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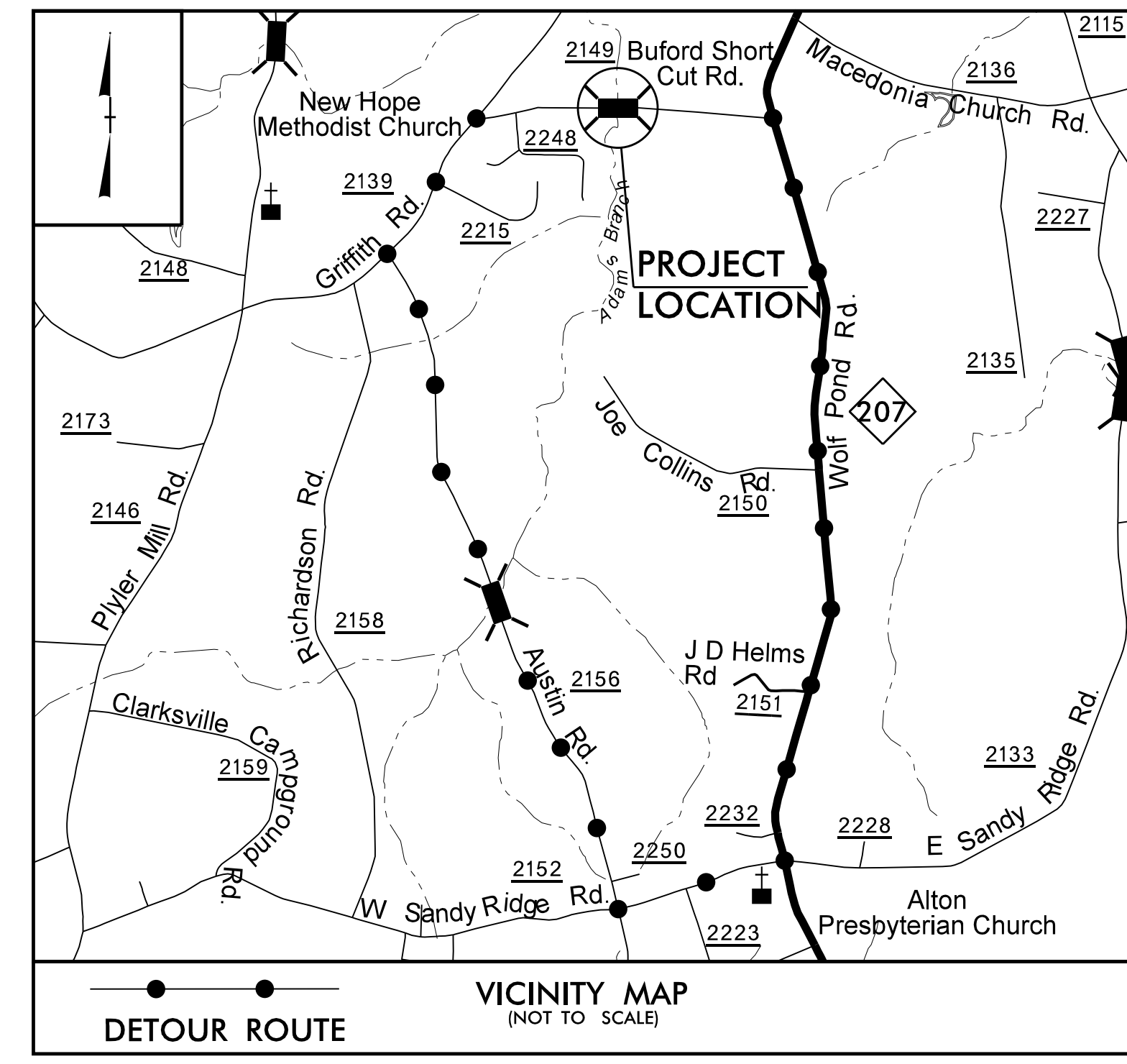
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09.08/2019

**STATE PROJECT: 17BP.10.R.118**

**CONTRACT: DJ00376**

See Sheet 1A For Index of Sheets



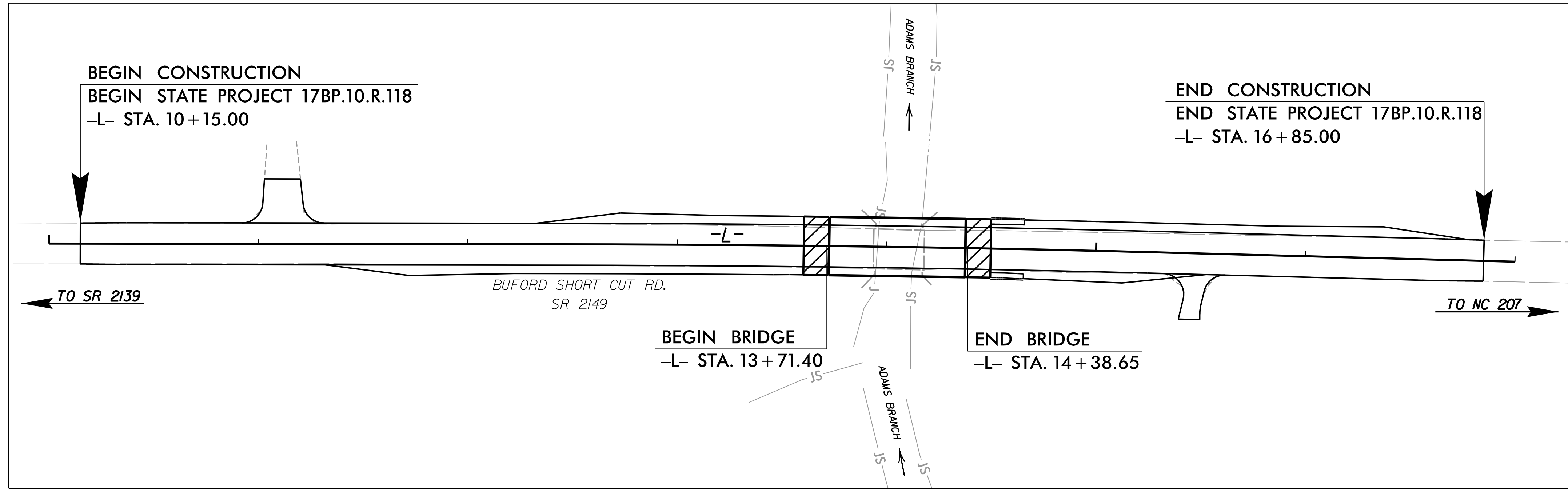
**FINAL PLANS**

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**UNION COUNTY**

**LOCATION: BRIDGE NO. 358 ON SR 2149 OVER ADAMS BRANCH BETWEEN SR 2139 AND NC 207**

**TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE**

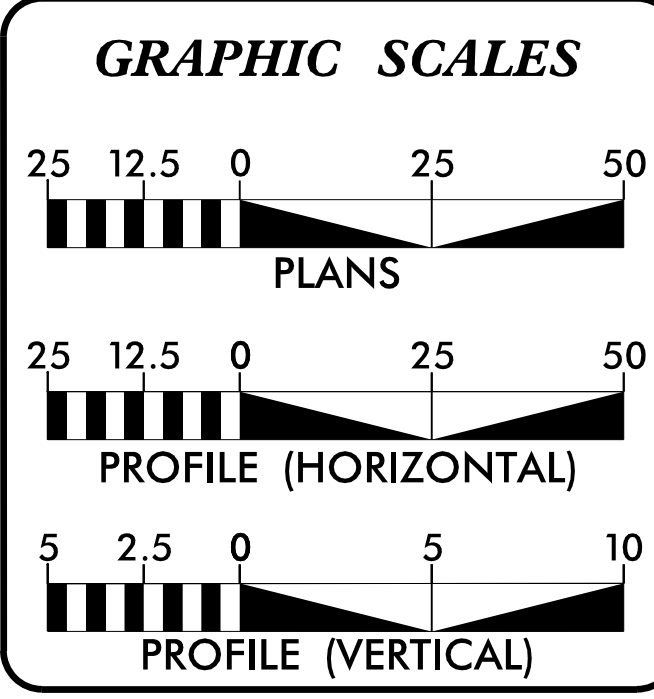
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.10.R.118	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
17BP.10.R.118		P.E., R/W, CONSTR.	



LOCATION SKETCH

**HDR** HDR Engineering, Inc. of the Carolinas  
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601  
N.C.B.E.L.S. License Number: F-0116

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**DESIGN DATA**

ADT 2017 = 800  
ADT 2040 = 1600

DHV = %  
D = %  
T = 6 %  
V = 55 MPH

FUNC CLASS =  
LOCAL RURAL  
SUBREGIONAL TIER

**PROJECT LENGTH**

LENGTH ROADWAY STATE PROJECT 17BP.10.R.118 = 0.114 MILES  
LENGTH STRUCTURES STATE PROJECT 17BP.10.R.118 = 0.013 MILES  
TOTAL LENGTH STATE PROJECT 17BP.10.R.118 = 0.127 MILES

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

2018 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:** APRIL 5, 2019  
**LETTING DATE:** APRIL 7, 2021

**CHARLES A. ABERNATHY, P.E.**  
PROJECT ENGINEER

**T. NATHAN BEDENBAUGH, P.E.**  
PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**  
2/19/2021


**ROADWAY DESIGN ENGINEER**  
2/19/2021

Seal for James R. Rice, P.E. (Seal 031986)  
Seal for Alexander D. Snider, P.E. (Seal 041473)

**DIVISION OF HIGHWAYS**  
STATE OF NORTH CAROLINA

**BRETT D. CANIPE** P.E.  
DIVISION ENGINEER

8/17/99

PROJECT REFERENCE NO. <i>17BPJORJ18</i>	SHEET NO. <i>1A</i>
ROADWAY DESIGN ENGINEER PROFESSIONAL SEAL 041473 2/19/2021 H. W. WYLER, D. CIVIL	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
 HDR Engineering, Inc. of the Carolinas 555 Fayetteville St. Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116	

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2B-1	STRUCTURE ANCHOR UNITS DETAIL
2D-1	DRAINAGE DETAILS
3	RIGHT-OF-WAY AREA DATA, SUMMARY OF DRAINAGE QUANTITIES, SUMMARY OF GUARDRAIL
3G-1	GEOTECHNICAL SUMMARY
4	PLAN AND PROFILE SHEET
TMP-1 THRU TMP-2	TRAFFIC MANAGEMENT PLAN
PMP-1 THRU PMP-2	PAVEMENT MARKING PLAN
SD-01	DETOUR SIGN DESIGN
EC-1 THRU EC-5	EROSION CONTROL PLANS
X-1 THRU X-11	CROSS-SECTIONS
S-1 THRU S-14	STRUCTURE PLANS
S-15	STRUCTURE STANDARD NOTES

GENERAL NOTES: 2018 SPECIFICATIONS  
EFFECTIVE: 01-16-2018  
REVISED:

GRADE LINE:  
GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED 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 II.

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

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3 FOOT RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS 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.

END BENTS:

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY OTHERS.

EFF. 01-16-2018  
REV.

2018 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, 2018 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 4 - MAJOR STRUCTURES	
422.01	Bridge Approach Fills - Type I Standard Approach Fill
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
848.02	Driveway Turnout - Radius Type
862.01	Guardrail Placement
862.02	Guardrail Installation
866.02	Woven Wire Fence - with Wood Post
876.04	Drainage Ditches with Class 'B' Rip Rap

2/12/2021 8:00:35 AM RDY\_TSH.DGN

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: Boundary or Site, Potential Soil Contamination: Boundary 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 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, Curb Cut Future Ramp, Existing Metal Guardrail, Proposed Guardrail, Existing Cable Guiderail, Proposed Cable Guiderail, Equality Symbol, Pavement Removal.

Table listing symbols for roads and related features: Proposed Curb Ramp, Curb Cut Future 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.

04.16/11

8/17/99

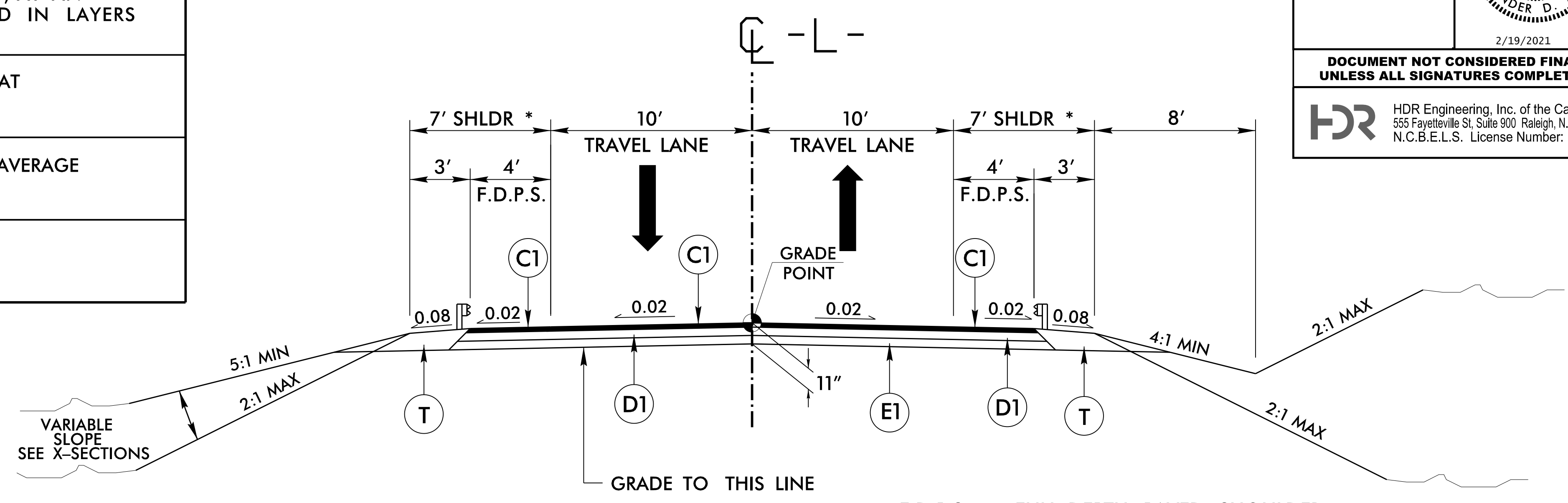
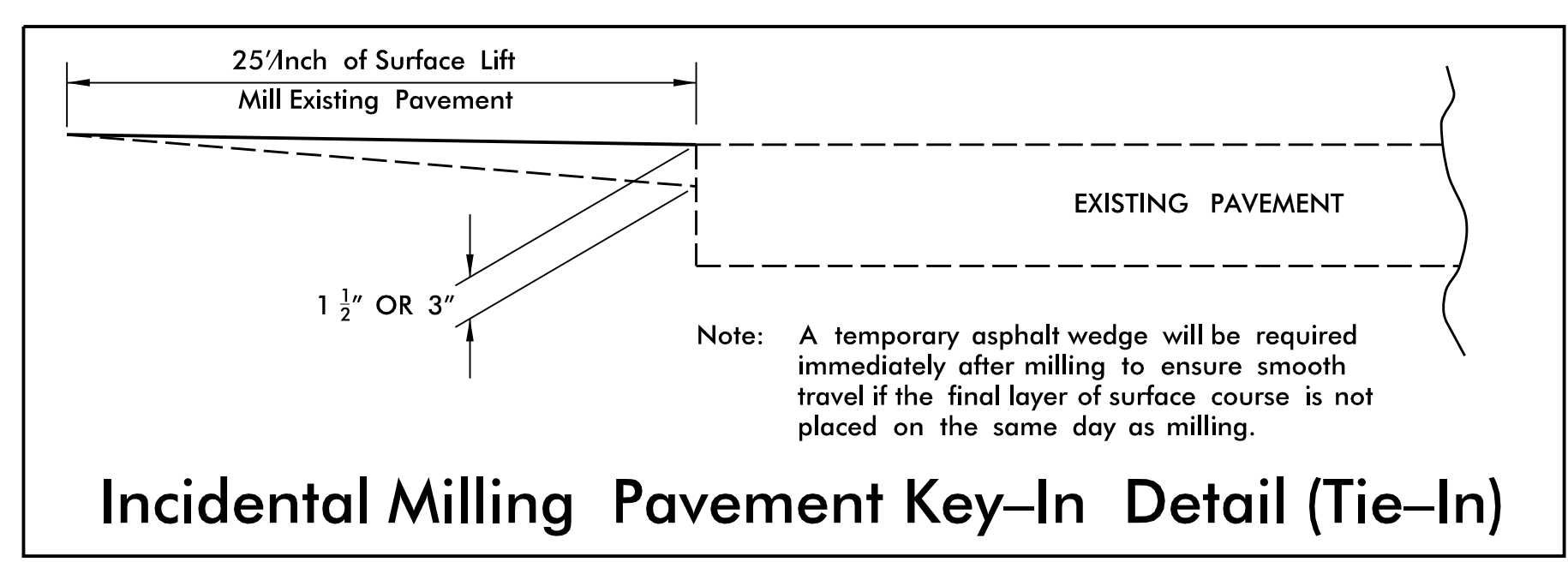
# PAVEMENT SCHEDULE

C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQUARE YARD IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQUARE YARD.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQUARE YARD.
T	EARTH MATERIAL

NOTE: ALL DRIVEWAYS, UP TO THE RADIUS POINT, SHALL BE CONSTRUCTED WITH THE FULL-DEPTH PAVEMENT OF THE INTERSECTING ROADWAY. THE REMAINDER OF THE DRIVEWAY SHALL BE PAVED WITH 8" INCIDENTAL STONE BASE.

PROJECT REFERENCE NO. 17BP10R118	SHEET NO. 2A-1
RW SHEET NO.	
PAVEMENT DESIGN ENGINEER	ROADWAY DESIGN ENGINEER
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HDR Engineering, Inc. of the Carolinas 555 Fayetteville St, Suite 900, Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116	

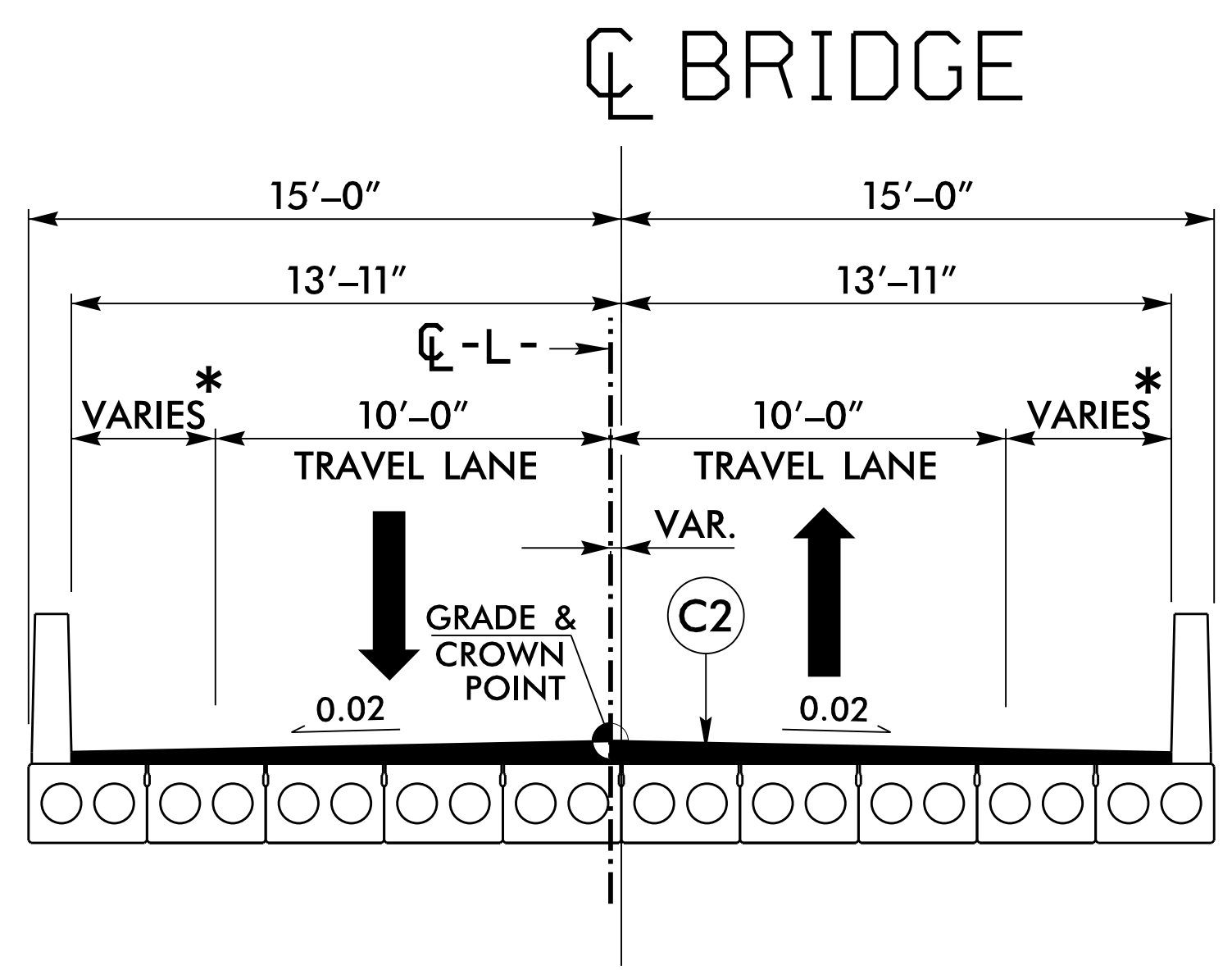
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE SHOWN.



F.D.P.S. = FULL DEPTH PAVED SHOULDER  
 \* USE 4' TOTAL TURF SHOULDER WIDTH WITHOUT GUARDRAIL

## TYPICAL SECTION NO. 1

LINE	FROM STATION	TO STATION
-L-	10+15.00	13+71.40 (BEGIN BRIDGE)
-L-	14+38.65 (END BRIDGE)	16+85.00

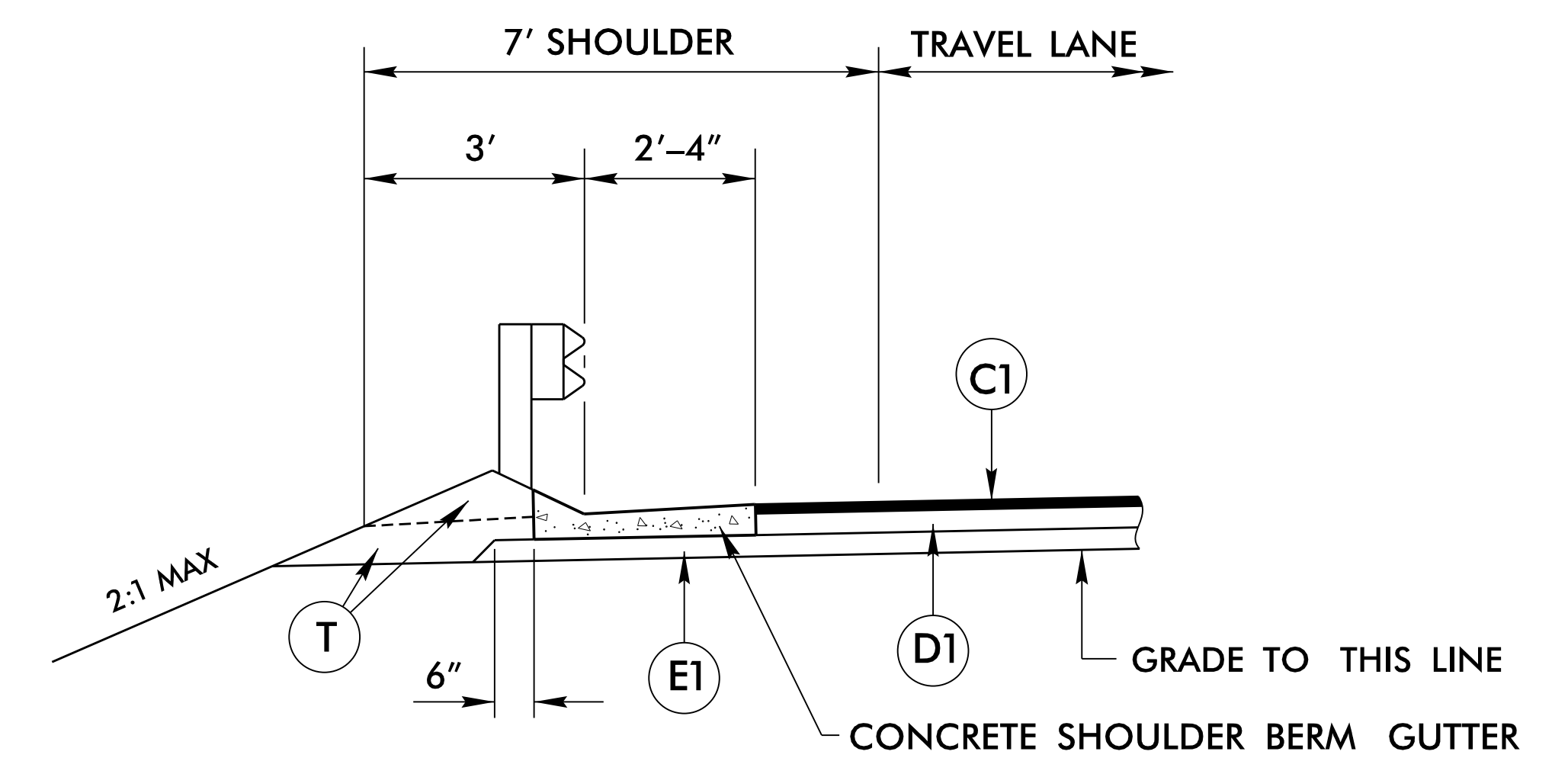


## TYPICAL SECTION NO. 2

**24" CORED SLAB BRIDGE**

LINE	FROM STATION	TO STATION
-L-	13+71.40	14+38.65

\* NOTE:  
 LEFT SHOULDER WIDTH ON BRIDGE VARIES FROM 3'-10" +/- TO 3'-11" +/-  
 RIGHT SHOULDER WIDTH ON BRIDGE VARIES FROM 3'-11" +/- TO 4'-0" +/-



## SHOULDER BERM GUTTER DETAIL

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 1

LINE	FROM STATION	TO STATION
-L-	14+50 +/-	14+66 +/-

REVISIONS

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

ROADWAY DETAIL DRAWING FOR  
**STRUCTURE ANCHOR UNITS**  
GUARDRAIL ANCHOR UNIT, TYPE III  
FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7  
**862D03**

ROADWAY DETAIL DRAWING FOR  
**STRUCTURE ANCHOR UNITS**  
GUARDRAIL ANCHOR UNIT, TYPE III  
FOR ATTACHMENT TO RAIL ON BRIDGE

**NOTE:**

- \*\*POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- \*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
- SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
- MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
- LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
- SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.

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

ROADWAY DETAIL DRAWING FOR  
**STRUCTURE ANCHOR UNITS**  
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO  
RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 1 OF 7  
**862D03**

ROADWAY DETAIL DRAWING FOR  
**STRUCTURE ANCHOR UNITS**  
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO  
RAIL ON BRIDGE - SUB REGIONAL TIER

**NOTE:**

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

ROADWAY DETAIL DRAWING FOR  
**STRUCTURE ANCHOR UNITS**  
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO  
RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7  
**862D03**

ROADWAY DETAIL DRAWING FOR  
**STRUCTURE ANCHOR UNITS**  
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO  
RAIL ON BRIDGE - SUB REGIONAL TIER

**NOTE:**

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- SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.



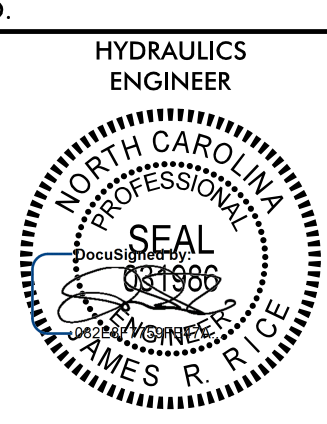

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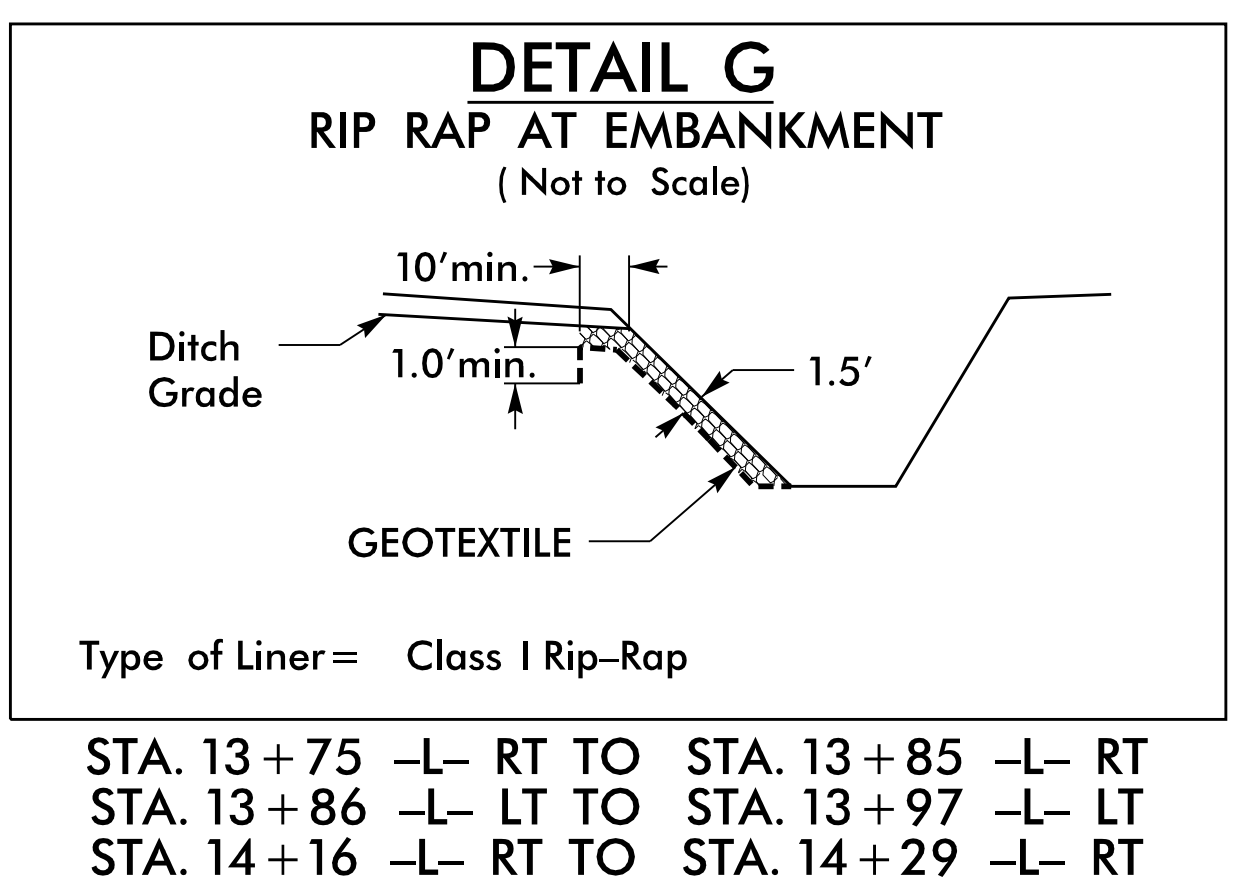
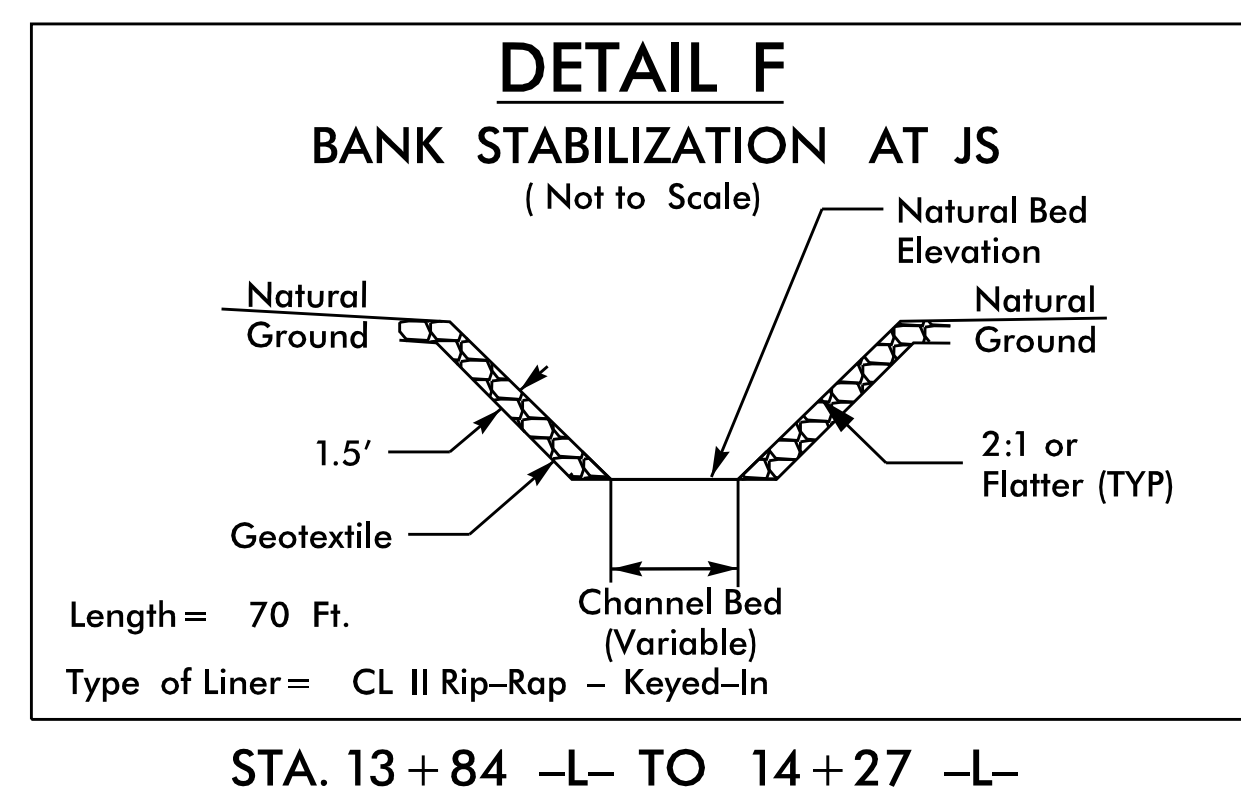
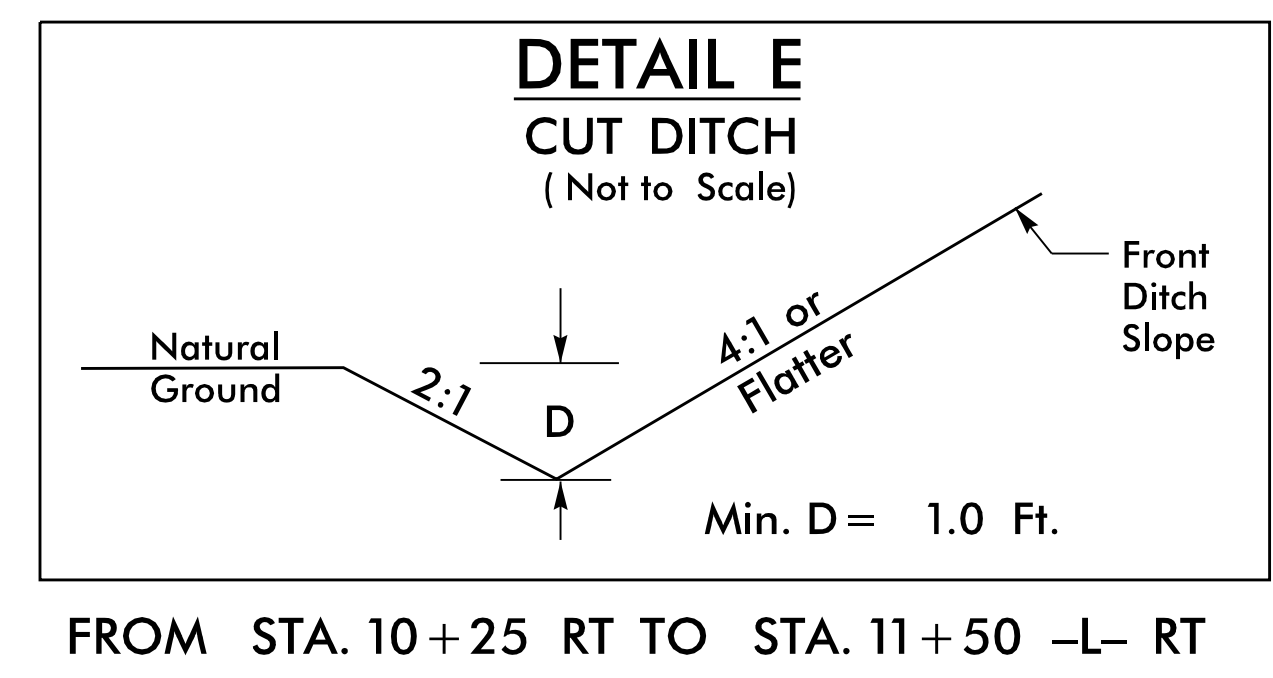
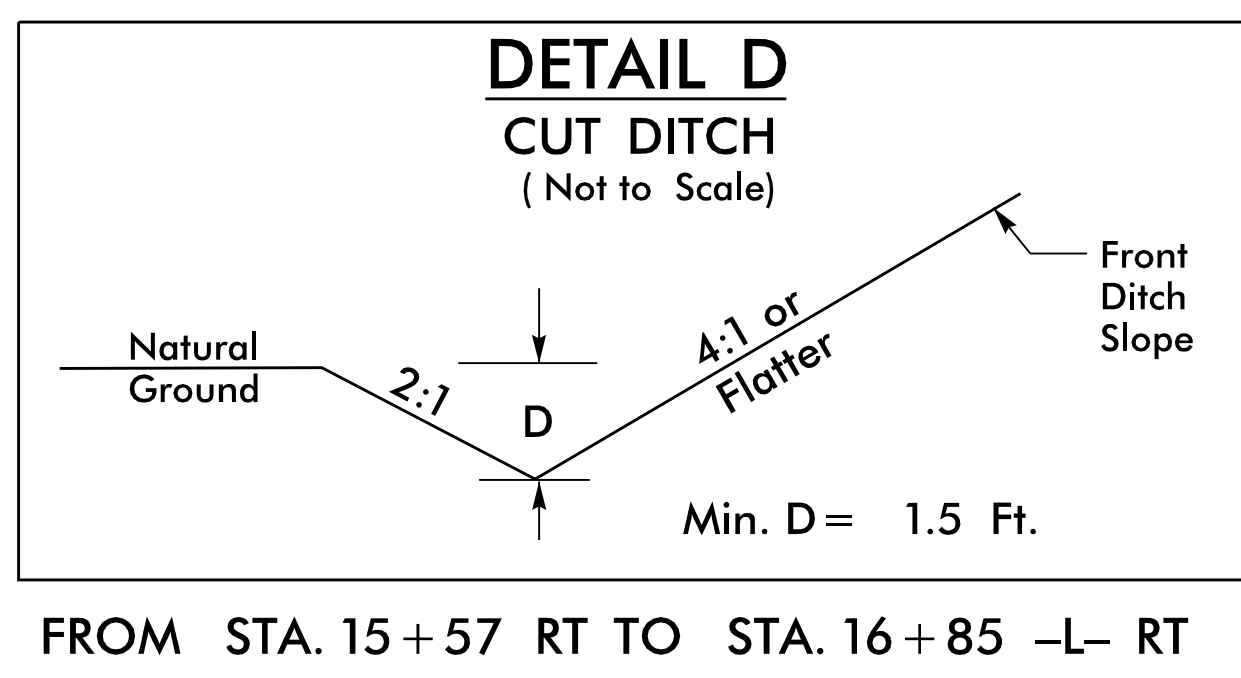
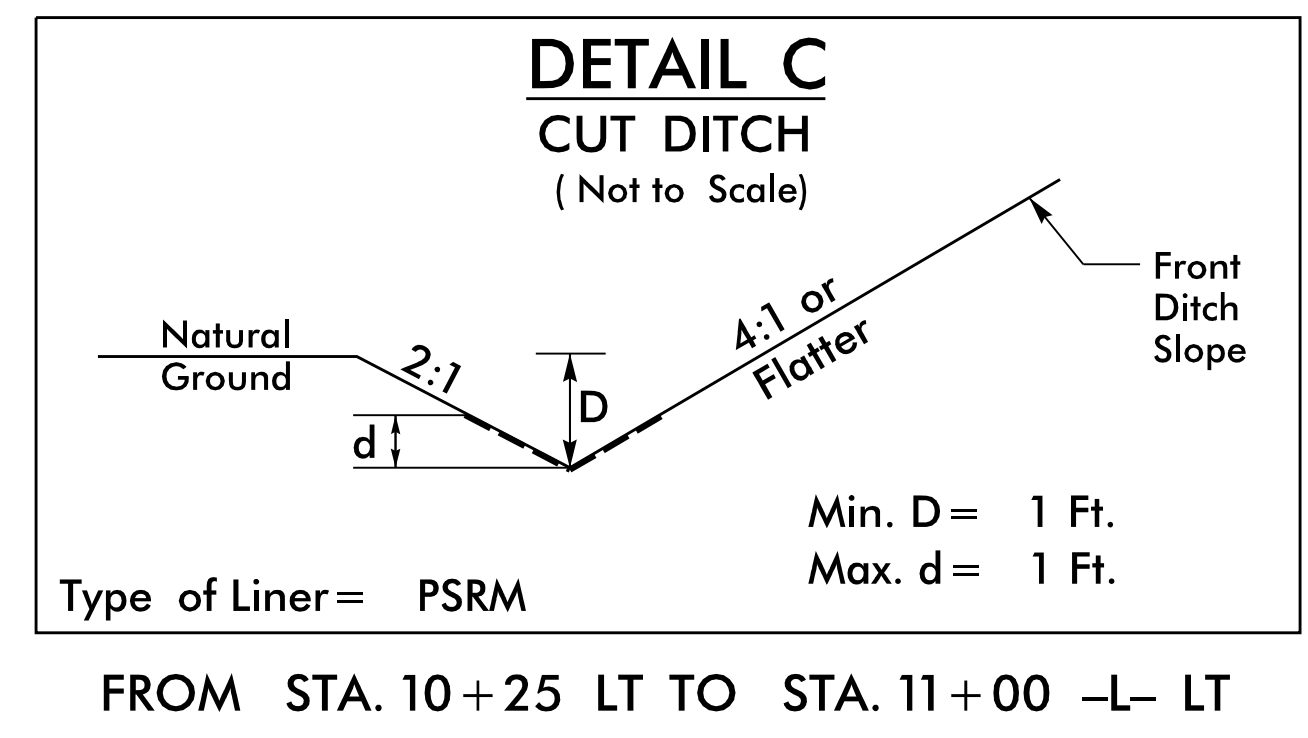
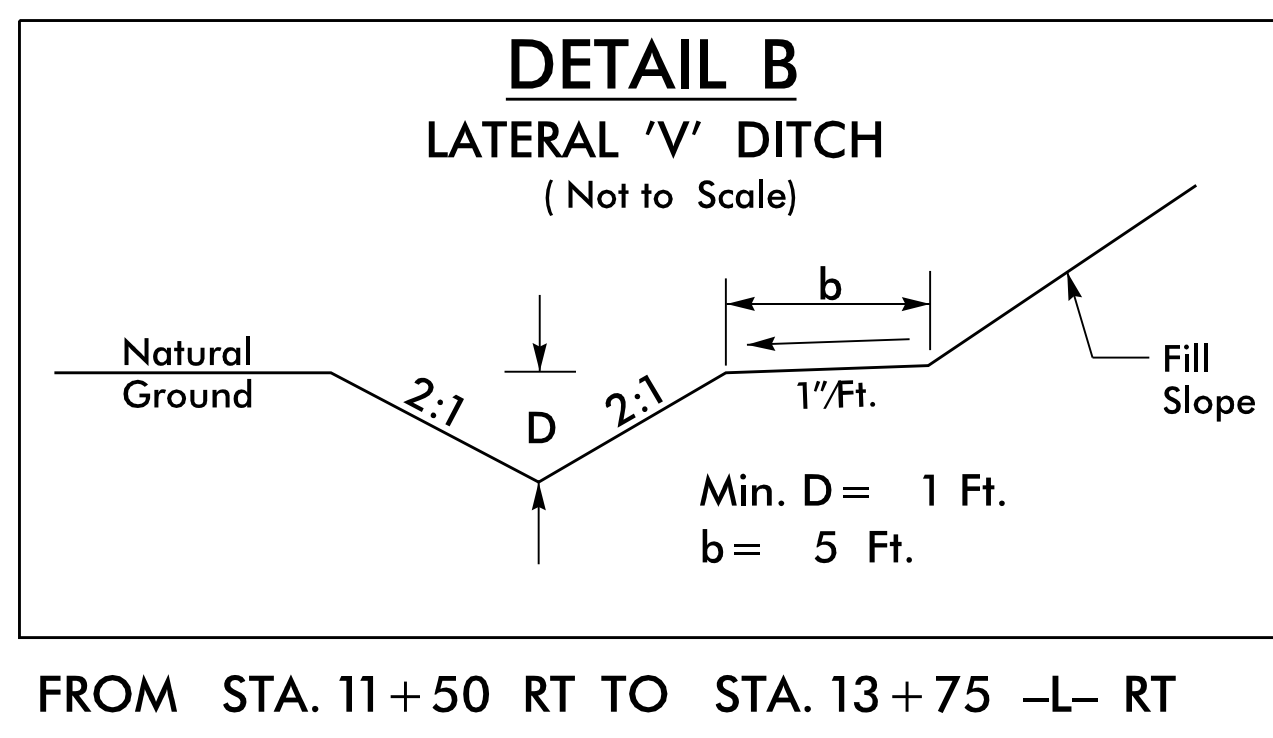
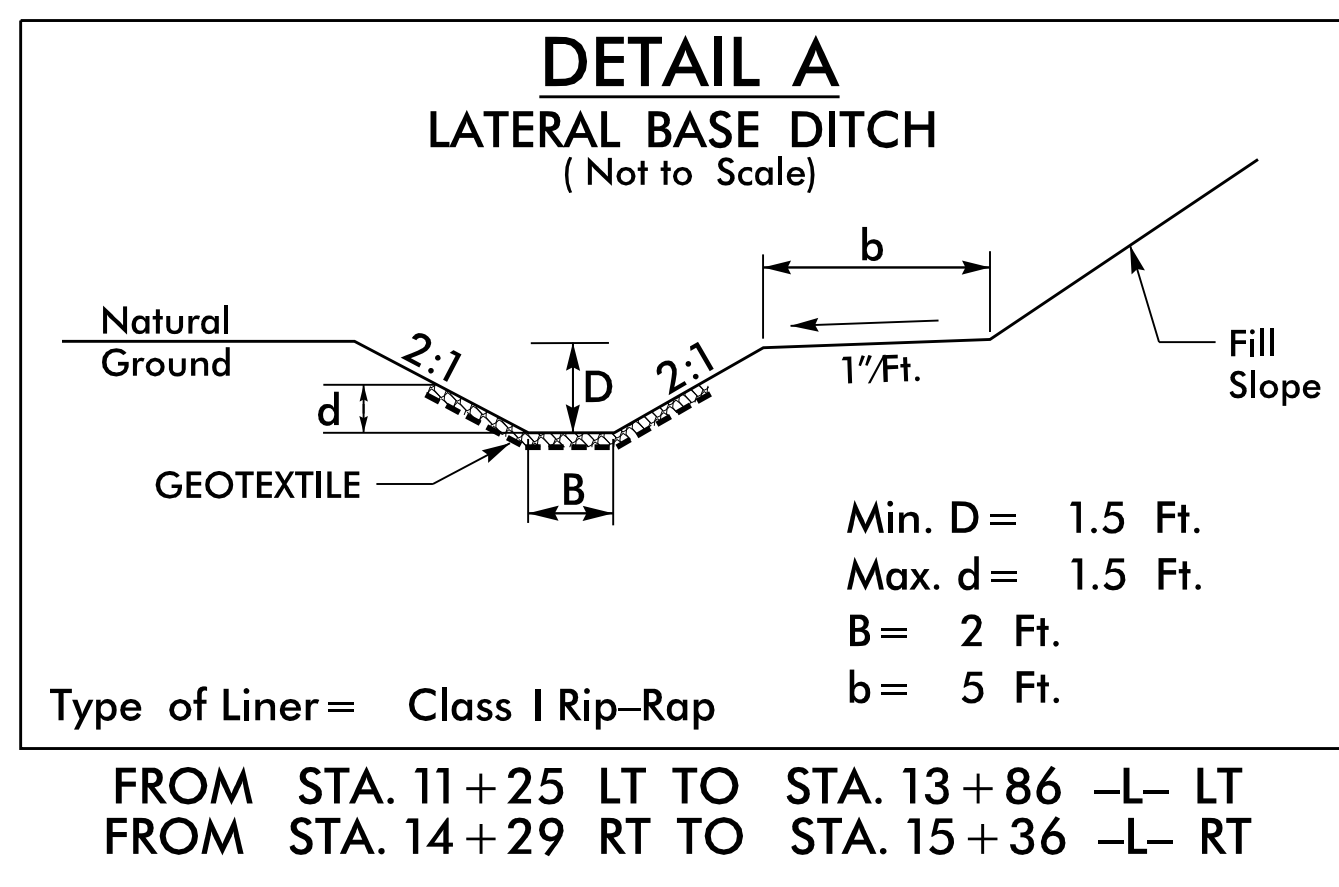
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**CONTRACT STANDARDS  
AND DEVELOPMENT UNIT**  
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

ORIGINAL BY: J. HOWERTON	DATE: 06-22-12
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.:	

PROJECT REFERENCE NO. <b>17BP.10.R.118</b>	SHEET NO. <b>2D-1</b>
RW SHEET NO.	
HYDRAULICS ENGINEER	
	
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 HDR Engineering, Inc. of the Carolinas 555 Fayetteville St. Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116	



6/21/2019

COMPUTED BY: ADS DATE: 1/29/2019  
CHECKED BY: TNB DATE: 2/18/2019

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO. 17BP-JO-R-118  
SHEET NO. 3

SUMMARY OF EARTHWORK  
IN CUBIC YARDS

Table with columns: LOCATION, UNCLASSIFIED EXCAVATION, UNDERCUT, EMBT + %, BORROW, WASTE. Includes rows for STA. 10+15.00 TO 13+71.40, STA. 14+38.65 TO 16+85.00, and GRAND TOTALS.

RIGHT OF WAY AREA DATA

Table with columns: PARCEL NO., PROPERTY OWNERS NAMES, TOTAL ACREAGE, AREA TAKEN, AREA REMAINING RT., AREA REMAINING LT., CONST. EASE., PERM. DRAIN. EASE., TEMP. DRAIN. EASE., TEMP. UTILITY EASE., PERM. DRAINAGE / UTILITY EASE.

\*NOTE: ALL AREAS ARE IN ACRES

SUMMARY OF PAVEMENT REMOVAL  
IN SQUARE YARDS

Table with columns: LOCATION, ASPHALT REMOVAL, ASPHALT BREAK UP, CONCRETE REMOVAL, CONCRETE BREAK UP. Includes rows for STA. 10+15.00 TO EXIST. BRIDGE and PROJECT TOTALS.

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."

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

Large table listing pipe details including Station, Location, Structure No., Invert Elevation, Slope, Pipe Size, Endwalls, Quantities, Frame/Grates, and Remarks. Includes a summary row at the bottom.

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".

"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 with columns: SURVEY LINE, BEG. STA., END STA., LOCATION, LENGTH (STRAIGHT, SHOP CURVED, DOUBLE FACED), WARRANT POINT (APPROACH END, TRAILING END), "N" DIST. FROM E.O.L., TOTAL SHOUL. WIDTH, FLARE LENGTH (APPROACH END, TRAILING END), W (APPROACH END, TRAILING END), ANCHORS (XI MOD, XI, GREU, M-350, XIII, CAT-1, VI MOD, TYPE III, AT-1), IMPACT ATTENUATOR TYPE 350 (EA, G, NG), SINGLE FACED GUARDRAIL, REMOVE EXISTING GUARDRAIL, REMOVE AND STOCKPILE EXISTING GUARDRAIL, REMARKS.

REVISIONS

2/17/2019 8:30:358.RDY\_SUM.dgn



COMPUTED BY: Kevin Miller, PG DATE: May 14, 2019  
 CHECKED BY: Shipping Yang, PE DATE: May 14, 2019

(5-15-18)

PROJECT NO. 17BP.10.R.118(SF-890358) SHEET NO. 3G-1

**STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS**

**SUMMARY OF SUBSURFACE DRAINAGE**

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				SD	200
				<b>TOTAL LF:</b>	200

\*UD = Underdrain  
 \*BD = Blind Drain  
 \*SD = Subsurface Drain

**SUMMARY OF GEOTEXTILE  
 FOR PAVEMENT STABILIZATION**

LINE	Station	Station	Geotextile for Pavement Stabilization SY	Class IV Subgrade Stabilization TONS
CONTINGENCY				
			<b>TOTAL SY/TONS:</b>	0
				0*

\*Total tons of "Class IV Subgrade Stabilization" is only the estimated quantity for pavement stabilization and may only represent a portion of the subgrade stabilization quantity shown in the Item Sheets of the Proposal.

**SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION**

LINE	Station	Station	Aggregate Type* ASU(1/2)/AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU	18	100	200	200		
			<b>TOTAL CY/TONS/SY:</b>		100	200**	200**	0	0

\*ASU(1/2) = Aggregate Subgrade (Type 1 or 2)  
 \*AST = Aggregate Stabilization  
 \*\*Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Soil Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade stabilization and geotextile quantities shown in the Item Sheets of the Proposal.

**SUMMARY OF ROCK PLATING**

LINE	Beginning Slope (H:V)	Approx. Station	Ending Slope (H:V)	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/3/4	Riprap Class* 1/2/B	Rock Plating SY
							<b>TOTAL SY:</b>	0

\*Use Class 1, 2 or B riprap if riprap class is not shown for rock plating location.

**SUMMARY OF REINFORCED SOIL SLOPES AND SLOPE EROSION CONTROL**

LINE	Beginning Slope/ RSS (H:V)	Approx. Station	Ending Slope/ RSS (H:V)	Approx. Station	Location LT/RT	Reinforced Soil Slope (RSS) SY	Geocells SY	Coir Fiber Mat SY	Matting for Erosion Control SY
						<b>TOTAL SY:</b>	0	0	0*
									0**

\*Total square yards of "Coir Fiber Mat" is only the estimated quantity for slopes steeper than 2:1 (H:V) and may only represent a portion of the coir fiber mat quantity shown in the Item Sheets of the Proposal.  
 \*\*Total square yards of "Matting for Erosion Control" is only the estimated quantity for RSS and may only represent a portion of the matting quantity shown in the Item Sheets of the Proposal.

**SUMMARY OF PRE-SPLITTING OF ROCK**

LINE	Beginning Rock Cut Slope (H:V)	Approx. Station	Ending Rock Cut Slope (H:V)	Approx. Station	Location LT/RT	Pre-splitting of Rock SY
					<b>TOTAL SY:</b>	0

**SUMMARY OF SURCHARGES  
 AND SURCHARGE WAITING PERIODS**

LINE	Station	Station	Surcharge Height FT	MONTHS
				<b>TOTAL MONTHS:</b>

**SUMMARY OF  
 SETTLEMENT GAUGES**

Gauge No.	LINE and Station	Offset	
		Distance FT	Direction LT/RT
		<b>TOTAL GAUGES (EACH):</b>	

**SUMMARY OF EMBANKMENT  
 WAITING PERIODS**

LINE	Station	Station	MONTHS
			<b>TOTAL MONTHS:</b>

**SUMMARY OF BRIDGE WAITING PERIODS**

Bridge Description	End Bent/ Bent No.	MONTHS
		<b>TOTAL MONTHS:</b>

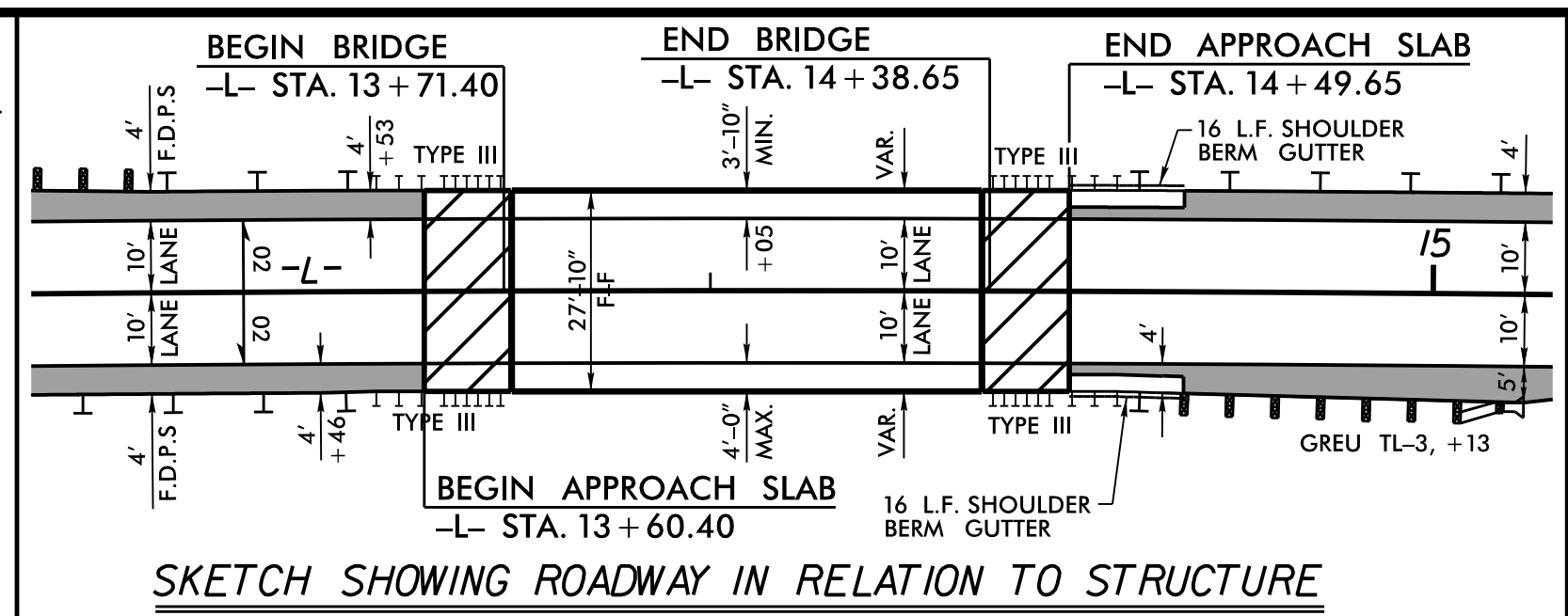
### DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY OTHERS FOR MONUMENT "890358-2" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 429104.4091(FT) EASTING: 1533359.4201(FT) ELEVATION: 577.91(FT)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: .99986647

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "890358-2" TO -L- STATION 10+15.00 IS S 82° 47' 56.21" E 85.93'

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

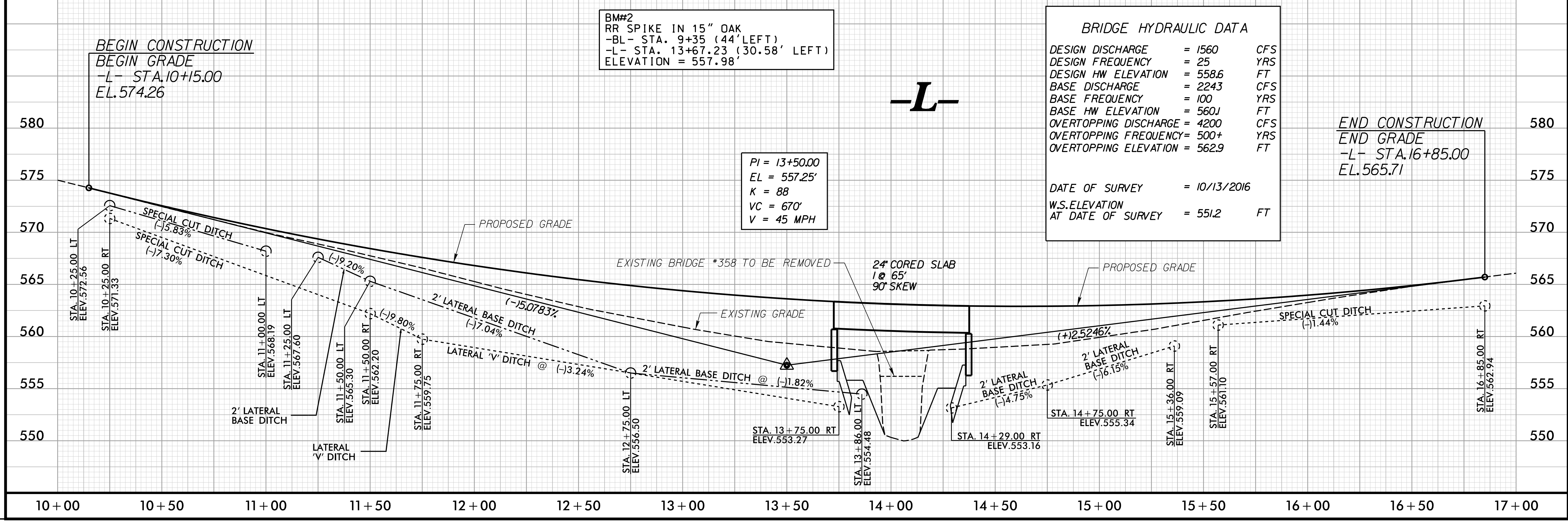
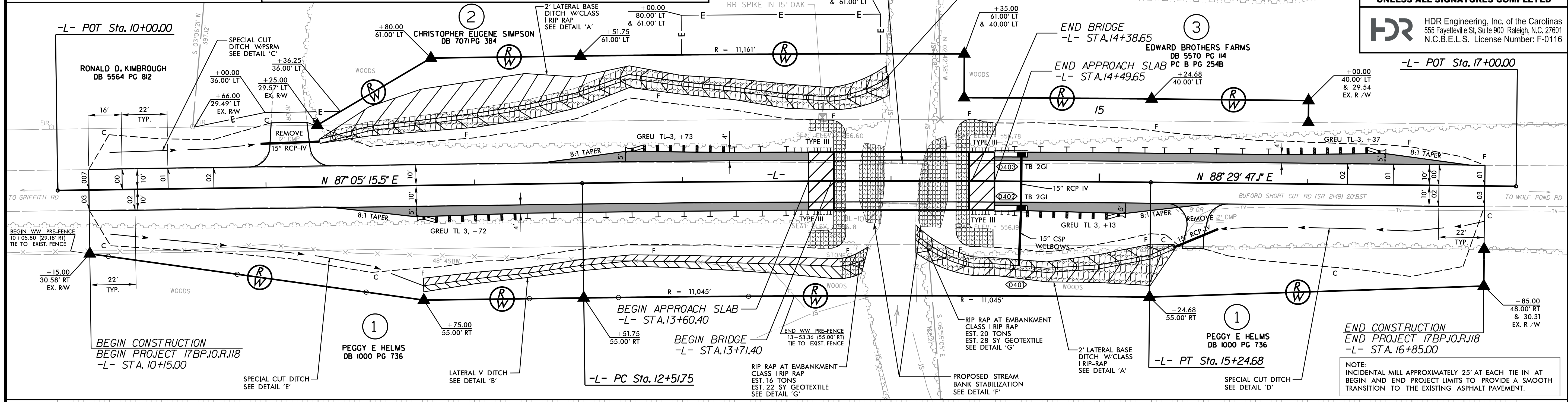


**-L-**  
 PI Sta 13+88.22  
 $\Delta = 1' 24' 31.6" (RT)$   
 $D = 0' 30' 58.2"$   
 $L = 272.92'$   
 $T = 136.47'$   
 $R = 11,000.0'$   
 $V = 55 \text{ MPH}$   
 $e = NC$

PROJECT REFERENCE NO. <b>17BP.10.R.118</b>	SHEET NO. <b>4</b>
ROADWAY DESIGN ENGINEER [Signature]	HYDRAULICS ENGINEER [Signature]
2/19/2021	2/19/2021

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

**HDR** HDR Engineering, Inc. of the Carolinas  
 555 Fayetteville St. Suite 900 Raleigh, N.C. 27601  
 N.C.B.E.L.S. License Number: F-0116



#### BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 1560	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 558.6	FT
BASE DISCHARGE	= 2243	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 560.1	FT
OVERTOPPING DISCHARGE	= 4200	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 562.9	FT

DATE OF SURVEY = 10/13/2016  
 W.S. ELEVATION AT DATE OF SURVEY = 551.2 FT

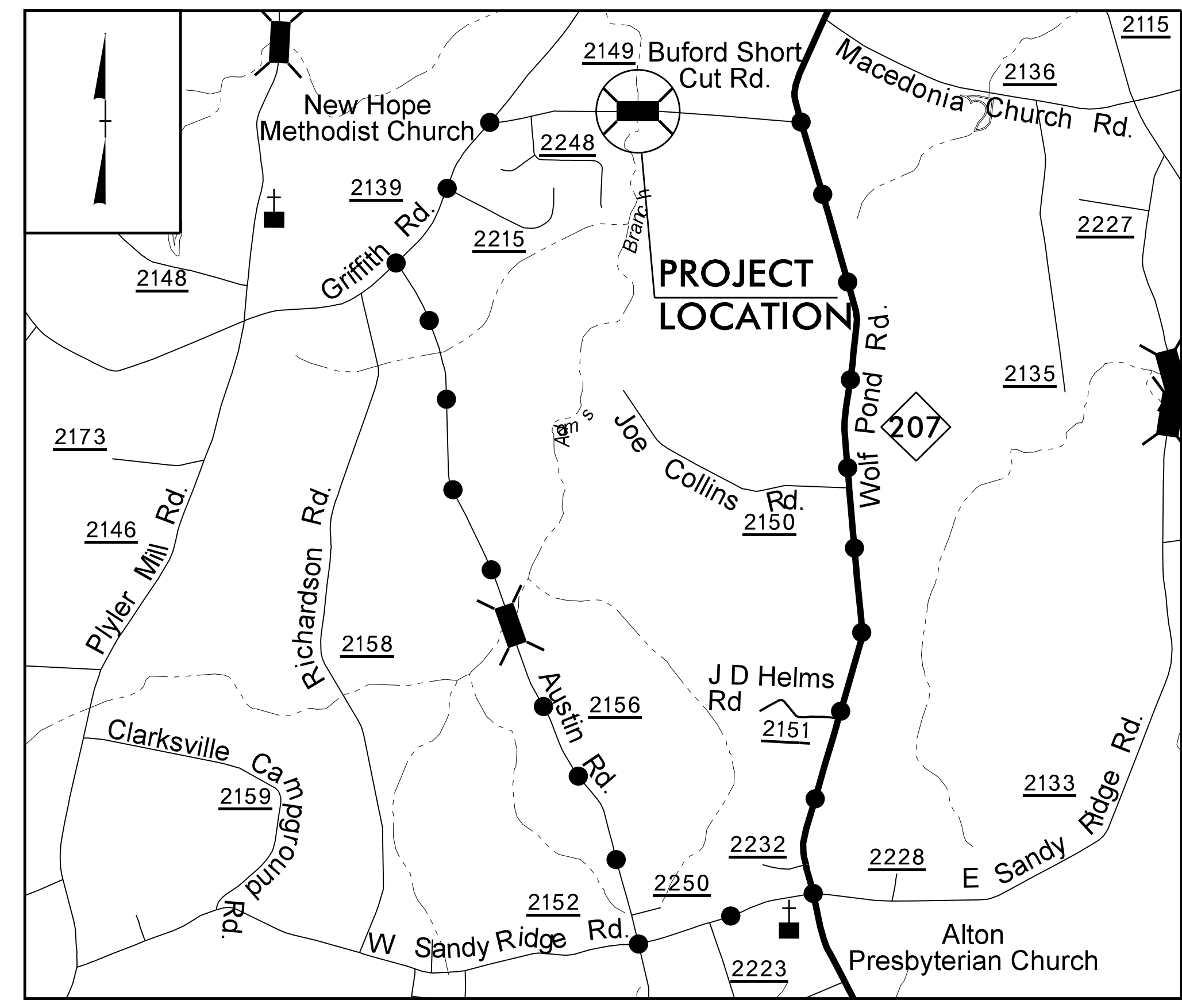
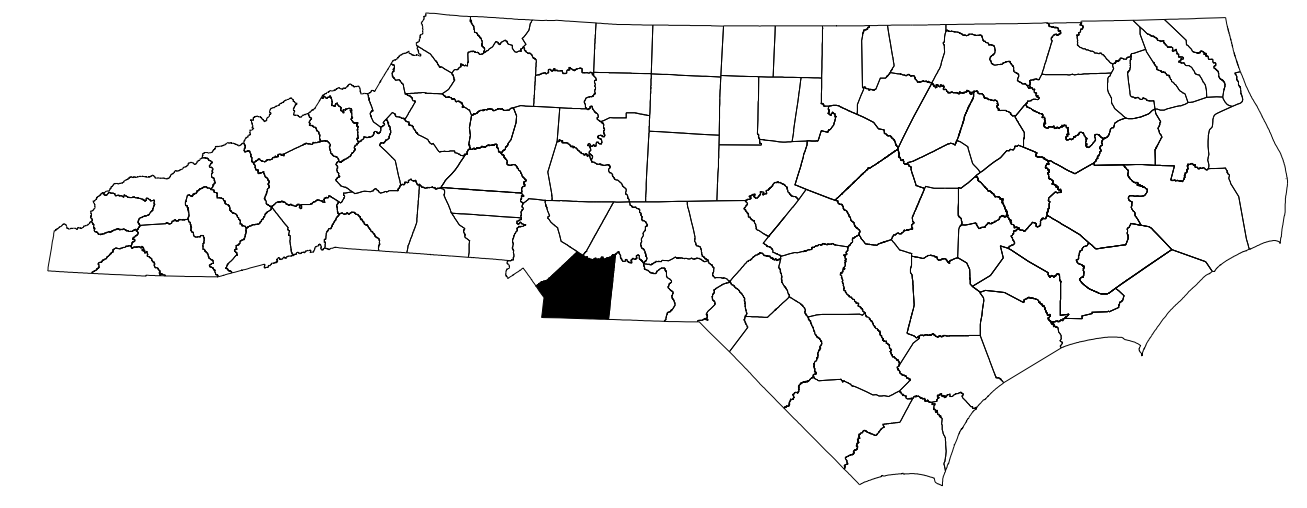
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 USER: TBEDEBNA  
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REVISIONS

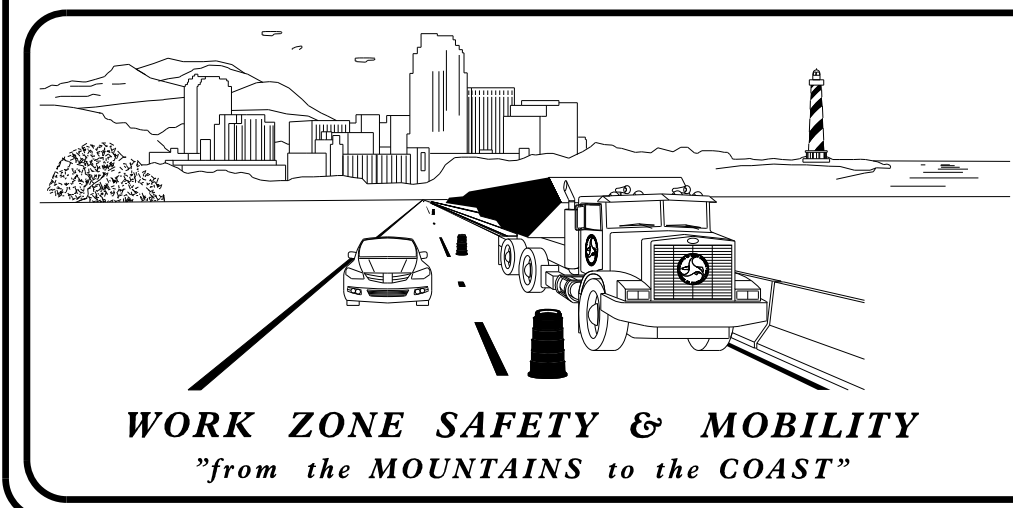
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**TRANSPORTATION MANAGEMENT PLAN**

**UNION COUNTY**

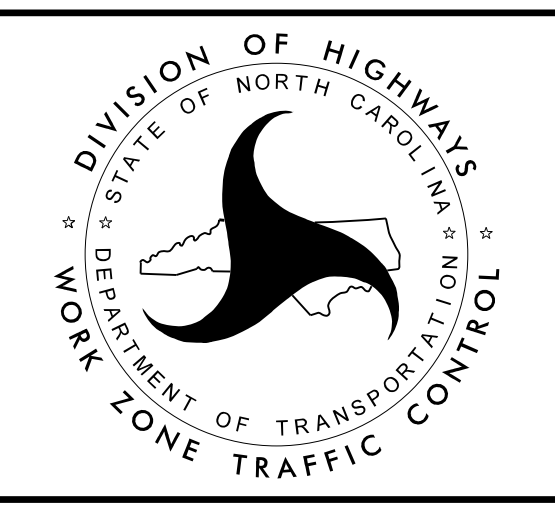


●—● DETOUR ROUTE  
VICINITY MAP  
(NOT TO SCALE)



**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

J. HUMMER, P.E. STATE TRAFFIC MANAGEMENT ENGINEER  
DON A. PARKER, P.E. TRAFFIC CONTROL PROJECT ENGINEER  
TRAFFIC CONTROL PROJECT DESIGN ENGINEER  
TRAFFIC CONTROL DESIGN ENGINEER



**INDEX OF SHEETS**

SHEET NO.	TITLE
TMP-1	TITLE SHEET AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, AND LEGEND
TMP-1B	GENERAL NOTES AND PHASING
TMP-2	OFF-SITE DETOUR PLAN - BUFORD SHORT CUT ROAD (SR 2149)
SD-01	SPECIAL SIGN DESIGN

PLAN PREPARED BY:  
**HDR** HDR Engineering, Inc. of the Carolinas  
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601  
N.C.B.E.L.S. License Number: F-0116

MICHELLE WARD, P.E. TRAFFIC CONTROL PROJECT ENGINEER  
TRAFFIC CONTROL PROJECT DESIGN ENGINEER  
T. NATHAN BEDENBAUGH, P.E. TRAFFIC CONTROL DESIGN ENGINEER

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

APPROVED: Nathan Bedenbaugh  
DATE: 2/19/2021

SEAL

PLOT DRIVER: NCDOT\_pcf\_color\_eng\_50.plt  
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# 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 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

<u>STD. NO.</u>	<u>TITLE</u>
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.03	TEMPORARY ROAD CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1145.01	BARRICADES
1205.01	PAVEMENT MARKINGS - LINE TYPES & OFFSETS
1205.02	PAVEMENT MARKINGS - 2 LANE & MULTILANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1253.01	RAISED PAVEMENT MARKERS - SNOWPLOWABLE

# LEGEND

## GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- TEMP. SHORING (LOCATION PURPOSES ONLY)
- WORK AREA
- REMOVAL

## TRAFFIC CONTROL DEVICES

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

## 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: <small>40F2E9D9CF8442B</small> DATE: 2/19/2021  SEAL			<b>ROADWAY STANDARD                  DRAWINGS &amp; LEGEND</b>
<b>DOCUMENT NOT CONSIDERED FINAL                  UNLESS ALL SIGNATURES COMPLETED</b>			

PROJ. REFERENCE NO.	SHEET NO.
17BP.10.R.118	TMP-1B
 HDR Engineering, Inc. of the Carolinas 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116	

## 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 OR 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.

### TRAFFIC PATTERN ALTERATIONS

- A) NOTIFY THE ENGINEER THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

### SIGNING

- B) 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 UNLESS COVERED.

- C) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRAFFIC CONTROL PLANS.

PROVIDE SIGNING REQUIRED FOR THE OFFSITE DETOUR ROUTE AS SHOWN IN THE TRAFFIC CONTROL PLANS.

- D) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN THE ROAD CLOSURE IS NOT IN OPERATION.

COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFFSITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.

- E) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

### TRAFFIC CONTROL DEVICES

- F) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

### PAVEMENT MARKINGS AND MARKERS

- G) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE. SEE SHEET PMP-1 THRU PMP-2 FOR PAVEMENT MARKING PLAN.

## PHASING NOTES

### TRAFFIC CONTROL PHASING

NOTE: COORDINATE WITH THE ENGINEER FOR INSTALLATION AND REMOVAL OF ALL SIGNING AND TRAFFIC CONTROL DEVICES.

NOTE: MAINTAIN ACCESS TO DRIVEWAYS WITHIN PROJECT LIMITS AT ALL TIMES.

STEP 1: USING RSD 1101.01, SHEET 3 OF 3, INSTALL ADVANCE WORK ZONE WARNING SIGNS ON BUFORD SHORT CUT RD. (SR 2149).


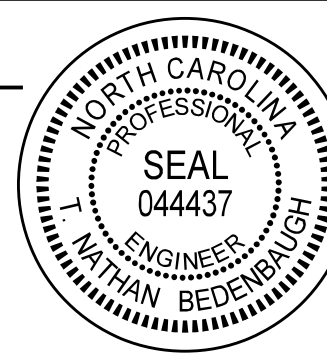

STEP 2: USING RSD 1101.03, SHEET 1 OF 9 AND SHEET TMP-2, INSTALL DETOUR SIGNS AND BARRICADES AND CLOSE BUFORD SHORT CUT RD. (SR 2149).

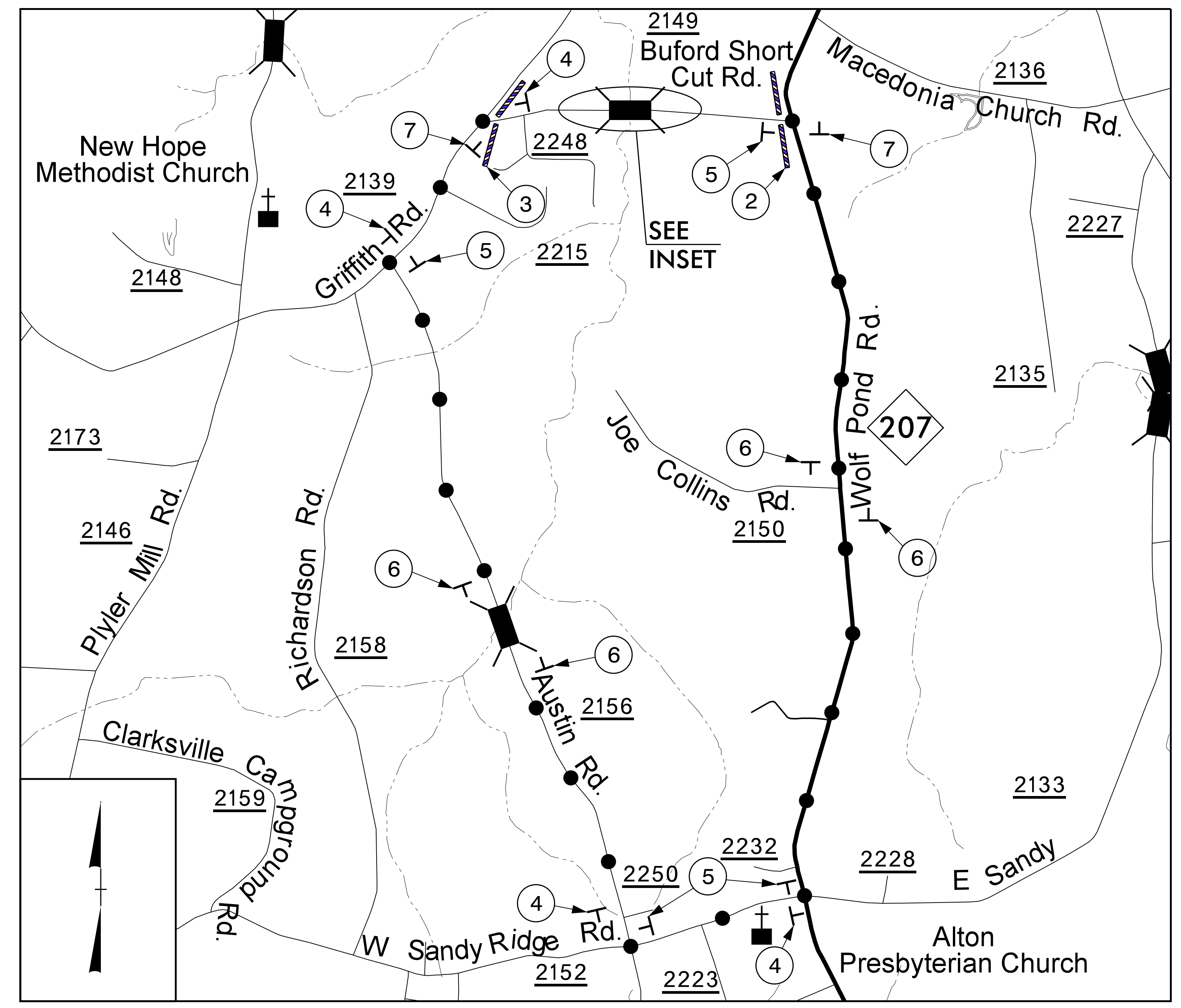
STEP 3: REMOVE EXISTING BRIDGE NO. 358 AND CONSTRUCT PROPOSED BRIDGE AND ROADWAY, UP TO AND INCLUDING THE FINAL LAYER OF SURFACE COURSE. (NOTE: COORDINATE WITH STATE FORCES TO INSTALL FINAL PAVEMENT MARKINGS AND MARKERS ONCE CONSTRUCTION IS COMPLETE.)

STEP 4: REMOVE ALL WORK ZONE TRAFFIC CONTROL DEVICES AND OPEN BUFORD SHORT CUT RD. (SR 2149) TO TRAFFIC.

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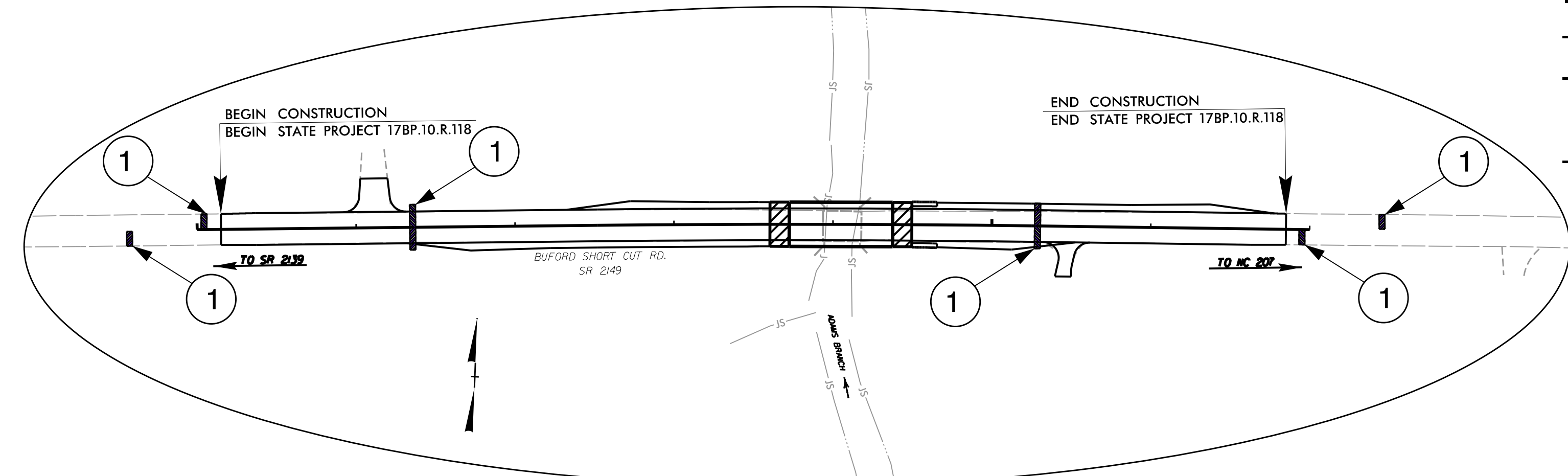
REVISIONS

APPROVED:  DATE: 2/19/2021 SEAL 		GENERAL NOTES AND PHASING
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

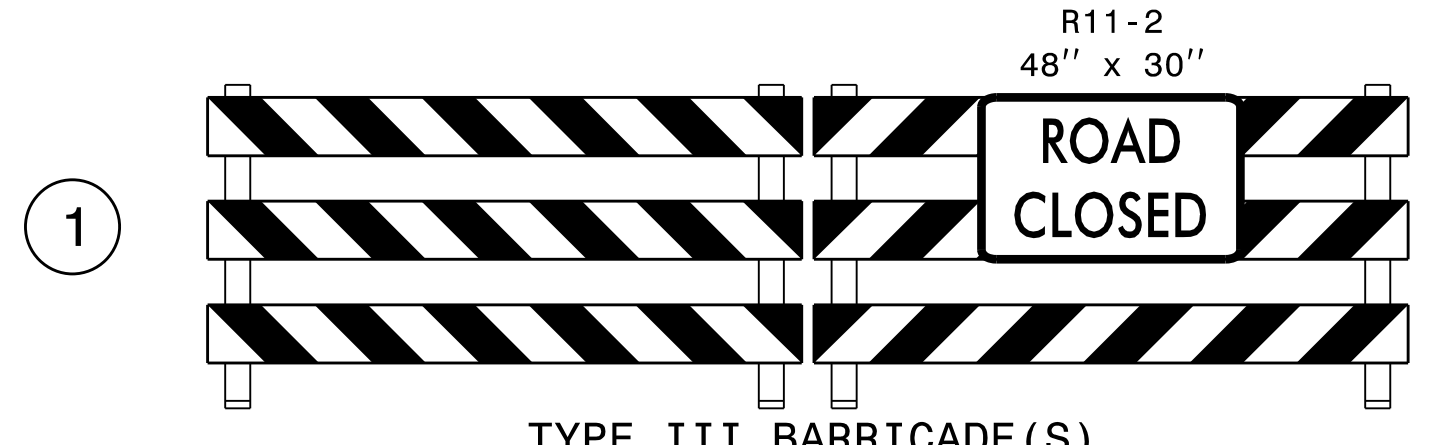
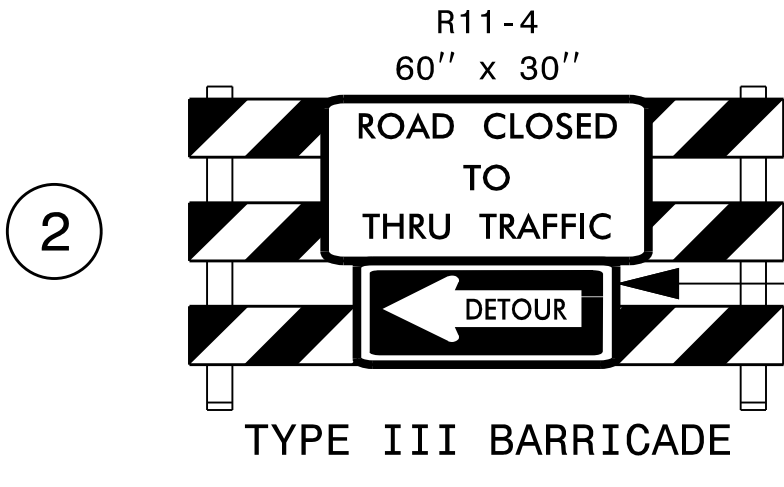
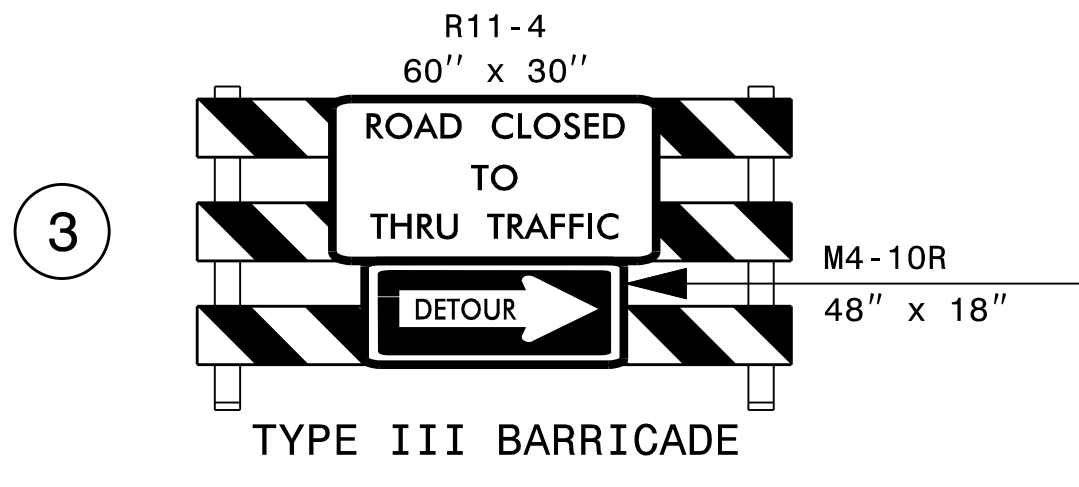
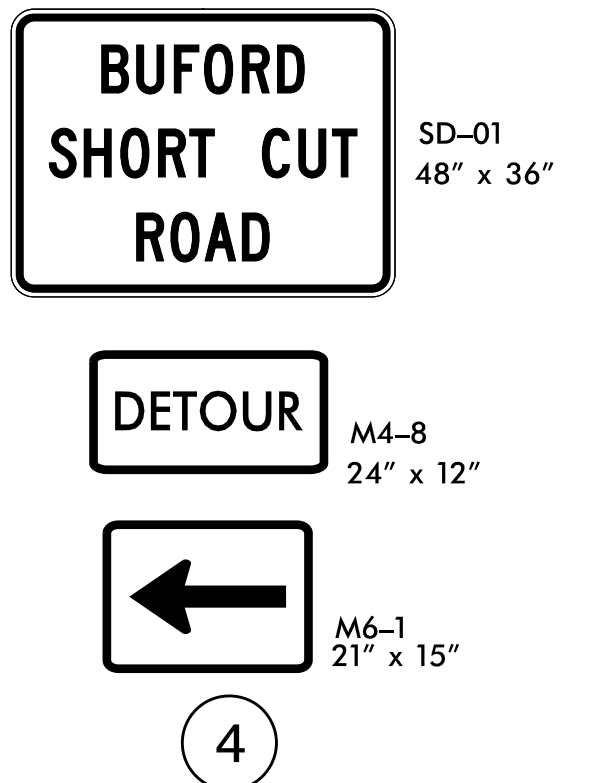
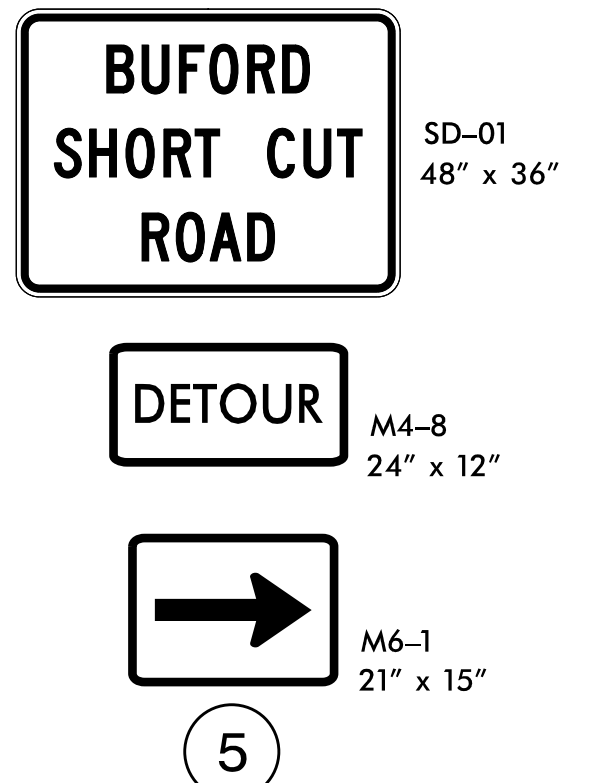
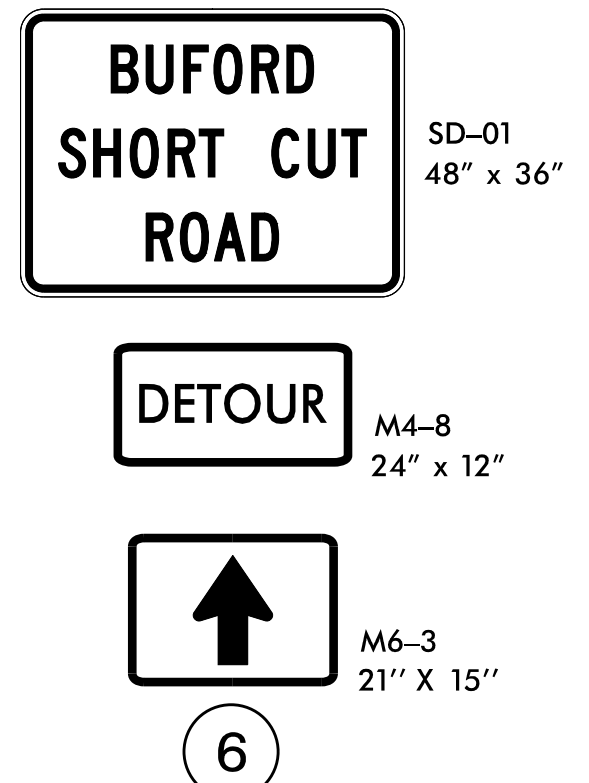
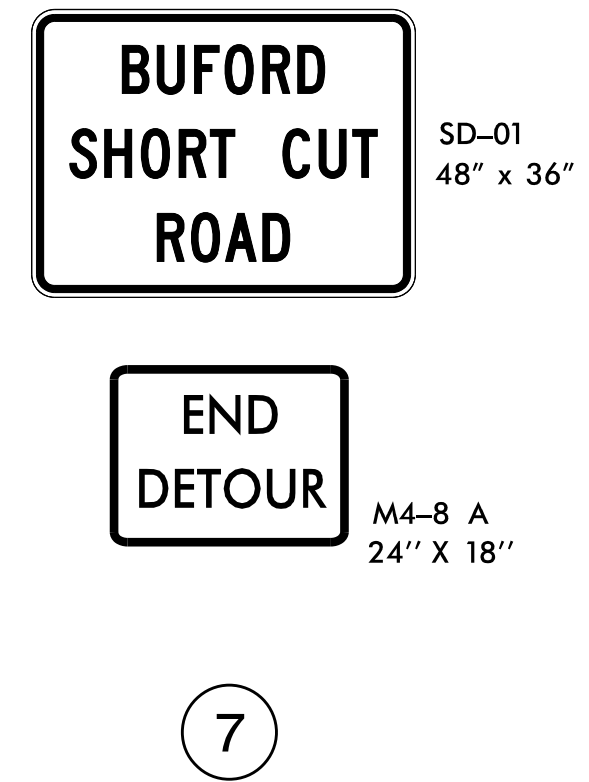


 **DETOUR ROUTE**

**REFER TO RSD 1101.03 SHEET 1 OF 9 FOR ADDITIONAL SIGN AND BARRICADE PLACEMENT**




**INSET (NOT TO SCALE)**

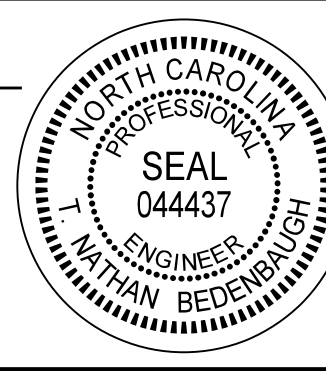
 <p><b>TYPE III BARRICADE (S)</b></p>	
 <p><b>TYPE III BARRICADE</b></p>	 <p><b>TYPE III BARRICADE</b></p>
 <p><b>4</b></p>	 <p><b>5</b></p>
 <p><b>6</b></p>	<p><b>SEE SHEET SD-01 FOR SPECIAL SIGN DESIGN DETAIL</b></p>
 <p><b>7</b></p>	

**INSET NOTES:**

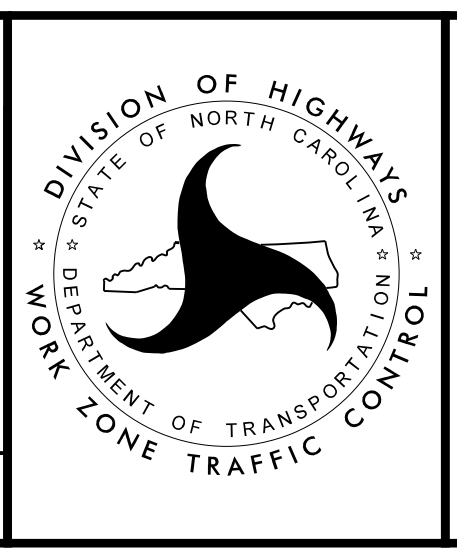
- MAINTAIN ACCESS TO DRIVEWAYS WITHIN CONSTRUCTION LIMITS.
- PLACE ROAD CLOSED BARRICADES AFTER THE LAST DRIVEWAY APPROACHING BRIDGE IN EITHER DIRECTION.
- PLACE ADDITIONAL STAGGERED ROAD CLOSED BARRICADES BEFORE CONSTRUCTION LIMITS IN EITHER DIRECTION.

APPROVED:   
 DATE: 2/19/2021

SEAL



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



**OFF-SITE  
DETOUR ROUTE  
DETAILS**

PLOT DRIVER: NCDOT\_eng\_50.pit  
 USER: TBEDENBA  
 DATE: 12/22/2020  
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REVISIONS

<b>SIGN NUMBER:</b> SP-01	<b>BACKG COLOR:</b> Fluorescent Orange	<b>DESIGN BY:</b> R Drayton	<b>CHECKED BY:</b> R King	<b>DATE:</b> Feb 07, 2019
<b>TYPE:</b> STATIONARY	<b>COPY COLOR:</b> Black	<b>PROJECT ID:</b> 17BP.10.R.118		<b>DIV:</b> 10
<b>QUANTITY:</b> SEE PLANS				
<b>SIGN WIDTH:</b> 4'-0"				
<b>HEIGHT:</b> 3'-0"				
<b>TOTAL AREA:</b> 12.0 Sq.Ft.				
<b>BORDER TYPE:</b> INSET				
<b>RECESS:</b> 0.63"				
<b>WIDTH:</b> 0.88"				
<b>RADII:</b> 2.25"				
<b>NO. Z BARS:</b>	<b>MAT'L:</b> 0.080" (2.0 mm) ALUMINUM			
<b>LENGTH:</b>				

**USE NOTES:** 1,2

- Legend and border shall be direct applied black non-reflective sheeting.
- Background shall be NC GRADE B fluorescent orange retroreflective sheeting.

**BORDER** 4.75" 38.5" 4.75"  
**R=2.25"**  
**TH=0.88"**  
**IN=0.63"**

Spacing Factor is 1 unless specified otherwise

**LETTER POSITIONS**

Letter spacings are to start of next letter

	B	U	F	O	R	D															Series/Size Text Length
	11.3	4.4	4.7	3.8	4.7	4.4	3.4	11.3													C 2000
																					25.3
		S	H	O	R	T		C	U	T											C 2000
	4.8	4.4	4.6	4.7	3.9	3.1	6	4.6	4.2	3.1	4.8										38.5
		R	O	A	D																C 2000
	15.7	4.3	4.3	4.7	3.4	15.7															16.6

FILENAME: Guidsign\_Division10 NORTH CAROLINA D.O.T. SIGN DETAIL

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REVISIONS

APPROVED: DATE: 2/19/2021 SEAL 		SPECIAL SIGN DESIGN
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		


PLOT DRIVER: NCDOT... PENTABLE: NCDOT... USER: CHARNDEN... DATE: 2/19/2021... FILE: p:\p\h\p\uses\01\HDR\_US\_Eost\01\Documents\NCDOT\NCDOT\Western\_Div\_0n\_Cali\_M\_NCDOT\_2018\_Div\_10\_Bridges\_Group\6.0\_CAD\_BITMAP\6.2\_WIP\Site #1\_Union #358 17BP.10.R.118\_Traffic\ Pavement\_Marking\Title&slash\Plan\_Sheet and Design

17BP.10.R.118  
CONTRACT: DJ00376

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

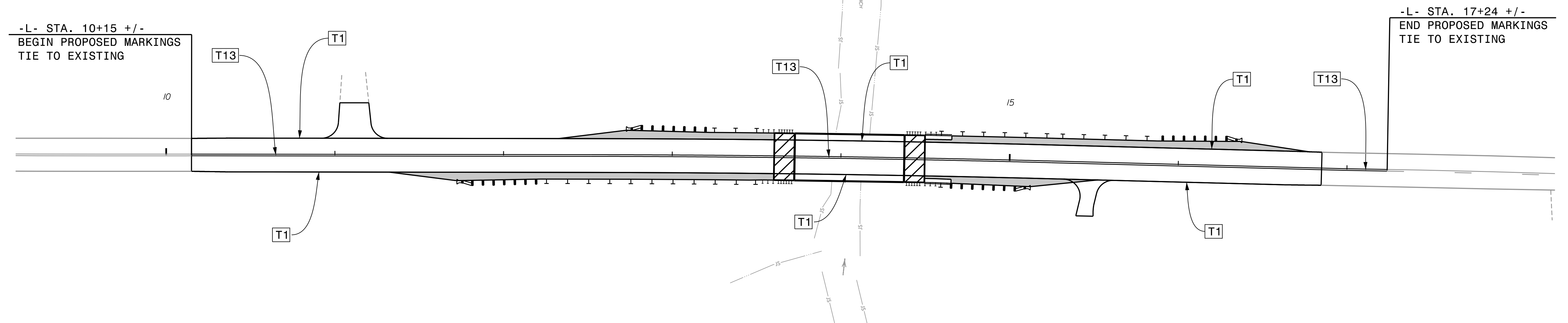
PAVEMENT MARKING PLAN  
UNION COUNTY

LOCATION: BRIDGE NO. 358 ON SR 2149 OVER ADAMS BRANCH  
BETWEEN SR 2139 AND NC 207

PROJECT NO. 17BP.10.R.118	SHEET NO. PMP-1
APPROVED: <i>Ron King</i> 3974C4101528481...	
DATE: 2/19/2021	
SEAL 	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

INDEX	
SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING TITLE/PLAN, INDEX, GENERAL NOTES, ROADWAY STANDARD DRAWINGS
PMP-2	PAVEMENT MARKING DETAILS (REVISED RSD 1205.12)

T1	4" THERMO WHITE EDGELINE (50 MIL)
T13	4" THERMO YELLOW DOUBLE CENTER (50 MIL)



ALL LANES ARE 10' WIDTH UNLESS NOTED

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 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 MULTI-LANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES (SEE PMP-2 FOR REVISED RSD 1205.12)
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1253.01	RAISED PAVEMENT MARKERS - SNOWPLOWABLE
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

GENERAL NOTES

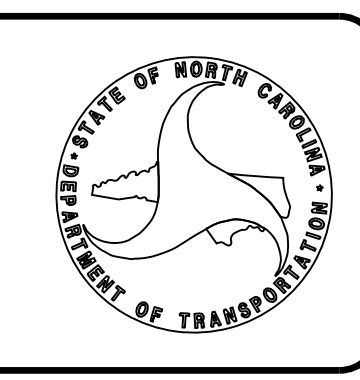
- THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT, EXCEPT WHEN OTHERWISE NOTED IN THE PLAN, OR DIRECTED BY THE ENGINEER.
- A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKER
SR 2149	HOT SPRAY THERMOPLASTIC (50 MIL)	MATCH EXISTING
  - B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
  - C) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.
  - D) PASSING ZONES WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

PLAN SUBMITTED TO: N.C.D.O.T. SIGNING AND DELINEATION UNIT

\_\_\_\_\_  
SIGNING & DELINEATION STANDARDS ENGINEER


\_\_\_\_\_  
SIGNING & DELINEATION PROJECT DESIGN ENGINEER



PLAN PREPARED BY: HDR ENGINEERING, INC. OF THE CAROLINAS

RON KING, P.E. \_\_\_\_\_ SIGNING & DELINEATION PROJECT DESIGN ENGINEER

CHRIS HARNDEN \_\_\_\_\_ SIGNING & DELINEATION PROJECT DESIGN TECHNICIAN

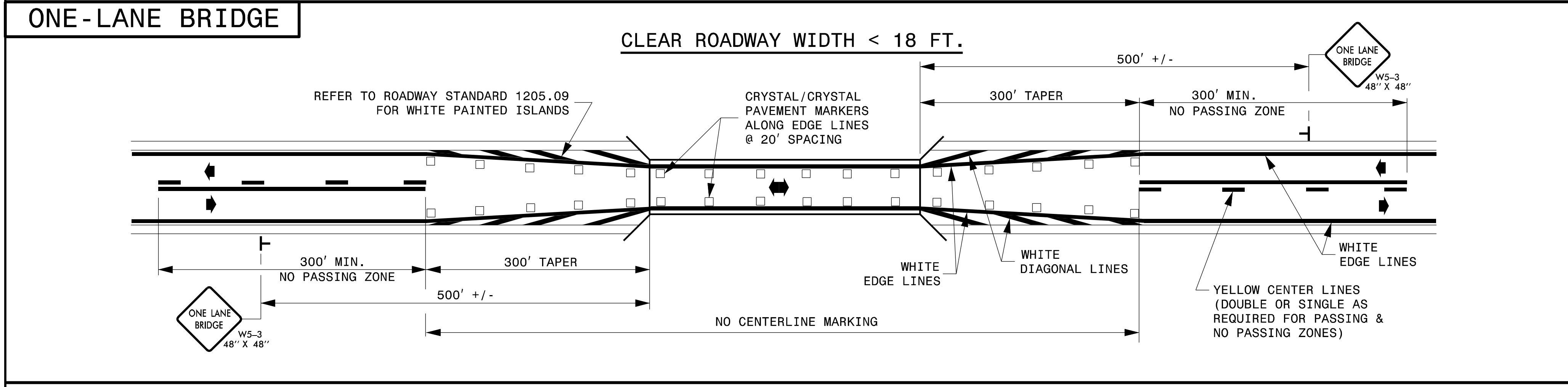
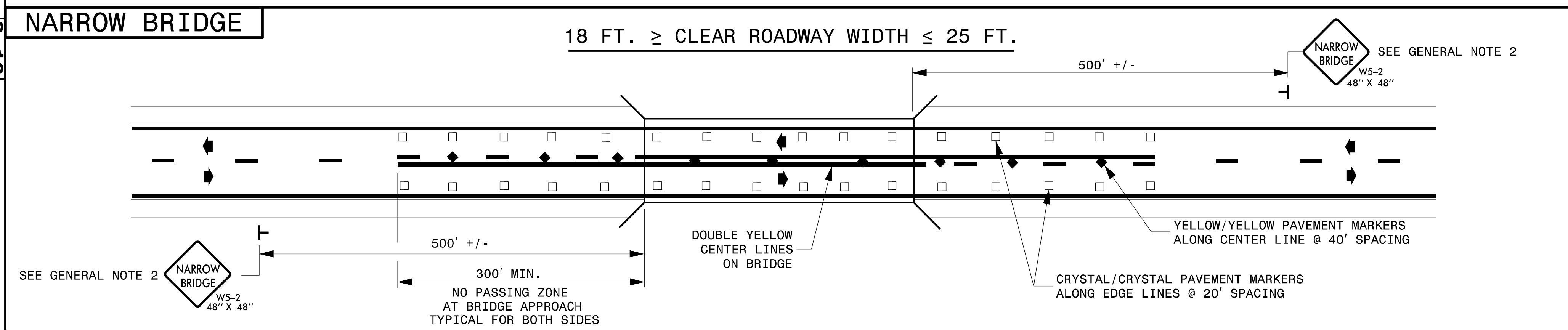
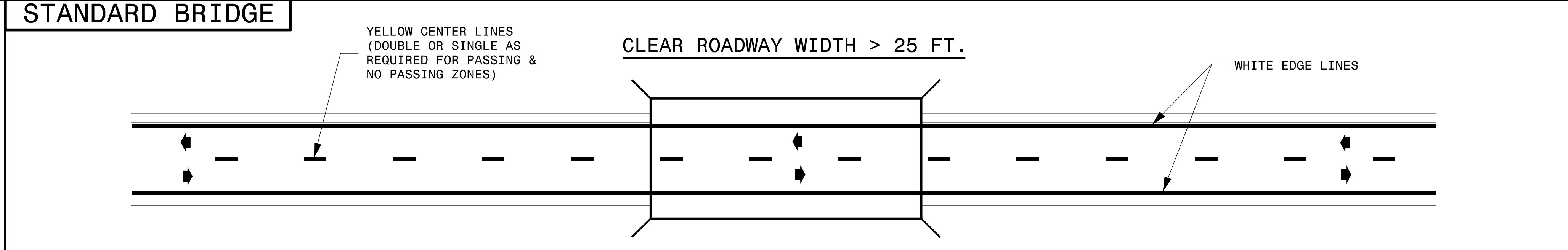


HDR Engineering, Inc. of the Carolinas  
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601  
N.C.B.E.L.S. License Number: F-0116



PROJECT NO.	SHEET NO.
17BP.10.R.116	RMP-02
APPROVED:	<i>Matthew V. Springer</i>
DATE:	8/30/2019
SEAL	

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



- GENERAL NOTES:
- NO PASSING ZONES SHOWN ARE MINIMUMS. APPLY MINIMUM PASSING AND STOPPING SIGHT DISTANCES AS DETERMINED BY THE ENGINEER.
  - FOR BRIDGES WITH 18 TO 25 FEET CLEAR ROADWAY WIDTH, SIGNS MUST BE USED WHEN THE APPROACH PAVEMENT WIDTH IS 2 FOOT OR GREATER THAN THE CLEAR ROADWAY WIDTH.

LEGEND	
←	DIRECTION OF TRAFFIC FLOW
◆	YELLOW/YELLOW PAVEMENT MARKER
⊥	STATIONARY SIGN
□	CRYSTAL/CRYSTAL PAVEMENT MARKER

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

ENGLISH DETAIL DRAWING FOR  
**PAVEMENT MARKINGS**  
 BRIDGES

SHEET 1 OF 1  
**1205D12**

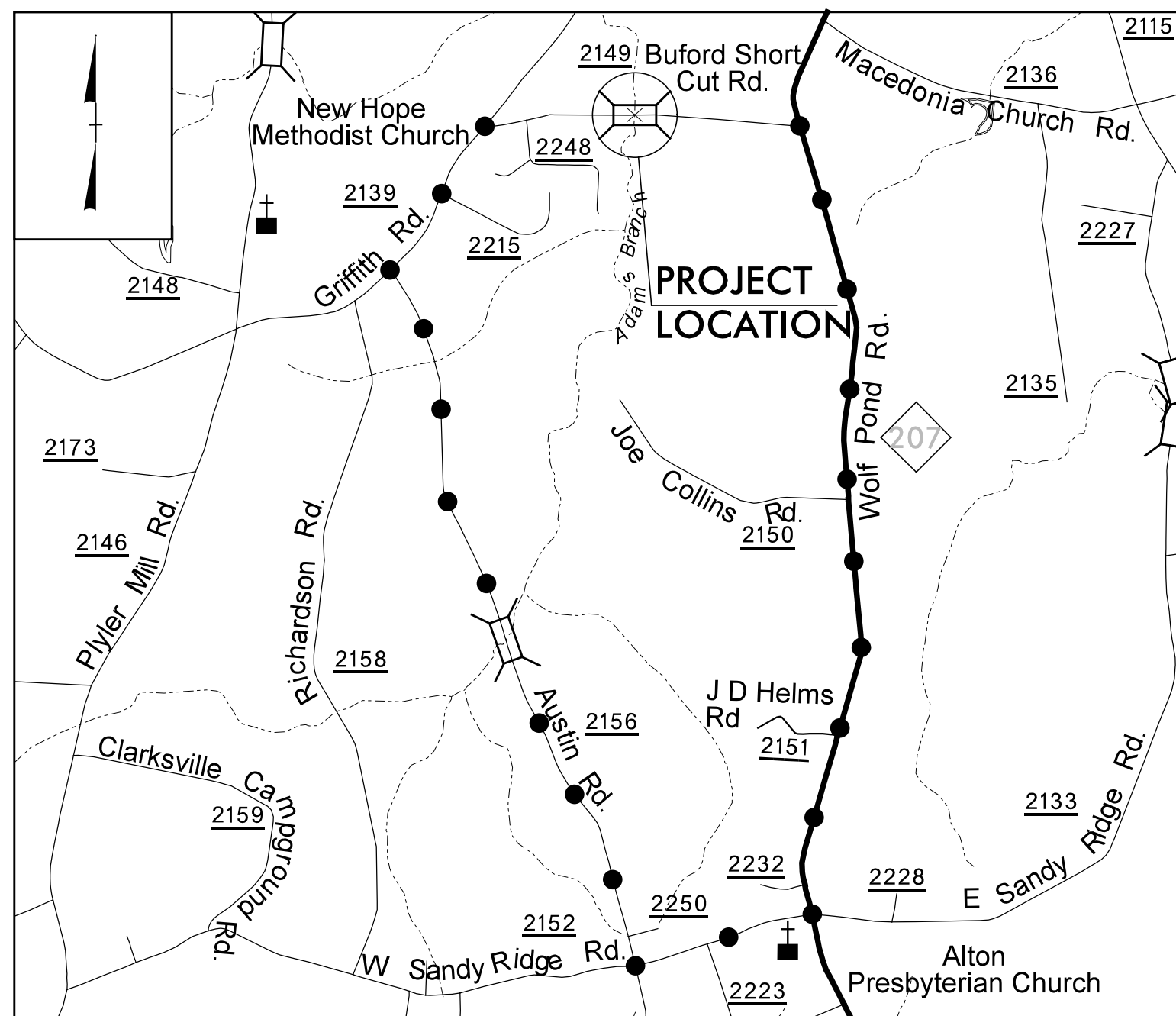
SHEET 1 OF 1  
**1205D12**

**REVISED PAVEMENT MARKING ROADWAY STANDARD DRAWING**

08/30/19  
 S:\S&B\Standards Group\Standards and Drawings\Drawings\Division 12 Final\1205D12\08-29-19.dgn  
 User:dstokes

See Sheet 1A For Index of Sheets

**TIP PROJECT: 17BP.10.R.118**



**VICINITY MAP**  
(NOT TO SCALE)

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

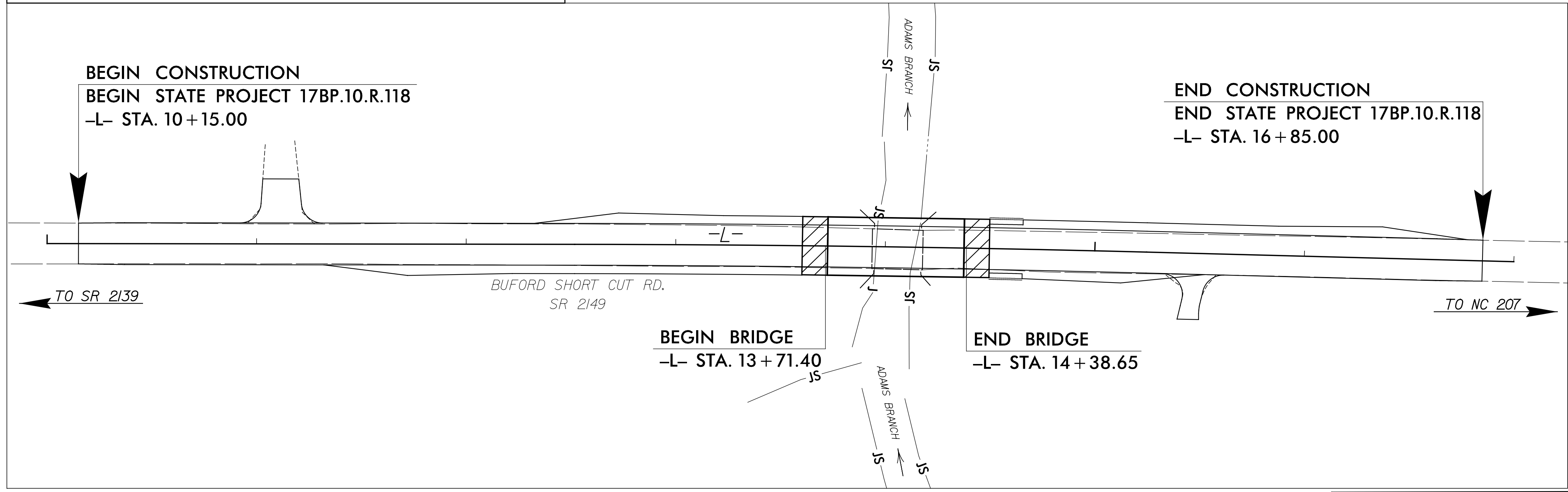
**LOCATION: BRIDGE NO.118 ON SR 2149 OVER ADAMS BRANCH  
BETWEEN SR 2139 AND NC 207**



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.10.R.118	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
17BP.10.R.118			

**EROSION AND SEDIMENT CONTROL MEASURES**

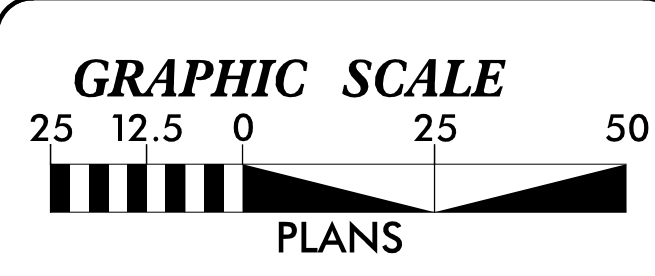
Std. #	Description	Symbol
1650.05	Temporary Silt Ditch	TD
1650.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	III III III
1606.01	Special Sediment Control Fence	ZZZZZZ
1622.01	Temporary Berms and Slope Drains	TD
1650.02	Silt Basin Type B	▨
1653.01	Temporary Rock Silt Check Type-A	▨
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	▨
1653.02	Temporary Rock Silt Check Type-B	▨
	Wattle / Coir Fiber Wattle	W
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	W
1654.01	Temporary Rock Sediment Dam Type-A	▨
1654.02	Temporary Rock Sediment Dam Type-B	▨
1655.01	Rock Pipe Inlet Sediment Trap Type-A	⊓
1655.02	Rock Pipe Inlet Sediment Trap Type-B	⊓
1650.04	Stilling Basin	▭
1650.06	Special Stilling Basin	▭
	Rock Inlet Sediment Trap:	
1652.01	Type A	A
1652.02	Type B	B
1652.05	Type C	C
	Skimmer Basin	▭
	Tiered Skimmer Basin	▭
	Infiltration Basin	▭



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

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II

**HDR** HDR Engineering, Inc. of the Carolinas  
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601  
N.C.B.E.L.S. License Number: F-0116



THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 1, 2016 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER RESOURCES.

Prepared In the Office of:  
**HDR** HDR Engineering, Inc. of the Carolinas  
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601  
N.C.B.E.L.S. License Number: F-0116

Designed by:  
**Dean W. Lewis, EI** 4097  
NAME LEVEL III CERTIFICATION NO.

Reviewed In the Office of:  
**ROADSIDE ENVIRONMENTAL UNIT**  
1 South Wilmington St.  
Raleigh, NC 27611

2018 STANDARD SPECIFICATIONS

Reviewed by:  
**Thomas A. Smith, CPESC**

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 2018 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

1604.01 Railroad Erosion Control Detail	1632.01 Rock Inlet Sediment Trap Type A
1605.01 Temporary Silt Fence	1632.02 Rock Inlet Sediment Trap Type B
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
1630.01 Riser Basin	1634.01 Temporary Rock Sediment Dam Type A
1630.02 Silt Basin Type B	1634.02 Temporary Rock Sediment Dam Type B
1630.03 Temporary Silt Ditch	1635.01 Rock Pipe Inlet Sediment Trap Type A
1630.04 Stilling Basin	1635.02 Rock Pipe Inlet Sediment Trap Type B
1630.05 Temporary Diversion	1640.01 Coir Fiber Baffle
1630.06 Special Stilling Basin	1645.01 Temporary Stream Crossing
1631.01 Matting Installation	

157-49, PM, E, AND, HD, INC., TSH-DCN  
HDR ENGINEERING, INC.

PROJECT REFERENCE NO. 17BP.JO.R.118	SHEET NO. EC-2A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# COIR FIBER WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL

**NOTES:**

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

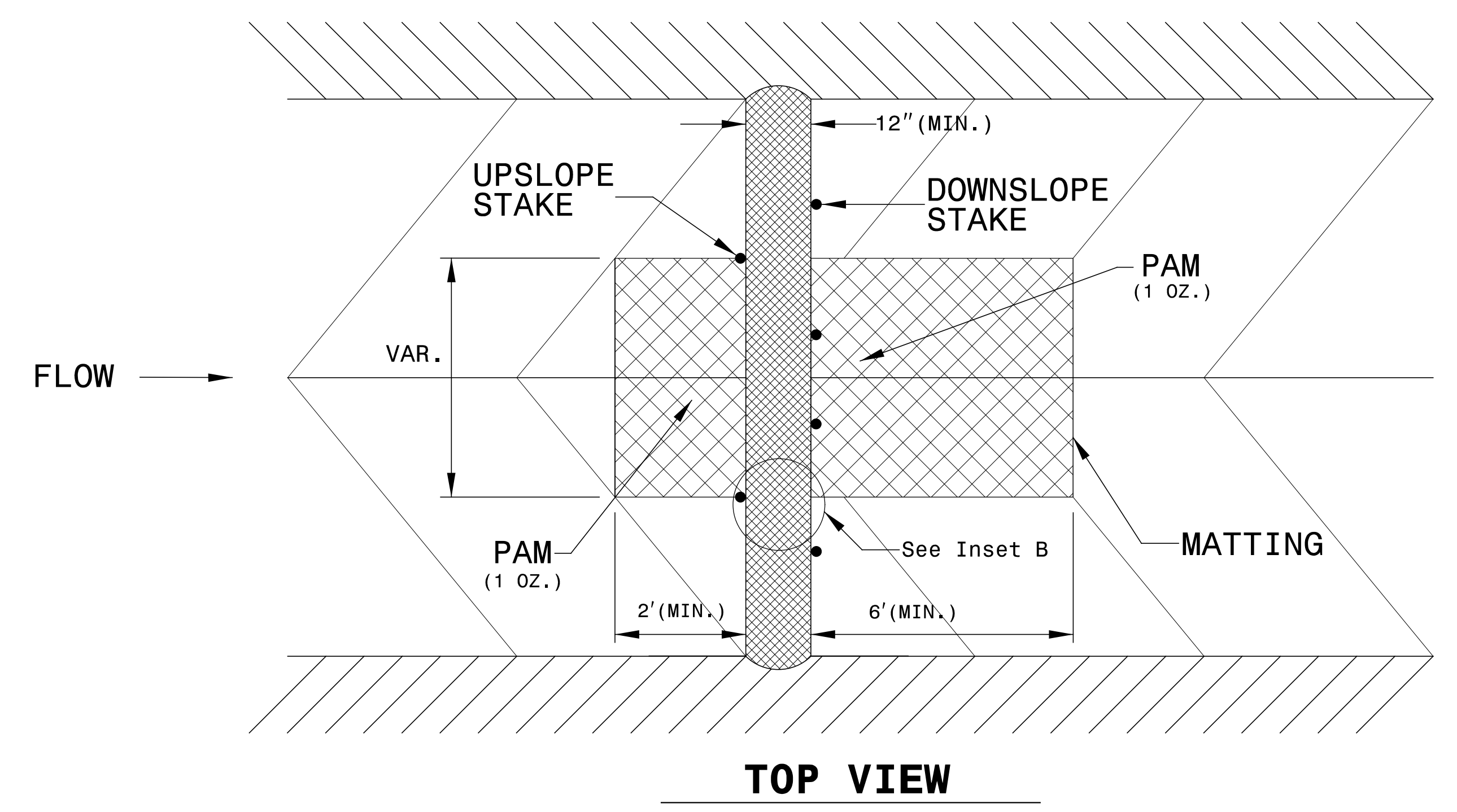
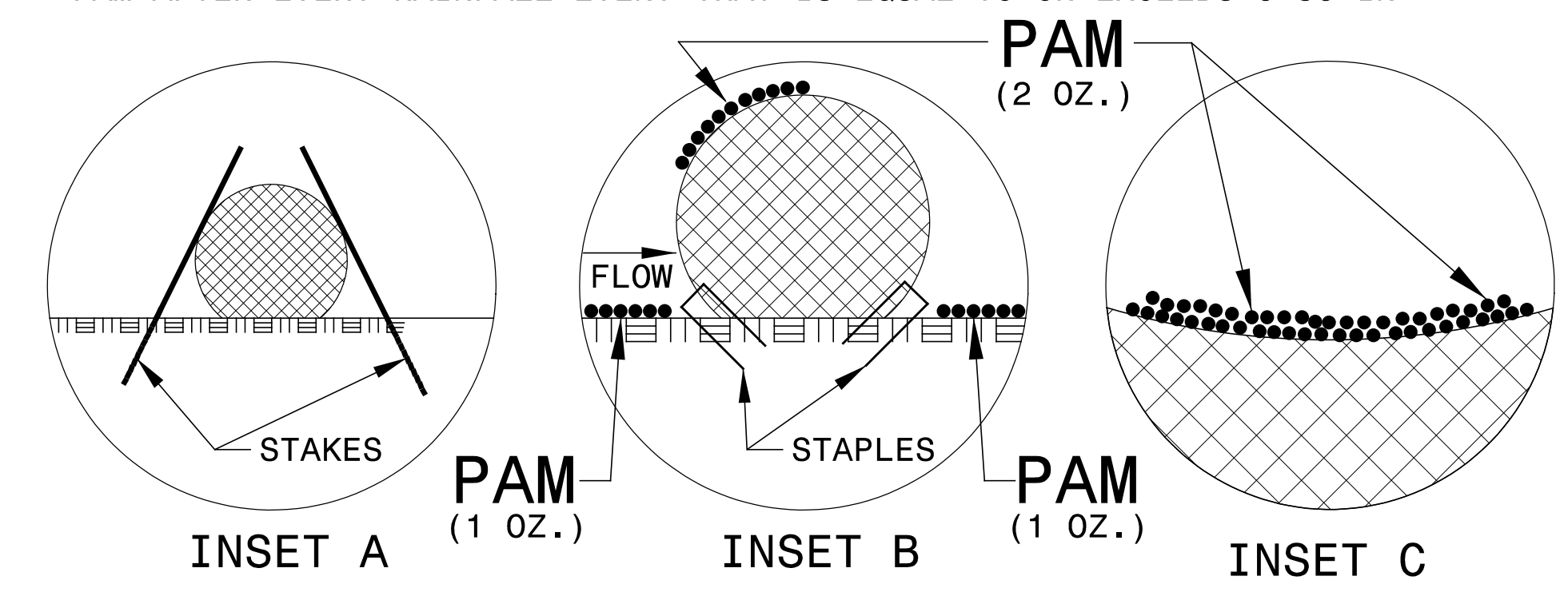
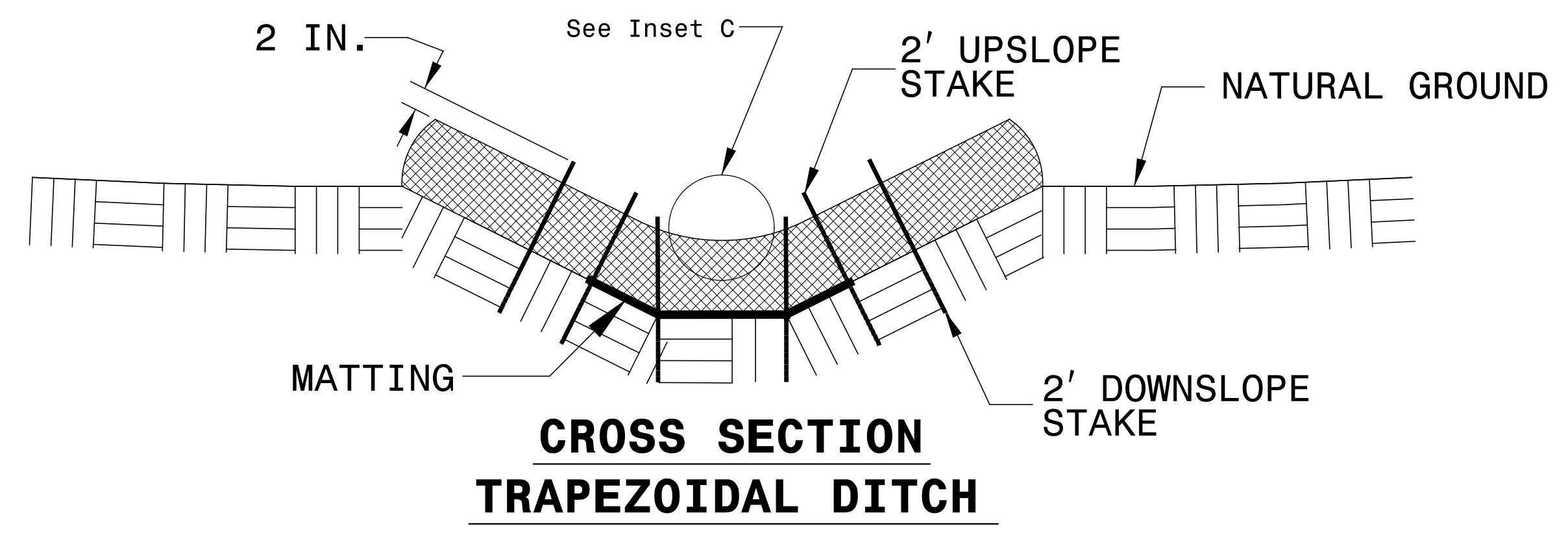
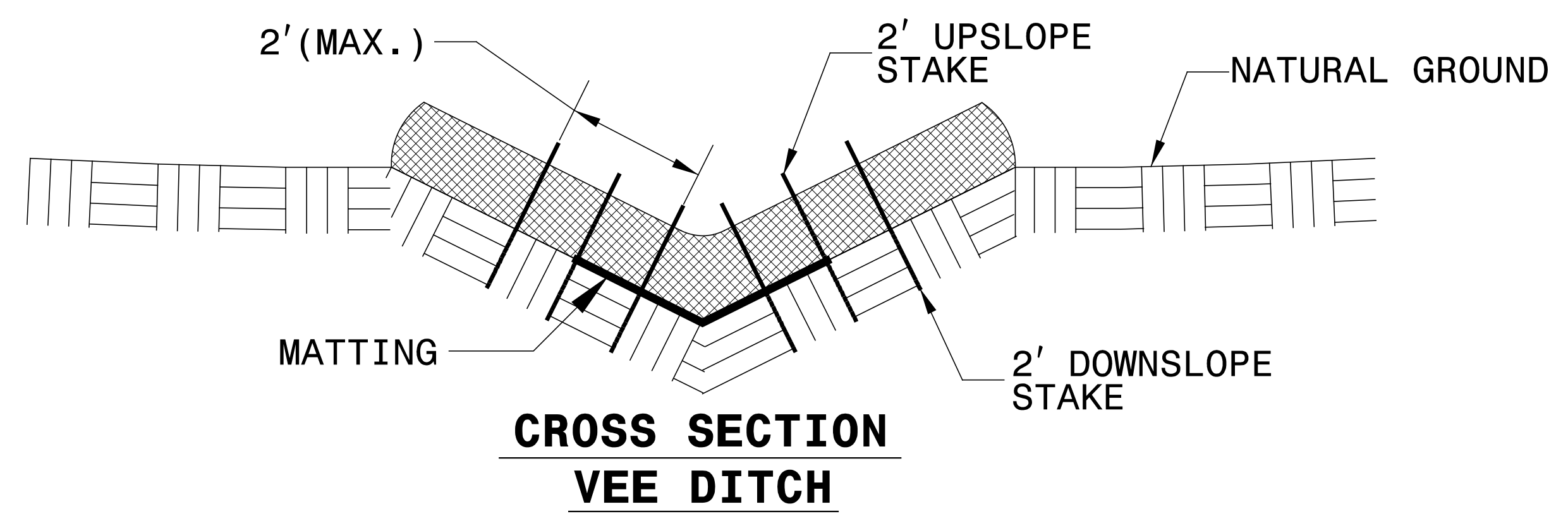
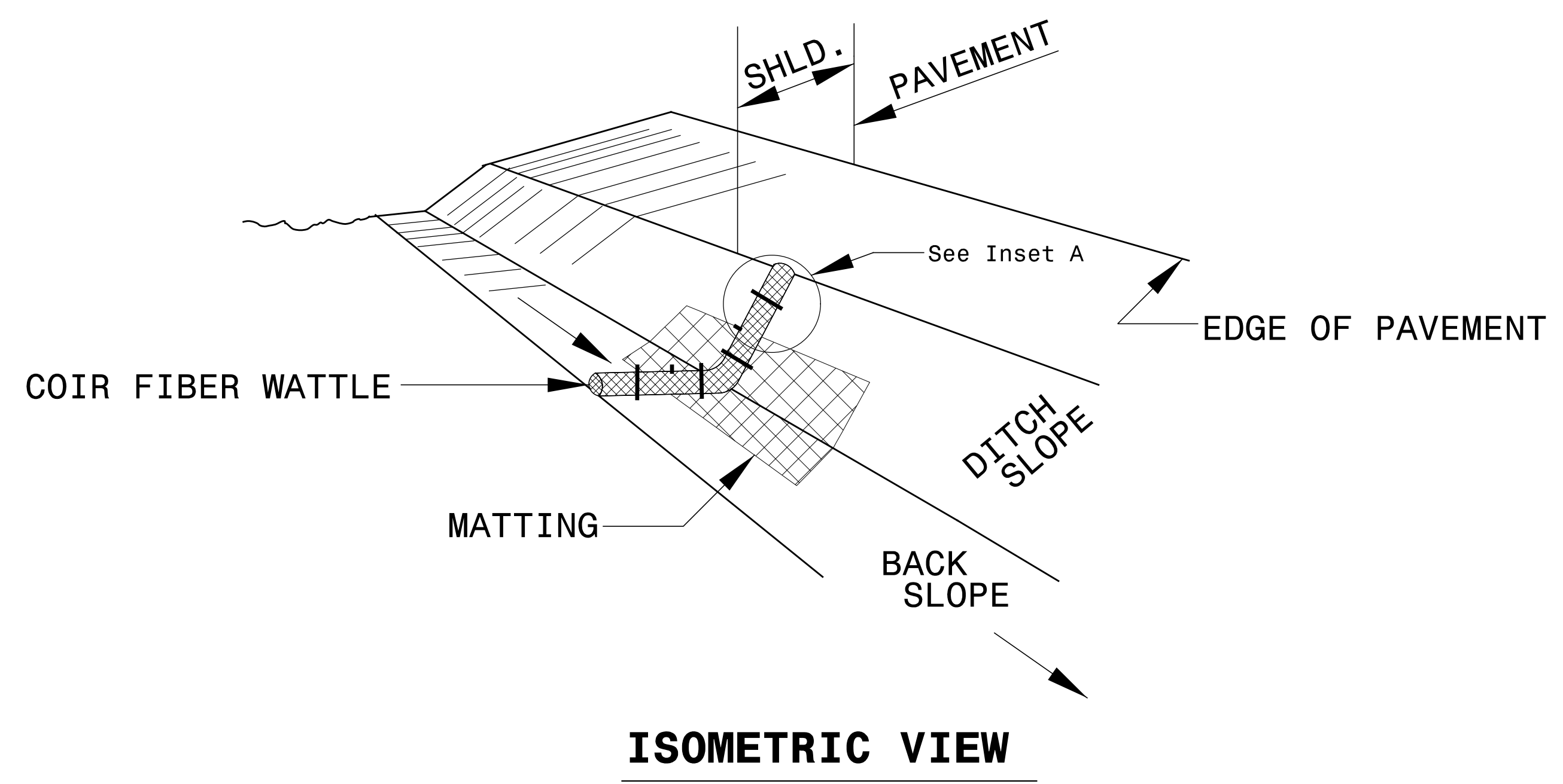
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.

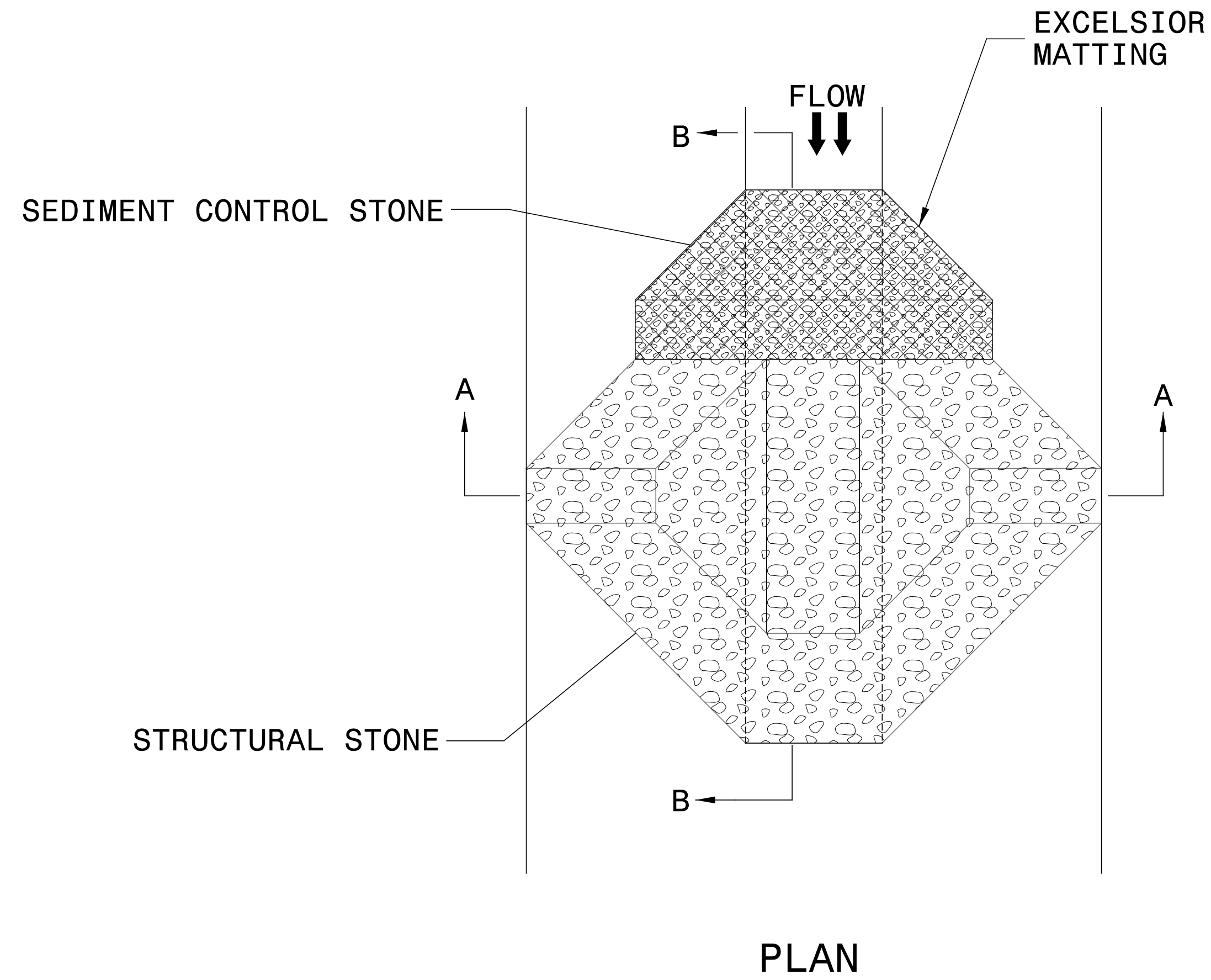
PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH WATTLE.

INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALLY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE OF PAM ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.



PROJECT REFERENCE NO. 17BP10.R.118	SHEET NO. EC-2B
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



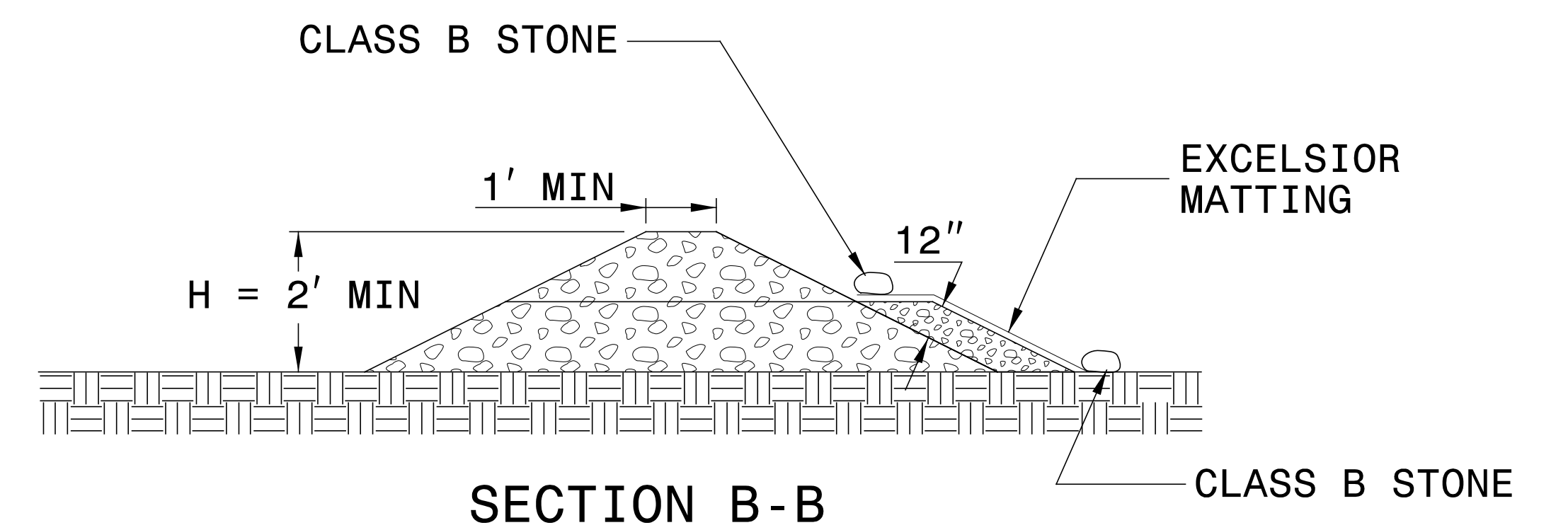
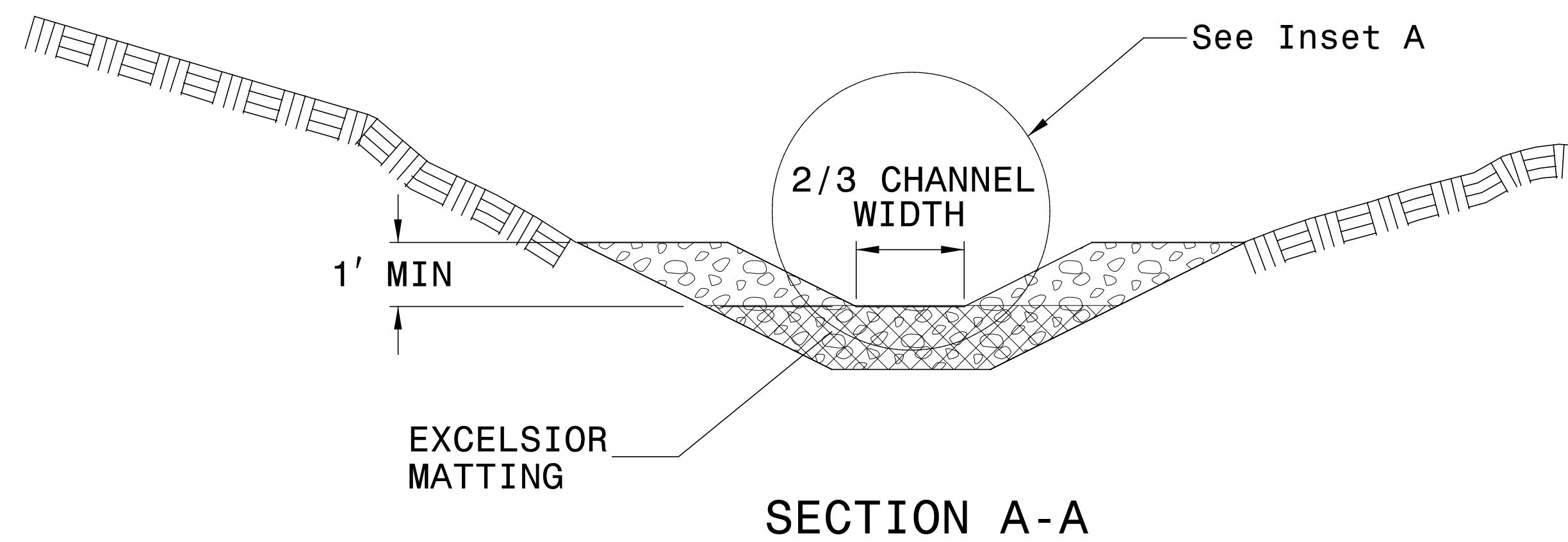
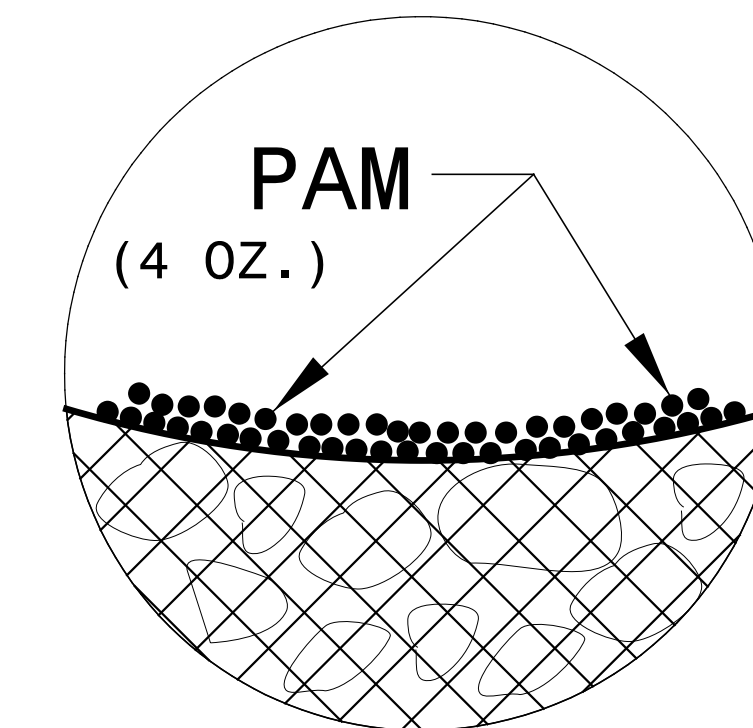
**NOTES:**

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.

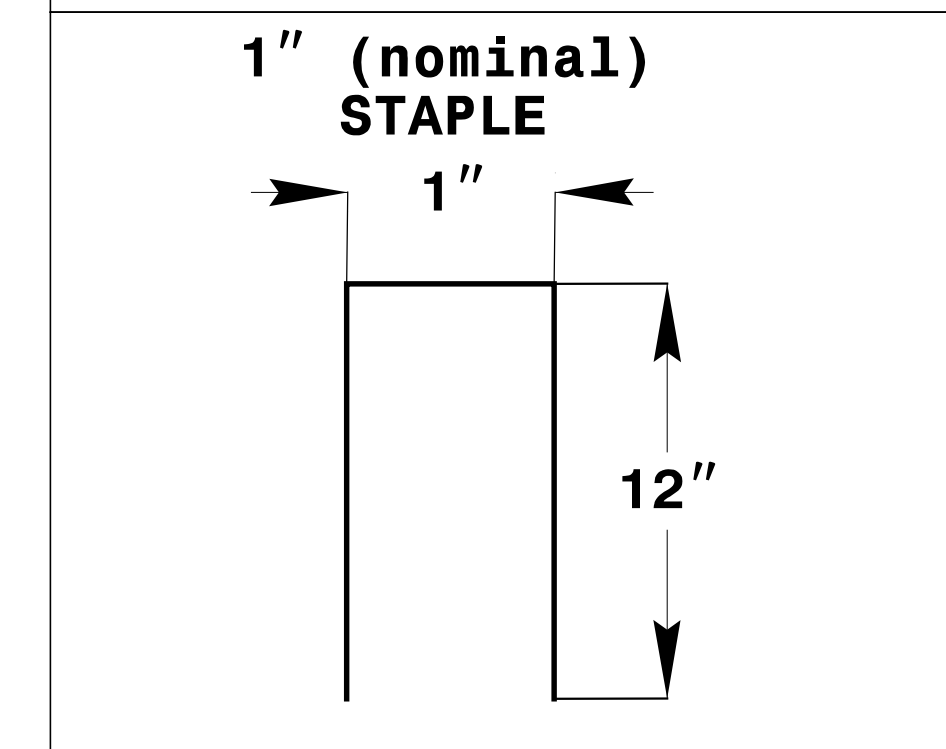
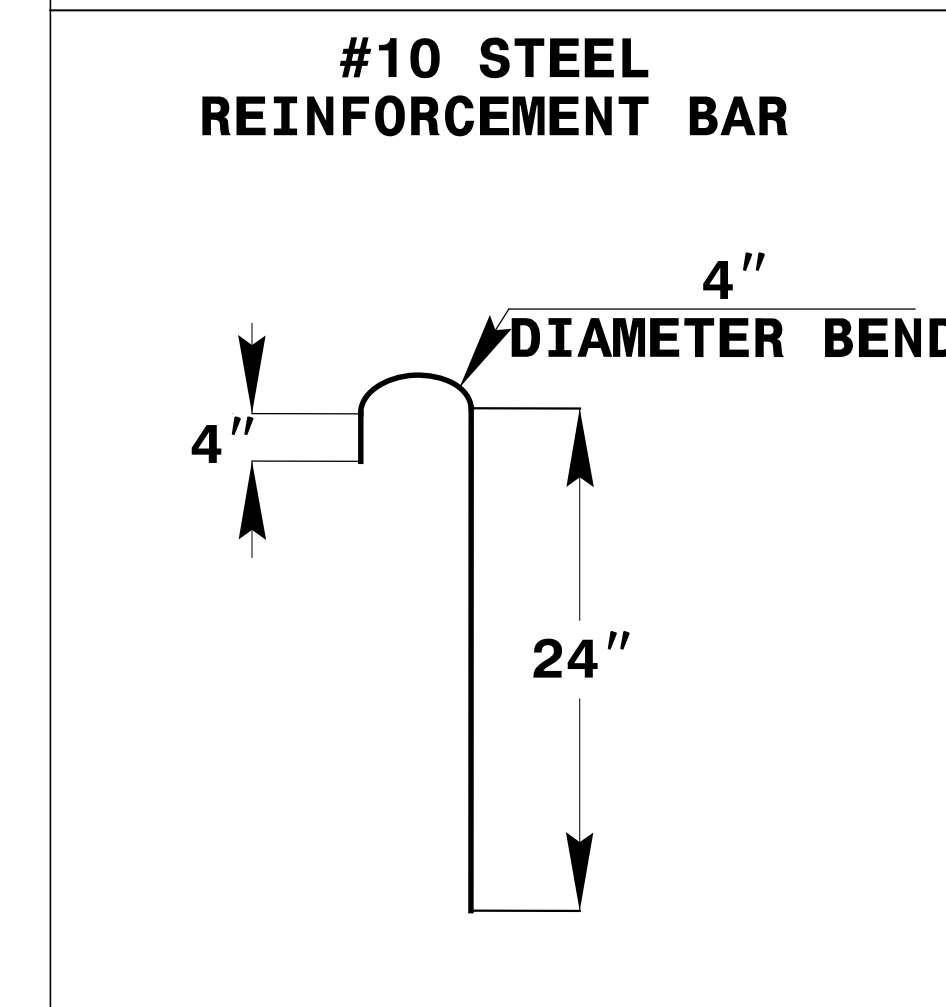
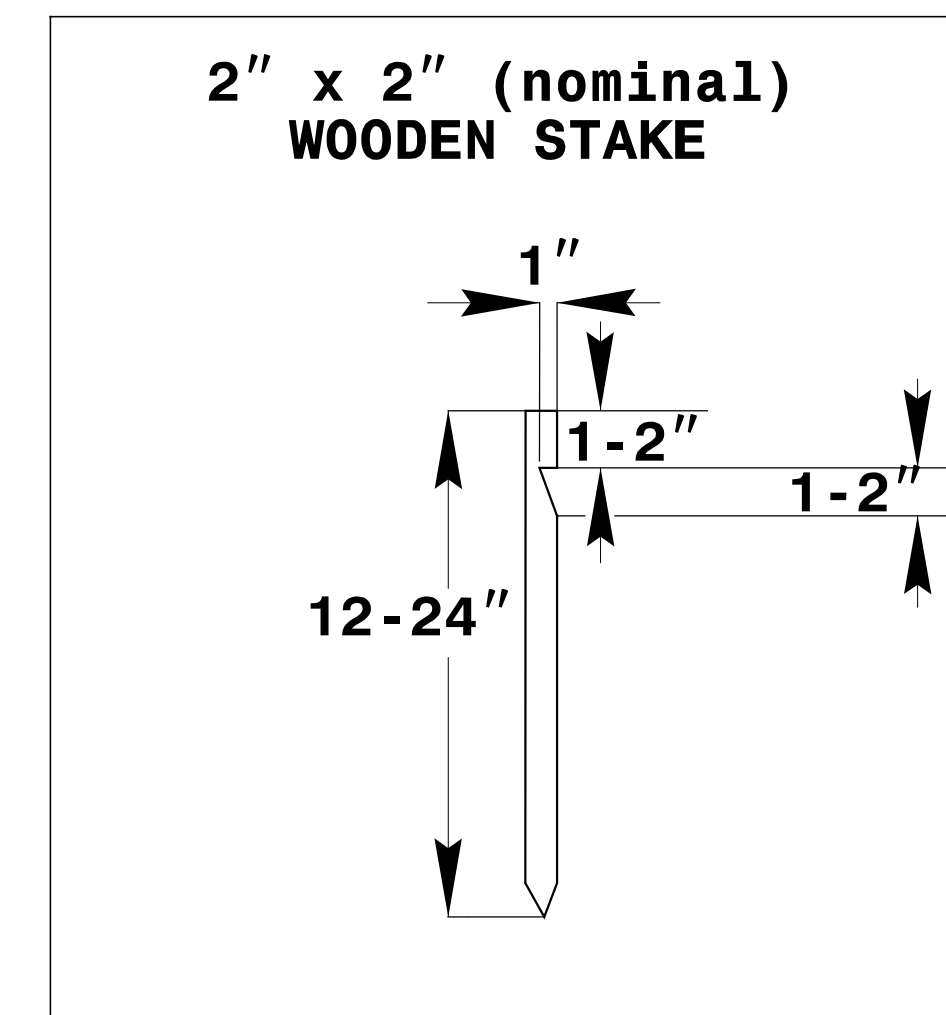
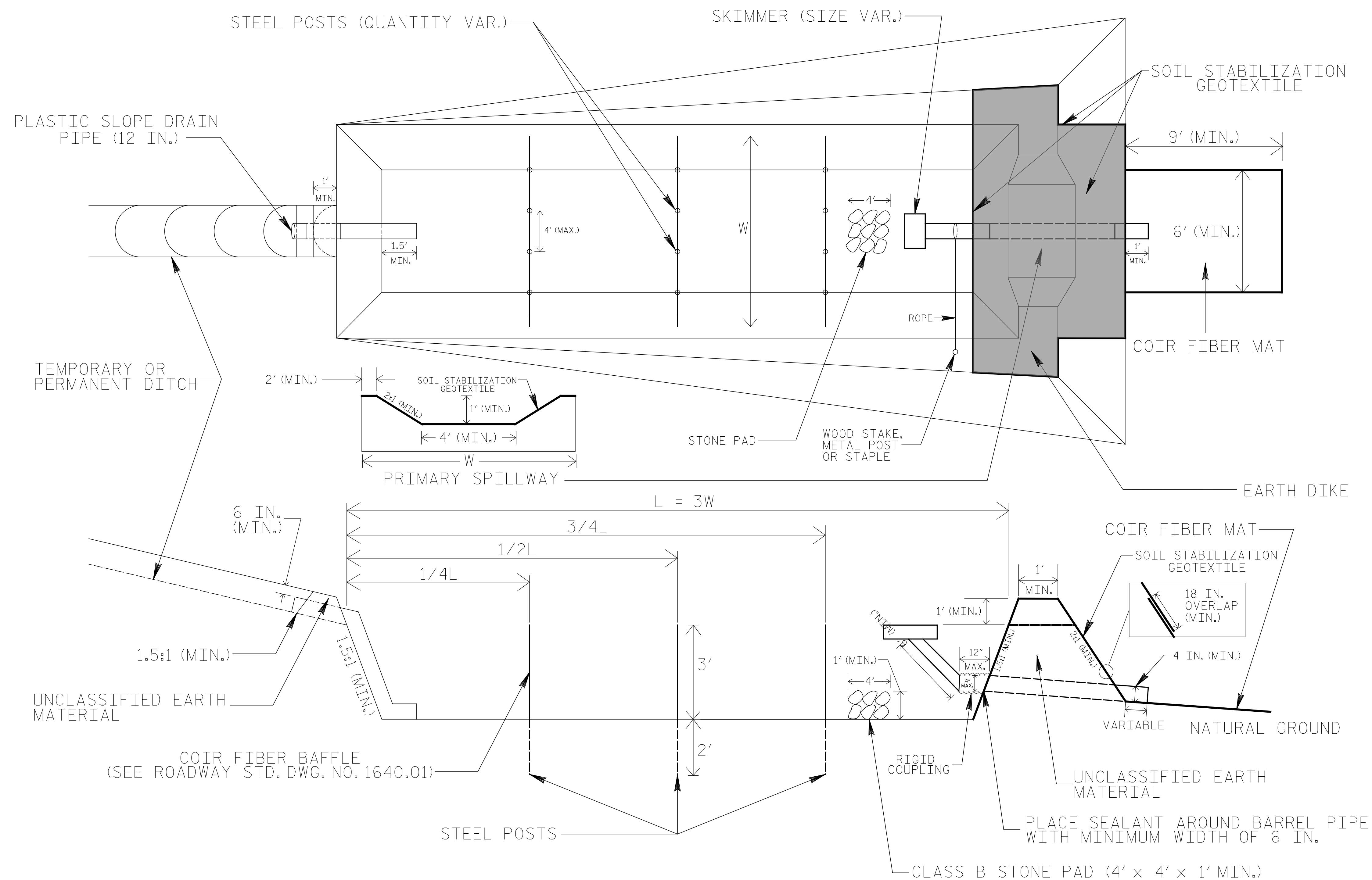
INITIALLY APPLY 4 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



NOT TO SCALE

PROJECT REFERENCE NO. 117BP.10.R.118	SHEET NO. EC-2C
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# SKIMMER BASIN WITH BAFFLES DETAIL



## COIR FIBER MAT ANCHOR OPTIONS

### NOTES

1. SEED AND PLACE MATTING FOR EROSION CONTROL ON INTERIOR AND EXTERIOR SIDESLOPES.
2. LIMIT EARTH DIKE HEIGHT TO 5 FT.
3. FOR BASIN DEPTH OF 3 FT., THE MINIMUM BASIN WIDTH SHALL BE 9 FT.
4. DETERMINE PRIMARY SPILLWAY WEIR LENGTH (FT.) USING  $Q/0.8$ , WHERE Q IS FLOW RATE (CFS) INTO BASIN.
5. PLASTIC SLOPE DRAIN PIPE AT INLET OF BASIN MAY BE REPLACED BY FILTRATION GEOTEXTILE OR TARP AS DIRECTED.
6. SOIL STABILIZATION GEOTEXTILE FOR PRIMARY SPILLWAY SHALL BE ONE CONTINUOUS PIECE OF MATERIAL OR OVERLAPPED 18 IN. (MIN.).

NOT TO SCALE

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO. 17BP10R118	SHEET NO. EC-3A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

## SOIL STABILIZATION SUMMARY SHEET

### MATTING FOR SLOPES

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	11+75	13+60	RT	385
4	-L-	12+70	13+60	LT	230
4	-L-	14+49	15+25	RT	135
4	-L-	14+50	16+37	LT	200
4	-L-	15+60	16+80	RT	165
SUBTOTAL					1115

### MATTING FOR DITCHES

4	-L-	12+75	13+86	LT	80
4	-L-	11+75	13+75	RT	100
4	-L-	15+57	16+85	RT	90
SUBTOTAL					270

TOTAL FOR DITCHES 270

TOTAL FOR SLOPES 1115

MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER 6525

TOTAL 7910

SAY 7950

### PERMANENT SOIL REINFORCEMENT MAT (PSRM)

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	10+25	11+00	LT	65
4	-L-	14+29	15+36	RT	80
SUBTOTAL					145

### PSRM FROM DRAINAGE CALLOUTS

4	-L-	10+25	11+00	LT	20
SUBTOTAL					20
TOTAL					165
SAY					200

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

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PROJECT REFERENCE NO.	SHEET NO.
17BP.10.R.118	EC-3B
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# ***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.

**CLEARING AND GRUBBING  
EROSION CONTROL FOR  
CONSTRUCTION SHEET 4**

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

75 x 35 x 3  
1.5 inch Skimmer  
with 1.375 inch  
Orifice Diameter  
10 ft. weir  
(See Skimmer  
Basin Detail)  
ID 4.1B

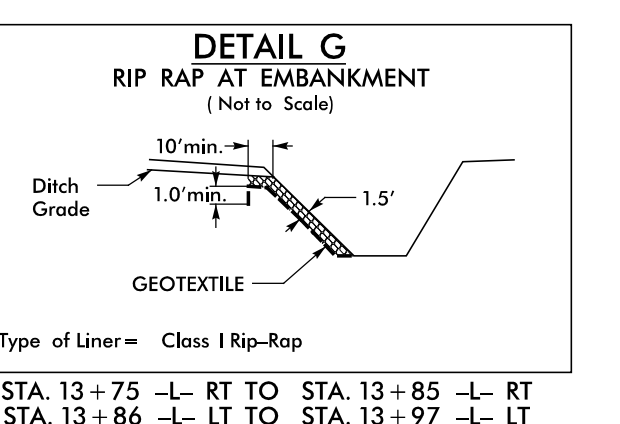
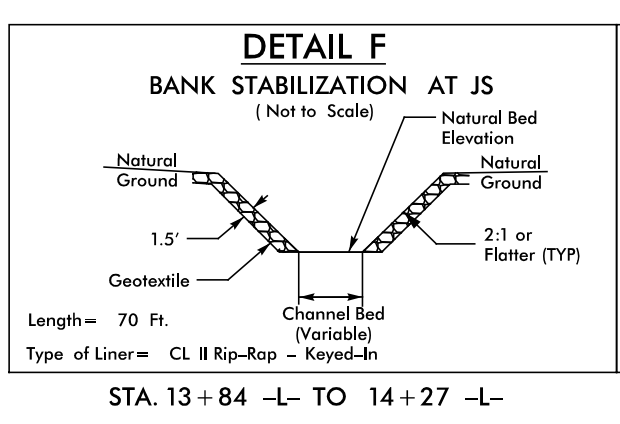
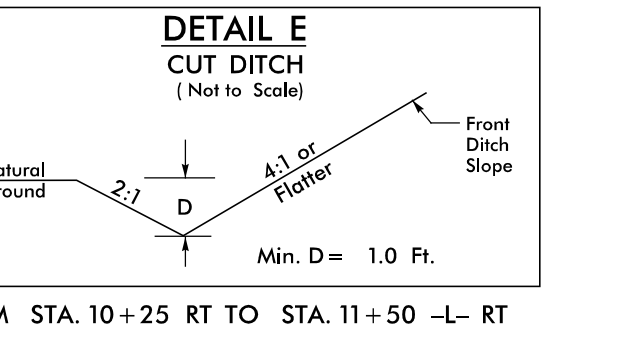
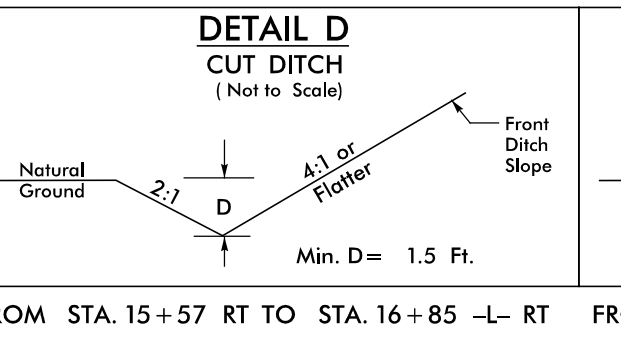
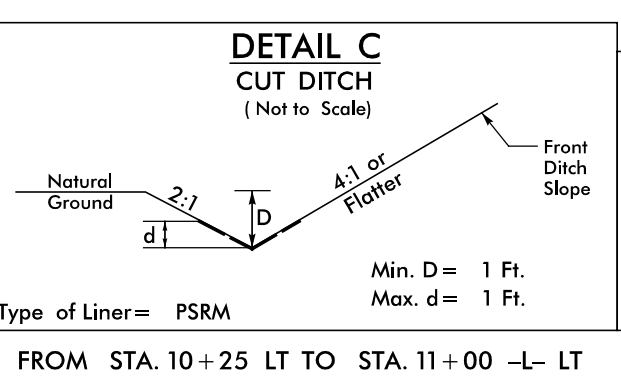
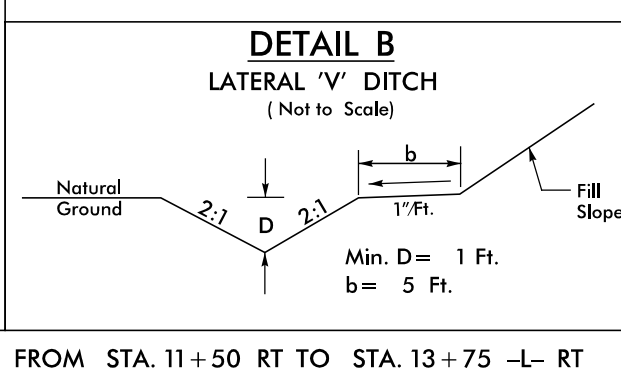
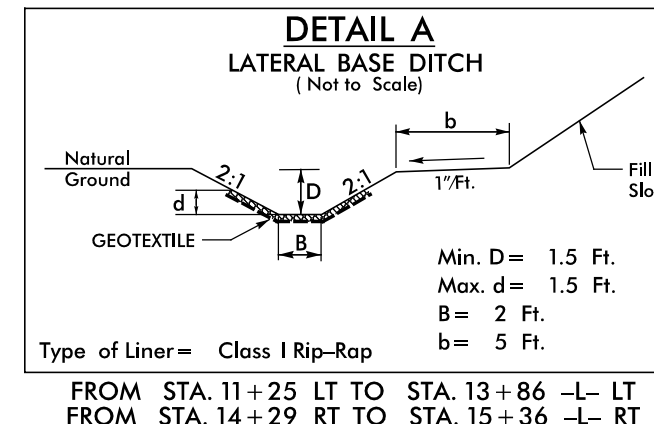
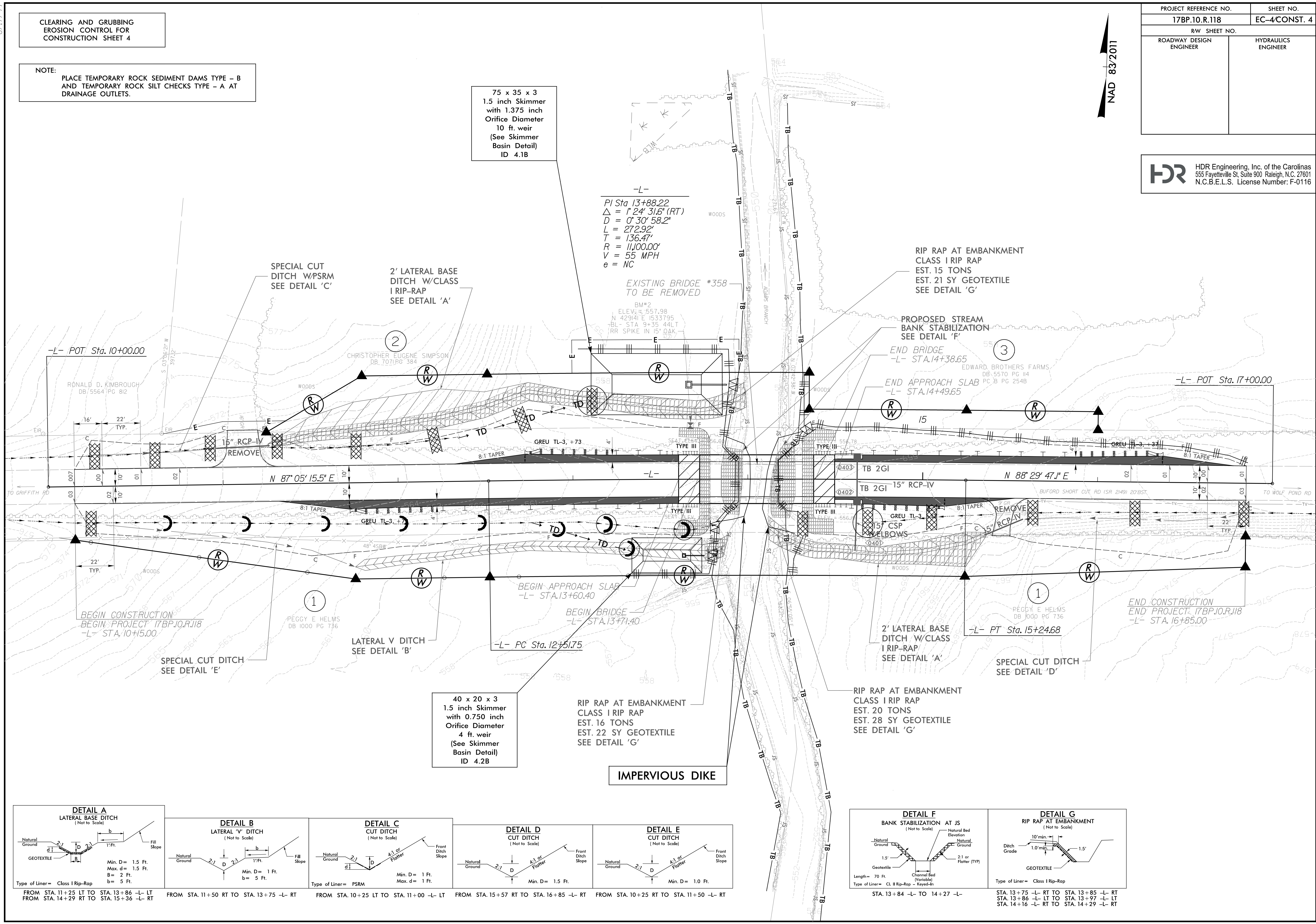
40 x 20 x 3  
1.5 inch Skimmer  
with 0.750 inch  
Orifice Diameter  
4 ft. weir  
(See Skimmer  
Basin Detail)  
ID 4.2B

-L-  
PI Sta. 13+88.22  
 $\Delta = 1' 24' 31.6"$  (RT)  
D = 0' 30' 58.2"  
L = 272.92'  
T = 136.47'  
R = 11,000.00'  
V = 55 MPH  
e = NC

PROJECT REFERENCE NO.	SHEET NO.
17BP.10.R.118	EC-4CONSTR. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**HDR** HDR Engineering, Inc. of the Carolinas  
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601  
N.C.B.E.L.S. License Number: F-0116

NAD 83/2011



PLOT DRIVER: Hydro\_block.pdf.plt  
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 FILE: NCDOT\NCDOT\Western\_Div\_0m-Cell\_M\_NCDOT\_2018\_Div\_10\_Bridge\_Group\6.0\_CAD\_BTM\6.2\_WIP\Site #1\_Union #358\_17BP.10.R.118\Erosion Control\890358\_HYD\_EC\_PSH4.dgn  
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PROJECT REFERENCE NO.	SHEET NO.
17BP.10.R.118	EC-5CONSTR. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**HDR** HDR Engineering, Inc. of the Carolinas  
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601  
N.C.B.E.L.S. License Number: F-0116

NAD 83/2011

Place Matting for Erosion Control on Slope as Work Allows.  
Sta. 11+75 Rt to Sta. 13+60 Rt  
Sta. 12+70 Lt to Sta. 13+60 Lt  
Sta. 14+49 Rt to Sta. 15+25 Rt  
Sta. 14+50 Lt to Sta. 16+37 Lt  
Sta. 15+60 Rt to Sta. 16+80 Rt

Place Matting for Erosion Control on Ditches as Work Allows.  
Sta. 12+75 Lt to Sta. 13+86 Lt  
Sta. 11+75 Rt to Sta. 13+75 Rt  
Sta. 15+57 Rt to Sta. 16+85 Rt

INSTALL COIR FIBER MATTING FOR STABILITY ON FLOODPLAIN BENCH UNDER PROPOSED BRIDGE

75 x 35 x 3  
1.5 inch Skimmer  
with 1.375 inch  
Orifice Diameter  
10 ft. weir  
(See Skimmer  
Basin Detail)  
ID 4.1B

-L-  
PI Sta. 13+88.22  
 $\Delta = 1' 24' 31.6" (RT)$   
 $D = 0' 30' 58.2"$   
 $L = 272.92'$   
 $T = 136.47'$   
 $R = 11,000.00'$   
 $V = 55 MPH$   
 $e = NC$

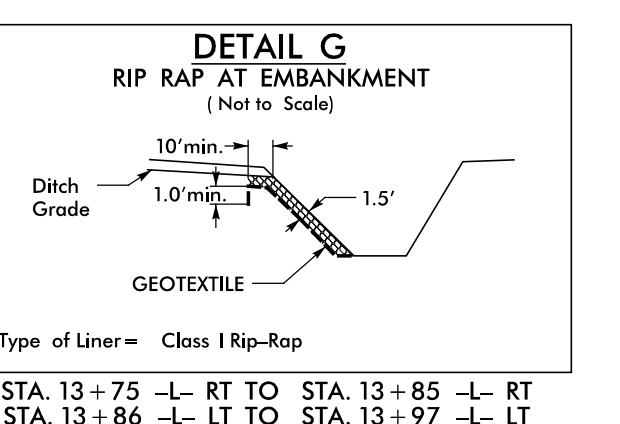
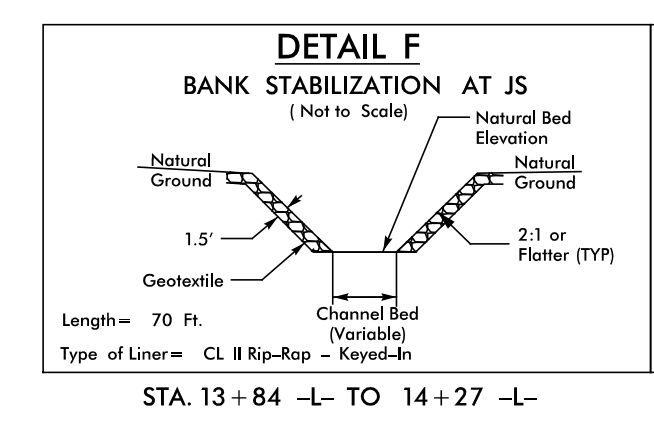
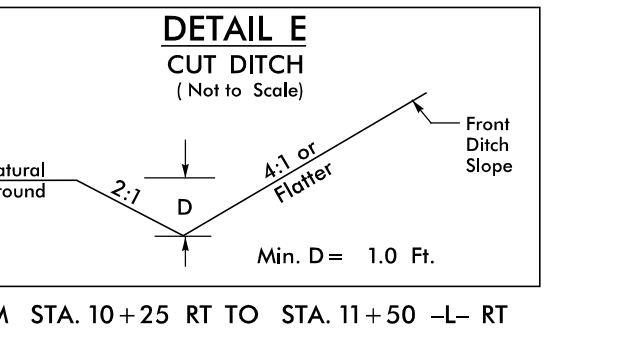
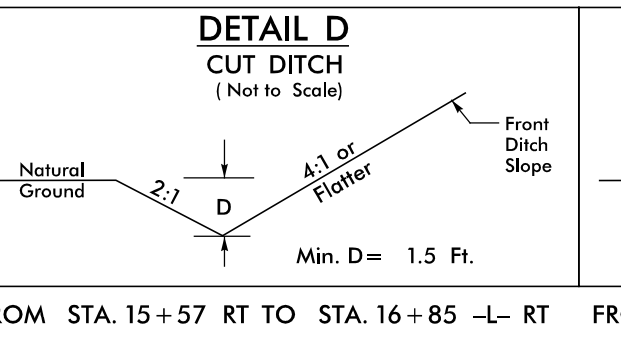
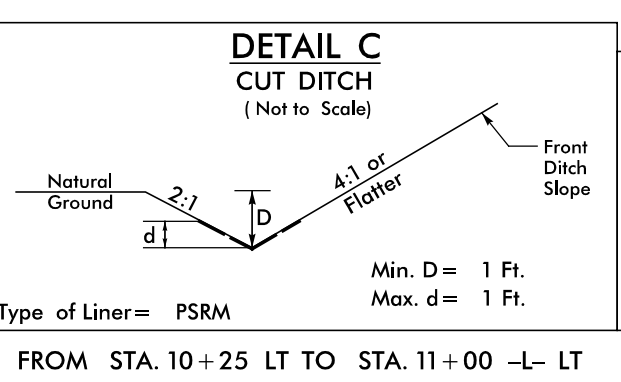
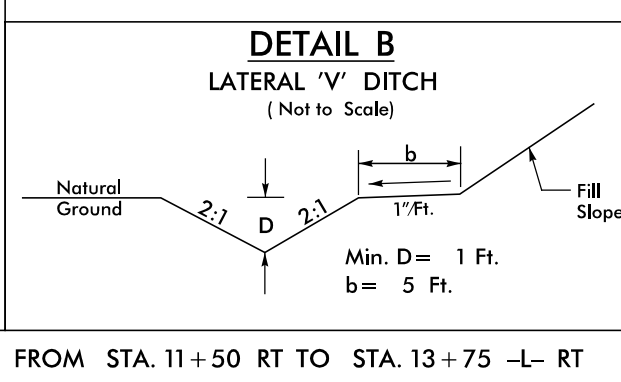
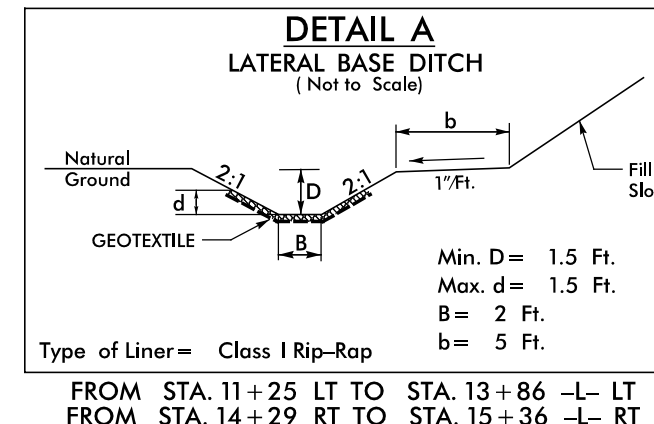
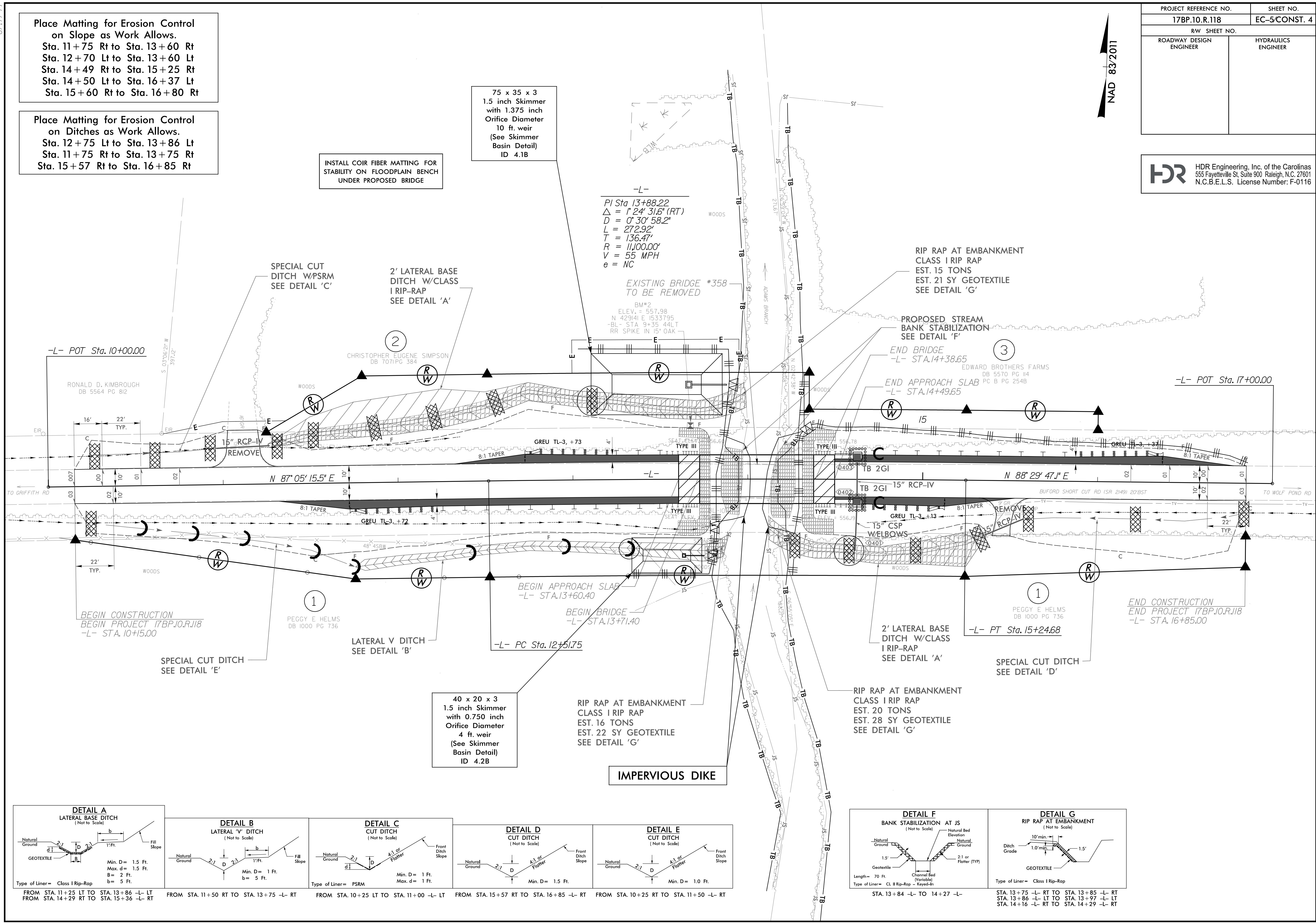
RIP RAP AT EMBANKMENT  
CLASS I RIP RAP  
EST. 15 TONS  
EST. 21 SY GEOTEXTILE  
SEE DETAIL 'G'

PROPOSED STREAM  
BANK STABILIZATION  
SEE DETAIL 'F'

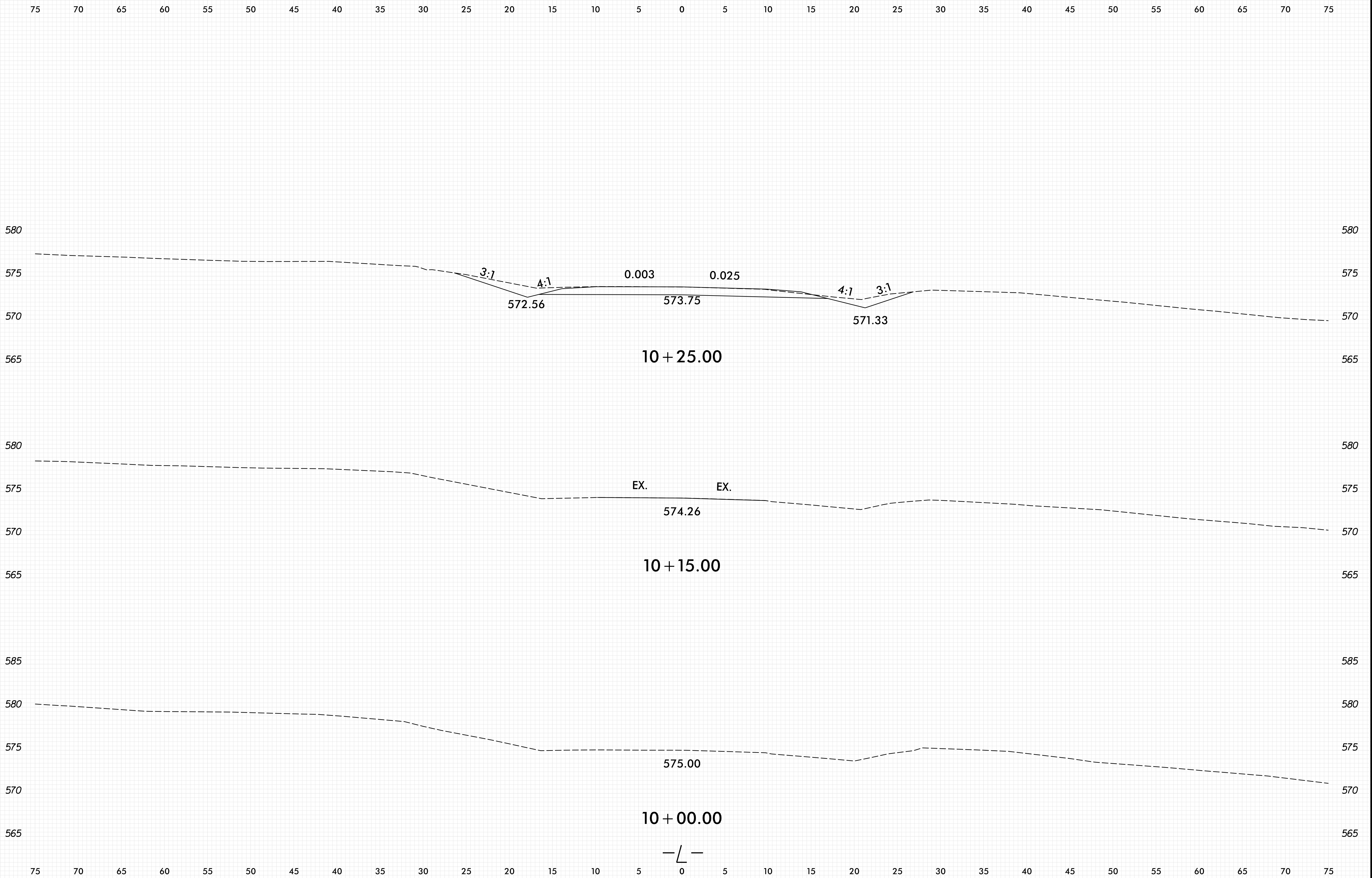
END BRIDGE  
-L- STA. 14+38.65

END APPROACH SLAB  
-L- STA. 14+49.65

-L- POT Sta. 17+00.00

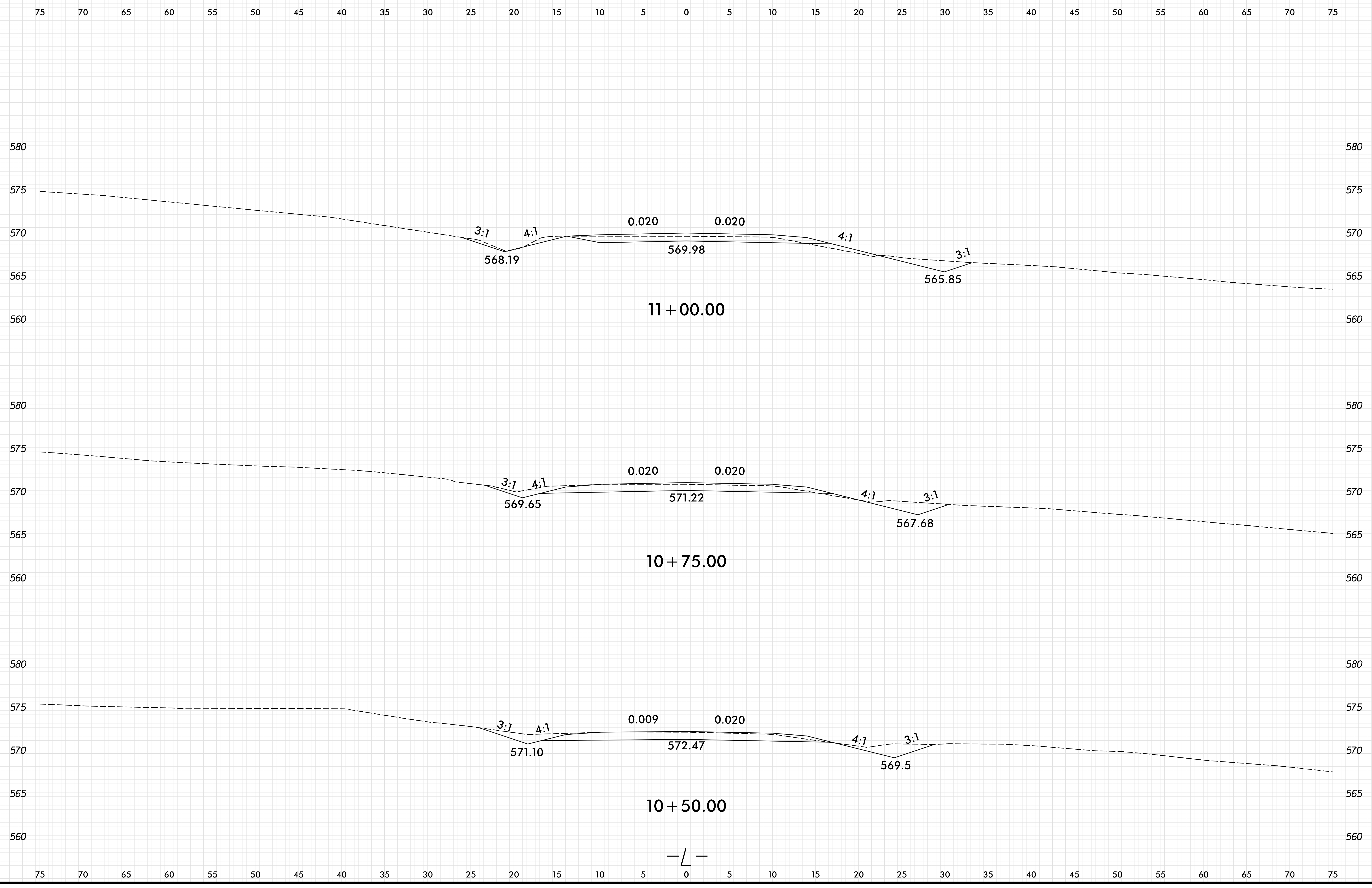


PLOT DRIVER: Hydro\_block.pdf; p1tofg  
 USER: DEWIS  
 FILE: NCDOT\NCDOT\Western\_Div\_0m-Coll\_M\_NCDOT\_2018\_Div\_10\_Bridge\_Group\6.0\_CAD\_BTM\6.2\_WTP\Site #1\_Union #358\_17BP.10.R.118\Erosion\_Control\890358\_HYD\_EC\_PSH4.dgn  
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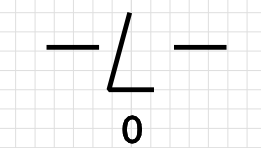


6/23/16

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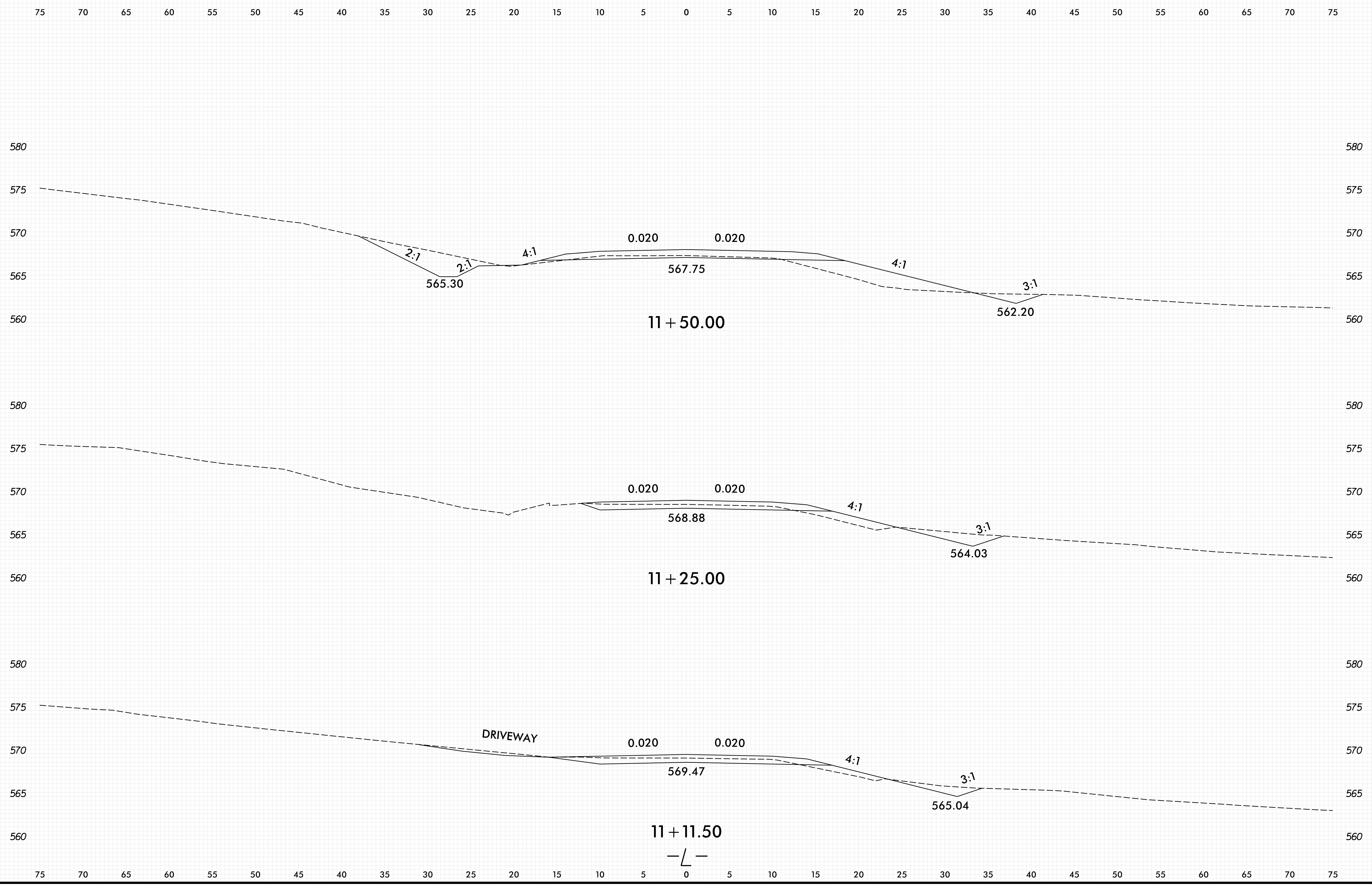


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6/23/16

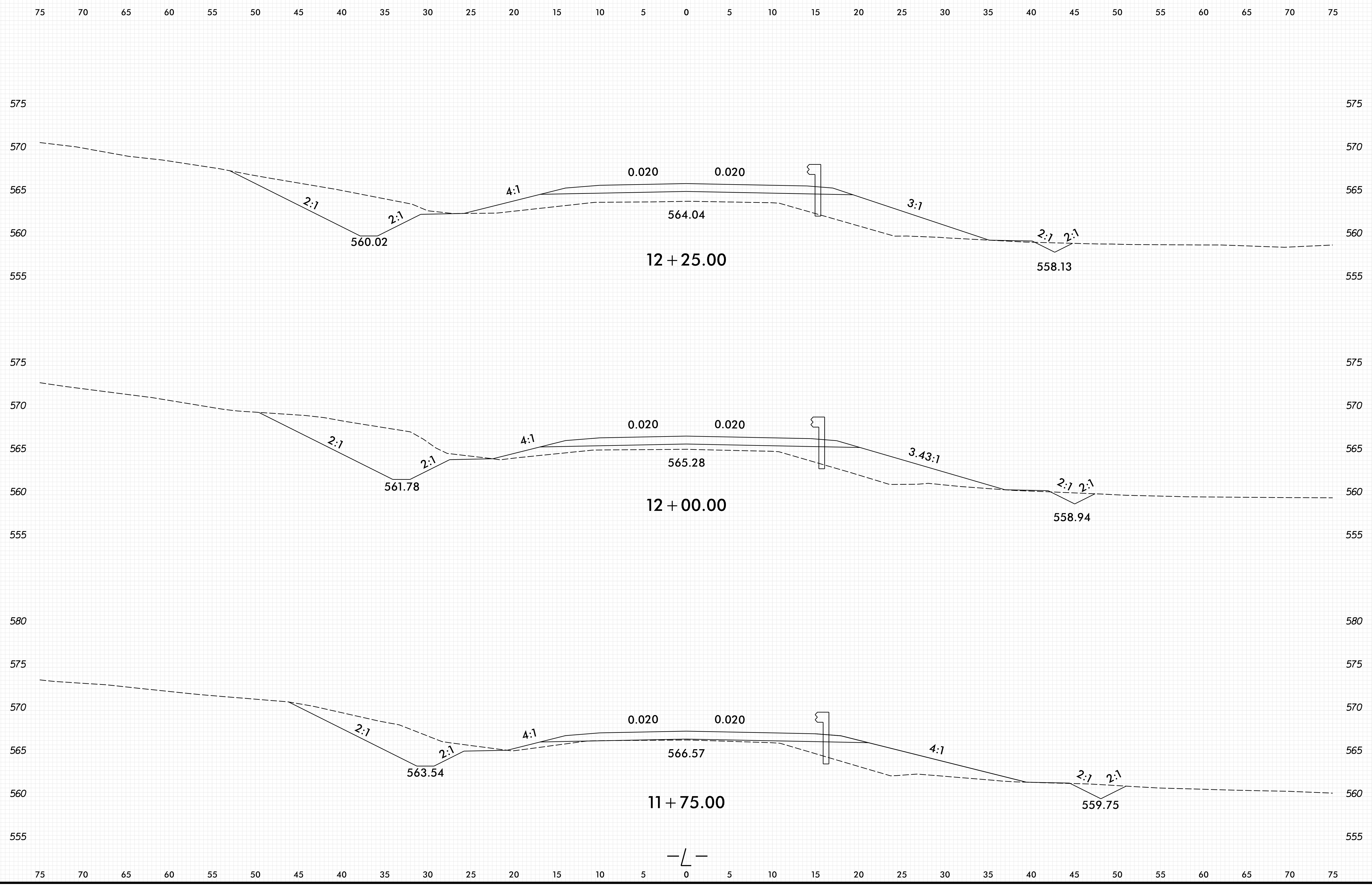
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6/23/16

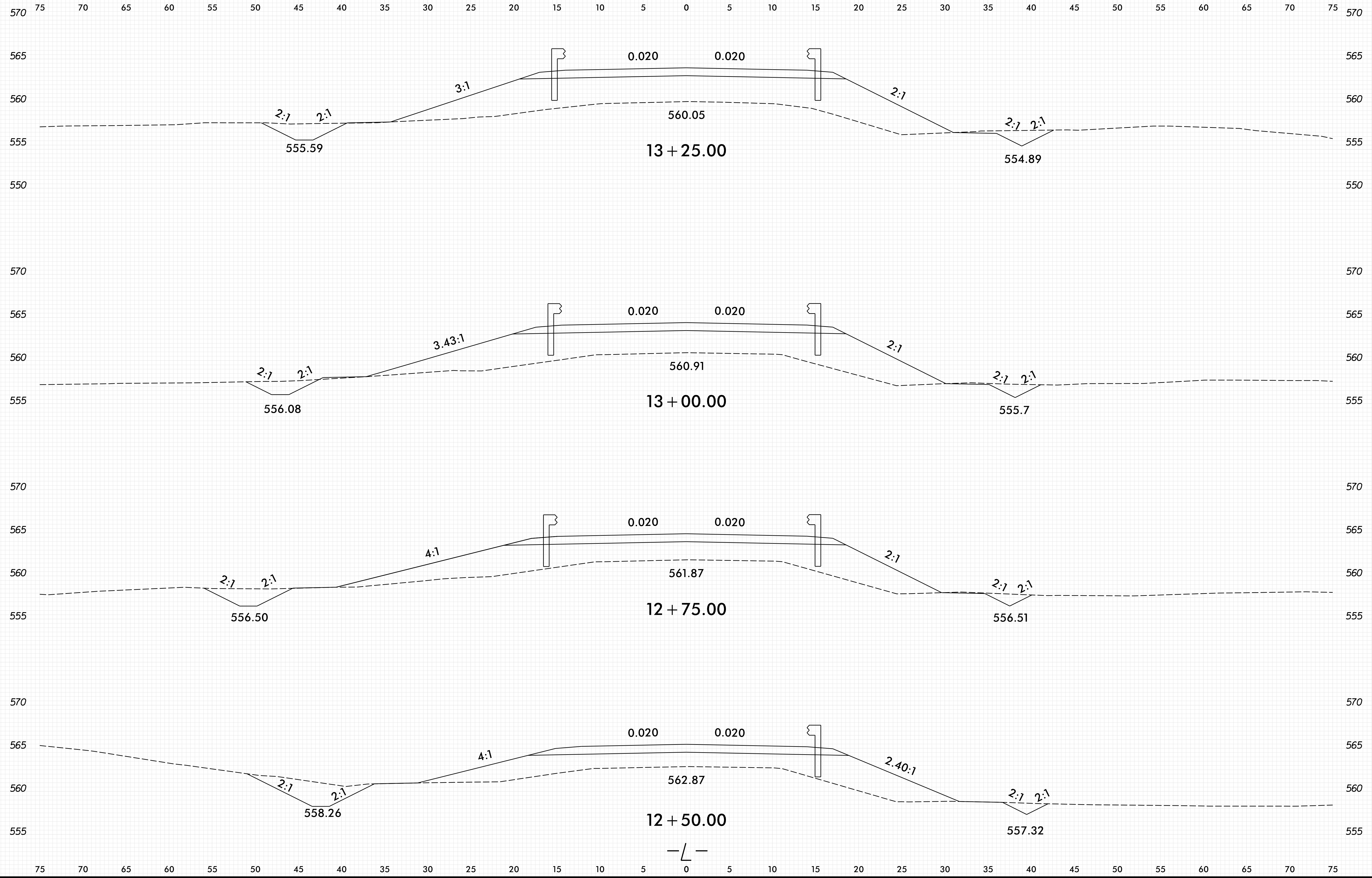
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6/23/16

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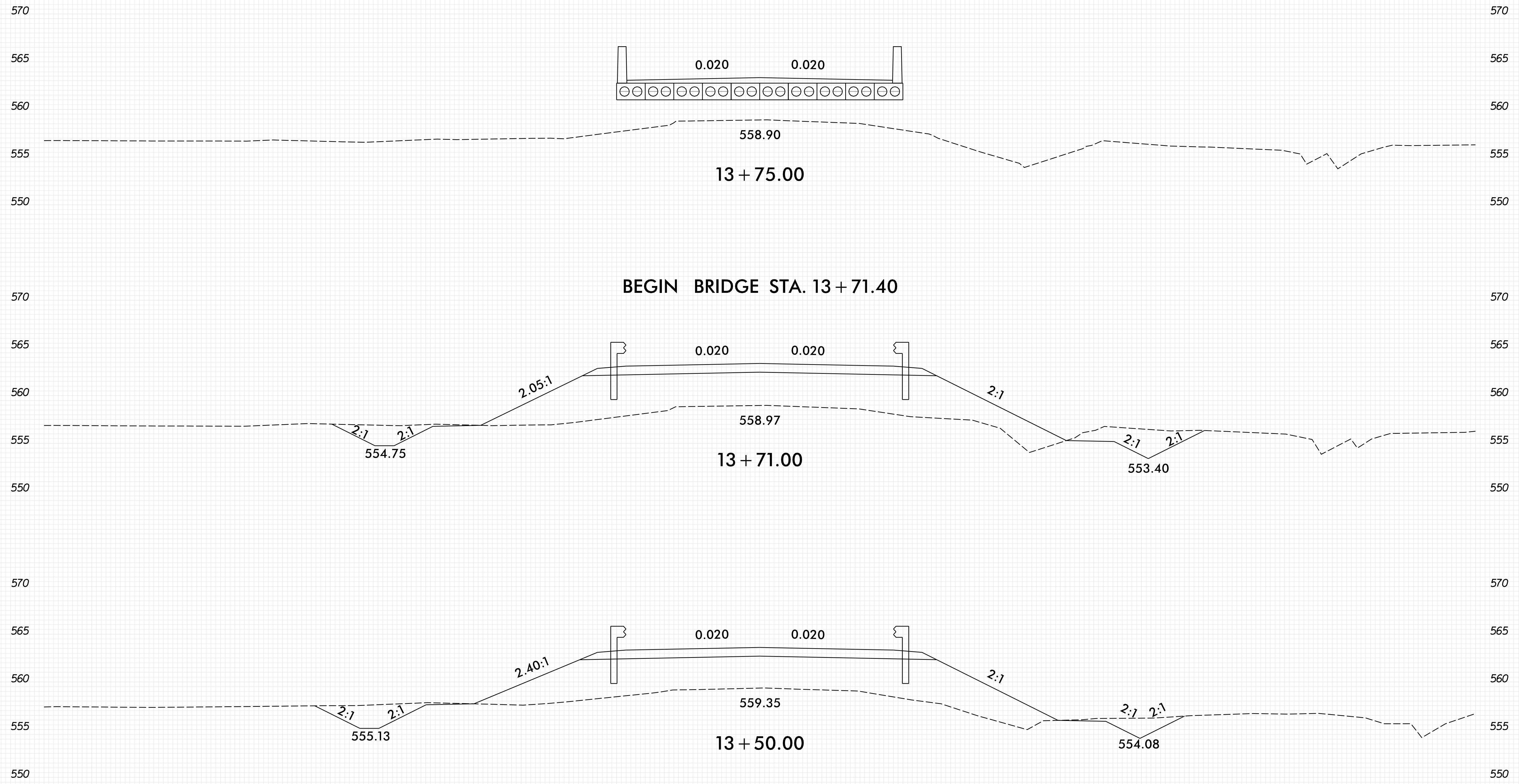


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6/23/16

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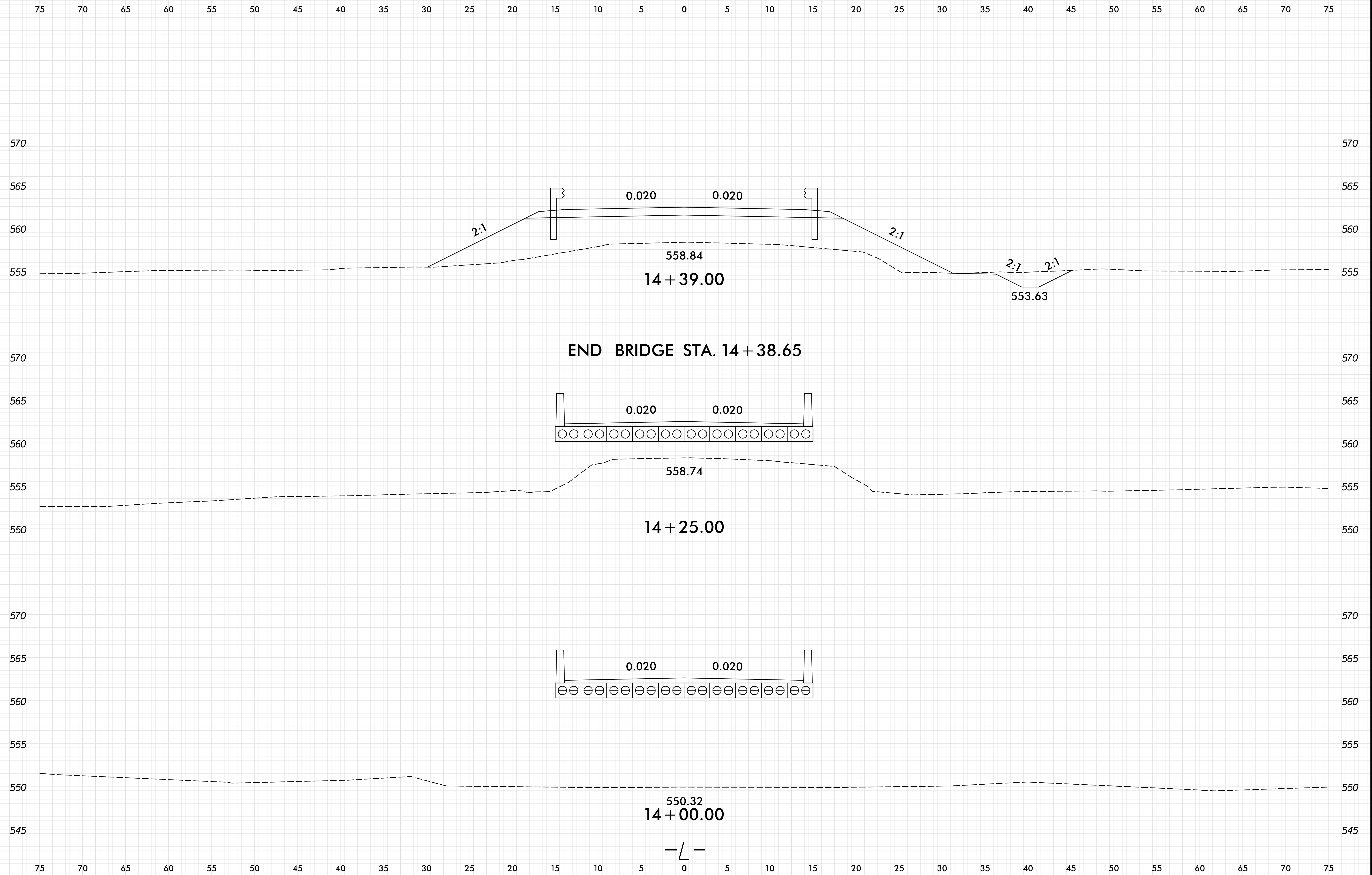
BEGIN BRIDGE STA. 13 + 71.40

— / —

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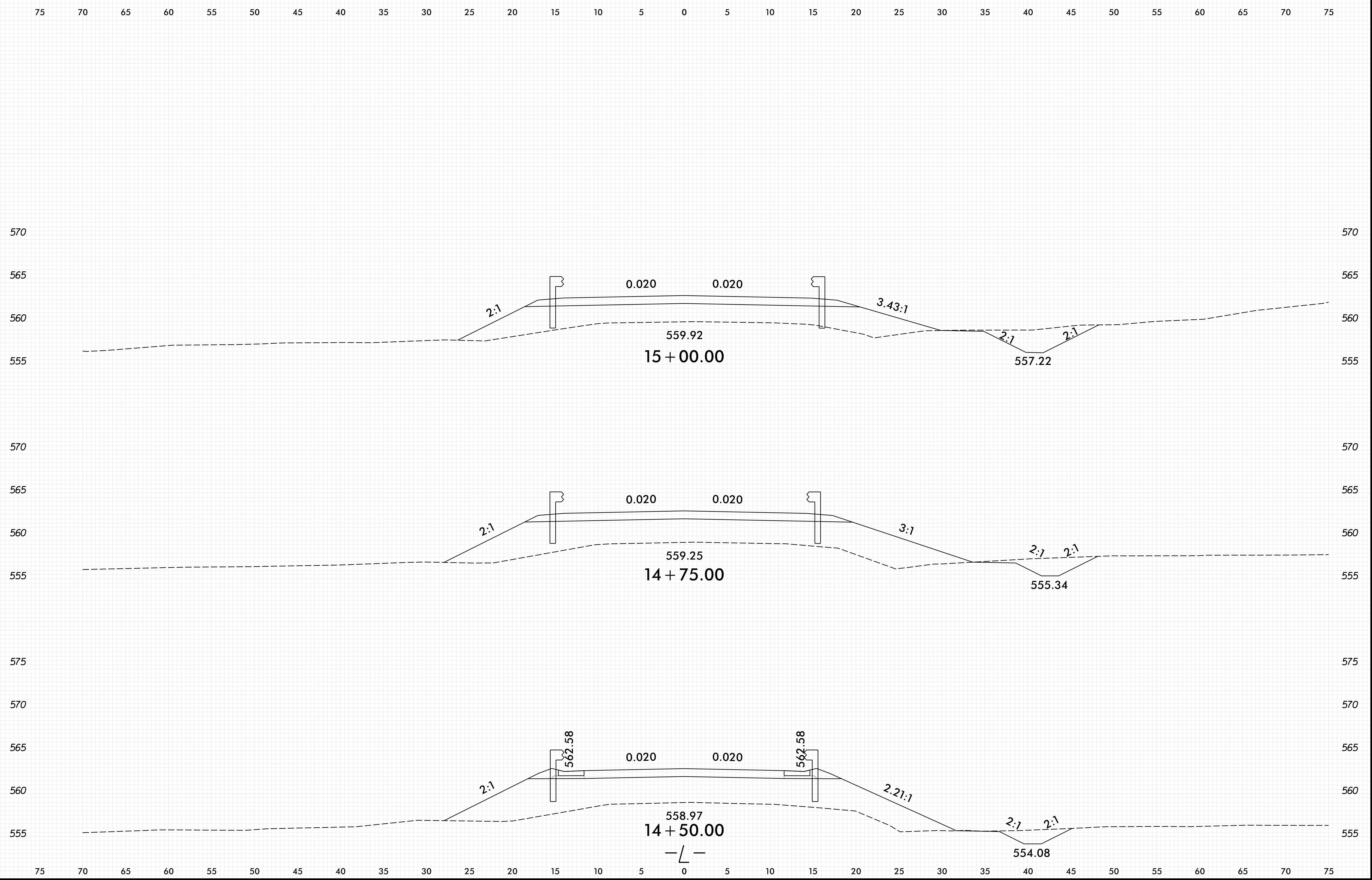
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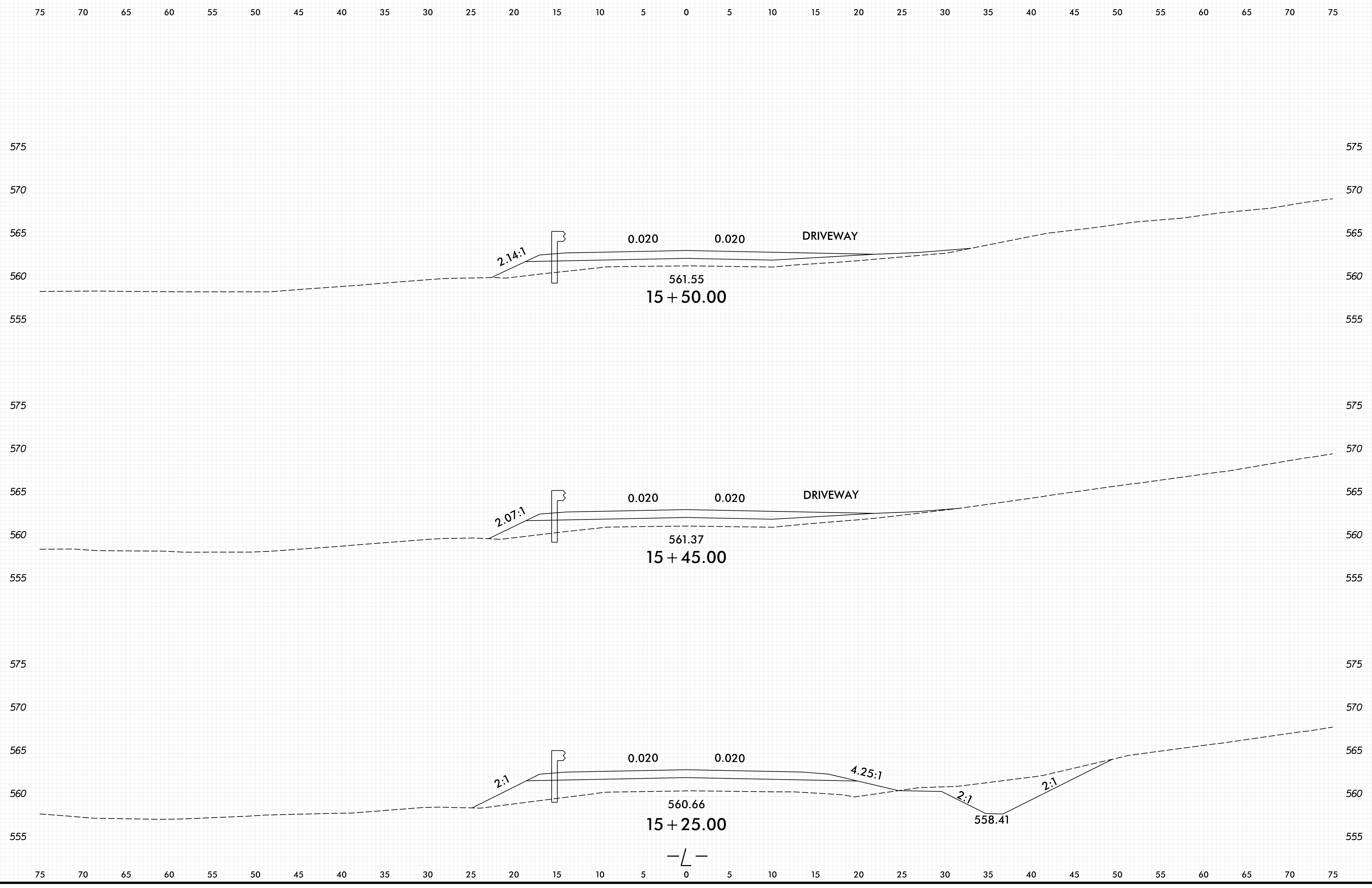
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6/23/16

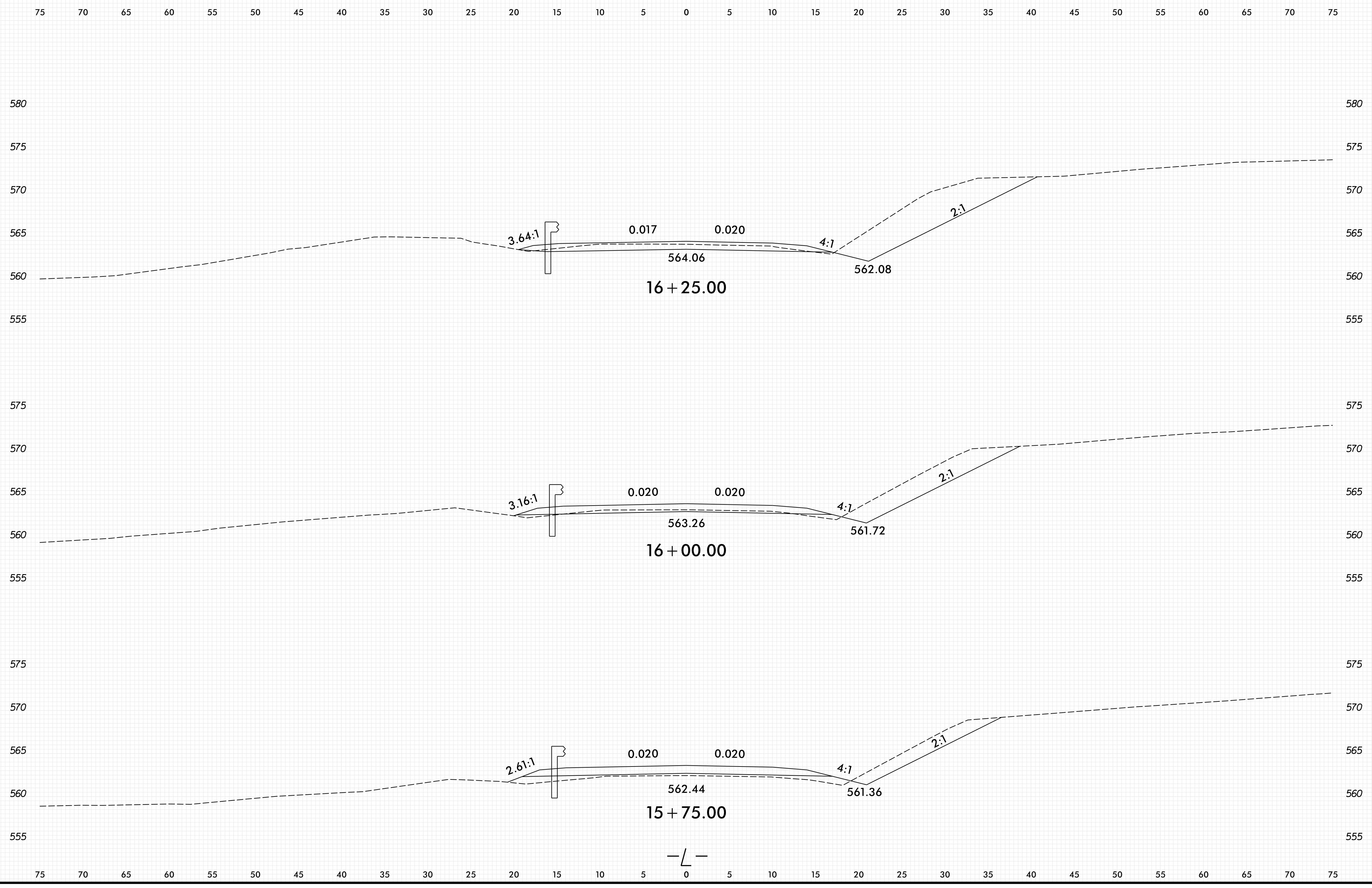
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6/23/16

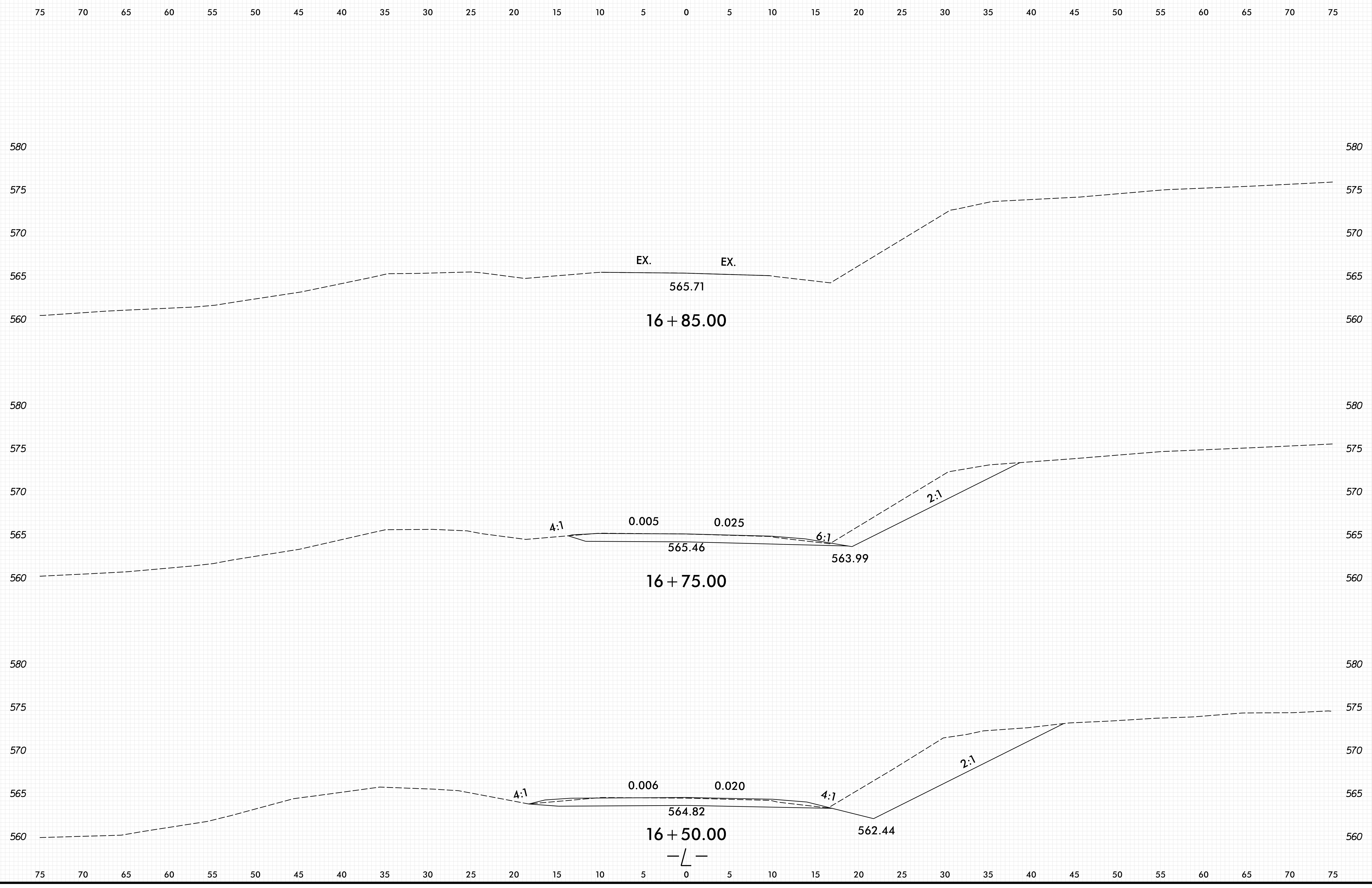
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