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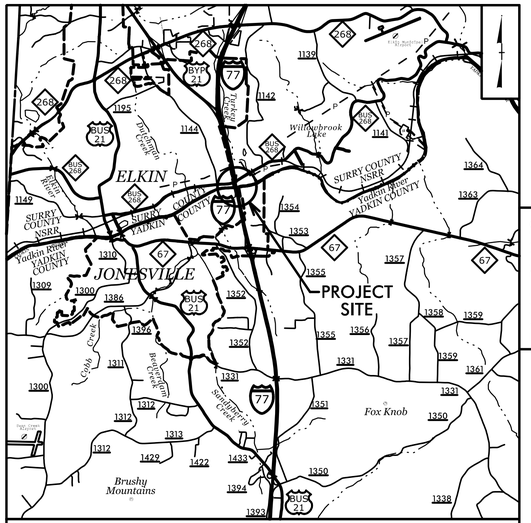
09/08/99

TIP PROJECT: B-5831

CONTRACT: C205044

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Plan Sheet Symbols
See Sheet RW01 thru RW04 For Survey Control & Right-of-Way Sheets



VICINITY MAP

FINAL PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

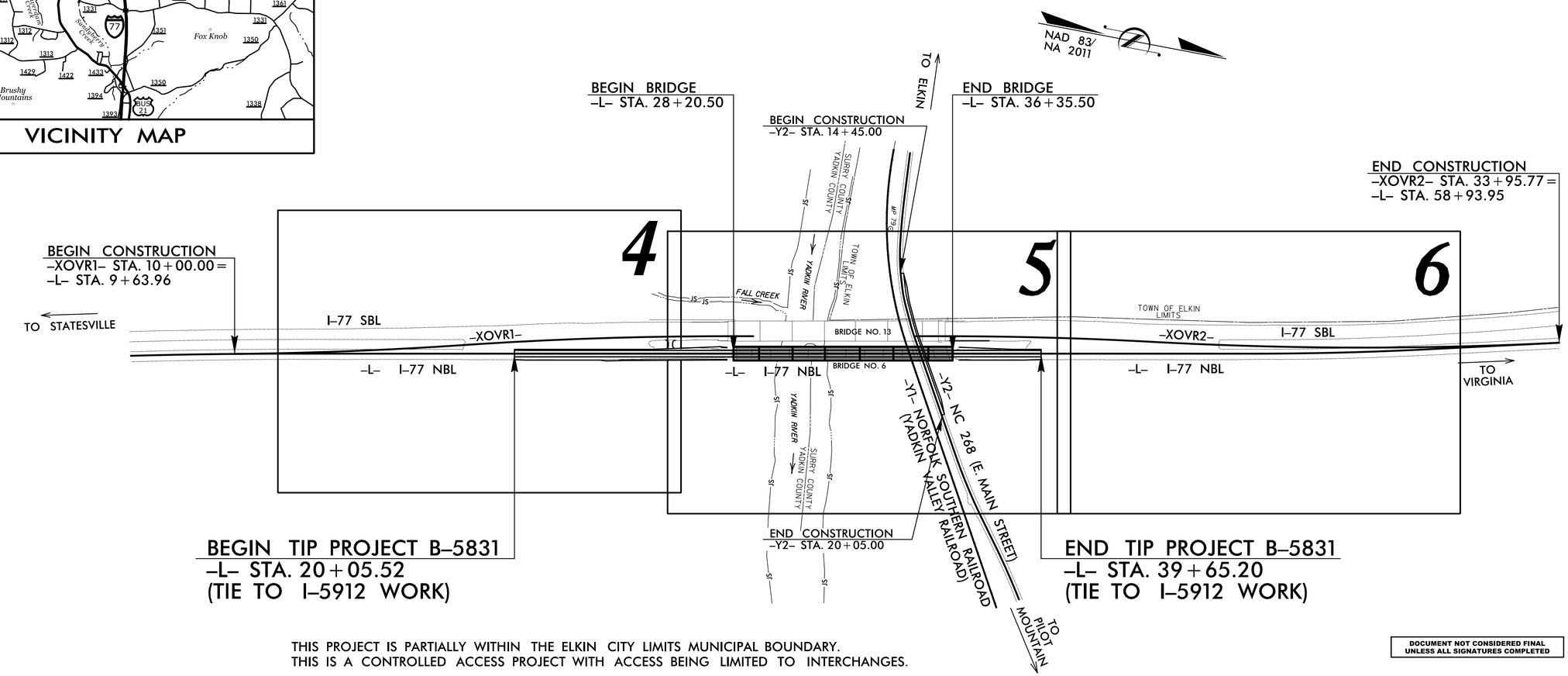
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5831	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
45784.1.2		PE
45784.2.1	0077006	R/W, UTIL.
45784.3.1	0077006	CONST

YADKIN & SURRY COUNTIES

LOCATION: REPLACE BRIDGE NO. 6 OVER YADKIN RIVER, NORFOLK SOUTHERN RAILROAD, AND NC 268 ON I-77 NBL

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



THIS PROJECT IS PARTIALLY WITHIN THE ELKIN CITY LIMITS MUNICIPAL BOUNDARY.
THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2025 = 41,170
ADT 2045 = 50,420
K = 7 %
D = 55 %
T = 21 % *
V = 75 MPH
* (TTST 17% + DUAL 4%)

FUNC CLASS = INTERSTATE
STATEWIDE TIER DESIGN

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-5831	=	*0.217 mile*
LENGTH STRUCTURES TIP PROJECT B-5831	=	*0.154 mile*
TOTAL LENGTH TIP PROJECT B-5831	=	*0.371 mile*

Prepared For:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610
By:
TGS ENGINEERS
TGS ENGINEERS
706 HILLSBOROUGH ST.
SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 10, 2024

LETTING DATE:
NOVEMBER 18, 2025

V. MARCUS LOWERY, P.E.
PROJECT ENGINEER

DAVID STUTTS, P.E.
NCDOT CONTACT

HYDRAULICS ENGINEER
9/12/2025
DocuSigned by: R C Henegar
DF2F2B9A8BE4FD...
SIGNATURE:
NORTH CAROLINA PROFESSIONAL SEAL 16600 ENGINEER RANDALL C. HENEGAR P.E.

ROADWAY DESIGN ENGINEER
9/12/2025
DocuSigned by: Marcus Lowery
3EA7CB8D2D34481...
SIGNATURE:
NORTH CAROLINA PROFESSIONAL SEAL 027418 ENGINEER V. MARCUS LOWERY P.E.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

9/12/2025
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PROJECT REFERENCE NO.	SHEET NO.
B-5831	1A

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ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 027418 ENGINEER MARCUS LOWERY

DocuSigned by: Marcus Lowery
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9/9/2025

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A–1 THRU 2A–2	PAVEMENT SCHEDULE, TYPICAL SECTIONS, DETAIL SHOWING METHOD OF WEDGING, DETAIL FOR SHOULDER BERM GUTTER, SHOULDER DRAIN DETAIL, & MEDIAN SHOULDER DRAIN DETAIL
2B–1 THRU 2B–4	CROSSOVER DESIGN DETAILS
2C–1	PROPOSED OFFSET DROP INLET FOR EXISTING DROP INLET DETAIL
2C–2	METHOD OF PIPE INSTALLATION (FLEXIBLE PIPE) DETAIL
2C–3	METHOD OF PIPE INSTALLATION (RIGID PIPE) DETAIL
2C–4	GUARDRAIL PLACEMENT DETAIL
2C–5	GUARDRAIL PLACEMENT DETAIL
2C–6	GUARDRAIL INSTALLATION DETAIL
2D–1	PROPOSED OFFSET 2–GRATE INLET DETAIL
2D–2	DETAIL OF TEMPORARY 1" STEEL COVER OVER DRAINAGE STRUCTURE
3B–1	ROADWAY SUMMARIES
3D–1 THRU 3D–2	DRAINAGE SUMMARY
3G–1	GEOTECHNICAL SUMMARY
04 THRU 06	PLAN SHEETS
07 THRU 08	PROFILE SHEETS
RW01 THRU RW06	SURVEY CONTROL AND RIGHT–OF–WAY SHEETS
TMP–1 THRU TMP–16	TRANSPORTATION MANAGEMENT PLANS
PMP–1 THRU PMP–5	PAVEMENT MARKING PLANS
EC–1 THRU EC–9	EROSION CONTROL PLANS
SIGN–1 THRU SIGN–5	SIGNING PLANS
UO–1 THRU UO–4	UTILITIES BY OTHERS PLANS
X–1	CROSS SECTION INDEX SHEET
X–1A	CROSS SECTION EARTHWORK VOLUME SUMMARY
X–2 THRU X–58	CROSS SECTIONS
1 THRU SN	STRUCTURE PLANS

GENERAL NOTES

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 III.

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 AND 560.02

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.

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

Telecom (Surry Telephone)

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT–OF–WAY MARKERS:

ALL RIGHT–OF–WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT.

STANDARD DRAWINGS

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	
200.03	Method of Clearing – Method III
225.01	Guide for Grading Subgrade – Interstate and Freeway
225.02	Guide for Grading Subgrade – Secondary and Local
225.04	Method of Obtaining Superelevation – Two Lane Pavement
225.05	Method of Obtaining Superelevation – Divided Highways
225.07	Grading for False Cut at Grade Separations
225.09	Guide for Shoulder and Ditch Transition at Grade Separations
DIVISION 3 – PIPE CULVERTS	
310.10	Driveway Pipe Construction
DIVISION 4 – MAJOR STRUCTURES	
423.01	Bridge Approach Fills – Type 1 Approach Fill for Bridge Abutment
DIVISION 5 – SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction – High Side of Superelevated Curve – Method I
560.02	Method of Shoulder Construction – High Side of Superelevated Curve – Method II
DIVISION 6 – ASPHALT BASES AND PAVEMENTS	
610.01	Guide for Paving Shoulders Under Bridges – Method I
654.01	Pavement Repairs
665.01	Asphalt Shoulders – Milled Rumble Strips
DIVISION 7 – CONCRETE PAVEMENTS AND SHOULDERS	
700.01	Concrete Pavement Joints – Construction and Contraction Joints
700.02	Expansion Joint Layout – for Rigid Doweled Pavement at Bridges
700.03	Dowel Assembly
700.04	Concrete Pavement Header Board
700.05	Tying Proposed Pavement to Existing Pavement
710.01	Concrete Pavement – Station Marking
720.01	Concrete Shoulder – Stamped or Rolled Rumble Strips, Milled Rumble Strips
DIVISION 8 – INCIDENTALS	
806.01	Concrete Right–of–Way Marker
806.02	Granite Right–of–Way Marker
815.02	Subsurface Drain
816.01	Concrete Pads – for Shoulder Drain Installation
816.02	Aggregate Shoulder Drain
816.04	Markers for Drainage Structure and Concrete Pad
838.01	Concrete Endwall for Single and Double Pipe Culverts – 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts – 15" thru 48" Pipe 90 Skew
838.80	Precast Endwalls – 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.04	Concrete Open Throat Catch Basin – 12" thru 48" Pipe
840.05	Brick Open Throat Catch Basin – 12" thru 48" Pipe
840.17	Concrete Grated Drop Inlet Type 'A' – 12" thru 72" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' – 12" thru 36" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' – 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
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
840.27	Brick Grated Drop Inlet Type 'B' – 12" thru 36" Pipe
840.28	Brick Grated Drop Inlet Type 'D' – 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.31	Concrete Junction Box – 12" thru 66" Pipe
840.32	Brick Junction Box – 12" thru 66"
840.35	Traffic Bearing Grated Drop Inlet – for Cast Iron Double Frame and Grates
840.36	Traffic Bearing Grated Drop Inlet – for Steel (840.37) Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.51	Brick Manhole – 12" thru 36" Pipe
840.52	Precast Manhole – 4', 5' and 6' Diameter 12" thru 48" Pipe
840.53	Precast Manhole with Masonry Base – 12" thru 42" Pipe
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
857.01	Precast Reinforced Concrete Barrier – 41" Single Faced
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail – for B–77 and B–83 Anchor Units
865.01	Cable Guiderail
876.01	Rip Rap in Channels and Ditches
876.02	Guide for Rip Rap at Pipe Outlets

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PROJECT REFERENCE NO.	SHEET NO.
B-5831	1B

9/10/2021

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) — EIP
- Computed Property Corner
- Existing Concrete Monument (ECM) — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- 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 — FLOW
- False Sump

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — 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 — RW
- Existing Control of Access Line — CA
- Proposed Control of Access Line — CA
- Proposed ROW and CA Line — RW CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage/Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- 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 — Vineyard

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

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 — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole — HH
- H-Frame Pole
- U/G Power Line Test Hole (SUE – LOS A)*
- U/G Power Line (SUE – LOS B)* — P
- U/G Power Line (SUE – LOS C)* — P
- U/G Power Line (SUE – LOS D)* — P

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line (SUE – LOS B)* — 2UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

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PROJECT REFERENCE NO.	SHEET NO.
B-5831	2A-1

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 027418 ENGINEER V. MARCUS LOWERY — 9/5/2025

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 038176 ENGINEER SHIHAI ZHANG — 9/5/2025

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TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

PAVEMENT SCHEDULE

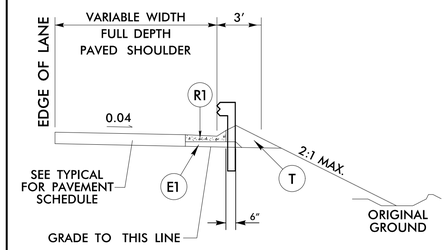
FINAL PAVEMENT DESIGN: DECEMBER 10, 2024

A1	13″ PORTLAND CEMENT CONCRETE PAVEMENT, THROUGH LANES (JOINTED WITH DOWELS)
A2	13″ PORTLAND CEMENT CONCRETE PAVEMENT, MISCELLANEOUS (JOINTED WITHOUT DOWELS)
C1	PROP. APPROX. 1.25″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.
C2	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C4	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2″ IN DEPTH.
C5	PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
D1	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E1	PROP. APPROX. 7.25″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 413.25 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 5½″ IN DEPTH.
E3	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E4	PROP. APPROX. 5″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
K	PROP. 12″ AGGREGATE SUBGRADE (AS DIRECTED BY THE ENGINEER)
R1	CONCRETE SHOULDER BERM GUTTER
R2	41″ SINGLE FACED PRECAST REINFORCED CONC. BARRIER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V1	MILLING BITUMINOUS PAVEMENT, 3″ DEPTH
V3	MILLING BITUMINOUS PAVEMENT, 1.5″ DEPTH
V4	MILLED RUMBLE STRIPS (ASPHALT CONCRETE)
V5	MILLED RUMBLE STRIPS (CONCRETE SHOULDERS)
X1	GEOTEXTILE FOR SUBGRADE STABILIZATION
X2	NONWOVEN GEOTEXTILE INTERLAYER
W1	WEDGING (VARIABLE DEPTH ASPHALT PAVEMENT, SEE DETAIL ON THIS SHEET)

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

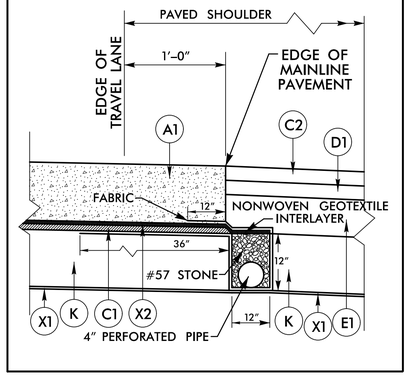
DETAIL FOR SHOULDER BERM GUTTER

SEE CORRESPONDING TYPICAL SECTION FOR PAVEMENT DESIGN.
SEE TYPICAL SECTIONS AND PLANS FOR ACTUAL DIMENSIONS.

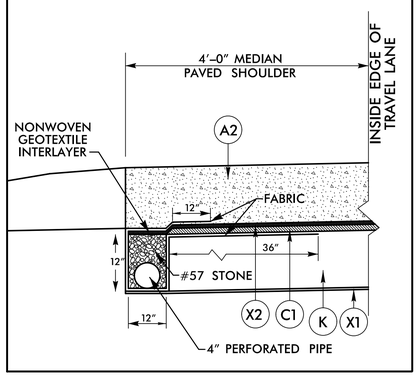


LINE	STATIONS
–L–	27+75.00 to 27+96.50 LT
–L–	23+97.64 to 27+96.50 RT
–L–	36+25.00 to 37+72.00 SBL

OUTSIDE SHOULDER DRAIN DETAIL



MEDIAN SHOULDER DRAIN DETAIL

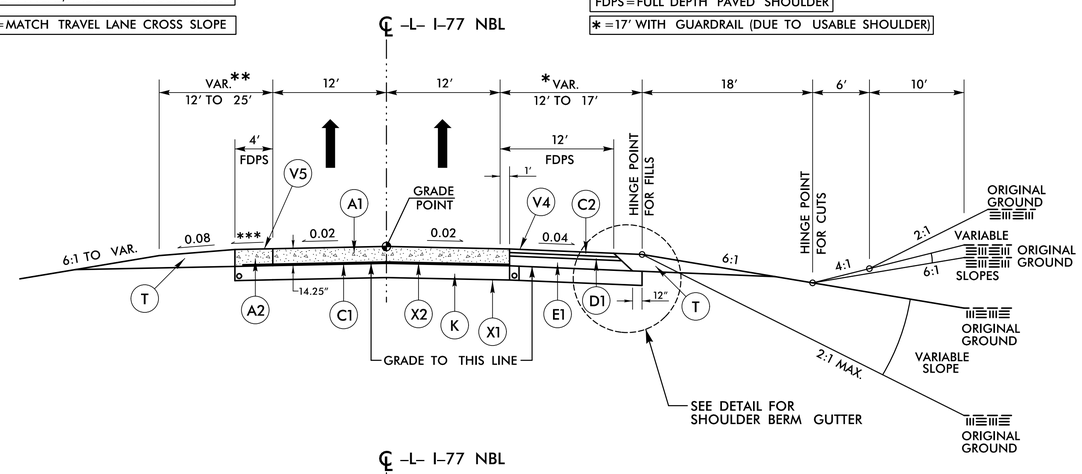


** =12′ TYPICAL; WIDER WITH GUARDRAIL

*** =MATCH TRAVEL LANE CROSS SLOPE

FDPS=FULL DEPTH PAVED SHOULDER

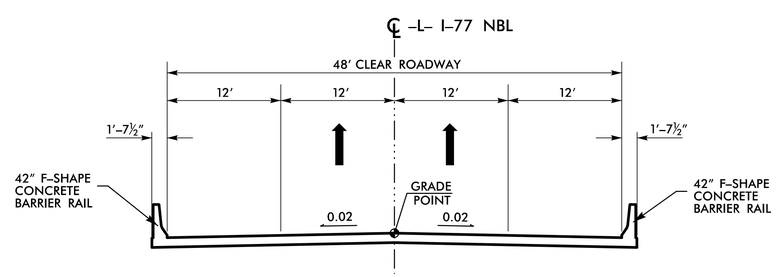
* =17′ WITH GUARDRAIL (DUE TO USABLE SHOULDER)



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1:

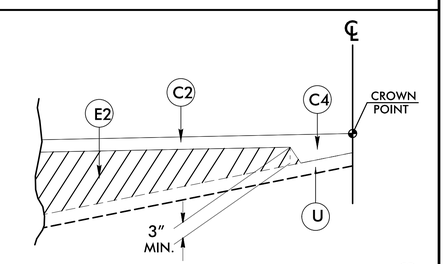
FROM –L– STA. 20+05.52 TO 28+20.50 (BEGIN BRIDGE)
FROM –L– STA. 36+35+.50 (END BRIDGE) TO 39+65.20



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2:

FROM –L– STA. 28+20.50 (BEGIN BRIDGE) TO STA. 36+35.50 (END BRIDGE)



Detail Showing Method of Wedging (W1)

8/5/2025
R:\Roadways\Projects\NCDOT\B-5831\Roadway\Proj\b5831_rdy_typ.dgn
(lsermington)

Docusign Envelope ID: D727DC04-4050-4236-B898-A4A1E80C1417

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
B-5831	2A-2

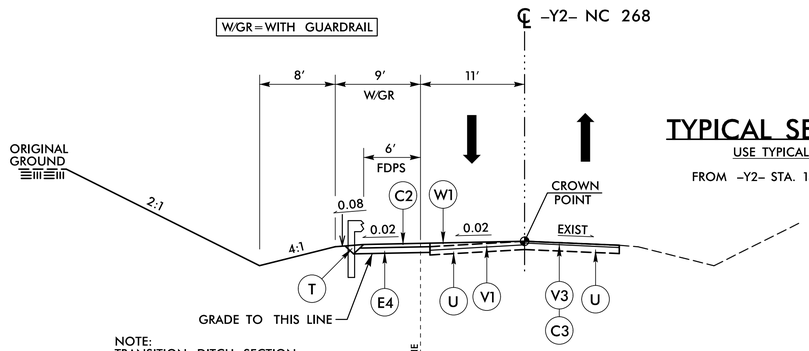
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 027418 ENGINEER MARCUS LOWERY
9/5/2025

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 038176 ENGINEER SHIHAI ZHANG
9/5/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

W/GR = WITH GUARDRAIL

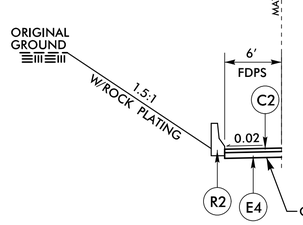


NOTE:
TRANSITION DITCH SECTION
STA 15+89.00 TO 16+50.00
STA 17+97.00 TO 18+50.00

TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3:

FROM -Y2- STA. 14+50.00 TO 20+00.00

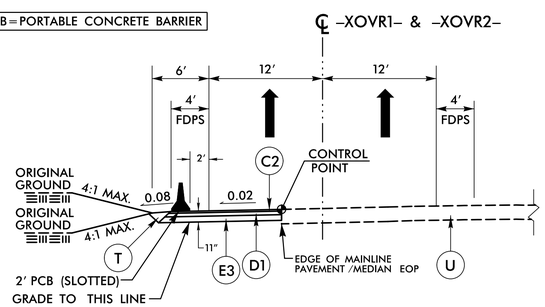


TYPICAL SECTION NO. 3A

USE FOR 41" SINGLE FACED PRECAST REINFORCED CONC. BARRIER:

FROM -Y2- STA. 15+89.00 TO 17+97.00

PCB = PORTABLE CONCRETE BARRIER

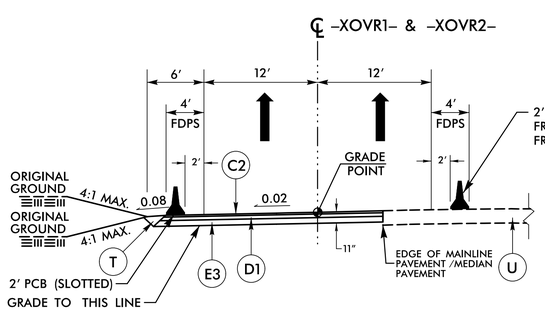


TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4:

FROM -XOVR1- STA. 10+00.00 TO 15+86.12
FROM -XOVR2- STA. 26+82.72 TO 32+97.69

NOTE: CONTROL POINT INDICATES USING THE EXISTING EDGE OF PAVEMENT AS THE HORIZONTAL AND VERTICAL CONTROL



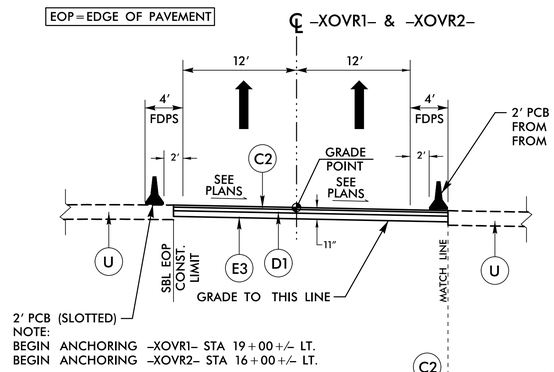
2′ PCB (SLOTTED)
FROM -XOVR1- STA 16+50+/- TO 18+59.88
FROM -XOVR2- STA 21+28.13 TO 23+50+/-

TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5:

FROM -XOVR1- STA. 15+86.12 TO 18+59.88
FROM -XOVR2- STA. 21+28.13 TO 26+82.72

EOP = EDGE OF PAVEMENT



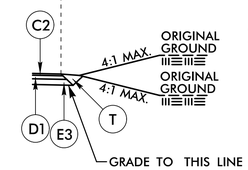
2′ PCB (SLOTTED)
FROM -XOVR1- STA 18+59.88 TO 28+00.00+/- RT.
FROM -XOVR2- STA 11+50.00 TO 21+28.13 RT.

NOTE:
BEGIN ANCHORING -XOVR1- STA 19+00+/- LT.
BEGIN ANCHORING -XOVR2- STA 16+00+/- LT.

TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6:

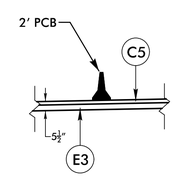
FROM -XOVR1- STA. 18+59.88 TO 28+00.00
FROM -XOVR2- STA. 11+50.00 TO 21+28.13



TYPICAL SECTION NO. 6A

USE TYPICAL SECTION NO. 6A:

FROM -XOVR1- STA. 25+47.86 TO 26+75.30
FROM -XOVR2- STA. 13+16.89 TO 14+29.32



TYPICAL SECTION NO. 7

USE TYPICAL SECTION NO. 7:

TEMPORARY PAVEMENT TO SUPPORT THE PCB - NO TRAFFIC

A1	13" CONCRETE
C1	1.25" S9.5B
C2	3" S9.5C
C3	1.5" S9.5C
C4	VAR. S9.5C
C5	1.5" S9.5B
D1	4" I19.0C
E1	7.25" B25.0C
E2	VAR. B25.0C
E3	4" B25.0C
E4	5" B25.0C
K	12" AGG. SUB.
R1	SBG
R2	41" BARRIER
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	3" MILLING
V3	1.5" MILLING
V4	RUMB.STRIP(ASPH.)
V5	RUMB.STRIP(CONC.)
X1	GEO. FOR SUB.
X2	NONWOVEN GEO.
W1	WEDGING

9/5/2025
8:34:07 AM
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(ser-mlowery)

Docusign Envelope ID: 7C202650-49B4-4A98-BBF1-C00FE6D8E59A

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-5831	2B-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 027418 ENGINEER MARCUS LOWERY
DocuSigned by: Marcus Lowery
9/5/2025

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16600 ENGINEER RANDALL C. HENIGAN
DocuSigned by: Randall C. Henigan
9/8/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

-XOVRI-

PI Sta 14+25.00
Δ = 3° 21' 28.0" (LT)
D = 0° 23' 42.5"
L = 849.76'
T = 425.00'
R = 14,500.00'
SE = SEE PLANS
DS = 60 MPH

PI Sta 23+40.94
Δ = 3° 52' 48.7" (RT)
D = 0° 23' 42.5"
L = 981.97'
T = 491.17'
R = 14,500.00'
SE = SEE PLANS
DS = 60 MPH

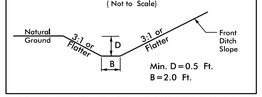
NAD 83 /NA 2011

JOHNNIE M WALTERS ET VIR
JAMES WALTERS
DB 823 PG 254

-XOVRI- PRC Sta. 18+49.76

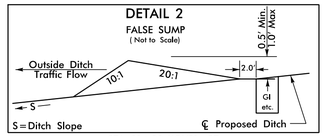
-XOVRI- PC Sta. 10+00.00=
-L- POC Sta. 9+63.96 (0.00' LT)
BEGIN CONSTRUCTION

DETAIL 2B-1
SPECIAL CUT BASE DITCH
(Not to Scale)



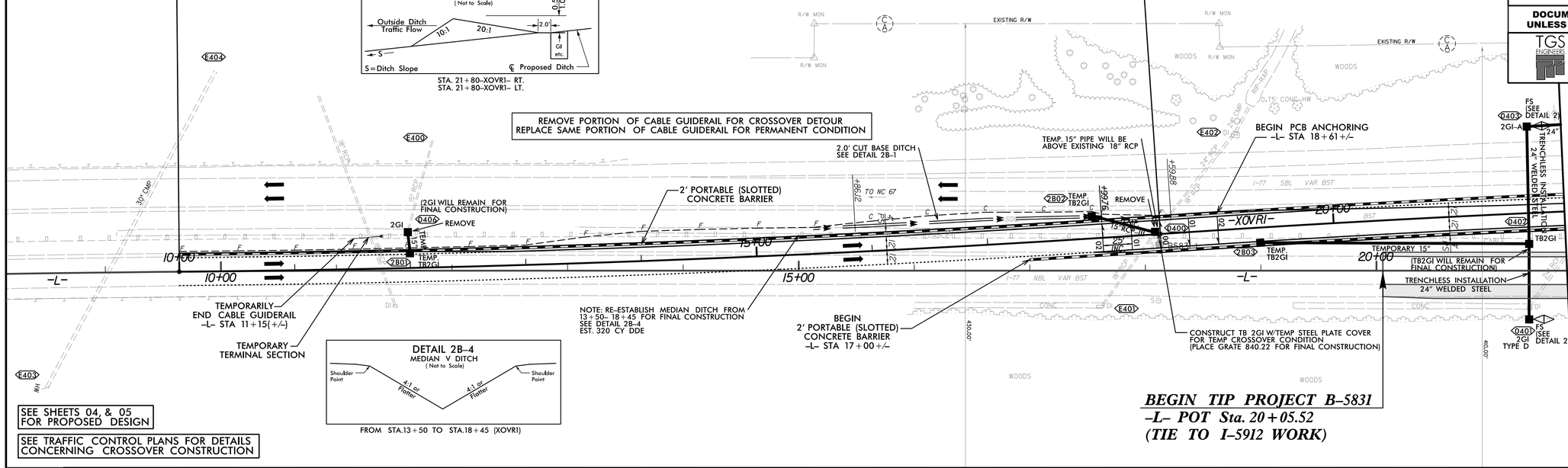
FROM STA. 15+50 TO STA. 18+00 LT. (XOVR1)

DETAIL 2
FALSE SUMP
(Not to Scale)



STA. 21+80-XOVR1- RT.
STA. 21+80-XOVR1- LT.

REMOVE PORTION OF CABLE GUIDERAIL FOR CROSSOVER DETOUR
REPLACE SAME PORTION OF CABLE GUIDERAIL FOR PERMANENT CONDITION



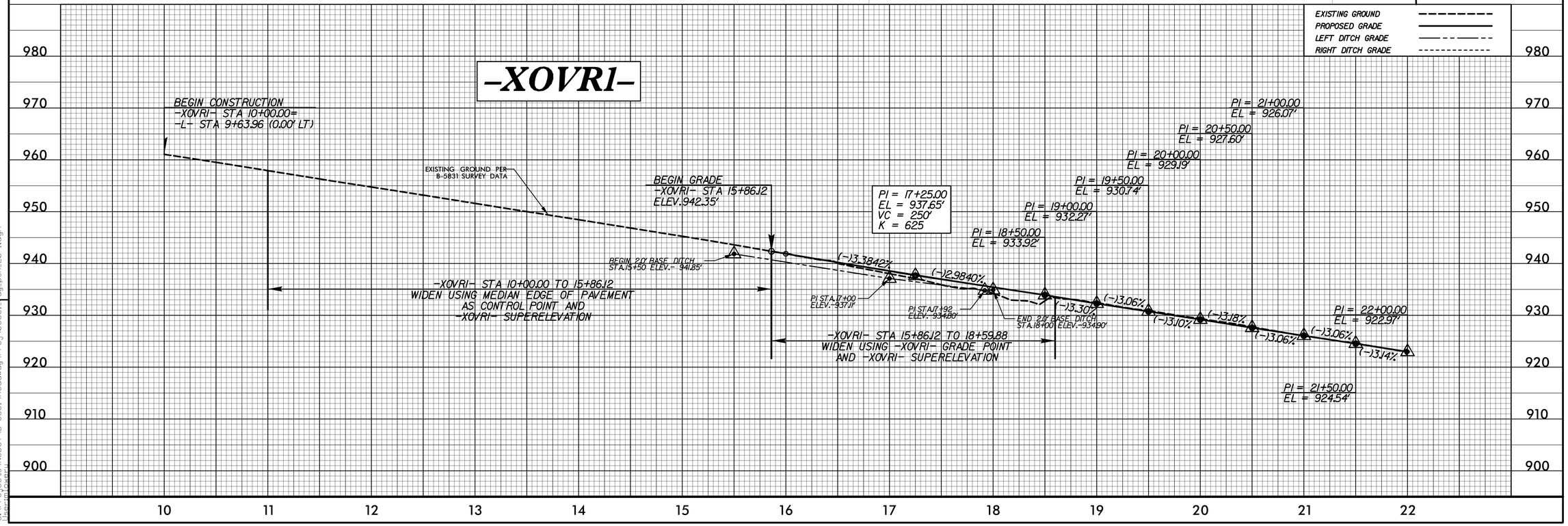
DETAIL 2B-4
MEDIAN V DITCH
(Not to Scale)

FROM STA.13+50 TO STA.18+45 (XOVR1)

SEE SHEETS 04, & 05
FOR PROPOSED DESIGN

SEE TRAFFIC CONTROL PLANS FOR DETAILS
CONCERNING CROSSOVER CONSTRUCTION

BEGIN TIP PROJECT B-5831
-L- POT Sta. 20+05.52
(TIE TO I-5912 WORK)



9/5/2025
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Kevin Lower

Docusign Envelope ID: 7C202650-49B4-4A98-BBF1-C00FE6D8E59A

PROJECT REFERENCE NO.	SHEET NO.
B-5831	2B-2
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 027418 ENGINEER MARCUS LOWERY
9/5/2025

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16600 ENGINEER RANDALL C. HENIGAN
9/8/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

-XOVRI-
PI Sta 23+40.94
Δ = 3° 52' 48.7" (RT)
D = 0° 23' 42.5"
L = 981.97'
T = 491.17'
R = 14,500.00'
SE = SEE PLANS
DS = 60 MPH

REMOVE PORTION OF CABLE GUIDERAIL FOR CROSSOVER DETOUR
REPLACE SAME PORTION OF CABLE GUIDERAIL FOR PERMANENT CONDITION

-XOVRI- PT Sta. 28+31.73=
-L- POT Sta. 27+94.20 (65.00' LT)
END CONSTRUCTION

-XOVRI- POT Sta. 29+31.73=
-L- POT Sta. 28+94.20 (65.00' LT)

NAD 83 /NA 2011

JOHNNIE M. WALTERS ET VIR
JAMES WALTERS
DB 823 PG 254

TOWN OF JONESVILLE
DB 995 PG 380

GERARD F. DAVIS II
KADEANA TODD DAVIS
DB 1595 PG 389

YADKIN COUNTY
SURRY COUNTY

MATCHLINE -XOVRI- STA. 22+00.00
SEE SHEET 2B-1

CL I RIP RAP
7 TONS
GEOTEXT- 15 SY

24" CSP
ELBOWS W/ROD AND
LUG CONNECTORS

24" CSP
W/ROD AND LUG
CONNECTORS

1.0'-1.4' WIDE
VAR. HEIGHT RETW

2' PORTABLE (SLOTTED)
CONCRETE BARRIER

REMOVE

TEMP.
TB2GI

OFFSET 2GI
(SEE 2C-1)

(OFFSET 2GI WILL REMAIN FOR
FINAL CONSTRUCTION)

(BOTH OFFSET 2GI AND 2GI WILL REMAIN
FOR FINAL CONSTRUCTION)

N 10° 45' 15.9" W

ELBOWS W/ROD AND LUG
AND SLEEVE GASKETS

CL I RIP RAP 4 TONS
GEOTEXT.- 12SY

24" CSP WILL REMAIN
FOR FINAL CONSTRUCTION)

B5831-2

BRIDGE #13

BRIDGE #6

1' CONC HW/WW
TYPICAL

N 10° 45' 15.9" W
-XOVR2-

DO NOT DISTURB
DRAINAGE STRUCTURES

END
2' PORTABLE (SLOTTED)
CONCRETE BARRIER
-XOVR1- STA 28+00 +/- RT.

APPROX. LOCATION OF GREENWAY PEDESTRIAN BRIDGE

BRIDGE & 13
CONC BENTS
STEEL GIRDERS
CONCRETE WW
CONC & MTL GUARD RAILS
CONC CURBING

EXISTING I-77 R/W

NORFOLK SOUTHERN RAILWAY

SEE SHEETS 04, & 05
FOR PROPOSED DESIGN

SEE TRAFFIC CONTROL PLANS FOR DETAILS
CONCERNING CROSSOVER CONSTRUCTION

REVISIONS

-XOVR1-

EXISTING GROUND
PROPOSED GRADE
LEFT DITCH GRADE
RIGHT DITCH GRADE

PI = 22+50.00
EL = 921.24'

PI = 23+00.00
EL = 919.67'

PI = 23+50.00
EL = 918.06'

PI = 24+00.00
EL = 916.64'

PI = 24+50.00
EL = 915.37'

PI = 25+00.00
EL = 914.32'

PI = 25+50.00
EL = 913.42'

PI = 26+00.00
EL = 912.83'

PI = 26+50.00
EL = 912.20'

PI = 27+00.00
EL = 911.80'

PI = 27+50.00
EL = 911.51'

END CONSTRUCTION
-XOVR1- STA 28+31.73=
-L- STA 27+94.20 (65.00' LT)
ELEV. 911.34'

END GRADE
-XOVR1- STA 28+00.00
EL = 911.39'

(-)13.46%
(-)13.14%
(-)13.22%
(-)12.84%
(-)12.54%
(-)12.10%
(-)11.80%
(-)11.18%
(-)11.26%
(-)10.80%
(-)10.58%
(-)0.26%
(-)0.126%

EXISTING GROUND PER
B-5831 SURVEY DATA

950 940 930 920 910 900 890 880 870

22 23 24 25 26 27 28

9/5/2025
C:\Users\rlhenigan\Projects\NCDOT\B-5831\Roadway\Proj\b5831_rdy_psh_2b-2.dgn

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PROJECT REFERENCE NO.	SHEET NO.
B-5831	2B-3
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 027418 MARCUS LOWERY
9/5/2025

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 16600 RANDALL C. HENGEMAN
9/8/2025

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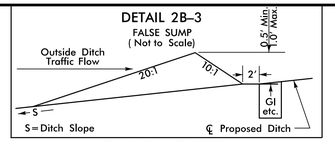
TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

NAD 83 /NA 2011

DETAIL 2B-3
FALSE SUMP
(Not to Scale)

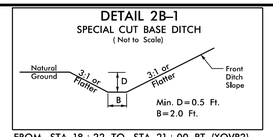


STA. 11+57–L– RT (XOVR2)
STA. 11+90–L– RT (XOVR2)
STA. 18+10–L– RT (XOVR2)

-XOVR2-
PI Sta 14+92.47
Δ = 3°06' 03.J" (RT)
D = 0°23' 42.5"
L = 784.74'
T = 392.47'
R = 14,500.00'
SE = SEE PLANS
DS = 60 MPH

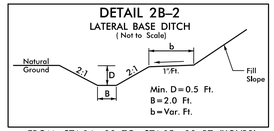
PI Sta 26+40.94
Δ = 5°58' 14.7" (LT)
D = 0°23' 42.5"
L = 1,511.03'
T = 756.20'
R = 14,500.00'
SE = SEE PLANS
DS = 60 MPH

DETAIL 2B-1
SPECIAL CUT BASE DITCH
(Not to Scale)



FROM STA. 18+22 TO STA. 21+00 RT. (XOVR2)
FROM STA. 22+50 TO STA. 24+00 LT. (XOVR2)

DETAIL 2B-2
LATERAL BASE DITCH
(Not to Scale)



FROM STA.14+00 TO STA.15+00 RT. (XOVR2)

-XOVR2- POT Sta. 10+00.00=
-L- POT Sta.34+98.36 (65.00' LT)

-XOVR2- PC Sta. 11+00.00=
-L- POT Sta.35+98.36 (65.00' LT)

REMOVE PORTION OF CABLE GUIDERAIL FOR CROSSOVER DETOUR
REPLACE SAME PORTION OF CABLE GUIDERAIL FOR PERMANENT CONDITION

-XOVR2- PRC Sta. 18+84.74

BEGIN CONSTRUCTION
-XOVR2- POC 11+50.00

END PCB ANCHORING
-L- STA 40+98 +/-

2' PORTABLE (SLOTTED) CONCRETE BARRIER

REMOVE +/-70' 18" RCP

2.0' LATERAL BASE DITCH
SEE DETAIL 2B-2
EST. 10 CY DDE

0507, 0508, 0509, 0510, & 0511 WILL REMAIN FOR FINAL CONSTRUCTION)

(TB2GI WILL REMAIN FOR FINAL CONSTRUCTION)

REMOVE EXIST DI

TEMP. 15" RCP-III

TEMP. 15"

TEMP. FS (SEE DETAIL 2B-3)

TEMPORARY 15"

2.0' CUT BASE DITCH
SEE DETAIL 2B-1

CONSTRUCT TB2GI(840.35) W/TEMP. STEEL PLATE COVER FOR TEMP. CROSSOVER CONDITION (PLACE GRATE 840.22 FOR FINAL CONSTRUCTION)

BEGIN
2' PORTABLE (SLOTTED) CONCRETE BARRIER
-XOVR2- STA 11+50 +/- RT.

END TIP PROJECT B-5831
-L- POT Sta. 39+65.20
(TIE TO I-5912 WORK)

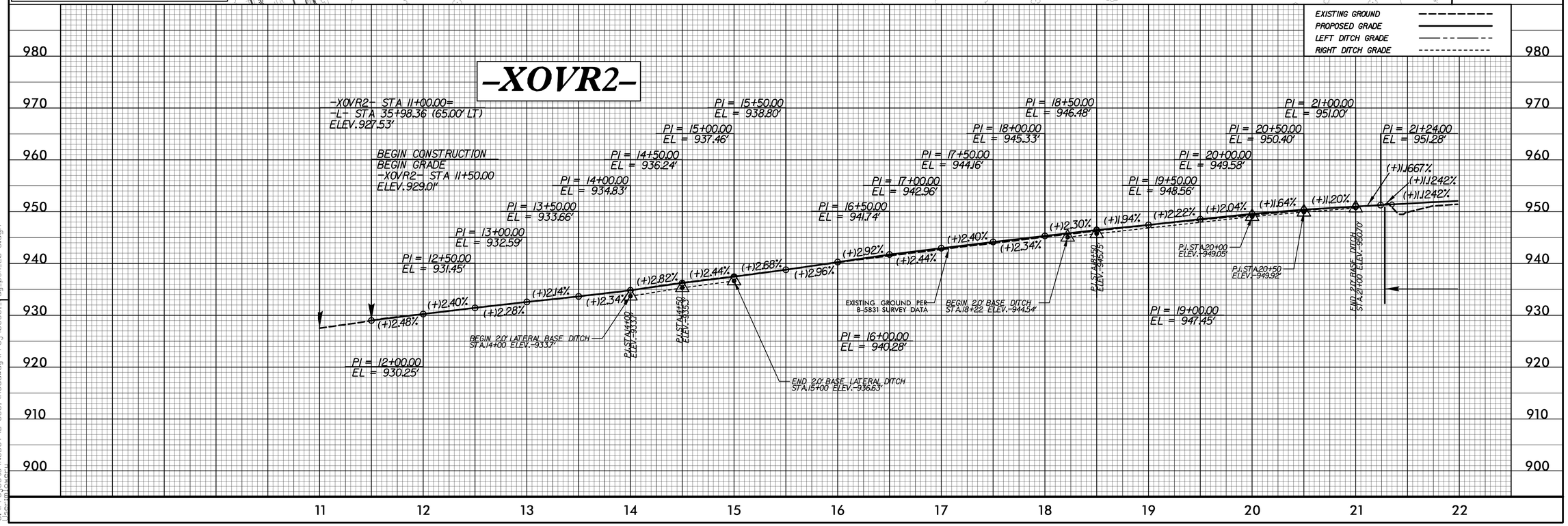
BRIDGE 6 & 13
CONC BENTS
STEEL GIRDERS
CONCRETE RW
CONC & MTL GUARD RAILS
CONC CURBING

SEE SHEETS 04, & 05 FOR PROPOSED DESIGN

SEE TRAFFIC CONTROL PLANS FOR DETAILS CONCERNING CROSSOVER CONSTRUCTION

MATCHLINE -XOVR2- STA. 22+00.00 SEE SHEET 2B-4

REVISIONS



9/5/2025
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Docusign Envelope ID: 7C202650-49B4-4A98-BBF1-C00FE6D8E59A

PROJECT REFERENCE NO.	SHEET NO.
B-5831	2B-4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 027418 ENGINEER MARCUS LOWERY
9/5/2025

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16600 ENGINEER RANDALL C. HERRIGAN
9/8/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

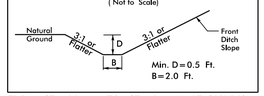
TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

-XOVR2-
PI Sta 26+40.94
Δ = 5° 58' 14.7" (LT)
D = 0° 23' 42.5"
L = 1,511.03'
T = 756.20'
R = 14,500.00'
SE = SEE PLANS
DS = 60 MPH

NAD 83 /NA 2011

-XOVR2- PT Sta. 33+95.77=
-L- POT Sta.58+93.95 (0.00' LT)
END CONSTRUCTION

DETAIL 2B-1
SPECIAL CUT BASE DITCH
(Not to Scale)



FROM STA. 22+50 TO STA. 24+00 LT. (XOVR2)
FROM STA. 25+50 TO STA. 27+00 LT. (XOVR2)

REMOVE PORTION OF CABLE GUIDERAIL FOR CROSSOVER DETOUR
REPLACE SAME PORTION OF CABLE GUIDERAIL FOR PERMANENT CONDITION

MATCHLINE -XOVR2- STA. 22+00.00
SEE SHEET 2B-3

CONSTRUCT TB 2GI W/TEMP STEEL PLATE COVER FOR TEMP CROSSOVER CONDITION (PLACE GRATE 840.22 FOR FINAL CONSTRUCTION)

2.0' CUT BASE DITCH SEE DETAIL 2B-1

TEMPORARY TERMINAL SECTION

TEMPORARILY END CABLE GUIDERAIL -L- STA 54+07.5(+/-)

2.0' CUT BASE DITCH SEE DETAIL 2B-1

TEMP. TB2GI 2B06 15"
REMOVE
2B13 TEMP. TB2GI
TEMPORARY 15" RCP
2B12 TEMP. TB2GI
TB2GI
BL-4
E607
BM-3
E607
E513
+82.72
+97.69
36" CMP
18" RCP
18" CMP
15" CMP
DI
HW
EXISTING R/W
48" WW ISBW
R/W MON
S 72°24'01" W 20.53'
25+00
30+00
-XOVR2-
55+00
-L-
50+00
60+00
-L-
TO CC CAMP ROAD
MTL
WOODS
END 2' PORTABLE (SLOTTED) CONCRETE BARRIER -L- STA 48+47+/-
2' PORTABLE (SLOTTED) CONCRETE BARRIER

SEE SHEETS 04, & 05 FOR PROPOSED DESIGN

SEE TRAFFIC CONTROL PLANS FOR DETAILS CONCERNING CROSSOVER CONSTRUCTION

EXISTING GROUND
PROPOSED GRADE
LEFT DITCH GRADE
RIGHT DITCH GRADE

-XOVR2-

PI = 22+85.00
EL = 953.09'
VC = 300'
K = 464

(+)1.242%
(+)0.4777%
(+)0.4777%
BEGIN 2.0' BASE DITCH 22+50 ELEV.=951.57'
PI STA 23+50 ELEV.=952.39'
END 2.0' BASE DITCH 24+00 ELEV.=953.11'
BEGIN 2.0' BASE DITCH 25+50 ELEV.=952.89'
PI STA 26+50 ELEV.=953.79'
END 2.0' BASE DITCH 27+00 ELEV.=953.96'
END GRADE -XOVR2- STA 26+82.72 ELEV.954.99'
EXISTING GROUND PER B-5831 SURVEY DATA
END CONSTRUCTION -XOVR2- STA 33+95.77= -L- STA 58+93.95 (0.00' LT)

-XOVR2- STA 21+28.13 TO 26+82.72
WIDEN USING -XOVR2- GRADE POINT AND -XOVR2- SUPERELEVATION

-XOVR2- STA 26+82.72 TO 32+97.69
WIDEN USING MEDIAN EDGE OF PAVEMENT AS CONTROL POINT AND -XOVR2- SUPERELEVATION

990 980 970 960 950 940 930 920 910

22 23 24 25 26 27 28 29 30 31 32 33

REVISIONS

8/17/99

9/5/2025
C:\Users\hermin\OneDrive - Ramboll\Projects\NCDOT\B-5831\Roadway\Proj\b5831_rdy_psh_2b-4.dgn

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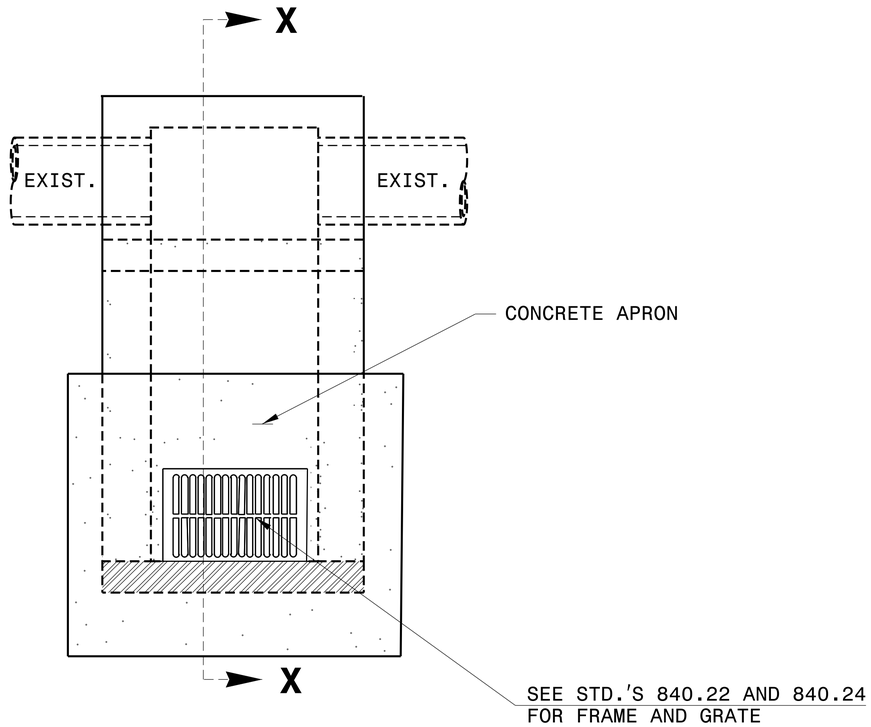
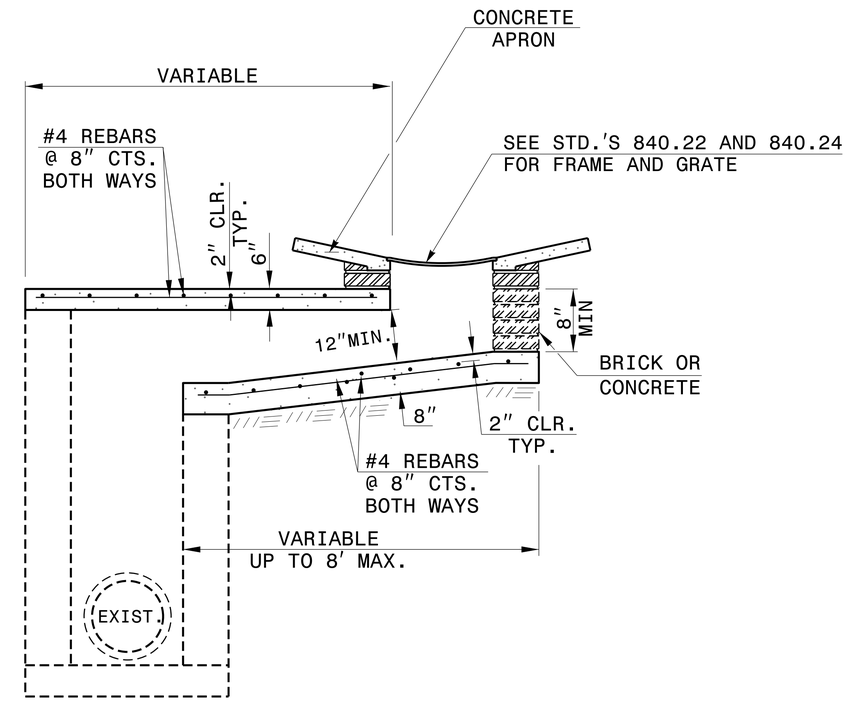
PROJECT REFERENCE NO.	SHEET NO.
B-5831	2C-1



PLAN



SECTION X-X

NOTES:

MORTAR JOINTS ½" TO ¼" THICK.

USE CLASS "B" CONCRETE THROUGHOUT.

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.

5/29/2025

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

PROPOSED OFFSET DROP INLET

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: rnbritt DATE: 4/13/15
CHECKED BY: _____ DATE: _____
FILE SPEC.: nbritt/english/hydro/840d06 offset boxes.dgn

$$$$SYSTIME$$$$
$$$$DGNNAME$$$$
$$$$USERNAME$$$$

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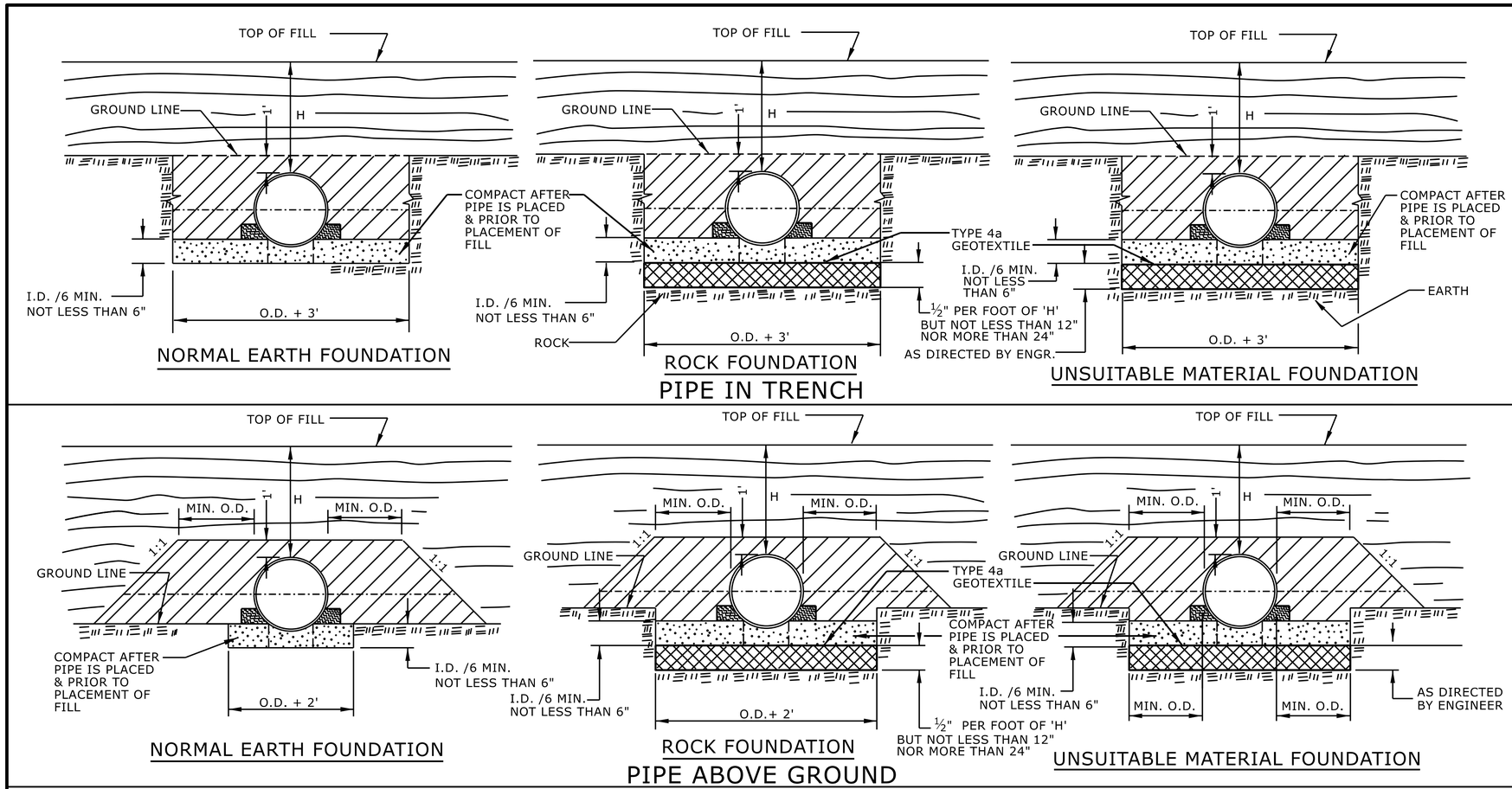
B-5831	2C-2



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

NORTH CAROLINA PROFESSIONAL SEAL 033144 ENGINEER NICOLE M. HACKLER

9/5/2025

SHEET 1 OF 2

300.01

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.:			

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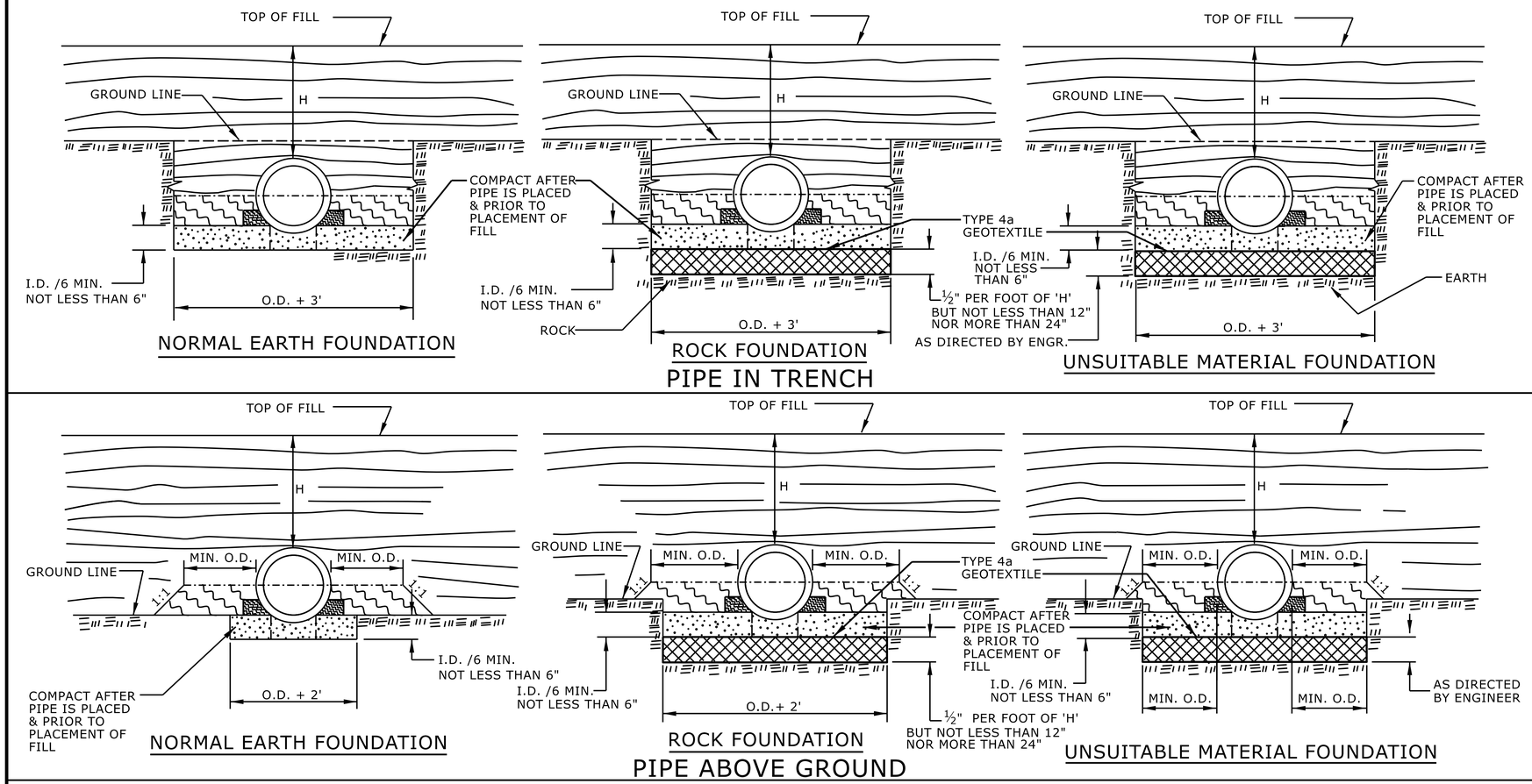
PROJECT REFERENCE NO.	SHEET NO.
B-5831	2C-3



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, 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

RIGID PIPE

9/5/2025

SHEET 2 OF 2

300.01

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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:
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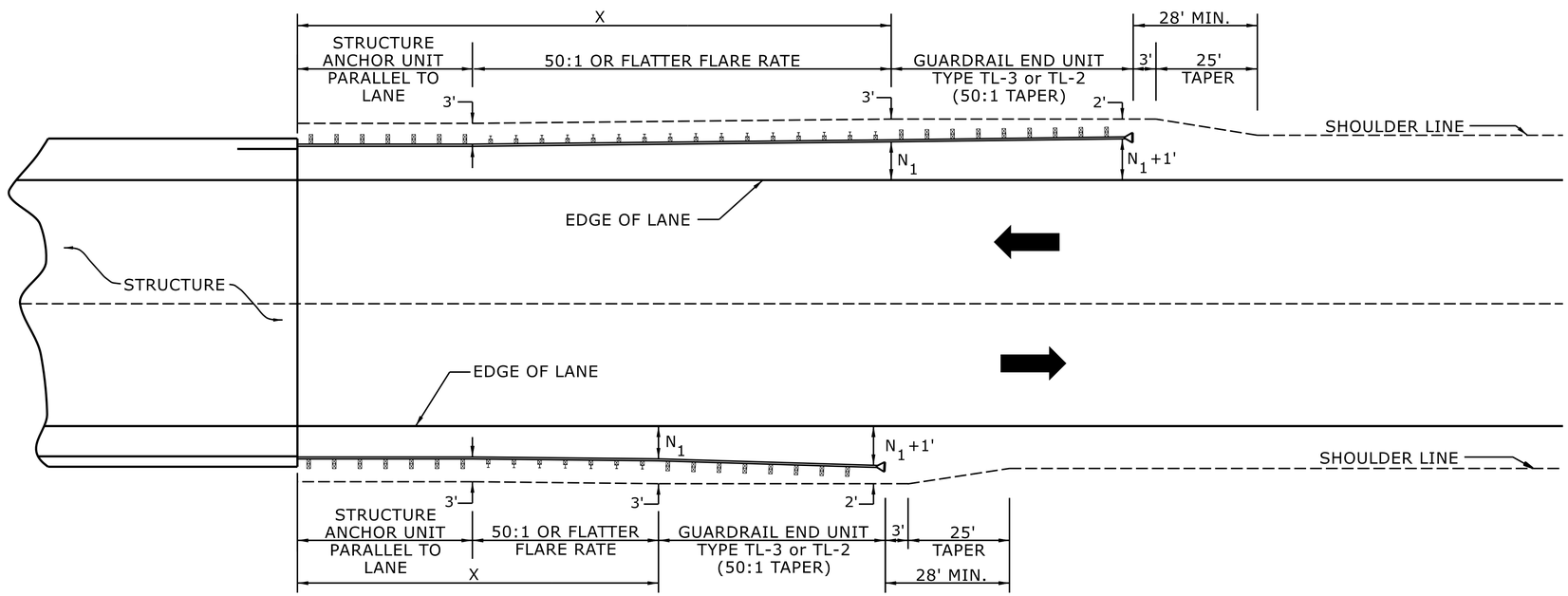

USE FLARE RATE AS THE CONTROL IF THE "N_1" DISTANCE IS NOT OBTAINED.
("N_1" IS BASED ON SHOULDER WIDTHS IN THE ROADWAY DESIGN MANUAL)

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
9/5/2025

SHEET 4 OF 15
862D01

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.:

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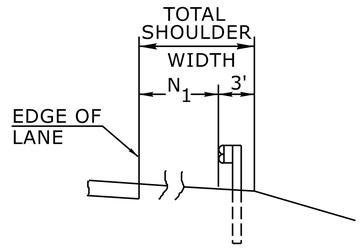
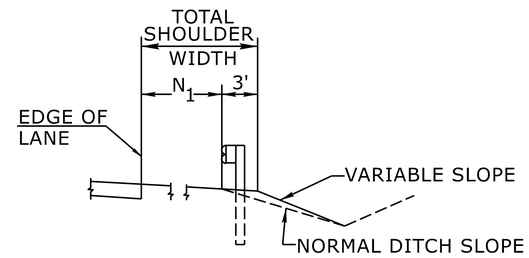
B-5831	2C-5

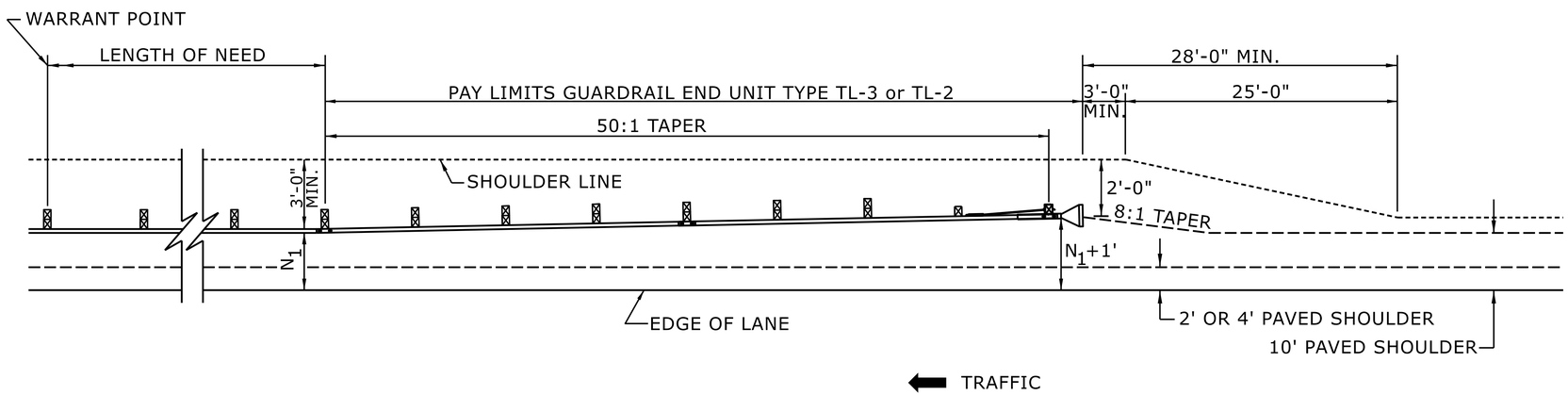


FILL SECTION



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

9/5/2025

SHEET 6 OF 15

862D01

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

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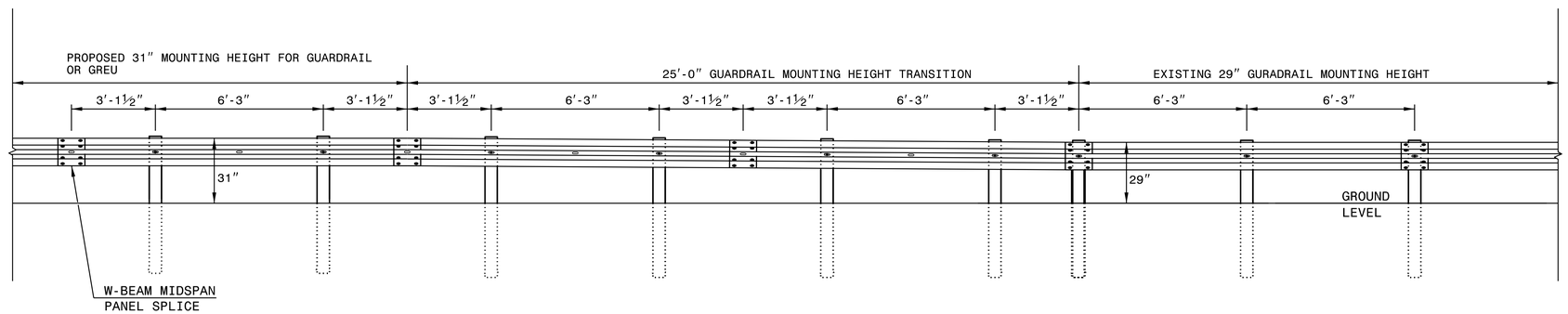
ORIGINAL BY:	S.CALHOUN	DATE:	7-25-2024
MODIFIED BY:		DATE:	
CHECKED BY:		DATE:	
FILE SPEC.:			

Docusign Envelope ID: 7B42FA5B-DFD3-4238-BEEF-19F3B805A334

PROJECT REFERENCE NO.	SHEET NO.
B-5831	2C-6

NOTE: IF EXISTING GUARDRAIL IS LOWER THAN 29″, USE AN ADDITIONAL 12′-6″ LONG SECTION OF GUARDRAIL, FOR EVERY 1″ OF HEIGHT DIFFERENCE, TO TRANSITION FROM EXISTING GUARDRAIL TO PROPOSED 31″ GUARDRAIL.

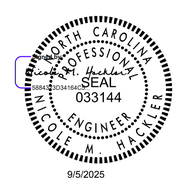


ELEVATION VIEW

TRANSITION FROM 29″ TO 31″ W-BEAM GUARDRAIL MOUNTING HEIGHT

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION



SHEET 5 OF 9

862D02

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-8950 FAX 919-250-4119

SEE TITLE BLOCK

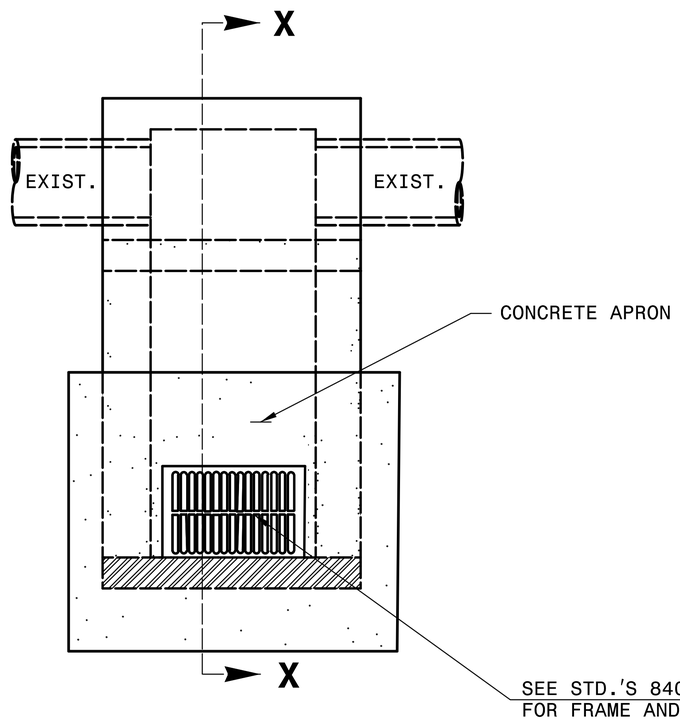
ORIGINAL BY: K. Aldridge DATE: 02-25
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

05-FEB-2025 07:53
U:\Special Details Revisions\862D02 Detail\862D02.dgn
$$$$USERNAME$$$$

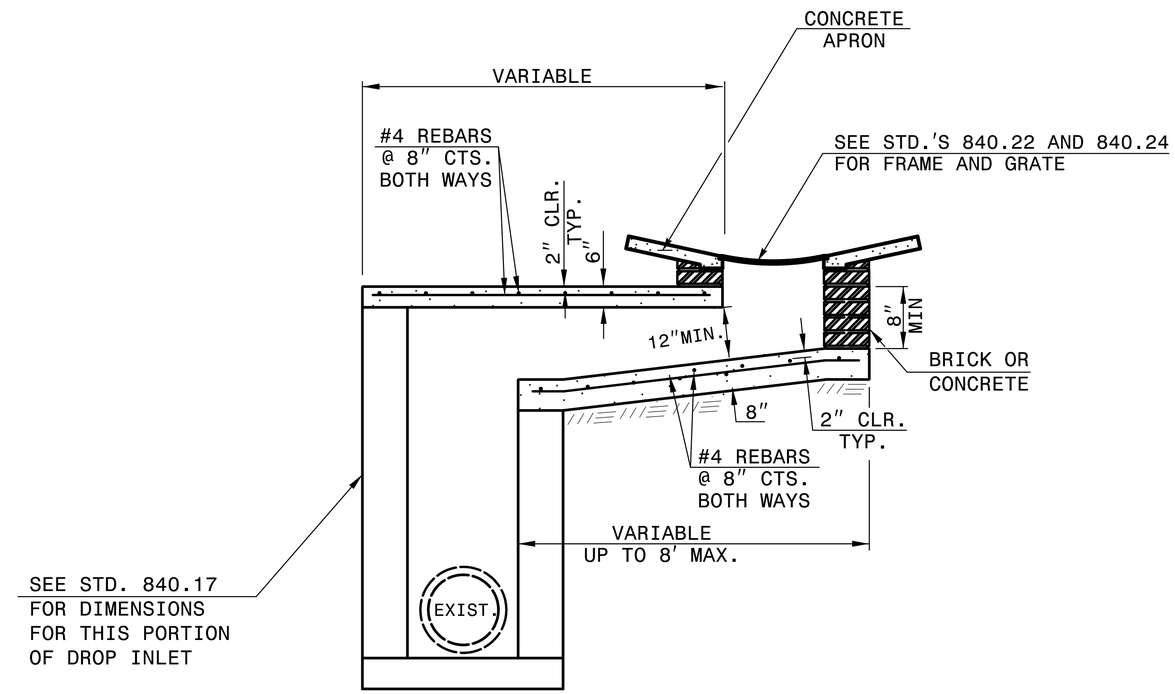
Docusign Envelope ID: D3B8E386-37DB-4274-A18F-CD9FC8E6F96C

PROJECT REFERENCE NO.	SHEET NO.
B-5831	2D-1

PROPOSED OFFSET 2-GRATE INLET



PLAN



SECTION X-X

NOTES:

MORTAR JOINTS ½" TO ¼" THICK.

USE CLASS "B" CONCRETE THROUGHOUT.

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.

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL C. CHECK, JR.

5/29/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

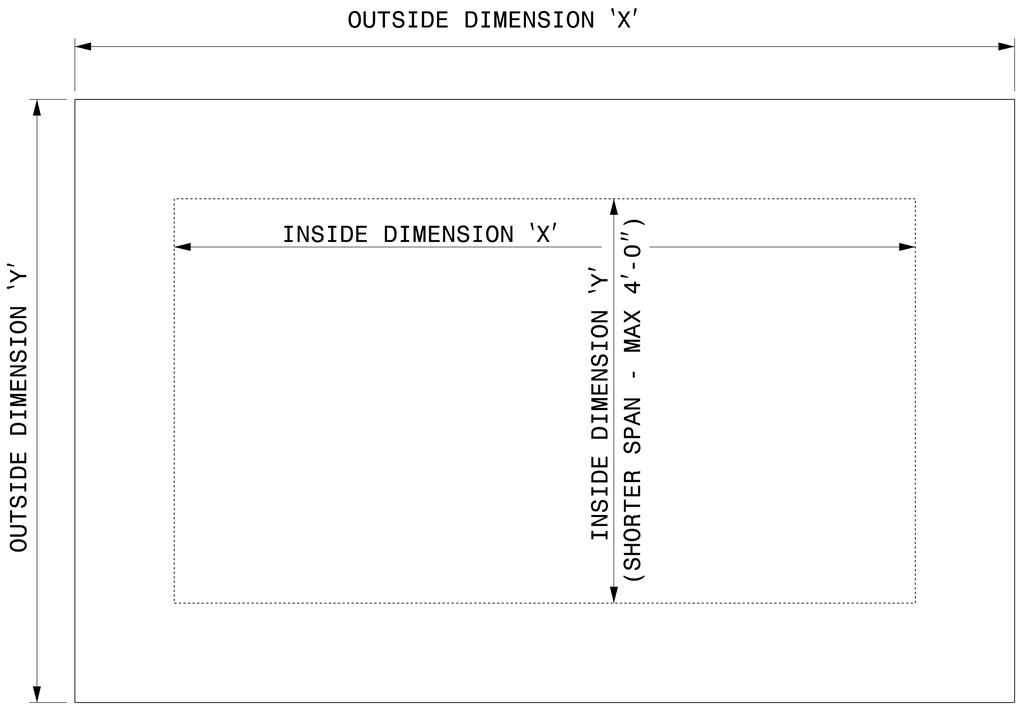
TGS ENGINEERS
706 HILLSBOROUGH STREET
SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

DRAWN BY : ZCS DATE : 1/25
CHECKED BY : MGC DATE : 2/25

2/24/2025
$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
User:zSmith

Docusign Envelope ID: 7B42FA5B-DFD3-4238-BEEF-19F3B805A334

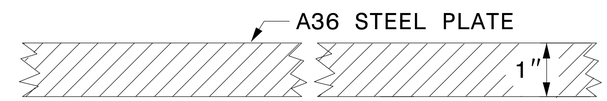
PROJECT REFERENCE NO.	SHEET NO.
B-5831	2D-2



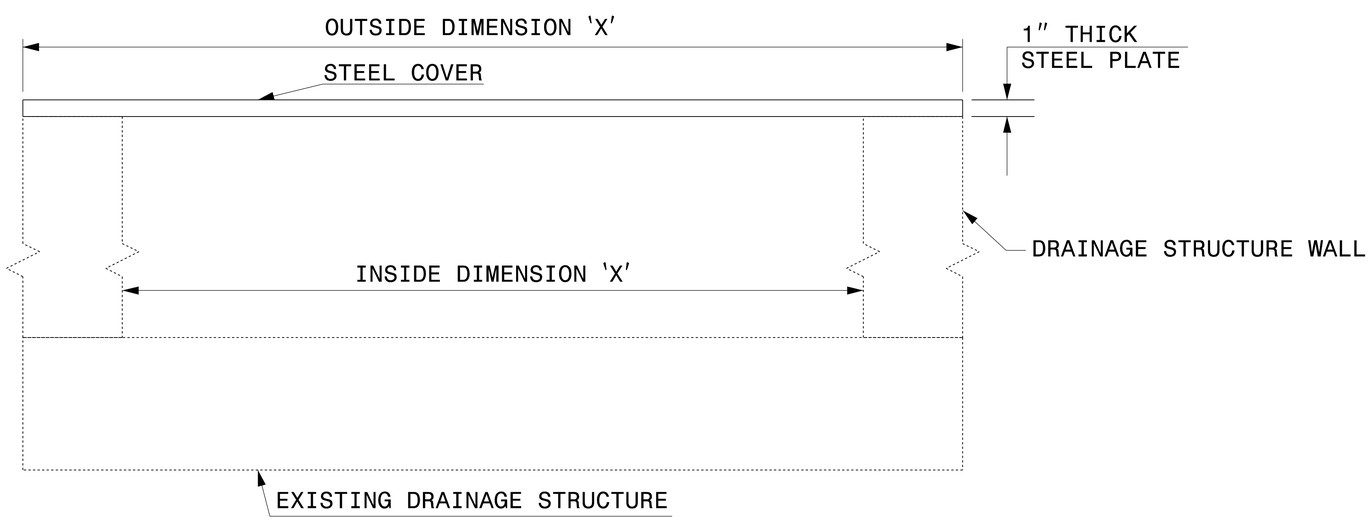
PLAN VIEWS

GENERAL NOTES:

-USE GRADE A36 STEEL
-STEEL COVERS ARE FOR TEMPORARY USE DURING PHASE CONSTRUCTION.
-FILL SHALL BE PLACED DIRECTLY OVER THE STEEL PLATES.
-SEE ROADWAY PLANS AND PROVISIONS FOR LOCATIONS
-QUANTITES TO BE PAID FOR AT THE UNIT PRICE BID PER EACH.



SECTION VIEW OF STEEL TOP PLATE



ELEVATION VIEWS

9/5/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

DETAIL OF TEMPORARY 1" STEEL COVER OVER DRAINAGE STRUCTURE

ORIGINAL BY: E.E. WARD DATE: 2-2-98
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: eric:/usr/details/metric/stand/stlcvr2.dgn

$$$$$SYSTIME$$$$$
$$$$$DGNS$$$$$
$$$$$USERNAME$$$$$

5/26/20

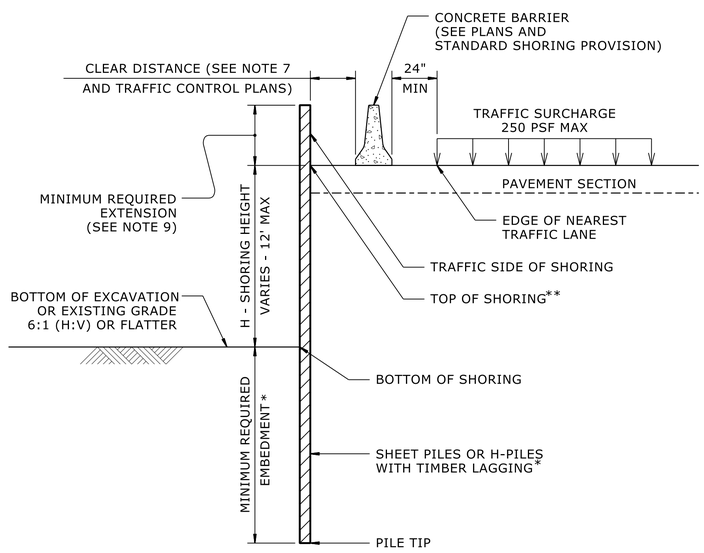
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN^2/FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)			MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN^2/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 "--".

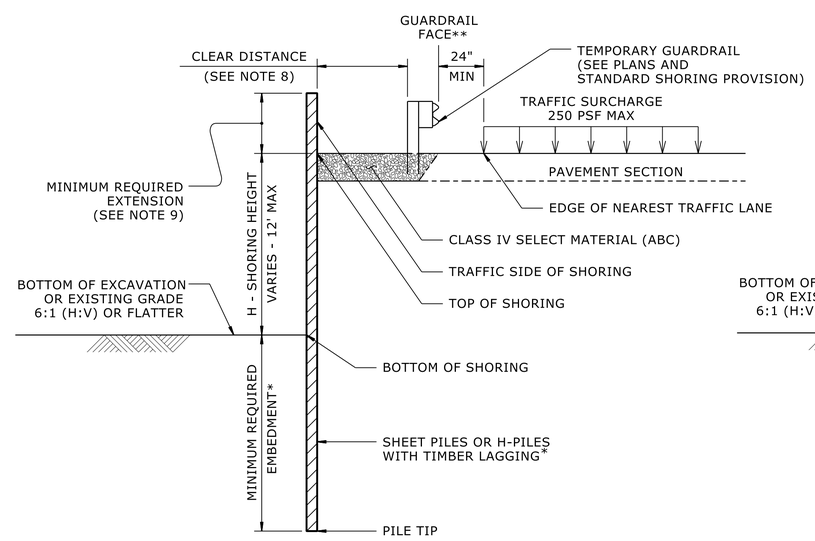
NOTES:

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.



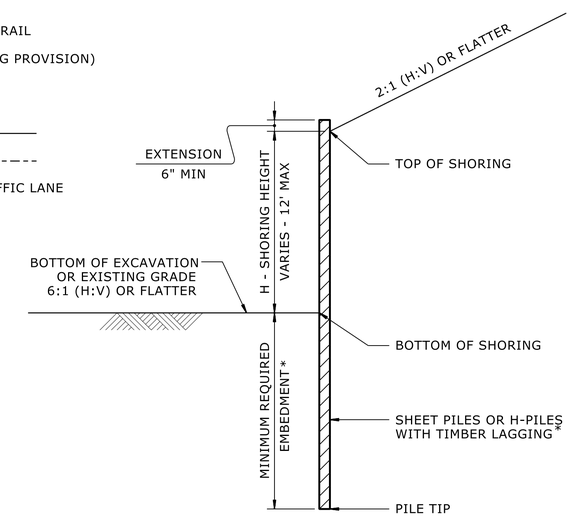
CONCRETE BARRIER

**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-5831

2G-1 -

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

GEOTECHNICAL ENGINEER

DocuSign envelope ID: F7600

Scott A. Hidden 07/10/2025

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

COMPUTED BY: VML DATE: 03 SEPT 2025
CHECKED BY: DBE DATE: 04 SEPT 2025

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-5831	3B-1

SUMMARY OF EARTHWORK
IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
PHASE 1					
-XOVR1- STA 10+00.00 TO STA 28+31.73	765		179		586
-XOVR2- STA 11+00.00 TO STA 33+95.77	965		71		894
SUBTOTAL	1730		251		1479
PHASE 2					
-L- STA 20+05.52 TO STA 28+20.50 (BEG. BRIDGE)	12410		7495		4915
-L- STA 36+35.50 (END BRIDGE) TO STA 39+65.20	3485		6		3479
-Y2- STA 14+50.00 TO STA 20+00.00	2738		13		2725
SUBTOTAL	18633		7513		11120
PHASE 3					
-XOVR1- STA 10+00.00 TO STA 28+31.73	156		880	724	
-XOVR2- STA 11+00.00 TO STA 33+95.77	62		1110	1048	
SUBTOTAL	218		1990	1772	
TOTAL	20581		9754	1772	12599
MATERIAL FOR SHOULDER CONSTRUCTION			975	975	
LOSS DUE TO CLEARING & GRUBBING					
WASTE IN LIEU OF BORROW					
PROJECT TOTAL	20581		10729	2747	12599
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT					
GRAND TOTAL	20581		10729	2747	12599
SAY	22640			3030	

PER GEOTECHNICAL RECOMMENDATIONS DATED OCTOBER 7, 2020:
ESTIMATED UNDERCUT = 450 CY (CONTINGENCY, AS DIRECTED BY THE ENGINEER)
SELECT GRANULAR MATERIAL = 400 CY (CONTINGENCY, AS DIRECTED BY THE ENGINEER)
GEOTEXTILE FOR SOIL STABILIZATION = 400 SY (CONTINGENCY, AS DIRECTED BY THE ENGINEER)

DDE = 330 CY

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

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

REMOVAL OF EXISTING ASPHALT PAVEMENT SUMMARY
IN SQUARE YARDS

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	SY
-L-	20+05	28+32	CL	2216.44
-L-	36+14	39+65	CL	913.78
-XOVR1-	18+59	28+00	CL	2376.00
-XOVR2-	11+50	21+28	CL	2472.44
			TOTAL:	7978.66
			SAY:	7980

SUMMARY OF CABLE GUIDERAIL
IN LINEAR FEET AND EACH

LINE	BEGIN STATION	END STATION	LOC.	SINGLE FACED LENGTH (LF)	DOUBLE FACED LENGTH (LF)	INTERMEDIATE ANCHORS (EA)	TERMINAL ANCHORS (EA)	REMOVE EX. GUIDERAIL (LF)
-L-	11+15	25+99.0	MED.		TERMINATE EXIST GUIDERAIL		1 (TEMP)	1484.0'
-L-	38+08.9	54+07.5	MED.		TERMINATE EXIST GUIDERAIL		1 (TEMP)	1598.6'
-L-	11+15	25+48.5	MED.		1433.5		1	
-L-	38+08.9	54+07.5	MED.		1598.6'		1	
			TOTAL:		3032.1'		4	3082.6
			SAY:		3050'		4	3100'
ADDITIONAL GUIDERAIL POSTS SAY 10 EA								

SUMMARY OF 4" SHOULDER DRAINS
IN LINEAR FEET AND EACH

LINE	BEGIN STATION	END STATION	SHOULDER DRAIN PIPE LF	SHOULDER DRAINS LF	OUTLET PIPE LF	CONC PADS EA	OULET LOCATIONS
-L- LT (NB MEDIAN)	20+05.52	27+96.50	790.98	790.98	30	N/A (3@2GI)	21+30(2GI); 25+30(2GI); 27+80(2GI)
-L- LT (NB MEDIAN)	36+70.00	39+65	295.00	295.00	22	N/A (2@2GI)	36+70(2GI); 37+00(2GI)
-L- RT (NB OUTSIDE)	20+05.52	27+96.00	790.48	790.48	80	1	21+30(2GI); 24+30(PAD); 27+20(2GI); 27+80(2GI)
-L- RT (NB OUTSIDE)	37+00.00	39+65	265.00	265.00	30	N/A (1@2GI)	37+00(2GI)
		TOTAL:	2141.46	2141.46	162	1	
		SAY:	2150	2150	170	1	
NOTE: SEE SHEET 2A-1 FOR SHOULDER DRAIN DETAILS							

SHOULDER BERM GUTTER SUMMARY
IN LINEAR FEET

SURVEY LINE	STATION	STATION	LOCATION	LENGTH (LF)
-L-	23+97.64	27+96.50	RT	398.9
-L-	27+75.00	27+96.50	LT	21.5
-L-	36+25.00	37+72.00	SBL	147.0
			TOTAL:	567.4
			SAY:	570

"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 STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS TYPE GREU, TL-3	ANCHORS CAT-1	ANCHORS AT-1	ANCHORS TYPE III	ANCHORS B-77	ANCHORS TYPE GREU, TL-2	ANCHORS	ANCHORS	ANCHORS	IMPACT ATTENUATOR TYPE 350 EA	IMPACT ATTENUATOR TYPE 350 G	IMPACT ATTENUATOR TYPE 350 NG	41" SINGLE FACED CONC BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE AND RESET EXISTING GUARDRAIL	REMARKS
-L-	23+47.63	28+20.50	RT	472.875'			25+00		12'	VAR. 12'-17'	450.00'		3'		1				1											
-L-	25+97.96	28+20.50	MED. LT	222.875'			28+20.50		12'	VAR. 12'-25'	200.00'		11'		1				1											
-L-	36+35.50	38+08.37	MED. LT	172.875'				36+35.50	12'	15'		50'		1'	1				1											
-L-	36+35.50	36+64.62	RT	29.125'				36+35.50	12'	17'						1			1											
-Y2-	15+01.20	15+89.00	LT	85.375'				15+89.00	6'	9'		50'		1'	1				1											
-Y2-	15+89.00	17+97.00	LT																								207'			41" SINGLE FACED CONC BARRIER
-Y2-	17+97.00	19+44.87	LT	147.875'			17+97.00		6'	9'	50'		1'		1				1											
-L-	35+93.73	38+14.90	SBL																										221.17'	REMOVE AND RESET EXISTING GUARDRAIL
-L-	23+60.45	28+32.08	RT																									471.63'		REMOVE -L- 23+60.56 TO EXIST. BRIDGE
-L-	26+23.13	28+32.04	LT																									208.91'		REMOVE -L- 26+23.13 TO EXIST. BRIDGE
-L-	36+13.54	37+86.23	LT																									172.75		REMOVE FROM EXIST. BRIDGE TO -L- 37+86.23
-L-	36+22.59	36+38.30	RT																									15.75'		REMOVE FROM EXIST. BRIDGE TO -L- 36+38.30
		SUBTOTAL (LF)		1131.00'								TOTAL ANCHORS OR ATTENUATORS (EA)			5	1			6								207'	869.04'	221.17'	
		LESS ANCHORS (LF)		393.50'																										
		TOTAL GUARDRAIL (LF)		737.50								ANCHOR UNIT LENGTH (LF)			50'	6.25'	6.25'	18.75'	22.875'	25'										
												DEDUCTION PER TYPE (LF)			250'	6.25			137.25								207'	870'	222'	
		SAY GUARDRAIL (LF)		737.50'			ADDITIONAL GUARDRAIL POSTS: SAY 10 EA					TOTAL DEDUCTION (LF)			393.50'															

12/06/07
9/9/2025
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User:mjlowery

TGSLTW1014

COMPUTED BY:	REL	DATE:	12/6/2023
CHECKED BY:	JWT	DATE:	12/6/2023

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
B-5831	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 / SIZE / THICKNESS OR GAUGE | OFFSET | STRUCTURE NUMBER FROM | STRUCTURE NUMBER TO | TOP ELEVATION FT. | INVERT ELEVATION FT. | INVERT ELEVATION FT. | MINIMUM REQUIRED SLOPE % | Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12 | 15 | 18 | 24 | 30 | 36 | 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 | R. C. PIPE CLASS III 12 | 15 | 18 | 24 | 30 | R. C. PIPE CLASS IV 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | 18" WELDED STEEL PIPE 0.5" THICK, GRADE B IN SOIL | 18" WELDED STEEL PIPE 0.5" THICK, GRADE B NOT IN SOIL | 24" WELDED STEEL PIPE ###" THICK, GRADE B IN SOIL | 24" WELDED STEEL PIPE0.5" THICK, GRADE B NOT IN SOIL | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY | QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) A 0' THRU 5' EACH | B 5' THRU 10' LIN. FT. | 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 | CONCRETE TRANSITIONAL SECTION D.I. STD. 852.06 | D.I. STD. 852.04 OR 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 OR STD. 840.27 | G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28 | G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20 | G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20 | G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22 | G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22 | 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 | J.B. STD. 840.31 OR STD. 840.32 | T.B.J.B. STD. 840.34 | T.B.D.I. STD. 840.35 | T.B.D.I. FOR STEEL GRATES STD. 840.36 | STEEL FRAME WITH TWO GRATES STD. 840.37 | TEMP STEEL PLATE COVER, SEE DETAIL 2D-2 | M.H. STD. 840.51, STD. 840.52, OR STD. 840.53 | M.H. FRAME AND COVER STD. 840.54 | 15" C.S. ELBOW | 24" C.S. ELBOW | OFFSET 2GI, SEE DETAIL 2C-1 | OFFSET 2GI, SEE DETAIL 2D-1 | 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 |
|---|---|---|---

TGSLTW1014

COMPUTED BY:	REL	DATE:	12/6/2023
CHECKED BY:	JWT	DATE:	12/6/2023

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
B-5831	3D-2

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 / SIZE / THICKNESS OR GAUGE | OFFSET | STRUCTURE NUMBER FROM | STRUCTURE NUMBER TO | TOP ELEVATION FT. | INVERT ELEVATION FT. | INVERT ELEVATION FT. | MINIMUM REQUIRED SLOPE % | Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12 | 15 | 18 | 24 | 30 | 36 | 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 | | R. C. PIPE CLASS III 12 | 15 | 18 | 24 | 30 | R. C. PIPE CLASS IV 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | 18" WELDED STEEL PIPE 0.5" THICK, GRADE B IN SOIL | 18" WELDED STEEL PIPE 0.5" THICK, GRADE B NOT IN SOIL | 24" WELDED STEEL PIPE ###" THICK, GRADE B IN SOIL | 24" WELDED STEEL PIPE0.5" THICK, GRADE B NOT IN SOIL | ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) 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 | CONCRETE TRANSITIONAL SECTION D.I. STD. 852.06 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 OR STD. 840.27 | G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28 | G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20 | G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20 | G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22 | G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22 | 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 | J.B. STD. 840.31 OR STD. 840.32 | T.B.J.B. STD. 840.34 | T.B.D.I. STD. 840.35 | T.B.D.I. FOR STEEL GRATES STD. 840.36 | STEEL FRAME WITH TWO GRATES STD. 840.37 | TEMP STEEL PLATE COVER, SEE DETAIL 2D-2 | M.H. STD. 840.51, STD. 840.52, OR STD. 840.53 | M.H. FRAME AND COVER STD. 840.54 | 15" C.S. ELBOW | 24" C.S. ELBOW | OFFSET 2GI, SEE DETAIL 2C-1 | OFFSET 2GI, SEE DETAIL 2D-1 | 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 |
|---|---|---|---

COMPUTED BY: C R Lavender DATE: 02/10/20 DATE: 2/10/2025
CHECKED BY: M H Stepehens DATE: 02/10/2025

(9-17-24)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
B-5831	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.

Docusign Envelope ID: 7C202650-49B4-4A98-BBF1-C00FE6D8E59A

PROJECT REFERENCE NO.	SHEET NO.
B-5831	04
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
MARCUS LOWERY
SEAL 027418
9/5/2025

HYDRAULICS ENGINEER
RANDALL C. HENEGAR
SEAL 16600
9/8/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

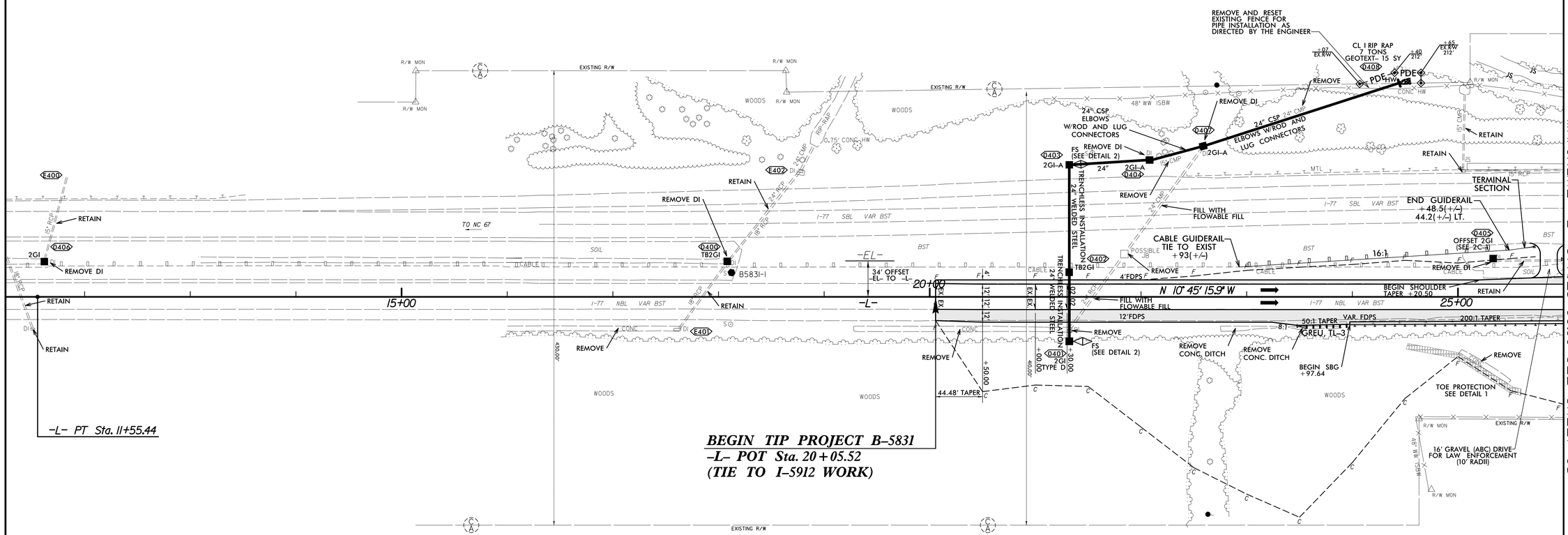
-L-
PI Sta 8+66.79
Δ = 1° 34' 30.7" (RT)
D = 0° 16' 22.2"
L = 577.34'
T = 288.69'
R = 21,000.00'

NAD 83
NA 2011

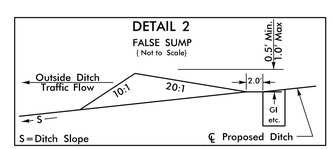
REVISIONS

ROW REV. -- SEPTEMBER 10, 2024 -- ADDED PDE FROM -L- STA 24+07 TO 24+65 LEFT; ADDED PARCEL 4 (VML)

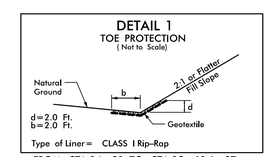
8/17/99



JOHNNIE M WALTERS ET VIR
JAMES WALTERS
DB 823 PG 254



STA. 21+44-L- RT.
STA. 21+44-L- LT.



FROM STA.24+50 TO STA.25+60-L- RT.
CL I RIP RAP 60 TONS
GEOTEXTILE 80 SY

SEE SHEET 07 FOR -L- PROFILE

9/5/2025
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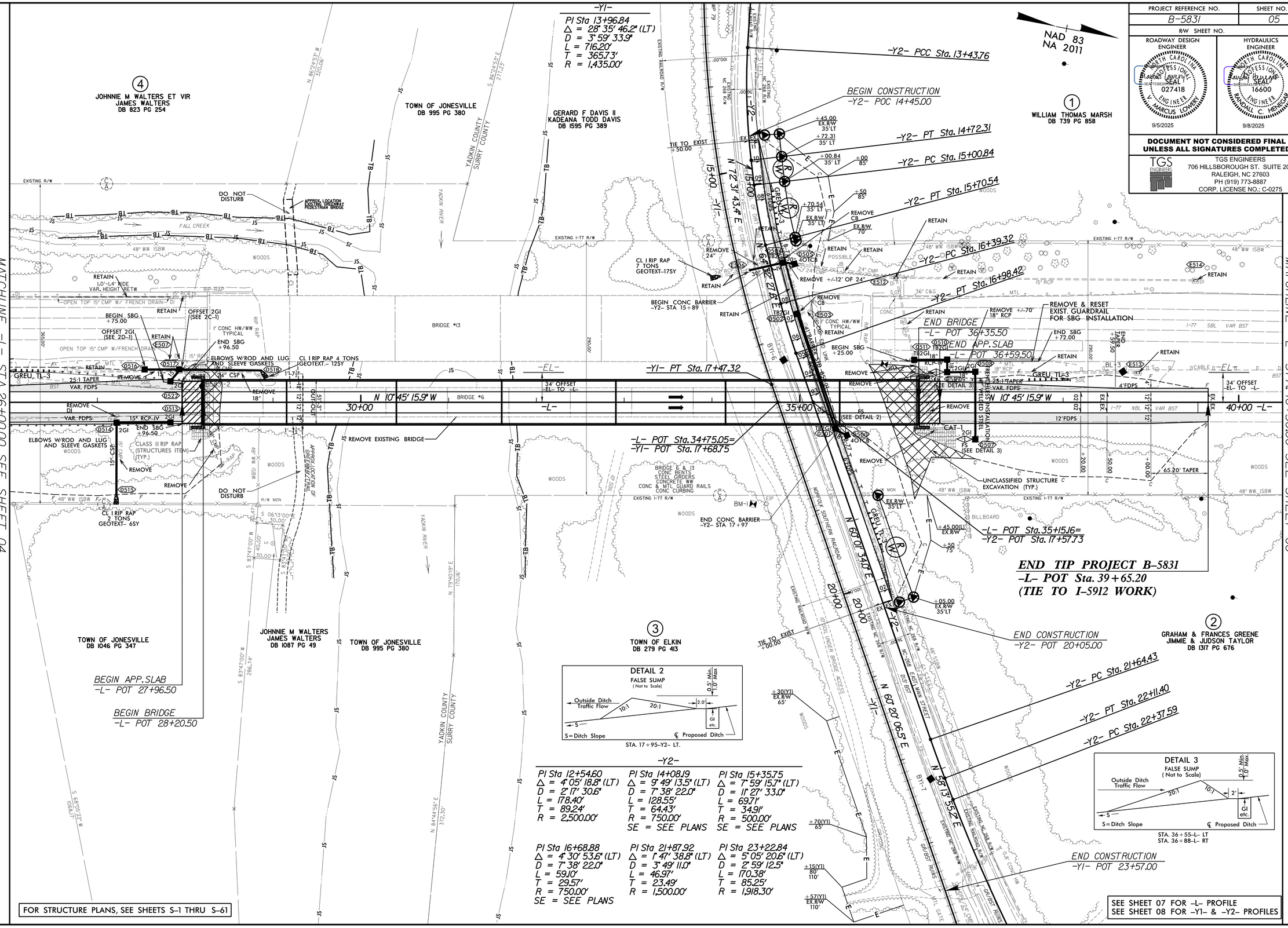
PROJECT REFERENCE NO.	SHEET NO.
B-5831	05
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 027418 ENGINEER MARCUS LOWERY
DELANO WALLACE LOWERY
9/5/2025

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16600 ENGINEER RANDALL C. HERNCAN
9/8/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
706 HILLSBOROUGH ST. SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275



FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-61

SEE SHEET 07 FOR -L- PROFILE
SEE SHEET 08 FOR -Y1- & -Y2- PROFILES

REVISIONS

8/17/99

9/5/2025
R:\Projects\NCDOT\B-5831\Roadway\Proj\b5831_rdy_psh_05.dgn
(Jeremy Cooper)

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PROJECT REFERENCE NO.	SHEET NO.
B-5831	06
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 027418 ENGINEER V. MARCUS LOWERY
9/5/2025

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16600 ENGINEER RANDALL C. HERLOCKER
9/8/2025

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-L-
PI Sta 50+80.67
Δ = 2° 52' 11.6" (LT)
D = 0° 26' 26.7"
L = 651.16'
T = 325.65'
R = 13,000.00'

NAD 83
NA 2011

MATCHLINE -L- STA. 40+50.00 SEE SHEET 05

REVISIONS

8/17/99

EBENEZER CHRISTIAN CHILDRENS HOME
DB 1168 PG 72

N 73°10'54" E 229.14'

S 72°24'21" W 204.53'

68 DUKE POWER COMPANY RIGHT OF WAY

68.00'

EXISTING R/W

WOODS

48" WW ISBW

R/W MON

CONC DRAIN

24" RCP

E600

RETAIN

I-77 SBL VAR BST

CABLE

TB2GI

REMOVE DI

D600

BST

18" RCP

D601

E601

D602

BL-4

D603

REMOVE DI

2GI

TRENCHLESS INSTALLATION 24" WELDED STEEL

FILL WITH FLOWABLE FILL

18" CMP

D604

N 10° 45' 15.9" W

-L-

I-77 NBL VAR BST

45+00

50+00

55+00

N 13° 37' 27.5" W

TO CC CAMP ROAD

MTL

BM-3

E607

D605

JB w/MH

-L- PC Sta. 47+55.02

-L- PT Sta. 54+06.18

ELBOWS & LUG CONNECTORS

D606

CL I RIP RAP
7 TONS
GEOTEXT- 15 SY

BILLBOARD

340.00'

NAIL

9/5/2025
12:37:06 pm
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User: mlowery

Docusign Envelope ID: B2E702B6-074C-44BC-A0F7-01E3C52E4963

5/28/99

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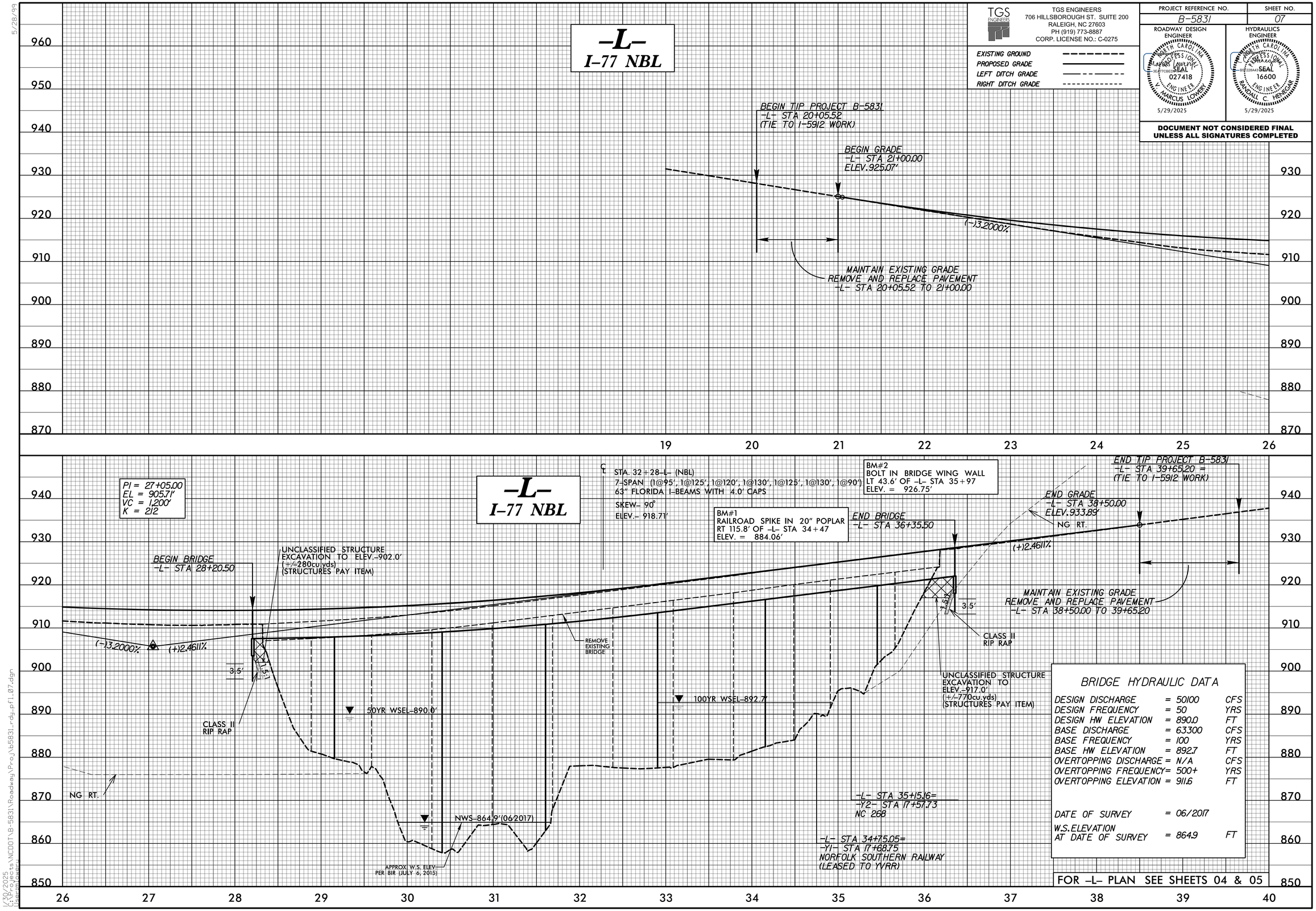
PROJECT REFERENCE NO.	SHEET NO.
B-5831	07

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 027418 ENGINEER MARCUS LOWERY
5/29/2025

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16600 ENGINEER RANDALL C. HENNEGAR
5/29/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

EXISTING GROUND
PROPOSED GRADE
LEFT DITCH GRADE
RIGHT DITCH GRADE



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 50100	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 890.0	FT
BASE DISCHARGE	= 63300	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 892.7	FT
OVERTOPPING DISCHARGE	= N/A	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 911.6	FT
DATE OF SURVEY	= 06/2017	
W.S. ELEVATION AT DATE OF SURVEY	= 864.9	FT

1/30/2025
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Docusign Envelope ID: B2E702B6-074C-44BC-A0F7-01E3C52E4963

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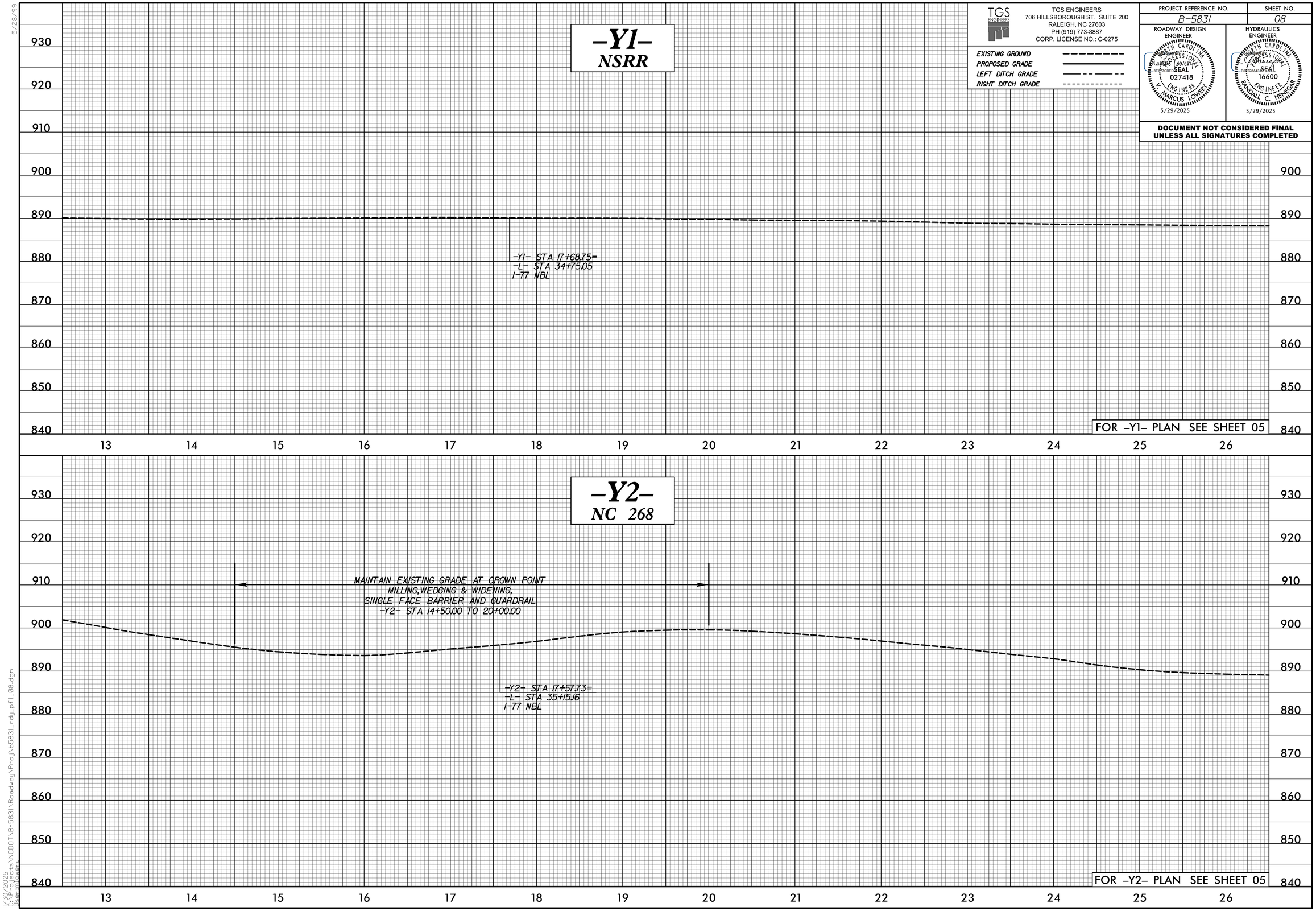
PROJECT REFERENCE NO.	SHEET NO.
B-5831	08

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 027418 ENGINEER MARCUS LOWERY
5/29/2025

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16600 ENGINEER RANDALL C. HENGEMIHLE
5/29/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

EXISTING GROUND
PROPOSED GRADE
LEFT DITCH GRADE
RIGHT DITCH GRADE



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