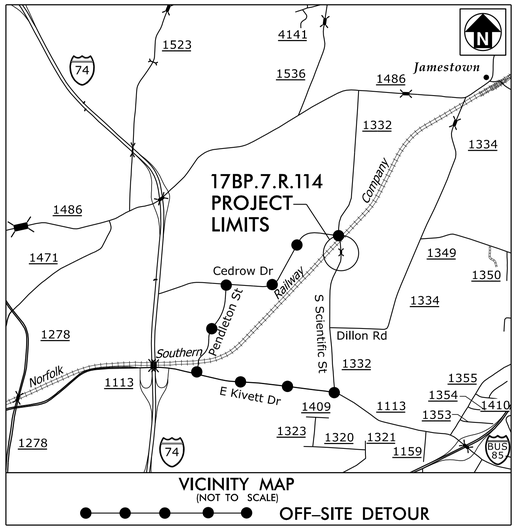
PROJECT: 17BP.7.R.114

CONTRACT: C205202



VICINITY MAP
(NOT TO SCALE)

OFF–SITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

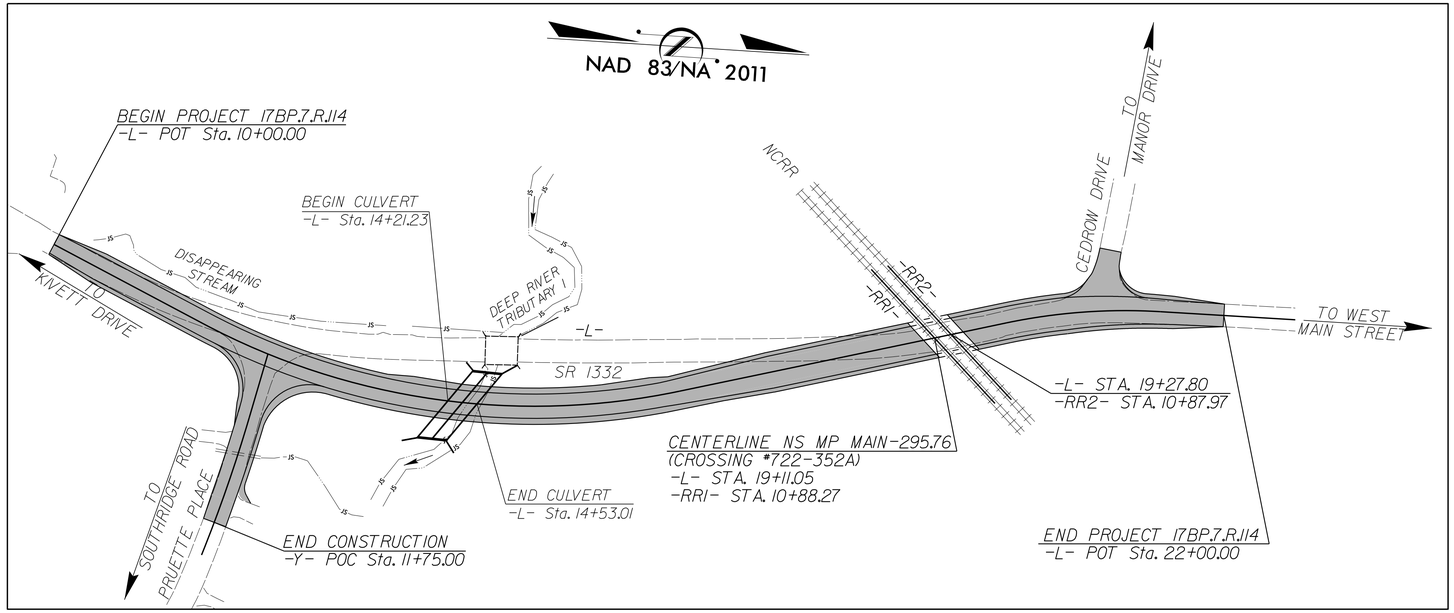
GUILFORD COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.7.R.114	1	

STATE PROJECT NO.	F.A. PROJ. NO.	DESCRIPTION
17BP.7.PE.114	N/A	PE
17BP.7.ROW.114	N/A	RW/UTL
17BP.7.R.114	N/A	CONST.

LOCATION: BRIDGE #400052 OVER DEEP RIVER TRIBUTARY 1 ON SR 1332 (SCIENTIFIC STREET)

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



DESIGN EXCEPTION APPROVED FOR:
VERTICAL SSD (CREST)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2026 = 4125

ADT 2046 = 6625

TTST = 6%

V = 40 MPH

SUB REGIONAL TIER
MAJOR ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY PROJECT = 0.221 MILES

LENGTH STRUCTURE PROJECT = 0.006 MILES

TOTAL LENGTH PROJECT = 0.227 MILES

Prepared in the Office of Mott MacDonald for

DIVISION 7

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JUNE 6, 2018

LETTING DATE: AUGUST 18, 2026

TIM JORDAN, PE
PROJECT ENGINEER

JOSHUA MASSROCK, PE
HYDRAULICS ENGINEER

NCDOT CONTACT: DANIEL DAGENHART, MS
DIVISION BRIDGE PROGRAM MANAGER

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER JAMES TIMOTHY JORDAN

Signed by: James Timothy Jordan
DocuSigned by:
SIGNATURE:
03-Jun-2026
P.E.

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042084 ENGINEER JOSHUA MASSROCK

Signed by: Joshua Massrock
DocuSigned by:
SIGNATURE:
03-Jun-2026
P.E.

PLANS PREPARED BY:

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

LICENSE NO. F-0669

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

$$DATE$$
5/11/2026
c:\pwworking\hmm\rail-transit_jor66165\d0176622\400052_rdy_tsh.dgn
tsajordan

GENERAL NOTES

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

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

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".

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE HIGH POINT (POWER, WATER & SEWER), DUKE ENERGY, LUMOS, SPECTRUM AND PIEDMONT NATURAL GAS.

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

RIGHT–OF–WAY MARKERS:

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

LIST OF ROADWAY STANDARD DRAWINGS

EFF. 01–16–2024
REV. 11–26–2025

2024 ROADWAY ENGLISH STANDARD DRAWINGS

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
225.06	Method of Grading Sight Distance at Intersections
	DIVISION 3 – PIPE CULVERTS
300.01	Method of Pipe Installation (Use Details in Lieu of Standards for Sheets 1 and 2 of 2)
310.10	Driveway Pipe Construction
	DIVISION 5 – SUBGRADE, BASES AND SHOULDERS
560.01	Method of Shoulder Construction – High Side of Superelevated Curve – Method I
	DIVISION 6 – ASPHALT BASES AND PAVEMENTS
654.01	Pavement Repairs
	DIVISION 8 – INCIDENTALS
806.01	Concrete Right–of–Way Marker
806.02	Granite Right–of–Way Marker
840.00	Concrete Base Pad for Drainage Structures
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
840.54	Manhole Frame & Cover
840.66	Drainage Structure Steps
848.04	Street Turnout
852.06	Method for Placement of Drop Inlets in Concrete Islands
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)
876.01	Rip Rap in Channels & Ditches
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

PROJECT REFERENCE	SHEET NO.
17BP.7.R.114	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER TIMOTHY JORDAN
Signed by: Timothy Jordan
25-Jun-2026

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

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Prepared in the Office of:
MOTT MACDONALD
930 Main Campus Drive, Suite 200
Raleigh, NC 27606
www.mottmac.com

INDEX OF SHEETS

SHEET NUMBER	DESCRIPTION
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A–1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2B–1	RAILROAD CROSSING DETAIL
2C–1	6" NON–MOUNTABLE CONCRETE ISLAND DETAIL
2C–2	DRAINAGE OPENING THRU MONOLITHIC ISLAND DETAIL
2C–3 THRU 2C–4	METHOD OF PIPE INSTALLATION DETAIL
2C–5 THRU 2C–6	GUARDRAIL PLACEMENT DETAILS
2C–7	CONCRETE CATCH BASIN (3 OR 4 SIDE OPEN THROAT)
2G–1 THRU 2G–3	STANDARD TEMPORARY (SHORING) WALL DETAILS
3B–1	GUARDRAIL, EARTHWORK AND PAVEMENT REMOVAL SUMMARIES
3D–1	DRAINAGE SUMMARY
4	PLAN SHEET
5	PROFILE SHEET
RW01 THRU RW04	RIGHT OF WAY PLANS
TMP–1 THRU TMP–8	TRAFFIC MANAGEMENT PLANS
EC–1 THRU EC–5	EROSION CONTROL PLANS
RF–1	REFORESTATION PLAN
UC–1 THRU UC–5	UTILITIES CONSTRUCTION PLANS
UO–1 THRU UO–2	UTILITIES BY OTHERS PLAN
X–1	CROSS–SECTION INDEX SHEET
X–1A	CROSS–SECTION SUMMARY SHEET
X–2 THRU X–9	CROSS–SECTIONS
C–1 THRU C–6	CULVERT PLANS
CN	CULVERT NOTES

9/10/2021

PROJECT REFERENCE	SHEET NO.
17BP.7.R.114	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:

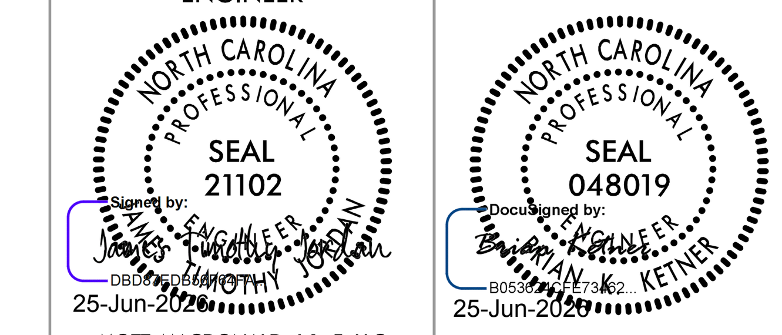
- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line
- Above Ground Sanitary Sewer
- SS Force Main Line Test Hole (SUE – LOS A)*
- SS Force Main Line (SUE – LOS B)*
- SS Force Main Line (SUE – LOS C)*
- SS Force Main Line (SUE – LOS D)*

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.
17BP.7.R.114	2A-1

ROADWAY DESIGN ENGINEER



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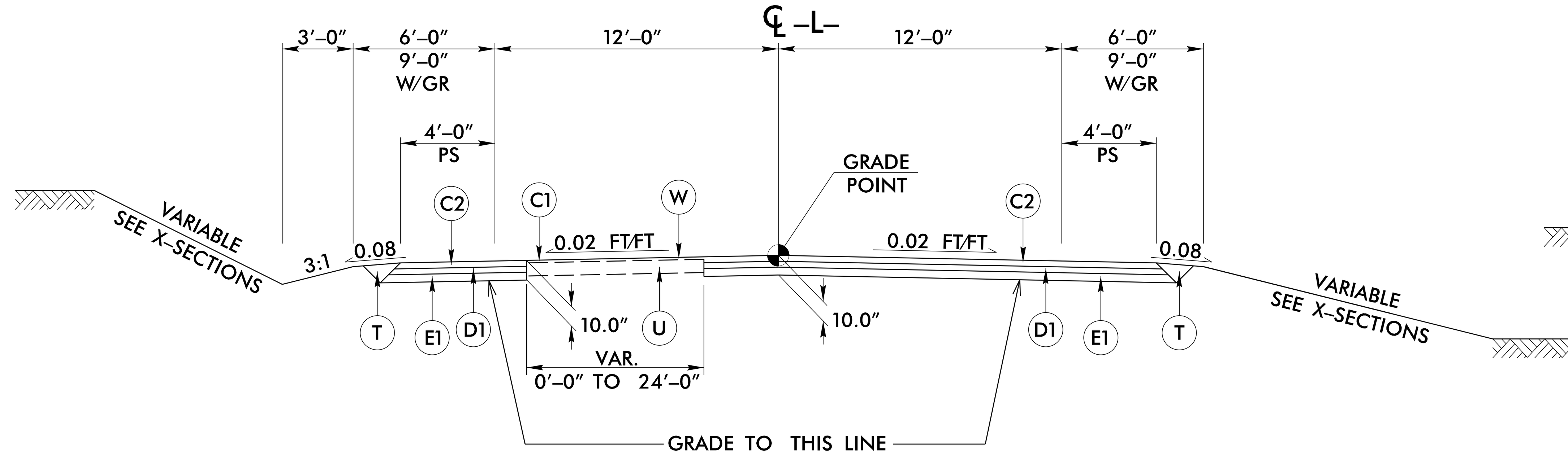
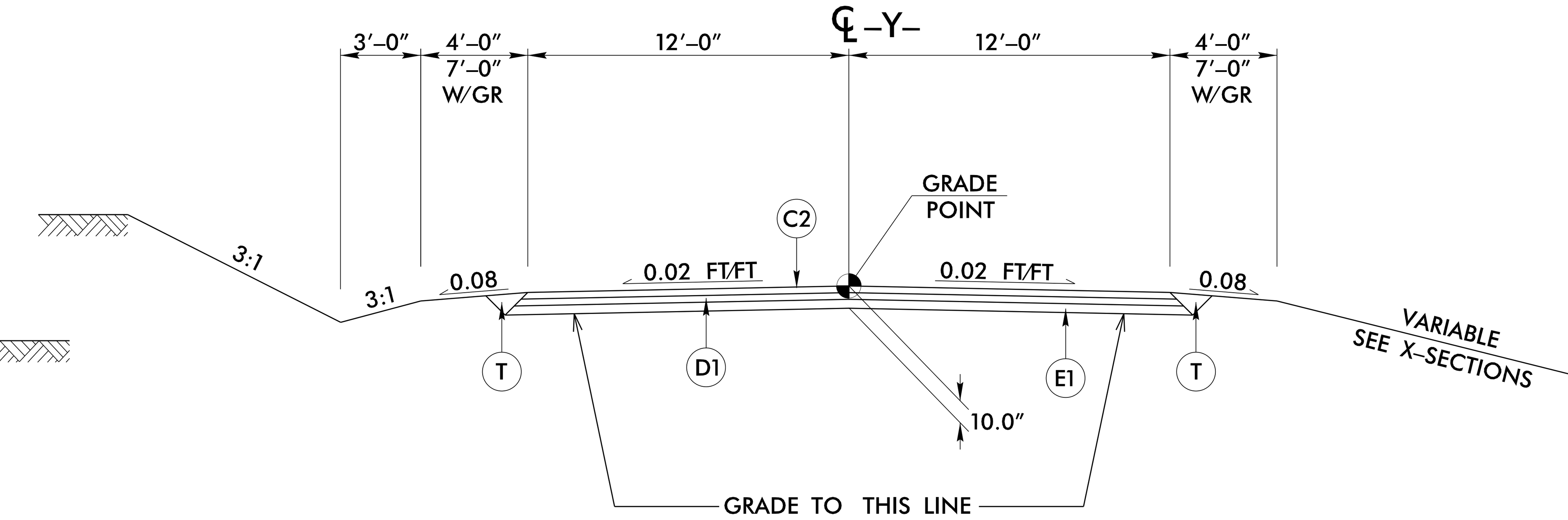


TYPICAL SECTION NO. 1

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

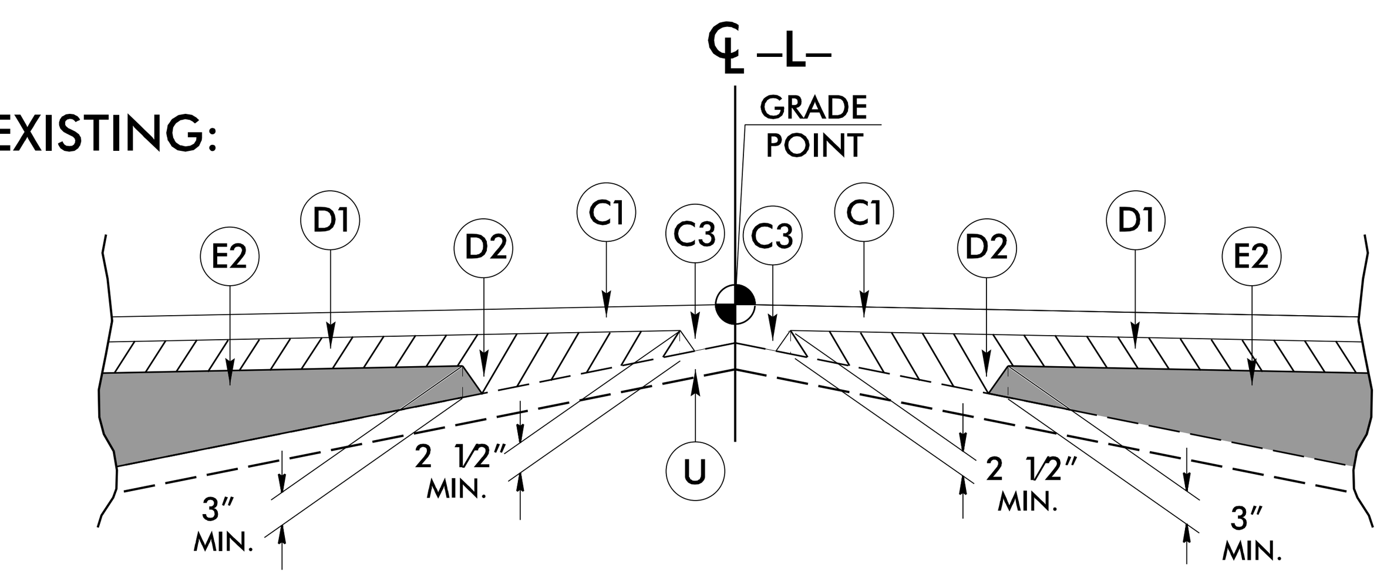
TRANSITION FROM TYPICAL SECTION NO. 1 TO EXISTING:
-L- STA 21+50.00 TO 22+00.00



TYPICAL SECTION NO. 4

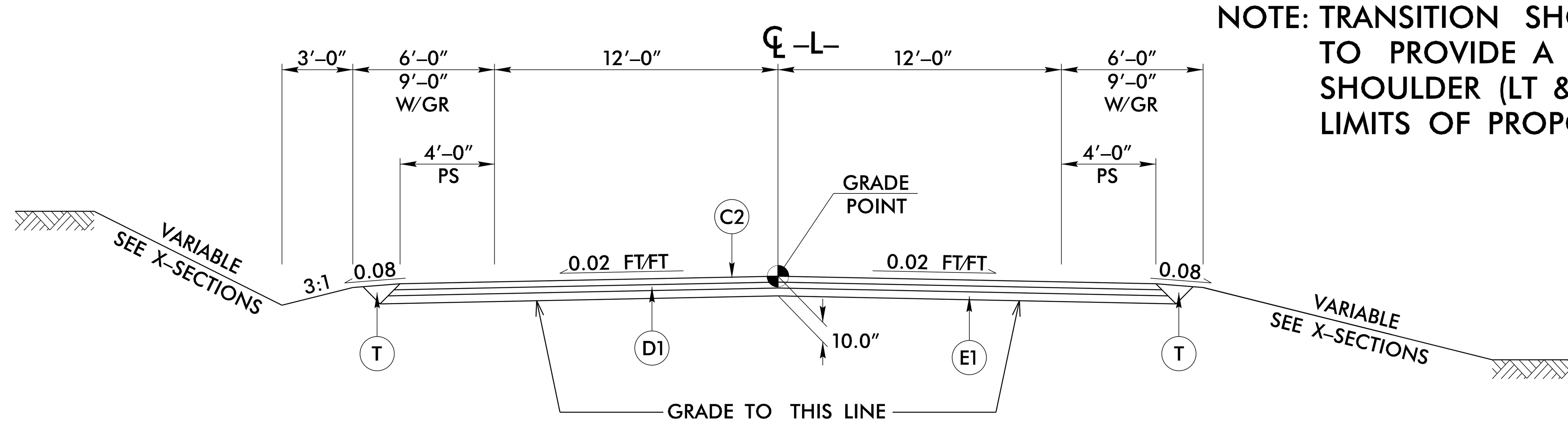
USE TYPICAL SECTION NO. 4:
-Y- STA 10+12.06 TO 11+50.00

TRANSITION FROM TYPICAL SECTION NO. 3 TO EXISTING:
-Y- STA 11+50.00 TO 11+75.00



Detail Showing Method of Wedging

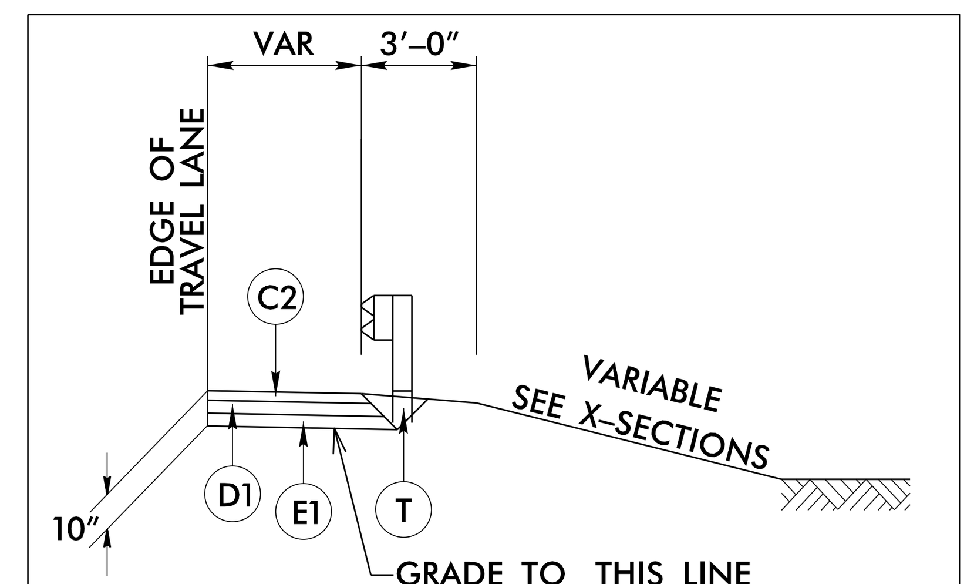
NOTE: TRANSITION SHOULDER WIDTH TO PROVIDE A 12'-0" TOTAL SHOULDER (LT & RT) WITHIN LIMITS OF PROPOSED CULVERT



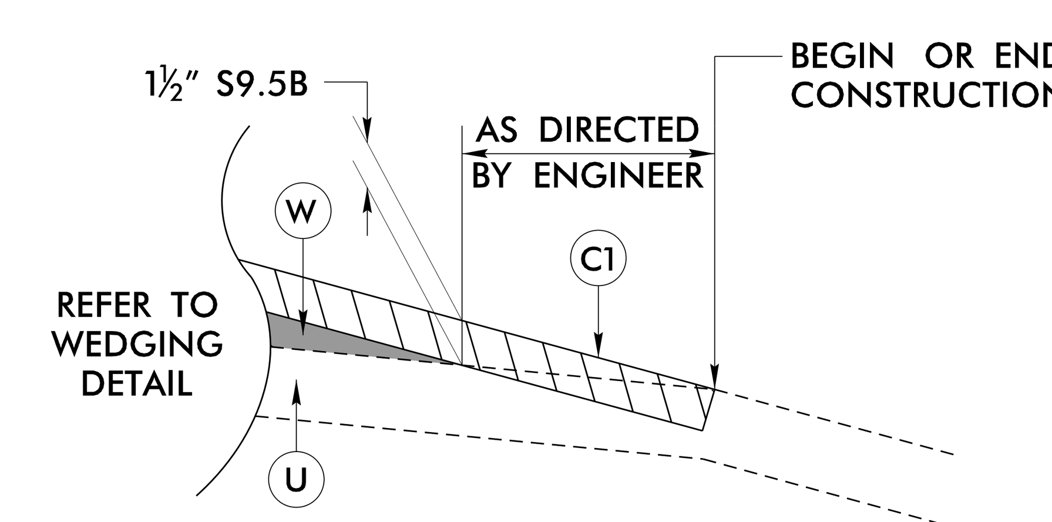
TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2:
-L- STA 12+25.00 TO 16+35.00

TRANSITION FROM TYPICAL SECTION NO. 2 TO TYPICAL SECTION NO. 3:
-L- STA 16+35.00 TO 17+45.00

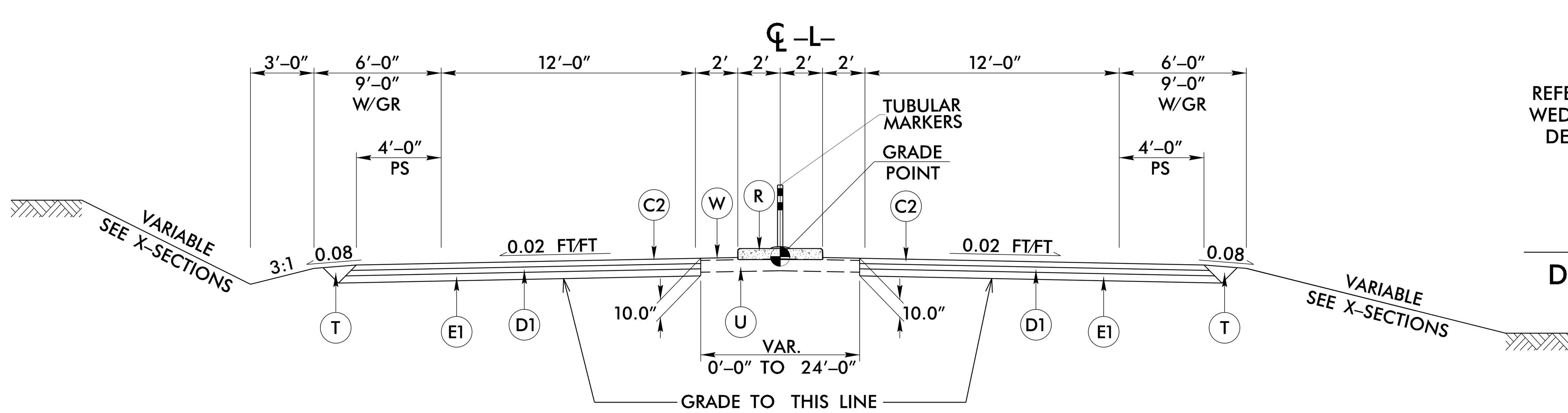


DETAIL FOR FULL DEPTH PAVED SHOULDER IN CONJUNCTION WITH GUARDRAIL



INCIDENTAL MILLING DETAIL

DETAIL SHOWING PROFILE VIEW



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3:
-L- STA 17+45.00 TO 18+95.00 (RAILROAD CROSSING)
-L- STA 19+43.00 (RAILROAD CROSSING) TO 20+43.00

TRANSITION FROM TYPICAL SECTION NO. 3 TO NO. 1:
-L- STA 20+43.00 TO 21+50.00

PAVEMENT SCHEDULE
FINAL PAVEMENT DESIGN DATED: 11/21/24

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. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 342 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. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
R	6" CONCRETE ISLAND NON-MOUNTABLE (KEYED IN) [SEE DETAIL 2C-1]
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	WEDGING (SEE DETAIL SHOWING METHOD OF WEDGING).

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

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PROJECT REFERENCE NO.	SHEET NO.
17BP.7.R.114	2B–1

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21102 ENGINEER JAMES TIMOTHY JORDAN

Signed by: James Timothy Jordan
DBD875DB66F04FA...
03-Jun-2026

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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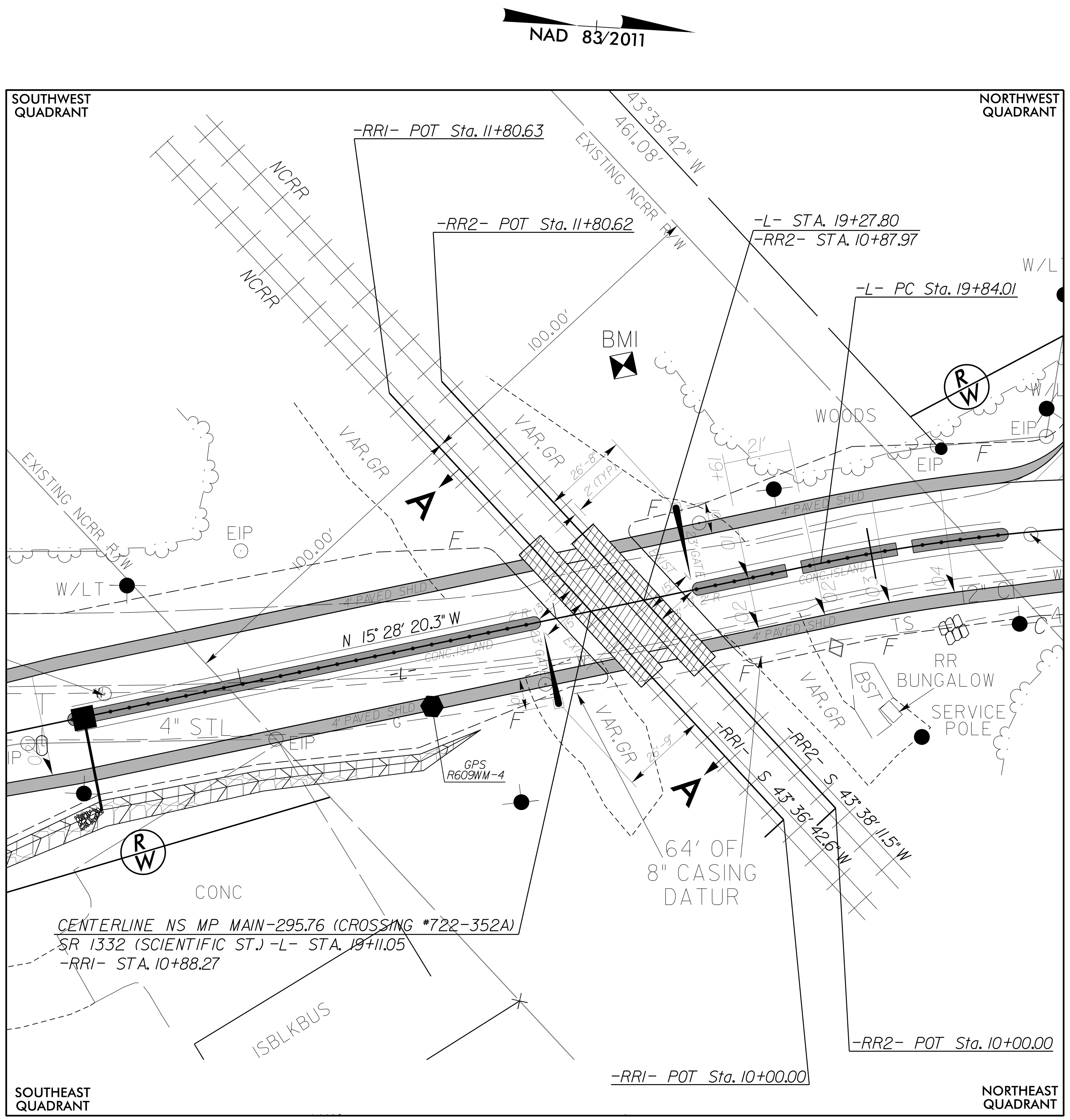
FOR –L– PLAN SEE SHEET 4
FOR –L– PROFILE SEE SHEET 5

CROSSING DETAIL

NS MP MAIN–295.76 (CROSSING #722–352A)
SR 1332 (SCIENTIFIC ST.) AT–GRADE CROSSING



INSET A (Not to scale)

RAILROAD CROSSING #722–352A, NS MP MAIN–295.76

NORFOLK SOUTHERN (NS) FORCES WILL INSTALL THE PROPOSED CROSSING TO 2'–0" BEYOND THE OUTSIDE EDGE OF EACH OUTSIDE RAIL AND BETWEENAT SPONSOR'S EXPENSE.

WORK TO BE DONE BY OTHERS

THE CONTRACTOR WILL BE RESPONSIBLE TO INSTALL THE REMAINING PORTION OF THE CROSSING IMPROVEMENTS OUTSIDE THE HATCHED AREA. NS REQUIRES THAT THE CROSSING GRADE BE 0% FROM EDGE OF RAIL TO 13'–0" BEYOND EDGE OF RAIL ON BOTH SIDES AND 2% MAX GRADE FOR AN ADDITIONAL 5' BEYOND THE 13'–0" DIMENSION.

CONTRACTOR WILL NOT BE PREMITTED TO STORE ANY EQUIPMENT ON NCRR PROPERTY WITHOUT PERMISSION FROM NCRR REAL ESTATE ASSET MANAGER, TAELOR FIELDS, WHOM CAN BE REACHED VIA EMAIL AT TFIELDS@NCRR.COM.

CONTRACTOR SHALL COORDINATE WITH NS TO MARK AND/OR PROTECT ANY RAILROAD FACITILITIES IN THE FIELD PRIOR TO AND DURING CONSTRUCTION.

ALL PARTIES REQUIRING ACCESS TO THE NCRR RIGHT OF WAY FOR THESE EFFORTS MUST COMPLETE A 'RIGHT OF ENTRY' APPLICATION AND SUBMIT A DETAILED SCOPE OF WORK AND REFERENCE PLANS/EXHIBITS CLEARLY CONVEYING THE LIMITS OCCUPIED OR DISTURBED BY THE INVESTIGATIVE ACTIVITIES.

ALL WORK TO BE PERFORMED ON, OVER, UNDER OR ADJACENT TO THE NCRR RIGHT OF WAY SHALL COMPLY WITH THE NORFOLK SOUTHERN RAILWAY COMPANY ("RAILROAD", "NSR" OR "NS") PUBLIC PROJECTS MANUAL AND NS/NCRR SPECIAL PROVISIONS FOR THE PROTECTION OF RAILWAY INTEREST. WHEN IN CONFLICT WITH OTHER PROJECT SPECIFICATIONS, THE MOST STRINGENT ONE SHALL APPLY.

RAILROAD CONTACT:
MR. GEORGE (BRIAN) TAYLOR
NORFOLK SOUTHERN RAILWAY COMPANY, ENGINEERING–DESIGN & CONSTRUCTION
650 WEST PEACHTREE STREET NW – BOX 45, ATLANTA GA 30308
TELEPHONE: (470) 463–7564
EMAIL: GEORGE.TAYLOR3@NSCORP.COM

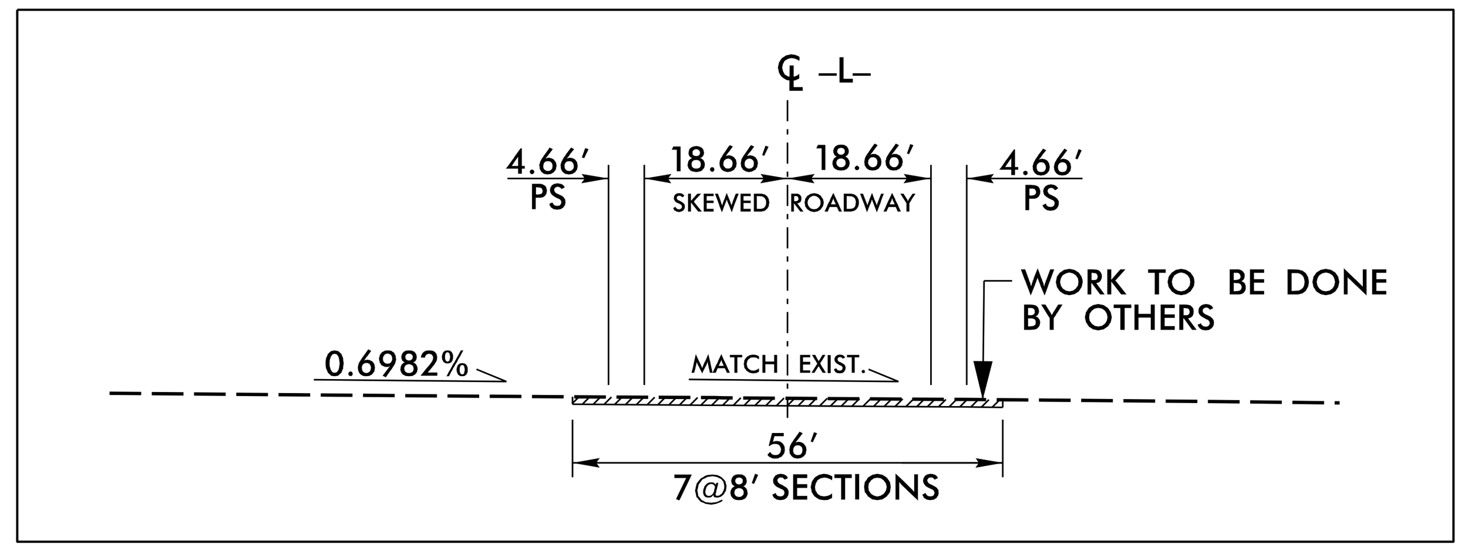
"ONE CALL" SERVICES DO NOT LOCATE BURIED RAILROAD SIGNAL AND COMMUNICATIONS LINES. THE CONTRACTOR SHALL CONTACT THE RAILROAD'S REPRESENTATIVE TWO (2) DAYS IN ADVANCE OF THOSE PLACES WHERE EXCAVATION, PILE DRIVING OR HEAVY LOADS MAY DAMAGE RAILROAD UNDERGROUND LINES ON RAILROAD PROPERTY. UPON REQUEST FROM THE CONTRACTOR OR AGENCY, RAILROAD SIGNAL FORCES WILL LOCATE AND PAINT MARK OR FLAG RAILROAD UNDERGROUND SIGNAL, COMMUNICATION AND POWER LINES IN THE AREA TO BE DISTURBED FOR THE CONTRACTOR. THE CONTRACTOR SHALL AVOID EXCAVATION OR OTHER DISTURBANCE OF THESE LINES WHICH ARE CRITICAL TO THE SAFETY OF THE RAILROAD AND THE PUBLIC. IF DISTURBANCE OR EXCAVATION IS REQUIRED NEAR A BURIED RAILROAD SIGNAL, COMMUNICATION OR POWER LINE, THE LINE SHALL BE POTHOLED MANUALLY WITH CAREFUL HAND EXCAVATION BY THE CONTRACTOR AND PROTECTED BY THE CONTRACTOR DURING THE COURSE OF THE DISTURBANCE UNDER THE SUPERVISION AND DIRECTION OF A RAILROAD SIGNAL REPRESENTATIVE.

ALL WORK INSIDE NCRR RIGHT–OF–WAY SHALL HAVE A RAILROAD REPRESENTATIVE PRESENT UNLESS OTHERWISE DIRECTED BY NS.

EXISTING RAILROAD SIGNALS SHALL BE REMOVED BY RAILROAD FORCES. NEW SIGNALS SHALL BE INSTALLED AND CROSSING CONSTRUCTION SHALL BE PERFORMED BY RAILROAD FORCES. SIGNING, MARKING AND STRIPING OF THE CROSSING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

ALL UTILITY INSTALLATIONS OR RELOCATIONS THAT ARE REQUIRED IN CONJUNCTION WITH THIS PROJECT CAN BE INSTALLED OR RELOCATED AS PART OF THE PROJECT PROVIDED THE CONSTRUCTION IS PERFORMED BY THE PROJECT CONTRACTOR OR PROJECT CONTRACTOR'S SUB –CONTRACTOR. HOWEVER, THE UTILITY MUST SUBMIT AN APPLICATION FOR THE INSTALLATION OR RELOCATION TO NCRR FOR APPROPRIATE HANDLING FOR LICENSE AGREEMENT AND APPLICABLE FEES. FOR UTILITY APPLICATIONS GO TO: WWW.NCRR.COM > RESOURCES > ENGINEERING PORTAL. FOR APPLICATION QUESTIONS PLEASE CONTACT NCRR_UTILITIES@HNTB.COM OR NCRR INFRASTRUCTURE MANAGER, JUSTIN MADIGAN AT JMADIGAN@NCRR.COM

APPLICABLE LICENSE AGREEMENT, WIRES & PIPES AGREEMENT, UTILITY AGREEMENT, CONSTRUCTION AGREEMENT, CROE AND CROSSING AGREEMENT, AS REQUIRED, SHOULD BE EXECUTED PRIOR TO CONSTRUCTION START.



TYPICAL A–A (Not to scale)

CROSSING TYPICAL ALONG RAILROAD –RR1–

PAVED SHOULDER

MONOLITHIC ISLAND

MONOLITHIC CONCRETE ISLAND [KEYED IN] (SEE DETAIL SHEETS 2C–1, 2C–2 AND 5)
USE TUBULAR MARKERS W/6' SPACING (STD. DRAWING 1266.01)

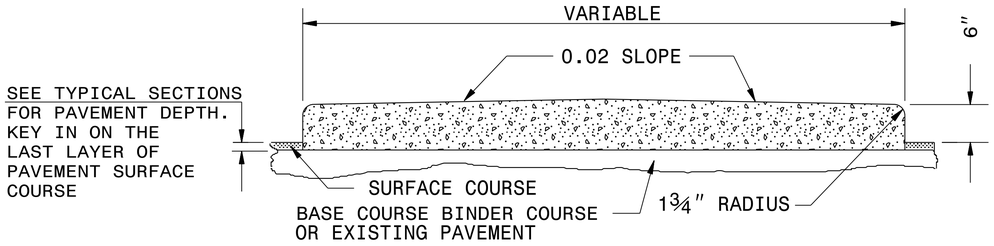
$$DATE$$

PROJECT REFERENCE NO.	SHEET NO.
17BP.7.R.114	2C-1

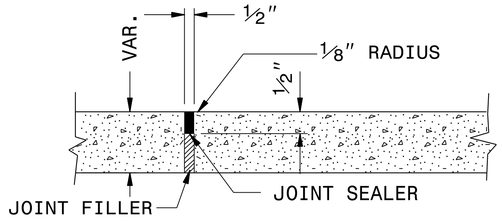
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR

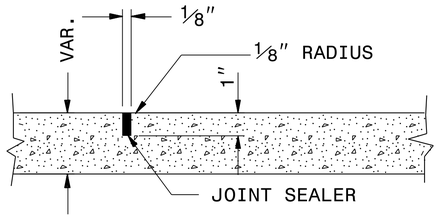
6″ NON-MOUNTABLE CONCRETE ISLANDS



6″ MONOLITHIC CONCRETE ISLAND (KEYED IN) ON ASPHALT OR CONCRETE PAVEMENT



SHOWING EXPANSION JOINT



SHOWING GROOVED JOINT

PARTIAL LONGITUDINAL SECTIONS OF PAVED ISLANDS

NOTE:

WHEN MONOLITHIC CONCRETE ISLAND IS ON TOP OF SURFACE COURSE, DRIVE 40d SPIKES INTO SURFACE UNDER MONOLITHIC CONCRETE ISLAND. STAGGER SPIKES ON 2′ CENTERS EACH WAY.

IN THE CONCRETE PAVEMENT (ISLAND) AND CONCRETE ISLAND (MONOLITHIC) PLACE ½″ EXPANSION JOINTS AT 30′ INTERVALS AND GROOVED JOINTS 1″ DEEP AT 10′ INTERVALS BETWEEN EXPANSION JOINTS.

LINE UP THE JOINTS IN THE CONCRETE PAVEMENT (ISLAND) WITH THE JOINTS IN THE CURB OR CURB AND GUTTER. FILL AND SEAL THE TOP ½″ OF THE EXPANSION JOINTS AND THE ENTIRE DEPTH OF GROOVED JOINTS WITH JOINT SEALER.

STATE OF
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR

CONCRETE ISLANDS
6″ NON-MOUNTABLE

SHEET 1 OF 1

852D01

SHEET 1 OF 1

852D01

08-NOV-2017 09:01
S:\Contracts\Special Details\tspell\details\stand\852d01islkeyin.dgn
jhowerton AT CSD-292595

Signed by:
Nicole M. Huckler
03-Jun-2026

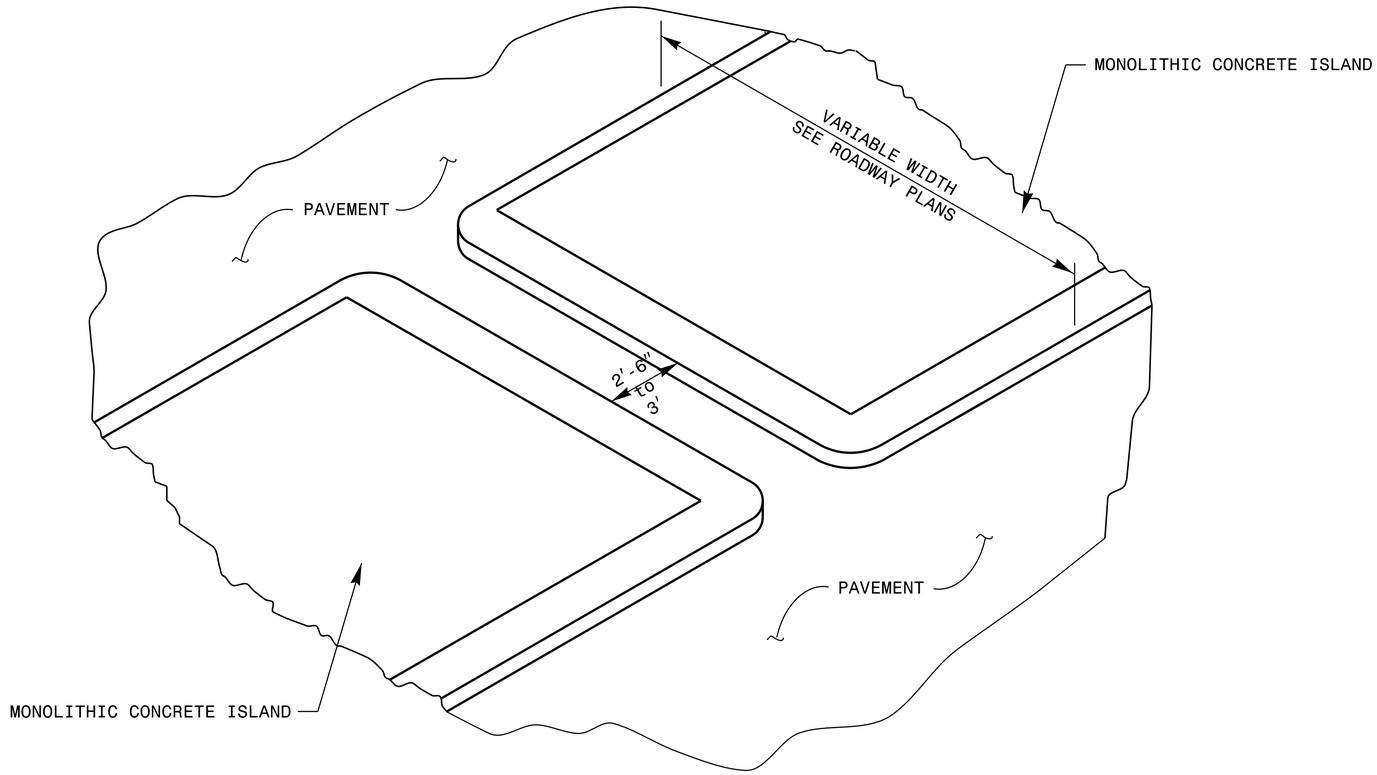
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SEE PLATE FOR TITLE

ORIGINAL BY: STD.852.01 DATE:
MODIFIED BY: K.A.Kempf DATE: 1-31-08
CHECKED BY: DATE:
FILE SPEC.: w:tspell/stand/852d01islkeyin.dgn

PROJECT REFERENCE NO.	SHEET NO.
17BP.7.R.114	2C-2



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

SEAL
33144
NORTH CAROLINA PROFESSIONAL
NICOLE M. HACKLER
ENGINEER
Signed by: Nicole M. Hackler
5884323034
29-Jun-2026

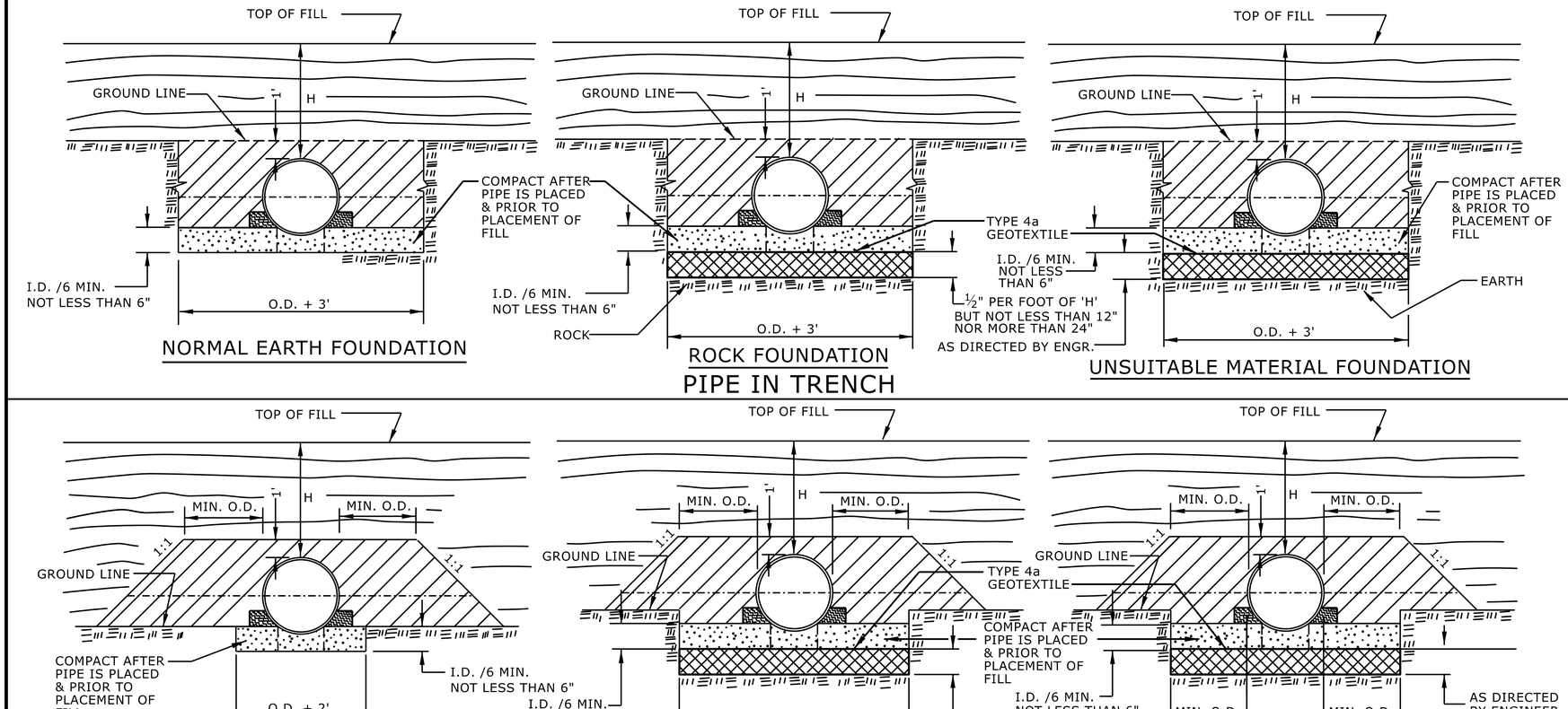
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

DRAINAGE OPENING THRU MONOLITHIC ISLAND

ORIGINAL BY: _____ DATE: 2-5-02
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: s:details\stand\Drainage Thru Island.dgn

PROJECT REFERENCE NO.	SHEET NO.
17BP.7.R.114	2C-3



GENERAL NOTES:

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

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

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

APPROVED SUITABLE LOCAL MATERIAL.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

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

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

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

SPRINGLINE OF PIPE

SELECT BACKFILL MATERIAL CLASS III OR CLASS II, 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
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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

FLEXIBLE PIPE

SHEET 1 OF 2

300.01

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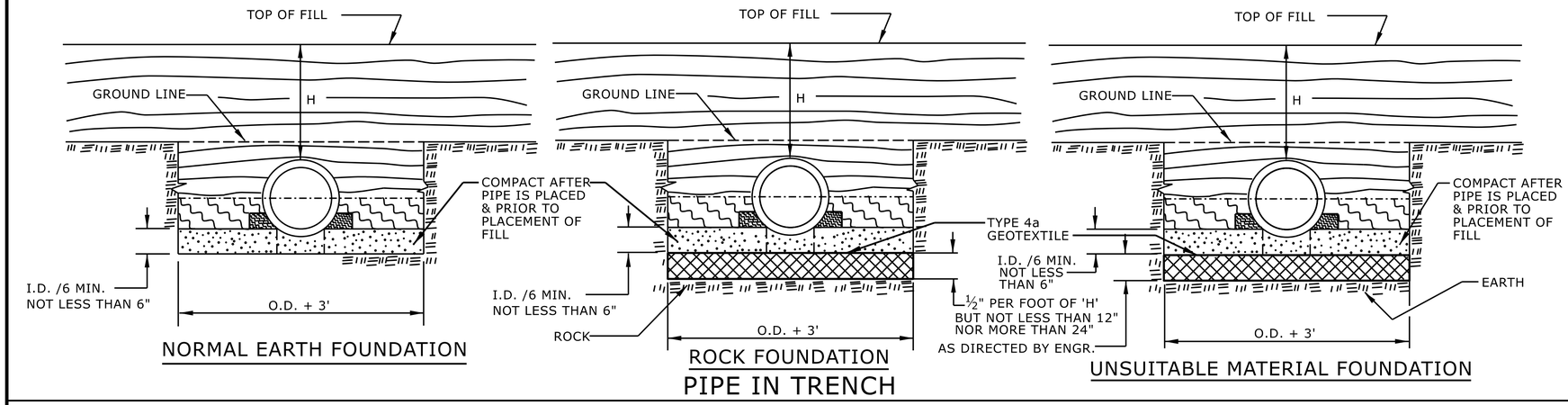
SEE TITLE BLOCK

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

PROJECT REFERENCE NO.	SHEET NO.
17BP.7.R.114	2C-4



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

NORTH CAROLINA PROFESSIONAL SEAL 033144 ENGINEER NICOLE M HACKLER
03-Jun-2026

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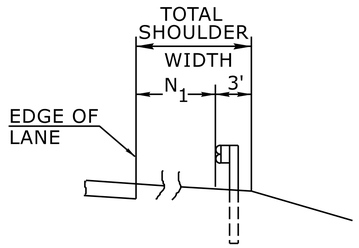
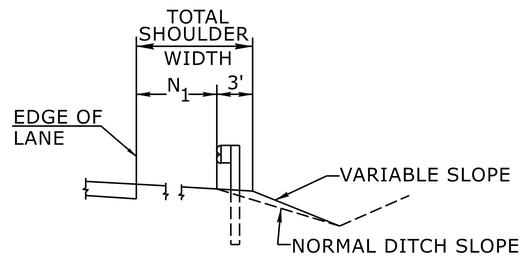
FILE SPEC.: _____

PROJECT REFERENCE NO.	SHEET NO.
17BP.7.R.114	2C-5

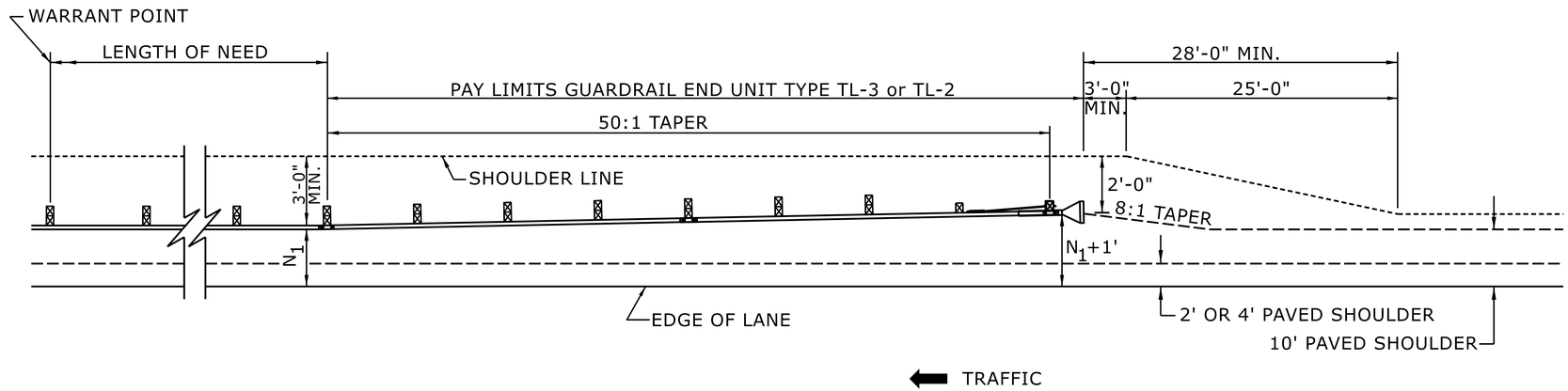


FILL SECTION



CUT SECTION

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



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

DETAIL OF BEGINNING OF GUARDRAIL IN CUT OR FILL SECTION

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DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 6 OF 15

862D01

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033144 NICOLE MARIE MACKLER
03-Jun-2026

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MODIFIED BY: DATE:
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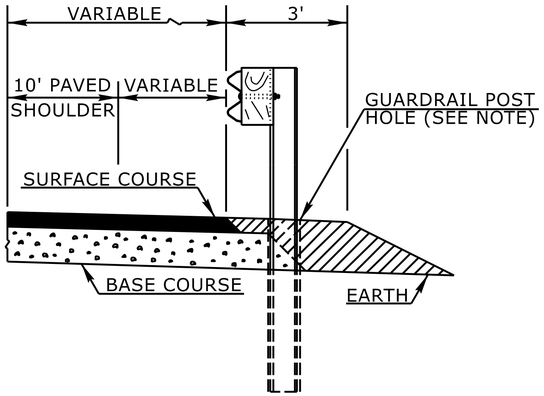
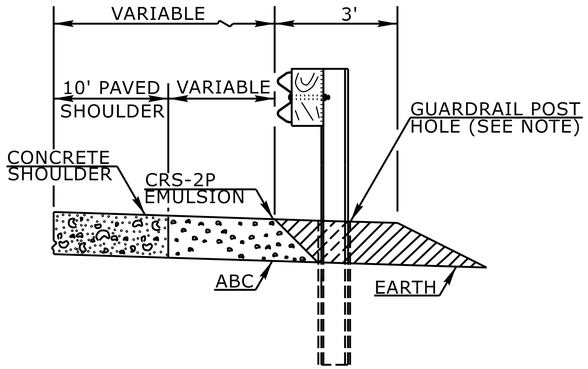
FILE SPEC.:

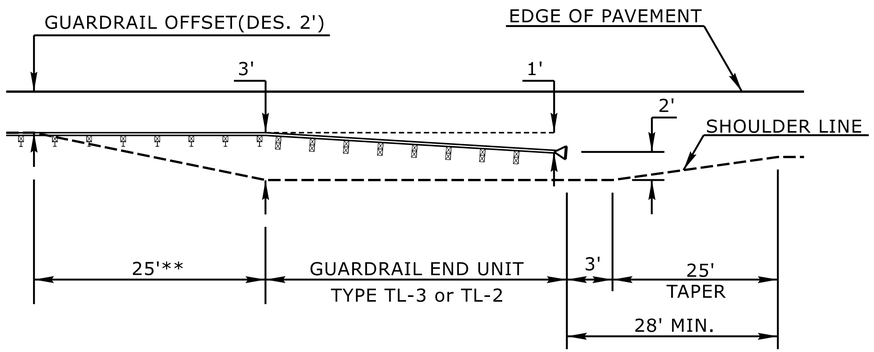
PROJECT REFERENCE NO.	SHEET NO.
17BP.7.R.114	2C-6



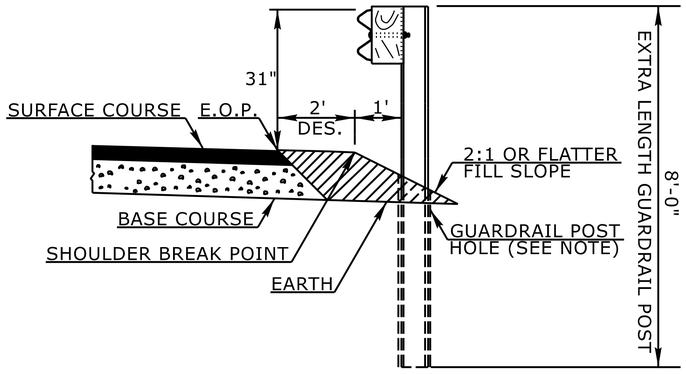
FLEXIBLE PAVED SHOULDER



CONCRETE PAVED SHOULDER



8' GUARDRAIL POST ON 2:1 SLOPE-END UNIT TRANSITION*
PLAN VIEW



8' GUARDRAIL POST ON 2:1 SLOPE*

* THE 8' GUARDRAIL POST ON 2:1 SLOPE DETAIL IS INTENDED FOR USE ONLY IN SEVERELY CONSTRAINED AREAS WITH A POSTED SPEED ≤ 60 MPH. GUARDRAIL END UNITS MAY NOT BE PLACED ON THE 2:1 SLOPE AND MUST TRANSITION TO THE SHOULDER.
** 8' GUARDRAIL POST SHOULD BE USED IN THIS RANGE

NOTE:
WHEN WOODEN GUARDRAIL POSTS ARE USED, DRILL HOLES THROUGH EARTH MATERIAL AND BASE COURSE.THE POST MAY THEN BE DRIVEN TO THE PROPER DEPTH. DRILL THE HOLE OF SUFFICIENT SIZE TO ACCOMMODATE THE PARTICULAR POST BEING USED. BACKFILL AND TAMP HOLES USING THE EXCAVATED MATERIAL.

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 11OF 15

862D01

SEAL
033144
NORTH CAROLINA PROFESSIONAL ENGINEER
NICOLE H. HACKLER
03-Jun-2026

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Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

ORIGINAL BY: L.SMITH DATE: 10-14-2025
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

24-APR-2019 07:24
S:\Contracts\Contracts\Special Details\jhowerton\840d04 3 or 4 side OTCB.dgn
jhowerton AT CSD-292595

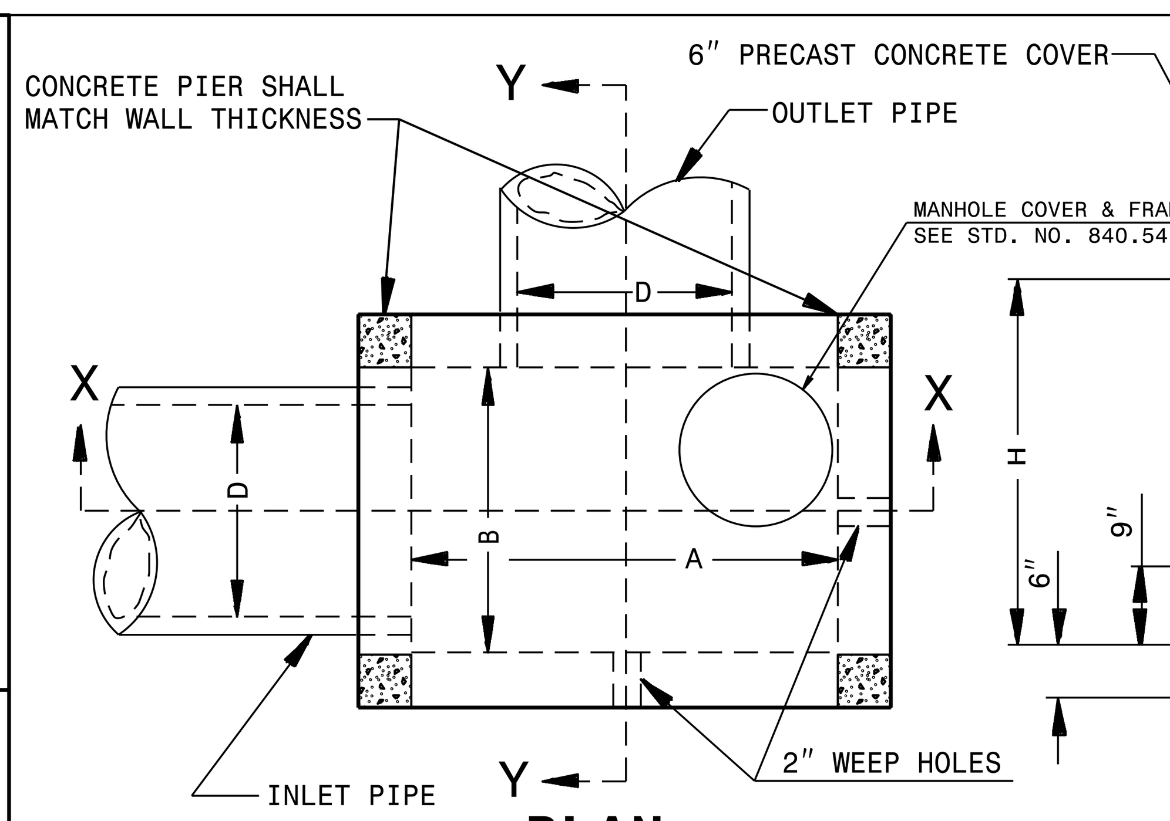
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
17BP.7.R.114	2C-7

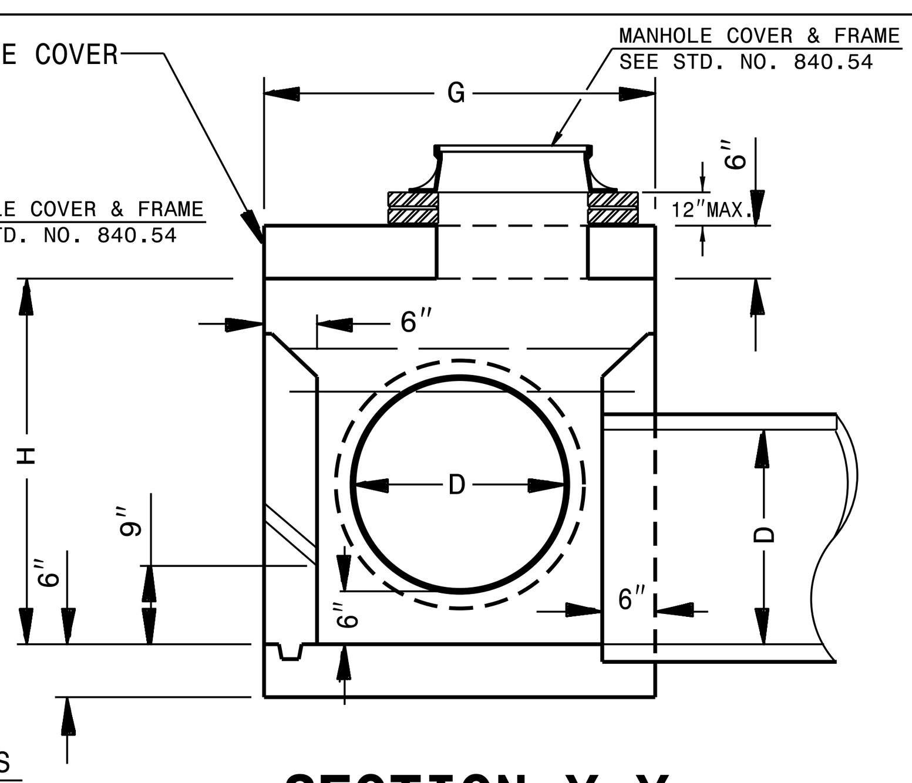
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
CONCRETE CATCH BASIN (3 OR 4 SIDE OPEN THROAT) (MANHOLE OPTIONAL)

SHEET 1 OF 2
840D04



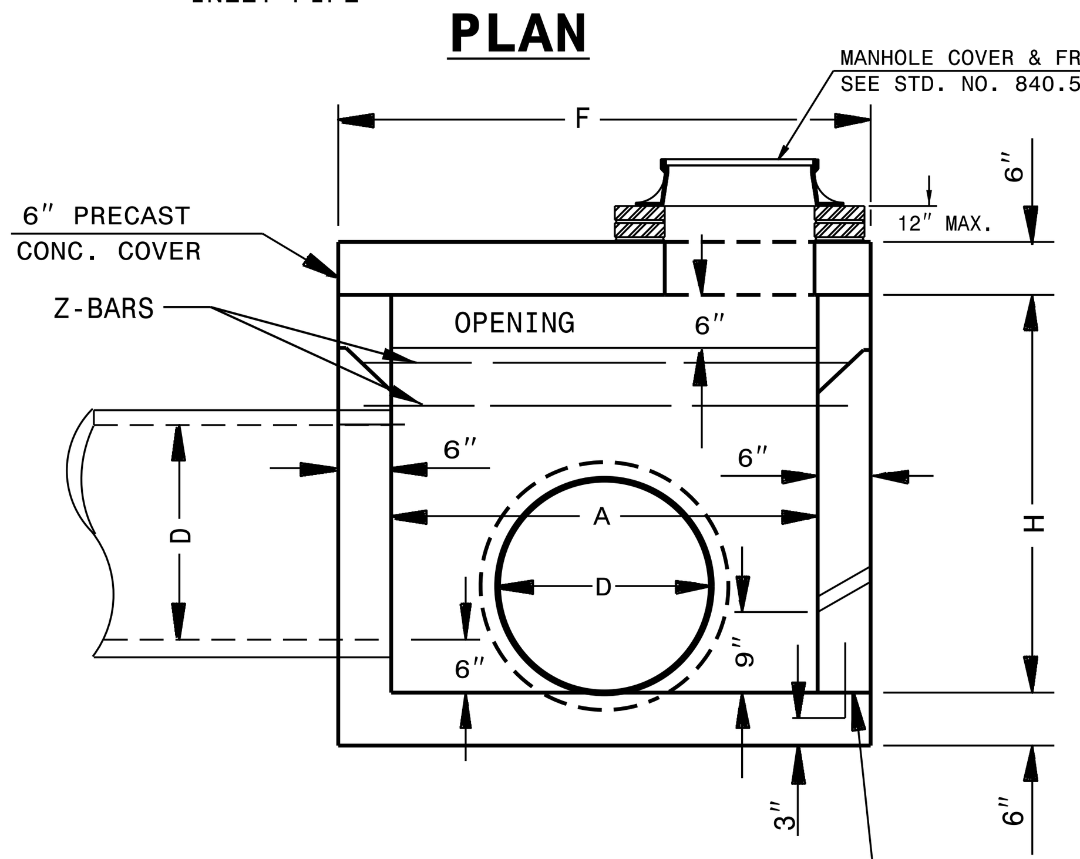
PLAN



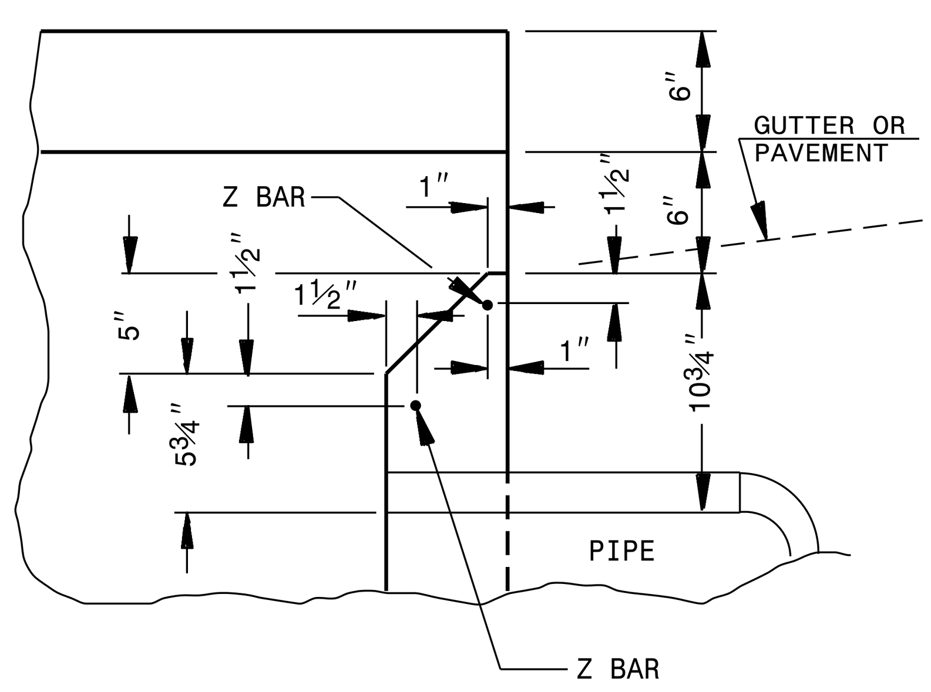
SECTION Y-Y

GENERAL NOTES:

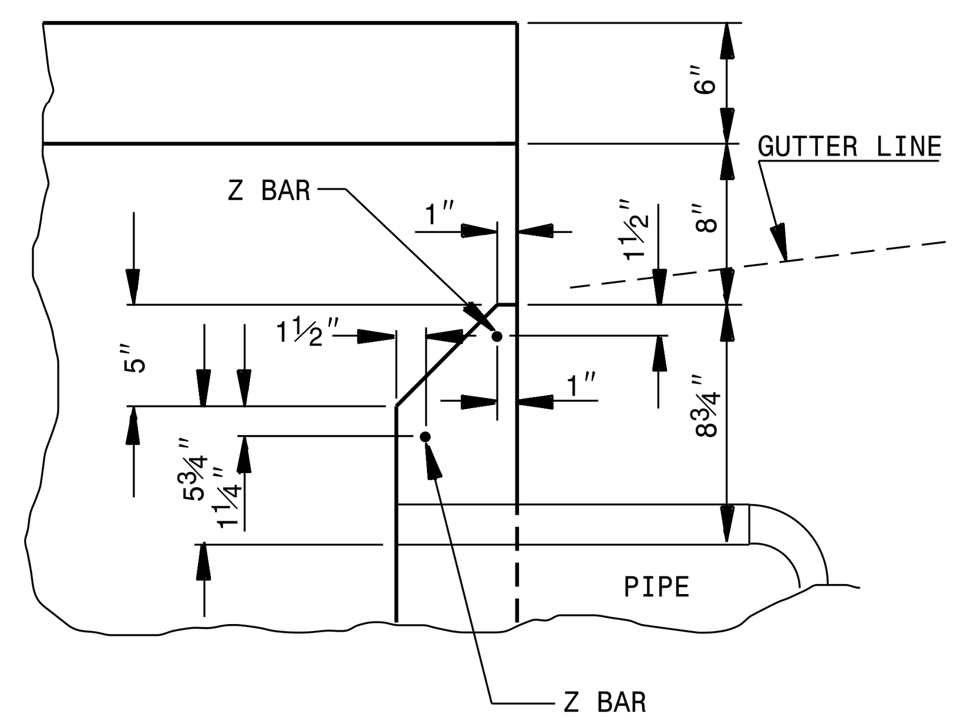
ALL CATCH BASINS OVER 3′-6″ IN DEPTH TO BE PROVIDED WITH STEPS 12″ ON CENTERS. STEPS SHALL BE IN ACCORDANCE WITH STD. 840.66.
ALL EXPOSED CORNERS TO BE CHAMFERED 1″.
CLASS ″B″ CONCRETE TO BE USED THROUGHOUT.
2″ PIPE WEEPHOLES TO BE PLACED AS DIRECTED BY ENGINEER.
THE 6″ OPENING SHOWN MAY BE INCREASED TO 8″ MAXIMUM IF DEEMED TO BE NECESSARY BY THE ENGINEER.
OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2″ KEYWAY, OR #5 BAR DOWELS AT 12″ CENTERS AS DIRECTED BY THE ENGINEER.
FORMS ARE TO BE USED FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OF BOX, ADD TO BASE AS SHOWN ON STD. DWG. 840.00.
A STONE DRAIN CONSISTING OF 1 CUBIC FOOT OF NO. 78M STONE CONTAINED IN A BAG OF POROUS FABRIC SHALL BE PLACED AT EACH WEEP HOLE.
FOR 8′ IN HEIGHT OR LESS USE 6″ WALLS AND BOTTOM SLAB.
OVER 8′ IN HEIGHT USE 8″ WALLS AND BOTTOM SLAB. QUANTITIES TO BE ADJUSTED ACCORDINGLY.
DIMENSIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER.



SECTION X-X



PART SECTION Y-Y
SHOWING METHOD OF CONSTRUCTION FOR 6″ OPENING



PART SECTION Y-Y
SHOWING METHOD OF CONSTRUCTION IF INCREASED OPENING IS USED

MIN. DIMENSIONS AND QUANTITIES FOR CONCRETE CATCH BASIN (BASED ON MIN. HEIGHT, H)

DIM'S OF BOX & PIPE				REINFORCING						TOP & BOT. SLAB DIMENSIONS		CU. YDS. CONC. IN BOX			TOTAL QUANTITIES BOX & SLABS		DEDUCTION ONE PIPE		DED. ONE 6" THROAT OPENING
PIPE	SPAN	WIDTH	HEIGHT	BARS - X		BARS - Y		BARS - Z											
D	A	B	H	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	F	G	TOP SLAB	BOT. SLAB	WALL/FT. HT.	LBS. REINF.	YD³ (MIN H)	C.S.	R.C.	YD³
12″	3′-6″	2′-3″	1′-10″	4	3′-0″	6	4′-3″	2	4′-3″	4′-6″	3′-3″	0.181	0.271	0.250	27	1.046	0.015	0.032	0.046
15″	3′-6″	2′-3″	2′-1″	4	3′-0″	6	4′-3″	2	4′-3″	4′-6″	3′-3″	0.181	0.271	0.250	27	1.108	0.023	0.036	0.046
18″	4′-0″	2′-8″	2′-4″	5	3′-5″	7	4′-9″	2	4′-9″	5′-0″	3′-8″	0.226	0.340	0.284	35	1.379	0.033	0.049	0.053
24″	4′-0″	2′-8″	2′-10″	5	3′-5″	7	4′-9″	2	4′-9″	5′-0″	3′-8″	0.226	0.340	0.284	35	1.521	0.059	0.085	0.053
30″	4′-0″	3′-6″	3′-4″	5	4′-3″	9	4′-9″	2	4′-9″	5′-0″	4′-6″	0.278	0.417	0.315	43	1.916	0.092	0.127	0.053
36″	4′-6″	4′-0″	3′-10″	5	4′-9″	10	5′-3″	2	5′-3″	5′-6″	5′-0″	0.340	0.510	0.352	51	2.390	0.132	0.178	0.059
42″	5′-0″	4′-6″	4′-4″	5	5′-3″	12	5′-9″	2	5′-9″	6′-0″	5′-6″	0.407	0.611	0.389	64	2.914	0.180	0.243	0.066
48″	5′-0″	5′-0″	4′-10″	5	5′-9″	13	5′-9″	2	5′-9″	6′-0″	6′-0″	0.444	0.666	0.407	68	3.298	0.235	0.317	0.066

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

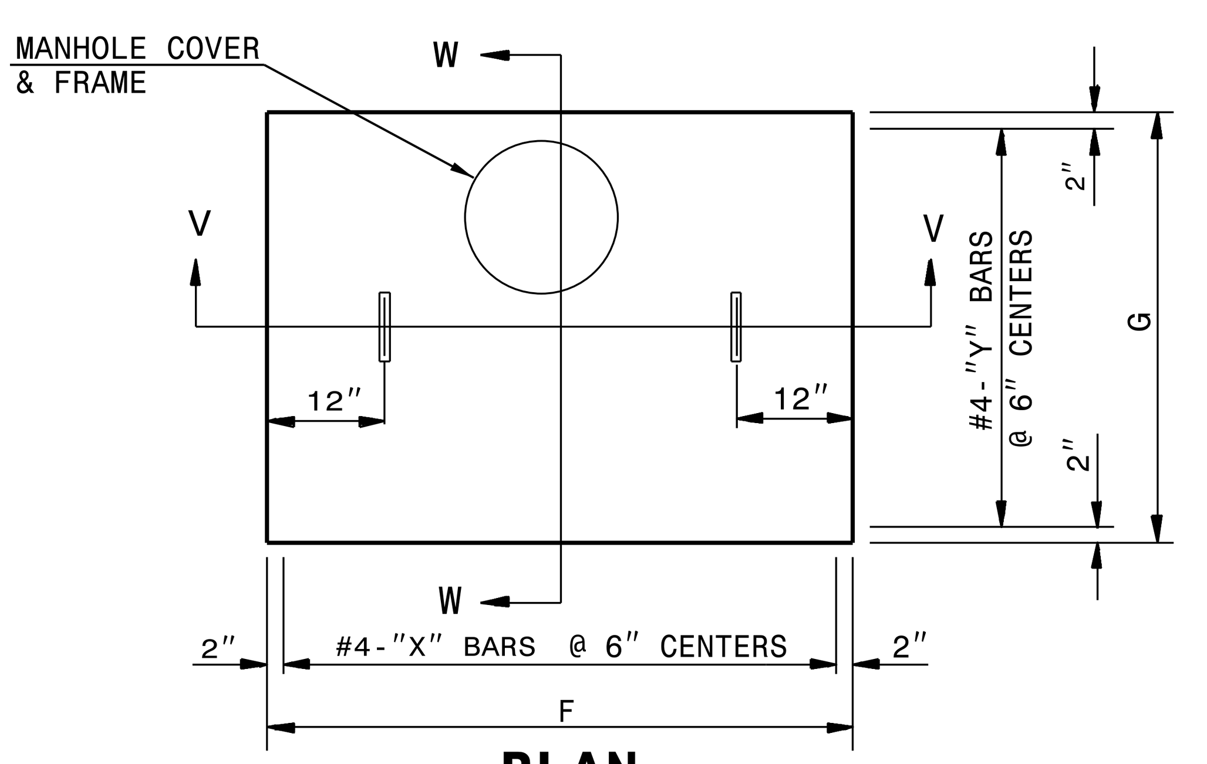
ENGLISH DETAIL DRAWING FOR
CONCRETE CATCH BASIN (3 OR 4 SIDE OPEN THROAT) (MANHOLE OPTIONAL)

SHEET 1 OF 2
840D04

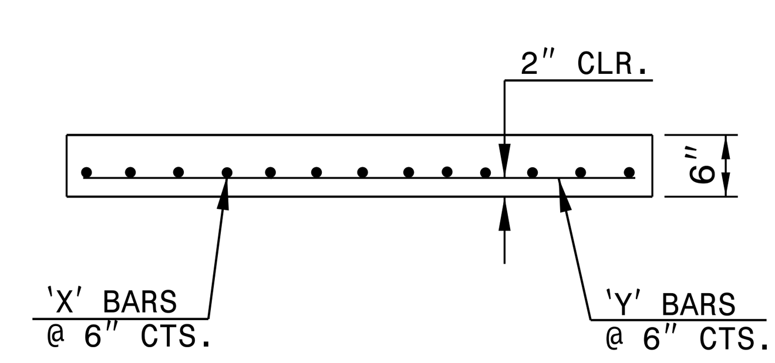
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
CONCRETE CATCH BASIN (3 OR 4 SIDE OPEN THROAT) (MANHOLE OPTIONAL)

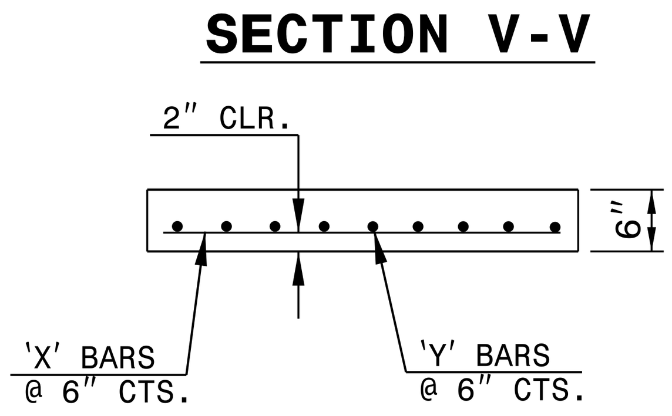
SHEET 2 OF 2
840D04



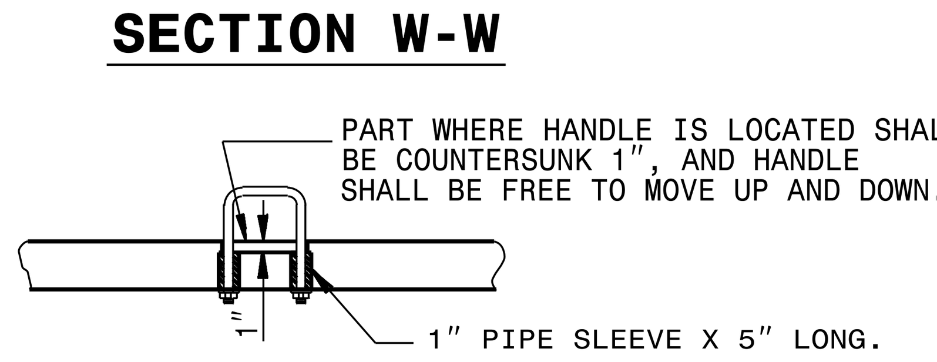
PLAN
PLAN OF PRECAST COVER



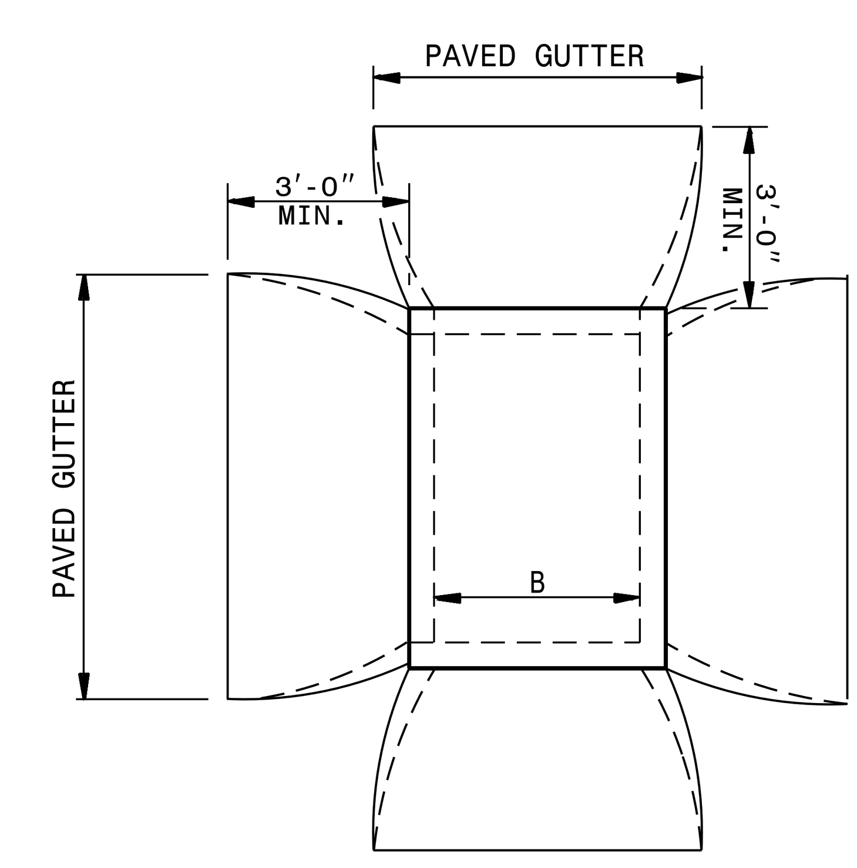
SECTION V-V



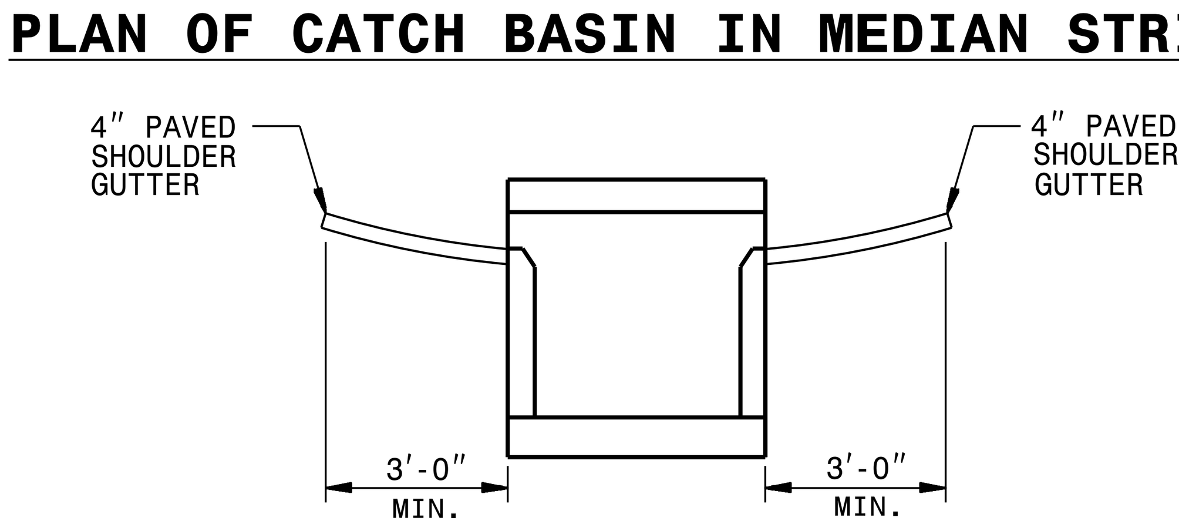
SECTION W-W



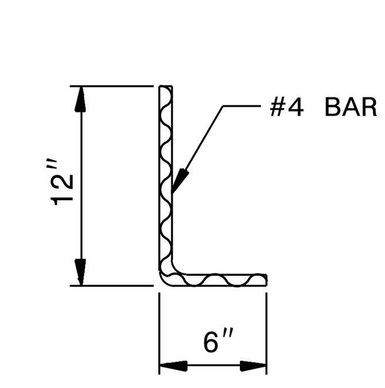
PART SECTION
THRU COVER SHOWING HANDLE



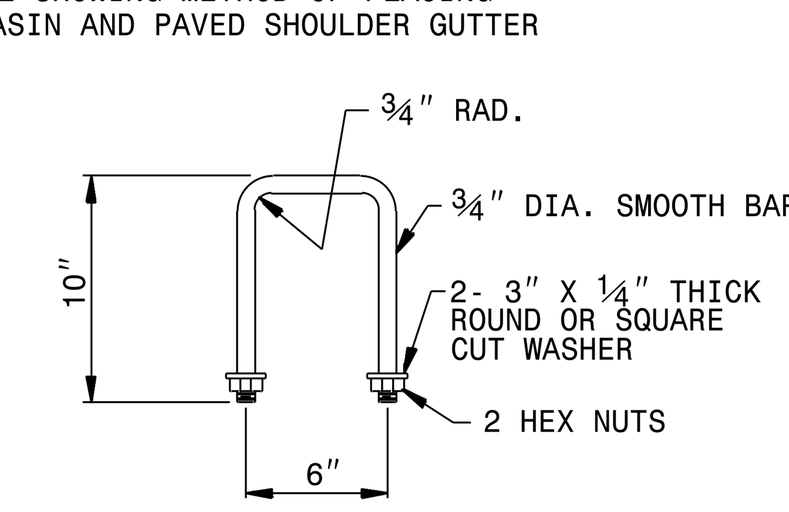
PLAN OF CATCH BASIN IN MEDIAN STRIP



SECTION OF CATCH BASIN MEDIAN STRIP
DETAIL SHOWING METHOD OF PLACING CATCH BASIN AND PAVED SHOULDER GUTTER



DOWEL



DETAIL OF HANDLE

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

ENGLISH DETAIL DRAWING FOR
CONCRETE CATCH BASIN (3 OR 4 SIDE OPEN THROAT) (MANHOLE OPTIONAL)

SHEET 2 OF 2
840D04

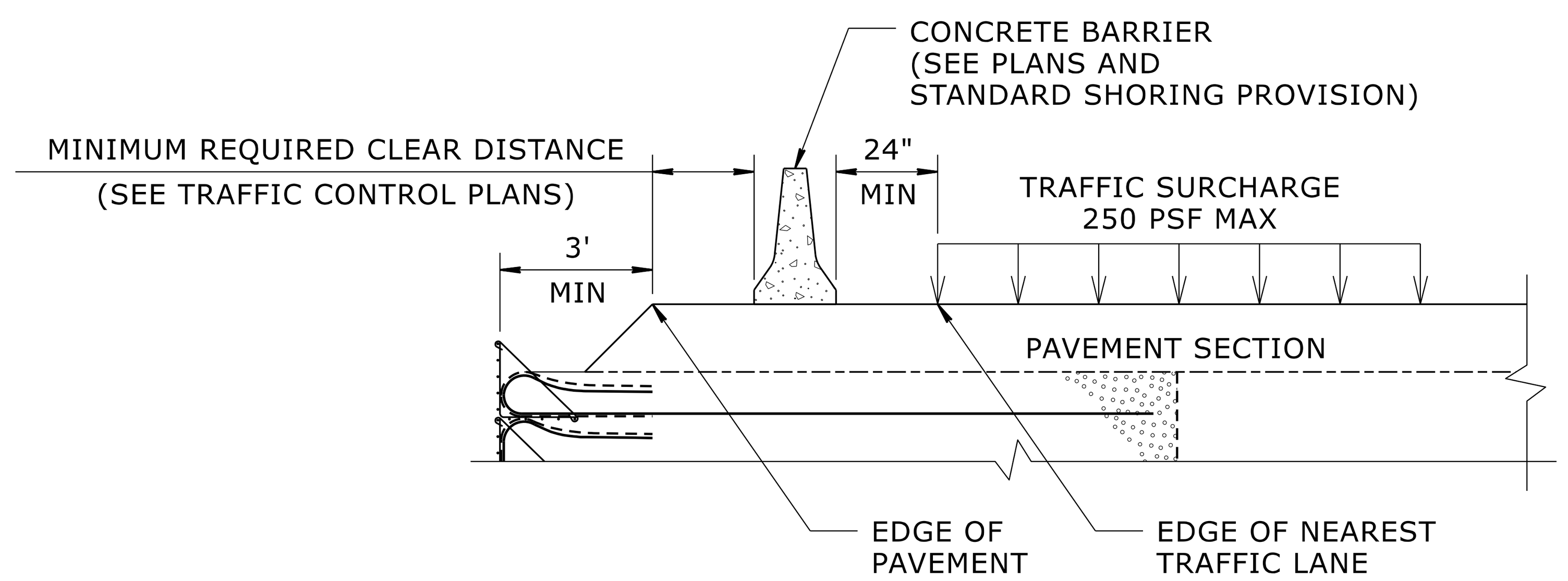
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 33144 NICHOLAS M. HACKLER
03-Jun-2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

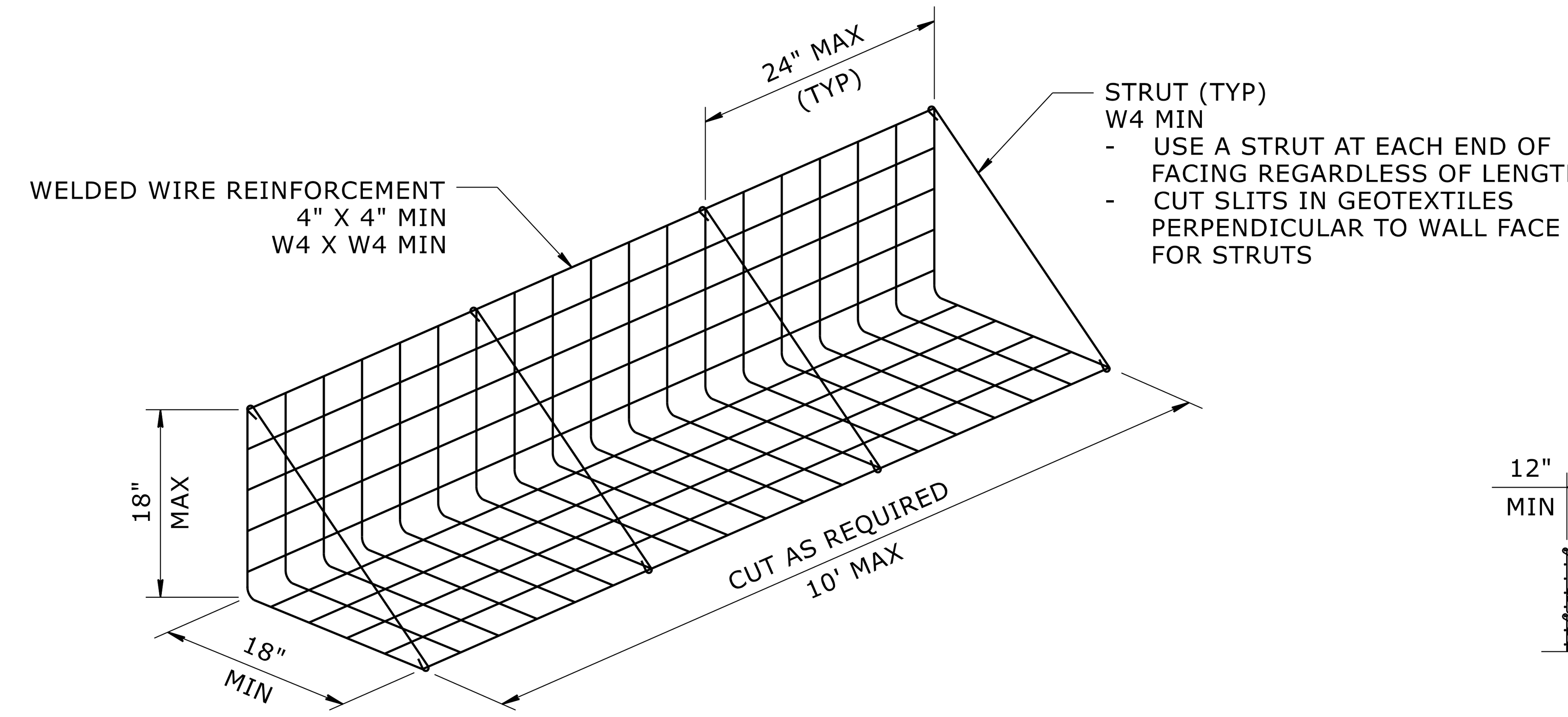
CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE PLATE FOR TITLE

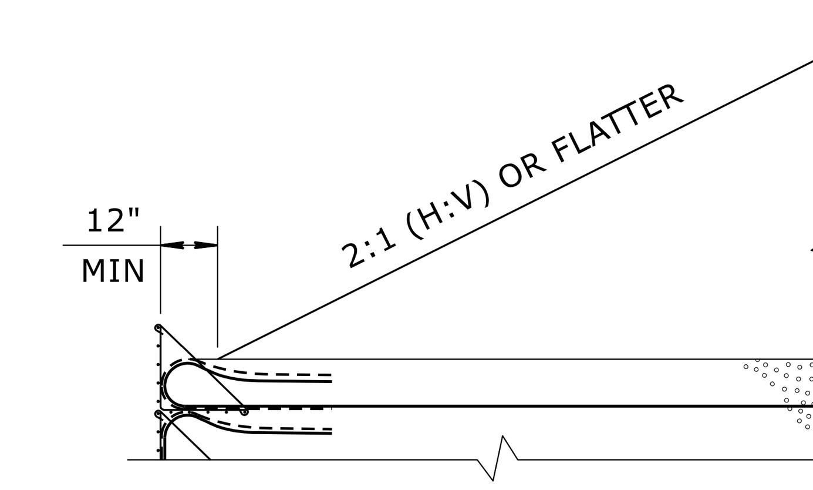
ORIGINAL BY: DATE:
MODIFIED BY: rnbritt DATE: 07-03-2014
CHECKED BY: DATE:
FILE SPEC.: details/nbritt/english/hydro/840d04.dgn



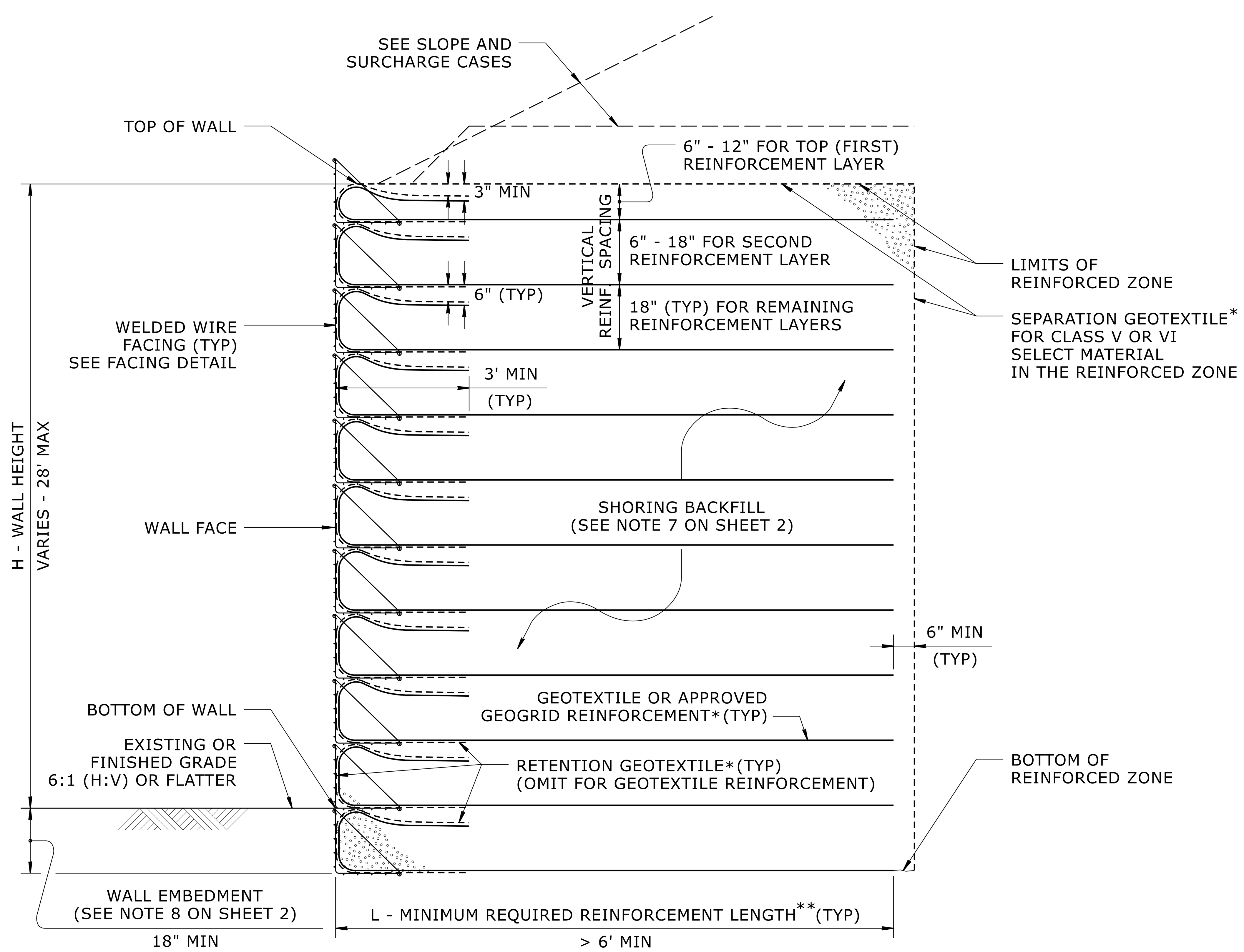
SURCHARGE CASE



FACING DETAIL

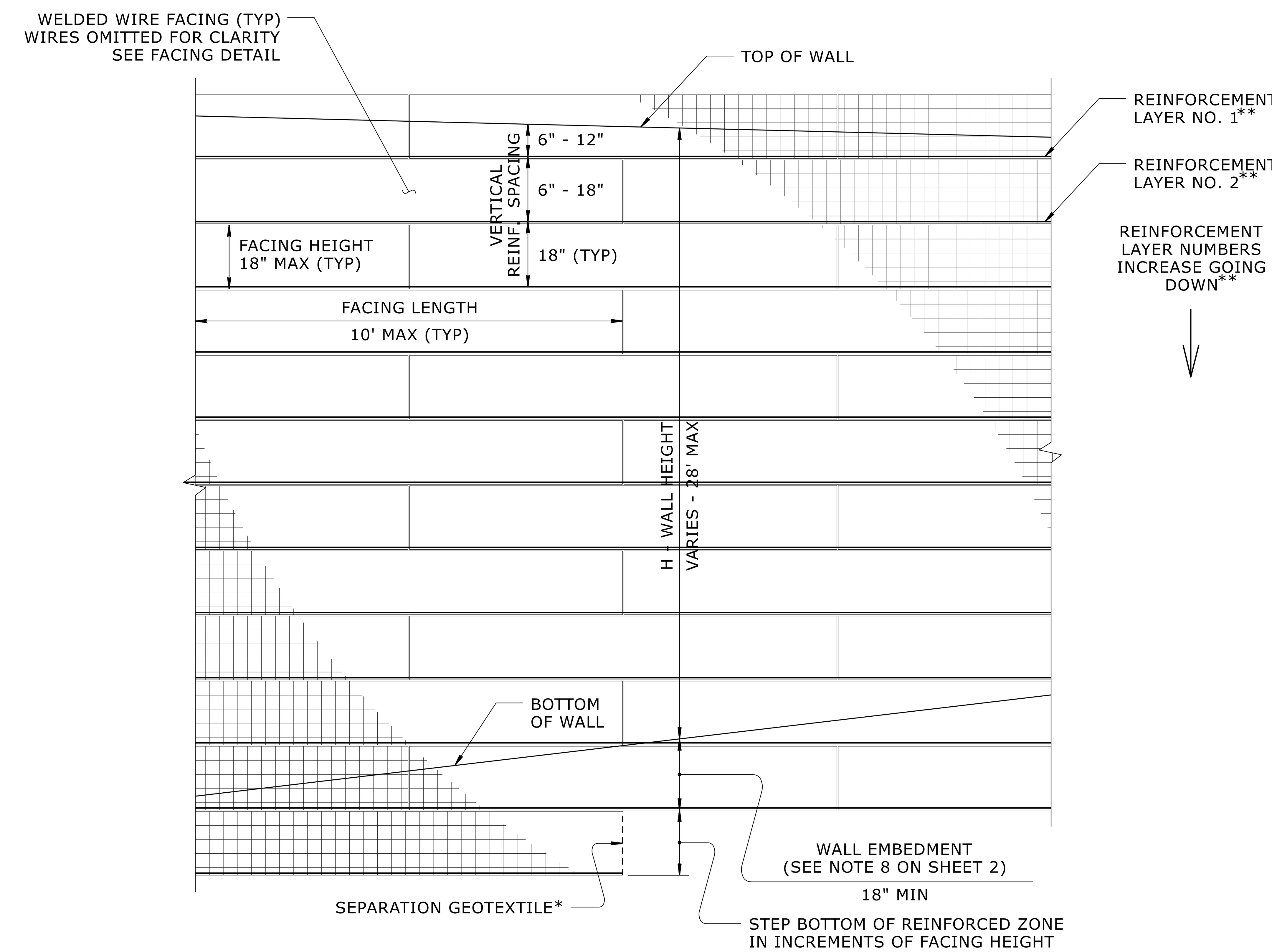


SLOPE CASE



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.

FALCON ENGINEERING, INC.

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 039779 JEREMY R. HAMM

4/24/2026
DocuSigned by: Jeremy Hamm

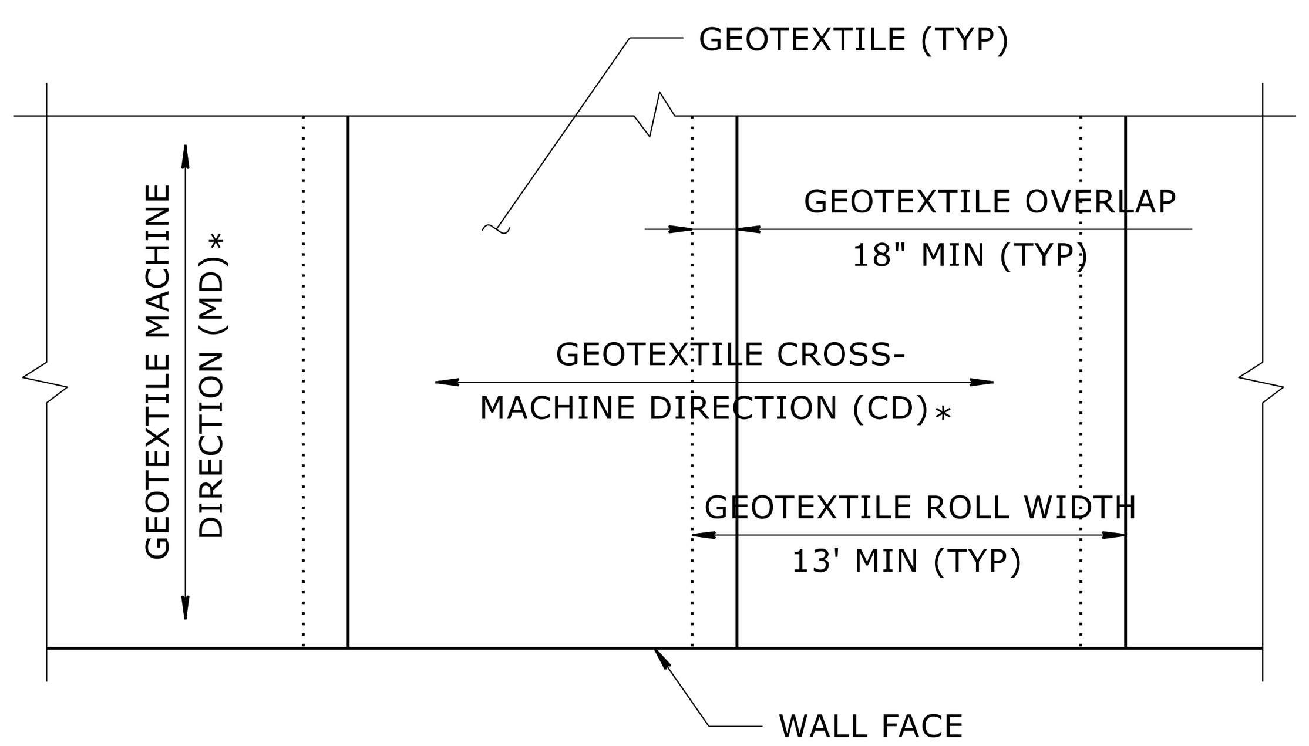
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STANDARD DETAIL NO. 1801.02

GEOTECHNICAL STANDARD DETAIL FOR TEMPORARY WALL (SHEET 1 OF 3)

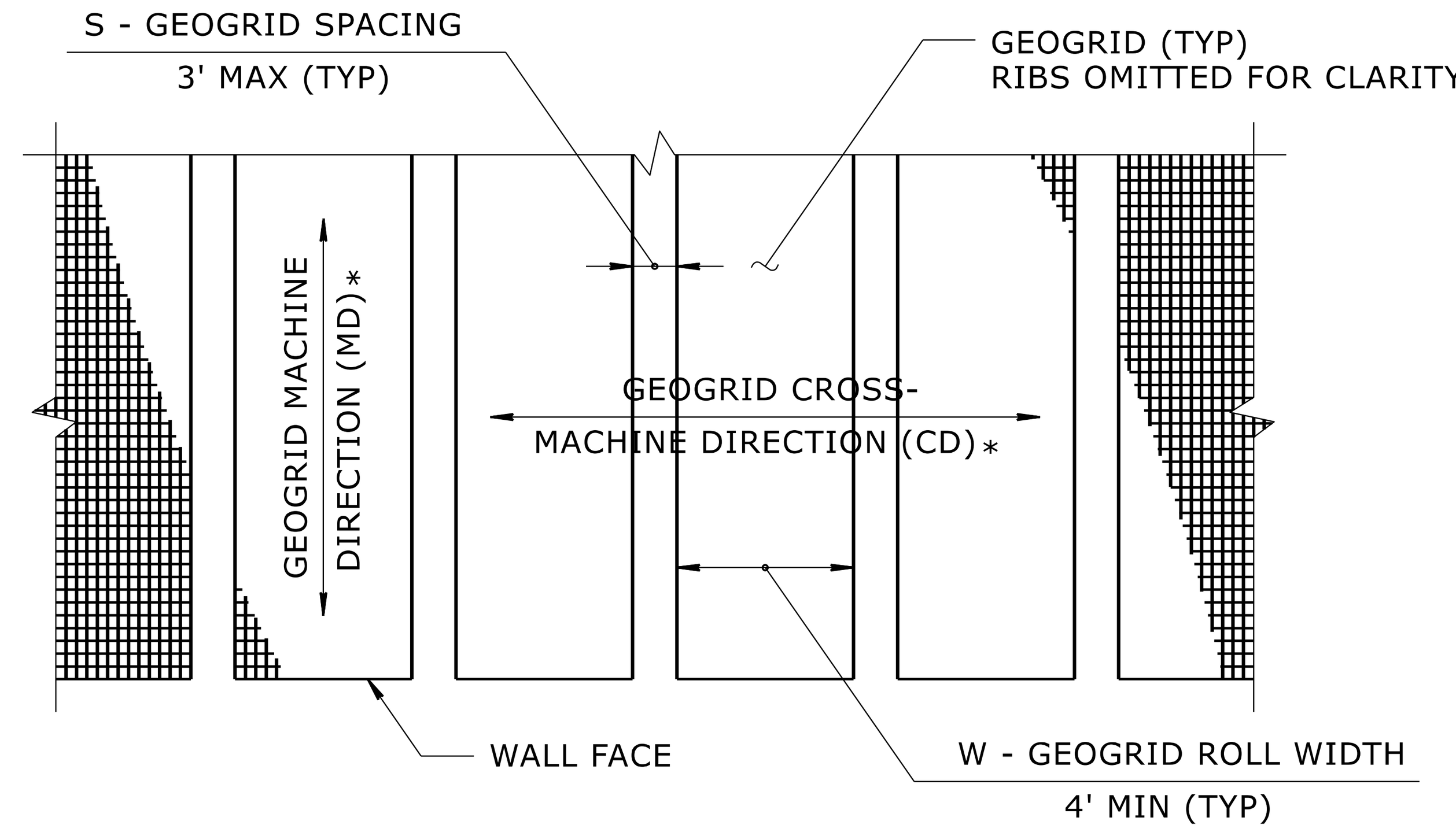
DATE: 02-18-2025

5/26/20



GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)

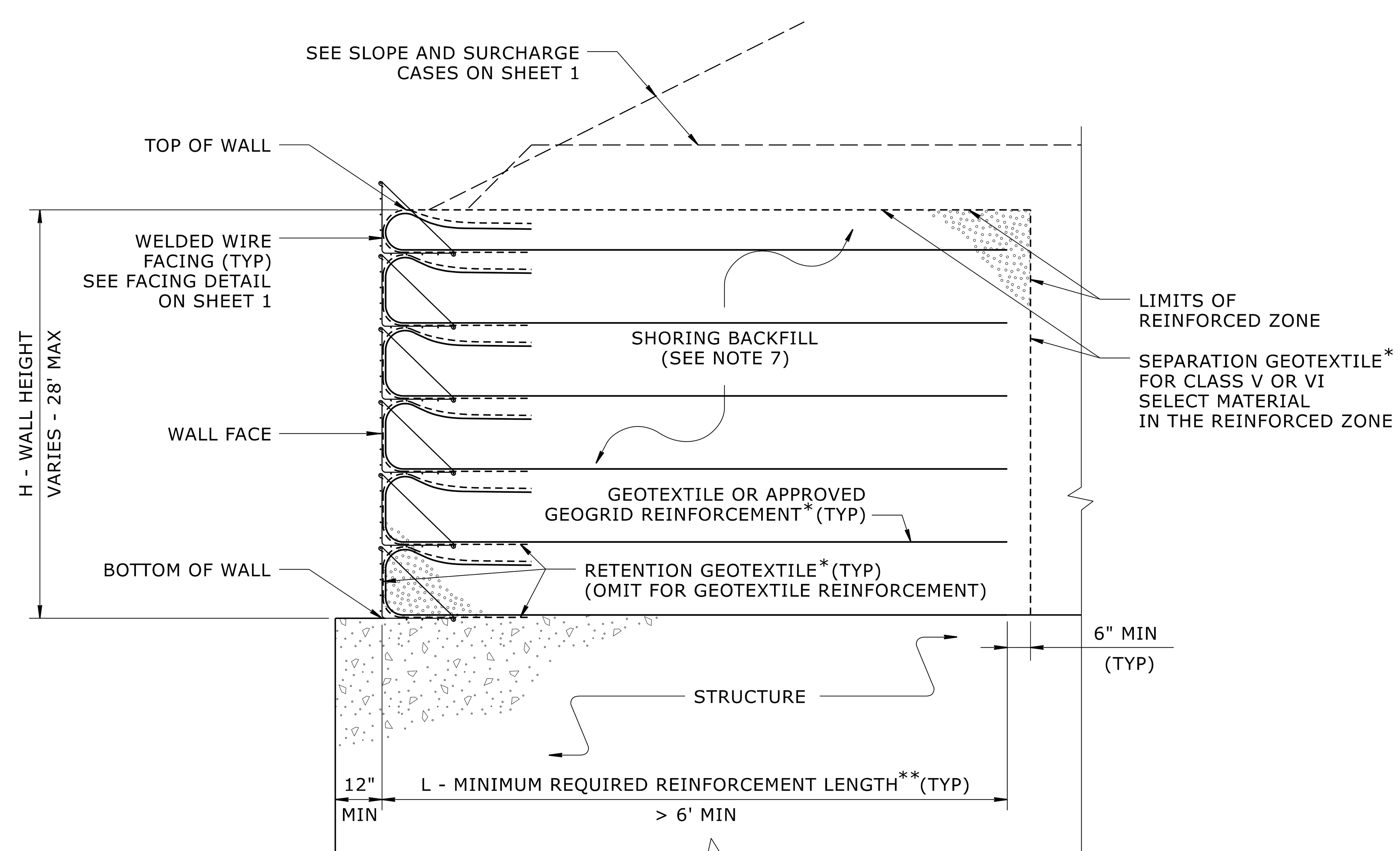


GEOGRID PLACEMENT

(80% COVERAGE MIN FOR GEOGRID REINFORCEMENT - $\frac{W}{W+S} \times 100 \geq 80\%$, 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 1 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) > (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND
    - REINFORCEMENT STRENGTH IN CD > 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.

FALCON ENGINEERING

GEOTECHNICAL ENGINEER

4/24/2026
DocuSigned by:
Jeremy Hamm

NORTH CAROLINA PROFESSIONAL SEAL 039779 ENGINEER JEREMY R. HAMM

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STANDARD DETAIL NO. 1801.02

GEOTECHNICAL STANDARD DETAIL FOR
TEMPORARY WALL (SHEET 2 OF 3)

DATE: 02-18-2025

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 1, 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 1 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)

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.

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II, TYPE 1 OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL	A-2-4 SOIL	CLASS II, TYPE 1 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 1 OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL	A-2-4 SOIL	CLASS II, TYPE 1 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.)

MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD

(SEE NOTE 9 ON SHEET 2.)
*SEE PARTIAL ELEVATION ON SHEET 1
FOR REINFORCEMENT LAYER NUMBERING.

17BP.7.R.114
GEO | 2G-3

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

FALCON ENGINEERING

GEOTECHNICAL ENGINEER

4/24/2026
DocuSigned by:
Jeremy Hamm

NORTH CAROLINA PROFESSIONAL SEAL 039779 ENGINEER JEREMY R. HAMM

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STANDARD DETAIL NO. 1801.02

GEOTECHNICAL STANDARD DETAIL FOR

TEMPORARY WALL (SHEET 3 OF 3)

DATE: 02-18-2025

COMPUTED BY: PADDY JORDAN DATE: 11-20-2025
CHECKED BY: TIM JORDAN DATE: 11-20-2025

PROJECT REFERENCE	SHEET NO.
17BP.7.R.114	3B-1

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOULDER WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	AT-1	GREU TL-3	TYPE III						PERMITTED		
																							NO.	G	NG	
-Y- /-L-	11+43 +/-	16+52 +/-	LT /RT	412.50'	112.50'		13+00.00	16+00.00	4'/6'	7'/9'					2											BREAK FOR DRIVE /BREAK FOR DRIVE
-L-	13+83 +/-	16+28 +/-	LT	237.50'			14+45 +/-	14+75 +/-	6'	9'	50'	50'	1'	1'		2										
		SUBTOTAL		650.00'																						
		LESS ANCHOR DEDUCTIONS																								
		GREU TL-3 2 x 50.00' =		-100.00'																						
		AT-1 2 x 6.25' =		-12.50'																						
		TOTAL		537.50'	112.50'										2	2										5 ADDITIONAL GUARDRAIL POSTS

SUMMARY OF EARTHWORK
IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
-L- 13+00.00 TO 16+50.00	0		8,839	8,839	
-L- 20+45.00 TO 22+00.00	73		74	1	
-Y- 10+12.06 TO 11+75.00	36		812	776	
SUBTOTAL	109		9,725	9,616	
-L- 10+00.00 TO 13+00.00	125		583	458	
-L- 16+50.00 TO 19+00.00	9		1,783	1,774	
-L- 19+40 TO 20+45.00	8		86	78	
SUBTOTAL	142		2,452	2,310	
PROJECT TOTAL	251		12,177	11,926	
LOSS DUE TO CLEARING & GRUBBING	-150			150	
5% TO REPLACE BORROW				604	
UNDERCUT CONTINGENCY		530			530
GRAND TOTAL	101	530		12,680	530
SAY	110			13,310	

EST. DDE = 440 CY

SUMMARY OF EXISTING ASPHALT PAVEMENT REMOVAL

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	SY
-L-	11+35.00	14+55.00	LT	634.11
-L-	14+90.00	19+00.00	LT	1,022.80
-Y-	10+12.00	11+21.00	CL	277.97
			TOTAL:	1,934.88
			SAY:	2,035

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".

COMPUTED BY: PADDY JORDAN	DATE: 6-1-2026
CHECKED BY: TIM JORDAN	DATE: 6-1-2026

PROJECT REFERENCE	SHEET NO.
17BP.7.R.114	3D–1

SUB–REGIONAL & REGIONAL
LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE PVC	DO NOT USE CAAP	DO NOT USE HDPE
10+05 –L–	CL	400																	
10+65 –L–	RT	401								28′							X		X
10+86 –Y–	RT	402	403		775.8′	772.7′				20′							X		X
11+07 –Y–	RT	403		777.4′															
		403	404		772.7′	771.2′													
11+54 –Y–	LT	405							40′								X		X
16+72 –L–	RT	406							60′								X		X
17+50 –L–	CL	407		792.9′															
		407	408		789.6′	789.3′													
21+16 –L–	LT	409							20′								X		X
13+57 –L–	LT																		
TOTAL									120′	48′									

STATION	STRUCTURE NO. FROM	STRUCTURE NO. TO	C.S. PIPE 12" .064	15" .064	18" .064	24" .064	36" .079	42" .109	48" .109	R.C. PIPE (CLASS III) 15"	18"	24"	30"	36"	42"	48"	R.C. PIPE (CLASS IV) 12"	15"	18"	24"	30"	36"	42"	48"	**" R. C. PIPE (CLASS V)	**" R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	**" R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.
10+05 –L–	400																														
10+65 –L–	401																														
10+86 –Y–	402	403																													
11+07 –Y–	403																														
	403	404																			68′										
11+54 –Y–	405																														
16+72 –L–	406																														
17+50 –L–	407																														
	407	408																28′													
21+16 –L–	409																														
13+57 –L–																															
TOTAL																		28′			68′										

STATION	STRUCTURE NO. FROM	STRUCTURE NO. TO	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	* TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. *FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G		CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET	OPEN THROAT C.B. (SEE SHEET 2C–7)	MANHOLE FRAME & COVER STD. 840.54	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	T.B.D.I. STD. 840.35	DRAINAGE PIPE ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y.	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN.FT.	PIPE CLEAN OUT EA.	REMARKS
10+05 –L–	400																					1	
10+65 –L–	401																				24		
10+86 –Y–	402	403																			24		
11+07 –Y–	403		1										1	1									
	403	404																					
11+54 –Y–	405																				24		
16+72 –L–	406																				52		
17+50 –L–	407		1									1				1	1						
	407	408																					
21+16 –L–	409																				20		
13+57 –L–																					24		
																			7.9				FOR CONCRETE COLLAR, SEE SHEET UC–4 SEWER
TOTAL			2									1	1	1		1	1		7.9		168	1	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I. (N.S.)	GRATED DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

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

iso-pjordan
c:\pwworking\hmm\rail_transit\jor66165\d0176622\400052_rdy_psh3D-1.dgn
$$DATE$$ 6/25/2026

PROJECT REFERENCE	SHEET NO.
17BP.7.R.114	4

ROADWAY DESIGN ENGINEER — SEAL 21102 — 03-Jun-2025 — MOTT MACDONALD I & E, LLC LICENSE NO. F-0669

HYDRAULICS ENGINEER — SEAL 042084 — 03-Jun-2025 — HDR ENGINEERING LICENSE NO. F-0116

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of: MOTT MACDONALD, 930 Main Campus Drive, Suite 200, Raleigh, NC 27606, www.mottmac.com

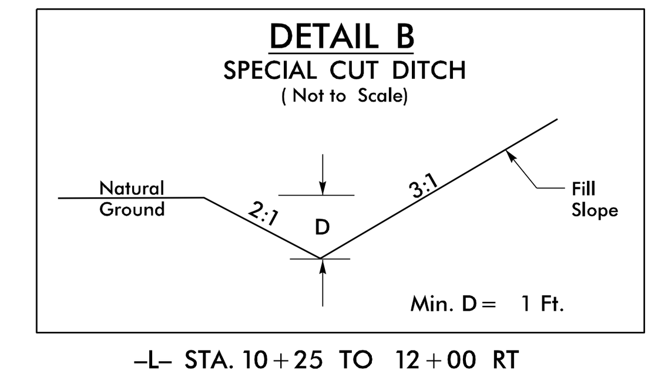
HDR Engineering, Inc. of the Carolinas, 555 Fayetteville St. Suite 900 Raleigh, N.C. 27601, N.C.B.E.L.S. License Number: F-0116

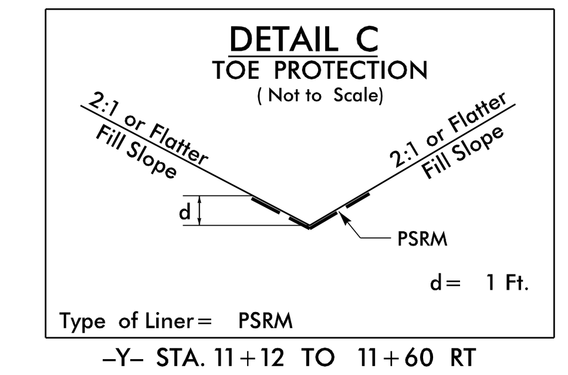
FOR -L- & -Y- PROFILE SEE SHEET 5

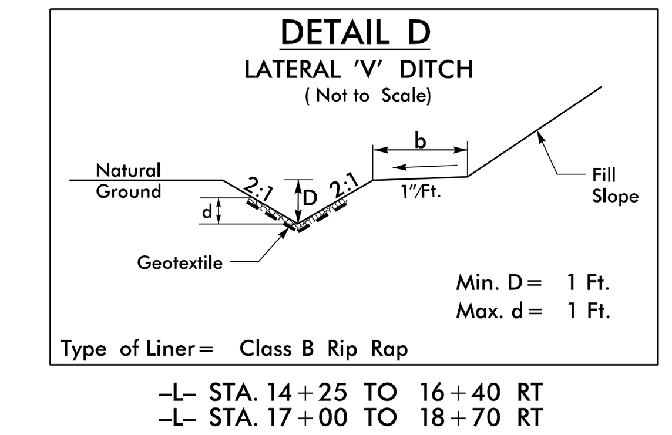
TEMP. SHORING (SEE TMP PLANS)

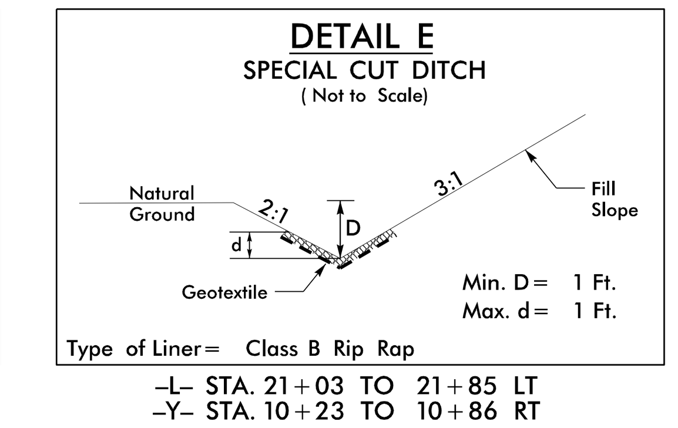
MONOLITHIC ISLAND

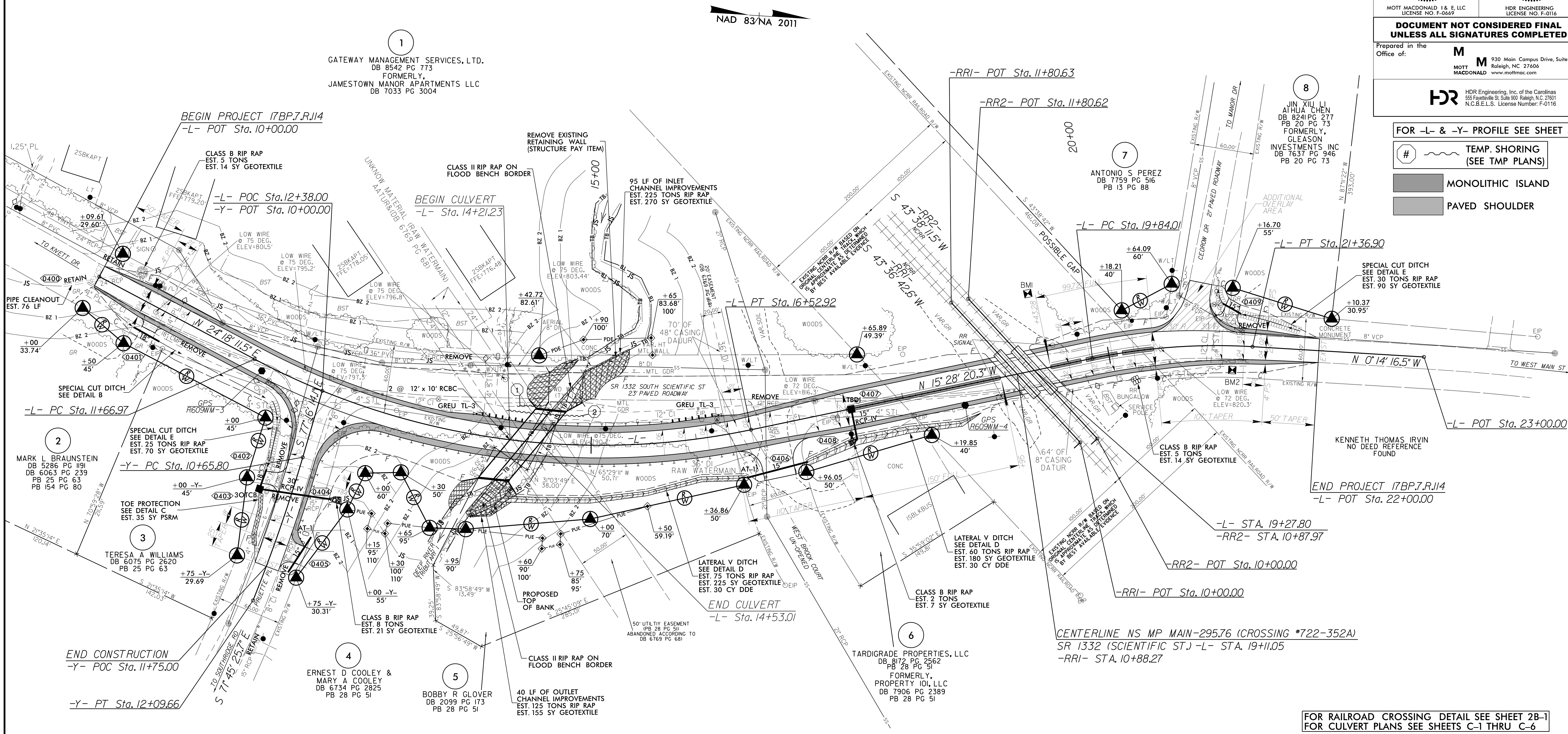
PAVED SHOULDER











NAD 83/NA 2011
GATEWAY MANAGEMENT SERVICES, LTD.
DB 8542 PG 773
FORMERLY,
JAMESTOWN MANOR APARTMENTS LLC
DB 7033 PG 3004
BEGIN PROJECT 17BP.7.R.114
-L- POT Sta. 10+00.00
CLASS B RIP RAP
EST. 5 TONS
EST. 14 SY GEOTEXTILE
REMOVE EXISTING RETAINING WALL (STRUCTURE PAY ITEM)
CLASS II RIP RAP ON FLOOD BENCH BORDER
95 LF OF INLET CHANNEL IMPROVEMENTS
EST. 225 TONS RIP RAP
EST. 270 SY GEOTEXTILE
-L- POC Sta. 12+38.00
-Y- POT Sta. 10+00.00
BEGIN CULVERT
-L- Sta. 14+21.23
-L- PT Sta. 16+52.92
-RR1- POT Sta. 11+80.63
-RR2- POT Sta. 11+80.62
JIN XIU LI
AI HUA CHEN
DB 8241 PG 277
PB 20 PG 73
FORMERLY,
GLEASON INVESTMENTS INC
DB 7637 PG 946
PB 20 PG 73
ANTONIO S PEREZ
DB 7759 PG 516
PB 13 PG 88
-L- PC Sta. 19+84.01
-L- PT Sta. 21+36.90
SPECIAL CUT DITCH
SEE DETAIL E
EST. 30 TONS RIP RAP
EST. 90 SY GEOTEXTILE
PIPE CLEANOUT
EST. 76 LF
SPECIAL CUT DITCH
SEE DETAIL B
-L- PC Sta. 11+66.97
2 @ 12' x 10' RCBC
SR 1332 SOUTH SCIENTIFIC ST
23' PAVED ROADWAY
N 24°18' 11.5" E
N 15°28' 20.3" W
N 0°14' 16.5" W
TO WEST MAIN ST
TO KIVETT DR
MARK L BRAUNSTEIN
DB 5286 PG 1191
DB 6063 PG 239
PB 25 PG 63
PB 154 PG 80
SPECIAL CUT DITCH
SEE DETAIL E
EST. 25 TONS RIP RAP
EST. 70 SY GEOTEXTILE
-Y- PC Sta. 10+65.80
TOE PROTECTION
SEE DETAIL C
EST. 35 SY PSRM
TERESA A WILLIAMS
DB 6075 PG 2620
PB 25 PG 63
END CONSTRUCTION
-Y- POC Sta. 11+75.00
-Y- PT Sta. 12+09.66
CLASS B RIP RAP
EST. 8 TONS
EST. 21 SY GEOTEXTILE
ERNEST D COOLEY &
MARY A COOLEY
DB 6734 PG 2825
PB 28 PG 51
BOBBY R GLOVER
DB 2099 PG 173
PB 28 PG 51
CLASS II RIP RAP ON FLOOD BENCH BORDER
40 LF OF OUTLET CHANNEL IMPROVEMENTS
EST. 125 TONS RIP RAP
EST. 155 SY GEOTEXTILE
PROPOSED TOP OF BANK
LATERAL V DITCH
SEE DETAIL D
EST. 75 TONS RIP RAP
EST. 225 SY GEOTEXTILE
EST. 30 CY DDE
END CULVERT
-L- Sta. 14+53.01
LATERAL V DITCH
SEE DETAIL D
EST. 60 TONS RIP RAP
EST. 180 SY GEOTEXTILE
EST. 30 CY DDE
CLASS B RIP RAP
EST. 2 TONS
EST. 7 SY GEOTEXTILE
TARDIGRADE PROPERTIES, LLC
DB 8172 PG 2562
PB 28 PG 51
FORMERLY,
PROPERTY 101, LLC
DB 7906 PG 2389
PB 28 PG 51
CLASS B RIP RAP
EST. 5 TONS
EST. 14 SY GEOTEXTILE
KENNETH THOMAS IRVIN
NO DEED REFERENCE FOUND
-L- POT Sta. 23+00.00
END PROJECT 17BP.7.R.114
-L- POT Sta. 22+00.00
-L- STA. 19+27.80
-RR2- STA. 10+87.97
-RR2- POT Sta. 10+00.00
-RR1- POT Sta. 10+00.00
CENTERLINE NS MP MAIN-295.76 (CROSSING #722-352A)
SR 1332 (SCIENTIFIC ST.) -L- STA. 19+11.05
-RR1- STA. 10+88.27
WEST BROOK COURT

FOR RAILROAD CROSSING DETAIL SEE SHEET 2B-1
FOR CULVERT PLANS SEE SHEETS C-1 THRU C-6

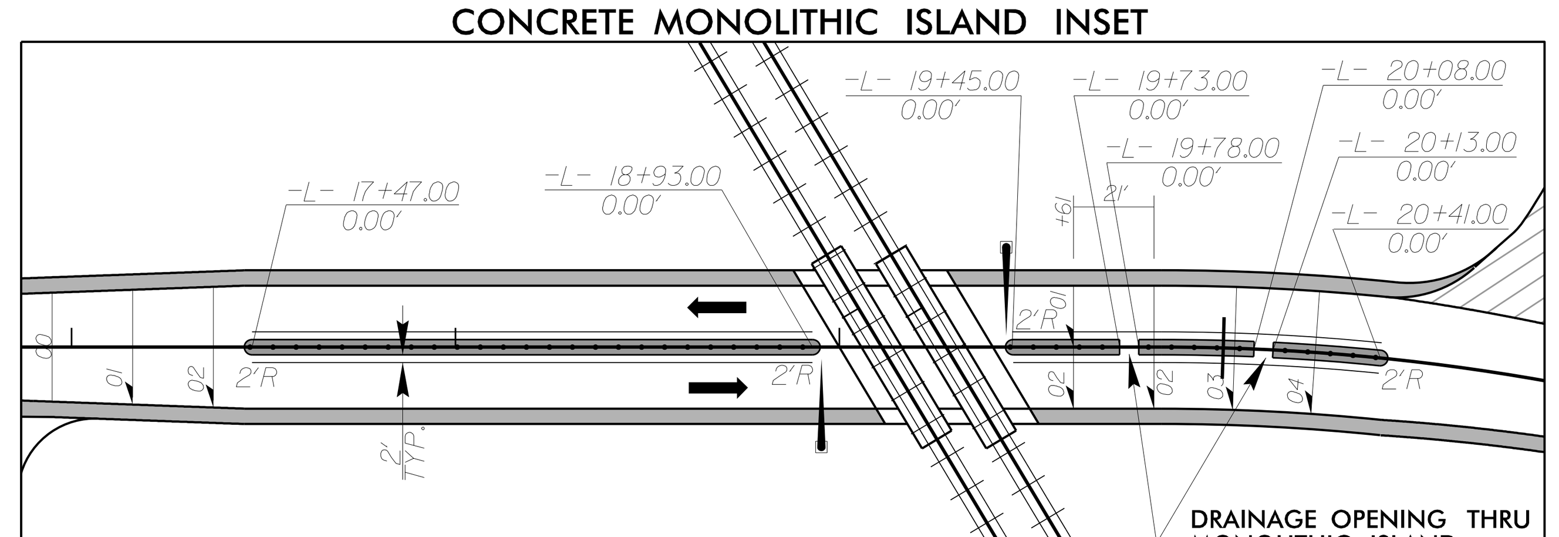
-L-

PI Sta 14+20.20	PI Sta 20+60.91
Δ = 39° 46' 31.8" (LT)	Δ = 15° 14' 03.8" (RT)
D = 8° 11' 06.4"	D = 9° 57' 52.1"
L = 485.95'	L = 152.89'
T = 253.23'	T = 76.90'
R = 700.00'	R = 575.00'
SE = .06	SE = .04
RO = 126'	

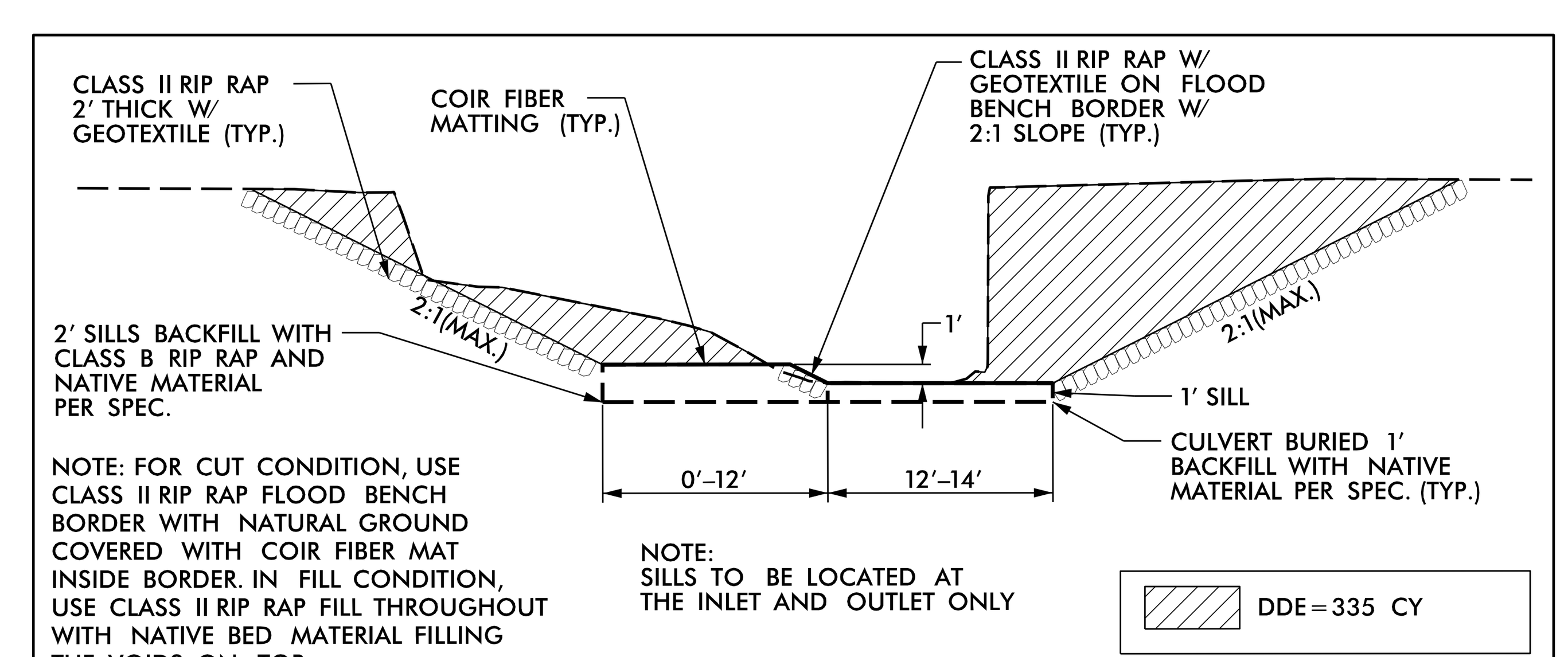
-Y-

PI Sta 11+37.79
Δ = 5° 30' 48.4" (RT)
D = 3° 49' 57.0"
L = 143.86'
T = 71.99'
R = 1,495.00'
SE = .02

CONCRETE MONOLITHIC ISLAND INSET



FOR 6" NON-MOUNTABLE CONCRETE ISLAND DETAIL SEE SHEET 2C-1
FOR DRAINAGE OPENING THRU MONOLITIC ISLAND DETAIL SEE SHEET 2C-2
USE TUBULAR MARKERS W/6' SPACING (STD. DRAWING 1266.01)

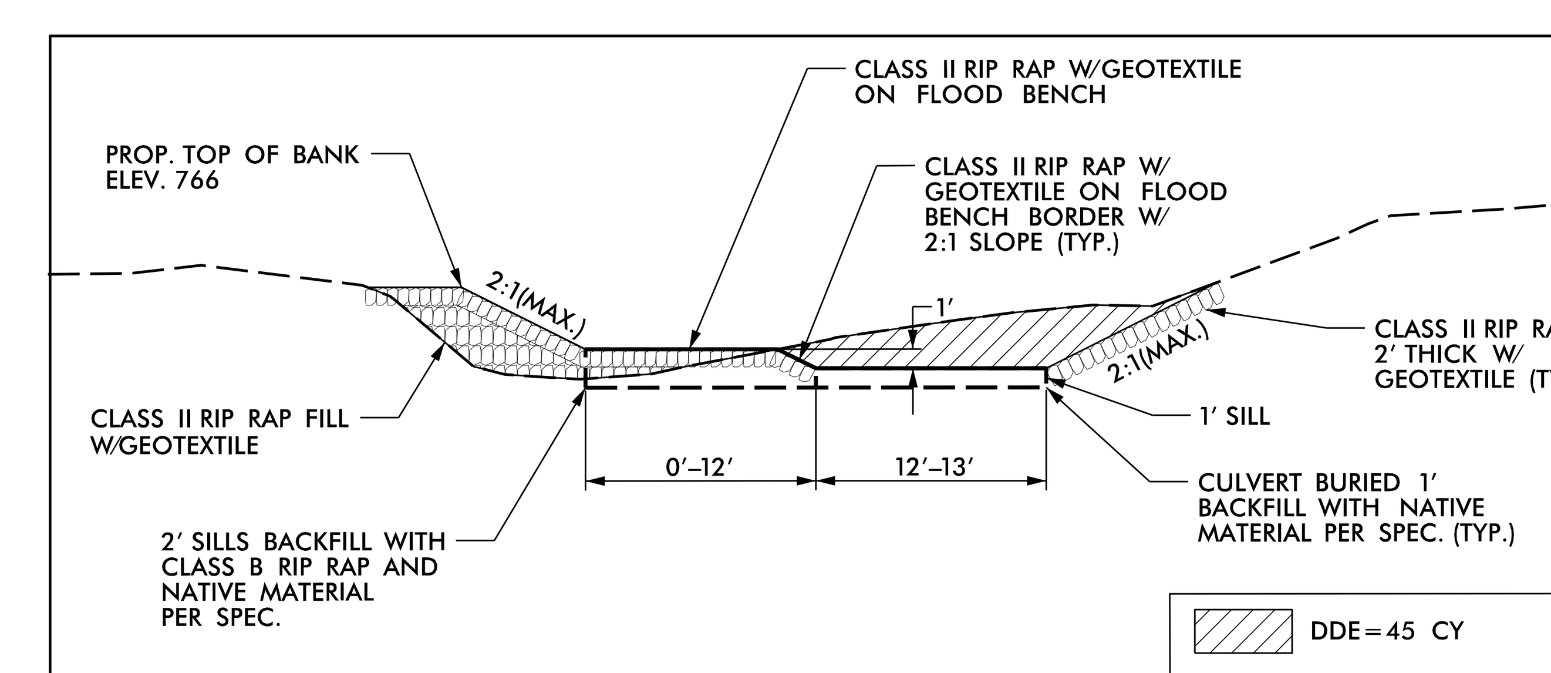


CLASS II RIP RAP 2' THICK W/ GEOTEXTILE (TYP.)
COIR FIBER MATTING (TYP.)
CLASS II RIP RAP W/ GEOTEXTILE ON FLOOD BENCH BORDER W/ 2:1 SLOPE (TYP.)
2:1(MAX.)
2' SILLS BACKFILL WITH CLASS B RIP RAP AND NATIVE MATERIAL PER SPEC.
1' SILL
CULVERT BURIED 1' BACKFILL WITH NATIVE MATERIAL PER SPEC. (TYP.)
0'-12'
12'-14'
DDE=335 CY

NOTE: FOR CUT CONDITION, USE CLASS II RIP RAP FLOOD BENCH BORDER WITH NATURAL GROUND COVERED WITH COIR FIBER MAT INSIDE BORDER. IN FILL CONDITION, USE CLASS II RIP RAP FILL THROUGHOUT WITH NATIVE BED MATERIAL FILLING THE VOIDS ON TOP.

NOTE: SILLS TO BE LOCATED AT THE INLET AND OUTLET ONLY

INLET CHANNEL (LOOKING DOWNSTREAM) (SCALE 1" =10')



CLASS II RIP RAP W/GEOTEXTILE ON FLOOD BENCH
PROP. TOP OF BANK ELEV. 766
CLASS II RIP RAP W/ GEOTEXTILE ON FLOOD BENCH BORDER W/ 2:1 SLOPE (TYP.)
2:1(MAX.)
CLASS II RIP RAP 2' THICK W/ GEOTEXTILE (TYP.)
CLASS II RIP RAP FILL W/GEOTEXTILE
1' SILL
0'-12'
12'-13'
2' SILLS BACKFILL WITH CLASS B RIP RAP AND NATIVE MATERIAL PER SPEC.
CULVERT BURIED 1' BACKFILL WITH NATIVE MATERIAL PER SPEC. (TYP.)
DDE=45 CY

OUTLET CHANNEL (LOOKING DOWNSTREAM) (SCALE 1" =10')

PROJECT REFERENCE	SHEET NO.
17BP.7.R.114	5

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21102 JAMES TIMOTHY JORDAN Signed by: James Timothy Jordan DBD87EDB56F64FA... 03-Jun-2026	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042084 JOSHUA J. MASSROCK Signed by: Joshua Massrock D6D5DB73060C4E7... 03-Jun-2026
MOTT MACDONALD I & E, LLC LICENSE NO. F-0669	HDR ENGINEERING LICENSE NO. F-0116

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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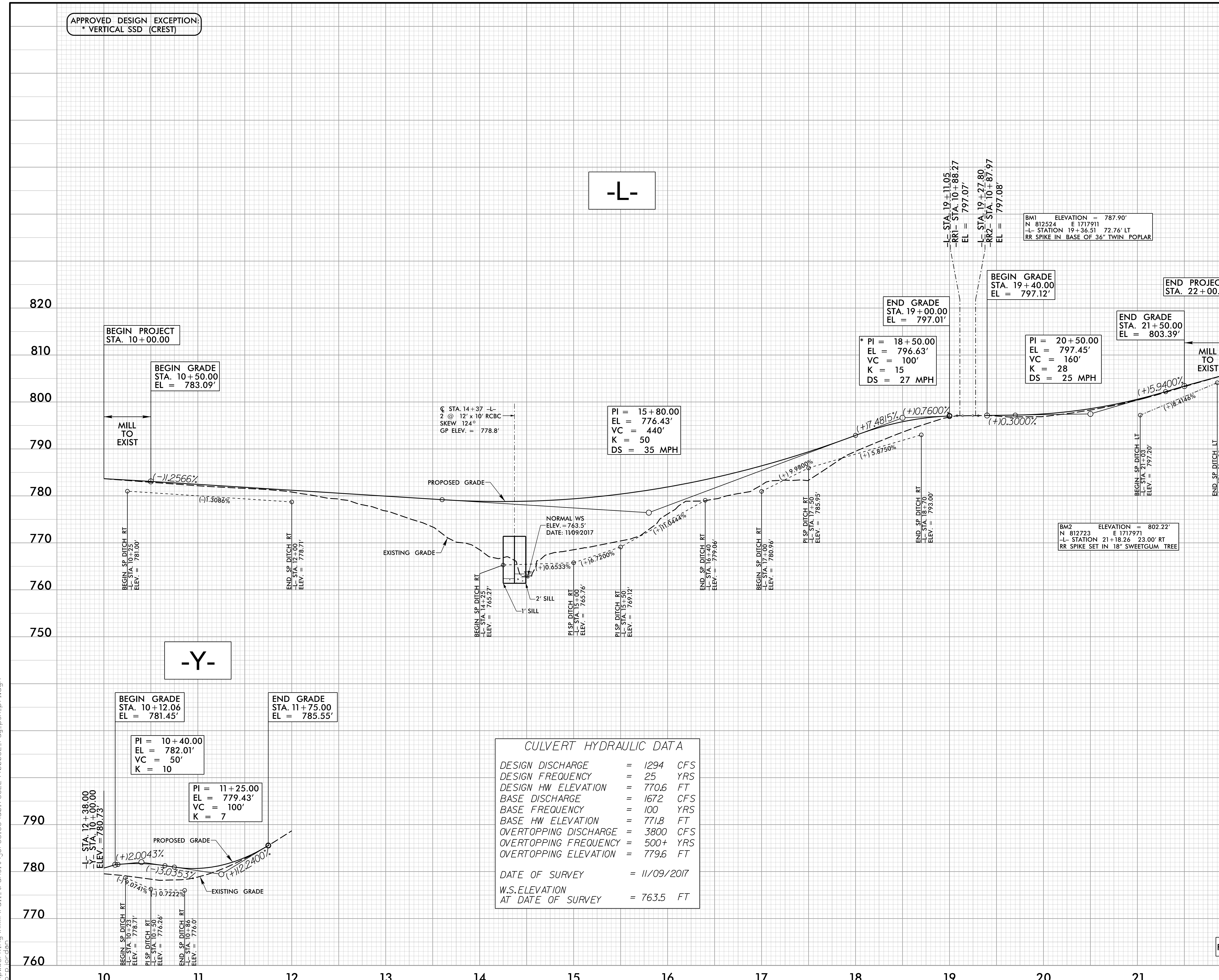
www.mottmac.com

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

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



CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	=	1294	CFS
DESIGN FREQUENCY	=	25	YRS
DESIGN HW ELEVATION	=	770.6	FT
BASE DISCHARGE	=	1672	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	771.8	FT
OVERTOPPING DISCHARGE	=	3800	CFS
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING ELEVATION	=	779.6	FT
DATE OF SURVEY	=	11/09/2017	
W.S.ELEVATION AT DATE OF SURVEY	=	763.5	FT

FOR -L- & -Y- PLAN SEE SHEET 4

$$DATE$$ 5/11/2026
c:\pwworking\hmm\rail_transit\jor66165\d0176622\400052_rdy_psh_pfl.dgn
jeo.p.jordan