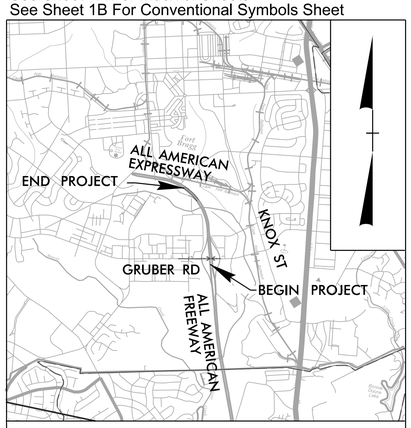
01/16/24

CONTRACT: C205187 TIP PROJECT: 49218.26/49218.6

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols Sheet



VICINITY MAP (NTS)

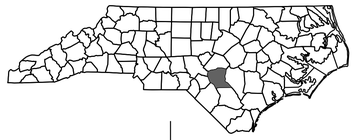
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	49218.26/49218.6	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
49218.26	-	PE, CONST.
49218.6	-	PE, CONST.

NAD 83'2011



LOCATION: *BRIDGE #H4072 (GRUBER RD.) OVER ALL AMERICAN FREEWAY AND ALL AMERICAN FREEWAY NEAR HONEYCUTT RD. ON FORT BRAGG*

TYPE OF WORK: *GRADING, DRAINAGE, PAVING, SIGNALS , STRUCTURE, AND RETAINING WALLS*

★ PROPOSED SIGNAL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECTS
49218.26/49218.6 = 0.425 MILES

LENGTH OF STRUCTURE TIP PROJECTS
49218.26/49218.6 = 0.038 MILES

TOTAL LENGTH OF TIP PROJECTS
49218.26/49218.6 = 0.463 MILES

PLANS PREPARED BY:	PLANS PREPARED FOR:
INFRASTRUCTURE CONSULTING & ENGINEERING 4505 Falls of Neuse Road Suite 110 Raleigh, North Carolina 27609 Phone: 984-255-0410 License #: F-1528	*DIVISION OF HIGHWAYS* HIGHWAY DIVISION 6 558 GILLESPIE ST. FAYETTEVILLE, NC 28301
2024 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE: N/A	BRIAN LUSK , P.E. *PROJECT ENGINEER*
LETTING DATE: MAY 19, 2026	KYLE HAGAN, P.E. *PROJECT DESIGN ENGINEER*
	CHRISTY HUFF, P.E. *NCDOT CONTACT*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION

KE,Kyle Hagan 3/15/2026

SHEET NUMBER	SHEET
1	COMBINED TITLE SHEET (49218.26/49218.6)
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS

PART 1 49218.26: INDEX OF SHEETS

PART 2 49218.6: INDEX OF SHEETS

STANDARD DRAWINGS

EFF. 08-11-2025
REV. 11-26-2025

2024 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Contracts Standards and Development Unit -
N. C. Department of Transportation - Raleigh, N. C., Dated January 16, 2024 are applicable to this project
and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.01	Guide for Grading Subgrade - Interstate and Freeway
225.03	Deceleration and Acceleration Lanes
225.04	Method of Obtaining Superelevation - Two Lane Pavement
235.01	Embankment Monitoring
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation (Use Details in Lieu of Standards for Sheet 2 of 2)
DIVISION 4 - MAJOR STRUCTURES	
423.03	Bridge Approach Fills - Type 2 Approach Fill for Bridge Abutment with MSE Wall
423.04	Bridge Approach Fills - Type 2A Alternate Approach Fill for Integral Bridge Abutment with MSE Wall
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.02	Method of Shoulder Construction - High Side of Superelevated Curve - Method II
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
610.04	Guide for Paving Shoulders Under Bridges - Method IV (Use Details in Lieu of Standards for sheet 1 of 1)
665.01	Asphalt Shoulders - Milled Rumble Strips
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.22	Frames and Wide Slot Sag Grates
840.25	Anchorage for Frames - Brick, Concrete or Precast
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.45	Precast Drainage Structure
480.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
848.04	Street Turnout
848.06	Curb Ramp (Use Details in Lieu of Standards for Sheets 9 and 10 of 13)
848.07	Concrete Sidepath / Shared Use Path / Greenway Construction
852.02	Concrete Mountable Median - for Use with Rigid or Flexible Pavement
854.07	Single Slope Concrete Barrier
862.01	Guardrail Placement (Use Details in Lieu of Standards for Sheets 4, 6, 11, 12, and 14 of 15)
862.02	Guardrail Installation (Use Detail in Lieu of Standard for Sheet 5 of 9)
862.03	Structure Anchor Units (Use Detail in Lieu of Standards for Sheets 6 and 8 of 9)
862.04	Anchoring End of Guardrail - for B-77 and B-83 Anchor Units
865.01	Cable Guiderail
876.01	Rip Rap in Channels and Ditches
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

GENERAL NOTES

GENERAL NOTES: 2024 SPECIFICATIONS
EFFECTIVE: 01-16-2024
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING (49218.26 & 49218.60):

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 AND STD. NO. 225.05 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.

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.

STREET TURNOUT:

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

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.02

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 WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

END BENTS:

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

UTILITIES (49218.26):

UTILITY OWNERS ON THIS PROJECT ARE SANDHILLS, DPW, ASUS, NEC, PNG, AND CHARTER.

CURB RAMPS

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

Note: Not to Scale

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS
CONVENTIONAL PLAN SHEET SYMBOLS

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

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

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

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

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

ROADS AND RELATED FEATURES:
- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut
- Proposed Slope Stakes Fill
- Proposed Curb Ramp
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

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

EXISTING STRUCTURES:
MAJOR:
- Bridge, Tunnel or Box Culvert
- Bridge Wing Wall, Head Wall and End Wall

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

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

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

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

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

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

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

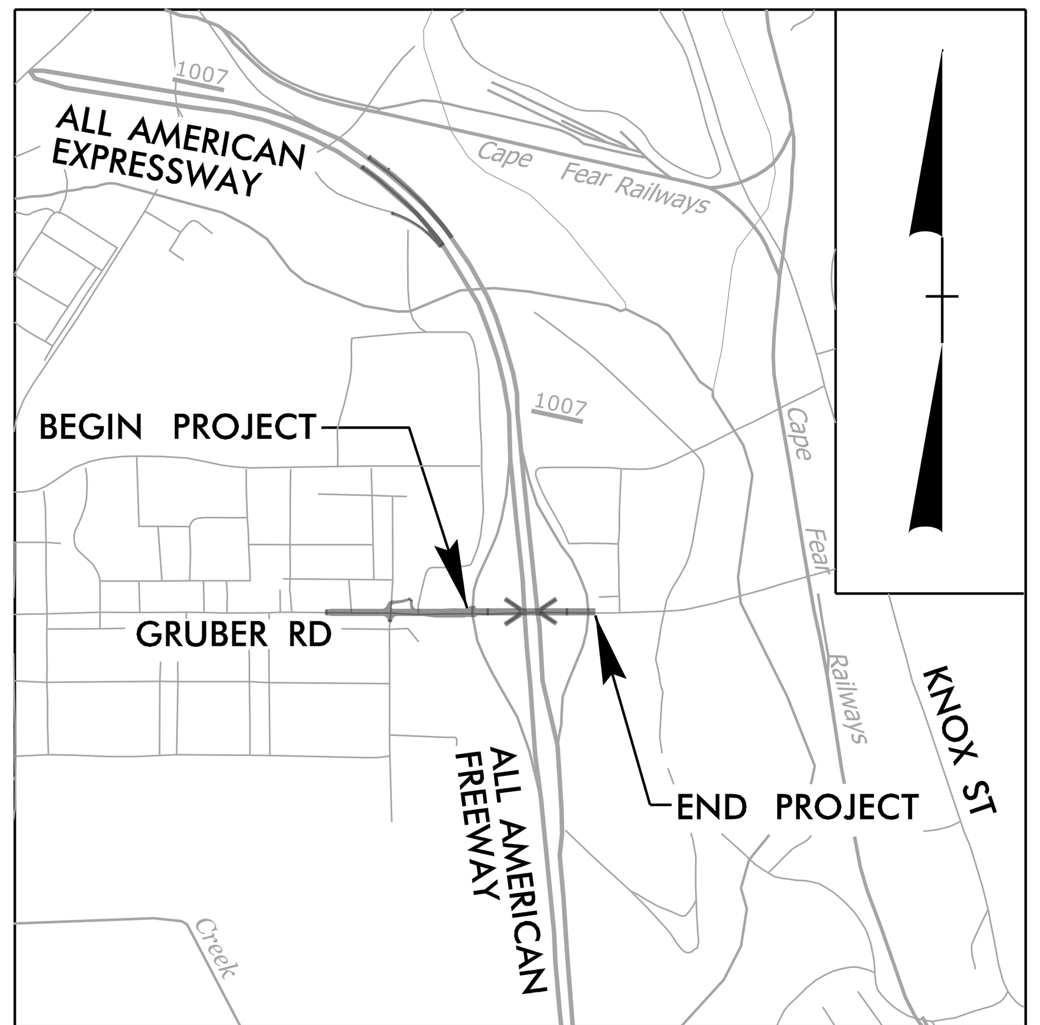
SANITARY SEWER:
- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line
- Above Ground Sanitary Sewer
- SS Force Main Line Test Hole (SUE - LOS A)*
- SS Force Main Line (SUE - LOS B)*
- SS Force Main Line (SUE - LOS C)*
- SS Force Main Line (SUE - LOS D)*

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

01/16/24

TIP PROJECT: 49218.26

CONTRACT: C205187



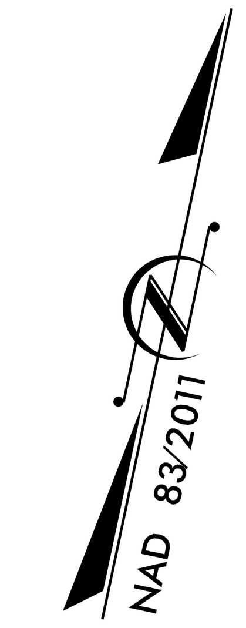
VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

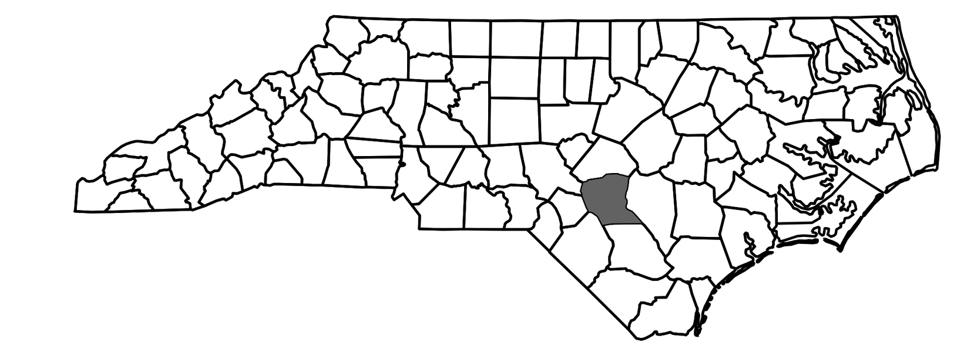
LOCATION: *BRIDGE #H4072 OVER ALL AMERICAN FREEWAY ON GRUBER ROAD*

TYPE OF WORK: *GRADING, DRAINAGE, PAVING, SIGNALS, STRUCTURES, AND RETAINING WALLS*



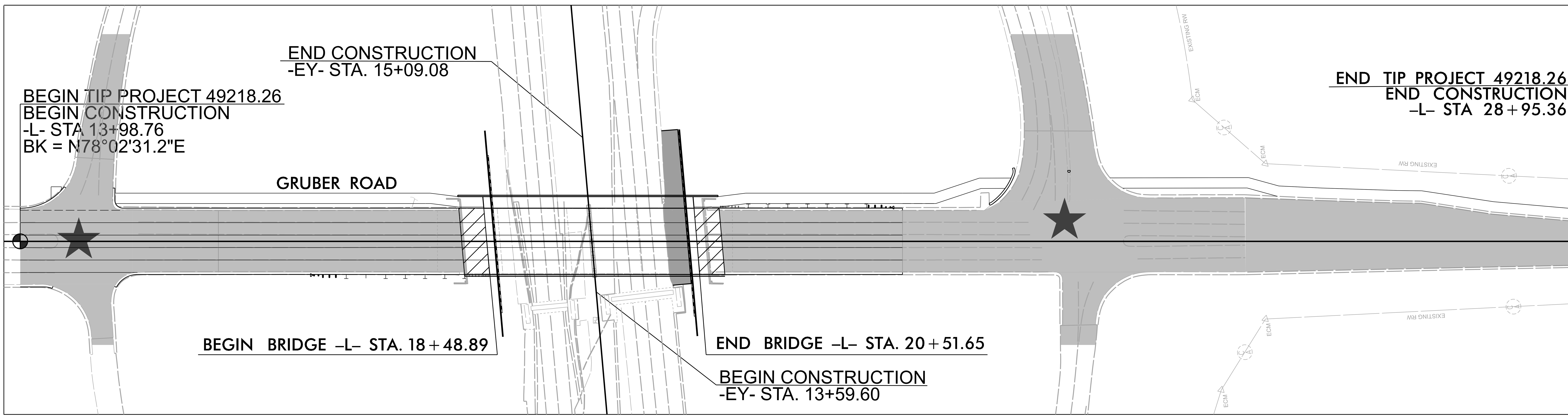
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	49218.26	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
49218.26	-	PE, CONST.



PART 1

4



★ PROPOSED SIGNAL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

20 10 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2025 = 4700
ADT 2045 = 6400
K = N/A %
D = N/A %
T = 6 % *
V = 40 MPH
* TTST =3 DUAL 3
FUNC CLASS = LOCAL SUBREGIONAL

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT 49218.26 = 0.245 MILES
LENGTH OF STRUCTURE TIP PROJECT 49218.26 = 0.038 MILE
TOTAL LENGTH OF TIP PROJECT 49218.26 = 0.283 MILES

PLANS PREPARED BY:
INFRASTRUCTURE CONSULTING & ENGINEERING
4505 Falls of Neuse Road, Suite 110
Raleigh, North Carolina 27609
Phone: 984-255-0410
License #: F-1528

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
N/A

LETTING DATE:
05/19/2026

PLANS PREPARED FOR:
DIVISION OF HIGHWAYS
HIGHWAY DIVISION 6
558 GILLESPIE ST.
FAYETTEVILLE, NC 28301

BRIAN LUSK , P.E.
PROJECT ENGINEER

KYLE HAGAN, P.E.
PROJECT DESIGN ENGINEER

CHRISTY HUFF, P.E.
NCDOT CONTACT

HYDRAULICS ENGINEER

Signed by: Jeffrey King
P.E. 3/16/2026
SIGNATURE:

NORTH CAROLINA PROFESSIONAL SEAL 056368 ENGINEER JEFFREY KING

ROADWAY DESIGN ENGINEER

DocuSigned by: Brian K. Lusk
P.E. 3/16/2026
SIGNATURE:

NORTH CAROLINA PROFESSIONAL SEAL 039183 ENGINEER BRIAN K. LUSK

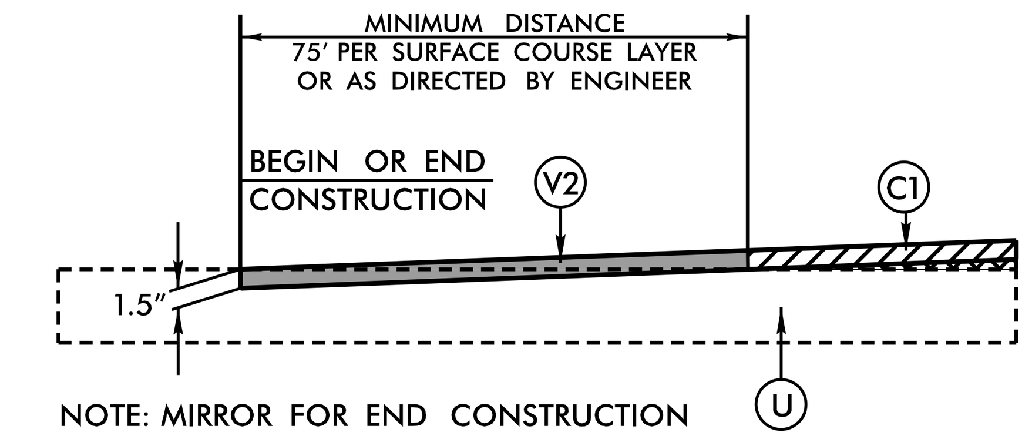
STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION

ICE/kyle.hagan - 3/10/2026

11/14/23

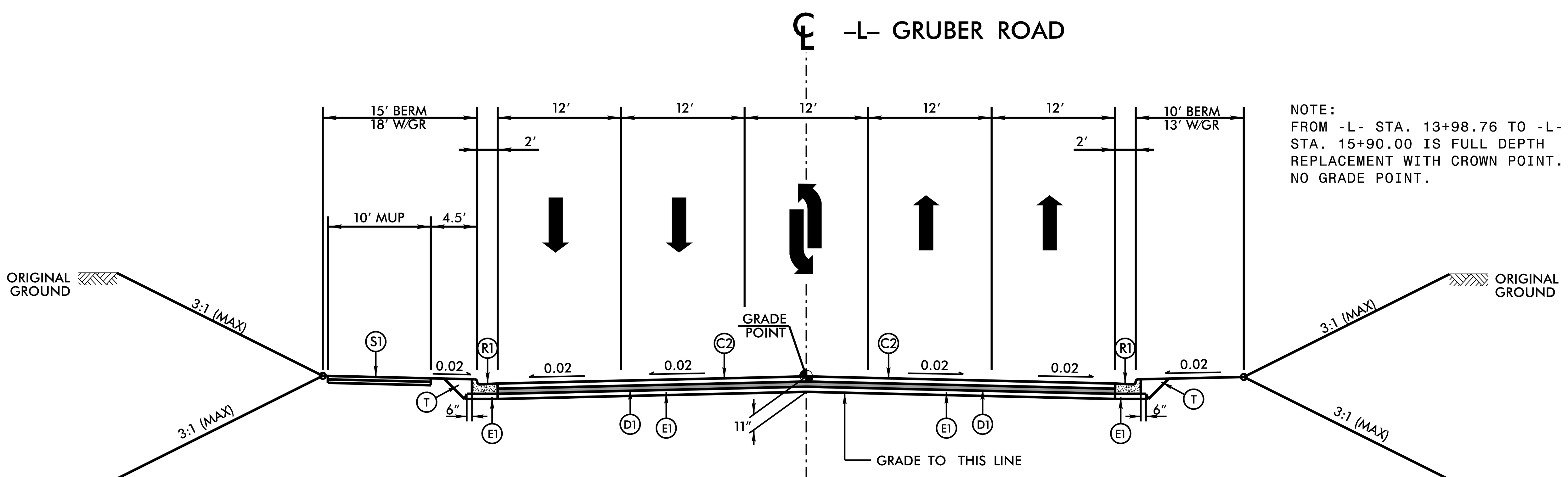
FINAL PAVEMENT SCHEDULE					
C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	J1	PROP. 4" AGGREGATE BASE COURSE.	T	EARTH MATERIAL.
C2	PROP. APPROX. 3.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	R1	2'-6" CONCRETE CURB AND GUTTER.	U	EXISTING PAVEMENT.
D1	PROP. APPROX. 4.0" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R2	SINGLE FACE CONCRETE BARRIER	V1	1.5" MILLING.
E1	PROP. APPROX. 4.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	S1	CONCRETE SIDEWALK (LIBERTY TRAIL) SEE SPECIAL DETAIL 2B-1 AND SPECIAL PROVISIONS.	V2	INCIDENTAL MILLING.

NOTES:
ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE.



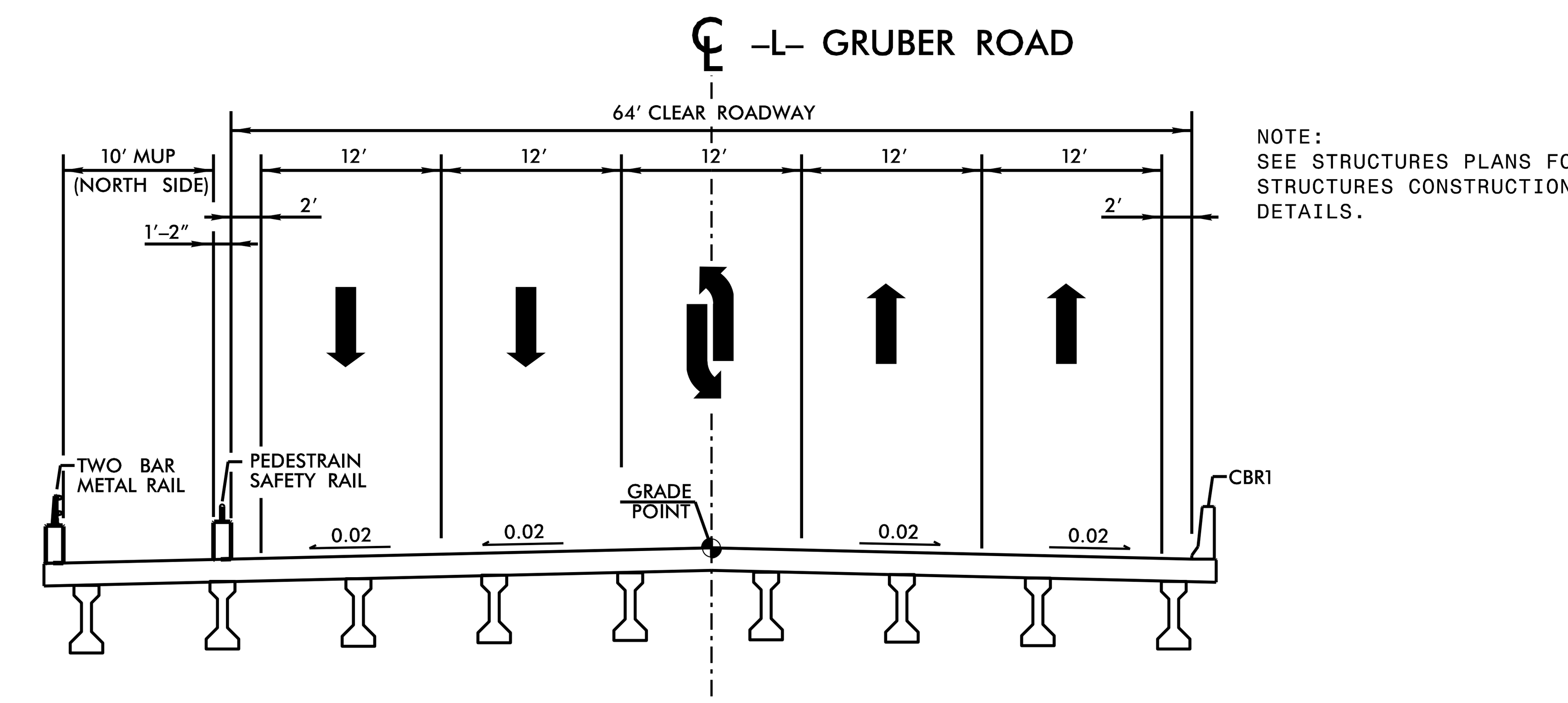
KEY-IN DETAIL

TO BE USED AT ALL ASPHALT TIE-IN LOCATIONS PAID AS INCIDENTALL MILLING



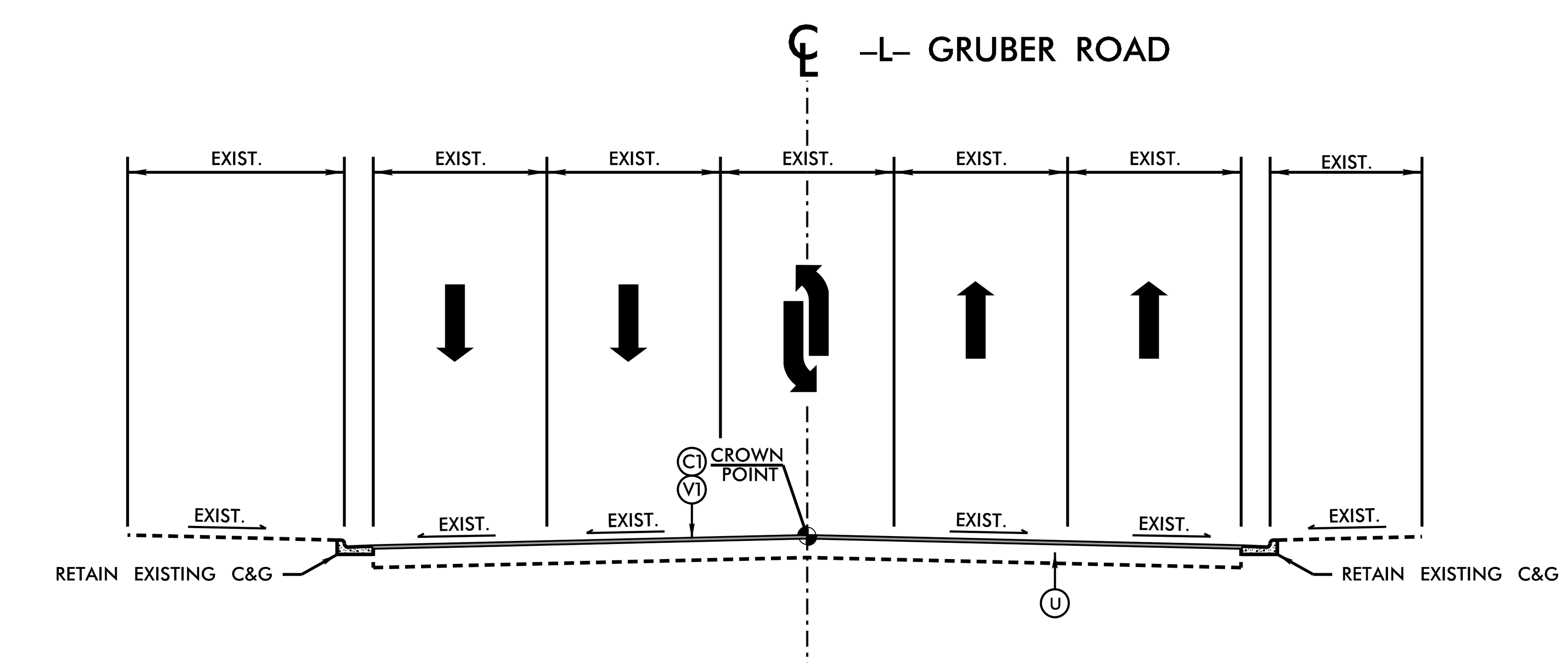
TYPICAL SECTION #1

–L– STA. 13+98.76 to STA. 18+48.89 (Begin Bridge)
–L– STA. 20+51.65 (End Bridge) to STA. 22+50.00



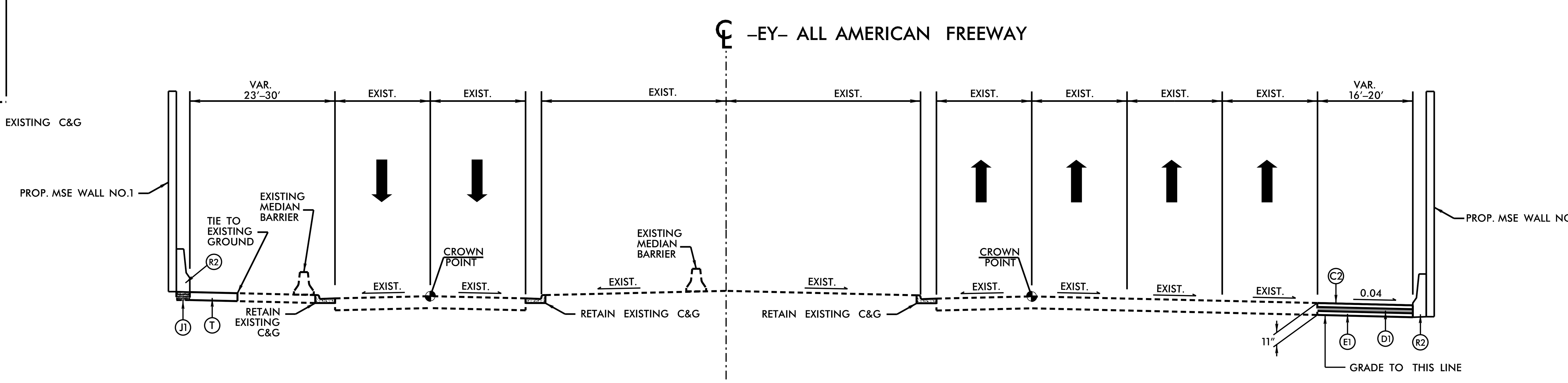
TYPICAL SECTION #3

–L– STA. 18+48.89 (Begin Bridge) to STA. 20+51.65 (End Bridge)



TYPICAL SECTION #2

–L– STA. 22+50.00 to STA. 28+95.36
NOTE: INCLUDES AREA OF RAMP B AND RAMP C



TYPICAL SECTION #4

–EY– STA. 13+59.60 to STA. 15+09.08

49218.26
SHEET NO. 2A-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
CUMBERLAND COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 059828

4/13/2026

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029147

4/13/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PREPARED BY

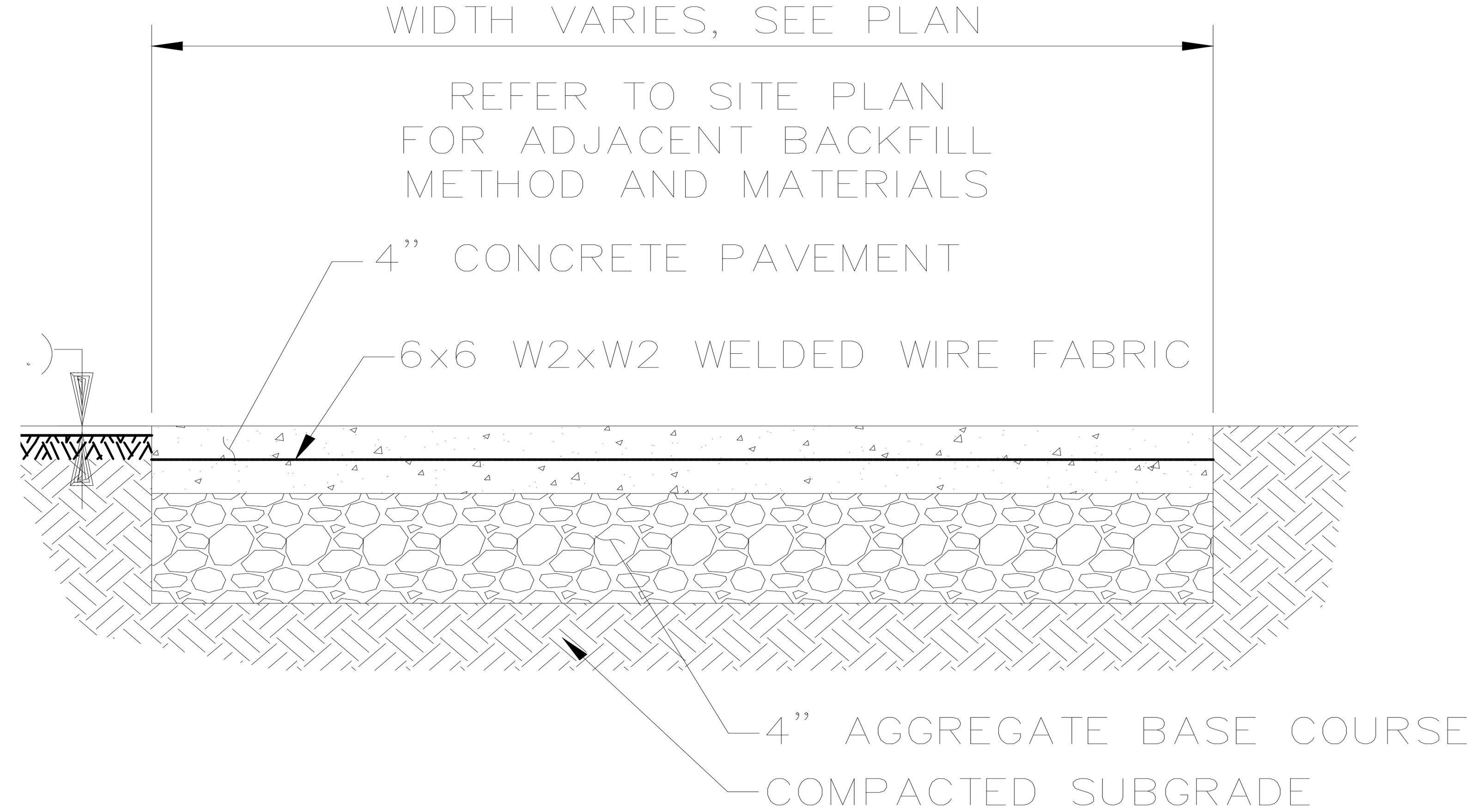
INFRASTRUCTURE CONSULTING & ENGINEERING
4505 Falls of Neuse Road, Suite 110
Raleigh, North Carolina 27609
Phone: 803-822-0333
License #: F-1528

PREPARED BY

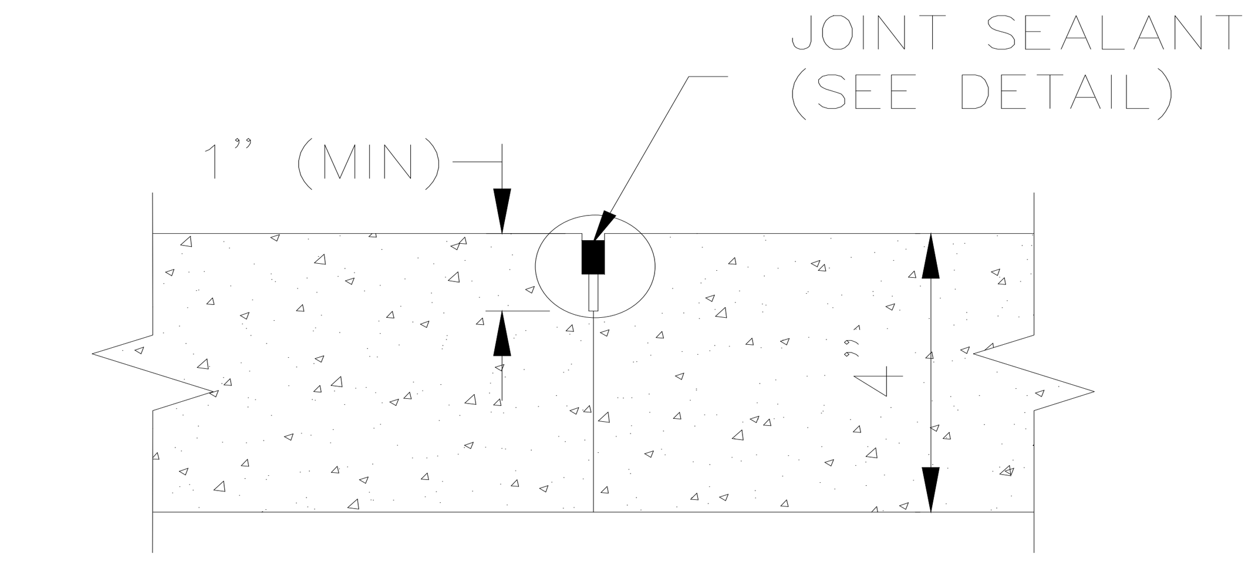
3201 Spring Forest Rd
Raleigh, North Carolina 27616
Phone: 919-872-2660
License #: F-0176

REVISIONS

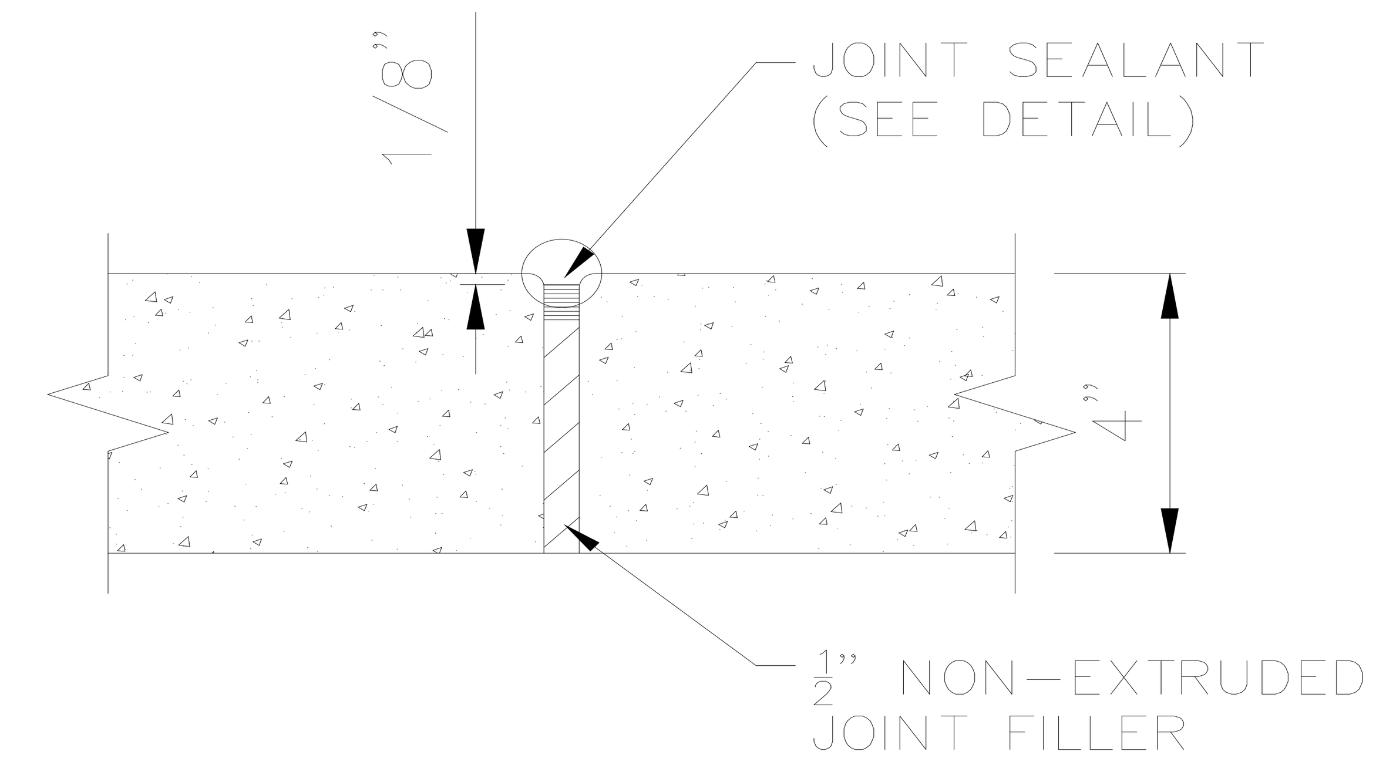
11/14/23



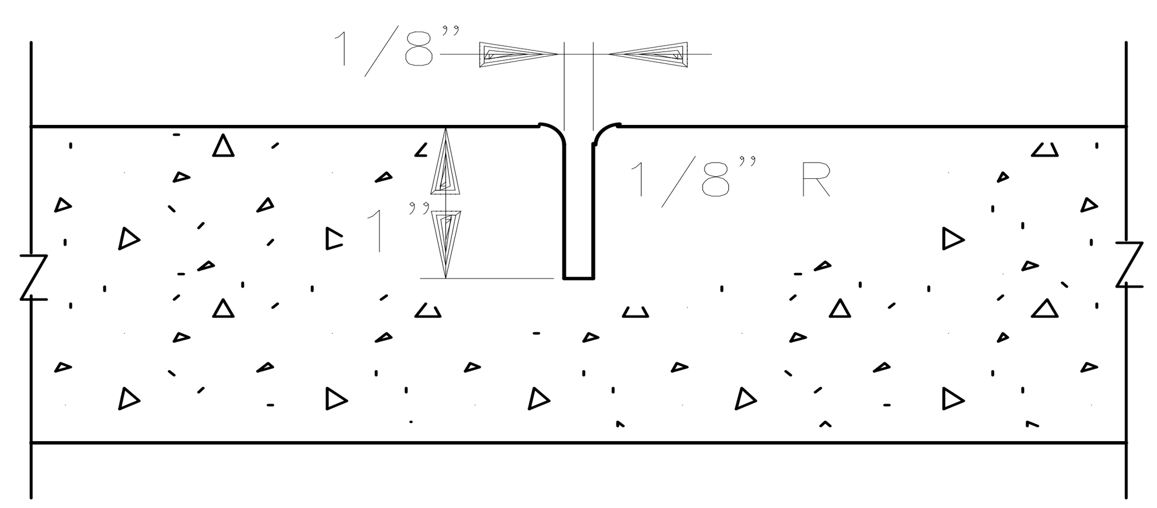
CONCRETE WALK SECTION



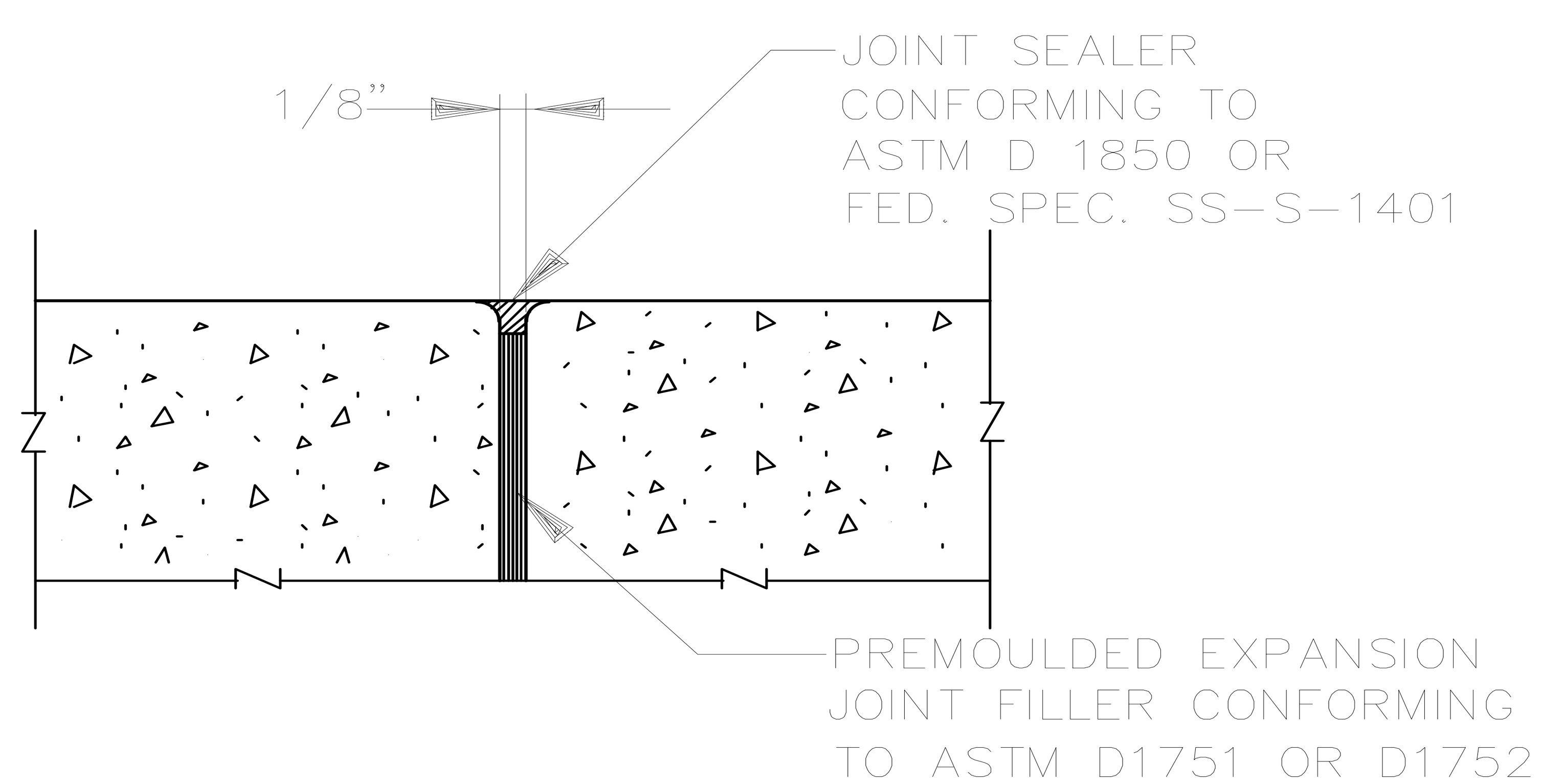
LONGITUDINAL OR TRAVERSE CONSTRUCTION JOINT



LONGITUDINAL OR TRAVERSE EXPANSION JOINT



CONTRACTION JOINT



EXPANSION JOINT

NOTES:

1. MINIMUM COMPRESSIVE STRENGTH FOR CONCRETE SIDEWALKS IS 4000 PSI, TYPE 1.
2. CONCRETE SHALL BE AIR ENTRAINED.
3. PROVIDE SCORED JOINTS EVERY 5' AND EXPANSION JOINTS AT MAXIMUM 50' INTERVALS.
4. WHERE CONCRETE ABUTS RIGID OBJECTS, INSTALL 1/2" PREMOLDED EXPANSION MATERIAL.
5. PROVIDE LIGHT BROOM FINISH PERPENDICULAR TO FOOT TRAFFIC.
6. CROSS SLOPE OF WALK TO BE 1% MINIMUM AND 2% MAXIMUM. LONGITUDINAL SLOPE TO BE 5.0% MAXIMUM UNLESS INDICATED OTHERWISE ON GRADING PLAN OR OTHER DETAILS.

NOT TO SCALE

ROADWAY SPECIAL DETAIL

CONCRETE SIDEWALK (LIBERTY TRAIL)

49218.26

SHEET NO. 2B-1

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
CUMBERLAND COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 059828 ENGINEER

4/13/2026

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PREPARED BY

INFRASTRUCTURE CONSULTING & ENGINEERING

4505 Falls of Neuse Road, Suite 110
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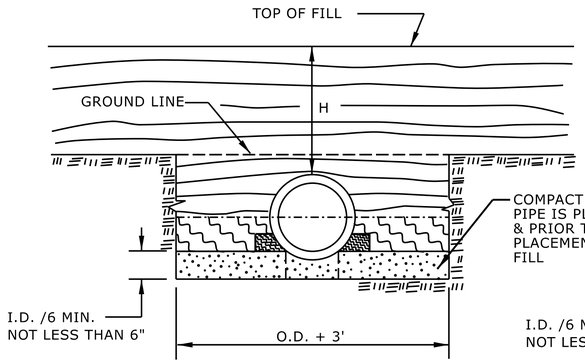
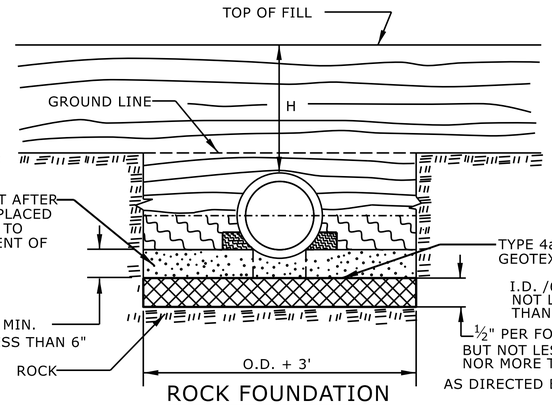
REVISIONS

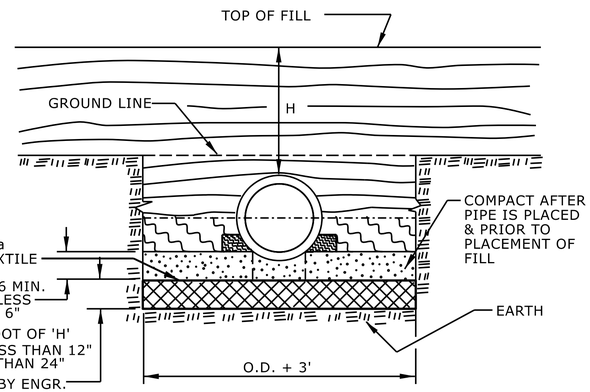
PROJECT REFERENCE NO.	SHEET NO.
49218.26	2C-1



NORMAL EARTH FOUNDATION

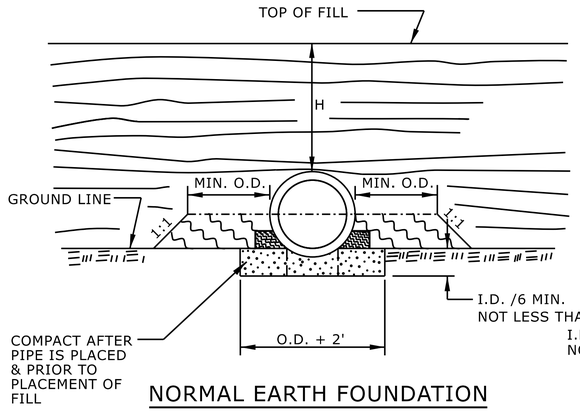


ROCK FOUNDATION

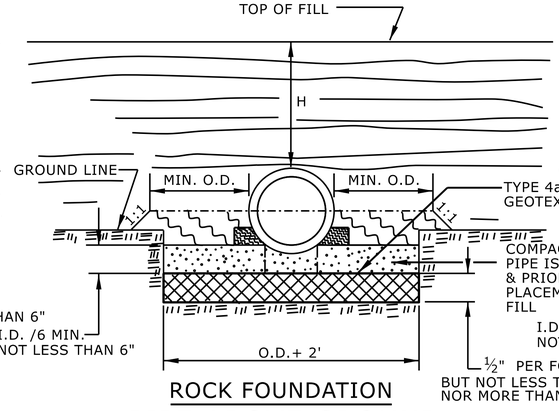


UNSUITABLE MATERIAL FOUNDATION

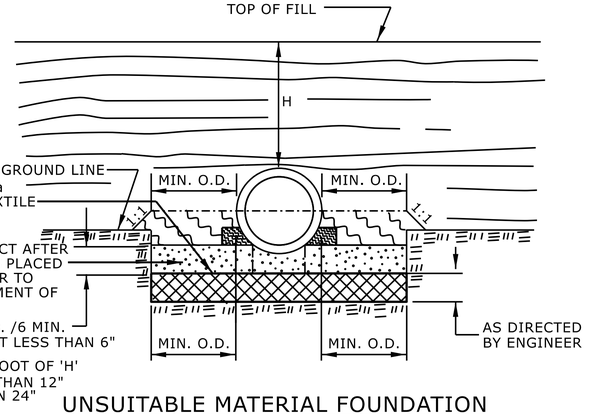
PIPE IN TRENCH



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
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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

RIGID PIPE

SHEET 2 OF 2

300.01

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CONTRACTS STANDARDS AND DEVELOPMENT UNIT
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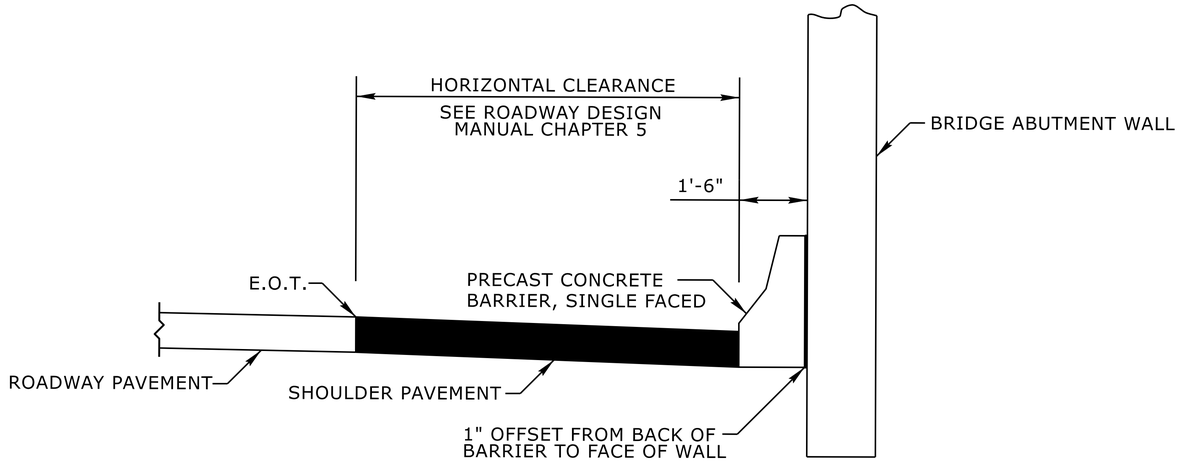
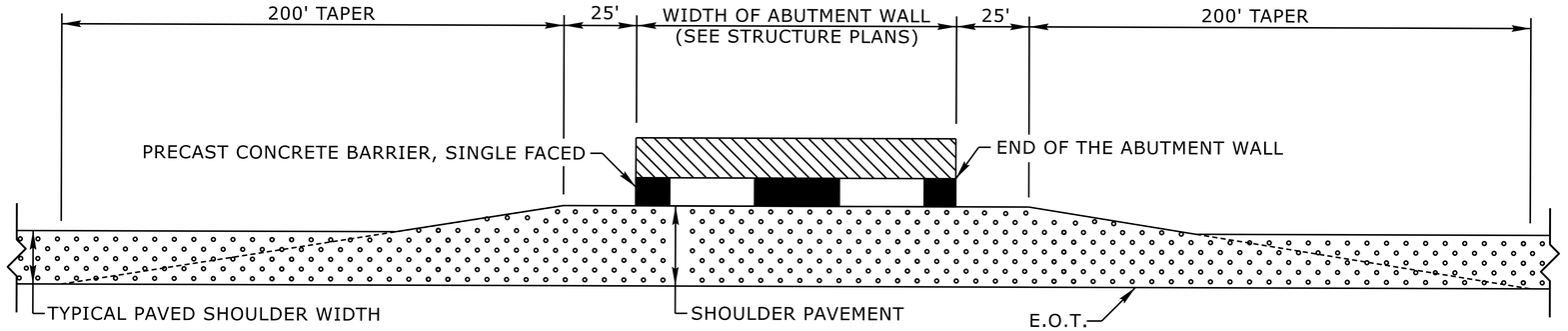
49218.26	2C-2



ELEVATION



PLAN

NOTE:
1. SHOULDER PAVEMENT SHOULD BE CONSTRUCTED AS SHOWN IN THE PLANS WITH THE SAME PAVEMENT DESIGN USED ON THE PAVED SHOULDER APPROACHING THE STRUCTURE UNDERPASS.

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ROADWAY DETAIL DRAWING FOR

GUIDE FOR PAVING SHOULDERS UNDER BRIDGES
METHOD IV

SHEET 1 OF 1

610D04

NORTH CAROLINA PROFESSIONAL SEAL 033144 ENGINEER HACKLER

3/16/2026

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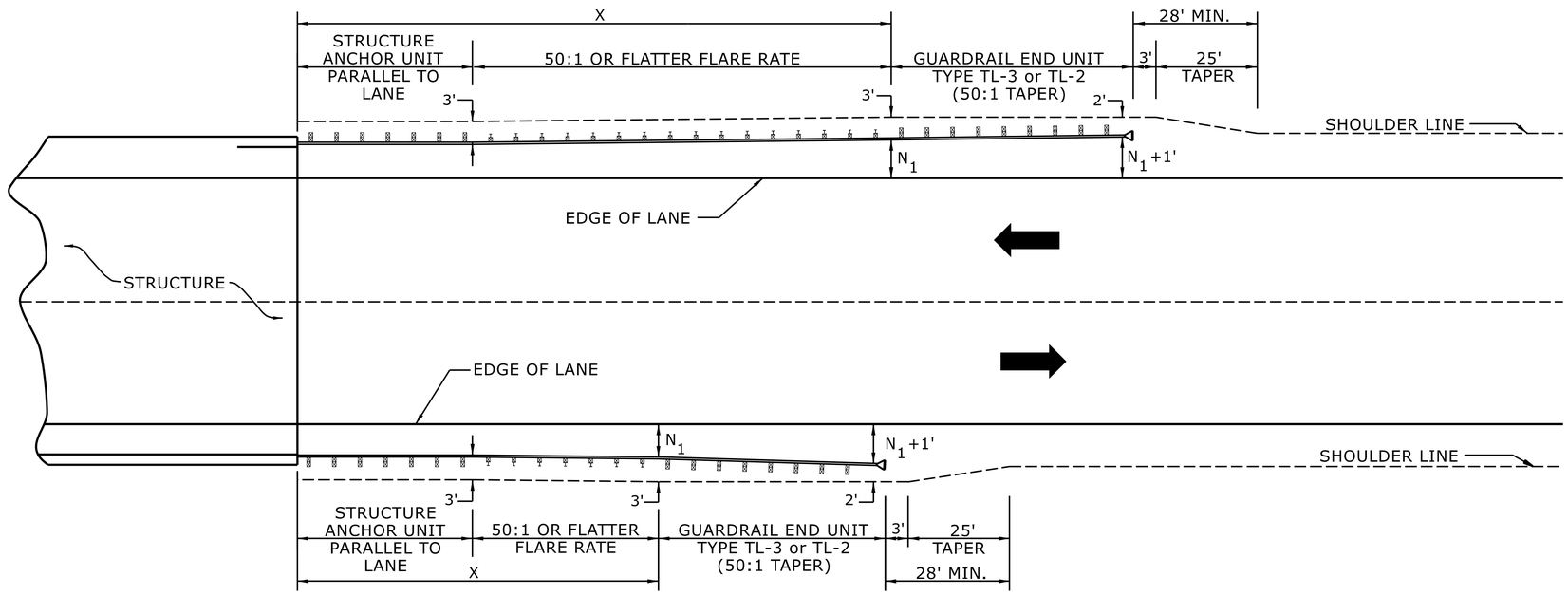
49218.26	2C-3



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

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 4 OF 15

862D01

NORTH CAROLINA PROFESSIONAL SEAL 033144 ENGINEER NICOLE M. HACKLER

3/16/2026

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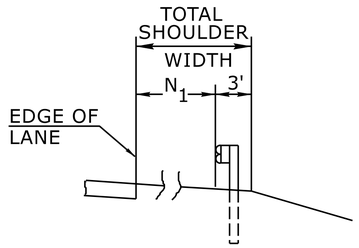
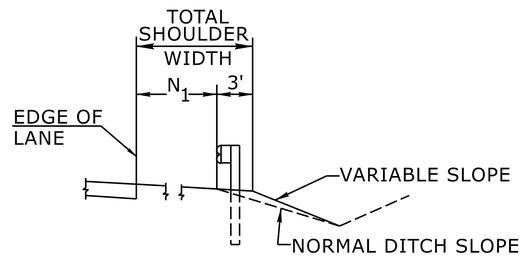
49218.26	2C-4

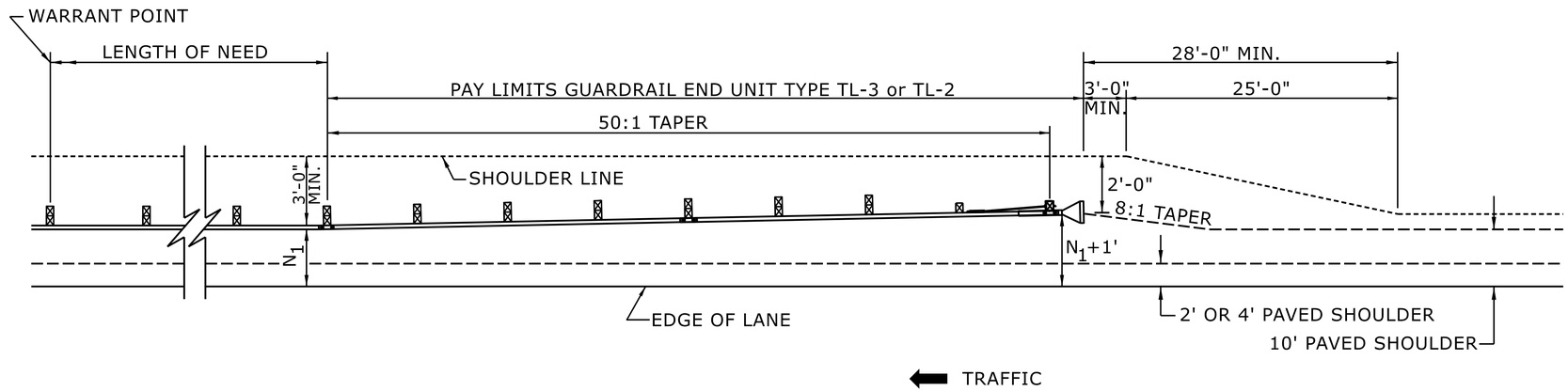


FILL SECTION



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

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 6 OF 15

862D01

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033144 NICOLE M. HACKLER
3/16/2026

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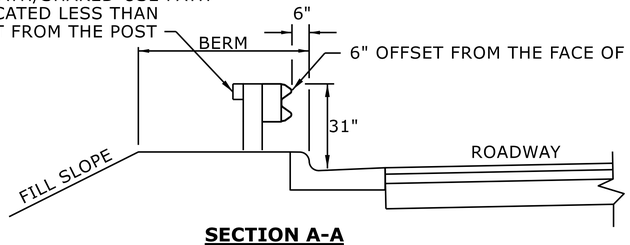
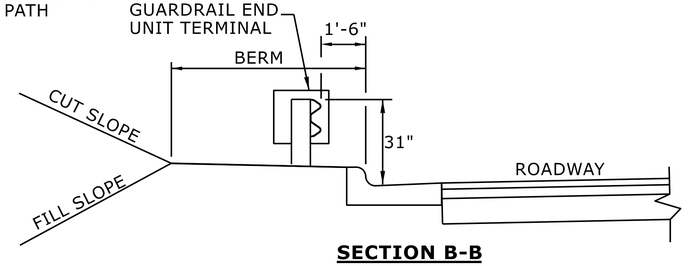
49218.26	2C-5

PLACE APPROVED BICYCLE FRIENDLY RAILINGS, FENCE, OR RUB RAILS IF SIDEPATH/SHARED-USE PATH IS LOCATED LESS THAN 4 FEET FROM THE POST

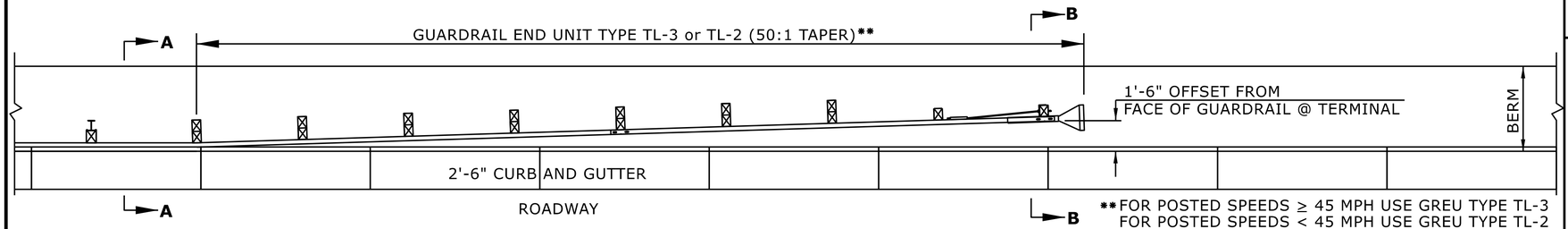
SEE THE ROADWAY DESIGN MANUAL (PART I CHAPTER 4 SECTION 4.14) FOR OFFSET DISTANCES FROM FACE OF GUARDRAIL AND BACK OF GUARDRAIL TO SIDEWALK OR SIDEPATH/SHARED-USE PATH



SECTION A-A



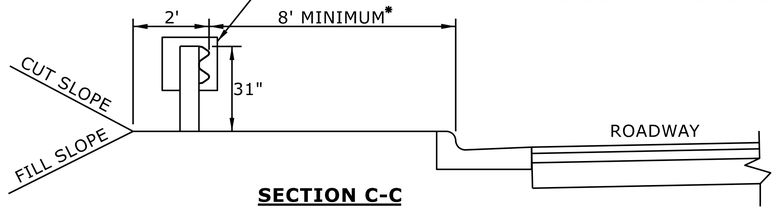
SECTION B-B



GUARDRAIL 6" FROM THE FACE OF CURB

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

BICYCLE FRIENDLY RAILINGS, FENCE OR RUB RAIL SHOULD NOT BE PLACED WITHIN THE LIMITS OF THE STRUCTURAL ANCHOR OR END UNITS



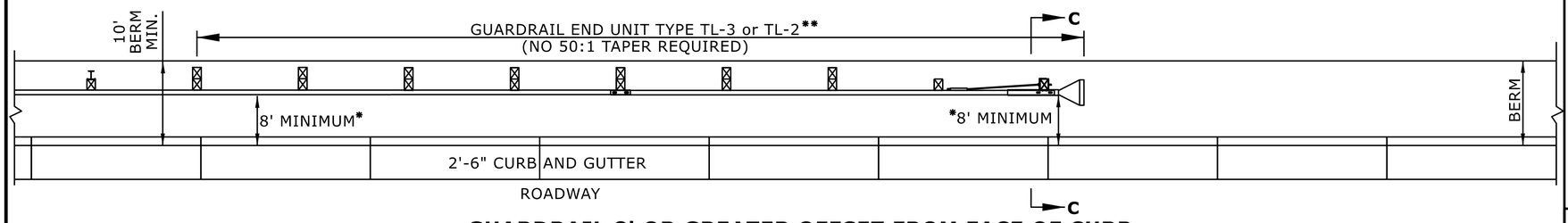
SECTION C-C

* FOR POSTED SPEED ≥ 40 MPH USE 13' MINIMUM OFFSET

SEE THE ROADWAY DESIGN MANUAL (PART I CHAPTER 4 SECTION 4.14) FOR OFFSET DISTANCES FROM FACE OF GUARDRAIL AND BACK OF GUARDRAIL TO SIDEWALK OR SIDEPATH/SHARED-USE PATH

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

BICYCLE FRIENDLY RAILINGS, FENCE OR RUB RAIL SHOULD NOT BE PLACED WITHIN THE LIMITS OF THE STRUCTURAL ANCHOR OR END UNITS



GUARDRAIL 8' OR GREATER OFFSET FROM FACE OF CURB

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ROADWAY DETAIL DRAWING FOR

GUARDRAIL PLACEMENT

GUARDRAIL TREATMENT AT CURB AND GUTTER

3/16/2026

SHEET 12 OF 15

862D01

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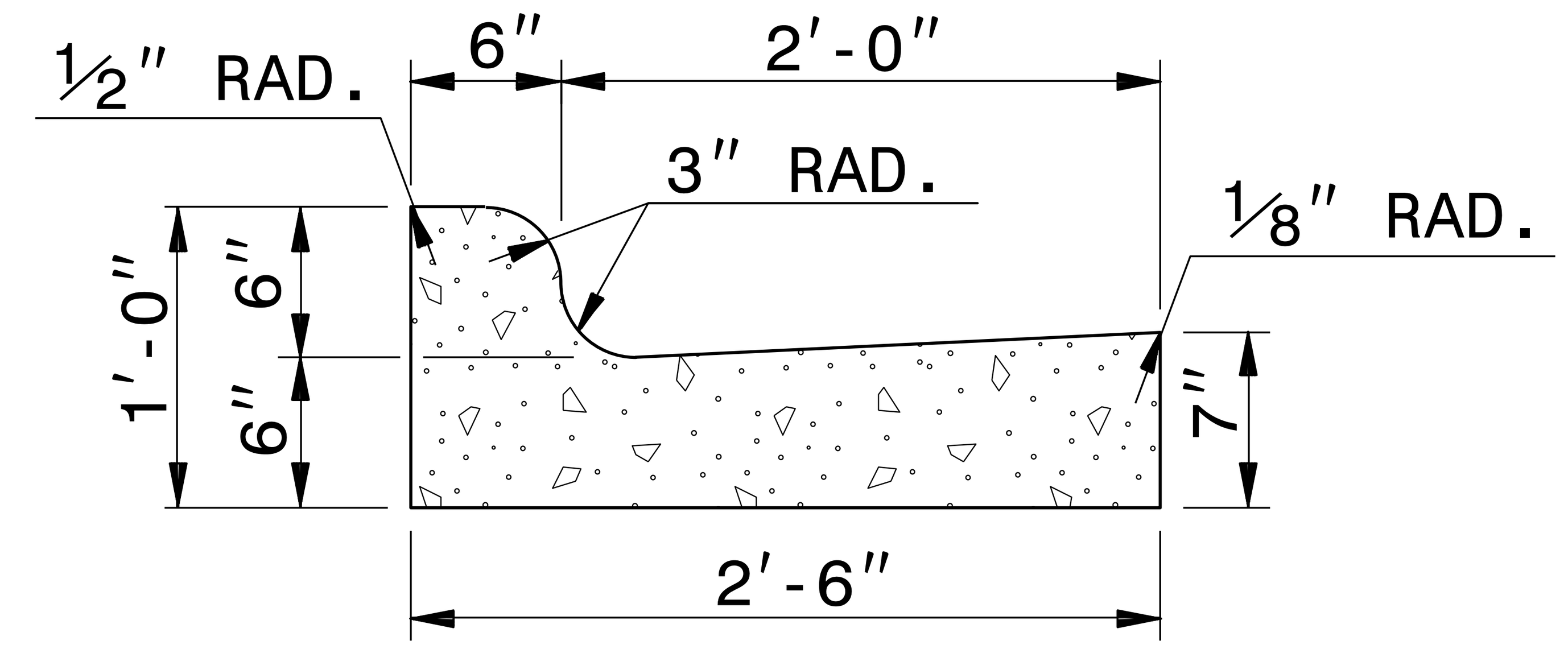
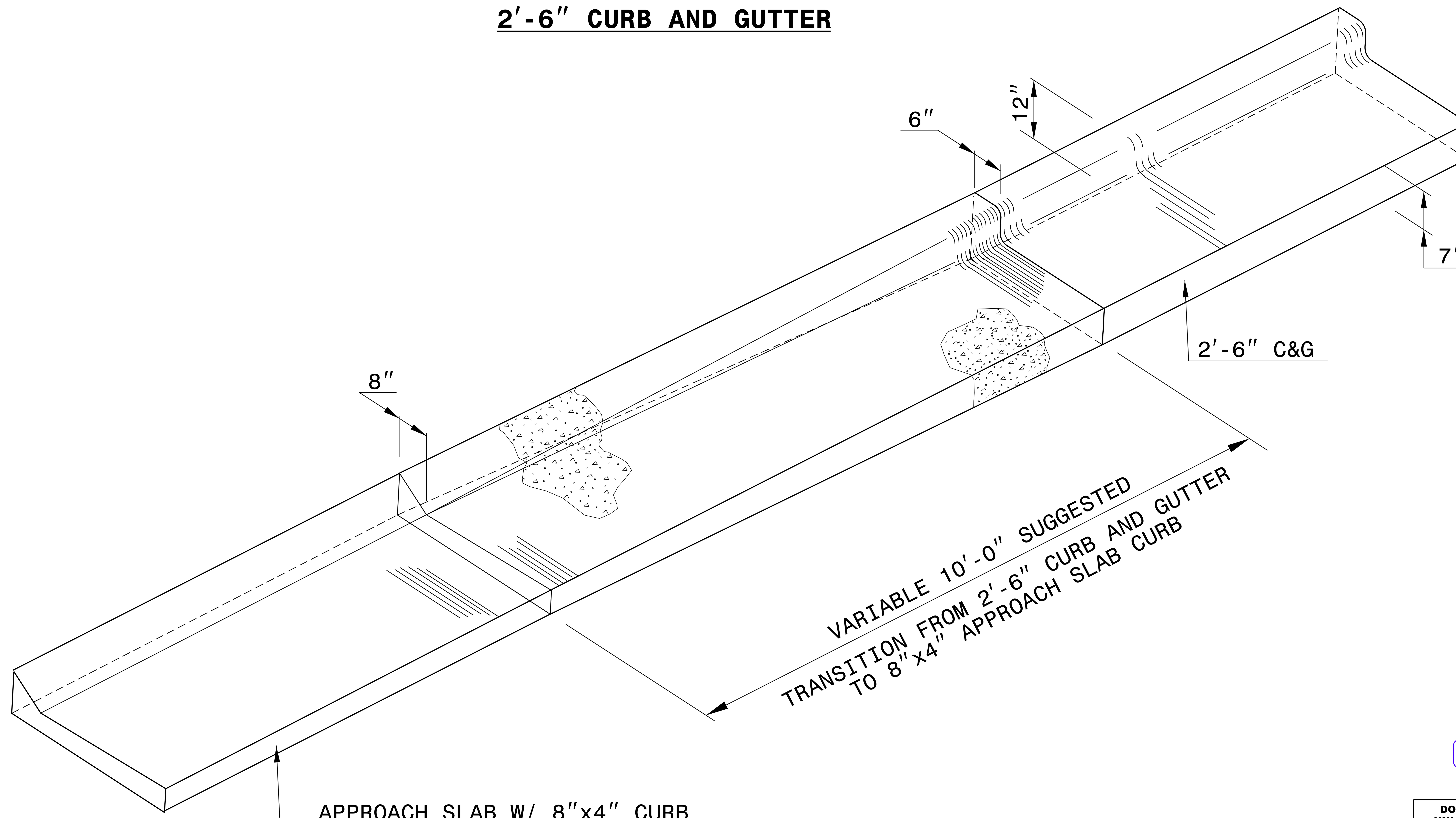
49218.26	2C-6

*NOTE: SEE STD. DWG. 846.01 FOR GENERAL NOTES



2′-6″ CURB AND GUTTER



ISOMETRIC VIEW OF TRANSITION

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 33144 NICOLE M. HACKLER

3/16/2026

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DETAIL OF 2′-6″ CURB & GUTTER TO 8″x4″ APPROACH SLAB CURB TRANSITION SECTION

ORIGINAL BY: E.E. WARD DATE: 5-29-02
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: /usr/details/stand/cgtransit.dgn

5/14/99

08-JAN-2020 09:26
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jhowerton AT CSD-320965

10-AUG-2017 10:11
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jhowerton AT CSD-292595

5/14/99

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49218.26	2C-7

STATE OF
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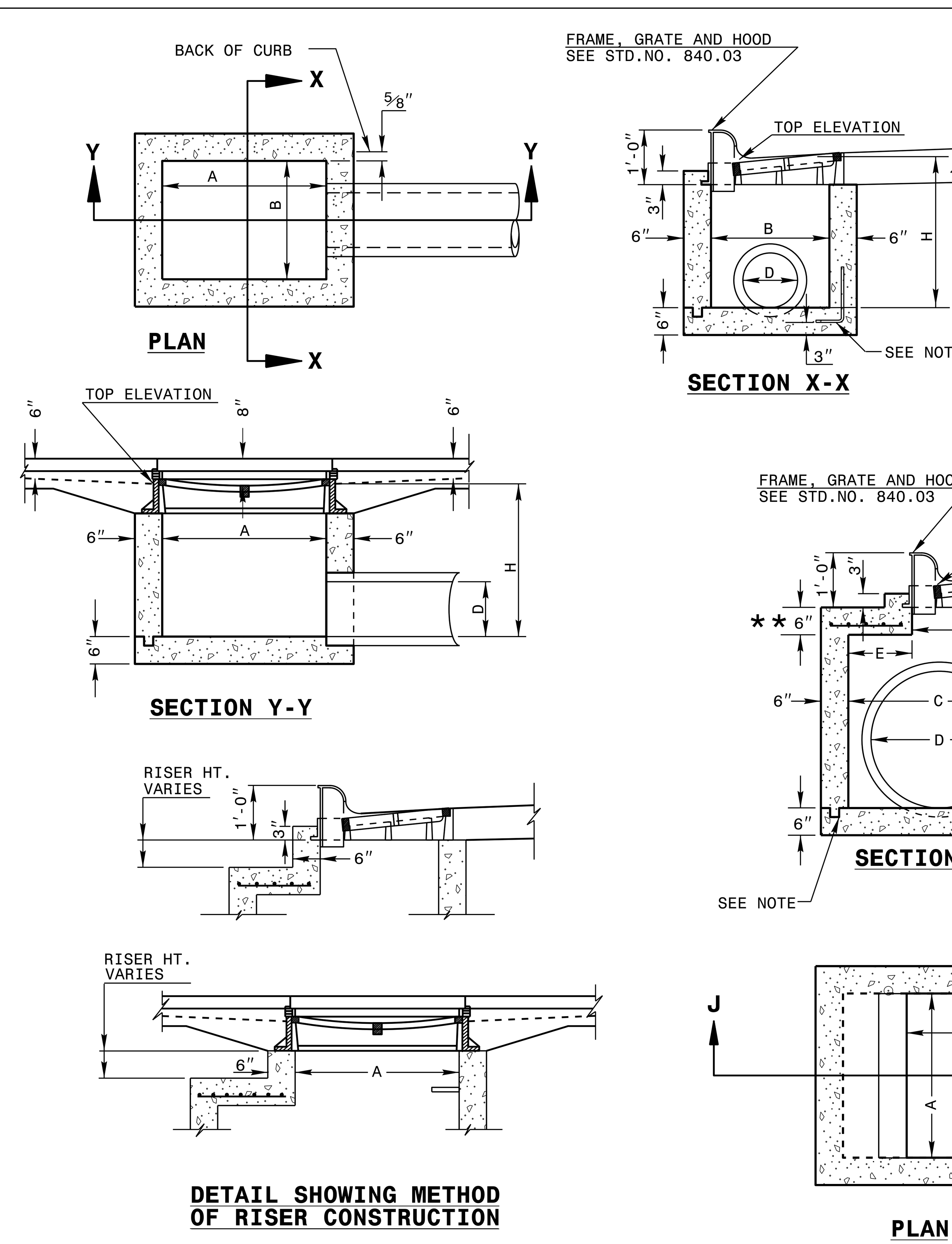
ENGLISH DETAIL DRAWING FOR
MINIMUM DEPTH
CONCRETE CATCH BASIN
12″ THRU 84″ PIPE

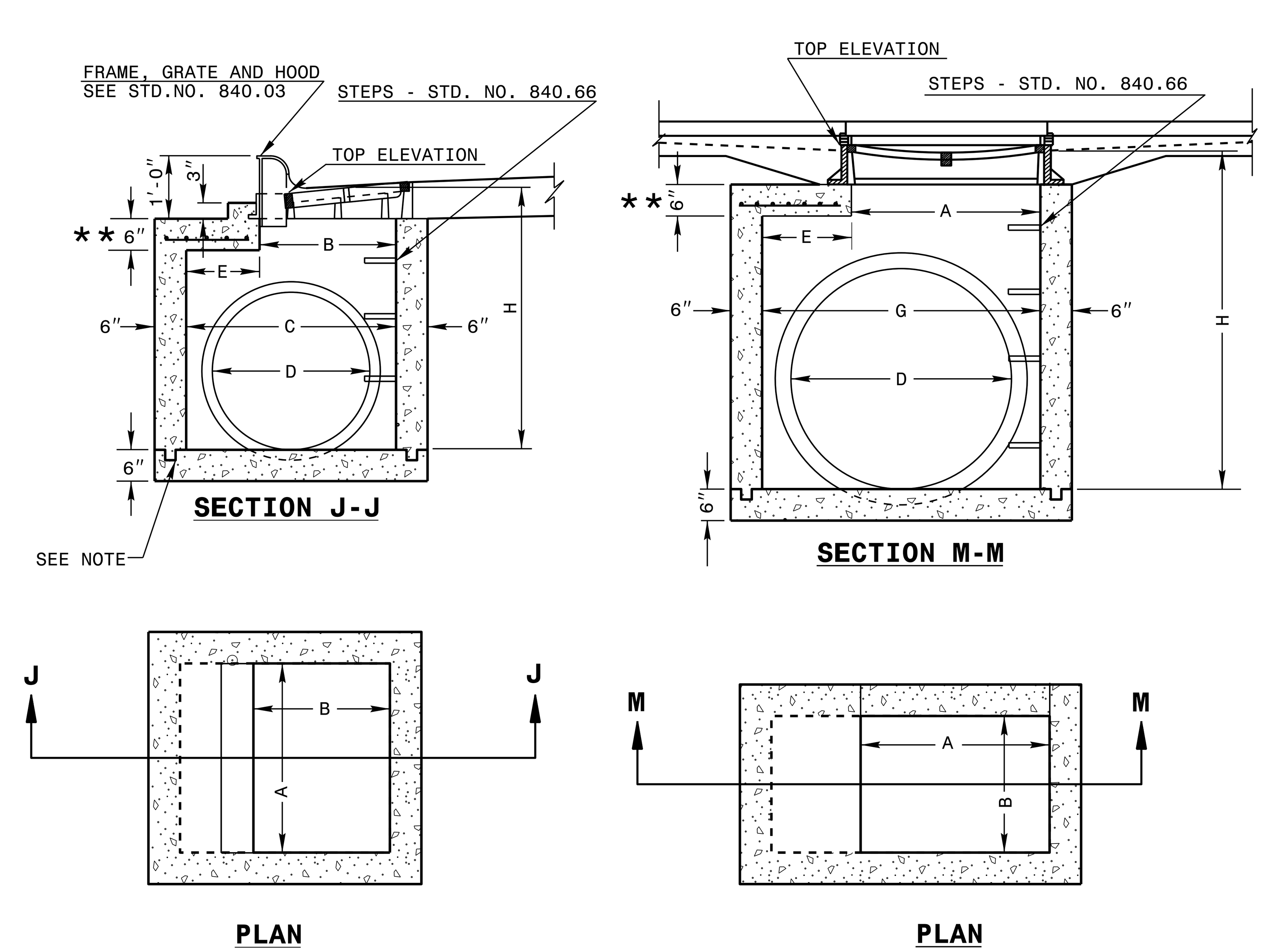
SHEET 1 OF 2
840D02

GENERAL NOTES:

- USE CLASS "B" CONCRETE THROUGHOUT.
- PROVIDE ALL CATCH BASINS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.
- OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.
- USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
- IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.
- USE TYPE "E", "F" AND "G" GRATES UNLESS OTHERWISE INDICATED.
- FOR 8'-0" IN HEIGHT OR LESS USE 6" WALLS AND BOTTOM SLAB. OVER 8'-0" TO 16'-0" IN HEIGHT USE 8" WALLS AND BOTTOM SLAB. ADJUST QUANTITIES ACCORDINGLY.
- CONSTRUCT WITH PIPE CROWNS MATCHING.
- CHAMFER ALL EXPOSED CORNERS 1".

** FOR STRUCTURES WITH PIPE LARGER THAN 54", MAKE THE TOP SLAB 8" THICK.





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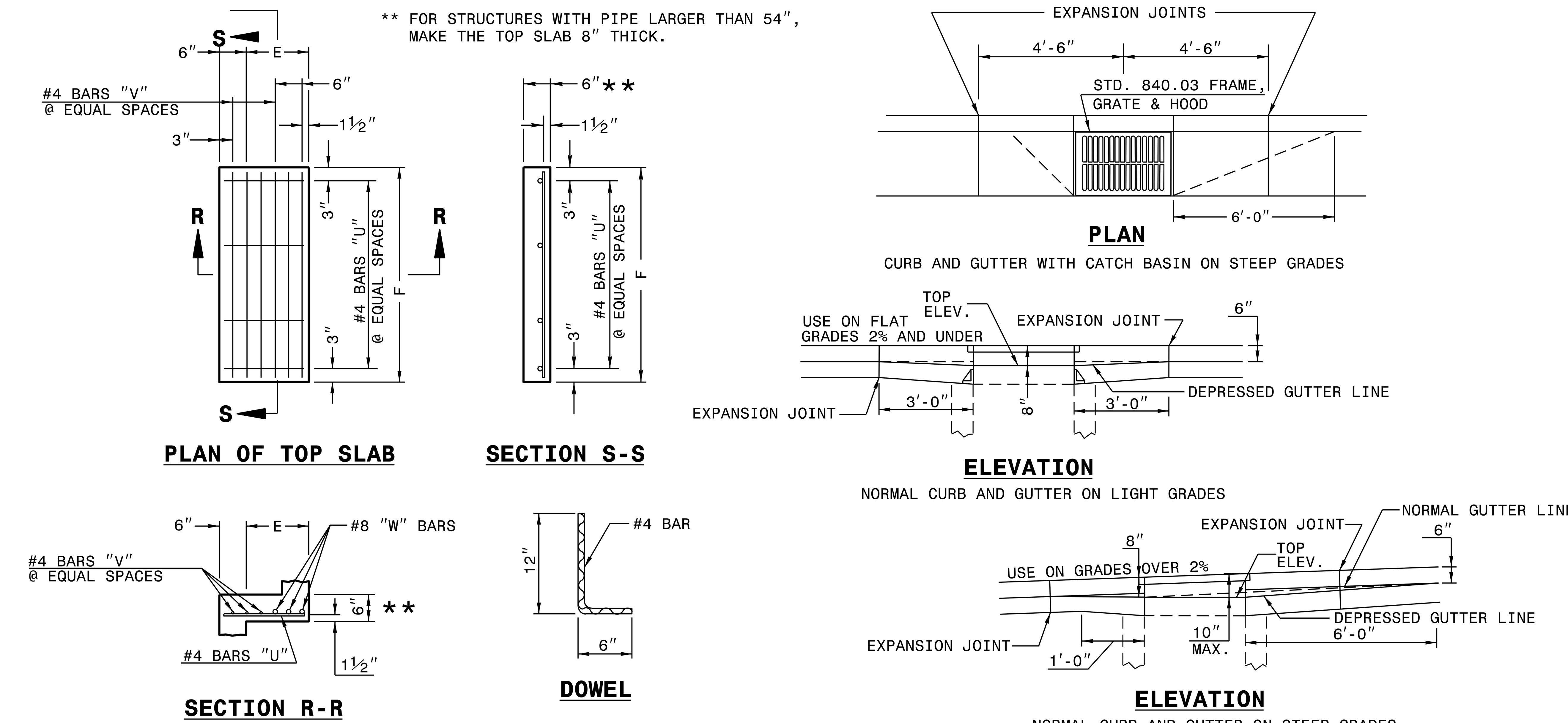
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
MINIMUM DEPTH
CONCRETE CATCH BASIN
12″ THRU 84″ PIPE

SHEET 2 OF 2
840D02

** FOR STRUCTURES WITH PIPE LARGER THAN 54", MAKE THE TOP SLAB 8" THICK.



* RISER HAS .228 CUBIC YARDS OF CONCRETE PER FOOT HEIGHT

MINIMUM DIMENSIONS AND QUANTITIES FOR CONCRETE CATCH BASIN(BASED ON MIN. HEIGHT, H, WITH NO RISER) *

DIMENSIONS OF BOX AND PIPE						COVER DIMENSION									CU.YDS. CONC. IN BOX			DEDUCTIONS ONE PIPE	
PIPE	SPAN	WIDTH	WIDTH	SPAN	MIN. HEIGHT			BARS-U		BARS-V		BARS-W		TOTAL LBS.	TOP SLAB	BOTTOM SLAB	TOT. CONC. FOR MINIMUM HEIGHT, H		
D	A	B	C	G	H	E	F	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH					C.M.	R.C.
12″	3′-0″	2′-2″	--	--	2′-0″	--	--	--	--	--	--	--	--	--	--	0.235	0.772	0.015	0.026
15″	3′-0″	2′-2″			2′-3″											0.235	0.829	0.023	0.036
18″	3′-0″	2′-2″			2′-6″											0.235	0.887	0.033	0.049
24″	3′-0″	2′-2″			3′-1″											0.235	1.001	0.059	0.085
30″	3′-0″	2′-2″	3′-4″	3′-4″	3′-10″	1′-2″	4′-4″	4	1′-5″	2	4′-1″	3	4′-1″	39	0.123	0.347	1.433	0.092	0.127
36″	3′-0″	2′-2″	3′-10″	3′-10″	4′-6″	1′-8″	4′-10″	4	1′-11″	3	4′-7″	3	4′-7″	43	0.161	0.432	1.714	0.132	0.178
42″	3′-0″	2′-2″	4′-5″	4′-5″	4′-11″	2′-2″	5′-5″	5	2′-5″	4	5′-2″	3	5′-2″	47	0.200	0.543	1.738	0.180	0.243
48″	3′-0″	2′-2″	5′-0″	5′-0″	5′-6″	2′-10″	6′-0″	5	3′-1″	4	5′-9″	3	5′-9″	51	0.235	0.667	2.052	0.235	0.317
54″	3′-0″	2′-2″	5′-7″	5′-7″	6′-0″	3′-5″	6′-7″	6	3′-8″	5	6′-4″	3	6′-4″	56	0.289	0.802	2.387	0.297	0.401
60″	3′-0″	2′-2″	6′-3″	6′-3″	6′-6″	4′-1″	7′-3″	6	4′-4″	5	7′-0″	3	7′-0″	61	0.340	0.973	2.722	0.363	0.546
66″	3′-0″	2′-2″	6′-11″	6′-11″	7′-0″	4′-9″	7′-11″	7	5′-0″	6	7′-8″	3	7′-8″	66	0.391	1.160	3.057	0.440	0.655
72″	3′-0″	2′-2″	7′-6″	7′-6″	7′-6″	5′-3″	8′-6″	7	5′-6″	6	8′-3″	3	8′-3″	72	0.442	1.340	3.392	0.524	0.774
78″	3′-0″	2′-2″	8′-1″	8′-1″	8′-0″	5′-11″	9′-1″	8	6′-2″	7	8′-10″	3	8′-10″	78	0.493	1.530	3.727	0.615	0.893
84″	3′-0″	2′-2″	8′-9″	8′-9″	8′-6″	6′-7″	9′-9″	8	6′-10″	7	9′-6″	3	9′-6″	84	0.544	1.760	4.062	0.713	1.010

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 33144

3/16/2026

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SEE PLATE FOR TITLE

ORIGINAL BY: 2002 Std.840.01 DATE:
MODIFIED BY: E.E. WARD DATE: 3-1-02
CHECKED BY: DATE:
FILE SPEC.: s:Special Details/jhowerton/840d02.dgn

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

SUMMARY OF EARTHWORK IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT %	BORROW	WASTE
–L– STA 13+50.00 TO 18+48.89 (BEGIN BRIDGE)	269	0	3021	2752	—
–L– STA 20+51.65 (END BRIDGE) TO 22+50	78	0	1495	1417	—
–EY– STA 13+50.00 TO 15+50.00	882	0	0	0	882
SUBTOTAL	1229	0	4516	4169	882
MATERIAL FOR SHOULDER CONSTRUCTION	—		0	0	
WASTE IN LIEU OF BORROW				–882	
PROJECT TOTAL	1229		4516	3287	—
EST. 5% TO REPL. TOP SOIL ON BORROW PIT				164	
GRAND TOTAL	1229	0	4516	3451	—
SAY	1229			3451	

Earthwork quantities are calculated by the Roadway Designer. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineer.

PAVEMENT REMOVAL SUMMARY

LINE	BEG. STA.	END STA.	LOCATION (LT/RT)	ASPHALT REMOVAL	
–L–	13+99	18+02	LT & RT	2970	
–L–	20+86	22+50	LT & RT	1082	
			TOTAL	4052 SY	
			SAY	4060 SY	

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.T.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	TYPE III	B–77	GREU TL–2	GREU TL–3	CAT–1	AT–1	B–83	B–77 SC	TES	EA	G	NG				
–L–	16+78.82	18+51.69	RT	172.875					2.0		25		0.5			1	1													
–L–	20+73.01	22+41.76	LT	168.75					2.0		25		0.5		1		1													
–L–	16+27.02	18+28.28	RT																								202		
–L–	20+63.82	23+92.76	RT																								378		
–L–	20+59.43	23+48.72	LT																								203		
			TOTAL	341.625											1	1	2										783		
		ANCHOR DEDUCTIONS																											
		TYPE III	@18.75′	18.75																									
		GREU TL–2	@25.00′	50.00																									
		B–77	@22.875′	22.875																									
			TOTAL	250																									
			SAY	250																									
		ADDITIONAL POSTS		5																									

"N" = DISTANCE FROM EDGE OF TRAVEL TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON–GATING IMPACT ATTENUATOR TYPE 350

5VLV44

COMPUTED BY: JSK **DATE:** 07/16/2025

CHECKED BY: WTS **DATE:** 07/17/2025

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO. 49218.26 **SHEET NO.** 3D-1

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

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

LINE & STATION	OFFSET	STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Drainage Pipe (RCP, CSP, CAAP, HDPE, PVC, or PP PIPE)													R. C. PIPE CLASS III							R. C. PIPE CLASS IV					R. C. PIPE CLASS V	
SIZE THICKNESS OR GAUGE		FROM	TO	FT.	FT.	FT.	%	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	DO NOT USE PP PIPE	15	18	24	30	36	42	48		15	18	24	30		42
L 18+00	32 RT	0401		271.5																														
		0401	0402		268.6	268.5																							20					
L 17+77	32 RT	0402		271.9																														
		0402	0404		268.5	267.7																												
L 18+00	32 LT	0403		271.5																														
		0403	0404		267.9	267.6																							20					
L 17+77	32 LT	0404		271.9																														
		0404	0405		267.6																													
SHEET TOTALS																													40					

FROM	TO	42" WELDED STEEL PIPE 0.5" THICK, GRADE B	48" WELDED STEEL PIPE 0.5" THICK, GRADE B IN SOIL	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	DRAINAGE STRUCTURE	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03		
				CY	CY	MASONRY CY	0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.		GRATE TYPE E	F	G
0401							1			1		1	
0401	0402												
0402							1			1		1	
0402	0404												
0403							1			1			1
0403	0404												
0404							1			1			1
0404	0405												
SHEET TOTALS							4			4		2	2

FROM	TO	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32
0401																					
0401	0402																				
0402																					
0402	0404																				
0403																					
0403	0404																				
0404																					
0404	0405																				
SHEET TOTALS																					

FROM	TO	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	ADJUST D.I.	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	42" DRAINAGE PIPE ELBOW	48" DRAINAGE PIPE ELBOW	BERM DITCH OUTLET STD. 850.10 (PER EACH)	BERM DITCH OUTLET STD. 850.11 (PER EACH)	ENERGY DISSIPATION BASIN	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
0401																							MINIMUM DEPTH BOX
0401	0402																						
0402																							REMOVE EXISTING CB
0402	0404																						EXISTING RCP
0403																							
0403	0404																						
0404																							REMOVE EXISTING CB
0404	0405																						EXISTING CMP
SHEET TOTALS																							

ABBREVIATIONS

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

COMPUTED BY: S. Johnson DATE: 7/10/2025
CHECKED BY: M. Valiquette DATE: 7/10/2025

(9-17-24)

PROJECT NO.	SHEET NO.
49218.26	3G-1

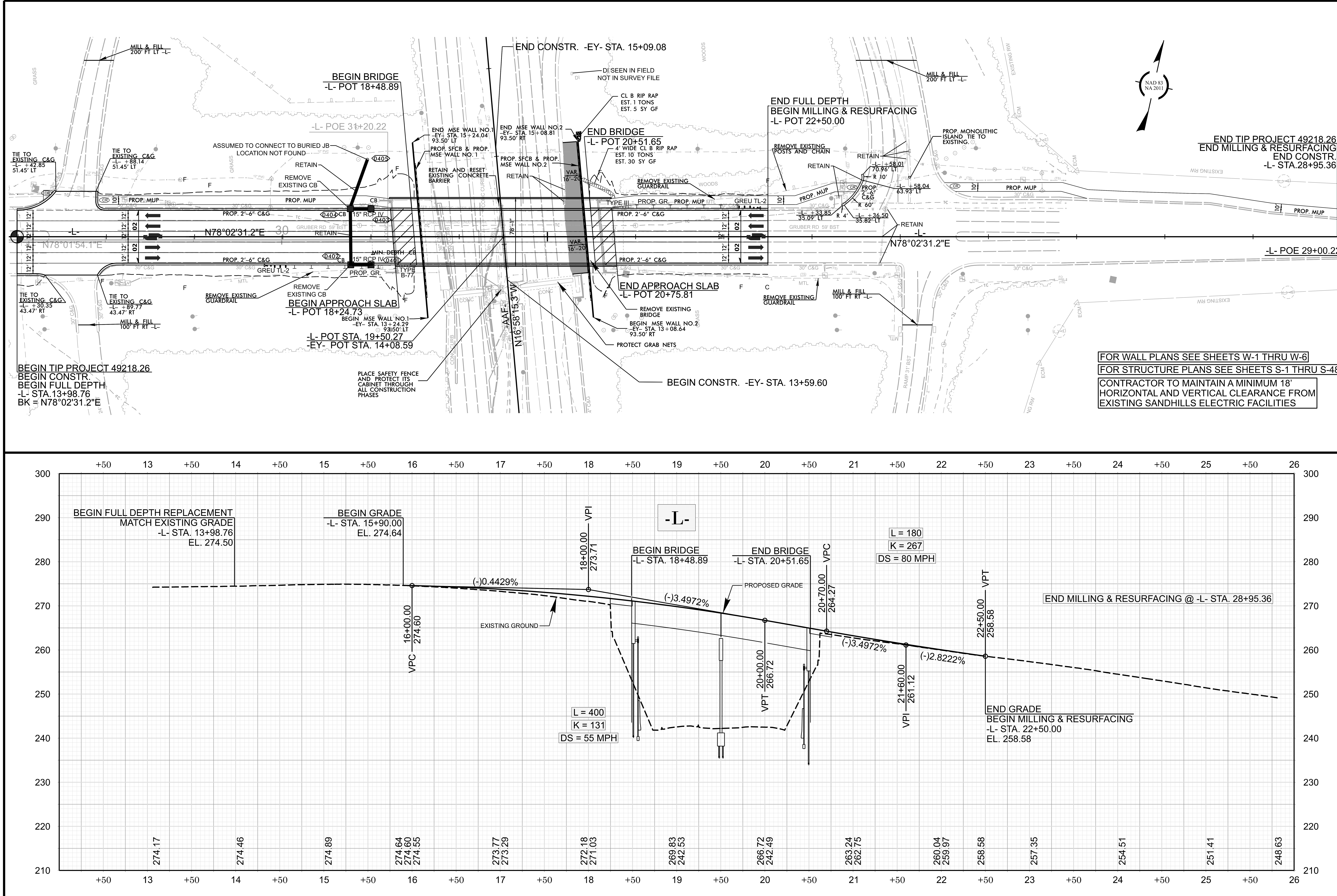
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				SD	500
				TOTAL LF:	500

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

11/14/23



49218.26

SHEET NO. 004

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
CUMBERLAND COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER

SEAL 059828

3/26/2026

HYDRAULICS ENGINEER

SEAL 056368

3/26/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PREPARED BY

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REVISIONS

ICE/kyle.hagan - 3/26/2026