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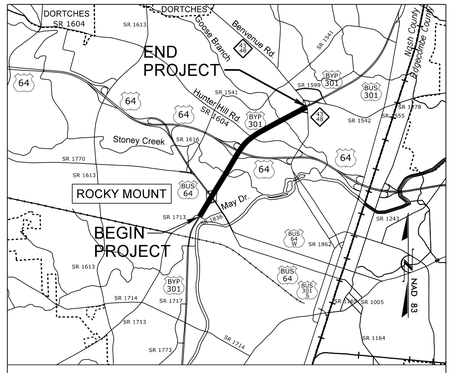
09/08/09

TIP PROJECT: U–3330

CONTRACT: C203907

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Plan Sheet Symbols Sheet
See Sheets 1C-1 and 1C-2 For Survey Control Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

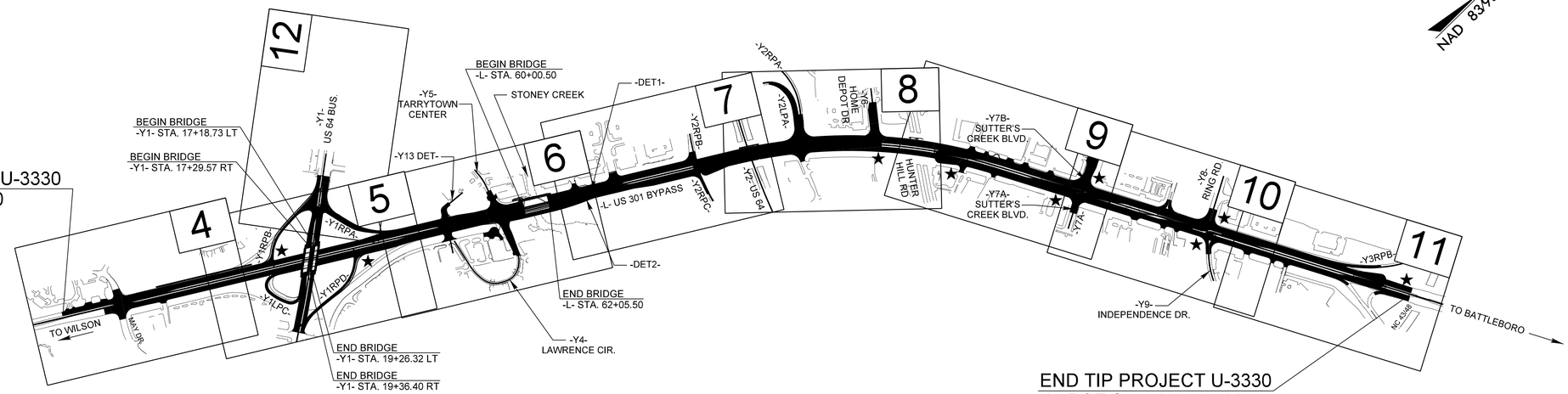
NASH COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U–3330	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
36596.1.2	STP – 0301 (28)	PE
36596.2.FR1	STP – 0301 (28)	R/W
36596.2.FRU1	STP – 0301 (28)	UTIL.
36596.3.4	STP – 0301 (28)	CONST.

LOCATION: ***ROCKY MOUNT – US 301 BYPASS FROM SR 1836 (MAY DRIVE) TO NC 43–48 (BENVENUE ROAD) INTERCHANGE***

TYPE OF WORK: ***GRADING, DRAINAGE, PAVING, SIGNALS, NOISE WALL, STRUCTURES, AND CULVERT***



NOTES:
1. THIS IS A PARTIAL CONTROLLED–ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS.

★ PROPOSED TRAFFIC SIGNAL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2017 = 39,000
ADT 2037 = 47,500
K = 10%
D = 55%
T = 4%*
V = 50 mph

*TTST 2% DUAL 2%
FUNCTIONAL CLASS.:URBAN ARTERIAL
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U–3330 ..... 2.005 Miles
LENGTH STRUCTURE TIP PROJECT U–3330 ..... 0.039 Mile
TOTAL LENGTH TIP PROJECT U–3330 ..... 2.044 Miles

Prepared In the Office of:
CALYX ENGINEERS + CONSULTANTS
Formerly Mulkey Engineers & Consultants
NC License # F-1333

FOR THE NORTH CAROLINA DEPT. OF TRANSPORTATION

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 21, 2014

LETTING DATE:
MAY 16, 2017

NCDOT CONTACT:

Steve A. Drum, PE
PROJECT ENGINEER

Michael A. Holt, PE
PROJECT DESIGN ENGINEER

Gary R. Lovering, PE
PROJECT ENGINEER – ROADWAY DESIGN

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 029984 ENGINEER DAVID P. BECKER
DocuSigned by: David Becker
SIGNATURE: P.E. 4/6/2017

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 17265 ENGINEER STEPHEN ANTHONY DRUM
DocuSigned by: Steve Drum
SIGNATURE: P.E. 4/6/2017

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

4/6/2017
R:\Roadway\Proj\U3330_RDY_#sh.dgn
Keys

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-3330	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 17265 ENGINEER STEVE ANTHONY DRUM
DocuSigned by: Steve Drum
8145549B98D0493...
4/6/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX OF SHEETS, GENERAL NOTES, and LIST OF STANDARDS

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARDS
1B	CONVENTIONAL SYMBOLS
1C-1 THRU 1C-3	SURVEY CONTROL SHEETS
2A-1 THRU 2A-8	PAVEMENT SCHEDULE, WEDGING DETAILS & TYPICAL SECTIONS
2B-1 THRU 2B-4	DETAIL OF INTERSECTIONS
2B-5	DETAIL OF DETOUR ALIGNMENT FOR *DET1-, -DET2-, AND *Y13DET-
2B-6	DETAIL OF DETOUR ALIGNMENT FOR *DET3-, -DET4-, AND *Y13DET-
2C-1	DETAIL OF TEMPORARY ANCHOR UNIT W-BEAM
2C-2	DETAIL OF COAL COMBUSTION PRODUCT PLACEMENT
2C-3	DETAIL OF MEDIAN HAZARD PROTECTION
2C-4	DETAIL OF PAVING SHOULDERS UNDER BRIDGES METHOD I
2C-5	DETAIL OF PAVING SHOULDERS UNDER BRIDGES METHOD III
2C-6	DETAIL OF STRUCTURE ANCHOR UNITS, TYPE III
2C-7	DETAIL OF STRUCTURE ANCHOR UNITS, TYPE B-77
2C-8	DETAIL OF PAVING SHOULDERS UNDER BRIDGES METHOD II
2D-1	DETAIL OF DRAINAGE DITCHES
2G-1	DETAIL OF STANDARD ROCK PLATING
2G-2	DETAIL OF STANDARD TEMPORARY SHORING
2G-3	DETAIL OF STANDARD TEMPORARY WALL SHEET 1 OF 3
2G-4	DETAIL OF STANDARD TEMPORARY WALL SHEET 2 OF 3
2G-5	DETAIL OF STANDARD TEMPORARY WALL SHEET 3 OF 3
2H-1	DETAIL OF STOCKPILE CONTAINMENT
2N-1	PLAN AND PROFILE OF NOISE WALL 2REV
3B-1	SUMMARY OF GUARDRAIL
3B-2	SUMMARY OF WOVEN WIRE FENCE, REMOVAL OF EXISTING ASPHALT PAVEMENT, SHOULDER BERM GUTTER, AND CONCRETE EXPRESSWAY GUTTER
3B-3	SUMMARY OF EARTHWORK
3D-1 THRU 3D-9	SUMMARY OF DRAINAGE
3G-1	SUMMARY OF GEOTECHNICAL QUANTITIES
3P-1	PARCEL INDEX SHEET
4 THRU 12	PLAN SHEETS
13 THRU 28	PROFILE SHEETS
TMP-1 THRU TMP-15D	TRANSPORTATION MANAGEMENT PLANS
PMP-1 THRU PMP-10	PAVEMENT MARKING PLANS
EC-1 THRU EC-21	EROSION CONTROL PLANS
RF-1	REFORESTATION PLANS
SIGN-1 THRU SIGN-15	SIGNING PLANS
SIG-1 THRU SIG-M8	SIGNAL PLANS
SCP-1 THRU SCP-54	SIGNAL COMMUNICATION PLANS
UC-1 THRU UC-14	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-10	UTILITIES BY OTHERS PLANS
X-1	CROSS-SECTION INDEX
X-1A THRU X-1D	CROSS-SECTION SUMMARY SHEETS
X-2 THRU X-89	CROSS-SECTIONS
S1-1 THRU S1-38	STRUCTURE PLANS
S2-1 THRU S2-39	STRUCTURE PLANS
S3-1 THRU S3-42	STRUCTURE PLANS
C-1 THRU C-11	CULVERT PLANS
W-1 THRU W-3	WALL PLANS

2012 ROADWAY ENGLISH STANDARD DRAWINGS

EFF. 01-17-2012
REV. 02-29-2016

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2012 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
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.11	Bridge Approach Fills - Sub Regional Tier
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 (Sheet 2 of 3 is no longer applicable)
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.02	Subsurface Drain
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
840.04	Concrete Open Throat Catch Basin - 12" thru 48" Pipe
840.05	Brick Open Throat Catch Basin - 12" thru 48" Pipe
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
840.24	Frames and Narrow Slot Sag Grates
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.34	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
840.72	Pipe Collar
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
848.04	Street Turnout
848.05	Curb Ramp - Proposed Curb & Gutter
852.01	Concrete Islands
852.04	Method for Placement of Drop Inlets in Grassed Median - Using 1'-6" Curb and Gutter
852.06	Method for Placement of Drop Inlets in Concrete Islands
857.01	Precast Reinforced Concrete Barrier - 41" Single Faced
862.01	Guardrail Placement
862.02	Guardrail Installation
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
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

GENERAL NOTES:

2012 SPECIFICATIONS
EFFECTIVE: 01-17-2012
REVISED: 10-31-2014

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

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

SUPERELEVATION:
ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 AND 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. 560.01

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

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

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

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

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

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

UTILITIES:
UTILITY OWNERS ON THIS PROJECT ARE: CITY OF ROCKY MOUNT ELECTRIC, CITY OF ROCKY MOUNT GAS, CONTERRA ULTRA BROADBAND, SUDDENLINK, MCNC, AT&T TRANSMISSION, CENTURYLINK, LEVEL 3, INTELIPORT INC., LMK COMMUNICATIONS

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

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

CURB RAMPS:
CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS.
CONSTRUCT ALL CURB RAMPS ACCORDANCE WITH STD 848.05 and/or 848.06.

ROCK:
ROCK IS ANTICIPATED BETWEEN -L- STA 36+25 TO 38+75, -L- STA 41+75 TO 42+75, -L- STA 43+25 TO 44+25, -Y1LPC- STA 10+00 TO 12+25, AND -Y4- STA 11+50 TO 12+50. BLASTING MAY BE REQUIRED FOR EXCAVATION ON THE PROJECT. SEE SECTION 220 OF THE STANDARD SPECIFICATIONS AND IF APPLICABLE, ROCK BLASTING PROVISION.

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NC License # F-1333

4/5/2017
R:\Roadway\Proj\U3330_RDY_PSH_01A.dgn
Fkeus

04/06/15

PROJECT REFERENCE NO.	SHEET NO.
U-3330	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- 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

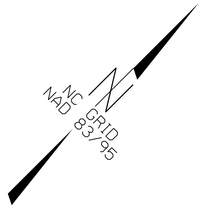
MISCELLANEOUS:

- 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.
- 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

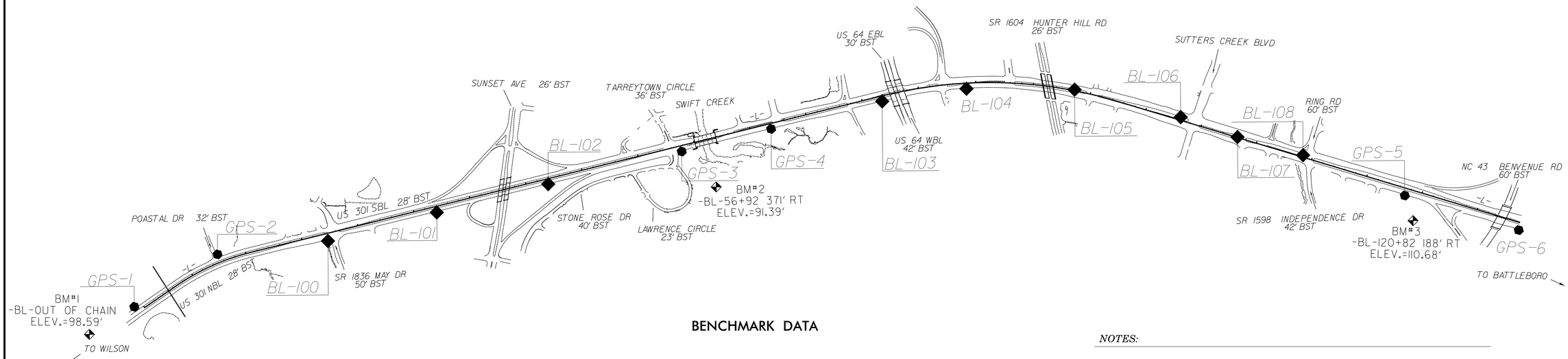
PROJECT REFERENCE NO.	SHEET NO.
U-3330	1C-1
Location and Surveys	

SURVEY CONTROL SHEET U-3330



BASELINE DATA

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	GPS-1	802499.2110	2346555.3720	103.12	OUTSIDE PROJECT LIMITS	
2	GPS-2	803330.1810	2346743.8720	104.31	17+68.96	71.31 LT
100	BL-100	804088.9120	2347337.5150	97.17	27+16.32	64.98 RT
101	BL-101	804930.7050	2347829.7330	100.15	36+91.37	52.06 RT
102	BL-102	805786.8440	2348338.3620	97.35	46+87.18	45.79 RT
3	GPS-3	806804.9440	2348956.0730	98.21	58+78.01	49.34 RT
4	GPS-4	807490.4650	2349365.2060	96.77	66+76.33	45.92 RT
103	BL-103	808340.3880	2349876.5420	94.16	76+68.30	45.15 RT
104	BL-104	808934.2300	2350315.5330	97.91	84+16.60	47.68 RT
105	BL-105	809593.4750	2350988.0660	111.58	93+63.96	8.60 LT
106	BL-106	810073.6890	2351801.3610	111.75	103+07.46	27.36 LT
107	BL-107	810299.8720	2352270.9640	101.74	108+28.18	4.04 LT
108	BL-108	810590.9570	2352783.7120	94.08	114+17.64	17.43 LT
5	GPS-5	810967.5930	2353653.2810	104.23	123+61.86	62.90 RT
6	GPS-6	811457.2222	2354564.4509	120.58	OUTSIDE PROJECT LIMITS	



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "U3330-GPS-3" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 806804.945(ft) EASTING: 2348956.073(ft) ELEVATION: 98.21(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9999497600

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U3330-GPS-3" TO -L- STATION 10+00.00 IS S 28° 46' 58.9" W 4845.46'

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES

VERTICAL DATUM USED IS NAVD 88

BENCHMARK DATA

```
**********************************************
BM#1       ELEVATION = 98.59
N 802055       E 2346449
L STATION 10+00.00
S 19°02'47.12" W  DIST    532.02
RR SPIKE IN 12" TWIN PINE
**********************************************
**********************************************
BM#2       ELEVATION = 91.39
N 806799       E 2349385
L STATION 60+94.00 420 RIGHT
RR SPIKE IN 24" OAK
**********************************************
**********************************************
BM#3       ELEVATION = 110.68
N 810865       E 2353858
L STATION 124+93.00 251 RIGHT
RR SPIKE IN 24" OAK
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NOTES:

1. *THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/95 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:*

   HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   U3330_LS_GPSCALIB.HTML
   U3330_LS_WGS84.TXT
   U3330_LS_LOCAL.TXT
   U3330_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.

NOTE: DRAWING NOT TO SCALE

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PROJECT REFERENCE NO.	SHEET NO.
U-3330	1C-2
Location and Surveys	

SURVEY CONTROL SHEET U3330

GPS Calibration Report

Project : u3330z

TIP Number	u3330		
User name	pwoodard	**Date & Time**	2:53:09 PM 1/22/2009
Coordinate System	US State Plane 1983(at ground)	**Zone**	North Carolina 3200
Horizontal Datum	NAD 1983 (Conus)		
Vertical Datum	NAVD88	**Geoid Model**	G03NC
Coordinate Units	Meters		
Distance Units	Meters		
Height Units	Meters		

LOCAL SITE INFORMATION

Localized around	
Latitude	35°57'39.90505"N
Longitude	77°49'15.01145"W
Site Scale Factor	1.0000502425
Height	-4.944m

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	242884.359m
Easting coordinate of rotation center	718667.651m
Rotation about the center point	0°00'00"
Translation north	-0.002m
Translation east	0.000m
Scale factor	1.00000008

Vertical Adjustment Parameters

Northing coordinate of origin point	251068.949m
Easting coordinate of origin point	744724.236m
Vertical separation at origin	0.014m
Slope north	-0.538ppm
Slope east	0.047ppm

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "U3330-GPS-3" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 806804.945(ft) EASTING: 2348956.073(ft) ELEVATION: 98.21(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9999497600
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U3330-GPS-3" TO -L- STATION 10+00.00 IS S 28°46'58.9"W 4845.46'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Geoid Model Definition

G03NC

Residual Differences Between GPS (WGS84) And Local Coordinates

Summary

	Maximum error	Root Mean Square error	Point
Horizontal	0.004m	0.002	SHINGLED_GPS
Vertical	0.011m	0.006	RED OAK_GPS
Three-dimensional	0.011m	0.006	RED OAK_GPS

Point Residuals

WGS84 Coordinates		Calculated point FOR DISPLAY ONLY		Local Coordinates	
Point	CUTOFF_GPS	**Northing**	251068.949m	**Point**	CUTOFF
Latitude	36°00'14.53240"N	**Easting**	744724.236m	**Northing**	251068.952m
Longitude	77°30'04.24649"W	**Elevation**	29.273m	**Easting**	744724.237m
Height	-5.952m	**Horz error**	0.003m	**Elevation**	29.277m
		Vert error	0.004m	**Utilized**	Horz and Vert
		3D error	0.005m	**Quality**	Control quality
Point	SHINGLED_GPS	**Northing**	223026.395m	**Point**	SHINGLED
Latitude	35°45'10.19636"N	**Easting**	733131.237m	**Northing**	223026.392m
Longitude	77°38'02.50728"W	**Elevation**	31.812m	**Easting**	733131.234m
Height	-3.607m	**Horz error**	0.004m	**Elevation**	31.804m
		Vert error	0.008m	**Utilized**	Horz and Vert
		3D error	0.009m	**Quality**	Control quality
Point	WILSONPORT_GPS	**Northing**	224544.515m	**Point**	WILSONPORT
Latitude	35°46'11.32189"N	**Easting**	702828.612m	**Northing**	224544.516m
Longitude	77°58'08.01582"W	**Elevation**	46.156m	**Easting**	702828.614m
Height	11.412m	**Horz error**	0.003m	**Elevation**	46.163m
		Vert error	0.007m	**Utilized**	Horz and Vert
		3D error	0.007m	**Quality**	Control quality
Point	RED OAK_GPS	**Northing**	254191.632m	**Point**	RED OAK
Latitude	36°02'11.25674"N	**Easting**	708353.126m	**Northing**	254191.633m
Longitude	77°54'15.04985"W	**Elevation**	64.371m	**Easting**	708353.127m
Height	29.765m	**Horz error**	0.001m	**Elevation**	64.360m
		Vert error	0.011m	**Utilized**	Horz and Vert
		3D error	0.011m	**Quality**	Control quality
Point	mon1_GPS	**Northing**	244602.250m	**Point**	mon1
Latitude	35°56'57.60899"N	**Easting**	715231.508m	**Northing**	244602.249m
Longitude	77°49'44.82909"W	**Elevation**	31.437m	**Easting**	715231.508m
Height	-3.449m	**Horz error**	0.001m	**Elevation**	31.433m
		Vert error	0.003m	**Utilized**	Horz and Vert
		3D error	0.003m	**Quality**	Adjusted quality
Point	mon2_GPS	**Northing**	244855.529m	**Point**	mon2
Latitude	35°57'05.80402"N	**Easting**	715288.962m	**Northing**	244855.529m
Longitude	77°49'42.41743"W	**Elevation**	31.797m	**Easting**	715288.963m
Height	-3.088m	**Horz error**	0.001m	**Elevation**	31.794m
		Vert error	0.003m	**Utilized**	Horz and Vert
		3D error	0.003m	**Quality**	Adjusted quality
Point	mon3_GPS	**Northing**	245914.640m	**Point**	mon3
Latitude	35°57'39.90512"N	**Easting**	715963.244m	**Northing**	245914.639m
Longitude	77°49'15.01140"W	**Elevation**	29.934m	**Easting**	715963.243m
Height	-4.959m	**Horz error**	0.001m	**Elevation**	29.934m
		Vert error	0.001m	**Utilized**	Horz and Vert
		3D error	0.001m	**Quality**	Adjusted quality
Point	mon4_GPS	**Northing**	246123.587m	**Point**	mon4
Latitude	35°57'46.63578"N	**Easting**	716087.948m	**Northing**	246123.587m
Longitude	77°49'09.93591"W	**Elevation**	29.494m	**Easting**	716087.948m
Height	-5.400m	**Horz error**	0.001m	**Elevation**	29.495m
		Vert error	0.001m	**Utilized**	Horz and Vert
		3D error	0.001m	**Quality**	Adjusted quality
Point	mon5_GPS	**Northing**	247183.417m	**Point**	mon5
Latitude	35°58'20.51163"N	**Easting**	717394.955m	**Northing**	247183.417m
Longitude	77°48'17.26945"W	**Elevation**	31.765m	**Easting**	717394.955m
Height	-3.153m	**Horz error**	0.001m	**Elevation**	31.770m
		Vert error	0.006m	**Utilized**	Horz and Vert
		3D error	0.006m	**Quality**	Adjusted quality
Point	mon6_GPS	**Northing**	247332.656m	**Point**	mon6
Latitude	35°58'25.24462"N	**Easting**	717672.681m	**Northing**	247332.656m
Longitude	77°48'06.11340"W	**Elevation**	36.746m	**Easting**	717672.680m
Height	1.823m	**Horz error**	0.000m	**Elevation**	36.752m
		Vert error	0.006m	**Utilized**	Horz and Vert
		3D error	0.006m	**Quality**	Adjusted quality

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SURVEY CONTROL SHEET U-3330

PROJECT REFERENCE NO.	SHEET NO.
U-3330	1C-3
Location and Surveys	

FINAL

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	802558.1471	2346623.0148
TS	12+53.09	802807.0655	2346668.7820
SC	14+18.09	802968.8931	2346700.9141
CS	19+52.52	803467.0927	2346889.6330
ST	21+17.52	803609.5950	2346972.7817
TS	76+22.09	808324.2017	2349814.0415
SC	77+72.09	808452.1636	2349892.3038
CS	96+65.11	809744.3840	2351249.1164
ST	98+15.11	809816.3169	2351380.7405
POT	133+80.82	811505.7782	2354520.8097

Y1

TYPE	STATION	NORTH	EAST
POT	10+00.00	806136.5020	2347602.2131
PC	19+70.09	805365.7693	2348191.3131
PT	22+32.59	805152.9268	2348344.9072
POT	25+08.40	804924.9162	2348500.0893

Y1RPA

TYPE	STATION	NORTH	EAST
TS	10+00.00	806179.1750	2348461.7948
SC	11+40.00	806062.7361	2348384.2694
CS	14+11.59	805904.3072	2348167.4988
ST	15+51.59	805865.7988	2348033.0172
POT	17+46.30	805820.6806	2347843.6072

Y2

TYPE	STATION	NORTH	EAST
POT	10+00.00	808962.1527	2349036.8911
PC	15+53.40	808687.6318	2349517.3974
PT	25+37.90	808274.9141	2350409.8852
POT	25+37.90	808274.9141	2350409.8852

Y4

TYPE	STATION	NORTH	EAST
POT	10+00.00	806766.8287	2348875.4899
PC	13+24.30	806662.5159	2349182.5542
PCC	13+98.67	806623.5440	2349245.1295
PCC	14+39.86	806592.4418	2349272.0898
PCC	15+36.81	806502.0366	2349302.1456
PCC	16+00.39	806440.6542	2349287.8212
PCC	16+52.70	806394.6032	2349263.0399
PCC	17+78.19	806323.6517	2349163.9550
PT	19+39.45	806324.6626	2349003.8800
POT	21+65.61	806373.0757	2348782.9639

Y5

TYPE	STATION	NORTH	EAST
POT	13+93.46	806872.6439	2348499.4747
EQB	14+49.91	806867.6861	2348555.7045
EQA	10+56.45	806867.6861	2348555.7045
PT	11+51.78	806848.0730	2348648.7677
EQB	13+93.46	806770.3353	2348877.6032
EQA	10+00.00	806770.3353	2348877.6032

Y6

TYPE	STATION	NORTH	EAST
POT	10+00.00	809512.8006	2350206.8635
POT	14+40.03	809241.3853	2350553.2203

Y7A

TYPE	STATION	NORTH	EAST
POT	10+00.00	810105.2936	2351917.8389
POT	13+00.00	809840.8709	2352059.5449

Y7B

TYPE	STATION	NORTH	EAST
POT	10+00.00	810426.9583	2351777.3269
POT	13+50.00	810113.9052	2351933.8445

Y8

TYPE	STATION	NORTH	EAST
POT	10+00.00	810991.1326	2352614.5253
POT	14+50.00	810594.7266	2352827.5096

Y9

TYPE	STATION	NORTH	EAST
POT	10+00.00	810599.1221	2352835.6792
PC	11+97.78	810466.6955	2352982.5834
PT	13+88.00	810363.0304	2353141.1676

ROW MARKER PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
L	28+18.79	118.00	804149.31753	2347435.81730
L	28+60.00	118.00	804184.61028	2347457.08650
L	28+90.00	99.16	804220.02969	2347456.43483
L	59+30.84	110.00	806818.88170	2349035.29088
L	62+22.00	98.75	807074.06416	2349175.94389
L	62+22.00	118.00	807064.12898	2349192.42970
L	62+48.00	118.00	807086.39772	2349205.84997
L	62+48.00	98.75	807096.33454	2349189.36143
L	63+27.00	117.00	807154.57657	2349245.77043
L	63+27.00	98.74	807164.00222	2349230.13010
L	63+53.00	117.00	807176.84531	2349259.19069
L	63+53.00	98.74	807186.27260	2349243.54764
L	66+37.00	98.70	807429.53364	2349390.10844
L	66+37.00	110.00	807423.70156	2349399.78583
L	66+63.00	110.00	807445.97029	2349413.20609
L	66+63.00	98.70	807451.80402	2349403.52598
L	68+00.00	98.68	807569.15177	2349474.22608
L	68+00.00	120.00	807558.14776	2349492.48545
L	68+58.00	110.00	807612.98580	2349513.85806
L	68+58.00	98.67	807618.83185	2349504.15751
L	94+77.00	-100.45	809732.99504	2351034.01662
L	94+77.00	-127.00	809755.45809	2351019.85550
L	95+04.00	-100.43	809747.67209	2351057.52022
L	95+04.00	-127.00	809770.25212	2351043.50739
L	110+68.00	-100.00	810498.00846	2352436.69091
L	111+63.00	-125.00	810565.03587	2352508.50544
L	111+63.00	-164.00	810599.38039	2352490.02695
L	111+98.08	-164.00	810616.00155	2352520.91940
L	111+98.08	-152.00	810605.43401	2352526.60509
L	112+18.08	-164.00	810625.47769	2352538.53197
L	112+18.08	-152.00	810614.91015	2352544.21766
L	112+63.00	-164.00	810646.76112	2352578.08980
L	113+45.41	120.00	810435.70690	2352785.21963
L	113+45.41	100.00	810453.31946	2352775.74346
L	113+60.00	-167.00	810695.36232	2352662.08935
L	113+80.00	-135.00	810676.65835	2352694.86375
L	114+04.00	-135.00	810688.02973	2352715.99884
L	114+19.00	-169.00	810725.07821	2352713.09882
L	115+03.00	-128.00	810728.77226	2352806.49771
L	115+03.00	-133.00	810733.17540	2352804.12868
L	115+08.00	-106.85	810712.51755	2352820.92104
L	115+08.00	-128.00	810731.14129	2352810.90086
L	115+08.00	-133.00	810735.54443	2352808.53182
L	115+08.00	-170.00	810768.12769	2352791.00095

ROW MARKER PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
Y1	10+42.00	-71.00	806146.24892	2347684.12765
Y1	10+42.00	-61.78	806140.65048	2347676.80307
Y1	12+06.00	-80.00	806021.41648	2347790.86967
Y1	13+34.00	-105.46	805935.18039	2347888.82603

ROW MARKER PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
Y4	12+29.00	-64.00	806753.76817	2349112.90606
Y4	12+60.00	-30.06	806711.65759	2349131.34060
Y4	12+60.00	-58.00	806738.11568	2349140.32867

ROW MAKRER PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
Y9	11+34.00	42.27	810478.00815	2352906.90964
Y9	11+34.00	107.00	810429.92602	2352863.56607

ROW MARKER CONCRETE OR GRANITE

ALIGN	STATION	OFFSET	NORTH	EAST
L	49+98.00	-118.00	806137.60016	2348358.51343
L	50+30.00	-150.00	806181.52508	2348347.62301
L	52+50.00	-150.00	806369.95284	2348461.17908
L	53+39.00	-99.52	806420.12260	2348550.35638
L	53+39.00	-120.00	806430.69551	2348532.81236
L	57+40.00	-101.19	806764.43843	2348755.90543
L	58+19.48	-101.20	806832.51726	2348796.92181
L	59+42.00	98.79	806834.22933	2349031.44733
L	81+79.91	98.63	808723.85914	2350204.99467
L	81+96.21	141.00	808709.88910	2350247.99594
L	82+35.11	125.00	808749.15895	2350259.09070
L	82+63.00	98.68	808786.78328	2350255.90929
L	115+84.00	100.00	810566.36739	2352985.85659

ROW MARKER CONCRETE OR GRANITE

ALIGN	STATION	OFFSET	NORTH	EAST
Y1	12+95.00	-62.03	805939.79334	2347830.63893

ROW MARKER CONCRETE OR GRANITE

ALIGN	STATION	OFFSET	NORTH	EAST
Y1RPA	12+00.00	60.00	806061.02947	2348301.94969
Y1RPA	13+00.00	61.00	806006.28932	2348232.80625
Y1RPA	13+50.00	67.00	805989.06421	2348192.08619
Y1RPA	16+05.00	78.00	805929.30074	2347962.99114

ROW MARKER CONCRETE OR GRANITE

ALIGN	STATION	OFFSET	NORTH	EAST
Y4	11+75.00	-38.00	806746.51935	2349053.41274
Y4	12+91.03	-27.16	806698.93244	2349159.78563

ROW MARKER CONCRETE OR GRANITE

ALIGN	STATION	OFFSET	NORTH	EAST
Y5	11+75.00	-19.79	806859.33977	2348677.11509
Y5	11+75.00	20.25	806821.43534	2348664.23858

ROW MARKER CONCRETE OR GRANITE

ALIGN	STATION	OFFSET	NORTH	EAST
Y9	11+55.00	-37.83	810523.43790	2352976.13522

NOTES:

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   U3330_LS_LOCAL.TXT
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4/5/2017
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PAVEMENT SCHEDULE	
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1.5" IN DEPTH OR GREATER THAN 2" IN DEPTH.
C3	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
D3	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D4	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2.5" OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
E3	PROP. APPROX. 5.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
E4	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5.5" IN DEPTH.
J1	PROP. 8" AGGEGRATE BASE COURSE
L1	CLASS IV SUBGRADE STABILIZATION
N1	GEOTEXTILE FOR SOIL STABILIZATION
P1	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YARD
R1	2'-6" CONCRETE CURB & GUTTER
R2	1'-6" CONCRETE CURB & GUTTER
R3	5" MONOLITHIC CONCRETE ISLAND (KEYED IN)
R4	CONCRETE EXPRESSWAY GUTTER
R5	SHOULDER BERM GUTTER
R6	4" CONCRETE ISLAND COVER
R7	SINGLE FACED CONCRETE BARRIER
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V1	MILLING ASPHALT PAVEMENT, 3" DEPTH
V2	MILLING ASPHALT PAVEMENT, 1.5" DEPTH
W1	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL 1)
W2	WEDGING DETAIL 2
W3	WEDGING DETAIL 3

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

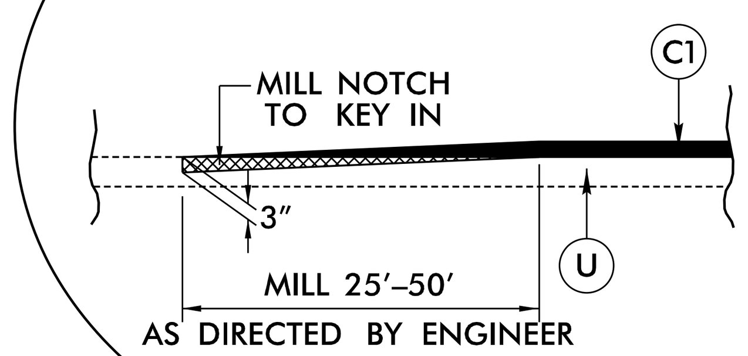
PROJECT REFERENCE NO.	SHEET NO.
U-3330	2A-1

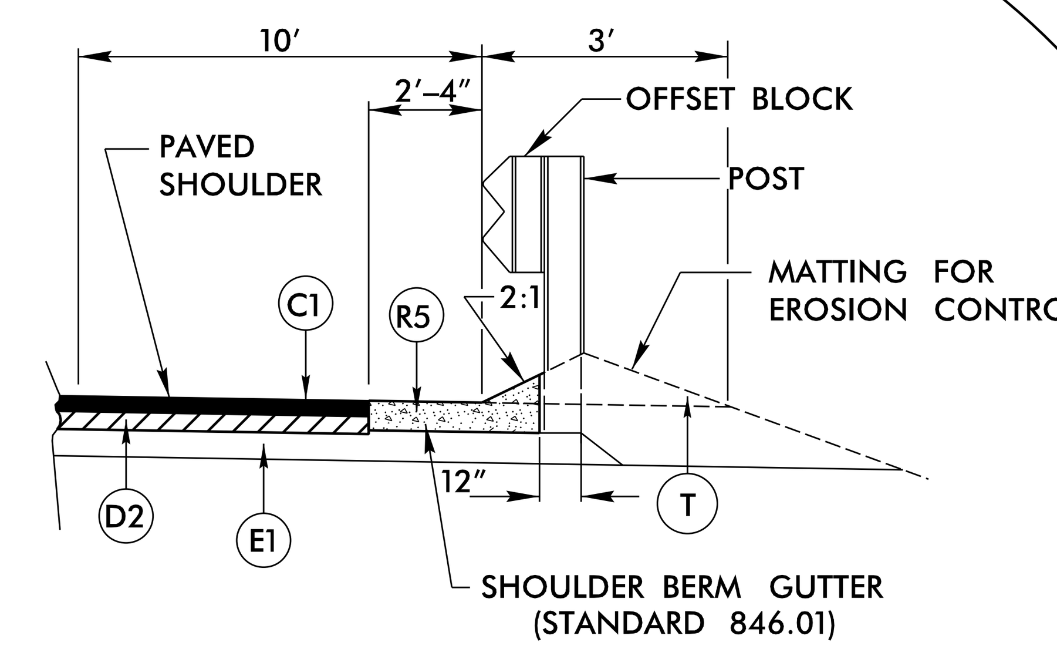
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 17265 STEVE ANTHONY DRUM
DocuSigned by: Steve Drum 8145549B98D0493...
4/6/2017

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022896 CLARK S. MORRISON
DocuSigned by: Clark Morrison B0A110DD1E004C4...
4/7/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MILLING DETAIL

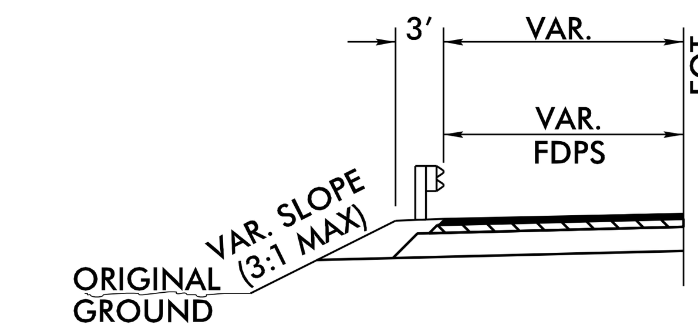




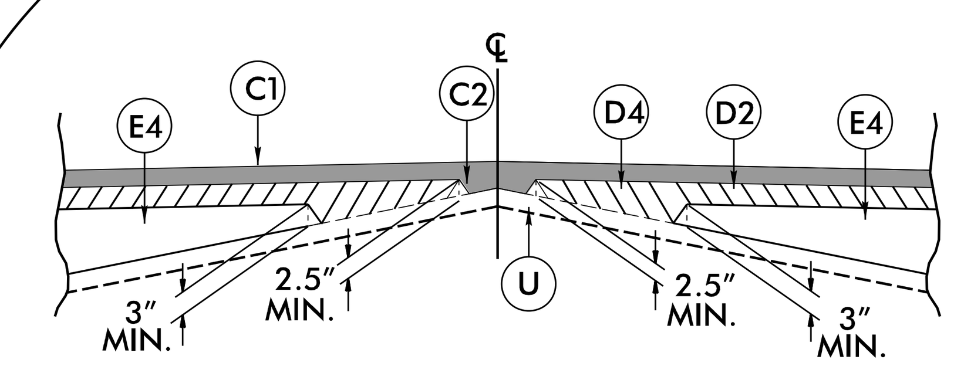
DETAIL SHOWING SHOULDER BERM GUTTER

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 2
-L- STA. 58+78.00 TO STA. 59+75 +/- LT
-L- STA. 62+30 +/- TO STA. 62+55.00 LT
-L- STA. 62+30 +/- TO STA. 68+50.00 RT

SHOULDER WIDENING DETAILS FOR -L-, Y-LINES, & RAMPS

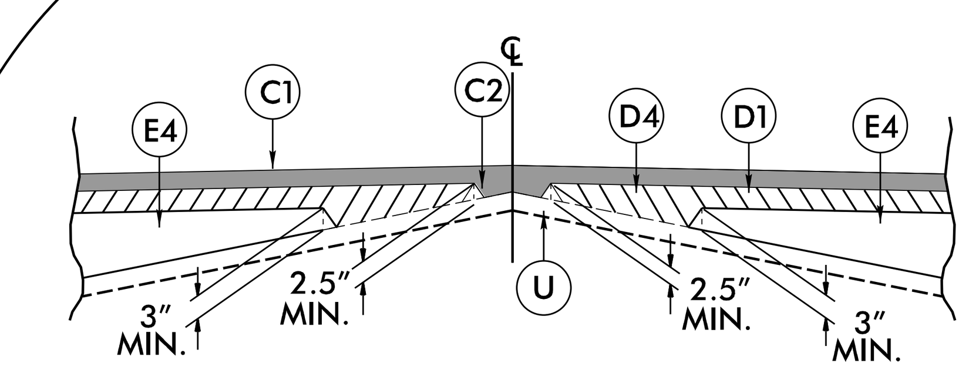


WEDGING DETAIL 1



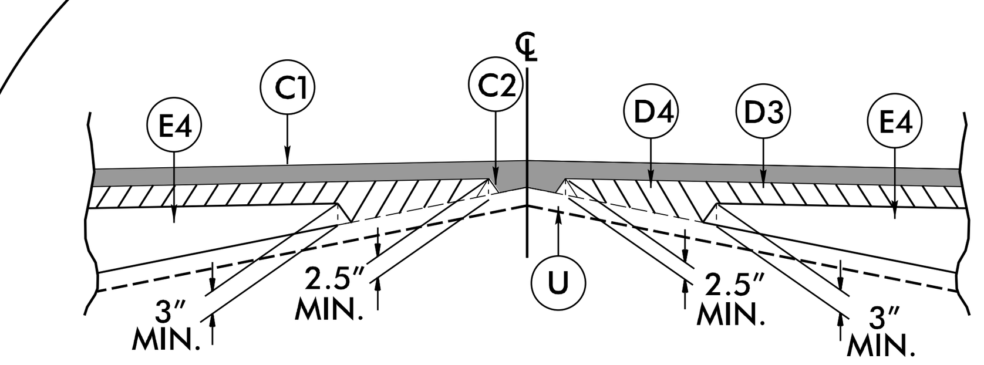
DETAIL SHOWING METHOD OF WEDGING NO. 1 FOR
-L- STA. 26+50.00 TO STA. 131+15.00

WEDGING DETAIL 2

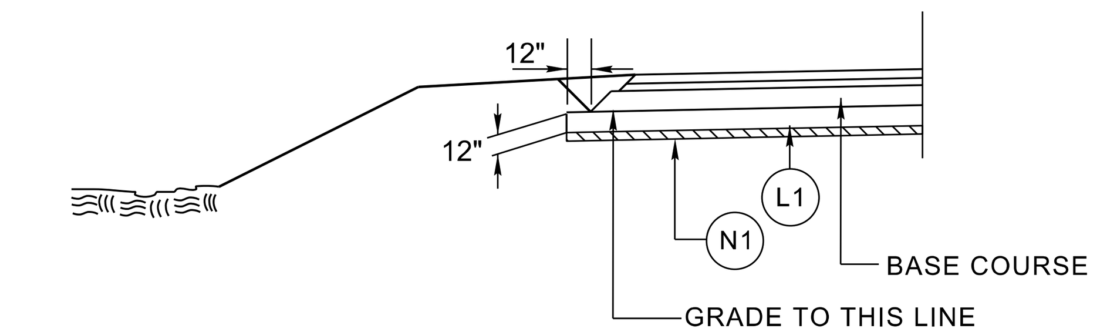


DETAIL SHOWING METHOD OF WEDGING NO. 2 FOR
-L- STA. 23+25.00 TO STA. 26+50.00
-Y1-, -Y1RPA-, -Y1RPB-, -Y1LPC-, -Y2RPA-, -Y2RPB-
-Y2RPC-, -Y2LPA-, -Y4-, -Y5-, -Y6-, -Y7A-,
-Y7B-, -Y8-, -Y9-

WEDGING DETAIL 3

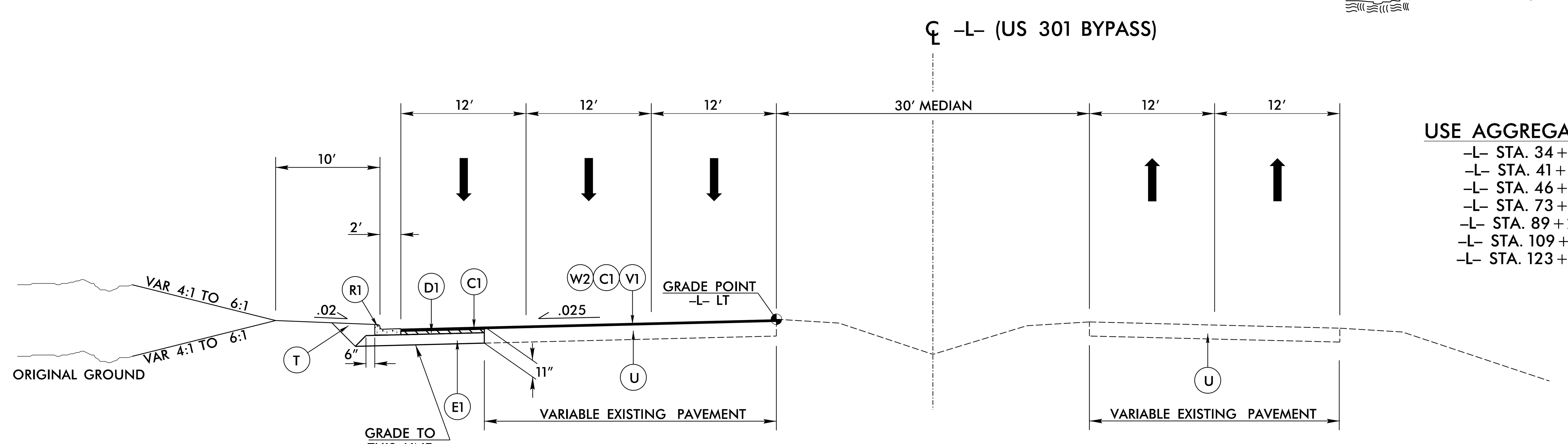


DETAIL SHOWING METHOD OF WEDGING NO. 3 FOR
-Y1RPD-, -Y3RPB-



USE AGGREGATE SUBGRADE DETAIL

-L- STA. 34+25.00 TO 35+75.00
-L- STA. 41+25.00 TO 43+25.00
-L- STA. 46+75.00 TO 49+75.00
-L- STA. 73+25.00 TO 85+75.00
-L- STA. 89+25.00 TO 106+75.00
-L- STA. 109+75.00 TO 112+25.00
-L- STA. 123+75.00 TO 126+75.00



TYPICAL SECTION NO. 1

-L- STA. 23+25.00 TO 26+50.00
SEE PLANS FOR AUXILIARY LANE LOCATIONS

CALYX™
ENGINEERS + CONSULTANTS
Formerly Mulkey Engineers & Consultants
7500 EAST INDEPENDENCE
BOULEVARD, SUITE 100
CHARLOTTE, NC 28227
phone: 704.537.7300
CALYXengineers.com
NC License # F-1333

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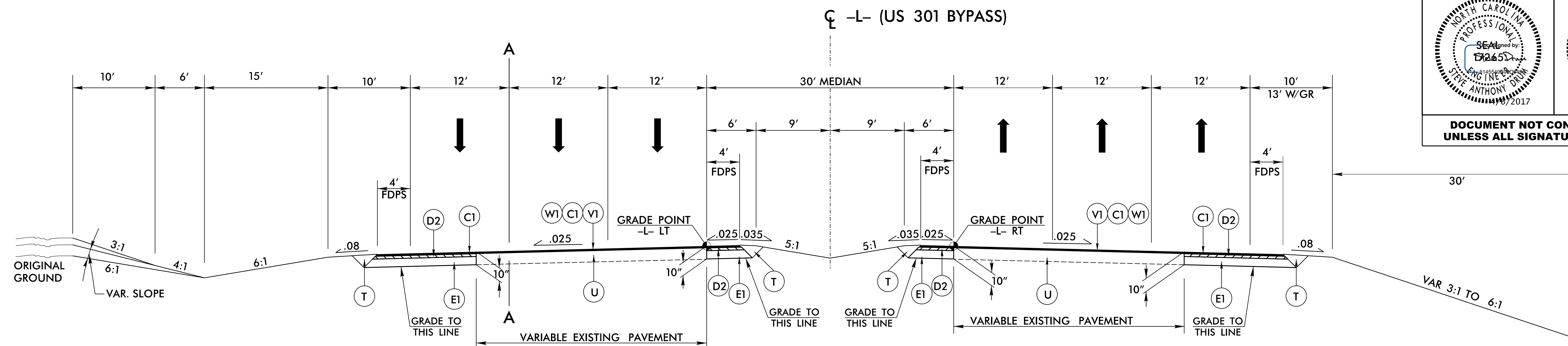
PROJECT REFERENCE NO.	SHEET NO.
U-3330	2A-2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

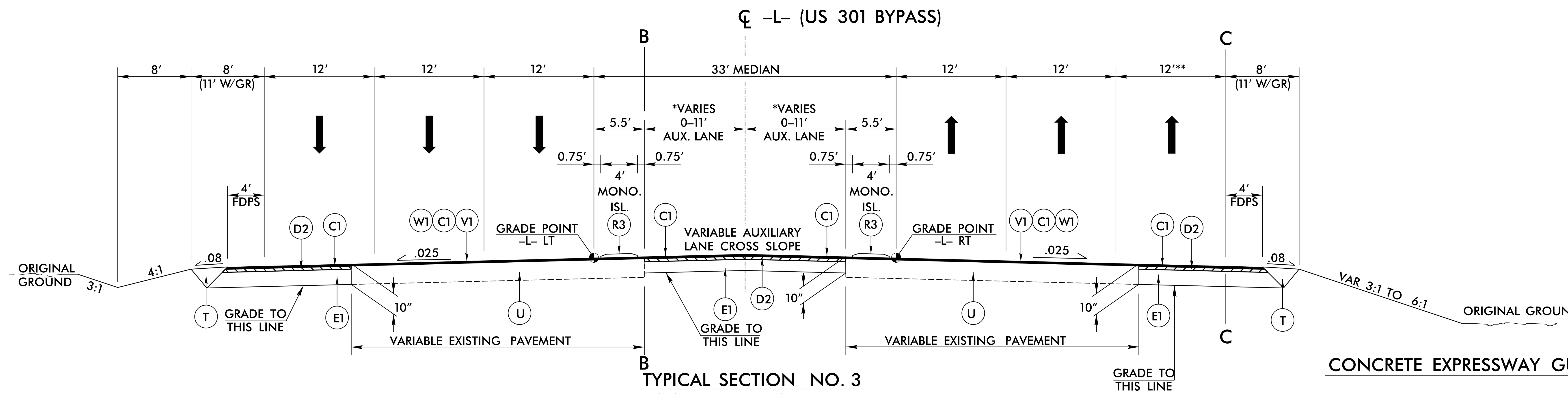
PAVEMENT SCHEDULE	
C1	3″ S9.5B
C2	VAR. S9.5B
C3	1.5″ S9.5B
D1	4″ I19.0B
D2	3″ I19.0B
D3	2.5″ I19.0B
D4	VAR. I19.0B
E1	4″ B25.0B
E2	5″ B25.0B
E3	5.5″ B25.0B
E4	VAR. B25.0B
J1	8″ ABC
L1	CLASS IV SUBGRADE STABILIZATION
N1	GEOTEXTILE FOR SOIL STABILIZATION
P1	PRIME COAT
R1	2′-6″ CURB & GUTTER
R2	1′-6″ CURB & GUTTER
R3	5″ MONO. ISLAND
R4	CONC. EXP. GUTTER
R5	SHOULDER BERM GUTTER
R6	4″ CONCRETE ISLAND COVER
R7	SINGLE FACED CONCRETE BARRIER
S	4″ CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V1	3″ MILLING
V2	1.5″ MILLING
W1	SEE WEDGING DETAIL 1
W2	SEE WEDGING DETAIL 2
W3	SEE WEDGING DETAIL 3

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



TYPICAL SECTION NO. 2

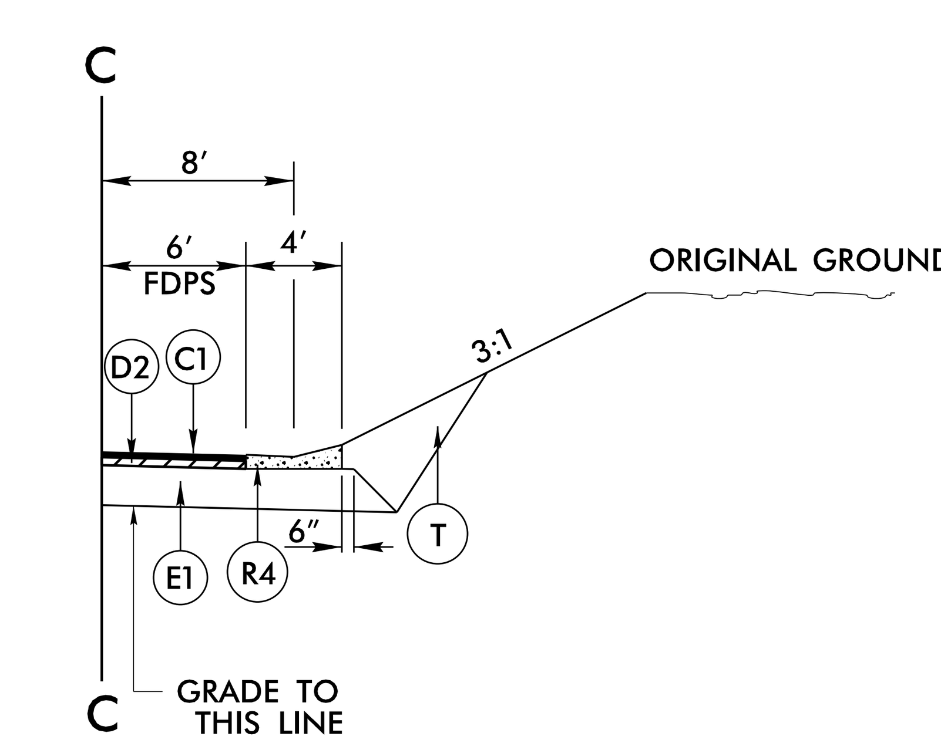
-L- STA. 26+50.00 TO 60+00.50 (BEGIN BRIDGE)
-L- STA. 62+05.50 (END BRIDGE) TO 73+90.00
SEE PLANS FOR AUXILIARY LANE LOCATIONS



TYPICAL SECTION NO. 3

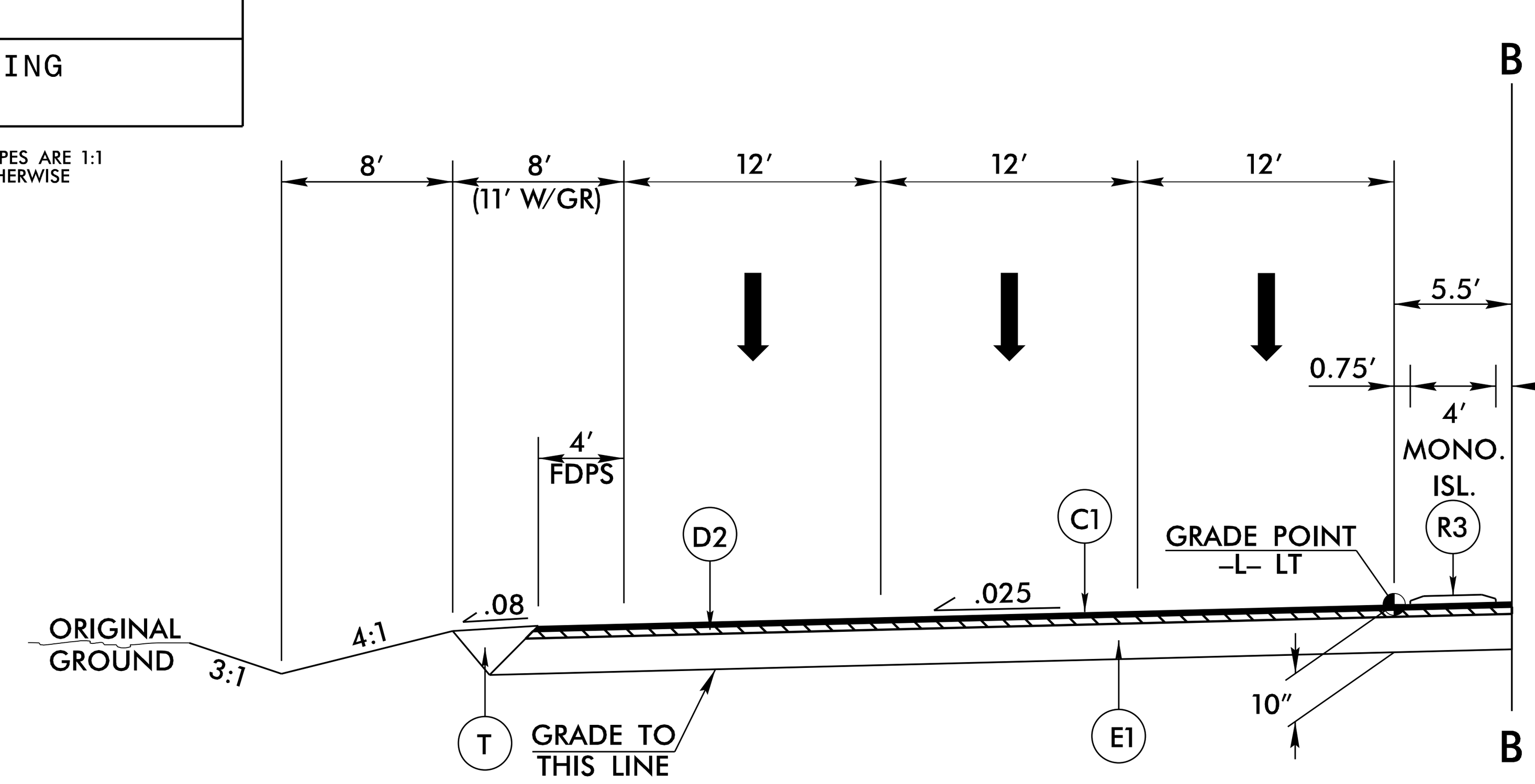
-L- STA. 73+90.00 TO 131+15.00
* SEE PLANS FOR AUXILIARY LANE LOCATIONS AND BULBOUTS
- TRANSITION FROM 30′ TO 33′ MEDIAN STA. 73+90.00 TO 74+65.00
** 0′ FROM -L- STA. 125+38.00 TO 131+15.00

CONCRETE EXPRESSWAY GUTTER



USE IN CONJUNCTION WITH TYPICAL SECTION NO. 3

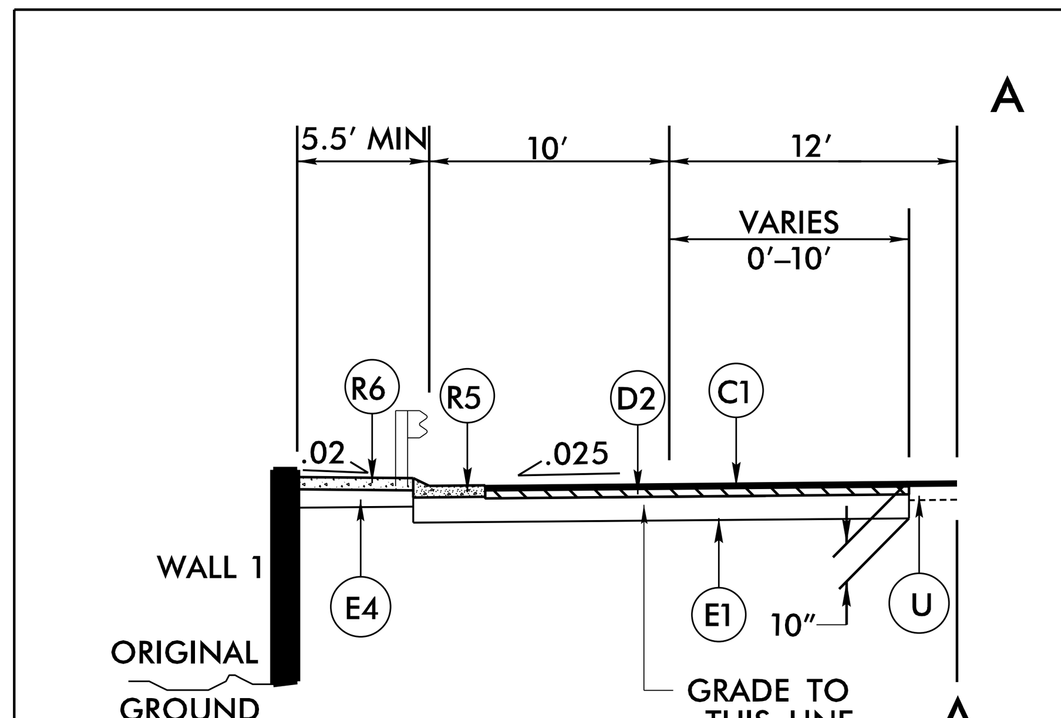
-L- STA. 92+40.00 TO STA. 94+10.00 RT



USE IN CONJUNCTION WITH TYPICAL SECTION NO. 3

-L- STA. 76+00.00 LT. TO 81+00.00 LT.
SEE PLANS FOR AUXILIARY LANE LOCATIONS

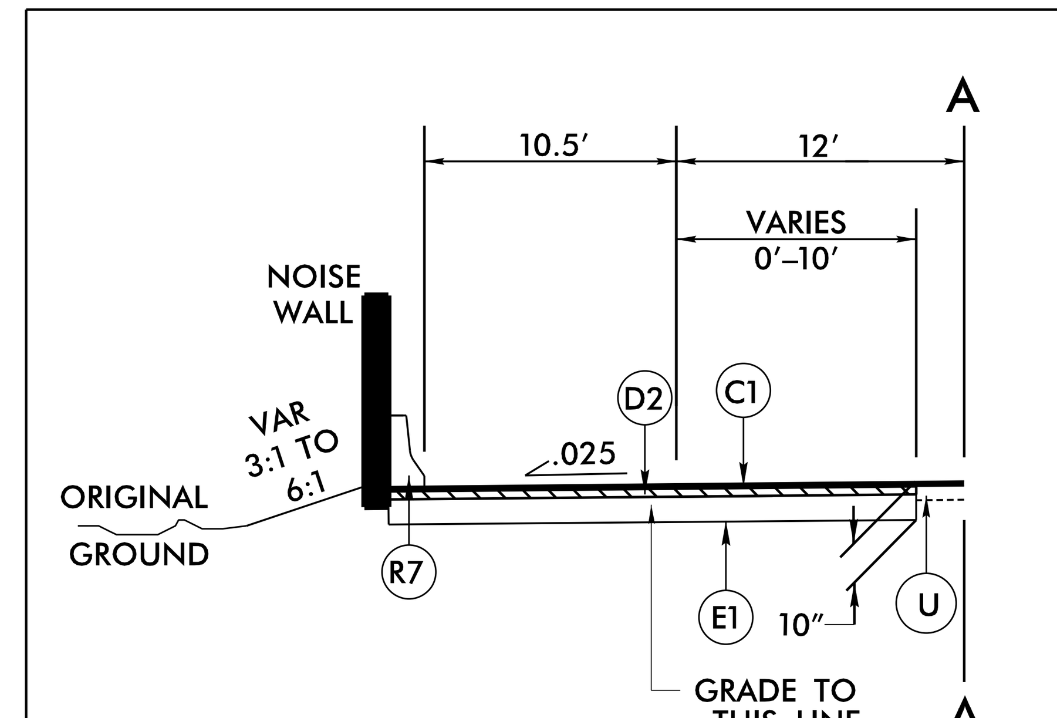
PROPOSED RETAINING WALL



USE IN CONJUNCTION WITH TYPICAL SECTION NO. 2

-L- STA. 58+80+/- TO STA. 60+00+/- LT

PROPOSED NOISE WALL



USE IN CONJUNCTION WITH TYPICAL SECTION NO. 2

-L- STA. 30+80.70 TO STA. 38+45.70 LT

CALYX
ENGINEERS + CONSULTANTS
Formerly Mulkey Engineers & Consultants
7500 EAST INDEPENDENCE
BOULEVARD, SUITE 100
CHARLOTTE, NC 28227
phone: 704.537.7300
CALYXengineers.com
NC License # F-1333

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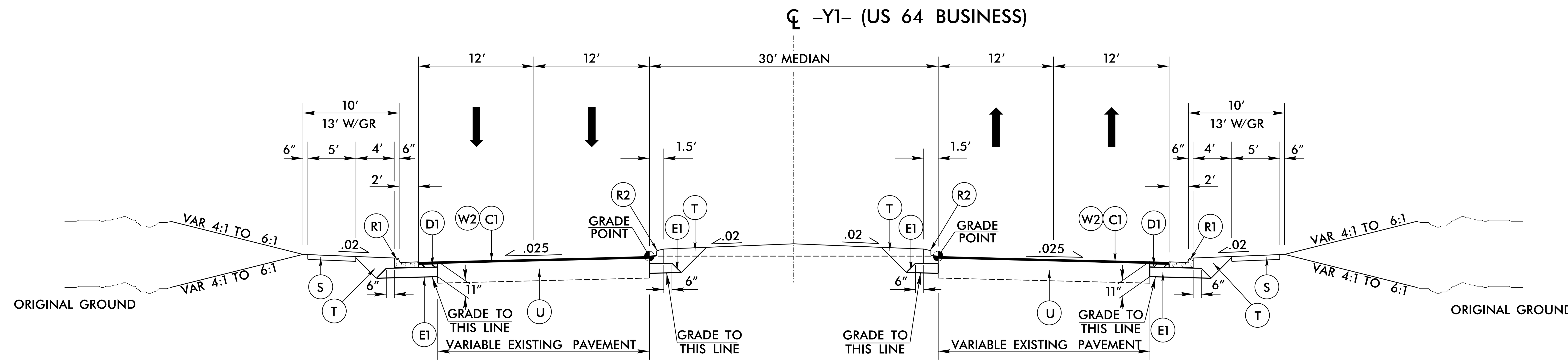
6/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-3330	2A-3
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 17265 STEVE ANTHONY DRUM 4/5/2017	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022896 CLARK S. MORRISON 4/5/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

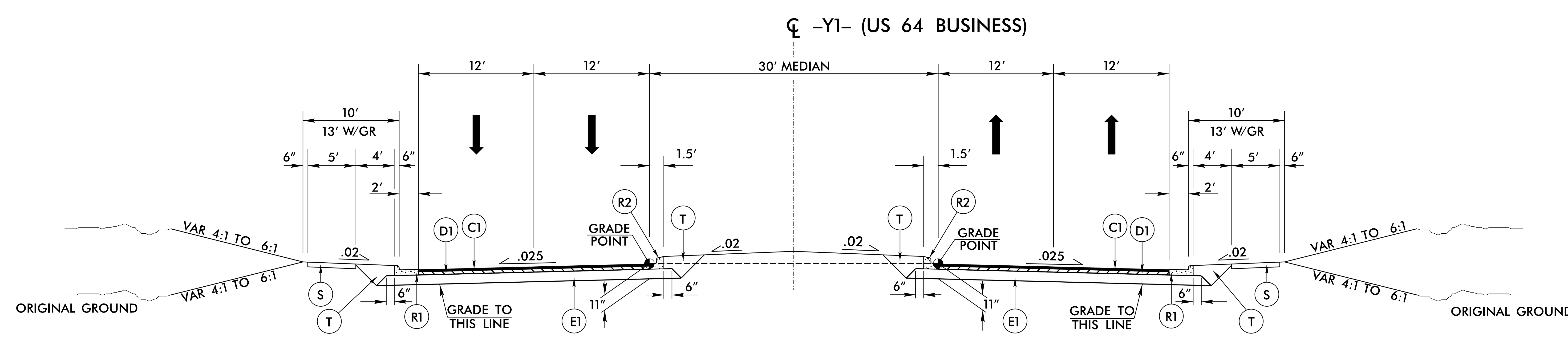
PAVEMENT SCHEDULE	
C1	3″ S9.5B
C2	VAR. S9.5B
C3	1.5″ S9.5B
D1	4″ I19.0B
D2	3″ I19.0B
D3	2.5″ I19.0B
D4	VAR. I19.0B
E1	4″ B25.0B
E2	5″ B25.0B
E3	5.5″ B25.0B
E4	VAR. B25.0B
J1	8″ ABC
L1	CLASS IV SUBGRADE STABILIZATION
N1	GEOTEXTILE FOR SOIL STABILIZATION
P1	PRIME COAT
R1	2′-6″ CURB & GUTTER
R2	1′-6″ CURB & GUTTER
R3	5″ MONO. ISLAND
R4	CONC. EXP. GUTTER
R5	SHOULDER BERM GUTTER
R6	4″ CONCRETE ISLAND COVER
R7	SINGLE FACED CONCRETE BARRIER
S	4″ CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V1	3″ MILLING
V2	1.5″ MILLING
W1	SEE WEDGING DETAIL 1
W2	SEE WEDGING DETAIL 2
W3	SEE WEDGING DETAIL 3

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



TYPICAL SECTION NO. 4

-Y1- STA. 11+75.00 TO 15+00.00
-Y1- STA. 21+00.00 TO STA. 24+04.00
SEE PLANS FOR AUXILIARY LANE LOCATIONS
SEE PLANS FOR SIDEWALK LOCATIONS



TYPICAL SECTION NO. 5

-Y1- STA. 15+00.00 TO 17+29.57 (BEGIN BRIDGE RT)
-Y1- STA. 19+36.40 (END BRIDGE RT) TO STA. 21+00.00
SEE PLANS FOR AUXILIARY LANE LOCATIONS

CALYX ENGINEERS + CONSULTANTS
Formerly Mulkey Engineers & Consultants
7500 EAST INDEPENDENCE BOULEVARD, SUITE 100
CHARLOTTE, NC 28227
phone: 704.537.7300
CALYXengineers.com
NC License # F-1333

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6/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-3330	2A-4

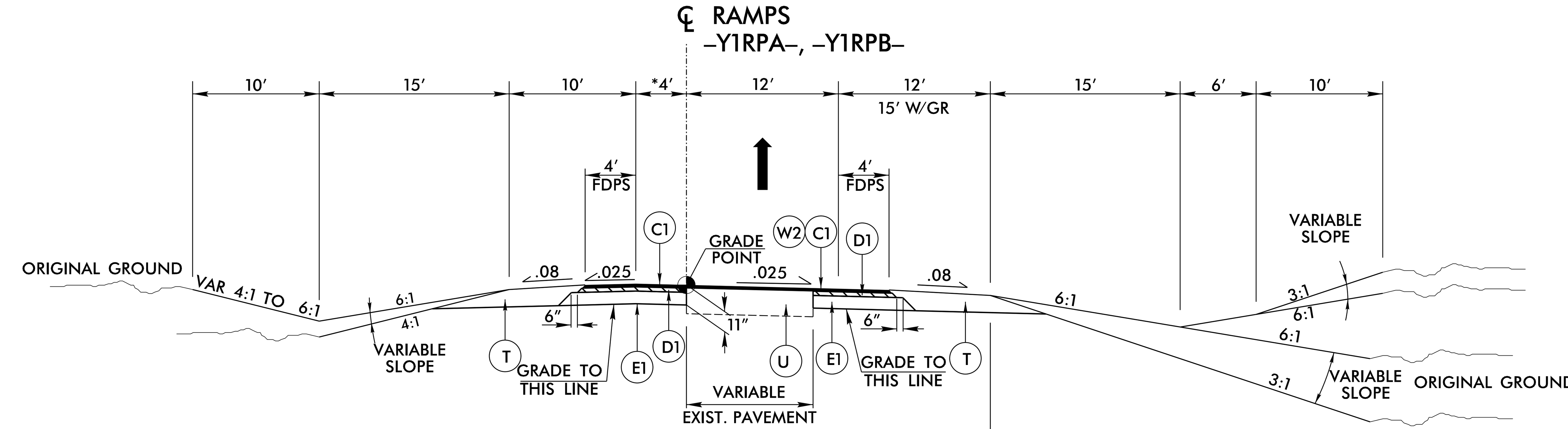
ROADWAY DESIGN ENGINEER — SEAL 032651 — STEVE ANTHONY DRUM — 4/5/2017

PAVEMENT DESIGN ENGINEER — SEAL 022896 — CLARK S. MORRISON — 4/5/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

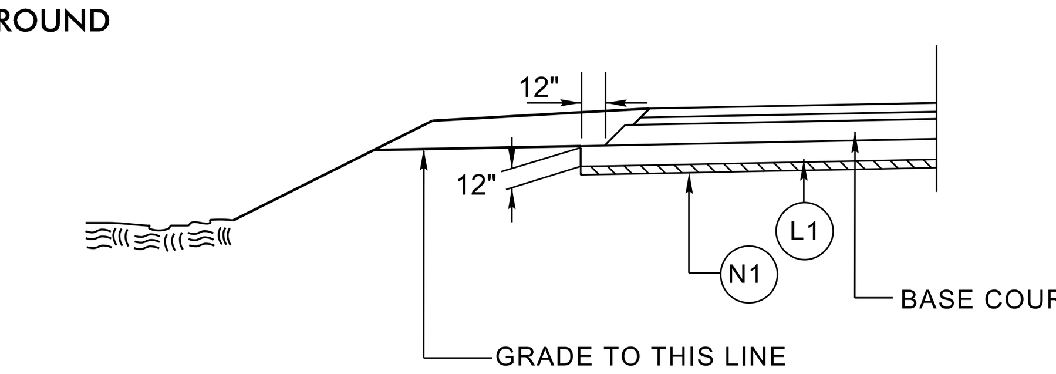
PAVEMENT SCHEDULE	
C1	3" S9.5B
C2	VAR. S9.5B
C3	1.5" S9.5B
D1	4" I19.0B
D2	3" I19.0B
D3	2.5" I19.0B
D4	VAR. I19.0B
E1	4" B25.0B
E2	5" B25.0B
E3	5.5" B25.0B
E4	VAR. B25.0B
J1	8" ABC
L1	CLASS IV SUBGRADE STABILIZATION
N1	GEOTEXTILE FOR SOIL STABILIZATION
P1	PRIME COAT
R1	2'-6" CURB & GUTTER
R2	1'-6" CURB & GUTTER
R3	5" MONO. ISLAND
R4	CONC. EXP. GUTTER
R5	SHOULDER BERM GUTTER
R6	4" CONCRETE ISLAND COVER
R7	SINGLE FACED CONCRETE BARRIER
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V1	3" MILLING
V2	1.5" MILLING
W1	SEE WEDGING DETAIL 1
W2	SEE WEDGING DETAIL 2
W3	SEE WEDGING DETAIL 3

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



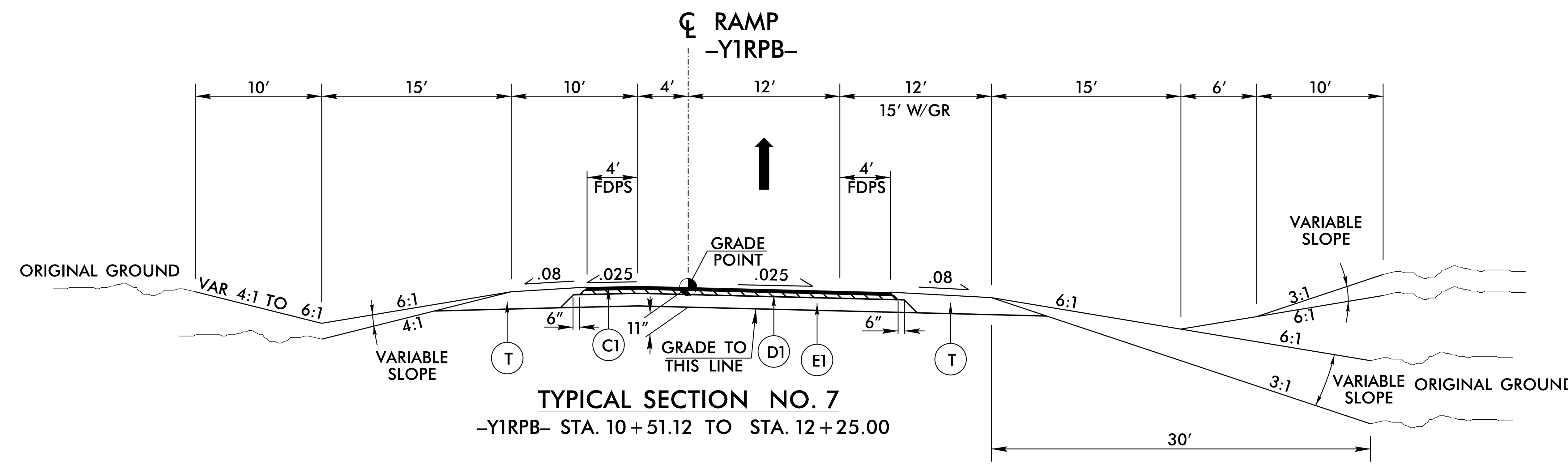
TYPICAL SECTION NO. 6

-Y1RPA- STA. 10+00.00 TO STA. 17+03.62
-Y1RPB- STA. 12+25.00 TO STA. 16+83.66
* VARIES FROM 6' TO 24' FOR -Y1RPA-



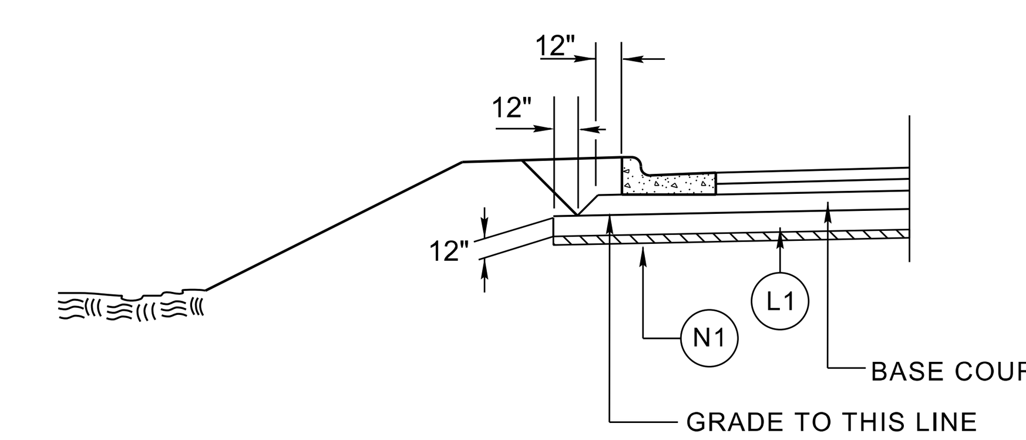
USE AGGREGATE SUBGRADE DETAIL

-Y1RPA- STA. 11+75.00 TO 15+25.00
-Y1RPB- STA. 11+00 TO 13+75.00



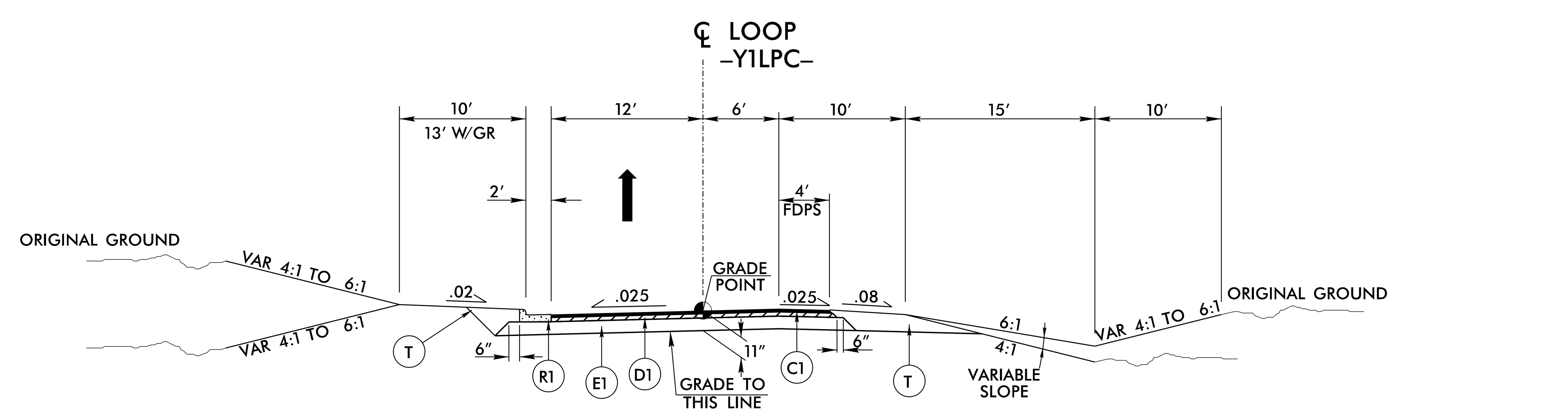
TYPICAL SECTION NO. 7

-Y1RPB- STA. 10+51.12 TO STA. 12+25.00



USE AGGREGATE SUBGRADE DETAIL

-Y1LPC- STA. 11+75.00 TO 15+00.00



TYPICAL SECTION NO. 8

-Y1LPC- STA. 10+00.00 TO STA. 15+34.11

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7500 EAST INDEPENDENCE BOULEVARD, SUITE 100
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CALYXengineers.com
NC License # F-1333

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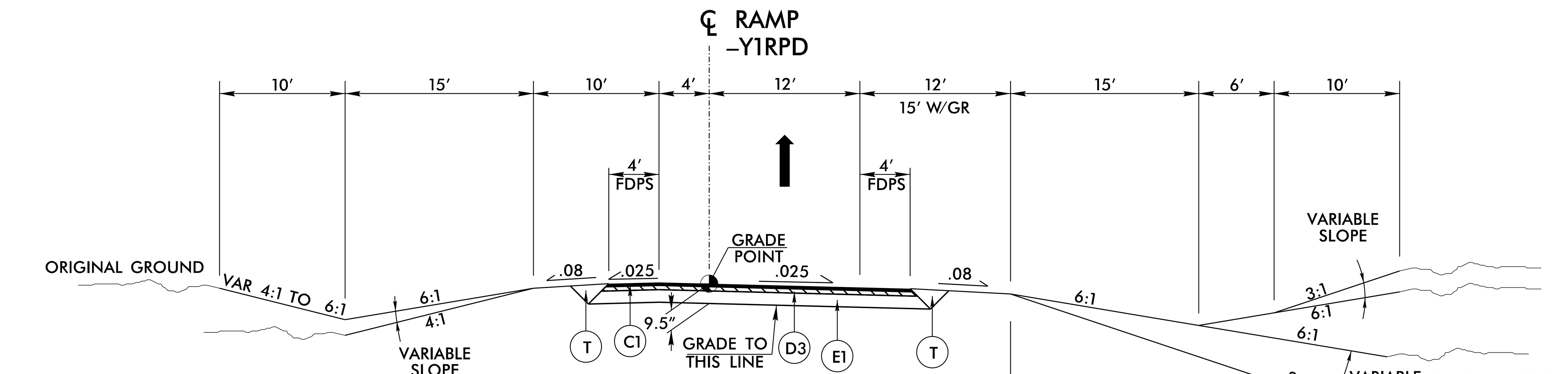
PROJECT REFERENCE NO.	SHEET NO.
U-3330	2A-5
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

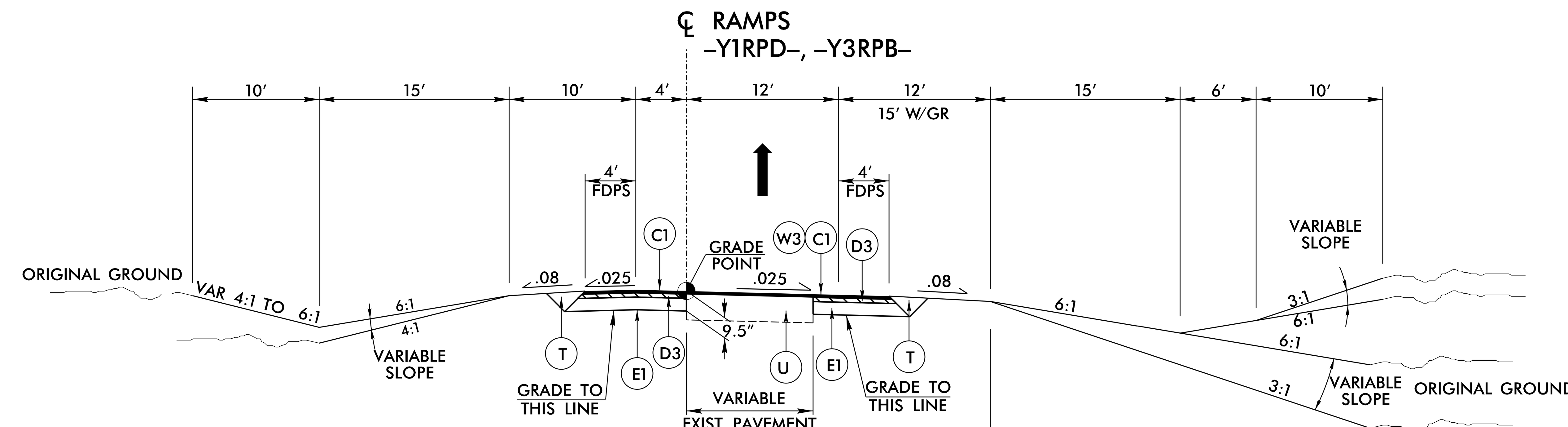
PAVEMENT SCHEDULE	
C1	3" S9.5B
C2	VAR. S9.5B
C3	1.5" S9.5B
D1	4" I19.0B
D2	3" I19.0B
D3	2.5" I19.0B
D4	VAR. I19.0B
E1	4" B25.0B
E2	5" B25.0B
E3	5.5" B25.0B
E4	VAR. B25.0B
J1	8" ABC
L1	CLASS IV SUBGRADE STABILIZATION
N1	GEOTEXTILE FOR SOIL STABILIZATION
P1	PRIME COAT
R1	2'-6" CURB & GUTTER
R2	1'-6" CURB & GUTTER
R3	5" MONO. ISLAND
R4	CONC. EXP. GUTTER
R5	SHOULDER BERM GUTTER
R6	4" CONCRETE ISLAND COVER
R7	SINGLE FACED CONCRETE BARRIER
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V1	3" MILLING
V2	1.5" MILLING
W1	SEE WEDGING DETAIL 1
W2	SEE WEDGING DETAIL 2
W3	SEE WEDGING DETAIL 3

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



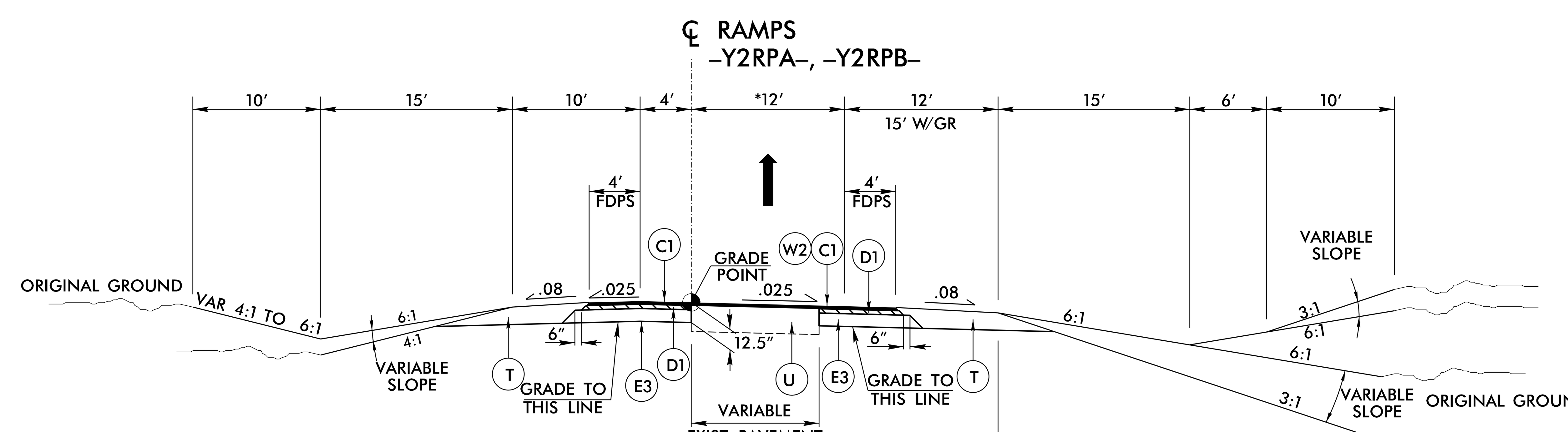
TYPICAL SECTION NO. 9

-Y1RPD- STA. 10+63.33 TO STA. 12+75.00



TYPICAL SECTION NO. 10

-Y1RPD- STA. 12+75.00 TO STA. 17+09.17
-Y3RPB- STA. 10+00.00 TO STA. 14+94.70



TYPICAL SECTION NO. 11

-Y2RPA- STA. 16+85.00 TO STA. 18+77.44 (LT)
-Y2RPB- STA. 11+43.77 TO STA. 12+09.59
* 30' FOR -Y2RPB-

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7500 EAST INDEPENDENCE BOULEVARD, SUITE 100
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4/5/2017
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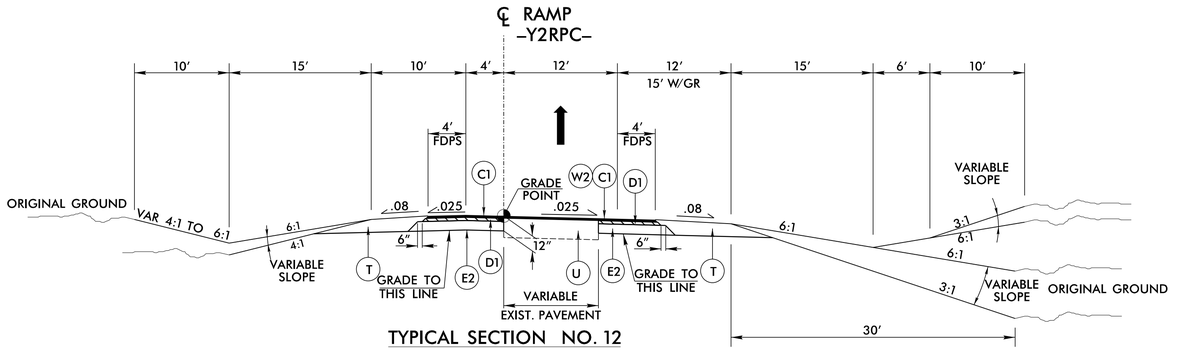
6/2/99

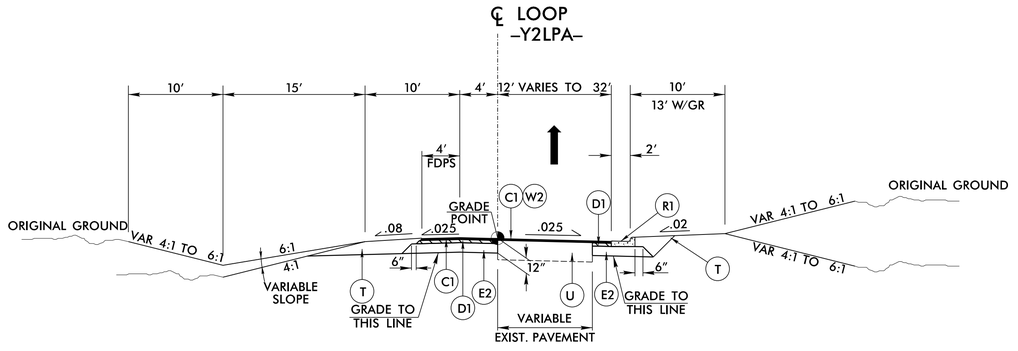
PAVEMENT SCHEDULE	
C1	3″ S9.5B
C2	VAR. S9.5B
C3	1.5″ S9.5B
D1	4″ I19.0B
D2	3″ I19.0B
D3	2.5″ I19.0B
D4	VAR. I19.0B
E1	4″ B25.0B
E2	5″ B25.0B
E3	5.5″ B25.0B
E4	VAR. B25.0B
J1	8″ ABC
L1	CLASS IV SUBGRADE STABILIZATION
N1	GEOTEXTILE FOR SOIL STABILIZATION
P1	PRIME COAT
R1	2′-6″ CURB & GUTTER
R2	1′-6″ CURB & GUTTER
R3	5″ MONO. ISLAND
R4	CONC. EXP. GUTTER
R5	SHOULDER BERM GUTTER
R6	4″ CONCRETE ISLAND COVER
R7	SINGLE FACED CONCRETE BARRIER
S	4″ CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V1	3″ MILLING
V2	1.5″ MILLING
W1	SEE WEDGING DETAIL 1
W2	SEE WEDGING DETAIL 2
W3	SEE WEDGING DETAIL 3

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



TYPICAL SECTION NO. 12

–Y2RPC– STA. 10+70.00 TO STA. 12+47.46



TYPICAL SECTION NO. 13

–Y2LPA– STA. 10+50.03 TO STA. 16+13.30 (RT)

PROJECT REFERENCE NO.	SHEET NO.
U-3330	2A-6

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 037265 ENGINEER KEITH ANTHONY GRUM
6/5/2017

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022896 ENGINEER CLARK S. MORRISON
6/7/2017

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phone: 704.537.7300
CALYXengineers.com
NC License # F-1333

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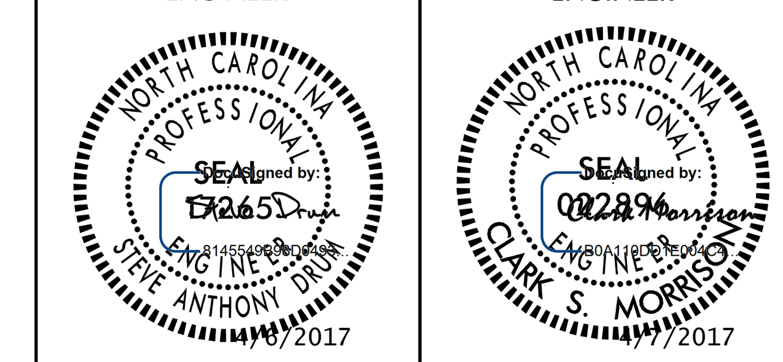
kevis

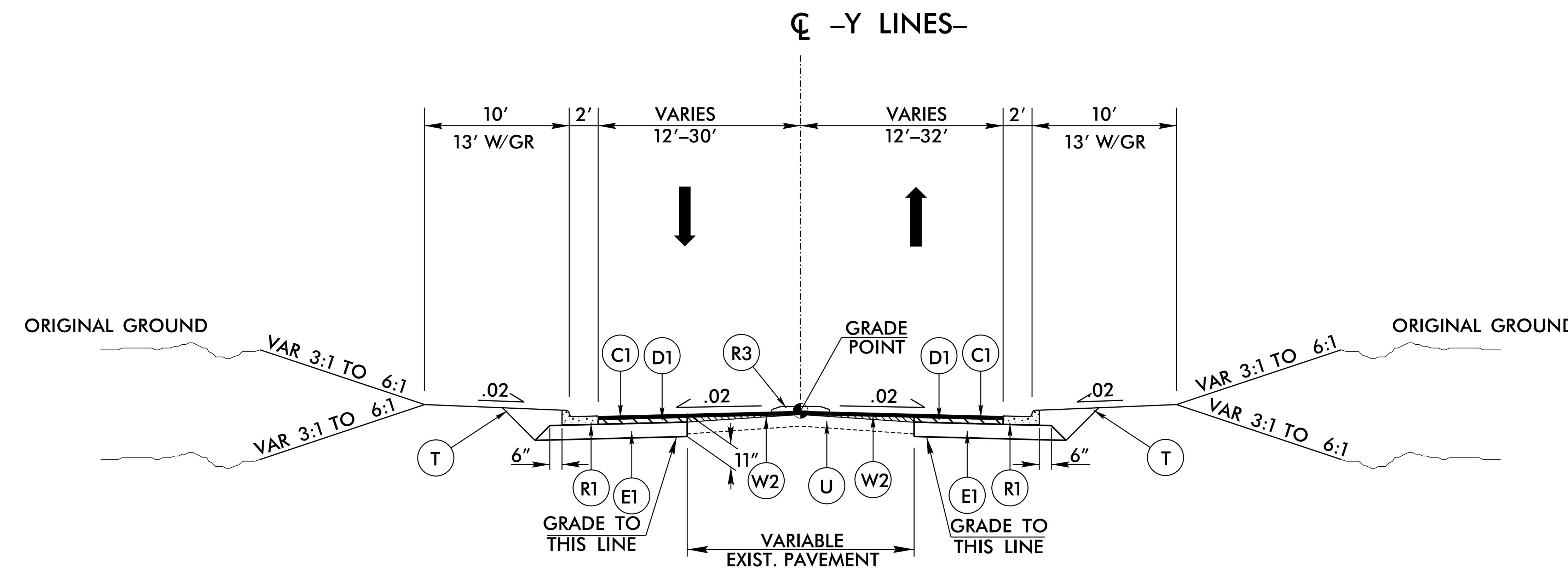
PROJECT REFERENCE NO.	SHEET NO.
U-3330	2A-7
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

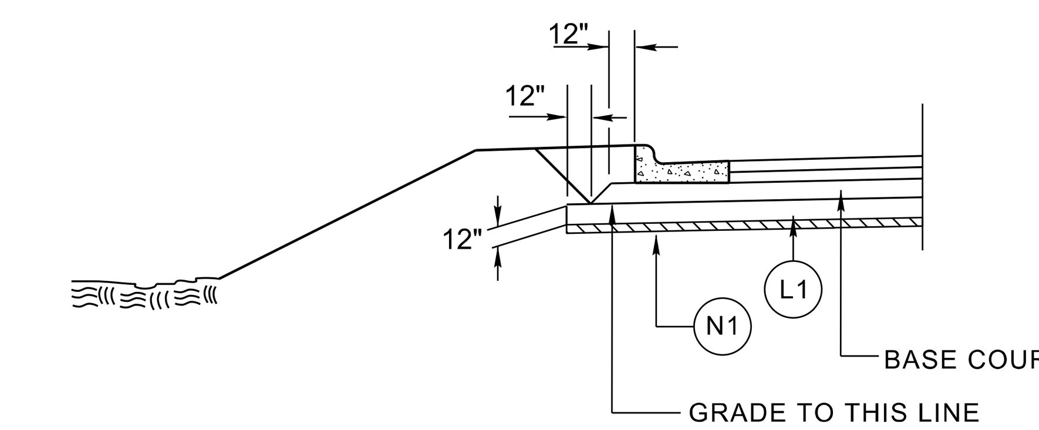
PAVEMENT SCHEDULE	
C1	3″ S9.5B
C2	VAR. S9.5B
C3	1.5″ S9.5B
D1	4″ I19.0B
D2	3″ I19.0B
D3	2.5″ I19.0B
D4	VAR. I19.0B
E1	4″ B25.0B
E2	5″ B25.0B
E3	5.5″ B25.0B
E4	VAR. B25.0B
J1	8″ ABC
L1	CLASS IV SUBGRADE STABILIZATION
N1	GEOTEXTILE FOR SOIL STABILIZATION
P1	PRIME COAT
R1	2′-6″ CURB & GUTTER
R2	1′-6″ CURB & GUTTER
R3	5″ MONO. ISLAND
R4	CONC. EXP. GUTTER
R5	SHOULDER BERM GUTTER
R6	4″ CONCRETE ISLAND COVER
R7	SINGLE FACED CONCRETE BARRIER
S	4″ CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V1	3″ MILLING
V2	1.5″ MILLING
W1	SEE WEDGING DETAIL 1
W2	SEE WEDGING DETAIL 2
W3	SEE WEDGING DETAIL 3

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



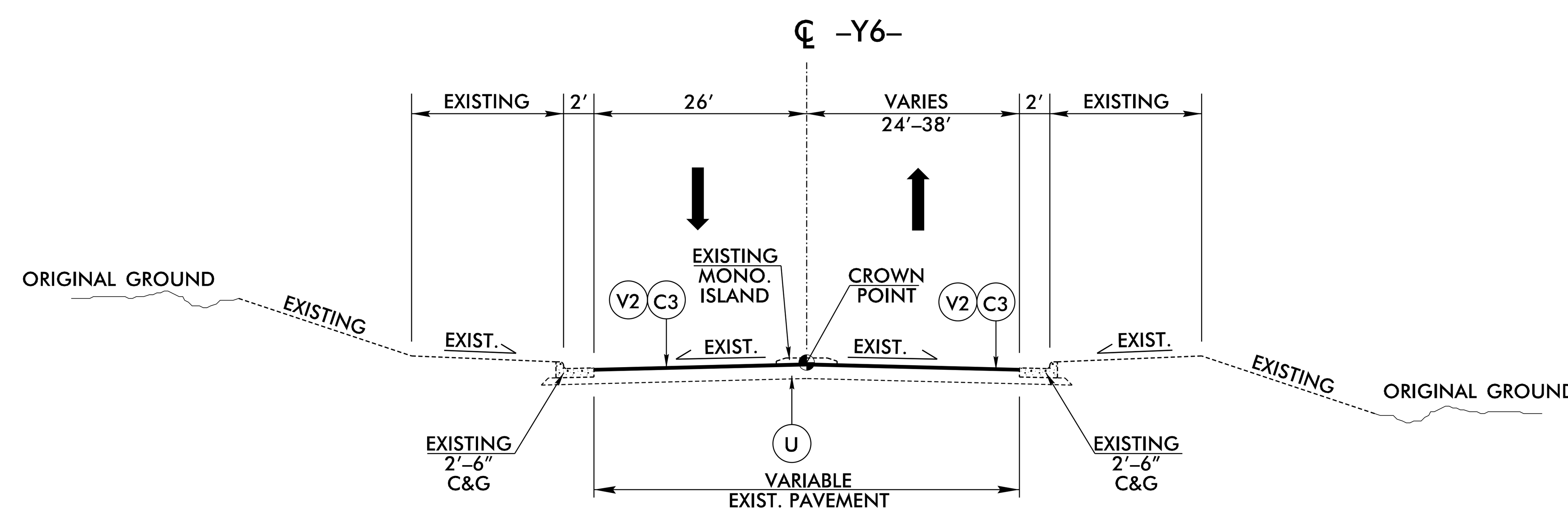
TYPICAL SECTION NO. 14

-Y4- STA. 10+52.20 TO STA. 13+58.00
-Y5- STA. 12+00.55 TO STA. 13+41.26
-Y6- STA. 12+75.05 TO STA. 13+75.65
-Y7A- STA. 10+63.50 TO STA. 11+04.84
-Y7B- STA. 10+68.04 TO STA. 12+86.47
-Y8- STA. 12+71.57 TO STA. 13+86.50
-Y9- STA. 10+55.76 TO STA. 11+72.39
SEE PLAN SHEETS FOR MONO ISLAND LOCATIONS



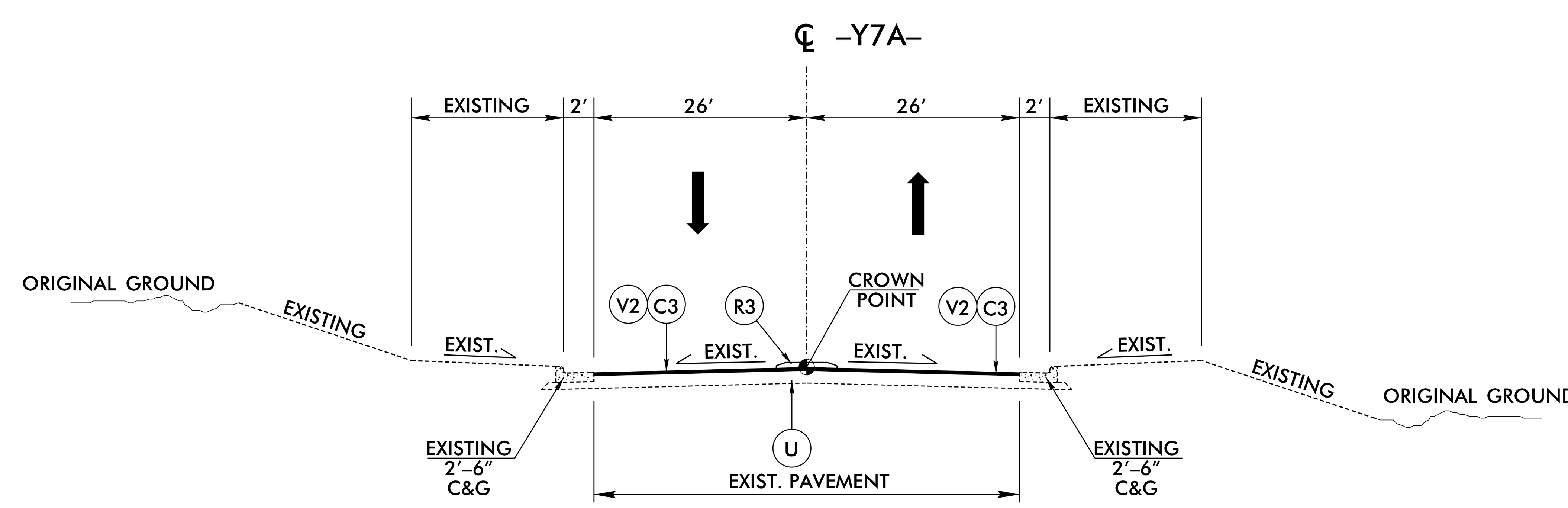
USE AGGREGATE SUBGRADE DETAIL

-Y7A- STA. 11+00.00 TO 11+04.84



TYPICAL SECTION NO. 15

-Y6- STA. 11+12.05 TO STA. 12+75.05



TYPICAL SECTION NO. 16

-Y7A- STA. 11+04.84 TO STA. 11+70.00

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PAVEMENT SCHEDULE	
C1	3" S9.5B
C2	VAR. S9.5B
C3	1.5" S9.5B
D1	4" I19.0B
D2	3" I19.0B
D3	2.5" I19.0B
D4	VAR. I19.0B
E1	4" B25.0B
E2	5" B25.0B
E3	5.5" B25.0B
E4	VAR. B25.0B
J1	8" ABC
L1	CLASS IV SUBGRADE STABILIZATION
N1	GEOTEXTILE FOR SOIL STABILIZATION
P1	PRIME COAT
R1	2'-6" CURB & GUTTER
R2	1'-6" CURB & GUTTER
R3	5" MONO. ISLAND
R4	CONC. EXP. GUTTER
R5	SHOULDER BERM GUTTER
R6	4" CONCRETE ISLAND COVER
R7	SINGLE FACED CONCRETE BARRIER
S	4" CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V1	3" MILLING
V2	1.5" MILLING
W1	SEE WEDGING DETAIL 1
W2	SEE WEDGING DETAIL 2
W3	SEE WEDGING DETAIL 3

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

PROJECT REFERENCE NO.	SHEET NO.
U-3330	2A-8

ROADWAY DESIGN ENGINEER

PAVEMENT DESIGN ENGINEER

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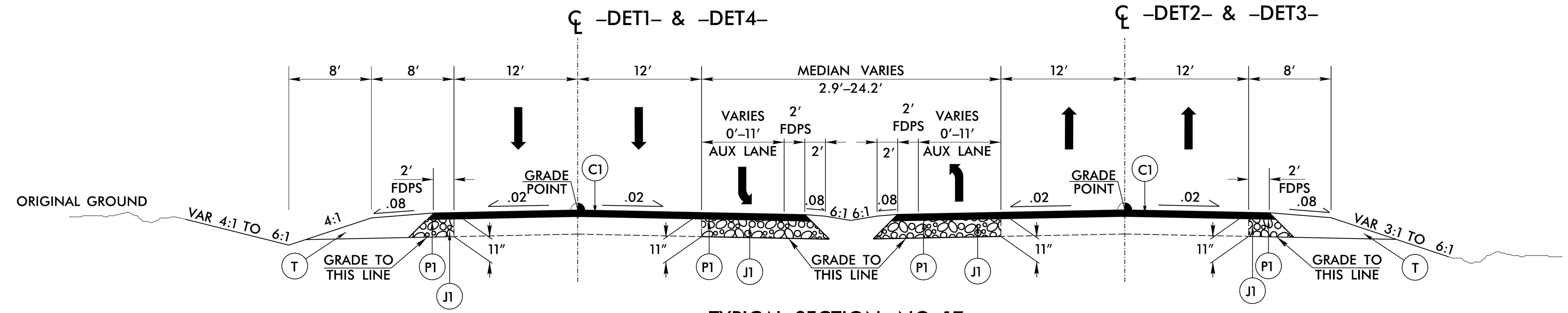
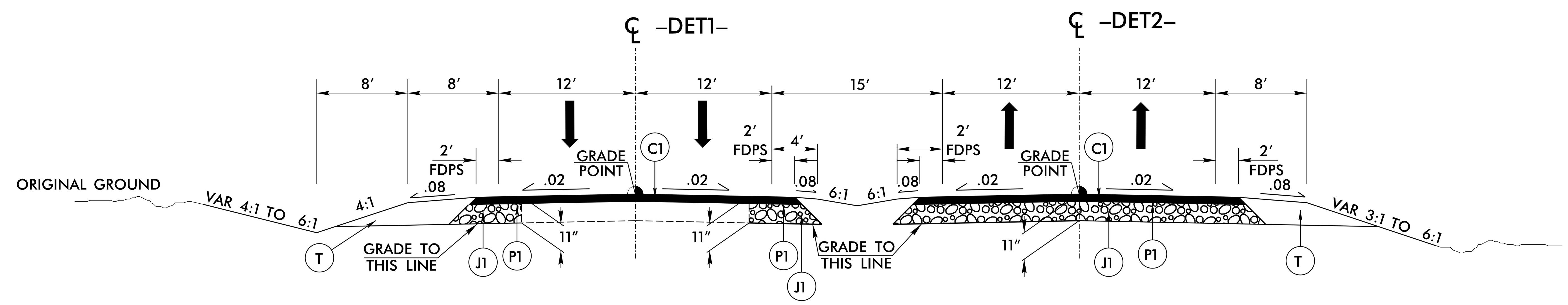


TYPICAL SECTION NO. 17

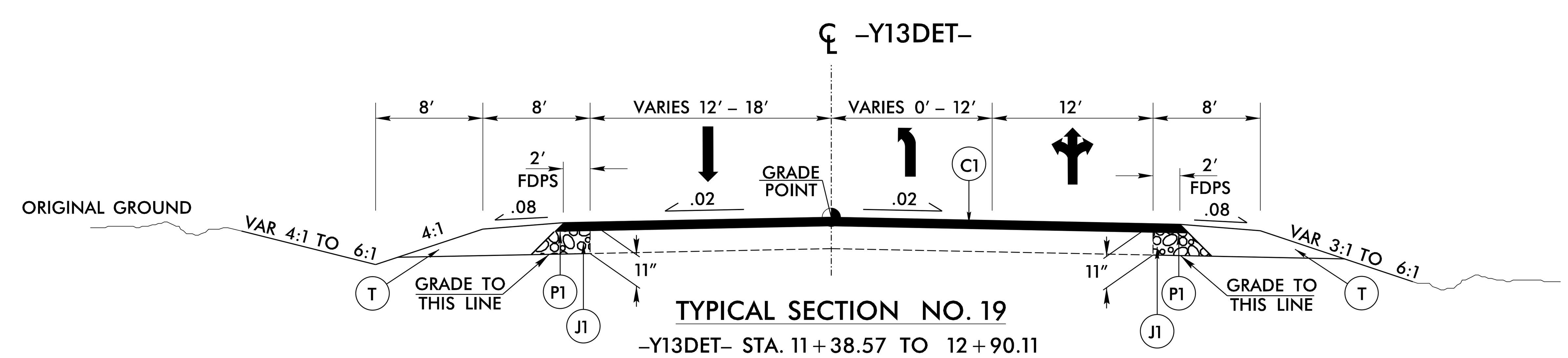
-DET1- STA. 10+96.78 TO 19+55.00
-DET1- STA. 24+97.56 TO 29+78.53
-DET2- STA. 10+96.78 TO 19+51.15
-DET2- STA. 25+00.00 TO 29+76.29
SEE PLANS FOR AUXILIARY LANE LOCATIONS

-DET3- STA. 14+67.28 TO 21+02.65 (BEGIN BRIDGE)
-DET3- STA. 23+07.65 (END BRIDGE) TO 29+43.03
-DET4- STA. 16+56.86 TO 21+01.16 (BEGIN BRIDGE)
-DET4- STA. 23+06.16 (END BRIDGE) TO 27+50.46
SEE PLANS FOR AUXILIARY LANE LOCATIONS



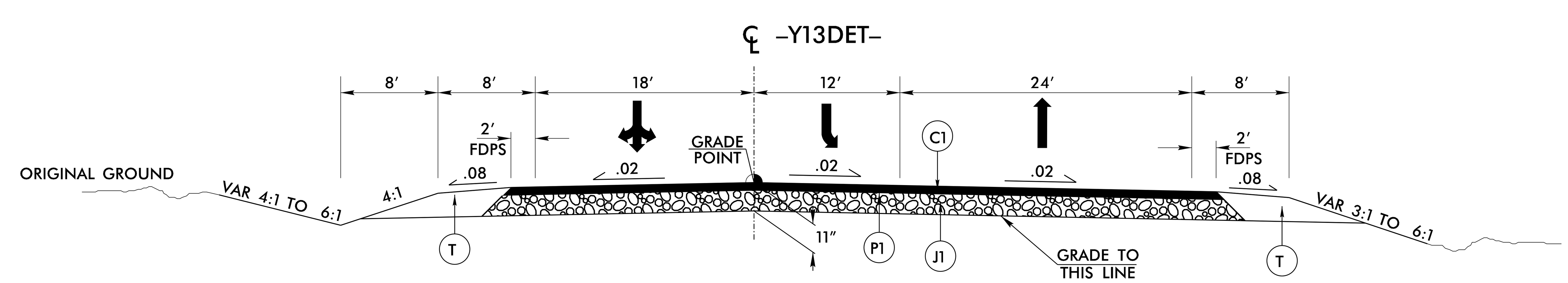
TYPICAL SECTION NO. 18

-DET1- STA. 19+55.00 TO 21+10.14 (BEGIN EXIST. BRIDGE)
-DET1- STA. 22+96.40 (END EXIST. BRIDGE) TO 24+97.56
-DET2- STA. 19+51.15 TO 21+09.27 (BEGIN BRIDGE)
-DET2- STA. 22+95.28 (END BRIDGE) TO 25+00.00



TYPICAL SECTION NO. 19

-Y13DET- STA. 11+38.57 TO 12+90.11



TYPICAL SECTION NO. 20

-Y13DET- STA. 13+67.08 TO 14+40.55

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PROJECT REFERENCE NO.	SHEET NO.
U-3330	2B-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 37265 ENGINEER CHRISTINE DRUM STEVE ANTHONY

4/6/2017

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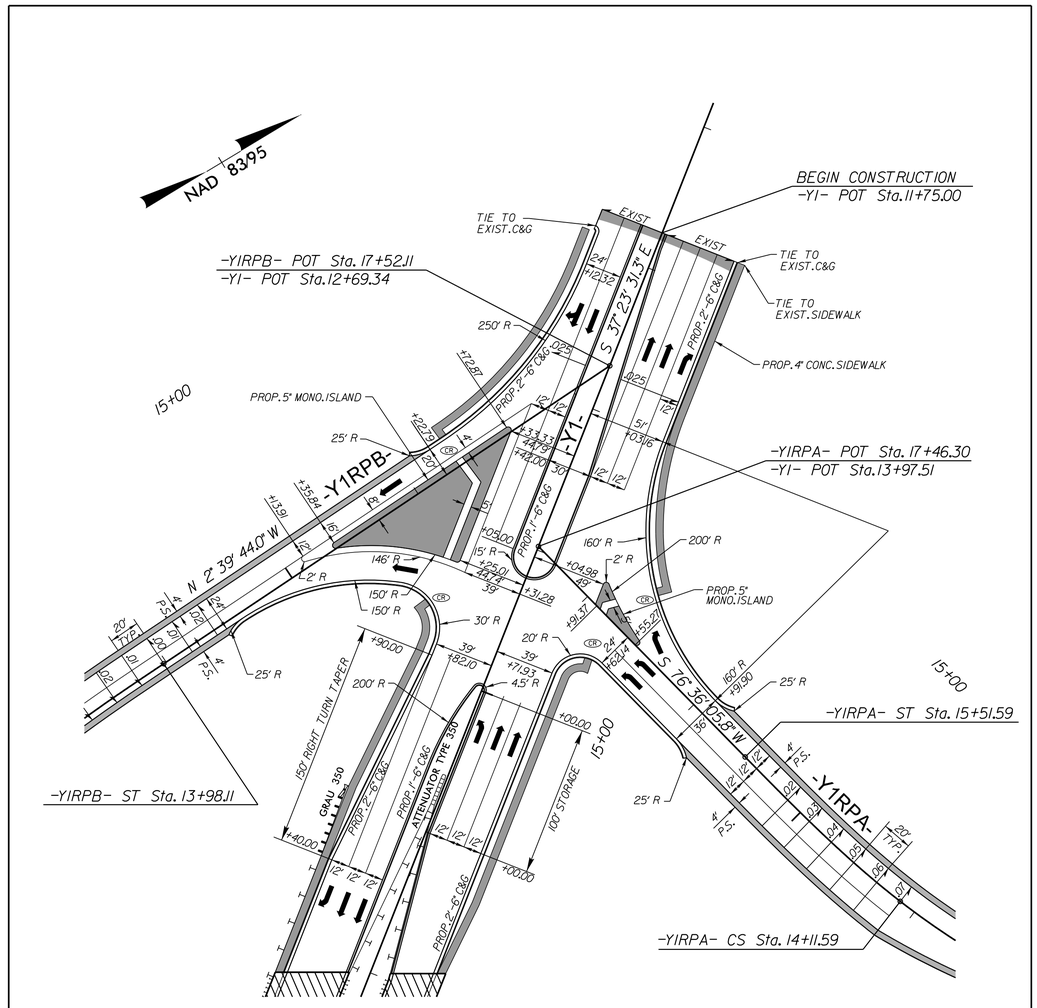
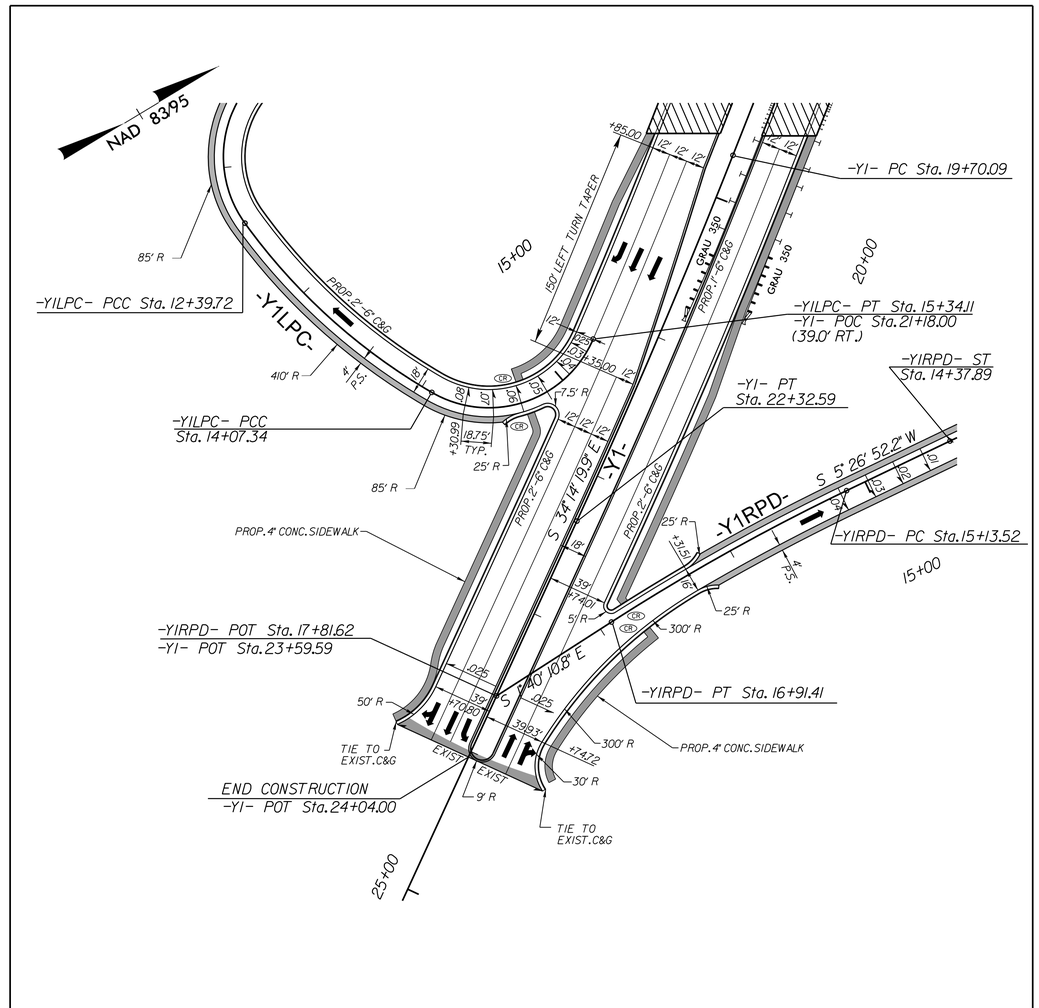
INTERSECTION DETAIL SHEET

-Y1-
-YIRPA-
-YIRPB-



SEE SHEETS 5 & 12 FOR PLAN VIEW



SEE SHEET 5 FOR PLAN VIEW

NOTE: ALL ISLAND RADII ARE 2' UNLESS NOTED OTHERWISE.

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PROJECT REFERENCE NO.	SHEET NO.
U-3330	2B-2
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 37265 ENGINEER STEVE ANTHONY DIXON

4/6/2017

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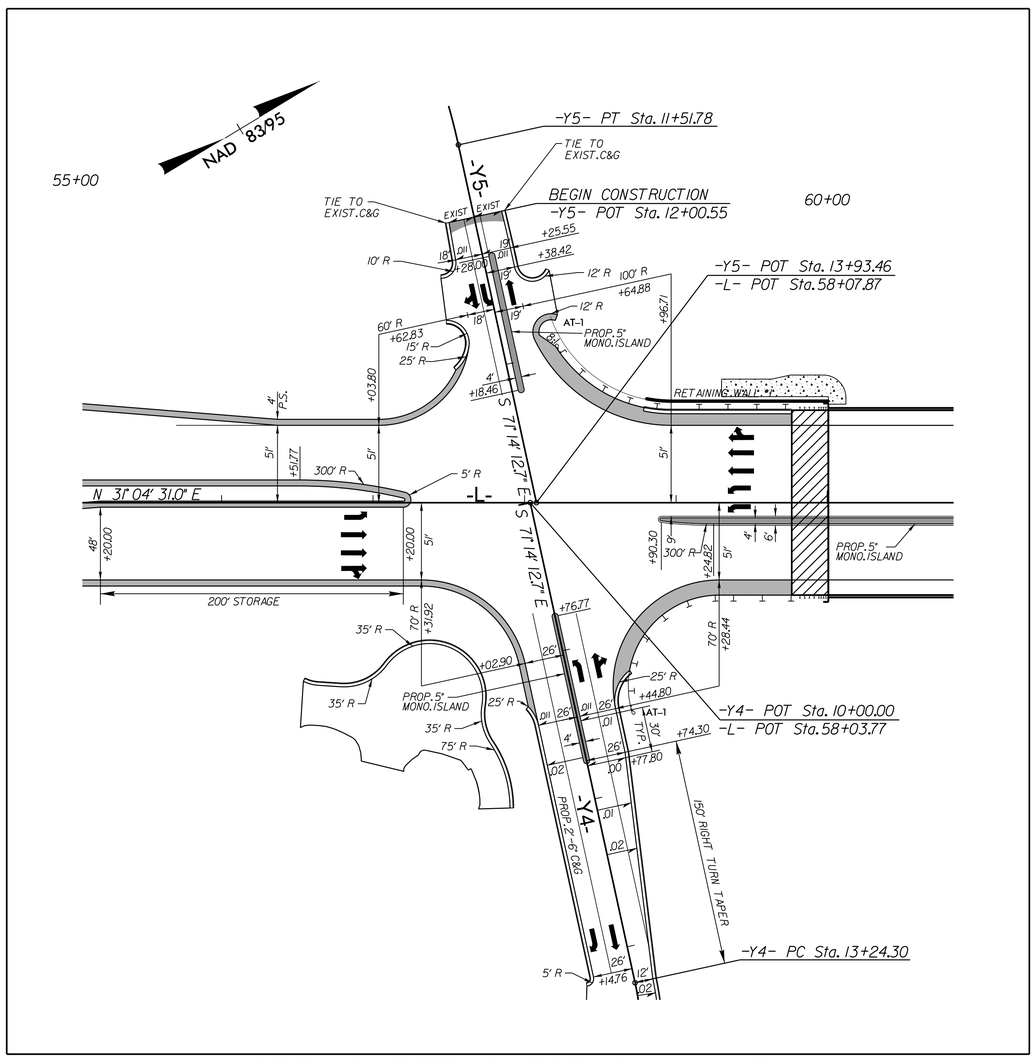
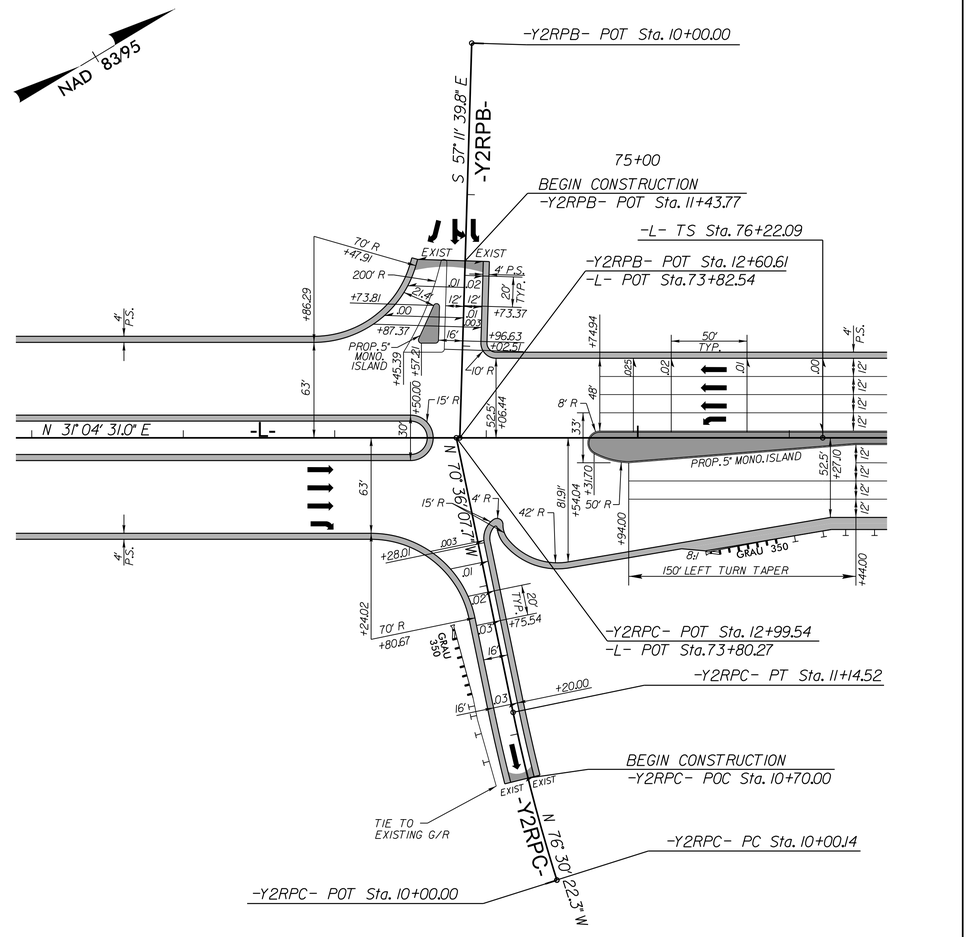
INTERSECTION DETAIL SHEET

-L-
-Y4-
-Y5-



SEE SHEET 6 FOR PLAN VIEW

-L-
-Y2RPB-
-Y2RPC-



SEE SHEET 7 FOR PLAN VIEW

NOTE: ALL ISLAND RADII ARE 2' UNLESS NOTED OTHERWISE.

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PROJECT REFERENCE NO.	SHEET NO.
U-3330	2B-3
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 37065 STEVE ANTHONY DUNN

4/6/2017

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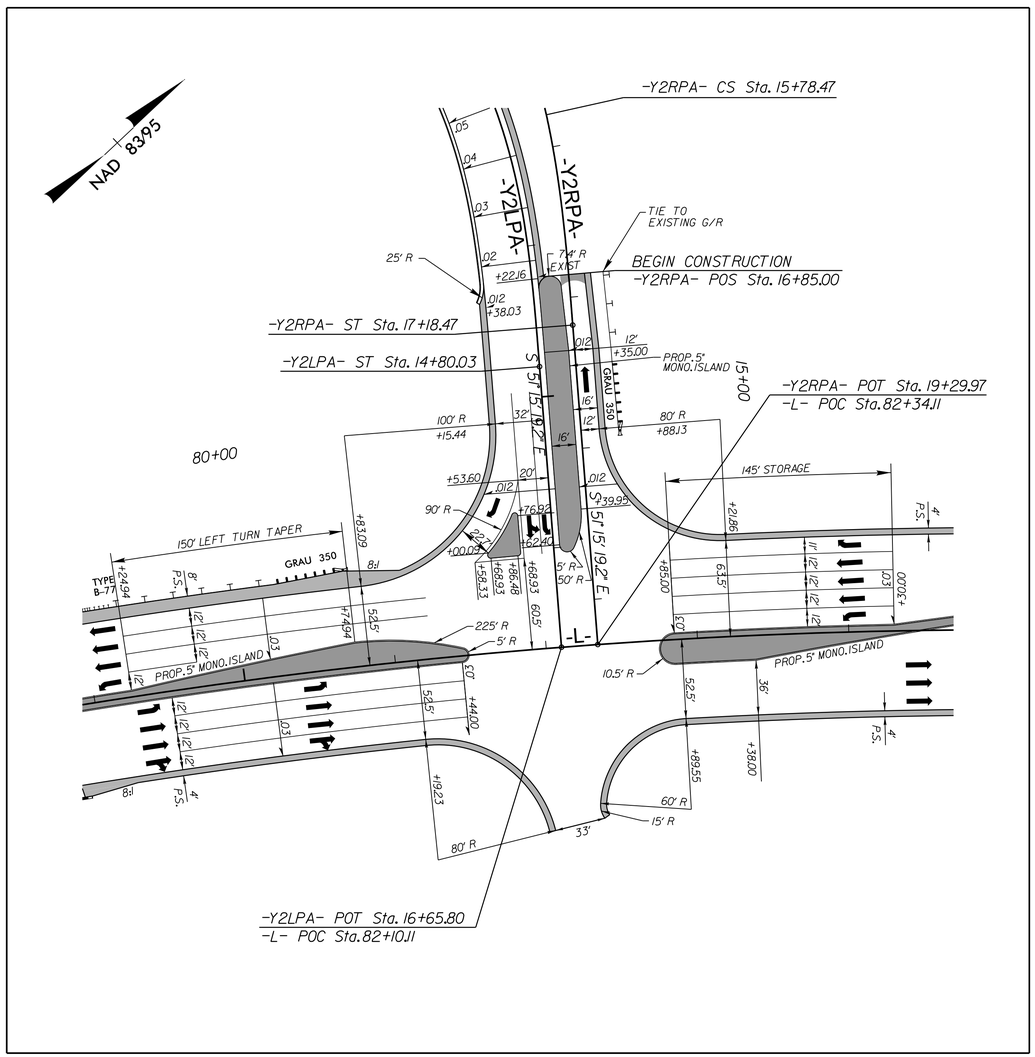
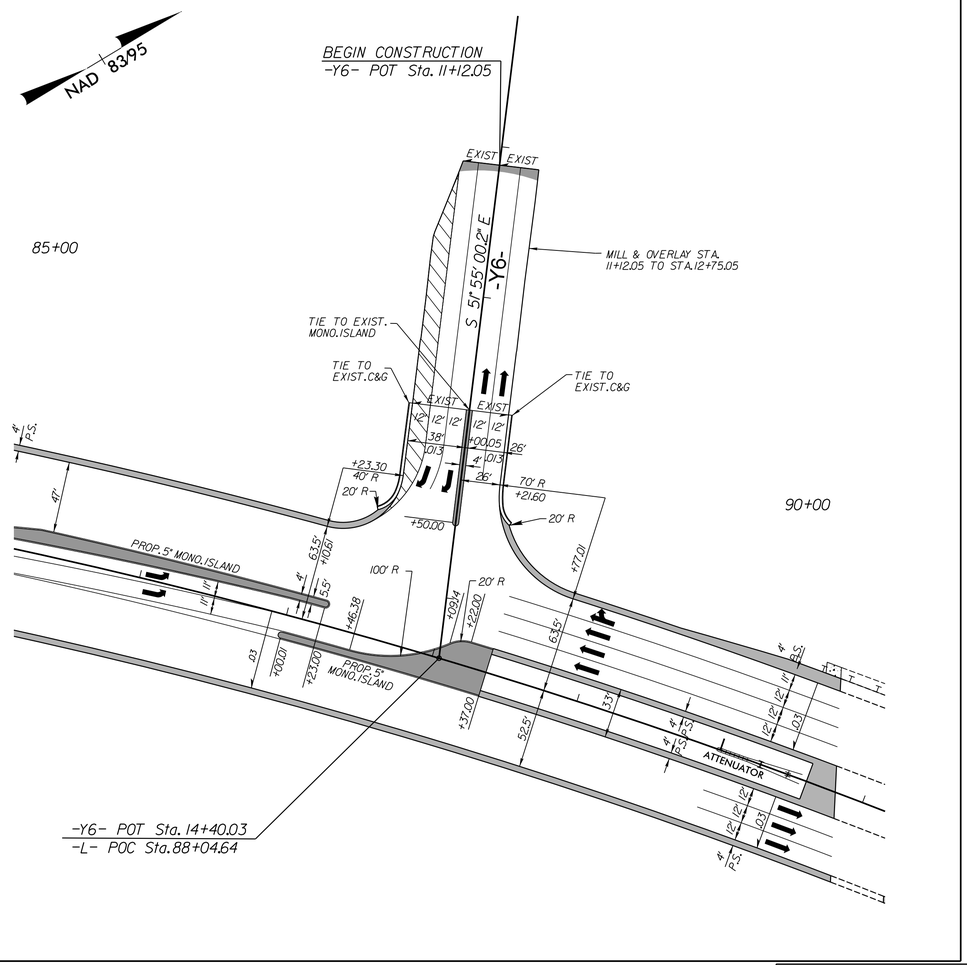
INTERSECTION DETAIL SHEET

-L-
-Y2LPA-
-Y2RPA-



SEE SHEET 8 FOR PLAN VIEW

-L-
-Y6-



SEE SHEET 8 FOR PLAN VIEW

NOTE: ALL ISLAND RADII ARE 2' UNLESS NOTED OTHERWISE.

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PROJECT REFERENCE NO.	SHEET NO.
U-3330	2B-4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

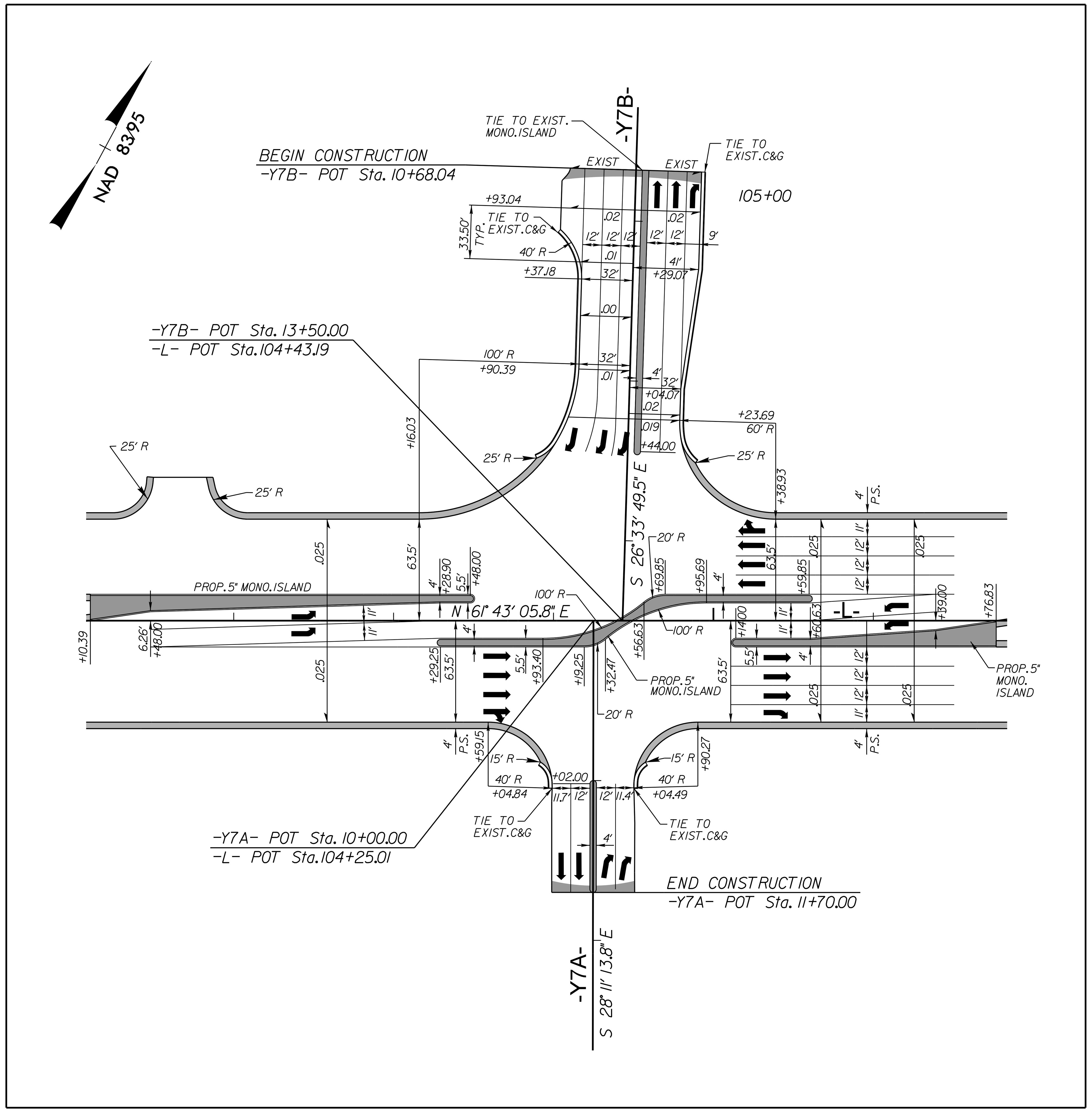
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 17265 STEVE ANTHONY DRUM

4/6/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

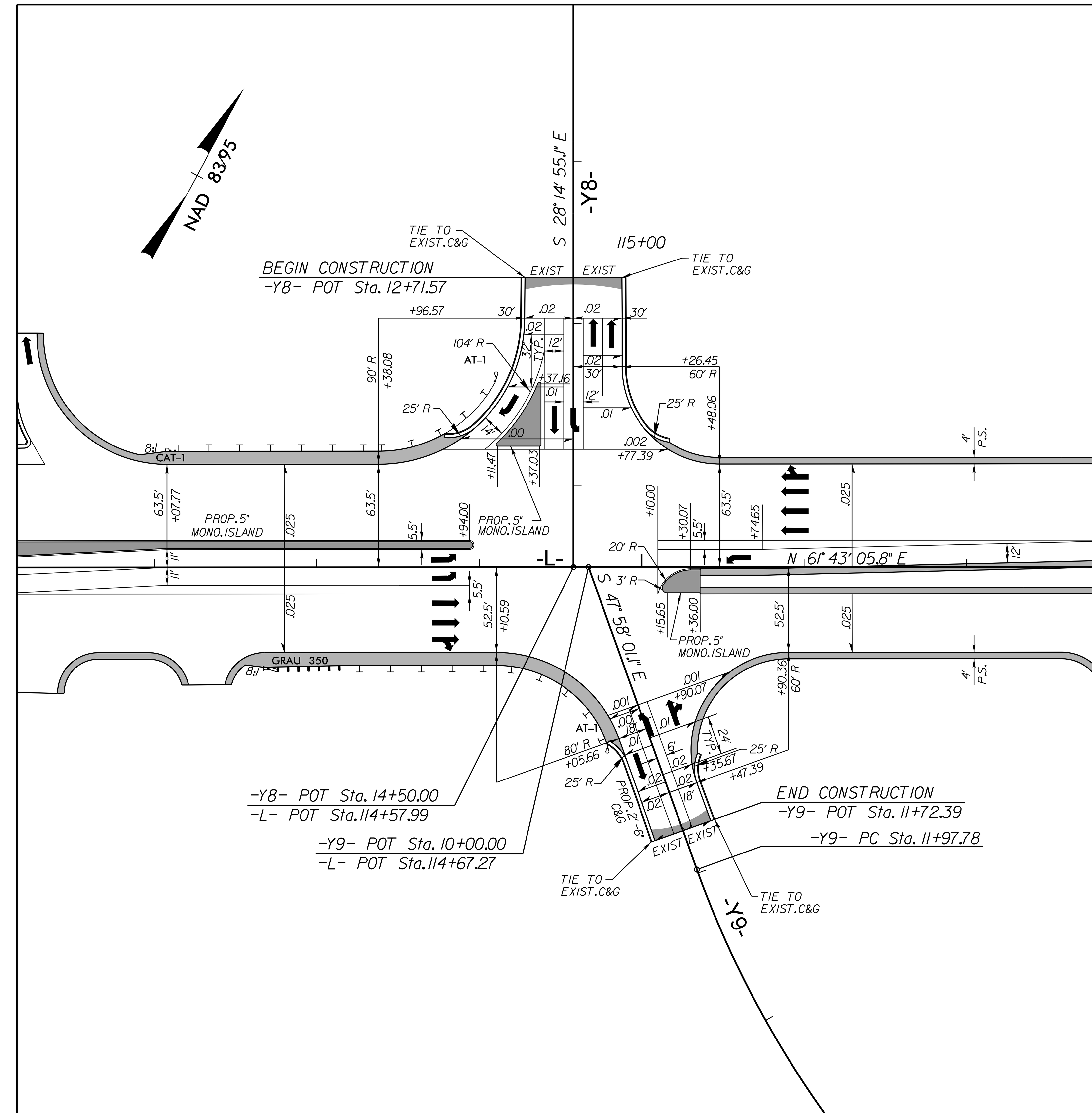
INTERSECTION DETAIL SHEET

-L-
-Y7A-/-Y7B-



SEE SHEET 9 FOR PLAN VIEW

-L-
-Y8-
-Y9-



SEE SHEET 10 FOR PLAN VIEW

NOTE: ALL ISLAND RADII ARE 2' UNLESS NOTED OTHERWISE.

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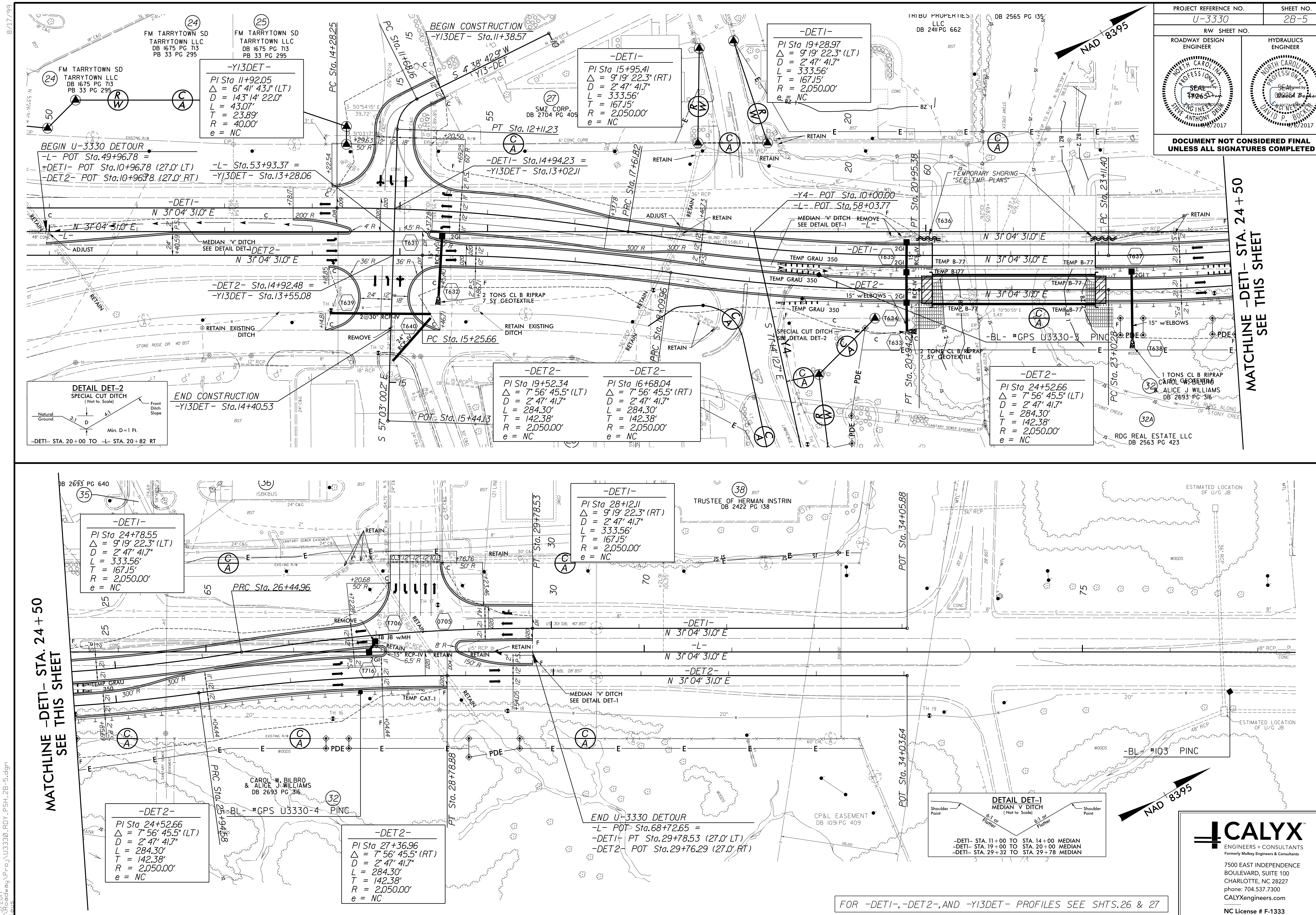

PROJECT REFERENCE NO.	SHEET NO.
U-3330	2B-6
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — SEAL 17265, STEVE ANTHONY DRAW, NORTH CAROLINA PROFESSIONAL ENGINEER, 4/6/2017

HYDRAULICS ENGINEER — SEAL, DAVID P. BOCKER, NORTH CAROLINA PROFESSIONAL ENGINEER, 4/6/2017

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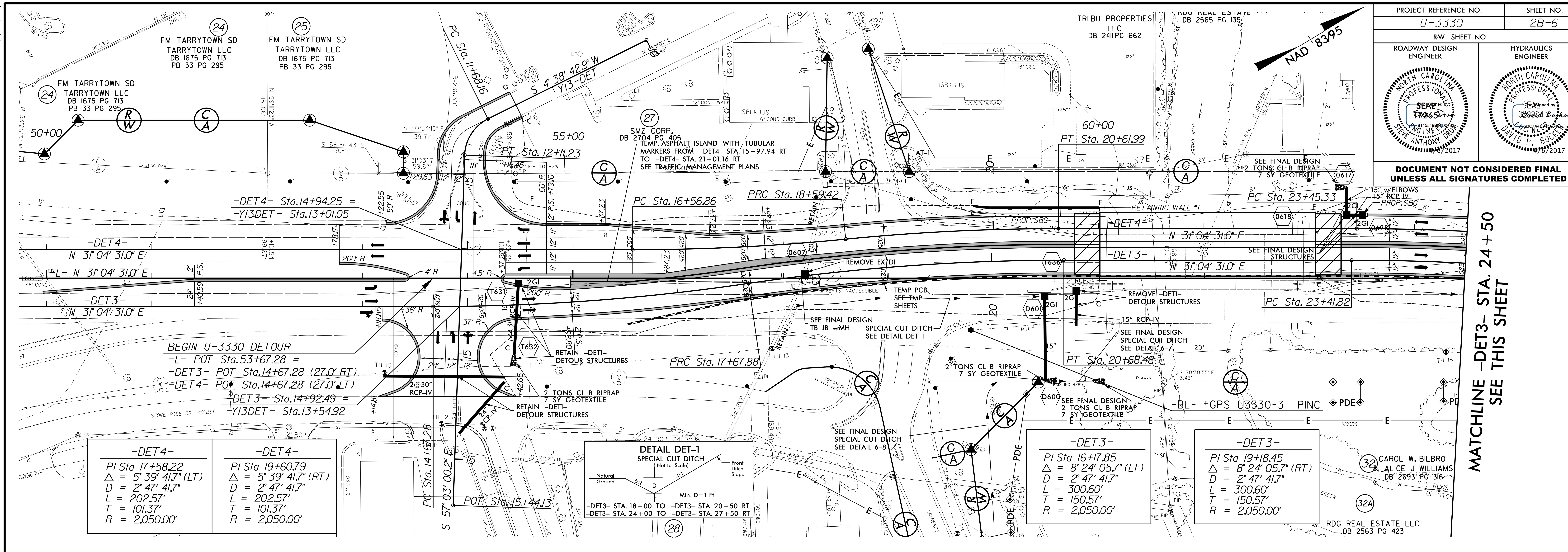
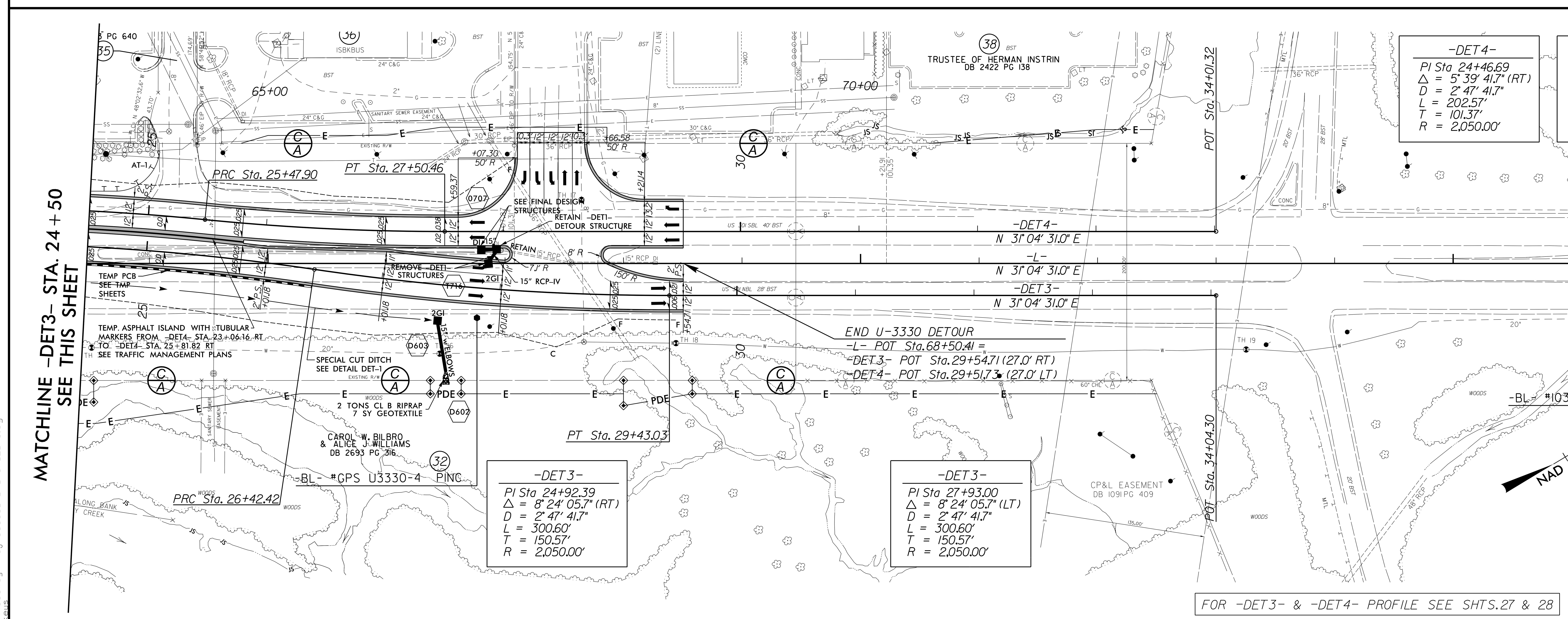

NAD 83/95
FM TARRYTOWN SD TARRYTOWN LLC DB 1675 PG 713 PB 33 PG 295
TRIBO PROPERTIES LLC DB 2411 PG 662
SMZ CORP. DB 2704 PG 405
-DET4- Sta.14+94.25 = -Y13DET- Sta.13+01.05
BEGIN U-3330 DETOUR
-L- POT Sta.53+67.28 =
-DET3- POT Sta.14+67.28 (27.0' RT)
-DET4- POT Sta.14+67.28 (27.0' LT)
-DET3- Sta.14+92.49 = -Y13DET- Sta.13+54.92
TEMP. ASPHALT ISLAND WITH TUBULAR MARKERS FROM -DET4- STA. 15+97.94 RT TO -DET4- STA. 21+01.16 RT SEE TRAFFIC MANAGEMENT PLANS
PC Sta. 16+56.86
PRC Sta. 18+59.42
PT Sta. 20+61.99
PC Sta. 23+45.33
PC Sta. 23+41.82
PRC Sta. 17+67.88
PT Sta. 20+68.48
PT Sta. 12+11.23
POT Sta. 15+44.13
-BL- #GPS U3330-3 PINC
CAROL W. BILBRO ALICE J WILLIAMS DB 2693 PG 316
RDG REAL ESTATE LLC DB 2563 PG 423
DETAIL DET-1 SPECIAL CUT DITCH (Not to Scale)
-DET3- STA. 18+00 TO -DET3- STA. 20+50 RT
-DET3- STA. 24+00 TO -DET3- STA. 27+50 RT
-DET4- PI Sta 17+58.22 Δ = 5° 39' 41.7" (LT) D = 2° 47' 41.7" L = 202.57' T = 101.37' R = 2,050.00'
-DET4- PI Sta 19+60.79 Δ = 5° 39' 41.7" (RT) D = 2° 47' 41.7" L = 202.57' T = 101.37' R = 2,050.00'
-DET3- PI Sta 16+17.85 Δ = 8° 24' 05.7" (LT) D = 2° 47' 41.7" L = 300.60' T = 150.57' R = 2,050.00'
-DET3- PI Sta 19+18.45 Δ = 8° 24' 05.7" (RT) D = 2° 47' 41.7" L = 300.60' T = 150.57' R = 2,050.00'
MATCHLINE -DET3- STA. 24+50 SEE THIS SHEET


MATCHLINE -DET3- STA. 24+50 SEE THIS SHEET
TRUSTEE OF HERMAN INSTRIN DB 2422 PG 138
PRC Sta. 25+47.90
PT Sta. 27+50.46
POT Sta. 34+01.32
END U-3330 DETOUR
-L- POT Sta.68+50.41 =
-DET3- POT Sta.29+54.71 (27.0' RT)
-DET4- POT Sta.29+51.73 (27.0' LT)
TEMP. ASPHALT ISLAND WITH TUBULAR MARKERS FROM -DET4- STA. 23+06.16 RT TO -DET4- STA. 25+81.82 RT SEE TRAFFIC MANAGEMENT PLANS
PT Sta. 29+43.03
PRC Sta. 26+42.42
-BL- #GPS U3330-4 PINC
-BL- #103 PINC
CP&L EASEMENT DB 1091 PG 409
POT Sta. 34+04.30
-DET4- PI Sta 24+46.69 Δ = 5° 39' 41.7" (RT) D = 2° 47' 41.7" L = 202.57' T = 101.37' R = 2,050.00'
-DET4- PI Sta 26+49.26 Δ = 5° 39' 41.7" (LT) D = 2° 47' 41.7" L = 202.57' T = 101.37' R = 2,050.00'
-DET3- PI Sta 24+92.39 Δ = 8° 24' 05.7" (RT) D = 2° 47' 41.7" L = 300.60' T = 150.57' R = 2,050.00'
-DET3- PI Sta 27+93.00 Δ = 8° 24' 05.7" (LT) D = 2° 47' 41.7" L = 300.60' T = 150.57' R = 2,050.00'
NAD 83/95

FOR -DET3- & -DET4- PROFILE SEE SHTS.27 & 28

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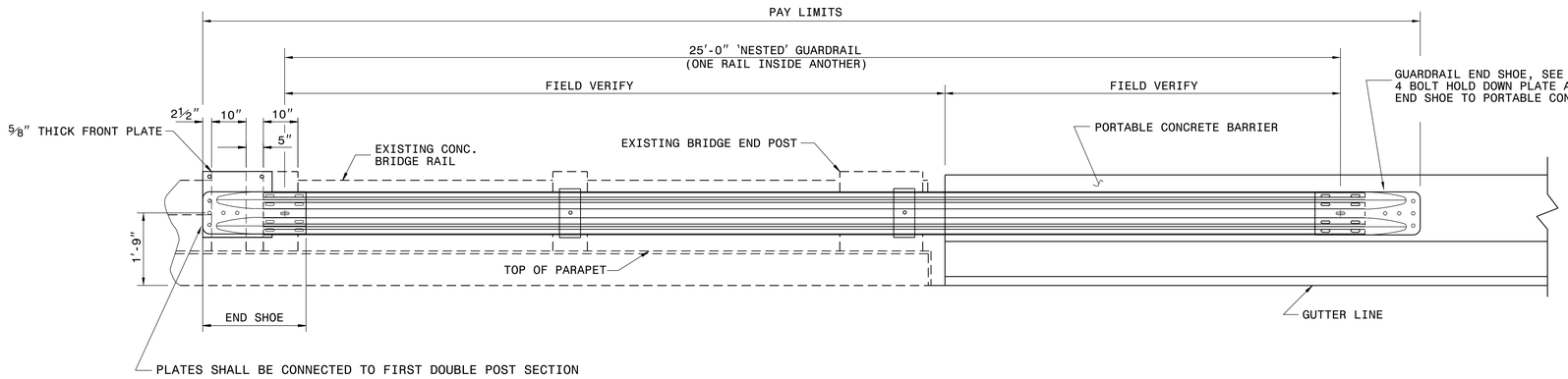
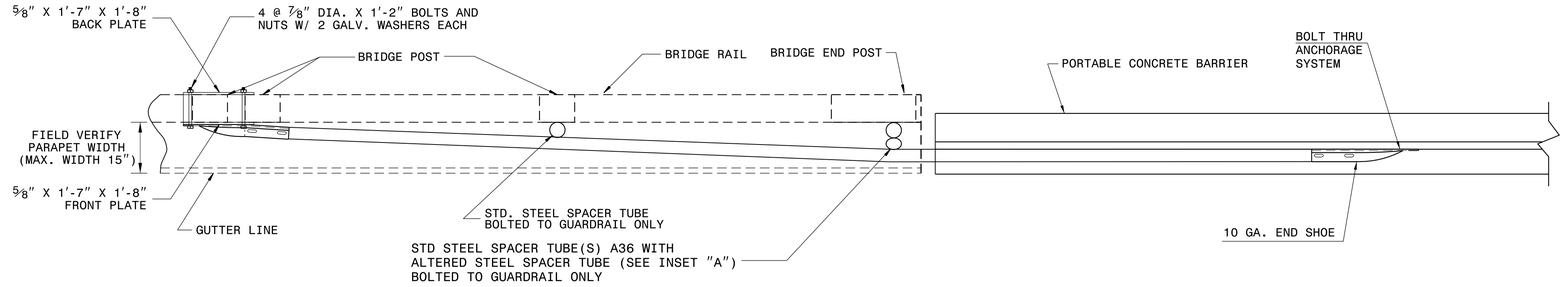
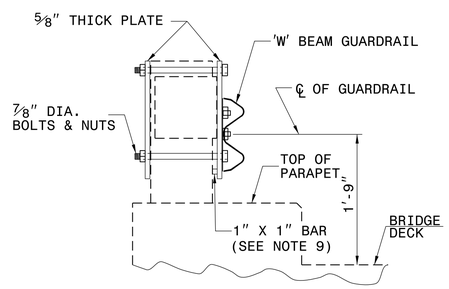
PROJECT REFERENCE NO.	SHEET NO.
U-3330	2C-1



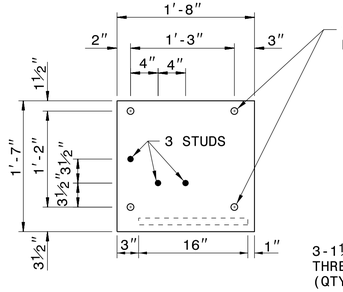
ELEVATION VIEW

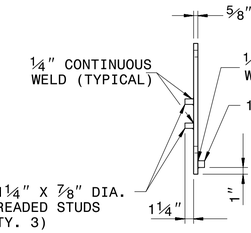


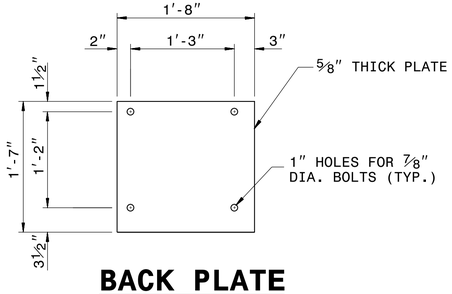
PLAN VIEW



SECTION VIEW







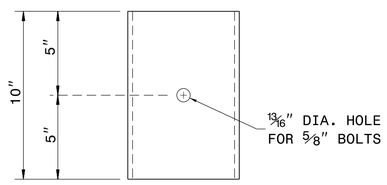
BACK PLATE

STUDS MAY BE ADJUSTED TO MEET FIELD CONDITIONS

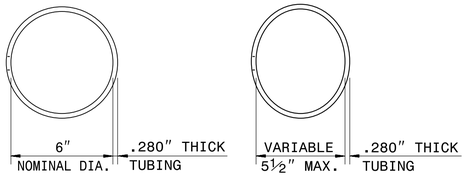
FRONT VIEW

SIDE VIEW

FRONT PLATE



FRONT VIEW



PLAN VIEW

PLAN VIEW INSET "A"

STEEL SPACER TUBE

GENERAL NOTES:

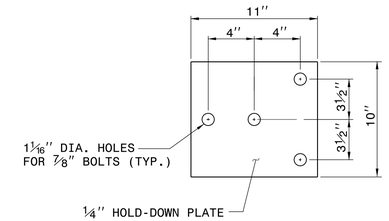
1. USE NUTS, BOLTS, AND WASHERS CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-307 AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF STAND. SPECS.
2. TAP NUTS FOR THE 7/8" DIA. STUDS AND BOLTS AFTER GALVANIZING SEE A.S.T.M. A-563.
3. USE PLATES AND TUBES CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-36 AND GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH SECTION 1076 OF STAND. SPECS.
4. ADDITIONAL FIELD HOLES MAY BE DRILLED IN STEEL RAIL AS DIRECTED BY THE ENGINEER.
5. INSTALL FACE OF GUARDRAIL AS NEAR AS POSSIBLE TO PLUMB WITH THE PARAPET FACE AT BRIDGE END POST SPACER TUBE LOCATION BY USING STANDARD OR ALTERED SPACER TUBES OR A COMBINATION THEREOF OR AS DIRECTED BY THE ENGINEER. FOR VERY SMALL PARAPET WIDTHS, GUARDRAIL MAY BE INSTALLED AGAINST BRIDGE RAIL WITHOUT SPACER TUBES.
6. DO NOT DRILL BRIDGE RAIL IN ORDER TO INSTALL GUARDRAIL ANCHOR UNIT.
7. KEEP TOE OF PORTABLE CONCRETE BARRIER FLUSH WITH FACE OF PARAPET.
8. ATTACH 1" X 1" BAR AND THREADED STUDS TO PLATE WITH ¼" WELDS ALL AROUND.
9. 1" X 1" BAR MAY NOT BE NEEDED ON BRIDGE RAILS WHERE FACE OF RAIL DOES NOT PROJECT BEYOND FACE OF POST.

NOTES FOR 4 BOLT HOLD DOWN PLATE

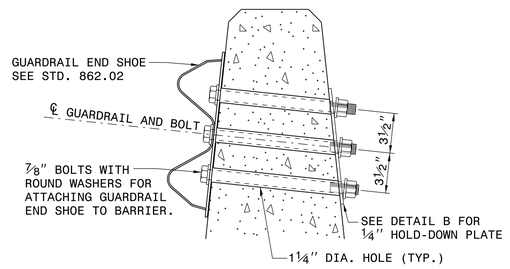
THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A ¼" HOLD DOWN PLATE AND 4 - 7/8" DIA. BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL. THE 1¼" DIA. HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



4 BOLT HOLD DOWN PLATE



PART SECTION OF BARRIER OR RAIL

THRU END SHOE SECTION AND
4 BOLT HOLD DOWN PLATE

4/7/2017

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

DocuSigned by: Joel S. Howerton 873F3D17DCDC45F...

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

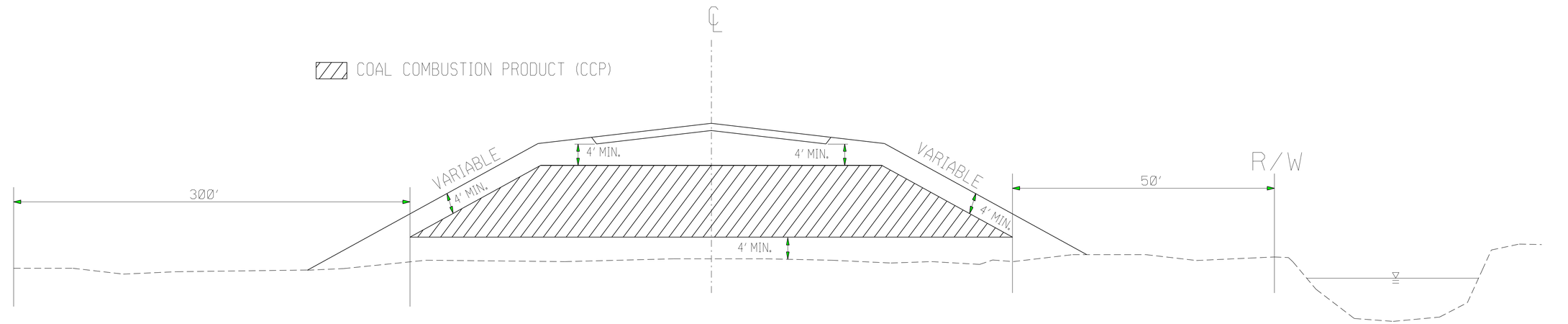
TEMPORARY ANCHOR UNIT TYPE W-BEAM

ORIGINAL BY: E.E. WARD DATE: 4-03
MODIFIED BY: E.E. WARD DATE: 6-04
CHECKED BY: DATE:
FILE SPEC.: :\usr\details\stand\862stds\anc.dgn

$$$$USERNAME$$$$ $$$$DGNS$$$$ $$$$SYSTIME$$$$

PROJECT REFERENCE NO.	SHEET NO.
U–3330	2C–2

COAL COMBUSTION PRODUCT PLACEMENT



*(OBTAIN PERMISSION FROM ARMY CORPS OF ENGINEERS)

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

4/7/2017

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

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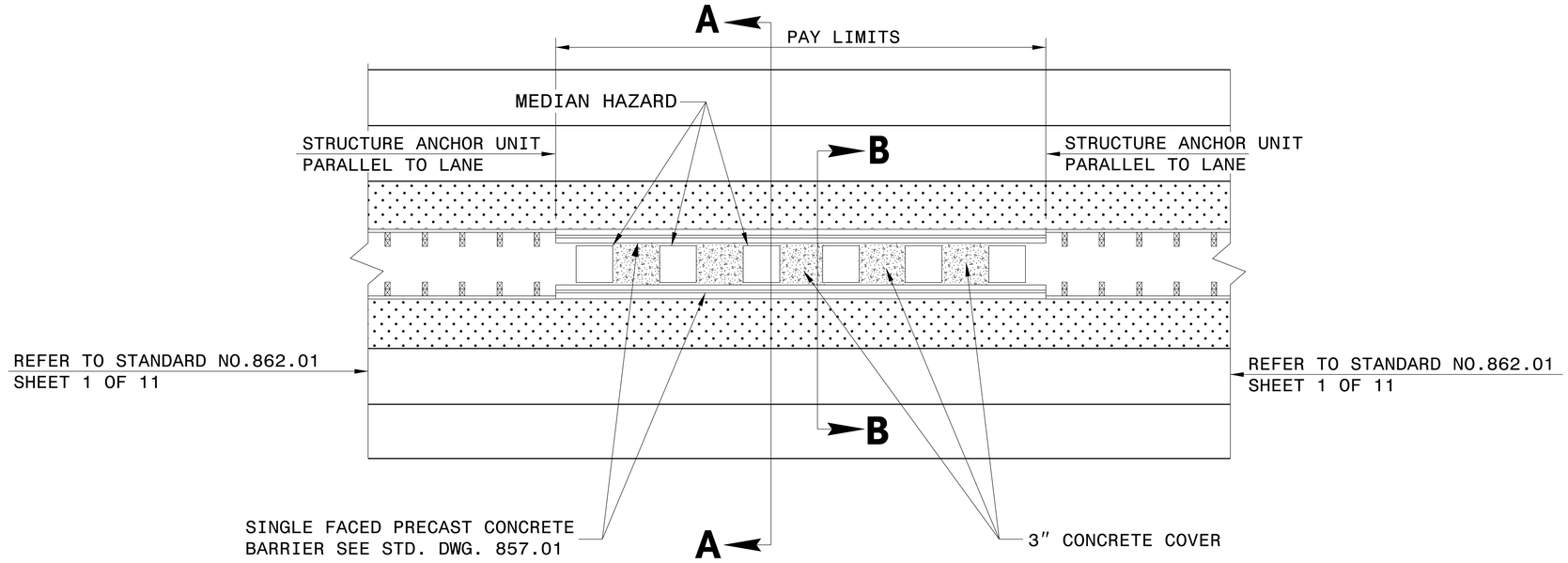
COAL COMBUSTION PRODUCT PLACEMENT DETAIL

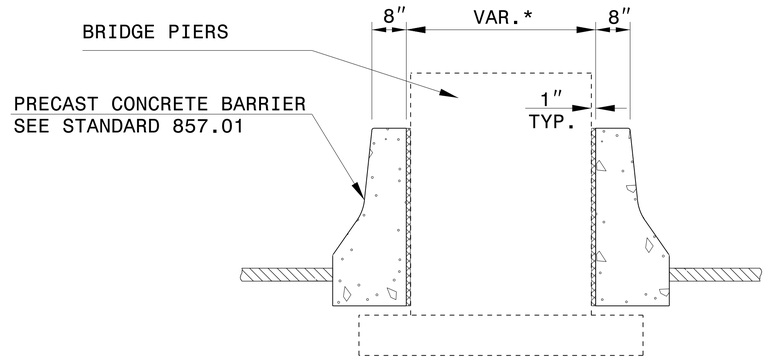
ORIGINAL BY: J.S.H. DATE: 3/16/15
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: joel/coal combustion material detail.dgn

$$$$SYSTIME$$$$
$$$$FILENAME$$$$
$$$$USERNAME$$$$

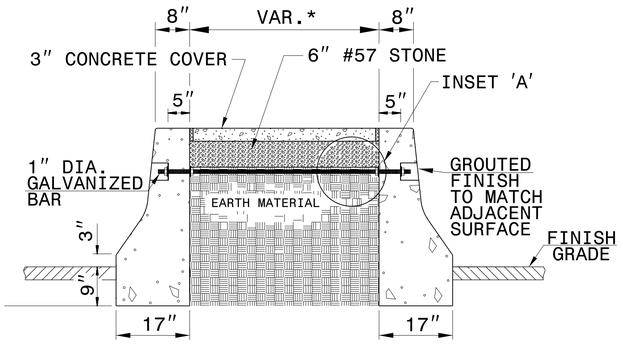
PROJECT REFERENCE NO.	SHEET NO.
U-3330	2C-3



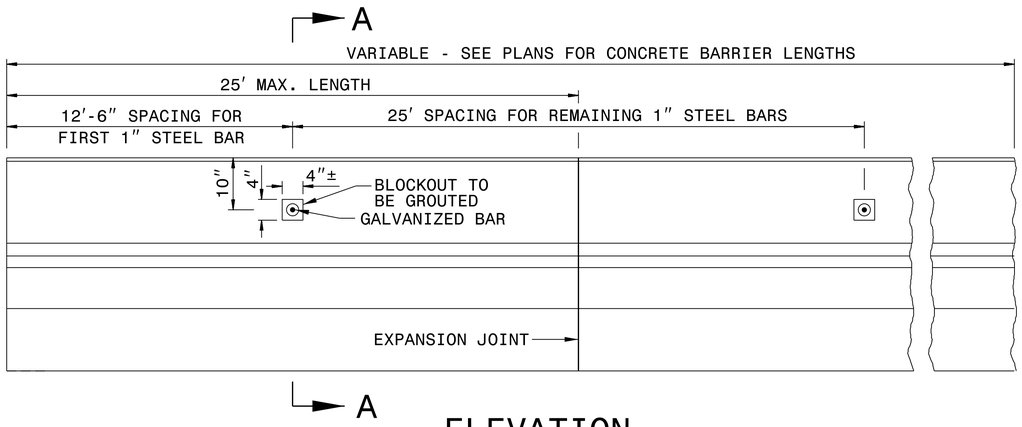
INSET 'A'



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

4/7/2017

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DETAIL OF MEDIAN HAZARD PROTECTION

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

$$$$ SYSTIME $$$$ SYSNAME $$$$ USERNAME $$$$

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-3330	2C-4

STATE OF
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

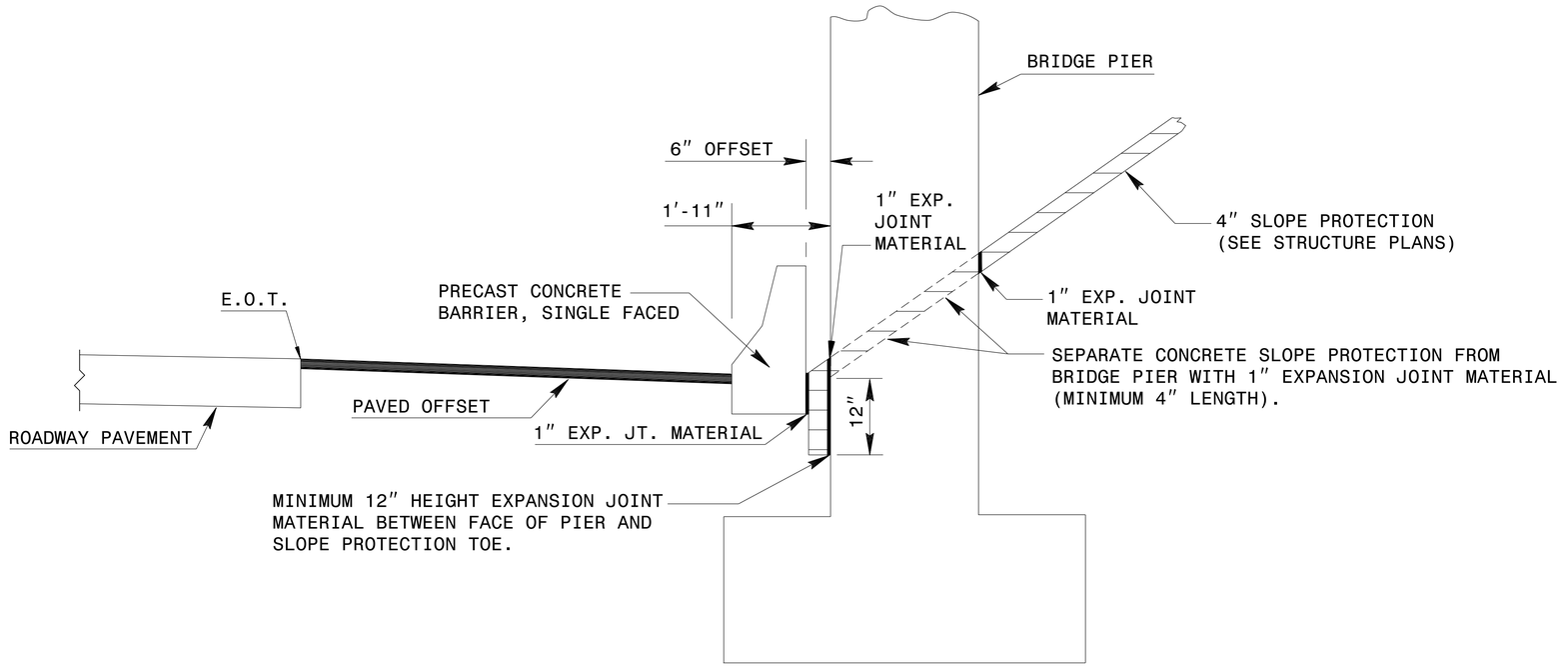
ENGLISH DETAIL DRAWING FOR

GUIDE FOR PAVING SHOULDERS UNDER BRIDGES

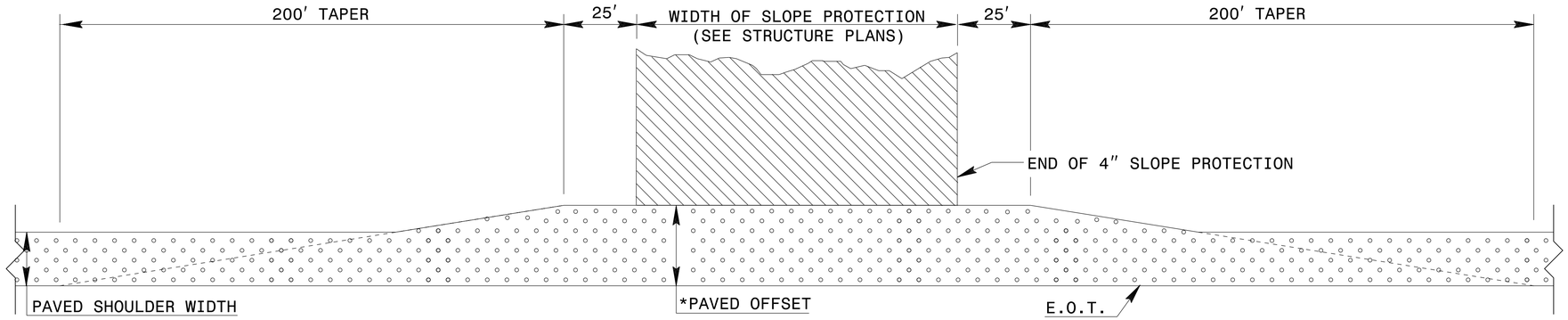
METHOD I

SHEET 1 OF 1

610D01



ELEVATION



PLAN

NOTES:
PAVE THE FULL WIDTH OF THE SHOULDER AND OFFSET AS SHOWN WITH SHOULDER PAVEMENT MATERIAL AS SHOWN ON PLANS.
*PAVED OFFSET BASED ON BRIDGE POLICY (SEE STRUCTURE PLANS).
PROTECT SLOPE WITH REINFORCED CONCRETE PAVING. CONCRETE BLOCK PAVING WILL NOT BE PERMITTED.

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RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR

GUIDE FOR PAVING SHOULDERS UNDER BRIDGES

METHOD I

SHEET 1 OF 1

610D01

4/7/2017

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

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ORIGINAL BY: DATE:
MODIFIED BY: J Howerton DATE: 12/02/15
CHECKED BY: DATE:
FILE SPEC.: Special Details/jhowerton/610d03.dgn

$$$$USERNAME$$$$
$$$$DGN$$$$
$$$$TIME$$$$
$$$$SYSTEM$$$$

PROJECT REFERENCE NO.	SHEET NO.
U-3330	2C-5

5/14/99

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ENGLISH DETAIL DRAWING FOR

GUIDE FOR PAVING SHOULDERS UNDER BRIDGES

METHOD III

SHEET 1 OF 1

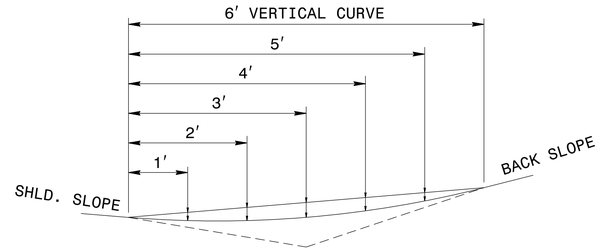
610D03

HORZ. DIM.	1½:1 BACK SLOPE									
	SHOULDER SLOPE									
	.04	.03	.02	.01	.00	-.01	-.02	-.03	-.04	-.05
1′	0.26′	0.27′	0.27′	0.27′	0.28′	0.28′	0.28′	0.29′	0.30′	0.31′
2′	0.42′	0.42′	0.43′	0.44′	0.44′	0.45′	0.46′	0.46′	0.47′	0.48′
3′	0.47′	0.48′	0.49′	0.49′	0.50′	0.51′	0.52′	0.52′	0.53′	0.54′
4′	0.42′	0.42′	0.43′	0.44′	0.44′	0.45′	0.46′	0.46′	0.47′	0.48′
5′	0.26′	0.27′	0.27′	0.27′	0.28′	0.28′	0.28′	0.29′	0.30′	0.31′

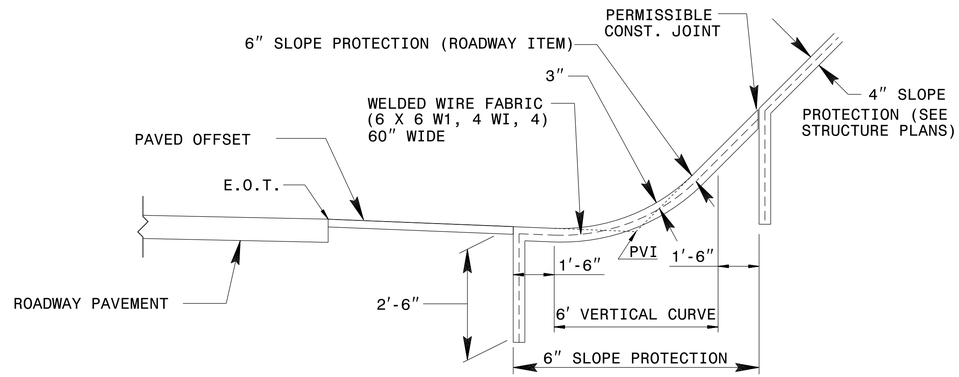
HORZ. DIM.	2:1 BACK SLOPE									
	SHOULDER SLOPE									
	.04	.03	.02	.01	.00	-.01	-.02	-.03	-.04	-.05
1′	0.19′	0.20′	0.20′	0.20′	0.21′	0.21′	0.22′	0.22′	0.23′	0.23′
2′	0.31′	0.31′	0.32′	0.33′	0.33′	0.34′	0.35′	0.35′	0.36′	0.37′
3′	0.35′	0.35′	0.36′	0.37′	0.38′	0.38′	0.39′	0.40′	0.41′	0.41′
4′	0.31′	0.31′	0.32′	0.33′	0.33′	0.34′	0.35′	0.35′	0.36′	0.37′
5′	0.19′	0.20′	0.20′	0.20′	0.21′	0.21′	0.22′	0.22′	0.23′	0.23′

VERTICAL CURVE OFFSET

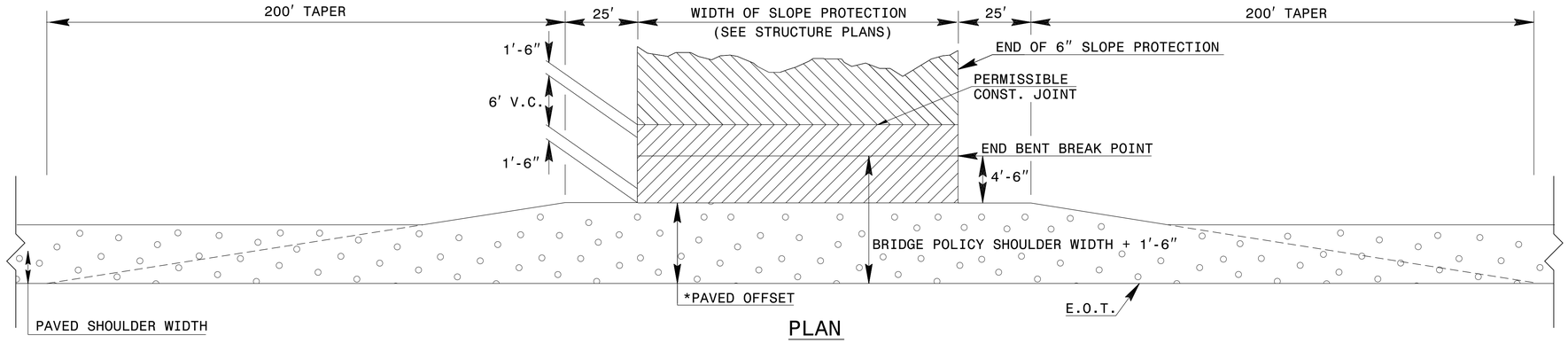
(FOR 6′ V.C. AT BRIDGES)



TYPICAL SECTION



ELEVATION



PLAN

NOTES:
PAVE THE FULL WIDTH OF THE SHOULDER AS SHOWN WITH SHOULDER PAVEMENT MATERIAL AS SHOWN ON PLANS.
* PAVED OFFSET BASED ON BRIDGE POLICY (SEE STRUCTURE PLANS).
PROTECT SLOPE WITH REINFORCED CONCRETE PAVING. CONCRETE BLOCK PAVING WILL NOT BE PERMITTED.
OFFSETS FOR 6′ V.C. DENOTES FINISHED GRADE OF SLOPE PROTECTION.

STATE OF
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RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR

GUIDE FOR PAVING SHOULDERS UNDER BRIDGES

METHOD III

SHEET 1 OF 1

610D03

4/7/2017

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

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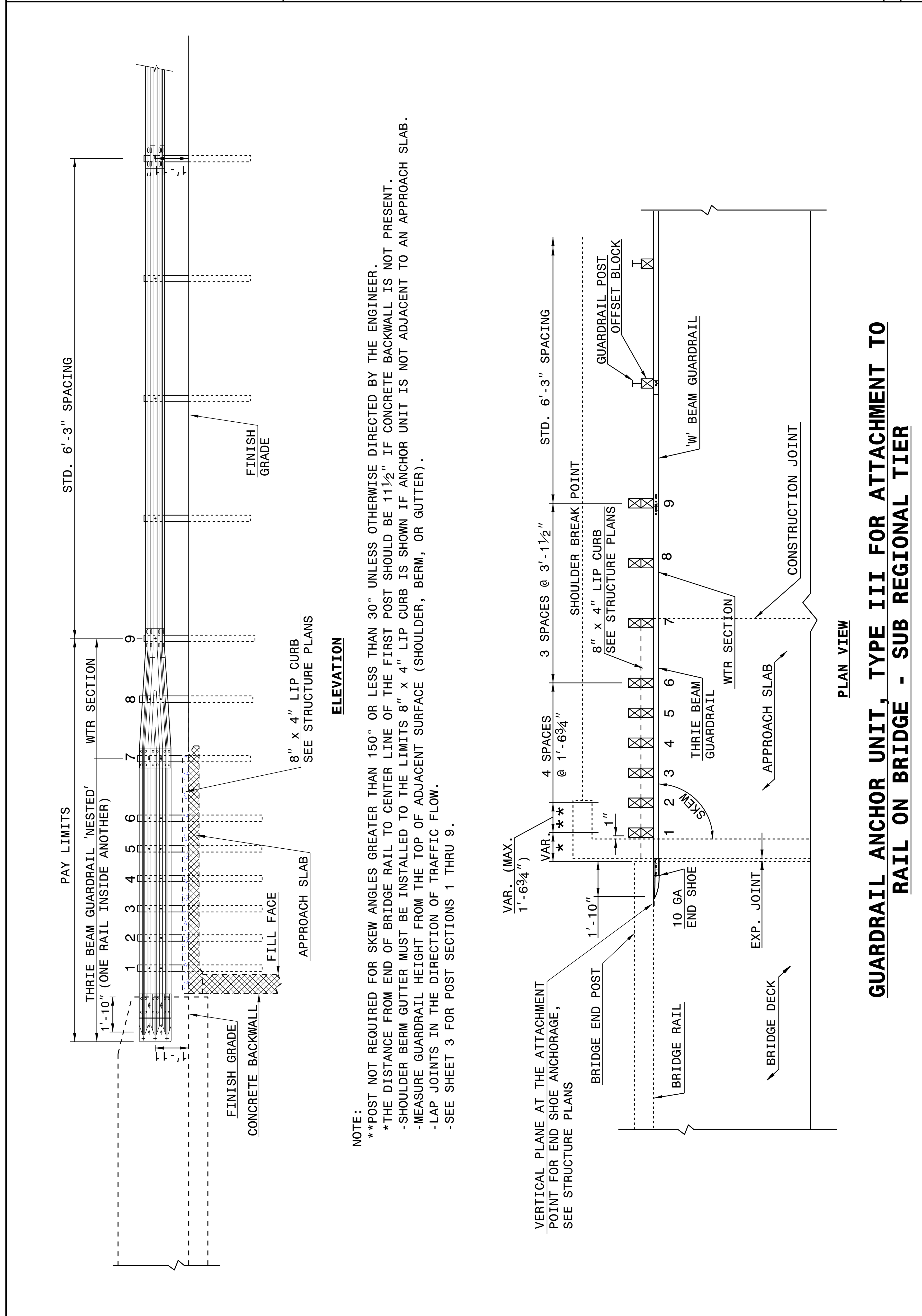
ORIGINAL BY: _____ DATE: _____
MODIFIED BY: J Howerton DATE: 12/02/15
CHECKED BY: _____ DATE: _____
FILE SPEC.: Division 6/0610d03.dgn

$$$$USERNAME$$$$ $$$$SYSTIME$$$$ $$$$USERNAME$$$$ $$$$SYSTIME$$$$

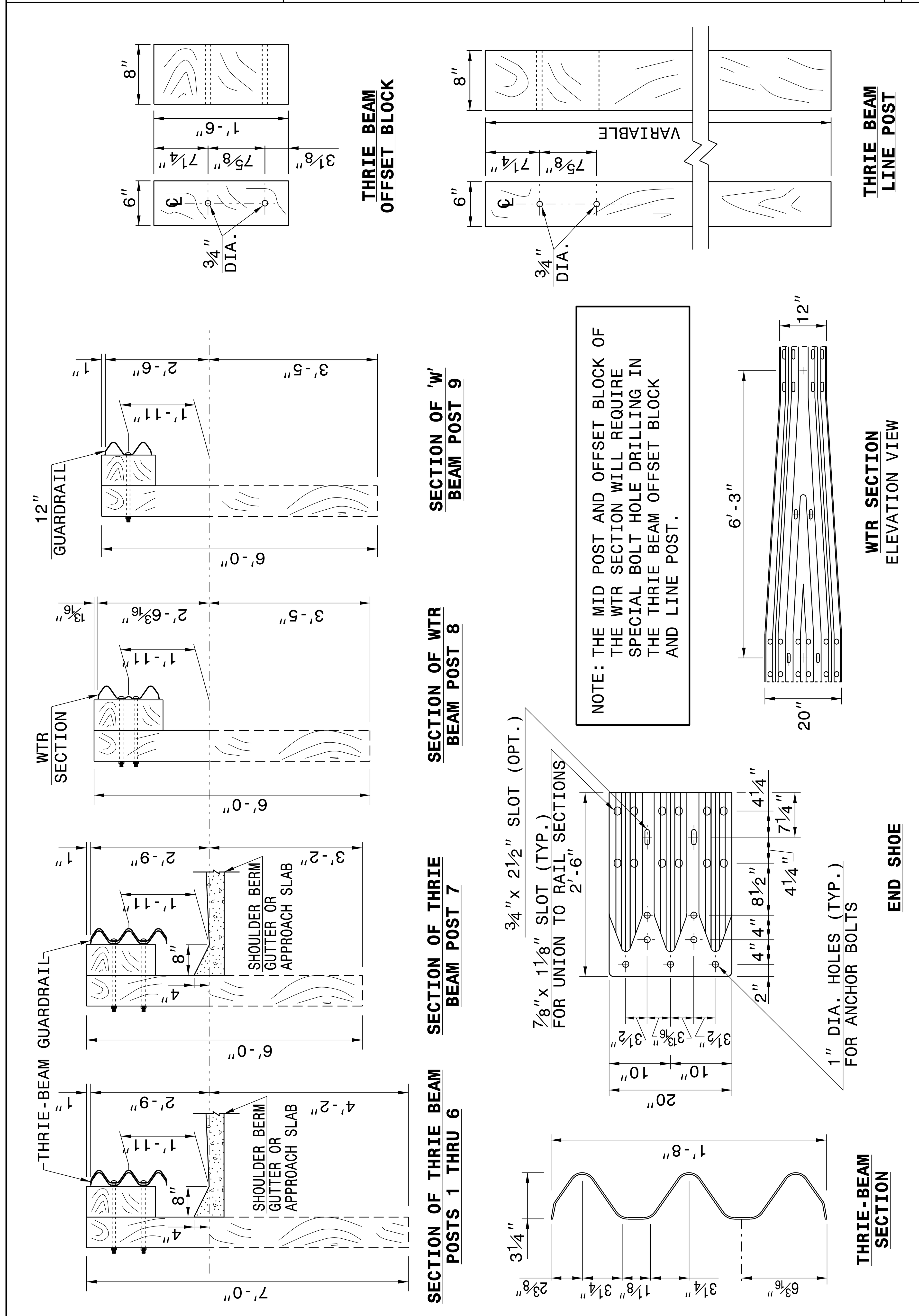
PROJECT REFERENCE NO.	SHEET NO.
U-3330	2C-6



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

ENGLISH 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.

ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III

SHEET 3 OF 7
862d03

4/7/2017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 Joel S. Howerton

DocuSigned by: Joel S. Howerton

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SEE TITLE BLOCK

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

PROJECT REFERENCE NO.	SHEET NO.
U-3330	2C-7

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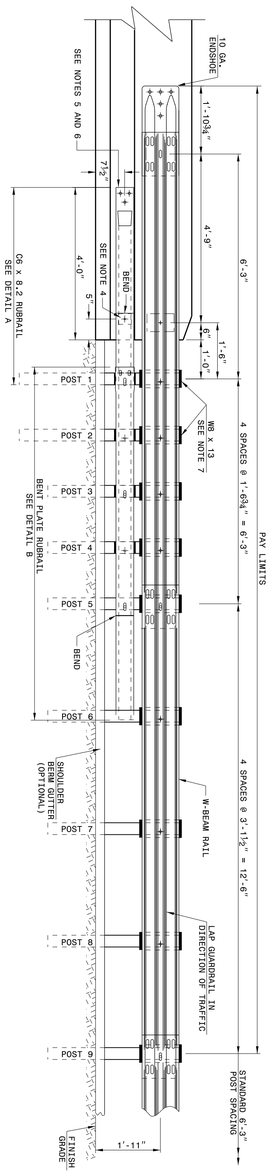
DIVISION OF HIGHWAYS
RALEIGH, N.C.

SHEET 4 OF 7
862D03

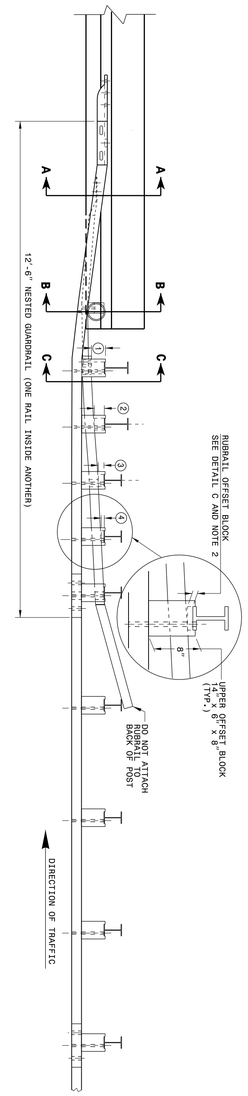
ENGLISH DETAIL DRAWING FOR
GUARDRAIL ANCHOR UNIT
GUARDRAIL ANCHOR UNIT TYPE B-77
FOR F-SHAPE BARRIER

ELEVATION



GENERAL NOTES:
1) THROUGH 6 REQUIRE AN ADDITIONAL HOLE TO ATTACH LOWER BLOCKOUTS AND/OR RUBRAIL.
2) RUBRAIL BLOCKOUTS LOCATED ON POSTS 1 THROUGH 4 ARE OFFSET VERTICALLY AND GROUPED WITH 5⅛" BUTTONHEAD BOLTS (SEE CHART FOR BOLT LENGTHS). SECURE BLOCKS ONLY TO POSTS 2 AND 4. SECURE RUBRAIL AND BLOCKOUTS TO POSTS 1 AND 3.
3) STEEL SPACER TUBE IS A SCHEDULE 40 GALVANIZED PIPE 6" INSIDE DIAMETER x 9" LONG. ATTACH TUBE TO GUARDRAIL ONLY WITH A 5⅛" x 4½" BUTTONHEAD BOLT. RUBRAIL IS FLARED TO BACK OF POST 6 AND NOT SECURED.
4) SEE DETAIL D FOR SLOPED RUBRAIL BLOCKOUT. BLOCKOUT IS ATTACHED TO RAIL ELEMENT ONLY. USE ¾" x 3" LAG BOLT WITH FLAT WASHER.
5) SHOP FABRICATE THE C6 x 8.2 RUBRAIL END TO BE CONSISTENT WITH THE SLOPE OF THE F SHAPE AND ATTACH FLUSH WITH THE SLOPED TOE OF THE BARRIER OR BRIDGE RAIL.
6) ANCHORAGE: FOR EXISTING BRIDGE RAIL AND NEW OR EXISTING BARRIERS, ANCHOR RUBRAIL USING THREE ⅝" x 6" CHEMICALLY ANCHORED BOLTS WITH WASHERS. MAXIMUM PROJECTION FOR BOLTS IS 1½".
   (a) AT EXISTING BRIDGE RAIL AND NEW OR EXISTING BARRIERS, ANCHOR THE W-BEAM END SHOE USING A 4 BOLT HOLD DOWN PLATE (SEE STD. DWG. 862.04). INSERT ASSEMBLY IS ALLOWED ON PRECAST REINFORCED CONCRETE BARRIER (SEE STD. DWG. 857.01).
   (b) AT EXISTING BRIDGE RAIL AND NEW OR EXISTING BARRIERS, ANCHOR THE W-BEAM END SHOE BEHIND THE NESTED W-BEAM ELEMENTS. INSTALL THE W-BEAM END SHOE AS DETAILED ON THE STRUCTURE PLANS.
   (c) POSTS 1 AND 2 ARE W8 x 13, 7'-6" LONG. ALL OTHER POSTS IN THE ANCHOR UNIT ARE W6 x 8.5.
7) POSTS 1 AND 2 ARE W8 x 13, 7'-6" LONG. ALL OTHER POSTS IN THE ANCHOR UNIT ARE W6 x 8.5.

PLAN



GUARDRAIL ANCHOR UNIT TYPE B-77

4/7/2017

SEAL 022966 ENGINEER Joel S. Howerton
DocuSigned by: Joel S. Howerton 873F3D17DCDC45F...

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SEE TITLE BLOCK

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

ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNIT
GUARDRAIL ANCHOR UNIT TYPE B-77
FOR F-SHAPE BARRIER

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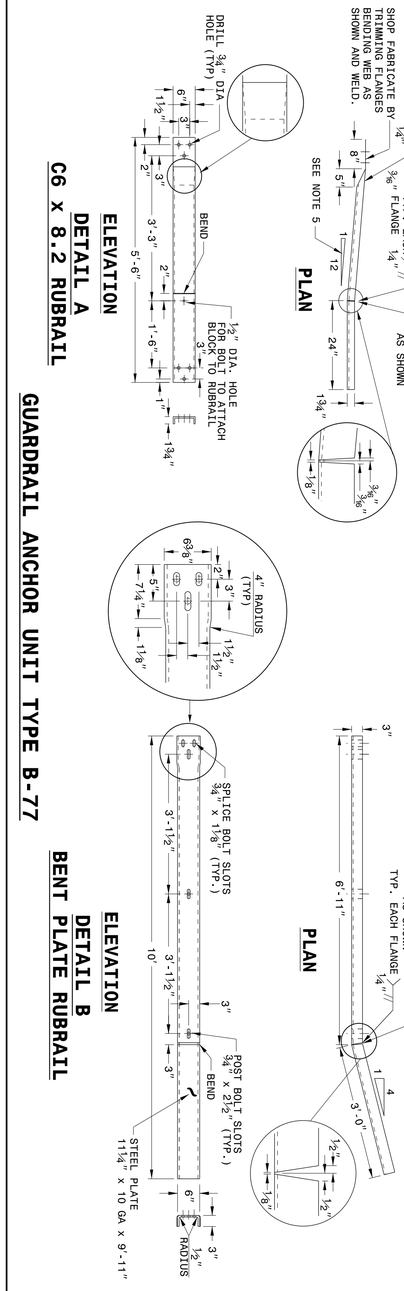
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

SHEET 5 OF 7
862D03

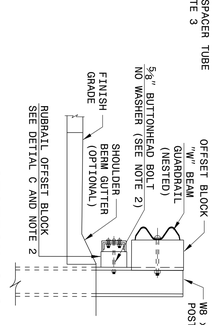


RUBRAIL BLOCKS 7" HIGH x 4" WIDE			
POST	THICKNESS	BOLT LENGTH	
①	4½"	9"	
②	3¼"	5" *	
③	2"	6"	
④	1"	3" *	

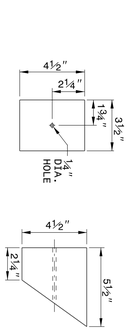
* BOLTS FOR POSTS 2 AND 4 ARE USED TO ATTACHED TO BLOCK. RUBRAIL NOT

DETAIL C
RUBRAIL BLOCKOUT

SECTION C-C

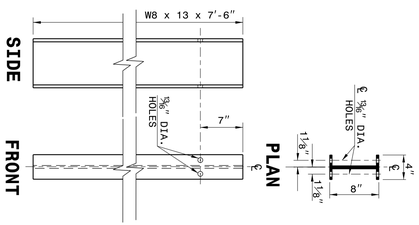


FRONT
SIDE
DETAIL D
SLOPED RUBRAIL BLOCKOUT



DETAIL E
LAG BOLT

SIDE
FRONT
DETAIL F STEEL POST
"W8 X 13 X 7'-6"



DETAIL A
C6 x 8.2 RUBRAIL

DETAIL B
BENT PLATE RUBRAIL

DETAIL B
BENT PLATE RUBRAIL

GUARDRAIL ANCHOR UNIT TYPE B-77

SHEET 5 OF 7
862D03

ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNIT
GUARDRAIL ANCHOR UNIT TYPE B-77
FOR F-SHAPE BARRIER

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

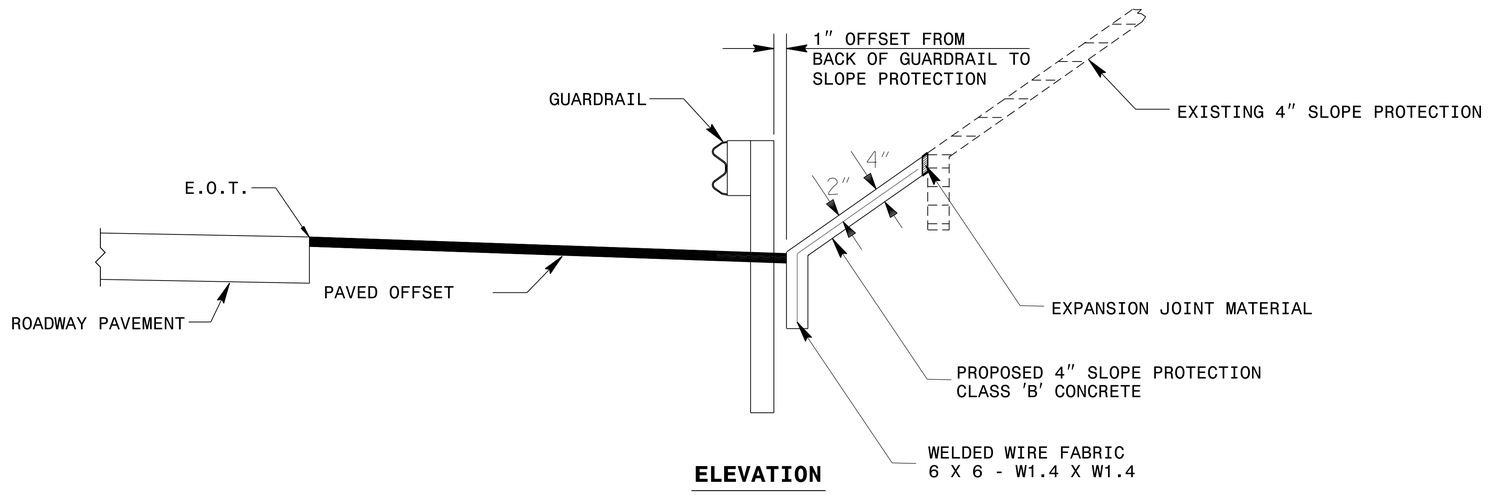
PROJECT REFERENCE NO.	SHEET NO.
U-3330	2C-8

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

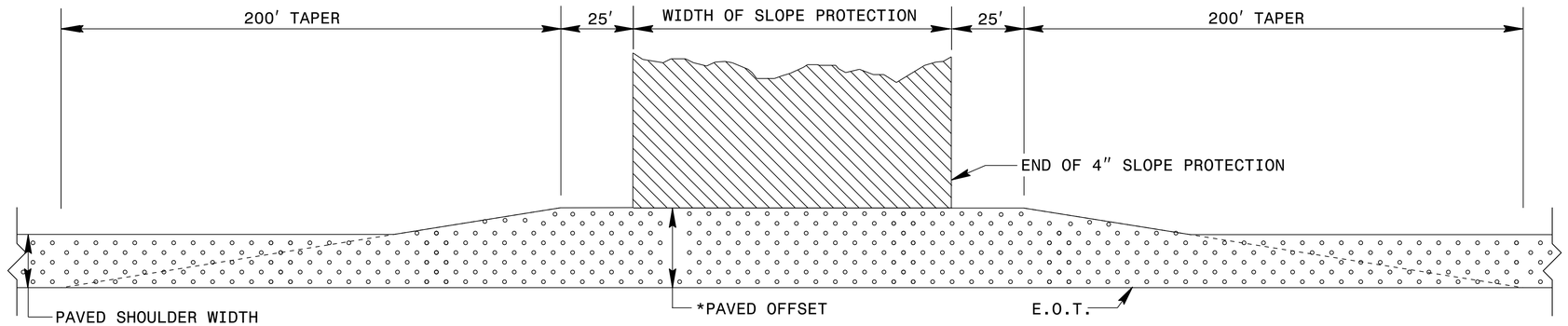
ENGLISH DETAIL DRAWING FOR

GUIDE FOR PAVING SHOULDERS UNDER BRIDGES

METHOD II



ELEVATION



PLAN

NOTES:
PAVE THE FULL WIDTH OF THE SHOULDER AND OFFSET AS SHOWN WITH SHOULDER PAVEMENT MATERIAL AS SHOWN ON PLANS.
*PAVED OFFSET BASED ON BRIDGE POLICY.
PROTECT SLOPE WITH REINFORCED CONCRETE PAVING. CONCRETE BLOCK PAVING WILL NOT BE PERMITTED.

SHEET 1 OF 1

610D02

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

ENGLISH DETAIL DRAWING FOR

GUIDE FOR PAVING SHOULDERS UNDER BRIDGES

METHOD II

SHEET 1 OF 1

610D02

4/7/2017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 Joel S. Howerton

DocuSigned by: Joel S. Howerton B73F3D17DCDC45F...

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

SEE TITLE BLOCK

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

23-MAR-2017 11:20
S:\Contracts\Contracts\Special Details\jhowerton\610d02 Modified Method II.dgn
jhowerton 417 CSD-292595

8/17/99

DRAINAGE DITCH DETAILS

PROJECT REFERENCE NO.	SHEET NO.
U-3330	2D-1
R/W SHEET NO.	

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER DAVID P. BOCKER

4/6/2017

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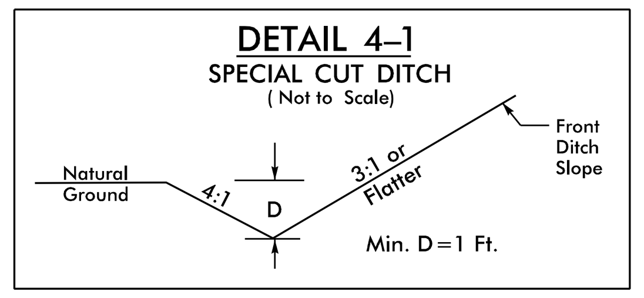
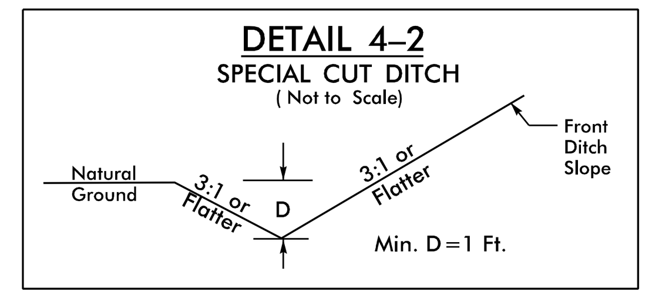
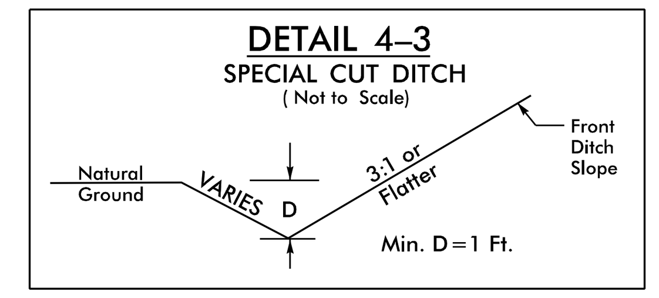


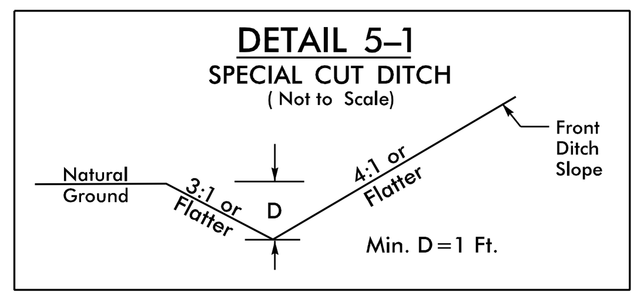
-L- STA. 29+00 TO STA. 30+50 LT



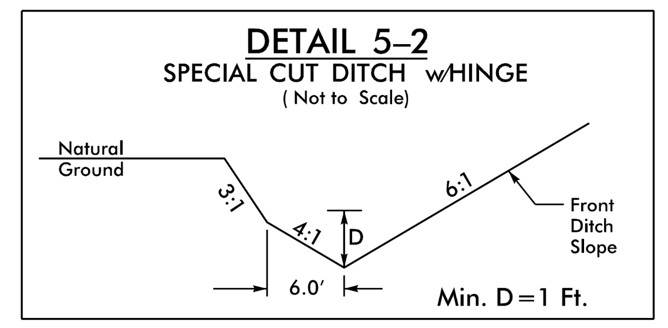
-L- STA. 32+00 TO STA. 39+00 RT



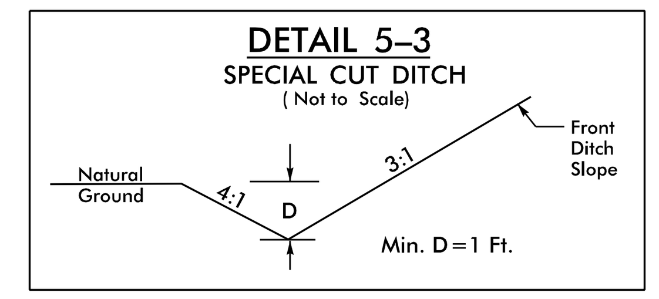
-L- FROM STA. 36+00 TO STA. 39+00 LT



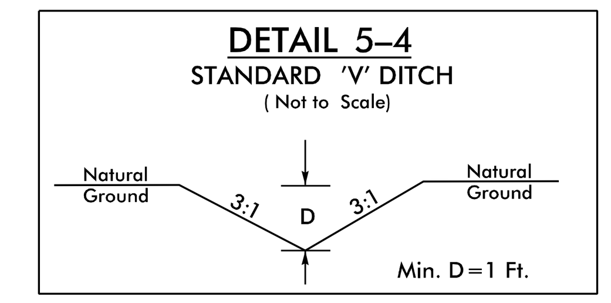
-Y1RPB- STA. 14+50 LT TO -L- STA. 39+00 LT
-Y1RPB- STA. 13+00 TO STA. 15+00 RT



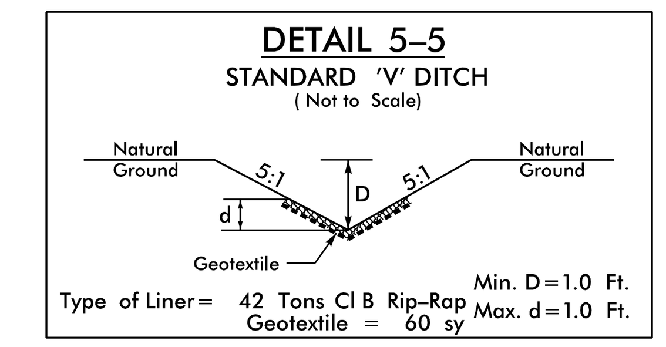
-L- STA. 50+00 TO STA. 51+00 LT
-Y1LPC- STA. 10+45 LT TO -L- STA. 41+50 RT



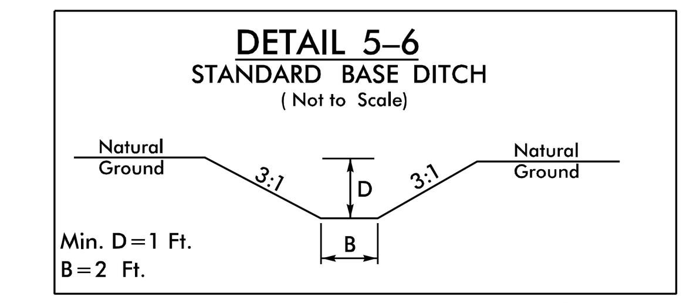
-Y1RPA- STA. 16+00 TO STA. 16+50 RT
-Y1RPD- STA. 10+81 TO STA. 16+00 LT



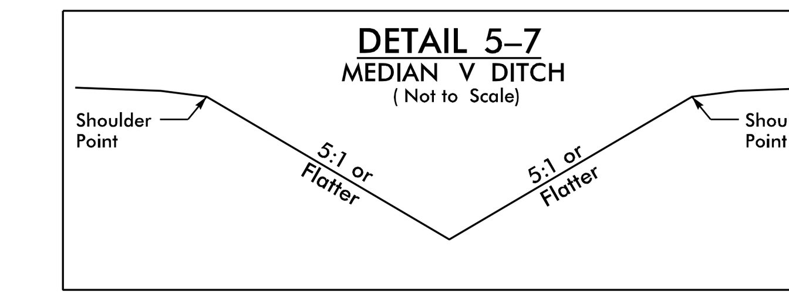
-Y1RPA- STA. 13+00 TO STA. 16+00 RT



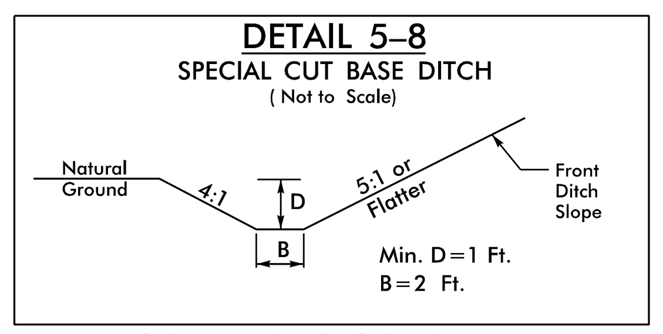
-Y1RPD- STA. 15+00 TO STA. 15+50 RT



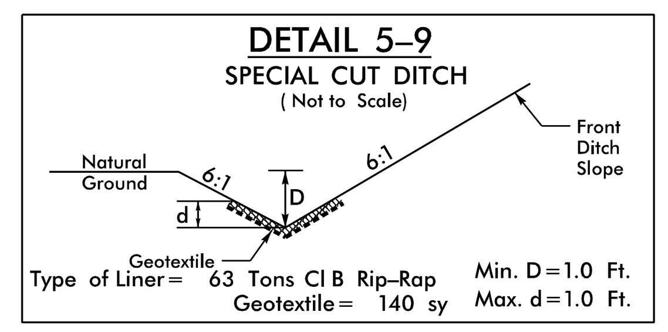
-Y1RPA- STA. 10+90 TO STA. 12+15 RT



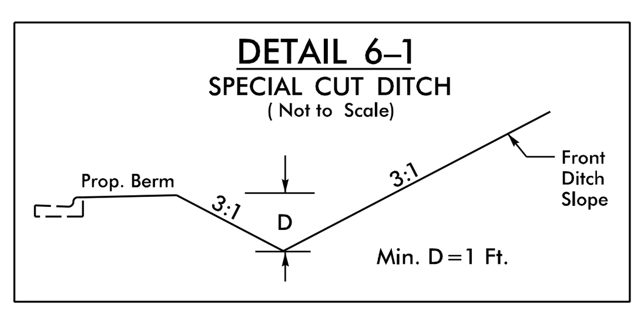
-L- STA. 37+00 TO STA. 41+50 MEDIAN



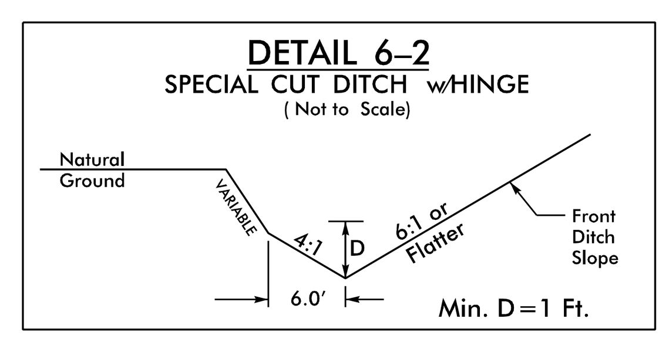
-L- STA. 47+00 TO STA. 50+50 RT



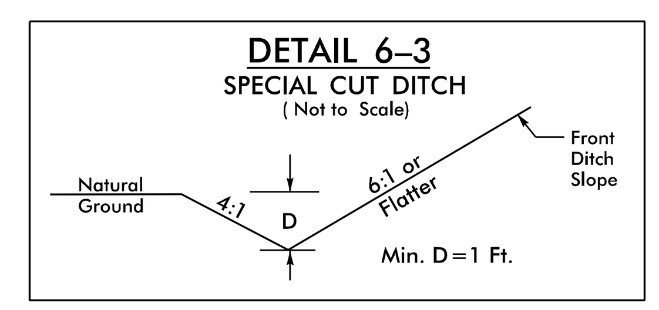
-Y1LPC- STA. 13+00 TO STA. 14+00 RT



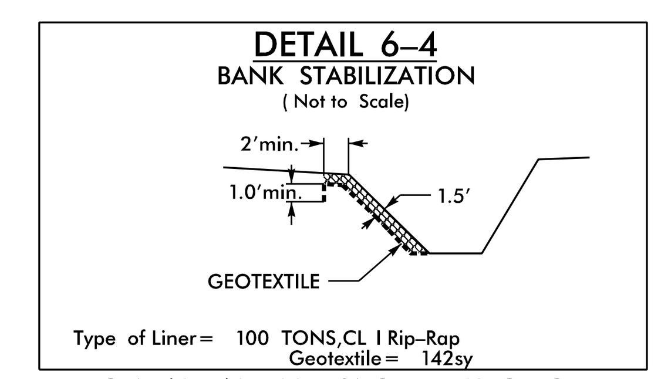
-L- STA. 58+50 TO STA. 58+88 LT



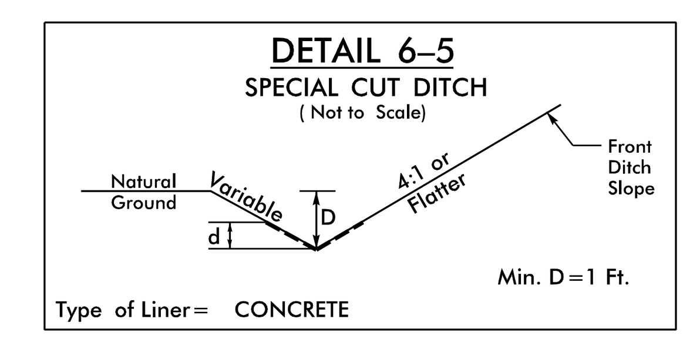
-L- STA. 51+00 TO STA. 52+50 LT



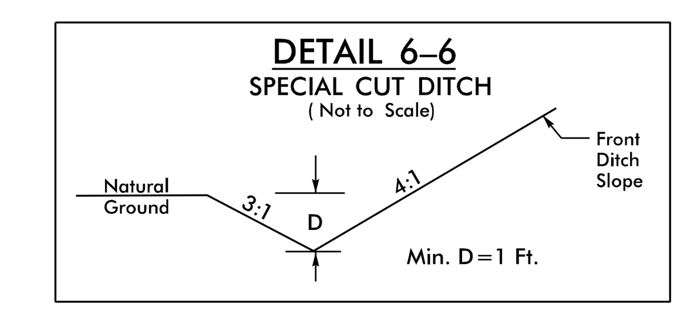
-L- STA. 52+50 TO STA. 53+00 LT



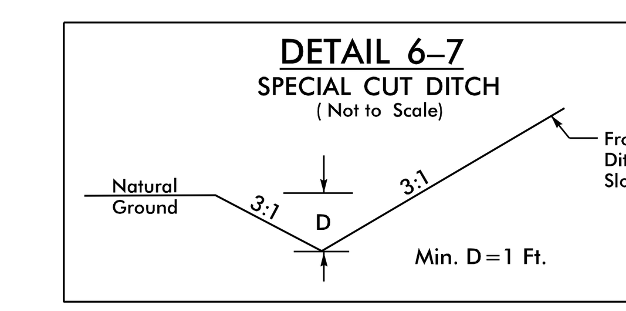
STA. 60+60; 100 TONS RR, 142 SY GF



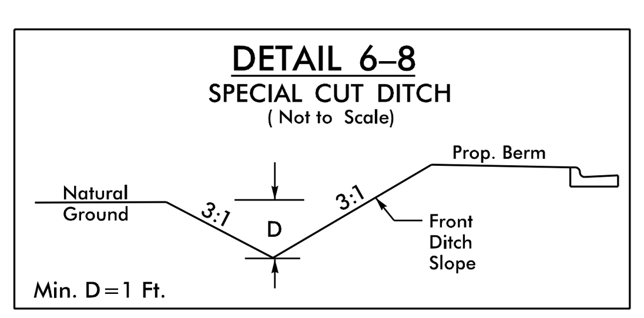
-L- STA. 51+00 TO STA. 57+00 RT



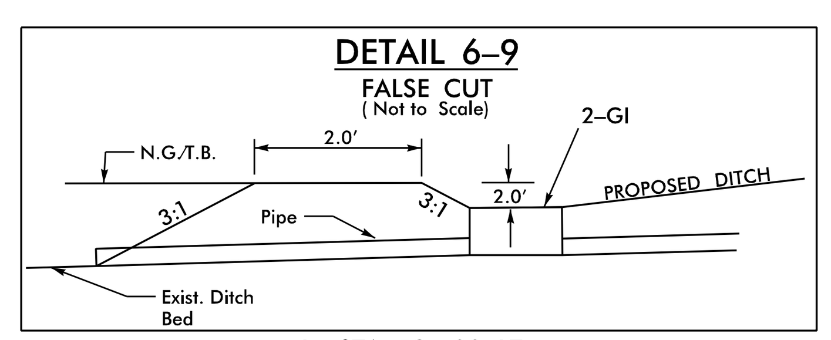
-L- STA. 55+00 TO STA. 57+00 LT



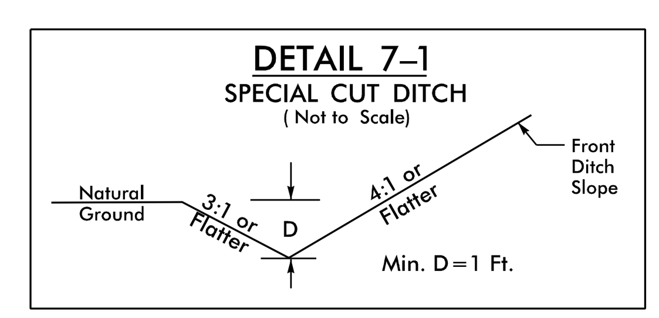
-L- STA. 59+01 TO STA. 59+95 RT



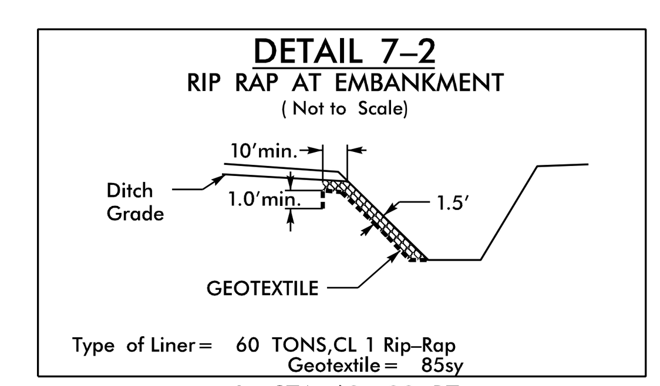
-Y4- STA. 12+50 TO STA. 11+13 LT



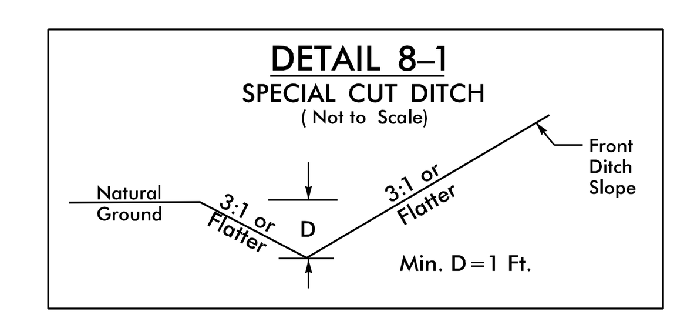
-L- STA. 59+00 LT



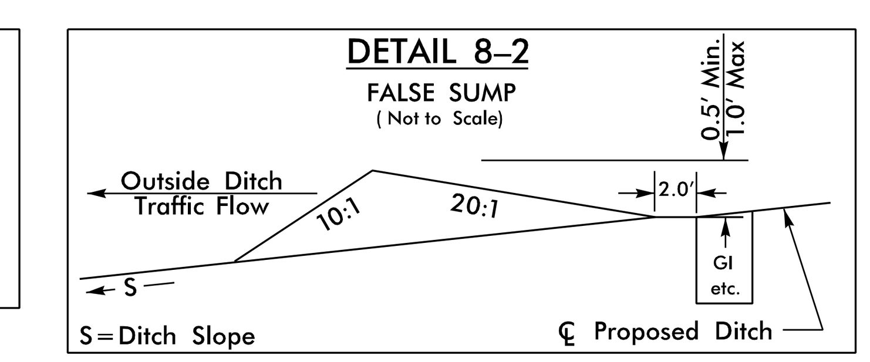
-L- STA. 66+00 TO STA. 66+50 LT



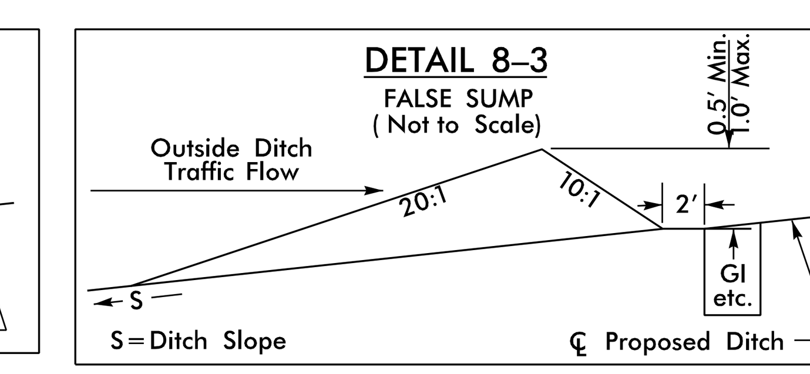
-L- STA. 68+22 RT



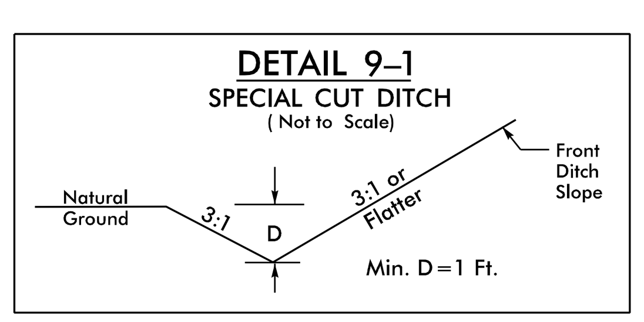
-L- STA. 81+00 TO STA. 81+50 RT



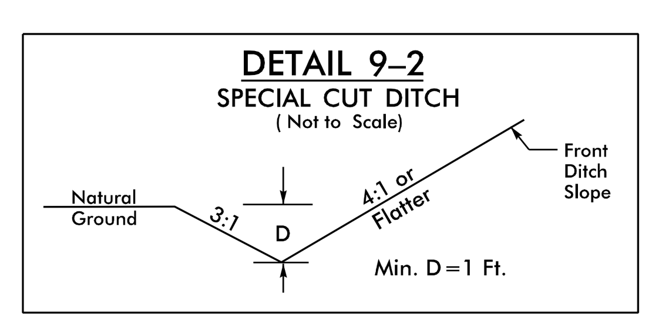
-L- STA. 85+98 LT



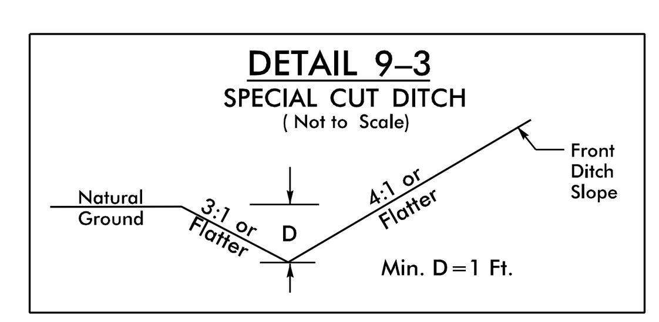
-L- STA. 90+54 RT



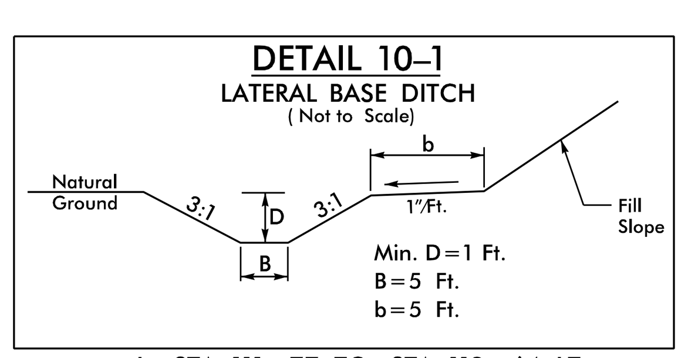
-L- STA. 95+50 TO STA. 97+00 RT
-L- STA. 98+00 TO STA. 99+50 RT
-L- STA. 103+00 TO STA. 103+50 RT
-L- STA. 105+00 TO STA. 105+50 RT



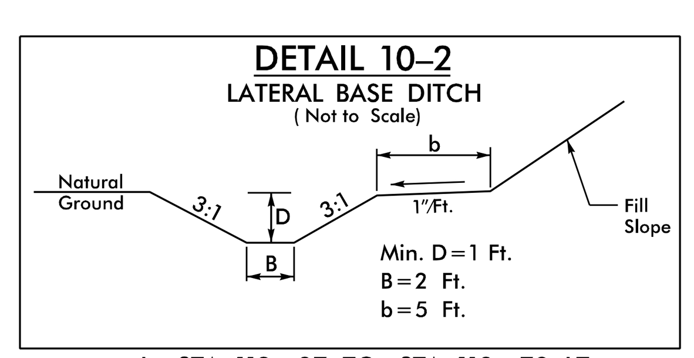
-Y7B- STA. 12+00 TO STA. 12+50 LT



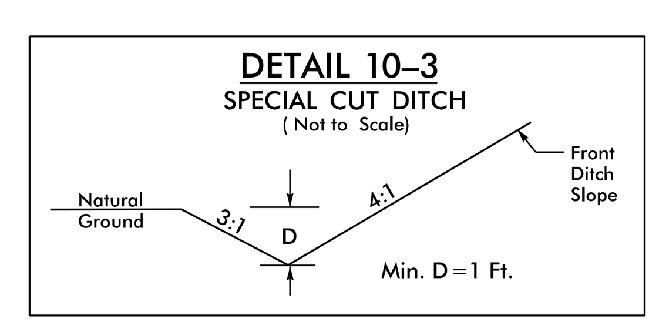
-Y7A- STA. 11+00 TO STA. 11+50 RT



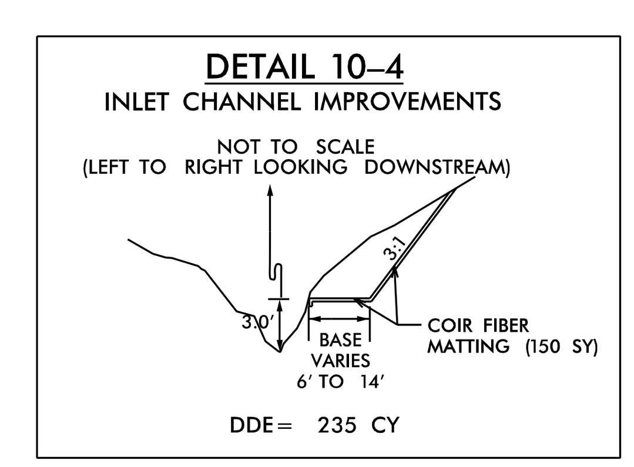
-L- STA. 111+77 TO STA. 112+64 LT



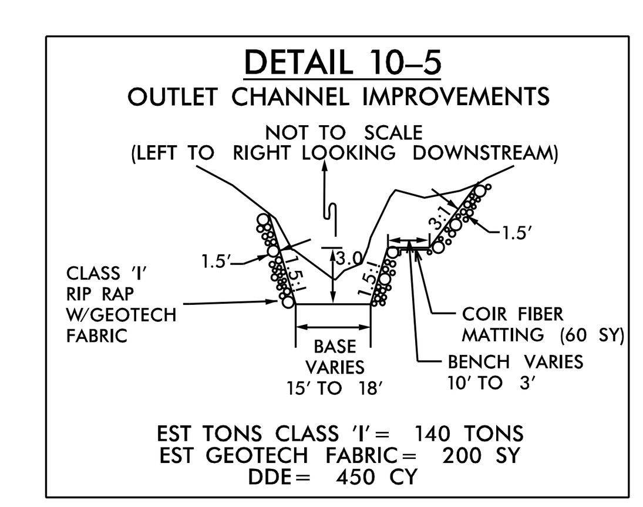
-L- STA. 112+87 TO STA. 113+79 LT



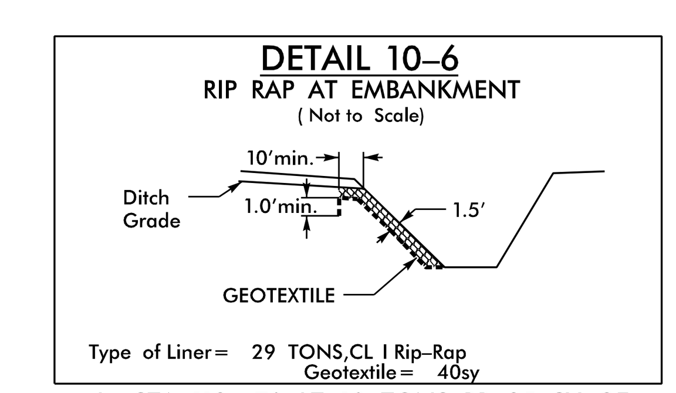
-L- STA. 108+00 TO STA. 108+45 RT



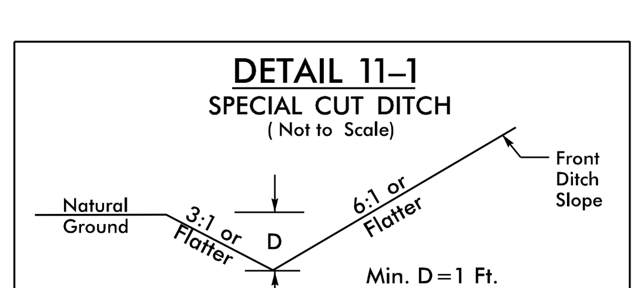
-L- STA. 112+70 LT


DETAIL 10-5
OUTLET CHANNEL IMPROVEMENTS
NOT TO SCALE
(LEFT TO RIGHT LOOKING DOWNSTREAM)
CLASS 'I' RIP RAP W/GEOTECH FABRIC
1.5'
1.5'
BASE VARIES 15' TO 18'
COIR FIBER MATTING (60 SY)
BENCH VARIES 10' TO 3'
EST TONS CLASS 'I'= 140 TONS
EST GEOTECH FABRIC= 200 SY
DDE= 450 CY

-L- STA. 114+00 RT



-L- STA. 112+70 LT; 18 TONS RR, 25 SY GF
-L- STA. 113+00 LT; 11 TONS RR, 15 SY GF



-Y3RPB- STA. 10+00 TO STA. 11+50 LT

CALYX™
ENGINEERS + CONSULTANTS
Formerly Mulkey Engineers & Consultants
7500 EAST INDEPENDENCE
BOULEVARD, SUITE 100
CHARLOTTE, NC 28227
phone: 704.537.7300
CALYXengineers.com
NC License # F-1333

4/5/2017
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PROJECT REFERENCE NO.	SHEET NO.
U-3330	2G-1

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

DocuSigned by: Scott A. Hidden 1/24/2017
F760CAE8B6F24B3... SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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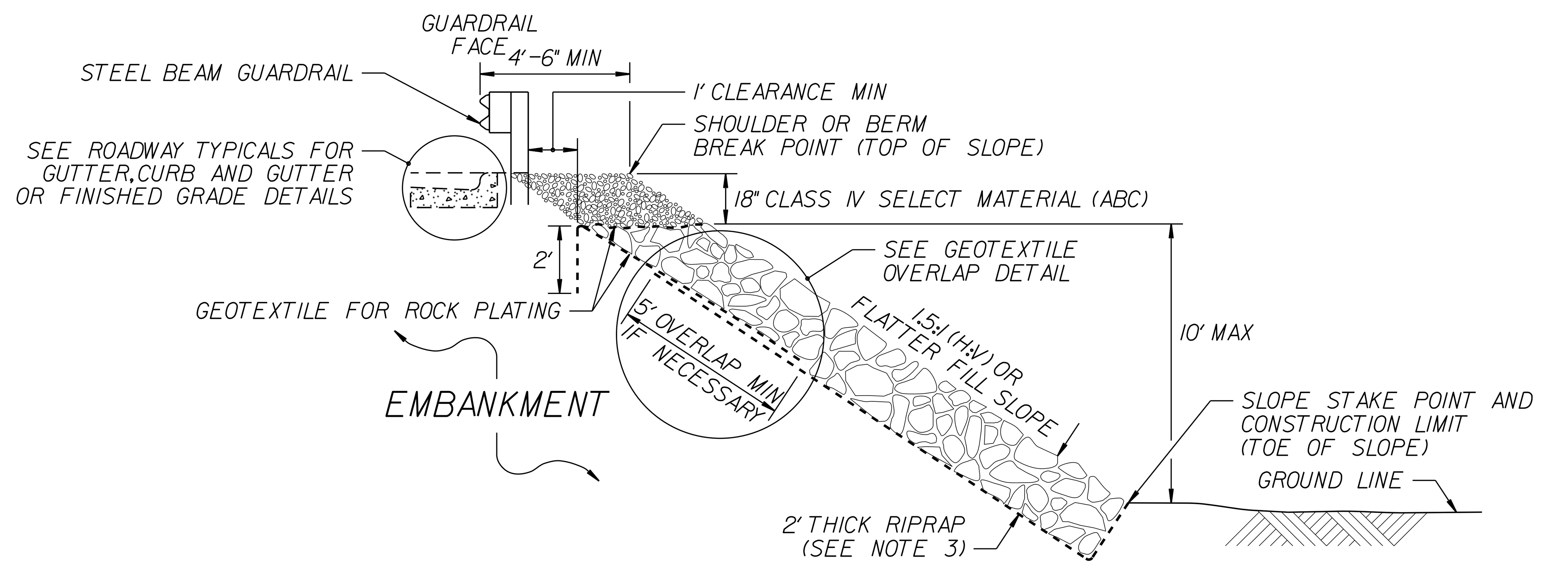
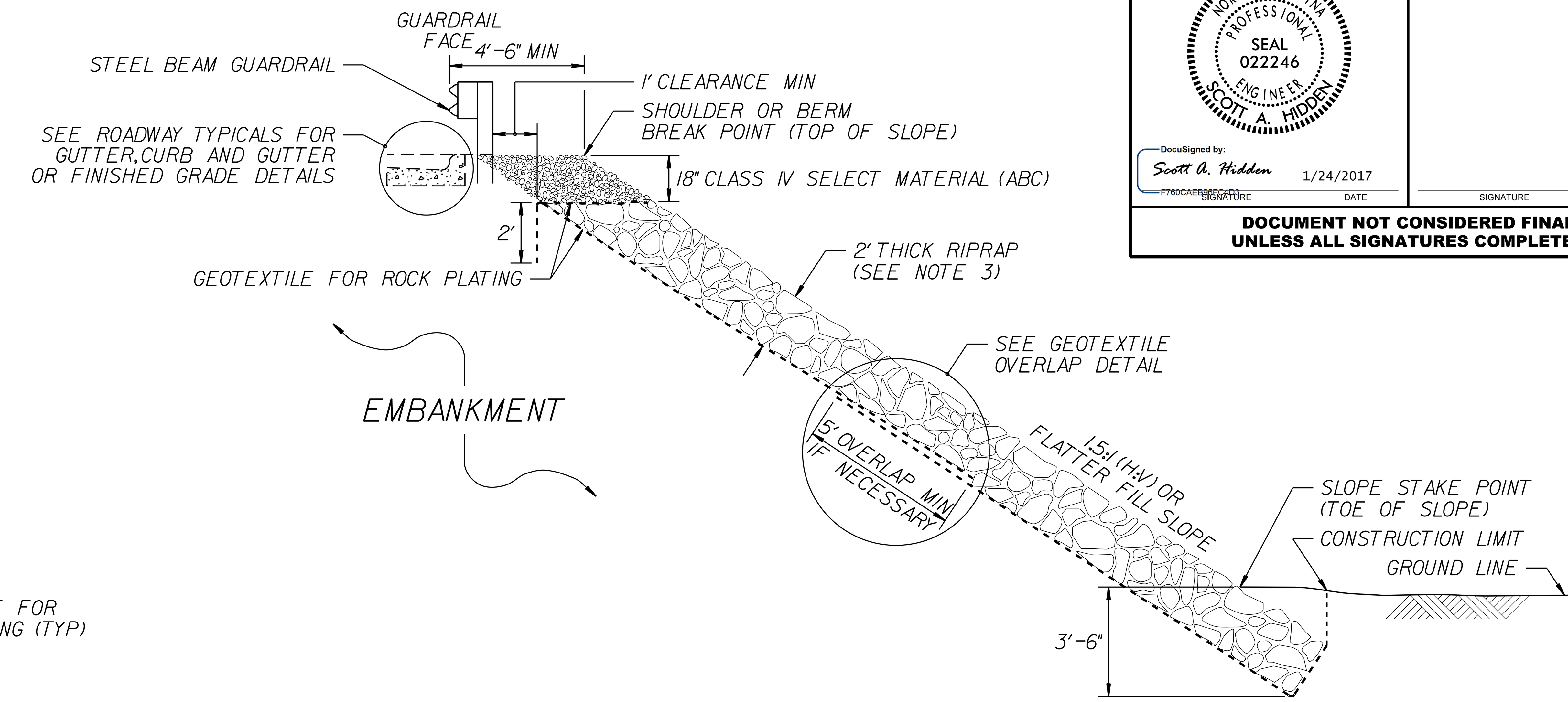
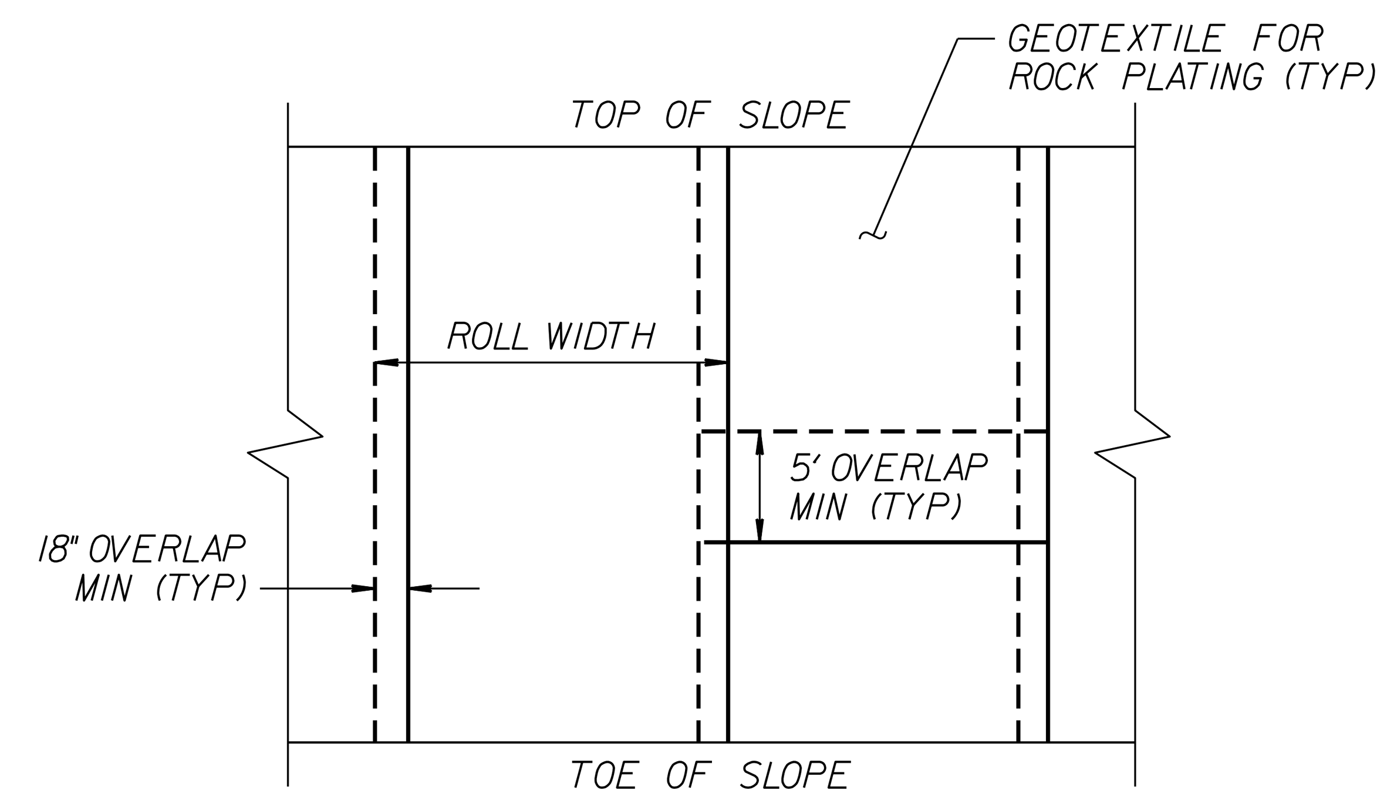


ROCK PLATING DETAIL NO. 1 – TYPICAL SECTION

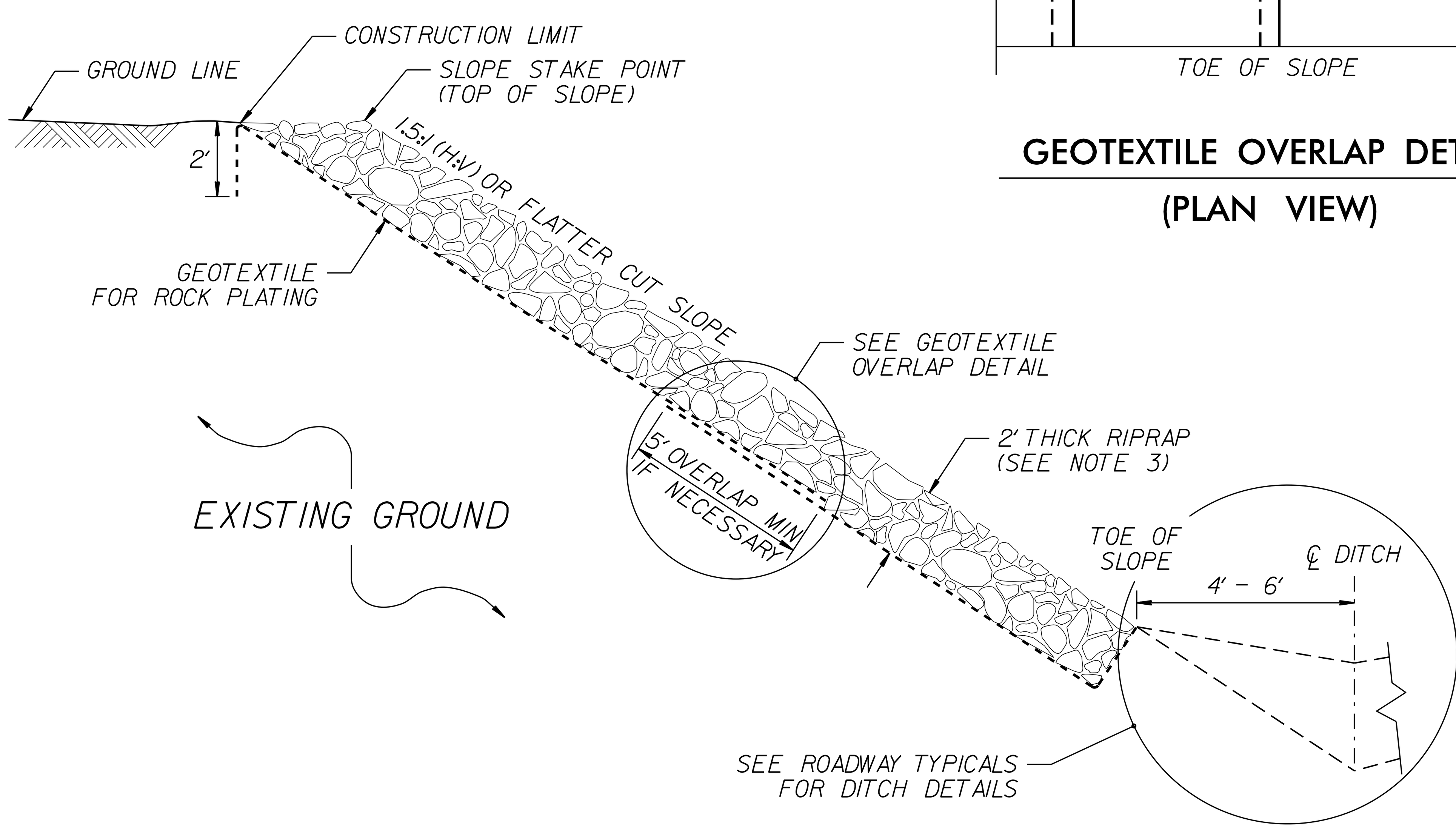


ROCK PLATING DETAIL NO. 2 – TYPICAL SECTION

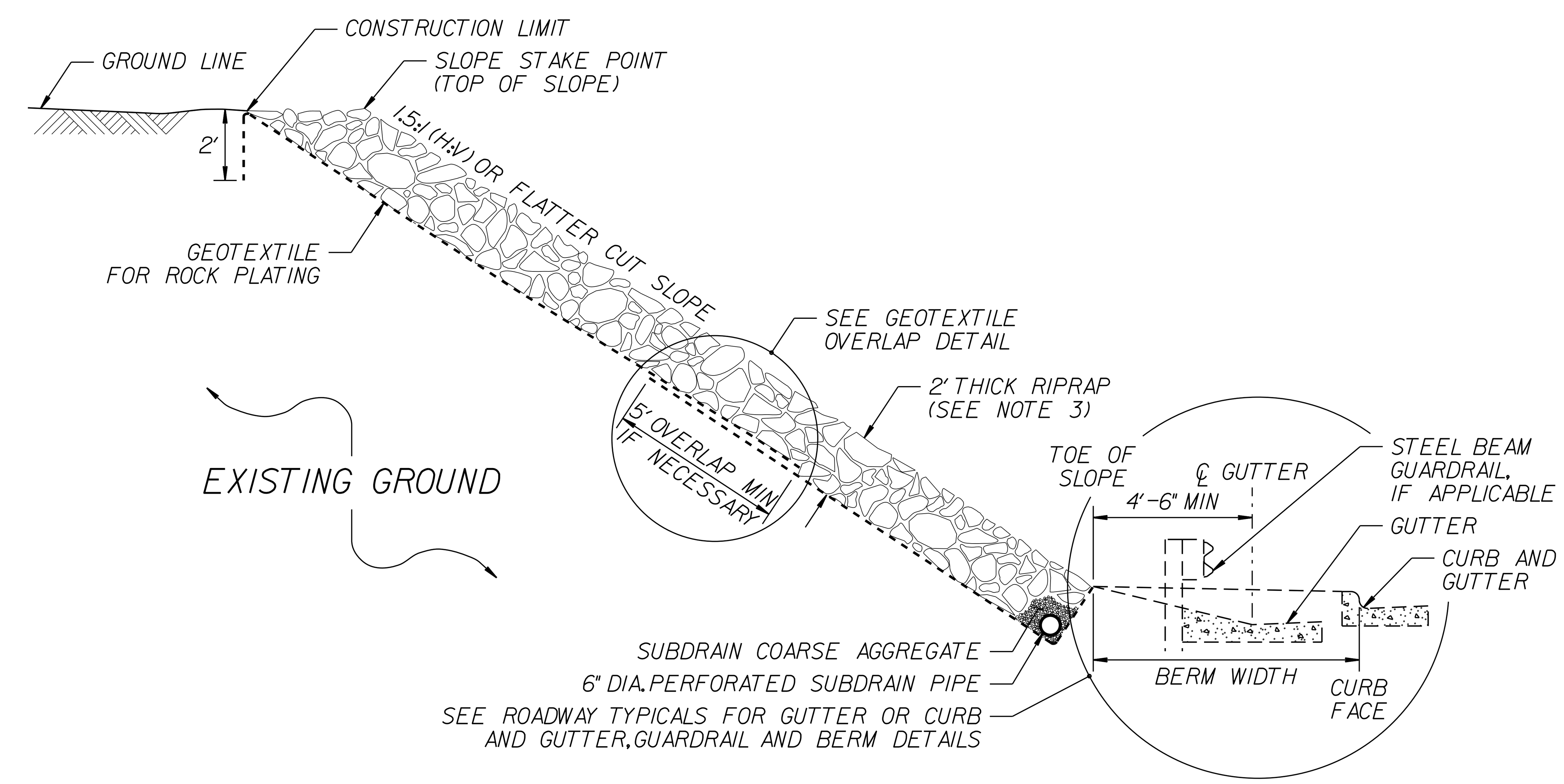


GEOTEXTILE OVERLAP DETAIL

(PLAN VIEW)



ROCK PLATING DETAIL NO. 3 – TYPICAL SECTION



ROCK PLATING DETAIL NO. 4 – TYPICAL SECTION

NOTES:

1. SEE ROADWAY PLANS AND SUMMARY SHEETS FOR ROCK PLATING LOCATIONS.
2. FOR STANDARD ROCK PLATING, SEE SECTION 275 OF THE STANDARD SPECIFICATIONS.
3. USE CLASS 1,2 OR B RIPRAP UNLESS REQUIRED OTHERWISE IN THE ROADWAY SUMMARY SHEETS.

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1802.01

STANDARD ROCK PLATING

DATE: 2-19-13

PROJECT REFERENCE NO.	SHEET NO.
U-3330	2G-2

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden 1/24/2017
F760CAE806FC4D5... SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

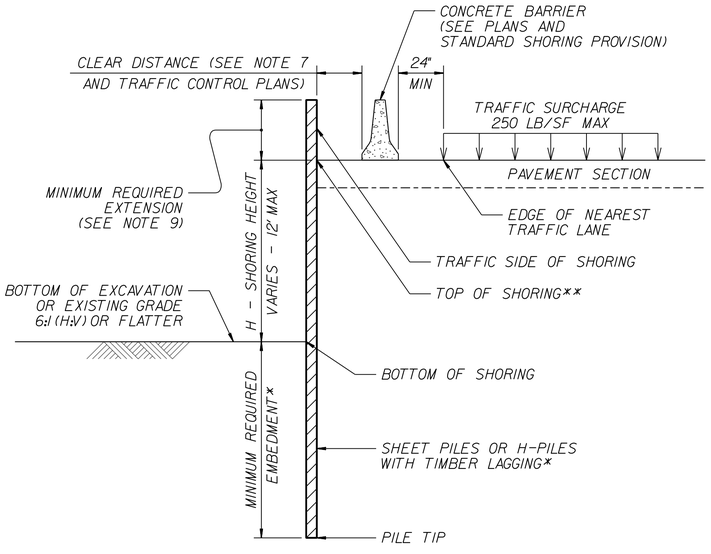
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS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

MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS

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

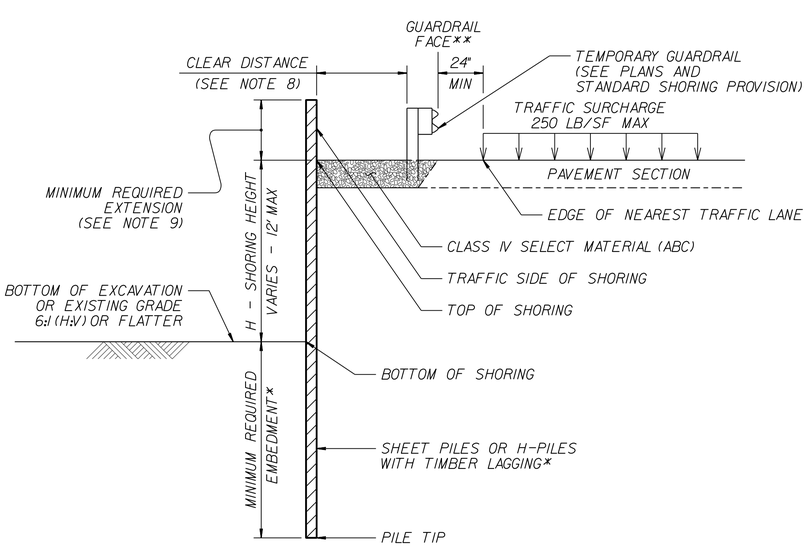
NOTES:

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



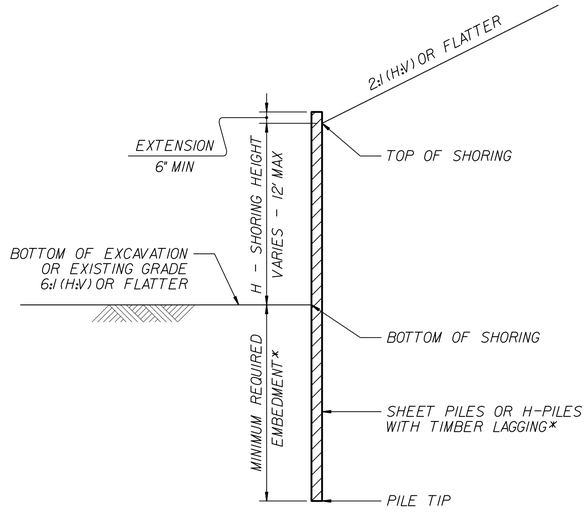
CONCRETE BARRIER

****TOP OF SHORING = EDGE OF PAVEMENT**



TEMPORARY GUARDRAIL

****GUARDRAIL FACE = EDGE OF PAVEMENT**



STANDARD TEMPORARY SHORING

(SLOPE CASE)
*SEE TABLE ABOVE.

STANDARD TEMPORARY SHORING

(SURCHARGE CASE)
*SEE TABLE ABOVE.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.01

STANDARD TEMPORARY SHORING

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
U-3330	2G-3

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

DocuSigned by: Scott A. Hidden 1/24/2017 — SIGNATURE DATE

ENGINEER — SIGNATURE DATE

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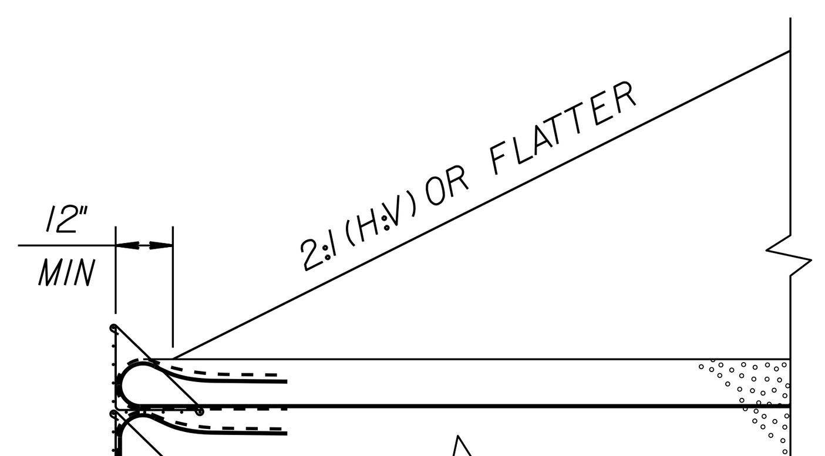
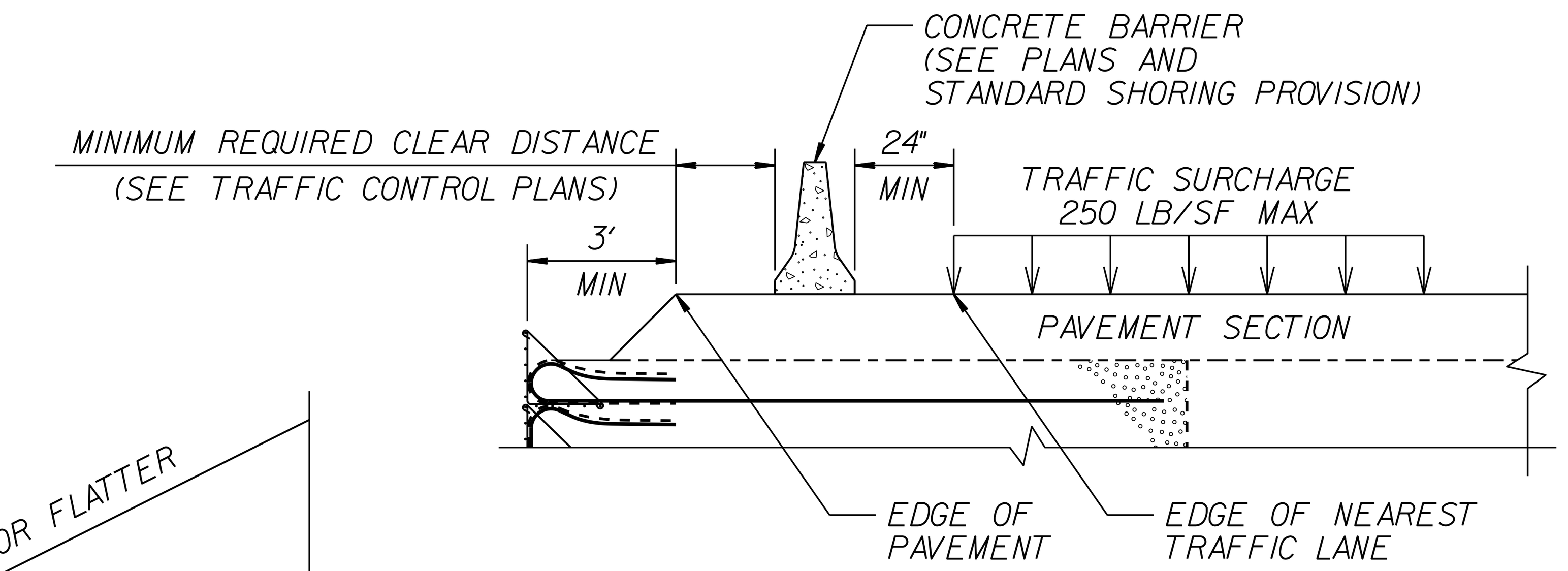
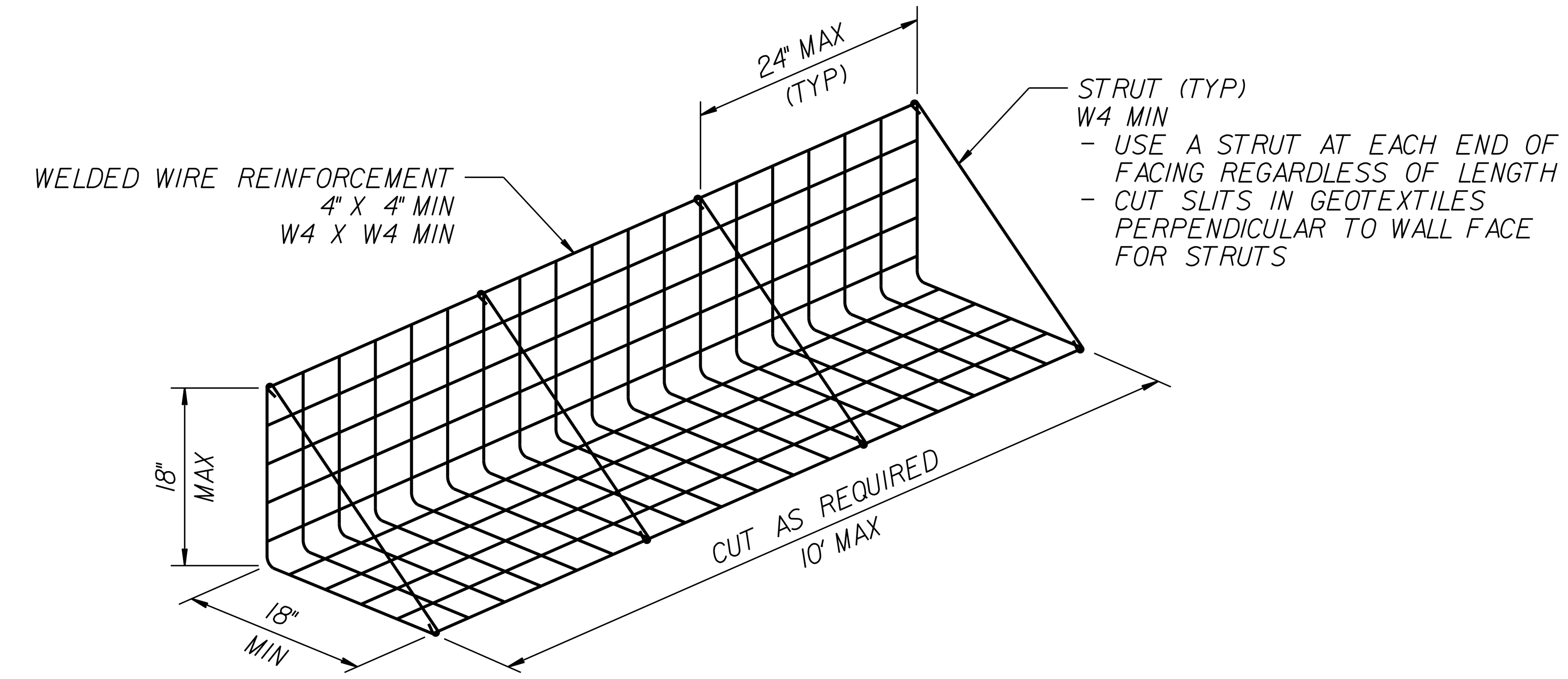


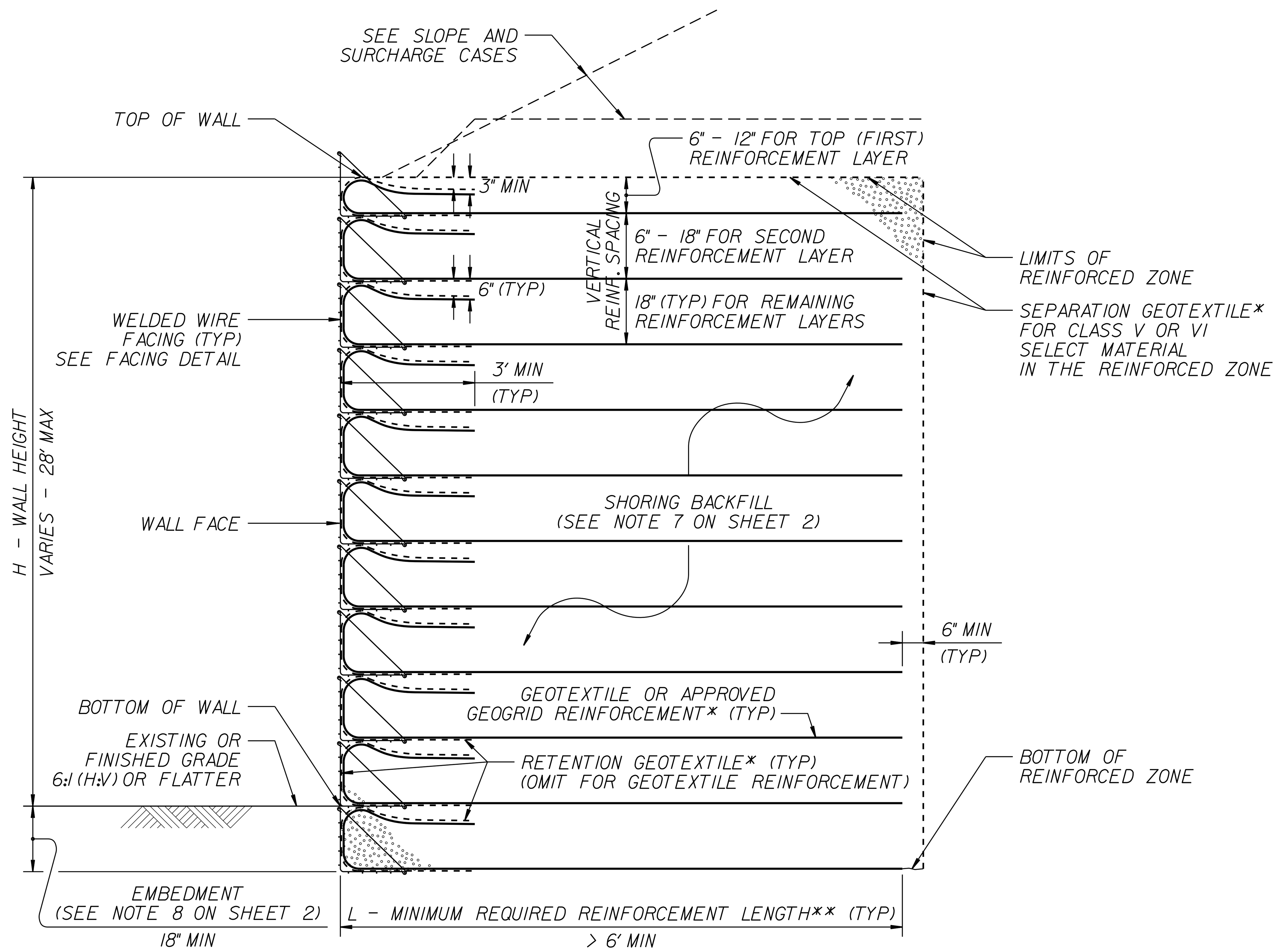
SLOPE CASE



SURCHARGE CASE

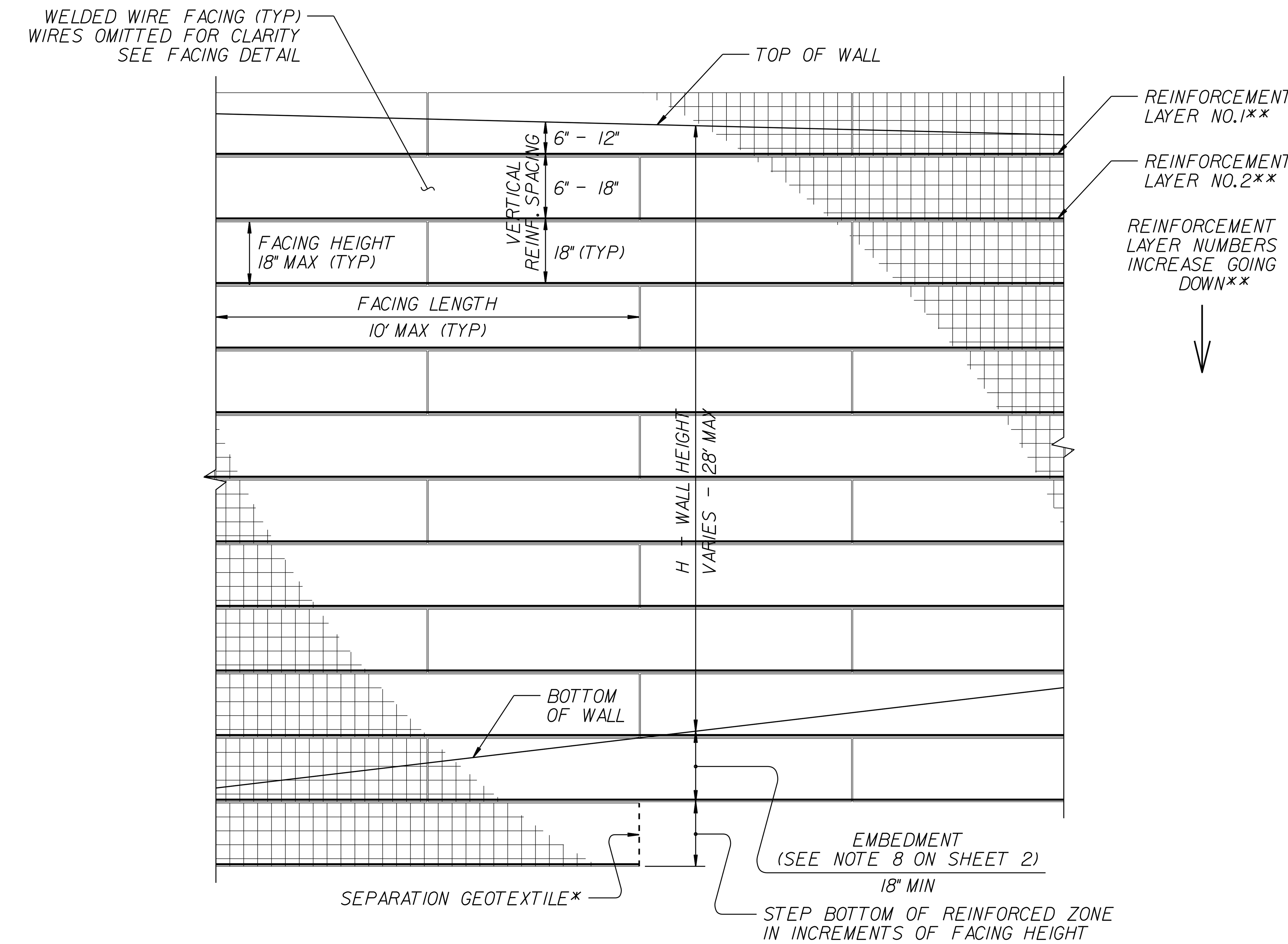


FACING DETAIL



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

GEOTECHNICAL ENGINEER

SEAL 022246 NORTH CAROLINA PROFESSIONAL ENGINEER SCOTT A. HIDDEN

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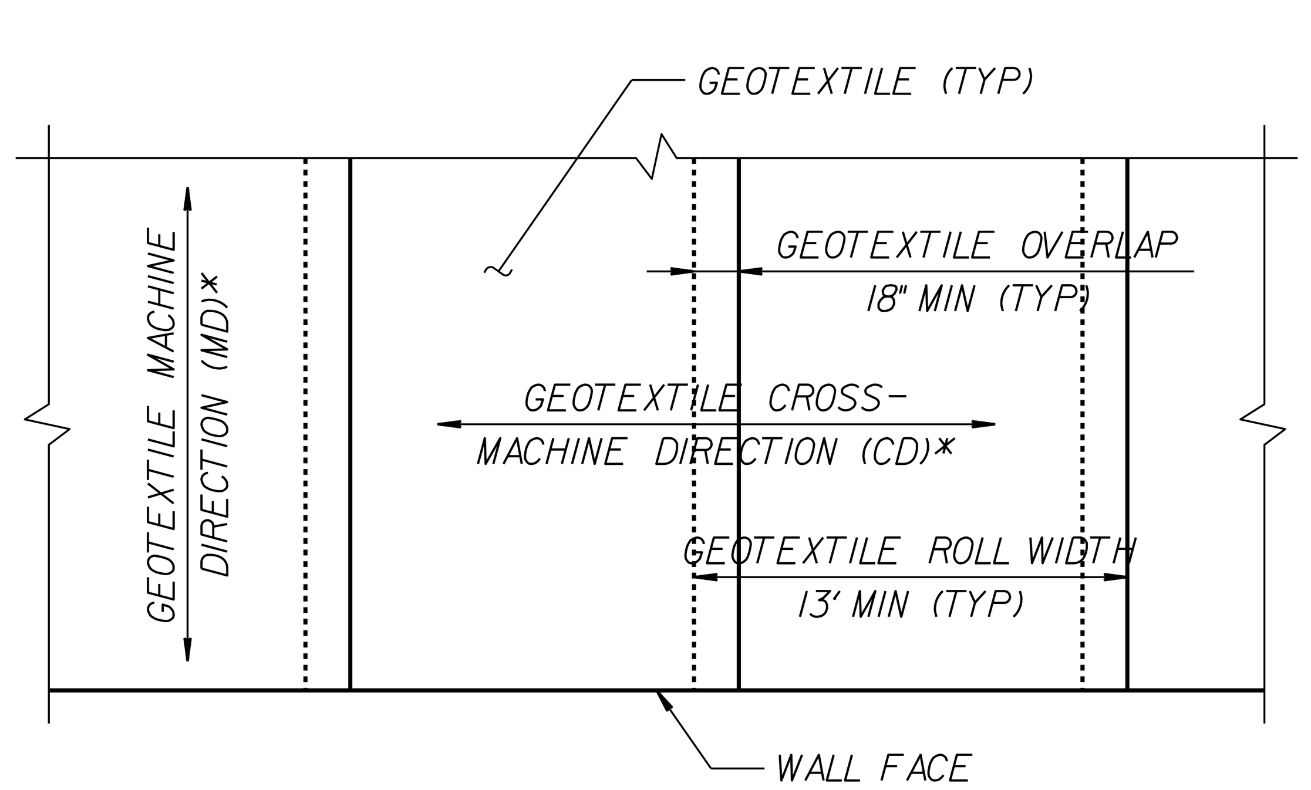
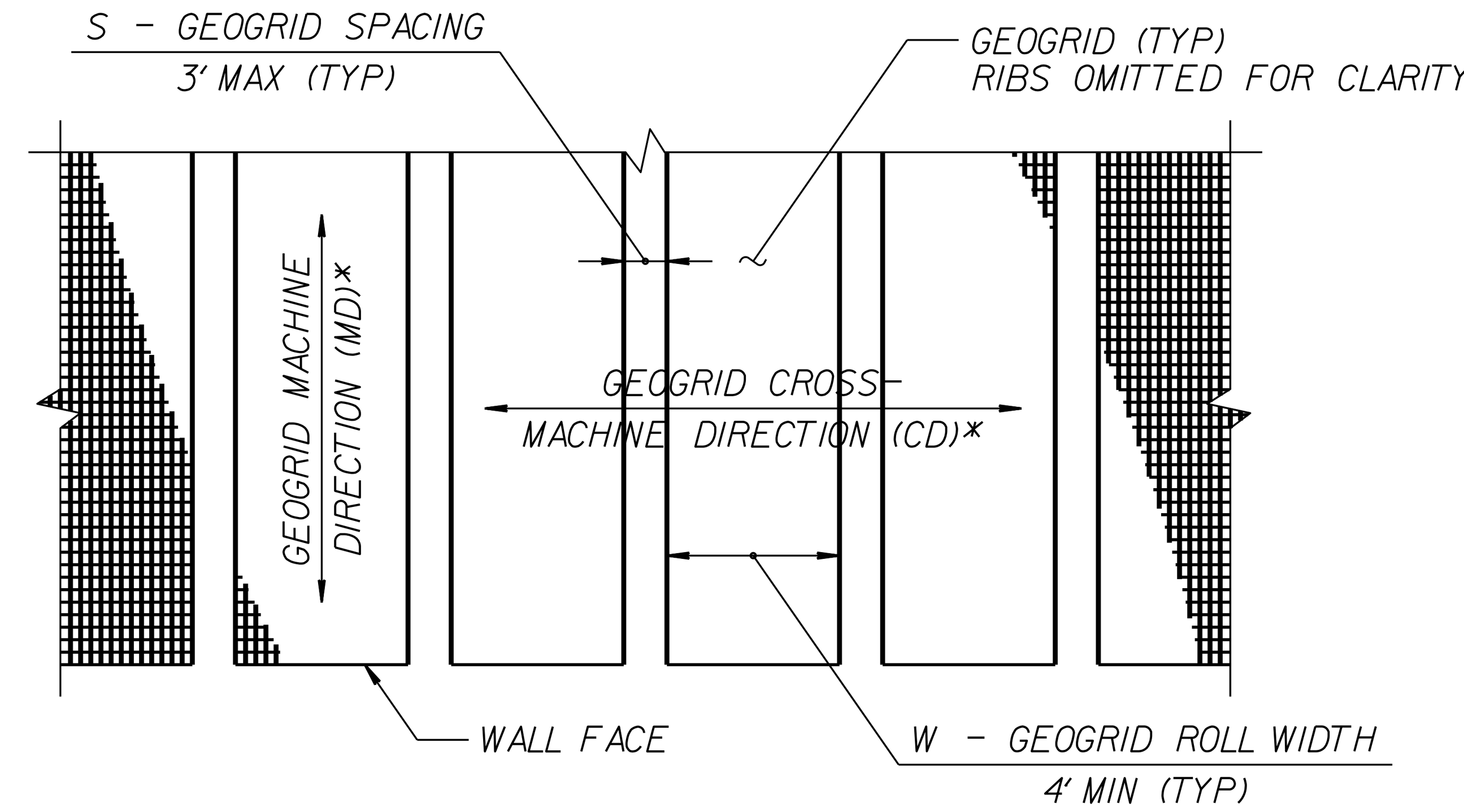


GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)



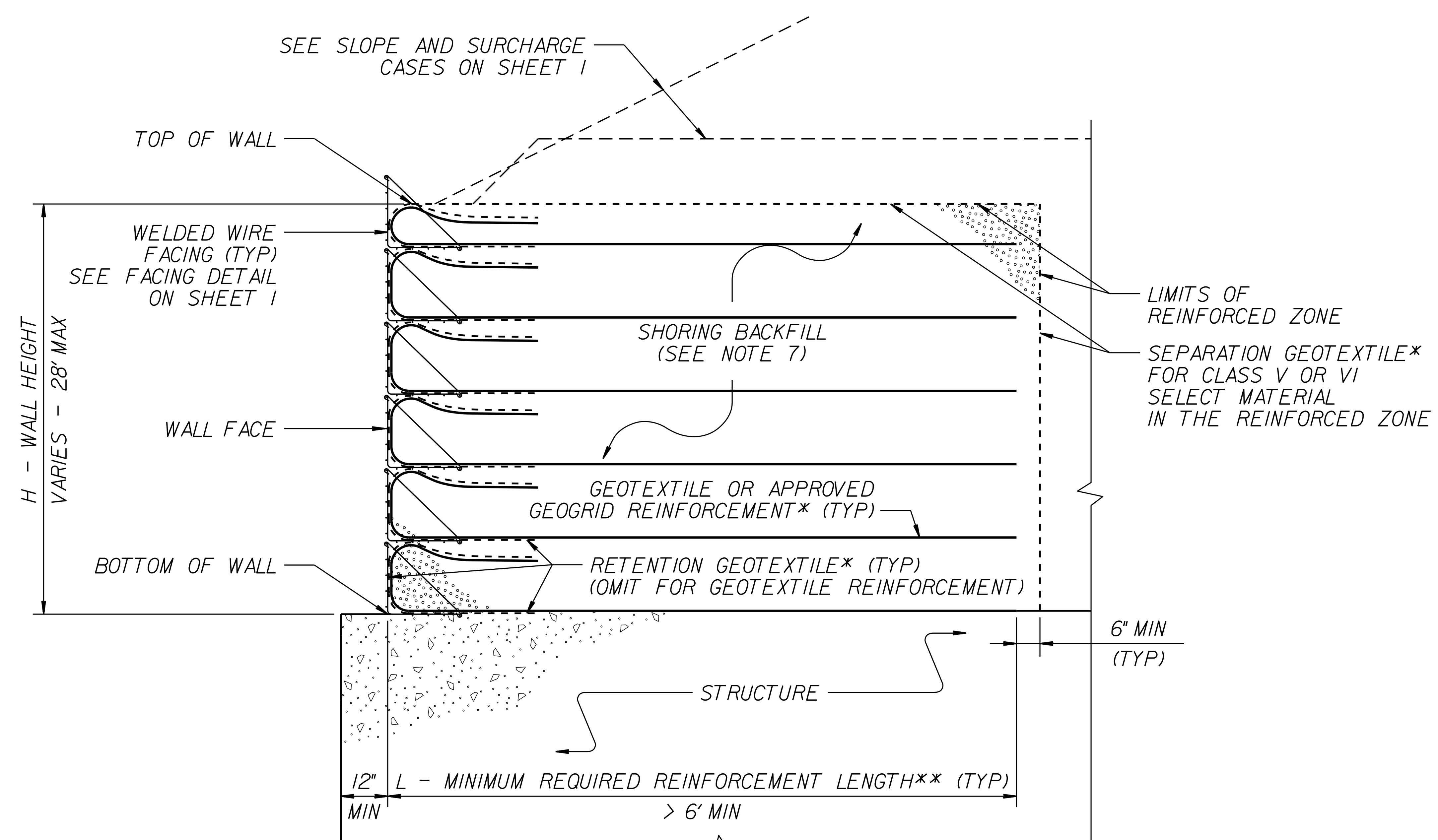
GEOGRID PLACEMENT

(80% COVERAGE MIN FOR GEOGRID REINFORCEMENT – $\frac{W}{W+S} \times 100 \geq 80\%$, 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 LB/CF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 LB/SF
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/SoilsLaboratory.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 1 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) ≥ (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND
    - REINFORCEMENT STRENGTH IN CD ≥ 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.
U-3330	2G-5

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

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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)

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.)

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.

MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD

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

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
U-3330	2H-1

GEOENVIRONMENTAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 31499 ENGINEER CYRUS F. PARKER

DocuSigned by: Cyrus F. Parker 4/6/2016
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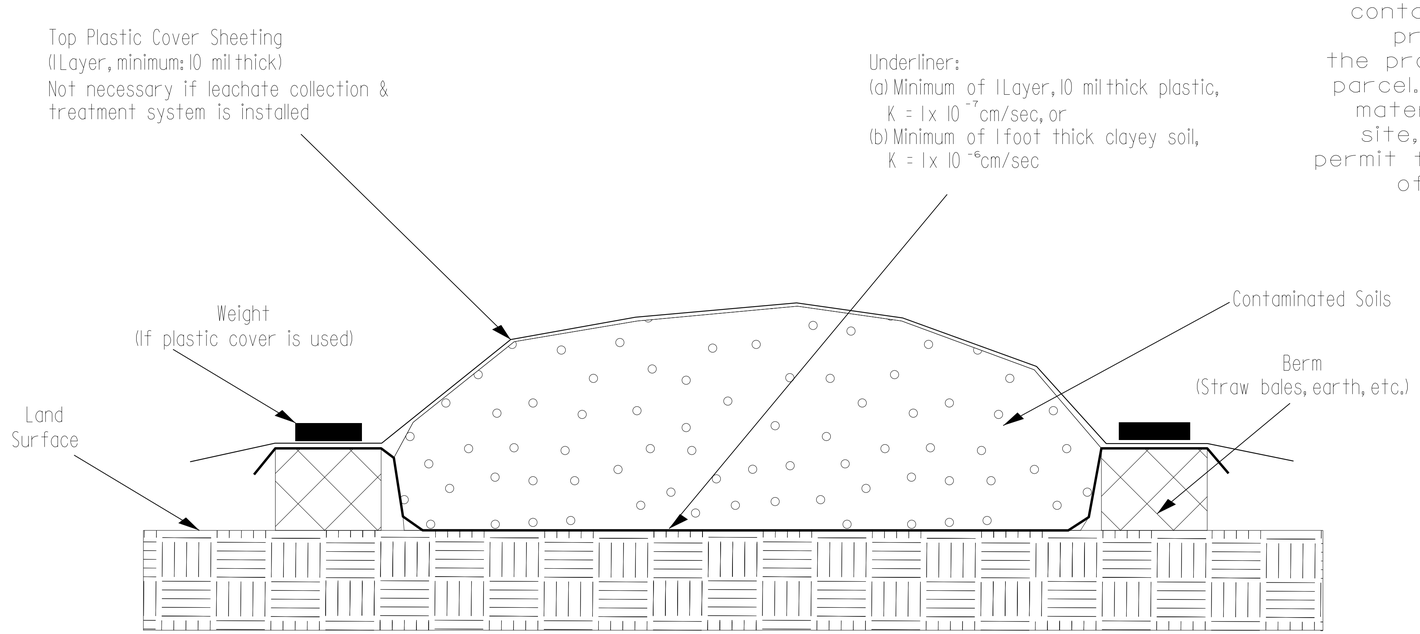
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

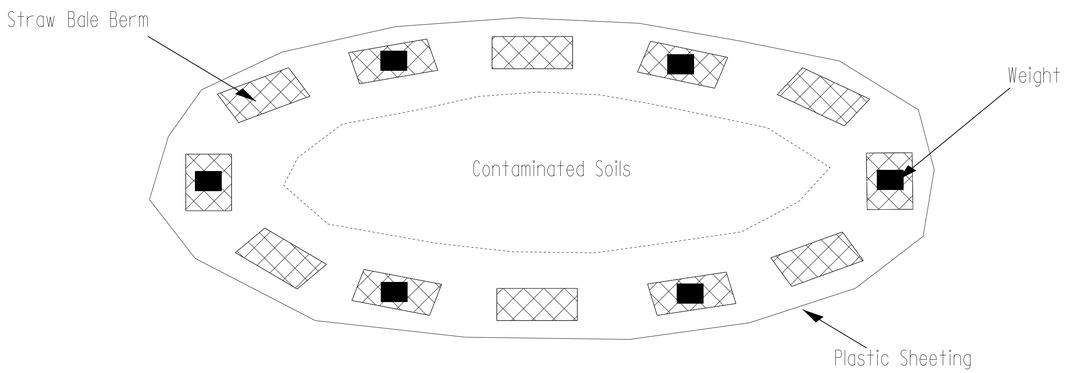
Detail for Temporary Containment of Contaminated Soil

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 NCDENR UST Section for off-site temporary storage.

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

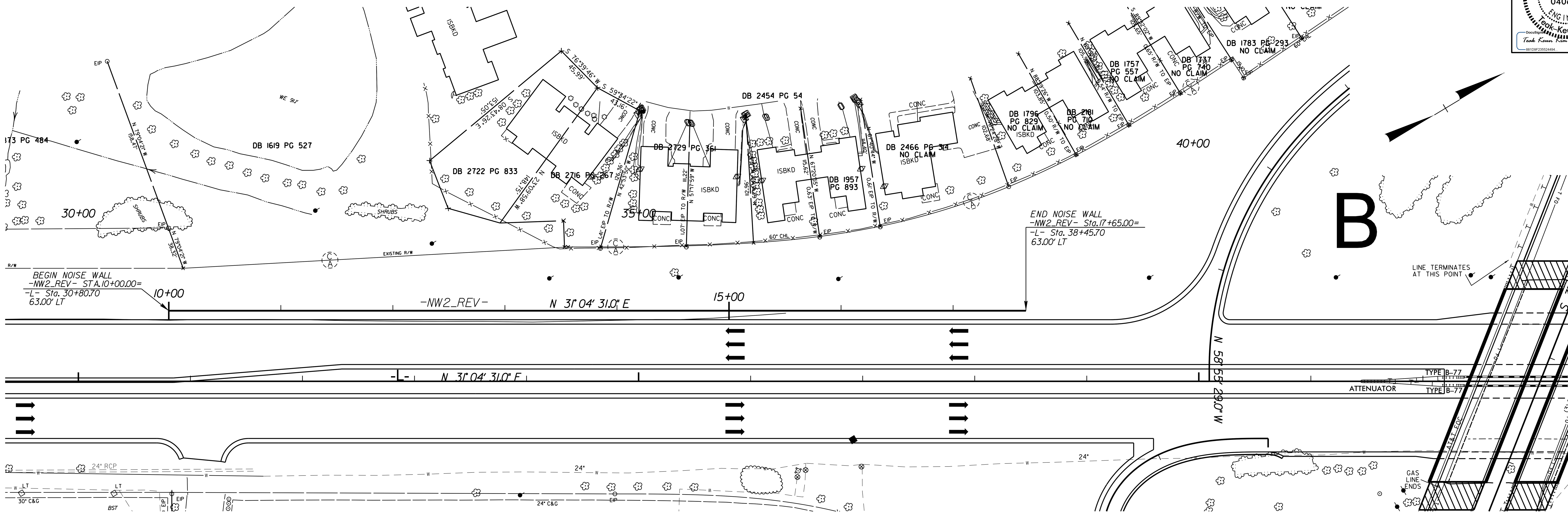
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

PROJECT REFERENCE NO.	SHEET NO.
U-3330	2N-1

HUMAN ENVIRONMENT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040699 ENGINEER Teak-Keun Kim 4/4/2017

PLAN AND PROFILE OF NOISE WALL 2REV



NOISE WALL 2REV DESIGN DATA						
PANEL NUMBER	1-5	6-10	11-13	14-17	18-25	26-51
TOP ELEVATION	108'	109'	110'	111'	112'	113'
PANEL LENGTH	75'	75'	45'	60'	120'	390'

COMPUTED BY: *DJM* **DATE:** *5-12-2016*
CHECKED BY: *SAD* **DATE:** *3-08-2017*

PROJECT REFERENCE NO.	SHEET NO.
U-3330	*3B-1*

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
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 TYPE 350		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	B-77	GRAU 350	M-350	TYPE III	CAT-1	AT-1	TEMP B 77	TEMP GRAU 350	TEMP CAT-1	G	NG				
-L-	30+80.70	38+45.70	LT				NOISE WALL	NOISE WALL	10.5'																	765			BARRIER FOR NOISE WALL
-L- & -Y1RPB-	38+45.70	11+63.85	LT	118.75	112.5		NOISE WALL	N/A	10.5'-12	10.5'-15'	50		1		1	1													
-L-	41+44.78	44+51.84	MED	275			BRIDGE COLUMN	BRIDGE COLUMN	10	15	37.5	37.5	2.25	2.25	4										2			124	MEDIAN BRIDGE PIERS @ -Y1- OVER -L-; SEE SHEET 2C-3
-Y1-	15+90.48	17+46.73	RT	156.25			BRIDGE APPROACH	N/A	7.5	12	50		1			1		1											
-Y1-	15+60.52	17+28.78	MED RT	156.25			BRIDGE APPROACH	N/A	13.5	15	150		10.5		1										1				
-Y1-	15+60.52	17+19.52	MED LT	150			N/A	G/R ON MED RT	1.5	15'-3'					1														
-Y1-	19+27.11	20+83.36	MED LT	156.25			BRIDGE APPROACH	N/A	1.5	15	50		1		1	1												56.5	
-Y1-	19+13.89	20+70.14	LT	156.25			BRIDGE APPROACH	N/A	7.5	12	50		1			1		1											
-Y5- & -L-	12+95.38	60+00.50	LT	100	87.5		N/A	BRIDGE & RET WALL	10	15.5					1					1								174	
-Y4- & -L-	11+48.35	60+00.50	LT & RT	75	112.5		BRIDGE APPROACH	N/A	10	13					1					1								142	
-L-	62+05.50	64+08.35	LT	162.5	50		BRIDGE APPROACH	N/A	10	13					1					1								142	
-L-	62+05.50	68+80.50	RT	675			BRIDGE	68+75	10	13					1				1										
-Y2RPC-	10+70.00	11+81.44	LT	112.5			EXISTING G/R	EXISTING G/R	12	15	50		1			1												112.5	
-L-	75+46.13	77+49.97	RT	206.25			BRIDGE COLUMN	N/A	8	11	50				1	1													
-L-	77+49.97	78+88.56	RT				BRIDGE COLUMN	N/A																		136.5			BRIDGE PIERS FOR -Y2- OVER -L-
-L-	77+36.62	79+00.00	LT				BRIDGE COLUMN	N/A																		166			BRIDGE PIERS FOR -Y2- OVER -L-
-L-	79+00.00	80+76.57	LT	175			BRIDGE COLUMN	N/A	8	11	50		1		1	1													
-Y2RPA-	16+85.00	17+97.50	LT	112.5			17+75	EXISTING G/R	12	15	50		1			1												126.5	
-L-	89+97.91	92+52.39	MED	225			BRIDGE COLUMN	BRIDGE COLUMN	13	16.5	37.5	37.5	2.25	2.25	4										2			652	103	MEDIAN BRIDGE PIERS @ HUNTER HILL RD; SEE SHT 2C-3
-L-	90+18.16	93+61.88	LT	350			91+50	SLOPE PROTECT.	8	11	50		1			1			1										FOR SLOPE PROTECTION; SEE DETAIL SHEET 2C-8
-L- & -Y8-	112+07.82	13+31.08	LT & RT	125	87.5		BOX CULVERT	112+25	8	11									1	1									
-L- & -Y9-	112+68.02	11+10.91	RT	143.75	87.5		BOX CULVERT	RADIUS RETURN	8	11	50		1			1				1									
SUBTOTAL				**3,631.25**	**537.50**										**18**	**10**		**2**	**3**	**5**					**5**	**1067.5**	**1405.5**	**227**	
ANCHOR UNIT DEDUCTIONS																													
	B-77 @ 18.75' EACH			-337.5																									
	GRAU @ 50' EACH			-500																									
	TYPE III @ 18.75' EACH			-37.5																									
	CAT-1 @ 6.25' EACH			-18.75																									
	AT-1 @ 6.25' EACH			-31.25																									
GRAND TOTAL				**2,706.25**	**537.50**										**18**	**10**		**2**	**3**	**5**					**5**	**1067.5**	**1405.5**	**227**	
SAY				**2,850.00**	**575.00**										**18**	**10**		**2**	**3**	**5**					**5**	**1,075.00**	**1,410.00**	**230.00**	
TEMPORARY GUARDRAIL:																													
-DET1-	19+41.63	21+10.38	RT	168.75			G/R ON -DET2- LT	G/R ON -DET2- LT	2	4		50		1							1	1							
-DET2-	19+40.52	21+09.27	LT	168.75			TEMP BRIDGE	N/A	2	4	50		1								1	1							
-DET2-	19+40.52	21+09.27	RT	168.75			TEMP BRIDGE	N/A	4	8	50		1								1	1							
-DET1-	22+96.40	24+65.15	RT	168.75			TEMP BRIDGE	N/A	2	4	50		1								1	1							
-DET2-	22+95.28	24+64.03	LT	168.75			G/R ON -DET1- LT	G/R ON -DET2- LT	2	4		50		1							1	1							
-DET2-	22+95.28	28+57.78	RT	562.5			23+00	28+50	4	8											1		1						
SUBTOTAL				**1,406.25**																	**6**	**5**	**1**						
TEMPORARY ANCHOR UNIT DEDUCTIONS							**TEMP. GR. ANCHORS**																						
	B-77 @ 18.75' EACH			-112.5			TEMP. W-BEAM = 4 EA.																						
	GRAU @ 50' EACH			-250																									
	CAT-1 @ 6.25' EACH			-6.25																									
GRAND TOTAL				**1,037.50**																	**6**	**5**	**1**						
SAY				**1,100.00**																	**6**	**5**	**1**						
ADDITIONAL GUARDRAIL POSTS = 10																													

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
U–3330	3B–2

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WOVEN WIRE FENCE, 47" FABRIC

E = [A - (8B + 16C + 16D)] - (B + C + D)
14 2

F = (2B + 3C + 3D)

LINE	STATION TO STATION	LT. OR RT.	A FABRIC L.F.	B END BRACE	C CORNER BRACE	D LINE BRACE	E 4" POSTS	F 5" POSTS
L	28+18.89 - 30+83.39	RT	265.00	2			17	4
L	28+07.77 - 34+25.27	LT	644.00	2	2		41	10
L	31+44.00 - 40+36.21	RT	978.00	1		2	66	8
Y1RPB	13+54.94 - 17+48.50	LT	405.00	2	1		25	7
Y1	22+68.25 - 24+08.00	RT	156.00	1	2		7	8
Y1	12+20.27 - 13+83.71	LT	208.00	2	2		9	10
Y1RPA	16+05.00 - 10+59.31	RT	510.00	1	5		27	17
Y1RPD	11+56.11 - 17+79.90	LT	695.00	1	4		42	14
L	47+35.24 - 57+39.96	RT	1,033.00		1	2	69	9
L	50+30.00 - 57+40.00	LT	736.00	1	3		47	11
Y4	10+68.87 - 12+74.38	RT	227.00	1			15	2
L	58+78.22 - 60+00.00	RT	187.00	2	2		8	10
L	58+19.48 - 60+53.81	LT	235.00	2			15	4
L	62+05.00 - 70+50.00	RT	883.00	2	4		54	16
L	62+05.00 - 63+93.00	LT	229.00	2	1		13	7
L	64+53.00 - 67+01.00	LT	248.00	2			16	4
L	71+10.00 - 72+45.42	RT	151.00	2			9	4
L	67+86.00 - 72+51.79	LT	496.00	2	1		32	7
L	80+15.06 - 81+79.91	RT	161.00	2			9	4
L	82+63.00 - 91+02.75	RT	818.00	2			56	4
Y2RPA	16+30.99 - 17+97.16	LT	173.00	1	1		10	5
L	83+45.25 - 87+30.00	LT	420.00	1	2		26	8
L	88+26.04 - 90+23.92	LT	219.00	2			14	4
L	91+51.70 - 95+00.00	LT	358.00	2			23	4
L	92+38.69 - 94+65.00	RT	221.00	2			14	4
L	95+25.00 - 97+18.00	RT	189.00	2			11	4
L	95+60.00 - 96+98.00	LT	142.00	2			8	4
L	97+58.00 - 99+32.00	LT	156.00	2			9	4
L	97+78.00 - 103+83.31	RT	606.00	2			41	4
L	99+92.00 - 101+36.00	LT	144.00	2			8	4
L	101+96.00 - 103+70.71	LT	175.00	1			11	2
Y7B	11+80.78 - 12+52.06	RT	83.00	1			5	2
Y7B	11+80.78 - 12+47.74	LT	84.00	1			5	2
L	104+65.00 - 108+70.00	RT	405.00	2			27	4
L	105+20.14 - 110+68.00	LT	548.00	1			38	2
L	109+30.00 - 110+94.00	RT	164.00	2			10	4
L	111+54.00 - 112+09.00	RT	55.00	2			2	4
L	111+60.00 - 112+48.27	LT	99.00	2	1		3	7
L	112+69.00 - 113+68.87	RT	101.00	2			5	4
L	113+06.06 - 113+95.00	LT	90.00	2			4	4
L	114+26.69 - 114+57.95	RT	32.00	1	1		0	5
Y9	10+91.02 - 11+55.00	RT	64.00	1			4	2
L	115+13.00 - 124+72.78	LT	961.00	1			68	2
Y3RPB	11+28.79 - 14+94.70	LT	347.00	1			24	2
L	115+55.10 - 117+84.00	RT	245.00	2	1		14	7
L	118+44.00 - 119+87.00	RT	143.00	2			8	4
L	120+47.00 - 120+94.00	RT	47.00	2			1	4
L	121+54.00 - 125+89.26	RT	436.00	2			29	4
	TOTAL		15,972.00				995	270
	SAY		**16,000**				**1005**	**275**

REMOVAL OF EXISTING ASPHALT PAVEMENT

LINE	STATION	STATION	LOCATION	LENGTH OR AREA	WIDTH	SQUARE YARDS
-L-	36+67	40+63	LT	7,049.92		783.32
-Y1LPC-	11+19	14+48	LT	5,663.27		629.25
-L-	45+61	50+10	RT	9,075.58		1008.40
-L-	53+69	53+90	LT	324.48		36.05
-L-	53+98	54+29	LT	471.57		52.40
					TOTAL	2509.42
					SAY	**2600.00**

SHOULDER BERM GUTTER

LOCATION	SIDE	BEG. STA.	END STA.	LENGTH
-L-	LT	58+78	59+75	96.5
-L-	LT	62+30	62+55	25.0
-L-	RT	62+30	68+50	620.0
			TOTAL	741.5
			SAY	**780.0**

CONCRETE EXPRESSWAY GUTTER

LINE	STATION	STATION	LOC	LENGTH
-L-	92+40	94+10	RT	177
			TOTAL	177
			SAY	**200**

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4/5/2017
R:\Raleigh\Proj\U3330_RDY_Summary of quantities.dgn
kevis

5/9/06
COMPUTED BY: D. MCCANN DATE: 6-22-2016
CHECKED BY: M. HOLT DATE: 2-20-2017

PROJECT REFERENCE NO.	SHEET NO.
U-3330	3B-3

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
PHASE 1					
-L- STA. 23+25.00 TO 28+00.00 LT	48		424	376	
-L- STA. 38+50.00 TO 54+00.00 LT	5,235		658		4,577
-L- STA. 67+50.00 TO 95+00.00 LT	3,185		3,060	2,161	2,286
-L- STA. 126+00.00 TO 131+15.00 LT	127		109		18
-L- STA. 73+50.00 TO 103+50.00 MED	748		2,196	1,531	83
-L- STA. 103+50.00 TO 131+15.00 MED	45		6,204	6,159	
-L- STA. 26+50.00 TO 49+00.00 RT	7,470		1,516		5,954
-L- STA. 69+00.00 TO 100+00.00 RT	2,644		4,416	2,879	1,107
-L- STA. 100+00.00 TO 131+15.00 RT	1,562		3,406	2,655	811
-DET1- STA. 10+96.78 TO 21+10.14 (BRIDGE)	112		2,560	2,448	
-DET1- STA. 22+96.40 (BRIDGE) TO 29+50.00	28		6,451	6,423	
-Y13DET- STA. 11+38.57 TO 12+90.11	314		15		299
-Y13DET- STA. 13+67.08 TO 14+40.55	56		61	5	
-Y1- STA. 11+75.00 TO 17+29.57 (BRIDGE)	34		13,326	13,292	
-Y1- STA. 19+29.57 (BRIDGE) TO 22+30.00	20		7,316	7,296	
-Y1LPC- STA. 10+00.00 TO 15+34.11	2,899		49		2,850
-Y1RPA- STA. 10+00.00 TO 17+03.62	846		2,384	1,754	216
-Y1RPB- STA. 10+51.12 TO 16+83.66	3,729		779		2,950
-Y1RPD- STA. 10+63.33 TO 17+09.17	735		1,253	518	
-Y2RPA- STA. 16+85.00 TO 18+77.47	13		91	78	
-Y2RPB- STA. 11+43.77 TO 12+09.59	16		34	18	
-Y2RPC- STA. 11+70.00 TO 12+47.46	37		423	386	
-Y2LPA- STA. 10+50.03 TO 16+13.30	294		4,280	3,986	
-Y6- STA. 12+75.05 TO 13+75.65	410		8		402
-Y7A- STA. 10+63.50 TO 11+04.84	8				8
-Y9- STA. 10+55.76 TO 11+72.39	24		24		
SUBTOTAL	30,639		61,043	51,965	21,561
PHASE 2					
-L- STA. 28+00.00 TO 38+50.00 LT	719		181		538
-L- STA. 54+00.00 TO 60+00.50 (BRIDGE) LT	86		1,206	1,120	
-L- STA. 62+05.50 (BRIDGE) TO 67+50.00 LT	165		996	831	
-L- STA. 28+00.00 TO 53+00.00 MED	10		3,281	3,271	
-Y1- STA. 22+30.00 TO 24+04.00	47		156	109	
-Y5- STA. 12+00.55 TO 13+41.26			360	360	
SUBTOTAL	1,027		6,180	5,691	538

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
PHASE 3					
-L- STA. 95+00.00 TO 126+00.00 LT	1,857		2,234	980	603
-L- STA. 68+00.00 TO 73+50.00 MED			858	858	
-L- STA. 56+00.00 TO 60+00.50 (BRIDGE) RT	188		1,529	1,341	
-L- STA. 62+05.50 (BRIDGE) TO 69+00.00 RT	21		5,256	5,235	
-DET3- STA. 14+67.28 TO 21+02.65 (BRIDGE)	589		776	187	
-DET3- STA. 23+07.65 (BRIDGE) TO 29+43.03	1,229		438		792
REMOVAL -DET1- 20+00.00 TO 26+00.00	4,255		76		4,179
-Y4- STA. 10+52.20 TO 13+58.00	539		462		77
-Y7B- STA. 10+68.04 TO 12+86.47	59		90	31	
-Y8- STA. 12+71.57 TO 13+86.50	24		70	46	
-Y3RPB- STA. 10+00.00 TO 14+94.70	390				390
SUBTOTAL	9,151		11,789	8,678	6,040
PHASE 4					
REMOVAL -Y13DET- STA. 11+38.57 TO 12+90.11	12		393	381	
REMOVAL -Y13DET- STA. 13+67.08 TO 14+40.55	49		70	21	
-L- STA. 53+00.00 TO 60+00.50 (BRIDGE) MED	4		894	890	
-L- STA. 62+05.50 (BRIDGE) TO 68+00.00 MED			426	426	
-L- STA. 49+0.00 TO 56+00.00 RT	473		1,341	868	
SUBTOTAL	538		3,124	2,586	
PROJECT SUMMARY SUBTOTAL:	41,355		82,136	68,920	28,139
MATERIAL FOR SHOULDER CONSTRUCTION			9,250	9,250	
EST. LOSS DUE TO CLEARING AND GRUBBING:	-500			500	
ROCK WASTE TO REPLACE BORROW:				-205	-205
ADJUST FOR ROCK WASTE:			-51	-51	
WASTE IN LIEU OF BORROW:				-12,261	-12,261
PROJECT TOTAL:	40,855		91,335	66,153	15,673
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				3,308	
GRAND TOTAL	40,855			69,461	
SAY	40,900			69,500	

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.

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DBOCKER-7

COMPUTED BY:	TLR/JPS	DATE:	11/2/2016
CHECKED BY:	DPB	DATE:	3-20-17

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-3330	3D-1

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

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

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Side Drain Pipe (RCP, CSP, CAAP, or HDPE) 12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
L 28+14	5	RT	0401		99.4																
L 28+66	9	RT	0402		99.7																
L 29+17	6	RT	0403		99.0																
			0403	0402		94.5	94.0			52								X	X	X	X
L 32+50	0	CL	0404		98.5																
			0404	0403		95.8	94.5			336								X	X	X	X
L 28+84	85	LT	0405		92.0																
L 28+91	81	RT	0406		95.4																
L 32+00	82	RT	0407		95.4																
			0407	0418		92.7	92.6			20								X	X	X	X
L 33+50	82	RT	0408		95.9																
			0408	0419		93.1	93.0			20								X	X	X	X
L 36+00	78	RT	0409		96.6																
			0409	0420		93.9	93.8			16								X	X	X	X
L 27+15	53	LT	0414		98.0																
			0414	0415		95.0	94.1			68								X	X	X	X
L 27+44	113	LT	0415		97.1																
			0415	0416		94.1	93.6														
L 29+10	72	RT	0417		96.2																
			0417	0406		89.1	88.8					20						X	X	X	X
L 32+00	61	RT	0418		98.8																
			0418	0417		91.8	89.1					292						X	X	X	X
L 33+50	61	RT	0419		99.3																
			0419	0418		92.3	91.8					152						X	X	X	X
L 36+00	61	RT	0420		100.0																
			0420	0419		93.1	92.3					252						X	X	X	X
L 30+84	58	LT	0421		98.8																
			0421	0405		90.0	88.7					200						X	X	X	X
L 33+50	58	LT	0422		99.6																
			0422	0421		91.3	90.0					264						X	X	X	X
L 36+00	58	LT	0423		100.4																
			0423	0422		93.0	91.8	0.5			248							X	X	X	X
L 47+23	74	LT	0504		94.5																
			0504	0539		91.3	90.6														
L 47+16	60	LT	0505		93.8																
			0505	0504		92.3	92.3				16							X	X	X	X
L 46+80	0	CL	0506		96.6																
L 42+50	76	LT	0507		96.2																
			0507	0531		93.8	93.7														
L 41+00	76	LT	0508		96.7																
			0508	0507		94.8	94.0	0.5			148							X	X	X	X
L 41+00	0	CL	0509		98.6																
			0509	0508		95.8	94.8														
Y1RPA 15+95	14	RT	0511		107.5																
			0511	0510		104.3	95.5			52								X	X	X	X
Y1 15+00	41	LT	0512		112.8																
			0512	0533		109.4	105.0														
Y1 15+00	42	RT	0513		112.8																
			0513	0541		109.8	103.9			52							X			X	X
Y1 21+44	41	LT	0515		116.9																
SHEET TOTALS										616	412	1180									

STRUCTURE FROM	TO	C. S. PIPE 12 (.064)	15 (.064)	18 (.064)	24 (.064)	30 (.079)	36 (.079)	42 (.109)	48 (.109)	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
0415	0416																		96						
0504	0539																				128				
0507	0531																				40				
0509	0508																		76						
0512	0533																		88						
SHEET TOTALS																			260		168				

LINE & STATION	STRUCTURE	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. 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
L 28+14	0401	1	5.0	2.6																				
L 28+66	0402	1	0.7																					
L 29+17	0403	1															1							1
L 32+50	0404	1															1							1
L 28+84	0405	1														1								1
L 28+91	0406	1	1.6													1								1
L 32+00	0407	1															1							1
L 33+50	0408	1															1							1
L 36+00	0409	1															1							1
L 27+15	0414	1			1			1																
L 27+44	0415	1			1			1																
L 29+10	0417	1	2.1																					
L 32+00	0418	1	2.0																					
L 33+50	0419	1	2.0																					
L 36+00	0420	1	1.9																					
L 30+84	0421	1	3.8																					
L 33+50	0422	1	3.3																					
L 36+00	0423	1	2.3																					
L 47+23	0504	1														1								1
L 46+80	0506	1															1							1
L 42+50	0507	1														1								1
L 41+00	0508	1														1								1
L 41+00	0509	1															1							1
Y1RPA 15+95	0511	1			1			1																
Y1 15+00	0512	1			1		1																	
Y1 15+00	0513	1			1			1																
Y1 21+44	0515	1			1			1																
SHEET TOTALS		27	24.7	2.6	6		1	5								5	7							12

LINE & STATION	STRUCTURE	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	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE	##" SPRING BOX PIPE	SPRING BOX STD. 840.41	15" ELBOWS	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
L 28+14	0401							1									1					
L 28+66	0402							1									1					
L 29+10	0417							1									1					
L 32+00	0418							1									1					
L 33+50	0419							1									1					
L 36+00	0420							1									1					
L 30+84	0421		1						1													
L 33+50	0422		1						1													
L 36+00	0423		1						1													
	0504–0539																				98	REMOVE EX. 24' RCP
L 47+16	0505																		0.4465			
	0505–0504																	4				PLUG & FILL EX. 18" RCP
	0512–0533																				33	REMOVE EX. 15" RCP
	0513–0541														2			5			77	REMOVE EX. 15" CMP & RCP; PLUG & FILL EX. 15" RCP
SHEET TOTALS			3					6	3						2		6	9	0.4465		208	

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

DBOCKER-7

COMPUTED BY:	TLR/JPS	DATE:	11/2/2016
CHECKED BY:	DPB	DATE:	3-20-17

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-3330	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	OFFSET		STRUCTURE NUMBER FROM	TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Side Drain Pipe (RCP, CSP, CAAP, or HDPE) 12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
			0515	0514		113.4	109.0	0.3		68										X	X
Y1 19+48	41	LT	0516		122.7																
			0516	0515		119.5	113.4														
Y1 21+38	2	RT	0517		118.5																
Y1 21+12	43	RT	0518		115.1																
Y1 21+07	53	RT	0519		117.5																
			0519	0518		114.4	113.9														
Y1 19+83	53	RT	0520		121.5																
			0520	0519		118.3	114.4														
L 50+72	97	RT	0521		93.0																
			0521	0609		87.6	84.6							320				X	X	X	X
L 50+00	0	CL	0522		95.5																
			0522	0521		89.3	88.1														
L 50+00	108	LT	0523		95.0																
			0523	0522		89.8	89.3														
Y1LPC 12+40	14	LT	0524		101.2																
			0524	0525		98.2	95.7														
Y1LPC 11+25	14	LT	0525		98.7																
			0525	0535		95.4	94.8	0.4													
Y1LPC 10+50	43	LT	0526		100.2																
			0526	0525		95.7	95.4														
Y1 17+13	53	RT	0527		121.1																
			0527	0513		118.4	109.8														
Y1 16+78	41	LT	0528		120.2																
			0528	0512		117.5	109.4														
L 44+30	76	LT	0529		95.6																
			0529	0504		93.2	91.8					292						X	X	X	X
L 43+90	60	LT	0530		98.4																
			0530	0529		93.4	93.2														
L 42+90	60	LT	0531		98.8																
			0531	0530		93.7	93.4														
L 50+50	102	RT	0532		93.6																
			0532	0521		88.9	88.6	1.0													
Y1RPA 15+95	26	LT	0533		108.2																
			0533	0511		105.0	104.3														
Y1RPD 10+94		CL	0534																		
L 39+00	75	RT	0535		97.5																
			0536	0420		94.5	93.6				304							X	X	X	X
L 39+00	61	RT	0536		99.8																
			0537	0423		94.3	93.0	0.4			244							X	X	X	X
L 38+45	58	LT	0537		100.3																
			0538		97.0																
			0538	0537		94.5	94.3	0.4			60							X	X	X	X
Y1RPA 12+50	20	RT	0539		95.0																
			0539	0501		90.6	90.3					40						X	X	X	X
Y1RPA 13+00	47	RT	0540		92.8																
			0540	0539		91.3	91.1				56							X	X	X	X
L 58+37	88	LT	0602		96.0																
			0602	0625		82.9	82.7								48			X	X	X	X
L 58+35	93	LT	0603		90.6																
SHEET TOTALS										68	664	332		320	48						

FROM	TO	C. S. PIPE 12 (.064)	15 (.064)	18 (.064)	24 (.064)	30 (.079)	36 (.079)	42 (.109)	48 (.109)	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
0515	0514																								
0516																									
0516	0515																		196						
0517																									
0518																									
0519																									
0519	0518																		12						
0520																									
0520	0519																		128						
0521																									
0521	0609																								
0522																									
0522	0521																					120			
0523																									
0523	0522																					108			
0524																									
0524	0525																		88						
0525																									
0525	0535																		56						
0526																									
0526	0525																		68						
0527																									
0527	0513																		212						
0528																									
0528	0512																		176						
0529																									
0529	0504																								
0530																									
0530	0529																				44				
0531																									
0531	0530																				96				
0532																									
0532	0521												24												
0533																									
0533	0511																		40						
0534																					100				
0535																									
0536	0420																								
0536																									
0537	0423																								
0537																									
0538																									
0538	0537																								
0539																									
0539	0501																								
0540																									
0540	0539																								
0602																									
0602	0625																								
0603																									
SHEET TOTALS													24						976		240	228			

FROM	TO	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28
0515	0514																	
0516		1			1			1										
0516	0515																	
0517		1								1				1	1			
0518																		
0519		1			1		1											
0519	0518																	
0520		1			1		1											
0520	0519																	
0521		1	0.4															
0521	0609																	
0522		1	1.3														1	
0522	0521																	
0523																		
0523	0522																	
0524		1			1		1											
0524	0525																	
0525		1			1	1												
0525	0535																	
0526																		
0526	0525																	
0527		1			1			1										
0527	0513																	
0528		1			1		1											
0528	0512																	
0529		1														1		
0529	0504																	
0530		1	0.1													1		
0530	0529																	
0531		1	0.1													1		
0531	0530																	
0532																		
0532	0521																	
0533		1			1		1											
0533	0511																	
0534																		
0535		1															1	
0536	0420																	
0536		1																
0537	0423																	
0537		1	1.1															
0538		1										1						
0538	0537																	
0539		1																
0539	0501																	
0540																		
0540	0539																	
0602		1	5.0	3.1														
0602	0625																	
0603																		
SHEET TOTALS		20	8.0	3.1	8	1	5	2		1		1		1	1	3	2	

FROM	TO	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	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE	##" SPRING BOX PIPE	SPRING BOX STD. 840.41	15" ELBOWS	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
0515	0514																										36	REMOVE EX. 15" RCP
0516																												
0516	0515																											
0517																												CONCRETE TRANSITIONAL SECTION
0518																									0.3990			
0519																												
0519	0518																											
0520																												
0520	0519																											
0521												1											1					
0521	0609																											
0522							1																					
0522	0521																										108	REMOVE EX. 24" RCP
0523																												STUB-PIPE OUT
0523	0522																										103	REMOVE EX. 24' RCP
0524																												
0524	0525																											
0525																												
0525	0535																											
0526																												STUB-PIPE OUT
0526	0525																											
0527																												
0527	0513																											
0528																												
0528	0512																											
0529							1																					
0529	0504																											
0530							1																					
0530	0529																											
0531							1																					
0531	0530																											
0532																												STUB-PIPE OUT
0532	0521																										69	REMOVE EX. 15' RCP
0533																												
0533	0511																											
0534																												
0535							1																					
0536	0420																											
0536												1											1					
0537	0423																										83	REMOVE EX. 15" RCP
0537									1						1													
0538																												
0538	0537																											
0539												1											1					
0539	0501																											
0540																												STUB-PIPE OUT
0540	0539																											
0602												1											1					
0602	0625																											
0603																									0.3990			
SHEET TOTALS							5		1			4			1								4		0.7980		399	

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

DBOCKER-7

COMPUTED BY:	TLR/JPS	DATE:	11/2/2016
CHECKED BY:	DPB	DATE:	3-20-17

PROJECT NO.	SHEET NO.
U-3330	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	OFFSET		STRUCTURE NUMBER FROM	TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Side Drain Pipe (RCP, CSP, CAAP, or HDPE) 12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
			0603	0602		89.3	88.6														
L 57+40	89	LT	0605		95.0																
			0605	0602		83.2	82.9														
L 57+00	78	LT	0606		91.2																
			0606	0605		88.5	88.3			44								X	X	X	X
L 57+21	4	LT	0607		98.5																
			0607	0605		83.4	83.2														
L 56+75	92	RT	0608		92.0																
			0608	0607		83.7	83.4														
L 53+93	87	RT	0609		90.8																
			0609	0608		84.6	84.2								284			X	X	X	X
			0610	0608		85.8	83.7														
Y4 12+50	21	LT	0612		94.3																
			0612	0611		91.0	90.9			24								X	X	X	X
Y4 12+50	28	RT	0613		94.2																
			0613	0612		91.2	91.0														
Y4 13+44	14	LT	0615		93.3																
L 62+35	60	LT	0618		97.4																
			0618	0617		94.6	91.5			28							X			X	X
L 62+35	12	RT	0619		98.9																
			0619	0618		95.8	94.6														
L 62+35	60	RT	0621		97.8																
			0621	0620		95.0	88.5			36							X			X	X
L 53+92	148	RT	0623		92.0																
			0623	0609		90.0	84.6														
L 57+50	93	RT	0624		95.2																
			0624	0608		92.2	88.4														
L 58+88	85	LT	0625		91.8																
			0625	0601		82.7	82.6								44			X	X	X	X
L 63+40	60	RT	0627		80.6																
			0627	0626		77.8	77.7			36								X	X	X	X
L 62+50	60	LT	0628		97.4																
			0628	0618		94.6	94.6														
L 66+50	60	RT	0702		97.1																
			0702	0701		94.3	87.9	0.4		32							X			X	X
L 68+12	82	RT	0704		86.9																
			0704	0703		83.4	83.4	0.6							20			X	X	X	X
L 66+93	12	LT	0706		98.6																
L 66+80	11	LT	0707		98.2																
			0707	0706		93.3	92.7			12								X	X	X	X
L 66+50	90	LT	0710		90.5																
L 69+82	110	LT	0711		95.0																
L 68+45	60	RT	0713		96.5																
			0713	0712		93.7	86.6			36							X			X	X
L 73+30	0	CL	0715		94.6																
			0715	0714		91.9	86.6														
L 77+99	3	LT	0791		93.8																
			0791	0792		90.6	90.5														
L 77+83	2	LT	0792		93.8																
			0792	0793		90.5	90.1														
							SHEET TOTALS			248					348						

SIZE / THICKNESS OR GAUGE: C. S. PIPE 12 (.064), 15 (.064), 18 (.064), 24 (.064), 30 (.079), 36 (.079), 42 (.109), 48 (.109)

FROM	TO	C. S. PIPE 12	15	18	24	30	36	42	48	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
0603	0602																		8						
0605																									
0605	0602																							100	
0606																									
0606	0605																								
0607																									
0607	0605																							88	
0608																									
0608	0607																							108	
0609																									
0609	0608																								
0610	0608																								
0612																									
0612	0611																								
0613																									
0613	0612																		48						
0615																									
0618																									
0618	0617																								
0619																									
0619	0618																		72						
0621																									
0621	0620																								
0623																									
0623	0609																				128				
0624																									
0624	0608																		76						
0625																									
0625	0601																								
0627																									
0627	0626																								
0628																									
0628	0618																		12						
0702																									
0702	0701																								
0704																									
0704	0703																								
0706																									
0707																									
0707	0706																								
0710																									
0711																									
0713																									
0713	0712																								
0715																									
0715	0714																		108						
0791																									
0791	0792																		16						
0792																									
0792	0793																		124						
SHEET TOTALS																			464		128			296	

QUANTITIES FOR DRAINAGE STRUCTURES — NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)

FRAME, GRATES, AND HOOD STD. 840.03

FROM	TO	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	GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION: D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. 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
0603	0602																			
0605		1	5.0	1.8																
0605	0602																			
0606		1															1			
0606	0605																			
0607		1	5.0	5.1																
0607	0605																			
0608		1	3.3																	
0608	0607																			
0609		1	1.3													1				
0609	0608																			
0610	0608																			
0612		1			1			1												
0612	0611																			
0613		1			1		1													
0613	0612																			
0615		1			1			1												
0618		1															1			
0618	0617																			
0619		1								1				1	1					
0619	0618																			
0621		1															1			
0621	0620																			
0623																				
0623	0609																			
0624		1			1	1														
0624	0608																			
0625		1	4.1													1				
0625	0601																			
0627		1															1			
0627	0626																			
0628		1															1			
0628	0618																			
0702		1															1			
0702	0701																			
0704																				
0704	0703																			
0706		1	0.8																	
0707		1								1				1	1					
0707	0706																			
0710		1														1				
0711																				
0713		1															1			
0713	0712																			
0715		1															1			
0715	0714																			
0791		1								1				1	1					
0791	0792																			
0792		1								1				1	1					
0792	0793																			
SHEET TOTALS		23	19.5	6.9	4	1	1	2		4				4	4	3	8			

FROM	TO	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	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE	##" SPRING BOX PIPE	SPRING BOX STD. 840.41	15" ELBOWS	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
0603	0602																									
0605										1											1					
0605	0602																									
0606					1																					
0606	0605																									
0607												1									1					
0607	0605																									
0608										1											1					
0608	0607																									
0609					1																					
0609	0608																									
0610	0608																									RETAIN EX. 36" RCP
0612																										
0612	0611																									
0613																										
0613	0612																									
0615																									48	REMOVE EX. 15" RCP
0618							1																			
0618	0617																		2						107	REMOVE EX. 12" RCP
0619																										CONCRETE TRANSITIONAL SECTION
0619	0618																									
0621							1																			
0621	0620																		2							
0623																										STUB-PIPE OUT
0623	0609																									2 @ 64 EACH
0624																										
0624	0608																								33	REMOVE EX. 12" RCP
0625					1																					
0625	0601																								62	REMOVE EX. 12" RCP
0627					1																					
0627	0626																									
0628							1																			
0628	0618																									
0702							1																			
0702	0701																		2							
0704																							0.8856			
0704	0703																									
0706												1									1					
0707																										CONCRETE TRANSITIONAL SECTION
0707	0706																					2			35	REMOVE EX. 15" RCP; PLUG & FILL EX. 15" RCP
0710					1																				16	REMOVE EX. 24" RCP
0711																										STUB-PIPE OUT
0713							1																			
0713	0712																		2							
0715					1																					
0715	0714																									
0791																										CONCRETE TRANSITIONAL SECTION
0791	0792																									
0792																										CONCRETE TRANSITIONAL SECTION
0792	0793																									
SHEET TOTALS					6		5			2		2							8		4	2	0.8856		301	

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

DBOCKER-7

COMPUTED BY:	TLR/JPS	DATE:	11/2/2016
CHECKED BY:	DPB	DATE:	3-20-17

PROJECT NO.	SHEET NO.
U-3330	3D-4

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	OFFSET		STRUCTURE NUMBER FROM	TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %
L 76+59	0	CL	0793		94.9			
L 78+15	3	LT	0795		93.8			
			0795	0791		90.6	90.6	
L 76+52	163	LT	0796		100.0			
L 78+82	246	LT	0797		100.0			
L 76+62	68	RT	0799		93.4			
			0799	0798		85.2	85.0	
Y2LPA 14+20	34	RT	0801		104.2			
			0801	0827		95.6	93.0	
Y2RPA 18+11	6	RT	0802		100.8			
			0802	0828		96.3	94.0	
Y2RPA 18+37	6	RT	0803		100.0			
			0803	0802		96.8	96.3	
L 82+95	85	LT	0804		98.9			
			0804	0809		92.7	88.3	
L 83+30	106	LT	0805		96.4			
			0805	0804		94.2	93.9	
L 86+00	80	LT	0806		102.0			
			0806	0805		99.2	94.2	
Y6 13+50	48	LT	0807		104.0			
			0807	0835		101.3	100.6	
L 91+94	80	LT	0808		109.6			
			0808	0901		102.1	100.4	0.6
L 82+77	1	RT	0809		98.8			
			0809	0819		86.7	86.6	
L 83+00	3	LT	0810		99.0			
			0810	0809		94.9	94.4	
L 84+72	2	LT	0812		101.3			
L 85+36	13	LT	0813		102.0			
			0813	0814		98.8	98.0	
L 85+36	4	LT	0814		102.1			
L 86+71	11	LT	0815		103.7			
L 87+07	13	RT	0816		104.1			
			0816	0815		101.0	100.5	
L 88+72	2	RT	0817		104.7			
L 79+59	60	RT	0818		94.9			
			0818	0799		86.0	85.2	
L 81+90	67	RT	0819		96.2			
			0819	0818		86.6	86.0	
L 81+95	122	RT	0820		97.0			
			0820	0819		93.3	91.3	0.9
L 82+33	115	RT	0821		97.7			
			0821	0820		93.9	93.3	0.8
L 82+51	99	RT	0822		99.0			
			0822	0821		94.6	93.9	0.5
L 83+00	77	RT	0823		95.3			
			0823	0819		89.5	89.0	
L 87+15	77	RT	0824		100.8			
			0824	0823		95.6	90.0	0.6
L 90+53	69	RT	0825		105.3			

(SIZE / THICKNESS OR GAUGE)

FROM	TO	Side Drain Pipe (RCP, CSP, CAAP, or HDPE) 12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 12 .064	15 .064	18 .064	24 .064	30 .079	36 .079	42 .109	48 .109
0793																						
0795																						
0795	0791																					
0796																						
0797																						
0799																						
0799	0798																					
0801																						
0801	0827																					
0802																						
0802	0828																					
0803																						
0803	0802																					
0804																						
0804	0809																					
0805																						
0805	0804		44								X	X	X	X								
0806																						
0806	0805		280								X	X	X	X								
0807																						
0807	0835																					
0808																						
0808	0901		68								X	X	X	X								
0809																						
0809	0819																					
0810																						
0810	0809																					
0812																						
0813																						
0813	0814																					
0814																						
0815																						
0816																						
0816	0815																					
0817																						
0818																						
0818	0799																					
0819																						
0819	0818																					
0820																						
0820	0819																					
0821																						
0821	0820																					
0822																						
0822	0821				24						X	X	X	X								
0823																						
0823	0819																					
0824																						
0824	0823					408					X	X	X	X								
0825																						
SHEET TOTALS			392		24	408																

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	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	
0793																		1	4.4						
0795																		1							
0795	0791										20														
0796																		1	5.0	3.9					
0797																									
0799																		1	3.2						
0799	0798																64								
0801																		1	3.5		1		1		
0801	0827										28														
0802																		1							
0802	0828										104														
0803																		1							
0803	0802										28														
0804																		1	1.2						
0804	0809													88											
0805																		1							
0805	0804																								
0806																		1							
0806	0805																								
0807																		1							
0807	0835										140														
0808																		1	2.5						
0808	0901																								
0809																		1	1.0	2.1					
0809	0819																								
0810																		1							
0810	0809											24													
0812																		1	0.5						
0813																		1							
0813	0814										12														
0814																		1	0.6						
0815																		1	0.8						
0816																		1							
0816	0815										44														
0817																		1	0.8						
0818																		1	3.9						
0818	0799																296								
0819																		1	4.6						
0819	0818															228									
0820																		1			1			1	
0820	0819												56												
0821																		1			1		1		
0821	0820												40												
0822																		1							
0822	0821																								
0823																		1	0.8						
0823	0819														108										
0824																		1	0.3						
0824	0823																								
0825																		1	2.8						
SHEET TOTALS											376	24	96	88	108	228	360	28	36.0	6.0	3		2	1	

FROM	TO	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. 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
0793																		
0795		1				1	1											
0795	0791																	
0796																		
0797																		
0799																		
0799	0798																	
0801																		
0801	0827																	
0802		1				1	1											
0802	0828																	
0803		1				1	1											
0803	0802																	
0804																		
0804	0809																	
0805									1							1		
0805	0804																	
0806									1							1		
0806	0805																	
0807									1							1		
0807	0835																	
0808									1							1		
0808	0901																	
0809																		
0809	0819																	
0810		1				1	1											
0810	0809																	
0812																		
0813		1				1	1											
0813	0814																	
0814																		
0815		1				1	1											
0816		1				1	1											
0816	0815																	
0817									1							1		
0818																		
0818	0799																	
0819																		
0819	0818																	
0820																		
0820	0819																	
0821																		
0821	0820																	
0822																		
0822	0821																	
0823								1								1		
0823	0819																	
0824								1								1		
0824	0823																	
0825								1								1		
SHEET TOTALS		7				7	7	3	5							8		

FROM	TO	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE	##" SPRING BOX PIPE	SPRING BOX STD. 840.41	15" ELBOWS	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54
0793						1									1
0795															
0795	0791														
0796															
0797															
0799				1											
0799	0798														
0801															
0801	0827														
0802															
0802	0828														
0803															
0803	0802														
0804				1											1
0804	0809														
0805															
0805	0804														
0806															
0806	0805														
0807															
0807	0835														
0808															
0808	0901														
0809						1									1
0809	0819														
0810															
0810	0809														
0812						1									1
0813															
0813	0814														
0814						1									1
0815															
0816															
0816	0815														
0817															
0818						1									1
0818	0799														
0819						1									1
0819	0818														
0820															
0820	0819														
0821															
0821	0820														
0822				1											1
0822	0821														
0823															
0823	0819														
0824															
0824	0823														
0825															
SHEET TOTALS				3		6									8

FROM	TO	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
0793						
0795						CONCRETE TRANSITIONAL SECTION
0795	0791					
0796						RETAIN EX. MH/JB
0797						RETAIN EX. MH/JB
0799						JB W/ SLAB LID
0799	0798					
0801						
0801	0827					
0802						CONCRETE TRANSITIONAL SECTION
0802	0828				36	REMOVE EX. 18" RCP
0803						CONCRETE TRANSITIONAL SECTION
0803	0802					
0804						
0804	0809					
0805						
0805	0804					
0806						
0806	0805					
0807						
0807	0835				353	REMOVE EX. 24" RCP
0808						
0808	0901				26	REMOVE EX. 15" RCP
0809						
0809	0819					RETAIN EX. 30" RCP
0810						CONCRETE TRANSITIONAL SECTION
0810	0809					
0812						
0813						CONCRETE TRANSITIONAL SECTION
0813	0814					
0814						
0815						CONCRETE TRANSITIONAL SECTION
0816						CONCRETE TRANSITIONAL SECTION
0816	0815					
0817						
0818						
0818	0799					
0819						
0819	0818					
0820						
0820	0819					
0821						
0821	0820				33	REMOVE EX. 24" RCP
0822						
0822	0821				25	REMOVE EX. 24" RCP
0823						
0823	0819				62	REMOVE EX. 18" RCP
0824						
0824	0823					
0825						
SHEET TOTALS					535	

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

DBOCKER-7

COMPUTED BY:	TLR/JPS	DATE:	11/2/2016
CHECKED BY:	DPB	DATE:	3-20-17

PROJECT NO.	SHEET NO.
U-3330	3D-5

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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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, CSP, CAAP, or HDPE) 12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
			0825	0824		97.4	95.6	0.6					332					X	X	X	X
L 83+22	3	LT	0830		99.2																
			0830	0810		95.0	94.9														
L 83+00	114	LT	0831		97.6																
			0831	0804		94.0	92.7						44					X	X	X	X
L 79+62	84	RT	0832		93.0																
			0832	0818		86.5	86.4							28				X	X	X	X
L 90+55	120	RT	0833		120.0																
			0833	0825		106.2	101.0				52						X			X	X
L 91+98	108	LT	0834		234.7																
			0834	0808		105.0	102.1	0.6		32											
L 87+00	75	LT	0835		104.8																
			0835	0806		100.6	99.2			100											
L 92+60	80	LT	0901		110.4																
			0901	0912		99.7	99.3	0.4													
L 94+81	80	LT	0902		113.2																
			0902	0901		108.5	105.6					228								X	X
L 94+86	96	LT	0903		119.0																
			0903	0902		110.2	108.5					20								X	X
L 95+75	80	LT	0904		114.4																
			0904	0902		111.5	109.2														
L 96+81	82	LT	0905		114.8																
			0905	0904		112.1	111.5														
L 101+24	83	LT	0906		110.9																
L 103+36	84	LT	0908		109.5																
Y7B 12+66	48	RT	0909		110.5																
Y7B 12+00	48	RT	0910		107.4																
			0910	0909		104.7	103.7														
L 105+00	88	LT	0911		108.2																
			0911	1001		102.6	89.0						404							X	X
L 92+60	14	LT	0912		111.3																
			0912	0914		99.3	99.3	0.4													
92+56	0	CL	0914		111.4																
			0914	0920		98.8	98.5														
L 93+48	13	RT	0915		112.3																
			0915	0914		109.1	100.0	0.4													
L 96+00	1	RT	0916		113.7																
			0916	0915		111.0	109.1														
L 100+00	0	CL	0917		115.2																
			0917	0918		112.5	112.3			68								X	X	X	X
L 100+64	5	LT	0918		115.9																
L 104+35	4	RT	0919		111.7																
			0919	1005		108.5	104.3			224								X	X	X	X
L 92+60	60	RT	0920		109.8																
			0920	0825		98.5	97.4	0.5													
L 93+00	89	RT	0921		109.6																
			0921	0952		104.9	104.6	0.5													
L 94+50	84	RT	0922		111.4																
			0922	0921		107.5	106.6	0.3													
L 95+65	81	RT	0923		111.1																
							SHEET TOTALS			424	52	248	780	28							

QUANTITIES FOR DRAINAGE STRUCTURES — NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)

FRAME, GRATES, AND HOOD STD. 840.03

FROM	TO	C. S. PIPE 12 (.064)	15 (.064)	18 (.064)	24 (.064)	30 (.079)	36 (.079)	42 (.109)	48 (.109)	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	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	GRATE TYPE E	F	G	
0825	0824																																
0830																										1							
0830	0810																			20													
0831																																	
0831	0804																																
0832																																	
0832	0818																																
0833																																	
0833	0825																																
0834																																	
0834	0808																																
0835																										1							
0835	0806																																
0901																										1	5.0	0.7					
0901	0912																				68												
0902																										1							
0902	0901																																
0903																										1	3.8						
0903	0902																																
0904																										1							
0904	0902																			96														
0905																										1							
0905	0904																			112														
0906																																	
0908																										1	0.1						
0909																										1	1.8						
0910																										1							
0910	0909																			68														
0911																										1	0.6						
0911	1001																																
0912																										1	5.0	1.9					
0912	0914																				16												
0914																										1	5.0	2.6					
0914	0920																					60											
0915																										1							
0915	0914																			96														
0916																										1							
0916	0915																			252														
0917																										1							
0917	0918																																
0918																										1	3.4						
0919																										1							
0919	1005																			224														
0920																										1	5.0	1.4					
0920	0825																					204											
0921																										1							
0921	0952																				16													
0922																										1							
0922	0921																				148													
0923																										1							
SHEET TOTALS																			848	184	84	264				22	29.7	6.6					

FROM	TO	CONCRETE TRANSITIONAL SECTION: D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. 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	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE	##" SPRING BOX PIPE	SPRING BOX STD. 840.41	15" ELBOWS	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
0825	0824																																				
0830		1				1	1																														CONCRETE TRANSITIONAL SECTION
0830	0810																																				
0831																																					STUB-PIPE OUT
0831	0804																																				
0832																																					STUB-PIPE OUT
0832	0818																																				
0833																																					STUB-PIPE OUT
0833	0825																																				
0834																																					STUB-PIPE OUT
0834	0808																																				
0835																					1											1					
0835	0806																																				
0901								1								1																					
0901	0912																																				
0902								1								1																					
0902	0901																																				
0903																					1											1					
0903	0902																																			9	REMOVE EX. 24" RCP
0904									1							1																					
0904	0902																																			56	REMOVE EX. 18" RCP
0905									1							1																					
0905	0904																																			57	REMOVE EX. 15" RCP
0906																																					RETAIN EX. MH/JB
0908								1								1																					
0909																							1									1					
0910									1							1																					
0910	0909																																				
0911																					1											1					
0911	1001																																				
0912		1				1	1																														CONCRETE TRANSITIONAL SECTION
0912	0914																																			82	REMOVE EX. 18" RCP & 3 Dis
0914						1	1																														
0914	0920																																				
0915		1				1	1																														CONCRETE TRANSITIONAL SECTION
0915	0914																																				
0916									1							1																					
0916	0915																																			112	REMOVE EX. 15" RCP
0917									1							1																					
0917	0918																																5			14	REMOVE EX. 18" RCP & HW; PLUG & FILL EX. 18' RCP
0918									1							1																					
0919		1				1	1																														CONCRETE TRANSITIONAL SECTION
0919	1005																																			45	REMOVE EX. 18" RCP
0920								1										1																			
0920	0825																																				
0921									1									1																			
0921	0952																																				
0922									1							1																					
0922	0921																																				
0923									1							1																					
SHEET TOTALS		4				5	5	4	9							11		2			3		1									4	5			375	

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

DBOCKER-7

COMPUTED BY:	TLR/JPS	DATE:	11/2/2016
CHECKED BY:	DPB	DATE:	3-20-17

PROJECT NO.	SHEET NO.
U-3330	3D-6

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)

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

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, CSP, CAAP, or HDPE) 12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
		0923	0922		108.1	107.5														
L 97+84	85 RT	0924		112.5																
		0924	0955		109.7	108.9														
L 103+44	13 LT	0925		113.2																
		0925	0919		110.0	108.5														
L 92+85	85 RT	0952		109.5																
		0952	0920		104.1	104.0														
L 96+39	96 RT	0953		115.3																
		0953	0955		111.0	108.9														
L 96+39	82 RT	0955		111.6																
		0955	0923		108.9	108.3	0.4													
L 103+50	80 RT	0956		109.4																
		0956	0957		106.4	106.0														
L 109+00	87 LT	1001		94.2																
		1001	1002		89.0	88.4						104							X	X
L 110+00	95 LT	1002		93.6																
		1002	1003		88.4	88.2						60					X	X	X	X
L 110+56	93 LT	1003		96.7																
		1003	1085		88.2	87.8														
L 106+57	4 RT	1005		107.5																
		1005	1024		104.3	95.0														
L 108+45	83 RT	1007		101.9																
		1007	1008		98.7	97.1	0.3				20						X	X	X	X
L 108+61	78 RT	1008		101.5																
		1008	1009		97.1	91.1	0.4													
L 110+88	69 RT	1009		95.9																
		1009	1010		91.1	90.3	0.4													
L 111+61	69 RT	1010		95.1																
		1010	1011		90.3	89.7	0.9				40						X	X	X	X
L 112+00	69 RT	1011		94.5																
		1011	1012		89.2	88.1														
L 112+87	69 RT	1012		93.4																
		1012	1013		88.1	87.9	0.3					84					X	X	X	X
L 110+84	90 RT	1015		98.6																
		1015	1009		94.1	91.9			24										X	X
L 111+67	87 RT	1016		98.1																
		1016	1010		93.0	91.1			20										X	X
L 110+52	96 LT	1022		93.9																
L 110+50	8 LT	1024		99.6																
		1024	1003		95.0	93.0														
L 118+49	74 RT	1053		94.6																
		1053	1052		88.9	88.4	0.4													
Y8 12+95	32 LT	1071		94.8																
		1071	1072		91.8	91.5														
Y8 12+95	32 RT	1072		94.8																
		1072	1075		91.5	91.2														
Y8 13+50	50 RT	1075		94.6																
		1075	1076		84.0	82.5					36								X	X
L 115+61	9 RT	1077		95.8																
		1077	1078		89.3	86.9														
SHEET TOTALS									44		96	248								

FROM	TO	C. S. PIPE 12 (.064)	15 (.064)	18 (.064)	24 (.064)	30 (.079)	36 (.079)	42 (.109)	48 (.109)	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
0923	0922																			116					
0924																									
0924	0955																		144						
0925																									
0925	0919																		96						
0952																									
0952	0920																				36				
0953																									
0953	0955																		16						
0955																									
0955	0923																		72						
0956																									
0956	0957																			160					
1001																									
1001	1002																								
1002																									
1002	1003																								
1003																									
1003	1085																					88			
1005																									
1005	1024																		396						
1007																									
1007	1008																								
1008																									
1008	1009																				228				
1009																									
1009	1010																				76				
1010																									
1010	1011																								
1011																									
1011	1012																					88			
1012																									
1012	1013																								
1015																									
1015	1009																								
1016																									
1016	1010																								
1022																									
1024																									
1024	1003																		96						
1053																									
1053	1052																						92		
1071																									
1071	1072																		68						
1072																									
1072	1075																		60						
1075																									
1075	1076																								
1077																									
1077	1078																			48					
SHEET TOTALS																			948	324	340	176	92		

FROM	TO	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A: 5' THRU 10' LIN. FT.	B: 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION: D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. 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
0923	0922																									
0924		1															1							1		
0924	0955																									
0925		1								1				1	1											
0925	0919																									
0952		1	0.4													1										1
0952	0920																									
0953		1																								
0953	0955																									
0955		1															1							1		
0955	0923																									
0956		1															1							1		
0956	0957																									
1001		1	0.3													1								1		
1001	1002																									
1002		1	0.3													1								1		
1002	1003																									
1003		1	3.5																							
1003	1085																									
1005		1								1				1	1											
1005	1024																									
1007																										
1007	1008																									
1008		1																								
1008	1009																									
1009		1														1								1		
1009	1010																									
1010		1														1								1		
1010	1011																									
1011		1	0.3													1								1		
1011	1012																									
1012		1	0.3													1								1		
1012	1013																									
1015		1																								
1015	1009																									
1016		1	0.1																							
1016	1010																									
1022																										
1024		1															1							1		
1024	1003																									
1053		1	0.8													1								1		
1053	1052																									
1071		1			1			1																		
1071	1072																									
1072		1			1		1																			
1072	1075																									
1075		1	5.0	0.6	1	1																				
1075	1076																									
1077		1	1.5														1							1		
1077	1078																									
SHEET TOTALS		23	12.5	0.6	3	1	1	1		2				2	2	8	5							12		1

FROM	TO	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE	##" SPRING BOX PIPE	SPRING BOX STD. 840.41	15" ELBOWS	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
0923	0922																		88	REMOVE EX. 18" RCP
0924																				
0924	0955																		33	REMOVE EX. 12" RCP
0925																				CONCRETE TRANSITIONAL SECTION
0925	0919															7			35	REMOVE EX. 18" RCP; PLUG & FILL EX. 18" RCP
0952																				
0952	0920																			
0953				1											1					
0953	0955																			
0955																				
0955	0923																			
0956																				
0956	0957																		88	REMOVE EX. 18" RCP
1001																				
1001	1002																			
1002																				
1002	1003																			
1003				1											1					
1003	1085																			
1005																				CONCRETE TRANSITIONAL SECTION
1005	1024																			
1007																				STUB-PIPE OUT
1007	1008																		29	REMOVE EX. 12" RCP
1008				1											1					
1008	1009																		86	REMOVE EX. 15" RCP
1009																				
1009	1010																		78	REMOVE EX. 15" RCP
1010																				
1010	1011																			
1011																				
1011	1012																		43	REMOVE EX. 18" RCP
1012																				
1012	1013																			
1015				1											1					
1015	1009																		7	REMOVE EX. 12" RCP
1016				1											1					
1016	1010																		9	REMOVE EX. 15" RCP
1022																	0.3990			
1024																				
1024	1003																			
1053																				
1053	1052																			
1071																				
1071	1072																			
1072																				
1072	1075																			
1075																				
1075	1076																		55	REMOVE EX. 24" RCP
1077																				
1077	1078																			
SHEET TOTALS				5											5	7	0.3990		551	

DBOCKER-7

COMPUTED BY: TLR/JPS DATE: 11/2/2016

CHECKED BY: DPB DATE: 3-20-17

PROJECT NO.	SHEET NO.
U-3330	3D-7

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	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Side Drain Pipe (RCP, CSP, CAAP, or HDPE) 12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
L 115+15	2	LT	1078		96.0																
L 113+86	13	LT	1081		96.4																
			1081	1082		93.2	93.2														
L 113+85	18	LT	1082		96.3																
L 111+42	113	LT	1085		97.6																
			1085	1004		83.6	83.3						36								
L 120+48	74	RT	1101		97.6																
			1101	1053		91.8	88.9	0.3													
L 121+68	75	RT	1102		99.5																
			1102	1101		92.8	91.8	0.3													
L 122+94	80	RT	1103		105.1																
L 124+35	86	RT	1104		107.7																
L 124+23	226	RT	1108		103.8																
Y3RPB 14+25	38	LT	1113		106.9																
L 127+74	91	LT	1114		109.8																
			1114	1113		105.0	103.5	1.2													
L 128+30	74	LT	1115		112.7																
			1115	1114		106.0	105.0	0.9													
L 129+15	74	LT	1116		112.0																
L 130+49	106	LT	1119		118.2																
L 128+91	1	RT	1120		115.5																
L 129+15	0	CL	1121		113.5																
			1121	1120		110.7	110.7														
L 126+90	72	LT	1122		108.6																
			1122	1114		105.9	105.0			88								X	X	X	X
L 126+91	9	LT	1123		111.9																
			1123	1122		108.7	105.9														
L 121+42	11	LT	1124		95.6																
L 121+48	0	CL	1125		100.5																
			1125	1124		94.6	94.4														
DET1 15+50	29	RT	T0631		96.9																
			T0631	T0632		93.9	93.6														
DET2 20+80	15	RT	T0634		97.6																
			T0634	T0633		93.8	88.9			32							X			X	X
DET1 20+81	19	RT	T0635		96.9																
			T0635	T0634		93.9	93.8														
DET1 20+81	15	LT	T0636		97.5																
			T0636	T0635		94.7	93.9														
DET1 23+38	19	RT	T0637		97.4																
			T0637	T0638		94.5	87.3			76							X			X	X
			T0639			89.7	89.0														
			T0640			90.0	89.0														
DET1 27+98	7	RT	T0706		97.6																
			T0716		96.5																
			T0716	T0706		93.3	92.7														
DET3 20+50	34	RT	D0601		96.1																
			D0601	D0600		93.3	88.6			80										X	X
DET3 27+50	30	RT	D0603		94.7																
			D0603	D0602		92.0	87.9			44							X			X	X
								SHEET TOTALS		320			36								

SIZE / THICKNESS OR GAUGE

LINE & STATION	FROM	TO	C. S. PIPE 12 (.064)	15 (.064)	18 (.064)	24 (.064)	30 (.079)	36 (.079)	42 (.109)	48 (.109)	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
L 115+15	1078																									
L 113+86	1081																									
	1081	1082																		8						
L 113+85	1082																									
L 111+42	1085																									
	1085	1004																								
L 120+48	1101																									
	1101	1053																						200		
L 121+68	1102																									
	1102	1101																						124		
L 122+94	1103																									
L 124+35	1104																									
L 124+23	1108																									
Y3RPB 14+25	1113																									
L 127+74	1114																									
	1114	1113																			60					
L 128+30	1115																									
	1115	1114																			60					
L 129+15	1116																									
L 130+49	1119																									
L 128+91	1120																									
L 129+15	1121																									
	1121	1120																		28						
L 126+90	1122																									
	1122	1114																								
L 126+91	1123																									
	1123	1122																		64						
L 121+42	1124																									
L 121+48	1125																									
	1125	1124										16														
DET1 15+50	T0631																									
	T0631	T0632																		68						
DET2 20+80	T0634																									
	T0634	T0633																								
DET1 20+81	T0635																									
	T0635	T0634																		36						
DET1 20+81	T0636																									
	T0636	T0635																		32						
DET1 23+38	T0637																									
	T0637	T0638																								
	T0639																						232			
	T0640																					68				
DET1 27+98	T0706																									
	T0716																									
	T0716	T0706																		12						
DET3 20+50	D0601																									
	D0601	D0600																								
DET3 27+50	D0603																									
	D0603	D0602																								
SHEET TOTALS												16								248	120	68	232	324		

QUANTITIES FOR DRAINAGE STRUCTURES — NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)

LINE & STATION	FROM	TO	0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28
L 115+15	1078		1	4.1															
L 113+86	1081		1								1				1	1			
	1081	1082																	
L 113+85	1082		1	5.0	3.5														
L 111+42	1085		1	5.0	4.0														
	1085	1004																	
L 120+48	1101		1	0.8													1		
	1101	1053																	
L 121+68	1102		1	1.7													1		
	1102	1101																	
L 122+94	1103		1	4.7															
L 124+35	1104																		
L 124+23	1108																		
Y3RPB 14+25	1113		1														1		
L 127+74	1114		1															1	
	1114	1113																	
L 128+30	1115																		
	1115	1114																	
L 129+15	1116		1												1	1			
L 130+49	1119																		
L 128+91	1120		1	1.2															
L 129+15	1121		1															1	
	1121	1120																	
L 126+90	1122		1															1	
	1122	1114																	
L 126+91	1123		1								1				1	1			
	1123	1122																	
L 121+42	1124																		
L 121+48	1125		1	0.8														1	
	1125	1124																	
DET1 15+50	T0631		1															1	
	T0631	T0632																	
DET2 20+80	T0634		1															1	
	T0634	T0633																	
DET1 20+81	T0635		1															1	
	T0635	T0634																	
DET1 20+81	T0636		1															1	
	T0636	T0635																	
DET1 23+38	T0637		1															1	
	T0637	T0638																	
	T0639																		
	T0640																		
DET1 27+98	T0706		1																
	T0716		1															1	
	T0716	T0706																	
DET3 20+50	D0601		1															1	
	D0601	D0600																	
DET3 27+50	D0603		1															1	
	D0603	D0602																	
SHEET TOTALS			24	23.3	7.5						2				3	3	3	12	

LINE & STATION	FROM	TO	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	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE	##" SPRING BOX PIPE	SPRING BOX STD. 840.41	15" ELBOWS	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
L 115+15	1078														1									1					
L 113+86	1081																												CONCRETE TRANSITIONAL SECTION
	1081	1082																											
L 113+85	1082														1									1					
L 111+42	1085																						1	1					
	1085	1004																										115	REMOVE EX. 42" RCP
L 120+48	1101							1																					
	1101	1053																											
L 121+68	1102							1																					
	1102	1101																											
L 122+94	1103												1											1					
L 124+35	1104																												ADJUST MH
L 124+23	1108																												STUB-PIPE OUT
Y3RPB 14+25	1113							1																					
L 127+74	1114							1																					
	1114	1113																											
L 128+30	1115														1									1					
	1115	1114																											
L 129+15	1116																												
L 130+49	1119																												STUB-PIPE OUT
L 128+91	1120														1									1					
L 129+15	1121							1																					
	1121	1120																											
L 126+90	1122							1																					
	1122	1114																											
L 126+91	1123																												CONCRETE TRANSITIONAL SECTION
	1123	1122																											
L 121+42	1124																									0.3990			
L 121+48	1125							1																					
	1125	1124																											
DET1 15+50	T0631							1																					
	T0631	T0632																										68	REMOVE TEMPORARY PIPE
DET2 20+80	T0634									1																			
	T0634	T0633																				2						32	REMOVE TEMPORARY PIPE
DET1 20+81	T0635							1																					
	T0635	T0634																										36	REMOVE TEMPORARY PIPE
DET1 20+81	T0636									1																			
	T0636	T0635																										32	REMOVE TEMPORARY PIPE
DET1 23+38	T0637							1																					
	T0637	T0638																				2						76	REMOVE TEMPORARY PIPE
	T0639																											232	REMOVE TEMPORARY PIPE
	T0640																											68	REMOVE TEMPORARY PIPE
DET1 27+98	T0706														1									1					
	T0716							1																					
	T0716	T0706																										12	REMOVE TEMPORARY PIPE
DET3 20+50	D0601							1																					
	D0601	D0600																										80	REMOVE TEMPORARY PIPE
DET3 27+50	D0603							1																					
	D0603	D0602																				2						44	REMOVE TEMPORARY PIPE
SHEET TOTALS								13		2			1		5							6	1	7		0.3990		795	

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

DBOCKER-7

COMPUTED BY:	TLR/JPS	DATE:	11/2/2016
CHECKED BY:	DPB	DATE:	3-20-17

PROJECT NO.	SHEET NO.
U-3330	3D-8

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, CSP, CAAP, or HDPE)	12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
SHEET TOTALS													
PROJECT TOTALS		2112	1128	1880	1472	348	396						

C. S. PIPE	12 (.064)	15 (.064)	18 (.064)	24 (.064)	30 (.079)	36 (.079)	42 (.109)	48 (.109)
SHEET TOTALS								
PROJECT TOTALS								

R. C. PIPE CLASS III	12	15	18	24	30	36	42	48
SHEET TOTALS								
PROJECT TOTALS		16		24				

R. C. PIPE CLASS IV	12	15	18	24	30	36	42	48
SHEET TOTALS								
PROJECT TOTALS		4120	652	1124	988	524	524	360

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	
SHEET TOTALS								
PROJECT TOTALS	167	196.9		24	3	10	11	

	CONCRETE TRANSITIONAL SECTION: D.I. STD. 852.04 OR STD. 852.06	CONCRETE TRANSITIONAL SECTION: C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. 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
SHEET TOTALS													
PROJECT TOTALS	20		1		22	22	29	48					

	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	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE
SHEET TOTALS													
PROJECT TOTALS		67		14			18		20	4			

	##" SPRING BOX PIPE	SPRING BOX STD. 840.41	15" ELBOWS	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
SHEET TOTALS										
PROJECT TOTALS			16	1	38	23	2.9281		3164	

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

DBOCKER-7

COMPUTED BY: TLR/JPS DATE: 11/2/2016

CHECKED BY: DPB DATE: 3/22/2017

PROJECT NO.	SHEET NO.
U-3330	3D-9

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 54 INCHES & OVER)

LINE & STATION	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Side Drain Pipe (RCP, CSP, CAAP, or HDPE) SIZE 54	60	66	72	78	84	THICKNESS OR GAUGE	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	R. C. PIPE CLASS III 54	60	66	72	78	84	R. C. PIPE CLASS IV 54	60	66	72	78	84	R. C. PIPE CLASS V 54	60	66	72	78	84
L 113+70	72 RT	1013		93.2																							24								
		1013	1014		8.1.1	81.0																														
L 113+73	95 RT	1025	1013		81.5	81.1																														
L 115+71	86 RT	1051		89.9																							120								
		1051	1050		81.1	80.7																														
L 115+58	75 RT	1052		94.2																							188								
		1052	1051		83.9	81.1																														
SHEET TOTALS																											24	308							
PROJECT TOTALS																											24	308							

### " R.C. PIPE CULVERTS, CONTRACTOR DESIGN CY	### " R.C. PIPE CULVERTS, CONTRACTOR DESIGN CY	### " R.C. PIPE CULVERTS, CONTRACTOR DESIGN CY	### " x ### " C.S. PIPE ARCH CULVERTS, ### " THICK	### " x ### " C.S. STRUCTURAL PLATE PIPE ARCH, ## GAUGE	66" WELDED STEEL PIPE 0.5" THICK, GRADE B IN SOIL	66" WELDED STEEL PIPE 0.5" THICK, GRADE B NOT IN SOIL	### " WELDED STEEL PIPE ###" THICK, GRADE B (UNDER RR)	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B) A 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	A 10' AND ABOVE LIN. FT.	B	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	M.H. FRAME AND COVER STD. 840.54	JB. STD. 840.31 OR STD. 840.32	##" SLUICE GATE (##" SIZE SLUICE GATE)	MODIFIED CONC. FLUME	PREFORMED SCOUR HOLE (PER EACH)	ENERGY DISSIPATION BASIN	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
																				11.261																	
																				7.868																
																				7.868																
																				26.997																
																				26.997																

ABBREVIATIONS

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

COMPUTED BY: Neil Roberson DATE: 11/17/14 CHECKED BY: Steve Drum DATE: 1/26/17	(11-19-13)	PROJECT NO. U-3330	SHEET NO. 3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
		TOTAL SUBSURFACE DRAINAGE:		SD	0
		CONTINGENCY:		SD	3000
		CONTINGENCY PER DIVISION:		SD	1000
				TOTAL LF:	**4000**

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

SUMMARY OF GEOTEXTILE FOR PAVEMENT STABILIZATION

LINE	Station	Station	SY
CONTINGENCY			3500
		TOTAL SY:	**3500**

SUMMARY OF ROCK PLATING

LINE	Beginning Slope	Approx. Station	Ending Slope	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/3/4	Riprap Class* 1/2/B	SY
-Y2RPA-	2.75	16+90	2.75	17+95	LT	1		250
							TOTAL SY:	**250**

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

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type ASU/AST	Aggregate Thickness INCHES	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
-L-	34+25	35+75	ASU	12	186	268	416		
-L-	41+25	43+25	ASU	12	354	895	1391		
-L-	46+75	49+75	ASU	12	384	680	1057		
-L-	73+25	85+75	ASU	12	2498	4793	7448		
-L-	89+25	106+75	ASU	12	1837	3943	6127		
-L-	109+75	112+25	ASU	12	230	509	792		
-L-	123+75	126+75	ASU	12	278	405	629		
-Y1LPC-	11+75	15+00	ASU	12	335	611	949		
-Y1RPA-	11+75	15+25	ASU	12	115	384	596		
-Y1RPB-	11+00	13+75	ASU	12	221	370	576		
-Y7A-	11+00	11+70	ASU	12	2	71	111		
CONTINGENCY			AST	3			500		500
CONTINGENCY			ASU	12	2000	4000	2500		
				TOTAL CY/TONS/SY:	8440	16929	23092		500
				SAY:	**8500**	**17000**	**23100***		**500**

ASU = Aggregate Subgrade, AST = Aggregate Stabilization
***Total square yards of Geotextile for Soil Stabilization is only the estimated quantity for ASU/AST and may only represent a portion of the geotextile quantity shown in the item Sheet of the Proposal.**

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
U–3330	3P–1
R/W SHEET NO.	

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PARCEL INDEX SHEET

PARCEL NO.	SHEET NO.	PROPERTY OWNERS NAME
1	4	ICHIBAN USA 2, INC.
2	4	CITY OF ROCKY MOUNT
3	4,5	5699 CENTRAL AVENUE, LLC
4	4	RIDGEWAY DEVELOPMENT CORP.
5	4	PATSY W. EZZELL
6	4	JAMES C. & KIMBERLY MOORE
7	4	IRONWOOD RENTALS
8	4	IRONWOOD RENTALS
9	4	MINNIE P. KEARNEY
10	4	LOUIS W. FERRELL
11	5	WILLIE J. THORNE
12	5	JOSEPH E. CAMPBELL JR.
13	5	WJP REALTY
14	5	MICHAEL L. BELLE
15	5	RUTH MOBELY
16	5	WINFRED W. PORTER
17	5	ELSIE E. EDWARDS
18	5	MAGGIE S. SMITH
19	5,12	WAYNE D. NEWNAM
20	5	MICHAEL D. GREENE
21	12	PRESBYTERY OF NEW HOPE
22	5,12	FM TARRYTOWN SD TARRYTOWN LLC
23	5	FM TARRYTOWN SD TARRYTOWN LLC
24	5	FM TARRYTOWN SD TARRYTOWN LLC
25	6	FM TARRYTOWN SD TARRYTOWN LLC
26	6	SAMS REALESTATE BUSINESS TR
26A	12	FM TARRYTOWN SD TARRYTOWN LLC
27	6	SMZ CORP.
28	6	WILLIAM T. WESTCOT JR.
29	6	DAVIS T. MILLER
30	6	JAMES PALIOURAS
31	6	TRI BO PROPERTIES LLC
32	6,7	CAROL W. BILBRO & ALICE J. WILLIAMS
32A	6	RDG REAL ESTATE LLC
33	6	RDG REAL ESTATE LLC
34	6	BODDIE NOELL ENTERPRISES INC
35	6,7	ARCLWRMTNC001, LLC
36	6,7	64NOVO LLC
37	7	NATIONAL PROPERTIES CORP.
38	7	TRUSTEE OF HERMAN INSTRIN
39	8	WAFFLE HOUSE INC.
40	8	THREE RD PROPERTIES LP
41	8	JOHNSON ROCKY MOUNT
42	8	THE MARISSA DIANE MESSER FAMILY TRUST
43	8	WORD TABERNACLE CHURCH
44	8	WILLIAM A. MOORE
45	8	WADE & JOHNNY MEDLIN
46	8,9	JOSEPH T. HOWELL CHRISTOPHER D. HOWELL TRUSTEES

PARCEL NO.	SHEET NO.	PROPERTY OWNERS NAME
47	9	HERNDON HOLDING, INC
48	9	NASH THREE, LLC
49	9	SANDY FLATS, LLC
50	9	LIDL US OPERATIONS, LLC
51	9	JACQUELINE D. MURRAY
52	9	WESTOVR TERRACE II LLC
53	9	OBS INVESTMENTS, LLC
54	9	MEGA FORTUNE LLC
55	9	ROCKY MOUNT M, LLC
56	9,10	ROCKY FIELDS LLC
57	9,10	K M ROCKY MOUNT LLC
58	9,10	WRS SOTHFIELD LLC & MJS SOUTHFIELD LLC
59	10	ROCKY MOUNT M LLC
60	10	DAUGHTRIDGE ENTERPRISES INC.
61	10	COOKOUT ROCKY MOUNT INC.
62	10	COOKOUT ROCKY MOUNT INC.
63	10	JUDITH S. TILLEY
64	10	CD SMITH CONSTRUCTION INC.
65	10	THOMAS G. CLIETT
66	10	CLIETT INC.
67	10	HENDON GOLDENEAST LLC
68	10	RM PROPERTIES
69	10	CLIETT INC.
70	10,11	HAMBONE DOG PROPERTIES LLC
71	10,11	THOMAS G. CLIETT
72	11	GMRIA FLORIDA CORP.
73	11	JAN H. BASS
74	11	KANCOV INVESTMENTS PRTNSHP
75	11	HENDON GOLDENEAST OUT PARCEL LLC

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ekeen

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-3330	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 17265 STEVE ANTHONY DRUM 4/5/2017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL DAVID P. BOCKER 4/5/2017

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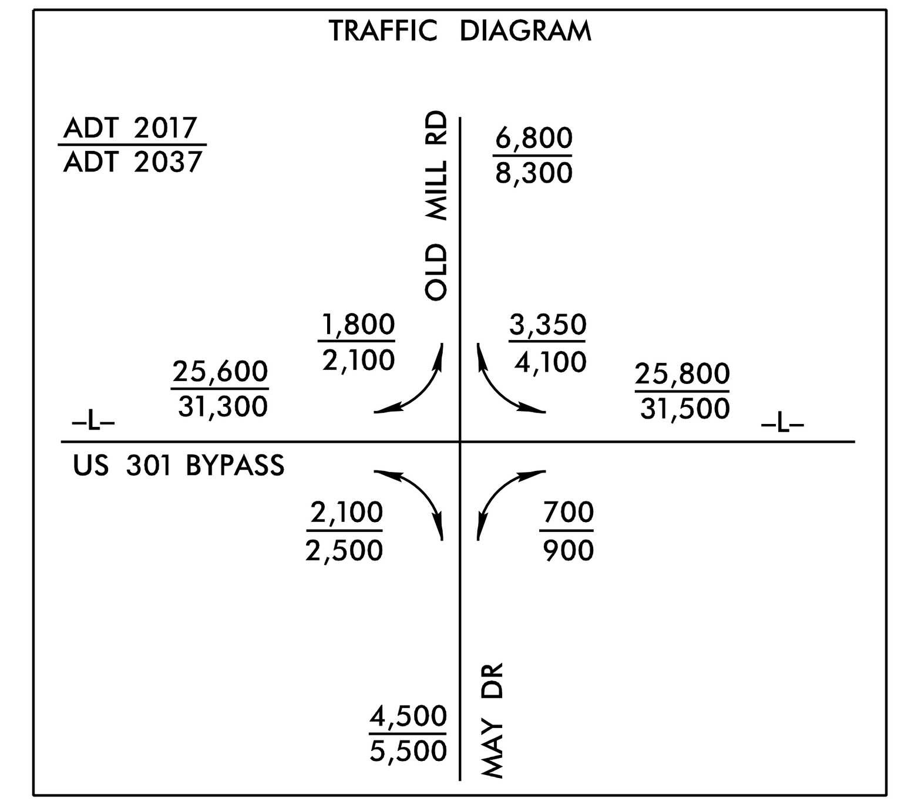

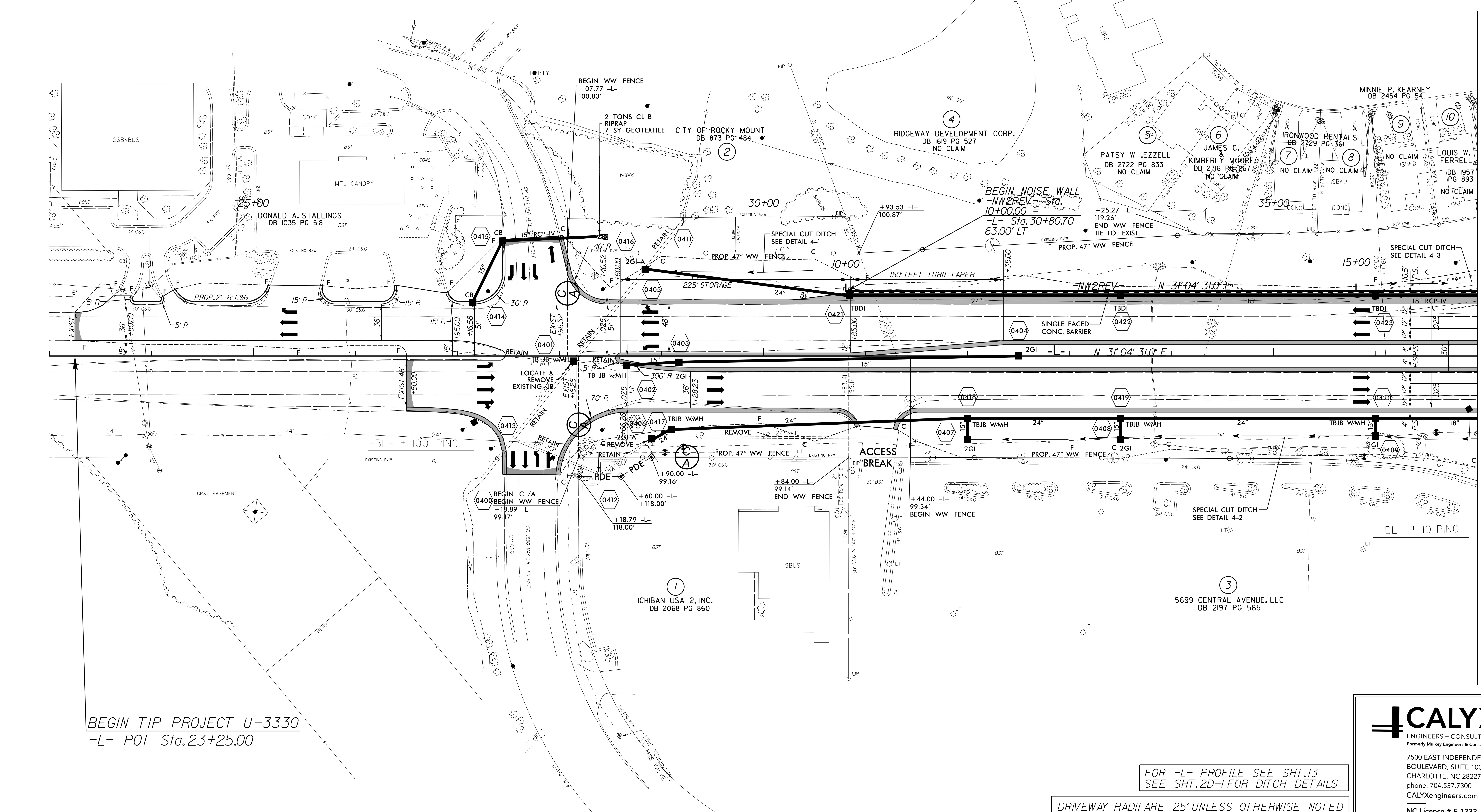

BEGIN TIP PROJECT U-3330
-L- POT Sta.23+25.00

FOR -L- PROFILE SEE SHT.13
SEE SHT.2D-1 FOR DITCH DETAILS

DRIVEWAY RADII ARE 25' UNLESS OTHERWISE NOTED

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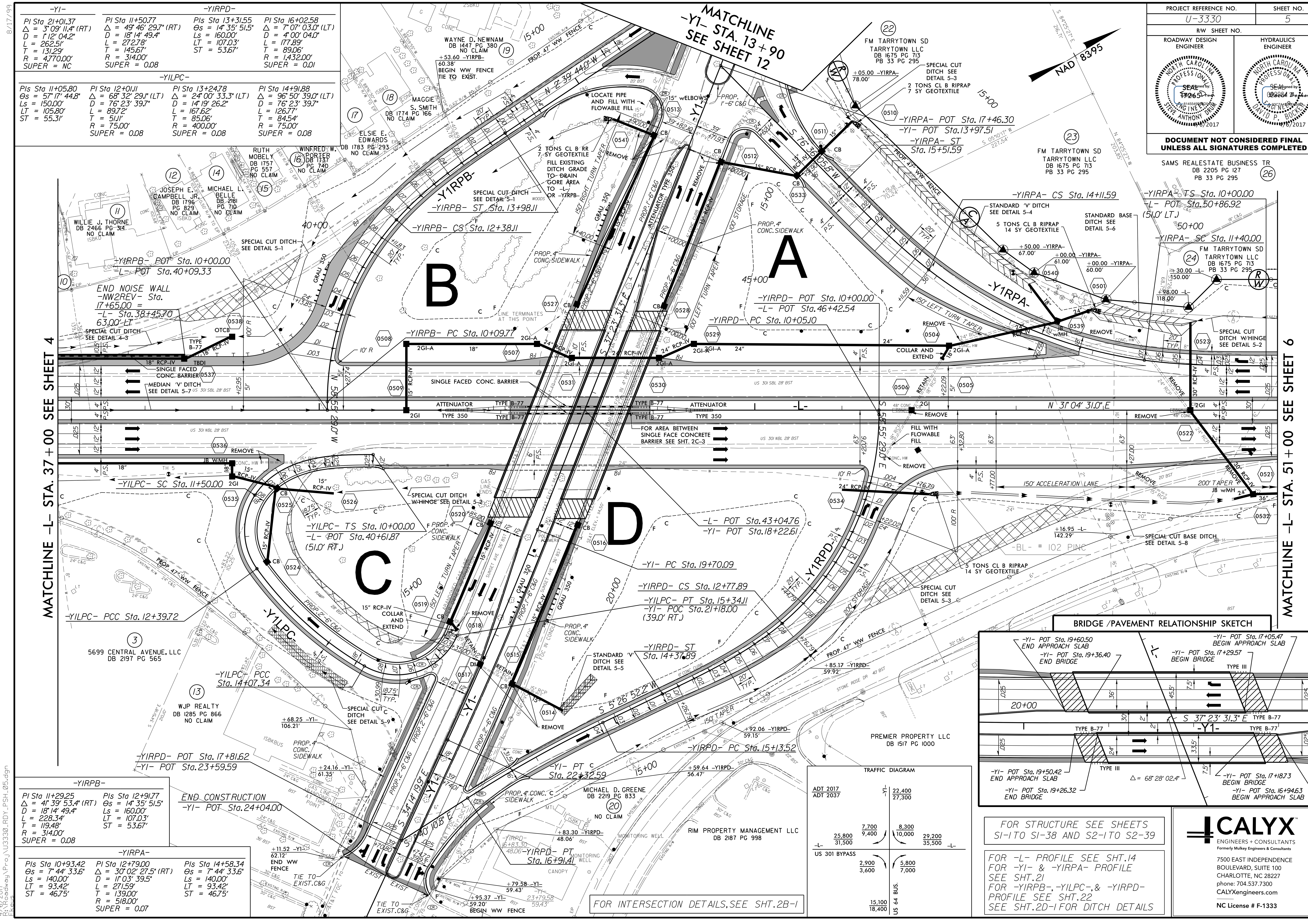

-Y1-
PI Sta 21+01.37
Δ = 3°09' 11.4" (RT)
D = 1°12' 04.2"
L = 262.51'
T = 131.29'
R = 4,770.00'
SUPER = NC
-Y1RPD-
PI Sta 11+50.77
Δ = 49°46' 29.7" (RT)
D = 18°14' 49.4"
L = 272.78'
T = 145.67'
R = 314.00'
SUPER = 0.08
PIs Sta 13+31.55
Θs = 14°35' 51.5"
Ls = 160.00'
LT = 107.03'
ST = 53.67'
PI Sta 16+02.58
Δ = 7°07' 03.0" (LT)
D = 4°00' 04.0"
L = 177.89'
T = 89.06'
R = 1,432.00'
SUPER = 0.01
-Y1LPC-
PIs Sta 11+05.80
Θs = 57°17' 44.8"
Ls = 150.00'
LT = 105.80'
ST = 55.31'
PI Sta 12+01.11
Δ = 68°32' 29.1" (LT)
D = 76°23' 39.7"
L = 89.72'
T = 51.11'
R = 75.00'
SUPER = 0.08
PI Sta 13+24.78
Δ = 24°00' 33.3" (LT)
D = 14°19' 26.2"
L = 167.62'
T = 85.06'
R = 400.00'
SUPER = 0.08
PI Sta 14+91.88
Δ = 96°50' 39.0" (LT)
D = 76°23' 39.7"
L = 126.77'
T = 84.54'
R = 75.00'
SUPER = 0.08
-Y1RPB-
PI Sta 11+29.25
Δ = 41°39' 53.4" (RT)
D = 18°14' 49.4"
L = 228.34'
T = 119.48'
R = 314.00'
SUPER = 0.08
PIs Sta 12+91.77
Θs = 14°35' 51.5"
Ls = 160.00'
LT = 107.03'
ST = 53.67'
-Y1RPA-
PIs Sta 10+93.42
Θs = 7°44' 33.6"
Ls = 140.00'
LT = 93.42'
ST = 46.75'
PI Sta 12+79.00
Δ = 30°02' 27.5" (RT)
D = 11°03' 39.5"
L = 271.59'
T = 139.00'
R = 518.00'
SUPER = 0.07
PIs Sta 14+58.34
Θs = 7°44' 33.6"
Ls = 140.00'
LT = 93.42'
ST = 46.75'
MATCHLINE -Y1- STA. 13+90 SEE SHEET 12
MATCHLINE -L- STA. 37+00 SEE SHEET 4
MATCHLINE -L- STA. 51+00 SEE SHEET 6
NAD 83/95
A
B
C
D
-Y1RPB- POT Sta. 10+00.00
-L- POT Sta. 40+09.33
END NOISE WALL -NW2REV- Sta. 17+65.00 = -L- Sta. 38+45.70 63.00' LT
-Y1RPB- ST Sta. 13+98.11
-Y1RPB- CS Sta. 12+38.11
-Y1RPB- PC Sta. 10+09.77
-Y1RPA- POT Sta. 17+46.30
-Y1- POT Sta. 13+97.51
-Y1RPA- ST Sta. 15+51.59
-Y1RPA- CS Sta. 14+11.59
-Y1RPA- TS Sta. 10+00.00
-L- POT Sta. 50+86.92 (51.0' LT.)
-Y1RPA- SC Sta. 11+40.00
-Y1RPD- POT Sta. 10+00.00
-L- POT Sta. 46+42.54
-Y1RPD- PC Sta. 10+05.10
-Y1LPC- SC Sta. 11+50.00
-Y1LPC- TS Sta. 10+00.00
-L- POT Sta. 40+61.87 (51.0' RT.)
-Y1LPC- PCC Sta. 12+39.72
-Y1LPC- PCC Sta. 14+07.34
-L- POT Sta. 43+04.76
-Y1- POT Sta. 18+22.61
-Y1- PC Sta. 19+70.09
-Y1RPD- CS Sta. 12+77.89
-Y1LPC- PT Sta. 15+34.11
-Y1- POC Sta. 21+18.00 (39.0' RT.)
-Y1RPD- ST Sta. 14+37.89
-Y1RPD- POT Sta. 17+81.62
-Y1- POT Sta. 23+59.59
END CONSTRUCTION -Y1- POT Sta. 24+04.00
-Y1- PT Sta. 22+32.59
-Y1RPD- PC Sta. 15+13.52
-Y1RPD- PT Sta. 16+91.41
N 31°04' 31.0" E
S 37°23' 31.3" E
S 5°26' 52.2" W
N 2°39' 44.0" W
S 76°36' 05.8" W
N 58°55' 29.0" W
S 34°14' 19.9" E
FM TARRYTOWN SD TARRYTOWN LLC DB 1675 PG 713 PB 33 PG 295
SAMS REALESTATE BUSINESS TR DB 2205 PG 127 PB 33 PG 295
WAYNE D. NEWNAM DB 1447 PG 380 NO CLAIM
MAGGIE S. SMITH DB 1774 PG 166 NO CLAIM
ELSIE E. EDWARDS DB 1783 PG 293 NO CLAIM
RUTH MOBELY DB 1757 PG 557 NO CLAIM
WINFRED W. PORTER DB 1137 PG 740 NO CLAIM
JOSEPH E. CAMPBELL JR. DB 1796 PG 829 NO CLAIM
MICHAEL L. BELLE DB 2181 PG 710 NO CLAIM
WILLIE J. THORNE DB 2466 PG 314 NO CLAIM
5699 CENTRAL AVENUE, LLC DB 2197 PG 565
WJP REALTY DB 1285 PG 866 NO CLAIM
MICHAEL D. GREENE DB 2219 PG 833 NO CLAIM
RIM PROPERTY MANAGEMENT LLC DB 2187 PG 998
PREMIER PROPERTY LLC DB 1517 PG 1000
BRIDGE /PAVEMENT RELATIONSHIP SKETCH
-Y1- POT Sta. 19+60.50 END APPROACH SLAB
-Y1- POT Sta. 19+36.40 END BRIDGE
-Y1- POT Sta. 17+05.47 BEGIN APPROACH SLAB
-Y1- POT Sta. 17+29.57 BEGIN BRIDGE
-Y1- POT Sta. 19+50.42 END APPROACH SLAB
-Y1- POT Sta. 19+26.32 END BRIDGE
-Y1- POT Sta. 17+18.73 BEGIN BRIDGE
-Y1- POT Sta. 16+94.63 BEGIN APPROACH SLAB
Δ = 68°28' 02.4"
TRAFFIC DIAGRAM
ADT 2017
ADT 2037

PROJECT REFERENCE NO.	SHEET NO.
U-3330	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — SEAL 17265 — STEVE ANTHONY DRUM — 4/6/2017

HYDRAULICS ENGINEER — SEAL — DAVID P. BOCKER — 4/6/2017

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FOR STRUCTURE SEE SHEETS S1-1 TO S1-38 AND S2-1 TO S2-39

FOR -L- PROFILE SEE SHT.14
FOR -Y1- & -Y1RPA- PROFILE SEE SHT.21
FOR -Y1RPB-, -Y1LPC-, & -Y1RPD- PROFILE SEE SHT.22
SEE SHT.2D-1 FOR DITCH DETAILS

FOR INTERSECTION DETAILS, SEE SHT.2B-1

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4/6/2017
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PROJECT REFERENCE NO.	SHEET NO.
U-3330	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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-Y5-

PI Sta 11+04.34
△ = 13° 43' 27.8" (RT)
D = 14° 23' 45.3"
L = 95.34'
T = 47.90'
R = 398.00'
SUPER = EXIST.

TRAFFIC DIAGRAM (Tarrytown Dr / Lawrence Cir / US 301 Bypass)

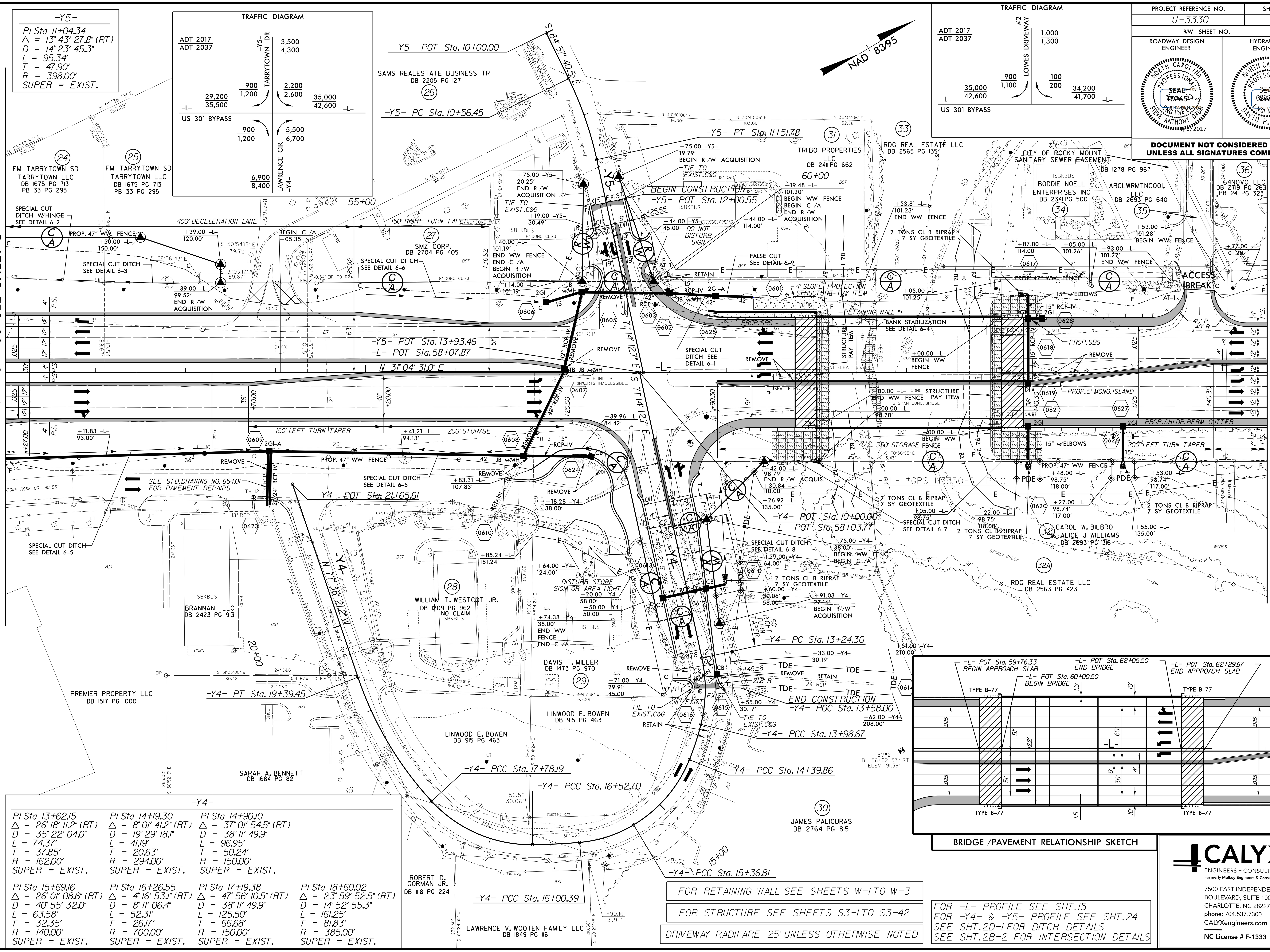
ADT 2017 / ADT 2037

-Y5- TARRYTOWN DR: 3,500 / 4,300; 900 / 1,200; 2,200 / 2,600
-L- US 301 BYPASS: 29,200 / 35,500; 35,000 / 42,600
900 / 1,200; 5,500 / 6,700
LAWRENCE CIR -Y4-: 6,900 / 8,400

TRAFFIC DIAGRAM (Lowes Driveway #2)

ADT 2017 / ADT 2037

LOWES DRIVEWAY #2: 1,000 / 1,300; 900 / 1,100; 100 / 200
-L- US 301 BYPASS: 35,000 / 42,600; 34,200 / 41,700



NAD 83/95
MATCHLINE -L- STA. 51+00 SEE SHEET 5
MATCHLINE -L- STA. 65+00 SEE SHEET 7
-Y5- POT Sta. 10+00.00
-Y5- PC Sta. 10+56.45
-Y5- PT Sta. 11+51.78
BEGIN CONSTRUCTION -Y5- POT Sta. 12+00.55
-Y5- POT Sta. 13+93.46
-L- POT Sta. 58+07.87
N 31° 04' 31.0" E
-Y4- POT Sta. 21+65.61
-Y4- POT Sta. 10+00.00
-L- POT Sta. 58+03.77
-Y4- PT Sta. 19+39.45
-Y4- PC Sta. 13+24.30
END CONSTRUCTION -Y4- POC Sta. 13+58.00
-Y4- PCC Sta. 13+98.67
-Y4- PCC Sta. 14+39.86
-Y4- PCC Sta. 17+78.19
-Y4- PCC Sta. 16+52.70
-Y4- PCC Sta. 15+36.81
-Y4- PCC Sta. 16+00.39
SAMS REALESTATE BUSINESS TR DB 2205 PG 127
FM TARRYTOWN SD TARRYTOWN LLC DB 1675 PG 713 PB 33 PG 295
SMZ CORP. DB 2704 PG 405
TRIBO PROPERTIES LLC DB 2411 PG 662
RDG REAL ESTATE LLC DB 2565 PG 135
CITY OF ROCKY MOUNT SANITARY SEWER EASEMENT DB 1278 PG 967
BODDIE NOELL ENTERPRISES INC DB 2341 PG 500
ARCLWRMTNCOOL LLC DB 2693 PG 640
64NOVO LLC DB 2719 PG 263 PB 24 PG 323
WILLIAM T. WESTCOT JR. DB 1209 PG 962 NO CLAIM
BRANNAN I LLC DB 2423 PG 913
PREMIER PROPERTY LLC DB 1517 PG 1000
DAVIS T. MILLER DB 1473 PG 970
LINWOOD E. BOWEN DB 915 PG 463
SARAH A. BENNETT DB 1684 PG 821
ROBERT D. GORMAN JR. DB 1118 PG 224
LAWRENCE V. WOOTEN FAMILY LLC DB 1849 PG 116
JAMES PALIOURAS DB 2764 PG 815
CAROL W. BILBRO ALICE J WILLIAMS DB 2693 PG 316
RDG REAL ESTATE LLC DB 2563 PG 423
400' DECELERATION LANE
150' RIGHT TURN TAPER
150' LEFT TURN TAPER
200' STORAGE
350' STORAGE
200' LEFT TURN TAPER
SEE STD.DRAWING NO. 654.01 FOR PAVEMENT REPAIRS
4' SLOPE PROTECTION STRUCTURE PAY ITEM
BANK STABILIZATION SEE DETAIL 6-4
ACCESS BREAK
STONEY CREEK

BRIDGE /PAVEMENT RELATIONSHIP SKETCH

-L- POT Sta. 59+76.33 BEGIN APPROACH SLAB
-L- POT Sta. 60+00.50 BEGIN BRIDGE
-L- POT Sta. 62+05.50 END BRIDGE
-L- POT Sta. 62+29.67 END APPROACH SLAB
TYPE B-77

-Y4-

PI Sta 13+62.15	PI Sta 14+19.30	PI Sta 14+90.10	
△ = 26° 18' 11.2" (RT)	△ = 8° 01' 41.2" (RT)	△ = 37° 01' 54.5" (RT)	
D = 35° 22' 04.0"	D = 19° 29' 18.1"	D = 38° 11' 49.9"	
L = 74.37'	L = 41.19'	L = 96.95'	
T = 37.85'	T = 20.63'	T = 50.24'	
R = 162.00'	R = 294.00'	R = 150.00'	
SUPER = EXIST.	SUPER = EXIST.	SUPER = EXIST.	
PI Sta 15+69.16	PI Sta 16+26.55	PI Sta 17+19.38	PI Sta 18+60.02
△ = 26° 01' 08.6" (RT)	△ = 4° 16' 53.1" (RT)	△ = 47° 56' 10.5" (RT)	△ = 23° 59' 52.5" (RT)
D = 40° 55' 32.0"	D = 8° 11' 06.4"	D = 38° 11' 49.9"	D = 14° 52' 55.3"
L = 63.58'	L = 52.31'	L = 125.50'	L = 161.25'
T = 32.35'	T = 26.17'	T = 66.68'	T = 81.83'
R = 140.00'	R = 700.00'	R = 150.00'	R = 385.00'
SUPER = EXIST.	SUPER = EXIST.	SUPER = EXIST.	SUPER = EXIST.

FOR RETAINING WALL SEE SHEETS W-1 TO W-3

FOR STRUCTURE SEE SHEETS S3-1 TO S3-42

DRIVEWAY RADII ARE 25' UNLESS OTHERWISE NOTED

FOR -L- PROFILE SEE SHT.15
FOR -Y4- & -Y5- PROFILE SEE SHT.24
SEE SHT.2D-1 FOR DITCH DETAILS
SEE SHT.2B-2 FOR INTERSECTION DETAILS

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PROJECT REFERENCE NO.	SHEET NO.
U-3330	7
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — SEAL 17265 — STEVE ANTHONY DRUM — 4/6/2017

HYDRAULICS ENGINEER — SEAL 033354 — DAVID P. BOCKER — 4/6/2017

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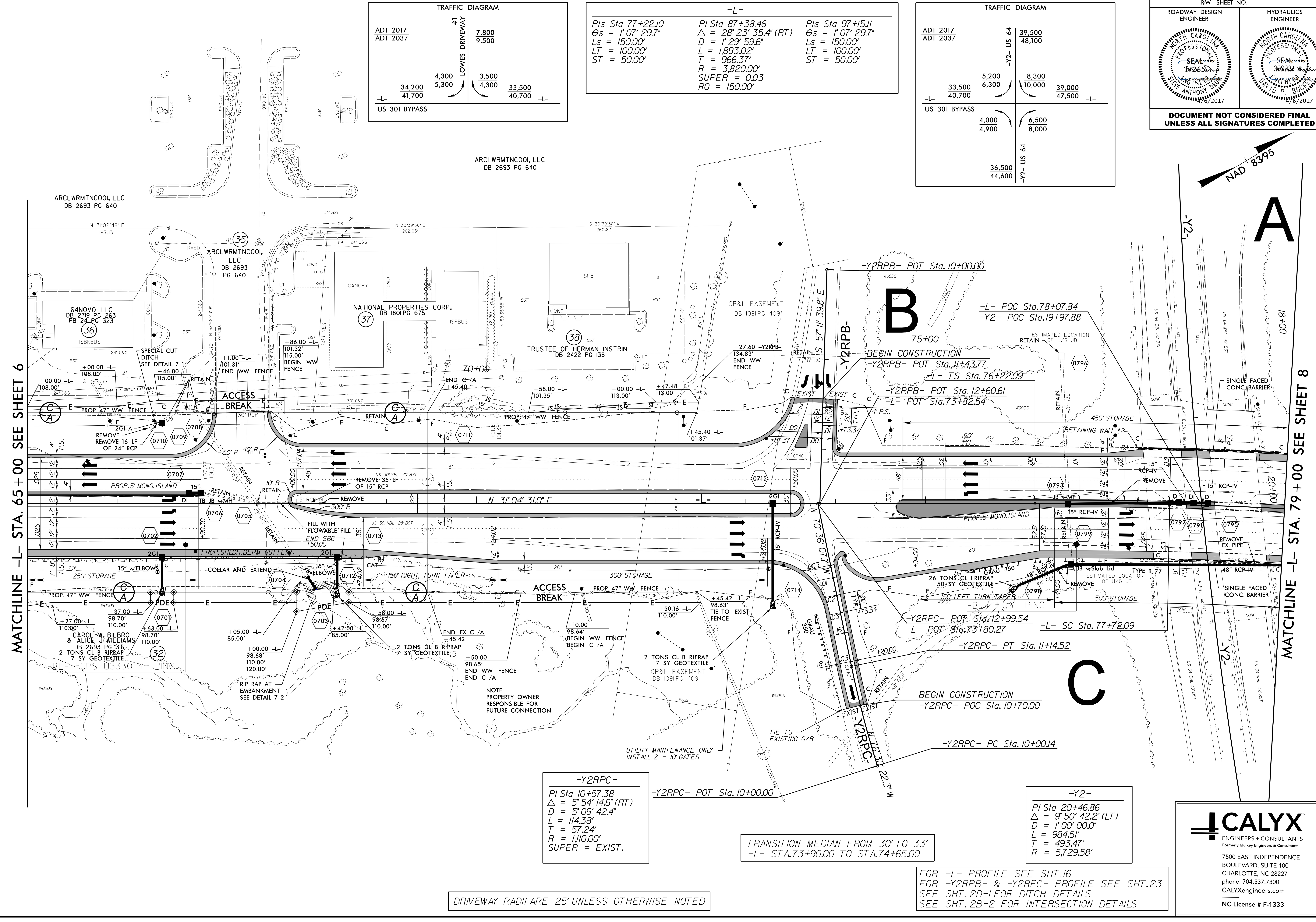

TRAFFIC DIAGRAM
ADT 2017
ADT 2037
LOWES DRIVEWAY #1
7,800
9,500
4,300
5,300
3,500
4,300
34,200
41,700
33,500
40,700
-L-
US 301 BYPASS
TRAFFIC DIAGRAM
-Y2- US 64
39,500
48,100
5,200
6,300
8,300
10,000
33,500
40,700
39,000
47,500
4,000
4,900
6,500
8,000
36,500
44,600
NAD 83/95
A
B
C
ARCLWRMTNCOOI, LLC DB 2693 PG 640
64NOVO LLC DB 2719 PG 263 PB 24 PG 323
NATIONAL PROPERTIES CORP. DB 1801 PG 675
TRUSTEE OF HERMAN INSTRIN DB 2422 PG 138
CAROL W. BILBRO & ALICE J. WILLIAMS DB 2693 PG 316
CP&L EASEMENT DB 1091 PG 409
MATCHLINE -L- STA. 65+00 SEE SHEET 6
MATCHLINE -L- STA. 79+00 SEE SHEET 8
-Y2RPB- POT Sta. 10+00.00
-L- POC Sta.78+07.84
-Y2- POC Sta.19+97.88
BEGIN CONSTRUCTION
-Y2RPB- POT Sta. 11+43.77
-L- TS Sta. 76+22.09
-Y2RPB- POT Sta. 12+60.61
-L- POT Sta.73+82.54
-Y2RPC- POT Sta. 12+99.54
-L- POT Sta.73+80.27
-L- SC Sta. 77+72.09
-Y2RPC- PT Sta. 11+14.52
BEGIN CONSTRUCTION
-Y2RPC- POC Sta. 10+70.00
-Y2RPC- PC Sta. 10+00.14
-Y2RPC- POT Sta. 10+00.00
ACCESS BREAK
450' STORAGE
500' STORAGE
250' STORAGE
300' STORAGE
150' RIGHT TURN TAPER
150' LEFT TURN TAPER
PROP. 5' MONO. ISLAND
PROP. SHLDR. BERM GUTTER
SINGLE FACED CONC. BARRIER
RETAINING WALL #2
NOTE: PROPERTY OWNER RESPONSIBLE FOR FUTURE CONNECTION
UTILITY MAINTENANCE ONLY INSTALL 2 - 10' GATES
TIE TO EXISTING G/R
RIP RAP AT EMBANKMENT SEE DETAIL 7-2
SPECIAL CUT DITCH SEE DETAIL 7-1
2 TONS CL B RIPRAP 7 SY GEOTEXTILE
26 TONS CL I RIPRAP 50 SY GEOTEXTILE

-L-		
PIs Sta 77+22.10	PI Sta 87+38.46	PIs Sta 97+15.11
Θs = 1°07' 29.7"	Δ = 28° 23' 35.4" (RT)	Θs = 1°07' 29.7"
Ls = 150.00'	D = 1° 29' 59.6"	Ls = 150.00'
LT = 100.00'	L = 1,893.02'	LT = 100.00'
ST = 50.00'	T = 966.37'	ST = 50.00'
	R = 3,820.00'	
	SUPER = 0.03	
	RO = 150.00'	

-Y2RPC-
PI Sta 10+57.38
Δ = 5° 54' 14.6" (RT)
D = 5° 09' 42.4"
L = 114.38'
T = 57.24'
R = 1,110.00'
SUPER = EXIST.

-Y2-
PI Sta 20+46.86
Δ = 9° 50' 42.2" (LT)
D = 1° 00' 00.0"
L = 984.51'
T = 493.47'
R = 5,729.58'

TRANSITION MEDIAN FROM 30' TO 33'
-L- STA.73+90.00 TO STA.74+65.00

DRIVEWAY RADII ARE 25' UNLESS OTHERWISE NOTED

FOR -L- PROFILE SEE SHT.16
FOR -Y2RPB- & -Y2RPC- PROFILE SEE SHT.23
SEE SHT. 2D-1 FOR DITCH DETAILS
SEE SHT. 2B-2 FOR INTERSECTION DETAILS

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4/5/2017 R:\Roadway\Proj\U3330_RDY_PSH_07.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-3330	8

R/W SHEET NO.

ROADWAY DESIGN ENGINEER — HYDRAULICS ENGINEER

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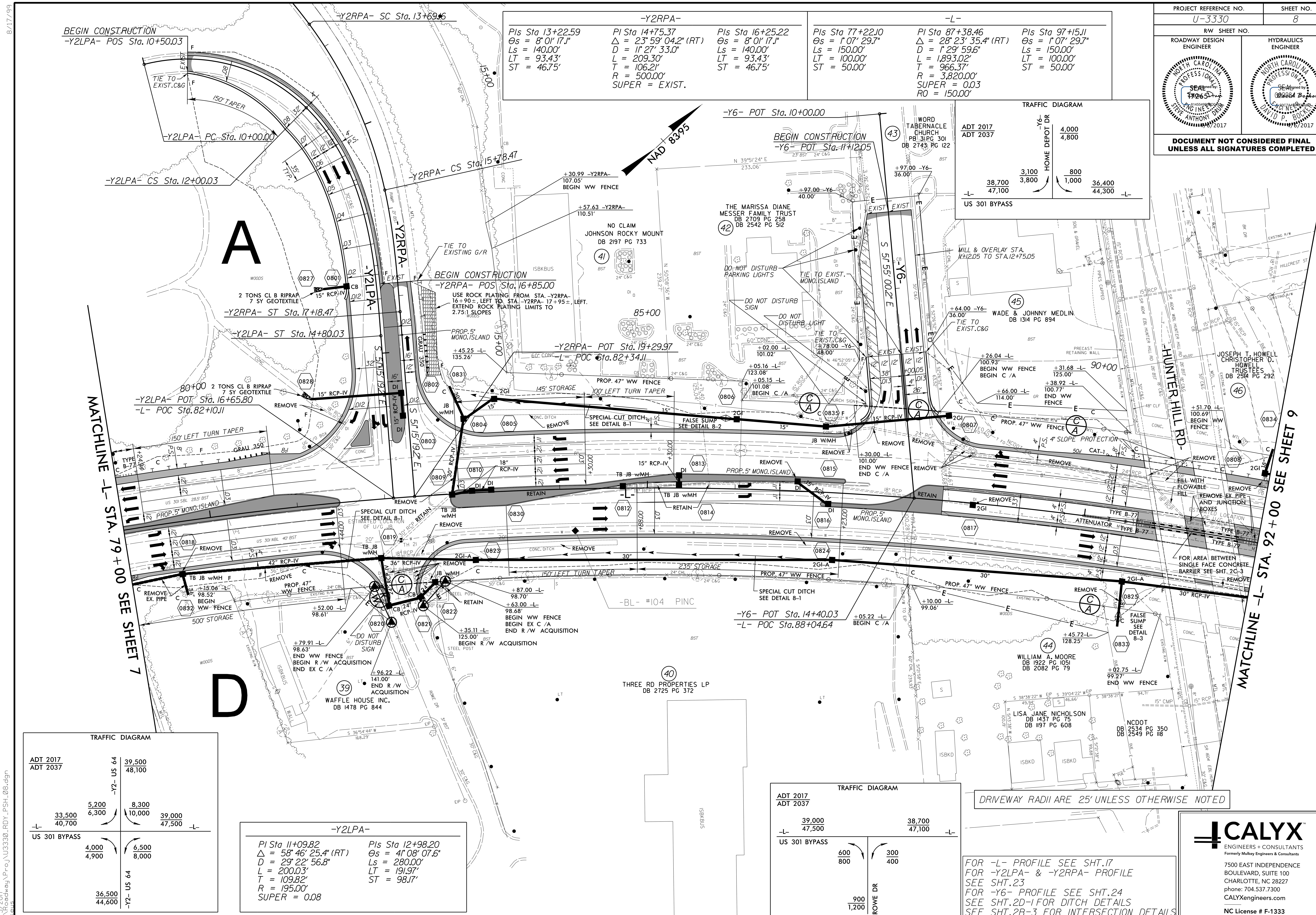

-Y2RPA-

PIs Sta 13+22.59	PI Sta 14+75.37	PIs Sta 16+25.22
Θs = 8° 01' 17.1"	△ = 23° 59' 04.2" (RT)	Θs = 8° 01' 17.1"
Ls = 140.00'	D = 11° 27' 33.0"	Ls = 140.00'
LT = 93.43'	L = 209.30'	LT = 93.43'
ST = 46.75'	T = 106.21'	ST = 46.75'
	R = 500.00'	
	SUPER = EXIST.	

-L-

PIs Sta 77+22.10	PI Sta 87+38.46	PIs Sta 97+15.11
Θs = 1° 07' 29.7"	△ = 28° 23' 35.4" (RT)	Θs = 1° 07' 29.7"
Ls = 150.00'	D = 1° 29' 59.6"	Ls = 150.00'
LT = 100.00'	L = 1,893.02'	LT = 100.00'
ST = 50.00'	T = 966.37'	ST = 50.00'
	R = 3,820.00'	
	SUPER = 0.03	
	RO = 150.00'	

-Y2LPA-

PI Sta 11+09.82	PIs Sta 12+98.20
△ = 58° 46' 25.4" (RT)	Θs = 41° 08' 07.6"
D = 29° 22' 56.8"	Ls = 280.00'
L = 200.03'	LT = 191.97'
T = 109.82'	ST = 98.17'
R = 195.00'	
SUPER = 0.08	

TRAFFIC DIAGRAM

ADT 2017 / ADT 2037

-Y6- HOME DEPOT DR: 4,000 / 4,800; 3,100 / 3,800; 800 / 1,000

-L- US 301 BYPASS: 38,700 / 47,100; 36,400 / 44,300

TRAFFIC DIAGRAM

ADT 2017 / ADT 2037

-Y2- US 64: 39,500 / 48,100; 5,200 / 6,300; 8,300 / 10,000; 4,000 / 4,900; 6,500 / 8,000; 36,500 / 44,600

-L- US 301 BYPASS: 33,500 / 40,700; 39,000 / 47,500

TRAFFIC DIAGRAM

ADT 2017 / ADT 2037

-L- US 301 BYPASS: 39,000 / 47,500; 38,700 / 47,100

ROWE DR: 600 / 800; 300 / 400; 900 / 1,200

FOR -L- PROFILE SEE SHT.17
FOR -Y2LPA- & -Y2RPA- PROFILE SEE SHT.23
FOR -Y6- PROFILE SEE SHT.24
SEE SHT.2D-1 FOR DITCH DETAILS
SEE SHT.2B-3 FOR INTERSECTION DETAILS

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PROJECT REFERENCE NO.	SHEET NO.
U-3330	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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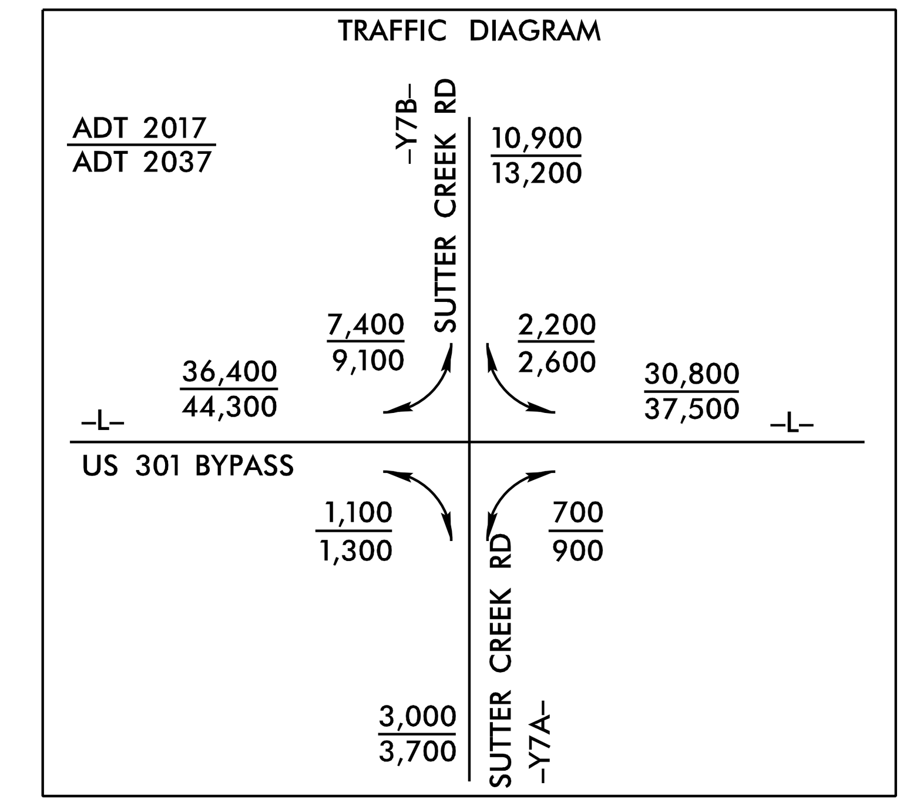
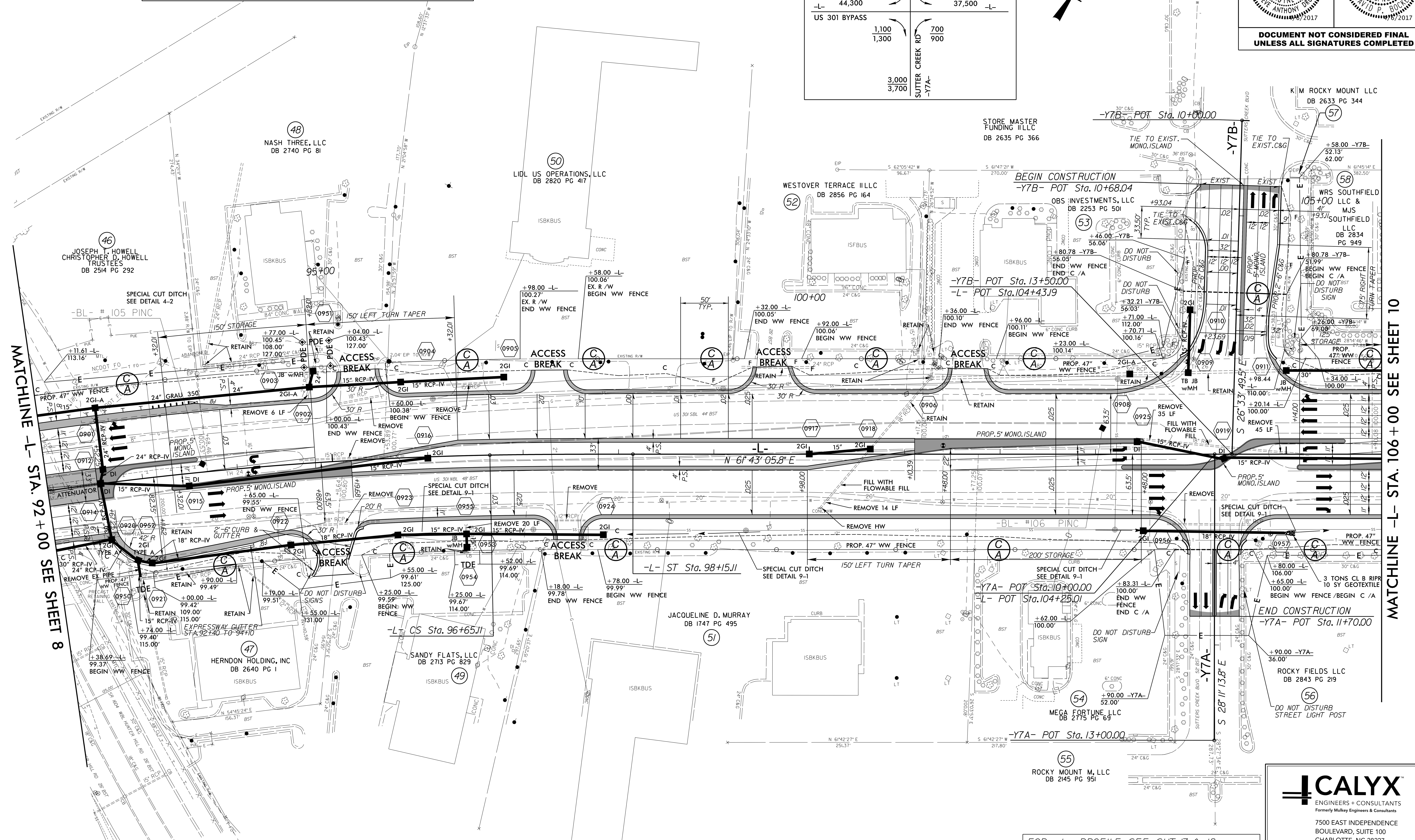
-L-

PIs Sta 77+22.10	PI Sta 87+38.46	PIs Sta 97+15.11
Θs = 1° 07' 29.7"	Δ = 28° 23' 35.4" (RT)	Θs = 1° 07' 29.7"
Ls = 150.00'	D = 1° 29' 59.6"	Ls = 150.00'
LT = 100.00'	L = 1,893.02'	LT = 100.00'
ST = 50.00'	T = 966.37'	ST = 50.00'
	R = 3,820.00'	
	SUPER = 0.03	
	RO = 150.00'	

TRAFFIC DIAGRAM





FOR -L- PROFILE SEE SHT. 17 & 18
FOR -Y7A- & -Y7B- PROFILE SEE SHT. 24
SEE SHT. 2D-1 FOR DITCH DETAILS
SEE SHT. 2B-4 FOR INTERSECTION DETAILS

DRIVEWAY RADII ARE 25' UNLESS OTHERWISE NOTED

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PROJECT REFERENCE NO.	SHEET NO.
U-3330	10
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 17265 STEVE ANTHONY DRUM 4/5/2017	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL DAVID P. BOCKER 4/5/2017

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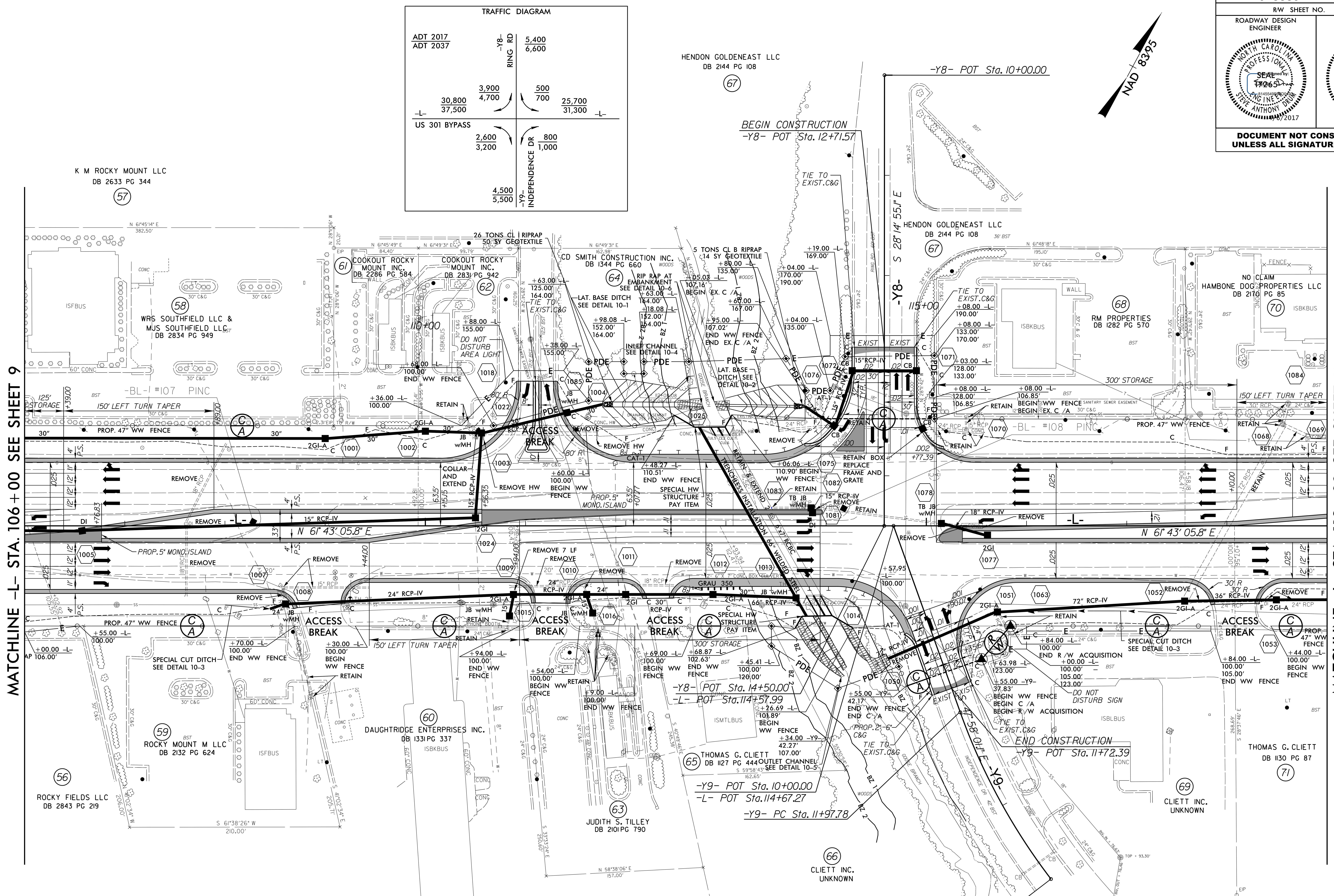

-Y9-
PI Sta 12+93.66
Δ = 17° 43' 17.2" (LT)
D = 9° 18' 59.0"
L = 190.22'
T = 95.87'
R = 615.00'
SUPER = EXIST.

-Y9- PT Sta. 13+88.00

FOR CULVERT SEE SHEETS C-1 THROUGH C-11

DRIVEWAY RADII ARE 25' UNLESS OTHERWISE NOTED

FOR -L- PROFILE SEE SHT. 18 & 19
FOR -Y8- & -Y9- PROFILE SEE SHT. 25
SEE SHT. 2D-1 FOR DITCH DETAILS
SEE SHT. 2B-4 FOR INTERSECTION DETAILS

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PROJECT REFERENCE NO.	SHEET NO.
U-3330	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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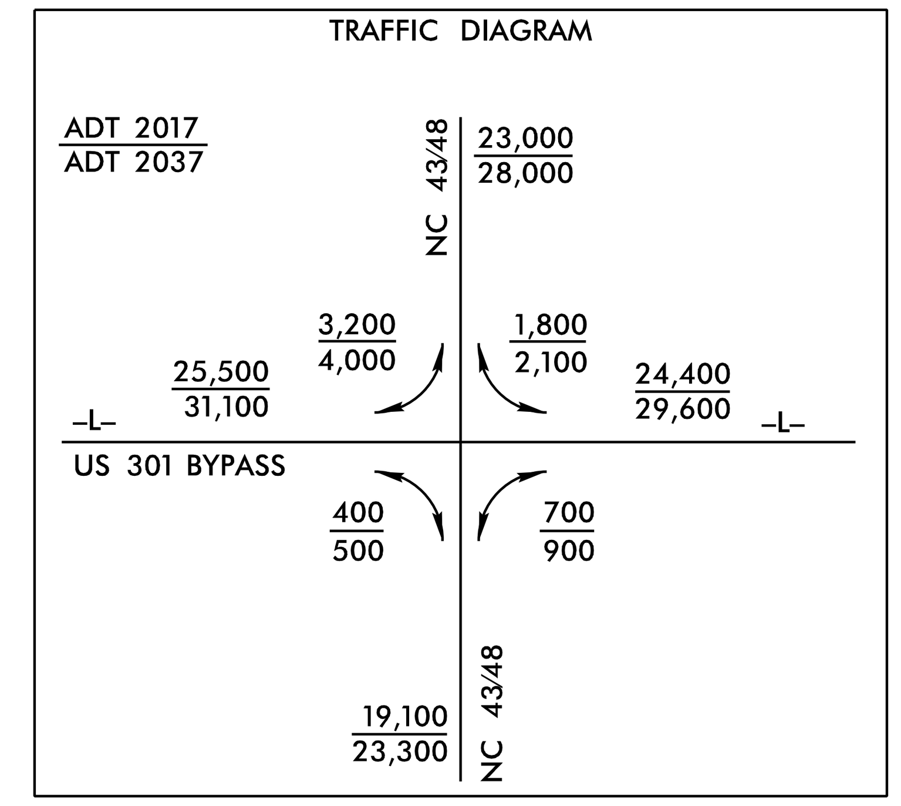
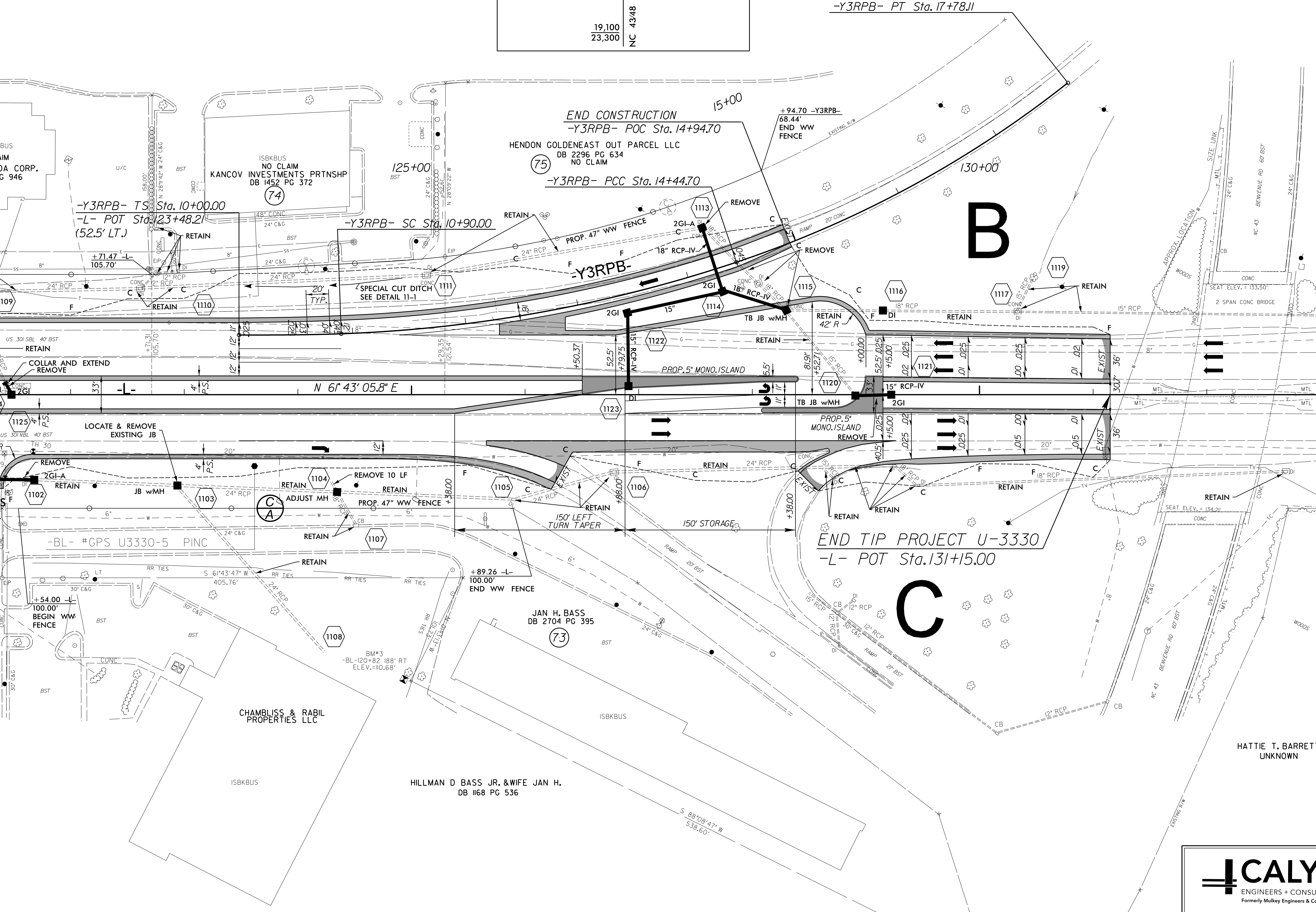
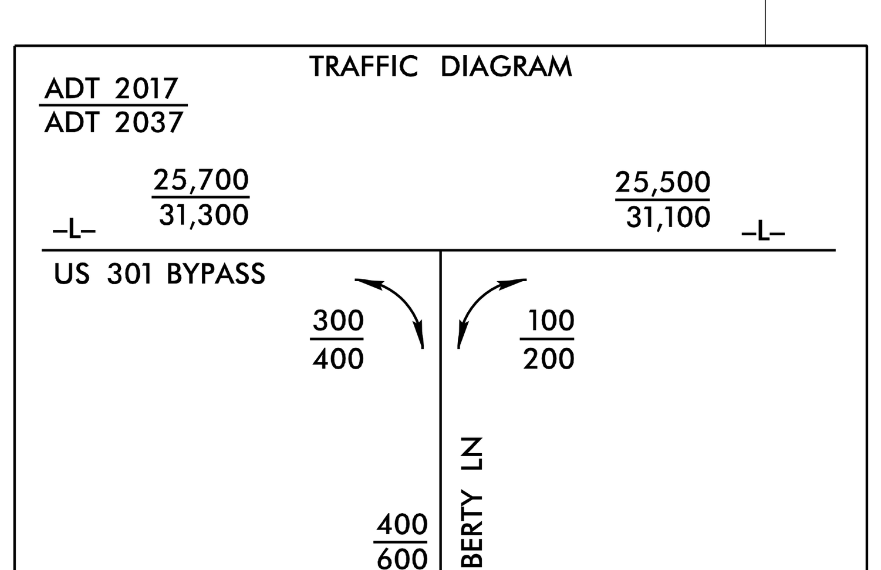
-Y3RPB-

PIs Sta 10+60.00	PI Sta 12+68.57	PI Sta 16+13.10
Θs = 2° 04' 45.4"	Δ = 16° 23' 21.1" (LT)	Δ = 19° 53' 57.1" (LT)
Ls = 90.00'	D = 4° 37' 14.3"	D = 5° 58' 05.9"
LT = 60.00'	L = 354.70'	L = 333.41'
ST = 30.00'	T = 178.57'	T = 168.40'
	R = 1,240.00'	R = 960.00'
	SUPER = 0.045	





NAD 83/95
MATCHLINE -L- STA. 119+00 SEE SHEET 10
NO CLAIM
HAMBONE DOG PROPERTIES LLC
DB 2170 PG 85
ISSTONEBUS
NO CLAIM
GMRIA FLORIDA CORP.
DB 2422 PG 946
ISBKBUS
NO CLAIM
KANCOV INVESTMENTS PRTNSHP
DB 1452 PG 372
HENDON GOLDENEAST OUT PARCEL LLC
DB 2296 PG 634
NO CLAIM
-Y3RPB- PT Sta. 17+78.11
END CONSTRUCTION
-Y3RPB- POC Sta. 14+94.70
-Y3RPB- PCC Sta. 14+44.70
-Y3RPB- TS Sta. 10+00.00
-L- POT Sta. 123+48.21
(52.5' LT.)
-Y3RPB- SC Sta. 10+90.00
+94.70 -Y3RPB-
68.44'
END WW FENCE
150' LEFT TURN TAPER
PROP. 47" WW FENCE
SPECIAL CUT DITCH SEE DETAIL 11-1
COLLAR AND EXTEND
REMOVE
N 61° 43' 05.8" E
PROP. 5" MONO. ISLAND
TB JB wMH
LOCATE & REMOVE EXISTING JB
ADJUST MH
REMOVE 10 LF
ACCESS BREAK
+87.00 -L- 100.00' END WW FENCE
+47.00 -L- 100.00' BEGIN WW FENCE
+94.00 -L- 100.00' END WW FENCE
+54.00 -L- 100.00' BEGIN WW FENCE
+89.26 -L- 100.00' END WW FENCE
150' LEFT TURN TAPER
150' STORAGE
END TIP PROJECT U-3330
-L- POT Sta.131+15.00
-BL- #GPS U3330-5 PINC
BM#3
-BL-120+82 188' RT
ELEV.=110.68'
THOMAS G. CLIETT
DB 1130 PG 87
CHAMBLISS & RABIL PROPERTIES LLC
JAN H. BASS
DB 2704 PG 395
HILLMAN D BASS JR. &WIFE JAN H.
DB 1168 PG 536
HATTIE T. BARRETT
UNKNOWN
B
C



DRIVEWAY RADII ARE 25' UNLESS OTHERWISE NOTED

FOR -L- PROFILE SEE SHT.19 & 20
FOR -Y3RPB- PROFILE SEE SHT.23
SEE SHT.2D-1 FOR DITCH DETAILS

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PROJECT REFERENCE NO.	SHEET NO.
U-3330	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 17265 STEVE ANTHONY DRUM 4/7/2017	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL DAVID P. BOCKER 4/7/2017

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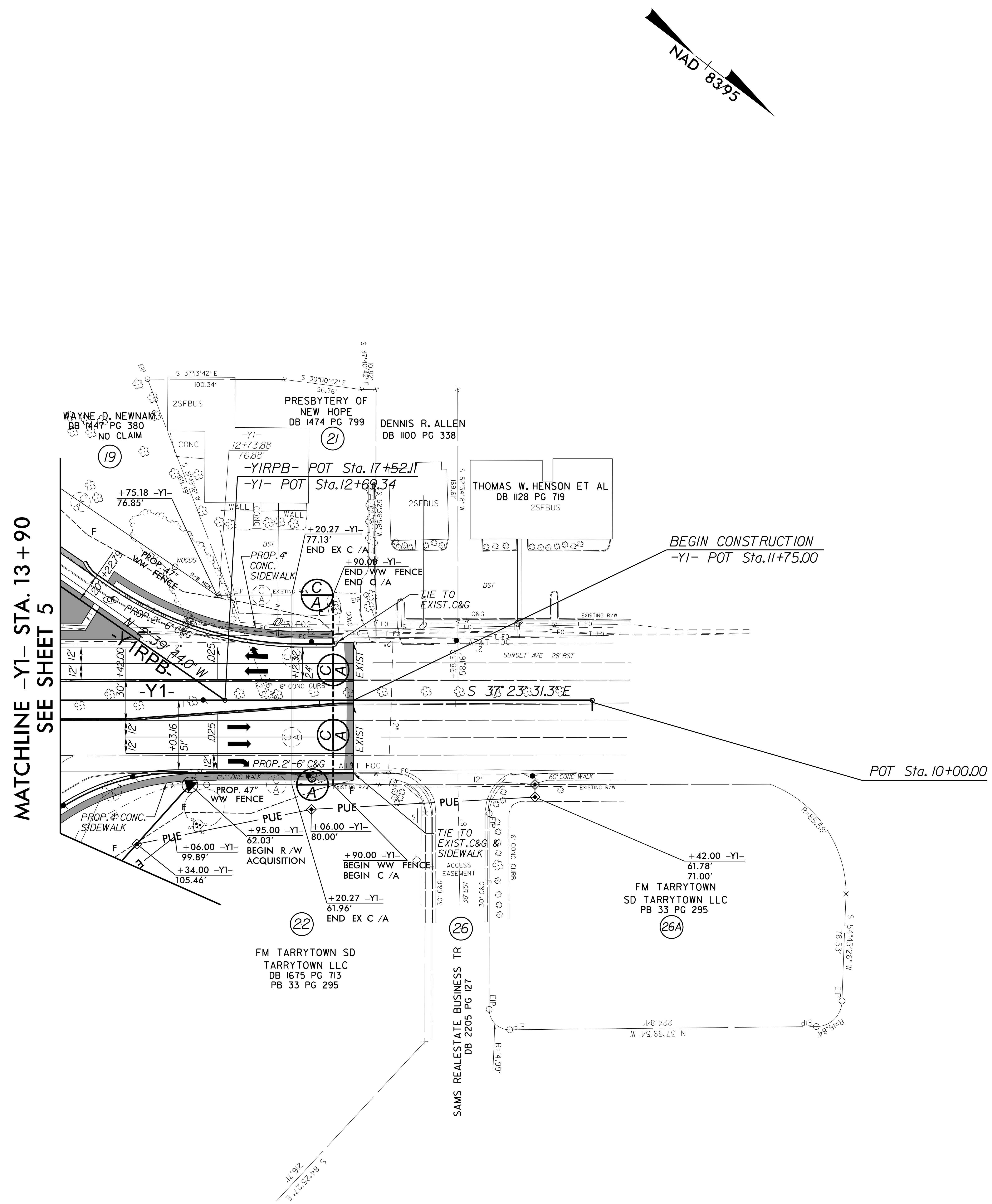

FOR -Y1- PROFILE SEE SHT.21
FOR -YIRPB- PROFILE SEE SHT.22
SEE SHT.2D-1 FOR DITCH DETAILS

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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
U-3330	13
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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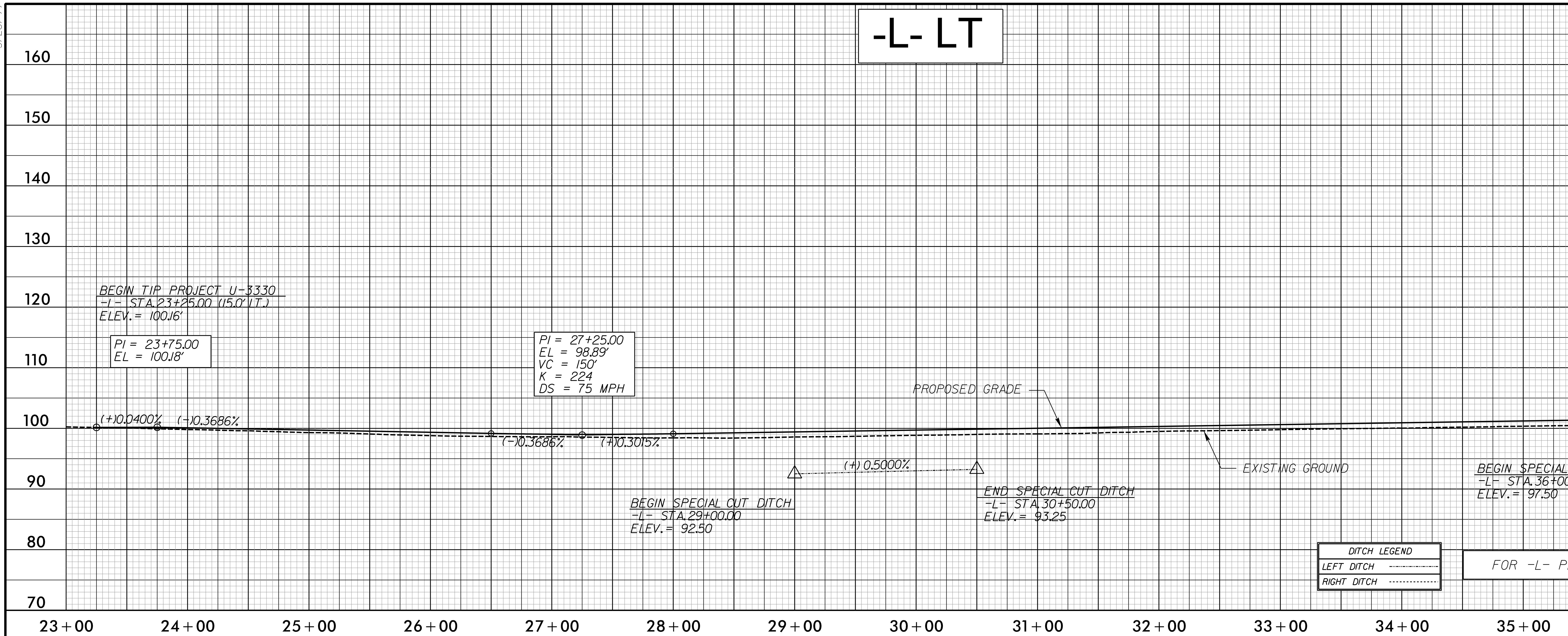

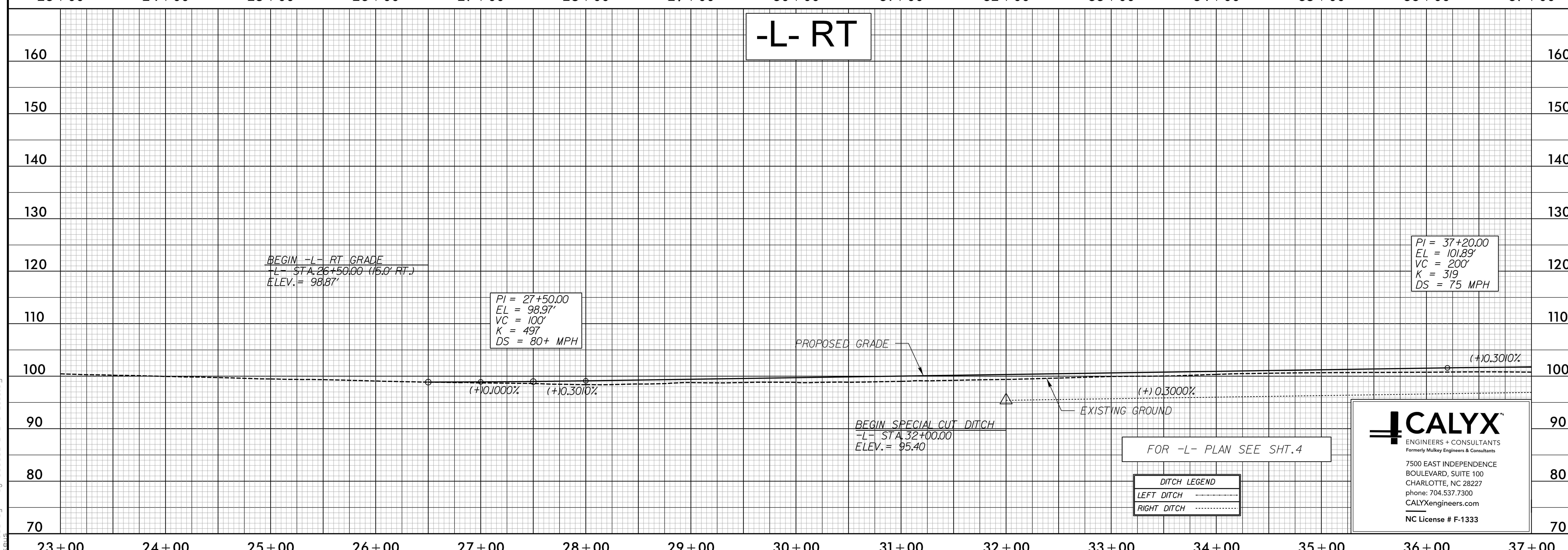

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PROJECT REFERENCE NO.	SHEET NO.
U-3330	14

ROADWAY DESIGN ENGINEER — SEAL 17265 — STEVE ANTHONY DRUM — 4/6/2017

HYDRAULICS ENGINEER — SEAL 033384 — DAVID P. BOCKER — 4/6/2017

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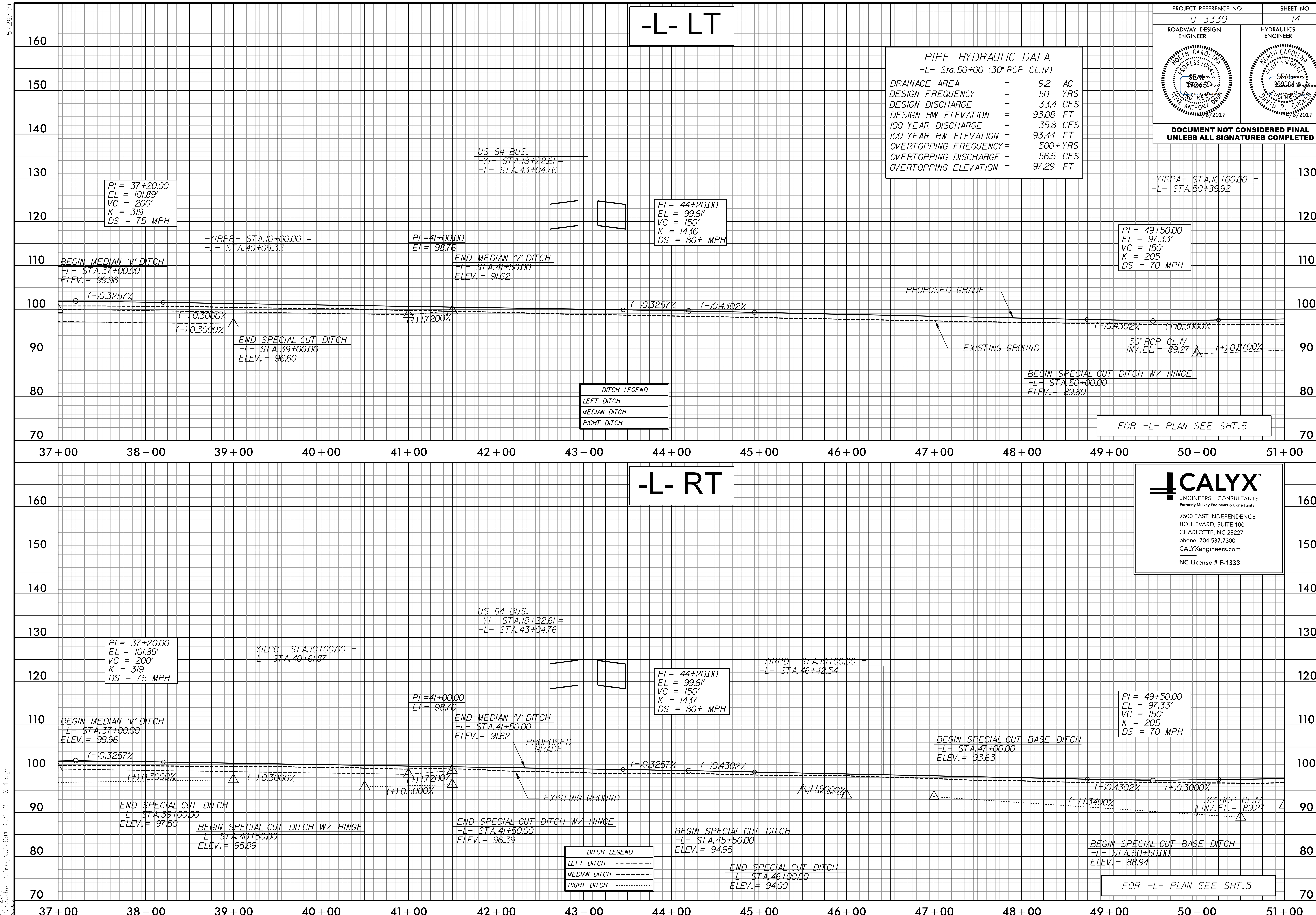
PIPE HYDRAULIC DATA

-L- Sta.50+00 (30" RCP CL.IV)

DRAINAGE AREA	=	9.2	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	33.4	CFS
DESIGN HW ELEVATION	=	93.08	FT
100 YEAR DISCHARGE	=	35.8	CFS
100 YEAR HW ELEVATION	=	93.44	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	56.5	CFS
OVERTOPPING ELEVATION	=	97.29	FT


-L- LT
US 64 BUS.
-Y1- STA.18+22.61 =
-L- STA.43+04.76
PI = 37+20.00
EL = 101.89'
VC = 200'
K = 319
DS = 75 MPH
-YIRPB- STA.10+00.00 =
-L- STA.40+09.33
PI =41+00.00
EI = 98.76
END MEDIAN 'V' DITCH
-L- STA.41+50.00
ELEV.= 91.62
PI = 44+20.00
EL = 99.61'
VC = 150'
K = 1436
DS = 80+ MPH
BEGIN MEDIAN 'V' DITCH
-L- STA.37+00.00
ELEV.= 99.96
(-)0.3257%
(-) 0.3000%
(-)0.3000%
(+) 1.7200%
(-)0.3257%
(-)0.4302%
END SPECIAL CUT DITCH
-L- STA.39+00.00
ELEV.= 96.60
PROPOSED GRADE
EXISTING GROUND
-YIRPA- STA.10+00.00 =
-L- STA.50+86.92
PI = 49+50.00
EL = 97.33'
VC = 150'
K = 205
DS = 70 MPH
(-)0.4302%
(+)0.3000%
30" RCP CL.IV
INV.EL.= 89.27
(+) 0.8700%
BEGIN SPECIAL CUT DITCH W/ HINGE
-L- STA.50+00.00
ELEV.= 89.80
DITCH LEGEND
LEFT DITCH
MEDIAN DITCH
RIGHT DITCH
FOR -L- PLAN SEE SHT.5
-L- RT
US 64 BUS.
-Y1- STA.18+22.61 =
-L- STA.43+04.76
PI = 37+20.00
EL = 101.89'
VC = 200'
K = 319
DS = 75 MPH
-YILPC- STA.10+00.00 =
-L- STA.40+61.87
-YIRPD- STA.10+00.00 =
-L- STA.46+42.54
PI =41+00.00
EI = 98.76
END MEDIAN 'V' DITCH
-L- STA.41+50.00
ELEV.= 91.62
PI = 44+20.00
EL = 99.61'
VC = 150'
K = 1437
DS = 80+ MPH
PI = 49+50.00
EL = 97.33'
VC = 150'
K = 205
DS = 70 MPH
BEGIN MEDIAN 'V' DITCH
-L- STA.37+00.00
ELEV.= 99.96
(-)0.3257%
(+) 0.3000%
(-) 0.3000%
(+) 1.7200%
(+) 0.5000%
PROPOSED GRADE
EXISTING GROUND
(-)0.3257%
(-)0.4302%
(-)1.9000%
BEGIN SPECIAL CUT BASE DITCH
-L- STA.47+00.00
ELEV.= 93.63
(-) 1.3400%
(-)0.4302%
(+)0.3000%
30" RCP CL.IV
INV.EL.= 89.27
END SPECIAL CUT DITCH
-L- STA.39+00.00
ELEV.= 97.50
BEGIN SPECIAL CUT DITCH W/ HINGE
-L- STA.40+50.00
ELEV.= 95.89
END SPECIAL CUT DITCH W/ HINGE
-L- STA.41+50.00
ELEV.= 96.39
BEGIN SPECIAL CUT DITCH
-L- STA.45+50.00
ELEV.= 94.95
END SPECIAL CUT DITCH
-L- STA.46+00.00
ELEV.= 94.00
BEGIN SPECIAL CUT BASE DITCH
-L- STA.50+50.00
ELEV.= 88.94
DITCH LEGEND
LEFT DITCH
MEDIAN DITCH
RIGHT DITCH
FOR -L- PLAN SEE SHT.5
160 150 140 130 120 110 100 90 80 70
37+00 38+00 39+00 40+00 41+00 42+00 43+00 44+00 45+00 46+00 47+00 48+00 49+00 50+00 51+00

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PROJECT REFERENCE NO.	SHEET NO.
U-3330	15

ROADWAY DESIGN ENGINEER — SEAL 17265, STEVE ANTHONY DRUM, 4/6/2017

HYDRAULICS ENGINEER — SEAL 023084, DAVID P. BOCKER, 4/6/2017

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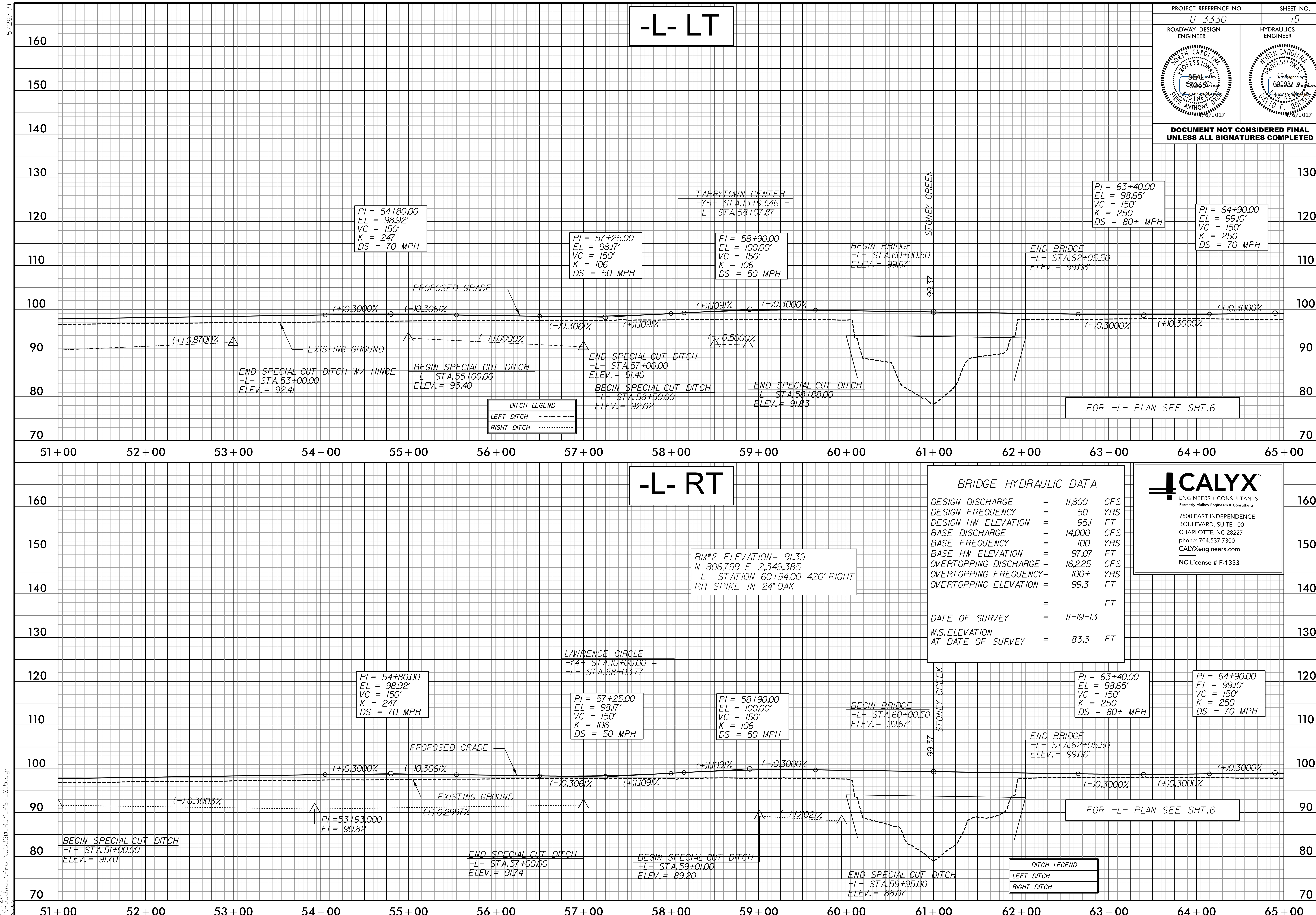

-L- LT
PI = 54+80.00
EL = 98.92'
VC = 150'
K = 247
DS = 70 MPH
PI = 57+25.00
EL = 98.17'
VC = 150'
K = 106
DS = 50 MPH
TARRYTOWN CENTER
-Y5- STA.13+93.46 =
-L- STA.58+07.87
PI = 58+90.00
EL = 100.00'
VC = 150'
K = 106
DS = 50 MPH
STONEY CREEK
BEGIN BRIDGE
-L- STA.60+00.50
ELEV.= 99.67'
END BRIDGE
-L- STA.62+05.50
ELEV.= 99.06'
PI = 63+40.00
EL = 98.65'
VC = 150'
K = 250
DS = 80+ MPH
PI = 64+90.00
EL = 99.10'
VC = 150'
K = 250
DS = 70 MPH
PROPOSED GRADE
99.37
(+)0.3000%
(-)0.3061%
(+)1.1091%
(-)0.3000%
(-)0.3061%
(+)1.1091%
(-)0.3000%
(+)0.3000%
(+)0.3000%
(+) 0.8700%
EXISTING GROUND
(-) 1.0000%
(-) 0.5000%
END SPECIAL CUT DITCH W/ HINGE
-L- STA.53+00.00
ELEV.= 92.41
BEGIN SPECIAL CUT DITCH
-L- STA.55+00.00
ELEV.= 93.40
END SPECIAL CUT DITCH
-L- STA.57+00.00
ELEV.= 91.40
BEGIN SPECIAL CUT DITCH
-L- STA.58+50.00
ELEV.= 92.02
END SPECIAL CUT DITCH
-L- STA.58+88.00
ELEV.= 91.83
DITCH LEGEND
LEFT DITCH
RIGHT DITCH
FOR -L- PLAN SEE SHT.6
-L- RT
BM#2 ELEVATION= 91.39
N 806,799 E 2,349,385
-L- STATION 60+94.00 420' RIGHT
RR SPIKE IN 24" OAK
BRIDGE HYDRAULIC DATA
DESIGN DISCHARGE = 11,800 CFS
DESIGN FREQUENCY = 50 YRS
DESIGN HW ELEVATION = 95.1 FT
BASE DISCHARGE = 14,000 CFS
BASE FREQUENCY = 100 YRS
BASE HW ELEVATION = 97.07 FT
OVERTOPPING DISCHARGE = 16,225 CFS
OVERTOPPING FREQUENCY = 100+ YRS
OVERTOPPING ELEVATION = 99.3 FT
= FT
DATE OF SURVEY = 11-19-13
W.S.ELEVATION AT DATE OF SURVEY = 83.3 FT
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LAWRENCE CIRCLE
-Y4- STA.10+00.00 =
-L- STA.58+03.77
PI = 54+80.00
EL = 98.92'
VC = 150'
K = 247
DS = 70 MPH
PI = 57+25.00
EL = 98.17'
VC = 150'
K = 106
DS = 50 MPH
PI = 58+90.00
EL = 100.00'
VC = 150'
K = 106
DS = 50 MPH
BEGIN BRIDGE
-L- STA.60+00.50
ELEV.= 99.67'
STONEY CREEK
END BRIDGE
-L- STA.62+05.50
ELEV.= 99.06'
PI = 63+40.00
EL = 98.65'
VC = 150'
K = 250
DS = 80+ MPH
PI = 64+90.00
EL = 99.10'
VC = 150'
K = 250
DS = 70 MPH
PROPOSED GRADE
99.37
EXISTING GROUND
(-) 0.3003%
PI =53+93.000
El = 90.82
(+) 0.2997%
(-) 1.2021%
BEGIN SPECIAL CUT DITCH
-L- STA.51+00.00
ELEV.= 91.70
END SPECIAL CUT DITCH
-L- STA.57+00.00
ELEV.= 91.74
BEGIN SPECIAL CUT DITCH
-L- STA.59+01.00
ELEV.= 89.20
END SPECIAL CUT DITCH
-L- STA.59+95.00
ELEV.= 88.07
FOR -L- PLAN SEE SHT.6
DITCH LEGEND
LEFT DITCH
RIGHT DITCH
51+00 52+00 53+00 54+00 55+00 56+00 57+00 58+00 59+00 60+00 61+00 62+00 63+00 64+00 65+00
160 150 140 130 120 110 100 90 80 70

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PROJECT REFERENCE NO.	SHEET NO.
U-3330	16

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

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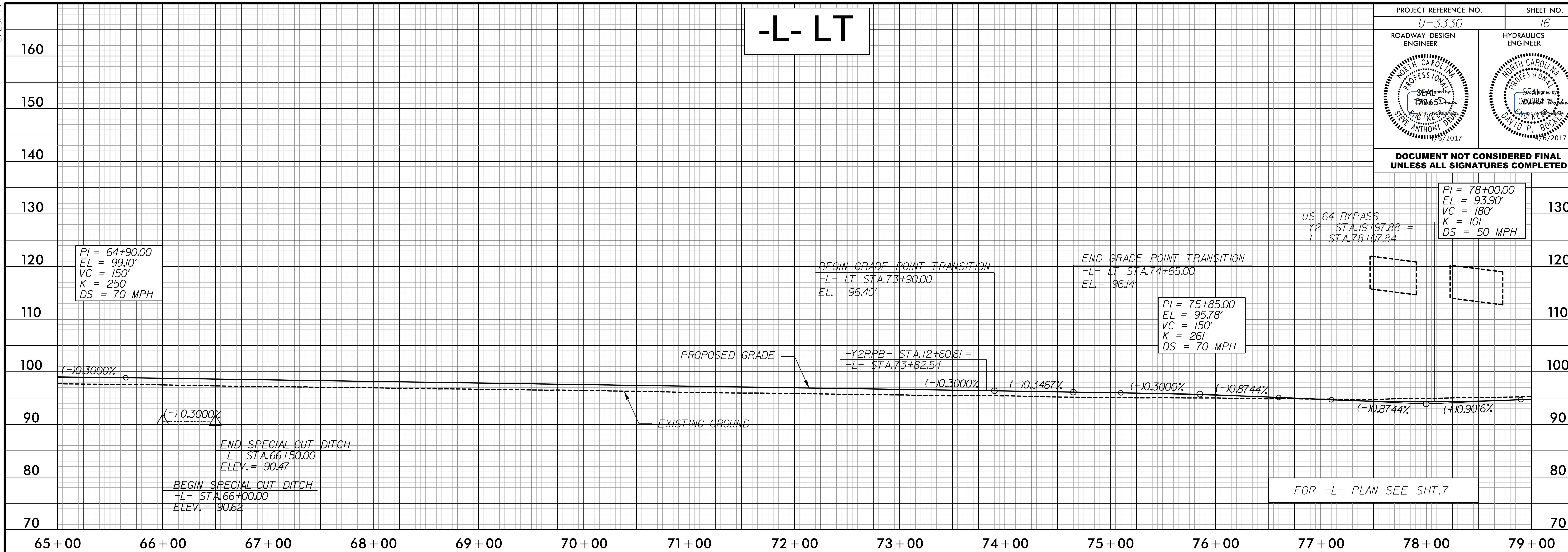

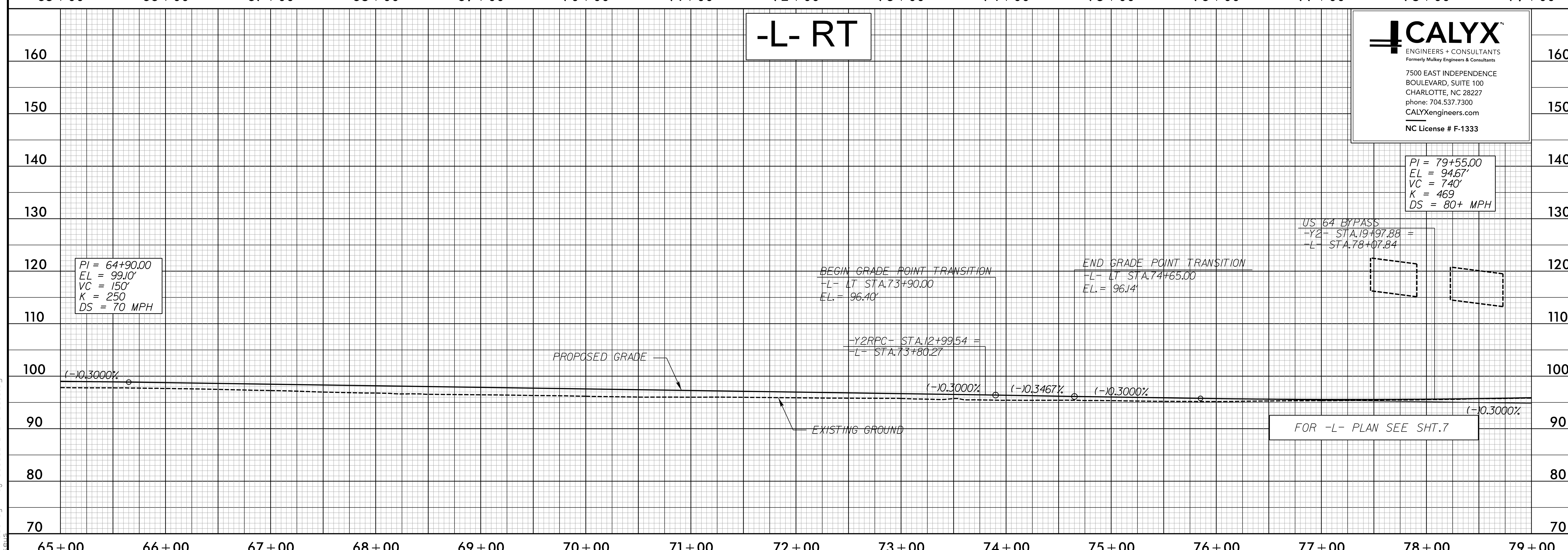

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PROJECT REFERENCE NO.	SHEET NO.
U-3330	17

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19265 STEVE ANTHONY DRUM 4/5/2017

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022984 DAVID P. BOCKER 4/5/2017

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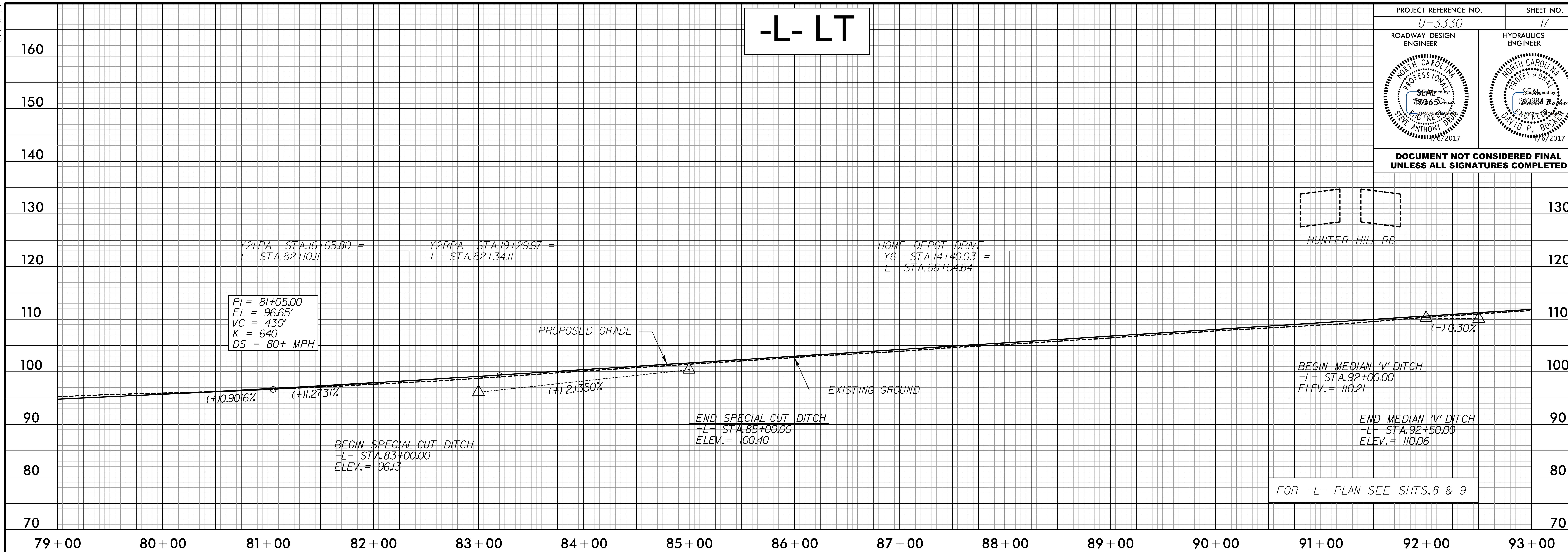
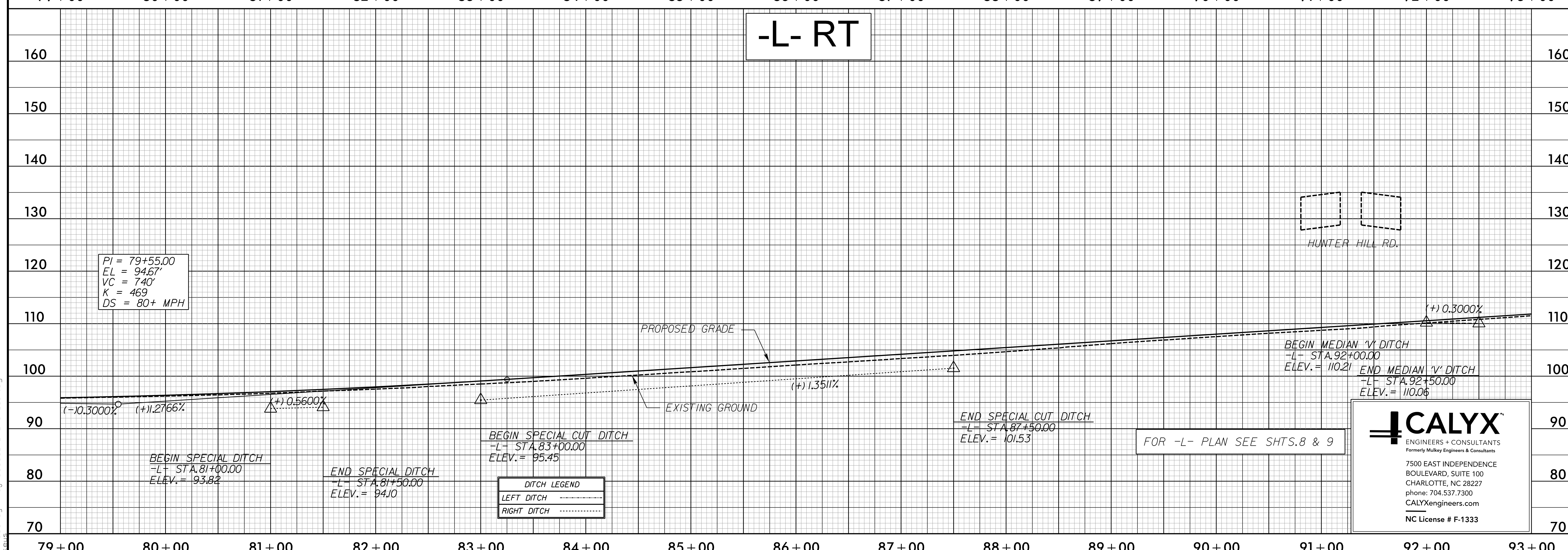
-L- LT



-L- RT



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PROJECT REFERENCE NO.	SHEET NO.
U-3330	18

ROADWAY DESIGN ENGINEER — SEAL 17265 — NORTH CAROLINA PROFESSIONAL ENGINEER — STEVE ANTHONY DRUM — 4/5/2017

HYDRAULICS ENGINEER — SEAL 022984 — NORTH CAROLINA PROFESSIONAL ENGINEER — DAVID P. BOCKER — 4/5/2017

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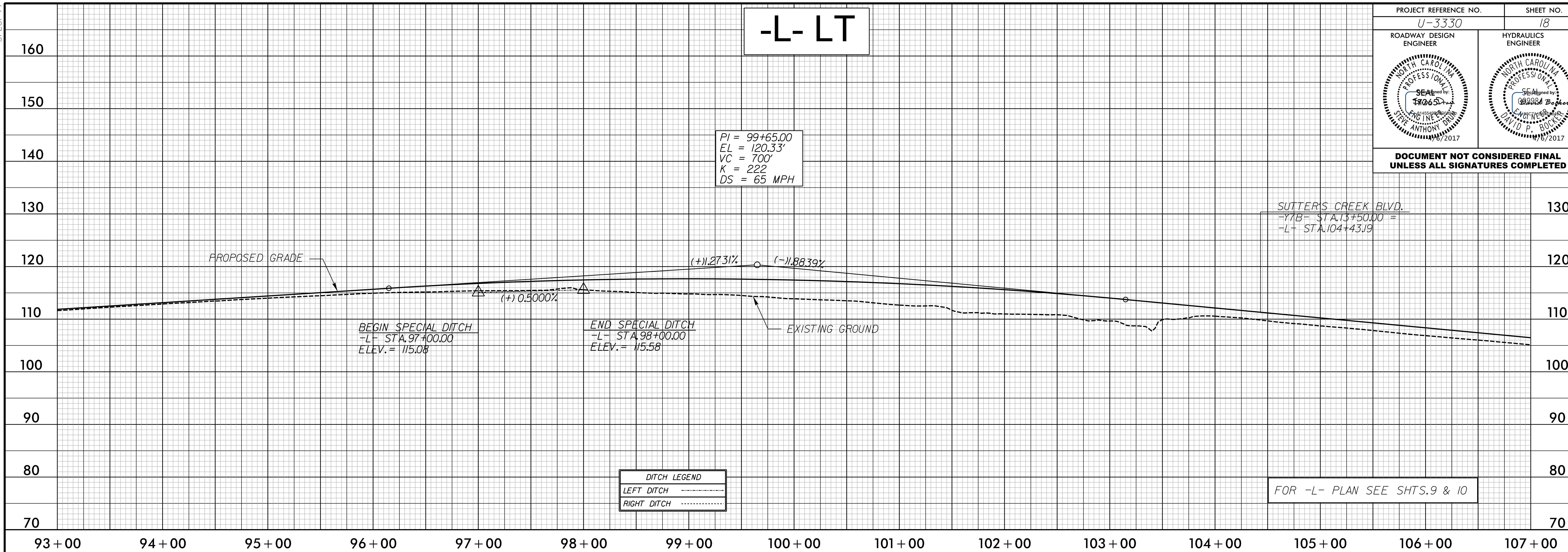

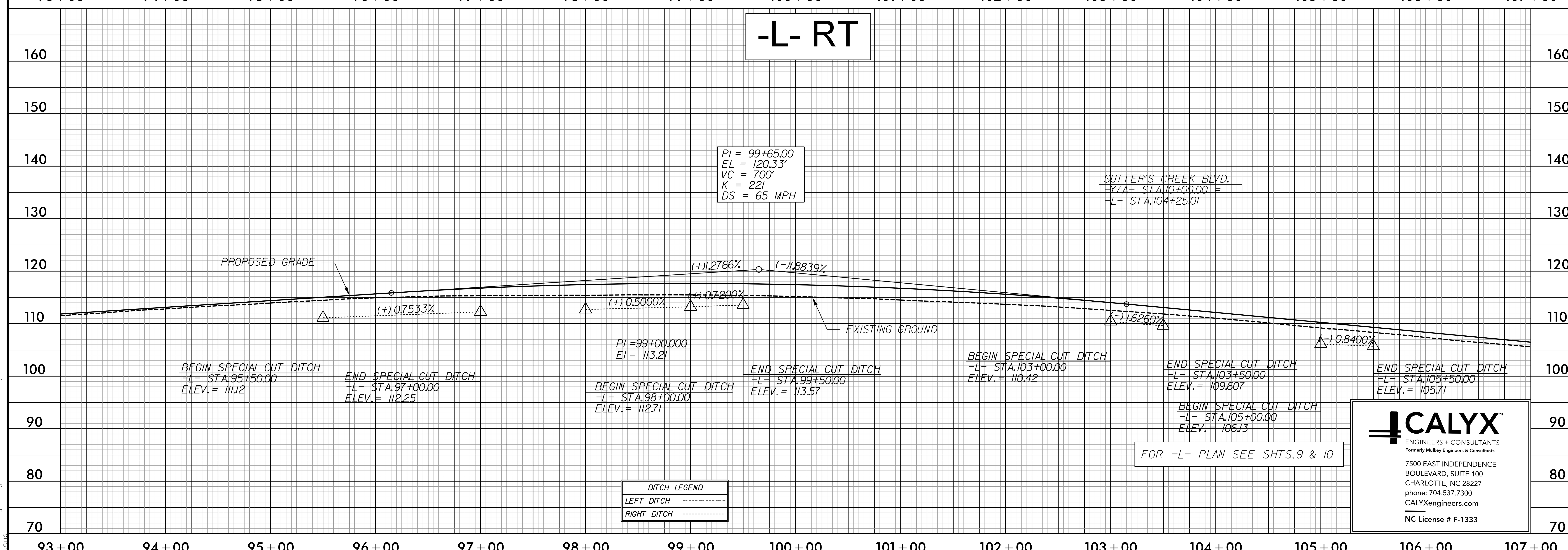

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5/28/99

-L- LT

PROJECT REFERENCE NO.	SHEET NO.
U-3330	19

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 39365 ENGINEER ANTHONY TRUM

4/5/2017

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 39384 ENGINEER DAVID P. BOLEK

4/5/2017

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RING RD.
Y8 STA.114+90.00 =
-L- STA.114+57.99

PI = 114+90.00
EL = 91.60'
VC = 1,000'
K = 281
DS = 80+ MPH

PROPOSED GRADE

RETAIN & EXTEND EXIST.2@6'X7' RCBC

EXISTING GROUND

66" WELDED STEEL TRENCHLESS INSTALLATION
INV.EL.= 81.24

BEGIN 2' LAT.BASE DITCH
-L- STA.111+76.00
ELEV.= 82.90

(-) 0.4082%

END 2' LAT.BASE DITCH
-L- STA.112+74.00
ELEV.= 82.50

BEGIN 2' LAT.BASE DITCH
-L- STA.112+87.00
ELEV.= 82.00

(+) 0.5000%

(-)1.8839%

(+)1.6807%

END 2' LAT.BASE DITCH
-L- STA.113+79.00
ELEV.= 82.46

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

FOR -L- PLAN SEE SHTS.10 & 11

107+00 108+00 109+00 110+00 111+00 112+00 113+00 114+00 115+00 116+00 117+00 118+00 119+00 120+00 121+00

160 150 140 130 120 110 100 90 80 70

-L- RT

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	=	1,700	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	93.1	FT
BASE DISCHARGE	=	1,900	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	95.35	FT
OVERTOPPING DISCHARGE	=	2,000	CFS
OVERTOPPING FREQUENCY	=	100+	YRS
OVERTOPPING ELEVATION	=	96.4'	FT

INDEPENDENCE DRIVE
Y9 STA.10+00.00 =
-L- STA.114+67.27

PI = 114+90.00
EL = 91.60'
VC = 1,000'
K = 281
DS = 80+ MPH

PROPOSED GRADE

RETAIN & EXTEND EXIST.2@6'X7' RCBC

(-) 4.0000%

END SPECIAL CUT DITCH
-L- STA.108+45.00
ELEV.= 99.30

BEGIN SPECIAL CUT DITCH
-L- STA.108+00.00
ELEV.= 101.10

EXISTING GROUND

66" WELDED STEEL TRENCHLESS INSTALLATION
INV.EL.= 81.24

(-)1.8839%

(+)1.6807%

(+) 1.5200%

BEGIN SPECIAL CUT DITCH
-L- STA.116+00.00
ELEV.= 90.30

END SPECIAL CUT DITCH
-L- STA.117+50.00
ELEV.= 92.58

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

FOR -L- PLAN SEE SHTS.10 & 11

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107+00 108+00 109+00 110+00 111+00 112+00 113+00 114+00 115+00 116+00 117+00 118+00 119+00 120+00 121+00

160 150 140 130 120 110 100 90 80 70

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PROJECT REFERENCE NO.	SHEET NO.
U-3330	20
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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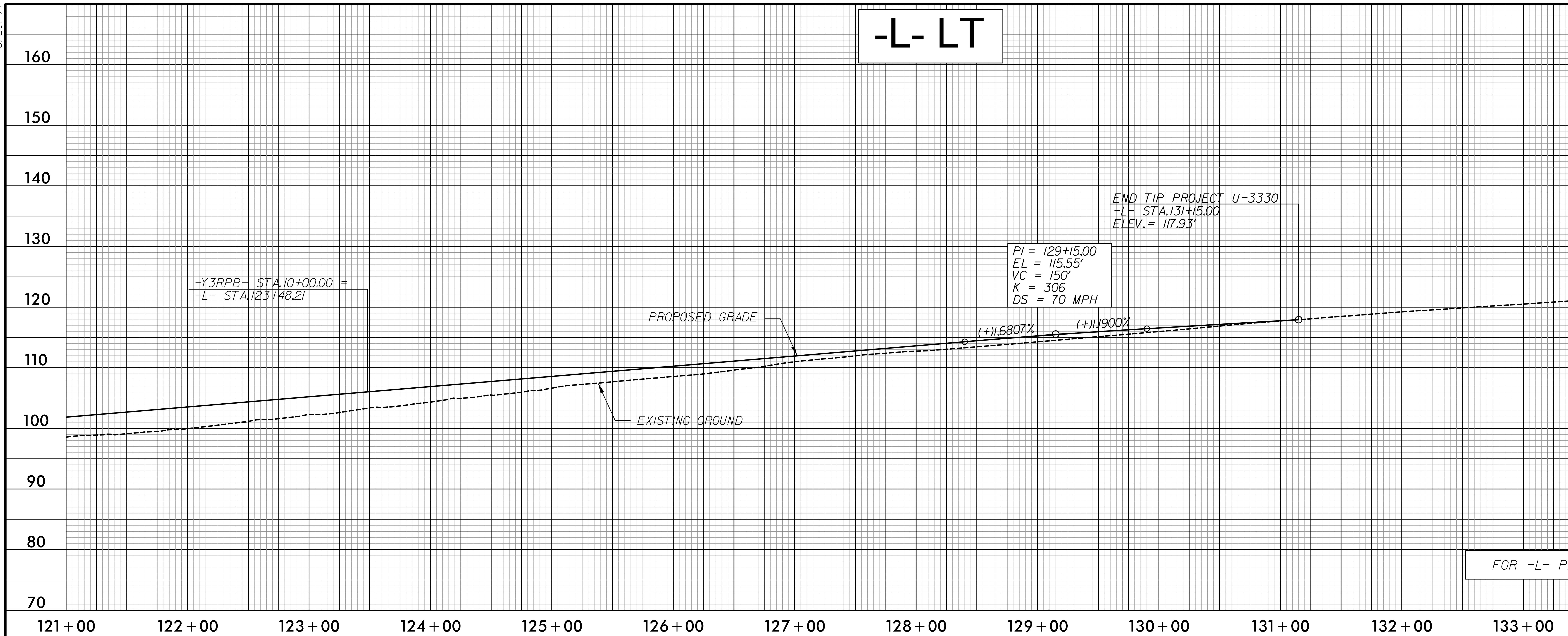

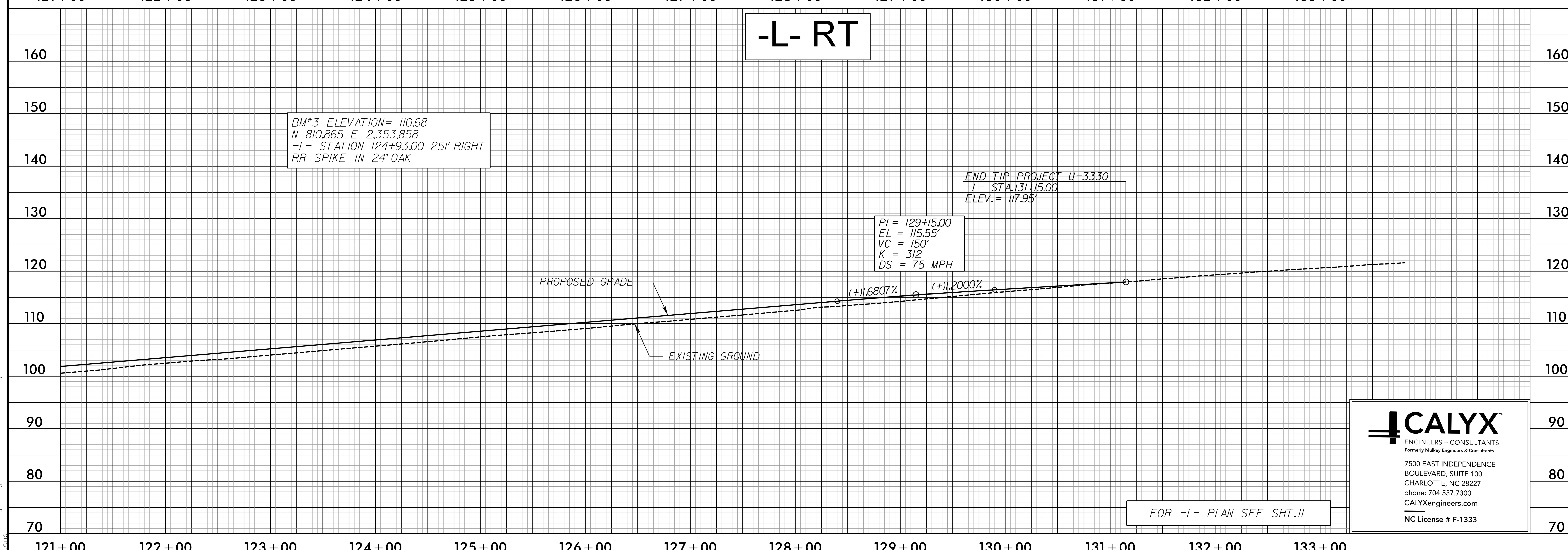

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-Y1-

PROJECT REFERENCE NO.	SHEET NO.
U-3330	21

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19365 ENGINEER ANTHONY TRUM
4/5/2017

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 39382 ENGINEER DAVID P. BOLLER
4/5/2017

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-YIRPB- STA.17+52.11 =
-Y1- STA.12+69.34

BEGIN GRADE
STA.11+75.00
ELEV = 106.10

PI = 12+75.00
EL = 108.81'
VC = 100'
K = 148
DS = 55 MPH

-YIRPA- STA.17+46.30 =
-Y1- STA.13+97.51

PI = 14+80.00
EL = 112.98'
VC = 150'
K = 69
DS = 40 MPH

-L- STA.43+04.76 =
-Y1- STA.18+22.61

PI = 18+30.00
EL = 127.68'
VC = 326'
K = 45
DS = 40 MPH

-Y1LPC- STA.15+34.11 =
-Y1- STA.21+18.00

PI = 21+50.00
EL = 117.76'
VC = 120'
K = 73
DS = 40 MPH

-Y1RPD- STA.17+81.62 =
-Y1- STA.23+59.59

PI = 23+54.00
EL = 114.81'
VC = 100'
K = 153
DS = 60 MPH

END GRADE
STA.24+04.00
ELEV = 113.76

(+)2.7100%
(+)2.0341%
(+)2.0341%
(+)4.2000%
(+)4.2000%
(−)13.1000%
PROPOSED GRADE
EXISTING GROUND
(−)8.1000%
(−)1.4461%
(−)1.4461%
(−)2.1000%

FOR -Y1- PLAN SEE SHTS.5 & 12

-Y1RPA-

BEGIN GRADE
-YIRPA- STA.10+00.00 =
-L- STA.50+86.92 (51.0' LT.)
ELEV.= 96.84'

PI = 10+90.00
EL = 96.57'
VC = 100'
K = 280
DS = 70 MPH

PI = 12+65.00
EL = 95.42'
VC = 220'
K = 49
DS = 35 MPH

END GRADE
-YIRPA- STA.17+03.62 =
-Y1- STA.14+14.87 (39' LT.)
ELEV.= 111.06'

PI = 16+50.00
EL = 110.12'
VC = 80'
K = 39
DS = 35 MPH

PROPOSED GRADE
EXISTING GROUND

(−)0.3000%
(−)0.6571%
(−)0.6571%
(+)3.8182%
(+)3.8182%
(+)1.7531%
(+)1.4465%
(+)0.4960%
(+)1.0000%
(+)2.4000%

END STANDARD BASE DITCH
-YIRPA- STA.12+15.00
ELEV.= 90.42

BEGIN STANDARD BASE DITCH
-YIRPA- STA.10+90.00
ELEV.= 89.80

END STANDARD 'V' DITCH
BEGIN SPECIAL 'V' DITCH
-YIRPA- STA.15+00.00
ELEV.= 93.27

BEGIN STANDARD 'V' DITCH
-YIRPA- STA.13+00.00
ELEV.= 91.27

END SPECIAL 'V' DITCH
-YIRPA- STA.16+50.00
ELEV.= 96.87

DITCH LEGEND	
LEFT DITCH	
RIGHT DITCH	

FOR -YIRPA- PLAN SEE SHTS.5 & 12

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PROJECT REFERENCE NO.	SHEET NO.
U-3330	22

ROADWAY DESIGN ENGINEER — SEAL 17265 — STEVE ANTHONY DRUM — 4/5/2017

HYDRAULICS ENGINEER — SEAL 028984 — DAVID P. BOCKER — 4/5/2017

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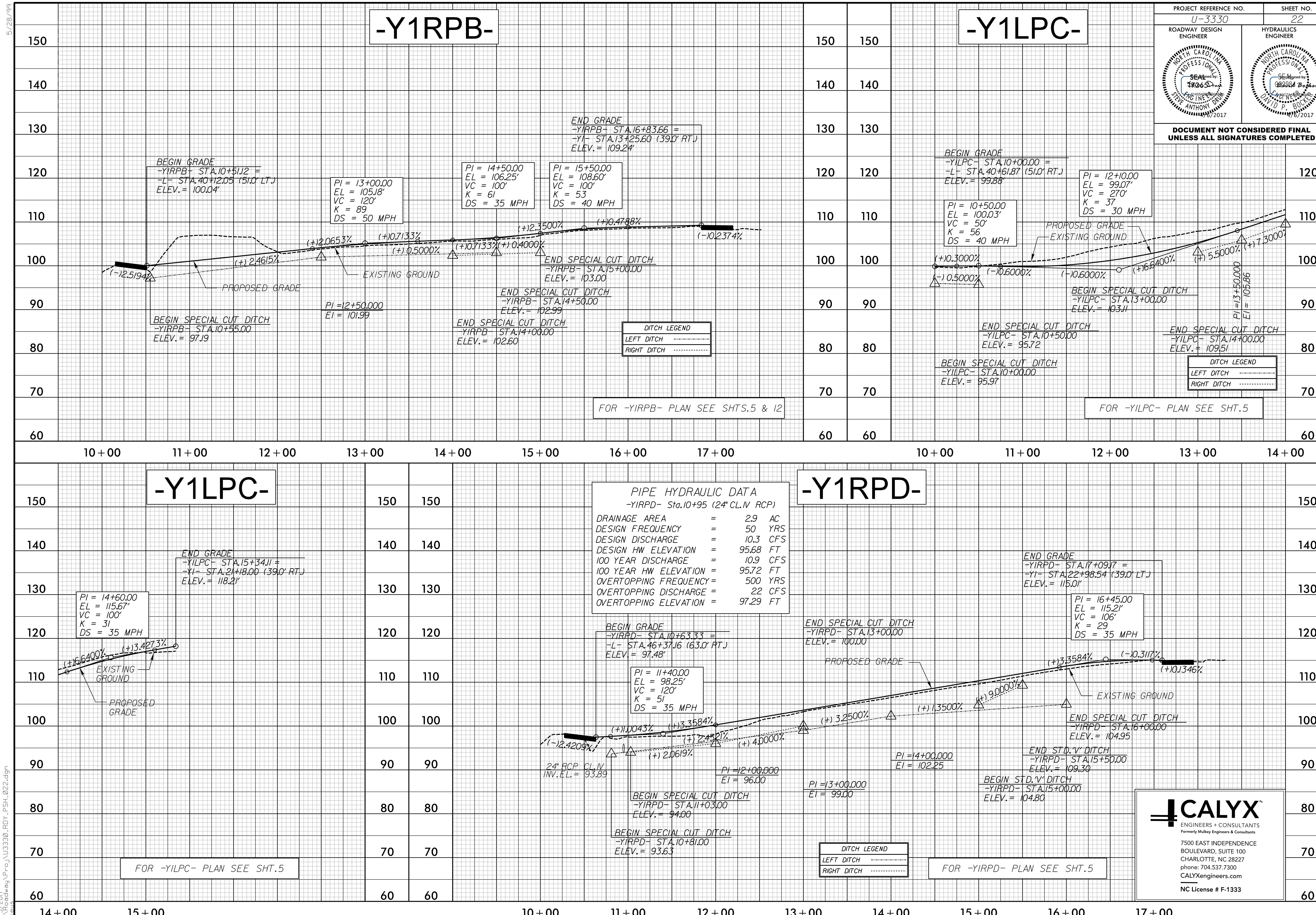
-Y1RPB-
BEGIN GRADE -Y1RPB- STA.10+51.12 = -L- STA.40+12.05 (51.0' LT.) ELEV.= 100.04'
PI = 13+00.00 EL = 105.18' VC = 120' K = 89 DS = 50 MPH
PI = 14+50.00 EL = 106.25' VC = 100' K = 61 DS = 35 MPH
PI = 15+50.00 EL = 108.60' VC = 100' K = 53 DS = 40 MPH
END GRADE -Y1RPB- STA.16+83.66 = -Y1- STA.13+25.60 (39.0' RT.) ELEV.= 109.24'
(-)2.5194%
(+)2.4615%
(+)2.0653%
(+)0.7133%
(+)0.5000%
(+)0.7133%
(+)0.4000%
(+)2.3500%
(+)0.4788%
(-)0.2374%
EXISTING GROUND
PROPOSED GRADE
END SPECIAL CUT DITCH -Y1RPB- STA.15+00.00 ELEV.= 103.00
END SPECIAL CUT DITCH -Y1RPB- STA.14+50.00 ELEV.= 102.99
END SPECIAL CUT DITCH -Y1RPB STA.14+00.00 ELEV.= 102.60
BEGIN SPECIAL CUT DITCH -Y1RPB- STA.10+55.00 ELEV.= 97.19
PI =12+50.000 EI = 101.99
DITCH LEGEND
LEFT DITCH
RIGHT DITCH
FOR -Y1RPB- PLAN SEE SHTS.5 & 12
-Y1LPC-
BEGIN GRADE -Y1LPC- STA.10+00.00 = -L- STA.40+61.87 (51.0' RT.) ELEV.= 99.88'
PI = 10+50.00 EL = 100.03' VC = 50' K = 56 DS = 40 MPH
PI = 12+10.00 EL = 99.07' VC = 270' K = 37 DS = 30 MPH
PROPOSED GRADE
EXISTING GROUND
(+)0.3000%
(-) 0.5000%
(-)0.6000%
(-)0.6000%
(+)6.6400%
(+) 5.5000%
(+) 7.3000%
PI =13+50.000 EI = 105.86
BEGIN SPECIAL CUT DITCH -Y1LPC- STA.13+00.00 ELEV.= 103.11
END SPECIAL CUT DITCH -Y1LPC- STA.10+50.00 ELEV.= 95.72
END SPECIAL CUT DITCH -Y1LPC- STA.14+00.00 ELEV.= 109.51
BEGIN SPECIAL CUT DITCH -Y1LPC- STA.10+00.00 ELEV.= 95.97
DITCH LEGEND
LEFT DITCH
RIGHT DITCH
FOR -Y1LPC- PLAN SEE SHT.5
-Y1LPC-
END GRADE -Y1LPC- STA.15+34.11 = -Y1- STA.21+18.00 (39.0' RT.) ELEV.= 118.21'
PI = 14+60.00 EL = 115.67' VC = 100' K = 31 DS = 35 MPH
(+)6.6400%
(+)3.4273%
EXISTING GROUND
PROPOSED GRADE
FOR -Y1LPC- PLAN SEE SHT.5
-Y1RPD-
BEGIN GRADE -Y1RPD- STA.10+63.33 = -L- STA.46+37.16 (63.0' RT.) ELEV.= 97.48'
PI = 11+40.00 EL = 98.25' VC = 120' K = 51 DS = 35 MPH
END SPECIAL CUT DITCH -Y1RPD- STA.13+00.00 ELEV.= 100.00
PROPOSED GRADE
END GRADE -Y1RPD- STA.17+09.17 = -Y1- STA.22+98.54 (39.0' LT.) ELEV.= 115.01'
PI = 16+45.00 EL = 115.21' VC = 106' K = 29 DS = 35 MPH
(-)2.4209%
(+)1.0043%
(+)3.3584%
(+)2.4521%
(+) 2.0619%
(+) 4.0000%
(+) 3.2500%
(+) 1.3500%
(+) 9.0000%
(+)3.3584%
(-)0.3117%
(+)0.1346%
EXISTING GROUND
END SPECIAL CUT DITCH -Y1RPD- STA.16+00.00 ELEV.= 104.95
END STD.'V' DITCH -Y1RPD- STA.15+50.00 ELEV.= 109.30
BEGIN STD.'V' DITCH -Y1RPD- STA.15+00.00 ELEV.= 104.80
24" RCP CL.IV INV.EL.= 93.89
PI =12+00.000 EI = 96.00
PI =13+00.000 EI = 99.00
PI =14+00.000 EI = 102.25
BEGIN SPECIAL CUT DITCH -Y1RPD- STA.11+03.00 ELEV.= 94.00
BEGIN SPECIAL CUT DITCH -Y1RPD- STA.10+81.00 ELEV.= 93.63
DITCH LEGEND
LEFT DITCH
RIGHT DITCH
FOR -Y1RPD- PLAN SEE SHT.5

PIPE HYDRAULIC DATA

-Y1RPD- Sta.10+95 (24" CL.IV RCP)

DRAINAGE AREA	=	2.9	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	10.3	CFS
DESIGN HW ELEVATION	=	95.68	FT
100 YEAR DISCHARGE	=	10.9	CFS
100 YEAR HW ELEVATION	=	95.72	FT
OVERTOPPING FREQUENCY	=	500	YRS
OVERTOPPING DISCHARGE	=	22	CFS
OVERTOPPING ELEVATION	=	97.29	FT

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PROJECT REFERENCE NO.	SHEET NO.
U-3330	23

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19365 ENGINEER ANTHONY TRUM
4/5/2017

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039381 ENGINEER DAVID P. BOLLER
4/5/2017

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-Y2LPA-

BEGIN GRADE
STA.10+50.03
ELEV = 113.50'

PI = 11+00.03
EL = 112.85'

(−)1.3000%

(−)2.0002%

PROPOSED GRADE

PI = 13+55.00
EL = 107.75'
VC = 300'
K = 178
DS = 60 MPH

(−)2.0002%

(−)3.6860%

EXISTING GROUND

END GRADE
-Y2LPA- STA.16+13.30 =
-L- STA.82+10.09 (52.5' LT.)
ELEV.= 99.12'

PI = 15+62.00
EL = 100.12'
VC = 80'
K = 46
DS = 30 MPH

(−)3.8860%

(−)1.9493%

(−)3.0000%

FOR -Y2LPA- PLAN SEE SHT.8

-Y2RPA-

BEGIN GRADE
STA.16+85.00
ELEV = 105.15'

PI = 17+35.00
EL = 103.78'

(−)2.7400%

PROPOSED GRADE

(−)3.7667%

(−)1.8868%

(−)3.0000%

EXISTING GROUND

END GRADE
-Y2RPA- STA.18+77.47 =
-L- STA.82+33.76 (52.5' LT.)
ELEV.= 99.40'

PI = 18+25.00
EL = 100.39'
VC = 80'
K = 43
DS = 30 MPH

FOR -Y2RPA- PLAN SEE SHT.8

-Y2RPB-

END GRADE
-Y2RPB- STA.12+09.59 =
-L- STA.73+84.08 (51' LT.)
ELEV.= 95.52'

BEGIN GRADE
STA.11+45.77 =
ELEV.= 96.28'

EXISTING GROUND

(−)1.1547%

(+)2.4986%

PROPOSED GRADE

FOR -Y2RPB- PLAN SEE SHT.7

-Y2RPC-

END GRADE
-Y2RPC- STA.12+47.46 =
-L- STA.73+90.81 (51' RT.)
ELEV.= 95.50'

PI = 11+20.00
EL = 97.65'

PI = 11+80.00
EL = 95.91'
VC = 114'
K = 50
DS = 35 MPH

BEGIN GRADE
STA.10+70.00 =
ELEV.= 99.01'

(−)2.7200%

PROPOSED GRADE

(−)2.9000%

(−)0.6078%

(+)2.5027%

EXISTING GROUND

FOR -Y2RPC- PLAN SEE SHT.7

-Y3RPB-

BEGIN GRADE
-Y3RPB- STA.10+00.00 =
-L- STA.123+48.21 (52.5' LT.)
ELEV.= 105.12'

PI = 10+70.00
EL = 106.28'
VC = 60'
K = 326
DS = 75 MPH

(+)1.6571%

(+)1.4732%

(+) 0.9800%

PROPOSED GRADE

EXISTING GROUND

END GRADE
STA.14+94.70
ELEV = 113.23'

PI = 14+44.70
EL = 111.80'

(+)1.4732%

(+)2.8600%

BEGIN SPECIAL DITCH
-Y3RPB- STA.10+00.00
ELEV.= 102.57

END SPECIAL DITCH
-Y3RPB- STA.11+50.00
ELEV.= 104.04

DITCH LEGEND	
LEFT DITCH	
RIGHT DITCH	

FOR -Y3RPB- PLAN SEE SHT.11

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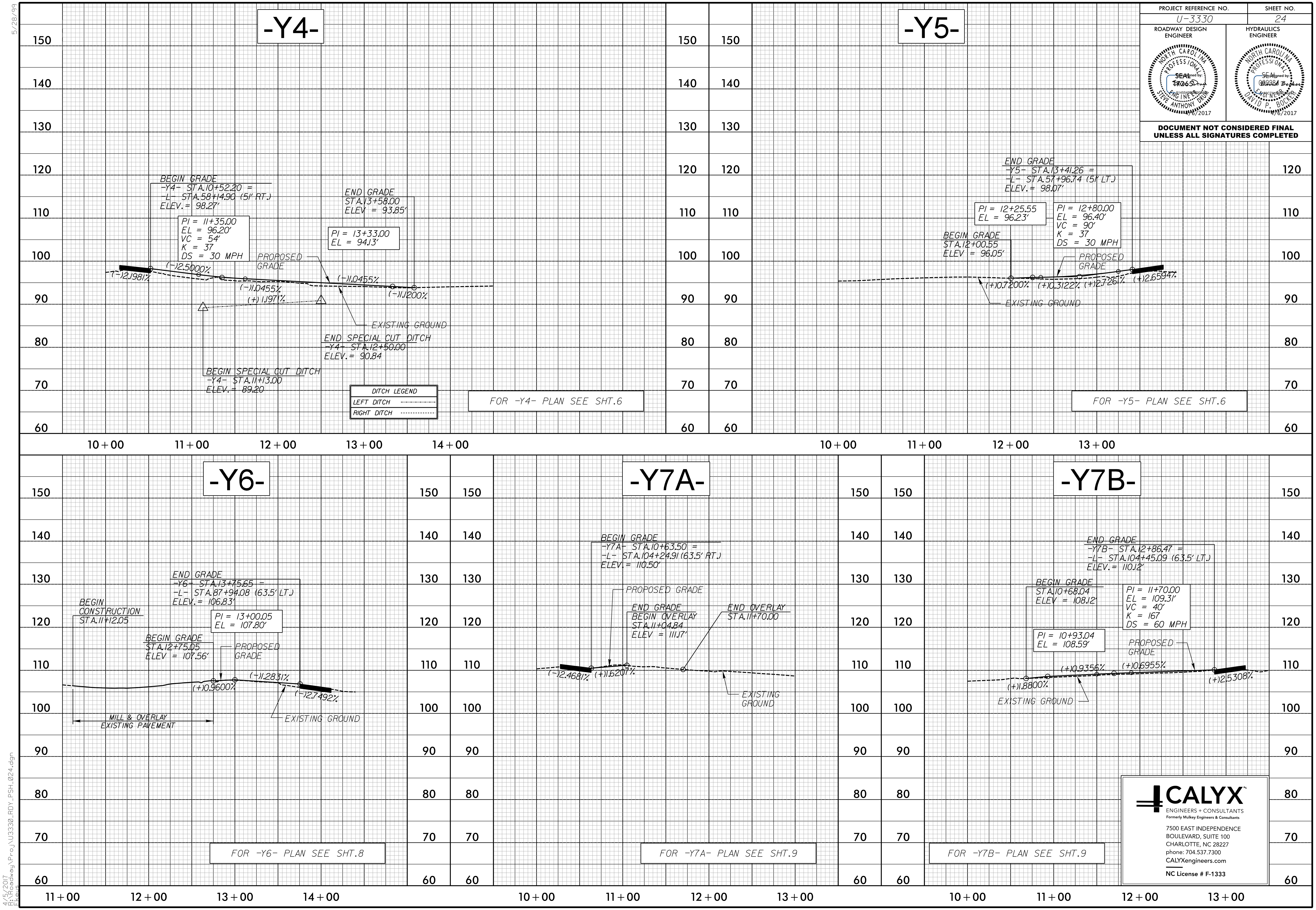

PROJECT REFERENCE NO.	SHEET NO.
U-3330	25

ROADWAY DESIGN ENGINEER — SEAL 17065, NORTH CAROLINA PROFESSIONAL ENGINEER, STEVE ANTHONY DRUM, 4/6/2017

HYDRAULICS ENGINEER — SEAL 022984, NORTH CAROLINA PROFESSIONAL ENGINEER, DAVID P. BOCKER, 4/6/2017

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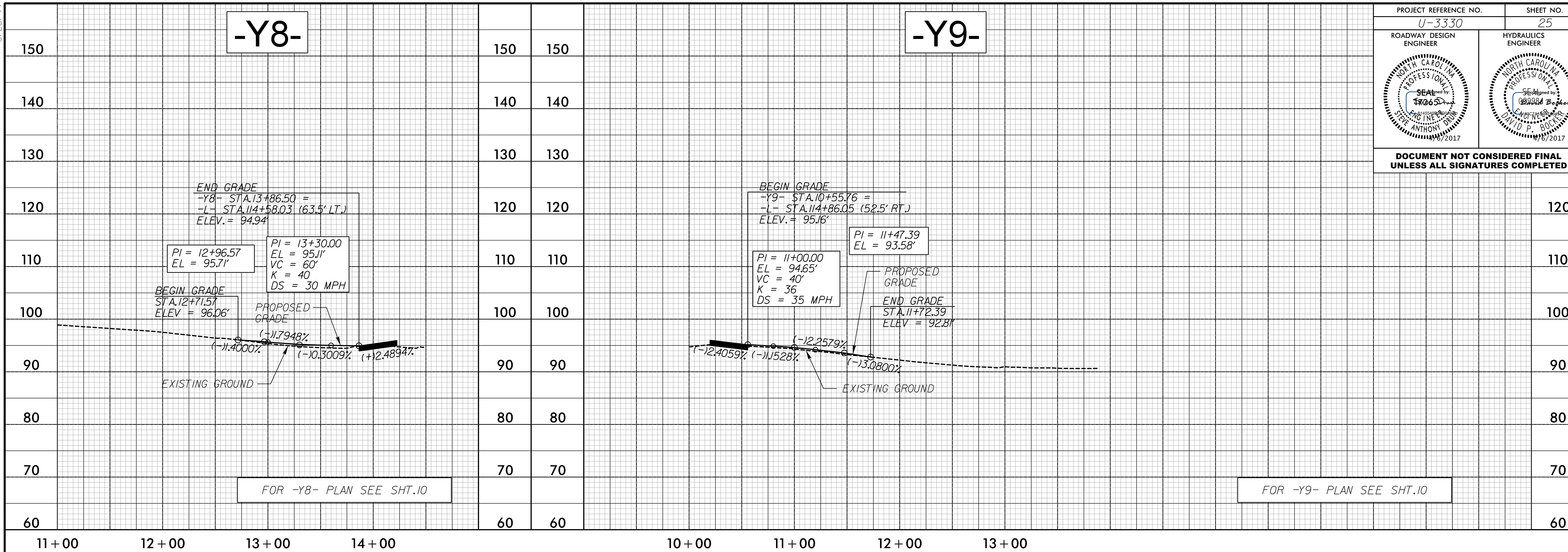

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PROJECT REFERENCE NO.	SHEET NO.
U-3330	26

ROADWAY DESIGN ENGINEER — SEAL 17065 — STEVE ANTHONY DRUM — 4/5/2017

HYDRAULICS ENGINEER — SEAL 022084 — DAVID P. BOCKER — 4/5/2017

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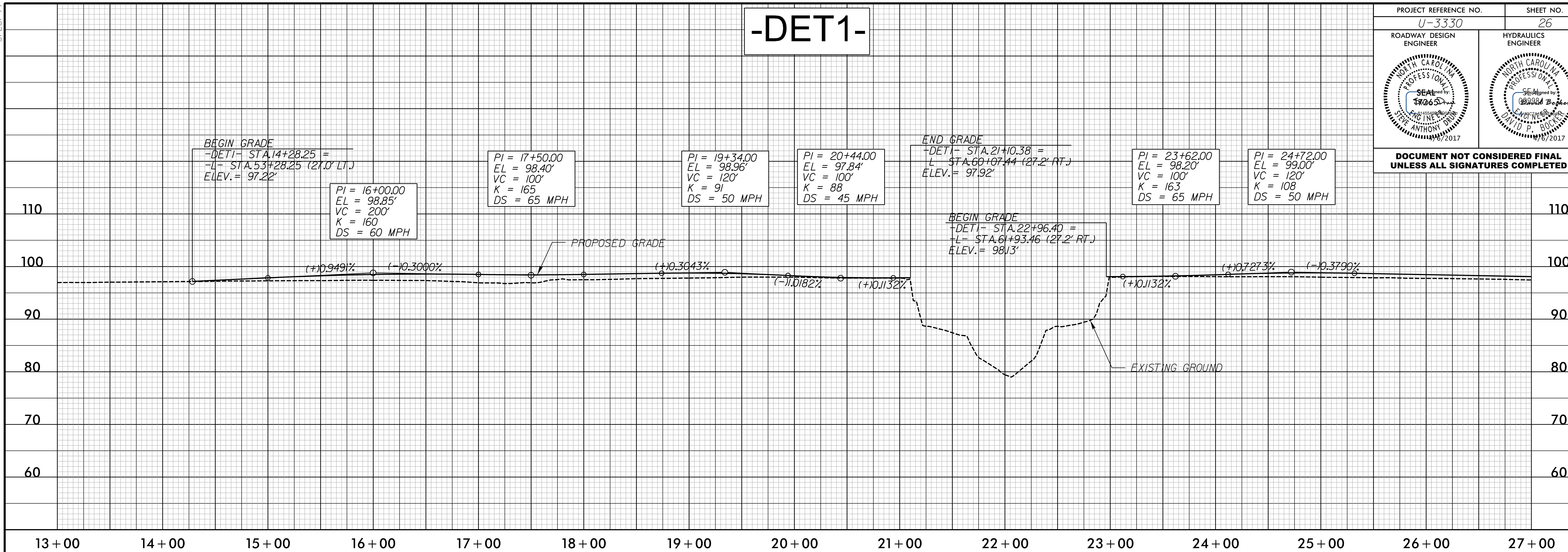

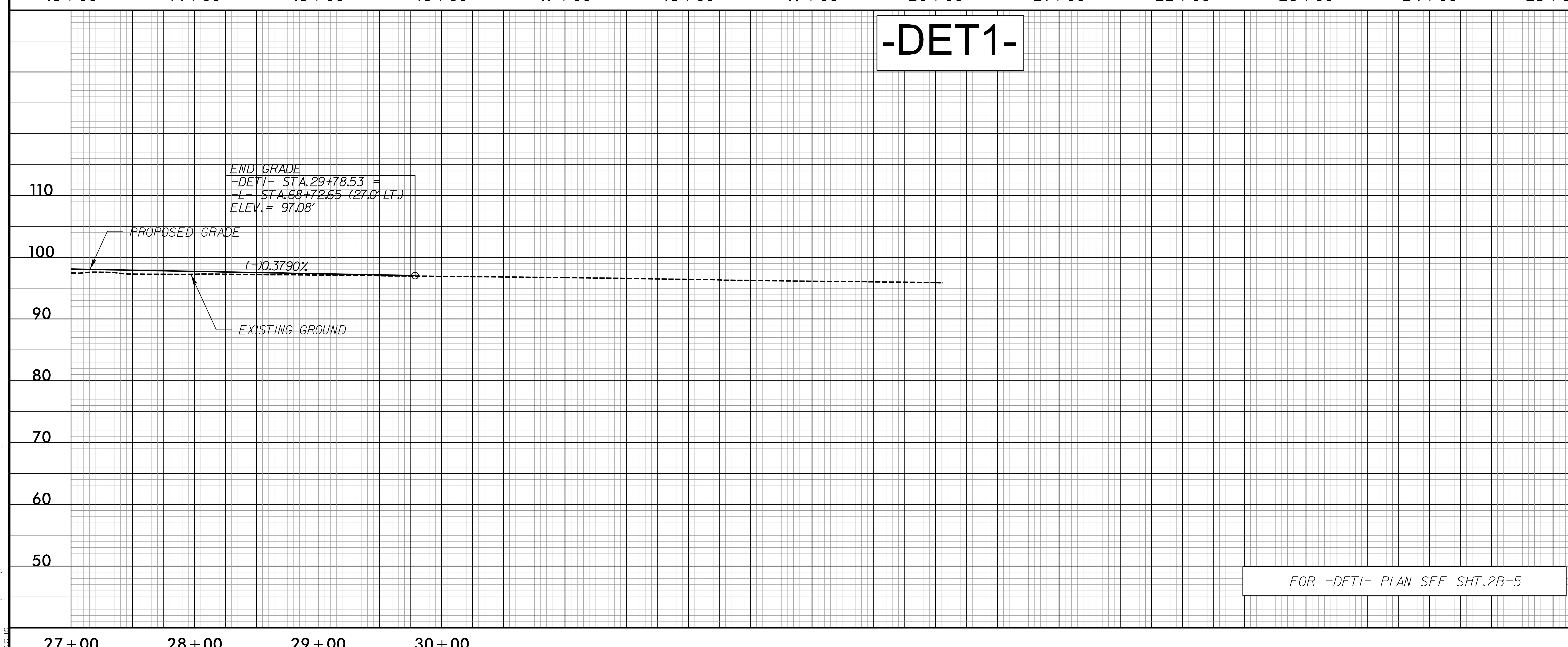

FOR -DET1- PLAN SEE SHT.2B-5

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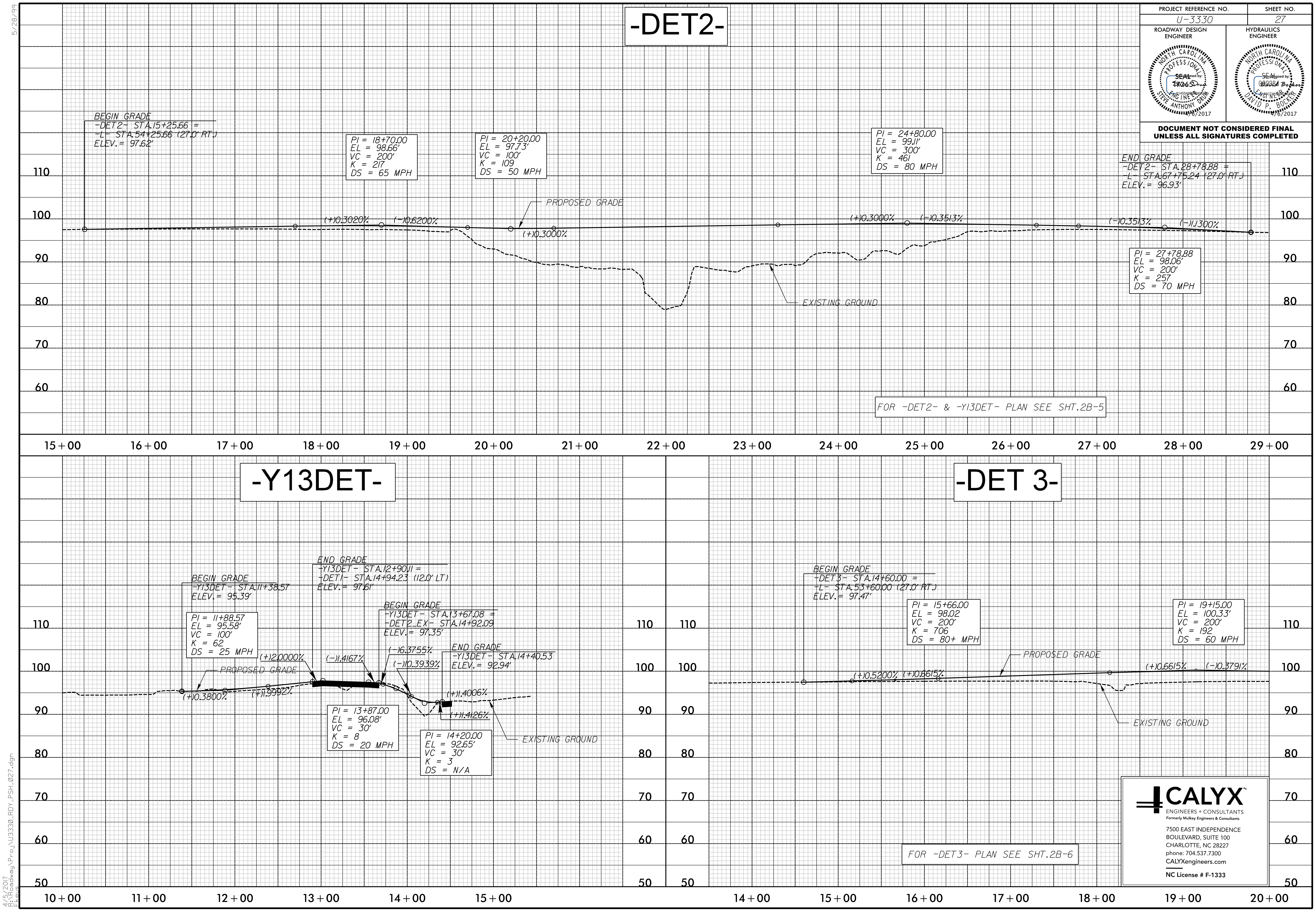

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PROJECT REFERENCE NO.	SHEET NO.
U-3330	28

ROADWAY DESIGN ENGINEER — SEAL 17265 — NORTH CAROLINA PROFESSIONAL ENGINEER — STEVE ANTHONY DRUM — DocuSigned by: 8145549B98D0493... — 4/6/2017

HYDRAULICS ENGINEER — SEAL 029984 — NORTH CAROLINA PROFESSIONAL ENGINEER — DAVID P. BOCKER — DocuSigned by: 93C7A1B94E86497... — 4/6/2017

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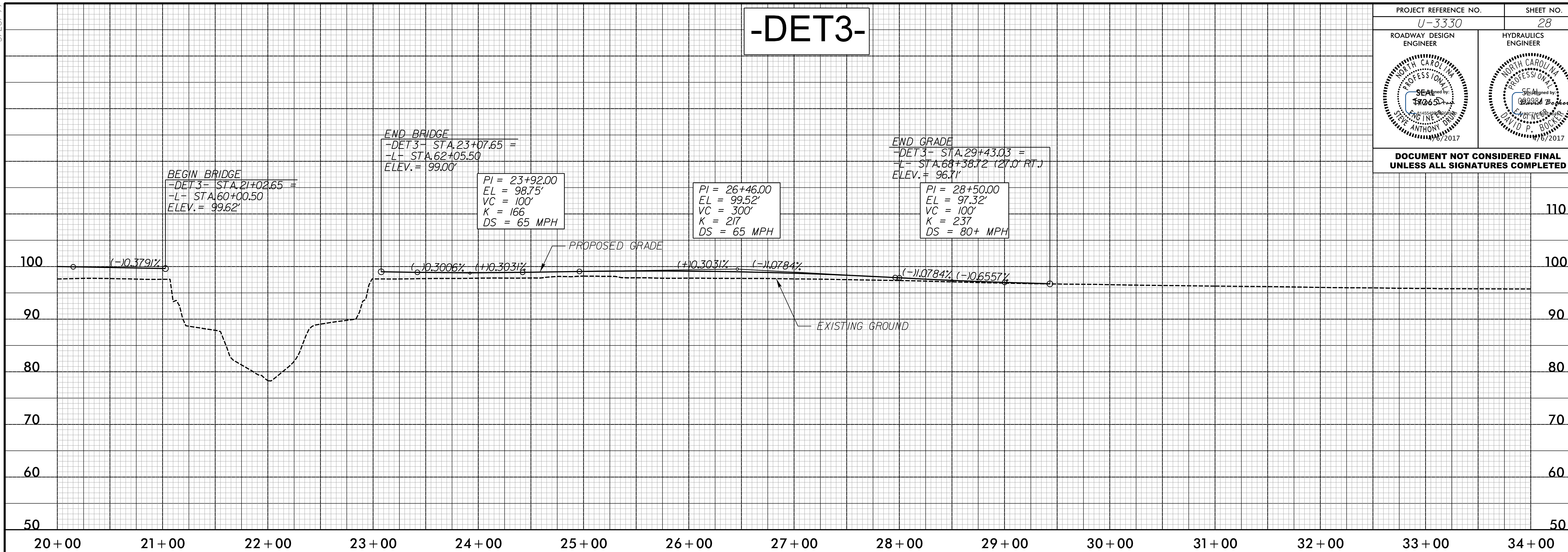

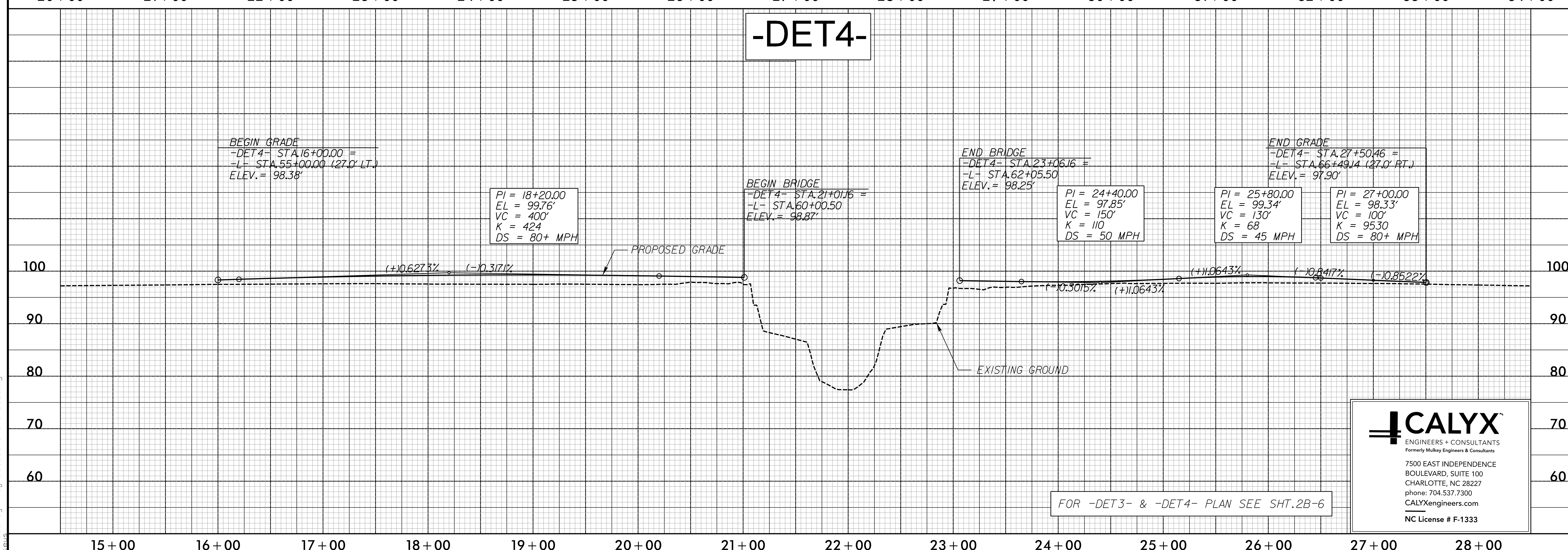

FOR -DET3- & -DET4- PLAN SEE SHT.2B-6

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