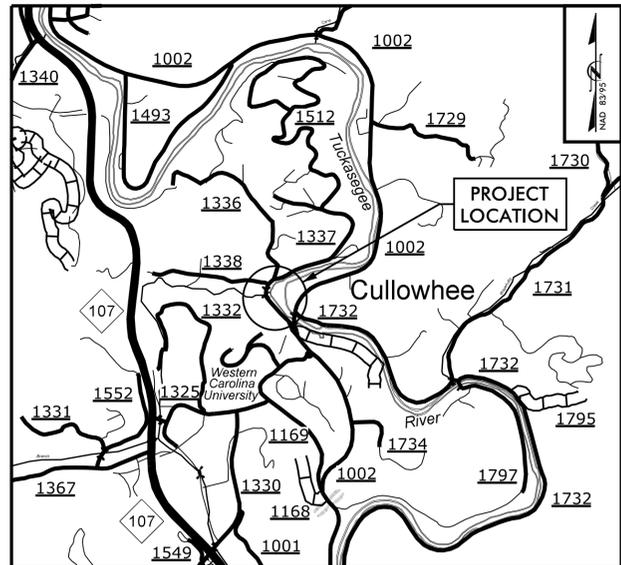


09_08/2019

CONTRACT: C204715 STATE PROJECT: 17BP.14.R.212 / 44983

PLOT DRIVER: NCDOT_pcf_color_eng_50.pit
 USER: JMASSR9C
 PENTABLE: NCDOT_pshpflt.tbl
 TIME: 5/18/2023 10:44:56 AM
 FILE: NCDOT\NCDOT_Western_Div_On-Coll_M_NCDOT-17BP.14.R.212_Cullowhee\6.0_CAD_BTM\6.2_Work_In_Progress\17BP.14.R.212_Roadway\Proj\490159_RDY_TSH.dgn

See Sheet 1A For Index of Sheets



VICINITY MAP (NOT TO SCALE)

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

JACKSON COUNTY

LOCATION: SR 1336 (MONTEITH GAP ROAD) FROM NORTH OF SR 1002 (OLD CULLOWHEE ROAD) TO NORTH OF SR 1337 (LEDBETTER ROAD)

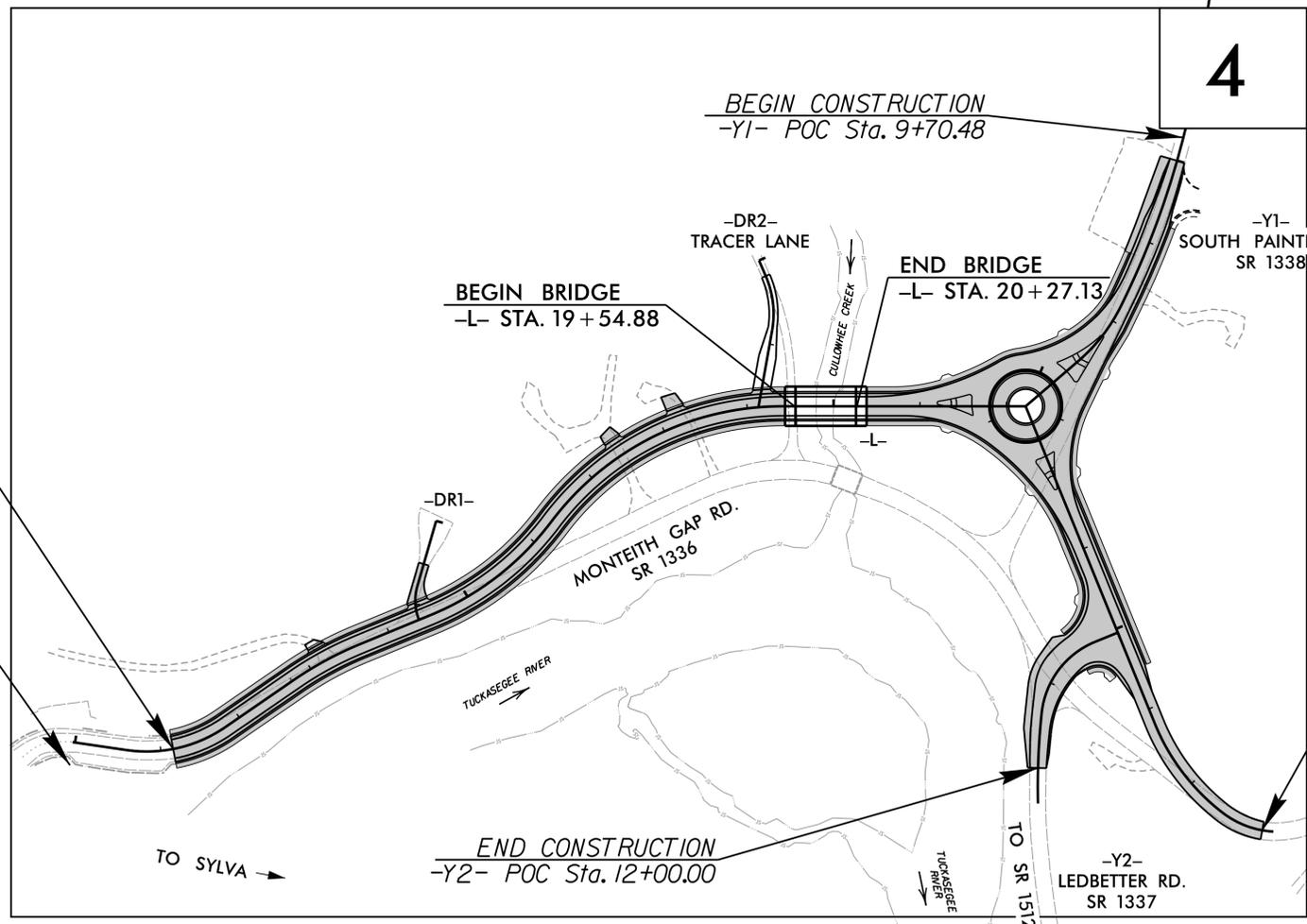
TYPE OF WORK: ROADWAY WIDENING, BIKE LANE/SIDEWALK CONSTRUCTION, GRADING, PAVING, DRAINAGE, AND STRUCTURES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.14.R.212	1	32
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
17BP.14.PE.212	N/A	P.E.	
17BP.14.ROW.212	N/A	ROW	
17BP.14.R.212	N/A	BRIDGE CONST.	
44983	N/A	BIKE LANES SIDEWALK ROADWAY	

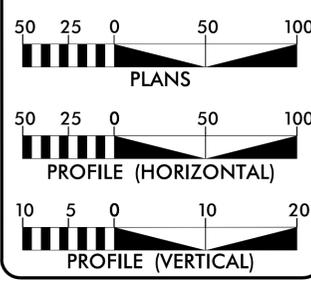


BEGIN STATE PROJECT 17BP.14.R.212
 -L- PCC Sta. 11+14.45
 TIE TO TIP PROJECT
 B-4159 -Y1- POC Sta. 11+20.00

BEGIN CONSTRUCTION
 -L- STA. POT 9+97.97
 26.82' RT



GRAPHIC SCALES



DESIGN DATA

ADT 2022 = 6,210
 ADT 2042 = 8,650
 K = 9 %
 D = 60 %
 T = 3 % *
 V = 30 MPH
 *TTST 1% + DUAL 2%
 FUND CLASS =
 LOCAL
 SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY STATE PROJECT 17BP.14.R.212 = 0.305 MILES
 LENGTH ROADWAY STATE PROJECT 44983 = 0.109 MILES
 LENGTH STRUCTURE STATE PROJECT 17BP.14.R.212 = 0.014 MILES
 TOTAL LENGTH STATE PROJECT 17BP.14.R.212/44983 = 0.428 MILES

NCDOT CONTACT: **ZACHARY T. SHULER, P.E.**
 DIVISION 14 BRIDGE PROGRAM MANAGER

Prepared for the Office of:
DIVISION OF HIGHWAYS
 Highway Division 14, 253 Webster Road, Sylva NC, 28779

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: **JOSHUA J. MASSROCK, P.E.**
 PROJECT ENGINEER
 APRIL 09, 2021

LETTING DATE: **ERSKINE BROOKS, P.E.**
 PROJECT DESIGN ENGINEER
 JULY 18, 2023

HYDRAULICS ENGINEER

5/18/2023

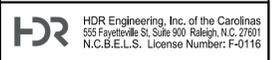
Joshua J. Massrock
 SIGNATURE: **JOSHUA J. MASSROCK, P.E.**

ROADWAY DESIGN ENGINEER

5/18/2023

T. Nathan Bedenbaugh
 SIGNATURE: **T. NATHAN BEDENBAUGH, P.E.**

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED



PROJECT REFERENCE NO. 17BPJ4R.212	SHEET NO. 1A
ROADWAY DESIGN ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1 THRU 2A-4	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2B-1	ROUNDAABOUT GRADING DETAIL
2B-2	ROUNDAABOUT CONFIGURATION DETAIL
2B-3	ROUNDAABOUT CROSS SECTION LAYOUT DETAIL
2B-4	BRIDGE SKETCH
2B-5	ON-SITE DETOUR
2C-1	DETAIL IN LIEU OF STANDARD TYPE III- SHOP CURVED STRUCTURE ANCHOR UNIT
2C-2	DETAIL IN LIEU OF STANDARD TYPE III- FOR ATTACHEMNT TO RAIL ON BRIDGE SUB REGIONAL TIER
2C-3	DETAIL IN LIEU OF STANDARD GUARDRAIL INSTALLATION- SYSTEM PARTS
2C-4	AT-1 DETAIL
2C-5	CURB RAMP DETAIL
2C-6	OFFSET CATCH BASIN DETAIL
2D-1	CHANNEL IMPROVEMENT DETAIL
3B-1	ROADWAY SUMMARIES
3D-1 THRU 3D-2	DRAINAGE SUMMARIES
4	PLAN SHEET
5 THRU 7	PROFILE SHEETS
SW1 THRU SW9	CENTRAL DRIVE SIDEWALK PLANS
RW1 THRU RW4	RIGHT OF WAY PLANS
TMP-1 THRU TMP-9	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-3	PAVEMENT MANAGEMENT PLANS
EC-1 THRU EC-5A	EROSION CONTROL PLANS
RF-1 THRU RF-3	REFORESTATION PLANS
RW-1 THRU 1RW-4	RIGHT OF WAY PLANS
SIGN-1 THRU SIGN-3A	SIGNING PLANS
UC-1 THRU UC-4B	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-3	UTILITY BY OTHERS PLANS
X-0	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-27	CROSS-SECTIONS
S-1 THRU S-20	STRUCTURES PLANS

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 III.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.05 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT 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.

SUBSURFACE DRAINS:

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

SHOULDER DRAINS:

SHOULDER DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 816.02 AND DETAILS IN PLANS AT LOCATIONS DIRECTED BY THE ENGINEER.

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.

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

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.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE DUKE, WCU POWER, FRONTIER, MORRIS BROADBAND, AND DOMINION ENERGY

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

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

CURB RAMPS:

CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS. CONSTRUCT ALL CURB RAMPS ACCORDANCE WITH STD 848.05 and/or 848.06.

ROCK:

ROCK IS ANTICIPATED BETWEEN -L- STA. 12+30 TO 14+50 AND 26+50 TO 28+00. BLASTING MAY BE REQUIRED FOR EXCAVATION ON THE PROJECT. SEE SECTION 220 OF THE STANDARD SPECIFICATIONS AND IF APPLICABLE, ROCK BLASTING PROVISION.

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	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Super-elevation - Two Lane Pavement
225.06	Method of Grading Sight Distance at Intersections
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 4 - MAJOR STRUCTURES	
422.02	Bridge Approach Fills - Type II Modified Approach Fill
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Super-elevated Curve - Method I
DIVISION 6 ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
816.02	Aggregate Shoulder Drain
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.04	Concrete Open Throat Catch Basin - 12" thru 48" Pipe
840.05	Brick Open Throat Catch Basin - 12" thru 48" Pipe
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.22	Frames and Wide Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.45	Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.02	Driveway Turnout - Radius Type
848.04	Street Turnout
848.05	Curb Ramp - Proposed Curb & Gutter
852.01	Concrete Islands
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

EFF. 01-16-2018
 REV.

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EIP
Computed Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	①23
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	---WLB---
Proposed Wetland Boundary	WLB
Existing Endangered Animal Boundary	---EAB---
Existing Endangered Plant Boundary	---EPB---
Existing Historic Property Boundary	---HPB---
Known Contamination Area: Soil	☠-S-☠
Potential Contamination Area: Soil	☠-S-☠
Known Contamination Area: Water	☠-W-☠
Potential Contamination Area: Water	☠-W-☠
Contaminated Site: Known or Potential	☠?

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○ S
Well	○ W
Small Mine	⊗
Foundation	□
Area Outline	□
Cemetery	□
Building	□
School	□
Church	□
Dam	▬

HYDROLOGY:

Stream or Body of Water	-----
Hydro, Pool or Reservoir	-----
Jurisdictional Stream	---JS---
Buffer Zone 1	---BZ 1---
Buffer Zone 2	---BZ 2---
Flow Arrow	←
Disappearing Stream	→
Spring	○
Wetland	▽
Proposed Lateral, Tail, Head Ditch	-----
False Sump	▽

RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○ MILEPOST 35
Switch	□ SWITCH
RR Abandoned	-----
RR Dismantled	-----

RIGHT OF WAY & PROJECT CONTROL:

Secondary Horiz and Vert Control Point	◆
Primary Horiz Control Point	○
Primary Horiz and Vert Control Point	◆
Exist Permanent Easement Pin and Cap	◇
New Permanent Easement Pin and Cap	◆
Vertical Benchmark	⊠
Existing Right of Way Marker	△
Existing Right of Way Line	-----
New Right of Way Line	-----
New Right of Way Line with Pin and Cap	-----
New Right of Way Line with Concrete or Granite R/W Marker	-----
New Control of Access Line with Concrete C/A Marker	-----
Existing Control of Access	-----
New Control of Access	-----
Existing Easement Line	-----
New Temporary Construction Easement	-----
New Temporary Drainage Easement	-----
New Permanent Drainage Easement	-----
New Permanent Drainage / Utility Easement	-----
New Permanent Utility Easement	-----
New Temporary Utility Easement	-----
New Aerial Utility Easement	-----

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	---C---
Proposed Slope Stakes Fill	---F---
Proposed Curb Ramp	-----
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	⊕
Pavement Removal	⊗

VEGETATION:

Single Tree	☼
Single Shrub	☼

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

Hedge	-----
Woods Line	-----
Orchard	-----
Vineyard	-----

EXISTING STRUCTURES:

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

UTILITIES:

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	⊕
Power Line Tower	⊠
Power Transformer	⊠
U/G Power Cable Hand Hole	-----
H-Frame Pole	-----
U/G Power Line LOS B (S.U.E.*)	-----
U/G Power Line LOS C (S.U.E.*)	-----
U/G Power Line LOS D (S.U.E.*)	-----

TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊕
Telephone Pedestal	⊠
Telephone Cell Tower	⊠
U/G Telephone Cable Hand Hole	-----
U/G Telephone Cable LOS B (S.U.E.*)	-----
U/G Telephone Cable LOS C (S.U.E.*)	-----
U/G Telephone Cable LOS D (S.U.E.*)	-----
U/G Telephone Conduit LOS B (S.U.E.*)	-----
U/G Telephone Conduit LOS C (S.U.E.*)	-----
U/G Telephone Conduit LOS D (S.U.E.*)	-----
U/G Fiber Optics Cable LOS B (S.U.E.*)	-----
U/G Fiber Optics Cable LOS C (S.U.E.*)	-----
U/G Fiber Optics Cable LOS D (S.U.E.*)	-----

WATER:

Water Manhole	⊕
Water Meter	○
Water Valve	⊗
Water Hydrant	⊕
U/G Water Line LOS B (S.U.E.*)	-----
U/G Water Line LOS C (S.U.E.*)	-----
U/G Water Line LOS D (S.U.E.*)	-----
Above Ground Water Line	-----

TV:

TV Pedestal	⊕
TV Tower	⊗
U/G TV Cable Hand Hole	-----
U/G TV Cable LOS B (S.U.E.*)	-----
U/G TV Cable LOS C (S.U.E.*)	-----
U/G TV Cable LOS D (S.U.E.*)	-----
U/G Fiber Optic Cable LOS B (S.U.E.*)	-----
U/G Fiber Optic Cable LOS C (S.U.E.*)	-----
U/G Fiber Optic Cable LOS D (S.U.E.*)	-----

GAS:

Gas Valve	◇
Gas Meter	⊕
U/G Gas Line LOS B (S.U.E.*)	-----
U/G Gas Line LOS C (S.U.E.*)	-----
U/G Gas Line LOS D (S.U.E.*)	-----
Above Ground Gas Line	-----

SANITARY SEWER:

Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	-----
Above Ground Sanitary Sewer	-----
SS Forced Main Line LOS B (S.U.E.*)	-----
SS Forced Main Line LOS C (S.U.E.*)	-----
SS Forced Main Line LOS D (S.U.E.*)	-----

MISCELLANEOUS:

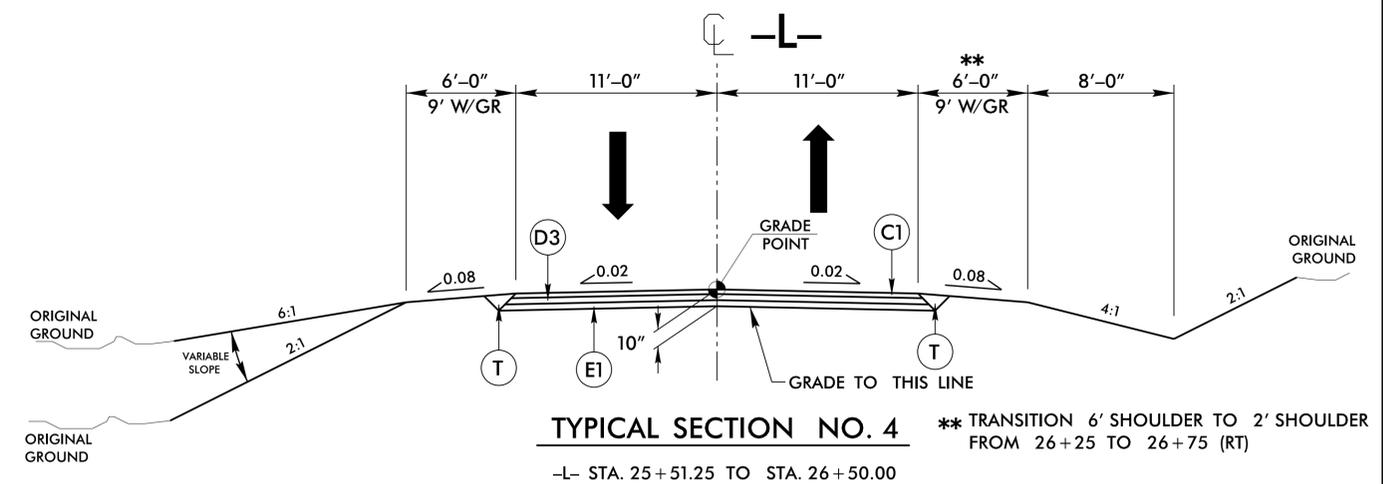
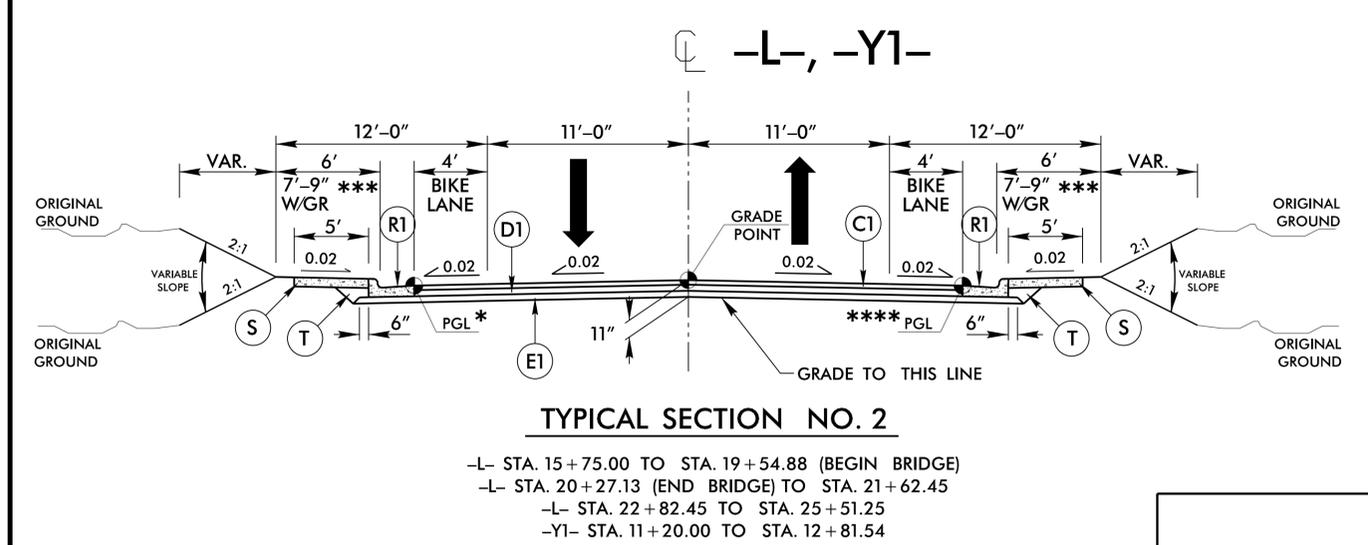
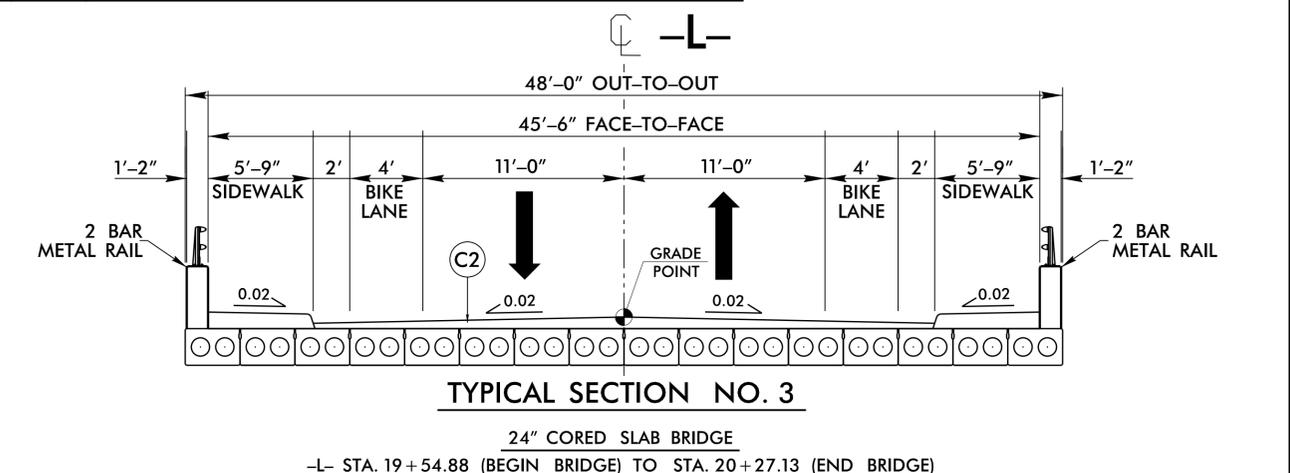
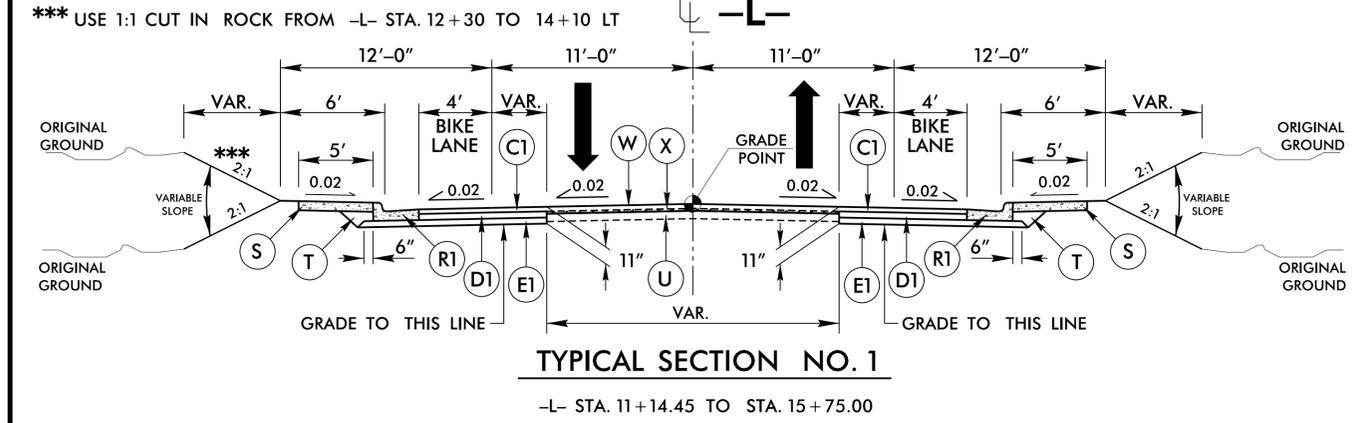
Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊠
Utility Unknown U/G Line LOS B (S.U.E.*)	-----
U/G Tank; Water, Gas, Oil	-----
Underground Storage Tank, Approx. Loc.	-----
A/G Tank; Water, Gas, Oil	-----
Geoenvironmental Boring	⊕
U/G Test Hole LOS A (S.U.E.*)	-----
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

FINAL PAVEMENT SCHEDULE

A	7" PORTLAND CEMENT JOINTED STAMPED CONCRETE PAVEMENT TRUCK APRON WITH 4x4-W3.5xW3.5 WELDED WIRE REINFORCEMENT PLACED NEAR THE CENTER OF THE SLAB IN LIEU OF DOWELS	E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R3	MODIFIED 2'-6" CONCRETE CURB & GUTTER (SEE DETAIL ON SHEET 2A-2)
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, 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 5.5" IN DEPTH.	S	4" CONCRETE SIDEWALK
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 1.5" IN DEPTH.	J1	6" AGGREGATE BASE COURSE	T	EARTH MATERIAL
C3	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	J2	8" AGGREGATE BASE COURSE	U	EXISTING PAVEMENT
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	P	PRIME COAT	V	INCIDENTAL MILLING
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2.5" IN DEPTH OR GREATER THAN 4" IN DEPTH.	R1	2'-6" CONCRETE CURB & GUTTER	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL ON SHEET 2A-1)
D3	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	R2	EXPRESSWAY GUTTER	X	INCIDENTAL MILLING

PROJECT REFERENCE NO. 17BP.14.R.212	SHEET NO. 2A-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 	PAVEMENT DESIGN ENGINEER 
6/16/2023	6/16/2023
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 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	

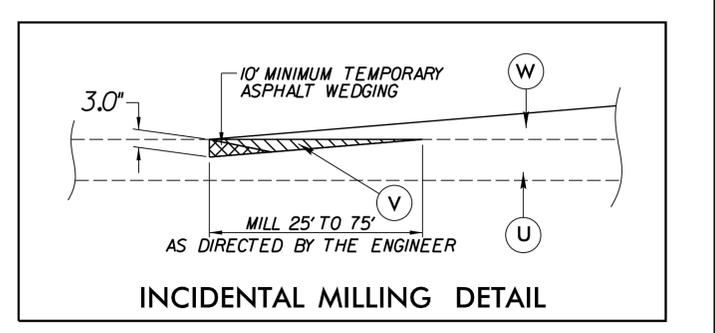
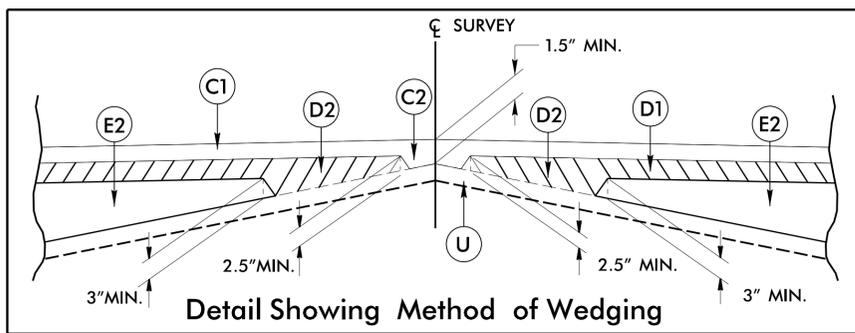
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.
 GEOTEXTILE FOR SOIL STABILIZATION TO BE USED FROM STA. 21+35 TO 23+44 -L-



*PGL -RAB WEST- TO BE USED IN CONJUNCTION WITH CL GP FROM -L- STA. 20+69.12 TO STA. 21+62.45
 PGL -RAB NORTH- TO BE USED IN CONJUNCTION WITH CL GP FROM -L- STA. 22+82.45 TO STA. 23+75.77
 PGL -RAB NORTH- TO BE USED IN CONJUNCTION WITH CL GP FROM -Y1- STA. 11+74.17 TO STA. 12+81.54

***PGL -RAB EAST- TO BE USED IN CONJUNCTION WITH CL GP FROM -L- STA. 21+12.20 TO STA. 21+62.45
 PGL -RAB EAST- TO BE USED IN CONJUNCTION WITH CL GP FROM -L- STA. 22+82.45 TO STA. 23+75.77
 PGL -RAB WEST- TO BE USED IN CONJUNCTION WITH CL GP FROM -Y1- STA. 11+70.33 TO STA. 12+81.54

*** GUARDRAIL AT OFFSET OF BRIDGE RAIL
 SHOULDER POINT 2'-0" BEYOND THE FACE OF GUARDRAIL.



PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
 USER: CHARNDEN
 FILE: NCDOT\NCDOT_Western_Div_On-Cell_M_VNCDDOT-17BP.14.R.212_Culwhhee\6.0_CAD_BIM\6.2_Work_In_Progress\17BP.14.R.212_Roadway\Prj\490159_R0Y_TYP.dgn
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 TIME: 11:50:06 AM
 DATE: 6/16/2023

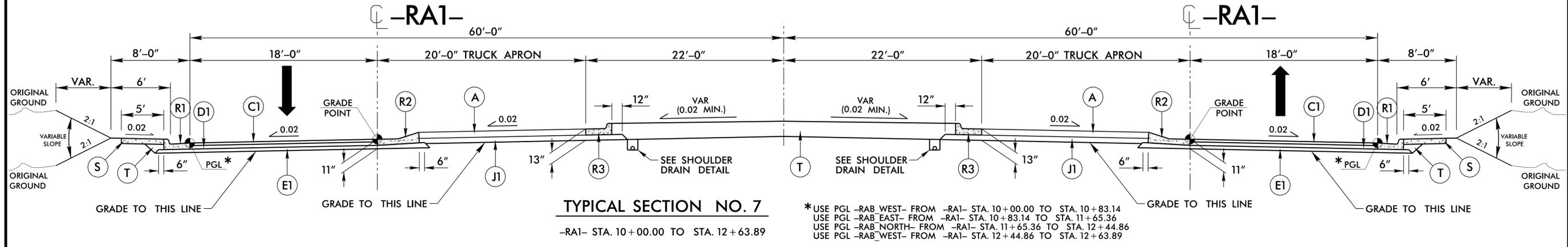
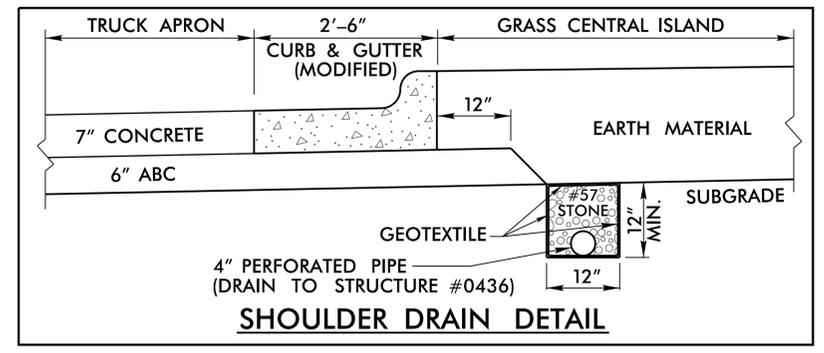
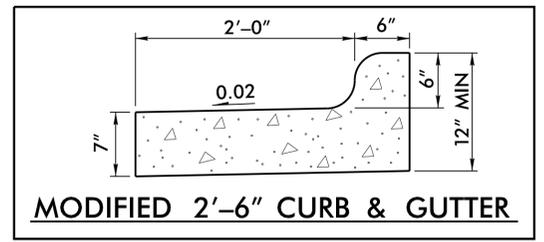
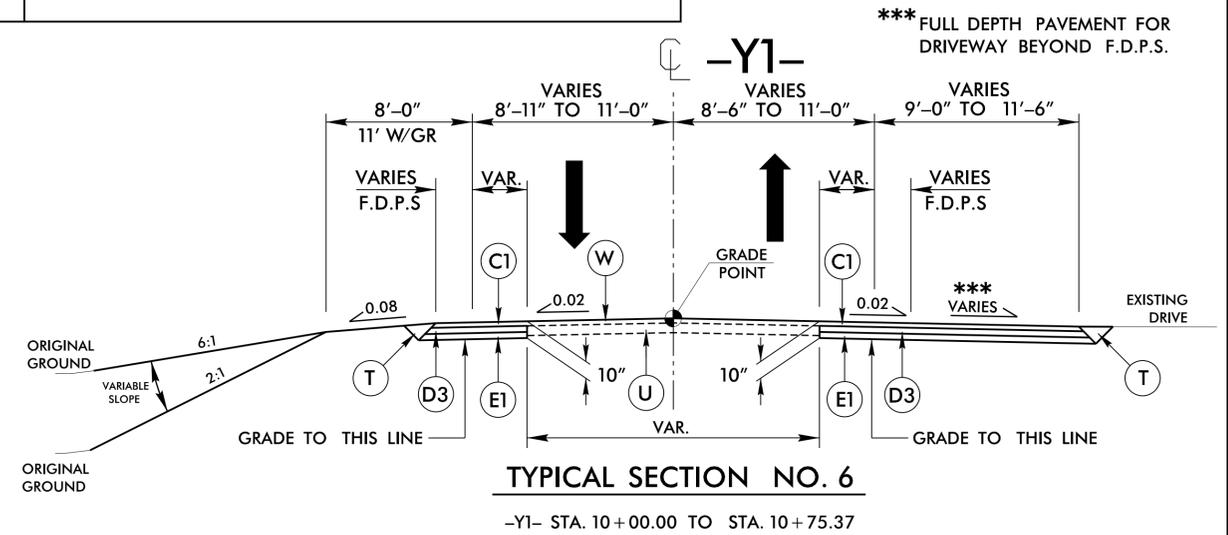
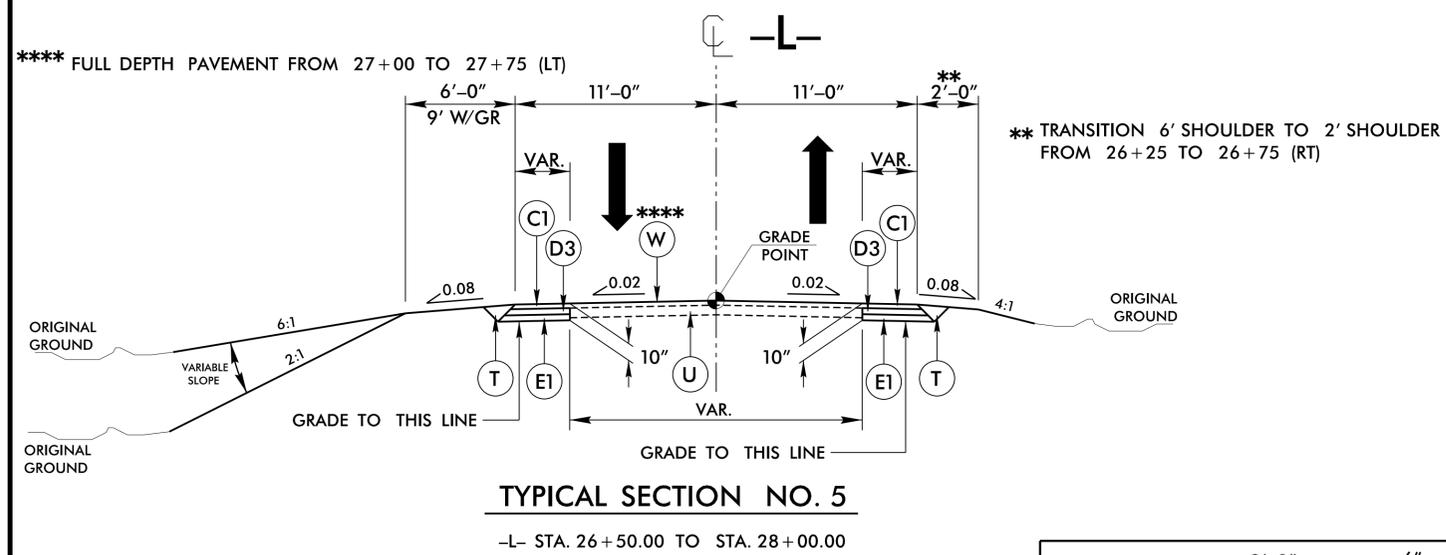
REVISIONS

FINAL PAVEMENT SCHEDULE

A	7" PORTLAND CEMENT JOINTED STAMPED CONCRETE PAVEMENT TRUCK APRON WITH 4x4-W3.5xW3.5 WELDED WIRE REINFORCEMENT PLACED NEAR THE CENTER OF THE SLAB IN LIEU OF DOWELS	E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R3	MODIFIED 2'-6" CONCRETE CURB & GUTTER (SEE DETAIL ON SHEET 2A-2)
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, 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 5.5" IN DEPTH.	S	4" CONCRETE SIDEWALK
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 1.5" IN DEPTH.	J1	6" AGGREGATE BASE COURSE	T	EARTH MATERIAL
C3	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	J2	8" AGGREGATE BASE COURSE	U	EXISTING PAVEMENT
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	P	PRIME COAT	V	INCIDENTAL MILLING
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2.5" IN DEPTH OR GREATER THAN 4" IN DEPTH.	R1	2'-6" CONCRETE CURB & GUTTER	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL ON SHEET 2A-1)
D3	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	R2	EXPRESSWAY GUTTER	X	INCIDENTAL MILLING

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.
 GEOTEXTILE FOR SOIL STABILIZATION TO BE USED FROM STA. 21+35 TO 23+44 -L-

PROJECT REFERENCE NO. 17BP.14.R.212	SHEET NO. 2A-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 	PAVEMENT DESIGN ENGINEER 
6/16/2023	6/16/2023
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 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	



* USE PGL -RAB WEST- FROM -RA1- STA. 10+00.00 TO STA. 10+83.14
 * USE PGL -RAB EAST- FROM -RA1- STA. 10+83.14 TO STA. 11+65.36
 * USE PGL -RAB NORTH- FROM -RA1- STA. 11+65.36 TO STA. 12+44.86
 * USE PGL -RAB WEST- FROM -RA1- STA. 12+44.86 TO STA. 12+63.89

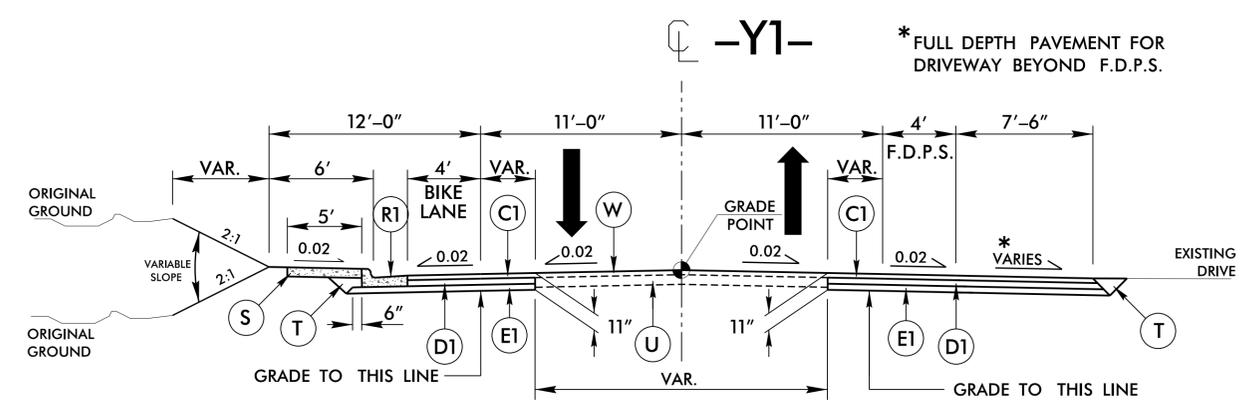
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 USER: CHARNDEN
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 DATE: 6/16/2023

FINAL PAVEMENT SCHEDULE

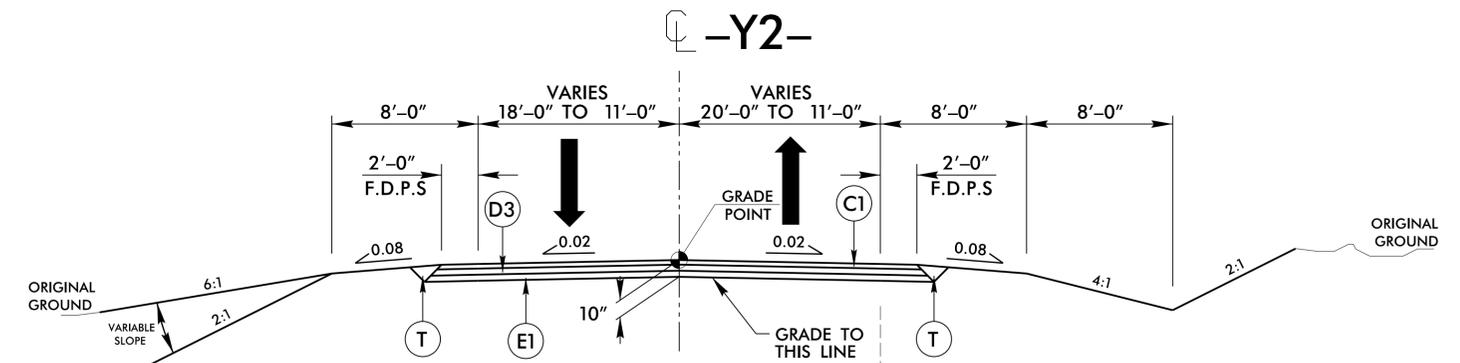
A	7" PORTLAND CEMENT JOINTED STAMPED CONCRETE PAVEMENT TRUCK APRON WITH 4x4-W3.5xW3.5 WELDED WIRE REINFORCEMENT PLACED NEAR THE CENTER OF THE SLAB IN LIEU OF DOWELS	E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R3	MODIFIED 2'-6" CONCRETE CURB & GUTTER (SEE DETAIL ON SHEET 2A-2)
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, 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 5.5" IN DEPTH.	S	4" CONCRETE SIDEWALK
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 1.5" IN DEPTH.	J1	6" AGGREGATE BASE COURSE	T	EARTH MATERIAL
C3	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	J2	8" AGGREGATE BASE COURSE	U	EXISTING PAVEMENT
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	P	PRIME COAT	V	INCIDENTAL MILLING
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2.5" IN DEPTH OR GREATER THAN 4" IN DEPTH.	R1	2'-6" CONCRETE CURB & GUTTER	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL ON SHEET 2A-1)
D3	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	R2	EXPRESSWAY GUTTER	X	INCIDENTAL MILLING

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.
 GEOTEXTILE FOR SOIL STABILIZATION TO BE USED FROM STA. 21+35 TO 23+44 -L-

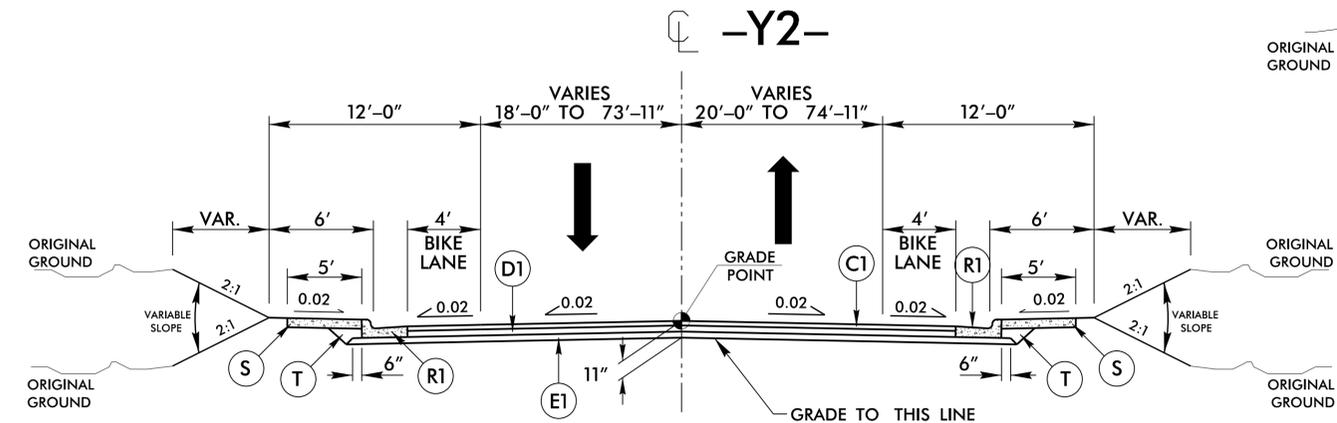
PROJECT REFERENCE NO. 17BP.14.R.212	SHEET NO. 2A-3
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 	PAVEMENT DESIGN ENGINEER 
6/16/2023	6/16/2023
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 HDR Engineering, Inc. of the Carolinas 555 Fayetteville St. Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116	



TYPICAL SECTION NO. 8
-Y1- STA. 10+75.37 TO STA. 11+20.00



TYPICAL SECTION NO. 10
-Y2- STA. 10+52.30 TO STA. 10+76.00



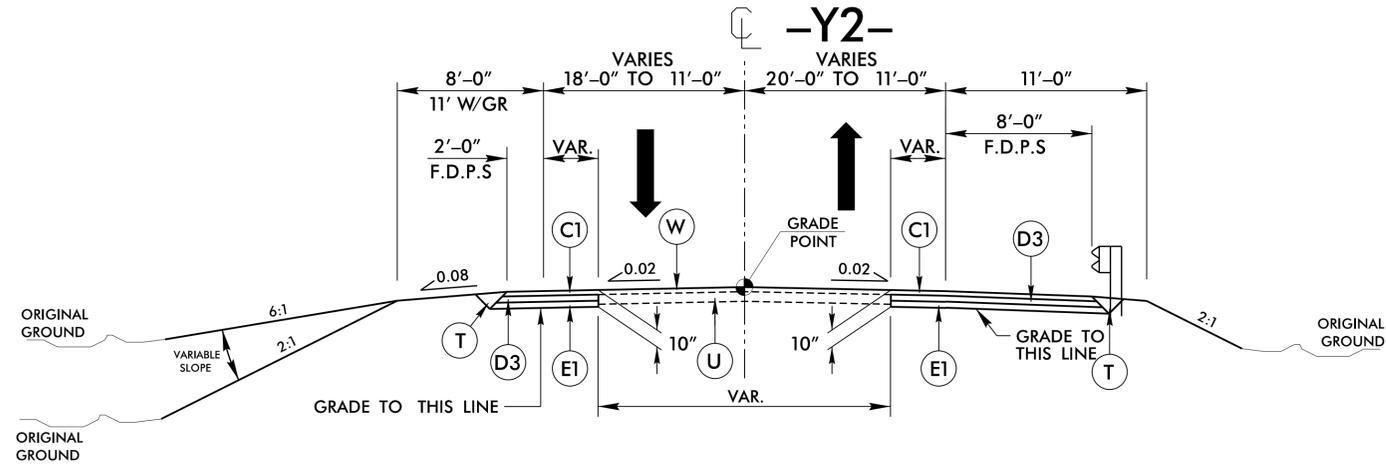
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-Y2- STA. 10+15.00 TO STA. 10+52.30

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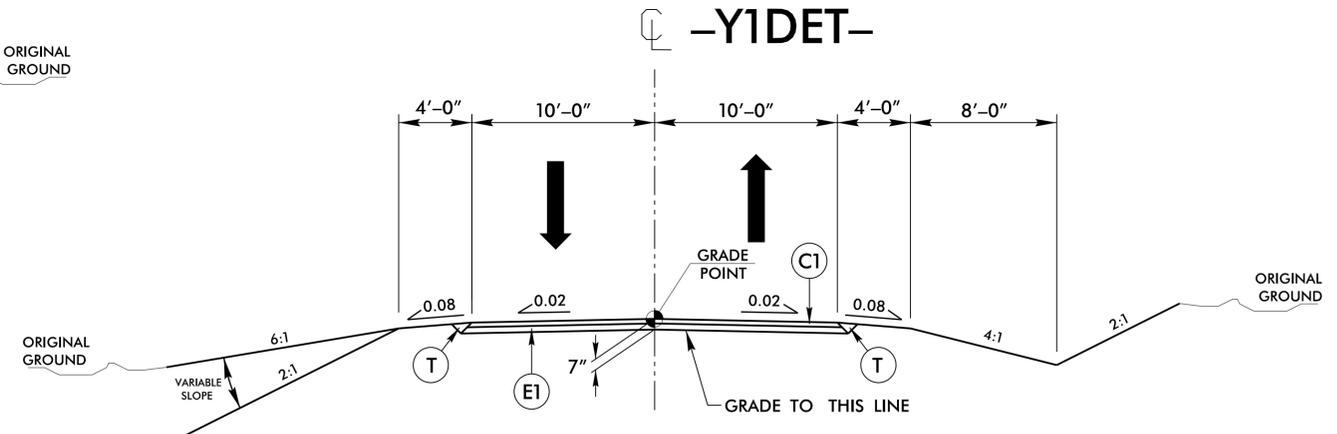
FINAL PAVEMENT SCHEDULE

A	7" PORTLAND CEMENT JOINTED STAMPED CONCRETE PAVEMENT TRUCK APRON WITH 4x4-W3.5xW3.5 WELDED WIRE REINFORCEMENT PLACED NEAR THE CENTER OF THE SLAB IN LIEU OF DOWELS	E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R3	MODIFIED 2'-6" CONCRETE CURB & GUTTER (SEE DETAIL ON SHEET 2A-2)
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, 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 5.5" IN DEPTH.	S	4" CONCRETE SIDEWALK
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 1.5" IN DEPTH.	J1	6" AGGREGATE BASE COURSE	T	EARTH MATERIAL
C3	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	J2	8" AGGREGATE BASE COURSE	U	EXISTING PAVEMENT
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	P	PRIME COAT	V	INCIDENTAL MILLING
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2.5" IN DEPTH OR GREATER THAN 4" IN DEPTH.	R1	2'-6" CONCRETE CURB & GUTTER	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL ON SHEET 2A-1)
D3	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	R2	EXPRESSWAY GUTTER	X	INCIDENTAL MILLING

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.
 GEOTEXTILE FOR SOIL STABILIZATION TO BE USED FROM STA. 21+35 TO 23+44 -L-

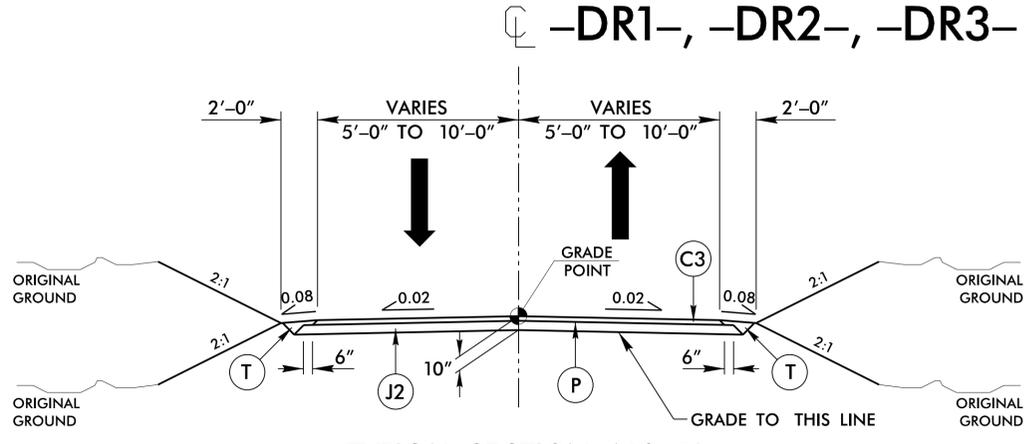


TYPICAL SECTION NO. 11
 -Y2- STA. 10+76.00 TO STA. 12+00.00



TYPICAL SECTION NO. 13
 -Y1DET- STA. 10+00.00 TO STA. 13+10.13
 -Y1DET- STA. 14+26.19 TO STA. 15+23.74

NOTE: SEE SHEET 2B-5 AND TYPICALS NO. 1 AND NO. 2 FOR
 -Y1DET- PAVEMENT FROM STA. 13+10.13 TO 14+26.19



TYPICAL SECTION NO. 12
 -DR1- STA. 10+52.00 TO STA. 10+94.58
 -DR2- STA. 10+19.75 TO STA. 11+50.27
 -DR3- STA. 10+56.00 TO STA. 11+27.26

PROJECT REFERENCE NO. 17BP.14.R.212	SHEET NO. 2A-4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 	PAVEMENT DESIGN ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
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	

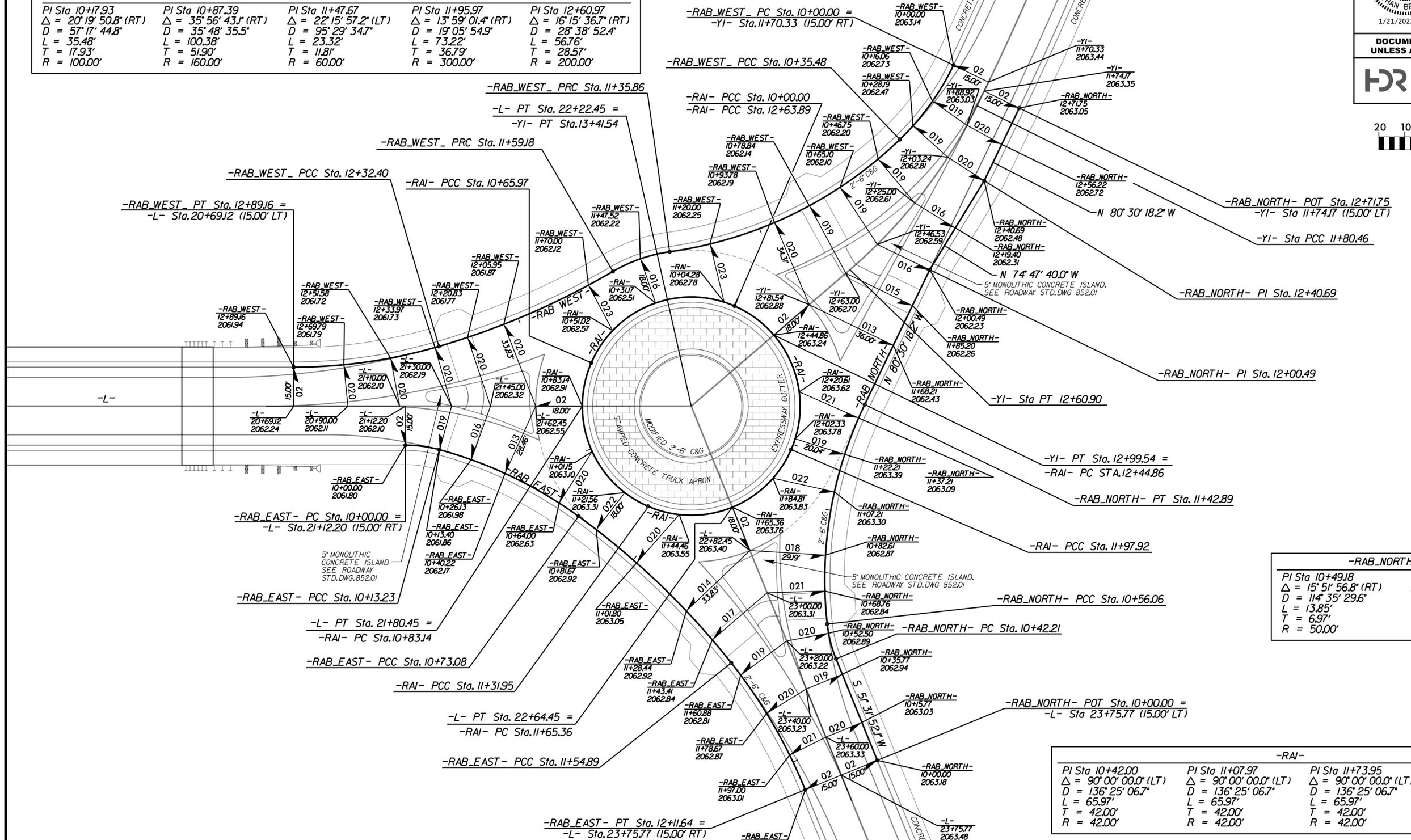
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ROUNDBABOUT -RA1- LINE & GRADE -L- /-Y1- INTERSECTION

PROJECT REFERENCE NO. 17BP.14.R.212	SHEET NO. 2B-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
 1/21/2022	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 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	



-RAB_WEST-			
PI Sta 10+17.93 Δ = 20° 19' 50.8" (RT) D = 57' 17" 44.8" L = 35.48' T = 17.93' R = 100.00'	PI Sta 10+87.39 Δ = 35° 56' 43.1" (RT) D = 35' 48' 35.5" L = 100.38' T = 51.90' R = 160.00'	PI Sta 11+47.67 Δ = 22° 15' 57.2" (LT) D = 95' 29' 34.7" L = 23.32' T = 11.81' R = 60.00'	PI Sta 11+95.97 Δ = 13° 59' 01.4" (RT) D = 19' 05' 54.9" L = 73.22' T = 36.79' R = 300.00'
PI Sta 12+60.97 Δ = 16° 15' 36.7" (RT) D = 28' 38' 52.4" L = 56.76' T = 28.57' R = 200.00'			



-RAB_EAST-			
PI Sta 10+06.65 Δ = 15° 09' 21.7" (RT) D = 114' 35' 29.6" L = 13.23' T = 6.65' R = 50.00'	PI Sta 10+43.49 Δ = 20° 47' 06.9" (RT) D = 34' 43' 29.0" L = 59.86' T = 30.26' R = 165.00'	PI Sta 11+14.24 Δ = 15° 37' 23.0" (RT) D = 19' 05' 54.9" L = 81.80' T = 41.16' R = 300.00'	PI Sta 11+83.46 Δ = 16° 15' 36.7" (RT) D = 28' 38' 52.4" L = 56.76' T = 28.57' R = 200.00'

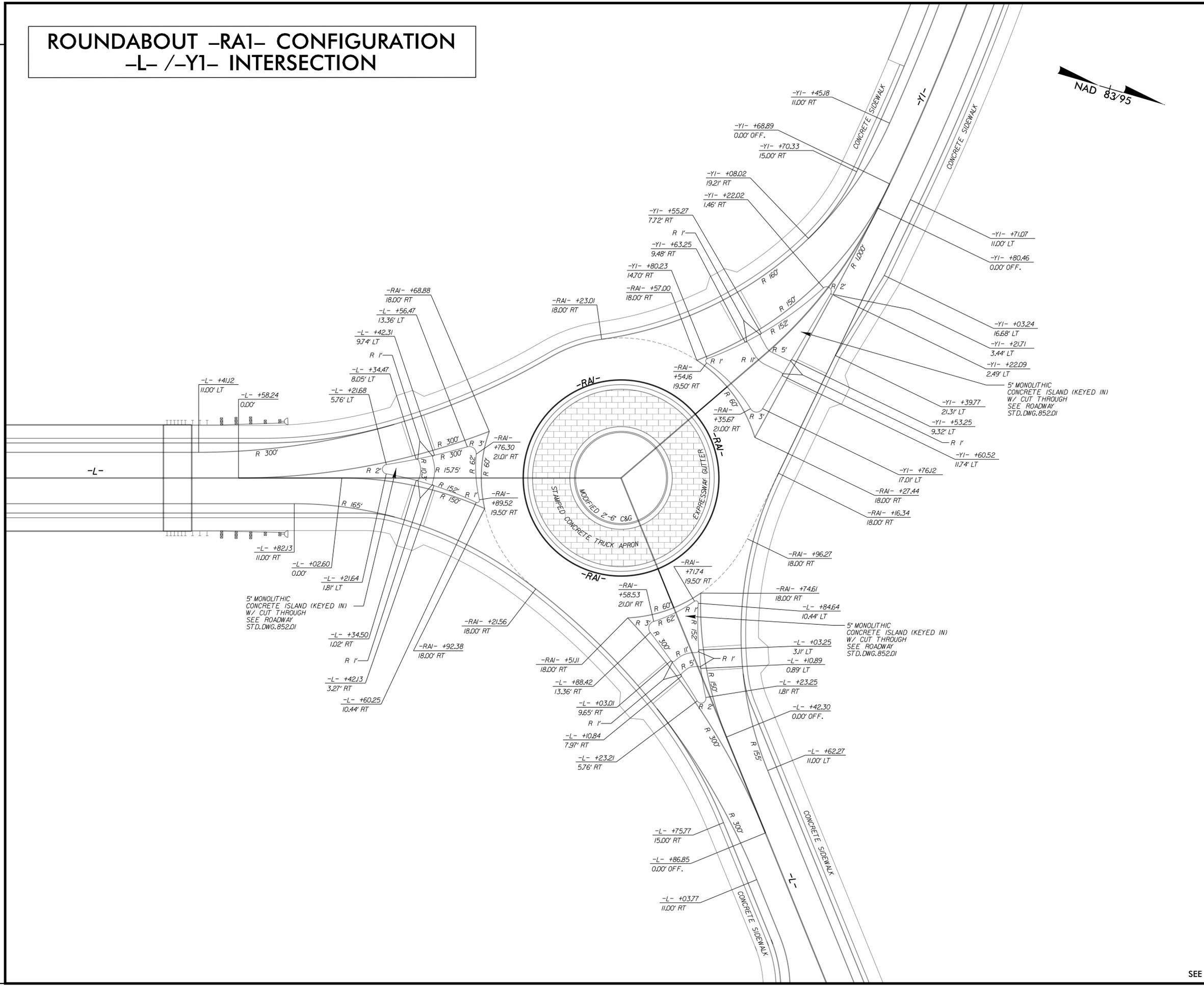
-RAB_NORTH-	
PI Sta 10+49.18 Δ = 15° 51' 56.8" (RT) D = 114' 35' 29.6" L = 13.85' T = 6.97' R = 50.00'	PI Sta 11+00.65 Δ = 32° 05' 52.9" (RT) D = 36° 57' 54.1" L = 86.83' T = 44.59' R = 155.00'

-RAI-			
PI Sta 10+42.00 Δ = 90° 00' 00.0" (LT) D = 136° 25' 06.7" L = 65.97' T = 42.00' R = 42.00'	PI Sta 11+07.97 Δ = 90° 00' 00.0" (LT) D = 136° 25' 06.7" L = 65.97' T = 42.00' R = 42.00'	PI Sta 11+73.95 Δ = 90° 00' 00.0" (LT) D = 136° 25' 06.7" L = 65.97' T = 42.00' R = 42.00'	PI Sta 12+39.92 Δ = 90° 00' 00.0" (LT) D = 136° 25' 06.7" L = 65.97' T = 42.00' R = 42.00'

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 REVISIONS
 PENTABLE: NCDOT_pshpfl.tbl
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 DATE: 10/17/2021

ROUNDBABOUT -RAI- CONFIGURATION -L- /-YI- INTERSECTION

PROJECT REFERENCE NO. 17BP.14.R.212	SHEET NO. 2B-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>	



REVISIONS

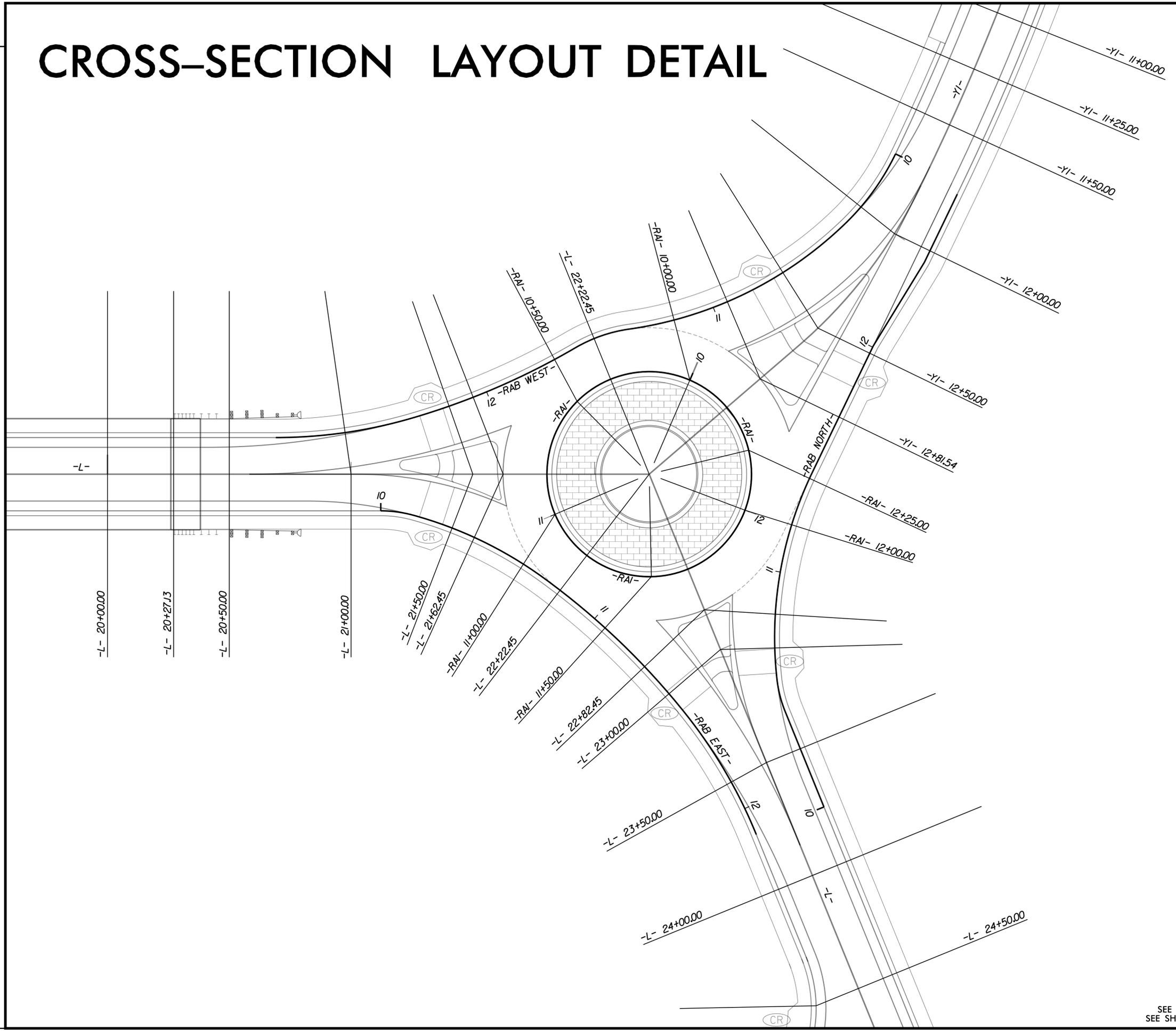
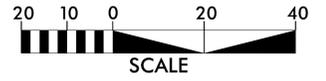
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 DATE: 3/2/2022

SEE SHEET NO. 4 FOR ROADWAY PLAN.
 SEE SHEET NO. 6 FOR -L-, -YI- & -RAI- PROFILE.

CROSS-SECTION LAYOUT DETAIL

PROJECT REFERENCE NO. 17BP.14.R.212	SHEET NO. 2B-3
RW SHEET NO.	
ROADWAY DESIGN ENGINEER  1/21/2022	HYDRAULICS ENGINEER
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	



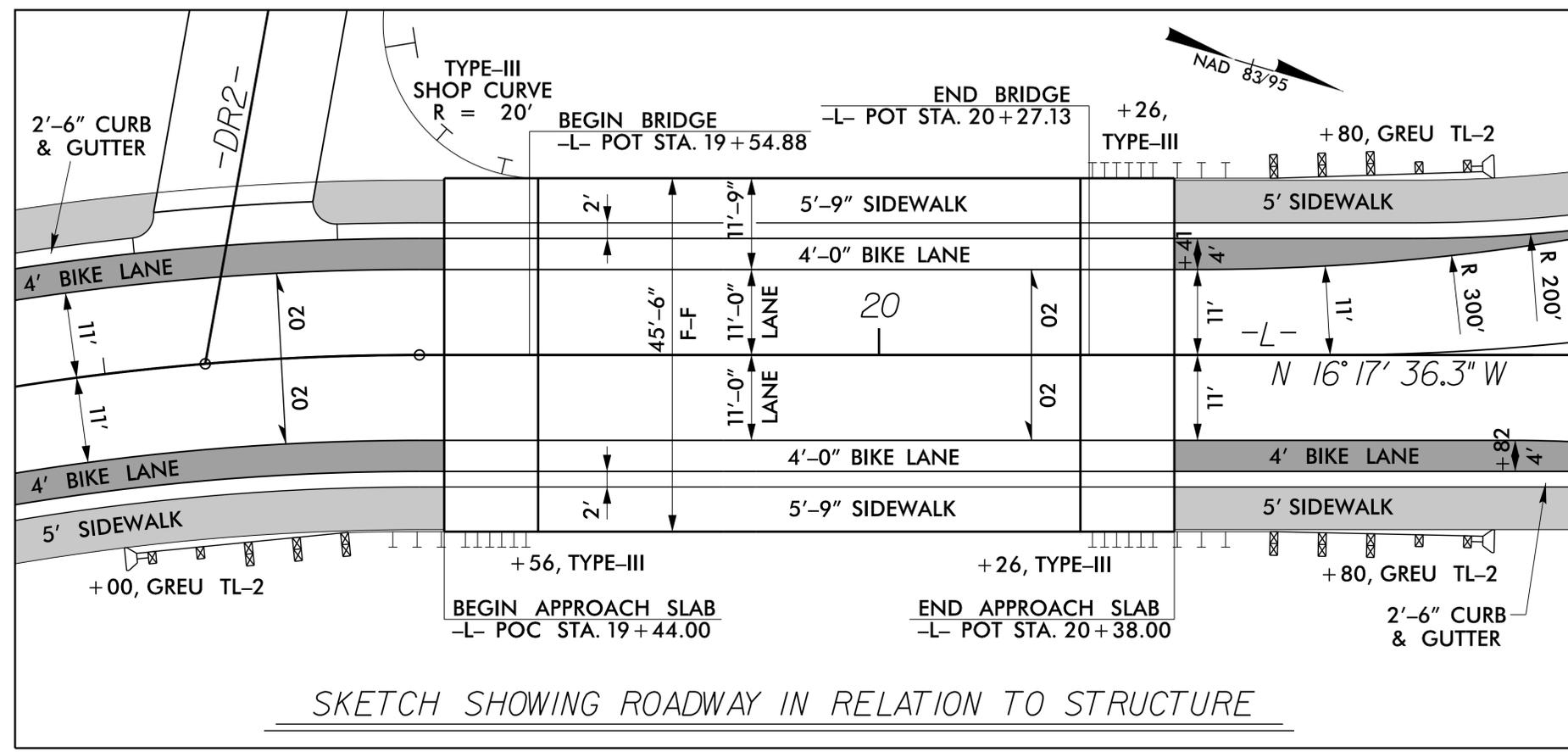
REVISIONS

Station	Description
-L- 20+00.00	
-L- 20+27.13	
-L- 20+50.00	
-L- 21+00.00	

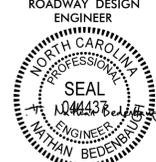
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 TIME: 1:54:20 PM
 DATE: 10/17/2021

SEE SHEET NOS. X-8 TO X-11 FOR -L- ROADWAY CROSS-SECTIONS.
 SEE SHEET NOS. X-16 TO X-17 FOR -YI- ROADWAY CROSS-SECTIONS.

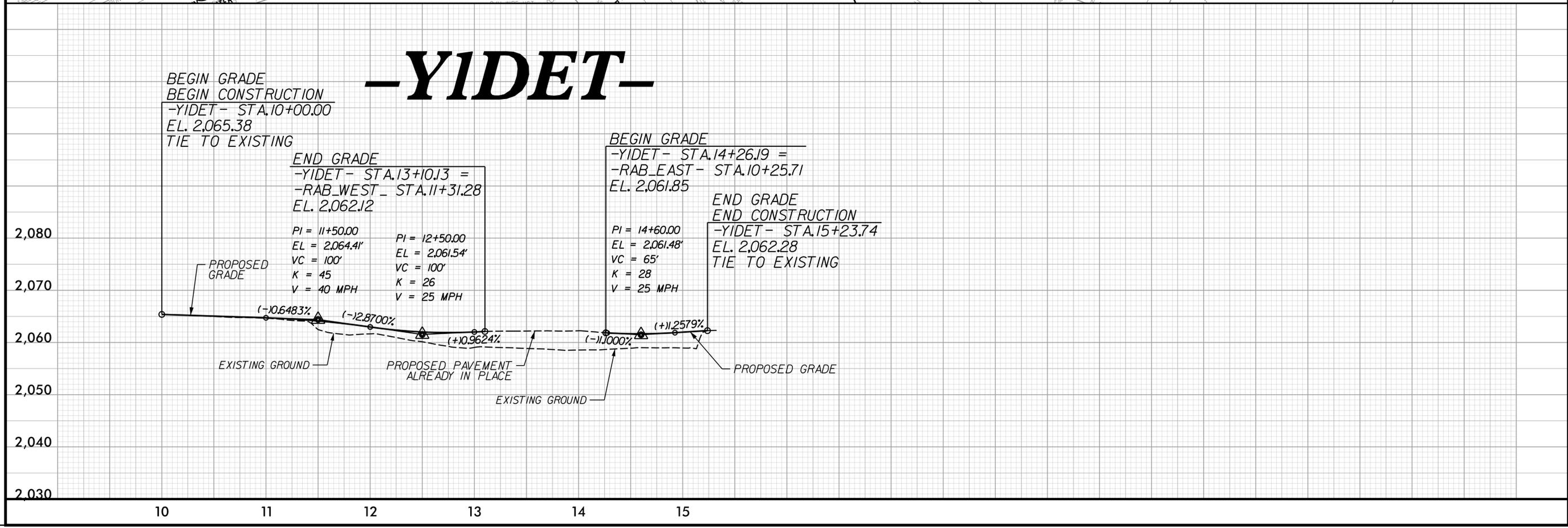
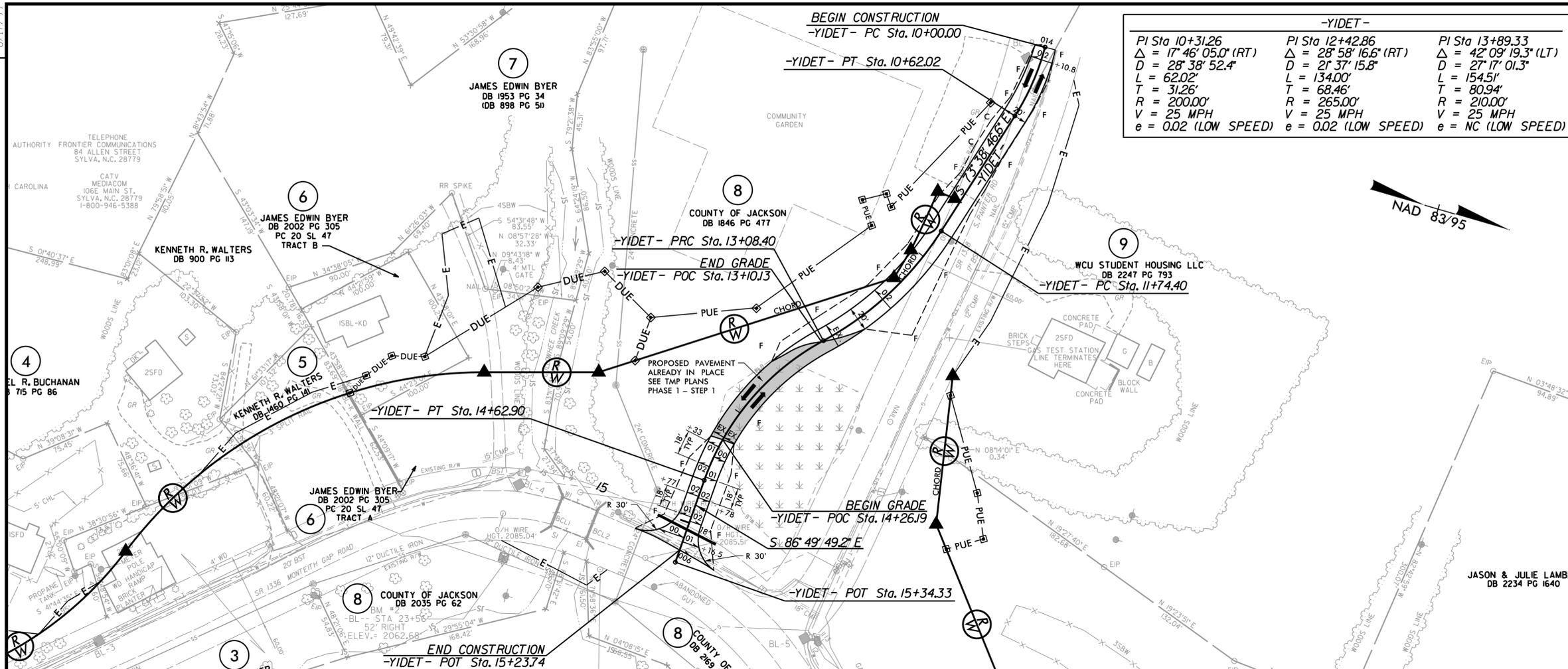
PROJECT REFERENCE NO. 17BP.14.R.212	SHEET NO. 2B-4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



PLOT DRIVER: NCDOT_color_eng_50.plt
 USER: TBEDEBBA
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 DATE: 10/17/2021

PROJECT REFERENCE NO. 17BP.14.R.212	SHEET NO. 2B-5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
	
1/21/2022	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 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	
SEE SHEET NO. 4 FOR ROADWAY PLAN	

-YIDET-		
PI Sta 10+31.26 Δ = 17° 46' 05.0" (RT) D = 28' 38" 52.4" L = 62.02' T = 31.26' R = 200.00' V = 25 MPH e = 0.02 (LOW SPEED)	PI Sta 12+42.86 Δ = 28° 58' 16.6" (RT) D = 21' 37" 15.8" L = 134.00' T = 68.46' R = 265.00' V = 25 MPH e = 0.02 (LOW SPEED)	PI Sta 13+89.33 Δ = 42° 09' 19.3" (LT) D = 27' 17" 01.3" L = 154.51' T = 80.94' R = 210.00' V = 25 MPH e = NC (LOW SPEED)



-YIDET-

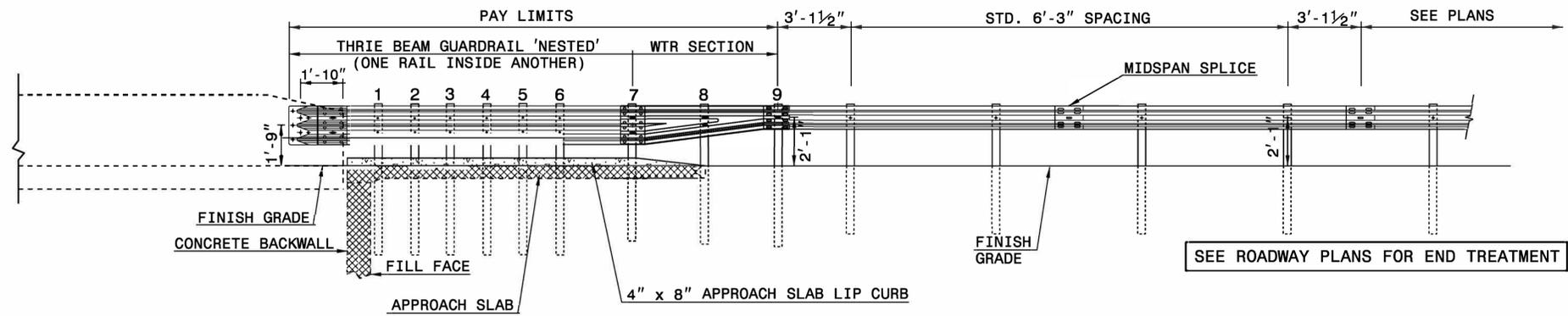
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 PENTABLE: NCDOT_pshp.fltd
 TIME: 1:56:38 PM
 DATE: 10/1/2021
 REVISIONS

PATRICK JOSEPH & BARBARA J. CO
DB 994 PG 522

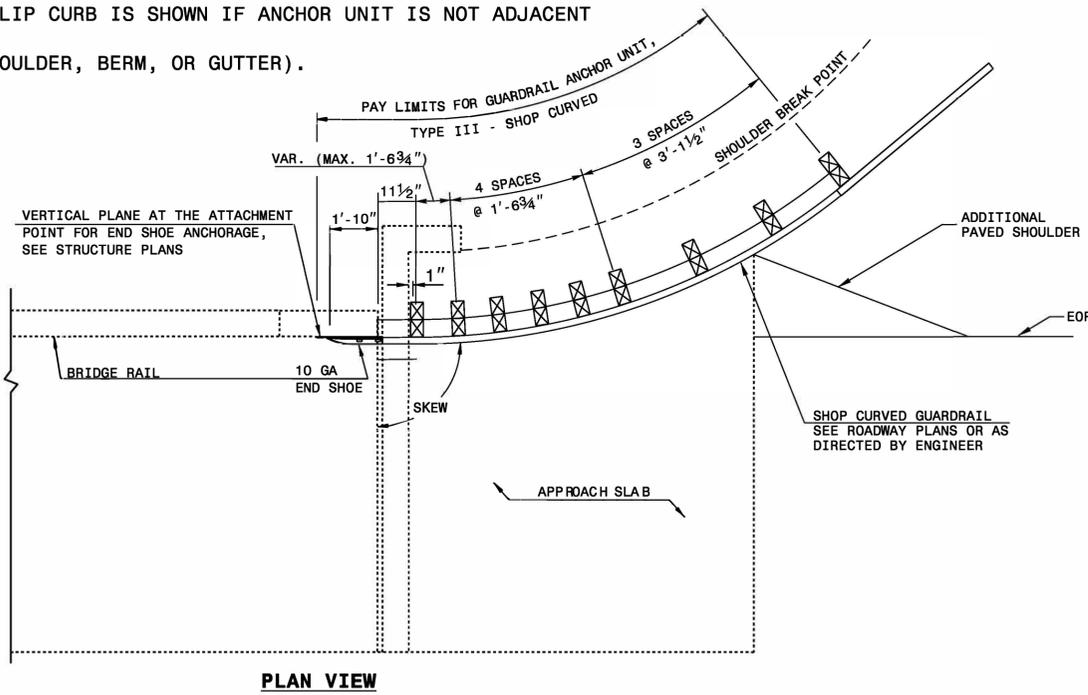
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
**TYPE III - SHOP CURVED
STRUCTURE ANCHOR UNIT**

SHEET 1 OF 1
TYPE III SC



- 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 11 1/2" 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).
 - USE NO STEEL POSTS WITHIN THE GUARDRAIL ANCHOR UNIT LIMITS.
 - LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
 - SEE STANDARD 862.03 SHEET 4 FOR POST SECTIONS 1 THRU 9.



**GUARDRAIL ANCHOR UNIT, TYPE III - SHOP CURVED
FOR ATTACHMENT TO RAIL ON BRIDGE**

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

ENGLISH DETAIL DRAWING FOR
**TYPE III - SHOP CURVED
STRUCTURE ANCHOR UNIT**

SHEET 1 OF 1
TYPE III SC

01-FEB-2018 09:49 S:\Contracts\Special Details\howerton\guardrail\31 inch Guardrail\type.iii.sc.dgn howerton AT USD-292595



4/11/2023

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

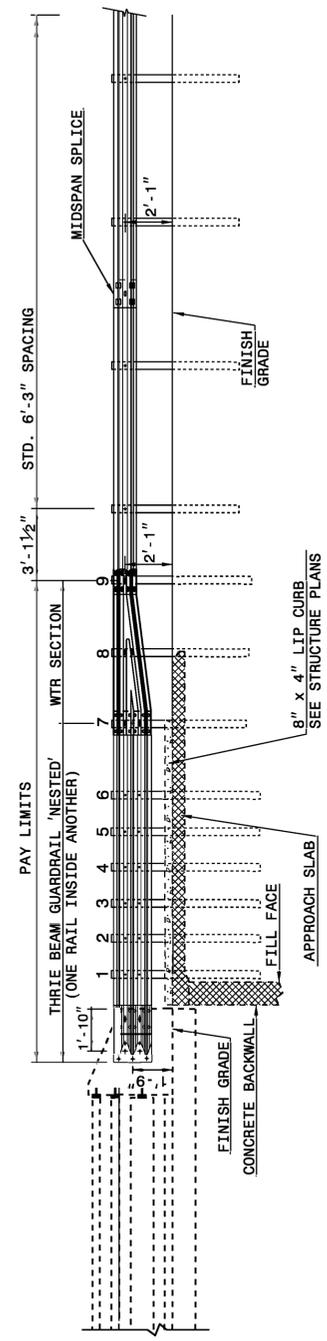
**CONTRACT STANDARDS
AND DEVELOPMENT UNIT**
Office 919-707-6950 FAX 919-250-4119

SEE PLATE FOR TITLE

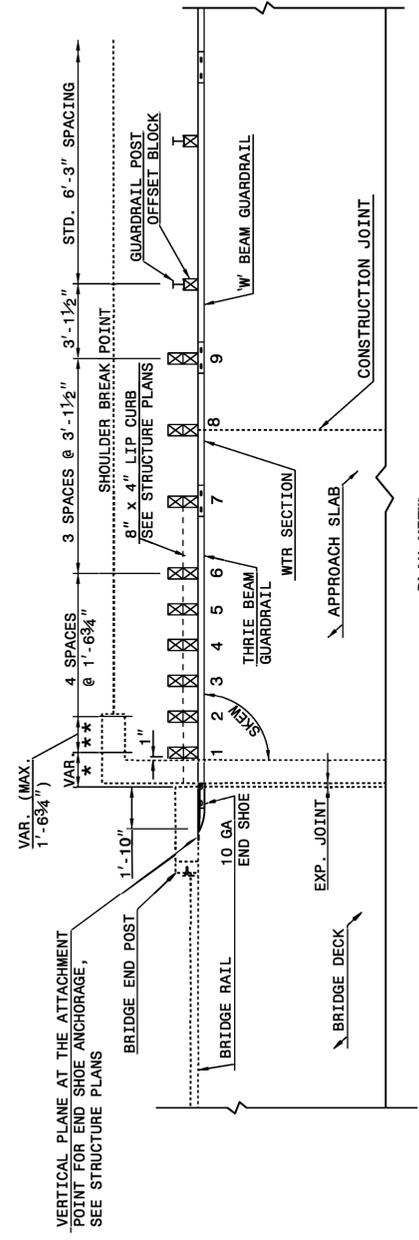
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MODIFIED BY: T.S.Spell DATE: 2-01-18
CHECKED BY: DATE:
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14-DEC-2017 10:36 S:\Contracts\2017\Standard Drawings\2018 Standard Drawings\Details in Lieu of Standards\Division 8\0862d0301.dgn Jhowerton AT:CSU-212855

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



NOTE:
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-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.



GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

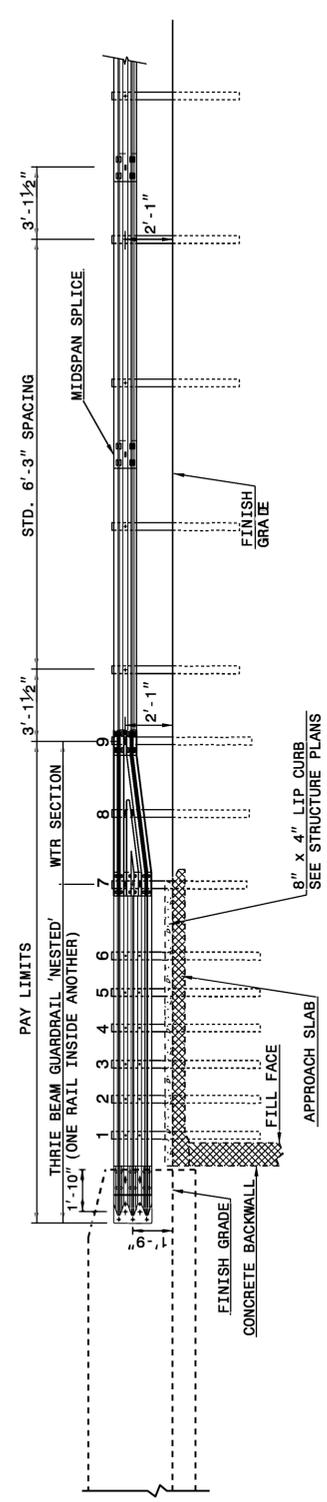
SHEET 1 OF 7 862D03

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

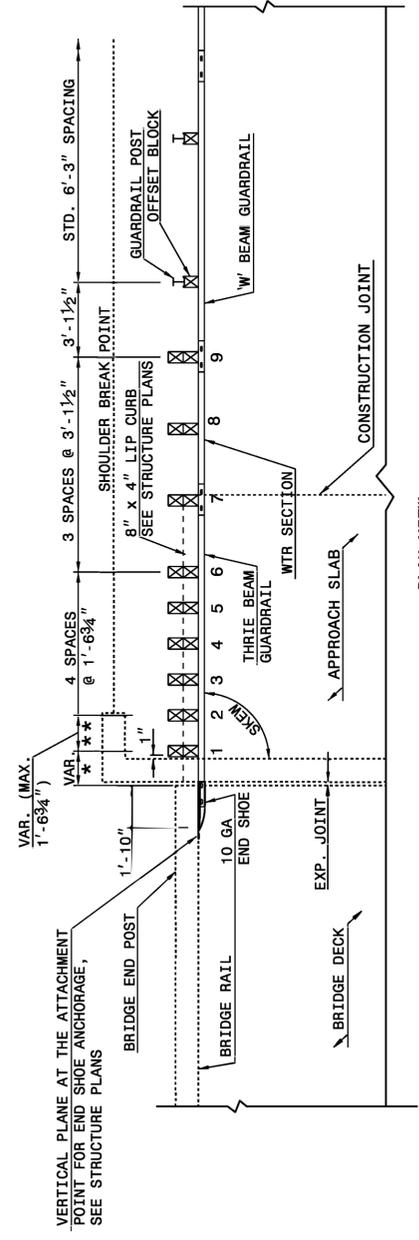
ROADWAY DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7 862D03

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



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 11 1/2" IF CONCRETE BACKWALL IS NOT PRESENT.
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-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.



GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7 862D03

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



4/11/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

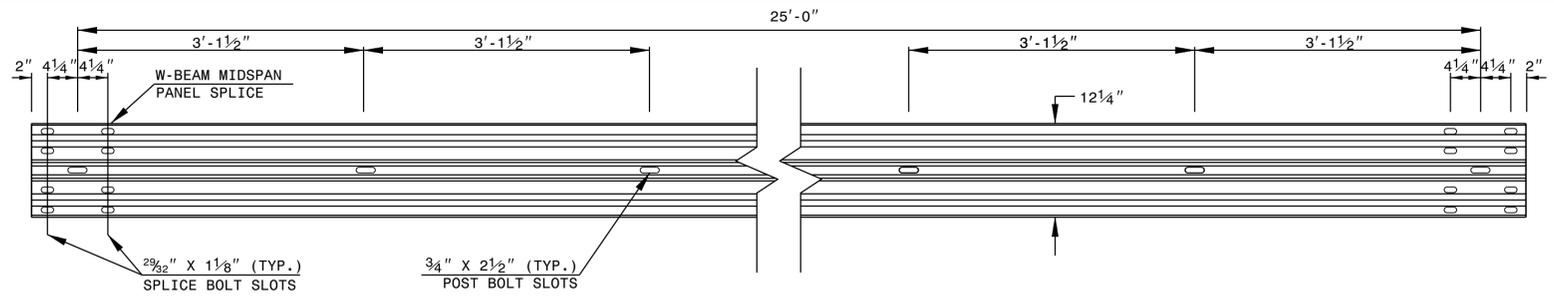
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MODIFIED BY: DATE:
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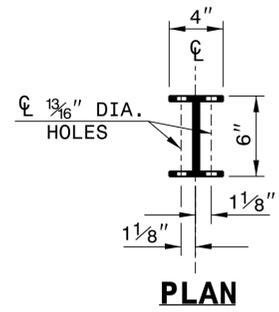
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

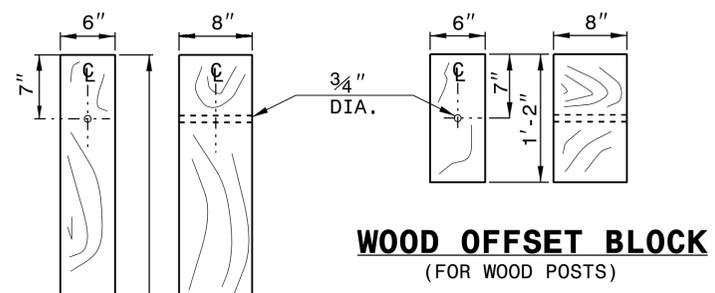
SHEET 6 OF 8
862D02



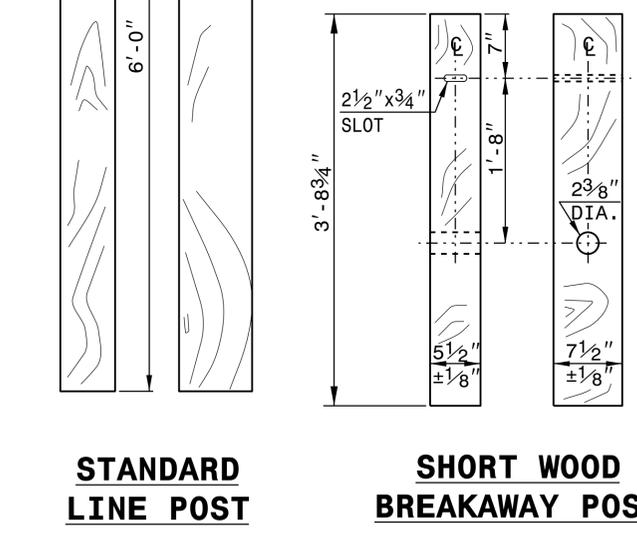
STANDARD W-BEAM GUARDRAIL



PLAN

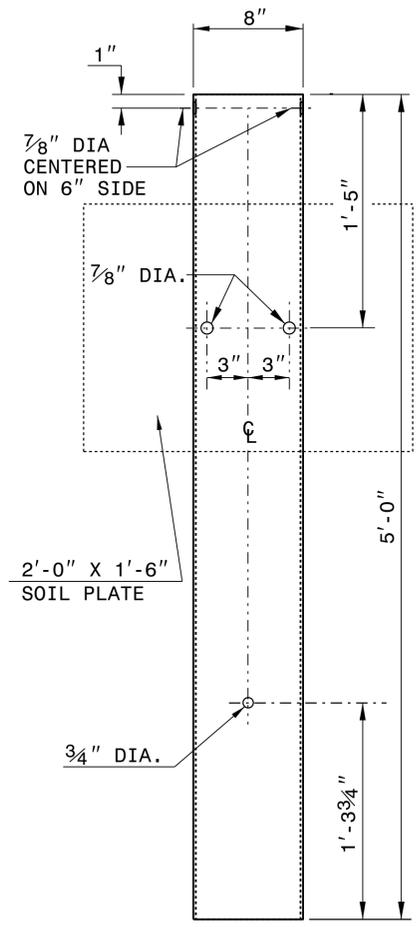


**WOOD OFFSET BLOCK
(FOR WOOD POSTS)**

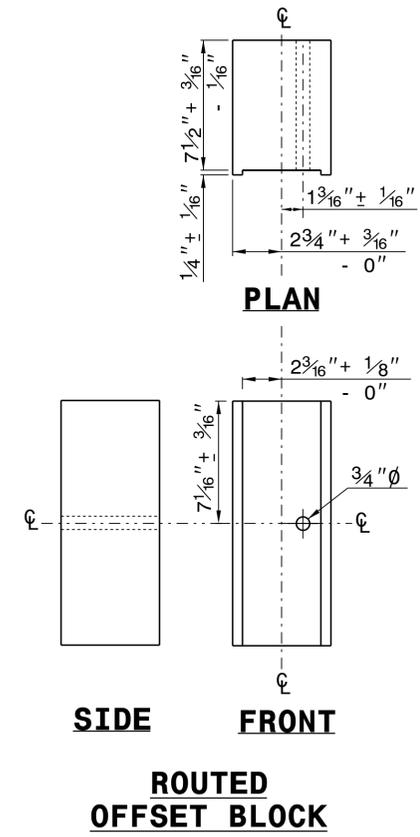


**STANDARD
LINE POST**

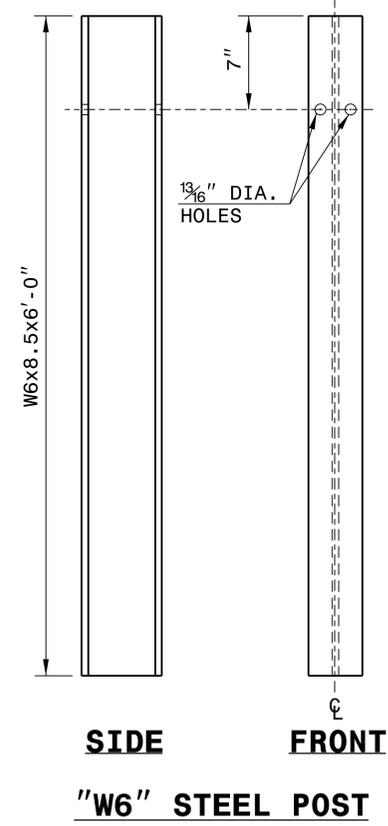
**SHORT WOOD
BREAKAWAY POST**



**STEEL TUBE
TS 6"x8"x0.1875"**



**ROUTED
OFFSET BLOCK**



"W6" STEEL POST

SYSTEM PARTS

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



4/11/2023

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

SEE TITLE BLOCK

ORIGINAL BY: J. HOWERTON DATE: 3-7-2018
MODIFIED BY: DATE: _____
CHECKED BY: DATE: _____
FILE SPEC.: _____

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

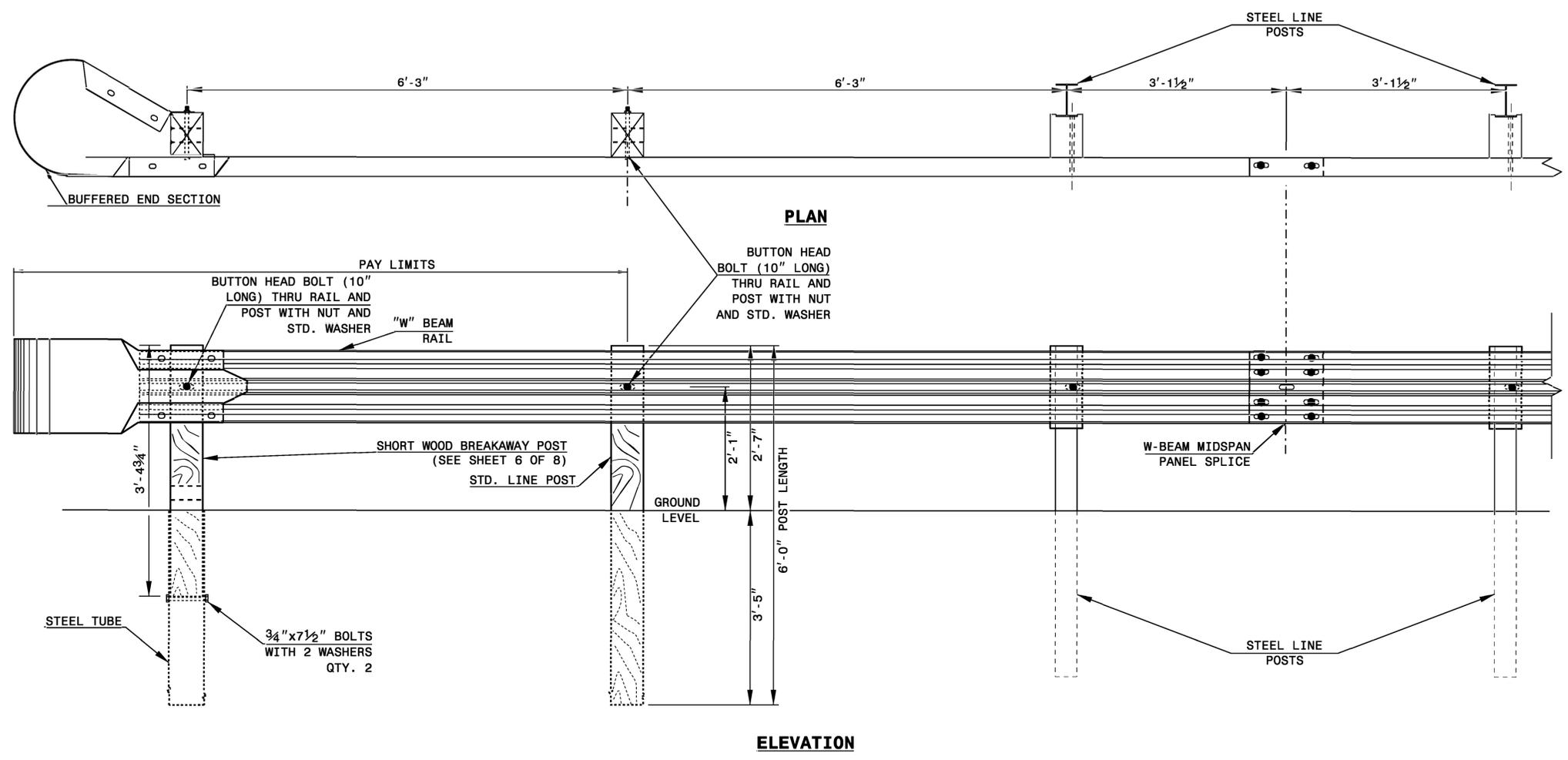
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF



TRAILING END UNIT ASSEMBLY
A.T. - 1 SYSTEM



4/11/2023

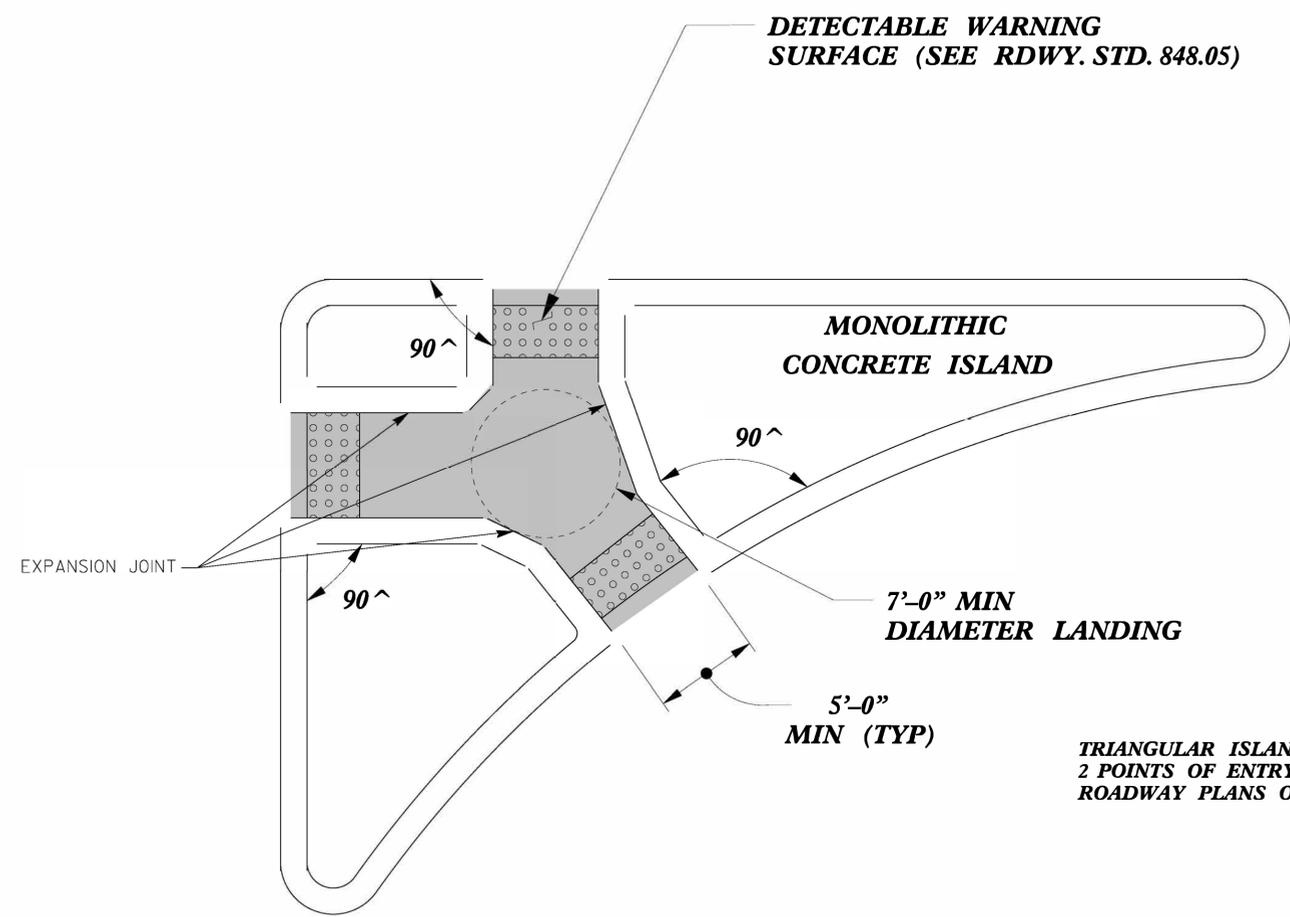
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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

A.T. - 1 SYSTEM

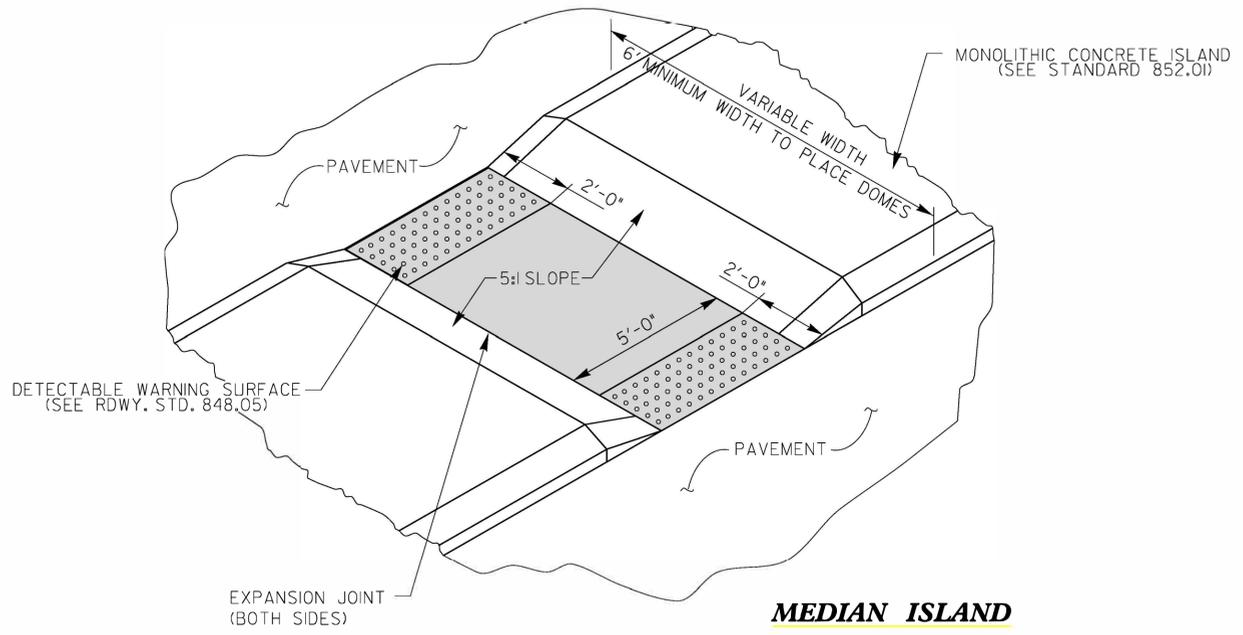
ORIGINAL BY: _____	DATE: _____
MODIFIED BY: _____	DATE: _____
CHECKED BY: _____	DATE: _____
FILE SPEC.: _____	

**PAY LIMITS FOR 2 OR 3 CURB RAMPS
(CALCULATE BASED ON NUMBER OF
SETS OF TRUNCATED DOMES)**

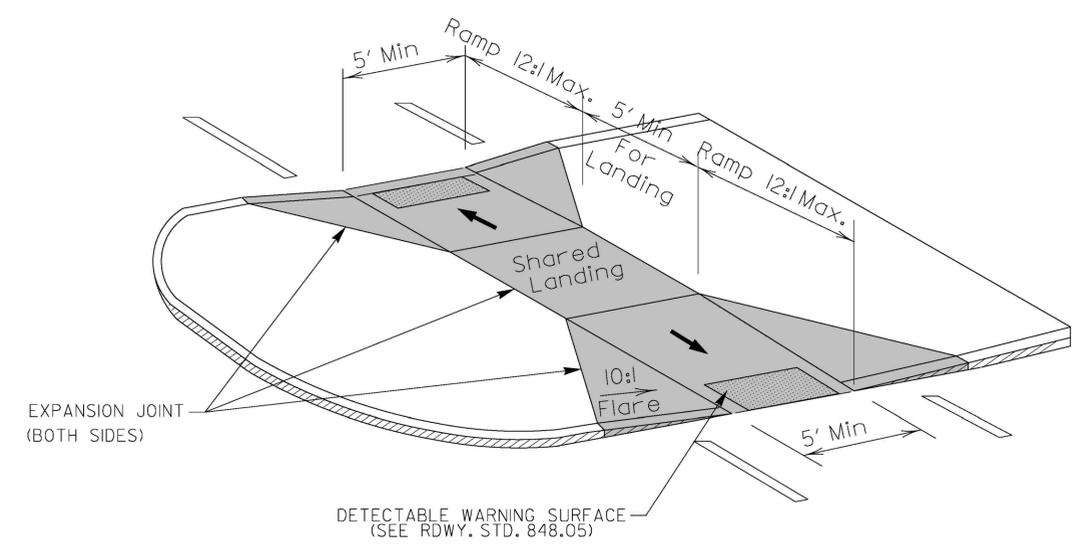


TRIANGULAR ISLANDS MAY BE CONSTRUCTED WITH ONLY 2 POINTS OF ENTRY AND EXIT AS SHOWN IN THE ROADWAY PLANS OR AS DIRECTED BY THE ENGINEER.

**TRIANGULAR ISLAND WITH CUT THROUGH
TYPE 6**



**MEDIAN ISLAND WITH CUT THROUGH
TYPE 7**



**MEDIAN ISLAND CURB RAMPS
TYPE 8**

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

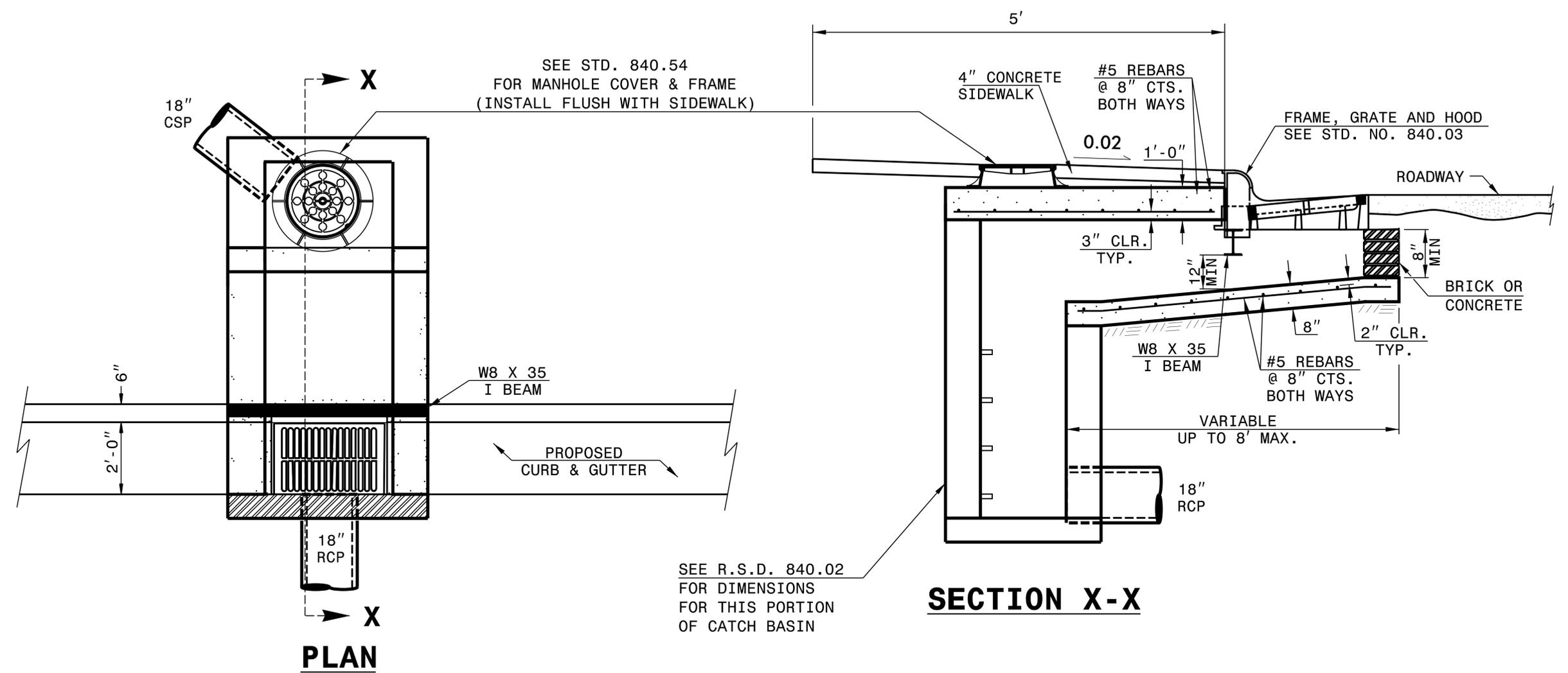
CURB RAMPS
Median or Turn Lane Islands

ORIGINAL BY: J.S. HOWERTON DATE: 7/7/11
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC: stds/2012CurbRamp/CurbRampDetails.dgn



4/11/2023

5/14/99
SYTIME
CONSULTING
SUGERNAVE



NOTES:

MORTAR JOINTS 1/2" TO 1/4" THICK.

USE CLASS "B" CONCRETE THROUGHOUT.

USE TYPE "E", "F" AND "G" GRATES UNLESS OTHERWISE INDICATED.

USE BRICK OR CONCRETE BLOCK WHICH COMPLIES WITH THE REQUIREMENTS OF SECTION 840 OF THE STANDARD SPECIFICATIONS.

CHAMFER ALL EXPOSED CORNERS 1".

DRAWING NOT TO SCALE.

PROVIDE ALL CATCH BASINS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66



5/18/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

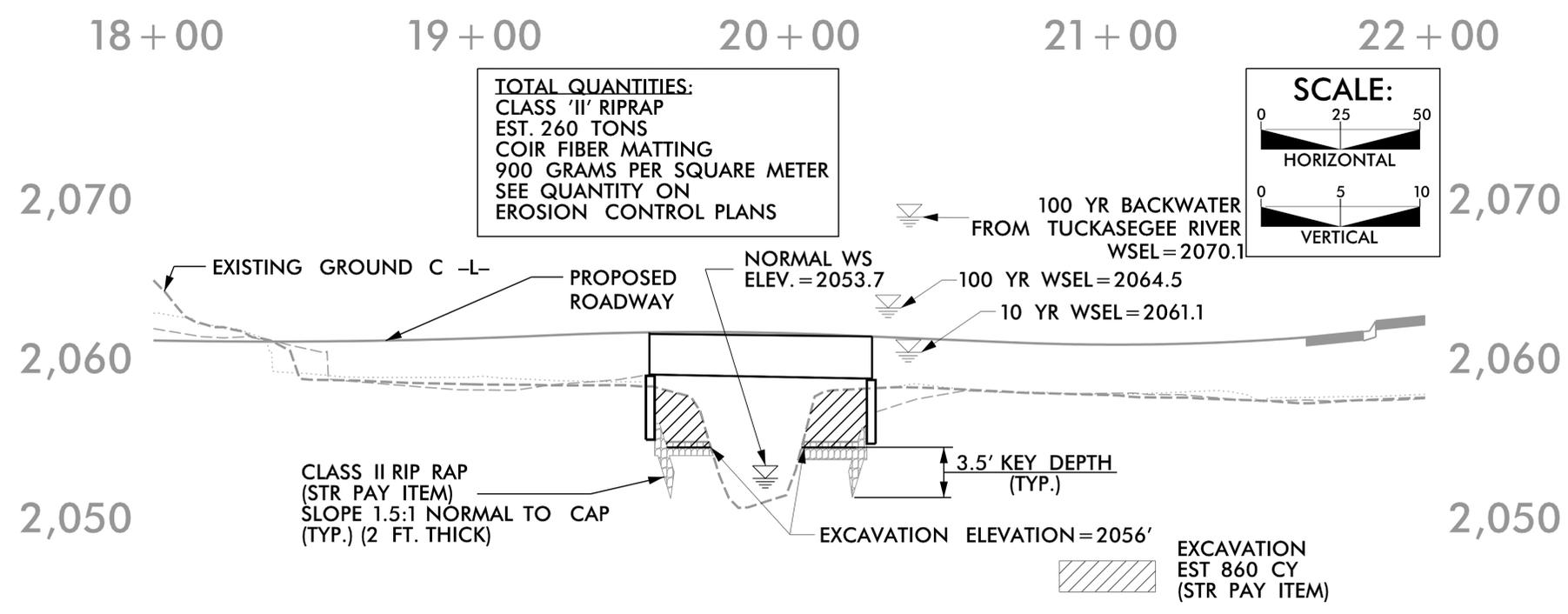
CONTRACT STANDARDS AND DEVELOPMENT UNIT
 Office 919-707-6950 FAX 919-250-4119

PROPOSED OFFSET CATCH BASIN

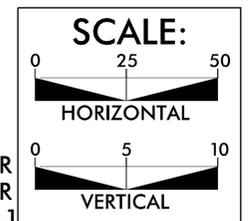
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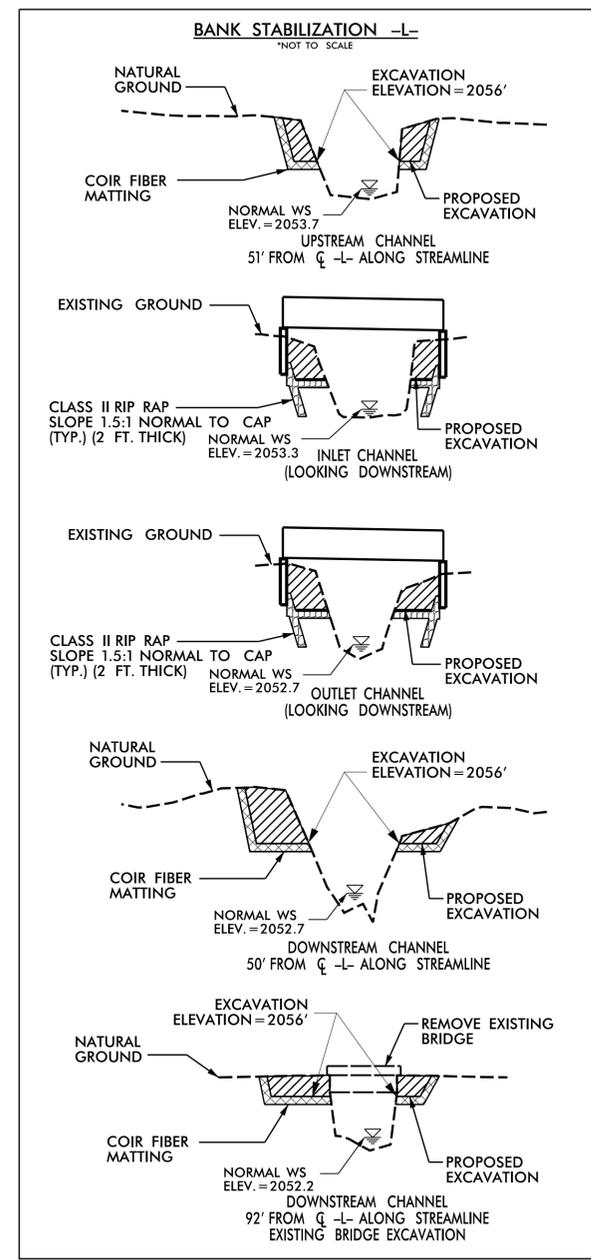
PROJECT REFERENCE NO. 17BP.14.R.212	SHEET NO. 2D-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



TOTAL QUANTITIES:
CLASS 'II' RIPRAP
EST. 260 TONS
COIR FIBER MATTING
900 GRAMS PER SQUARE METER
SEE QUANTITY ON
EROSION CONTROL PLANS



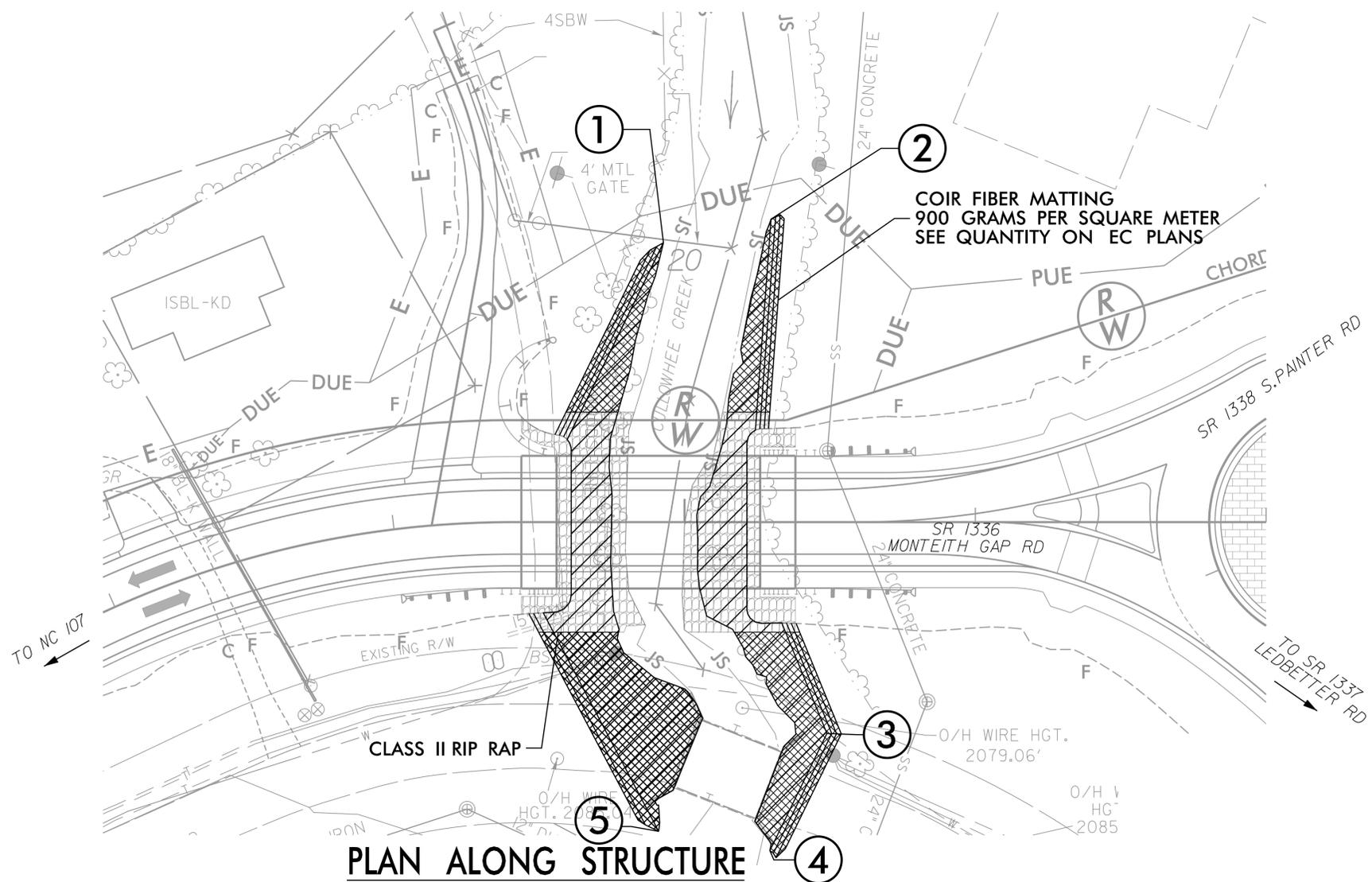
CHANNEL IMPROVEMENT DETAIL



LOCATION FOR EXCAVATION LIMITS (STATION AND OFFSET FROM -L-)

- ① -L- STA. 19+92.75, 95.87' LT.
- ② -L- STA. 20+29.76, 104.00' LT.
- ③ -L- STA. 20+48.97, 72.48' LT
- ④ -L- STA. 20+29.34, 112.67' RT
- ⑤ -L- STA. 19+19.12, 106.08' RT

PROFILE ALONG STRUCTURE



PLAN ALONG STRUCTURE

SEE SHEET NO. 4 FOR ROADWAY PLAN.
SEE SHEET NO. 2A-1 FOR BRIDGE TYPICAL SECTION.

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COMPUTED BY: DMM _____ DATE: 7/11/2019 _____
 CHECKED BY: JCK _____ DATE: 7/11/2019 _____

(5-15-18)

PROJECT NO. 17BP.14.R.212	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
				TOTAL LF:	200

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

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					100	200	500		
					TOTAL CY/TONS/SY:	100	200**	500**	0

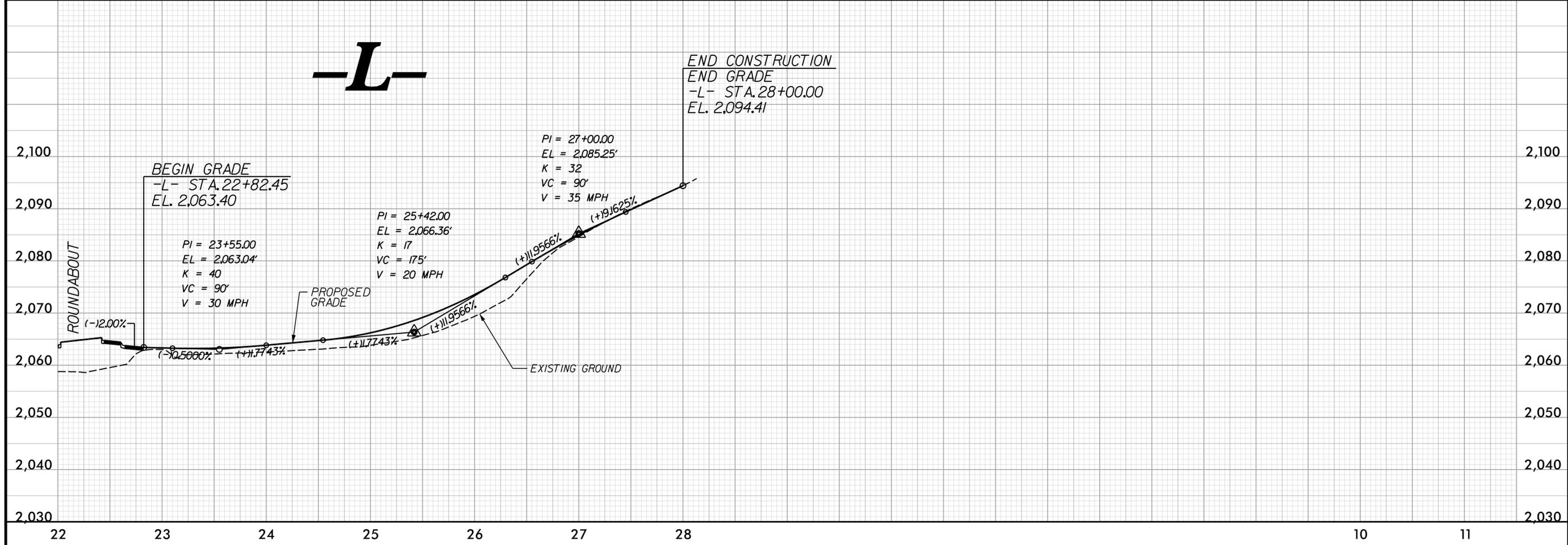
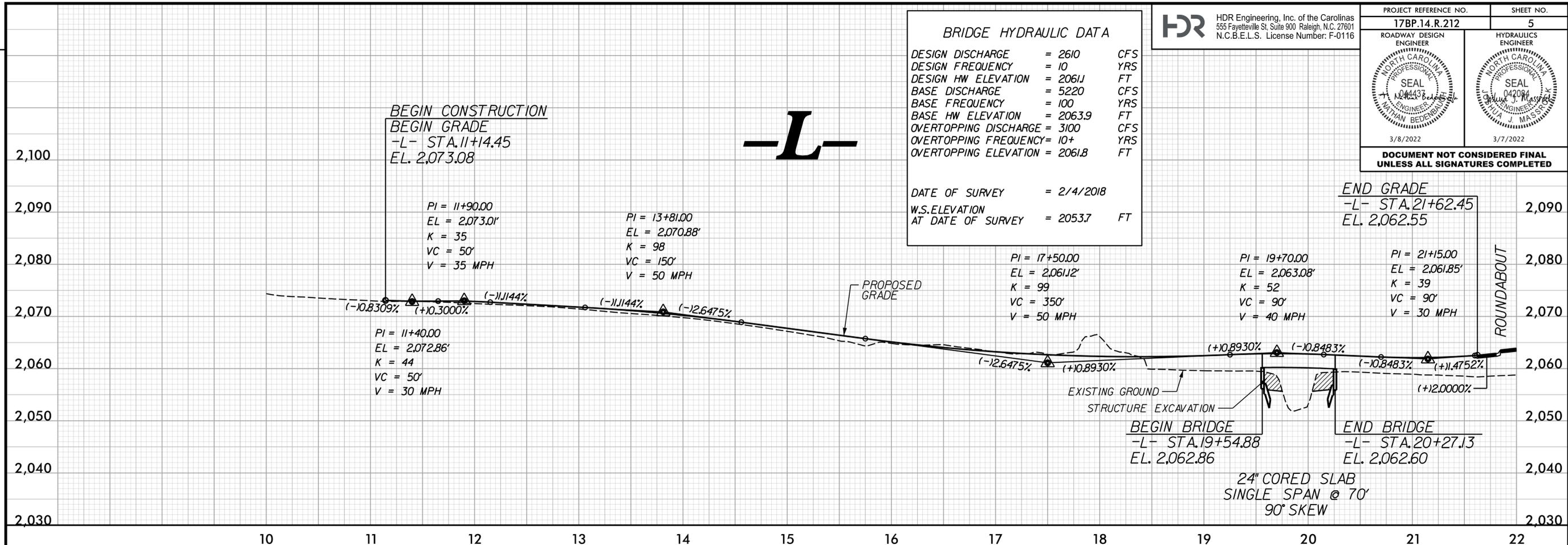
*ASU(1/2) = Aggregate Subgrade (Type 1 or 2)
 *AST = Aggregate Stabilization
 **Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Soil Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade stabilization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

PROJECT REFERENCE NO. 17BP.14.R.212	SHEET NO. 5
ROADWAY DESIGN ENGINEER SEAL 044438 MATTHEW BEDEMBER	HYDRAULICS ENGINEER SEAL 042084 J. MASSIE
3/8/2022	3/7/2022

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 2610	CFS
DESIGN FREQUENCY	= 10	YRS
DESIGN HW ELEVATION	= 2061.1	FT
BASE DISCHARGE	= 5220	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 2063.9	FT
OVERTOPPING DISCHARGE	= 3100	CFS
OVERTOPPING FREQUENCY	= 10+	YRS
OVERTOPPING ELEVATION	= 2061.8	FT

DATE OF SURVEY	= 2/4/2018
W.S.ELEVATION AT DATE OF SURVEY	= 2053.7 FT



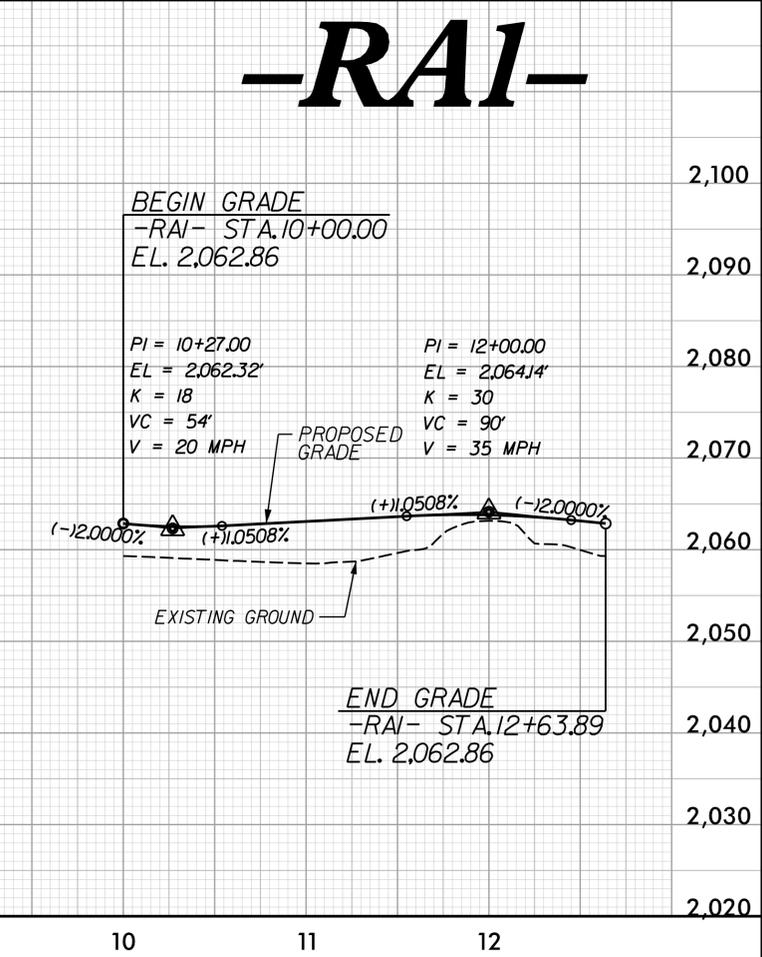
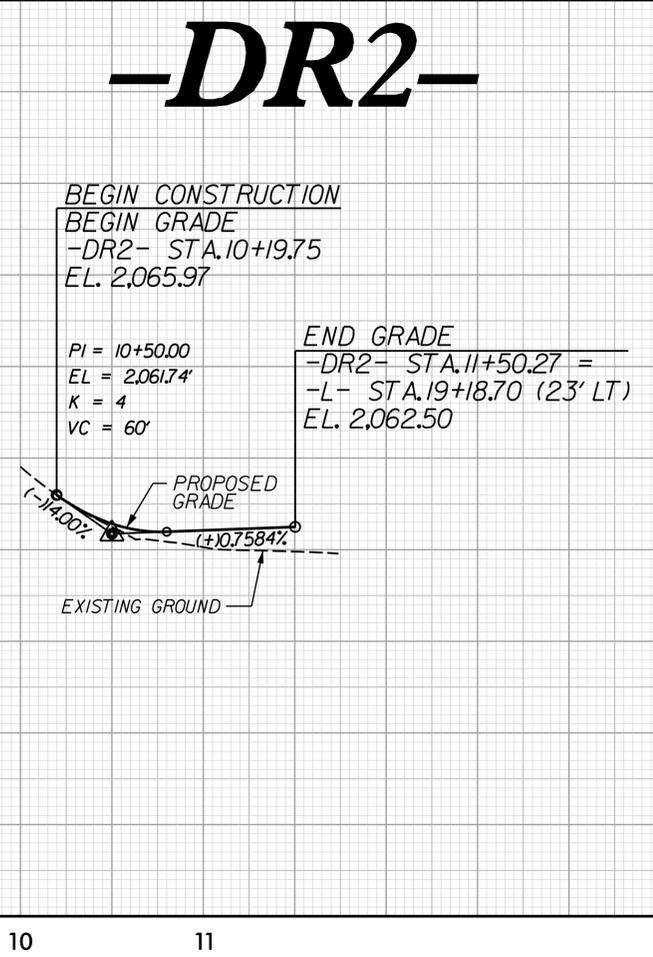
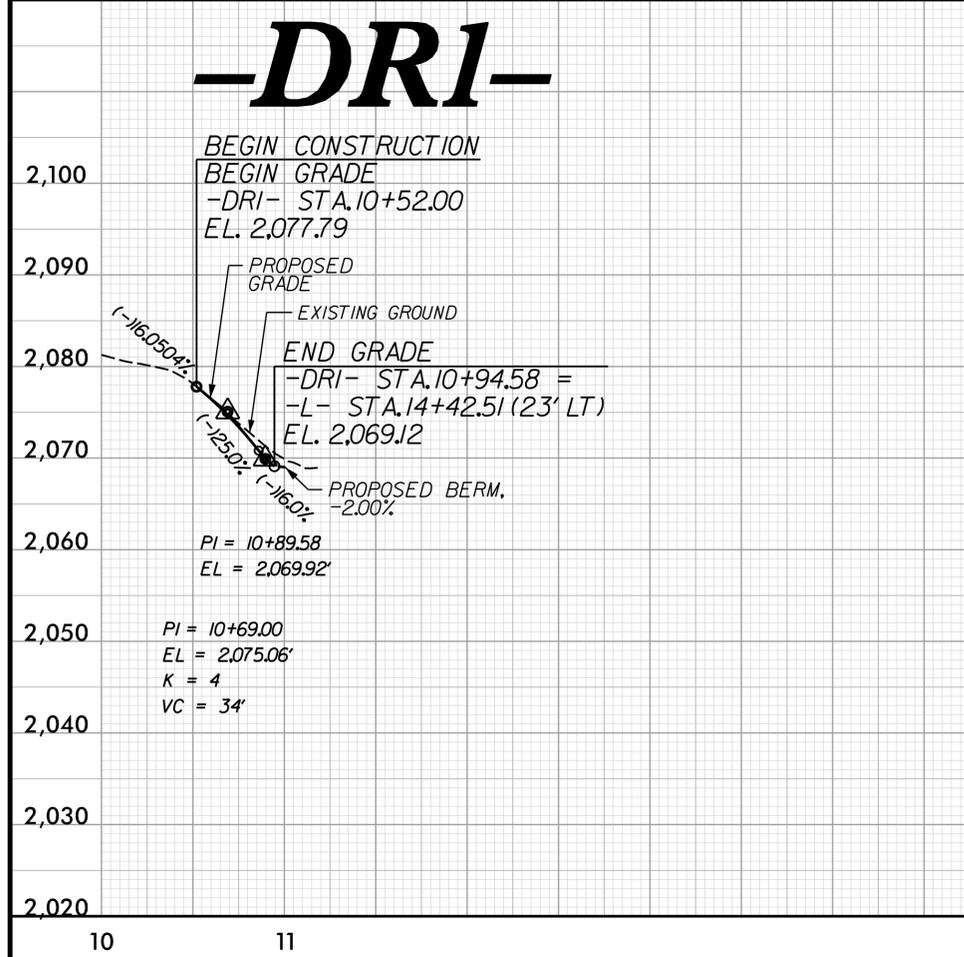
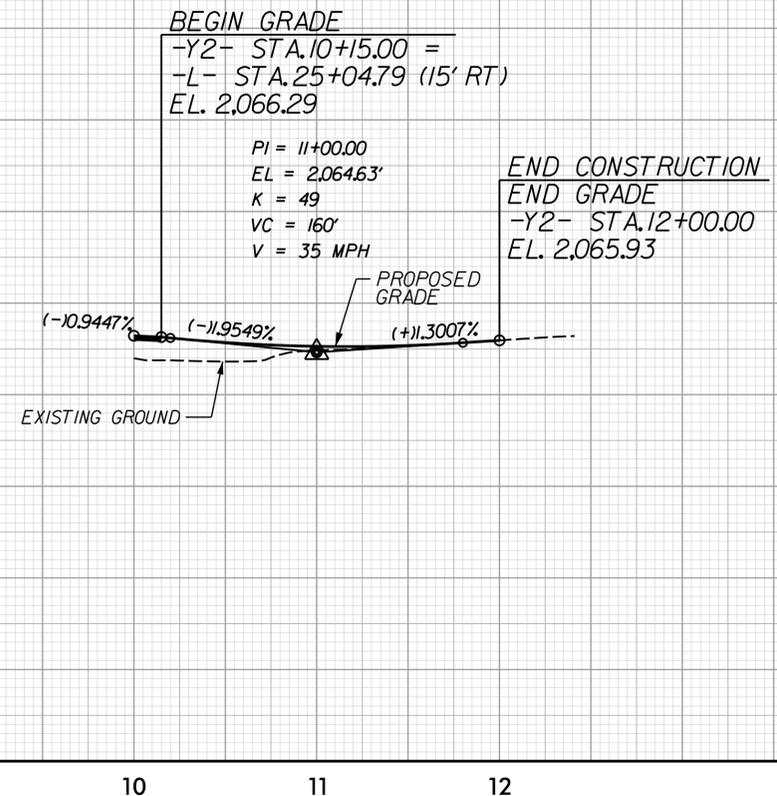
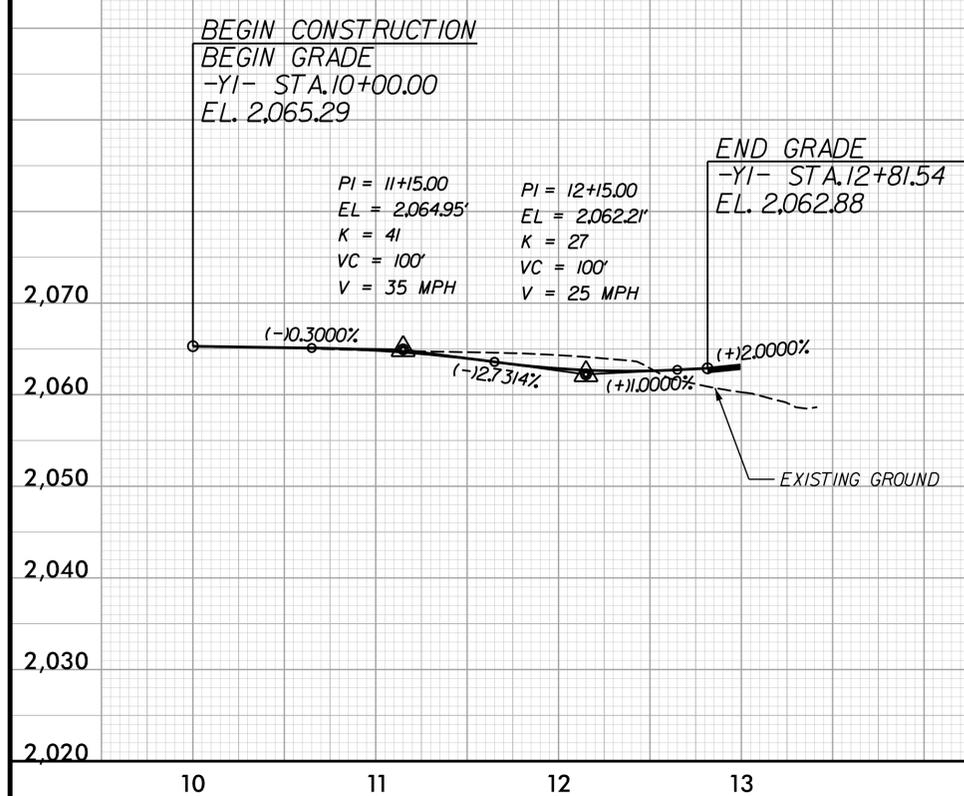
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REVISIONS

PROJECT REFERENCE NO. 17BP.14.R.212	SHEET NO. 6
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 1044438 MATTHEW BEDEENBA 1/21/2022	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 042084 DANIEL J. MASHLEY 1/21/2022
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

-Y1-

-Y2-



PLOT DRIVER: NCDOT_color_eng_50.plt
 USER: TBEDEENBA
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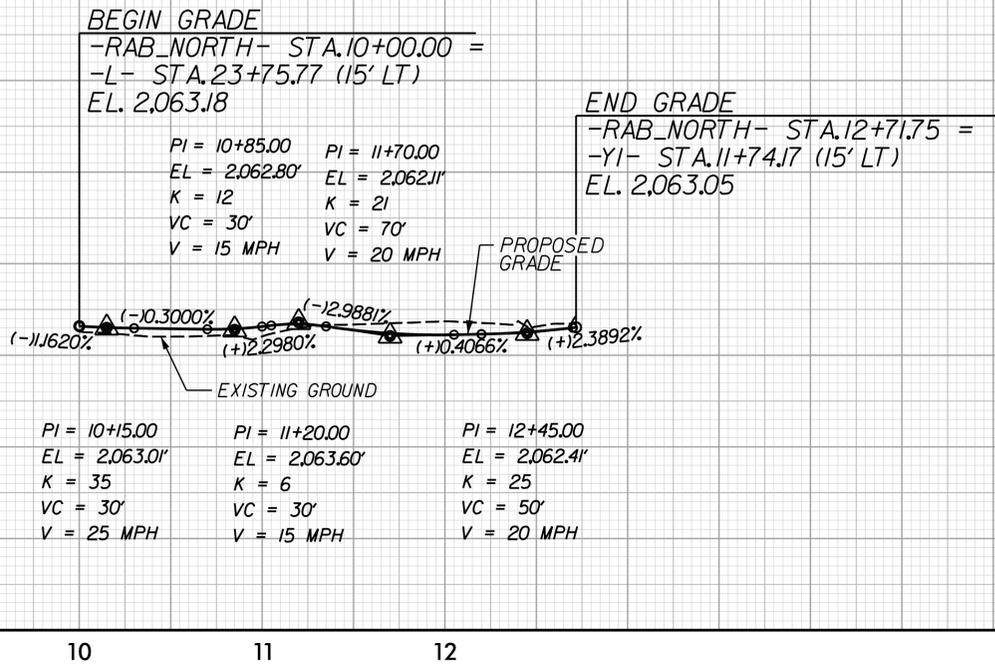
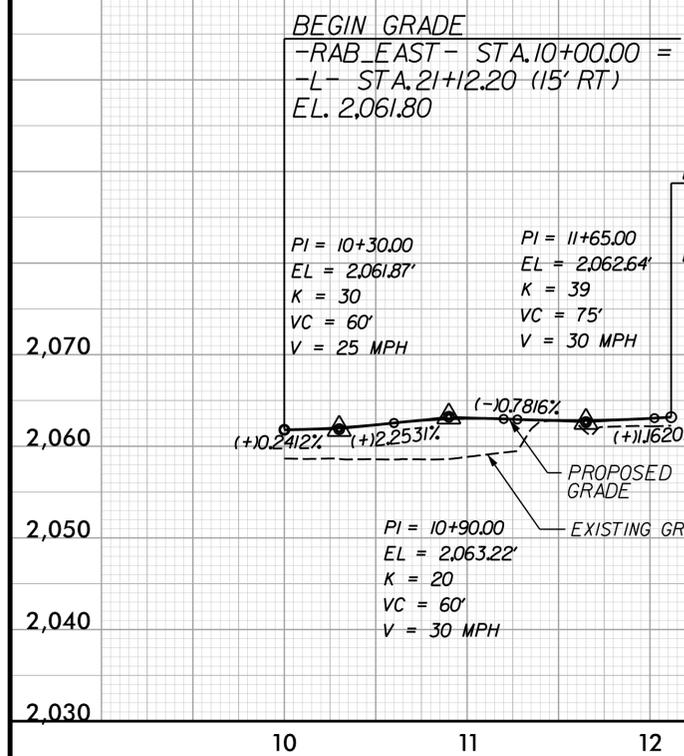
REVISIONS

-RAB_EAST-

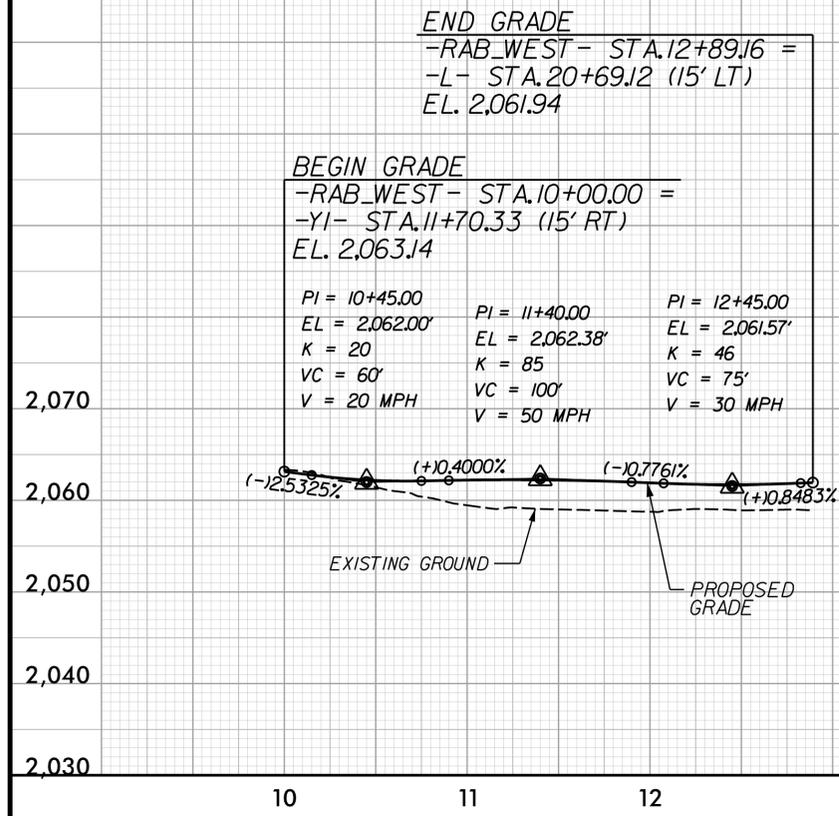
-RAB_NORTH-

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

PROJECT REFERENCE NO. 17BP.14.R.212	SHEET NO. 7
ROADWAY DESIGN ENGINEER SEAL 1044438 MATTHEW BEDEENBAUM	HYDRAULICS ENGINEER SEAL 042084 J. MASSEY
1/21/2022	1/21/2022
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



-RAB_WEST-



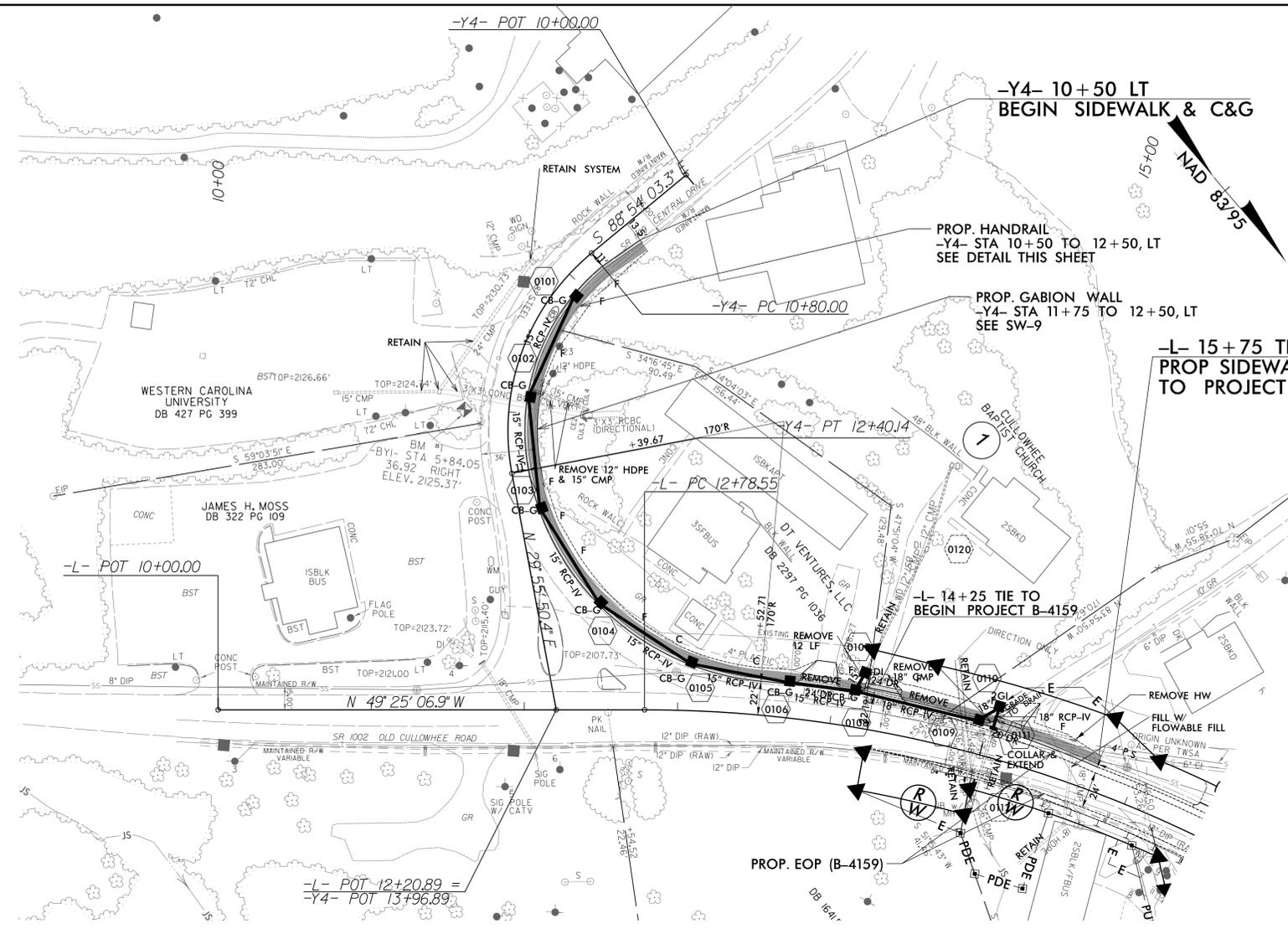
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REVISIONS

8/17/99

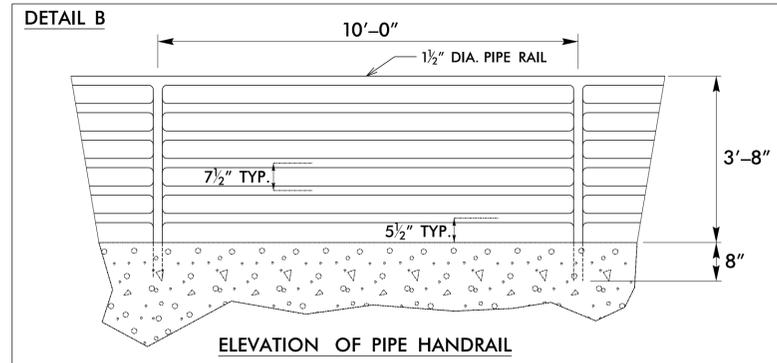
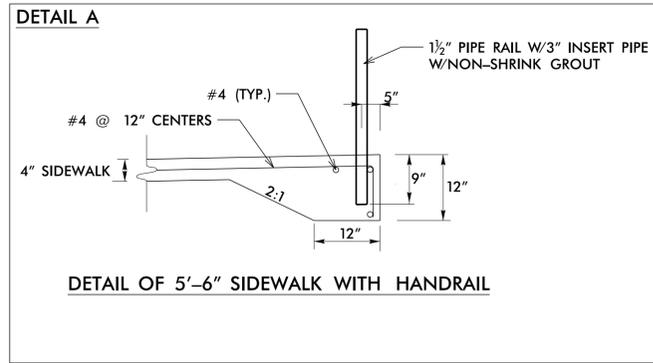
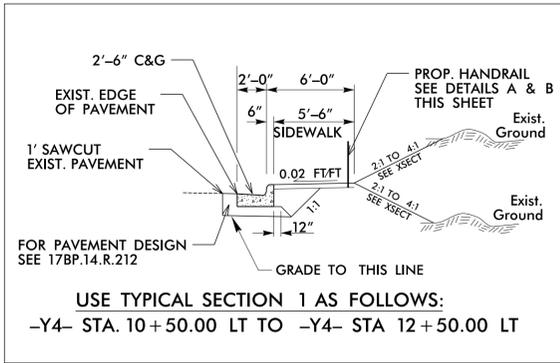
REVISIONS

3/24/2022
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 User: turner



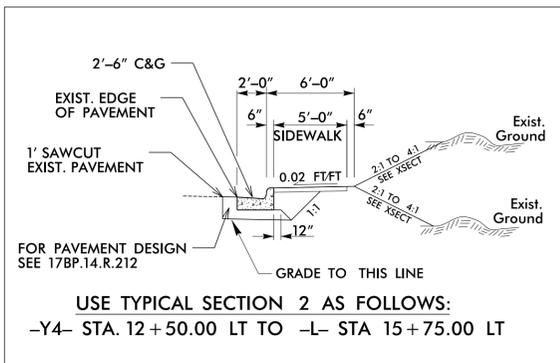
-Y4- CURVE DATA	-L- CURVE DATA
PI Sta 11+68.65	PI Sta 26+65.65
$\Delta = 61^{\circ} 10' 06.3''$ (LT)	$\Delta = 118^{\circ} 08' 55.9''$ (RT)
$D = 38^{\circ} 11' 49.9''$	$D = 6^{\circ} 53' 41.3''$
$L = 160.14'$	$L = 1,713.59'$
$T = 88.65'$	$T = 1,387.09'$
$R = 150.00'$	$R = 831.00'$

PROJECT REFERENCE NO. 44983	SHEET NO. SW-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 TGS ENGINEERS 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH: (704) 476-0003 CORP. LICENSE NO.: C-0275	



NOTES

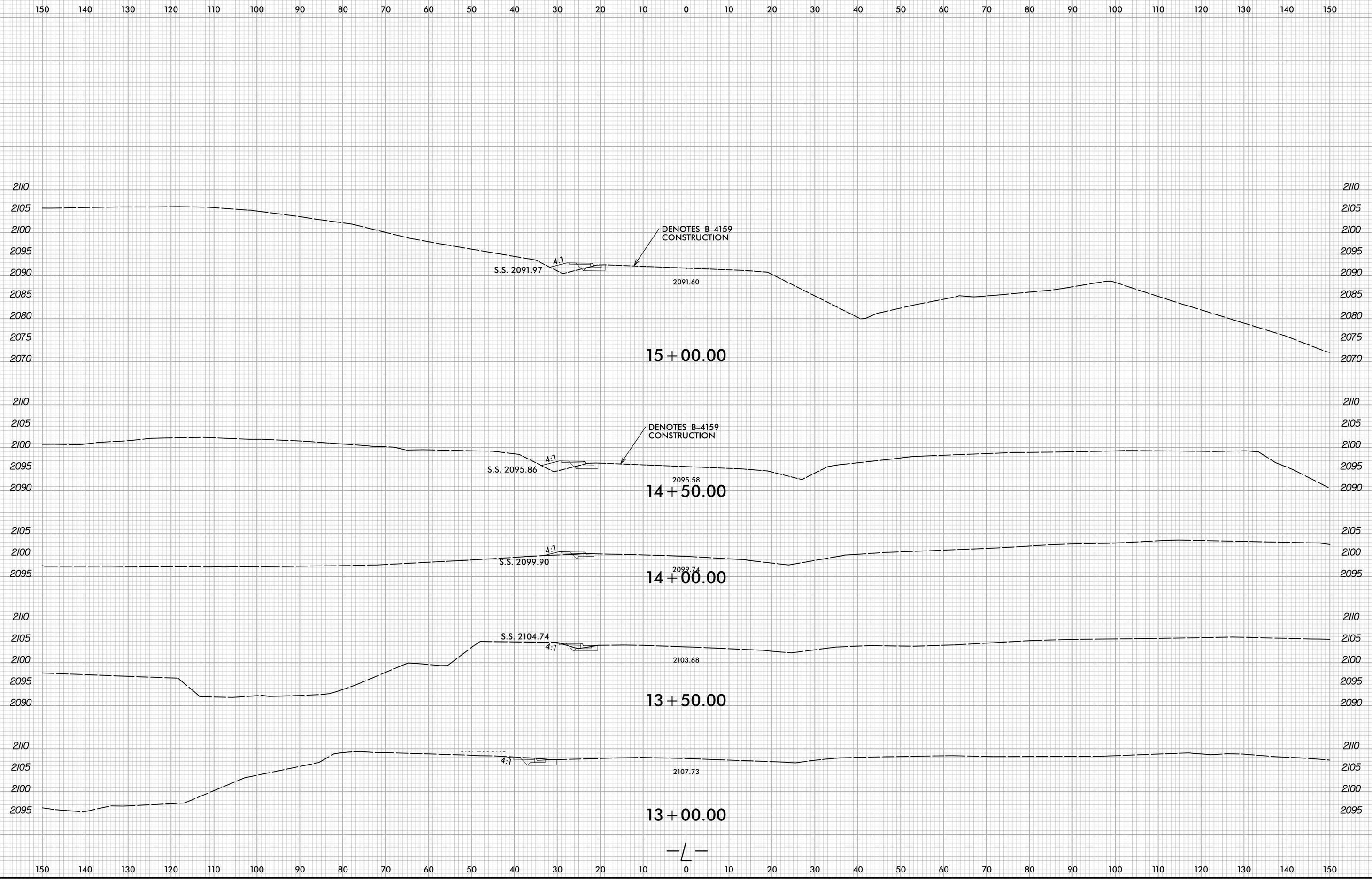
- CONSTRUCT THE PROPOSED STEEL PIPE RAIL OF 1 1/2" DIAMETER SCHEDULE 40 PLAIN END GALVANIZED STEEL PIPE MEETING THE REQUIREMENTS OF ASTM A53.
- REPAIR GALVANIZING IN ACCORDANCE WITH SECTION 1076 OF THE NCDOT STANDARD SPECIFICATIONS.
- WELD AS NEEDED IN ACCORDANCE WITH ARTICLE 1072-18 OF THE STANDARD SPECIFICATIONS.



6/23/16

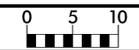


PROJ. REFERENCE NO.	SHEET NO.
44983	SW-3



7/22/2021
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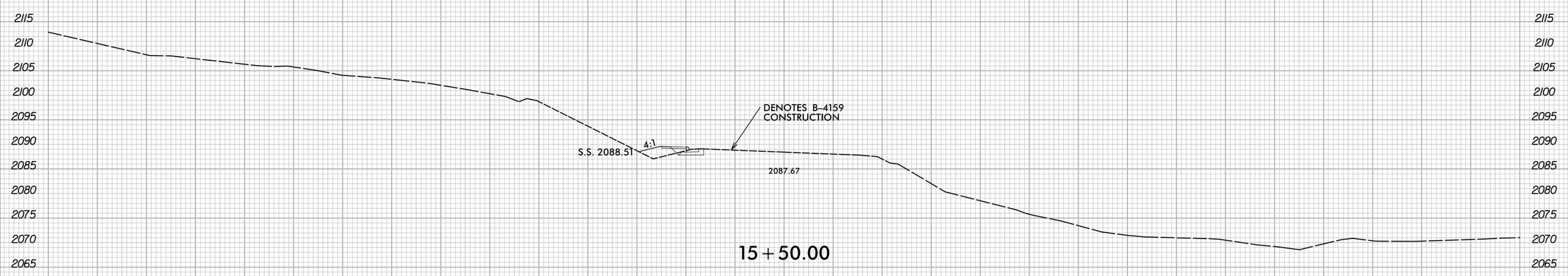
6/23/16



PROJ. REFERENCE NO.
44983

SHEET NO.
SW-4

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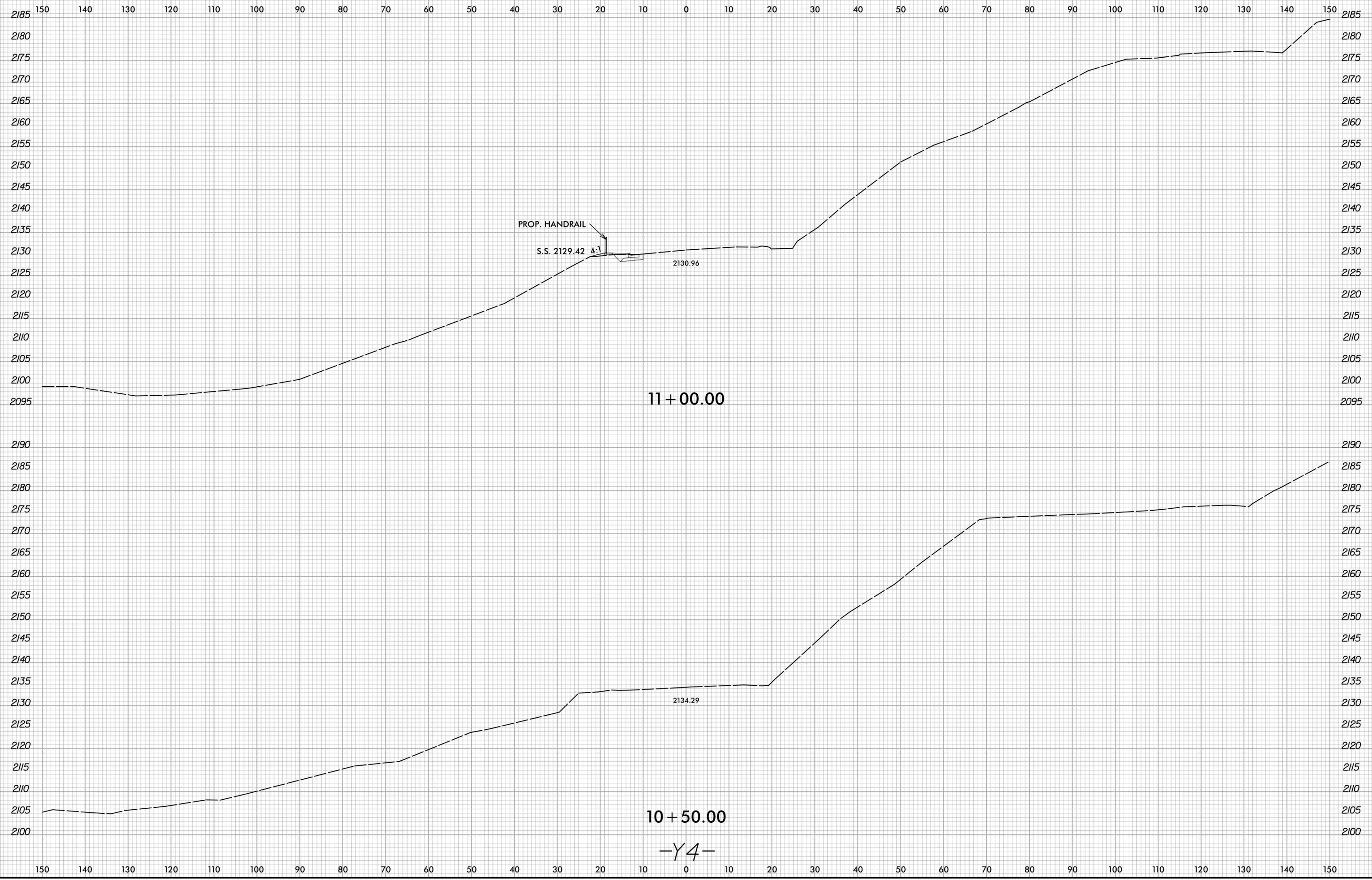


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	44983	SW-5

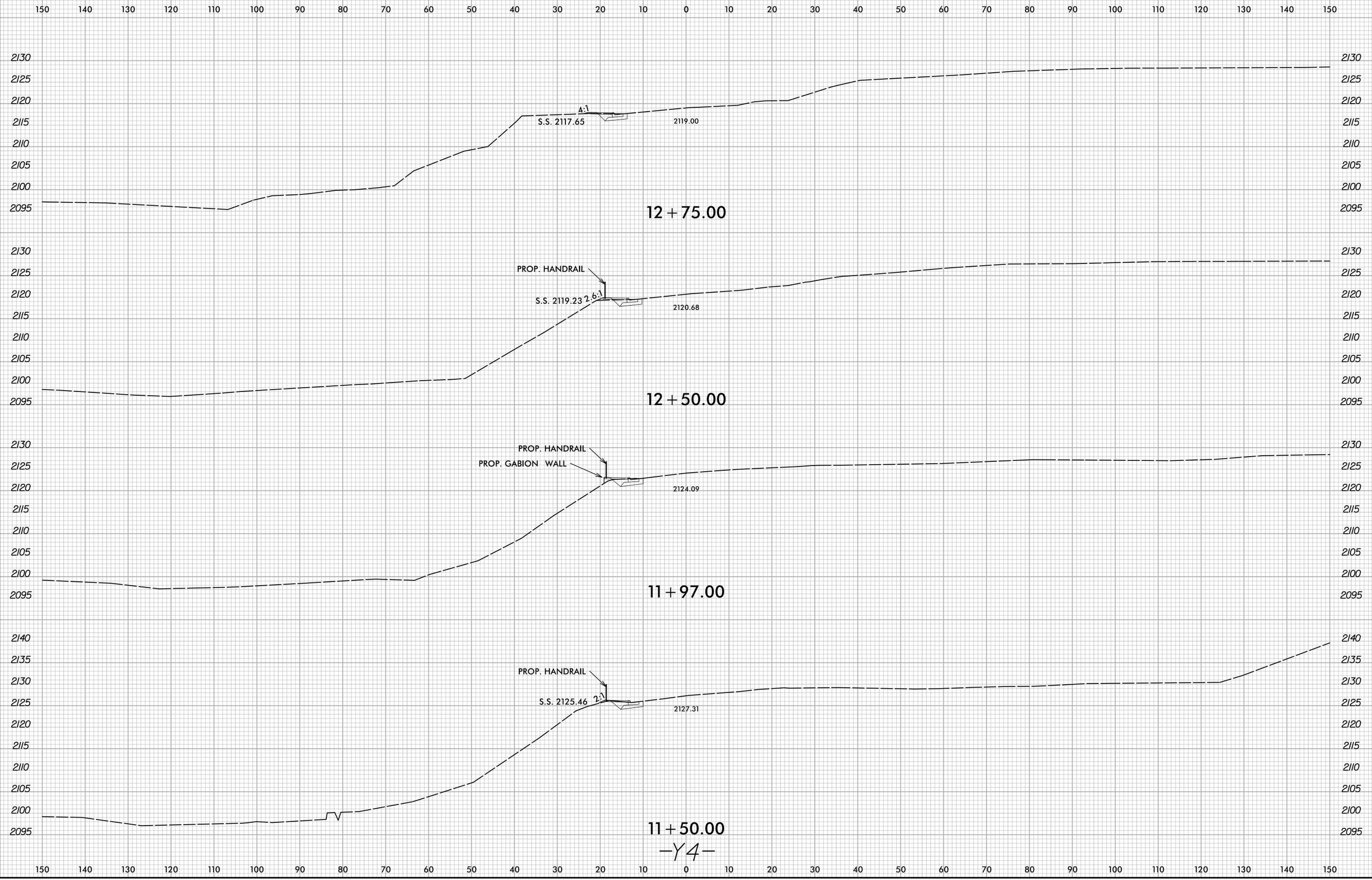


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6/23/16

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	44983	SW-6

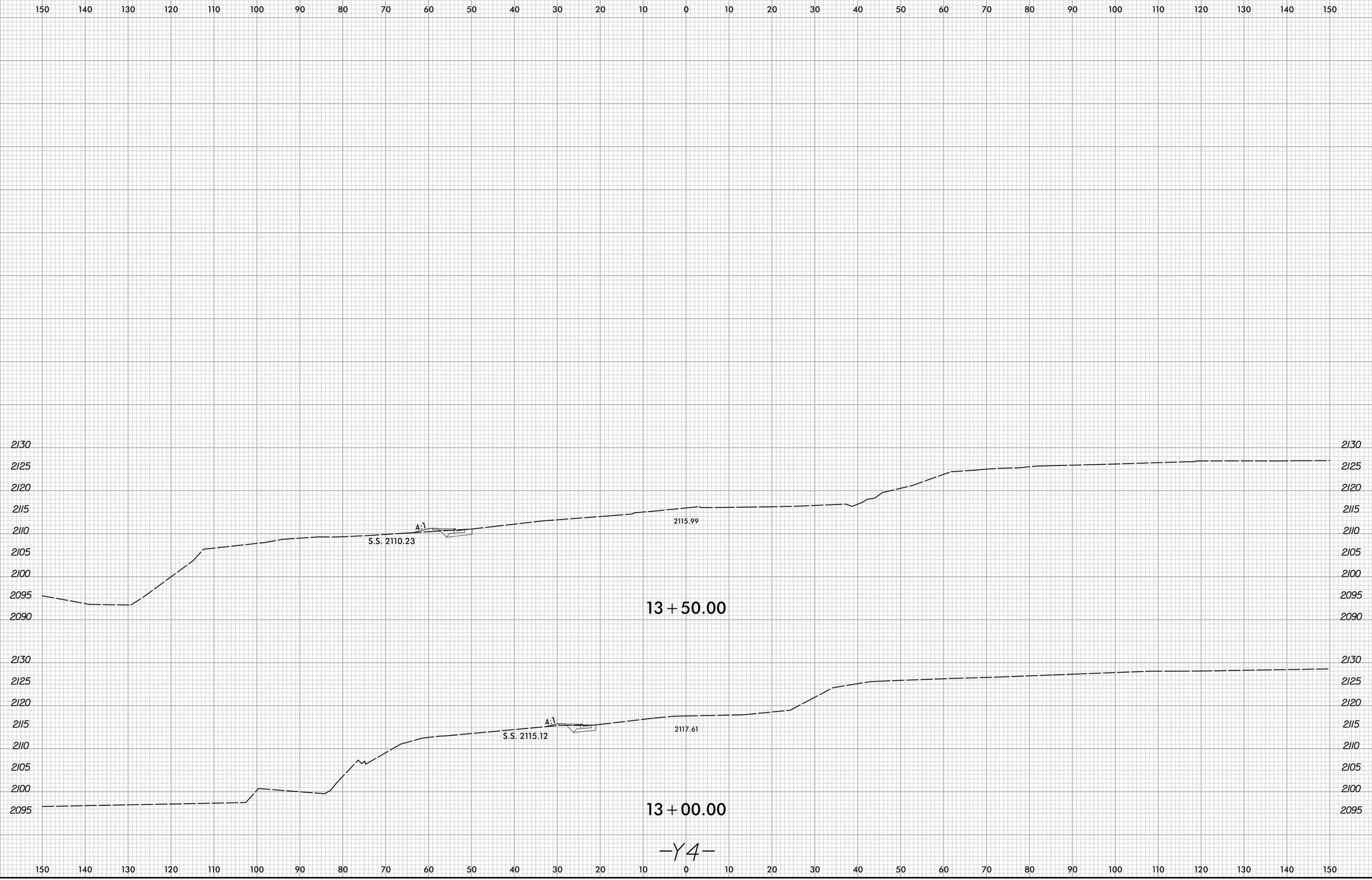


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User: rprueitt

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	44983	SW-7



NOTES:

FOR GABION RETAINING WALLS, SEE GABION RETAINING WALL PROVISION.

FOR HAND RAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.

BEFORE BEGINNING GABION RETAINING WALL DESIGN, SURVEY EXISTING GROUND ELEVATIONS AND SUBMIT A WALL ENVELOPE FOR REVIEW. DO NOT START DESIGN UNTIL THIS ENVELOPE IS ACCEPTED.

AN ALLOWABLE BEARING OF 2,000 PSF SHALL BE VERIFIED PRIOR TO CONSTRUCTION OF THE WALL. IF NECESSARY THE CONTRACTOR SHALL PREPARE AND/OR MAKE GROUND MODIFICATIONS IN ORDER TO SATISFY THE MINIMUM BEARING PRESSURE.

DESIGN THE RETAINING WALL FOR A LIVE LOAD OF 250 PSF.

DESIGN THE RETAINING WALL FOR AN IMPACT LOAD OF 300 LB AT THE HAND RAIL.

THE MINIMUM EMBEDMENT FOR THE WALL IS 2 FEET BELOW THE PROPOSED OR EXISTING GROUND ELEVATIONS.

TRANSITION ENDS OF WALL BY SPILLING ADJACENT SLOPES SLOILS AROUND FACE OF WALL AS DIRECTED BY ENGINEER.

WHERE GABION RETAINING WALL INTERSECTS DRAINAGE PIPES, SUBMIT PENETRATION REINFORCEMENT DETAILS FOR APPROVAL PRIOR TO ORDERING MATERIALS OR BEGINNING CONSTRUCTION, SEE DRAINAGE PLANS FOR ADDITIONAL INFORMATION.

THE TOP OF WALL LOCATION, AS SHOWN IN THE DETAIL, CORRESPONDS TO WALL LOCATION SHOWN IN ROADWAY PLANS. THE CONTRACTOR/DESIGNER IS RESPONSIBLE FOR LOCATING THE FACE OF THE BOTTOM OF THE WALL SO THE TOP OF THE WALL LINES UP WITH THE CORRECT OFFSET AS SHOWN IN THE PLANS.

SEE ROADWAY PLANS FOR FINISH GRADE DETAILS.

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL POSTS, PAVEMENTS, PIPES, INLETS, OR UTILITIES MAY INTERFERE WITH THE REINFORCEMENT FOR GABION RETAINING WALLS.

DESIGN GABION RETAINING WALL FOR A HEIGHT EQUAL TO DESIGN HEIGHT AND EMBEDMENT.

DESIGN GABION RETAINING WALL FOR THE FOLLOWING:

1) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT (WEIGHT γ) PCF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) PSF
BACKFILL	120	32	0
FOUNDATION	120	30	100
EXISTING EMBANKMENT	120	30	100

IF REQUIRED, REMOVE EXISTING GABION RETAINING WALL BASKETS.

A WALL PROFILE WAS NOT AVAILABLE FOR INCLUSION IN THE PLANS

GABION INFILL MATERIAL IS ASSUMED TO HAVE A UNIT WEIGHT OF 145 PCF FOR DESIGN. THE CONTRACTOR SHALL VERIFY DESIGN BASED ON ACTUAL INFILL MATERIALS.

OVERLAP GEOTEXTILE A MINIMUM OF 18 INCHES OR AS DIRECTED BY THE ENGINEER.

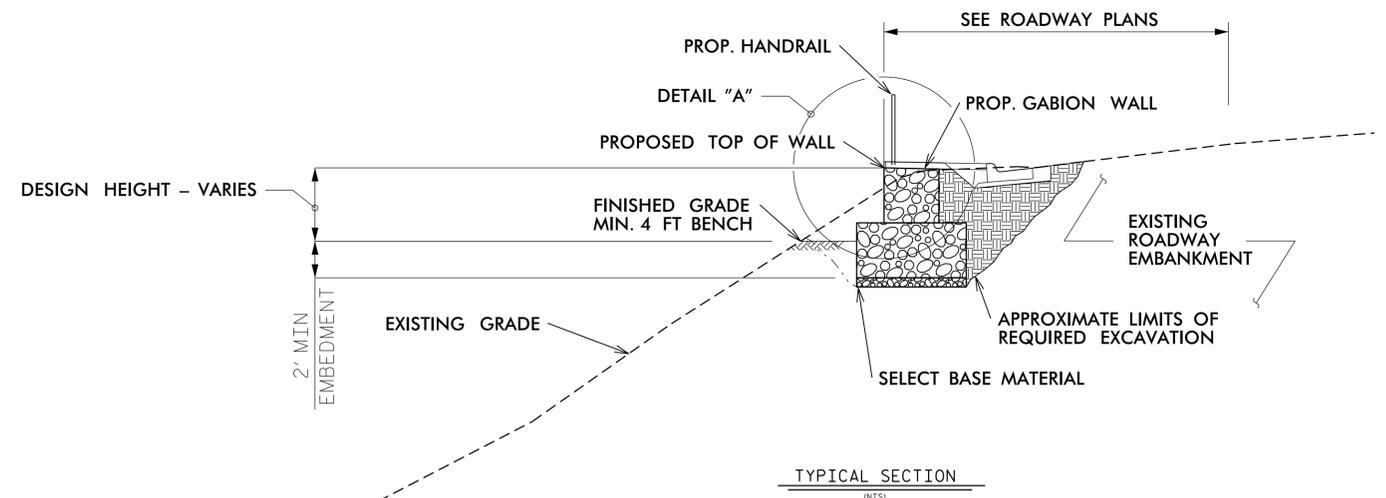
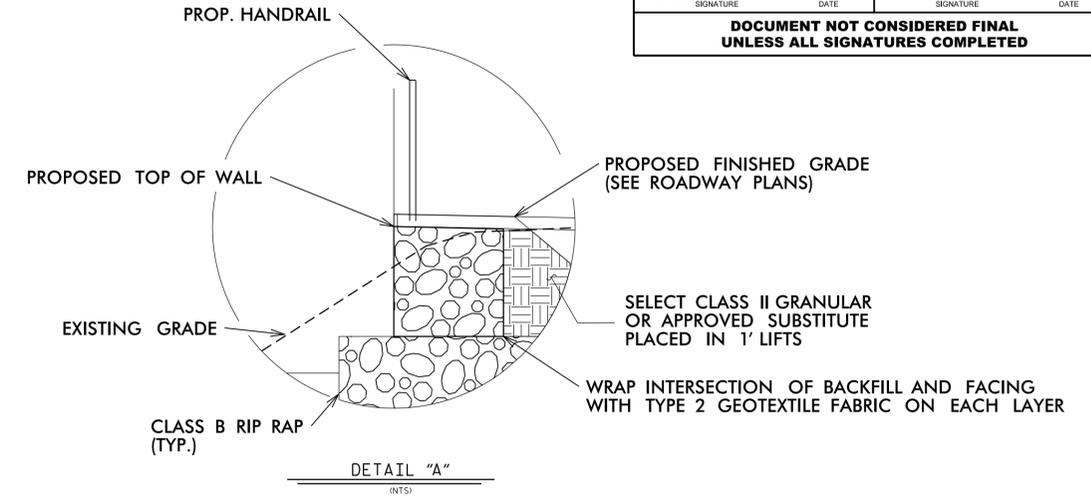
BACKFILL BEHIND GABION WALL WITH CLASS II TYPE I SELECT MATERIAL IN ACCORDANCE WITH SECTION 1016 OF THE STANDARD SPECIFICATIONS.

ESTIMATED GABION RETAINING WALL QUANTITY	
(SQUARE FEET)	
GABION RETAINING WALL**	300 SF

** EMBEDDED WALL NOT INCLUDED IN QUANTITY ESTIMATE

PREPARED BY: M. BREWER, P.E.	DATE: 8/28/18
REVIEWED BY: M. WALKO, P.E.	DATE: 8/28/18

GEOTECHNICAL ENGINEER  D. Matthew Brewer SIGNATURE	ENGINEER DATE: 8/30/18 DATE
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



PROJECT NO.: 44983
 JACKSON COUNTY
 STATION: -Y4- 11+75.00 & 12+50.00, LT
 SHEET 2 OF 3

Prepared in the Office of:



ECS SOUTHEAST, LLP
 1812 CENTER PARK DRIVE, SUITE D
 CHARLOTTE, NC 28217
 (704) 525-5152 [PHONE]
 (704) 357-0023 [FAX]
 NC REGISTERED ENGINEERING FIRM # F-1078



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

GABION RETAINING WALL DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			SW-9
2			4			