Softening Temperature, °F	305-325	ASTM D 1525
Brittleness Temperature, °F	Below -200	ASTM D 746
Flammability	Self-extinguishing	ASTM D 635
Tensile Strength, yield, PSI	8500 minimum	ASTM D 638
Elongation at yield, %	5.5-8.5	ASTM D 638
Shear, strength, yield, PSI	5500 minimum	ASTM D 732
Izod impact strength, ft-lb/in [notched, 1/8 inch]	15 minimum	ASTM D 256
Fatigue strength, PSI at 2.5 mm cycles	950 minimum	ASTM D 671

To minimize signal head movement due to wind, mount top and bottom of signal heads to the signal head supports.

Provide 120V AC powered LED modules listed on the QPL, or provide 12V DC powered LED modules that meet the *ITE VTCSH Part 2: Light Emitting Diode (LED) Vehicle Signal Modules (Interim Purchase Specification)* with the exception of paragraphs 5.2, 5.3, 5.7, and testing associated with 120V AC. Ensure DC powered LED modules operate with input power between 9V DC and 15V DC.

Provide trailers that have durable paint in highway orange, Federal Standard 595C Color Chip ID # 12473 with a minimum paint thickness of 2.5 mils.

Provide trailers with a 12-volt trailer lighting system complying with *Federal Motor Carrier Safety Regulations 393*, safety chains, and a 2-inch ball hitch. When provided, locate generators, fuel tanks, batteries and electronic controls in protective housings that are provided with locks to restrict access.

Design the trailer assembly and signal supports to withstand an 80 MPH wind load with the signal supports raised in the operating position. Provide independent certification from a registered Professional Engineer that the assembly meets this 80 MPH wind load requirement. Provide a reliable hydraulic, electric or manual means for raising and lowering the signal support members. Provide screw-type stabilizing and leveling devices with a self-leveling foot to support the unit in the operating position on slopes 1V:3H or flatter when detached from the transporting vehicle.

During manual operation, ensure the system provides a means of informing the operator of signal indications, such as a light on the back of each signal head that illuminates when the signal displays a red indication.

Design the portable traffic signal system to perform without interruption during the time it is in operation.

Where a traffic actuated system is required, provide a system control unit that is capable of pre-timed operation, traffic actuated operation, a variable green time interval dependent upon vehicle actuations, and programmable yellow clearance and red clearance intervals. Furnish all sensors to

Version 12.4 103 print date: 10/23/15

TIP Number **TS-104** *County* **County**

monitor vehicle demands for vehicle actuation per the Project Special Provisions and Section 1098 of the Standard Specifications.

Design the systems to be fail-safe. Ensure the system monitors the following conditions: lack of green, yellow, and red signal indication voltage, total loss of indication on any approach, presence of multiple signal indications on any approach, conflicting green/yellow signal indications, and low power condition. In the event any of these conditions are detected, immediately begin flashing operation of red indications in all directions.

Provide either hard-wired, microwave, or radio controlled type communications for pre-timed and traffic actuated portable traffic signal systems. In the event a loss of communication is detected, immediately begin flashing operation of red indications in all directions.

Ensure systems that use wireless communication links continuously monitor and verify proper transmission and reception of data used to monitor and control each signal head. Ensure ambient mobile or other radio transmissions or adverse weather conditions do not affect the system. Encode signal transmissions digitally to protect radio transmissions from interference. Do not violate FCC regulations and ensure radio frequencies are appropriate for portable signal equipment applications.

Upon detecting a malfunction, ensure all signals go to a flashing red condition and the operator is notified by a reliable means approved by the Engineer. Provide a battery back-up system for generator and direct current powered signal systems to power the warning means and "flashing red" condition. Provide a back-up system with a 72-hour minimum reserve.

Ensure the system meets the Environmental Standards for traffic signals in accordance with NEMA TS-1, Section 2.

16.3. CONSTRUCTION METHODS

Do not use portable traffic signal systems in a work area with intersecting streets or driveways, unless directed by the Engineer.

Do not install portable traffic signal within 300 feet of at-grade railroad crossing.

During automatic operation, ensure the motorist has an unobstructed view of opposing traffic.

Ensure the distance between signal units does not exceed 500 feet unless otherwise shown on the plans or directed by the Engineer. If modification to the distance between signal units is required after the units are positioned, relocate the signals or the system and make the necessary timing revisions only as directed by the Engineer.

Submit a traffic signal timing plan to the Engineer for approval a minimum of two weeks prior to installation. Include the following items in the plan: distance between stop bars, speed limit to be posted during operation, each approach grade, recommended yellow change interval, recommended red clearance interval, recommended minimum and maximum green intervals. Make timing changes to approved signal timing plan only as authorized by the Engineer. Keep a written record of all timing changes.

Allow only trained operators to set up and operate the system. Provide an experienced operator at all times for each portable traffic signal system during periods of manual operation. Do not violate yellow change and red clearance intervals during periods of manual operation. During manual operation, ensure the operator has an unobstructed view of the motorists and all signal head units. Locate the operator as close to the center of the operation as possible.

Perform all maintenance operations required by the system manufacturer including periodic cleaning of the systems. Ensure properly skilled and trained maintenance personnel are available to maintain the system in good working order and to perform all emergency and preventive maintenance as recommended by the system manufacturer.

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TIP Number **TS-105** *County* **County**

Furnish the Engineer with the name, office telephone number, cellular (mobile) telephone number, and pager number of the supervisory employee who will be responsible for maintenance and repair of equipment during all hours.

For all failures, malfunctions, or damage to this equipment, begin necessary repairs within four hours of notification. Complete repairs within eight hours of notification. Comply with Section 150 of the Standard Specifications for maintenance of traffic flow. The inability to contact the supervisory employee or prearranged alternate will not extend repair time requirements.

In the event that the system becomes inoperative, be prepared at all times to revert to flagging operations or suspend all construction activities requiring the use of the portable traffic signal system until the system is restored to proper operation. Implement flagging operations as shown on 2012 Roadway Standard Drawing No. 1101.02 Sheet 1 (Closure of one lane of a Two-lane, Two-way Highway).

When not in operation, remove signal heads from the view of traffic or cover signal heads with burlap bags or bags made of non-ripping material specifically designed for covering signal heads. Do not use trash bags of any type. Remove, cover, fold, or turn all inappropriate signs so that they are not readable by oncoming traffic.

16.4. MEASUREMENT AND PAYMENT


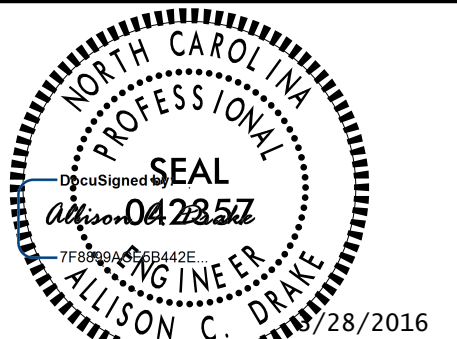

Actual number of portable traffic signal systems furnished, installed, operated, removed, and accepted.

No measurement will be made for operation, relocation, maintenance, removal of each system, or use of flaggers during repair periods as these will be considered incidental to furnishing, installing, and operating the portable traffic signal systems.

No measurement will be made for signal controller, communication cable, messenger cable, wireless communication, inductive loop sawcut, loop emulator detection system, machine vision detection system, microwave detection system, detector channel/unit, detector lead-in cable, trenching, vehicle signal heads, signal head support assemblies, signal cable, and traffic signal software as these will be considered incidental to furnishing, installing, and operating the portable traffic signal systems.

Payment will be made under:
 Portable Traffic Signal System (actuated).....Each
 Portable Traffic Signal System (pre-timed).....Each

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	APPROVED: _____ DATE: _____			SPECIAL PROVISION

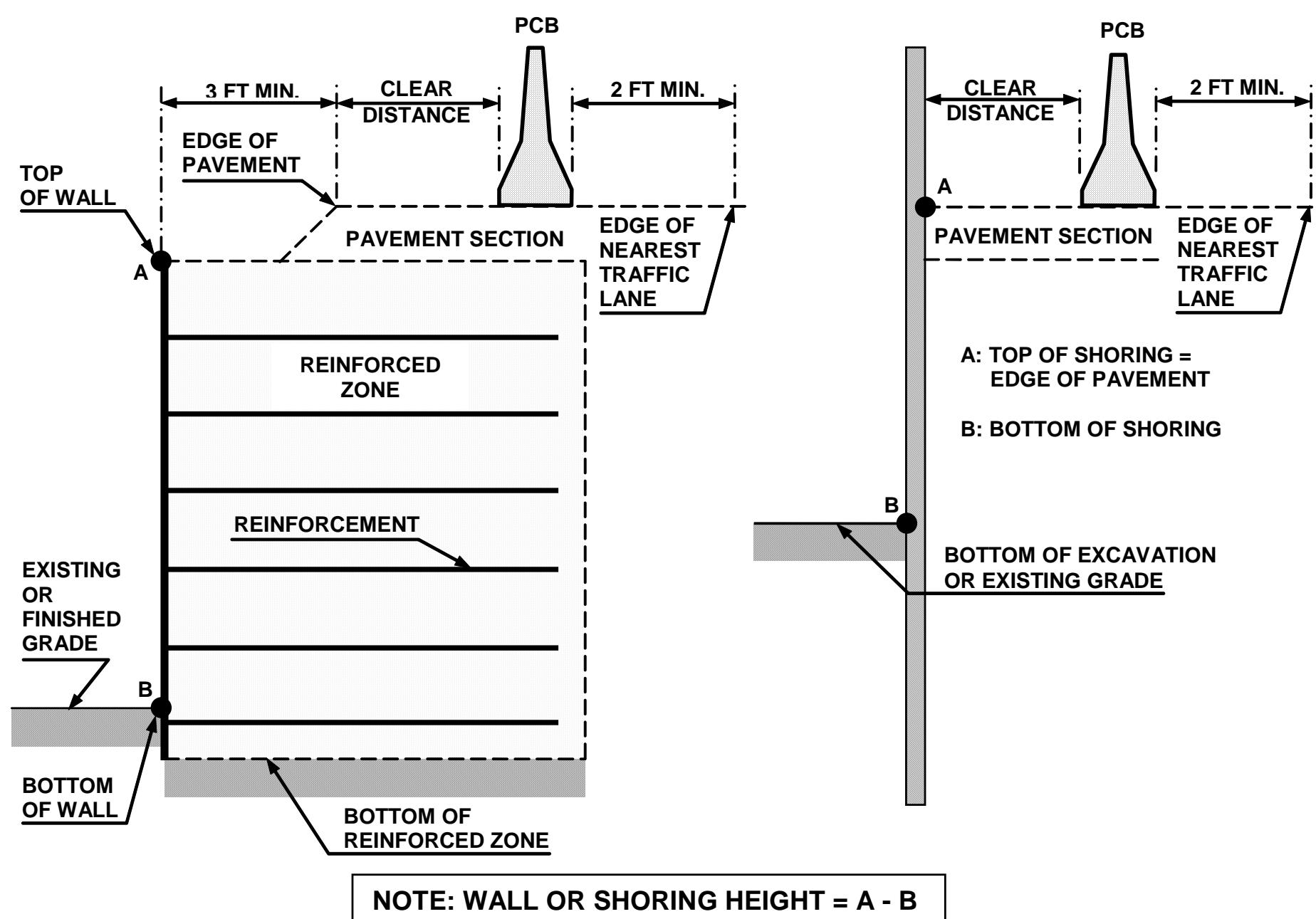


FIGURE A

NOTES

- 1- REFER TO THE TRAFFIC CONTROL PLANS FOR TEMPORARY SHORING LOCATIONS AND NOTES.
- 2- REFER TO THE "TEMPORARY SHORING" PROJECT SPECIAL PROVISION FOR INFORMATION ABOUT TEMPORARY SHORING AND PORTABLE CONCRETE BARRIER (PCB).
- 3- PCB IS REQUIRED IF TEMPORARY SHORING IS LOCATED WITHIN THE CLEAR ZONE IN ACCORDANCE WITH THE AASHTO ROADSIDE DESIGN GUIDE. DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE. (CONTACT NCDOT PAVEMENT MANAGEMENT UNIT FOR APPLICABLE PAVEMENT DESIGN).
- 4- BASED ON THE CLEAR DISTANCE, OFFSET, DESIGN SPEED AND PAVEMENT TYPE, CHOOSE AN UNANCHORED OR ANCHORED PCB FROM THE TABLE SHOWN IN FIGURE B. CLEAR DISTANCE IS DEFINED AS SHOWN IN FIGURE A AND OFFSET IS DEFINED AS SHOWN IN FIGURE B.
- 5- AT THE CONTRACTOR'S OPTION OR IF THE MINIMUM REQUIRED CLEAR DISTANCE IS NOT AVAILABLE, SET PCB NEXT TO AND UP AGAINST THE TRAFFIC SIDE OF THE TEMPORARY SHORING EXCEPT FOR BARRIER ABOVE TEMPORARY WALLS. PCB WITH THE MINIMUM REQUIRED CLEAR DISTANCE IS REQUIRED ABOVE TEMPORARY WALLS.
- 6- USE NCDOT PORTABLE CONCRETE BARRIER (PCB) IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1170.01 AND SECTION 1170 OF THE STANDARD SPECIFICATIONS.
- 7- PCB REQUIREMENTS FOR TEMPORARY WALLS APPLY TO TEMPORARY MECHANICALLY STABILIZED EARTH (MSE) WALLS AND TEMPORARY SOIL NAIL WALLS.
- 8- SET PCB WITH A MINIMUM HORIZONTAL DISTANCE OF 2 FT BETWEEN THE FRONT FACE OF THE BARRIER AND THE EDGE OF THE NEAREST TRAFFIC LANE AS SHOWN IN FIGURE A UNLESS OTHERWISE SHOWN IN THE PLANS AND OR AS APPROVED BY THE ENGINEER.
- 9- FOR PCB ABOVE AND BEHIND TEMPORARY WALLS, PROVIDE A MINIMUM DISTANCE OF 3 FT BETWEEN THE EDGE OF PAVEMENT AND THE WALL FACE AS SHOWN IN FIGURE A. IF THESE MINIMUM REQUIRED DISTANCES ARE NOT AVAILABLE, CONTACT THE ENGINEER.
- 10- TABLE SHOWN IN FIGURE B IS BASED ON NCDOT RESEARCH PROJECT NO. 2005-010 WITH VEHICLE TYPE USED FOR NCHRP 350 CRASH TESTS. BARRIER DEFLECTIONS AND RESULTING MINIMUM REQUIRED CLEAR DISTANCES MIGHT VARY SIGNIFICANTLY FOR LARGER HEAVIER VEHICLES, RUNS OF BARRIER LESS THAN 200 FT IN LENGTH AND WET OR DRY PAVEMENT.

Barrier Type	Pavement Type	Offset * ft	Design Speed, mph					
			<30	31-40	41-50	51-60	61-70	71-80
Unanchored PCB	Asphalt	<8	24	26	29	32	36	40
		8-14	26	28	31	35	38	42
		14-20	27	29	34	36	39	43
		20-26	28	31	35	38	40	44
		26-32	29	32	36	39	42	45
		32-38	30	34	38	41	43	46
		38-44	31	34	41	43	45	48
		44-50	31	35	41	43	46	49
		50-56	32	36	42	44	47	50
	>56	32	36	42	45	47	51	
	Concrete	<8	17	18	21	22	25	26
		8-14	19	20	23	25	26	29
		14-20	22	22	24	26	28	31
		20-26	23	24	26	27	30	34
		26-32	24	25	27	28	32	35
		32-38	24	26	27	30	33	36
		38-44	25	26	28	30	34	37
		44-50	26	26	28	32	35	37
50-56		26	26	28	32	35	38	
>56	26	27	29	32	36	38		
Anchored PCB	Asphalt	All Offsets	24 for All Design Speeds					
Anchored PCB	Concrete (including bridge approach slabs)	All Offsets	12 for All Design Speeds					

* See Figure Below

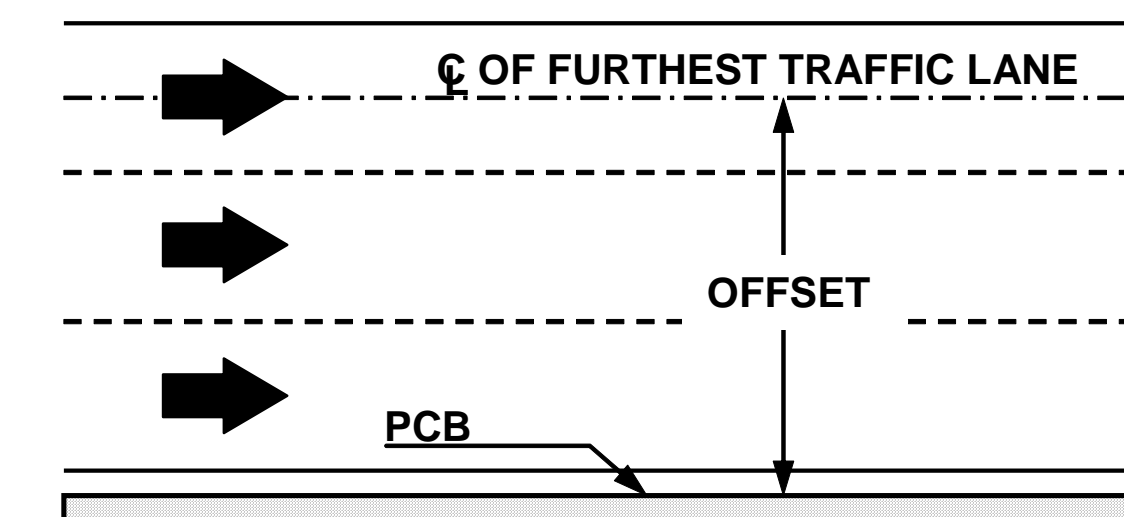
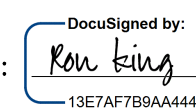



FIGURE B

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RS&H	APPROVED: _____ DATE: _____			PORTABLE CONCRETE BARRIER AT TEMPORARY SHORING LOCATIONS

PROJECT REFERENCE NO. B-4792	SHEET NO. PMP - 1
APPROVED:  13E7AF7BBA4448	
DATE: 10/13/2015	
SEAL 	

**STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION**

**PAVEMENT MARKING PLAN
POLK**

**LOCATION: BRIDGE NO.4 OVER FORK CREEK (SMALL
BRANCH OF PACOLET RIVER) ON SR 1102**

T.I.P.: B-4792

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

GENERAL NOTES

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT, EXCEPT WHEN OTHERWISE NOTED IN THE PLAN, OR DIRECTED BY THE ENGINEER.

A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKER
PEARSON FALLS ROAD	PAINT	NONE

B) PLACE TWO APPLICATIONS OF PAINT PAVEMENT MARKINGS ON THE FINAL WEARING SURFACE. PLACE THE SECOND APPLICATION OF PAINT UPON SUFFICIENT DRYING TIME OF THE FIRST.

C) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

D) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.

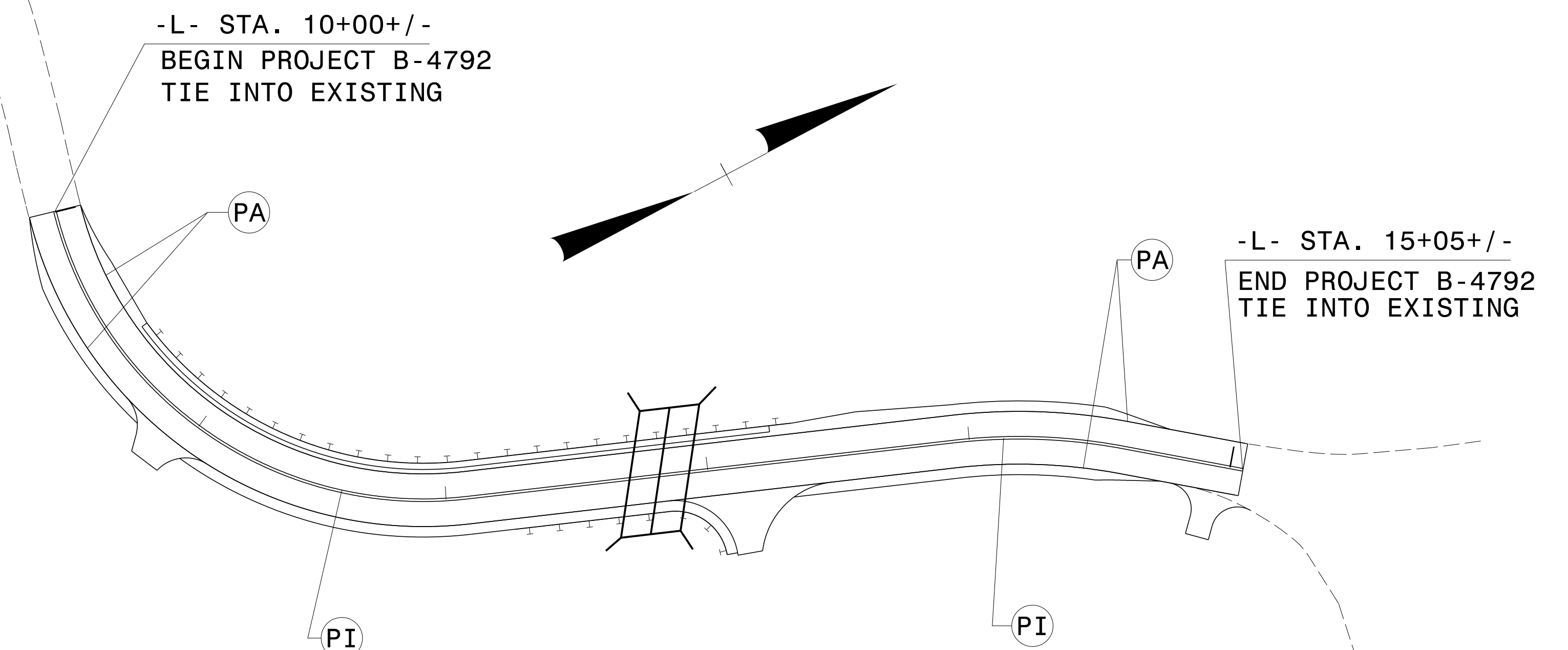
E) PASSING ZONES WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

INDEX

SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING PLAN TITLE AND SCHEDULE SHEET

PAVEMENT MARKING SCHEDULE

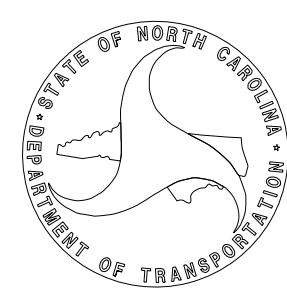
SYMBOL	FINAL PAVEMENT MARKINGS PAINT(4")
	DESCRIPTION
PA	WHITE EDGLINE (2X)
PI	YELLOW DOUBLE CENTER (2X)



PLAN PREPARED BY: N.C.D.O.T. SIGNING AND DELINEATION UNIT

KELVIN JORDAN SIGNING & DELINEATION REGIONAL ENGINEER

J.NAVARRETE SIGNING & DELINEATION PROJECT DESIGN ENGINEER/TECHNICIAN

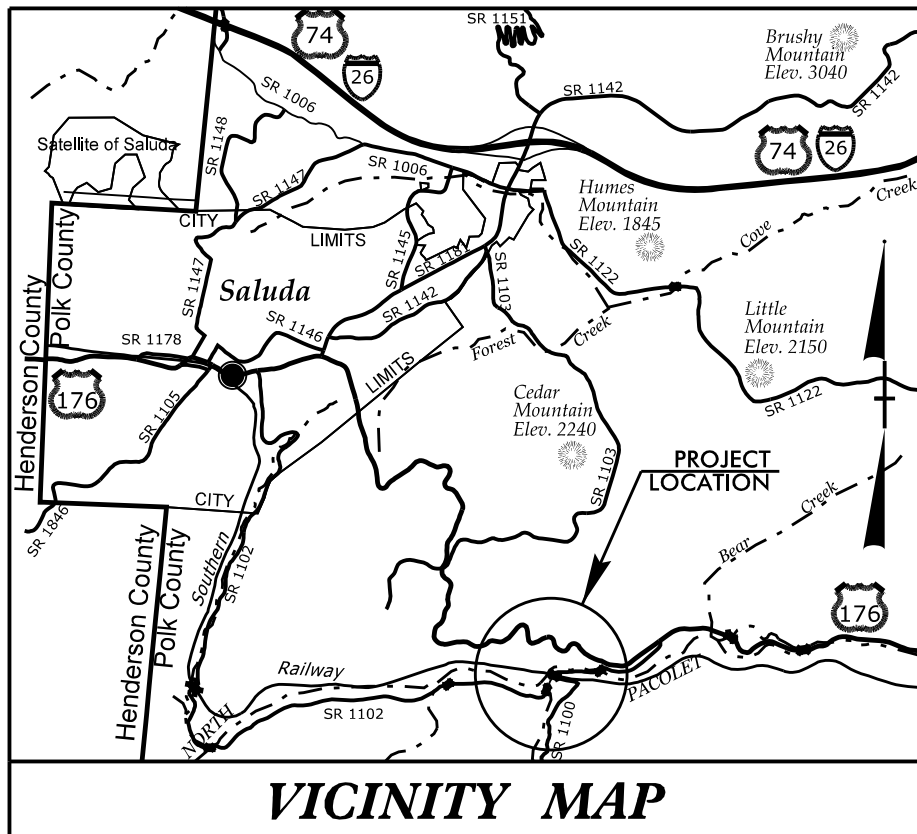


10/13/2015 P:\TIP\Projects-B\B4792\Traffic\Signing\CADD\Signing Layout Plans\B-4792_Sgn_PMP.dgn User: jnavarrete

CONTRACT:

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4792	EC-1	7
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

TIP PROJECT: B-4792



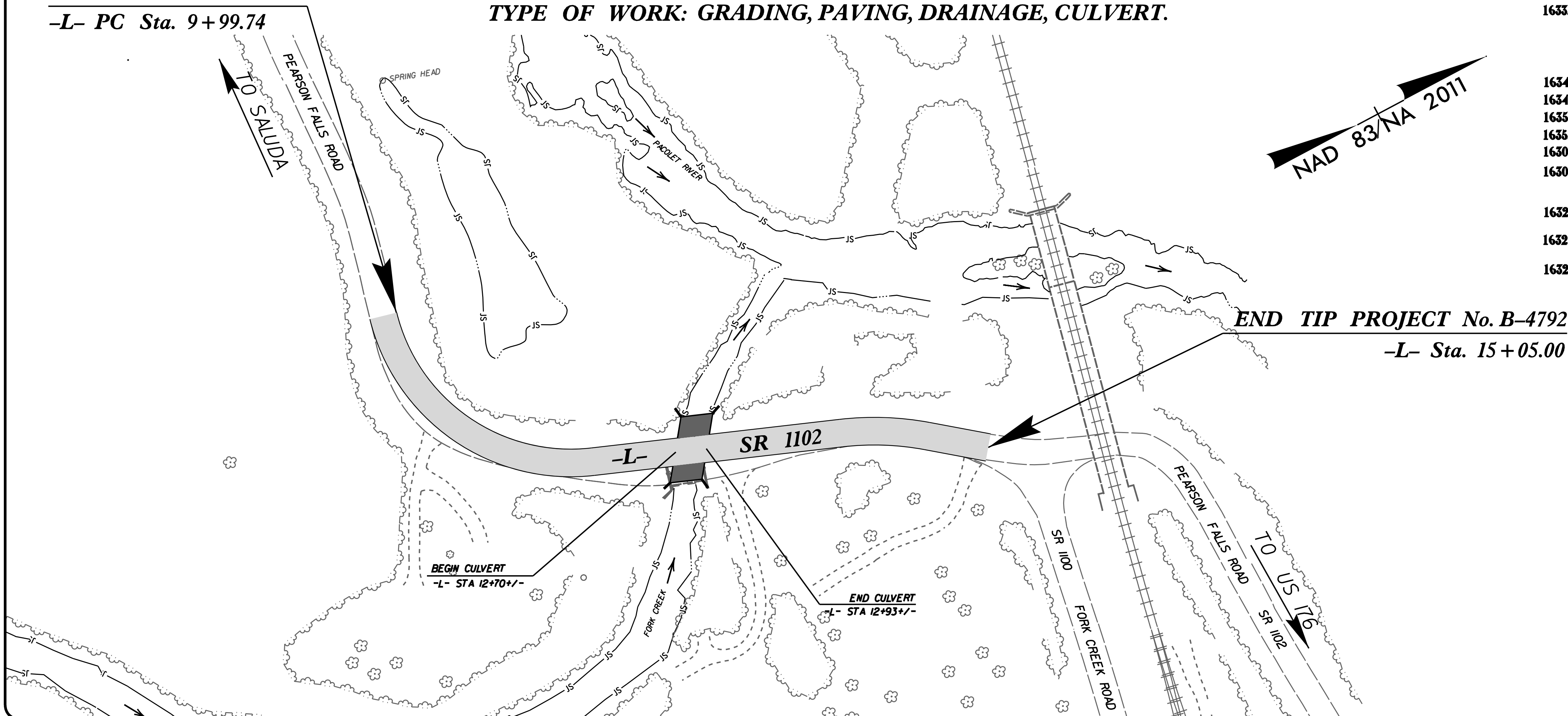
BEGIN TIP PROJECT
No. B-4792

-L- PC Sta. 9+99.74

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

**LOCATION: REPLACEMENT OF BRIDGE No. 4 OVER FORK CREEK
(A SMALL BRANCH OF PACOLET RIVER) ON SR 1102.**

TYPE OF WORK: GRADING, PAVING, DRAINAGE, CULVERT.



EROSION AND SEDIMENT CONTROL MEASURES

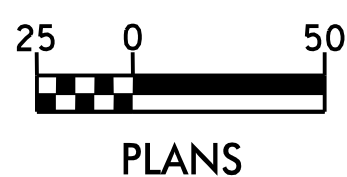
Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	— TD —
1630.05	Temporary Diversion	— TD —
1605.01	Temporary Silt Fence	— III — III — III —
1606.01	Special Sediment Control Fence	— ZZZZZ —
1622.01	Temporary Berms and Slope Drains	— TSD —
1630.02	Silt Basin Type B	— [Symbol] —
1633.01	Temporary Rock Silt Check Type-A	— [Symbol] —
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	— [Symbol] —
1633.02	Temporary Rock Silt Check Type-B	— [Symbol] —
	Wattle / Coir Fiber Wattle	— [Symbol] —
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	— [Symbol] —
1634.01	Temporary Rock Sediment Dam Type-A	— [Symbol] —
1634.02	Temporary Rock Sediment Dam Type-B	— [Symbol] —
1635.01	Rock Pipe Inlet Sediment Trap Type-A	— [Symbol] —
1635.02	Rock Pipe Inlet Sediment Trap Type-B	— [Symbol] —
1630.04	Stilling Basin	— [Symbol] —
1630.06	Special Stilling Basin	— [Symbol] —
	Rock Inlet Sediment Trap:	
1632.01	Type A	— [Symbol] —
1632.02	Type B	— [Symbol] —
1632.03	Type C	— [Symbol] —
	Skimmer Basin	— [Symbol] —
	Tiered Skimmer Basin	— [Symbol] —
	Infiltration Basin	— [Symbol] —

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

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT
Refer To E. C. Special Provisions for Special Considerations.

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

GRAPHIC SCALE



THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 3, 2011 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER RESOURCES.

Prepared In the Office of:

RS&H

1520 SOUTH BOULEVARD, SUITE 200
CHARLOTTE, NC 28203
704-752-0610

2012 STANDARD SPECIFICATIONS

Designed by:

Will Weathersbee, PE

3161

NAME

LEVEL III CERTIFICATION NO.

Reviewed In the Office of:

ROADSIDE ENVIRONMENTAL UNIT

1 South Wilmington St.
Raleigh, NC 27611

2012 STANDARD SPECIFICATIONS

Reviewed by:

Jennifer Parish, EI, CPESC, CPSWQ

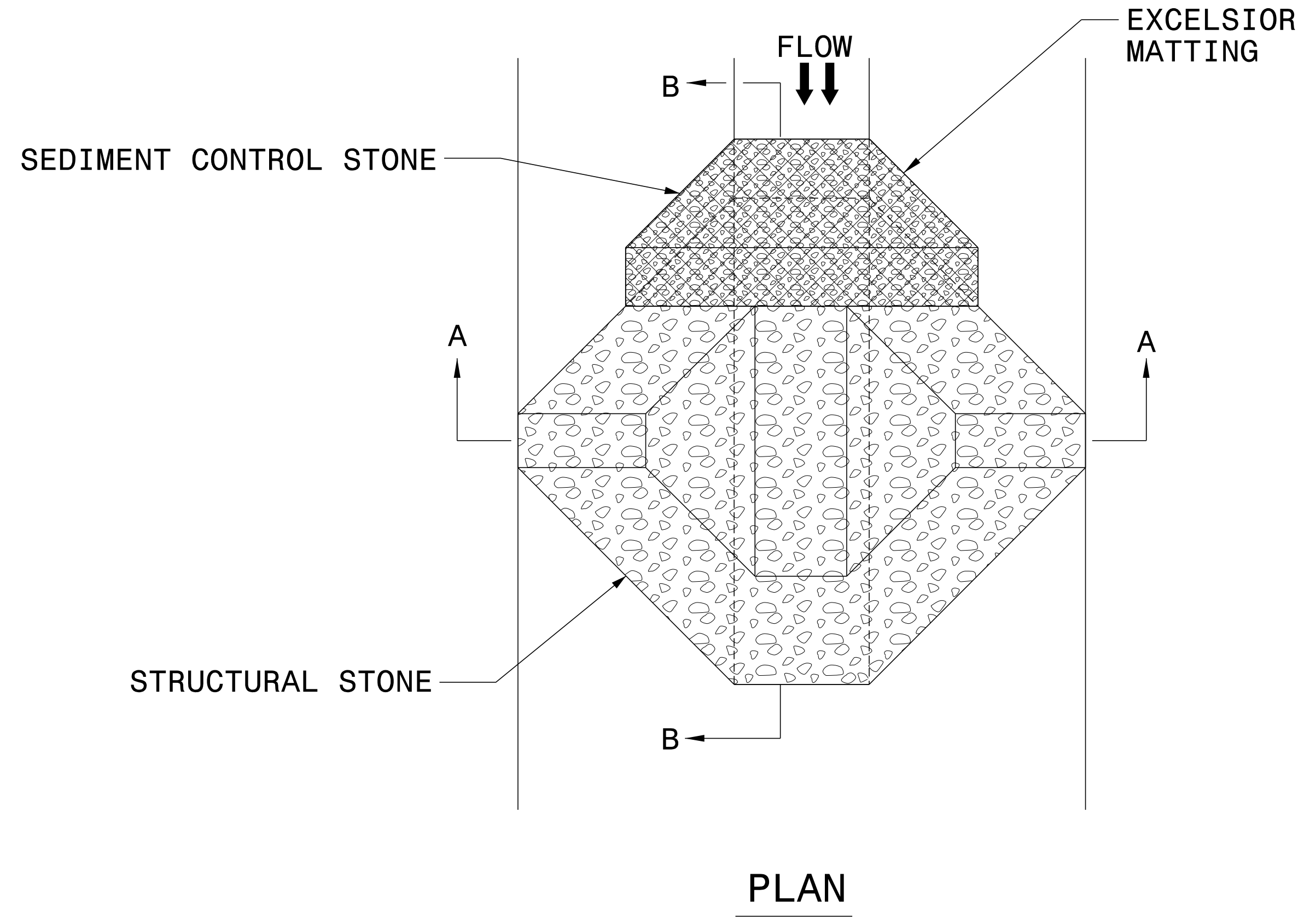
Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2012 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

1605.01	Temporary Silt Fence	1631.01	Matting Installation
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1607.01	Gravel Construction Entrance	1633.01	Temporary Rock Silt Check Type A
1622.01	Temporary Berms and Slope Drains	1633.02	Temporary Rock Silt Check Type B
1630.06	Special Stilling Basin	1635.02	Rock Pipe Inlet Sediment Trap Type B



TEMPORARY ROCK SILT CHECK TYPE 'A' WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM)



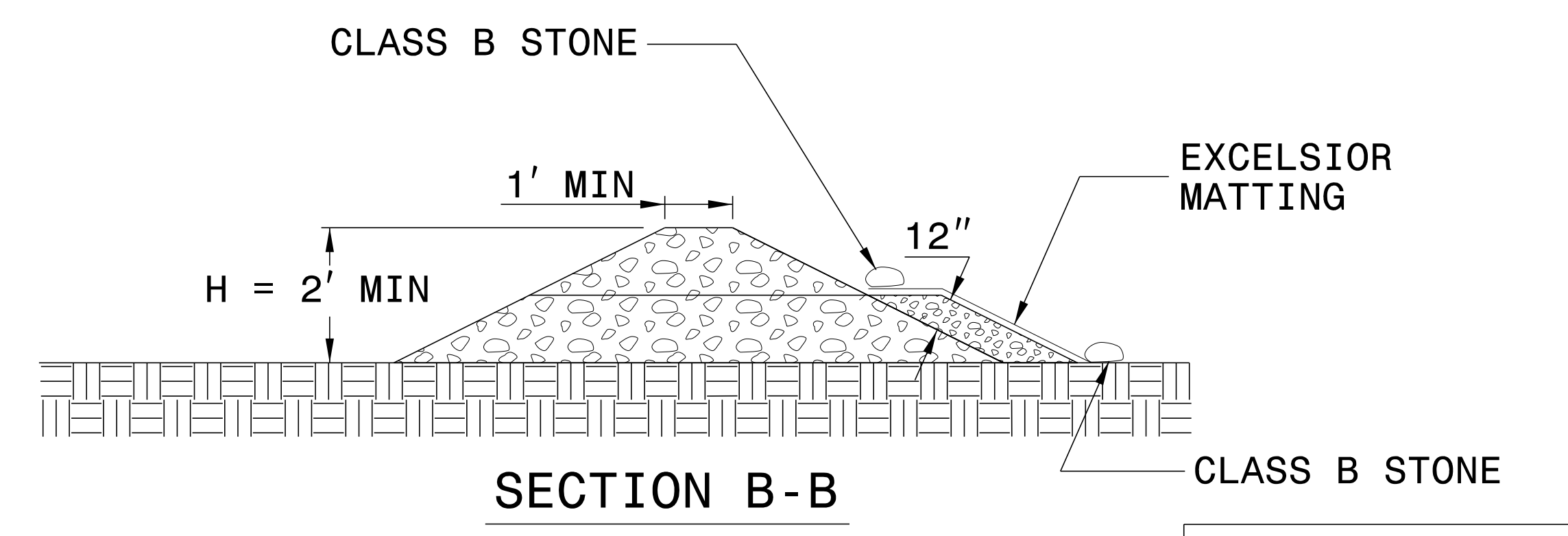
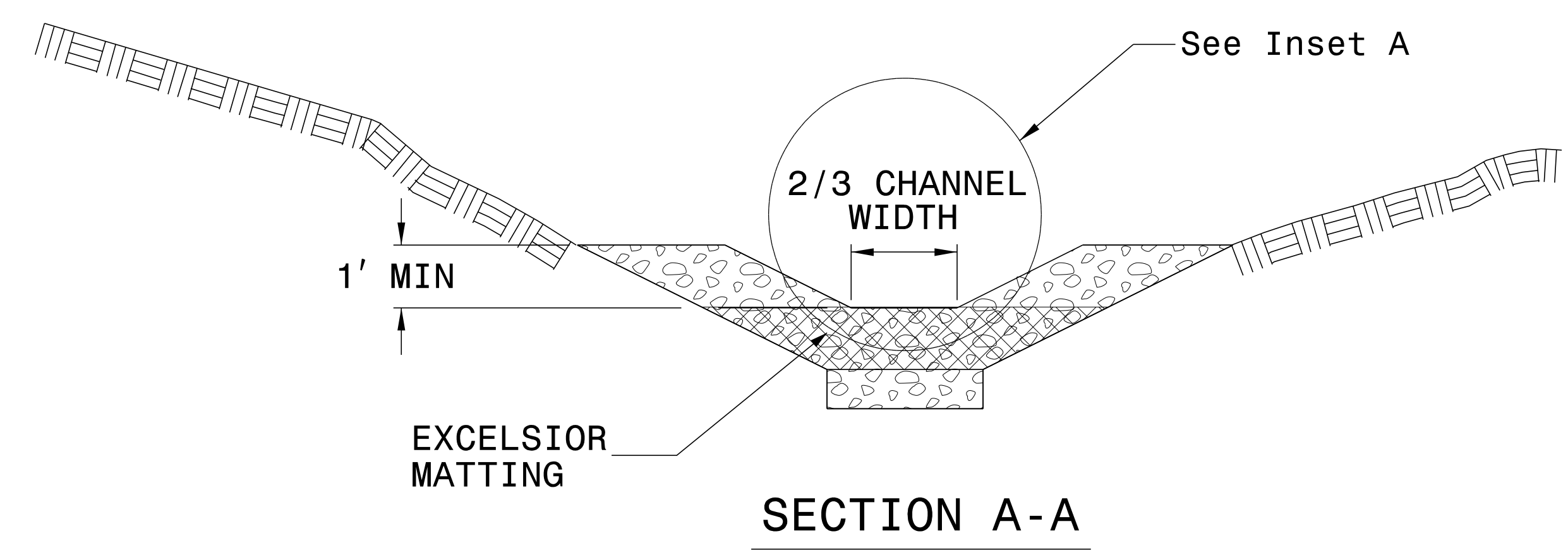
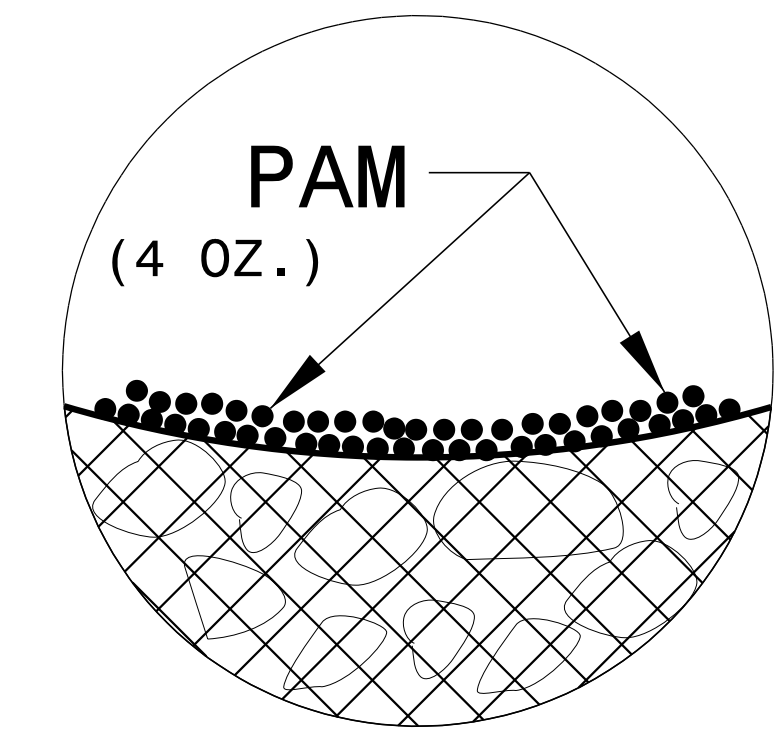
NOTES:

INSTALL TEMPORARY ROCK SILT CHECK TYPE A IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1633.01.

USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH ROCK SILT CHECK.

INITIALLY APPLY 4 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



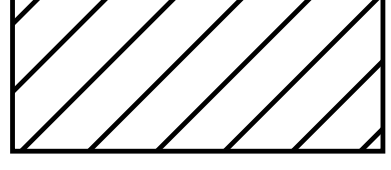
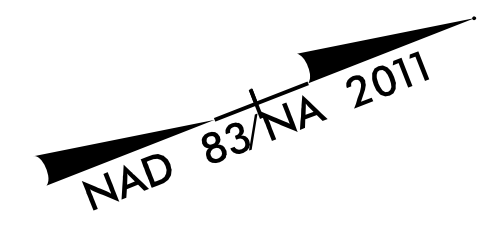
NOT TO SCALE

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA



SOIL STABILIZATION TIMEFRAMES

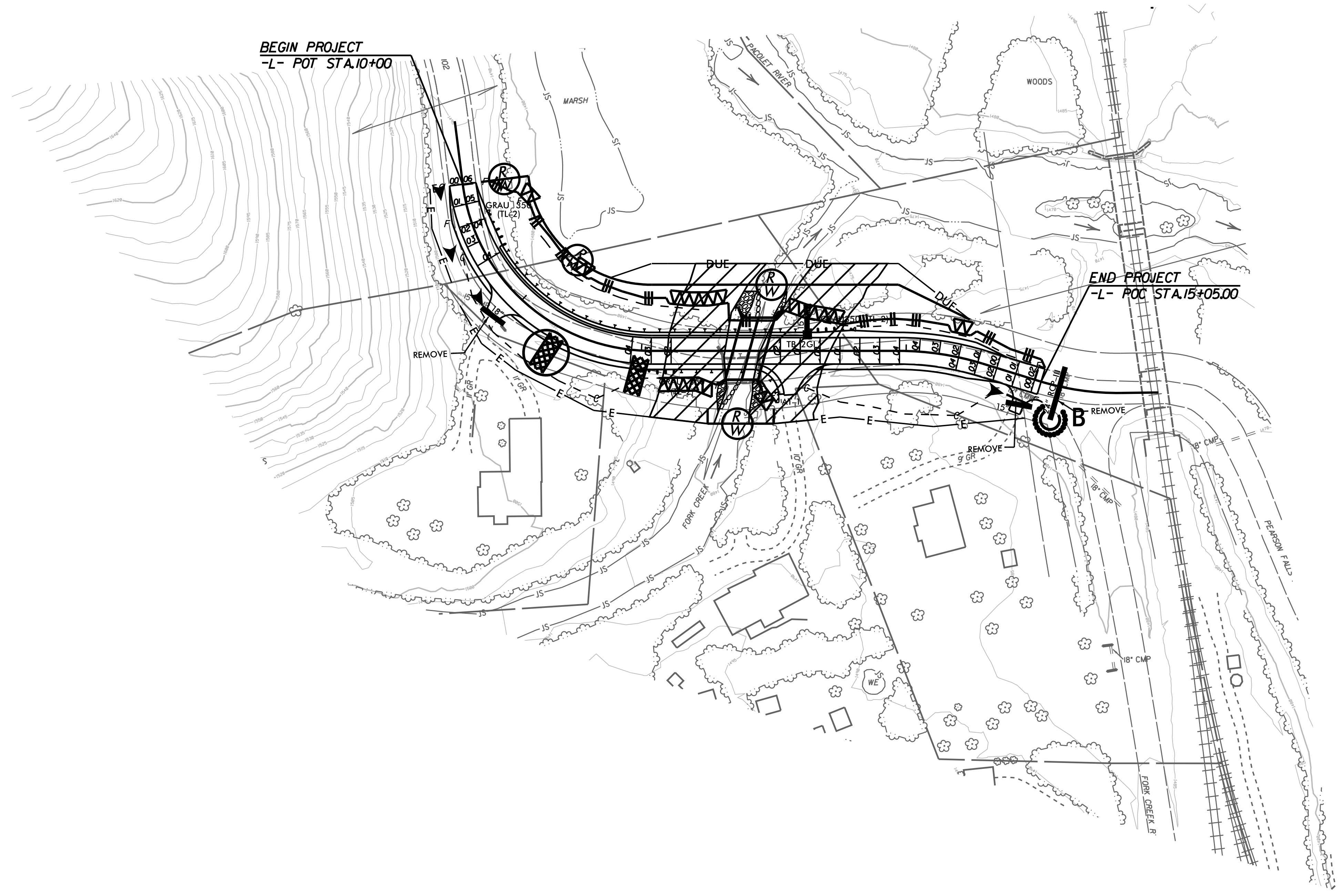
<i>SITE DESCRIPTION</i>	<i>STABILIZATION TIME</i>	<i>TIMEFRAME EXCEPTIONS</i>
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES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



ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

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

NOTE:
UTILIZE SPECIAL STILLING BASIN AS
STILLING BASIN WHERE APPLICABLE.



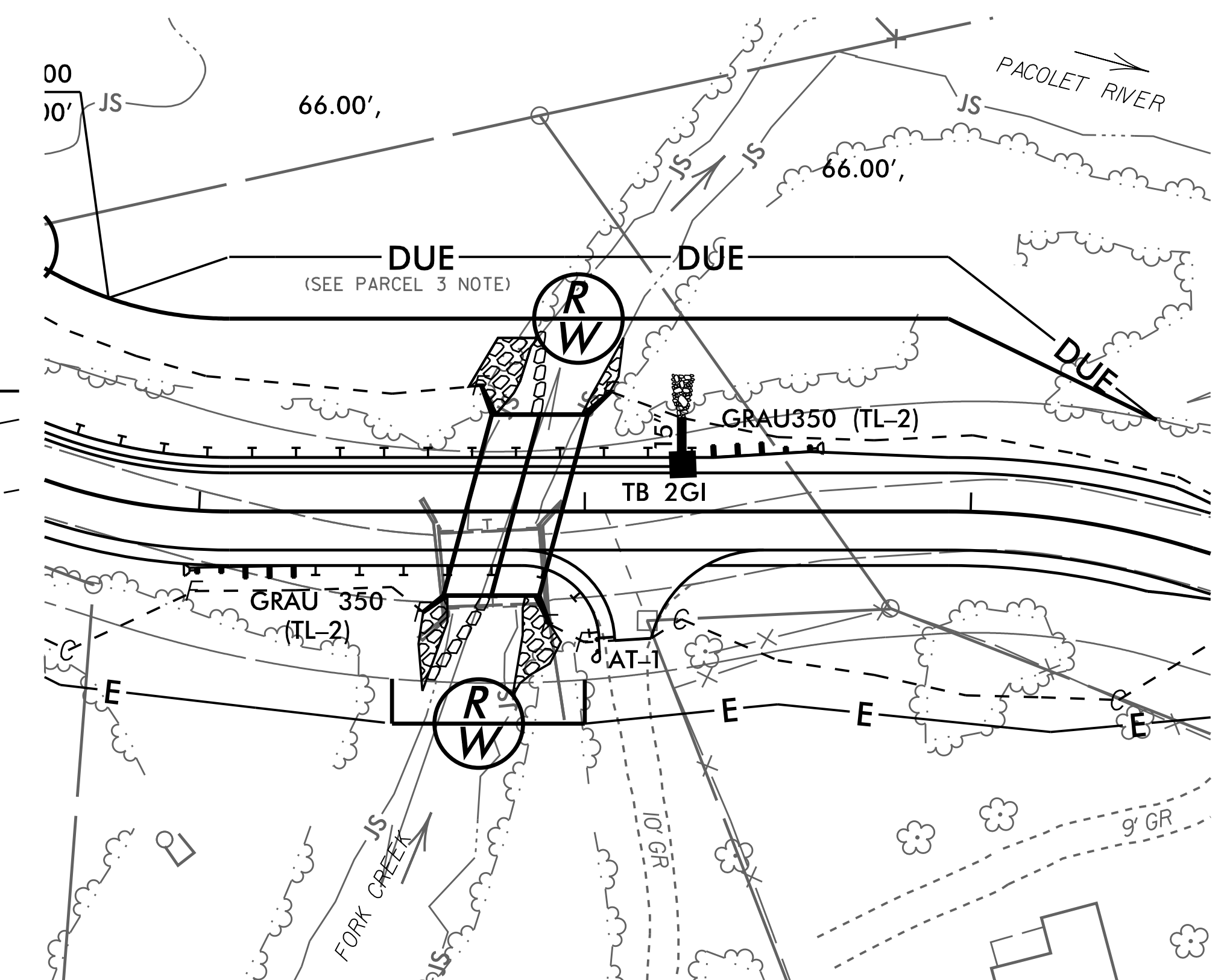
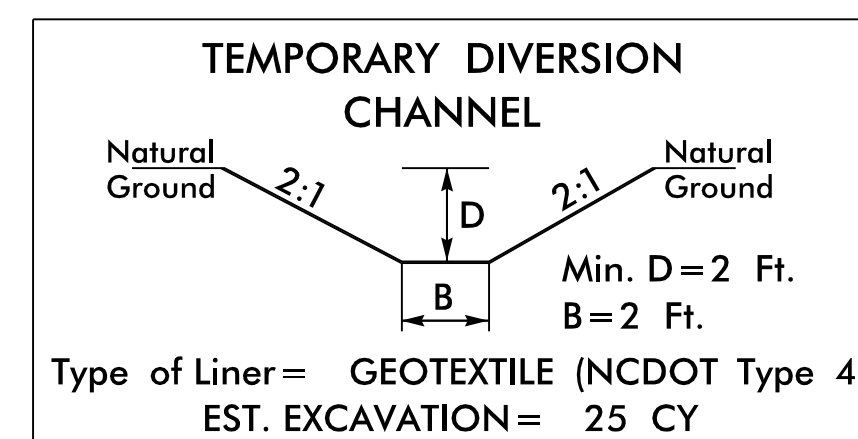
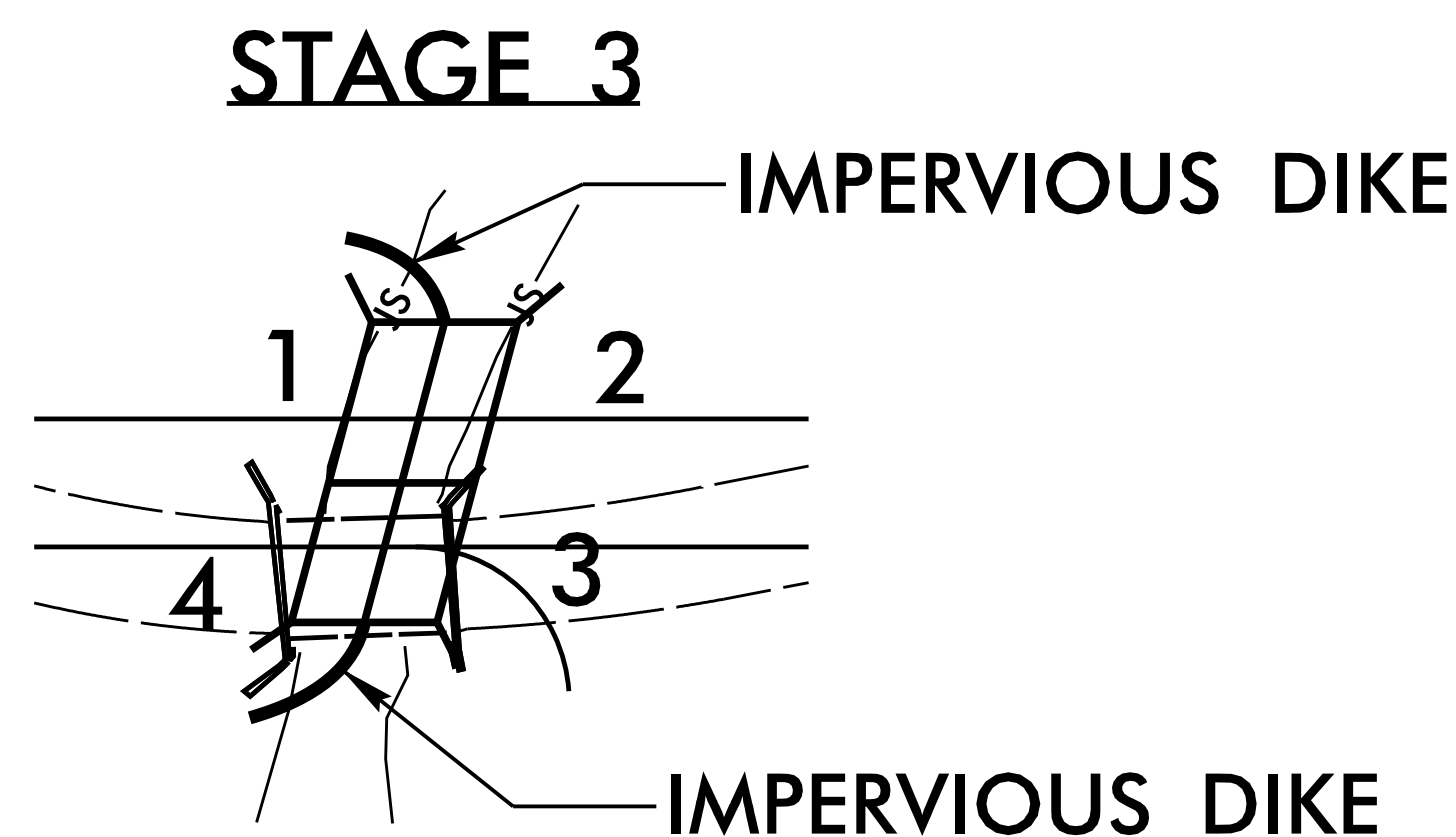
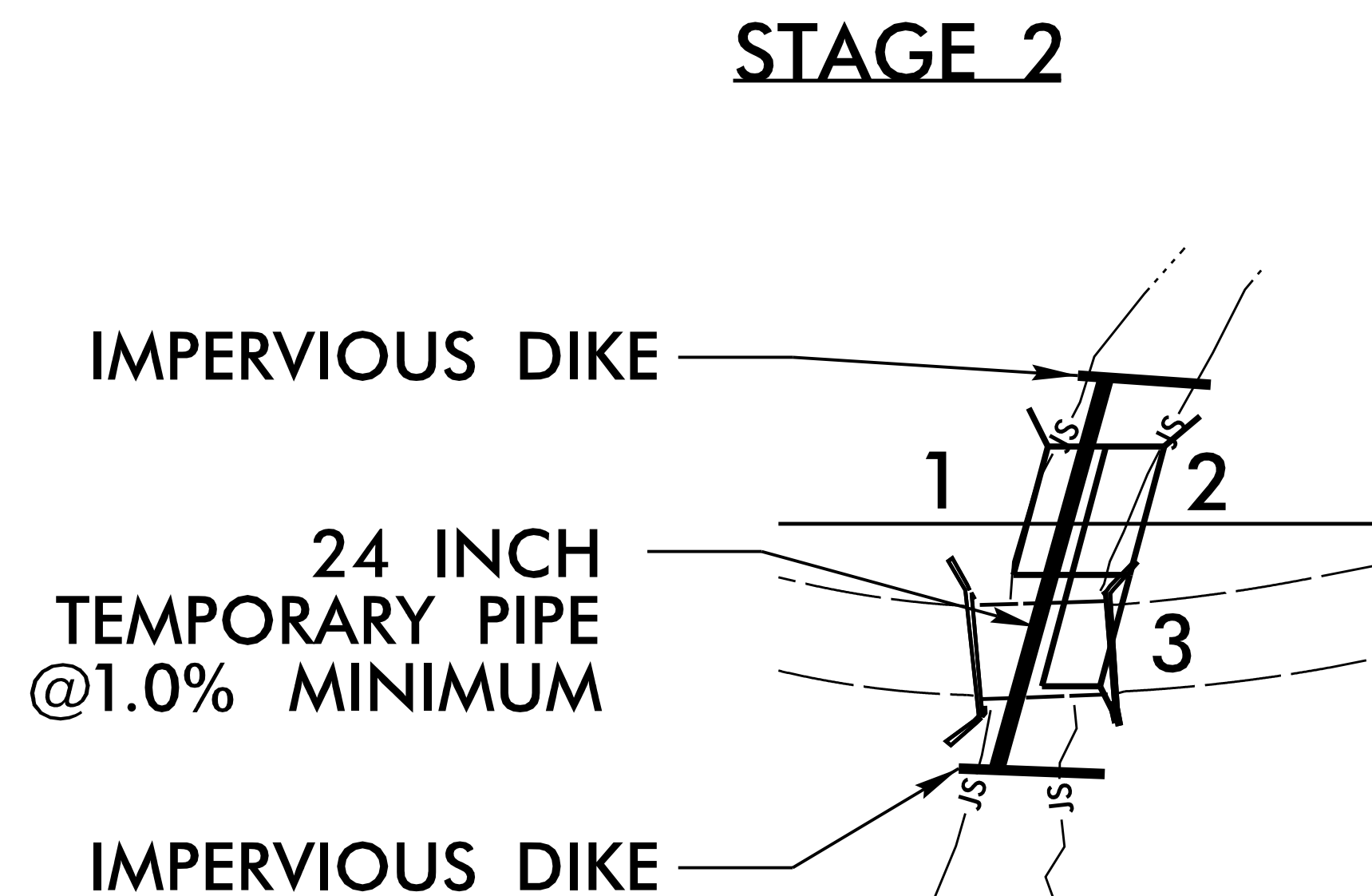
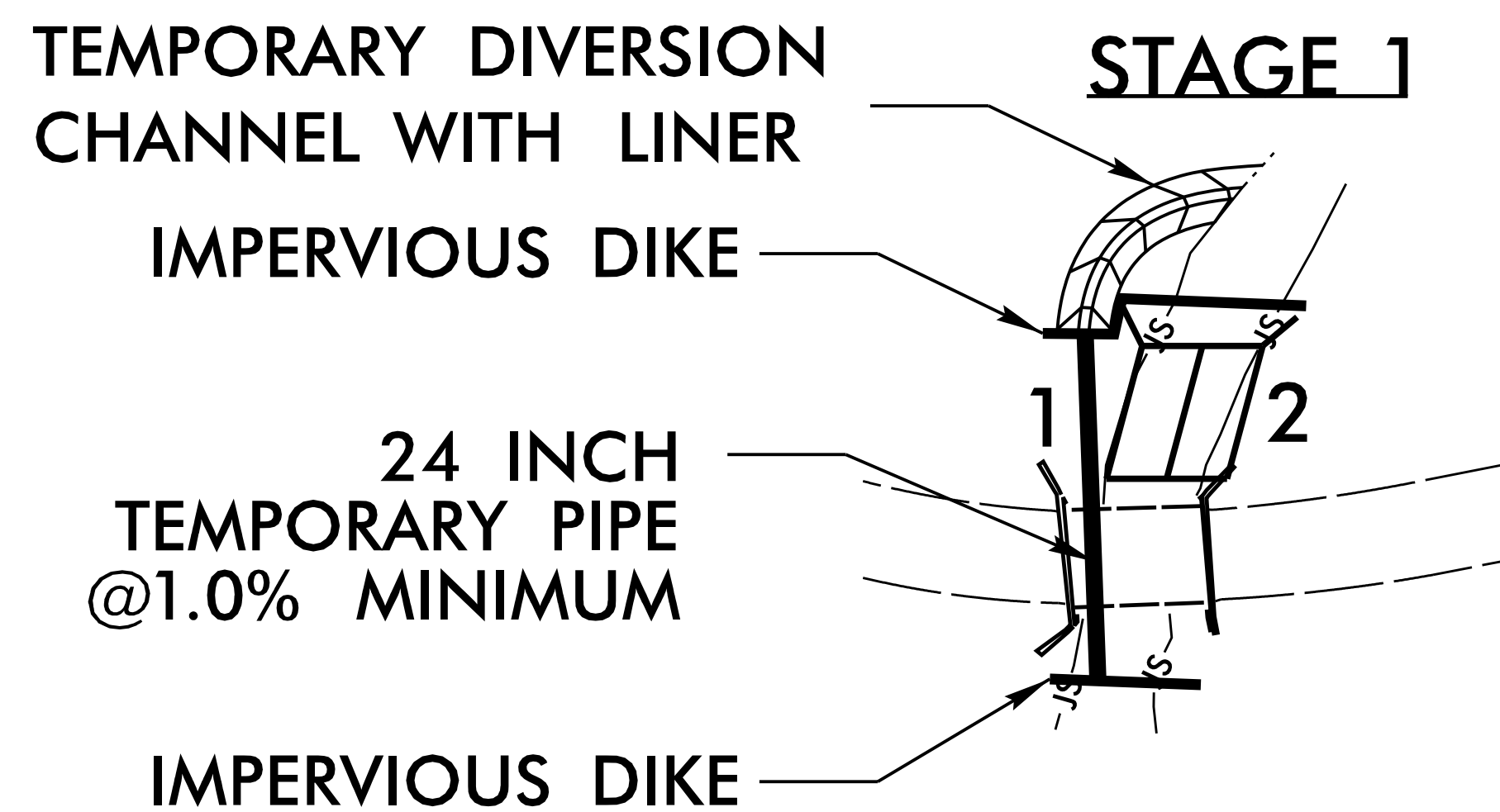
REVISIONS

3/21/2016 3:18:50 PM B:\4792\B-4792-Polk\Project_Products\Environmental\Design\B4792_EC.dsn_4.dgn

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

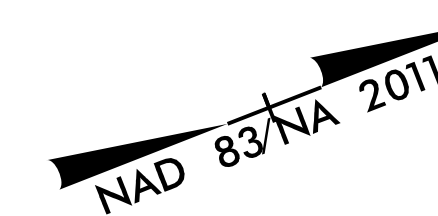
CULVERT CONSTRUCTION SEQUENCE –L– STA. 12 + 82

1. UTILIZE SPECIAL STILLING BASIN(S) AS NEEDED THROUGHOUT CULVERT CONSTRUCTION.
2. STAGE 1 – CONSTRUCT IMPERVIOUS DIKES AND TEMPORARY DIVERSION CHANNEL WITH LINER AS SHOWN AND DIVERT FLOW THROUGH TEMPORARY CHANNEL AND 24" CMP.
3. CONSTRUCT PROPOSED CULVERT SECTIONS 1 AND 2 AS SHOWN.
4. REMOVE TEMPORARY DIVERSION CHANNEL AND 24" CMP. REDIRECT 24" CMP THROUGH CULVERT SECTION 1.
5. CONSTRUCT ROADWAY OVER PROPOSED CULVERT SECTIONS 1 AND 2.
6. STAGE 2 – SHIFT TRAFFIC ONTO NEWLY CONSTRUCTED ROADWAY AND CLOSE EXISTING NB LANE.
7. REMOVE EXISTING STRUCTURE AND CONSTRUCT CULVERT SECTION 3 AS SHOWN.
8. STAGE 3 – CONSTRUCT IMPERVIOUS DIKES AS SHOWN IN STAGE 3.
9. REMOVE TEMPORARY PIPE INSTALLED IN STAGE 2.
10. REMOVE IMPERVIOUS DIKES INSTALLED IN STAGE 2 AND DIVERT STREAM THROUGH CULVERT SECTIONS 2 AND 3.
11. CONSTRUCT PROPOSED CULVERT SECTION 4.
12. REMOVE IMPERVIOUS DIKES INSTALLED IN STAGE 3 AND DIVERT FLOW THROUGH PROPOSED CULVERT.
13. COMPLETE PROPOSED ROADWAY CONSTRUCTION.



NAD 83/NA 2011

NOT TO SCALE

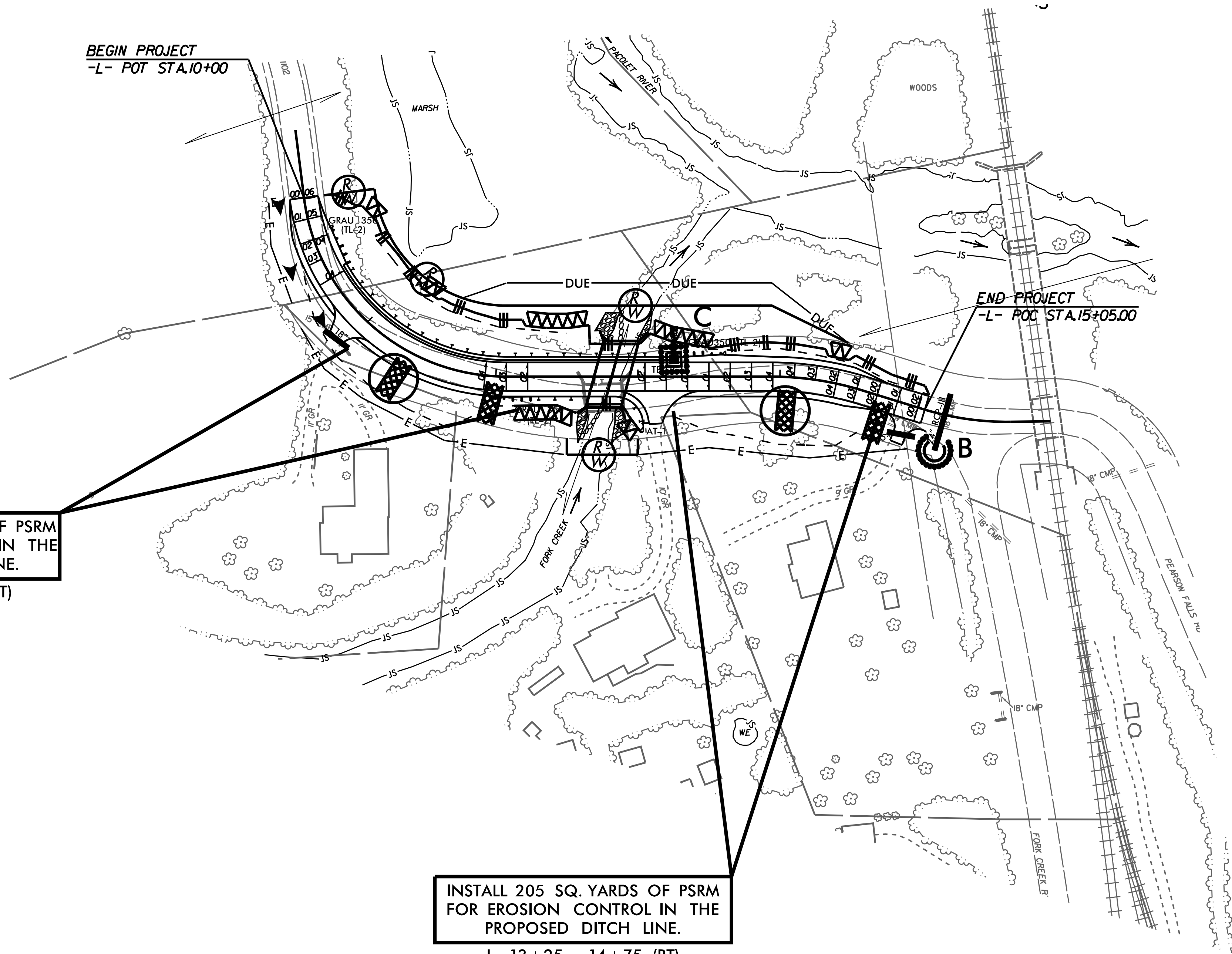


NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B
AND TEMPORARY ROCK SILT CHECKS TYPE - A AT
DRAINAGE OUTLETS.

NOTE:
UTILIZE SPECIAL STILLING BASIN AS
STILLING BASIN WHERE APPLICABLE.

REVISIONS

3/21/2016 10:31:18 AM 3185002-B-4792-Polk\Project_Products\Environmental\Design\B4792_EC.dgn



INSTALL 185 SQ. YARDS OF PSRM
FOR EROSION CONTROL IN THE
PROPOSED DITCH LINE.
-L- 11+02 - 12+15 (RT)

INSTALL 205 SQ. YARDS OF PSRM
FOR EROSION CONTROL IN THE
PROPOSED DITCH LINE.
-L- 13+25 - 14+75 (RT)

NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL
REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY
NEED TO BE INSTALLED AS DIRECTED BY THE
ENGINEER.

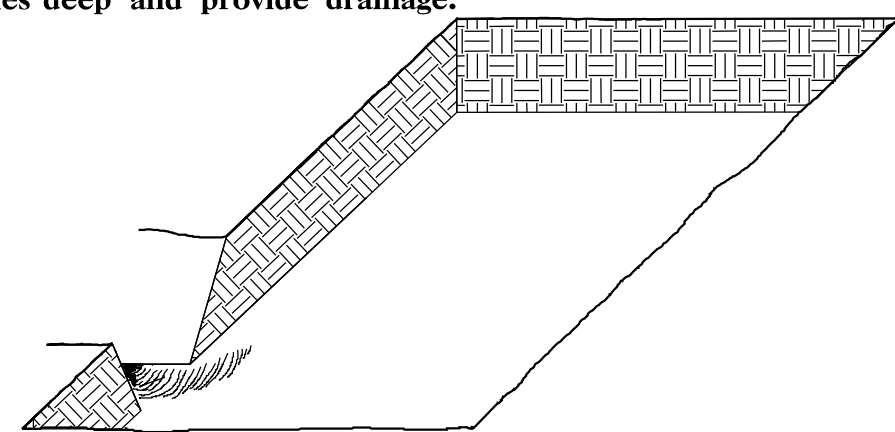
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4792	RF-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

PLANTING DETAILS

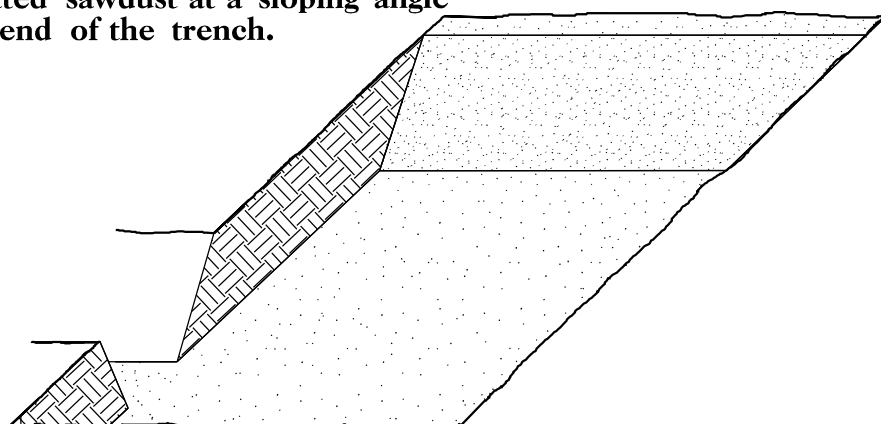
SEEDLING / LINER BAREROOT PLANTING DETAIL

HEALING IN

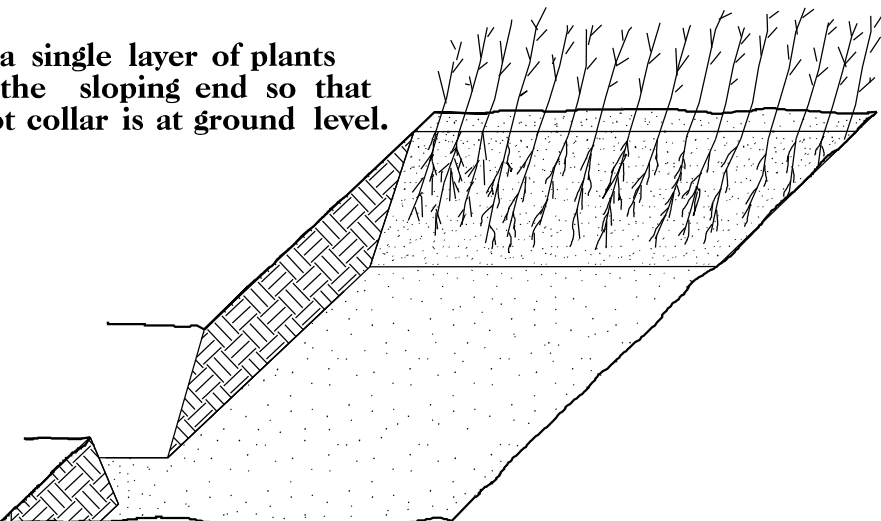
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



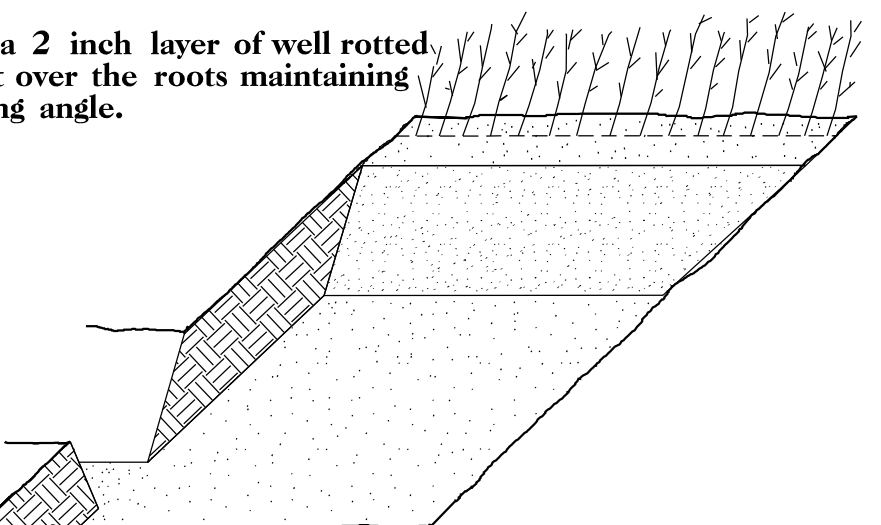
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



4. Place a single layer of plants against the sloping end so that the root collar is at ground level.

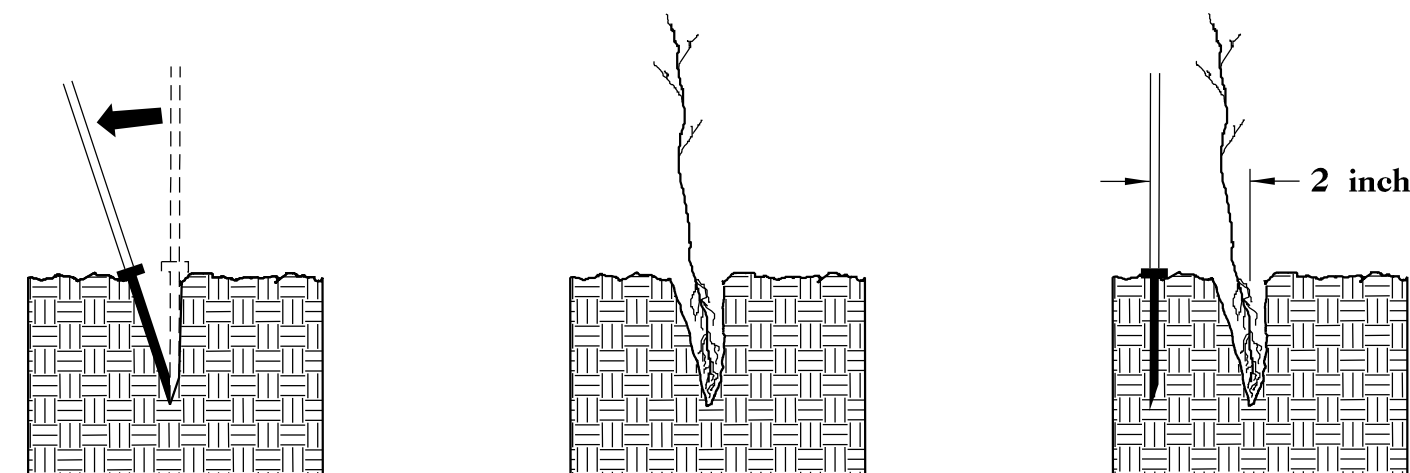


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

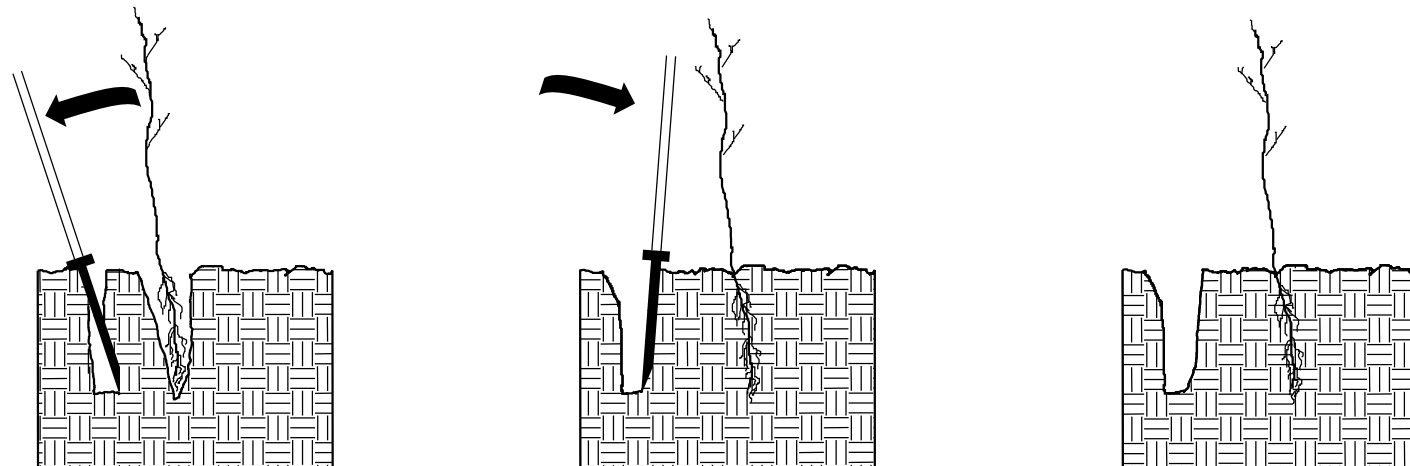


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

DIBBLE PLANTING METHOD USING THE KBC PLANTING BAR



1. Insert planting bar as shown and pull handle toward planter.
2. Remove planting bar and place seedling at correct depth.
3. Insert planting bar 2 inches toward planter from seedling.



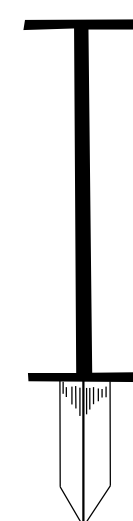
4. Pull handle of bar toward planter, firming soil at bottom.
5. Push handle forward firming soil at top.
6. Leave compaction hole open. Water thoroughly.

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.

REFORESTATION

- TREE REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

REFORESTATION


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

50% CORNUS FLORIDA	FLOWERING DOGWOOD	12 in - 18 in BR
50% CERCIS CANADENSIS	REDBUD	12 in - 18 in BR

REFORESTATION DETAIL SHEET

N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PROJECT REFERENCE NO. B-4792	SHEET NO. SIGN - 1
APPROVED: <i>Ron King</i> 13E7AF7B9A4448	
DATE: 10/13/2015	
SEAL 	

B-4792

SIGNING PLAN

POLK

LOCATION: BRIDGE NO.4 OVER FORK CREEK (SMALL BRANCH OF PACOLET RIVER) ON SR 1102

SUMMARY OF QUANTITIES

ITEM NO.	DESC. NO.	SECT. NO.	ITEM DESCRIPTION	QUANTITY	UNIT
4072000000	903		SUPPORTS, 3 LB STEEL U-CHANNEL	17	L.F.
4102000000	904		SIGN ERECTION, TYPE E	1	EA.
4155000000	907		DISPOSAL OF SIGN SYSTEM, U-CHANNEL	5	EA.

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

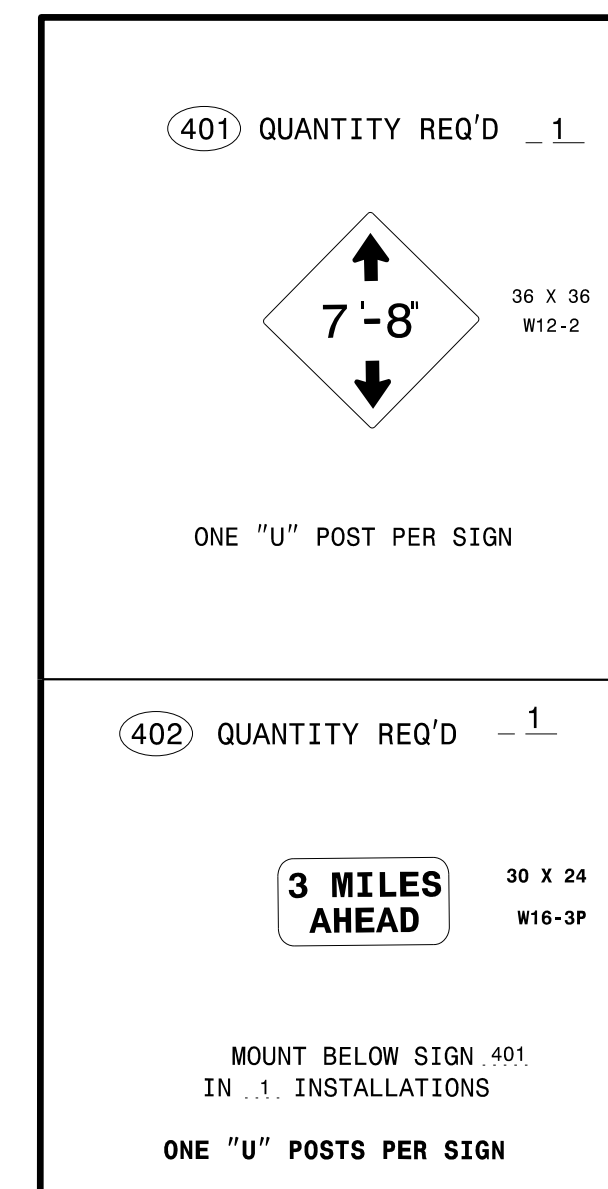
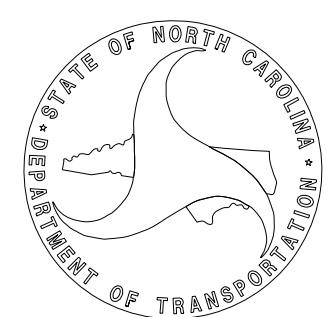
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.50	MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POSTS

PROJECT NOTES

1 DISPOSAL OF SIGN SYSTEM, U-CHANNEL

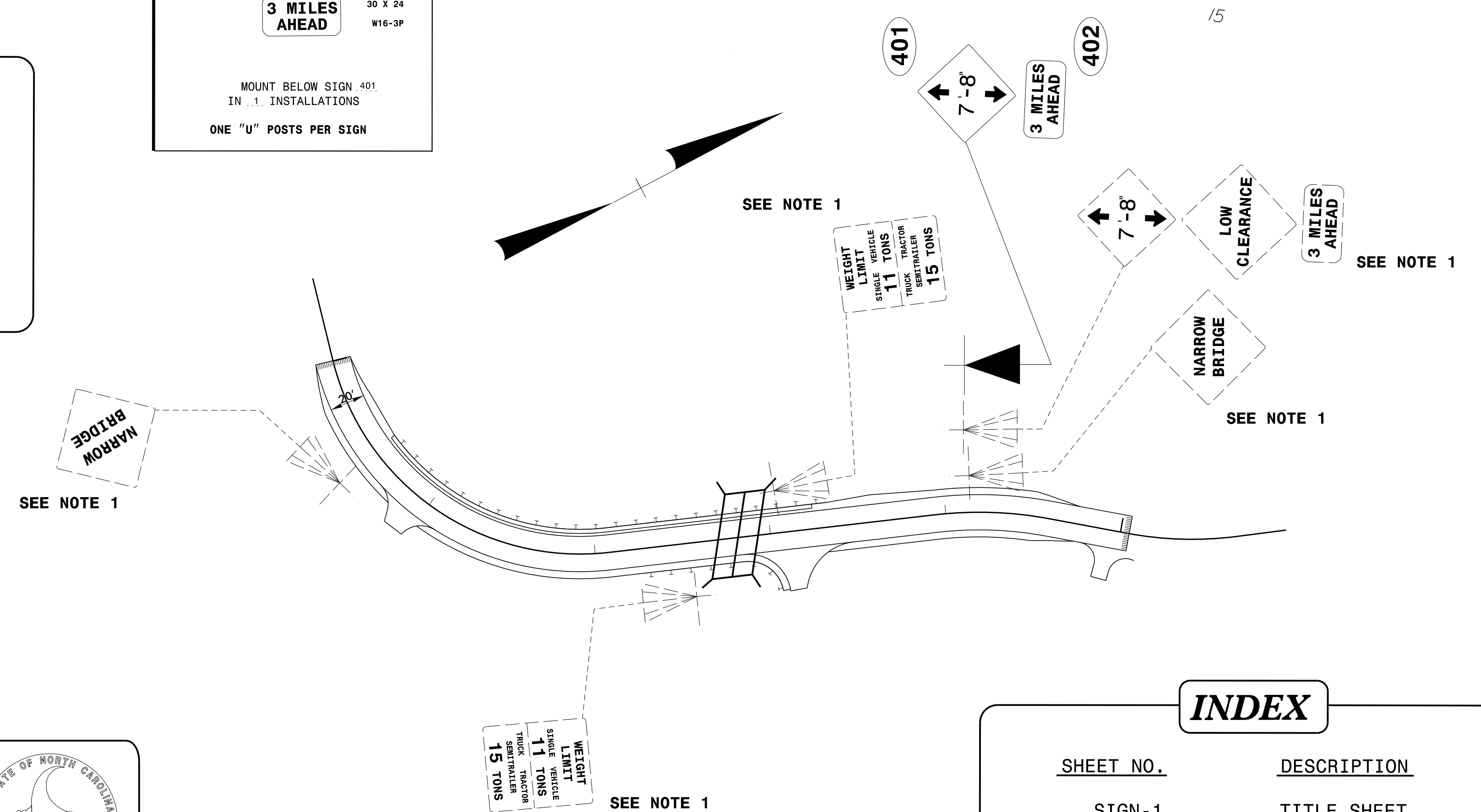
PLAN PREPARED BY: N.C.D.O.T. SIGNING AND DELINEATION UNIT

KELVIN JORDAN SIGNING & DELINEATION REGIONAL ENGINEER
J.NAVARRETE SIGNING & DELINEATION PROJECT DESIGN ENGINEER



GENERAL NOTES

- SIGNS FURNISHED BY STATE
- IF REMOVAL OR RELOCATION OF SIGNS ON PRIVATE STREET (NON-STATE MAINTAINED) IS REQUIRED DUE TO CONSTRUCTION, THE CONTRACTOR SHALL INFORM THE ENGINEER. THE WORK WILL BE COMPLETED BY OTHERS.
- WHEN NOT STATIONED OR DIMENSIONED ON PLANS, ALL 'E' AND 'F' SIGNS SHALL BE FIELD LOCATED BY THE ENGINEER
- ALL EXISTING SIGNS ON "U" CHANNEL POST WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND DISPOSED OF UNLESS OTHERWISE NOTED ON PLANS.
- WHEN EXISTING SIGNS ARE REMOVED AND INSTALLED ON NEW SUPPORTS, THE RE-ERECTION SHALL IMMEDIATELY FOLLOW THE REMOVAL.
- THE BACKGROUND FOR TYPE E & F SIGNS SHALL BE TYPE C REFLECTIVE SHEETING.
- SEE ROADWAY PLANS FOR GUARD/GUIDE RAIL DETAILS.



INDEX

SHEET NO.	DESCRIPTION
SIGN-1	TITLE SHEET

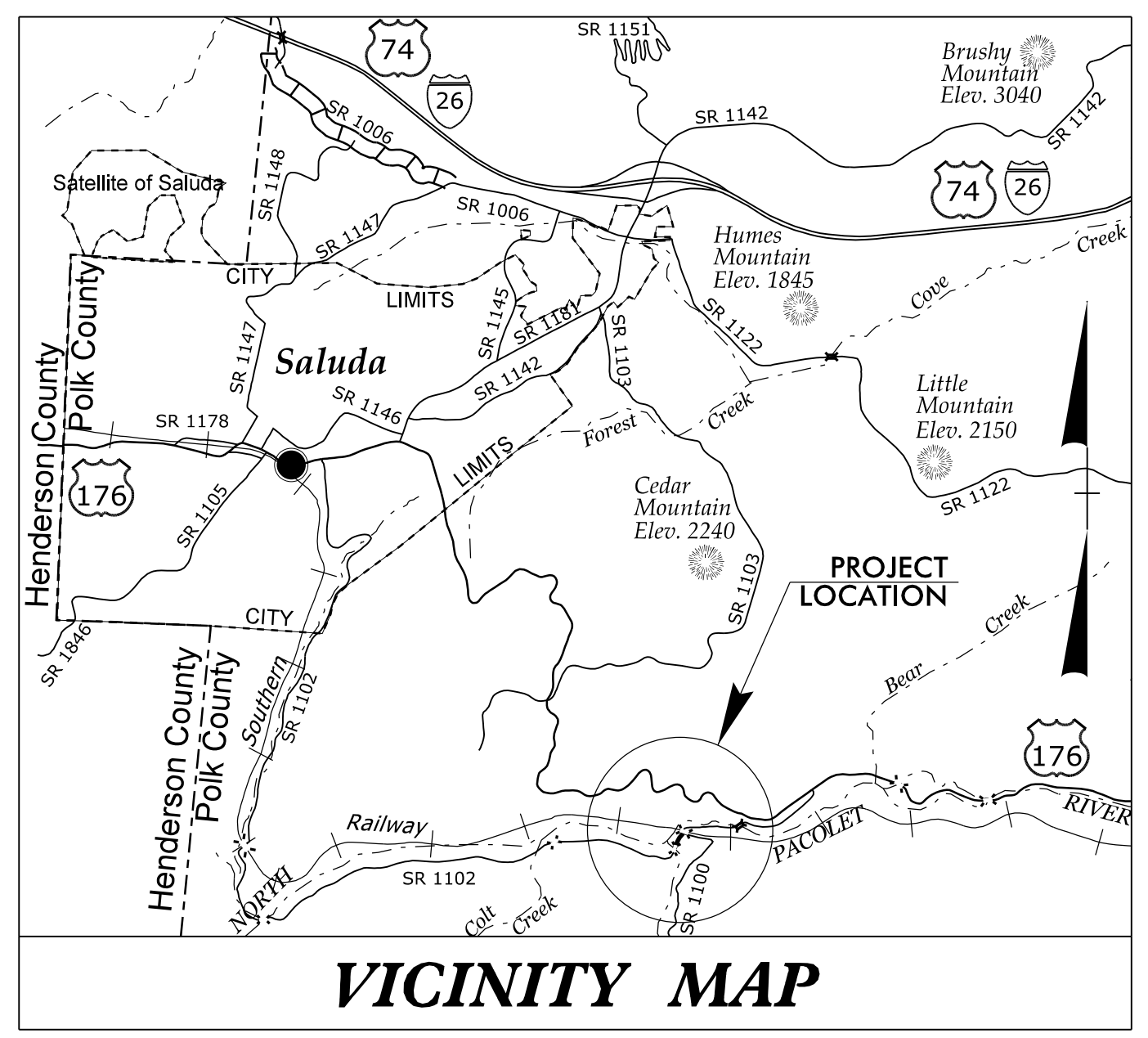
09_208/299

T.I.P. NO.	SHEET NO.
B-4792	UO-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

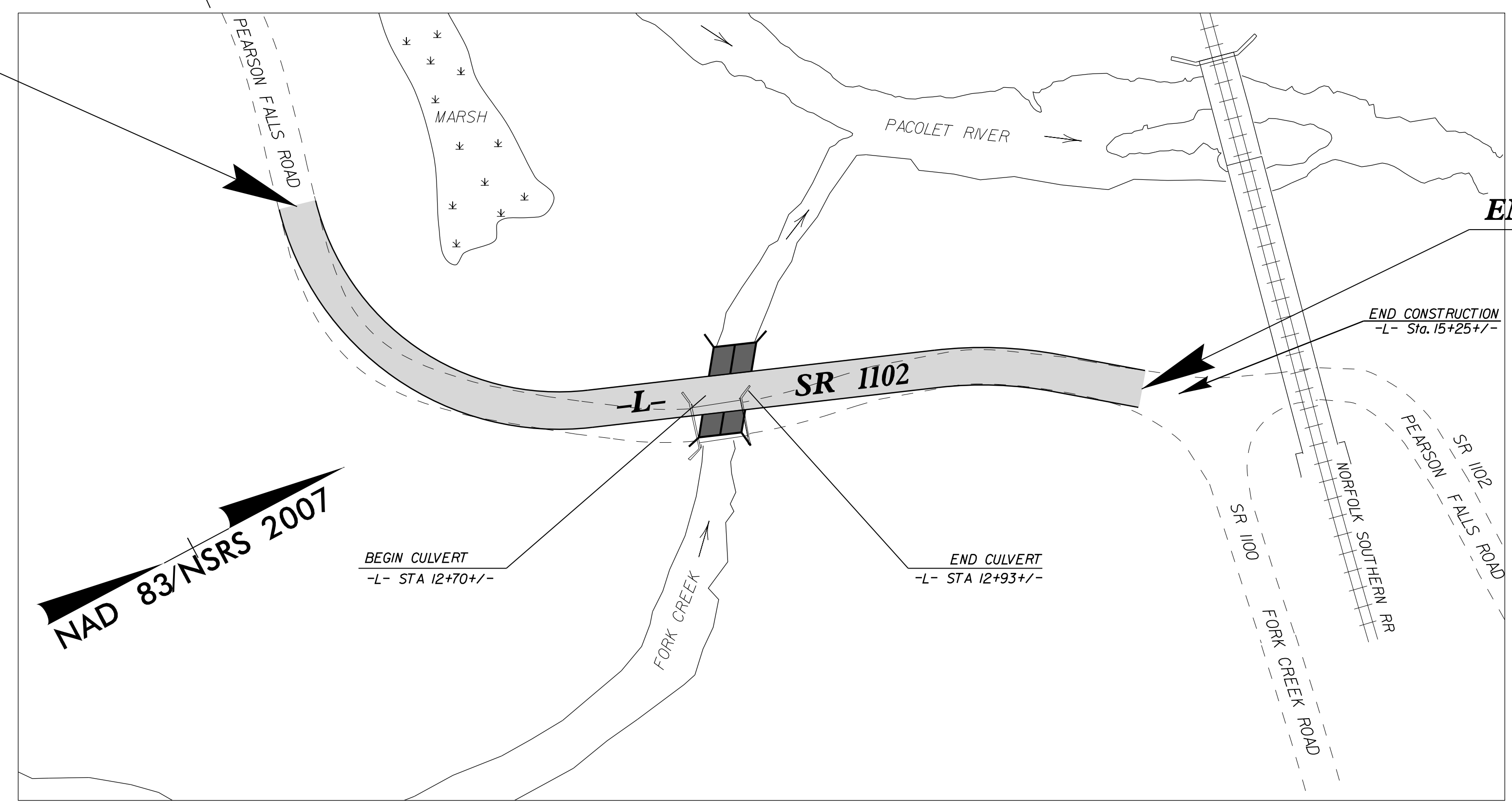
**UTILITIES BY OTHERS PLANS
POLK COUNTY**

LOCATION: BRIDGE NO. 4 OVER SMALL BRANCH OF PACOLET RIVER ON SR 1102
TYPE OF WORK: UNDERGROUND POWER AND TELEPHONE, AERIAL POWER AND TELEPHONE

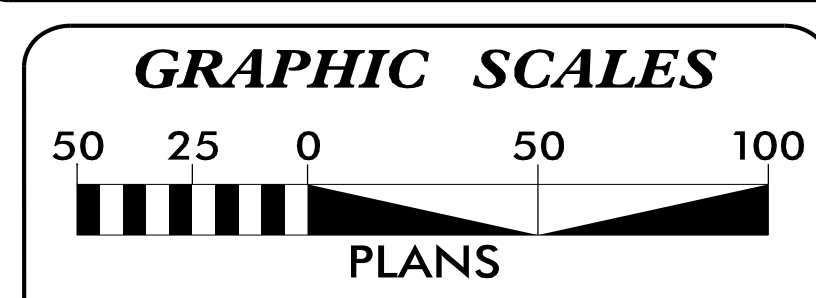


TIP PROJECT: B-4792

BEGIN TIP PROJECT No. B-4792
-L- PC Sta. 9+99.74



END TIP PROJECT No. B-4792
-L- Sta. 15+05.00

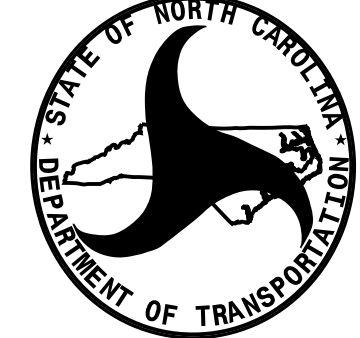


INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
UO-1	TITLE SHEET
UO-2	UTILITY BY OTHERS PLAN SHEETS

UTILITY OWNERS ON PROJECT

- (1) POWER - DUKE - (DUKE ENERGY PROGRESS)
- (2) TELEPHONE - TDS - (TDS TELECOM)
- (3) FIBER - PALMETTO NET - (PALMETTO NET) - NO CONFLICT

PLANS PREPARED BY:
RS&H



PREPARED FOR THE OFFICE OF:
DIVISION OF HIGHWAYS
UTILITIES ENGINEERING SECTION

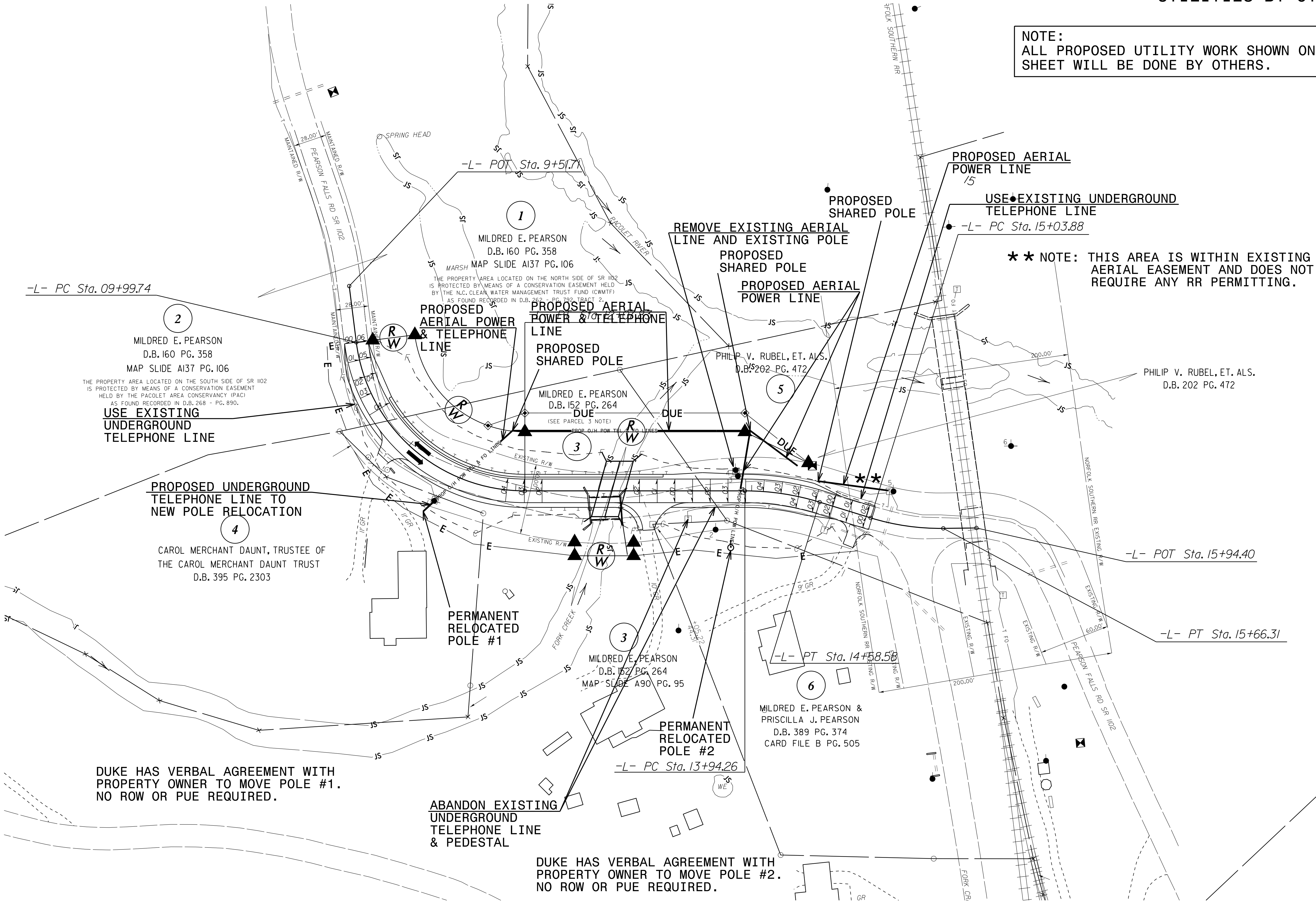
1591 MAIL SERVICES CENTER
RALEIGH, NC 27699-1591
PHONE (919) 250-4128
FAX (919) 250-4119

Jaston Talley, P.E. UTILITIES PROJECT DESIGNER

09-NOV-2015 14:59 R:\UtilFiles\B4792_Ut_1.tsh.dgn

UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS.



B:17/99

RS: NOV 2015 15:40
RS: Util: res: B-4792_U0.dgn

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJ. REFERENCE NO.	SHEET NO.
B-4792	X-1A

Approximate quantities only. Unclassified excavation, borrow excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the lump sum price for "Grading".

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

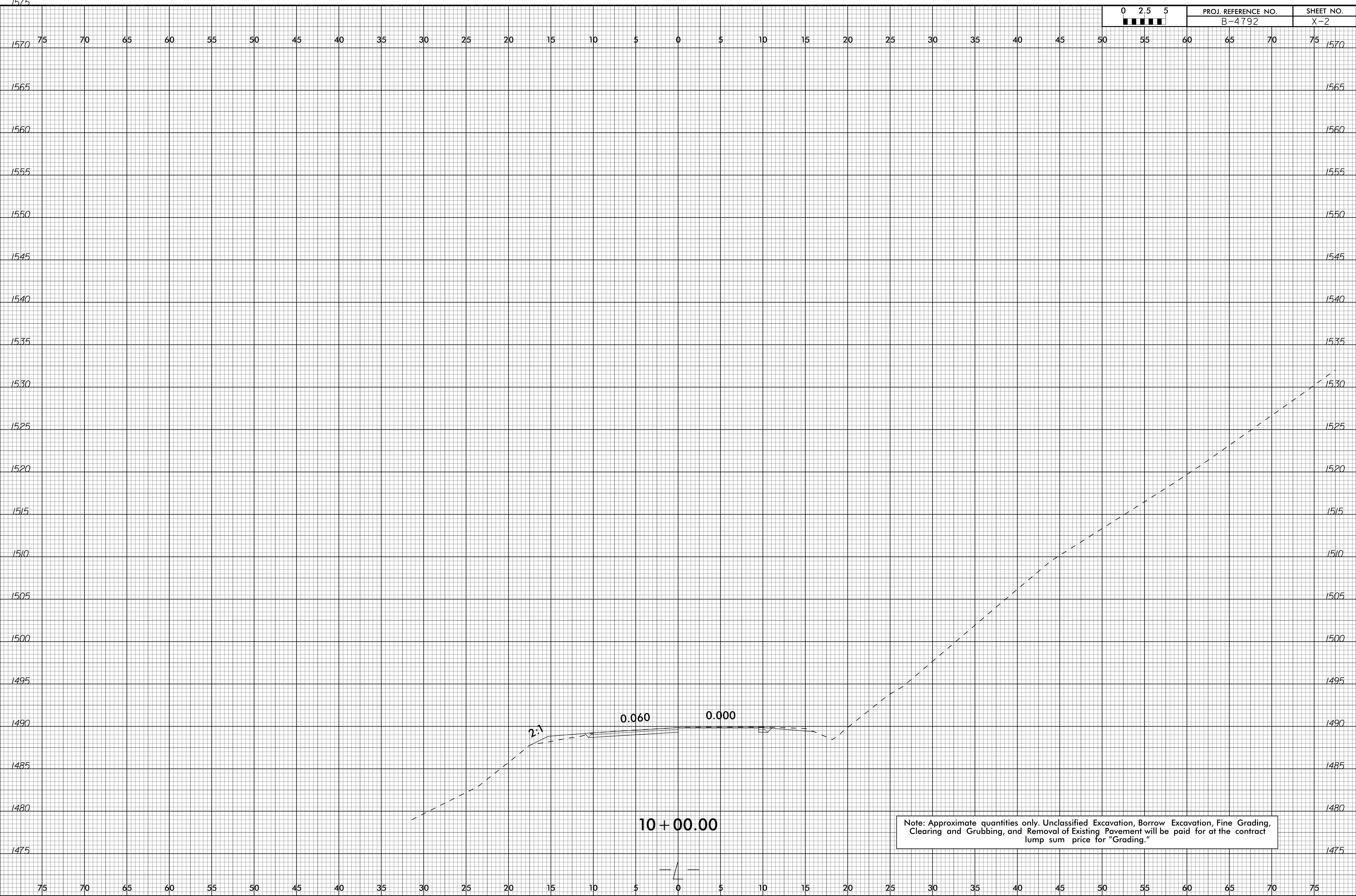
CROSS-SECTION SUMMARY

Station	Uncl. Exc.	Embt	Station	Uncl. Exc.	Embt
L	(cu. yd.)	(cu. yd.)	L	(cu. yd.)	(cu. yd.)
Phase I			Phase II		
9+99.74	0	0	9+99.74	0	0
10+00.00	0	0	10+00.00	0	0
10+10.00	2	11	10+10.00	1	0
10+20.00	1	24	10+20.00	1	0
10+30.00	1	28	10+30.00	1	0
10+40.00	0	34	10+40.00	1	0
10+50.00	0	39	10+50.00	1	0
10+60.00	0	46	10+60.00	1	0
10+70.00	0	53	10+70.00	3	0
10+80.00	0	60	10+80.00	5	0
10+90.00	0	65	10+90.00	9	0
11+00.00	0	66	11+00.00	12	0
11+10.00	0	66	11+10.00	12	0
11+20.00	0	62	11+20.00	12	0
11+30.00	0	54	11+30.00	14	0
11+40.00	0	46	11+40.00	16	1
11+50.00	0	42	11+50.00	18	2
11+60.00	0	39	11+60.00	24	3
11+70.00	0	37	11+70.00	31	3
11+80.00	0	35	11+80.00	35	5
11+90.00	0	34	11+90.00	34	7
12+00.00	0	35	12+00.00	16	9
12+10.00	0	39	12+10.00	0	10
12+20.00	0	42	12+20.00	0	9
12+30.00	0	41	12+30.00	0	8
12+40.00	0	38	12+40.00	0	8
12+50.00	0	36	12+50.00	0	7
12+60.00	0	38	12+60.00	0	6
12+70.00	0	49	12+70.00	0	38
12+80.00	0	67	12+80.00	0	70
12+81.60	0	0	12+81.60	0	0
12+90.00	0	64	12+90.00	0	29
13+00.00	0	54	13+00.00	1	1
13+10.00	0	23	13+10.00	2	0
13+20.00	0	13	13+20.00	3	0
13+30.00	0	13	13+30.00	4	0
13+40.00	0	11	13+40.00	7	0
13+50.00	0	5	13+50.00	15	0
13+60.00	1	2	13+60.00	25	1
13+70.00	1	1	13+70.00	33	1
13+80.00	1	1	13+80.00	41	1
13+90.00	1	1	13+90.00	47	1
14+00.00	0	1	14+00.00	48	1
14+10.00	0	1	14+10.00	49	1
14+20.00	0	1	14+20.00	53	1
14+30.00	0	1	14+30.00	52	1
14+40.00	0	1	14+40.00	48	1
14+50.00	1	0	14+50.00	44	0
14+60.00	1	0	14+60.00	21	1
14+70.00	0	0	14+70.00	0	1
14+80.00	0	0	14+80.00	0	1
14+90.00	0	0	14+90.00	0	1
15+00.00	0	0	15+00.00	0	0
15+05.00	0	0	15+05.00	0	0
15+10.00	0	0	15+10.00	0	0
Phase I Total	10	1419	Phase II Total	740	229

INDEX OF SHEETS	
-L-	X-2 THRU X-11

8/23/99

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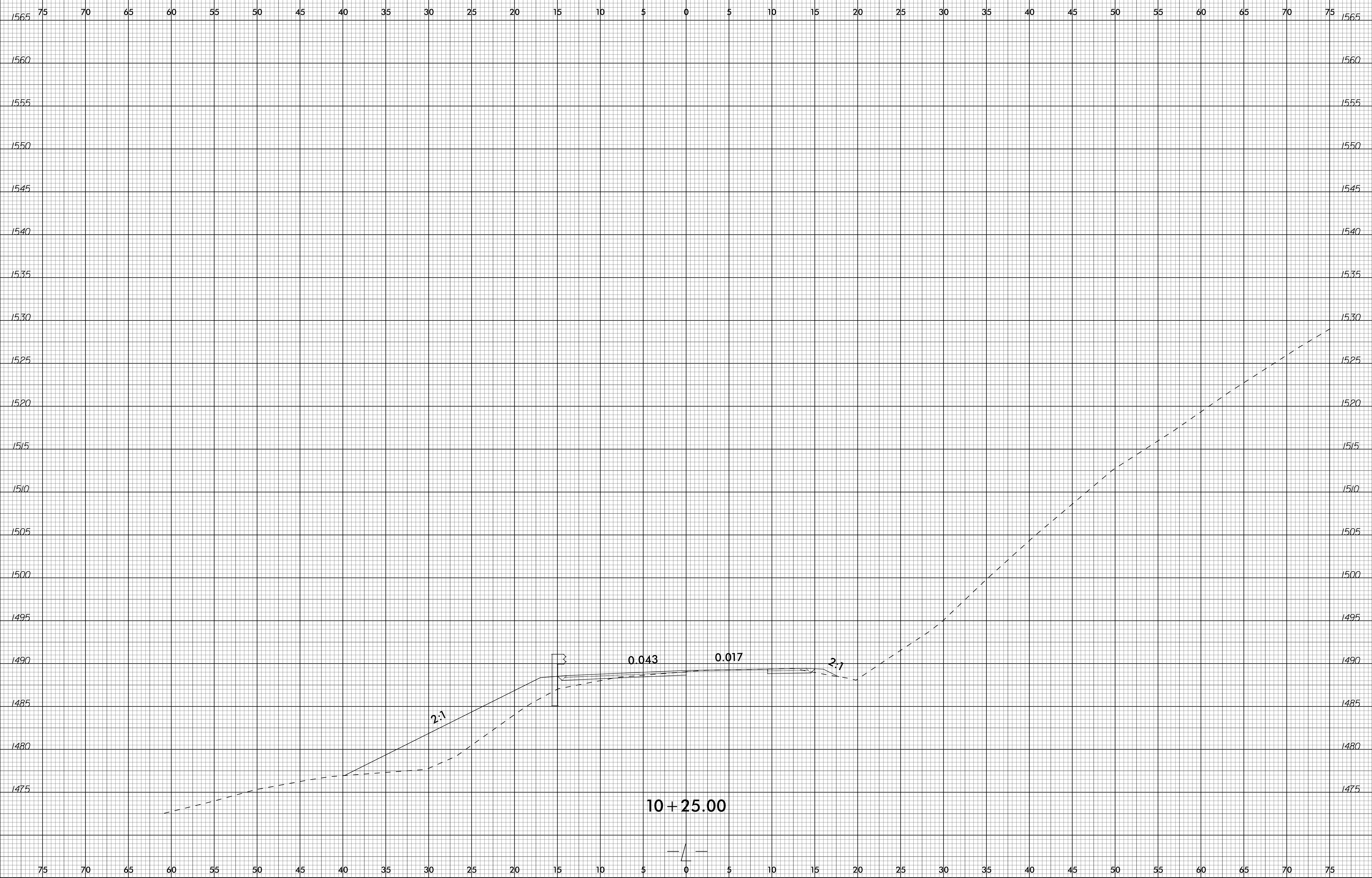


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Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing and Grubbing, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

8/23/99

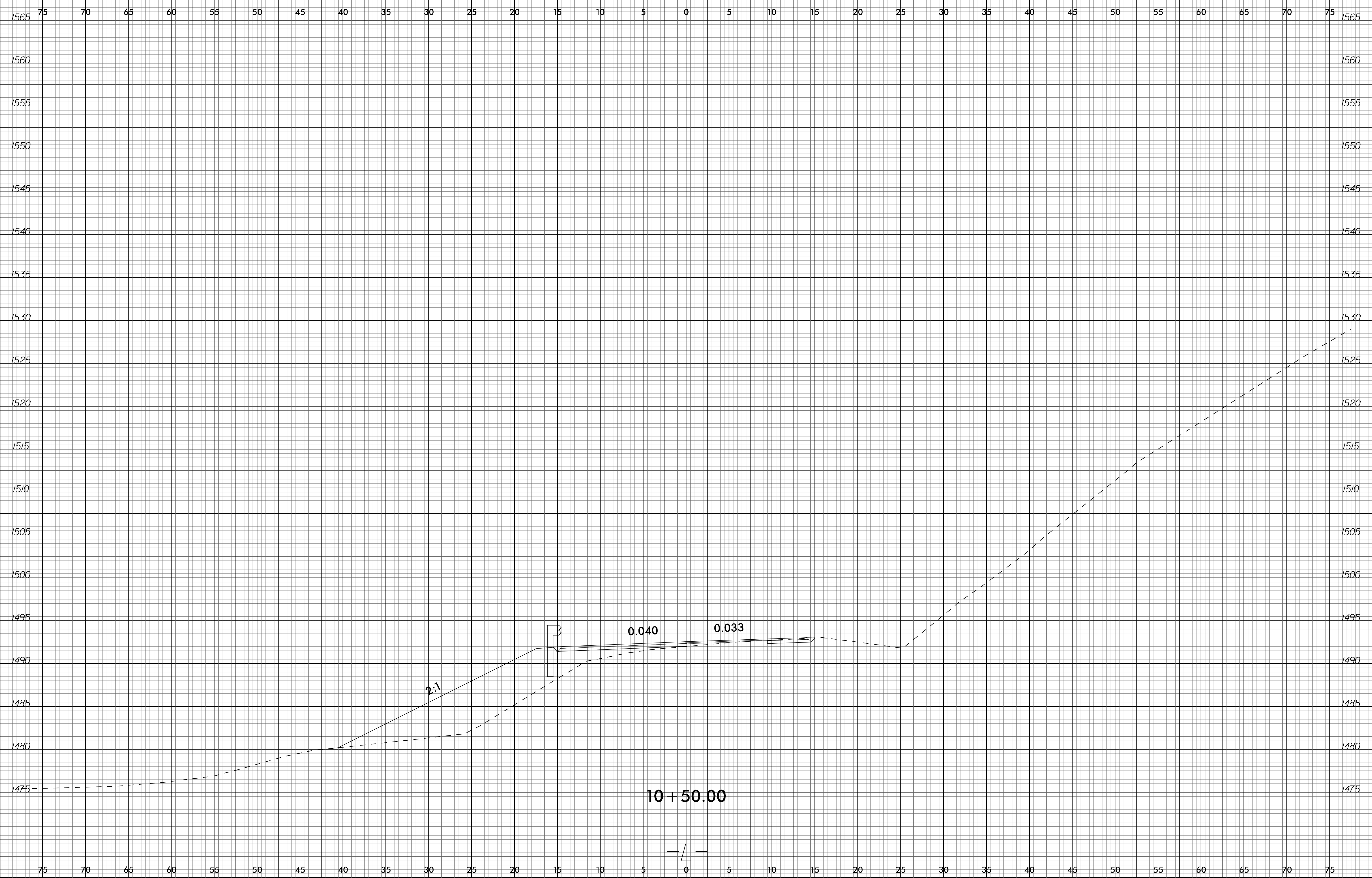
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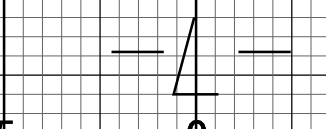
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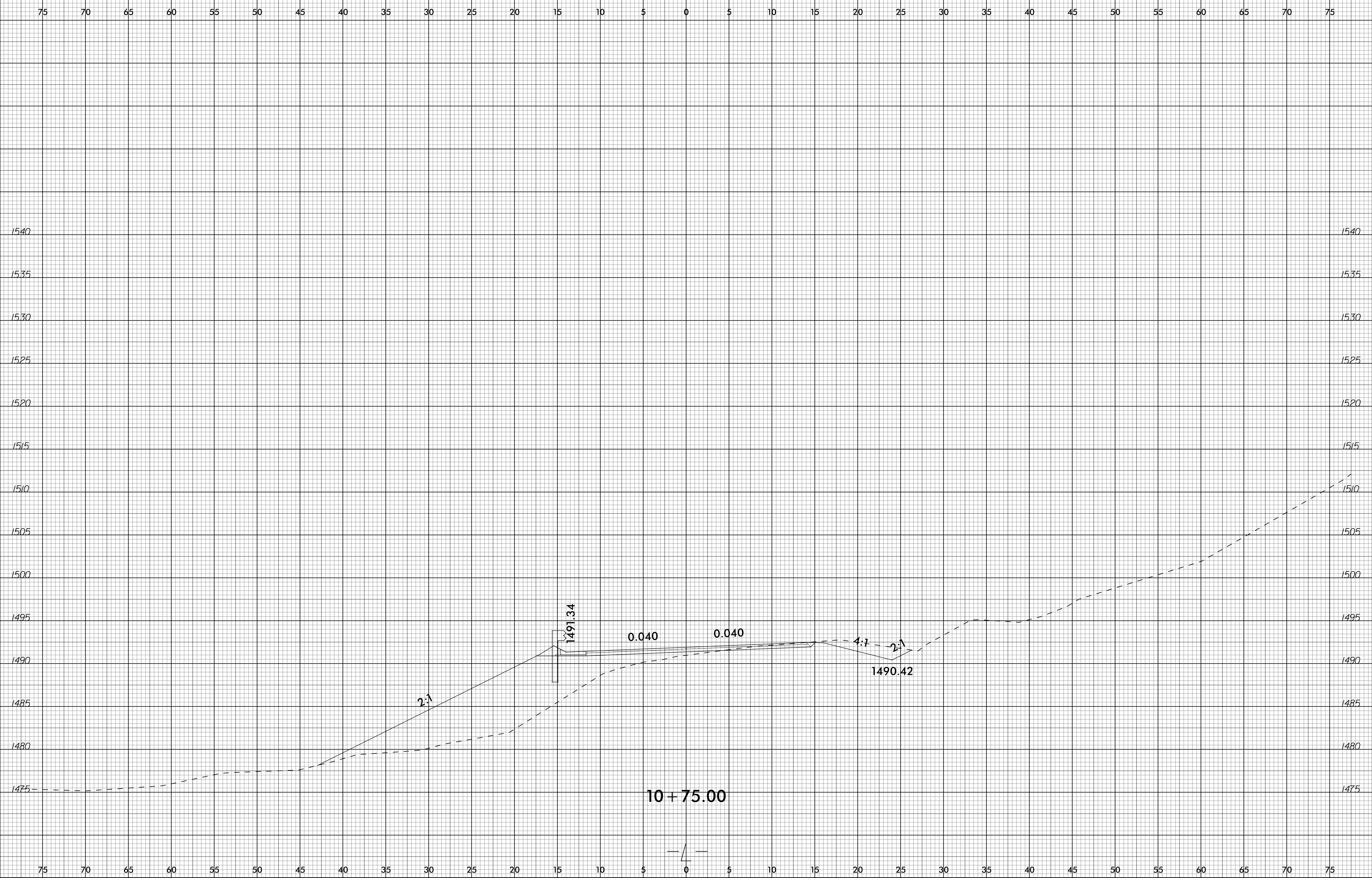


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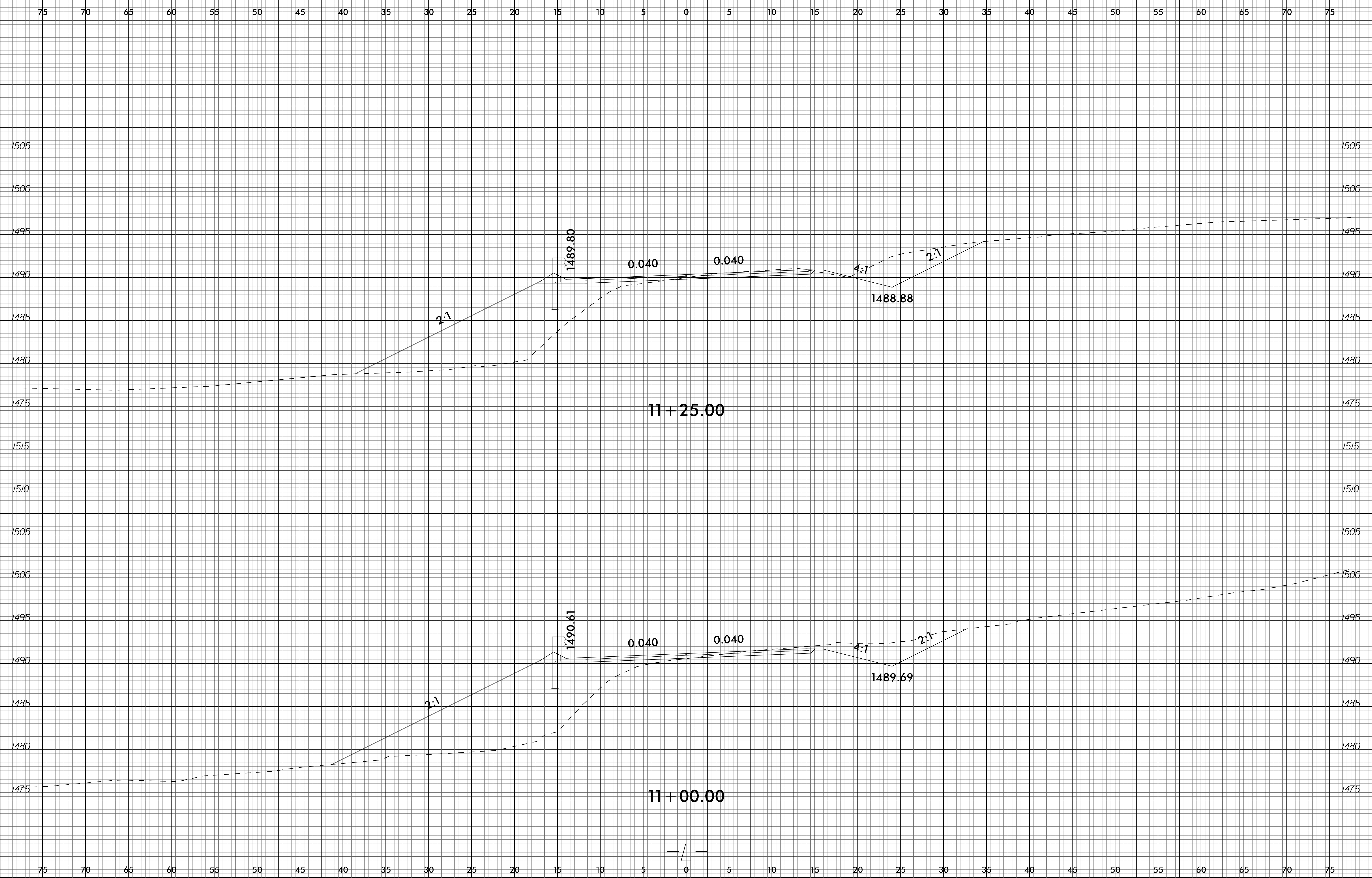
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8/23/99

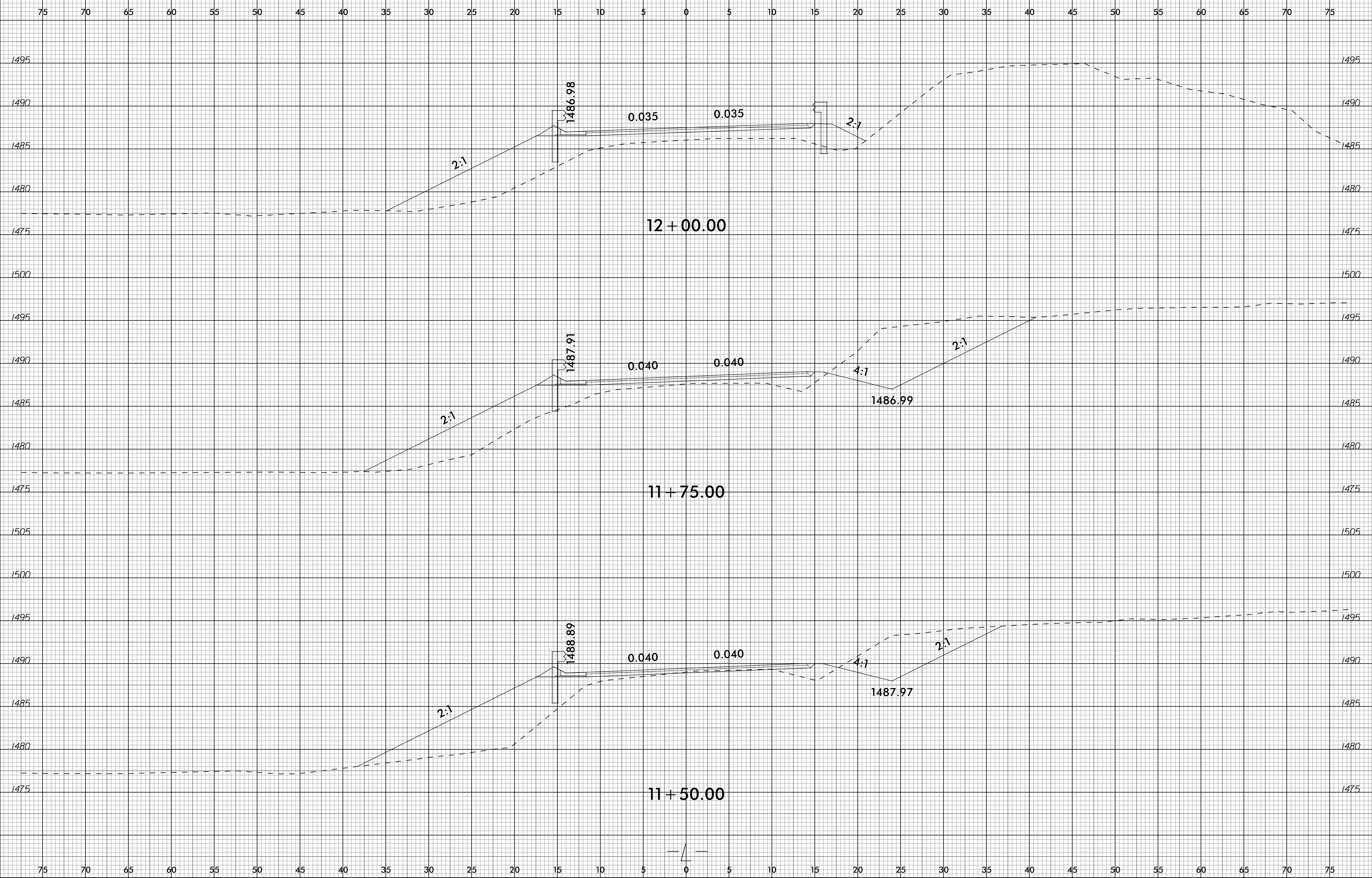
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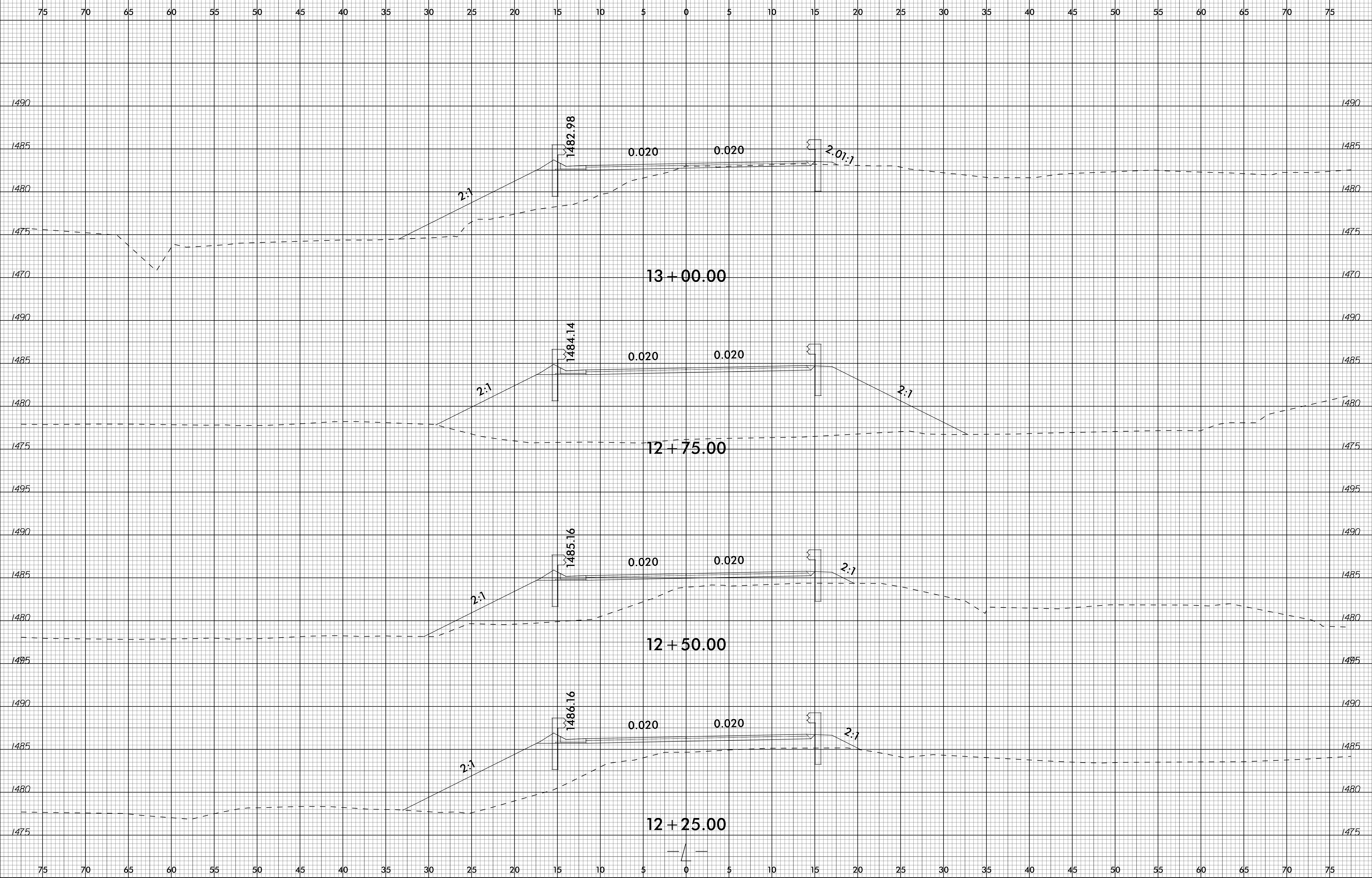
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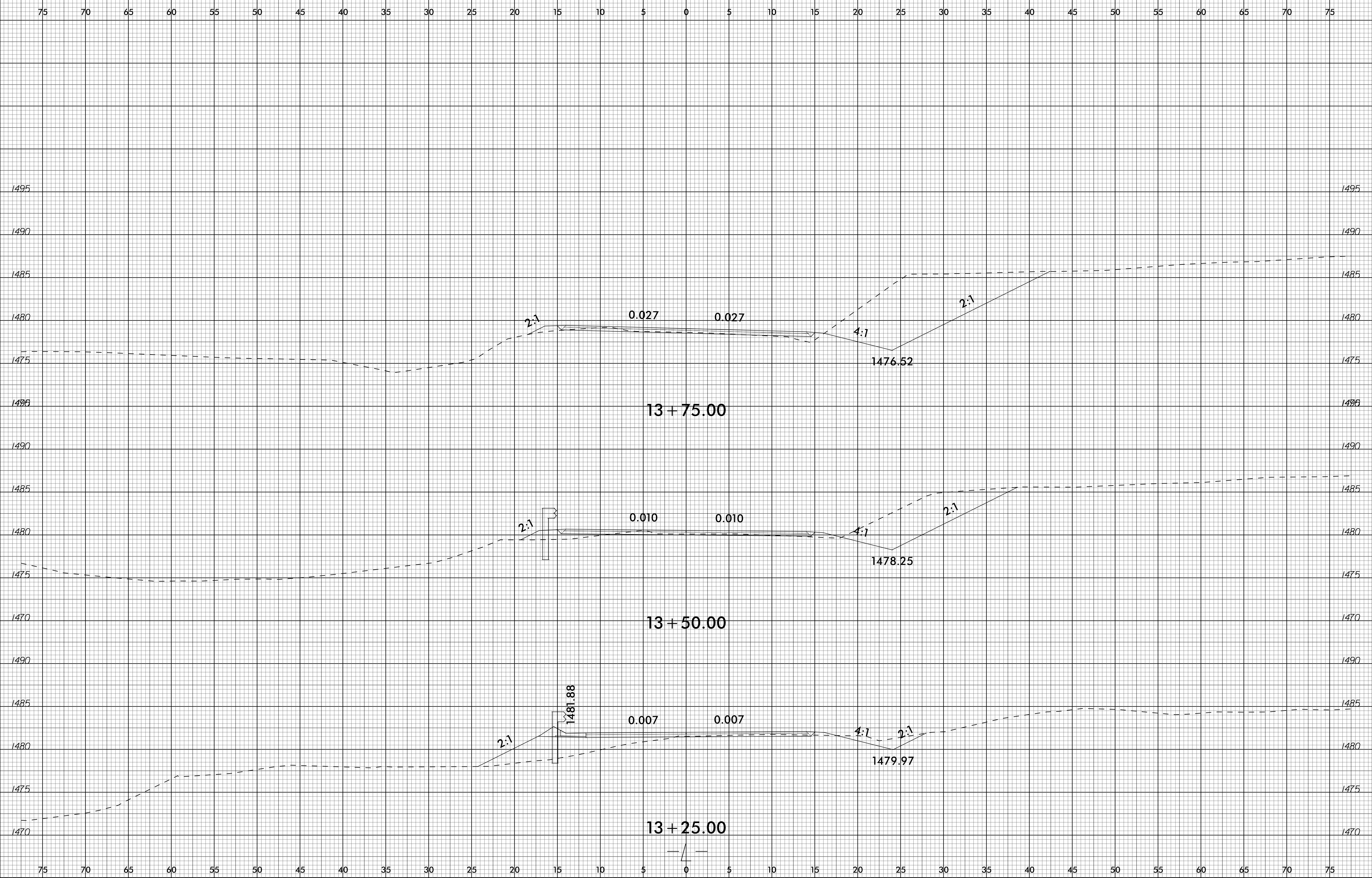
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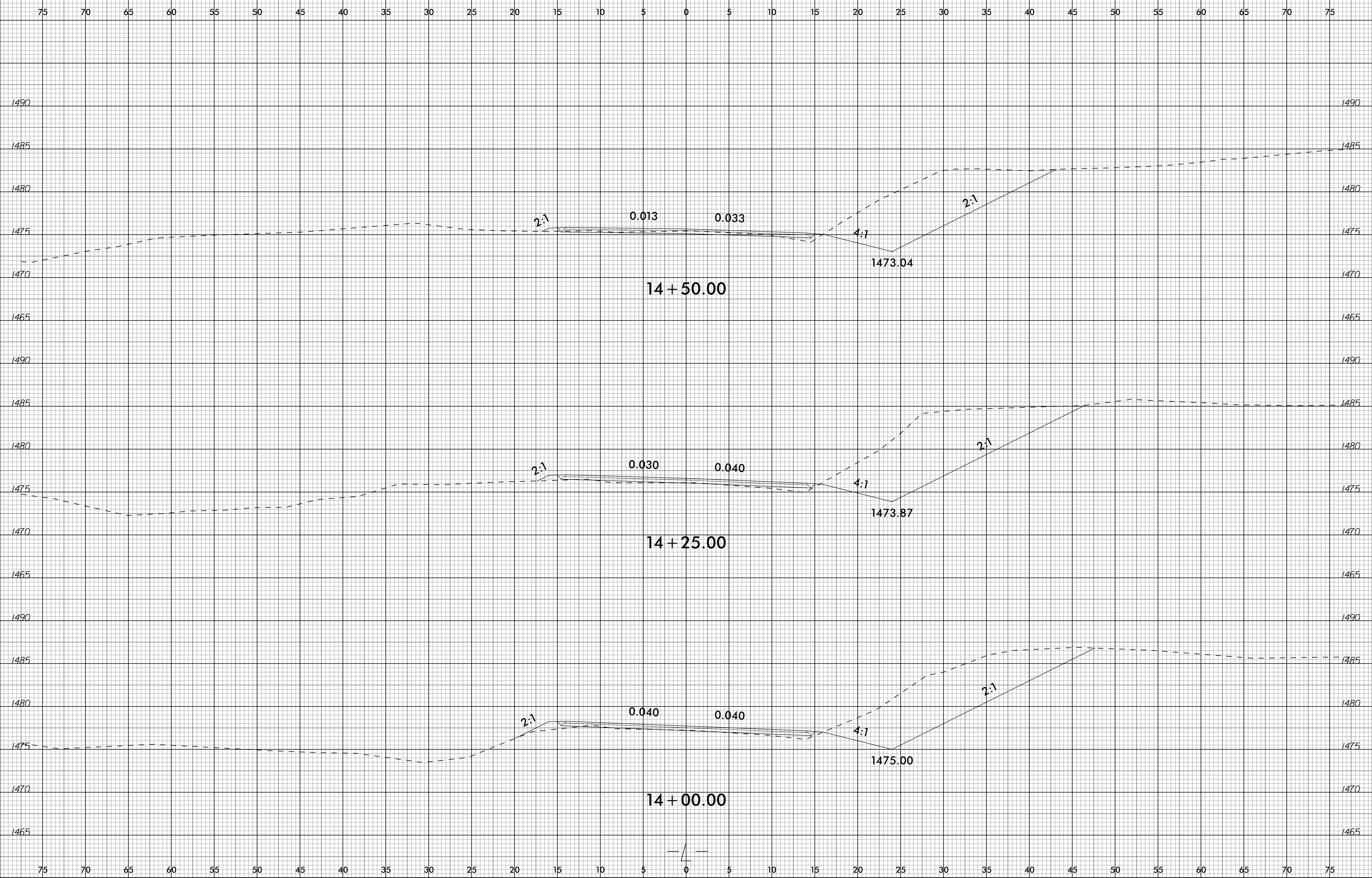
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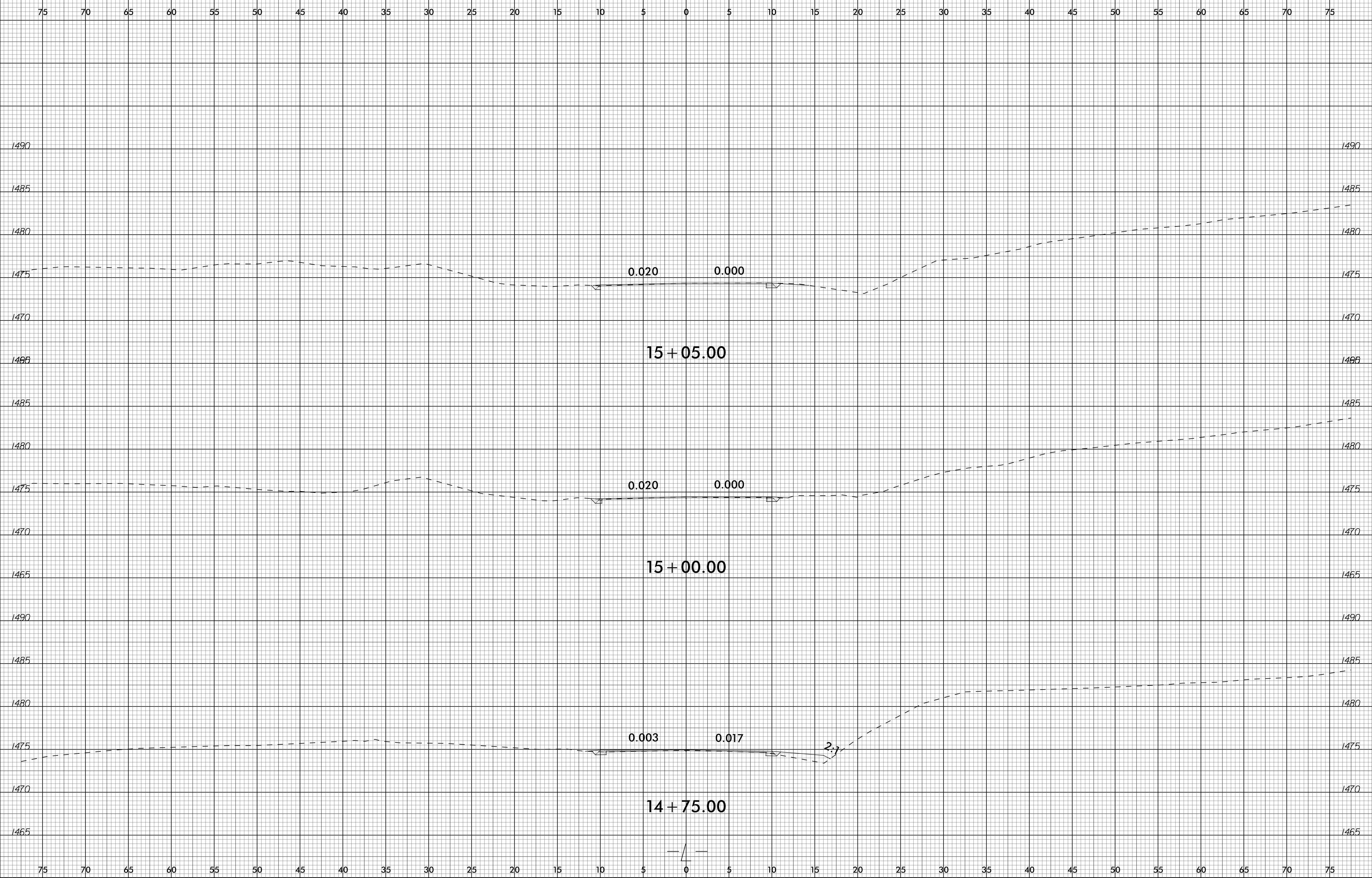
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