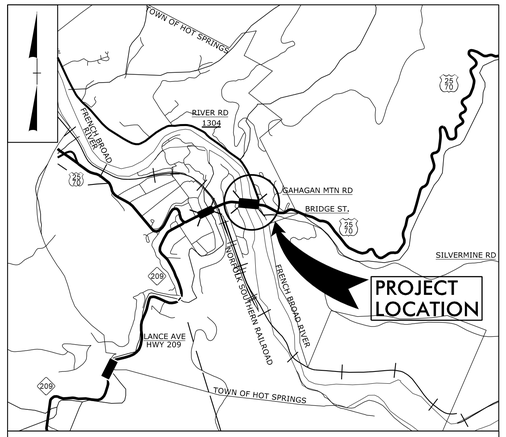
09/08/99

TIP PROJECT: B-5895

CONTRACT: C204766

See Sheet 1A For Index of Sheets
See Sheet 1B For Symbology Sheet



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MADISON COUNTY

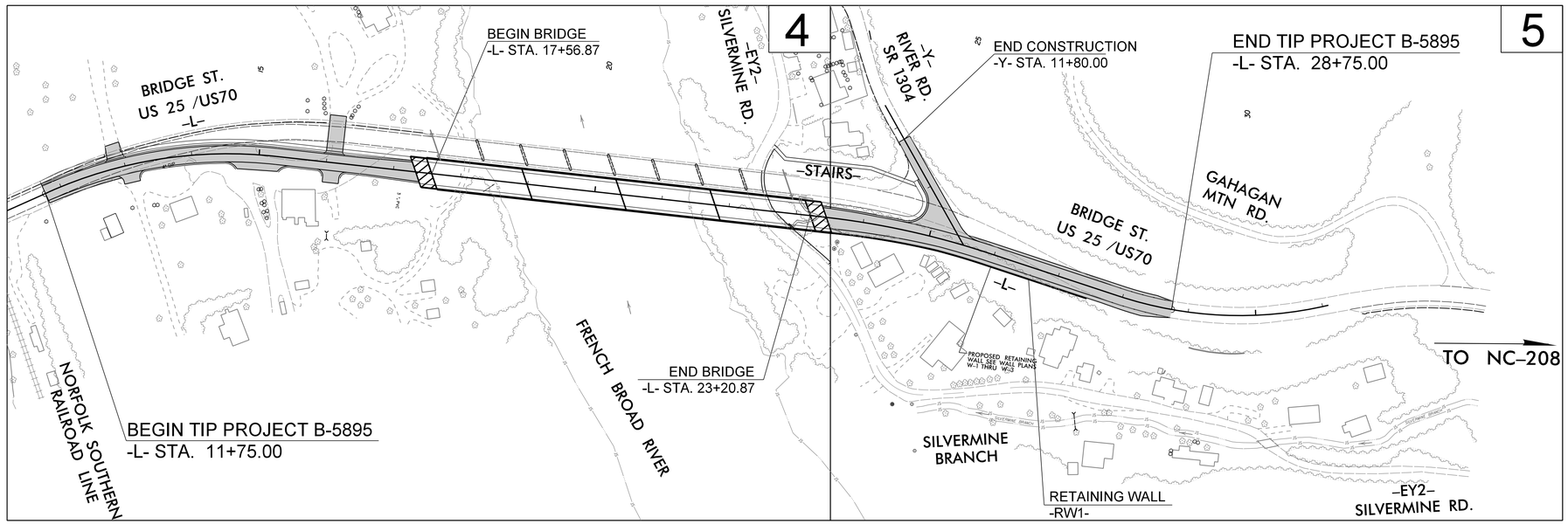
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5895	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
48088.1.1	N/A	PE
48088.2.1	N/A	R/W & UTILITY
48088.3.1	N/A	CONSTRUCTION

LOCATION: US 25/70, REPLACE BRIDGE 560067 OVER THE FRENCH BROAD RIVER

TYPE OF WORK: DRAINAGE, GRADING, PAVING, RETAINING WALL, STRUCTURE

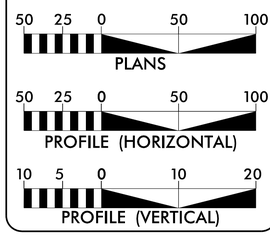
NAD 83/
NA 2011



THIS PROJECT HAS NO CONTROL OF ACCESS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



DESIGN DATA

ADT 2024 = 4400 VPD
ADT 2044 = 5900 VPD
K = 11 %
D = 55 %
T = 7 % *
V = 40 MPH
* TTST = 2% DUAL = 5%
FUNC CLASS = MINOR ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-5895	=	0.215 MI
LENGTH STRUCTURE TIP PROJECT B-5895	=	0.107 MI
TOTAL LENGTH TIP PROJECT B-5895	=	0.322 MI

Prepared In the Office of
WSP USA
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
FAX: 1.919.836.4099
LICENSE NO. F-0165
FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JANUARY 19, 2022

LETTING DATE: MARCH 18, 2025

RONYELL THIGPEN, PE
PROJECT ENGINEER

LAYLA McDANIEL, PE
PROJECT DESIGN ENGINEER

NCDOT CONTACT: DAVID STUTTS, PE
STRUCTURES MANAGEMENT UNIT

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032312 ENGINEER CHARLES W HEARNEN P.E.

DocuSigned by: Heather Charles
SIGNATURE: 12/18/2024

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 33290 ENGINEER RONYELL A THIGPEN P.E.

DocuSigned by:
SIGNATURE: 12/18/2024

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

2:15:48 PM
B-5895_rdy-tsh.dgn
12/12/2024

PROJECT REFERENCE NO.	SHEET NO.
B-5895	1A

8/17/99

INDEX OF SHEETS

GENERAL NOTES: 2024 SPECIFICATIONS

EFFECTIVE: 01-16-2024
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUBSURFACE DRAINS:

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 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.

STREET TURNOUT:

STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADII NOTED ON PLANS.

GUARDRAIL:

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

TEMPORARY SHORING:

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

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

POWER (DISTRIBUTION) - DUKE ENERGY

FIBER - FRENCH BROAD ELECTRIC MEMBERSHIP CORPORATION

FIBER - SKYRUNNER TELEPHONE - FRONTIER WATER /SEWER - TOWN OF HOT SPRINGS

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 CONTRACT.

EFF. 01-16-2024
REV.

2024 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Contracts Standards and Development Unit - N. C. Department of Transportation - Raleigh, N. C., Dated January 16, 2024 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	
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
423.03	Bridge Approach Fills - Type 2 Approach Fill for Bridge Abutment
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.02	Subsurface 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
840.14	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
840.24	Frames and Narrow Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.29	Frames and Narrow Slot Flat Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
848.02	Driveway Turnout - Radius Type
848.04	Street Turnout
850.01	Concrete Paved Ditches
857.01	Precast Reinforced Concrete Barrier - 41" Single Faced
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.01	Rip Rap in Channels and Ditches
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

9/10/2021

PROJECT REFERENCE NO.	SHEET NO.
B-5895	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin (EIP)
- Computed Property Corner
- Existing Concrete Monument (ECM)
- Parcel/Sequence Number
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary
- Proposed Wetland Boundary
- Existing Endangered Animal Boundary
- Existing Endangered Plant Boundary
- Existing Historic Property Boundary
- Known Contamination Area: Soil
- Potential Contamination Area: Soil
- Known Contamination Area: Water
- Potential Contamination Area: Water
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign
- Well
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

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

RAILROADS:

- Standard Gauge
- RR Signal Milepost
- Switch
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert
- Bridge Wing Wall, Head Wall and End Wall

MINOR:

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

UTILITIES:

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

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

8/17/99

REVISIONS

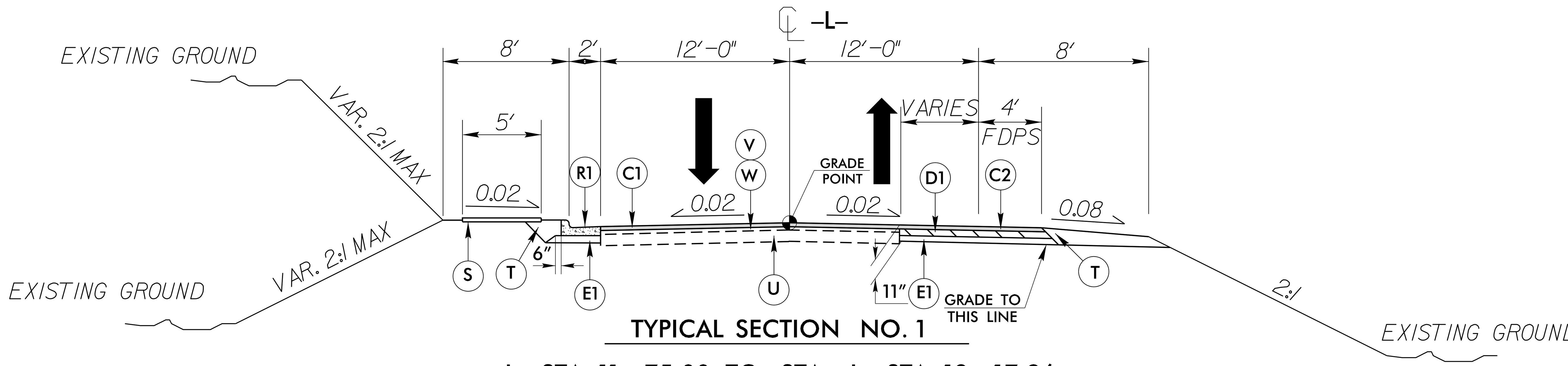
PROJECT REFERENCE NO.	SHEET NO.
B-5895	2A-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER 12/16/2024 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 33290 RONYELL A. THIGPEN

PAVEMENT DESIGN ENGINEER 12/17/2024 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 024964 JOSEPH T. HOLLAND

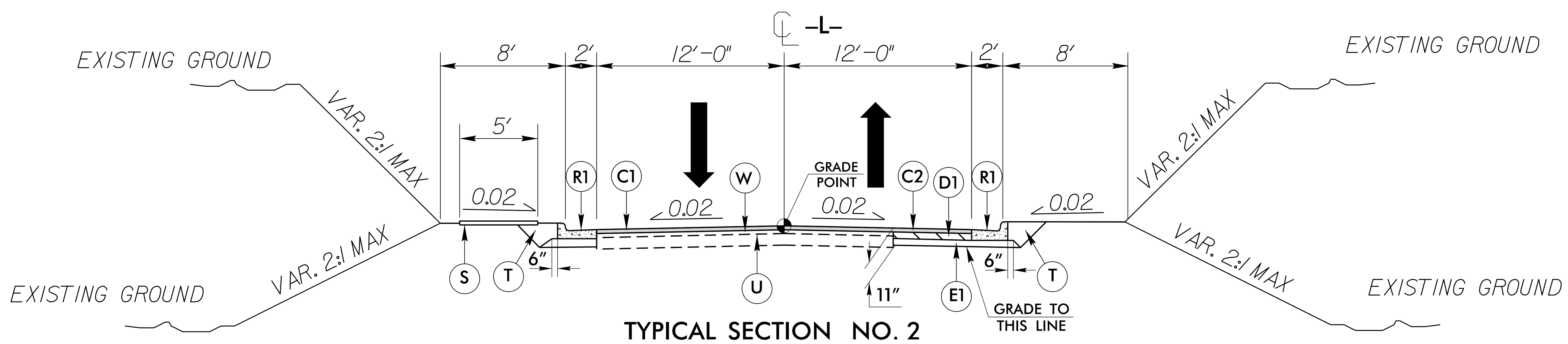
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:
WSP USA
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
FAX: 1.919.836.4099
LICENSE NO. F-0165



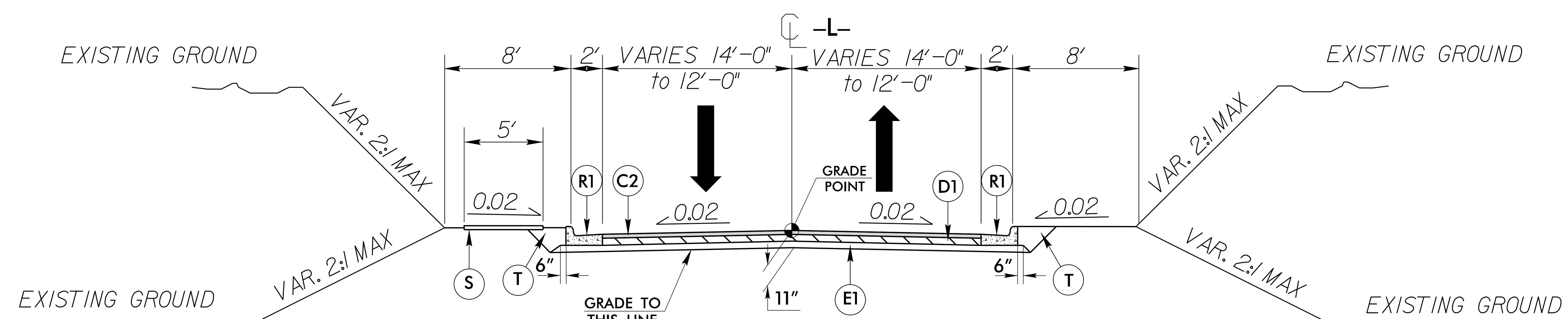
TYPICAL SECTION NO. 1

–L– STA. 11+75.00 TO STA. –L– STA. 13+17.86



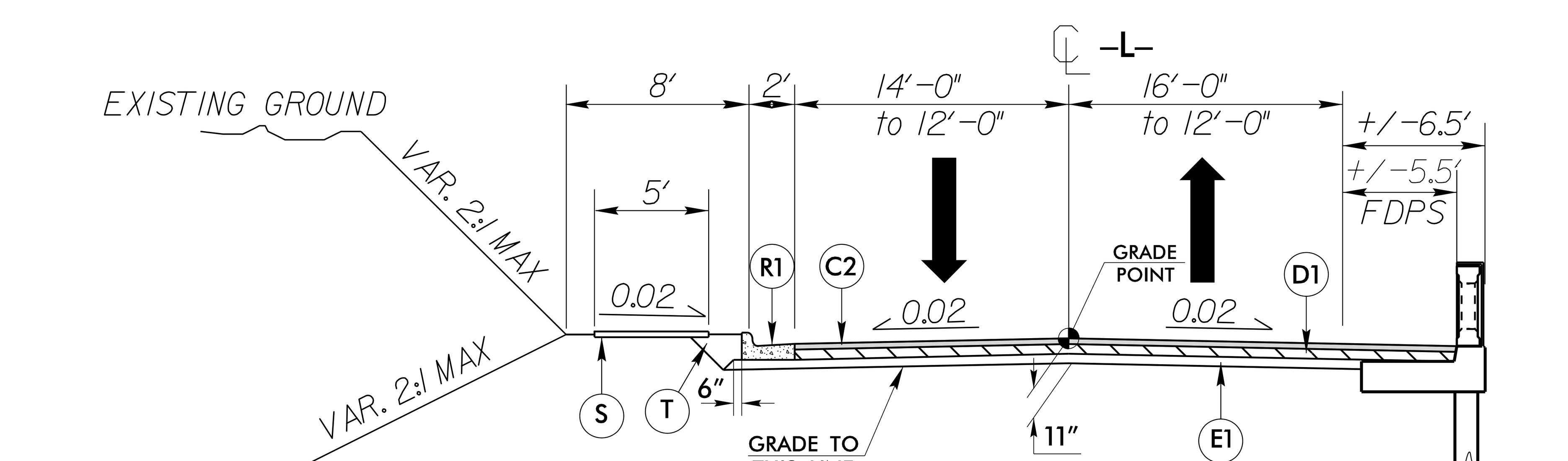
TYPICAL SECTION NO. 2

–L– STA. 13+17.86 TO STA. –L– STA. 14+25.00



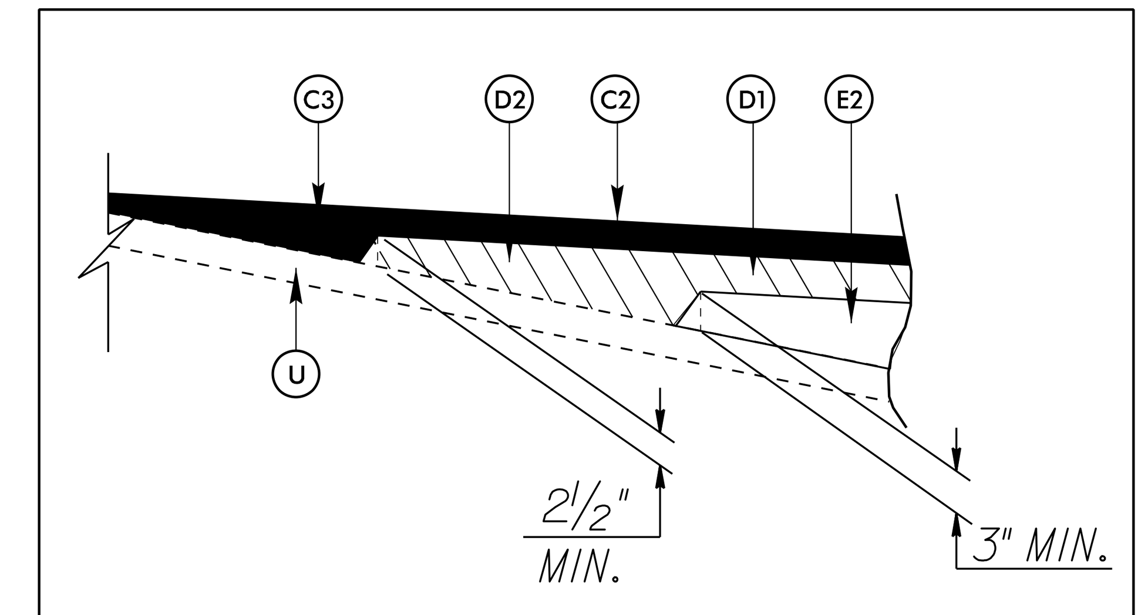
TYPICAL SECTION NO. 3

–L– STA. 14+25.00 TO STA. –L– STA. 17+56.87 (BEGIN BRIDGE)



TYPICAL SECTION NO. 4

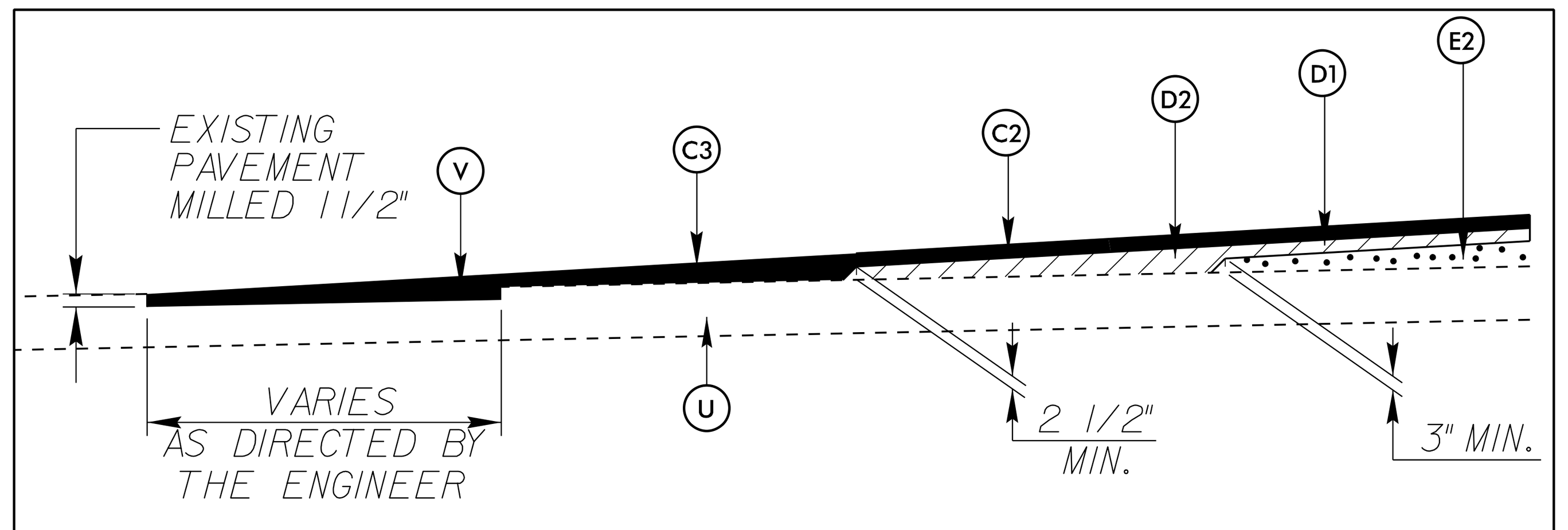
–L– STA. 23+20.87 (END BRIDGE) TO STA. –L– STA. 25+73.83



WEDGING DETAIL (W)

FINAL PAVEMENT SCHEDULE

C1	PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	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.
C3	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 LESS THAN 1″ IN DEPTH OR GREATER THAN 1½″ IN DEPTH.
D1	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YARD
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 2½″ IN DEPTH OR GREATER THAN 4″ IN DEPTH.
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
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 5½″ IN DEPTH.
R1	2′-6″ CURB AND GUTTER
S	4″ SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	INCIDENTAL MILLING
W	ASPHALT WEDGING (SEE WEDGING DETAIL)



MILLING DETAIL FOR PROFILE CONNECTIONS

TYING PROPOSED PAVEMENTS TO EXISTING PAVEMENTS

NOTES:

1. ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.

10-OCT-2024 08:00
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WSP

PROJECT REFERENCE NO.	SHEET NO.
B-5895	2A-2

R/W SHEET NO.

ROADWAY DESIGN ENGINEER 2/4/2025 — SEAL 33290, RONYE A. THIGPEN

PAVEMENT DESIGN ENGINEER 2/4/2025 — SEAL 024964, JOSEPH T. HOLLAND

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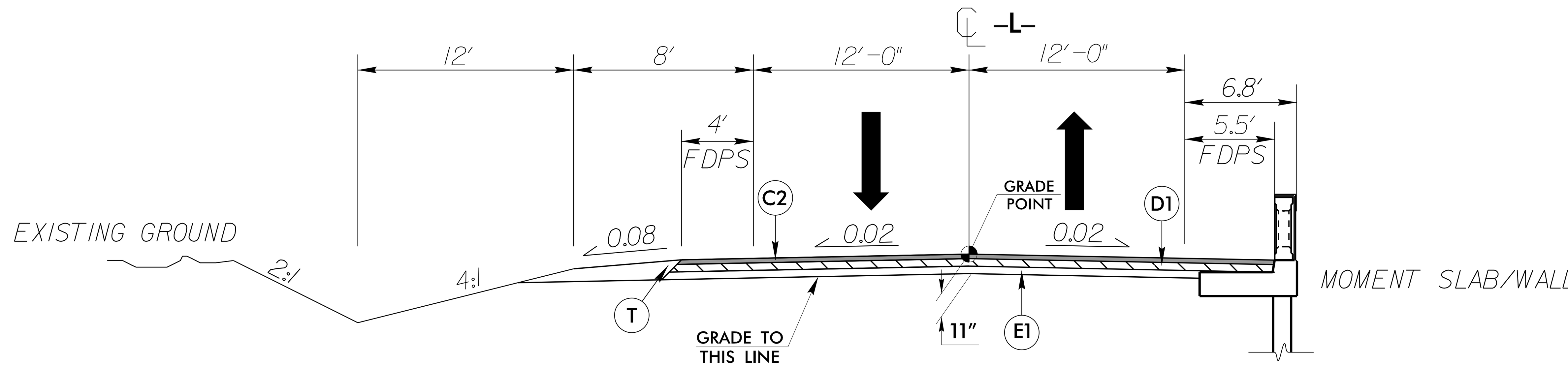
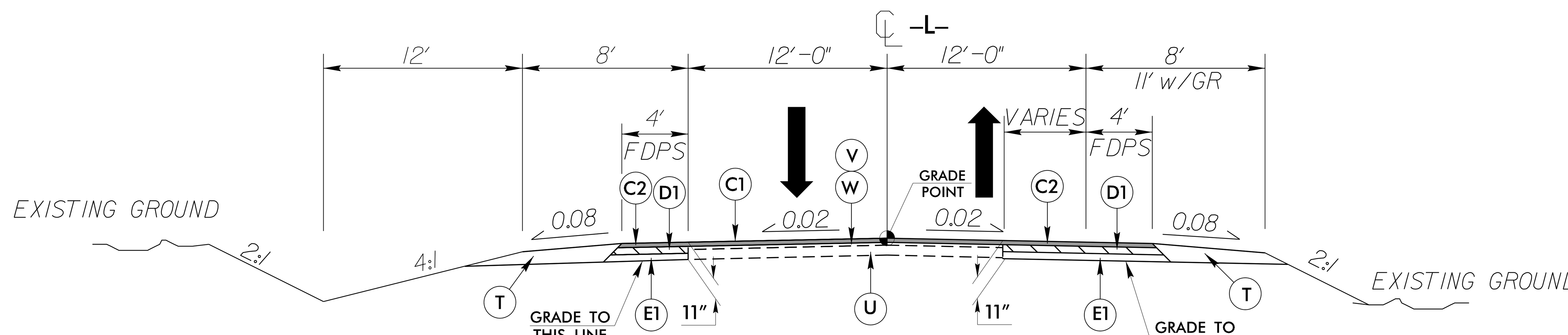


TYPICAL SECTION NO. 5

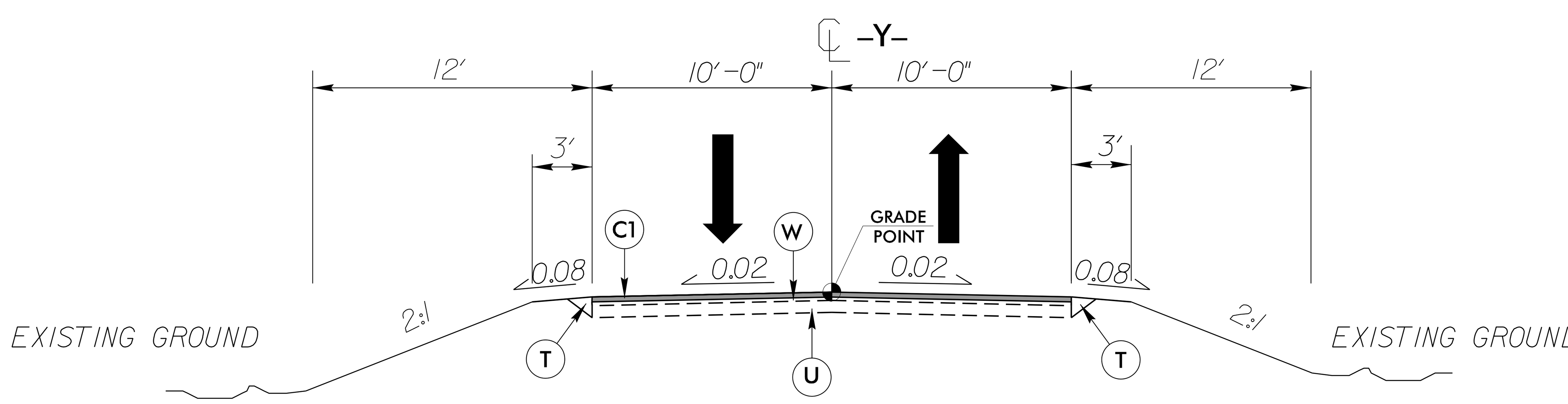
-L- STA. 25+73.83 TO STA. -L- STA. 27+50.00

*NOTE: FULL DEPTH PAVEMENT ENDS -L- STA. 26+25.00



TYPICAL SECTION NO. 6

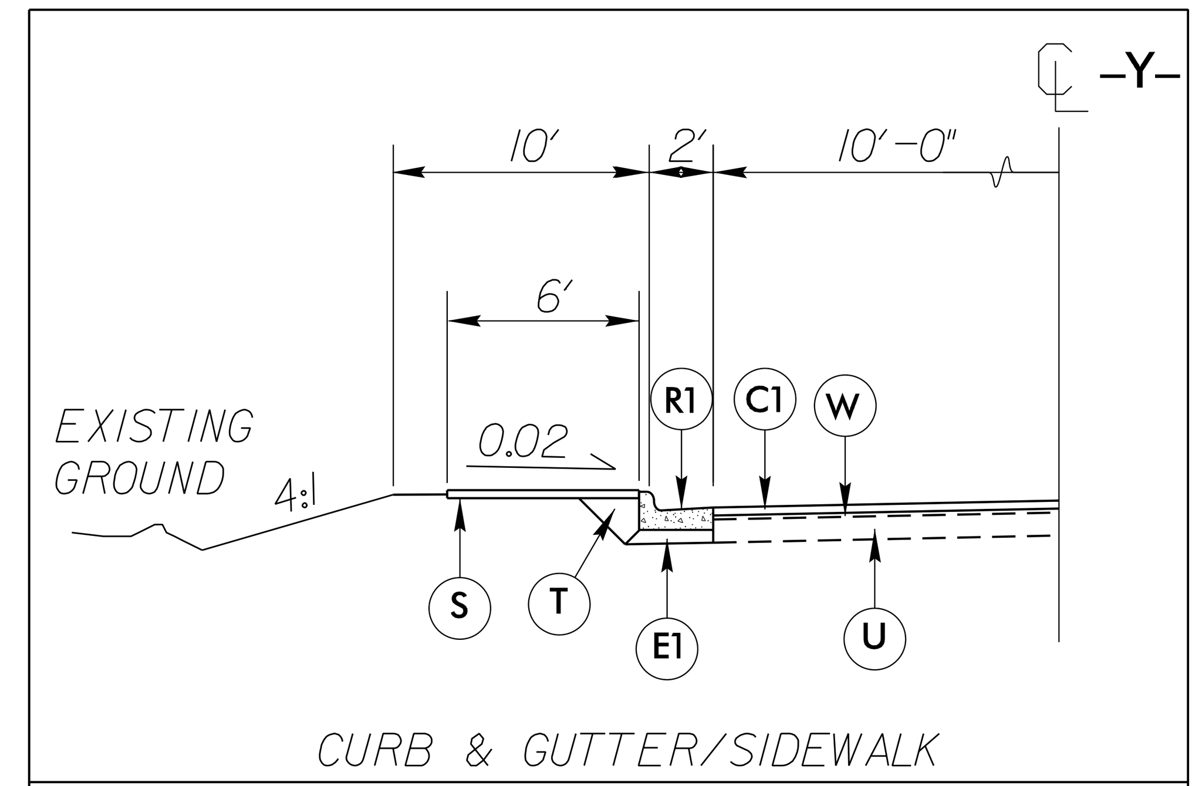
-L- STA. 27+50.00 TO STA. -L- STA. 28+75.00



TYPICAL SECTION NO. 7

IN CONJUNCTION WITH DETAIL A

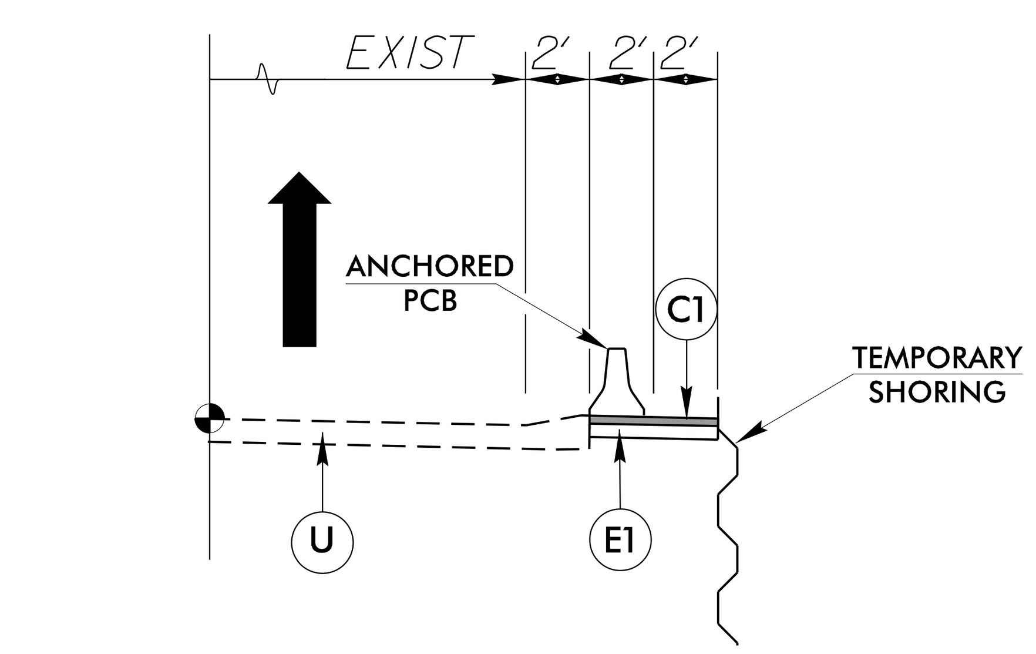
-Y- STA. 10+17.10 TO STA. -Y- STA. 11+80.00



CURB & GUTTER/SIDEWALK

DETAIL A

-Y- STA. 10+73.27 TO STA. -Y- 11+17.67



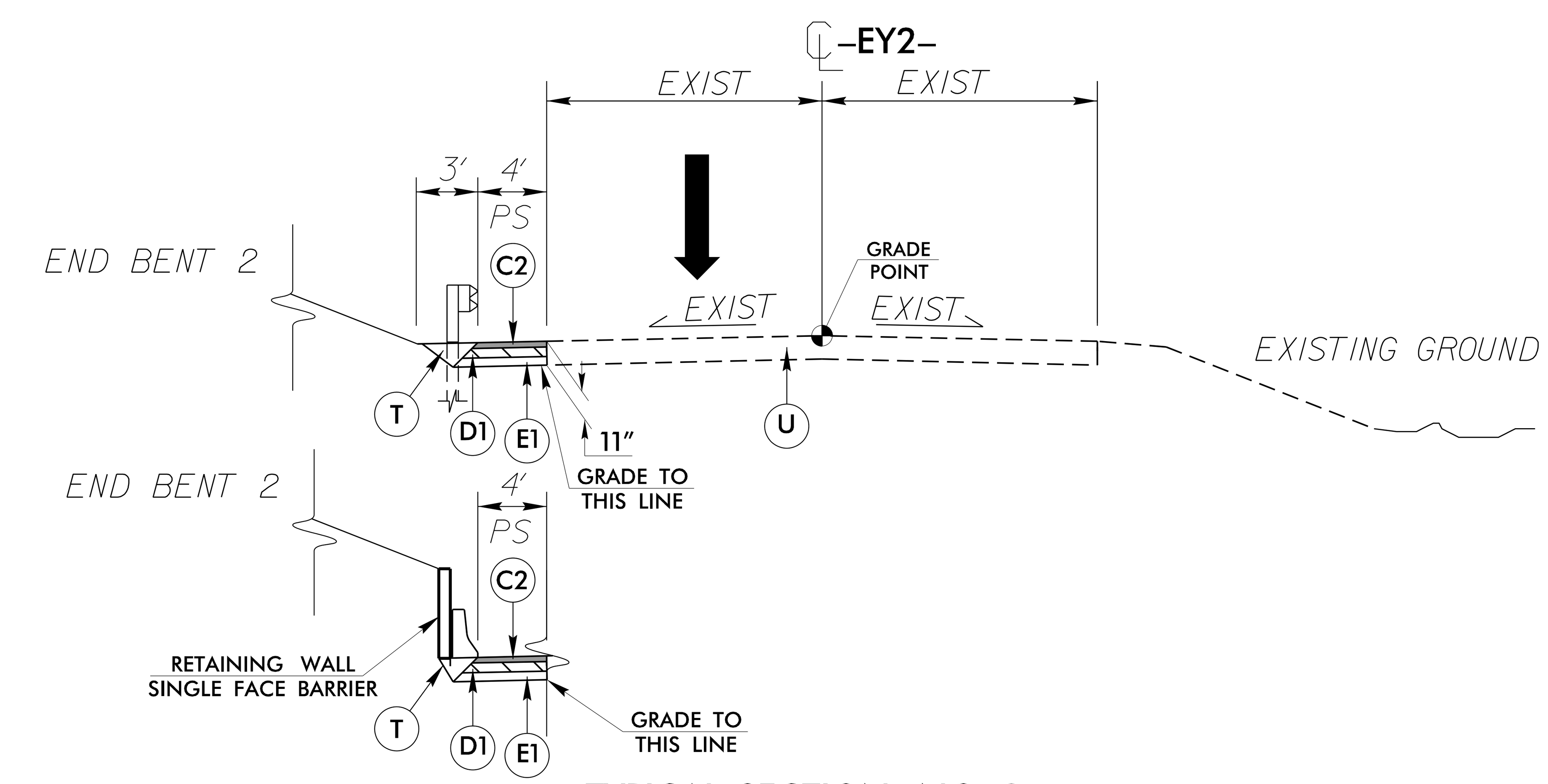
TEMPORARY PAVEMENT (SEE TMP-4&5)

DETAIL B

-L- STA. 16+40.00 TO STA. -L- 17+63.00

FINAL PAVEMENT SCHEDULE

C1	1½" TYPE S9.5B
C2	3" TYPE S9.5B
C3	VAR. DEPTH TYPE S9.5B
D1	4" TYPE I19.0C
D2	VAR. DEPTH TYPE I19.0C
E1	4" TYPE B25.0C
E2	VAR. DEPTH TYPE B25.0C
R1	2'-6" C&G
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	INCIDENTAL MILLING
W	WEDGING



TYPICAL SECTION NO. 8

-EY2- STA. 12+51.29 TO STA. -EY2- STA. 14+80.00

8/17/99

8:08:28 AM
B-5895_rdy_typ.dgn
2/3/2025

8/17/99

REVISIONS

BEGIN STAIR/DOUBLE HAND RAIL
-STAIR- Sta. 10+14.13
EL. 1318.93′

S 42° 17′ 06.0″ E
-STAIR- PI Sta. 10+34.48
BEND 1

-STAIR- PI Sta. 11+62.30
BEND 2

END DOUBLE HAND RAIL
-STAIR- Sta. 12+01.48
S 69° 47′ 13.6″ E

END STAIR
-STAIR- Sta. 12+31.67
EL. 1351.63′
-STAIR- POT Sta. 12+60.15

JOHN DANIEL ARNOLD
DB 413 PG 159
-STAIR- POT Sta. 10+00.00

MICHAEL S. PERKINS
DB 667 PG 525

RIVER ROAD (SR 1860)

0412
15″ RCP-IV

CONCRETE STAIRS
S 83° 40′ 32.9″ E

0408
DI
BEGIN DITCH
-STAIR- Sta. 10+21.64
EL. 1321.09′

CONCRETE DITCH
50 SY

15″ CSP w/ELBOWS

CB-G

0407

PHASE I
PHASE II

END DITCH
END PHASE I/BEGIN PHASE II
-STAIR- Sta. 11+99.31, EL. 1348.85′

PHASE II

REFERENCE SHEET 2B-3 SECTION A-A FOR ADDITIONAL DETAILS

GRAPHIC SCALE
20 10 0 20 40
PLANS

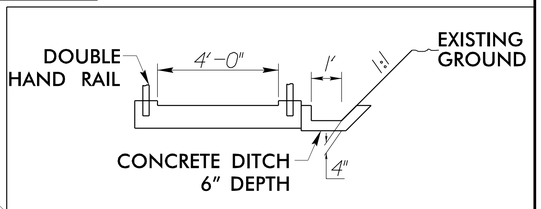
NAD 83/NA 2011

PROJECT REFERENCE NO.	SHEET NO.
B-5895	2B-1
RW SHEET NO.	

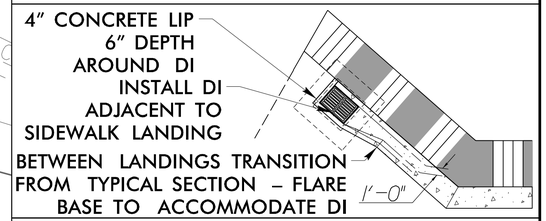
ROADWAY DESIGN ENGINEER
12/30/2024
NORTH CAROLINA PROFESSIONAL SEAL 33290 ENGINEER RONTERIA A THIGPEN

HYDRAULICS ENGINEER
12/31/2024
NORTH CAROLINA PROFESSIONAL SEAL 032312 ENGINEER CHARLES W HEATHER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

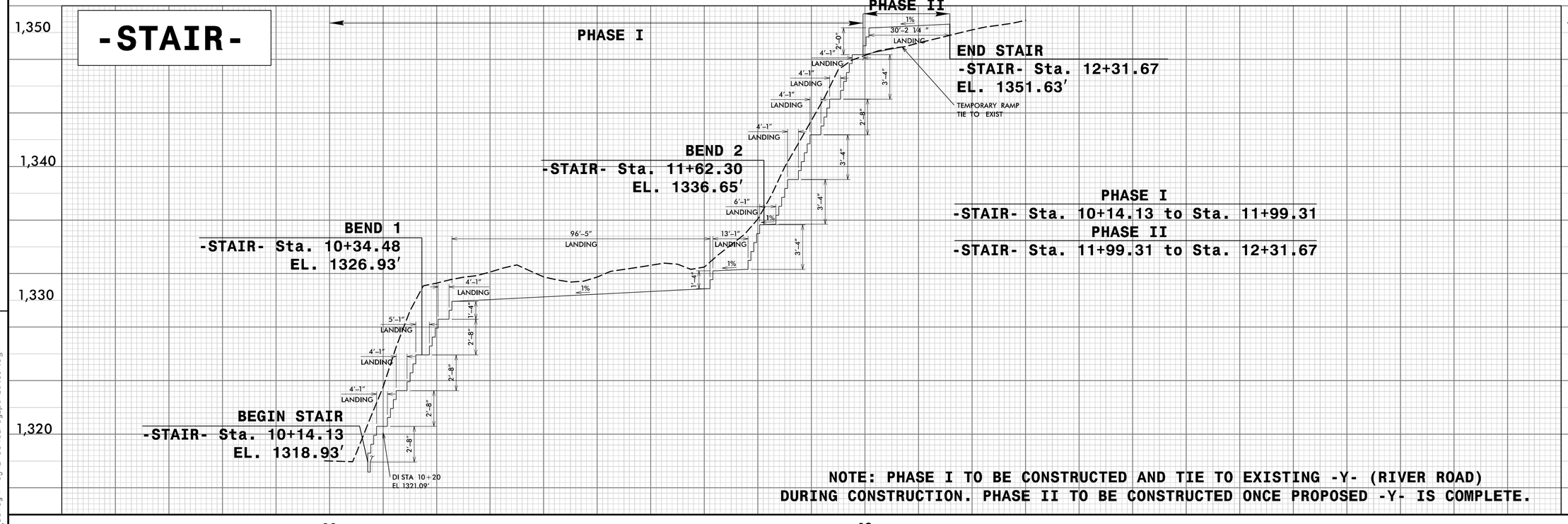


STAIR TYPICAL SECTION



STAIR DRAINAGE DETAIL

-STAIR-



PHASE I
-STAIR- Sta. 10+14.13 to Sta. 11+99.31
PHASE II
-STAIR- Sta. 11+99.31 to Sta. 12+31.67

NOTE: PHASE I TO BE CONSTRUCTED AND TIE TO EXISTING -Y- (RIVER ROAD) DURING CONSTRUCTION. PHASE II TO BE CONSTRUCTED ONCE PROPOSED -Y- IS COMPLETE.

30-DEC-2024 10:22
\Roadway\Proj\B-5895_rdy_psh_stair.dgn
WSP

PROJECT REFERENCE NO.	SHEET NO.
B-5895	2B-2
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
	12/30/2024

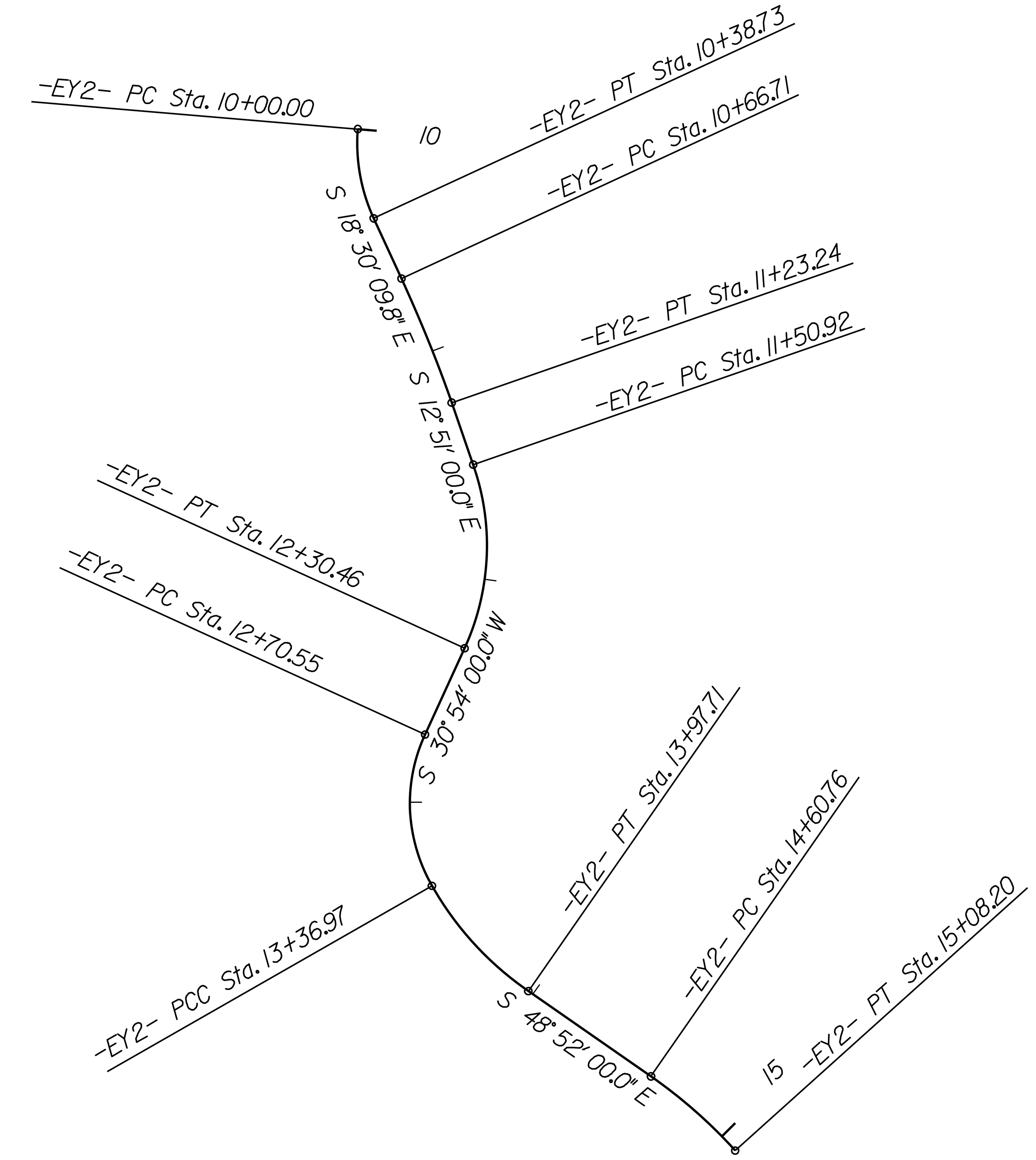
NORTH CAROLINA PROFESSIONAL SEAL 33290 ENGINEER RONYELL A. THIGPEN

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:
WSP USA
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
FAX: 1.919.836.4099
LICENSE NO. F-0165

-L-

PI Sta 10+19.81	PI Sta 10+95.00	PI Sta 11+92.74
Δ = 29° 35′ 04.8″ (LT)	Δ = 5° 39′ 09.8″ (RT)	Δ = 43° 45′ 00.0″ (RT)
D = 76° 23′ 39.7″	D = 10° 00′ 00.0″	D = 55° 00′ 00.0″
L = 38.73′	L = 56.53′	L = 79.55′
T = 19.81′	T = 28.29′	T = 41.82′
R = 75.00′	R = 572.96′	R = 104.17′
PI Sta 13+06.50	**PI Sta 13+67.85**	**PI Sta 14+84.59**
Δ = 54° 22′ 02.0″ (LT)	Δ = 25° 23′ 58.0″ (LT)	Δ = 13° 15′ 37.2″ (RT)
D = 81° 51′ 04.0″	D = 41° 49′ 18.3″	D = 27° 56′ 57.0″
L = 66.42′	L = 60.73′	L = 47.44′
T = 35.95′	T = 30.87′	T = 23.83′
R = 70.00′	R = 137.00′	R = 205.00′



NAD 83/NA 2011

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-5895	2C-1
R/W SHEET NO.	

STRUCTURAL ENGINEER
1/3/2025

NORTH CAROLINA PROFESSIONAL SEAL 044167 ENGINEER ELIZABETH F. JAMES

Docusigned by: Elizabeth F. James

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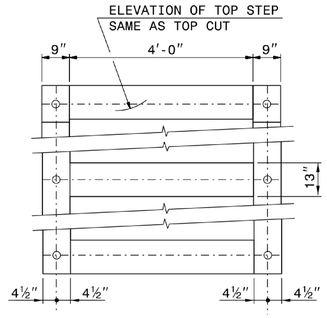
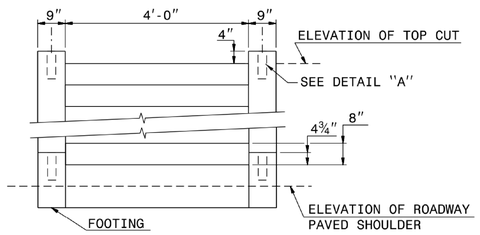
PLANS PREPARED BY:

WSP USA
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
FAX: 1.919.836.4099

LICENSE NO. F-0165



PLAN



FRONT ELEVATION

GENERAL NOTES :

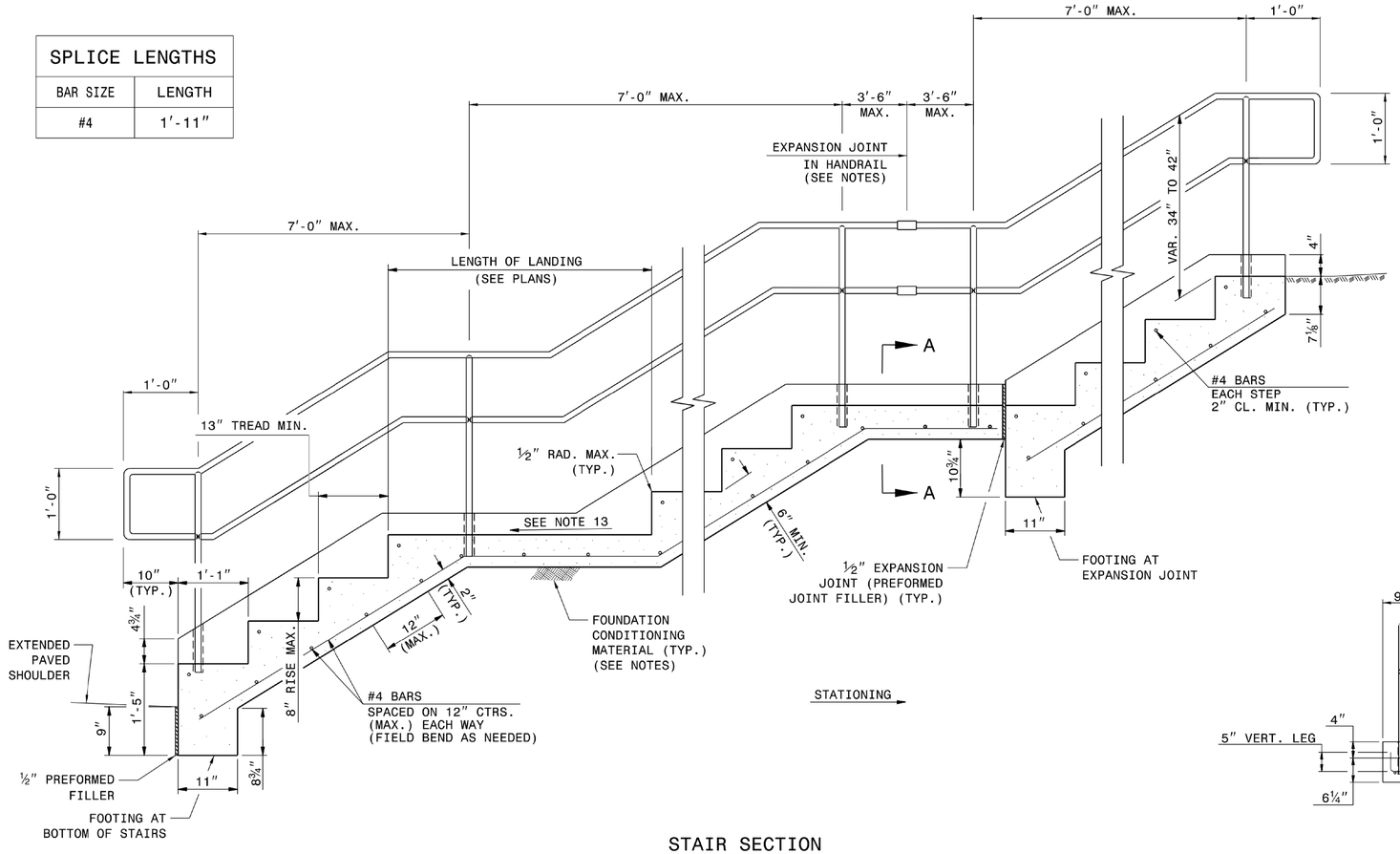
1- CONSTRUCT PROPOSED STEEL PIPE RAIL OF 1½″ DIAMETER SCHEDULE 40 PLAIN END GALVANIZED STEEL PIPE MEETING THE REQUIREMENTS OF ASTM A53. EMBED PIPE RAIL 8″ INTO PROPOSED STEPS WITH CHEMICAL OR CONCRETE GROUT ANCHORING SYSTEM AS DIRECTED BY THE ENGINEER.
2- USE A ROTARY DRILL FOR DRILLING THE HOLES FOR THE PIPE RAIL. NO IMPACT DRILLS ALLOWED.
3- USE CLASS "B" CONCRETE THROUGHOUT FOR CONCRETE STEPS.
4- LOCATION AND QUANTIES SHOWN ARE APPROXIMATE ONLY. EXACT LOCATION AND QUANTIES WILL BE DETERMINED BY THE ENGINEER.
5- ALL WORK AS DIRECTED BY THE ENGINEER.
6- REPAIR OF GALVANIZING IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.
7- WELD IN ACCORDANCE WITH ARTICLE 1072-18 OF THE STANDARD SPECIFICATIONS.
8- 2″ MINIMUM CONCRETE COVER ON ALL REINFORCING BARS.
9- EXTEND HORIZONTAL REINFORCING BARS UPWARD INTO SIDE WALLS.
10- INCLUDE EXPANSION JOINT IN STAIRS FOR EVERY 15′-0″ MAX. OF VERTICAL RISE.
11- INCLUDE EXPANSION JOINT IN HANDRAIL FOR EVERY 30′-0″ MAX. OF HORIZONTAL LENGTH.
12- PROVIDE FOUNDATION CONDITIONING MATERIAL BELOW FULL AREA OF THE CONCRETE STAIRS, LANDINGS AND FOOTINGS (NOT TO EXCEED 6″ DEPTH).
13- LANDINGS GREATER THAN 5′-0″ TO BE SLOPED 1% DOWNSTATION.

SPLICE LENGTHS	
BAR SIZE	LENGTH
#4	1′-11″

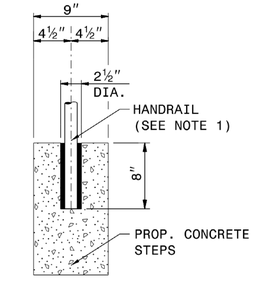
BILL OF MATERIAL

4′ WIDE STAIRWAY WITH DOUBLE RAILS

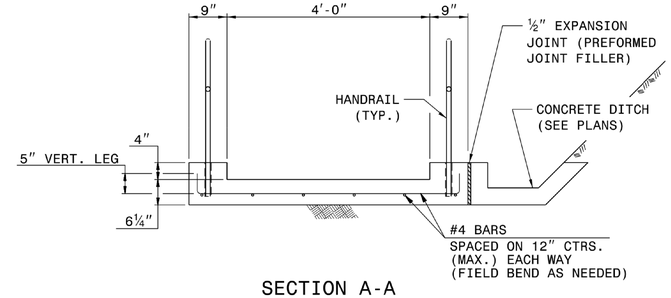
	CONCRETE (CY)	REBAR (LB)	HANDRAIL (LF)
PER STEP	0.26	13	1.08
PER 1′ LENGTH OF LANDING	0.15	9	1.00
TOTAL CLASS "B" CONCRETE			36.1 CY
TOTAL REBAR (#4)			2071 LB
TOTAL HANDRAIL			378.33 LF



STAIR SECTION

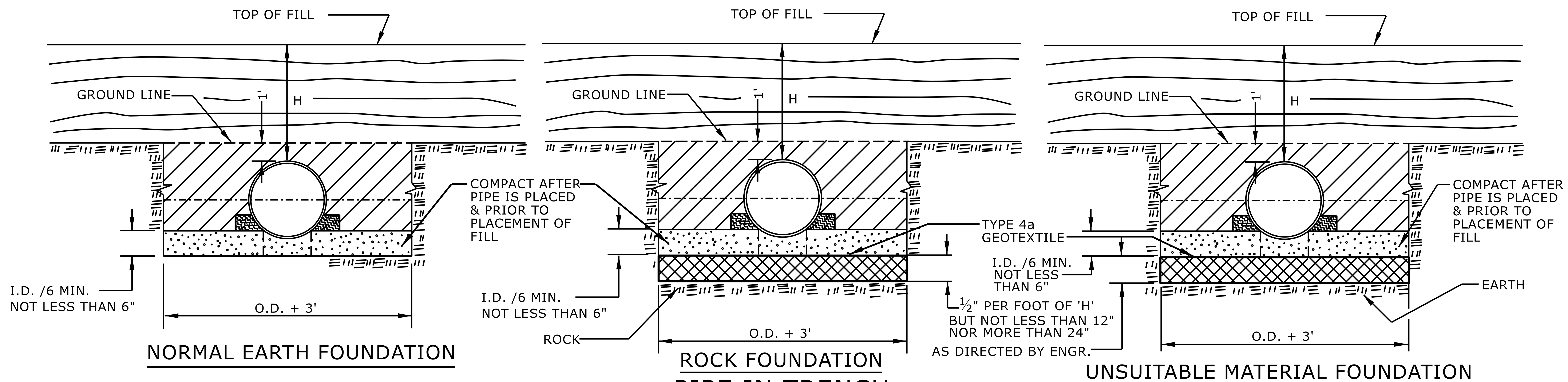


DETAIL "A"

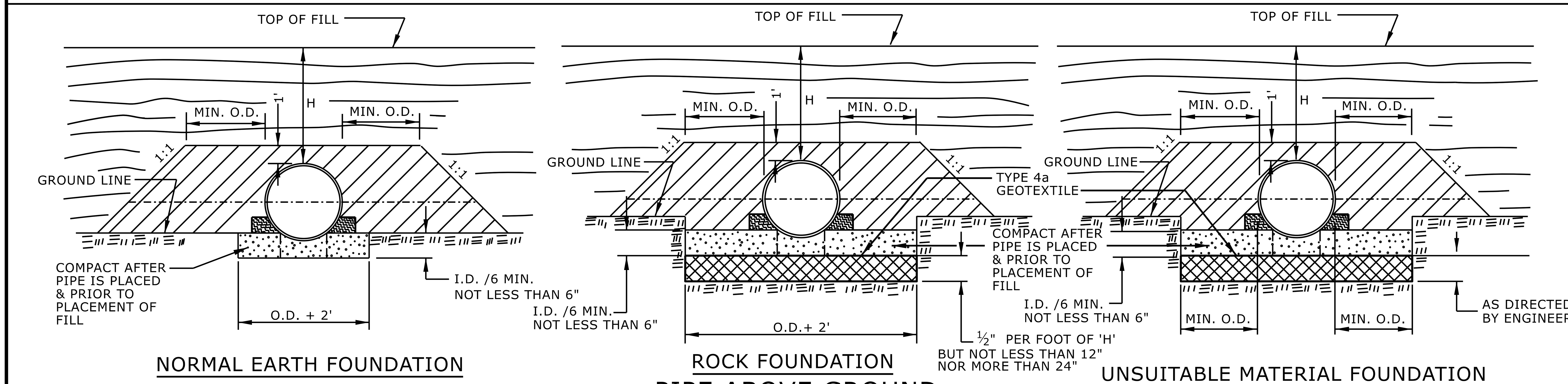


SECTION A-A

PROJECT REFERENCE NO.	SHEET NO.
B-5895	2C-2



PIPE IN TRENCH



PIPE ABOVE GROUND

GENERAL NOTES:

I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.

O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.

H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.

APPROVED SUITABLE LOCAL MATERIAL.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

REFER TO NCDOT PIPE MATERIAL SELECTION GUIDE AND STANDARD SPECIFICATIONS FOR ALLOWABLE PIPE FILL HEIGHTS AND PIPE SPECIFICATIONS.

SPRINGLINE OF PIPE

SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1 ABOVE AND BELOW SPRINGLINE.

UNDISTURBED EARTH MATERIAL

SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH TYPE IV GEOTEXTILE AS DIRECTED BY THE ENGINEER.

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

ROADWAY DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
FLEXIBLE PIPE

SHEET 1 OF 2
300.01

Signed by:
Nicole M. Hackler
12/16/2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SEE TITLE BLOCK

ORIGINAL BY: S.CALHOUN DATE: 7-25-2024
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

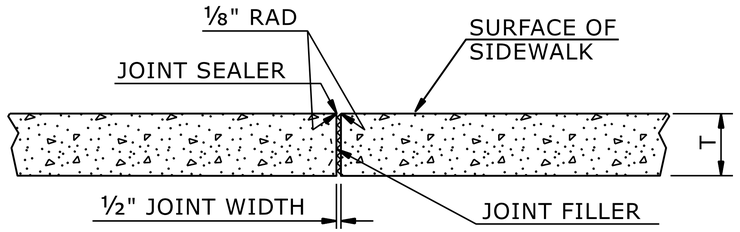
PROJECT REFERENCE NO.	SHEET NO.
B-5895	2C-3

NOTES:

CONSTRUCT STANDARD SIDEWALK 5' WIDE AND 4" THICK UNLESS OTHERWISE DENOTED ON PLANS.

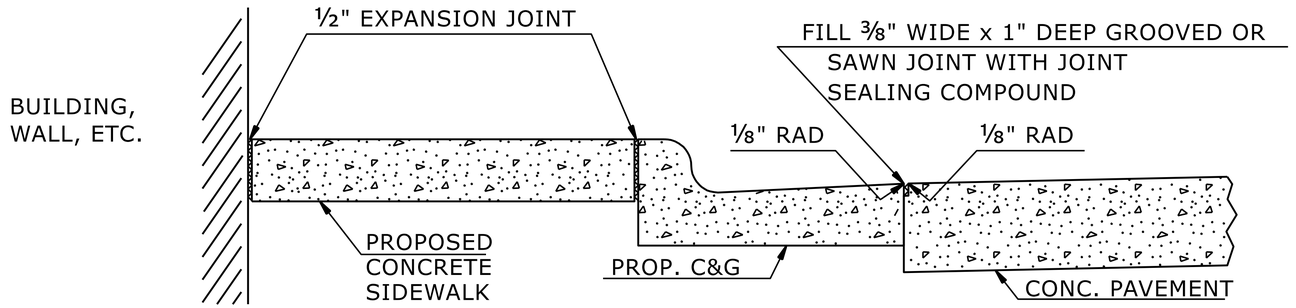
PLACE A GROOVE JOINT 1" DEEP WITH ⅛" RADII IN THE CONCRETE SIDEWALK AT 5' INTERVALS. ONE ½" EXPANSION JOINT WILL BE REQUIRED AT 50' INTERVALS. A ½" EXPANSION JOINT WILL BE REQUIRED WHERE THE SIDEWALK JOINS ANY RIGID STRUCTURE.

SEE STD. DWG. 848.06 FOR CURB RAMP LOCATION REQUIREMENTS AND CONSTRUCTION GUIDELINES.



T = SIDEWALK THICKNESS

TRANSVERSE EXPANSION JOINT IN SIDEWALK



DETAILS SHOWING JOINTS IN CONCRETE SIDEWALK

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

ROADWAY DETAIL DRAWING FOR
CONCRETE SIDEWALK

SHEET 1 OF 1

848D01

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033144 NICOLE M. HACKLER

Signed by: Nicole M. Hackler
12/16/2024

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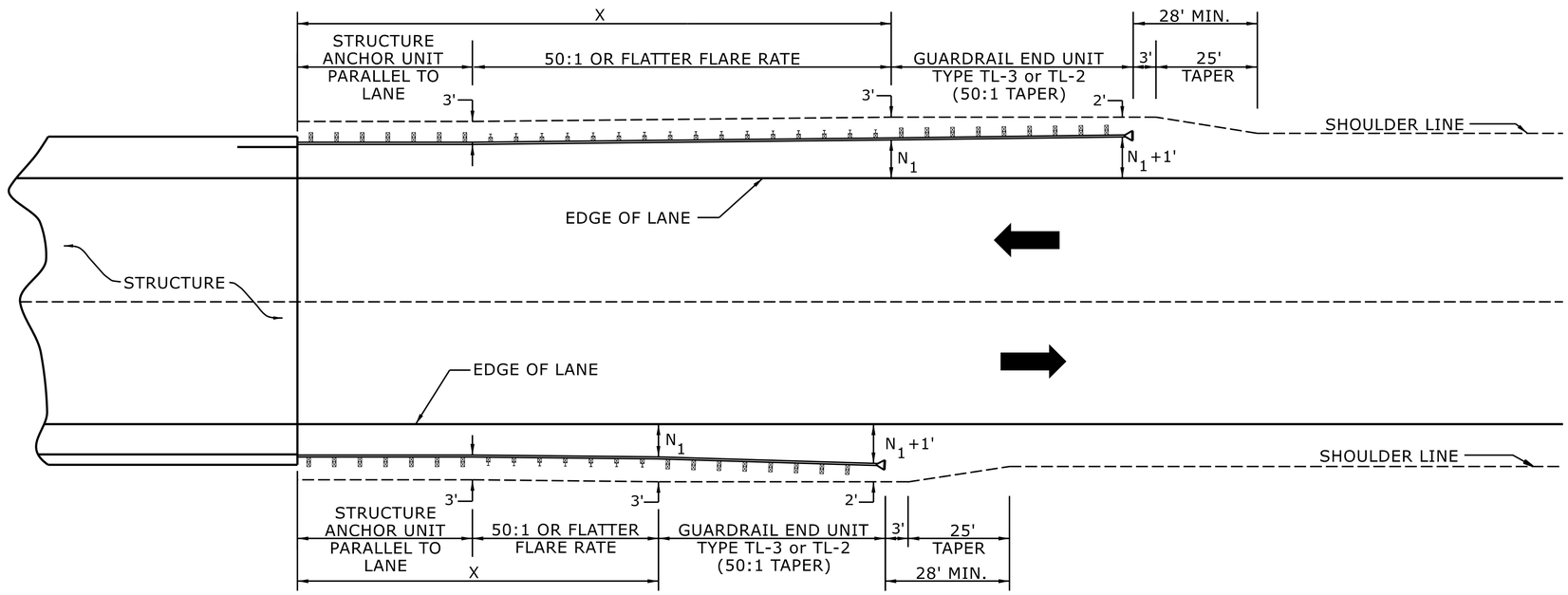
FILE SPEC.:

PROJECT REFERENCE NO.	SHEET NO.
B-5895	2C-4



USE FLARE RATE AS THE CONTROL IF THE "N_1" DISTANCE IS NOT OBTAINED.
("N_1" IS BASED ON SHOULDER WIDTHS IN THE ROADWAY DESIGN MANUAL)

SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS

FOR POSTED SPEEDS ≥ 45MPH USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45MPH USE GREU TYPE TL-2

GUARDRAIL LENGTH OF NEED (X) IS CALCULATED BASED ON THE AASHTO ROADSIDE DESIGN GUIDE.

LENGTHS AND OFFSETS FOR PROPOSED GUARDRAIL AT TWO LANE - TWO WAY LOCATIONS

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

NORTH CAROLINA PROFESSIONAL SEAL 033144 ENGINEER NICOLE M. HACKLER

Signed by: Nicole M. Hackler
12/16/2024

SHEET 4 OF 15

862D01

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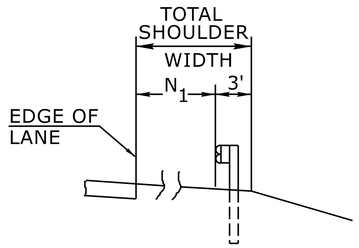
CONTRACTS STANDARDS
AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

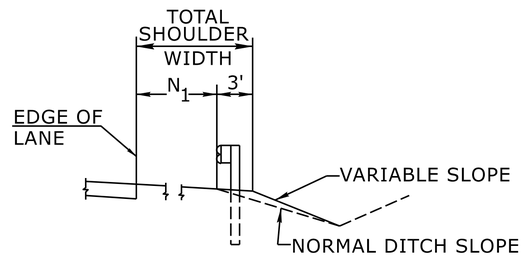
SEE TITLE BLOCK

ORIGINAL BY: S.CALHOUN DATE: 7-25-2024
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

PROJECT REFERENCE NO.	SHEET NO.
B-5895	2C-5

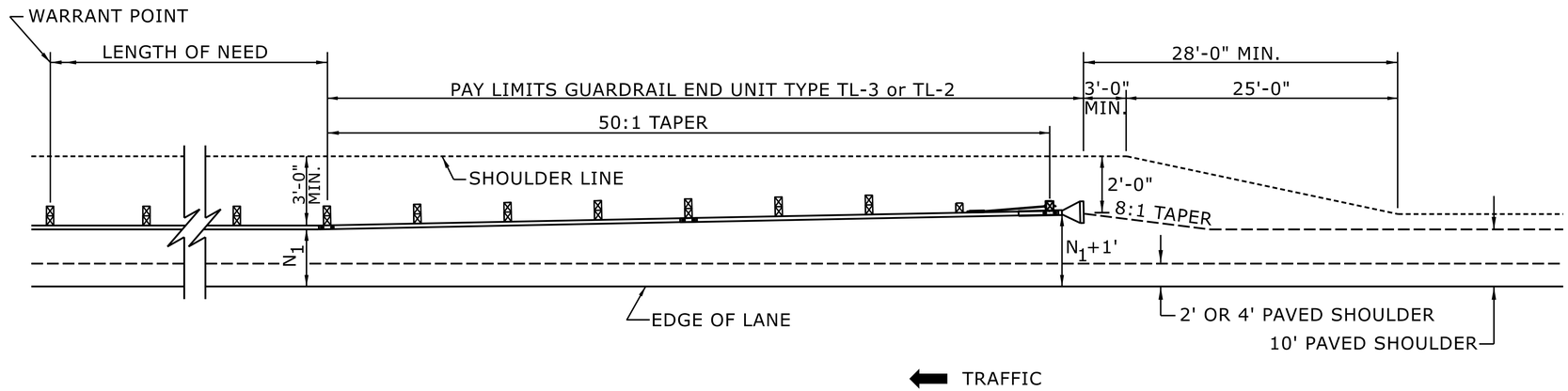


FILL SECTION



CUT SECTION

"N_1"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.



FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

DETAIL OF BEGINNING OF GUARDRAIL IN CUT OR FILL SECTION

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 6 OF 15

862D01

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033144 NICOLE M. HACKLER

Signed by: Nicole M. Hackler 588432303416 4C5...
12/16/2024

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

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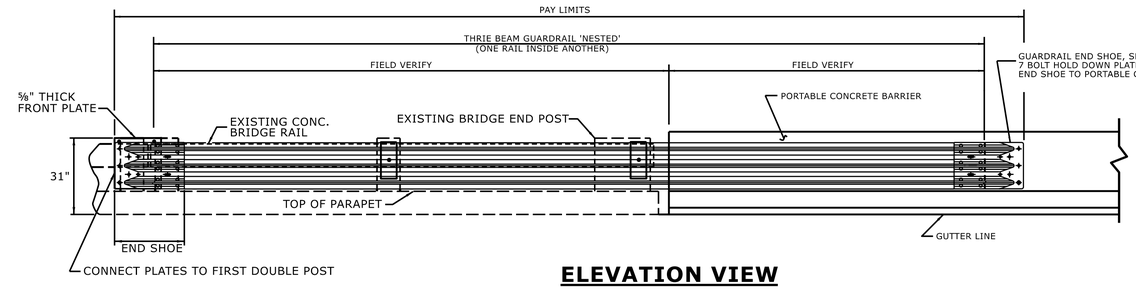
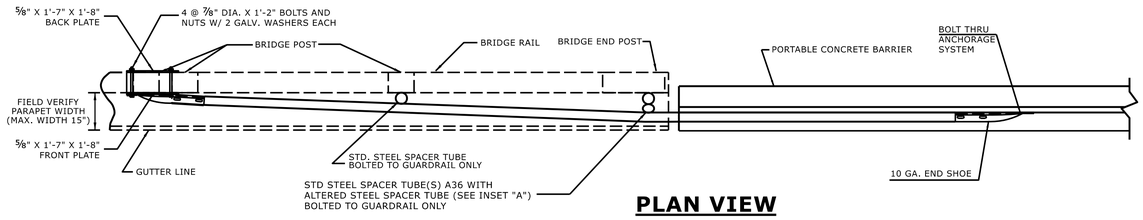
ORIGINAL BY: S.CALHOUN DATE: 7-25-2024
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

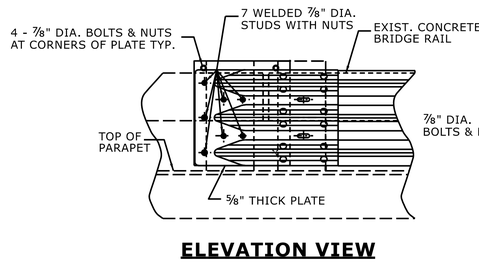
PROJECT REFERENCE NO.	SHEET NO.
B-5895	2C-6



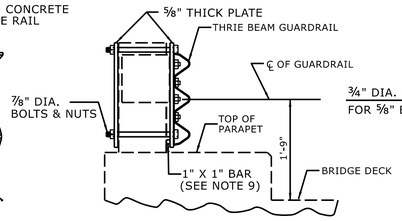
ELEVATION VIEW



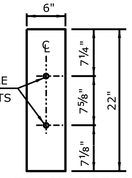
PLAN VIEW



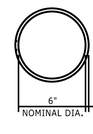
ELEVATION VIEW



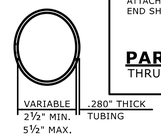
SECTION VIEW



FRONT VIEW



PLAN VIEW



PLAN VIEW
INSET "A"

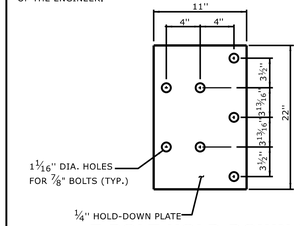
STEEL SPACER TUBE

NOTES FOR 7 BOLT HOLD DOWN PLATE

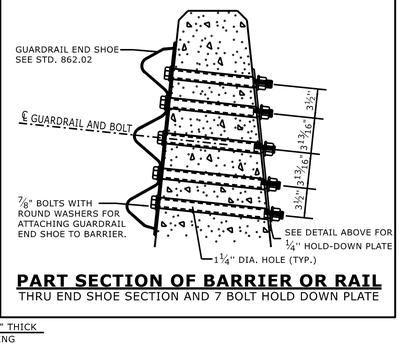
THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A ¼" HOLD DOWN PLATE AND 7 - ⅞" DIA. BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL. THE 1¹⁵⁄₁₆" DIA. HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



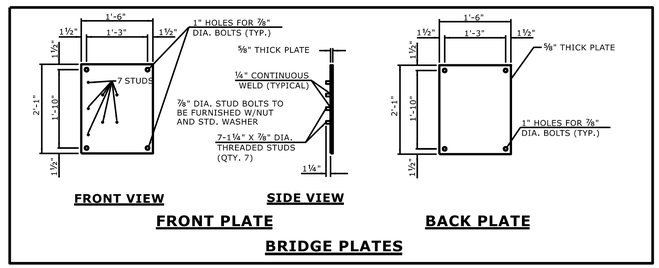
7 BOLT HOLD DOWN PLATE



PART SECTION OF BARRIER OR RAIL
THRU END SHOE SECTION AND 7 BOLT HOLD DOWN PLATE

GENERAL NOTES:

1. USE NUTS, BOLTS, AND WASHERS CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-307 AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF STAND. SPECS.
2. TAP NUTS FOR THE ⅞" DIA. STUDS AND BOLTS AFTER GALVANIZING SEE A.S.T.M. A-563.
3. USE PLATES AND TUBES CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-36 AND GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH SECTION 1076 OF STAND. SPECS.
4. ADDITIONAL FIELD HOLES MAY BE DRILLED IN STEEL RAIL AS DIRECTED BY THE ENGINEER.
5. INSTALL FACE OF GUARDRAIL AS NEAR AS POSSIBLE TO PLUMB WITH THE PARAPET FACE AT BRIDGE END POST SPACER TUBE LOCATION BY USING STANDARD OR ALTERED SPACER TUBES OR A COMBINATION THEREOF OR AS DIRECTED BY THE ENGINEER. FOR VERY SMALL PARAPET WIDTHS, GUARDRAIL MAY BE INSTALLED AGAINST BRIDGE RAIL WITHOUT SPACER TUBES.
6. DO NOT DRILL BRIDGE RAIL IN ORDER TO INSTALL GUARDRAIL ANCHOR UNIT.
7. USE THIS DETAIL ONLY FOR BRIGES WITH POST AND BEAM TYPE RAIL.
8. ATTACH 1" X 1" BAR AND THREADED STUDS TO PLATE WITH ¼" WELDS ALL AROUND.
9. 1" X 1" BAR MAY NOT BE NEEDED ON BRIDGE RAILS WHERE FACE OF RAIL DOES NOT PROJECT BEYOND FACE OF POST.
10. PROVIDE SHOP DRAWINGS OF THE PLATES TO THE ENGINEER FOR APPROVAL BEFORE FABRICATING THE PLATES.
11. LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
12. SEE ROADWAY STANDARD DRAWING 862.03 SHEET 3 FOR ADDITIONAL INFORMATION ON THE TYPE III ANCHOR UNIT



BRIDGE PLATES

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

ROADWAY DETAIL DRAWING FOR

STRUCTURE ANCHOR UNITS

TEMPORARY ANCHOR UNIT TYPE THRIE-BEAM

SHEET 8 OF 9

862D03

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033144 NICOLE M. HACKLER

Signed by: Nicole M. Hackler 58543203D34164C5...

12/16/2024

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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

SEE TITLE BLOCK

ORIGINAL BY: S.CALHOUN DATE: 7-25-2024
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

5/26/20

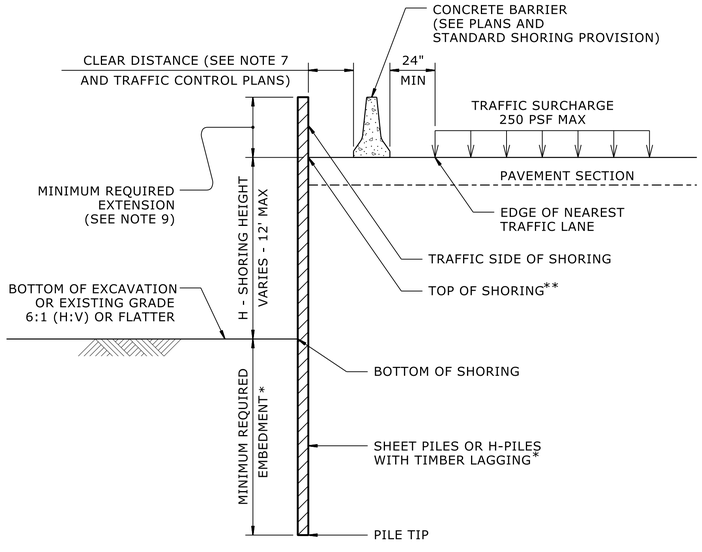
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS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

MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS

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

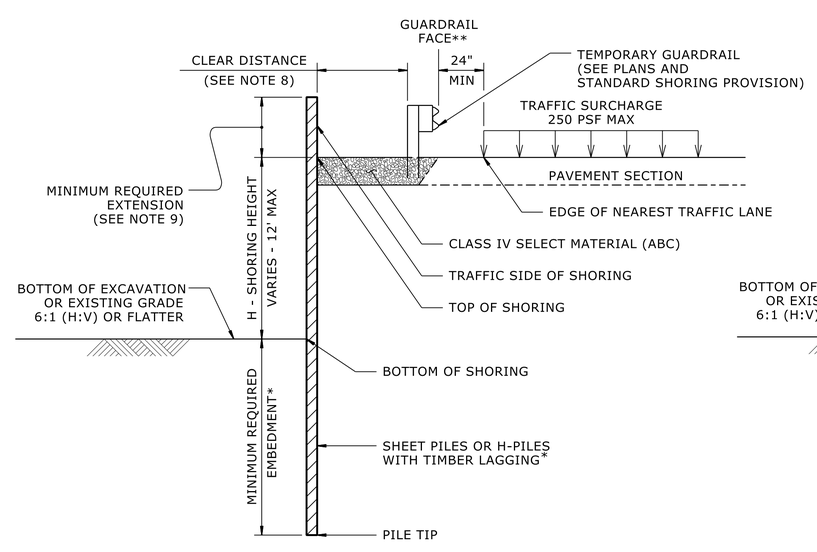
NOTES:

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



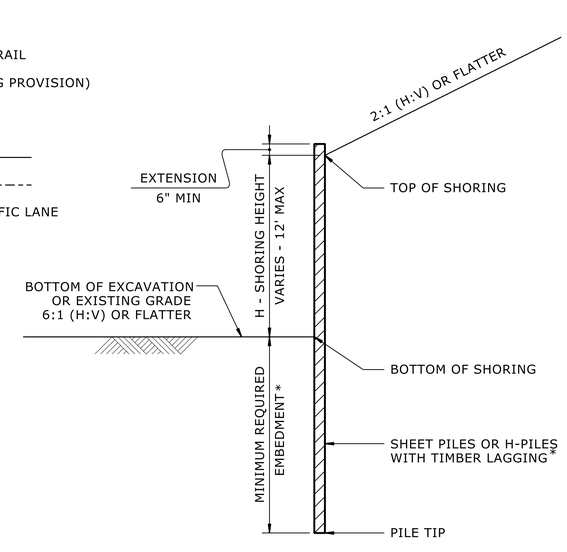
CONCRETE BARRIER

**TOP OF SHORING = EDGE OF PAVEMENT



TEMPORARY GUARDRAIL

**GUARDRAIL FACE = EDGE OF PAVEMENT



STANDARD TEMPORARY SHORING

(SLOPE CASE)
*SEE TABLE ABOVE.

STANDARD TEMPORARY SHORING

(SURCHARGE CASE)
*SEE TABLE ABOVE.

B-5895

2G-1 | -

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

GEOTECHNICAL ENGINEER

Scott A. Hidden 12/19/2024

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STANDARD DETAIL NO. 1801.01

GEOTECHNICAL STANDARD DETAIL FOR

TEMPORARY SHORING

DATE: 02-18-2025

12/06/07

COMPUTED BY: HEC DATE: 5-20-2019
CHECKED BY: EM DATE: 10-11-2024

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-5895	3B-1

wsp
434 Fayetteville Street Suite 1500
Raleigh, NC 27601 - 919.836.4040
www.wspgroup.com
LICENSE NO. F-0165

ASPHALT PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD²
L	11+75.00	17+62.31	LT	1526.29
L	22+77.13	24+87.47	LT	713.70
L	25+53.71	28+70.36	LT	451.30
TEMP. PVMT.	16+40.00	17+63.00	LT	54.67
			TOTAL:	2745.96
			SAY:	2750

SUMMARY OF EARTHWORK

STATION	STATION	UNCL. EXCAV. CY	EMBANK. +15% CY	BORROW CY	WASTE CY
PHASE I					
12+75.00 –L–	17+56.87 –L–	107	1024	917	
23+20.87 –L–	28+75.00 –L–	120	5337	5217	
STAIR 10+14.13	STAIR 12+31.67	394	5		389
SUBTOTALS 1:		621	6365	6134	389
PHASE II					
11+75.00 –L–	17+56.87 –L–	236	154		59
23+20.87 –L–	28+75.00 –L–	23	23	3	
10+25.00 –Y–	11+80.00 –Y–	8	41	39	
SUBTOTALS 2:		267	218	42	59
TOTALS:		888	6616	6176	448
MATERIAL FOR SHOULDER CONSTRUCTION			49	49	
LOSS DUE TO CLEARING AND GRUBBING		–75		75	
WASTE IN LIEU OF BORROW				–431	–431
PROJECT TOTALS:		813	6665	5869	
EST. 5% TO REPLACE TOP SOIL BORROW				293	
GRAND TOTALS:		813	6665	6163	17
SAY:		850		6200	

DDE = 110 CY
CONTINGENCY:
EST. UNDERCUT EXCAVATION = 450 CY
EST. SELECT GRANULAR MATERIAL = 400 CY
EST. GEOTEXTILE FOR SOIL STABILIZATION = 500 SY

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

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

"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

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	XI	GREU TL-2	B-77	TYPE III	CAT-1	TERMINAL SECTION	THRIE BEAM	AT-1	EA	G	NG				
L	16+27.48	17+66.90	RT	137.50				17+66.90 BRIDGE	7'-6"	12'-0"	113'-7"		2'-3"				1		1											
L	23+10.84	24+77.47	LT	150.00	62.50		23+10.84 BRIDGE		7'-6"	12'-0"	50'-0"		1'-0"						1				1					277.19		
L	27+50.00	28+75.00	RT	125.00				27+50.00 WALL	5'-6"	8'-6"		100'-0"		2'-0"			1		1									612.32		
EY2	13+01.00	13+96.73	LT	47.875	31.25			13+96.76 WALL	4'-0"	7'-0"		25'-0"		0'-6"			1	1									15.11			
EY2	14+11.95	14+49.18	LT	22.875	18.75		14+09.76 WALL		4'-0"	7'-0"								1					1							
			SUBTOTAL	483.25'	112.50'																									
			LESS DEDUCTIONS																											
			GREU TL-2 (3x 25) =	75'																										
			AT-1 (3 x 6.25) =		18.75'																									
			TYPE III (3 x 18.75) =	56.25'																										
			TYPE B-77 (2 x 22.875) =	45.75'																										
			SUBTOTAL	177.0'	18.75'												3	2	3				2				15.11	889.51		
							ADDITIONAL GUARDRAIL POSTS = 5																								
			TOTALS	306.25'	93.75'												3	2	3				2				20	890		
			SAY	325'	100																									
TEMPORARY GUADRAIL SUMMARY																														
L	23+30.00	23+65.00	LT	20.1'	22.1'												1				1									TEMPORARY GUARDRAIL, SEE TRAFFIC MANAGEMENT PLANS
L	17+63.00		LT																			1								TEMPORARY GUARDRAIL, SEE TRAFFIC MANAGEMENT PLANS
			TOTALS	20.1'	22.1'												1				1	1								
			SAY	25'	25'																									

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B-5895_3B-1.dgn
2/24/2025

3WFXTV3

COMPUTED BY:	Owen Britt	DATE:	12/12/24
CHECKED BY:	Charles Heafner	DATE:	12/12/24

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
B-5895	3D-1

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

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

LINE & STATION	OFFSET		STRUCTURE NUMBER FROM	TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %
L 13+87	14	RT	0401		1329.1			
			0401	0402		1326.2	1325.0	
L 16+27	14	LT	0403		1331.3			
			0403	0402		1327.0	1325.0	
L 16+33	14	RT	0402		1331.4			
			0402	0404		1325.0	1324.5	
L 17+19	44	LT	0409		1328.5			
			0409	0405		1325.8	1325.6	
L 17+19	16	LT	0405		1332.8			
			0405	0404		1325.6	1324.6	
L 17+33	16	RT	0404		1333.2			
			0404	0413		1324.5	1322.0	0.4
L 24+48	17	RT	0501		1351.2			
			0501	0505		1347.2	1344.4	
L 23+75	19	RT	0505		1349.0			
			0505	0407		1344.4	1344.0	
L 23+44	16	LT	0407		1348.3			
			0407	0408		1344.0	1316.9	
STAIR 10+20	4	RT	0408		1321.1			
			0408	0412		1316.9	1315.6	
L 15+90	34	LT	0410					
L 16+00	50	RT						
L 17+59	73	RT	0411					
L 28+32	0		EX502	EX503				
L 13+91	1	RT						
L 22+85	11	RT						

SIZE / THICKNESS OR GAUGE — pipes:

LINE & STATION	FROM	TO	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 12 .064	15 .064	18 .064	24 .064	30 .079	36 .079	R. C. PIPE CLASS III 12	15	18	24	30	36	R. C. PIPE CLASS IV 12	15	18	24	30	36
	0401	0402																						240				
	0403	0402																						28				
	0402	0404																						100				
	0409	0405																28										
	0405	0404																32										
	0404	0413																32										
	0501	0505																68										
	0505	0407																44										
	0407	0408										108																
	0408	0412																						36				
L 15+90	0410			44					x	x																		
L 17+59	0411				16				x	x																		
L 28+32	EX502	EX503																52										
L 13+91			12				x	x		x																		
L 22+85			64			x	x	x		x																		
SHEET TOTALS			76	44	16							108						256						404				
PROJECT TOTALS			76	44	16							108						256						404				

LINE & STATION	FROM	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G
L 13+87	0401				1			1	1		
L 16+27	0403				1			1			1
L 16+33	0402				1	1.3		1		1	
L 17+19	0409				1						
L 17+19	0405				1	2.2		1			1
L 17+33	0404				1	3.7		1		1	
L 24+48	0501				1						
L 23+75	0505				1						
L 23+44	0407				1			1			1
STAIR 10+20	0408				1						
L 13+91					1						
SHEET TOTALS					11	7.2		6	1	2	3
PROJECT TOTALS					11	7.2		6	1	2	3

LINE & STATION	FROM	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18, STD. 840.27 OR STD. 840.45	G.D.I. TYPE "D" STD. 840.19, STD. 840.28 OR STD. 840.45	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31, STD. 840.32 OR STD. 840.45	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35 OR STD. 840.46
L 17+19	0409								1			1								
L 24+48	0501													1						1
L 23+75	0505													1						1
STAIR 10+20	0408					1	1													
L 13+91														1						1
SHEET TOTALS						1	1		1			1		3						3
PROJECT TOTALS						1	1		1			1		3						3

LINE & STATION	FROM	TO	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING C.B. TO D.I.	CONVERT EXISTING D.I. TO J.B.	CONVERT EXISTING J.B. TO D.I.	ADJUST C.B.	ADJUST D.I.	15" C.S. ELBOW	MODIFIED CONC. FLUME	PREFORMED SCOUR HOLE (PER EACH)	ENERGY DISSIPATION BASIN	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
	0407	0408									2								WITH 2 ELBOWS
L 15+90	0410																		DRIVEWAY PIPE
L 16+00																		101	REMOVE 6" PVC
L 17+59	0411																		DRIVEWAY PIPE
L 28+32	EX502	EX503								2									
L 13+91															0.4				TEMPORARY DRAINAGE, SEE SHEET TMP-4
L 22+85																			TEMPORARY DRAINAGE, SEE SHEET TMP-5
SHEET TOTALS										2	2				0.4			101	
PROJECT TOTALS										2	2				0.4			101	

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

COMPUTED BY: DC Elliott, PG DATE: 7/8/2024
CHECKED BY: SC Clark, PE DATE: 7/9/2024

(2-3-23)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
B-5895	3G-1

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 Subgrade Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU (1)	12	100	200	300		
			TOTAL CY/TONS/SY:		100	200**	300**	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 Subgrade 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.**

PROJ. REFERENCE NO.	SHEET NO.
B-5895	3P-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4	EUGENE GLEN HICKS ET. AL.
2	4	NC STATE HIGHWAY AND PUBLIC WORKS COMMISSION
3	4	JOHN DANIEL ARNOLD
4	4, 5	MICHAEL S. PERKINS
5	4, 5	NANTAHALA OUTDOOR CENTER, INC.
6	5	HOWARD TED MOORE
7	4, 5	RICHARD DAVID NEVILLE-DOVE
8	5	DONALD W. GAHAGEN SR. ET. AL.

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

Docusign Envelope ID: F59A6C88-29A9-43C8-84A0-5E8A2F3205BF

PROJECT REFERENCE NO.	SHEET NO.
B-5895	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 12/30/2024	HYDRAULICS ENGINEER 12/31/2024

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 33290 RONY A. THIGPEN

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032312 CHARLES W. HEAFNER

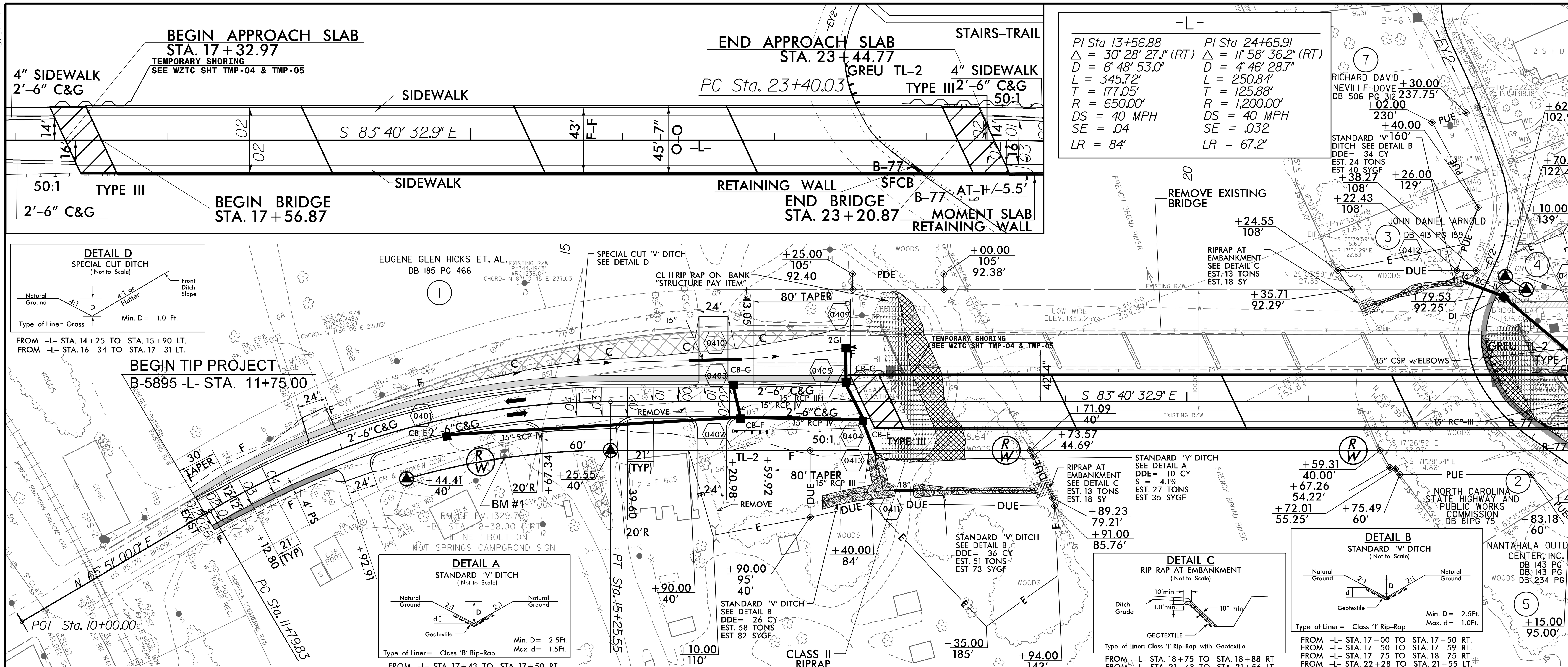
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:

WSP USA
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
FAX: 1.919.836.4099
LICENSE NO. F-0165

-L-

PI Sta 13+56.88	PI Sta 24+65.91
Δ = 30° 28' 27.1" (RT)	Δ = 11° 58' 36.2" (RT)
D = 8° 48' 53.0"	D = 4° 46' 28.7"
L = 345.72'	L = 250.84'
T = 177.05'	T = 125.88'
R = 650.00'	R = 1,200.00'
DS = 40 MPH	DS = 40 MPH
SE = .04	SE = .032
LR = 84'	LR = 67.2'



DETAIL D
SPECIAL CUT DITCH
(Not to Scale)
Min. D= 1.0 Ft.
Type of Liner: Grass
FROM -L- STA. 14+25 TO STA. 15+90 LT.
FROM -L- STA. 16+34 TO STA. 17+31 LT.

DETAIL A
STANDARD 'V' DITCH
(Not to Scale)
Min. D= 2.5Ft.
Max. d= 1.5Ft.
Type of Liner= Class 'B' Rip-Rap
FROM -L- STA. 17+43 TO STA. 17+50 RT.

DETAIL C
RIP RAP AT EMBANKMENT
(Not to Scale)
Type of Liner: Class 'I' Rip-Rap with Geotextile
FROM -L- STA. 18+75 TO STA. 18+88 RT
FROM -L- STA. 21+43 TO STA. 21+56 LT

DETAIL B
STANDARD 'V' DITCH
(Not to Scale)
Min. D= 2.5Ft.
Max. d= 1.0Ft.
Type of Liner= Class 'I' Rip-Rap
FROM -L- STA. 17+00 TO STA. 17+50 RT.
FROM -L- STA. 17+50 TO STA. 17+59 RT.
FROM -L- STA. 17+75 TO STA. 18+75 RT.
FROM -L- STA. 22+28 TO STA. 21+55 LT.

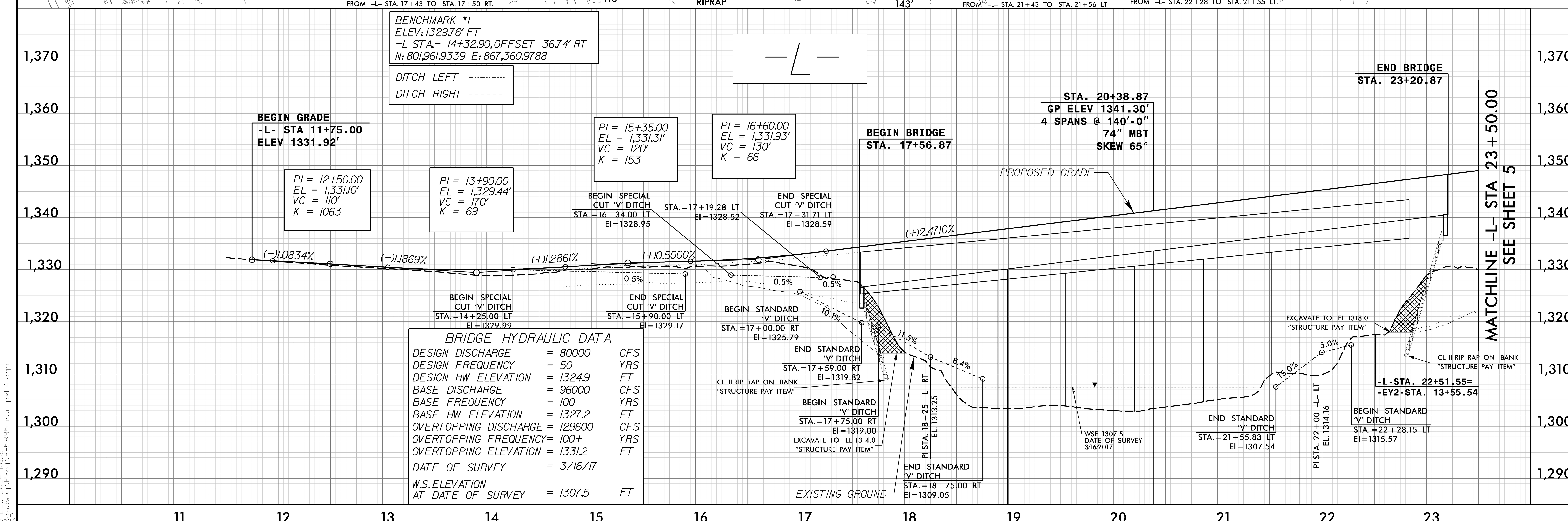
SIDEWALK
PAVED SHOULDER
PAVEMENT REMOVAL

NOTES:
ALL RADIUS ARE 10' UNLESS OTHERWISE NOTED.
STAIRS FOR APP. TRAIL TO BE BUILT BY CONTRACTOR.
SEE STRUCTURE PLANS S-1 THRU S-48
CONTRACTOR TO MAINTAIN PROPERTY OWNER ACCESS TO DRIVEWAY OF PARCEL 4 AT ALL TIMES.
SEE SHEET 2B-2 FOR -EY2- ALIGNMENT

BENCHMARK #1
ELEV: 1329.76' FT
-L STA.- 14+32.90, OFFSET 36.74' RT
N: 801,961.9339 E: 867,360.9788

DITCH LEFT
DITCH RIGHT

-L-



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	80000	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	1324.9	FT
BASE DISCHARGE	=	96000	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	1327.2	FT
OVERTOPPING DISCHARGE	=	129600	CFS
OVERTOPPING FREQUENCY	=	100+	YRS
OVERTOPPING ELEVATION	=	1331.2	FT
DATE OF SURVEY	=	3/16/17	
W.S. ELEVATION AT DATE OF SURVEY	=	1307.5	FT

30-DEC-2024 10:58

PROJECT REFERENCE NO.	SHEET NO.
B-5895	5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 12/30/2024	HYDRAULICS ENGINEER 12/31/2024
NORTH CAROLINA PROFESSIONAL SEAL 33290 ENGINEER RONYELL A. THIGPEN	NORTH CAROLINA PROFESSIONAL SEAL 032312 ENGINEER CHARLES W. HEAFNER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:

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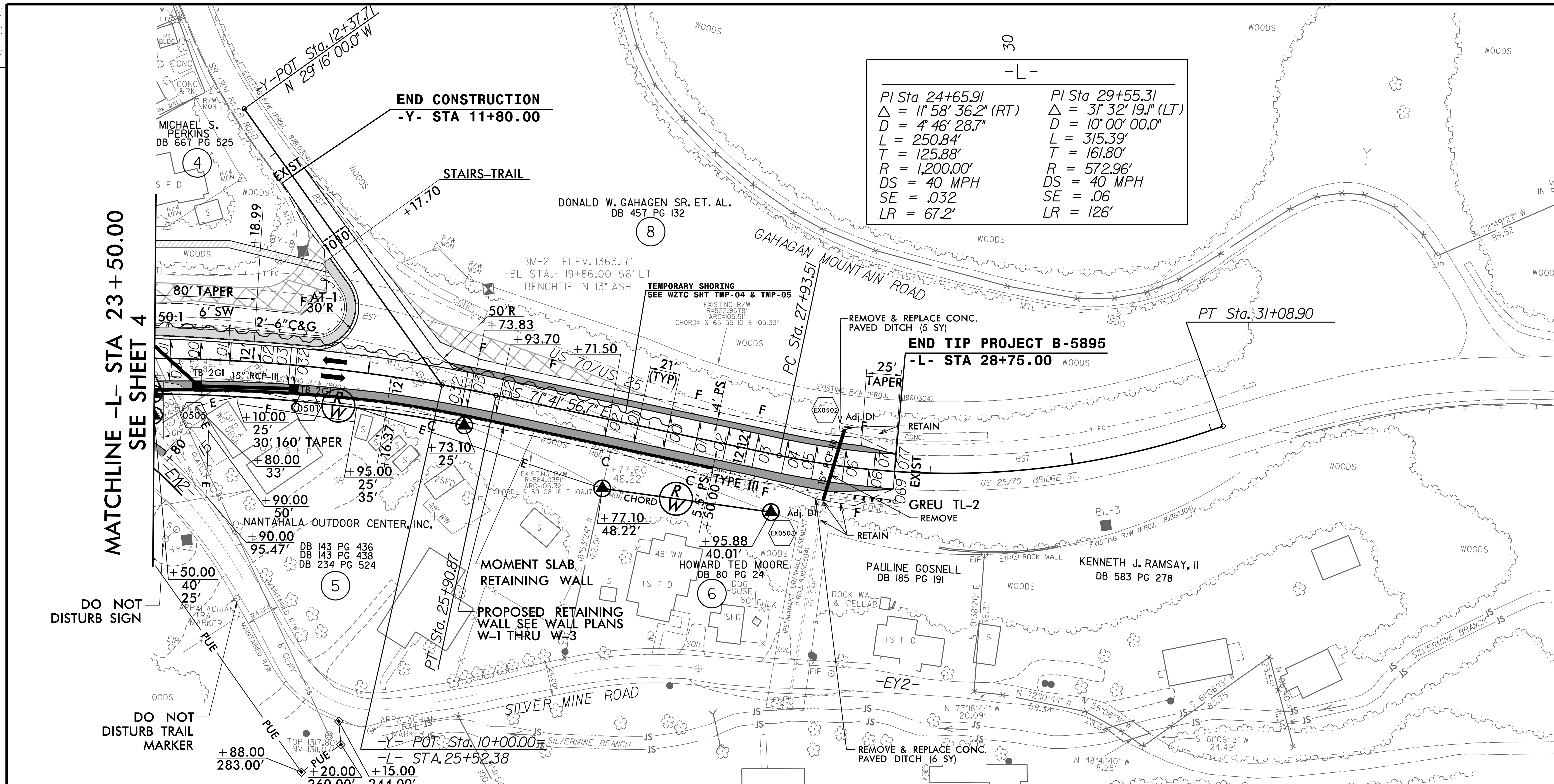
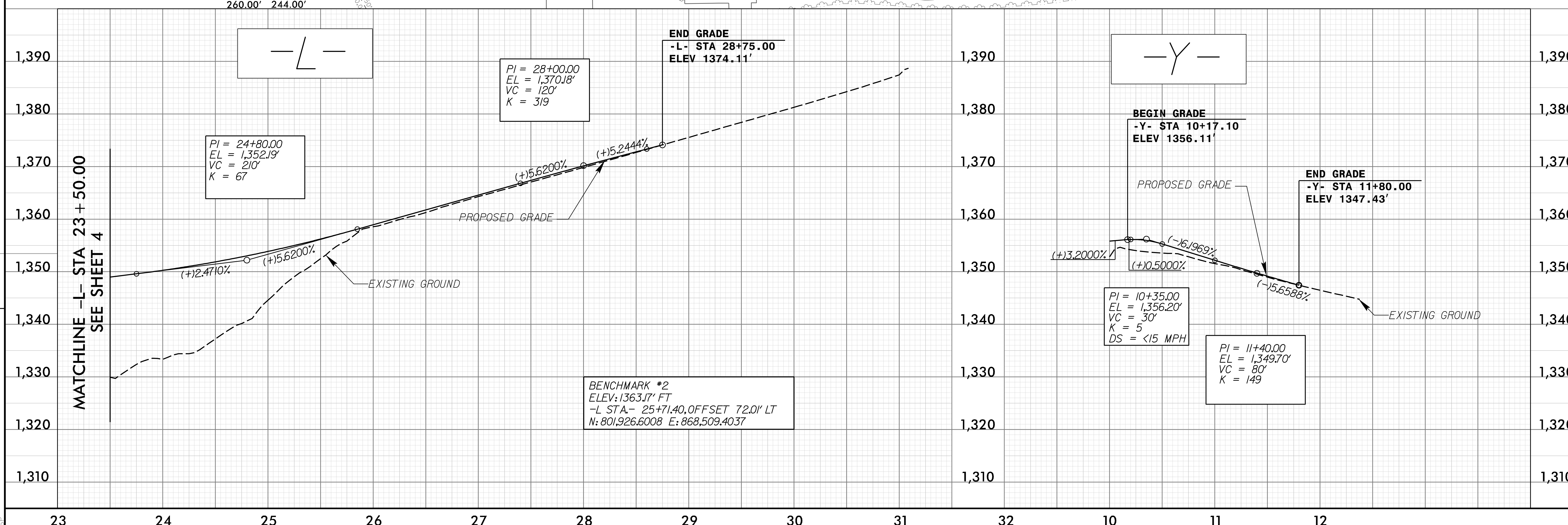
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
FAX: 1.919.836.4099
LICENSE NO. F-0165



END CONSTRUCTION
-Y- STA 11+80.00
-L-
PI Sta 24+65.91
Δ = 11° 58' 36.2" (RT)
D = 4° 46' 28.7"
L = 250.84'
T = 125.88'
R = 1,200.00'
DS = 40 MPH
SE = .032
LR = 67.2'
PI Sta 29+55.31
Δ = 31° 32' 19.1" (LT)
D = 10° 00' 00.0"
L = 315.39'
T = 161.80'
R = 572.96'
DS = 40 MPH
SE = .06
LR = 126'
NAD 83/NA 2011
MATCHLINE -L- STA 23+50.00 SEE SHEET 4
DONALD W. GAHAGEN SR. ET. AL. DB 457 PG 132
GAHAGAN MOUNTAIN ROAD
END TIP PROJECT B-5895
-L- STA 28+75.00
PT Sta. 31+08.90
NANTAHALA OUTDOOR CENTER, INC.
MOMENT SLAB RETAINING WALL
PROPOSED RETAINING WALL SEE WALL PLANS W-1 THRU W-3
HOWARD TED MOORE DB 80 PG 24
PAULINE GOSNELL DB 185 PG 191
KENNETH J. RAMSAY, II DB 583 PG 278
SILVER MINE ROAD
-EY2-
DO NOT DISTURB SIGN
DO NOT DISTURB TRAIL MARKER
-Y- POT Sta. 10+00.00 = -L- STA. 25+52.38

SIDEWALK
PAVED SHOULDER
PAVEMENT REMOVAL

NOTES:
ALL RADIUS ARE 10' UNLESS OTHERWISE NOTED.
STAIRS FOR THE APP. TRAIL TO BE BUILT BY CONTRACTORS.
SEE SHEET 2B-2 FOR -EY2- ALIGNMENT.



-L-
MATCHLINE -L- STA 23+50.00 SEE SHEET 4
PI = 24+80.00
EL = 1,352.19'
VC = 210'
K = 67
PI = 28+00.00
EL = 1,370.18'
VC = 120'
K = 319
END GRADE
-L- STA 28+75.00
ELEV 1374.11'
(+)2.4710%
(+)5.6200%
(+)5.2444%
PROPOSED GRADE
EXISTING GROUND
BENCHMARK #2
ELEV: 1363.17' FT
-L STA.- 25+71.40, OFFSET 72.01' LT
N: 801,926.6008 E: 868,509.4037
-Y-
BEGIN GRADE
-Y- STA 10+17.10
ELEV 1356.11'
END GRADE
-Y- STA 11+80.00
ELEV 1347.43'
(+)3.2000%
(+)0.5000%
(-)6.1969%
(-)5.6588%
PI = 10+35.00
EL = 1,356.20'
VC = 30'
K = 5
DS = <15 MPH
PI = 11+40.00
EL = 1,349.70'
VC = 80'
K = 149

REVISIONS