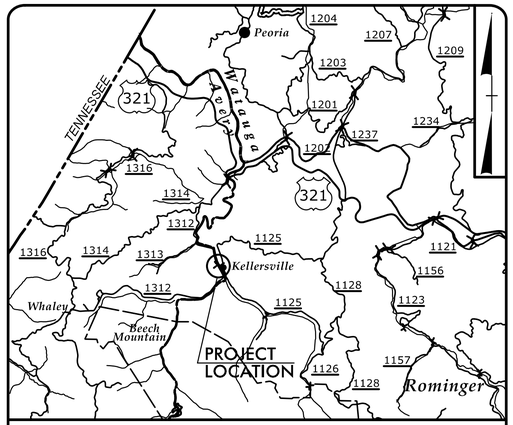
09/08/99

PROJECT: DF18311.2095167.PR

CONTRACT: DK00434

See Sheet 1A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

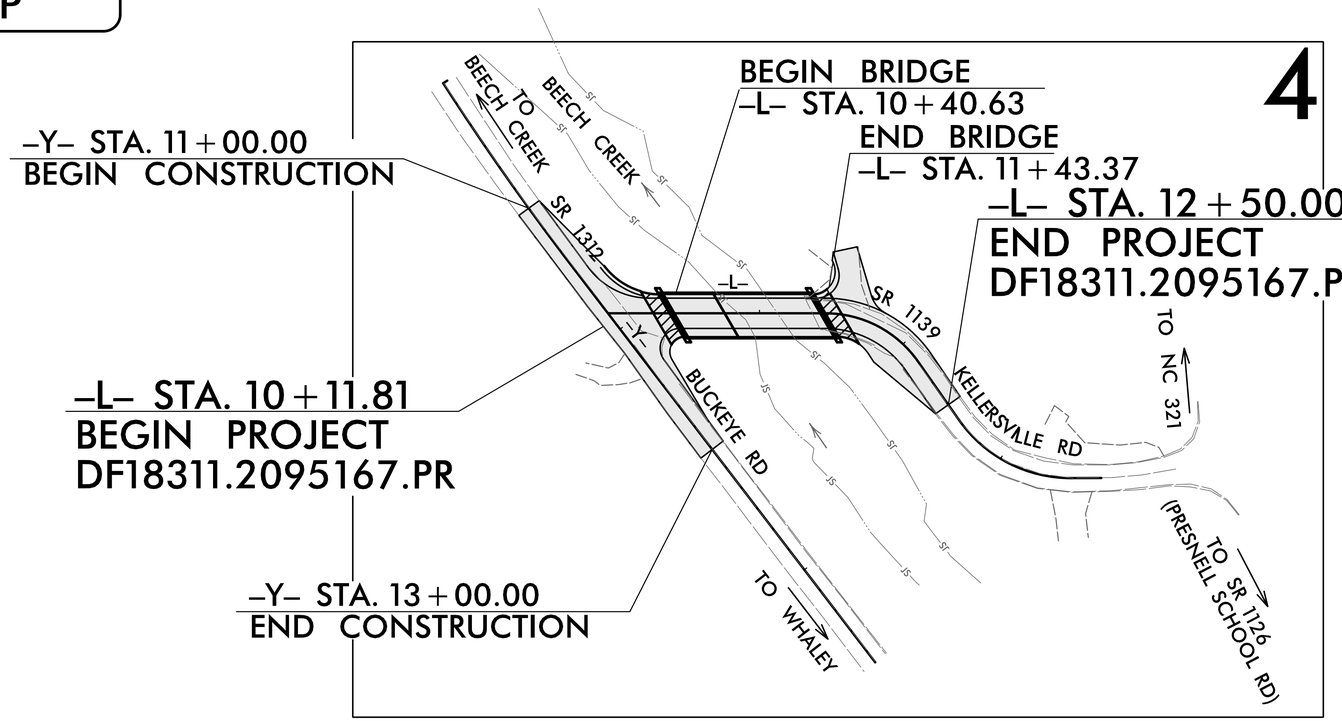
WATAUGA COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DF18311.2095167.PR	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
DF18311.2095167.PR		PE
DF18311.2095167.PR		R/W, UTIL.
DF18311.2095167.PR		CONST.

LOCATION: BRIDGE #940058 OVER BEECH CREEK ON SR 1139 (KELLERSVILLE RD)

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



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

PLANS: 20 10 0 20 40

PROFILE (HORIZONTAL): 20 10 0 20 40

PROFILE (VERTICAL): 4 2 0 4 8

DESIGN DATA

ADT 2025 = 110
ADT 2045 = 135
V = 30 MPH

FUNC CLASS = LOCAL RURAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY PROJECT DF18311.2095167.PR = 0.026 MILES
LENGTH OF STRUCTURE PROJECT DF18311.2095167.PR = 0.019 MILES

TOTAL LENGTH OF PROJECT DF18311.2095167.PR = 0.045 MILES

NCDOT CONTACT: Rob Weisz, PE

PLANS PREPARED BY:

TGS ENGINEERS
201 W. MARION ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PLANS PREPARED FOR:

NORTH CAROLINA DEPARTMENT OF TRANSPORATION
DIVISION 11
801 Statesville Rd
N. Wilkesboro, NC 28659

RIGHT OF WAY DATE: MARCH 28, 2025

LETTING DATE: AUGUST 21, 2025

2024 STANDARD SPECIFICATIONS

JIMMY L. TERRY, PE
PROJECT ENGINEER

SANDRA MELVIN
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

7/7/2025

NORTH CAROLINA PROFESSIONAL SEAL 038697 ENGINEER DAVID B. PETTY

Signed by: David B. Petty
SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

7/7/2025

NORTH CAROLINA PROFESSIONAL SEAL 35018 ENGINEER JIMMY L. TERRY

DocuSigned by: Jimmy Terry
SIGNATURE: *P.E.*

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

7/7/2025
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User:smelvin

8/17/99

TGS ENGINEERS
201 W. MARION ST., STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PROJECT REFERENCE NO.	SHEET NO.
DF1831I.2095167.PR	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 35018 ENGINEER JIMMY L. TERRY
7/7/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

EFF. 01-16-2024
REV.

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 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

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.

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 SKYLINE

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 OTHERS.

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
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation (Use Details in Lieu of Standards for Sheets 1 and 2 of 2)
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
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
840.00	Concrete Base Pad for Drainage Structures
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement (Use Details in Lieu of Standards for Sheets 4, 6, 12, and 14 of 15)
862.02	Guardrail Installation
862.03	Structure Anchor Units (Use Detail in Lieu of Standard for Sheet 8 of 9)
862.04	Anchoring End of Guardrail - for B-77 and B-83 Anchor Units

7/7/2025
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User:jmelvin

PROJECT REFERENCE NO.	SHEET NO.
DF1831I.2095167.PR	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

05/20/24

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 — 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
- 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 — 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
- 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 — A/G Water

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 — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line
- Above Ground Sanitary Sewer — A/G 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. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
DF1831I.2095167.PR	2A-1

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 35018 ENGINEER JIMMY L. TERRY
7/7/2025

PAVEMENT DESIGN ENGINEER

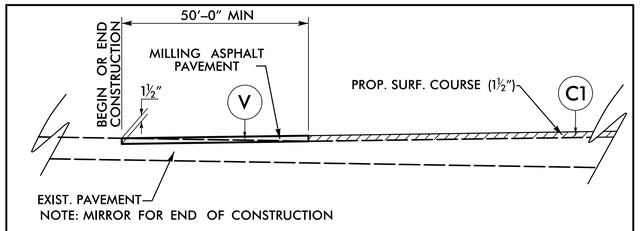
NORTH CAROLINA PROFESSIONAL SEAL 049851 ENGINEER RAMIE A. SHAW
7/7/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

FINAL PAVEMENT SCHEDULE

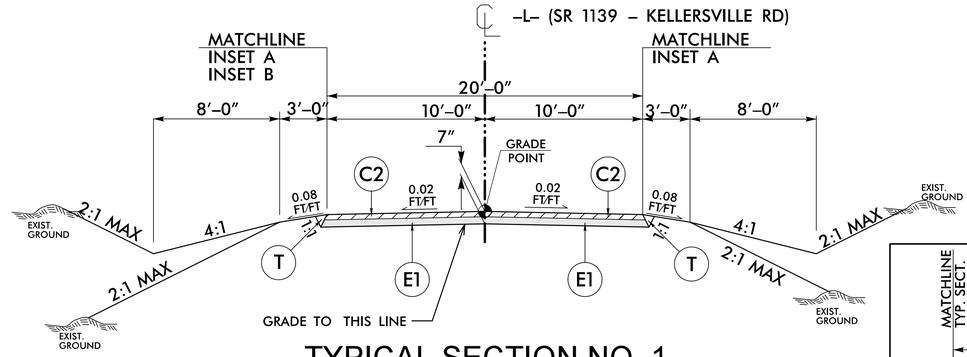
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1" OR GREATER THAN 1 ½"IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	INCIDENTAL MILLING, SEE THIS SHEET FOR DETAIL

PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE SHOWN.



INCIDENTAL MILLING DETAIL

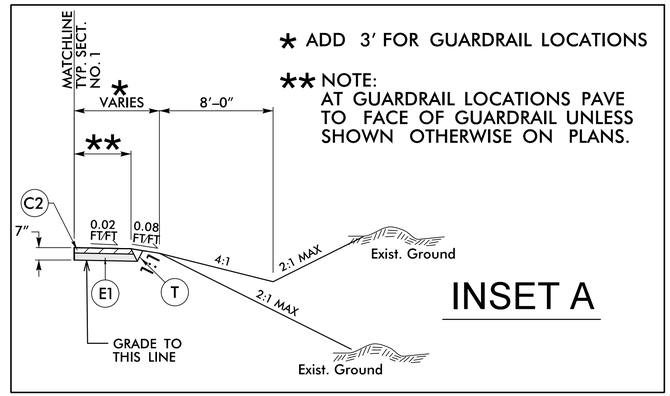
USE MILLING DETAIL AT TIE-IN LOCATIONS



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

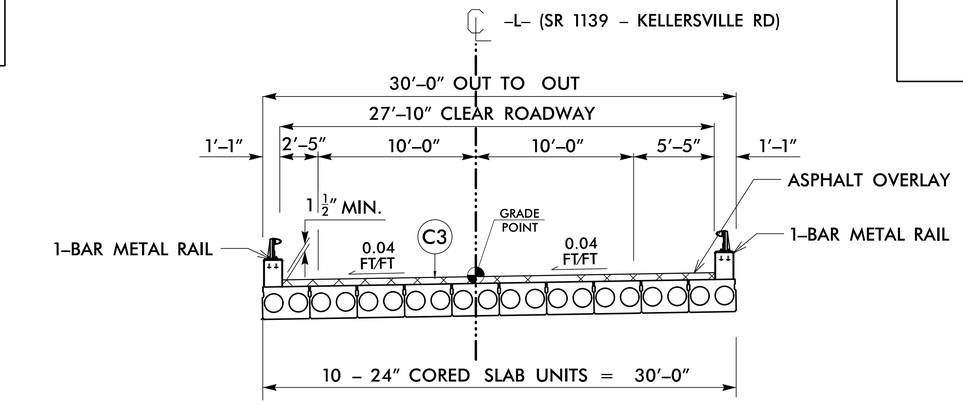
-L- STA. 10+11.81 TO -L- STA. 10+40.63 (BEGIN BRIDGE)
-L- STA. 11+43.37 (END BRIDGE) TO -L- STA. 12+50.00



* ADD 3' FOR GUARDRAIL LOCATIONS

** NOTE:
AT GUARDRAIL LOCATIONS PAVE TO FACE OF GUARDRAIL UNLESS SHOWN OTHERWISE ON PLANS.

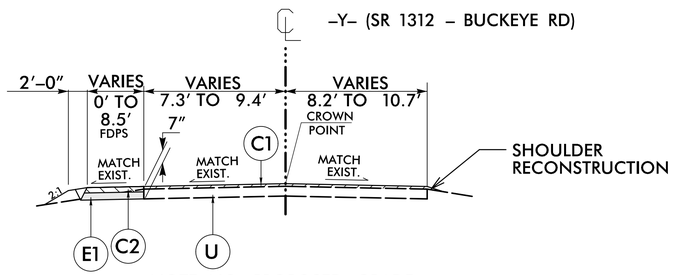
INSET A



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

-L- STA. 10+40.63 TO -L- STA. 11+43.37

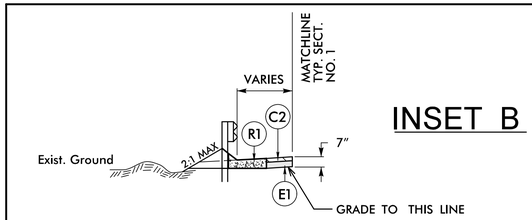


NOTE: NO PROPOSED GRADE

TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

-Y- STA. 11+00.00 TO -Y- STA. 13+00.00

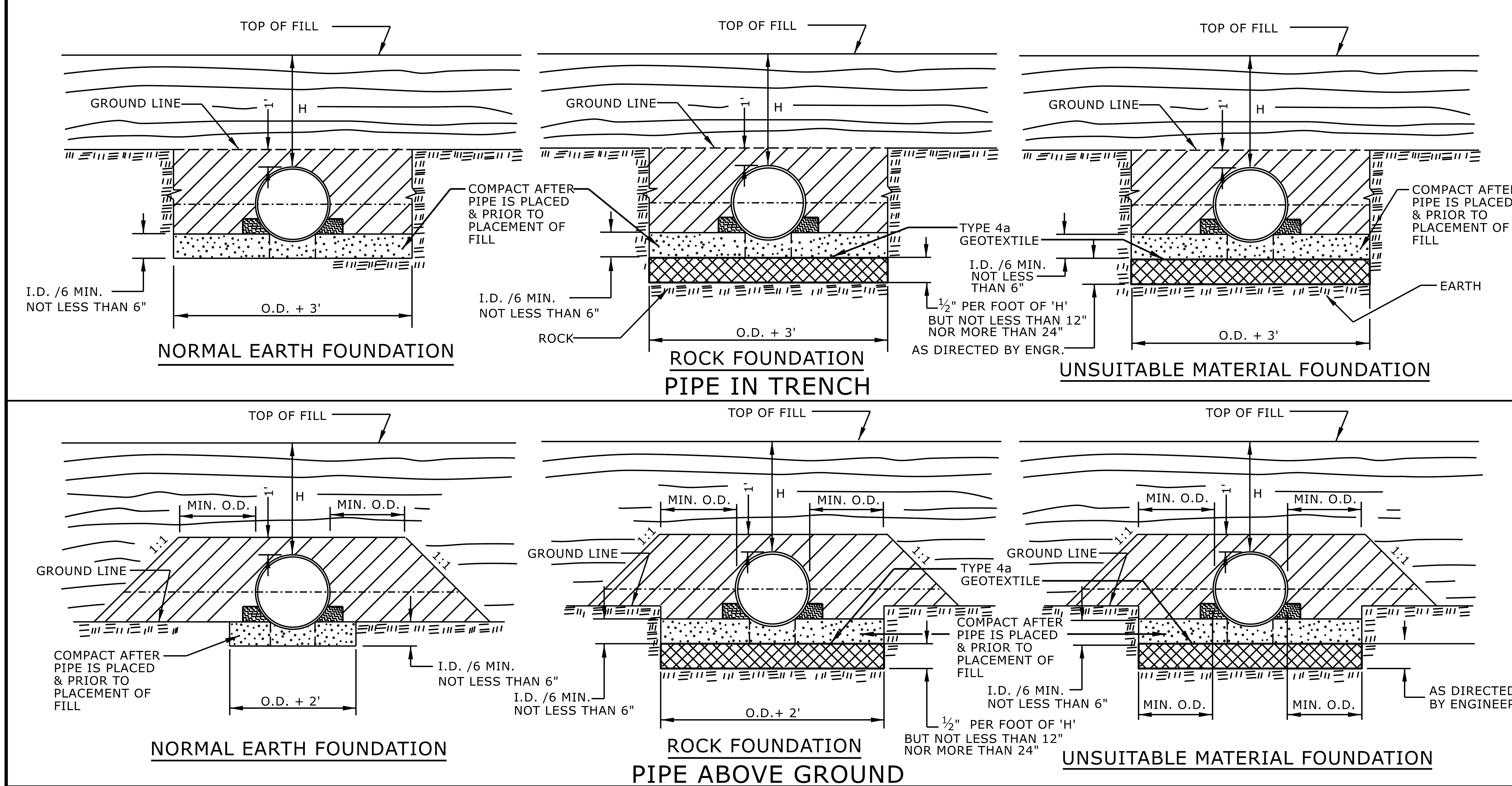


INSET B

USE INSET B

-Y- STA. 11+59.90 LT TO -L- STA. 10+21.67 LT (BEGIN APPROACH SLAB)

PROJECT REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	2C-1



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

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033144 NICOLE M. HACKLER
7/7/2025

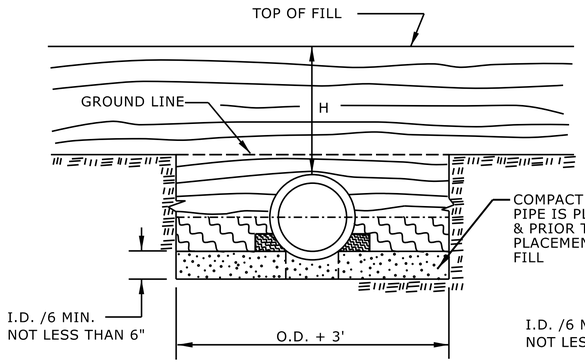
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

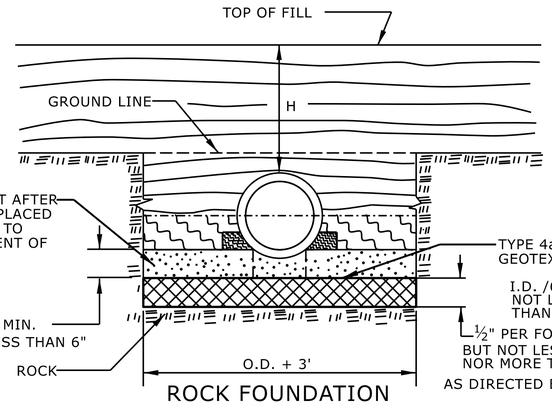
SEE TITLE BLOCK

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

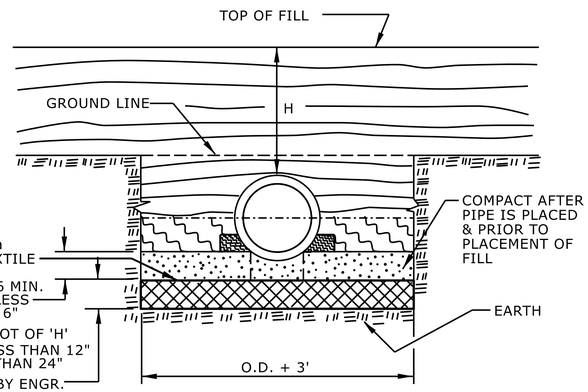
PROJECT REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	2C-2



NORMAL EARTH FOUNDATION

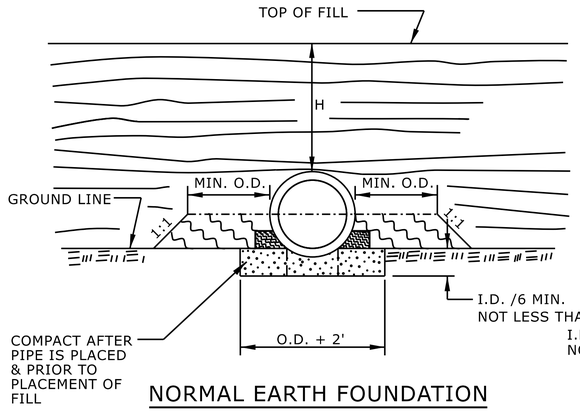


ROCK FOUNDATION

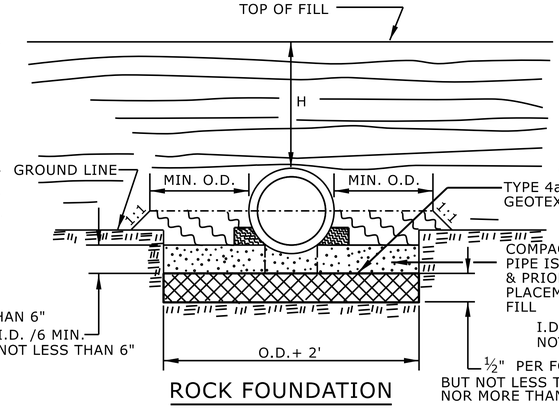


UNSUITABLE MATERIAL FOUNDATION

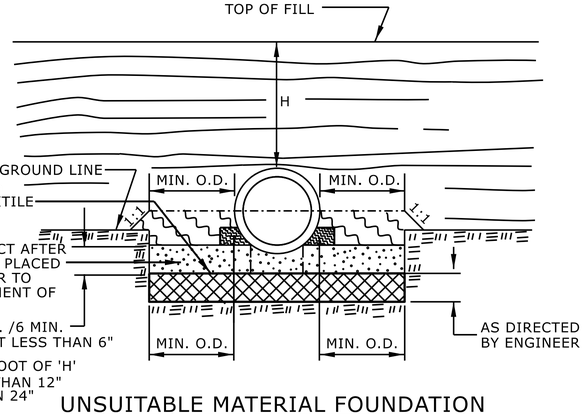
PIPE IN TRENCH



NORMAL EARTH FOUNDATION



ROCK FOUNDATION



UNSUITABLE MATERIAL FOUNDATION

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, 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

SHEET 2 OF 2

300.01

NORTH CAROLINA PROFESSIONAL SEAL 033144 ENGINEER NICOLE M. HACKLER

Signed by: Nicole M. Hackler

7/7/2025

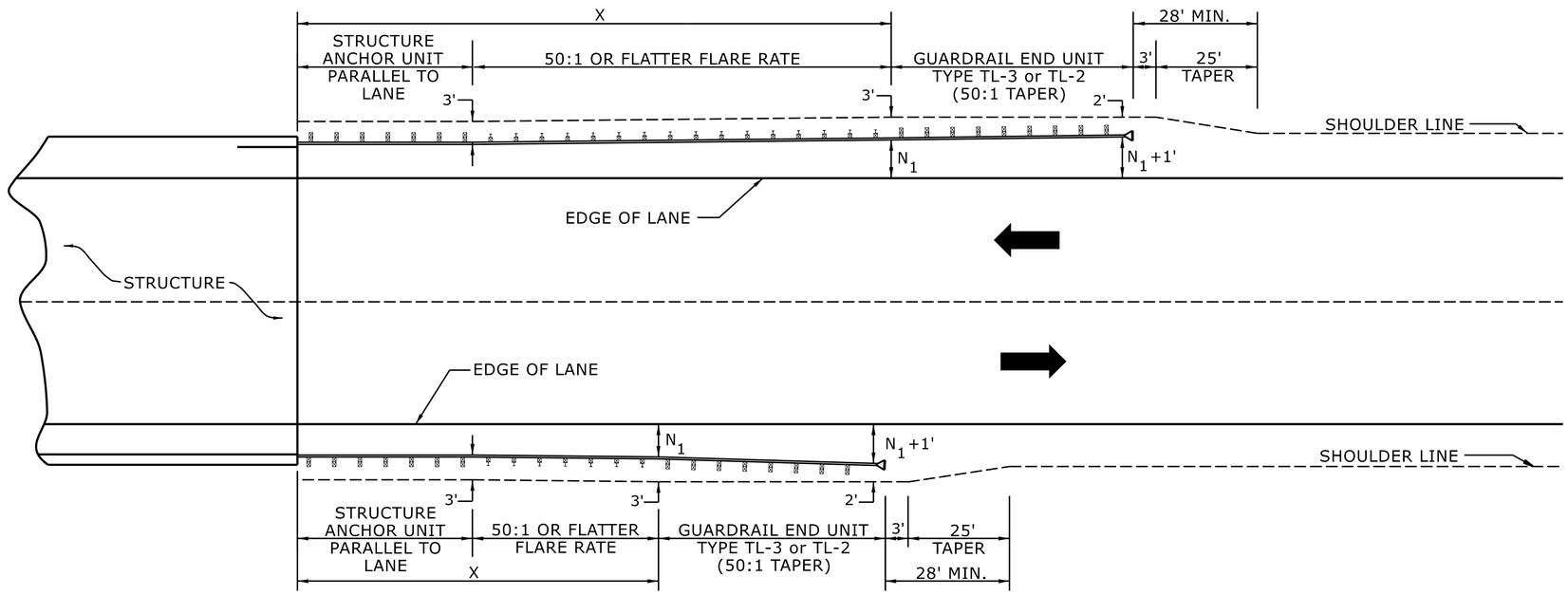
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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.
DF18311.2095167.PR	2C-3



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
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DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 4 OF 15

862D01

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033144 NICOLE M. HACKLER
Nicole M. Hackler
7/7/2025

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AND DEVELOPMENT UNIT
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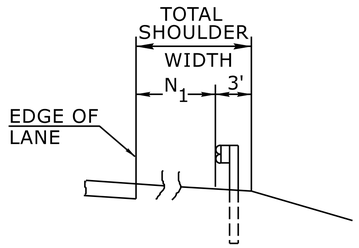
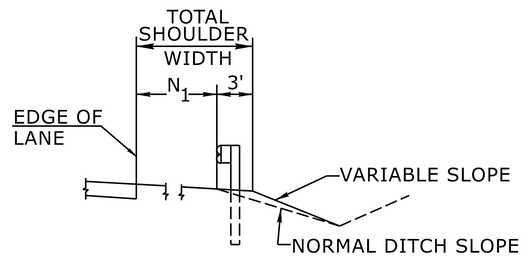
SEE TITLE BLOCK

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

PROJECT REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	2C-4

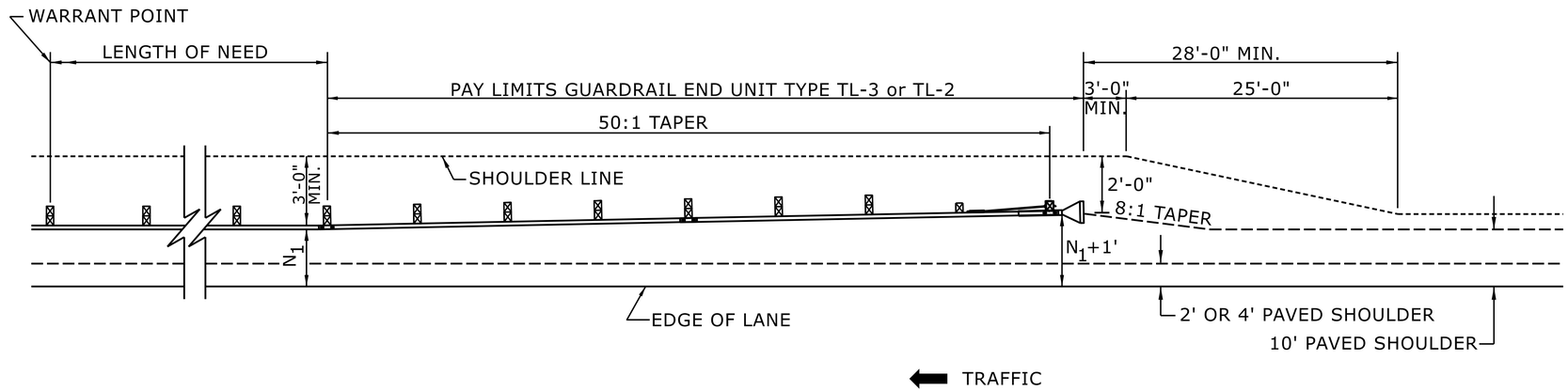


FILL SECTION



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 SEAL 033144 ENGINEER NICOLE M. HACKLER
Signature
Nicole M Hackler
7/7/2025

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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.:

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	2C-5

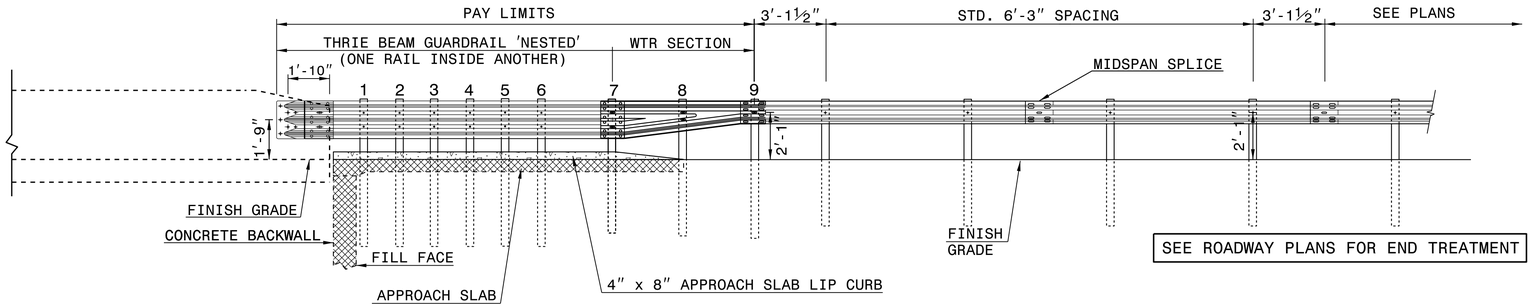
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR

TYPE III - SHOP CURVED STRUCTURE ANCHOR UNIT

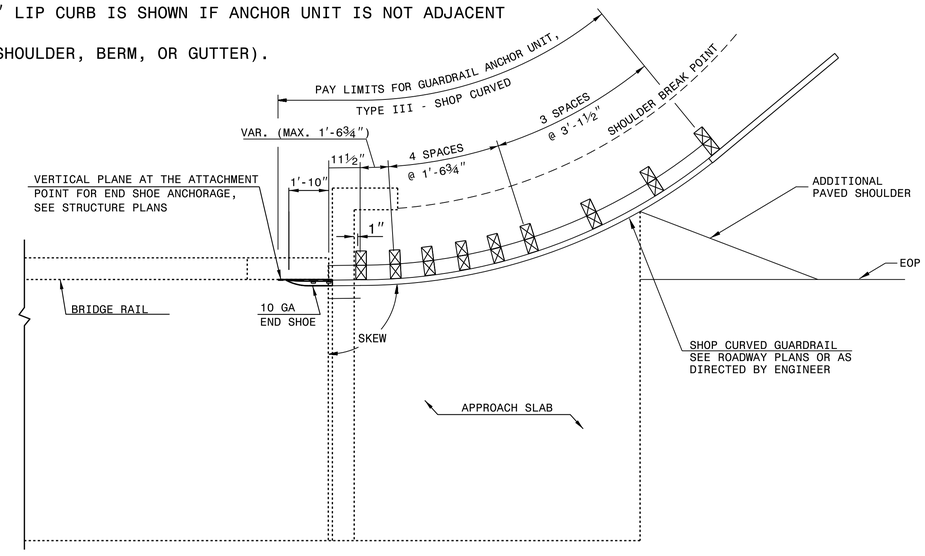
SHEET 1 OF 1

TYPE III SC



ELEVATION

NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-USE NO STEEL POSTS WITHIN THE GUARDRAIL ANCHOR UNIT LIMITS.
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE STANDARD 862.03 SHEET 4 FOR POST SECTIONS 1 THRU 9.



PLAN VIEW

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

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

ENGLISH DETAIL DRAWING FOR

TYPE III - SHOP CURVED STRUCTURE ANCHOR UNIT

SHEET 1 OF 1

TYPE III SC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 33144 NICOLE M. HACKLER

7/7/2025

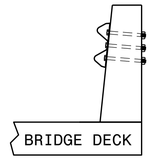
CONTRACT STANDARDS
AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE PLATE FOR TITLE

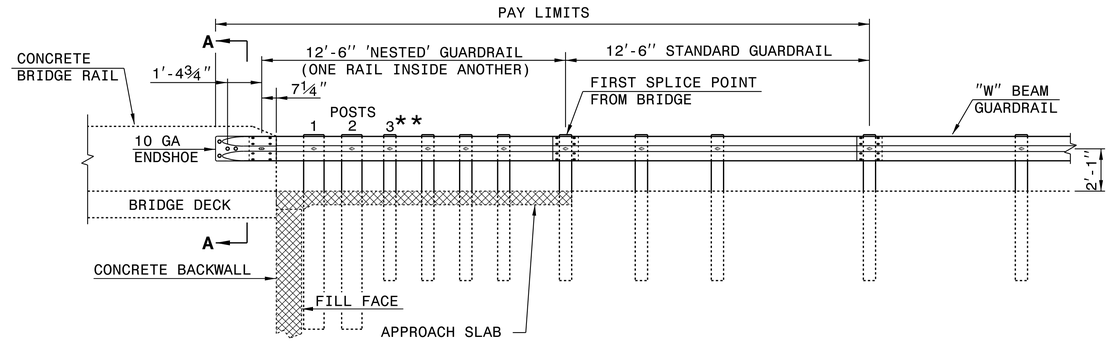
ORIGINAL BY: E.E.Ward DATE: 4-4-02
MODIFIED BY: T.S.Spell DATE: 2-01-18
CHECKED BY: DATE:
FILE SPEC.: \jhowerton\guardrail\31inguardrail\typeiiisc.dgn

01-FEB-2018 09:09
S:\Contracts\Contracts\Special Details\jhowerton\Guardrail\31 inch Guardrail\type_iii_sc.dgn
jhowerton AT CSD-232595

PROJECT REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	2C-6

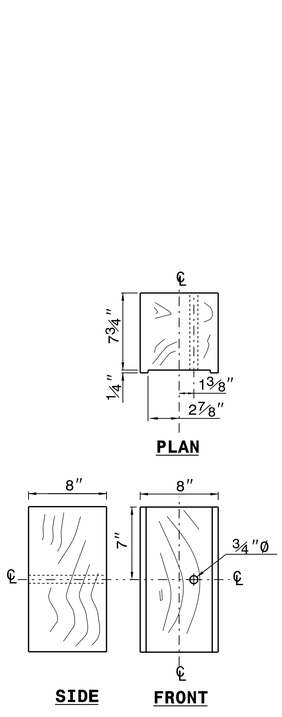


SECTION A-A

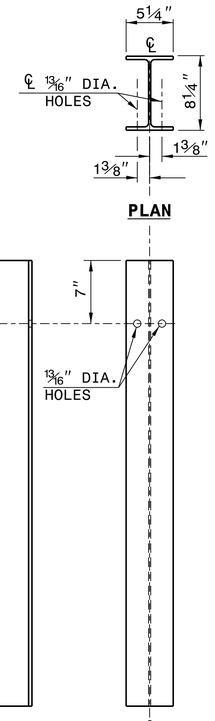


ELEVATION VIEW

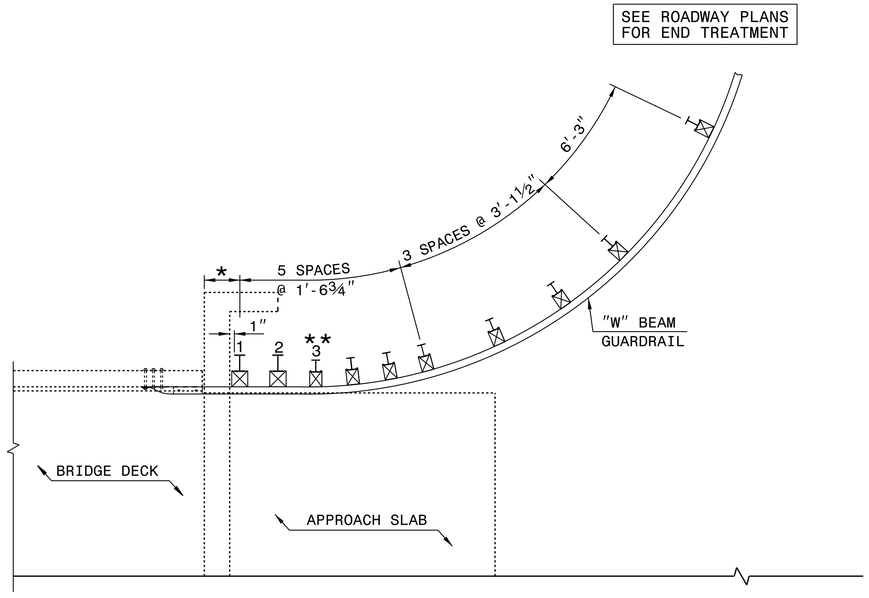
NOTE:
**ELIMINATE POST 3 AND SHIFT POSTS 1 & 2 ON SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½″ IF CONCRETE BACKWALL IS NOT PRESENT.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-USE NO WOOD POSTS WITHIN THE GUARDRAIL ANCHOR UNIT LIMITS.
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-POSTS 1 AND 2 TO BE W8 x 21 X 8′-0″ LONG STEEL POST AND 8″ X 8″ X 14″ WOOD ROUTED OFFSET BLOCK.



8″X 8″X 14″ ROUTED WOOD OFFSET BLOCK



″W8 X 21 X 8′-0″ STEEL POST



PLAN VIEW

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 33144 NICOLE M HACKLER
Nicole M Hackler
7/7/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

GUARDRAIL ANCHOR UNIT TYPE B-83 SHOP CURVED

ORIGINAL BY: E.E. WARD DATE: 6-10-02
MODIFIED BY: E.E. WARD DATE: 7-14-04
CHECKED BY: DATE:
FILE SPEC.:

19-NOV-2018 08:26
S:\Contracts\Contracts\Special Details\Leeward\Misc guardrail\NCHRP350 Approved\b-83 mnndot.dgn
jhowerton AT CSD-292595

Docusign Envelope ID: ED20112A-A3B7-4624-B44D-318DC5631D26

COMPUTED BY: SGM DATE: 5/30/2025
CHECKED BY: JLT DATE: 7/7/2025

PROJECT NO.	SHEET NO.
DF18311.2095167.PR	3B-1

STATE OF NORTH CAROLINA

SUMMARY OF EARTHWORK

IN CUBIC YARDS

Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
-Y- 11+00.00	-Y- 13+00.00	0	37	37	
-L- 10+11.81	-L- 10+40.63	3	62	59	
BRIDGE					
SUBTOTAL:		3	99	96	
-L- 11+43.37	-L- 12+50.00	14	107	93	
SUBTOTAL:		14	107	93	
TOTALS:		17	206	189	
LOSS DUE TO CLEARING & GRUBBING					
PROJECT TOTALS:		17	206	189	0
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				9	
GRAND TOTALS:		17	206	198	0
SAY		50		250	

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

Note: Earthwork quantities are calculated by TGS Engineers. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

SELECT GRANULAR MATERIAL = 400 CUBIC YARDS

SHALLOW UNDERCUT = 100 CUBIC YARDS

PER GEOTECH RECOMMENDATION, ESTIMATED 400 CUBIC YARDS OF UNDERCUT TO BE USED IN THE DISCRETION OF THE RESIDENT ENGINEER.

SHOULDER BERM GUTTER SUMMARY

IN LINEAR FEET

LINE	STATION	STATION	LENGTH
-L-, LT	11+59.90 -Y-	10+21.67	34.70
		TOTAL:	34.70
		SAY	35

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

LINE	STATION	STATION	LT/RT/CL	ASPHALT REMOVAL	ASPHALT BREAKUP	CONCRETE REMOVAL	CONCRETE BREAKUP
-L-	11+35	12+50	CL	253.07			
-L-	Asphalt Pad at Temp. Bridge			66.46			
-L-	Asphalt Pad at Temp. Bridge			29.35			
			TOTAL:	348.88			
			SAY	350			

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
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

FLARE

GUARDRAIL SUMMARY

IN FEET

LINE	BEG. STA.	END STA.	LOC.	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHLDR WIDTH	FLAIR LENGTH		W		ANCHORS					IMP. ATTEN. TYPE 350			Extra Depth Posts	REMOVE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPR. END	TRAIL. END			APPR. END	TRAIL. END	APPR. END	TRAIL. END	TYPE III SC	TL-3	AT-1	B-83 SC		EA	G	NG			
-Y-/-L-	11+10	10+34.76	LT	50.00	43.75			10+34.76	2.42'	5.42'		50'		1'	1	1									R=47'
-L-/-Y-	10+50.83	12+95.00	RT/LT	56.25	25		10+50.83		5.42'	8.42'								1					9		R=10', Tie to exist. Guardrail; Extra Depth post: 56.25 ft @ 6'-3" = 9 ea,
-L-	11+52.90	11+90.25	RT		31.25			11+52.90	5.42'	8.42'					1		1								R=25'
-L-	11+34.90	11+47.00	LT		31.25		11+34.90		2.42'	5.42'					1		1								R=15'
-Y-	12+52.00	12+95.00	LT																					45	
SUB-TOTALS				106.25	131.25										3	1	2	1					9	45	
LESS ANCHOR DEDUCTIONS																									
	TYPE III Shop Curved	3 @ 18.75 ft			56.25																				
	TYPE TL-3	1 @ 50.00 ft		50.00																					
	AT-1	2 @ 6.25 ft			12.5																				
	B-83 Shop Curved	1 @ 25.00 ft			25																				
ANCHOR TOTALS				50.00	93.75																				
GRAND-TOTALS				56.25	37.50										3	1	2	1					9	45	
				62.50	50										3	1	2	1					10	45	

ADDITIONAL GUARDRAIL POSTS = 5 EA

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".

COMPUTED BY: Kathleen Gray, PE DATE: 6/5/2025
CHECKED BY: Zachary Richard, PE DATE: 6/5/2025

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

STATION SIZE THICKNESS OR GAUGE	OFFSET	STRUCTURE NO.		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC)												C.S. PIPE								R.C. PIPE CLASS III								R.C. PIPE CLASS IV								** " R.C. PIPE (CLASS V)	***" RC PIPE CULVERTS, CONTRACTOR DESIGN	***" RC PIPE CULVERTS, CONTRACTOR DESIGN	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	QUANTITIES FOR DRAINAGE STRUCTURES *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B')			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03			CONCRETE TRANSITIONAL SECTION		D.I. STD. 840.14 OR STD. 840.15	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	T.B.D.I STD. 840.35	G.D.I. (N.S. FLAT)FRAME W/2 GRATES STD. 840.29		T.B.D.I STD. 840.35					CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	ABBREVIATIONS C.B. CATCH BASIN N.D.I. NARROW DROP INLET D.I. DROP INLET G.D.I. GRATED DROP INLET G.D.I.(N.S.) (NARROW SLOT) J.B. JUNCTION BOX M.H. MANHOLE T.B.D.I. TRAFFIC BEARING DROP INLET T.B.J.B. TRAFFIC BEARING JUNCTION BOX
		FROM	TO	FT	FT	FT	%	12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"	30"	36"	42"	48"						CY	CY	PER EACH (0' THRU 5.0') EACH	A 5.0' THRU 10.0' LIN.FT	B 10.0' AND ABOVE LIN.FT		TYPE OF GRATE E	F	G	DROP INLET	CATCH BASIN														REMARKS
L 10+11	19 LT	0401		2694.4																																															1												1		1								
		0401	0402		2692.5	2692.0			12								X	X																																																							
L 11+50	25 LT	0403							56																																																															
TOTALS									68																																										1												1		1								

COMPUTED BY: DMB DATE:05/16/2025
CHECKED BY: DMB DATE: 05/16/2025

(9-17-24)

PROJECT NO.	SHEET NO.
DF18311.2095167.PR	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

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

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

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU(1/2)/ AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for 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.

WATAUGA COUNTY
BRIDGE #940058

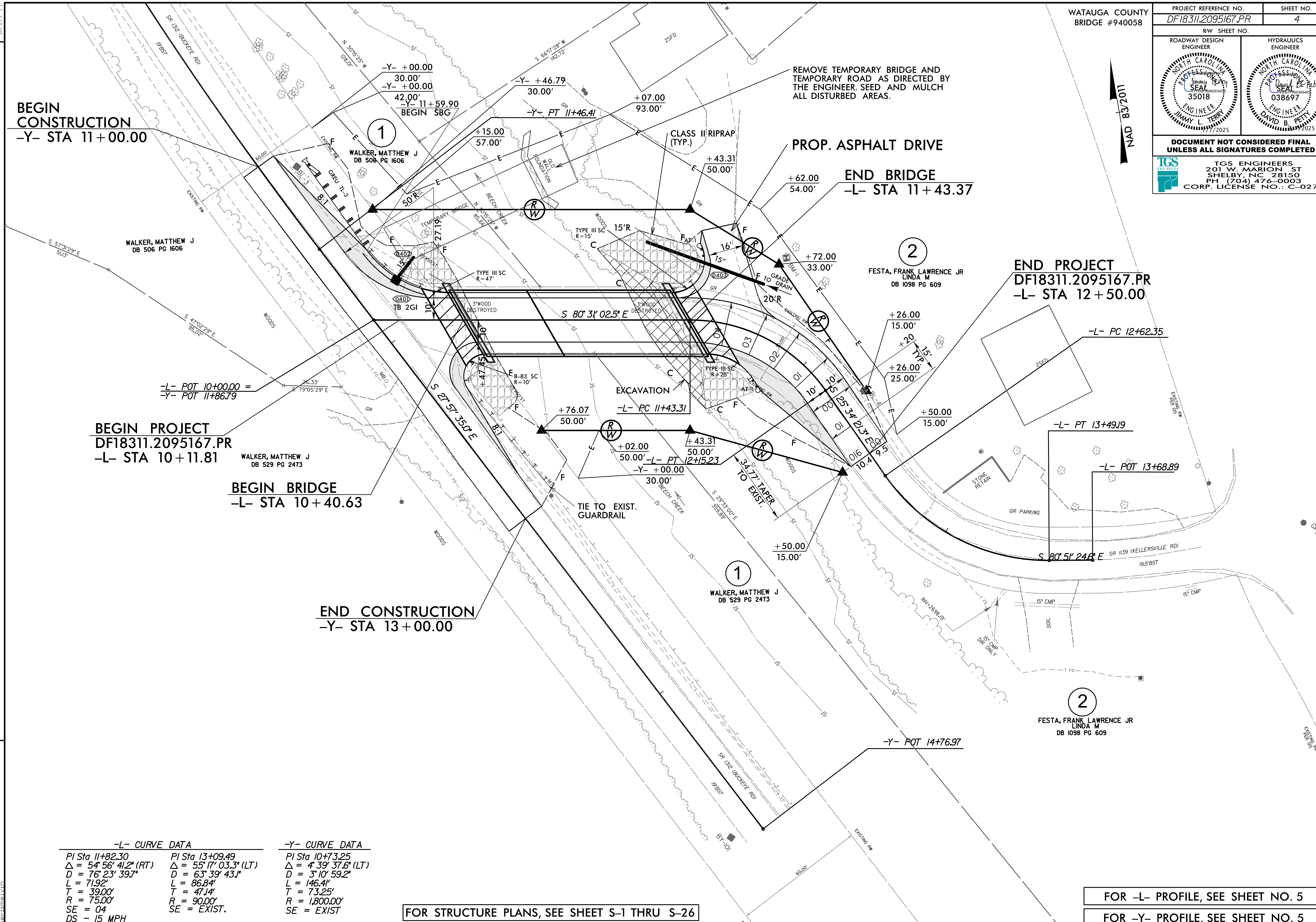
PROJECT REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — SEAL 35018 — JIMMY L. TERRY — 7/7/2025

HYDRAULICS ENGINEER — SEAL 038697 — DAVID B. PETTY — 7/7/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275



BEGIN CONSTRUCTION
-Y- STA 11+00.00
BEGIN PROJECT
DF18311.2095167.PR
-L- STA 10+11.81
BEGIN BRIDGE
-L- STA 10+40.63
END CONSTRUCTION
-Y- STA 13+00.00
END BRIDGE
-L- STA 11+43.37
END PROJECT
DF18311.2095167.PR
-L- STA 12+50.00
PROP. ASPHALT DRIVE
REMOVE TEMPORARY BRIDGE AND TEMPORARY ROAD AS DIRECTED BY THE ENGINEER. SEED AND MULCH ALL DISTURBED AREAS.
CLASS II RIPRAP (TYP.)
EXCAVATION
TIE TO EXIST. GUARDRAIL
34.77' TAPER TO EXIST.
GRADE TO DRAIN
-Y- +00.00 30.00'
-Y- +00.00 42.00'
-Y- 11+59.90 BEGIN SBG
-Y- +46.79 30.00'
-Y- PT 11+46.41
+07.00 93.00'
+15.00 57.00'
+43.31 50.00'
+62.00 54.00'
+72.00 33.00'
+26.00 15.00'
+26.00 25.00'
+50.00 15.00'
+76.07 50.00'
+02.00 50.00'
+43.31 50.00'
-L- PT 12+15.23
-Y- +00.00 30.00'
+50.00 15.00'
-L- POT 10+00.00 =
-Y- POT 11+86.79
-L- PC 11+43.31
-L- PC 12+62.35
-L- PT 13+49.19
-L- POT 13+68.89
-Y- POT 14+76.97
S 80° 31' 02.5" E
S 27° 57' 35.0" E
S 25° 34' 21.3" E
S 80° 51' 24.6" E
WALKER, MATTHEW J
DB 506 PG 1606
WALKER, MATTHEW J
DB 529 PG 2473
FESTA, FRANK LAWRENCE JR
LINDA M
DB 1098 PG 609
SR 1312 (BUCKEYE RD)
SR 1139 (KELLERSVILLE RD)
NAD 83/2011
GR PARKING
STONE RETAIN
TEMPORARY BRIDGE
TYPE III SC R=47'
TYPE III SC R=15'
TYPE III SC R=25'
B-83 SC R=10'
TB 2GI
3"WOOD DESTROYED

-L- CURVE DATA

PI Sta 11+82.30	PI Sta 13+09.49
Δ = 54° 56' 41.2" (RT)	Δ = 55° 17' 03.3" (LT)
D = 76° 23' 39.7"	D = 63° 39' 43.1"
L = 71.92'	L = 86.84'
T = 39.00'	T = 47.14'
R = 75.00'	R = 90.00'
SE = 04	SE = EXIST.
DS - 15 MPH	

-Y- CURVE DATA

PI Sta 10+73.25
Δ = 4° 39' 37.6" (LT)
D = 3° 10' 59.2"
L = 146.41'
T = 73.25'
R = 1,800.00'
SE = EXIST

FOR STRUCTURE PLANS, SEE SHEET S-1 THRU S-26

FOR -L- PROFILE, SEE SHEET NO. 5

FOR -Y- PROFILE, SEE SHEET NO. 5

REVISIONS

8/17/99

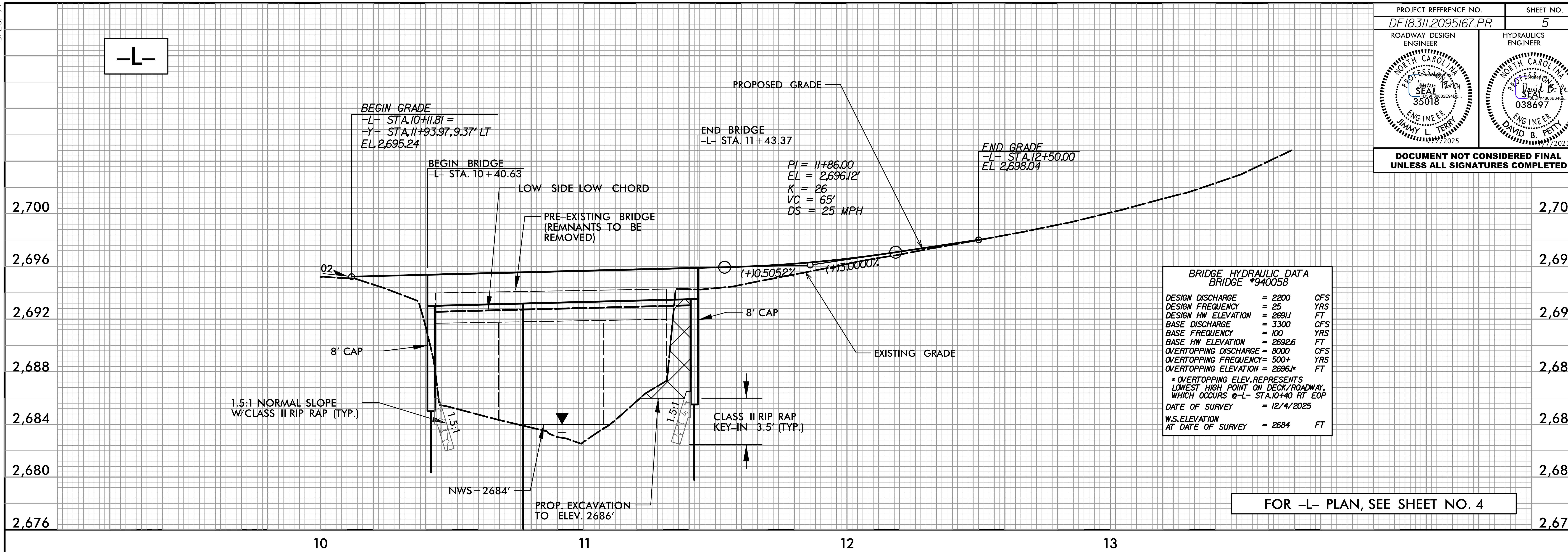
7/7/2025
X:\NCDOT\Div 11 Watauga 58\Roadway\Design\Watauga58_Rdy_psh.dgn

PROJECT REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	5

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35018, JIMMY L. TERRY, DocuSigned by: Jimmy Terry, FD39F38882E94D0..., 7/7/2025

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038697, DAVID B. PETTY, Signed by: David B. Petty, 400EFF4863B6465..., 7/7/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

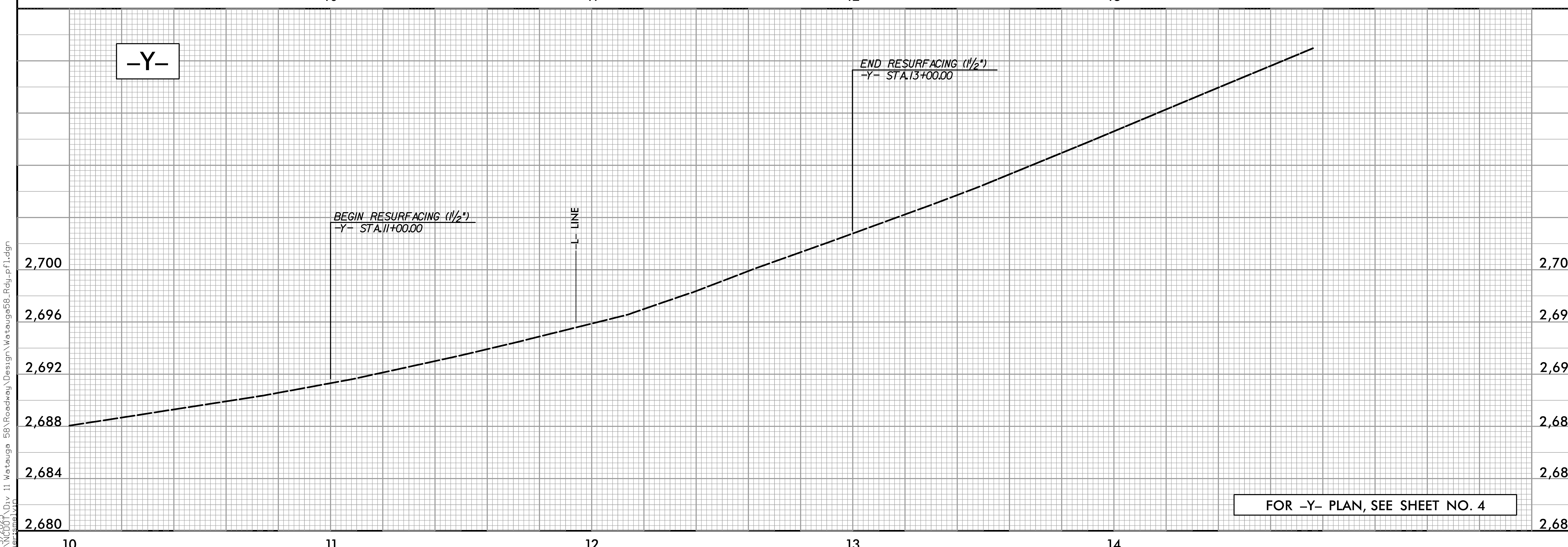


BRIDGE HYDRAULIC DATA
BRIDGE #940058

DESIGN DISCHARGE	= 2200	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 2691.1	FT
BASE DISCHARGE	= 3300	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 2692.6	FT
OVERTOPPING DISCHARGE	= 8000	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 2696.1*	FT

* OVERTOPPING ELEV. REPRESENTS LOWEST HIGH POINT ON DECK/ROADWAY, WHICH OCCURS @-L- STA.10+40 RT EOP

DATE OF SURVEY	= 12/4/2025	
W.S. ELEVATION AT DATE OF SURVEY	= 2684	FT



6/2025

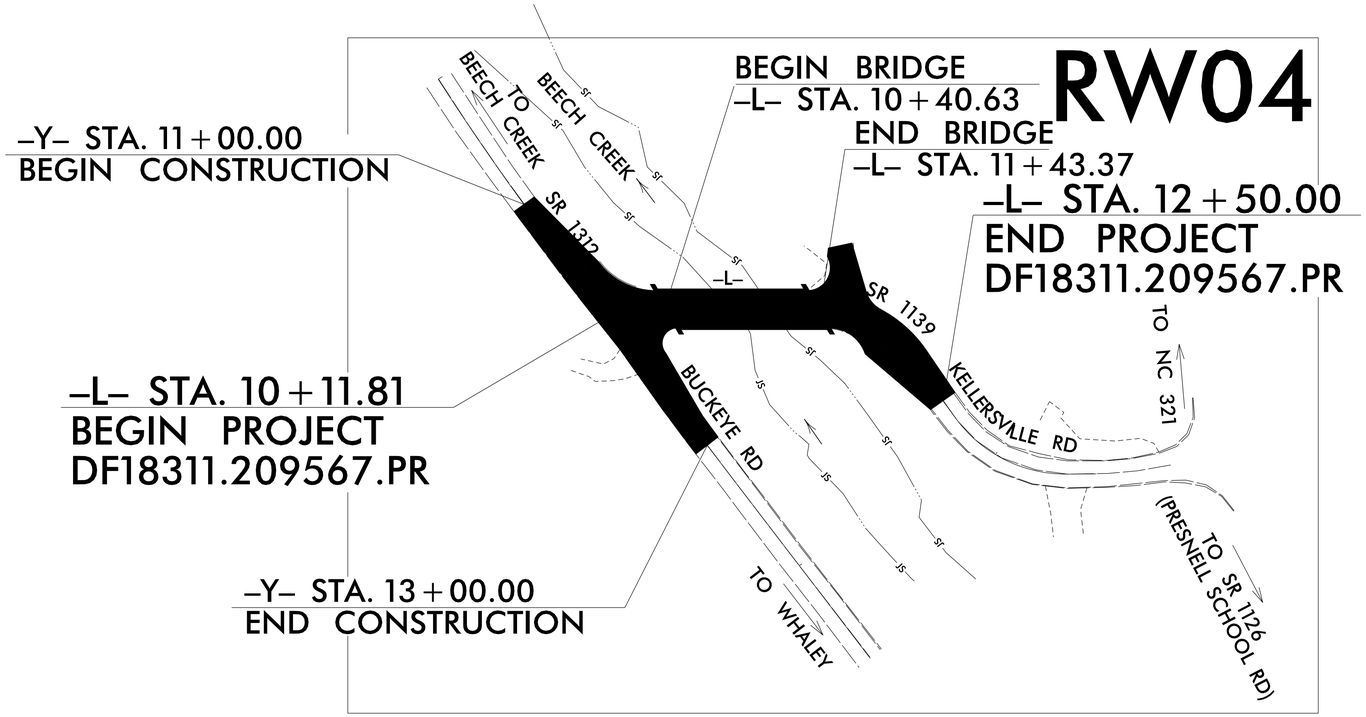
TIP PROJECT: DF18311.2095167.PR

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DF18311.2095167.PR	RW01	7

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENTS AND PROPERTY TIES

WATAUGA COUNTY



GRAPHIC SCALE

50 25 0 50 100
PLANS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "GPS-1" WITH NAD 83/NSRS 2011 STATE PLANE GRID COORDINATES OF NORTHING: 920,556.47(ft) EASTING: 1,145,648.14(ft) ELEVATION: 2,712.280(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998979435
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS-1" TO -L- STATION 10+00.00 IS N 68°13'35.1" W 431.074(ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Prepared In the Office of:

TGS ENGINEERS
201 WEST MARION STREET
SUITE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:	*LETTING DATE:*
3/28/2025	*08/21/2025*

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4775 LAND SURVEYOR MATTHEW T. CORNWELL

Signed by: Matthew Cornwell
EBD36F11473E475...
6/9/2025
SIGNATURE: *Date:*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

09-JUN-2025 07:57
S:\Surveyor\projects\LIB\940058\MTC\WORK\940058_ls_rw01.dgn
mcornwell AT MCORNWELLLAPTOP

6/2/99

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	RW02C-1

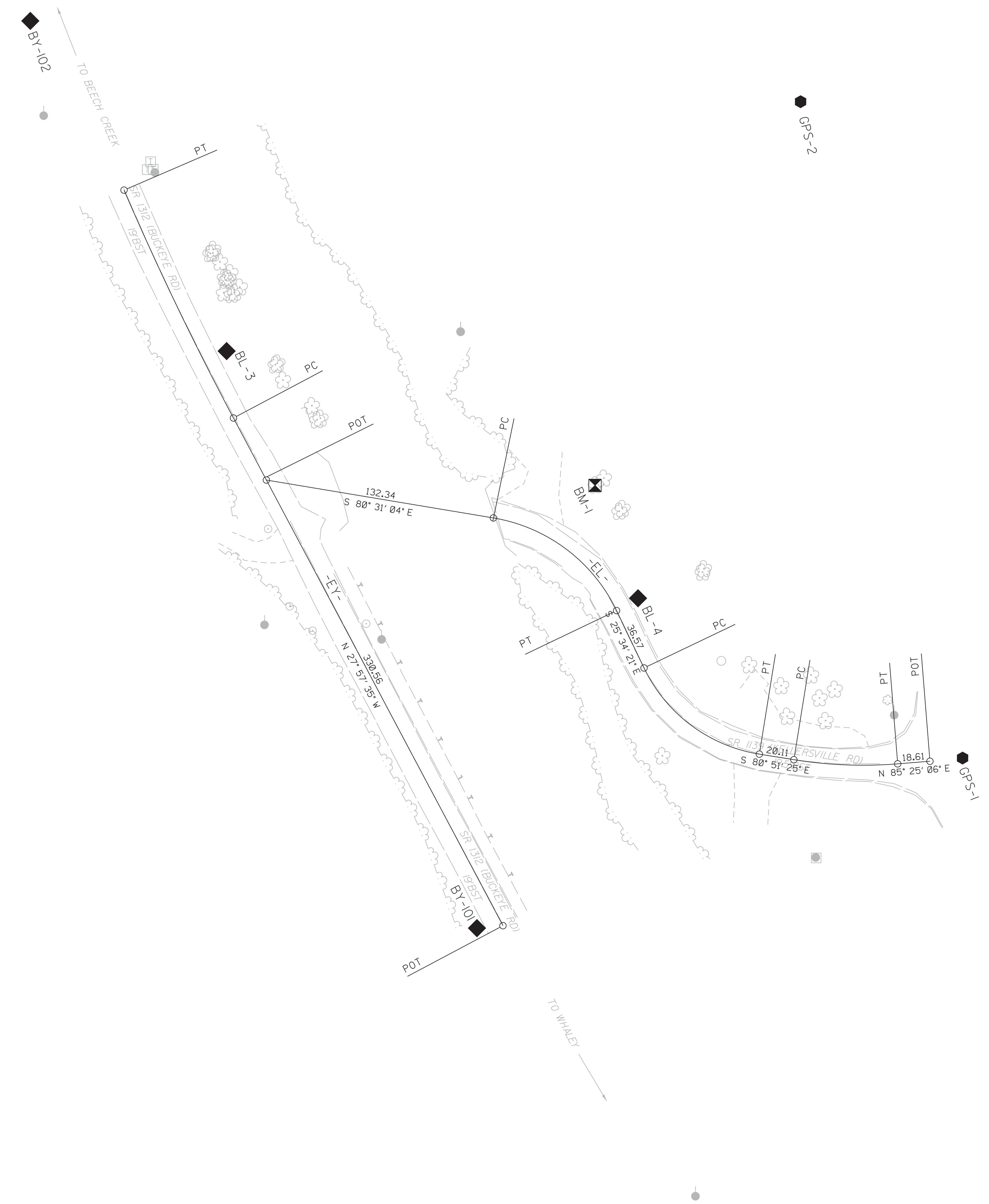
Location and Surveys

PROJECT SURVEYOR

SEAL L-5617 NORTH CAROLINA PROFESSIONAL LAND SURVEYOR SARAH J. VINCENT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NC GRID
NAD 83 NA 2011



I, Sarah J. Vincent, PLS, certify that the Project Control was performed under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: ***AA***
Type of GPS field procedure: RTN
Dates of survey: 10/23/2024-10/30/2024
Datum/Epoch: NAD 83/NSRS 2011
Published/Fixed-control use: N/A
Localized around: GPS-1
Northing: 920556.47
Easting: 1145648.14
Combined grid factor: 0.9998979435
Geoid model: GEOID18
Units: US Survey Feet

I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed from 10/23/2024 to 10/30/2024 , and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 21st day of November, 2024.

DocuSigned by:
Sarah Vincent
Professional Land Surveyor L-5617

SEE SHEET RW02C-3 FOR FURTHER ALIGNMENT DETAILS

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

21-NOV-2024 15:06
C:\Users\USLG729784\Desktop\Projects\Bridges\WATAUGA58\WATAUGA58_RW02C1.dgn
USLG729784 AT 42HYHW3

6/2/99

REVISIONS

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	RW02C-2

Location and Surveys

WSP USA Inc.
1021 WADE AVE
SUITE 400
RALEIGH, NC 27605
TEL: 919.829.4040
WWW.WSP.COM

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-5617 LAND SURVEYOR SARAH J. VINCENT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BL

POINT	DESC.	NORTH	EAST	ELEVATION
2	GPS-2	920933.9600	1145555.0000	2731.06
1	GPS-1	920556.4700	1145648.1400	2712.28
4	BL-4	920648.3600	1145461.5000	2696.80
3	BL-3	920790.5200	1145224.9300	2690.38

BY

POINT	DESC.	NORTH	EAST	ELEVATION
101	BY-101	920458.6300	1145368.8700	2716.20
3	BL-3	920790.5200	1145224.9300	2690.38
102	BY-102	920980.4100	1145112.0500	2684.53

****
BM1 ELEVATION = 2696.11
N 920713 E 1145437
BENCH TIE IN 15" WALNUT
****

I, Sarah J. Vincent, PLS, certify that the Project Control was performed under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: AA
Type of GPS field procedure: RTN
Dates of survey: 10/23/2024-10/30/2024
Datum/Epoch: NAD 83/NSRS 2011
Published/Fixed-control use: N/A
Localized around: GPS-1
Northing: 920556.47
Easting: 1145648.14
Combined grid factor: 0.9998979435
Geoid model: GEOID18
Units: US Survey Feet

I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed from 10/23/2024 to 10/30/2024 , and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 21st day of November, 2024.

DocuSigned by:
Sarah Vincent
-B6054178BA5848A...

Professional Land Surveyor L-5617

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

21-NOV-2024 15:12
C:\Users\USLG729784\Desktop\Projects\Bridges\WATAUGA58\Watauga58_RW02C2 - Copy.dgn
USLG729784 AT 42HYHW3

6/2/99

REVISIONS

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	RW02C-3

Location and Surveys

WSP USA Inc.
1021 WADE AVE
SUITE 400
RALEIGH, NC 27605
TEL: 919.829.4040
WWW.WSP.COM

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-5617 LAND SURVEYOR SARAH J. VINCENT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I, Sarah J. Vincent, PLS, certify that the Project Control was performed under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: AA
Type of GPS field procedure: RTN
Dates of survey: 10/23/2024-10/30/2024
Datum/Epoch: NAD 83/NSRS 2011
Published/Fixed-control use: N/A
Localized around: GPS-1
Northing: 920556.47
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Units: US Survey Feet

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This 21st day of November, 2024.

DocuSigned by:
Sarah Vincent
860541788A5848A...

Professional Land Surveyor L-5617

EL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	920716.371	1145247.820							
LINE			S 80°31'04.0" E	132.34					
PC	920694.569	1145378.356							
CURVE			S 53°02'42.7" E	88.65	54°56'42.7"(RT)	59°37'51.1"	92.14	49.96	96.08
PT	920641.273	1145449.198							
LINE			S 25°34'21.3" E	36.57					
PC	920608.289	1145464.982							
CURVE			S 53°12'53.0" E	82.79	55°17'03.3"(LT)	64°13'07.9"	86.09	46.73	89.22
PT	920558.715	1145531.284							
LINE			S 80°51'24.6" E	20.11					
PC	920555.519	1145551.142							
CURVE			S 87°43'09.5" E	59.74	13°43'29.7"(LT)	22°55'05.9"	59.89	30.09	250.00
PT	920553.142	1145610.838							
LINE			N 85°25'05.7" E	18.61					
POT	920554.628	1145629.385							

EY

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	920460.065	1145383.870							
LINE			N 27°57'35.0" W	330.56					
PC	920752.037	1145228.889							
CURVE			N 25°38'45.0" W	145.39	04°37'40.1"(RT)	03°10'56.1"	145.42	72.75	1800.47
PT	920883.100	1145165.965							

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

21-NOV-2024 14:11
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USLG729784
AT 42HYHW3

6/2025

PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	RW02D-1

Location and Surveys

TGS ENGINEERS
TGS ENGINEERS
201 WEST MARION STREET
SUITE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PROJECT SURVEYOR

Signed by:
Matthew Cornwell
EBD36F11473E475...

NORTH CAROLINA PROFESSIONAL SEAL L-4775 LAND SURVEYOR MATTHEW T. CORNWELL

6/9/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I, Matthew T. Cornwell, PLS, certify that the data compiled came from available surveys/mapping performed by others and provided to me by NCDOT and do not certify to the accuracy or quality of the individual data sources.

This 6/9/2025.

Signed by:
Matthew Cornwell
EBD36F11473E475...

Professional Land Surveyor L-4775

REVISIONS

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	920716.3725	1145247.8198
PC	11+43.31	920692.7627	1145389.1696
PT	12+15.23	920651.1616	1145444.4664
PC	12+62.35	920608.6581	1145464.8056
PT	13+49.19	920558.6505	1145531.6880
POT	13+68.89	920555.5195	1145551.1418

Y

TYPE	STATION	NORTH	EAST
PC	10+00.00	920884.0076	1145165.5755
PT	11+46.41	920752.0370	1145228.8888
POT	14+76.97	920460.0650	1145383.8700

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

2. THE PROPOSED ALIGNMENT CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

03-JUN-2025 13:09
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mcornwell AT MCORNWELLLAPTOP

6/2025

REVISIONS

RIGHT OF WAY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	RW03E-1

Location and Surveys

TGS ENGINEERS
201 WEST MARION STREET
SUITE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PROJECT SURVEYOR

Signed by:
Matthew Cornwell
EBD36F11473E475...

6/9/2025

NORTH CAROLINA PROFESSIONAL SEAL L-4775 LAND SURVEYOR MATTHEW T. CORNWELL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I , Matthew T. Cornwell, certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from 6/4/2025 to 6/5/2025, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 6/9/2025

Signed by:
Matthew Cornwell
EBD36F11473E475...

Professional Land Surveyor L-4775

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y	11+46.79	-30.00	920765.7719	1145255.5626

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
L	10+76.07	50.00	920654.5231	1145314.6145
L	11+43.31	50.00	920643.4459	1145380.9321
L	11+43.31	-50.00	920742.0792	1145397.4090
L	11+72.00	-33.00	920710.9693	1145433.0852
L	12+26.00	-15.00	920647.9219	1145462.6456
L	12+50.00	15.00	920613.3234	1145445.9442

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED 6/4/2025 TO 6/5/2025.

09-JUN-2025 07:59
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mcornwell A1PC MCORNWELL LAPTOP

PROJECT REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	RW04

Location and Surveys

TGS ENGINEERS
201 WEST MARION STREET
SUITE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PROJECT SURVEYOR

Signed by: Matthew Cornwell
EBD36F11473E475...

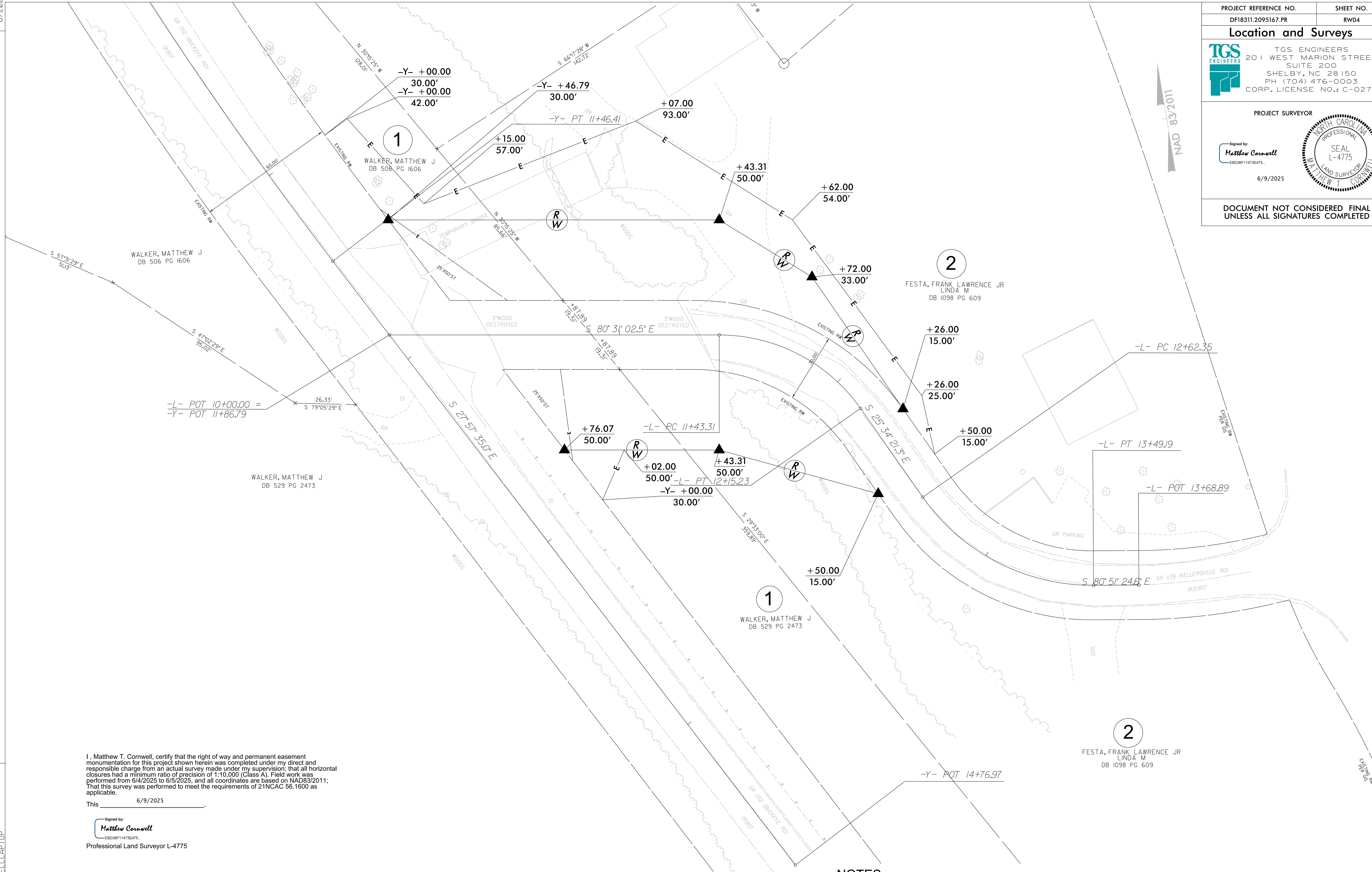
6/9/2025

NORTH CAROLINA PROFESSIONAL SEAL L-4775 LAND SURVEYOR MATTHEW T. CORNWELL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

6/2025



I, Matthew T. Cornwell, certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from 6/4/2025 to 6/5/2025, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 6/9/2025.

Signed by: Matthew Cornwell
EBD36F11473E475...

Professional Land Surveyor L-4775

-L- CURVE DATA

PI Sta 11+82.30	PI Sta 13+09.49
△ = 54° 56' 41.2" (RT)	△ = 55° 17' 03.3" (LT)
D = 76° 23' 39.7"	D = 63° 39' 43.1"
L = 71.92'	L = 86.84'
T = 39.00'	T = 47.14'
R = 75.00'	R = 90.00'
SE = 04	SE = EXIST.
DS - 15 MPH	

-Y- CURVE DATA

PI Sta 10+73.25
△ = 4° 39' 37.6" (LT)
D = 3° 10' 59.2"
L = 146.41'
T = 73.25'
R = 1,800.00'
SE = EXIST

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED 6/4/2025 TO 6/5/2025.

09-JUN-2025 08:02
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mcornwell AT MCORNWELLLAPTOP

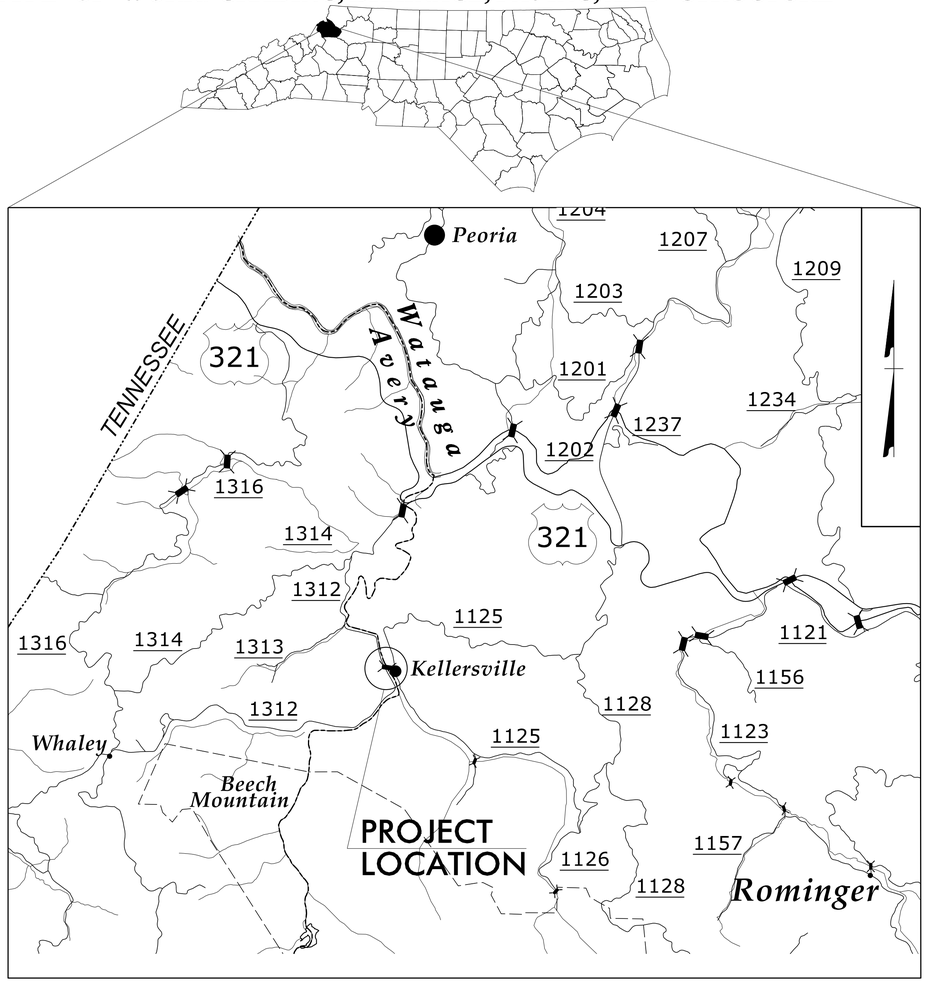
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

WATAUGA COUNTY

LOCATION: BRIDGE #940058 OVER BEECH CREEK ON SR 1139 (KELLERSVILLE RD)

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



VICINITY MAP

INDEX OF SHEETS

SHEET NO.
TMP-1

TIP PROJECT: DF1811.2095167.PR

PLANS PREPARED FOR N.C.D.O.T. BY: TGS ENGINEERS

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

DON A. PARKER, P.E.
PROJECT ENGINEER

CODA BRANNAN, E.I.
DESIGN ENGINEER

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

APPROVED: Signed by: Don A. Parker 75DBBE90ADEF440...

DATE: 7/8/2025

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A. PARKER

6/16/2025
X:\NCDOT\Div 11\Watauga 58\Work Zone Traffic Control\Watauga58_TC_TMP_01.dgn
User:cbrannan

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGERS
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO LANE AND MULTILANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.12	PAVEMENT MARKINGS - BRIDGES
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

PROJ. REFERENCE NO.	SHEET NO.
DF183111.2095167.PR	TMP-1A

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

LEGEND

GENERAL

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

SIGNALS

EXISTING | PROPOSED | TEMPORARY

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

TRAFFIC CONTROL DEVICES

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

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

PAVEMENT MARKERS

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

PAVEMENT MARKING SYMBOLS

PAVEMENT MARKING SYMBOLS

TEMPORARY PAVEMENT MARKING

SYMBOL	DESCRIPTION
P61	WHITE STOPBAR (24")

APPROVED: Signed by: Don A. Parker 75DB9E90ADEF440... DATE: 7/8/2025

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A. PARKER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

ROADWAY STANDARD DRAWINGS & LEGEND

PROJ. REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	TMP-1B

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

GENERAL NOTES

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

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

LANE AND SHOULDER CLOSURE REQUIREMENTS

A) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.

B) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.

C) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 5 FT OF AN OPEN TRAVEL LANE ON AN UNDIVIDED FACILITY, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

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

D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.

E) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.

PAVEMENT EDGE DROP OFF REQUIREMENTS

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

BACKFILL DROP-OFFS THAT EXCEED 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.

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

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

TRAFFIC PATTERN ALTERATIONS

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

SIGNING

H) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

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

J) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 100 FT IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC BARRIER

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

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

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

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

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

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

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

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

TRAFFIC CONTROL DEVICES

M) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.

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

PAVEMENT MARKINGS AND MARKERS

O) INSTALL TEMPORARY PAVEMENT MARKINGS AND TEMPORARY PAVEMENT MARKERS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

ROAD NAME	MARKING	MARKER
-L- SR 1139 KELLERSVILLE RD	PAINT	NONE
-Y- SR 1312 BUCKEYE RD	PAINT	NONE

P) PLACE ONE APPLICATION OF PAINT FOR TEMPORARY TRAFFIC PATTERNS. PLACE A SECOND APPLICATION OF PAINT SIX (6) MONTHS AFTER THE INITIAL APPLICATION AND EVERY SIX MONTHS AS DIRECTED BY THE ENGINEER.

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

R) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

MANAGEMENT STRATEGIES

THE FOLLOWING LISTED WORK ZONE STRATEGIES ARE RECOMMENDED FOR INCLUSION WITHIN THIS TRANSPORTATION MANAGEMENT PLAN (TMP).

RECOMMENDED STRATEGIES:

TRAFFIC MANAGEMENT STRATEGIES:
- LANE SHIFTS OR CLOSURES
- SHOULDER CLOSURES
- ONE-LANE, TWO WAY OPERATION (FLAGGING)
- ONE-LANE, TWO WAY OPERATION (SIGNALIZED)

LOCAL NOTES

DUE TO SITE CONDITIONS, PLACEMENT OF THE WATERFILLED BARRIER FROM -L- STA. 11+34± TO STA. 11+56± IS NOT REQUIRED TO BE ON AN ASPHALT OR CONCRETE SURFACE.

APPROVED: Signed by: Don A. Parker 75DB9E90ADEF440...

DATE: 7/8/2025

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A. PARKER

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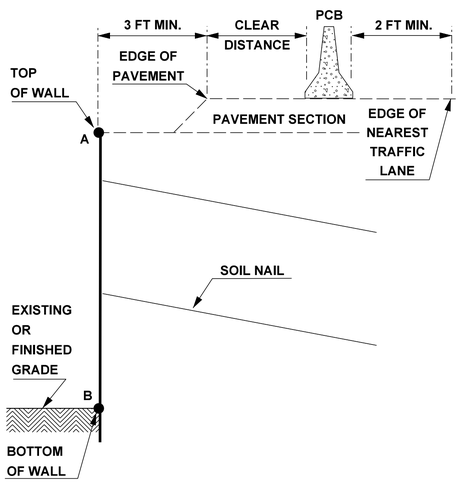
DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

TRANSPORTATION OPERATIONS PLAN

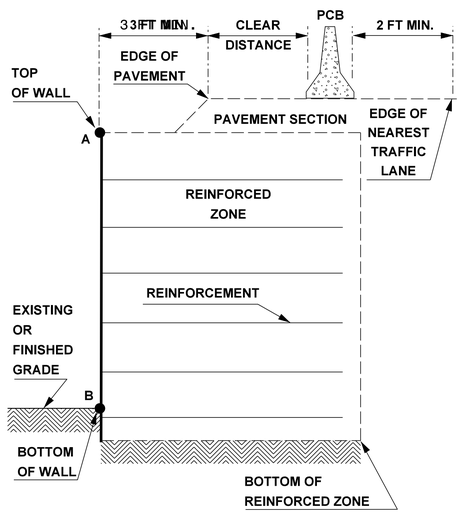
6/16/2025
X:\NCDOT\Div II Watauga 58\Work Zone Traffic Control\Watauga58_TC_TMP_01B.dgn
User:cbrannan

PROJ. REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	TMP-2

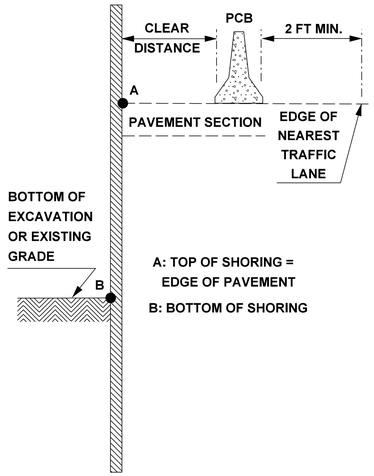
TEMPORARY SOIL NAIL WALL



TEMPORARY MSE WALL



TEMPORARY SHORING



NOTE: WALL OR SHORING HEIGHT = A-B

FIGURE A

NOTES

1- REFER TO THE TRAFFIC CONTROL PLANS FOR TEMPORARY SHORING LOCATIONS AND NOTES.

2- REFER TO THE "TEMPORARY SHORING" STANDARD PROVISION FOR INFORMATION ABOUT TEMPORARY SHORING AND PORTABLE CONCRETE BARRIER (PCB).

3- PCB IS REQUIRED IF TEMPORARY SHORING/WALL IS LOCATED WITHIN THE CLEAR ZONE IN ACCORDANCE WITH THE AASHTO ROADSIDE DESIGN GUIDE. DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE. (CONTACT NCDOT PAVEMENT MANAGEMENT FOR APPLICABLE PAVEMENT DESIGN).

4- BASED ON THE CLEAR DISTANCE, OFFSET, DESIGN SPEED AND PAVEMENT TYPE, CHOOSE AN UNANCHORED OR ANCHORED PCB FROM THE TABLE SHOWN IN FIGURE B. CLEAR DISTANCE IS DEFINED AS SHOWN IN FIGURE A AND OFFSET IS DEFINED AS SHOWN IN FIGURE B.

5- AT THE CONTRACTOR'S OPTION OR IF THE MINIMUM REQUIRED CLEAR DISTANCE IS NOT AVAILABLE, SET PCB NEXT TO AND UP AGAINST THE TRAFFIC SIDE OF THE TEMPORARY SHORING/WALLS EXCEPT FOR BARRIER ABOVE TEMPORARY WALLS. PCB WITH THE MINIMUM REQUIRED CLEAR DISTANCE IS REQUIRED ABOVE TEMPORARY WALLS.

6- USE NCDOT PORTABLE CONCRETE BARRIER (PCB) IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1170.01 AND SECTION 1170 OF THE STANDARD SPECIFICATIONS.

7- SET PCB WITH A MINIMUM HORIZONTAL DISTANCE OF 2 FT BETWEEN THE FRONT FACE OF THE BARRIER AND THE EDGE OF THE NEAREST TRAFFIC LANE AS SHOWN IN FIGURE A UNLESS OTHERWISE SHOWN IN THE PLANS OR APPROVED BY THE ENGINEER.

8- FOR PCB ABOVE AND BEHIND TEMPORARY WALLS, PROVIDE A MINIMUM DISTANCE OF 3 FT BETWEEN THE EDGE OF PAVEMENT AND THE WALL FACE AS SHOWN IN FIGURE A. IF THIS MINIMUM REQUIRED DISTANCE IS NOT AVAILABLE, CONTACT THE ENGINEER.

9- TABLE SHOWN IN FIGURE B IS BASED ON NCDOT RESEARCH PROJECT NO. 2005-010 WITH VEHICLE TYPE USED FOR NCHRP 350 CRASH TESTS.

MINIMUM REQUIRED CLEAR DISTANCE, inches

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

* See Figure Below

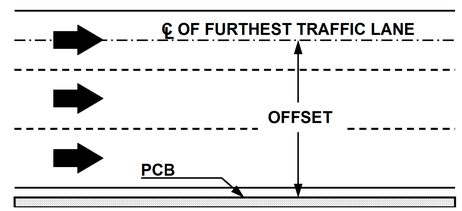


FIGURE B

APPROVED: Signed by: Don A. Parker 75DB9E9RADEF440...

DATE: 7/8/2025

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A PARKER

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DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

PORTABLE CONCRETE BARRIER AT TEMPORARY SHORING LOCATIONS

PROJ. REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	TMP-2A

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

SHORING NOTES

Shoring Location No. 1 (CUT SHORING):

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

TEMPORARY SHORING IS REQUIRED FOR THE STRUCTURE CONSTRUCTION FROM -L- STATION 10+17±, 19.7′ LT TO -L- STATION 10+34±, 19.7′ LT.

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

DESIGN TEMPORARY SHORING FROM -L- STATION 10+17±, 19.7′ LT TO -L- STATION 10+34±, 19.7′ LT, FOR THE FOLLOWING ASSUMED SOIL PARAMETERS:

ABOVE ELEVATION 2,681.3 FT
UNIT WEIGHT (γ) = 120 LB/CF
FRICTION ANGLE (ϕ) = 26 DEGREES
COHESION (c) = 0 LB/SF

ELEVATION 2,681.3 FT TO ELEVATION 2,679.5 FT
UNIT WEIGHT (γ) = 135 LB/CF
FRICTION ANGLE (ϕ) = 38 DEGREES
COHESION (c) = 500 LB/SF
GROUNDWATER ELEVATION = 2,681.3 FT

BELOW ELEVATION 2,679.5 FT (ROCK)
UNIT WEIGHT (γ) = 165 LB/CF
FRICTION ANGLE (ϕ) = 40 DEGREES
COHESION (c) = 1000 LB/SF

LIMITED SUBSURFACE INFORMATION IS AVAILABLE IN THE VICINITY OF TEMPORARY SHORING FROM -L- STATION 10+17±, 19.7′ LT TO -L- STATION 10+34±, 19.7′ LT. THE INFORMATION PROVIDED FOR TEMPORARY SHORING DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL CONDITIONS ENCOUNTERED DURING CONSTRUCTION.

DRIVEN PILING FOR TEMPORARY SHORING FROM -L- STATION 10+17±, 19.7′ LT TO -L- STATION 10+34±, 19.7′ LT MAY NOT PENETRATE BELOW ELEVATION 2,681.3 FT DUE TO OBSTRUCTION, VERY DENSE OR HARD SOIL, BOULDERS, OR WEATHERED OR HARD ROCK.

DO NOT USE STANDARD TEMPORARY SHORING FOR TEMPORARY SHORING -L- STATION 10+17±, 19.7′ LT TO -L- STATION 10+34±, 19.7′ LT. CONTRACTOR DESIGNED SHORING IS REQUIRED. SEE TEMPORARY SHORING SPECIAL PROVISION.

IF GROUNDWATER OR THE FLOOD ELEVATION IS ABOVE THE BOTTOM OF THE REINFORCED ZONE, DO NOT USE A TEMPORARY WALL FOR TEMPORARY SHORING FROM -L- STATION 10+17±, 19.7′ LT TO -L- STATION 10+34±, 19.7′ LT.

Shoring Location No. 2 (CUT SHORING):

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

TEMPORARY SHORING IS REQUIRED FOR THE STRUCTURE CONSTRUCTION FROM -Y- STATION 11+81±, 25.3′ LT TO -Y- STATION 12+37±, 18.2′ LT.

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

DESIGN TEMPORARY SHORING FROM -Y- STATION 11+81±, 25.3′ LT TO -Y- STATION 12+37±, 18.2′ LT, FOR THE FOLLOWING ASSUMED SOIL PARAMETERS:

ABOVE ELEVATION 2,688.2 FT
UNIT WEIGHT (γ) = 120 LB/CF
FRICTION ANGLE (ϕ) = 26 DEGREES
COHESION (c) = 0 LB/SF

ELEVATION 2,688.2 FT TO ELEVATION 2,682.8 FT
UNIT WEIGHT (γ) = 120 LB/CF
FRICTION ANGLE (ϕ) = 30 DEGREES
COHESION (c) = 0 LB/SF
GROUNDWAY ELEVATION = 2,687.7

BELOW ELEVATION 2,682.8 FT (ROCK)
UNIT WEIGHT (γ) = 165 LB/CF
FRICTION ANGLE (ϕ) = 40 DEGREES
COHESION (c) = 1000 LB/SF

LIMITED SUBSURFACE INFORMATION IS AVAILABLE IN THE VICINITY OF TEMPORARY SHORING FROM -Y- STATION 11+81±, 25.3′ LT TO -Y- STATION 12+37±, 18.2′ LT. THE INFORMATION PROVIDED FOR TEMPORARY SHORING DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL CONDITIONS ENCOUNTERED DURING CONSTRUCTION.

DRIVEN PILING FOR TEMPORARY SHORING FROM -Y- STATION 11+81±, 25.3′ LT TO -Y- STATION 12+37±, 18.2′ LT MAY NOT PENETRATE BELOW ELEVATION 2,682.8 FT DUE TO OBSTRUCTION, VERY DENSE OR HARD SOIL, BOULDERS, OR WEATHERED OR HARD ROCK.

DO NOT USE STANDARD TEMPORARY SHORING FOR TEMPORARY SHORING FROM -Y- STATION 11+81±, 25.3′ LT TO -Y- STATION 12+37±, 18.2′ LT. CONTRACTOR DESIGNED SHORING IS REQUIRED. SEE TEMPORARY SHORING SPECIAL PROVISION.

DO NOT USE A TEMPORARY WALL FOR TEMPORARY SHORING FROM -Y- STATION 11+81±, 25.3′ LT TO -Y- STATION 12+37±, 18.2′ LT.

Shoring Location No. 3 (CUT SHORING):

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

TEMPORARY SHORING IS REQUIRED FOR THE STRUCTURE CONSTRUCTION FROM -L- STATION 11+41±, 25.0′ LT TO -L- STATION 11+79±, 17.5′ LT.

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

DESIGN TEMPORARY SHORING FROM -L- STATION 11+41±, 25.0′ LT TO -L- STATION 11+79±, 17.5′ LT, FOR THE FOLLOWING ASSUMED SOIL PARAMETERS:

ABOVE ELEVATION 2,670.3 FT
UNIT WEIGHT (γ) = 120 LB/CF
FRICTION ANGLE (ϕ) = 26 DEGREES
COHESION (c) = 0 LB/SF
GROUNDWATER ELEVATION = 2,687.0 FT

ELEVATION 2,670.3 FT TO ELEVATION 2,664.9 FT
UNIT WEIGHT (γ) = 135 LB/CF
FRICTION ANGLE (ϕ) = 38 DEGREES
COHESION (c) = 500 LB/SF

BELOW ELEVATION 2,663.7 FT (ROCK)
UNIT WEIGHT (γ) = 165 LB/CF
FRICTION ANGLE (ϕ) = 40 DEGREES
COHESION (c) = 1000 LB/SF

LIMITED SUBSURFACE INFORMATION IS AVAILABLE IN THE VICINITY OF TEMPORARY SHORING FROM -L- STATION 11+41±, 25.0′ LT TO -L- STATION 11+79±, 17.5′ LT. THE INFORMATION PROVIDED FOR TEMPORARY SHORING DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL CONDITIONS ENCOUNTERED DURING CONSTRUCTION.

DRIVEN PILING FOR TEMPORARY SHORING FROM -L- STATION 11+41±, 25.0′ LT TO -L- STATION 11+79±, 17.5′ LT MAY NOT PENETRATE BELOW ELEVATION 2,684.9 FT DUE TO OBSTRUCTION, VERY DENSE OR HARD SOIL, BOULDERS, OR WEATHERED OR HARD ROCK.

DO NOT USE STANDARD TEMPORARY SHORING FOR TEMPORARY SHORING FROM -L- STATION 11+41±, 25.0′ LT TO -L- STATION 11+79±, 17.5′ LT. CONTRACTOR DESIGNED SHORING IS REQUIRED. SEE TEMPORARY SHORING SPECIAL PROVISION.

DO NOT USE A TEMPORARY WALL FOR TEMPORARY SHORING FROM -L- STATION 11+41±, 25.0′ LT TO -LSTATION 11+79±, 17.5′ LT.

APPROVED: Signed by: Kelly de Montbrun BAB6607DE9D747C...

DATE: 7/7/2025

NORTH CAROLINA PROFESSIONAL SEAL 045542 ENGINEER KELLY DE MONTBRUN

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SHORING NOTES

6/16/2025
X:\NCDOT\Div. II\Watauga 58\Work Zone Traffic Control\Watauga58_TC_TMP_02A.dgn
User:cbrannan

PROJ. REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	TMP-3

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

PHASING

NOTE: FOR ALL FLAGGING OPERATIONS, SEE RSD 1101.02, SHEET 1.

PHASE I

STEP 1 -- INSTALL WORK ZONE ADVANCE WARNING SIGNS IN ACCORDANCE WITH RSD 1101.01, SHEET 3 AND TMP-4.

STEP 2 -- INSTALL TEMPORARY PORTABLE SIGNAL AND WARNING SIGNS AND SHIFT TRAFFIC TO THE PHASE I SIGNALIZED PATTERN (SEE TMP-4 AND SPECIAL PROVISION).

-- INSTALL WATERFILLED BARRIER AS DETAILED ON TMP-4 (SEE LOCAL NOTES).

STEP 3 -- AWAY FROM TRAFFIC PERFORM THE FOLLOWING (SEE TMP-4):

-- INSTALL TEMPORARY SHORING 1, 2, AND 3. (SEE TMP-2,2A, AND 4).

-- CONSTRUCT PROPOSED BRIDGE AND APPROACH SLABS FROM -L- STA. 10+30 +/- TO -TAN EXT- STA. 11+54 +/-.

STEP 4 -- AWAY FROM TRAFFIC REMOVE TEMPORARY SHORING 1, 2, AND 3.

STEP 5 -- USING FLAGGERS, REMOVE AND STOCKPILE WATERFILLED BARRIER AND REPLACE WITH DRUMS (SEE TMP-5).

STEP 6 -- UNDER SIGNAL CONTROL, AND USING FLAGGERS AS NECESSARY, PERFORM THE FOLLOWING (SEE TMP-5):

-- CONSTRUCT FULL DEPTH ROADWAY FROM -L- STA 10+12 +/- TO -L- STA. 10+30 +/- INCLUDING PAVED SHOULDER TO -Y- STA. 12+82 +/- , UP TO BUT NOT INCLUDING FINAL LAYER OF SURFACE COURSE.

-- CONSTRUCT FULL DEPTH ROADWAY INCLUDING PAVED SHOULDER FROM -TAN EXT- STA 11+54 +/- TO -L- STA. 12+50 +/- (RIGHT LANE), UP TO BUT NOT INCLUDING FINAL LAYER OF SURFACE COURSE.

-- INSTALL PROPOSED RIGHT SIDE GUARDRAIL.

-- PLACE ASPHALT OVERLAY ON PROPOSED BRIDGE

PHASE II

STEP 1 -- USING FLAGGERS, SHIFT 1 LANE-2 WAY TRAFFIC ON KELLERSVILLE RD. (-L-) INTO THE RIGHT LANE AND ONTO THE PROPOSED BRIDGE (SEE TMP-6).

-- USE TYPE III BARRICADES TO CLOSE ACCESS TO TEMPORARY BRIDGE.

STEP 2 -- RESET WATERFILLED BARRIER TO -Y- STA. 11+00 +/- TO -L- STA. 10+79 +/- (SEE TMP-6).

STEP 3 -- UNDER SIGNAL CONTROL, AND USING FLAGGERS AS NECESSARY, PERFORM THE FOLLOWING (SEE TMP-6):

-- REMOVE TEMPORARY BRIDGE.

-- CONSTRUCT FULL DEPTH ROADWAY INCLUDING DRIVE AND PIPE TO PARCEL 1 FROM -TAN EXT- STA 11+54 +/- TO -L- STA. 12+50 +/- (LEFT LANE), UP TO BUT NOT INCLUDING FINAL LAYER OF SURFACE COURSE.

-- CONSTRUCT PAVED SHOULDER INCLUDING DRAINAGE STRUCTURE 401 AND 402 FROM -Y-STA. 11+00 +/- TO -Y-STA. 11+93 +/- UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE.

-- INSTALL PROPOSED LEFT SIDE GUARDRAIL

PHASE III

STEP 1 -- USING FLAGGERS, REMOVE TEMPORARY PORTABLE SIGNAL, COVER SIGNAL WARNING SIGNS, REMOVE WATERFILLED BARRIER, AND OPEN PROJECT TO FINAL PATTERN.

STEP 2 -- USING FLAGGERS, PLACE THE FINAL LAYER OF SURFACE COUSE THROUGHOUT THE PROJECT LIMITS.

STEP 3 -- USING FLAGGERS, PLACE FINAL PAVEMENT MARKINGS AND PROPOSED SIGNING THROUGHOUT THE PROJECT LIMITS (SEE SIGNING AND PAVEMENT MARKING PLANS).

STEP 4 -- REMOVE ALL TRAFFIC CONTROL DEVICES.

APPROVED: Don A. Parker (Signed by) 750B9E90ADEF440...

DATE: 7/8/2025

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A PARKER

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DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

PHASING

PROJ. REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	TMP-4

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

1 QUANTITY = 162 SF

TEMPORARY SHORING
FROM STA. -L- 10+17±, 19.7′ LT
TO STA. -L- 10+34±, 19.7′ LT

(SEE SHEET TMP-2A FOR
TEMPORARY SHORING NOTES)

2 QUANTITY = 644 SF

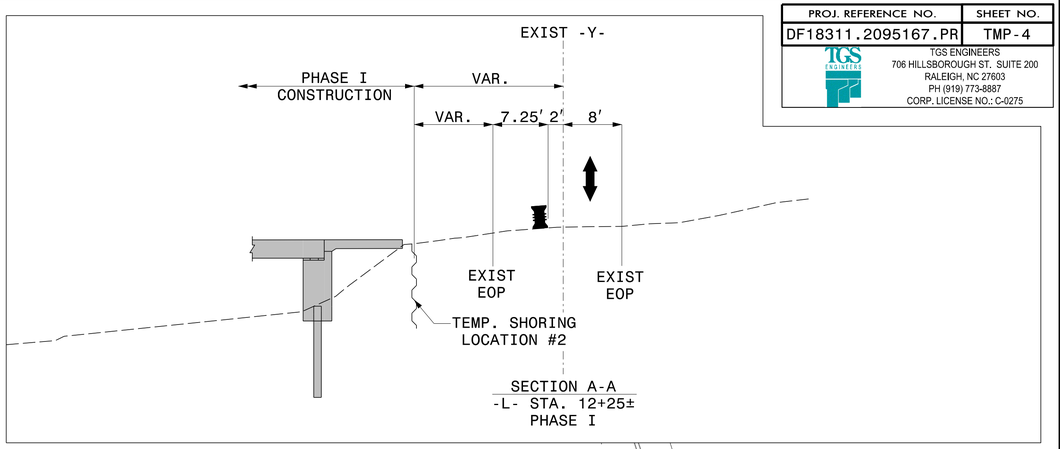
TEMPORARY SHORING
FROM STA. -Y- 11+81±, 25.3′ LT
TO STA. -Y- 12+37±, 18.2′ LT

(SEE SHEET TMP-2A FOR
TEMPORARY SHORING NOTES)

3 QUANTITY = 532 SF

TEMPORARY SHORING
FROM STA. -L- 11+41±, 25.0′ LT
TO STA. -L- 11+79±, 17.5′ RT

(SEE SHEET TMP-2A FOR
TEMPORARY SHORING NOTES)



SECTION A-A
-L- STA. 12+25±
PHASE I

-Y- STA. 8+70± P61
-L- STA. 11+34± BEGIN WFB
-L- STA. 11+56±
-Y- STA. 11+76± BEGIN WFB
-L- STA. 10+30±
-TAN EXT- STA. 11+54±
-L- STA. 12+30± END WFB
-Y- STA. 13+03± END WFB
-L- STA. 13+05± P61
-Y- STA. 15+12± P61
-L- SR 1139 KELLERSVILLE RD
-Y- SR 1312 BUCKEYE RD
PERRY PRESNELL RD
EXIST.
500′±
100′±
40′
10′
DRUMS
WFB
DS
PORT
STOP

A	STOP HERE ON RED	R10-6 24″ X 36″
B		W3-3 48″ X 48″
C	BE PREPARED TO STOP	W3-4 48″ X 48″
D	ONE LANE ROAD AHEAD	W20-4 48″ X 48″
E	ONE LANE ROAD AHEAD NEXT LEFT	W20-4 48″ X 48″ SP-4L 42″ X 12″
F	ONE LANE ROAD AHEAD NEXT RIGHT	W20-4 48″ X 48″ SP-4R 42″ X 12″
G	ROAD WORK AHEAD 25 M.P.H.	W20-1 48″ X 48″ W13-1 24″ X 24″
H	END ROAD WORK	G20-2 A 48″ X 24″

APPROVED: Signed by: Don A. Parker 75DB9E90ADEF440...
DATE: 7/8/2025

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A. PARKER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

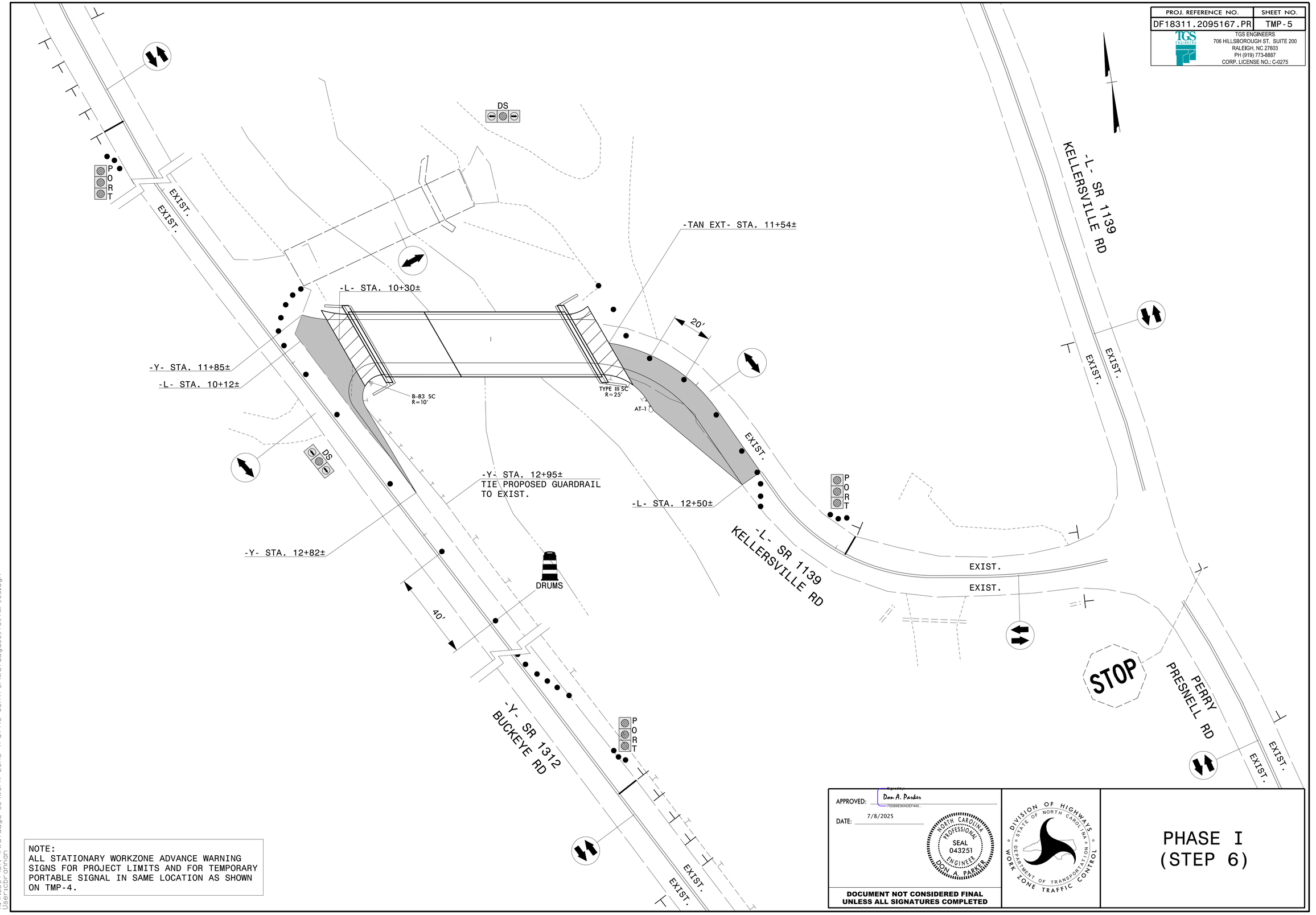
DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

PHASE I

7/7/2025
X:\NCDOT\Div 11\Watauga 58\Work Zone Traffic Control\Watauga58_TC_TMP_04.dgn
User:cbrannan

PROJ. REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	TMP-5

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



NOTE:
ALL STATIONARY WORKZONE ADVANCE WARNING SIGNS FOR PROJECT LIMITS AND FOR TEMPORARY PORTABLE SIGNAL IN SAME LOCATION AS SHOWN ON TMP-4.

APPROVED: Signed by: Don A. Parker 75DB9E90ADEF440... DATE: 7/8/2025

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A. PARKER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

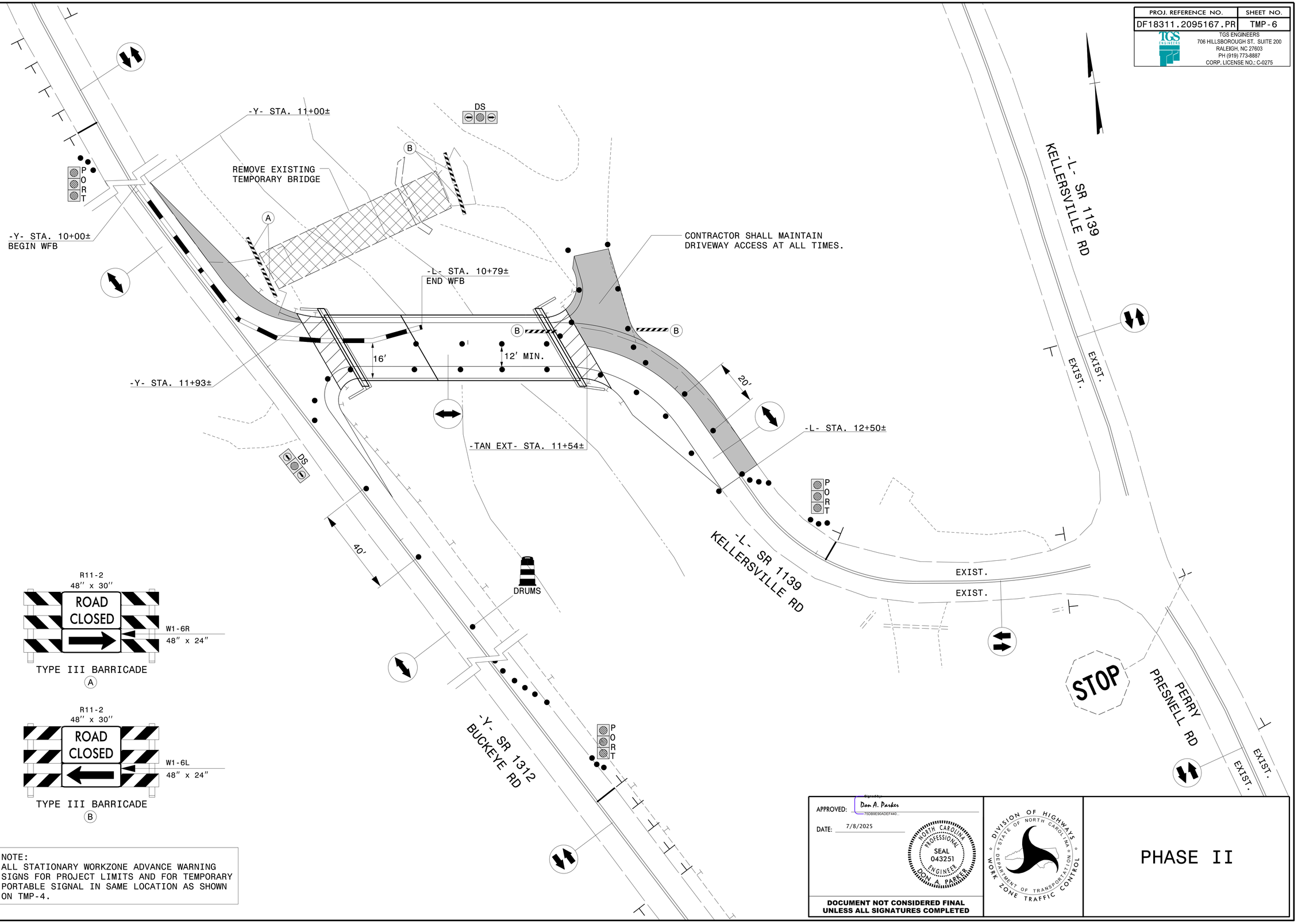
DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

PHASE I (STEP 6)

6/16/2025
X:\NCDOT\Div II\Watauga 58\Work Zone Traffic Control\Watauga58_TC_TMP_05.dgn
User:cbrannan

PROJ. REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	TMP-6

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



R11-2
48" x 30"

W1-6R
48" x 24"

TYPE III BARRICADE
(A)

R11-2
48" x 30"

W1-6L
48" x 24"

TYPE III BARRICADE
(B)

NOTE:
ALL STATIONARY WORKZONE ADVANCE WARNING SIGNS FOR PROJECT LIMITS AND FOR TEMPORARY PORTABLE SIGNAL IN SAME LOCATION AS SHOWN ON TMP-4.

APPROVED: Don A. Parker
Signature
750B9E99ADEF440...

DATE: 7/8/2025

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A. PARKER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

PHASE II

6/16/2025
X:\NCDOT\Div II\Watauga 58\Work Zone Traffic Control\Watauga58_TC_TMP_06.dgn
User:cbrannan

T.I.P.: DF18311.2095167.PR

CONTRACT: DK00434

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN

WATAUGA COUNTY

LOCATION: BRIDGE #640058 OVER BEECH CREEK ON SR 1139 (KELLERSVILLE RD)

TIP NO.	SHEET NO.
DF18311.2095167.PR	PMP-1

APPROVED: Signed by: Don A. Parker 75DB9E90ADEF440... DATE: 7/8/2025

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A PARKER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.12	PAVEMENT MARKINGS - BRIDGES
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

GENERAL NOTES

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

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

ROAD NAME	MARKING	MARKER
-L- SR 1139 KELLERSVILLE RD	PAINT	NONE
-Y- SR 1312 BUCKEYE RD	PAINT	NONE

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

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

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

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

FINAL PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION
PAVEMENT MARKINGS	
PAINT (4")	
P1	(4") WHITE EDGELINE
P5	(4") 2 FT.-6 FT./SP WHITE MINISKIP
P13	(4") YELLOW DOUBLE CENTER

PLAN SUBMITTED TO: NCDOT

ROB WEISZ, P.E. DIVISION 11 BRIDGE PROGRAM MANAGER

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PLAN PREPARED BY: TGS ENGINEERS

DON A. PARKER, P.E. PROJECT ENGINEER

CODA BRANNAN, E.I. DESIGN ENGINEER

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

7/7/2025
K:\NCDOT\Div 11 Watauga 58\Signing and Delineation\Pavement Marking\Design\Watauga58_Sgn_PMP_01.dgn
User:cbrannan

TIP NO.	SHEET NO.
DF18311.2095167.PR	PMP-2

APPROVED: Signed by: Don A. Parker 75DB9E90ADEF440...

DATE: 7/8/2025

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A PARKER

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

-Y- STA. 11+00±
TIE TO EXIST. MKGS.

-Y- STA. 11+62±

-Y- STA. 12+12±

-Y- STA. 12+31±

-Y- STA. 13+00±
TIE TO EXIST. MKGS.

-Y- STA. 11+63±

-L- STA. 10+25±

-L- STA. 12+15±

-L- STA. 12+50±
TIE TO EXIST. MKGS.

-L- SR 1139
KELLERSVILLE RD

-Y- SR 1312
BUCKEYE RD

GREU TL-3

EXIST.

P1 P5 P13

TYPE III SC R=15'

TYPE III SC R=47'

TYPE III SC R=25'

B-83 SC R=10'

AT-1

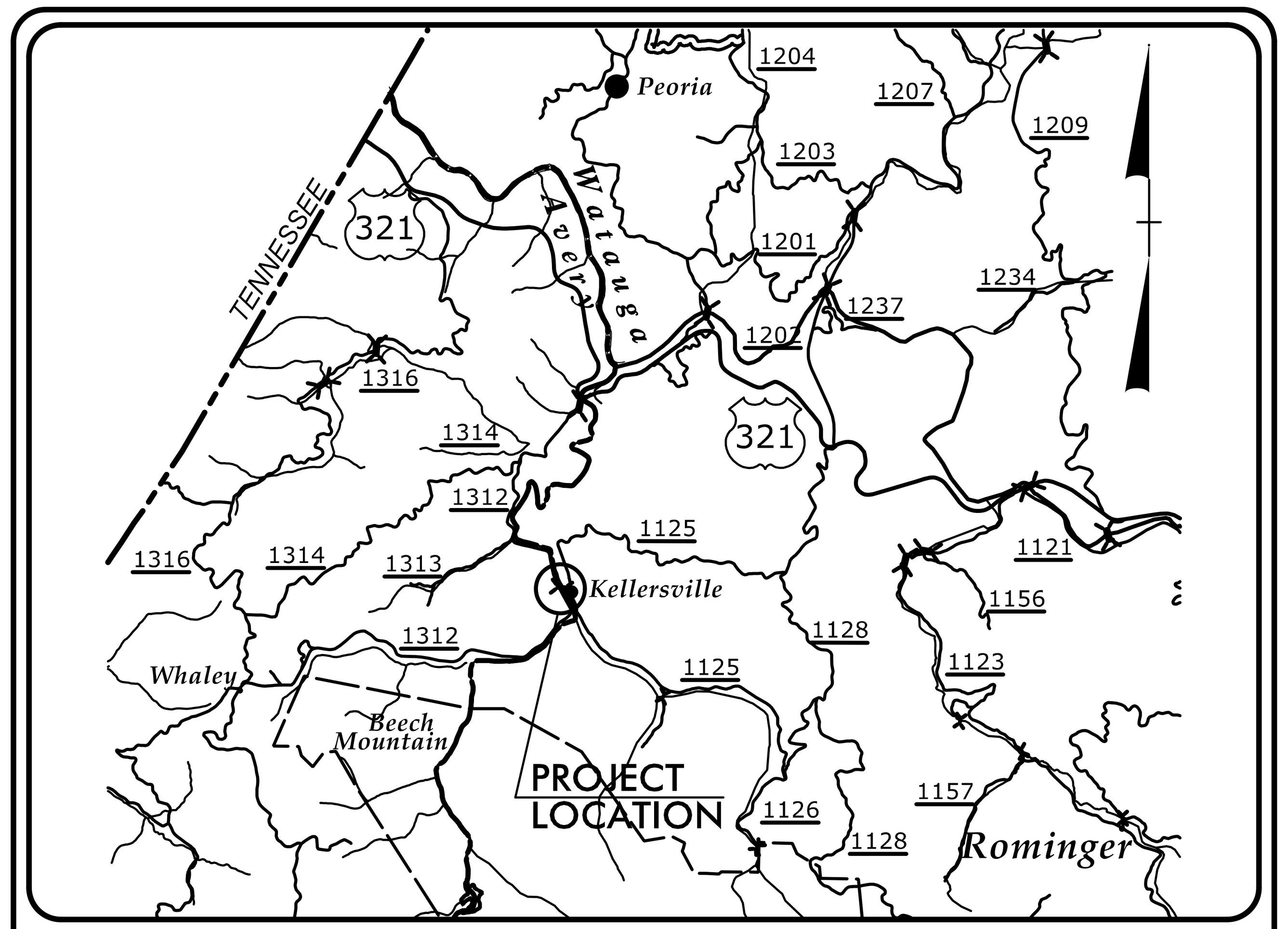
10'

10'

PAVEMENT MARKING DETAIL

7/7/2025
X:\NCDOT\Div 11\Watauga 58\Signing and Delineation\Pavement Marking\Design\Watauga58_Sgn_PMP.dgn
User:cbrannon

CONTRACT: DK00434 PROJECT: DF18311.2095167.PR



VICINITY MAP

NOT TO SCALE

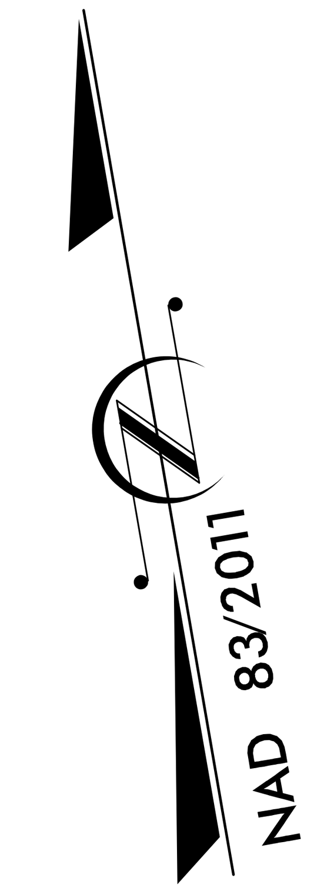
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

WATAUGA COUNTY

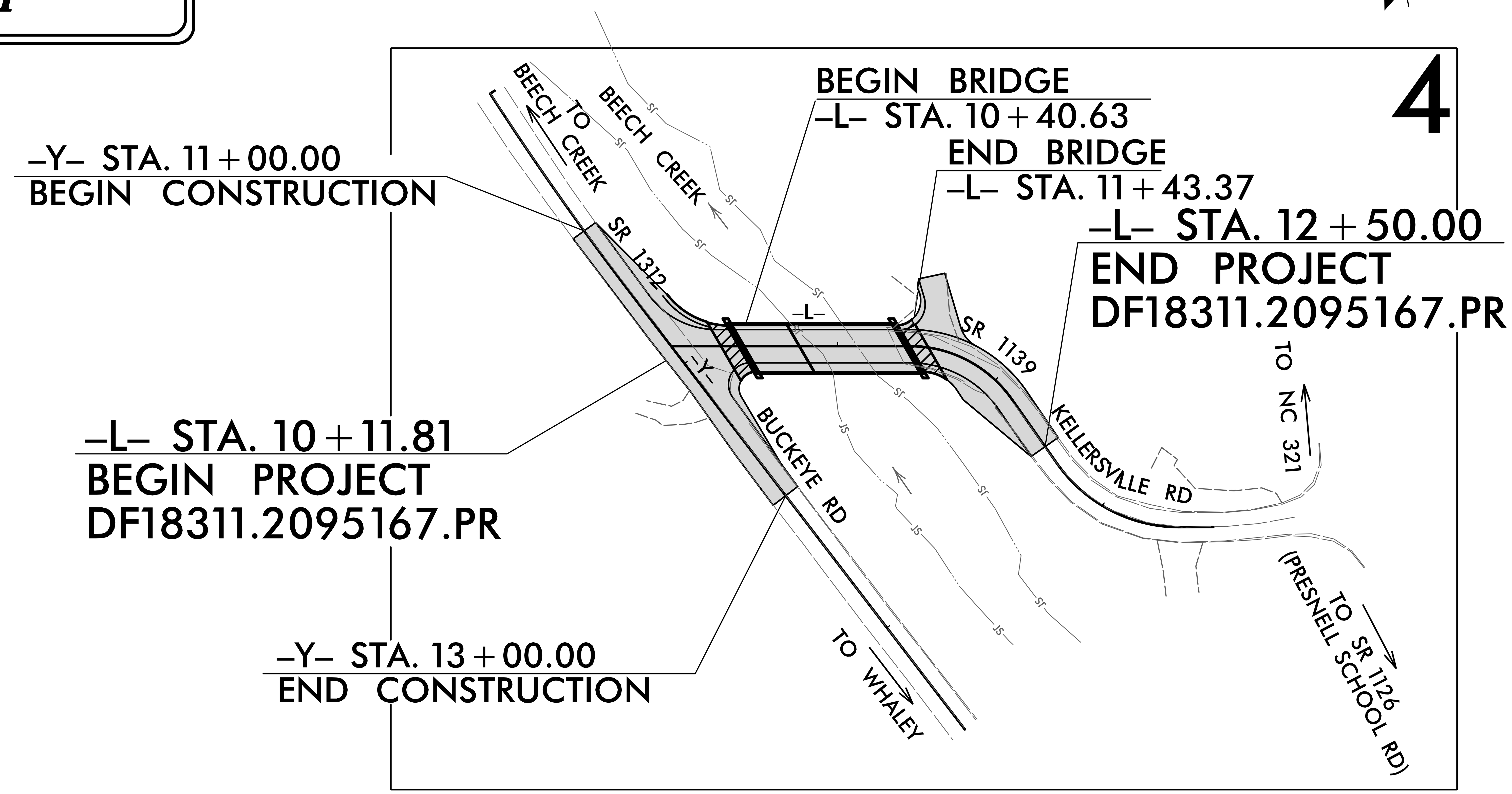
LOCATION: BRIDGE NO. 940058 OVER BEECH CREEK ON SR 1139 (KELLERSVILLE ROAD)

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



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DF18311.2095167.PR	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
DF18311.2095167.PR	TBD	PE
DF18311.2095167.PR	TBD	R/W, UTIL.
DF18311.2095167.PR	TBD	CONST.



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

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

Refer To E. C. Special Provisions for Special Considerations.

GRAPHIC SCALE

20 10 0 20 40

PLANS

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG 010000 GENERAL STORMWATER CONSTRUCTION PERMIT ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF ENERGY, MINERAL, AND LAND RESOURCES.

TGS ENGINEERS

Prepared In the Office of:

TGS ENGINEERS

201 W. MARION ST-STE 200
SHELBY, NC 28150

Designed by:

Andrew H. Cochrane, PE — *3015*

NAME — LEVEL III CERTIFICATION NO.

Roadway Standard Drawings

The "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2024 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

PROJECT REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	EC-02
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

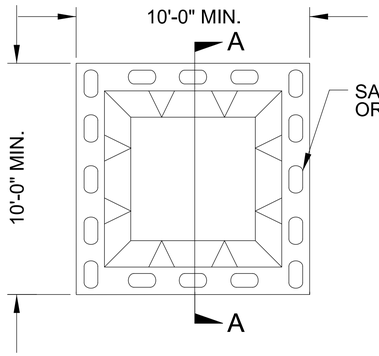
EROSION & SEDIMENT CONTROL LEGEND

Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1630.03	Temporary Silt Ditch	TSD
1630.04	Stilling Basin	
1630.05	Temporary Diversion	TD
1630.06	Special Stilling Basin	
1630.07	Skimmer Basin	
1630.08	Tiered Skimmer Basin	
1630.09	Earthen Dam with Skimmer	
	Infiltration Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C

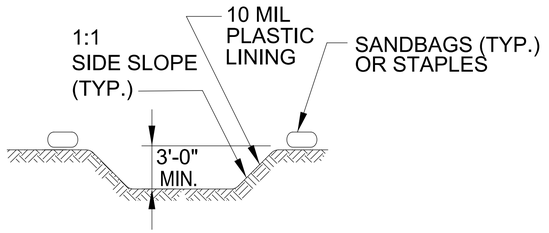
Std. #	Description	Symbol
1633.01	Temporary Rock Silt Check Type A	
1633.02	Temporary Rock Silt Check Type B	
1633.03	Temporary Rock Silt Check Type A with Excelsior Matting and Flocculant	
1634.01	Temporary Rock Sediment Dam Type A	
1634.02	Temporary Rock Sediment Dam Type B	
1635.01	Rock Pipe Inlet Sediment Trap Type A	A
1635.02	Rock Pipe Inlet Sediment Trap Type B	B
1636.01	Excelsior Wattle Check	
1636.01	Excelsior Wattle Check with Flocculant	
1636.01	Coir Fiber Wattle Check	
1636.01	Coir Fiber Wattle Check with Flocculant	
1636.02	Silt Fence Excelsior Wattle Break	EW
	Silt Fence Coir Fiber Wattle Break	CFW
1636.03	Excelsior Wattle Barrier	EW EW EW
1636.03	Coir Fiber Wattle Barrier	CFW CFW CFW

PROJECT REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	EC-2A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

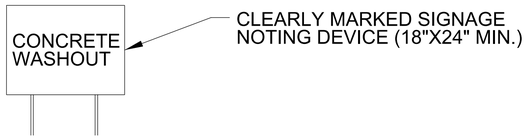
ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



PLAN



SECTION A-A



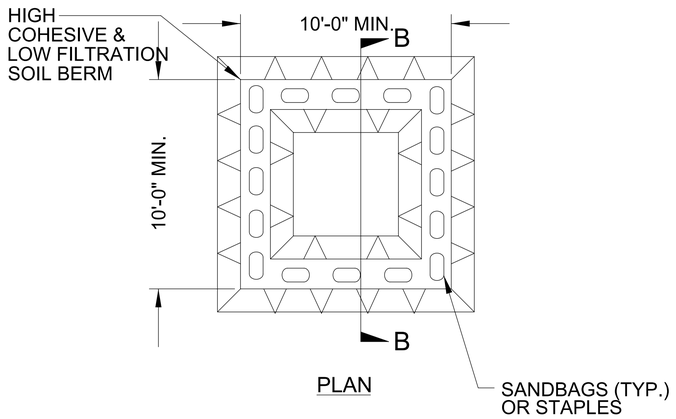
NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.

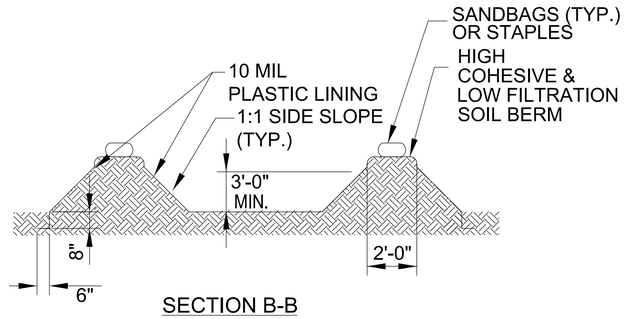
3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

BELOW GRADE WASHOUT STRUCTURE

NOT TO SCALE



PLAN



SECTION B-B

NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.

3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

ABOVE GRADE WASHOUT STRUCTURE

NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	EC-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

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

Watauga County Bridge #940058

PROJECT REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	EC-04/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83/2011

TGS ENGINEERS
201 W. MARION ST–STE 200
SHELBY, NC 28150
PH (704) 476–0003
CORP. LICENSE NO.: C–0275

BEGIN CONSTRUCTION
–Y– STA 11+00.00

–Y– +00.00
30.00′
–Y– +00.00
42.00′
–Y– 11+59.90
BEGIN SBG

–Y– +46.79
30.00′

–Y– PT 11+46.41

+07.00
93.00′

+15.00
57.00′

+43.31
50.00′

IMPVIOUS DIKE

CLASS II RIPRAP (TYP.)

PROP. ASPHALT DRIVE

+62.00
54.00′

END BRIDGE
–L– STA 11+43.37

FG=2694.65
MAX 15″ INV=2692.90
So EOP TO EOP=2.33%

+72.00
33.00′

END PROJECT
DF18311.2095167.PR
–L– STA 12+50.00

+26.00
15.00′

+20′ 15′ TYP

+26.00
25.00′

–L– PC 12+62.35

+50.00
15.00′

–L– PT 13+49.19

–L– POT 13+68.89

–L– POT 10+00.00 =
–Y– POT 11+86.79

EXCAVATION

–L– PC 11+43.31

+76.07
50.00′

+02.00
50.00′

–L– PT 12+15.23
–Y– +00.00
30.00′

+43.31
50.00′

34.77′ TAPER TO EXIST.

+50.00
15.00′

BEGIN PROJECT
DF18311.2095167.PR
–L– STA 10+11.81

BEGIN BRIDGE
–L– STA 10+40.63

TIE TO EXIST. GUARDRAIL

PRE–EXISTING BRIDGE
(REMNANTS TO BE REMOVED)

END CONSTRUCTION
–Y– STA 13+00.00

IMPVIOUS DIKE

–Y– POT 14+76.97

WALKER, MATTHEW J

FESTA, FRANK LAWRENCE JR
LINDA M

SR 1132 (BEACH RD)

SR 1139 (KELLERSVILLE RD)

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

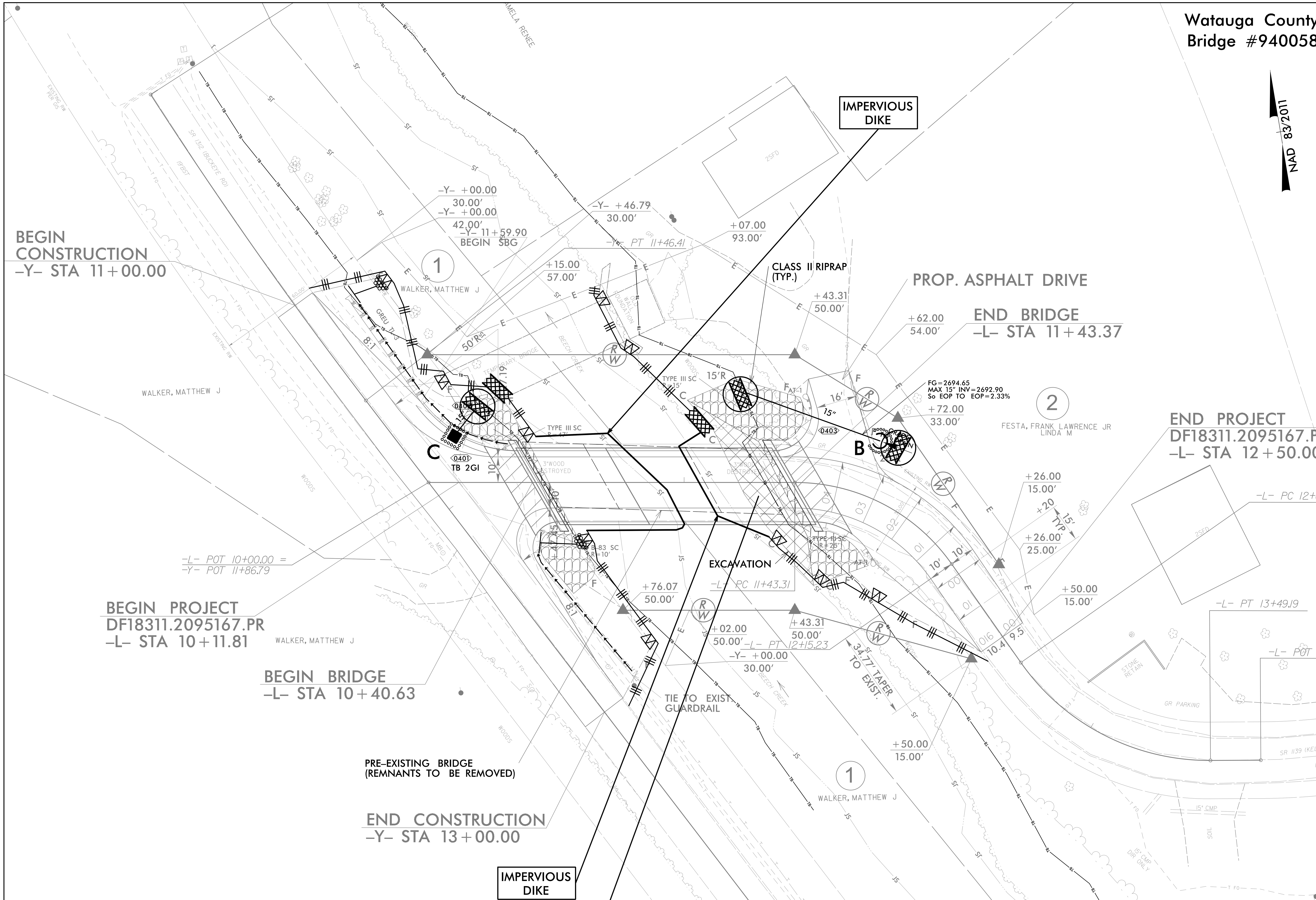
UTILIZE TEMPORARY SEDIMENT BASIN OR SPECIAL STILLING BASIN(S) AS STILLING BASIN WHERE APPLICABLE.

Watauga County Bridge #940058

PROJECT REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	EC-05/CONST.4

R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

TGS ENGINEERS
201 W. MARION ST-STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275


NAD 83/2011
BEGIN CONSTRUCTION
-Y- STA 11+00.00
-Y- +00.00
30.00'
-Y- +00.00
42.00'
-Y- 11+59.90
BEGIN SBG
-Y- +46.79
30.00'
-Y- PT 11+46.41
+07.00
93.00'
IMPERVIOUS DIKE
CLASS II RIPRAP (TYP.)
PROP. ASPHALT DRIVE
+43.31
50.00'
+62.00
54.00'
END BRIDGE
-L- STA 11+43.37
WALKER, MATTHEW J
50'R
8:1
TYPE III SC
15'R
16'
15"
FG=2694.65
MAX 15" INV=2692.90
So EOP TO EOP=2.33%
+72.00
33.00'
FESTA, FRANK LAWRENCE JR
LINDA M
END PROJECT
DF18311.2095167.PR
-L- STA 12+50.00
C
0401
TB 2GI
0403
B
+26.00
15.00'
+20 TYP
15'
+26.00
25.00'
-L- PC 12+62.35
-L- POT 10+00.00 =
-Y- POT 11+86.79
EXCAVATION
TYPE III SC
B-83 SC
+76.07
50.00'
-L- PC 11+43.31
+43.31
50.00'
-L- PT 12+15.23
+02.00
50.00'
-Y- +00.00
30.00'
+50.00
15.00'
-L- PT 13+49.19
-L- POT 13+68.89
BEGIN PROJECT
DF18311.2095167.PR
-L- STA 10+11.81
BEGIN BRIDGE
-L- STA 10+40.63
34.77' TAPER TO EXIST.
TIE TO EXIST. GUARDRAIL
10.4
9.5
GR PARKING
SR 1139 (KELLERSVILLE RD)
PRE-EXISTING BRIDGE
(REMNANTS TO BE REMOVED)
+50.00
15.00'
END CONSTRUCTION
-Y- STA 13+00.00
IMPERVIOUS DIKE
Place Coir Fiber Matting on Exposed Soil Under Bridge Which Will Not Be Plated with Stone
-Y- POT 14+76.97
SR 1182 (BUCKEYE RD)

Place Straw Matting for Erosion Control on Slope as Work Allows.
-L- Sta. 11+75 to 12+25 RT EST. 63 SY
-Y- Sta. 11+00 to 11+50 LT EST. 100 SY
-Y- Sta. 12+50 to 13+00 LT EST. 81 SY

IN LIEU OF ROCK INLET SEDIMENT TRAP TYPE C, UTILIZE FABRIC INSERT INLET PROTECTION DEVICES IN AREAS WHERE WATER MAY POND ON ROAD OPEN TO LIVE TRAFFIC.

UTILIZE TEMPORARY SEDIMENT BASIN OR SPECIAL STILLING BASIN(S) AS STILLING BASIN WHERE APPLICABLE.

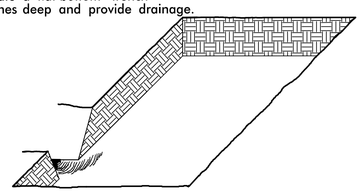
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DF18311.2095167.PR	RF–1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

PLANTING DETAILS

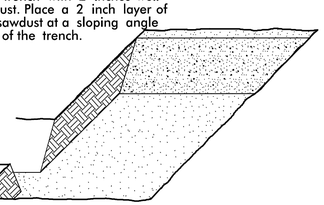
SEEDLING / LINER BAREROOT PLANTING DETAIL

HEALING IN

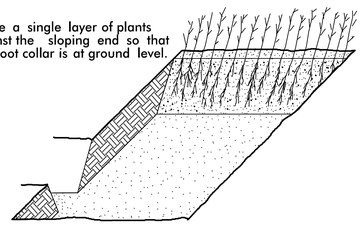
1. Locate a healing–in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



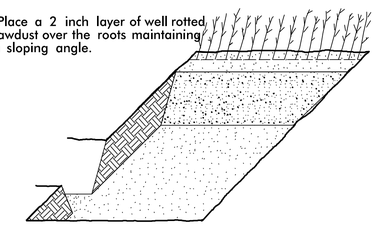
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



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

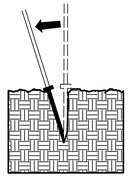


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

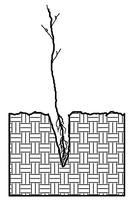


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

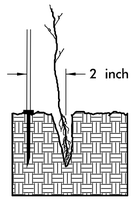
DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



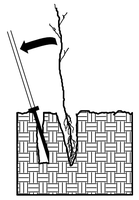
1. Insert planting bar as shown and pull handle toward planter.



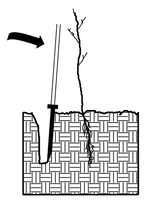
2. Remove planting bar and place seedling at correct depth.



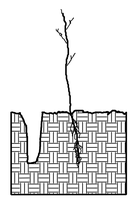
3. Insert planting bar 2 inches toward planter from seedling.



4. Pull handle of bar toward planter, firming soil at bottom.



5. Push handle forward firming soil at top.



6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

PLANTING BAG
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.

KBC PLANTING BAR
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.

ROOT PRUNING
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

REFORESTATION

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

REFORESTATION

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

25%	LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in – 18 in BR
25%	PLATANUS OCCIDENTALIS	SYCAMORE	12 in – 18 in BR
25%	BETULA NIGRA	RIVER BIRCH	12 in – 18 in BR
25%	NYSSA SYLVATICA	BLACK GUM	12 in – 18 in BR

REFORESTATION DETAIL SHEET

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

T.I.P.: DF18311.2095167.PR

CONTRACT: DK00434

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

TIP NO.	SHEET NO.
DF18311.2095167.PR	SIGN-1

APPROVED: Signed by: Don A. Parker 75DB9E90ADEF440... 7/8/2025

DATE:

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A. PARKER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SIGNING PLAN
WATAUGA COUNTY

LOCATION: BRIDGE #940058 OVER BEECH CREEK ON SR 1139 (KELLERSVILLE RD)

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.50	MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POSTS

GENERAL NOTES

. SIGNS FURNISHED BY STATE

. CONFIRM IN WRITING AT LEAST 4 MONTHS IN ADVANCE, THE ACTUAL DATE THE DEPARTMENT FURNISHED SIGNS WILL BE REQUIRED.

. IF REMOVAL OR RELOCATION OF SIGNS ON PRIVATE STREET (NON-STATE MAINTAINED) IS REQUIRED DUE TO CONSTRUCTION, THE CONTRACTOR SHALL INFORM THE ENGINEER. THE WORK WILL BE COMPLETED BY OTHERS.

. WHEN NOT STATIONED OR DIMENSIONED ON PLANS, ALL 'E' AND 'F' SIGNS SHALL BE FIELD LOCATED BY THE ENGINEER

. ALL EXISTING SIGNS ON "U" CHANNEL POST WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND DISPOSED OF UNLESS OTHERWISE NOTED ON PLANS.

. THE BACKGROUND FOR TYPE E & F SIGNS SHALL BE TYPE C REFLECTIVE SHEETING.

. SEE ROADWAY PLANS FOR GUARD/GUIDE RAIL DETAILS.

SUMMARY OF QUANTITIES

ITEM NO.		ITEM DESCRIPTION	QUANTITY	UNIT
DESC. NO.	SECT. NO.			
4072000000	903	SUPPORTS, 3 LB STEEL U-CHANNEL	77	L.F.
4102000000	904	SIGN ERECTION, TYPE E	3	EA.
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	2	EA.

INDEX

PLAN SUBMITTED TO: NCDOT

ROB WEISZ, P.E. DIVISION 11 BRIDGE PROGRAM MANAGER

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

PLAN PREPARED BY: TGS ENGINEERS

DON A. PARKER, P.E. PROJECT ENGINEER

CODA BRANNAN, E.I. DESIGN ENGINEER

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

07/07/25
X:\NCDOT\Div 11 Watauga 58\Signing and Delineation\Signing\Watauga58_Sgn_SGN_01.dgn
User:cbrannan

401 QUANTITY REQ'D 1

30 X 30
R1-1

ONE "U" POST PER SIGN

402 QUANTITY REQ'D 2

24 X 30
R2-1

ONE "U" POST PER SIGN

TIP NO.	SHEET NO.
DF18311.2095167.PR	SIGN-2

APPROVED: Signed by: Don A. Parker 7DDB9E90ADEF440...

DATE: 7/8/2025

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A PARKER

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

TYPE "E" SIGNS

TIP NO.	SHEET NO.
DF18311.2095167.PR	SIGN-3

APPROVED: Signed by: Don A. Parker 75DB9E90ADEF440...

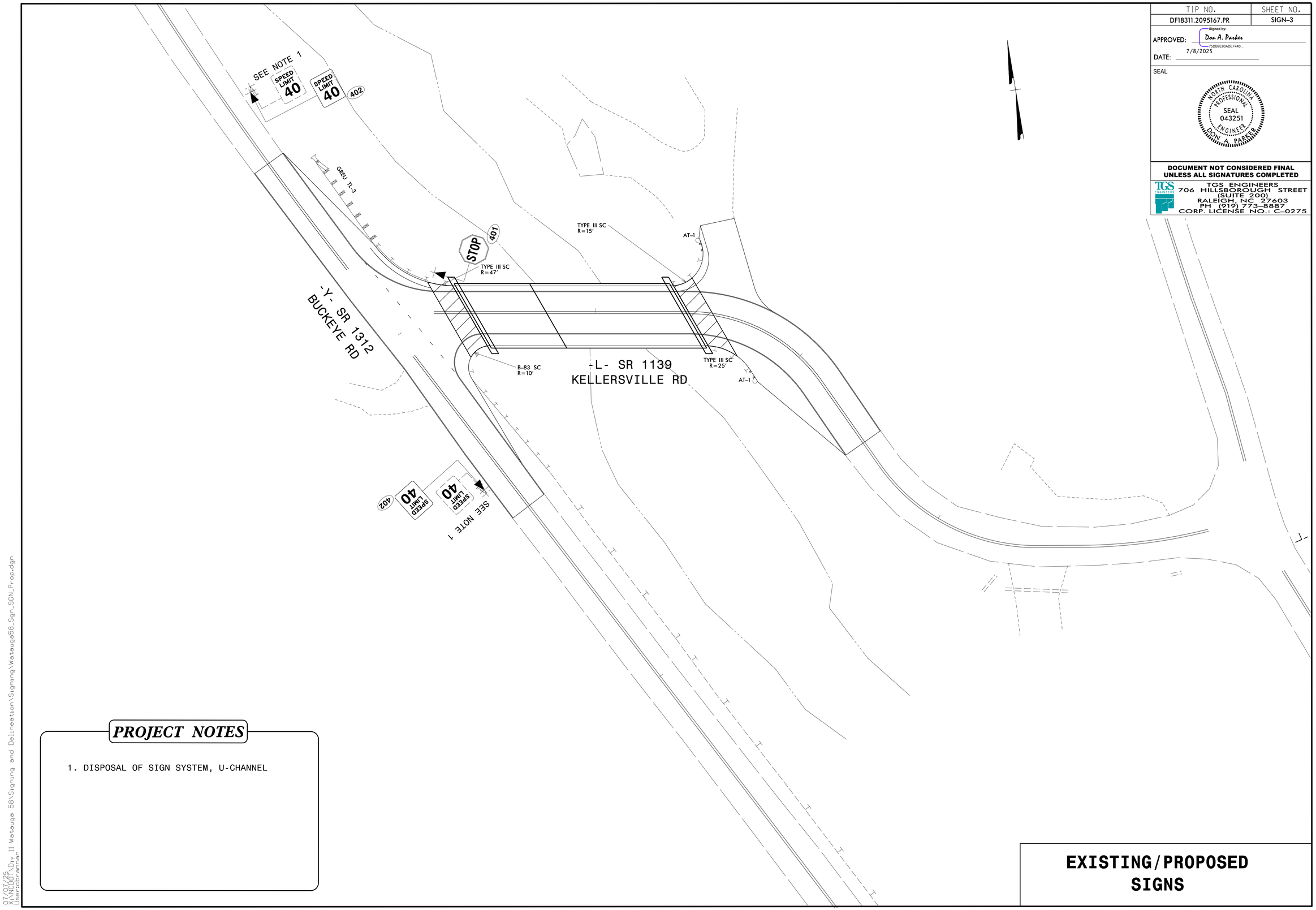
DATE: 7/8/2025

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043251 ENGINEER DON A PARKER

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



PROJECT NOTES

1. DISPOSAL OF SIGN SYSTEM, U-CHANNEL

EXISTING/PROPOSED SIGNS

07/07/25
X:\NCDOT\Div 11 Watauga 58\Signing and Delineation\Signing\Watauga58_Sgn_SGN_Prop.dgn
User:tbramlan

PROJECT REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	X-1
R/W SHEET NO.	

8/17/99

REVISIONS

DF18311.2095167.PR
CROSS-SECTION INDEX

5/30/2025
X:\NCDOT\Div 11 Watauga 58\Roadway\Design\XSC\Watauga58_Rdy_xpl_Index.dgn
lisarismelvin

PROJ. REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	X-1A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CROSS-SECTION SUMMARY

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+11.81	0	0
10+25.00	1	16
10+40.63	2	38

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
11+43.37	0	0
11+50.00	1	6
11+75.00	1	29
12+00.00	2	33
12+25.00	6	20
12+50.00	4	5

Station Y	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
11+00.00	0	0
11+25.00	0	3
11+50.00	0	5
11+75.00	0	3

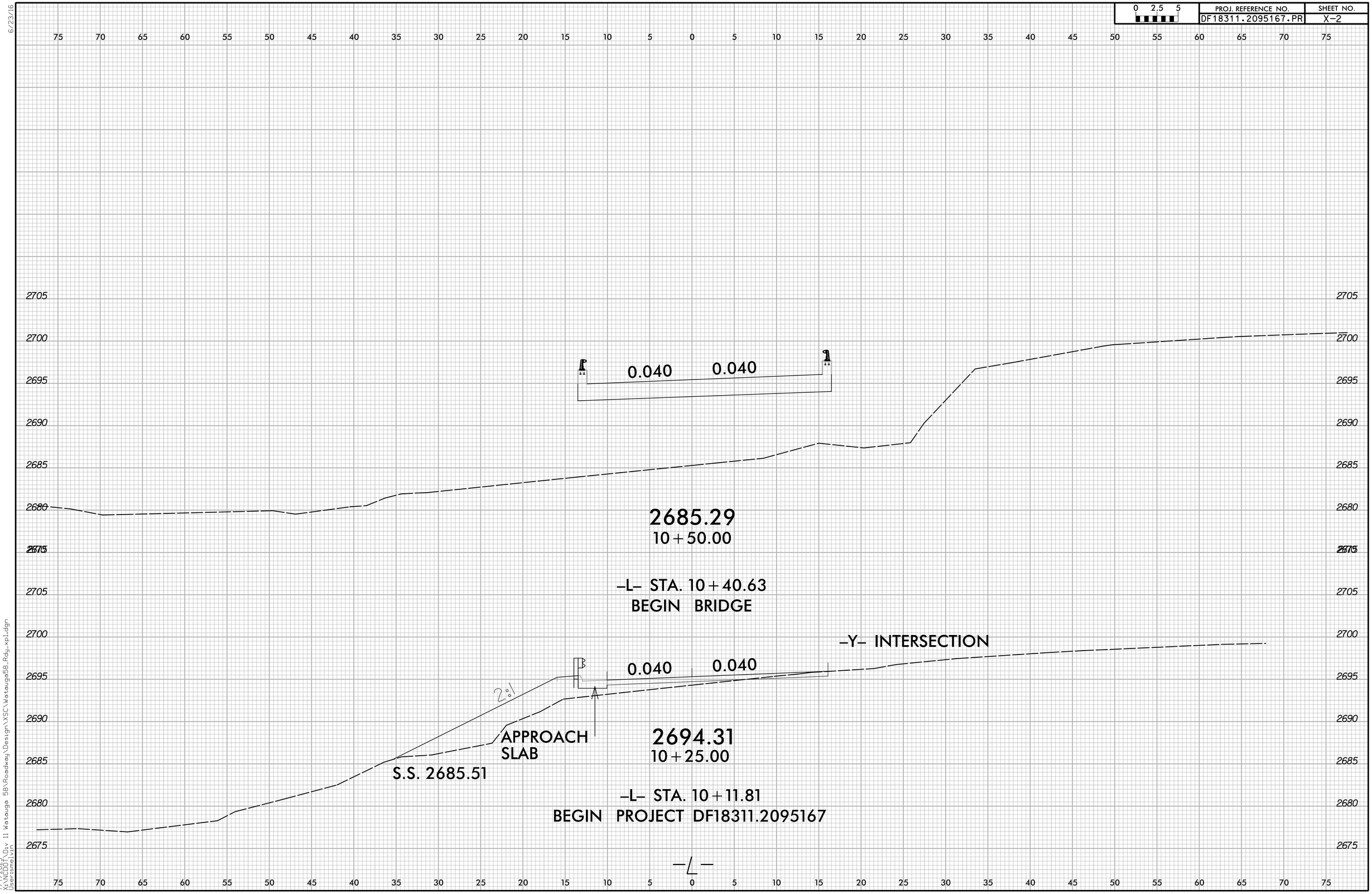
Station Y	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
12+25.00	0	0
12+50.00	0	3
12+75.00	0	10
13+00.00	0	8

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

6/23/16

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	X-2



7/7/2025
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User:smelvin

6/23/16

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	DF18311.2095167.PR	X-3

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

–L– STA. 11+43.37
END BRIDGE

2700 2695 2690 2685 2680 2675

0.040 0.040

2686.56
11+25.00

2700 2695 2690 2685 2680 2675

0.040 0.040

2682.70
11+00.00

2700 2695 2690 2685 2680 2675

0.040 0.040

2684.01
10+75.00
–L–

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

5/30/2025
X:\NCDOT\Div 11 Watauga 58\Roadway\Design\XSC\Watauga58_Rdy_xpl.dgn
User:smelvin

6/23/16

0 2.5 5

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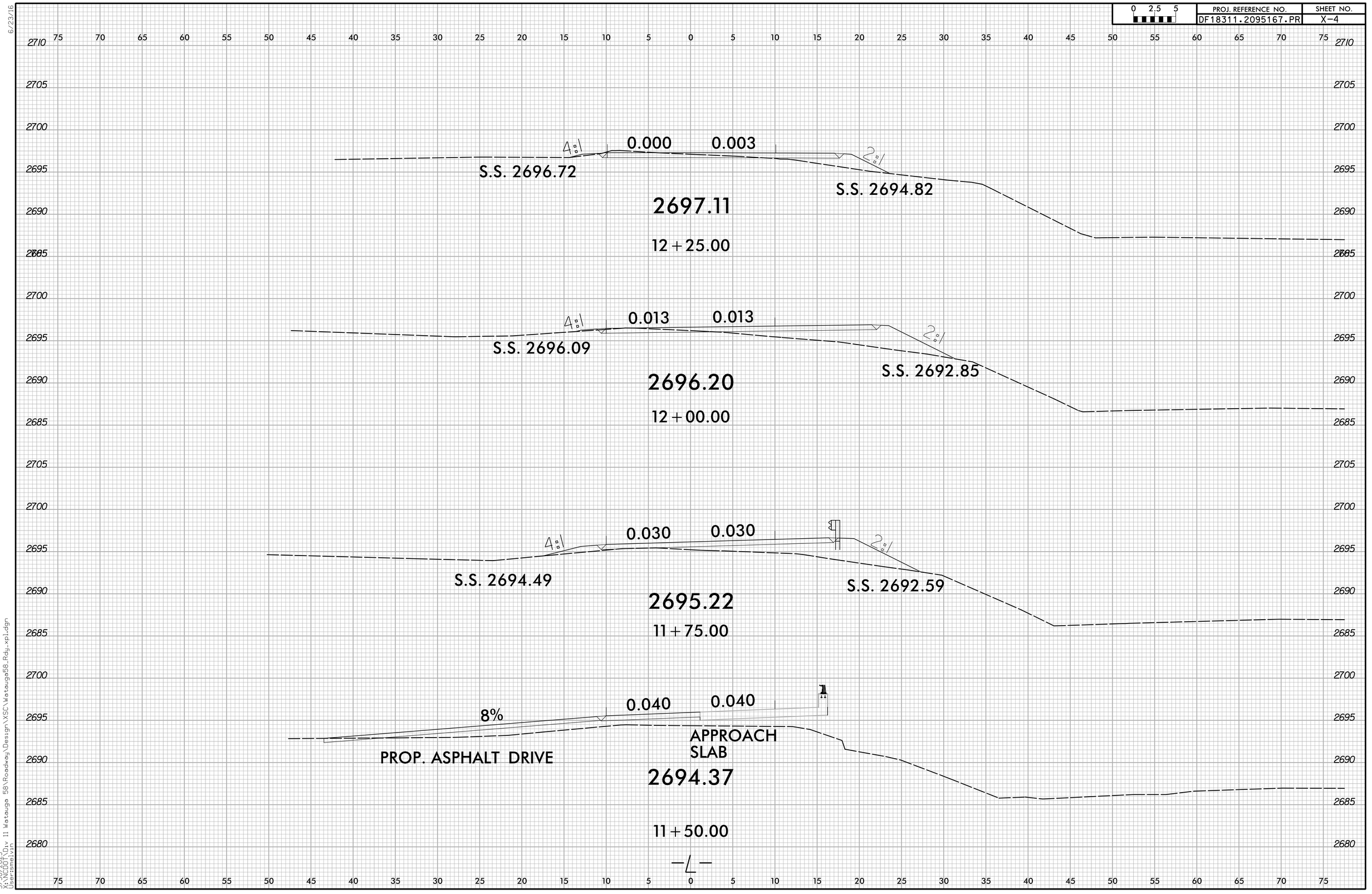

5/30/2025
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User:smelvin

6/23/16

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	X-5

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

–L– STA. 12 + 50.00

END PROJECT DF18311.2095167

2700
2695
2690
2685

2698.02

12 + 50.00

–L–

2700
2695
2690
2685

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

5/30/2025
X:\NCDOT\Div 11 Watauga 58\Roadway\Design\XSC\Watauga58_Rdy_xpl.dgn
User:smelvin

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	DF18311.2095167.PR	X-6

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

2700
2695
2690
2685
2680
2675
2670

EXIST. EXIST.
2693.44
S.S. 2691.93
2:1
11+50.00

EXIST. EXIST.
2692.34
S.S. 2685.07
2:1
11+25.00

2691.31
11+00.00

–Y– STA. 11+00.00
BEGIN CONSTRUCTION

–Y–

5/30/2025
X:\NCDOT\Div 11 Watauga 58\Roadway\Design\XSC\Watauga58_Rdy_xpl_Y.dgn
User:smelvin

6/23/16

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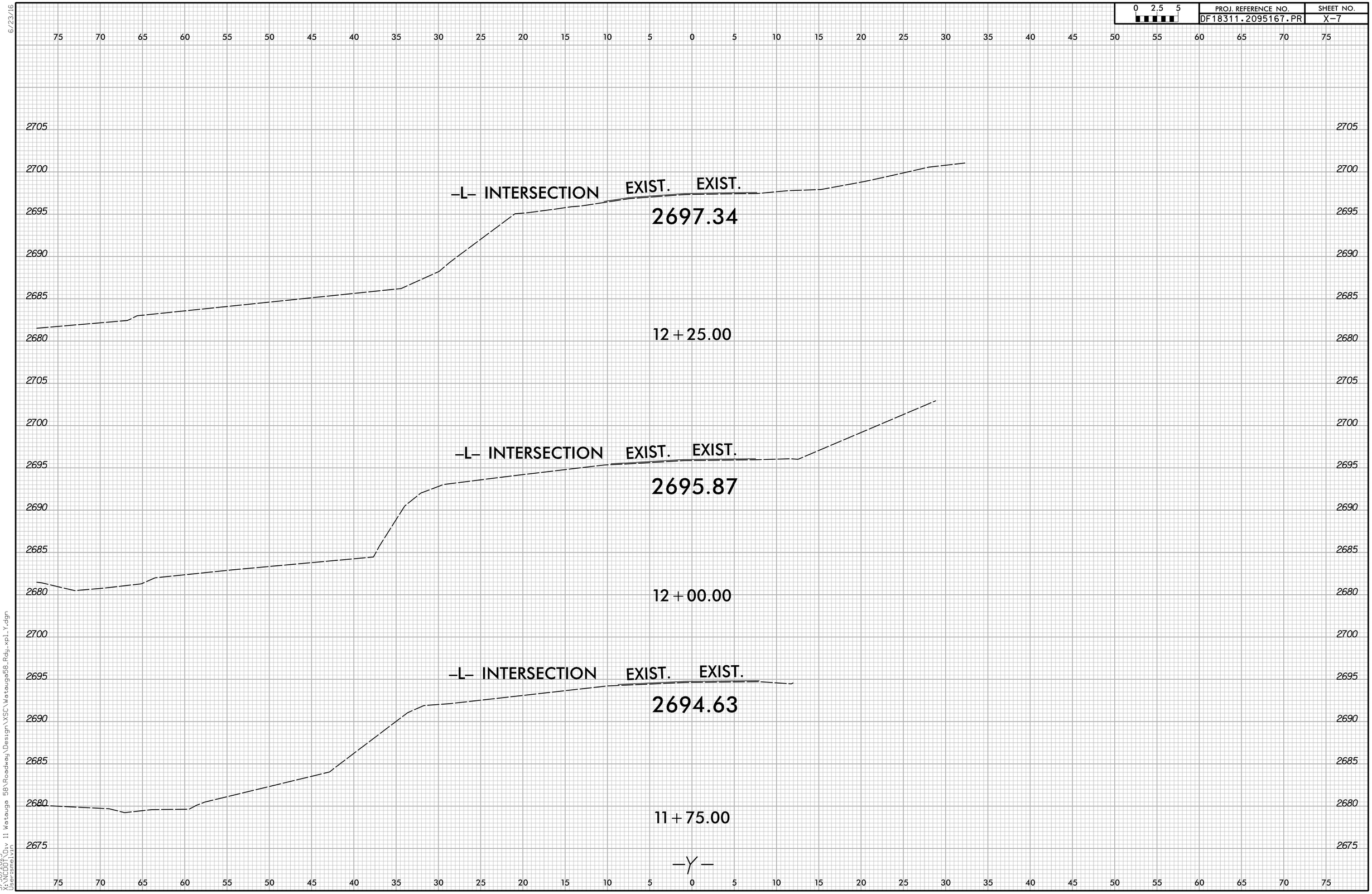

5/30/2025
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User:smelvin

6/23/16

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
DF18311.2095167.PR	X-8

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

–Y– STA. 13+00.00
END CONSTRUCTION

2705 2700 2695 2690 2685

NOTE:
REPAIRS HAVE BEEN COMPLETED TO RESTORE EMBANKMENT TO PRE–HELENE CONDITIONS.

2702.78

13+00.00

EXTRA DEPTH GUARDRAIL POST

EXIST. EXIST.

2700.98

NOTE:
REPAIRS HAVE BEEN COMPLETED TO RESTORE EMBANKMENT TO PRE–HELENE CONDITIONS.

1.5:1

S.S. 2692.54

12+75.00

EXTRA DEPTH GUARDRAIL POST

EXIST. EXIST.

2699.13

1.5:1

S.S. 2695.10

12+50.00

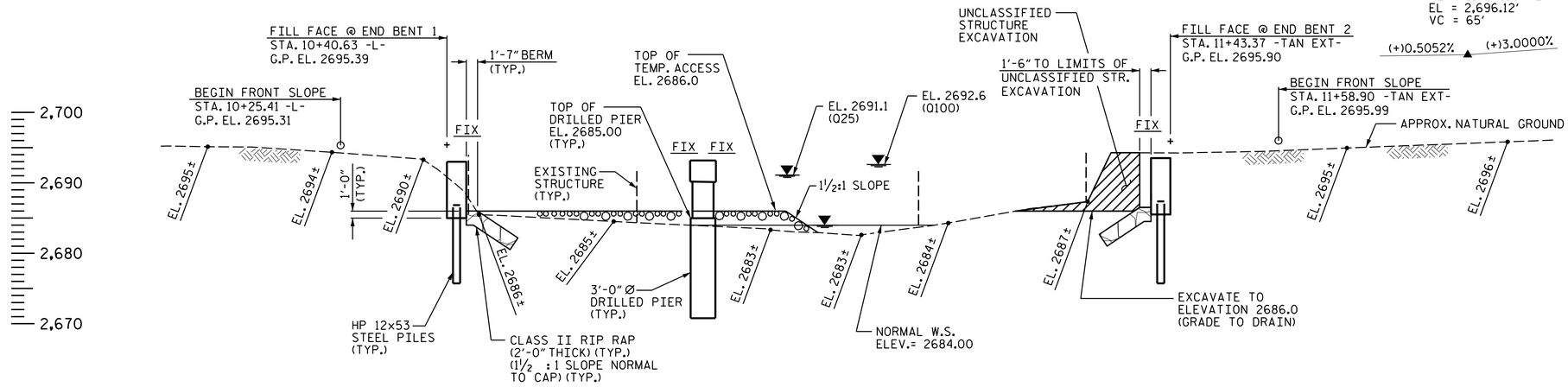
–Y–

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

5/30/2025
X:\NCDOT\Div 11 Watauga 58\Roadway\Design\XSC\Watauga58_Rdy_xpl_Y.dgn
User:smelvin

10+00 10+50 11+00 11+50 12+00

SPAN A — SPAN B



END BENT 1 — BENT 1 — END BENT 2

VERTICAL CURVE DATA

PI = 11+86.00 -L-
EL = 2,696.12'
VC = 65'
(+)0.5052% (+)3.0000%

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS.

SEAL

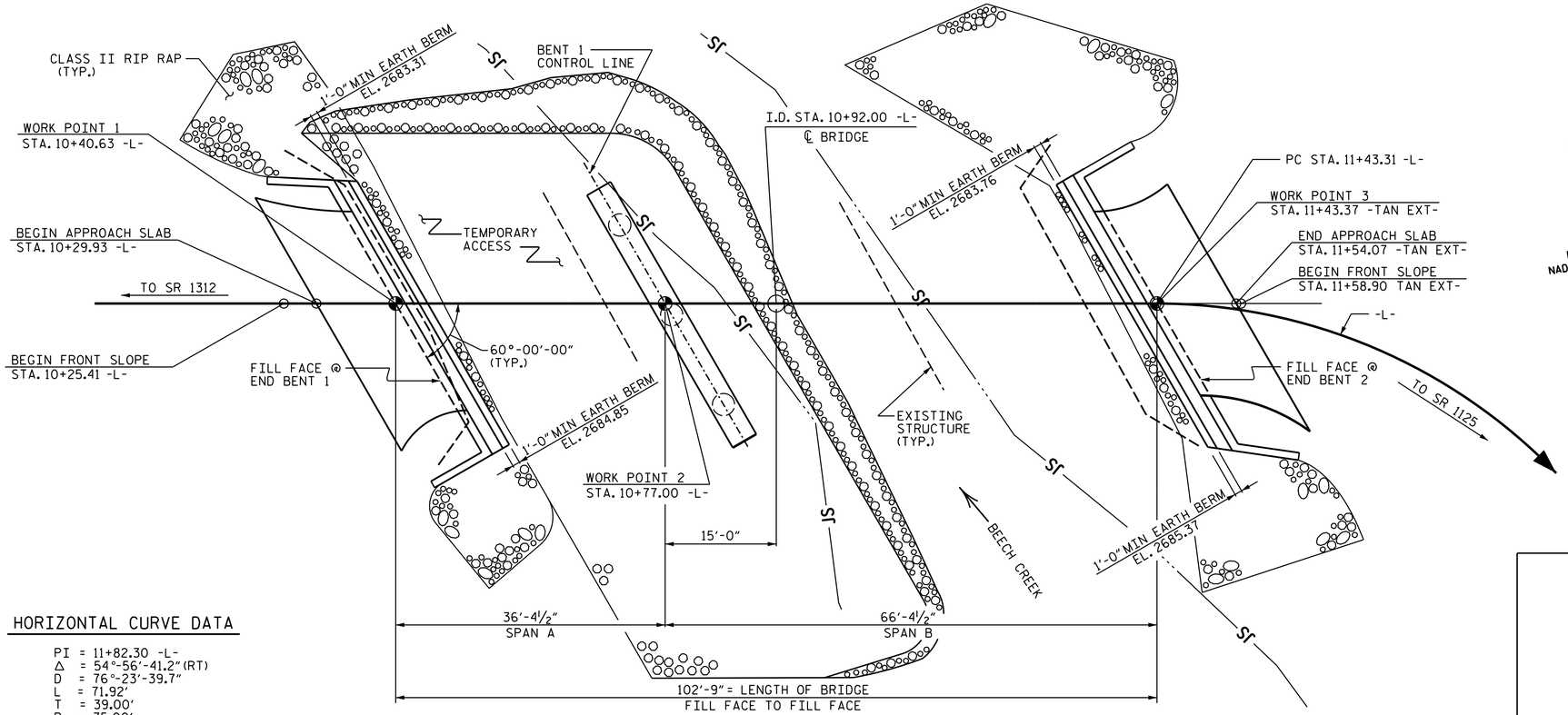
HYDRAULIC DATA:	
DESIGN DISCHARGE	2200 CFS
FREQUENCY OF DESIGN FLOOD	25 YRS.
DESIGN HIGH WATER ELEVATION	2691.1
DRAINAGE AREA	13.9 SQ. MI.
BASIC DISCHARGE	3300 CFS
FREQUENCY OF BASIC DISCHARGE	100 YRS.
BASIC HIGH WATER ELEVATION	2692.6
OVERTOPPING FLOOD DATA:	
OVERTOPPING DISCHARGE	8000 CFS
FREQUENCY OF OVERTOPPING FLOOD	500+ YRS.
OVERTOPPING FLOOD ELEVATION	2691.1 *

* AT STA. 10+40 -L- RT EOP.
WS EL TAKEN @ RIVER STATION 12348

LOW CHORD ELEVATION			
EB1	2692.53	EB2	2693.03

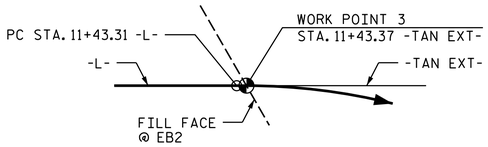
SECTION ALONG -L-

SECTION THRU END BENTS & BENT ARE AT RIGHT ANGLES.



PLAN

PILES NOT SHOWN IN PLAN VIEW FOR CLARITY.



WORKPOINT #3 DETAIL

THE CONTRACTOR SHALL USE THE TANGENT EXTENDED @ END BENT 2 FOR THE LAYOUT OF THE FOLLOWING:
1. LAYOUT OF END BENT 2.
2. LAYOUT OF THE APPROACH SLAB AT END BENT 2.
3. COMPUTATIONS OF BRIDGE AND APPROACH SLAB ELEVATIONS.

IN ADDITION, THE CONTRACTOR SHALL ASSUME THAT ALL STATIONING OCCURS ALONG THE TANGENT EXTENDED.

NC GRID NAD 83 NA 2011

HORIZONTAL CURVE DATA

PI = 11+82.30 -L-
Δ = 54°-56'-41.2" (RT)
D = 76°-23'-39.7"
L = 71.92'
T = 39.00'
R = 75.00'

PROJECT NO. DF18311.2095167.PR
WATAUGA COUNTY
STATION: 10+92.00 -L-

SHEET 1 OF 5 REPLACES BRIDGE #940058

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER Marshall G. Cheek, Jr.
7/8/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

IGS ENGINEERS
TGS ENGINEERS
201 WEST MARION ST
SUITE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

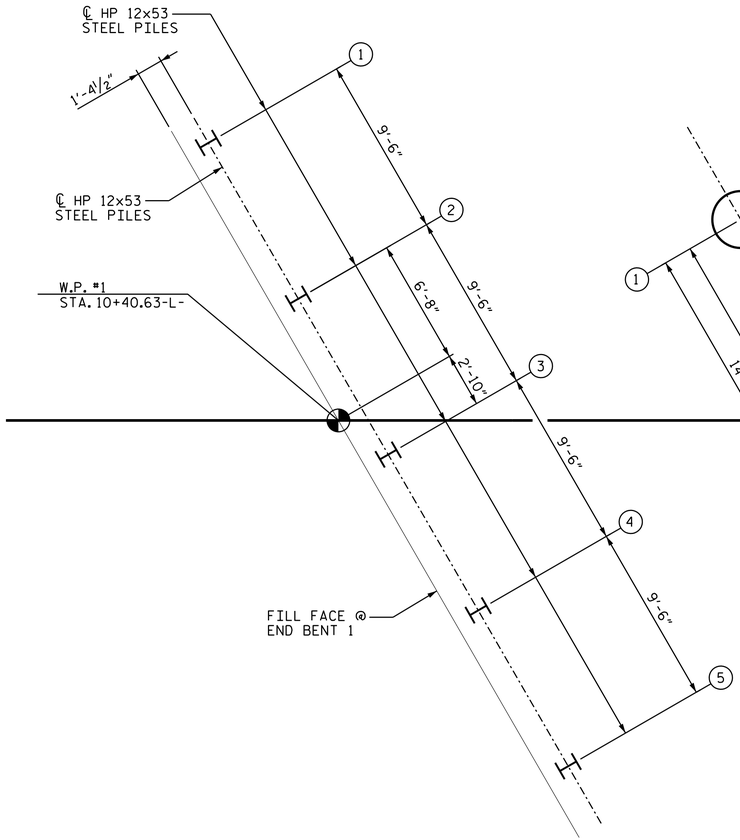
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

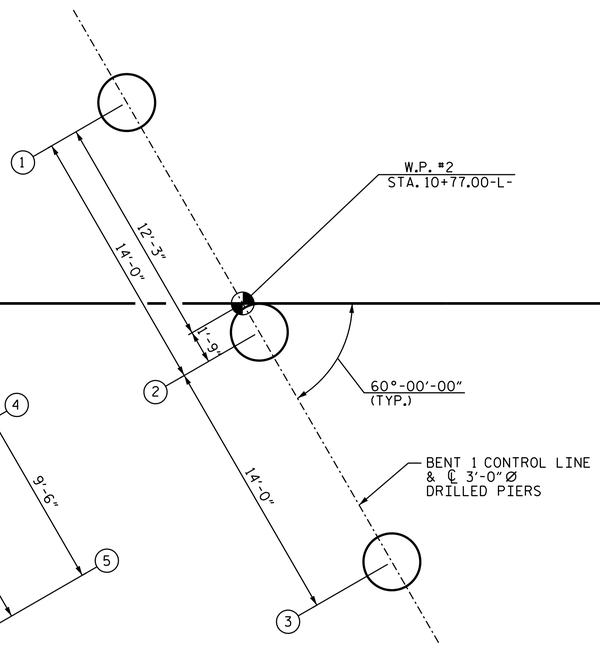
FOR BRIDGE OVER BEECH CREEK ON SR 1139 BETWEEN SR 1312 AND SR 1125

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			26

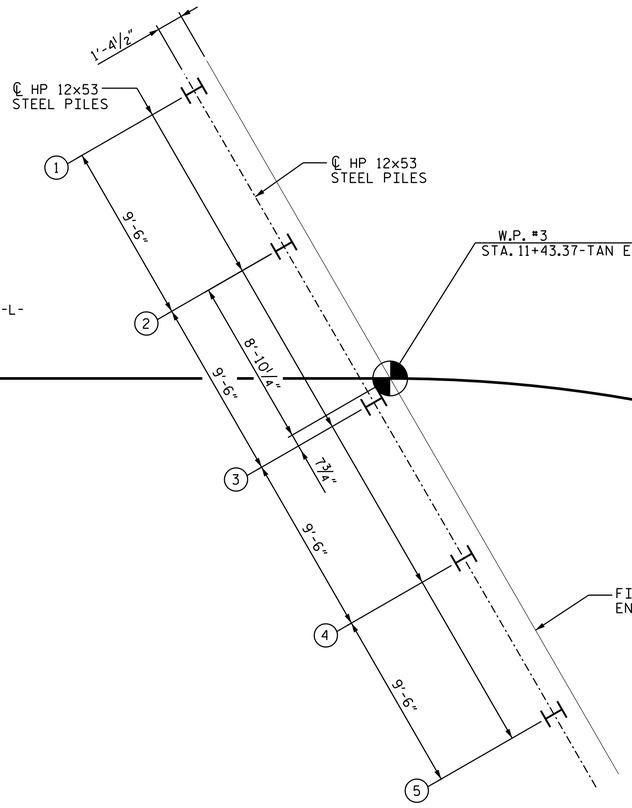
DRAWN BY :	ZCS	DATE :	5/25
CHECKED BY :	MGC	DATE :	6/25



END BENT 1



BENT 1



END BENT 2

FOUNDATION LAYOUT PLAN

ALL END BENT PILES ARE HP 12x53 STEEL PILES. DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES. ORIENT PILES AS SHOWN.

NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

FILL HOLES FOR PILE EXCAVATION AT END BENT 1 AND END BENT 2 WITH CONCRETE.

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

IF WEATHERED ROCK IS ENCOUNTERED AFTER PILE EXCAVATION AT END BENT 2, DRIVE PILES TO THE REQUIRED DRIVING RESISTANCE BEFORE BACKFILLING HOLES WITH CONCRETE.

INSTALL PERMANENT STEEL CASINGS AT BENT 1 BY VIBRATING, SCREWING OR DRIVING PERMANENT CASINGS BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATION 2,676 FT.

DRILLED PIERS AT BENT 1 REQUIRE PILOT BORINGS THAT WILL BE USED TO DETERMINE THE REQUIRED TIP NO HIGHER THAN ELEVATION. EACH BORING AT BENT 1 (PIER 1) SHALL BE ADVANCED TO AN ELEVATION OF 2,647 FEET AND BENT 1 (PIERS 2-3) TO AN ELEVATION OF 2,635 FEET. THE ENGINEER WILL REVIEW THE RESULTS INCLUDING ROCK CORES TO DETERMINE THE TIP ELEVATION FOR EACH DRILLED PIER. SEE GEOTECHNICAL SPECIAL PROVISION FOR PILOT BORINGS.

DRAWN BY :	ZCS	DATE :	5/25
CHECKED BY :	MGC	DATE :	6/25

PROJECT NO. DF18311.2095167.PR

WATAUGA COUNTY

STATION: 10+92.00-L-

SHEET 2 OF 5

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 Marshall G. Cheek, Jr. MARSHALL G. CHEEK, JR. 7/8/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER
BEECH CREEK
ON SR 1139 BETWEEN
SR 1312 AND SR 1125

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			26

SUMMARY OF PILE INFORMATION/INSTALLATION

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

End Bent/ Bent No. Pile(s) #-# (e.g., "Bent 1, Piles 1-5")	Number of Piles per Line	Factored Resistance per Pile KIPS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Length per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling For Piles *			Drilled-in-Piles		
						Min. Pile Tip (Tip No Higher Than) Elev. FT	Required Driving Resistance (RDR)** per Pile KIPS	Pile Redrives Quantity EACH	Predrilling Length per Pile LIN FT	Predrilling Elevation (Elev Not To Predrill Below) FT	Maximum Predrilling Dia INCHES	Pile Excavation (Bottom of Hole) Elev FT	Pile Exc Not In Soil per Pile LIN FT	Pile Exc In Soil per Pile LIN FT
End Bent 1, Piles 1-3	3	132	SEE END BENT SHEETS	15								2676	4.40	4.60
End Bent 1, Piles 4-5	2	132		15								2677	5.80	2.20
End Bent 2, Piles 1-3	3	188		25			314					2669	5.20	11.50
End Bent 2, Piles 4-5	2	188		25								2665	11.10	9.50
TOTAL QUANTITY:													62.60	71.70

* Predrilling for Piles is required for end bents/bents with a predrilling length and at the Contractor's option for end bents/bents with predrilling information but no predrilling length.

$$**\text{RDR} = \frac{\text{Factored Resistance} + \text{Factored Drag Load} + \text{Factored Dead Load}}{\text{Dynamic Resistance Factor}} + \text{Nominal Drag Load Resistance} + \text{Nominal Resistance From Scourable Material}$$

SUMMARY OF PILE ACCESSORIES

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

End Bent/ Bent No. Pile(s) #-# (e.g., "Bent 1, Piles 1-5")	Pipe Pile Plates EACH	Steel Pile Points		
		Pipe Pile Cutting Shoes EACH	Pipe Pile Conical Points EACH	H-Pile Points EACH
End Bent 2, Piles 1-3				3
TOTAL QUANTITY:				3

PILE DESIGN INFORMATION

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

End Bent/ Bent No. Pile(s) #-# (e.g., "Bent 1, Piles 1-5")	Factored Axial Load per Pile KIPS	Factored Drag Load per Pile KIPS	Factored Dead Load * per Pile KIPS	Dynamic Resistance Factor	Nominal Drag Resistance per Pile KIPS	Nominal Scour Resistance per Pile KIPS
End Bent 1, Piles 1-5	132					
End Bent 2, Piles 1-3	188			0.6		
End Bent 2, Piles 4-5	188					

* Factored Dead Load is factored weight of pile above the groundline.

SUMMARY OF DRILLED PIER TESTING

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

End Bent/ Bent No. PIER(s) #-# (e.g., "Bent 1, Piers 1-3")	Standard Penetration Test (SPT) Required? EACH	Crosshole Sonic Logging (CSL) EACH	Thermal Integrity Profiler (TIP) EACH	Shaft Inspection Device (SID) Required? EACH	Pile Integrity Test (PIT) Required? EACH
Bent 1, Piers 2-3		1			
TOTAL QUANTITY:		1			

SUMMARY OF DRILLED PIER INFORMATION/INSTALLATION

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

End Bent/ Bent No. Piers) #-# (e.g., "Bent 1, Piers 1-3")	Number of Piles per Line	Factored Resistance per Pier KIPS	Required Drilled Pier Tip Elevation FT	Required Tip Resistance Per Pier KSF	Scour Critical Elevation FT	Minimum Drilled Pier Penetration Into Rock per Pier LIN FT	Drilled Pier Length * per Pier LIN FT	Drilled Pier Length Not In Soil * per Pier LIN FT	Drilled Pier Length In Soil * per Pier LIN FT	Permanent Steel Casing Required? YES or MAYBE	Permanent Steel Casing Tip Elevation (Elev Not To Extend Casing Below) FT	Permanent Steel Casing Length ** per Pier LIN FT
Bent 1, Pier 1	1	680	2657.00	10	2674.00	13.00		16.00	12.00	YES	2670.00	15.00
Bent 1, Piers 2-3	2	680	2645.00	10	2674.00	31.00		31.00	9.00	YES	2675.00	10.00
TOTAL QUANTITY:								78.00	30.00			35.00

* Drilled Pier Length, Drilled Pier Length Not in Soil and Drilled Pier Length in Soil represent estimated drilled pier quantities and are measured and paid for as either "__ Dia. Drilled Piers" or "__ Dia. Drilled Piers Not in Soil" and "__ Dia. Drilled Piers in Soil" in accordance with Article 411-7 of the NCDOT Standard Specifications. For bents with a not in soil pay item, drilled piers through air or water will be paid at the contract unit price for "__ Dia. Drilled Piers in Soil."

** Permanent Steel Casing Length equals the difference between the ground line or top of drilled pier elevation, whichever is higher, and the permanent casing tip elevation and is measured and paid for as "Permanent Steel Casing for "__ Dia. Drilled Pier" in accordance with Article 411-7 of the NCDOT Standard Specifications.

NOTES:

1. The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Michael J. Walko, #026917) on 06-06-2025.
2. Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, ie., the number of piles with a Required Driving Resistance.
3. The Engineer may adjust the quantity for DPT Testing, Pipe Pile Plates, Permanent Steel Casing, SPTs, TIPs, CSL Testing, SID Inspections and PITs when necessary.

DRAWN BY : ZCS DATE : 5/25
CHECKED BY : MGC DATE : 6/25

PROJECT NO. DF18311.2095167.PR

WATAUGA COUNTY

STATION: 10+92.00-L-

SHEET 3 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR. — Marshall G. Cheek, Jr. — 7/8/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

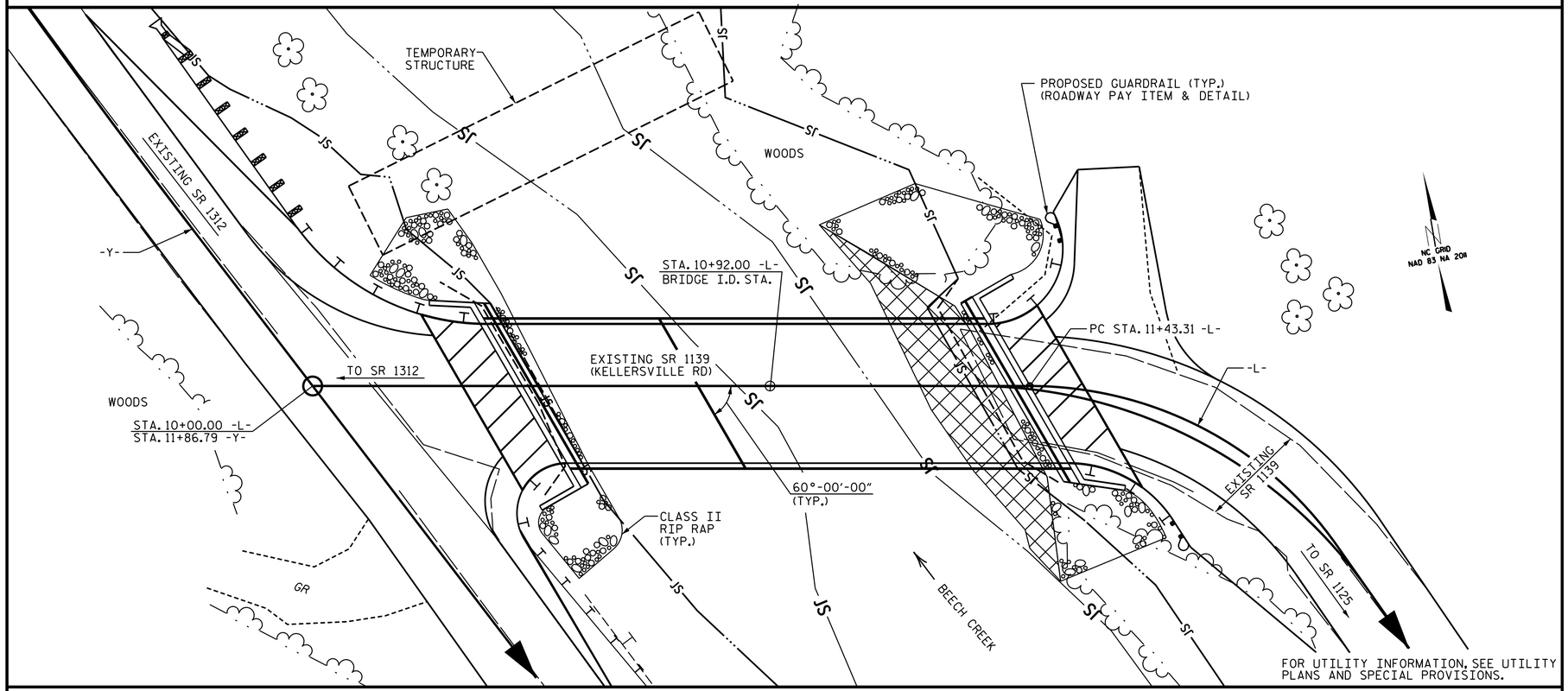
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOUNDATION TABLES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			26

BENCHMARK #1 : BENCH TIE IN 15" WALNUT TREE: 36.9 FT LEFT OF STA 11+73.32 -L-; ELEV. 2696.11



LOCATION SKETCH

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS.

SEAL

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE STANDARD NOTES SHEET.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

THE 3-SPAN BRIDGE (1 @ 25-10", 1 @ 40'-0", 1 @ 24'-10") CONSISTING OF A STEEL PLANK FLOOR ON STEEL I-BEAMS, WAS WASHED OUT AS A RESULT OF HURRICANE HELENE. A TEMPORARY STRUCTURE CONSISTING OF A RAIL CAR WAS PLACED BY NCDOT FORCES DOWNSTREAM OF THE PROPOSED STRUCTURE. THIS TEMPORARY STRUCTURE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE INTEGRITY OF THE BRIDGE DETERIORATE, THIS LOAD LIMIT MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. FOR REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR THE DISTANCE OF 35 FT. LT. AND 40 FT. RT. OF -L- @ EB2 AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION, SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES".

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR ASBESTOS ASSESSMENT, SEE SPECIAL PROVISIONS.

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY ACCESS AT STATION 10+92.00-L- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS, SEE SPECIAL PROVISIONS.

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 10+92.00 -L-.

ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITIES ON ROADWAY PLANS.

AT THE CONTRACTORS OPTION, PRESTRESSED CONCRETE END BENT AND BENT CAPS MAY BE SUBSTITUTED IN PLACE OF THE CAST-IN-PLACE CAPS. THE CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER TO RECEIVE REVISED PLANS AND DETAILS FROM THE STRUCTURES MANAGEMENT UNIT. THE REDESIGN AND ANY ADDITIONAL MATERIALS NEEDED WILL BE AT NO ADDITIONAL COST TO THE CONTRACTOR.

PROJECT NO. DF18311.2095167.PR

WATAUGA COUNTY

STATION: 10+92.00 -L-

SHEET 4 OF 5

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 Marshall G. Check, Jr. MARSHALL G. CHECK, JR. ENGINEER

7/8/2025

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER BEECH CREEK ON SR 1139 BETWEEN SR 1312 AND SR 1125

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 WEST MARION ST
SUITE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			26

DRAWN BY :	ZCS	DATE :	5/25
CHECKED BY :	MGC	DATE :	6/25

TOTAL BILL OF MATERIAL

ITEM	CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	3'-0" Ø DRILLED PIERS IN SOIL	3'-0" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIERS	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS
	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EA.	LUMP SUM	C.Y.	LUMP SUM
SUPERSTRUCTURE												
END BENT 1				18.20	24.80						48.5	
BENT 1						30.00	78.00	35.00	1		16.7	
END BENT 2				53.50	37.80					LUMP SUM	48.5	
TOTALS	LUMP SUM	LUMP SUM	LUMP SUM	71.70	62.60	30.00	78.00	35.00	1	LUMP SUM	113.7	LUMP SUM

TOTAL BILL OF MATERIAL

ITEM	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12x53 STEEL PILES		STEEL PILE POINTS	ONE BAR METAL RAIL	1'-0" X 1-9½" CONCRETE PARAPET	RIP RAP, CLASS II	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" x 2'-0" PRESTRESSED CONCRETE CORED SLABS	
	LBS.	LBS.	EA.	NO.	LIN. FT.	EA.	LIN. FT.	LIN. FT.	TONS	S.Y.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE							184.13	200.29				20	1000.00
END BENT 1	5927			5	75				155	175			
BENT 1	10341	2140											
END BENT 2	5927		3	5	125	3			175	195			
TOTALS	22195	2140	3	10	200	3	184.13	200.29	330	370	LUMP SUM	20	1000.00

PROJECT NO. DF18311.2095167.PR

WATAUGA COUNTY

STATION: 10+92.00 -L-

SHEET 5 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
Marshall G. Cheek, Jr.
7/8/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER
BEECH CREEK
ON SR 1139 BETWEEN
SR 1312 AND SR 1125

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			26

DRAWN BY :	ZCS	DATE : 5/25
CHECKED BY :	MGC	DATE : 6/25

8/26/21

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LOAD TYPE		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVE-LOAD FACTORS (γ LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD		HL-93 (INVENTORY)	N/A	1	1.54	--	1.75	0.26	3.57	35'	EL	13.42	0.65	1.54	35'	EL	1.71	0.80	0.26	4.53	35'	EL	16.92	
		HL-93 (OPERATING)	N/A		2.78	--	1.35	0.26	4.63	35'	EL	13.42	0.65	2.78	35'	EL	1.71	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	2	2.10	75.60	1.75	0.26	4.53	35'	EL	13.42	0.65	2.10	35'	EL	1.71	0.80	0.26	5.94	35'	EL	13.42	
		HS-20 (OPERATING)	36.000		3.36	120.96	1.35	0.26	5.87	35'	EL	13.42	0.65	3.36	35'	EL	6.42	N/A	--	--	--	--	--	
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500		6.44	86.94	1.4	0.26	10.08	35'	EL	13.42	0.65	6.44	35'	EL	6.42	0.80	0.26	10.35	35'	EL	16.92	
		SNGARBS2	20.000		4.96	99.20	1.4	0.26	8.30	35'	EL	13.42	0.65	4.96	35'	EL	6.42	0.80	0.26	8.71	35'	EL	13.42	
		SNAGRIS2	22.000		4.78	105.16	1.4	0.26	8.24	35'	EL	13.42	0.65	4.78	35'	EL	6.42	0.80	0.26	8.64	35'	EL	13.42	
		SNCOTTS3	27.250		3.18	88.66	1.4	0.26	5.13	35'	EL	13.42	0.65	3.18	35'	EL	6.42	0.80	0.26	5.18	35'	EL	16.92	
		SNAGGRS4	34.925		2.92	101.98	1.4	0.26	4.67	35'	EL	13.42	0.65	2.92	35'	EL	6.42	0.80	0.26	4.80	35'	EL	16.92	
		SNS5A	35.550		3.11	110.56	1.4	0.26	4.66	35'	EL	16.92	0.65	3.11	35'	EL	6.42	0.80	0.26	4.66	35'	EL	16.92	
		SNS6A	39.950		2.92	116.65	1.4	0.26	4.45	35'	EL	13.42	0.65	2.92	35'	EL	6.42	0.80	0.26	4.49	35'	EL	16.92	
		SNS7B	42.000		2.98	125.16	1.4	0.26	4.23	35'	EL	13.42	0.65	2.98	35'	EL	6.42	0.80	0.26	4.29	35'	EL	16.92	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		3.50	115.50	1.4	0.26	5.56	35'	EL	16.92	0.65	3.50	35'	EL	6.42	0.80	0.26	5.56	35'	EL	16.92	
		TNT4A	33.075		3.24	107.16	1.4	0.26	5.41	35'	EL	13.42	0.65	3.24	35'	EL	6.42	0.80	0.26	5.55	35'	EL	16.92	
		TNT6A	41.600		3.12	129.79	1.4	0.26	4.79	35'	EL	13.42	0.65	3.12	35'	EL	6.42	0.80	0.26	4.86	35'	EL	16.92	
		TNT7A	42.000		2.97	124.74	1.4	0.26	4.78	35'	EL	13.42	0.65	2.97	35'	EL	6.42	0.80	0.26	5.02	35'	EL	13.42	
		TNT7B	42.000		2.90	121.80	1.4	0.26	4.81	35'	EL	13.42	0.65	2.90	35'	EL	6.42	0.80	0.26	4.94	35'	EL	16.92	
		TNAGRIT4	43.000		2.48	106.64	1.4	0.26	4.70	35'	EL	13.42	0.65	2.48	35'	EL	1.71	0.80	0.26	4.93	35'	EL	13.42	
		TNAGT5A	45.000		2.85	128.25	1.4	0.26	4.56	35'	EL	13.42	0.65	2.85	35'	EL	1.71	0.80	0.26	4.62	35'	EL	16.92	
		TNAGT5B	45.000	3	2.18	98.10	1.4	0.26	4.30	35'	EL	13.42	0.65	2.18	35'	EL	1.71	0.80	0.26	4.45	35'	EL	16.92	
EMERGENCY VEHICLE (EV)		EV2	28.750		3.77	108.39	1.3	0.26	6.43	35'	EL	13.42	0.65	3.77	35'	EL	6.42	0.80	0.26	6.27	35'	EL	13.42	
		EV3	43.000	4	2.15	92.45	1.3	0.26	4.33	35'	EL	13.42	0.65	2.15	35'	EL	1.71	0.80	0.26	4.12	35'	EL	16.92	

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ DC	γ DW
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

1.

2.

3.

4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING * *

(4) EMERGENCY VEHICLE LOAD RATING **

* * SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER

EL - EXTERIOR LEFT GIRDER

ER - EXTERIOR RIGHT GIRDER

LRFR SUMMARY

FOR SPAN "A"

PROJECT NO. DF18311.2095167.PR

WATAUGA COUNTY

STATION: 10+92.00 -L-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 MARSHALL G. CHEEK, JR. Marshall G. Cheek, Jr. 2F34ADC4D3...

7/8/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 WEST MARION ST
SUITE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR 35' CORED SLAB UNIT 60° SKEW

(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			26

ASSEMBLED BY:	STM	DATE :	05/25
CHECKED BY :	MGC	DATE :	05/25
DESIGN ENGINNER OF RECORD:	STM	DATE :	06/25

6/25/2025
c:\workdir\ncdot-pw.bentley.com_ncdot-pw-01\sam massinople\d0495835\SMU OBM-seed3d.dgn
smassinople

8/26/21

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LOAD TYPE		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVE-LOAD FACTORS (γ LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD		HL-93 (INVENTORY)	N/A	1	1.06	--	1.75	0.26	1.21	65'	EL	31.92	0.66	1.06	65'	EL	1.62	0.80	0.26	1.32	65'	EL	31.92	
		HL-93 (OPERATING)	N/A		1.57	--	1.35	0.26	1.57	65'	EL	31.92	0.66	1.67	65'	EL	5.92	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	2	1.56	56.16	1.75	0.26	1.56	65'	EL	31.92	0.66	1.57	65'	EL	5.92	0.80	0.26	1.69	65'	EL	31.92	
		HS-20 (OPERATING)	36.000		2.02	72.72	1.35	0.26	2.02	65'	EL	31.92	0.66	2.08	65'	EL	5.92	N/A	--	--	--	--	--	
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500		3.71	50.09	1.4	0.26	4.27	65'	EL	31.92	0.66	4.88	65'	EL	5.92	0.80	0.26	3.71	65'	EL	31.92	
		SNGARBS2	20.000		2.81	56.20	1.4	0.26	3.23	65'	EL	31.92	0.66	3.45	65'	EL	5.92	0.80	0.26	2.81	65'	EL	31.92	
		SNAGRIS2	22.000		2.68	58.96	1.4	0.26	3.08	65'	EL	31.92	0.66	3.20	65'	EL	5.92	0.80	0.26	2.68	65'	EL	31.92	
		SNCOTTS3	27.250		1.85	50.41	1.4	0.26	2.13	65'	EL	31.92	0.66	2.36	65'	EL	5.92	0.80	0.26	1.85	65'	EL	31.92	
		SNAGGRS4	34.925		1.56	54.48	1.4	0.26	1.80	65'	EL	31.92	0.66	1.96	65'	EL	5.92	0.80	0.26	1.56	65'	EL	31.92	
		SNS5A	35.550		1.53	54.39	1.4	0.26	1.76	65'	EL	31.92	0.66	1.99	65'	EL	5.92	0.80	0.26	1.53	65'	EL	31.92	
		SNS6A	39.950		1.41	56.33	1.4	0.26	1.62	65'	EL	31.92	0.66	1.81	65'	EL	5.92	0.80	0.26	1.41	65'	EL	31.92	
		SNS7B	42.000		1.34	56.28	1.4	0.26	1.54	65'	EL	31.92	0.66	1.79	65'	EL	5.92	0.80	0.26	1.34	65'	EL	31.92	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.72	56.76	1.4	0.26	1.98	65'	EL	31.92	0.66	2.18	65'	EL	5.92	0.80	0.26	1.72	65'	EL	31.92	
		TNT4A	33.075		1.73	57.22	1.4	0.26	1.99	65'	EL	31.92	0.66	2.11	65'	EL	5.92	0.80	0.26	1.73	65'	EL	31.92	
		TNT6A	41.600		1.42	59.07	1.4	0.26	1.63	65'	EL	31.92	0.66	1.94	65'	EL	5.92	0.80	0.26	1.42	65'	EL	31.92	
		TNT7A	42.000		1.43	60.06	1.4	0.26	1.65	65'	EL	31.92	0.66	1.86	65'	EL	5.92	0.80	0.26	1.43	65'	EL	31.92	
		TNT7B	42.000		1.49	62.58	1.4	0.26	1.71	65'	EL	31.92	0.66	1.74	65'	EL	5.92	0.80	0.26	1.49	65'	EL	31.92	
		TNAGRIT4	43.000		1.41	60.63	1.4	0.26	1.62	65'	EL	31.92	0.66	1.67	65'	EL	5.92	0.80	0.26	1.41	65'	EL	31.92	
		TNAGT5A	45.000		1.33	59.85	1.4	0.26	1.53	65'	EL	31.92	0.66	1.68	65'	EL	5.92	0.80	0.26	1.33	65'	EL	31.92	
		TNAGT5B	45.000	3	1.31	58.95	1.4	0.26	1.50	65'	EL	31.92	0.66	1.58	65'	EL	5.92	0.80	0.26	1.31	65'	EL	31.92	
EMERGENCY VEHICLE (EV)		EV2	28.750		1.99	57.21	1.3	0.26	2.47	65'	EL	31.92	0.66	2.57	65'	EL	5.92	0.80	0.26	1.99	65'	EL	31.92	
		EV3	43.000	4	1.30	55.90	1.3	0.26	1.61	65'	EL	31.92	0.66	1.69	65'	EL	5.92	0.80	0.26	1.30	65'	EL	31.92	

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γDC	γDW
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

1.

2.

3.

4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING * *

(4) EMERGENCY VEHICLE LOAD RATING **

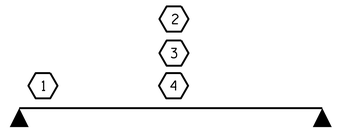
* * SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER

EL - EXTERIOR LEFT GIRDER

ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY

FOR SPAN "B"

PROJECT NO. DF18311.2095167.PR

WATAUGA COUNTY

STATION: 10+92.00 -L-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

Marshall G. Cheek, Jr.

7/8/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 WEST MARION ST
SUITE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR 65' CORED SLAB UNIT 60° SKEW

(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			26

ASSEMBLED BY:	STM	DATE :	05/25
CHECKED BY :	MGC	DATE :	05/25
DESIGN ENGINNER OF RECORD:	STM	DATE :	06/25

6/25/2025
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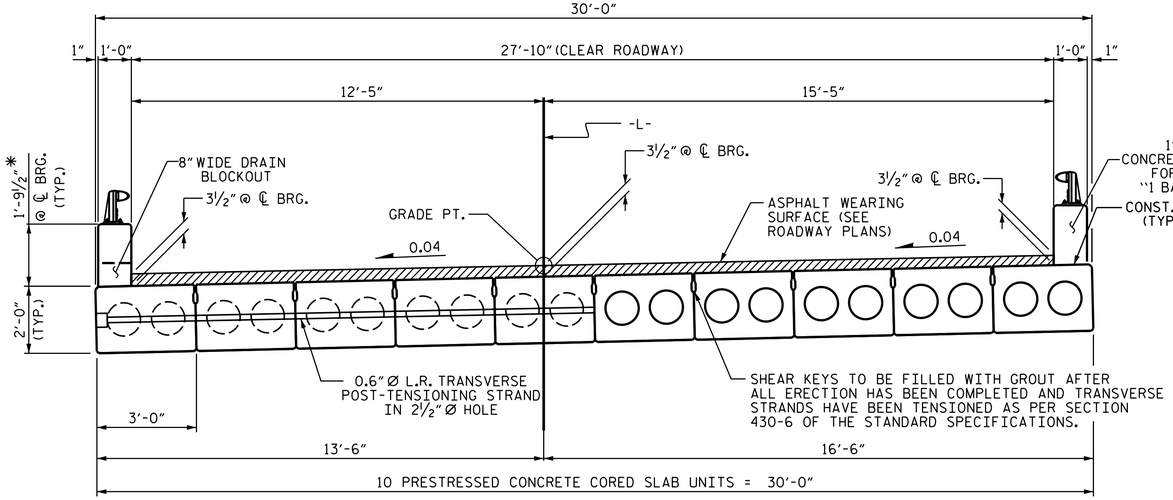
smassinople

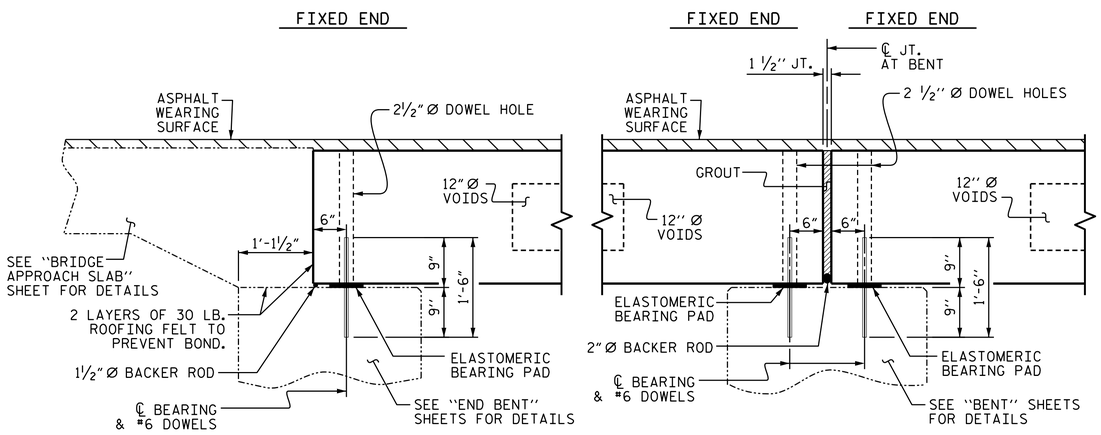


HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION
THROUGH VOIDS

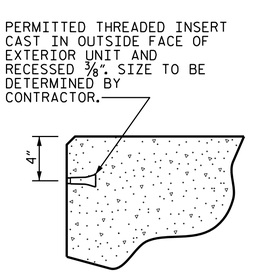
TYPICAL SECTION

* - THE MAXIMUM PARAPET HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE PARAPET AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE PARAPET FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR PARAPET HEIGHT DETAILS AND ASPHALT THICKNESS, SEE THE "ONE BAR METAL RAIL PARAPET SECTION", SHEET 4 OF 4.

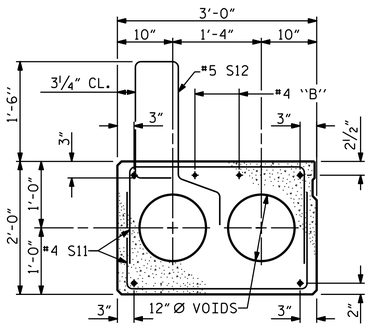


SECTION AT END BENT

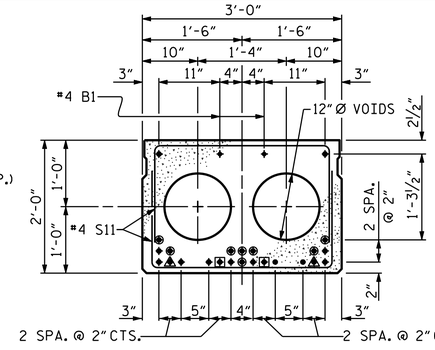
SECTION AT BENT



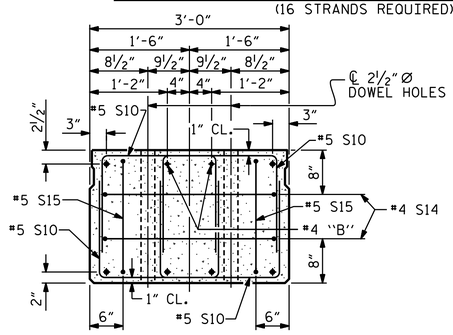
THREADED INSERT DETAIL



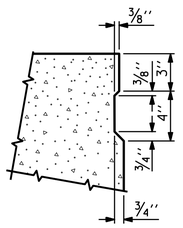
EXTERIOR SLAB SECTION
(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)



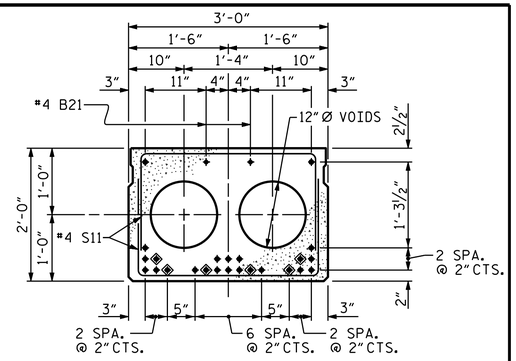
INTERIOR SLAB SECTION (35' UNIT)
(16 STRANDS REQUIRED)



END ELEVATION
SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.)
INTERIOR SLAB SECTION SHOWN-EXTERIOR SLAB SECTION SIMILAR EXCEPT SHEAR KEY LOCATION.



SHEAR KEY DETAIL
NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.



INTERIOR SLAB SECTION (65' UNIT)
(24 STRANDS REQUIRED)

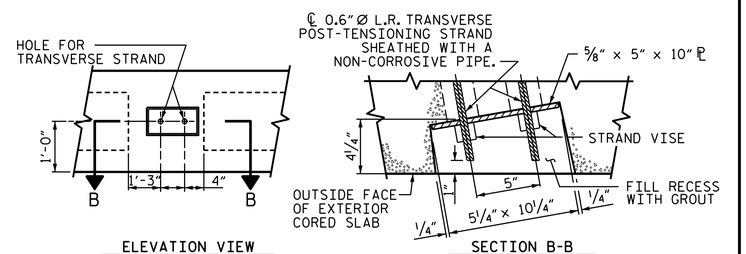
◆ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 12'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

◉ OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

▣ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 4'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

▲ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 8'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND



ELEVATION VIEW

SECTION B-B

GROUTED RECESS AT END OF POST-TENSIONED STRAND CORED SLABS

PROJECT NO. DF18311.2095167.PR

WATAUGA COUNTY

STATION: 10+92.00 -L-

SHEET 1 OF 4

DRAWN BY : S. B. WILLIAMS DATE : 4-25
CHECKED BY : M. G. CHEEK DATE : 5-25
DESIGN ENGINEER OF RECORD: S. T. M. DATE : 6-25

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER Marshall G. Cheek, Jr. MARSHALL G. CHEEK, JR.

7/8/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLAB UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			26

6/25/2025
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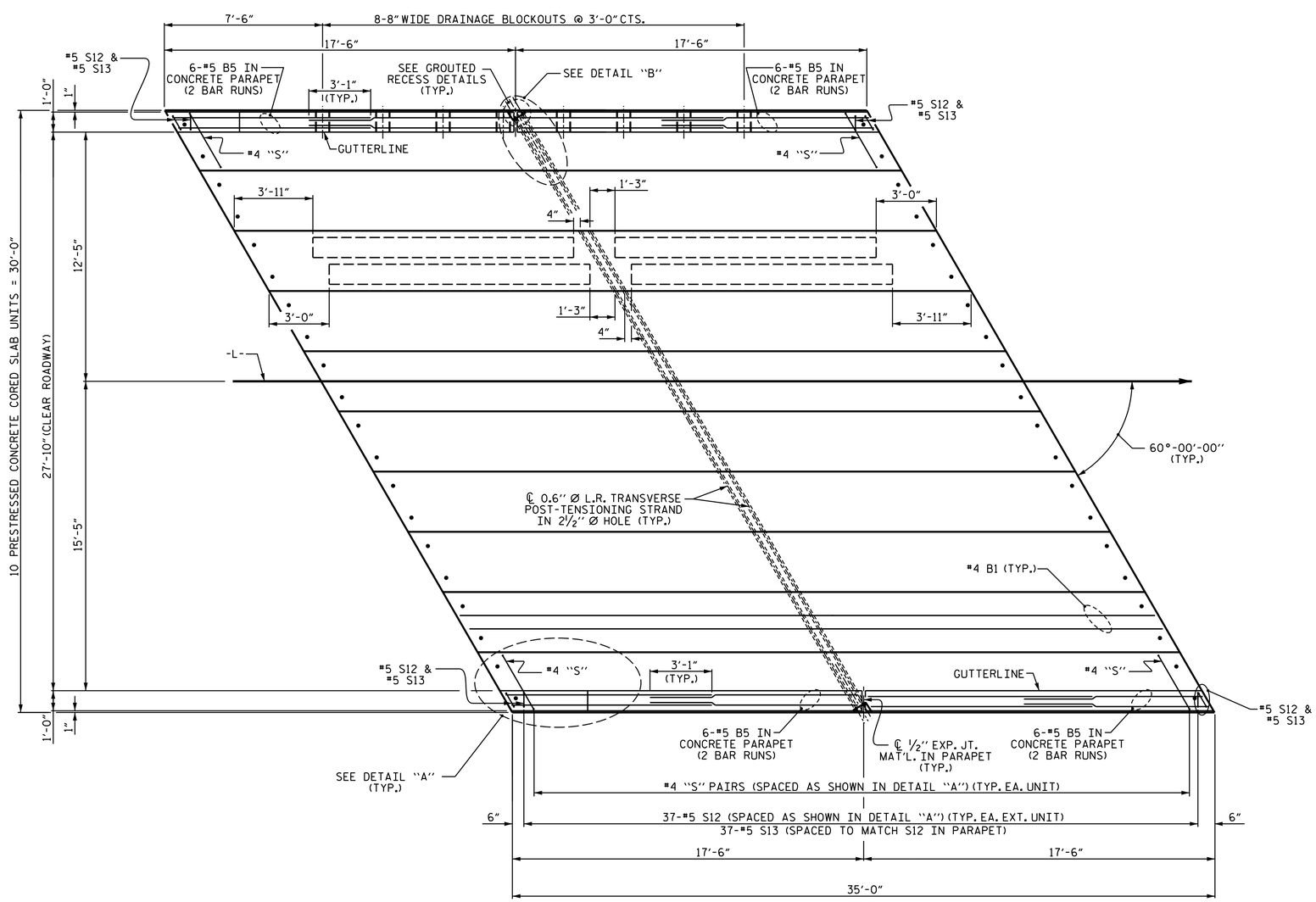
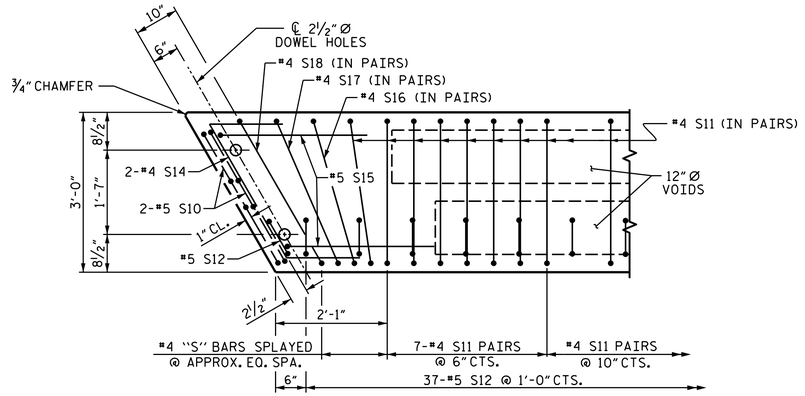
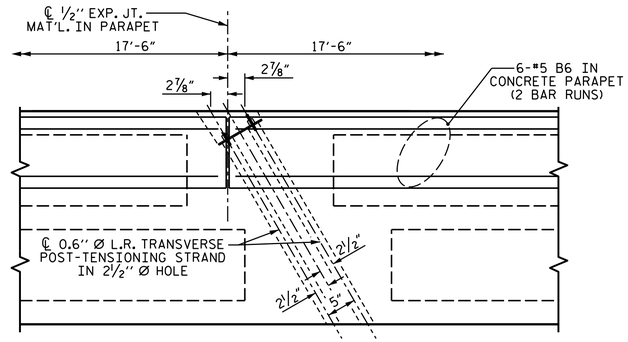


SPAN A



DETAIL "A"

(SIMILAR EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S12 BARS.



DETAIL "B"

#4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUTED RECESS AND 2½" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

PROJECT NO. DF18311.2095167.PR

WATAUGA COUNTY

STATION: 10+92.00 -L-

SHEET 2 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
Marshall G. Cheek, Jr.
DocuSigned by: 3A4DC41...
7/8/2025

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 35' UNIT 27'-10" CLEAR ROADWAY 60° SKEW

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			26

DRAWN BY : S. B. WILLIAMS DATE : 4-25
CHECKED BY : M. G. CHEEK DATE : 5-25
DESIGN ENGINEER OF RECORD: S. T. M. DATE : 6-25

6/25/2025
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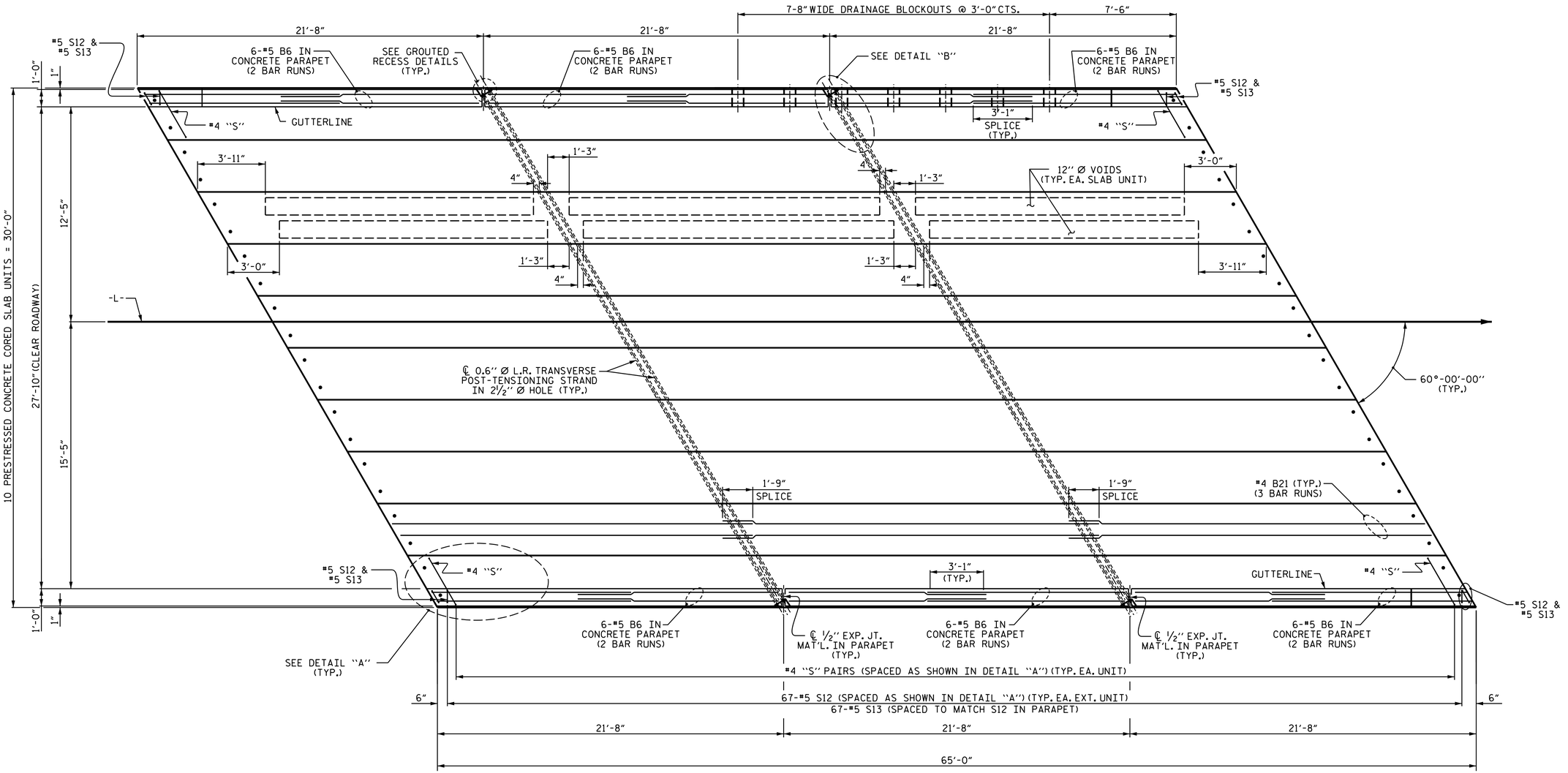
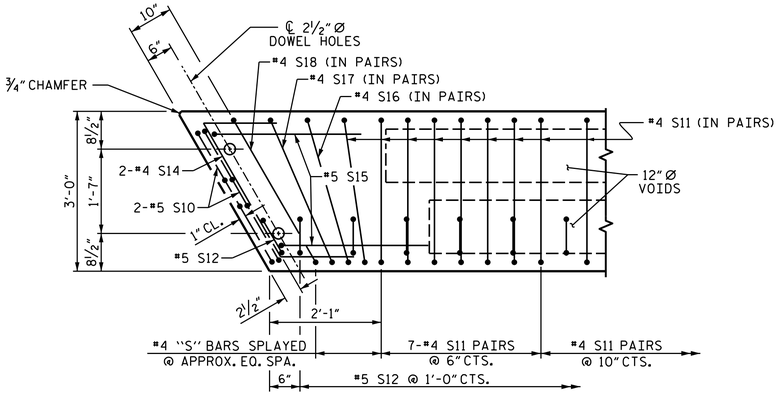
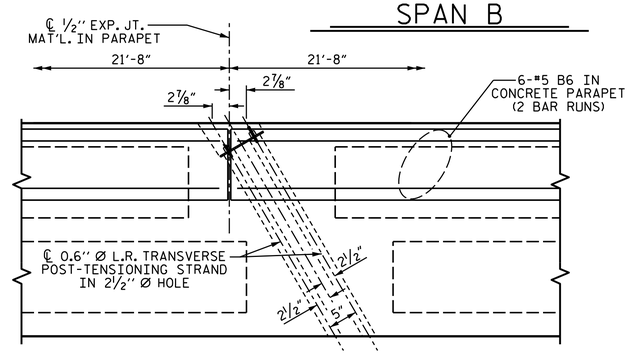




DETAIL "A"

(SIMILAR EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S12 BARS.



DETAIL "B"

#4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUTED RECESS AND 2½" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

PROJECT NO. DF18311.2095167.PR

WATAUGA COUNTY

STATION: 10+92.00 -L-

SHEET 3 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER Marshall G. Cheek, Jr. MARSHALL G. CHEEK, JR.

7/8/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD PLAN OF 65' UNIT 27'-10" CLEAR ROADWAY 60° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			26

DRAWN BY :	S. B. WILLIAMS	DATE :	4-25
CHECKED BY :	M. G. CHEEK	DATE :	5-25
DESIGN ENGINEER OF RECORD:	S. T. M.	DATE :	6-25

6/25/2025
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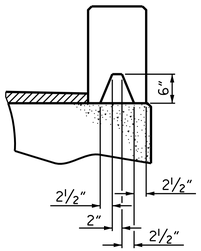
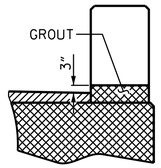
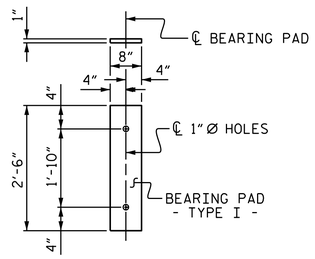
STD. NO. 24PCS_30_60S_65L



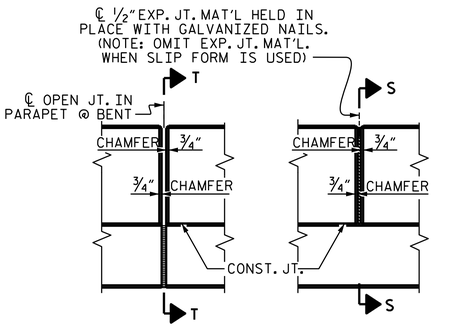
SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY
WHEN SLIP FORM IS USED)



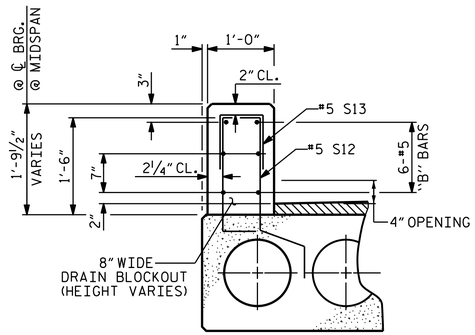
SECTION T-T
AT OPEN JOINT AT BENT
(THIS IS TO BE USED WHERE
FOAM JOINT IS NOT USED)



FIXED END
(TYPE I - 40 REQ'D)



ELEVATION AT EXPANSION JOINTS



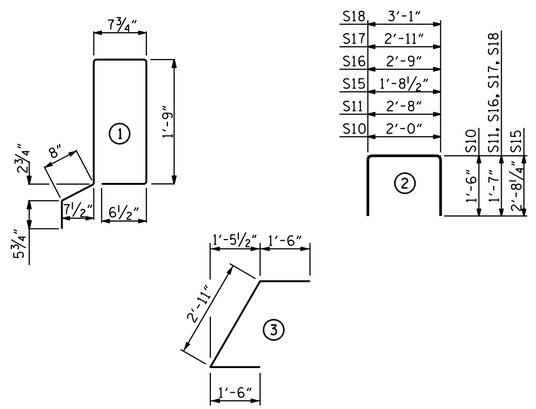
ONE BAR METAL RAIL PARAPET SECTION

THE DRAIN OPENING AT THE GUTTERLINE SHALL BE 4" X 8". THE HEIGHT OF THE BLOCKOUT IN THE PARAPET SHALL EXTEND FROM THE TOP OF THE CORED SLAB UNIT TO THE TOP OF THE DRAIN OPENING.

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE 35' CORED SLAB UNIT

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
B1	2	#4	STR	34'- 8"	46	34'- 8"	46
S10	8	#5	2	5'-0"	42	5'-0"	42
S11	86	#4	2	5'-10"	335	5'-10"	335
✱S12	39	#5	1	5'-10"	237		
S14	4	#4	3	5'-11"	16	5'-11"	16
S15	4	#5	2	7'-1"	30	7'-1"	30
S16	4	#4	2	5'-11"	16	5'-11"	16
S17	4	#4	2	6'-1"	16	6'-1"	16
S18	4	#4	2	6'-3"	17	6'-3"	17
REINFORCING STEEL LBS.					518		518
✱EPOXY COATED REINFORCING STEEL LBS.					237		
5000 P.S.I. CONCRETE					6.2		6.2
0.6" Ø L.R. STRANDS No.					16		16

BILL OF MATERIAL FOR ONE 65' CORED SLAB UNIT

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
B21	6	#4	STR	22'-10"	92	22'-10"	92
S10	8	#5	2	5'-0"	42	5'-0"	42
S11	158	#4	2	5'-10"	616	5'-10"	616
✱S12	69	#5	1	5'-10"	420		
S14	4	#4	3	5'-11"	16	5'-11"	16
S15	4	#5	2	7'-1"	30	7'-1"	30
S16	4	#4	2	5'-11"	16	5'-11"	16
S17	4	#4	2	6'-1"	16	6'-1"	16
S18	4	#4	2	6'-3"	17	6'-3"	17
REINFORCING STEEL LBS.					845		845
✱EPOXY COATED REINFORCING STEEL LBS.					420		
6000 P.S.I. CONCRETE CU. YDS.					11.2		11.2
0.6" Ø L.R. STRANDS No.					24		24

CORED SLABS REQUIRED

35' UNIT	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	35'-0"	70'-0"
INTERIOR C.S.	8	35'-0"	280'-0"
TOTAL	10		350'-0"

CORED SLABS REQUIRED

65' UNIT	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	65'-0"	130'-0"
INTERIOR C.S.	8	65'-0"	520'-0"
TOTAL	10		650'-0"

GUTTERLINE ASPHALT THICKNESS & PARAPET HEIGHT

	ASPHALT OVERLAY THICKNESS @ MID-SPAN	PARAPET HEIGHT @ MID-SPAN
35' UNITS	2⅞"	1'-8⅞"
65' UNITS	2¾6"	1'-8¾6"

CONCRETE RELEASE STRENGTH

UNIT	PSI
35' UNITS	4000
65' UNITS	4800

GRADE 270 STRANDS

	0.6" Ø L.R.
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950

DEAD LOAD DEFLECTION AND CAMBER

	35' UNIT	65' UNIT
	3'-0" x 2'-0"	3'-0" x 2'-0"
	0.6" Ø L.R. STRAND	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	11/16" ↑	1¾" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1/16" ↑	7/16" ↑
FINAL CAMBER	5/8" ↑	1 5/16" ↑

** INCLUDES FUTURE WEARING SURFACE

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2½" Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH GROUT. THE 2½" Ø DOWEL HOLES AT EXPANSION ENDS OF SLAB SECTIONS SHALL BE FILLED WITH JOINT SEALER MATERIAL TO 1½" ABOVE THE TOP OF DOWELS AND THEN FILLED WITH GROUT.

THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE SL LOW MODULUS SILICONE SEALANT. THE 2" Ø BACKER ROD SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN CORED SLABS ARE CAST, AN INTERNAL HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

ALL REINFORCING STEEL IN PARAPET SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

FLAME CUTTING OF THE TRANSVERSE POST-TENSIONING STRAND IS NOT ALLOWED.

MAINTAIN A SYMMETRIC TENSION FORCE BETWEEN EACH PAIR OF TRANSVERSE POST TENSIONING STRANDS IN THE DIAPHRAGM.

THE #4 S11 STIRRUPS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO THE GROUTED RECESS.

THE PERMITTED THREADED INSERTS ARE DETAILED AS AN OPTION FOR THE CONTRACTOR TO ATTACH FALSEWORK AND FORMWORK DURING CONSTRUCTION.

THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4'-0" CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

THE PERMITTED THREADED INSERTS SHALL BE GROUTED BY THE CONTRACTOR IMMEDIATELY FOLLOWING REMOVAL OF THE FALSEWORK.

THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.

APPLY EPOXY PROTECTIVE COATING TO EXTERIOR FACE OF THE EXTERIOR CORED SLAB UNITS THAT REQUIRE DRAINS IN THE PARAPET.

THE BOTTOM TWO #5 "B" BARS IN THE PARAPET MAY BE FIELD CUT TO AVOID DRAINS.

PROJECT NO. DF18311.2095167.PR

WATAUGA COUNTY

STATION: 10+92.00 -L-

SHEET 4 OF 4

DRAWN BY : S. B. WILLIAMS DATE : 4-25
CHECKED BY : M. G. CHEEK DATE : 5-25
DESIGN ENGINEER OF RECORD: S.T.M. DATE : 6-25

NORTH CAROLINA PROFESSIONAL Engineering Seal 20125 ENGINEER Marshall G. Cheek, Jr. MARSHALL G. CHEEK, JR.
7/8/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLAB UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			26

6/25/2025
c:\workdir\ncdot-pw.bentley.com_ncdot-pw-01\sam massinople\d0495835\13.205721-SMU-CS-940058.dgn
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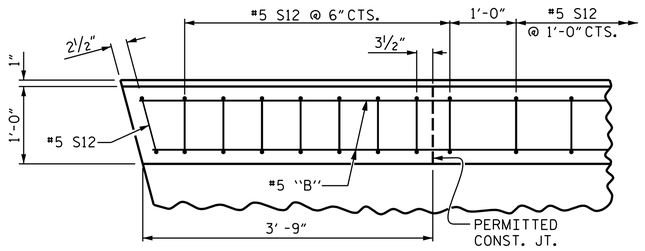
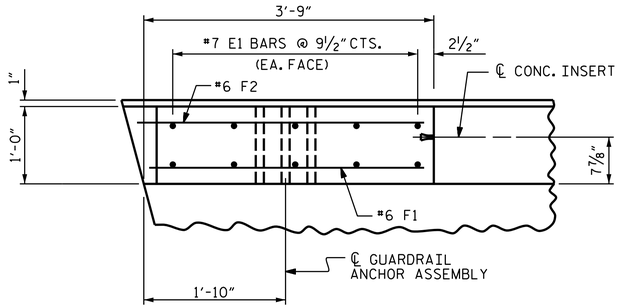
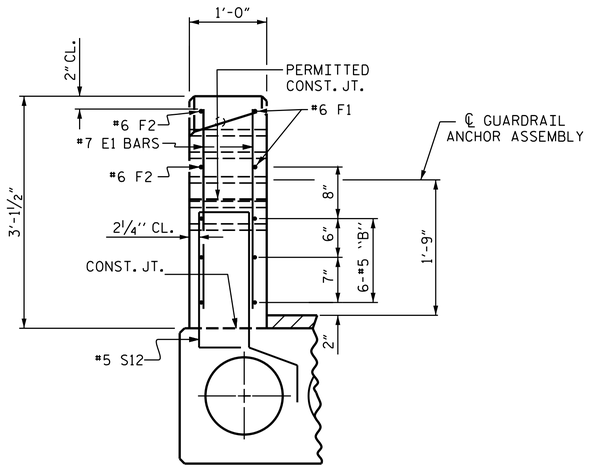


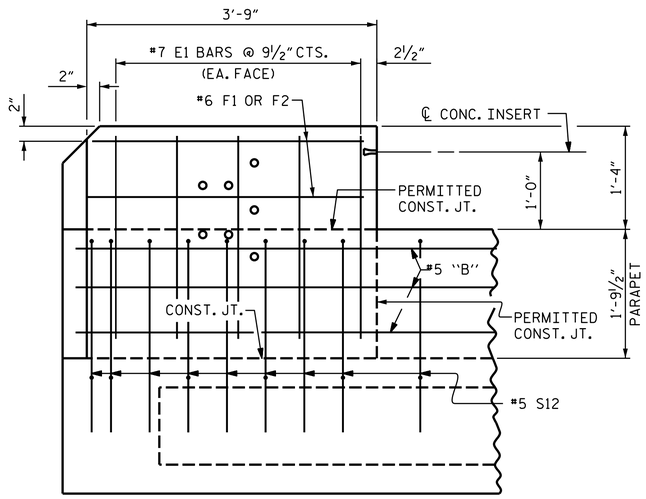
PLAN OF PARAPET



PLAN OF END POST



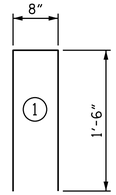
END VIEW



ELEVATION

PARAPET AND END POST FOR ONE BAR RAIL

BAR TYPES



BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR PARAPET & END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B5	48	# 5	STR	10'-6"	526
✳B6	72	# 5	STR	12'-6"	939
✳E1	40	# 7	STR	2'-9"	225
✳F1	8	# 6	STR	3'-5"	41
✳F2	8	# 6	STR	3'-10"	46
✳S13	236	# 5	1	3'-8"	903

✳EPOXY COATED REINFORCING STEEL	LBS.	2,680
CLASS AA CONCRETE	CU.YDS.	13.3
1'-0" X 1'-9½" CONCRETE PARAPET	200.29 LIN. FT.	

NOTES:

QUANTITIES FOR THE #5 S12 ARE SHOWN IN THE CORED SLAB BILL OF MATERIAL.

PROJECT NO. DF18311.2095167.PR

WATAUGA COUNTY

STATION: 10+92.00 -L-

SHEET 1 OF 3

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 MARSHALL G. CHEEK, JR. ENGINEER

Marshall G. Cheek, Jr.

7/8/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

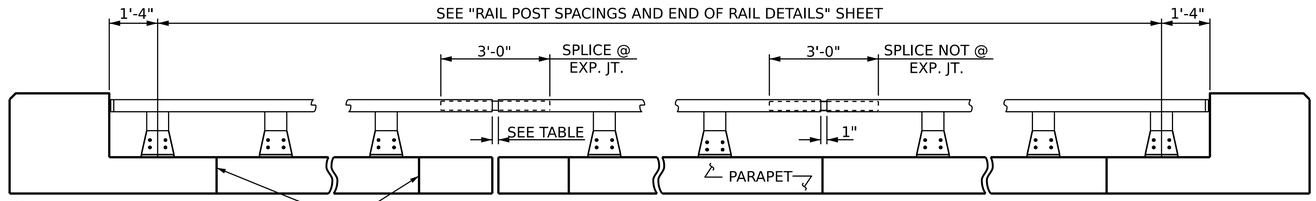
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

END POST DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			26

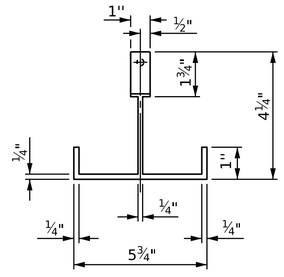
DRAWN BY : S. B. WILLIAMS DATE : 4-25
CHECKED BY : M.G. CHEEK DATE : 5-25

8/26/21

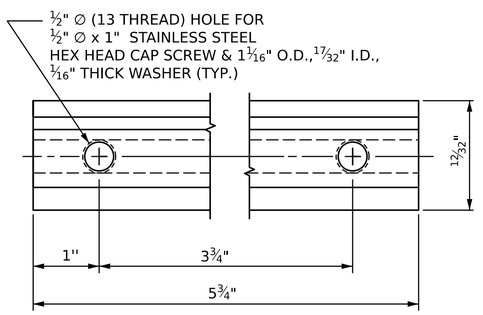


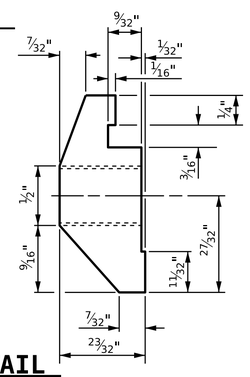
ELEVATION

TABLE	
℄ EXP. JT. @	RAIL OPENING
BENT 1	1½"



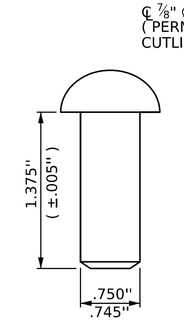
PLAN



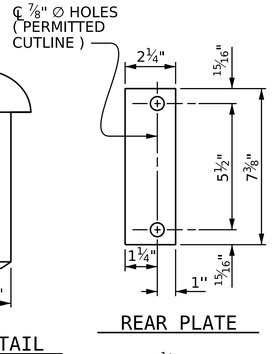


CLAMP BAR DETAIL

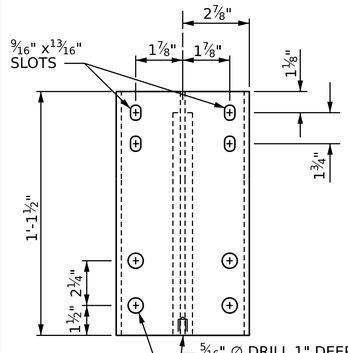
(2 REQUIRED PER POST)



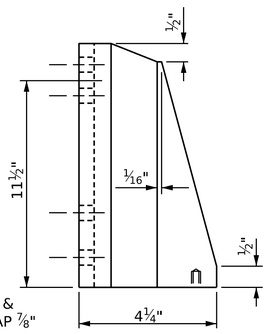
RIVET DETAIL



REAR PLATE

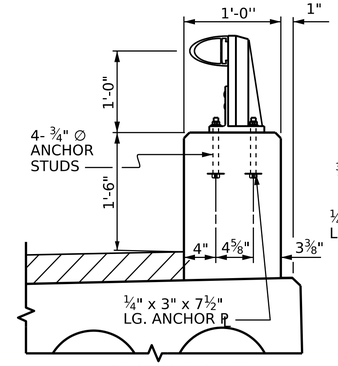


FRONT ELEVATION

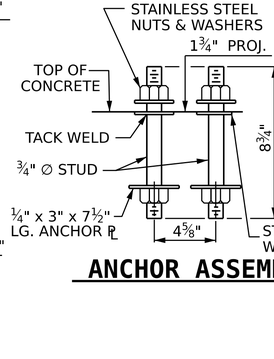


SIDE ELEVATION

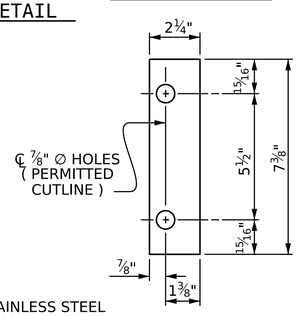
DETAILS OF POST



SECTION THRU PARAPET AND RAIL



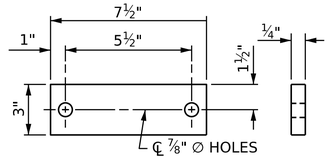
ANCHOR ASSEMBLY



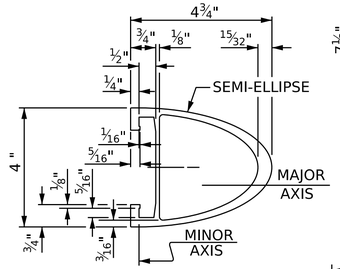
FRONT PLATE

SHIM DETAILS

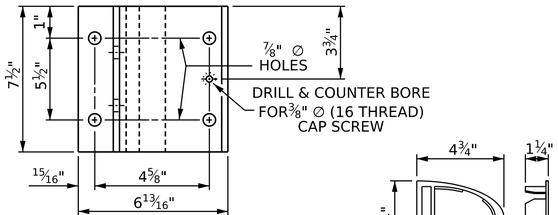
NOTE : SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.



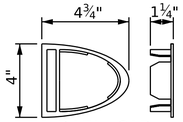
ANCHOR PLATE



RAIL SECTION

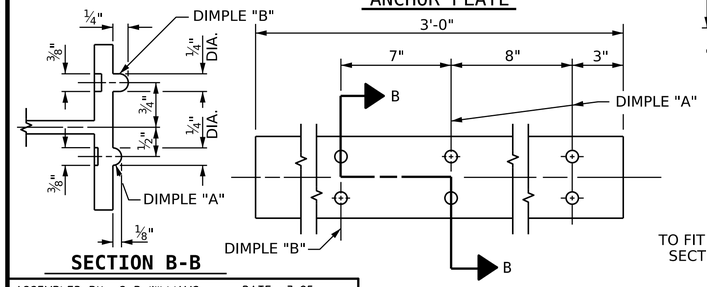


PLAN

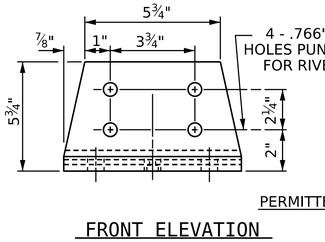


RAIL CAP

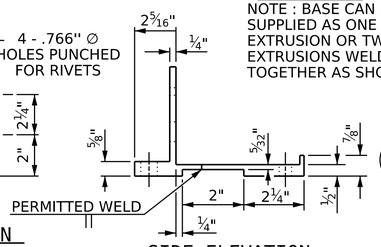
NOTE : BASE CAN BE SUPPLIED AS ONE EXTRUSION OR TWO EXTRUSIONS WELDED TOGETHER AS SHOWN.



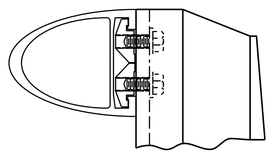
SECTION B-B



FRONT ELEVATION



SIDE ELEVATION



CLAMP & RAIL ASSEMBLY

BAR SECTION

EXPANSION BAR DETAILS

POST BASE DETAILS

NOTES

AT THE CONTRACTOR'S OPTION, METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS; HOWEVER THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B221 ALLOY 6061-T6.

MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

GALVANIZED STEEL RAILS

MATERIALS AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS: ASTM A36 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO ASTM A123.

RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A502 FOR GRADE 1 RIVETS.

THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-641.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A1011 FOR GRADE 36, 40, 45 OR ASTM A1008 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.

RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A1011 FOR GRADE 36, 40, 45 OR ASTM A1008 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.

GENERAL NOTES

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR2.

MATERIAL FOR ANCHOR STUDS SHALL BE ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. STUDS TO BE EMBEDDED 7" IN CONCRETE. NUTS SHALL BE AMERICAN STANDARD FINISHED HEXAGON THICK, CLASS 2B THREAD, AND MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. ANCHOR ℄ SHALL BE ASTM A36 GRADE 36.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKINGTO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE ANCHOR ASSEMBLY. LEVEL TWO FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE ¾" ∅ BOLT IS 10 KIPS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS, NUTS AND WASHERS SHALL MEET THE SAME REQUIREMENTS AS THE ANCHOR STUDS, NUTS AND WASHERS FOR USE WITH THE ANCHOR ASSEMBLY.

GROOVED CONTRACTION JOINTS ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

PAY LENGTH = 184.13 LIN. FT.

PROJECT NO. DF18311.2095167.PR

WATAUGA COUNTY

STATION: 10+92.00 -L-

SHEET 2 OF 3

ASSEMBLED BY : S. B. WILLIAMS	DATE : 3-25		
CHECKED BY : M.G. CHEECK	DATE : 5-25		
DRAWN BY : FCJ 1/88	REV. 12/17	MAA/THC	
CHECKED BY : CRK 3/89	REV. 5/18	MAA/THC	
	REV. 10/23	BNB/SNM	

NORTH CAROLINA PROFESSIONAL SEAL 20129 ENGINEER Marshall G. Cheek, Jr. MARSHALL G. CHEEK JR.

7/8/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

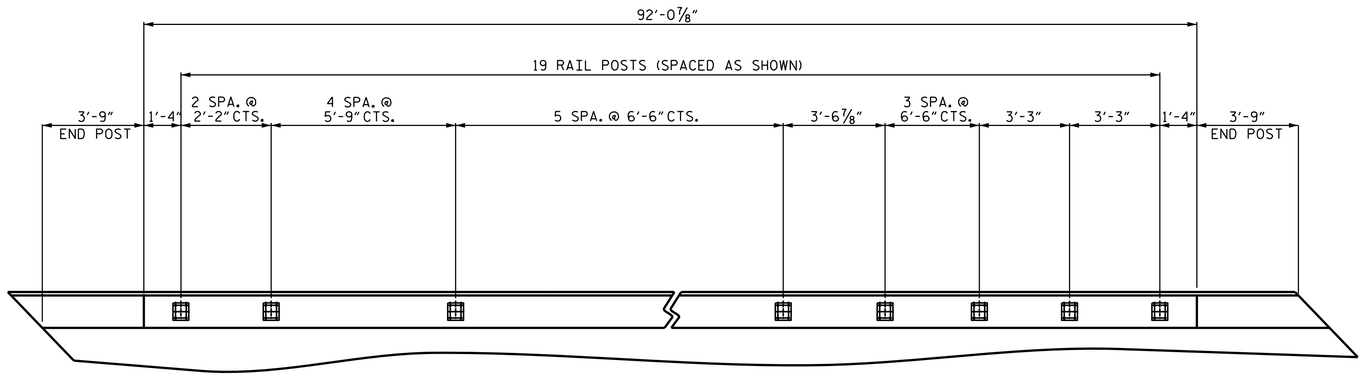
STANDARD

1 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			26

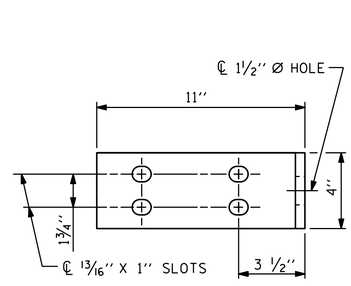
STD. NO. BMR1

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

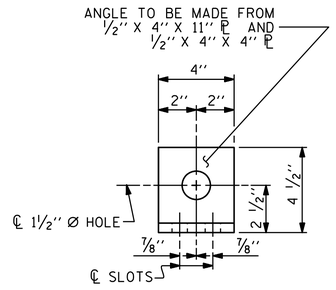


PLAN OF RAIL POST SPACINGS

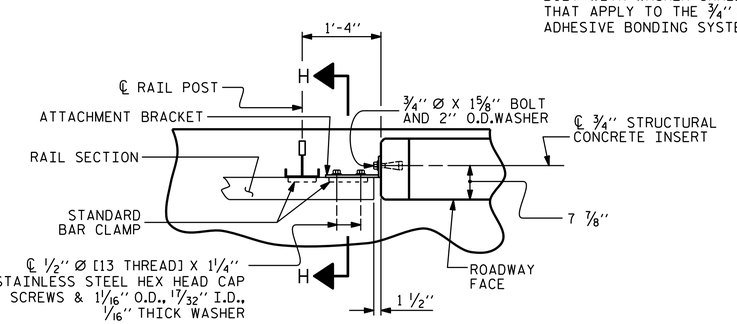
(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)



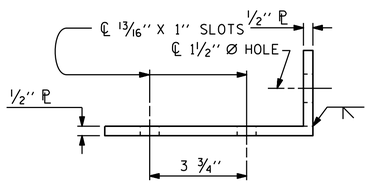
ELEVATION



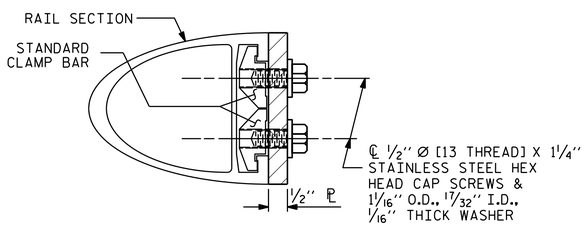
END VIEW (FIX AND EXP.)



PLAN - RAIL AND END POST



TOP VIEW



SECTION H-H (FIX)

FIXED

DETAILS FOR ATTACHING METAL RAIL TO END POST

NOTES

STRUCTURAL CONCRETE INSERT

THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1½".

B. 1 - ¾" Ø X 1⅝" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE ¾" Ø X 1⅝" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES

METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. ½" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.

B. ¾" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A ¾"Ø X 1⅝" BOLT WITH 2" O.D. WASHER IN PLACE. THE ¾"Ø X 1⅝" BOLT SHALL HAVE N. C. THREADS.

C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.

D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).

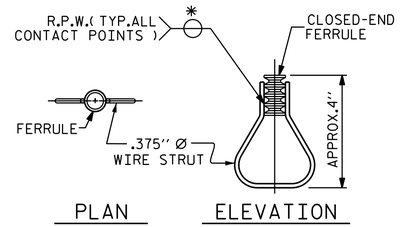
E. ½" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.

THE ¾" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE ¾" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE ½" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE ¾" Ø X 1⅝" BOLT WITH WASHER SHALL BE REPLACED WITH A ¾"Ø X 6½" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE ¾" Ø X 1⅝" BOLT SHALL APPLY TO THE ¾"Ø X 6 ½" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

PROJECT NO. DF18311.2095167.PR

WATAGUA COUNTY

STATION: 10+92.00 -L-

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
Marshall G. Cheek, Jr.
7/8/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

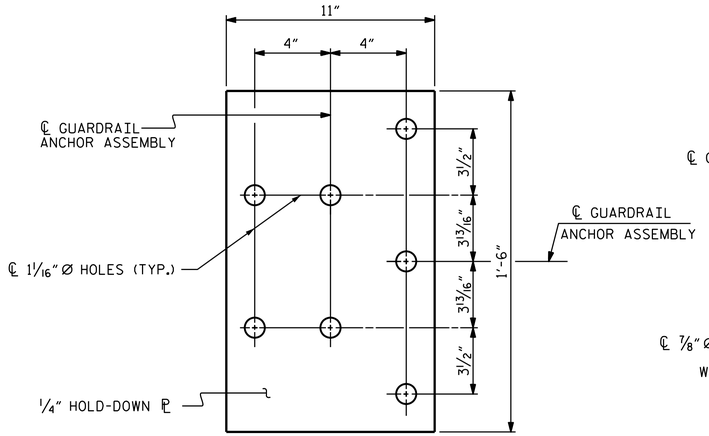
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
RAIL POST SPACINGS AND END OF RAIL DETAILS
FOR ONE BAR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			26

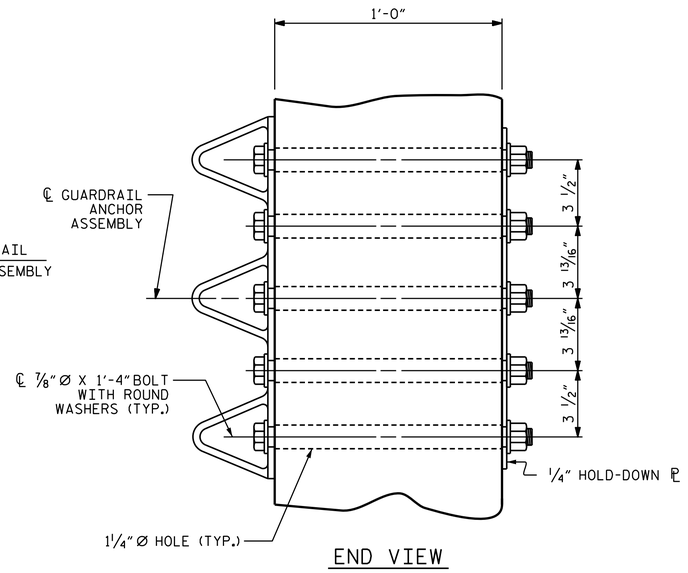
ASSEMBLED BY : S. B. WILLIAMS	DATE : 3-25
CHECKED BY : M. G. CHEECK	DATE: 5-25
DRAWN BY : FCJ 1/88	REV. 5/1/06 TLA/GM
CHECKED BY : CRK 3/89	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

STD. NO. BMR2

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$



PLAN



END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4'' HOLD DOWN PLATE AND 7 - 7/8'' Ø 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.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8'' Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

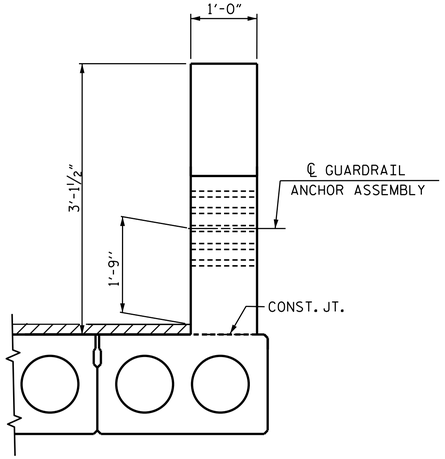
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

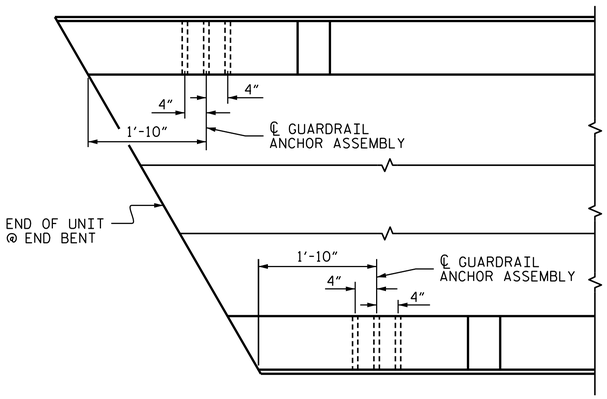
THE 1 1/4'' Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

SKETCH SHOWING POINTS OF ATTACHMENT

✳ LOCATION OF GUARDRAIL ATTACHMENT



END VIEW



PLAN

END BENT 1 SHOWN, END BENT 2 SIMILAR

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. DF18311.2095167.PR

WATAUGA COUNTY

STATION: 10+92.00-L-

ASSEMBLED BY : S. B. WILLIAMS	DATE : 5-25		
CHECKED BY : M. G. CHEEK	DATE : 5-25		
DRAWN BY : MAA 5/10	REV. 1/15	MAA/TMG	
CHECKED BY : GM 5/10	REV. 12/17	MAA/THC	
	REV. 5/18	MAA/THC	

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 Marshall G. Cheek, Jr. MARSHALL G. CHEEK, JR. ENGINEER

7/8/2025

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201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			26

STD. No. GRA3

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

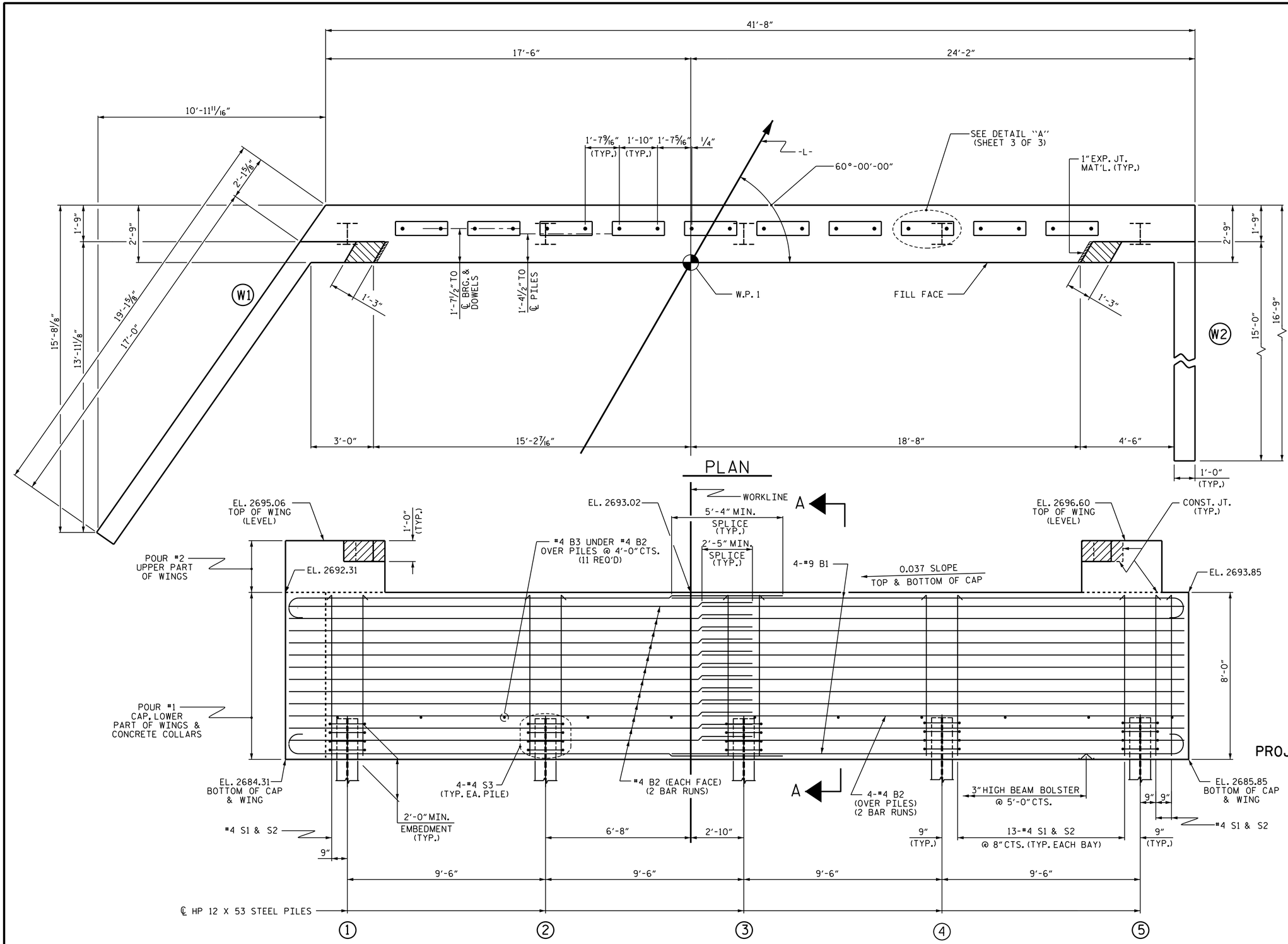
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE CONCRETE PARAPET IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR WING DETAILS, SEE SHEET 2 OF 3.

INSTALL THE 6"Ø DRAIN PIPE THROUGH THE WINGWALL AS REQUIRED FOR BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WINGWALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

TOP OF PILE ELEVATIONS	
①	2686.44
②	2686.79
③	2687.14
④	2687.49
⑤	2687.85



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 3 OF 3.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 3 OF 3.

NORTH CAROLINA PROFESSIONAL SEAL Marshall G. Cheek, Jr. 20126 ENGINEER MARSHALL G. CHEEK, JR.

7/8/2025

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201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PROJECT NO. DF18311.2095167.PR

WATAUGA COUNTY

STATION: 10+92.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

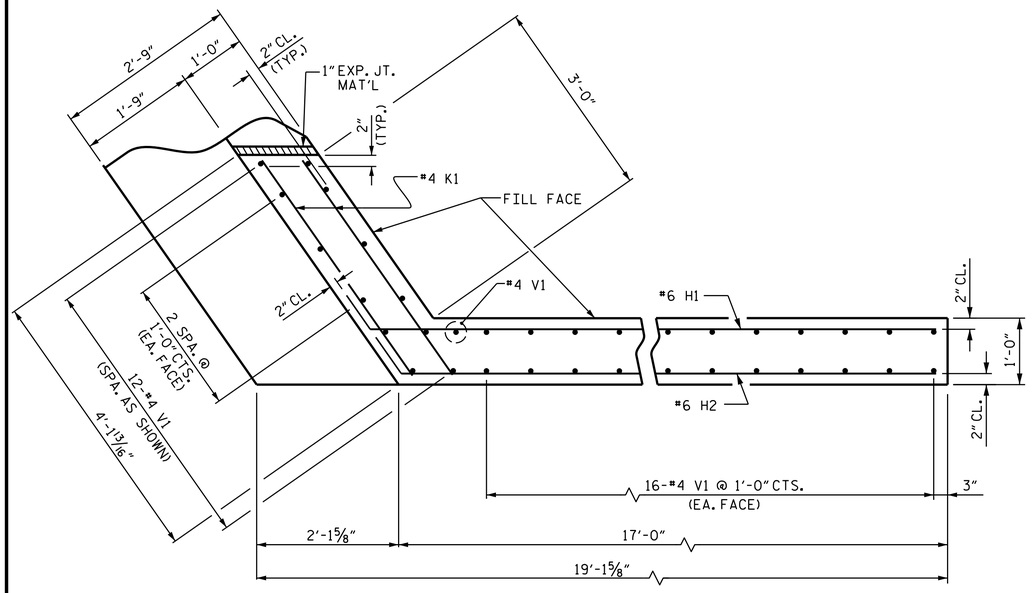
SUBSTRUCTURE

END BENT 1

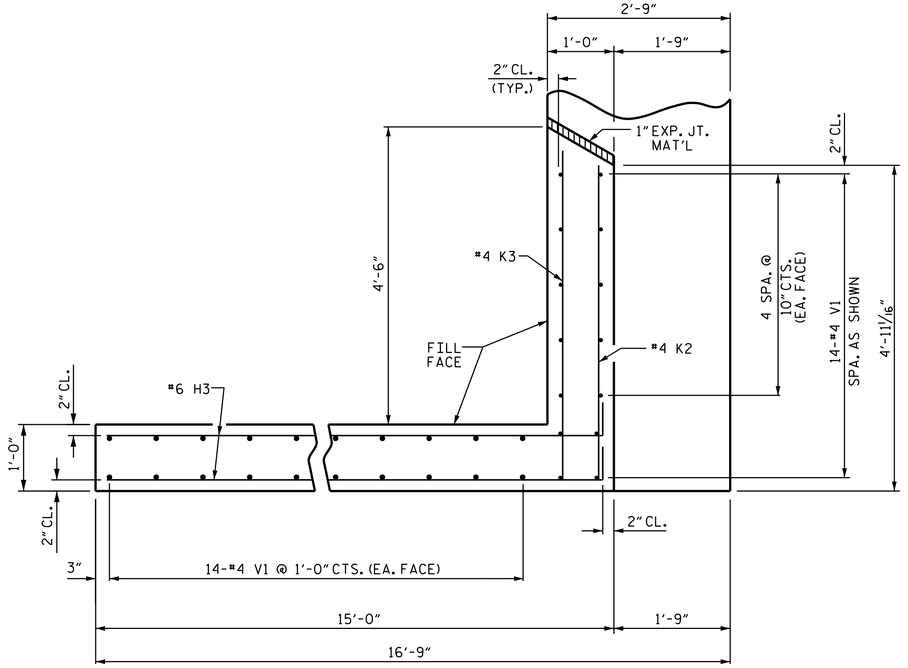
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			26

DRAWN BY : S. B. WILLIAMS DATE : 5/25
CHECKED BY : M. G. CHEEK DATE : 5/25
DESIGN ENGINEER OF RECORD : S.T.M. DATE : 6/25

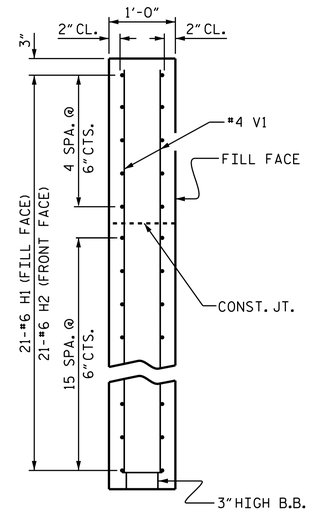
$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$



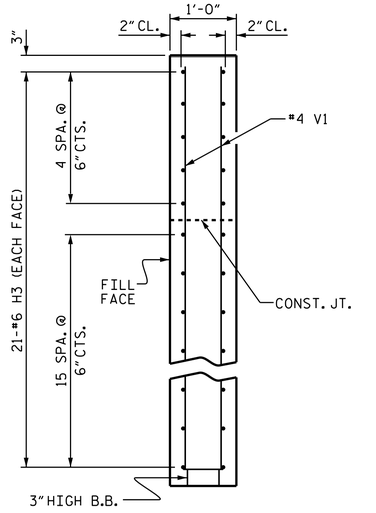
PLAN OF WING (W1)



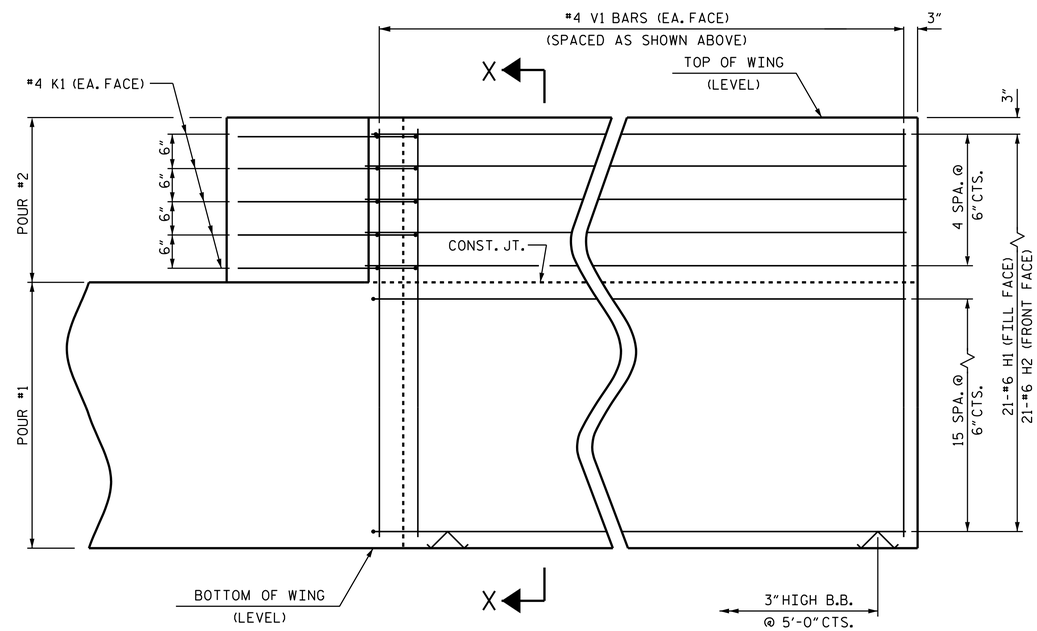
PLAN OF WING (W2)



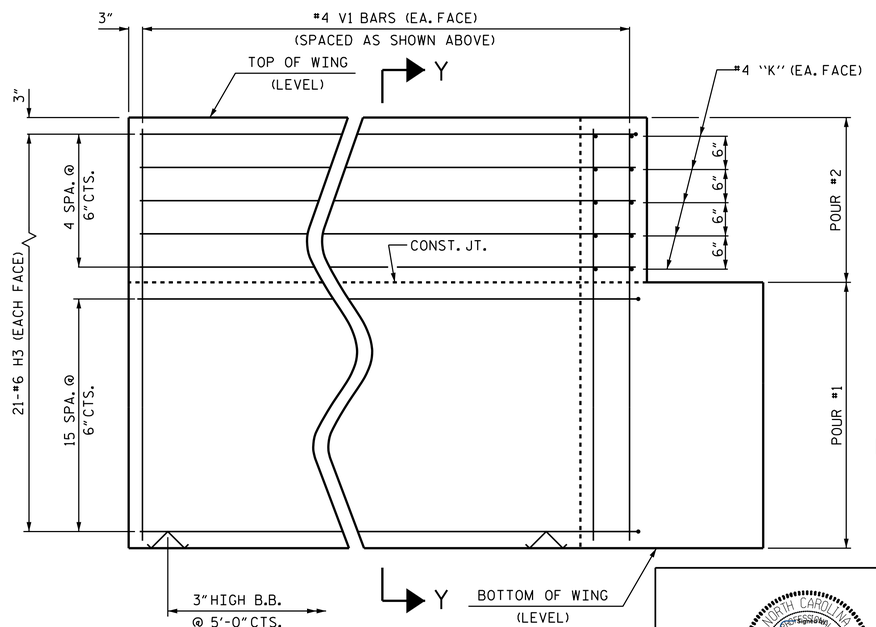
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

PROJECT NO. DF18311.2095167.PR

WATAUGA COUNTY

STATION: 10+92.00 -L-

SHEET 2 OF 3

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 — Marshall G. Cheek, Jr. — MARSHALL G. CHEEK, JR. — 7/8/2025

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CORP. LICENSE NO.: C-0275

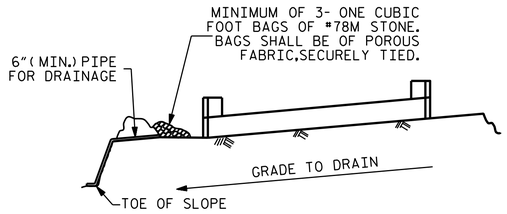
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			26

DRAWN BY : S. B. WILLIAMS DATE : 5/25
CHECKED BY : M. G. CHEEK DATE : 5/25
DESIGN ENGINEER OF RECORD : S.T.M. DATE : 6/25

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

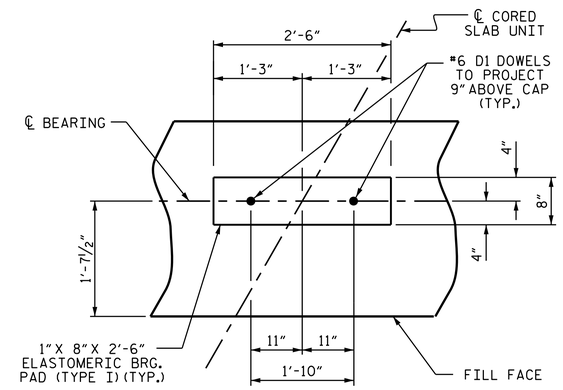


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

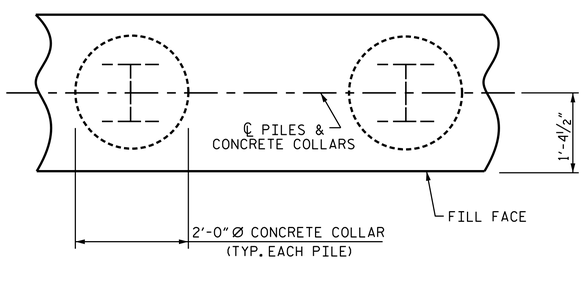
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

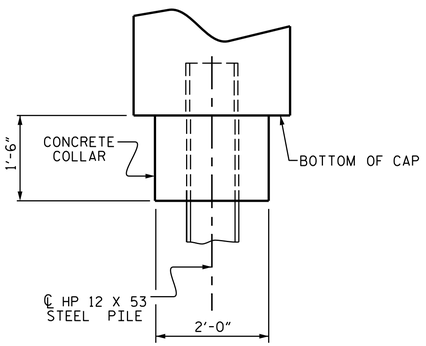
TEMPORARY DRAINAGE AT END BENT



DETAIL "A"

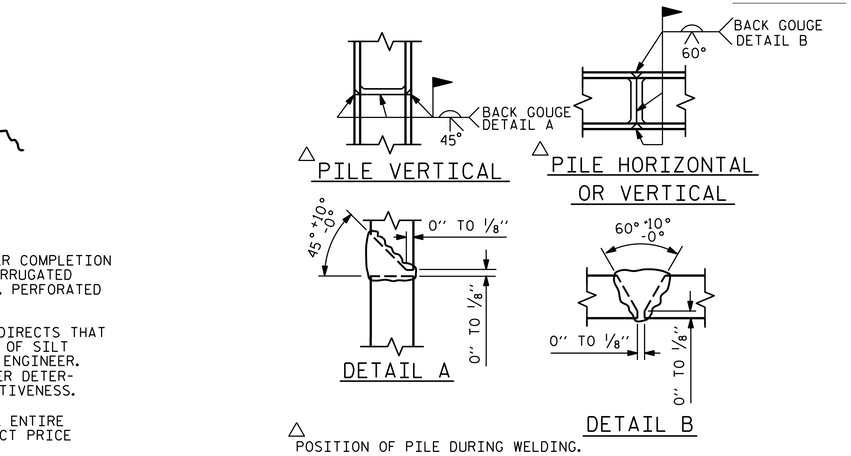


PLAN



ELEVATION

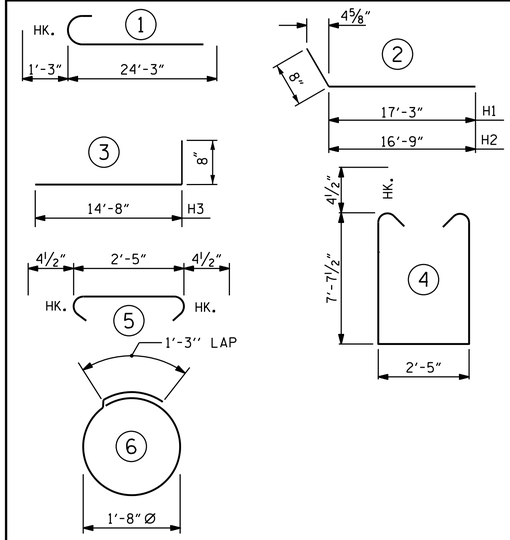
CORROSION PROTECTION FOR STEEL PILES DETAIL



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	#9	1	25'-6"	1387
B2	56	#4	STR	22'-10"	854
B3	11	#4	STR	2'-5"	18
D1	20	#6	STR	1'-6"	45
H1	21	#6	2	17'-11"	565
H2	21	#6	2	17'-5"	549
H3	42	#6	3	15'-4"	967
K1	10	#4	STR	3'-9"	25
K2	5	#4	STR	4'-8"	16
K3	5	#4	STR	4'-11"	16
S1	55	#4	4	18'-5"	677
S2	55	#4	5	3'-2"	116
S3	20	#4	6	6'-6"	87
V1	87	#4	STR	10'-5"	605

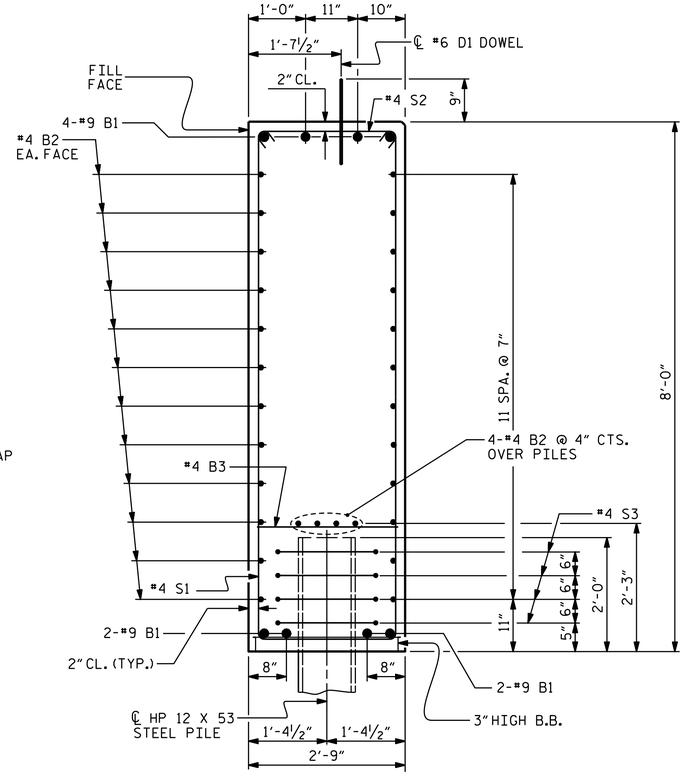
REINFORCING STEEL 5927 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 44.5 C.Y.

POUR #2 UPPER PART OF WINGS 4.0 C.Y.

TOTAL CLASS A CONCRETE 48.5 C.Y.



SECTION A-A

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")

PROJECT NO. DF18311.2095167.PR

WATAUGA COUNTY

STATION: 10+92.00 -L-

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 Marshall G. Cheek, Jr. ENGINEER MARSHALL G. CHEEK, JR.

7/8/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

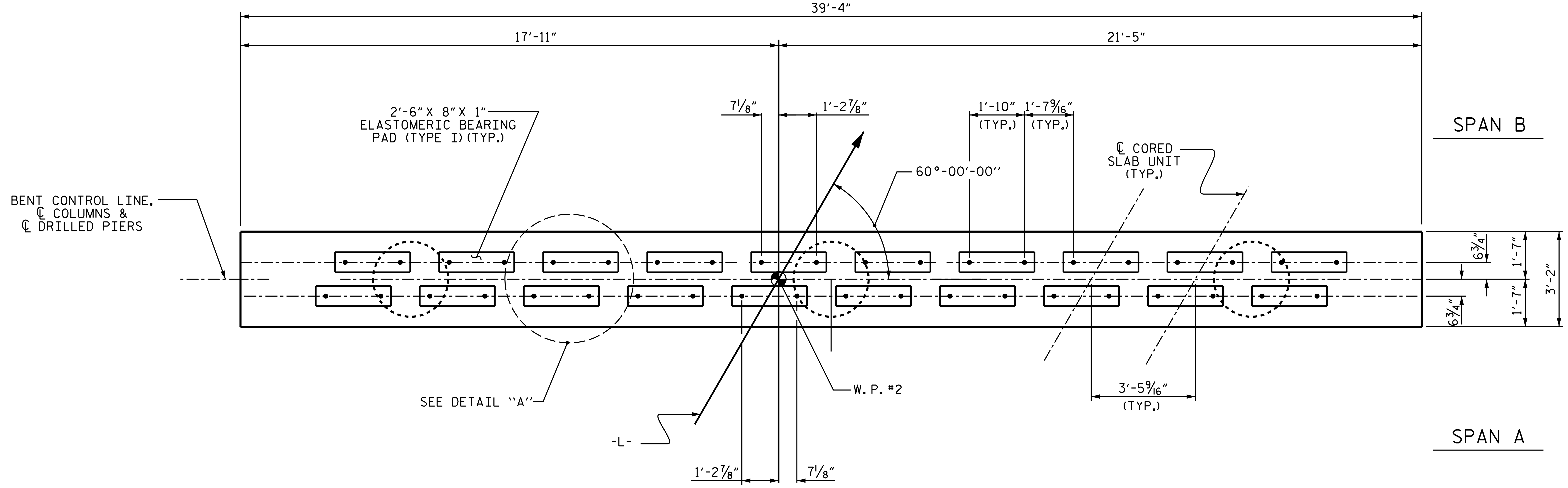
SUBSTRUCTURE

END BENT 1 DETAILS

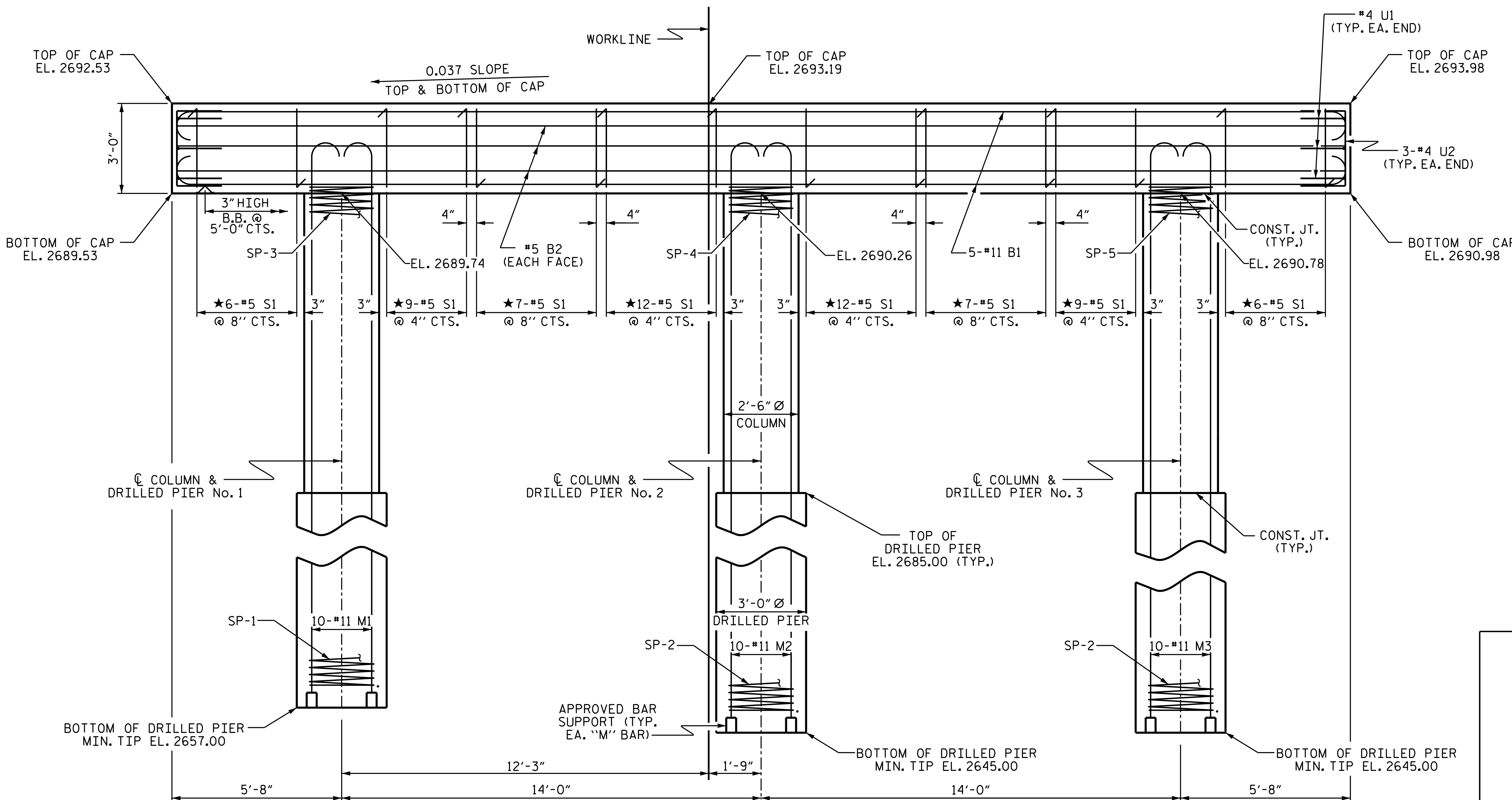
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			26

DRAWN BY : S. B. WILLIAMS DATE : 5/25
CHECKED BY : M. G. CHEEK DATE : 5/25
DESIGN ENGINEER OF RECORD : S.T.M. DATE : 6/25

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$



PLAN



ELEVATION

DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

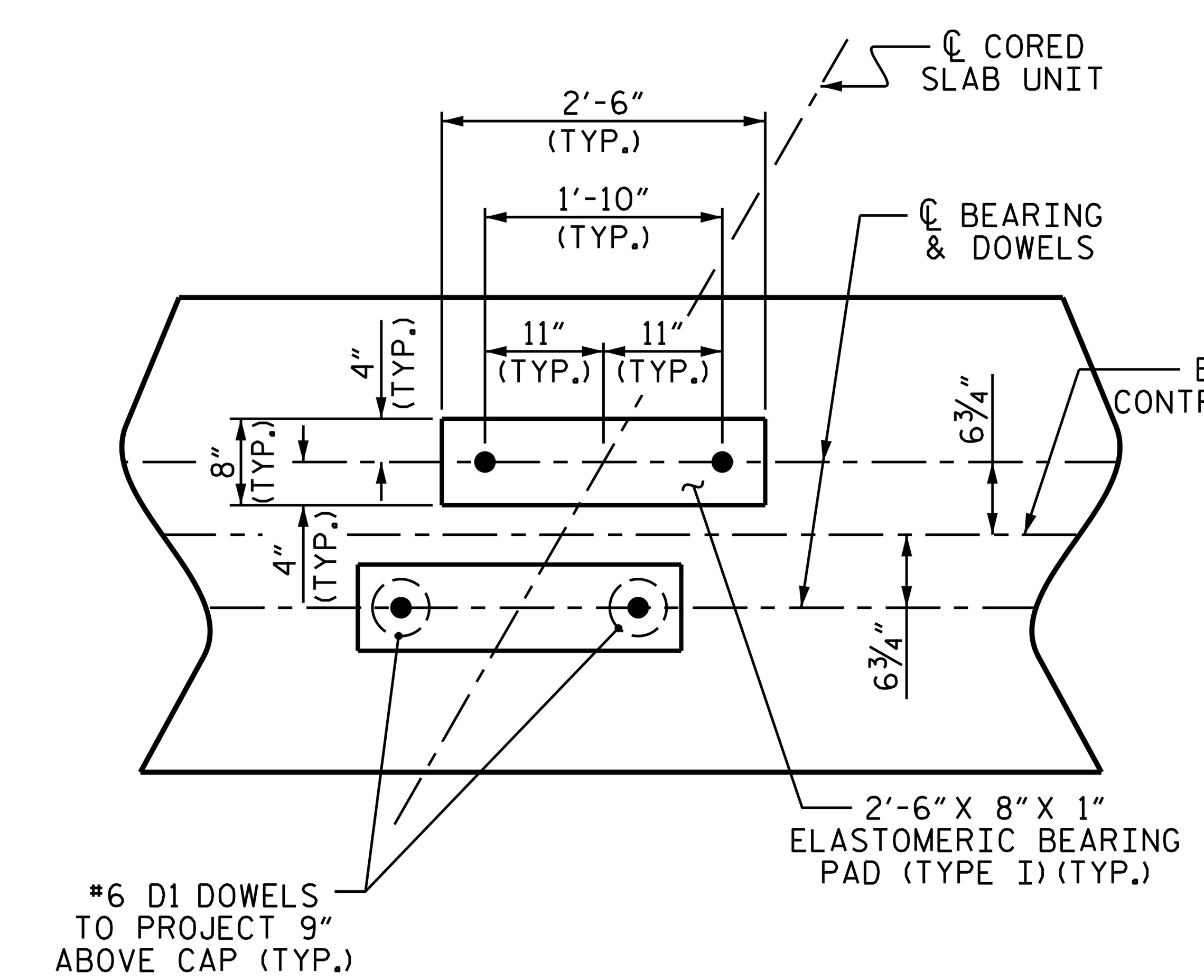
FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

★ INVERT ALTERNATE STIRRUPS.

DRILLED PIERS SHALL BE TERMINATED ONE FOOT ± ABOVE NORMAL WATER SURFACE ELEVATION FOR SHAFTS LOCATED IN WATER.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. DF18311.2095167.PR

WATAUGA COUNTY

STATION: 10+92.00 -L-

SHEET 1 OF 2

Marshall G. Cheek, Jr.

7/8/2025

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

ASSEMBLED BY : S. B. WILLIAMS	DATE : 4-25
CHECKED BY : M. G. CHEEK	DATE : 5-25
DRAWN BY : DGE 4/10	REV. 11/14 MAA/TMG
CHECKED BY : MKT 4/10	

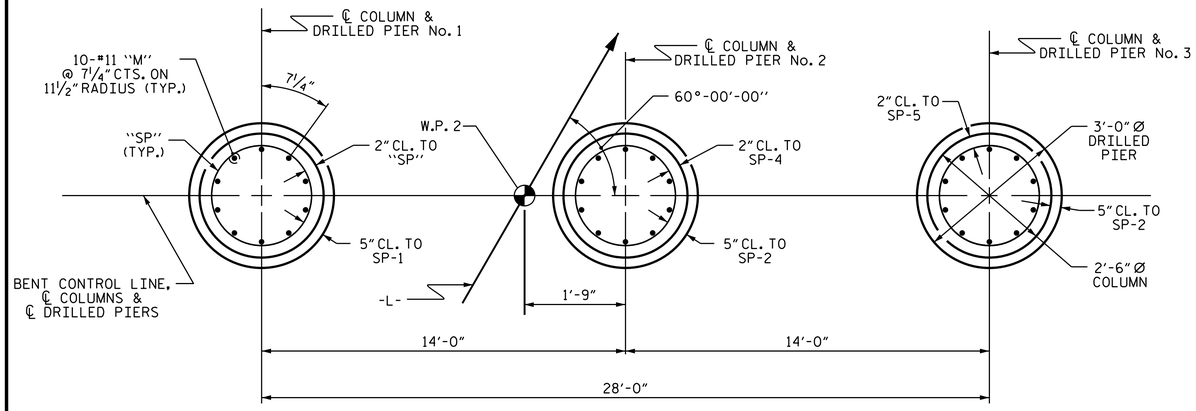
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

SHEET NO. S-19

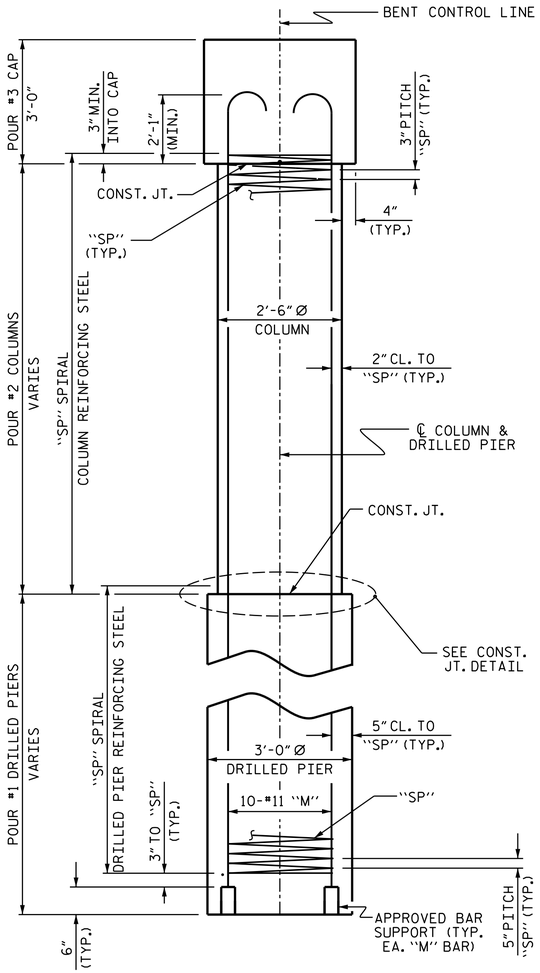
TOTAL SHEETS 26

$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

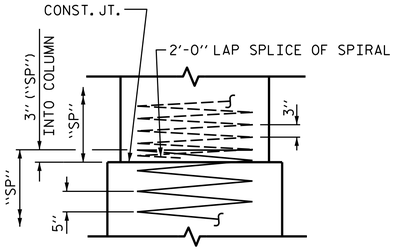
STD. NO. DP_BT_30_60S_<50'



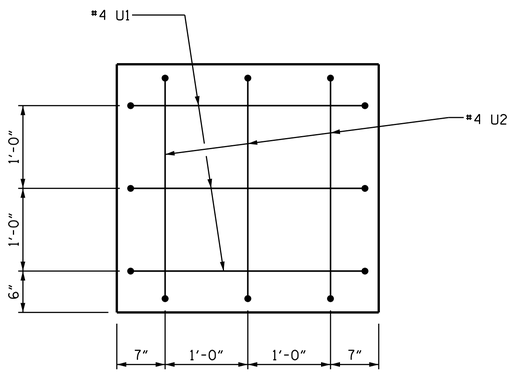
PLAN OF DRILLED PIERS & COLUMNS



END ELEVATION



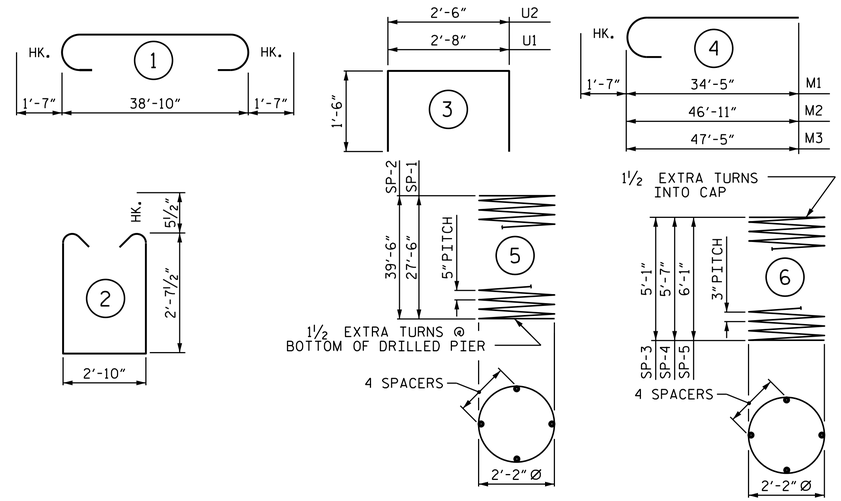
CONSTRUCTION JOINT DETAIL



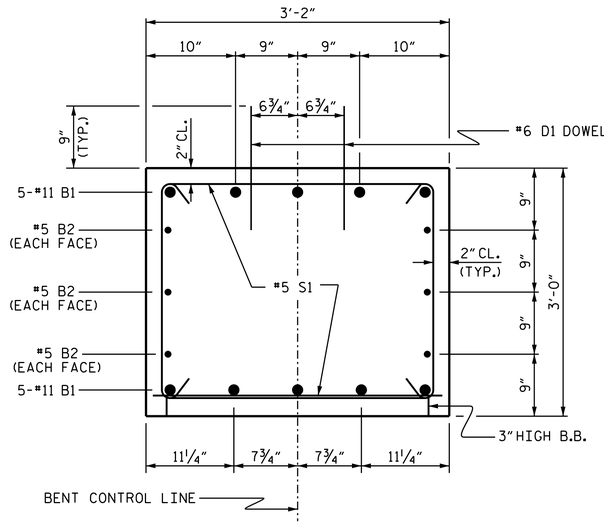
END OF CAP VIEW

(TYPICAL BOTH ENDS)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT



SECTION THRU CAP

BILL OF MATERIAL

FOR ONE BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	1	42'-0"	2231
B2	6	#5	STR	39'-0"	244
D1	40	#6	STR	1'-6"	90
M1	10	#11	4	36'-0"	1,913
M2	10	#11	4	48'-6"	2,577
M3	10	#11	4	49'-0"	2,603
S1	68	#5	2	9'-0"	638
U1	6	#4	3	5'-8"	23
U2	6	#4	3	5'-6"	22

REINFORCING STEEL (FOR ONE BENT) 10,341 LBS.

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
SP-1	1	*	5	452'-8"	472
SP-2	2	*	5	645'-8"	1,347
SP-3	1	**	6	147'- 0"	98
SP-4	1	**	6	160'- 4"	107
SP-5	1	**	6	173'- 9"	116

SPIRAL COLUMN REINFORCING STEEL (FOR ONE BENT) 2,140 LBS.

* THE SP-1 & SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

** THE SP-3, SP-4 & SP-5 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN (FOR ONE BENT)

POUR #2 (COLUMNS)	2.9 C.Y.
POUR #3 (CAP)	13.8 C.Y.
TOTAL CLASS A CONCRETE	16.7 C.Y.

DRILLED PIERS: (FOR ONE BENT)

DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	28.3 C.Y.

PROJECT NO. DF18311.2095167.PR

WATAUGA COUNTY

STATION: 10+92.00 -L-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL ENGINEER Marshall G. Cheek, Jr. SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

7/8/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

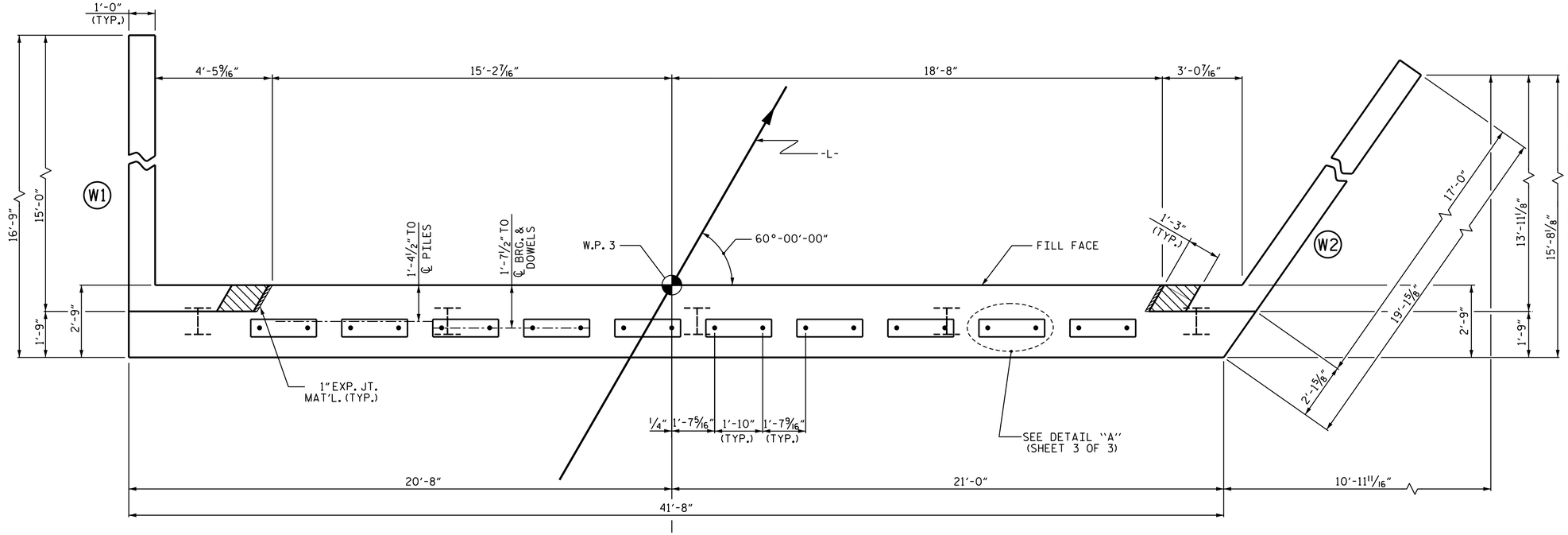
ASSEMBLED BY : S. B. WILLIAMS	DATE : 4-25
CHECKED BY : M. G. CHEEK	DATE : 5-25
DRAWN BY : DGE 3/10	REV. 11/14 MAA/TMG
CHECKED BY : MKT 3/10	

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

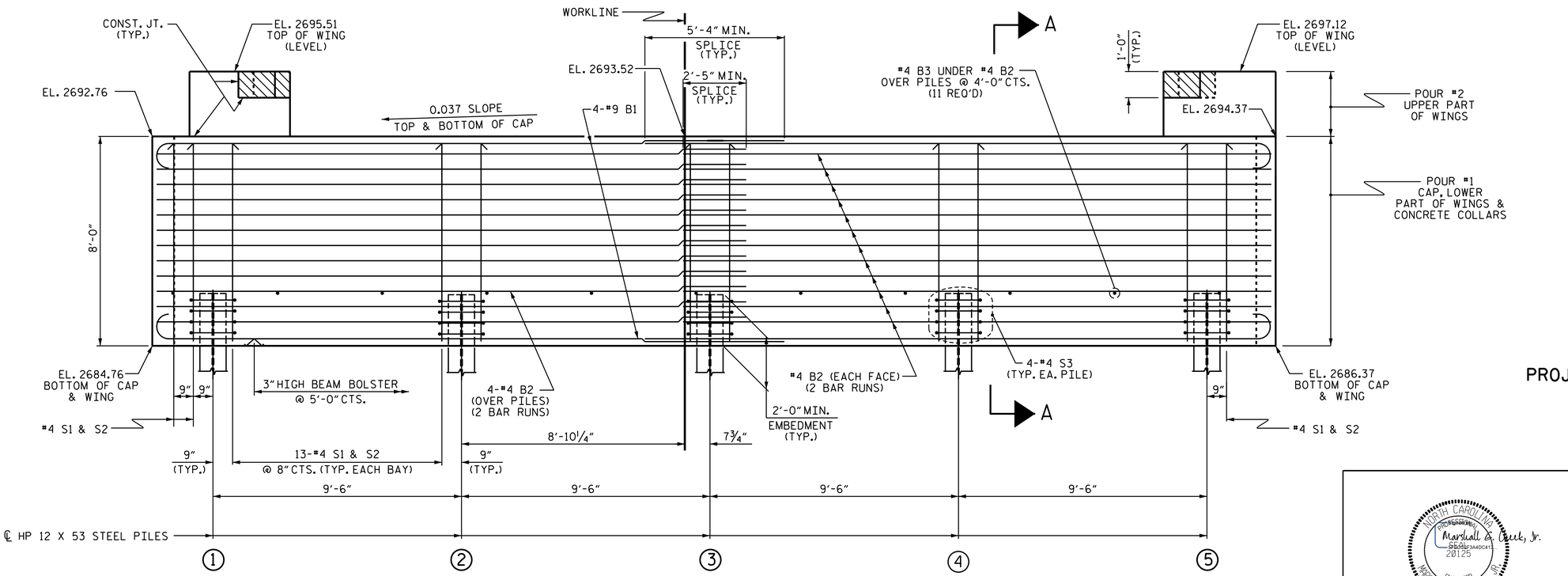
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			26

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

STD. NO. DP_BT_30_60S_<50'



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 3 OF 3.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 3 OF 3.

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE CONCRETE PARAPET IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR WING DETAILS, SEE SHEET 2 OF 3.

INSTALL THE 6" Ø DRAIN PIPE THROUGH THE WINGWALL AS REQUIRED FOR BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WINGWALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

TOP OF PILE ELEVATIONS

1	2686.86
2	2687.21
3	2687.56
4	2687.91
5	2688.27

PROJECT NO. DF18311.2095167.PR

WATAUGA COUNTY

STATION: 10+92.00 -L-

SHEET 1 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
Marshall G. Cheek, Jr.
7/8/2025

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201 W. MARION ST STE 200
SHELBY, NC 28150
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CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

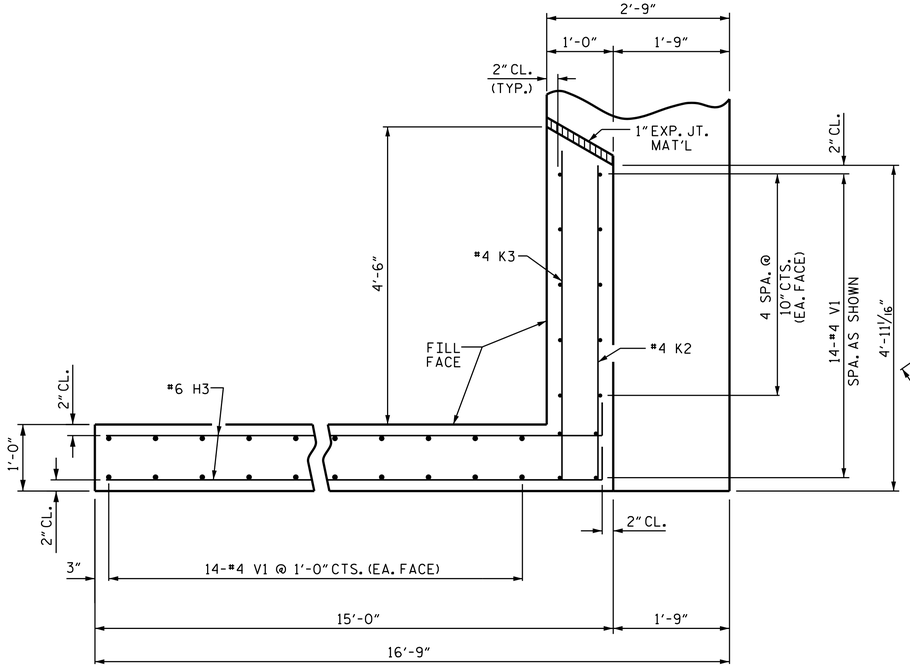
SUBSTRUCTURE

END BENT 2

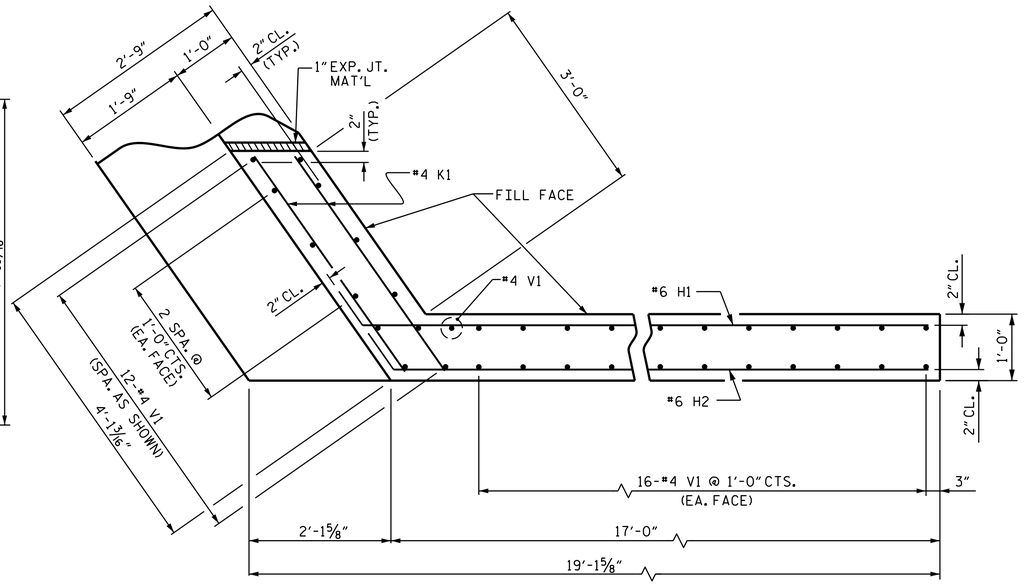
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			26

DRAWN BY : S. B. WILLIAMS DATE : 5/25
CHECKED BY : M. G. CHEEK DATE : 5/25
DESIGN ENGINEER OF RECORD : S.T.M. DATE : 6/25

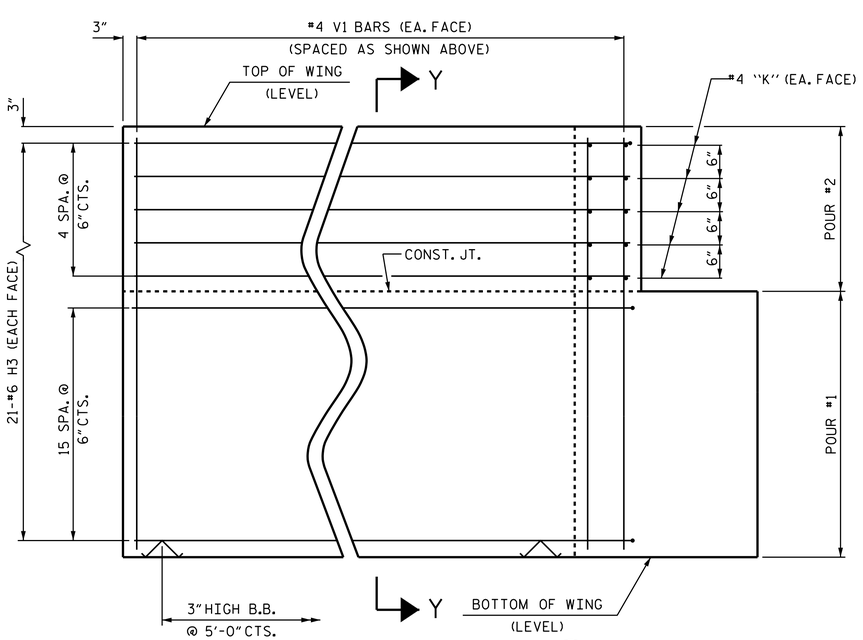
$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$



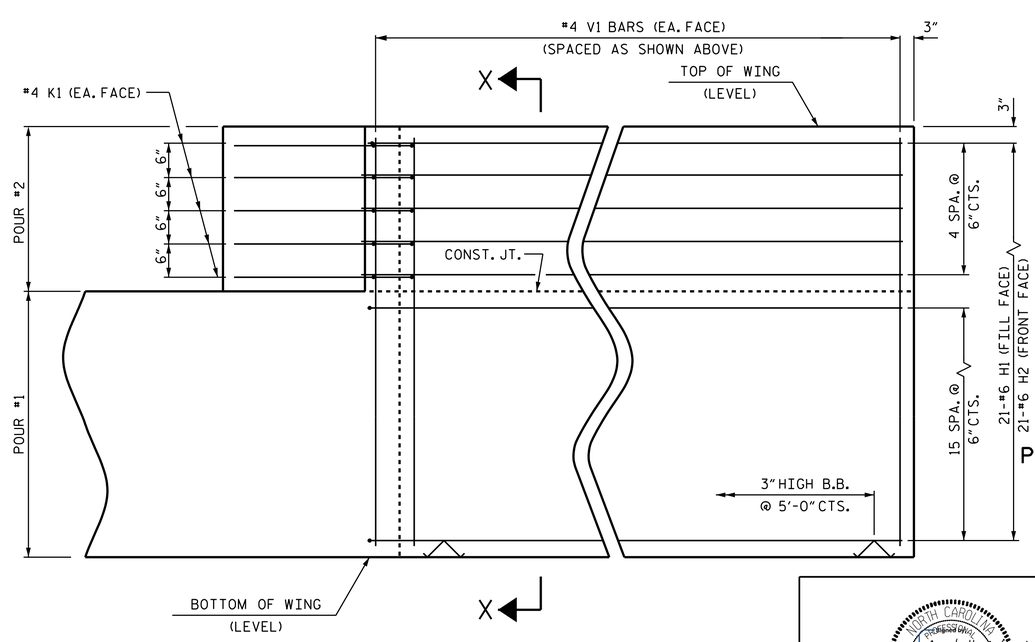
PLAN OF WING (W1)



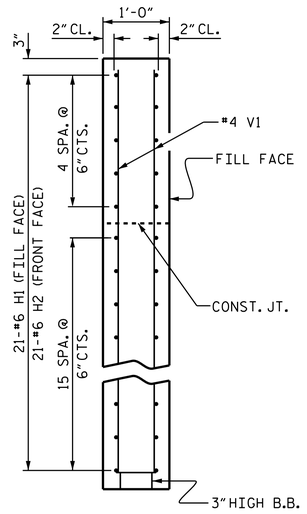
PLAN OF WING (W2)



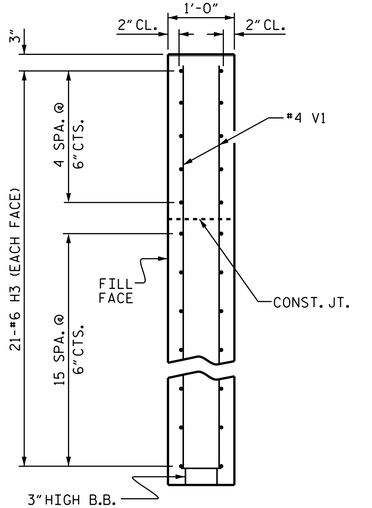
ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION X-X



SECTION Y-Y

WING DETAILS

PROJECT NO. DF18311.2095167.PR

WATAUGA COUNTY

STATION: 10+92.00 -L-

SHEET 2 OF 3

DRAWN BY : S. B. WILLIAMS DATE : 5/25
CHECKED BY : M.G. CHEEK DATE : 5/25
DESIGN ENGINEER OF RECORD : S.T.M. DATE : 6/25

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
Marshall G. Cheek, Jr.
7/8/2025

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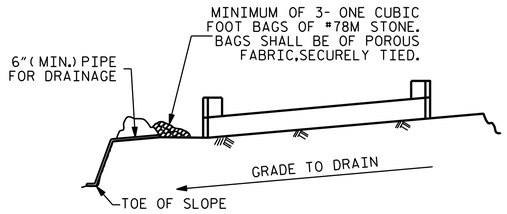
TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			26

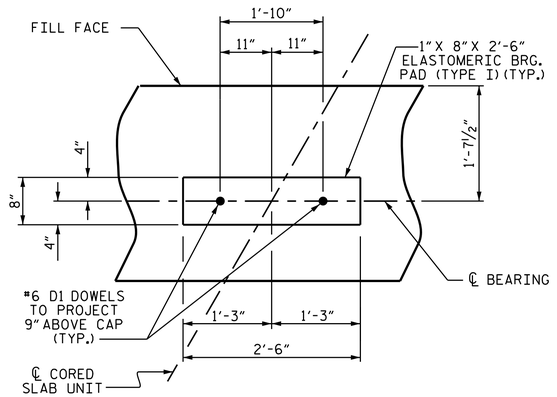


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

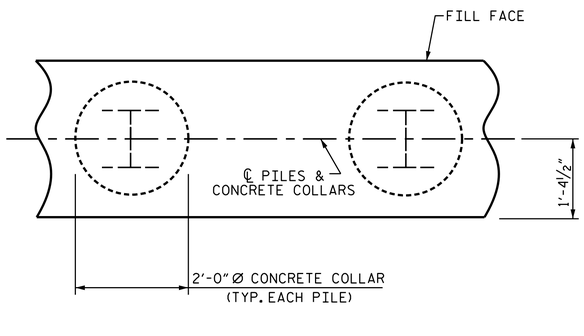
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

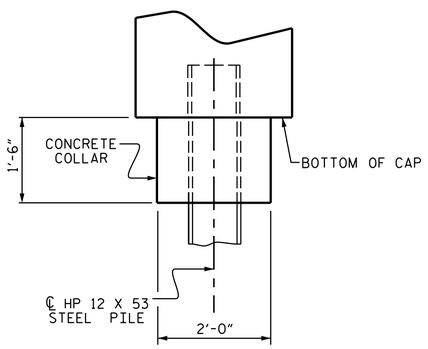
TEMPORARY DRAINAGE AT END BENT



DETAIL "A"

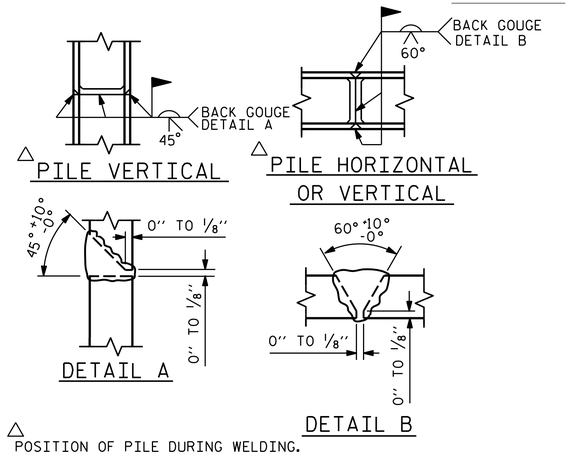


PLAN



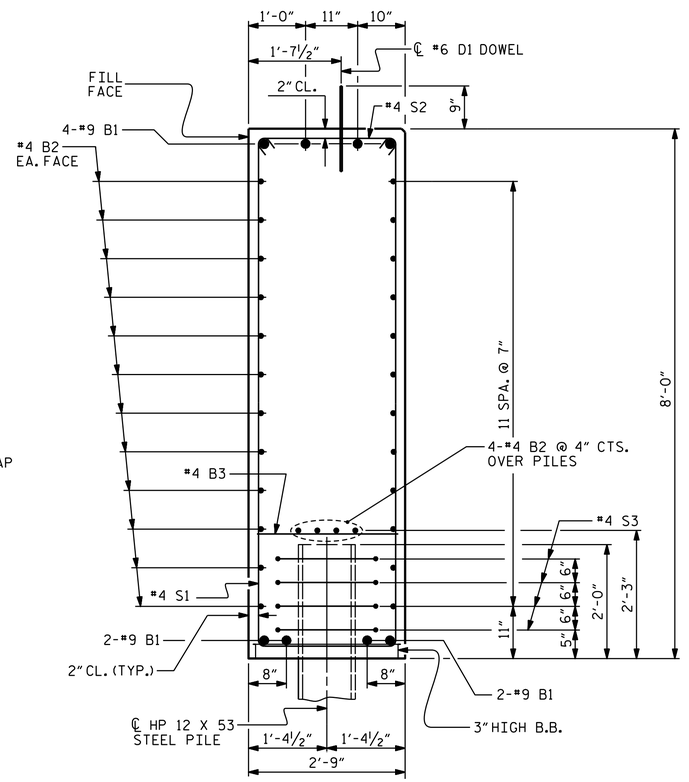
ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL



△ POSITION OF PILE DURING WELDING.

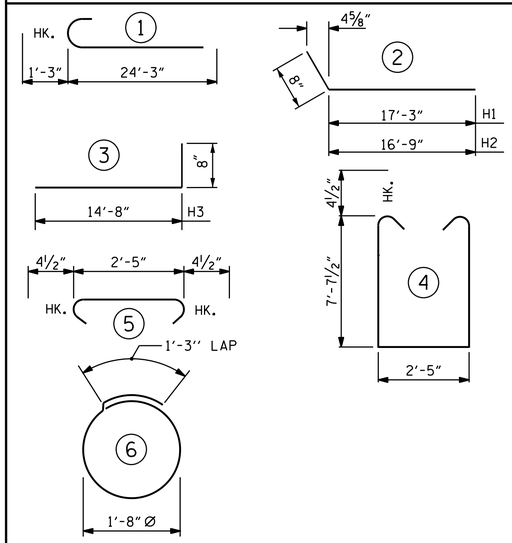
PILE SPLICE DETAILS



SECTION A-A

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	#9	1	25'-6"	1387
B2	56	#4	STR	22'-10"	854
B3	11	#4	STR	2'-5"	18
D1	20	#6	STR	1'-6"	45
H1	21	#6	2	17'-11"	565
H2	21	#6	2	17'-5"	549
H3	42	#6	3	15'-4"	967
K1	10	#4	STR	3'-9"	25
K2	5	#4	STR	4'-8"	16
K3	5	#4	STR	4'-11"	16
S1	55	#4	4	18'-5"	677
S2	55	#4	5	3'-2"	116
S3	20	#4	6	6'-6"	87
V1	87	#4	STR	10'-5"	605

REINFORCING STEEL 5927 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 44.5 C.Y.

POUR #2 UPPER PART OF WINGS 4.0 C.Y.

TOTAL CLASS A CONCRETE 48.5 C.Y.

PROJECT NO. DF18311.2095167.PR

WATAUGA COUNTY

STATION: 10+92.00 -L-

SHEET 3 OF 3

NORTH CAROLINA Professional Seal Marshall G. Cheek, Jr. SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR. 7/8/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2 DETAILS

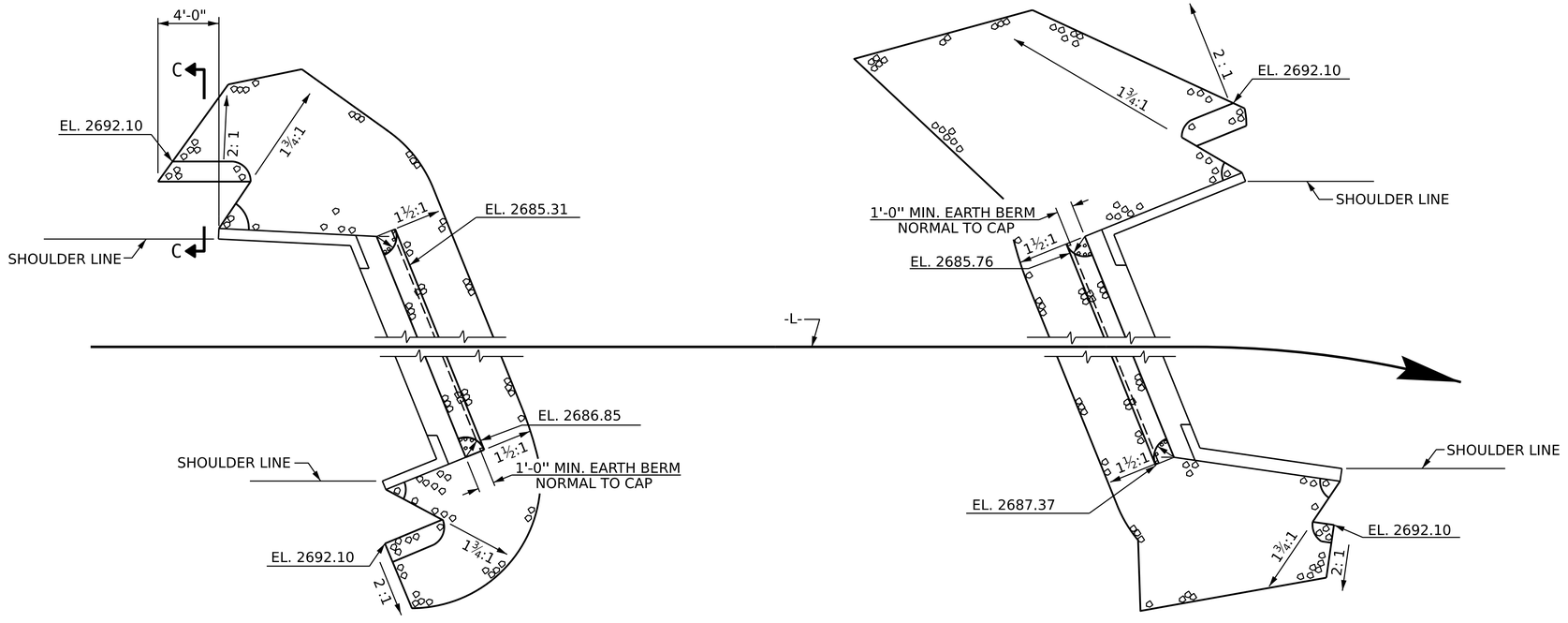
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			26

DRAWN BY : S. B. WILLIAMS DATE : 5/25
CHECKED BY : M. G. CHEEK DATE : 5/25
DESIGN ENGINEER OF RECORD : S.T.M. DATE : 6/25

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

NOTES :

FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

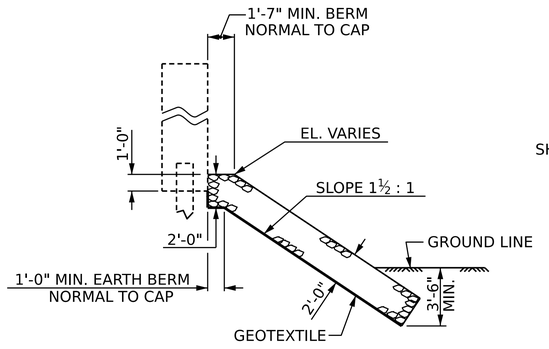


END BENT 1

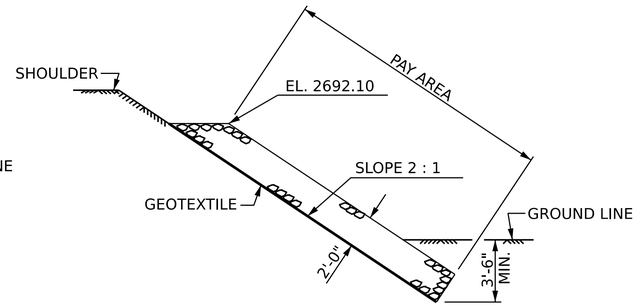
END BENT 2

PLAN

ESTIMATED QUANTITIES		
BRIDGE @ STA. 10+92.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	155	175
END BENT 2	175	195



℄ SECTION



SECTION C-C

BERM RIP RAPPED

PROJECT NO. DF18311.2095167.PR

WATAUGA COUNTY

STATION: 10+92.00 -L-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20125 Marshall G. Creek, Jr. 7/8/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
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PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

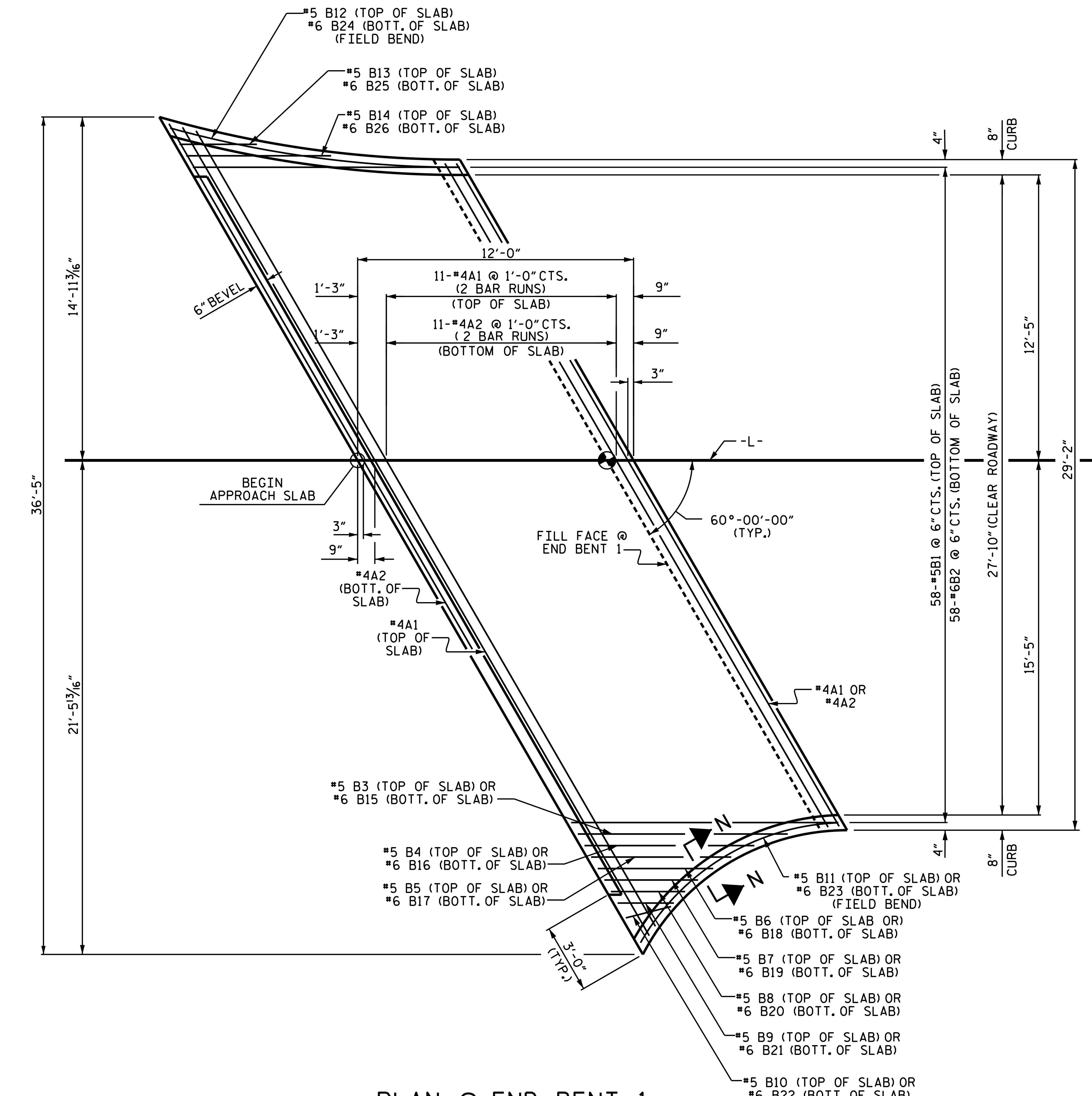
RIP RAP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			26

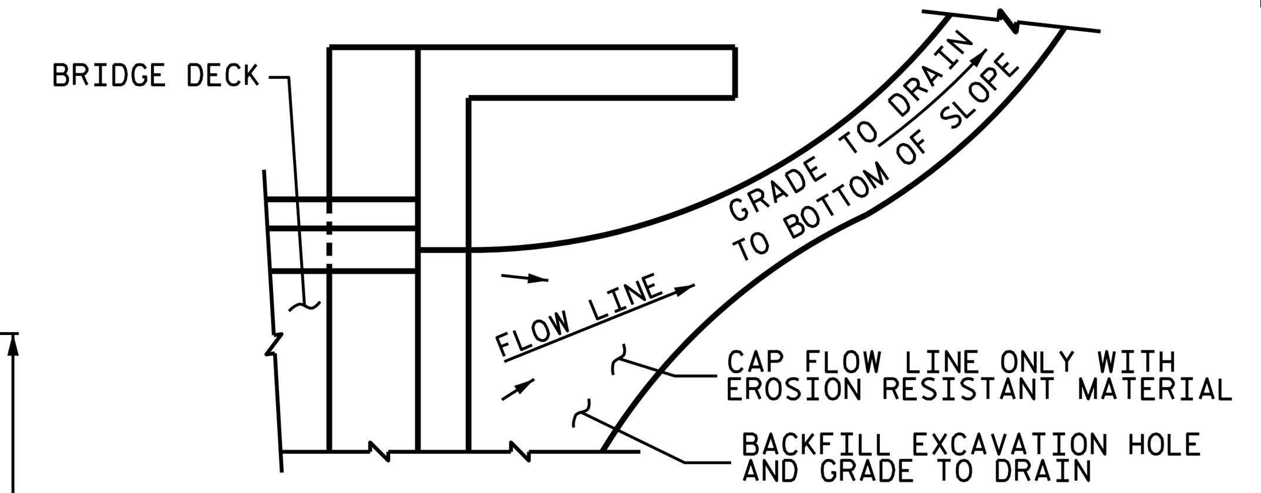
ASSEMBLED BY :	ZCS	DATE : 6/25
CHECKED BY :	MGC	DATE : 6/25
DRAWN BY : REK 1/84	REV. 10/1/11	MAA/GM
CHECKED BY : RDU 1/84	REV. 12/21/11	MAA/GM
	REV. 12/17	MAA/THC

6/23/2025
c:\workdir\ncdot-pw.bentley.com_ncdot-pw-01\zachary smith\d0495835\Rip Rap.dgn
ZSmith

STD. NO. RR1



PLAN @ END BENT 1



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

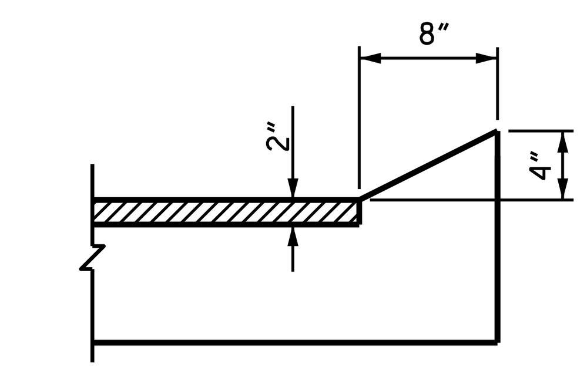
TEMPORARY DRAINAGE DETAIL

NOTES

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

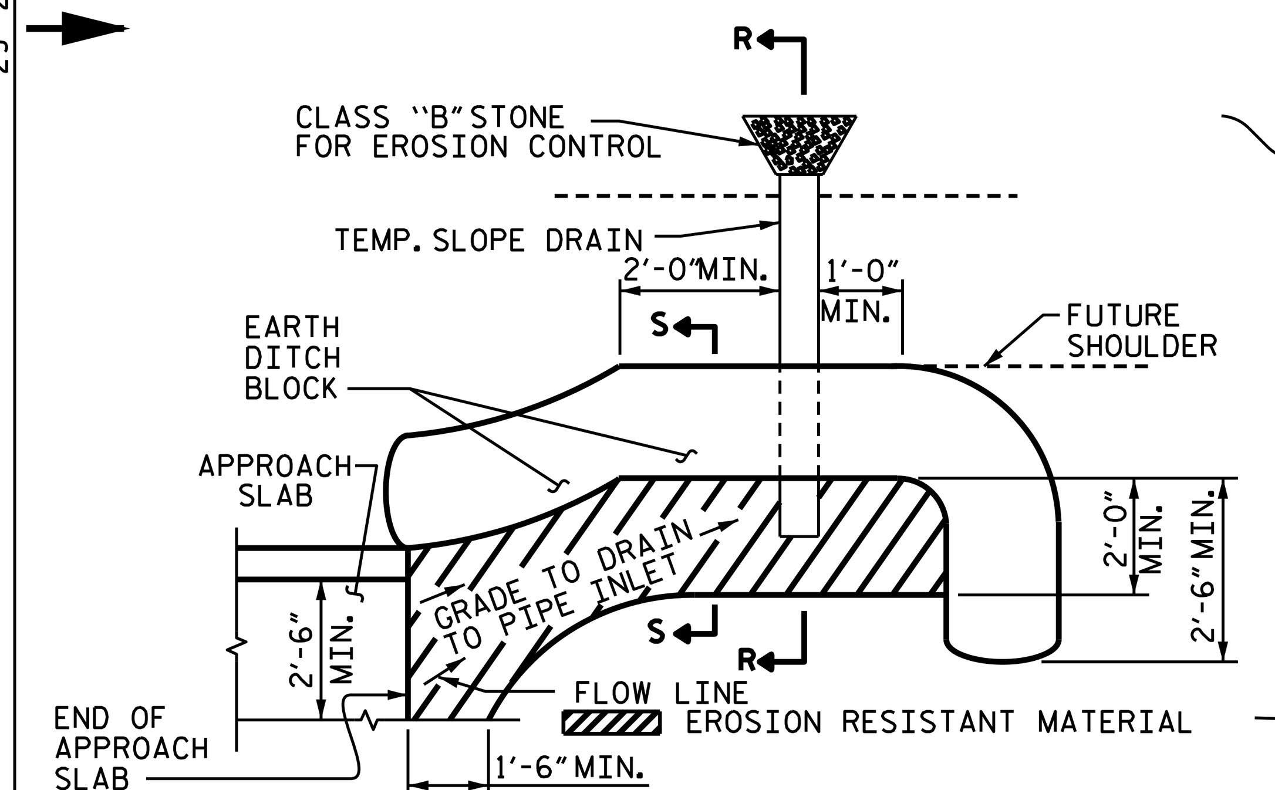


SECTION N-N

CURB DETAILS

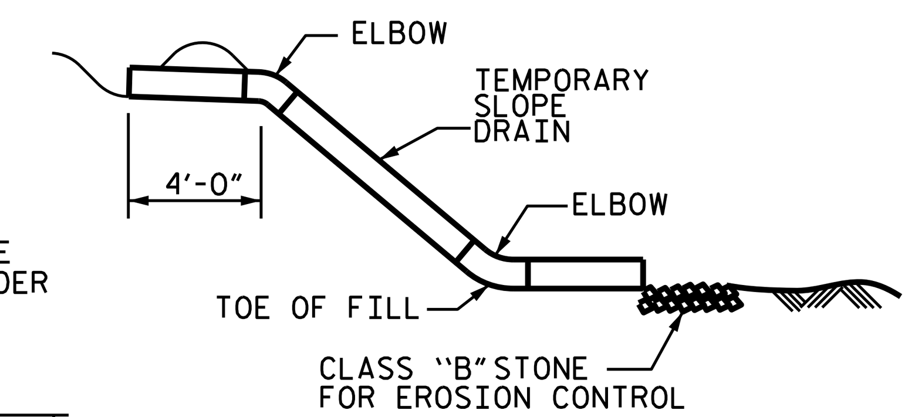
BILL OF MATERIAL					
APPROACH SLAB AT EB 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	26	#4	STR	21'-10"	379
A2	26	#4	STR	21'-8"	376
* B1	58	#5	STR	11'-1"	670
B2	58	#6	STR	11'-7"	1009
* B3	1	#5	STR	8'-7"	9
* B4	1	#5	STR	6'-5"	7
* B5	1	#5	STR	5'-2"	5
* B6	1	#5	STR	4'-2"	4
* B7	1	#5	STR	3'-3"	3
* B8	1	#5	STR	2'-7"	3
* B9	1	#5	STR	2'-6"	3
* B10	1	#5	STR	2'-0"	2
* B11	1	#5	STR	10'-6"	11
* B12	1	#5	STR	12'-9"	13
* B13	1	#5	STR	3'-4"	3
* B14	1	#5	STR	6'-3"	7
B15	1	#6	STR	9'-1"	14
B16	1	#6	STR	7'-4"	11
B17	1	#6	STR	6'-1"	9
B18	1	#6	STR	5'-0"	8
B19	1	#6	STR	4'-1"	6
B20	1	#6	STR	3'-2"	5
B21	1	#6	STR	2'-5"	4
B22	1	#6	STR	2'-0"	3
B23	1	#6	STR	10'-6"	16
B24	1	#6	STR	12'-9"	19
B25	1	#6	STR	3'-4"	5
B26	1	#6	STR	6'-3"	9
REINFORCING STEEL				LBS.	1,494
* EPOXY COATED REINFORCING STEEL				LBS.	1,119
CLASS AA CONCRETE				C.Y.	19.3

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"

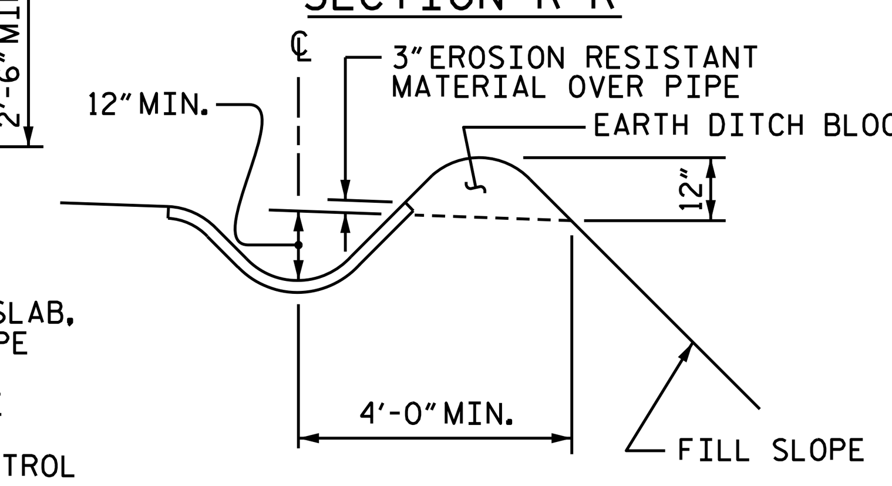


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.

PLAN VIEW



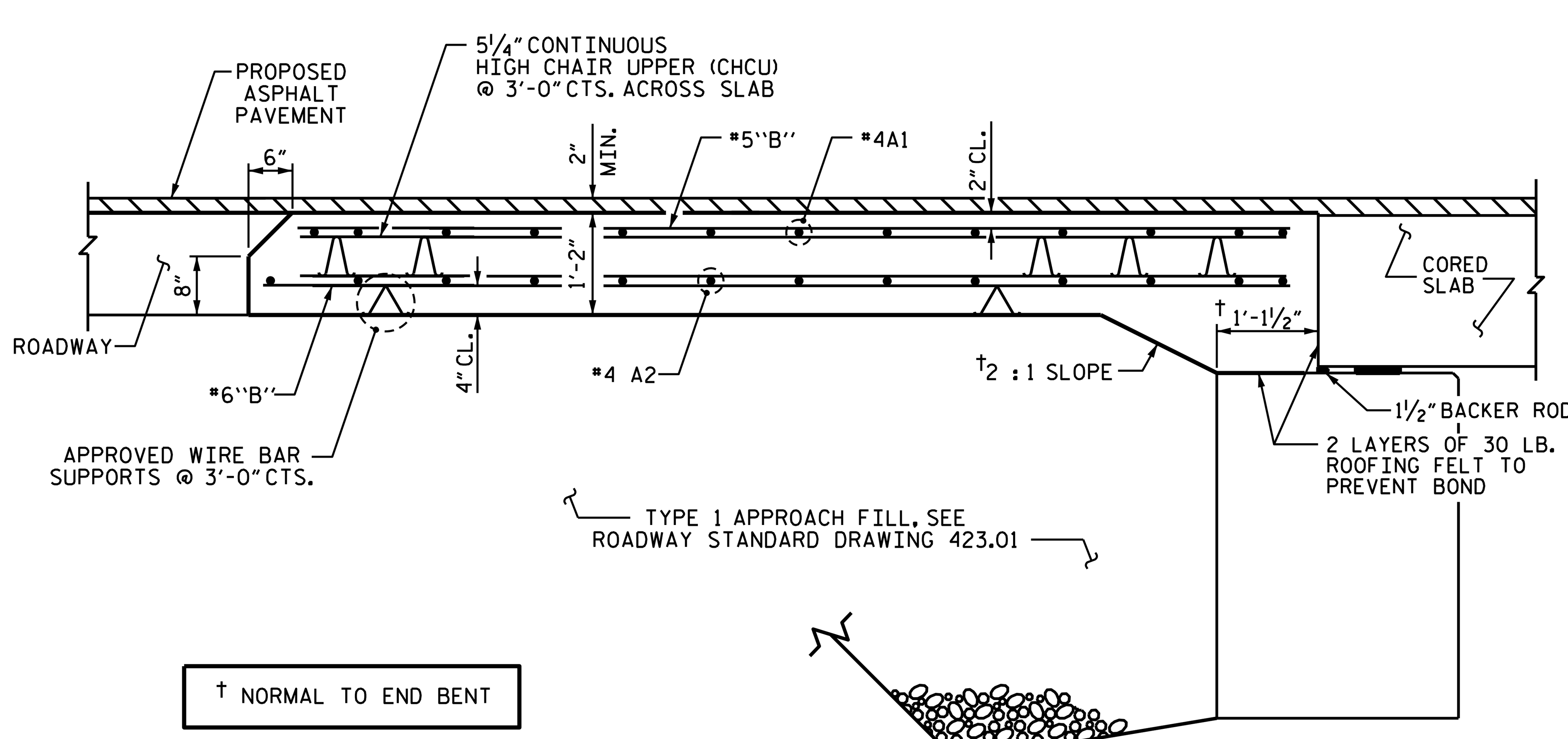
SECTION R-R



SECTION S-S

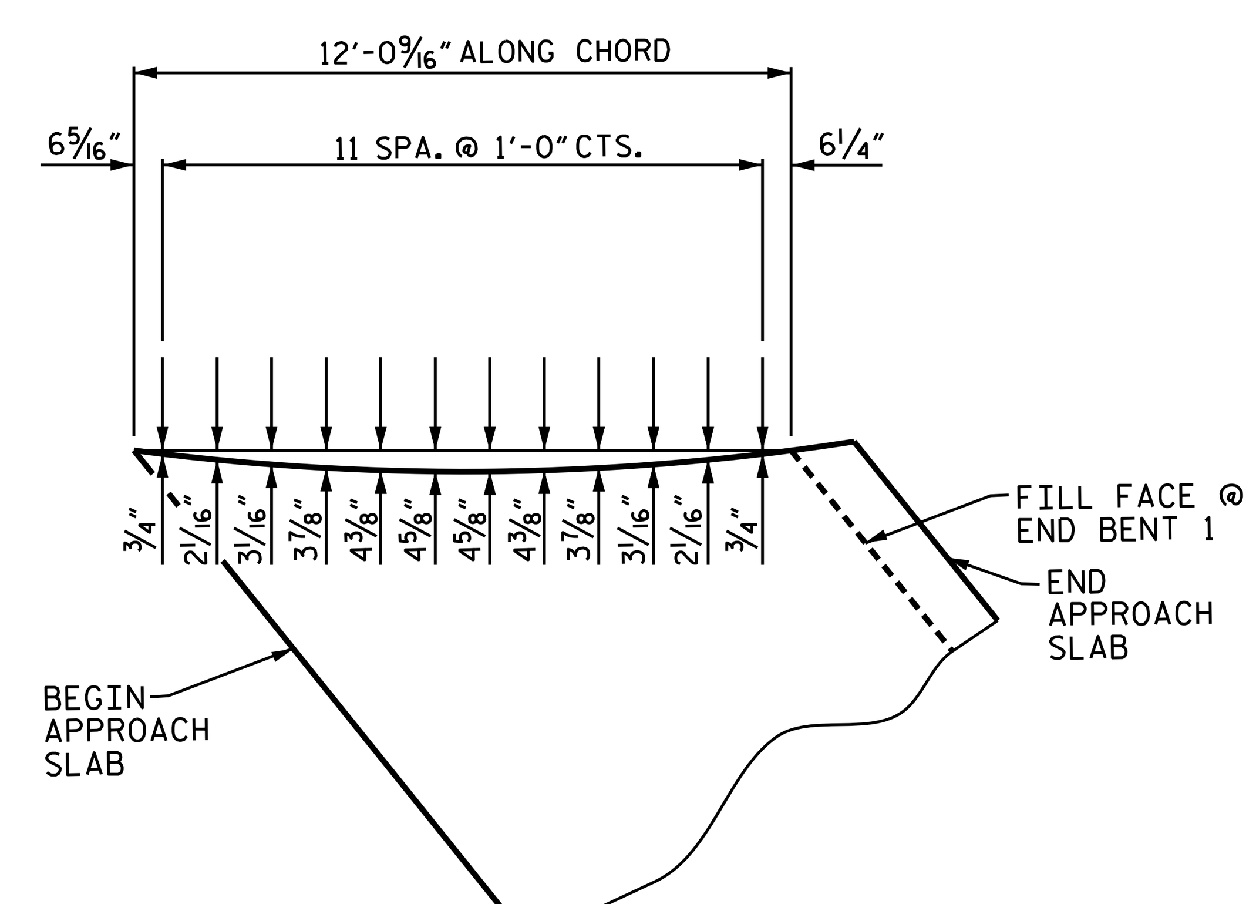
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

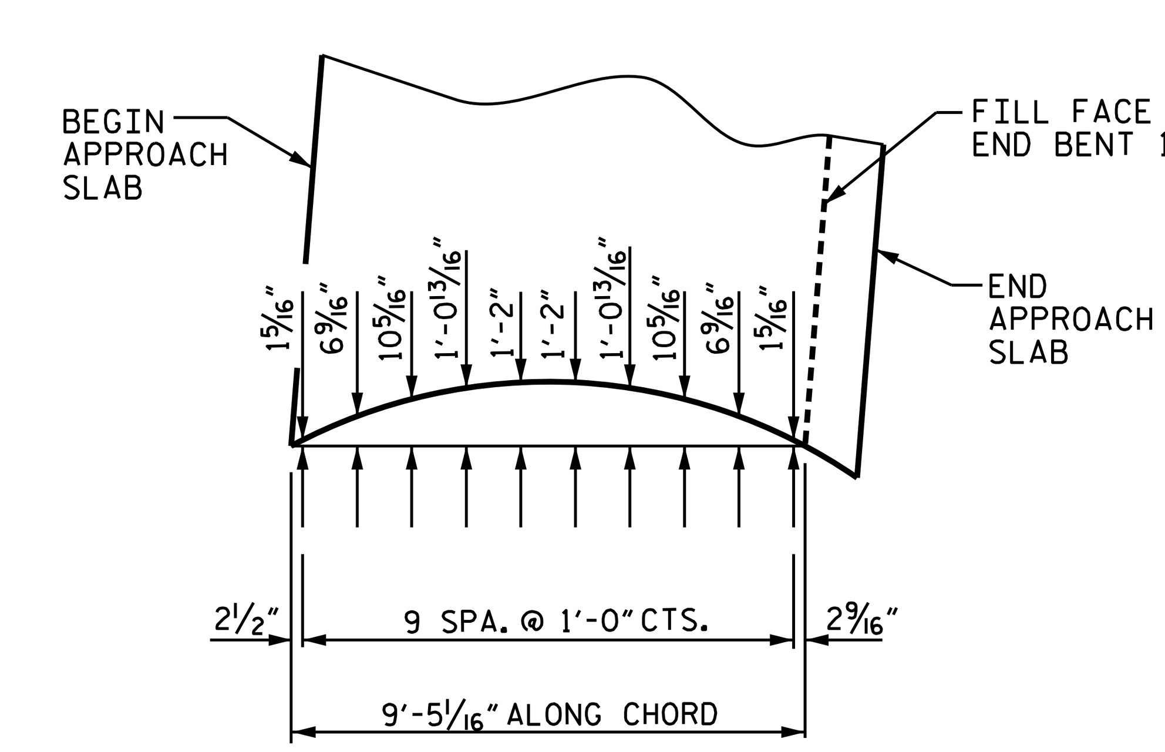


† NORMAL TO END BENT

SECTION THRU SLAB



ARC OFFSETS - LEFT SIDE



ARC OFFSETS - RIGHT SIDE

NORTH CAROLINA PROFESSIONAL SEAL 28125 ENGINEER MARSHALL G. CHEEK, JR.
Marshall G. Cheek, Jr.
7/8/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PROJECT NO. DF18311.2095167.PR
WATAUGA COUNTY
STATION: 10+92.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

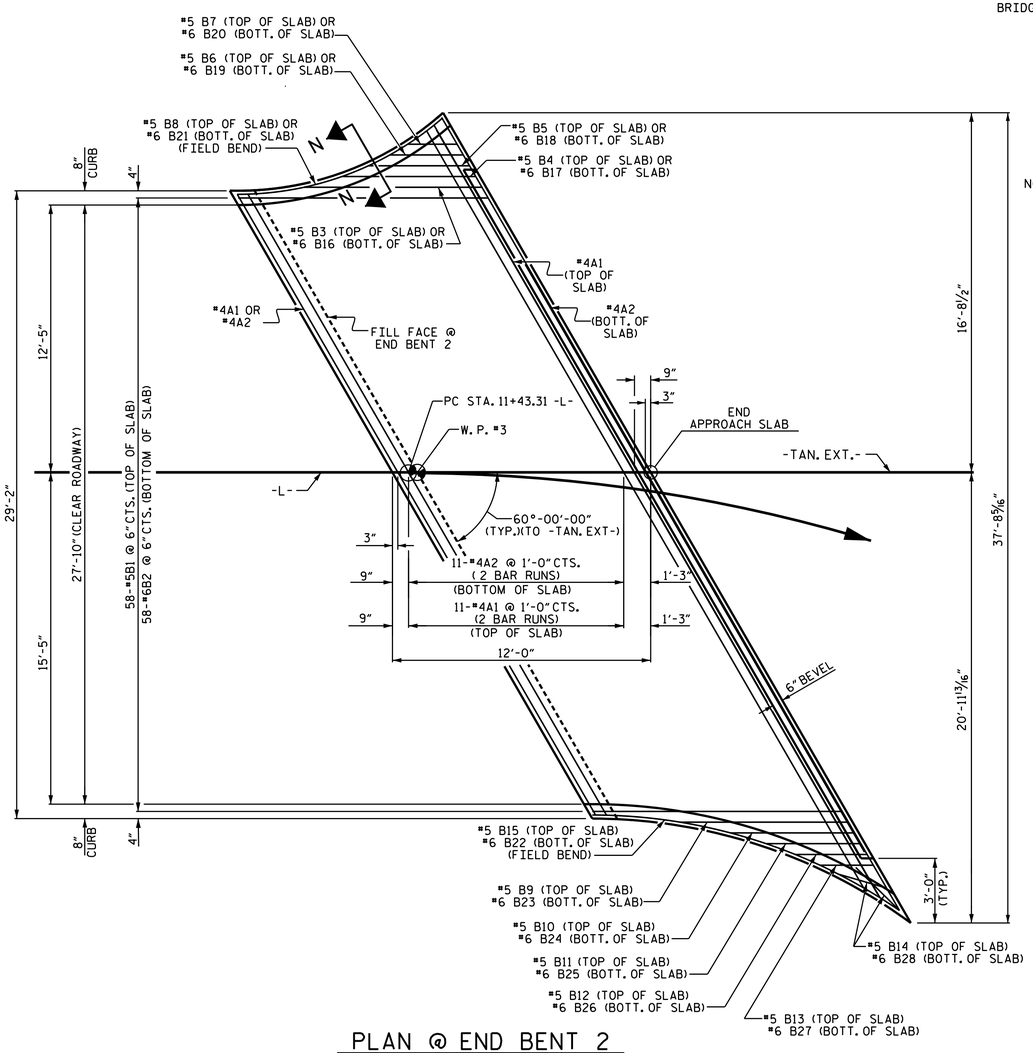
STANDARD
BRIDGE APPROACH SLAB
FOR PRESTRESSED CONCRETE
CORED SLAB UNIT
(SUB-REGIONAL TIER)
60° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			26

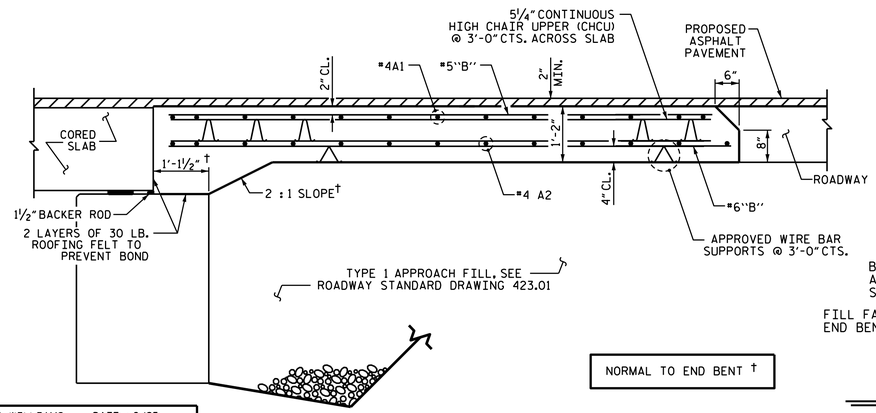
ASSEMBLED BY : S.B. WILLIAMS	DATE : 6/25
CHECKED BY : M.G. CHEEK	DATE : 6/25
DRAWN BY : SHS/MAA 5-09 CHECKED BY : BCH 5-09	REV. 08-19 BNB/THC REV. 01-25 HRS

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

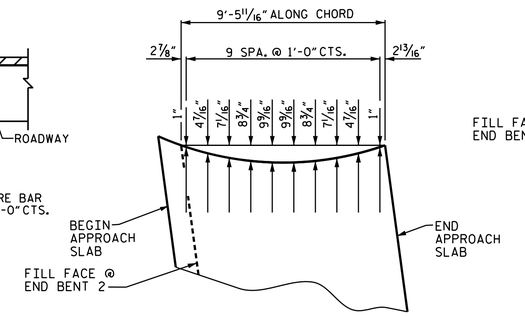
STD. NO. BAS_30_60S



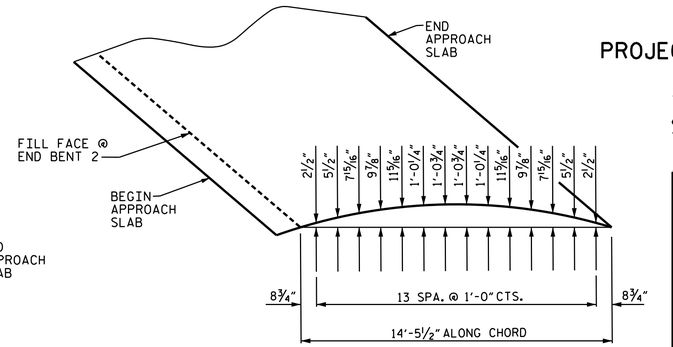
PLAN @ END BENT 2



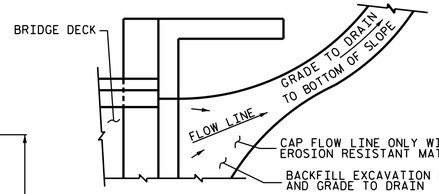
SECTION THRU SLAB



ARC OFFSETS - LEFT SIDE

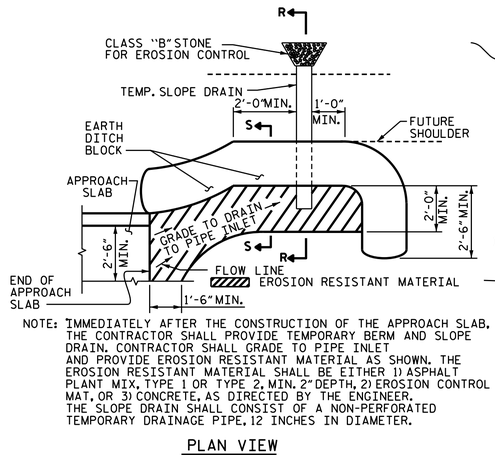


ARC OFFSETS - RIGHT SIDE



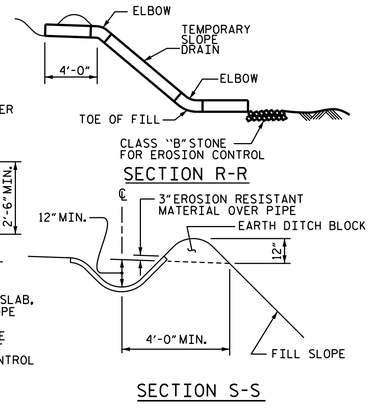
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAIL



NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.

PLAN VIEW



SECTION R-R

SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

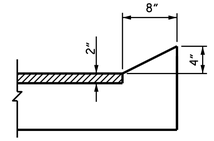
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

NOTES

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.



SECTION N-N

CURB DETAILS

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"

BILL OF MATERIAL

APPROACH SLAB AT EB 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	26	#4	STR	22'-3"	386
A2	26	#4	STR	22'-1"	384
✱ B1	58	#5	STR	11'-1"	670
B2	58	#6	STR	11'-7"	1009
✱ B3	1	#5	STR	7'-8"	8
✱ B4	1	#5	STR	5'-7"	6
✱ B5	1	#5	STR	4'-8"	5
✱ B6	1	#5	STR	3'-5"	4
✱ B7	1	#5	STR	2'-3"	2
✱ B8	1	#5	STR	10'-4"	11
✱ B9	1	#5	STR	7'-2"	7
✱ B10	1	#5	STR	5'-2"	5
✱ B11	1	#5	STR	3'-9"	4
✱ B12	1	#5	STR	2'-9"	3
✱ B13	1	#5	STR	1'-10"	2
✱ B14	2	#5	STR	2'-10"	6
✱ B15	1	#5	STR	15'-2"	16
B16	1	#6	STR	8'-3"	12
B17	1	#6	STR	6'-2"	9
B18	1	#6	STR	4'-8"	7
B19	1	#6	STR	3'-5"	5
B20	1	#6	STR	2'-3"	3
B21	1	#6	STR	10'-4"	16
B22	1	#6	STR	15'-2"	23
B23	1	#6	STR	7'-9"	12
B24	1	#6	STR	5'-8"	9
B25	1	#6	STR	4'-5"	7
B26	1	#6	STR	3'-4"	5
B27	1	#6	STR	1'-10"	3
B28	2	#6	STR	2'-10"	9
REINFORCING STEEL			LBS.		1,513
✱ EPOXY COATED REINFORCING STEEL			LBS.		1,135
CLASS AA CONCRETE			C. Y.		19.4

NORTH CAROLINA PROFESSIONAL SEAL Marshall G. Cheek, Jr. 20125 ENGINEER MARSHALL G. CHEEK, JR.
7/8/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PROJECT NO. DF18311.2095167.PR

WATAUGA COUNTY

STATION: 10+92.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE CORED SLAB UNIT (SUB-REGIONAL TIER) 60° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			26

ASSEMBLED BY : S. B. WILLIAMS	DATE : 6/25	
CHECKED BY : M. G. CHEEK	DATE : 6/25	
DRAWN BY : SHS/MAA 5-09	REV. 08-19	BNB/THC
CHECKED BY : BCH 5-09	REV. 01-25	HRS

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

STD. NO. BAS_30_60S

8/26/21

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	AASHTO (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE AASHTO
STRESS IN EXTREME FIBER OF STRUCTURAL STEEL - AASHTO M270 GRADE 36	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION - GRADE 60	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	SEE AASHTO
STRUCTURAL TIMBER - TREATED OR UNTREATED EXTREME FIBER STRESS	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2024 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO ½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A ¼" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE ⅞" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - ⅞"Ø STUDS FOR 4 - ¾" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST $\frac{5}{16}$" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY $\frac{1}{16}$" OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.