TIP PROJECT: B-5716

CONTRACT: C204829

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5716	1	

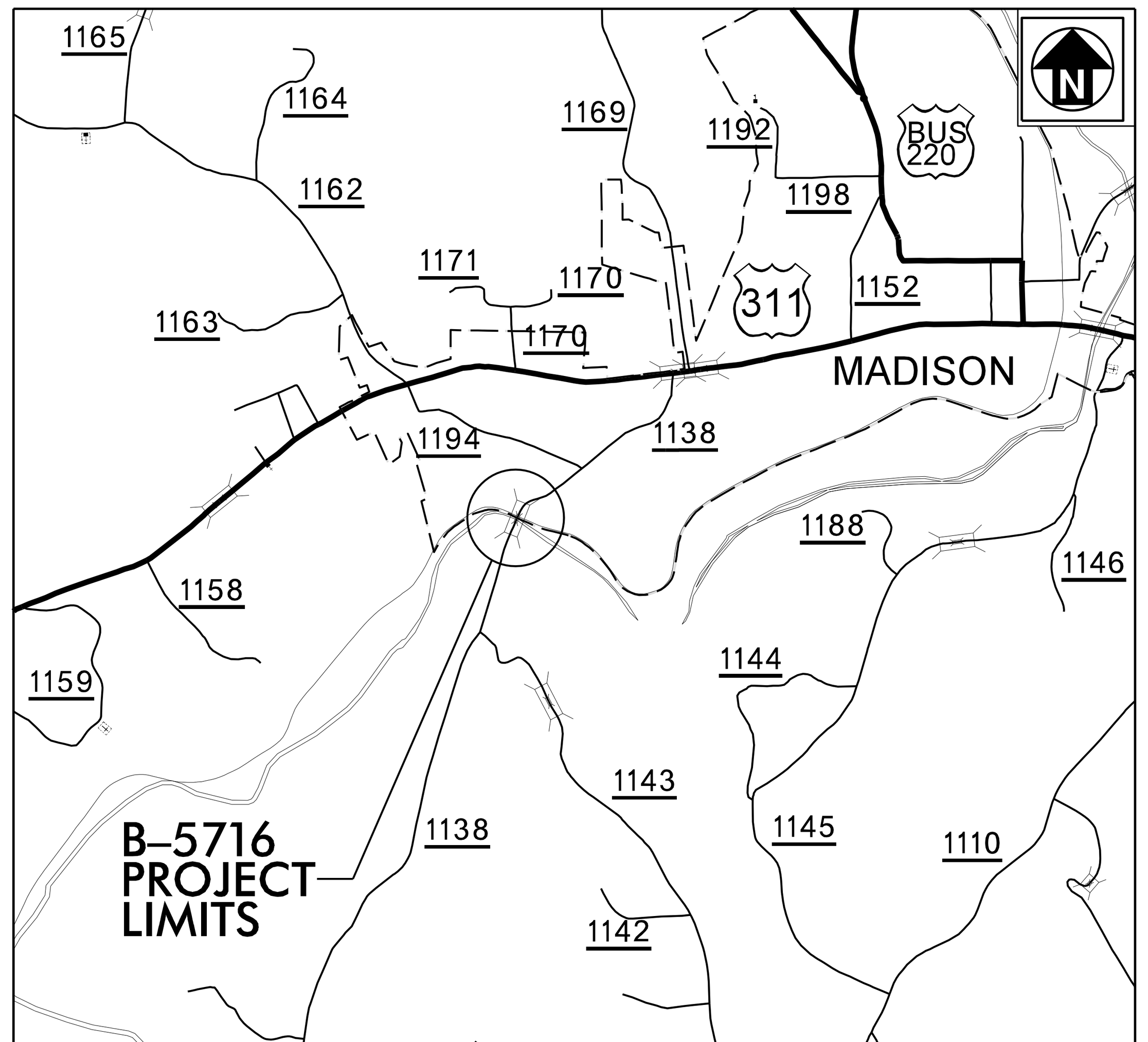
STATE PROJECT NO.	F. A. PROJ. NO.	DESCRIPTION
45672.1.1	BRZ-1138(021)	PE
45672.2.1	BRZ-1138(021)	RW/UTL
45672.3.1	BRZ-1138(021)	CONST.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

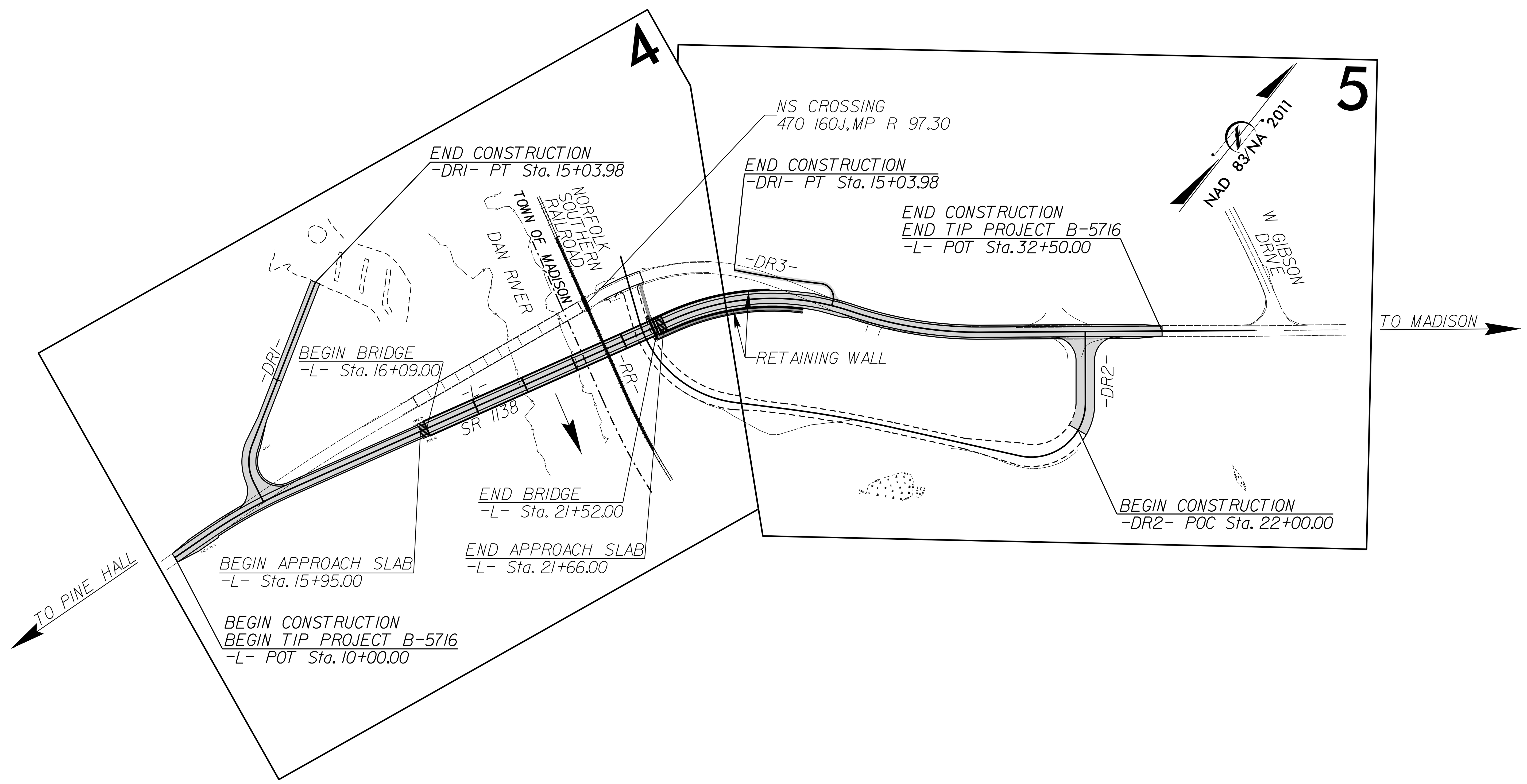
ROCKINGHAM COUNTY

LOCATION: BRIDGE NO. 140 OVER DAN RIVER ON SR 1138 (LINDSEY BRIDGE ROAD)

TYPE OF WORK: DRAINAGE, GRADING, PAVING AND STRUCTURES



VICINITY MAP
(NOT TO SCALE)



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GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2025 = 1120
ADT 2040 = 1700
D = 50%
T = 6%*
V = 40 MPH
*TTST = 3% DUAL = 3%
MINOR COLLECTOR
SUB REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT	=	0.323 MILES
LENGTH STRUCTURE TIP PROJECT	=	0.103 MILES
TOTAL LENGTH TIP PROJECT	=	0.426 MILES

Prepared In the Office of Mott MacDonald for

DIVISION 7

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: OCTOBER 18, 2022 — TIM JORDAN, PE, PROJECT ENGINEER

LETTING DATE: AUGUST 19, 2025 — TRENTON J. CORMIER, PE, HYDRAULICS ENGINEER

NCDOT CONTACT: DANIEL DAGENHART, DIVISION BRIDGE PROGRAM MANAGER

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21102 JAMES TIMOTHY JORDAN
Signed by: James T. Jordan
09-Jun-2025
P.E.
SIGNATURE:

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 34364 TRENTON J. CORMIER
Signed by: Trenton Cormier
09-Jun-2025
P.E.
SIGNATURE:

PLANS PREPARED BY:

M M MOTT MACDONALD
930 Main Campus Drive, Suite 200
Raleigh, NC 27606
(919) 552-2253
www.mottmac.com

LICENSE NO. F-0669

6/4/2025
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iso-hooker

GENERAL NOTES

GENERAL NOTES: 2024 SPECIFICATIONS
EFFECTIVE: 01–16–2024

GRADING AND SURFACING:

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

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01.

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

SUBSURFACE DRAINS:

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

STREET TURNOUT:

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

GUARDRAIL:

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

TEMPORARY SHORING:

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

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE DUKE ENERGY, BRIGHTSPEED, SPECTRUM AND THE TOWN OF MADISON WATER & SEWER.

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

RIGHT–OF–WAY MARKERS:

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

CURB RAMPS:

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

LIST OF ROADWAY STANDARD DRAWINGS

2024 ROADWAY ENGLISH STANDARD DRAWINGS — EFF. 01–16–2024

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch – 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
DIVISION 2 – EARTHWORK	
200.02	Method of Clearing – Method II
225.02	Guide for Grading Subgrade – Secondary and Local
225.04	Method of Obtaining Superelevation – Two Lane Pavement
275.01	Rock Plating
DIVISION 3 – PIPE CULVERTS	
310.10	Driveway Pipe Construction
DIVISION 4 – MAJOR STRUCTURES	
423.01	Bridge Approach Fills – Type I Approach Fill for Bridge Abutment
423.02	Bridge Approach Fills – Type 1A Alternate Approach Fill for Intergral Bridge Abutment
423.03	Bridge Approach Fills – Type 2A Approach Fill for Bridge Abutment with MSE Wall
423.04	Bridge Approach Fills – Type 2A Alternate Approach Fill for Intergral Bridge Abutment with MSE Wall
DIVISION 5 – SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction – High Side of Superelevated Curve – Method I
DIVISION 6 – ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 – INCIDENTALS	
815.02	Subsurface Drain
838.01	Concrete Endwall for Single and Double Pipe Culverts – 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts – 15" thru 48" Pipe 90 Skew
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
840.25	Anchorage for Frames – Brick or Concrete or Precast
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet – for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
848.04	Street Turnout
848.06	Curb Ramp
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
866.01	Chain Link Fence – 4', 5', and 6' High Fence
866.02	Woven Wire Fence – with Wood Post
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

PROJECT REFERENCE	SHEET NO.
B–5716	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER JAMES TIMOTHY JORDAN

Signed by: James T. Jordan
DBD87EDB56F64FA...
09–Jun–2025

MOTT MACDONALD I & E, LLC
LICENSE NO. F–0669

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MOTT MACDONALD
930 Main Campus Drive, Suite 200
Raleigh, NC 27606
www.mottmac.com

INDEX OF SHEETS

9/10/2021

PROJECT REFERENCE	SHEET NO.
B-5716	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

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

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

PROJECT REFERENCE	SHEET NO.
B-5716	2A-1

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21102 — 09-Jun-2025
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 048019 — 10-Jun-2025
MOTT MACDONALD I & E, LLC LICENSE NO. F-0669

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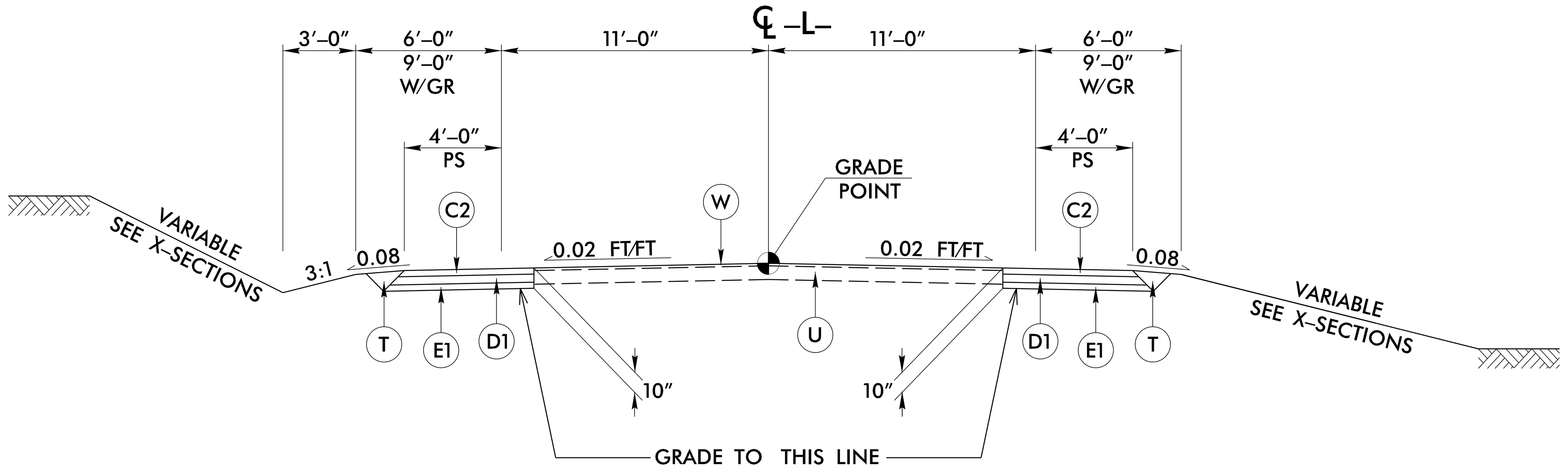
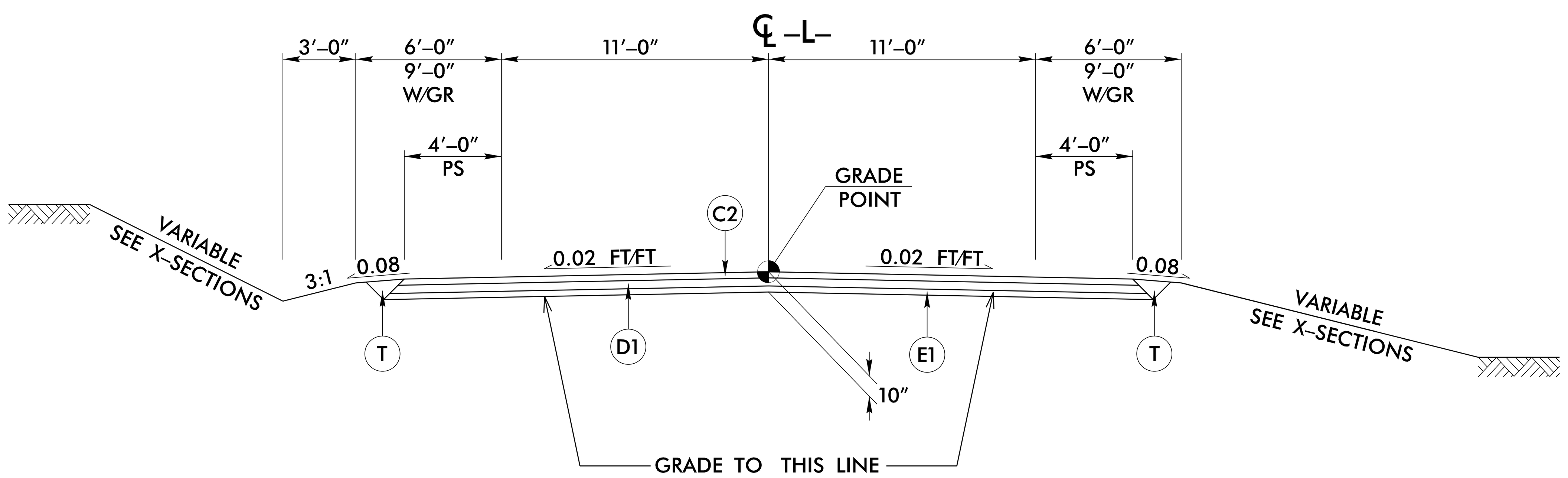


TYPICAL SECTION NO. 1

TRANSITION FROM EXISTING TO TYPICAL SECTION NO. 1:
-L- STA 10+00.00 TO 10+50.00

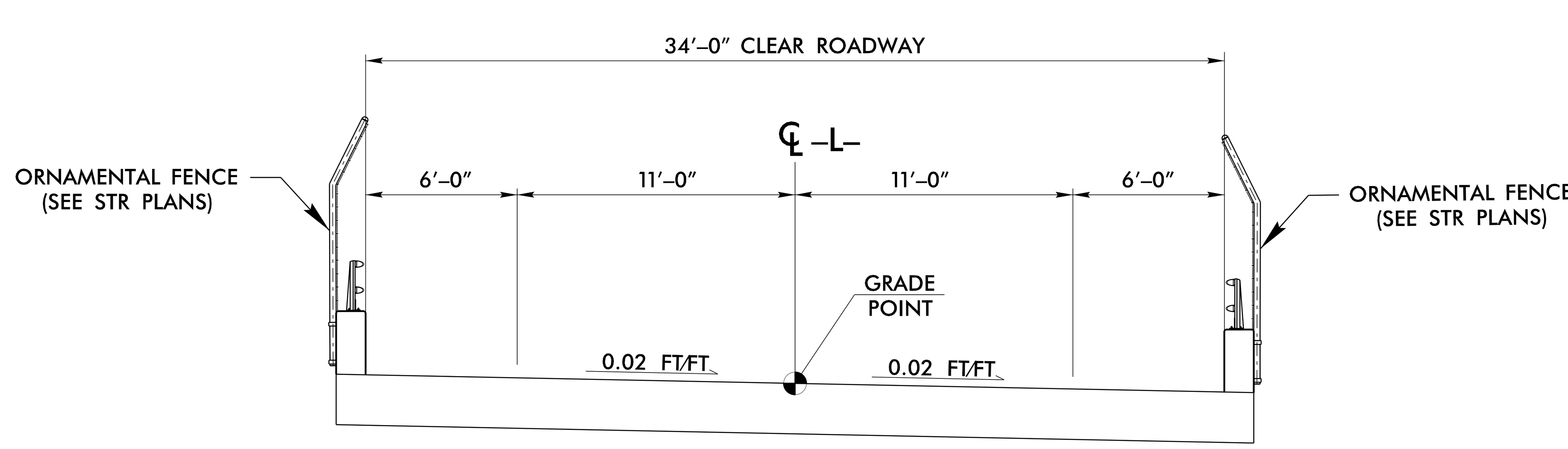
USE TYPICAL SECTION NO. 1:
-L- STA 10+50.00 TO 12+25.00
-L- STA 25+80.00 TO 32+00.00

TRANSITION FROM TYPICAL SECTION NO. 1 TO EXISTING:
-L- STA 32+00.00 TO 32+50.00



TYPICAL SECTION NO. 2

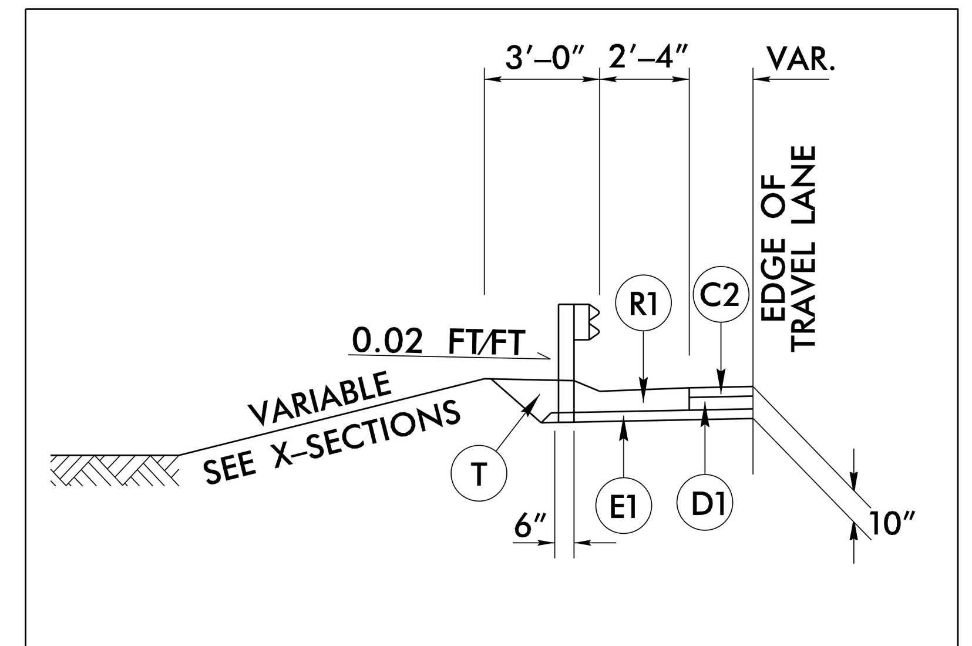
USE TYPICAL SECTION NO. 2:
-L- STA 12+25.00 TO 16+09.00 (BEGIN BRIDGE)
-L- STA 21+52.00 (END BRIDGE) TO 25+80.00



TYPICAL SECTION NO. 3

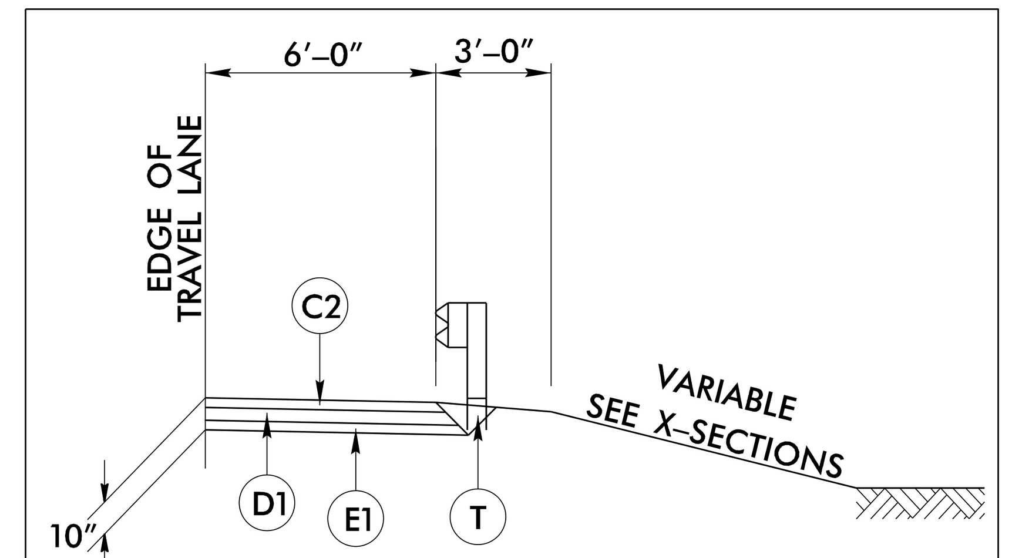
USE TYPICAL SECTION NO. 3:
-L- STA 16+09.00 (BEGIN BRIDGE) TO 21+52.00 (END BRIDGE)

NOTE: SEE STRUCTURE PLANS FOR STRUCTURE CONSTRUCTION DETAILS

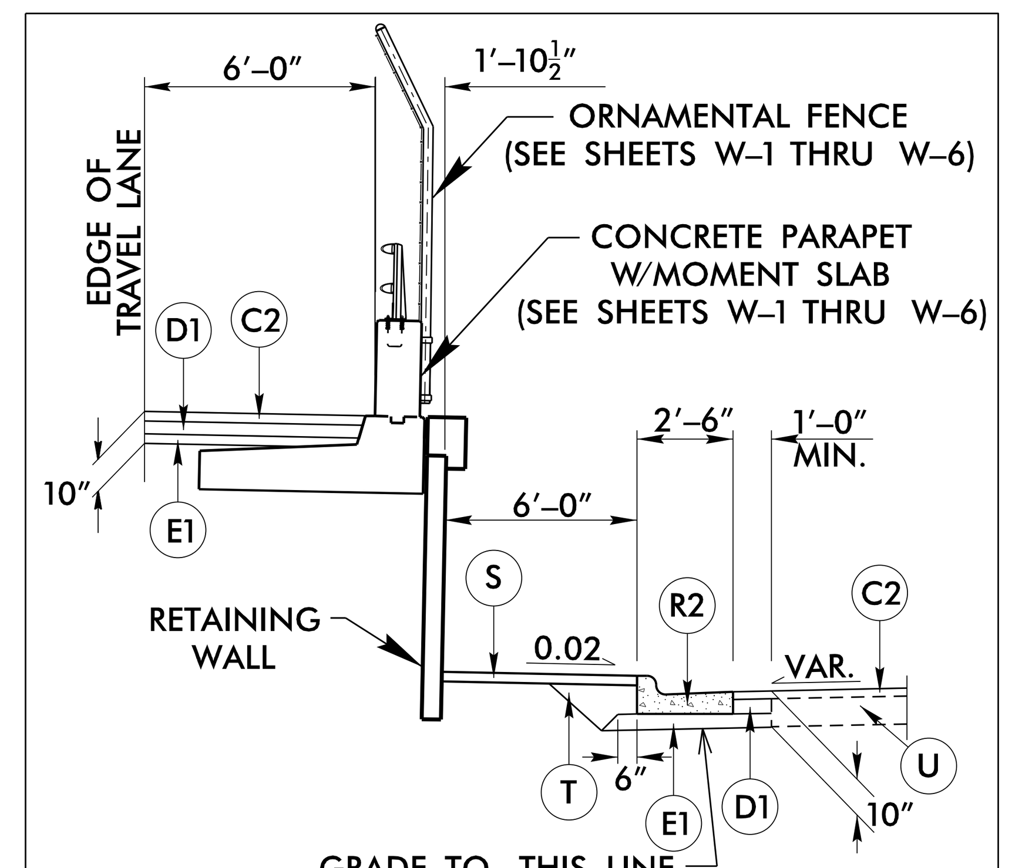


DETAIL FOR SHOULDER BERM GUTTER IN CONJUNCTION WITH GUARDRAIL

-L- STA 11+03.00 TO 15+94.00 RT
-DR1- STA 11+29.26 RT TO -L- STA 15+94.00 LT



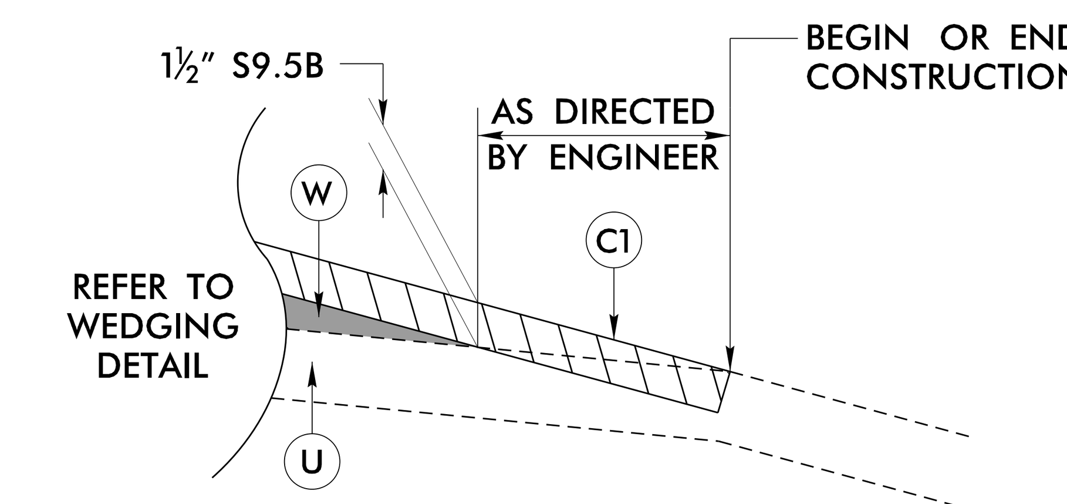
DETAIL FOR FULL DEPTH PAVED SHOULDER IN CONJUNCTION WITH GUARDRAIL



DETAIL FOR FULL DEPTH PAVED SHOULDER IN CONJUNCTION WITH WALL

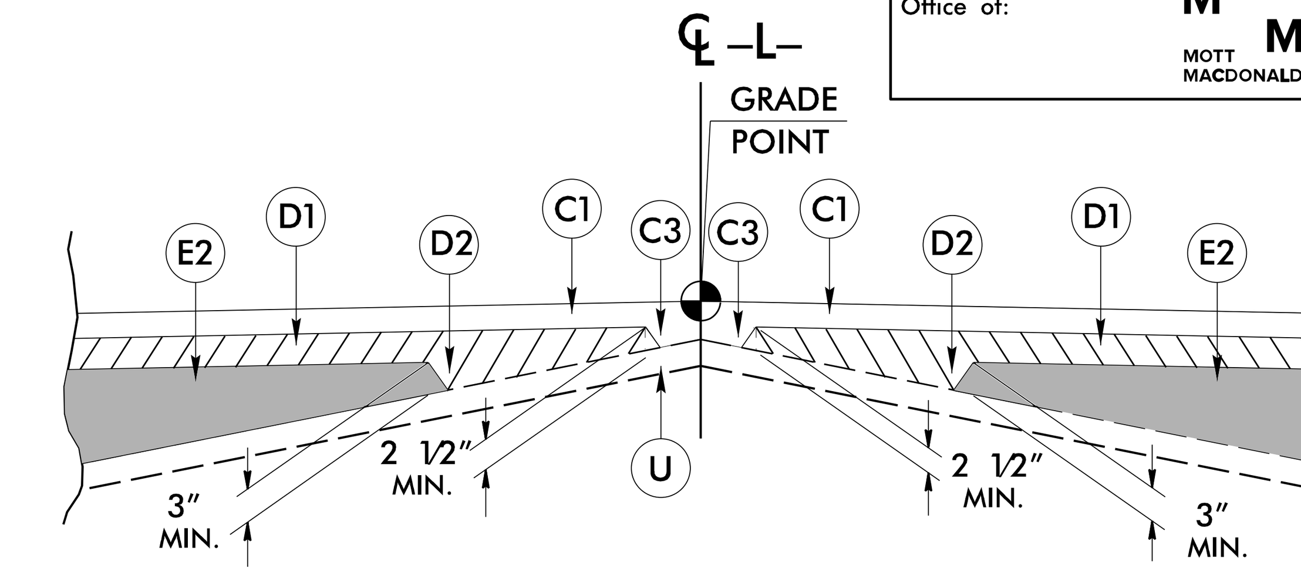
-L- STA 21+47.25 TO 24+74.79 RT
-L- STA 21+47.25 TO 24+00.00 LT

NOTE: SIDEWALK AND CURB ONLY LOCATED ON RT SIDE



MILLING DETAIL

DETAIL SHOWING PROFILE VIEW



Detail Showing Method of Wedging

FINAL PAVEMENT SCHEDULE (PAVEMENT DESIGN DATED: 11/21/2024)	
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" IN DEPTH OR GREATER THAN 1½" IN DEPTH
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH
E1	PROP. APPROX. 3" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 4" IN DEPTH OR GREATER THAN 5½" IN DEPTH
J	6" PROP. AGGREGATE BASE COURSE
R1	SHOULDER BERM GUTTER
R2	2'-6" CURB & GUTTER
S	CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING (SEE DETAIL SHOWING METHOD OF WEDGING)

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

PROJECT REFERENCE	SHEET NO.
B-5716	2A-2

ROADWAY DESIGN ENGINEER

SEAL 21102 — 09-Jun-2025

SEAL 048019 — 10-Jun-2025

MOTT MACDONALD I& E, LLC LICENSE NO. F-0669

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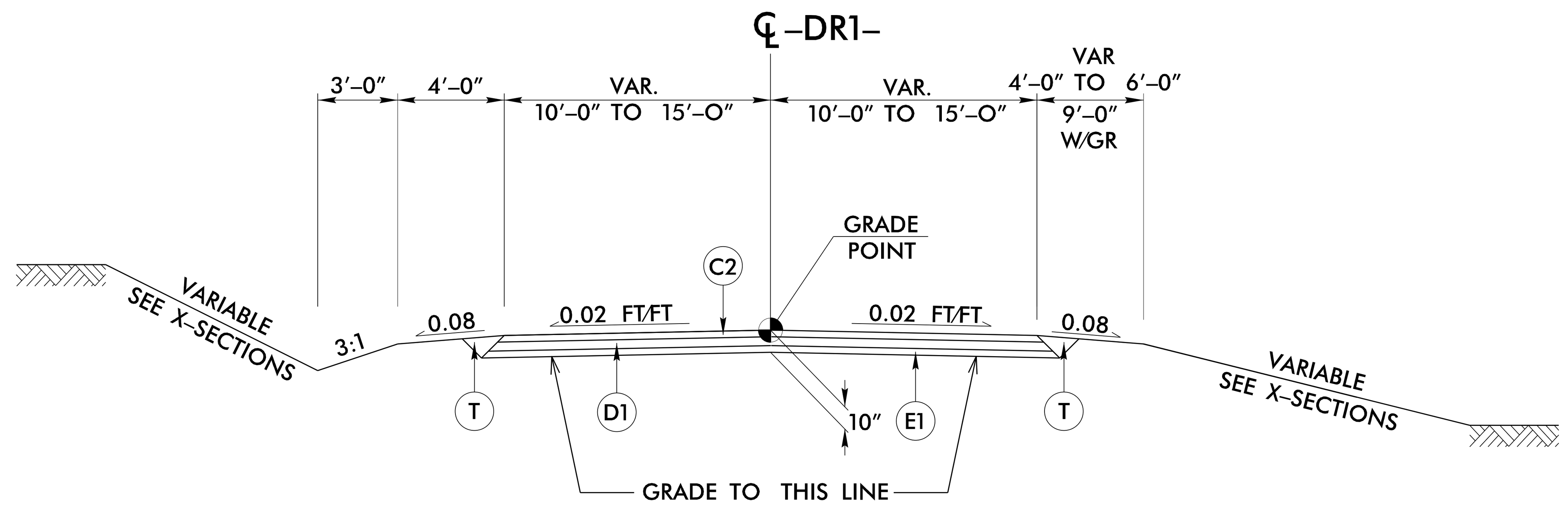
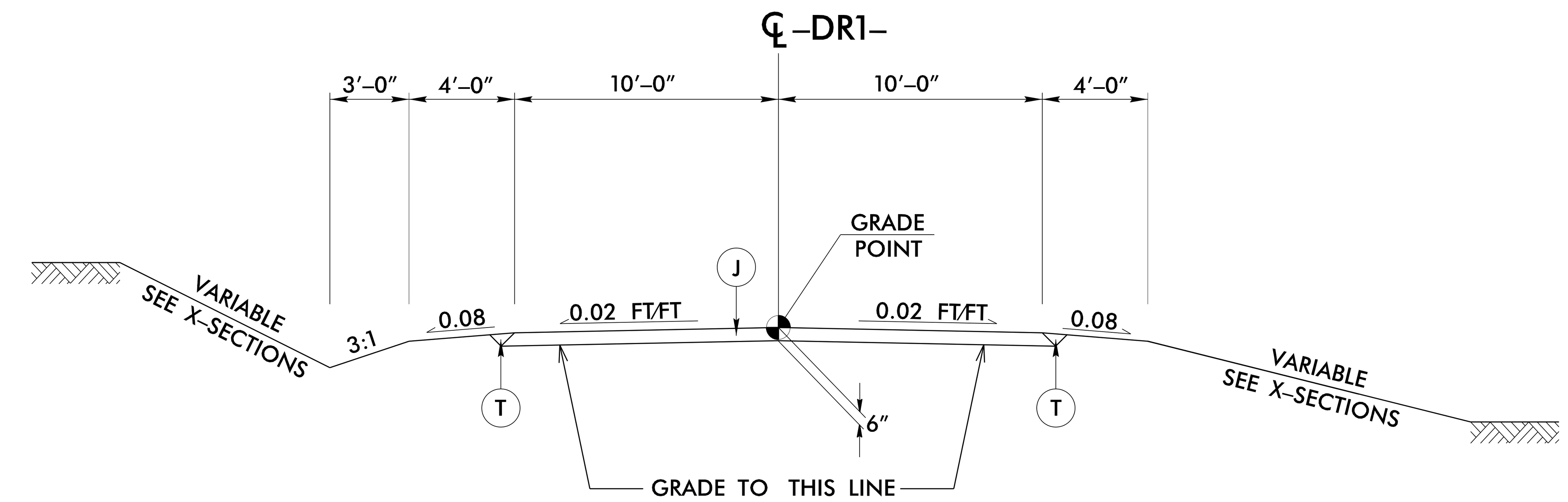


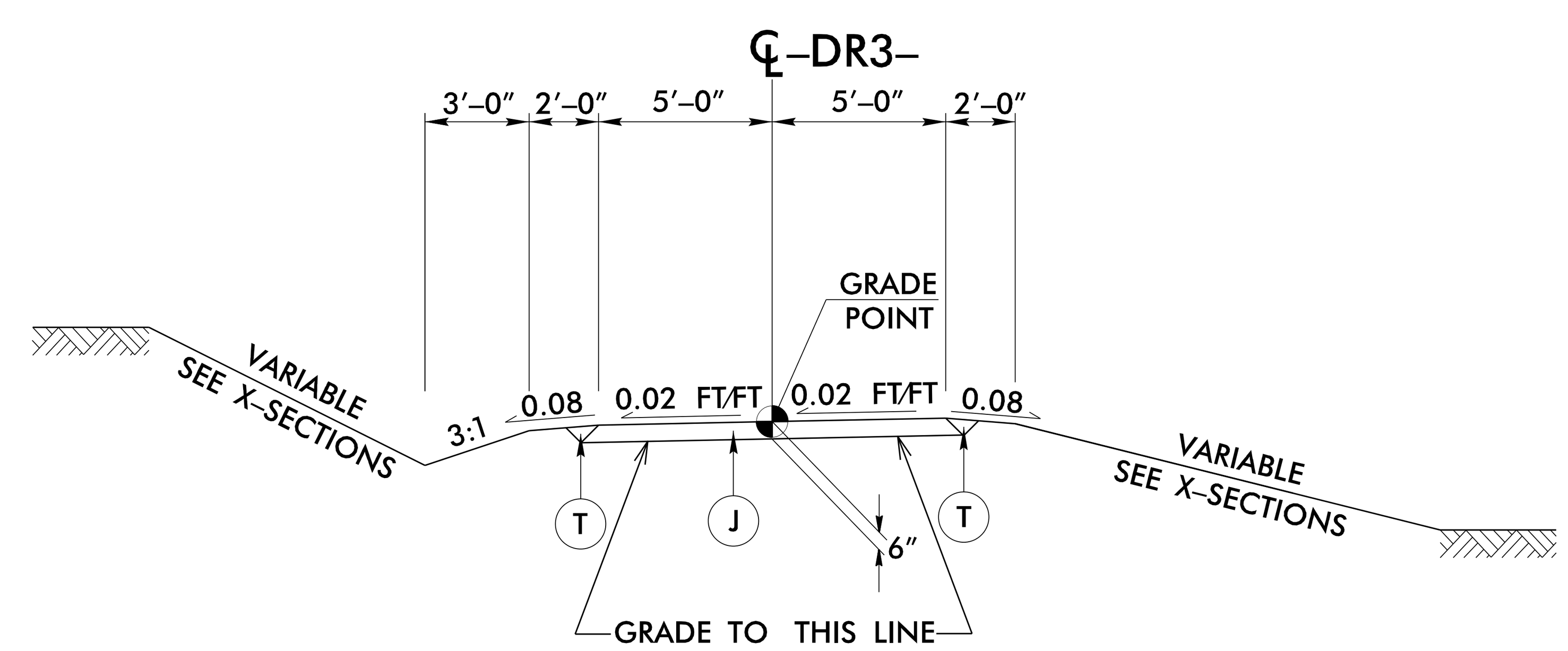
TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4:
-DR1- STA 10+11.00 TO 12+79.10



TYPICAL SECTION NO. 5

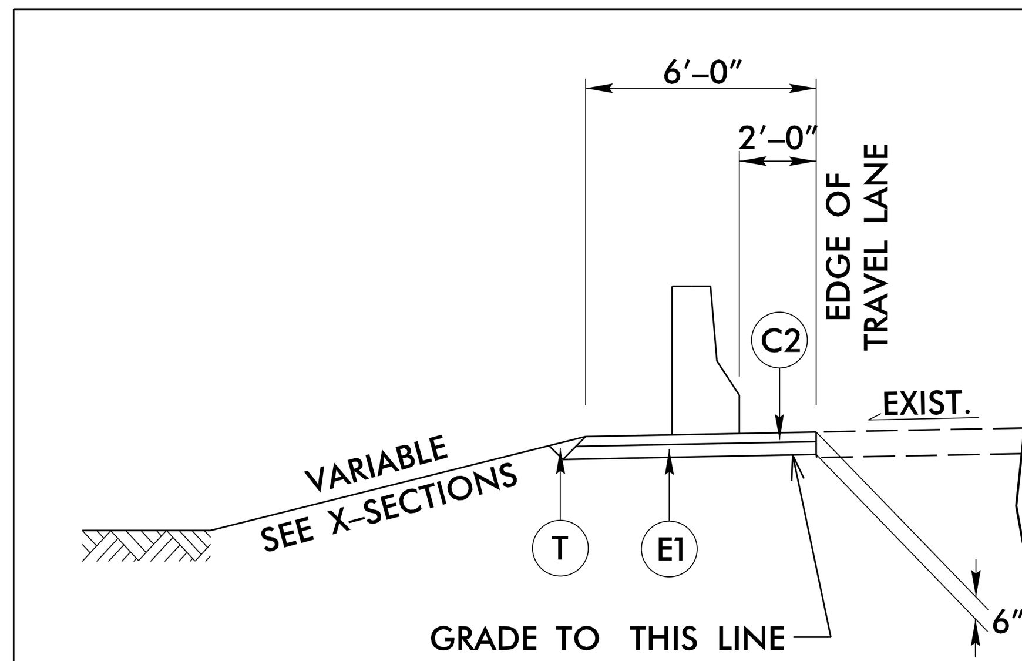
USE TYPICAL SECTION NO. 5:
-DR1- STA 12+79.10 TO 15+03.98



TYPICAL SECTION NO. 6

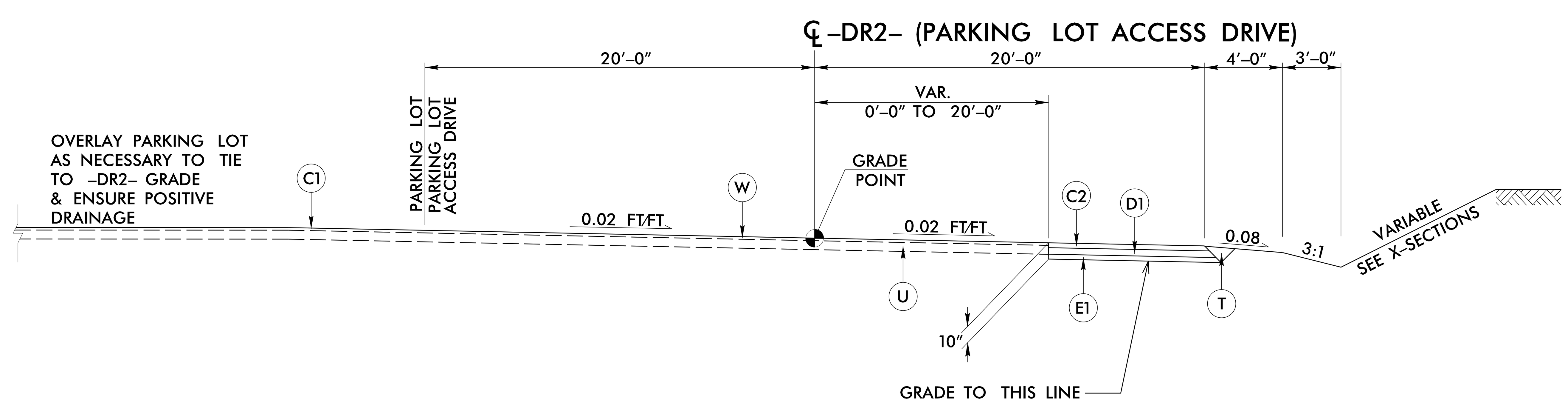
USE MAINLINE PAVEMENT -DR3- STA 10+11.00 TO 10+33.00

USE TYPICAL SECTION NO. 6:
-DR3- STA 10+33.00 TO 12+50.00



TEMPORARY PAVEMENT DETAIL UNDER TEMPORARY BARRIER

-L- STA 23+08+/- TO 25+68+/- (SEE TMP PLANS)



TYPICAL SECTION NO. 7

USE TYPICAL SECTION NO. 7:
-DR2- STA 22+00.00 TO 24+03.06

PAVEMENT SCHEDULE	
C1	1.5" S9.5B
C2	3" S9.5B
D1	4" I19.0C
E1	3" B25.0C
J	6" ABC
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING

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

PROJECT REFERENCE	SHEET NO.
B-5716	2B-1

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21102 TIMOTHY JORDAN

09-Jul

MOTT MACDONALD I & E, LLC LICENSE NO. F-0669

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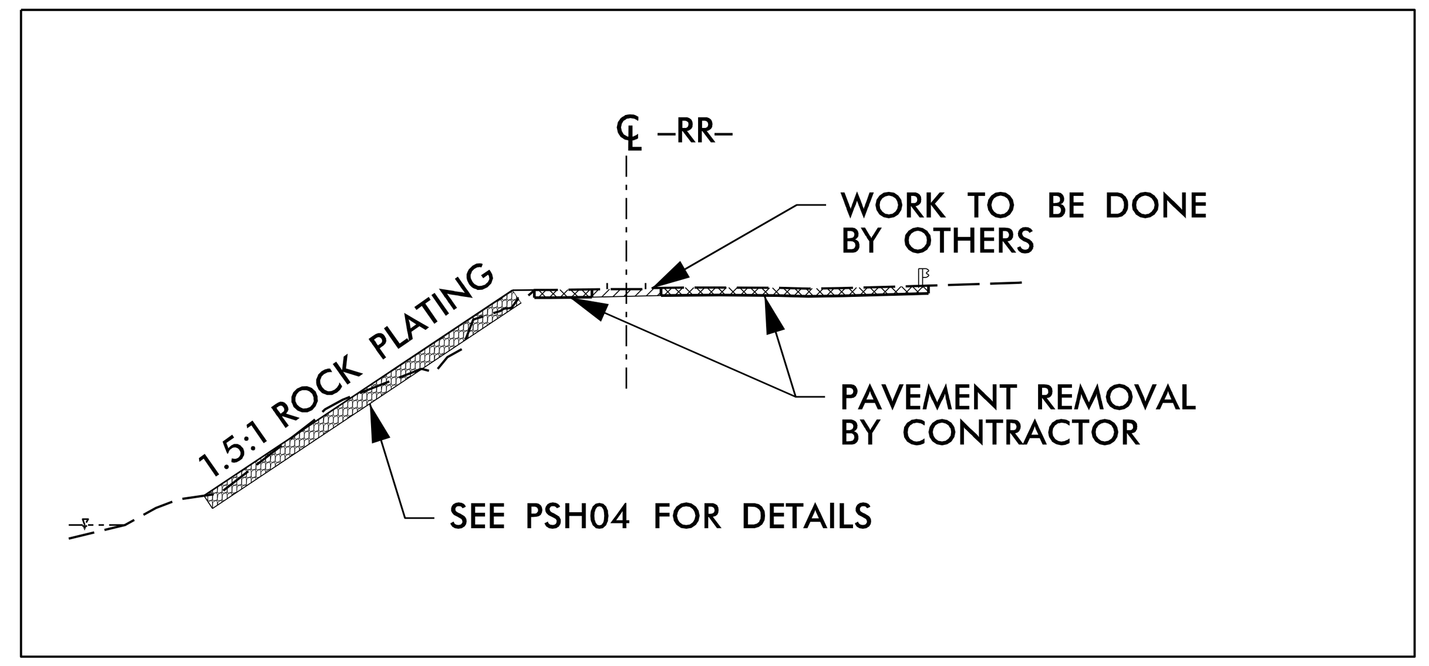


TYPICAL A–A (Not to scale)

CROSSING CLOSURE TYPICAL AT EXISTING BRIDGE

-RR- STA. 11+50.00

CROSSING CLOSURE DETAIL

MADISON, NC – 470 160J, MP R 97.30
LINDSEY BRIDGE RD CROSSING CLOSURE

NOTES:

CONTACT THE NCDOT RESIDENT ENGINEER TO SCHEDULE THE CLOSURE OF THE EXISTING AT-GRADE CROSSING.

THE EXISTING PAVEMENT WITHIN 2' OF THE EDGE OF THE TRACK AND EXISTING CROSSING EQUIPMENT WILL BE REMOVED BY OTHERS.

CONTRACTOR SHALL SEED AND MULCH THE DISTURBED AREA OUTSIDE OF THE RAILROAD BALLAST LINE.

CONTRACTOR SHALL CONTACT NORTH CAROLINA 811 TO LOCATE ALL UNDERGROUND UTILITIES IN THE WORK AREA. CONTRACTOR SHALL ALSO CONTACT NS TO LOCATE ANY UNDERGROUND RAILROAD UTILITIES IN THE WORK AREA PRIOR TO COMMENCEMENT OF WORK ON THE NS CORRIDOR.

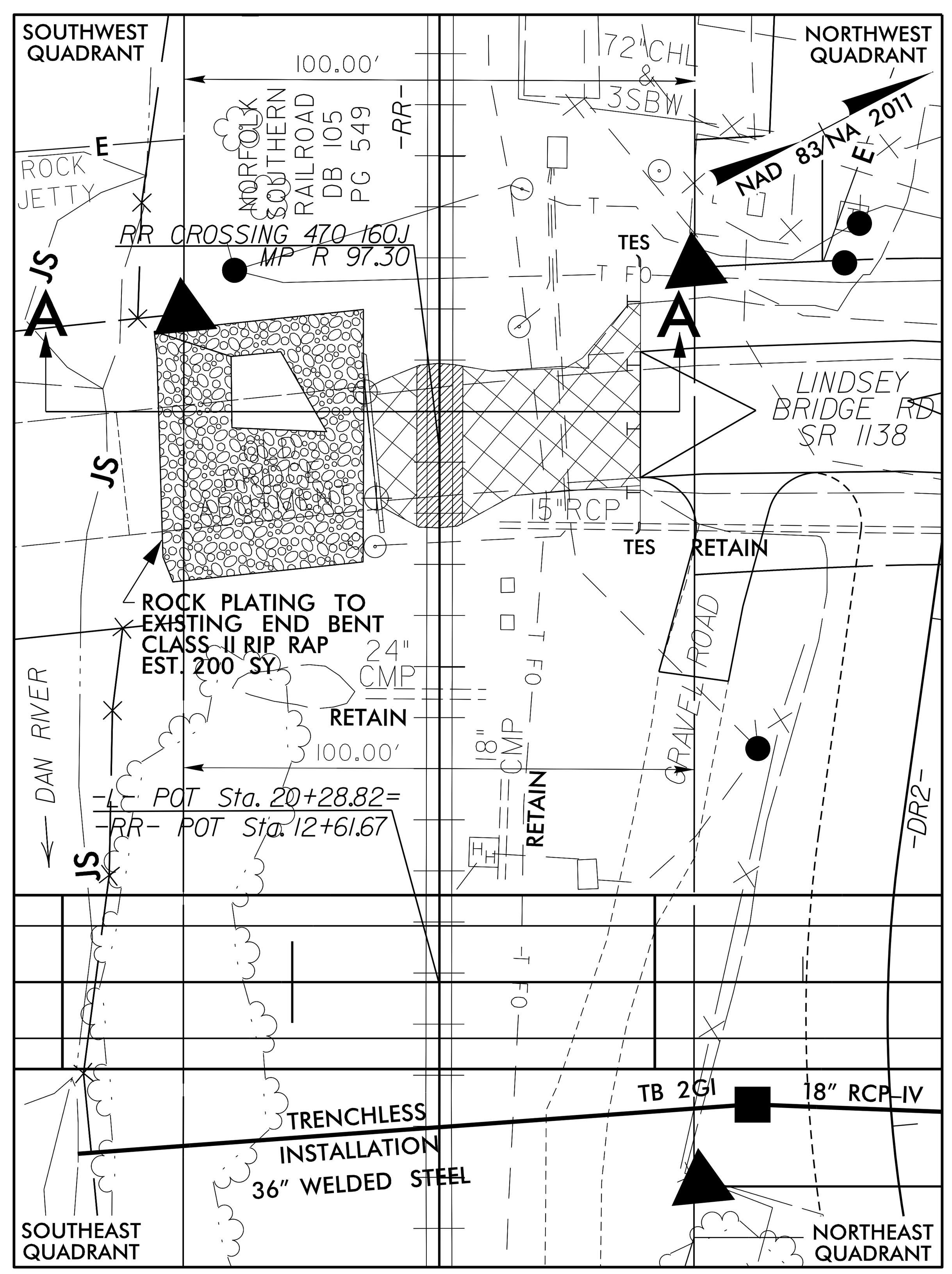
CONTRACTOR SHALL REMOVE EXISTING HIGHWAY ROADBED AND GRADE AREA TO MATCH ADJACENT TOPOGRAPHY. ANY EXISTING CULVERTS IN THE RAILROAD DITCHES SHALL BE REMOVED AND GRADE EXISTING DITCHES TO DRAIN. ALL GRADING AND DITCHING SHALL NOT BE WITHIN 14' OF EXISTING RAIL. CONTRACTOR SHALL COORDINATE WITH THE ENGINEER ON HAULING AWAY ANY ASPHALT LEFT BY THE REMOVAL OF OTHERS. ALL PAVEMENT WITHIN THE RAILROAD CORRIDOR IS TO BE REMOVED PRIOR TO THE CONCLUSION OF THE PROJECT.

PROVIDE PERMANENT SIGNING AS SHOWN ACCORDING TO THE ROADWAY STANDARD DRAWING AND TRAFFIC CONTROL PLANS.

ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERNATING ANY TRAFFIC PATTERNS.

WORK TO BE DONE BY OTHERS

PAVEMENT REMOVAL BY CONTRACTOR



INSET A (Not to scale)

iso-pjordan
c:\pwworking\hmm\rail_transit\jor66165\d0171410\B5716_rdy_psh2B-1_RR_Crossing.dgn
9:12:28 AM
3/10/2025

PROJECT REFERENCE	SHEET NO.
B–5716	2B–2

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER JAMES TIMOTHY JORDAN

Signed by: DBD87EDB56F64FA...

09-Jun-2025

MOTT MACDONALD I & E, LLC
LICENSE NO. F–0669

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MOTT MACDONALD
930 Main Campus Drive, Suite 200
Raleigh, NC 27606
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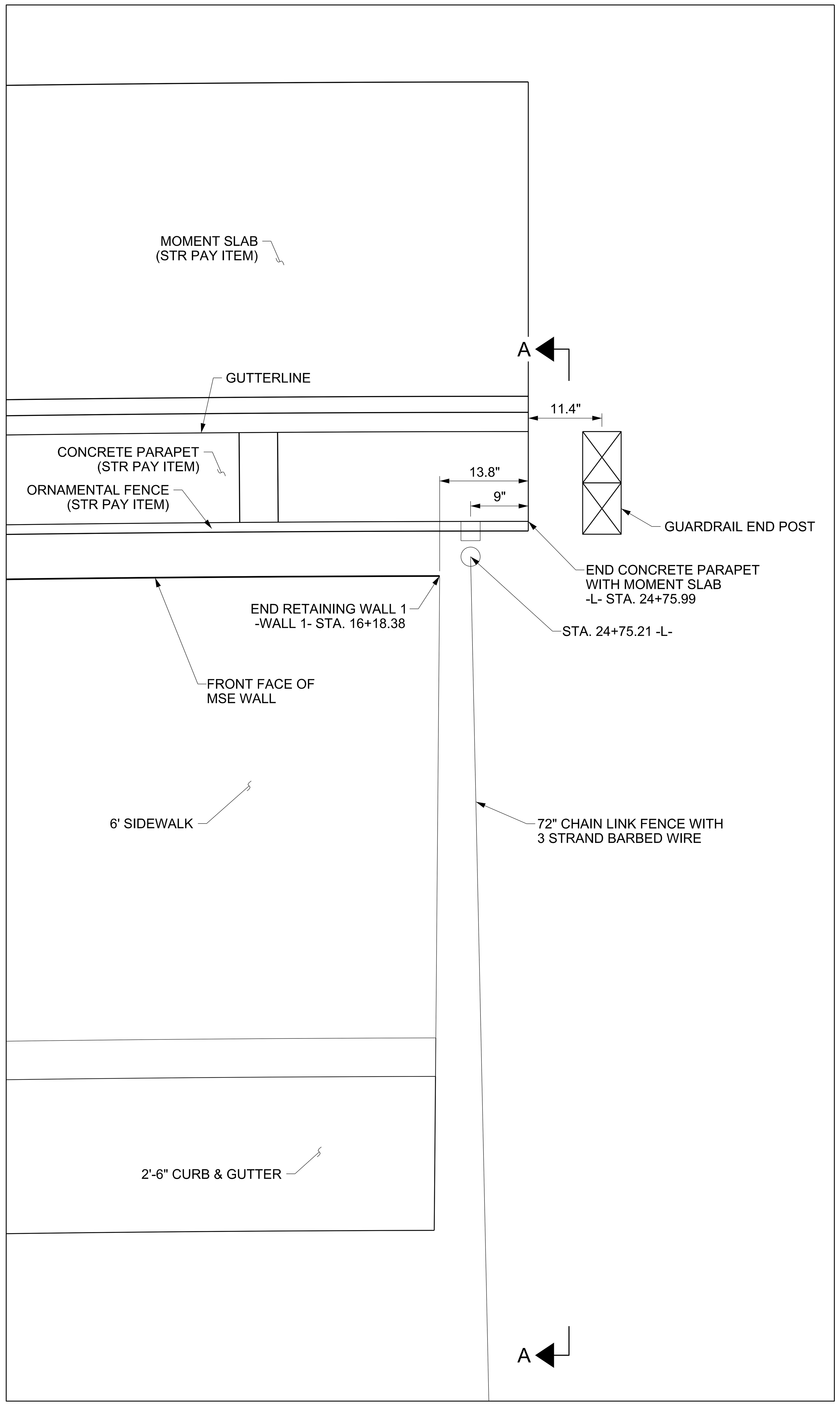
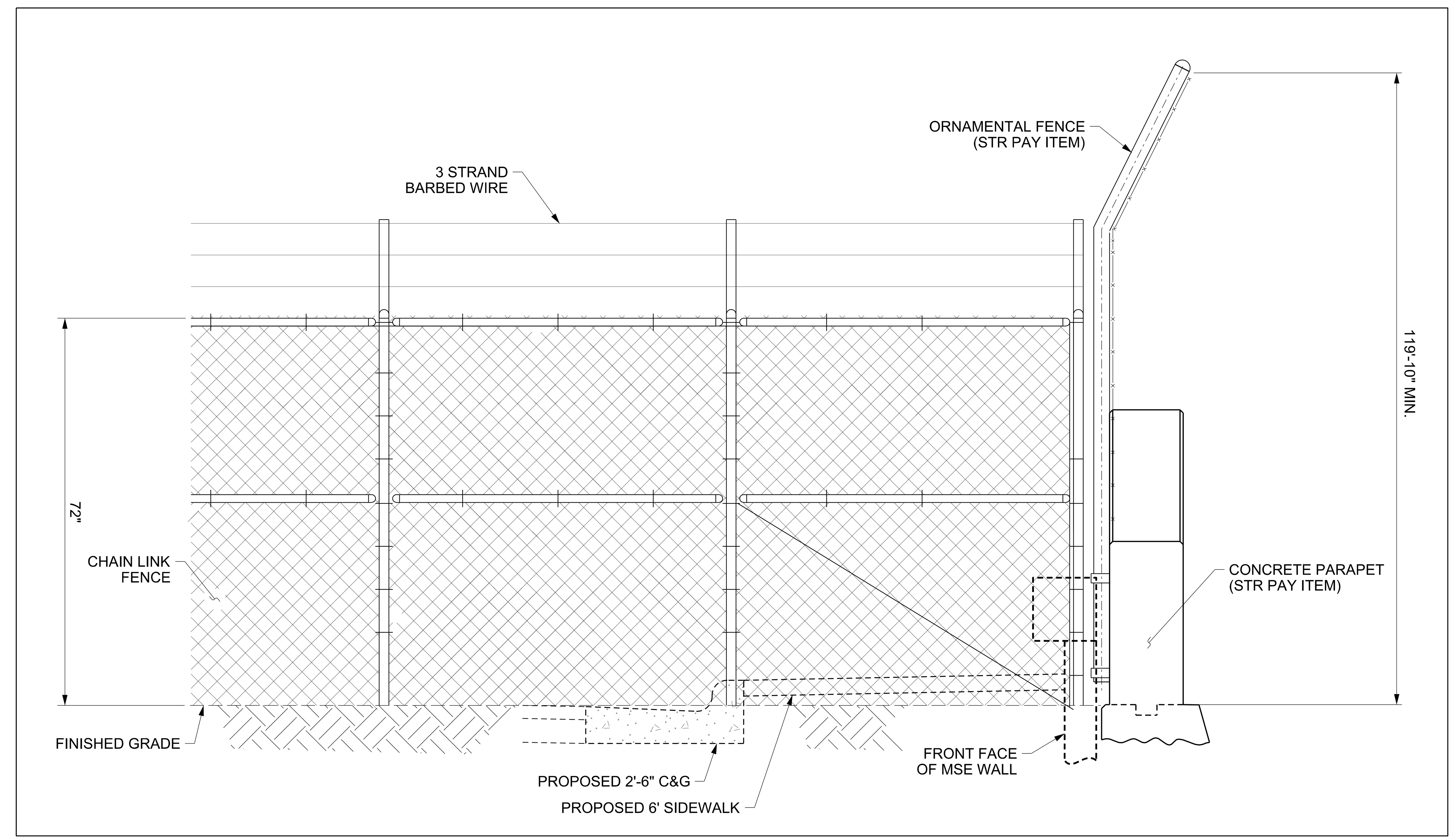
SEE DETAIL 2C-5 FOR CHAIN LINK FENCE WITH BARBED WIRE

FENCE DETAIL

72" CHAIN LINK FENCE WITH 3 STRAND BARBED WIRE AND 90° BEND TRANSITION TO ORNAMENTAL FENCE ALONG CONCRETE PARAPET



PLAN VIEW



SECTION A-A

PROJECT REFERENCE NO.	SHEET NO.
B-5716	2B-3

ROADWAY DESIGN ENGINEER

SEAL 21102

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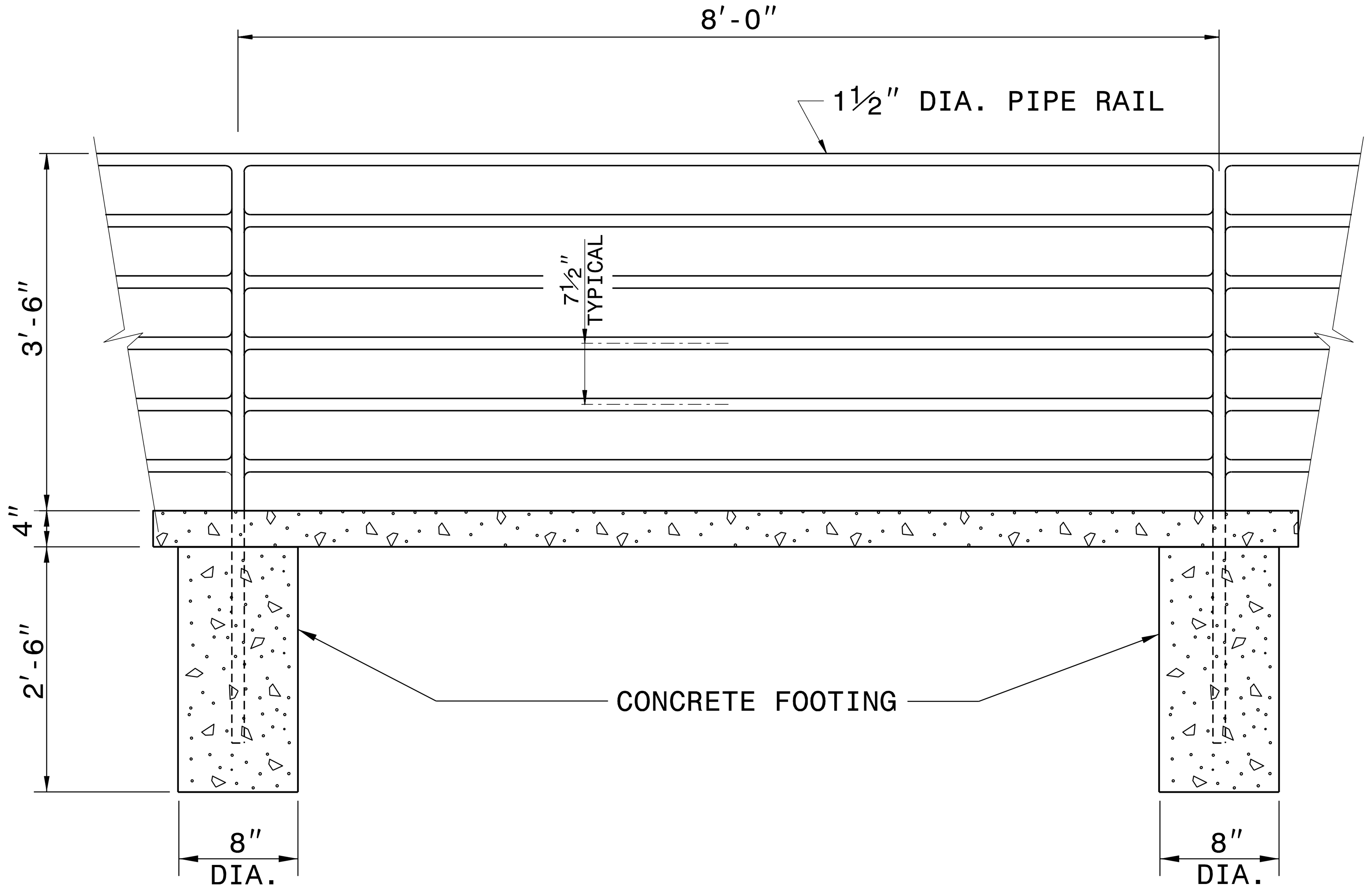
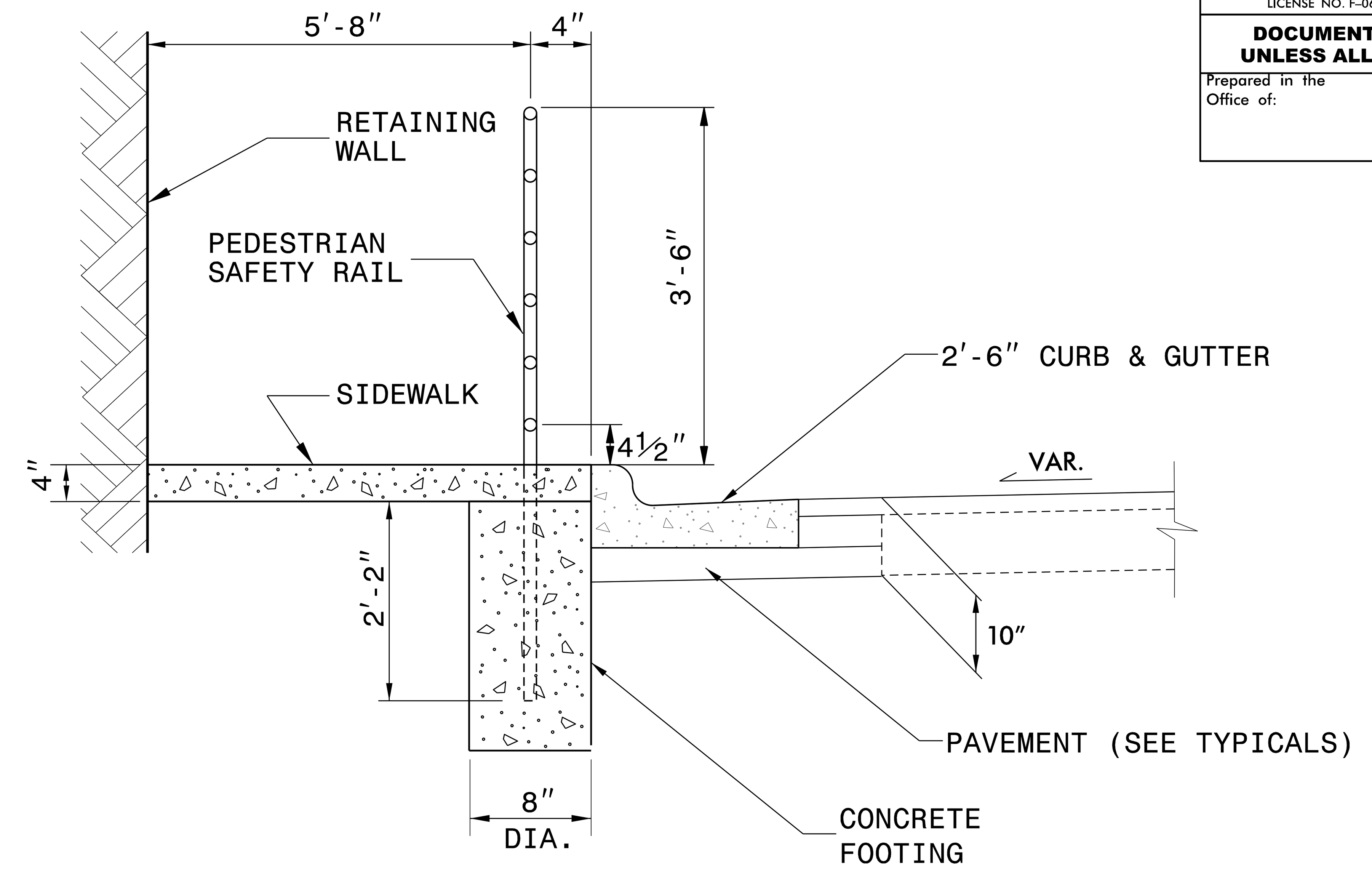


ELEVATION



SECTION VIEW

NOTES:

CONSTRUCT PROPOSED STEEL PIPE RAIL OF 1½″ DIAMETER SCHEDULE 40 PLAIN END GALVANIZED STEEL PIPE MEETING THE REQUIREMENTS OF ASTM A53.

REPAIR GALVANIZING IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1076.

PAINT, IF REQUIRED BY THE ENGINEER, IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1080.

WELD IN ACCORDANCE WITH ARTICLE 1072-18 OF THE STANDARD SPECIFICATIONS.

USE CLASS ′B′ CONCRETE FOR HANDRAIL FOOTINGS.

PLACEMENT OF HANDRAIL IN RELATION TO RETAINING WALL AND SIDEWALK MAY BE MODIFIED AS DIRECTED BY THE ENGINEER.

PEDESTRIAN SAFETY RAIL

STRUCTURE / RETAINING WALL DETAIL

FOR PLAN SEE SHEETS NO. 4 & 5

PROJECT REFERENCE	SHEET NO.
B-5716	2B-4

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21102

09-Jun-2025

MOTT MACDONALD I & E, LLC LICENSE NO. F-0669

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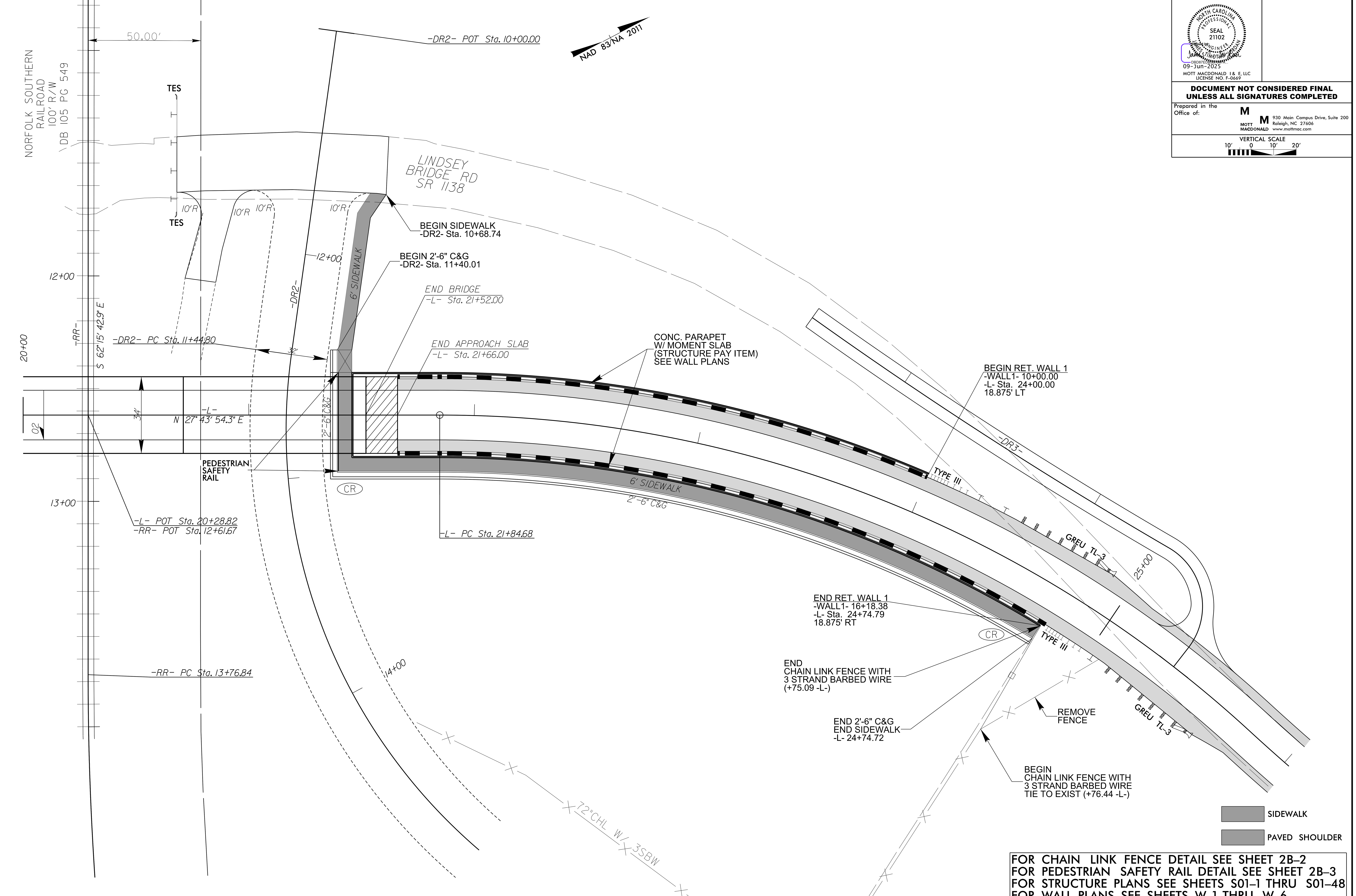
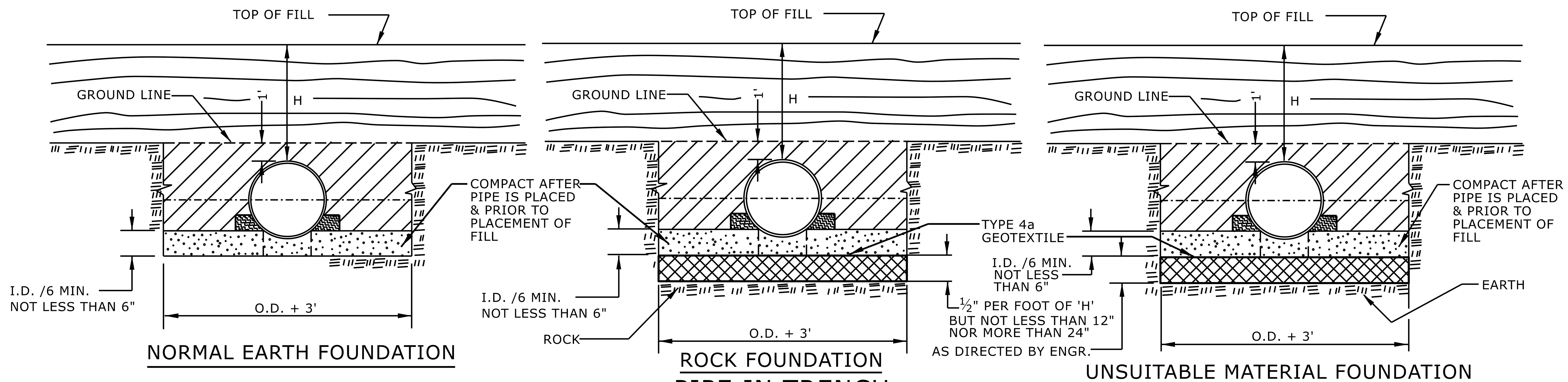
VERTICAL SCALE 10' 0 10' 20'

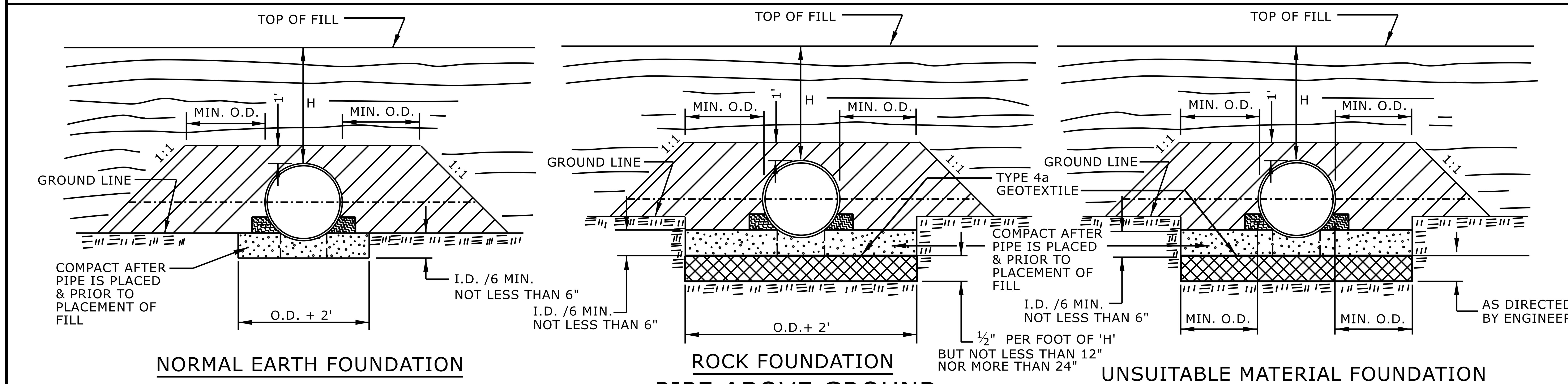


FOR CHAIN LINK FENCE DETAIL SEE SHEET 2B-2
FOR PEDESTRIAN SAFETY RAIL DETAIL SEE SHEET 2B-3
FOR STRUCTURE PLANS SEE SHEETS S01-1 THRU S01-48
FOR WALL PLANS SEE SHEETS W-1 THRU W-6

PROJECT REFERENCE NO.	SHEET NO.
B-5716	2C-1



PIPE IN TRENCH



PIPE ABOVE GROUND

GENERAL NOTES:

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

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

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

APPROVED SUITABLE LOCAL MATERIAL.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

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

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

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

SPRINGLINE OF PIPE

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

UNDISTURBED EARTH MATERIAL

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

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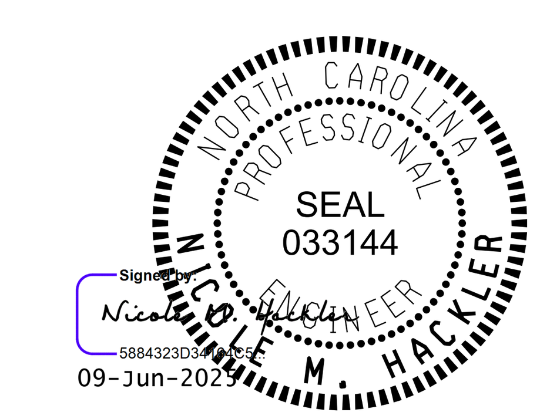
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
FLEXIBLE PIPE

SHEET 1 OF 2

300.01



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

SEE TITLE BLOCK

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

PROJECT REFERENCE NO.	SHEET NO.
B-5716	2C-2

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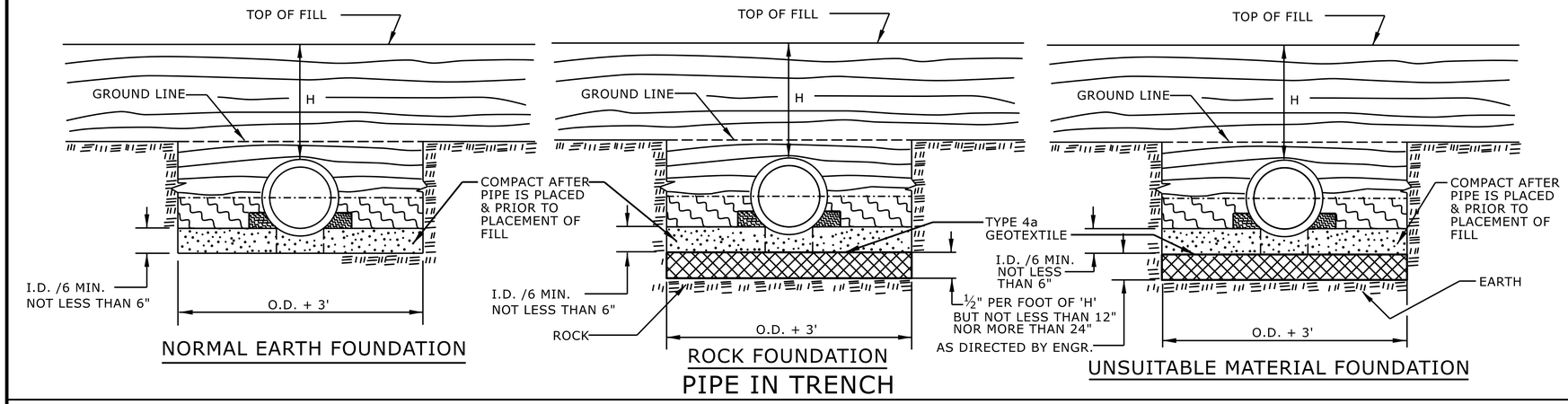
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR

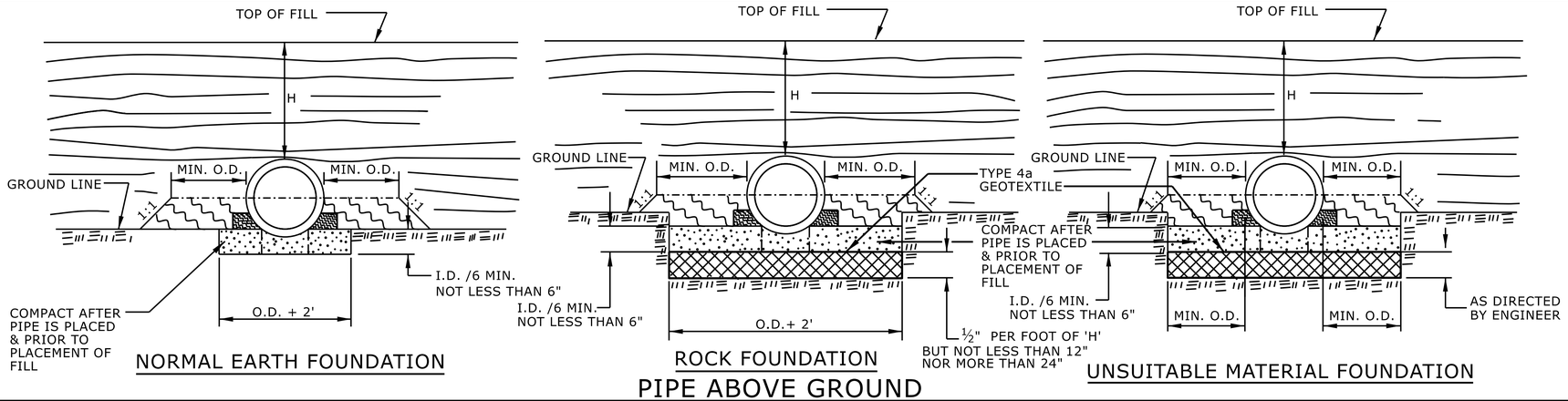
METHOD OF PIPE INSTALLATION

RIGID PIPE

PIPE IN TRENCH



PIPE ABOVE GROUND



GENERAL NOTES:

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

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

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

APPROVED SUITABLE LOCAL MATERIAL.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

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

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

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

SPRINGLINE OF PIPE

SELECT BACKFILL MATERIAL CLASS III OR CLASS II, BELOW SPRINGLINE.

UNDISTURBED EARTH MATERIAL

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

SHEET 2 OF 2

300.01

NORTH CAROLINA PROFESSIONAL SEAL 033144 ENGINEER NICOLE M. HACKLER
Signature: Nicole M. Hackler
09-Jun-2025

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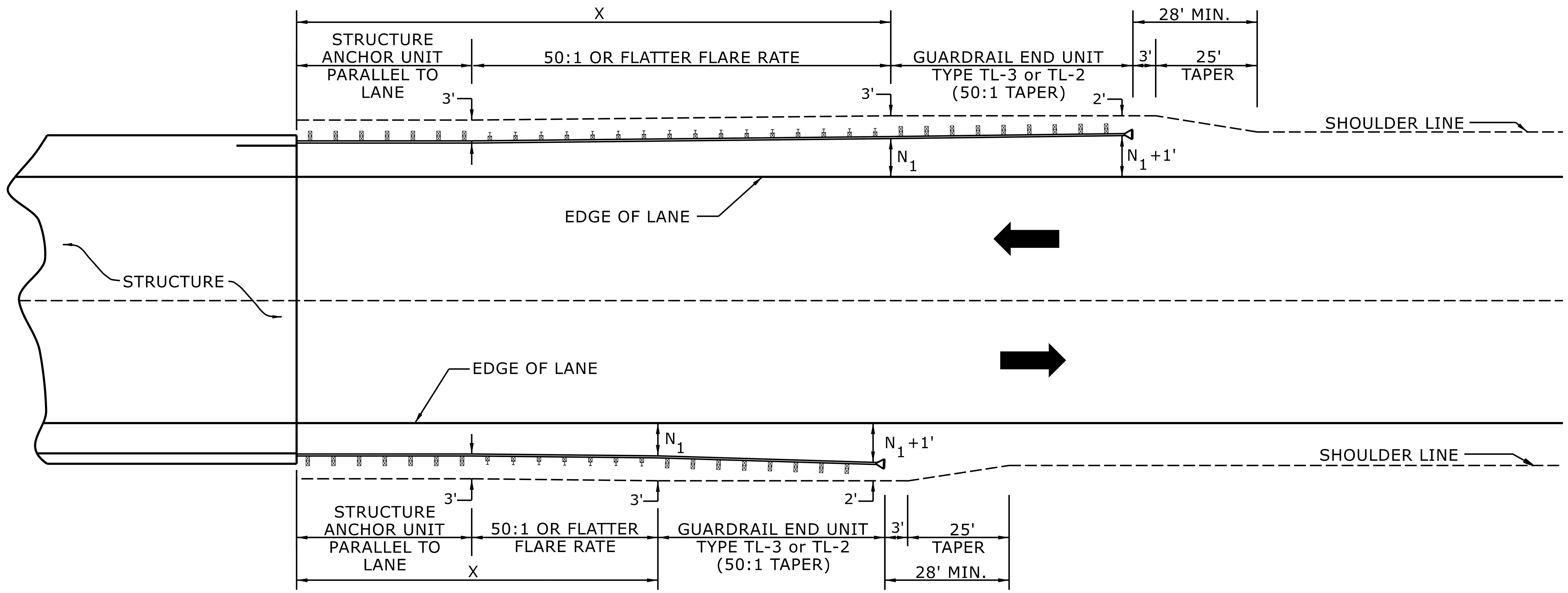
PROJECT REFERENCE NO.	SHEET NO.
B-5716	2C-3



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 NORTH CAROLINA
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 4 OF 15

862D01

SEAL 033144
NORTH CAROLINA PROFESSIONAL ENGINEER
NICOLE M. HACKLER
09-Jun-2025

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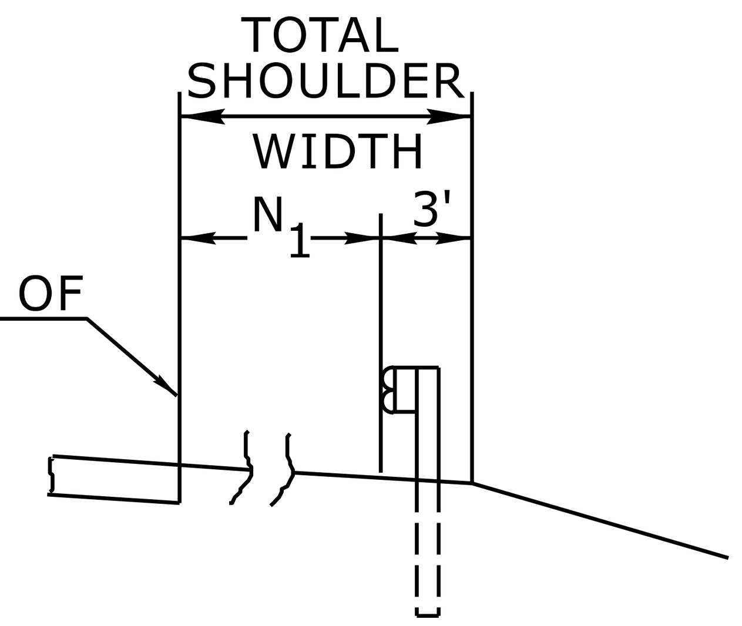
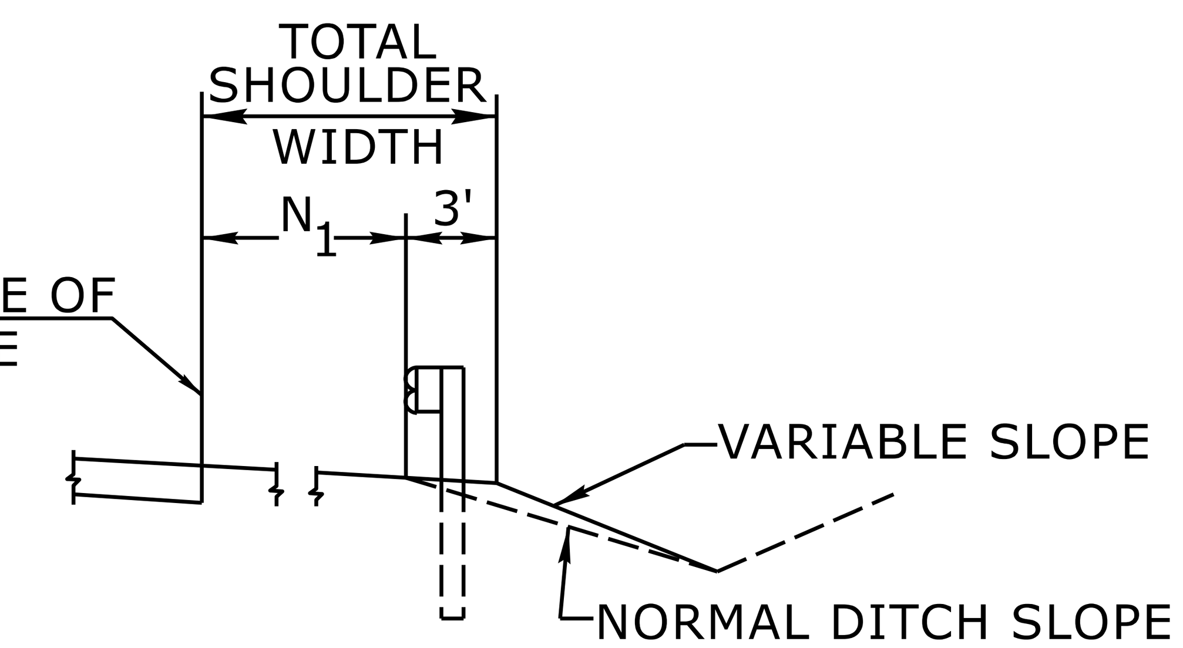
FILE SPEC.:

PROJECT REFERENCE NO.	SHEET NO.
B-5716	2C-4

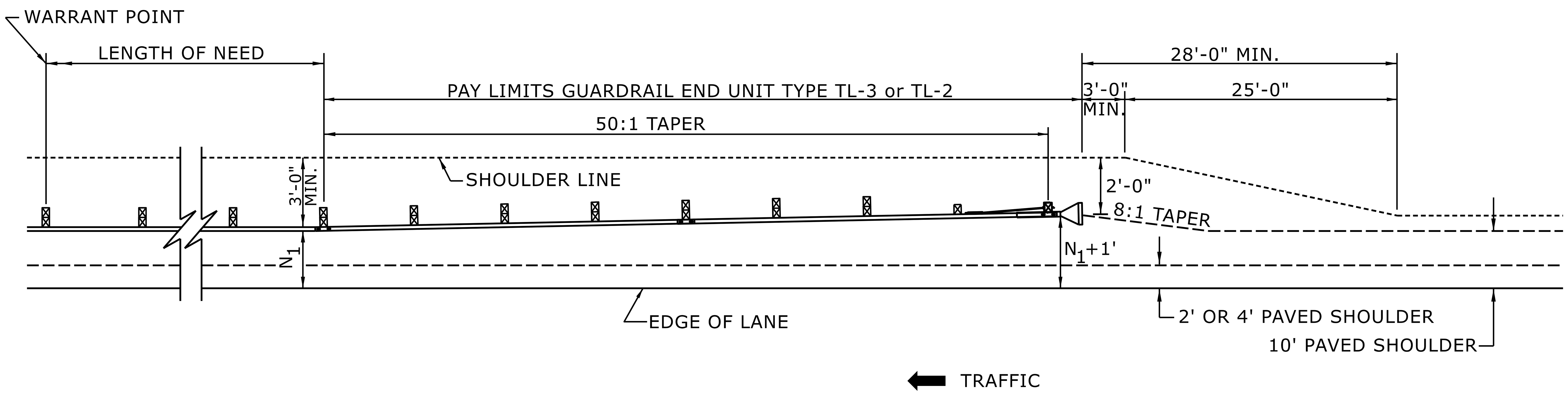


FILL SECTION



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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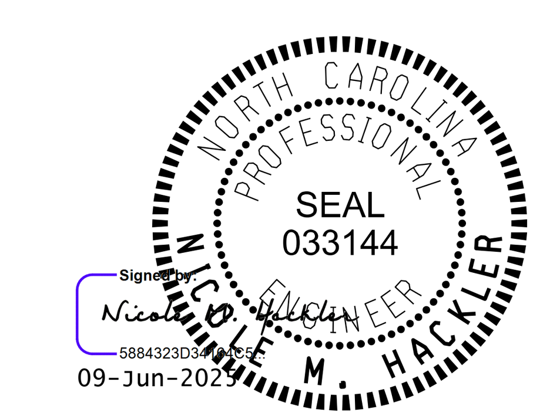
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 6 OF 15
862D01



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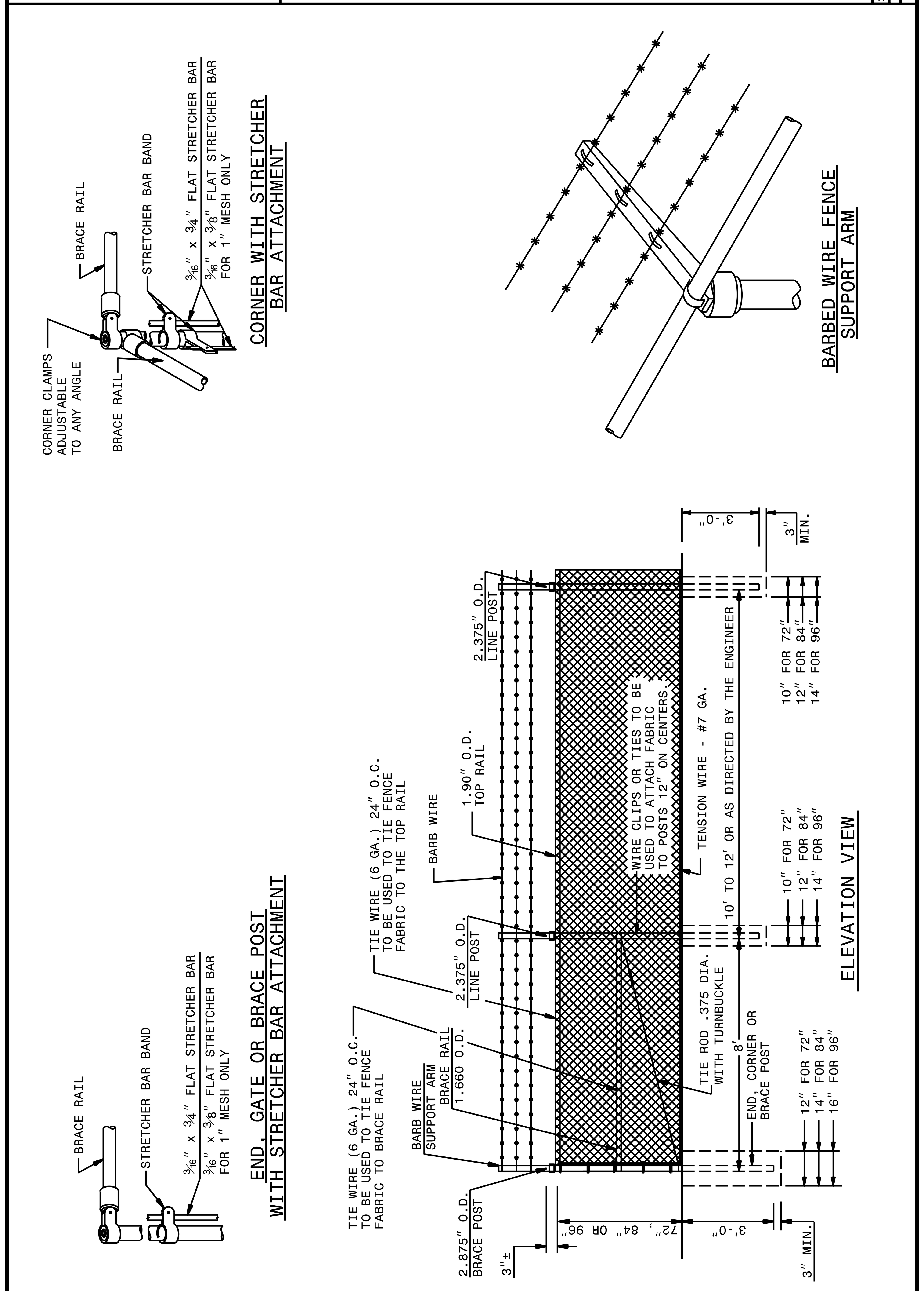
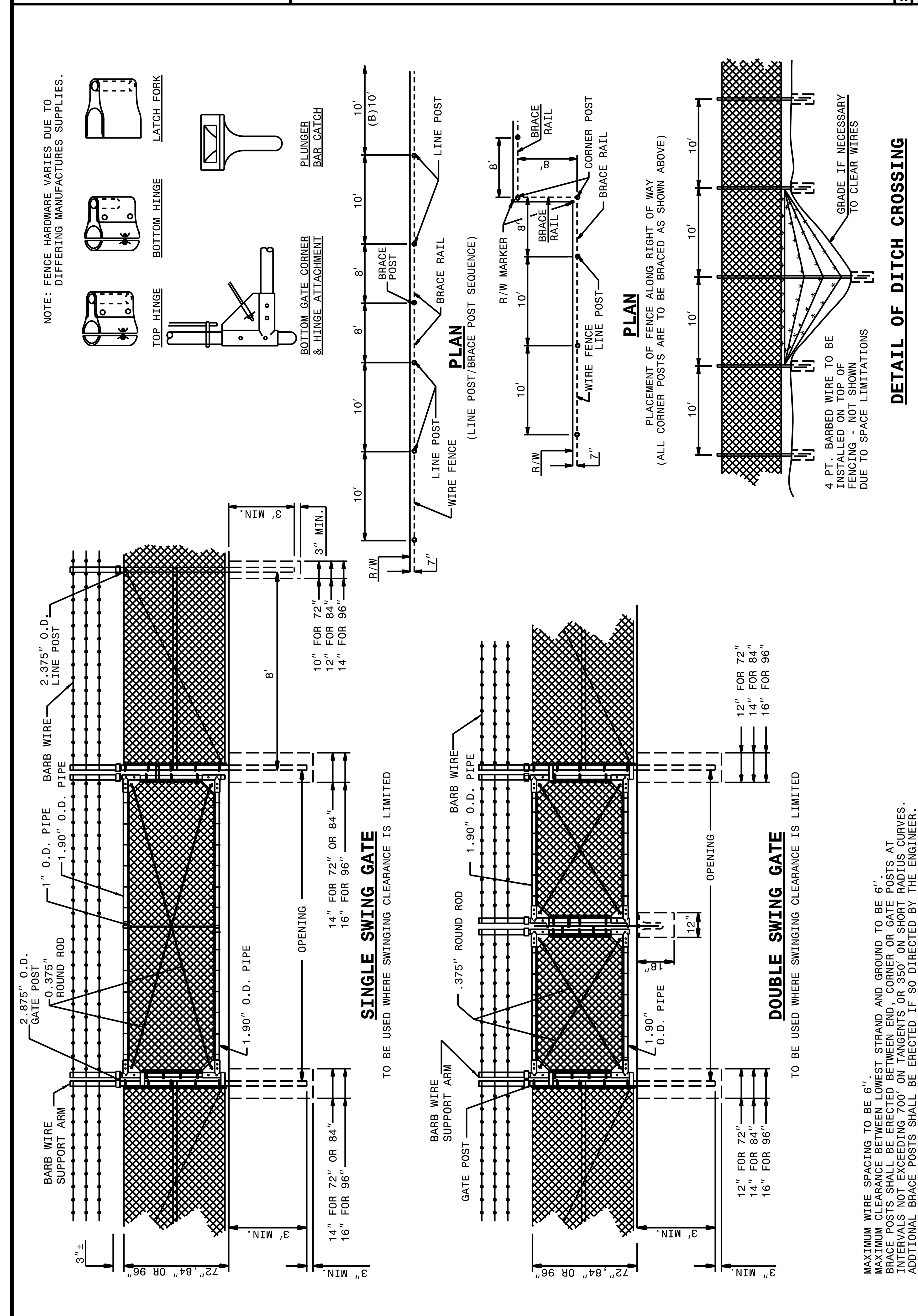
PROJECT REFERENCE NO.	SHEET NO.
B-5716	2C-5

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ENGLISH DETAIL DRAWING FOR CHAIN LINK FENCE WITH BARBED WIRE 6', 7' AND 8' HEIGHT
SHEET 1 OF 2 fence4cl



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ENGLISH DETAIL DRAWING FOR CHAIN LINK FENCE WITH BARBED WIRE 6', 7' AND 8' HEIGHT
SHEET 2 OF 2 fence4cl



MAXIMUM WIRE SPACING TO BE 6".
MAXIMUM CLEARANCE BETWEEN LOWEST STRAND AND GROUND TO BE 6".
BRACE POSTS SHALL BE ERECTED BETWEEN END, CORNER OR GATE POSTS AT INTERVALS NOT EXCEEDING 700' ON TANGENTS OR 350' ON SHORT RADIUS CURVES.
ADDITIONAL BRACE POSTS SHALL BE ERECTED IF SO DIRECTED BY THE ENGINEER.
BRACE POSTS SHALL BE BRACED FROM BOTH SIDES OF POST.

STATE OF
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ENGLISH DETAIL DRAWING FOR
CHAIN LINK FENCE WITH BARBED WIRE
6', 7' AND 8' HEIGHT

SHEET 1 OF 2 fence4cl

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

ENGLISH DETAIL DRAWING FOR
CHAIN LINK FENCE WITH BARBED WIRE
6', 7' AND 8' HEIGHT

SHEET 2 OF 2 fence4cl

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 33144 NICOLE M. HACKLER
Signed by: Nicole Hackler 09-Jun-2025

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

SEE PLATE FOR TITLE

ORIGINAL BY: N.T. KEGLERS DATE: MAR.11, 1996
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

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

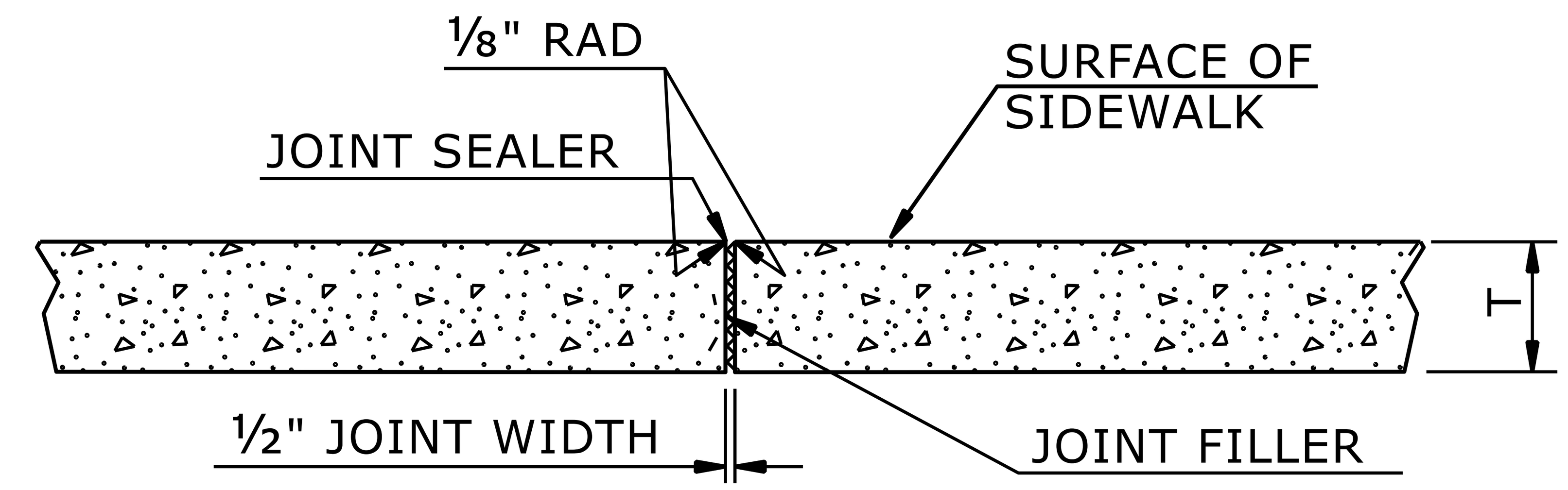
PROJECT REFERENCE NO.	SHEET NO.
B-5716	2C-6

NOTES:

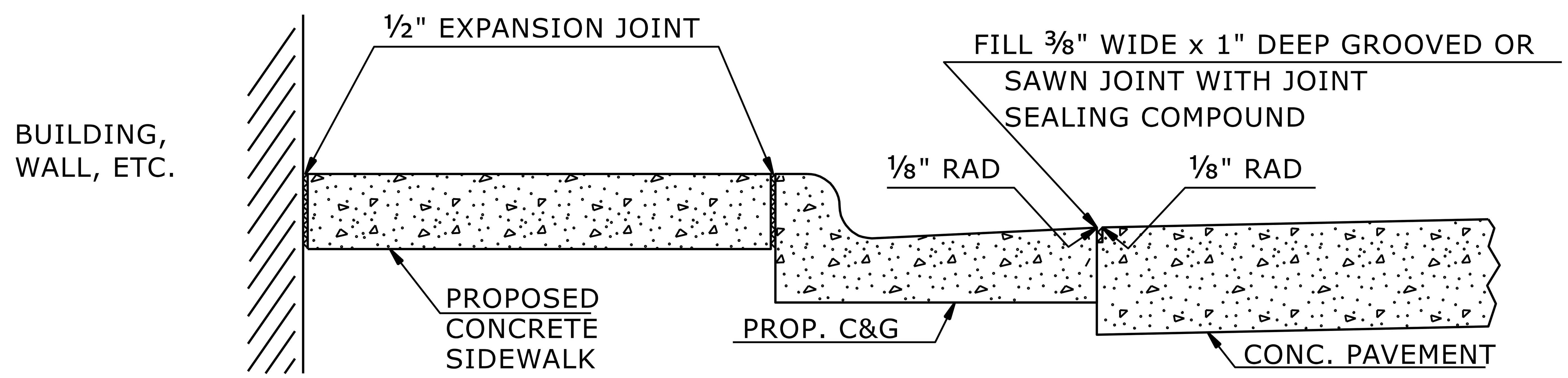
CONSTRUCT STANDARD SIDEWALK 5' WIDE AND 4" THICK UNLESS OTHERWISE DENOTED ON PLANS.

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

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



TRANSVERSE EXPANSION JOINT IN SIDEWALK



DETAILS SHOWING JOINTS IN CONCRETE SIDEWALK

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

ROADWAY DETAIL DRAWING FOR
CONCRETE SIDEWALK

SHEET 1 OF 1
848D01

NORTH CAROLINA PROFESSIONAL SEAL 033144 ENGINEER NICOLE M. HACKLER
09-Jun-2024

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FILE SPEC.:

PROJECT REFERENCE NO.	SHEET NO.
B-5716	2G-1

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 036283 ENGINEER SCOTT HUNSBERGER

DocuSigned by: W. Scott Hunsberger 1/17/2024
5A469AC80FCD49E...
SIGNATURE DATE

SIGNATURE DATE

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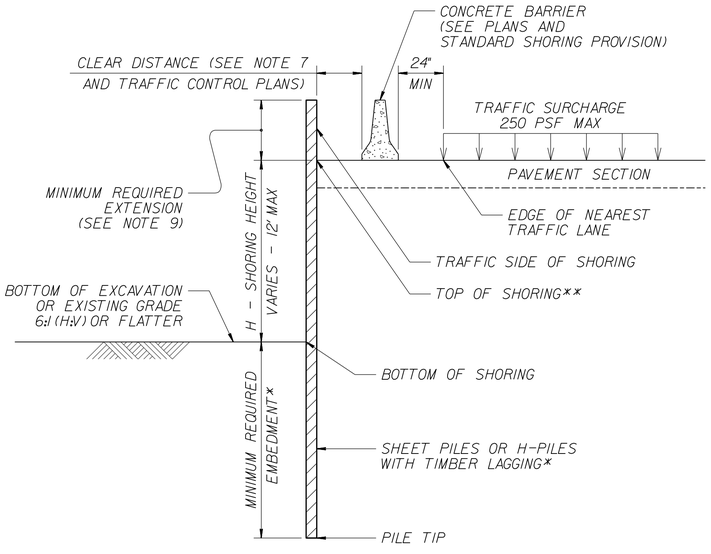
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS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

MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS

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

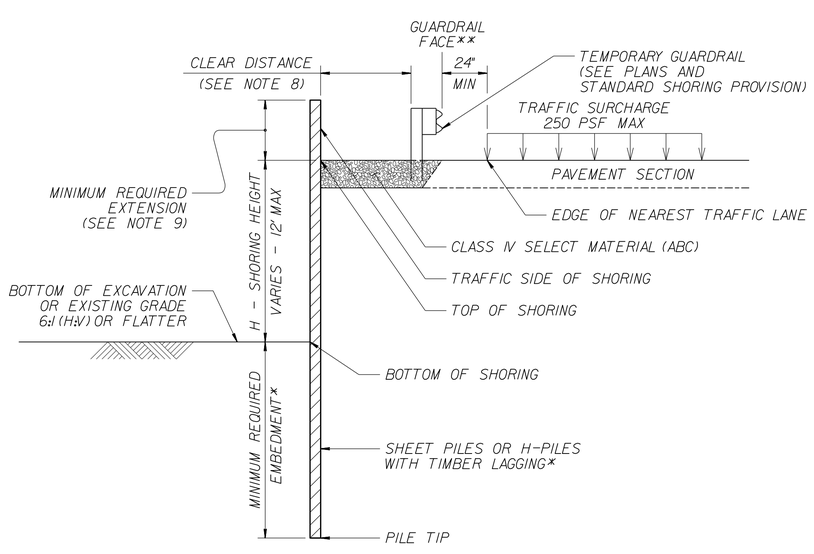
NOTES:

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



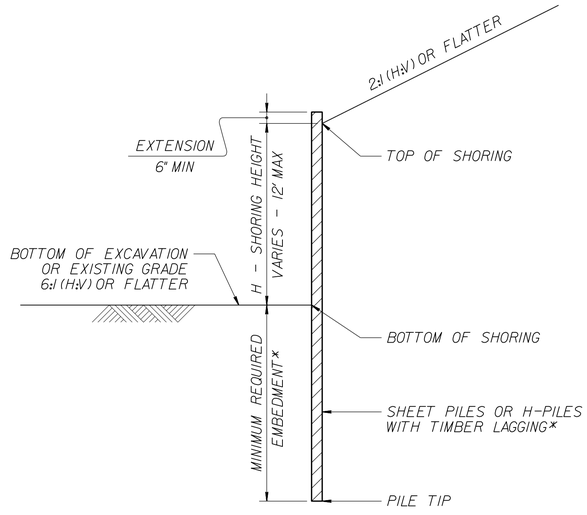
CONCRETE BARRIER

****TOP OF SHORING = EDGE OF PAVEMENT**



TEMPORARY GUARDRAIL

****GUARDRAIL FACE = EDGE OF PAVEMENT**



STANDARD TEMPORARY SHORING

(SLOPE CASE)
*SEE TABLE ABOVE.

STANDARD TEMPORARY SHORING

(SURCHARGE CASE)
*SEE TABLE ABOVE.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.01

STANDARD TEMPORARY SHORING

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
B-5716	2G-2

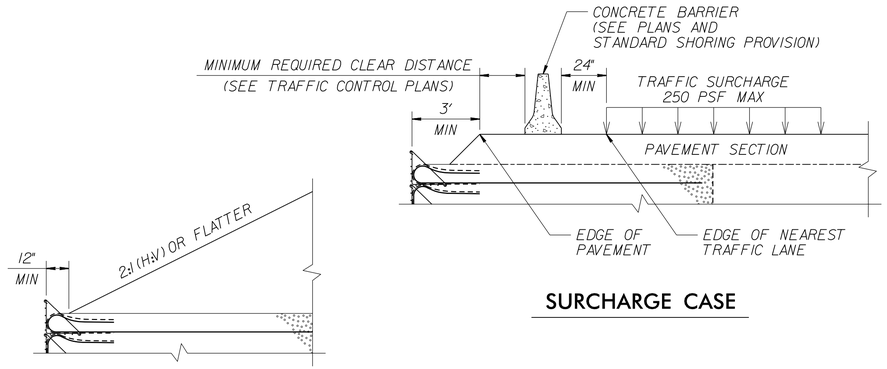
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 036283 ENGINEER W. SCOTT HUNSBERGER

DocuSigned by: W. Scott Hunsberger 1/17/2024
SIGNATURE DATE

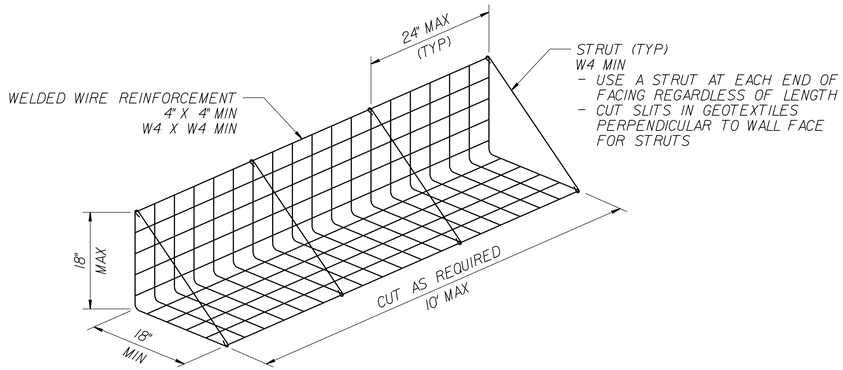
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

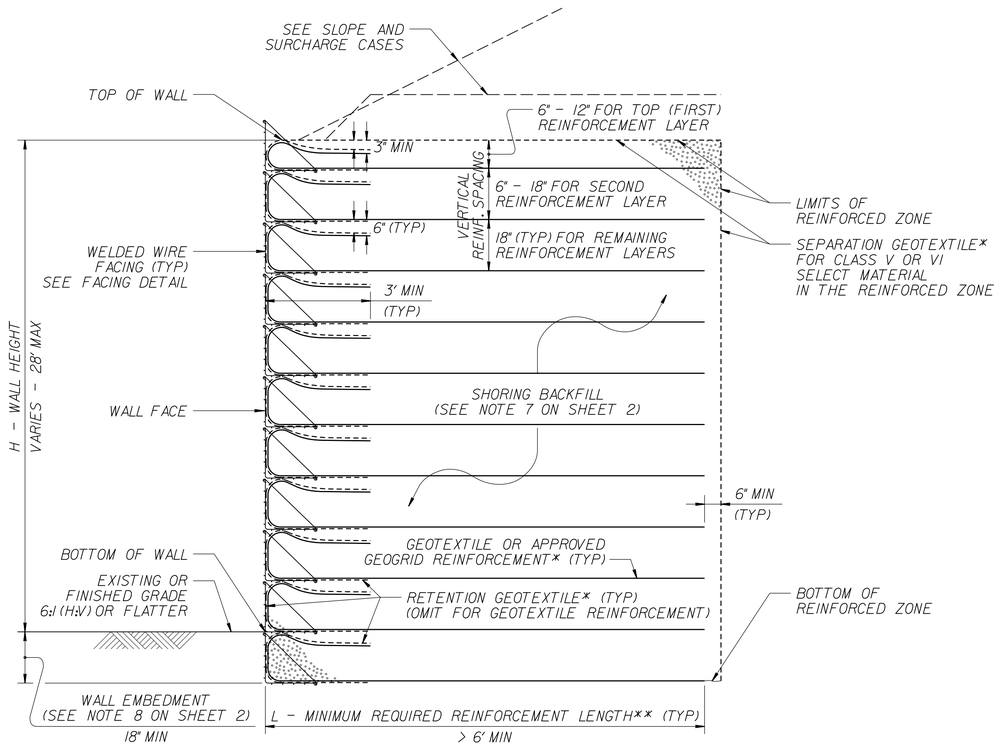


SURCHARGE CASE

SLOPE CASE

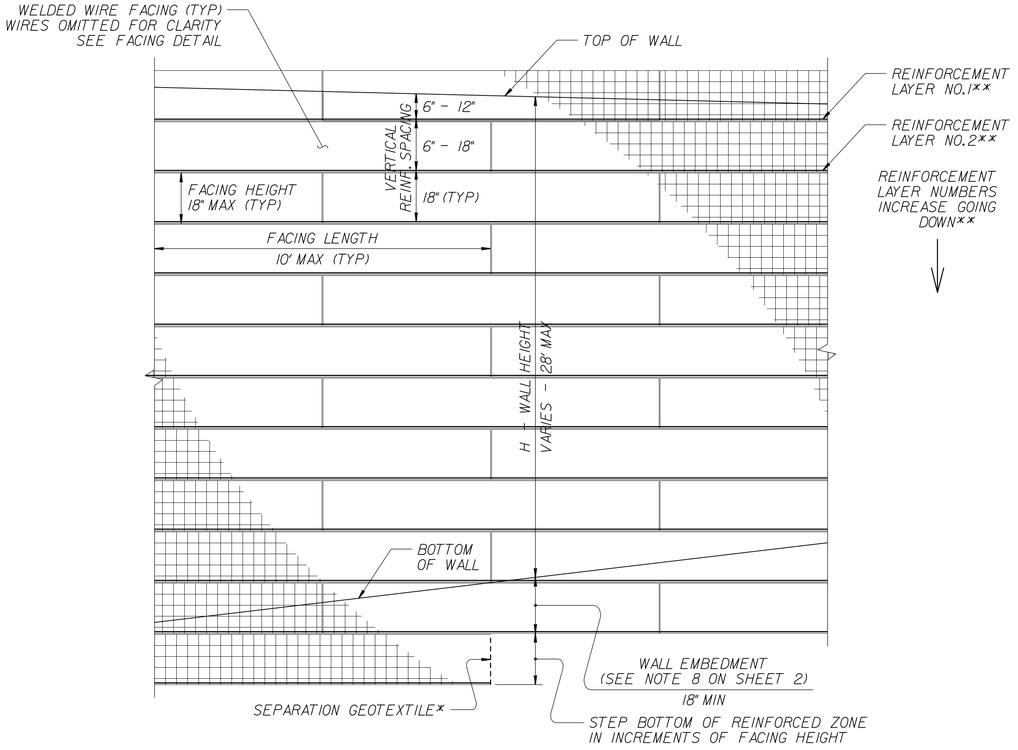


FACING DETAIL



STANDARD TEMPORARY WALL

(FOR STANDARD TEMPORARY WALLS ON STRUCTURES, SEE TEMPORARY WALL ON STRUCTURE DETAIL ON SHEET 2.)
*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.



STANDARD TEMPORARY WALL – PARTIAL ELEVATION

*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD
TEMPORARY WALL
SHEET 1 OF 3

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
B-5716	2G-3

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 036283 ENGINEER W. SCOTT HUNSBERGER

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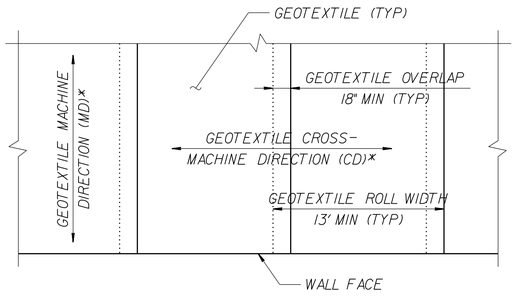
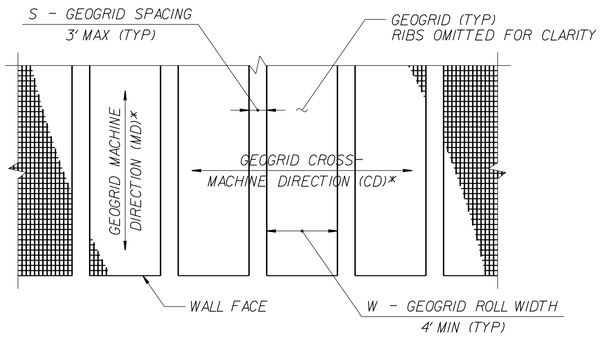


GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)

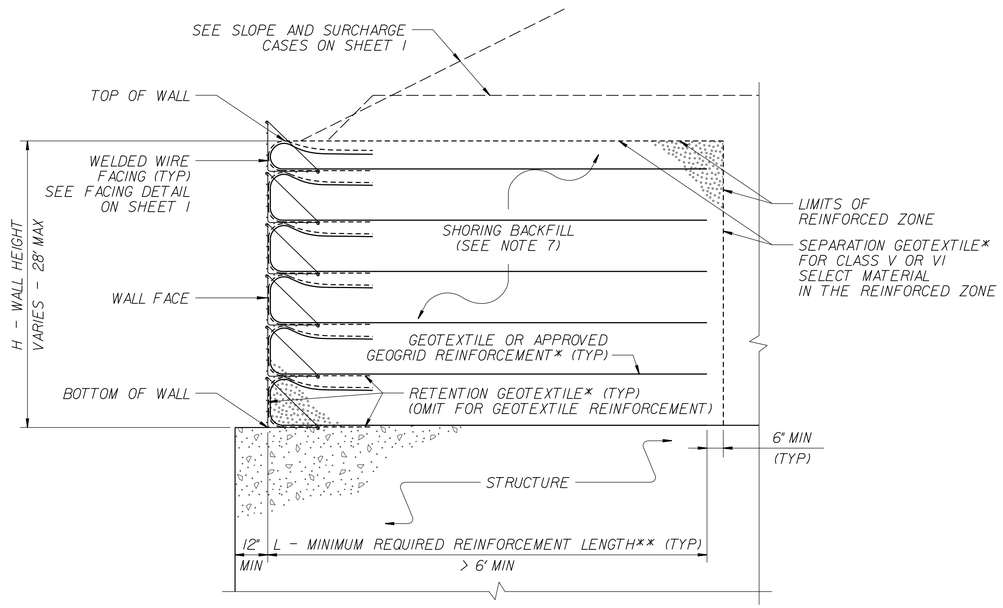


GEOGRID PLACEMENT

(80% COVERAGE MIN FOR GEOGRID REINFORCEMENT – $\frac{W}{W+S}$ x 100 $\geq$ 80%, SEE NOTE 11)

GEOSYNTHETIC PLACEMENT DETAILS

(PLAN VIEW)
*SEE NOTE 12.



TEMPORARY WALL ON STRUCTURE DETAIL

*SEE GEOSYNTHETIC PLACEMENT DETAILS.
**SEE REINFORCEMENT TABLES ON SHEET 3.

NOTES:

1. AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY WALLS AS NOTED IN THE PLANS.
2. FOR STANDARD TEMPORARY WALLS, SEE STANDARD SHORING PROVISION.
3. STANDARD TEMPORARY WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
   UNIT WEIGHT, γ = 120 PCF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 PSF
4. DO NOT USE STANDARD TEMPORARY WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE STANDARD TEMPORARY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW TEMPORARY WALLS.
6. USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, ASSUME GROUNDWATER DEPTH IS LESS THAN 7' BELOW BOTTOM OF REINFORCED ZONE. DO NOT USE STANDARD TEMPORARY WALLS IF GROUNDWATER OR FLOOD ELEVATION IS ABOVE BOTTOM OF REINFORCED ZONE.
7. DO NOT USE A-2-4 SOIL FOR STANDARD TEMPORARY WALLS AROUND CULVERTS OR IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS FOR SLOPE CASES. DO NOT USE CLASS VI SELECT MATERIAL IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS WITH GEOTEXTILE REINFORCEMENT.
8. WALL EMBEDMENT IS NOT REQUIRED FOR STANDARD TEMPORARY WALLS ON STRUCTURES OR ROCK AS DETERMINED BY THE ENGINEER.
9. DO NOT USE MORE THAN 4 DIFFERENT REINFORCEMENT STRENGTHS FOR EACH STANDARD TEMPORARY WALL.
10. GEOGRIDS FOR GEOGRID REINFORCEMENT ARE APPROVED FOR SHORT TERM DESIGN STRENGTHS (3-YEAR DESIGN LIFE) IN THE MD AND CD BASED ON MATERIAL TYPE. THE LIST OF APPROVED GEOGRIDS WITH DESIGN STRENGTHS IS AVAILABLE FROM: connect.ncdot.gov/resources/Geological/Pages/Products.aspx
    DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SHORING BACKFILL AS FOLLOWS:

MATERIAL TYPE	SHORING BACKFILL
BORROW	A-2-4 SOIL
FINE AGGREGATE	CLASS II, TYPE I OR CLASS III SELECT MATERIAL
COARSE AGGREGATE	CLASS V OR VI SELECT MATERIAL

11. FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
12. AT THE CONTRACTOR'S OPTION, REINFORCEMENT MAY BE INSTALLED WITH THE MD PARALLEL TO THE WALL FACE IF BOTH OF THE FOLLOWING CONDITIONS OCCUR:
    - W (REINFORCEMENT ROLL WIDTH) $\geq$ (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND
    - REINFORCEMENT STRENGTH IN CD $\geq$ MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
13. SUBMIT A "STANDARD TEMPORARY WALL SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY WALL CONSTRUCTION. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM: connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
14. DO NOT PLACE SHORING BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
15. FOR STANDARD TEMPORARY WALLS WITH PILE FOUNDATIONS IN THE REINFORCED ZONE, DRIVE PILES THROUGH REINFORCEMENT AFTER CONSTRUCTING TEMPORARY WALLS.
16. DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
17. CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
18. FOR STANDARD TEMPORARY WALLS WITH INTERIOR ANGLES LESS THAN 90 DEGREES, WRAP GEOSYNTHETICS AT ACUTE CORNERS AS DIRECTED BY THE ENGINEER.
19. FOR STANDARD TEMPORARY WALLS WITH TOP OF WALL WITHIN 5' OF FINISHED GRADE, REMOVE TOP FACING AND INCORPORATE TOP REINFORCEMENT LAYER INTO FILL WHEN PLACING FILL IN FRONT OF WALL.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD TEMPORARY WALL SHEET 2 OF 3

DATE: 10-19-21

PROJECT REFERENCE NO.	SHEET NO.
B-5716	2G-4

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 036283 ENGINEER SCOTT HUNSBERGER

DocuSigned by: W. Scott Hunsberger 1/17/2024 5AA69AC80FCD49E...

SIGNATURE DATE SIGNATURE DATE

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SLOPE OR SURCHARGE CASE	GROUNDWATER DEPTH BELOW BOTTOM OF REINFORCED ZONE (SEE NOTE 6 ON SHEET 2) (FT)	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)	H - WALL HEIGHT (FT)																								
			< 4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
SLOPE CASE	> 0	CLASS II,TYPE I, CLASS III,CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	8	9	11	12	13	13	14	15	16	17	18	19	20	21	22	23	24	24	25	26	27	27
SURCHARGE CASE	> 0 TO 7 FOR H < 20' > 0 TO 10 FOR H ≥ 20'	ALL SHORING BACKFILL TYPES	6	7	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	17	17	18	19	19	20	21	22
	> 7 FOR H < 20' > 10 FOR H ≥ 20'	A-2-4 SOIL	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16	17	18	18	19	20	20	21
		CLASS II,TYPE I OR CLASS III SELECT MATERIAL	6	6	7	7	8	8	9	10	10	11	11	12	12	13	14	15	15	16	16	17	17	18	18	19	20
		CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	7	7	8	8	9	9	10	10	11	12	13	13	14	14	15	15	16	17	17	18	19	19

L – MINIMUM REQUIRED REINFORCEMENT LENGTH (FT)

(FOR ALL REINFORCEMENT TYPES)

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL	A-2-4 SOIL	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL
1	2400	2400	2400	2400	2400
2	2400	2400	2400	2400	2400
3	2400	2400	2400	2400	2400
4	2400	2400	2500	2400	2400
5	2500	2400	3000	2400	2400
6	3000	2400	3500	2800	2400
7	3500	2700	4000	3200	2600
8	4000	3100	4500	3600	2900
9	4500	3500	5000	4000	3200
10	5000	3900	5500	4400	3500
11	5500	4300	6000	4800	3800
12	6000	4700	6500	5200	4100
13	6500	5100	7000	5600	4400
14	7000	5400	7500	6000	4700
15	7500	5800	8000	6400	5000
16	8000	6200	8500	6800	5300
17	8500	6600	9000	7200	5600
18	9000	7000	9500	7600	5900
19	9500	7400	10000	8000	6200
20	10000	7800	10500	8400	6500

GEOTEXTILE REINFORCEMENT
ULTIMATE TENSILE STRENGTH (LB/FT)

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL	A-2-4 SOIL	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL
1	240	200	340	290	240
2	380	310	520	430	350
3	530	420	700	570	460
4	690	550	870	720	570
5	860	690	1050	860	680
6	1030	830	1220	1000	790
7	1200	970	1400	1150	900
8	1370	1110	1580	1290	1010
9	1550	1240	1750	1430	1120
10	1720	1380	1930	1580	1230
11	1890	1520	2100	1720	1340
12	2060	1660	2280	1860	1450
13	2240	1800	2450	2010	1560
14	2410	1940	2630	2150	1670
15	2580	2080	2800	2290	1780
16	2750	2220	2980	2440	1890
17	2930	2360	3160	2580	2000
18	3100	2500	3330	2720	2110
19	3270	2640	3510	2860	2220
20	3440	2780	3690	3000	2330

GEOGRID REINFORCEMENT
SHORT-TERM DESIGN STRENGTH (LB/FT)
(SEE NOTE 10 ON SHEET 2.)

WALL HEIGHT (H) + WALL EMBEDMENT (FT)	NUMBER OF REINFORCEMENT LAYERS*
2.5 - 4	3
4 - 5.5	4
5.5 - 7	5
7 - 8.5	6
8.5 - 10	7
10 - 11.5	8
11.5 - 13	9
13 - 14.5	10
14.5 - 16	11
16 - 17.5	12
17.5 - 19	13
19 - 20.5	14
20.5 - 22	15
22 - 23.5	16
23.5 - 25	17
25 - 26.5	18
26.5 - 28	19
28 - 29.5	20

*BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 1.

MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD
(SEE NOTE 9 ON SHEET 2.)
*SEE PARTIAL ELEVATION ON SHEET 1 FOR REINFORCEMENT LAYER NUMBERING.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD TEMPORARY WALL
SHEET 3 OF 3

DATE: 11-19-13

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION		UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
-L- STA. 10+00.00	-L- STA. 16+09.00	7		19164	19157	
	(BEGIN BRIDGE)					
-L-/-DR3- STA. 21+52.00	-L-/-DR3- STA. 32+50.00	609		6580	5971	
(END BRIDGE)						
-DR1- STA. 10+11.00	-DR1- STA. 15+03.98	4		9014	9010	
-DR2- STA. 22+00.00	-DR2- STA. 24+03.06	510		12		498
PROJECT SUBTOTAL		1130		34770	34138	498
LOSS DUE TO CLEARING & GRUBBING		-150			150	
WASTE IN LIEU OF BORROW					-498	-498
PROJECT TOTAL		980		34770	33790	
EST. 5% TO REPLACE TOPSOIL ON BORROW PIT					1690	
GRAND TOTAL		980			35480	
SAY		1030			37260	

EST. DDE = 525 CY
EST. SHALLOW UNDERCUT = 100 CY
EST. CLASS IV SUBGRADE STABILIZATION = 200 TONS
PER GEOTECH RECOMMENDATIONS, ESTIMATED 950 CY OF UNDERCUT TO BE USED AT THE DISCRETION OF THE RESIDENT ENGINEER

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

NOTE: Approximate quantities only. Unclassified Excavation, Fine Grading, Clearing and Grubbing and Removal of Existing Asphalt Pavement will be paid for at the contract Lump Sum price for "Grading".

SUMMARY OF EXISTING ASPHALT PAVEMENT REMOVAL

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	SQ. YD.
-L-	10+00.00	16+08.00	CL	1041.93
-L-	20+17.00	20+68.00	LT	163.19
-L-	21+61.00	25+84.00	CL	1282.38
-L-	25+84.00	32+50.00	LT	85.54
-L-	25+84.00	32+50.00	RT	161.91
OLD DRIVE				200.42
PARKING LOT				1698.62
PARKING LOT DRIVE				182.16
TEMPORARY PAVEMENT				139.78
			TOTAL:	4955.93
			SAY:	5205

SUMMARY OF CHAIN LINK FENCE, 72" FABRIC WITH 3 STRAND BARBED WIRE

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	A FABRIC L.F.	B END BRACE EA.	C CORNER BRACE EA.	D LINE BRACE EA.	E LINE POSTS EA.	F TERMINAL POSTS EA.
-L-	24+75.09	24+76.44	RT	52.72'	2			2	2
-DR2-	23+00.00	23+36.25	LT	43.93'	1	2			3
-DR2-	23+00.00		RT	10.51'	1				1
			TOTAL:	107.16'				2	6
			SAY:	110'				2	6

SUMMARY OF SHOULDER BERM GUTTER

SURVEY LINE	STATION	STATION	LOCATION	LENGTH
-DR1-/-L-	11+29.26	15+94.00	RT/LT	429.00'
-L-	11+03.00	15+94.004	RT	491.00'
			TOTAL	920.00
			SAY	970'

SUMMARY OF WOVEN WIRE FENCE, 47" FABRIC

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	A FABRIC L.F.	B END BRACE EA.	C CORNER BRACE EA.	D LINE BRACE EA.	E LINE POSTS EA.	F TERMINAL POSTS EA.
-L-	10+00.00	15+94.00	RT	589.03'	2		2	37	10
			TOTAL:	589.03'				37	10
			SAY:	590'				37	10

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END
-L-	10+52.75	16+09.00	RT	556.25'			11+00.00	16+09.00 (BRIDGE)	6'	9'	50'		1'	
-DR1-/-L-	11+34 +/-	16+09.00	RT/LT	337.50'	112.50'		16+09.00 (BRIDGE)	11+00 -DR1-	6'	9'				
-DR2-	10+40 +/-	10+90 +/-	RT	50.00'										
-L-	24+00.00	24+93.75	LT	93.75'			24+00.00 (WALL)	21+52.00 (BRIDGE)	6'	9'	50'		1'	
-L-	24+76.67	25+57.92	RT	81.25'			21+52.00 (BRIDGE)	24+74.79 (WALL)	6'	9'		50'		1'
-DR2-	16+21 +/-	18+54 +/-	LT	225.00'			16+75 +/-	18+25 +/-			50'	50'	1'	1'
			TOTAL	1,343.75'										
		LESS DEDUCTION FOR ANCHOR UNITS												
		GRAU TL-2	2 X 25' =	-50.00'										
		GRAU TL-3	3 X 50' =	-150.00'										
		CAT-1	1 X 6.25' =	-6.25''										
		TYPE III	4 X 18.75' =	-75.00										
			GRAND TOTAL	1,062.50'	112.50'									

SURVEY LINE	BEG. STA.	ANCHORS XI MOD	ANCHORS XI	ANCHORS GREU TL-2	ANCHORS GREU TL-3	ANCHORS TYPE III	ANCHORS B-77	ANCHORS CAT-1	ANCHORS AT-1	ANCHORS TES	IMPACT ATTENUATOR TYPE 350 EA	IMPACT ATTENUATOR TYPE 350 G	IMPACT ATTENUATOR TYPE 350 NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
-L-	10+52.75				1	1											
-DR1-/-L-	11+34 +/-					1		1									
-DR2-	10+40 +/-									2							PERMANENT ROAD CLOSURE
-L-	24+00.00				1	1											
-L-	24+76.67				1	1											
-DR2-	16+21 +/-			2													
GRAND TOTAL				2	3	4		1		2							10 ADDITIONAL GUARDRAIL POSTS

US008215AB

COMPUTED BY:	M. L. MARLEY	DATE:	5/18/2023
CHECKED BY:	T. J. CORMIER	DATE:	3/9/2025

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
B-5716	3D-1

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

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

LINE & STATION	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, PVC, or PP PIPE) 12	15	18	24	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	C. S. PIPE 12 .064	15 .064	18 .064	24 .064	30 .079	36 .079
L 15+78	17 LT	0401		587.2																
		0401	0402		584.2	573.8														
L 13+35	17 RT	0402		577.8																
		0402	0403		573.8	572.3														
L 12+15	17 RT	0403		575.8																
		0403	0404		572.3	571.5														
L 11+13	17 RT	0404		576.0																
		0404	0405		571.5	567.3	0.3										28			
L 21+50	25 RT	0406		583.6																
		0406	0409		579.6	576.7														
L 13+35	17 LT	0407		578.4																
		0407	0402		574.4	573.8														
L 23+00	25 RT	0408		589.5																
		0408	0406		585.5	579.6														
L 20+89	24 RT	0409		582.1																
		0409	0410		576.7	548.0	0.2													
DR1 13+15	31 LT	0411			558.7	558.2														
DR1 11+18	21 RT	0412		574.6			0.7													
		0412	0413		570.6	564.0										28				
L 15+04	33 RT	0501																		
L 23+00	14 RT	0502		598.0																
		0502	0503		595.3	591.8														
L 24+70	14 RT	0503		597.8																
		0503	0505		591.8	591.3														
L 24+85	26 RT	0504	0505	598.0	595.0	591.3											28			
L 24+70	25 RT	0505		596.3																
		0505	0408		596.3	585.5														
L 26+34	22 RT	0506																		
L 27+16	22 RT	0507																		
L 28+18	23 RT	0508																		
SHEET TOTALS																28	56			
PROJECT TOTALS																28	56			

LINE & STATION	FROM	TO	R. C. PIPE CLASS III 12	15	18	24	30	36	42	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	R. C. PIPE CLASS V 12	15	18	24	30	36	42	STRUCTURAL PLATE PIPE 60	66	72
L 15+78	0401																										
	0401	0402									240																
L 13+35	0402																										
	0402	0403										116															
L 12+15	0403																										
	0403	0404										96															
L 11+13	0404																										
	0404	0405																									
L 21+50	0406																										
	0406	0409										60															
L 13+35	0407																										
	0407	0402			32							32															
L 23+00	0408																										
	0408	0406			144																						
L 20+89	0409																										
	0409	0410																									
DR1 13+15	0411							64																			
DR1 11+18	0412																										
	0412	0413																									
L 15+04	0501																										
L 23+00	0502																										
	0502	0503									52																
L 24+70	0503																										
	0503	0505																									
L 24+85	0504	0505																									
L 24+70	0505			8																							
	0505	0408			160																						
L 26+34	0506																										
L 27+16	0507																										
L 28+18	0508																										
SHEET TOTALS				8	336			64			292	304															
PROJECT TOTALS				8	336			64			292	304															

LINE & STATION	FROM	TO	36" WELDED STEEL PIPE ##" THICK, GRADE B (UNDER RR) (50% IN SOIL; 50% OUT OF SOIL	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	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. (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	T.B.D.I. STD. 840.35	15" C.S. ELBOW	18" C.S. ELBOW	PIPE REMOVAL LIN. FT.	REMARKS
L 15+78	0401									1																	1	1				
	0401	0402																														
L 13+35	0402									1																	1	1				
	0402	0403																														
L 12+15	0403									1																	1	1				
	0403	0404																														
L 11+13	0404									1																	1	1				
	0404	0405																												2		
L 21+50	0406									1			1			1																
	0406	0409																														
L 13+35	0407									1																	1	1				
	0407	0402																														
L 23+00	0408									1			1			1																
	0408	0406																														
L 20+89	0409									1	0.4																1	1				
	0409	0410	132																													36" welded steel, bore and jack under RR, 131' len.
DR1 13+15	0411						2.800																									HW, Q25, seepipe data sheet
DR1 11+18	0412									1																	1	1				
	0412	0413																											2			
L 15+04	0501						0.732																									
L 23+00	0502									1																	1	1				
	0502	0503																														
L 24+70	0503									1	1.0																1	1				
	0503	0505																														
L 24+85	0504	0505																												2		
L 24+70	0505									1			1			1																
	0505	0408																														
L 26+34	0506			40																												
L 27+16	0507			52																												
L 28+18	0508			60																												
SHEET TOTALS			132	152			3.532			12	1.4		3			3											9	9	2	4		
PROJECT TOTALS			132	152			3.532			12	1.4		3			3											9	9	2	4		

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: Hunsberger, W. S. DATE: 6/17/25
CHECKED BY: Hamm, J. R. DATE: 6/17/25

(9-17-24)

PROJECT NO.	SHEET NO.
B-5716	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 (6")	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.

SUMMARY OF ROCK PLATING

LINE	Beginning Slope (H:V)	Approx. Station	Ending Slope (H:V)	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/3/4	Riprap Class* 1/2/B	Rock Plating SY
-L-	1.5:1	24+50	1.5:1	25+50	LT	2		200
							TOTAL SY:	200

*Use Class 1, 2 or B riprap if riprap class is not shown for rock plating location.

SUMMARY OF BRIDGE WAITING PERIODS

Bridge Description	End Bent/ Bent No.	MONTHS
Bridge No. 140	EB1	1
Bridge No. 140	EB2	1

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-5716	3P-1

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PARCEL INDEX SHEET

PARCEL NO.	SHEET NO.	PROPERTY OWNERS NAME
1	4	WILLIAM MARTIN WILLIAMSON
2	4	JEFFREY D. MURRHY, MONICA C. MEDINA-MURRHY
3	4	TOWN OF MADISON
4	4, 5	PINE HALL BRICK COMPANY INC

9:13:24 AM
c:\pwworking\hmm\roll_transit\jor66165\d0171410\B5716_rdy_psh03P.dgn
jordan

PROJECT REFERENCE	SHEET NO.
B-5716	4

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21102	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 34364
09-Jun-2025	09-Jun-2025
MOTT MACDONALD I& E, LLC LICENSE NO. F-0669	MOTT MACDONALD I& E, LLC LICENSE NO. F-0669

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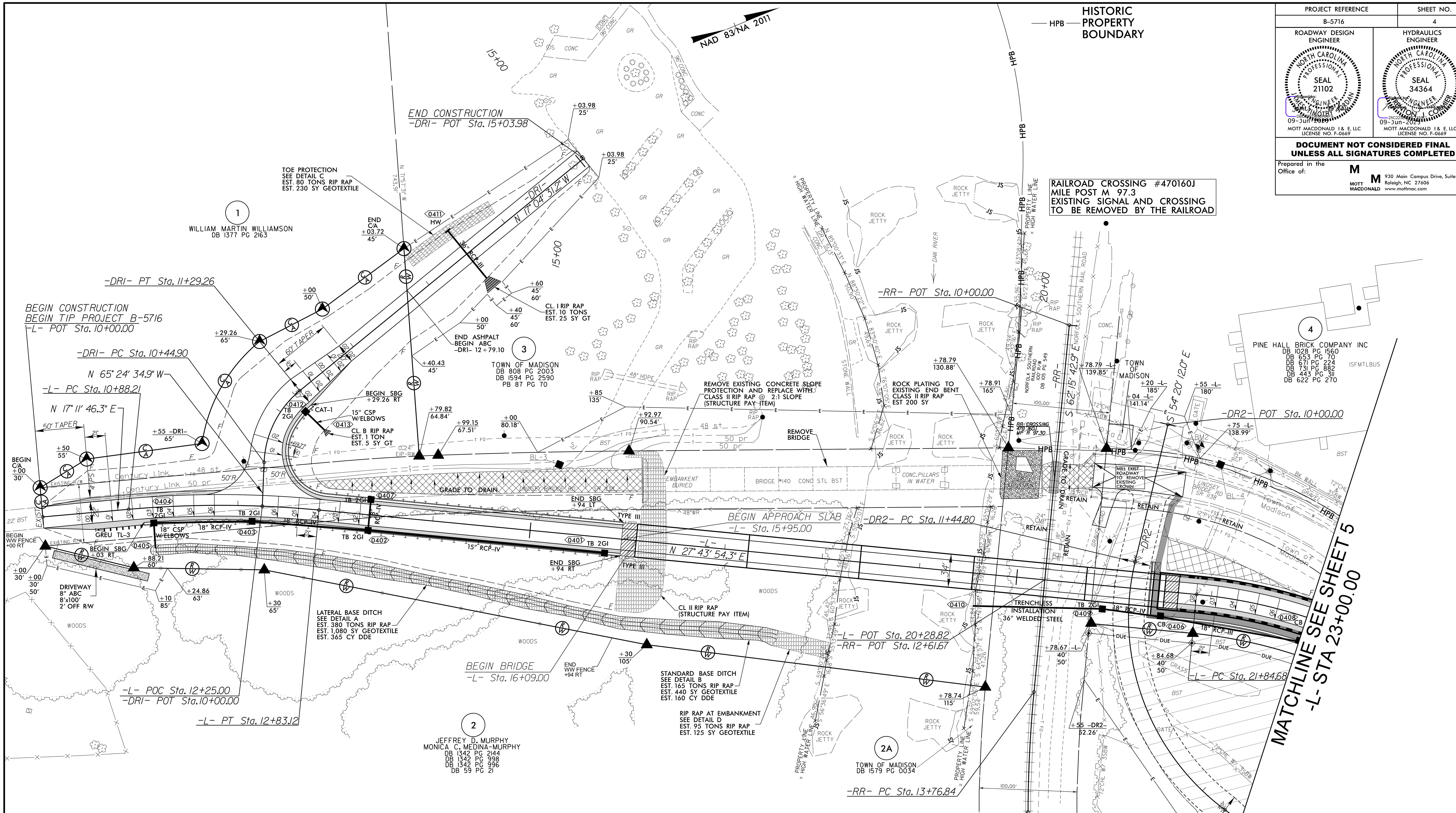
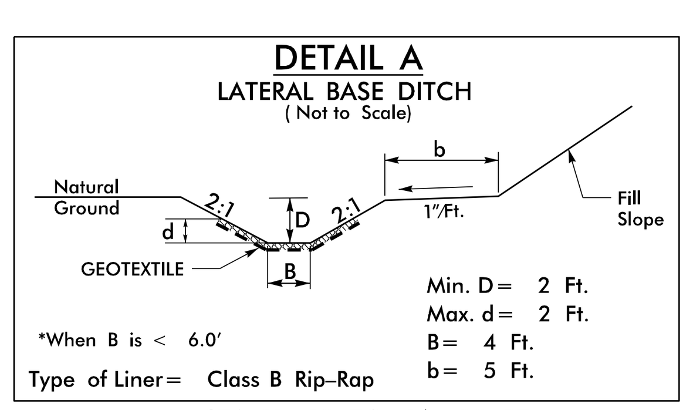
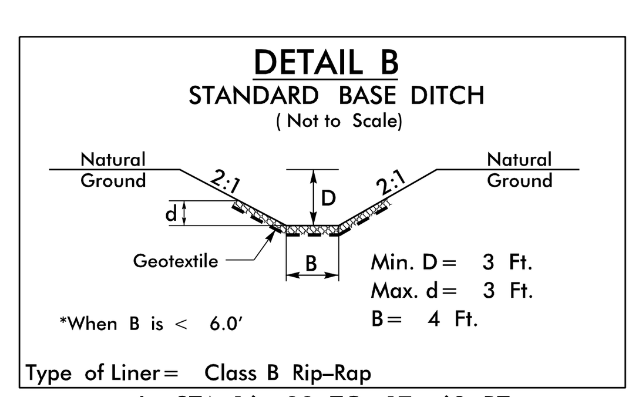
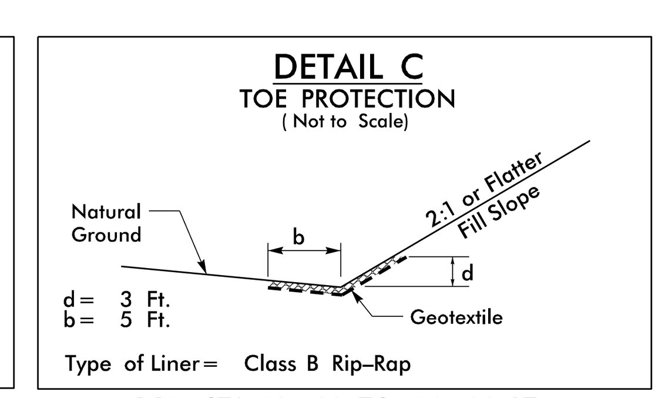
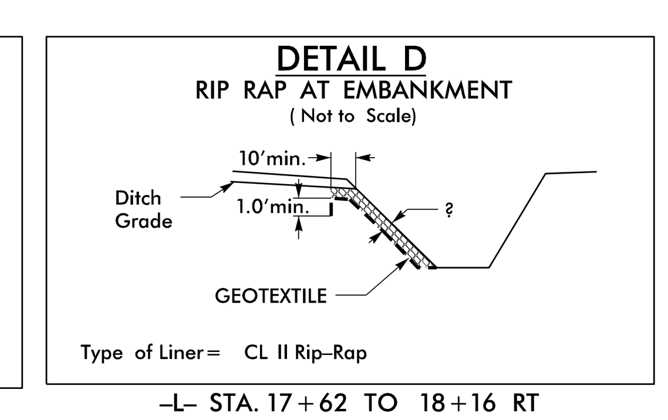


HISTORIC PROPERTY BOUNDARY
HPB
NAD 83/NA 2011
END CONSTRUCTION -DR1- POT Sta. 15+03.98
TOE PROTECTION SEE DETAIL C EST. 80 TONS RIP RAP EST. 230 SY GEOTEXTILE
WILLIAM MARTIN WILLIAMSON DB 1377 PG 2163
-DR1- PT Sta. 11+29.26
BEGIN CONSTRUCTION
BEGIN TIP PROJECT B-5716
-L- POT Sta. 10+00.00
-DR1- PC Sta. 10+44.90
N 65° 24' 34.9" W
-L- PC Sta. 10+88.21
N 17° 11' 46.3" E
N 17° 04' 31.2" W
END ASPHALT BEGIN ABC -DR1- 12+79.10
TOWN OF MADISON DB 808 PG 2003 DB 1594 PG 2590 PB 87 PG 70
CL. I RIP RAP EST. 10 TONS EST. 25 SY GT
BEGIN SBG +29.26 RT
15" CSP W/ELBOWS
CL. B RIP RAP EST. 1 TON EST. 5 SY GT
REMOVE EXISTING CONCRETE SLOPE PROTECTION AND REPLACE WITH CLASS II RIP RAP @ 2:1 SLOPE (STRUCTURE PAY ITEM)
REMOVE BRIDGE
GRADE TO DRAIN
BRIDGE 140 CONC STL BST
CONC. PILLARS IN WATER
RAILROAD CROSSING #470160J MILE POST M 97.3 EXISTING SIGNAL AND CROSSING TO BE REMOVED BY THE RAILROAD
-RR- POT Sta. 10+00.00
ROCK PLATING TO EXISTING END BENT CLASS II RIP RAP EST 200 SY
TOWN OF MADISON
NORFOLK SOUTHERN RAIL ROAD
PINE HALL BRICK COMPANY INC DB 1028 PG 1560 DB 653 PG 70 DB 671 PG 224 DB 731 PG 882 DB 443 PG 311 DB 622 PG 270
-DR2- POT Sta. 10+00.00
MILL EXIST ROADWAY TO REMOVE EXISTING CROWN
BEGIN APPROACH SLAB -L- Sta. 15+95.00
-DR2- PC Sta. 11+44.80
N 27° 43' 54.3" E
S 62° 15' 42.9" E
S 54° 20' 12.0" E
END SBG +94 LT
END SBG +94 RT
GREU TL-3
BEGIN SBG +03 RT
BEGIN WW FENCE +00 RT
DRIVEWAY 8" ABC 8'x100' 2' OFF R/W
18" CSP W/ELBOWS
18" RCP-IV
15" RCP-IV
TB 2GI
CL II RIP RAP (STRUCTURE PAY ITEM)
LATERAL BASE DITCH SEE DETAIL A EST. 380 TONS RIP RAP EST. 1,080 SY GEOTEXTILE EST. 365 CY DDE
TRENCHLESS INSTALLATION 36" WELDED STEEL
-L- POT Sta. 20+28.82
-RR- POT Sta. 12+61.67
BEGIN BRIDGE -L- Sta. 16+09.00
END WW FENCE +94 RT
STANDARD BASE DITCH SEE DETAIL B EST. 165 TONS RIP RAP EST. 440 SY GEOTEXTILE EST. 160 CY DDE
RIP RAP AT EMBANKMENT SEE DETAIL D EST. 95 TONS RIP RAP EST. 125 SY GEOTEXTILE
-L- POC Sta. 12+25.00
-DR1- POT Sta. 10+00.00
-L- PT Sta. 12+83.12
JEFFREY D. MURPHY MONICA C. MEDINA-MURPHY DB 1342 PG 2144 DB 1342 PG 998 DB 1342 PG 996 DB 59 PG 21
TOWN OF MADISON DB 1579 PG 0034
-RR- PC Sta. 13+76.84
-RR- PT Sta. 15+00.00
-L- PC Sta. 21+84.68
-DR2- PT Sta. 14+30.23
MATCHLINE SEE SHEET 5 -L- STA 23+00.00
WOODS









PINE HALL BRICK COMPANY INC
DB 1028 PG 1560
DB 653 PG 70
DB 671 PG 224
DB 731 PG 882
DB 443 PG 311
DB 622 PG 270

-L-

PI Sta 11+85.94	PI Sta 23+91.40
Δ = 10° 32' 08.0" (RT)	Δ = 42° 36' 59.1" (RT)
D = 5° 24' 18.9"	D = 10° 48' 37.9"
L = 194.91'	L = 394.21'
T = 97.73'	T = 206.73'
R = 1,060.00'	R = 530.00'
SE = 06	SE = 06
RO = 126'	

-DR1-

PI Sta 10+89.77
Δ = 48° 20' 03.8" (RT)
D = 57° 17' 44.8"
L = 84.36'
T = 44.87'
R = 100.00'
SE = 02

-DR2-

PI Sta 13+06.20
Δ = 66° 45' 05.1" (LT)
D = 23° 23' 09.7"
L = 285.43'
T = 161.40'
R = 245.00'
SE = EXIST

-RR-

PI Sta 14+38.46
Δ = 5° 15' 58.0" (LT)
D = 4° 16' 32.9"
L = 123.16'
T = 61.62'
R = 1,340.00'

PAVEMENT REMOVAL
SIDEWALK
PAVED SHOULDER
OVERLAY AREA 1.5" S9.5B

FOR -L- PROFILE SEE SHEET 6
FOR -DR1- PROFILE SEE SHEET 7
FOR -DR2- PAINT STIPING SEE PMP PLANS

FOR STRUCTURE/RETAINING WALL DETAIL SEE SHEET 2B-4
FOR STRUCTURE PLANS SEE SHEETS S01-1 THRU S01-48
FOR WALL PLANS SEE SHEETS W-1 THRU W-6

iso-hcoker
6/4/2025 2:25:47 PM

PROJECT REFERENCE	SHEET NO.
B-5716	5

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21102 — 09-Jun-2025 — MOTT MACDONALD I& E, LLC LICENSE NO. F-0669

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 34364 — 09-Jun-2025 — MOTT MACDONALD I& E, LLC LICENSE NO. F-0669

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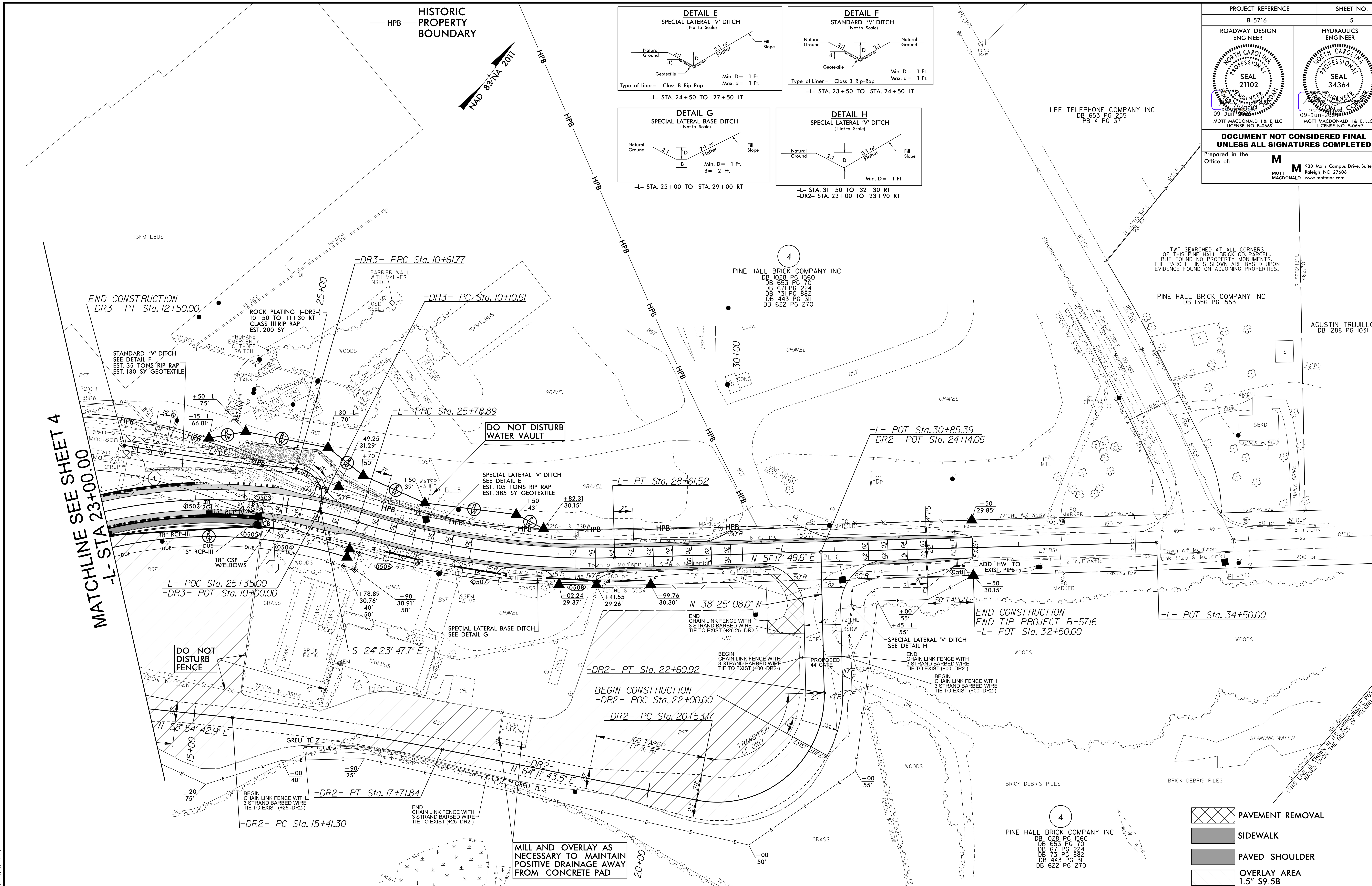

PAVEMENT REMOVAL

SIDEWALK

PAVED SHOULDER

OVERLAY AREA 1.5" S9.5B

-L-	
PI Sta 23+91.40	PI Sta 27+21.52
△ = 42° 36' 59.1" (RT)	△ = 19° 03' 03.8" (LT)
D = 10° 48' 37.9"	D = 6° 44' 26.4"
L = 394.21'	L = 282.63'
T = 206.73'	T = 142.63'
R = 530.00'	R = 850.00'
SE = 06	SE = 06
	RO = 126'

-DR2-	
PI Sta 16+56.65	PI Sta 21+98.00
△ = 5° 17' 00.5" (RT)	△ = 102° 36' 51.5" (LT)
D = 2° 17' 30.6"	D = 49° 23' 34.5"
L = 230.54'	L = 207.75'
T = 115.35'	T = 144.83'
R = 2,500.00'	R = 116.00'
SE = EXIST	SE = 02

(#) TEMP. SHORING (SEE TMP PLANS)

-DR3-	
PI Sta 10+44.94	PI Sta 11+55.95
△ = 97° 42' 28.4" (LT)	△ = 5° 23' 33.0" (RT)
D = 190° 59' 09.4"	D = 2° 51' 53.2"
L = 51.16'	L = 188.23'
T = 34.33'	T = 94.19'
R = 30.00'	R = 2,000.00'
SE = 02	SE = 02

FOR -L- PROFILE SEE SHEET 7
FOR -DR2- PROFILE SEE SHEET 7
FOR -DR2- PAINT STRIPING SEE PMP PLANS
FOR -DR3- PROFILE SEE SHEET 7

FOR STRUCTURE / RETAINING WALL DETAIL SEE SHEET 2B-4
FOR STRUCTURE PLANS SEE SHEETS S01-1 THRU S01-48
FOR WALL PLANS SEE SHEETS W-1 THRU W-6

PROJECT REFERENCE	SHEET NO.
B-5716	6

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER JOSEPH T. MOTLEY

09-Jun-2021

MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 34364 ENGINEER THOMAS J. COMER

09-Jun-2021

MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

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www.mottmac.com

VERTICAL SCALE 5' 0 5' 10'
HORIZONTAL SCALE 25' 0 25' 50'

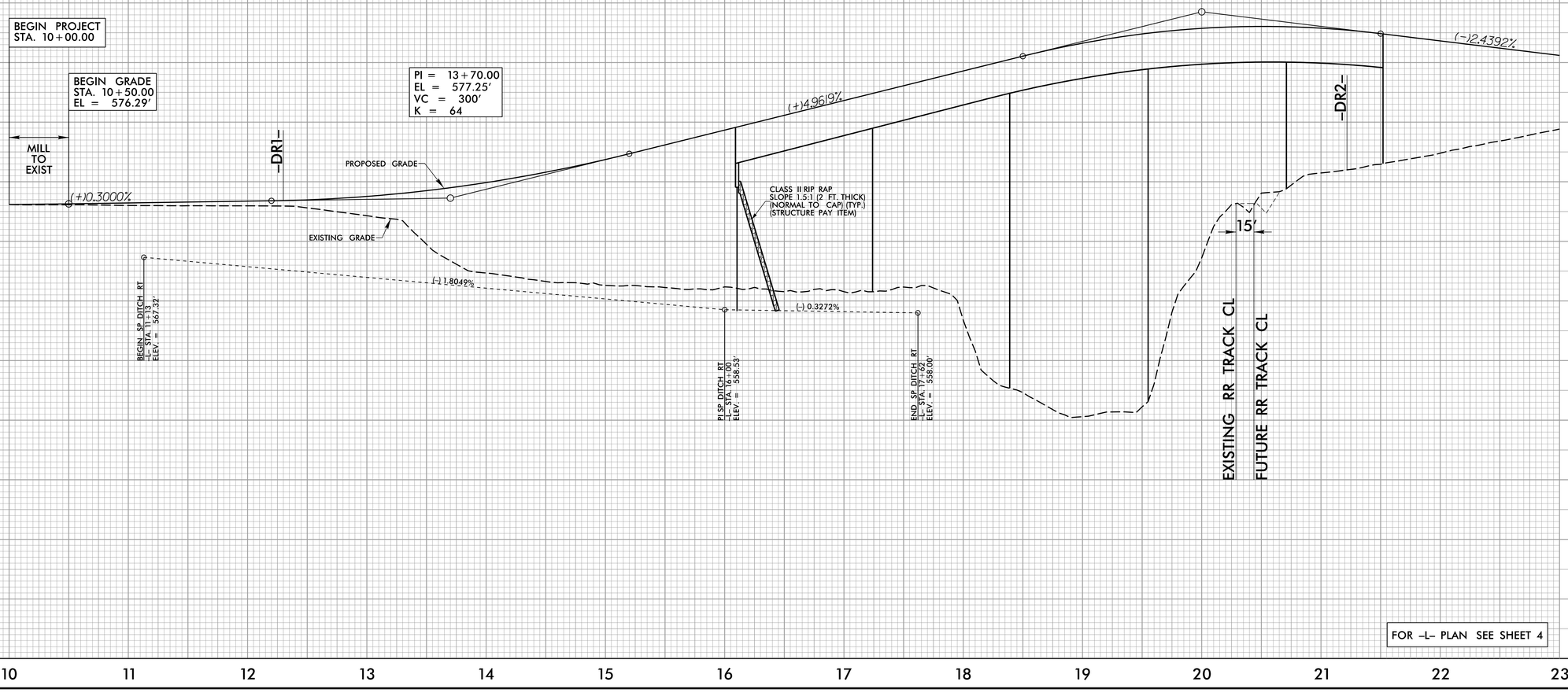
-L-

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 27,000	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 571.0	FT
BASE DISCHARGE	= 35,900	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 573.6	FT
OVERTOPPING DISCHARGE	= 59,000	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 576.2	FT
DATE OF SURVEY	= 11/11/2021	
W.S. ELEVATION AT DATE OF SURVEY	= 543.3	FT

BM2 ELEVATION = 581.85
N 957067 E 1707919
L STATION 21+75.58 151.71' LEFT
BOLT AT "N" ON FIRE HYDRANT

PI = 20+00.00
EL = 608.51'
VC = 300'
K = 41



FOR -L- PLAN SEE SHEET 4

PROJECT REFERENCE NO.	SHEET NO.
B-5716	7

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER JAMES TIMOTHY JORDAN. Signed by: James T. Jordan, DBD87EDB56F64FA... 09-Jun-2025. MOTT MACDONALD I & E, LLC LICENSE NO. F-0669

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 34364 ENGINEER TRENTON J. CORMIER. Signed by: Trenton J. Cormier, 25C223E696C7455... 09-Jun-2025. MOTT MACDONALD I & E, LLC LICENSE NO. F-0669

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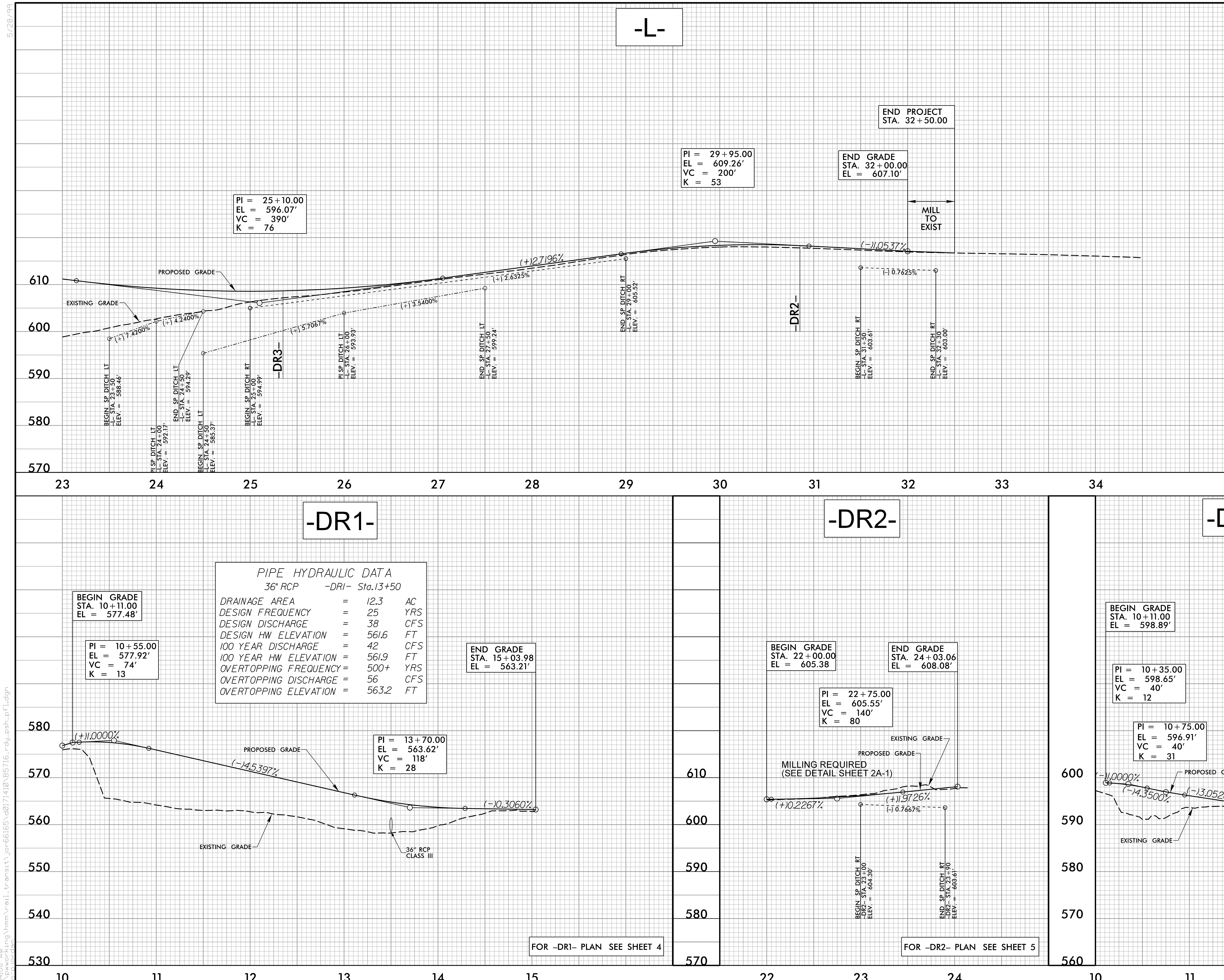
VERTICAL SCALE 5′ 0 5′ 10′ — HORIZONTAL SCALE 25′ 0 25′ 50′


-L-
PI = 25+10.00 EL = 596.07′ VC = 390′ K = 76
PI = 29+95.00 EL = 609.26′ VC = 200′ K = 53
END GRADE STA. 32+00.00 EL = 607.10′
END PROJECT STA. 32+50.00
MILL TO EXIST
PROPOSED GRADE
EXISTING GRADE
(+)2.7196%
(−)1.0537%
(+) 2.6325%
(+) 3.5400%
(+) 5.7067%
(+) 4.2400%
(+) 7.4200%
(−) 0.7625%
-DR3-
-DR2-
BEGIN SP DITCH LT -L- STA. 23+50 ELEV. = 588.46′
PI SP DITCH LT -L- STA. 24+00 ELEV. = 592.17′
END SP DITCH LT -L- STA. 24+50 ELEV. = 594.29′
BEGIN SP DITCH LT -L- STA. 24+50 ELEV. = 585.37′
BEGIN SP DITCH RT -L- STA. 25+00 ELEV. = 594.99′
PI SP DITCH LT -L- STA. 26+00 ELEV. = 593.93′
END SP DITCH LT -L- STA. 27+50 ELEV. = 599.24′
END SP DITCH RT -L- STA. 29+00 ELEV. = 605.52′
BEGIN SP DITCH RT -L- STA. 31+50 ELEV. = 603.61′
END SP DITCH RT -L- STA. 32+30 ELEV. = 603.00′
FOR -L- PLAN SEE SHEET 5
610 600 590 580 570
23 24 25 26 27 28 29 30 31 32 33 34
-DR1-
PIPE HYDRAULIC DATA
36″ RCP -DR1- Sta.13+50
DRAINAGE AREA = 12.3 AC
DESIGN FREQUENCY = 25 YRS
DESIGN DISCHARGE = 38 CFS
DESIGN HW ELEVATION = 561.6 FT
100 YEAR DISCHARGE = 42 CFS
100 YEAR HW ELEVATION = 561.9 FT
OVERTOPPING FREQUENCY = 500+ YRS
OVERTOPPING DISCHARGE = 56 CFS
OVERTOPPING ELEVATION = 563.2 FT
BEGIN GRADE STA. 10+11.00 EL = 577.48′
PI = 10+55.00 EL = 577.92′ VC = 74′ K = 13
END GRADE STA. 15+03.98 EL = 563.21′
PI = 13+70.00 EL = 563.62′ VC = 118′ K = 28
(+)1.0000%
(−)4.5397%
(−)0.3060%
PROPOSED GRADE
EXISTING GRADE
36″ RCP CLASS III
FOR -DR1- PLAN SEE SHEET 4
580 570 560 550 540 530
10 11 12 13 14 15
-DR2-
BEGIN GRADE STA. 22+00.00 EL = 605.38
END GRADE STA. 24+03.06 EL = 608.08′
PI = 22+75.00 EL = 605.55′ VC = 140′ K = 80
EXISTING GRADE
PROPOSED GRADE
MILLING REQUIRED (SEE DETAIL SHEET 2A-1)
(+)0.2267%
(+)1.9726%
(−) 0.7667%
BEGIN SP DITCH RT -DR2- STA. 23+00 ELEV. = 604.30′
END SP DITCH RT -DR2- STA. 23+90 ELEV. = 603.61′
FOR -DR2- PLAN SEE SHEET 5
610 600 590 580 570
22 23 24
-DR3-
BEGIN GRADE STA. 10+11.00 EL = 598.89′
END GRADE STA. 12+50.00 EL = 589.55′
PI = 10+35.00 EL = 598.65′ VC = 40′ K = 12
PI = 11+70.00 EL = 594.01′ VC = 50′ K = 16
PI = 10+75.00 EL = 596.91′ VC = 40′ K = 31
PI = 12+25.00 EL = 590.60′ VC = 50′ K = 25
PROPOSED GRADE
EXISTING GRADE
(−)1.0000%
(−)4.3500%
(−)3.0526%
(−)6.2000%
(−)4.1833%
FOR -DR3- PLAN SEE SHEET 5
600 590 580 570 560
10 11 12 13