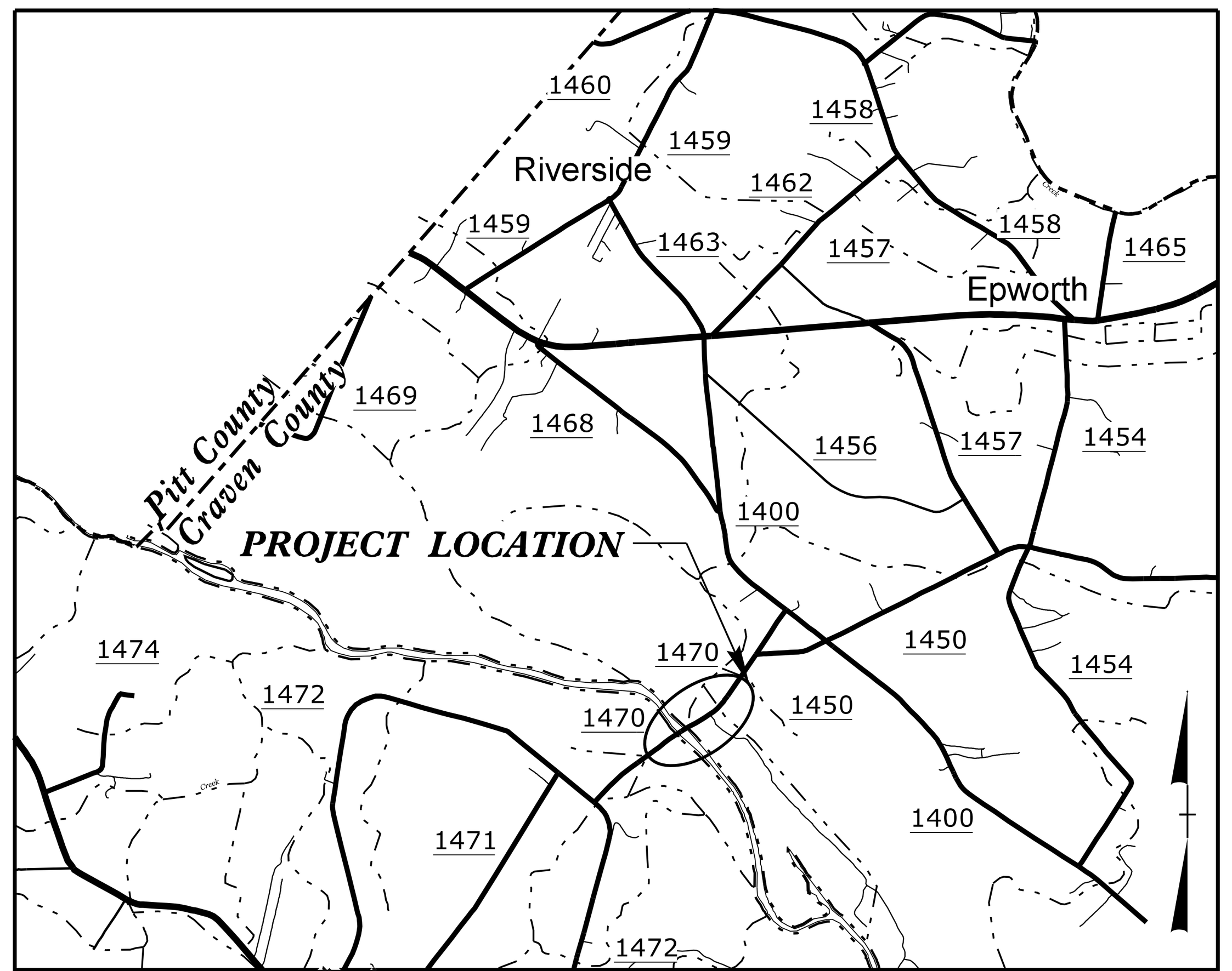
09/08/99

TIP PROJECT: B-4484

CONTRACT: C204434

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



VICINITY MAP N. T. S.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

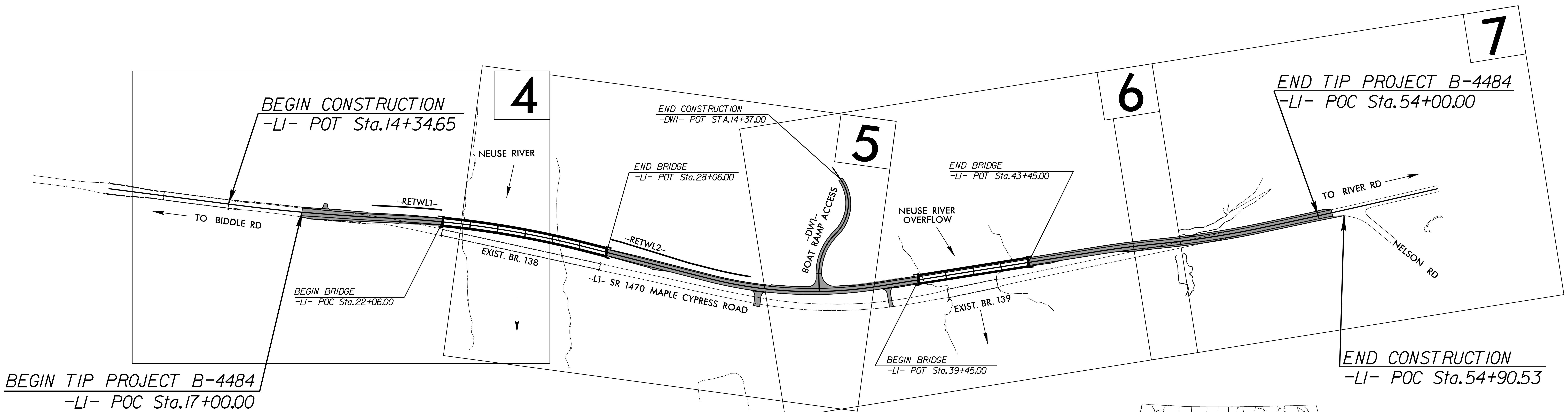
CRAVEN COUNTY

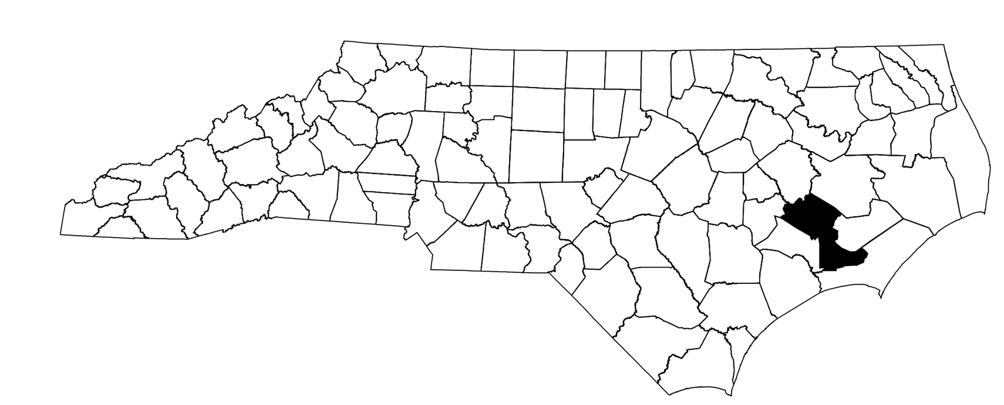
LOCATION: REPLACE BRIDGES NO. 138 & 139 OVER NEUSE RIVER AND NEUSE RIVER OVERFLOW ON SR 1470 (MAPLE CYPRESS ROAD)

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4484	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
33723.1.2	N/A	PE	
33723.2.1	N/A	ROW, UTIL	
33723.3.1	N/A	CONST	

NAD 83/2001





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 2020 = 1,884
ADT 2039 = 2,279
K = 12 %
D = 60 %
T = 10 % *
V = 60 MPH
*(TTST = 3% + DUAL = 7%)
FUNC CLASS = MAJOR COLLECTOR
SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4484	=	0.512 MILE
LENGTH STRUCTURE TIP PROJECT B-4484	=	0.189 MILE
TOTAL LENGTH TIP PROJECT B-4484	=	0.701 MILE

PREPARED IN THE OFFICE OF:

RS&H
1520 SOUTH BOULEVARD, SUITE 200
CHARLOTTE, NC 28203
NC FIRM LICENSE No: F-0493

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MARCH 7, 2019

LETTING DATE: FEBRUARY 16, 2021

JENNIFER FARINO, PE
PROJECT ENGINEER

DREW MORROW, PE
PROJECT DESIGN ENGINEER

HON YEUNG, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 018442 ENGINEER RICHARD LEON BOLLINGER, JR.

SIGNATURE: P.E. 12/9/2020

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030952 ENGINEER JENNIFER D. FARINO

SIGNATURE: P.E. 12/9/2020

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

08-DEC-2020 09:31
R:\Roadway\Proj\B4484_Rdy_tsh.dgn

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-4484	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030952 ENGINEER JENNIFER D. FARINO

3/27/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H

NC FIRM LICENSE No: F-0493

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1 THRU 2A-3	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2C-1	W-BEAM RAIL SECTION DETAIL
2C-2	TRAILING END UNIT ASSEMBLY - AT-1 SYSTEM
2C-3	TYPE III - STRUCTURE ANCHOR UNIT
2C-4	25' CLEAR SPAN GUARDRAIL SECTION
2D-1	TEMPORARY DITCH DETAIL SHEET
2D-2	84" PIPE COLLAR DETAIL
2D-3	84" PIPE HEADWALL DETAIL
2G-1	ROCK EMBANKMENT DETAILS & NOTES
2G-2	GEOTEXTILE FOR EMBANKMENT STABILIZATION DETAILS
2G-3	SPECIAL ROCK PLATING DETAILS
2G-4	STANDARD TEMPORARY SHORING DETAILS
3B-1	ROADWAY SUMMARIES
3D-1	DRAINAGE SUMMARIES
3G-1	GEOTECHNICAL SUMMARIES
3P-1	PARCEL INDEX SHEET
4 THRU 7	PLAN SHEETS
8 THRU 10	PROFILE SHEETS
RW1 THRU RW7	R/W SHEETS
TMP-1 THRU TMP-13	TRANSPORTATION MANAGEMENT PLAN
PMP-1 THRU PMP-5	PAVEMENT MARKING PLANS
EC-1 THRU EC-13	EROSION CONTROL PLANS
RF-1	REFORESTATION DETAIL SHEET
SIGN-1 THRU SIGN-10	SIGNING PLANS
UC-1 THRU UC-9	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
X-1A	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-26	CROSS-SECTIONS
S1-1 THRU S1-37	BR 138 STRUCTURE PLANS
S2-1 THRU S2-31	BR 139 STRUCTURE PLANS
W-1 THRU W-2	RETAINING WALL PLANS
W-3 THRU W-5	RETAINING WALL DETAIL SHEETS

GENERAL NOTES

GENERAL NOTES: 2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADE LINE:
GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

SUBSURFACE DRAINS:

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

GUARDRAIL:

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

TEMPORARY SHORING:

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

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE DUKE ENERGY, CENTURYLINK, AND

CRAVEN COUNTY WATER DEPARTMENT.

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.

STANDARD DRAWINGS

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	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
235.01	Embankment Monitoring
275.01	Rock Plating
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.01	Bridge Approach Fills - Type I Standard Approach Fill
422.02	Bridge Approach Fills - Type II Modified Approach Fill
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
815.02	Subsurface Drain
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.29	Frames and Narrow Slot Flat Grates
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
850.01	Concrete Paved Ditches
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
B-4484	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale **S.U.E. = Subsurface Utility Engineering*

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Computed Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil — S
- Potential Contamination Area: Soil — S
- Known Contamination Area: Water — W
- Potential Contamination Area: Water — W
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:

- Secondary Horiz and Vert Control Point
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Exist Permanent Easement Pin and Cap
- New Permanent Easement Pin and Cap
- Vertical Benchmark
- Existing Right of Way Marker
- Existing Right of Way Line
- New Right of Way Line — RW
- New Right of Way Line with Pin and Cap — RW
- New Right of Way Line with Concrete or Granite R/W Marker — RW
- New Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- New Control of Access — CA
- Existing Easement Line — E
- New Temporary Construction Easement — E
- New Temporary Drainage Easement — TDE
- New Permanent Drainage Easement — PDE
- New Permanent Drainage / Utility Easement — DUE
- New Permanent Utility Easement — PUE
- New Temporary Utility Easement — TUE
- New Aerial Utility Easement — AUE

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- 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 — Vineyard

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- U/G Power Line LOS B (S.U.E.*) — P
- U/G Power Line LOS C (S.U.E.*) — P
- U/G Power Line LOS D (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- U/G Telephone Cable LOS B (S.U.E.*) — T
- U/G Telephone Cable LOS C (S.U.E.*) — T
- U/G Telephone Cable LOS D (S.U.E.*) — T
- U/G Telephone Conduit LOS B (S.U.E.*) — TC
- U/G Telephone Conduit LOS C (S.U.E.*) — TC
- U/G Telephone Conduit LOS D (S.U.E.*) — TC
- U/G Fiber Optics Cable LOS B (S.U.E.*) — T FO
- U/G Fiber Optics Cable LOS C (S.U.E.*) — T FO
- U/G Fiber Optics Cable LOS D (S.U.E.*) — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line LOS B (S.U.E*) — W
- U/G Water Line LOS C (S.U.E*) — W
- U/G Water Line LOS D (S.U.E*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- U/G TV Cable LOS B (S.U.E.*) — TV
- U/G TV Cable LOS C (S.U.E.*) — TV
- U/G TV Cable LOS D (S.U.E.*) — TV
- U/G Fiber Optic Cable LOS B (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS C (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS D (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*) — G
- U/G Gas Line LOS C (S.U.E.*) — G
- U/G Gas Line LOS D (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- SS Forced Main Line LOS B (S.U.E.*) — FSS
- SS Forced Main Line LOS C (S.U.E.*) — FSS
- SS Forced Main Line LOS D (S.U.E.*) — FSS

MISCELLANEOUS:

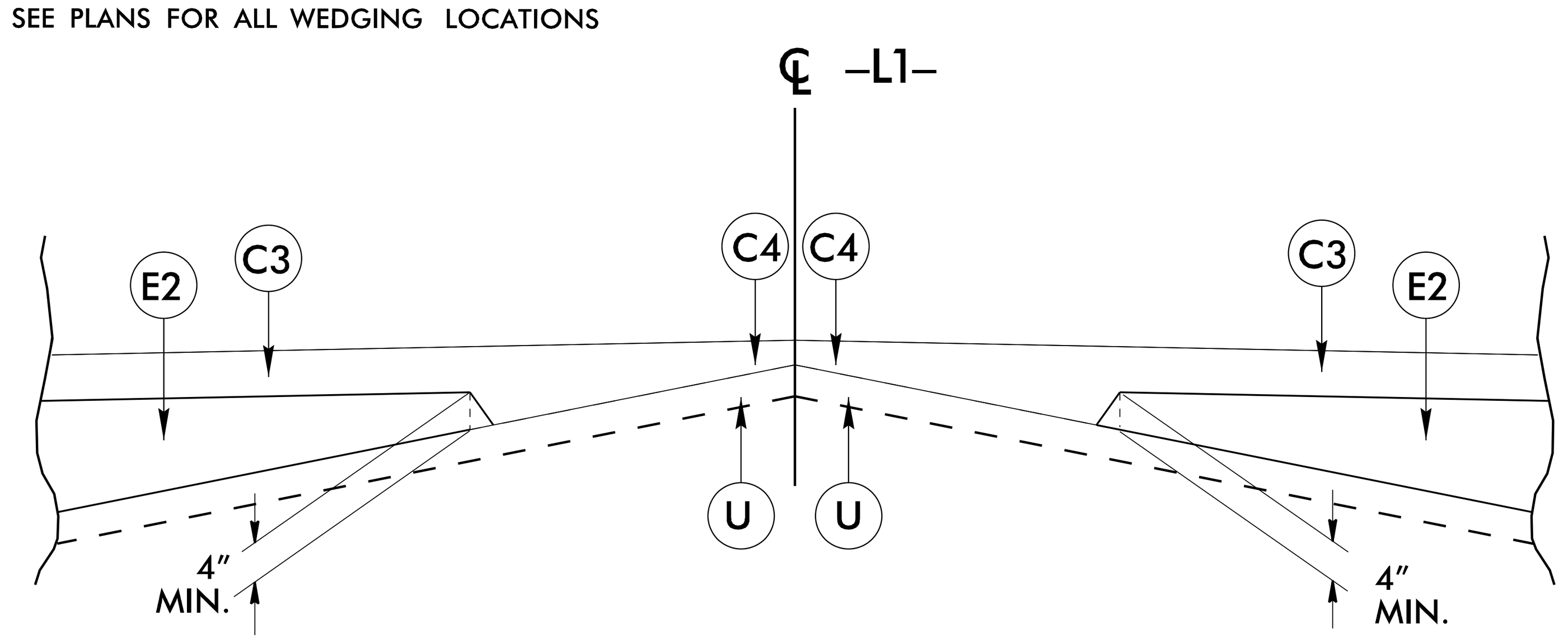
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line LOS B (S.U.E.*) — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole LOS A (S.U.E.*)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

8/17/99

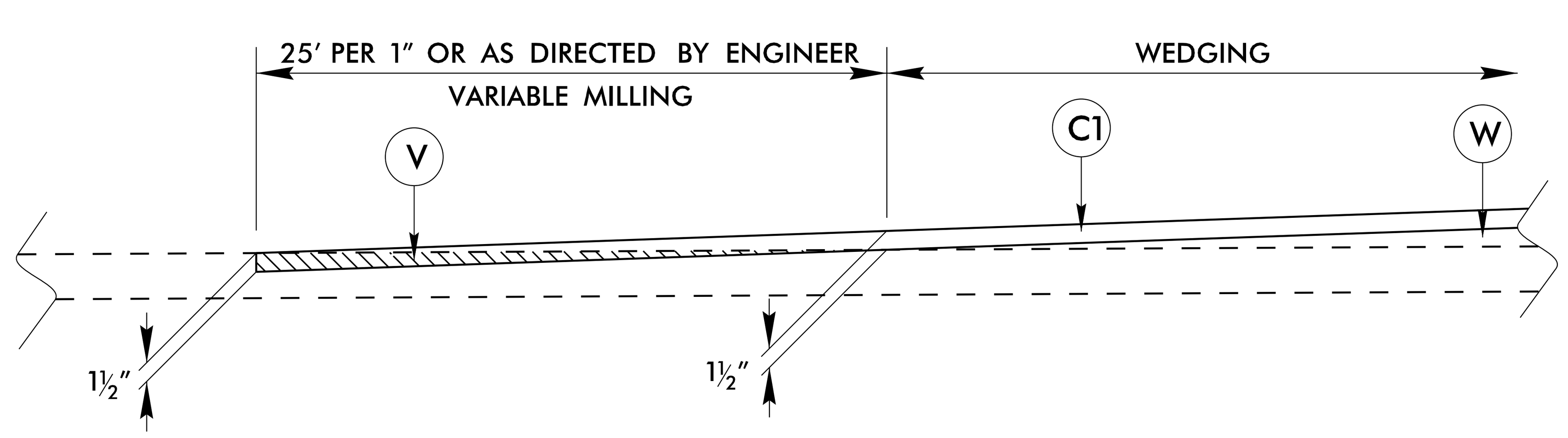
PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C4	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B,AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1" IN DEPTH OR GREATER THAN 1½" IN DEPTH.
E1	PROP. APPROX. 4½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 4" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
J1	2½" AGGREGATE BASE COURSE.
J2	PROP. 6" AGGREGATE BASE COURSE.
J3	PROP. 8" AGGREGATE BASE COURSE.
P	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YARD.
R1	PROP. SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	INCIDENTAL MILLING (SEE INCIDENTAL MILLING DETAIL SHEET 2A-1)
W	WEDGING (SEE WEDGING DETAIL SHEET 2A-1)

NOTE: ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE

SEE PLANS FOR ALL WEDGING LOCATIONS



Detail Showing Method of Wedging



Detail of Incidental Milling at Pavement Tie-ins
Use Detail
-L1- STA. 54+00.00 TO STA. 54+50.00

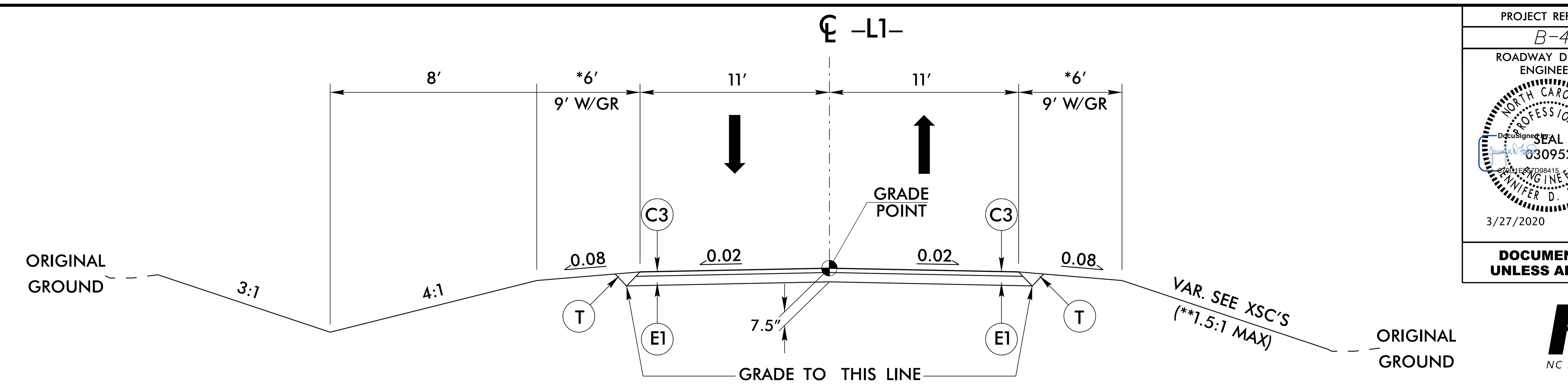
PROJECT REFERENCE NO.	SHEET NO.
B-4484	2A-1

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030952 JENNIFER D. FARINO — DocuSigned by: 679D1E857D98415... — 3/27/2020

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL — CLARK S. MORRISON — DocuSigned by: Clark S. Morrison — B0A110DD1E004C4... — 3/27/2020

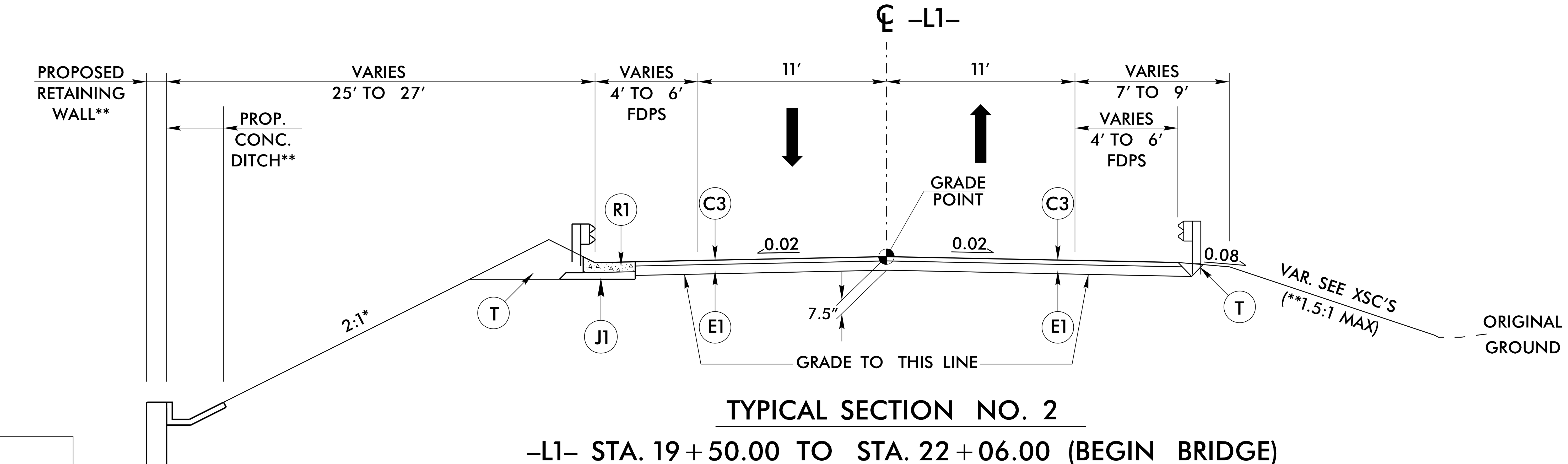
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H
NC FIRM LICENSE No: F-0493



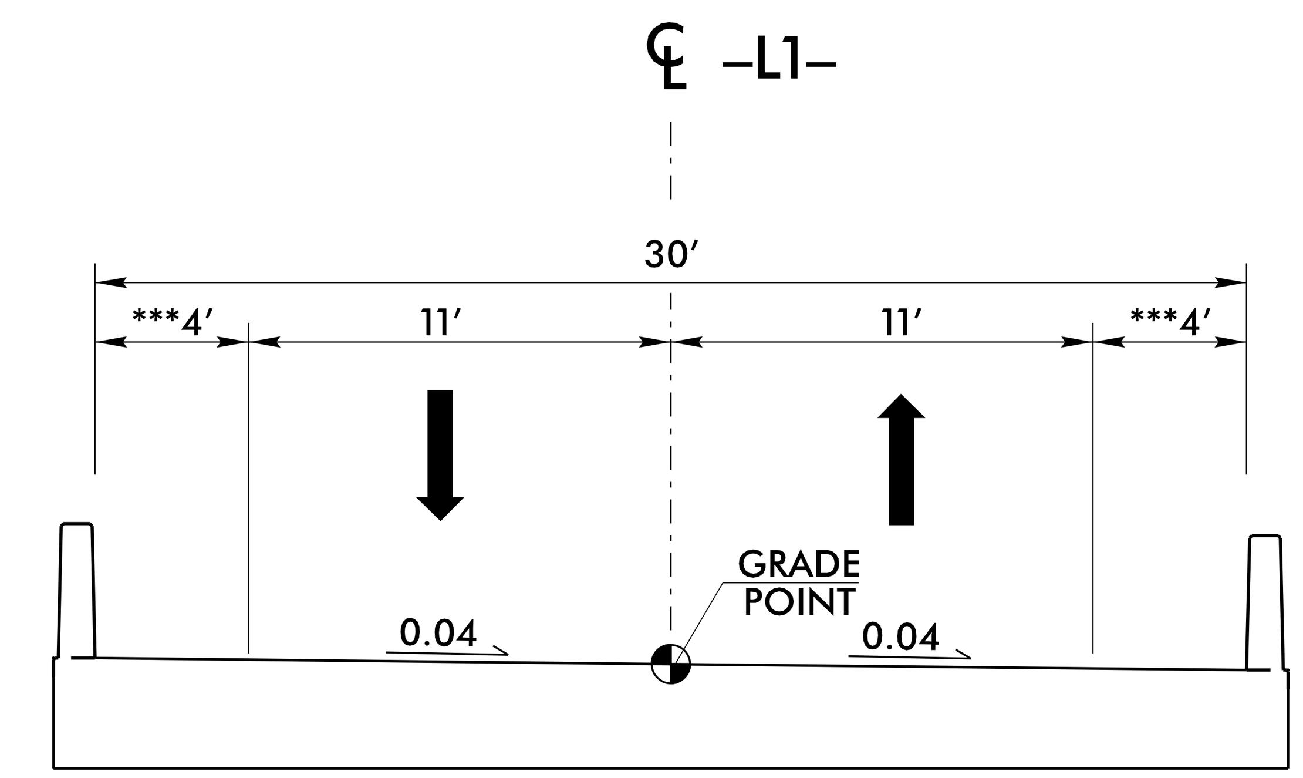
TYPICAL SECTION NO. 1

-L1- STA. 17+00.00 TO -L1- STA. 19+50.00
-L1- STA. 43+45.00 (END BRIDGE) TO -L1- STA. 51+89.00
*VARIABLE WIDTH FULL DEPTH PAVED SHOULDER PROPOSED IN AREAS WITH GUARDRAIL ONLY - SEE PLANS
**ROCK PLATING PROPOSED FOR ALL SLOPES STEEPER THAN 3:1



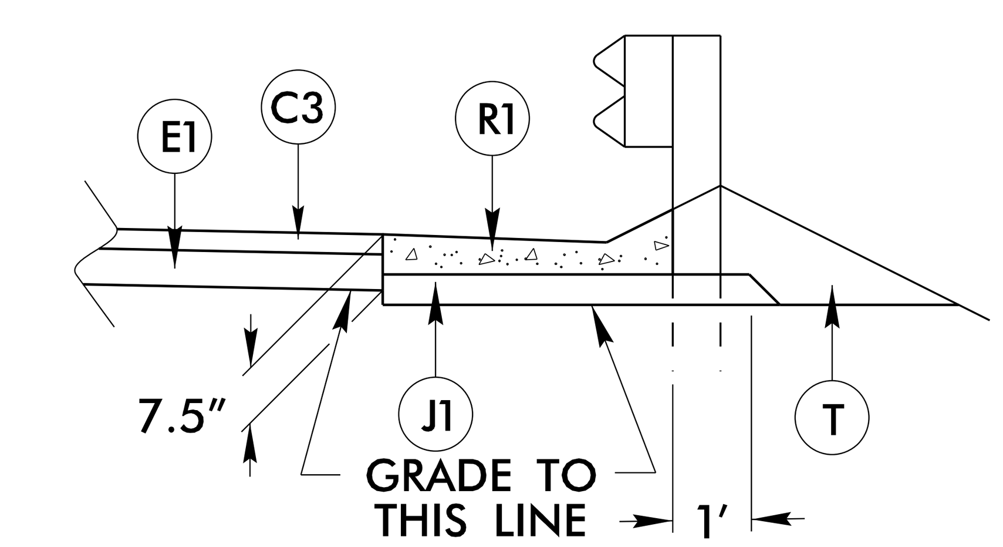
TYPICAL SECTION NO. 2

-L1- STA. 19+50.00 TO STA. 22+06.00 (BEGIN BRIDGE)
*ROCK PLATING PROPOSED FOR ALL SLOPES STEEPER THAN 3:1
** SEE SHEET W-1 FOR RETAINING WALL AND CONC. DITCH DETAILS



TYPICAL SECTION NO. 3

-L1- STA. 22+06.00 (BEGIN BRIDGE) TO
-L1- STA. 28+06.00 (END BRIDGE)
***4' SHOULDER REQUIRED FOR SIGHT DISTANCE



SHOULDER BERM GUTTER DETAIL

-L1- STA. 19+34.00 TO -L1- STA. 21+95.00 LT
-L1- STA. 20+49.00 TO -L1- STA. 21+95.00 RT
-L1- STA. 28+15.00 TO -L1- STA. 34+11.00 LT
-L1- STA. 28+19.00 TO -L1- STA. 29+74.00 RT
-L1- STA. 36+95.00 TO -L1- STA. 39+34.00 LT
-L1- STA. 43+56.00 TO -L1- STA. 43+72.00 LT

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8/17/99

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C4	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B,AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1" IN DEPTH OR GREATER THAN 1½" IN DEPTH.
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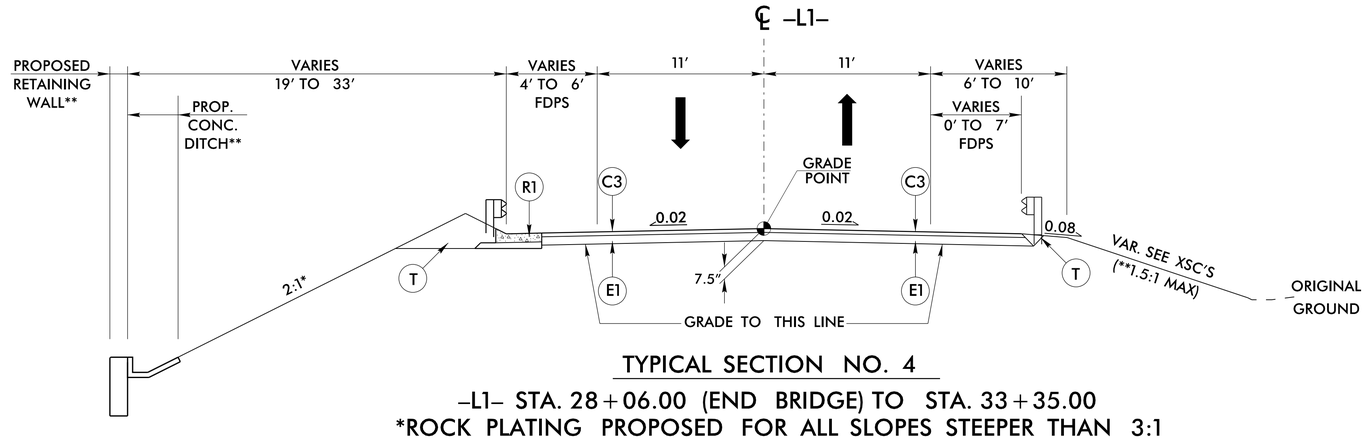
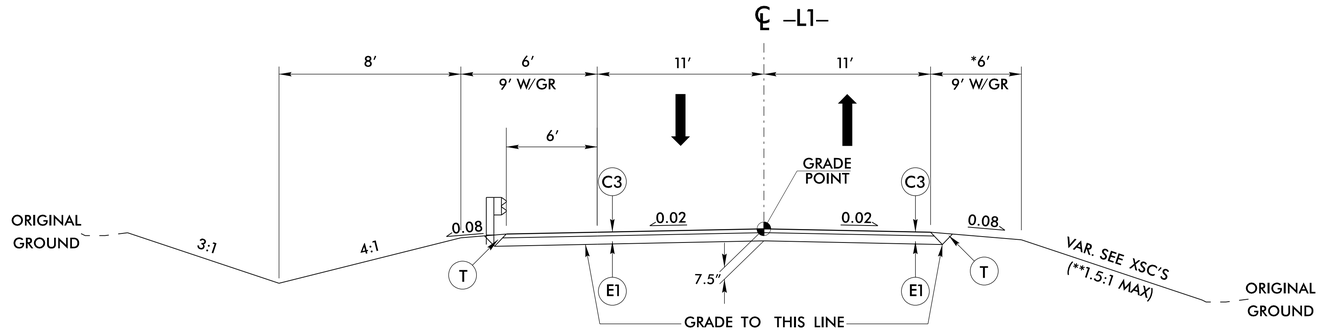
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 4" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
J1	2½" AGGREGATE BASE COURSE.
J2	PROP. 6" AGGREGATE BASE COURSE.
J3	PROP. 8" AGGREGATE BASE COURSE.
P	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YARD.
R1	PROP. SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	INCIDENTAL MILLING (SEE INCIDENTAL MILLING DETAIL SHEET 2A-1)
W	WEDGING (SEE WEDGING DETAIL SHEET 2A-1)

NOTE: ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE



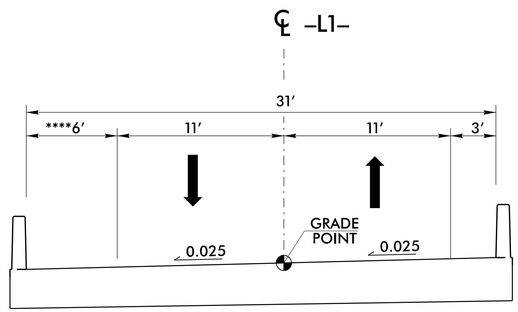
TYPICAL SECTION NO. 4

–L1– STA. 28+06.00 (END BRIDGE) TO STA. 33+35.00
*ROCK PLATING PROPOSED FOR ALL SLOPES STEEPER THAN 3:1
** SEE SHEET W–1 FOR CONC. DITCH DETAIL, AND SHEET W–2 FOR RETAINING WALL DETAIL



TYPICAL SECTION NO. 5

–L1– STA. 33+35.00 TO –L1– STA. 39+45.00
*VARIABLE WIDTH FULL DEPTH PAVED SHOULDER PROPOSED IN AREAS WITH GUARDRAIL ONLY – SEE PLANS



TYPICAL SECTION NO. 6

–L1– STA. 39+45.00 (BEGIN BRIDGE) TO
–L1– STA. 43+45.00 (END BRIDGE)
****6' SHOULDER REQUIRED FOR SPREAD

PROJECT REFERENCE NO.	SHEET NO.
B-4484	2A-2

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 030952 ENGINEER JENNIFER D. FARING
3/27/2020

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 032890 ENGINEER MARK T. MORRISON
3/27/2020

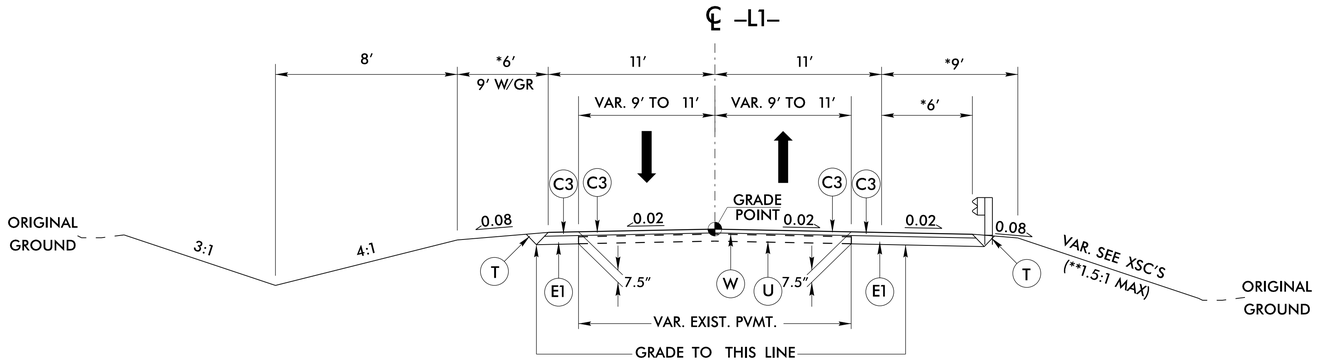
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H
NC FIRM LICENSE No: F-0493

8/17/99

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C4	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B,AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1" IN DEPTH OR GREATER THAN 1½" IN DEPTH.
E1	PROP. APPROX. 4½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 4" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
J1	2½" AGGREGATE BASE COURSE.
J2	PROP. 6" AGGREGATE BASE COURSE.
J3	PROP. 8" AGGREGATE BASE COURSE.
P	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YARD.
R1	PROP. SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	INCIDENTAL MILLING (SEE INCIDENTAL MILLING DETAIL SHEET 2A-1)
W	WEDGING (SEE WEDGING DETAIL SHEET 2A-1)

NOTE: ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE

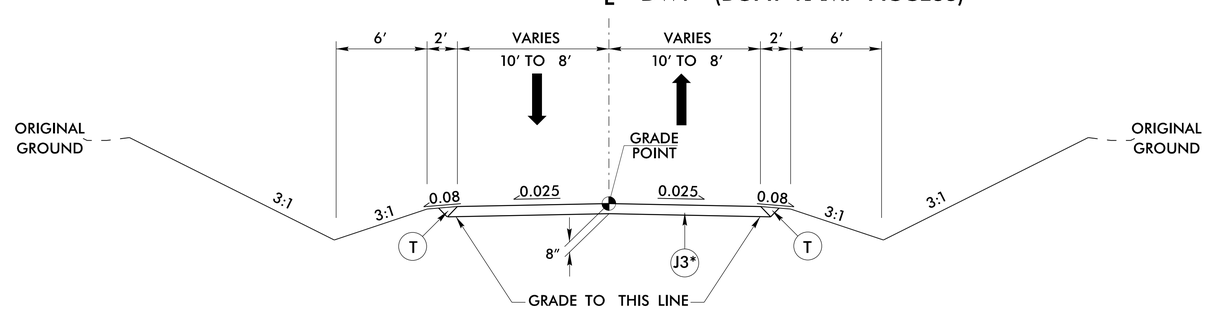


TYPICAL SECTION NO. 7

–L1– STA. 51+89.00 TO –L1– STA. 54+00.00

*6′ FULL DEPTH PAVED SHOULDER PROPOSED IN AREAS WITH GUARDRAIL ONLY

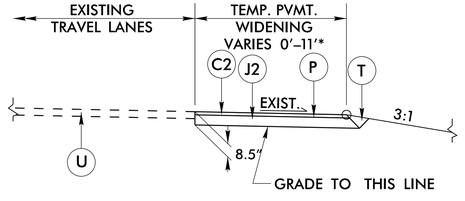
**ROCK PLATING PROPOSED FOR ALL SLOPES STEEPER THAN 3:1



TYPICAL SECTION NO. 8

–DW1– STA. 10+63.79 TO –DW1– STA. 14+37.00

*USE PAVEMENT DESIGN FROM –L– FOR –DW1– STA. 10+11.00 TO 10+63.79



TEMPORARY WIDENING DETAIL A

–L– STA. 49+14± TO –L– STA. 54+67+/– RT

* WIDTH INCLUDES 2′ PAVED SHOULDER

PROJECT REFERENCE NO.	SHEET NO.
B-4484	2A-3

ROADWAY DESIGN ENGINEER

PROFESSIONAL SEAL 030952 ENGINEER JENNIFER D. FAINO

3/27/2020

PAVEMENT DESIGN ENGINEER

PROFESSIONAL SEAL 029896 ENGINEER MARK T. MORRISON

3/27/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H

NC FIRM LICENSE No: F-0493

PROJECT REFERENCE NO.	SHEET NO.
B-4484	2C-1

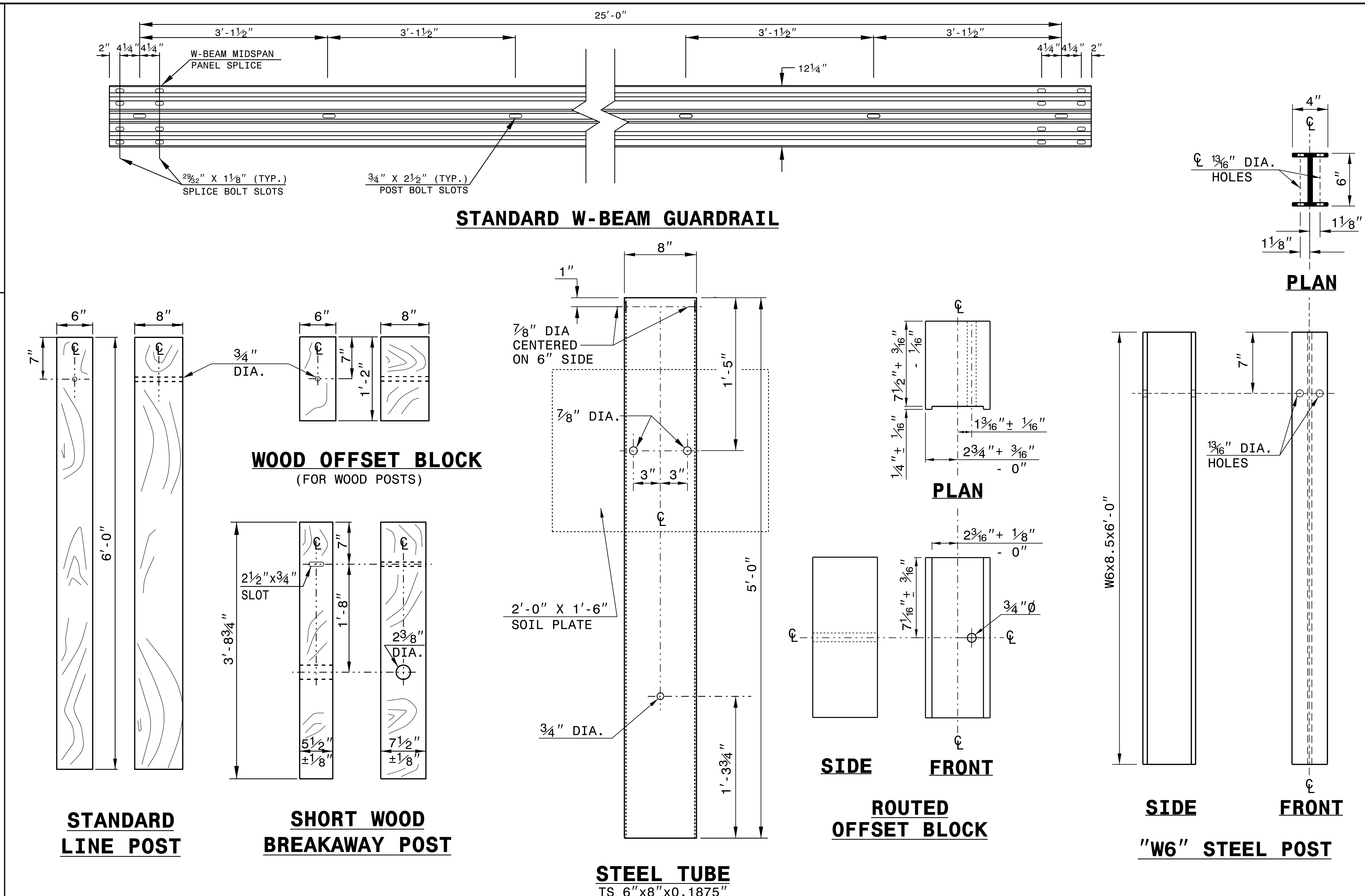
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8

862D02



SYSTEM PARTS

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8

862D02

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022865 JOEL S. HOWERTON

3/27/2020

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

SEE TITLE BLOCK

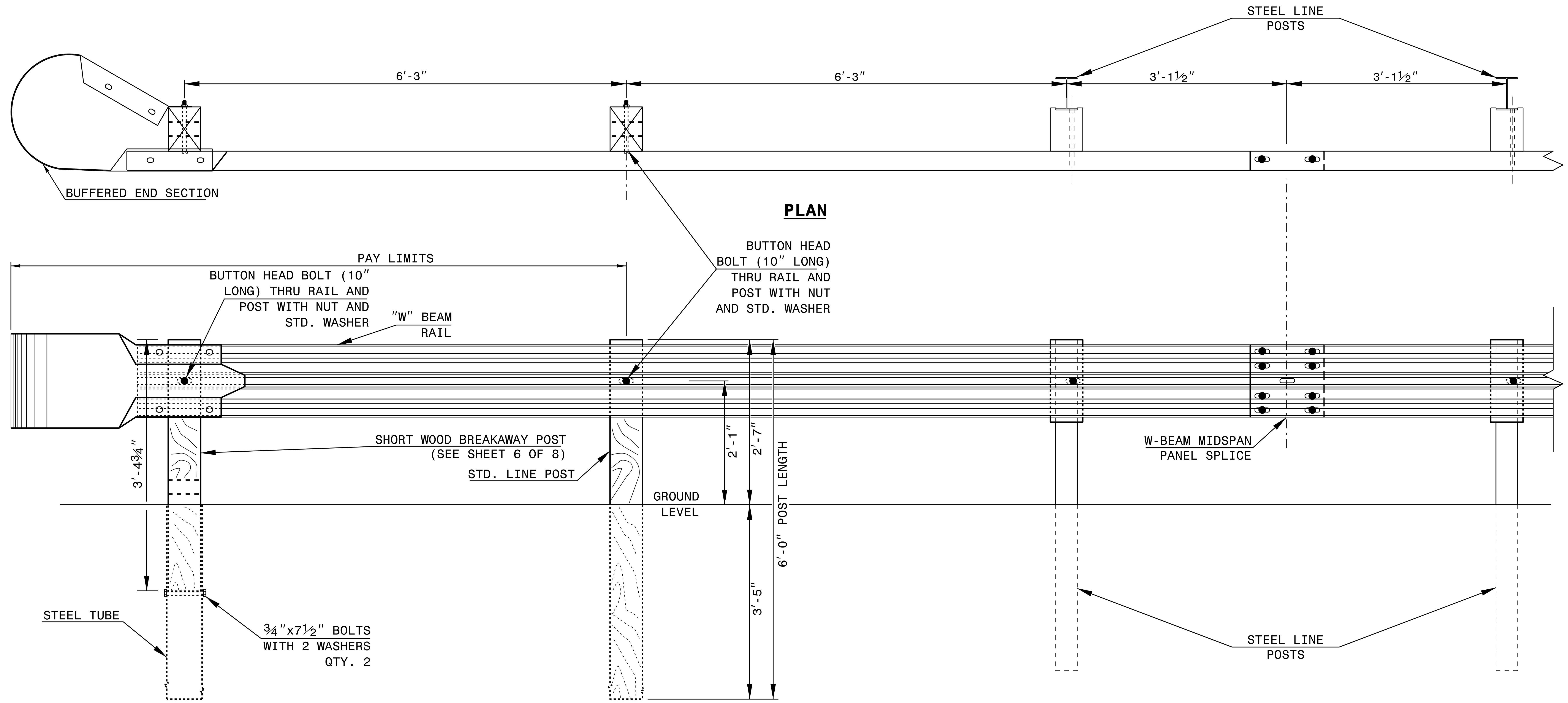
ORIGINAL BY: J.HOWERTON DATE: 3-7-2018
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

PROJECT REFERENCE NO.	SHEET NO.
B-4484	2C-2

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF



TRAILING END UNIT ASSEMBLY

A.T.-1 SYSTEM

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF

NORTH CAROLINA PROFESSIONAL SEAL 029946 ENGINEER JOEL S. HOWERTON

3/27/2020

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

A.T.-1 SYSTEM

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

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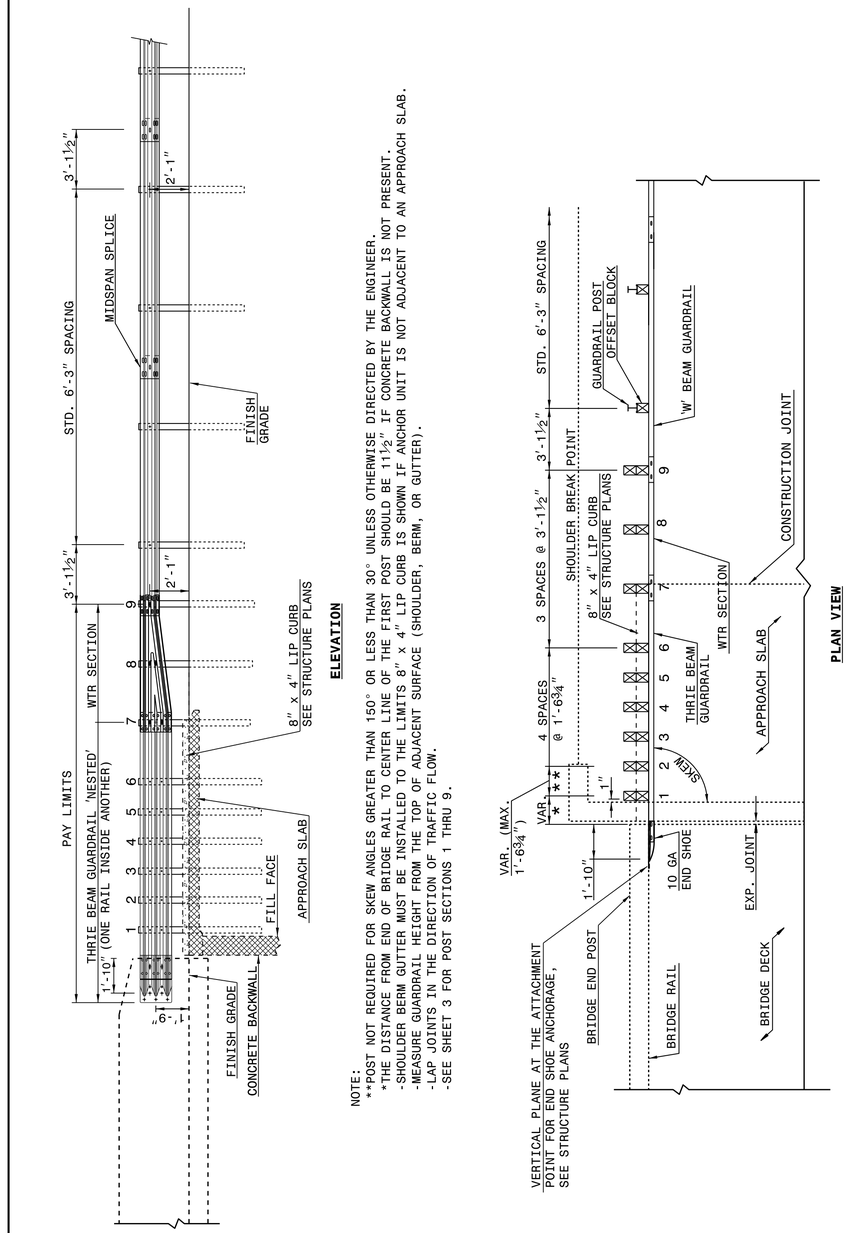
PROJECT REFERENCE NO.	SHEET NO.
B-4484	2C-3

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

ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7
862D03



ELEVATION

PLAN VIEW

NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.

GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

3/27/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

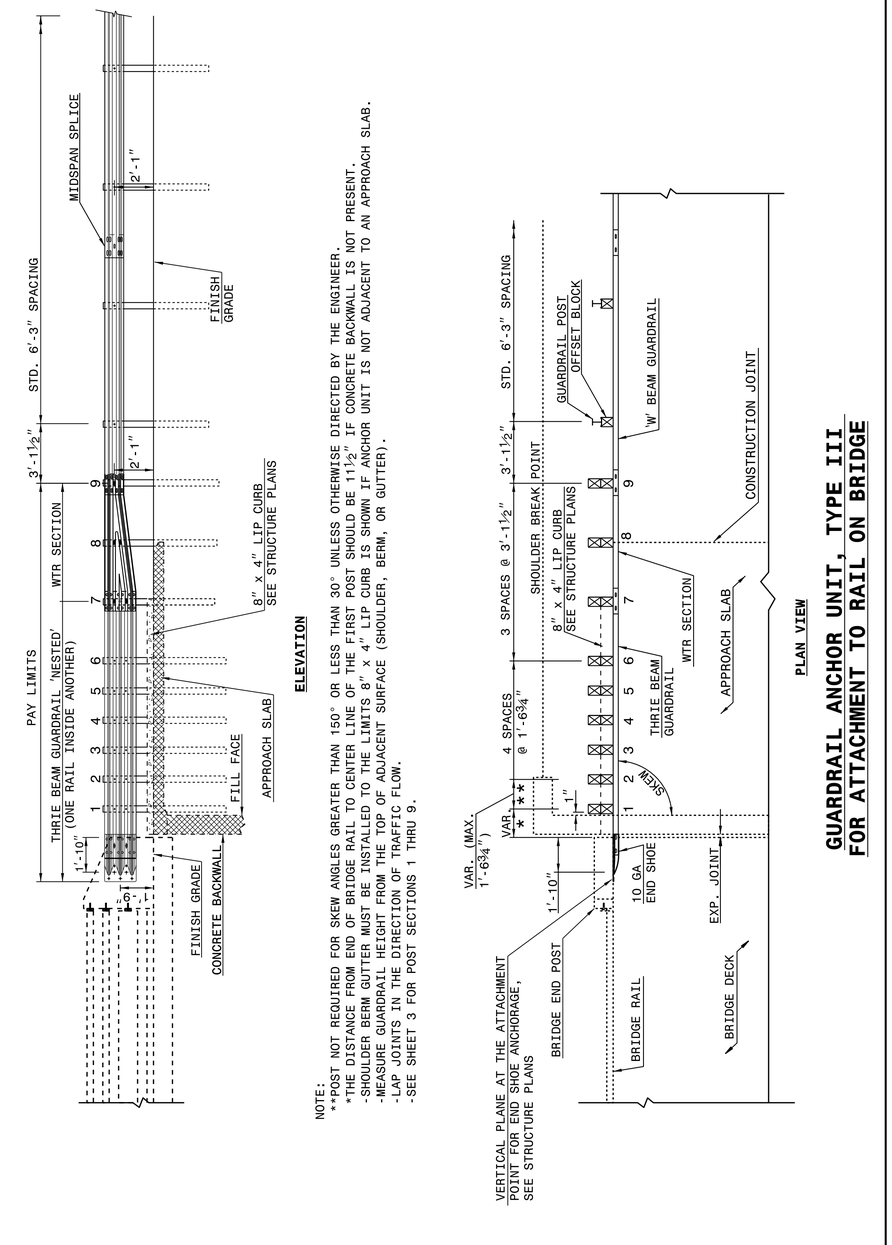
SEE TITLE BLOCK

ORIGINAL BY: J HOWERTON DATE: 06-22-12
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

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

ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7
862D03



ELEVATION

PLAN VIEW

NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.

GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

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

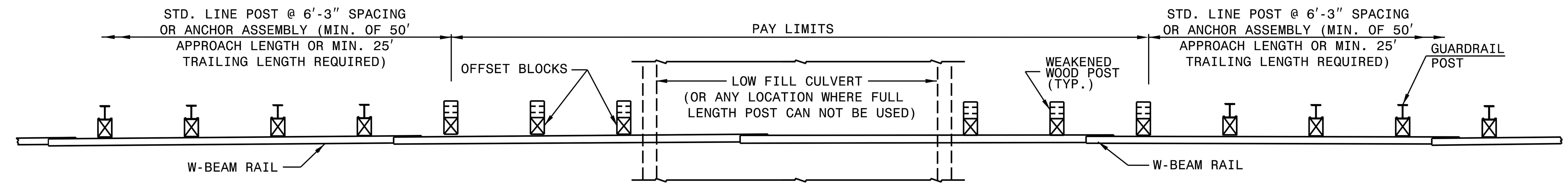
ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 1 OF 7
862D03

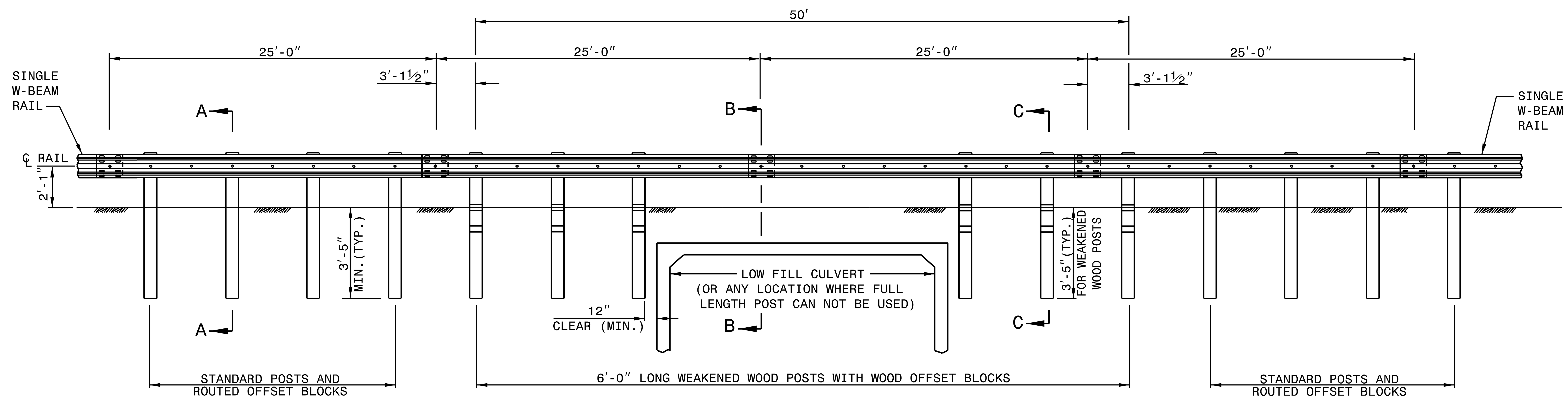
PROJECT REFERENCE NO.	SHEET NO.
B-4484	2C-4

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

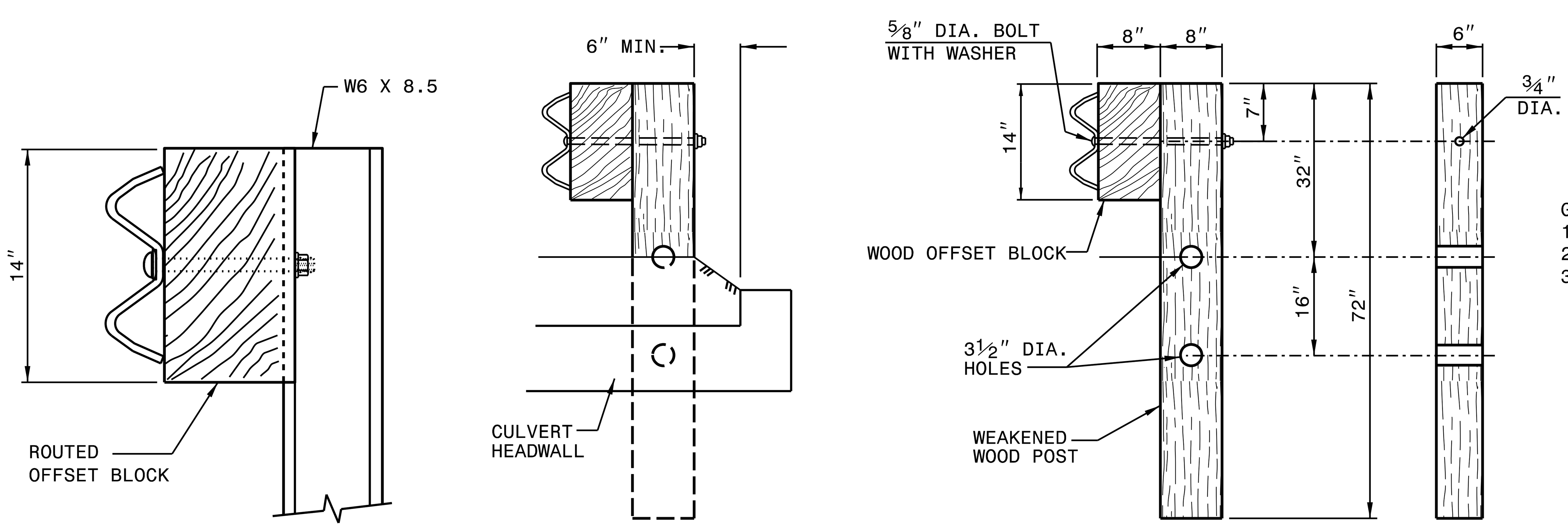
SPECIAL DETAIL FOR
GUARDRAIL PLACEMENT
25'-0" CLEAR SPAN



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

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

SHEET - OF -
862D01

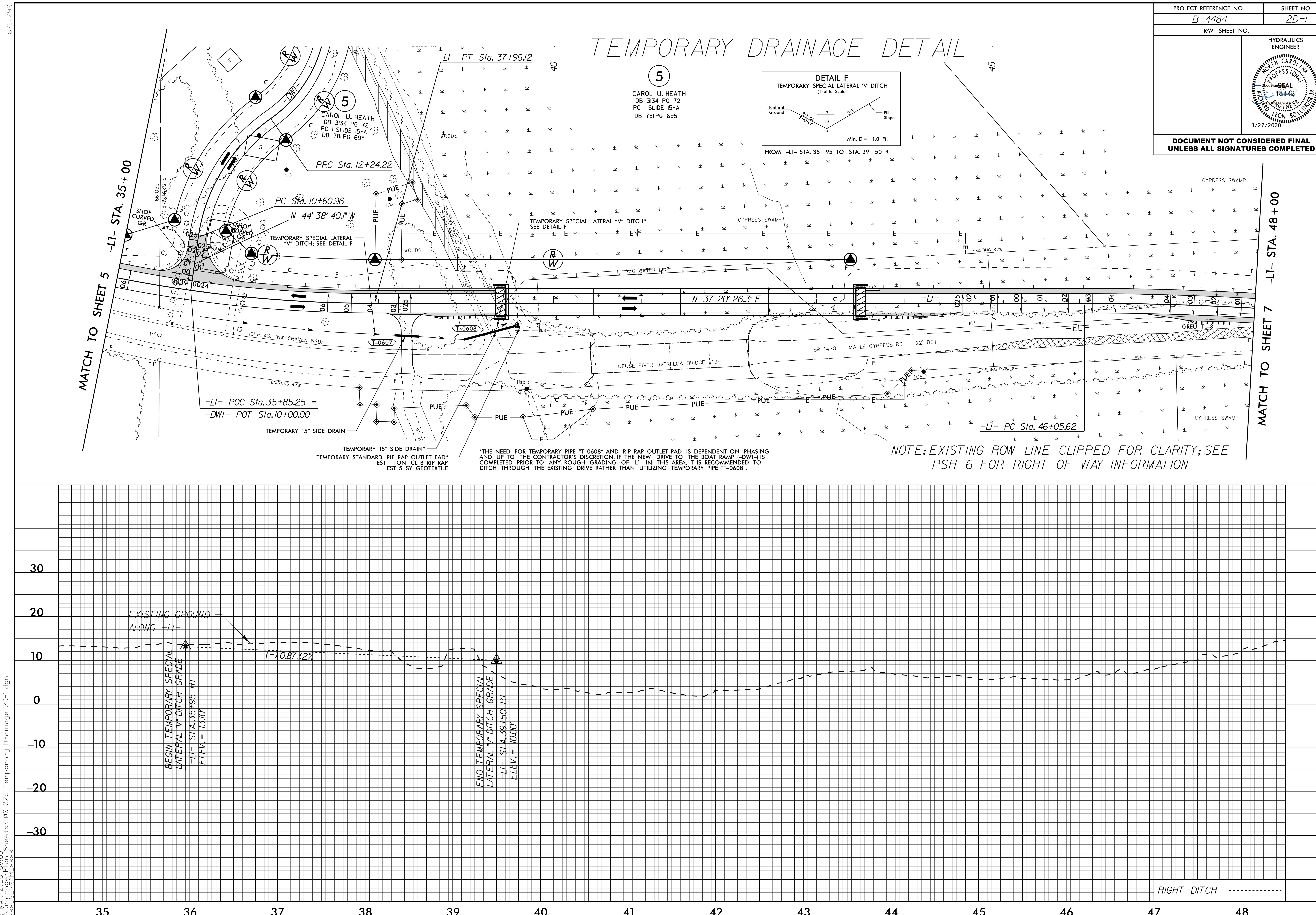
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022003 JOEL S. HOWERTON
3/27/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACTS STANDARDS AND DEVELOPMENT UNIT
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.:______



REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-4484	2D-2

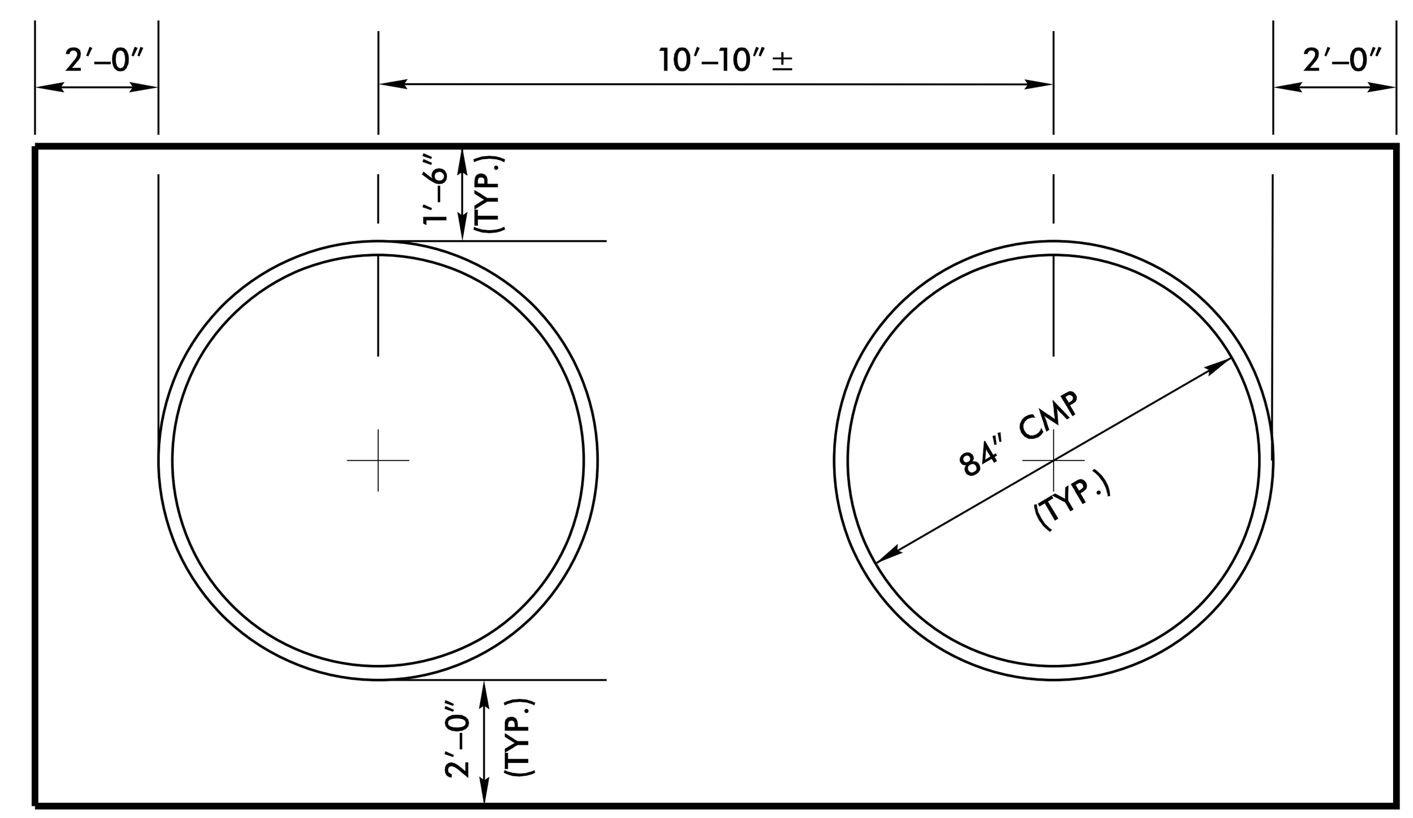
R/W SHEET NO.

HYDRAULICS ENGINEER

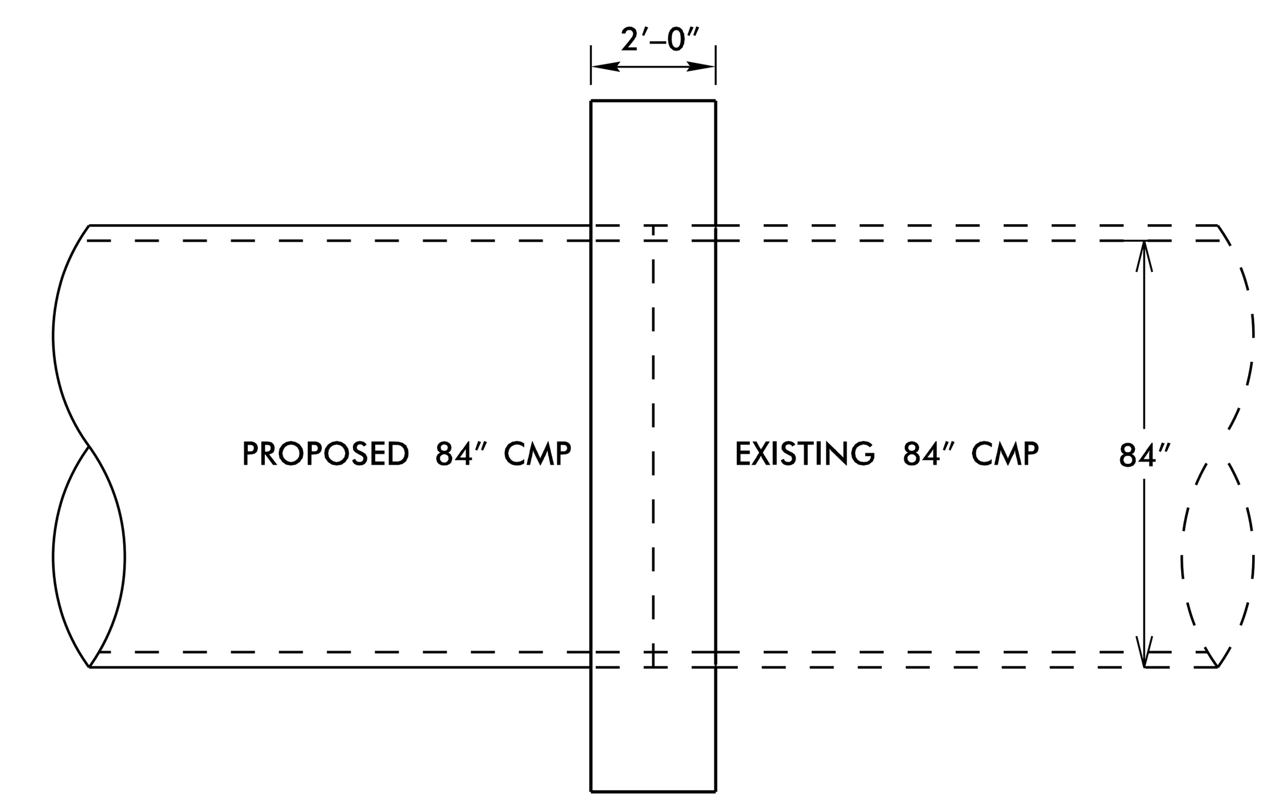
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18442 RICHARD LEON BOLLINGER JR.

3/27/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



ELEVATION



SIDE ELEVATION

D	CU. YD.
84"	4.2790

GENERAL NOTES:

USE PIPE COLLAR FOR EXTENDING EXISTING DUAL 84" CMP'S AT STA. -L1- 48+84.15.

CONSTRUCT THE PIPE COLLAR WITH CLASS "B" OR BETTER CONCRETE.

OBSERVE ALL REQUIREMENTS OF SECTION 840 OF THE STANDARD SPECIFICATIONS.

84" DUAL CMP PIPE COLLAR

TIP NO.:	B-4484	COUNTY:	CRAVEN
DESIGNED BY:	ABN		
CHECKED BY:	RLB	DATE:	10/14/2019

REVISIONS

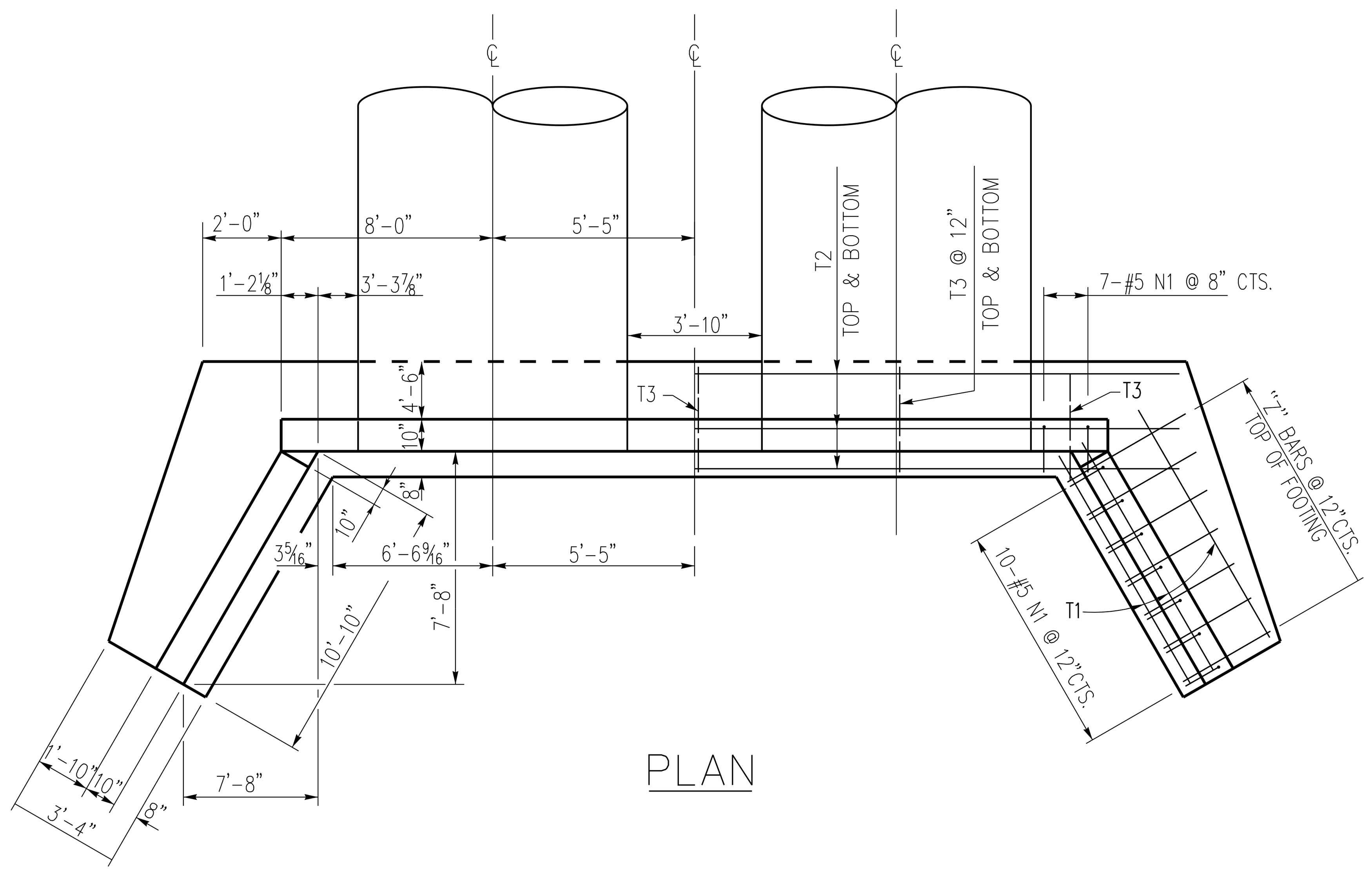
PROJECT REFERENCE NO.	SHEET NO.
B-4484	2D-3
R/W SHEET NO.	

HYDRAULICS ENGINEER

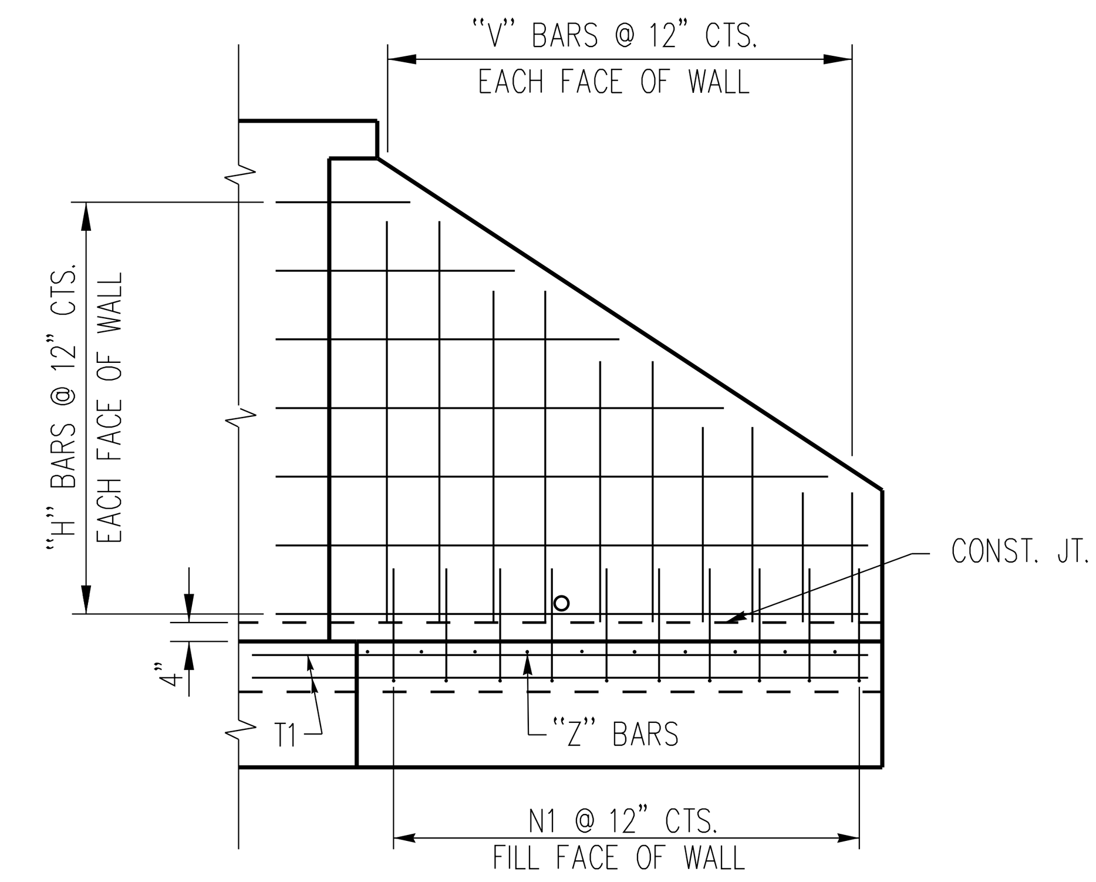
NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD LEON BOLLINGER, JR.
3/27/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HEADWALL DETAIL



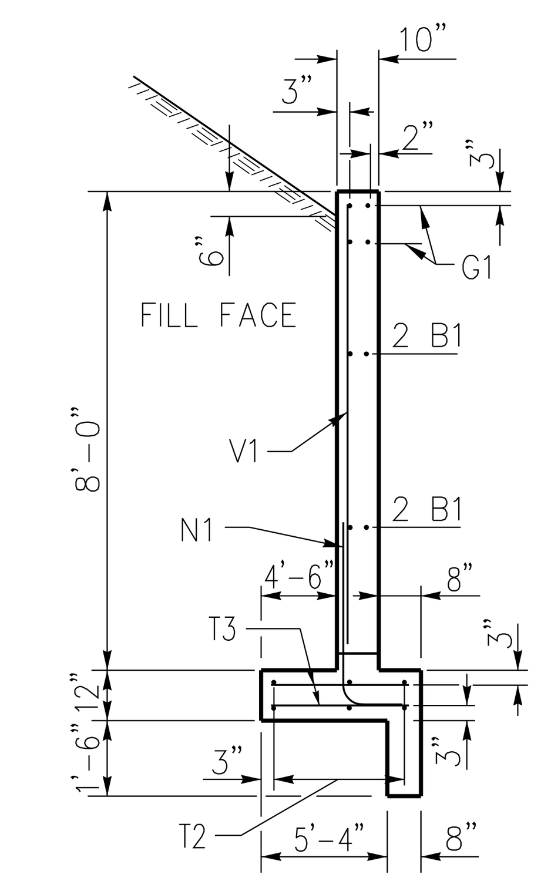
PLAN



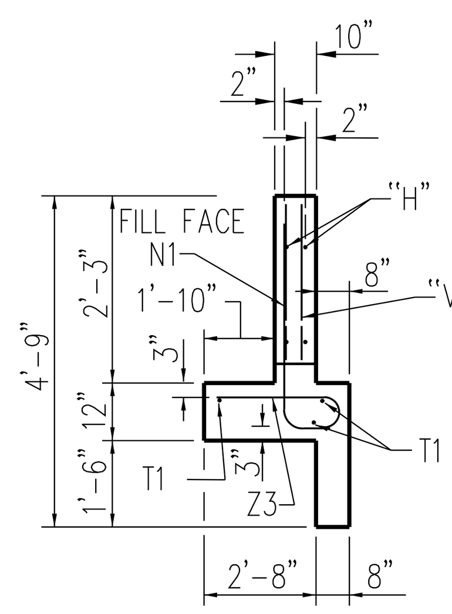
ELEVATION OF WING SHOWING REINFORCEMENT

DESIGN DATA

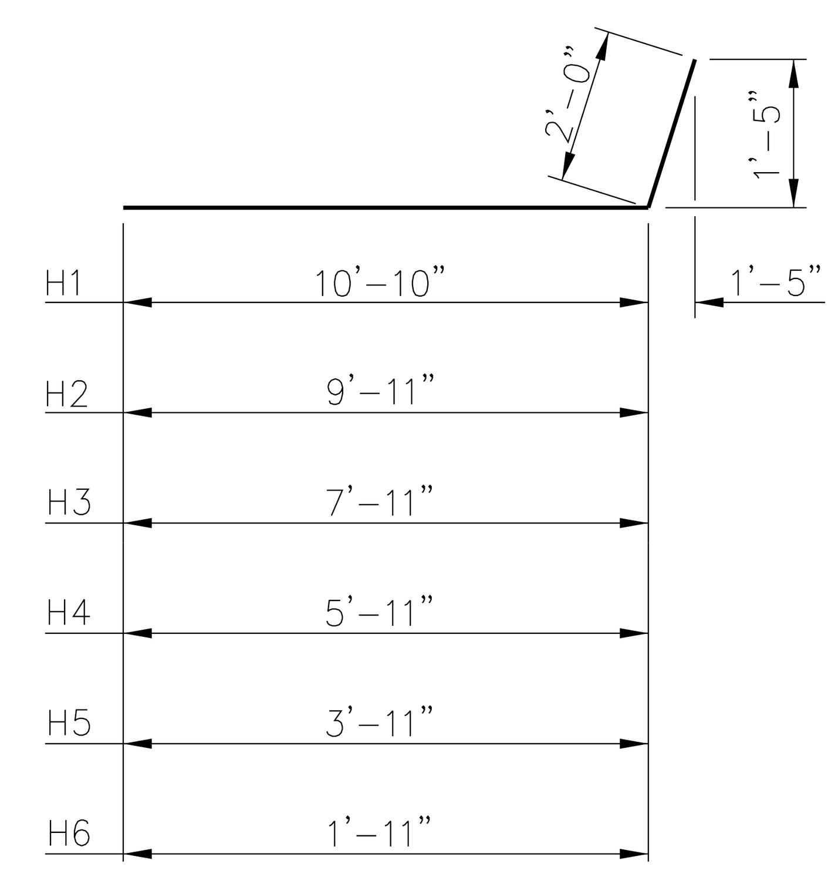
Specifications	A.A.S.H.T.O.
Steel in tension	20,000 LBS. PER SQ.IN.
Concrete in compression	1,200 LBS. PER SQ.IN.
Shear Class "A" Concrete	SEE A.A.S.H.T.O.
Equiv. fluid pressure of earth	30 LBS.PER CU. FT.



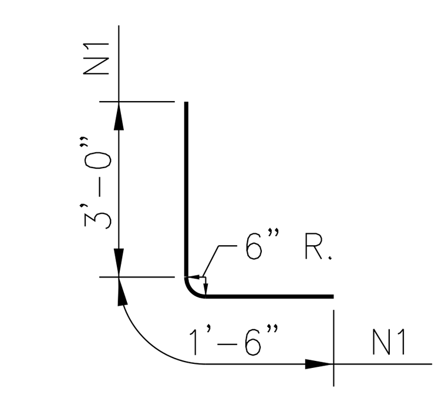
SECTION A-A FOR ALL ENDWALLS



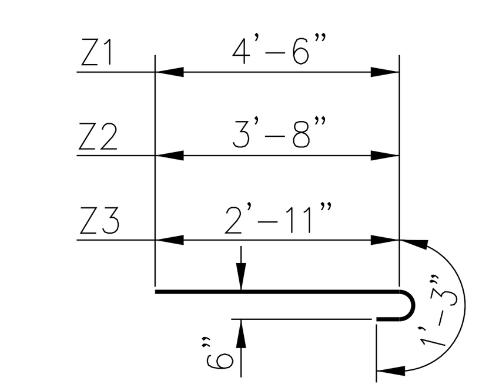
END OF WING



"H" BARS

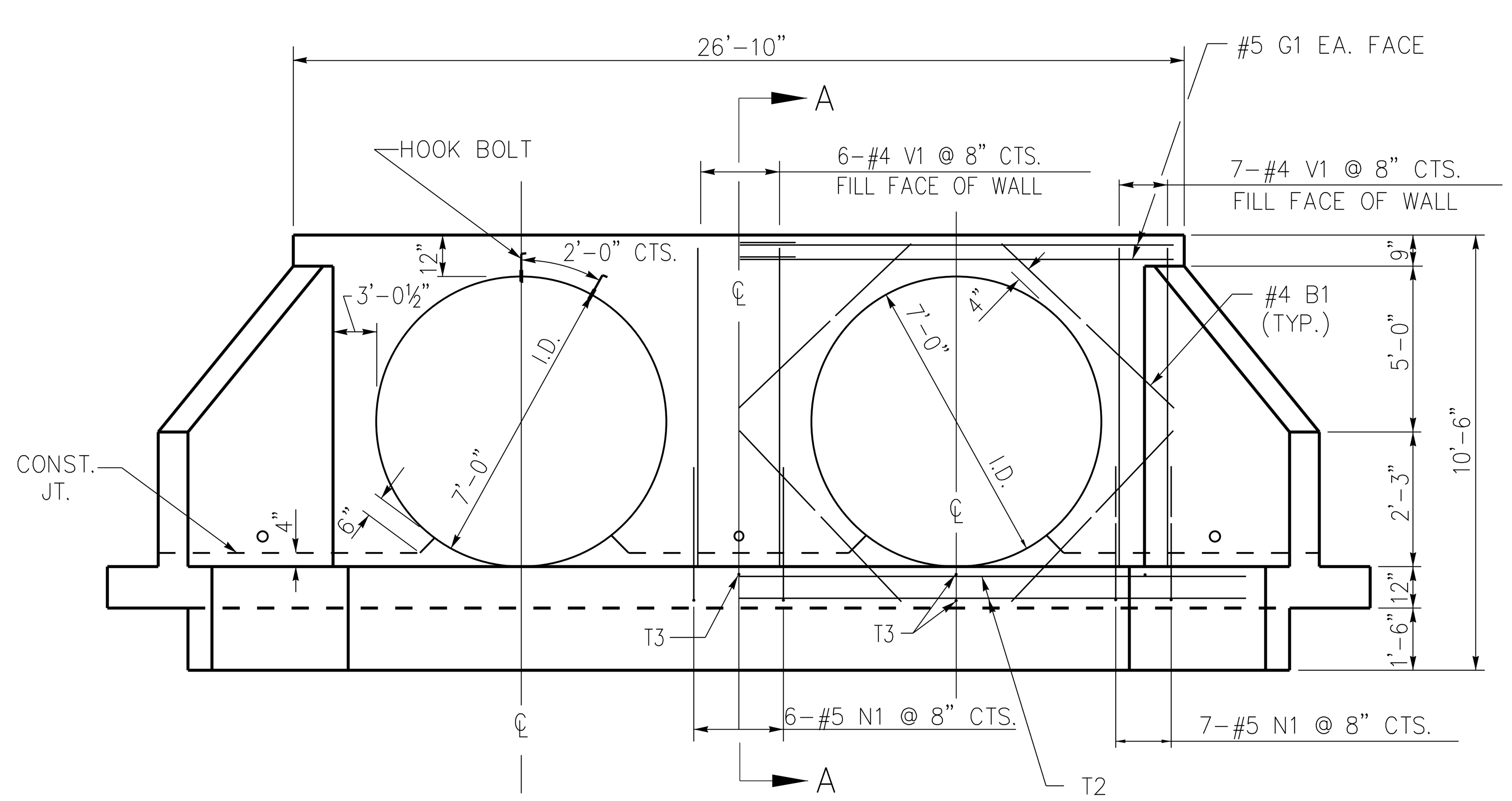


BARS N1



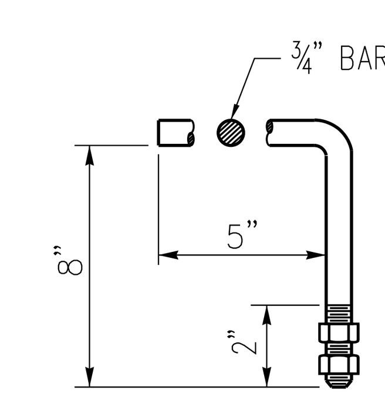
BARS Z1-Z2-Z3

BILL OF MATERIAL				
ENDWALL				
REINF. STEEL			2 PIPES	
BAR	SIZE	LENGTH	NO.	WEIGHT
B1	#4	7'-0"	16	75
G1	#5	14'-5"	8	120
H1	#4	12'-10"	8	69
H2	#4	11'-11"	4	32
H3	#4	9'-11"	4	27
H4	#4	7'-11"	4	21
H5	#4	5'-11"	4	16
H6	#4	3'-11"	4	11
N1	#5	4'-6"	40	188
T1	#4	11'-0"	6	44
T2	#4	16'-3"	6	65
T3	#4	5'-6"	54	198
V1	#4	7'-6"	20	100
V2	#4	5'-9"	8	31
V3	#4	4'-9"	8	25
V4	#4	3'-9"	8	20
V5	#4	2'-9"	8	15
V6	#4	1'-9"	8	9
Z1	#4	5'-9"	8	31
Z2	#4	4'-11"	6	20
Z3	#4	4'-2"	6	17
REINF. STEEL LBS.				1,132
CLASS "A" CONC. CU. YDS				19.1



END ELEVATION

(REINFORCEMENT IS SYMMETRIC ABOUT CENTERLINE OF HEADWALL)



HOOK BOLT

HOOK BOLTS (ANCHORS SHALL BE CONSTRUCTED AT 2'-0" CTS. ALONG THE CIRCUMFERENCE OF THE 7'-0" CSPA. THE HOOK BOLTS SHALL BE EMBEDDED IN THE CONCRETE ENDWALL 8" IN DEPTH. THE GALVANIZED ¾" DIA. HOOK BOLTS MUST MEET ASTM A-307 OR ASTM A-836. BOTH BOLTS AND NUTS MUST BE IN ACCORDANCE WITH ASTM A-153 FOR GALVANIZING.

NOTES:

ALL CONCRETE TO BE CLASS "A".

ALL REINFORCING STEEL SHALL BE ASTMA615-GRADE 60.

ALL REINFORCING STEEL SHALL BE DEFORMED BARS. WHERE SPLICING OF REINFORCMENT IS NECESSARY, BARS ARE TO BE LAPPED 45 DIAMETERS. ALL DIMENSIONS RELATIVE TO REINFORCEMENT ARE TO CENTERS OF BARS.

THE FOOTING, CURTAIN WALL AND 4" OF WALL ARE TO BE POURED IN ONE OPERATION ALLOWING NO TIME FOR INITIAL SET TO TAKE PLACE BETWEEN THEM. THE REMAINING WALL SHALL THEN BE POURED IN ONE OPERATION.

ALL EXPOSED CORNERS ARE TO BE CHAMFERED 1".

3" DIAMETER DRAINS SHALL BE PLACED IN WALL AS SHOWN AND BE 6" ABOVE NORMAL FLOW LINE.

ALL MATERIAL AND WORKMANSHIP AS PER N.C.DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.

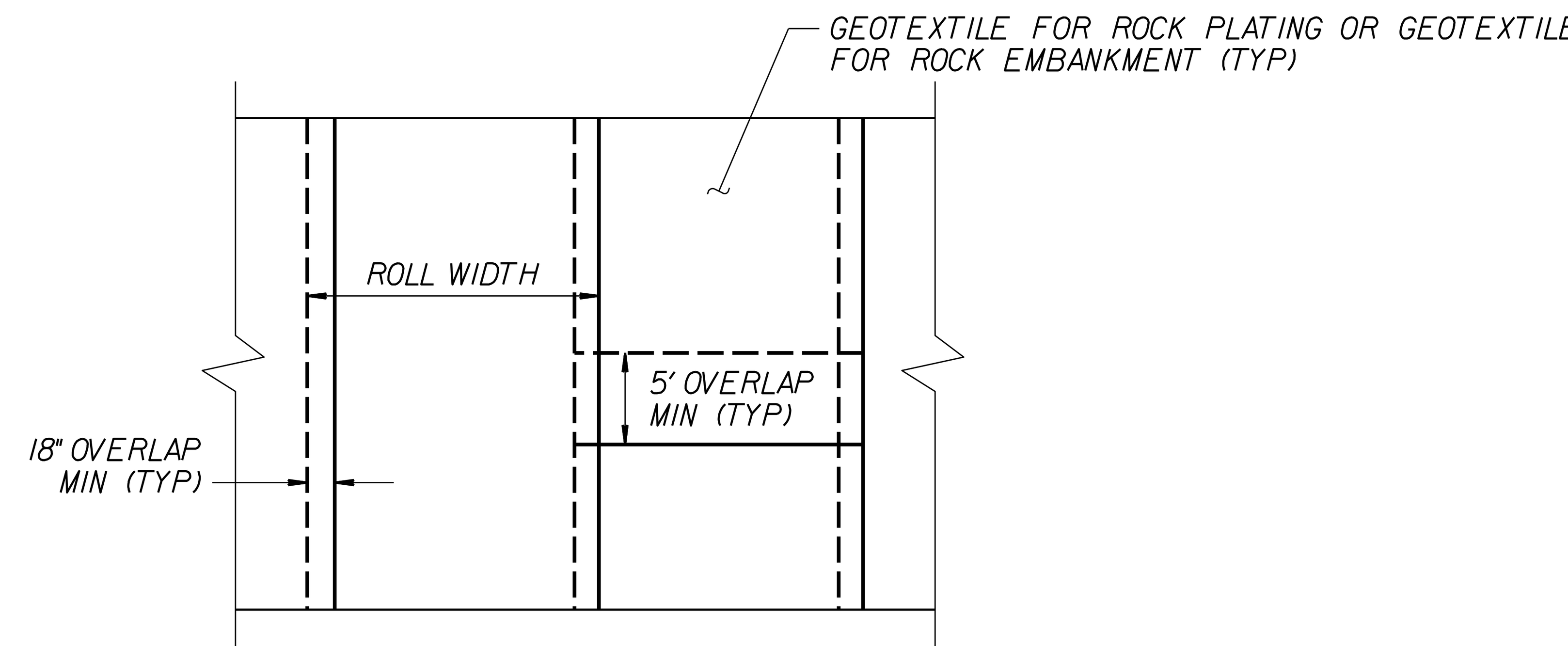
TIP NO.: B-4484	COUNTY: CRAVEN
DESIGNED BY: JMR	
CHECKED BY: RLB	DATE: 10/14/2019

PROJECT REFERENCE NO.	SHEET NO.
B-4484	2G-1

GEOTECHNICAL ENGINEER — SEAL 029147 KRISTEN H. HILL — DocuSigned by: Kristen H. Hill 3/11/2020

ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



GEOTEXTILE OVERLAP DETAIL

(PLAN VIEW)

ROCK EMBANKMENTS

FOR ROCK EMBANKMENTS, SEE ROCK EMBANKMENTS SPECIAL PROVISION

USE ROCK EMBANKMENTS AT FOLLOWING LOCATIONS:

-LINE-	APPROX. BEGINNING STATION	APPROX. ENDING STATION	LOCATION LT/RT
-L-	43+45.00 -L-	50+50.00 -L-	LEFT

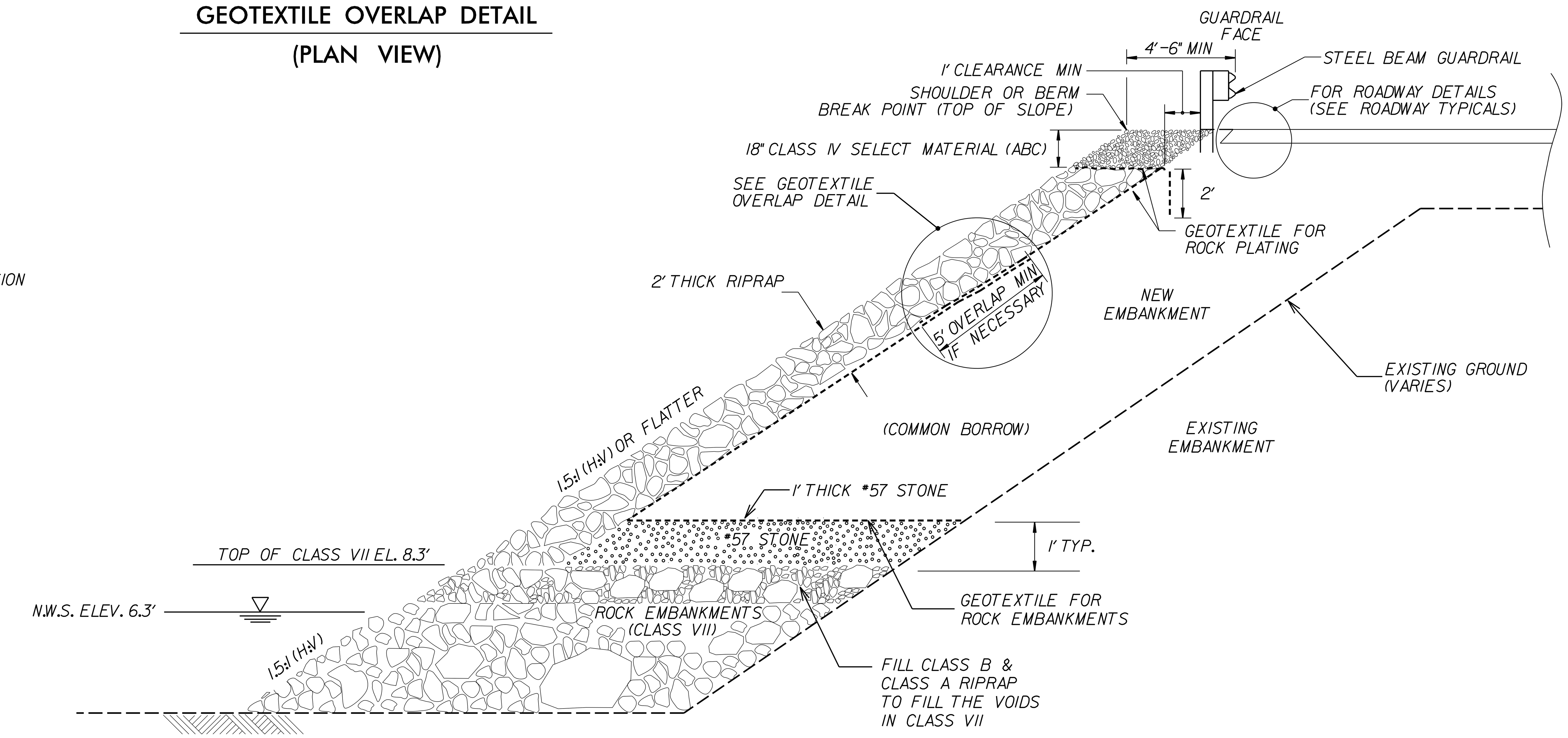
CONSTRUCT ROCK EMBANKMENTS TO THE ELEVATION SHOWN IN THE ROCK EMBANKMENTS / ROCK PLATING DETAIL NO. 1 AND ACCORDING TO THE ROCK EMBANKMENTS SPECIAL PROVISION

FILL VOIDS IN THE TOP OF ROCK EMBANKMENTS WITH CLASS B AND CLASS A RIP RAP

PLACE #57 STONE (SELECT MATERIAL, CLASS VI) UP TO 1 FT. ABOVE ROCK EMBANKMENTS AS SHOWN IN PLAN

CONSTRUCT ROCK PLATING ABOVE ROCK EMBANKMENTS FROM ELEVATION SHOWN IN THE ROCK EMBANKMENTS / ROCK PLATING DETAIL NO. 1 TO THE SHOULDER HINGE POINT AND ACCORDING TO THE ROCK PLATING (SPECIAL) PROVISION.

INSTALL GEOTEXTILE ON TOP OF NO. 57 STONE IN ACCORDANCE WITH THE ARTICLE 270-3 OF THE STANDARD SPECIFICATIONS.



ROCK EMBANKMENTS /ROCK PLATING DETAIL NO. 1 – TYPICAL SECTION

ESTIMATED MATERIAL QUANTITIES FOR ROCK EMBANKMENTS

ROCK EMBANKMENTS (SELECT MATERIAL, CLASS VII) = 3,850 TONS

RIP RAP CLASS A = 375 TONS

RIP RAP CLASS B = 375 TONS

#57 STONE (SELECT MATERIAL, CLASS VI) = 1,100 TONS

GEOTEXTILE FOR ROCK EMBANKMENTS = 2,300 SY

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GEOTECHNICAL ENGINEERING UNIT

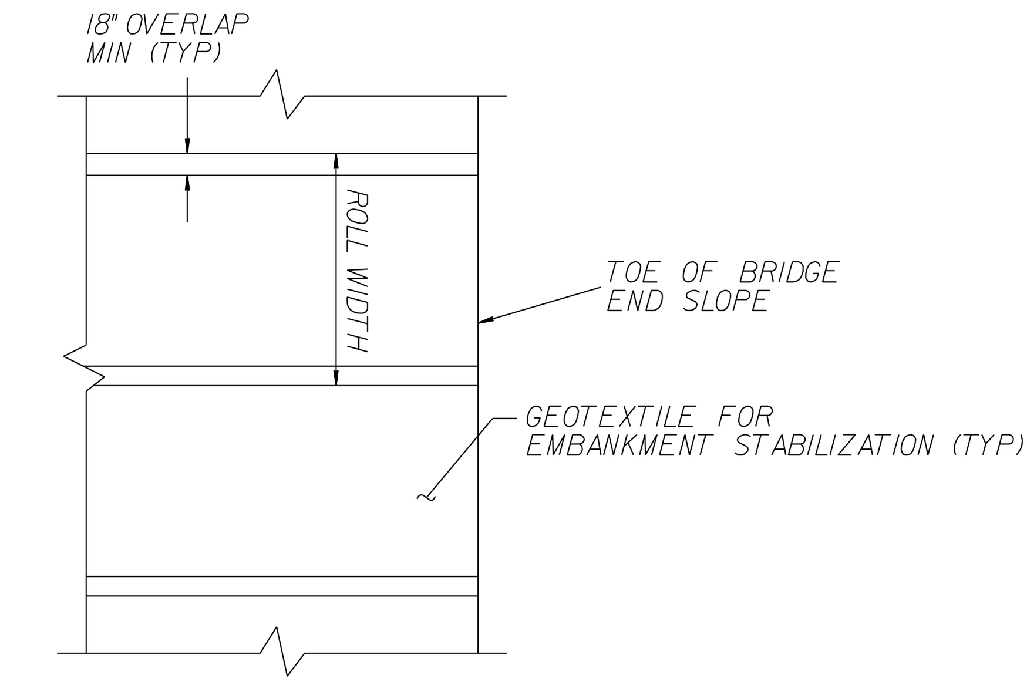
ROCK EMBANKMENTS DETAILS & NOTES

REVISIONS

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

PREPARED BY: J.R. SWARTLEY	DATE: 2/2020
REVIEWED BY: S.S. LANEY	DATE: 2/2020

1. PLACE GEOTEXTILE FOR EMBANKMENT STABILIZATION PARALLEL TO THE CENTERLINE AS SHOWN ON THE CROSS SECTION A-A' AND CORRESPONDING PLAN VIEW.
2. PLACE GEOTEXTILE WITHOUT ANY WRINKLES OR CREASES.
3. NO SEAMS OR JOINTS ARE ALLOWED IN THE MACHINE DIRECTION OF GEOTEXTILE.
4. GEOTEXTILE FOR EMBANKMENT STABILIZATION SHEETS MUST HAVE A CONTINUOUS LENGTH AS SHOWN ON THE CROSS SECTION A-A'.
5. THE TERMS ROLL AND MACHINE DIRECTION ARE USED INTERCHANGEABLY.
6. ALL JOINTS IN THE CROSS MACHINE DIRECTION MUST BE OVERLAPPED A MINIMUM OF 18 INCHES.
7. FOR GEOTEXTILE FOR EMBANKMENT STABILIZATION, SEE GEOTEXTILE FOR EMBANKMENT STABILIZATION SPECIAL PROVISION.

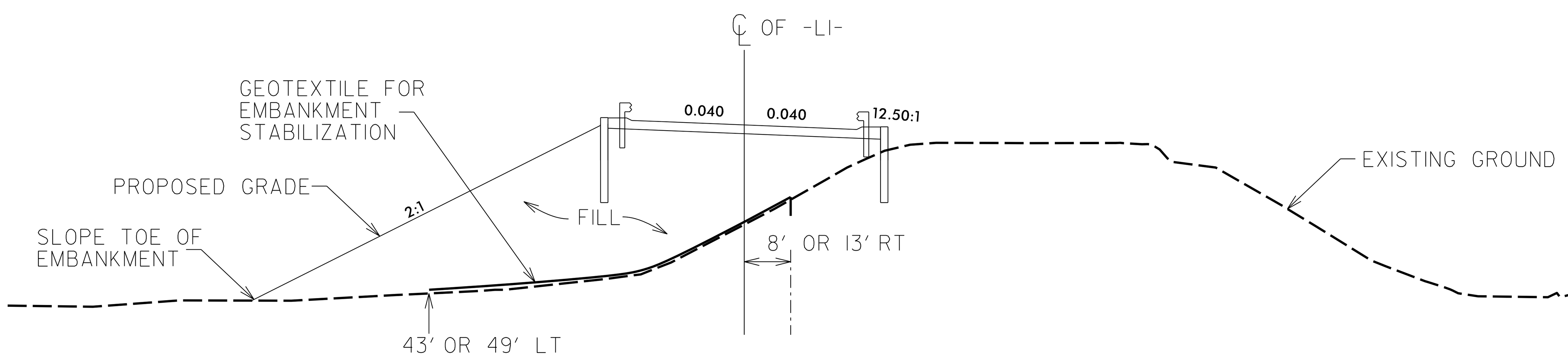


GEOTEXTILE OVERLAP DETAIL
(PLAN VIEW)

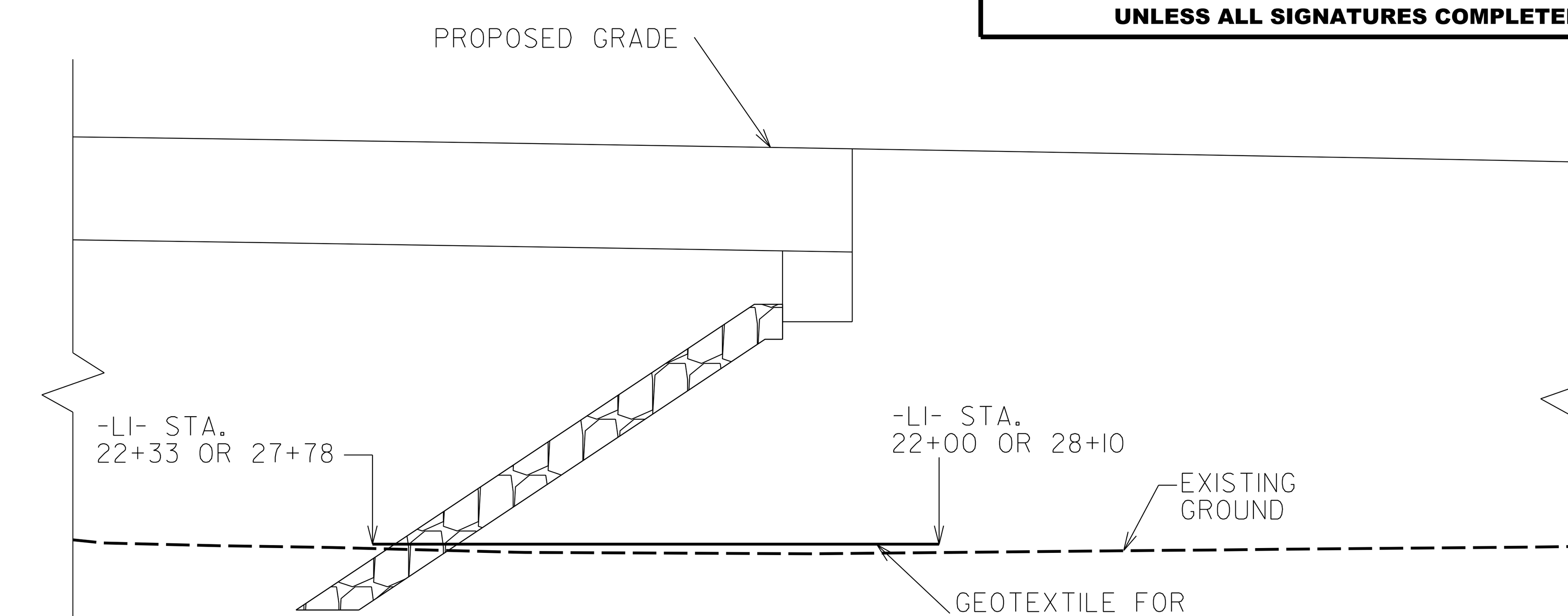
PROJECT REFERENCE NO.	SHEET NO.
B-4484	2G-2

GEOTECHNICAL ENGINEER — SEAL 029147, KRISTEN H. HILL, PROFESSIONAL ENGINEER, NORTH CAROLINA
DocuSigned by: Kristen H. Hill — 11/4/2019
ENGINEER
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



CROSS SECTION A-A'
N.T.S. (TYP.)



PROFILE B-B'
N.T.S. (TYP.)

PLAN VIEW FOR LIMITS OF GEOTEXTILE

AREA OF GEOTEXTILE FOR EMBANKMENT STABILIZATION - MACHINE DIRECTION PARALLEL TO CENTERLINE

PREPARED BY: S. SPRADLIN	DATE: 10/2019
REVIEWED BY: S. LANEY	DATE: 10/2019

3201 SPRING FOREST ROAD
RALEIGH, NC 27616
(919) 872-2660

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DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

GEOTEXTILE FOR EMBANKMENT STABILIZATION DETAILS
(-LI- 22+00 - 22+33)
(-LI- 27+78 - 28+10)

REVISIONS

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

PROJECT REFERENCE NO.	SHEET NO.
B-4484	2G-3

GEOTECHNICAL ENGINEER — SEAL 029147, NORTH CAROLINA PROFESSIONAL ENGINEER, KRISTEN H. HILL — DocuSigned by: Kristen H. Hill 12/2/2019

ENGINEER

SIGNATURE DATE SIGNATURE DATE

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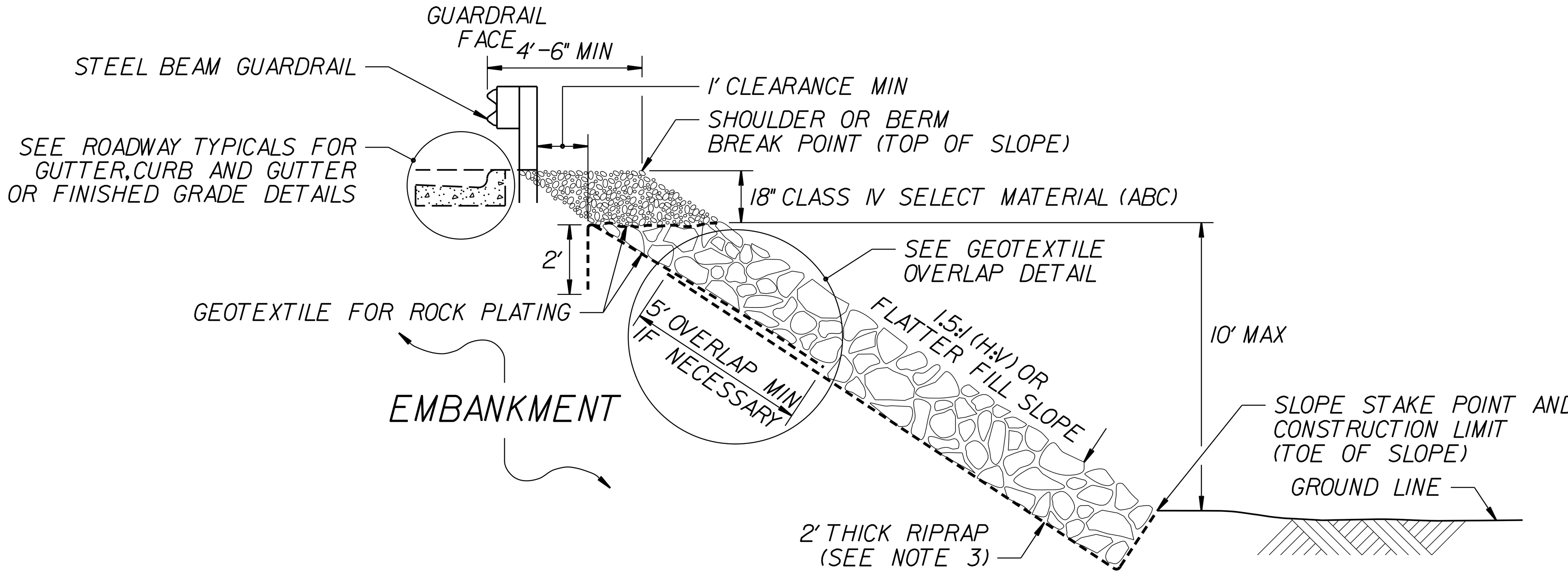
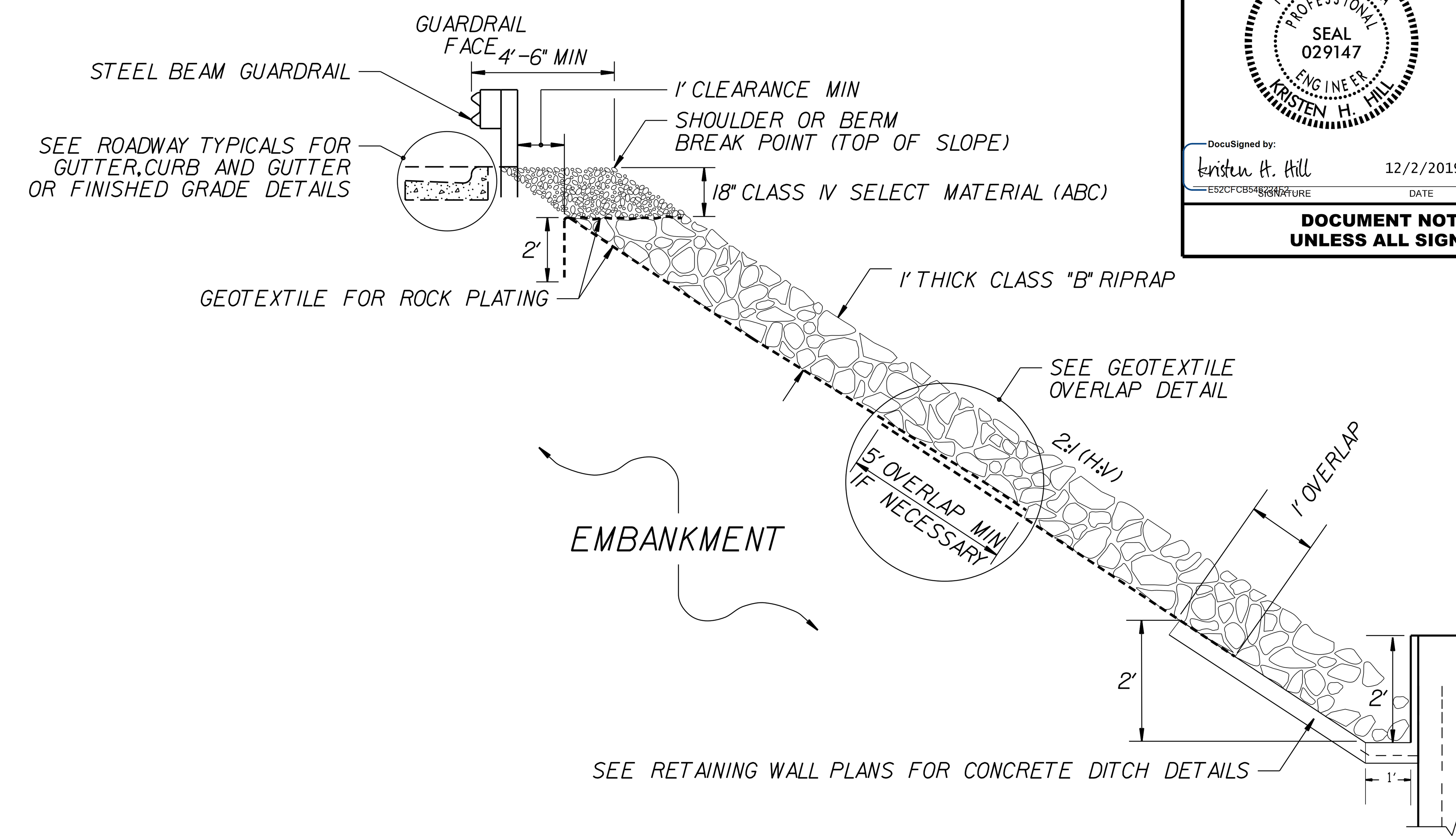
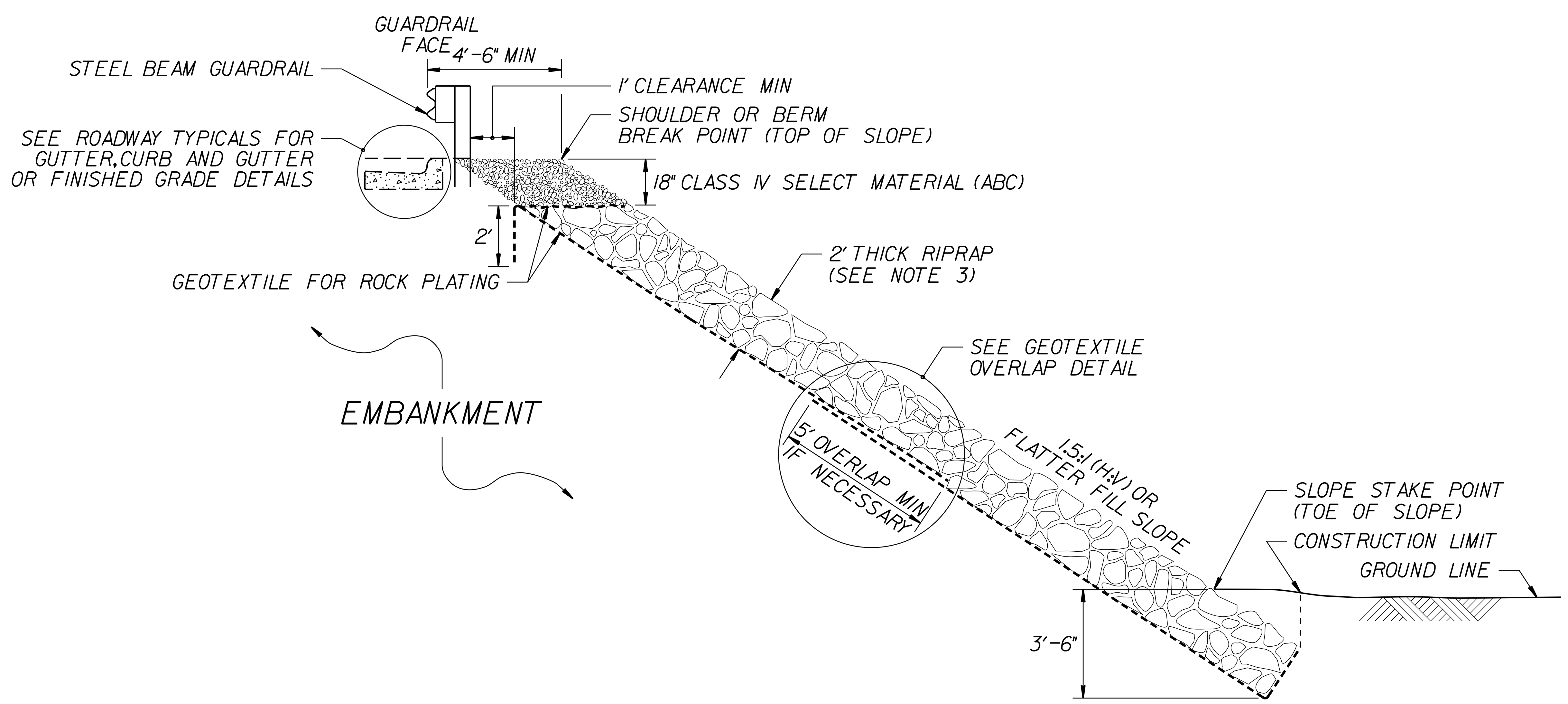


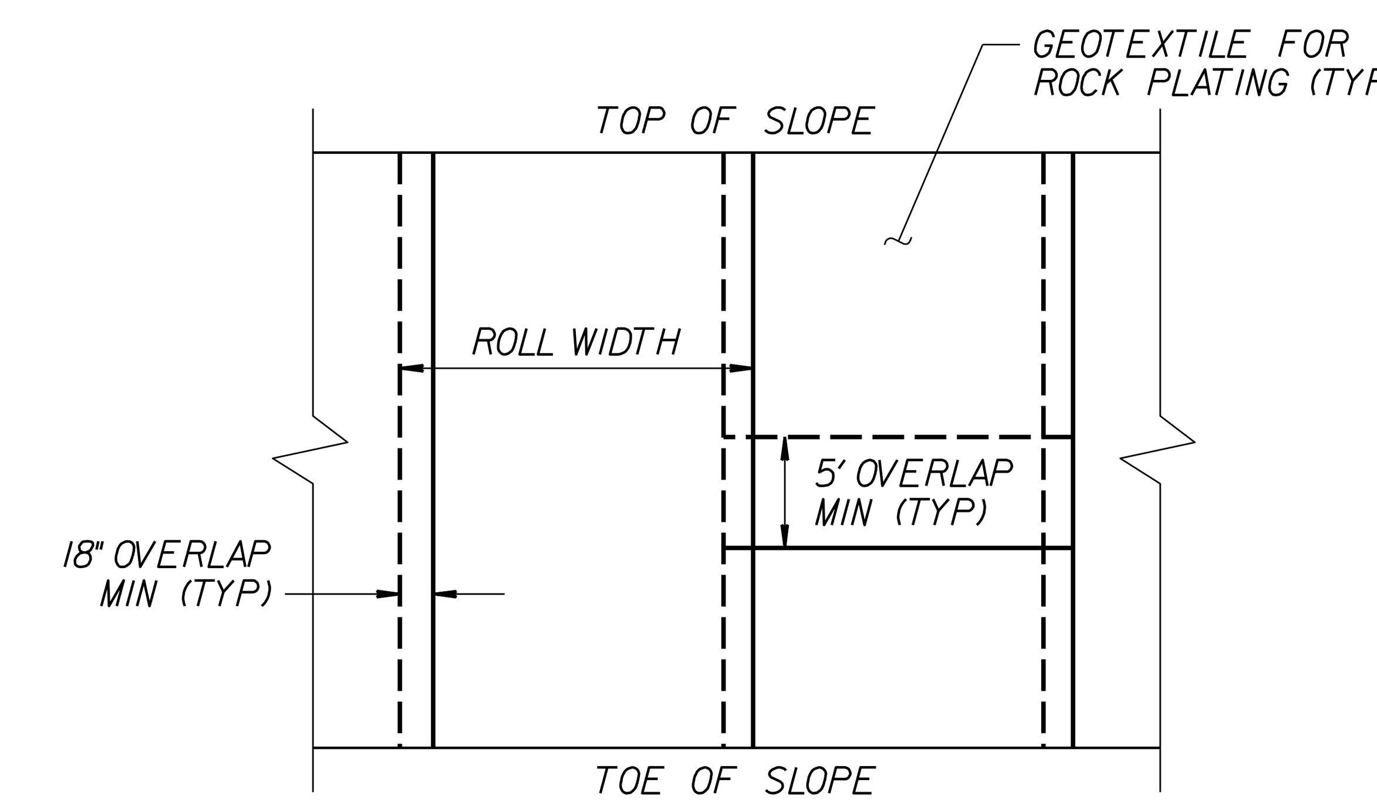
ROCK PLATING DETAIL NO. 1 – TYPICAL SECTION



ROCK PLATING DETAIL NO. A – TYPICAL SECTION



ROCK PLATING DETAIL NO. 2 – TYPICAL SECTION



GEOTEXTILE OVERLAP DETAIL

(PLAN VIEW)

NOTES:

1. SEE ROADWAY PLANS AND SUMMARY SHEETS FOR ROCK PLATING LOCATIONS.
2. FOR ROCK PLATING, SEE ROCK PLATING (SPECIAL) PROVISION.
3. USE CLASS 1,2 OR B RIPRAP UNLESS REQUIRED OTHERWISE IN THE ROADWAY SUMMARY SHEET (3G-1).

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DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SPECIAL ROCK PLATING DETAILS

PREPARED BY: J.R. SWARTLEY	DATE: 10/2/19
REVIEWED BY: S.S. LANEY	DATE: 10/2/19

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	KRISTEN H. HILL	11/19/19	3		
2			4		

PROJECT REFERENCE NO.	SHEET NO.
B-4484	2G-4

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden 2/27/2020
F760CAEB96FC4D3...
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

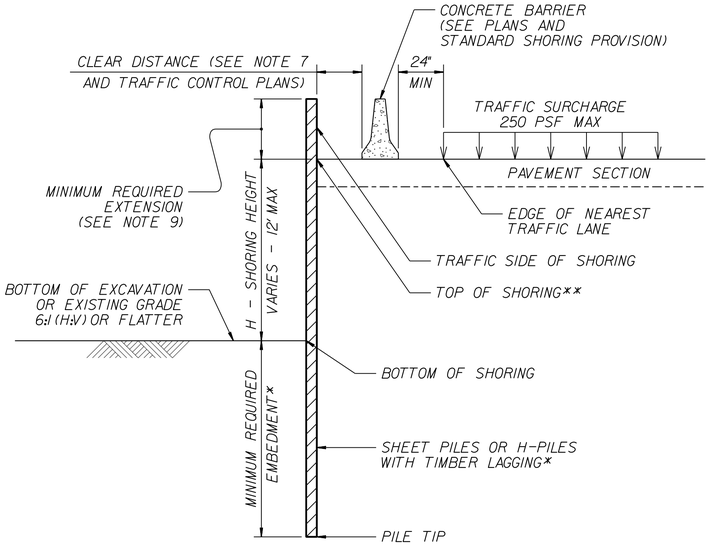
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS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

MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS

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

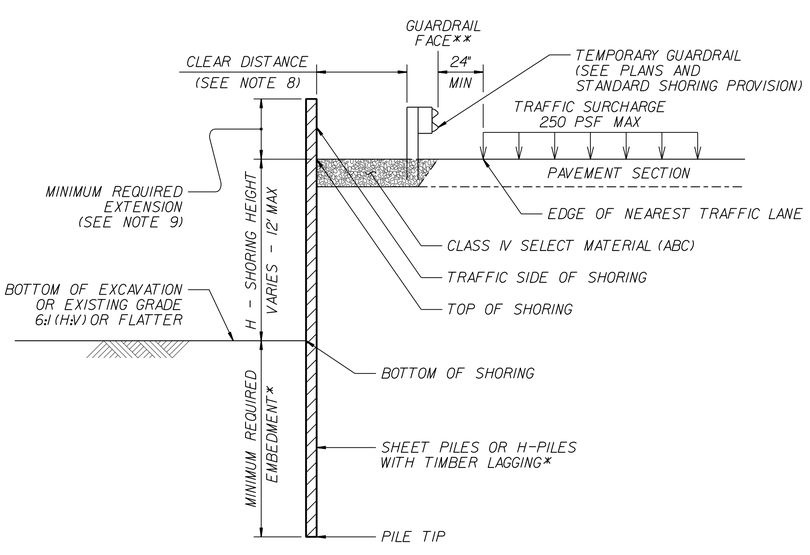
NOTES:

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



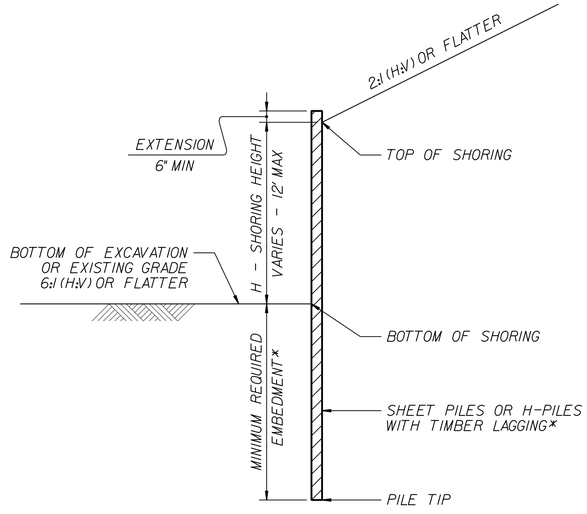
CONCRETE BARRIER

**TOP OF SHORING = EDGE OF PAVEMENT



TEMPORARY GUARDRAIL

**GUARDRAIL FACE = EDGE OF PAVEMENT



STANDARD TEMPORARY SHORING

(SLOPE CASE)
*SEE TABLE ABOVE.

STANDARD TEMPORARY SHORING

(SURCHARGE CASE)
*SEE TABLE ABOVE.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.01

STANDARD TEMPORARY SHORING

DATE: 11-19-13

12/06/07

COMPUTED BY: ANK DATE: 3/20/2020
CHECKED BY: DDM DATE: 3/20/2020

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-4484	3B-1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SUMMARY OF EARTHWORK

IN CUBIC YARDS

STATION	STATION	UNCL. EXCAV.	UNDERCUT	EMBANK. +%	BORROW	WASTE
PHASE I AND II						
–L1– 17+00.00	–L1– 22+05.00	168	342	6,302	6,134	342
–L1– 28+10.00	–L1– 39+45.00	139	3,395	30,107	29,968	3,395
–L1– 43+46.00	–L1– 54+50.00	155		13,329	13,174	0
–EL– 49+50.00	–EL– 54+50.00	36		636	600	0
–DW1– 10+11.00	–DW1– 14+37.00	1,097		21	0	1,076
REMOVE EXISTING DRIVEWAY		90		0	0	90
SUBTOTALS:		1,685	3,737	50,395	49,876	4,903
PHASE III						
–L1– 17+00.00	–L1– 21+50.00	68		118	50	0
–L1– 47+00.00	–L1– 54+00.00	56		402	346	0
SUBTOTALS:		124		520	396	0
EROSION CONTROL – FINAL GRADING						
–L1– 21+00.00	–L1– 22+06.00	394		18	0	376
–L1– 27+50.00	–L1– 40+00.00	2,233		4,147	1,914	0
–L1– 42+50.00	–L1– 47+50.00	2,170		517	0	1,653
SUBTOTALS:		4,797		4,682	1,194	2,029
TOTALS:		6,606	3,737	55,597	52,186	6,932
MATERIAL FOR SHOULDER CONSTRUCTION				234	234	
ADDITIONAL UNDERCUT			450	585	585	450
WASTE IN LIEU OF BORROW					–3,195	–3,195
PROJECT TOTALS:		6,606	4,187	56,416	49,810	4,187
EST. 5% TO REPLACE SOIL IN BORROW PIT					2,491	
GRAND TOTALS:		6,606	4,187	56,416	52,301	4,187
SAY:		6,940	4,250		54,920	

EST 130 CY DDE (FROM HYDRO)

Approximate quantities only. Unclassified excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the lump sum price for "Grading".

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH (LF)
–L1– LT	19+34.03	21+95.13	261.10
–L1– RT	20+48.75	21+95.04	146.29
–L1– LT	28+15.08	34+10.85	595.77
–L1– RT	28+18.95	29+74.49	155.54
–L1– LT	36+95.00	39+33.83	238.83
–L1– LT	43+56.17	43+72.17	16.00
		TOTAL:	1,413.53
		SAY:	1,414

PAVEMENT REMOVAL

LINE	STATION	STATION	LOCATION	AREA	SQUARE YARDS
–L1–	17+00	22+08	RT	14,582.65	1,620.29
–L1–	27+95	40+43	RT	28,940.96	3,215.66
–L1–	42+22	49+87	RT	21,800.08	2,422.23
–L1–	49+14	54+60	RT	4,328.65	480.96
				TOTAL:	7,739.15
				SAY:	7,740

"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

TEMPORARY GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU TL–3	GRAU TYPE III	AT–1						EA	G	NG				
–L1–	49+75.00	53+75.00	LT	400.00			51+00.00	52+50.00	6′	9′	50.00	50.00	1	1	2													TEMPORARY GUARDRAIL FOR TRAFFIC CONTROL
																		ANCHOR DEDUCTION										
			SUBTOTALS	400.00														GREU TL–3: 2 @ 50′ = 100′										
			ANCHOR DEDUCTION	100.00														GRAND TOTAL = 100′										
			TOTAL	300.00																								
			SAY	312.50																								

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS							IMPACT ATTENUATOR TYPE 350			REMOVE & STOCKPILE EXISTING GUARDRAIL (LF)	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU TL–3	TYPE III	AT–1	B–77				EA	G	NG		
–L1–	14+35.00	17+50.00	LT	315.00					3′	9′		50		1	1			1							265	REMOVE, STOCKPILE, & REPLACE EXIST. PLACE B–77 AT SAME HEIGHT OF EXIST. & TRANSITION PER 862.02 SHEET 4 OF 8.
–L1–	14+35.00	22+06.00 (BR)	RT	771.00					6′	9′						1		1							265	REMOVE, STOCKPILE, & REPLACE EXIST. PLACE B–77 AT SAME HEIGHT OF EXIST. & TRANSITION PER 862.02 SHEET 4 OF 8.
–L1–	18+25.00	22+06.00 (BR)	LT	381.25				22+06.00 (BR)	6′	9′		50		1	1	1										
–L1–/–DW1–	28+06.00 (BR)	10+52.84	LT	737.50	50.00		34+00.00		6′	9′						1	1									
–L1–	28+06.00 (BR)	29+87.50	RT	181.25				28+90.00	6′	9′		100		2	1	1										
–DW1–/–L1–	10+69.45	39+45.00 (BR)	LT	300.00	75.00			39+45.00 (BR)	6′	9′						1	1									
–L1–	38+63.75	39+45.00 (BR)	RT	81.25			39+45.00 (BR)		3′	9′	50		1		1	1										
–L1–	43+45.00 (BR)	54+25.00	LT	1081.25			53+00.00		6′	9′	50		1		1	1										
–L1–	43+45.00 (BR)	44+26.25	RT	81.25				43+45.00 (BR)	3′	9′		50		1	1	1										
–L1–	47+25.00	54+25.00	RT	700.00			48+50.00	53+00.00	6′	9′	50	50	1	1	2											25′ CLEAR SPAN GUARDRAIL PROPOSED OVER EXIST. 84″ PIPES
			SUBTOTALS	4629.75	125.00													ANCHOR DEDUCTION								
			ANCHOR DEDUCTION	608.25′	0.00													GREU TL–3: 8 @ 50′ = 400′								
		25′ CLEAR SPAN	GUARDRAIL DEDUCTION	100.00	0.00													TYPE III: 8 @ 18.75′ = 150′								
			TOTAL	3921.50	125.00													AT–1: 2 @ 6.25′ = 12.5′								
			SAY	3937.50	137.50													B–77: 2 @ 22.875′ = 45.75′								
																		GRAND TOTAL = 608.25′								
																		ADDITIONAL GUARDRAIL POSTS = 5								

18-MAR-2020 15:40
R:\Roadway Proj\B4484_Rdy_sum.dgn

12/06/07

COMPUTED BY:	ANK	DATE:	2/27/19
CHECKED BY:	ARV	DATE:	2/27/19

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-4484	3D-1

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

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	C.A.A. PIPE (UNLESS OTHERWISE NOTED) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	CLASS III R.C. PIPE (UNLESS OTHERWISE NOTED) 12"	15"	18"	24"	30"	36"	42"	48"	CLASS IV R.C. PIPE (UNLESS OTHERWISE NOTED) 12"	15"	18"	24"	30"	36"	42"	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES * TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') PER EACH (0' THRU 5.0')	LIN. *FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	T.B.D.I. STD. 840.35	J.B. STD. 840.31 OR 840.32	MANHOLE FRAME AND COVER STD. 840.54	C.A.A. PIPE ELBOWS	PIPE REMOVAL LIN.FT.	REMARKS
-L1- 21+86	15RT	0401		31.59																																									1							1	1					
		0401	0402		28.84	26.00																			128																																	
-L1- 20+54	17RT	0402		28.65																																									1							1	1					
		0402	0403		24.65	22.45																			24																																	
-L1- 20+55	39RT	0403		26.00																																									1									1	1			
		0403	0404		21.00	10.00													28																																					2		
-L1- 19+40	17LT	0405		24.75																																									1							1	1				32	REMOVE 32 LF OF EXIST 12" CMP
		0405	0406		22.00	7.00													40																																					2		
-L1- 28+28	15RT	0501		32.70																																									1							1	1					
		0501	0502		29.95	27.05																			140																																	
-L1- 29+69	15RT	0502		29.80																																									1							1	1					
		0502	0503		26.30	21.45																			52																																	
-L1- 29+71	67RT	0503		25.00																																									1									1	1			
		0503	0504		20.00	10.00													32																																					2		
-L1- 34+05	17 LT	0506		17.00																																									1							1	1					
		0506	0507		14.25	12.50													16																																							
-L1- 39+25	17LT	0601		18.10																																									1							1	1					
		0601	0602		13.50	13.00																			36																																	
-L1- 38+95	17LT	0602		17.50																																									1	0.3						1	1					
		0602	0603		12.20	12.00																			36																																	
-L1- 43+65	17LT	0604		20.10																																									1	3.1						1	1					
		0604	0605		12.00	9.00													24																																					2		
		0606			8.60	8.40																												44									1															CROSS PIPE WITH HEADWALL
-L1- 37+00	16LT	0607		15.36																																									1							1	1					
		0607	0608		13.20	13.00																			12																																	
-L1- 38+32	37RT	T-0607																																						28																	28	REMOVE 28 LF OF SIDE DRAIN PIPE (TEMP PIPE)
-L1- 39+33	32RT	T-0608																																						60																	60	REMOVE 60 LF OF SIDE DRAIN PIPE (TEMP PIPE)
TOTALS																	140								428									44						88			1		12	3.4						10	10	2	2	8	120	

ABBREVIATIONS

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

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 54" & OVER)

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 54"	60"	66"	72"	78"	84"	C.S. PIPE 54" .109	54" .138	54" .168	54" SHOP ELON-GATED .138	54" SHOP ELON-GATED .168	60" .138	60" .168	66" .138	66" .168	72" .138	72" .168	84" .168	STRUCTURAL PLATE PIPE 60" 12	60" 10	66" 12	66" 10	72" 12	72" 10	REINFORCED ENDWALLS WITH R.C. – C.Y.	WITH C.S. – C.Y.	MASONARY DRAINAGE STRUCTURES CUBIC YARDS	REINF. CONC. FLARED END SECTIONS NO. & SIZE	CORR. STEEL FLARED END SECTIONS NO. & SIZE	REINF. CONC. ELBOWS NO. & SIZE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD 840.72	PIPE REMOVAL LIN.FT.	REMARKS
-L- 48+80	LT	0701			4.75	4.70																			28							19.1							4.3		COLLAR AND EXTEND EXIST 84" CMP 10' x2, SEE SHEETS 2D-2 & 2D-3 REMOVE 4' OF EACH EXISTING 84" INLET PRIOR TO COLLARING
TOTALS																									28							19.1							4.3		

ABBREVIATIONS

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

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COMPUTED BY: J.R. Swartley DATE: 10/28/19
CHECKED BY: S.S. Laney DATE: 10/28/19

(12-17-19)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
B-4484	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 Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU(1)	12	100	200	300		
			TOTAL CY/TONS/SY:		100	200**	300**	0	0

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

SUMMARY OF ROCK PLATING

LINE	Beginning Slope (H:V)	Approx. Station	Ending Slope (H:V)	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/A**	Riprap Class* 1/2/B	Rock Plating SY	Rock Plating for Detail No. A SY
L1	2:1	19+50	2:1	22+00	LT	A**	B	0	700
L1	2:1	28+10	2:1	33+35	LT	A**	B	0	1300
L1	1.5:1	43+55	2:1	53+00	LT	1,2	*	1900	0
L1	1.5:1	50+50	2:1	53+00	RT	1	*	300	0
							TOTAL SY:	2200	2000

*Use Class 1, 2 or B riprap if riprap class is not shown for rock plating location.
**For Rock Plating Detail No. 1/2/A, see the SPECIAL ROCK PLATING DETAILS plan sheet.

SUMMARY OF SETTLEMENT GAUGES

Gauge No.	LINE and Station	Offset	
		Distance FT	Direction LT/RT
1	-L1- 20+00	20	LT
2	-L1- 21+00	20	LT
3	-L1- 22+00	20	LT
4	-L1- 28+00	20	LT
5	-L1- 29+00	20	LT
6	-L1- 30+00	20	LT
7	-L1- 31+00	20	LT
8	-L1- 32+00	20	LT
9	-L1- 33+00	20	LT
10	-L1- 39+50	20	LT
11	-L1- 43+50	20	LT
	TOTAL GAUGES (EACH):		11

SUMMARY OF EMBANKMENT WAITING PERIODS

LINE	Station	Station	MONTHS
L1	19+50	22+05	3
L1	28+02	34+00	3
L1	39+00	39+45	2
L1	43+45	44+00	3

SUMMARY OF BRIDGE WAITING PERIODS

Bridge Description	End Bent/ Bent No.	MONTHS
Bridge No. 138 on SR 1470 over Neuse River	EB1, EB2	3
Bridge No. 139 on SR 1470 over Neuse River Overflow	EB1	2
Bridge No. 139 on SR 1470 over Neuse River Overflow	EB2	3

12/06/07

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-4484	3P-1

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4	FRANCES T. KILPATRICK
2	4	SANDRA N. WHITE
3	5,6	WILLIAM E. DANIELS
4	5	COASTAL LUMBER COMPANY
5	6	CAROL U. HEATH
6	6	RAY M. HEATH
7	6,7	HAROLD HARGETT JR & TONYA H. BYRD
8	6,7	HAROLD HARGETT JR & TONYA H. BYRD

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

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PROJECT REFERENCE NO.	SHEET NO.
B-4484	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 030952 — 3/27/2020	SEAL 018442 — 3/27/2020

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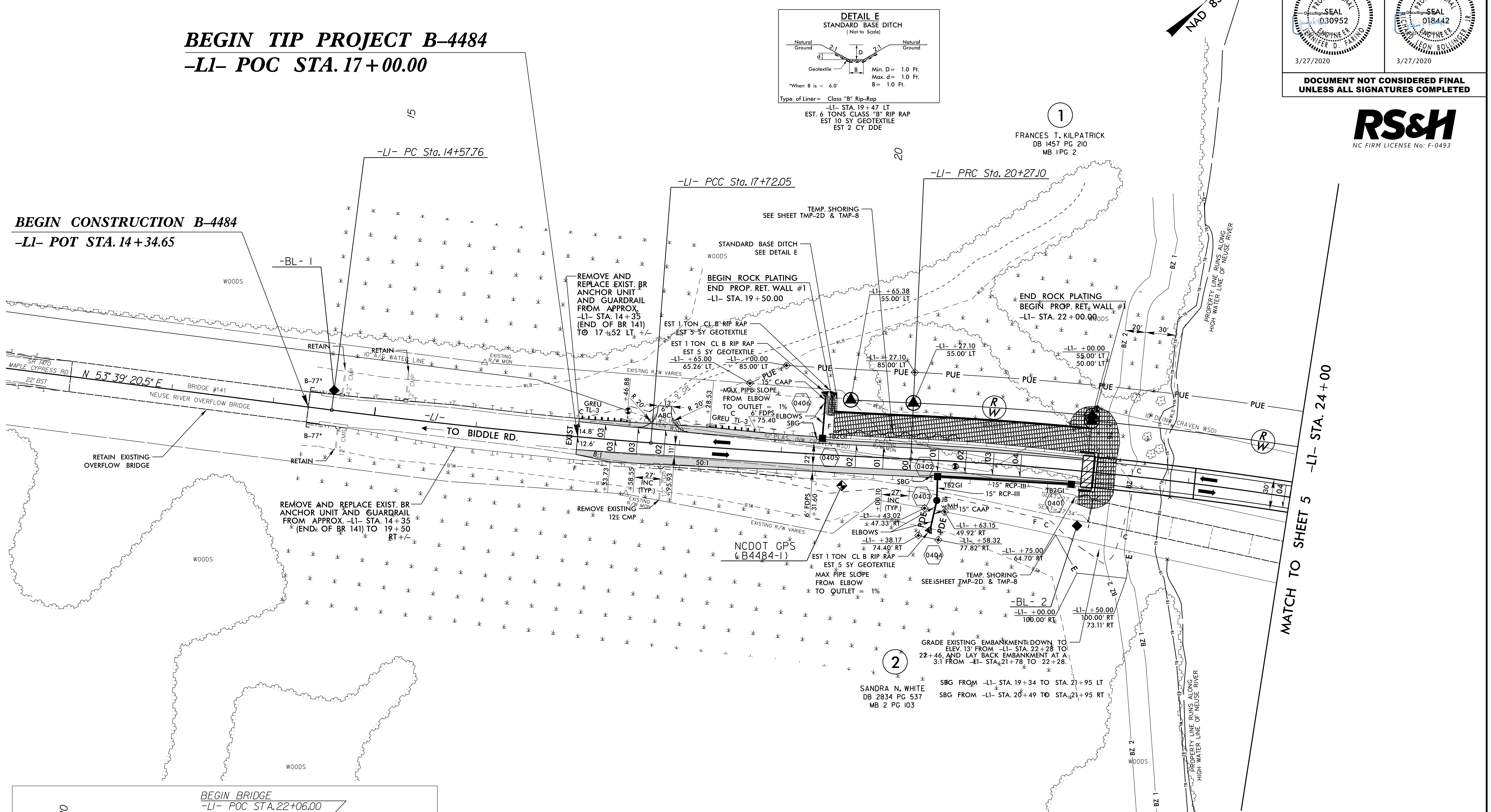
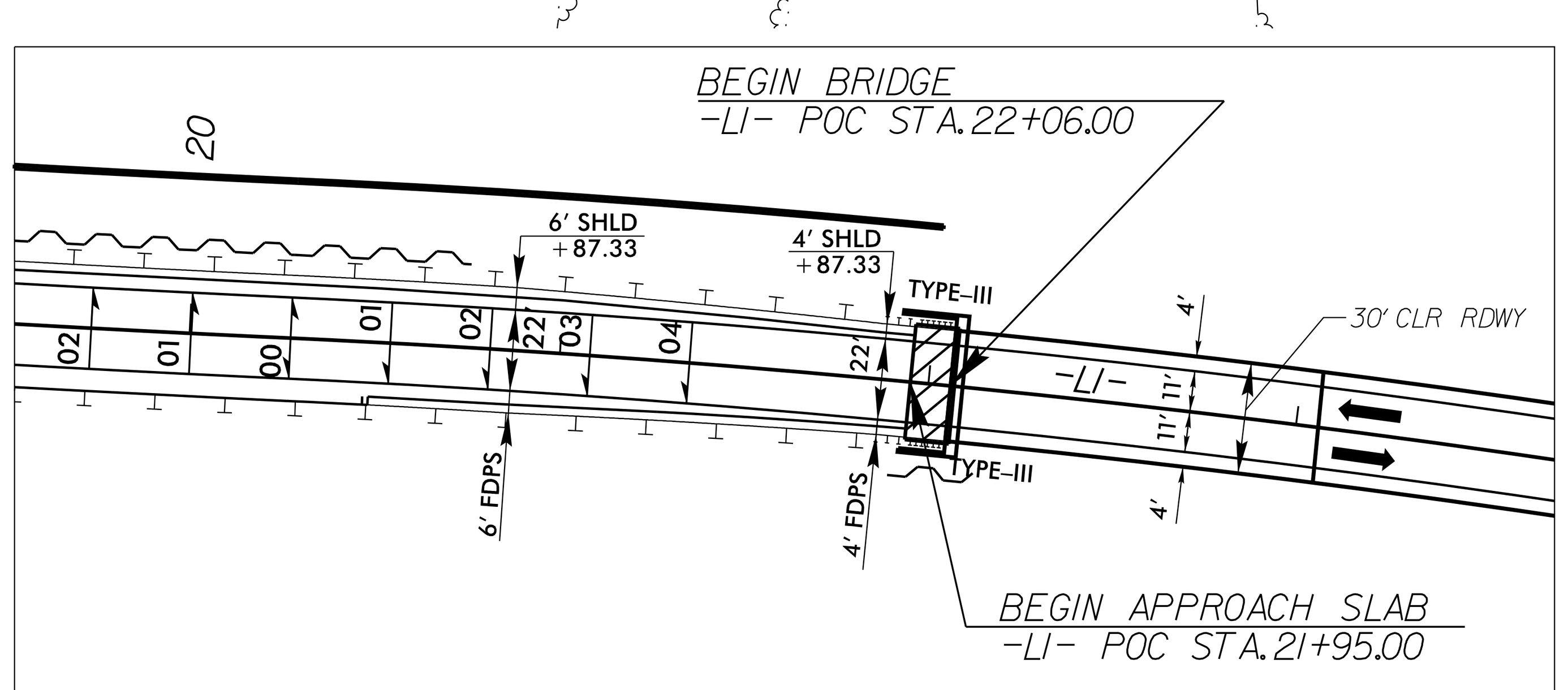
RS&H
NC FIRM LICENSE No: F-0493

*NOTE: PROPOSED B-77 ANCHOR UNITS FOR BR 141 NEED TO BE ANCHORED AT THE HEIGHT OF THE EXISTING ANCHOR UNITS, USING NCDOT ROADWAY STANDARD DRAWING 862.02 SHEET 4 OF 8 TO TRANSITION FROM THE PROPOSED GUARDRAIL TO EXISTING ANCHOR HEIGHT.

BEGIN TIP PROJECT B-4484
-L1- POC STA. 17+00.00



BEGIN CONSTRUCTION B-4484
-L1- POT STA. 14+34.65
-L1- PC Sta. 14+57.76
-L1- PCC Sta. 17+72.05
-L1- PRC Sta. 20+27.10
DETAIL E
STANDARD BASE DITCH
(Not to Scale)
Natural Ground
Geotextile
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
B = 1.0 Ft.
*When B is < 6.0'
Type of Liner = Class "B" Rip-Rap
-L1- STA. 19+47 LT
EST. 6 TONS CLASS "B" RIP RAP
EST 10 SY GEOTEXTILE
EST 2 CY DDE
FRANCES T. KILPATRICK
DB 1457 PG 210
MB 1 PG 2
SANDRA N. WHITE
DB 2834 PG 537
MB 2 PG 103
NAD 83/2001
TEMP. SHORING
SEE SHEET TMP-2D & TMP-8
STANDARD BASE DITCH
SEE DETAIL E
BEGIN ROCK PLATING
END PROP. RET. WALL #1
-L1- STA. 19+50.00
END ROCK PLATING
BEGIN PROP. RET. WALL #1
-L1- STA. 22+00.00
REMOVE AND REPLACE EXIST. BR ANCHOR UNIT AND GUARDRAIL FROM APPROX. -L1- STA. 14+35 (END OF BR 141) TO 17+52 LT +/-
REMOVE AND REPLACE EXIST. BR ANCHOR UNIT AND GUARDRAIL FROM APPROX. -L1- STA. 14+35 (END OF BR 141) TO 19+50 RT +/-
RETAIN EXISTING OVERFLOW BRIDGE
REMOVE EXISTING 12" CMP
N 53° 39' 20.5" E
SR 1470 MAPLE CYPRESS RD
NEUSE RIVER OVERFLOW BRIDGE
BRIDGE #141
TO BIDDLE RD.
-BL- 1
-BL- 2
NCDOT GPS (B4484-1)
EST 1 TON CL B RIP RAP
EST 5 SY GEOTEXTILE
MAX PIPE SLOPE FROM ELBOW TO OUTLET = 1%
GRADE EXISTING EMBANKMENT DOWN TO ELEV. 13' FROM -L1- STA. 22+28 TO 22+46, AND LAY BACK EMBANKMENT AT A 3:1 FROM -L1- STA. 21+78 TO 22+28.
SBG FROM -L1- STA. 19+34 TO STA. 21+95 LT
SBG FROM -L1- STA. 20+49 TO STA. 21+95 RT
PROPERTY LINE RUNS ALONG HIGH WATER LINE OF NEUSE RIVER
MATCH TO SHEET 5 -L1- STA. 24+00
WOODS



DETAIL SHOWING PAVEMENT - BRIDGE RELATIONSHIP (NOT TO SCALE)

-L1- CURVE DATA

PI Sta 16+14.94	PI Sta 18+99.59	PI Sta 23+80.19
Δ = 2° 51' 30.1" (LT)	Δ = 1° 48' 46.9" (LT)	Δ = 11° 41' 14.5" (RT)
D = 0° 54' 34.0"	D = 0° 42' 39.1"	D = 1° 39' 38.7"
L = 314.29'	L = 255.05'	L = 703.74'
T = 157.18'	T = 127.53'	T = 353.10'
R = 6,300.00'	R = 8,060.00'	R = 3,450.00'
SE = .03	SE = .02	SE = .04
RO = 81'	RO = 54'	RO = 108'

FOR -L1- PROFILE, SEE SHEET NO. 8

- BRIDGE APPROACH SLAB
- PAVEMENT REMOVAL
- ROCK PLATING

FOR B240138 STRUCTURE PLANS, SEE SHEETS S1-1 THRU S1-37

FOR RETAINING WALL PLANS, SEE SHEETS W-1 THRU W-5

PROJECT REFERENCE NO.	SHEET NO.
B-4484	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 030952 ENGINEER JENNIFER D. FARINO — DocuSigned by: 3/27/2020	NORTH CAROLINA PROFESSIONAL SEAL 018442 ENGINEER RICHARD LEON BOLLINGER, JR. — DocuSigned by: 3/27/2020

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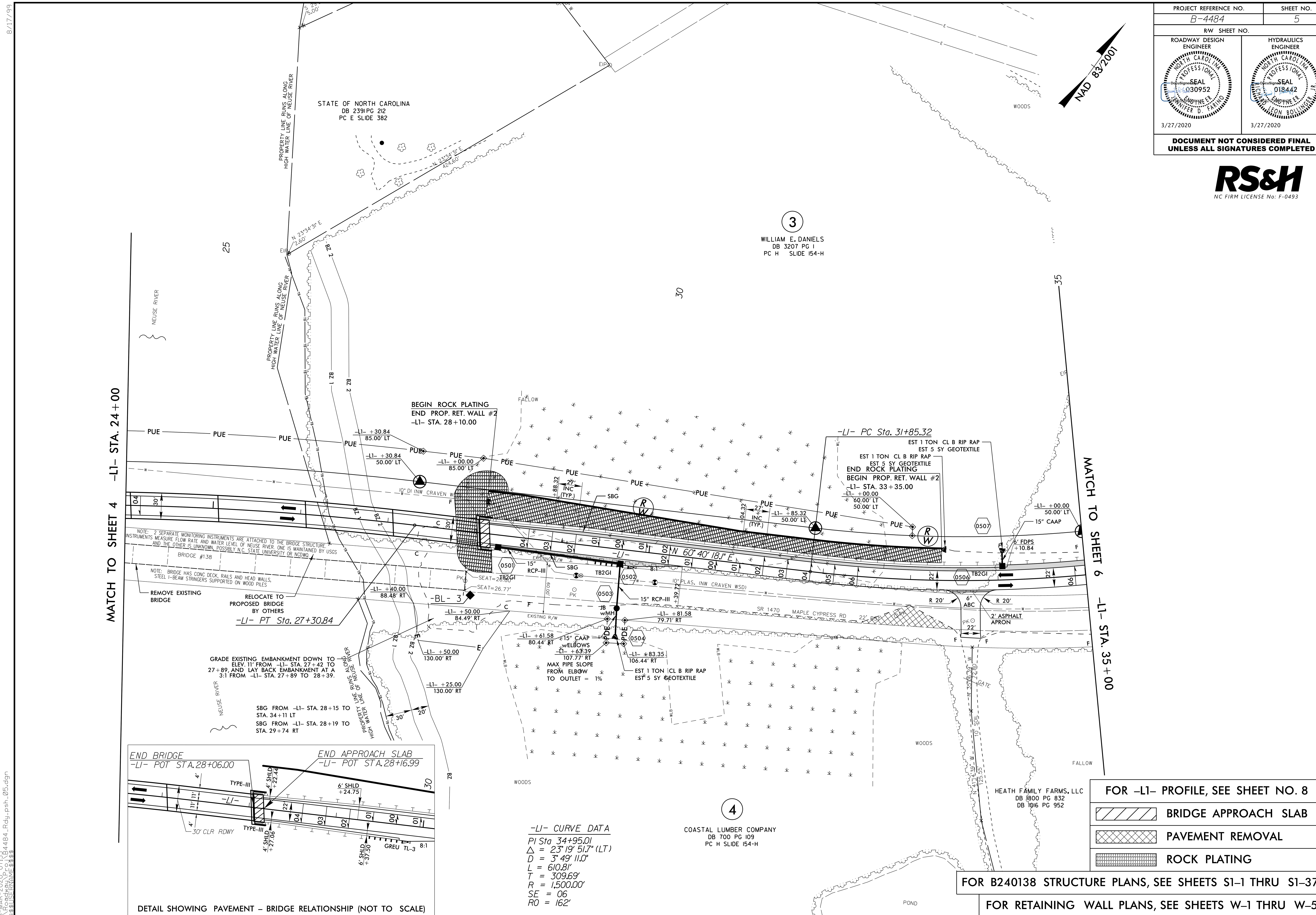
RS&H
NC FIRM LICENSE No: F-0493



-L1- CURVE DATA
PI Sta 34+95.01
Δ = 23° 19' 51.7" (LT)
D = 3° 49' 11.0"
L = 610.81'
T = 309.69'
R = 1,500.00'
SE = 06
RO = 162'

FOR -L1- PROFILE, SEE SHEET NO. 8

BRIDGE APPROACH SLAB

PAVEMENT REMOVAL

ROCK PLATING

FOR B240138 STRUCTURE PLANS, SEE SHEETS S1-1 THRU S1-37

FOR RETAINING WALL PLANS, SEE SHEETS W-1 THRU W-5

PROJECT REFERENCE NO.	SHEET NO.
B-4484	6

R/W SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030952 JENNIFER D. FARINO	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 018442 RICHARD LEON BOLLINGER, JR.
3/27/2020	3/27/2020

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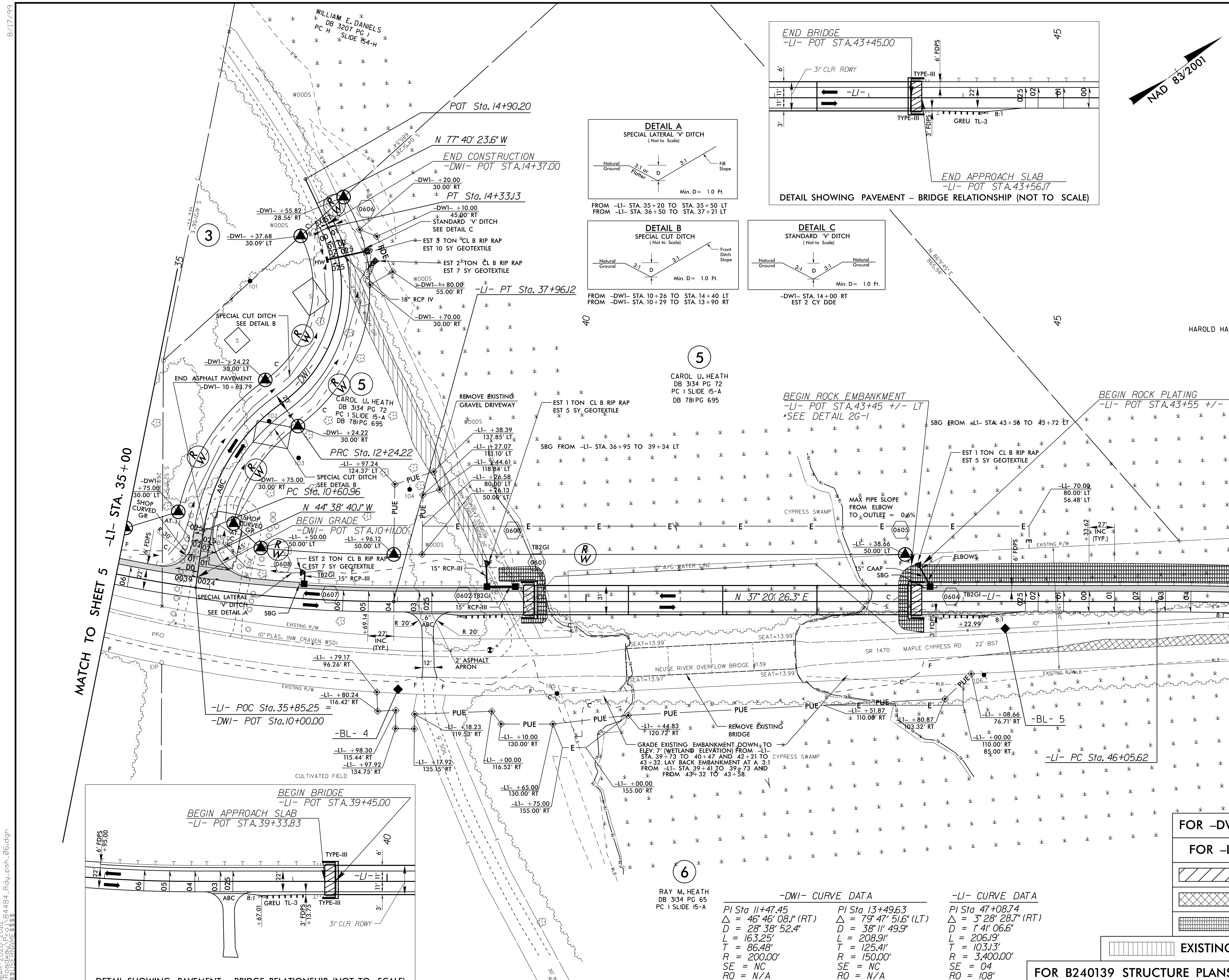
NC FIRM LICENSE No: F-0493



NAD 83/2001
MATCH TO SHEET 5
-L1- STA. 35+00
MATCH TO SHEET 7
-L1- STA. 48+00
WILLIAM E. DANIELS DB 3207 PG 1 PC H SLIDE 154-H
POT Sta. 14+90.20
N 77° 40' 23.6" W
END CONSTRUCTION -DW1- POT STA. 14+37.00
PT Sta. 14+33.13
-L1- PT Sta. 37+96.12
PRC Sta. 12+24.22
PC Sta. 10+60.96
N 44° 38' 40.1" W
BEGIN GRADE -DW1- POT STA. 10+11.00
-L1- POC Sta. 35+85.25 = -DW1- POT Sta. 10+00.00
CAROL U. HEATH DB 3134 PG 72 PC 1 SLIDE 15-A DB 781 PG 695
HAROLD HARGETT JR & TONYA H. BYRD DB 2677 PG 283 DB 781 PG 699
RAY M. HEATH DB 3134 PG 65 PC 1 SLIDE 15-A
N 37° 20' 26.3" E
SR 1470 MAPLE CYPRESS RD 22' BST
NEUSE RIVER OVERFLOW BRIDGE #139
BEGIN ROCK EMBANKMENT -L1- POT STA. 43+45 +/- LT *SEE DETAIL 2G-1
BEGIN ROCK PLATING -L1- POT STA. 43+55 +/- LT
SBG FROM -L1- STA. 36+95 TO 39+34 LT
SBG FROM -L1- STA. 43+56 TO 43+72 LT
REMOVE EXISTING GRAVEL DRIVEWAY
REMOVE EXISTING BRIDGE
GRADE EXISTING EMBANKMENT DOWN TO ELEV. 7' (WETLAND ELEVATION) FROM -L1- STA. 39+73 TO 40+47 AND 42+21 TO 43+32. LAY BACK EMBANKMENT AT A 3:1 FROM -L1- STA. 39+41 TO 39+73 AND FROM 43+32 TO 43+58.
MAX PIPE SLOPE FROM ELBOW TO OUTLET = 0.6%
-L1- PC Sta. 46+05.62
CYPRESS SWAMP
DETAIL A SPECIAL LATERAL 'V' DITCH (Not to Scale)
FROM -L1- STA. 35+20 TO STA. 35+50 LT
FROM -L1- STA. 36+50 TO STA. 37+21 LT
DETAIL B SPECIAL CUT DITCH (Not to Scale)
FROM -DW1- STA. 10+26 TO STA. 14+40 LT
FROM -DW1- STA. 10+29 TO STA. 13+90 RT
DETAIL C STANDARD 'V' DITCH (Not to Scale)
-DW1- STA. 14+00 RT EST 2 CY DDE
END BRIDGE -L1- POT STA. 43+45.00
END APPROACH SLAB -L1- POT STA. 43+56.17
DETAIL SHOWING PAVEMENT - BRIDGE RELATIONSHIP (NOT TO SCALE)
BEGIN BRIDGE -L1- POT STA. 39+45.00
BEGIN APPROACH SLAB -L1- POT STA. 39+33.83
DETAIL SHOWING PAVEMENT - BRIDGE RELATIONSHIP (NOT TO SCALE)

-DW1- CURVE DATA

PI Sta 11+47.45	PI Sta 13+49.63
Δ = 46° 46' 08.1" (RT)	Δ = 79° 47' 51.6" (LT)
D = 28° 38' 52.4"	D = 38° 11' 49.9"
L = 163.25'	L = 208.91'
T = 86.48'	T = 125.41'
R = 200.00'	R = 150.00'
SE = NC	SE = NC
RO = N/A	RO = N/A

-L1- CURVE DATA

PI Sta 47+08.74
Δ = 3° 28' 28.7" (RT)
D = 1° 41' 06.6"
L = 206.19'
T = 103.13'
R = 3,400.00'
SE = .04
RO = 108'

FOR -DW1- PROFILE, SEE SHEET NO. 10

FOR -L1- PROFILE, SEE SHEET NO. 9

Legend	
(hatch)	BRIDGE APPROACH SLAB
(cross-hatch)	PAVEMENT REMOVAL
(dense hatch)	ROCK PLATING
(vertical lines)	EXISTING GRAVEL DRIVEWAY REMOVAL

FOR B240139 STRUCTURE PLANS, SEE SHEETS S2-1 THRU S2-31

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-4484	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 030952, 3/27/2020	SEAL 018442, 3/27/2020

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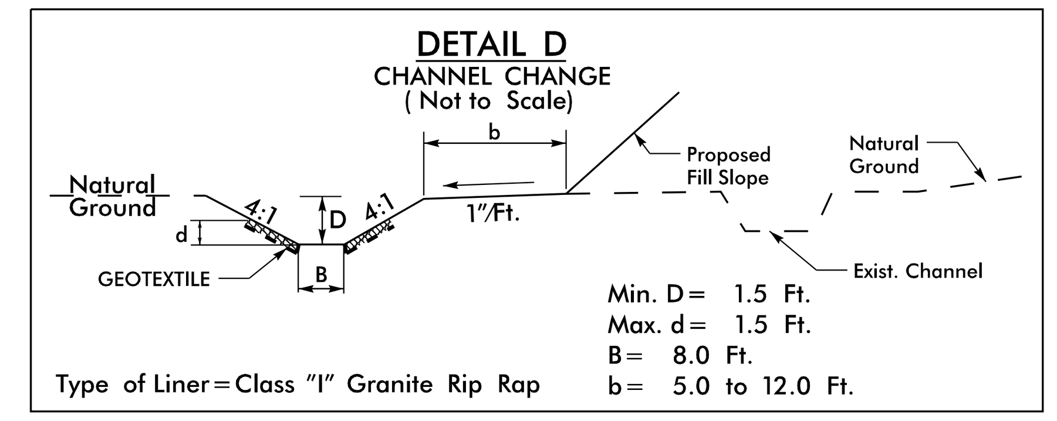
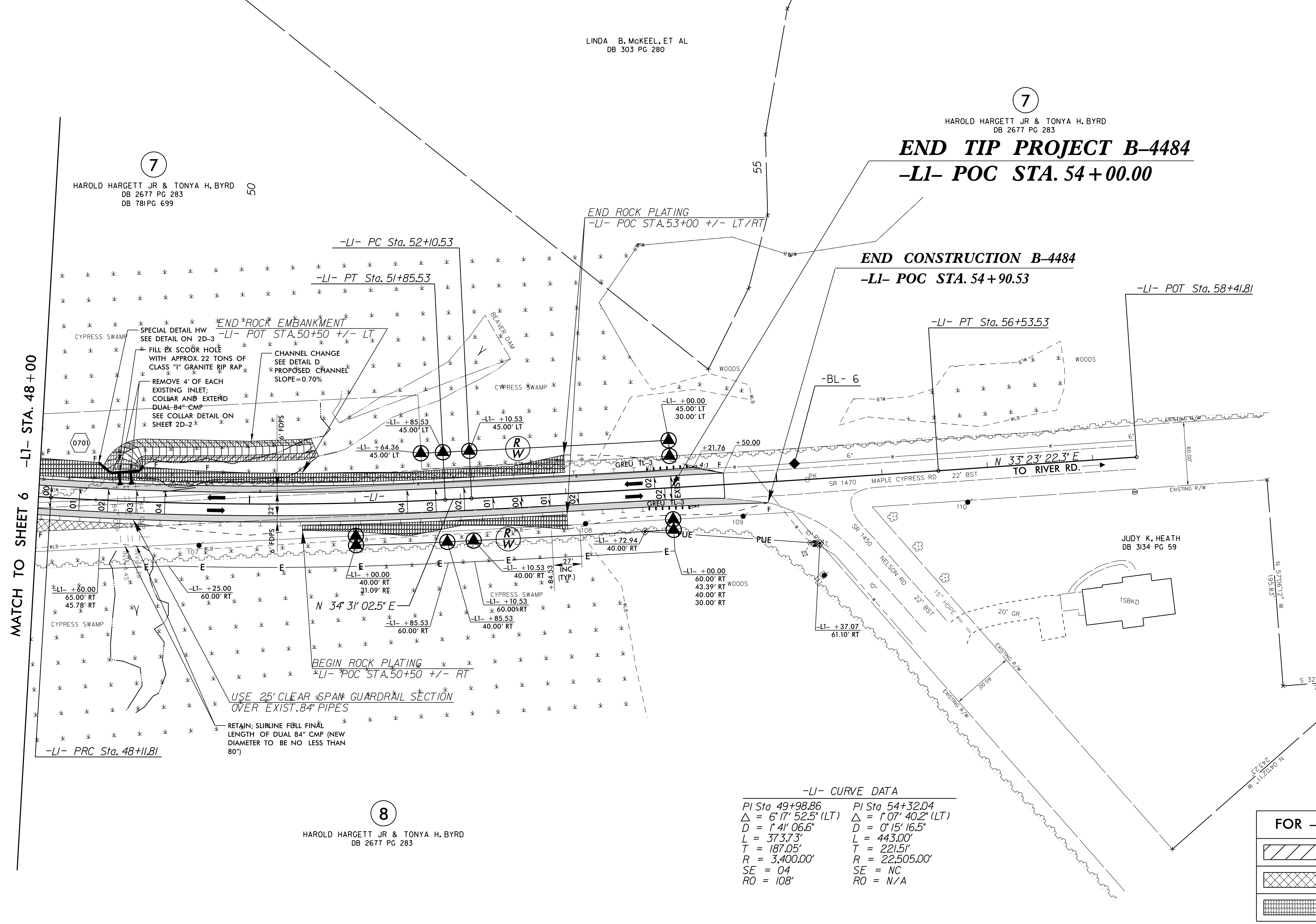
NC FIRM LICENSE No: F-0493

NAD 83/2001



FROM -L1- STA. 48+80 TO STA. 50+50 LT
EST. CLASS "I" GRANITE RIP RAP = 106 TONS
EST. GEOTEXTILE = 234 SY
EST. DDE = 120 CY


LINDA B. McKEEL, ET AL
DB 303 PG 280
7
HAROLD HARGETT JR & TONYA H. BYRD
DB 2677 PG 283
END TIP PROJECT B-4484
-L1- POC STA. 54+00.00
END CONSTRUCTION B-4484
-L1- POC STA. 54+90.53
7
HAROLD HARGETT JR & TONYA H. BYRD
DB 2677 PG 283
DB 781 PG 699
END ROCK PLATING
-L1- POC STA.53+00 +/- LT/RT
-L1- PC Sta. 52+10.53
-L1- PT Sta. 51+85.53
END ROCK EMBANKMENT
-L1- POT STA.50+50 +/- LT
SPECIAL DETAIL HW SEE DETAIL ON 2D-3
FILL EX SCOUR HOLE WITH APPROX. 22 TONS OF CLASS "I" GRANITE RIP RAP
REMOVE 4' OF EACH EXISTING INLET; COLLAR AND EXTEND DUAL 84" CMP SEE COLLAR DETAIL ON SHEET 2D-2
CHANNEL CHANGE SEE DETAIL D PROPOSED CHANNEL SLOPE=0.70%
-L1- POT Sta. 58+41.81
-L1- PT Sta. 56+53.53
-BL- 6
N 33° 23' 22.3" E
TO RIVER RD.
SR 1470 MAPLE CYPRESS RD
SR 1450 NELSON RD
JUDY K. HEATH
DB 3134 PG 59
-L1- STA. 48+00
MATCH TO SHEET 6
N 34° 31' 02.5" E
BEGIN ROCK PLATING
-L1- POC STA.50+50 +/- RT
USE 25' CLEAR SPAN GUARDRAIL SECTION OVER EXIST. 84" PIPES
RETAIN; SLIPLINE FULL FINAL LENGTH OF DUAL 84" CMP (NEW DIAMETER TO BE NO LESS THAN 80")
-L1- PRC Sta. 48+11.81
CYPRESS SWAMP
WOODS
S 32°51'25" W
77.87'
8
HAROLD HARGETT JR & TONYA H. BYRD
DB 2677 PG 283

-L1- CURVE DATA

PI Sta 49+98.86	PI Sta 54+32.04
Δ = 6° 17' 52.5" (LT)	Δ = 1° 07' 40.2" (LT)
D = 1° 41' 06.6"	D = 0° 15' 16.5"
L = 373.73'	L = 443.00'
T = 187.05'	T = 221.51'
R = 3,400.00'	R = 22,505.00'
SE = 04	SE = NC
RO = 108'	RO = N/A

FOR -L1- PROFILE, SEE SHEET NO. 9

//////	BRIDGE APPROACH SLAB
XXXXXX	PAVEMENT REMOVAL
▒▒▒▒▒▒	ROCK PLATING

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-L1-

UNDERCUT EXCAVATION

STRUCTURE HYDRAULIC DATA		
DRAINAGE AREA	= 3,950	SQ.MI.
DESIGN DISCHARGE	= 19,400	CFS
DESIGN FREQUENCY	= 2	YRS
DESIGN HW ELEVATION	= 13.2	FT
BASE DISCHARGE	= 70,000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 23.3	FT
OVERTOPPING DISCHARGE	= 22,400	CFS
OVERTOPPING FREQUENCY	= 2+	YRS
OVERTOPPING ELEVATION	= 13.8	FT

PROJECT REFERENCE NO.	SHEET NO.
B-4484	8

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 030952 ENGINEER JENNIFER D. FATINO
DocuSigned by: 3/27/2020

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 018442 ENGINEER LEON BOLLINGER, JR.
DocuSigned by: 3/27/2020

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RS&H
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BEGIN BRIDGE
-L1- STA. 22+06.00
ELEV. = 32.61'

PI = 18+40.00
EL = 21.62'
VC = 280'
K = 271

BEGIN PROPOSED GRADE
-L1- STA. 17+00.00
ELEV. = 18.26'

PROPOSED GRADE

35.40'

(+)3.4343%

(+)2.4000%

(+)3.4343%

TEMPORARY WORK PLATFORM

EXISTING GROUND

PROPOSED EXCAVATION TO ELEV. 13' (@ 450 CY)

1.5:1

KEY IN CLASS "II" RIP RAP 3'-6" BELOW ELEV 13.0'

NCDOT GPS (B4484-1)
-L1- STA. 19+61.03 (29.42' RT)
ELEV. = 24.216'

FOR -L1- ALIGNMENT, SEE SHEET 4

-L1-

UNDERCUT EXCAVATION

PI = 25+40.00
EL = 45.66'
VC = 1120'
K = 162

35.40'

(+)3.4343%

(-)3.4935%

END BRIDGE
-L1- STA. 28+06.00
ELEV. = 33.69'

PROPOSED GRADE

PI = 34+60.00
EL = 13.52'
VC = 630'
K = 138

16.70'

(-)3.4935%

(+)1.0780%

PROPOSED DOWNSTREAM EXCAVATION TO ELEV. 11'

2' (TYP)

1.5:1

KEY IN CLASS "II" RIP RAP 3'-6" BELOW ELEV 11.0'

NWS EL = 1.5' +/-
DATE OF SURVEY: 7/15/2018

TEMPORARY WORK PLATFORM

EXISTING GROUND

FOR -L1- ALIGNMENT, SEE SHEET 5

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PROJECT REFERENCE NO.	SHEET NO.
B-4484	9

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030952 ENGINEER JENNIFER D. FAITH

3/27/2020

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 018442 ENGINEER LEON BOLLINGER

3/27/2020

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RS&H
NC FIRM LICENSE No: F-0493

LEFT DITCH -·-·-·-·-·-

UNDERCUT EXCAVATION

STRUCTURE HYDRAULIC DATA

DRAINAGE AREA	= 3,950	SQ.MI.
DESIGN DISCHARGE	= 19,400	CFS
DESIGN FREQUENCY	= 2	YRS
DESIGN HW ELEVATION	= 13.2	FT
BASE DISCHARGE	= 70,000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 23.3	FT
OVERTOPPING DISCHARGE	= 22,400	CFS
OVERTOPPING FREQUENCY	= 2+	YRS
OVERTOPPING ELEVATION	= 13.8	FT

-L1-

-L1- STA. 35+85.25 =
-DW1- STA. 10+00.00
ELEV. = 16.18'

BEGIN BRIDGE
-L1- STA. 39+45.00
ELEV. = 18.75'

PI = 42+34.00
EL = 21.86'
VC = 320'
K = 154

END BRIDGE
-L1- STA. 43+45.00
ELEV. = 20.68'

16.70'

(+)1.0780%

BEGIN SPECIAL LATERAL
'V' DITCH GRADE
-L- STA. 35+20 LT
ELEV. = 15.36'

(-)3.7667%

END SPECIAL LATERAL
'V' DITCH GRADE
-L- STA. 35+50 LT
ELEV. = 12.23'

BEGIN SPECIAL LATERAL
'V' DITCH GRADE
-L- STA. 36+50 LT
ELEV. = 12.50'

(+)1.0000%

PI = 37+00.000
EL = 13.00'

(+)4.7961%

END SPECIAL LATERAL
'V' DITCH GRADE
-L- STA. 37+21 LT
ELEV. = 14.00'

(+)1.0780%

(-)0.9971%

PROPOSED GRADE

16.22'

(-)0.9971%

NWS EL = 3.8' +/-
DATE OF SURVEY:
7/15/2018

3' (TYP.)

KEY IN CLASS "II" RIP RAP
3'-6" BELOW ELEV 6.0'

KEY IN CLASS "II" RIP RAP
3'-6" BELOW ELEV 7.0'

PROPOSED DOWNSTREAM
EXCAVATION TO ELEV. 7'

PROPOSED DOWNSTREAM
EXCAVATION TO ELEV. 7'

EXISTING GROUND

TEMPORARY WORK PLATFORM

FOR -L1- ALIGNMENT, SEE SHEET 6

-L1-

PI = 49+90.00
EL = 14.33'
VC = 200'
K = 139

16.22'

PROPOSED GRADE

(-)0.9971%

(+)0.4385%

END PROPOSED GRADE
BEGIN MILL AND OVERLAY
-L1- STA. 54+00.00
ELEV. = 16.12'

END MILL AND OVERLAY
-L1- STA. 54+50.00
ELEV. = 16.58'

(+)0.4385%

EXISTING GROUND

SLIPLINE EXISTING DUAL 84" CMP (NEW DIAMETER TO BE NO LESS THAN 80")

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 19,400	CFS
DESIGN FREQUENCY	= 2	YRS
DESIGN HW ELEVATION	= 13.2	FT
BASE DISCHARGE	= 70,000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 23.3	FT
OVERTOPPING DISCHARGE	= 22,400	CFS
OVERTOPPING FREQUENCY	= 2+	YRS
OVERTOPPING ELEVATION	= 13.8	FT

FOR -L1- ALIGNMENT, SEE SHEET 7

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-DW1-

LEFT DITCH	-·-·-·-·-
RIGHT DITCH	----------

NOTE: DITCH VPI TRIANGLE MARKERS TURNED OFF FOR CLARITY

PROJECT REFERENCE NO.	SHEET NO.
B-4484	10

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030952 ENGINEER JENNIFER D. FATINO

3/27/2020

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 018442 ENGINEER LEON BOLLINGER, JR.

3/27/2020

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NC FIRM LICENSE No: F-0493

BEGIN GRADE
-DW1- Sta. 10+11.00
ELEV.= 15.52'

PI = 10+42.00
EL = 13.81'
VC = 50'
K = 10

EXISTING GROUND

PROPOSED GRADE

END GRADE
-DW1- Sta. 14+37.00
ELEV.= 11.54'

(-)5.40000% (+)0.57483% (-)0.60000% LT (-)0.60000% RT

BEGIN SPECIAL CUT
DITCH GRADE
-DW1- STA.10+26 LT
ELEV.= 12.23'

BEGIN SPECIAL CUT
DITCH GRADE
-DW1- STA.10+29 RT
ELEV.= 12.50'

(-)0.9583% LT

(-)3.3333% RT

PI =10+50.000 RT
ET = 11.80'

PI =10+50.000 LT
EL = 12.00'

PI =13+50.000 RT
ET = 10.00'

(+)2.0000% RT

PI =13+75.000 LT
ET = 10.05'

PI =13+75.000 RT
ET = 9.50'

(+)3.3333% RT

END SPECIAL CUT
DITCH GRADE
-DW1- STA.13+90 RT
ELEV.= 9.60'

(-)5.8000% LT

PI =14+00.000 LT
EL = 9.80'

(+)6.4865% LT

PI =14+37.000 LT
EL = 11.00'

(+)20.000% LT

END SPECIAL CUT
DITCH GRADE
-DW1- STA.14+40 LT
ELEV.= 11.60'

FOR -DW1- ALIGNMENT, SEE SHEET 6

10 11 12 13 14 15

50 40 30 20 10 0 –10 –20 –30