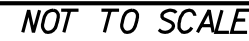


**This electronic collection of documents is provided
for the convenience of the user
and is Not a Certified Document –**

**The documents contained herein were originally issued
and sealed by the individuals whose names and license
numbers appear on each page, on the dates appearing
with their signature on that page.**

**This file or an individual page
shall not be considered a certified document.**

SEE SHEET 1A FOR INDEX OF SHEETS
SEE SHEET 1B FOR CONVENTIONAL PLAN SHEET SYMBOLS

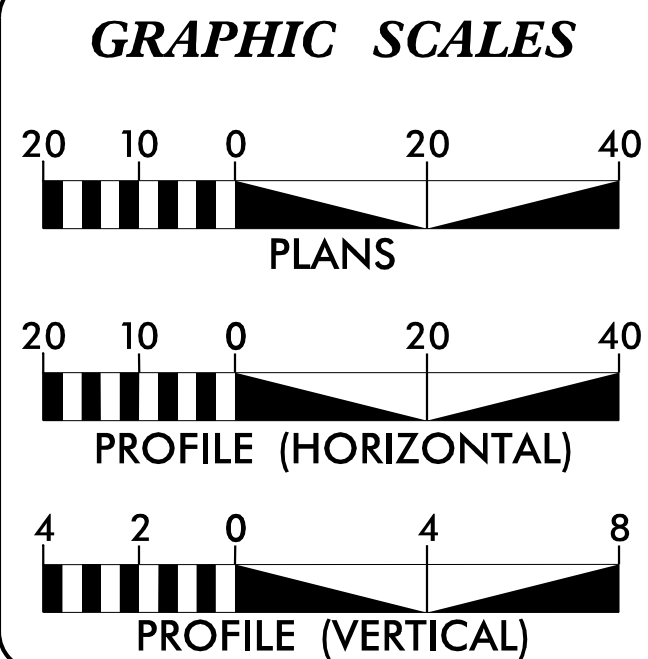


HENDERSON COUNTY

TYPE OF WORK: GRADING, DRAINAGE, PAVING, SLOPE REPAIRS & CULVERTS



STATE	STATE PROJECT REFERENCE NO.		SHEET NO.	TOTAL SHEETS
N.C.	DF18314.2045121		1	
STATE PROJ.NO.	SITE NO.	F.A.PROJ.NO.	DESCRIPTION	
DF18314.2045413	1		PE, ROW, UTIL, CONSTRUCTION	
DF18314.2045408	2		PE, ROW, UTIL, CONSTRUCTION	
DF18314.2045405	4		PE, ROW, UTIL, CONSTRUCTION	
DF18314.2045404	5		PE, ROW, UTIL, CONSTRUCTION	
DF18314.2045233	8		PE, ROW, UTIL, CONSTRUCTION	
DF18314.2045234	9		PE, ROW, UTIL, CONSTRUCTION	
DF18314.2045231	10		PE, ROW, UTIL, CONSTRUCTION	
DF18314.2045480	11		PE, ROW, UTIL, CONSTRUCTION	
DF18314.2045481	12		PE, ROW, UTIL, CONSTRUCTION	
DF18314.2045230	13		PE, ROW, UTIL, CONSTRUCTION	
DF18314.2045121	14		PE, ROW, UTIL, CONSTRUCTION	
DF18314.2045126	16		PE, ROW, UTIL, CONSTRUCTION	



BEARWALLOW
DESIGN DATA
ADT 2025 = 350
ADT 2045 = 350
K = 7%
D = 55
T = 5%*
V = 35 MPH
* (TTST 2% + DUAL 3%)
CLASSIFICATION:
LOCAL ROAD

PROJECT LENGTH

TOTAL PROJECT LENGTH DF18314.2045121 W03290 = 1.02 MILES

**PLANS PREPARED FOR
THE NCDOT BY:**

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

LETTING DATE:
OCTOBER 28, 2025

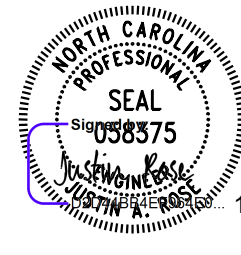
Kimley»Horn

BENJAMIN CRAWFORD, P.E.
PROJECT ENGINEER

TYLER G. SPRING, P.E.
PROJECT DESIGN ENGINEER

BARRY MOSTELLER, P.E.
PROJECT MANAGER
NCDOT HIGHWAY DIVISION 14

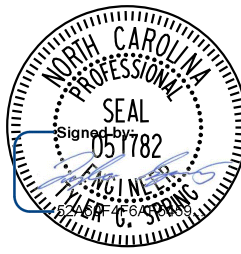
HYDRAULICS ENGINEER



10/1/2025

JUSTIN A. ROSE, P.E.

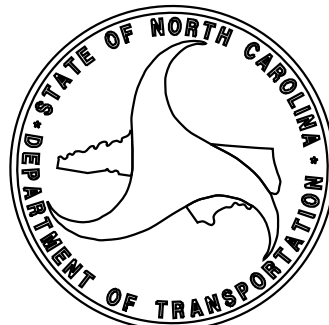
SIGNATURE:

ROADWAY DESIGN ENGINEER

10/1/202

TYLER G. SPRING, P.E.

SIGNATURE



9/30/2025

DF18314.2045121
HENDERSON COUNTY

INDEX OF SHEETS	
SHEET NUMBER	SHEET
I	TITLE SHEET
IA	INDEX OF SHEETS, GENERAL NOTES, LIST OF ROADWAY STANDARD DRAWINGS
IB	CONVENTIONAL SYMBOLS SHEET
2B-1 THRU 2B-2	SOIL NAIL SLOPE STABILIZATION ENVELOPES
2D-1	MODIFIED CONCRETE ENDWALL DETAIL
SN	STANDARD NOTES
2G-1 THRU 2G-12	GEOTECHNICAL DETAILS
3B-1	SUMMARY OF ROADWAY QUANTITIES
3D-1	DRAINAGE SUMMARY SHEET
3P-1	PARCEL INDEX SHEET
4 THRU 12	PLAN SHEETS, PAVEMENT SCHEDULE, TYPICAL SECTIONS
13 THRU 14	PROFILE SHEETS
RWO1 THRU RWXX	SURVEY CONTROL, EXISTING CENTERLINES
TMP-1 THRU TMP-7	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-6	PAVEMENT MARKING AND SIGNING PLANS
EC-1 THRU EC-13	EROSION CONTROL PLANS
UO-1 THRU UO-10	UTILITIES BY OTHERS PLANS
X-0	CROSS-SECTIONS INDEX
X-1 THRU X-118	CROSS-SECTIONS

GENERAL NOTES
2024 SPECIFICATIONS

EFFECTIVE: 01-02-24

GRADE LINE:
GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED 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.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

POWER: DUKE ENERGY
TELECOMMUNICATIONS: SPECTRUM (CHARTER)
TELECOMMUNICATIONS: AT&T
WATER: TOWN OF HENDERSONVILLE

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

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

DIVISION 3 - PIPE CULVERTS
300.01 Method of Pipe Installation (Use Details in Lieu of Standards for Sheets 1 and 2 of 2)

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
816.02 Aggregate Shoulder Drain
816.03 Frame, Grates and Hood - for Use on Standard Catch Basin
840.00 Concrete Base Pad for Drainage Structures
840.02 Concrete Catch Basin - 12" thru 54" Pipe
840.17 Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.24 Frames and Narrow Slot Sag Grates
840.66 Drainage Structure Steps
846.04 Drop Inlet Installation in Shoulder Berm Gutter
876.02 Guide for Rip Rap at Pipe Outlets

PROJECT REFERENCE NO.
DF18314.2045121

SHEET NO.
I-A

ROADWAY DESIGN
ENGINEER



10/1/2025

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	

Woods Line	
Orchard	
Vineyard	

EXISTING STRUCTURES:

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

UTILITIES:

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

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

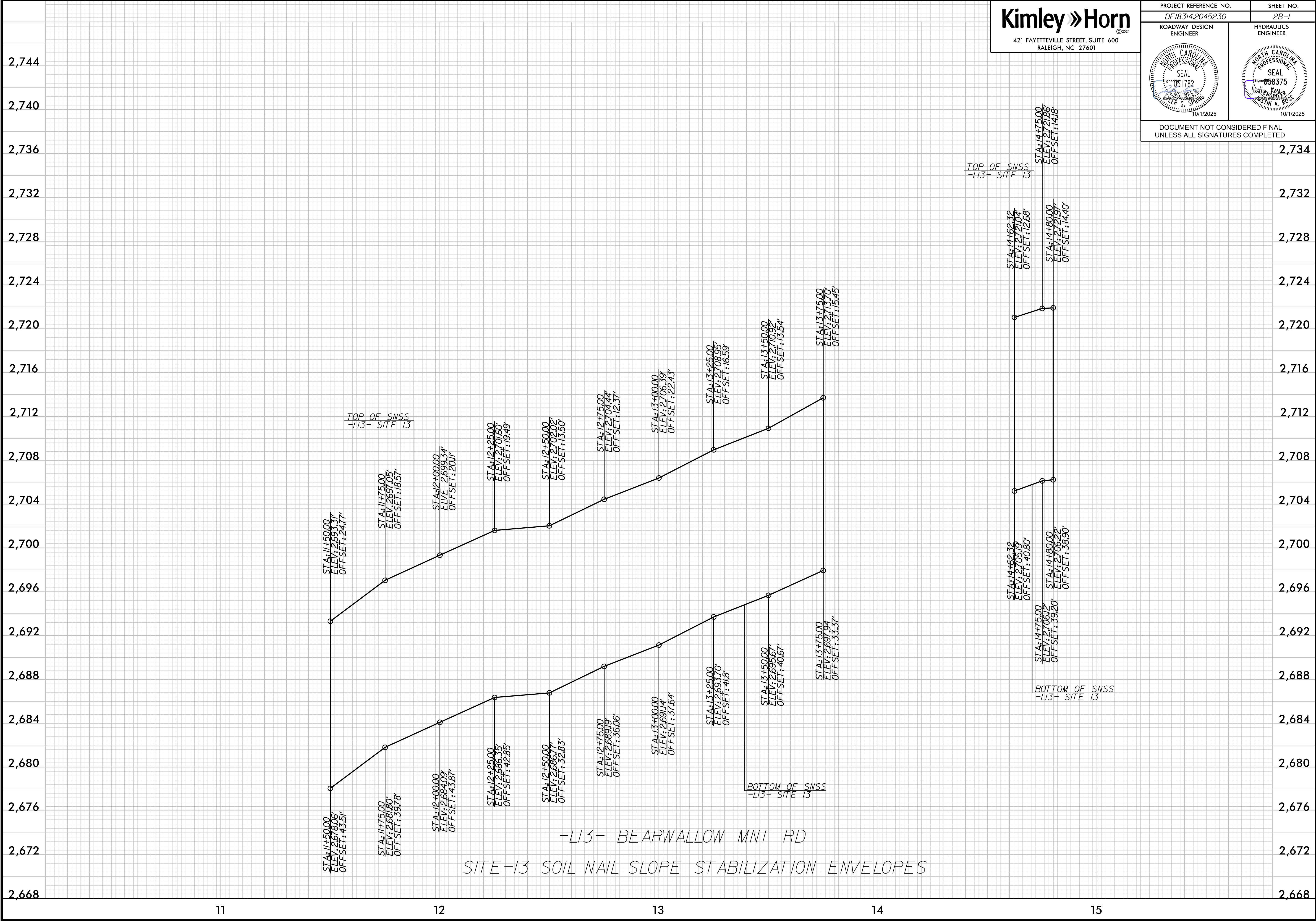
Sanitary Sewer Manhole	
Sanitary Sewer Cleanout	
U/G Sanitary Sewer Line	
Above Ground Sanitary Sewer	
SS Force Main Line Test Hole (SUE – LOS A)*	
SS Force Main Line (SUE – LOS B)*	
SS Force Main Line (SUE – LOS C)*	
SS Force Main Line (SUE – LOS D)*	

MISCELLANEOUS:

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

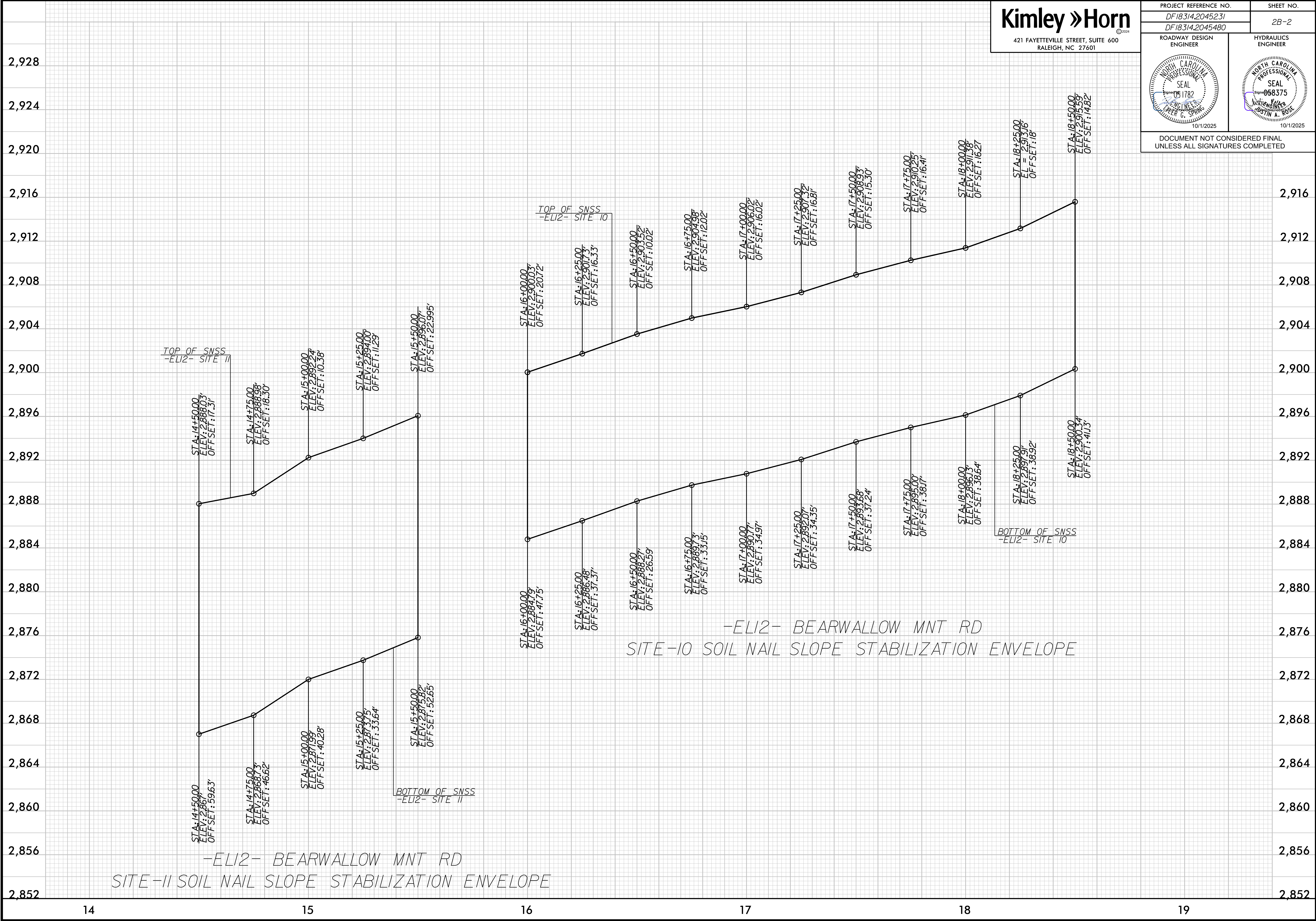
K:\RAL_Roadway\010136679 - Bearwallow Roadway\Proj\Bearingwallow_rdy.plt.dgn

10/11/2025

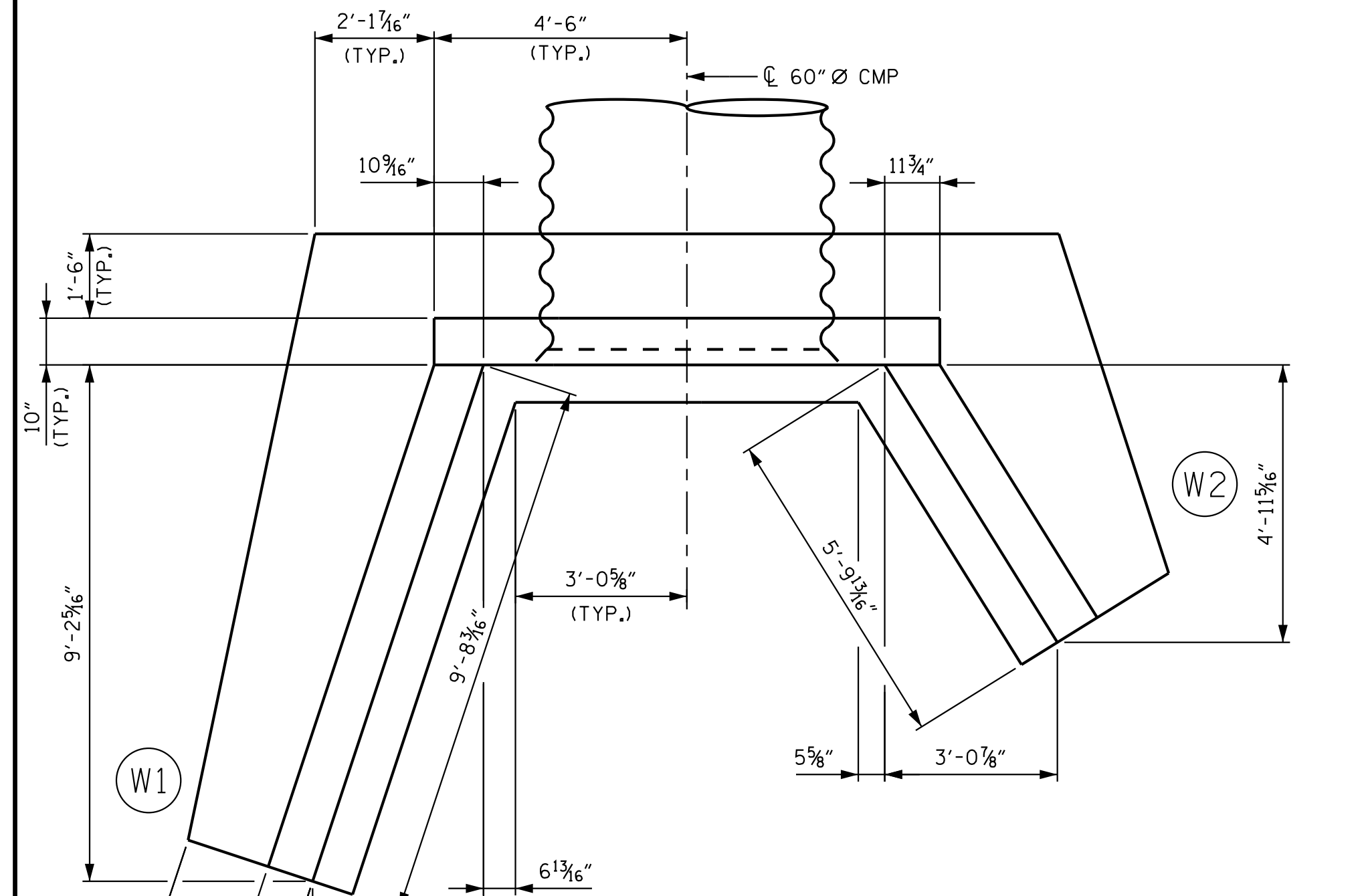


K:\RAL_Roadway\01036679 - Bearwallow\Roadway\Proj\Bearwallow_rdy.plt.dgn

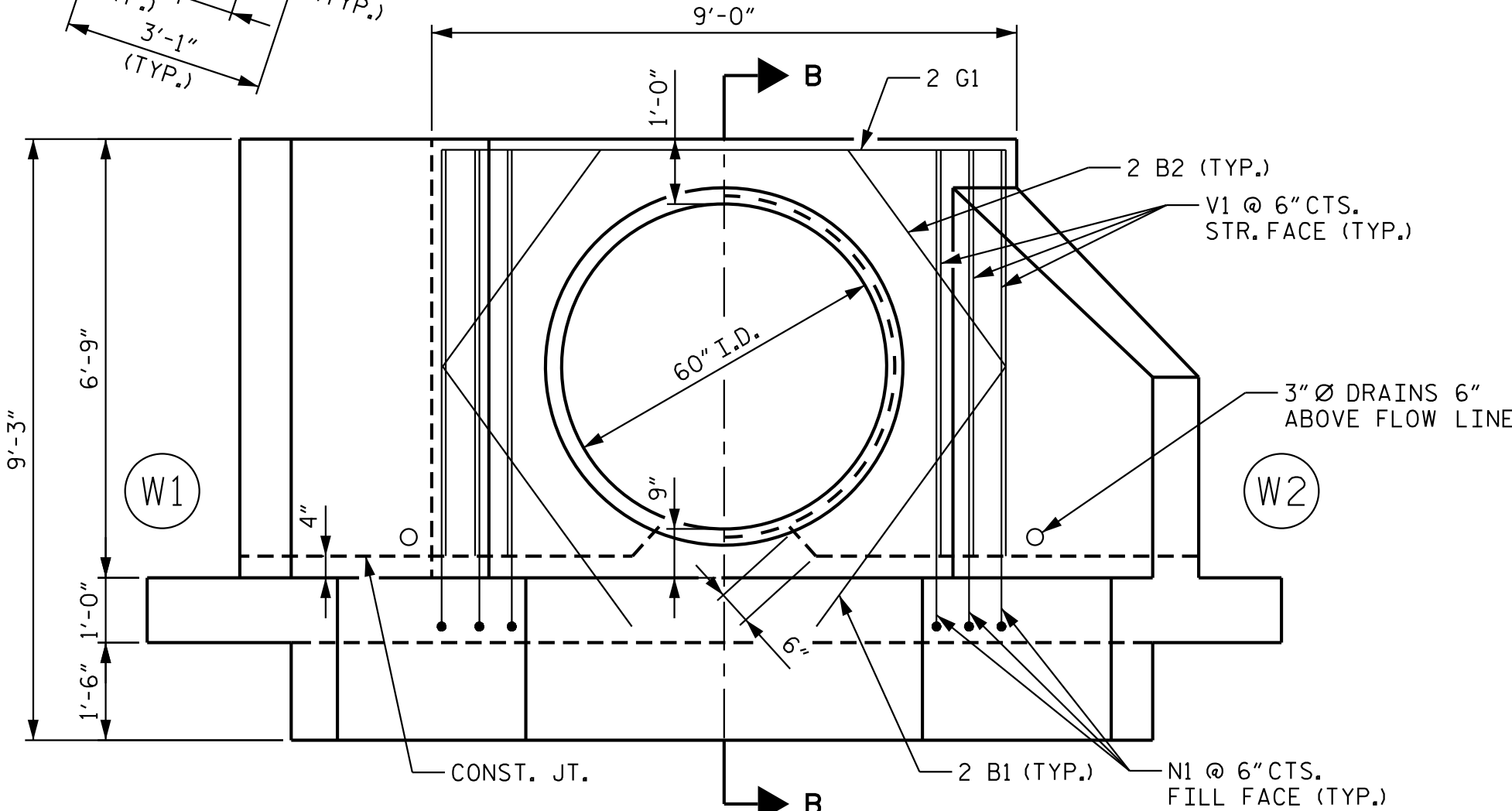
10/1/2025



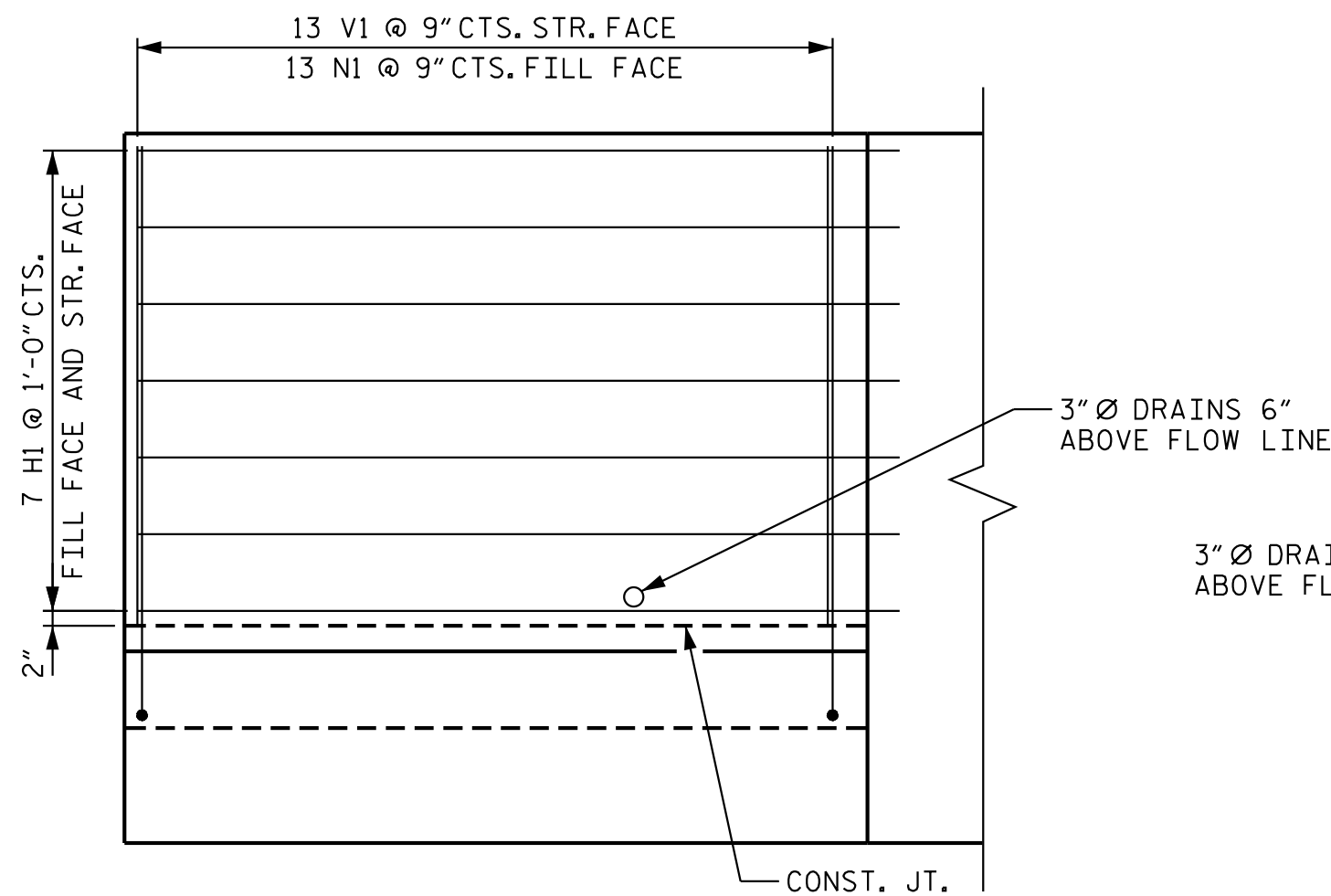
9/22/2025 K:\B01_Structures\Calver\NC\01036679 - Bear\allow\Con\01036679-SML\CU01.dgn



PLAN DETAILS

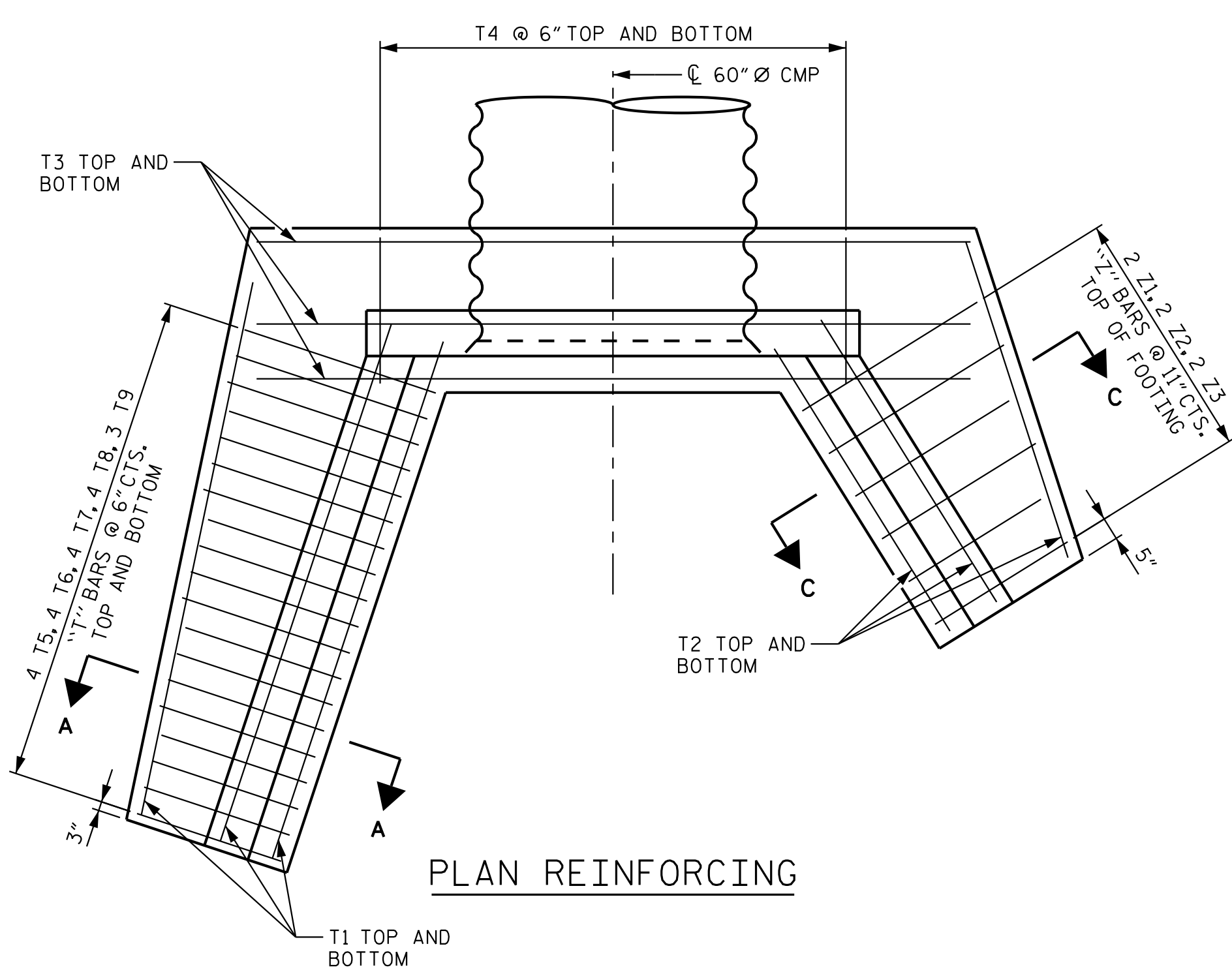


ELEVATION

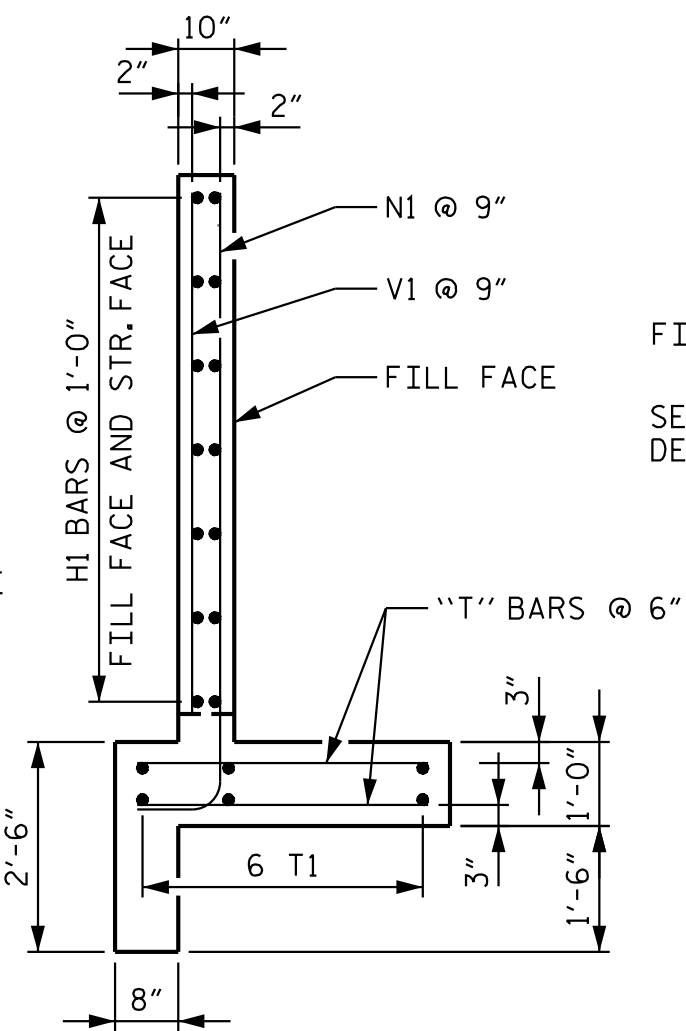


W1 ELEVATION

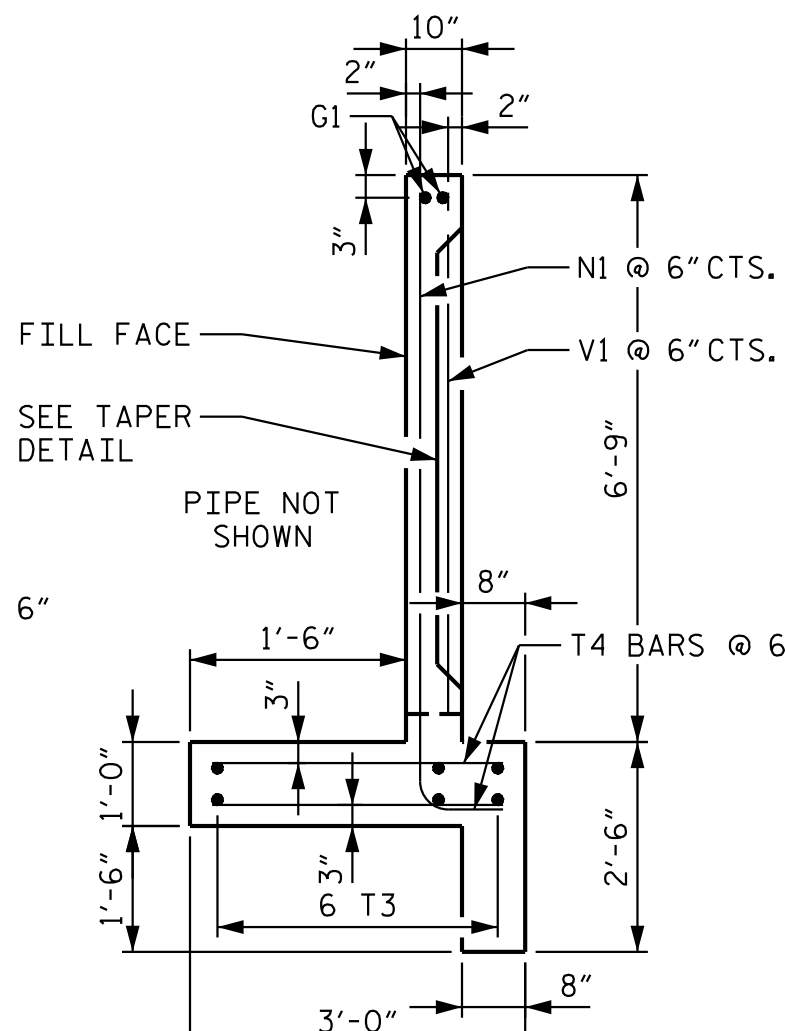
FOOTING REINFORCING NOT SHOWN FOR CLARITY



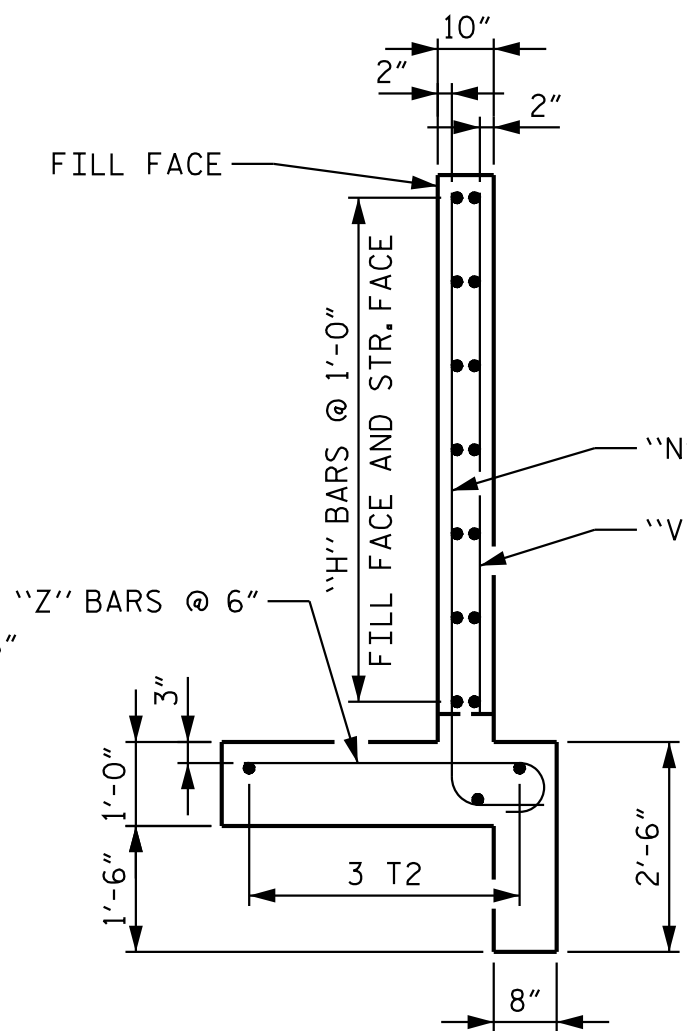
PLAN REINFORCING



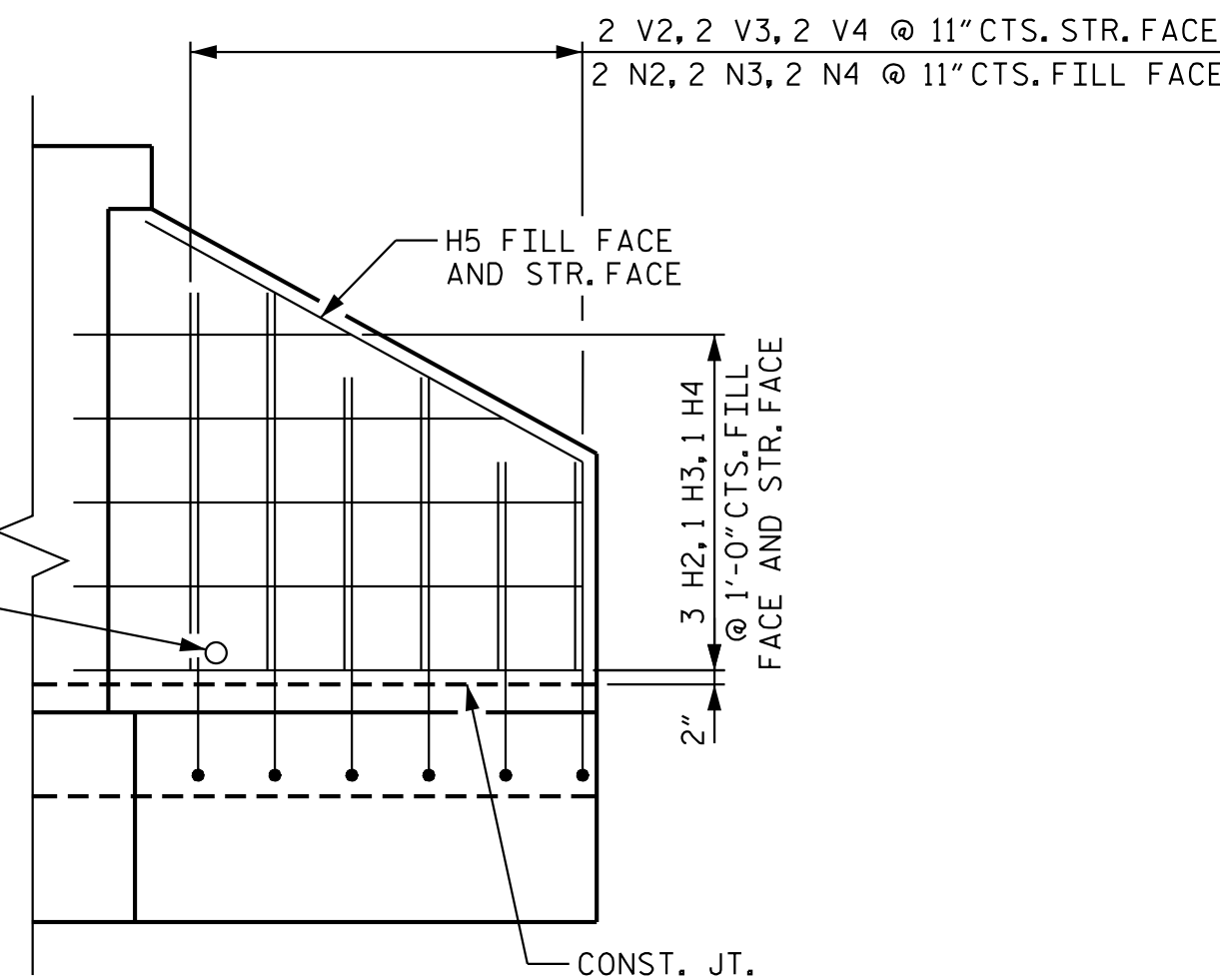
SECTION A-A



SECTION B-B

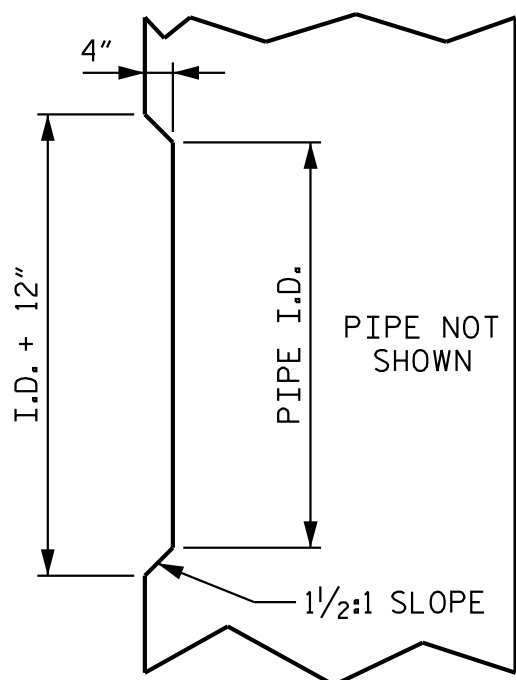


SECTION C-C

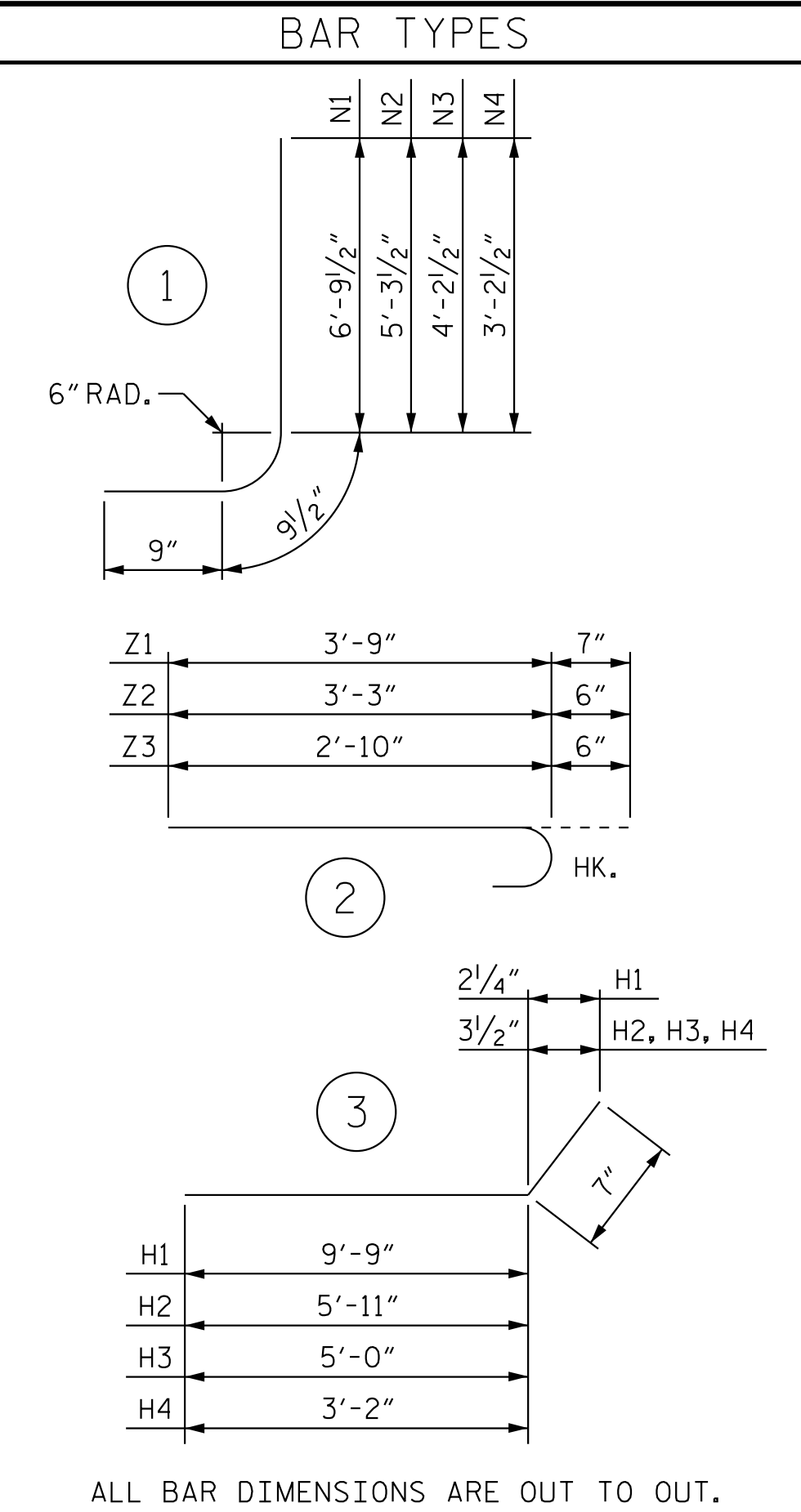


W2 ELEVATION

FOOTING REINFORCING NOT SHOWN FOR CLARITY



TAPER DETAIL



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	4	STR	4'-11"	13
B2	4	4	STR	4'-1"	11
G1	2	7	STR	8'-8"	35
H1	14	4	3	10'-4"	97
H2	6	4	3	6'-6"	26
H3	2	4	3	5'-7"	7
H4	2	4	3	3'-9"	5
H5	2	4	STR	6'-1"	8
N1	19	5	1	8'-4"	165
N2	2	4	1	6'-10"	9
N3	2	4	1	5'-9"	8
N4	2	4	1	4'-9"	6
T1	6	4	STR	10'-0"	40
T2	3	4	STR	6'-0"	12
T3	6	4	STR	13'-0"	52
T4	36	4	STR	2'-8"	64
T5	8	4	STR	2'-9"	15
T6	8	4	STR	3'-0"	16
T7	8	4	STR	3'-2"	17
T8	8	4	STR	3'-5"	18
T9	6	4	STR	3'-8"	15
V1	19	4	STR	6'-3"	79
V2	2	4	STR	4'-8"	6
V3	2	4	STR	3'-8"	5
V4	2	4	STR	2'-8"	4
Z1	2	5	2	4'-4"	9
Z2	2	4	2	3'-9"	5
Z3	2	4	2	3'-4"	4
TOTAL ENDWALL QUANTITIES					
REINFORCING STEEL					751 LBS.
CLASS B CONCRETE					TOTAL 8.3 C.Y.

NOTES

FOR STRUCTURAL STANDARD NOTES, REFER TO SHEET STD. NO. SN.

ALL CORNERS SHALL HAVE A 1" CHAMFER OR HAVE A RADIUS OF 1".

CONSTRUCT BOTTOM SLAB WITH FORMS.

WHEN THE CONTRACTOR ELECTS TO USE A CONSTRUCTION JOINT AT THE BOTTOM OF THE PIPE, PLACE THE "N" BARS AND "V" BARS IN THE BASE AS SHOWN ON PLANS.

WHEN THE CONTRACTOR ELECTS TO USE A CONSTRUCTION JOINT AT THE BOTTOM OF THE PIPE AND POUR THE BASE SEPARATELY, LEAVE THE POUR ROUGH.

3" Ø WEEP HOLES SHALL BE IN ACCORDANCE WITH NCDOT STANDARD SPECIFICATIONS.

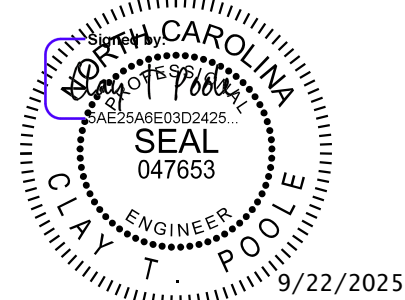
USE CLASS "B" CONCRETE.

FOR "MODIFIED CONCRETE ENDWALL", SEE SPECIAL PROVISIONS.

PROJECT NO. DF18314.2045121

HENDERSON COUNTY

STATION: 13+98.65 -L9-



Kimley»Horn

421 Fayetteville Street, Suite 600
Raleigh, NC 27601-1772
Phone (919) 677-2000 NC LICENSE # F-0102

This document, together with the concepts and designs presented herein, is an integral part of the project. It is intended only for the specific project and shall not be used for any other project without the written authorization and approval of Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

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

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A ¼" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST ⅝" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY ⅛" OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

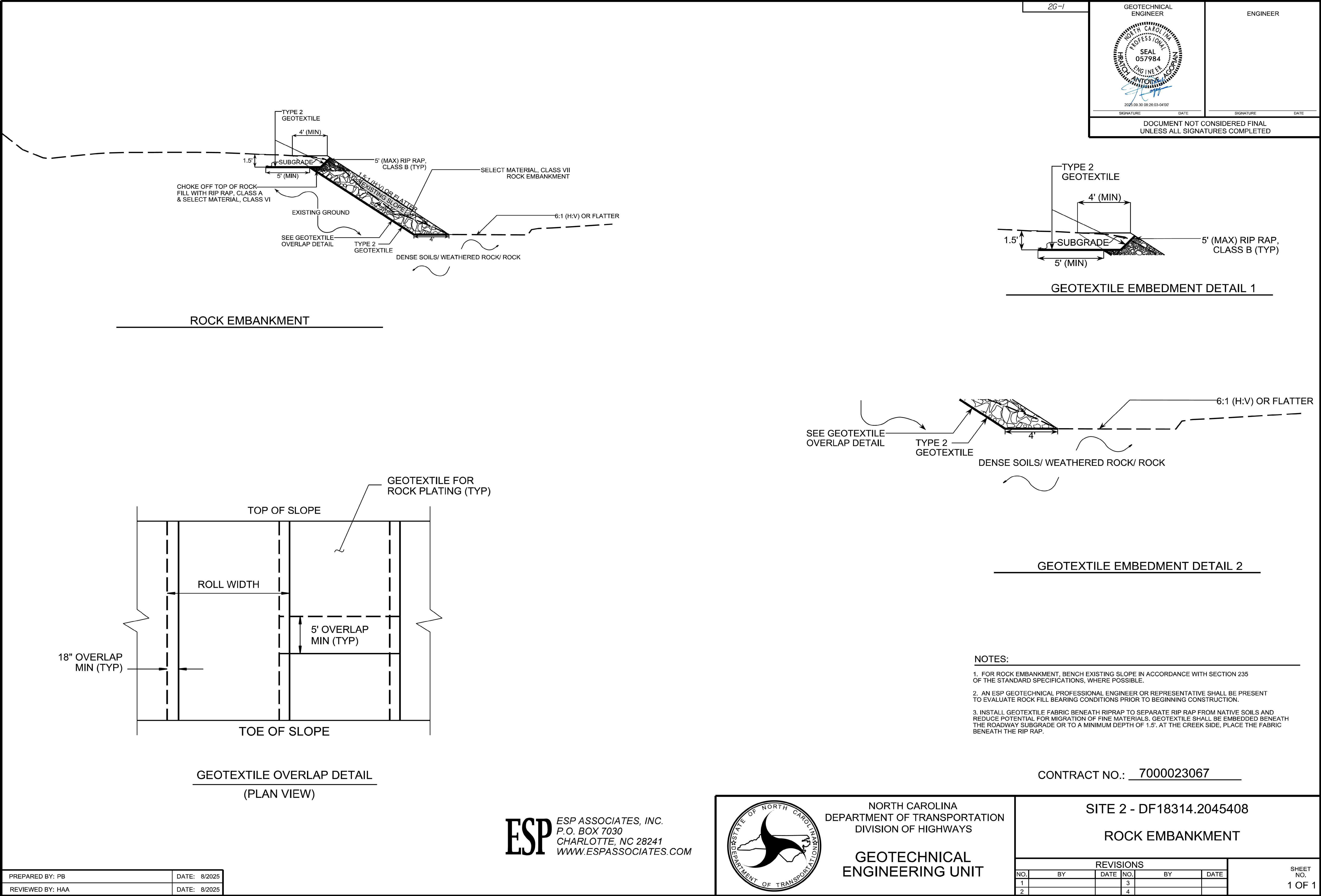
HANDRAILS AND POSTS:

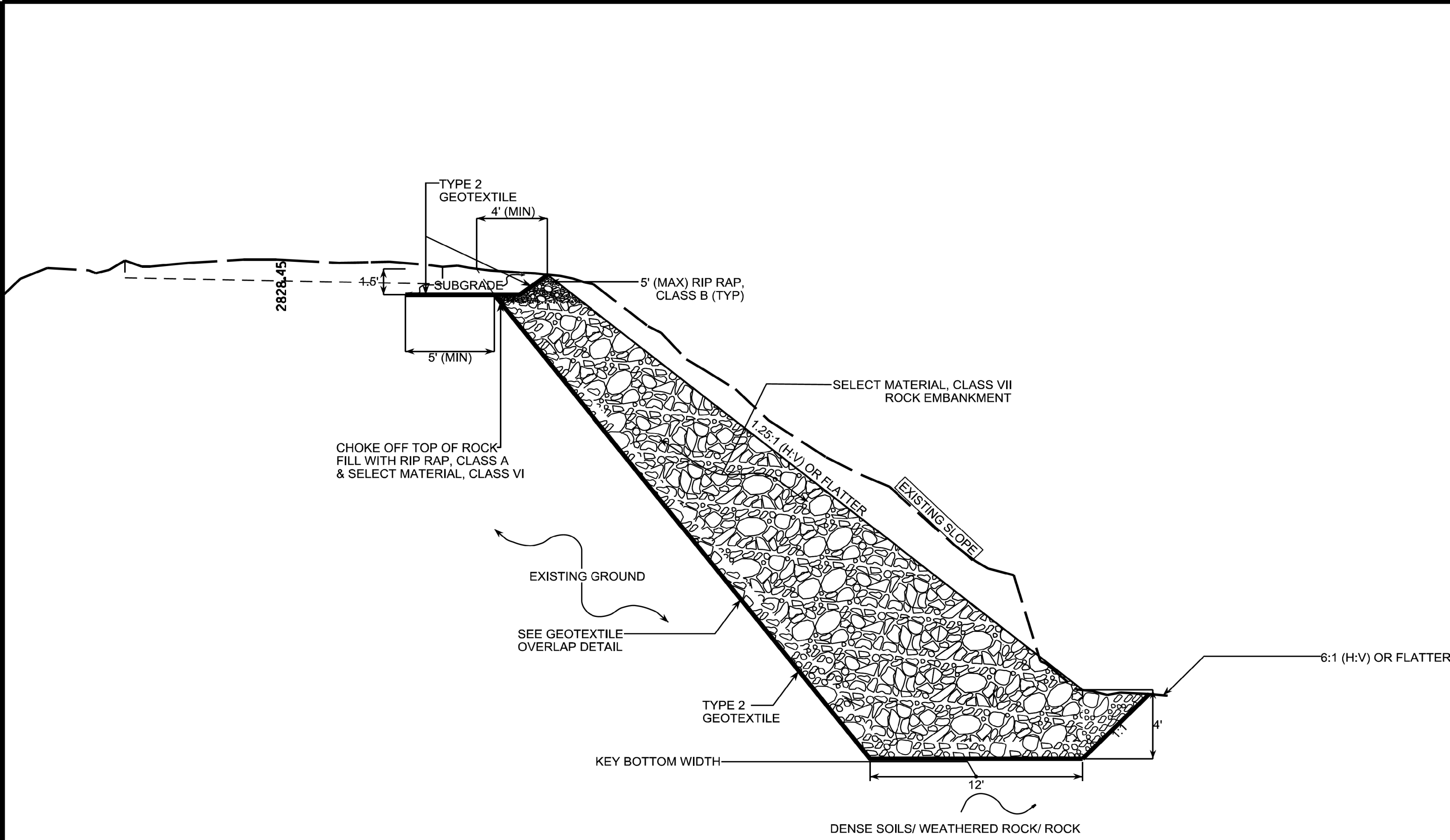
METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

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

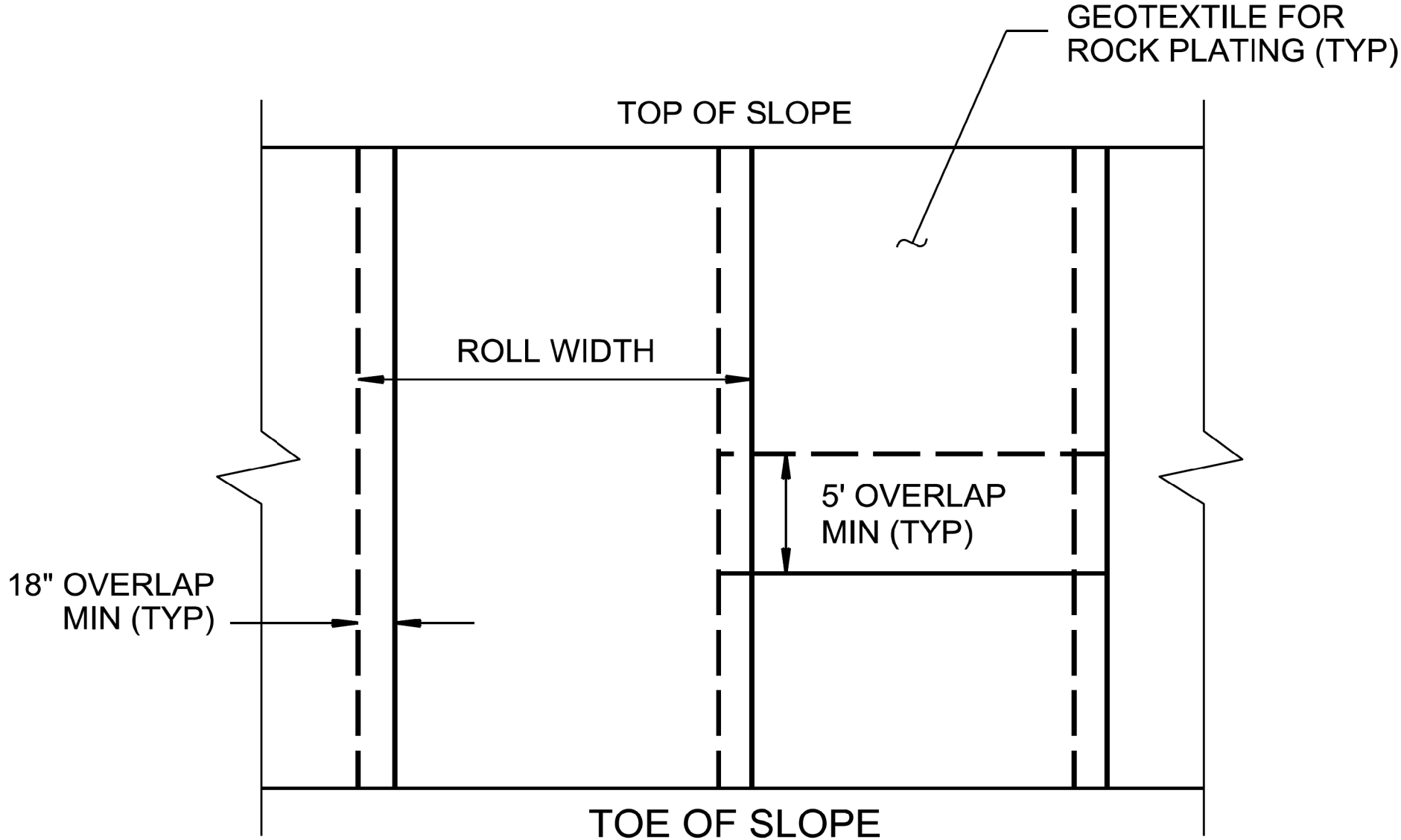
SPECIAL NOTES:

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

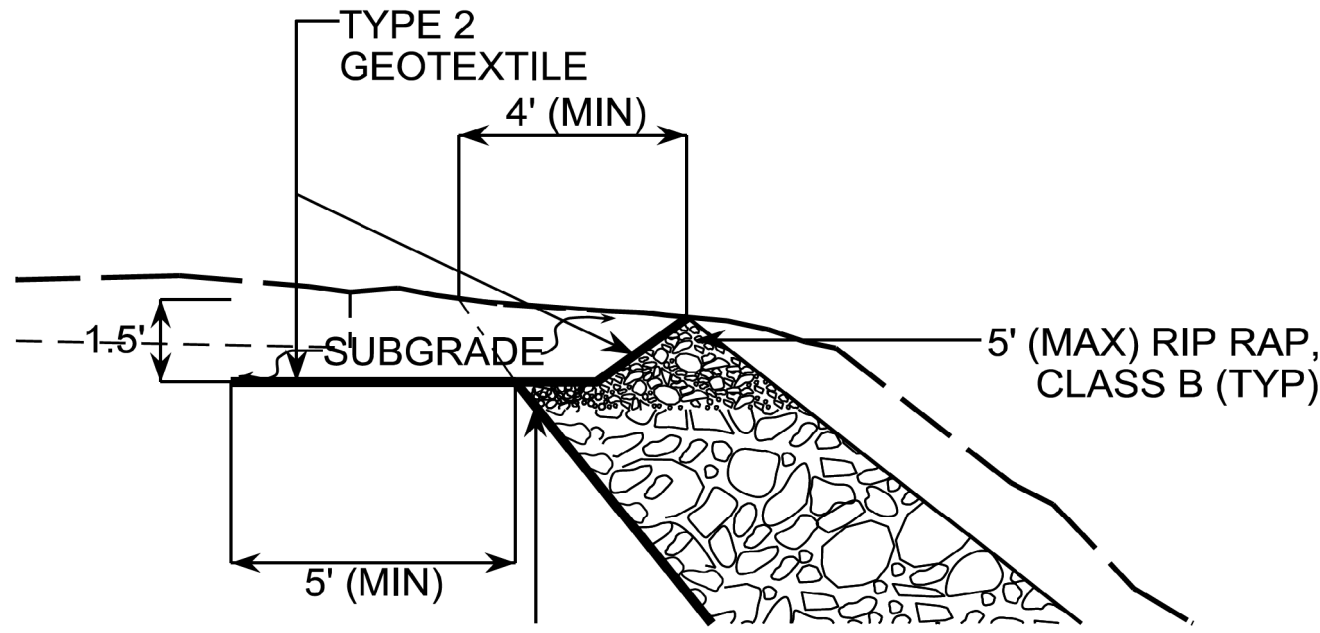




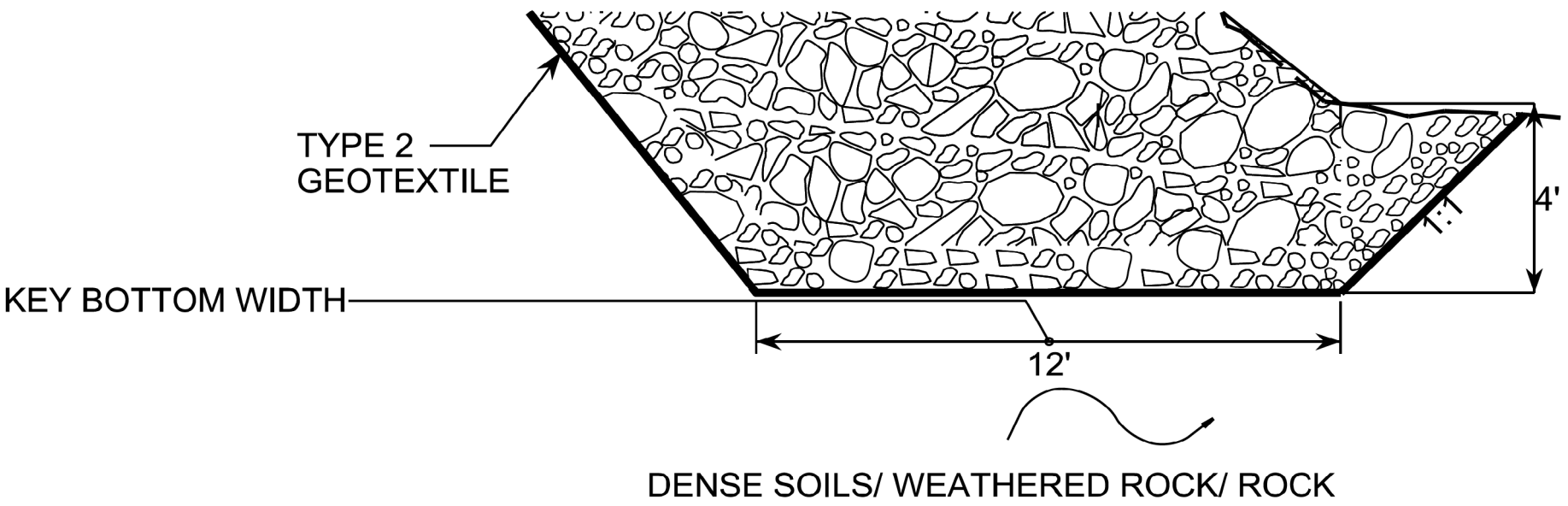
ROCK EMBANKMENT WITH TOE KEY DETAIL



GEOTEXTILE OVERLAP DETAIL
(PLAN VIEW)



GEOTEXTILE EMBEDMENT DETAIL 1



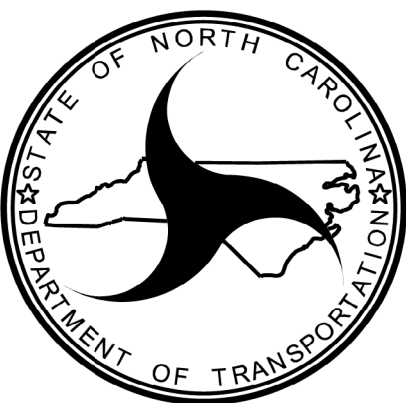
GEOTEXTILE EMBEDMENT DETAIL 2

1. FOR ROCK EMBANKMENT, BENCH EXISTING SLOPE IN ACCORDANCE WITH SECTION 235 OF THE STANDARD SPECIFICATIONS, WHERE POSSIBLE.
2. AN ESP GEOTECHNICAL PROFESSIONAL ENGINEER OR REPRESENTATIVE SHALL BE PRESENT TO EVALUATE ROCK FILL BEARING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION.
3. INSTALL GEOTEXTILE FABRIC BENEATH RIPRAP TO SEPARATE RIPRAP FROM NATIVE SOILS AND REDUCE POTENTIAL FOR MIGRATION OF FINE MATERIALS. GEOTEXTILE SHALL BE EMBEDDED BENEATH THE ROADWAY SUBGRADE OR TO A MINIMUM DEPTH OF 1.5 FEET. AT THE CREEK SIDE, KEY IN THE FABRIC BENEATH THE RIP RAP WITH A 1:1 (H:V) SLOPE TIED INTO THE NATURAL GROUNDLINE ON THE RIGHT SIDE.

CONTRACT NO.: 7000023067

PREPARED BY: PB	DATE: 8/2025
REVIEWED BY: HAA	DATE: 8/2025

ESP ESP ASSOCIATES, INC.
P.O. BOX 7030
CHARLOTTE, NC 28241
WWW.ESPASSOCIATES.COM



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

REVISIONS						SHEET NO. 1 OF 1
NO.	BY	DATE	NO.	BY	DATE	
1			3			
2			4			

SITE 4 - DF18314.2045405
ROCK EMBANKMENT

2G-2

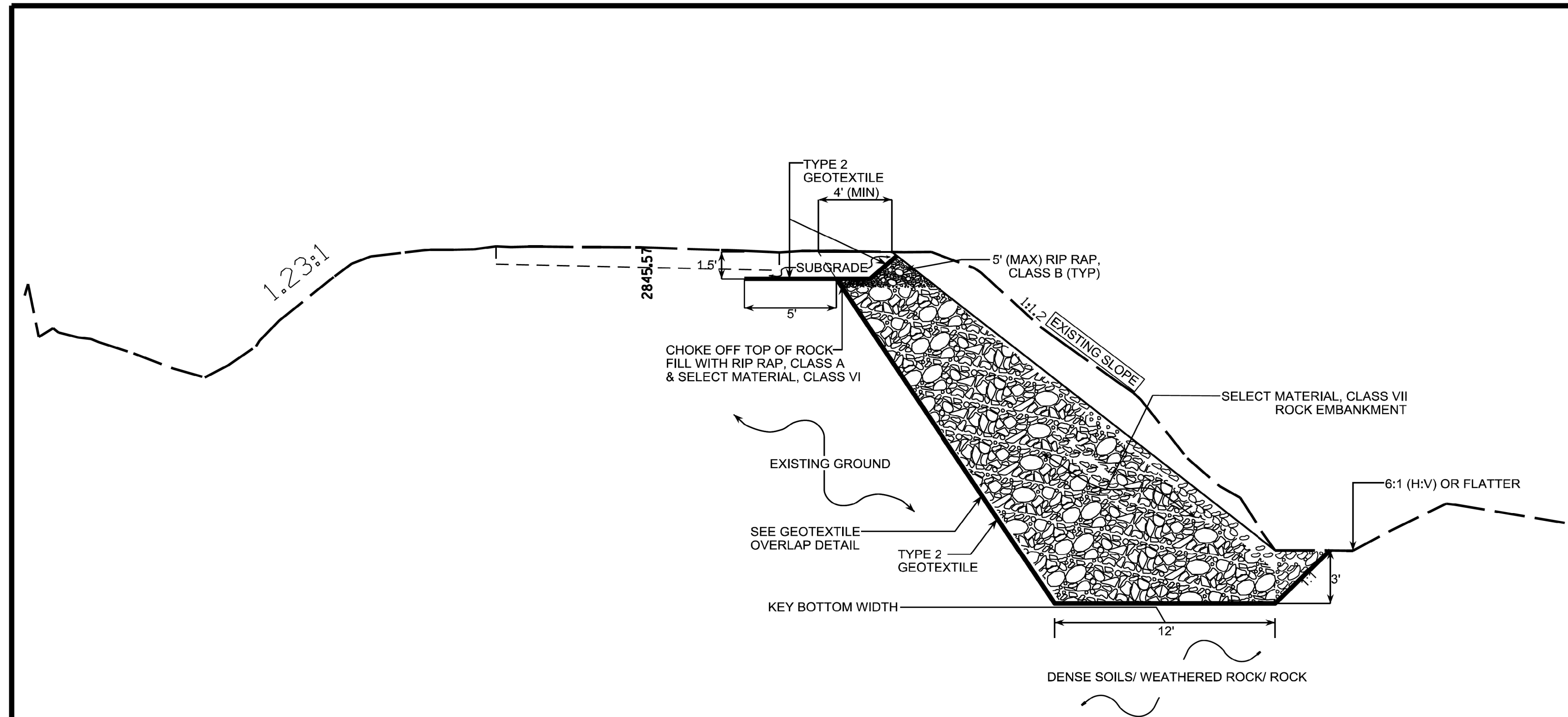
GEOTECHNICAL
ENGINEER

SIGNATURE: DATE: _____

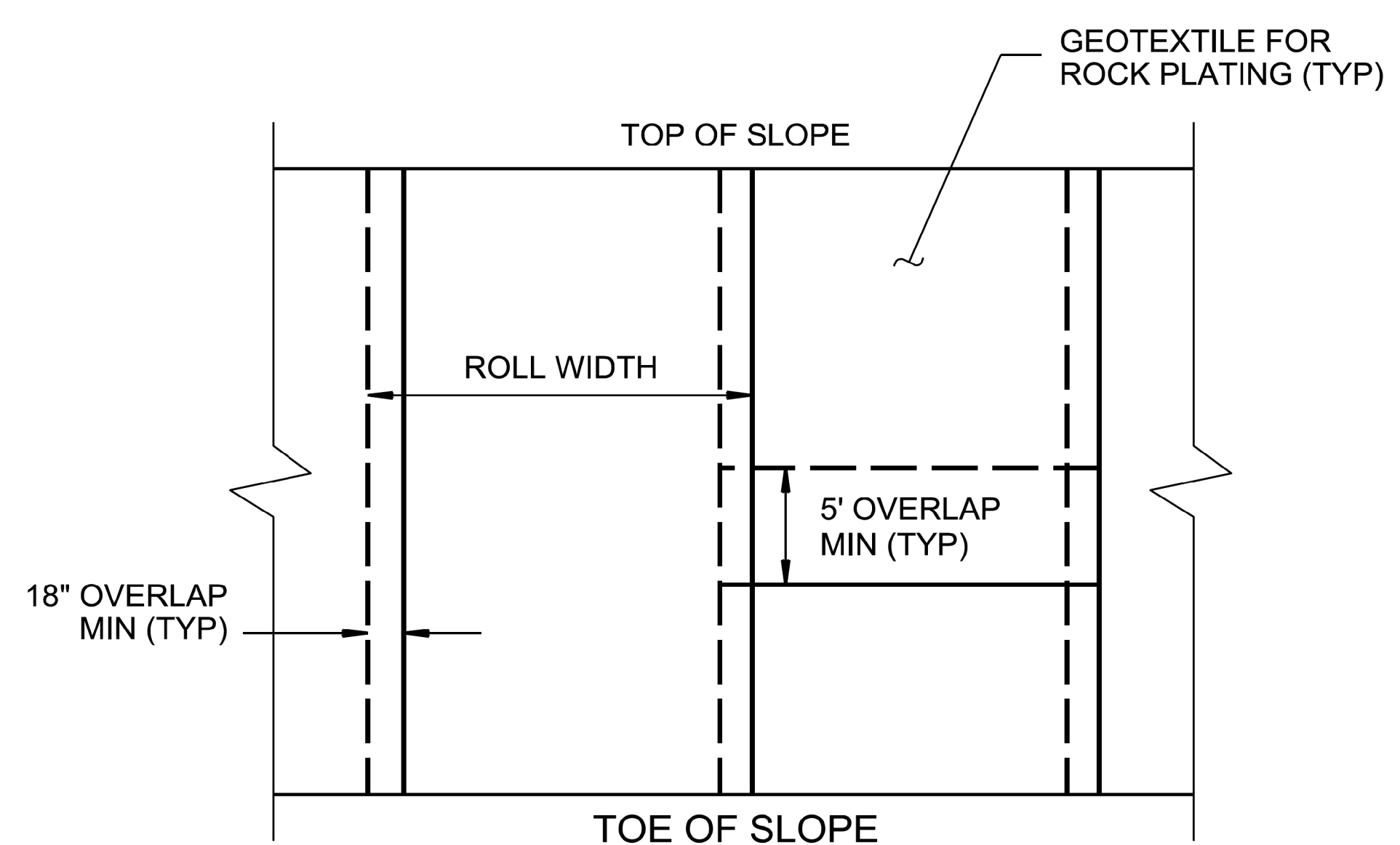
ENGINEER

SIGNATURE: _____ DATE: _____

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



ROCK EMBANKMENT WITH TOE KEY DETAIL



GEOTEXTILE OVERLAP DETAIL
(PLAN VIEW)

2G-3

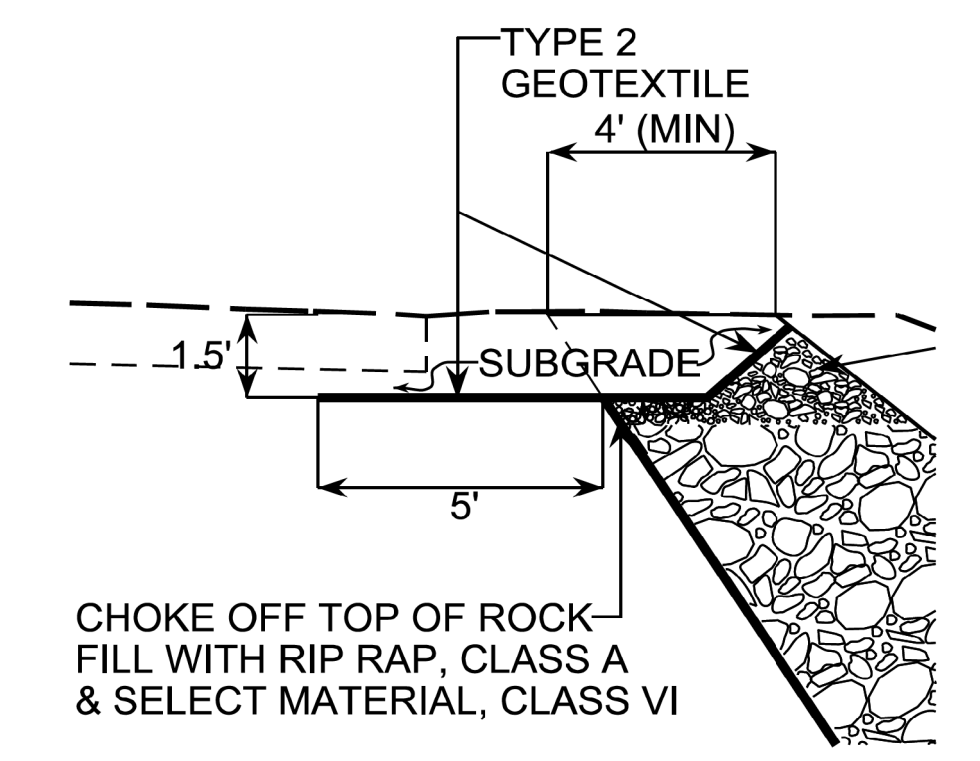
GEOTECHNICAL
ENGINEER

2025.09.30 09:27:54-04'00"

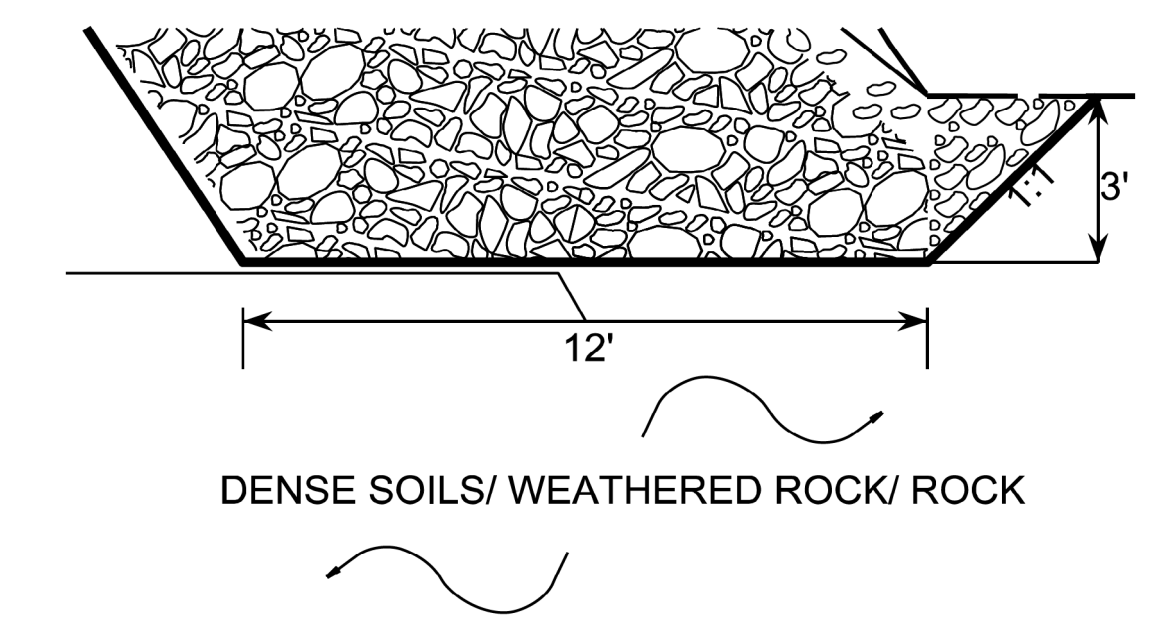
ENGINEER

SIGNATURE DATE SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



GEOTEXTILE EMBEDMENT DETAIL 1



GEOTEXTILE EMBEDMENT DETAIL 2

- NOTES:
- FOR ROCK EMBANKMENT, BENCH EXISTING SLOPE IN ACCORDANCE WITH SECTION 235 OF THE STANDARD SPECIFICATIONS, WHERE POSSIBLE.
 - AN ESP GEOTECHNICAL PROFESSIONAL ENGINEER OR REPRESENTATIVE SHALL BE PRESENT TO EVALUATE ROCK FILL BEARING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION.
 - INSTALL GEOTEXTILE FABRIC BENEATH RIPRAP TO SEPARATE RIPRAP FROM NATIVE SOILS AND REDUCE POTENTIAL FOR MIGRATION OF FINE MATERIALS. GEOTEXTILE SHALL BE EMBEDDED BENEATH THE ROADWAY SUBGRADE OR TO A MINIMUM DEPTH OF 1.5 FEET, AT THE CREEK SIDE. KEY IN THE FABRIC BENEATH THE RIP RAP WITH A 1:1 (H:V) SLOPE TIED INTO THE NATURAL GROUNDLINE ON THE RIGHT SIDE.

CONTRACT NO.: 7000023067

PREPARED BY: PB	DATE: 8/2025
REVIEWED BY: HAA	DATE: 8/2025

ESP ESP ASSOCIATES, INC.
P.O. BOX 7030
CHARLOTTE, NC 28241
WWW.ESPASSOCIATES.COM

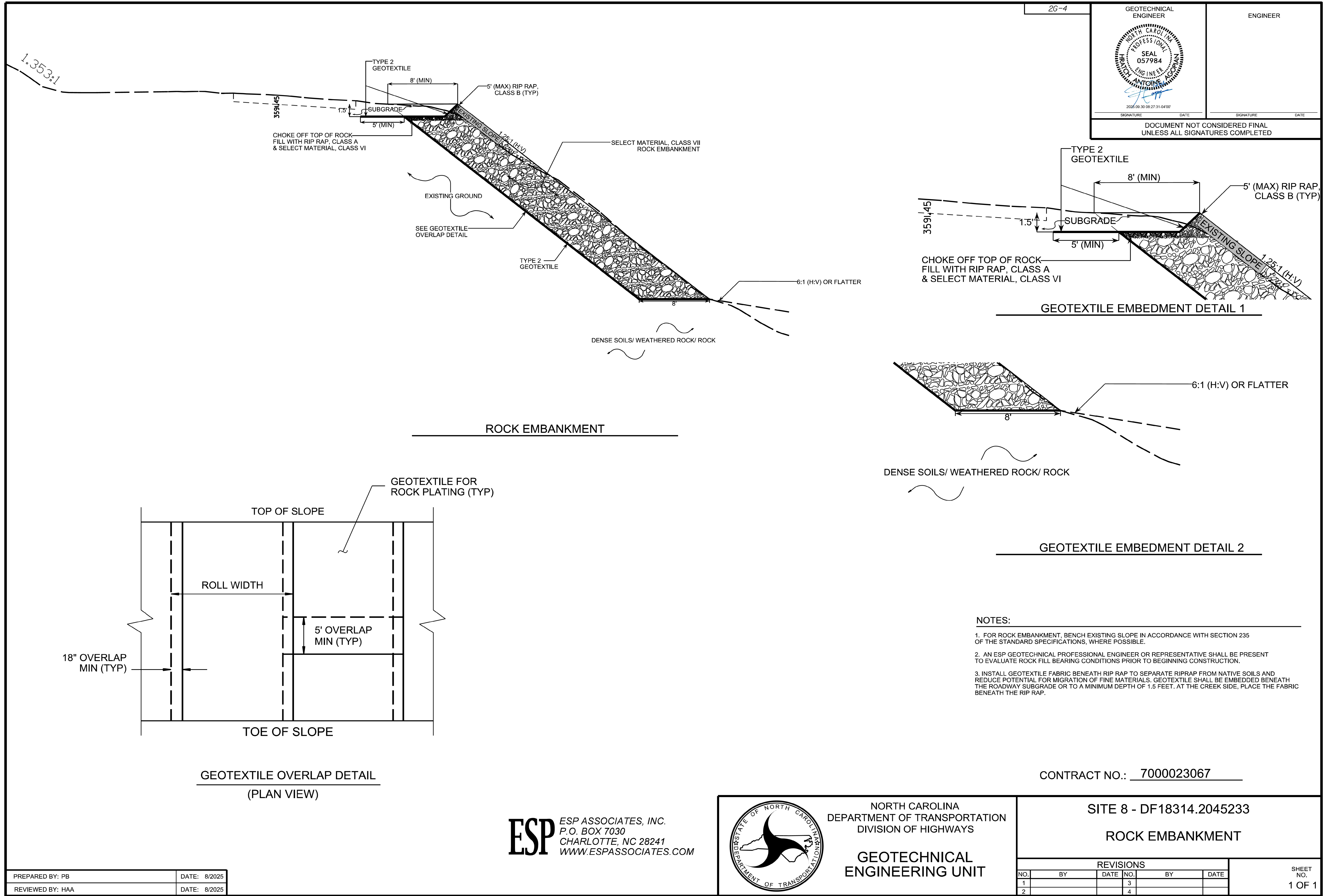
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

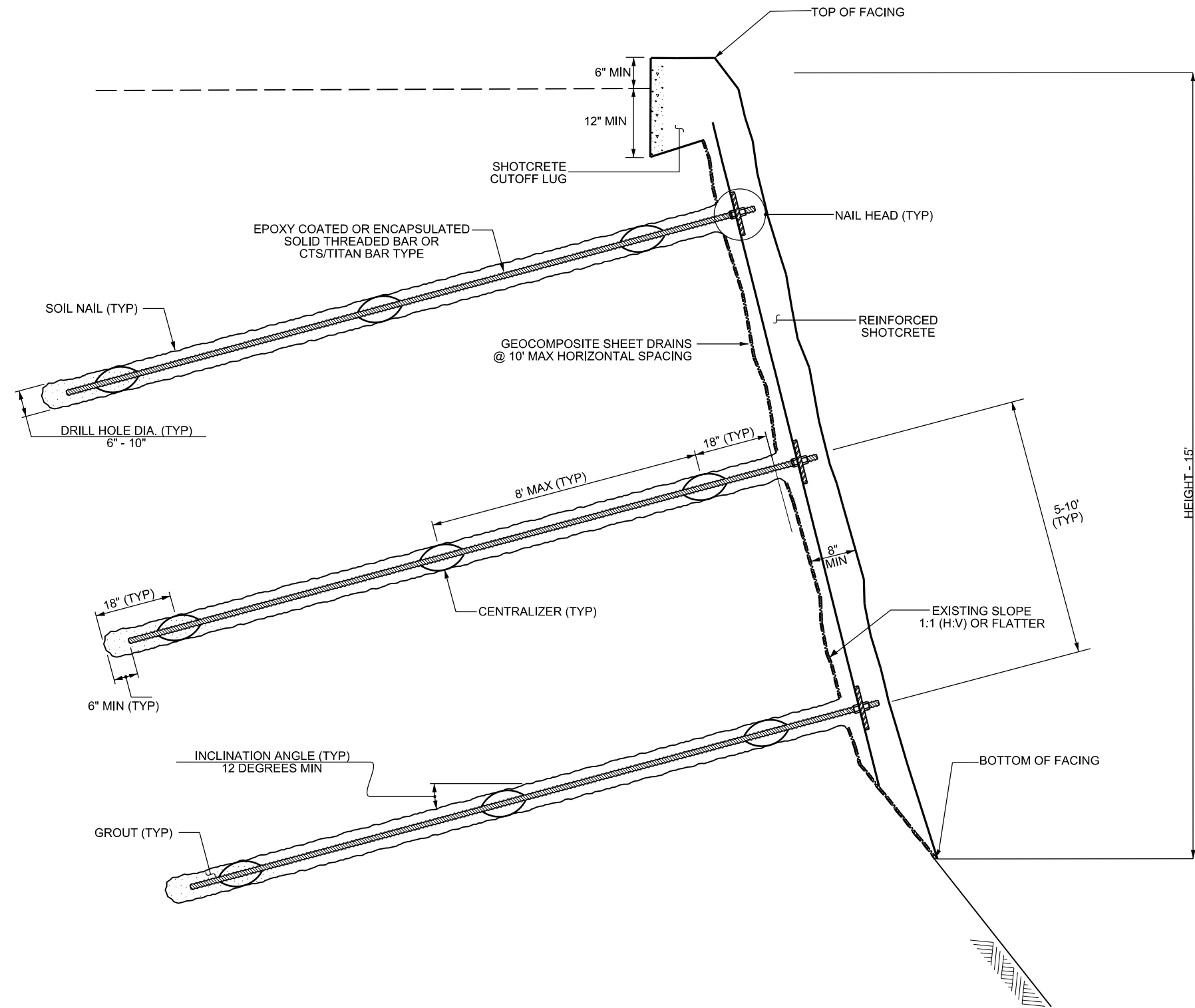
SITE 5 - DF18314.2045404
ROCK EMBANKMENT

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

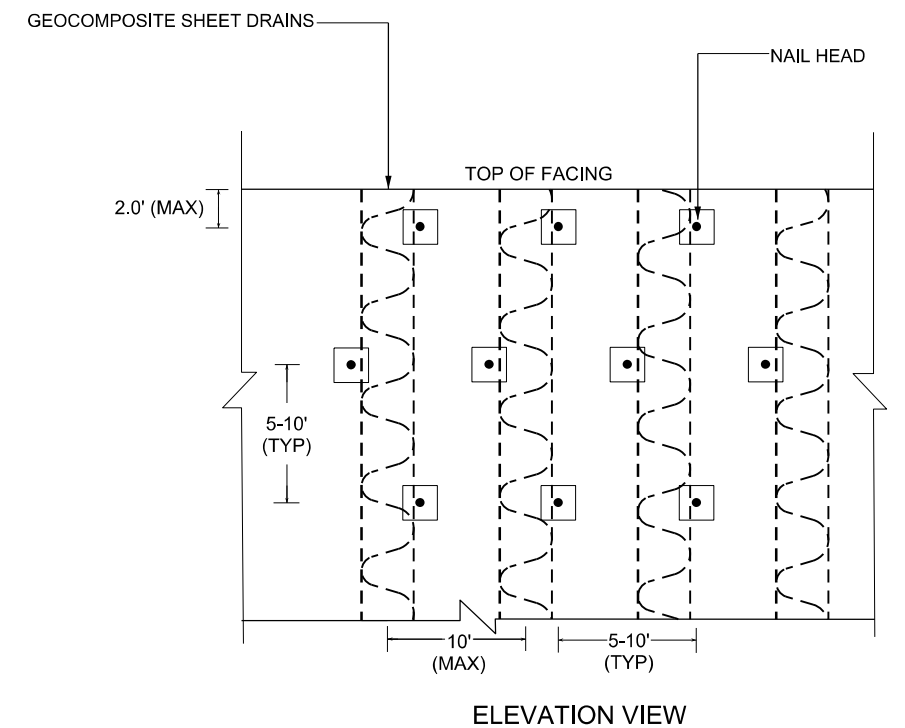
SHEET
NO.
1 OF 1



GEOTECHNICAL ENGINEER		ENGINEER	
SIGNATURE	DATE	SIGNATURE	DATE
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



SOIL NAIL SLOPE STABILIZATION - TYPICAL SECTION



CONTRACT NO.: 7000023067

DF18314.2045121 W03290 SITE NO. 10
SOIL NAIL SLOPE STABILIZATION

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

SHEET NO.
1 OF 2

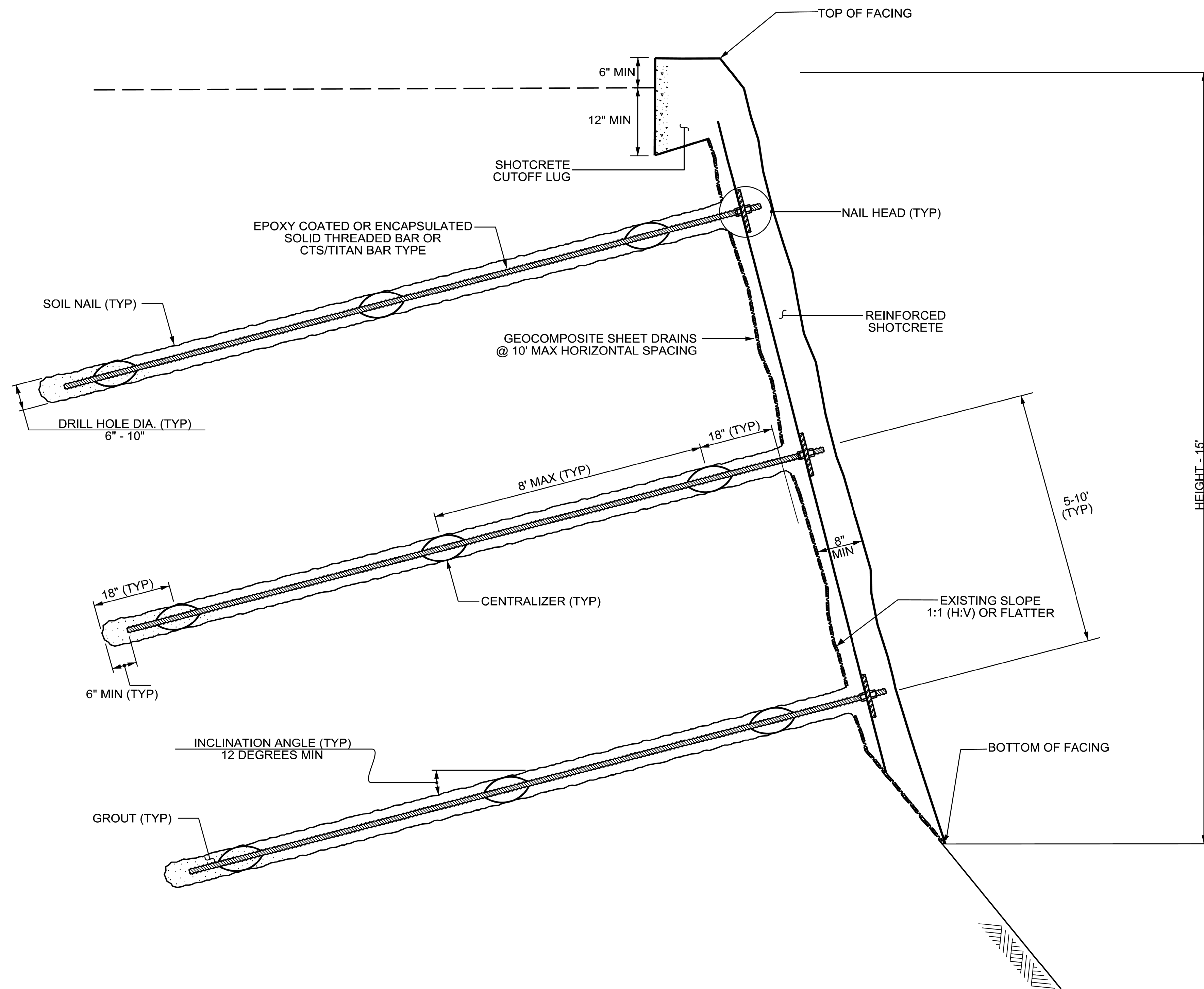
PREPARED BY: PB	DATE: 8/2025
REVIEWED BY: HAA	DATE: 8/2025

ESP ESP ASSOCIATES, INC.
P.O. BOX 7030
CHARLOTTE, NC 28241
WWW.ESPASSOCIATES.COM

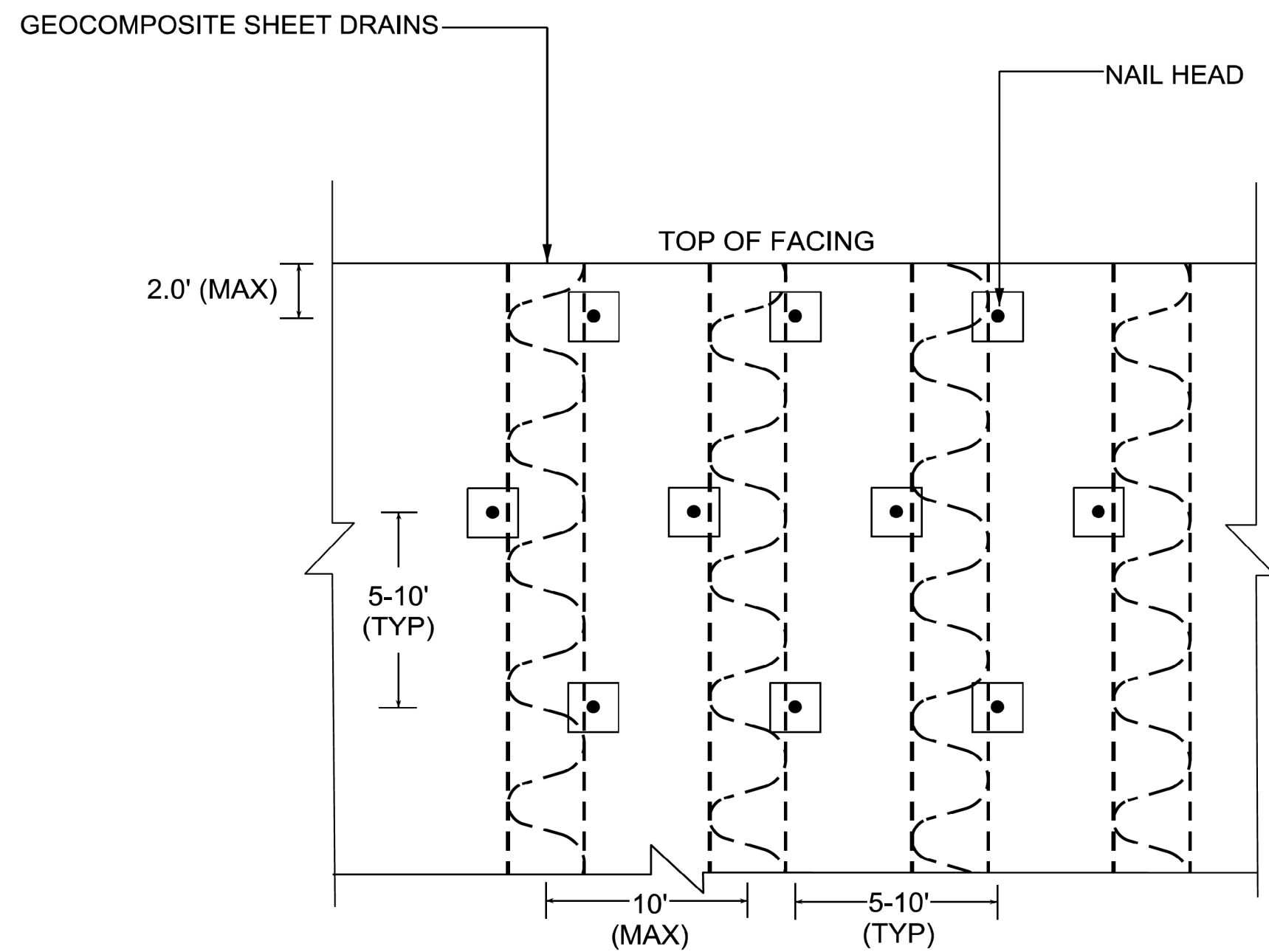


NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT



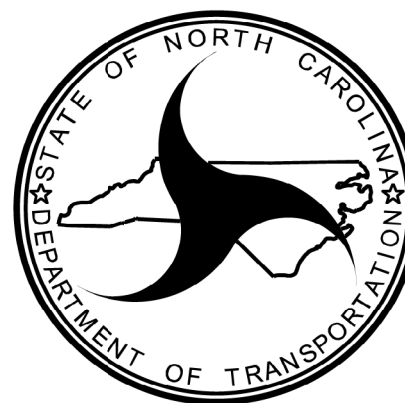
SOIL NAIL SLOPE STABILIZATION - TYPICAL SECTION



ELEVATION VIEW

CONTRACT NO.: 7000023067

ESP ESP ASSOCIATES, INC.
P.O. BOX 7030
CHARLOTTE, NC 28241
WWW.ESPASSOCIATES.COM



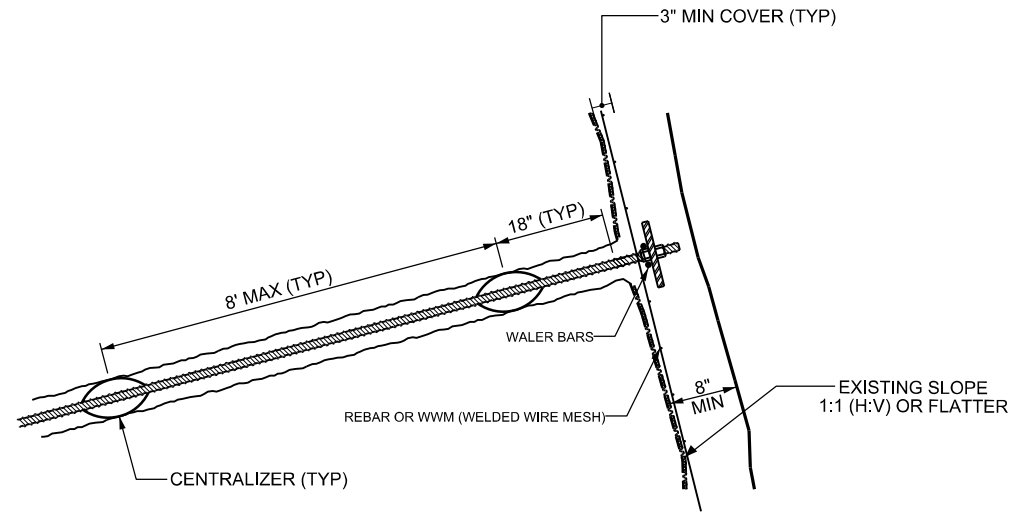
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

SITE 10 - DF18314.2045231
SOIL NAIL SLOPE STABILIZATION

PREPARED BY: PB	DATE: 8/2025
REVIEWED BY: HAA	DATE: 8/2025

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



SOIL NAIL SLOPE STABILIZATION - VERTICAL CROSS SECTION AREA (PER UNIT LENGTH)

NOTES:

FOR SOIL NAIL SLOPE STABILIZATION, SEE PROVISION.

DESIGN SOIL NAIL SLOPE STABILIZATION AT SITE NO. 10 FOR THE FOLLOWING:

- 1) DESIGN HEIGHT (H) = 15 FT
- 2) DESIGN LIFE = 75 YEARS
- 3) IN-SITU ASSUMED MATERIAL PARAMETERS FOR TOP RESIDUAL SOIL:
UNIT WEIGHT, γ = 120 PCF
FRICTION ANGLE, ϕ = 32 DEGREES
COHESION, c = 50 PSF
- 4) IN-SITU ASSUMED MATERIAL PARAMETERS FOR BOTTOM RESIDUAL SOIL:
UNIT WEIGHT, γ = 130 PCF
FRICTION ANGLE, ϕ = 38 DEGREES
COHESION, c = 0 PSF

DESIGN SOIL NAIL SLOPE STABILAZATION AT SITE NO. 10 FOR A LIVE LOAD (TRAFFIC) SURCHARGE OF 250 LB/FT.

FOR GLOBAL STABILITY, MINIMUM NAIL LENGTH SHALL BE EQUAL TO THE DIFFERENCE BETWEEN THE TOP OF FACING AND BOTTOM OF FACING ELEVATIONS.

WHERE INTERFERENCE WITH EXISTING NAILS IS LIKELY, CONSIDER STAGGERED PATTERNS OR SKEWING THE NAILS Laterally to achieve design coverage and maintain structural capacity.

GEOTECHNICAL
ENGINEER

ENGINEER

SIGNATURE

DATE

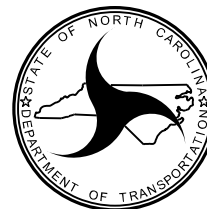
SIGNATURE

DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

CONTRACT NO.: 7000023067

ESP ESP ASSOCIATES, INC.
P.O. BOX 7030
CHARLOTTE, NC 28241
WWW.ESPASSOCIATES.COM



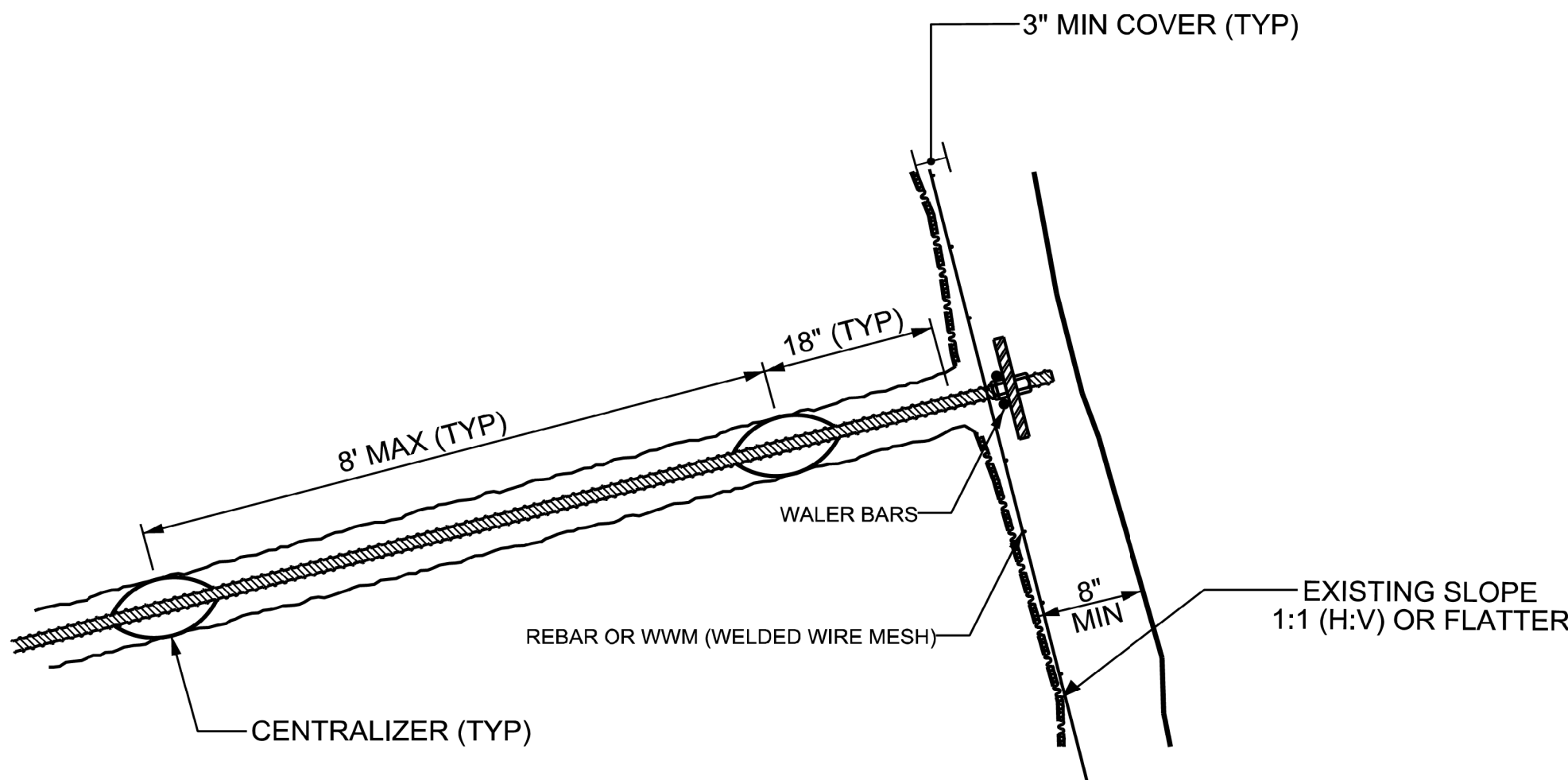
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

DF18314.2045121 W03290 SITE NO. 10
SOIL NAIL SLOPE STABILIZATION

PREPARED BY: PB	DATE: 8/2025
REVIEWED BY: HAA	DATE: 8/2025

REVISIONS						SHEET NO. 2 OF 2
NO.	BY	DATE	NO.	BY	DATE	
1			3			
2			4			



SOIL NAIL SLOPE STABILIZATION - VERTICAL CROSS SECTION AREA (PER UNIT LENGTH)

NOTES:

FOR SOIL NAIL SLOPE STABILIZATION, SEE PROVISION.

DESIGN SOIL NAIL SLOPE STABILIZATION AT SITE NO. 10 FOR THE FOLLOWING:

- 1) DESIGN HEIGHT (H) = 15 FT
- 2) DESIGN LIFE = 75 YEARS
- 3) IN-SITU ASSUMED MATERIAL PARAMETERS FOR TOP RESIDUAL SOIL:
UNIT WEIGHT, γ = 120 PCF
FRICTION ANGLE, ϕ = 32 DEGREES
COHESION, c = 50 PSF
- 4) IN-SITU ASSUMED MATERIAL PARAMETERS FOR BOTTOM RESIDUAL SOIL:
UNIT WEIGHT, γ = 130 PCF
FRICTION ANGLE, ϕ = 38 DEGREES
COHESION, c = 0 PSF

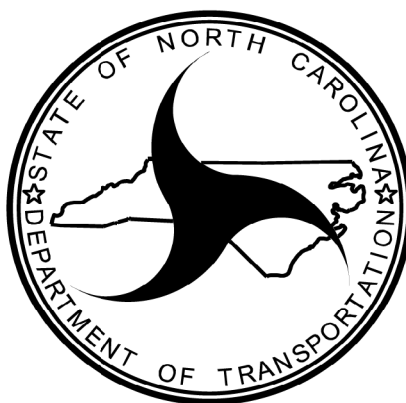
DESIGN SOIL NAIL SLOPE STABILAZATION AT SITE NO. 10 FOR A LIVE LOAD (TRAFFIC) SURCHARGE OF 250 LB/FT.

FOR GLOBAL STABILITY, MINIMUM NAIL LENGTH SHALL BE EQUAL TO THE DIFFERENCE BETWEEN THE TOP OF FACING AND BOTTOM OF FACING ELEVATIONS.

WHERE INTERFERENCE WITH EXISTING NAILS IS LIKELY, CONSIDER STAGGERED PATTERNS OR SKEWING THE NAILS Laterally TO ACHIEVE DESIGN COVERAGE AND MAINTAIN STRUCTURAL CAPACITY.

CONTRACT NO.: 7000023067

ESP ESP ASSOCIATES, INC.
P.O. BOX 7030
CHARLOTTE, NC 28241
WWW.ESPASSOCIATES.COM



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

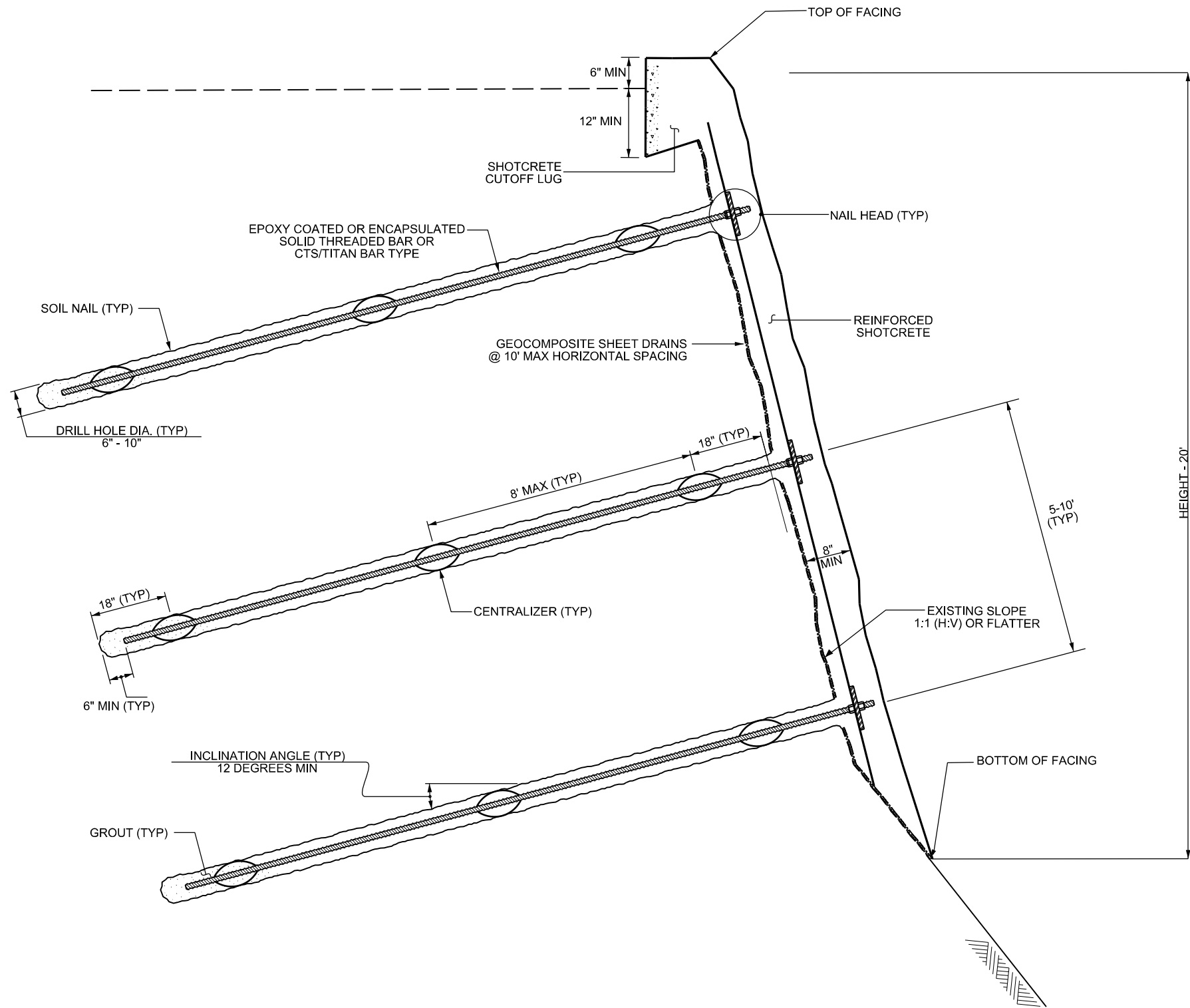
SITE 10 - DF18314.2045231
SOIL NAIL SLOPE STABILIZATION

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

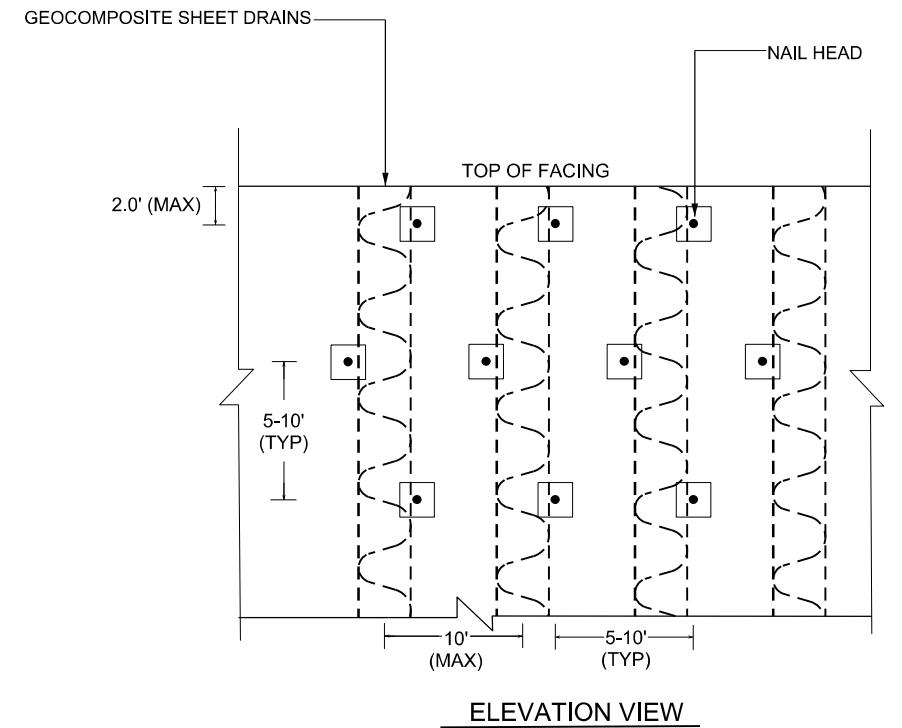
SHEET
NO.
2 OF 2

PREPARED BY: PB	DATE: 8/2025
REVIEWED BY: HAA	DATE: 8/2025

GEOTECHNICAL ENGINEER		ENGINEER	
SIGNATURE	DATE	SIGNATURE	DATE
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



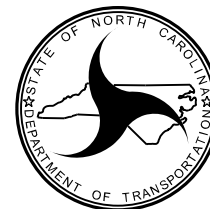
SOIL NAIL SLOPE STABILIZATION - TYPICAL SECTION



CONTRACT NO.: 7000023067

PREPARED BY: PB	DATE: 8/2025
REVIEWED BY: HAA	DATE: 8/2025

ESP ESP ASSOCIATES, INC.
P.O. BOX 7030
CHARLOTTE, NC 28241
WWW.ESPASSOCIATES.COM



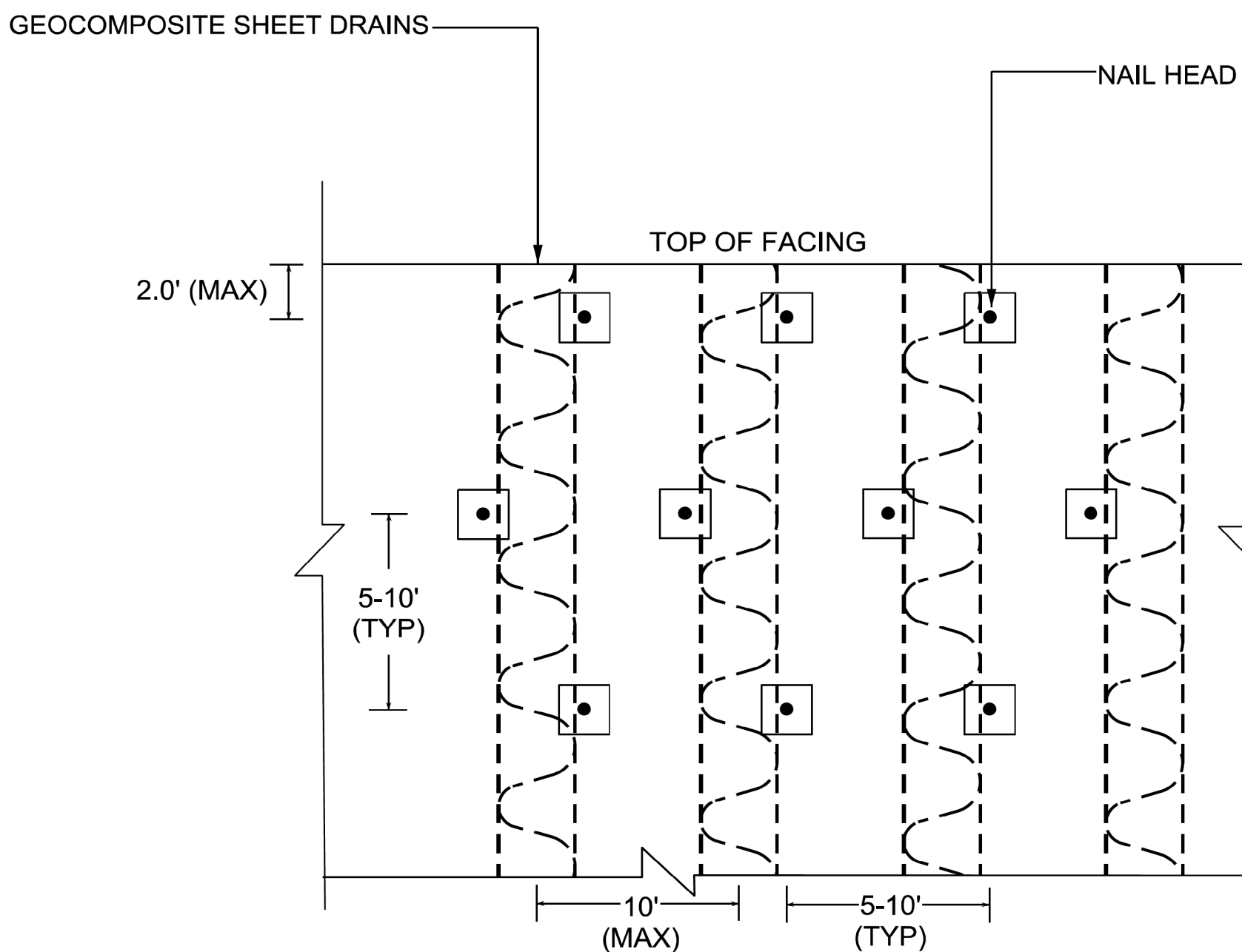
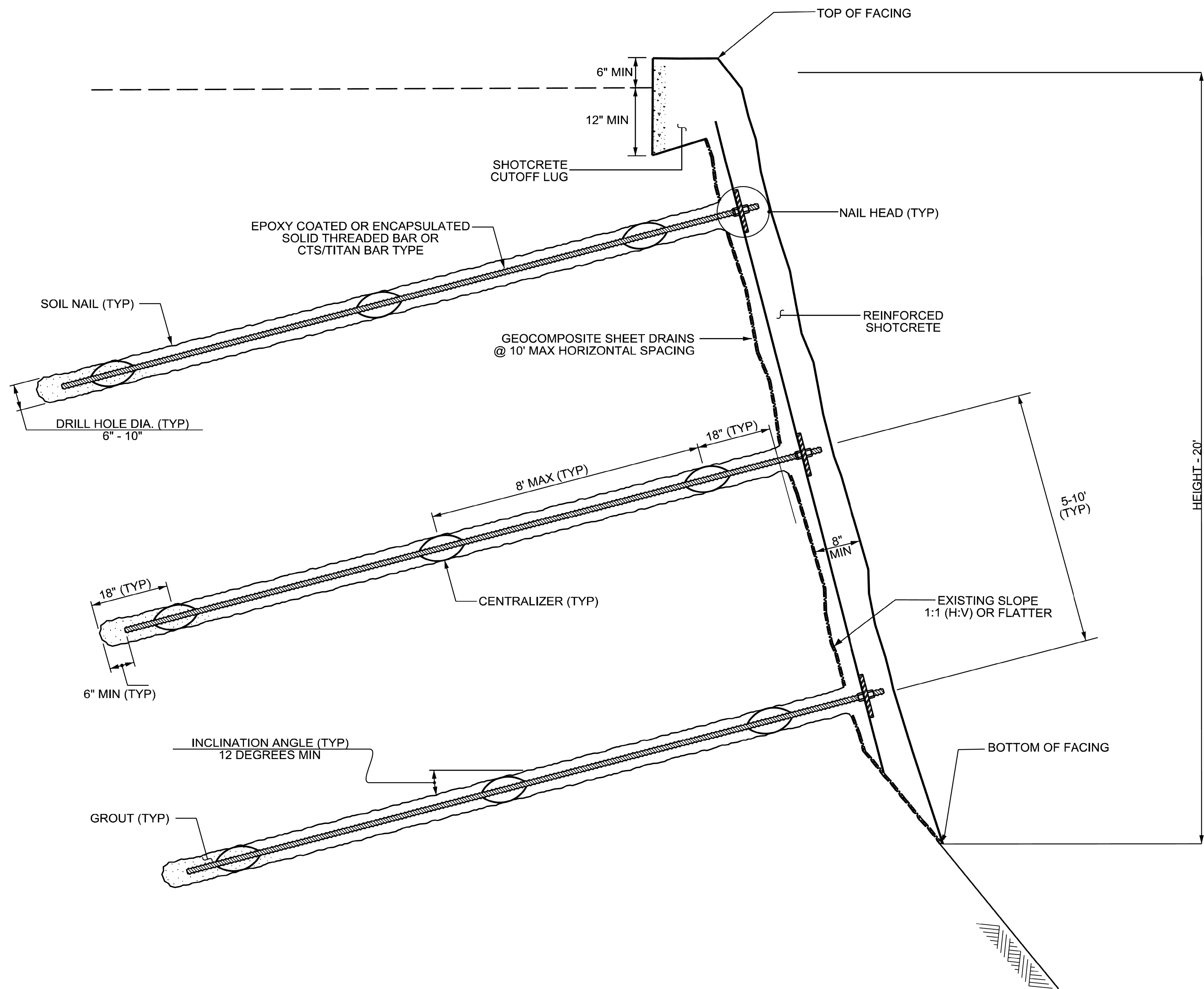
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

DF18314.2045121 W03290 SITE NO. 11
SOIL NAIL SLOPE STABILIZATION

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

SHEET
NO.
1 OF 2

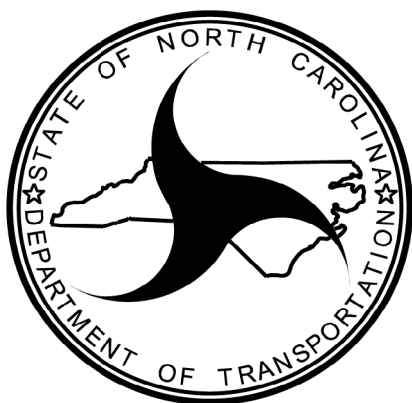


ELEVATION VIEW

SOIL NAIL SLOPE STABILIZATION - TYPICAL SECTION

CONTRACT NO.: 7000023067

ESP ESP ASSOCIATES, INC.
P.O. BOX 7030
CHARLOTTE, NC 28241
WWW.ESPASSOCIATES.COM



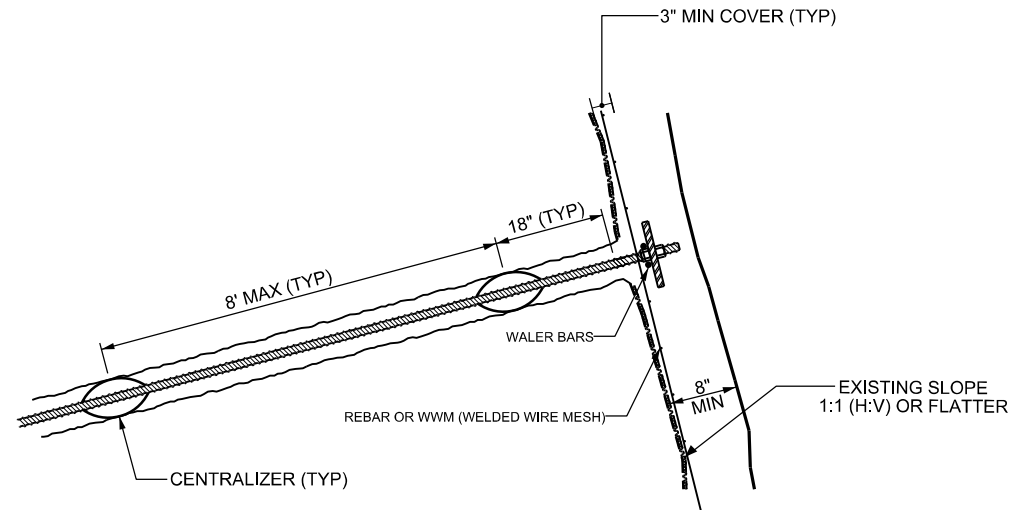
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

SITE 11 - DF18314.2045480
SOIL NAIL SLOPE STABILIZATION

PREPARED BY: PB	DATE: 8/2025
REVIEWED BY: HAA	DATE: 8/2025

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



SOIL NAIL SLOPE STABILIZATION - VERTICAL CROSS SECTION AREA (PER UNIT LENGTH)

NOTES:

FOR SOIL NAIL SLOPE STABILIZATION, SEE PROVISION.

DESIGN SOIL NAIL SLOPE STABILIZATION AT SITE NO. 11 FOR THE FOLLOWING:

- 1) DESIGN HEIGHT (H) = 20 FT
- 2) DESIGN LIFE = 75 YEARS
- 3) IN-SITU ASSUMED MATERIAL PARAMETERS FOR TOP RESIDUAL SOIL:
UNIT WEIGHT, γ = 110 PCF
FRICTION ANGLE, ϕ = 30 DEGREES
COHESION, c = 75 PSF
- 4) IN-SITU ASSUMED MATERIAL PARAMETERS FOR MIDDLE RESIDUAL SOIL:
UNIT WEIGHT, γ = 120 PCF
FRICTION ANGLE, ϕ = 32 DEGREES
COHESION, c = 50 PSF
- 5) IN-SITU ASSUMED MATERIAL PARAMETERS FOR BOTTOM RESIDUAL SOIL:
UNIT WEIGHT, γ = 130 PCF
FRICTION ANGLE, ϕ = 36 DEGREES
COHESION, c = 50 PSF

DESIGN SOIL NAIL SLOPE STABILAZATION AT SITE NO. 11 FOR A LIVE LOAD (TRAFFIC) SURCHARGE OF 250 LB/FT.

FOR GLOBAL STABILITY, THE MINIMUM NAIL LENGTH SHALL BE 1.5 TIMES THE DIFFERENCE BETWEEN THE TOP OF FACING AND BOTTOM OF FACING ELEVATIONS, CORRESPONDING WITH A FACTOR OF SAFETY (FOS) OF 1.4. THIS IS LESS THAN THE RESISTANCE FACTOR RECOMMENDED BY AASHTO LFRD OF $\phi=0.65$ (FOS $\approx$ 1.5), FOR SLOPES SUPPORTING STRUCTURES WITHIN THE SLOPE MASS. HOWEVER, CONSIDERING THE SITE IS LOCATED IN A LOW-VOLUME TRAFFIC AREA WITH LIMITED TRAFFIC LOADING, A REDUCED GLOBAL STABILITY RESISTANCE FACTOR OF $\phi=0.75$ (FOS $\approx$ 1.3) MAY BE CONSIDERED ACCEPTABLE SUBJECT TO CONFIRMATION BY THE CONTRACTOR'S ENGINEER RESPONSIBLE FOR INTERNAL STABILITY DESIGN.

WHERE INTERFERENCE WITH EXISTING NAILS IS LIKELY, CONSIDER STAGGERED PATTERNS OR SKEWING THE NAILS Laterally TO ACHIEVE DESIGN COVERAGE AND MAINTAIN STRUCTURAL CAPACITY.

GEOTECHNICAL
ENGINEER

ENGINEER

SIGNATURE

DATE

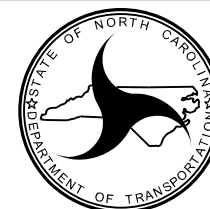
SIGNATURE

DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PREPARED BY:PB	DATE: 8/2025
REVIEWED BY:HAA	DATE: 8/2025

ESP ESP ASSOCIATES, INC.
P.O. BOX 7030
CHARLOTTE, NC 28241
WWW.ESPASSOCIATES.COM



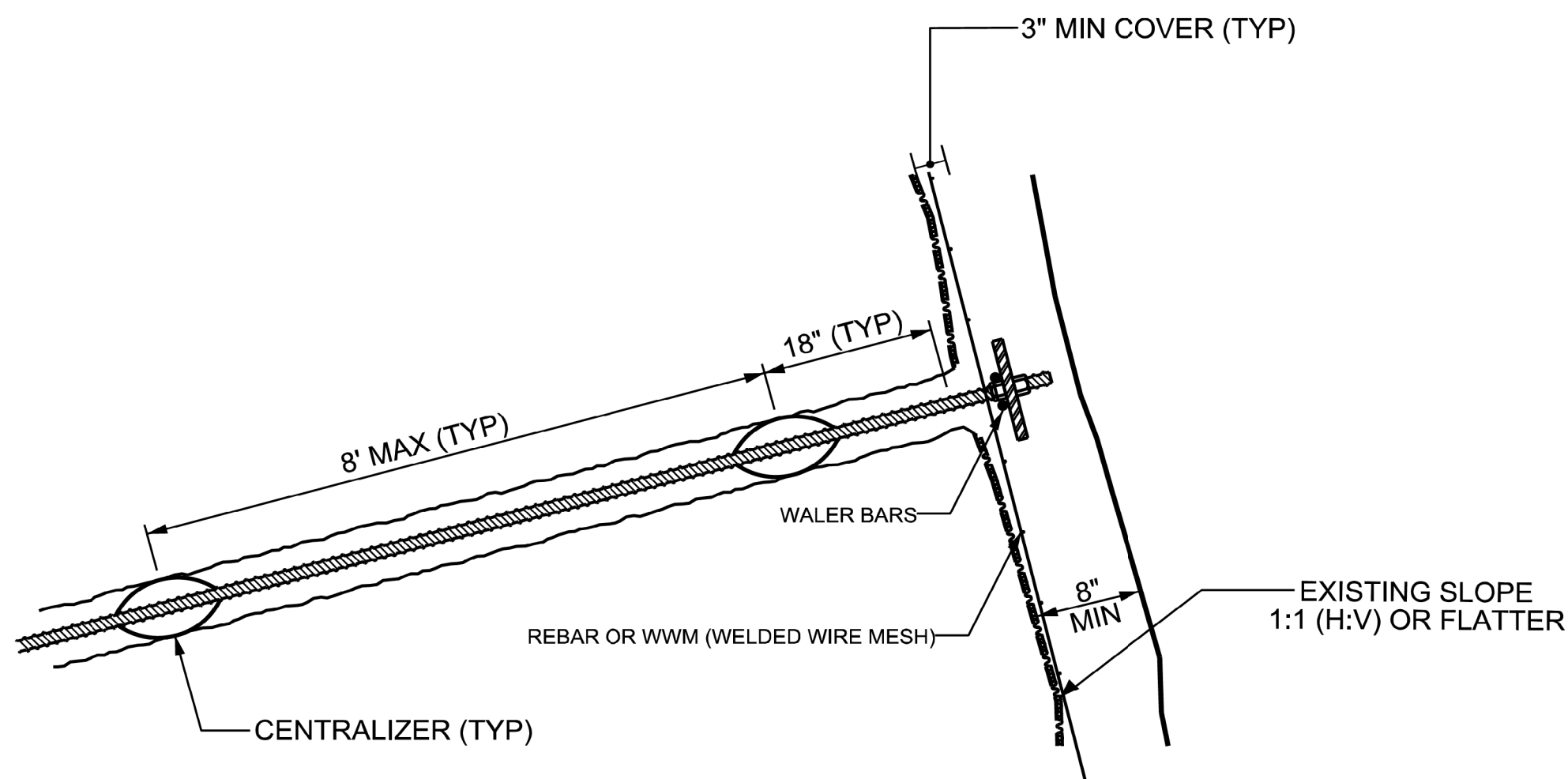
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

CONTRACT NO.: 7000023067

DF18314.2045121 W03290 SITE NO. 11
SOIL NAIL SLOPE STABILIZATION

REVISIONS						SHEET NO. 2 OF 2
NO.	BY	DATE	NO.	BY	DATE	
1			3			
2			4			



SOIL NAIL SLOPE STABILIZATION - VERTICAL CROSS SECTION AREA (PER UNIT LENGTH)

NOTES:

FOR SOIL NAIL SLOPE STABILIZATION, SEE PROVISION.

DESIGN SOIL NAIL SLOPE STABILIZATION AT SITE NO. 11 FOR THE FOLLOWING:

- 1) DESIGN HEIGHT (H) = 20 FT
- 2) DESIGN LIFE = 75 YEARS
- 3) IN-SITU ASSUMED MATERIAL PARAMETERS FOR TOP RESIDUAL SOIL:
UNIT WEIGHT, γ = 110 PCF
FRICTION ANGLE, ϕ = 30 DEGREES
COHESION, c = 75 PSF
- 4) IN-SITU ASSUMED MATERIAL PARAMETERS FOR MIDDLE RESIDUAL SOIL:
UNIT WEIGHT, γ = 120 PCF
FRICTION ANGLE, ϕ = 32 DEGREES
COHESION, c = 50 PSF
- 5) IN-SITU ASSUMED MATERIAL PARAMETERS FOR BOTTOM RESIDUAL SOIL:
UNIT WEIGHT, γ = 130 PCF
FRICTION ANGLE, ϕ = 36 DEGREES
COHESION, c = 50 PSF

DESIGN SOIL NAIL SLOPE STABILAZATION AT SITE NO. 11 FOR A LIVE LOAD (TRAFFIC) SURCHARGE OF 250 LB/FT.

FOR GLOBAL STABILITY, THE MINIMUM NAIL LENGTH SHALL BE 1.5 TIMES THE DIFFERENCE BETWEEN THE TOP OF FACING AND BOTTOM OF FACING ELEVATIONS, CORRESPONDING WITH A FACTOR OF SAFETY (FOS) OF 1.4. THIS IS LESS THAN THE RESISTANCE FACTOR RECOMMENDED BY AASHTO LFRD OF $\phi=0.65$ ($FOS\approx 1.5$), FOR SLOPES SUPPORTING STRUCTURES WITHIN THE SLOPE MASS. HOWEVER, CONSIDERING THE SITE IS LOCATED IN A LOW-VOLUME TRAFFIC AREA WITH LIMITED TRAFFIC LOADING, A REDUCED GLOBAL STABILITY RESISTANCE FACTOR OF $\phi=0.75$ ($FOS\approx 1.3$) MAY BE CONSIDERED ACCEPTABLE SUBJECT TO CONFIRMATION BY THE CONTRACTOR'S ENGINEER RESPONSIBLE FOR INTERNAL STABILITY DESIGN.

WHERE INTERFERENCE WITH EXISTING NAILS IS LIKELY, CONSIDER STAGGERED PATTERNS OR SKEWING THE NAILS Laterally TO ACHIEVE DESIGN COVERAGE AND MAINTAIN STRUCTURAL CAPACITY.

2G-8

GEOTECHNICAL
ENGINEER

ENGINEER

SIGNATURE

DATE

SIGNATURE

DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

NOTES:

FOR SOIL NAIL SLOPE STABILIZATION, SEE PROVISION.

DESIGN SOIL NAIL SLOPE STABILIZATION AT SITE NO. 11 FOR THE FOLLOWING:

- 1) DESIGN HEIGHT (H) = 20 FT
- 2) DESIGN LIFE = 75 YEARS
- 3) IN-SITU ASSUMED MATERIAL PARAMETERS FOR TOP RESIDUAL SOIL:
UNIT WEIGHT, γ = 110 PCF
FRICTION ANGLE, ϕ = 30 DEGREES
COHESION, c = 75 PSF
- 4) IN-SITU ASSUMED MATERIAL PARAMETERS FOR MIDDLE RESIDUAL SOIL:
UNIT WEIGHT, γ = 120 PCF
FRICTION ANGLE, ϕ = 32 DEGREES
COHESION, c = 50 PSF
- 5) IN-SITU ASSUMED MATERIAL PARAMETERS FOR BOTTOM RESIDUAL SOIL:
UNIT WEIGHT, γ = 130 PCF
FRICTION ANGLE, ϕ = 36 DEGREES
COHESION, c = 50 PSF

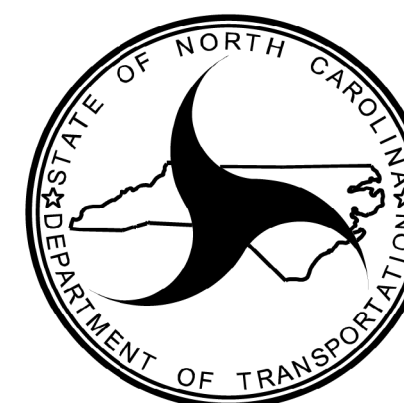
DESIGN SOIL NAIL SLOPE STABILAZATION AT SITE NO. 11 FOR A LIVE LOAD (TRAFFIC) SURCHARGE OF 250 LB/FT.

FOR GLOBAL STABILITY, THE MINIMUM NAIL LENGTH SHALL BE 1.5 TIMES THE DIFFERENCE BETWEEN THE TOP OF FACING AND BOTTOM OF FACING ELEVATIONS, CORRESPONDING WITH A FACTOR OF SAFETY (FOS) OF 1.4. THIS IS LESS THAN THE RESISTANCE FACTOR RECOMMENDED BY AASHTO LFRD OF $\phi=0.65$ ($FOS\approx 1.5$), FOR SLOPES SUPPORTING STRUCTURES WITHIN THE SLOPE MASS. HOWEVER, CONSIDERING THE SITE IS LOCATED IN A LOW-VOLUME TRAFFIC AREA WITH LIMITED TRAFFIC LOADING, A REDUCED GLOBAL STABILITY RESISTANCE FACTOR OF $\phi=0.75$ ($FOS\approx 1.3$) MAY BE CONSIDERED ACCEPTABLE SUBJECT TO CONFIRMATION BY THE CONTRACTOR'S ENGINEER RESPONSIBLE FOR INTERNAL STABILITY DESIGN.

WHERE INTERFERENCE WITH EXISTING NAILS IS LIKELY, CONSIDER STAGGERED PATTERNS OR SKEWING THE NAILS Laterally TO ACHIEVE DESIGN COVERAGE AND MAINTAIN STRUCTURAL CAPACITY.

CONTRACT NO.: 7000023067

ESP ESP ASSOCIATES, INC.
P.O. BOX 7030
CHARLOTTE, NC 28241
WWW.ESPASSOCIATES.COM



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

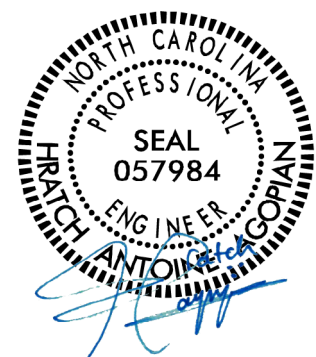
SITE 11 - DF18314.2045480
SOIL NAIL SLOPE STABILIZATION

REVISIONS

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

SHEET
NO.
2 OF 2

PREPARED BY: PB	DATE: 8/2025
REVIEWED BY: HAA	DATE: 8/2025



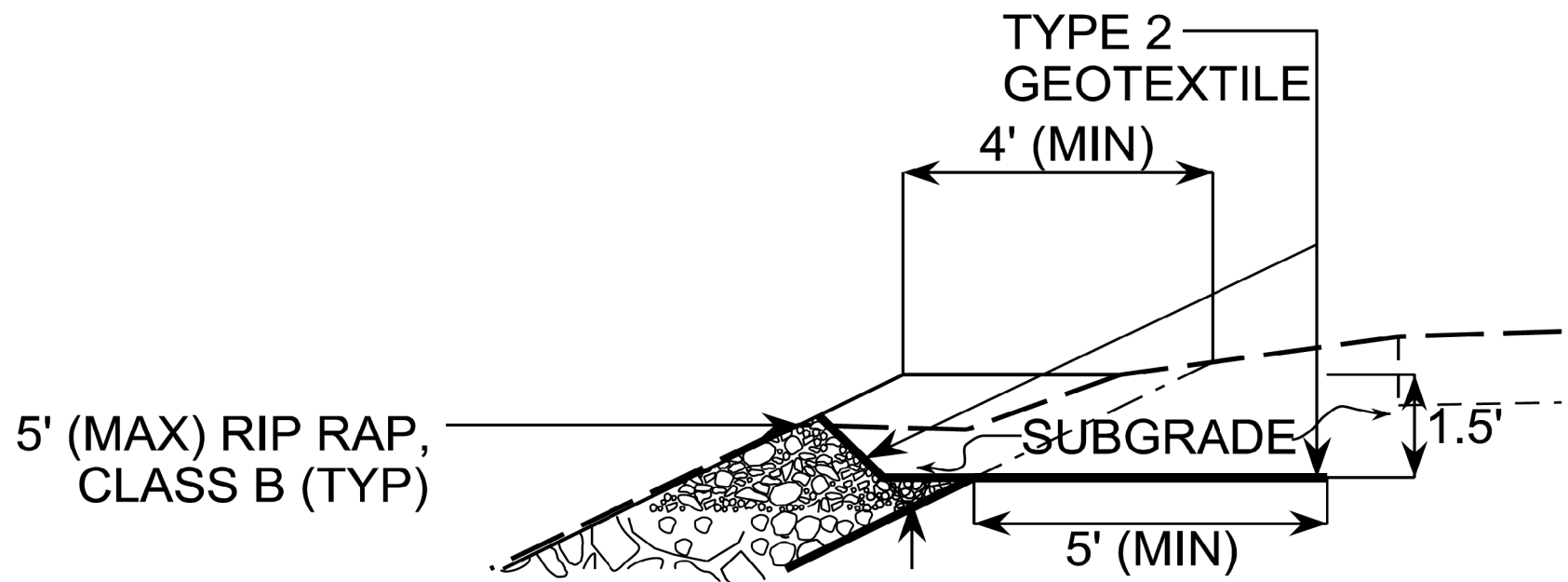
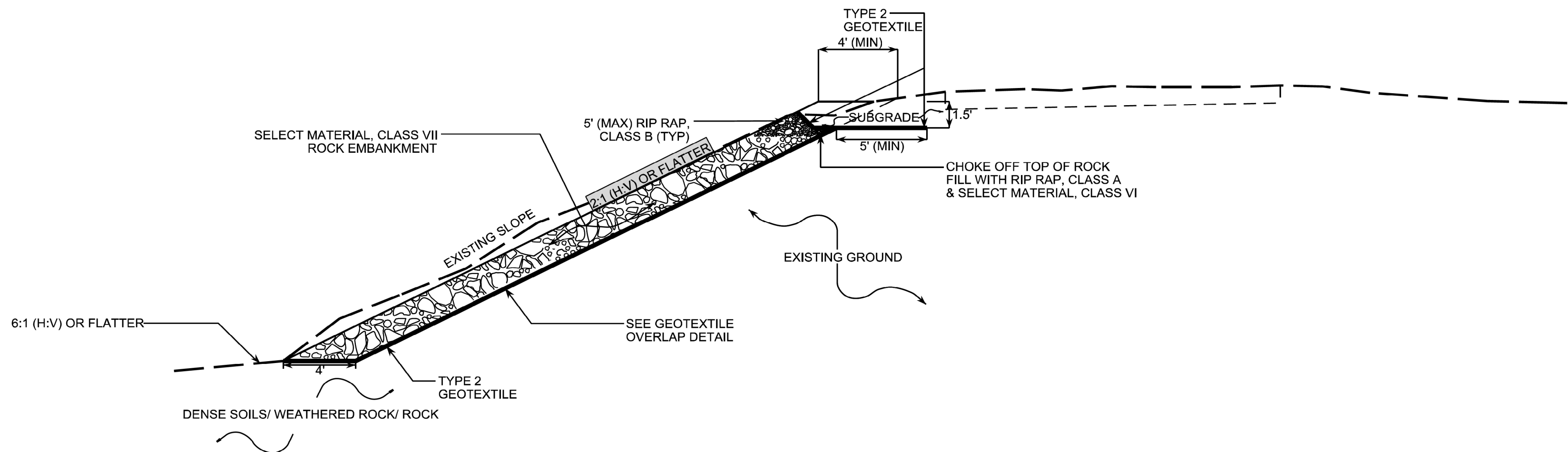
SIGNATURE

DATE

SIGNATURE

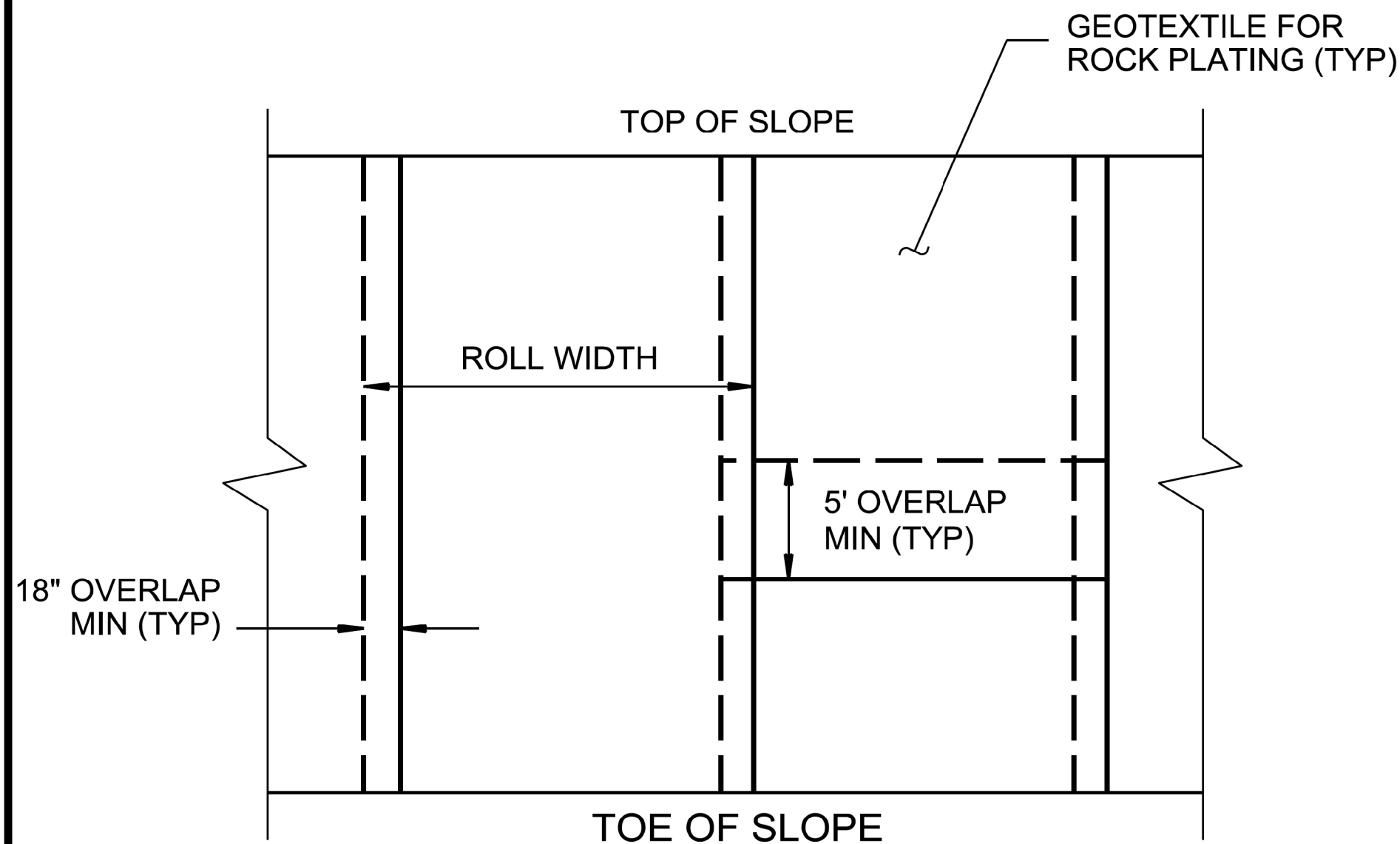
DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

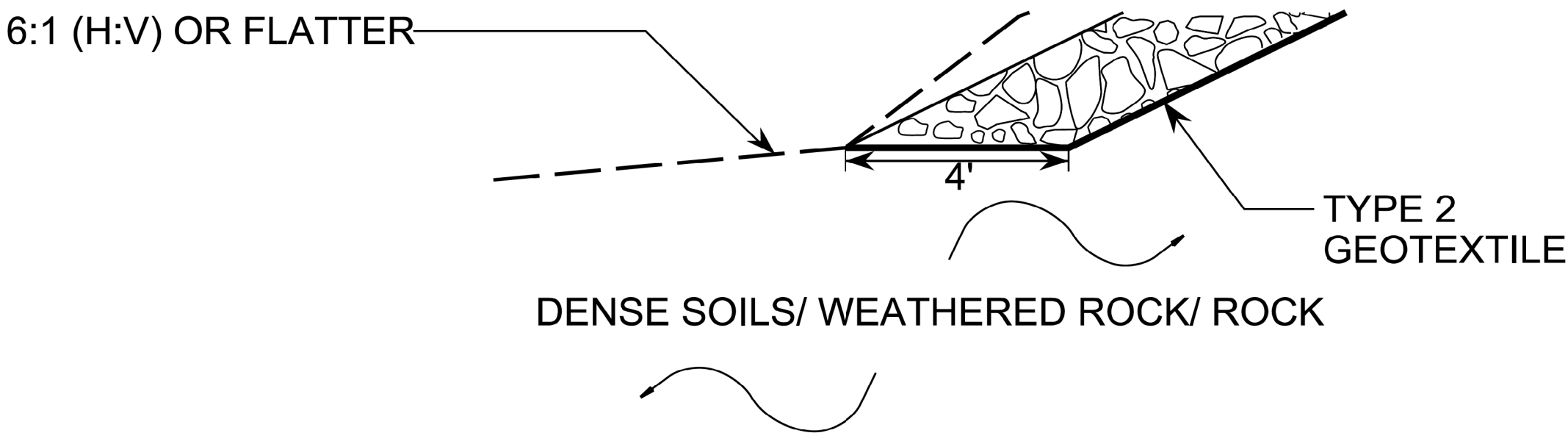


GEOTEXTILE EMBEDMENT DETAIL 1

ROCK EMBANKMENT WITH TOE KEY DETAIL



GEOTEXTILE OVERLAP DETAIL
(PLAN VIEW)



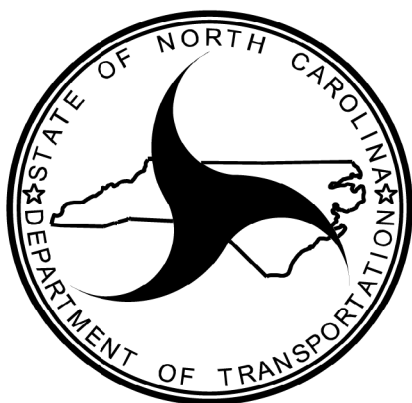
GEOTEXTILE EMBEDMENT DETAIL 2

NOTES:

1. FOR ROCK EMBANKMENT, BENCH EXISTING SLOPE IN ACCORDANCE WITH SECTION 235 OF THE STANDARD SPECIFICATIONS, WHERE POSSIBLE.
2. AN ESP GEOTECHNICAL PROFESSIONAL ENGINEER OR REPRESENTATIVE SHALL BE PRESENT TO EVALUATE ROCK FILL BEARING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION.
3. INSTALL GEOTEXTILE FABRIC BENEATH RIP RAP TO SEPARATE RIP RAP FROM NATIVE SOILS AND REDUCE POTENTIAL FOR MIGRATION OF FINE MATERIALS. GEOTEXTILE SHALL BE EMBEDDED BENEATH THE ROADWAY SUBGRADE OR TO A MINIMUM DEPTH OF 1.5'. AT THE CREEK SIDE, PLACE THE FABRIC BENEATH THE RIP RAP.

CONTRACT NO.: 7000023067

ESP ESP ASSOCIATES, INC.
P.O. BOX 7030
CHARLOTTE, NC 28241
WWW.ESPASSOCIATES.COM



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

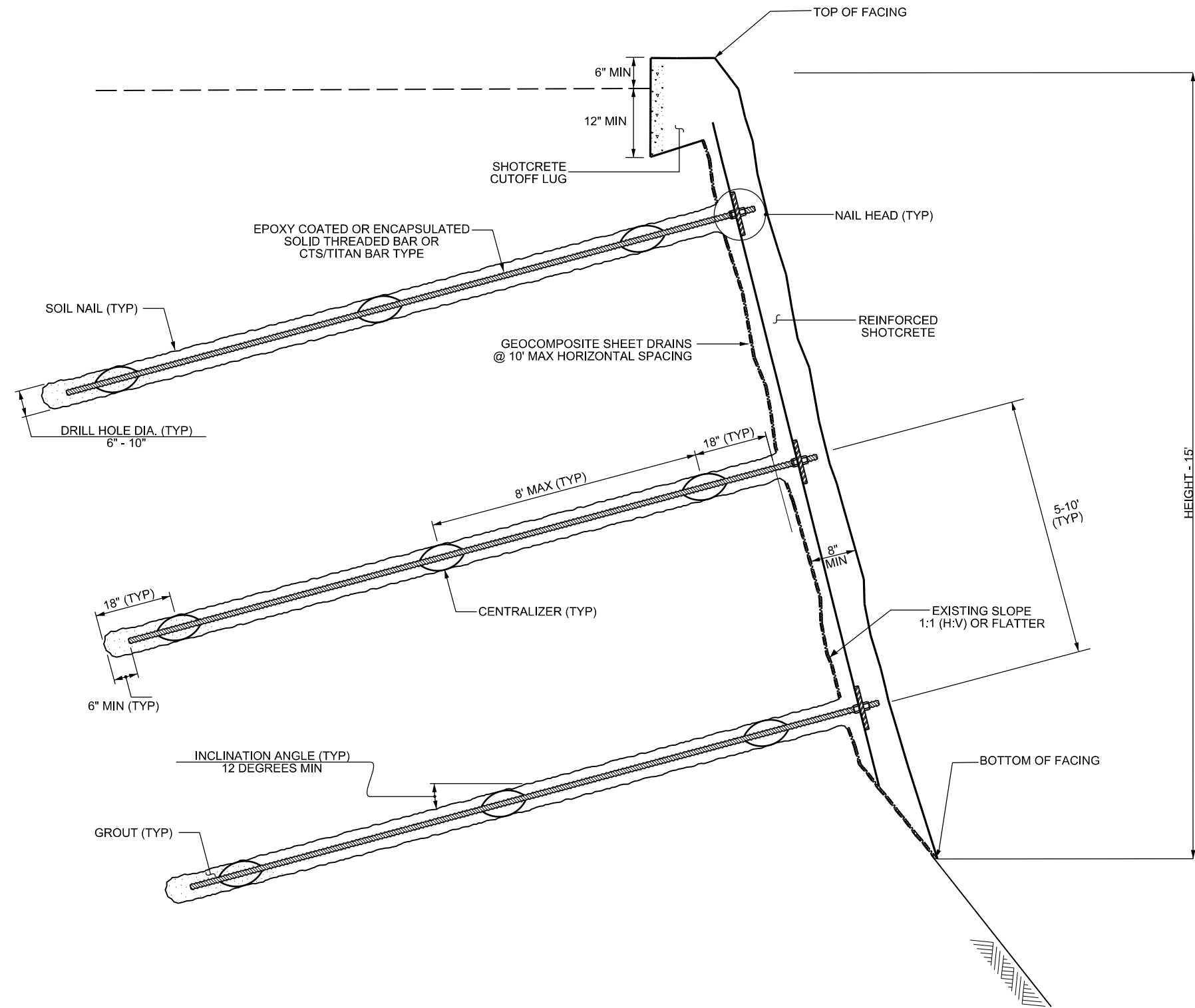
SITE 12 - DF18314.2045481
ROCK EMBANKMENT

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

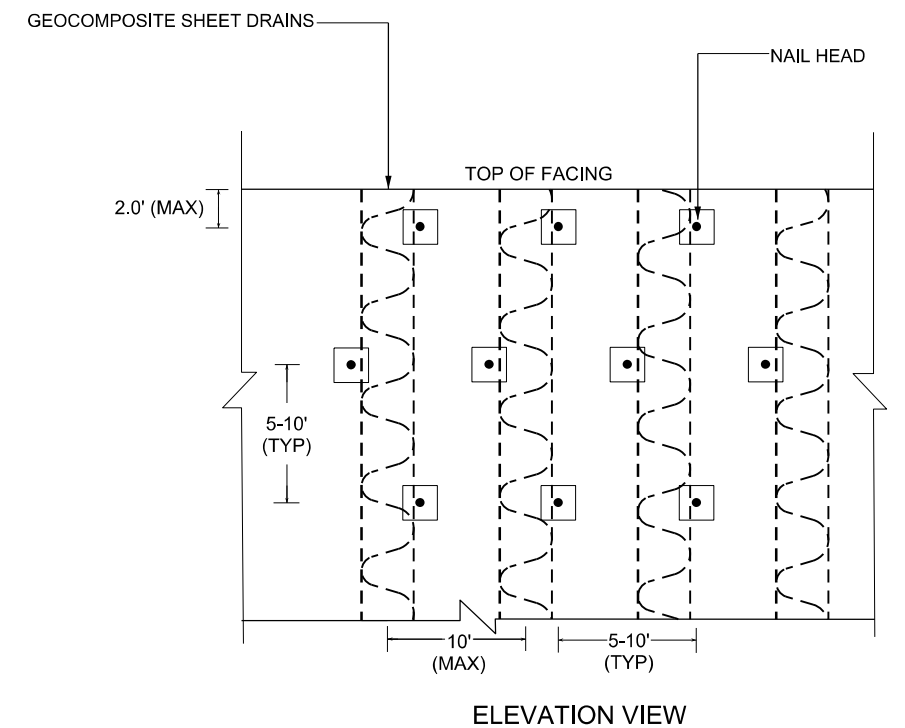
SHEET
NO.
1 OF 1

PREPARED BY: PB	DATE: 8/2025
REVIEWED BY: HAA	DATE: 8/2025

GEOTECHNICAL ENGINEER		ENGINEER	
SIGNATURE	DATE	SIGNATURE	DATE
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

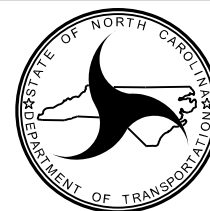


SOIL NAIL SLOPE STABILIZATION - TYPICAL SECTION



CONTRACT NO.: 7000023067

ESP ESP ASSOCIATES, INC.
P.O. BOX 7030
CHARLOTTE, NC 28241
WWW.ESPASSOCIATES.COM



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

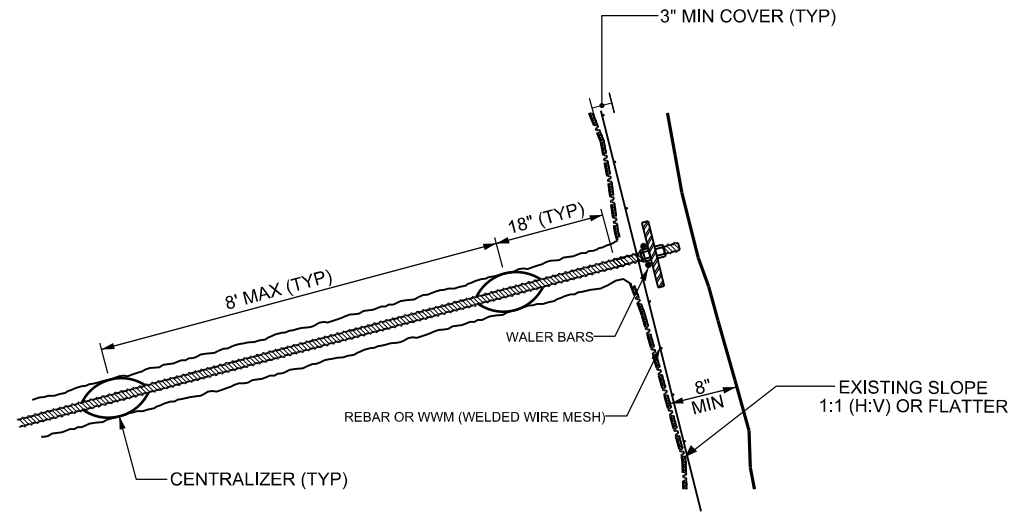
GEOTECHNICAL
ENGINEERING UNIT

DF18314.2045121 W03290 SITE NO. 13
SOIL NAIL SLOPE STABILIZATION

PREPARED BY: PB	DATE: 8/2025
REVIEWED BY: HAA	DATE: 8/2025

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

SHEET
NO.
1 OF 2



SOIL NAIL SLOPE STABILIZATION - VERTICAL CROSS SECTION AREA (PER UNIT LENGTH)

NOTES:

FOR SOIL NAIL SLOPE STABILIZATION, SEE PROVISION.

DESIGN SOIL NAIL SLOPE STABILIZATION AT SITE NO. 13 FOR THE FOLLOWING:

- 1) DESIGN HEIGHT (H) = 15 FT
- 2) DESIGN LIFE = 75 YEARS
- 3) IN-SITU ASSUMED MATERIAL PARAMETERS FOR EMBANKMENT/ARTIFICIAL FILL SOIL:
UNIT WEIGHT, γ = 120 PCF
FRICTION ANGLE, ϕ = 33 DEGREES
COHESION, c = 50 PSF
- 4) IN-SITU ASSUMED MATERIAL PARAMETERS FOR RESIDUAL SOIL:
UNIT WEIGHT, γ = 115 PCF
FRICTION ANGLE, ϕ = 30 DEGREES
COHESION, c = 50 PSF
- 5) IN-SITU ASSUMED MATERIAL PARAMETERS FOR WEATHERED ROCK:
UNIT WEIGHT, γ = 130 PCF
FRICTION ANGLE, ϕ = 42 DEGREES
COHESION, c = 50 PSF

DESIGN SOIL NAIL SLOPE STABILAZATION AT SITE NO. 13 FOR A LIVE LOAD (TRAFFIC) SURCHARGE OF 250 LB/FT.

FOR GLOBAL STABILITY, MINIMUM NAIL LENGTH SHALL BE EQUAL TO THE DIFFERENCE BETWEEN THE TOP OF FACING AND BOTTOM OF FACING ELEVATIONS.

WHERE INTERFERENCE WITH EXISTING NAILS IS LIKELY, CONSIDER STAGGERED PATTERNS OR SKEWING THE NAILS Laterally TO ACHIEVE DESIGN COVERAGE AND MAINTAIN STRUCTURAL CAPACITY.

GEOTECHNICAL
ENGINEER

ENGINEER

SIGNATURE

DATE

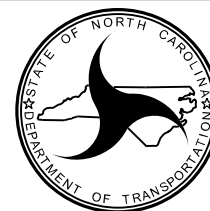
SIGNATURE

DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PREPARED BY:PB	DATE: 8/2025
REVIEWED BY:HAA	DATE: 8/2025

ESP ESP ASSOCIATES, INC.
P.O. BOX 7030
CHARLOTTE, NC 28241
WWW.ESPASSOCIATES.COM



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

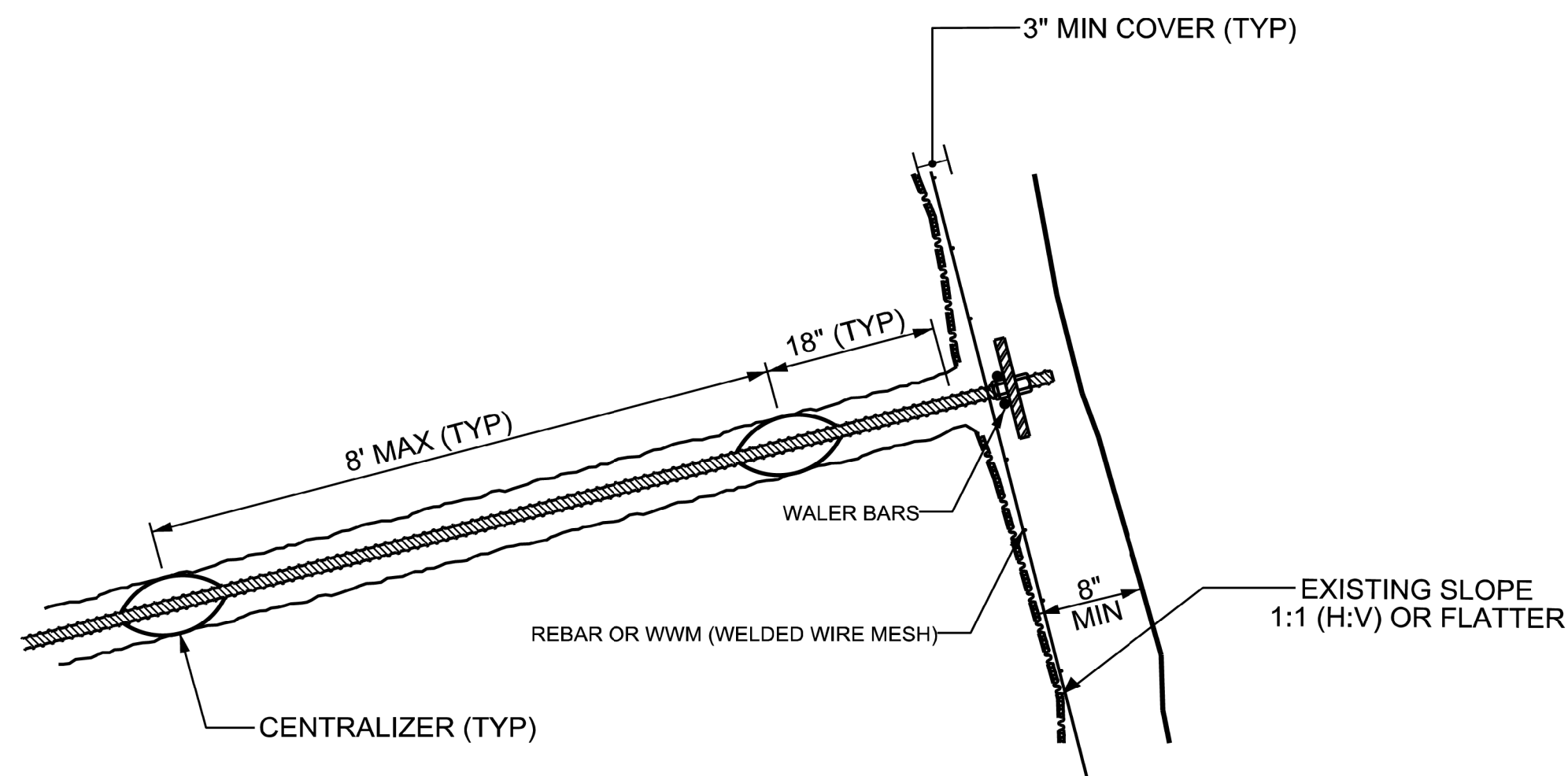
**GEOTECHNICAL
ENGINEERING UNIT**

CONTRACT NO.: 7000023067

DF18314.2045121 W03290 SITE NO. 13
SOIL NAIL SLOPE STABILIZATION

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

SHEET
NO.
2 OF 2



SOIL NAIL SLOPE STABILIZATION - VERTICAL CROSS SECTION AREA (PER UNIT LENGTH)

NOTES:

FOR SOIL NAIL SLOPE STABILIZATION, SEE PROVISION.

DESIGN SOIL NAIL SLOPE STABILIZATION AT SITE NO. 13 FOR THE FOLLOWING:

- 1) DESIGN HEIGHT (H) = 15 FT
- 2) DESIGN LIFE = 75 YEARS
- 3) IN-SITU ASSUMED MATERIAL PARAMETERS FOR EMBANKMENT/ARTIFICIAL FILL SOIL:
UNIT WEIGHT, γ = 120 PCF
FRICTION ANGLE, ϕ = 33 DEGREES
COHESION, c = 50 PSF
- 4) IN-SITU ASSUMED MATERIAL PARAMETERS FOR RESIDUAL SOIL:
UNIT WEIGHT, γ = 115 PCF
FRICTION ANGLE, ϕ = 30 DEGREES
COHESION, c = 50 PSF
- 5) IN-SITU ASSUMED MATERIAL PARAMETERS FOR WEATHERED ROCK:
UNIT WEIGHT, γ = 130 PCF
FRICTION ANGLE, ϕ = 42 DEGREES
COHESION, c = 50 PSF

DESIGN SOIL NAIL SLOPE STABILIZATION AT SITE NO. 13 FOR A LIVE LOAD (TRAFFIC) SURCHARGE OF 250 LB/FT.

FOR GLOBAL STABILITY, MINIMUM NAIL LENGTH SHALL BE EQUAL TO THE DIFFERENCE BETWEEN THE TOP OF FACING AND BOTTOM OF FACING ELEVATIONS.

WHERE INTERFERENCE WITH EXISTING NAILS IS LIKELY, CONSIDER STAGGERED PATTERNS OR SKEWING THE NAILS Laterally TO ACHIEVE DESIGN COVERAGE AND MAINTAIN STRUCTURAL CAPACITY.

2G-II

GEOTECHNICAL
ENGINEER

ENGINEER

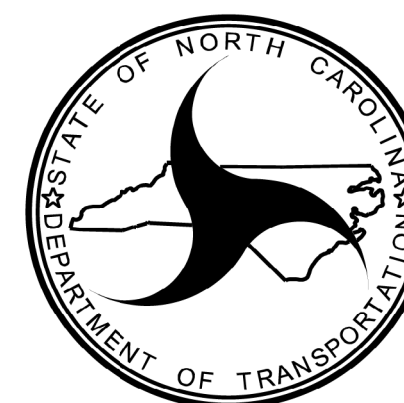
SIGNATURE DATE

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

CONTRACT NO.: 7000023067

ESP ESP ASSOCIATES, INC.
P.O. BOX 7030
CHARLOTTE, NC 28241
WWW.ESPASSOCIATES.COM



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

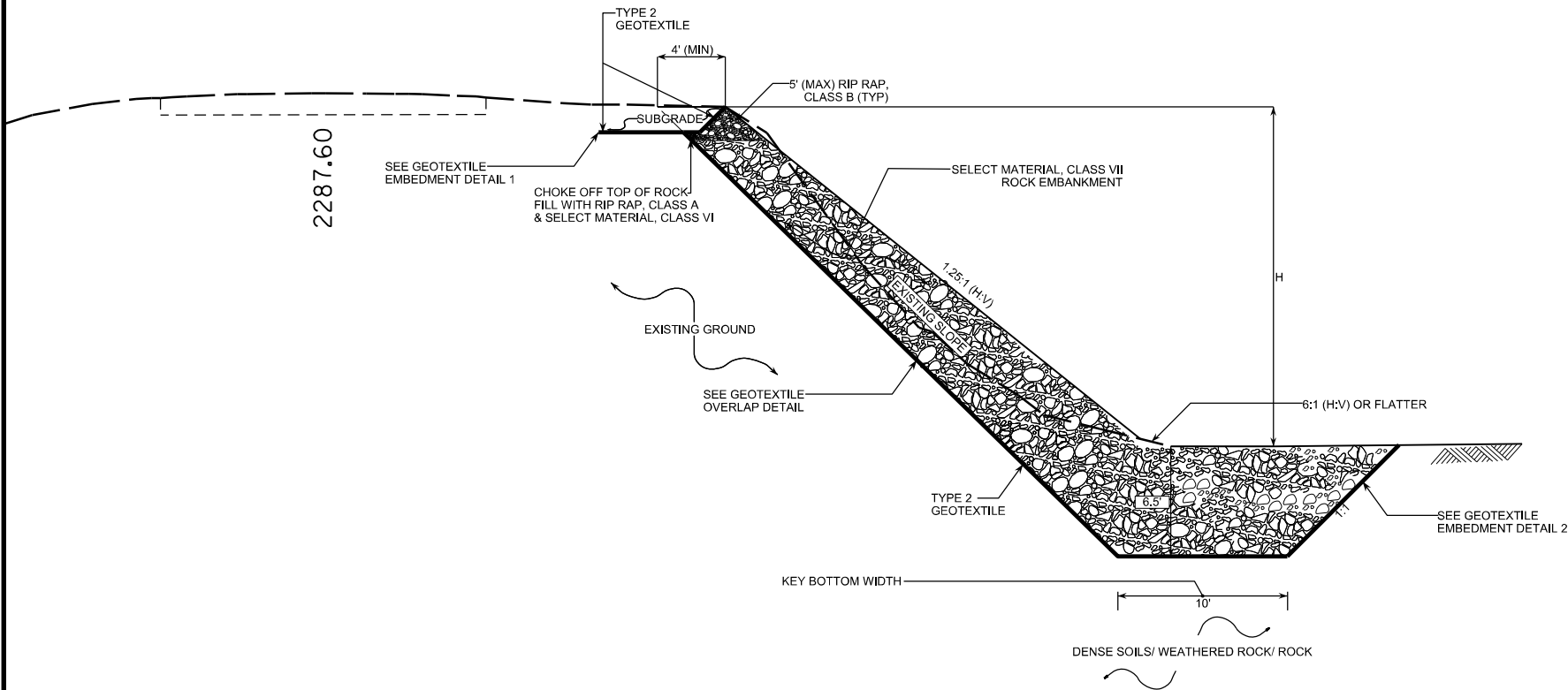
GEOTECHNICAL
ENGINEERING UNIT

SITE 13 - DF18314.2045230
SOIL NAIL SLOPE STABILIZATION

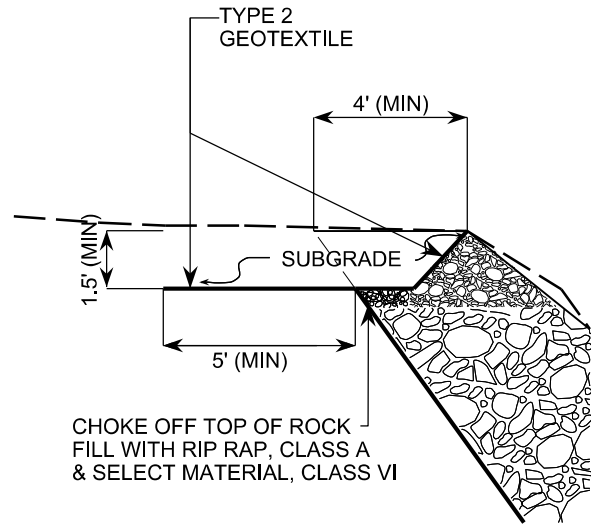
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET
NO.
2 OF 2

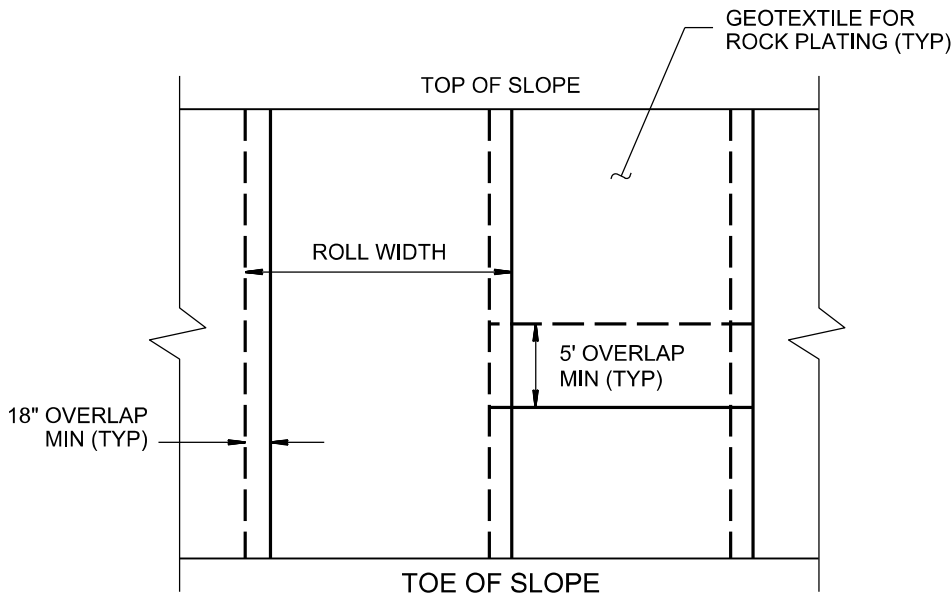
PREPARED BY: PB	DATE: 8/2025
REVIEWED BY: HAA	DATE: 8/2025



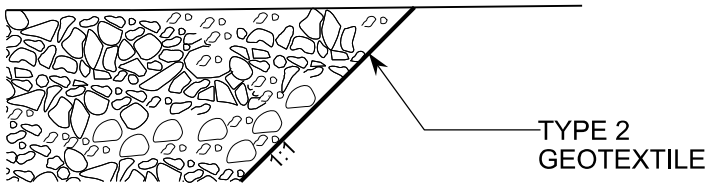
ROCK EMBANKMENT WITH TOE KEY DETAIL



GEOTEXTILE EMBEDMENT DETAIL 1



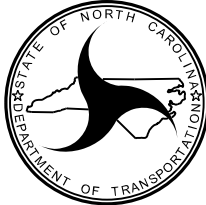
GEOTEXTILE OVERLAP DETAIL
(PLAN VIEW)



GEOTEXTILE EMBEDMENT DETAIL 2

- NOTES:
1. FOR ROCK EMBANKMENT, BENCH EXISTING SLOPE IN ACCORDANCE WITH SECTION 235 OF THE STANDARD SPECIFICATIONS, WHERE POSSIBLE.
 2. AN ESP GEOTECHNICAL PROFESSIONAL ENGINEER OR REPRESENTATIVE SHALL BE PRESENT TO EVALUATE ROCK FILL BEARING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION.
 3. INSTALL GEOTEXTILE FABRIC BENEATH RIP RAP TO SEPARATE RIP RAP FROM NATIVE SOILS AND REDUCE POTENTIAL FOR MIGRATION OF FINE MATERIALS. GEOTEXTILE SHALL BE EMBEDDED BENEATH THE ROADWAY SUBGRADE OR TO A MINIMUM DEPTH OF 1.5 FEET. AT THE CREEK SIDE, KEY IN THE FABRIC BENEATH THE RIP RAP WITH A 1:1 (H:V) SLOPE TIED INTO THE NATURAL GROUNDLINE ON THE RIGHT SIDE.

CONTRACT NO.: 7000023067

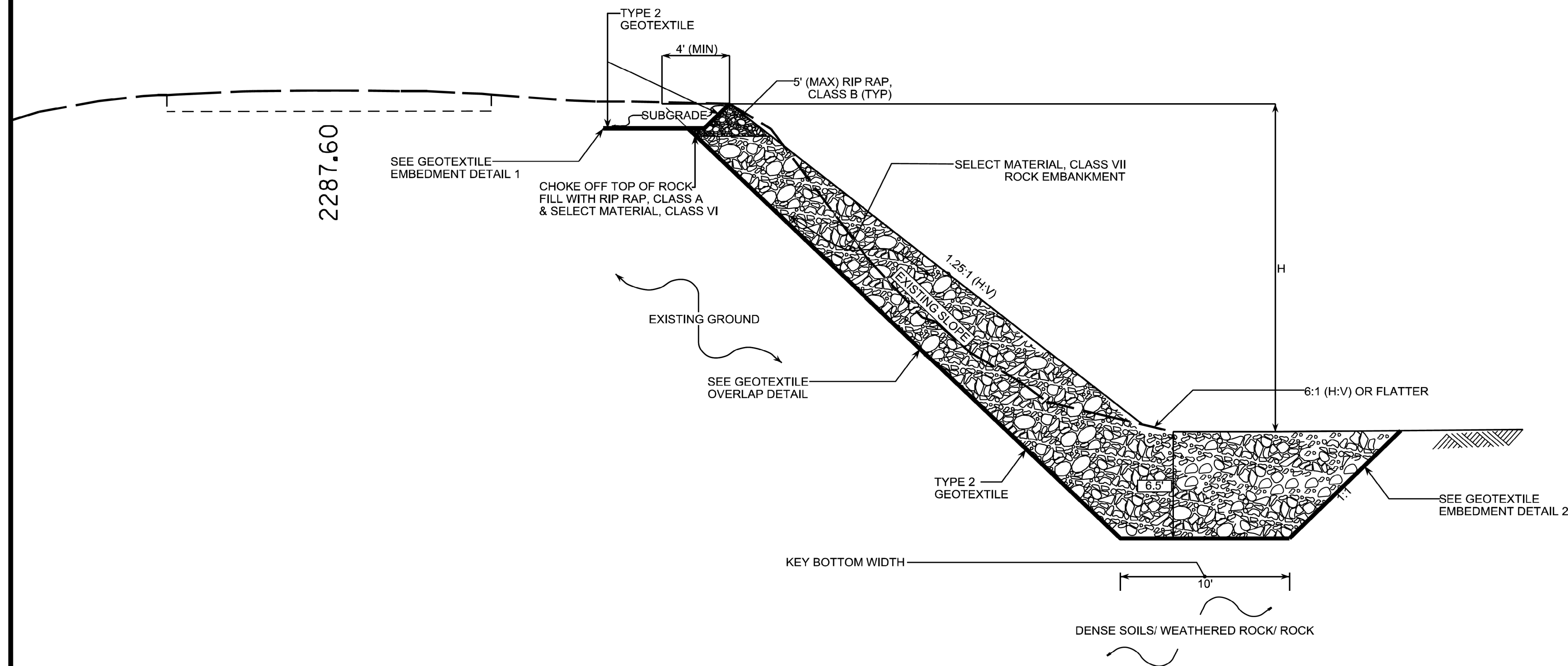




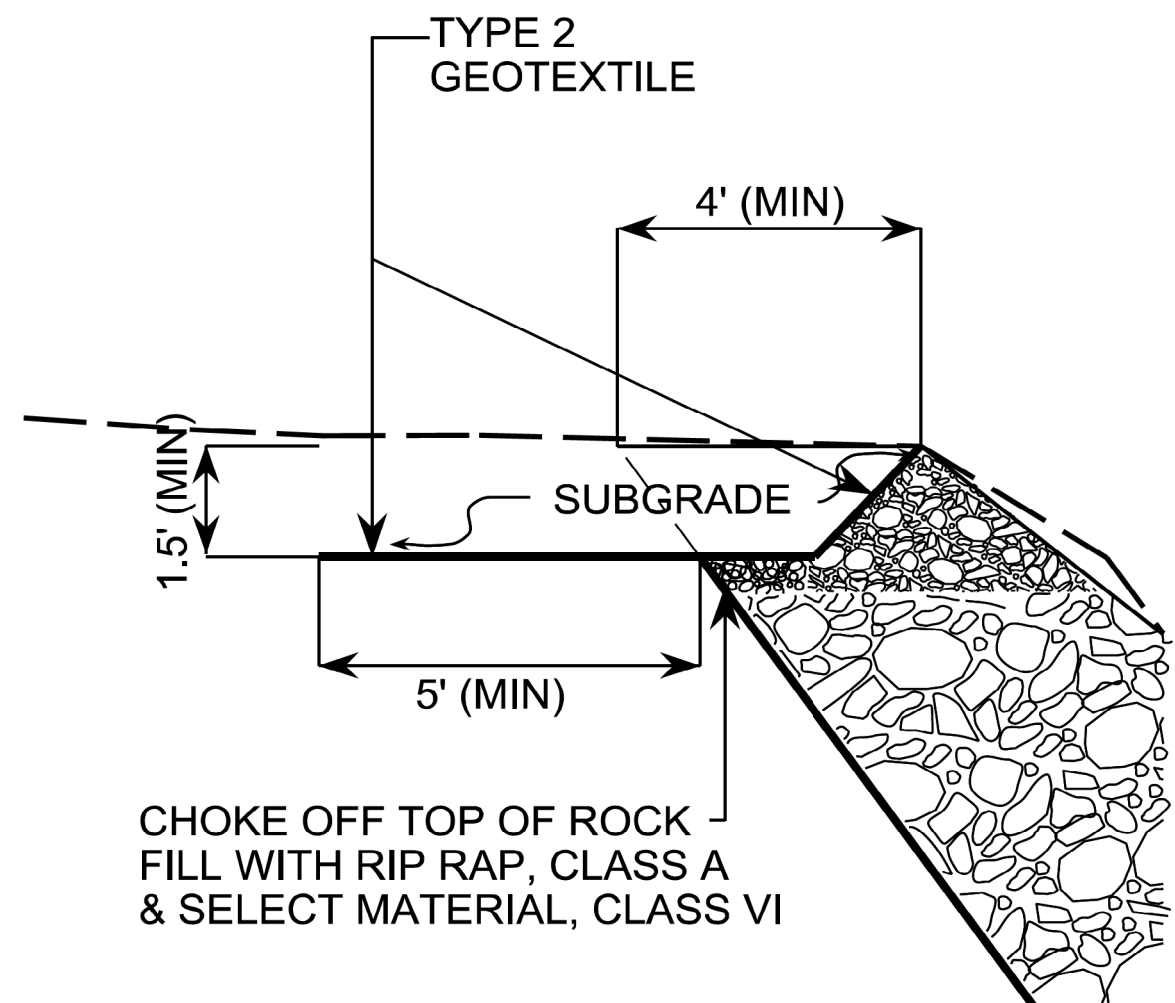
SIGNATURE DATE

SIGNATURE DATE

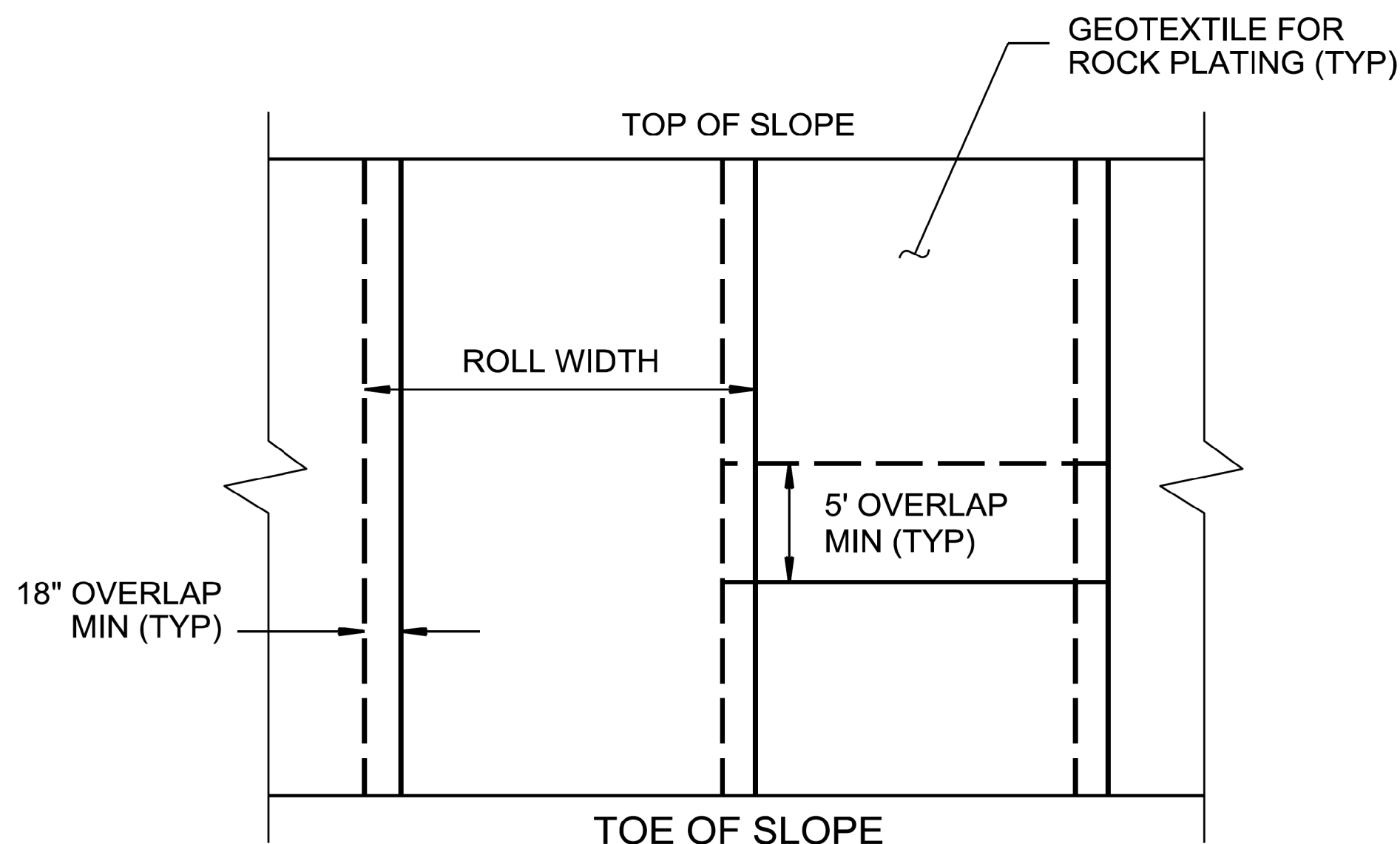
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



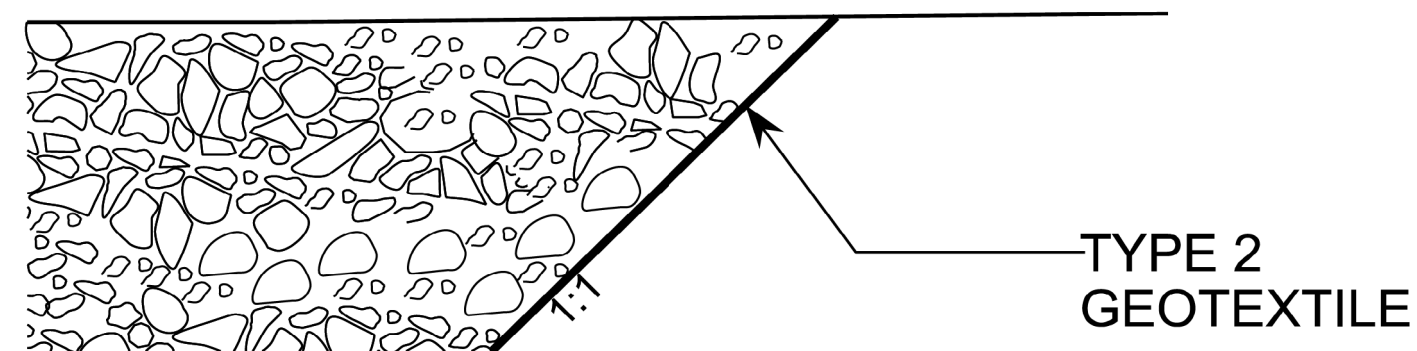
ROCK EMBANKMENT WITH TOE KEY DETAIL



GEOTEXTILE EMBEDMENT DETAIL 1



GEOTEXTILE OVERLAP DETAIL
(PLAN VIEW)



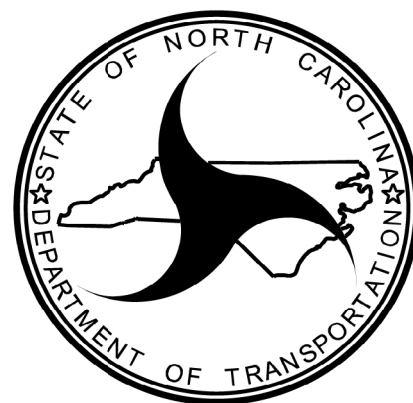
GEOTEXTILE EMBEDMENT DETAIL 2

NOTES:

1. FOR ROCK EMBANKMENT, BENCH EXISTING SLOPE IN ACCORDANCE WITH SECTION 235 OF THE STANDARD SPECIFICATIONS, WHERE POSSIBLE.
2. AN ESP GEOTECHNICAL PROFESSIONAL ENGINEER OR REPRESENTATIVE SHALL BE PRESENT TO EVALUATE ROCK FILL BEARING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION.
3. INSTALL GEOTEXTILE FABRIC BENEATH RIP RAP TO SEPARATE RIP RAP FROM NATIVE SOILS AND REDUCE POTENTIAL FOR MIGRATION OF FINE MATERIALS. GEOTEXTILE SHALL BE EMBEDDED BENEATH THE ROADWAY SUBGRADE OR TO A MINIMUM DEPTH OF 1.5 FEET, AT THE CREEK SIDE, KEY IN THE FABRIC BENEATH THE RIP RAP WITH A 1:1 (H:V) SLOPE TIED INTO THE NATURAL GROUNDLINE ON THE RIGHT SIDE.

CONTRACT NO.: 7000023067

ESP ESP ASSOCIATES, INC.
P.O. BOX 7030
CHARLOTTE, NC 28241
WWW.ESPASSOCIATES.COM



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

SITE 16 - DF18314.2045126
ROCK EMBANKMENT WITH TOE KEY

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

SHEET
NO.
1 OF 1

PREPARED BY: PB	DATE: 8/2025
REVIEWED BY: HAA	DATE: 8/2025

SUMMARY OF EARTHWORK

IN CUBIC YARDS

SITE NO.	LINE	STATION	STATION	EXCAVATION		EMBANKMENT	BORROW	WASTE
				TOTAL UNCLASSIFIED	UNDERCUT	EMBANKMENT +15%		TOTAL
1	–Y1–	10 + 30	11 + 79.35	3		1090	1087	
2	–EL3–	13 + 69	15 + 35	202		0		202
5	–EL6–	19 + 16	23 + 56	1018		0		1018
4	–EL6–	22 + 74	23 + 56	876		0		876
8	–EL8–	11 + 70	13 + 25	638		0		638
12	–EL12–	9 + 60	10 + 60	78		0		78
13	–L13–	11 + 26.05	15 + 73.40	161	300	99		362
16	–EL16–	13 + 00	14 + 25	1004		0		1004
			PROJECT TOTAL	3980		1189	1087	4178
	WASTE IN LIEU OF BORROW						–1087	–1087
	ADD. UNDERCUT TO BE FILLED WITH SELECT GRANULAR MATERIAL – CLASS III				200			200
			GRAND TOTAL	3980	500		0	3291
			SAY	4000	500		0	

EXPRESSWAY GUTTER			
LINE	STATION TO STATION	LOCATION	LINEAR FEET (LF)
–L13–	12 + 85 TO 13 + 65	LT	80
TOTAL			80
SAY			80

REMOVAL OF EXISTING ASPHALT PAVEMENT				
SITE NO.	LINE	STATION TO STATION	LOCATION	AREA (SY)
1	–Y1–	10 + 30 TO 11 + 79.35	LT/RT	190
2	–EL3–	13 + 69 TO 15 + 35	LT/RT	360
4	–EL6–	22 + 74 TO 23 + 57.65	LT/RT	170
5	–EL6–	19 + 16 TO 20 + 58	LT/RT	285
5	–EL6–	18 + 98 TO 20 + 30	TEMP PVMT	75
8	–EL8–	11 + 70 TO 13 + 25	LT/RT	260
9	–EL9–	17 + 65 TO 18 + 12	LT/RT	200
10	–EL12–	15 + 75 TO 18 + 51	LT/RT	560
11	–EL12–	14 + 46 TO 15 + 75	LT/RT	260
12	–EL12–	9 + 60 TO 10 + 60	LT/RT	200
13	–L13–	10 + 75 TO 15 + 73.40	LT/RT	1040
14	–EL14–	11 + 00 TO 12 + 16	LT/RT	200
16	–EL16–	13 + 00 TO 14 + 25	LT/RT	250
	TOTAL			4050
	SAY			4050

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

PROJ. REFERENCE NO.

DF18314.2045121

SHEET NO.

3P-1

PARCEL INDEX SHEET

[illegible][illegible]

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

PROJ. REFERENCE NO.

DF18314.2045121

SHEET NO.

3P-1

PARCEL INDEX SHEET

[illegible][illegible]

5/14/99

K:\RAL_Roadway\01036679 - Bearwallow\Roadway\Proj\Bearwallow_rdy_dsh_4_Site-2.dgn

9/30/2025

Kimley »Horn

421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, NC 27601
PE NO. F-0102

RIGHT-OF-WAY REV.

CONST. REV.

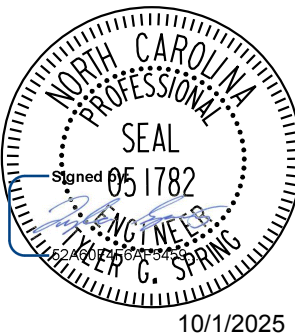
PROJECT REFERENCE NO.

DF18314.2045408

SHEET NO.

4

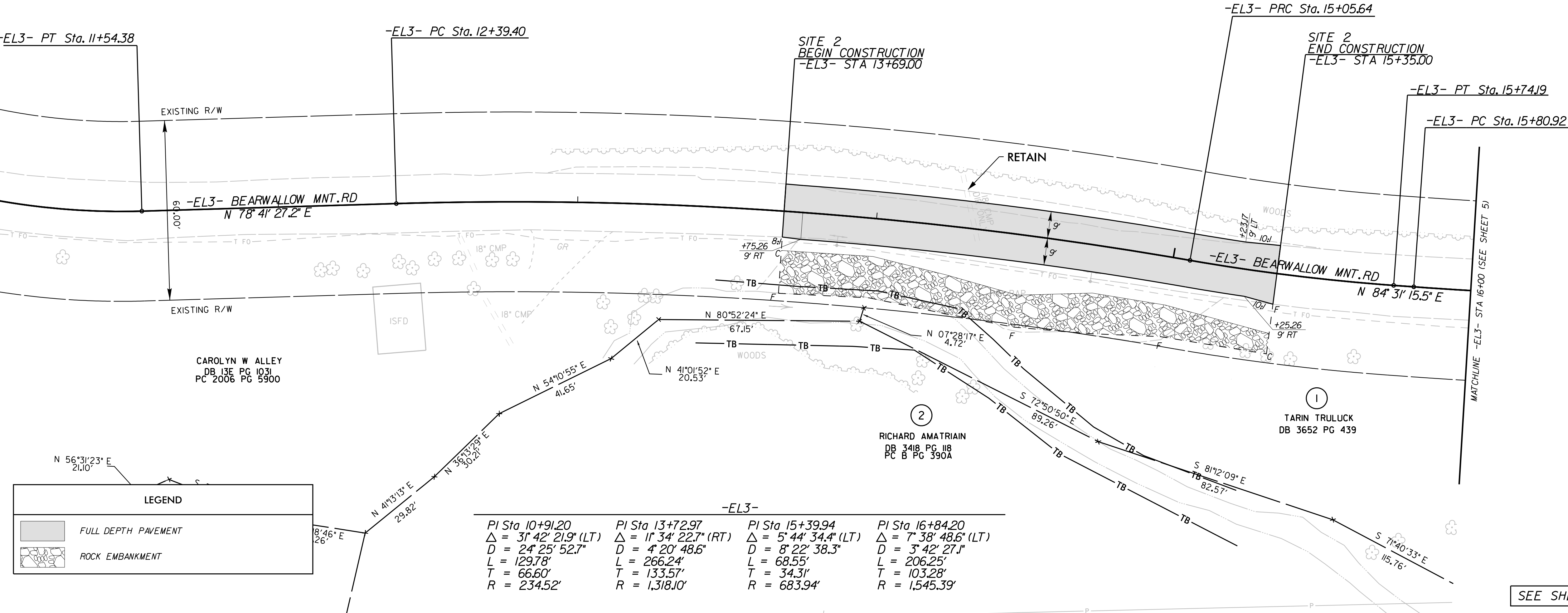
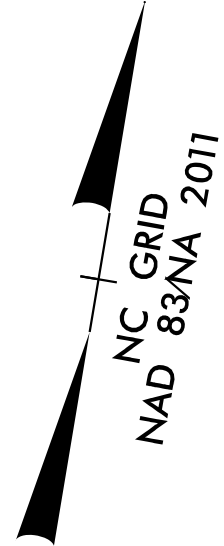
ROADWAY DESIGN
ENGINEER



HYDRAULICS
ENGINEER



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

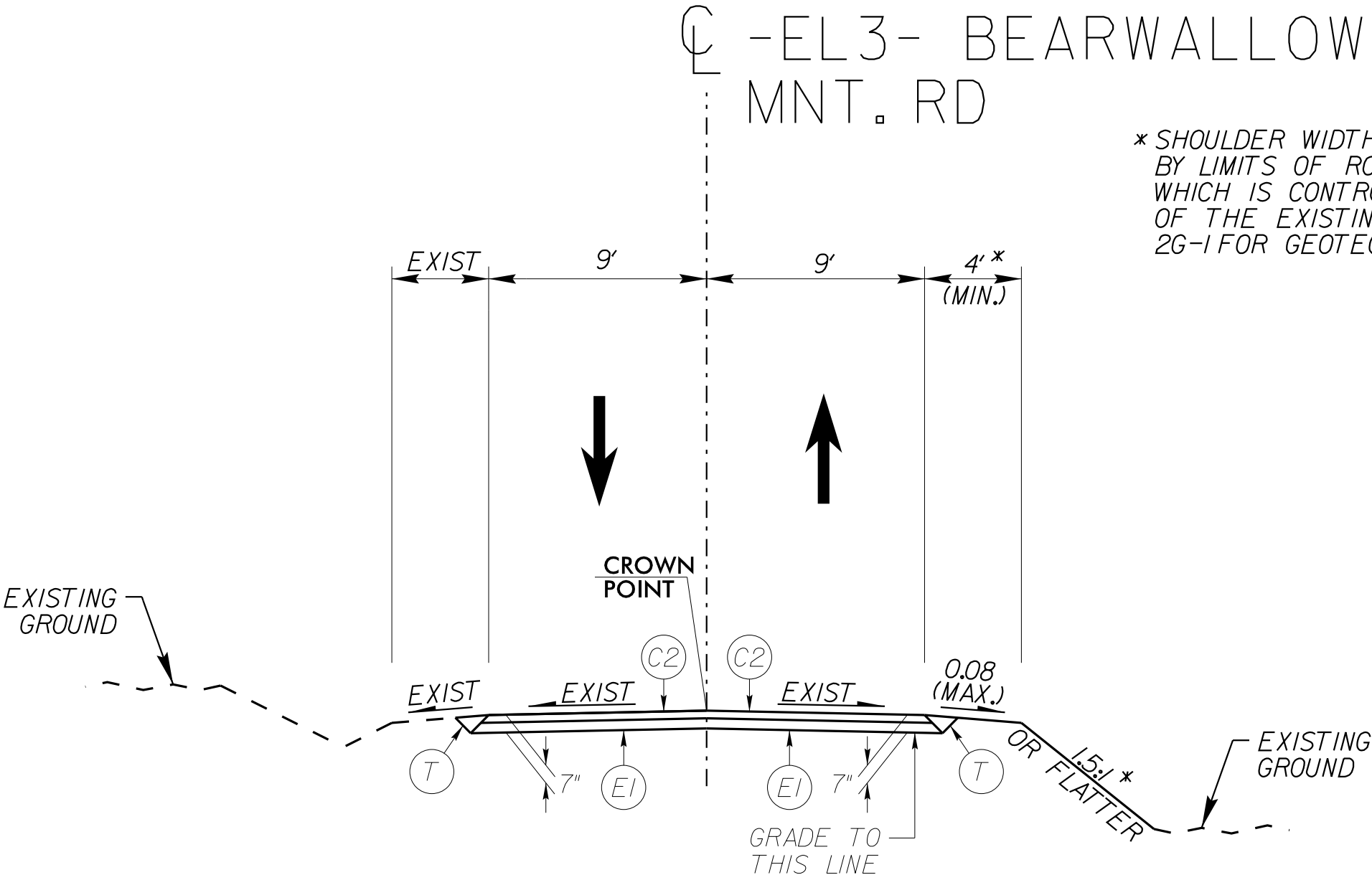


PAVEMENT SCHEDULE

(FINAL PAVEMENT DESIGN)

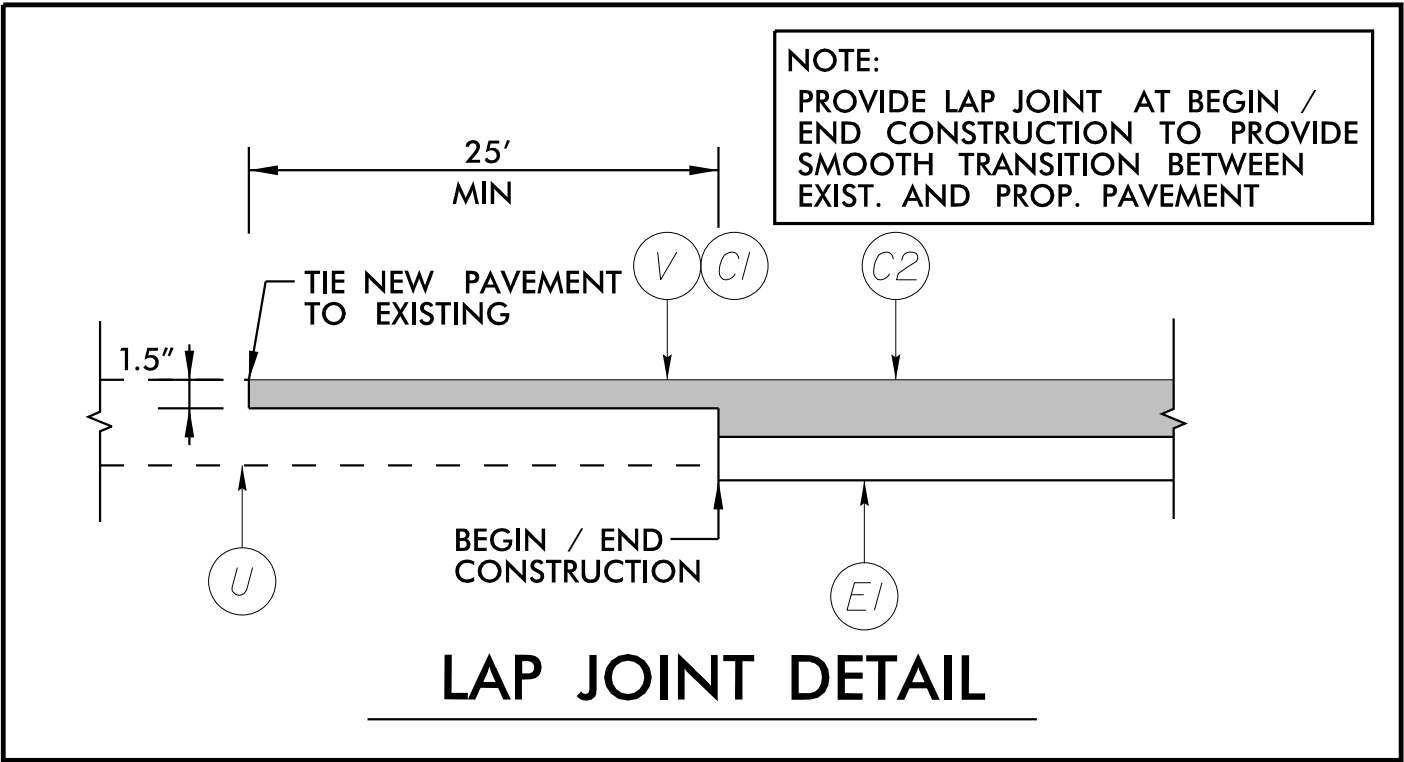
C1	PROPOSED 1.5" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.	T	EARTH MATERIAL
C2	PROPOSED 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS	U	EXISTING PAVEMENT
E1	PROPOSED 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	V	INCIDENTAL MILLING
R	PROPOSED CONCRETE EXPRESSWAY GUTTER		

- NOTES:
- ALL PAVEMENT EDGE SLOPES ARE H UNLESS OTHERWISE NOTED
 - TIE PROPOSED PAVEMENT TO EXISTING AT CONSTRUCTION LIMITS AT TAPER RATE SHOWN IN THE PLANS



TYPICAL SECTION NO. 1

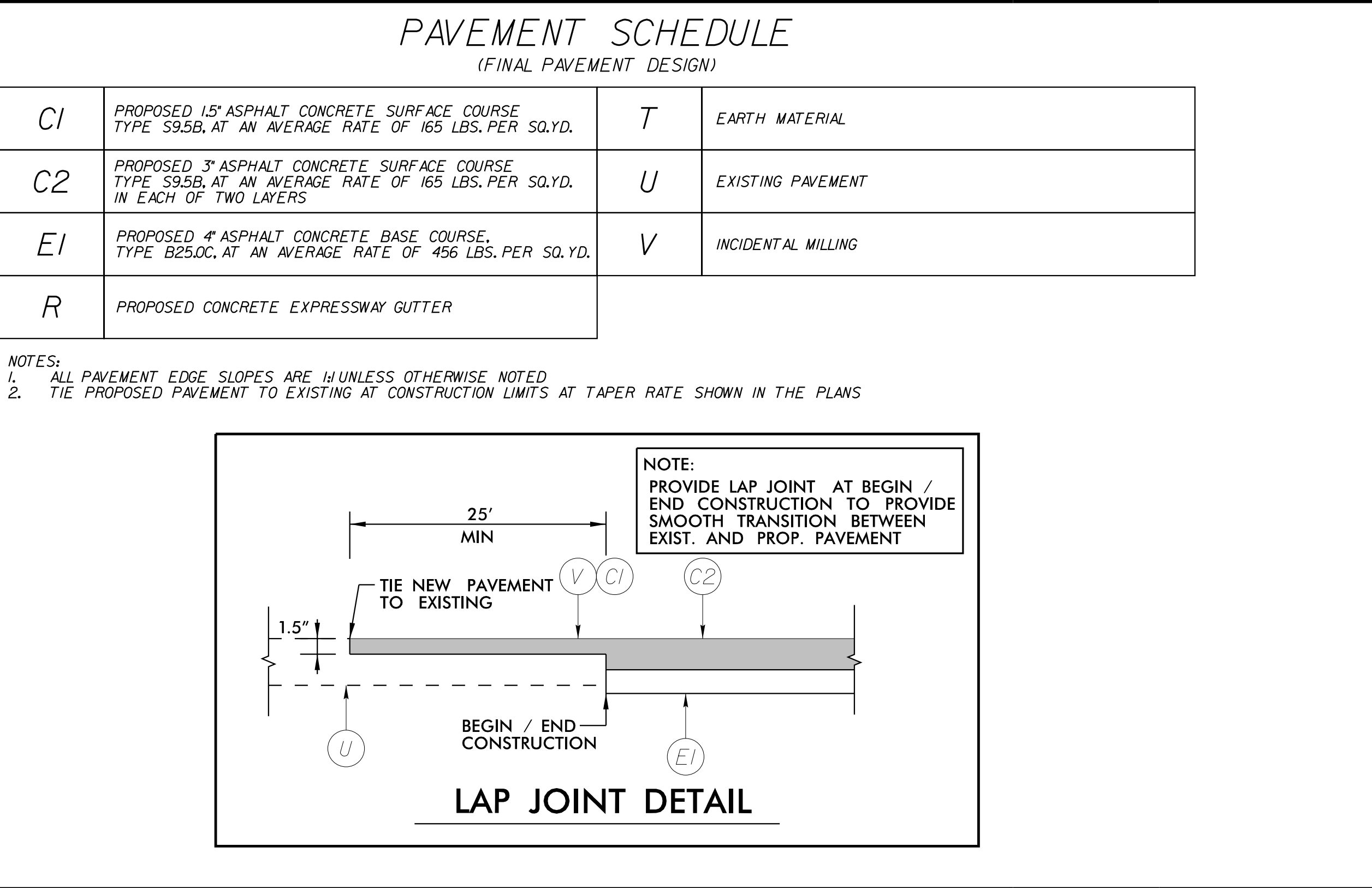
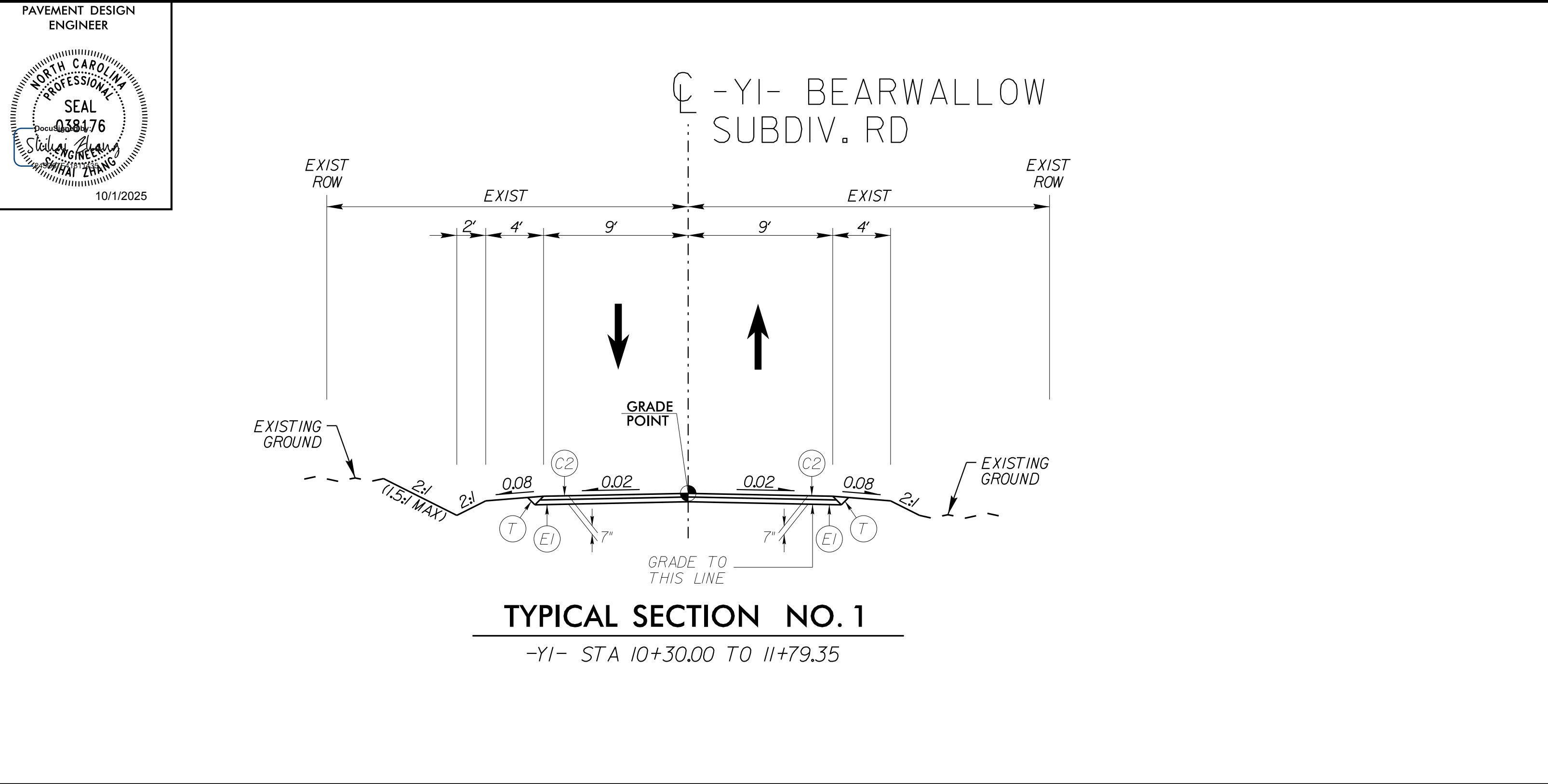
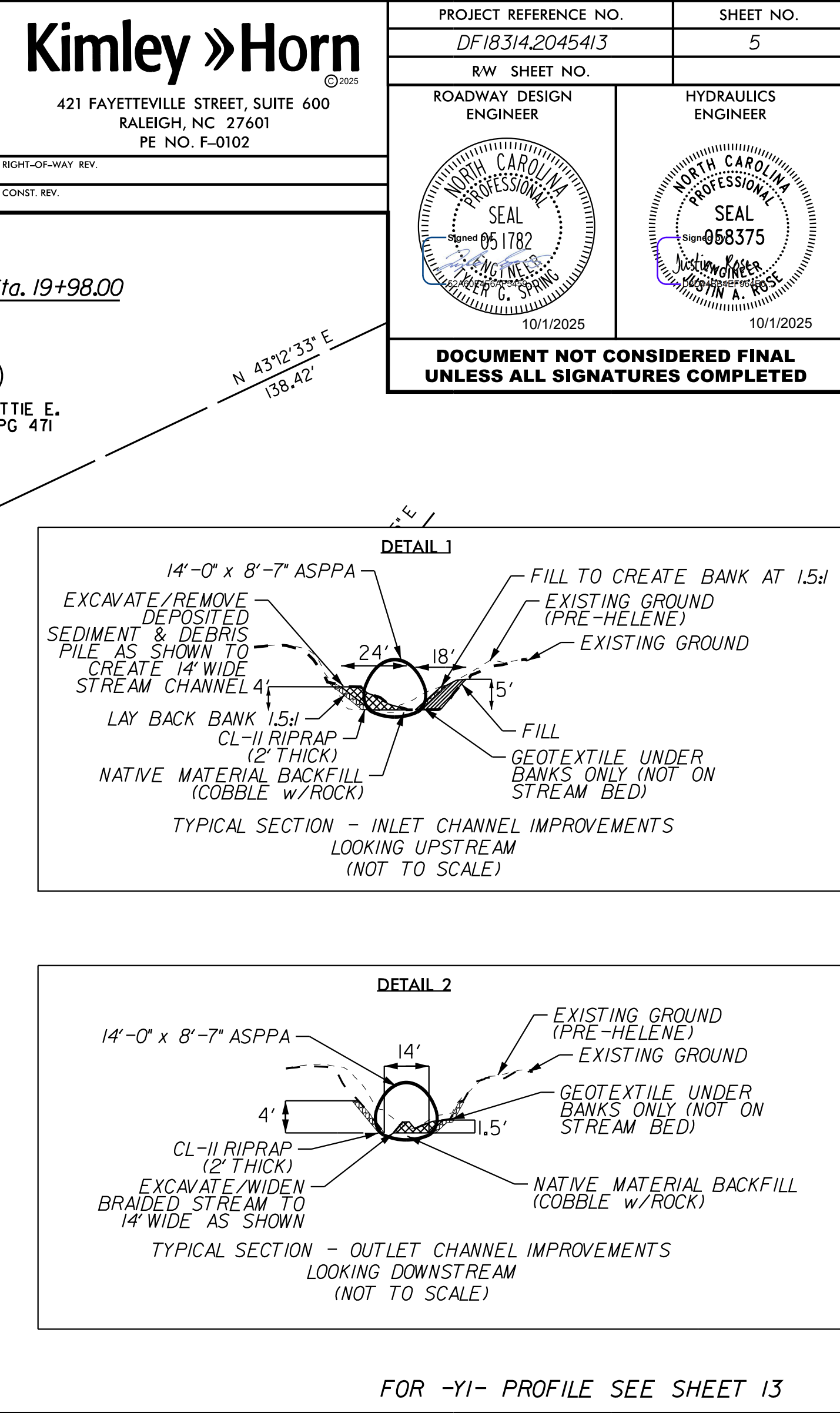
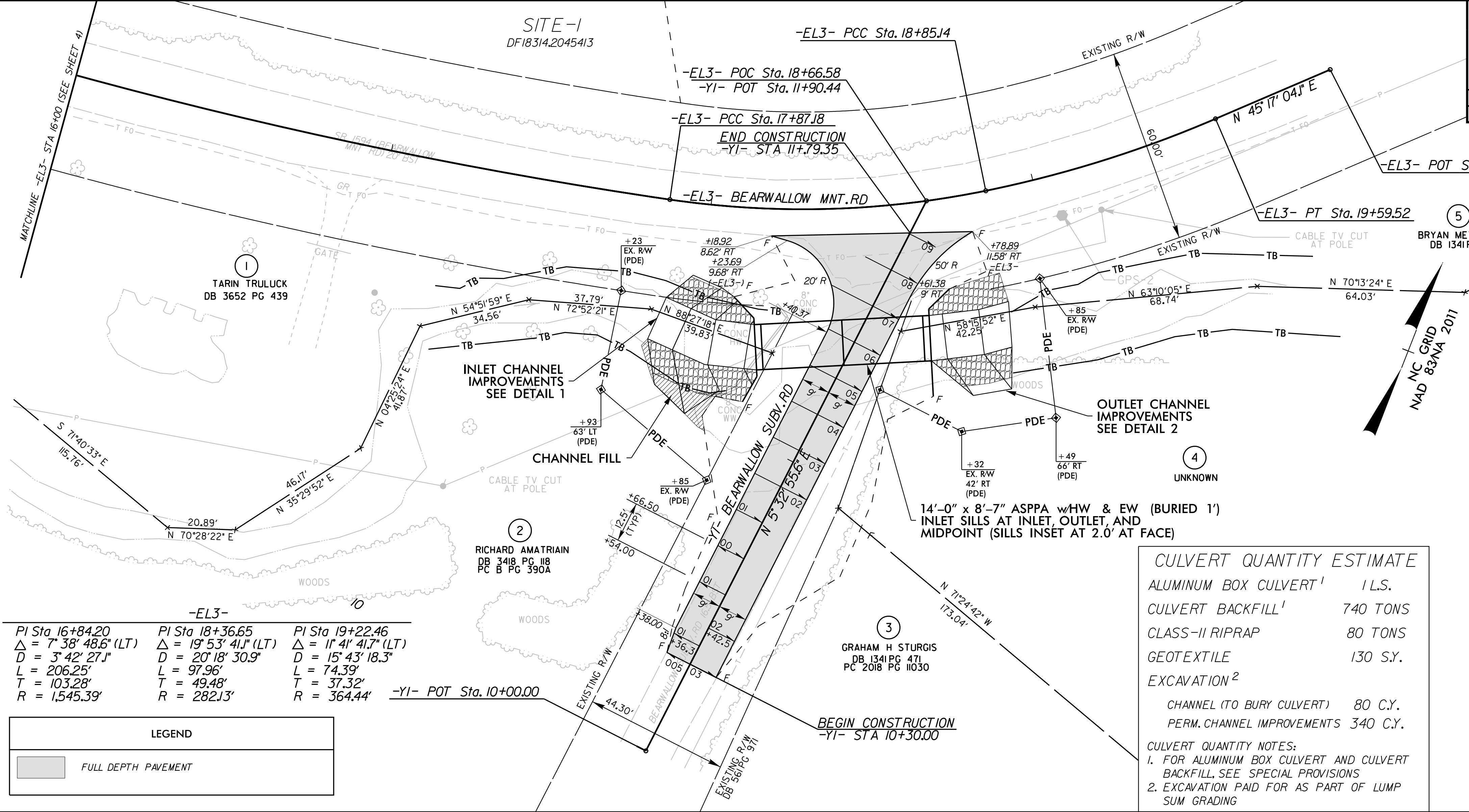
EL3- STA 13+69.00 TO 15+35.00



5/14/2019

K:\RAL_Roadway\01036679 - Bearwallow\Roadway\Proj\Bearwallow_rdy_dsh_5_Site.dgn

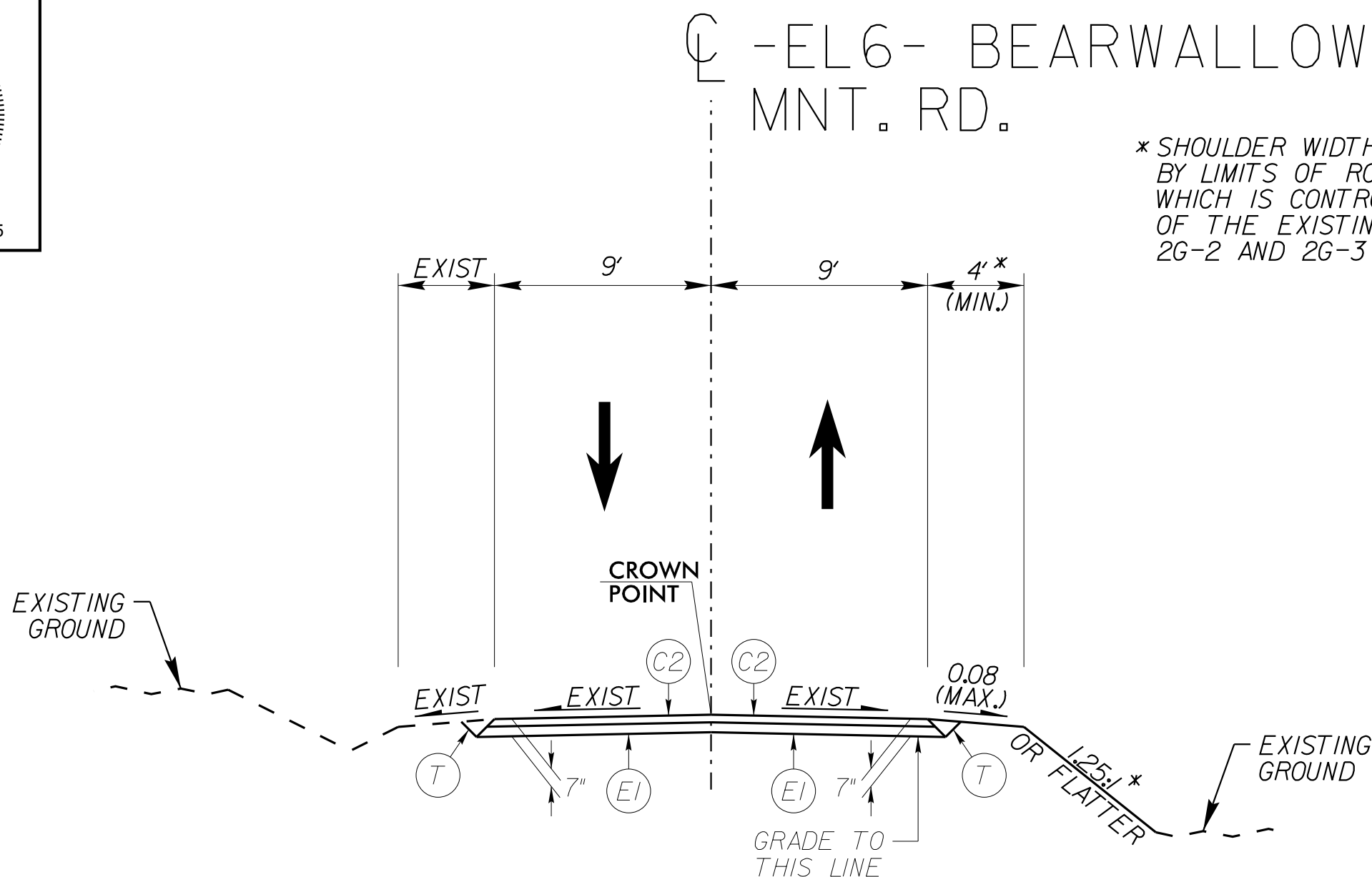
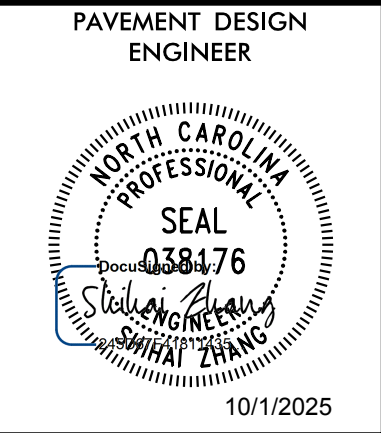
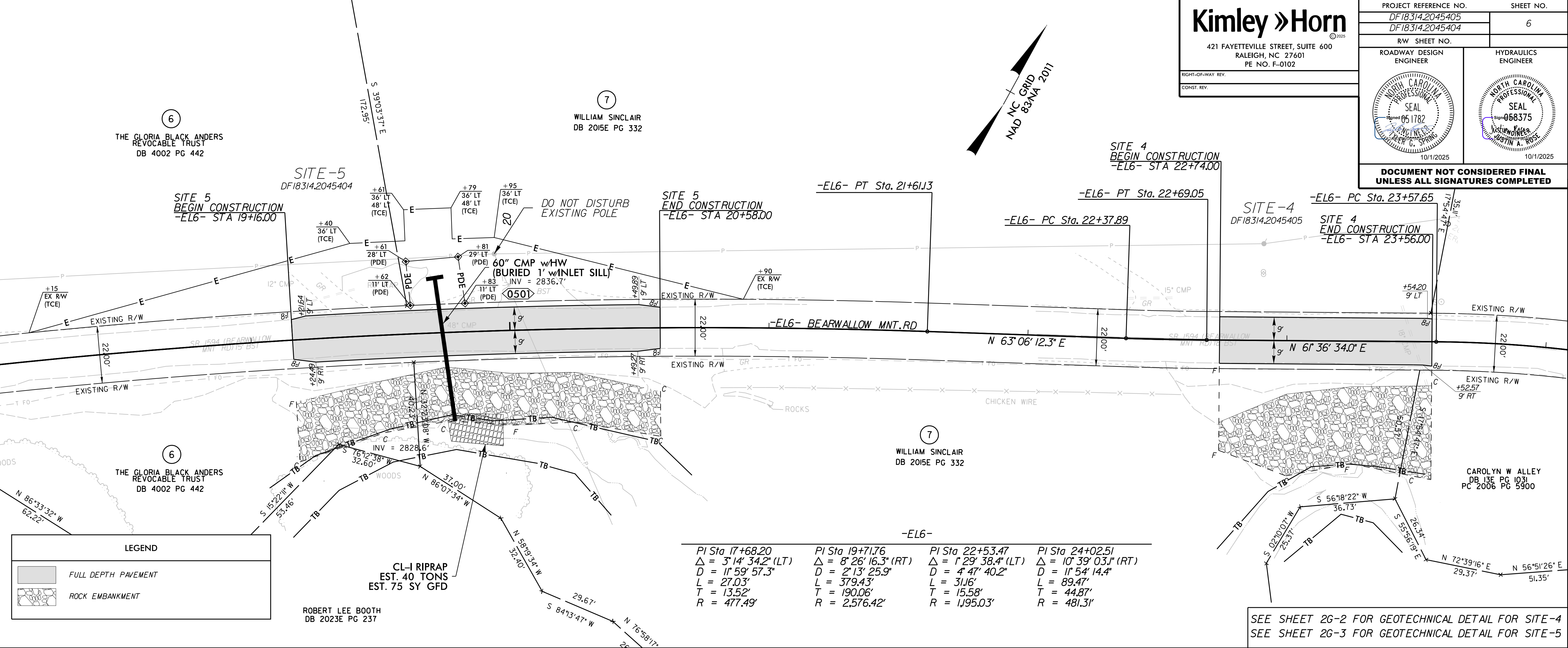
9/30/2025



5/14/2019

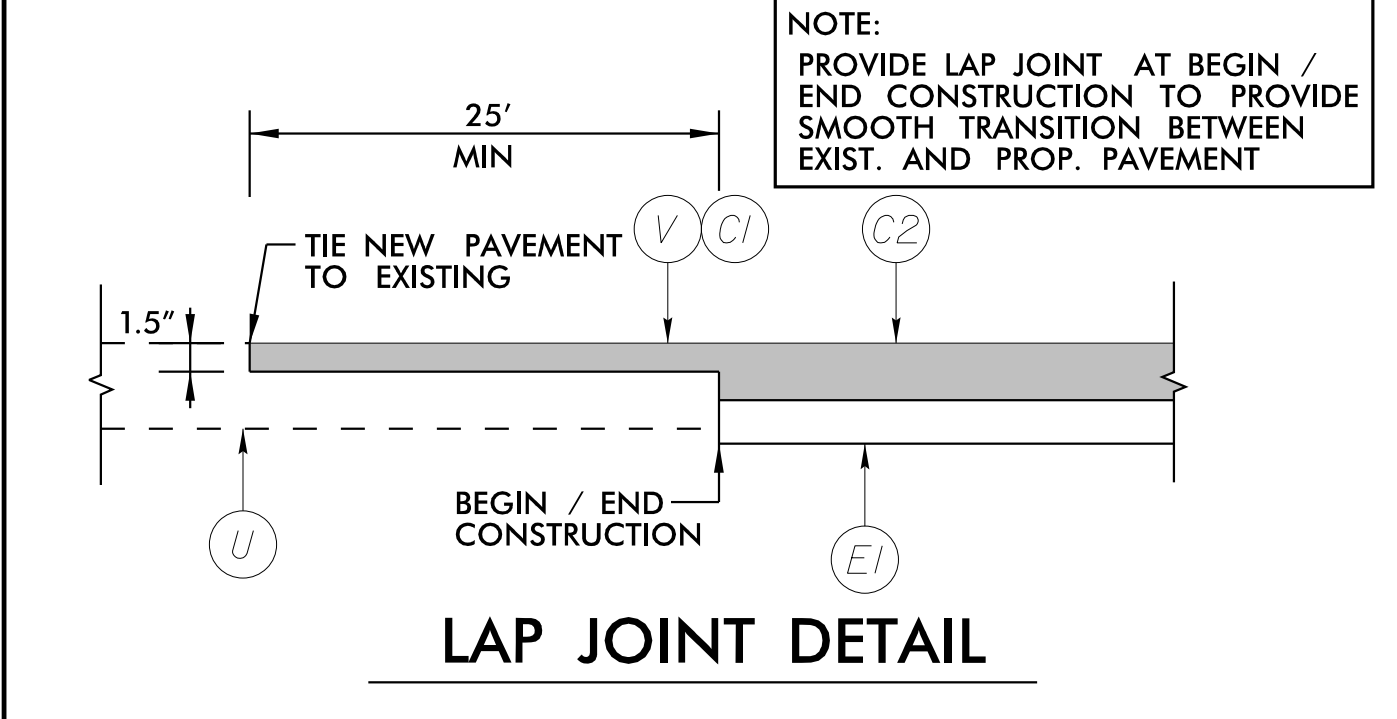
K:\RAL_Roadway\01036679 - Bearwallow\Roadway\Proj\Bearwallow_rdy_dsh_6_Site_4&5.dgn

9/30/2025



TYPICAL SECTION NO. 2

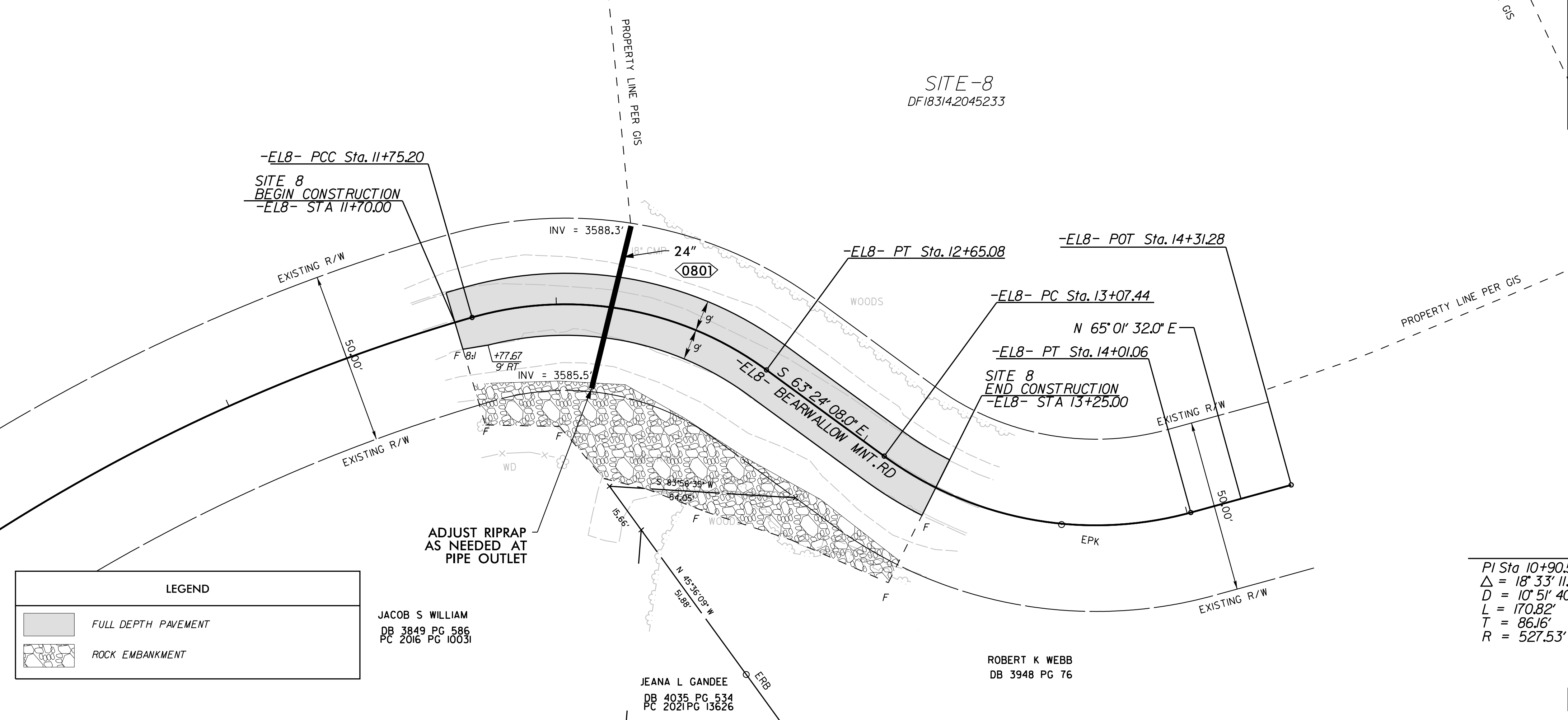
-EL6- STA 19+16.00 TO 20+58.00
-EL6- STA 22+74.00 TO 23+56.00



5/14/99

K:\RAL_Roadway\01036679 - Bearwallow\Roadway\Proj\Bearwallow_rdy_dsh_7_Site_8.dgn

9/30/2025



Kimley »Horn
421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, NC 27601
PE NO. F-0102

RIGHT-OF-WAY REV.
CONST. REV.

PROJECT REFERENCE NO. DF18314.2045233	SHEET NO. 7
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

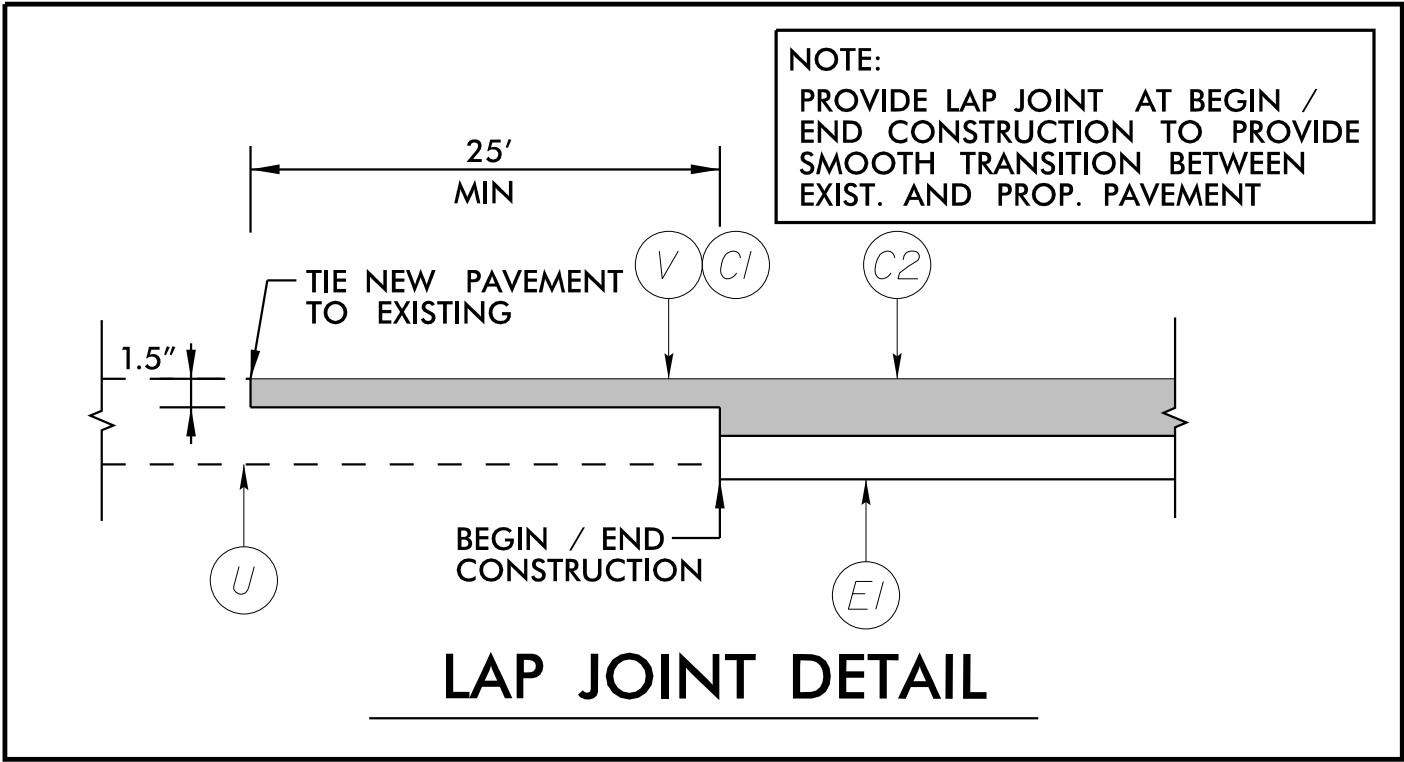
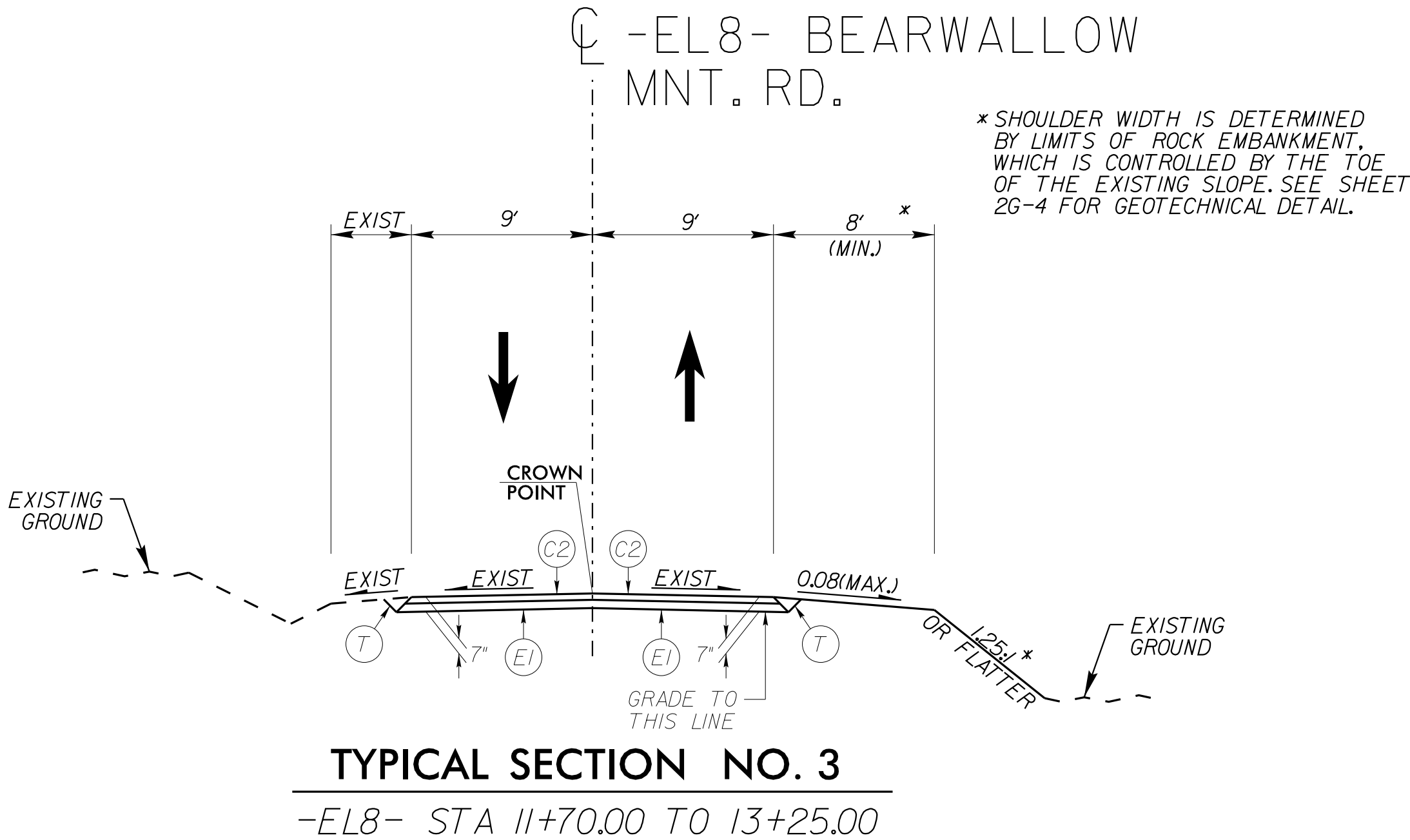
-EL8-		
PI Sta 10+90.55 Δ = 18° 33' 11.2" (RT) D = 10° 51' 40.4" L = 170.82' T = 86.16' R = 527.53'	PI Sta 12+23.53 Δ = 52° 11' 11.1" (RT) D = 58° 03' 45.3" L = 89.88' T = 48.33' R = 98.68'	PI Sta 13+57.69 Δ = 51° 34' 20.0" (LT) D = 55° 05' 26.5" L = 93.61' T = 50.25' R = 104.00'

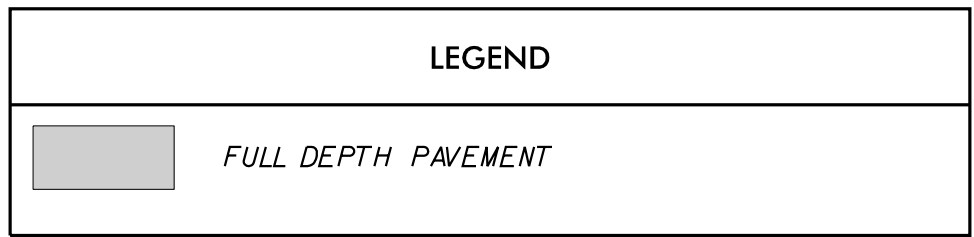
SEE SHEET 26-4 FOR GEOTECHNICAL DETAIL

PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

C1	PROPOSED 1.5" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ.YD.	T	EARTH MATERIAL
C2	PROPOSED 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ.YD. IN EACH OF TWO LAYERS	U	EXISTING PAVEMENT
E1	PROPOSED 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ.YD.	V	INCIDENTAL MILLING
R	PROPOSED CONCRETE EXPRESSWAY GUTTER		

- NOTES:
- ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED
 - TIE PROPOSED PAVEMENT TO EXISTING AT CONSTRUCTION LIMITS AT TAPER RATE SHOWN IN THE PLANS





<i>PI Sta 11+63.72</i>	<i>PI Sta 13+20.23</i>	<i>PI Sta 13+86.91</i>	<i>PI Sta 14+24.54</i>
$\Delta = 50^{\circ} 32' 26.2''$ (LT)	$\Delta = 33^{\circ} 36' 36.9''$ (LT)	$\Delta = 94^{\circ} 10' 35.3''$ (LT)	$\Delta = 27^{\circ} 05' 22.4''$ (LT)
$D = 2^{\circ} 03' 44''$	$D = 63^{\circ} 12' 00.7''$	$D = 150^{\circ} 46' 42''$	$D = 86^{\circ} 00' 19.3''$
$L = 239.96'$	$L = 53.18'$	$L = 62.46'$	$L = 31.50'$
$T = 128.42'$	$T = 27.38'$	$T = 40.88'$	$T = 16.05'$
$R = 272.03'$	$R = 90.66'$	$R = 38.00'$	$R = 66.62'$

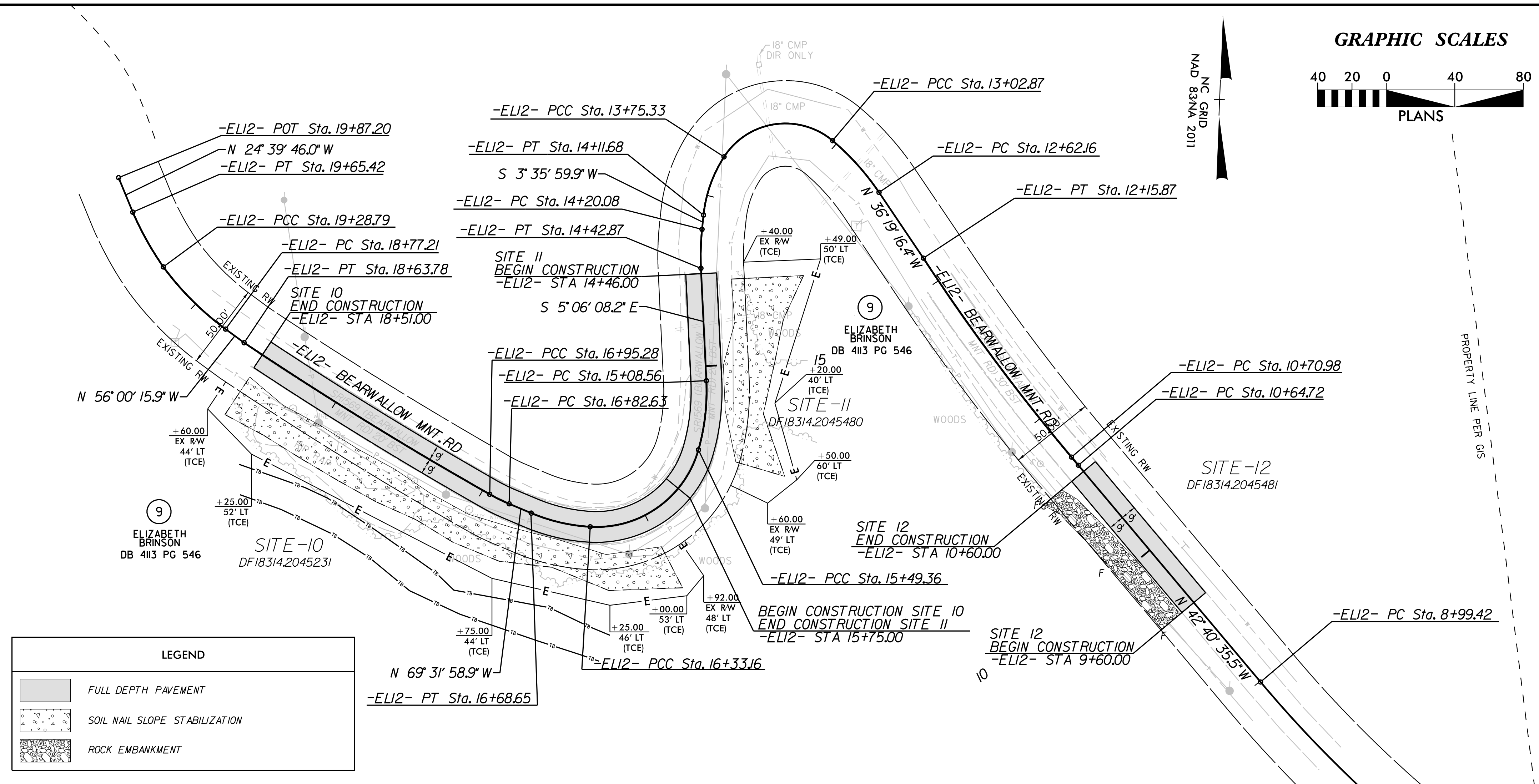
(FINAL PAVEMENT DESIGN)

NOTES:
1. ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED
2. TIE PROPOSED PAVEMENT TO EXISTING AT CONSTRUCTION LIMITS AT TAPER RATE SHOWN IN THE PLANS



The diagram illustrates a lap joint detail for pavement construction. It shows a cross-section of a road with a new pavement layer (shaded gray) being laid over an existing pavement layer (unshaded). The new pavement is 25 feet minimum long, as indicated by a dimension line at the top. A note in a box states: "NOTE: PROVIDE LAP JOINT AT BEGIN / END CONSTRUCTION TO PROVIDE SMOOTH TRANSITION BETWEEN EXIST. AND PROP. PAVEMENT". The diagram includes several callouts: "TIE NEW PAVEMENT TO EXISTING" points to the joint area, "BEGIN / END CONSTRUCTION" points to the start of the new pavement, and "LAP JOINT DETAIL" is written in large bold letters at the bottom. Other callouts include "U" (underneath the existing pavement), "V" (on the new pavement), "C1" (on the new pavement), "C2" (on the new pavement), and "E1" (on the existing pavement). A vertical dimension of 1.5 inches is shown on the left side, indicating the thickness of the new pavement layer.

5/14/99
K:\RAL_Roadway\01036679 - Bearwallow\Roadway\Proj\Bearwallow\Roadway\rdy_psh_9_Site_10&11&12.dgn
9/30/2025



PROJECT REFERENCE NO.

DF18314.2045231

DF18314.2045480

DF18314.2045481

RW SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

KIMLEY-HORN

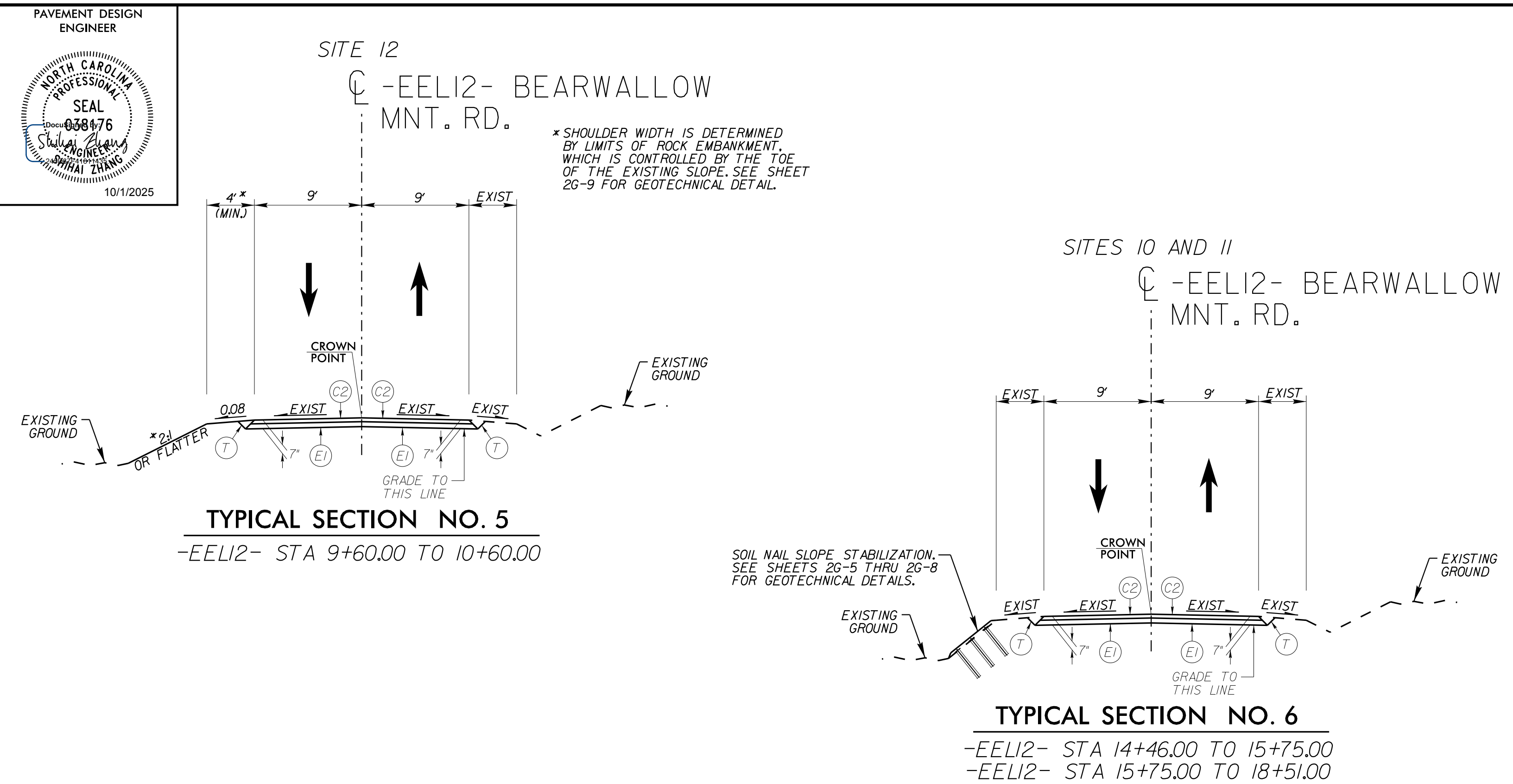
421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, NC 27601
PE NO. F-0102

RIGHT-OF-WAY REV.

CONST. REV.

-EELI2-		
PI Sta 11+40.39 Δ = 7° 04' 05.8" (RT) D = 4° 40' 34.3" L = 151.15' T = 75.67' R = 1,225.27'	PI Sta 12+82.64 Δ = 15° 52' 16.7" (LT) D = 38° 58' 51.3" L = 40.72' T = 20.49' R = 146.98'	PI Sta 13+51.34 Δ = 97° 16' 26.9" (LT) D = 134° 15' 14.9" L = 72.46' T = 48.47' R = 42.68'
PI Sta 13+93.84 Δ = 26° 56' 00.1" (LT) D = 74° 04' 48.7" L = 36.36' T = 18.52' R = 77.34'	PI Sta 14+31.50 Δ = 8° 42' 08.1" (LT) D = 38° 11' 49.9" L = 22.78' T = 11.41' R = 150.00'	PI Sta 15+29.14 Δ = 18° 33' 55.7" (RT) D = 45° 30' 34.3" L = 40.79' T = 20.58' R = 125.90'
PI Sta 15+99.09 Δ = 77° 31' 46.6" (RT) D = 92° 30' 55.3" L = 83.80' T = 49.73' R = 61.93'	PI Sta 16+51.08 Δ = 19° 28' 27.1" (RT) D = 54° 52' 16.8" L = 35.49' T = 17.92' R = 104.42'	PI Sta 16+88.96 Δ = 6° 46' 30.3" (RT) D = 53° 32' 57.5" L = 12.65' T = 6.33' R = 107.00'
PI Sta 17+79.57 Δ = 4° 12' 09.1" (RT) D = 2° 29' 39.0" L = 168.49' T = 84.29' R = 2,297.20'	PI Sta 19+03.20 Δ = 17° 15' 37.2" (RT) D = 33° 27' 39.5" L = 51.58' T = 25.99' R = 171.23'	PI Sta 19+47.16 Δ = 11° 05' 25.6" (RT) D = 30° 16' 39.1" L = 36.63' T = 18.37' R = 189.24'

SEE SHEET 26-5 AND 26-6 FOR GEOTECHNICAL DETAIL FOR SITE 10
SEE SHEET 26-7 AND 26-8 FOR GEOTECHNICAL DETAIL FOR SITE 11
SEE SHEET 26-9 FOR GEOTECHNICAL DETAIL FOR SITE 12



PAVEMENT SCHEDULE

(FINAL PAVEMENT DESIGN)

C1	PROPOSED 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S95B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.	T	EARTH MATERIAL
C2	PROPOSED 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S95B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS	U	EXISTING PAVEMENT
E1	PROPOSED 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	V	INCIDENTAL MILLING
R	PROPOSED CONCRETE EXPRESSWAY GUTTER		

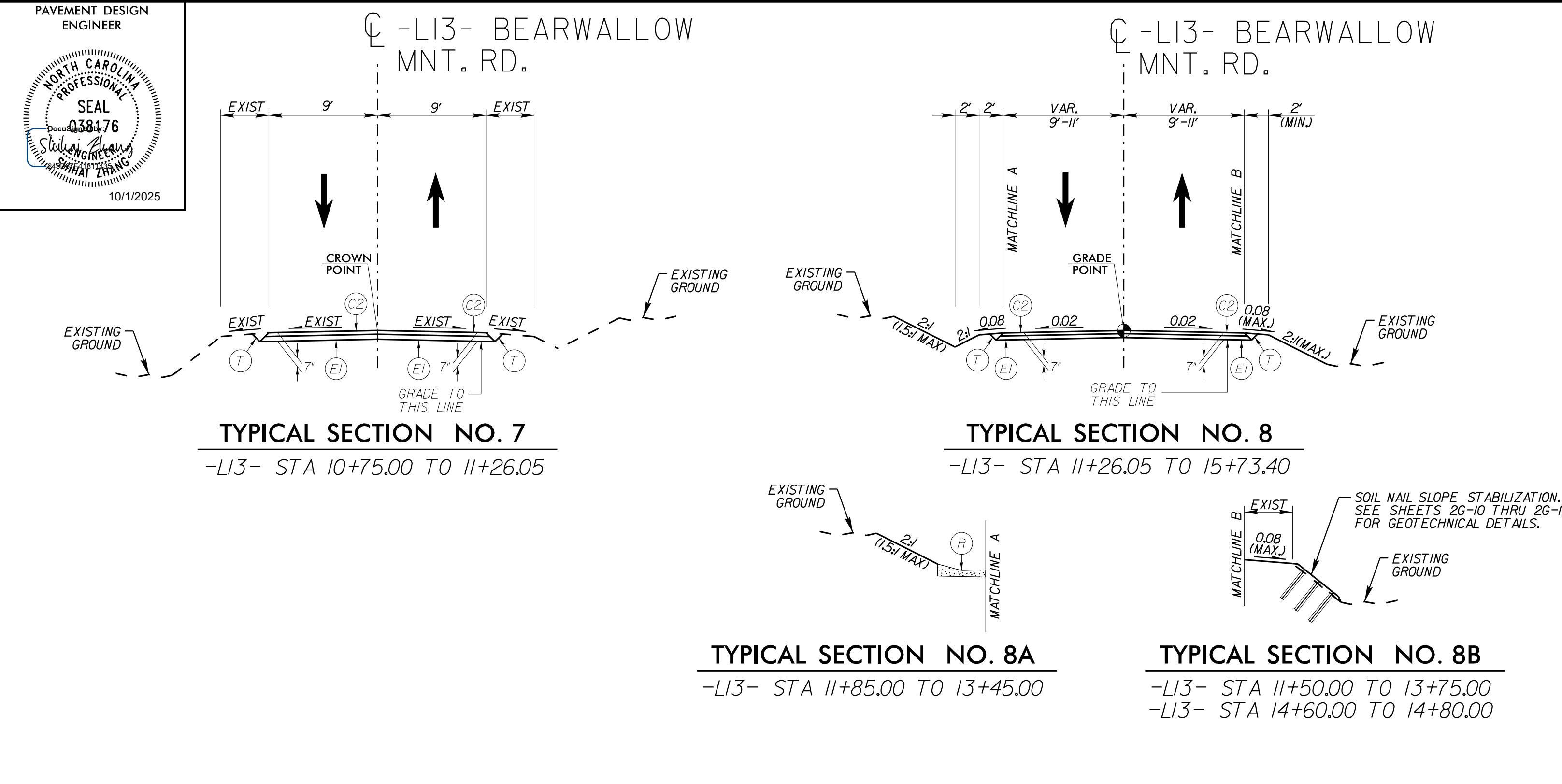
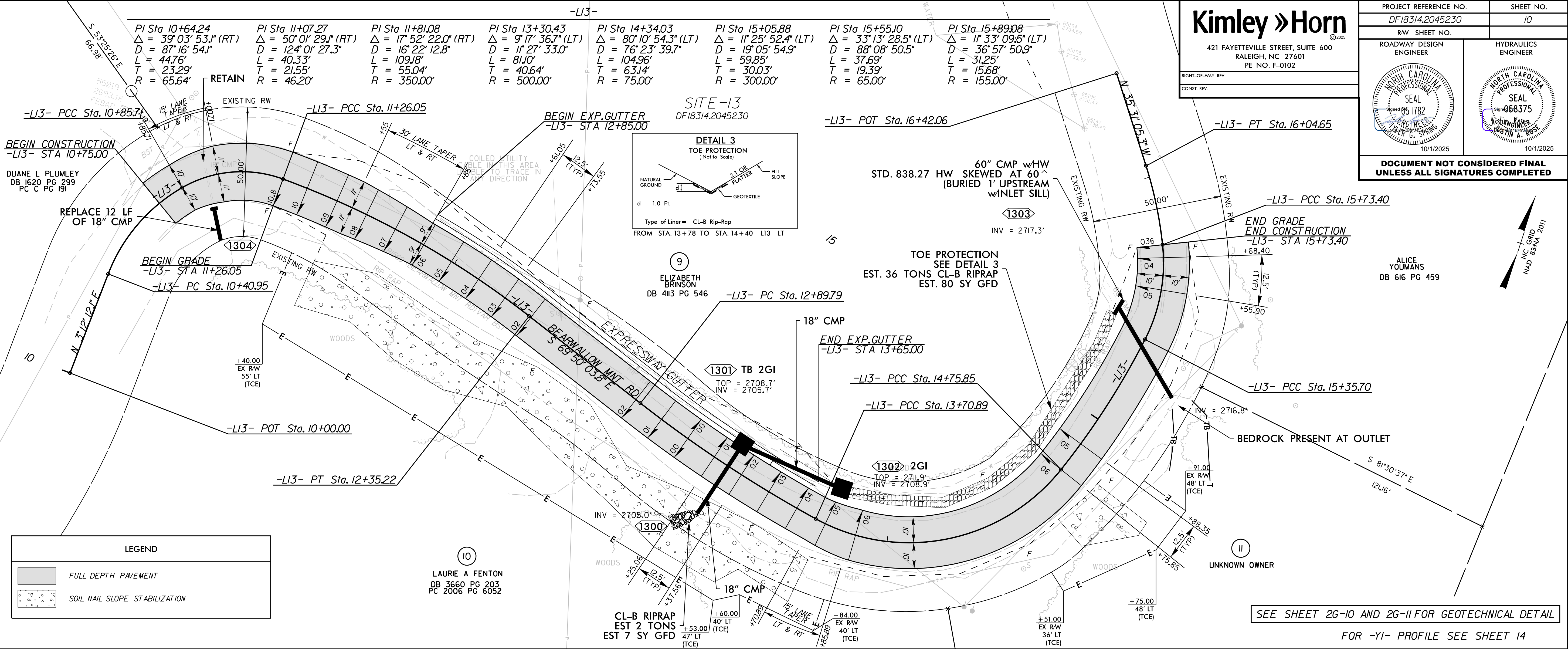
NOTES:
1. ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.
2. TIE PROPOSED PAVEMENT TO EXISTING AT CONSTRUCTION LIMITS AT TAPER RATE SHOWN IN THE PLANS.

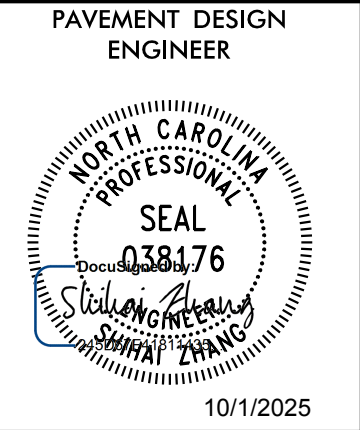
NOTE:
PROVIDE LAP JOINT AT BEGIN / END CONSTRUCTION TO PROVIDE SMOOTH TRANSITION BETWEEN EXIST. AND PROP. PAVEMENT

5/14/99

K:\RAL_Roadway\01036679 - Bearwallow\Roadway\Proj\Bearwallow_rdy_dsh_10_Site_13.dgn

10/1/2025



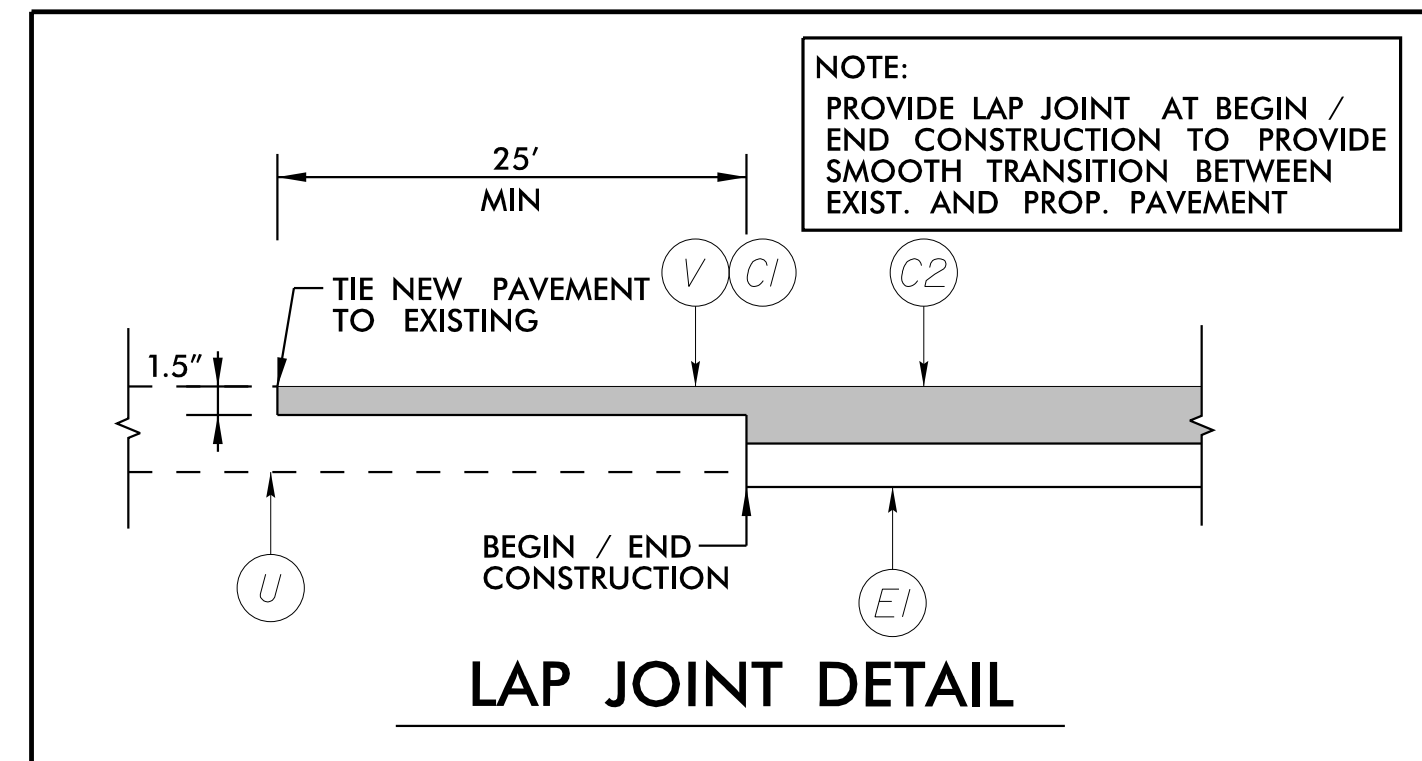


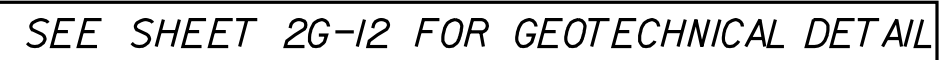
-EL14- STA 11+00.00 TO 12+16.00



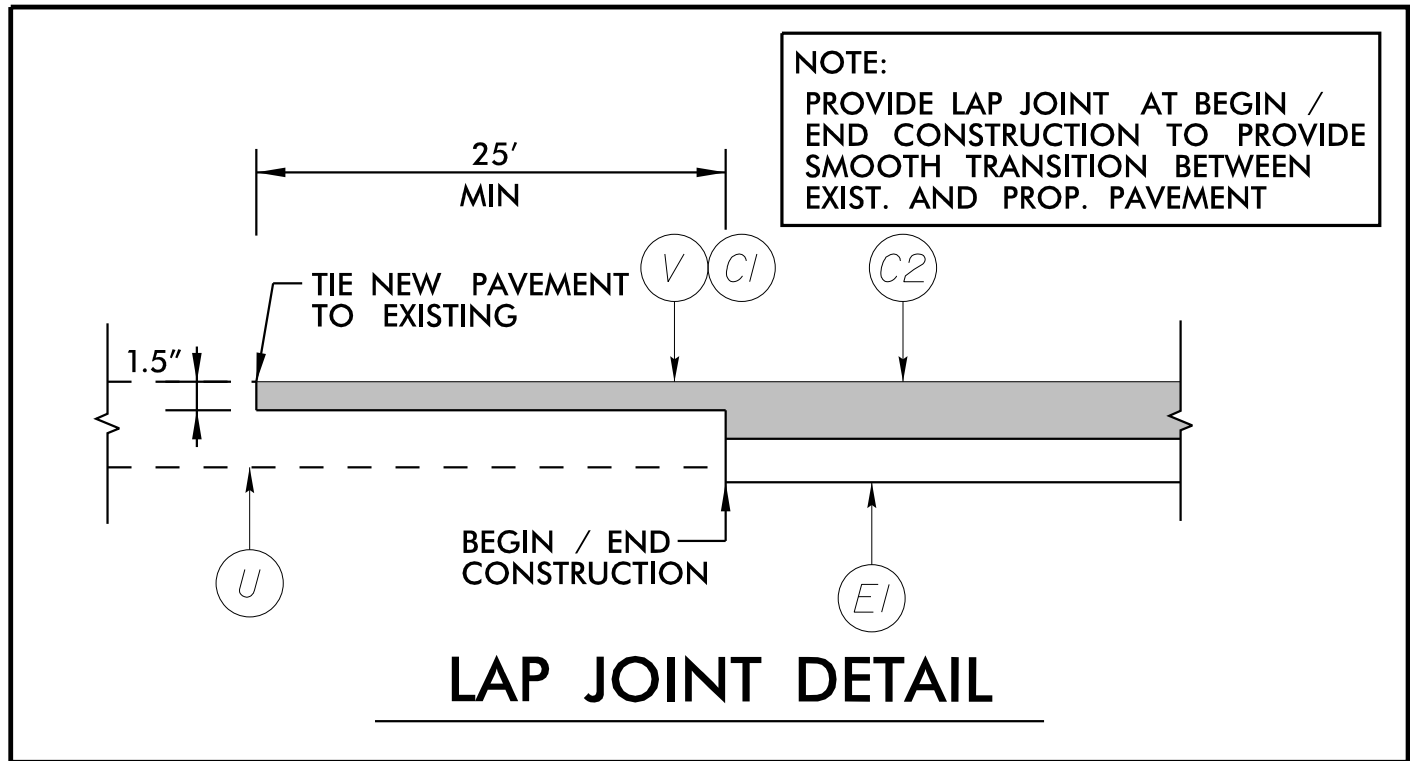
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

NOTES:
1. ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED
2. THE PROPOSED PAVEMENT TO EXISTING AT CONSTRUCTION LIMITS AT TAPER RATE SHOWN IN THE PLANS



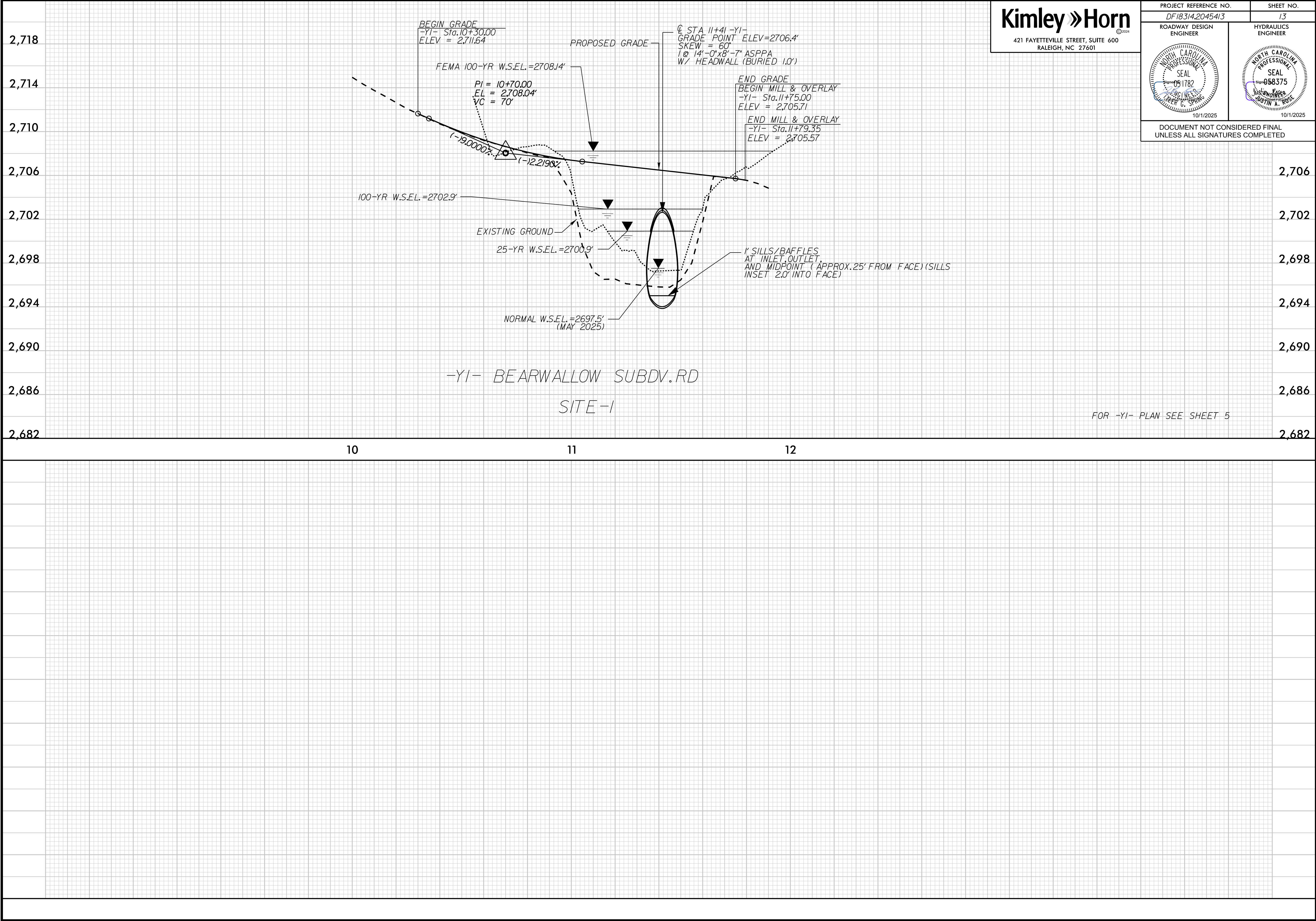


NOTES:
1. ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED
2. TIE PROPOSED PAVEMENT TO EXISTING AT CONSTRUCTION LIMITS AT TAPER RATE SHOWN IN THE PLANS



K:\RAL_Roadway\01036679 - Bearwallow\Roadway\Proj\Bearwallow_rdy.plt.dgn

9/30/2025



Kimley » Horn
421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, NC 27601

PROJECT REFERENCE NO.
DF18314.2045413

SHEET NO.
13

ROADWAY DESIGN
ENGINEER

HYDRAULICS
ENGINEER

SEAL

10/1/2025

051782

10/1/2025

SEAL

10/1/2025

058375

10/1/2025

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

2,706

2,702

2,698

2,694

2,690

2,686

2,682

