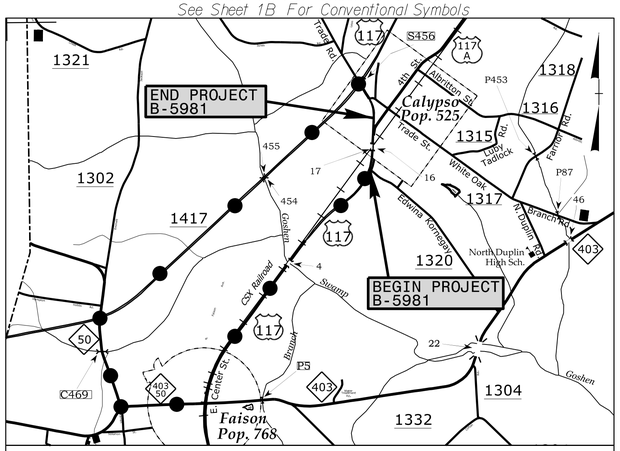


VICINITY MAP NOT TO SCALE

DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

DUPLIN COUNTY

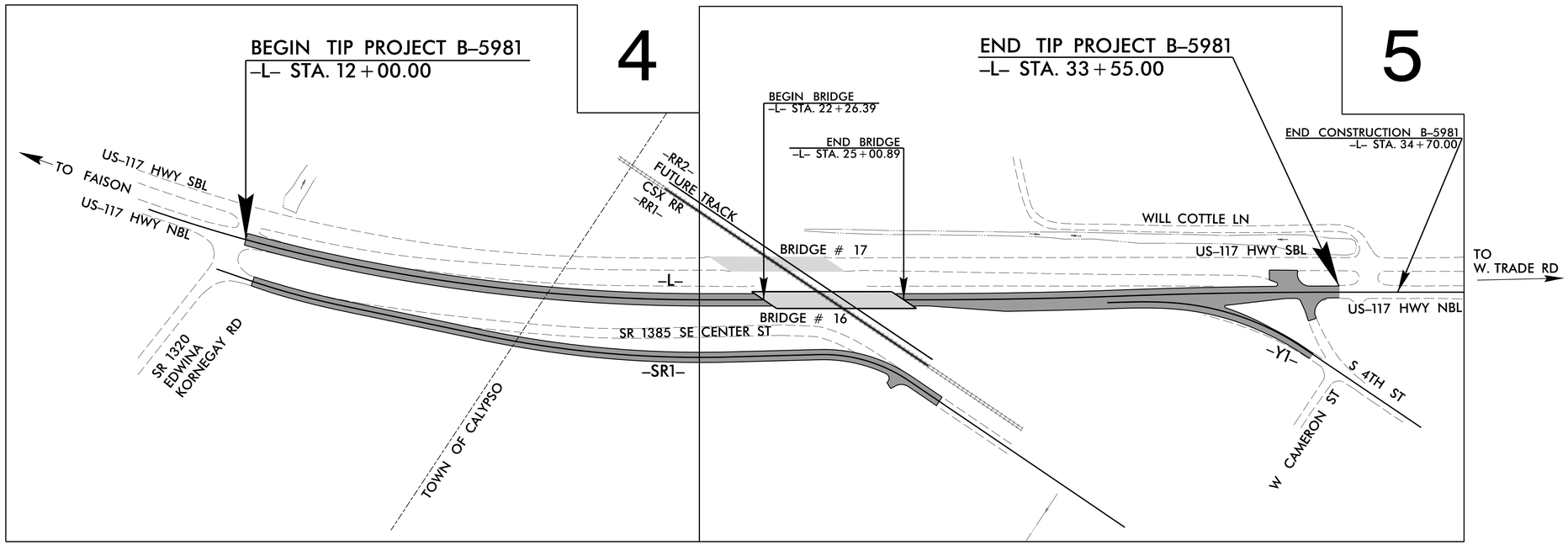
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5981	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
47747.1.1		PE
47747.2.1	BRZ-0117050	R/W
47747.3.1	BRZ-0117050	CONST.

LOCATION: BRIDGE NO. 16 OVER CSX RAILROAD ON US-117 NORTH BOUND LANES AND PRESERVATION OF BRIDGE NO. 17 OVER CSX RAILROAD

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

NAD 83 /NA 2011



THIS IS A CONTROLLED-ACCESS FACILITY WITH ACCESS LIMITED TO INTERCHANGES OR AT GRADE INTERSECTIONS.

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 2023 = 2,063
ADT 2042 = 2,300
K = 9% %
D = 100 %
T = 6 % *
V = 60 MPH
* (TTST=3%+DUAL=3%)
FUNC. CLASS =MAJOR COLLECTOR
REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-5981 = 0.356 MI
LENGTH OF STRUCTURE TIP PROJECT B-5981 = 0.052 MI
LENGTH OF STRUCTURE REHAB TIP PROJECT B-5981 = 0.043 MI

TOTAL LENGTH OF TIP PROJECT B-5981 = 0.451 MI

Prepared in the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh, NC 27610

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MAY 19, 2020

LETTING DATE:
DECEMBER 19, 2023

KRISTY W. ALFORD, PE
PROJECT MANAGER

SHERRI E. CALHOUN, PE
PROJECT TEAM LEAD

HAN C. NGUYEN, PE
ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 042644 ENGINEER Craig J. Lee
DocuSigned by: Craig Lee
P.E. 10/09/2023
SIGNATURE:

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 042662 ENGINEER Han C. Nguyen
DocuSigned by: Han C. Nguyen
P.E. 10/09/2023
SIGNATURE:

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

TIP PROJECT: B-5981

CONTRACT: C204767

09/08/99

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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-5981	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042662 ENGINEER Han C. Nguyen

DocuSigned by: Han C. Nguyen 10/02/2023
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX OF SHEETS

GENERAL NOTES:

2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

SUBSURFACE DRAINS:

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

STREET TURNOUT:

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

GUARDRAIL:

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

TEMPORARY SHORING:

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

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE AT&T CENTURYLINK

CHARTER COMMUNICATIONS DUKE ENERGY

PIEDMONT NATURAL GAS COMPANY DUPLIN COUNTY WATER

TOWN OF CALYPSO

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.

EFF. 01-16-2018

REV.

2018 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, 2018 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.03	Deceleration and Acceleration Lanes
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
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
815.02	Subsurface Drain
816.01	Concrete Pads - for Shoulder Drain Installation
840.00	Concrete Base Pad for Drainage Structures
840.05	Brick Open Throat Catch Basin - 12" thru 48" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.24	Frames and Narrow Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.36	Traffic Bearing Grated Drop Inlet - for Steel (840.37) Double Frame and Grates
840.37	Steel Grate and Frame
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

8/17/99

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9/10/2021

PROJECT REFERENCE NO.	SHEET NO.
B-5981	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.

6/2/99

FINAL PAVEMENT SCHEDULE

C1	PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 3.0″ 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 TO EXCEED 1.5″ IN DEPTH.
D1	PROP. APPROX. 4.0″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 2.5″ IN DEPTH OR GREATER THAN 4.0″ IN DEPTH.
E1	PROP. APPROX. 4.0″ 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 5.5″ IN DEPTH.
K	12″ CLASS IV SUBGRADE STABILIZATION
N	GEOTEXTILE FOR SUBGRADE STABILIZATION
R	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V1	INCIDENTAL MILLING
V2	MILLING ASPHALT PAVEMENT, 1.5″ DEPTH
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL)

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

PROJECT REFERENCE NO.	SHEET NO.
B-5981	2A-1

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042662 ENGINEER Hon C Nguyen

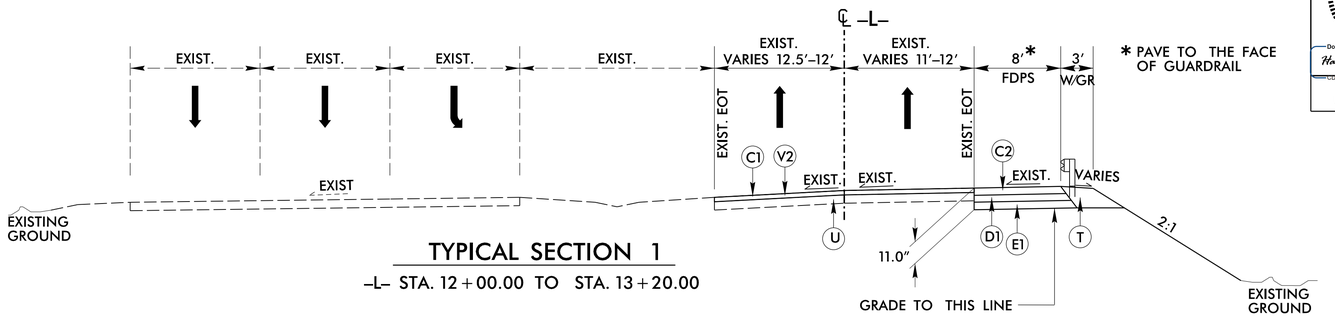
DocuSigned by: Hon C. Nguyen 08/11/2023

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022896 ENGINEER CLARK S MORRISON

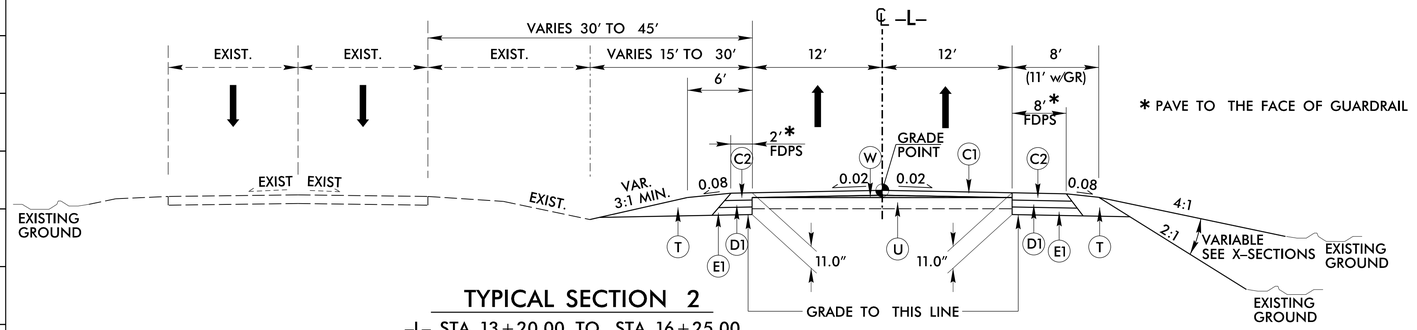
DocuSigned by: Clark S. Morrison 08/08/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



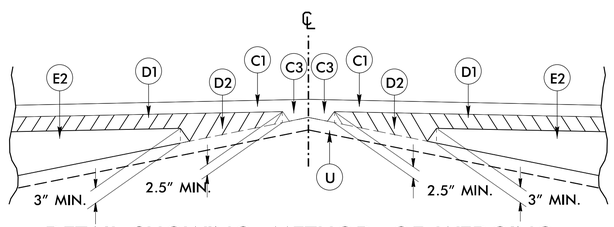
TYPICAL SECTION 1

–L– STA. 12+00.00 TO STA. 13+20.00

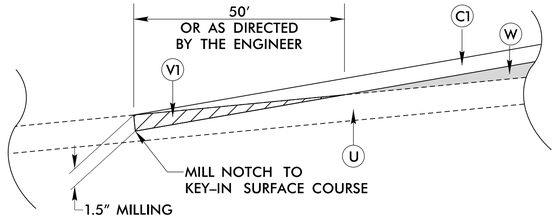


TYPICAL SECTION 2

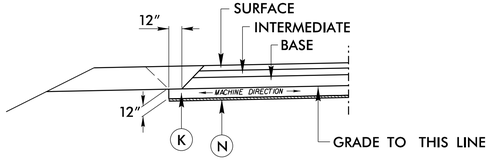
–L– STA. 13+20.00 TO STA. 16+25.00
–L– STA. 32+75.00 TO STA. 33+55.00



DETAIL SHOWING METHOD OF WEDGING



INCIDENTAL MILLING DETAIL



CLASS IV SUBGRADE STABILIZATION WITH GEOTEXTILE FOR SUBGRADE STABILIZATION

–L– STA. 31+25.00 TO 32+75.00
–Y1– STA. 11+25.00 TO 14+25.00
–SR1– STA. 12+20.00 TO 15+27.00

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6/2/99

PROJECT REFERENCE NO.	SHEET NO.
B-5981	2A-2

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042662 ENGINEER Han C Nguyen

DocuSigned by: Han C. Nguyen 9/20/2023

PAVEMENT DESIGN ENGINEER

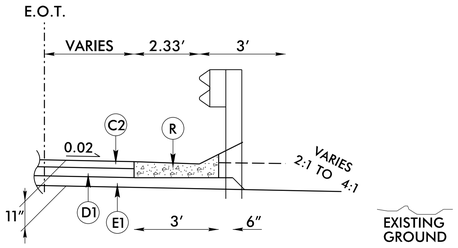
NORTH CAROLINA PROFESSIONAL SEAL 022896 ENGINEER CLARK S MORRISON

DocuSigned by: Clark S. Morrison 9/19/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

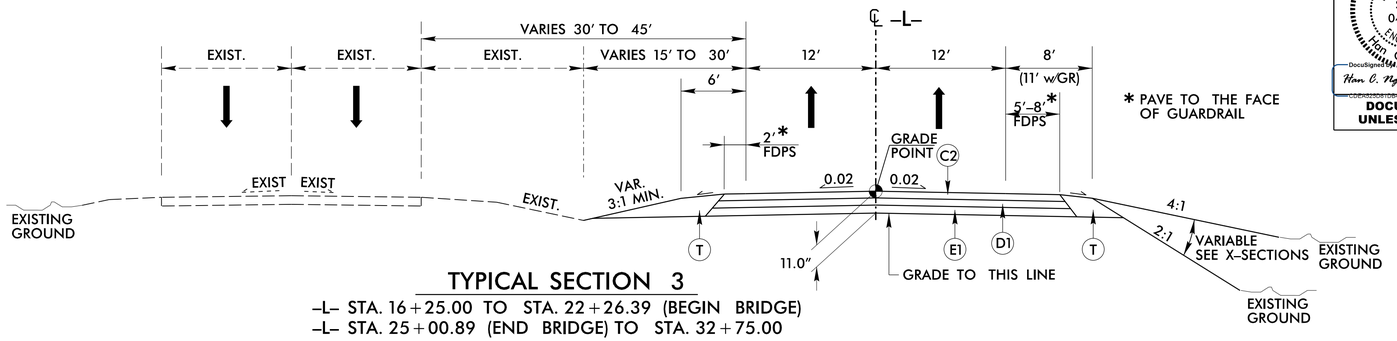
FINAL PAVEMENT DESIGN	
C1	1.5" S9.5B
C2	3.0" S9.5B
C3	VARIABLE DEPTH S9.5B
D1	4.0" I19.0C
D2	VARIABLE DEPTH I19.0C
E1	4.0" B25.0C
E2	VARIABLE DEPTH B25.0C
K	12" CLASS IV SUBGRADE STAB.
N	GEOTEXTILE FOR SUBGRADE STABILIZATION
R	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V1	INCIDENTAL MILLING
V2	MILLING, 1.5" DEPTH
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL)

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



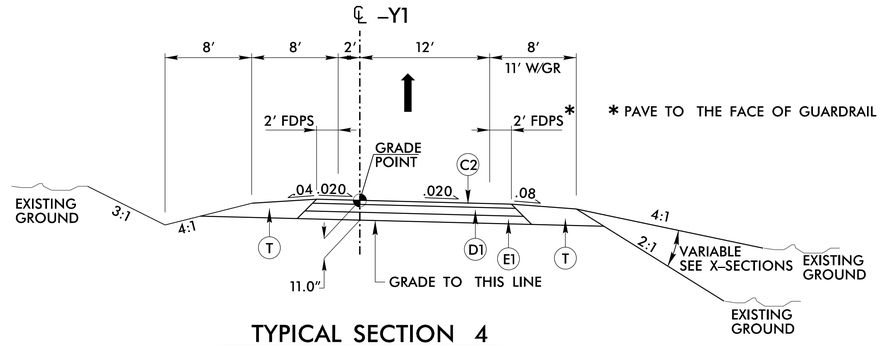
DETAIL OF SHOULDER BERM GUTTER

–L– STA. 20+34.00 TO STA. 21+92.90 (LT)
–L– STA. 24+90.30 TO STA. 26+26.00 (LT)
–L– STA. 25+35.90 TO STA. 29+79.20 (RT)
–L– STA. 29+29.00 TO STA. 29+43.00 (LT)



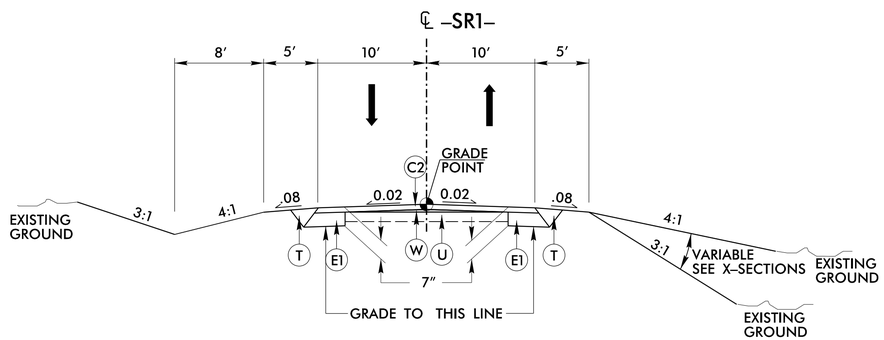
TYPICAL SECTION 3

–L– STA. 16+25.00 TO STA. 22+26.39 (BEGIN BRIDGE)
–L– STA. 25+00.89 (END BRIDGE) TO STA. 32+75.00



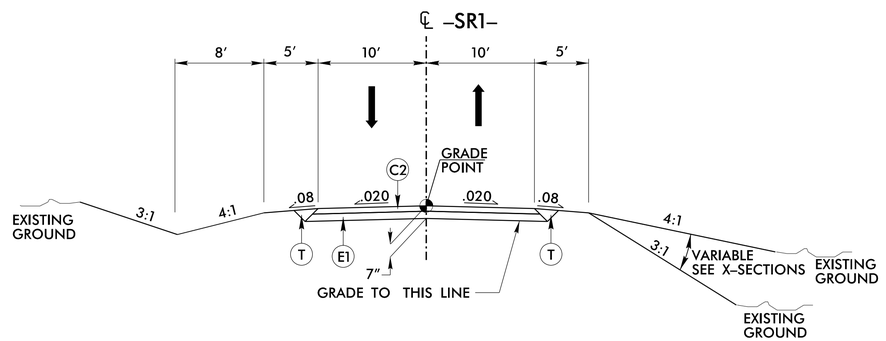
TYPICAL SECTION 4

–Y1– STA. 10+00.00 TO STA. 14+25.00



TYPICAL SECTION 5

–SR1– STA. 10+75.00 TO STA. 13+50.00
–SR1– STA. 23+50.00 TO STA. 24+60.00



TYPICAL SECTION 6

–SR1– STA. 13+50.00 TO STA. 23+50.00

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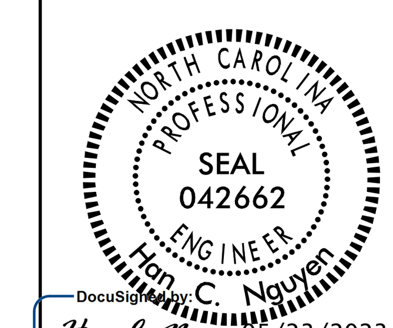
PROJECT REFERENCE NO.	SHEET NO.
B-5981	2B-1

ROADWAY DESIGN ENGINEER



DocuSigned by:
Han C. Nguyen 05/23/2023
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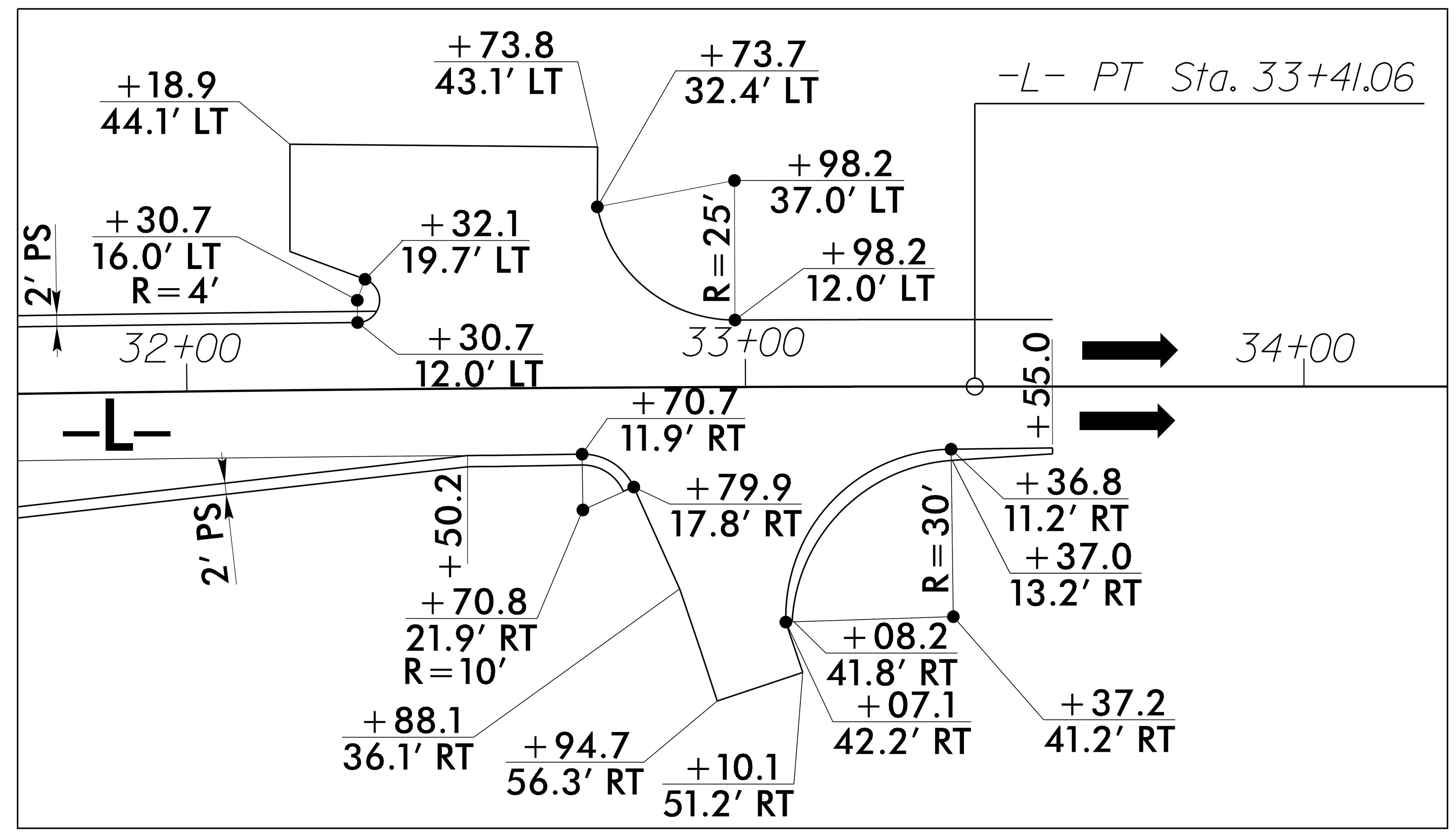
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

INTERSECTION DETAIL

NAD 83 / NA 2011



*STATIONS AND OFFSETS ARE BASED ON -L-

14-MAR-2023 14:14
R:\Roadway\Proj\B5981_Rdy_2B-1.dgn
$$$$USERNAME$$$$

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
B-5981	2C-1

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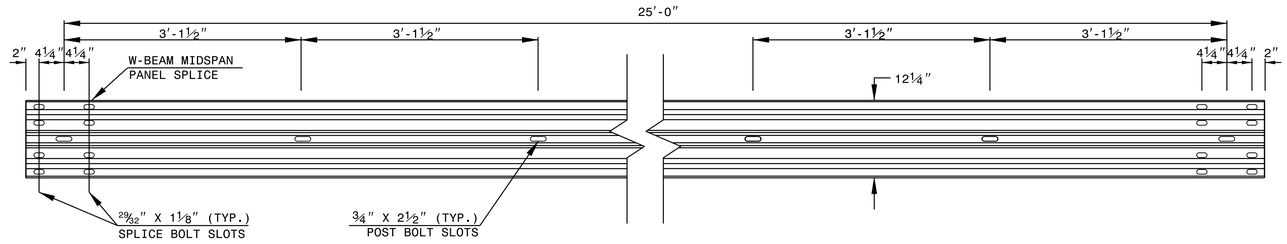
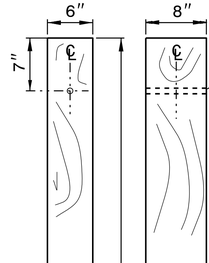
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

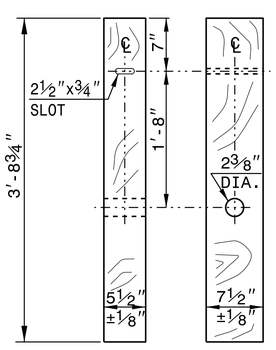


STANDARD W-BEAM GUARDRAIL

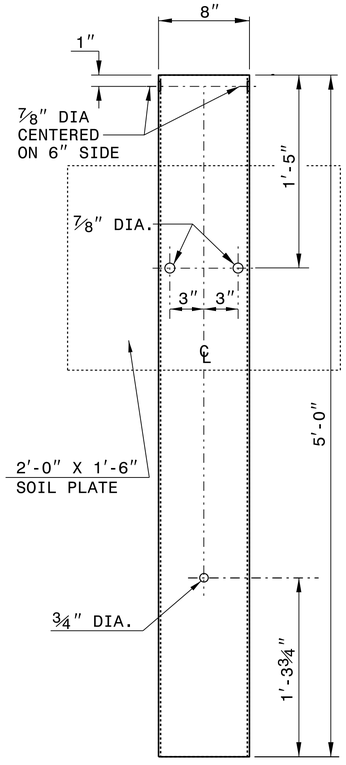


WOOD OFFSET BLOCK
(FOR WOOD POSTS)

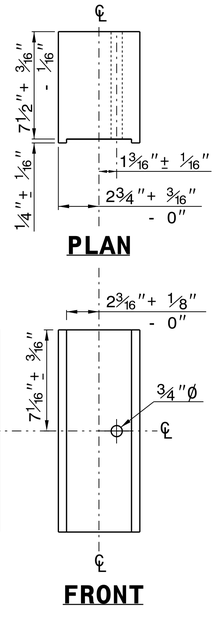
STANDARD LINE POST



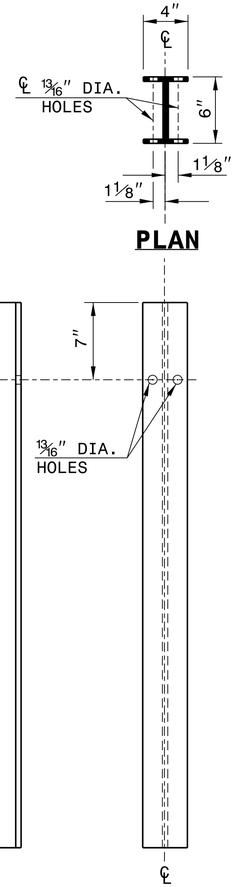
SHORT WOOD BREAKAWAY POST



STEEL TUBE
TS 6"x8"x0.1875"



ROUTED OFFSET BLOCK



"W6" STEEL POST

SYSTEM PARTS

STATE OF
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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 33144 NICOLE M. HOWERTON

DocuSigned by: Nicole Howerton 3/7/2023
5884323D34164C5...

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

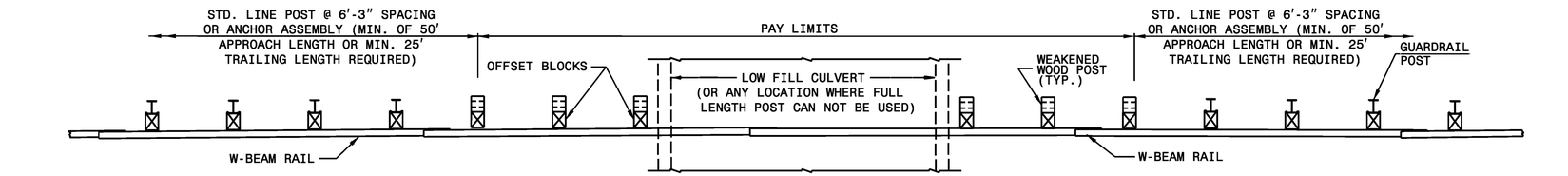
SEE TITLE BLOCK

ORIGINAL BY: J.HOWERTON DATE: 3-7-2018
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

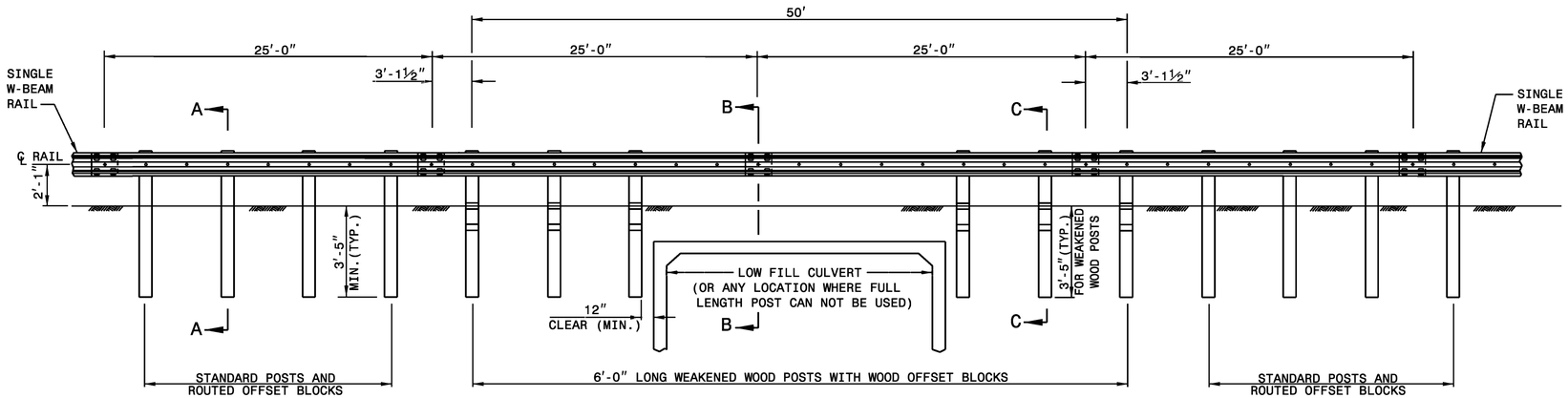
PROJECT REFERENCE NO.	SHEET NO.
B-5981	2C-2

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

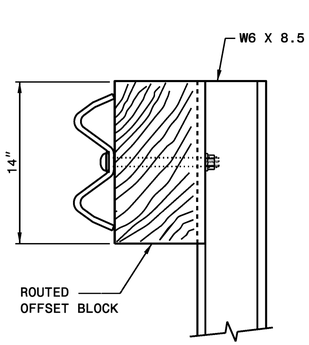
SPECIAL DETAIL FOR
GUARDRAIL PLACEMENT
25'-0" CLEAR SPAN



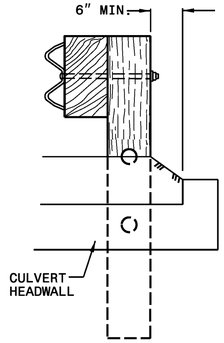
PLAN



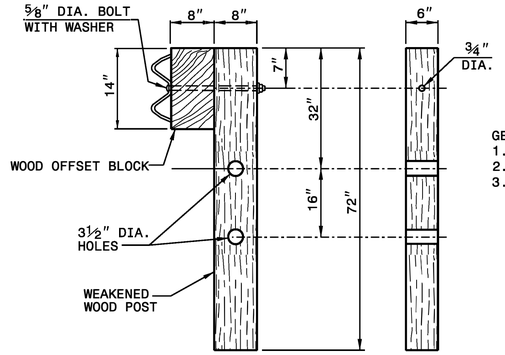
ELEVATION
25'-0" GUARDRAIL SPAN



SECTION A-A



SECTION B-B



SECTION C-C FRONT
WEAKENED WOOD POST

GENERAL NOTES:
1. LAP RAIL IN THE DIRECTION OF TRAFFIC FLOW.
2. SEE ROADWAY PLANS FOR LOCATIONS AND CONTINUATION OF RAIL OR END SECTIONS.
3. MINIMUM DISTANCE OF 5 FEET BEHIND THE GUARDRAIL SHOULD BE CLEAR OF ANY FIXED-OBJECT HAZARDS THAT COULD SNAG AN IMPACTING VEHICLE.

SHEET - OF -
862D01

STATE OF
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

SPECIAL DETAIL FOR
GUARDRAIL PLACEMENT
25'-0" CLEAR SPAN

SHEET - OF -
862D01

NORTH CAROLINA PROFESSIONAL SEAL 33144 ENGINEER NICOLE M HACKNEY
Nicole Hackney 3/2023
5884323D34164C5...

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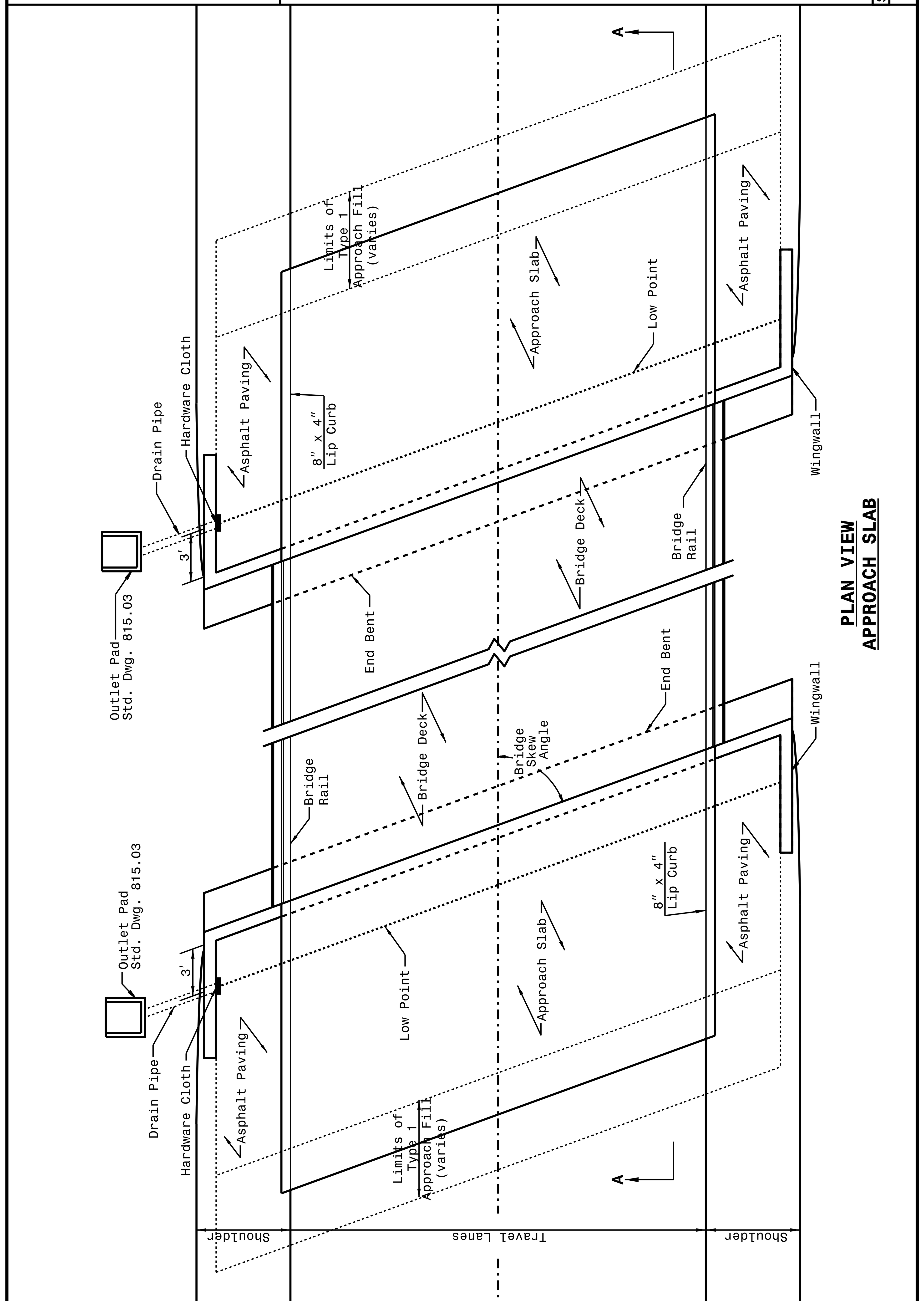
Office 919-707-6950 FAX 919-250-4119

25'-0" CLEAR SPAN GUARDRAIL PLACEMENT

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

PROJECT REFERENCE NO.	SHEET NO.
B-5981	2C-3

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. — ROADWAY DETAIL DRAWING FOR BRIDGE APPROACH FILLS TYPE 1 APPROACH FILL APPROACH FILL FOR BRIDGE ABUTMENT — SHEET 1 OF 2

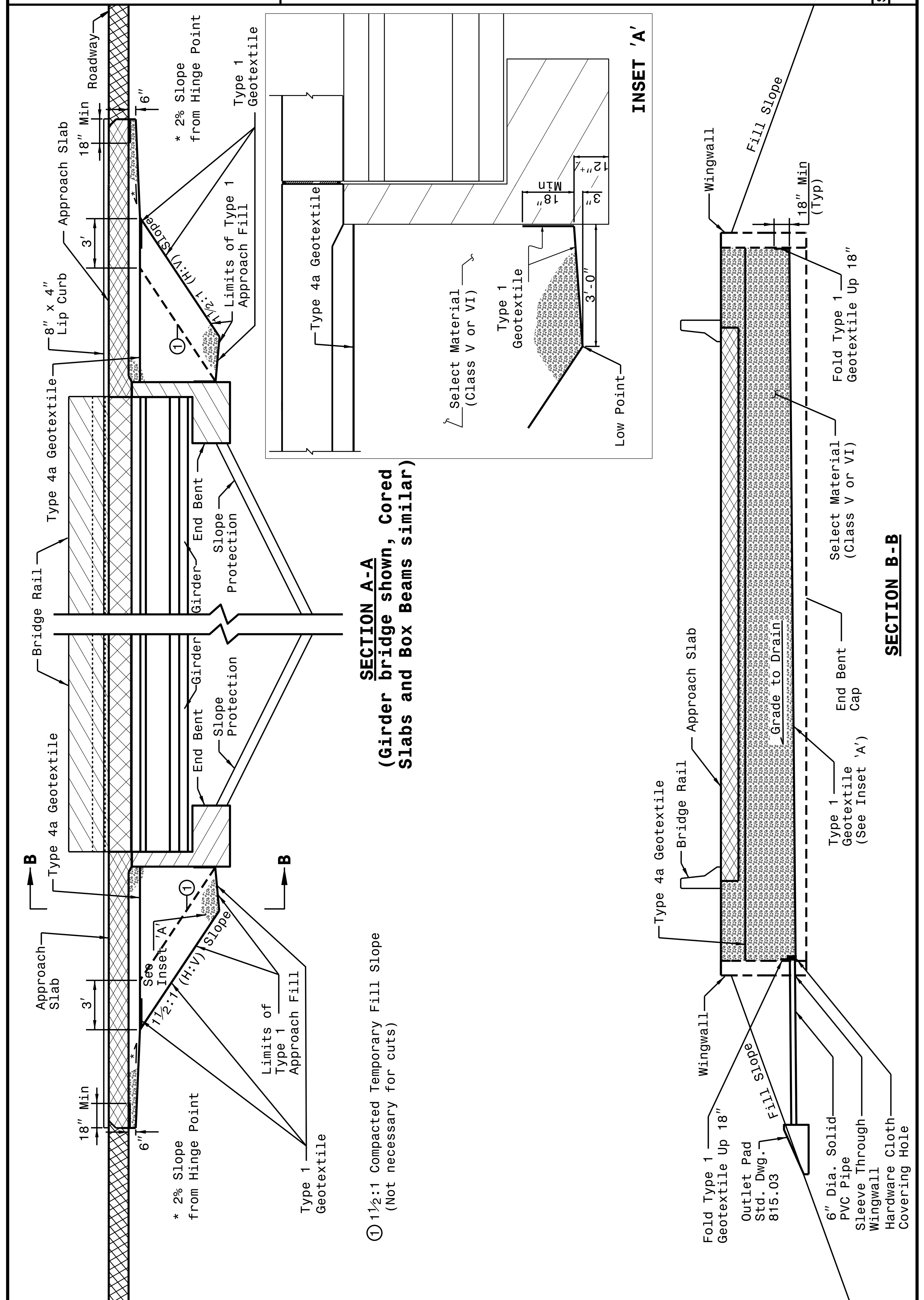


STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
BRIDGE APPROACH FILLS
TYPE 1 APPROACH FILL
APPROACH FILL FOR
BRIDGE ABUTMENT

SHEET 1 OF 2

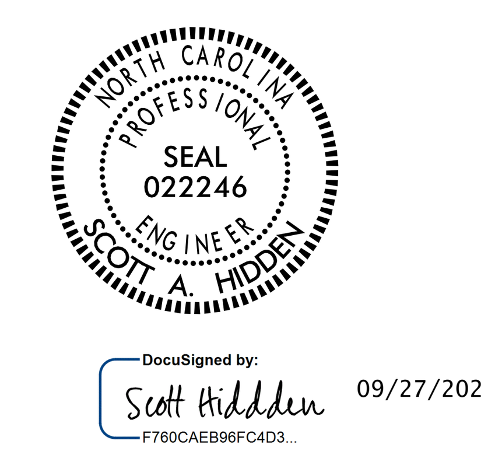
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. — ROADWAY DETAIL DRAWING FOR BRIDGE APPROACH FILLS TYPE 1 APPROACH FILL APPROACH FILL FOR BRIDGE ABUTMENT — SHEET 2 OF 2



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

ROADWAY DETAIL DRAWING FOR
BRIDGE APPROACH FILLS
TYPE 1 APPROACH FILL
APPROACH FILL FOR
BRIDGE ABUTMENT

SHEET 2 OF 2



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SEE TITLE BLOCK

ORIGINAL BY: K KEMPF DATE: 07-30-23
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

PROJECT REFERENCE NO.	SHEET NO.
B-5981	2G-1

GEOTECHNICAL ENGINEER

SEAL 022246 — NORTH CAROLINA PROFESSIONAL ENGINEER — SCOTT A. HIDDEN

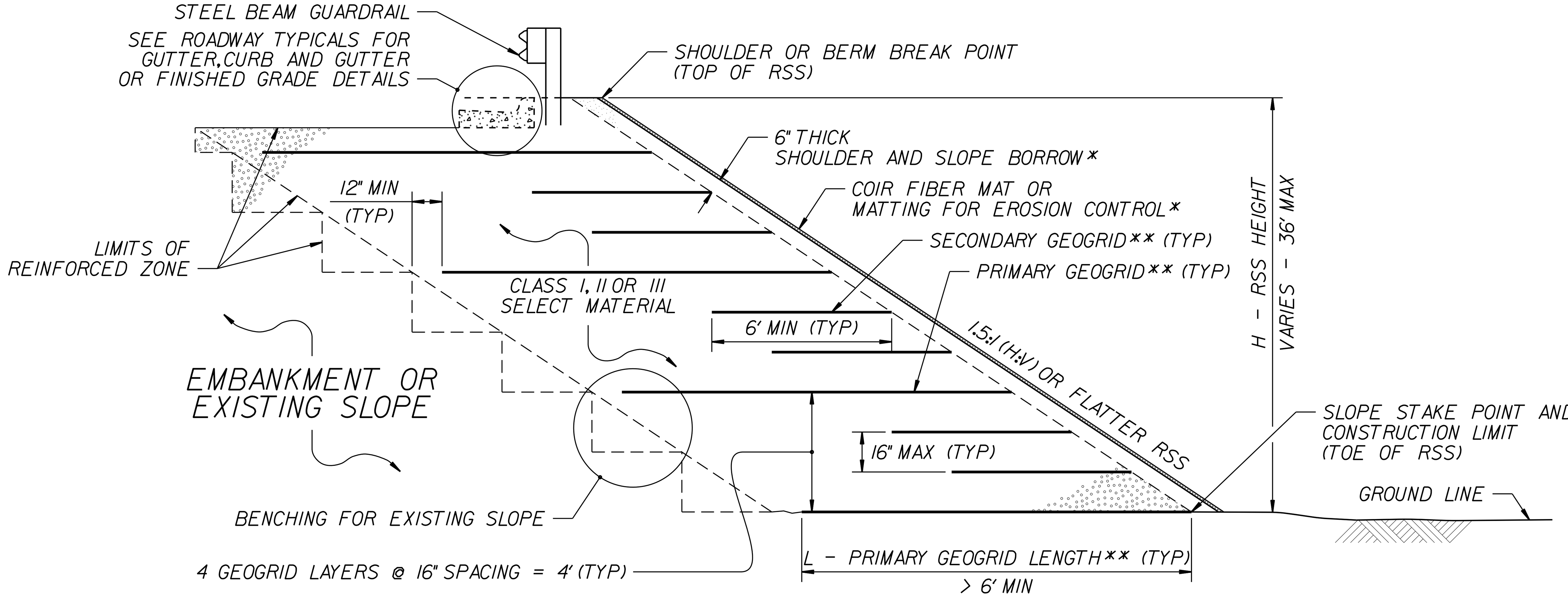
DocuSigned by: Scott A. Hidden 09/29/2022

SIGNATURE DATE

ENGINEER

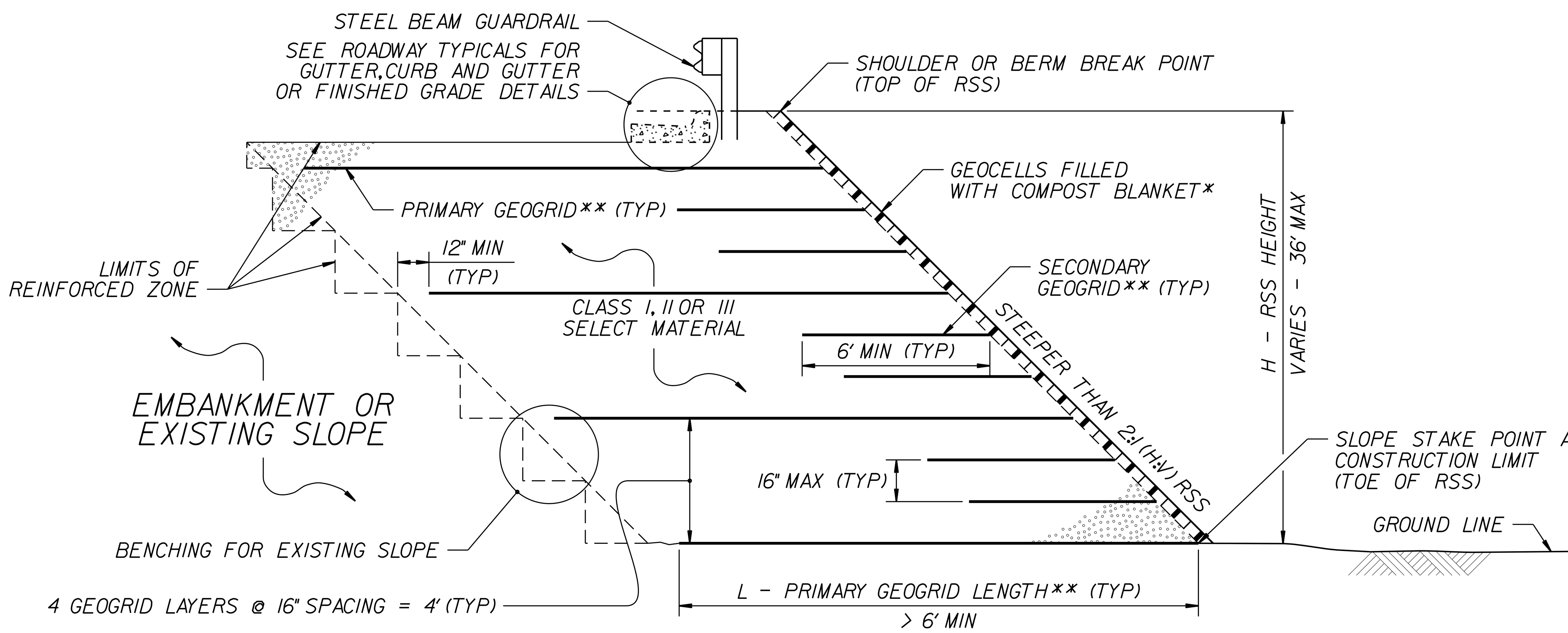
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



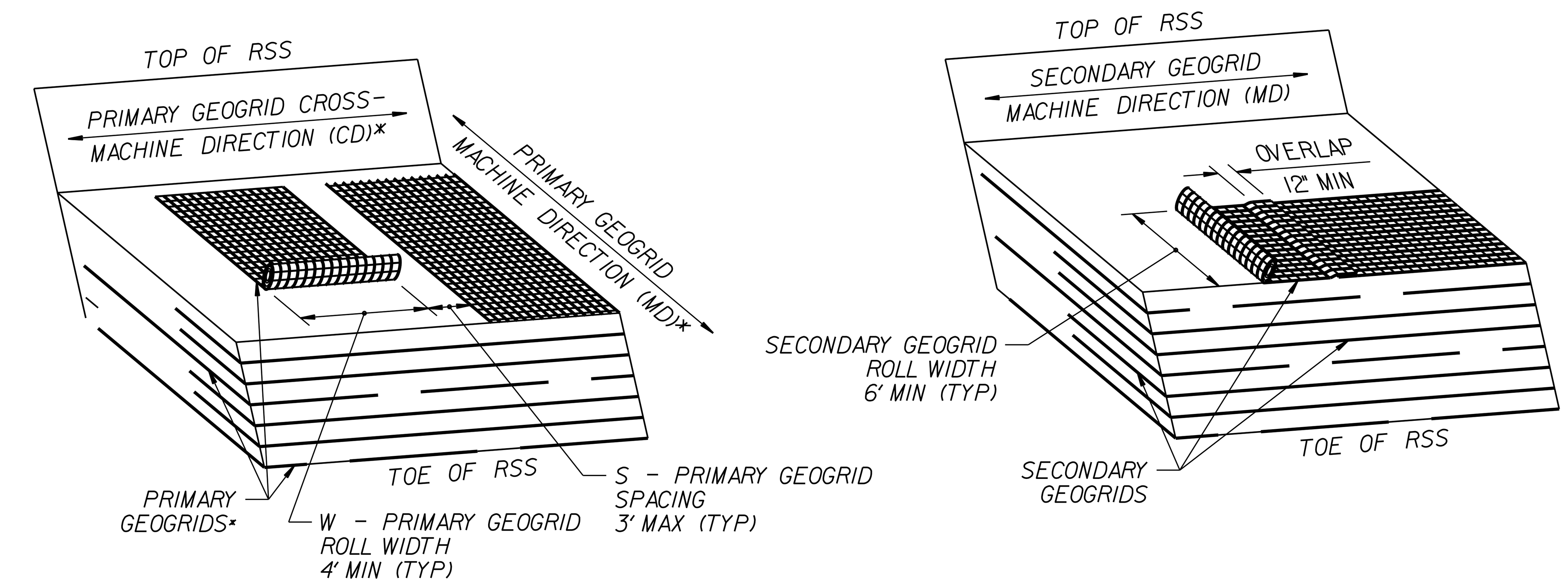
MATTING WITH SHOULDER AND SLOPE BORROW

*SEE NOTES 3 AND 10 ON SHEET 2.



GEOCELLS WITH COMPOST BLANKET

*SEE NOTES 3 AND 10 ON SHEET 2.



GEOGRID PLACEMENT DETAILS

(% COVERAGE = $\frac{W}{W+S}$ x 100 $\geq$ 75%)

*SEE NOTE 8 ON SHEET 2. DO NOT OVERLAP PRIMARY GEOGRIDS IN ANY DIRECTION.

STANDARD REINFORCED SOIL SLOPE (RSS)

**SEE TABLES ON SHEET 2 AND GEOGRID PLACEMENT DETAILS. IF RSS ANGLE IS 2:1 (H:V) OR FLATTER, REPLACE PRIMARY GEOGRID WITH SECONDARY GEOGRID PLACED AS SHOWN IN THE GEOGRID PLACEMENT DETAILS.

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1802.02

STANDARD
REINFORCED SOIL SLOPE (RSS)
WITH LOW GROUNDWATER
SHEET 1 OF 2

DATE: 12-17-19

PROJECT REFERENCE NO.	SHEET NO.
B-5981	2G-2

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden 09/29/2022
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SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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H (FT)	0 - < 12		12 - 24		> 24 - 36	
SELECT MATERIAL CLASS	I	II OR III	I	II OR III	I	II OR III
1:1 TO < 1.5:1 (H:V) RSS	900	500	1200	900	1800	1200
1.5:1 TO 1.75:1 (H:V) RSS	500	500	900	500	1400	1000
> 1.75:1 TO < 2:1 (H:V) RSS	500	500	600	500	1000	800

MINIMUM REQUIRED PRIMARY GEOGRID LONG-TERM DESIGN STRENGTH (LTDS, LB/FT) IN MACHINE DIRECTION (MD)

(LTDS IS BASED ON 100% COVERAGE FOR PRIMARY GEOGRID. SEE NOTE 8 FOR LESS THAN 100% COVERAGE.)

NOTES:

1. SEE EROSION CONTROL AND ROADWAY PLANS AND SUMMARY SHEETS FOR REINFORCED SOIL SLOPE (RSS) AND SLOPE EROSION CONTROL LOCATIONS.

2. FOR STANDARD REINFORCED SOIL SLOPES, SEE REINFORCED SOIL SLOPES PROVISION. FOR STEEL BEAM GUARDRAIL, SEE SECTION 862 OF THE STANDARD SPECIFICATIONS.

3. FOR SHOULDER AND SLOPE BORROW, SEE ARTICLE 1019-2 OF THE STANDARD SPECIFICATIONS. FOR GEOCELLS, SEE CELLULAR CONFINEMENT SYSTEMS PROVISION. FOR COIR FIBER MAT, MATTING FOR EROSION CONTROL AND COMPOST BLANKET, SEE EROSION CONTROL PROVISIONS, SECTION 1631 OF THE STANDARD SPECIFICATIONS AND ROADWAY STANDARD DRAWING NO. 1631.01.

4. STANDARD RSS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
   UNIT WEIGHT, γ = 120 PCF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 PSF

5. DO NOT USE STANDARD RSS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE OR DEPTH TO GROUNDWATER IS LESS THAN 7 FT.

6. DO NOT USE STANDARD RSS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW RSS.

7. PRIMARY GEOGRIDS ARE APPROVED FOR LTDS FOR A 75-YEAR DESIGN LIFE IN THE MD 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 SELECT MATERIAL AS FOLLOWS:

MATERIAL TYPE	SELECT MATERIAL
BORROW	CLASS I SELECT MATERIAL
FINE AGGREGATE	CLASS II OR III SELECT MATERIAL

8. FOR PRIMARY GEOGRIDS WITH 100% COVERAGE, PLACE PRIMARY GEOGRIDS SO GEOGRIDS ARE ADJACENT TO EACH OTHER IN THE CD. FOR PRIMARY GEOGRIDS WITH 75% TO LESS THAN 100% COVERAGE,

   MINIMUM REQUIRED PRIMARY GEOGRID LTDS = LTDS BASED ON 100% COVERAGE x (W + S) / W

   SEE TABLE FOR LTDS BASED ON 100% COVERAGE AND GEOGRID PLACEMENT DETAILS FOR PRIMARY GEOGRID ROLL WIDTH (W) AND SPACING (S). FOR PRIMARY GEOGRIDS WITH LESS THAN 100% COVERAGE, STAGGER PRIMARY GEOGRIDS SO GEOGRIDS ARE CENTERED OVER GAPS IN THE PRIMARY GEOGRID LAYER BELOW. DO NOT USE LESS THAN 75% COVERAGE FOR PRIMARY GEOGRIDS.

9. DO NOT PLACE ANY GEOGRIDS UNTIL EXCAVATION DIMENSIONS AND IN-SITU MATERIAL ARE APPROVED.

10. FOR SLOPE EROSION CONTROL, USE GEOCELLS OR MATTING ON SLOPE FACES OF RSS AS FOLLOWS:

RSS ANGLE	SLOPE EROSION CONTROL
1:1 TO < 1.5:1 (H:V)	GEOCELLS WITH COMPOST BLANKET
1.5:1 TO < 2:1 (H:V)	GEOCELLS WITH COMPOST BLANKET OR COIR FIBER MAT WITH SHOULDER AND SLOPE BORROW*
2:1 (H:V) OR FLATTER	MATTING FOR EROSION CONTROL WITH SHOULDER AND SLOPE BORROW

*SEE REINFORCED SOIL SLOPES AND SLOPE EROSION CONTROL SUMMARY TABLE IN THE ROADWAY SUMMARY SHEETS FOR SLOPE EROSION CONTROL ON SLOPE FACES OF RSS 1.5:1 (H:V) TO STEEPER THAN 2:1.

H (FT)	0 - < 12		12 - 24		> 24 - 36	
SELECT MATERIAL CLASS	I	II OR III	I	II OR III	I	II OR III
1:1 TO < 1.5:1 (H:V) RSS	1.10	1.00	0.90	0.85	0.85	0.80
1.5:1 TO 1.75:1 (H:V) RSS	0.90	0.80	0.75	0.70	0.75	0.70
> 1.75:1 TO < 2:1 (H:V) RSS	0.75	0.70	0.65	0.60	0.65	0.60

PRIMARY GEOGRID LENGTH / RSS HEIGHT (L/H) RATIO (L > 6' MIN)

(IF L ≤ 6', USE SECONDARY GEOGRID INSTEAD OF PRIMARY GEOGRID.)

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1802.02

STANDARD
REINFORCED SOIL SLOPE (RSS)
WITH LOW GROUNDWATER
SHEET 2 OF 2

DATE: 12-17-19

COMPUTED BY: R.DEMUYNCK DATE: 2/7/2023
CHECKED BY: K. ALDRIDGE DATE: 2/7/2023

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-5981	3B-1

SUMMARY OF EARTHWORK (CY)

STATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
-L- 12+00.00 TO 22+26.39 (BEGIN BRIDGE)	165	925	30,414	30,249	925
-L- 25+00.89 (END BRIDGE) TO 33+55.00	77		10,780	10,741	38
-Y1- 10+00.00 TO 14+25.00	78		778	700	
-SR1- 10+75.00 TO 20+66.54	908	2,067	1,721	813	2,067
-SR1- 20+66.54 TO 24+60	47		670	623	
TOTAL	1,275	2,992	44,363	43,126	3,030
LOSS DUE TO CLEARING AND GRUBBING	-500			500	
ADDITIONAL UNDERCUT		700	875	875	700
PROJECT TOTAL	775	3,692	45,238	44,501	3,730
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				2,225	
GRAND TOTAL	775	3,692	45,238	46,726	3,730
SAY	800	3,700		46,800	

EST. DDE = 550 CY
EST. TOTAL SHALLOW UNDERCUT = 540 CY
EST. CLASS IV SUBGRADE STABILIZATION = 2,365 TONS
EST. SELECT GRANULAR MATERIAL = 3,550
EST. UNDERCUT (CONTINGENCY) = 700 CY

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

Approximate quantities only. Unclassified Excavation, Fine Grading, Clearing and Grubbing, Removal of Existing Asphalt Pavement, and Breaking of Existing Asphalt Pavement will be paid for at the contract lump sum price for "Grading."

SUMMARY OF ASPHALT PAVEMENT REMOVAL (SY)

LINE	STATION - STATION	LOCATION	REMOVAL
-L-	16+25.00 TO 17+50.00	CL	335.67
-L-	21+00.00 TO 22+42.00	CL	320.89
-L-	24+23.00 TO 26+00.00	CL	465.00
-L-	29+00.00 TO 32+75.00	CL	1,765.33
-Y1-	12+30.00 TO 14+25.00	CL	349.33
-SR1-	13+50.00 TO 23+50.00	LT	2,188.11
-SR1-	19+12.00 TO 19+93.00	RT	136.22
GRAND TOTAL			5,560.55
SAY			5,570

SUMMARY OF SHOULDER BERM GUTTER (LF)

LINE	STATION	STATION	LENGTH
-L-	20+34.00	21+92.90	158.90
-L-	24+90.30	26+26.00	135.70
-L-	29+29.00	29+43.00	14.00
-L-	25+35.90	29+79.20	443.30
GRAND TOTAL			751.90
SAY			760

SUMMARY OF ASPHALT PAVEMENT BREAKING (SY)

LINE	STATION - STATION	LOCATION	REMOVAL
-L-	17+50.00 TO 21+00.00	CL	923.22
-L-	26+00.00 TO 29+00.00	CL	1,158.56
GRAND TOTAL			2,081.78
SAY			2,090

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS B-77	ANCHORS GREU TL-3	ANCHORS CAT-1	IMPACT ATTENUATOR TYPE 350 EA	G	NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
-L-	12+16.26	22+51.63	RT	1,035.375			13+20.00		8'	11'	50.00'		1.00		1	1						1,037.00		FILL/BRIDGE WARRANT
-L-	25+26.13	28+99.00	RT	372.875'				25+26.13	8'	11'					1							453.00'		FILL/BRIDGE WARRANT
-L-	19+42.25	22+02.63	LT	260.375'				22+02.63	4' - 7.75'	7' - 10.75'		50.00'		1.00	1	1						104.00'		BRIDGE WARRANT
-L-	24+77.13	26+75.00	LT	197.875'			24+77.13		4' - 6.51'	7' - 9.51'	50.00'		1.00		1	1						71.00'		BRIDGE WARRANT
-L-	17+06.00	21+62.00																				452.00'		EXIST. GUARDRAIL TO BE REMOVED
-L-	29+08.40	29+64.50	LT	56.250'																		56.25'		EXIST. GUARDRAIL TO BE REMOVED
-Y1-	10+00.00	11+68.75	RT	168.750'			10+00.00		8'	11'							1					151.00'		FILL WARRANT
			SUBTOTALS	2,091.50'											4	3	1					2,324.25'		SUBTOTALS
			GREU TL-3, 3@50.00'	-150.00'																				
			B-77, 4@22.875'	-91.50'																				
			CAT-1, 1@6.25'	-6.25'																				
			PROJECT TOTALS	1,843.75'											4	3	1					2,325.00'		PROJECT TOTALS
			SAY	1,875.00'																				
ADDITIONAL GUARDRAIL POSTS = 5 EA																								

6/21/00
31-MAR-2023 16:13
R:\Roadway\Proj\B5981_Rdy_sum_3B-1.dgn
$$$$USERNAME$$$$

HY-340662L

COMPUTED BY:	David K. Holmes	DATE:	03/28/2023
CHECKED BY:	Craig J. Lee, PE	DATE:	03/28/2023

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
B-5981	3D-1

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

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

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
			0401	0400		155.2	154.8														
L 12+50	21	LT	0401		169.4	155.2															
			0402	0401		171.0	166.4														
L 15+00	26	LT	0402		174.0	171.0															
			0403	0401		155.4	155.2														
SR1 10+90	32	LT	0403		158.5	155.4															
			0404	0402		174.5	171.0														
L 17+00	30	LT	0404		177.5	174.5															
			0405	0403		155.6	155.4														
L 20+42	43	LT	0406		181.7	178.7															
			0406	0404		178.7	174.5														
			0409	0407		156.1	156.0														
L 20+42	18	LT	0408		188.9	184.4															
			0408	0406		184.4	178.7														
			0501	0500		154.0	153.7														
L 27+82	125	LT	0501		156.8	154.0															
			0516	0501		154.9	154.0														
L 28+17	56	RT	0516																		
			0502	0516		156.7	154.9														
			0505	0503		164.0	157.0			36							X				
L 29+37	81	LT	0505		168.2	164.0															
			0506	0504		180.8	157.3			56							X				
L 26+19	23	RT	0506		184.3	180.8															
			0507	0505		164.2	164.0														
L 29+35	34	LT	0507		167.0	164.2															
			0508	0506		181.0	180.8														
L 26+16	17	LT	0508		184.4	181.0															
			0509	0511		158.2	157.8														
L 31+98	24	LT	0509		161.2	158.2															
			0510	0508		184.8	181.0														
L 25+12	25	LT	0510		187.6	184.8															
			0512			157.6	157.3														
			0513			157.0	156.9														
			0514			159.8	159.7														
			0518	0517		166.1	158.0			28							X				
Y1 10+75	19	RT	0518		168.9	166.1															
			0519	0518		167.0	166.1														
Y1 10+55	19	RT	0519		169.8	167.0															
			0407	0405																	
			0515			156.5	156.4														
SHEET TOTALS										120											
PROJECT TOTALS										120											

FROM	TO	R. C. PIPE CLASS III 12	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 12	15	18	24	30	36	42	48	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE
0401	0400					84																						
0401																												
0402	0401		248																									
0402																												
0403	0401					64																						
0403																												
0404	0402		196																									
0404																												
0405	0403					72																						
0406																												
0406	0404		336																									
0409	0407																				52								
0408																												
0408	0406		32																									
0501	0500				52																							
0501																												
0516	0501																											
0516																												
0502	0516			28																								
0505	0503																											
0505																												
0506	0504																											
0506																												
0507	0505										44																	
0507																												
0508	0506										40																	
0508																												
0509	0511										80																	
0509																												
0510	0508										100																	
0510																												
0512			60																									
0513			24																									
0514											60																	
0518	0517																											
0518																												
0519	0518										16																	
0519																												
0407	0405																											
0515											36																	
SHEET TOTALS			896	28	52	220					376									52								
PROJECT TOTALS			896	28	52	220					376									52								

FROM	TO	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	15" DRAINAGE PIPE ELBOW		FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
0401	0400																															241	
0401		1	5.0	4.2													1	1															
0402	0401																																
0402		1															1	1															
0403	0401																															73	
0403		1															1	1															
0404	0402																																
0404		1															1	1															
0405	0403																															61	
0406		1															1	1															
0406	0404																																
0409	0407																															37	
0408		1																					1	1									
0408	0406																																
0501	0500																																
0501		1										1																					
0516	0501																															8	RETAIN EXISTING 18" RCP
0516																														0.4465			
0502	0516																																
0505	0503																										2					31	
0505		1																					1	1									
0506	0504																										2						
0506		1																					1	1									
0507	0505																															46	
0507		1															1	1															
0508	0506																																
0508		1																					1	1									
0509	0511																															76	
0509		1															1	1															
0510	0508																																
0510		1																					1	1									
0512																																61	
0513																																24	
0514																																57	
0518	0517																										2						
0518		1																					1	1									
0519	0518																																
0519		1																					1	1									
0407	0405																															694	
0515																																	
SHEET TOTALS		15	5.0	4.2								1					7	7					7	7			6			0.4465		1409	
PROJECT TOTALS		15	10.5									1					7	7					7	7			6			0.4465		1409	

ABBREVIATIONS

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

COMPUTED BY: Paul Weaver DATE: 2/27/23
CHECKED BY: Matthew Lattin DATE: 2/27/23

(2-3-23)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
47747.1.1 (b-5981)	3G-1

SUMMARY OF SUBSURFACE DRAINAGE

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

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

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU(1/2)/ AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Subgrade Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
Varies	Varies	Varies	ASU (1)	12	340	1965	2930		
CONTINGENCY					200	400	600		
			TOTAL CY/TONS/SY:		540	2365**	3530**	0	0

***ASU(1/2) = Aggregate Subgrade (Type 1 or 2)**
***AST = Aggregate Stabilization**
****Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Subgrade Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade stabilization and geotextile quantities shown in the Item Sheets of the Proposal.**

SUMMARY OF REINFORCED SOIL SLOPES AND SLOPE EROSION CONTROL

LINE	Beginning Slope/ RSS (H:V)	Approx. Station	Ending Slope/ RSS (H:V)	Approx. Station	Location LT/RT	Reinforced Soil Slope (RSS) SY	Geocells SY	Coir Fiber Mat SY	Matting for Erosion Control SY
-L-	2:1	13+50	2:1	22+25	RT	5600			5600
-L-	2:1	24+75	2:1	28+75	RT	2300			2300
-Y-	2:1	11+25	2:1	11+25	RT	350			350
					TOTAL SY:	8250	0	0*	8250**

***Total square yards of "Coir Fiber Mat" is only the estimated quantity for slopes steeper than 2:1 (H:V) and may only represent a portion of the coir fiber mat quantity shown in the Item Sheets of the Proposal.**
****Total square yards of "Matting for Erosion Control" is only the estimated quantity for RSS and may only represent a portion of the matting quantity shown in the Item Sheets of the Proposal.**

PROJ. REFERENCE NO.	SHEET NO.
B-5981	3P-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4	DEBORAH K. KORNEGAY
2	4	DEBORAH K. KORNEGAY
3	4, 5	GOSHEN FARMS LLC
4	5	LEMUEL O. SUTTON
5	5	ROGER B. DAVIS SR. & WIFE MARTHA J. DAVIS
6	5	JAMES A, LAMBERT, JR.
7	5	RON ERVIN COTTLE
8	4	DONALD E. HARGROVE

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

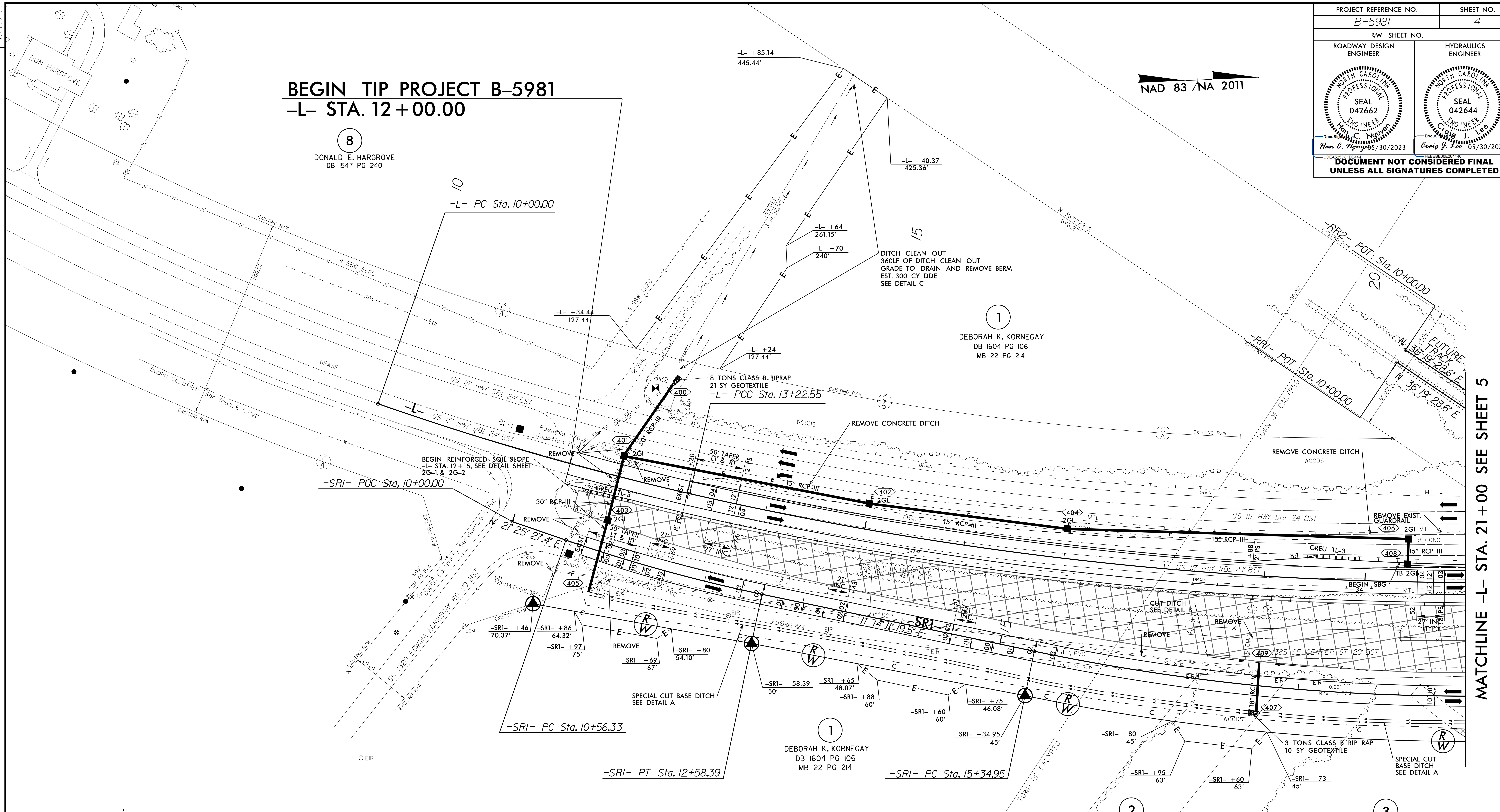
PROJECT REFERENCE NO.	SHEET NO.
B-5981	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — SEAL 042662 — Han C. Nguyen 05/30/2023

HYDRAULICS ENGINEER — SEAL 042644 — Craig J. Lee 05/30/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BEGIN TIP PROJECT B-5981
-L- STA. 12+00.00



-L-

PI Sta 11+61.44	PI Sta 17+17.98
Δ = 6° 24' 45.0" (LT)	Δ = 12° 53' 31.1" (LT)
D = 1° 59' 17.0"	D = 1° 38' 13.3"
L = 322.55'	L = 787.53'
T = 161.44'	T = 395.43'
R = 2,882.00'	R = 3,500.00'
SE = existing	SE = 0.04
Runoff = existing	Runoff = 108'

-SR1-

PI Sta 11+57.49	PI Sta 17+80.58
Δ = 7° 14' 07.9" (LT)	Δ = 13° 20' 34.0" (LT)
D = 3° 34' 51.6"	D = 2° 43' 42.1"
L = 202.05'	L = 489.04'
T = 101.16'	T = 245.63'
R = 1,600.00'	R = 2,100.00'
SE = 0.03	SE = 0.03
Runoff = 63'	Runoff = 63'

DETAIL E
MEDIAN V DITCH
(Not to Scale)
Shoulder Point — 3:1 or Flatter — 3:1 or Flatter — Shoulder Point
Min. D=1.0 Ft.
FOR REMOVAL OF CONCRETE DITCH ALSO REFERENCE CROSS SECTIONS
FROM STA. 12+50 TO STA. 21+55

DETAIL A
SPECIAL CUT BASE DITCH
(Not to Scale)
Natural Ground — 3:1 — D — B — 3:1 or Flatter — Front Ditch Slope
Min. D = 1.5Ft.
B = 3Ft.
FROM -SR1- STA. 10+91.63 RT TO -SR1- STA. 20+65.90 RT

DETAIL B
CUT DITCH
(Not to Scale)
Natural Ground — 3:1 or Flatter — 3:1 or Flatter — Front Ditch Slope
Min. D=1Ft.
FROM -SR1- STA. 17+08.16 LT TO -SR1- STA. 18+11.36 LT

DETAIL C
DITCH CLEAN OUT
(Not to Scale)
Natural Ground — 1.5:1 or Flatter — D — B — 1.5:1 or Flatter — Natural Ground
Min. D=3 Ft.
Min. B=4 Ft.

REINFORCED SOIL SLOPE

FOR -L- PROFILE, SEE SHEET 6
FOR -SR1- PROFILE, SEE SHEET 7

REVISIONS

31-MAR-2023 16:14
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PROJECT REFERENCE NO.	SHEET NO.
B-5981	5

R/W SHEET NO.

ROADWAY DESIGN ENGINEER — SEAL 042662 — Han C. Nguyen 05/30/2023

HYDRAULICS ENGINEER — SEAL 042644 — Craig J. Lee 05/30/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L-

PI Sta 27+26.23	PI Sta 31+36.13	PIs Sta 37+23.35	PI Sta 41+18.94
△ = 2° 05′ 48.9″ (LT)	△ = 2° 05′ 48.9″ (RT)	Θs = 4° 00′ 24.1″	△ = 25° 54′ 34.6″ (LT)
D = 0° 30′ 41.7″	D = 0° 30′ 41.7″	Ls = 200.00′	D = 4° 00′ 24.1″
L = 409.90′	L = 409.90′	LT = 133.37′	L = 646.66′
T = 204.97′	T = 204.97′	ST = 66.70′	T = 328.95′
R = 11,200.00′	R = 11,200.00′		R = 1,430.00′
SE = NC	SE = NC		SE = EXIST.
Runoff = N/A	Runoff = N/A		

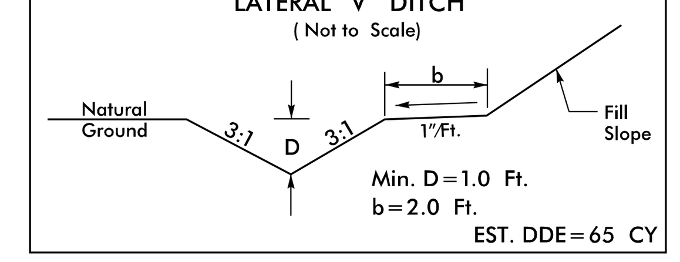
-Y1-

PIs Sta 11+00.11	PI Sta 12+78.35
Θs = 8° 15′ 49.7″	△ = 27° 43′ 50.5″ (RT)
Ls = 150.00′	D = 11° 01′ 06.3″
LT = 100.11′	L = 251.68′
ST = 50.10′	T = 128.35′
	R = 520.00′
	SE = 0.06

-SR1-

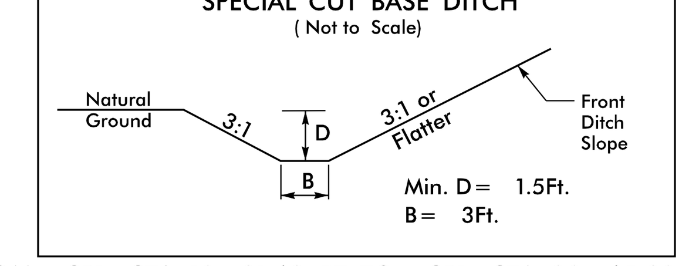
PI Sta 22+96.30
△ = 35° 50′ 23.7″ (RT)
D = 19° 05′ 54.9″
L = 187.66′
T = 97.01′
R = 300.00′
SE = 0.04
Runoff = 84′

DETAIL D — LATERAL 'V' DITCH (Not to Scale)



FROM STA. -L- 26+20 RT TO STA. -Y1- 10+50 RT

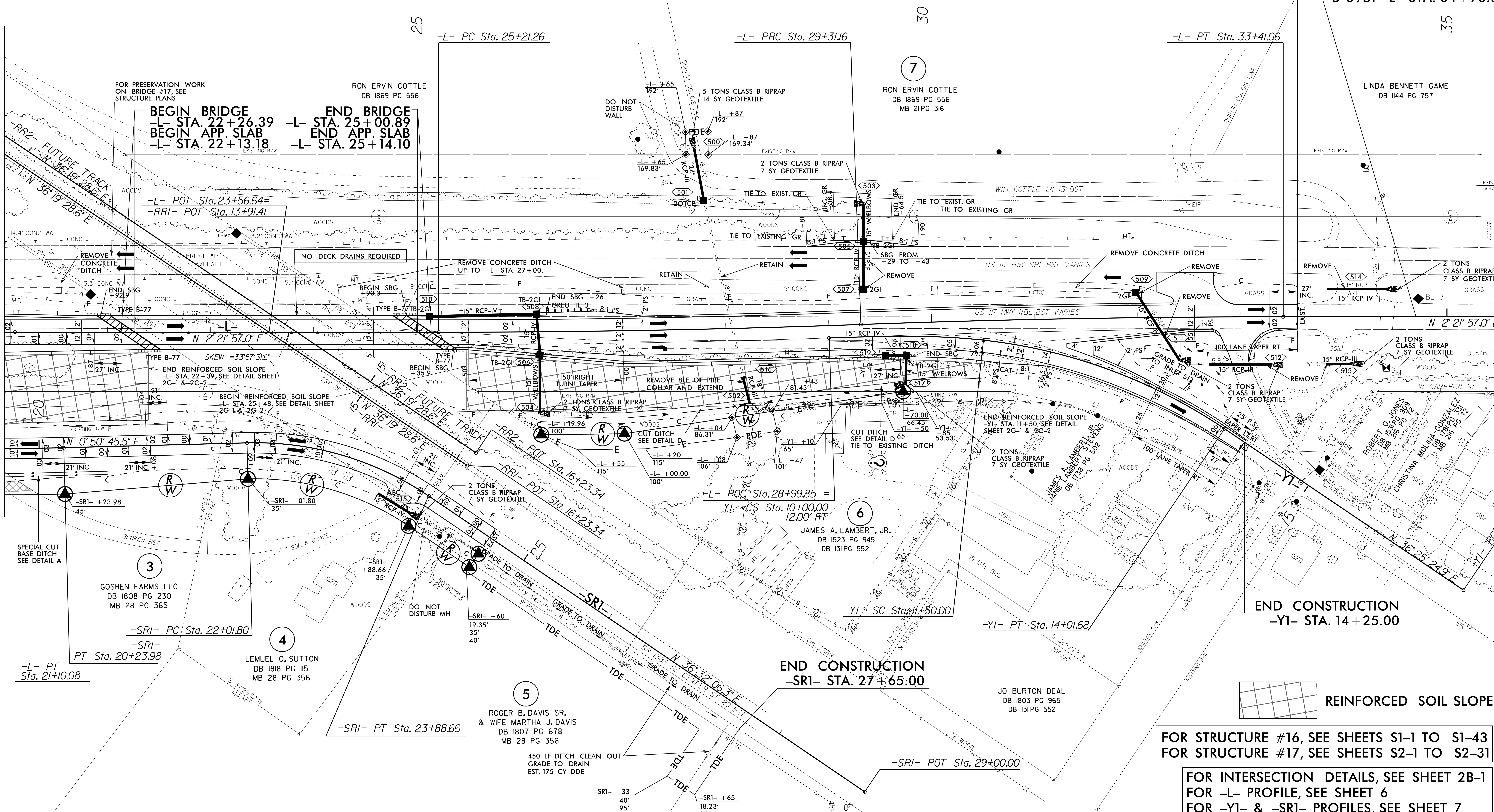
DETAIL A — SPECIAL CUT BASE DITCH (Not to Scale)



FROM -SR1- STA. 10+91.63 RT TO -SR1- STA. 20+65.90 RT

NAD 83 / NA 2011

END TIP PROJECT B-5981
-L- STA. 33+55.00



REINFORCED SOIL SLOPE

FOR STRUCTURE #16, SEE SHEETS S1-1 TO S1-43
FOR STRUCTURE #17, SEE SHEETS S2-1 TO S2-31

FOR INTERSECTION DETAILS, SEE SHEET 2B-1
FOR -L- PROFILE, SEE SHEET 6
FOR -Y1- & -SR1- PROFILES, SEE SHEET 7

REVISIONS

8/17/99

31-MAR-2023 16:14
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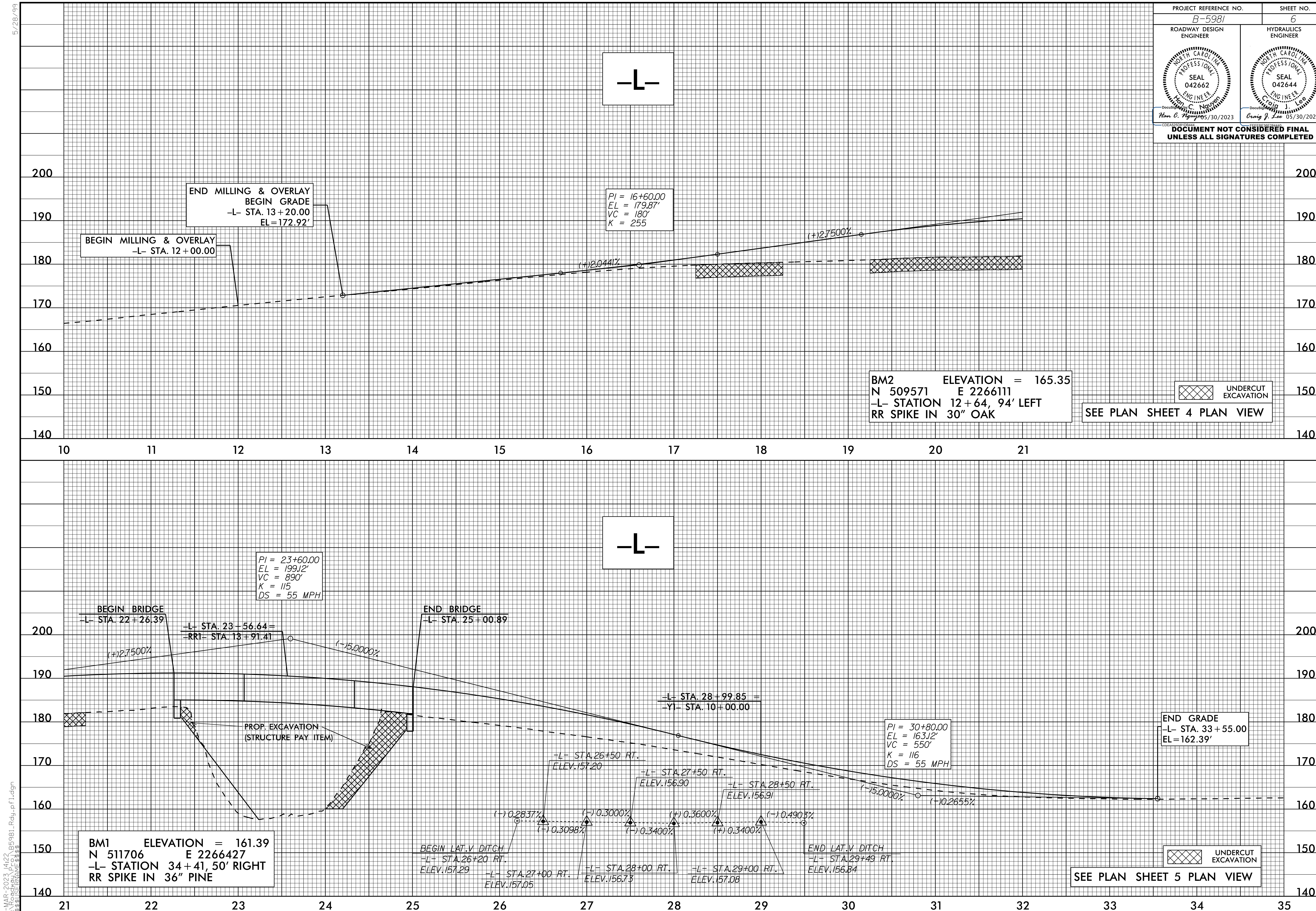
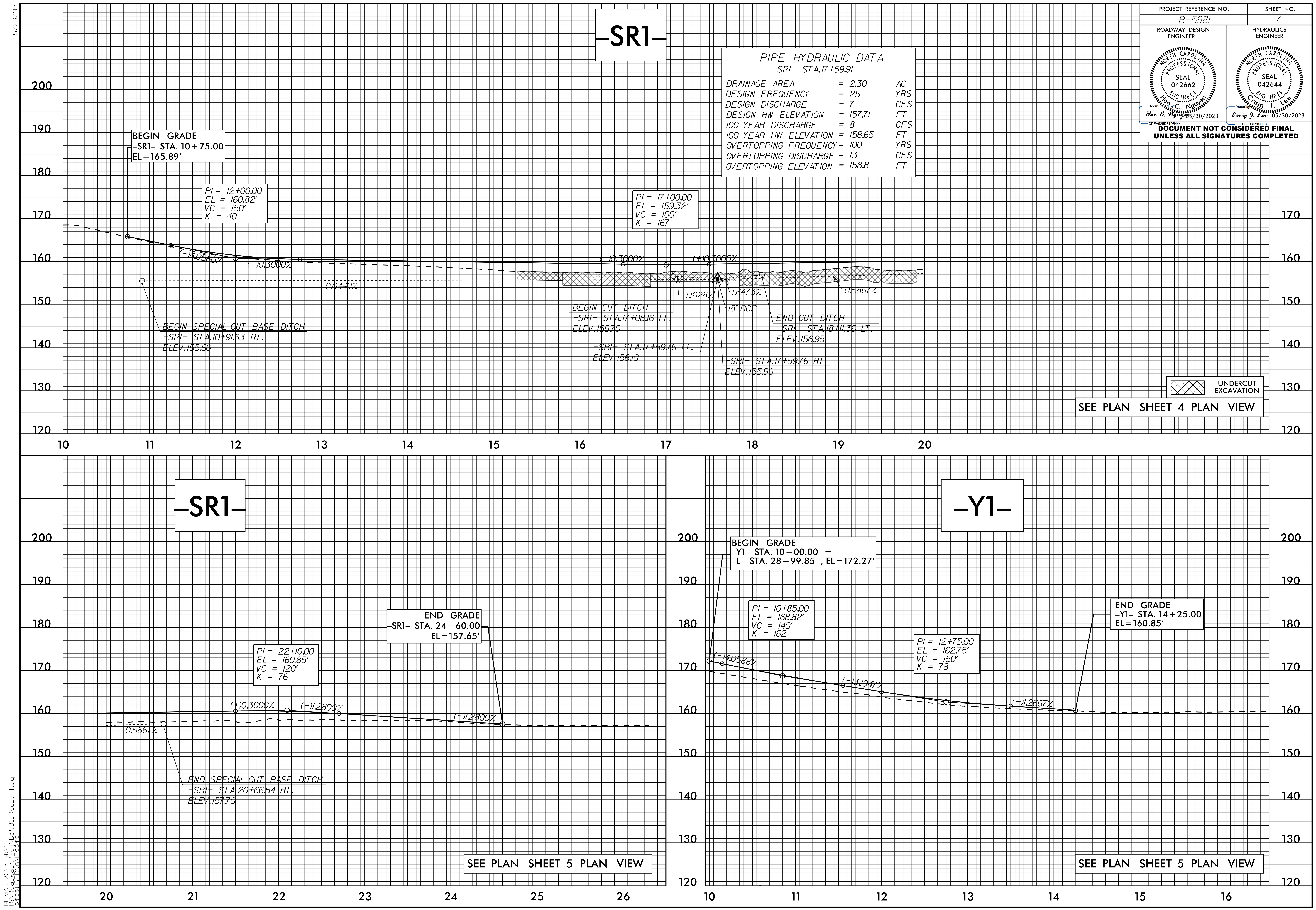

PROJECT REFERENCE NO.
B-5981
SHEET NO.
6
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 042662 ENGINEER Hon C. Nguyen
05/30/2023
NORTH CAROLINA PROFESSIONAL SEAL 042644 ENGINEER Craig J. Lee
05/30/2023
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
-L-
END MILLING & OVERLAY
BEGIN GRADE
-L- STA. 13+20.00
EL=172.92'
BEGIN MILLING & OVERLAY
-L- STA. 12+00.00
PI = 16+60.00
EL = 179.87'
VC = 180'
K = 255
(+)2.0441%
(+)2.7500%
BM2 ELEVATION = 165.35
N 509571 E 2266111
-L- STATION 12+64, 94' LEFT
RR SPIKE IN 30" OAK
UNDERCUT EXCAVATION
SEE PLAN SHEET 4 PLAN VIEW
-L-
PI = 23+60.00
EL = 199.12'
VC = 890'
K = 115
DS = 55 MPH
BEGIN BRIDGE
-L- STA. 22+26.39
-L- STA. 23+56.64 =
-RR1- STA. 13+91.41
END BRIDGE
-L- STA. 25+00.89
(+)2.7500%
(-)5.0000%
PROP. EXCAVATION
(STRUCTURE PAY ITEM)
-L- STA. 28+99.85 =
-Y1- STA. 10+00.00
PI = 30+80.00
EL = 163.12'
VC = 550'
K = 116
DS = 55 MPH
END GRADE
-L- STA. 33+55.00
EL=162.39'
-L- STA.26+50 RT.
ELEV.157.20
-L- STA.27+50 RT.
ELEV.156.90
-L- STA.28+50 RT.
ELEV.156.91
(-)5.0000%
(-)0.2655%
(-) 0.2837%
(-) 0.3098%
(-) 0.3000%
(-) 0.3400%
(+) 0.3600%
(+) 0.3400%
(-) 0.4903%
BEGIN LAT.V DITCH
-L- STA.26+20 RT.
ELEV.157.29
-L- STA.27+00 RT.
ELEV.157.05
-L- STA.28+00 RT.
ELEV.156.73
-L- STA.29+00 RT.
ELEV.157.08
END LAT.V DITCH
-L- STA.29+49 RT.
ELEV.156.84
BM1 ELEVATION = 161.39
N 511706 E 2266427
-L- STATION 34+41, 50' RIGHT
RR SPIKE IN 36" PINE
UNDERCUT EXCAVATION
SEE PLAN SHEET 5 PLAN VIEW


PROJECT REFERENCE NO. B-5981
SHEET NO. 7
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 042662 ENGINEER Hanh C. Nguyen 05/30/2023
NORTH CAROLINA PROFESSIONAL SEAL 042644 ENGINEER Craig J. Lee 05/30/2023
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
-SR1-
PIPE HYDRAULIC DATA
-SR1- STA.17+59.91
DRAINAGE AREA = 2.30 AC
DESIGN FREQUENCY = 25 YRS
DESIGN DISCHARGE = 7 CFS
DESIGN HW ELEVATION = 157.71 FT
100 YEAR DISCHARGE = 8 CFS
100 YEAR HW ELEVATION = 158.65 FT
OVERTOPPING FREQUENCY = 100 YRS
OVERTOPPING DISCHARGE = 13 CFS
OVERTOPPING ELEVATION = 158.8 FT
BEGIN GRADE -SR1- STA. 10+75.00 EL=165.89'
PI = 12+00.00 EL = 160.82' VC = 150' K = 40
PI = 17+00.00 EL = 159.32' VC = 100' K = 167
(-)4.0560%
(-)0.3000%
(-)0.3000%
(+)0.3000%
0.0449%
-1.1628%
1.6473%
0.5867%
18" RCP
BEGIN SPECIAL CUT BASE DITCH -SR1- STA.10+91.63 RT. ELEV.155.60
BEGIN CUT DITCH -SR1- STA.17+08.16 LT. ELEV.156.70
-SR1- STA.17+59.76 LT. ELEV.156.10
-SR1- STA.17+59.76 RT. ELEV.155.90
END CUT DITCH -SR1- STA.18+11.36 LT. ELEV.156.95
UNDERCUT EXCAVATION
SEE PLAN SHEET 4 PLAN VIEW
-SR1-
PI = 22+10.00 EL = 160.85' VC = 120' K = 76
END GRADE -SR1- STA. 24+60.00 EL=157.65'
(+)0.3000%
(-)1.2800%
(-)1.2800%
0.5867%
END SPECIAL CUT BASE DITCH -SR1- STA.20+66.54 RT. ELEV.157.70
SEE PLAN SHEET 5 PLAN VIEW
-Y1-
BEGIN GRADE -Y1- STA. 10+00.00 = -L- STA. 28+99.85 , EL=172.27'
PI = 10+85.00 EL = 168.82' VC = 140' K = 162
PI = 12+75.00 EL = 162.75' VC = 150' K = 78
END GRADE -Y1- STA. 14+25.00 EL=160.85'
(-)4.0588%
(-)3.1947%
(-)1.2667%
SEE PLAN SHEET 5 PLAN VIEW
5/28/99
14-MAR-2023 14:22 R:\Roadway\Proj\B5981_Rdy_pfl.dgn