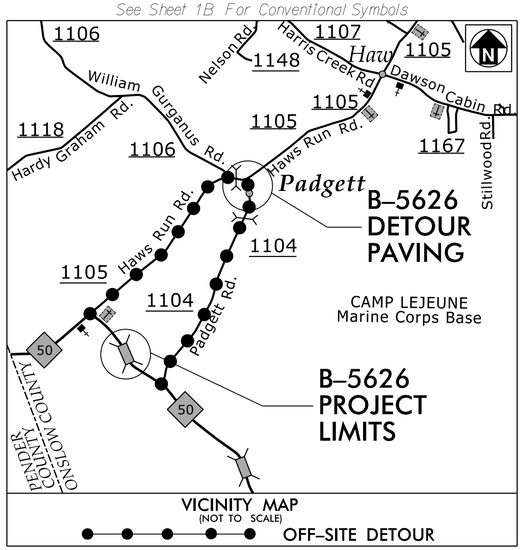
09/08/99

PROJECT: B–5626

CONTRACT: C204476

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



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

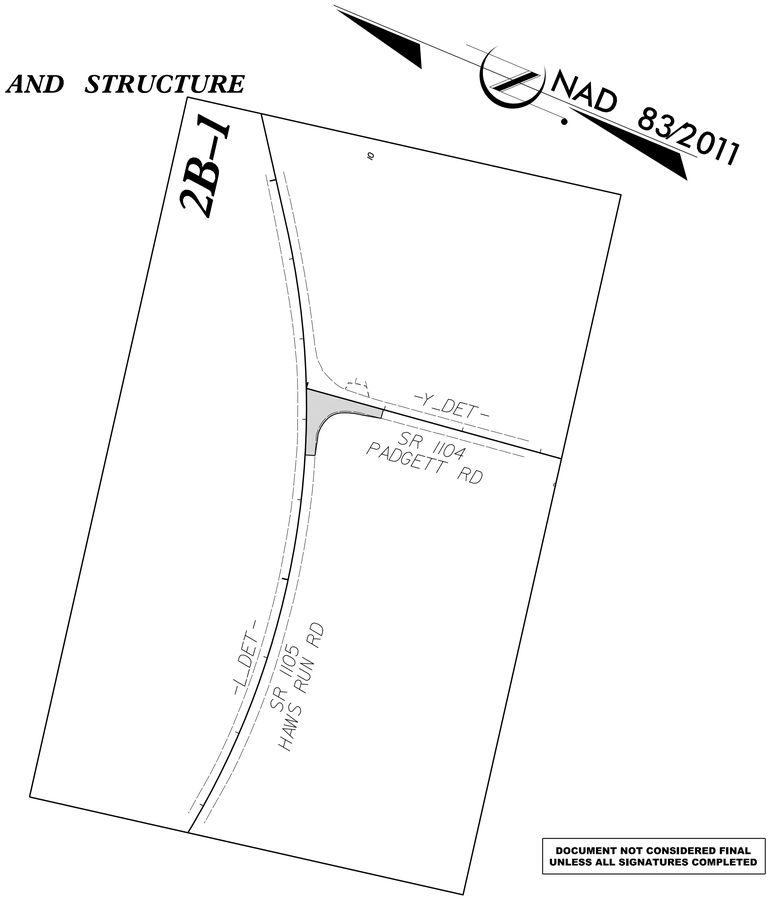
ONSLOW COUNTY

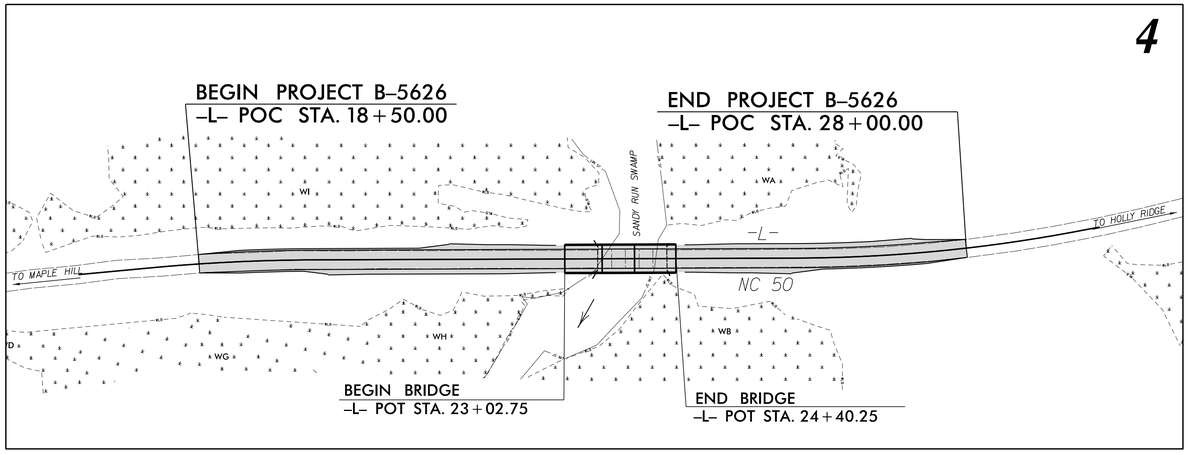
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–5626	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
45581.1.1		P.E.
45581.2.1		R/W, UTL
45581.3.1		CONST.

LOCATION: BRIDGE NO. 31 OVER SANDY RUN SWAMP ON NC 50

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE





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PLANS PREPARED BY:

SIMPSON ENGINEERS & ASSOCIATES
5640 Dillard Drive
Suite 200
Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com

LICENSE NO. C–2521

GRAPHIC SCALES

50 0 50 100
PLANS

50 0 50 100
PROFILE (HORIZONTAL)

10 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2020 = 1217
ADT 2040 = 1800

K = 9 %
D = 55 %
T = 6 %*
V = 60 MPH

* TTST = 2% DUAL 4%

SUB REGIONAL TIER
MAJOR COLLECTOR

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B–5626 = 0.154 MILES

LENGTH STRUCTURE TIP PROJECT B–5626 = 0.026 MILES

TOTAL LENGTH TIP PROJECT B–5626 = 0.180 MILES

PLANS PREPARED FOR NCDOT BY:

MOTT MACDONALD
PO Box 700
Fuquay-Varina, NC 27526
(919) 552-2253
(919) 552-2254 (Fax)
www.mottmac.com/americas
LICENSE NO. F–0669

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL. (919) 859-2243
ENG FIRM LICENSE NO. C–890

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
SEPTEMBER 23, 2019

LETTING DATE:
MAY 18, 2021

Michael Pekarek, PE
PROJECT ENGINEER

Joshua G. Dalton, PE
HYDRAULIC ENGINEER

David Stutts, PE
NCDOT BRIDGE PROGRAM MANAGER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

DocuSigned by: Joshua G Dalton
1089AD8C14994C3...
3/30/2021 *P.E.*
SIGNATURE:

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 27391 ENGINEER MICHAEL PEKAREK

DocuSigned by: Michael Pekarek
61C2AD44E7884CF...
3/30/2021 *P.E.*
SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

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REB413

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-5626	1A
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 27391 ENGINEER

DocuSigned by: Michael Severance 3/30/2021

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

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Prepared in the Office of:

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SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL: (919) 859-2243
ENG FIRM LICENSE NO. C-0490

GENERAL NOTES

GENERAL NOTES: 2018 SPECIFICATIONS
EFFECTIVE: 01–16–18

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 MODIFIED METHOD III. (SEE DETAIL 2C–3)

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.

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 WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104–7.

SUBSURFACE PLANS:

NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE ONSLOW WATER AND SEWER AUTHORITY AND SPECTRUM.

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

LIST OF ROADWAY STANDARD DRAWINGS

EFF. 01–16–2018

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
225.02	Guide for Grading Subgrade – Secondary and Local
225.04	Method of Obtaining Superelevation – Two Lane Pavement
275.01	Rock Plating
	DIVISION 3 – PIPE CULVERTS
300.01	Method of Pipe Installation
	DIVISION 4 – MAJOR STRUCTURES
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
815.02	Subsurface Drain
840.00	Concrete Base Pad for Drainage Structures
840.25	Anchorage for Frames – Brick or Concrete or Precast
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet – for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

INDEX OF SHEETS

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11/8/2013

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
B-5626	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.

PROJECT REFERENCE NO.	SHEET NO.
B-5626	2A-1

ROADWAY DESIGN ENGINEER — SEAL 27391 — MICHAEL PEKAREK — 2/19/2020 — MOTT MACDONALD I & E, LLC LICENSE NO. F-0669

PAVEMENT DESIGN ENGINEER — SEAL 022896 — 2/20/2020

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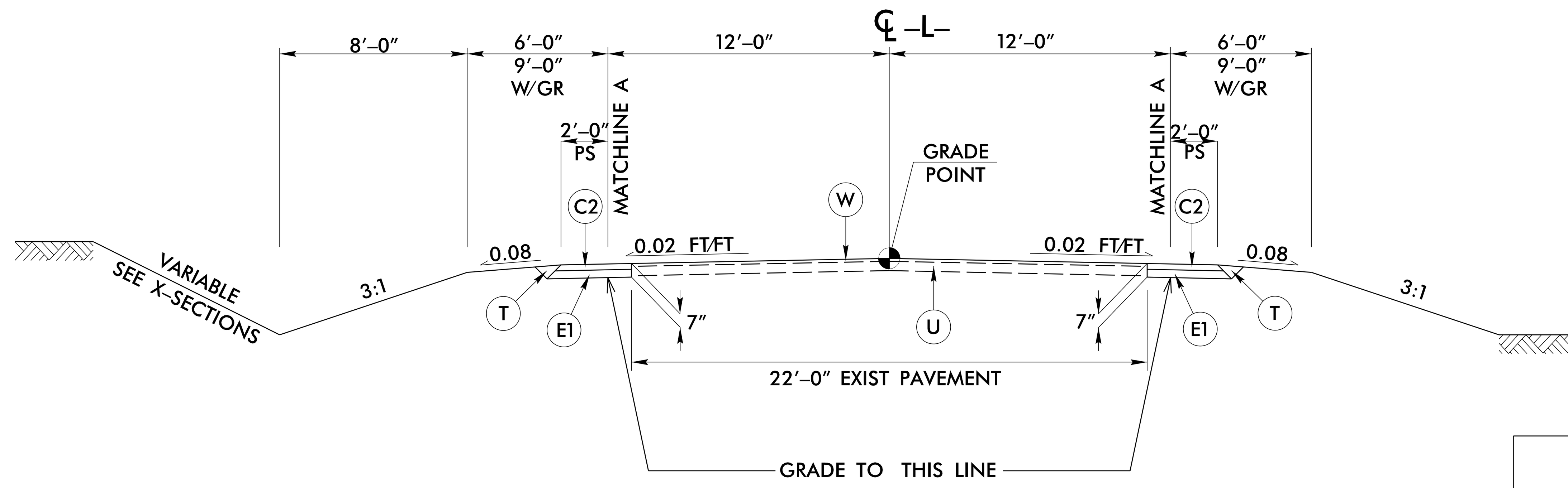
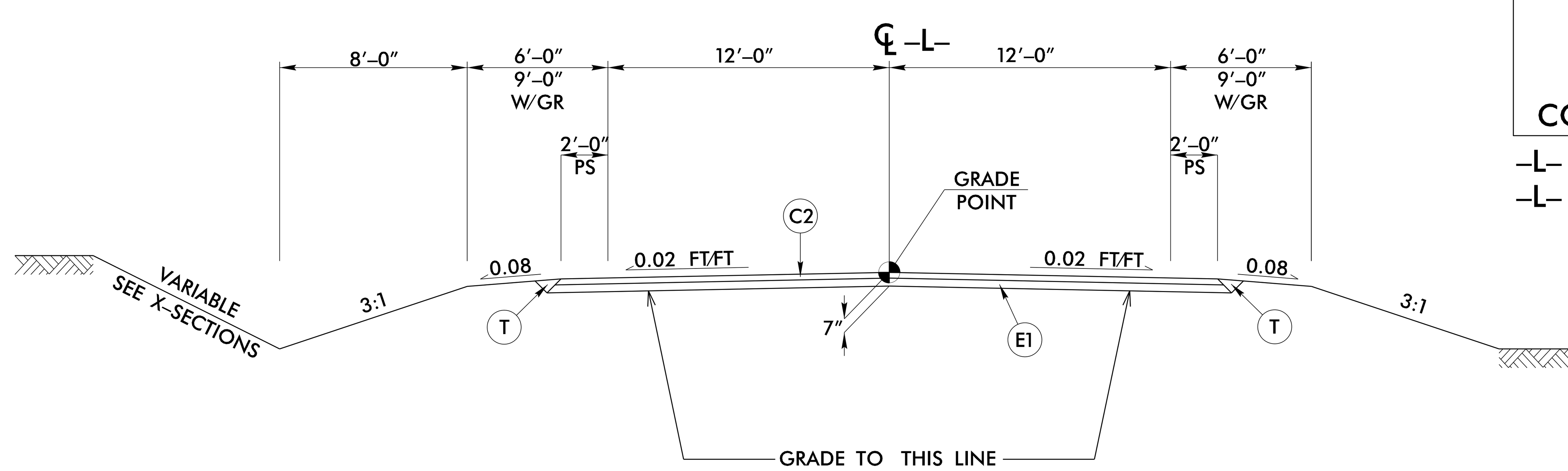


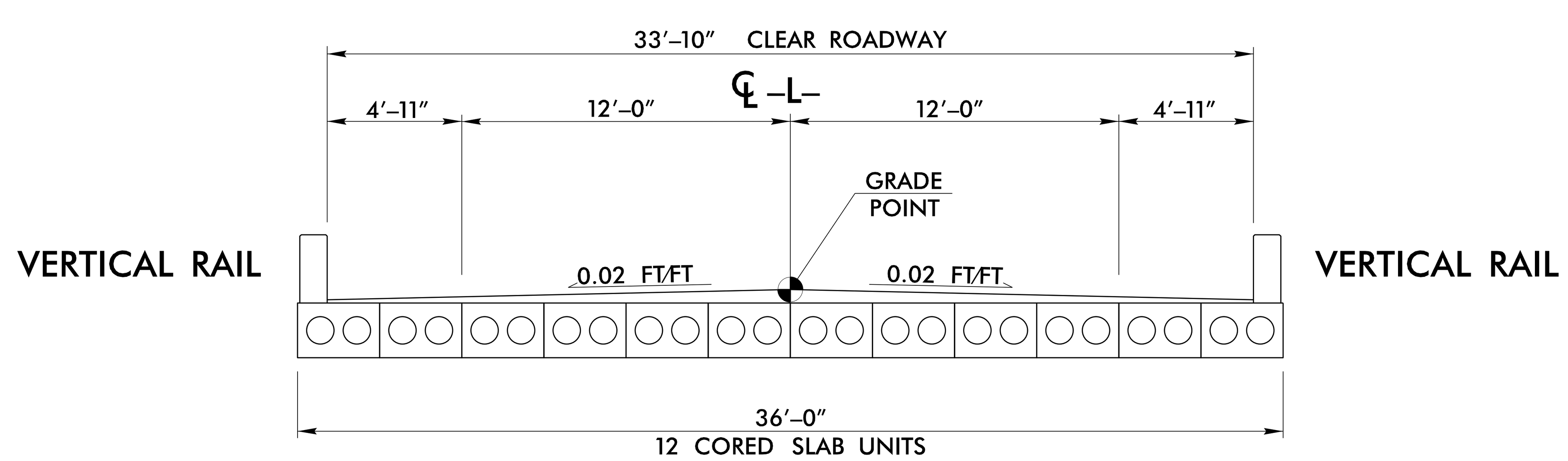
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1:
-L- STA 18+50.00 TO 22+50.00
-L- STA 24+90.00 TO 28+00.00



TYPICAL SECTION NO. 2

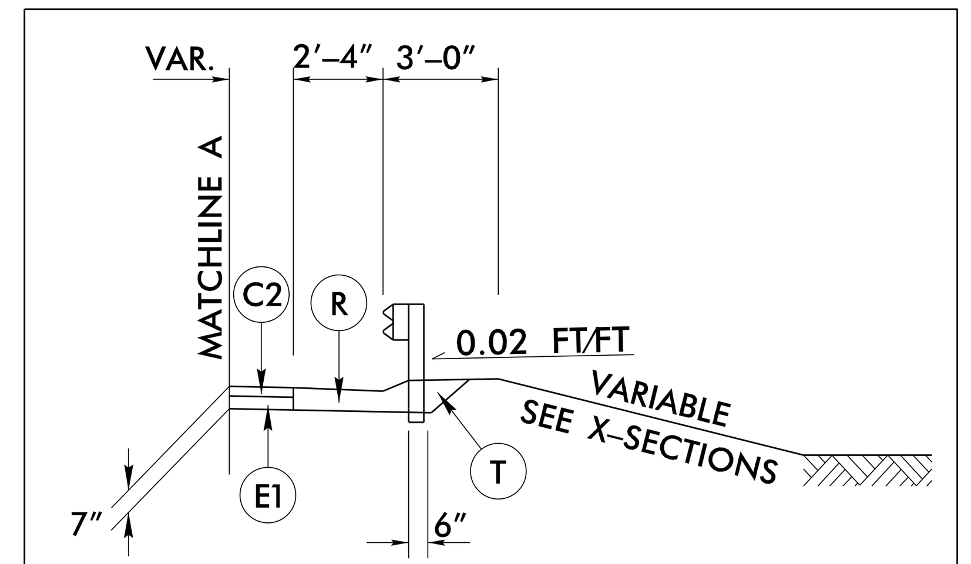
USE TYPICAL SECTION NO. 2:
-L- STA 22+50.00 TO 23+02.75 (BEGIN BRIDGE)
-L- STA 24+40.25 (END BRIDGE) TO 24+90.00



TYPICAL SECTION NO. 3

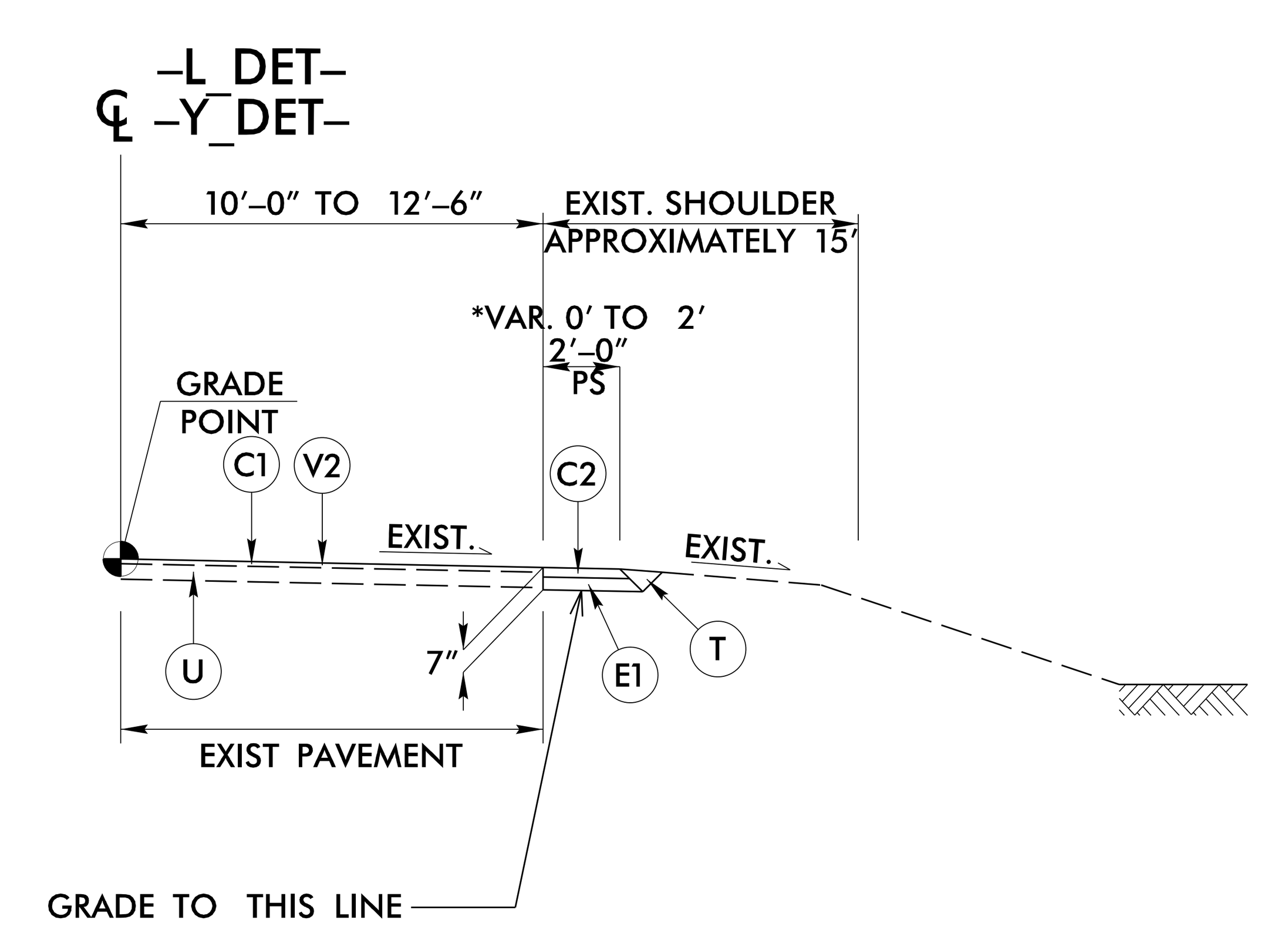
NOTE: SEE STRUCTURE PLANS FOR AWS THICKNESS

USE TYPICAL SECTION NO. 3:
-L- STA 23+02.75 (BEGIN BRIDGE) TO 24+40.25 (END BRIDGE)



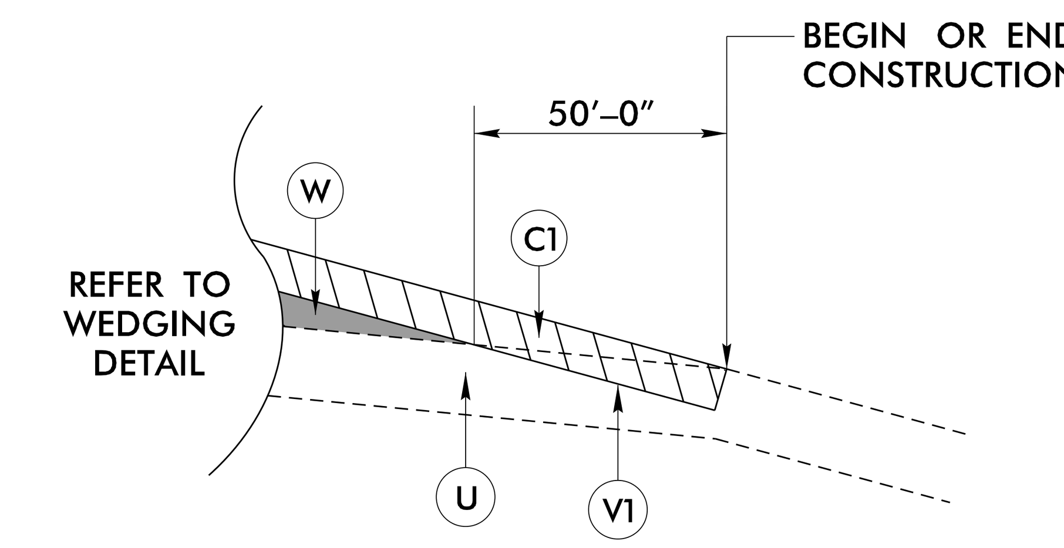
DETAIL FOR SHOULDER BERM GUTTER IN CONJUNCTION WITH GUARDRAIL

-L- STA 24+51.13 TO 24+75.00 RT
-L- STA 24+51.13 TO 26+83.00 LT



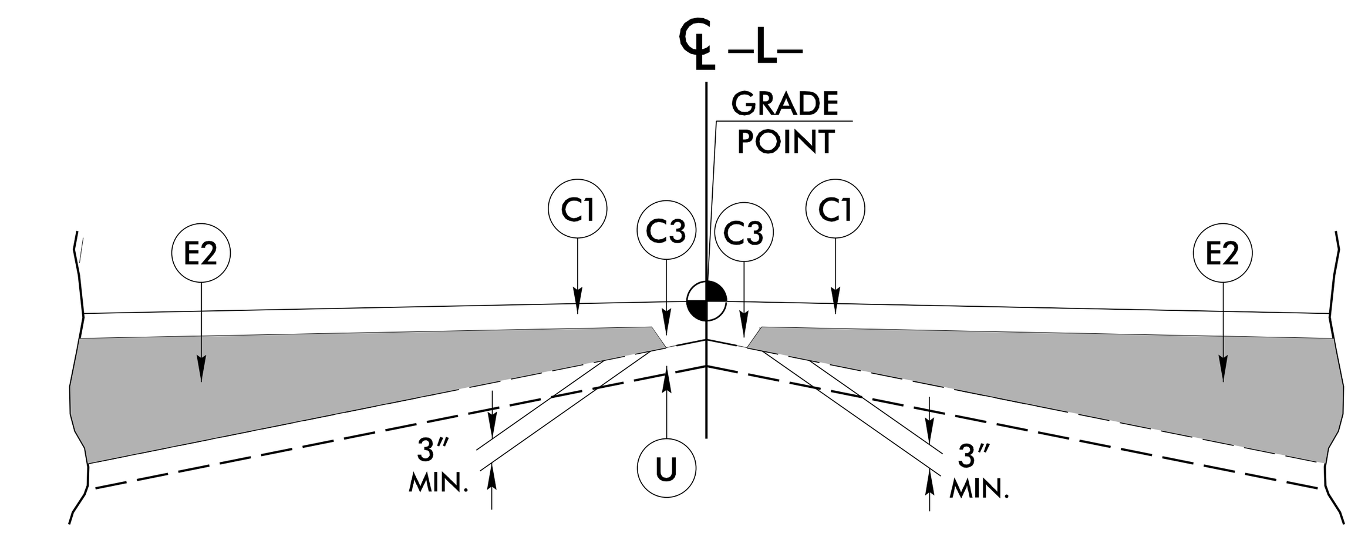
TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4:
* -L_DET- STA 20+56.00 TO 21+80.00
-L_DET- STA 21+80.00 TO 22+38.45
-Y_DET- STA 10+00.00 TO 10+75.00
* -Y_DET- STA 10+75.00 TO 10+99.00



INCIDENTAL MILLING DETAIL

DETAIL SHOWING PROFILE VIEW



Detail Showing Method of Wedging

FINAL PAVEMENT SCHEDULE

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1" IN DEPTH OR GREATER THAN 1½" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
R	SHOULDER BERM GUTTER.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V1	INCIDENTAL MILLING
V2	1½" DEPTH MILLING
W	WEDGING (SEE DETAIL SHOWING METHOD OF WEDGING).

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

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-5626	2B-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 27391 ENGINEER MICHAEL PEKAREK

Docusigned by: Michael Pekarek 2/19/2020

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JASON G DALTON

Docusigned by: Jason G Dalton 2/19/2020

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

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905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

NAD 83 NA 2011

-L_DET-
PI Sta 20+58.59
△ = 45° 40' 55.1" (LT)
D = 5° 36' 59.3"
L = 813.36'
T = 429.69'
R = 1,020.14'

-L_DET- PC Sta. 16+28.90

-L_DET- PT Sta. 24+42.26

-L_DET- POC Sta. 22+38.45
-Y_DET- POT Sta. 10+00.00
10

BEGIN CURVE WIDENING
-L_DET- Sta.10+56.00

END CURVE WIDENING
-Y_DET- Sta.10+99.00

S 79° 43' 23.8" E

N 54° 35' 41" E

S 7° 14' 44" E

CHRISTOPHER D. JONES
DB 3507 PG 423
MB 53 PG 176

STEVEN & SARAH STONE
DB 4907 PG 336

UNITED STATES OF AMERICA
DB 1096 PG 611
MB 28 PG 166

THOMAS R. AMBROGI
DB 4134 PG 387
MB 53 PG 27

UNITED STATES OF AMERICA
DB 1081 PG 415
MB 28 PG 166

DURLIN T. PADGETT
DB 272 PG 535
MB 28 PG 166

GERALD E. PADGETT
DB 276 PG 26

GERALD E. PADGETT
DB 816 PG 951
MB 24 PG 115

UNITED STATES OF AMERICA
DB 1039 PG 636
MB 1 PG 004

UNITED STATES OF AMERICA
DB 1081 PG 378
MB 28 PG 165

15

20

25

FOR –L_DET– & –Y_DET– PROFILE, SEE SHEET 2B–2

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RLF8/13

PROJECT REFERENCE NO.	SHEET NO.
B-5626	2B-2

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 27391 ENGINEER MICHAEL PEKAREK DocuSigned by: Michael Pekarek 61CDAD44F7984CF... 2/19/2020	NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON DocuSigned by: Joshua G. Dalton 1089AD8C14984C3... 2/19/2020
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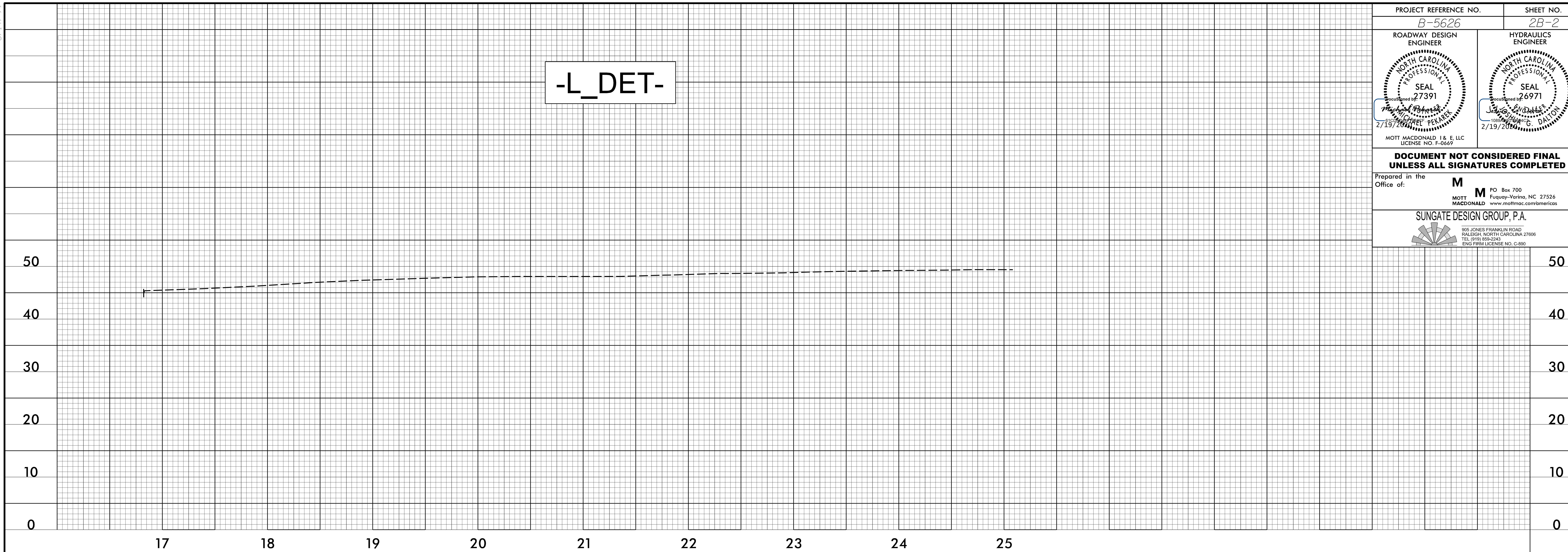

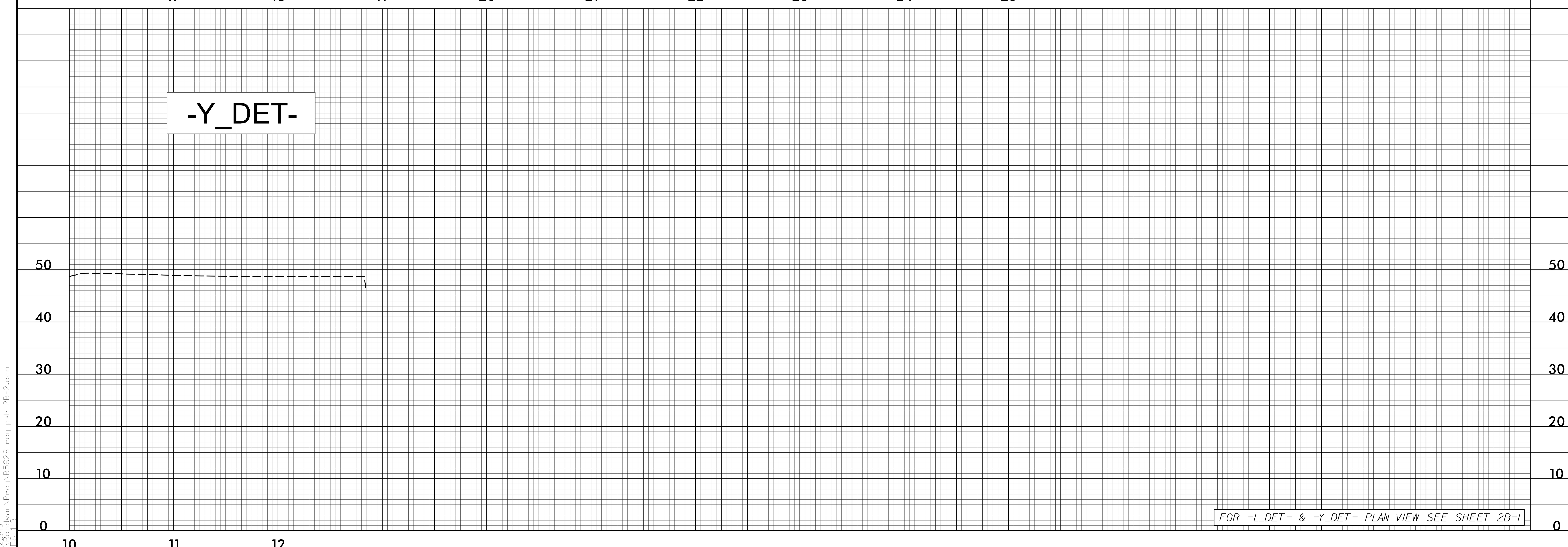

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PROJECT REFERENCE NO.	SHEET NO.
B-5626	2C-1

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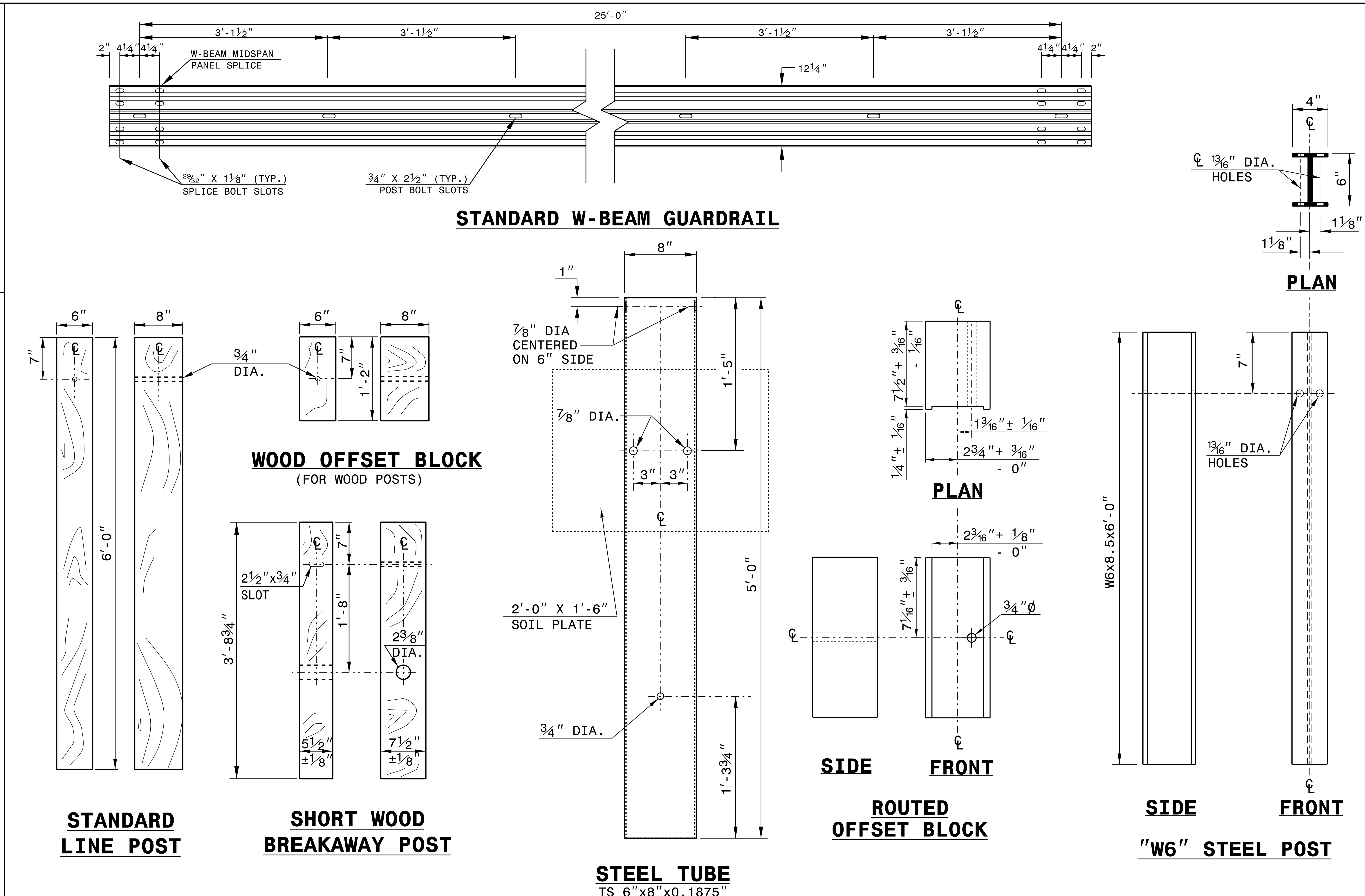
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



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 SEAL 022966 J. HOWERTON
2/20/2020

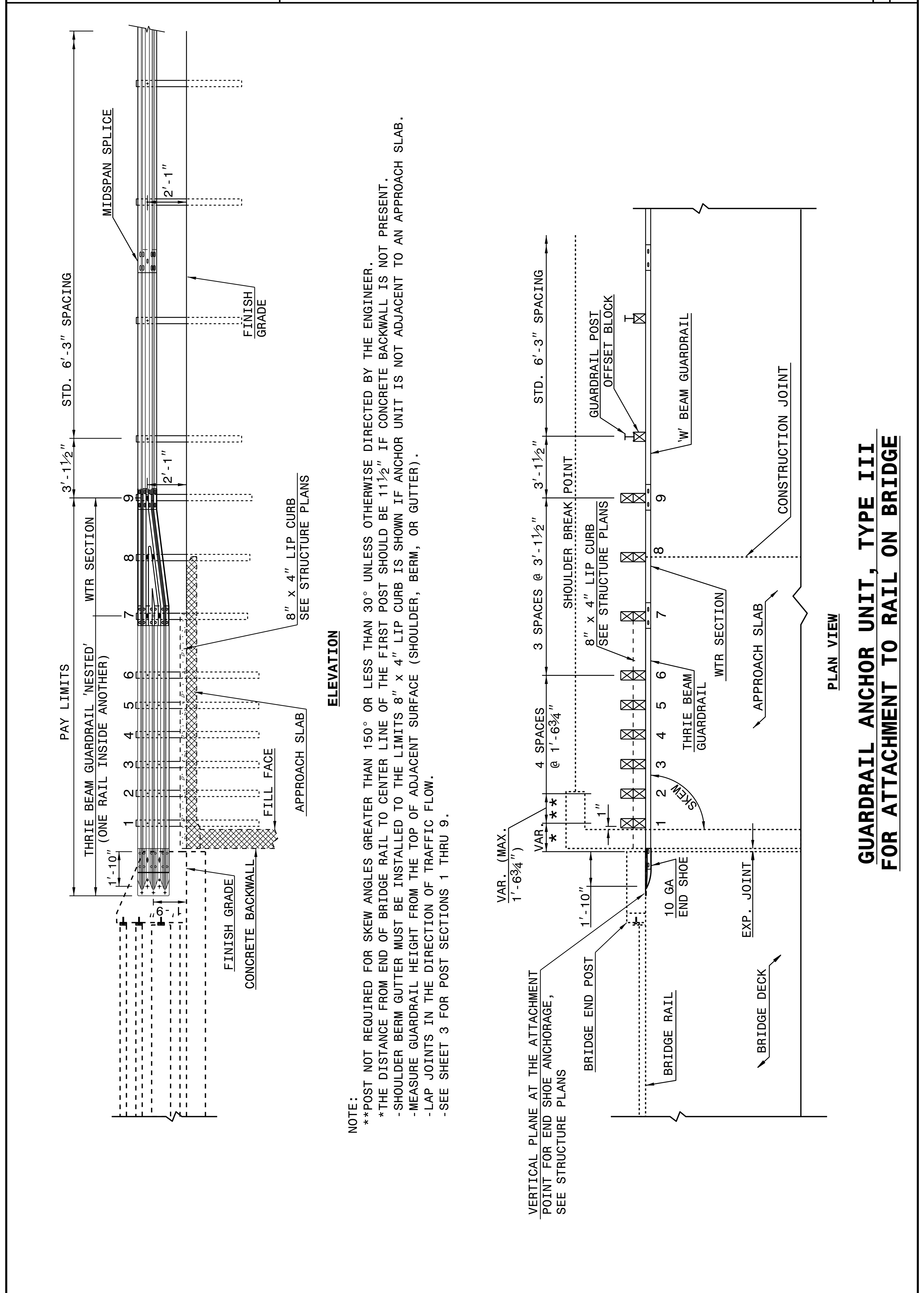
CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

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

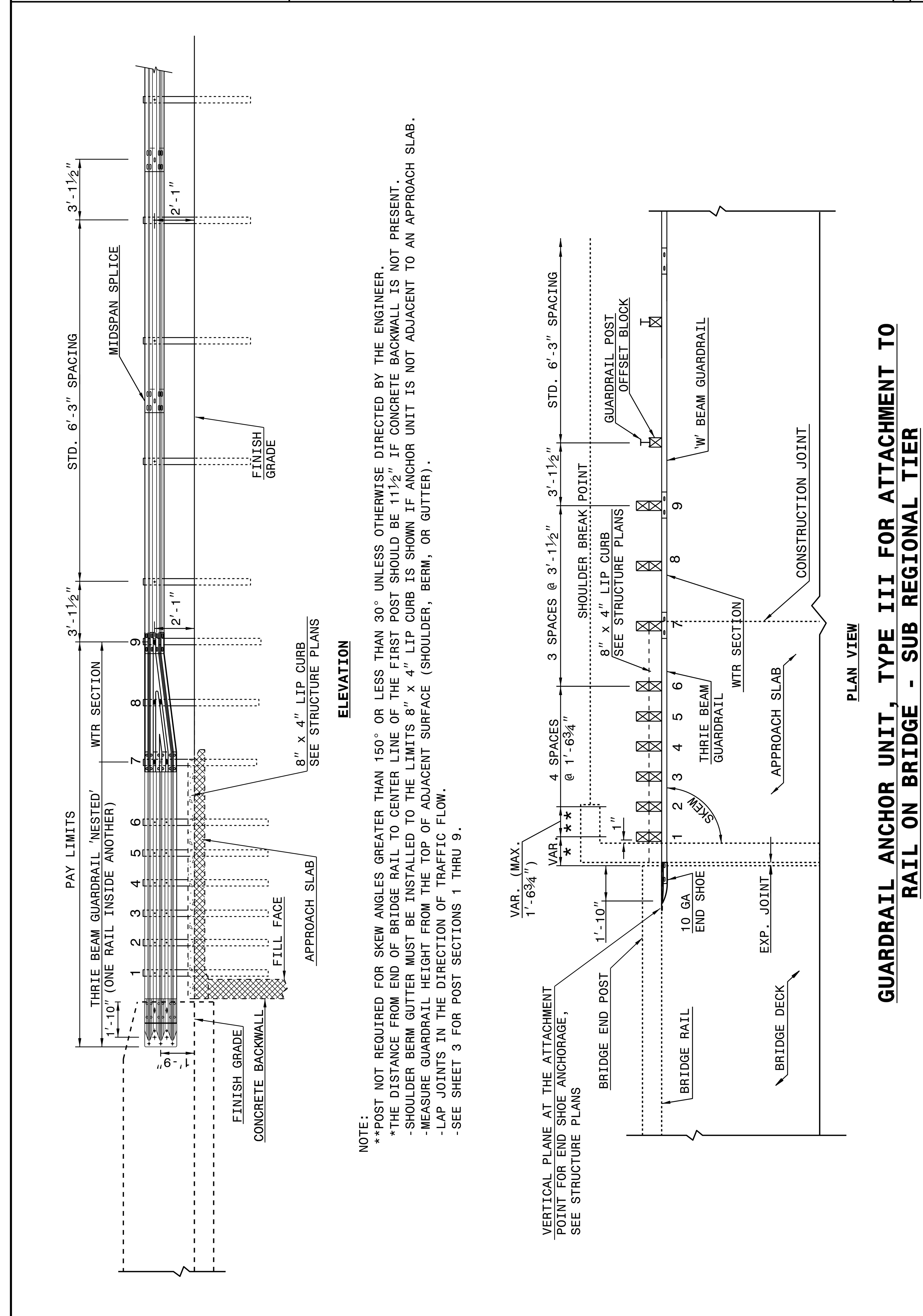
PROJECT REFERENCE NO.	SHEET NO.
B-5626	2C-2

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



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**

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



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**

SEAL 022966 — 2/20/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

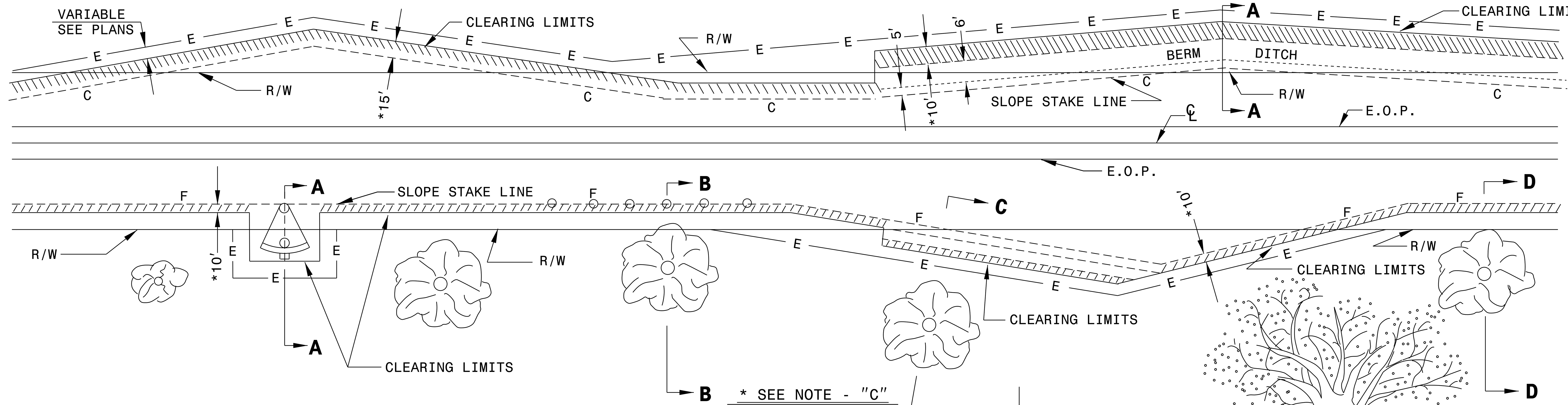
CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

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.

ENGLISH DETAIL DRAWING FOR
METHOD OF CLEARING
MODIFIED METHOD - III



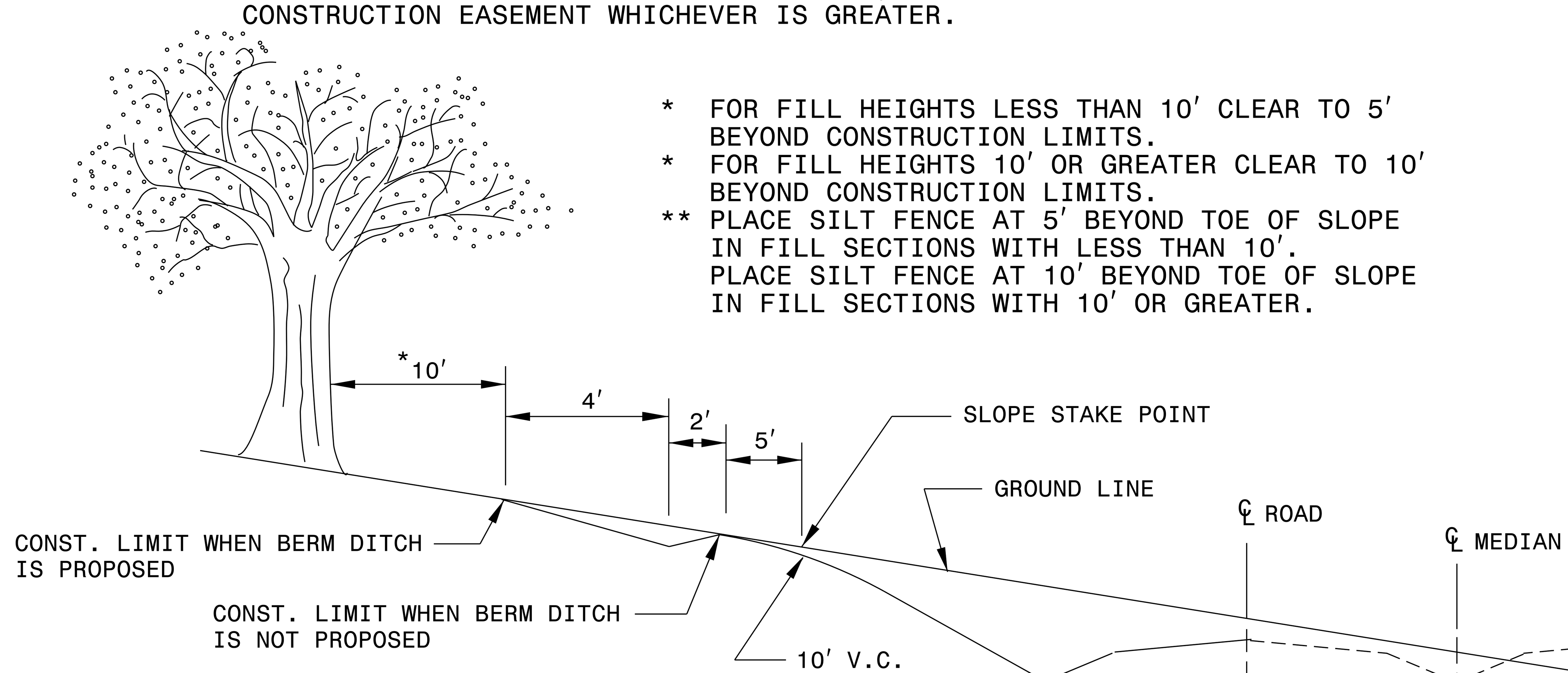
GENERAL NOTES:

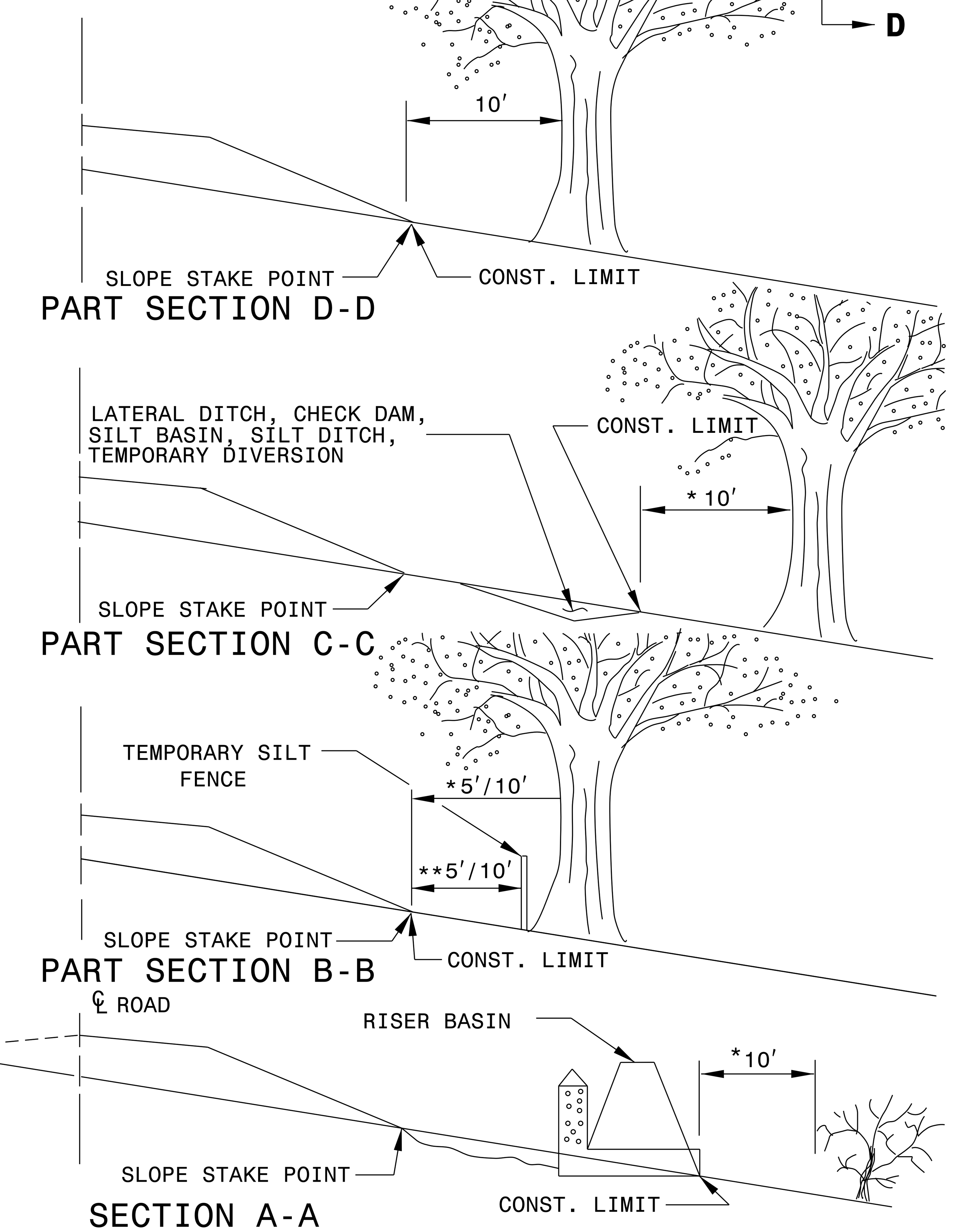
1. REMOVE TREES OUTSIDE THE CLEARING LIMIT WHEN, IN THE OPINION OF THE ENGINEER, THE UTILITY OF A TREE WILL BE DESTROYED BY THE CONSTRUCTION OR THE CLEARING OPERATION.
2. CLEAR IN ACCORDANCE WITH THIS STANDARD EXCEPT WHERE ADDITIONAL CLEARING IS REQUIRED FOR SAFETY AS SHOWN ON THE PLANS.

METHOD III CLEARING LIMITS

(A) CUTS -- CLEAR TO CONSTRUCTION LIMITS.
(B) FILLS - CLEAR TO 5'/10' * BEYOND CONSTRUCTION LIMITS, UNLESS SPECIFIED OTHERWISE BY WETLAND PERMIT.
(C) CUTS AND FILLS - WHEN THE CLEARING LIMITS (A AND B) EXCEED THE PROPOSED R/W OR PROPOSED CONSTRUCTION EASEMENTS, THEN CLEAR ONLY TO THE R/W OR CONSTRUCTION EASEMENT WHICHEVER IS GREATER.

* FOR FILL HEIGHTS LESS THAN 10' CLEAR TO 5' BEYOND CONSTRUCTION LIMITS.
* FOR FILL HEIGHTS 10' OR GREATER CLEAR TO 10' BEYOND CONSTRUCTION LIMITS.
** PLACE SILT FENCE AT 5' BEYOND TOE OF SLOPE IN FILL SECTIONS WITH LESS THAN 10'. PLACE SILT FENCE AT 10' BEYOND TOE OF SLOPE IN FILL SECTIONS WITH 10' OR GREATER.





SHEET 1 OF 1
200D03

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

ENGLISH DETAIL DRAWING FOR
METHOD OF CLEARING
MODIFIED METHOD - III

SHEET 1 OF 1
200D03

NORTH CAROLINA PROFESSIONAL SEAL 022966 S. Howerton
2/20/2020

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

SEE TITLE BLOCK

ORIGINAL BY:	T.S.S.	DATE:	FEB.2000
MODIFIED BY:	K.A.K.	DATE:	AUG.2016
CHECKED BY:		DATE:	
FILE SPEC.:	kkempf/english/0200d301.dgn		

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

5/14/99

05-DEC-2017 10:31
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jhowerton AT CSD-292595

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
B-5626	3B-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOULDER WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU, TL-3	TYPE III							NO.	PERMITTED G	PERMITTED NG	
-L-	20+09.00	23+02.75	RT	293.75'			23+02.75		4' 11"	6'	50'	54'	1'	1' 11"	1	1										
-L-	21+59.00	23+02.75	LT	143.75'				23+02.75	4' 11"	6'	54'	50'	1' 11"	1'	1	1										
-L-	24+40.25	25+84.00	RT	143.75'				24+40.25	4' 11"	6'	54'	50'	1' 11"	1'	1	1										
-L-	24+40.25	27+34.00	LT	293.75'			24+40.25		4' 11"	6'	50'	54'	1'	1' 11"	1	1										
		SUBTOTAL		875.00'																						
		LESS ANCHOR DEDUCTIONS																								
		GREU, TL-3 4 x 50.00' =		-200.00'																						
		TYPE III 4 x 18.75' =		-75.00'																						
		TOTAL		600.00'			ADDITIONAL POSTS: 5								4	4										

SUMMARY OF EXISTING ASPHALT PAVEMENT REMOVAL

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD'
-L-	22+50.00	23+43.43	CL	229.31
-L-	24+29.05	24+90.00	CL	149.47
			TOTAL:	378.79
			SAY:	400

SUMMARY OF EARTHWORK IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	EMBT+%	BORROW	WASTE
-L- 18+50.00 TO 23+02.75 (BEGIN BRIDGE)	6	1343	1337	
-L- 24+40.25 (END BRIDGE) TO 28+00.00	57	556	499	
-L_DET- 21+56.00 TO 22+00.00	16			16
-Y_DET- 10+13.31 TO 10+99.00	7			7
SUBTOTAL	86	1899	1836	23
WASTE IN LIEU OF BORROW			-23	-23
PROJECT TOTAL	86	1899	1813	
EST. 5% TO REPLACE TOPSOIL ON BORROW PIT			91	
GRAND TOTAL	86	1899	1904	
SAY	100		2000	

EST. SELECT GRANULAR MATERIAL = 300 YD'
UNDERCUT EXCAVATION = 300 YD'

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

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

SUMMARY OF SHOULDER BERM GUTTER

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	LENGTH
-L-	24+51.13	26+83.00	LT	231.87'
-L-	24+51.13	24+75.00	RT	23.87'
			TOTAL:	255.74'
			SAY:	270'

COMPUTED BY: Joshua G. Dalton, PE DATE: 12/20/19
CHECKED BY: Brian N. Elam, PE DATE: 12/20/19

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO.		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC)											C.S. PIPE							R.C. PIPE (CLASS III)							R.C. PIPE (CLASS IV)								**" R. C. PIPE (CLASS V)	**" R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	**" R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS.		QUANTITIES FOR DRAINAGE STRUCTURES	* TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. *FT.		C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE				CONCRETE TRANSITIONAL SECTION		G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	T.B.D.I. STD. 840.35	15" DRAINAGE PIPE ELBOWS	CONC. COLLARS CL. "B" C.Y. STD 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN.FT.	REMARKS
SIZE		FROM	TO					12"	15"	18"	24"	30"	36"	42"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE PVC	DO NOT USE CAAP	DO NOT USE HDPE	12"	15"	18"	24"	36"	42"	48"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"	30"	36"	42"	48"						R.C.P.	C.S.P.	PER EACH (0' THRU 5.0')	A 5.0' THRU 10.0'	B 10.0' AND ABOVE		E	F	G		CATCH BASIN	DROP INLET											
THICKNESS OR GAUGE																				.064	.064	.064	.064	.079	.109	.109																																											
24+71	RT	401		37.8																																													1														1	1	2				
		401	402		34.6	33.1			20'						X	X																																																					
24+71	LT	403		37.8																																													1														1	1	2				
		403	404		34.6	34.1			20'						X	X																																																					
26+71	LT	405		36.8																																													1														1	1					
		405	406		33.8	33.6			16'							X																																																					
TOTAL									56'																																								3														3	3	4				

ABBREVIATIONS

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

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

COMPUTED BY: Tyler C. Bottoms DATE: 12/5/18
CHECKED BY: Thein Tun Zan DATE: 12/19/18

(5-15-18)

PROJECT NO.	SHEET NO.
B-5626	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

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

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

SUMMARY OF ROCK PLATING

LINE	Beginning Slope (H:V)	Approx. Station	Ending Slope (H:V)	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/3/4	Riprap Class* 1/2/B	Rock Plating SY
L	2.5:1	21+75	2:1	22+90	RT	1	2	180
							TOTAL SY:	180

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

PROJECT REFERENCE NO.	SHEET NO.
B-5626	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 27391 MICHAEL PEKAREK 4/7/2020	NORTH CAROLINA PROFESSIONAL SEAL 26971 JOSHUA G. DALTON 4/7/2020
MOTT MACDONALD I& E, LLC LICENSE NO. F-0669	

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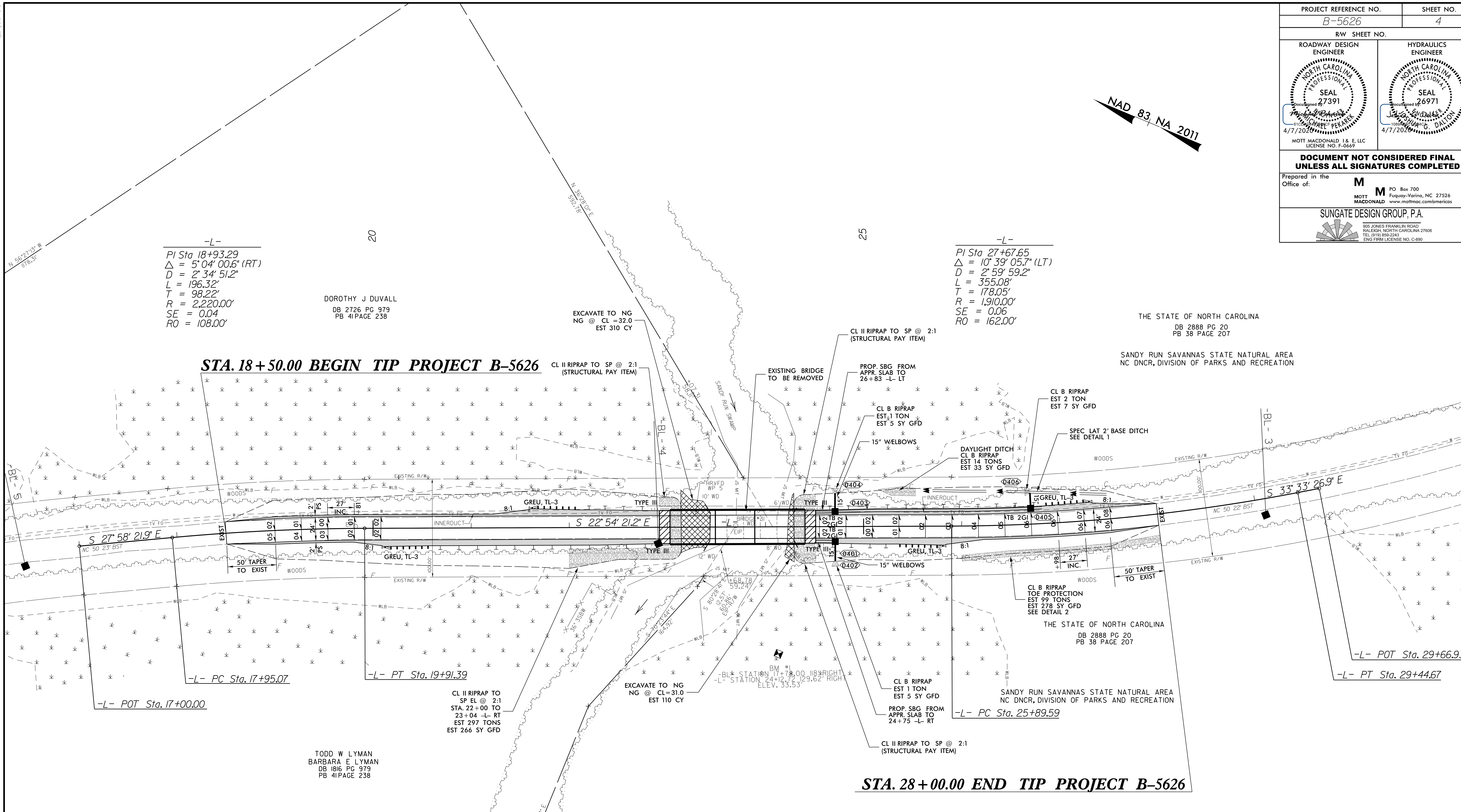
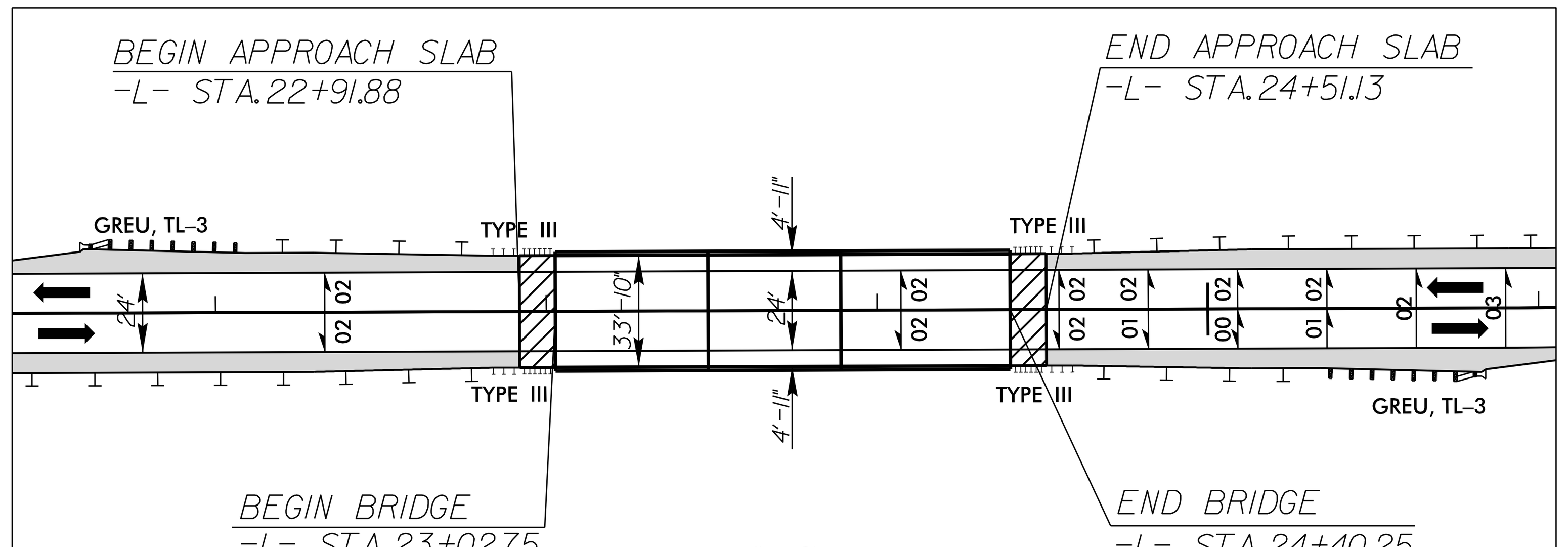
Prepared in the Office of: MOTT MACDONALD PO Box 700 Fuquay-Varina, NC 27526 www.mottmac.com/americas

SUNGATE DESIGN GROUP, P.A. 905 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27606 TEL (919) 859-2243 ENG FIRM LICENSE NO. C-890

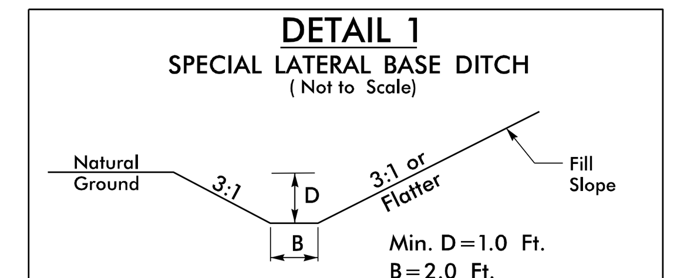


NAD 83 NA 2011
-L-
PI Sta 18+93.29
△ = 5° 04' 00.6" (RT)
D = 2° 34' 51.2"
L = 196.32'
T = 98.22'
R = 2,220.00'
SE = 0.04
RO = 108.00'
-L-
PI Sta 27+67.65
△ = 10° 39' 05.7" (LT)
D = 2° 59' 59.2"
L = 355.08'
T = 178.05'
R = 1,910.00'
SE = 0.06
RO = 162.00'
DOROTHY J DUVALL
DB 2726 PG 979
PB 41 PAGE 238
THE STATE OF NORTH CAROLINA
DB 2888 PG 20
PB 38 PAGE 207
SANDY RUN SAVANNAS STATE NATURAL AREA
NC DNCR, DIVISION OF PARKS AND RECREATION
STA. 18+50.00 BEGIN TIP PROJECT B-5626
STA. 28+00.00 END TIP PROJECT B-5626
EXCAVATE TO NG
NG @ CL =32.0
EST 310 CY
CL II RIPRAP TO SP @ 2:1
(STRUCTURAL PAY ITEM)
EXISTING BRIDGE
TO BE REMOVED
PROP. SBG FROM
APPR. SLAB TO
26+83 -L- LT
CL B RIPRAP
EST 1 TON
EST 5 SY GFD
15" W/ELBOWS
DAYLIGHT DITCH
CL B RIPRAP
EST 14 TONS
EST 33 SY GFD
CL B RIPRAP
EST 2 TON
EST 7 SY GFD
SPEC LAT 2' BASE DITCH
SEE DETAIL 1
S 27° 58' 21.9" E
S 22° 54' 21.2" E
S 33° 33' 26.9" E
GREU, TL-3
TYPE III
50' TAPER
TO EXIST
27' INC.
WOODS
EXISTING R/W
NC 50 23' BST
NC 50 22' BST
SANDY RUN SWAMP
-BL-4
-BL-5
-BL-3
CL B RIPRAP
TOE PROTECTION
EST 99 TONS
EST 278 SY GFD
SEE DETAIL 2
-L- POT Sta. 17+00.00
-L- PC Sta. 17+95.07
-L- PT Sta. 19+91.39
CL II RIPRAP TO
SP EL @ 2:1
STA. 22+00 TO
23+04 -L- RT
EST 297 TONS
EST 266 SY GFD
EXCAVATE TO NG
NG @ CL=31.0
EST 110 CY
BM #1
-BL- STATION 17+78.00 118' RIGHT
-L- STATION 24+12.72 129.62' RIGHT
ELEV. 33.53
CL B RIPRAP
EST 1 TON
EST 5 SY GFD
PROP. SBG FROM
APPR. SLAB TO
24+75 -L- RT
CL II RIPRAP TO SP @ 2:1
(STRUCTURAL PAY ITEM)
-L- PC Sta. 25+89.59
-L- PT Sta. 29+44.67
-L- POT Sta. 29+66.93
TODD W LYMAN
BARBARA E LYMAN
DB 1816 PG 979
PB 41 PAGE 238
20
25



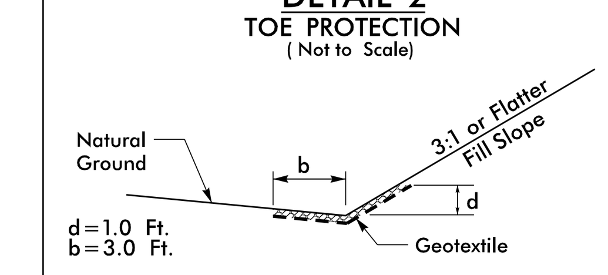
SKETCH SHOWING BRIDGE/PAVEMENT RELATIONSHIP

DETAIL 1
SPECIAL LATERAL BASE DITCH
(Not to Scale)



FROM STA. 25+50 TO STA. 27+50 -L- LT

DETAIL 2
TOE PROTECTION
(Not to Scale)



FROM STA. 26+00 TO STA. 28+00 -L- RT

APPROACH SLABS

* NOTE: USE ROCK PLATING FROM -L- STA. 21+75 +/- TO STA. 22+90 +/-, RIGHT AND CARRY ROCK PLATING TO 2.5:1 (H:V) SLOPE. USE ROCK PLATING DETAIL NO. 1 OF ROADWAY STANDARD DRAWING NO. 275.01.

* NOTE: DIVISION OF MITIGATION SERVICES CONSERVATION EASEMENT (SANDY RUN SAVANNAS STATE NATURAL AREA), NO DISTURBANCE OR ENCROACHMENT ALLOWED.

FOR -L- PROFILE, SEE SHEET 5

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-5626	5

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 27391 ENGINEER

Docusigned by: Michael Pekarek
ELECTRONIC SIGNATURE: MICHAEL PEKAREK
2/19/2020

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER

Docusigned by: Joshua Dalton
ELECTRONIC SIGNATURE: JOSHUA G. DALTON
2/19/2020

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

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Prepared in the Office of:

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PO Box 700
Fuquay-Varina, NC 27526
www.mottmac.com/americas

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

-L-

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 2600	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 35.0	FT
BASE DISCHARGE	= 3100	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 35.5	FT
OVERTOPPING DISCHARGE	= 5500	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 37.5	FT
DATE OF SURVEY	= 4/15/2016	
W.S.ELEVATION AT DATE OF SURVEY	= 30.1	FT

BENCH MARKS
BM1: TIE IN 18" OAK
-L- STA 24+12.72 OFF 129.62'
N=326089 E=2416119
EL.= 33.53'

BEGIN GRADE
-L- STA 19+00.00
EL.= 37.76'

END GRADE
-L- STA 27+50.00
EL.= 38.12'

BLEND TO EXIST

BEGIN BRIDGE
-L- STA 23+02.75

BRIDGE C STA. 23+71.50 -L-
21" CORED SLABS
3 SPANS: 1@46.19', 1@40.13', 1@51.19', SKEW 90
W/4' DEEP CAPS
GF ELEV.=38.53'

END BRIDGE
-L- STA 24+40.25

BLEND TO EXIST

PI = 21+30.00
EL = 39.50'
VC = 320'
K = 277

PI = 26+00.00
EL = 37.62'
VC = 300'
K = 409

EXISTING BRIDGE TO BE REMOVED

PROPOSED GRADE

(+)0.7565%

(-)0.4000%

(-)0.4000%

(+)0.3333%

(+)0.3000%

(+)1.5000%

EXISTING GRADE

CL II RIPRAP 2:1 NORMAL (TYPICAL)

EXCAVATE TO NG
NG @ CL=32.0
EST 310 CY
(STRUCTURE PAY ITEM)

PROPOSED 2:1 BANK SLOPE

WS ON 4-15-2016
=NWS=30.1

EXCAVATE TO NG
NG @ CL=31.0
EST 310 CY
(STRUCTURE PAY ITEM)

EXCAVATE AT 2:1 TO NG

CLASS II RIPRAP TO TOP OF BERM 2:1 NORMAL

BEG SPEC LAT 2' BASE DITCH -L- LT STA.25+50 EL=33.00

SPEC LAT 2' BASE DITCH -L- LT STA.26+50 EL=33.30

END SPEC LAT 2' BASE DITCH -L- LT STA.27+50 EL=34.90

LEFT DITCH

FOR -L- PLAN VIEW SEE SHEET 4

50 40 30 20 10 0

17 18 19 20 21 22 23 24 25 26 27 28 29 30

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RIEB1413

PROJECT REFERENCE NO.	SHEET NO.
B-5626	RW02C-1
Location and Surveys	

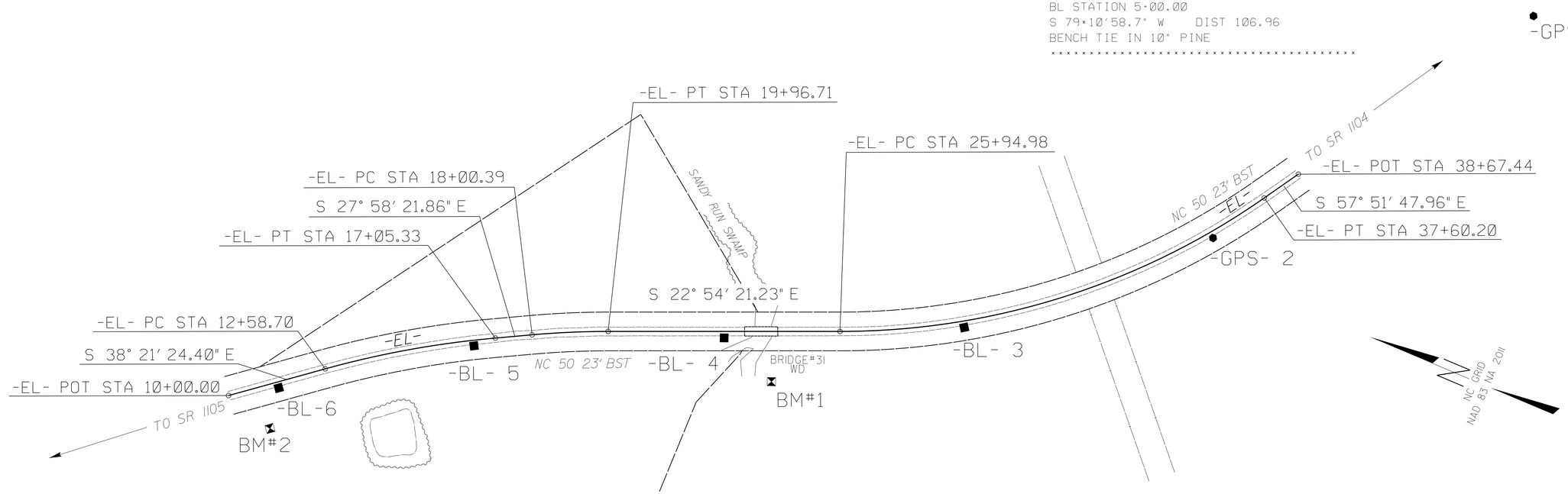
SURVEY CONTROL SHEET B5626

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

BL

POINT	DESC.	NORTH	EAST	ELEVATION
BL6	TRV CAP & REBAR	327253.4380	2415609.3080	36.76
BL5	TRV CAP & REBAR	326831.7170	2415905.4780	36.26
BL4	TRV CAP & REBAR	326245.4000	2416175.5050	36.19
BL3	TRV CAP & REBAR	325685.4280	2416441.3190	39.27
GPS2	GPS CAP & REBAR	325184.3210	2416903.9680	44.51
GPS1	GPS CAP & REBAR	324645.7960	2417753.4270	46.62

```
**********************************************
BM1       ELEVATION = 33.53
N 326089      E 2416119
BL STATION 17+78.00 118 RIGHT
BENCH TIE IN 18" OAK
**********************************************
**********************************************
BM2       ELEVATION = 37.21
N 327233      E 2415504
BL STATION 5+00.00
S 79°10'58.7" W    DIST 106.96
BENCH TIE IN 10" PINE
**********************************************
```



EL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	327365.049	2415540.967							
LINE			S 38°21'24.4" E	258.70					
PC	327162.188	2415701.504							
CURVE			S 33°09'53.1" E	446.02	10°23'02.5"(RT)	02°19'30.0"	446.63	223.93	2464.35
PT	326788.827	2415945.497							
LINE			S 27°58'21.9" E	95.07					
PC	326704.867	2415990.088							
CURVE			S 25°26'21.5" E	196.26	05°04'00.6"(RT)	02°34'51.2"	196.32	98.22	2220.00
PT	326527.639	2416074.391							
LINE			S 22°54'21.2" E	598.27					
PC	325976.550	2416307.247							
CURVE			S 40°23'04.6" E	1147.23	34°57'26.7"(LT)	03°00'00.2"	1165.22	601.38	1909.82
PT	325102.689	2417050.556							
LINE			S 57°51'48.0" E	107.24					
POT	325045.646	2417141.362							

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

REVISIONS

8/17/99

10:17:50
R:\LocationSurveys\Survey Control\b5626_ls_1C_190227.dgn
RE18413