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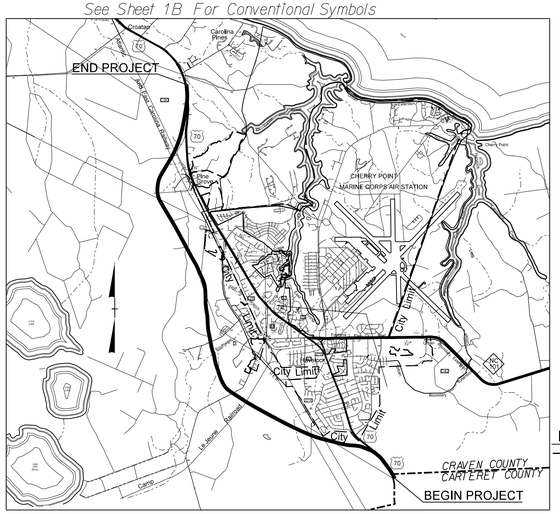
09.08.09

TIP PROJECT: R-1015

CONTRACT: C204177

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CRAVEN / CARTERET COUNTY

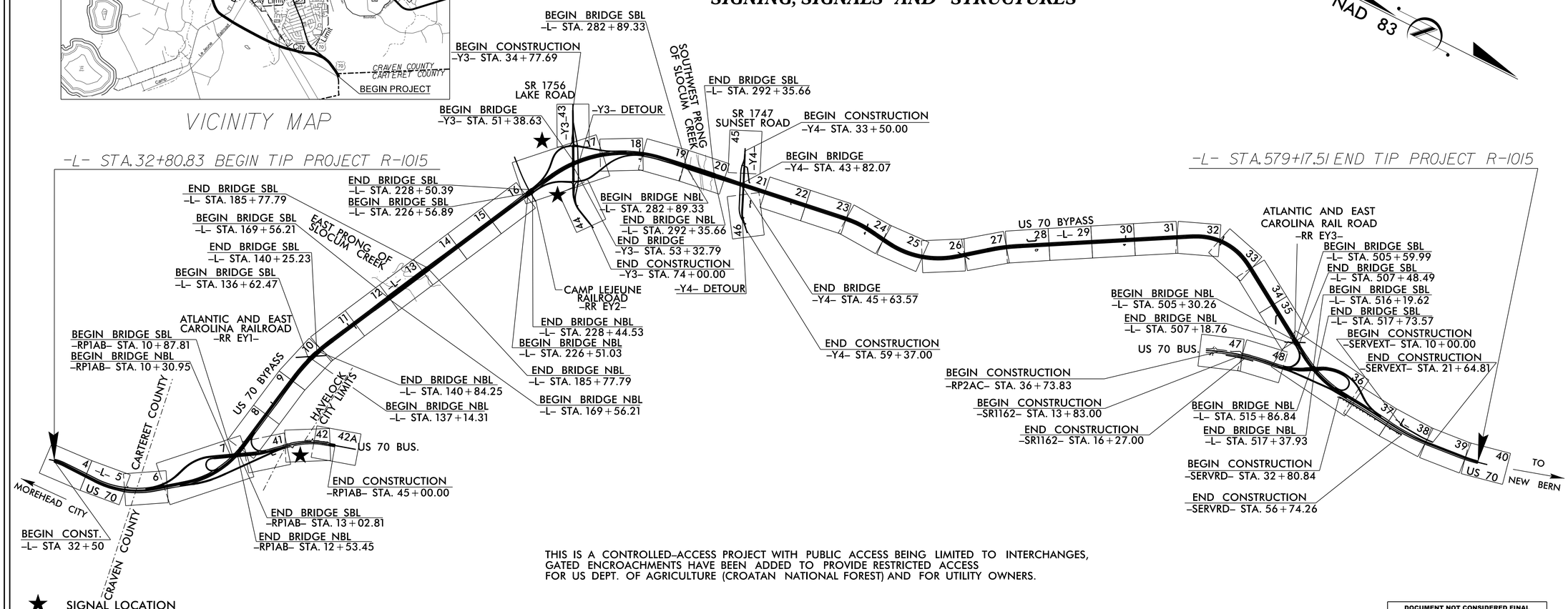
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-1015	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34360.1.2	NHF-70(49)	PE
34360.2.4	NHF-70(49)	RW
34360.2.5	NHF-70(49)	UTIL
34360.3.4	NHF-70(49)	CONST

LOCATION: US 70 (HAVELOCK BYPASS) FROM SOUTH OF CARTERET / CRAVEN COUNTY LINE TO SOUTH OF SR 1176, (CAROLINA PINES BLVD.)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, WIDENING, CULVERTS SIGNING, SIGNALS AND STRUCTURES

NAD 83



THIS IS A CONTROLLED-ACCESS PROJECT WITH PUBLIC ACCESS BEING LIMITED TO INTERCHANGES, GATED ENCROACHMENTS HAVE BEEN ADDED TO PROVIDE RESTRICTED ACCESS FOR US DEPT. OF AGRICULTURE (CROATAN NATIONAL FOREST) AND FOR UTILITY OWNERS.

★ SIGNAL LOCATION

NCDOT CONTACT: ROADWAY DESIGN PROJECT ENGINEER
GARY LOVERING, P.E.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

PLANS 50 25 0 50 100

PROFILE (HORIZONTAL) 50 25 0 50 100

PROFILE (VERTICAL) 10 5 0 10 20

DESIGN DATA

ADT 2015 = N/A
ADT 2035 = 22,900
K = 9 %
D = 60 %
T = 6 % *
V = 70 MPH
* TTST 3% DUAL 3%
FUNC. CLASS = FREEWAY (FUTURE INTERSTATE)

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT R-1015 = 9.691 MILES
LENGTH OF STRUCTURE TIP PROJECT R-1015 = 0.657 MILES
TOTAL LENGTH OF TIP PROJECT R-1015 = 10.348 MILES
USED NBL FOR PROJECT LENGTHS

Prepared for NCDOT In the Office of:
moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX (F-0105)

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
SEPTEMBER 16, 2016

LETTING DATE:
APRIL 16, 2019

TIM REID, PE
PROJECT ENGINEER

TRENT HUFFMAN, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032581 ENGINEER Brock E. Anderson P.E.

DocuSigned by: Brock Anderson CEC3F33C9B9E495...

SIGNATURE:

ROADWAY DESIGN ENGINEER

moffatt & nichol

NORTH CAROLINA PROFESSIONAL SEAL 015869 ENGINEER Timothy R. Reid P.E.

DocuSigned by: Timothy R Reid 2856BA242E83411...

SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

3/15/2019
G:\RA\9729-02\CADD\R1015\Roadway\Proj\r-1015_rdy_tsh.dgn
gmodlin

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-1015	1-A

ROADWAY DESIGN ENGINEER

SEAL 015869

2/28/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX OF SHEETS

GENERAL NOTES:

2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADE LINE:
GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.05 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. 560.02

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

POWER - DUKE ENERGY (TRANS)

POWER - CITY OF NEW BERN

POWER - CARTERET-CRAVEN

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

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

EFF. 01-16-2018
REV.

2018 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2018 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.01	Guide for Grading Subgrade - Interstate and Freeway
225.02	Guide for Grading Subgrade - Secondary and Local
225.03	Deceleration and Acceleration Lanes
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.05	Method of Obtaining Superelevation - Divided Highways
225.06	Method of Grading Sight Distance at Intersections
225.09	Guide for Shoulder and Ditch Transition at Grade Separations
235.01	Embankment Monitoring
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
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
560.02	Method of Shoulder Construction - High Side of Superelevated Curve - Method II
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
610.03	Guide for Paving Shoulders Under Bridges - Method III
610.04	Guide for Paving Shoulders Under Bridges - Method IV
654.01	Pavement Repairs
665.01	Asphalt Shoulders - Milled Rumble Strips
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
806.03	Concrete Contol of Access 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
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.24	Frames and Narrow Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
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
846.02	Drop Inlet Installation in Expressway Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
848.01	Concrete Sidewalk
852.01	Concrete Islands
852.04	Method for Placement of Drop Inlets in Grassed Median - Using 1'-6" Curb and Gutter
852.10	Median Construction - with Curb and Gutter
857.01	Precast Reinforced Concrete Barrier - 41" Single Faced
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
865.01	Cable Guiderail
866.02	Woven Wire Fence - with Wood Post
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

04/06/15

PROJECT REFERENCE NO.	SHEET NO.
R-1015	1-B

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
- 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
- Potential Contamination Area: Soil
- Known Contamination Area: Water
- Potential Contamination Area: Water
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — 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:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite R/W Marker — RW
- Proposed Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage / Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

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.

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
R-1015	1C-1
Location and Surveys	

SURVEY CONTROL SHEET R-1015

END TIP PROJECT R-1015
-L- Sta. 579+17.51
LOCALIZED PROJECT COORDINATES
N=444127.308 E=2614514.517

NCDOT GPS STATION "RIOI5-24"
LOCALIZED PROJECT COORDINATES
N=443544.5070 E=2614708.4970

NCDOT GPS STATION "RIOI5-23"
LOCALIZED PROJECT COORDINATES
N=442470.5970 E=2614782.1270

-L-
US 70

NCDOT GPS STATION "RIOI5-22"
LOCALIZED PROJECT COORDINATES
N=438603.3150 E=2614639.1660

NCDOT GPS STATION "RIOI5-21"
LOCALIZED PROJECT COORDINATES
N=437565.0280 E=2614691.1730

-L-
US 70

NAD 83

NCDOT GPS STATION "RIOI5-19"
LOCALIZED PROJECT COORDINATES
N=433351.9600 E=2611277.9520

NCDOT GPS STATION "RIOI5-20"
LOCALIZED PROJECT COORDINATES
N=433410.0010 E=2612367.8950

-L-
NEW LOCATION

NCDOT GPS STATION "RIOI5-18"
LOCALIZED PROJECT COORDINATES
N=427960.8240 E=2614749.7350

-Y4-
SR 1747
SUNSET RD

NCDOT GPS STATION "RIOI5-17"
LOCALIZED PROJECT COORDINATES
N=427767.6550 E=2613644.8240

NCDOT GPS STATION "RIOI5-14"
LOCALIZED PROJECT COORDINATES
N=420103.6990 E=2619272.7620

NCDOT GPS STATION "RIOI5-13"
LOCALIZED PROJECT COORDINATES
N=419384.2560 E=2618536.6250

NCDOT GPS STATION "RIOI5-16"
LOCALIZED PROJECT COORDINATES
N=421454.8290 E=2613421.6550

NCDOT GPS STATION "RIOI5-10"
LOCALIZED PROJECT COORDINATES
N=415109.8270 E=2620829.2900

NCDOT GPS STATION "RIOI5-4"
LOCALIZED PROJECT COORDINATES
N=408338.8480 E=2632319.7630

NCDOT GPS STATION "RIOI5-15"
LOCALIZED PROJECT COORDINATES
N=420391.7100 E=2612668.8240

NCDOT GPS STATION "RIOI5-9"
LOCALIZED PROJECT COORDINATES
N=414291.1030 E=2620442.1810

-L-
US 70

NCDOT GPS STATION "RIOI5-3"
LOCALIZED PROJECT COORDINATES
N=407698.6590 E=2633116.7990

NCDOT GPS STATION "RIOI5-6"
LOCALIZED PROJECT COORDINATES
N=409334.9550 E=2627080.4600

-L-
NEW LOCATION

NCDOT GPS STATION "RIOI5-11"
LOCALIZED PROJECT COORDINATES
N=418244.0860 E=2616471.2140

NCDOT GPS STATION "RIOI5-12"
LOCALIZED PROJECT COORDINATES
N=418731.1920 E=2617567.0920

-Y3-
SR 1756
LAKE ROAD

NCDOT GPS STATION "RIOI5-2"
LOCALIZED PROJECT COORDINATES
N=402973.1970 E=2635346.7900

-L-
US 70

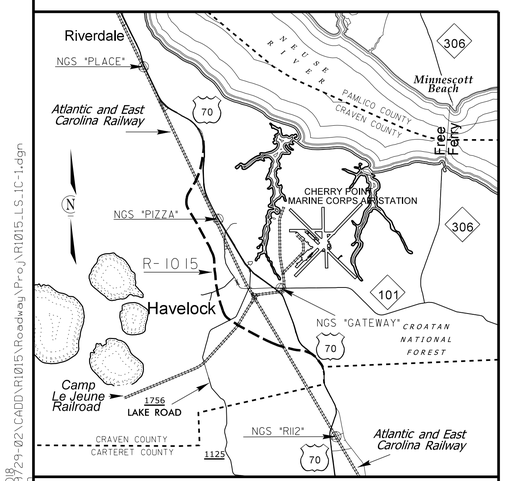
NCDOT GPS STATION "RIOI5-5"
LOCALIZED PROJECT COORDINATES
N=408355.0270 E=2627076.5230

NCDOT GPS STATION "RIOI5-1"
LOCALIZED PROJECT COORDINATES
N=402003.3190 E=2635547.5550

NCDOT GPS STATION "RIOI5-8"
LOCALIZED PROJECT COORDINATES
N=412271.7430 E=2617188.1960

NCDOT GPS STATION "RIOI5-7"
LOCALIZED PROJECT COORDINATES
N=411734.7500 E=2616116.1910

BEGIN TIP PROJECT R-1015
-L- Sta. 32+80.83
LOCALIZED PROJECT COORDINATES
N=402418.234 E=2635391.793



GPS CONTROL NETWORK MAP

NOTE: DRAWING NOT TO SCALE

NOTES:

1. THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE NAD 83/86 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.

2. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

THE FILES TO BE FOUND ARE AS FOLLOWS:
R1015_LS_GPSCALIB_.PDF
R1015_LS_WGS84.TXT
R1015_LS_LOCAL.TXT
R1015_LS_CONTROL.TXT

THE WGS84 AND LOCAL FILES ARE COMMA DELIMITED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

△ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NGS FOR MONUMENT "GATEWAY"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 418777.949(ft) EASTING: 2627954.249(ft)
ELEVATION: 24.00(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999897445
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GATEWAY" TO -L- STATION 32+80.83 IS
S 24°26'51.9" E 17971.01(ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

11/28/2008
R-1015-729-02\CADD\R1015\Roadway\Proj\R1015_LS_1C-1.dgn
dmallin

PROJECT REFERENCE NO.	SHEET NO.
R-1015	1C-2
Location and Surveys	

SURVEY CONTROL SHEET R-1015

GPS Calibration Report

Project : R1015

TIP Number	R-1015		
User name	breigner	**Date & Time**	4:17:50 PM 12/7/2010
Coordinate System	US State Plane 1983(at ground)	**Zone**	North Carolina 3200
Horizontal Datum	calibration		
Vertical Datum	NGVD29	**Geoid Model**	G09NC
Coordinate Units	US survey feet		
Distance Units	US survey feet		
Height Units	US survey feet		

LOCAL SITE INFORMATION

Localized around	Gateway
Latitude	34°52'56.87769"N
Longitude	76°54'21.39879"W
Site Scale Factor	1.0001025660
Height	-98.811sft

**The North Carolina Department of Transportation uses a Localized Coordinate System which is very similar to North Carolina Zone 3200 from which it is derived.
Please take care in utilizing these coordinates to eliminate confusion of the two systems.
This file is to aid in the use of Real Time Kinematic (RTK) GPS during construction layout.**

Datum Transformation Parameters

Datum Transformation computation not requested

Updated Default Projection (Transverse Mercator) Definition

Updated default projection not requested

Horizontal Adjustment Parameters

Northing coordinate of rotation center	420459.143sft
Easting coordinate of rotation center	2619572.046sft
Rotation about the center point	0°00'00"
Translation north	0.002sft
Translation east	-0.010sft
Scale factor	1.00000717

Vertical Adjustment Parameters

Northing coordinate of origin point	443544.477sft
Easting coordinate of origin point	2614708.561sft
Vertical separation at origin	1.069sft
Slope north	-8.235ppm
Slope east	-11.775ppm

Geoid Model Definition

G09NC

Residual Differences Between GPS (WGS84) And Local Coordinates

Summary

	Maximum error	Root Mean Square error	Point
Horizontal	0.221sft	0.023	GATEWAY_GPS
Vertical	0.247sft	0.028	R1015-8_GPS
Three-dimensional	0.264sft	0.036	R1015-8_GPS

Point Residuals

WGS84 Coordinates		Calculated point FOR DISPLAY ONLY		Local Coordinates	
Point	R1015-24_GPS	**Northing**	443544.477sft	**Point** R1015-24	
Latitude	34°57'04.51218"N	**Easting**	2614708.561sft	**Northing**	443544.507sft
Longitude	76°56'54.20322"W	**Elevation**	29.646sft	**Easting**	2614708.497sft
Height	-94.119sft	**Horz error**	0.070sft	**Elevation**	29.695sft
		Vert error	0.049sft	**Utilized**	Horz and Vert
		3D error	0.085sft	**Quality**	Control quality
Point	R1015-22_GPS	**Northing**	438603.320sft	**Point** R1015-22	
Latitude	34°56'15.66428"N	**Easting**	2614639.180sft	**Northing**	438603.315sft
Longitude	76°56'56.26279"W	**Elevation**	28.741sft	**Easting**	2614639.166sft
Height	-95.064sft	**Horz error**	0.015sft	**Elevation**	28.720sft
		Vert error	0.020sft	**Utilized**	Horz and Vert
		3D error	0.025sft	**Quality**	Control quality
Point	R1015-21_GPS	**Northing**	437564.982sft	**Point** R1015-21	
Latitude	34°56'05.38574"N	**Easting**	2614691.199sft	**Northing**	437565.028sft
Longitude	76°56'55.89578"W	**Elevation**	27.215sft	**Easting**	2614691.173sft
Height	-96.598sft	**Horz error**	0.053sft	**Elevation**	27.257sft
		Vert error	0.042sft	**Utilized**	Horz and Vert
		3D error	0.068sft	**Quality**	Control quality
Point	R1015-19_GPS	**Northing**	433351.909sft	**Point** R1015-19	
Latitude	34°55'24.41893"N	**Easting**	2611277.935sft	**Northing**	433351.960sft
Longitude	76°57'37.92184"W	**Elevation**	29.444sft	**Easting**	2611277.952sft
Height	-94.434sft	**Horz error**	0.054sft	**Elevation**	29.245sft
		Vert error	0.199sft	**Utilized**	Horz and Vert
		3D error	0.206sft	**Quality**	Control quality
Point	PIZZA_GPS	**Northing**	430681.313sft	**Point** PIZZA	
Latitude	34°54'56.80804"N	**Easting**	2617165.113sft	**Northing**	430681.327sft
Longitude	76°56'27.90362"W	**Elevation**	29.709sft	**Easting**	2617165.113sft
Height	-94.141sft	**Horz error**	0.014sft	**Elevation**	29.744sft
		Vert error	0.035sft	**Utilized**	Horz and Vert
		3D error	0.038sft	**Quality**	Control quality
Point	R1015-17_GPS	**Northing**	427767.673sft	**Point** R1015-17	
Latitude	34°54'28.71561"N	**Easting**	2613644.753sft	**Northing**	427767.655sft
Longitude	76°57'10.88765"W	**Elevation**	32.527sft	**Easting**	2613644.824sft
Height	-91.388sft	**Horz error**	0.074sft	**Elevation**	32.480sft
		Vert error	0.046sft	**Utilized**	Horz and Vert
		3D error	0.087sft	**Quality**	Control quality
Point	R1015-18_GPS	**Northing**	427960.876sft	**Point** R1015-18	
Latitude	34°54'30.40062"N	**Easting**	2614749.711sft	**Northing**	427960.824sft
Longitude	76°56'57.57575"W	**Elevation**	31.155sft	**Easting**	2614749.735sft
Height	-92.748sft	**Horz error**	0.058sft	**Elevation**	31.181sft
		Vert error	0.026sft	**Utilized**	Horz and Vert
		3D error	0.063sft	**Quality**	Control quality
Point	R1015-16_GPS	**Northing**	421454.907sft	**Point** R1015-16	
Latitude	34°53'26.33522"N	**Easting**	2613421.606sft	**Northing**	421454.829sft
Longitude	76°57'15.12817"W	**Elevation**	31.544sft	**Easting**	2613421.655sft
Height	-92.449sft	**Horz error**	0.093sft	**Elevation**	31.663sft
		Vert error	0.119sft	**Utilized**	Horz and Vert
		3D error	0.151sft	**Quality**	Control quality
Point	R1015-15_GPS	**Northing**	420391.720sft	**Point** R1015-15	
Latitude	34°53'15.97487"N	**Easting**	2612668.832sft	**Northing**	420391.710sft
Longitude	76°57'24.42526"W	**Elevation**	31.265sft	**Easting**	2612668.824sft
Height	-92.747sft	**Horz error**	0.013sft	**Elevation**	31.224sft
		Vert error	0.041sft	**Utilized**	Horz and Vert
		3D error	0.043sft	**Quality**	Control quality
Point	R1015-11_GPS	**Northing**	418244.044sft	**Point** R1015-11	
Latitude	34°52'53.96050"N	**Easting**	2616471.187sft	**Northing**	418244.086sft
Longitude	76°56'39.32667"W	**Elevation**	22.165sft	**Easting**	2616471.214sft
Height	-101.855sft	**Horz error**	0.049sft	**Elevation**	22.083sft
		Vert error	0.081sft	**Utilized**	Horz and Vert
		3D error	0.095sft	**Quality**	Control quality
Point	R1015-12_GPS	**Northing**	418731.188sft	**Point** R1015-12	
Latitude	34°52'58.55313"N	**Easting**	2617567.093sft	**Northing**	418731.192sft
Longitude	76°56'26.05433"W	**Elevation**	22.969sft	**Easting**	2617567.092sft
Height	-101.036sft	**Horz error**	0.004sft	**Elevation**	22.907sft
		Vert error	0.062sft	**Utilized**	Horz and Vert
		3D error	0.062sft	**Quality**	Control quality
Point	GATEWAY_GPS	**Northing**	418778.073sft	**Point** GATEWAY	
Latitude	34°52'56.86767"N	**Easting**	2627954.431sft	**Northing**	418777.949sft
Longitude	76°54'21.39151"W	**Elevation**	23.965sft	**Easting**	2627954.249sft
Height	-99.963sft	**Horz error**	**0.221sft**	**Elevation**	23.999sft
		Vert error	**0.035sft**	**Utilized**	Horz and Vert
		3D error	**0.223sft**	**Quality**	Control quality
Point	R1015-10_GPS	**Northing**	415109.756sft	**Point** R1015-10	
Latitude	34°52'22.07046"N	**Easting**	2620829.267sft	**Northing**	415109.827sft
Longitude	76°55'47.81345"W	**Elevation**	24.105sft	**Easting**	2620829.290sft
Height	-99.940sft	**Horz error**	0.075sft	**Elevation**	24.193sft
		Vert error	0.088sft	**Utilized**	Horz and Vert
		3D error	0.115sft	**Quality**	Control quality
Point	R1015-9_GPS	**Northing**	414291.082sft	**Point** R1015-9	
Latitude	34°52'14.05457"N	**Easting**	2620442.138sft	**Northing**	414291.103sft
Longitude	76°55'52.66328"W	**Elevation**	25.767sft	**Easting**	2620442.181sft
Height	-98.294sft	**Horz error**	0.048sft	**Elevation**	25.751sft
		Vert error	0.015sft	**Utilized**	Horz and Vert
		3D error	0.050sft	**Quality**	Control quality
Point	R1015-7_GPS	**Northing**	411734.805sft	**Point** R1015-7	
Latitude	34°51'49.66443"N	**Easting**	2616116.175sft	**Northing**	411734.750sft
Longitude	76°56'45.20336"W	**Elevation**	27.575sft	**Easting**	2616116.191sft
Height	-96.550sft	**Horz error**	0.057sft	**Elevation**	27.480sft
		Vert error	0.095sft	**Utilized**	Horz and Vert
		3D error	0.110sft	**Quality**	Control quality

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT
IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY
NGS FOR MONUMENT "GATEWAY"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 418777.949(ft) EASTING: 2627954.249(ft)
ELEVATION: 24.00(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: 0.999897445
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"GATEWAY" TO -L- STATION 32+80.83 IS
S 24°26'51.9" E 17971.01(ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

NOTE: DRAWING NOT TO SCALE

6/2/99
11/28/2018
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PROJECT REFERENCE NO.	SHEET NO.
R-1015	1C-3

Location and Surveys

SURVEY CONTROL SHEET R-1015

Point	R1015-8_GPS	**Northing**	412271.652sft	**Point R1015-8**	
Latitude	34°51'54.75365"N	**Easting**	2617188.178sft	**Northing**	412271.743sft
Longitude	76°56'32.20841"W	**Elevation**	26.009sft	**Easting**	2617188.196sft
Height	-98.102sft	**Horz error**	0.093sft	**Elevation**	26.257sft
		Vert error	0.247sft	**Utilized**	Horz and Vert
		3D error	0.264sft	**Quality**	Control quality

Point	R1015-2_GPS	**Northing**	402973.166sft	**Point R1015-2**	
Latitude	34°50'19.02640"N	**Easting**	2635346.797sft	**Northing**	402973.197sft
Longitude	76°52'56.72820"W	**Elevation**	30.564sft	**Easting**	2635346.790sft
Height	-93.549sft	**Horz error**	0.031sft	**Elevation**	30.551sft
		Vert error	0.013sft	**Utilized**	Horz and Vert
		3D error	0.033sft	**Quality**	Control quality

Point	R1015-1_GPS	**Northing**	402003.315sft	**Point R1015-1**	
Latitude	34°50'09.39347"N	**Easting**	2635547.518sft	**Northing**	402003.319sft
Longitude	76°52'54.56904"W	**Elevation**	29.062sft	**Easting**	2635547.555sft
Height	-95.062sft	**Horz error**	0.037sft	**Elevation**	29.065sft
		Vert error	0.003sft	**Utilized**	Horz and Vert
		3D error	0.037sft	**Quality**	Control quality

Point	R112_GPS	**Northing**	393265.487sft	**Point R112**	
Latitude	34°48'42.58794"N	**Easting**	2637439.008sft	**Northing**	393265.426sft
Longitude	76°52'34.12612"W	**Elevation**	31.433sft	**Easting**	2637438.985sft
Height	-92.760sft	**Horz error**	0.065sft	**Elevation**	31.361sft
		Vert error	0.072sft	**Utilized**	Horz and Vert
		3D error	0.097sft	**Quality**	Control quality

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
BL1	GPS R1015-4	408338.8454	2632319.7550	28.40	100+83.32	622.22 RT
BL2	R1015C BL-2	407752.3177	2632037.4787	25.93	102+53.41	5.00 LT
BL3	R1015C BL-3	407839.2106	2631418.8710	25.37	108+77.70	27.28 LT
BL4	R1015C BL-4	407925.4998	2630805.6865	25.98	114+96.53	49.21 LT
BL5	R1015C BL-5	408014.8500	2630181.6491	23.57	121+26.59	70.02 LT
BL6	R1015C BL-6	408094.6759	2629587.6280	24.00	127+25.43	94.97 LT
BL7	R1015C BL-7	408158.0190	2629127.0547	22.40	131+83.85	121.38 LT
BL8	R1015C BL-8	408247.1264	2628670.0117	21.67	136+37.40	155.80 LT
21	R1015AB BL-21	408553.8929	2628278.5013	21.67	141+03.64	0.14 LT
22	R1015AB BL-22	408842.7433	2627665.7328	22.10	147+81.31	1.83 RT
23	R1015AB BL-23	409140.0354	2627064.0369	21.62	154+52.44	0.67 LT
24	R1015AB BL-24	409401.5434	2626511.9651	22.84	160+63.19	13.05 LT
25	R1015AB BL-25	409660.2358	2625992.1486	21.54	166+43.82	13.55 LT
26	R1015AB BL-26	409761.5971	2625788.3127	20.68	168+71.47	13.82 LT
27	R1015AB BL-27	409838.0888	2625641.4948	18.63	170+36.99	10.90 LT
28	R1015AB BL-28	410108.7648	2625077.6757	14.90	176+62.34	20.31 LT
29	R1015AB BL-29	410247.9328	2624801.4187	21.05	179+71.67	19.07 LT
30	R1015AB BL-30	410511.6212	2624280.6724	22.77	185+55.36	15.52 LT
31	R1015AB BL-31	410783.9881	2623756.4989	22.32	191+46.00	5.73 LT
32	R1015AB BL-32	411038.2757	2623245.6055	23.17	197+16.67	6.19 LT
33	R1015AB BL-33	411299.0685	2622731.2906	24.02	202+93.32	2.36 LT
34	R1015AB BL-34	411592.4645	2622144.8518	25.42	209+49.05	1.54 LT
35	R1015AB BL-35	411871.1218	2621612.6777	26.03	215+49.65	10.31 RT
36	R1015AB BL-36	412132.1262	2621082.2322	25.53	221+40.83	7.13 RT
37	R1015AB BL-37	412398.6558	2620539.8491	27.90	227+45.15	3.57 RT
38	R1015AB BL-38	412674.9473	2619985.6413	25.42	233+64.41	3.47 RT
39	R1015AB BL-39	412953.4871	2619468.4500	23.39	239+52.25	0.11 RT
40	R1015AB BL-40	413242.0147	2619084.3786	23.92	244+33.44	11.19 RT
41	R1015AB BL-41	413700.7254	2618610.0469	26.12	250+96.22	16.43 RT
42	R1015AB BL-42	414216.4150	2618198.4916	26.74	257+57.83	0.10 LT
43	R1015AB BL-43	414798.3965	2617889.2672	25.52	264+17.51	0.70 LT
44	R1015AB BL-44	415251.5337	2617735.3836	21.81	268+96.74	9.49 RT
45	R1015AB BL-45	415650.8137	2617640.1978	19.68	273+08.45	11.95 RT
46	R1015AB BL-46	415886.3585	2617600.0466	27.22	275+47.85	11.73 RT
47	R1015AB BL-47	416372.6689	2617517.7643	24.37	280+41.03	2.34 RT
48	R1015AB BL-48	416780.2603	2617452.2149	10.18	284+53.83	2.28 LT
49	R1015AB BL-49	417399.6232	2617364.0963	7.37	290+79.42	2.07 RT
50	R1015AB BL-50	417863.4550	2617292.0804	27.34	295+48.80	0.64 LT
51	R1015AB BL-51	418568.4982	2617186.5012	25.26	302+61.70	0.91 LT
52	R1015AB BL-52	419149.6991	2617100.0703	24.03	308+49.30	0.53 LT
53	R1015AB BL-53	419729.1277	2617019.5579	24.10	314+34.26	5.43 RT
54	R1015AB BL-54	420330.3942	2616927.2327	26.01	320+42.57	2.94 RT
55	R1015AB BL-55	420928.5272	2616836.1029	26.41	326+47.60	1.17 RT
56	R1015AB BL-56	421604.8507	2616732.9171	22.06	333+31.75	0.98 LT
57	R1015AB BL-57	422193.9250	2616651.9885	26.67	339+26.41	0.02 LT
58	R1015AB BL-58	422764.7654	2616641.0794	25.76	344+97.57	5.50 LT
59	R1015AB BL-59	423352.3337	2616718.9795	27.83	350+90.09	0.88 RT
60	R1015AB BL-60	423901.7801	2616752.9315	27.32	356+41.79	22.69 LT
61	R1015AB BL-61	424476.3991	2616747.8666	27.73	362+18.16	6.69 RT
62	R1015AB BL-62	425050.3697	2616579.6887	28.34	368+17.33	9.10 LT
63	R1015AB BL-63	425574.9497	2616329.9980	28.41	374+00.14	0.56 LT
64	R1015AB BL-64	426013.5217	2616009.3569	28.33	379+43.81	1.33 LT
65	R1015AB BL-65	426478.4486	2615645.2520	30.31	385+34.34	0.72 LT
66	R1015AB BL-66	426937.5546	2615295.6434	30.26	391+11.50	1.99 RT
67	R1015AB BL-67	427145.2363	2615139.4899	29.71	393+70.97	9.12 LT
68	R1015AB BL-68	427578.8318	2614888.0054	30.61	398+71.88	0.49 LT
69	R1015AB BL-69	427967.1132	2614665.8770	31.90	403+19.21	0.19 RT
70	R1015AB BL-70	428494.6945	2614367.9169	30.39	409+25.10	4.46 RT
71	R1015AB BL-71	428992.4396	2614075.1265	32.14	415+02.54	1.64 LT
72	R1015AB BL-72	429521.3608	2613745.9936	30.80	421+25.11	23.73 LT
73	R1015AB BL-73	430101.6024	2613437.4752	30.84	427+81.93	2.40 LT
74	R1015AB BL-74	430544.7672	2613186.7362	31.16	432+91.10	0.80 RT
75	R1015AB BL-75	431070.2412	2612884.0469	31.14	438+97.52	0.08 LT
76	R1015AB BL-76	431600.1217	2612578.8217	29.88	445+09.02	0.97 LT
77	R1015AB BL-77	432028.5132	2612334.4128	28.58	450+02.23	0.36 RT
78	R1015AB BL-78	432264.2575	2612200.4373	25.51	452+73.38	1.55 RT
79	R1015AB BL-79	432671.4499	2611984.3249	27.64	457+34.63	0.26 LT
80	R1015AB BL-80	433378.5368	2611772.9835	26.18	464+67.23	44.71 LT
570	R1015A BL-570	433661.4686	2611708.1362	29.62	467+37.72	116.33 LT
571	R1015A BL-571	433922.6591	2611775.1833	28.55	469+92.94	90.87 LT
572	R1015A BL-572	434204.3645	2611877.4042	28.51	472+80.36	74.84 LT
573	R1015A BL-573	434513.3993	2612024.4380	30.05	476+12.30	75.17 LT
574	R1015A BL-574	435099.5497	2612404.3126	30.01	483+07.33	55.40 LT
575	R1015A BL-575	435615.3689	2612737.9668	29.18	489+21.52	42.71 LT
576	R1015A BL-576	435798.3476	2612865.9291	27.32	491+44.45	30.04 LT
577	R1015A BL-577	436064.1213	2613021.7326	29.74	494+52.44	37.20 LT
578	R1015A BL-578	436238.0875	2613149.8459	27.20	496+67.78	19.66 LT
579	R1015A BL-579	436524.6913	2613326.1939	28.31	500+04.29	20.30 LT
580	R1015A BL-580	436780.5864	2613502.0138	28.90	503+14.40	5.25 LT
581	R1015A BL-581	436975.7468	2613654.7760	30.63	505+60.72	22.12 RT
582	R1015A BL-582	437184.2077	2613808.2993	23.79	508+18.76	43.14 RT
585	R1015A BL-585	437483.2458	2613974.3849	12.35	511+60.20	27.67 RT
586	R1015A BL-586	437852.0278	2614156.8517	18.42	515+69.66	11.29 RT
587	R1015A BL-587	438109.8259	2614278.4952	26.91	518+53.44	20.48 RT
588	R1015A BL-588	438375.7702	2614370.9425	29.95	521+33.54	20.65 RT
589	R1015A BL-589	438595.6418	2614436.3722	30.35	523+61.51	25.83 RT
590	R1015A BL-590	439106.6940	2614540.7683	30.42	528+78.54	43.37 RT
594	R1015A BL-594	440089.2182	2614597.6940	30.69	538+62.18	18.30 RT
595	R1015A BL-595	441068.3075	2614698.4845	30.57	548+46.41	11.23 RT
596	R1015A BL-596	441887.5775	2614737.1491	31.64	556+65.94	8.31 RT
597	R1015A BL-597	442868.3006	2614660.1053	30.23	566+49.50	0.27 RT
598	R1015A BL-598	443847.7376	2614562.8844	29.58	576+33.79	1.28 RT
599	R1015A BL-599	444584.4947	2614412.4615	25.64	OUTSIDE PROJECT LIMITS	

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NGS FOR MONUMENT "GATEWAY"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 418777.949(ft) EASTING: 2627954.249(ft)
ELEVATION: 24.00(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999897445
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GATEWAY" TO -L- STATION 32+80.83 IS
S 24°26'51.9" E 17971.01(ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

NOTE: DRAWING NOT TO SCALE

6/2/99
11/28/2018
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PROJECT REFERENCE NO.	SHEET NO.
R-1015	1C-4

Location and Surveys

SURVEY CONTROL SHEET R–1015

R1015C-BY

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
BY1	R1015C BY-1	403584.6686	2635355.0639	29.89	44+49.42	9.69 LT
BY2	R1015C BY-2	404162.5644	2635348.8927	28.69	50+28.37	10.35 LT
BY3	R1015C BY-3	404769.1806	2635240.1527	27.58	56+47.92	10.92 LT
BY4	R1015C BY-4	405387.4044	2635010.1499	27.30	63+08.55	10.57 RT
BY5	R1015C BY-5	405835.6122	2634713.3821	27.42	68+45.06	11.05 RT
BY6	R1015C BY-6	406387.7994	2634264.4624	27.76	75+56.45	8.04 LT
BY7	R1015C BY-7	406841.2565	2633915.9100	27.34	81+27.75	12.03 RT
BY8	R1015C BY-8	407314.0476	2633561.2060	28.29	86+92.17	137.99 RT
BY9	GPS R1015-3	407698.6564	2633116.7974	28.88	92+36.20	245.78 RT
BY10	GPS R1015-4	408338.8454	2632319.7550	28.40	100+83.32	622.22 RT
BY11	R1015C BY-11	408744.0578	2631832.8138	28.27	106+27.84	935.87 RT
BY12	R1015C BY-12	409102.6562	2631459.7699	28.33	110+57.68	1223.95 RT
BY13	R1015C BY-13	409631.9760	2631039.7149	29.98	115+63.58	1671.93 RT
BY14	R1015C BY-14	410017.4871	2630890.2730	29.20	117+77.94	2025.49 RT

R1015C-BY

POINT	DESC.	NORTH	EAST	ELEVATION	RP1CD STATION	OFFSET
BY1	R1015C BY-1	403584.6686	2635355.0639	29.89	OUTSIDE PROJECT LIMITS	
BY2	R1015C BY-2	404162.5644	2635348.8927	28.69	OUTSIDE PROJECT LIMITS	
BY3	R1015C BY-3	404769.1806	2635240.1527	27.58	OUTSIDE PROJECT LIMITS	
BY4	R1015C BY-4	405387.4044	2635010.1499	27.30	OUTSIDE PROJECT LIMITS	
BY5	R1015C BY-5	405835.6122	2634713.3821	27.42	OUTSIDE PROJECT LIMITS	
BY6	R1015C BY-6	406387.7994	2634264.4624	27.76	OUTSIDE PROJECT LIMITS	
BY7	R1015C BY-7	406841.2565	2633915.9100	27.34	5+21.28	74.08 LT
BY8	R1015C BY-8	407314.0476	2633561.2060	28.29	11+19.56	27.48 LT
BY9	GPS R1015-3	407698.6564	2633116.7974	28.88	17+09.73	21.09 LT
BY10	GPS R1015-4	408338.8454	2632319.7550	28.40	27+32.04	22.63 LT
BY11	R1015C BY-11	408744.0578	2631832.8138	28.27	33+64.46	18.75 LT
BY12	R1015C BY-12	409102.6562	2631459.7699	28.33	OUTSIDE PROJECT LIMITS	
BY13	R1015C BY-13	409631.9760	2631039.7149	29.98	OUTSIDE PROJECT LIMITS	
BY14	R1015C BY-14	410017.4871	2630890.2730	29.20	OUTSIDE PROJECT LIMITS	

R1015C-BY

POINT	DESC.	NORTH	EAST	ELEVATION	RP1AB STATION	OFFSET
BY1	R1015C BY-1	403584.6686	2635355.0639	29.89	OUTSIDE PROJECT LIMITS	
BY2	R1015C BY-2	404162.5644	2635348.8927	28.69	OUTSIDE PROJECT LIMITS	
BY3	R1015C BY-3	404769.1806	2635240.1527	27.58	OUTSIDE PROJECT LIMITS	
BY4	R1015C BY-4	405387.4044	2635010.1499	27.30	OUTSIDE PROJECT LIMITS	
BY5	R1015C BY-5	405835.6122	2634713.3821	27.42	OUTSIDE PROJECT LIMITS	
BY6	R1015C BY-6	406387.7994	2634264.4624	27.76	OUTSIDE PROJECT LIMITS	
BY7	R1015C BY-7	406841.2565	2633915.9100	27.34	OUTSIDE PROJECT LIMITS	
BY8	R1015C BY-8	407314.0476	2633561.2060	28.29	OUTSIDE PROJECT LIMITS	
BY9	GPS R1015-3	407698.6564	2633116.7974	28.88	9+44.00	485.49 RT
BY10	GPS R1015-4	408338.8454	2632319.7550	28.40	19+04.03	148.26 RT
BY11	R1015C BY-11	408744.0578	2631832.8138	28.27	25+10.20	25.78 RT
BY12	R1015C BY-12	409102.6562	2631459.7699	28.33	30+26.86	4.47 LT
BY13	R1015C BY-13	409631.9760	2631039.7149	29.98	36+93.99	61.95 LT
BY14	R1015C BY-14	410017.4871	2630890.2730	29.20	40+99.72	49.71 LT

R1015AB-BY3

POINT	DESC.	NORTH	EAST	ELEVATION	Y3 STATION	OFFSET
303	R1015AB BY3-303	412692.3534	2618010.0573	27.73	40+45.43	16.20 RT
304	R1015AB BY3-304	412968.5425	2618548.8413	25.20	46+50.88	15.57 RT
140	R1015AB BL-40	413242.0147	2619084.3786	23.62	52+52.20	15.87 RT
305	R1015AB BY3-305	413517.7005	2619620.0176	23.71	58+54.62	14.26 RT
306	R1015AB BY3-306	413807.9027	2620158.1977	25.08	64+59.12	37.24 RT

R1015AB-BY4

POINT	DESC.	NORTH	EAST	ELEVATION	Y4 STATION	OFFSET
401	R1015AB BY4-401	418062.6150	2616066.4522	25.25	OUTSIDE PROJECT LIMITS	
151	R1015AB BL-51	418568.4982	2617186.5012	25.28	44+76.42	19.97 LT
404	R1015AB BY4-404	418966.4760	2618084.6644	14.00	54+61.06	13.26 LT
405	R1015AB BY4-405	419245.2140	2618385.6025	15.57	58+75.23	21.18 LT

R1015A-BY4

POINT	DESC.	NORTH	EAST	ELEVATION	RP2AC STATION	OFFSET
513	R1015A BY4-513	434425.6305	2615370.7043	27.84	OUTSIDE PROJECT LIMITS	
512	R1015A BY4-512	435342.4462	2615012.6145	21.48	41+34.00	81.57 RT
511	R1015A BY4-511	436078.9179	2614798.4449	13.79	49+08.09	49.37 RT
510	R1015A BY4-510	436777.8272	2614705.2102	26.98	56+15.66	56.21 RT
412	GPS R1015-25	437565.0271	2614691.1715	27.26	63+38.83	252.89 RT
413	GPS R1015-26	438603.3157	2614639.1670	28.80	73+68.99	687.92 RT
507	R1015A BY4-507	438986.4383	2614629.8035	28.48	OUTSIDE PROJECT LIMITS	
506	R1015A BY4-506	440179.8939	2614692.6807	30.24	OUTSIDE PROJECT LIMITS	
505	R1015A BY4-505	441159.2916	2614791.6602	29.86	OUTSIDE PROJECT LIMITS	
414	GPS R1015-27	442470.5980	2614782.1261	30.27	OUTSIDE PROJECT LIMITS	
415	GPS R1015-28	443544.5066	2614708.4943	29.69	OUTSIDE PROJECT LIMITS	
500	R1015A BY4-500	444616.6469	2614507.9632	27.35	OUTSIDE PROJECT LIMITS	

R1015A-BY4

POINT	DESC.	NORTH	EAST	ELEVATION	RP2CD STATION	OFFSET
513	R1015A BY4-513	434425.6305	2615370.7043	27.84	OUTSIDE PROJECT LIMITS	
512	R1015A BY4-512	435342.4462	2615012.6145	21.48	OUTSIDE PROJECT LIMITS	
511	R1015A BY4-511	436078.9179	2614798.4449	13.79	OUTSIDE PROJECT LIMITS	
510	R1015A BY4-510	436777.8272	2614705.2102	26.98	OUTSIDE PROJECT LIMITS	
412	GPS R1015-25	437565.0271	2614691.1715	27.26	6+91.19	115.37 RT
413	GPS R1015-26	438603.3157	2614639.1670	28.80	17+31.83	112.30 RT
507	R1015A BY4-507	438986.4383	2614629.8035	28.48	21+26.50	92.00 RT
506	R1015A BY4-506	440179.8939	2614692.6807	30.24	OUTSIDE PROJECT LIMITS	
505	R1015A BY4-505	441159.2916	2614791.6602	29.86	OUTSIDE PROJECT LIMITS	
414	GPS R1015-27	442470.5980	2614782.1261	30.27	OUTSIDE PROJECT LIMITS	
415	GPS R1015-28	443544.5066	2614708.4943	29.69	OUTSIDE PROJECT LIMITS	
500	R1015A BY4-500	444616.6469	2614507.9632	27.35	OUTSIDE PROJECT LIMITS	

BM1 ELEVATION = 28.25
N 403592 E 2635565
L STATION 44+59.00 200 RIGHT
RR SPIKE IN 15 PINE

BM2 ELEVATION = 28.79
N 405950 E 2634872
L STATION 68+39.00 206 RIGHT
RR SPIKE IN 8 PINE

BM5 ELEVATION = 27.83
N 407448 E 2631519
L STATION 107+11.00 395 LEFT
RR SPIKE IN 14 PINE

BM6 ELEVATION = 26.80
N 408423 E 2629667
L STATION 127+05.00 243 RIGHT
RR SPIKE IN 24 PINE

BM7 ELEVATION = 22.75
N 408361 E 2628245
L STATION 140+63.00 192 LEFT
RR SPIKE IN TREE

BM8 ELEVATION = 24.02
N 409337 E 2627103
L STATION 155+05.00 193 RIGHT
RR SPIKE IN TREE

BM9 ELEVATION = 22.04
N 410024 E 2625602
L STATION 171+55.00 138 RIGHT
RR SPIKE IN TREE

BM10 ELEVATION = 23.64
N 410618 E 2623647
L STATION 191+70.00 203 LEFT
RR SPIKE IN TREE

BM11 ELEVATION = 25.52
N 411782 E 2622247
L STATION 209+42.00 213 RIGHT
RR SPIKE IN TREE

BM12 ELEVATION = 28.81
N 412234 E 2620317
L STATION 228+71.00 243 LEFT
RR SPIKE IN TREE

BM14 ELEVATION = 26.88
N 415206 E 2618079
L STATION 267+42.00 323 RIGHT
RR SPIKE IN TREE

BM16 ELEVATION = 27.52
N 420626 E 2617111
L STATION 323+08.00 228 RIGHT
RR SPIKE IN TREE

BM17 ELEVATION = 27.02
N 422594 E 2616818
L STATION 343+32.00 181 RIGHT
RR SPIKE IN H-FRAME PP

BM18 ELEVATION = 29.37
N 424718 E 2616464
L STATION 365+25.00 222 LEFT
RR SPIKE IN TREE

BM19 ELEVATION = 31.53
N 426925 E 2615541
L STATION 389+53.00 192 RIGHT
RR SPIKE IN TREE

BM20 ELEVATION = 31.44
N 427567 E 2614579
L STATION 400+16.00 274 LEFT
RR SPIKE IN TREE

BM21 ELEVATION = 32.90
N 428746 E 2614064
L STATION 412+94.00 134 LEFT
RR SPIKE IN TREE

BM22 ELEVATION = 33.65
N 429381 E 2613668
L STATION 420+42.00 162 LEFT
RR SPIKE IN TREE

BM23 ELEVATION = 33.09
N 430562 E 2613367
L STATION 432+16.00 166 RIGHT
RR SPIKE IN TREE

BM24 ELEVATION = 30.34
N 432847 E 2611740
L STATION 459+74.00 168 LEFT
RR SPIKE IN H-FRAME PP

BM25 ELEVATION = 31.12
N 433150 E 2611151
L STATION 463+19.00 684 LEFT
RR SPIKE IN H-FRAME PP

BM26 ELEVATION = 26.38
N 438405 E 2614036
L STATION 520+57.00 308 LEFT
RR SPIKE IN 8 OAK TREE

BM28 ELEVATION = 30.33
N 445397 E 2614435
L STATION 582+37.00
N 00°40′14.49" W DIST 957.55
RR SPIKE IN PP#HV79

BM3 ELEVATION = 28.54
N 407844 E 2633270
RP1CD STATION 16+82.00 189 RIGHT
RR SPIKE IN 12 PINE

BM4 ELEVATION = 27.11
N 409270 E 2631714
RP1AB STATION 29+86.00 297 RIGHT
RR SPIKE IN NW COR. BST PA

BM13 ELEVATION = 27.11
N 412297 E 2617075
Y3 STATION 32+81.00
S 76°03′18.82" W DIST 254.51
RR SPIKE IN TREE

BM15 ELEVATION = 27.08
N 418342 E 2616967
Y4 STATION 41+83.00 97 RIGHT
RR SPIKE IN TREE

BM27 ELEVATION = 14.12
N 435536 E 2615246
RP2AC STATION 42+58.00 361 RIGHT
RR SPIKE IN PP#57827

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NGS FOR MONUMENT "GATEWAY"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 418777.949(ft) EASTING: 2627954.249(ft)
ELEVATION: 24.00(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999897445
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GATEWAY" TO -L- STATION 32+80.83 IS
S 24°26′51.9″ E 17971.01(ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

NOTE: DRAWING NOT TO SCALE

6/2/99

11/28/2018
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6/2/99

SURVEY CONTROL SHEET R-1015

ROW & EASEMENT POINTS

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	32+80.83	-125.00	402393.7160	2635269.2211
L	32+80.83	125.00	402442.7524	2635514.3648
L	36+34.33	125.00	402768.5518	2635483.3829
L	36+34.33	-125.00	402770.5032	2635233.3905
L	47+82.02	125.00	403916.2044	2635492.3415
L	47+82.02	-125.00	403918.1558	2635242.3492
L	60+47.00	-125.00	405097.4709	2635001.1194
L	67+84.73	125.00	405857.2788	2634840.4853
L	70+57.00	125.00	406073.0722	2634674.4601
L	98+43.00	-125.00	407556.2461	2632411.3755
L	102+28.97	-125.00	407629.8965	2632040.6278
L	116+67.52	125.00	408126.8535	2630667.6893
L	119+66.00	-125.00	407932.7164	2630330.1970
L	127+38.75	200.00	408387.4545	2629625.9386
L	127+38.75	-200.00	407993.5799	2629556.2050
L	130+34.75	-200.00	408048.6474	2629260.1359
L	130+34.82	200.00	408440.6076	2629339.9304
L	134+57.90	-200.00	408151.8002	2628834.6748
L	137+45.74	-200.00	408239.7573	2628550.1137
L	139+08.94	200.00	408671.2256	2628529.2379
L	142+49.82	200.00	408794.1452	2628224.1179
L	143+88.78	200.00	408849.4169	2628101.9138
L	143+88.88	-200.00	408487.0251	2627932.5852
L	146+84.78	150.00	408932.2533	2627818.2436
L	146+84.78	-150.00	408663.7900	2627684.3500
L	150+31.00	125.00	409064.4034	2627497.2613
L	150+31.00	-125.00	408840.6840	2627385.6833
L	170+00.00	125.00	409943.1913	2625735.2474
L	170+00.00	-125.00	409719.4719	2625623.6695
L	185+40.00	125.00	410630.5115	2624357.1361
L	185+40.00	-125.00	410406.7921	2624245.5581
L	193+00.00	125.00	410969.7085	2623677.0291
L	193+00.00	-125.00	410745.9891	2623565.4512
L	207+00.00	-150.00	411348.4536	2622301.4649
L	207+00.00	150.00	411616.9169	2622435.3584
L	222+50.00	200.00	412353.4441	2621070.6138
L	222+50.00	-200.00	411995.4931	2620892.0891
L	226+84.79	-200.00	412189.5431	2620503.0090
L	228+30.00	-177.00	412274.9361	2620383.3253
L	265+00.00	-125.00	414827.5742	2617742.2525
L	268+25.00	-125.00	415142.3997	2617628.2862
L	272+98.83	150.00	415667.7602	2617777.5243
L	272+98.83	-125.00	415615.2413	2617507.5859
L	273+50.00	150.00	415716.3341	2617768.3734
L	276+58.83	125.00	416012.7828	2617695.5350
L	276+58.83	-125.00	415975.8521	2617448.2778
L	283+50.00	-125.00	416659.4360	2617346.1760
L	283+50.00	125.00	416696.3669	2617593.4332
L	291+75.00	125.00	417512.3156	2617471.5611
L	291+75.00	-125.00	417475.3846	2617224.3039
L	301+02.76	-125.00	418392.9660	2617087.2517
L	301+72.00	125.00	418498.3771	2617324.2805
L	303+33.00	-125.00	418620.6798	2617053.2398
L	304+23.00	125.00	418746.6233	2617287.2018
L	335+76.98	125.00	421865.9975	2616821.2844
L	335+76.98	-125.00	421829.0662	2616574.0273
L	338+00.00	100.00	422081.0154	2616765.4521
L	338+00.00	-100.00	422055.6430	2616567.0680
L	339+36.98	-100.00	422195.1250	2616551.4386
L	339+36.98	100.00	422213.7754	2616750.5671
L	344+50.00	-100.00	422723.1863	2616543.4212
L	344+96.51	100.00	422755.5737	2616746.1822
L	345+50.00	-100.00	422825.7970	2616551.4441
L	348+56.51	-100.00	423134.0796	2616588.2208
L	348+56.51	100.00	423107.7410	2616786.4789
L	351+68.60	-100.00	423443.4516	2616629.3218
L	351+68.60	100.00	423417.1132	2616827.5800
L	355+58.60	100.00	423811.2445	2616871.0646
L	355+58.60	-100.00	423824.4442	2616671.5007
L	375+23.56	100.00	425734.9872	2616345.5667
L	375+23.56	-100.00	425622.1638	2616180.4279
L	379+13.56	100.00	426052.2785	2616107.7453
L	379+13.56	-100.00	425928.8046	2615950.4107
L	387+18.49	100.00	426685.4994	2615610.7990
L	387+18.49	-100.00	426562.0252	2615453.4646
L	390+14.49	100.00	426917.8729	2615431.5372
L	390+14.49	-100.00	426798.3793	2615271.1586
L	393+00.00	100.00	427146.9097	2615269.3469
L	393+00.00	-100.00	427035.3058	2615103.3814
L	393+00.00	125.00	427160.8602	2615290.0926
L	393+00.00	-125.00	427021.3553	2615082.6357
L	395+70.37	-125.00	427253.9081	2614933.8691
L	395+70.37	125.00	427383.7731	2615147.4928
L	398+66.37	-125.00	427512.0615	2614782.7664
L	398+66.37	125.00	427636.5330	2614999.5770
L	452+51.21	125.00	432306.4926	2612318.5411
L	452+51.21	-125.00	432182.0229	2612101.7294
L	458+09.21	-125.00	432694.0126	2611839.5867
L	458+09.21	125.00	432786.6175	2612071.8023
L	473+67.19	125.00	434207.7391	2612094.7781
L	473+67.19	-125.00	434307.8024	2611865.6769
L	479+25.19	125.00	434679.6335	2612356.9053
L	479+25.19	-125.00	434811.0473	2612144.2308
L	491+05.00	125.00	435683.2927	2612977.0827
L	491+05.00	-125.00	435814.7074	2612764.4089
L	496+52.00	125.00	436148.6232	2613264.6181
L	496+52.00	-125.00	436280.0378	2613051.9442
L	504+16.24	150.00	436785.6155	2613687.6138
L	506+10.12	-150.00	437108.2491	2613534.3218
L	508+96.73	-225.00	437391.4863	2613621.1755
L	510+17.69	-225.00	437494.3939	2613684.7638
L	513+12.69	-225.00	437739.7600	2613832.0633
L	517+04.03	-225.00	438068.9473	2613996.1994
L	535+03.07	90.00	439726.9707	2614635.9803
L	538+49.87	90.00	440069.1216	2614667.6085
L	547+96.13	86.22	441010.0996	2614767.5345
L	550+38.00	-226.00	441279.1907	2614480.8546
L	550+38.00	-118.99	441270.1950	2614587.4902
L	551+54.00	-177.00	441387.6213	2614538.1745
L	551+54.00	-226.00	441390.8765	2614489.2828
L	551+67.00	-85.00	441394.3136	2614630.8110
L	552+77.07	79.36	441494.9414	2614801.0780
L	552+90.00	140.48	441505.2205	2614862.7466
L	558+16.00	-152.00	442032.2688	2614573.4868
L	560+66.59	-128.65	442278.3797	2614583.6832
L	561+19.69	-85.00	442333.8112	2614623.2092
L	561+19.69	80.00	442347.1094	2614787.6725
L	562+67.69	-70.00	442481.6575	2614625.1919
L	573+26.28	-70.00	443535.7743	2614527.9809
L	573+26.28	70.00	443548.6305	2614667.3894
L	579+17.51	-70.00	444114.0566	2614445.7825
L	579+17.51	70.00	444140.5562	2614583.2517

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
RP1A	0+00.00	75.00	408421.5989	2631923.3248
RP1A	2+00.00	75.00	408275.2172	2632016.8467
RP1A	7+86.56	75.00	407938.2684	2631811.6476
RP1A	9+86.56	75.00	407952.4123	2631635.7849

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
RP1AB	22+95.39	-125.00	408485.9270	2631865.0209
RP1AB	25+26.46	-125.00	408652.4331	2631711.9688
RP1AB	27+56.38	-125.00	408819.6804	2631554.2058
RP1AB	29+88.38	-125.00	408994.3042	2631393.9201
RP1AB	29+88.38	100.00	409141.9569	2631563.6954
RP1AB	31+00.00	-110.00	409093.0567	2631330.9006
RP1AB	34+00.00	-110.00	409345.6108	2631148.8085
RP1AB	35+00.00	-100.00	409438.9729	2631102.6860
RP1AB	35+00.00	-71.51	409453.5630	2631127.1591
RP1AB	40+73.90	100.00	410042.2617	2631040.1156

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
RP1B	0+00.00	-100.00	405448.4436	2634792.6861
RP1B	2+34.00	-100.00	405632.3486	2634666.3917
RP1B	10+90.94	-100.00	406121.0088	2634035.1810
RP1B	13+24.94	-100.00	406201.3408	2633822.7691
RP1B	15+52.94	-100.00	406285.5056	2633602.6545
RP1B	21+63.00	-100.00	406662.8465	2633077.3745
RP1B	23+22.60	-125.00	406779.7345	2632949.1744
RP1B	25+50.60	-150.00	406965.0061	2632797.3167

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
RP1CD	0+00.00	100.00	406518.6169	2634359.3269
RP1CD	3+20.01	100.00	406779.8741	2634174.5269
RP1CD	5+51.01	100.00	406969.6038	2634037.2407
RP1CD	13+19.57	100.00	407544.2179	2633497.4898
RP1CD	15+50.57	100.00	407693.0954	2633316.7130
RP1CD	30+64.33	100.00	408642.8111	2632137.9342
RP1CD	32+95.33	100.00	408787.5620	2631962.6695
RP1CD	36+08.47	100.00	408997.3826	2631744.0027

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
RP2A	79+22.74	-100.00	438936.5696	2613798.6076
RP2A	85+66.39	-100.00	439586.0084	2614015.1887
RP2A	88+13.39	-100.00	439794.5142	2614163.7185
RP2A	90+60.39	-100.00	439988.0579	2614301.9165
RP2A	95+46.75	-100.00	440404.2588	2614468.0591
RP2A	97+93.75	-77.25	440637.2734	2614523.7466

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
RP2AC	36+46.00	75.00	434884.4464	2615164.0402
RP2AC	52+23.75	75.00	436391.7381	2614773.3505
RP2AC	54+68.75	75.00	436633.4383	2614742.5129
RP2AC	72+44.93	-125.00	438213.8424	2613919.9285

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
RP2C	1+67.13	153.24	436927.0877	2613841.8240
RP2C	7+70.00	168.00	437221.1710	2614161.9737
RP2C	11+58.00	97.00	437171.0773	2614405.3555
RP2C	13+78.52	55.77	437009.0093	2614510.5676

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
RP2CD	2+99.04	90.00	437182.4296	2614697.5567
RP2CD	4+96.11	90.00	437371.5040	2614676.2313
RP2CD	6+40.11	90.00	437512.8056	2614668.2521
RP2CD	16+47.86	90.00	438519.4229	2614620.5565
RP2CD	21+11.87	50.00	438974.9741	2614586.8261
RP2CD	24+82.06	43.00	439344.6567	2614607.4217

NOTE: DRAWING NOT TO SCALE

11/28/2018
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PROJECT REFERENCE NO.	SHEET NO.
34360.1.2	1C-6
Location and Surveys	

SURVEY CONTROL SHEET R-1015

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
SERVRD	32+80.84	40.00	439109.4054	2614681.0139
SERVRD	32+80.84	30.05	439109.1308	2614671.0704
SERVRD	35+81.34	40.00	439405.4930	2614688.3381
SERVRD	40+29.30	40.00	439852.1215	2614722.8259
SERVRD	42+27.23	40.00	440048.2959	2614740.3590
SERVRD	52+18.01	40.00	441034.0123	2614840.4668
SERVRD	54+23.09	40.00	441240.2169	2614856.7673
SERVRD	56+74.26	40.00	441490.9843	2614870.9661

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y3	40+76.11	30.00	412694.0364	2618043.6558
Y3	41+93.00	-30.00	412800.6713	2618120.4169
Y3	41+93.00	-51.00	412819.3691	2618110.8568
Y3	45+33.00	112.00	412829.0200	2618487.7863
Y3	45+86.00	-112.00	413052.5904	2618433.0025
Y3	59+18.00	-75.00	413626.0243	2619635.8186
Y3	59+45.00	125.00	413460.2419	2619750.9063
Y3	61+98.86	100.00	413598.0679	2619965.5545
Y3	61+98.86	-50.00	413731.6254	2619897.2727
Y3	65+00.00	50.00	413828.2809	2620197.8685
Y3	65+63.76	-50.00	413943.1024	2620168.3917
Y3	65+69.75	-30.00	413934.3163	2620187.2532
Y3	65+86.21	30.00	413908.0395	2620243.6457
Y3	65+91.25	50.00	413899.3070	2620262.3878

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y3RPA	0+00.00	75.00	414593.6912	2617849.2474
Y3RPA	2+00.00	75.00	414413.2134	2617939.5367
Y3RPA	3+64.04	75.00	414267.1052	2618014.1122
Y3RPA	5+64.04	75.00	414090.9092	2618100.3509
Y3RPA	7+10.61	75.00	413960.2149	2618153.1424
Y3RPA	9+10.61	75.00	413773.5552	2618213.4727

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y3RPB	1+06.57	-150.00	412333.9500	2620218.7041
Y3RPB	6+00.00	-125.00	412485.6194	2619796.9089
Y3RPB	8+86.71	-125.00	412492.4532	2619534.9799
Y3RPB	10+84.71	-125.00	412470.4641	2619346.6812

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y3RPC	1+34.71	147.71	412525.1290	2620726.3768
Y3RPC	4+50.14	150.00	412679.0692	2620451.2070
Y3RPC	8+93.00	125.00	412891.1557	2620104.7832
Y3RPC	13+70.50	125.00	413241.1904	2619855.6737

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y3RPD	1+98.00	-100.00	415061.4162	2617946.2806
Y3RPD	11+67.59	-100.00	414396.2458	2618534.1710
Y3RPD	13+65.59	-100.00	414309.0440	2618704.3893
Y3RPD	17+59.29	-100.00	414137.2770	2619058.6440
Y3RPD	20+23.29	-100.00	414002.3402	2619303.0411
Y3RPD	23+36.00	-100.00	413755.6664	2619547.6900

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y4	33+50.49	-50.00	418137.8379	2616145.7545
Y4	36+62.26	30.00	418191.6024	2616463.0970
Y4	37+72.00	-50.00	418309.3327	2616530.7987
Y4	39+09.32	85.12	418241.7693	2616711.2165
Y4	39+23.37	-68.00	418387.3634	2616661.7537
Y4	39+76.00	100.00	418255.3084	2616778.1797
Y4	47+49.00	-100.00	418752.5091	2617402.9361
Y4	49+51.58	-100.00	418834.9327	2617587.9956
Y4	50+76.36	-100.00	418885.5396	2617703.0885
Y4	53+38.07	100.00	418806.2766	2618022.7892
Y4	53+38.07	-100.00	418989.7402	2617943.1580
Y4	55+16.00	-50.00	419026.4406	2618107.9425
Y4	56+35.42	-50.00	419098.5560	2618193.6814
Y4	56+35.41	31.29	419040.3127	2618250.3909
Y4	56+81.52	30.00	419073.4061	2618282.5243
Y4	58+45.00	-30.00	419230.4455	2618357.7879
Y4	58+45.00	-50.00	419244.7742	2618343.8348

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	117+74.00	-228.00	407797.8219	2630501.3007
L	117+74.00	-125.00	407899.2446	2630519.2569
L	118+26.00	-125.00	407908.3099	2630468.0532
L	118+26.00	-228.00	407806.8871	2630450.0970
L	153+50.00	-125.00	408983.0575	2627100.2174
L	153+50.00	-160.00	408951.7368	2627084.5965
L	154+10.00	-160.00	408978.5155	2627030.9038
L	154+10.00	-125.00	409009.8362	2627046.5248
L	154+75.00	125.00	409262.5658	2627099.9357
L	154+75.00	170.00	409302.8353	2627120.0197
L	155+40.00	170.00	409331.8456	2627061.8527
L	155+40.00	125.00	409291.5761	2627041.7686
L	266+40.00	-212.00	414932.0166	2617608.4607
L	266+45.00	-125.00	414966.9144	2617688.3246
L	266+89.00	-223.00	414976.8034	2617580.5764
L	267+01.00	-125.00	415021.2251	2617668.8214
L	268+40.00	-135.00	415154.1456	2617614.0903
L	268+73.00	-125.00	415189.6262	2617613.5817
L	268+73.00	-135.00	415186.7093	2617604.0166
L	279+85.00	-125.00	416298.4405	2617400.0952
L	279+85.00	-150.00	416294.7474	2617375.3694
L	283+00.00	-150.00	416606.2915	2617328.8365
L	283+00.00	-125.00	416609.9846	2617353.5622
L	292+00.00	135.00	417538.5185	2617477.7583
L	292+00.00	125.00	417537.0413	2617467.8680
L	293+64.00	135.00	417700.7192	2617453.5316
L	293+64.00	125.00	417699.2420	2617443.6413
L	329+95.00	125.00	421290.4051	2616907.2563
L	329+95.00	135.00	421291.8823	2616917.1466
L	335+46.00	125.00	421835.3598	2616825.8605
L	335+46.00	135.00	421836.8371	2616835.7508
L	342+50.00	-100.00	422517.2297	2616536.7175
L	342+50.00	-135.00	422517.3013	2616501.7175
L	343+00.00	-136.00	422569.3736	2616501.2209
L	344+39.00	-127.00	422713.4823	2616515.7734
L	344+55.00	-188.00	422734.0043	2616455.9319
L	344+99.45	-195.77	422781.4905	2616451.5397
L	363+00.00	170.00	424587.2650	2616894.4192
L	363+23.00	189.00	424614.7970	2616908.4992
L	363+57.00	100.00	424632.2035	2616814.2143
L	363+95.00	100.00	424670.6208	2616805.9956
L	369+50.00	136.00	425230.2461	2616663.6632
L	369+50.00	100.00	425216.0569	2616630.5774
L	369+75.00	136.00	425254.2365	2616653.2542
L	370+05.00	100.00	425268.1046	2616607.6801
L	370+05.00	110.00	425272.2165	2616616.7956
L	377+50.00	-144.00	425773.9076	2616015.2481
L	377+70.00	-102.69	425814.6748	2616036.0216
L	377+70.00	-112.00	425808.9922	2616028.6457
L	377+75.00	-168.00	425778.6933	2615981.2947
L	378+30.00	-134.00	425842.3505	2615974.9325
L	378+30.00	-101.73	425862.1943	2616000.3764
L	380+35.00	100.00	426147.8153	2616032.7689
L	380+55.00	162.00	426201.8259	2616069.1950
L	381+03.00	190.00	426256.8725	2616061.5879
L	381+25.00	170.00	426261.8318	2616032.2723
L	381+54.00	100.00	426241.4292	2615959.3015
L	431+98.00	125.00	430525.8660	2613340.8034
L	431+98.00	187.00	430556.7349	2613394.5725
L	432+68.00	-125.00	430462.1014	2613089.1408
L	432+98.00	187.00	430643.4591	2613344.7839
L	432+98.00	125.00	430612.5902	2613291.0148
L	433+03.00	-184.00	430463.0796	2613020.5475
L	433+26.00	-179.00	430485.5156	2613013.4323
L	433+42.00	-125.00	430526.2773	2613052.2972
L	464+43.00	-125.00	433349.1724	2611694.0983
L	464+50.00	-190.00	433353.0955	2611628.7779
L	464+80.00	-190.00	433385.9546	2611627.2520
L	465+06.00	-174.00	433414.8578	2611642.3294
L	465+39.00	-125.00	433451.2005	2611690.7097
L	563+13.00	203.00	442551.8412	2614892.8778
L	563+16.00	130.00	442548.1249	2614819.9107
L	563+20.00	242.00	442562.3930	2614931.0702
L	563+37.00	201.00	442575.5562	2614888.6823
L	563+39.00	130.00	442571.0277	2614817.7986
L	563+42.00	230.00	442583.1981	2614917.1006
L	563+71.00	285.00	442617.1263	2614969.2051
L	563+87.00	268.00	442631.4975	2614950.8077

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
RP1CD	33+31.00	133.00	408835.0220	2631958.6352
RP1CD	33+77.00	133.00	408864.5179	2631925.9142
RP1CD	33+77.00	100.00	408840.1718	2631903.6427

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
SERVRD	36+82.00	222.00	439491.8421	2614877.5476
SERVRD	37+09.00	40.00	439532.7740	2614698.1665
SERVRD	37+13.00	222.00	439522.7501	2614879.9343
SERVRD	37+39.50	40.00	439563.1834	2614700.5146
SERVRD	53+74.32	40.00	441191.1137	2614853.7254
SERVRD	54+01.00	154.00	441210.9804	2614969.2395
SERVRD	54+02.77	40.00	441219.7547	2614855.5633
SERVRD	54+27.00	148.00	441238.0143	2614964.8156

NOTE: DRAWING NOT TO SCALE

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
34360.1.2	1C-7
Location and Surveys	

SURVEY CONTROL SHEET R-1015

DESIGN ALIGNMENTS

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TYPE	STATION	NORTH	EAST
PC	32+80.83	402418.2342	2635391.7929
PT	36+34.33	402769.5275	2635358.3867
PC	47+82.02	403917.1801	2635367.3453
PT	67+84.73	405781.0562	2634741.4141
TS	76+06.30	406432.2090	2634240.4358
SC	79+96.30	406736.0620	2633996.0653
CS	98+38.97	407676.7532	2632444.8206
ST	102+28.97	407752.9828	2632062.4169
TS	127+38.75	408190.5172	2629591.0718
SC	130+34.75	408244.6206	2629300.0672
CS	143+88.78	408668.2000	2628017.2945
ST	146+84.78	408798.0234	2627751.2932
TS	233+62.32	412670.9112	2619985.9590
SC	237+22.32	412836.2652	2619666.2156
CS	272+98.83	415639.1135	2617630.2852
ST	276+58.83	415994.3173	2617571.9064
TS	335+76.98	421847.5317	2616697.6559
SC	339+36.98	422204.4474	2616651.0031
CS	344+96.51	422763.2862	2616646.4801
ST	348+56.51	423120.9103	2616687.3498
TS	351+68.60	423430.2824	2616728.4509
SC	355+58.60	423817.8472	2616771.2829
CS	375+23.56	425678.5755	2616262.9973
ST	379+13.56	425990.5416	2616029.0780
TS	387+18.49	426623.7623	2615532.1318
SC	390+14.49	426858.1287	2615351.3459
CS	395+70.37	427318.8406	2615040.6809
ST	398+66.37	427574.2973	2614891.1717
TS	452+51.21	432244.2578	2612210.1352
SC	458+09.21	432740.3116	2611955.6959
CS	473+67.19	434257.7708	2611980.2275
ST	479+25.19	434745.3408	2612250.5683
TS	510+17.69	437376.1207	2613876.1703
SC	513+12.69	437629.0580	2614027.9461
CS	528+24.69	439057.5119	2614491.8669
ST	531+19.69	439351.3610	2614517.6717
PC	535+03.07	439733.6750	2614546.2303
PT	538+49.87	440078.9832	2614578.1504
TS	547+95.79	441019.2043	2614681.7977
SC	549+43.79	441166.3723	2614697.4614
CS	561+19.69	442340.6618	2614707.9327
ST	562+67.69	442488.0857	2614694.8960
PC	573+26.28	443542.2024	2614597.6852
PT	582+36.78	444439.0483	2614445.7800

RP1A

TYPE	STATION	NORTH	EAST
CS	0+00.00	408469.1320	2631981.3386
SC	2+00.00	408300.7325	2632087.3731
CS	7+86.56	407863.8986	2631821.3441
ST	9+86.56	407878.5609	2631622.7095

RP1AB

TYPE	STATION	NORTH	EAST
POT	4+89.37	407056.2889	2632944.2739
TS	17+03.69	408087.8104	2632303.5437
SC	19+34.69	408282.4178	2632179.1181
CS	22+95.46	408568.1279	2631959.1910
ST	25+26.46	408738.2052	2631802.8981
TS	27+56.38	408905.4529	2631645.1347
SC	29+88.38	409076.3335	2631488.2397
PT	43+25.28	410249.6536	2630872.9659

RP1B

TYPE	STATION	NORTH	EAST
CS	0+00.00	405500.9586	2634877.7871
SC	2+34.00	405693.7277	2634745.3386
CS	10+90.94	406212.8150	2634074.8245
SRS	13+24.94	406295.6479	2633856.0282
SC	15+52.94	406376.9668	2633643.0877
CS	23+22.60	406853.6866	2633049.9519
ST	25+50.60	407044.1531	2632924.7363

RP1CD

TYPE	STATION	NORTH	EAST
POT	0+00.00	406460.8687	2634277.6866
TS	3+20.01	406722.1239	2634092.8879
SC	5+51.01	406909.2708	2633957.4915
CS	13+19.57	407468.3944	2633432.2916
ST	15+50.57	407615.2246	2633253.9744
TS	30+64.33	408564.9387	2632075.1947
SC	32+95.33	408712.0486	2631897.1125
PT	36+08.47	408928.7646	2631671.2595

LP1B

TYPE	STATION	NORTH	EAST
CS	0+00.00	407317.7901	2633213.9438
SC	1+95.00	407192.1831	2633359.9908
CS	7+09.19	406923.4706	2633091.0635
ST	9+04.19	407068.4248	2632963.8116

RP2A

TYPE	STATION	NORTH	EAST
PC	79+22.74	438928.0893	2613898.2474
CS	85+66.39	439532.9850	2614099.9737
SRS	88+13.39	439734.0097	2614243.3376
SC	90+60.39	439935.0345	2614386.7016
CS	95+46.75	440384.3197	2614566.0511
ST	97+93.75	440628.8095	2614600.5315

RP2AC

TYPE	STATION	NORTH	EAST
PC	32+80.83	434520.4249	2615234.5797
CS	52+23.75	436381.3613	2614699.0719
SRS	54+68.75	436624.3873	2614668.0610
SC	57+16.75	436870.0487	2614634.2633
CS	65+03.93	437614.9229	2614388.9477
ST	67+51.93	437832.5916	2614270.1531
TS	69+97.93	438046.6439	2614148.9195
SC	72+44.93	438265.1339	2614033.9206
PT	79+22.74	438926.1389	2613921.1646

RP2C

TYPE	STATION	NORTH	EAST
POT	0+00.00	436874.2643	2613621.3140
TS	3+26.32	437144.7527	2613803.8472
SC	5+22.32	437296.6714	2613926.7561
CS	11+86.23	437202.1488	2614500.4092
SC	13+82.23	437018.1405	2614565.7038

RP2CD

TYPE	STATION	NORTH	EAST
PC	0+00.00	436874.4016	2614659.8964
PT	0+24.04	436898.0820	2614655.7645
TS	1+55.04	437027.0288	2614632.6623
SC	2+99.04	437168.9934	2614608.5653
CS	4+96.11	437364.7805	2614586.4828
ST	6+40.11	437508.5460	2614578.3529
TS	16+47.86	438515.1633	2614530.6573
SC	17+91.86	438659.0534	2614525.1575
CS	19+67.87	438835.0115	2614527.5519
ST	21+11.87	438978.6987	2614536.9651
POT	24+82.06	439347.8599	2614564.5412

LP2A

TYPE	STATION	NORTH	EAST
CS	79+22.74	438924.1884	2613944.0817
SC	81+32.74	439123.0990	2614003.0450
CS	86+49.59	439059.1463	2614415.3253
SC	88+59.59	438851.2498	2614414.8465

Y3

TYPE	STATION	NORTH	EAST
POT	32+80.83	412358.7069	2617321.9086
PC	61+98.86	413687.1069	2619920.0347
PT	68+40.15	414141.3669	2620355.7790
POT	75+45.92	414782.5777	2620650.6579

Y3DET

TYPE	STATION	NORTH	EAST
PC	37+23.00	412560.3377	2617716.2644
PT	38+88.73	412647.8250	2617856.7897
PC	45+62.58	413050.8195	2618396.8524
PT	48+06.44	413181.6195	2618602.4013
PC	56+16.69	413564.6356	2619316.4055
PT	60+25.60	413711.2461	2619696.9940
PC	62+30.22	413760.4889	2619895.6066
PT	68+48.07	414141.3669	2620355.7790

Y3RPA

TYPE	STATION	NORTH	EAST
CS	0+00.00	414626.1673	2617916.8514
ST	2+00.00	414447.3097	2618006.3382
TS	3+64.04	414301.1997	2618080.9146
SC	5+64.04	414121.5686	2618168.7980
CS	7+10.61	413985.6962	2618223.6811
ST	9+10.61	413795.4215	2618285.2143
POT	17+64.60	412978.5350	2618534.1875

Y3RPB

TYPE	STATION	NORTH	EAST
TS	0+00.00	412422.5120	2620378.7044
SC	1+98.00	412506.8818	2620199.6233
CS	8+86.71	412617.1379	2619526.1074
SRS	10+84.71	412594.2738	2619329.4718
SC	13+24.71	412577.4094	2619090.5056
PT	18+40.46	412817.4533	2618652.4257
POT	20+40.28	412978.5350	2618534.1875

Y3RPC

TYPE	STATION	NORTH	EAST
POT	0+00.00	412330.7836	2620773.2395
TS	4+26.51	412536.3036	2620399.5128
SC	6+57.51	412653.4647	2620200.5215
PT	13+70.50	413188.3394	2619742.3963
POT	17+33.96	413517.7107	2619588.7242

Y3RPD

TYPE	STATION	NORTH	EAST
CS	0+00.00	415209.3368	2617787.5219
SC	1+98.00	415022.9028	2617853.9945
CS	11+67.59	414309.3915	2618484.6095
ST	13+65.59	414219.0633	2618660.7604
TS	17+59.29	414047.2963	2619015.0151
SC	20+23.29	413920.1593	2619246.0648
PT	23+36.19	413699.2150	2619465.1474
POT	25+55.77	413517.7107	2619588.7242

NOTE: DRAWING NOT TO SCALE

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PROJECT REFERENCE NO.	SHEET NO.
34360.1.2	1C-8
Location and Surveys	

SURVEY CONTROL SHEET R-1015

DESIGN ALIGNMENTS

Y4

TYPE	STATION	NORTH	EAST
POT	32+80.83	418063.8209	2616102.4624
PC	49+51.58	418743.5836	2617628.6815
PT	50+76.36	418793.8078	2617742.9041
PC	53+38.07	418898.0084	2617982.9736
PT	56+35.42	419062.7343	2618228.5642
POT	58+86.46	419237.8745	2618408.4179

DR1

TYPE	STATION	NORTH	EAST
POT	10+00.00	427643.1946	2614609.2813
PC	10+48.90	427681.8971	2614639.1642
PT	10+96.04	427726.2584	2614642.1932
PC	12+99.96	427903.1053	2614540.6650
PT	13+48.23	427922.6981	2614499.7222
POT	13+78.96	427917.8928	2614469.3616

Y4DET

TYPE	STATION	NORTH	EAST
PC	34+60.97	418137.1126	2616267.0186
PT	37+03.27	418201.8023	2616499.6113
PC	38+24.27	418216.7108	2616619.6894
PT	40+66.57	418281.4005	2616852.2821
PC	52+44.58	418760.6830	2617928.3781
PT	55+54.08	418947.4538	2618171.5733
PC	58+76.80	419198.3979	2618374.4946
PT	59+54.66	419255.8987	2618426.9272

SERVRD

TYPE	STATION	NORTH	EAST
PC	32+80.84	439108.3014	2614641.0292
PT	35+81.34	439408.5725	2614648.4568
PC	40+29.30	439855.2010	2614682.9446
PT	42+27.23	440052.3374	2614700.5637
PC	52+18.01	441038.0538	2614800.6715
PT	54+23.09	441242.4781	2614816.8313
POT	56+74.26	441493.2455	2614831.0301

Y4DR

TYPE	STATION	NORTH	EAST
POT	10+00.00	418301.4961	2616636.0963
PC	10+47.00	418344.4307	2616616.9737
PT	11+31.20	418418.8181	2616638.5805
POT	16+03.02	418679.9080	2617031.5681

SERVEXT

TYPE	STATION	NORTH	EAST
POT	10+00.00	441353.9514	2614566.1671
PC	16+78.15	442031.0655	2614603.5844
PT	21+13.97	442466.4437	2614595.9931
POT	21+64.81	442517.0749	2614591.4203

G12

TYPE	STATION	NORTH	EAST
POT	10+00.00	436127.5596	2613104.6639
PC	10+89.96	436080.2717	2613181.1919
PT	11+39.84	436077.6557	2613228.9554
POT	13+83.11	436182.1704	2613448.6387

SR1162

TYPE	STATION	NORTH	EAST
POT	10+00.00	435169.7925	2615085.1299
PC	12+24.78	435384.0578	2615017.1709
PT	18+58.37	435998.5339	2614864.5020
POT	19+24.56	436063.6598	2614852.6571

NOTE: DRAWING NOT TO SCALE

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PROJECT REFERENCE NO.	SHEET NO.
R-1015	2A-1

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 015869 — 12/13/2018

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022896 — 12/13/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

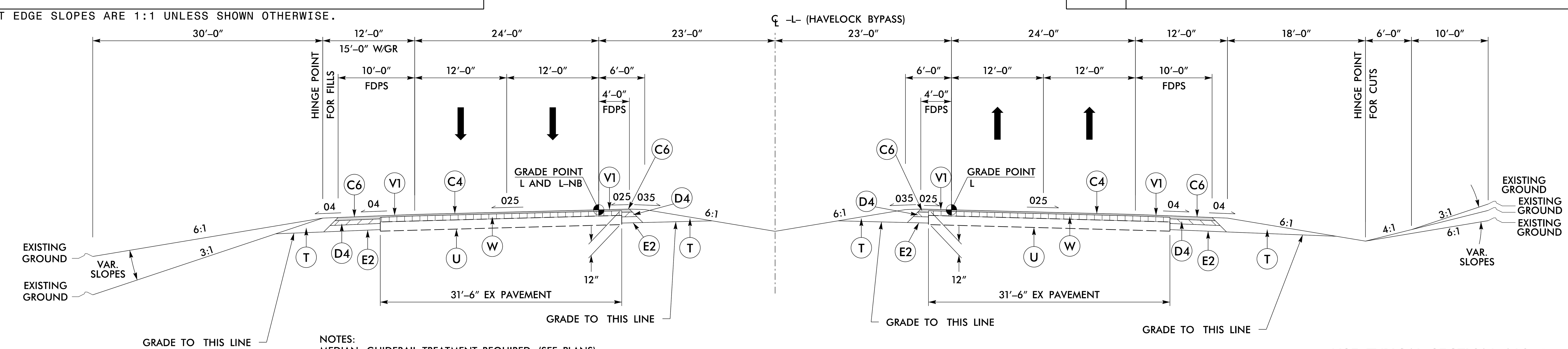
moffatt & nichol — 4700 FALLS OF NEUSE ROAD, SUITE 300, RALEIGH, NORTH CAROLINA 27609 — NC License No.: F-0105

PAVEMENT SCHEDULE

(FINAL PAVEMENT DESIGN - LETTER DATED 10/31/2018)

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.	D4	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	L	3" CLASS IV AGGREGATE STABILIZATION
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.	D5	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	P	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YD.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.	E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R1	2'-6" CONCRETE CURB AND GUTTER.
C4	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E2	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	R2	SHOULDER BERM GUTTER.
C5	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 224 LBS. PER SQ. YD.	E3	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.	R3	EXPRESSWAY GUTTER.
C6	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	J1	PROP. 6" AGGREGATE BASE COURSE.	R4	1'-6" CONCRETE CURB AND GUTTER.
C7	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	J2	PROP. 8" AGGREGATE BASE COURSE.	T	EARTH MATERIAL.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	J3	PROP. 10" AGGREGATE BASE COURSE.	U	EXISTING PAVEMENT.
D2	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	J4	PROP. VARIABLE DEPTH AGGREGATE BASE COURSE.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD DETAILS).
D3	PROP. APPROX. 3½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD.			V1	MILLED RUMBLE STRIP (STD.665.01)

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



NOTES:
MEDIAN GUIDERAIL TREATMENT REQUIRED (SEE PLANS)
USE L-NB PROFILE STA 32+80.83 TO STA 42+50.00
USE L-NB PROFILE STA 561+00.00 TO 579+17.51

TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1:
-L- STA 32+80.83 TO STA 42+50.00
-L- STA 547+00.00 TO STA 579+17.51

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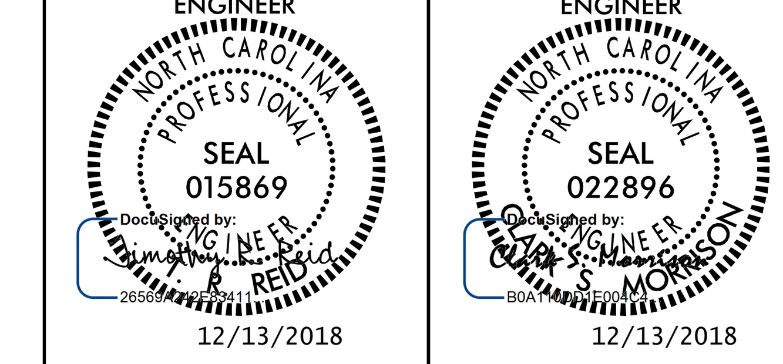
PROJECT REFERENCE NO.	SHEET NO.
R-1015	2A-2

ROADWAY DESIGN ENGINEER | PAVEMENT DESIGN ENGINEER



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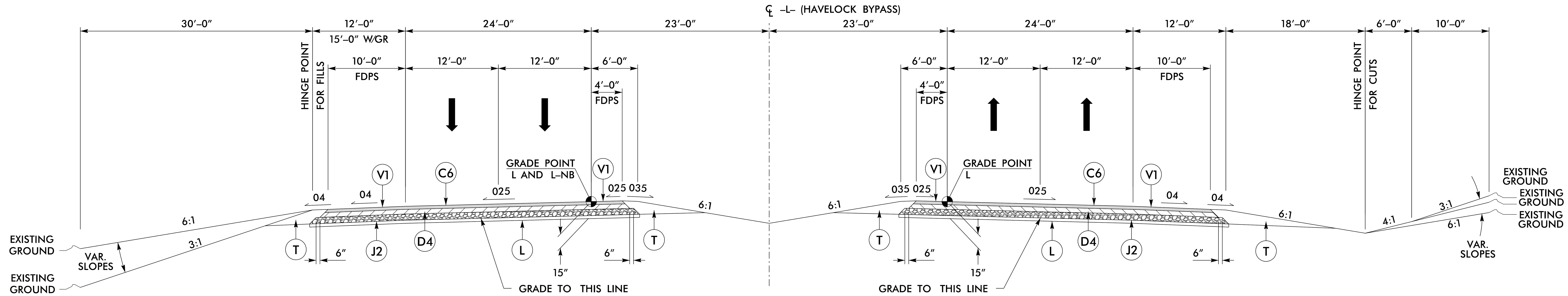
C6	3″ S9.5C
D4	4″ I19.0C
E2	5″ B25.0C
E3	VAR B25.0C
J2	8″ ABC
J4	VAR ABC
L	CLASS IV STAB AGGR
R2	SBG
R3	EXPWY GUTTER
T	EARTH MATERIAL
V1	MILLED RUMBLE STRIPS



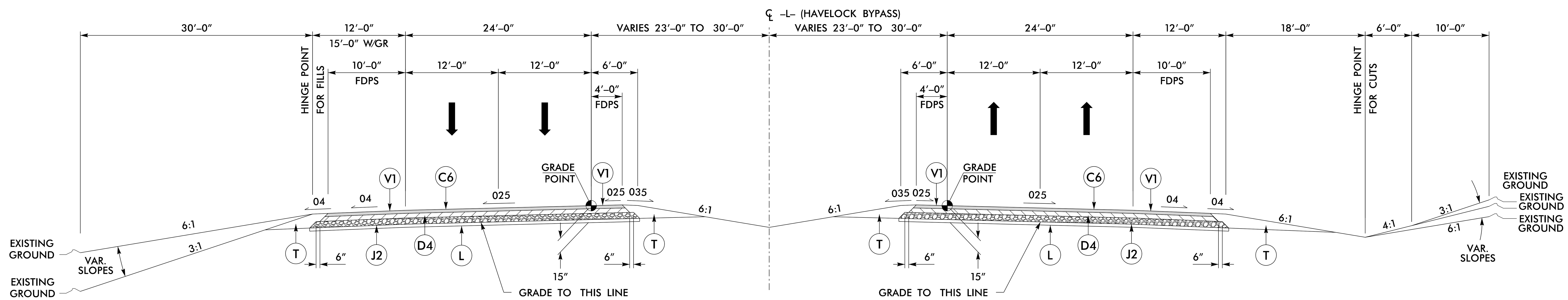
NOTE:
USE 2:1 FILL SLOPES WITH TYPICAL SECTION 2 AT THE FOLLOWING LOCATIONS:
-L- STA 341+00 TO STA 349+50 LT
-L- STA 390+00 TO STA 398+00 LT
-L- STA 352+00 TO STA 379+50 RT

NOTE:
MEDIAN GUIDERAIL TREATMENT REQUIRED (SEE PLANS)
USE L-NB PROFILE STA 42+50.00 TO STA 58+00.00

TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2:

-L- STA 42+50.00 TO STA 137+14.31 (BEGIN BRIDGE NBL)
-L- STA 140+84.23 (END BRIDGE NBL) TO STA 162+00.00
-L- STA 193+00.00 TO STA 226+51.03 (BEGIN BRIDGE NBL)
-L- STA 228+44.53 (END BRIDGE NBL) TO STA 275+00.00
-L- STA 300+00.00 TO STA 505+30.26 (BEGIN BRIDGE NBL)
-L- STA 507+18.76 (END BRIDGE NBL) TO STA 547+00.00



NOTE:
MEDIAN GUIDERAIL TREATMENT REQUIRED (SEE PLANS)

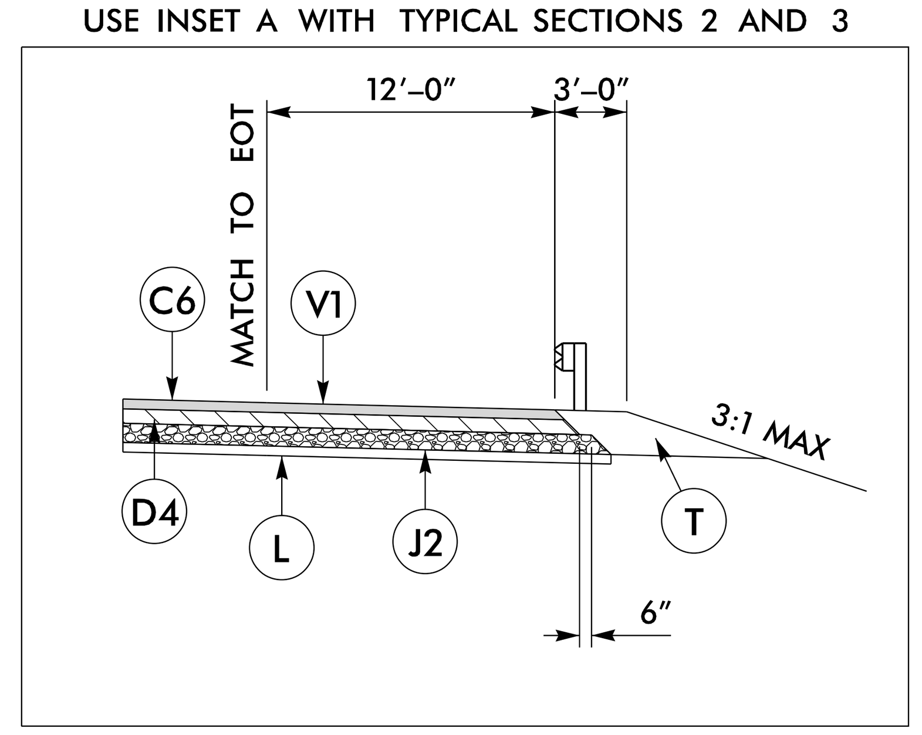
TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3:

-L- STA 162+00.00 TO STA 169+56.21 (BEGIN BRIDGE NBL)
-L- STA 185+77.79 (END BRIDGE NBL) TO STA 193+00.00
-L- STA 275+00.00 TO STA 282+89.33 (END BRIDGE NBL)
-L- STA 292+35.66 (BEGIN BRIDGE NBL) TO STA 300+00.00

INSET A

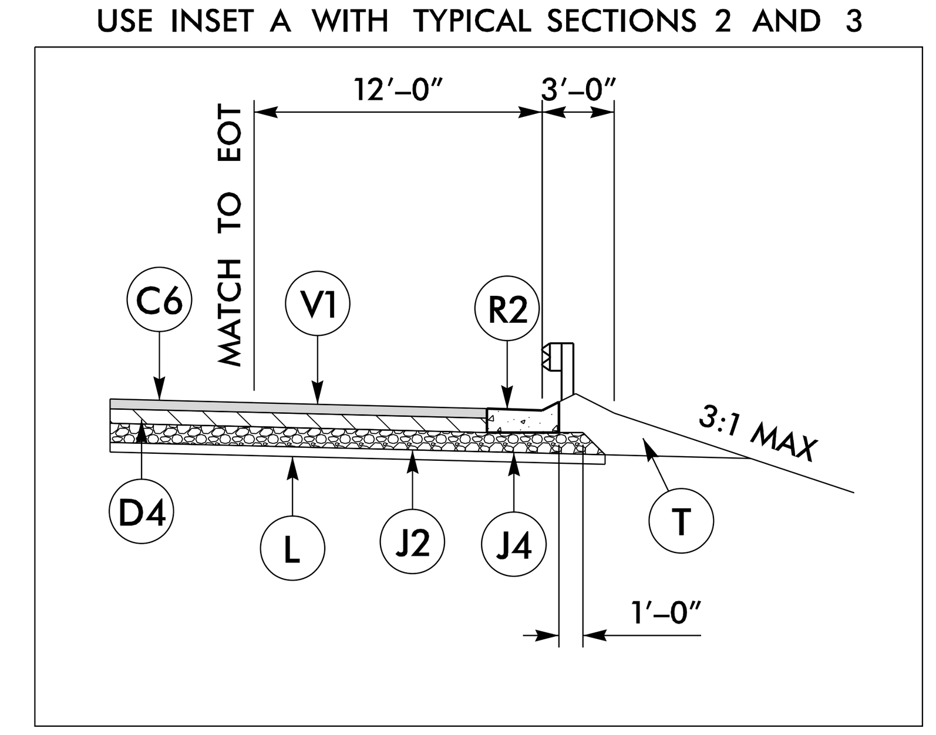
USE INSET A WITH TYPICAL SECTIONS 2 AND 3



-L- PAVE TO FACE OF GUARDRAIL DETAIL
USE AT LOCATIONS SHOWN ON PLANS

INSET B

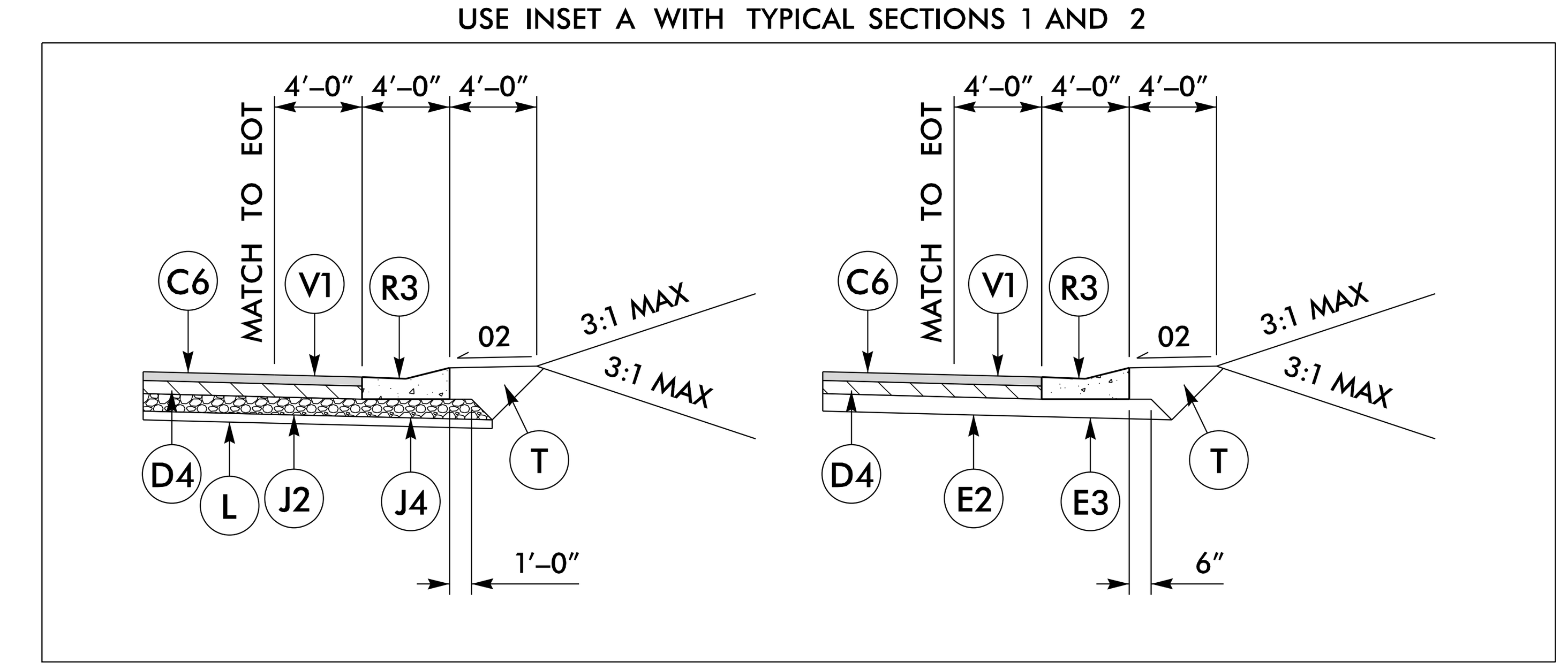
USE INSET A WITH TYPICAL SECTIONS 2 AND 3



-L- SHOULDER BERM GUTTER DETAIL
USE AT LOCATIONS SHOWN ON PLANS

INSET C

USE INSET A WITH TYPICAL SECTIONS 1 AND 2



-L- EXPRESSWAY GUTTER DETAIL
USE AT LOCATIONS SHOWN ON PLANS

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PROJECT REFERENCE NO.	SHEET NO.
R-1015	2A-3

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 015869 — 12/13/2018

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022896 — 12/13/2018

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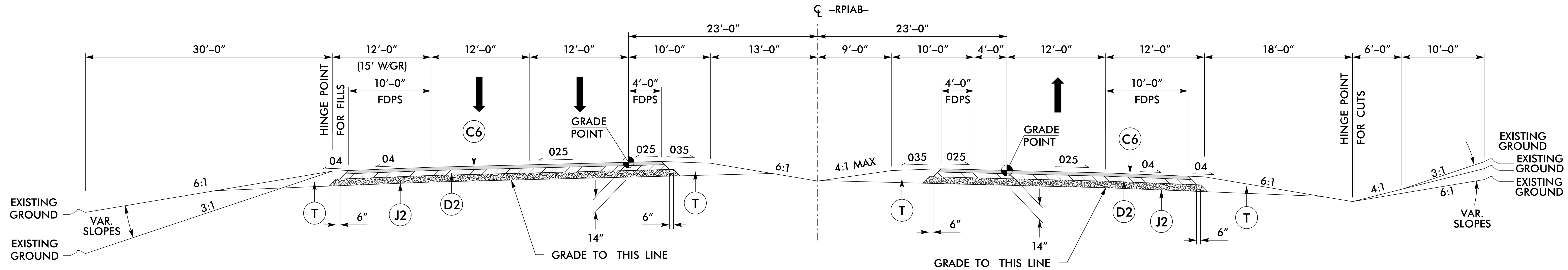
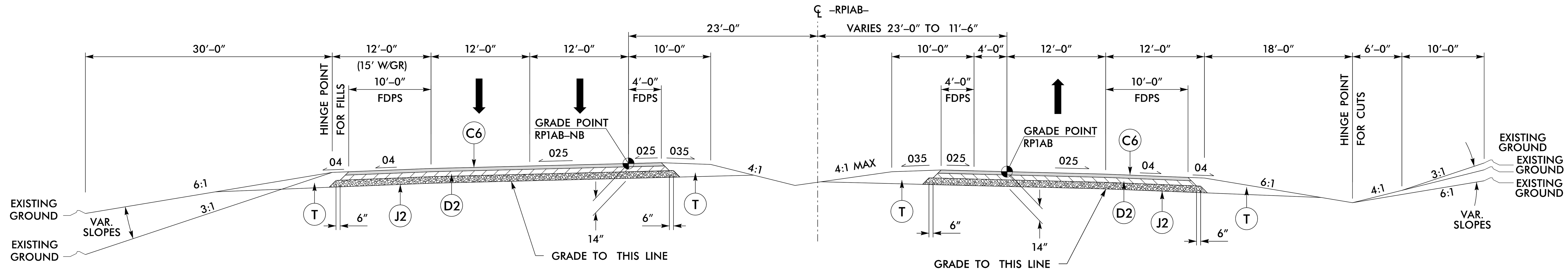
C4	1 1/2" S9.5C
C6	3" S9.5C
D2	3" I19.0C
E1	4" B25.0C
E3	VAR B25.0C
J2	8" ABC
J4	VAR ABC
R2	SBG
R4	1'-6" CURB AND GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4

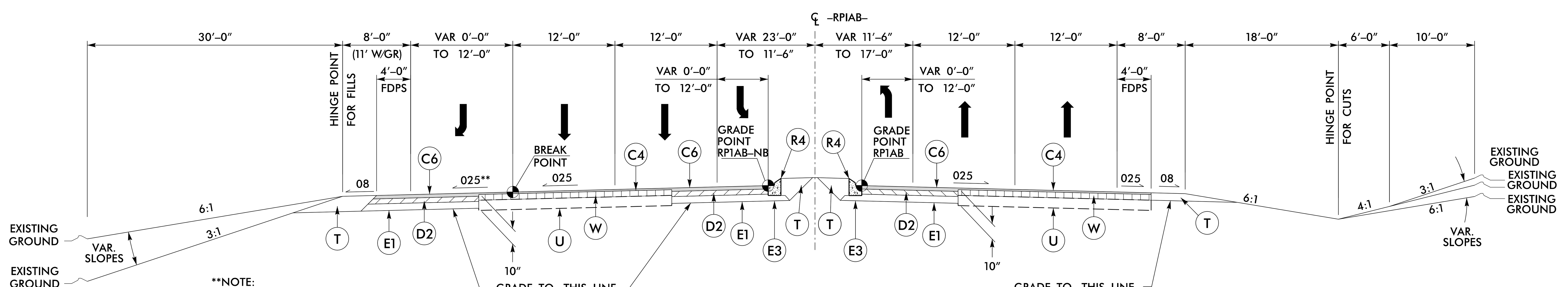
-RPIAB- STA 4+89.37 TO STA 10+30.95 (BEGIN BRIDGE EBL)
-RPIAB- STA 12+53.45 (END BRIDGE EBL) TO STA 19+34.69



TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5

-RPIAB- STA 19+34.69 TO STA 22+95.46

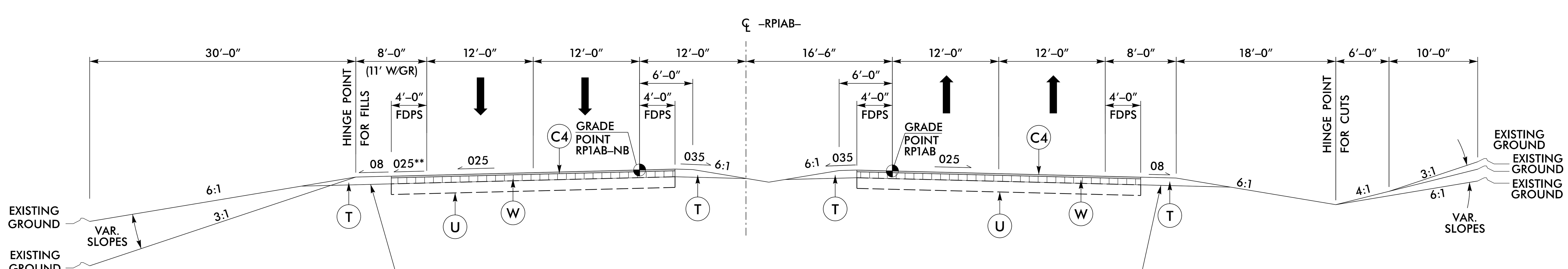


**NOTE:
STA. 38+83.00 TO 45+00.00 TURN LANE AND PAVED SHOULDER SLOPE =2%

TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6

-RPIAB- STA 22+95.46 TO STA 42+85.75



**NOTE:
STA. 38+83.00 TO 45+00.00 TURN LANE AND PAVED SHOULDER SLOPE =2%

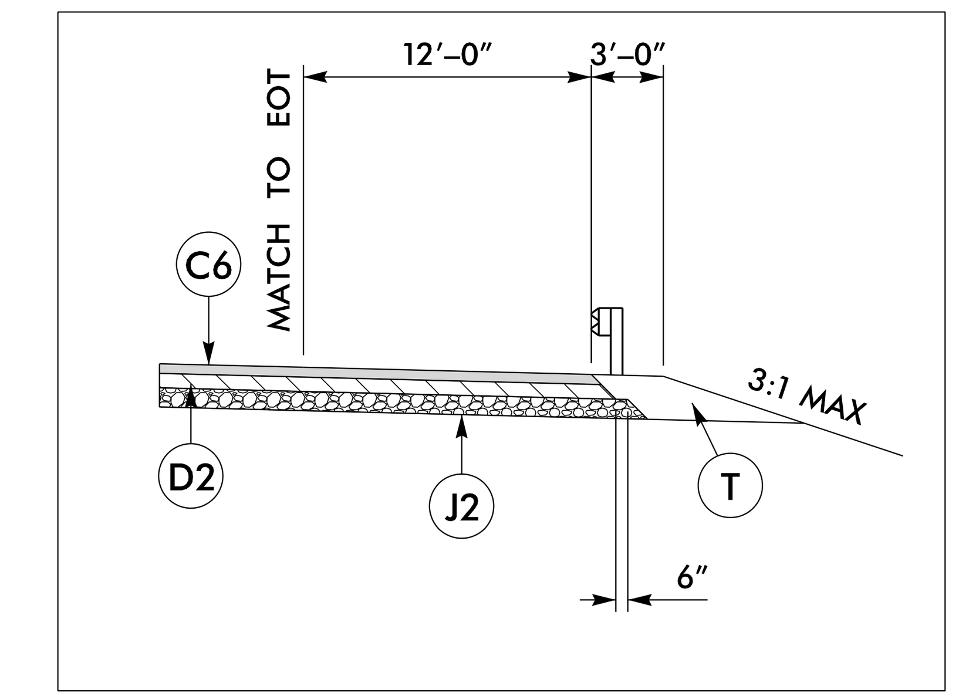
TYPICAL SECTION NO. 7

USE TYPICAL SECTION NO. 7

-RPIAB- STA 42+85.75 TO STA 45+00.00

INSET D

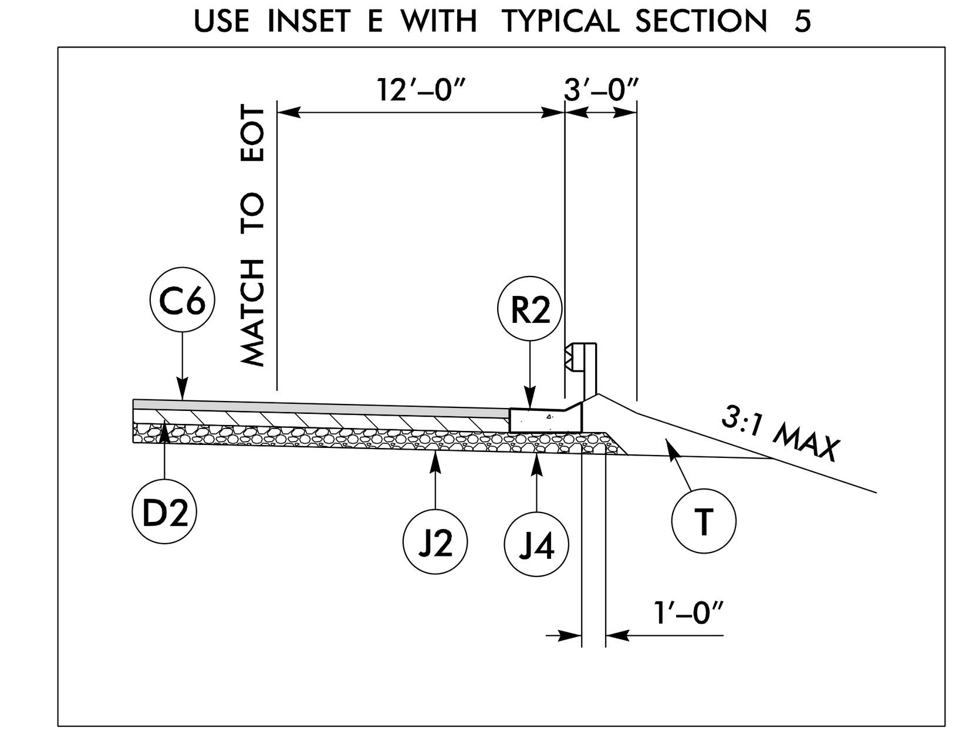
USE INSET D WITH TYPICAL SECTION 5



-RPIAB- PAVE TO FACE OF GUARDRAIL DETAIL
USE AT LOCATIONS SHOWN ON PLANS

INSET E

USE INSET E WITH TYPICAL SECTION 5



-RPIAB- SHOULDER BERM GUTTER DETAIL
USE AT LOCATIONS SHOWN ON PLANS

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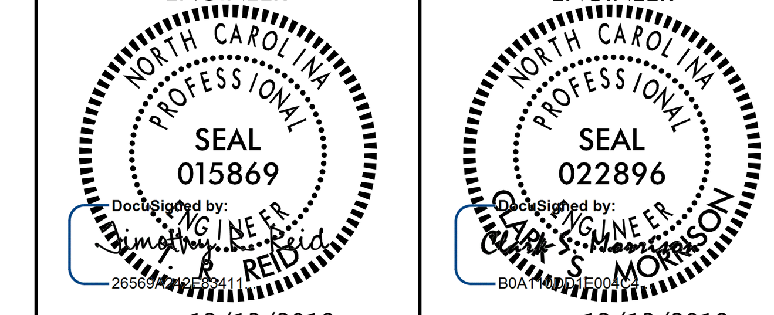
PROJECT REFERENCE NO.	SHEET NO.
R-1015	2A-4

ROADWAY DESIGN ENGINEER

PAVEMENT DESIGN ENGINEER



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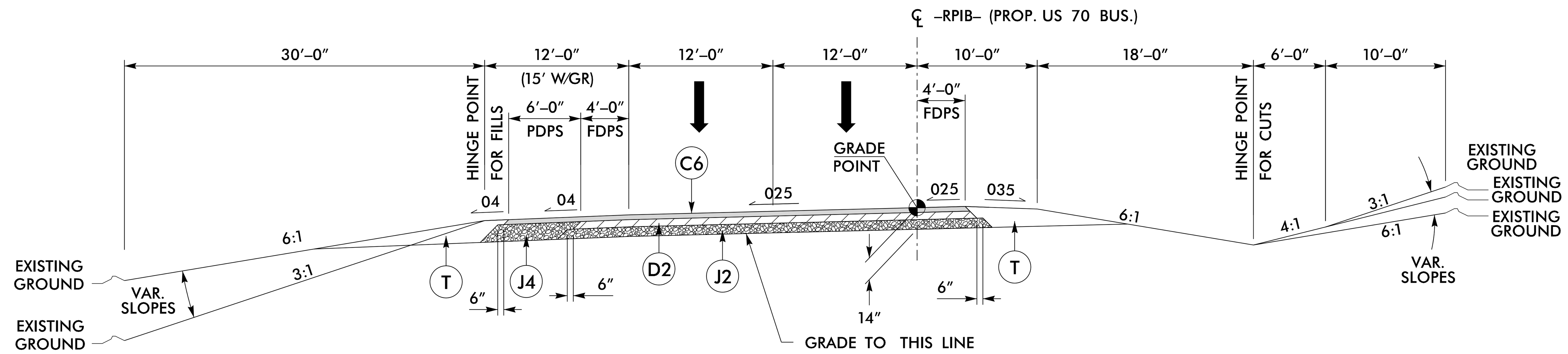
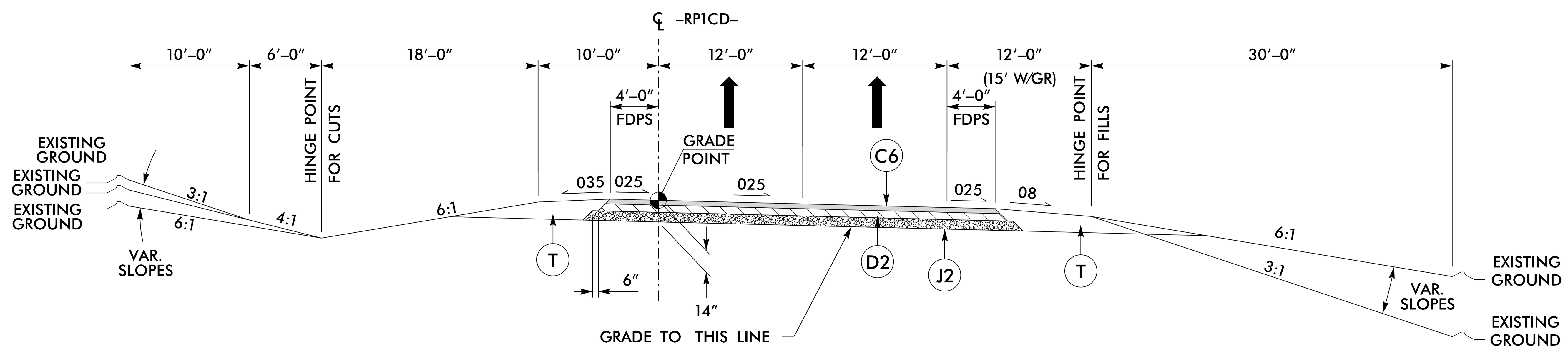
C4	1 1/2" S9.5C
C6	3" S9.5C
D2	3" I19.0C
D4	4" I19.0C
E1	4" B25.0C
J2	8" ABC
J4	VAR ABC
R1	2'-6" CURB AND GUTTER
R2	SBG
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING



TYPICAL SECTION NO. 8

USE TYPICAL SECTION NO. 8

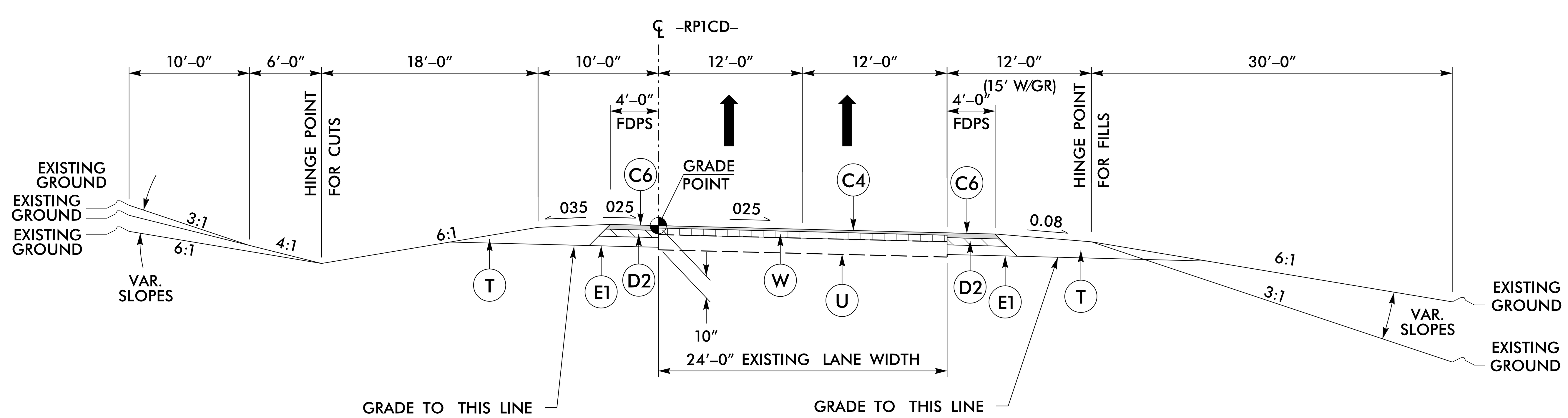
-RPIB- STA 0+00.00 TO STA 25+50.60



TYPICAL SECTION NO. 9

USE TYPICAL SECTION NO. 9:

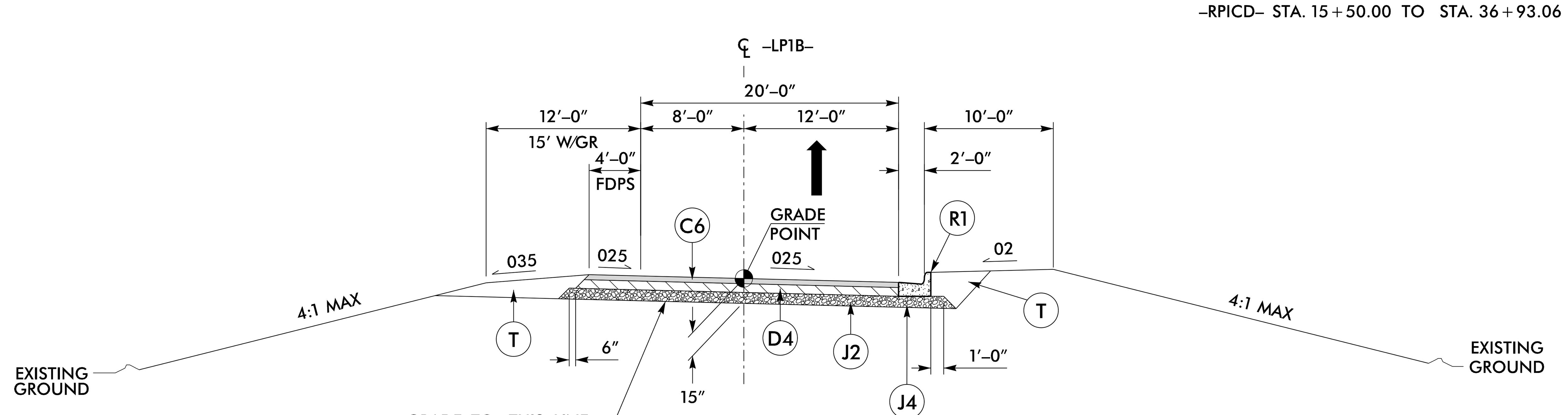
-RPICD- STA. 0+00.00 TO STA. 15+50.00



TYPICAL SECTION NO. 10

USE TYPICAL SECTION NO. 10:

-RPICD- STA. 15+50.00 TO STA. 36+93.06



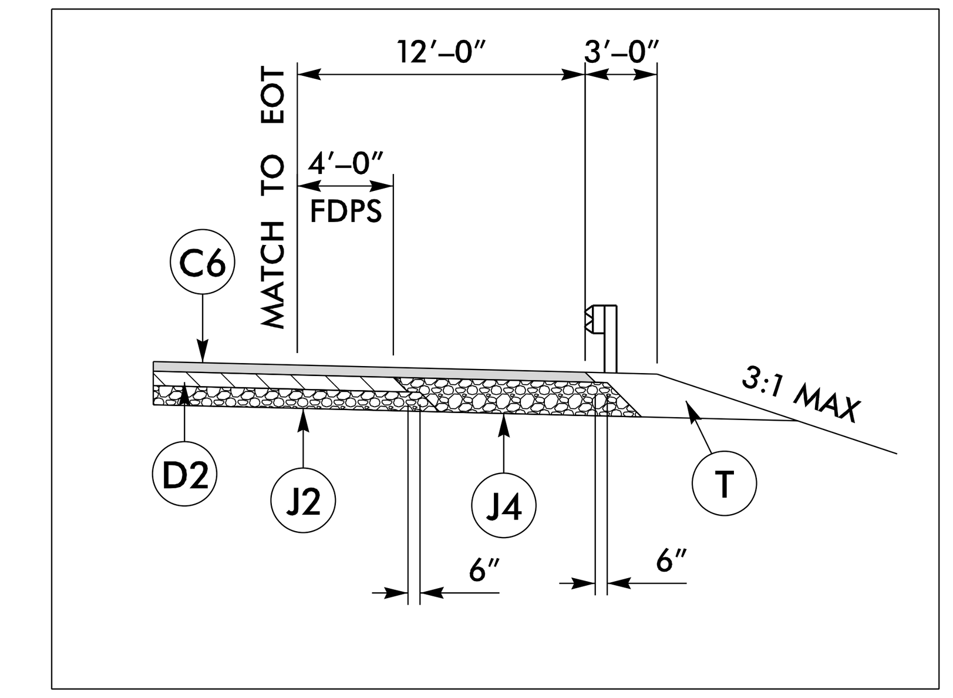
TYPICAL SECTION NO. 11

USE TYPICAL SECTION NO. 11:

-LPIB- STA. 0+00.00 TO STA. 9+04.19

INSET F

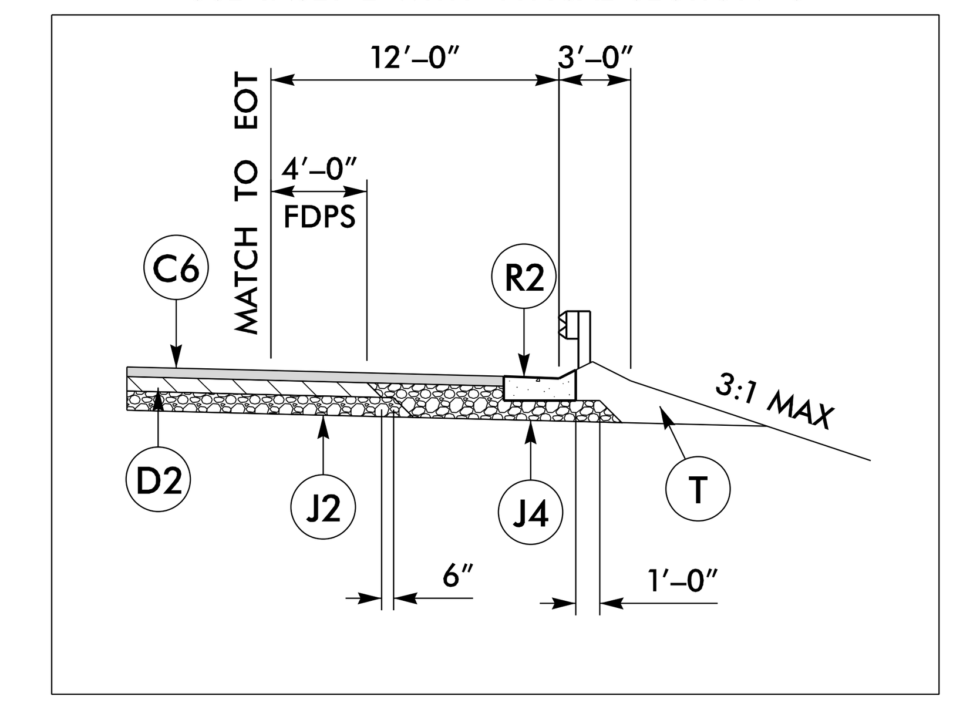
USE INSET D WITH TYPICAL SECTION 8



-RP1B- PAVE TO FACE OF GUARDRAIL DETAIL
USE AT LOCATIONS SHOWN ON PLANS

INSET G

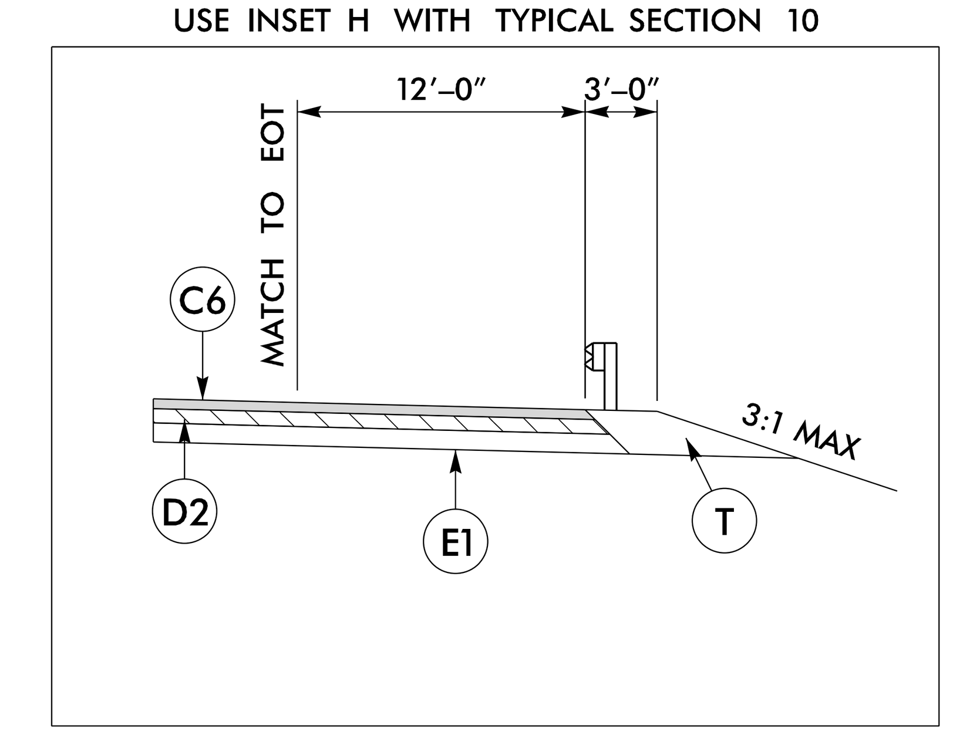
USE INSET E WITH TYPICAL SECTION 8



-RP1B- SHOULDER BERM GUTTER DETAIL
USE AT LOCATIONS SHOWN ON PLANS

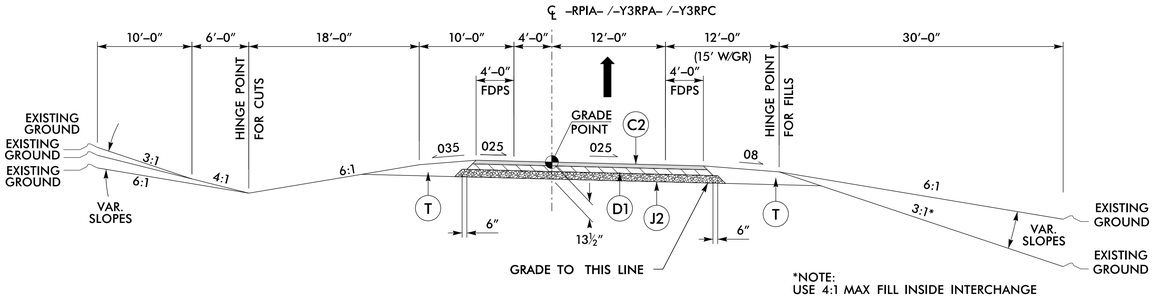
INSET H

USE INSET H WITH TYPICAL SECTION 10



-RPICD- PAVE TO FACE OF GUARDRAIL DETAIL
USE AT LOCATIONS SHOWN ON PLANS

DocuSign Envelope ID: AD8E8216-ED0A-41E3-B993-49BD5F4B9526

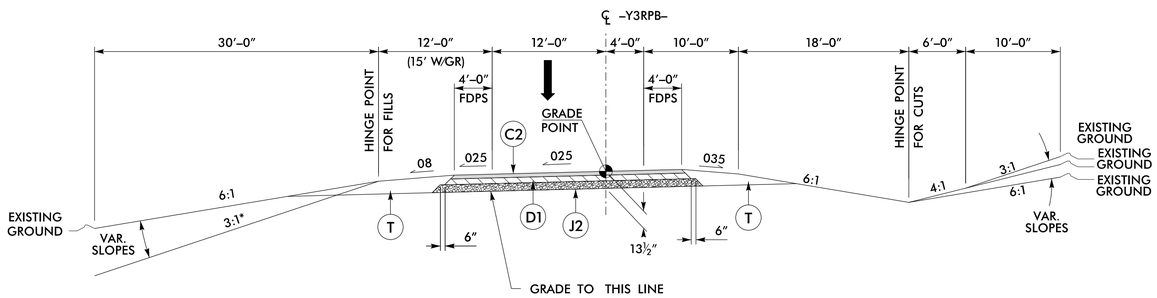


*NOTE:
USE 4:1 MAX FILL INSIDE INTERCHANGE

TYPICAL SECTION NO. 12

USE TYPICAL SECTION NO. 12:

–RPIA– STA. 0+00.00 TO STA. 9+86.56
–Y3RPA– STA. 0+00.00 TO STA. 17+44.28
–Y3RPC– STA. 0+00.00 TO STA. 17+13.94

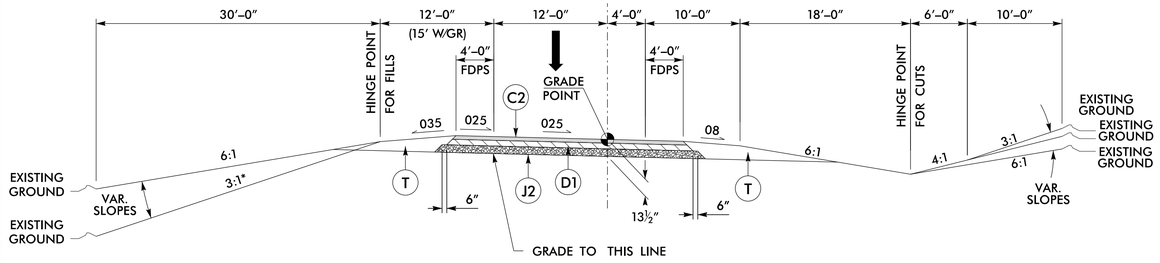


*NOTE:
USE 4:1 MAX FILL INSIDE INTERCHANGE

TYPICAL SECTION NO. 13

USE TYPICAL SECTION NO. 13:

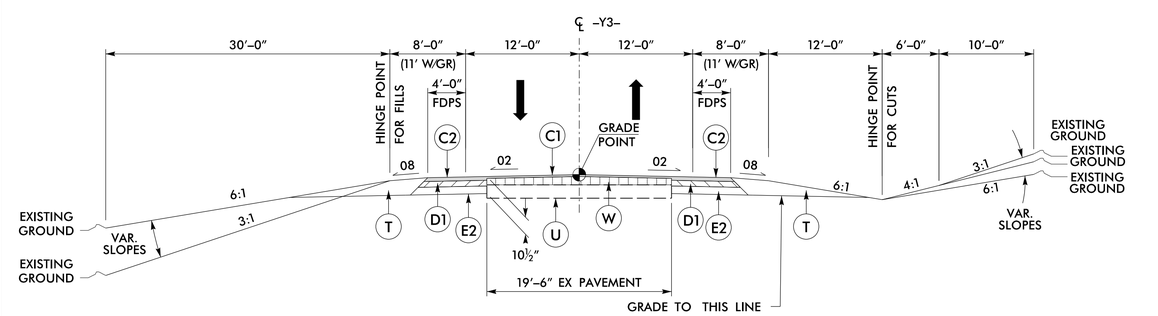
–Y3RPB– STA. 0+00.00 TO STA. 20+20.01



TYPICAL SECTION NO. 14

USE TYPICAL SECTION NO. 14:

–Y3RPD– STA. 0+00.00 TO STA. 25+35.61



TYPICAL SECTION NO. 15

USE TYPICAL SECTION NO. 15:

–Y3– STA. 34+77.69 TO STA. 40+50.00
–Y3– STA. 65+00.00 TO STA. 73+81.89

PROJECT REFERENCE NO.	SHEET NO.
R–1015	2A–5

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 015869 ENGINEER BRIAN K. REID
12/13/2018

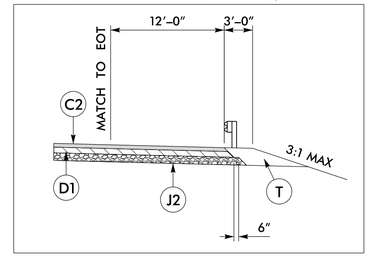
PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022896 ENGINEER CHRIS S. MORRISON
12/13/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

C1	1 1/2″ S9.5B
C2	3″ S9.5B
D1	2 1/2″ I19.0C
E2	5″ B25.0C
E3	VAR B25.0C
J2	8″ ABC
J4	VAR ABC
R2	SBG
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING

INSET I

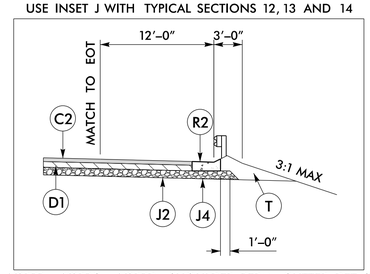
USE INSET I WITH TYPICAL SECTIONS 12, 13 AND 14



–Y3RPB– –Y3RPC– –Y3RPD– PAVE TO FACE OF GUARDRAIL DETAIL
USE AT LOCATIONS SHOWN ON PLANS

INSET J

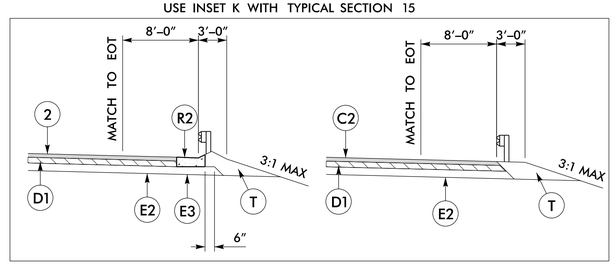
USE INSET J WITH TYPICAL SECTIONS 12, 13 AND 14



–Y3RPB– –Y3RPC– –Y3RPD– SHOULDER BERM GUTTER DETAIL
USE AT LOCATIONS SHOWN ON PLANS

INSET K

USE INSET K WITH TYPICAL SECTION 15



–Y3– PAVE TO FACE OF GUARDRAIL DETAIL
–Y3– SHOULDER BERM GUTTER DETAIL
USE AT LOCATIONS SHOWN ON PLANS

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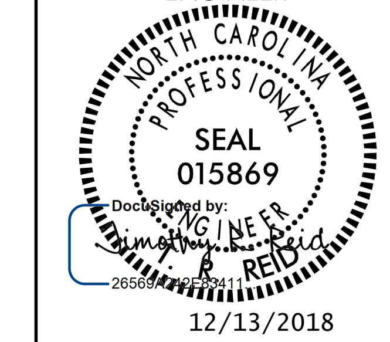
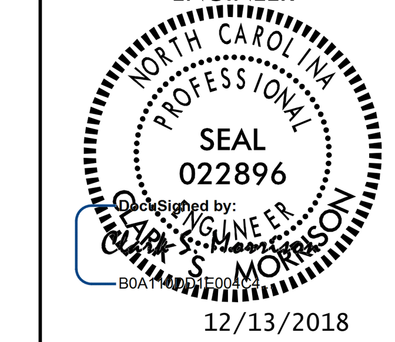
PROJECT REFERENCE NO.	SHEET NO.
R-1015	2A-6

ROADWAY DESIGN ENGINEER

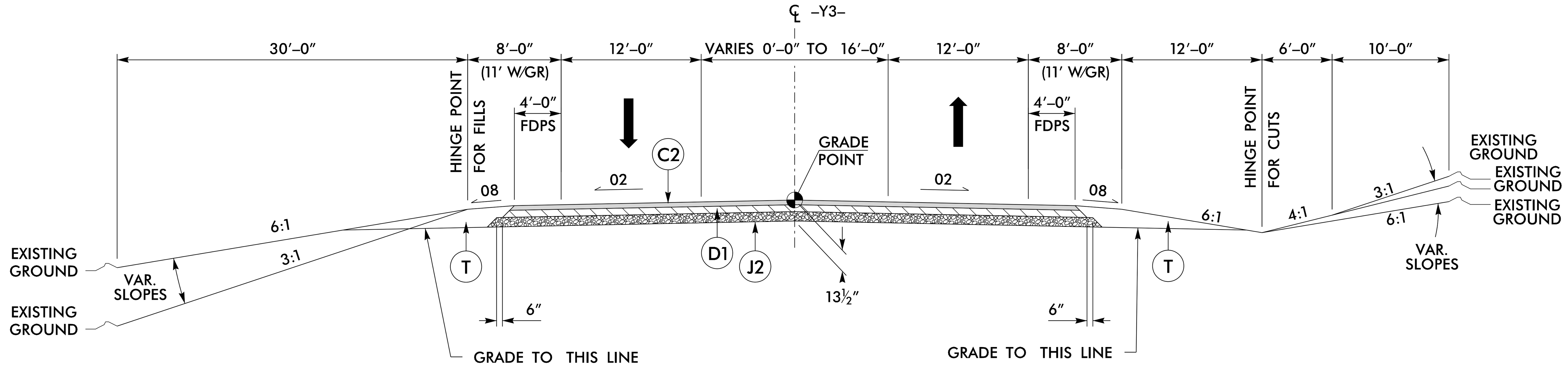


PAVEMENT DESIGN ENGINEER



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

C1	1 1/2" S9.5B
C2	3" S9.5B
D1	2 1/2" I19.0C
E2	5" B25.0C
E3	VAR B25.0C
J2	8" ABC
J4	VAR ABC
P	PRIME COAT
R2	SBG
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING



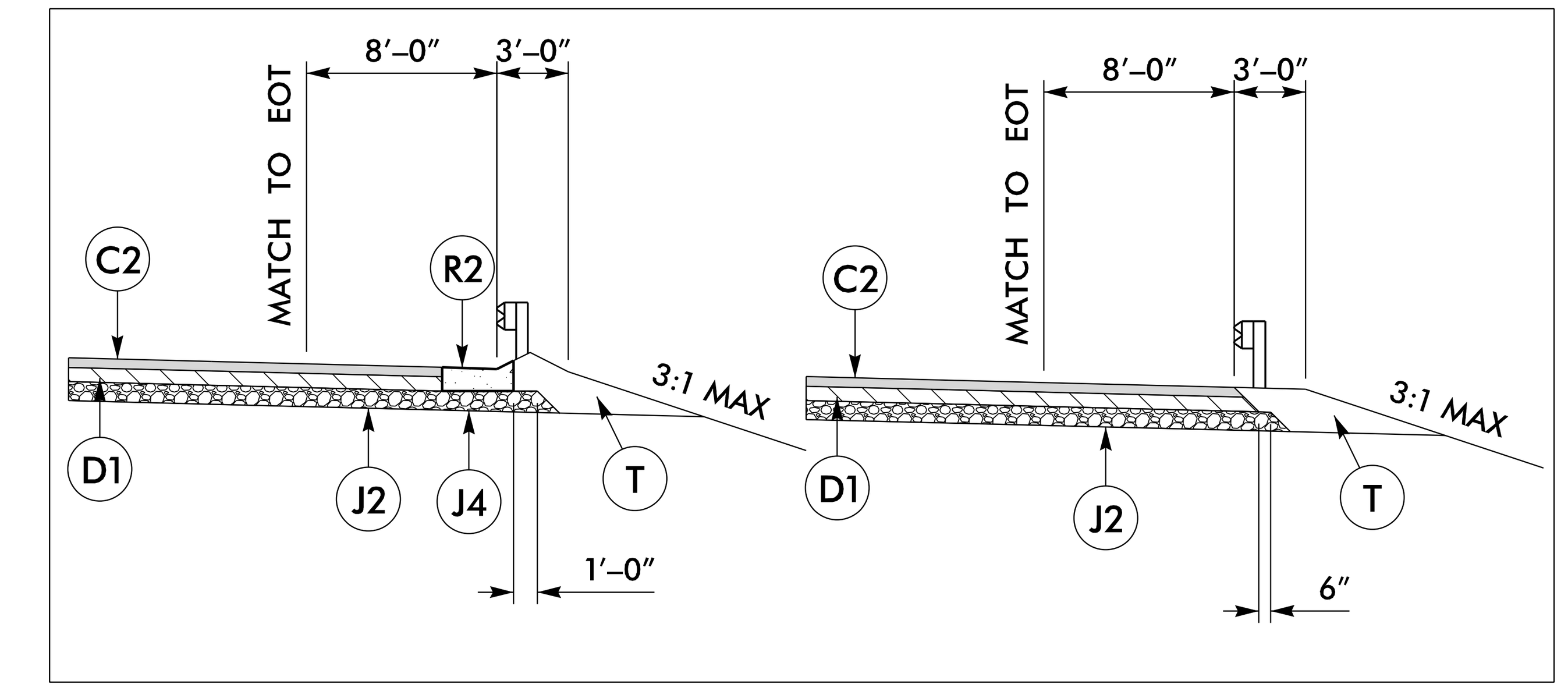
TYPICAL SECTION NO. 16

USE TYPICAL SECTION NO. 16:

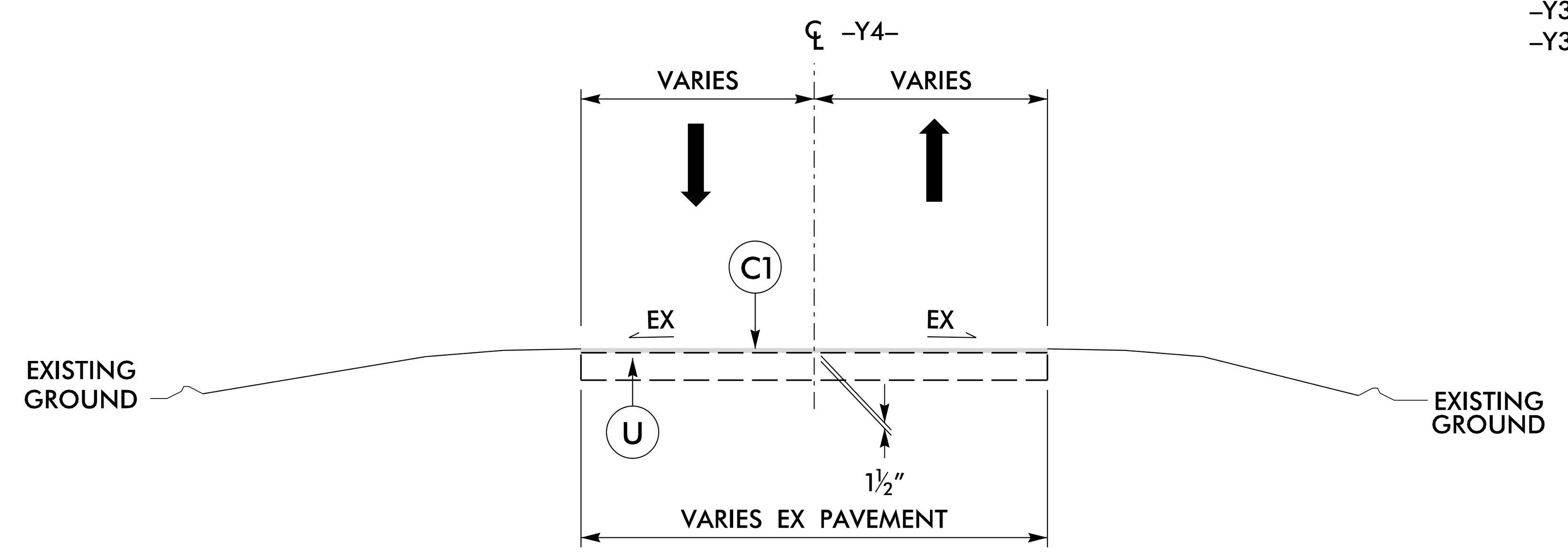
-Y3- STA 40+50.00 TO STA 51+38.63 (BEGIN BRIDGE)
-Y3- STA 53+32.79 (END BRIDGE) TO STA 65+00.00

INSET L

USE INSET L WITH TYPICAL SECTION 16



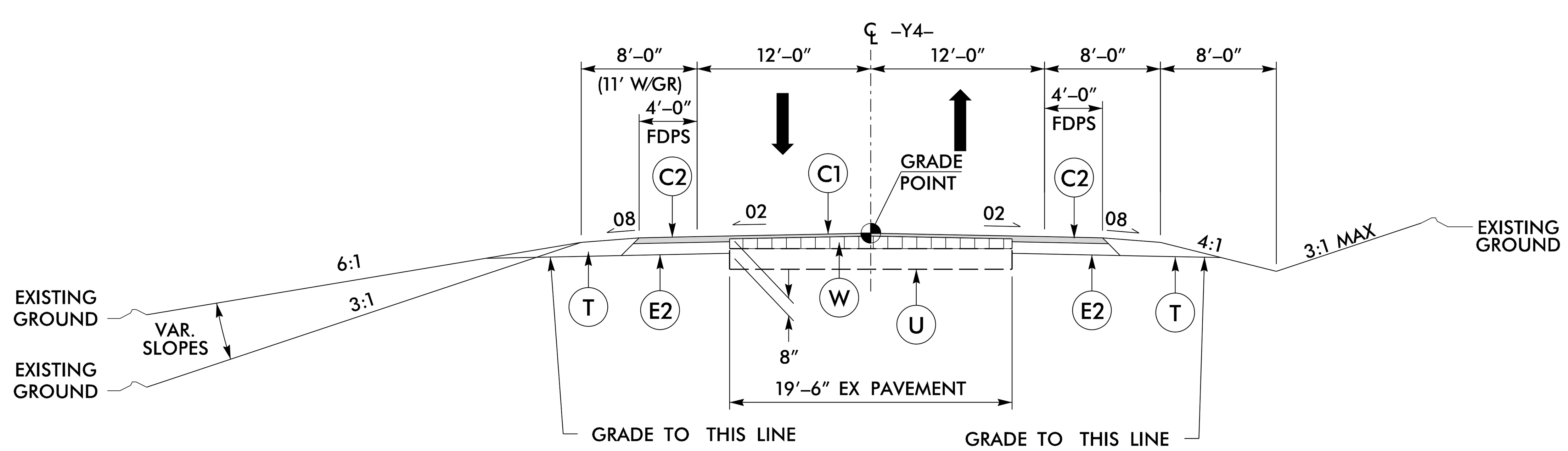
-Y3- SHOULDER BERM GUTTER DETAIL
-Y3- PAVE TO FACE OF GUARDRAIL DETAIL
USE AT LOCATIONS SHOWN ON PLANS



TYPICAL SECTION NO. 17

USE TYPICAL SECTION NO. 17:

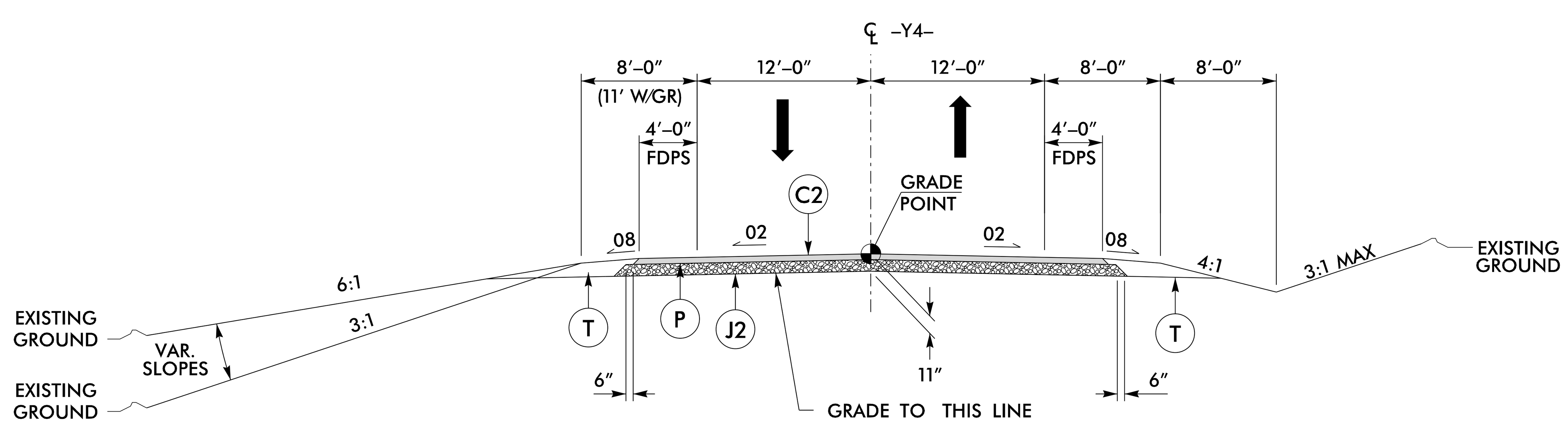
-Y4- STA. 33+50.00 TO STA. 34+40.00



TYPICAL SECTION NO. 18

USE TYPICAL SECTION NO. 18:

-Y4- STA. 34+40.00 TO STA. 36+50.00
-Y4- STA 56+00.00 TO STA 59+12.29



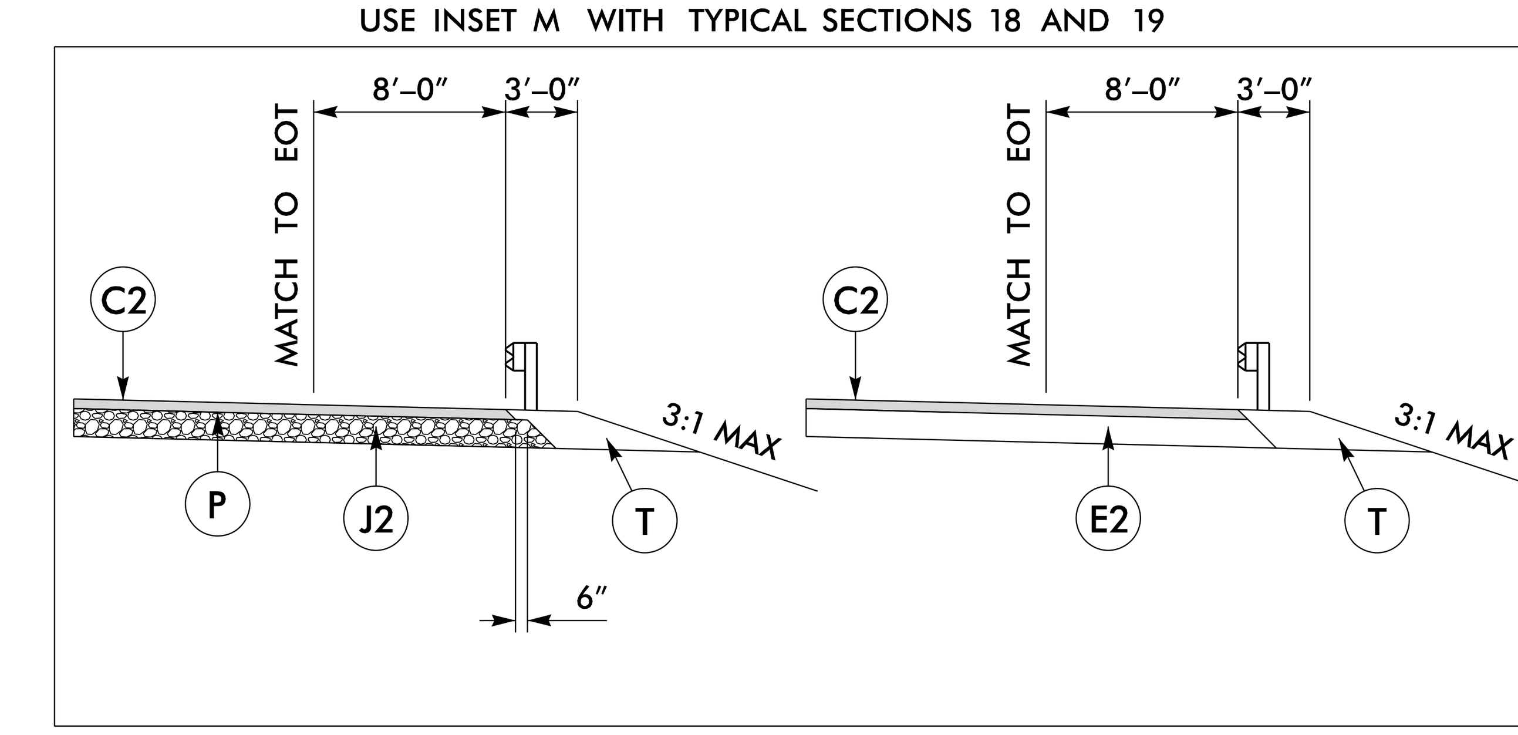
TYPICAL SECTION NO. 19

USE TYPICAL SECTION NO. 19:

-Y4- STA 36+50.00 TO STA 43+82.07 (BEGIN BRIDGE)
-Y4- STA 45+63.57 (END BRIDGE) TO STA 56+00.00

INSET M

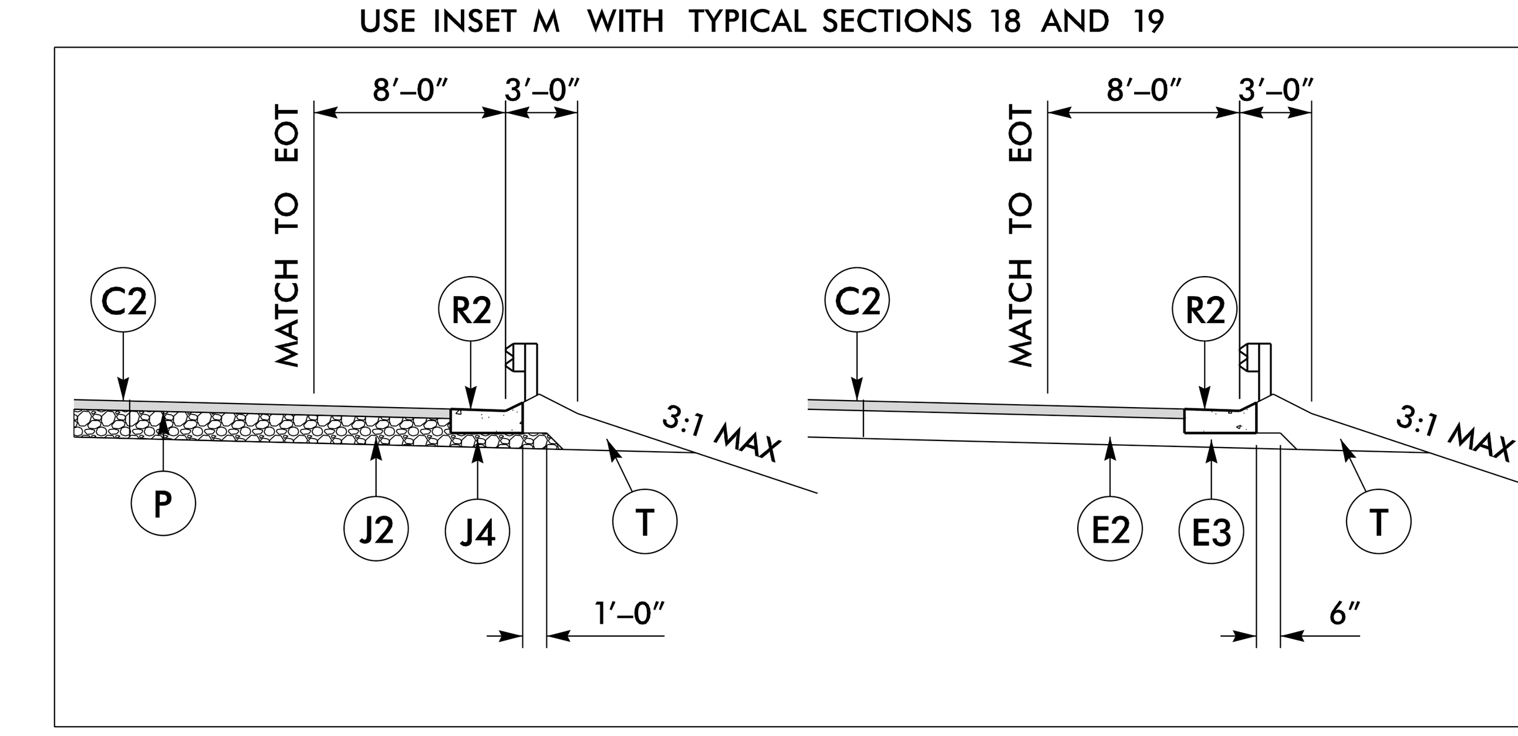
USE INSET M WITH TYPICAL SECTIONS 18 AND 19



-Y4- PAVE TO FACE OF GUARDRAIL DETAIL
USE AT LOCATIONS SHOWN ON PLANS

INSET N

USE INSET M WITH TYPICAL SECTIONS 18 AND 19



-Y4- SHOULDER BERM GUTTER DETAIL
USE AT LOCATIONS SHOWN ON PLANS

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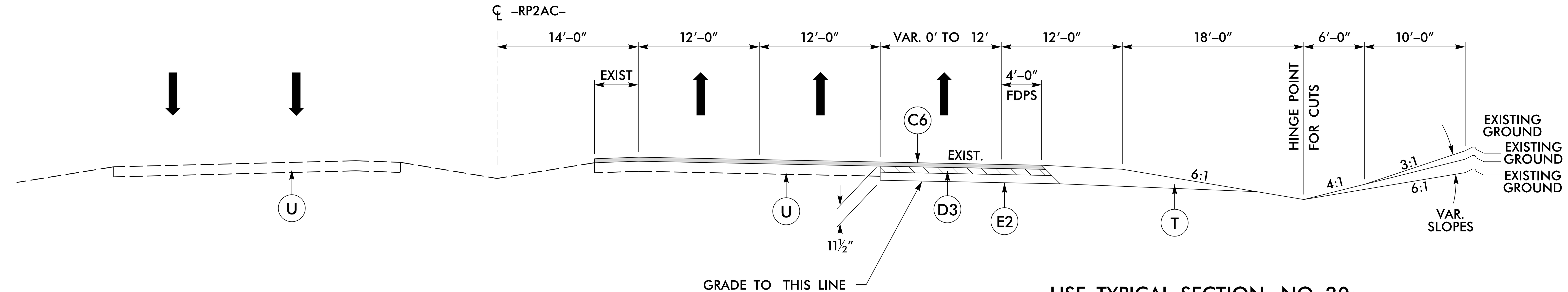
PROJECT REFERENCE NO.	SHEET NO.
R-1015	2A-7

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 015869 — 12/13/2018

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022896 — 12/13/2018

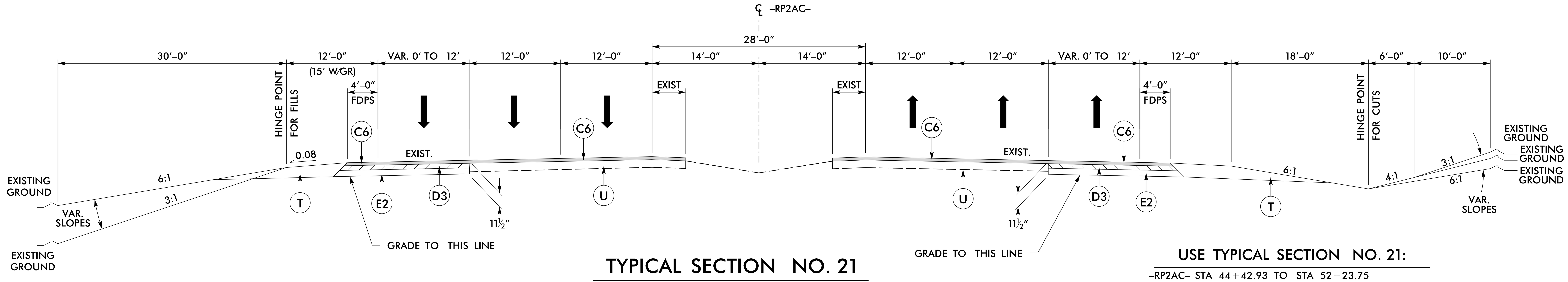
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

C4	1 1/2" S9.5C
C6	3" S9.5C
D3	3½" I19.0C
E2	5" B25.0C
J3	10" ABC
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING



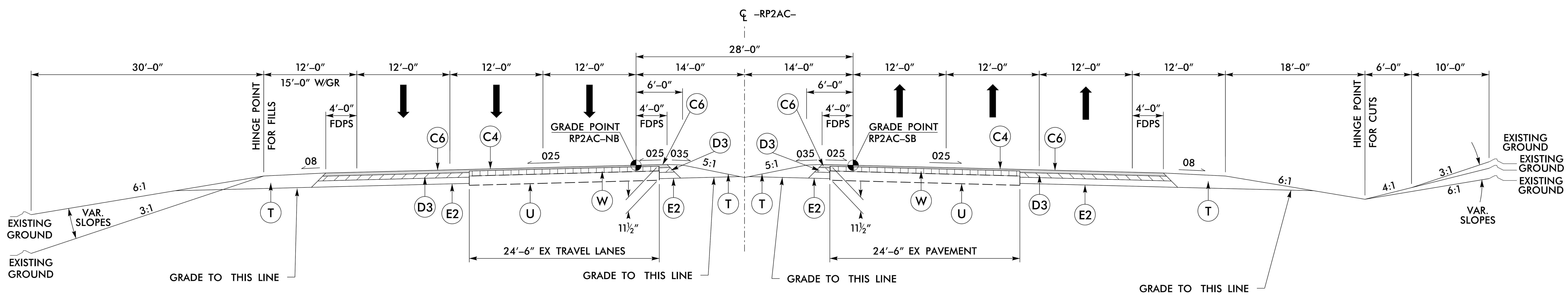
TYPICAL SECTION NO. 20

USE TYPICAL SECTION NO. 20:
-RP2AC- STA. 38+30.60 TO STA. 44+42.93



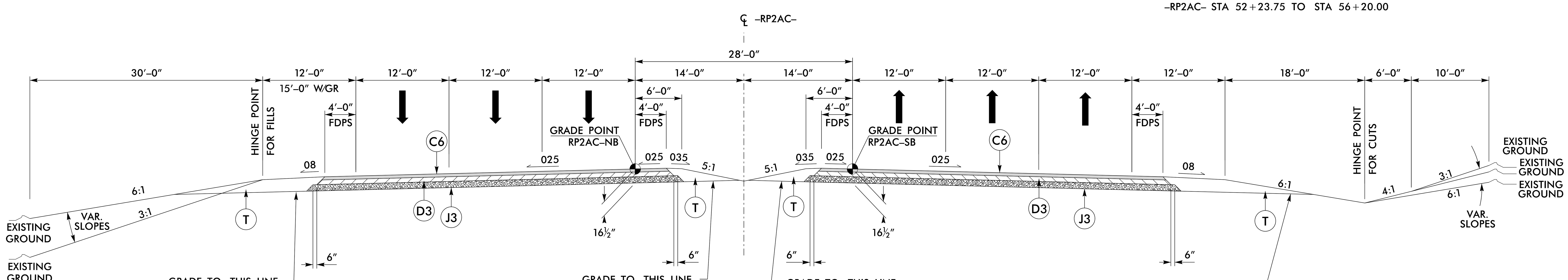
TYPICAL SECTION NO. 21

USE TYPICAL SECTION NO. 21:
-RP2AC- STA 44+42.93 TO STA 52+23.75



TYPICAL SECTION NO. 22

USE TYPICAL SECTION NO. 22:
-RP2AC- STA 52+23.75 TO STA 56+20.00



TYPICAL SECTION NO. 23

USE TYPICAL SECTION NO. 23:
-RP2AC- STA 56+20.00 TO STA 57+16.75

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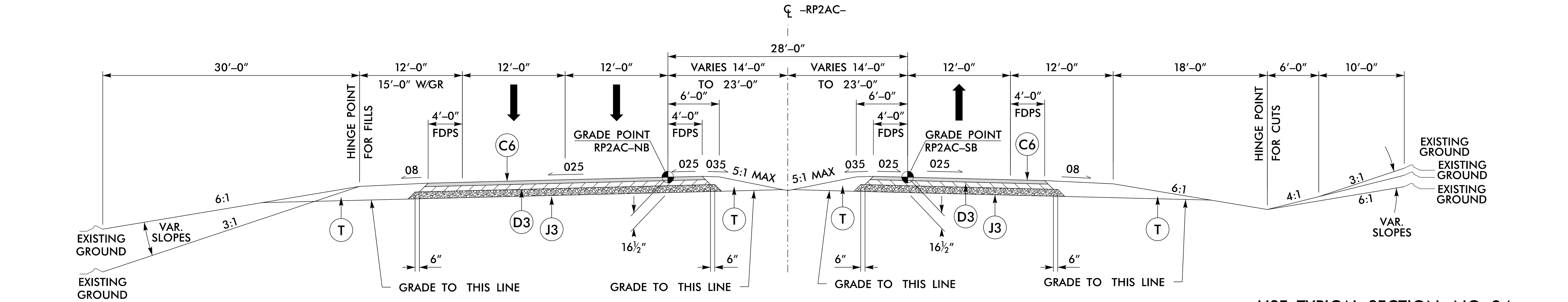
PROJECT REFERENCE NO.	SHEET NO.
R-1015	2A-8

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 015869 — 12/13/2018

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022896 — 12/13/2018

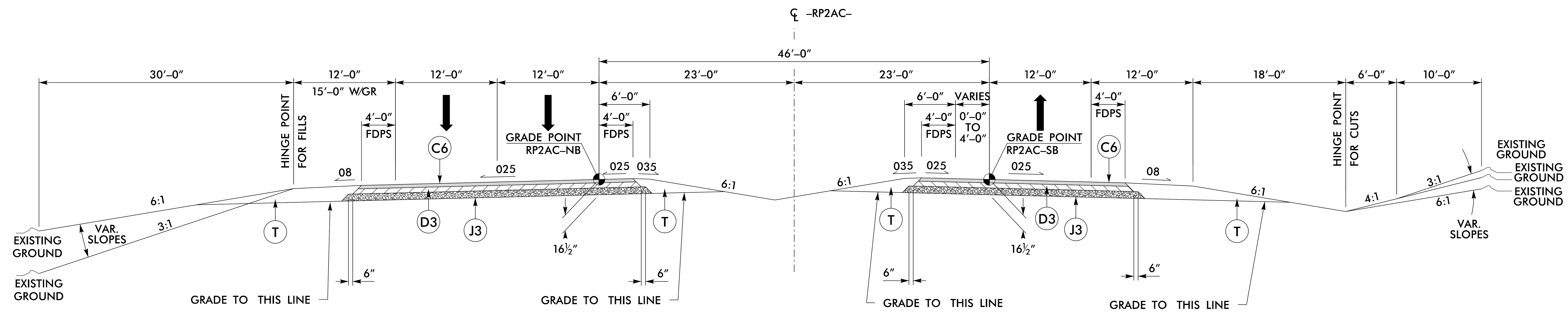
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

C6	3" S9.5C
D1	2 1/2" I19.0C
D2	3" I19.0C
D3	3½" I19.0C
J2	8" ABC
J3	10" ABC
J4	VAR ABC
R3	EXPWY GUTTER
T	EARTH MATERIAL



TYPICAL SECTION NO. 24

USE TYPICAL SECTION NO. 24:
-RP2AC- STA 57+16.75 TO STA 72+44.93

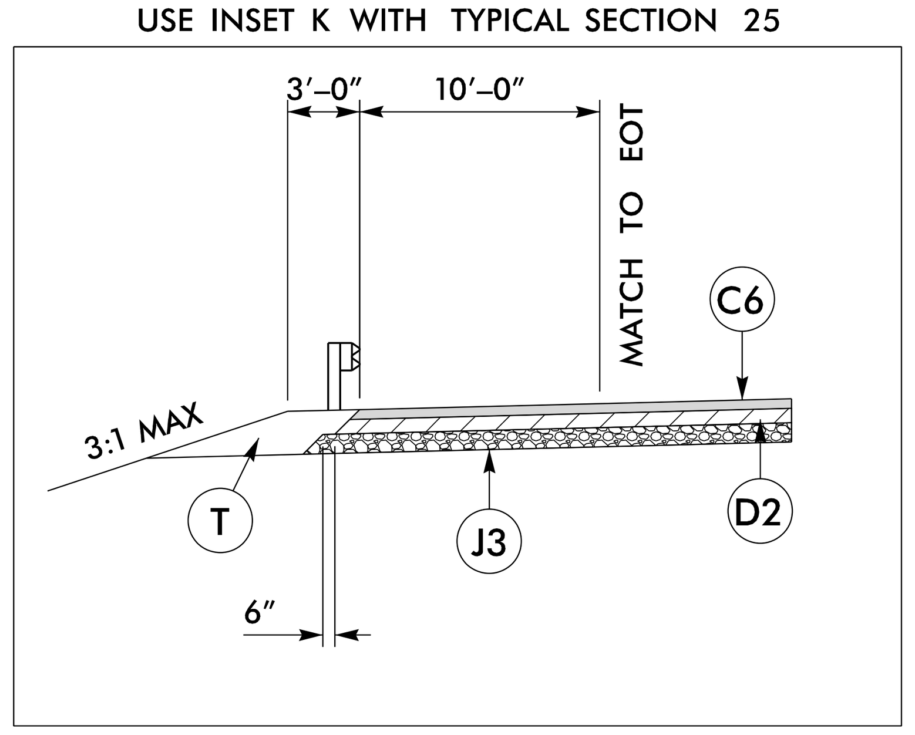


TYPICAL SECTION NO. 25

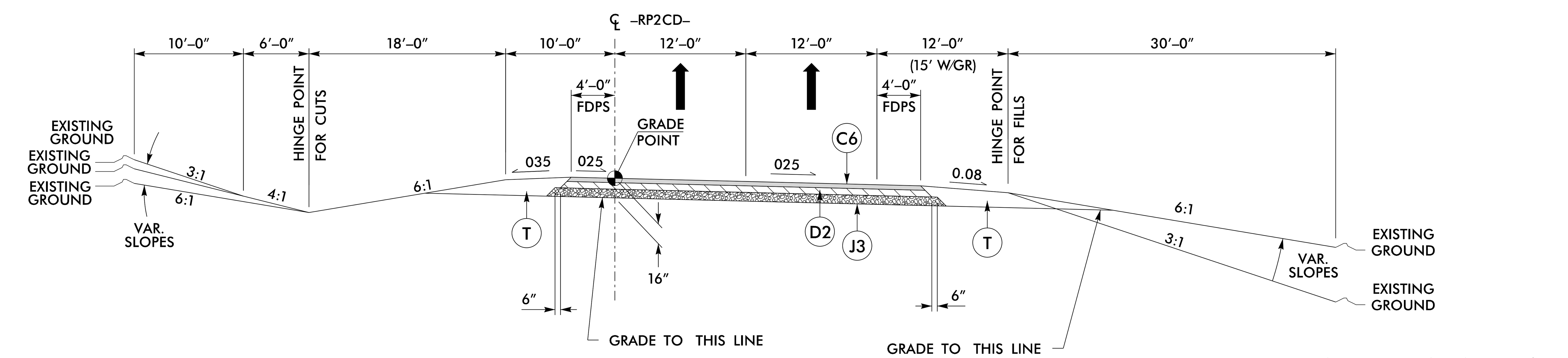
USE TYPICAL SECTION NO. 25:
-RP2AC- STA 72+44.93 TO STA 79+22.74

INSET Q

USE INSET K WITH TYPICAL SECTION 25



-RP2CD- PAVE TO FACE OF GUARDRAIL DETAIL
USE AT LOCATIONS SHOWN ON PLANS

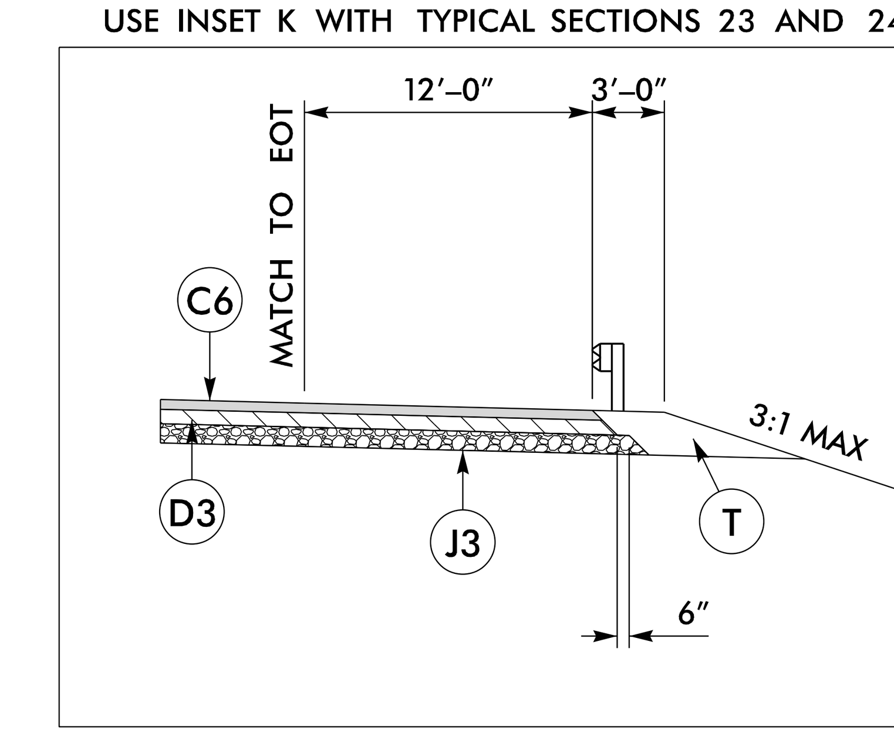


TYPICAL SECTION NO. 26

USE TYPICAL SECTION NO. 26:
-RP2CD- STA 0+00.00 TO STA 24+82.06

INSET O

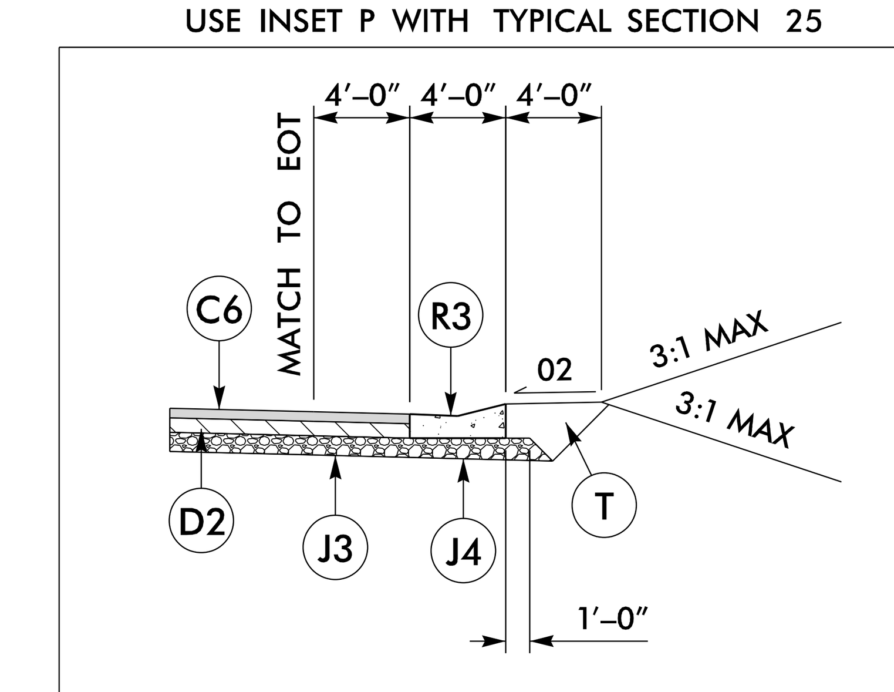
USE INSET K WITH TYPICAL SECTIONS 23 AND 24



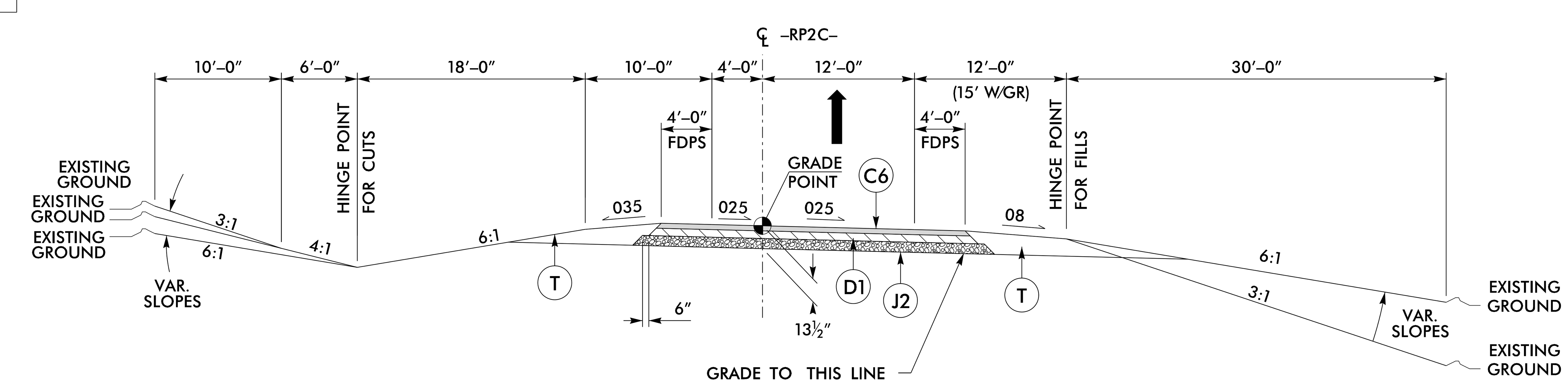
-RP2AC- PAVE TO FACE OF GUARDRAIL DETAIL
USE AT LOCATIONS SHOWN ON PLANS

INSET P

USE INSET P WITH TYPICAL SECTION 25



-RP2CD- EXPRESSWAY GUTTER DETAIL
USE AT LOCATIONS SHOWN ON PLANS



TYPICAL SECTION NO. 27

USE TYPICAL SECTION NO. 27:
-RP2C- STA. 0+00.00 TO STA. 13+82.23

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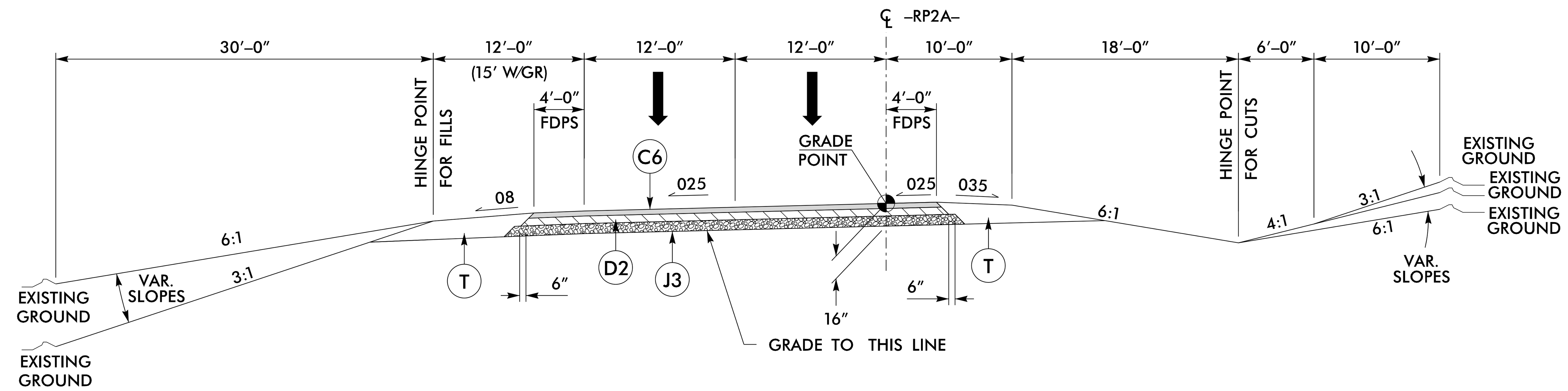
PROJECT REFERENCE NO.	SHEET NO.
R-1015	2A-9

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 015869 — 12/13/2018

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022896 — 12/13/2018

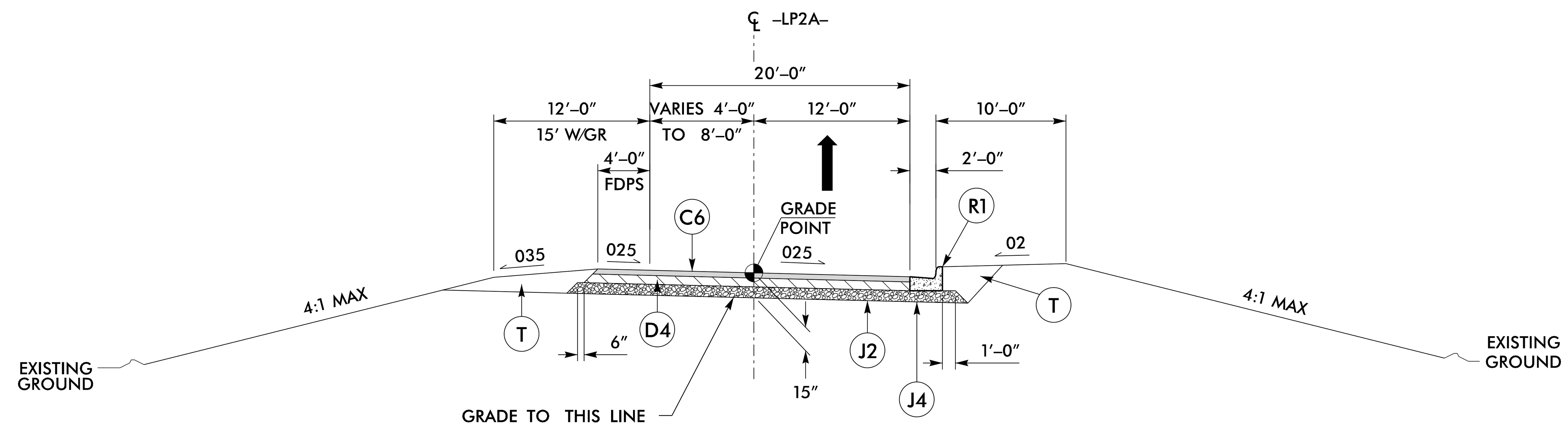
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

C1	1 1/2" S9.5B
C2	3" S9.5B
C6	3" S9.5C
D2	3" I19.0C
D4	4" I19.0C
E1	4" B25.0C
J2	8" ABC
J3	10" ABC
J4	VAR ABC
R1	2'-6" CURB AND GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING



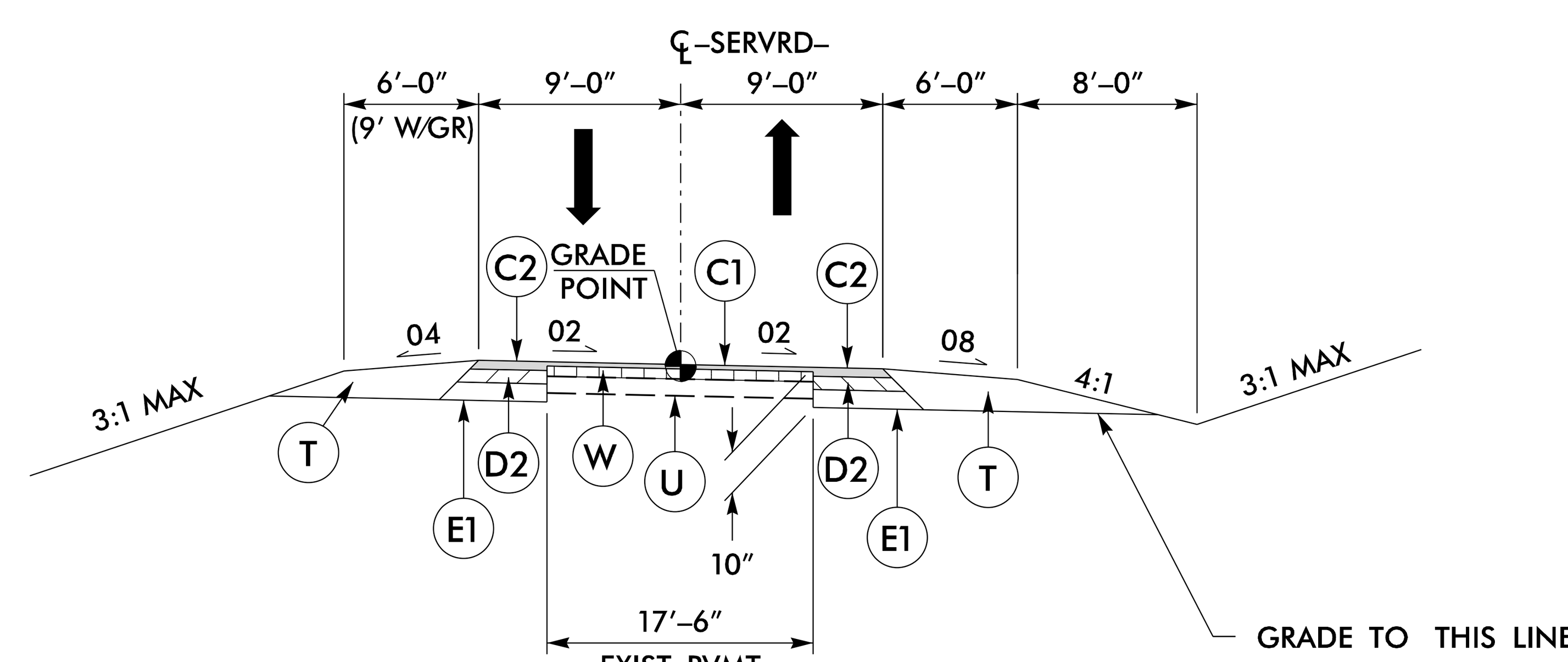
TYPICAL SECTION NO. 28

USE TYPICAL SECTION NO. 28:
-RP2A- STA. 79+22.74 TO STA. 97+93.75



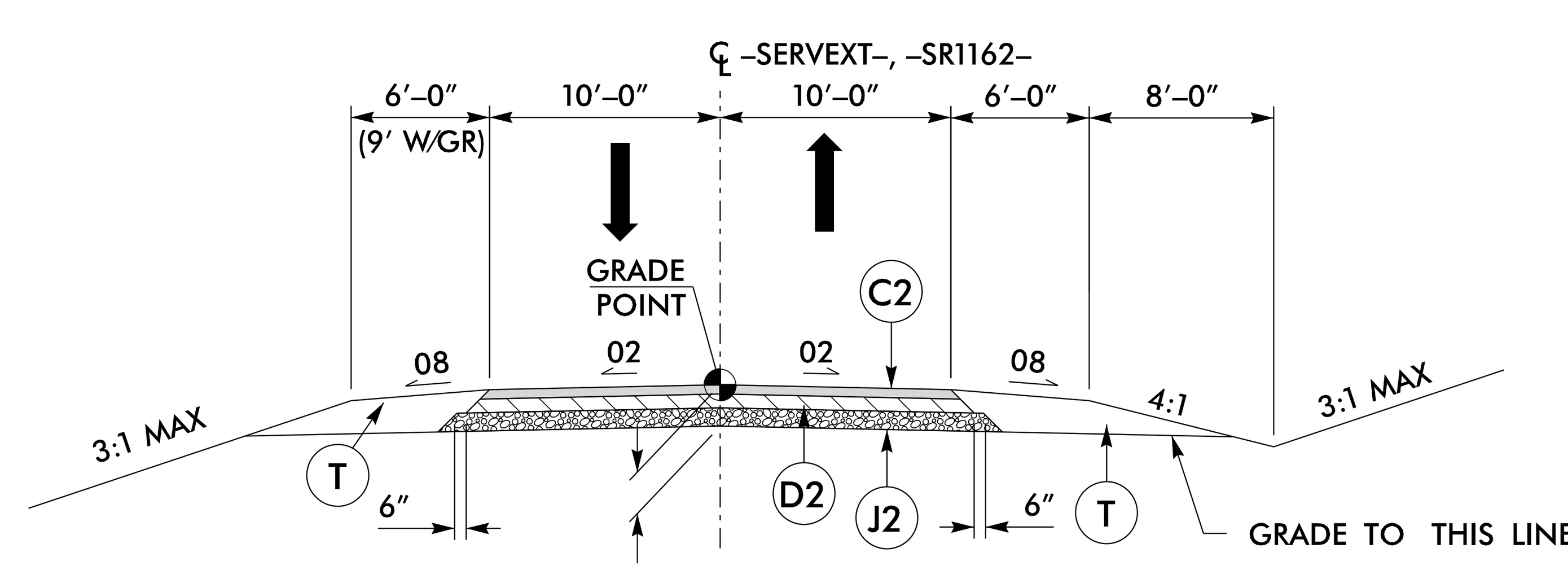
TYPICAL SECTION NO. 29

USE TYPICAL SECTION NO. 29:
-LP2A- STA. 79+22.74 TO STA. 88+59.59



TYPICAL SECTION NO. 30

USE TYPICAL SECTION NO. 30:
-SERVRD- STA. 32+80.84 TO STA. 56+74.26



TYPICAL SECTION NO. 31

USE TYPICAL SECTION NO. 31:
-SERVEXT- STA. 10+00.00 TO STA. 21+64.81
-SR1162- 13+83.00 TO STA 16+27.00

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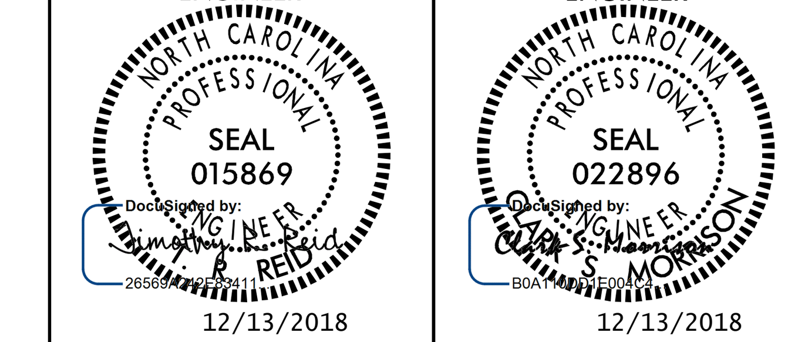
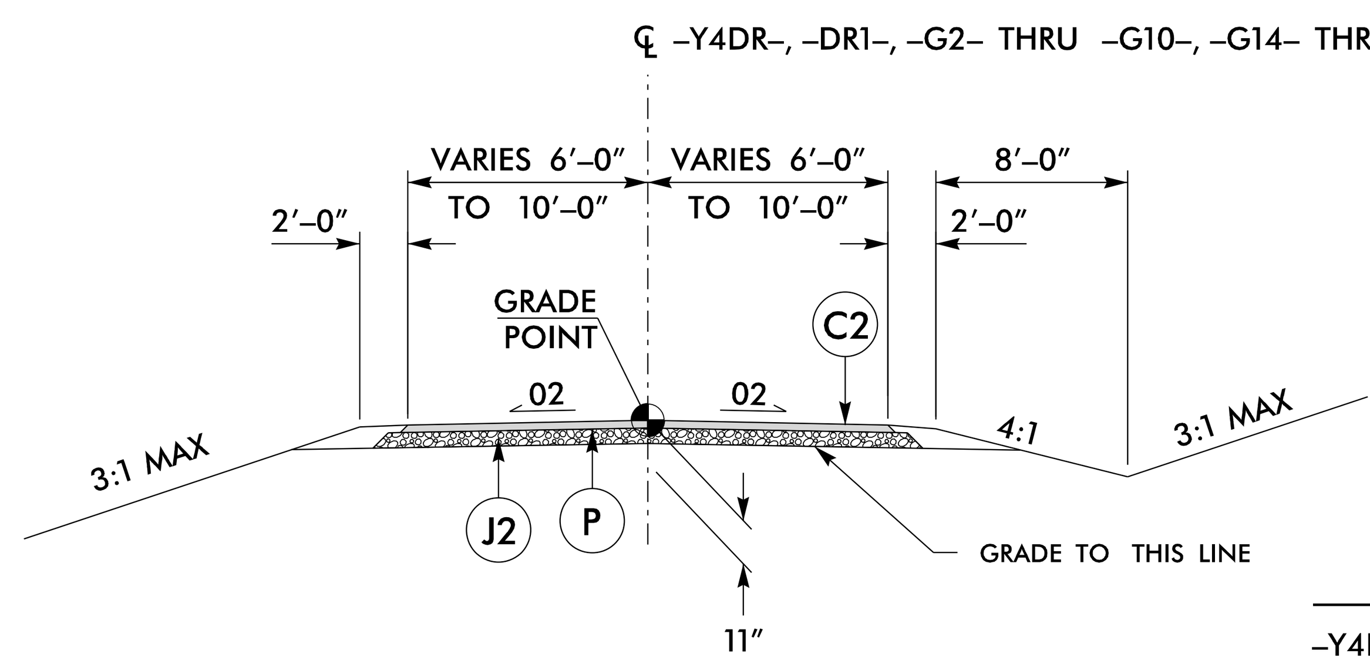
PROJECT REFERENCE NO.	SHEET NO.
R-1015	2A-10

ROADWAY DESIGN ENGINEER | PAVEMENT DESIGN ENGINEER



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

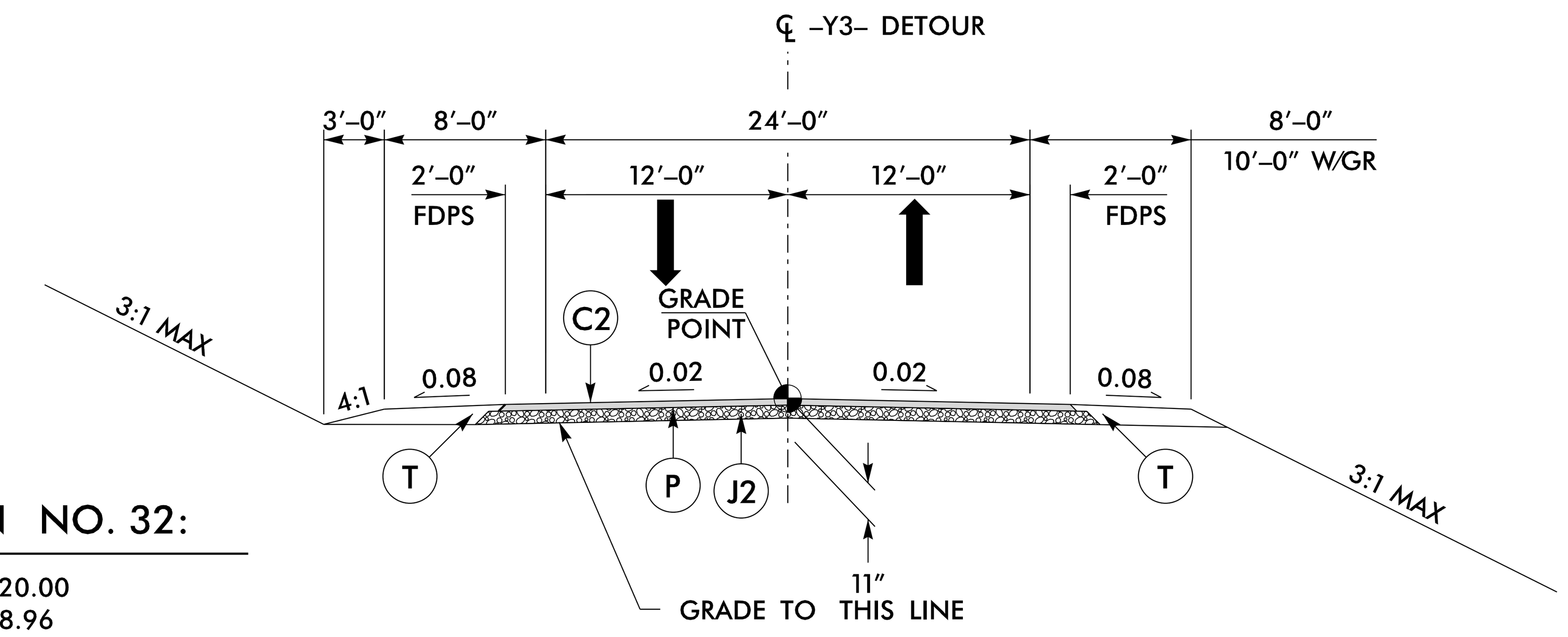
C1	1 1/2" S9.5B
C2	3" S9.5B
C3	VAR S9.5B
C4	1 1/2" S9.5C
C5	2" S9.5C
C6	3" S9.5C
C7	VAR S9.5C
D1	2 1/2" I19.0C
D2	3" I19.0C
D3	3½" I19.0C
D4	4" I19.0C
D5	VAR I19.0C
E1	4" B25.0C
E3	VAR B25.0C
J1	6" ABC
J2	8" ABC
P	PRIME COAT
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING



TYPICAL SECTION NO. 32

USE TYPICAL SECTION NO. 32:

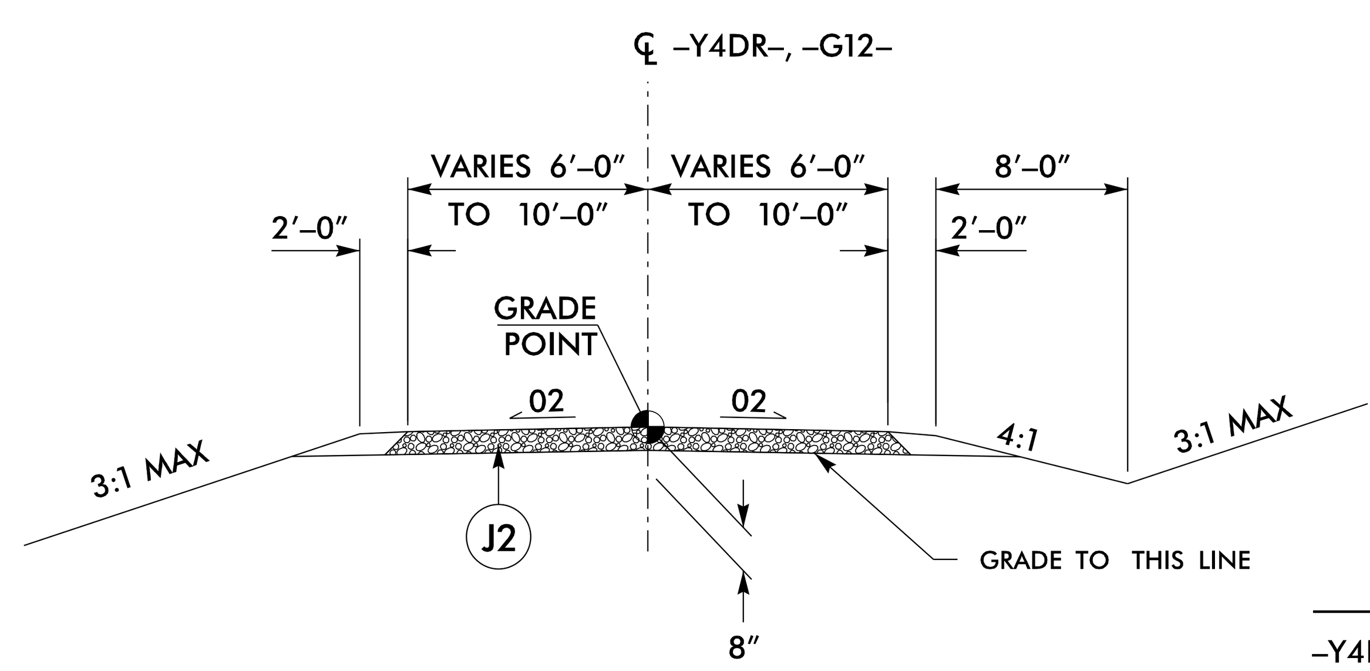
-Y4DR- STA 10+16.00 TO STA 14+20.00
-DR1- STA 10+00.00 TO STA 13+78.96
-G1- THRU -G11-
-G13- THRU -G15-



TYPICAL SECTION NO. 33

USE TYPICAL SECTION NO. 33:

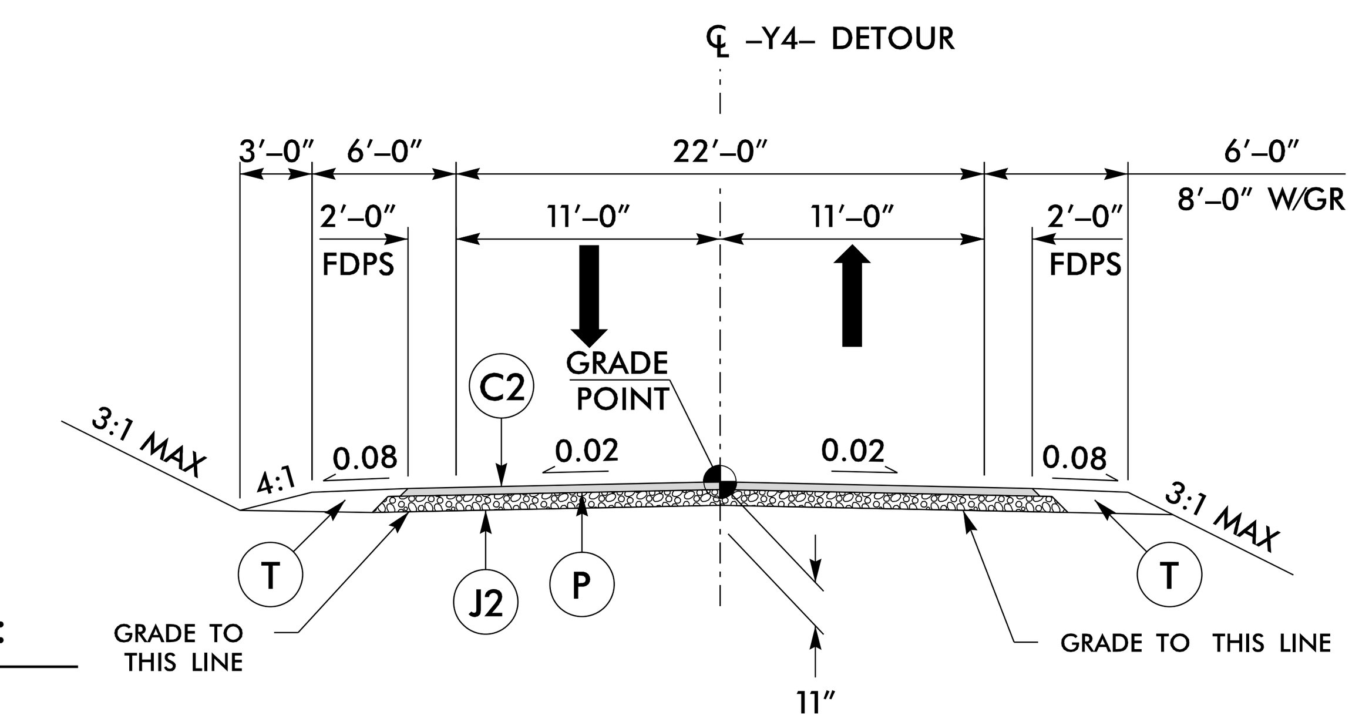
-Y3DET- STA. 36+50.00 TO STA. 69+00.00



TYPICAL SECTION NO. 34

USE TYPICAL SECTION NO. 34:

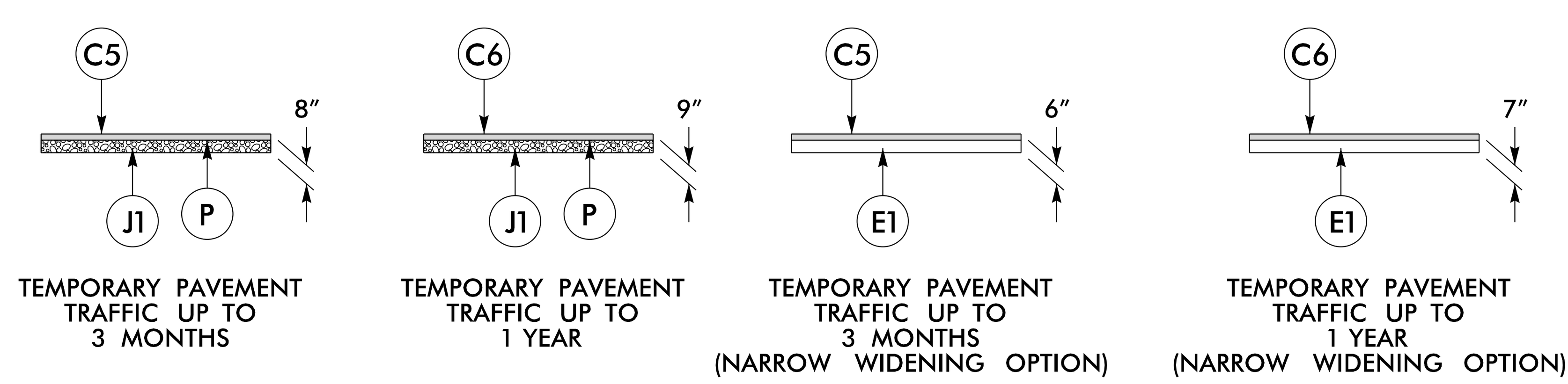
-Y4DR- STA 14+20.00 TO STA 16+03.02
-G12- STA 10+67.00 TO STA 13+47.00



TYPICAL SECTION NO. 35

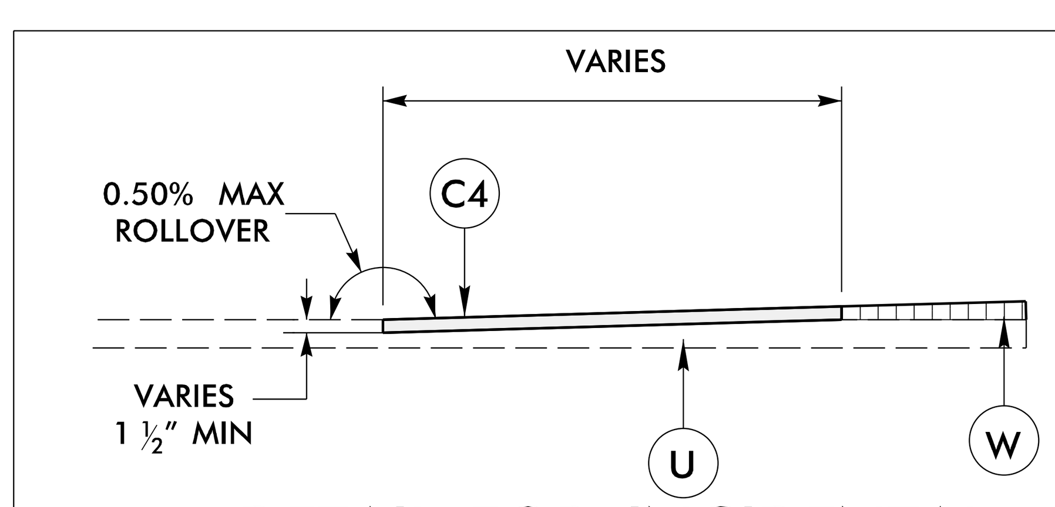
USE TYPICAL SECTION NO. 35:

-Y4DET- STA 34+60.97 TO STA 58+70.00

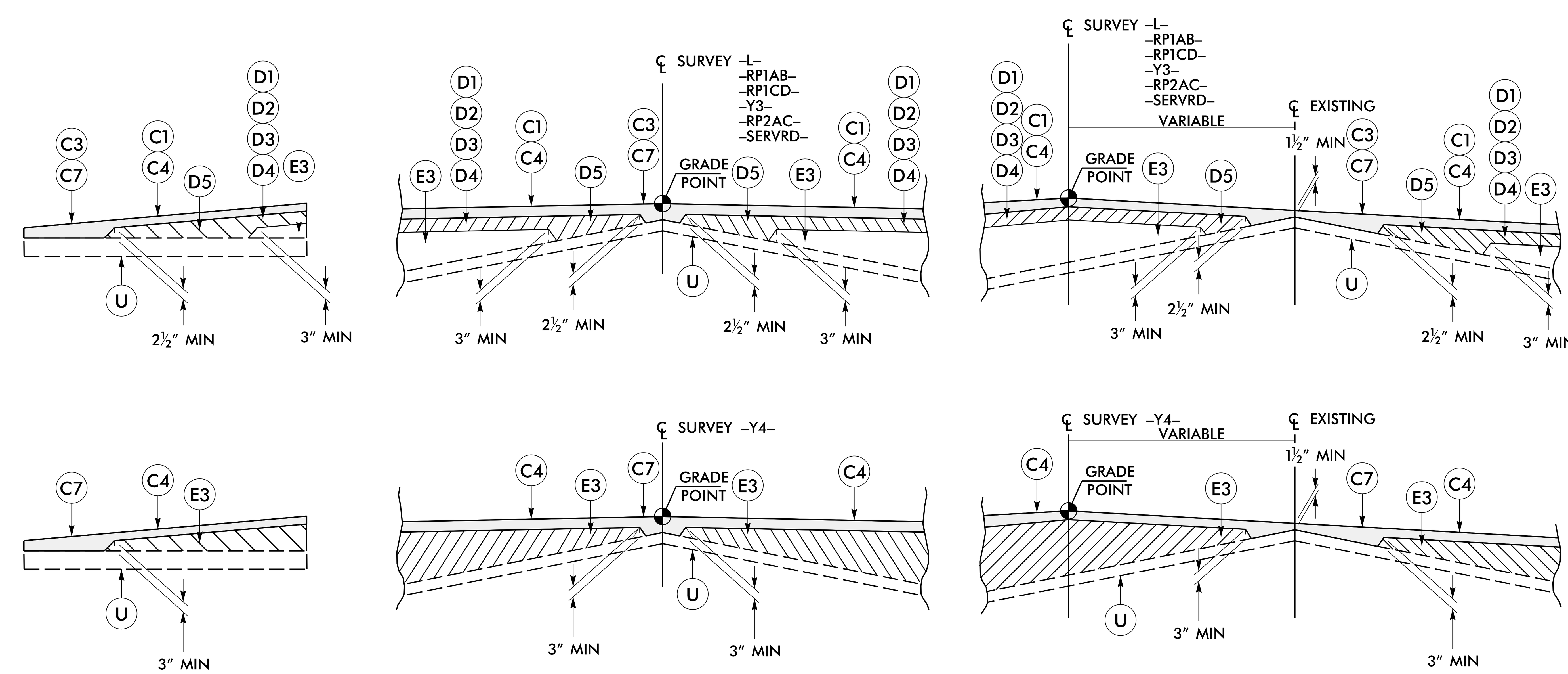


TYPICAL SECTION NO. 36

TEMPORARY PAVEMENT DESIGNS FOR USE WITH TMP PLANS



DETAIL FOR INCIDENTAL MILLING AT BUTT JOINTS



WEDGING DETAILS

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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-1015	2B-1
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 015869, 12/12/2018	SEAL 032581, 12/13/2018

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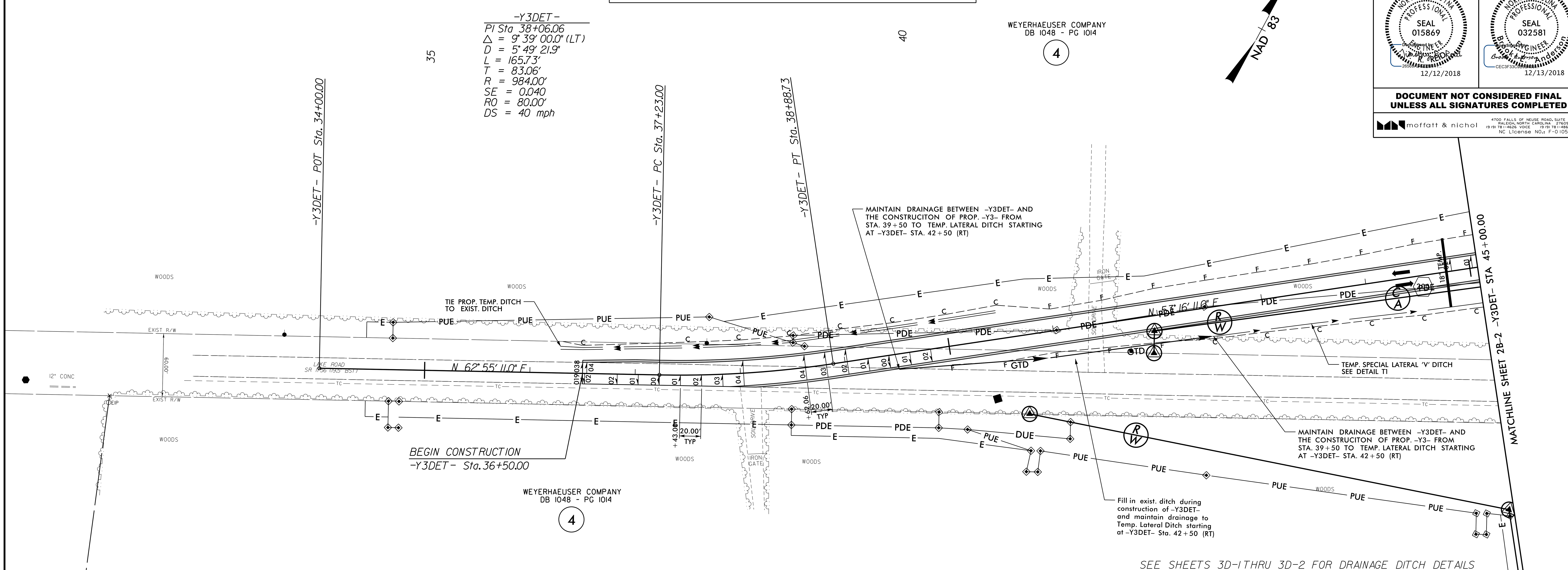
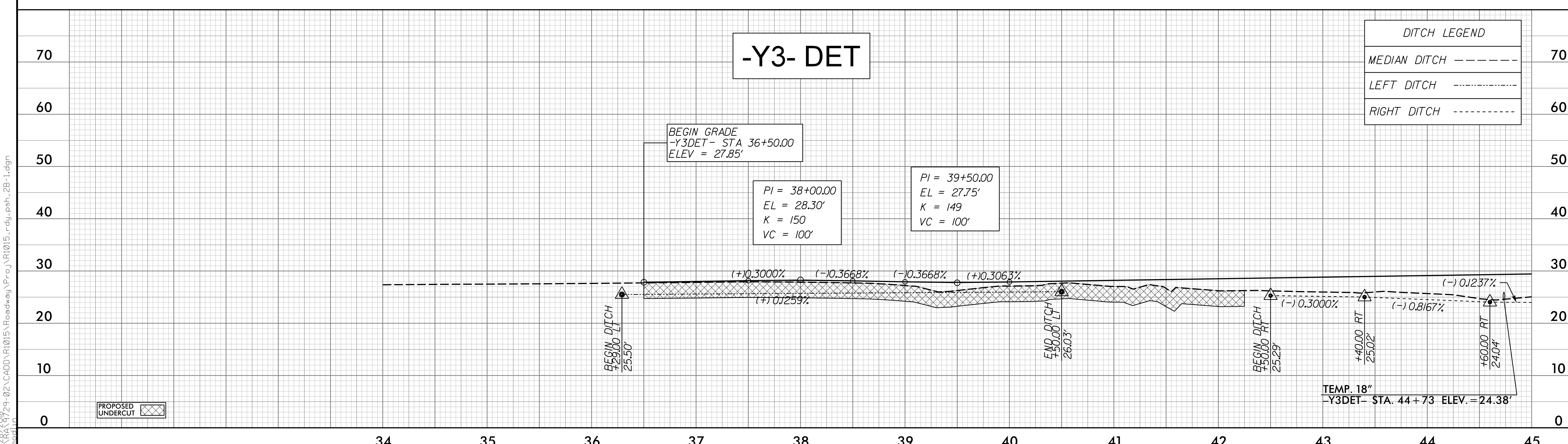
moffatt & nichol — 4700 FALLS OF NEUSE ROAD, SUITE 300, RALEIGH, NORTH CAROLINA 27609, NC License NO.: F-0105

DETAIL FOR –Y3– DETOUR



-Y3DET-
PI Sta 38+06.06
Δ = 9° 39' 00.0" (LT)
D = 5° 49' 21.9"
L = 165.73'
T = 83.06'
R = 984.00'
SE = 0.040
RO = 80.00'
DS = 40 mph
-Y3DET- POT Sta. 34+00.00
-Y3DET- PC Sta. 37+23.00
-Y3DET- PT Sta. 38+88.73
WEYERHAEUSER COMPANY DB 1048 - PG 1014
NAD 83
MAINTAIN DRAINAGE BETWEEN -Y3DET- AND THE CONSTRUCITON OF PROP. -Y3- FROM STA. 39+50 TO TEMP. LATERAL DITCH STARTING AT -Y3DET- STA. 42+50 (RT)
TIE PROP. TEMP. DITCH TO EXIST. DITCH
WOODS
EXIST R/W
LAKE ROAD SR 1196
N 62° 55' 11.0" E
12" CONC
BEGIN CONSTRUCTION -Y3DET- Sta. 36+50.00
TEMP. SPECIAL LATERAL 'V' DITCH SEE DETAIL T1
MATCHLINE SHEET 2B-2 -Y3DET- STA 45+00.00
Fill in exist. ditch during construction of -Y3DET- and maintain drainage to Temp. Lateral Ditch starting at -Y3DET- Sta. 42+50 (RT)
SEE SHEETS 3D-1 THRU 3D-2 FOR DRAINAGE DITCH DETAILS



-Y3- DET
DITCH LEGEND
MEDIAN DITCH
LEFT DITCH
RIGHT DITCH
BEGIN GRADE -Y3DET- STA 36+50.00 ELEV = 27.85'
PI = 38+00.00 EL = 28.30' K = 150 VC = 100'
PI = 39+50.00 EL = 27.75' K = 149 VC = 100'
(+)0.3000%
(-)0.3668%
(-)0.3668%
(+)0.3063%
(+)0.1259%
(-) 0.1237%
(-) 0.3000%
(-) 0.8167%
BEGIN DITCH +29.00 LT 25.50'
END DITCH +50.00 LT 26.03'
BEGIN DITCH +50.00 RT 25.29'
+40.00 RT 25.02'
+60.00 RT 24.04'
TEMP. 18" -Y3DET- STA. 44+73 ELEV.=24.38'
PROPOSED UNDERCUT
70 60 50 40 30 20 10 0
34 35 36 37 38 39 40 41 42 43 44 45

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PROJECT REFERENCE NO.	SHEET NO.
R-1015	2B-2

ROADWAY DESIGN ENGINEER — SEAL 015869 — 12/12/2018

HYDRAULICS ENGINEER — SEAL 032581 — 12/13/2018

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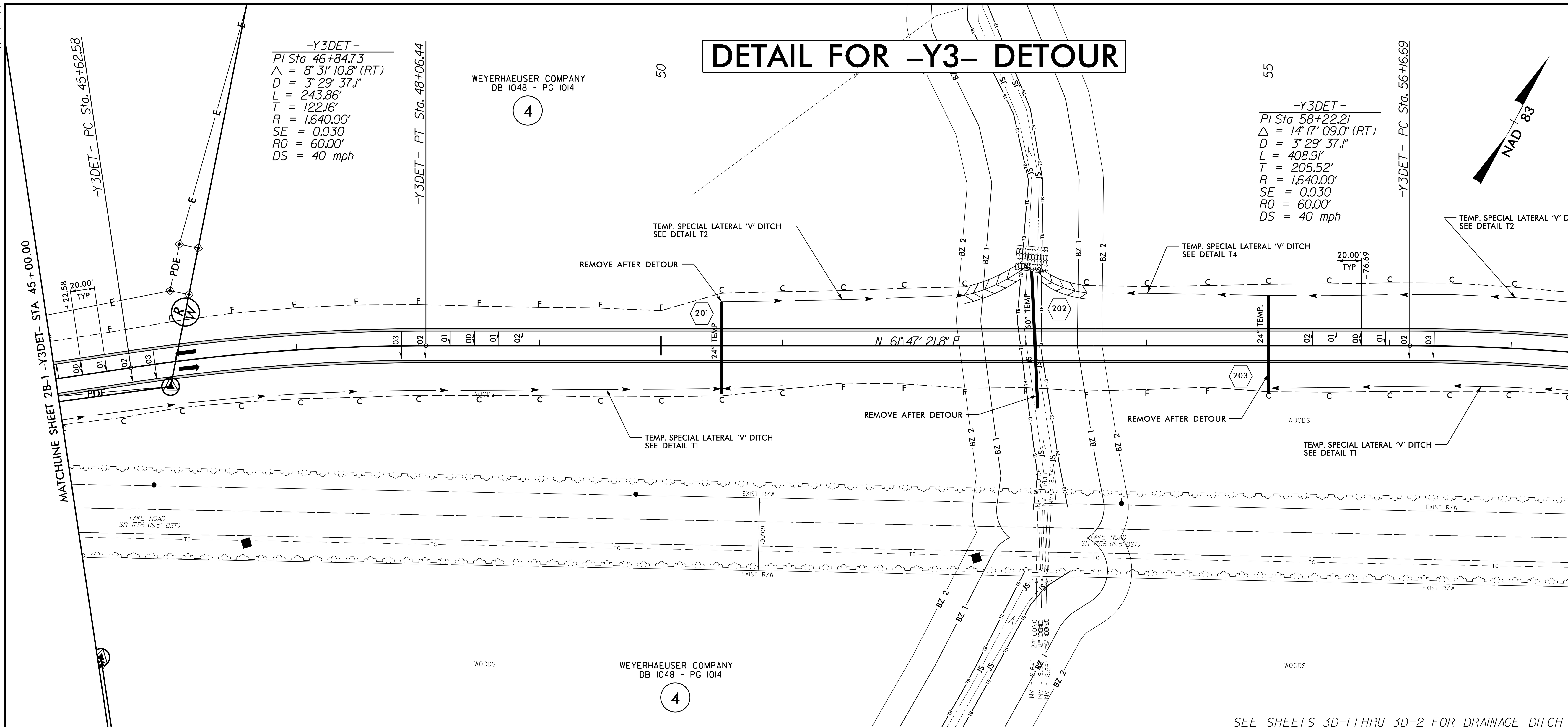
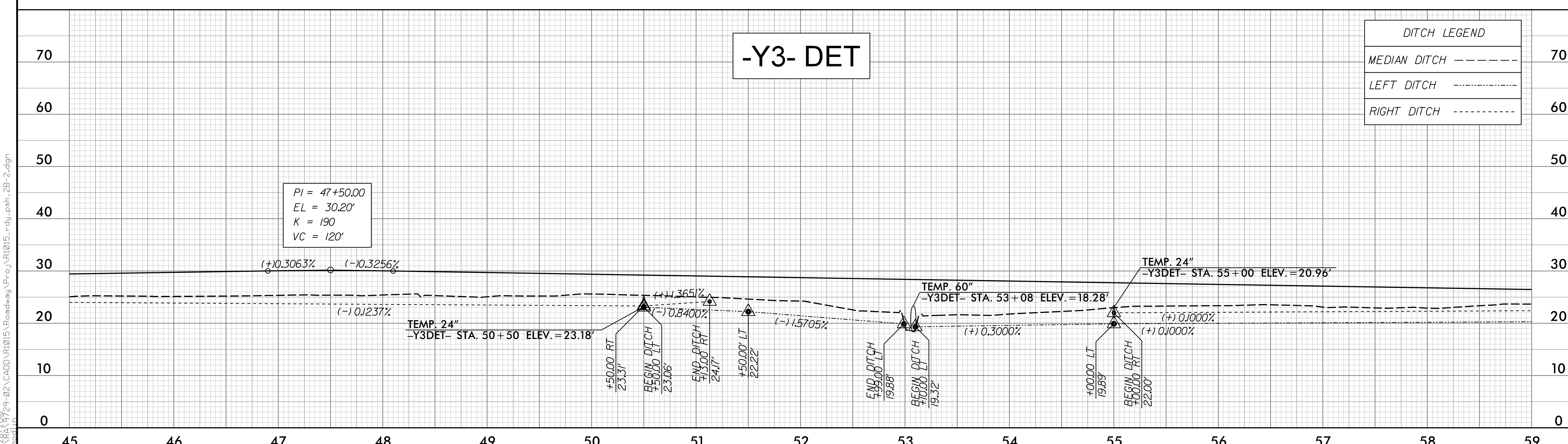
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
NC License NO.: F-0105

DETAIL FOR -Y3- DETOUR


-Y3DET-
PI Sta 46+84.73
Δ = 8° 31' 10.8" (RT)
D = 3° 29' 37.1"
L = 243.86'
T = 122.16'
R = 1,640.00'
SE = 0.030
RO = 60.00'
DS = 40 mph
-Y3DET-
PI Sta 58+22.21
Δ = 14° 17' 09.0" (RT)
D = 3° 29' 37.1"
L = 408.91'
T = 205.52'
R = 1,640.00'
SE = 0.030
RO = 60.00'
DS = 40 mph
-Y3DET- PC Sta. 45+62.58
-Y3DET- PT Sta. 48+06.44
-Y3DET- PC Sta. 56+16.69
WEYERHAEUSER COMPANY
DB 1048 - PG 1014
NAD 83
MATCHLINE SHEET 2B-1 -Y3DET- STA 45+00.00
MATCHLINE SHEET 2B-3 -Y3DET- STA 59+00.00
TEMP. SPECIAL LATERAL 'V' DITCH SEE DETAIL T2
TEMP. SPECIAL LATERAL 'V' DITCH SEE DETAIL T4
TEMP. SPECIAL LATERAL 'V' DITCH SEE DETAIL T1
REMOVE AFTER DETOUR
N 61° 47' 21.8" E
24" TEMP
60" TEMP
LAKE ROAD
SR 1756 (19.5' BST)
EXIST R/W
WOODS
SEE SHEETS 3D-1 THRU 3D-2 FOR DRAINAGE DITCH DETAILS


-Y3- DET
DITCH LEGEND
MEDIAN DITCH
LEFT DITCH
RIGHT DITCH
PI = 47+50.00
EL = 30.20'
K = 190
VC = 120'
(+)0.3063%
(-)0.3256%
(-)0.1237%
(+)1.365%
(-)0.8400%
(-)1.5705%
(+)0.3000%
(+)0.1000%
(+)0.1000%
TEMP. 24"
-Y3DET- STA. 50+50 ELEV.=23.18'
TEMP. 60"
-Y3DET- STA. 53+08 ELEV.=18.28'
TEMP. 24"
-Y3DET- STA. 55+00 ELEV.=20.96'
+50.00 RT 23.31'
BEGIN DITCH +50.00 LT 23.06'
END DITCH +13.00 RT 24.11'
+50.00' LT 22.22'
END DITCH +99.00 LT 19.88'
BEGIN DITCH +10.00 LT 19.32'
+00.00 LT 19.89'
BEGIN DITCH +00.00 RT 22.00'
70
60
50
40
30
20
10
0
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59

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PROJECT REFERENCE NO.	SHEET NO.
R-1015	2B-3

ROADWAY DESIGN ENGINEER — SEAL 015869 — 12/12/2018

HYDRAULICS ENGINEER — SEAL 032581 — 12/13/2018

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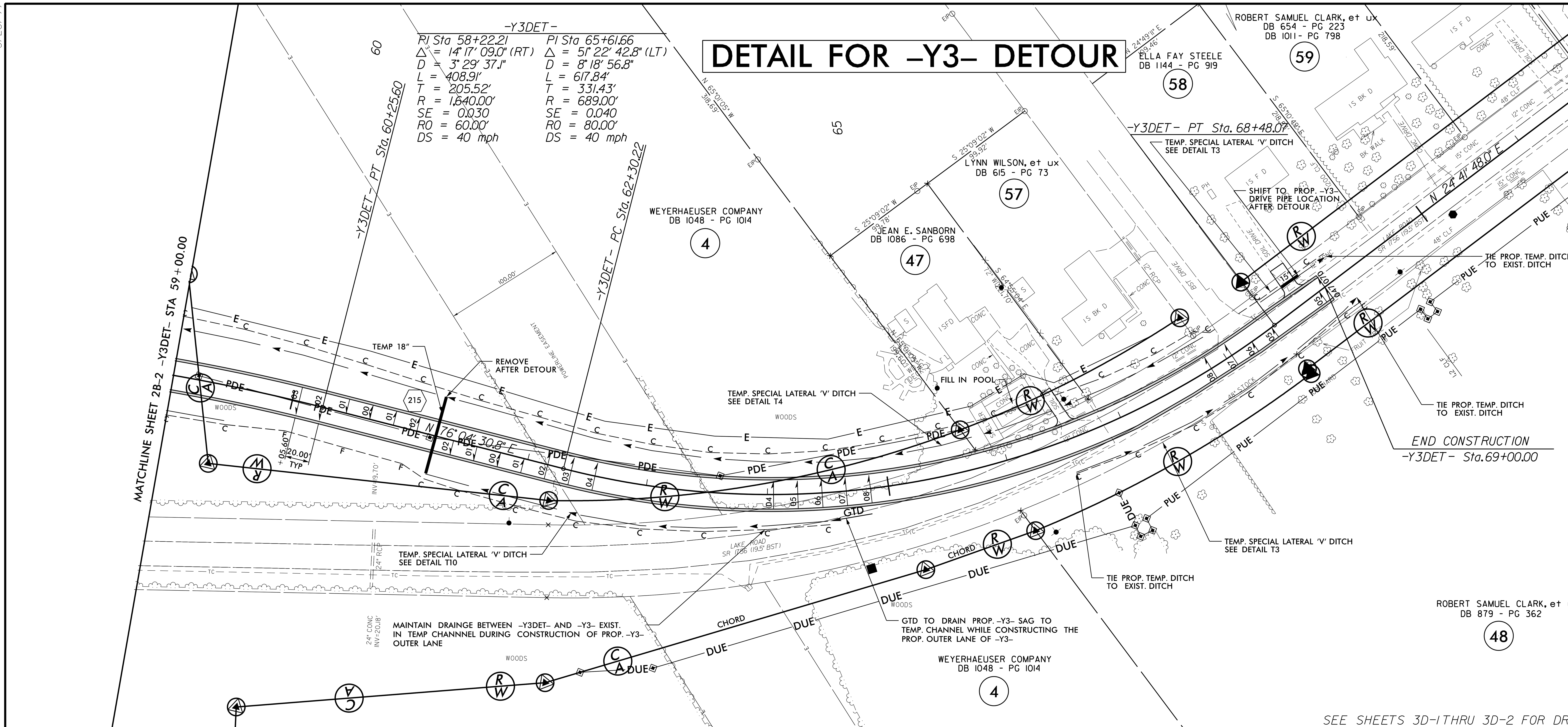
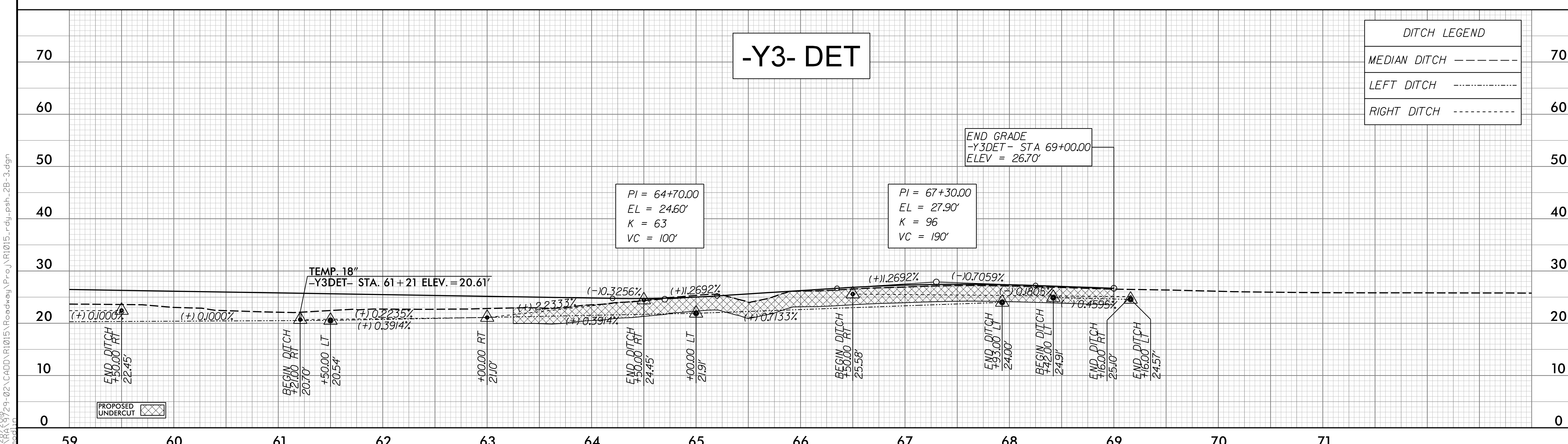
DETAIL FOR -Y3- DETOUR



-Y3DET-
PI Sta 58+22.21
△ = 14° 17' 09.0" (RT)
D = 3° 29' 37.1"
L = 408.91'
T = 205.52'
R = 1,640.00'
SE = 0.030
RO = 60.00'
DS = 40 mph
PI Sta 65+61.66
△ = 51° 22' 42.8" (LT)
D = 8° 18' 56.8"
L = 617.84'
T = 331.43'
R = 689.00'
SE = 0.040
RO = 80.00'
DS = 40 mph
MATCHLINE SHEET 2B-2 -Y3DET- STA 59+00.00
-Y3DET- PT Sta. 60+25.60
-Y3DET- PC Sta. 62+30.22
-Y3DET- PT Sta. 68+48.07
END CONSTRUCTION
-Y3DET- Sta. 69+00.00
WEYERHAEUSER COMPANY
DB 1048 - PG 1014
ROBERT SAMUEL CLARK, et ux
DB 654 - PG 223
DB 1011 - PG 798
ELLA FAY STEELE
DB 1144 - PG 919
LYNN WILSON, et ux
DB 615 - PG 73
JEAN E. SANBORN
DB 1086 - PG 698
ROBERT SAMUEL CLARK, et ux
DB 879 - PG 362
TEMP 18"
REMOVE AFTER DETOUR
TEMP. SPECIAL LATERAL 'V' DITCH SEE DETAIL T4
TEMP. SPECIAL LATERAL 'V' DITCH SEE DETAIL T3
TEMP. SPECIAL LATERAL 'V' DITCH SEE DETAIL T10
SHIFT TO PROP. -Y3- DRIVE PIPE LOCATION AFTER DETOUR
FILL IN POOL
TIE PROP. TEMP. DITCH TO EXIST. DITCH
MAINTAIN DRAINGE BETWEEN -Y3DET- AND -Y3- EXIST. IN TEMP CHANNEL DURING CONSTRUCTION OF PROP. -Y3- OUTER LANE
GTD TO DRAIN PROP. -Y3- SAG TO TEMP. CHANNEL WHILE CONSTRUCTING THE PROP. OUTER LANE OF -Y3-
N 76° 04' 30.8" E
N 24° 41' 48.0" E
NAD 83
SEE SHEETS 3D-1 THRU 3D-2 FOR DRAINAGE DITCH DETAILS



-Y3- DET
DITCH LEGEND
MEDIAN DITCH
LEFT DITCH
RIGHT DITCH
END GRADE
-Y3DET- STA 69+00.00
ELEV = 26.70'
PI = 64+70.00
EL = 24.60'
K = 63
VC = 100'
PI = 67+30.00
EL = 27.90'
K = 96
VC = 190'
TEMP. 18"
-Y3DET- STA. 61+21 ELEV.=20.61'
(+)0.1000%
(+)0.2235%
(+)0.3914%
(+)2.2333%
(-)0.3256%
(+)1.2692%
(+)0.7133%
(-)0.7059%
(-)0.1805%
(-)0.4595%
END DITCH +50.00 RT 22.45'
BEGIN DITCH +21.00 RT 20.70'
+50.00 LT 20.54'
+00.00 RT 21.10'
END DITCH +50.00 RT 24.45'
+00.00 LT 21.91'
BEGIN DITCH +50.00 RT 25.58'
END DITCH +93.00 LT 24.00'
BEGIN DITCH +42.00 LT 24.91'
END DITCH +16.00 RT 25.10'
END DITCH +16.00 LT 24.57'
PROPOSED UNDERCUT

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PROJECT REFERENCE NO.	SHEET NO.
R-1015	2B-4

ROADWAY DESIGN ENGINEER — SEAL 015869 — 12/12/2018

HYDRAULICS ENGINEER — SEAL 032581 — 12/13/2018

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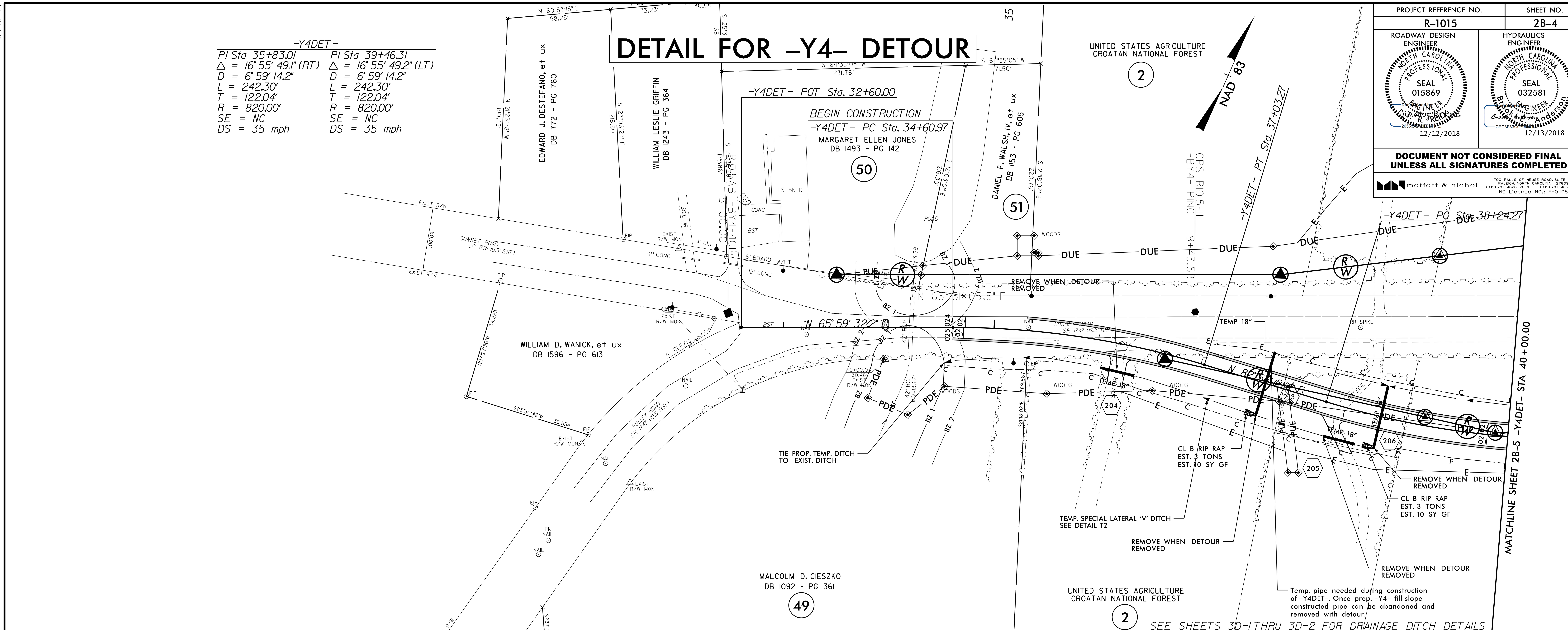
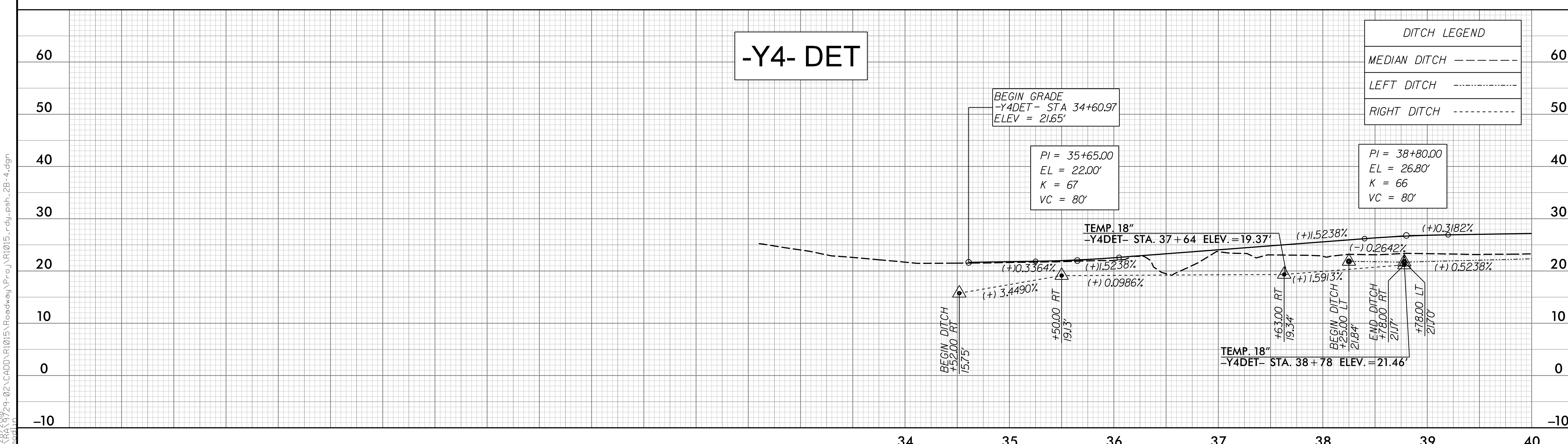
DETAIL FOR -Y4- DETOUR


-Y4DET-
PI Sta 35+83.01 △ = 16° 55' 49.1" (RT) D = 6° 59' 14.2" L = 242.30' T = 122.04' R = 820.00' SE = NC DS = 35 mph
PI Sta 39+46.31 △ = 16° 55' 49.2" (LT) D = 6° 59' 14.2" L = 242.30' T = 122.04' R = 820.00' SE = NC DS = 35 mph
-Y4DET- POT Sta. 32+60.00
BEGIN CONSTRUCTION -Y4DET- PC Sta. 34+60.97
-Y4DET- PT Sta. 37+03.27
-Y4DET- PC Sta. 38+24.27
NAD 83
UNITED STATES AGRICULTURE CROATAN NATIONAL FOREST
2
EDWARD J. DESTEFANO, et ux DB 772 - PG 760
WILLIAM LESLIE GRIFFIN DB 1243 - PG 364
MARGARET ELLEN JONES DB 1493 - PG 142
50
DANIEL F. WALSH, IV, et ux DB 1153 - PG 605
51
WILLIAM D. WANICK, et ux DB 1596 - PG 613
MALCOLM D. CIESZKO DB 1092 - PG 361
49
SUNSET ROAD SR 1747 (19.5' BST)
PULLEY ROAD SR 1747 (19.5' BST)
N 65° 59' 32.2" E
REMOVE WHEN DETOUR REMOVED
TIE PROP. TEMP. DITCH TO EXIST. DITCH
TEMP. SPECIAL LATERAL 'V' DITCH SEE DETAIL T2
CL B RIP RAP EST. 3 TONS EST. 10 SY GF
TEMP 18"
Temp. pipe needed during construction of -Y4DET-. Once prop. -Y4- fill slope constructed pipe can be abandoned and removed with detour.
MATCHLINE SHEET 2B-5 -Y4DET- STA 40+00.00
SEE SHEETS 3D-1 THRU 3D-2 FOR DRAINAGE DITCH DETAILS


-Y4- DET
DITCH LEGEND
MEDIAN DITCH
LEFT DITCH
RIGHT DITCH
BEGIN GRADE -Y4DET- STA 34+60.97 ELEV = 21.65'
PI = 35+65.00 EL = 22.00' K = 67 VC = 80'
PI = 38+80.00 EL = 26.80' K = 66 VC = 80'
TEMP. 18" -Y4DET- STA. 37+64 ELEV.=19.37'
TEMP. 18" -Y4DET- STA. 38+78 ELEV.=21.46'
(+)0.3364%
(+)1.5238%
(+) 0.0986%
(+) 3.4490%
(+)1.5238%
(−) 0.2642%
(+)0.3182%
(+)1.5913%
(+) 0.5238%
BEGIN DITCH +52.00 RT 15.75'
+50.00 RT 19.13'
+63.00 RT 19.34'
BEGIN DITCH +25.00 LT 21.84'
END DITCH +78.00 RT 21.17'
+78.00 LT 21.70'
60 50 40 30 20 10 0 −10
34 35 36 37 38 39 40

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PROJECT REFERENCE NO.	SHEET NO.
R-1015	2B-5

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 015869 — 12/12/2018

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032581 — 12/13/2018

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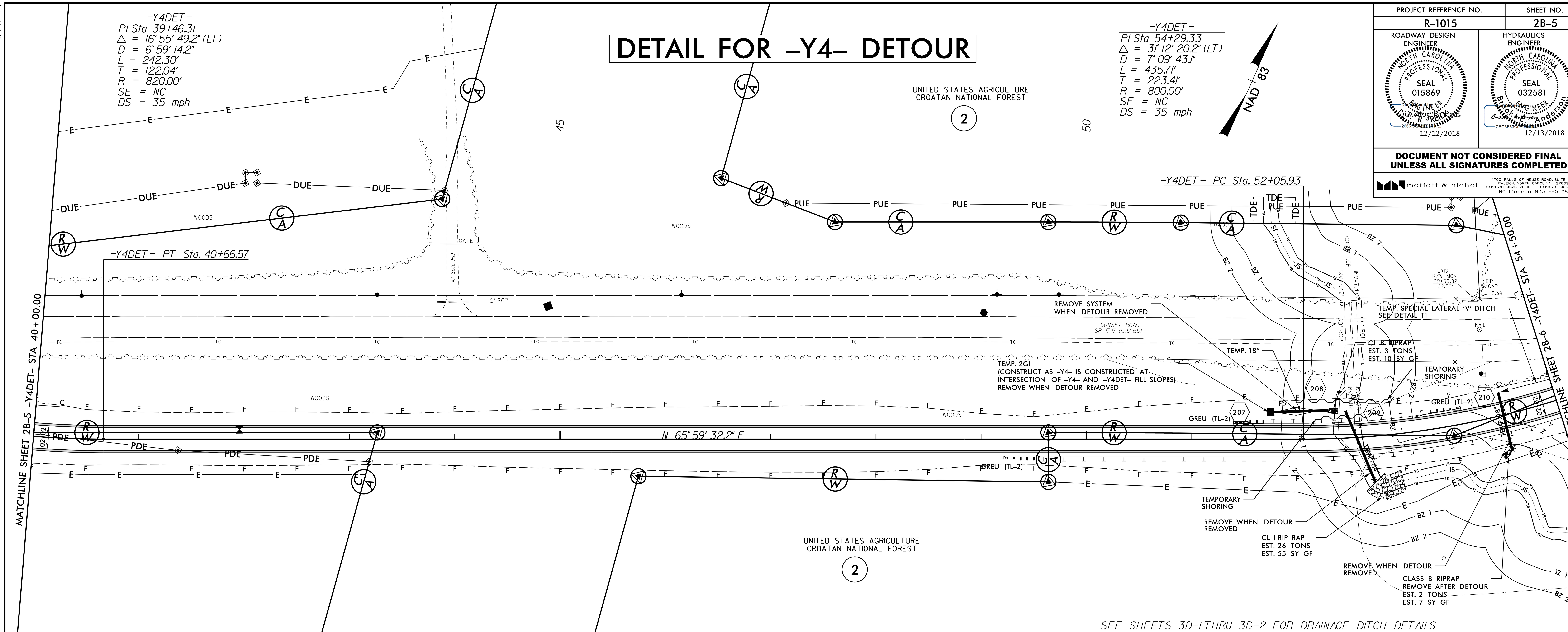
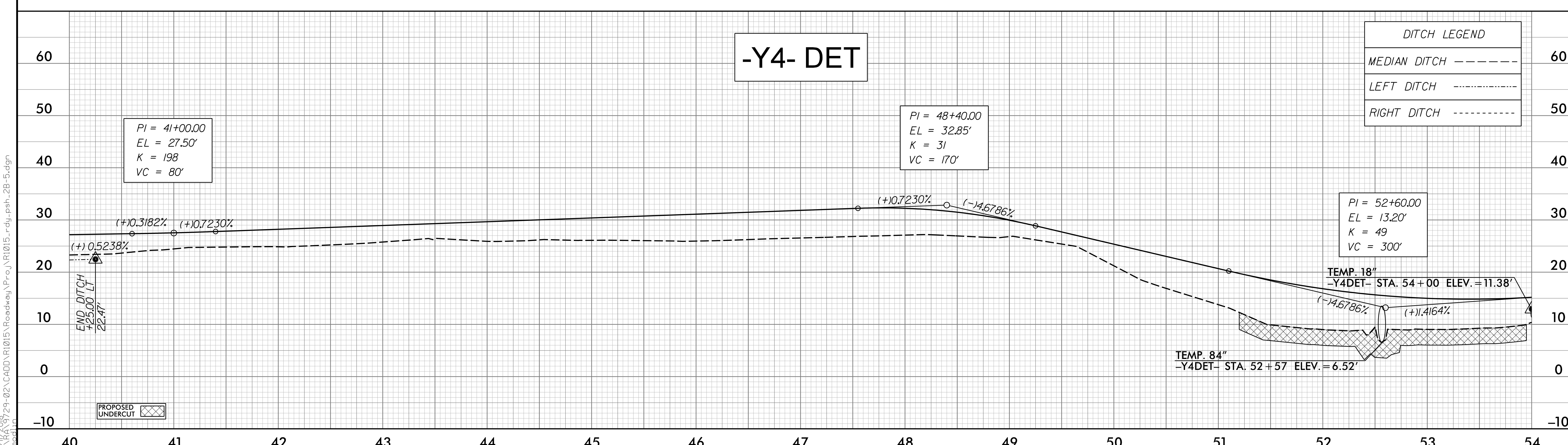
DETAIL FOR -Y4- DETOUR



-Y4DET-
PI Sta 39+46.31
Δ = 16° 55' 49.2" (LT)
D = 6° 59' 14.2"
L = 242.30'
T = 122.04'
R = 820.00'
SE = NC
DS = 35 mph
-Y4DET-
PI Sta 54+29.33
Δ = 31° 12' 20.2" (LT)
D = 7° 09' 43.1"
L = 435.71'
T = 223.41'
R = 800.00'
SE = NC
DS = 35 mph
NAD 83
UNITED STATES AGRICULTURE CROATAN NATIONAL FOREST
-Y4DET- PT Sta. 40+66.57
-Y4DET- PC Sta. 52+05.93
N 65° 59' 32.2" E
MATCHLINE SHEET 2B-5 -Y4DET- STA 40+00.00
MATCHLINE SHEET 2B-6 -Y4DET- STA 54+50.00
REMOVE SYSTEM WHEN DETOUR REMOVED
SUNSET ROAD SR 1747
TEMP. SPECIAL LATERAL 'V' DITCH SEE DETAIL 11
CL B RIPRAP EST. 3 TONS EST. 10 SY GF
TEMPORARY SHORING
TEMP. 18"
TEMP. 2GI (CONSTRUCT AS -Y4- IS CONSTRUCTED AT INTERSECTION OF -Y4- AND -Y4DET- FILL SLOPES) REMOVE WHEN DETOUR REMOVED
GREU (TL-2)
TEMPORARY SHORING
REMOVE WHEN DETOUR REMOVED
CL I RIP RAP EST. 26 TONS EST. 55 SY GF
REMOVE WHEN DETOUR REMOVED
CLASS B RIPRAP REMOVE AFTER DETOUR EST. 2 TONS EST. 7 SY GF
SEE SHEETS 3D-1 THRU 3D-2 FOR DRAINAGE DITCH DETAILS



-Y4- DET
DITCH LEGEND
MEDIAN DITCH
LEFT DITCH
RIGHT DITCH
PI = 41+00.00
EL = 27.50'
K = 198
VC = 80'
PI = 48+40.00
EL = 32.85'
K = 31
VC = 170'
PI = 52+60.00
EL = 13.20'
K = 49
VC = 300'
(+)0.5238%
(+)0.3182%
(+)0.7230%
(+)0.7230%
(-)4.6786%
(-)4.6786%
(+)1.4164%
END DITCH +25.00 LT 22.47'
TEMP. 18" -Y4DET- STA. 54+00 ELEV.=11.38'
TEMP. 84" -Y4DET- STA. 52+57 ELEV.=6.52'
PROPOSED UNDERCUT

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PROJECT REFERENCE NO.	SHEET NO.
R-1015	2B-6

ROADWAY DESIGN ENGINEER — SEAL 015869 — 12/12/2018

HYDRAULICS ENGINEER — SEAL 032581 — 12/13/2018

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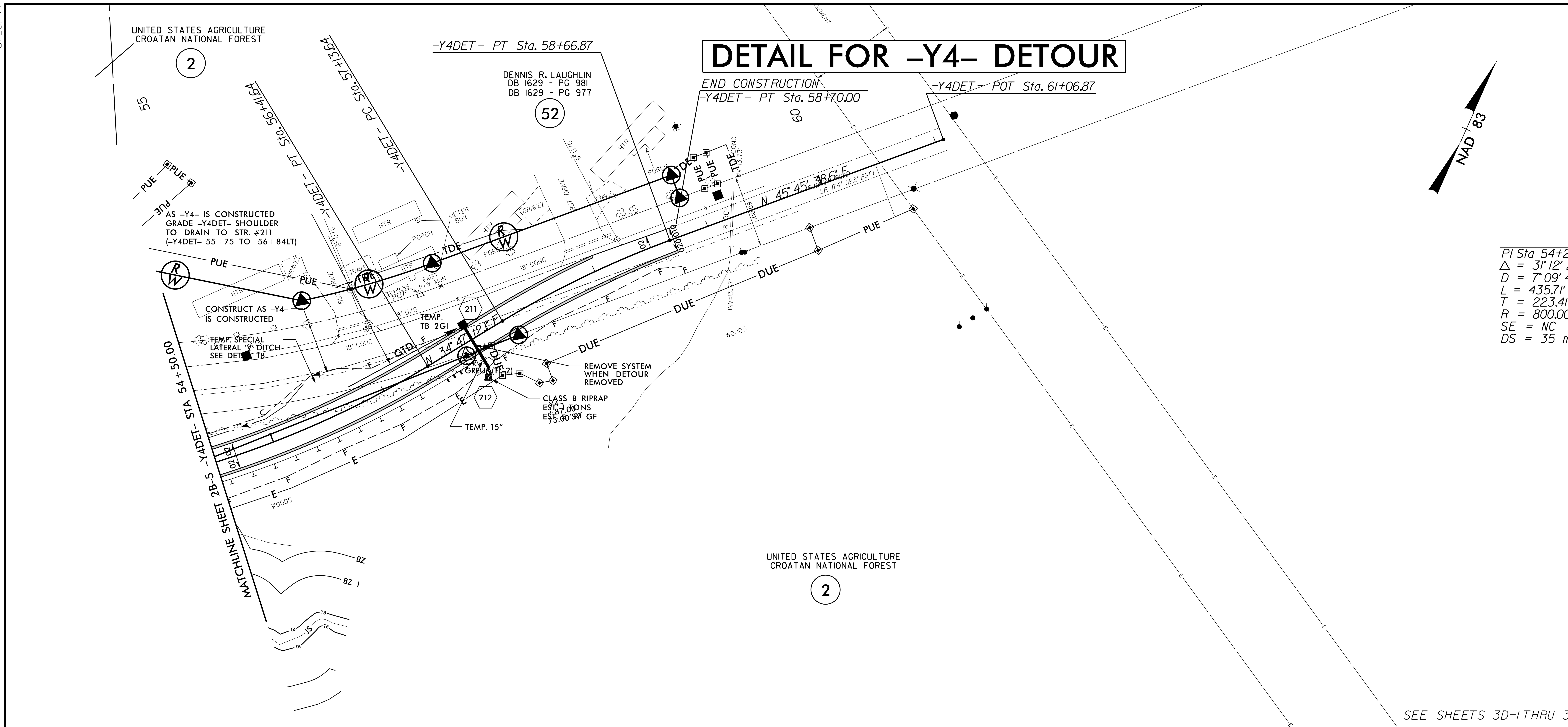
DETAIL FOR -Y4- DETOUR

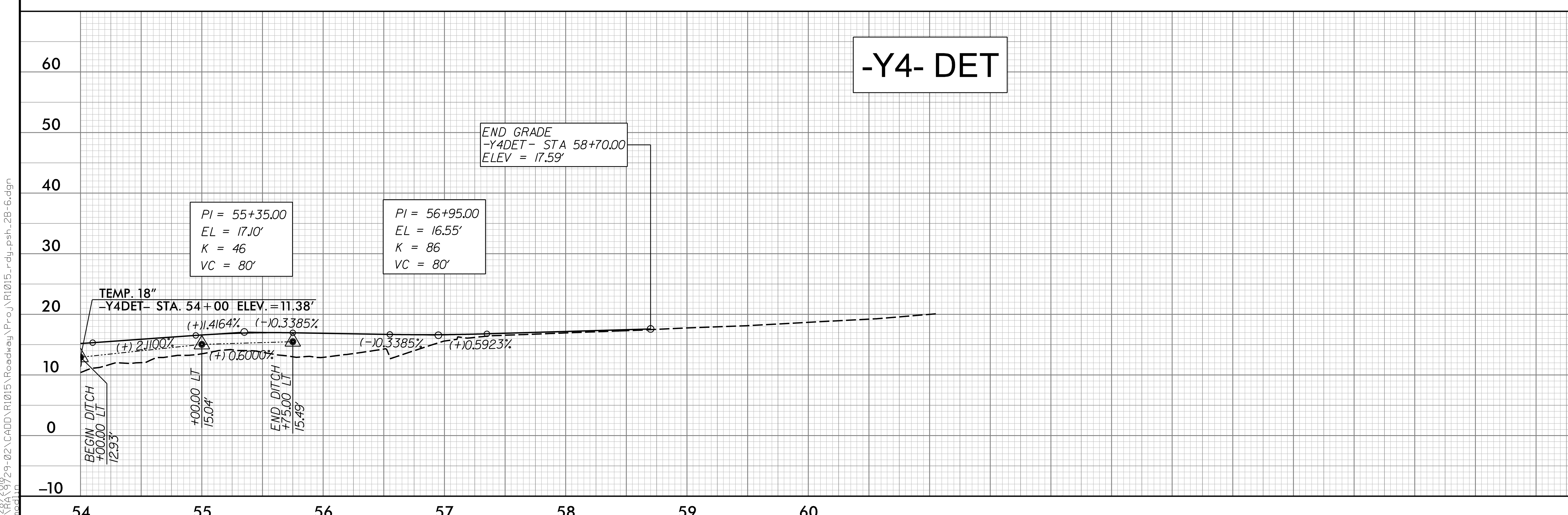


UNITED STATES AGRICULTURE CROATAN NATIONAL FOREST
2
-Y4DET- PT Sta. 58+66.87
DENNIS R. LAUGHLIN
DB 1629 - PG 981
DB 1629 - PG 977
52
END CONSTRUCTION
-Y4DET- PT Sta. 58+70.00
-Y4DET- POT Sta. 61+06.87
-Y4DET- PT Sta. 56+41.64
-Y4DET- PC Sta. 57+13.64
AS -Y4- IS CONSTRUCTED GRADE -Y4DET- SHOULDER TO DRAIN TO STR. #211 (-Y4DET- 55+75 TO 56+84LT)
CONSTRUCT AS -Y4- IS CONSTRUCTED
TEMP. SPECIAL LATERAL 'V' DITCH SEE DET. ON T8
TEMP. TB 2GI
211
212
REMOVE SYSTEM WHEN DETOUR REMOVED
CLASS B RIPRAP
TEMP. 15"
N 45° 45' 38.6" E
MATCHLINE SHEET 2B-5 -Y4DET- STA 54+50.00
UNITED STATES AGRICULTURE CROATAN NATIONAL FOREST
2
NAD 83

-Y4DET-	
PI Sta 54+29.33	PI Sta 57+90.49
Δ = 31° 12' 20.2" (LT)	Δ = 10° 58' 26.6" (RT)
D = 7° 09' 43.1"	D = 7° 09' 43.1"
L = 435.71'	L = 153.23'
T = 223.41'	T = 76.85'
R = 800.00'	R = 800.00'
SE = NC	SE = NC
DS = 35 mph	DS = 35 mph

SEE SHEETS 3D-1 THRU 3D-2 FOR DRAINAGE DITCH DETAILS

-Y4- DET



END GRADE
-Y4DET- STA 58+70.00
ELEV = 17.59'
PI = 55+35.00
EL = 17.10'
K = 46
VC = 80'
PI = 56+95.00
EL = 16.55'
K = 86
VC = 80'
TEMP. 18"
-Y4DET- STA. 54+00 ELEV. = 11.38'
(+)1.4164%
(-)0.3385%
(+)2.1100%
(+)0.5000%
(-)0.3385%
(+)0.5923%
BEGIN DITCH +00.00 LT 12.93'
+00.00 LT 15.04'
END DITCH +75.00 LT 15.49'
60
50
40
30
20
10
0
-10
54
55
56
57
58
59
60

DITCH LEGEND	
MEDIAN DITCH	— — — — —
LEFT DITCH	-·-·-·-·-
RIGHT DITCH	- - - - - -

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-1015	2B-7
R/W SHEET NO.	

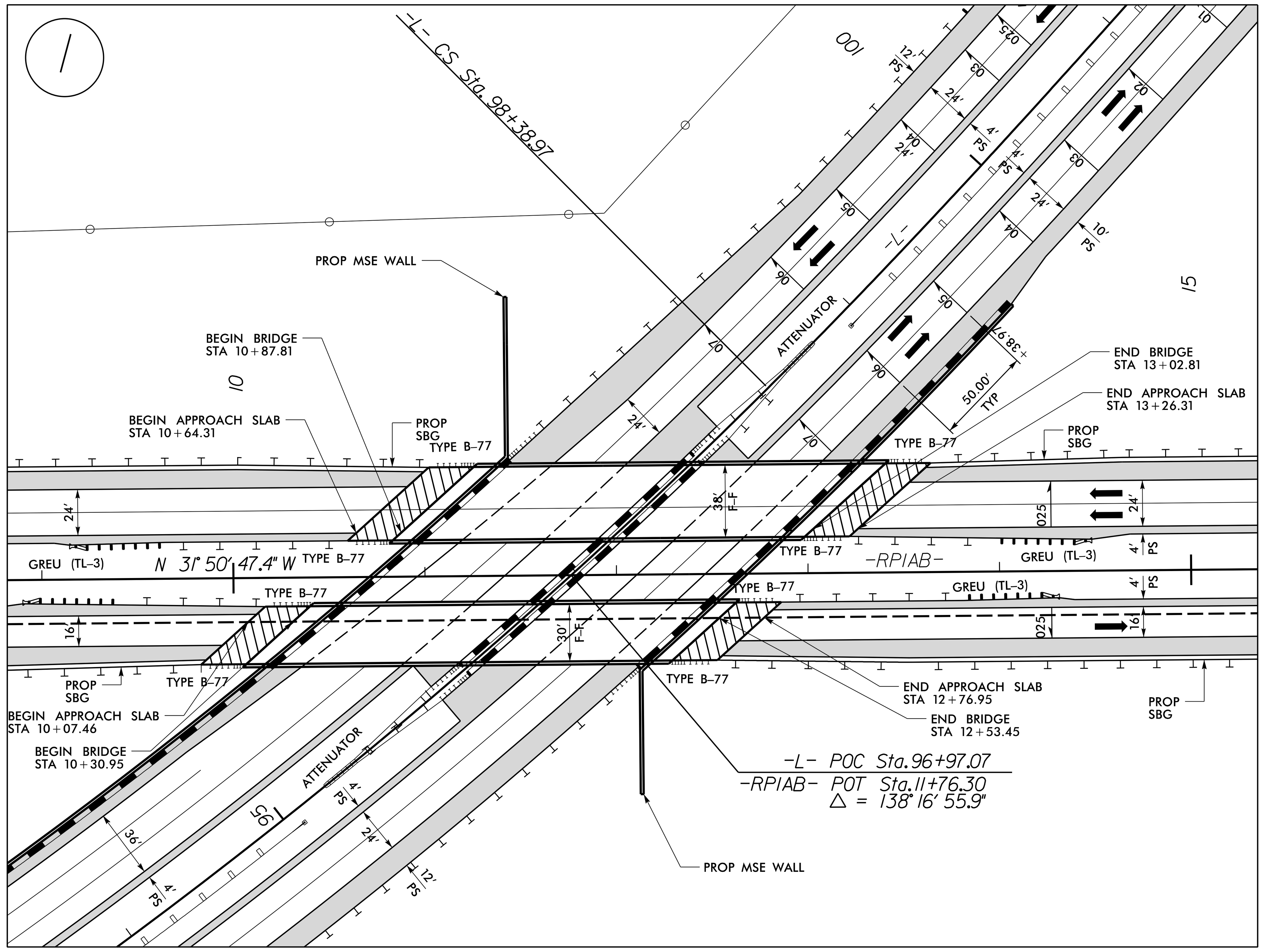
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 015869 R. REID

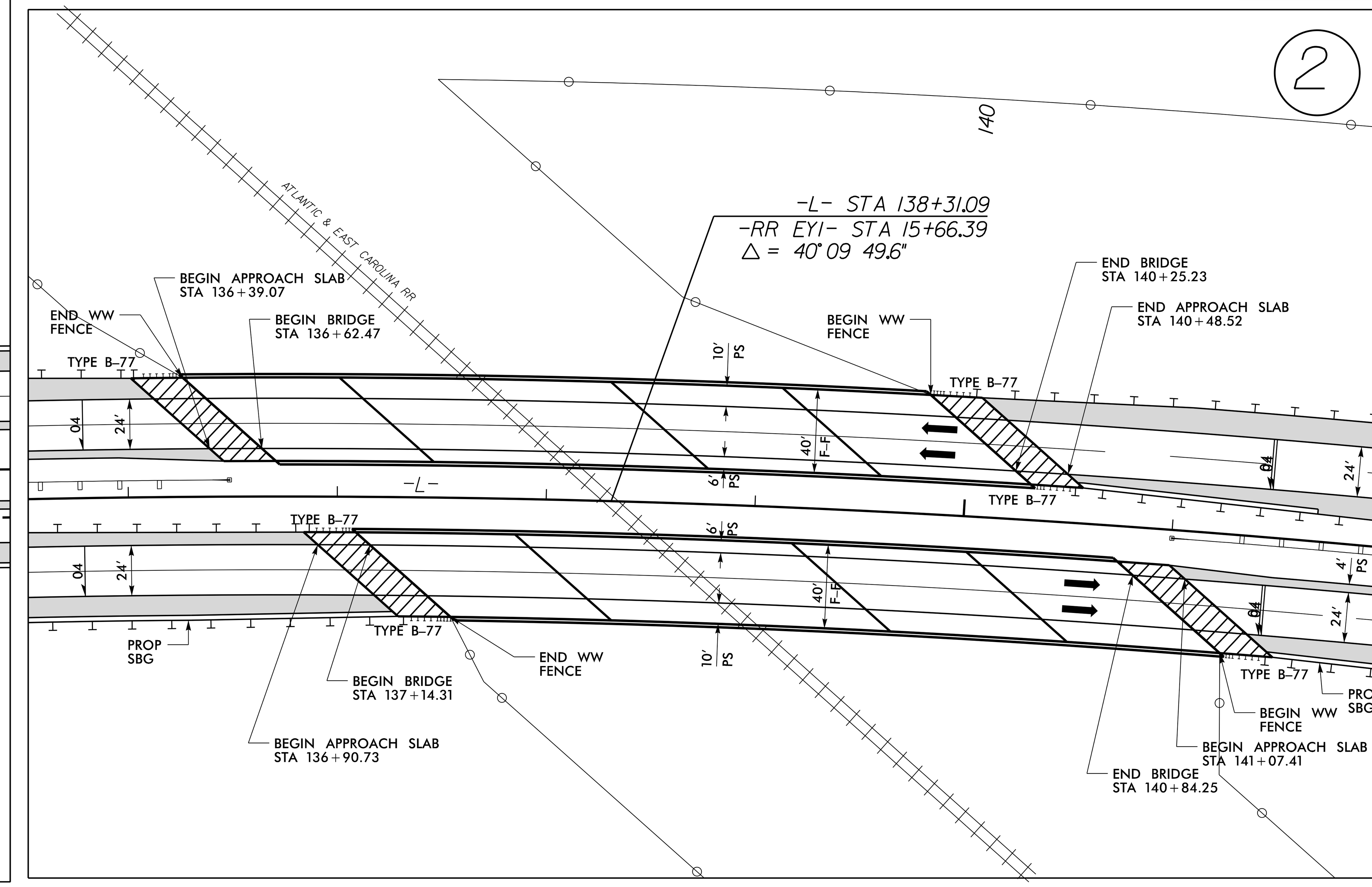
12/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

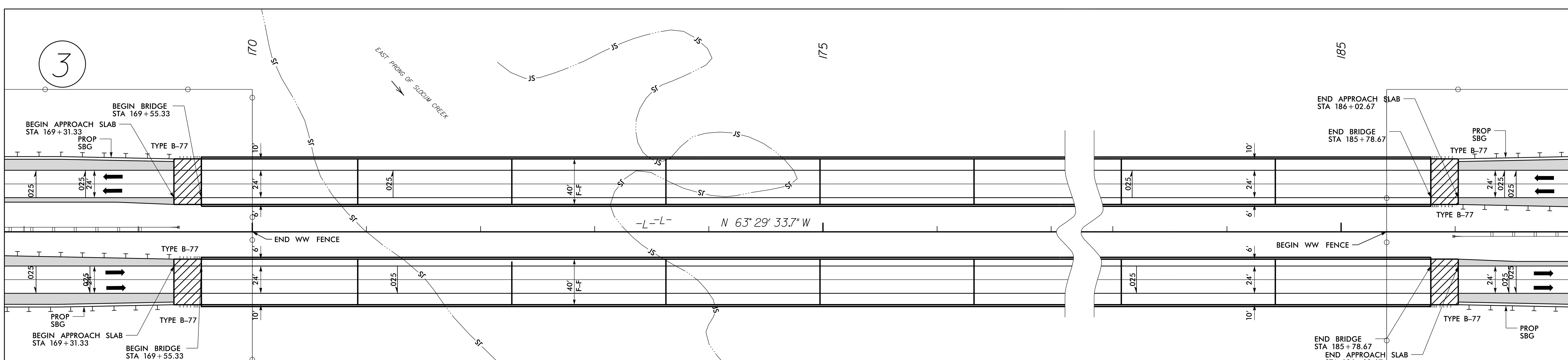
BRIDGE SKETCHES



DETAIL SHOWING PAVEMENT & BRIDGE RELATIONSHIP FOR -RP1AB- OVER -L-



DETAIL SHOWING PAVEMENT & BRIDGE RELATIONSHIP FOR -L- OVER ATLANTIC AND EAST CAROLINA RAILROAD



DETAIL SHOWING PAVEMENT & BRIDGE RELATIONSHIP FOR -L- OVER EAST PRONG OF SLOCUM CREEK

12/12/2018
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PROJECT REFERENCE NO.	SHEET NO.
R-1015	2B-8
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 015869

12/12/2018

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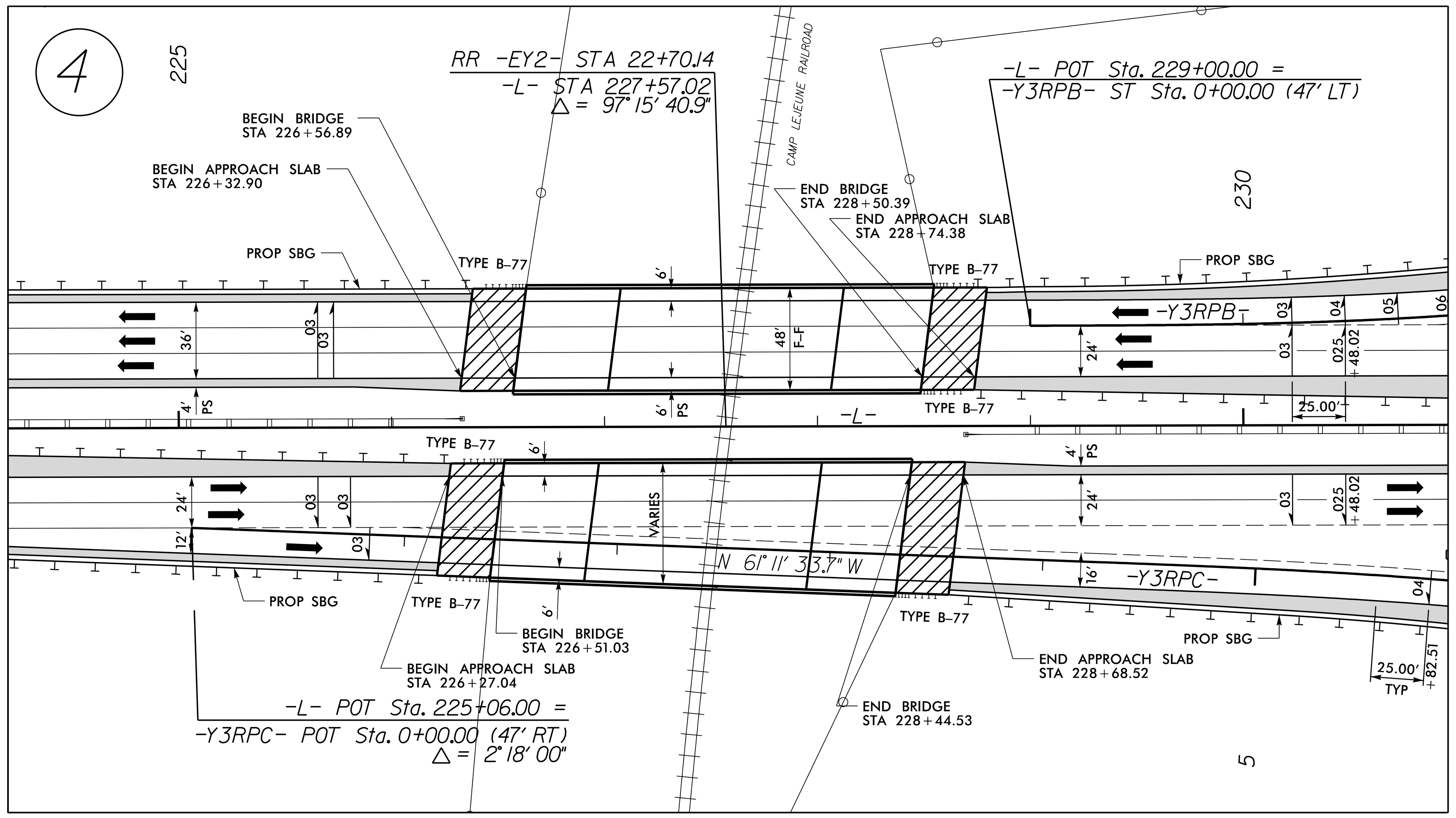
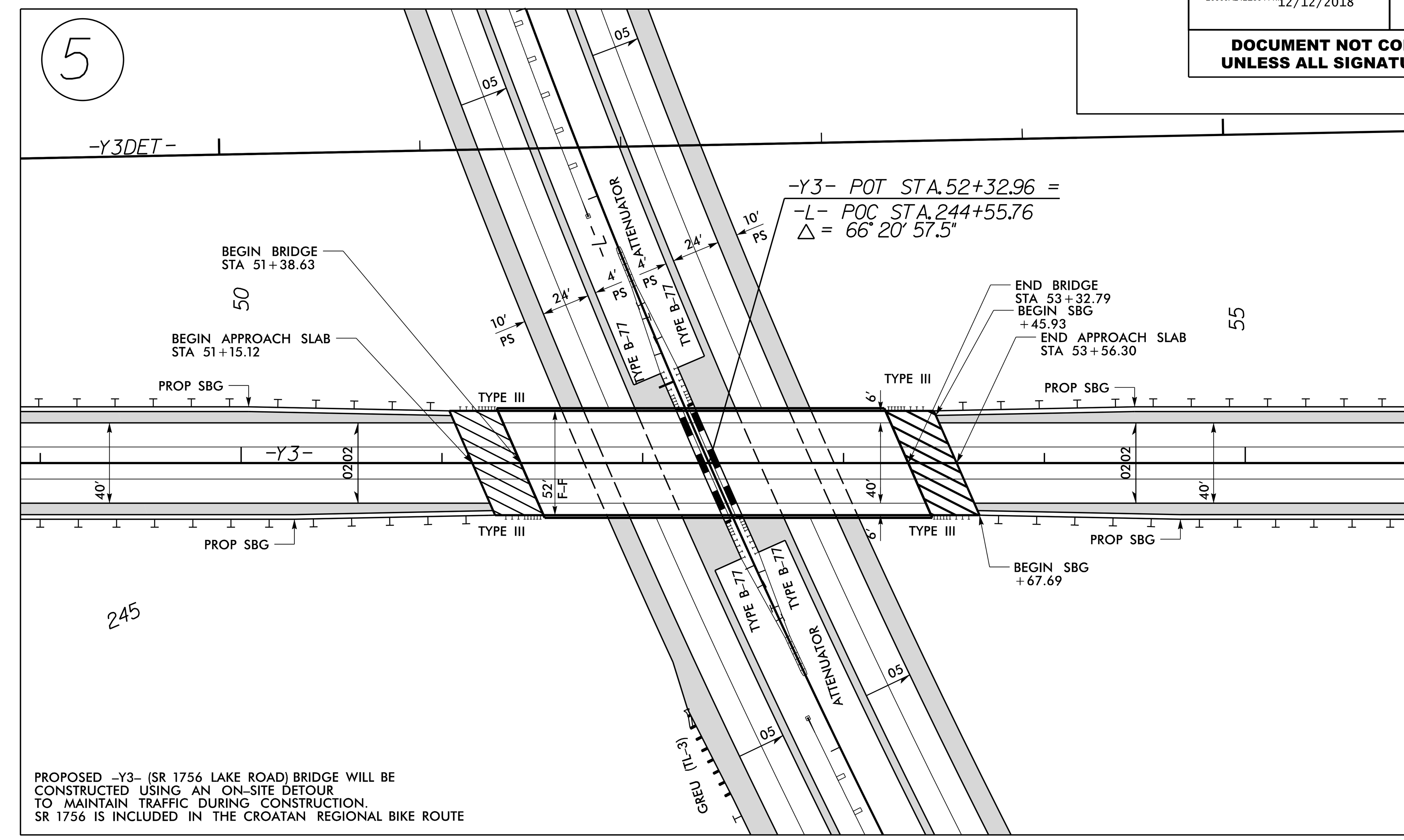
8/17/99

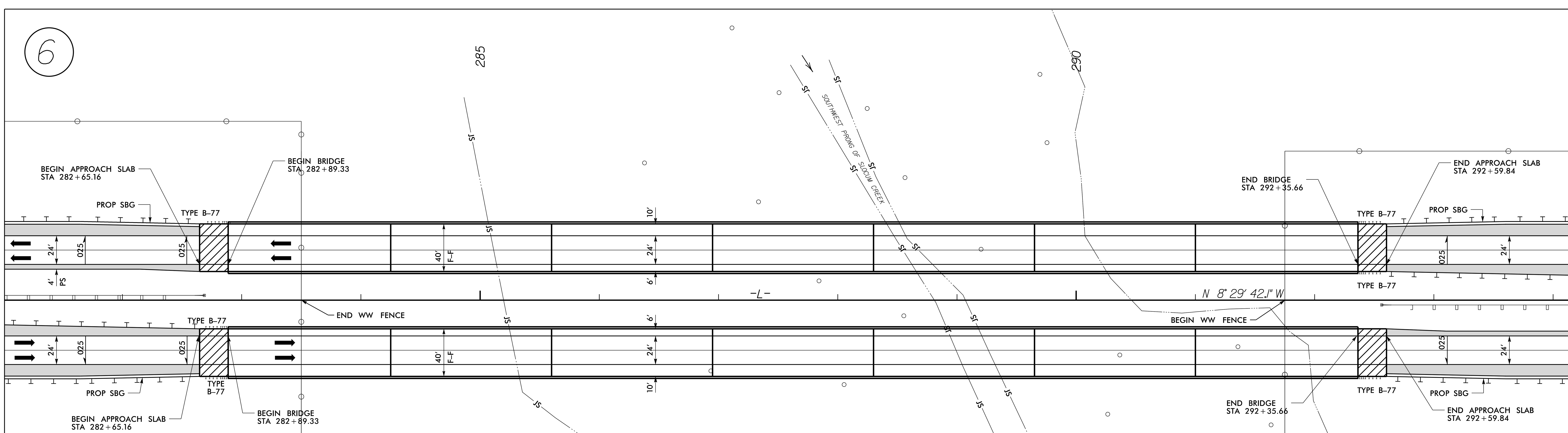
BRIDGE SKETCHES



DETAIL SHOWING PAVEMENT & BRIDGE RELATIONSHIP
FOR -L- OVER CAMP LEJEUNE RAILROAD



DETAIL SHOWING PAVEMENT & BRIDGE RELATIONSHIP
FOR -Y3-(SR 1756) OVER -L-



DETAIL SHOWING PAVEMENT & BRIDGE RELATIONSHIP
FOR -L- OVER SOUTHWEST PRONG OF SLOCUM CREEK

12/12/2018
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8/17/99

BRIDGE SKETCHES

PROJECT REFERENCE NO.	SHEET NO.
R-1015	2B-9
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 015869 ENGINEER
Digitally signed by JAMES R. REID
26569A242E83411...
12/12/2018

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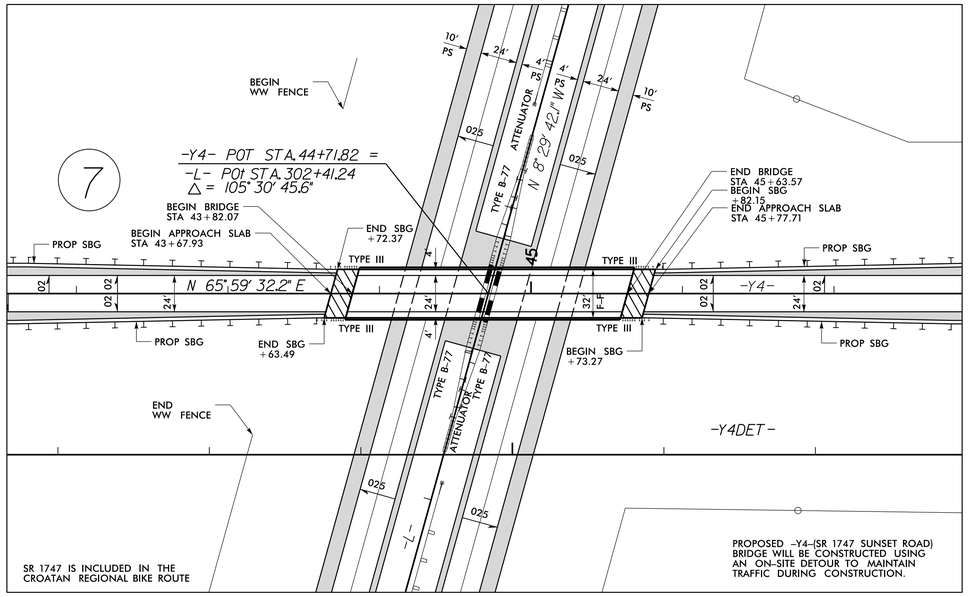

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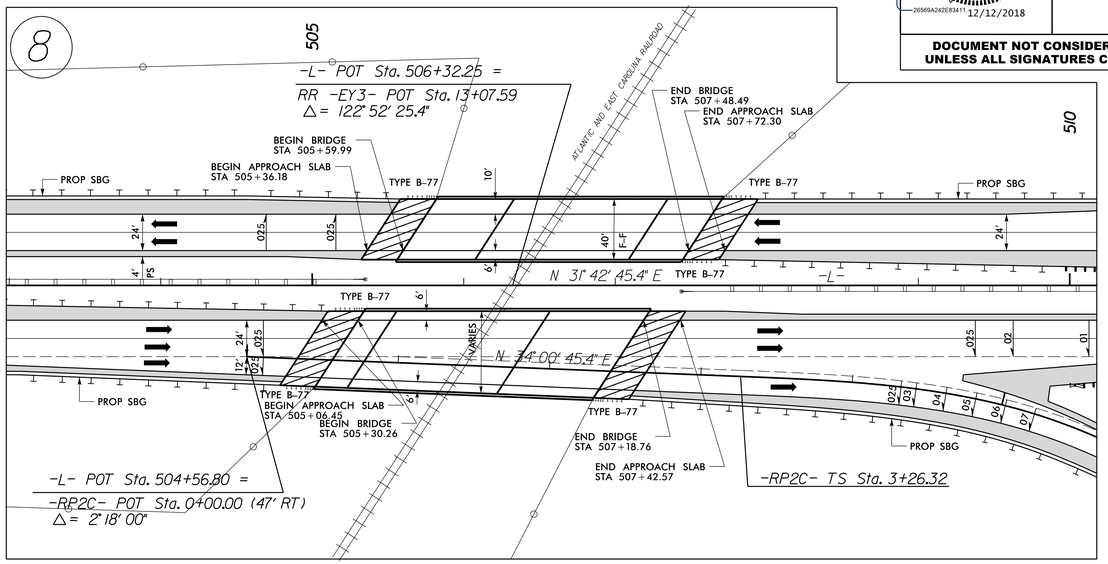
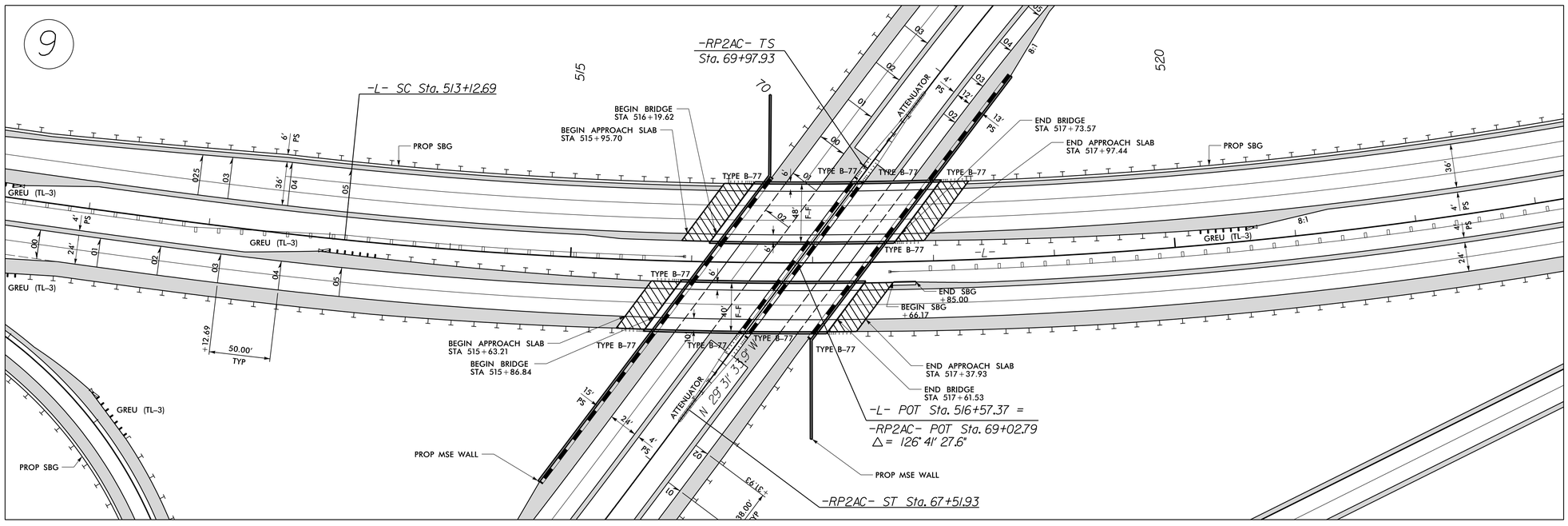


DETAIL SHOWING PAVEMENT & BRIDGE RELATIONSHIP FOR -L- OVER ATLANTIC AND EAST CAROLINA RAILROAD



DETAIL SHOWING PAVEMENT & BRIDGE RELATIONSHIP FOR -L- OVER -RP2AC-

12/12/2018
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jmedlin

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PROJECT REFERENCE NO.	SHEET NO.
R-1015	2C-1

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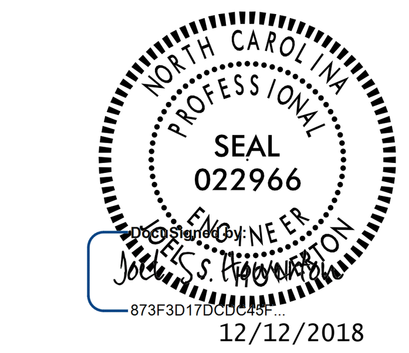


GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB, SEE STD. DRAWING 840.00.

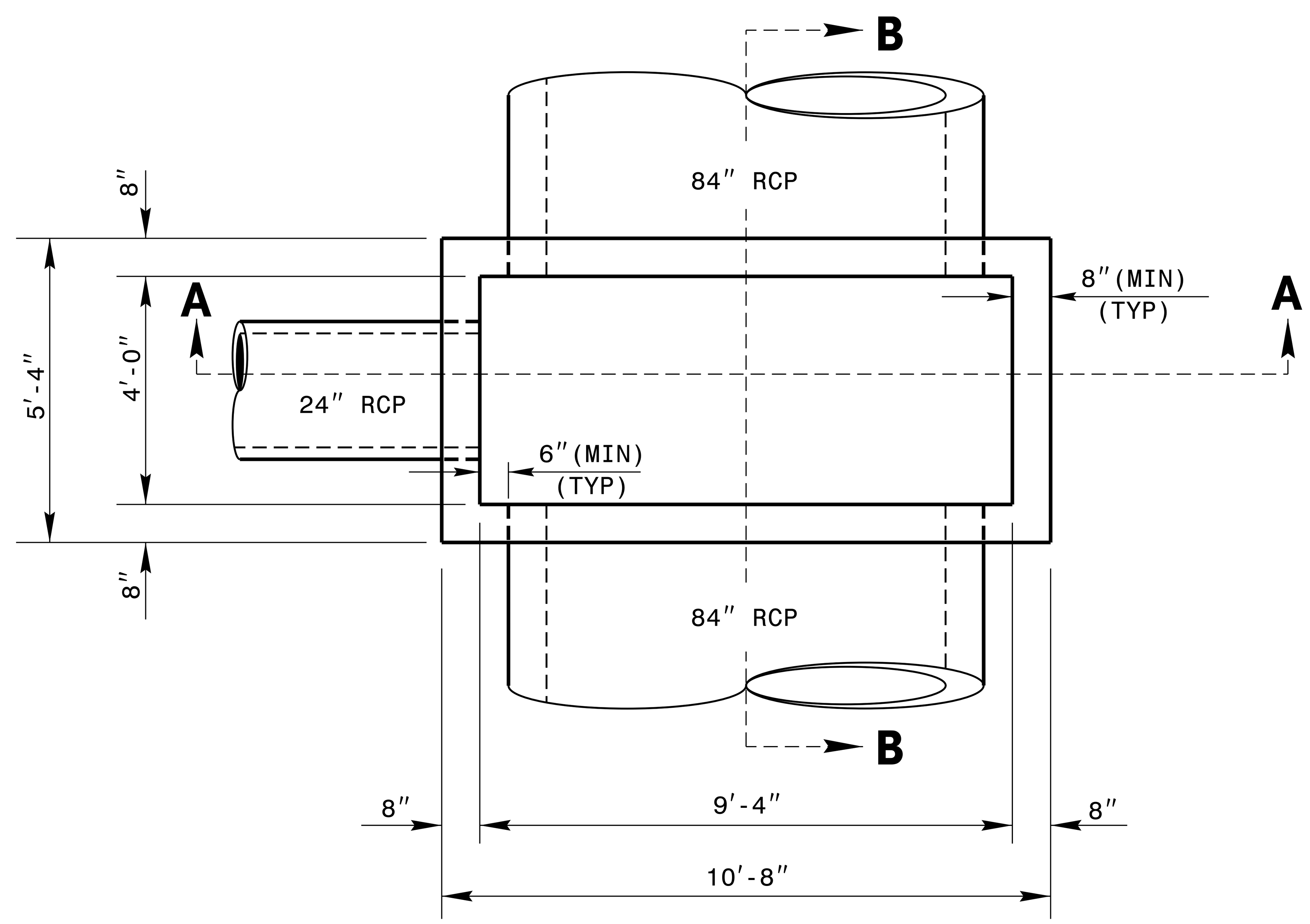
CHAMFER ALL EXPOSED CORNERS 1".

2" MINIMUM CONCRETE COVERAGE ON ALL REBAR.

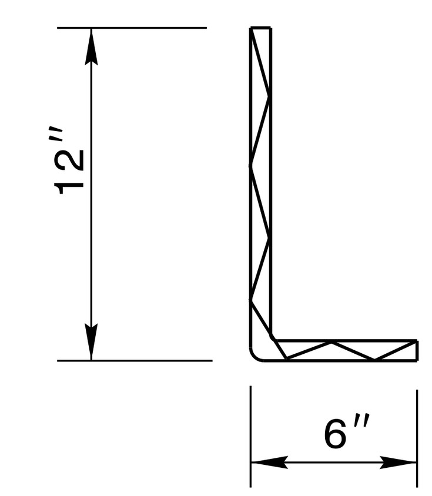
"Z" BAR TO BE USED TO REINFORCE OPENING AROUND 84 INCH WSP.

HEIGHT DIMENSIONS MAY BE ADJUSTED DOWN FOR SMALLER PIPES AS DIRECTED BY THE ENGINEER.

IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 8470.00.



PLAN VIEW

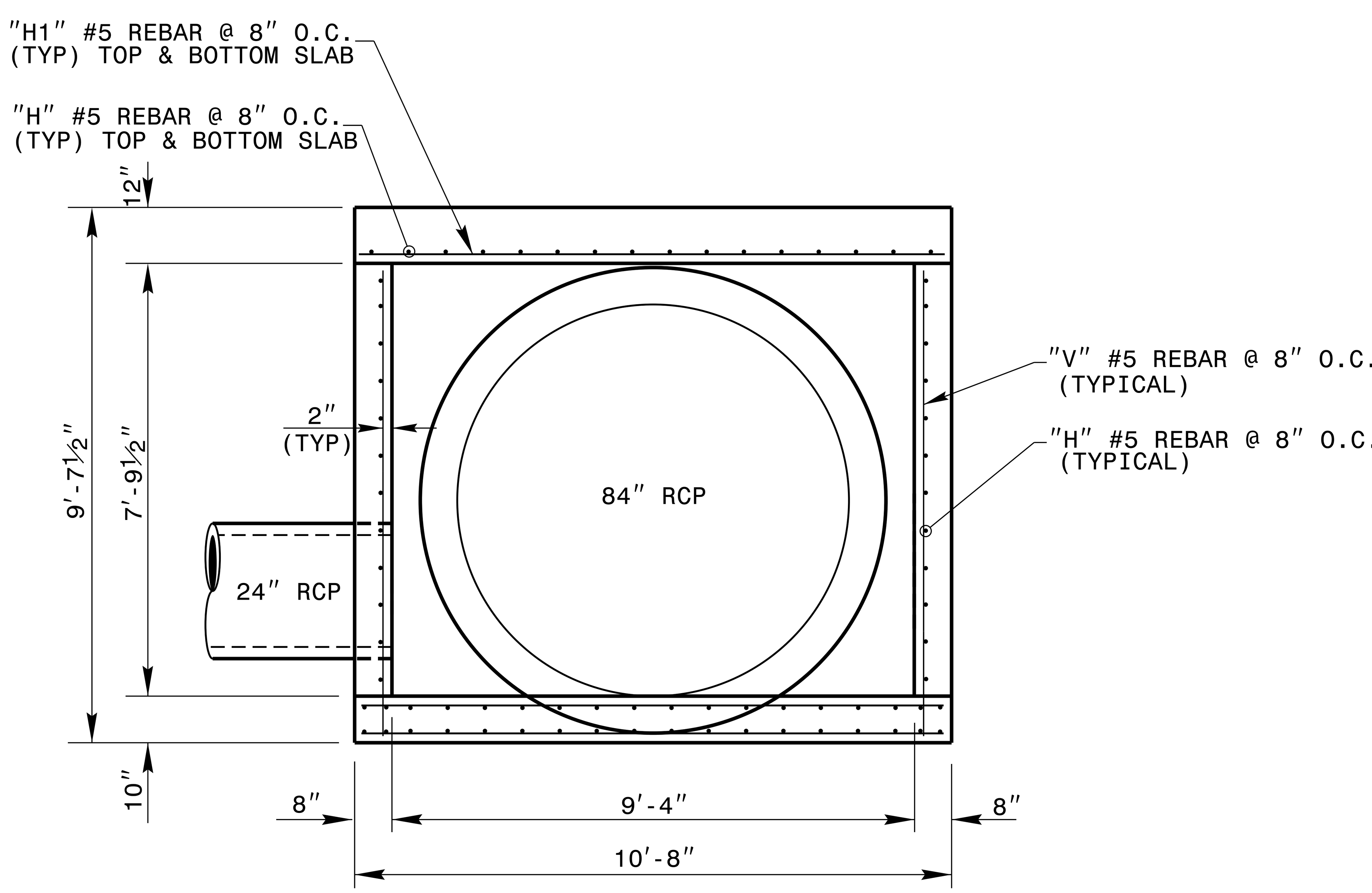


DOWEL

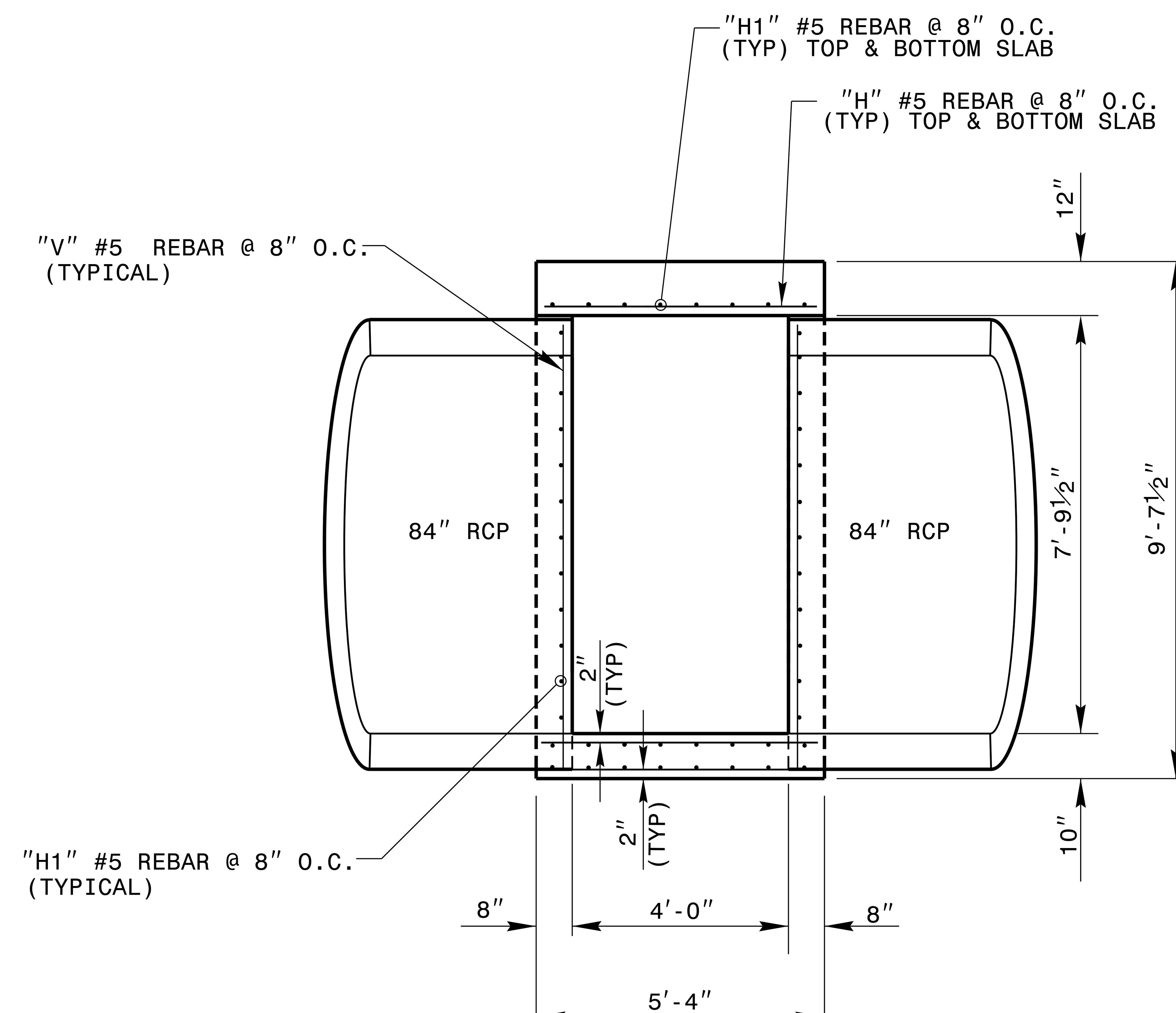
BILL OF MATERIALS

BAR	NO.	SIZE	LENGTH	WEIGHT
H	80	#5	5'-0"	417
H1	48	#5	10'-4"	517
V	48	#5	8'-5"	421
Z	7	#5	4'-0"	29
TOTAL REINF. STEEL (LBS.)				1416
TOTAL CONC. (CU. YDS.)				9.2

* NO DEDUCTION HAS BEEN MADE FOR PIPES



SECTION A-A



SECTION B-B

PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

JUNCTION BOX

ORIGINAL BY: DATE:
MODIFIED BY: kkempf DATE: 10/11/18
CHECKED BY: DATE:
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11-OCT-2018 14:46
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kkempf AT CSD-292596

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PROJECT REFERENCE NO.	SHEET NO.
R-1015	2C-2

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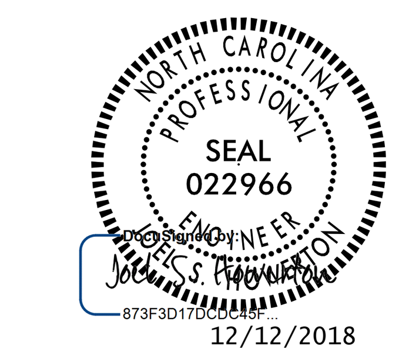
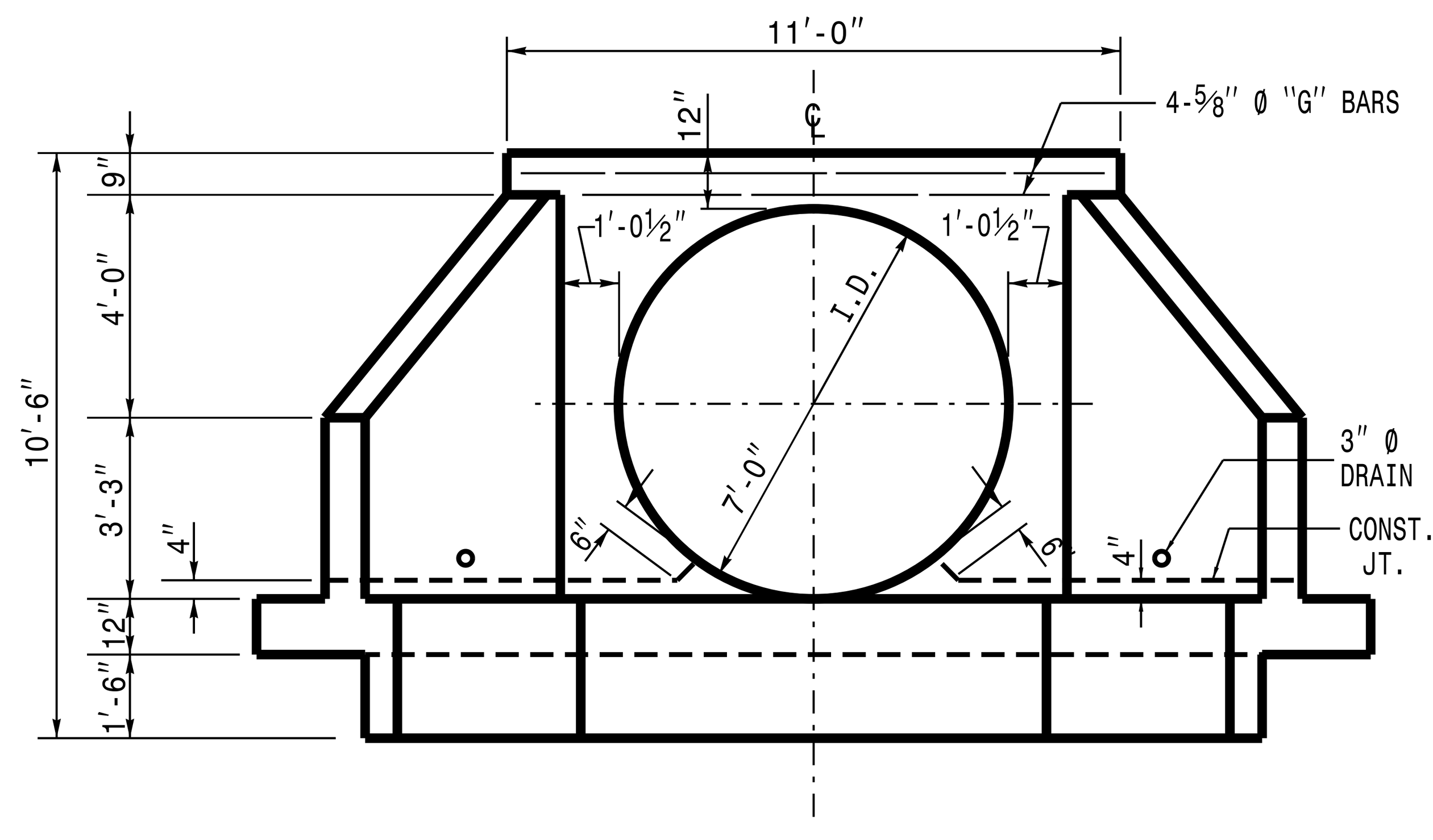
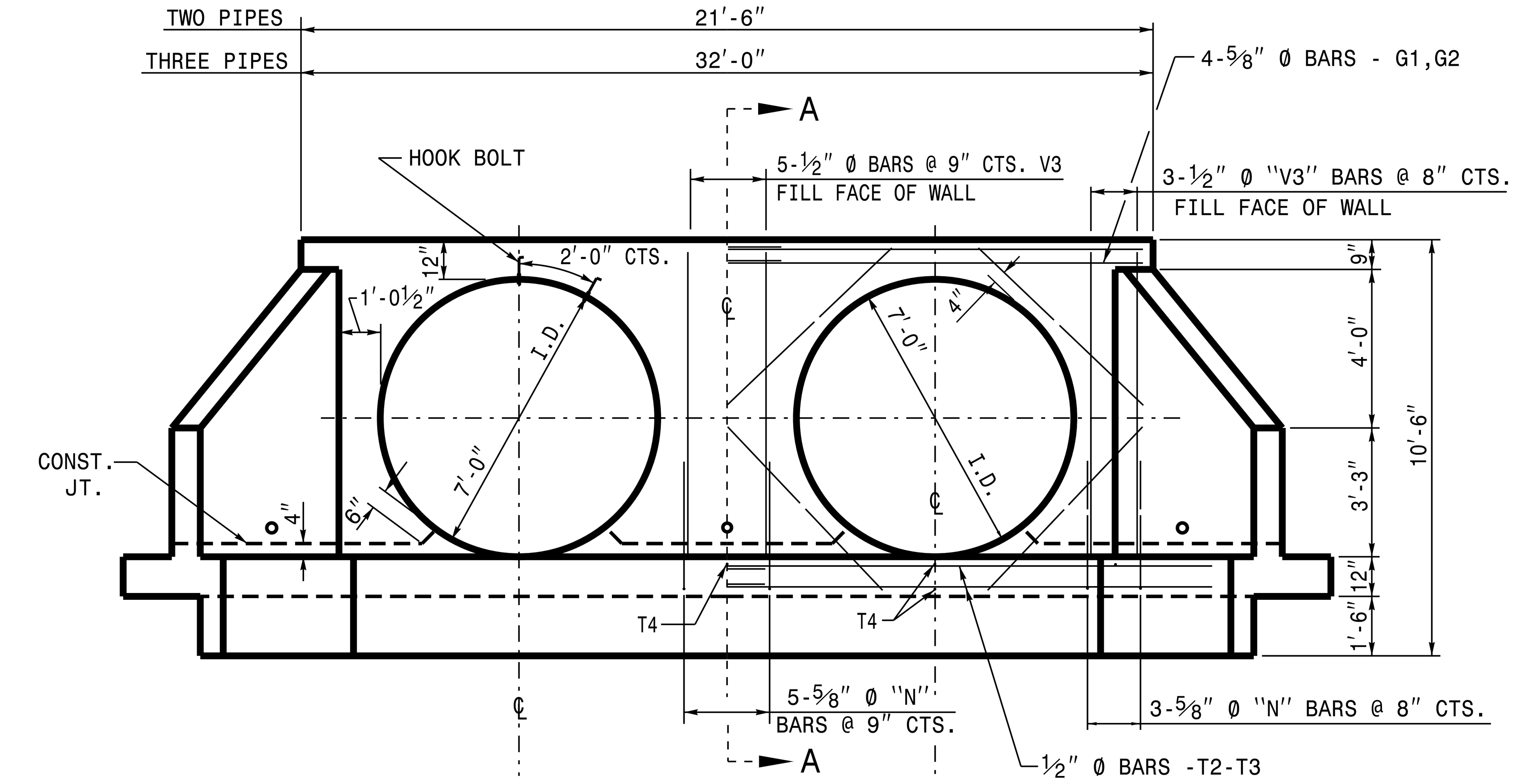




END ELEVATION



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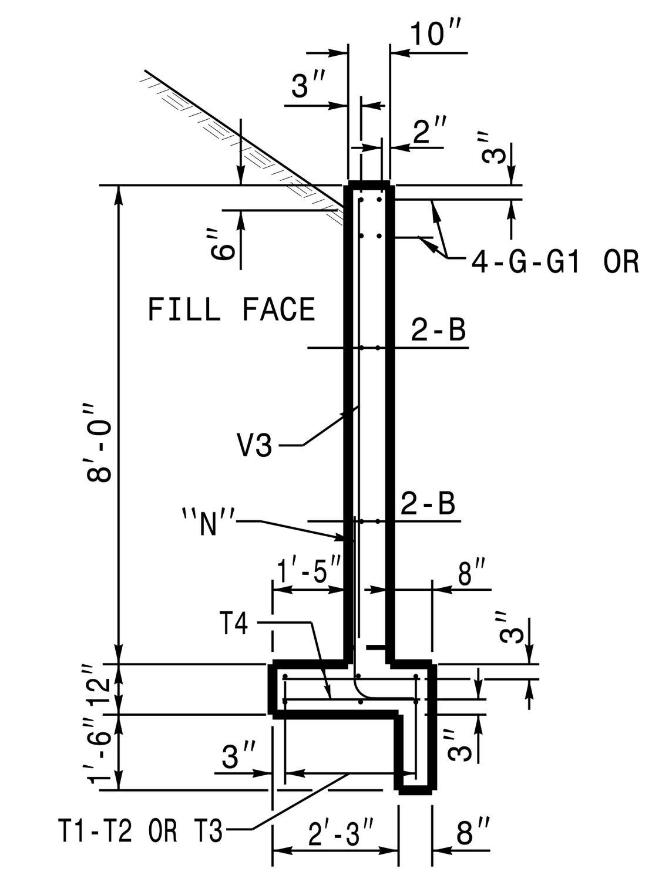
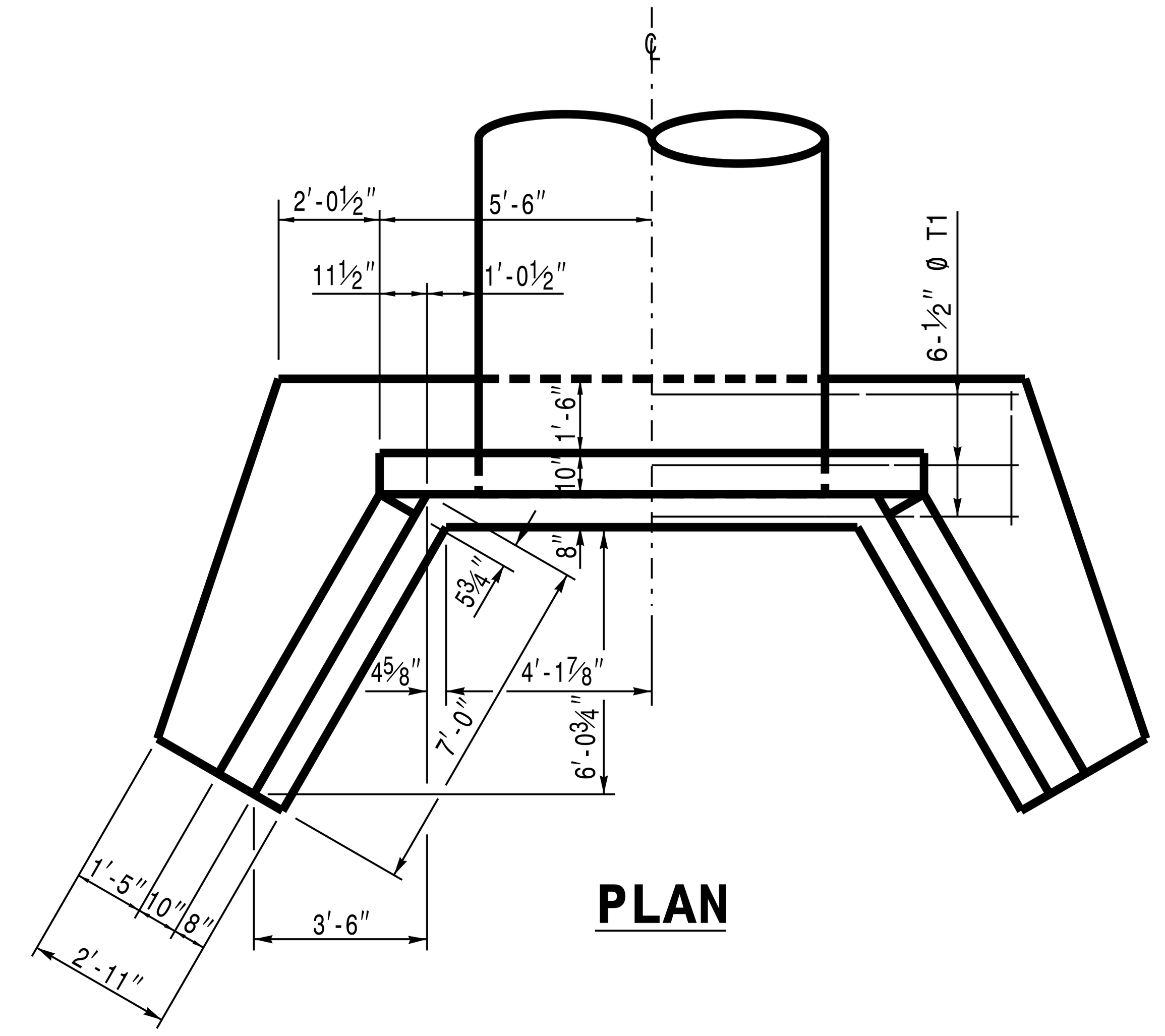
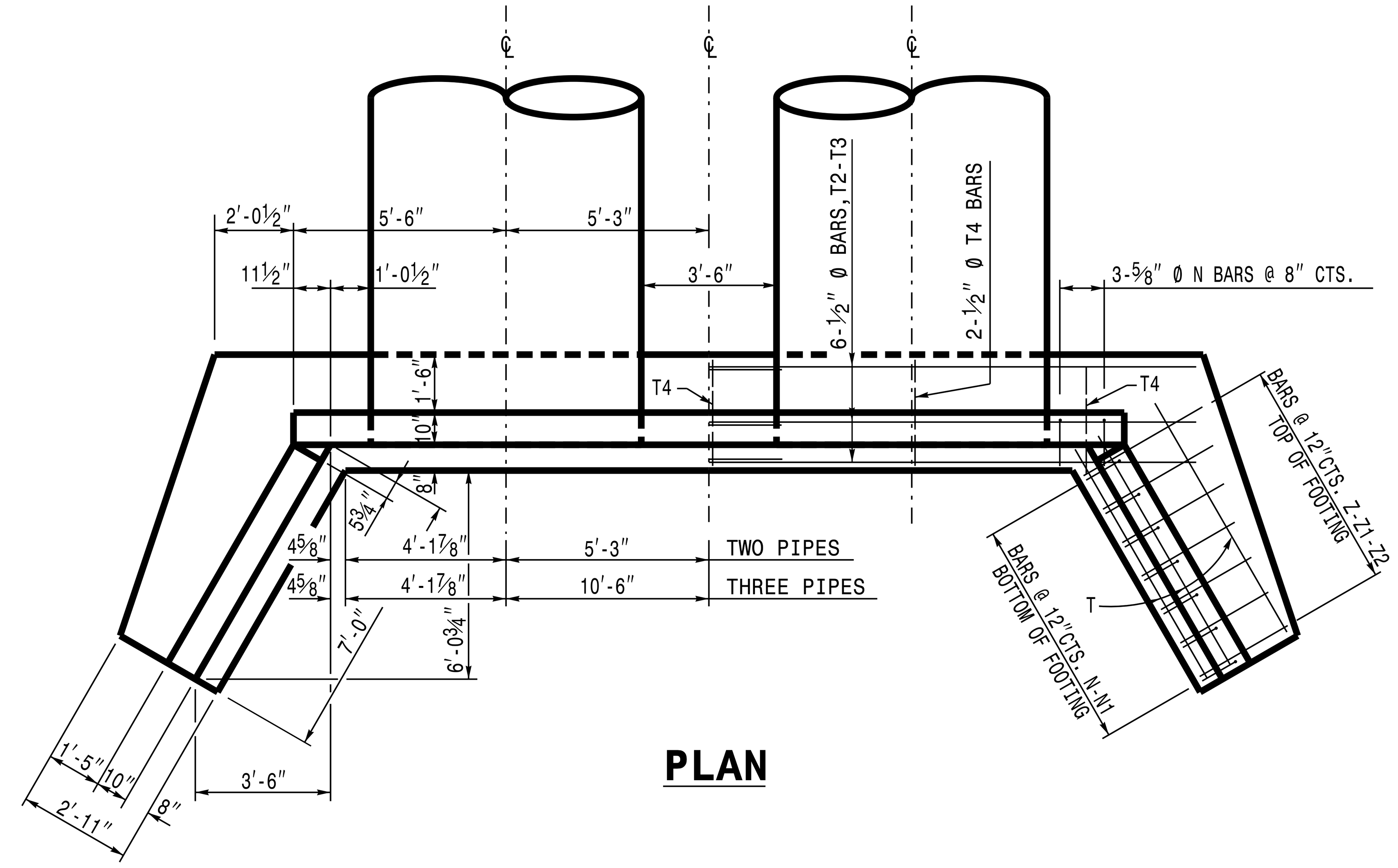


SECTION A-A
FOR ALL ENDWALLS



PLAN



PLAN

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.

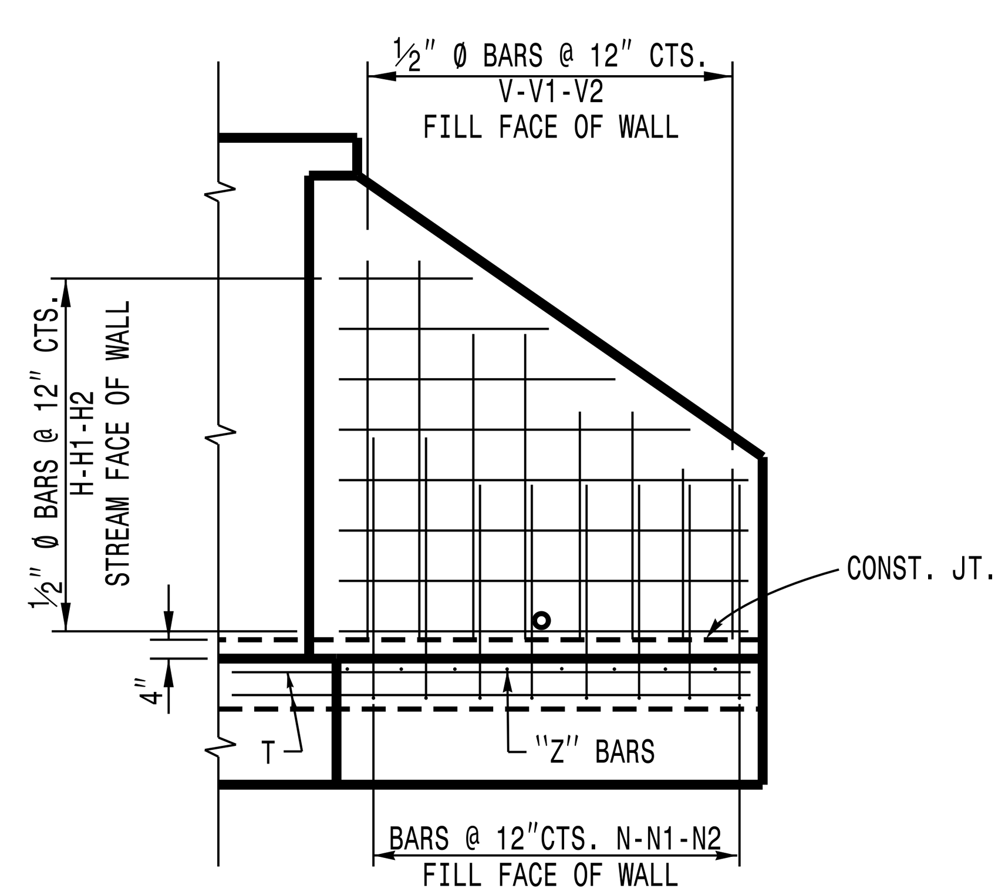
ALL EXPOSED CORNERS ARE TO BE CHAMFERED 1".

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

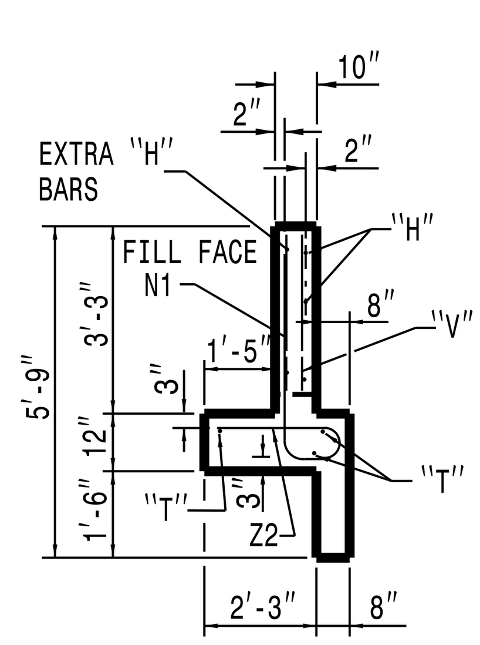
ALL MATERIAL AND WORKMANSHIP AS PER N.C.DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.

BILL OF MATERIAL FOR ONE ENDWALL

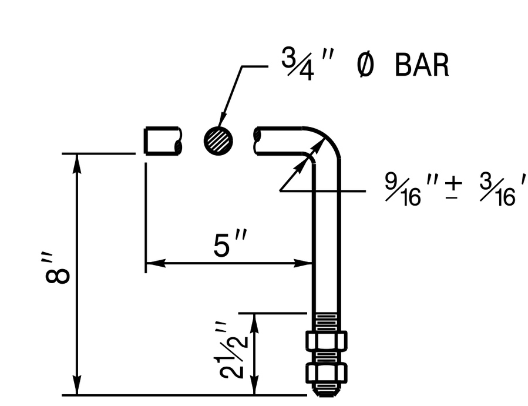
REINFORCING STEEL			1 PIPE		2 PIPES		3 PIPES	
BAR	SIZE	LENGTH	NO.	WEIGHT	NO.	WEIGHT	NO.	WEIGHT
B	#4	6'-0"	8	32	16	64	24	96
G	#5	10'-9"	4	45	-	-	-	-
G1	#5	11'-9"	-	-	8	98	-	-
G2	#5	17'-0"	-	-	-	-	8	142
H	#4	9'-0"	10	60	10	60	10	60
H1	#4	7'-0"	6	28	6	28	6	28
H2	#4	3'-9"	4	10	4	10	4	10
N	#5	4'-6"	10	47	15	70	20	94
N1	#4	4'-1"	10	27	10	27	10	27
T	#4	6'-6"	6	26	6	26	6	26
T1	#4	15'-0"	6	60	-	-	-	-
T2	#4	13'-9"	-	-	12	110	-	-
T3	#4	19'-0"	-	-	-	-	12	152
T4	#4	2'-9"	4	7	7	13	10	18
V	#4	5'-9"	6	23	6	23	6	23
V1	#4	4'-6"	6	18	6	18	6	18
V2	#4	2'-9"	8	15	8	15	8	15
V3	#4	7'-6"	6	30	11	55	16	80
Z	#5	4'-9"	4	20	4	20	4	20
Z1	#4	4'-3"	4	11	4	11	4	11
Z2	#4	3'-6"	6	14	6	14	6	14
TOTAL REINF. STEEL (lbs.)				473		662		834
CLASS "A" CONC. (cu. yds.)				7.9		10.8		13.8



ELEVATION OF WING
SHOWING REINFORCEMENT

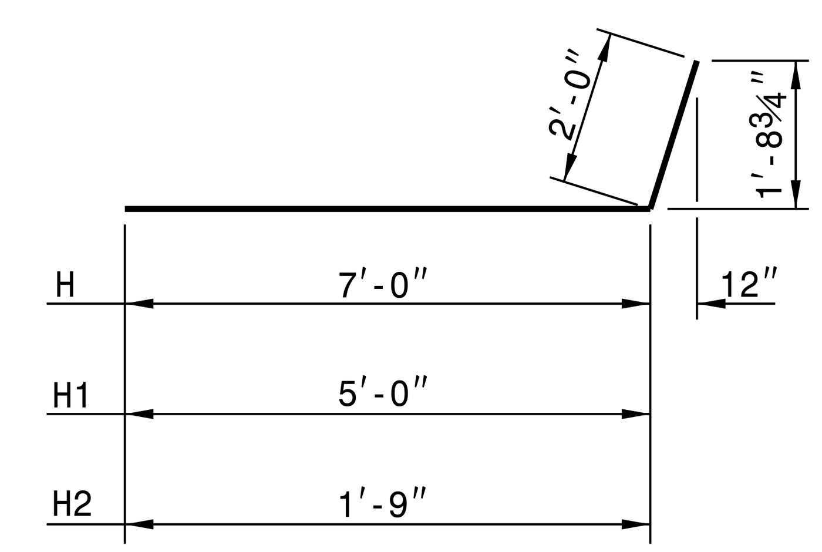


END OF WING

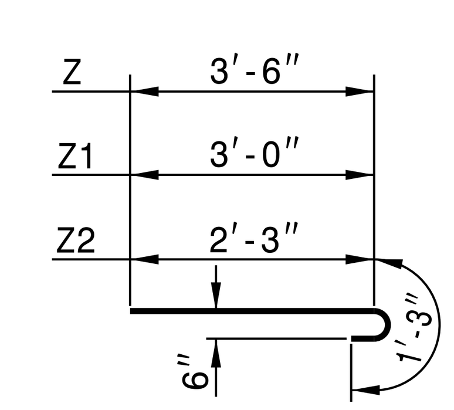


HOOK BOLT

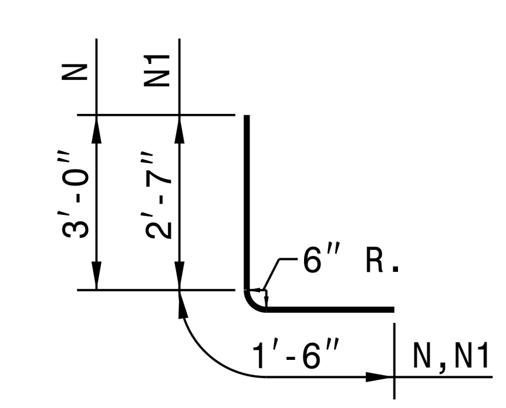
HOOK BOLTS (ANCHORS SHALL BE CONSTRUCTED AT 2'-0" CTS. ALONG THE CIRCUMFERENCE OF THE 7'-0" CSPA. THE HOOK BOLTS SHALL BE EMBEDDED IN THE CONCRETE ENDWALL 8" IN DEPTH. THE GALVANIZED 3/4" DIA. HOOK BOLTS MUST MEET ASTM A-307 OR ASTM A-836. BOTH BOLTS AND NUTS MUST BE IN ACCORDANCE WITH ASTM A-153 FOR GALVANIZING.



BARS H-H1-H2



BARS Z-Z1-Z2



BARS N-N1

CONTRACT STANDARDS & DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

DETAIL OF REINFORCED CONCRETE ENDWALL FOR 84" DIAMETER PIPE - 90° SKEW

ORIGINAL BY: R.S.WICKER DATE: 6-46
MODIFIED BY: R.E.D.&T.S.S. DATE: 6-96 & 5-00
CHECKED BY: DATE:
FILE SPEC.: details/nbritt/english/hydro/84 endwall 90sk.dgn

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PROJECT REFERENCE NO.	SHEET NO.
R-1015	2C-3

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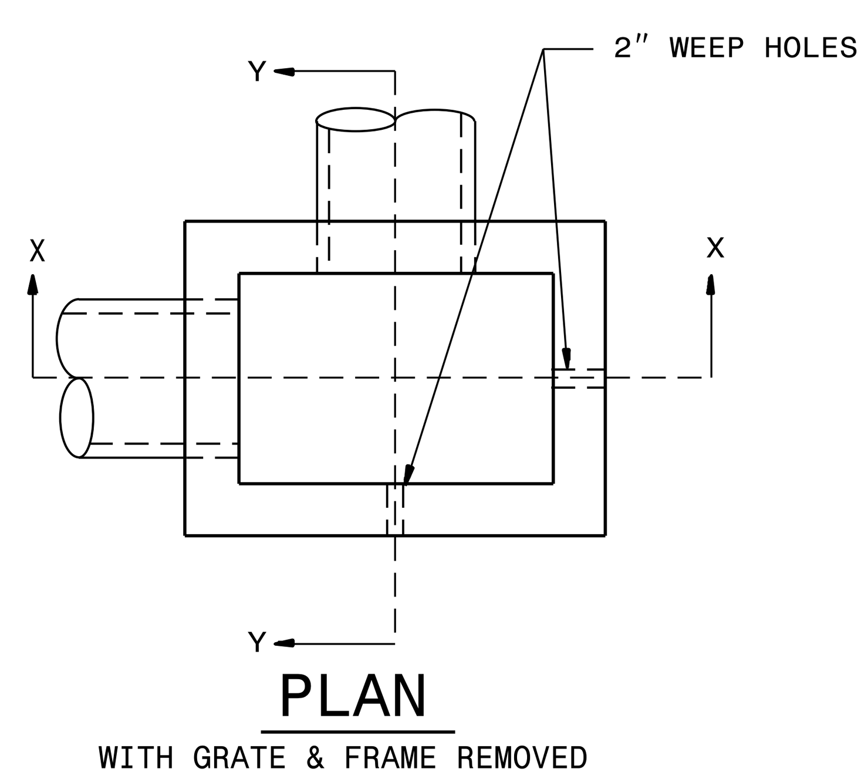
SEAL 022966 — NORTH CAROLINA PROFESSIONAL ENGINEER — 12/12/2018

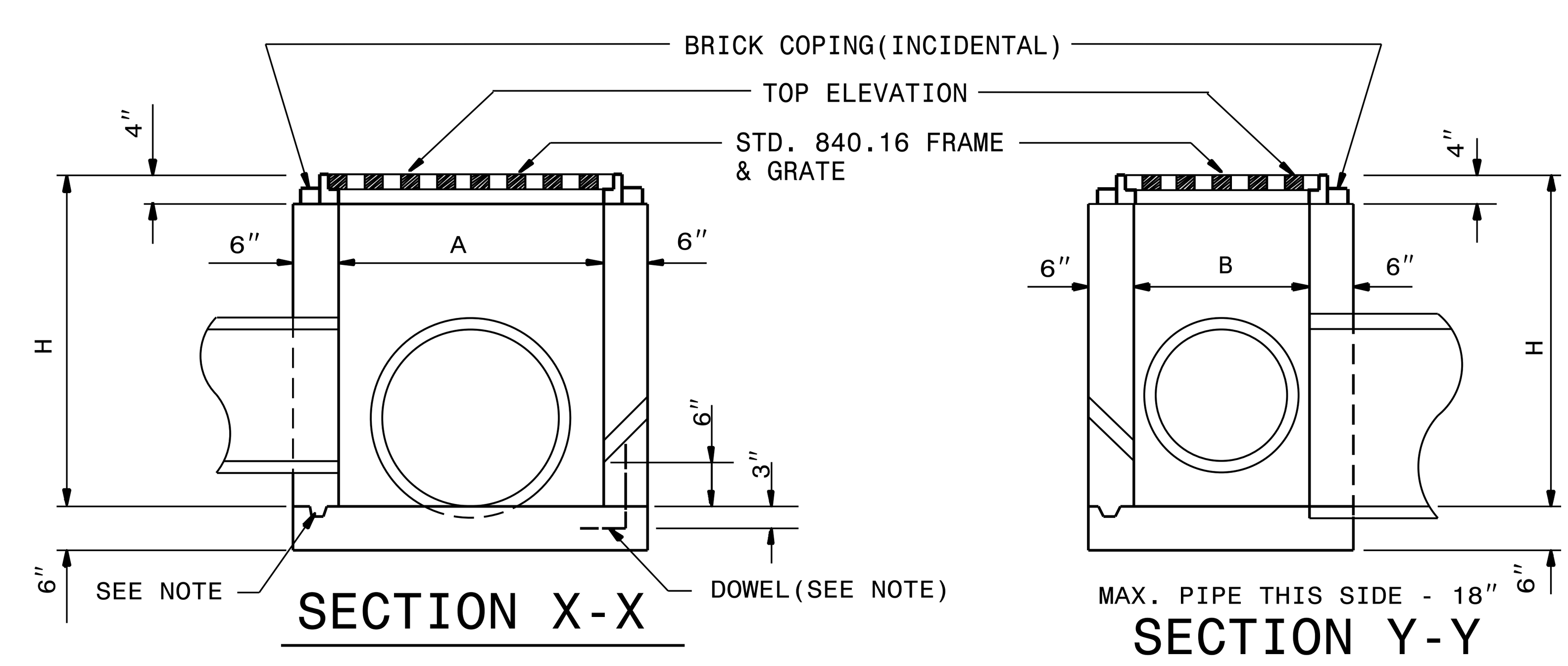
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

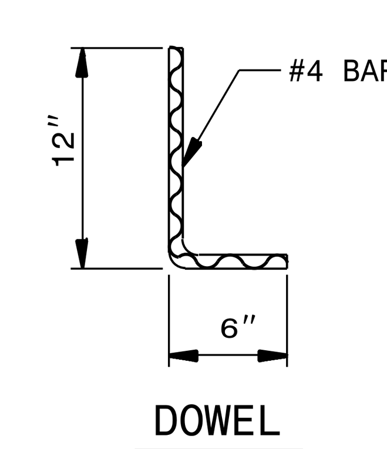
ENGLISH DETAIL DRAWING FOR
MINIMUM DEPTH CONCRETE DROP INLET
12" THRU 30" PIPE

SHEET 1 OF 1
840D14



GENERAL NOTES:
USE CLASS "B" CONCRETE THROUGHOUT.
OPTIONAL CONSTRUCTION - MONOLITHIC POUR 2" KEYWAY OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.
USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.
CONSTRUCT WITH PIPE CROWNS MATCHING.
INSTALL 2" WEEPHOLES AS DIRECTED BY THE ENGINEER.
INSTALL STONE DRAINS, OF A MINIMUM OF 1 CUBIC FOOT OF NO. 78M STONE IN A POROUS FABRIC BAG OR WRAP, AT EACH WEEP HOLE OR AS DIRECTED BY THE ENGINEER.
CHAMFER ALL EXPOSED CORNERS 1".
DRAWING NOT TO SCALE.





DIMENSIONS AND QUANTITIES FOR DROP INLET(BASED ON MIN. HEIGHT, H)

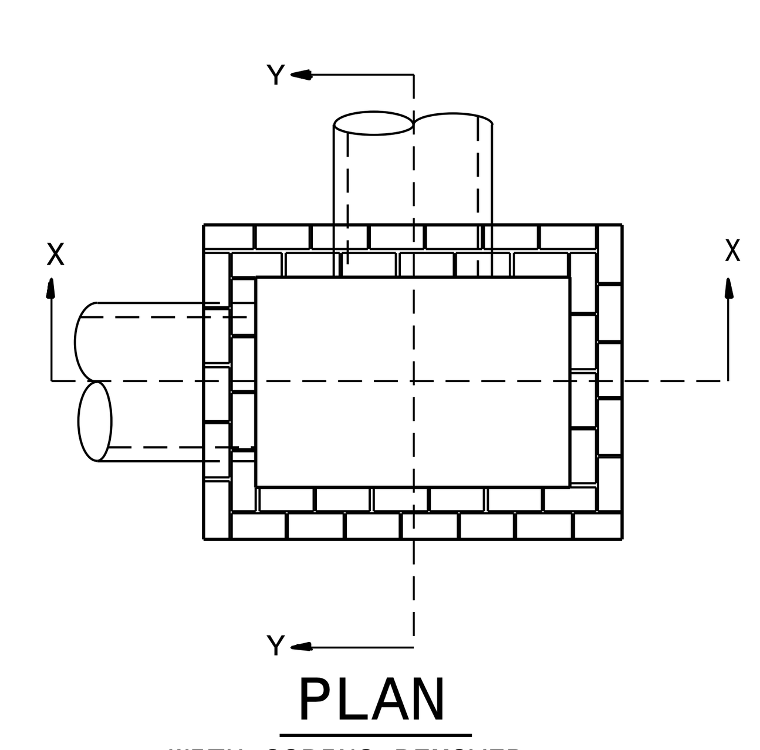
DIMENSIONS OF BOX & PIPE				CUBIC YARDS CONC. IN BOX			DEDUCTIONS FOR ONE PIPE	
PIPE	SPAN	WIDTH	MIN. HEIGHT					
D	A	B	H	BOTTOM SLAB	WALL PER FT. HT.	TOTAL CONCRETE FOR MINIMUM HEIGHT, H	C.M.	R.C.
12"	3'-0"	2'-0"	1'-8"	0.222	0.222	0.555	0.015	0.026
15"	/	/	1'-11"	/	/	0.611	0.023	0.036
18"			2'-1"			0.667	0.033	0.049
24"			2'-9"			0.814	0.059	0.085
30"	3'-0"	2'-0"	3'-2"	0.222	0.222	0.925	0.092	0.127

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ENGLISH DETAIL DRAWING FOR MINIMUM DEPTH CONCRETE DROP INLET 12" THRU 30" PIPE
SHEET OF 840D14

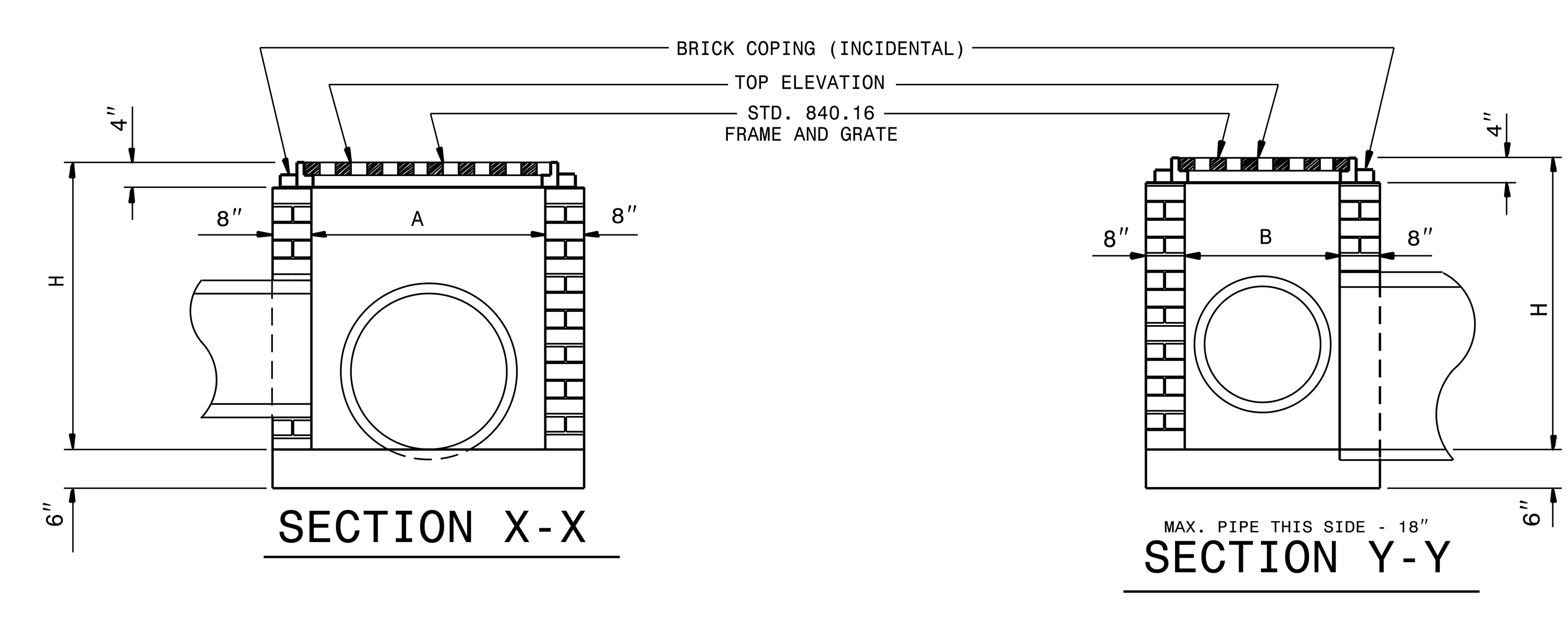
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
MINIMUM DEPTH BRICK DROP INLET
12" THRU 30" PIPE

SHEET 1 OF 1
840D15



GENERAL NOTES:
MORTAR JOINTS 1/2" TO 1/8" THICK.
USE CLASS "B" CONCRETE THROUGHOUT.
USE FORMS FOR CONSTRUCTION OF THE BOTTOM SLAB.
DEDUCT FOR PIPE(S) FROM TOTAL CU. YDS. OF BRICK MASONRY.
USE BRICK OR CONCRETE BLOCK WHICH COMPLIES WITH THE REQUIREMENTS OF SECTION 840 OF THE STANDARD SPECIFICATIONS.
IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.
CONSTRUCT WITH PIPE CROWNS MATCHING.
DO NOT USE BRICK MASONRY DROP INLET IN LOCATIONS SUBJECT TO TRAFFIC.
CHAMFER ALL EXPOSED CORNERS 1".
DRAWING NOT TO SCALE.



DIMENSIONS AND QUANTITIES FOR DROP INLET(BASED ON MIN. HEIGHT, H)

DIMENSIONS OF BOX & PIPE				CUBIC YARDS CONCRETE	CUBIC YARDS BRICK MASONRY		DEDUCTIONS FOR ONE PIPE	
PIPE	SPAN	WIDTH	MIN. HEIGHT					
D	A	B	H	BOTTOM SLAB	WALL PER FOOT HT.	TOTAL BRICK MASONRY FOR MIN. HEIGHT, H	C.S.	R.C.
12"	3'-0"	2'-0"	1'-8"	0.268	0.313	0.470	0.020	0.032
15"	/	/	1'-11"	0.268	0.313	0.548	0.031	0.047
18"			2'-1"	0.268	0.313	0.626	0.044	0.065
24"			2'-9"	0.268	0.313	0.835	0.078	0.113
30"	3'-0"	2'-0"	3'-2"	0.268	0.313	0.991	0.122	0.170

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
ENGLISH DETAIL DRAWING FOR MINIMUM DEPTH BRICK DROP INLET 12" THRU 30" PIPE
SHEET 1 OF 1 840D15

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

SEE PLATE FOR TITLE

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MODIFIED BY: E.E. WARD DATE: 3-4-02
CHECKED BY: DATE:
FILE SPEC.:

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PROJECT REFERENCE NO.	SHEET NO.
R-1015	2C-4

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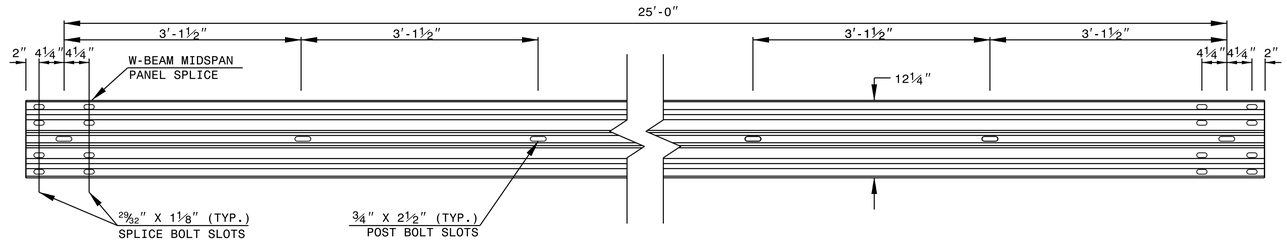
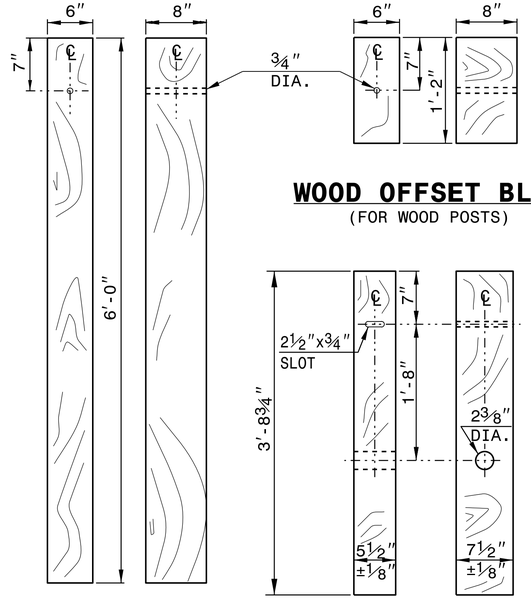
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



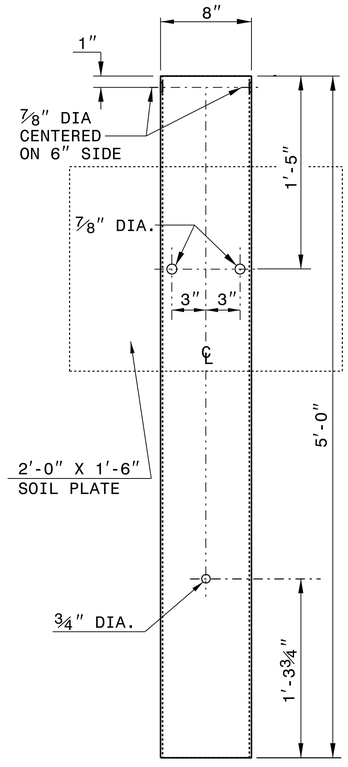
STANDARD W-BEAM GUARDRAIL



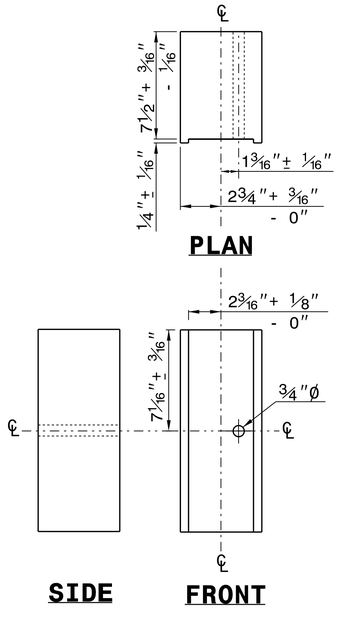
WOOD OFFSET BLOCK
(FOR WOOD POSTS)

STANDARD LINE POST

SHORT WOOD BREAKAWAY POST



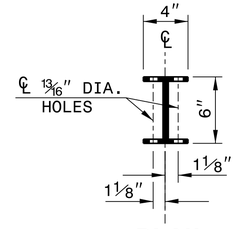
STEEL TUBE
TS 6"x8"x0.1875"



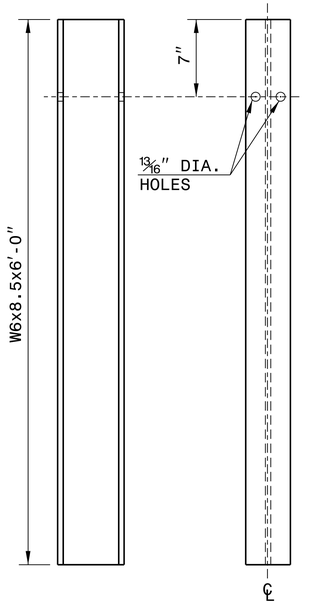
PLAN

SIDE FRONT

ROUTED OFFSET BLOCK



PLAN



SIDE FRONT

"W6" STEEL POST

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 ENGINEER JOHN S. HOWERTON
12/12/2018

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

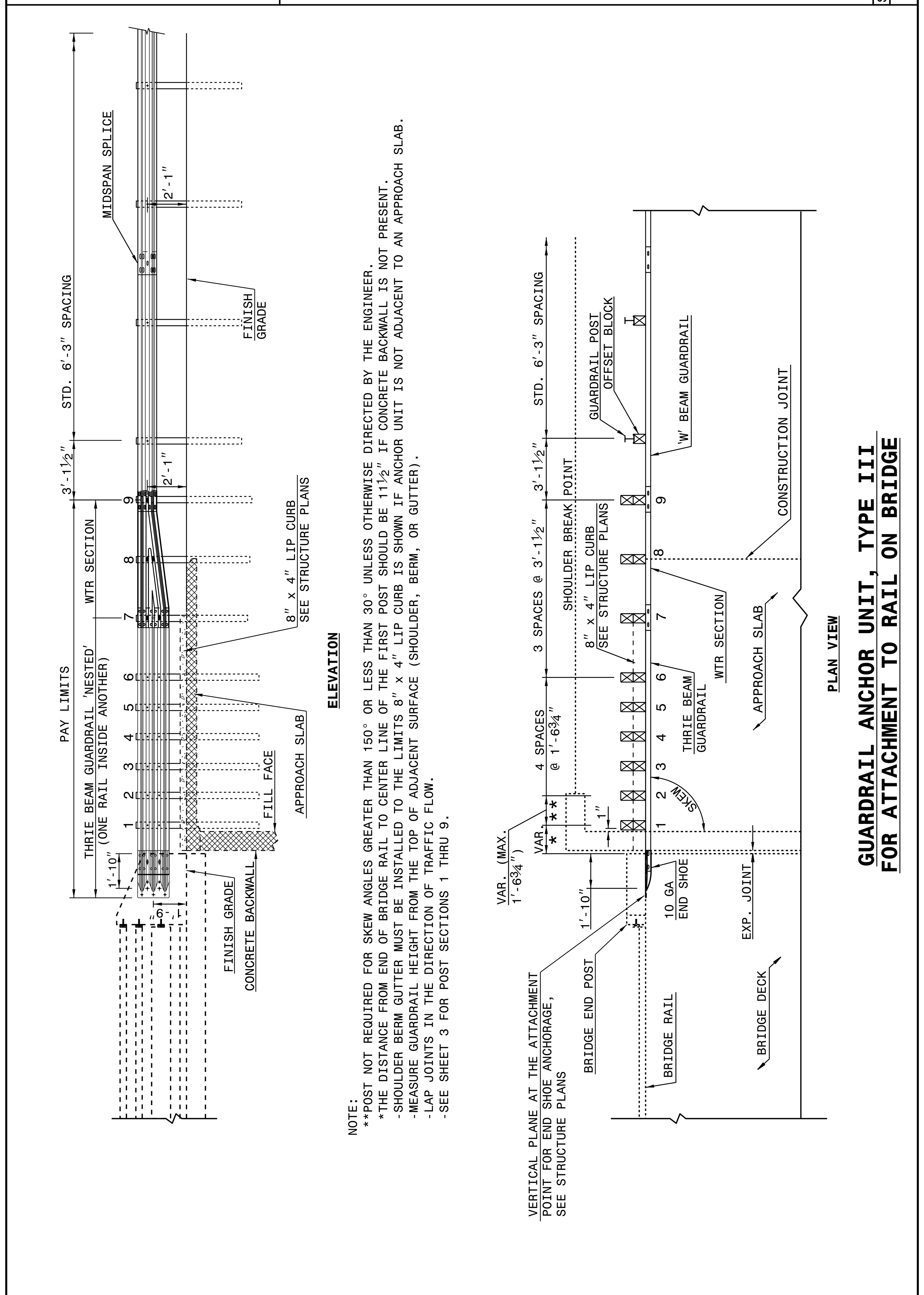
SEE TITLE BLOCK

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

DocuSign Envelope ID: 78D502D5-BB5C-4299-B5F4-BFA80A97C465

PROJECT REFERENCE NO.	SHEET NO.
R-1015	2C-5

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

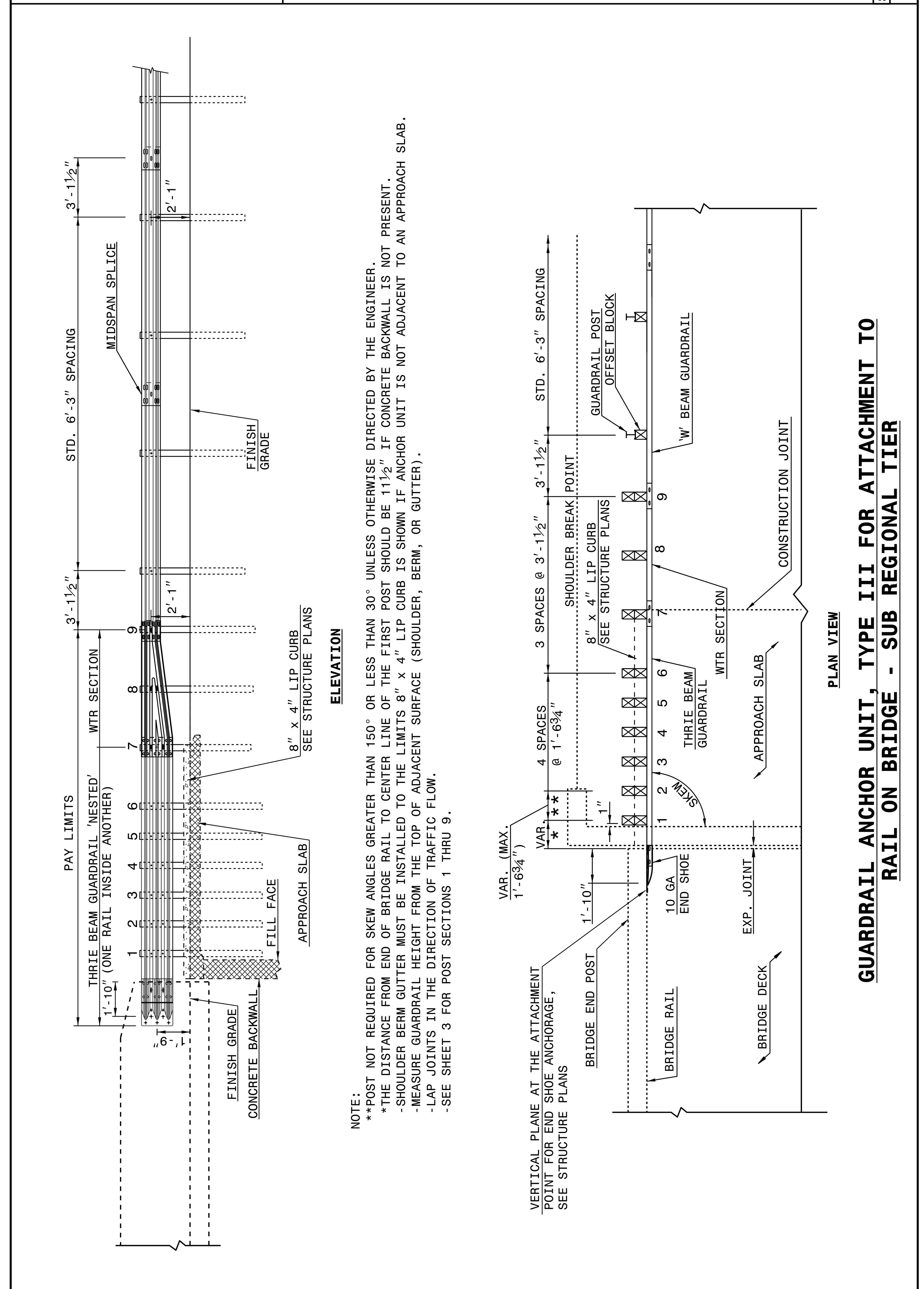


STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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 — 12/12/2018

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SEE TITLE BLOCK

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

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jhowerton AT CSD-2P2595

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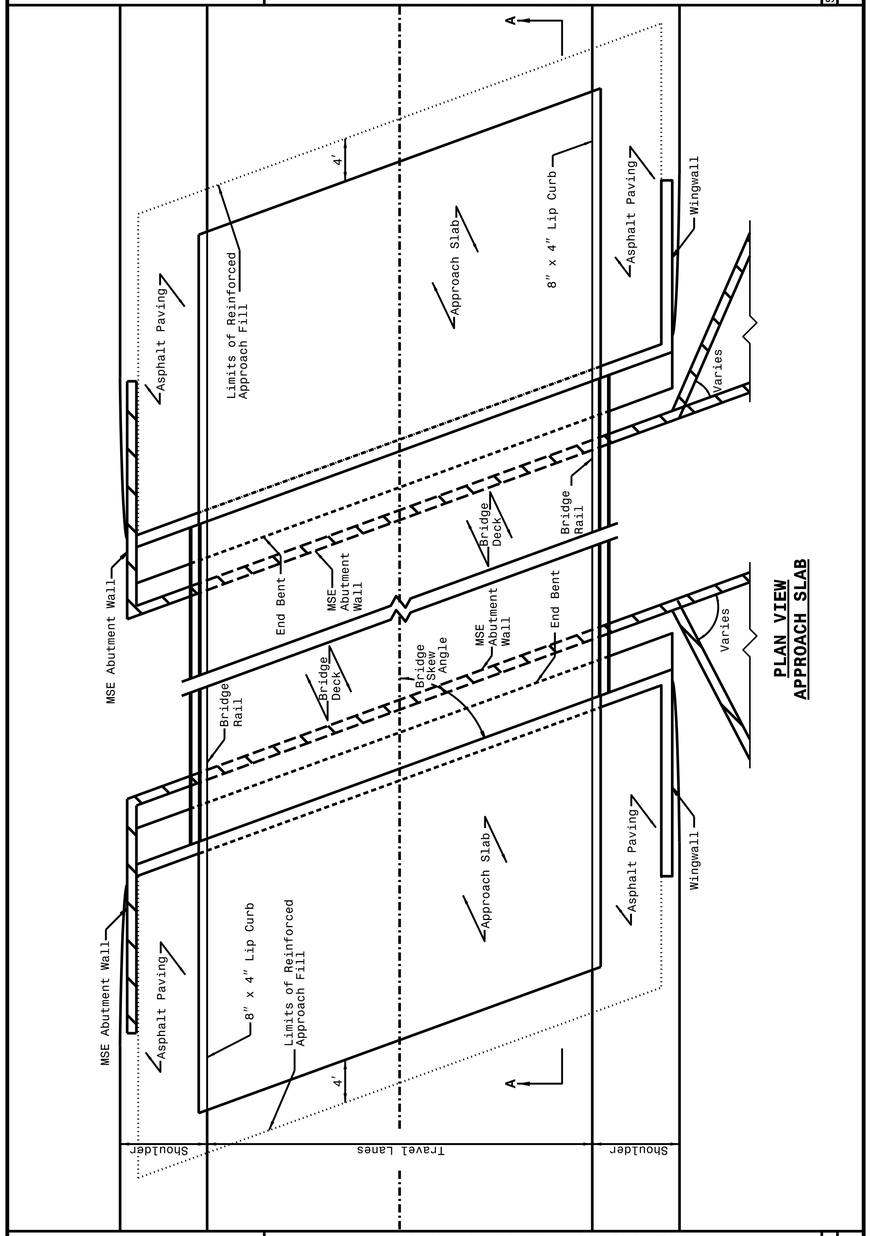
PROJECT REFERENCE NO.	SHEET NO.
R-1015	2C-6

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

ROADWAY DETAIL DRAWING FOR
BRIDGE APPROACH FILLS
TYPE III - REINFORCED APPROACH FILL FOR MECHANICALLY STABILIZED EARTH (MSE) ABUTMENT WALL

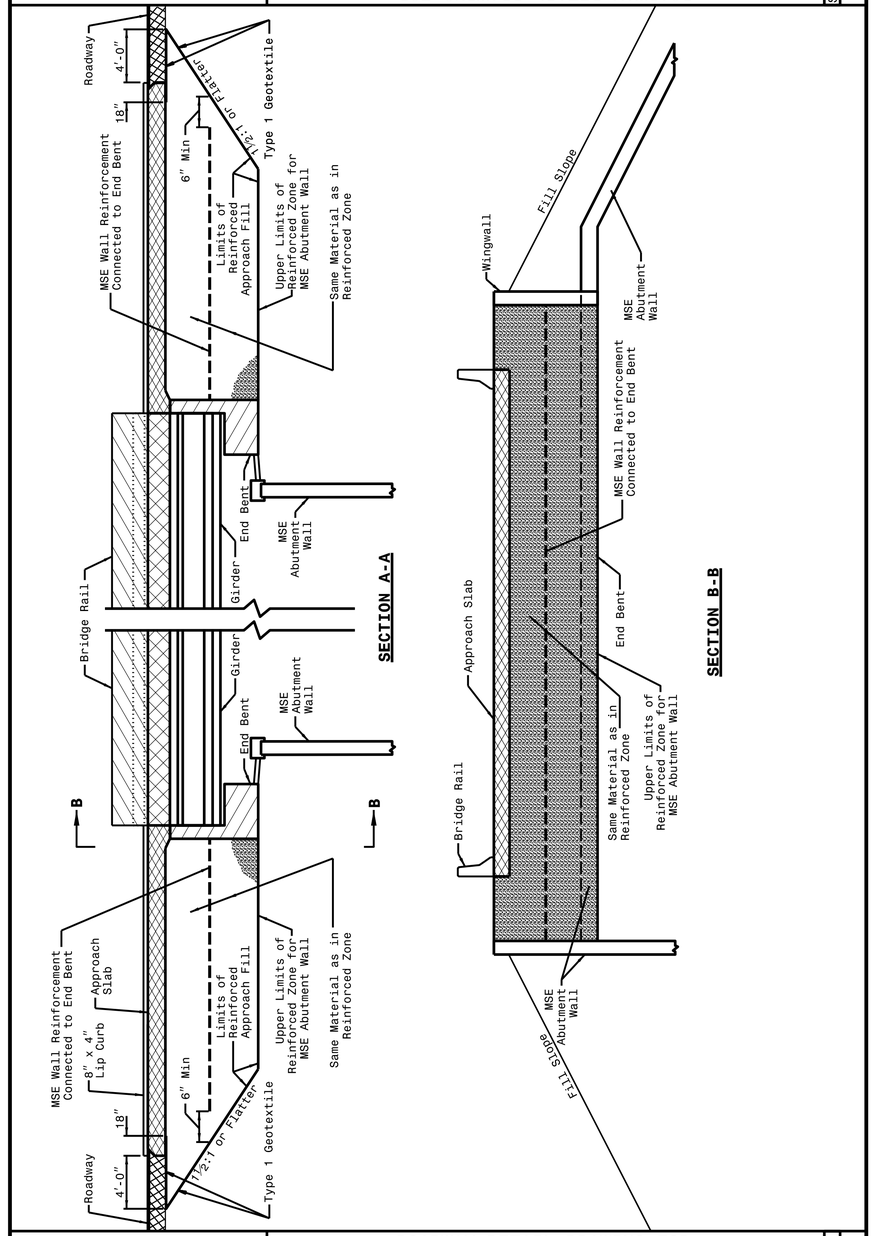
SHEET 1 OF 2 — 422D10



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

ROADWAY DETAIL DRAWING FOR
BRIDGE APPROACH FILLS
TYPE III - REINFORCED APPROACH FILL FOR MECHANICALLY STABILIZED EARTH (MSE) ABUTMENT WALL

SHEET 2 OF 2 — 422D10



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

ROADWAY DETAIL DRAWING FOR
BRIDGE APPROACH FILLS
TYPE III - REINFORCED APPROACH FILL FOR MECHANICALLY STABILIZED EARTH (MSE) ABUTMENT WALL

SHEET 1 OF 2 — 422D10

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER
873F3D17DCDC43F
12/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

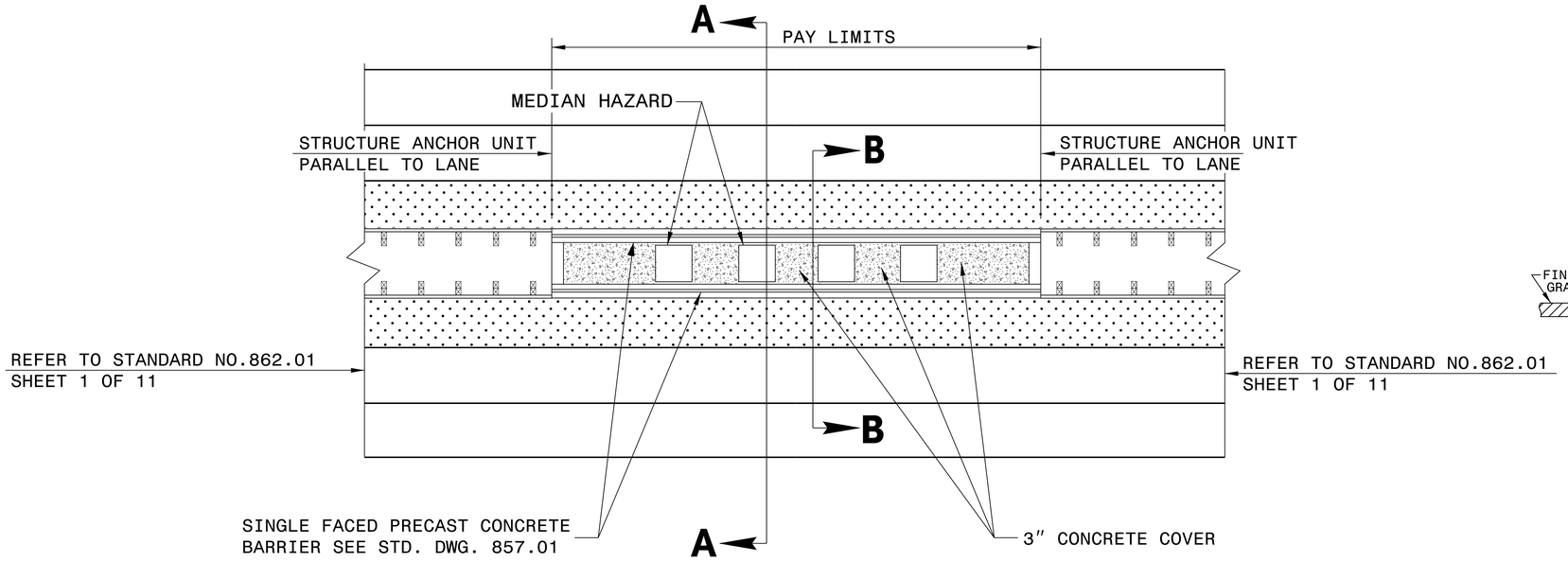
CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

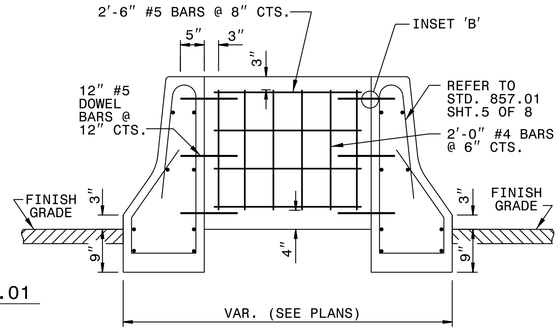
TYPE III REINFORCED APPROACH FILLS

ORIGINAL BY: K. A. KEMPF DATE: JULY 2017
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: 2018 standard drawings\division 422d10.dgn

DocuSign Envelope ID: 78D502D5-BB5C-4299-B5F4-BFA80A97C465

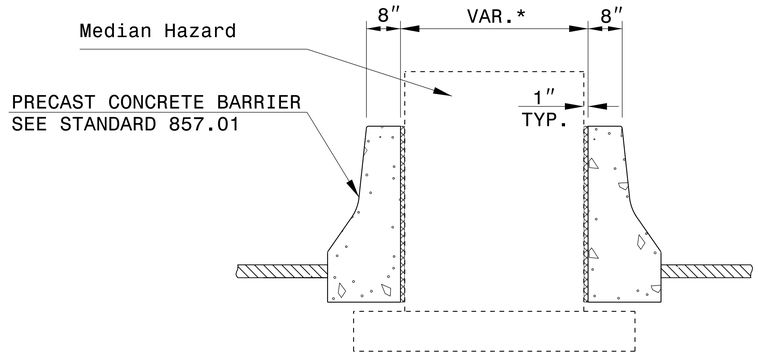
PROJECT REFERENCE NO.	SHEET NO.
R-1015	2C-7



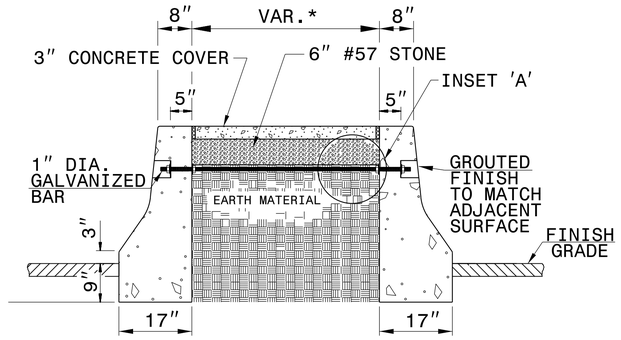


ENDWALL

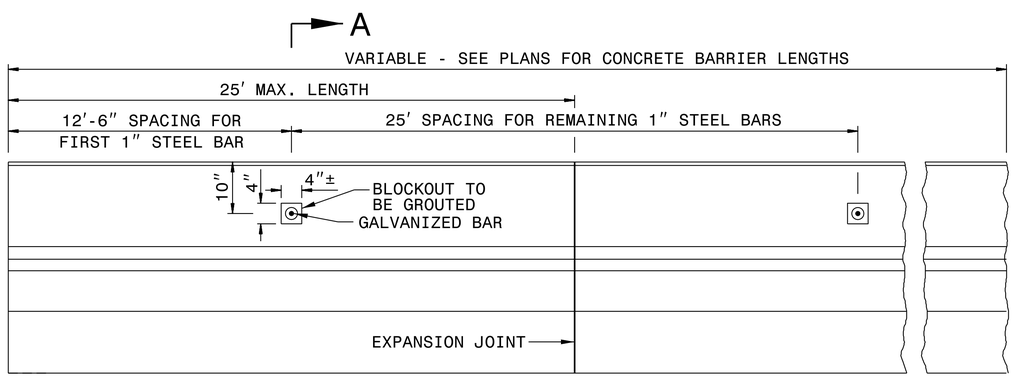
INSET 'A'



SECTION A-A



SECTION B-B



ELEVATION

GENERAL NOTES:

*THIS DIMENSION MAY VARY DEPENDING ON THE WIDTH OF THE PIER.
INSET FIRST 1" DIA. GALVANIZED BAR 12'-6" AND SPACE THE REMAINING 1" BARS AT 25'-0".

USE AN APPROVED BONDING SYSTEM IN ACCORDANCE WITH SECTION 1081-1, TYPE 3A OF THE STANDARD SPECIFICATIONS.

USE CLASS B CONCRETE FOR THE CONCRETE COVER

SEAL ALL EXPANSION JOINTS WITH JOINT FILLER (SEE SECTION 1028 OF THE SPECIFICATIONS).

PLACE A 1" BAR BETWEEN EACH SET OF PIERS

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER T.S. SPELL
12/12/2018

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

DETAIL OF MEDIAN HAZARD PROTECTION

ORIGINAL BY: T.S.Spell DATE: 2-4-10
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: howerton\Barrier Cover for Median Hazard Protection

15-NOV-2017 13:03
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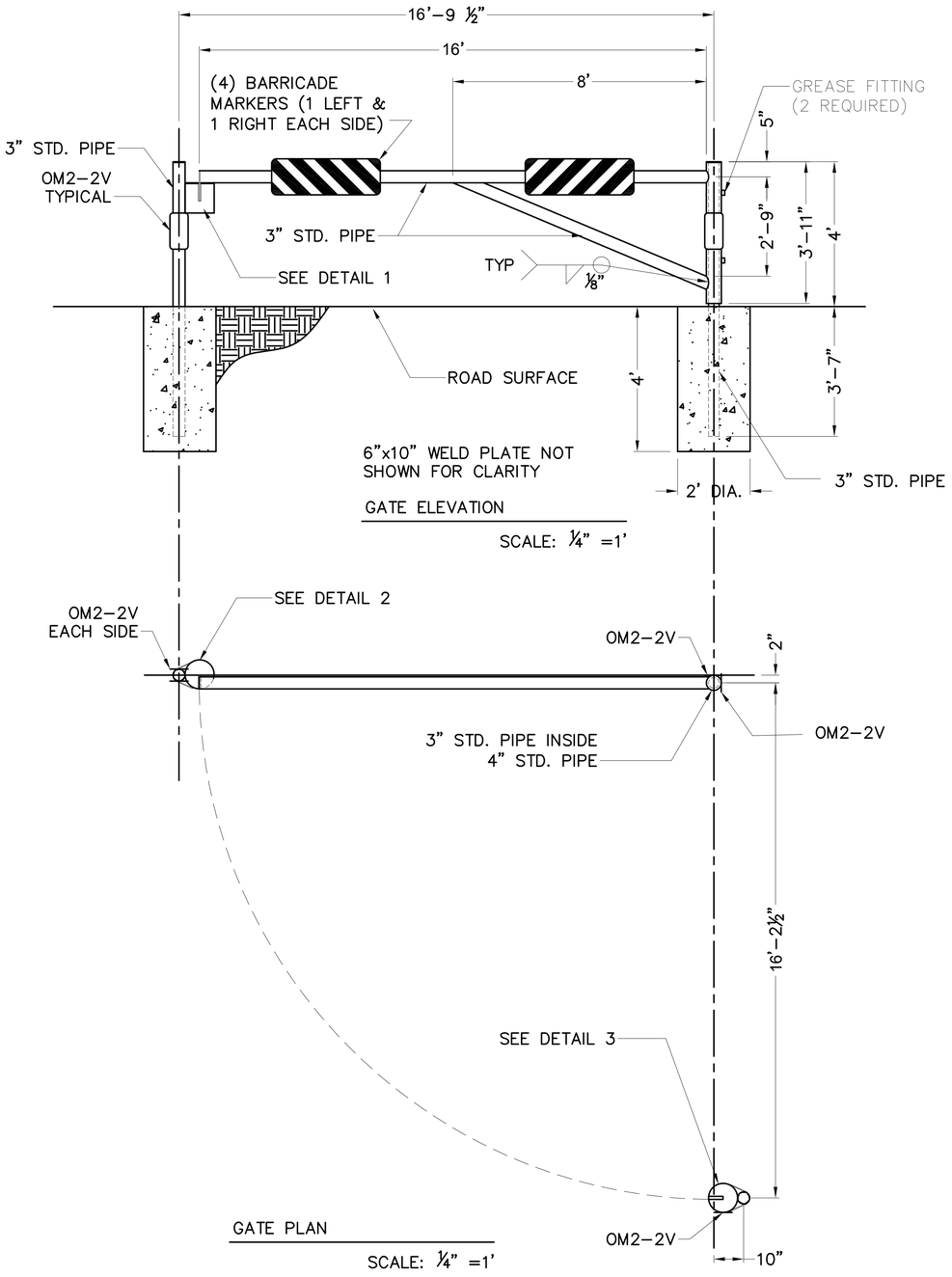
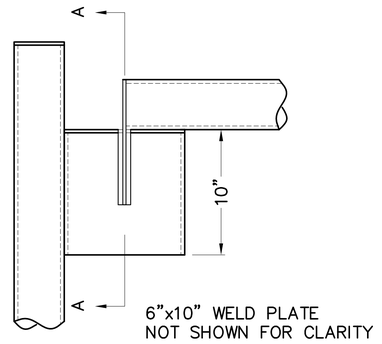
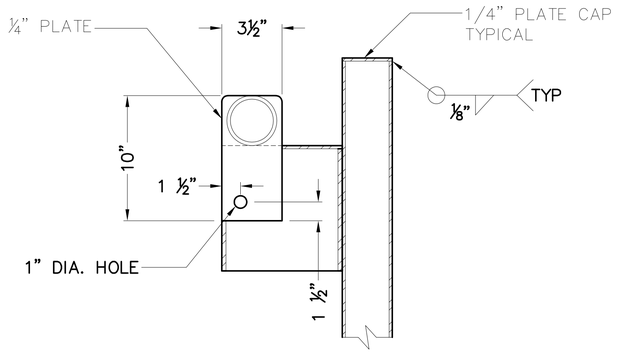
jhowerton AT CSD-292595





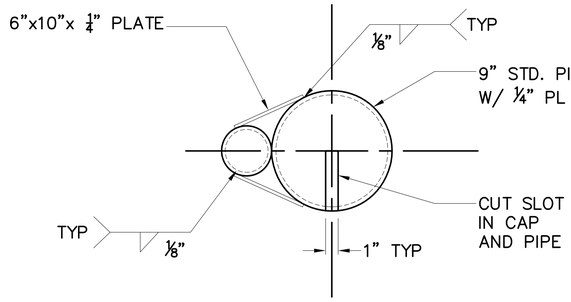
DETAIL 1, ELEVATION

SCALE: 1"=1'



SECTION A–A

SCALE: 1"=1'



DETAIL 2: PLAN VIEW

SCALE: 1"=1'

NOTE ORIENTATION, FOR OTHER INFO SEE DETAIL 2

DETAIL 3, PLAN VIEW

SCALE: 1"=1'

NOTES:

1. ALL PIPE SHALL BE ASTM A53 GRADE B STEEL PIPE.
2. ENTIRE STRUCTURE SHALL RECEIVE A STEEL COATING SYSTEM 5 FROM FP–03 TABLE 563–1 OR SYSTEM 7 FROM TABLE 563–2 AS APPLICABLE. SURFACE PREPARATION SHALL CONFORM TO FP–03 563.07(b). ALL COATS WILL BE SHOP APPLIED. PAINT SHALL COMPLY WITH FP–03 708. COLOR SHALL BE BROWN AS APPROVED BY THE CO.
3. GRIND ALL CORNERS AND WELDS SMOOTH.
4. ALL MATERIALS SHALL BE FREE OF RUST.
5. CONCRETE SHALL BE 3000 PSI AND MAY BE BLENDED PRE–APPROVED BAG MIX CONFORMING TO ASTM C–387.
6. CLOSURE GATE PAY ITEM INCLUDES ALL REQUIRED ATTACHED SIGNS.
7. ATTACH ALL SIGNS WITH VANDAL–PROOF FITTINGS TO BE APPROVED BY THE CO.
8. "OM2–2V" AND BARRICADE MARKERS SHALL HAVE RETROREFLECTIVE SHEETING OF ASTM D 4956 TYPE II "SUPER ENGINEERING GRADE"
9. FIELD VERIFY POST LENGTH FOR FILL SLOPE SIDE.

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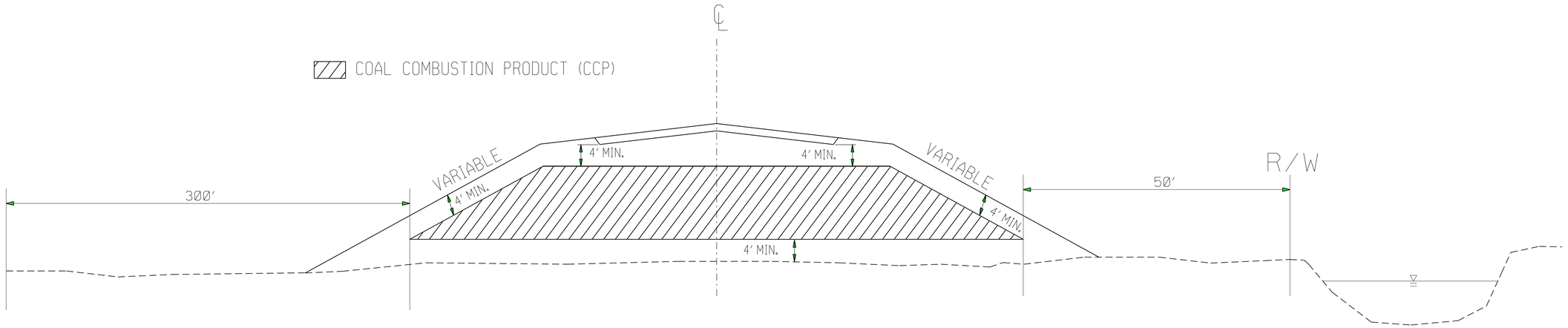
PROJECT REFERENCE NO.	SHEET NO.
R-1015	2C-9

COAL COMBUSTION PRODUCT PLACEMENT



PLACE CCP IN HATCHED AREA IN ACCORDANCE WITH THE PROJECT SPECIAL PROVISIONS

PLACE CCP A MINIMUM OF 5' ABOVE SEASONAL HIGH GROUND WATER

PLACE AT LOCATIONS AS APPROVED BY THE ENGINEER

PLACE SOIL BORROW MATERIAL ON THE OUTSIDE OF CCP AS EACH LIFT OF CCP IS PLACED

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton
12/14/2018

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

COAL COMBUSTION PRODUCT PLACEMENT DETAIL

ORIGINAL BY: J.S.H. DATE: 3/16/15
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: joel/coal combustion material detail.dgn

07-SEP-2017 08:21
S:\Contracts\Special Details\jhowerton\Coal Combustion Product Detail.dgn
jhowerton AT CSD-292595

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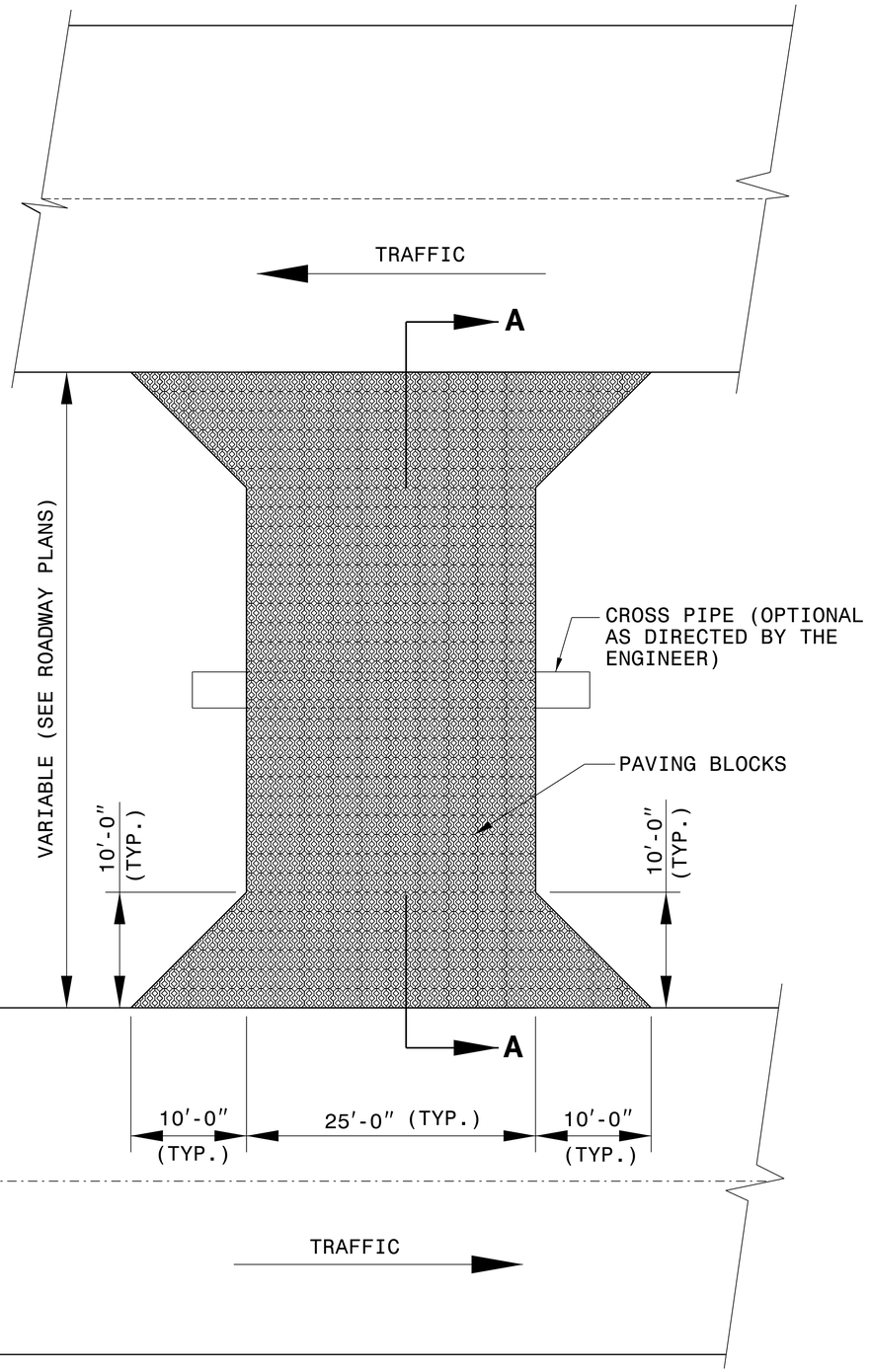
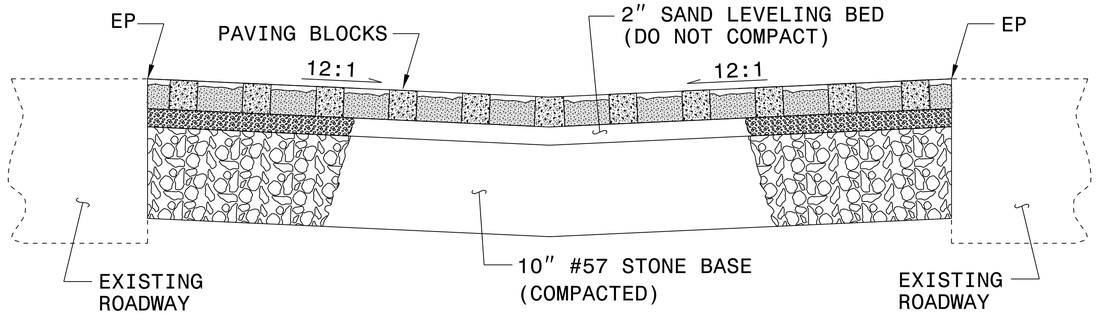
PROJECT REFERENCE NO.	SHEET NO.
R-1015	2C-10

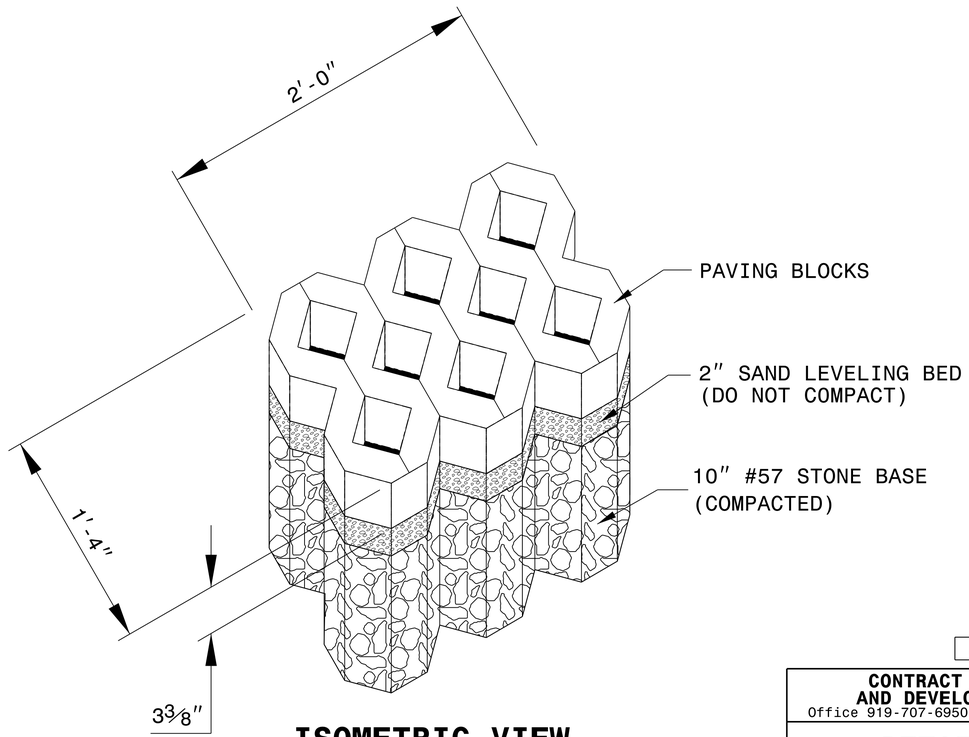


PLAN VIEW



SECTION "A-A"

GENERAL NOTES:
FILL CORES OF PAVING BLOCKS WITH TOPSOIL AND SEED IN ACCORDANCE WITH SPECIFICATION SECTION 1660.



ISOMETRIC VIEW

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032966 JOEL S. HOWERTON 2/28/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

DETAIL FOR MEDIAN CROSSOVER

ORIGINAL BY: C.O. Cuevas DATE: 10-00
MODIFIED BY: E.E. WARD DATE: 11-03
CHECKED BY: DATE:
FILE SPEC.: s:usr/details/stand/pavingblocks.dgn

29-NOV-2018 07:45
S:\Contracts\Contracts\Special Details\erioward\usr\details\stand\pavingblocks.dgn
jhowerton AT CSD-242595

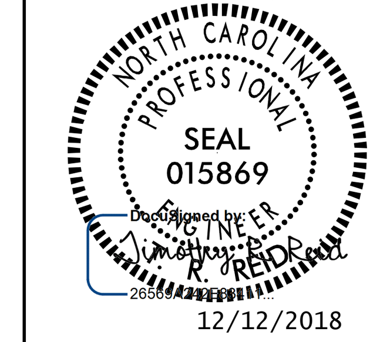
DocuSign Envelope ID: 66C2D836-48C9-42A0-A57A-6F483D3B6D42

8/17/99

REVISIONS

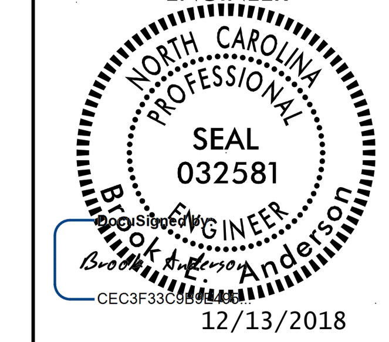
PROJECT REFERENCE NO.	SHEET NO.
R-1015	2D-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER



12/12/2018

HYDRAULICS ENGINEER



12/13/2018

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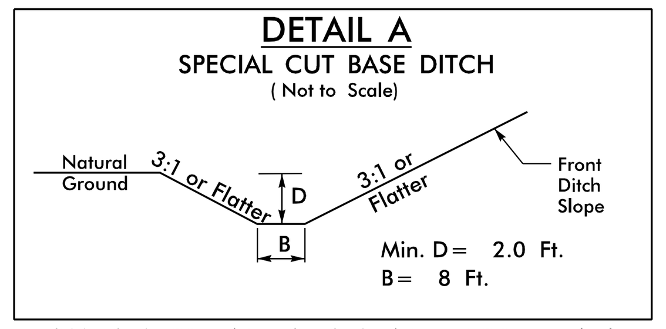
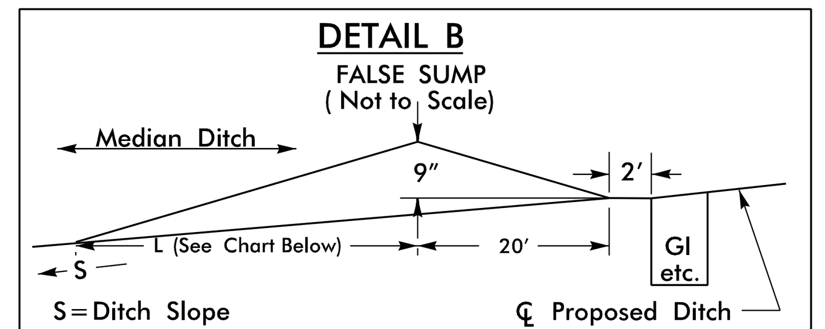
DRAINAGE DITCH DETAILS

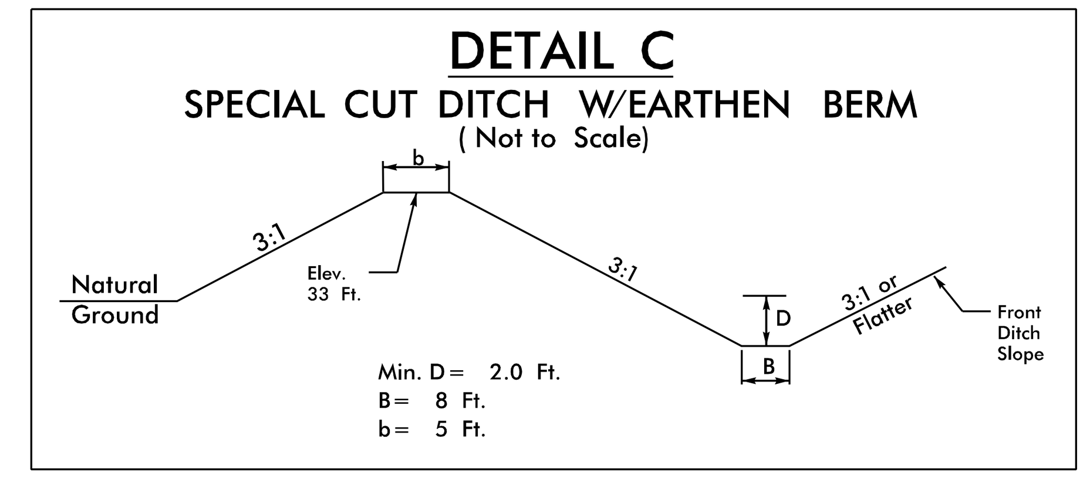


FROM STA. 32+60 TO STA. 64+74.20 –L– (LT)
FROM STA. 0+00 TO STA. 7+00 –RP1B– (LT)
FROM STA. 10+75 TO STA. 29+00 –RP1CD– (LT)

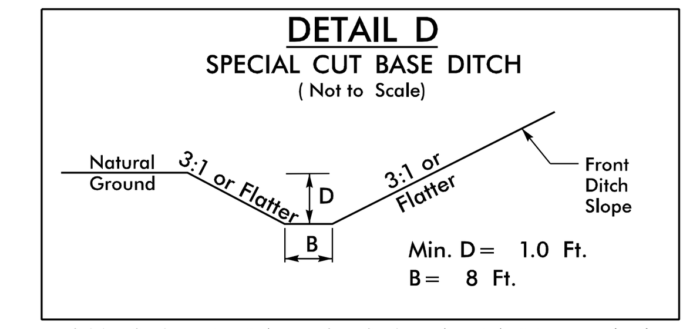


Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

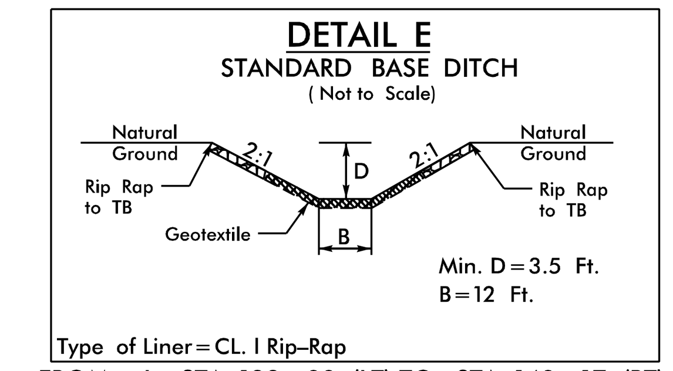
SEE PLANSHEETS FOR LOCATIONS



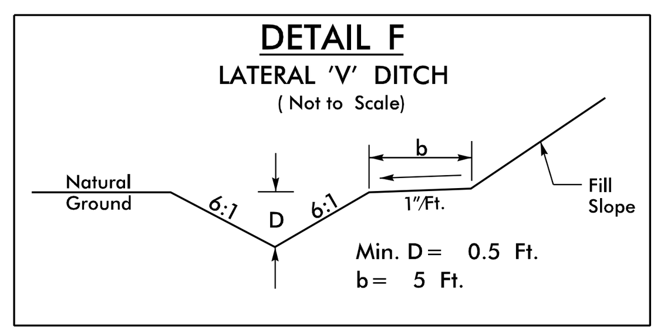
FROM STA. 79+50 TO STA. 86+87 –L– (LT)



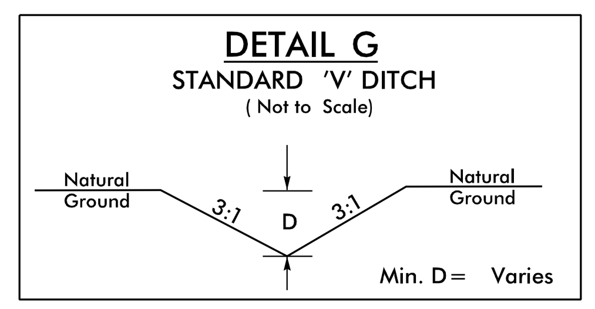
FROM STA. 74+26 TO STA. 76+06.30 –L– (RT)
FROM STA. 0+00 TO STA. 7+50 –RP1CD– (RT)
FROM STA. 330+40 TO STA. 336+35 –L– (LT)
FROM STA. 330+17 TO STA. 335+00 –L– (RT)
FROM STA. 356+50 TO STA. 361+50 –L– (LT)



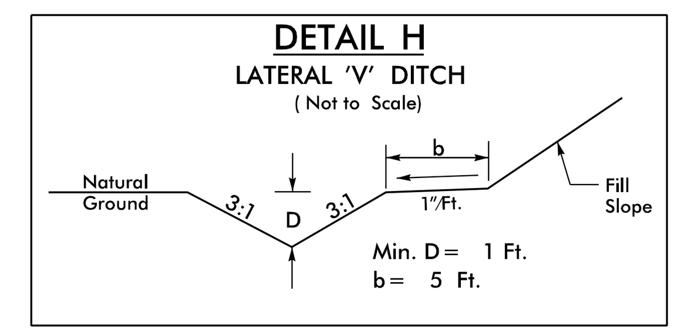
FROM –L– STA. 138+00 (LT) TO STA. 140+17 (RT)



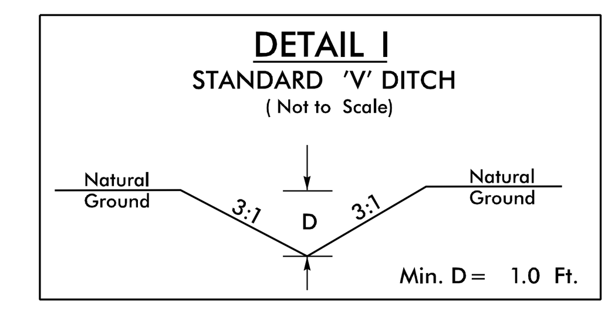
FROM –L– STA. 150+50 TO STA. 154+76 (RT)



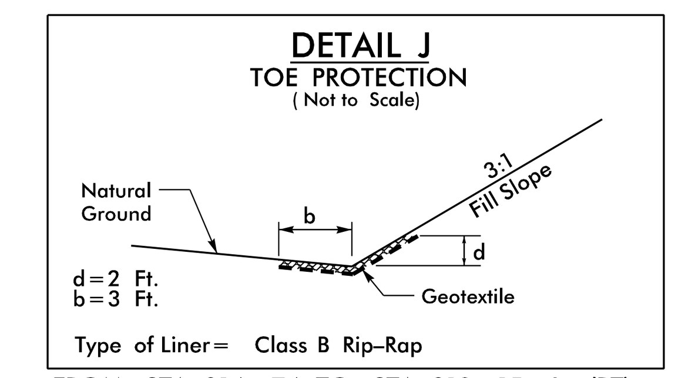
FROM –L– STA. 247+15 TO STA. 247+24 (RT)



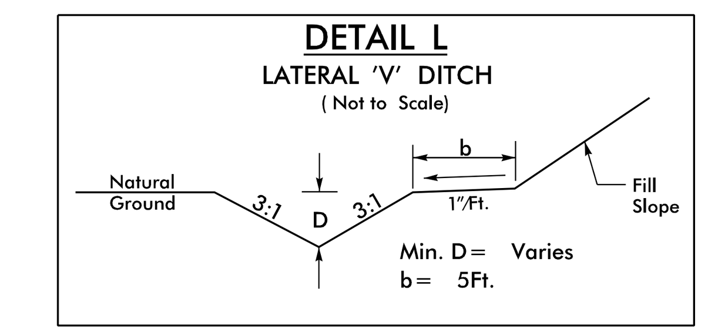
FROM STA. 165+23 TO STA. 169+60 –L– (RT)
FROM STA. 219+40 TO STA. 223+55 –L– (LT)
FROM STA. 363+57 TO STA. 364+30 –L– (RT)



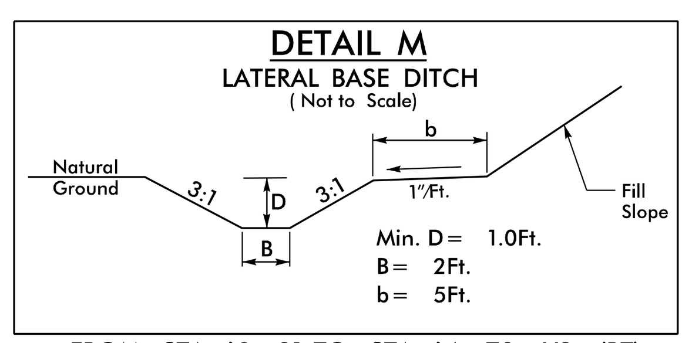
FROM STA. 169+60 TO STA. 170+50 –L– (RT)
FROM STA. 550+75 (–213') TO STA. 551+46 (–182') –L– (LT)



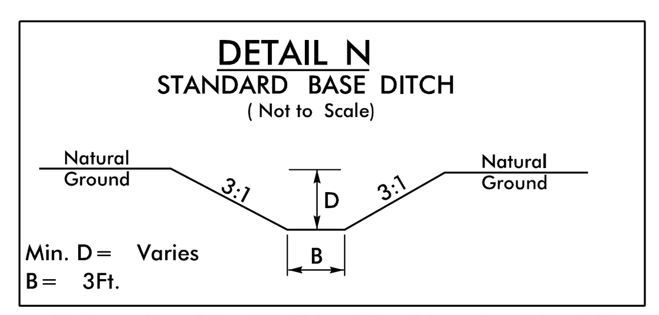
FROM STA. 214+74 TO STA. 218+15 –L– (RT)
FROM STA. 16+60 TO STA. 19+49 –Y3RPB– (LT)
FROM STA. 271+00 TO STA. 273+10 –L– (RT)
FROM STA. 292+34 TO STA. 293+00 –L– (LT)
FROM STA. 470+00 TO STA. 471+20 –L– (LT)
FROM STA. 470+00 TO STA. 471+00 –L– (RT)



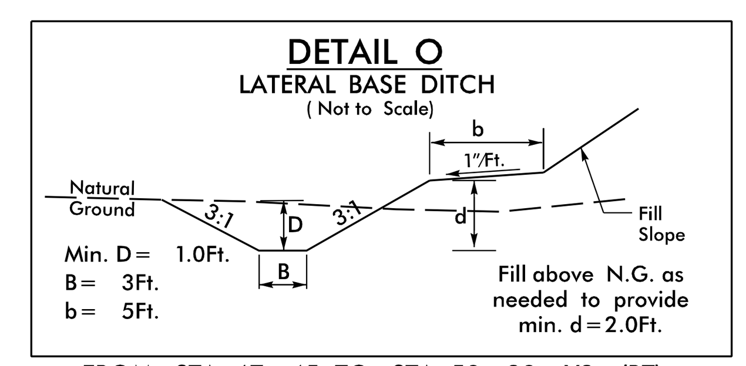
FROM STA. 13+31 TO STA. 16+56 –Y3RPB– (LT)
FROM STA. 267+67 TO STA. 271+88 –L– (RT)



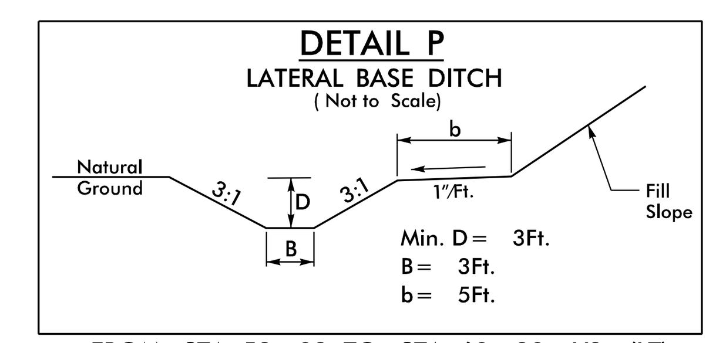
FROM STA. 60+31 TO STA. 64+79 –Y3– (RT)
FROM STA. 250+09 TO STA. 253+89 –L– (RT)



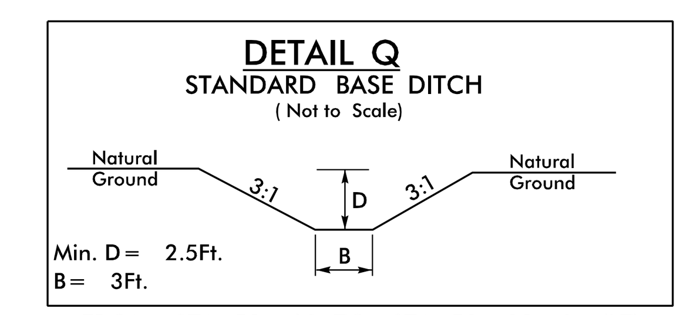
FROM STA.50+30 TO STA. 51+45 –Y3– (RT)
FROM STA. 52+76 TO STA. 53+50 –Y4– (LT)
FROM STA. 56+71 TO STA. 56+83 –Y4– (RT)



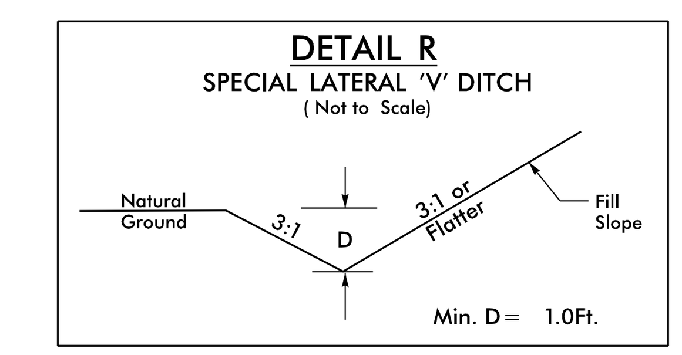
FROM STA. 47+45 TO STA. 50+30 –Y3– (RT)



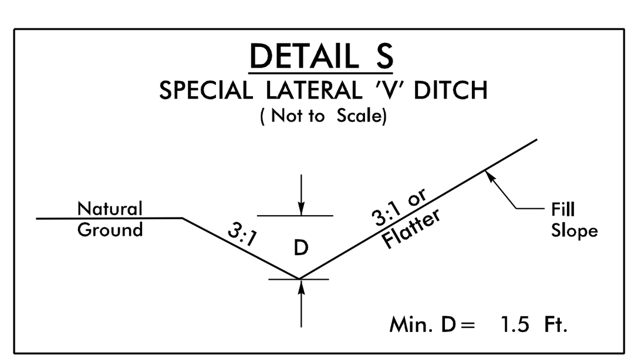
FROM STA. 53+03 TO STA. 60+30 –Y3– (LT)



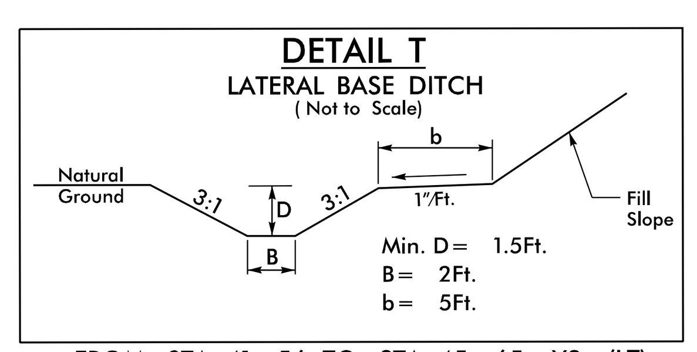
FROM STA. 52+60 TO STA. 52+92 –L– (LT)



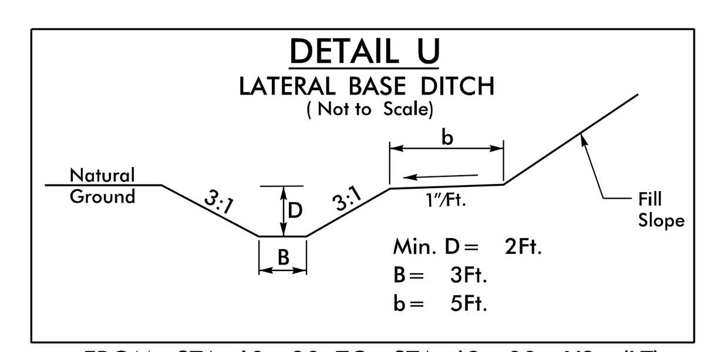
FROM STA. 68+34 TO STA. 73+89 –Y3– (LT)
FROM STA. 246+22 TO STA. 248+00 –L– (LT)
FROM STA. 58+00 TO STA. 59+25 –Y4– (RT)
FROM STA. 469+33 TO STA. 470+27 –L– (LT)
FROM STA. 529+15 TO STA. 530+50 –L– (LT)
FROM STA. 531+50 TO STA. 533+55 –L– (LT)
FROM STA. 526+50 TO STA. 530+14 –L– (RT)
FROM STA. 32+80.84 TO STA. 33+38 –SERVRD– (RT)
FROM STA. 35+17 TO STA. 37+10 –SERVRD– (RT)
FROM STA. 91+56 TO STA. 92+95 –RP2A– (LT)
FROM STA. 42+50 TO STA. 48+90 –SERVRD– (RT)
FROM STA. 53+92 TO STA. 56+47 –SERVRD– (RT)
FROM STA. 558+00 TO STA. 559+00 –L– (LT)
FROM STA. 10+25 TO STA. 14+50 –SERVEXT– (LT)
FROM STA. 53+92 TO STA. 56+47 –SERVRD– (RT)
FROM STA. 552+25 TO STA. 556+50 –L– (LT)
FROM STA. 16+00 TO STA. 17+80 –SERVEXT– (LT)



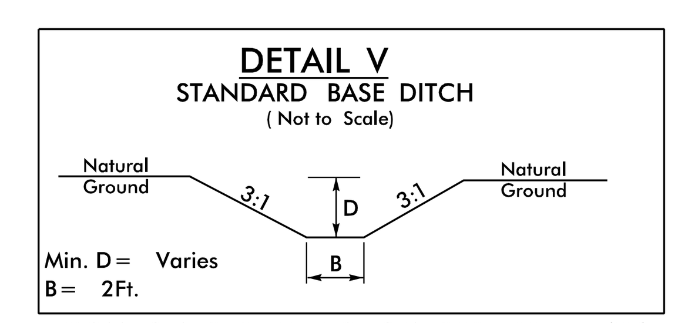
FROM STA. 65+16 TO STA. 73+89 –Y3– (RT)
FROM STA. 65+00 TO STA. 67+86 –Y3– (LT)
FROM STA. 63+00 TO STA. 65+86 –RP2AC– (RT)
FROM STA. 53+50 TO STA. 58+30 –RP2AC– (RT)
FROM STA. 37+45 TO STA. 42+50 –SERVRD– (RT)
FROM STA. 48+90 TO STA. 53+92 –SERVRD– (RT)



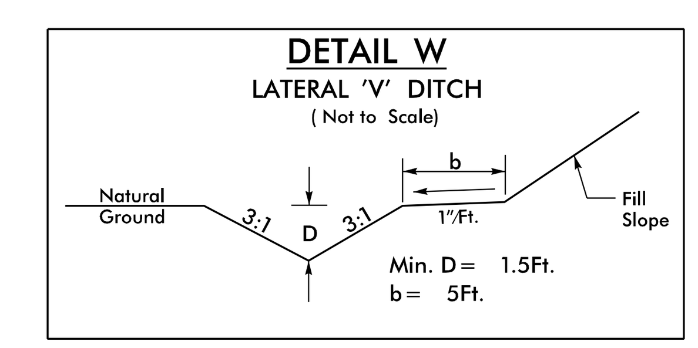
FROM STA. 41+56 TO STA. 45+65 –Y3– (LT)
FROM STA. 37+00 TO STA. 43+34 –Y4– (LT)
FROM STA. 38+00 TO STA. 43+50 –Y4– (RT)
FROM STA. 10+52 TO STA. 12+00 –Y4DR– (LT)
FROM STA. 45+26 TO STA. 49+73 –Y4– (RT)
FROM STA. 48+30 TO STA. 49+74 –Y4– (RT)



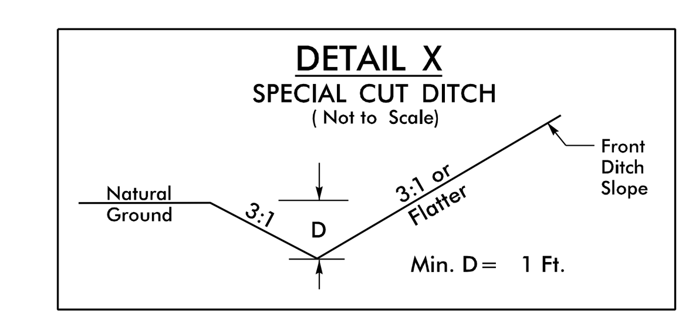
FROM STA. 60+30 TO STA. 62+00 –Y3– (LT)
FROM STA. 47+50 TO STA. 51+00 –Y3– (LT)



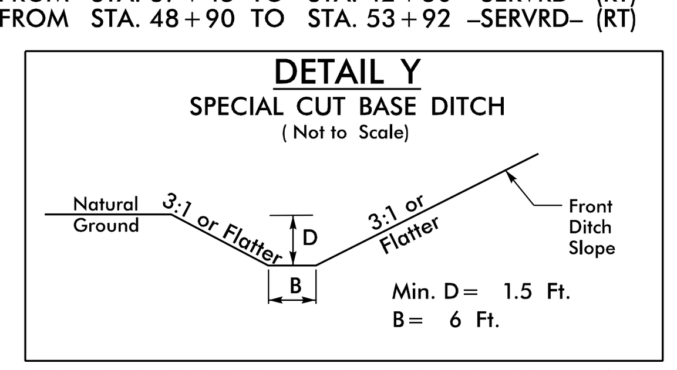
FROM STA. 249+74 TO STA. 250+09 –L– (RT)
FROM STA. 10+20 TO STA. 10+71 –Y3– (LT)
FROM STA. 377+78.7 TO STA. 377+97 –L– (LT)
FROM STA. 379+47 TO STA. 380+98.5 –L– (RT)



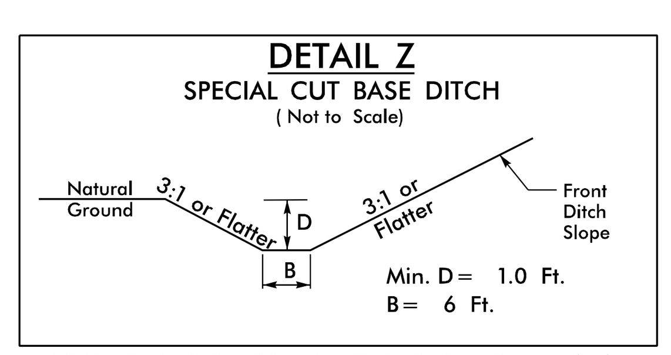
FROM STA. 269+75 TO STA. 278+50 –L– (LT)



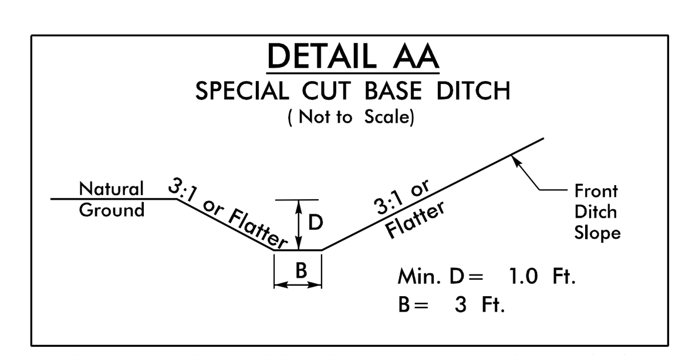
FROM STA. 309+00 TO STA. 313+25 –L– (RT)



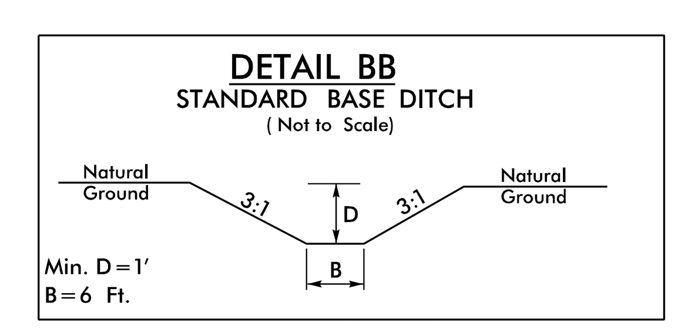
FROM STA. 310+00 –L– TO STA. 313+00 –L– (LT)



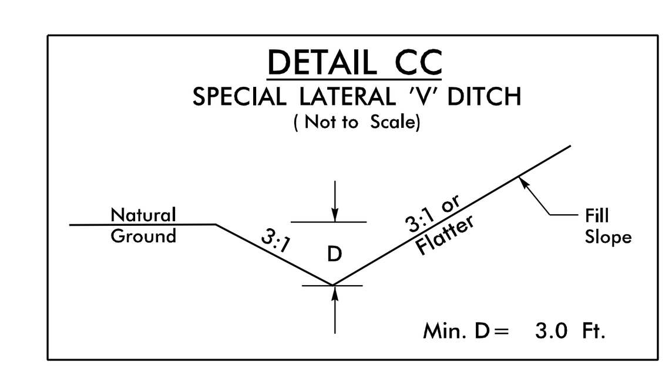
FROM STA. 313+00 TO STA. 319+50 –L– (LT)
FROM STA. 329+67 TO STA. 330+40 –L– (LT)
FROM STA. 361+50 TO STA. 372+10 –L– (LT)



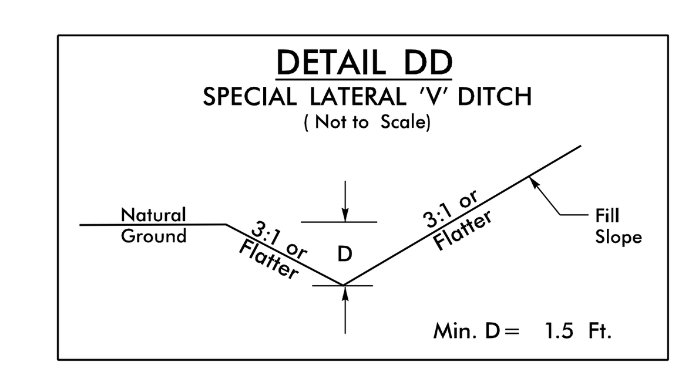
FROM STA. 342+60 TO STA. 345+56 –L– (RT)
FROM STA. 352+35 TO STA. 356+50 –L– (LT)



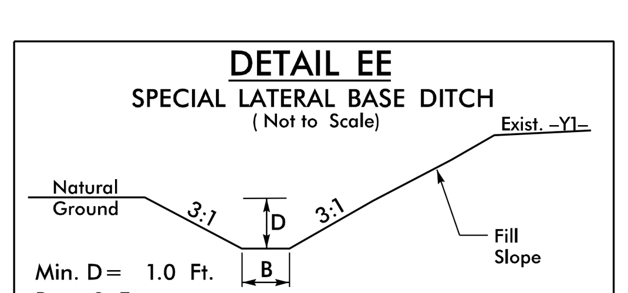
STA. 402+97 –L– (143' RT) S = 0.245 %
STA. 403+42 –L– (120' RT) S = 0.213 %
STA. 21+17 –RP2CD– (133' RT) S = 0.200 %



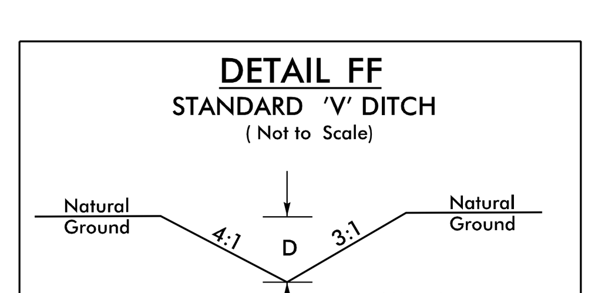
FROM STA. 10+50 TO STA. 13+50 –DR1– (LT)



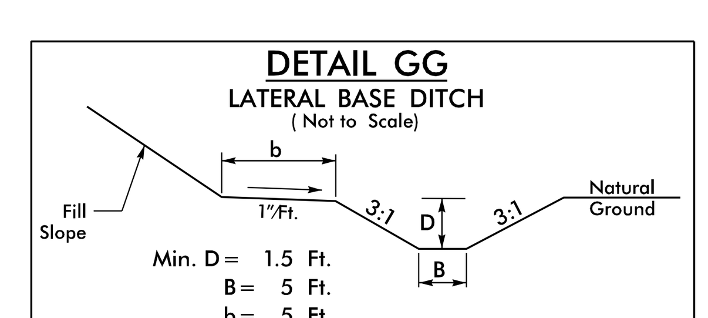
FROM STA. 40+50 TO STA. 41+63 –RP2AC– (RT)



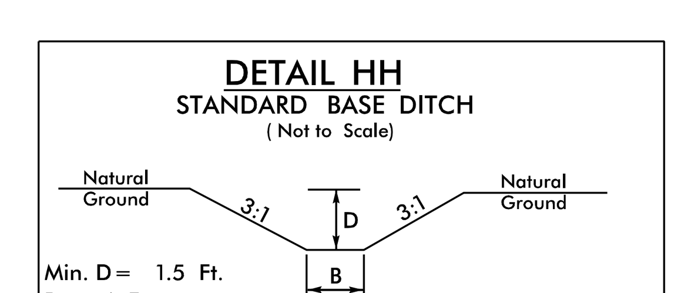
FROM STA. 464+23 TO STA. 464+54 –L– (LT)
FROM STA. 464+42 TO STA. 464+59 –L– (RT)
FROM STA. 464+83 TO STA. 465+29 –L– (LT)
FROM STA. 464+90 TO STA. 465+15 –L– (RT)



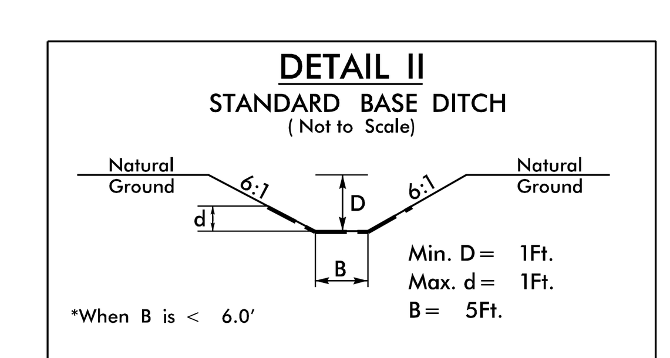
FROM STA. 153+37 TO STA. 153+63 –L– (LT)
FROM STA. 486+30 TO STA. 486+76 –L– (LT)
FROM STA. 21+18 (137') TO STA. 22+52 (117.3') –RP2CD– (RT)



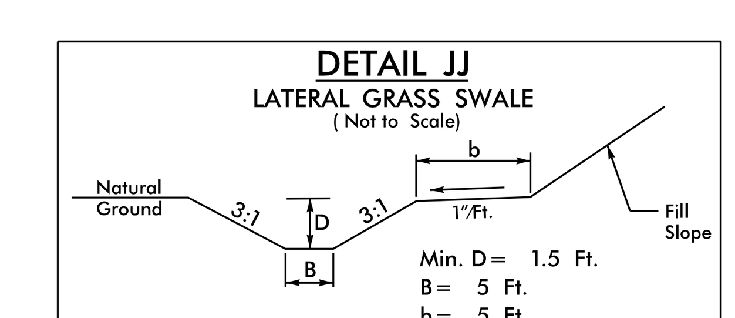
FROM STA. 71+92 TO STA. 74+75 –RP2AC– (RT)
FROM STA. 519+38 TO STA. 520+10 –L– (LT)



FROM STA. 8+75 TO STA. 9+00 –RP2CD– (LT)



FROM STA. 512+94 TO STA. 514+35 –L– (RT)



FROM STA. 509+37 TO STA. 517+00 –L– (LT)

11/28/2018
Q:\RA\...\CADD\R1015\Roadway\Proj\r1015_Hyd_DRN_details.dgn

DocuSign Envelope ID: 66C2D836-48C9-42A0-A57A-6F483D3B6D42

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
R-1015	2D-2
R/W SHEET NO.	

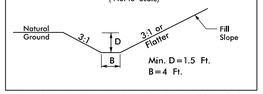
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 015869 ENGINEER
12/12/2018

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 032581 ENGINEER
12/13/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

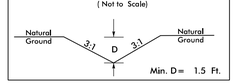
DRAINAGE DITCH DETAILS

DETAIL KK
SPECIAL LATERAL BASE DITCH
(Not to Scale)



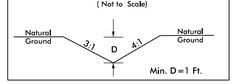
FROM STA. 9+00 TO STA. 11+65 –RP2CD– (LT)
FROM STA. 563+25 TO STA. 565+50 –L– (LT)

DETAIL LL
STANDARD 'V' DITCH
(Not to Scale)



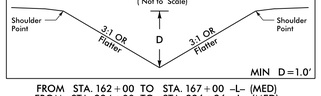
STA. 90+41 –RP2A– (LT)
FROM STA. 12+15 TO STA 12+89 –RP2CD– (RT)
FROM STA. 534+65 TO STA. 535+02 –L– (LT)
FROM STA. 536+53 TO STA. 536+74 –L– (LT)
FROM STA. 536+83 TO STA. 537+43 –L– (LT)

DETAIL MM
STANDARD 'V' DITCH
(Not to Scale)



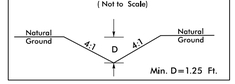
STA. 11+66 to 12+05 –RP2CD– (LT)

DETAIL NN
MEDIAN 'V' DITCH
(Not to Scale)



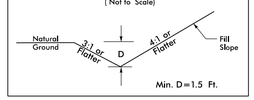
FROM STA. 162+00 TO STA. 167+00 –L– (MED)
FROM STA. 224+00 TO STA. 226+26 –L– (MED)
FROM STA. 434+50 TO STA. 450+50 –L– (MED)
FROM STA. 530+14 TO STA. 536+00 –L– (RT)
FROM STA. 537+00 TO STA. 579+00 –L– (RT)
FROM STA. 555+00 TO STA. 559+50 –L– (MED)
FROM STA. 566+47 TO STA. 575+00 –L– (MED)
FROM STA. 575+00 TO STA. 579+17.51 –L– (MED)

DETAIL OO
STANDARD 'V' DITCH
(Not to Scale)



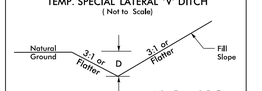
STA. 533+55 –L– (LT) S=6.8 %

DETAIL PP
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



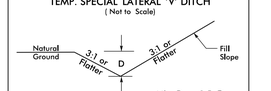
FROM STA. 559+00 TO STA. 562+50 –L– (LT)

DETAIL QQ
SPECIAL LATERAL BASE DITCH
(Not to Scale)



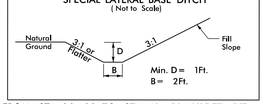
FROM STA. 544+00 TO STA. 552+25 –L– (LT)
FROM STA. 562+50 TO STA. 563+25 –L– (LT)

DETAIL RR
LATERAL BASE DITCH
(Not to Scale)



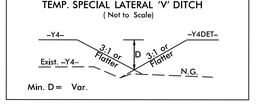
FROM STA. 53+50 TO STA. 54+50 –Y4– (LT)
STA. 11+00 –SERVEXT– S=0.286 %

DETAIL SS
SPECIAL LATERAL BASE DITCH
(Not to Scale)



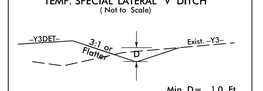
FROM STA. 34+57 TO STA. 41+17 –Y3– (LT)
FROM STA. 543+00 TO STA. 544+00 –L– (LT)

DETAIL TT
SPECIAL LATERAL BASE DITCH
(Not to Scale)



FROM STA. 34+57 TO STA. 37+79 –Y3– (RT)

DETAIL UU
SPECIAL LATERAL BASE DITCH
(Not to Scale)



FROM STA. 38+60 TO STA. 41+50 –Y3– (RT)

DETAIL WW
SPECIAL LATERAL BASE DITCH
(Not to Scale)

FROM STA. 34+23 TO STA. 37+00 –Y4– (LT)
FROM STA. 34+47 TO STA. 38+00 –Y4– (RT)
FROM STA. 12+00 TO STA. 15+70 –Y4DR– (LT)
FROM STA. 12+00 TO STA. 15+70 –Y4DR– (LT)

DETAIL XX
PIPE INLET CHANNEL AND BANK STABILIZATION
(Not to Scale)

Length= 25Ft.
Est.= 20 Tons of Class I Rip–Rap

STA. 51+65 –Y4– (LT)

DETAIL YY
PIPE OUTLET CHANNEL
(Not to Scale)

Length= 30Ft.
Est.= 100 Tons of Class I Rip–Rap

STA. 52+38 –Y4– (RT)

DETAIL ZZ
DITCH BLOCK
(Not to Scale)

STA. 58+77 –Y4– (LT)

DETAIL AAA
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM STA. 41+63 TO STA. 48+50 –RP2AC– (RT)

DETAIL CCC
SPECIAL CUT BASE DITCH
(Not to Scale)

FROM STA. 341+50 –L– TO STA. 347+63 –L– (LT)

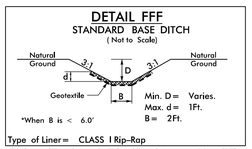
DETAIL DDD
LATERAL BASE DITCH
(Not to Scale)

FROM STA. 7+27 TO STA. 8+36 –RP2C– (RT)

DETAIL EEE
STANDARD BASE DITCH
(Not to Scale)

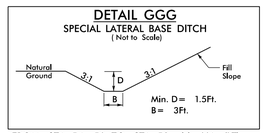
STA. 6+14 to 7+27 –RP2C–
STA. 72+02 to 72+50 –RP2AC– (RT)

DETAIL FFF
STANDARD BASE DITCH
(Not to Scale)



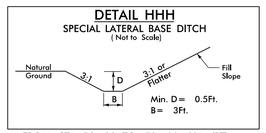
Type of Liner= CLASS I Rip–Rap
FROM STA. 34+12 TO STA. 34+47 –Y4– (RT)

DETAIL GGG
SPECIAL LATERAL BASE DITCH
(Not to Scale)



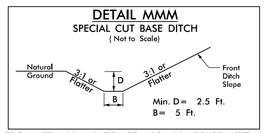
FROM STA. 54+50 TO STA. 58+66 –Y4– (LT)

DETAIL HHH
SPECIAL LATERAL BASE DITCH
(Not to Scale)



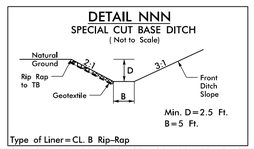
FROM STA. 56+83 TO STA. 58+00 –Y4– (RT)

DETAIL MMM
SPECIAL CUT BASE DITCH
(Not to Scale)



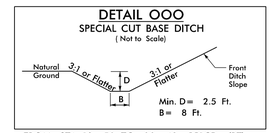
FROM STA. 33+48 TO STA. 36+78 –RP1CD– (RT)

DETAIL NNN
SPECIAL CUT BASE DITCH
(Not to Scale)



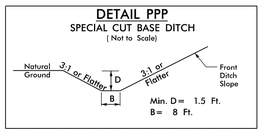
Type of Liner=CL. B Rip–Rap
FROM STA. 28+39.21 TO STA. 30+00 –RP1AB– (RT)
FROM STA. 36+78 TO STA. 36+93.06 –RP1CD– (RT)

DETAIL OOO
SPECIAL CUT BASE DITCH
(Not to Scale)



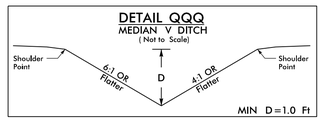
FROM STA. 12+50 TO 33+48 –RP1CD– (RT)
FROM STA. 0+00 TO 0+55 –RP1A– (RT)
FROM STA. 22+04.84 TO 28+50 –RP1AB– (LT)

DETAIL PPP
SPECIAL CUT BASE DITCH
(Not to Scale)



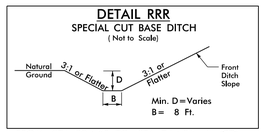
FROM STA. 7+50 TO 12+50 –RP1CD– (RT)

DETAIL QQQ
MEDIAN 'V' DITCH
(Not to Scale)



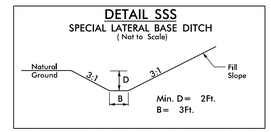
–RP1AB– FROM STA. 20+50 TO STA. 22+70 –RP1AB– (MED)

DETAIL RRR
SPECIAL CUT BASE DITCH
(Not to Scale)



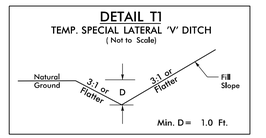
FROM STA. 32+60 TO STA. 74+26 –L– (RT)

DETAIL SSS
SPECIAL LATERAL BASE DITCH
(Not to Scale)



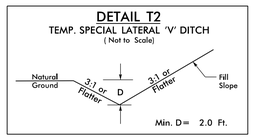
FROM STA. 62+00 TO STA. 65+00 –Y3– (LT)

DETAIL T1
TEMP. SPECIAL LATERAL 'V' DITCH
(Not to Scale)



FROM STA. 42+50 TO STA. 51+13 –Y3DET– (RT)
FROM STA. 55+00 TO STA. 59+50 –Y3DET– (RT)
FROM STA. 38+25 TO STA. 40+25 –Y4DET– (LT)
FROM STA. 54+00 TO STA. 55+00 –Y4DET– (LT)

DETAIL T2
TEMP. SPECIAL LATERAL 'V' DITCH
(Not to Scale)



FROM STA. 50+50 TO STA. 52+99 –Y3DET– (LT)
FROM STA. 54+50 TO STA. 61+00 –Y3DET– (LT)
FROM STA. 34+52 TO STA. 38+78 –Y4DET– (RT)

DETAIL T3
TEMP. SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM STA. 68+42 TO STA. 69+16 –Y3DET– (LT)
FROM STA. 66+50 TO STA. 69+16 –Y3DET– (RT)

DETAIL T4
TEMP. SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM STA. 53+10 TO STA. 54+50 –Y3DET– (LT)
FROM –Y3DET– STA. 61+00 TO STA. 67+93 (LT)

DETAIL T7
SPECIAL LATERAL BASE DITCH
(Not to Scale)

FROM STA. 36+29 TO STA. 40+50 –Y3DET– (LT)

DETAIL T8
TEMP. SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM STA. 55+00 TO STA. 55+75 –Y4DET– (LT)

DETAIL T10
TEMP. SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM STA. 61+21 TO STA. 64+50 –Y3DET– (RT)

PROJECT REFERENCE NO.	SHEET NO.
R-1015	2G-1

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 020175 ENGINEER ELIZABETH C. HOWEY

DocuSigned by: Elizabeth C Howey 9/10/2018
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ENGINEER

SIGNATURE DATE

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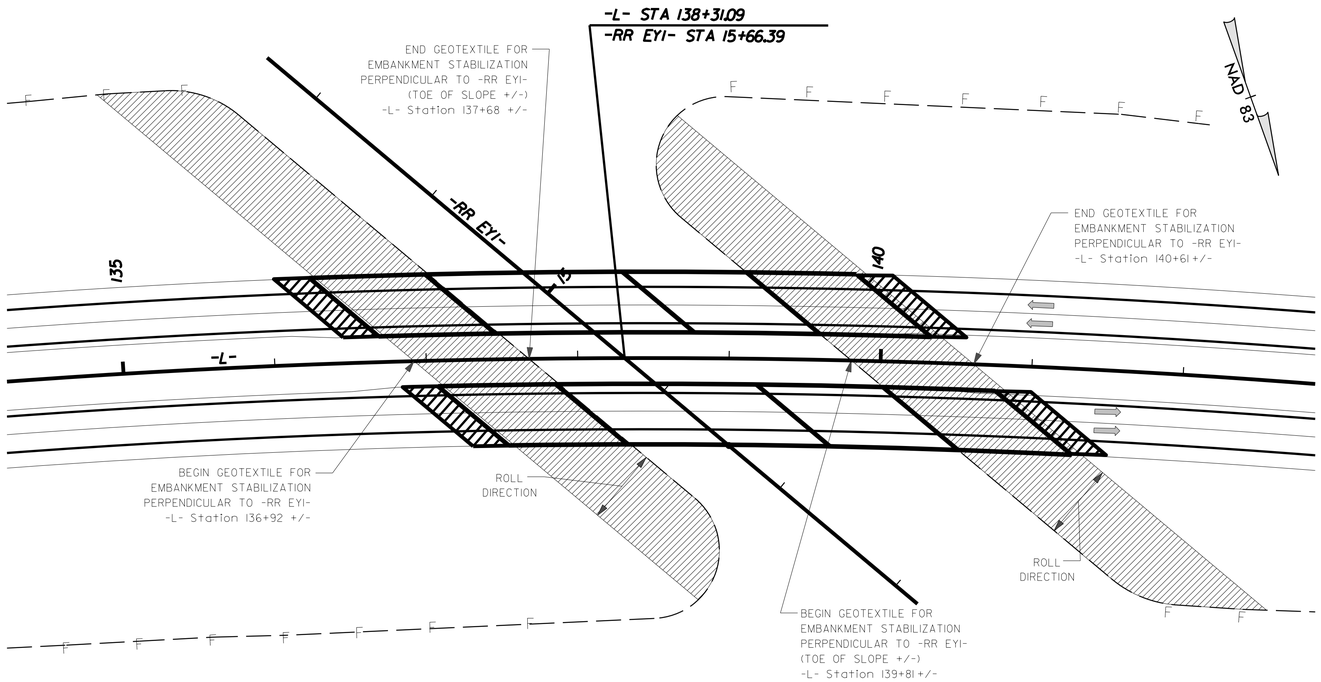
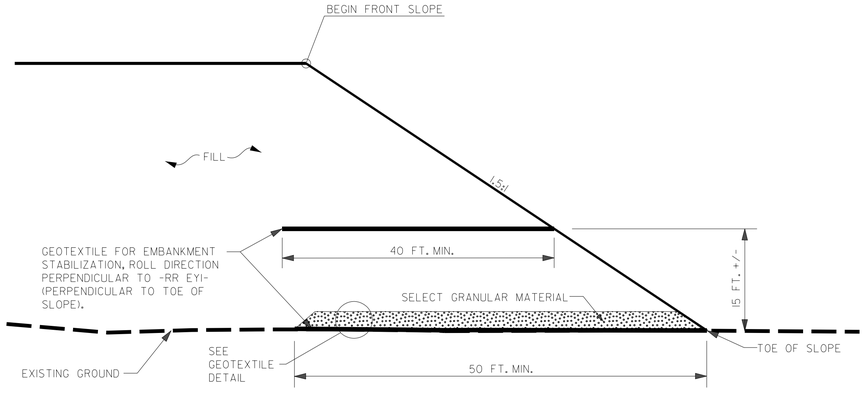


PLAN VIEW FOR LIMITS OF GEOTEXTILE
N.T.S.

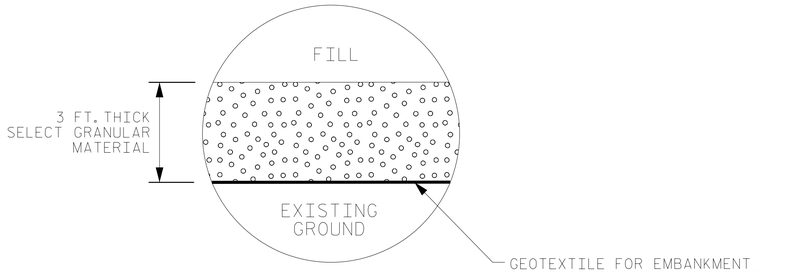
AREA OF GEOTEXTILE FOR EMBANKMENT STABILIZATION MACHINE OR ROLL DIRECTION PERPENDICULAR TO -RR EY1- (PERPENDICULAR TO TOE OF SLOPE)

NOTES

1. DO NOT GRUB, ONLY CLEAR THE AREA WITHIN THE LIMITS OF THE GEOTEXTILE FOR EMBANKMENT STABILIZATION.
2. PLACE GEOTEXTILE FOR EMBANKMENT STABILIZATION PERPENDICULAR TO -RR EY1- (PERPENDICULAR TO TOE OF SLOPE) ON THE EXISTING GROUND AFTER CLEARING.
3. PLACE THE GEOTEXTILE WITHOUT ANY WRINKLES OR CREASES.
4. NO SEAMS OR JOINTS ARE ALLOWED IN THE MACHINE DIRECTION OF GEOTEXTILE.
5. GEOTEXTILE FOR EMBANKMENT STABILIZATION SHEETS MUST HAVE A CONTINUOUS LENGTH OF 50 FEET MINIMUM FOR THE LOWER LAYER AND 40 FEET MINIMUM FOR THE UPPER LAYER.
6. THE TERMS ROLL AND MACHINE DIRECTION ARE USED INTERCHANGEABLY.
7. ALL JOINTS IN THE CROSS MACHINE DIRECTION MUST BE OVERLAPPED A MINMUM OF 18 INCHES.
8. PLACE 3 FT. OF SELECT GRANULAR MATERIAL ON THE LOWER LAYER OF GEOTEXTILE.
9. FOR GEOTEXTILE FOR EMBANKMENT STABILIZATION , SEE GEOTEXTILE FOR EMBANKMENT STABILIZATION SPECIAL PROVISION.
10. FOR SELECT GRANULAR MATERIAL, SEE SECTION 265 OF THE STANDARD SPECIFICATIONS.



TYPICAL PROFILE VIEW



GEOTEXTILE DETAIL
N.T.S.

QUANTITIES

GEOTEXTILE FOR EMBANKMENT STABILIZATION	6000 SY#
SELECT GRANULAR MATERIAL	6000 CY

GEOTEXTILE FOR EMBANKMENT STABILIZATION ESTIMATED QUANTITY DOES NOT INCLUDE OVERLAPS OR WASTE.

PREPARED BY: W. D. SHUECRAFT	DATE: 9/2018
REVIEWED BY: E.C. HOWEY	DATE: 9/2018

HDR

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

GEOTEXTILE FOR EMBANKMENT STABILIZATION DETAILS

REVISIONS

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

PROJECT REFERENCE NO.	SHEET NO.
R-1015	2G-2

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden 12/14/2018
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ENGINEER

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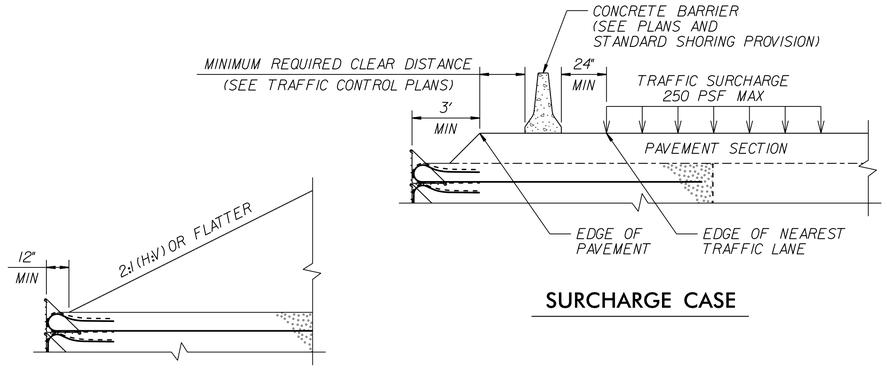
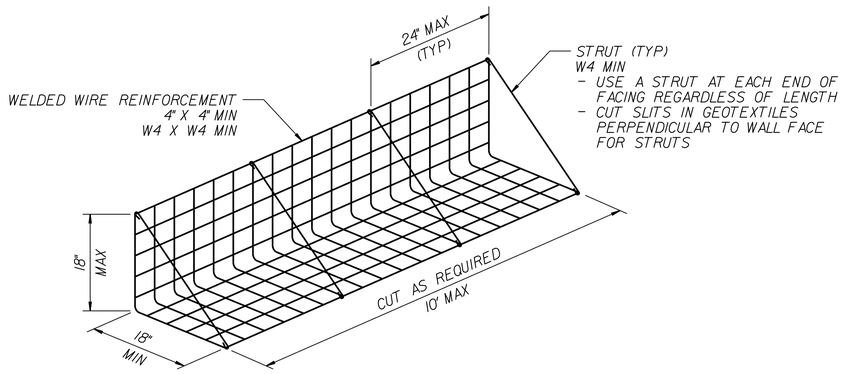
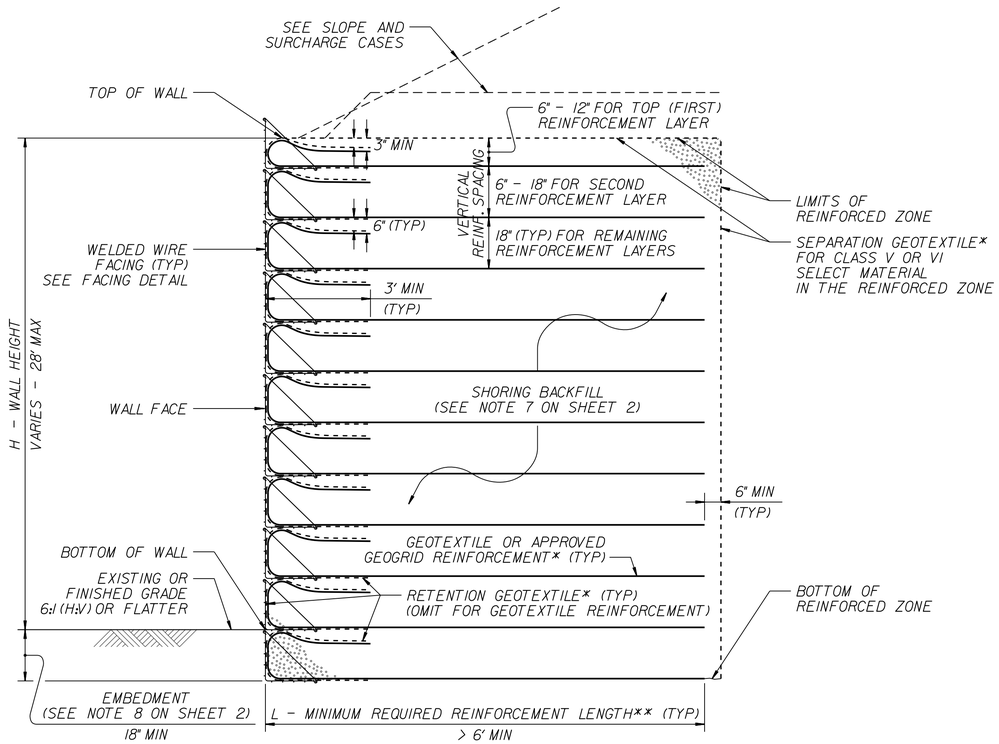


SURCHARGE CASE

SLOPE CASE



FACING DETAIL



STANDARD TEMPORARY WALL

(FOR STANDARD TEMPORARY WALLS ON STRUCTURES, SEE TEMPORARY WALL ON STRUCTURE DETAIL ON SHEET 2.)
*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.

STANDARD TEMPORARY WALL – PARTIAL ELEVATION

*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD
TEMPORARY WALL
SHEET 1 OF 3

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
R-1015	2G-3

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden 12/14/2018
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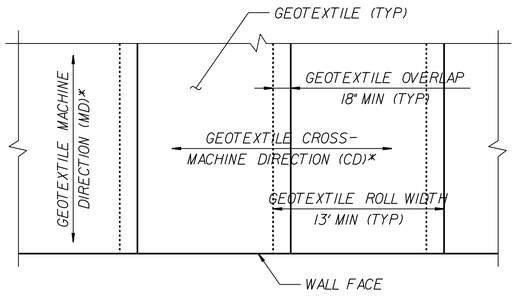
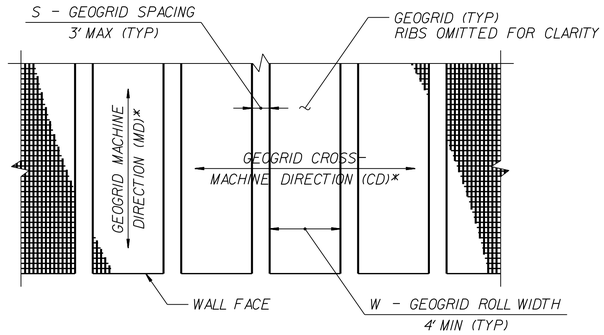


GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)

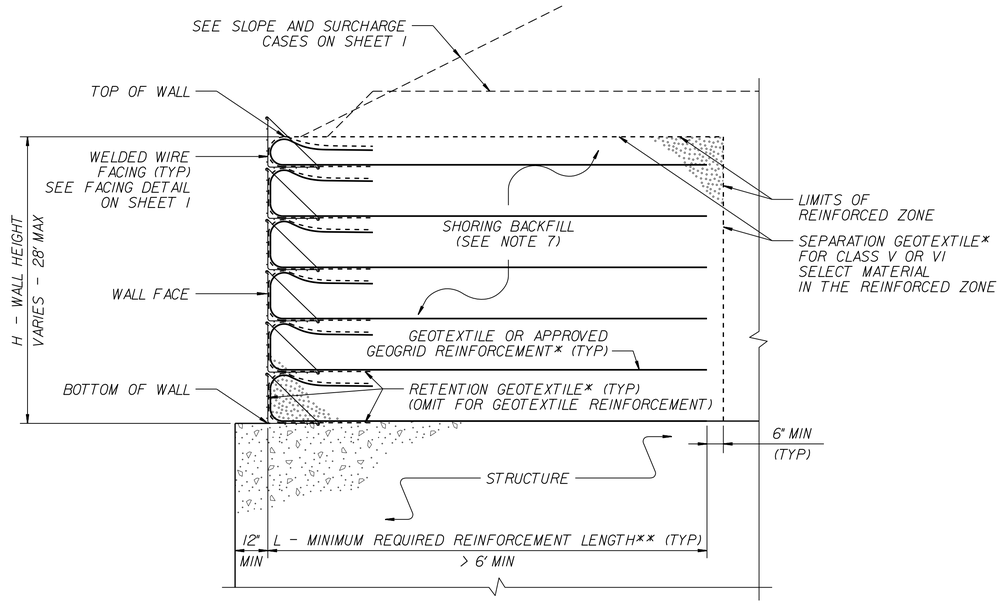


GEOGRID PLACEMENT

(80% COVERAGE MIN FOR GEOGRID REINFORCEMENT – $\frac{W}{W+S}$ x 100 $\geq$ 80%, SEE NOTE 11)

GEOSYNTHETIC PLACEMENT DETAILS

(PLAN VIEW)
*SEE NOTE 12.



TEMPORARY WALL ON STRUCTURE DETAIL

*SEE GEOSYNTHETIC PLACEMENT DETAILS.
**SEE REINFORCEMENT TABLES ON SHEET 3.

NOTES:

1. AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY WALLS AS NOTED IN THE PLANS.
2. FOR STANDARD TEMPORARY WALLS, SEE STANDARD SHORING PROVISION.
3. STANDARD TEMPORARY WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
   UNIT WEIGHT, γ = 120 PCF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 PSF
4. DO NOT USE STANDARD TEMPORARY WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE STANDARD TEMPORARY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW TEMPORARY WALLS.
6. USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, ASSUME GROUNDWATER DEPTH IS LESS THAN 7' BELOW BOTTOM OF REINFORCED ZONE. DO NOT USE STANDARD TEMPORARY WALLS IF GROUNDWATER IS ABOVE BOTTOM OF REINFORCED ZONE.
7. DO NOT USE A-2-4 SOIL FOR STANDARD TEMPORARY WALLS AROUND CULVERTS OR IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS FOR SLOPE CASES. DO NOT USE CLASS VI SELECT MATERIAL IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS WITH GEOTEXTILE REINFORCEMENT.
8. EMBEDMENT IS NOT REQUIRED FOR STANDARD TEMPORARY WALLS ON STRUCTURES OR ROCK AS DETERMINED BY THE ENGINEER.
9. DO NOT USE MORE THAN 4 DIFFERENT REINFORCEMENT STRENGTHS FOR EACH STANDARD TEMPORARY WALL.
10. GEOGRIDS ARE TYPICALLY APPROVED FOR ULTIMATE TENSILE STRENGTHS IN THE MACHINE DIRECTION (MD) AND CROSS-MACHINE DIRECTION (CD) OR SHORT-TERM DESIGN STRENGTHS FOR A 3-YEAR DESIGN LIFE IN THE MD BASED ON MATERIAL TYPE. THE LIST OF APPROVED GEOGRIDS WITH DESIGN STRENGTHS IS AVAILABLE FROM: connect.ncdot.gov/resources/Materials/Pages/Materials-Manual-by-Manual.aspx
    DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SHORING BACKFILL AS FOLLOWS:

MATERIAL TYPE	SHORING BACKFILL
BORROW	A-2-4 SOIL
FINE AGGREGATE	CLASS II, TYPE I OR CLASS III SELECT MATERIAL
COARSE AGGREGATE	CLASS V OR VI SELECT MATERIAL

    IF THE WEBSITE DOES NOT LIST A SHORT-TERM DESIGN STRENGTH FOR AN APPROVED GEOGRID, USE A SHORT-TERM DESIGN STRENGTH EQUAL TO THE ULTIMATE TENSILE STRENGTH DIVIDED BY 3.5 FOR THE GEOGRID REINFORCEMENT.
11. FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
12. AT THE CONTRACTOR'S OPTION, REINFORCEMENT MAY BE INSTALLED WITH THE MD PARALLEL TO THE WALL FACE IF BOTH OF THE FOLLOWING CONDITIONS OCCUR:
    - W (REINFORCEMENT ROLL WIDTH) $\geq$ (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND
    - REINFORCEMENT STRENGTH IN CD $\geq$ MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
13. SUBMIT A "STANDARD TEMPORARY WALL SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY WALL CONSTRUCTION. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM: connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
14. DO NOT PLACE SHORING BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
15. FOR STANDARD TEMPORARY WALLS WITH PILE FOUNDATIONS IN THE REINFORCED ZONE, DRIVE PILES THROUGH REINFORCEMENT AFTER CONSTRUCTING TEMPORARY WALLS.
16. DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
17. CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
18. FOR STANDARD TEMPORARY WALLS WITH INTERIOR ANGLES LESS THAN 90 DEGREES, WRAP GEOSYNTHETICS AT ACUTE CORNERS AS DIRECTED BY THE ENGINEER.
19. FOR STANDARD TEMPORARY WALLS WITH TOP OF WALL WITHIN 5' OF FINISHED GRADE, REMOVE TOP FACING AND INCORPORATE TOP REINFORCEMENT LAYER INTO FILL WHEN PLACING FILL IN FRONT OF WALL.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD TEMPORARY WALL SHEET 2 OF 3

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
R-1015	2G-4

GEOTECHNICAL ENGINEER

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

DocuSigned by: Scott A. Hidden 12/14/2018

SIGNATURE DATE

ENGINEER

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SLOPE OR SURCHARGE CASE	GROUNDWATER DEPTH BELOW BOTTOM OF REINFORCED ZONE (SEE NOTE 6 ON SHEET 2) (FT)	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)	H - WALL HEIGHT (FT)																							
			< 4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
SLOPE CASE	> 0	CLASS II,TYPE I, CLASS III,CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	8	9	11	12	13	13	14	15	16	17	18	19	20	21	22	23	24	24	25	26	27	27
SURCHARGE CASE	> 0 TO 7 FOR H < 20′ > 0 TO 10 FOR H ≥ 20′	ALL SHORING BACKFILL TYPES	6	7	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	17	17	18	19	19	20	21	22
	> 7 FOR H < 20′ > 10 FOR H ≥ 20′	A-2-4 SOIL	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16	17	18	18	19	20	20	21
		CLASS II,TYPE I OR CLASS III SELECT MATERIAL	6	6	7	7	8	8	9	10	10	11	11	12	12	13	14	15	15	16	16	17	17	18	18	19	20
		CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	7	7	8	8	9	9	10	10	11	12	13	13	14	14	15	15	16	17	17	18	19	19

L – MINIMUM REQUIRED REINFORCEMENT LENGTH (FT)

(FOR ALL REINFORCEMENT TYPES)

WALL HEIGHT (H) + EMBEDMENT (FT)	NUMBER OF REINFORCEMENT LAYERS*
2.5 - 4	3
4 - 5.5	4
5.5 - 7	5
7 - 8.5	6
8.5 - 10	7
10 - 11.5	8
11.5 - 13	9
13 - 14.5	10
14.5 - 16	11
16 - 17.5	12
17.5 - 19	13
19 - 20.5	14
20.5 - 22	15
22 - 23.5	16
23.5 - 25	17
25 - 26.5	18
26.5 - 28	19
28 - 29.5	20

*BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 1.

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL	A-2-4 SOIL	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL
1	2400	2400	2400	2400	2400
2	2400	2400	2400	2400	2400
3	2400	2400	2400	2400	2400
4	2400	2400	2500	2400	2400
5	2500	2400	3000	2400	2400
6	3000	2400	3500	2800	2400
7	3500	2700	4000	3200	2600
8	4000	3100	4500	3600	2900
9	4500	3500	5000	4000	3200
10	5000	3900	5500	4400	3500
11	5500	4300	6000	4800	3800
12	6000	4700	6500	5200	4100
13	6500	5100	7000	5600	4400
14	7000	5400	7500	6000	4700
15	7500	5800	8000	6400	5000
16	8000	6200	8500	6800	5300
17	8500	6600	9000	7200	5600
18	9000	7000	9500	7600	5900
19	9500	7400	10000	8000	6200
20	10000	7800	10500	8400	6500

GEOTEXTILE REINFORCEMENT ULTIMATE TENSILE STRENGTH (LB/FT)

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL	A-2-4 SOIL	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL
1	240	200	340	290	240
2	380	310	520	430	350
3	530	420	700	570	460
4	690	550	870	720	570
5	860	690	1050	860	680
6	1030	830	1220	1000	790
7	1200	970	1400	1150	900
8	1370	1110	1580	1290	1010
9	1550	1240	1750	1430	1120
10	1720	1380	1930	1580	1230
11	1890	1520	2100	1720	1340
12	2060	1660	2280	1860	1450
13	2240	1800	2450	2010	1560
14	2410	1940	2630	2150	1670
15	2580	2080	2800	2290	1780
16	2750	2220	2980	2440	1890
17	2930	2360	3160	2580	2000
18	3100	2500	3330	2720	2110
19	3270	2640	3510	2860	2220
20	3440	2780	3690	3000	2330

GEOGRID REINFORCEMENT SHORT–TERM DESIGN STRENGTH (LB/FT)

(SEE NOTE 10 ON SHEET 2.)

MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD

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

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD TEMPORARY WALL SHEET 3 OF 3

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET
R-1015	2H-1

GEOENVIRONMENTAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 31499 ENGINEER CYRUS F. PARKER

DocuSigned by: Cyrus Parker 2/1/2018
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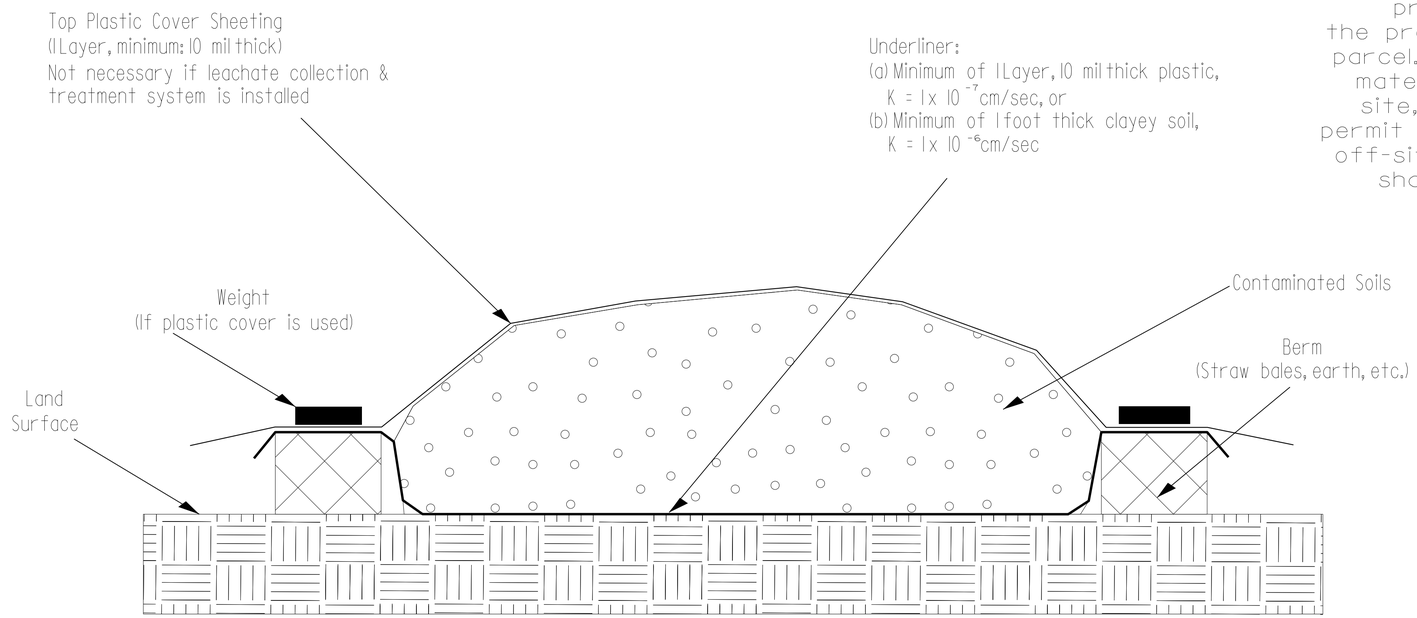
ENGINEER

SIGNATURE DATE

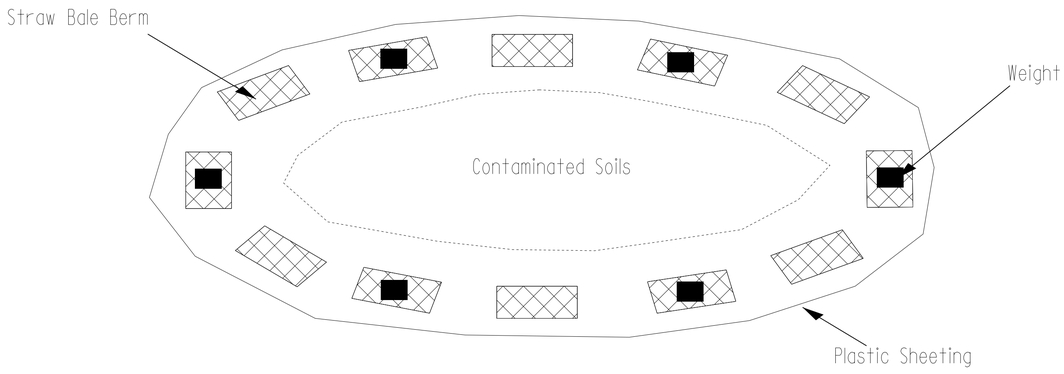
Detail for Temporary Containment of Contaminated Soil

Cross-Section View



NOTE:
The Contractor shall stockpile all contaminated soil excavated from a property in a location within the property boundaries of the source parcel. If the volume of contaminated material exceeds available space on site, the Contractor shall obtain a permit from the NCDEQ UST Section for off-site temporary storage. Stockpile shall be removed within 45 days.

Map View



PREPARED BY:	DATE:
REVIEWED BY:	DATE:

GEOTECHNICAL ENGINEERING UNIT

☐ *EASTERN REGIONAL OFFICE*
☐ *WESTERN REGIONAL OFFICE*
☒ *CONTRACT OFFICE*

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STOCKPILE CONTAINMENT DETAIL

REVISIONS

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

12/6/2018
G:\RA\9729-02\CADD\R1015\Roadway\Proj\R-1015_rdy_psh_3B-1-3B-2.dgn
gmodlin
5/9/06

COMPUTED BY: Z. LIU
CHECKED BY: G. MODLIN
DATE: 7/25/2018
DATE: 7/26/2018

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
–L– 32 + 80.83 –L– 64 + 50.00	12,241		71,075	58,834	
SUBTOTAL	12,241		71,075	58,834	
–L– 64 + 50.00 –L– 94 + 50.00	5,312		111,407	106,095	
–LP1B– 2 + 23.34 –LP1B– 6 + 50.00		4,015	11,722	11,722	4,015
–RP1B– 5 + 20.31 –RP1B– 25 + 50.60	3,022	18,930	72,894	69,872	18,930
–RP1CD– 2 + 95.59 –RP1CD– 32 + 53.25	13,793		33,073	19,280	
SUBTOTAL	22,127	22,945	229,096	206,969	22,945
–L– 94 + 50.00 –L– 107 + 00.00			55,392	55,392	
–RP1AB– 4 + 89.37 –RP1AB– 10 + 00.00		20,438	146,297	146,297	20,438
–RP1AB– 14 + 00.00 –RP1AB– 45 + 00.00	4,363		138,265	133,902	
–RP1A– 2 + 99.97 –RP1A– 7 + 54.62			8,153	8,153	
SUBTOTAL	4,363	20,438	348,107	343,744	20,438
–L– 107 + 00.00 –L– 136 + 50.00			544,442	544,442	
SUBTOTAL			544,442	544,442	
–L– 141 + 50.00 –L– 169 + 50.00			302,831	302,831	
SUBTOTAL			302,831	302,831	
–L– 186 + 00.00 –L– 216 + 00.00			488,075	488,075	
SUBTOTAL			488,075	488,075	
–L– 216 + 00.00 –L– 226 + 00.00			360,484	360,484	
SUBTOTAL			360,484	360,484	
–L– 228 + 70.94 –L– 258 + 50.00	137		358,709	358,572	
–Y3– 35 + 00.00 –Y3– 51 + 00.00	515	594	80,741	80,226	594
–Y3RPB– 6 + 41.92 –Y3RPB– 20 + 06.96			134,722	134,722	
–Y3RPC– 10 + 27.15 –Y3RPC– 17 + 04.29			74,233	74,233	
SUBTOTAL	652	594	648,405	647,753	594
–L– 258 + 50.00 –L– 282 + 50.00		4,561	201,174	201,174	4,561
–Y3– 53 + 50.00 –Y3– 73 + 50.00	1,375	1,322	113,981	122,701	1,417
–Y3RPA– 7 + 50.00 –Y3RPA– 17 + 30.74			40,682	40,682	
–Y3RPD– 6 + 50.00 –Y3RPD– 25 + 23.59			104,886	104,886	
–Y3DET– 36 + 50.00 –Y3DET– 69 + 00.00	2,256	2,123	16,836	14,580	2,123
SUBTOTAL	3,631	8,006	477,559	474,023	8,101
–L– 292 + 50.00 –L– 322 + 50.00	948	1,457	95,071	94,123	1,457
SUBTOTAL	948	1,457	95,071	94,123	1,457
–L– 322 + 50.00 –L– 352 + 50.00	2,231	319	135,246	133,015	319
–Y4– 34 + 40.00 –Y4– 43 + 50.00	988		45,133	44,145	
–Y4– 46 + 00.00 –Y4– 59 + 12.29	647	1,064	79,723	79,076	1,064
–Y4DET– 34 + 60.97 –Y4DET– 58 + 70.00	435	3,511	15,392	14,957	3,511
–Y4DR– 10 + 50.00 –Y4DR– 16 + 00.00	488	589	1,697	1,209	589
SUBTOTAL	4,789	5,483	277,191	272,402	5,483
–L– 352 + 50.00 –L– 382 + 50.00	921	1,880	153,001	152,080	1,880
SUBTOTAL	921	1,880	153,001	122,080	1,880
–L– 382 + 50.00 –L– 412 + 50.00			127,967	127,967	
–DR1– 10 + 00.00 –DR1– 13 + 78.96	440		331		109
SUBTOTAL	440		128,298	127,967	109
–L– 412 + 50.00 –L– 442 + 50.00			109,613	109,613	
SUBTOTAL			109,613	109,613	
–L– 442 + 50.00 –L– 472 + 50.00	20	2,285	99,125	99,105	2,285
SUBTOTAL	20	2,285	99,125	99,105	2,285

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

PROJECT REFERENCE NO. R-1015

SHEET NO. 3B-1

1/25/2019
G:\RA\9729-02\CADD\R1015\Roadway\Proj\R-1015_rdy_psh_3B-1-3B-2.dgn
gmodlin
5/9/06

COMPUTED BY: Z. LIU
CHECKED BY: G. MODLIN
DATE: 1/25/2019
DATE: 1/25/2019

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SUMMARY OF EARTHWORK

IN CUBIC YARDS

EST DDE = 1,560 CY
TOTAL EST SHALLOW UNDERCUT = 1,000 CY
SELECT GRANULAR MATERIAL = 144,000 CY
GEOTEXTILE FOR SOIL STABILIZATION = 62,500 SY

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
–L– 472 + 50.00 –L– 505 + 00.00		76	180,835	180,835	76
–G12– 11 + 00.00 –G12– 13 + 47.00			605	605	
SUBTOTAL		76	181,440	181,440	76
–L– 507 + 50.00 –L– 515 + 50.00		6,811	366,176	366,176	6,811
–RP2C– 5 + 87.11 –RP2C– 10 + 71.91		102	74,383	74,383	102
SUBTOTAL		6,913	440,559	440,559	6,913
–L– 518 + 07.32 –L– 548 + 00.00	2,101	1,083	211,540	209,439	1,083
–LP2A– 81 + 29.61 –LP2A– 86 + 00.00	28	313	5,344	5,316	313
–RP2A– 79 + 22.74 –RP2A– 92 + 00.00	7	17	29,731	29,724	17
–RP2AC– 38 + 30.60 –RP2AC– 67 + 00.00	1,439	18	43,424	42,020	53
–RP2AC– 67 + 00.00 –RP2AC– 79 + 22.74			50,236	50,236	
–RP2CD– 5 + 39.89 –RP2CD– 15 + 00.00	1,678		30,272	28,594	
SUBTOTAL	5,253	1,431	370,547	365,329	1,466
–L– 548 + 00.00 –L– 579 + 00.00	2,420	475	20,724	18,304	475
–SERVEXT– 10 + 00.00 –SERVEXT– 21 + 64.81	310	378	4,969	4,659	378
SUBTOTAL	2,730	853	25,963	22,963	853
DETOUR REMOVAL					
–Y3DET– 36 + 50.00 –Y3DET– 69 + 00.00	14,030				14,030
–Y4DET– 34 + 60.97 –Y4DET– 58 + 70.00	12,827				12,827
SUBTOTAL	26,857				26,857
PROJECT TOTAL	84,972	72,361	5,350,612	5,292,736	99,457
MATERIAL FOR SHOULDER CONSTRUCTION			64,776	64,776	
ADDITIONAL UNDERCUT		18,000	21,600	21,600	18,000
GRADE POINT UNDERCUT		2,900	3,480	3,480	2,900
WASTE IN LIEU OF BORROW				–26,966	–26,966
EST.5% TO REPLACE TOP SOIL ON BORROW PIT				267,781	
GRAND TOTAL	84,972	93,261	5,440,468	5,623,407	93,391
SAY	88,000	96,000		5,793,000	

PAVEMENT STRUCTURE VOLUME

L	6,970 CY
RP1A	35 CY
RP1B	160 CY
RP1AB	386 CY
LP1B	37 CY
RP1CD	192 CY
Y3	251 CY
Y3RPA	72 CY
Y3RPB	102 CY

PAVEMENT STRUCTURE VOLUME
PROJECT TOTAL = 9,487 CY

Y3RPC	62 CY
Y3RPD	115 CY
Y4	89 CY
Y4DR	10 CY
RP2A	112 CY
LP2A	36 CY
RP2C	50 CY
RP2AC	360 CY
RP2CD	153 CY

SERVEXT	50 CY
SERVRD	74 CY
SR1162	2 CY
DR1	10 CY
G12	4 CY
Y3DET	112 CY
Y4DET	43 CY

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

PROJECT REFERENCE NO. R-1015
SHEET NO. 3B-2

COMPUTED BY:	N. Hill	DATE:	7/3/2018
CHECKED BY:	G. Modlin	DATE:	7/25/2018

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
R1015	3B-3

GUARDRAIL SUMMARY

"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

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		SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	MEDIAN HAZARD PROTECTION	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	Type III	B-77	GREU, TL-3	GREU, TL-2	CAT-1	AT-1	Type III SC	B-77 SC		G	NG				
-L-	47+81	70+05	RT	2225.00			49+31	70+05	12	15	50		1			1	1		1									FILL WARRANT
-L-	92+55	96+91	RT	437.50				96+91	12	15	50		1			1	1											
-L-	96+91	99+58	RT																						267.00			RETAINING WALL
-L-	95+28	96+22	LT/MED	73.75			96+22									1							1					ATTENUATOR TL-3
-L-	95+28	96+22	RT/MED	73.75				96+22								1												
-L-	96+22	97+87	MED																								165.00	BRIDGE PIER
-L-	97+87	98+73	LT/MED	73.75				97+87								1							1					ATTENUATOR TL-3
-L-	97+87	98+73	RT/MED	73.75			97+87									1												
-L-	93+35	97+14	LT																						379.00			RETAINING WALL
-L-	97+14	101+01	LT	387.50				97+14	12	15	50		1			1	1											
-L-	118+05	137+55	RT	1950.00			116+55		12	15	50		1			1	1											FILL
-L-	118+51	136+26	LT	1775.00				118+51	12	15						1			1									FILL
-L-	134+09	137+09	RT/MED	300.00				137+09			275		5.5															BRIDGE
-L-	139+81	151+50	LT	1175.00			150+00		12	15	50		1			1	1											FILL
-L-	140+31	143+32	LT/MED	300.00				140+31			275		5.5			1	1											BRIDGE
-L-	141+27	150+99	RT	975.00				150+99	12	15						1			1									FILL
-L-	163+70	169+55	RT	587.50			165+20		12	15	50		1			1	1											FILL
-L-	165+65	169+55	LT	387.50				165+65	12	15						1			1									FILL
-L-	166+55	169+55	RT/MED	300.00				169+55			275		5.5			1	1											BRIDGE
-L-	185+79	226+63	LT	4087.50			226+63	185+79	12	15						2												BRIDGE
-L-	185+79	188+79	LT/MED	300.00				185+79			275		5.5			1	1											BRIDGE
-L-	185+79	226+46	RT	4075.00			185+79	226+46	12	15						2												BRIDGE
-L-	223+53	226+53	RT/MED	300.00				226+53			275		5.5			1	1											BRIDGE
-L-	228+49	231+49	LT/MED	300.00				228+49			275		5.5			1	1											BRIDGE
-L-	235+01	240+55	RT	562.50			236+51	240+55	12	15	50		1				1		1									FILL
-L-	236+45	243+49	LT	712.50			241+99	236+45	12	15	50		1				1		1									FILL
-L-	243+40	244+25	LT/MED	73.75				244+25								1							1					ATTENUATOR TL-3
-L-	243+40	244+25	RT/MED	73.75			244+25									1												
-L-	244+25	244+87	MED																								62.00	BRIDGE PIER
-L-	244+87	245+72	LT/MED	73.75			244+87									1							1					ATTENUATOR TL-3
-L-	244+87	245+72	RT/MED	73.75				244+87								1												
-L-	267+03	282+89	LT	1587.50				282+89	12	15						1			1									FILL
-L-	267+99	282+89	RT	1487.50			269+49		12	15	50		1			1	1											FILL
-L-	279+89	282+89	RT/MED	300.00				282+89			275		5.5			1	1											BRIDGE
-L-	292+36	295+55	LT	325.00				292+36	12	15	50		1			1	1											BRIDGE
-L-	292+36	295+36	LT/MED	300.00				292+36			275		5.5			1	1											BRIDGE
-L-	292+36	294+49	RT	212.50			292+36		12	15						1			1									BRIDGE
-L-	301+33	302+22	LT/MED	73.75				302+22								1												
-L-	301+33	302+22	RT/MED	73.75			302+22									1							1					ATTENUATOR TL-3
-L-	302+22	302+60	RT/MED																								38.00	BRIDGE PIER
-L-	302+60	303+50	LT/MED	73.75			302+60									1												
-L-	302+60	303+50	RT/MED	73.75				302+60								1							1					ATTENUATOR TL-3
-L-	340+50	344+66	LT	425.00			344+66	340+50	12	15	50	1					1		1									FILL
-L-	345+45	351+05	LT	562.50			349+55	345+45	12	15	50	1					1		1									FILL
-L-	350+00	379+56	RT	2962.50			351+50	379+56	12	15	50	1					1		1									FILL
-L-	389+51	399+50	LT	1000.00			398+00	389+51	12	15	50	1					1		1									FILL
-L-	470+00	472+47	LT	250.00			470+97	470+00	12	15	50	1					1		1									FILL
-L-	497+95	505+02	RT	712.50			499+45		12	15	50	1				1	1											FILL
-L-	499+45	505+82	LT	637.50				499+45	12	15						1			1									FILL
-L-	502+34	505+34	RT/MED	300.00				505+34			275	5.5				1	1											BRIDGE
-L-	507+70	516+50	LT	887.50			516+50	507+70	12/6	15/9						2												BRIDGE
-L-	507+44	510+45	LT/MED	300.00				507+44			275	5.5				1	1											BRIDGE
-L-	510+00	515+63	RT	562.50			511+50		12	15						1	1											FILL
-L-	512+92	515+91	RT/MED	300.00				515+91			275	5.5				1	1											BRIDGE
-L-	518+07	526+09	LT	800.00			524+59		6	9	50	1				1	1											FILL
-L-	517+69	520+69	LT/MED	300.00			517+69				275	5.5				1	1											BRIDGE
-L-	517+12	524+00	RT	687.50				524+00	12	15						1			1									FILL
SHEET TOTALS				**36,923**												**46**	**29**		**15**				**6**		**646.00**		**265.00**	

COMPUTED BY: *N. Hill* DATE: *7/3/2018*

CHECKED BY: *G. Modlin* DATE: *7/25/2018*

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
R1015	3B-4

"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

GUARDRAIL SUMMARY

G = GATING IMPACT ATTENUATOR
NG = NON-GATING IMPACT ATTENUATOR

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		SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	MEDIAN HAZARD PROTECTION	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	Type III	B-77	GREU, TL-3	GREU, TL-2	CAT-1	AT-1	Type III SC	B-77 SC		G	NG				
-RP1B-	21+45	25+51	LT	412.50				11+26	12	15									1									FILL
-RP1AB-	4+89	11+26	LT	637.50					12	15						1												BRIDGE
-RP1AB-	9+15	10+83	LT/MED	175.00			10+83					50		1		1	1											BRIDGE
-RP1AB-	8+90	10+40	RT/MED	150.00				10+40			125		2.5			1	1											BRIDGE
-RP1AB-	4+89	10+06	RT	525.00			5+89		12	15	50		1			1	1											FILL
-RP1AB-	13+41	18+05	LT	462.50				17+05	12	15	50		1			1	1											FILL
-RP1AB-	12+98	14+48	LT/MED	150.00				12+98			125		2.5			1	1											BRIDGE
-RP1AB-	12+62	14+31	RT/MED	175.00			12+62				50		1			1	1											BRIDGE
-RP1AB-	12+29	18+98	RT	675.00				18+98	12	15						1			1									FILL
-RP1CD-	4+50	10+50	RT	600.00			05+50	10+50	12	15	50		1				1		1									FILL
-Y3-	46+88	51+51	RT	462.50			47+88		8	11	50		1		1		1											FILL
-Y3-	47+05	51+28	LT	425.00				48+05	8	11		50		1	1		1											FILL
-Y3-	53+21	57+61	LT	437.50			52+21		8	11	50		1		1		1											FILL
-Y3-	53+44	57+39	RT	400.00				56+39	8	11		50		1	1		1											FILL
-Y3RPA-	13+86	17+65	RT	587.50					12	15	50	50	1	1			2											FILL
-Y3RPB-	0+00	20+36	LT	2250.00			20+36		12	15	50		1			1	1											FILL - ADJACENT TO -Y3-
-Y3RPC-	3+31	17+09	RT	1375.00			03+31		12	15						1												BRIDGE
-Y3-	59+13	63+49	RT	437.50				62+49	8	11		50		1			1											FILL
-Y3RPD-	14+95	25+34	LT	1137.50				25+34	12	15									1									FILL
-Y3-	59+69	62+95	LT	325.00			61+95		8	11	50		1				1											FILL
-Y4-	39+10	43+78	RT	475.00			40+10		8	11	50		1		1		1											FILL
-Y4-	39+27	43+87	LT	462.50				40+27	8	11		50		1	1		1											FILL
-Y4-	45+59	54+49	RT	887.50				53+49	8	11		50		1	1		1											FILL
-Y4-	45+68	54+09	LT	850.00			53+09		8	11	50		1		1		1											FILL
-RP2C-	2+30	10+37	RT	812.50				10+37	12	15						1			1									FILL
-RP2C-	6+77	10+32	LT	362.50			07+77	10+32	12	15	50		1				1		1									FILL
-SR1162-	13+26	15+96	RT	275.00			14+17	14+87	4	7								2										CULVERT
-SR1162-	12+83	16+23	RT																								340		
-SR1162-	13+34	16+34	LT																								300		
-RP2CD-	8+00	12+05	LT	412.50			9+00	12+05	10	13	50		1				1											
-RP2AC-	63+94	68+58	RT	462.50			64+94		12	15	50		1			1	1											FILL
-RP2AC-	68+58	71+33	RT																							275.00			RETAINING WALL
-RP2AC-	67+40	68+28	LT/MED	68.75				68+28								1								1				ATTENUATOR TL-3
-RP2AC-	67+40	68+28	RT/MED	68.75			68+28									1												BRIDGE PIER
-RP2AC-	68+28	69+89	RT/MED																								161.00	BRIDGE PIER
-RP2AC-	69+89	70+79	LT/MED	68.75			69+89									1								1				ATTENUATOR TL-3
-RP2AC-	69+89	70+79	RT/MED	68.75				69+89								1												BRIDGE PIER
-RP2AC-	69+47	72+96	LT	350.00					12	15	50		1			1	1											FILL
-RP2AC-	66+29	69+47	LT																							318.00			RETAINING WALL
SHEET 1 TOTALS				36922.50											0	46	29	0	15					6		646.00	0	265	
PROJECT SUBTOTAL				54347.50											8	63	53	2	22					8	0	1239	640	426	
LESS ANCHOR DEDUCTIONS																													
GREU TL-3		53	@ 50'	-2650																									
GREU TL-2		2	@ 25'	-50																									
TYPE III		8	@ 18.75'	-150																									
CAT -1		22	@ 6.25'	-138																									
B-77		63	@ 22.875'	-1,441																									
GRAND TOTAL				49,919											8	63	53	2	22	0	0	0	0	8	0	1239	640	426	
SAY				**50,425**											**8**	**63**	**53**	**2**	**22**					**8**		**1239.00**	**640**	**426**	

"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

TEMPORARY GUARDRAIL SUMMARY

G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

SURVEY LINE	BEG. STA.	END STA.	LOCATION	STRAIGHT			APPROACH END WARRANT	TRAILING END WARRANT							TEMP TL-2												
-Y4DET-	49+21	56+78	RT	762.50			49+86	56+03							2												FILL
-Y4DET-	51+43	53+55	LT	212.50			52+80	52+18							2												FILL / SHORING
PROJECT SUBTOTAL				975.00											4												
LESS ANCHOR DEDUCTIONS																											
GREU TL-2		4	@ 25'	-100																							
GRAND TOTAL				875											4												
SAY				**888**											**4**												

12/06/07

COMPUTED BY: N. HILL DATE: 7/23/2018
CHECKED BY: G. MODLIN DATE: 2/28/2019

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-1015	3B-5

DOUBLE FACED CABLE GUIDERAIL SUMMARY

SURVEY LINE	STATION	STATION	LENGTH	END ANCHOR UNIT	INTERMEDIATE ANCHOR UNIT	COMMENTS
–L–	32+83	94+84	6,718	2	3	
–L–	99+17	136+24	3,912	2	1	
–L–	141+24	150+56	1,092	2		
–L–	151+23	169+11	1,628	2		
–L–	186+23	226+09	4,189	2	1	
–L–	228+94	242+96	1,505	2		
–L–	246+16	282+45	3,938	2	1	
–L–	292+80	300+89	910	2		
–L–	303+94	402+16	9,822	2	4	
–L–	402+83	505+11	10,228	2	5	
–L–	507+68	515+70	904	2		
–L–	517+88	535+03	1,819	2		
		SUBTOTAL:	46,665	24	15	
LESS TERMINAL ANCHOR UNITS			–1,200			
		GRAND TOTALS:	45,465	24	15	
		SAY:	46,000	24	15	
EXTRA GUIDERAIL POSTS 18						

SUMMARY OF BREAKING EXISTING ASPHALT PAVEMENT

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD²
–L–	42+50	76+00	LT&RT	24,801.11
–RP1CD–	0+00	11+40	LT	3,703.22
–RP1CD–	0+00	15+50	LT	5,484.89
–Y3–	40+50	65+00	LT&RT	5,553.56
–Y4–	36+50	56+00	LT&RT	4,374.56
–RP2AC–	69+35	72+51	LT&RT	1,306.22
–RP2CD–	0+00	24+82	LT	12,342.67
–RP2CD–	20+50	24+82	RT	1,495.89
–L–	531+97	547+00	LT&RT	13,311.44
		TOTAL:		47,572.44
		SAY:		47,580

ASPHALT PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD²
–RP1CD–	15+50	31+54	LT	7,351.56
–L–	519+21	519+61	RT	184.89
–L–	528+21	538+04	LT	1,622.11
–RP2AC–	70+50	70+75	LT	116.67
–RP2AC–	41+48	73+13	LT	184.00
–RP2CD–	0+48	1+45	RT	150.89
–RP2CD–	1+35	23+20	RT	8,053.33
–SERVRD–	32+81	56+74	LT	1,799.89
–SR1162–	13+83	16+27	LT&RT	555.33
–Y3DET–	37+90	67+08	LT&RT	8,334.33
–Y4DET–	35+34	57+97	LT&RT	6,040.44
–L–	25+47	27+30	MED/TMP	428.89
–L–	28+18	29+73	MED/TMP	397.11
–L–	34+65	58+35	MED/TMP	4,817.89
–L–	59+14	77+19	MED/TMP	2,483.11
–RP1AB–	24+10	30+43	MED/TMP	1,175.56
–RP1AB–	30+91	33+84	MED/TMP	539.22
–RP2AC–	45+00	57+73	MED/TMP	2,792.33
–RP2CD–	6+79	12+25	MED/TMP	341.33
–RP2CD–	12+92	20+34	MED/TMP	780.44
–L–	546+50	554+53	MED/TMP	1,023.89
–L–	558+43	559+46	MED/TMP	93.67
–L–	559+97	561+00	MED/TMP	97.11
–L–	581+24	582+29	MED/TMP	90.44
–L–	582+69	583+33	MED/TMP	53.44
			TOTAL:	49,507.89
			SAY:	49,510

NOTE:
APPROXIMATE QUANTITIES ONLY. UNLCASSIFIED EXCAVATION, FINE GRADING, CLEARING AND GRUBBING, BREAKING OF EXISTING PAVEMENT, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "GRADING".

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	LOCATION	STATION	STATION	LENGTH
–L–	RT	118+55.00	137+27.00	1,872.0
–L–	RT	141+49.59	150+93.00	943.4
–L–	LT	118+58.00	128+35.00	977.0
–L–	MED	140+53.20	141+68.75	115.5
–L–	LT	145+89.00	151+00.00	511.0
–L–	RT	164+20.00	169+31.28	511.3
–L–	RT	186+02.72	226+21.39	4,018.7
–L–	LT	165+71.00	169+31.28	360.3
–L–	LT	186+02.72	226+37.95	4,035.2
–L–	RT	235+51.00	240+05.00	454.0
–L–	LT	228+79.43	229+00.00	20.6
–L–	RT	268+50.00	282+64.71	1,414.7
–L–	LT	267+08.00	282+64.71	1,556.7
–L–	RT	292+60.30	294+31.00	170.7
–L–	LT	292+60.30	295+05.00	244.7
–L–	RT	498+45.00	504+80.20	635.2
–L–	LT	499+50.00	505+56.66	606.7
–L–	LT	507+92.77	516+24.34	831.6
–L–	MED	517+66.68	517+85.00	18.3
–L–	LT	518+29.48	525+58.21	728.7
–Y3–	LT	44+65.00	45+66.44	101.4
–Y3–	RT	44+65.00	45+05.60	40.6
–Y3–	LT	47+60.00	51+04.76	344.8
–Y3–	RT	47+59.76	51+25.49	365.7
–Y3–	LT	53+45.93	56+84.00	338.1
–Y3–	RT	53+66.66	56+84.00	317.3
–Y3–	LT	58+76.80	62+43.99	375.0
–Y3–	RT	59+12.89	60+76.00	163.1
–Y4–	RT	39+95.00	43+64.14	369.1
–Y4–	RT	45+73.92	51+92.00	618.1
–Y4–	LT	39+95.00	43+71.72	376.7
–Y4–	LT	45+81.50	53+58.00	776.5
–RP1AB–	RT	4+94.97	9+85.46	490.5
–RP1AB–	RT	12+54.83	17+95.00	540.2
–RP1AB–	LT	4+93.00	10+99.89	606.9
–RP1BA–	LT	13+61.83	17+55.03	393.2
–Y3RPA–	RT	14+13.00	17+52.69	364.5
–Y3RPB–	LT	19+30.09	20+24.96	154.2
–Y3RPB–	LT	0+00.00	10+57.00	1,057.0
–Y3RPC–	RT	3+56.56	17+11.42	1,373.3
–RP2C–	RT	2+54.36	10+30.00	775.6
			TOTAL:	29,968.2
			SAY:	29,970

2/28/2019
8:38:57
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gmodlin

HY-311571

COMPUTED BY:	Michelle Berry	DATE:	11/1/2018
CHECKED BY:	Brook Anderson	DATE:	11/28/2018

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-1015	3D-1

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

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

LINE & STATION	OFFSET		STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Side Drain Pipe (RCP, CAAP, HDPE, or PVC)												C. A. A. PIPE			
SIZE									12	15	18	24	30	36	42	48					15	18	24	
THICKNESS OR GAUGE			FROM	TO	FT.	FT.	FT.	%									DO NOT USE RCP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	.064	.064	.064	
Y4DET 36+22	27	RT	0204								32													
Y4DET 38+46	32	RT	0205								32													
Y4DET 38+78	0	CL	0206								64													
Y4DET 51+75	26	LT	0207		14.2																			
			0207	0208		9.9	6.8	1.5			52													
Y4DET 53+98	6	RT	0210								56													
Y4DET 56+84	13	LT	0211		16.3																			
			0211	0212		13.5	12.9			40														
Y4DET 37+64	0	CL	0213								64													
Y3DET 61+22	1	LT	0215								68													
L 35+00	3	LT	0401		28.2																			
			0401	0402		25.5	23.3																	
L 33+18	4	LT	0402		27.4																			
			0402	0407		23.3	23.3																	
L 33+13	4	LT	0403		27.4																			
			0403	0405		23.3	23.3																	
L 33+23	80	LT	0404		27.8																			
			0404	0402		23.4	23.3																	
			0404	0403		23.4	23.3																	
L 37+18	0	CL	0408		29.2																			
			0408	0409		26.4	24.4																	
L 46+78	0	CL	0501		29.6																			
			0501	0503		25.4	24.9																	
L 46+99	1	RT	0502		29.6																			
			0502	0501		26.9	25.6																	
L 51+00	0	CL	0504		30.9																			
			0504	0505		28.2	25.1																	
L 54+50	3	RT	0506		32.1																			
			0506	0507		29.4	25.2																	
L 62+23	0	CL	0601		30.6																			
			0601	0602		28.6	28.5	0.3																
L 62+38	0	CL	0602		30.5																			
			0602	0603		27.8	27.5																	
L 60+00	0	CL	0604		31.3																			
			0604	0601		29.4	28.6																	
L 58+76	106	LT	0605																					
L 65+00	0	CL	0606		31.2																			
			0606	0602		29.0	28.2																	
L 77+46	0	CL	0701		29.8																			
			0701	0702		26.8	26.8																	
L 77+56	0	CL	0702		29.8																			
			0702	0703		26.3	25.0																	
L 83+00	0	CL	0704		31.7																			
			0704	0706		28.7	24.7																	
LP1B 03+24	14	RT	0707		30.2																			
			0707	0709		27.2	26.1															32		
LP1B 03+11	14	RT	0708		30.2																			
			0708	0707		27.3	27.2																	
L 95+07	0	CL	0710		30.4																			
			0710	0711		27.4	26.9																	
SHEET TOTALS										40	368											32		

LINE & STATION	FROM	TO	R. C. PIPE CLASS III								R. C. PIPE CLASS IV								R. C. PIPE CLASS V								ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)
			12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	12	15	18	24	30	36	42	48	CY
Y4DET 36+22	0204																										
Y4DET 38+46	0205																										
Y4DET 38+78	0206																										
Y4DET 51+75	0207																										
	0207	0208																									
Y4DET 53+98	0210																										
Y4DET 56+84	0211																										
	0211	0212																									
Y4DET 37+64	0213																										
Y3DET 61+22	0215																										
L 35+00	0401																										
	0401	0402										180															
L 33+18	0402																										
	0402	0407																							84			
L 33+13	0403																										
	0403	0405																							84			
L 33+23	0404																										4.500
	0404	0402																							76			
	0404	0403																							76			
L 37+18	0408																										
	0408	0409										80															
L 46+78	0501																										
	0501	0503											92														
L 46+99	0502																										
	0502	0501										20															
L 51+00	0504																										
	0504	0505										96															
L 54+50	0506																										
	0506	0507										96															
L 62+23	0601																										
	0601	0602										12															
L 62+38	0602																										
	0602	0603												100													
L 60+00	0604																										
	0604	0601										220															
L 58+76	0605					36																					
L 65+00	0606																										
	0606	0602										260															
L 77+46	0701																										
	0701	0702											8														
L 77+56	0702																										
	0702	0703												84													
L 83+00	0704																										
	0704	0706											88														
LP1B 03+24	0707																										
	0707	0709																									
LP1B 03+11	0708																										
	0708	0707										12															
L 95+07	0710																										
	0710	0711											88														
SHEET TOTALS						36						976	276	184										320			4.500

LINE & STATION	FROM	TO	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE				CONCRETE TRANSITIONAL SECTION		D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	ADJUST D.I.	15" C.A.A. ELBOW	18" C.A.A. ELBOW	24" C.A.A. ELBOW		CONCRETE COLLARS CL. "B" STD. 840.72	CONCRETE AND BRICK PIPE PLUG STD. 840.71	PIPE REMOVAL	
			0' THRU 5'	A 5' THRU 10'	B 10' AND ABOVE		E	F	G		D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																										
			EACH	LIN. FT.	LIN. FT.																														CY	CY	LIN. FT.	REMARKS
Y4DET 36+22	0204																																				32	TEMPORARY PIPE
Y4DET 38+46	0205																																				32	TEMPORARY PIPE
Y4DET 38+78	0206																																				64	TEMPORARY PIPE
Y4DET 51+75	0207		1													1					1																	TEMPORARY 2GI
	0207	0208																																			52	TEMPORARY PIPE
Y4DET 53+98	0210																																				56	TEMPORARY PIPE
Y4DET 56+84	0211		1																		1						1											TEMPORARY DI
	0211	0212																																			40	TEMPORARY PIPE
Y4DET 37+64	0213																																				64	TEMPORARY PIPE
Y3DET 61+22	0215																																				68	TEMPORARY PIPE
L 35+00	0401		1													1					1																	
	0401	0402																																				
L 33+18	0402		1													1					1																	
	0402	0407																																				
L 33+13	0403		1													1					1																	
	0403	0405																																				
L 33+23	0404																																					
	0404	0402																																				
	0404	0403																																				
L 37+18	0408		1													1					1																	
	0408	0409																																				
L 46+78	0501		1													1					1																	
	0501	0503																																				
L 46+99	0502		1													1					1																	
	0502	0501																																				
L 51+00	0504		1													1					1																	
	0504	0505																																				
L 54+50	0506		1													1					1																	
	0506	0507																																				
L 62+23	0601		1														1				1																	
	0601	0602																																				
L 62+38	0602		1														1				1																	
	0602	0603																																				
L 60+00	0604		1														1				1																	
	0604	0601																																				
L 58+76	0605																																					
L 65+00	0606		1														1				1																	
	0606	0602																																				
L 77+46	0701		1													1					1																	
	0701	0702																																				
L 77+56	0702		1													1					1																	
	0702	0703																																				
L 83+00	0704		1													1					1																	
	0704	0706																																				
LP1B 03+24	0707		1			1	1																															
	0707	0709																													2						
LP1B 03+11	0708		1			1		1																														
	0708	0707																																				
L 95+07	0710		1													1					1																	
	0710	0711																																				
SHEET TOTALS			20			2	1	1								13	4				18						1					2					408	

ABBREVIATIONS

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

HY-311571

COMPUTED BY:	Michelle Berry	**DATE:**	11/1/2018
CHECKED BY:	Brook Anderson	**DATE:**	11/28/2018

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
R-1015	3D-2

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

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

LINE & STATION SIZE THICKNESS OR GAUGE	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Side Drain Pipe (RCP, CAAP, HDPE, or PVC) 12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. A. A. PIPE 15 .064	18 .064	24 .064	
L 91+12	0	CL	0712		32.7																			
			0712	0714		30.0	25.8																	
RP1AB 14+00	58	LT	0713		57.6																			
			0713	4125		54.8	44.0																	
RP1AB 13+00	45	RT	0715		60.5																			
			0715	0716		57.7	26.6																136			
L 99+16	0	CL	0717		31.3																			
			0717	0718		28.6	26.4																	
RP1AB 04+98	58	LT	0719		49.0																			
			0719	0720		46.3	46.1																	
RP1AB 05+46	58	LT	0720		51.0																			
			0720	0721		45.9	25.8																	80		
RP1AB 06+00	46	RT	0722		52.9																			
			0722	0723		50.1	46.4																	
RP1AB_NB 05+00	27	RT	0723		49.2																			
			0723	0725		46.4	25.7																	96		
RP1AB 05+46	0	CL	0724		49.3																			
			0724	0720		46.3	45.9																	
LP1B 04+00	14	RT	0726		30.8																			
			0726	0707		27.8	27.2																	
RP1B 16+98	18	LT	0728																					
RP1B 10+00	10	LT	0730																					
RP1B 21+85	21	LT	0734																					
L 86+50	86	LT	0736		28.9																			
			0736	0737		24.5	24.3																	
L 92+01	1	RT	0738																					
L 73+50	1	RT	0740		30.9																			
			0740	0741		28.2	25.2	0.5																
L 92+93	288	LT	0742																					
L 95+10	65	LT	0743		30.2																			
			0743	0710		27.8	27.4																	
L 95+56	65	LT	0744		30.1																			
			0744	0743		28.0	27.8																	
LP1B 05+80	2	LT	0745																					
L 108+00	0	CL	0801		31.1																			
			0801	0804		25.7	25.6																	
L 108+00	82	LT	0802		28.8																			
			0802	0801		25.8	25.7																	
L 101+50	1	RT	0803																					
L 114+47	0	CL	0901		29.0																			
			0901	0902		26.9	26.1																	
L 118+60	0	CL	0903		33.4																			
			0903	0912		30.4	30.2																	
L 124+00	59	LT	0904		48.2																			
			0904	0907		45.5	23.5																80			
L 119+70	67	RT	0905		37.5																			
			0905	0912		34.8	30.4																	
L 126+50	59	RT	0906		53.6																			
			0906	0915		50.8	24.5	0.3															92			
L 120+00	57	LT	0908		38.4																			
SHEET TOTALS																					308	176		

STRUCTURE NUMBER FROM	TO	R. C. PIPE CLASS III 12	15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	R. C. PIPE CLASS V 12	15	18	24	30	36	42	48	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.
0712																											1		
0712	0714										92																		
0713																											1		
0713	4125										224																		
0715																											1		
0715	0716																												
0717																											1		
0717	0718										80																		
0719																											1		
0719	0720										44																		
0720																											1	0.1	
0720	0721																												
0722																											1		
0722	0723										100																		
0723																											1		
0723	0725																												
0724																											1		
0724	0720											56																	
0726																											1		
0726	0707										68																		
0728															104														
0730															88														
0734															128														
0736																										3.400			
0736	0737														200														
0738																							188						
0740																											1		
0740	0741										88																		
0742																							324						
0743																											1		
0743	0710										64																		
0744																											1		
0744	0743										44																		
0745															144														
0801																											1	0.4	
0801	0804														92														
0802																													
0802	0801														84														
0803															172														
0901																											1		
0901	0902											76																	
0903																											1		
0903	0912											64																	
0904																											1		
0904	0907																												
0905																											1		
0905	0912										108																		
0906																											1		
0906	0915																												
0908																											1		
SHEET TOTALS											912	196			1012								512			3.400	20	0.5	

STRUCTURE NUMBER FROM	TO	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	ADJUST D.I.	15" C.A.A. ELBOW	18" C.A.A. ELBOW	24" C.A.A. ELBOW		CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
0712												1					1																	
0712	0714																																	
0713															1								1											
0713	4125																																	
0715															1								1											
0715	0716																										2							
0717												1					1																	
0717	0718																																	
0719															1								1											
0719	0720																																	
0720															1								1											
0720	0721																											2						
0722															1								1											
0722	0723																																	
0723															1								1											
0723	0725																											2						
0724												1					1																	
0724	0720																																	
0726		1			1																													
0726	0707																																	
0728																																		
0730																																		
0734																																		
0736																																		
0736	0737																																	
0738																																		
0740												1							1															
0740	0741																																	
0742																																		
0743															1								1											
0743	0710																																	
0744															1								1											
0744	0743																																	
0745																																		
0801												1					1																	
0801	0804																																	
0802																																		
0802	0801																																	
0803																																		
0901													1				1																	
0901	0902																																	
0903												1					1																	
0903	0912																																	
0904															1								1											
0904	0907																										2							
0905															1								1											
0905	0912																																	
0906															1								1											
0906	0915																										2							
0908															1								1											
SHEET TOTALS		1			1							6	1		12		6		1				12				6	4						

ABBREVIATIONS

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

HY-311571

COMPUTED BY:	Michelle Berry	DATE:	11/1/2018
CHECKED BY:	Brook Anderson	DATE:	11/28/2018

PROJECT NO.	SHEET NO.
R-1015	3D-3

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION SIZE THICKNESS OR GAUGE	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Side Drain Pipe (RCP, CAAP, HDPE, or PVC) 12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. A. A. PIPE 15 .064	18 .064	24 .064		R. C. PIPE CLASS III 12	15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	R. C. PIPE CLASS V 12	15	18	24	30	36	42	48	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	ADJUST D.I.	15" C.A.A. ELBOW	18" C.A.A. ELBOW	24" C.A.A. ELBOW		CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
		0908	0913		35.6	32.4																											136																																																				
L 120+50	6 RT	0909																																			236																																																		
L 114+37	0 CL	0910		29.0																																													1																1				1																	
		0910	0901		27.1	27.1																											8																																																				
L 118+60	67 RT	0912		34.9																																													1																		1								1											
		0912	0911		30.2	22.8																	40																																																							2						
L 118+63	57 LT	0913		35.1																																													1																		1								1											
		0913	0914		32.4	23.8	0.6													40																																																									2							
L 123+00	59 RT	0920		45.8																																													1																		1								1											
		0920	0921		43.0	23.4	0.3													72																																																									2							
L 130+00	1 LT	1001		56.8																																													1															1					1																	
		1001	1002		53.8	53.6																												60																																																		
L 130+00	57 RT	1002		58.3																																													1																		1								1											
		1002	1003		53.6	22.8														112																																																										2						
L 136+50	1 LT	1004		58.5																																													1															1					1																	
		1004	1010		55.8	55.5																											60																																																				
L 137+21	57 RT	1005		59.4																																													1																		1								1											
		1005	1006		55.3	21.3	1.1													124																																																									2							
L 140+67	19 LT	1007		56.9																																													1																		1								1											
		1007	1008		54.1	52.5																											100																																																				
L 141+68	16 LT	1008		55.2																																													1																		1								1											
		1008	1009		52.5	51.4																											72																																																			
L 141+68	55 RT	1009		54.1																																													1																		1								1											
		1009	1101		51.4	49.9	0.7																										84																																																			
L 136+50	59 RT	1010		60.0																																													1																		1								1											
		1010	1005		55.5	55.3																											68																																																			
L 130+41	1 LT	1013																																			352																																																		
L 142+50	57 RT	1101		52.6																																													1																		1								1											
		1101	1102		49.9	22.3	3.3													96																																																									2							
L 146+50	0 CL	1103		42.0																																													1															1					1																	
		1103	1104		39.0	38.8																												56																																																		
L 146+50	59 RT	1104		43.8																																													1																		1								1											
		1104	1115		38.8	34.4	0.5																											264																																																	
L 150+88	59 RT	1105		33.6																																													1																		1								1											
		1105	1106		30.8	29.6																											36																																																			
L 150+50	59 RT	1106		34.3																																													1																		1								1											
		1106	1107		29.6	21.7	0.7													48																																																									2							
L 150+50	0 CL	1108		32.6																																													1															1					1																	
		1108	1106		29.8	29.6																											56																																																			
L 150+95	57 LT	1109		33.4																																													1																		1								1											
		1109	1110		30.6	23.0	0.7													36																																																									2							
L 154+67	0 CL	1112		28.2																																													1	2.4													1					1																	
		1112	1119		20.9	20.4																															156																																																				
L 149+15	57 LT	1114		37.4																																													1																		1								1											
		1114	1109		34.7	30.6																											180																																																			
L 149+15	59 RT	1115		37.4																																													1																		1								1											
		1115	1122		34.4	23.1																	48																																																								2						
L 153+44	84 LT	1116		25.0																																											3.400																																										
		1116	1117		20.6	20.5																															180																																																			
L 154+20	83 LT	1118		25.4																																											3.400																																										
						SHEET TOTALS														528	88												800	380			924												6.800	22	2.4													5	1		16		6						16				12	6						

ABBREVIATIONS

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