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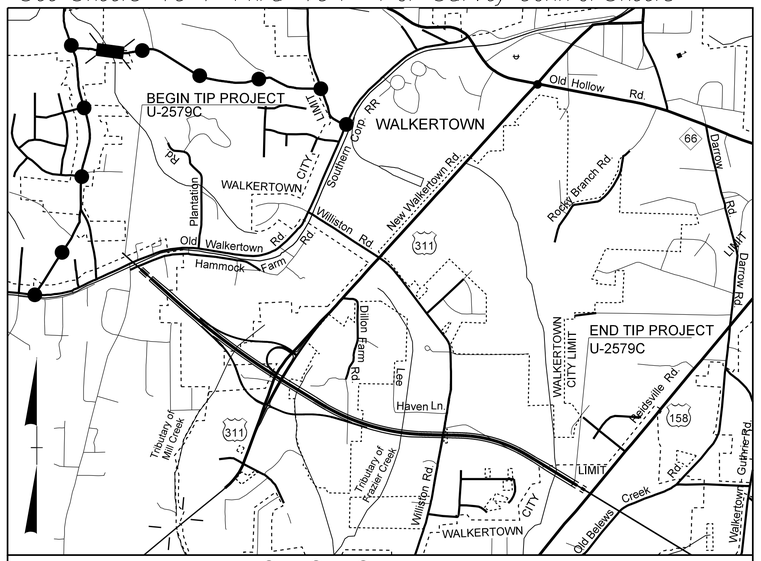
09/08/99

TIP PROJECT: U-2579C

CONTRACT: C203979

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols
See Sheets 1C-1 Thru 1C-7 For Survey Control Sheets



DETOUR

VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

FORSYTH COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2579C	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34839.1.9	N/A	PE
34839.2.6	N/A	R/W
34839.2.GV18	NHP-0918(062)	R/W
34839.2.16	N/A	UTIL
34839.3.GV6	NHP-0918(062)	CONST.

LOCATION: ***WINSTON – SALEM NORTHERN BELTWAY (EASTERN SECTION) FROM US 311 TO US 158 (FUTURE I–74)***

TYPE OF WORK: ***GRADING, PAVING, DRAINAGE, SIGNING, SIGNALS, ITS, CULVERTS, AND STRUCTURES.***

BEGIN TIP PROJECT U–2579C
–L– POT STA. 373+00.00

END TIP PROJECT U–2579C
BEGIN TIP PROJECT U–2579B
–L– POT STA. 478+00.00

END CONSTRUCTION
–L– POT STA. 483+50.00

THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES

★ PROPOSED 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 = 65,592
ADT 2037 = 93,112
K = 10 %
D = 60 %
T = 18 % *
V = 70 MPH
*(TTST=12% + DUAL=6%)
FUNC CLASS=INTERSTATE
STATEWIDE TIER

PROJECT LENGTH

LENGTH OF ROADWAY PROJECT U–2579C = 1.941 Miles
LENGTH OF STRUCTURE PROJECT U–2579C = 0.048 Mile
TOTAL LENGTH OF TIP PROJECT U–2579C = 1.989 Miles

PLANS PREPARED BY:

RS&H & SUNGATE DESIGN GROUP, P.A.
8601 SIX FORKS RD, SUITE 260
RALEIGH, NC 27615
919-926-4100

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: AUGUST 28, 2015

LETTING DATE: NOVEMBER 21, 2017

JASON TALLEY, PE
PROJECT ENGINEER

JARED BOND, PE
PROJECT DESIGN ENGINEER

TATIA L. WHITE, PE, PLS
NCDOT CONTACT

HYDRAULICS ENGINEER

10/26/2017

SIGNATURE:

ROADWAY DESIGN ENGINEER

10/26/2017

SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

23-OCT-2017 16:42
R:\Roadway\Proj\U2579c_rdy_tsh.dgn
$$$$USERNAME$$$$

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	1A

ROADWAY DESIGN ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H

INDEX OF SHEETS

GENERAL NOTES

GENERAL NOTES: 2012 SPECIFICATIONS
EFFECTIVE: 01-17-2012
REVISED: 01-24-2017

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.

GRADING:

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

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 OR 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.

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.

BERM DITCHES:

BERM DITCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 240.01 AT LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

UNDERDRAINS:

UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.03 AT LOCATIONS DIRECTED BY THE ENGINEER.

SHOULDER DRAINS:

SHOULDER DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 816.03 AND DETAILS IN PLANS AT LOCATIONS DIRECTED BY THE ENGINEER.

GUARDRAIL:

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

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

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 Winston-Salem/Forsyth County

Utilities Commission - Water/Sewer, Duke Energy Progress - Power Distribution

AT&T - Telephone, Century Link - Telephone, Time Warner Cable - Cable TV,

Piedmont Natural Gas

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.

ROCK

ROCK IS ANTICIPATED BETWEEN 416+00 TO 417+00 AND 457+00 TO 459+00. BLASTING MAY BE REQUIRED FOR EXCAVATION ON THE PROJECT. SEE SECTION 220 OF THE STANDARD SPECIFICATIONS AND IF APPLICABLE, ROCK BLASTING PROVISION.

STANDARD DRAWINGS

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

2012 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 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
225.07	Grading for False Cut at Grade Separations
225.09	Guide for Shoulder and Ditch Transition at Grade Separations
240.01	Guide for Berm Ditch Construction
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.10	Reinforced Bridge Approach Fills
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
665.01	Asphalt Shoulders - Milled Rumble Strips
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
816.01	Concrete Pads - for Shoulder Drain Installation
816.02	Aggregate Shoulder Drain
816.03	Geocomposite Shoulder Drain
816.04	Markers for Drainage Structure and Concrete Pad
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.39	Reinforced Concrete Endwall - for Single 72" Pipe 90 Skew
838.45	Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
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
850.10	Guide for Berm Drainage Outlet - 15" and 18" Pipe
850.11	Guide for Berm Drainage Outlet - 24" and 30" Pipe
852.01	Concrete Islands
852.06	Method for Placement of Drop Inlets in Concrete Islands
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

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

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

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut (C)
- Proposed Slope Stakes Fill (F)
- Proposed Curb Ramp (CR)
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard (Vineyard)

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

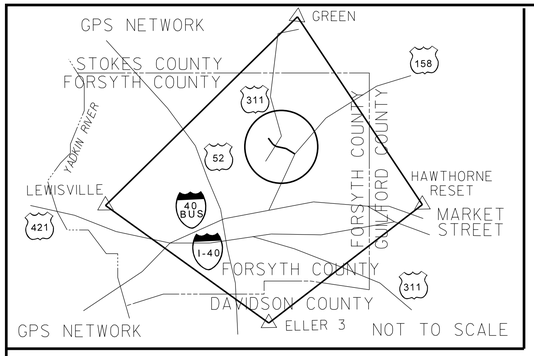
- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line (SS)
- Above Ground Sanitary Sewer (A/G Sanitary Sewer)
- SS Forced Main Line LOS B (S.U.E.*) (FSS)
- SS Forced Main Line LOS C (S.U.E.*) (FSS)
- SS Forced Main Line LOS D (S.U.E.*) (FSS)

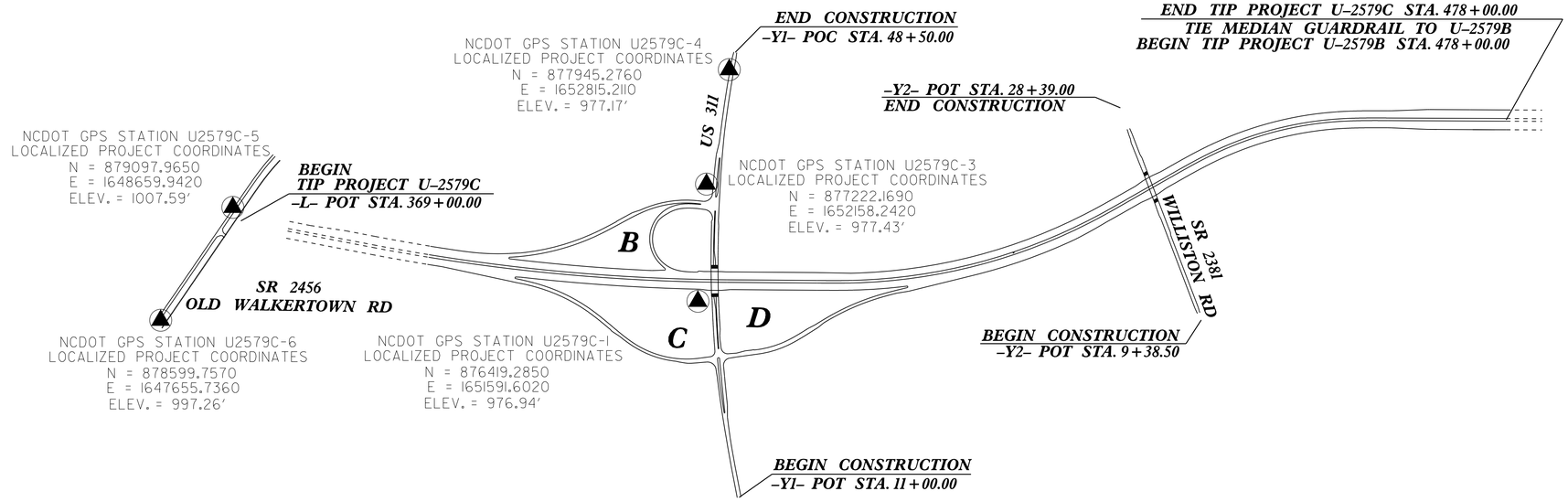
MISCELLANEOUS:

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

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	1C-1
Location and Surveys	

SURVEY CONTROL SHEET U-2579C





NOTES:

1. *THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 8395 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORKWITHIN 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:
   U2579C_LS_GPSCALIB.HTML
   U2579C_LS_WGS84.TXT
   U2579C_LS_LOCAL.TXT
   U2579C_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

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "U2579C-1" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 876419.285(ft) EASTING: 1651591.602(ft) ELEVATION: 976.94(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99995453
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U2579C-1" TO -L- STATION 390+00.00 IS N 49°00'53.54" 3884.0262'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	1C-2
Location and Surveys	

SURVEY CONTROL SHEET U-2579C

GPS Calibration Report
Project : U2579CZ

TIP Number U2579C
User name tbovender Date & Time 8:37:04 AM 3/16/2006
Coordinate System US State Plane 1983(at ground) Zone North Carolina 3200
Horizontal Datum NAD 1983 (Conus)
Vertical Datum NAVD88 Geoid Model Geoid99 NC Sub Grid
Coordinate Units US survey feet
Distance Units US survey feet
Height Units US survey feet

LOCAL SITE INFORMATION
Localized around
Latitude 36°09'08.35543"N
Longitude 80°10'48.39359"W
Site Scale Factor 1.0000454720
Height 869.698sft

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 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 881656.770sft
Easting coordinate of rotation center 1645222.163sft
Rotation about the center point 0°0'0"
Translation north 0.006sft
Translation east -0.007sft
Scale factor 0.99999960

Vertical Adjustment Parameters

Northing coordinate of origin point 874594.190sft
Easting coordinate of origin point 1650970.241sft
Vertical separation at origin 0.329sft
Slope north -8.333ppm
Slope east -22.536ppm

Geoid Model Definition

Geoid99 NC Sub Grid

Residual Differences Between GPS (WGS84) And Local Coordinates

Summary

Maximum error	Root Mean Square error	Point
Horizontal	0.004sft 0.001	U2579C-2 GPS
Vertical 0.000sft	0.000	U2579C-2 GPS
Three-dimensional	0.004sft 0.001	U2579C-2 GPS

	WGS84 Coordinates	Calculated point FOR DISPLAY ONLY	Local Coordinates
Point	U2579C-1 GPS	Northing 876419.312sft	Point U2579C-1
Latitude	36°09'08.35561"N	Easting 1651591.580sft	Northing 876419.314sft
Longitude	80°10'48.39376"W	Elevation 976.937sft	Easting 1651591.579sft
Height	869.565sft	Horz error 0.002sft	Elevation 976.937sft
		Vert error 0.000sft	Utilized Horz and Vert
		3D error 0.002sft	Quality Adjusted quality
Point	U2579C-2 GPS	Northing 874594.190sft	Point U2579C-2
Latitude	36°08'50.23619"N	Easting 1650970.241sft	Northing 874594.193sft
Longitude	80°10'55.70414"W	Elevation 962.984sft	Easting 1650970.238sft
Height	855.629sft	Horz error 0.004sft	Elevation 962.985sft
		Vert error 0.000sft	Utilized Horz and Vert
		3D error 0.004sft	Quality Adjusted quality
Point	U2579C-3 GPS	Northing 877222.169sft	Point U2579C-3
Latitude	36°09'16.36058"N	Easting 1652158.241sft	Northing 877222.169sft
Longitude	80°10'41.60119"W	Elevation 977.429sft	Easting 1652158.242sft
Height	870.066sft	Horz error 0.001sft	Elevation 977.429sft
		Vert error 0.000sft	Utilized Horz and Vert
		3D error 0.001sft	Quality Adjusted quality
Point	U2579C-4 GPS	Northing 877945.278sft	Point U2579C-4
Latitude	36°09'23.58750"N	Easting 1652815.209sft	Northing 877945.276sft
Longitude	80°10'33.69565"W	Elevation 977.168sft	Easting 1652815.211sft
Height	869.820sft	Horz error 0.004sft	Elevation 977.168sft
		Vert error 0.000sft	Utilized Horz and Vert
		3D error 0.004sft	Quality Adjusted quality
Point	U2579C-5 GPS	Northing 879097.966sft	Point U2579C-5
Latitude	36°09'34.49525"N	Easting 1648659.942sft	Northing 879097.965sft
Longitude	80°11'24.52785"W	Elevation 1007.592sft	Easting 1648659.942sft
Height	899.999sft	Horz error 0.001sft	Elevation 1007.592sft
		Vert error 0.000sft	Utilized Horz and Vert
		3D error 0.001sft	Quality Adjusted quality
Point	U2579C-6 GPS	Northing 878599.757sft	Point U2579C-6
Latitude	36°09'29.44991"N	Easting 1647655.737sft	Northing 878599.757sft
Longitude	80°11'36.69918"W	Elevation 997.261sft	Easting 1647655.736sft
Height	889.629sft	Horz error 0.001sft	Elevation 997.261sft
		Vert error 0.000sft	Utilized Horz and Vert
		3D error 0.001sft	Quality Adjusted quality
Point	U2579D-7 GPS	Northing 880888.478sft	Point U2579D-7
Latitude	36°09'51.74737"N	Easting 1644868.839sft	Northing 880888.477sft
Longitude	80°12'11.01767"W	Elevation 991.488sft	Easting 1644868.839sft
Height	883.654sft	Horz error 0.001sft	Elevation 991.488sft
		Vert error 0.000sft	Utilized Horz and Vert
		3D error 0.001sft	Quality Adjusted quality
Point	U2579D-8 GPS	Northing 881853.892sft	Point U2579D-8
Latitude	36°10'01.29767"N	Easting 1644907.587sft	Northing 881853.891sft
Longitude	80°12'10.68786"W	Elevation 978.362sft	Easting 1644907.587sft
Height	870.505sft	Horz error 0.001sft	Elevation 978.362sft
		Vert error 0.000sft	Utilized Horz and Vert
		3D error 0.001sft	Quality Adjusted quality
Point	U2579D-9 GPS	Northing 885999.857sft	Point U2579D-9
Latitude	36°10'41.58107"N	Easting 1639029.416sft	Northing 885999.857sft
Longitude	80°13'22.99025"W	Elevation 851.244sft	Easting 1639029.416sft
Height	742.988sft	Horz error 0.000sft	Elevation 851.244sft
		Vert error 0.000sft	Utilized Horz and Vert
		3D error 0.000sft	Quality Adjusted quality
Point	U2579D-10 GPS	Northing 887526.306sft	Point U2579D-10
Latitude	36°10'56.69827"N	Easting 1639229.479sft	Northing 887526.307sft
Longitude	80°13'20.77956"W	Elevation 897.604sft	Easting 1639229.479sft
Height	789.321sft	Horz error 0.000sft	Elevation 897.604sft
		Vert error 0.000sft	Utilized Horz and Vert
		3D error 0.001sft	Quality Adjusted quality
Point	U2579D-11 GPS	Northing 888976.550sft	Point U2579D-11
Latitude	36°11'10.57515"N	Easting 1635451.543sft	Northing 888976.550sft
Longitude	80°14'07.07724"W	Elevation 914.716sft	Easting 1635451.543sft
Height	806.214sft	Horz error 0.001sft	Elevation 914.715sft
		Vert error 0.000sft	Utilized Horz and Vert
		3D error 0.001sft	Quality Adjusted quality
Point	U2579D-12 GPS	Northing 890757.558sft	Point U2579D-12
Latitude	36°11'28.16966"N	Easting 1635328.064sft	Northing 890757.558sft
Longitude	80°14'08.85377"W	Elevation 906.848sft	Easting 1635328.064sft
Height	798.301sft	Horz error 0.000sft	Elevation 906.848sft
		Vert error 0.000sft	Utilized Horz and Vert
		3D error 0.000sft	Quality Adjusted quality

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 WORKWITHIN 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:
   U2579C_LS_GPSCALIB.HTML
   U2579C_LS_WGS84.TXT
   U2579C_LS_LOCAL.TXT
   U2579C_LS_CONTROL.TXT

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

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

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "U2579C-1" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 876419.285(ft) EASTING: 1651591.602(ft) ELEVATION: 976.94(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99995453
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U2579C-1" TO -L- STATION 390+00.00 IS N 49°00'53.54" 3884.0262'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

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PROJECT REFERENCE NO.	SHEET NO.
U-2579C	1C-3
Location and Surveys	

SURVEY CONTROL SHEET U-2579C

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
37	BL-37	878917.1490	1648253.6740	1004.53	366+30.66	307.74 RT
50	BY1A-50	878877.1310	1648520.6380	1009.97	368+56.21	159.43 RT
36	BL-36	878845.8860	1648742.7370	1013.20	370+42.50	34.52 RT
35	BL-35	878592.6930	1649050.4260	970.60	374+40.62	17.83 RT
34	BL-34	878364.6610	1649334.0440	961.33	378+04.02	1.55 LT
33	BL-33	877991.2850	1649757.2490	967.34	383+68.44	2.23 LT
32	BL-32	877789.2050	1649997.6060	945.92	386+82.51	2.51 LT
31	BL-31	877549.7810	1650280.2380	964.77	390+52.79	6.25 RT
30	BL-30	877276.3020	1650640.8900	956.39	395+05.27	3.86 RT
29	BL-29	877101.7870	1650879.2810	921.27	398+00.65	4.05 RT
28	BL-28	876970.5180	1651143.7410	957.29	400+92.79	40.84 LT
27	BL-27	876697.9310	1651728.7930	968.29	407+34.60	136.59 LT
26	BL-26	875730.0290	1653086.7730	964.02	424+00.70	5.50 RT
25	BL-25	875529.8050	1653613.7140	945.69	429+64.60	4.53 LT
24	BL-24	875379.5380	1654081.8010	935.64	434+55.28	17.37 RT
23	BL-23	875240.6970	1654505.3650	905.03	438+91.24	84.70 RT
22	BL-22	875236.2960	1655339.7950	953.42	447+18.18	48.07 RT
21	BL-21	875116.2950	1656388.3120	942.90	457+90.24	59.70 RT
20	BL-20	874788.3130	1657221.9250	918.98	467+00.09	19.98 RT
13	U2579B BL-13	874480.5920	1657767.3060	859.16	473+26.06	0.07 LT

BY1

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
40	BY1-40	879382.0370	1649895.8830	993.02	375+43.72	1134.23 LT
41	BY1-41	879373.0890	1649502.9110	993.70	372+56.98	865.37 LT
5	U2579C-5	879097.9650	1648659.9420	1007.59	368+12.64	98.00 LT
37	BL-37	878917.1490	1648253.6740	1004.53	366+30.66	307.74 RT
6	U2579C-6	878599.7570	1647655.7360	997.26	363+97.03	943.11 RT
42	BY1-42	878376.0450	1647114.4820	1005.32	361+42.62	1470.87 RT
43	BY1-43	878324.9540	1646422.9780	1011.12	350+41.95	1919.36 RT

BY1A

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
50	BY1A-50	878877.1310	1648520.6380	1009.97	368+56.21	159.43 RT
51	BY1A-51	878418.4500	1648514.5350	1017.07	371+57.70	505.17 RT
52	BY1A-52	877822.5750	1648402.6360	1013.17	374+71.92	1023.68 RT

BY1B

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
51	BY1A-51	878418.4500	1648514.5350	1017.07	371+57.70	505.17 RT
60	BY1B-60	878475.3670	1648039.2490	989.50	367+65.70	779.88 RT

BY3

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
70	BY3-70	879257.5980	1649739.9840	998.06	375+10.63	937.52 LT
71	BY3-71	879095.5770	1648953.3960	1006.80	370+32.82	292.02 LT
50	BY1A-50	878877.1310	1648520.6380	1009.97	368+56.21	159.43 RT

BY4

POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
4	U2579C-4	877945.2760	1652815.2110	977.17	46+98.17	22.68 LT
3	U2579C-3	877222.1690	1652158.2420	977.43	37+29.20	91.65 LT
27	BL-27	876697.9310	1651728.7930	968.29	30+64.62	164.94 LT
1	U2579C-1	876419.2850	1651591.6020	976.94	27+59.85	143.91 LT
80	BY4-80	875566.1010	1651284.1120	965.41	18+67.46	40.44 LT
2	U2579C-2	874594.1930	1650970.2380	962.99	OUTSIDE PROJECT LIMITS	

BY4A

POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
1	U2579C-1	876419.2850	1651591.6020	976.94	27+59.85	143.91 LT
90	BY4A-90	876546.2760	1651243.2220	974.52	27+04.18	510.20 LT

BY4B

POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
100	BY4B-100	874514.7520	1651289.2500	955.35	OUTSIDE PROJECT LIMITS	
2	U2579C-2	874594.1930	1650970.2380	962.99	OUTSIDE PROJECT LIMITS	

BY4C

POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
2	U2579C-2	874594.1930	1650970.2380	962.99	OUTSIDE PROJECT LIMITS	
110	BY4C-110	874793.3610	1650765.7980	968.70	OUTSIDE PROJECT LIMITS	

BY5

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
120	BY5-120	876347.1190	1653206.5820	973.27	422+21.42	600.45 LT
26	BL-26	875730.0290	1653086.7730	964.02	424+00.70	5.50 RT

BY6

POINT	DESC.	NORTH	EAST	ELEVATION	Y2 STATION	OFFSET
130	BY6-130	876210.7830	1655471.9540	962.57	30+65.40	15.08 LT
22	BL-22	875236.2960	1655339.7950	953.42	20+81.35	17.53 RT
131	BY6-131	874279.7050	1655168.5240	952.47	11+09.55	17.36 RT

NOTES:

1. *THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 8395 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORKWITHIN 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.*

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   THE FILES TO BE FOUND ARE AS FOLLOWS:
   U2579C_LS_GPSCALIB.HTML
   U2579C_LS_WGS84.TXT
   U2579C_LS_LOCAL.TXT
   U2579C_LS_CONTROL.TXT

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PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

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**************************************
BM1       ELEVATION = 999.15
N 878792      E 1649815
L STATION 378+78.00 640 LEFT
RAILROAD SPIKE SET IN BASE OF 30" WHITE
OAK TREE.  100' WEST OF WESTERN EDGE OF
PAVEMENT OF WILLISTON RD.
**************************************

**************************************
BM2       ELEVATION = 985.60
N 877996      E 1652824
Y1 STATION 47+42.00 50 LEFT
RAILROAD SPIKE SET IN BASE OF 36" OAK
TREE.  IN FRONT OF 4386 NEW WALKERTOWN
RD.  40' WEST OF WESTERN EDGE OF
PAVEMENT.  60' NORTH OF U2579C-4.
**************************************

**************************************
BM3       ELEVATION = 957.76
N 876348      E 1655376
Y2 STATION 31+99.00 120 LEFT
RAILROAD SPIKE SET IN BASE OF 30" OAK
TREE BEHIND OAK GROVE MORAVIAN CHURCH
CEMETARY.
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DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "U2579C-1"
WITH NAD 83/95 STATE PLANE GRID COORDINATES OF
NORTHING: 876419.285(ft) EASTING: 1651591.602(ft)
ELEVATION: 976.94(ft)
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THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U2579C-1" TO -L- STATION 390+00.00 IS
N 49°00'53.54" 3884.0262'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

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PROJECT REFERENCE NO.	SHEET NO.
U-2579C	1C-4
Location and Surveys	

SURVEY CONTROL SHEET U-2579C

L

TYPE	STATION	NORTH	EAST
POT	369+00.00	878966.6745	1648659.6288
PC	380+26.43	878215.1164	1649498.6799
PT	410+06.22	876438.9995	1651886.1818
TS	417+61.30	876045.1314	1652530.3984
SC	420+61.30	875891.4458	1652788.0265
CS	441+77.34	875300.0298	1654800.3025
ST	444+77.34	875289.8808	1655100.1166
TS	448+86.48	875280.4891	1655509.1473
SC	453+06.48	875260.6161	1655928.5769
CS	463+87.62	874958.9745	1656960.1431
ST	468+07.62	874749.7465	1657324.2031
POT	478+00.00	874234.4275	1658172.2973

Y1

TYPE	STATION	NORTH	EAST
POT	10+00.00	874741.2889	1651007.6977
PC	12+95.90	875019.3207	1651108.9743
PT	48+58.29	878049.8100	1652938.8597
POT	50+01.83	878156.0846	1653035.3402

Y1DET

TYPE	STATION	NORTH	EAST
POT	10+00.00	876296.7035	1651573.3343
PC	11+65.00	876451.3885	1651630.7587
PT	15+63.31	876802.1306	1651817.0466
PC	22+38.90	877351.5833	1652210.1421
PRC	29+50.71	877857.7175	1652706.6018
PT	33+97.69	878157.7969	1653036.9158
POT	34+26.59	878179.2134	1653056.3205

Y1LPB

TYPE	STATION	NORTH	EAST
CS	10+00.00	876625.7249	1651697.7880
SC	12+10.00	876759.1306	1651537.3571
CS	18+92.00	877194.8862	1651831.0355
ST	21+02.00	877096.6283	1652015.1471
POT	22+40.11	877016.9356	1652127.9444

Y1RPB

TYPE	STATION	NORTH	EAST
CS	10+00.00	877835.8305	1650029.8566
SC	12+40.00	877687.7044	1650218.6288
CS	22+47.50	877333.4398	1651149.8506
SRS	24+87.50	877318.0538	1651389.3165
SC	27+27.50	877296.9566	1651628.1971
PT	31+49.41	877129.7873	1652011.3753
POT	33+09.41	877033.4969	1652139.1569

Y1RPC

TYPE	STATION	NORTH	EAST
POT	10+00.00	877660.0453	1650058.1642
TS	14+08.00	877381.2148	1650356.0191
SC	16+48.00	877212.4781	1650526.5854
CS	21+17.08	876820.2603	1650780.1295
SRS	23+57.08	876595.4561	1650863.9626
SC	25+97.08	876372.6226	1650952.4822
PT	31+63.36	875994.3259	1651358.7181
POT	33+16.49	875934.0610	1651499.4869

Y1RPD

TYPE	STATION	NORTH	EAST
POT	10+00.00	875443.1529	1653675.9171
TS	15+80.00	875615.1016	1653121.9914
SC	18+20.00	875681.5253	1652891.4085
CS	22+07.75	875735.5541	1652508.0815
SRS	24+47.75	875735.4519	1652268.1219
SC	26+87.75	875742.1247	1652028.4431
PT	29+16.62	875801.8615	1651808.2828
POT	32+52.52	875934.0610	1651499.4869

Y2

TYPE	STATION	NORTH	EAST
POT	9+00.00	874076.4864	1655114.5377
TS	28+08.31	875954.9886	1655450.5354
SC	29+04.31	876049.5940	1655466.8303
CS	31+44.90	876288.6430	1655493.0887
ST	32+40.90	876384.5297	1655497.7184
POT	33+78.30	876521.8177	1655503.4632

Y2DET

TYPE	STATION	NORTH	EAST
POT	10+00.00	874174.9242	1655132.1447
PC	15+00.00	874667.1130	1655220.1798
PRC	17+50.83	874894.8079	1655319.7639
PT	20+01.66	875122.5027	1655419.3480
PC	23+01.66	875417.8160	1655472.1691
PRC	25+52.48	875665.9129	1655457.6874
PT	28+03.31	875914.0099	1655443.2057
POT	28+44.94	875954.9887	1655450.5354

Y3

TYPE	STATION	NORTH	EAST
POT	10+00.00	878606.2139	1647628.4038
PC	24+14.77	879194.4304	1648915.0972
PT	34+29.84	879359.3641	1649904.7980

Y4

TYPE	STATION	NORTH	EAST
POT	10+00.00	878738.4659	1648506.1882
PC	11+19.74	878857.5857	1648494.0464
PT	12+43.35	878976.0304	1648460.8490
POT	12+53.12	878984.8472	1648456.6447

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   THE FILES TO BE FOUND ARE AS FOLLOWS:
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   U2579C_LS_LOCAL.TXT
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NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION
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DATUM DESCRIPTION

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VERTICAL DATUM USED IS NAVD 88

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PROJECT REFERENCE NO.	SHEET NO.
U-2579C	1C-5
Location and Surveys	

SURVEY CONTROL SHEET U-2579C

ROW MARKER CONCRETE OR GRANITE-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	364+23.65	-240.00	879463.2656	1648464.9374
L	364+65.20	232.03	879083.9416	1648180.9486
L	364+86.84	255.00	879052.3903	1648181.7420
L	368+01.17	255.00	878842.6689	1648415.8781
L	370+15.52	-240.00	879068.3673	1648905.8080
L	369+63.43	255.00	878734.4118	1648536.7380
L	370+53.05	-240.00	879043.3314	1648933.7584
L	374+00.00	255.00	878443.1296	1648861.9300
L	380+26.43	317.00	877978.9913	1649287.1760
L	380+26.43	-240.00	878393.8866	1649658.8087
L	383+72.00	-205.00	878142.8279	1649892.0250
L	413+14.00	-180.00	876432.0269	1652242.6626
L	414+88.00	-180.00	876341.2644	1652391.1152
L	416+50.00	-230.00	876299.4201	1652555.4108
L	417+61.30	-230.00	876241.3634	1652650.3693
L	420+61.30	-230.00	876091.4889	1652901.5289
L	423+35.00	-307.00	876039.1012	1653165.2948
L	423+60.00	-255.00	875982.0751	1653163.5931
L	424+13.74	-340.00	876037.1406	1653245.5592
L	424+30.97	-304.68	875998.3575	1653245.1078
L	424+65.28	-232.51	875919.2932	1653244.2324
L	426+00.00	-200.00	875837.9402	1653348.7251
L	432+50.00	-200.00	875637.7388	1653936.7698
L	441+77.34	-200.00	875499.7207	1654811.4170
L	441+77.34	200.00	875100.3388	1654789.1881
L	444+77.34	-200.00	875489.8281	1655104.7075
L	444+77.34	200.00	875089.9335	1655095.5257
L	446+34.35	200.00	875086.3293	1655252.4964
L	446+69.30	-200.00	875485.4216	1655296.6212
L	447+19.36	200.00	875084.3780	1655337.4805
L	447+81.46	-200.00	875482.8470	1655408.7525
L	448+86.48	200.00	875080.5418	1655504.5564
L	448+86.48	-200.00	875480.4364	1655513.7383
L	450+18.00	-200.00	875477.0648	1655646.6547
L	451+00.00	-280.00	875553.9969	1655734.2967
L	453+06.48	219.51	875042.1191	1655907.5124
L	453+06.48	-276.76	875536.0979	1655955.1449
L	454+00.00	-280.00	875527.8083	1656057.4473
L	460+00.00	-240.00	875338.1348	1656683.7302
L	460+00.00	250.00	874875.8224	1656521.3505
L	463+87.62	-200.00	875137.0309	1657051.2251
L	463+87.62	227.48	874756.4532	1656856.5464
L	468+07.62	200.00	874578.8252	1657220.3479
L	468+07.62	-200.00	874920.6678	1657428.0583
L	468+80.00	-200.00	874883.0828	1657489.9144
L	469+03.00	-158.00	874835.2459	1657487.7608
L	469+78.00	-200.00	874832.1937	1657573.6659
L	470+63.40	200.00	874446.0043	1657438.9399
L	474+25.90	-200.00	874599.6092	1657956.4454

ROW MARKER CONCRETE OR GRANITE-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y1	10+50.00	50.00	874771.1559	1651071.7910
Y1	10+50.00	70.00	874764.3107	1651090.5831
Y1	13+00.00	70.00	874999.1821	1651176.1390
Y1	13+00.00	-65.00	875045.4442	1651049.3131
Y1	13+00.00	-50.00	875040.3042	1651063.4040
Y1	16+24.80	85.69	875294.0807	1651306.4645
Y1	16+56.76	-68.65	875381.8820	1651175.5781
Y1	18+75.00	90.00	875520.7668	1651406.6477
Y1	20+65.00	-90.00	875767.8779	1651320.4422
Y1	20+75.00	90.00	875701.3283	1651487.9867
Y1	32+15.00	120.00	876677.4983	1652050.4983
Y1	37+25.00	-180.00	877269.5885	1652083.5779
Y1	38+00.00	100.00	877168.7932	1652355.4475
Y1	38+00.00	-120.00	877296.9651	1652176.6404
Y1	44+50.00	80.00	877690.4252	1652732.7913
Y1	44+50.00	-70.00	877786.2158	1652617.3611
Y1	46+50.00	47.65	877862.7969	1652836.6126

ROW MARKER CONCRETE OR GRANITE-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y2	10+00.00	42.00	874167.5293	1655173.4886
Y2	10+00.00	29.69	874169.6965	1655161.3721
Y2	10+00.00	-42.00	874182.3192	1655090.8009
Y2	10+00.00	-30.31	874180.2607	1655102.3094
Y2	17+00.00	42.00	874856.5935	1655296.7379
Y2	18+25.00	-42.00	874994.4307	1655236.0590
Y2	25+30.00	42.00	875673.6270	1655442.8763
Y2	25+30.00	-57.00	875691.0580	1655345.4229
Y2	25+74.14	-54.87	875734.1332	1655355.2922
Y2	26+35.91	-50.00	875794.0808	1655370.9611
Y2	26+50.00	-31.25	875804.6489	1655391.9024
Y2	26+50.00	-50.00	875807.9507	1655373.4420
Y2	26+53.67	30.07	875797.4654	1655452.9073
Y2	26+53.67	42.00	875795.3649	1655464.6509

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "U2579C-1" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 876419.285(ft) EASTING: 1651591.602(ft) ELEVATION: 976.94(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99995453
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U2579C-1" TO -L- STATION 390+00.00 IS N 49°00'53.54" 3884.0262'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

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 WORKWITHIN 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:
U2579C_LS_GPSCALIB.HTML
U2579C_LS_WGS84.TXT
U2579C_LS_LOCAL.TXT
U2579C_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.

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PROJECT REFERENCE NO.	SHEET NO.
U-2579C	1C-6
Location and Surveys	

SURVEY CONTROL SHEET U-2579C

ROW MARKER CONCRETE OR GRANITE-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y1RPB	10+00.00	-206.00	877994.6104	1650161.1005
Y1RPB	12+40.00	-170.00	877825.8802	1650317.6615
Y1RPB	16+50.00	-120.00	877595.4996	1650622.4522
Y1RPB	22+47.50	-169.00	877501.5057	1651167.5948
Y1RPB	24+87.50	-144.00	877461.9167	1651395.5994
Y1RPB	27+27.50	-123.00	877418.0354	1651649.8517
Y1RPB	29+75.00	-165.00	877369.0710	1651934.8809

ROW MARKER CONCRETE OR GRANITE-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y1RPC	10+00.00	206.00	877509.6578	1649917.3821
Y1RPC	14+08.00	160.00	877264.4089	1650246.6737
Y1RPC	16+48.00	160.00	877105.1110	1650407.9587
Y1RPC	21+17.08	160.00	876756.1724	1650633.5255
Y1RPC	23+57.08	140.00	876550.1751	1650731.4876
Y1RPC	25+97.08	120.00	876317.6674	1650845.8054
Y1RPC	31+25.00	120.00	875902.2564	1651271.4836

ROW MARKER CONCRETE OR GRANITE-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y1RPD	10+00.00	-141.00	875308.4917	1653634.1158
Y1RPD	14+42.00	-132.62	875447.5343	1653214.4714
Y1RPD	15+80.00	-130.00	875490.9458	1653083.4512
Y1RPD	18+20.00	-120.00	875564.9491	1652862.9484
Y1RPD	22+07.75	-120.00	875615.6530	1652503.2108
Y1RPD	24+47.75	-155.00	875580.4859	1652271.3671
Y1RPD	26+87.75	-140.00	875603.2241	1652010.9326
Y1RPD	29+16.62	-120.00	875691.5458	1651761.0552
Y1RPD	30+68.00	-120.00	875751.1245	1651621.8894

ROW MARKER CONCRETE OR GRANITE-E

ALIGN	STATION	OFFSET	NORTH	EAST
SRSA	10+00.00	-35.00	875255.8513	1653186.9249
SRSA	10+00.00	40.00	875253.7619	1653261.8958
SRSA	12+27.64	40.00	875326.5710	1653369.6016
SRSA	27+92.06	40.00	875027.0730	1654911.2664
SRSA	28+97.00	40.00	875023.9571	1655161.1621
SRSA	30+69.75	40.00	874993.4909	1655105.4288
SRSA	31+27.42	66.22	874909.6399	1655220.8929

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "U2579C-1" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 876419.285(ft) EASTING: 1651591.602(ft) ELEVATION: 976.94(ft)
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ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES:

1. *THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 8395 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORKWITHIN 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.*

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

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   U2579C_LS_GPSCALIB.HTML
   U2579C_LS_WGS84.TXT
   U2579C_LS_LOCAL.TXT
   U2579C_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.

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PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

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PROJECT REFERENCE NO.	SHEET NO.
U-2579C	1C-7
Location and Surveys	

SURVEY CONTROL SHEET U-2579C

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	378+87.00	-266.00	878506.2820	1649572.2973
L	378+87.00	-240.00	878486.9152	1649554.9500
L	380+43.00	-265.00	878401.6382	1649687.6368
L	380+66.00	-236.36	878365.1901	1649685.4608
L	385+41.00	277.82	877665.2086	1649708.5137
L	385+41.00	302.00	877646.7002	1649692.9537
L	386+50.00	298.00	877578.6280	1649780.7134
L	386+76.00	270.29	877583.1004	1649818.7590
L	446+08.56	200.00	875086.9203	1655226.7117
L	446+34.00	-200.00	875486.2319	1655261.3292

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y1	37+24.29	-210.00	877286.2751	1652058.6364
Y1	37+34.50	-210.00	877294.8076	1652064.6539
Y1	42+25.00	-168.69	877274.7256	1652101.0406
Y1	41+94.00	93.33	877484.6865	1652583.9618
Y1	42+06.00	160.00	877452.8291	1652643.7169
Y1	42+25.00	92.09	877509.5702	1652601.9625
Y1	42+36.00	155.00	877479.0778	1652658.0490
Y1	43+77.50	84.50	877632.0958	1652690.5964
Y1	44+15.50	87.00	877659.6165	1652716.4043
Y1	44+19.00	98.00	877655.2962	1652727.0973
Y1	44+23.50	86.00	877666.3676	1652720.6731
Y1	44+27.00	95.50	877662.9933	1652730.2059
Y1	46+62.00	-52.11	877937.2719	1652769.1620
Y1	46+62.00	-96.00	877966.0728	1652736.0421
Y1	46+68.50	67.00	877863.9810	1652863.2767
Y1	46+68.50	59.00	877869.2348	1652857.2437
Y1	46+71.50	-51.91	877944.3470	1652775.5851
Y1	46+71.50	-96.00	877973.3131	1652742.3448
Y1	46+76.50	67.00	877869.9678	1652868.4948
Y1	46+76.50	58.50	877875.5555	1652862.0896
Y1	46+98.00	48.61	877898.1570	1652868.7139
Y1	48+28.50	-61.00	878068.5766	1652873.5746
Y1	48+31.00	-50.04	878063.1028	1652883.3965
Y1	48+37.00	-63.00	878076.2686	1652877.8244
Y1	48+40.00	-50.02	878069.8027	1652889.4789

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y1RPD	24+81.00	-151.38	875583.4317	1652237.6273
Y1RPD	25+62.24	-172.41	875561.9266	1652151.5174
Y1RPD	26+00.00	-170.00	875565.3750	1652109.4498
Y1RPD	26+20.00	-139.91	875596.4685	1652088.3084

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
SRSA	22+40.00	40.00	875075.3729	1654357.0344
SRSA	22+40.00	70.00	875045.6841	1654352.7246
SRSA	22+90.00	40.00	875068.3891	1654406.9628
SRSA	22+90.00	70.00	875038.6572	1654402.9610

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y2	8+93.00	-65.00	874081.0403	1655049.3207
Y2	8+98.00	-30.41	874079.8724	1655084.2479
Y2	9+02.00	-66.00	874090.0758	1655049.9209
Y2	9+07.00	-30.40	874088.7302	1655085.8416
Y2	9+47.00	29.64	874117.5337	1655151.9882
Y2	9+51.00	53.00	874117.3577	1655175.6903
Y2	10+80.00	70.00	874241.3493	1655215.1378
Y2	10+80.00	60.00	874243.1100	1655205.2941
Y2	10+87.50	71.00	874248.5560	1655217.4427
Y2	10+87.50	60.50	874250.4048	1655207.1068
Y2	11+92.00	50.00	874355.1209	1655215.1702
Y2	12+76.00	61.00	874435.8719	1655240.7882
Y2	12+77.00	71.00	874435.0956	1655250.8081
Y2	12+84.00	60.50	874443.8349	1655241.7046
Y2	12+85.50	70.00	874443.6388	1655251.3203
Y2	16+92.00	64.00	874844.8448	1655316.9866
Y2	16+94.00	74.50	874844.9648	1655327.6747
Y2	17+00.00	62.50	874852.9839	1655316.9186
Y2	17+02.00	73.00	874853.1039	1655327.6067
Y2	17+45.07	42.00	874900.9569	1655304.6729
Y2	18+58.53	-42.00	875027.4401	1655241.9632
Y2	26+45.26	42.00	875787.0863	1655463.1701
Y2	26+48.81	76.61	875784.4870	1655497.8645
Y2	26+57.14	75.75	875792.8383	1655498.4846
Y2	26+65.00	-58.50	875824.2130	1655367.7158
Y2	28+39.00	-31.10	875990.6129	1655425.2978
Y2	28+39.00	-53.00	875994.4271	1655403.7281

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y1RPC	10+70.00	198.11	877467.5758	1649973.8736
Y1RPC	10+79.00	230.00	877438.1477	1649958.6532
Y1RPC	11+10.00	193.60	877443.5324	1650006.1576
Y1RPC	11+20.00	225.00	877413.7782	1649992.0017
Y1RPC	12+42.00	178.72	877364.1884	1650112.6943
Y1RPC	12+46.00	215.00	877334.9691	1650090.8204
Y1RPC	13+46.00	207.00	877272.4685	1650169.2913
Y1RPC	13+75.00	163.72	877284.2457	1650220.0403
Y1RPC	19+13.00	160.00	876916.8705	1650549.3557
Y1RPC	19+23.00	180.00	876898.8984	1650536.9087
Y1RPC	20+75.00	210.00	876768.9003	1650572.8230
Y1RPC	21+30.00	180.00	876737.7296	1650619.7059

NOTES:

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2. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:*
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   THE FILES TO BE FOUND ARE AS FOLLOWS:
   U2579C_LS_GPSCALIB.HTML
   U2579C_LS_WGS84.TXT
   U2579C_LS_LOCAL.TXT
   U2579C_LS_CONTROL.TXT

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NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "U2579C-1"
WITH NAD 83/95 STATE PLANE GRID COORDINATES OF
NORTHING: 876419.285(ft) EASTING: 1651591.602(ft)
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LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"U2579C-1" TO -L- STATION 390+00.00 IS
N 49°00'53.54" 3884.0262'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

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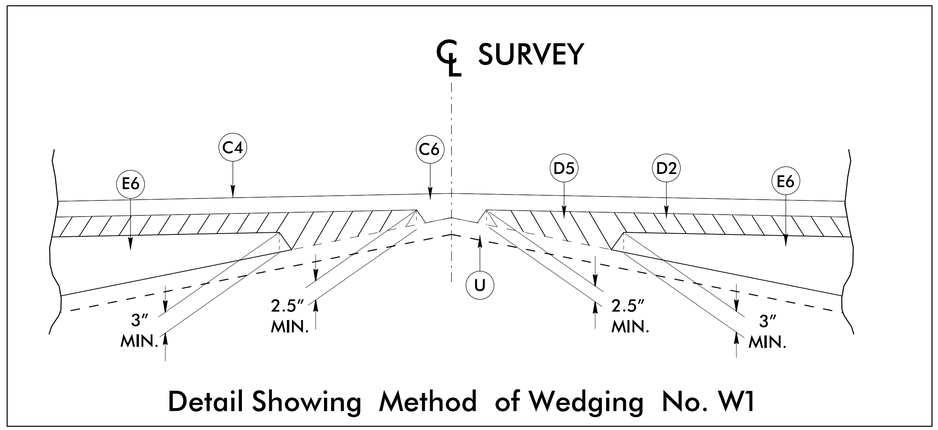
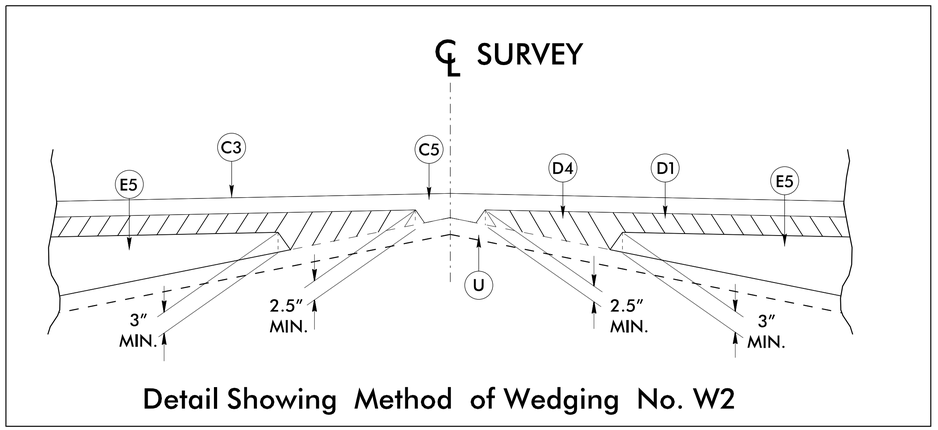
FINAL PAVEMENT SCHEDULE

C1	PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.	E1	PROP. APPROX. 4.0″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	N	GEOTEXTILE FOR SOIL STABILIZATION
C2	PROP. APPROX. 2.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E2	PROP. APPROX. 3.0″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	P	PRIME COAT
C3	PROP. APPROX. 3.0″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E3	PROP. APPROX. 5.5″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.	R1	2'-6"CONCRETE CURB AND GUTTER
C4	PROP. APPROX. 3.0″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E4	PROP. APPROX. 8.0″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	R2	5″ MONOLITHIC CONCRETE ISLAND (KEYED-IN)
C5	PROP. VAR. 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.	E5	PROP. VAR. 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.	R3	FUTURE SINGLE FACED CONRETE BARRIER
C6	PROP. VAR. ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1.5″ IN DEPTH OR GREATER THAN 2″ IN DEPTH.	E6	PROP. VAR. ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3″ IN DEPTH OR GREATER THAN 5.5″ IN DEPTH.	T	EARTH MATERIAL
D1	PROP. APPROX. 2.5″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	J1	PROP. 8″ AGGREGATE BASE COURSE	U	EXISTING PAVEMENT
D2	PROP. APPROX. 3.0″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	J2	PROP. 10″ AGGREGATE BASE COURSE	W1	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAILS)
D3	PROP. APPROX. 4.0″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	J3	PROP. VAR. DEPTH AGGREGATE BASE COURSE	W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAILS)
D4	PROP. VAR. 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″ IN DEPTH OR GREATER THAN 4″ IN DEPTH.	K	SUBBASE TO BE TREATED WITH LIME TO A DEPTH OF 8″, AT A RATE OF 20 LBS PER SQ YD AS DIRECTED BY THE ENGINEER. OR SUBBASE TO BE TREATED WITH CEMENT TO A DEPTH OF 7″, AT A RATE OF 55 LBS PER SQYD AS DIRECTED BY THE ENGINEER.	Y	RUMBLE STRIPS.
D5	PROP. VAR. ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 2.5″ IN DEPTH OR GREATER THAN 4″ IN DEPTH.				

NOTE: PAVEMENT EDGES ARE 1:1 UNLESS SHOW OTHERWISE.



Detail Showing Method of Wedging No. W1



Detail Showing Method of Wedging No. W2

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2A-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040478 ENGINEER JARED M. ROAD

PAVEMENT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042876 ENGINEER CLARK S. MORRISON

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2A-2
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

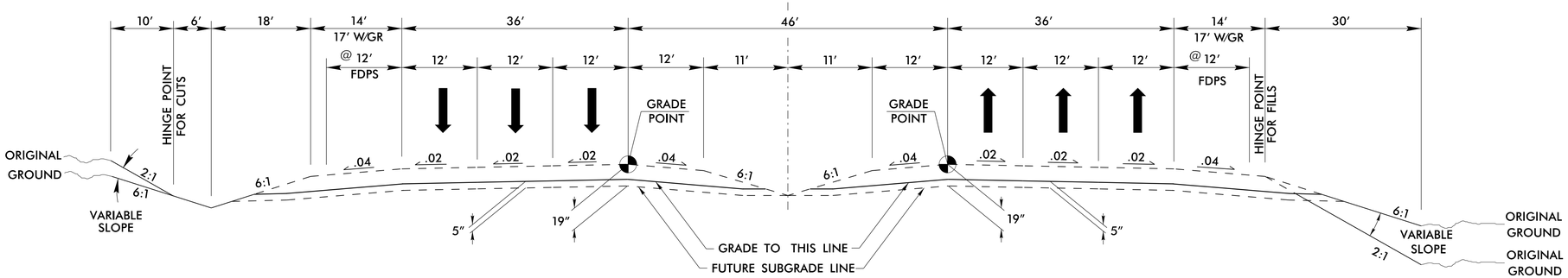
PAVEMENT ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H

C4	3" S9.5C
D2	3" I19.0C
E2	3" B25.0C
E4	8" B25.0C
J2	10" ABC
N	GEOTEXTILE FOR SOIL STABILIZATION
K	SUBGRADE STABILIZATION
R3	FUTURE SINGLE FACED BARRIER
T	EARTH MATERIAL
Y	RUMBLE STRIPS

℄ –L– (WINSTON–SALEM NORTHERN BELTWAY)



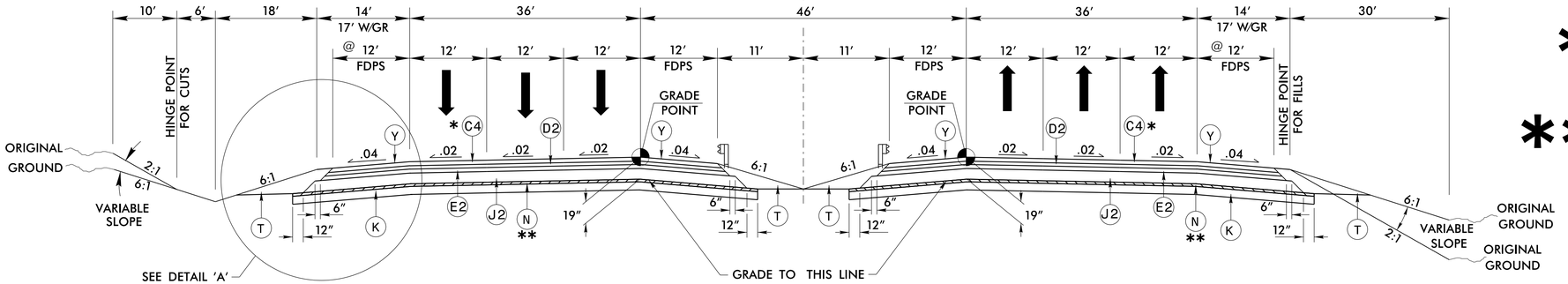
@ 14′ FDPS WITH GUARDRAIL (SEE PLANS)

USE TYPICAL SECTION NO. 1

–L– STA. 373+00.00 TO STA. 385+00.00

TYPICAL SECTION NO. 1

℄ –L– (WINSTON–SALEM NORTHERN BELTWAY)



@ 14′ FDPS WITH GUARDRAIL (SEE PLANS)

USE TYPICAL SECTION NO. 2

–L– STA. 385+00.00 LT. TO STA. 472+36.29 LT. (BEGIN BRIDGE)
–L– STA. 385+00.00 RT. TO STA. 472+48.61 RT. (BEGIN BRIDGE)
–L– STA. 474+91.29 LT. (END BRIDGE) TO STA. 478+00.00 LT.
–L– STA. 475+03.61 RT. (END BRIDGE) TO STA. 478+00.00 RT.

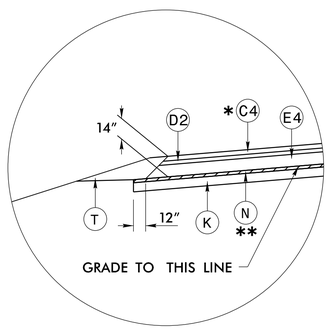
TYPICAL SECTION NO. 2

* CONSTRUCT UP TO BUT NOT INCLUDING THE FINAL SURFACE LAYER

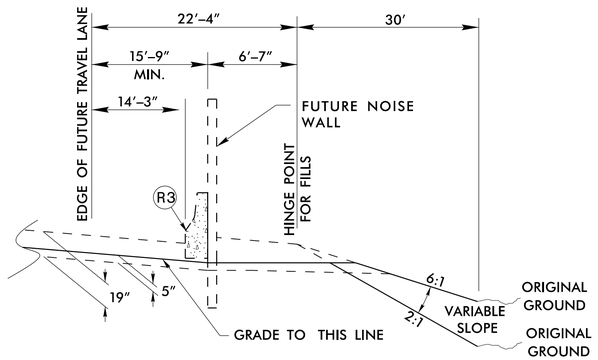
–L– STA. 385+00.00 TO STA. 403+00.00

** THESE LOCATIONS TO BE INVESTIGATED DURING CONSTRUCTION:

–L– STA. 373+00.00 TO STA. 401+75.00
–L– STA. 413+00.00 TO STA. 415+50.00
–L– STA. 427+25.00 TO STA. 428+50.00
–L– STA. 431+25.00 TO STA. 443+75.00
–L– STA. 470+00.00 TO STA. 472+36.00
–L– STA. 474+46.00 TO STA. 478+00.00



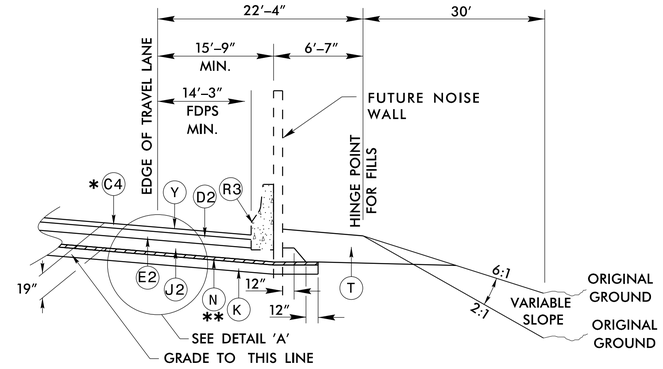
ALTERNATE PAVEMENT DESIGN DETAIL 'A'



TYPICAL SECTION NO. 1A

USE TYPICAL SECTION NO. 1A:

USE IN CONJUCTION WITH TYPICAL SECTION NO. 1
–L– STA. 373+00.00 TO STA. 385+00.00 RT (NOISE WALL –NWD–)



TYPICAL SECTION NO. 2A

USE TYPICAL SECTION NO. 2A:

USE IN CONJUCTION WITH TYPICAL SECTION NO. 2
–L– STA. 385+00.00 TO STA. 388+11.00 RT (NOISE WALL –NWD–)

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2A-3
R/W SHEET NO.	

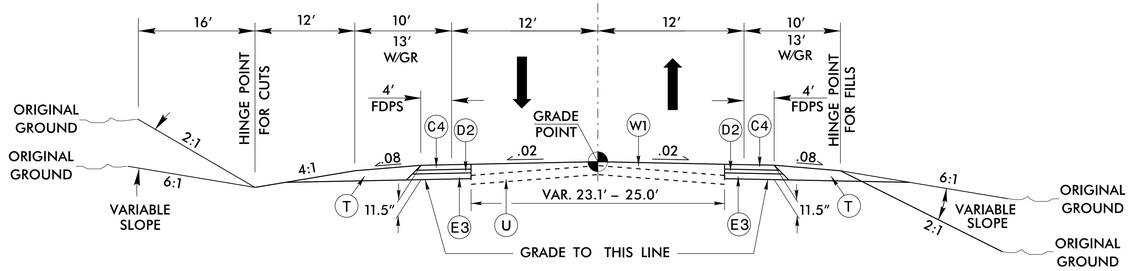
ROADWAY DESIGN ENGINEER

PAVEMENT ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H

℄ –Y1– (US 311 / NEW WALKERTOWN RD.)



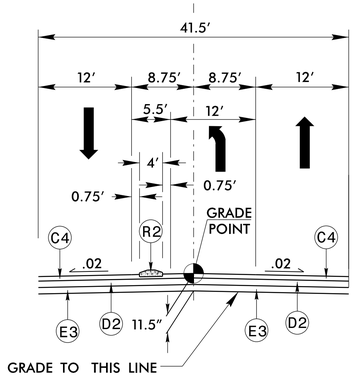
TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3:

–Y1– STA. 10+75.00 TO STA. 18+21.65
–Y1– STA. 46+75.00 TO STA. 48+50.00

C4	3″ S9.5C
D2	3″ I19.0C
E3	5.5″ B25.0C
N	GEOTEXTILE FOR SOIL STABILIZATION
R2	5″ MONO CONC. ISLAND (KEYED-IN)
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W1	WEDGING

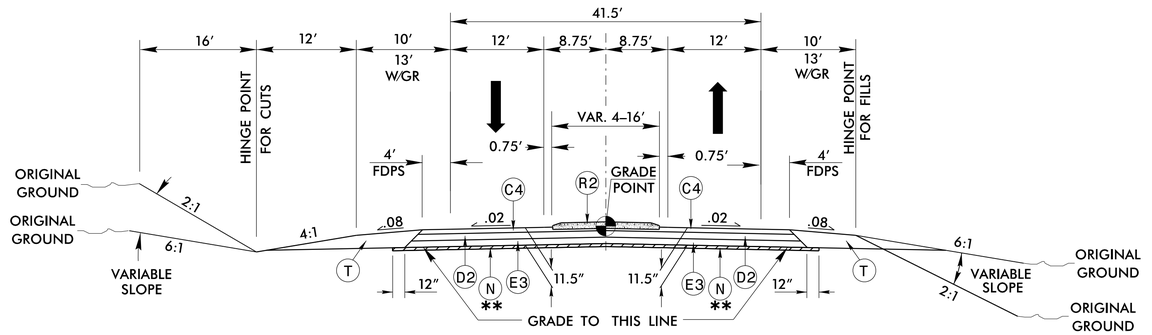
℄ –Y1– (US 311 NEW WALKERTOWN RD.)



TYPICAL SECTION NO. 4A

USE IN CONJUCTION WITH TYPICAL SECTION NO. 4
–Y1– STA. 23+59.22 TO STA. 26+89.22
–Y1– STA. 31+78.60 TO STA. 35+08.60

℄ –Y1– (US 311 / NEW WALKERTOWN RD.)



TYPICAL SECTION NO. 4

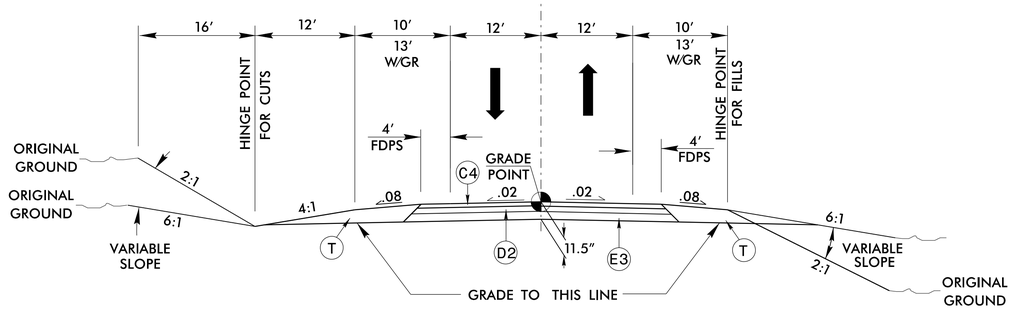
USE TYPICAL SECTION NO. 4:

–Y1– STA. 18+21.65 TO STA. 28+13.39 (BEGIN BRIDGE)
–Y1– STA. 30+34.05 (END BRIDGE) TO STA. 39+54.89

** THESE LOCATIONS TO BE INVESTIGATED DURING CONSTRUCTION:

–Y1– STA. 30+34.00 TO 35+25.00

℄ –Y1– (US 311 / NEW WALKERTOWN RD.)



TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5:

–Y1– STA. 39+54.89 TO STA. 46+75.00

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2A-4
R/W SHEET NO.	

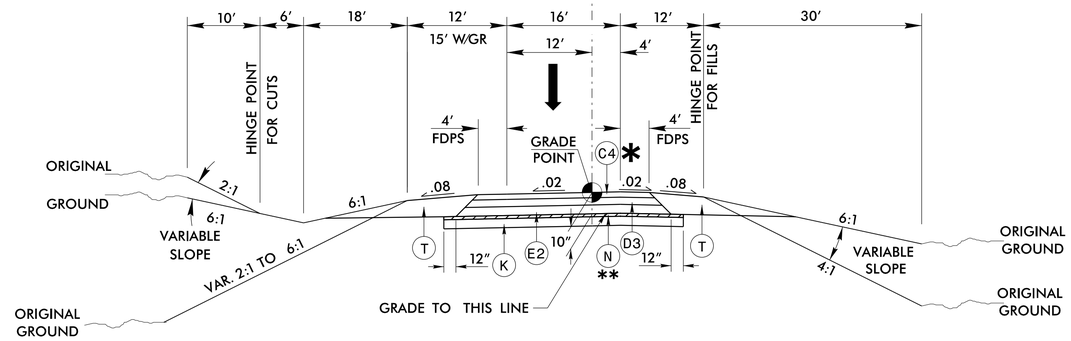
ROADWAY DESIGN ENGINEER

PAVEMENT ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H

℄ RAMP (–Y1RPB–)



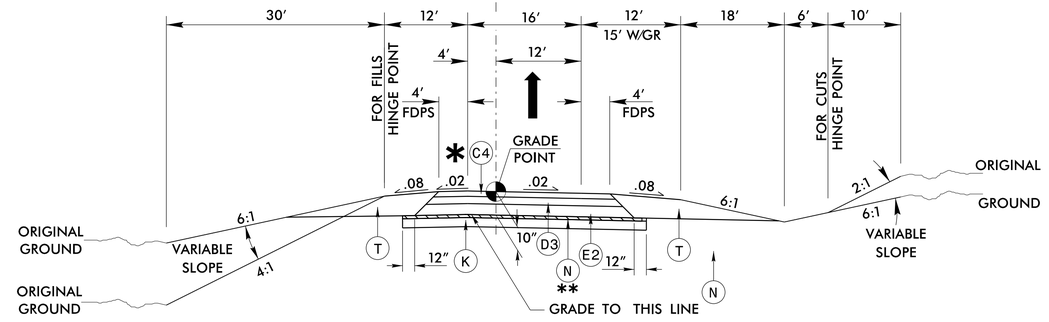
TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6:

–Y1RPB– STA. 14+89.73 TO STA. 30+02.32

C4	3″ S9.5C
D3	4″ I19.0C
E2	3″ B25.0C
K	SUBGRADE STABILIZATION
N	GEOTEXTILE FOR SOIL STABILIZATION
R3	FUTURE SINGLE FACED BARRIER
T	EARTH MATERIAL

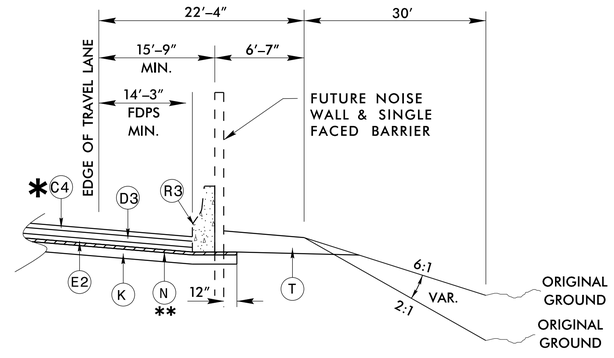
℄ RAMP (–Y1RPC–)



TYPICAL SECTION NO. 7

USE TYPICAL SECTION NO. 7:

–Y1RPC– STA. 14+30.42 TO STA. 32+95.71

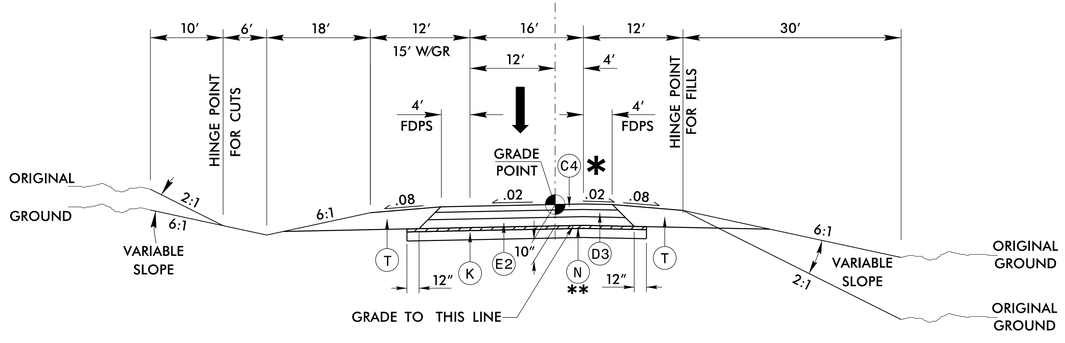


TYPICAL SECTION NO. 7A

USE TYPICAL SECTION NO. 7A:

USE IN CONJUCTION WITH TYPICAL SECTION NO. 7
–Y1RPC– STA. 10+00.00 TO STA. 18+93.92 RT (NOISEWALL –NWD–)

℄ RAMP (–Y1RPD–)



TYPICAL SECTION NO. 8

(SEE CROSS SECTIONS)

USE TYPICAL SECTION NO. 8:

–Y1RPD– STA. 15+46.23 TO STA. 32+31.74

***** CONSTRUCT UP TO BUT NOT INCLUDING THE FINAL SURFACE LAYER

–Y1RPB– STA. 14+89.73 TO STA. 30+02.32
–Y1RPC– STA. 14+30.42 TO STA. 33+09.41
–Y1RPD– STA. 15+46.23 TO STA. 32+31.74

****** THESE LOCATIONS TO BE INVESTIGATED DURING CONSTRUCTION:

–Y1RPB– STA. 10+00.00 TO 25+50.00
–Y1RPC– STA. 10+00.00 TO 25+00.00
–Y1RPD– STA. 22+00.00 TO 32+31.00

03-JUL-2017 15:34
U:\Corridor\U2579C_rdy_typ.dgn
$$$$USERNAME$$$$

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2A-5
R/W SHEET NO.	

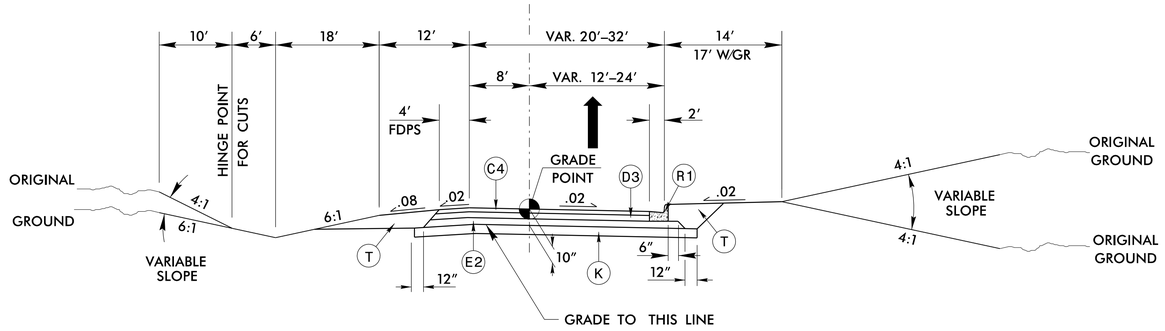
ROADWAY DESIGN ENGINEER

PAVEMENT ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H

℄ LOOP (–Y1LPB–)



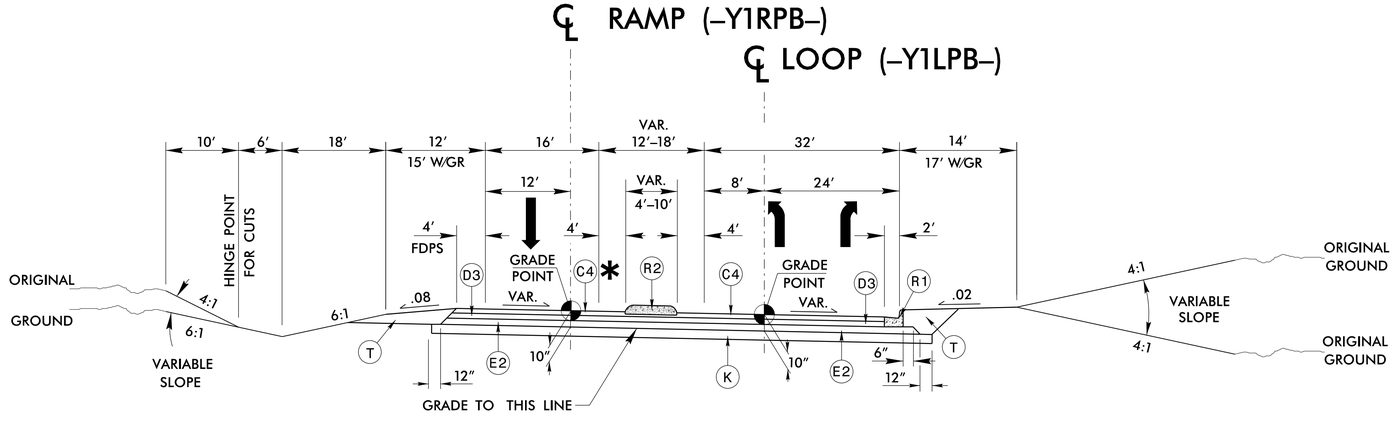
TYPICAL SECTION NO. 9

USE TYPICAL SECTION NO. 9:

–Y1LPB– STA. 12+58.57 TO STA. 19+37.88

℄ RAMP (–Y1RPB–)

℄ LOOP (–Y1LPB–)



TYPICAL SECTION NO. 10

USE TYPICAL SECTION NO. 10:

–Y1RPB– STA. 30+02.32 TO STA. 32+88.63

–Y1LPB– STA. 19+37.88 TO STA. 22+19.35

✱ CONSTRUCT UP TO BUT NOT INCLUDING THE FINAL SURFACE LAYER

–Y1RPB– STA. 30+02.32 TO STA. 32+88.63

C4	3″ S9.5C
D3	4″ I19.0C
E2	3″ B25.0C
K	SUBGRADE STABILIZATION
R1	2′-6″CONC. C&G
R2	5″ MONO CONC. ISLAND (KEYED-IN)
T	EARTH MATERIAL

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2A-6
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040418 ENGINEER JARED W. BOLD

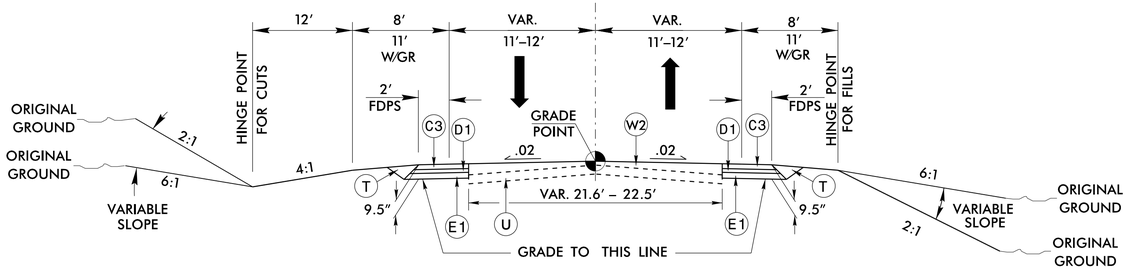
PAVEMENT ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042876 ENGINEER CLARK S. MORRISON

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H

℄ –Y2– (SR 2381 / WILLISTON RD.)

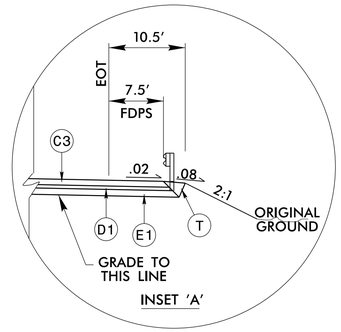


TYPICAL SECTION NO. 11

USE TYPICAL SECTION NO. 11:

–Y2– STA. 10+00.00 TO STA. 16+75.00
–Y2– STA. 23+25.00 TO STA. 26+50.00

INSET FOR SHOULDER WIDENING FOR FUTURE SIDEWALK –Y2– (US 158 / WILLISTON RD.)

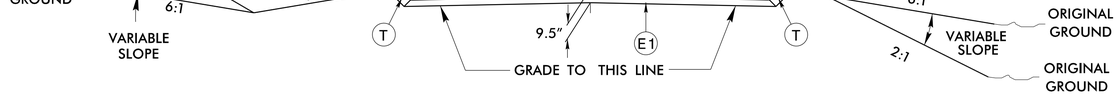


INSET 'A' RT OF CENTERLINE

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 11 & 12
–Y2– STA. 17+15.30 TO STA. 20+18.77 (BEGIN BRIDGE)
–Y2– STA. 22+40.02 (END BRIDGE) TO STA. 23+87.05

C3	3″ S9.5B
D1	2.5″ I19.0B
E1	4″ B25.0B
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W2	WEDGING

℄ –Y2– (SR 2381 / WILLISTON RD.)

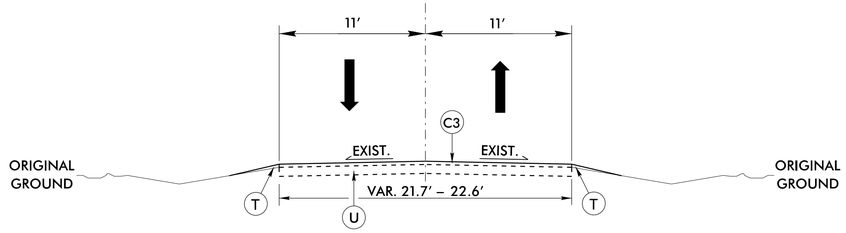


TYPICAL SECTION NO. 12

USE TYPICAL SECTION NO. 12:

–Y2– STA. 16+75.00 TO STA. 20+18.77 (BEGIN BRIDGE)
–Y2– STA. 22+40.02 (END BRIDGE) TO STA. 23+25.00

℄ –Y2– (SR 2381 / WILLISTON RD.)



TYPICAL SECTION NO. 13

USE TYPICAL SECTION NO. 13:

–Y2– STA. 26+50.00 TO STA. 28+00.00

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2A-7
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

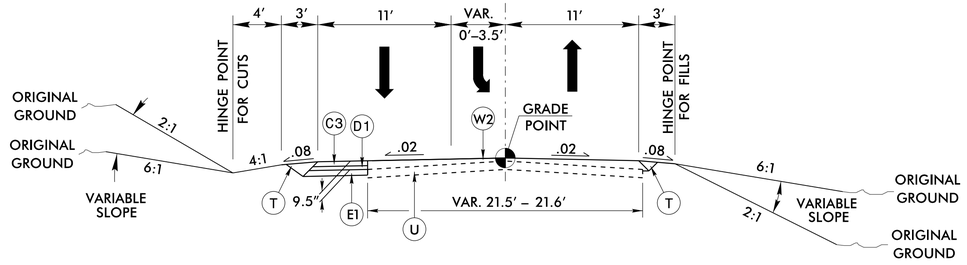
PAVEMENT ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H

C3	3" S9.5B
D1	2.5" I19.0B
E1	4" B25.0B
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W2	WEDGING

℄ –Y3– (OLD WALKERTOWN RD.)

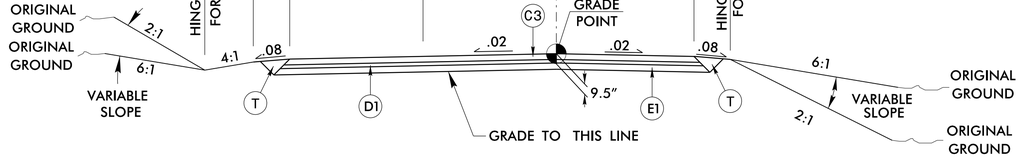


TYPICAL SECTION NO. 14

USE TYPICAL SECTION NO. 14:

–Y3– STA. 13+25.00 TO STA. 15+75.00
–Y3– STA. 24+75.00 TO STA. 26+50.00

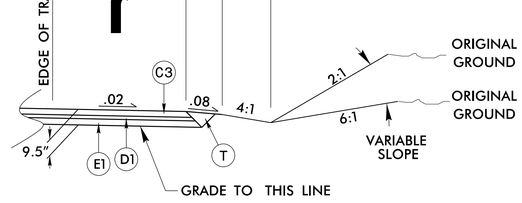
℄ –Y3– (OLD WALKERTOWN RD.)



TYPICAL SECTION NO. 15

USE TYPICAL SECTION NO. 15:

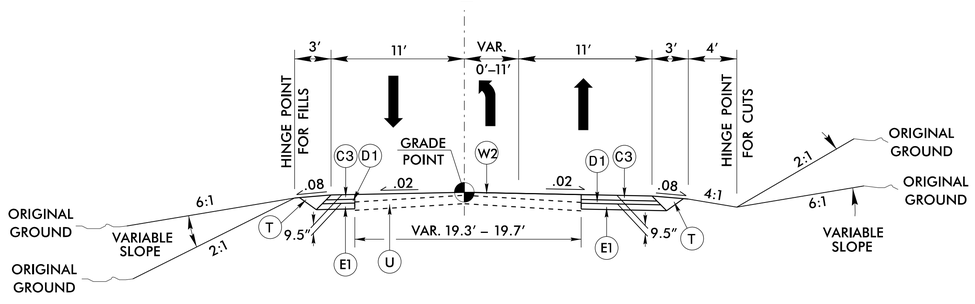
–Y3.– STA. 15+75.00 TO STA. 24+75.00



TYPICAL SECTION NO. 15A

USE IN CONJUCTION WITH TYPICAL SECTION NO. 15
–Y3– STA. 16+25.00 TO STA. 18+75.00

℄ –Y4– (NORTHAMPTON DR.)

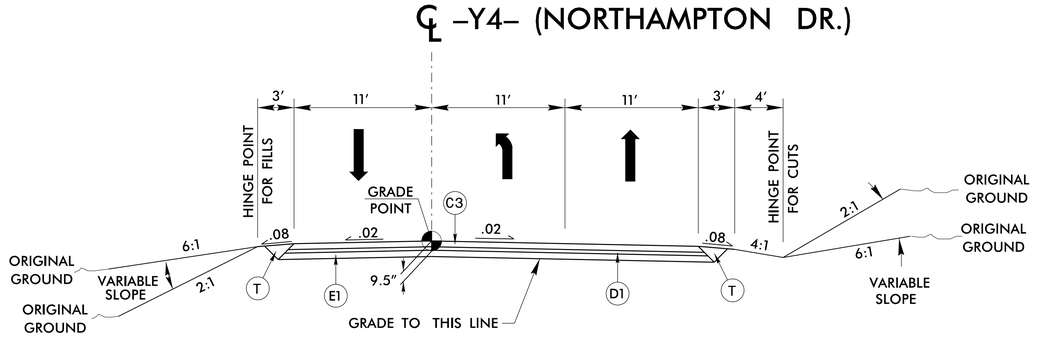


TYPICAL SECTION NO. 16

USE TYPICAL SECTION NO. 16:

–Y4– STA. 10+10.00 TO STA. 12+00.00

℄ –Y4– (NORTHAMPTON DR.)



TYPICAL SECTION NO. 17

USE TYPICAL SECTION NO. 17:

–Y4– STA. 12+00.00 TO STA. 12+42.12

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2A-8
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

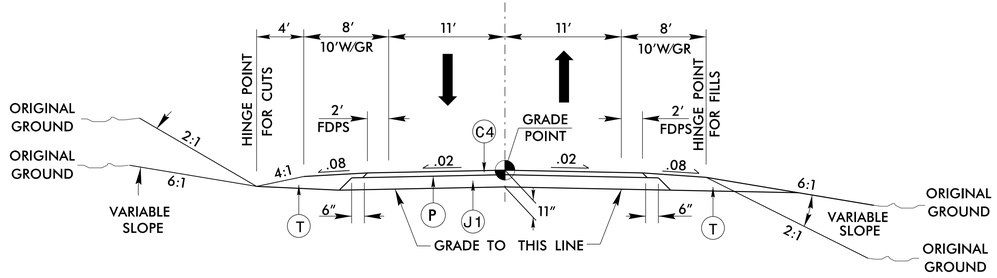
PAVEMENT ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H

C1	1.5" SF9.5A
C2	2.5" SF9.5A
C4	3" S9.5C
E1	4" B25.0B
J1	8" ABC
P	PRIME COAT
T	EARTH MATERIAL

℄ –Y1DET– (US 311 / NEW WALKERTOWN RD. DETOUR)

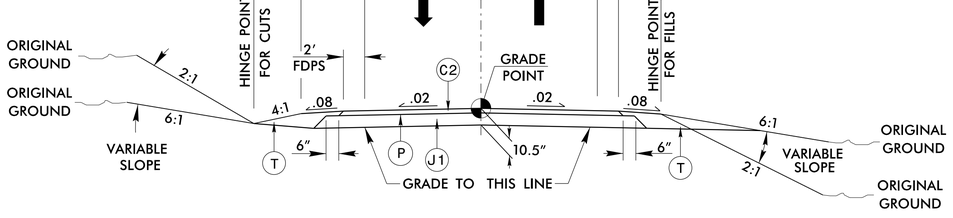


TYPICAL SECTION NO. 18

USE TYPICAL SECTION NO. 18:

–Y1DET– STA. 17+29.69 TO STA. 31+62.46

℄ –Y2DET– (US 158 / WILLISTON RD. DETOUR)

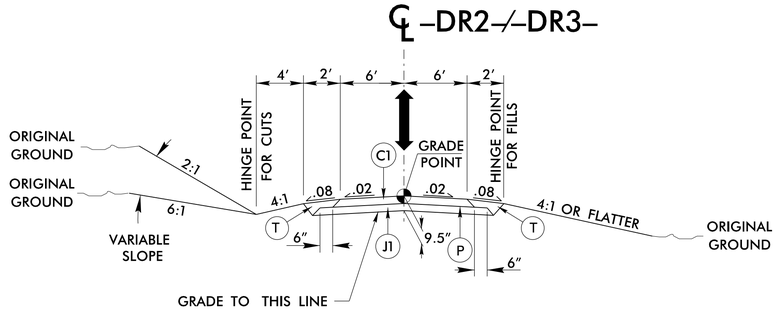


TYPICAL SECTION NO. 19

USE TYPICAL SECTION NO. 19:

–Y2DET– STA. 16+11.86 TO STA. 26+94.39

℄ –DR2–/–DR3–

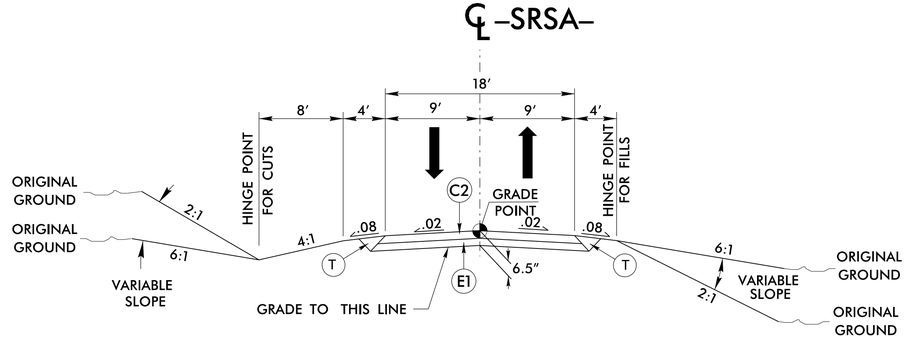


TYPICAL SECTION NO. 20

USE TYPICAL SECTION NO. 20 FOR THE FOLLOWING:

–DR2– STA 10+16.49 TO STA. 12+10.00
–DR3– STA 10+16.00 TO STA. 11+50.00

℄ –SRSA–



TYPICAL SECTION NO. 21

USE TYPICAL SECTION NO. 21 FOR THE FOLLOWING:

–SRSA– STA 10+00.00 TO STA. 31+64.74

5/14/99

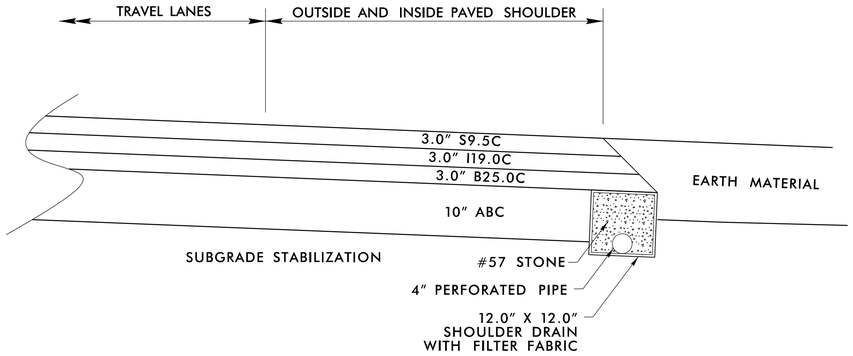
PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2A-9
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

PAVEMENT ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H



SHOULDER DRAIN DETAIL

USE SHOULDER DRAIN DETAIL:

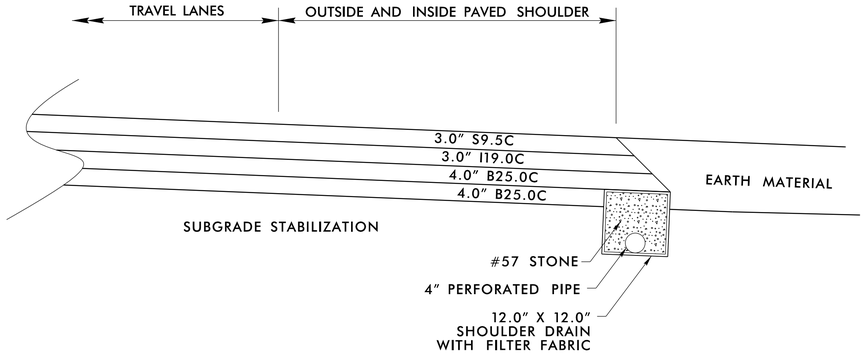
USE IN CONJUCTION WITH TYPICAL SECTION NO. 2

–L– STA. 408+00.00 TO STA. 441+77.00 (LEFT, OUTSIDE)
OUTLETS: 411+00, 414+50, 417+50, 420+50, 423+50, 426+50, 429+50, 432+50, 438+50, 441+77 (2GI)

–L– STA. 475+00.00 TO STA. 478+00.00 (LEFT, OUTSIDE)
OUTLET: 477+50 (2GI)

–L– STA. 408+00.00 TO STA. 441+77.00 (RIGHT, MEDIAN)
OUTLETS: 413+00 (2GI), 414+40 (2GI), 415+40 (2GI), 418+00 (2GI), 422+00 (2GI), 426+00 (2GI), 429+50 (2GI), 440+00 (2GI), 441+77 (2GI)

–L– STA. 475+00.00 TO STA. 478+00.00 (RIGHT, OUTSIDE)
OUTLET: 477+50 (2GI)



SHOULDER DRAIN DETAIL–ALTERNATE PAVEMENT DESIGN

REVISIONS

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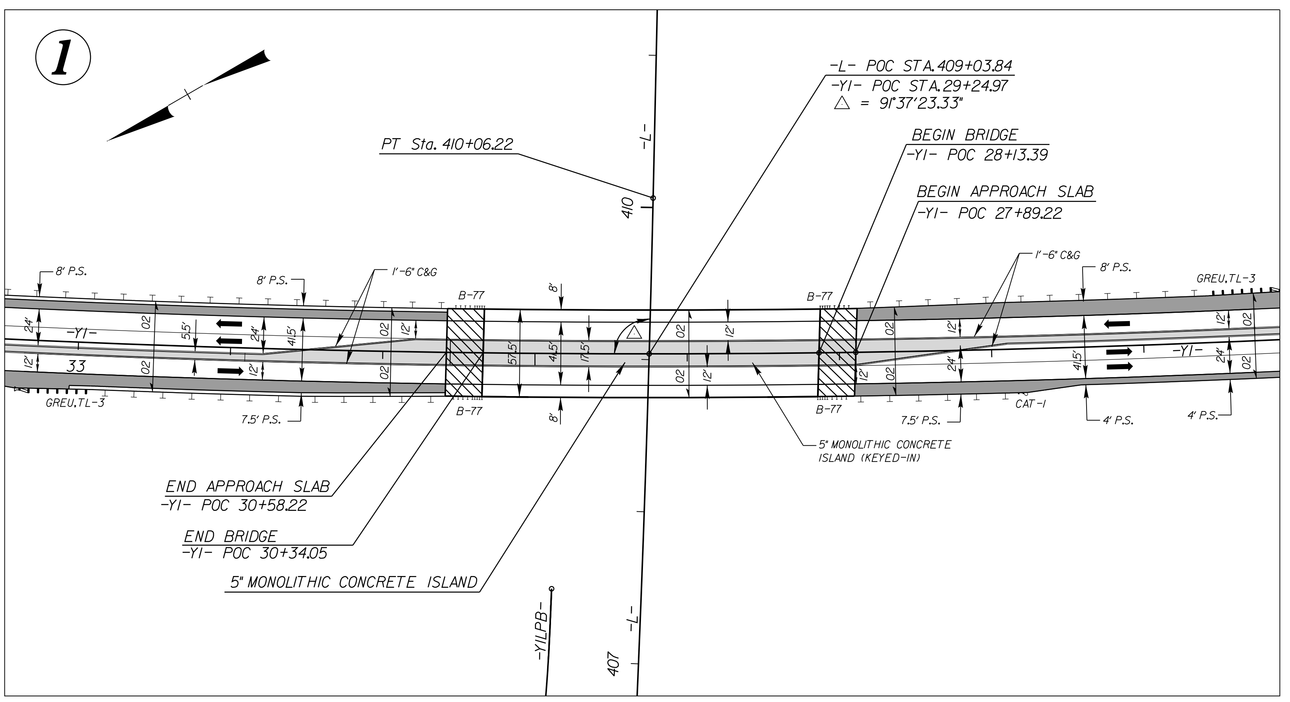
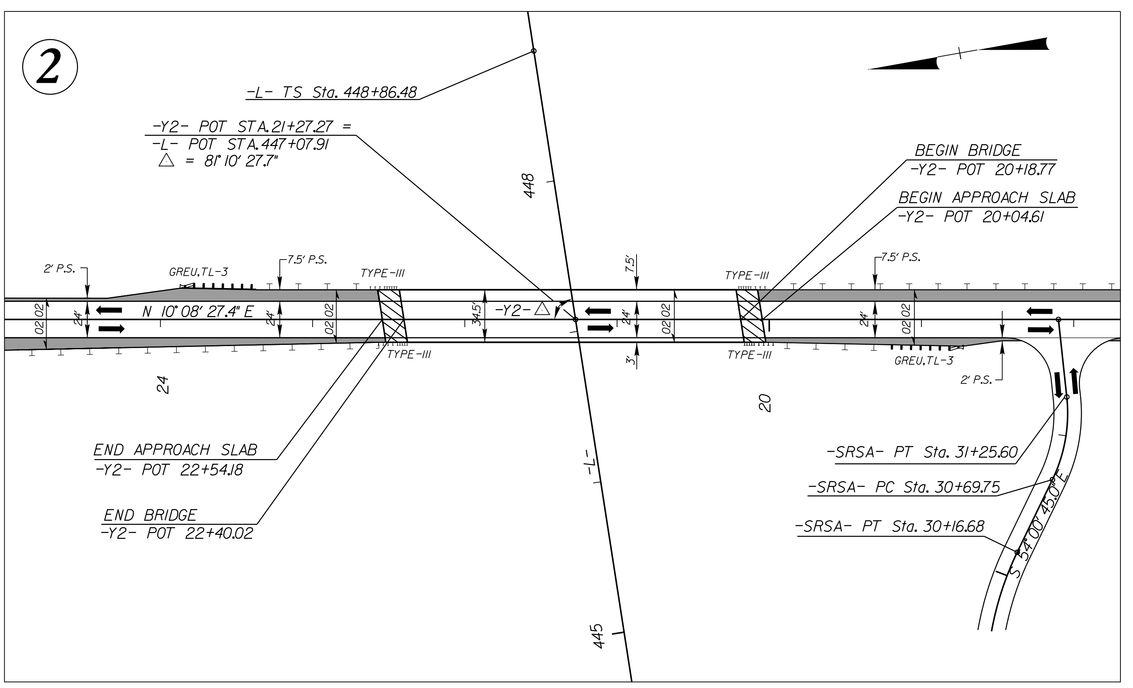
$$$$USERNAME$$$$

8/17/99



DETAIL SHOWING PAVEMENT & BRIDGE RELATIONSHIP FOR –Y1– OVER –L–



DETAIL SHOWING PAVEMENT & BRIDGE RELATIONSHIP FOR –Y2– OVER –L–

RS&H

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2B-1

R/W SHEET NO.
ROADWAY DESIGN ENGINEER

BRIDGE SKETCHES

8/17/99

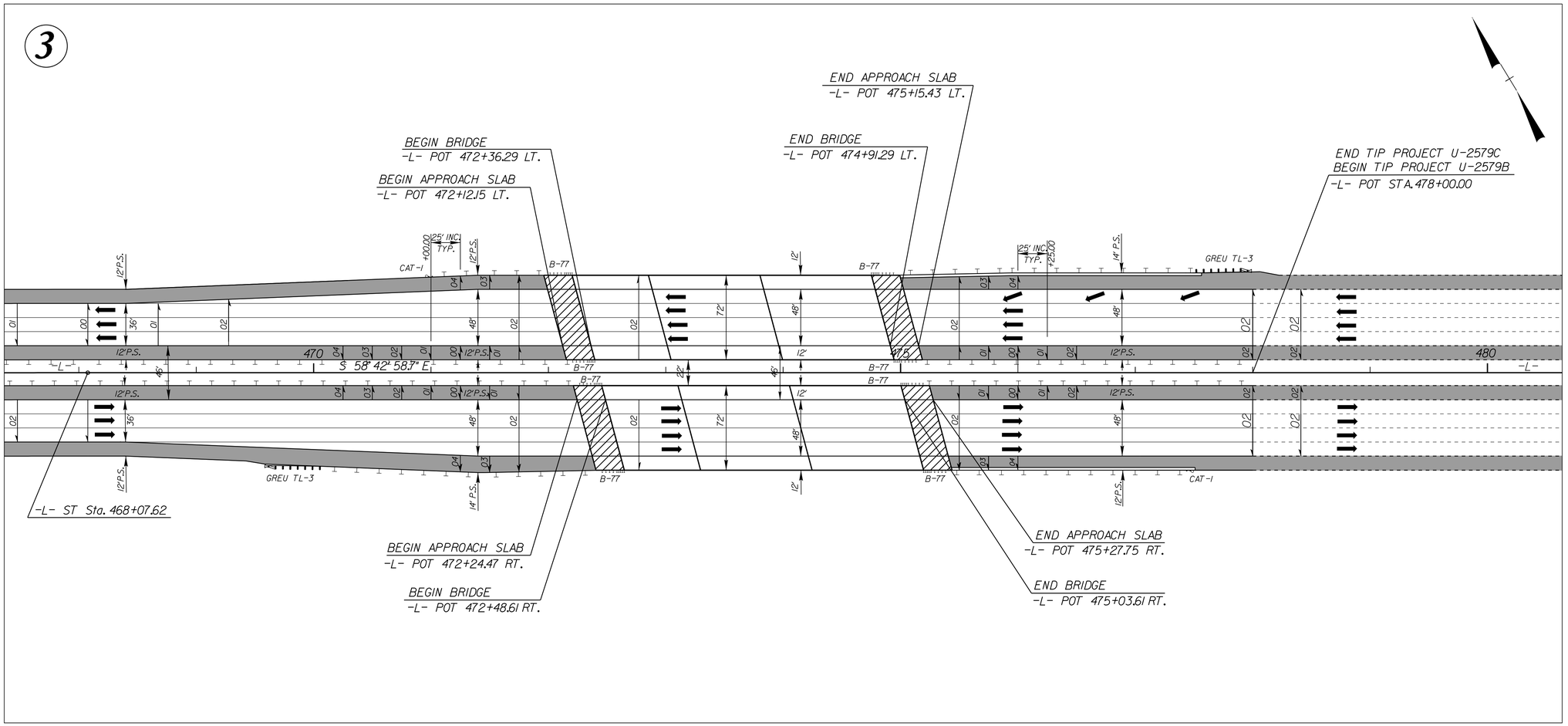
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2B-2
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H



DETAIL SHOWING PAVEMENT & BRIDGE RELATIONSHIP FOR –L– (DUAL BRIDGES) OVER LOWERY MILL CREEK

BRIDGE SKETCHES

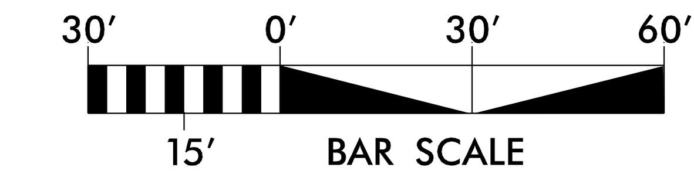
$$$$USERNAME$$$$
07-JUL-2017 09:29
R:\Roadway_Proj\U2579C_RDY_TYP_2B_1.dgn

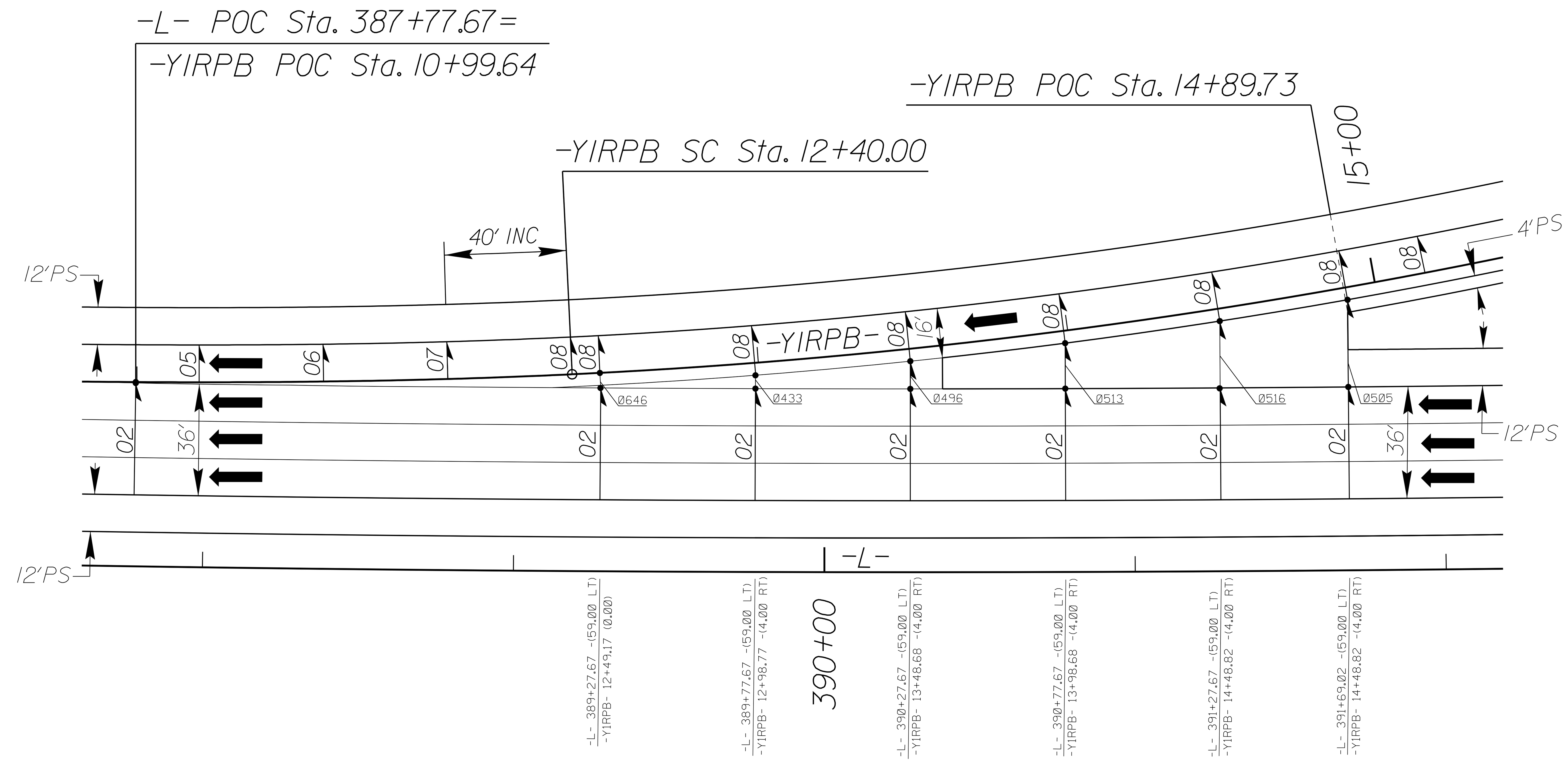
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2B-3
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

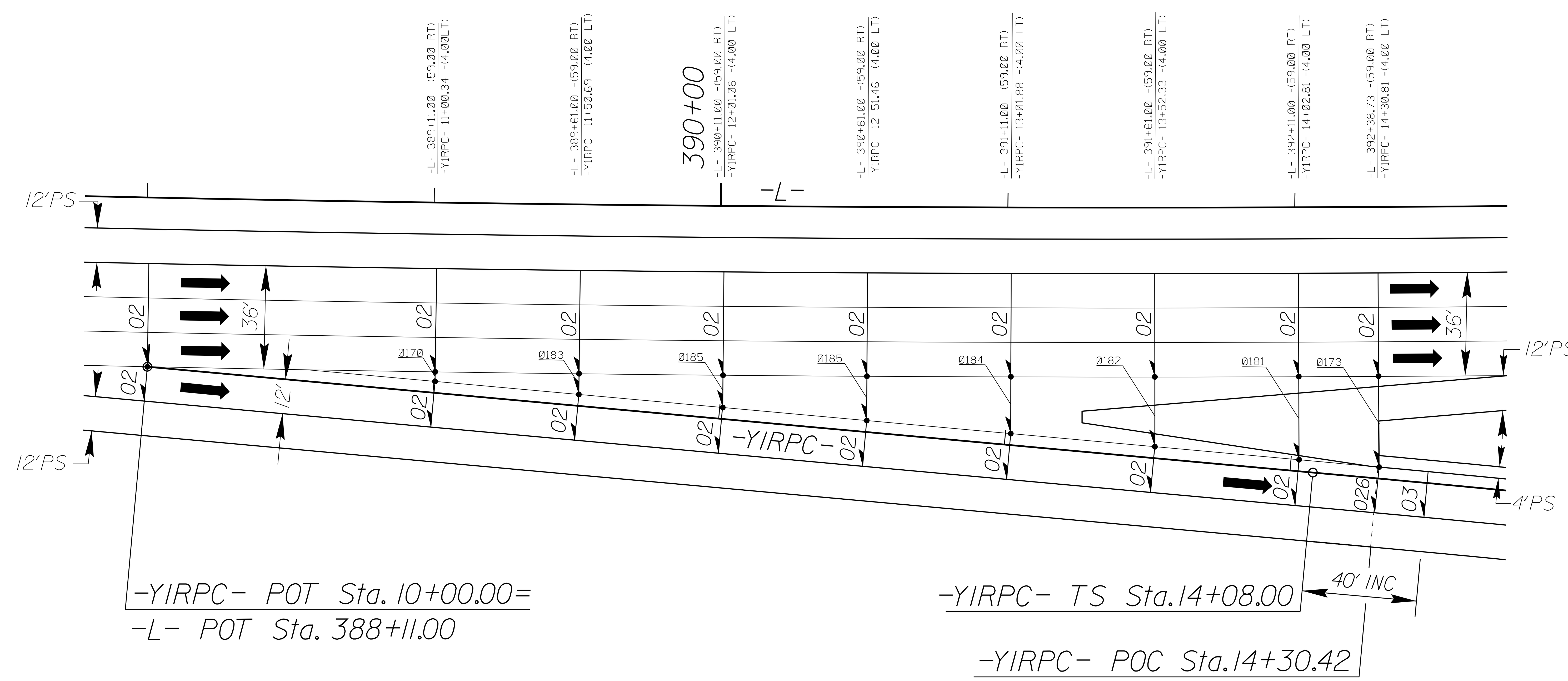
RS&H





-YIRPB- & -L- GORE DETAIL

(SEE PLAN SHEET 5 & 6 FOR PLAN VIEW)



-YIRPC- & -L- GORE DETAIL

(SEE PLAN SHEET 5 & 6 FOR PLAN VIEW)

03-JUL-2017 15:35

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2B-4

R/W SHEET NO.

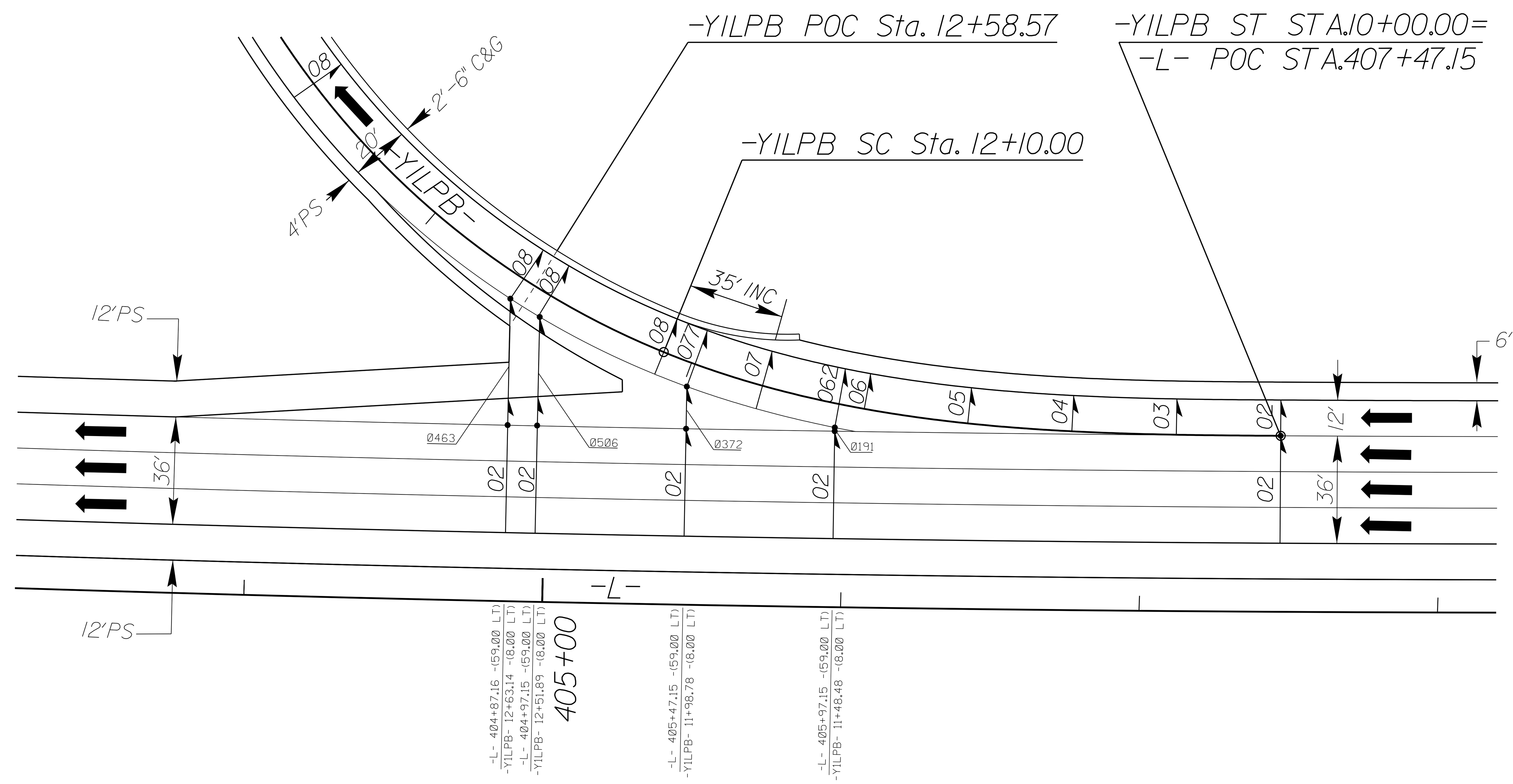
ROADWAY DESIGN ENGINEER

SEAL 040418 — JARED M. BOND — NORTH CAROLINA PROFESSIONAL ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

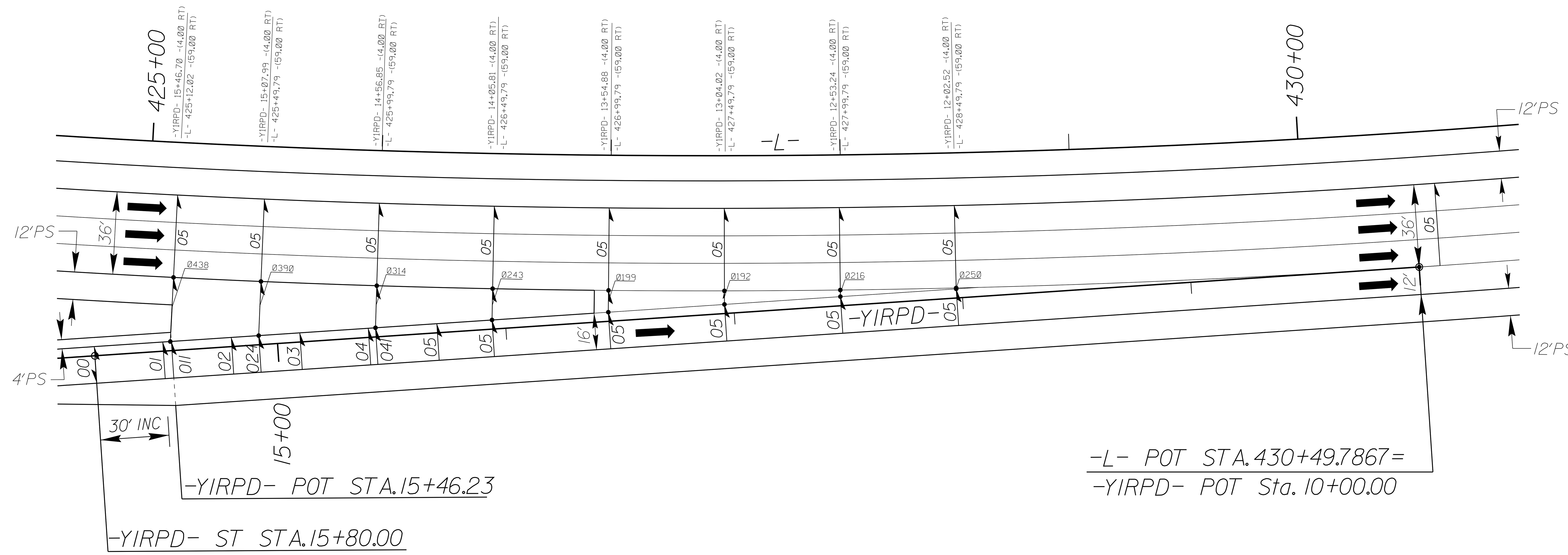
RS&H

30' 0' 30' 60' 15' BAR SCALE



-YILPB- & -L- GORE DETAIL

(SEE PLAN SHEET 6 FOR PLAN VIEW)



-YIRPD- & -L- GORE DETAIL

(SEE PLAN SHEET 7 FOR PLAN VIEW)

5/14/99

03-JUL-2017 15:35
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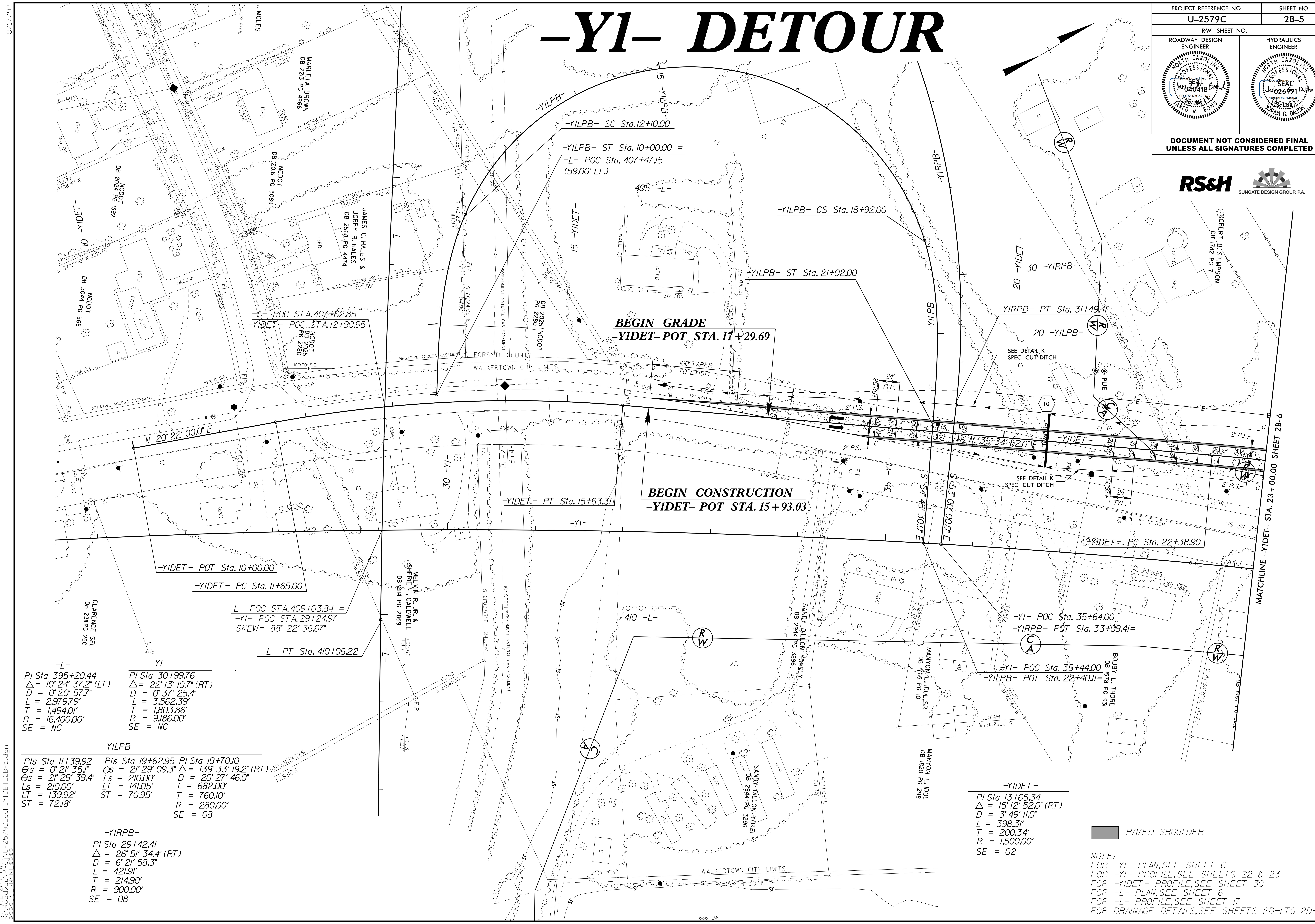
$$$$USERNAME$$$$



8/17/99

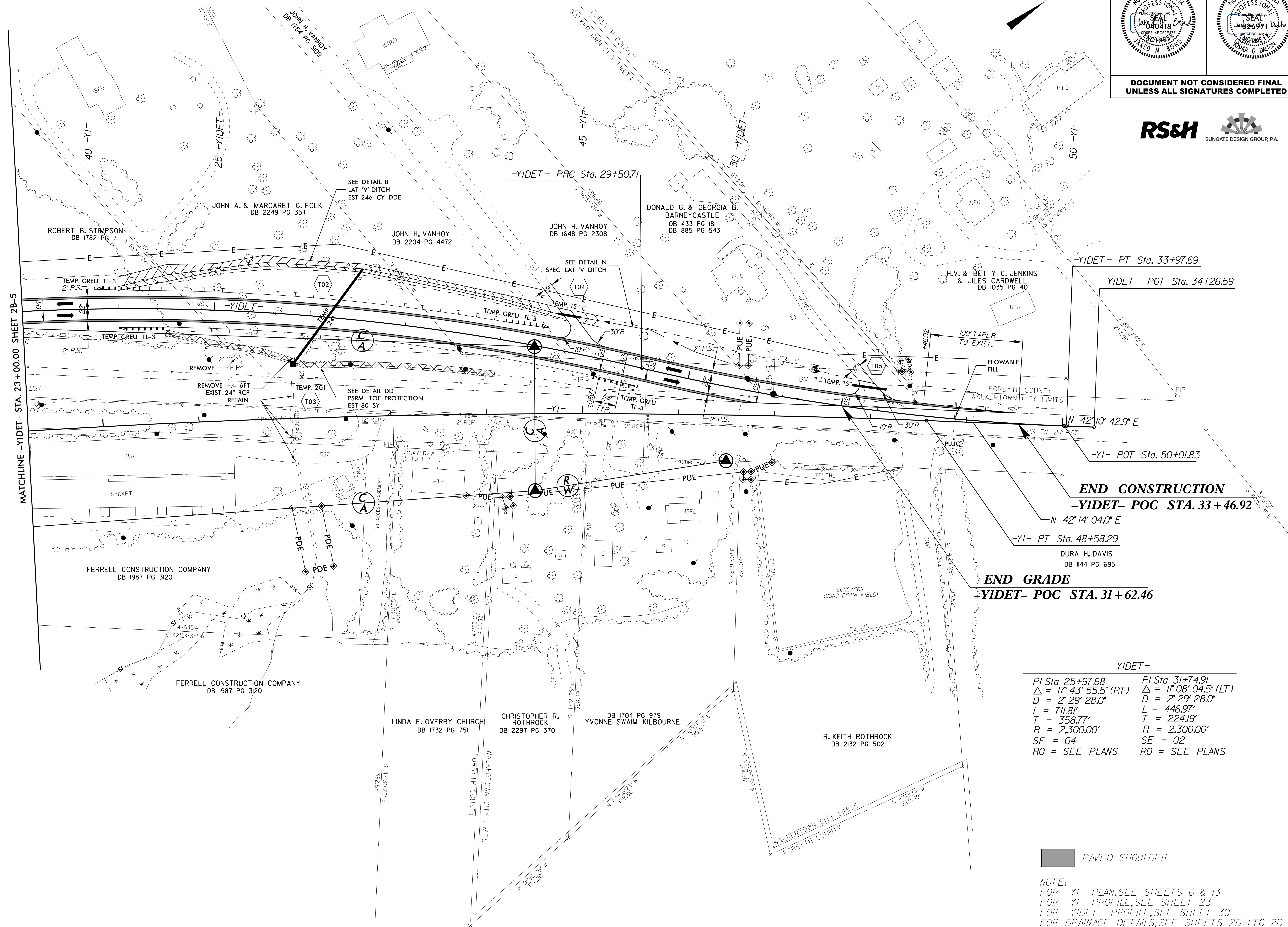
-Y1- DETOUR

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2B-6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H

SUNGATE DESIGN GROUP, P.A.



-YIDET-

PI Sta 25+97.68	PI Sta 31+74.91
Δ = 17° 43' 55.5" (RT)	Δ = 11° 08' 04.5" (LT)
D = 2° 29' 28.0"	D = 2° 29' 28.0"
L = 711.81'	L = 446.97'
T = 358.77'	T = 224.19'
R = 2,300.00'	R = 2,300.00'
SE = 04	SE = 02
RO = SEE PLANS	RO = SEE PLANS

PAVED SHOULDER

NOTE:
FOR -Y1- PLAN, SEE SHEETS 6 & 13
FOR -Y1- PROFILE, SEE SHEET 23
FOR -YIDET- PROFILE, SEE SHEET 30
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 TO 2D-4

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-Y2- DETOUR

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2B-7
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — SEAL 040418 — JARED W. BOND — NORTH CAROLINA PROFESSIONAL ENGINEER

HYDRAULICS ENGINEER — SEAL 026971 — JOSHUA G. DALTON — NORTH CAROLINA PROFESSIONAL ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H — SUNGATE DESIGN GROUP, P.A.

REVISIONS 8/17/99

-Y2DET- PC Sta. 15+00.00

BEGIN CONSTRUCTION
-Y2DET- PC STA 15+00.00

BEGIN GRADE
-Y2DET- POC STA. 16+11.86

-SRSA- PT Sta. 27+92.06

-SRSA- PC Sta. 28+97.00

-SRSA- PT Sta. 30+16.68

-SRSA- PC Sta. 30+69.75

-SRSA- PT Sta. 31+25.60

-SRSA- POT STA. 31+76.80 =
-Y2- POT STA. 18+10.00

-Y2- POT STA. 21+27.27
-L- POT STA. 447+07.91
SKEW = 98° 49' 32.3"

-L- ST Sta. 444+77.34

-Y2DET- POT Sta. 28+44.94

END CONSTRUCTION
-Y2DET- PT STA 28+03.31

-Y2DET- PT Sta. 28+03.31

END GRADE
-Y2DET- POC STA. 26+94.39

-Y2DET- PRC Sta. 17+50.83

-Y2DET- PT Sta. 20+01.66

-Y2DET- PC Sta. 23+01.66

-Y2DET- POT STA. 21+63.58 =
-L- POT STA. 448+25.17

-L- TS Sta. 448+86.48

-Y2DET- PRC Sta. 25+52.48

-Y2DET-

PI Sta 16+27.78	PI Sta 18+78.61	PI Sta 24+29.44	PI Sta 26+80.26
Δ = 26° 57' 47.4" (RT)	Δ = 26° 57' 47.4" (LT)	Δ = 26° 57' 47.3" (LT)	Δ = 26° 57' 47.3" (RT)
D = 10° 44' 58.8"	D = 10° 44' 58.8"	D = 10° 44' 58.8"	D = 10° 44' 58.8"
L = 250.83'	L = 250.83'	L = 250.83'	L = 250.83'
T = 127.78'	T = 127.78'	T = 127.78'	T = 127.78'
R = 533.00'	R = 533.00'	R = 533.00'	R = 533.00'
e = RC	SE = 04	SE = 04	SE = RC
RO = SEE PLANS	RO = SEE PLANS	RO = SEE PLANS	RO = SEE PLANS

PAVED SHOULDER

NOTE:
FOR -Y2- PLAN, SEE SHEETS 9 & 14
FOR -L- PLAN, SEE SHEET 9
FOR -Y2DET- PROFILE, SEE SHEET 31
FOR -Y2- PROFILE, SEE SHEET 29
FOR -L- PROFILE, SEE SHEETS 18 & 19
FOR DRAINAGE DETAILS, SEE SHEETS 2D-1 TO 2D-4

03-JUL-2017 15:35
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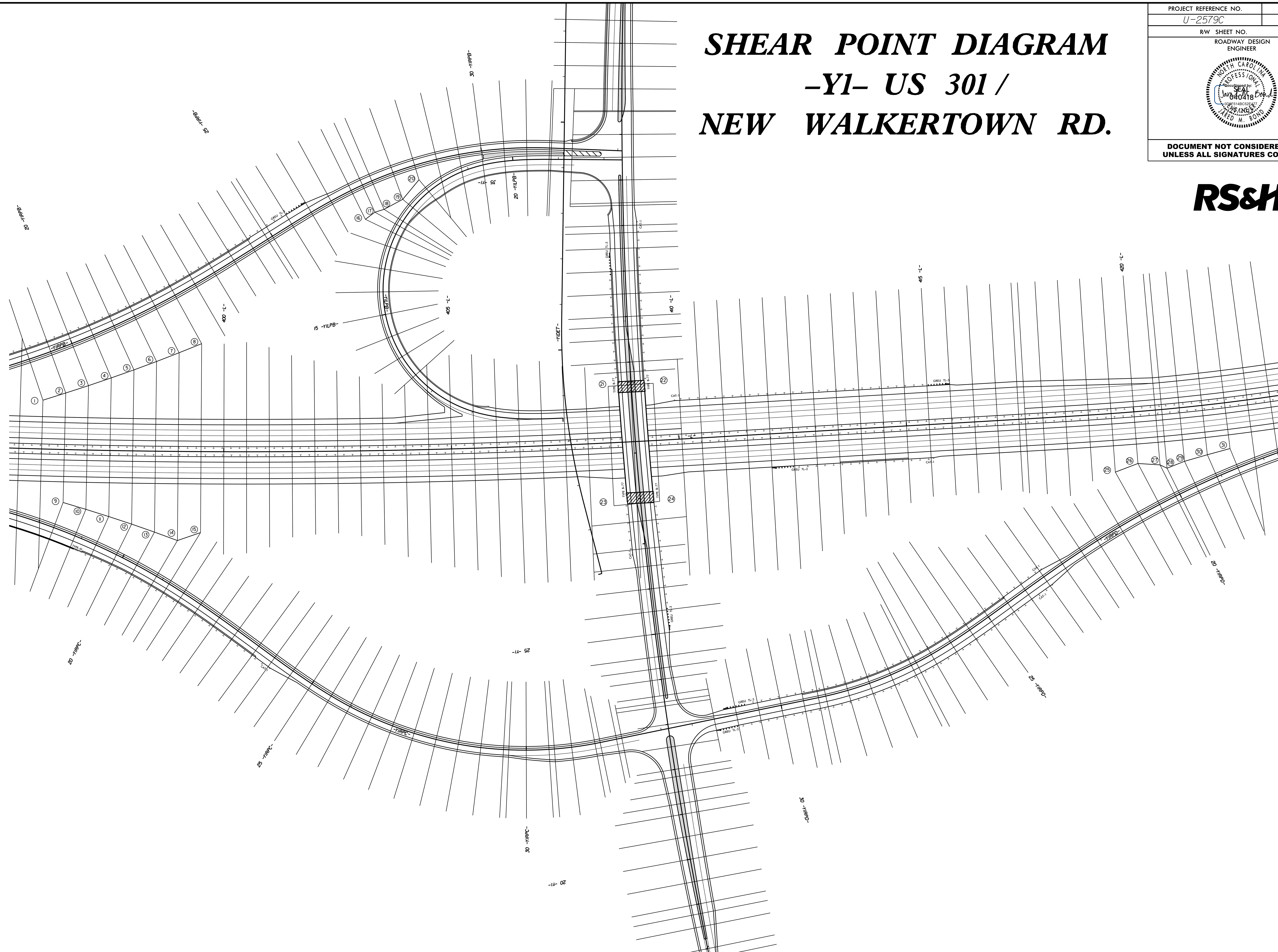
$$$$USERNAME$$$$

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2B-8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	

SHEAR POINT DIAGRAM
-Y1- US 301 / NEW WALKERTOWN RD.



NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040418 JARED M. BOND

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RS&H

03-JUL-2017 15:35
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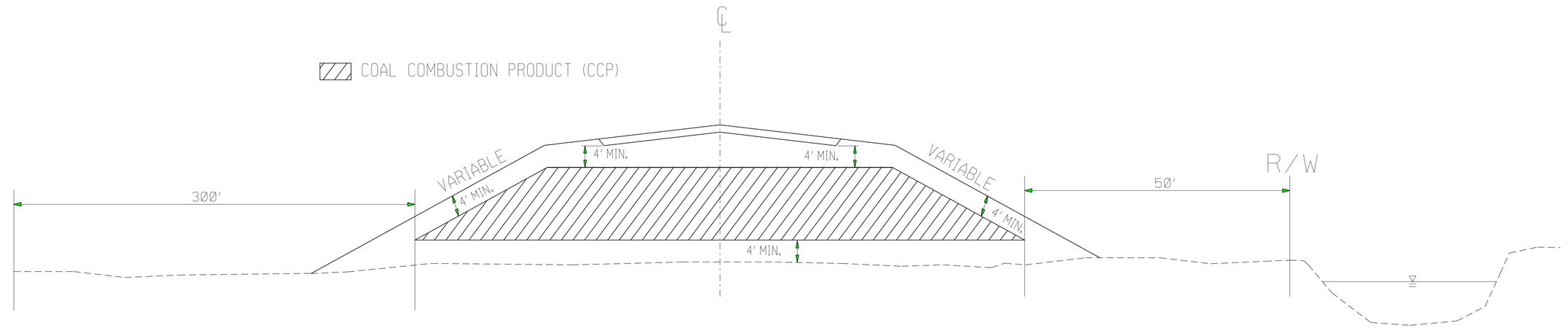
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2C-1

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

8/1/2017

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

DocuSigned by: Joel S. Howerton B73F3D17DCDC45F...

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

COAL COMBUSTION PRODUCT PLACEMENT DETAIL

ORIGINAL BY: J.S.H. DATE: JAN. 2015
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: joel/coal combustion material detail.dgn

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

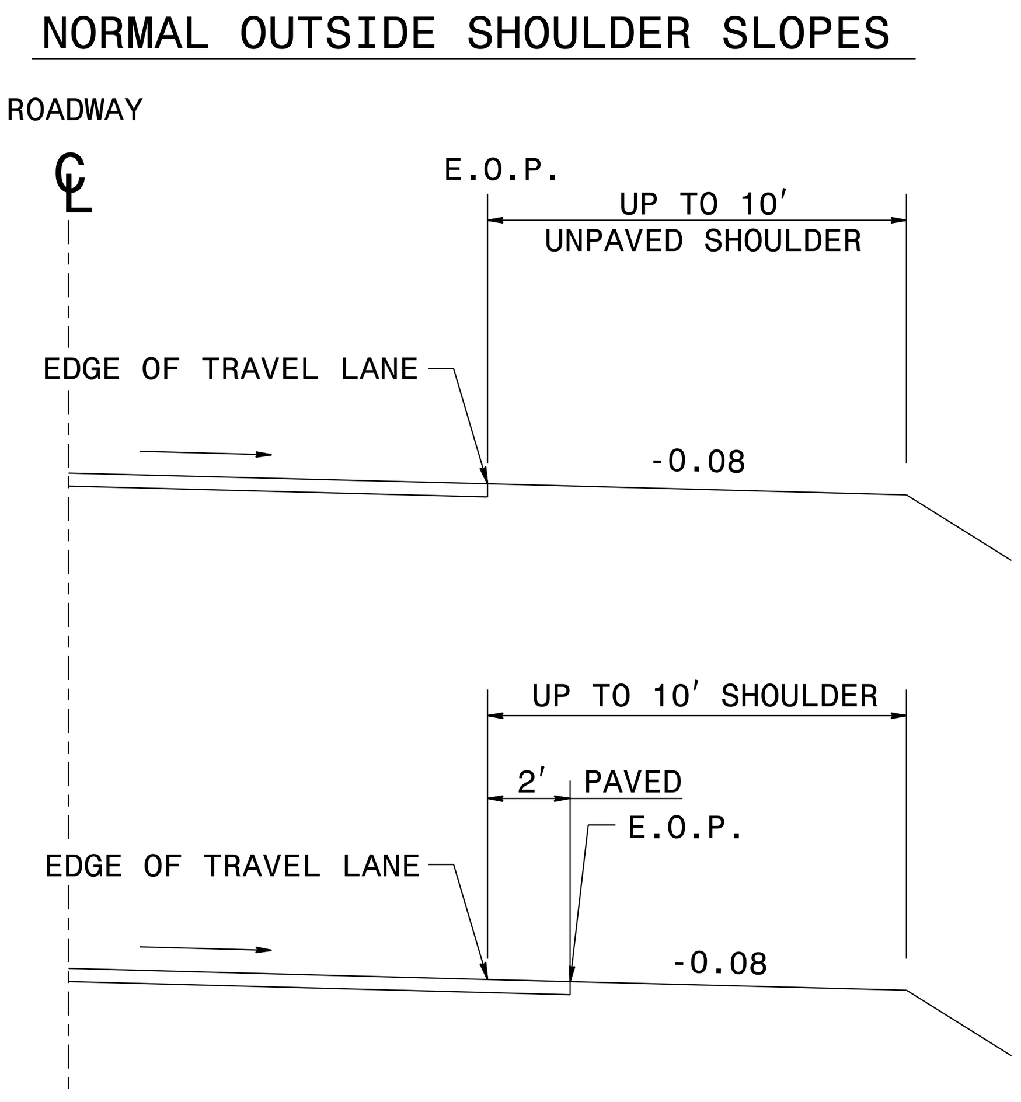
PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2C-2

ENGLISH DETAIL DRAWING FOR METHOD OF SHOULDER CONSTRUCTION HIGH SIDE OF SUPERELEVATED CURVE METHOD I (SHOULDERS UP TO 10′)

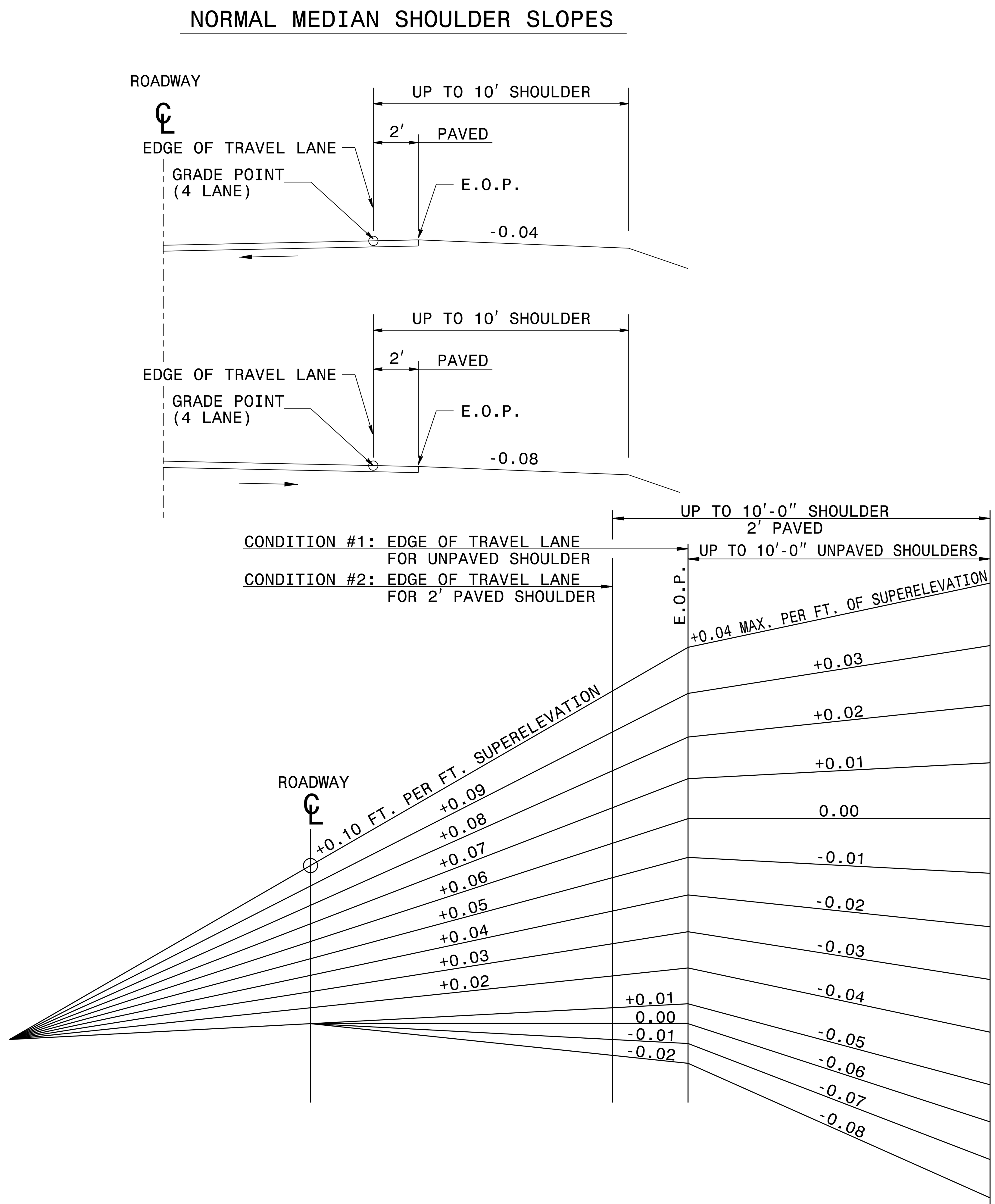
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

SHEET 1 OF 2 — 560D01

NORMAL OUTSIDE SHOULDER SLOPES



NORMAL MEDIAN SHOULDER SLOPES



ROADWAY
UP TO 10′ SHOULDER
2′ PAVED
EDGE OF TRAVEL LANE
GRADE POINT (4 LANE)
E.O.P.
-0.04
-0.08
UP TO 10′-0″ SHOULDER
2′ PAVED
CONDITION #1: EDGE OF TRAVEL LANE FOR UNPAVED SHOULDER
CONDITION #2: EDGE OF TRAVEL LANE FOR 2′ PAVED SHOULDER
UP TO 10′-0″ UNPAVED SHOULDERS
E.O.P.
+0.04 MAX. PER FT. OF SUPERELEVATION
+0.10 FT. PER FT. SUPERELEVATION
+0.09
+0.08
+0.07
+0.06
+0.05
+0.04
+0.03
+0.02
+0.01
0.00
-0.01
-0.02
+0.03
+0.02
+0.01
0.00
-0.01
-0.02
-0.03
-0.04
-0.05
-0.06
-0.07
-0.08

NOTE: ON LOW SIDE OF SUPERELEVATED PAVEMENT USE NORMAL SHOULDER SLOPE UNLESS NORMAL SHOULDER SLOPE IS FLATTER THAN SUPERELEVATION, THEN USE SUPER-ELEVATION RATE ON SHOULDER.

NOTE: "ROLL-OVER" ALGEBRAIC DIFFERENCE IN RATES OF CROSS SLOPE NOT TO EXCEED 0.06 AS SHOWN. IF SUPER-ELEVATION IS REVOLVED ABOUT CENTER LINE OF PAVEMENT, SAME APPLIES. ON DIVIDED ROADWAYS, GRADE POINT TO BE AT THE MEDIAN EDGE OF TRAVEL LANE.

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

ENGLISH DETAIL DRAWING FOR METHOD OF SHOULDER CONSTRUCTION HIGH SIDE OF SUPERELEVATED CURVE METHOD I (SHOULDERS UP TO 10′)

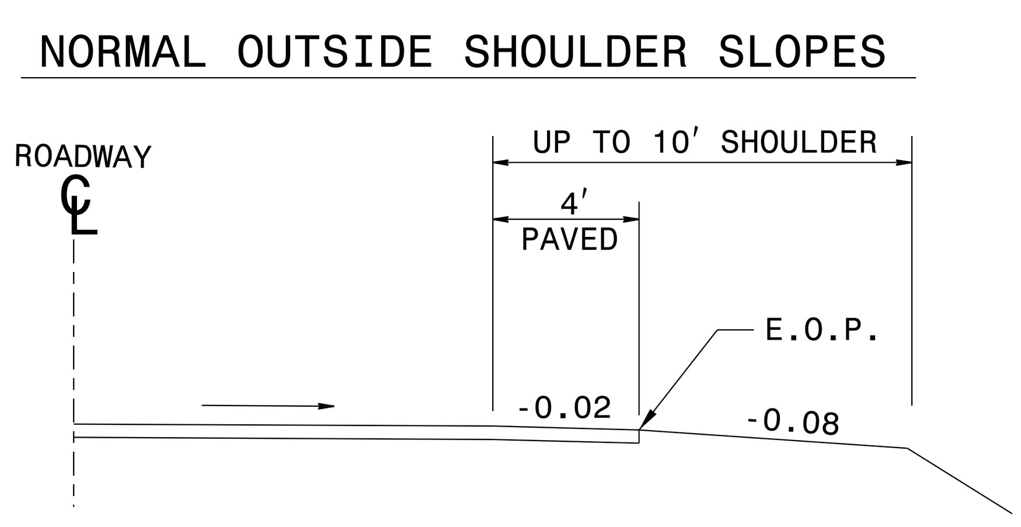
SHEET 1 OF 2 — 560D01

ENGLISH DETAIL DRAWING FOR METHOD OF SHOULDER CONSTRUCTION HIGH SIDE OF SUPERELEVATED CURVE METHOD I (SHOULDERS UP TO 10′)

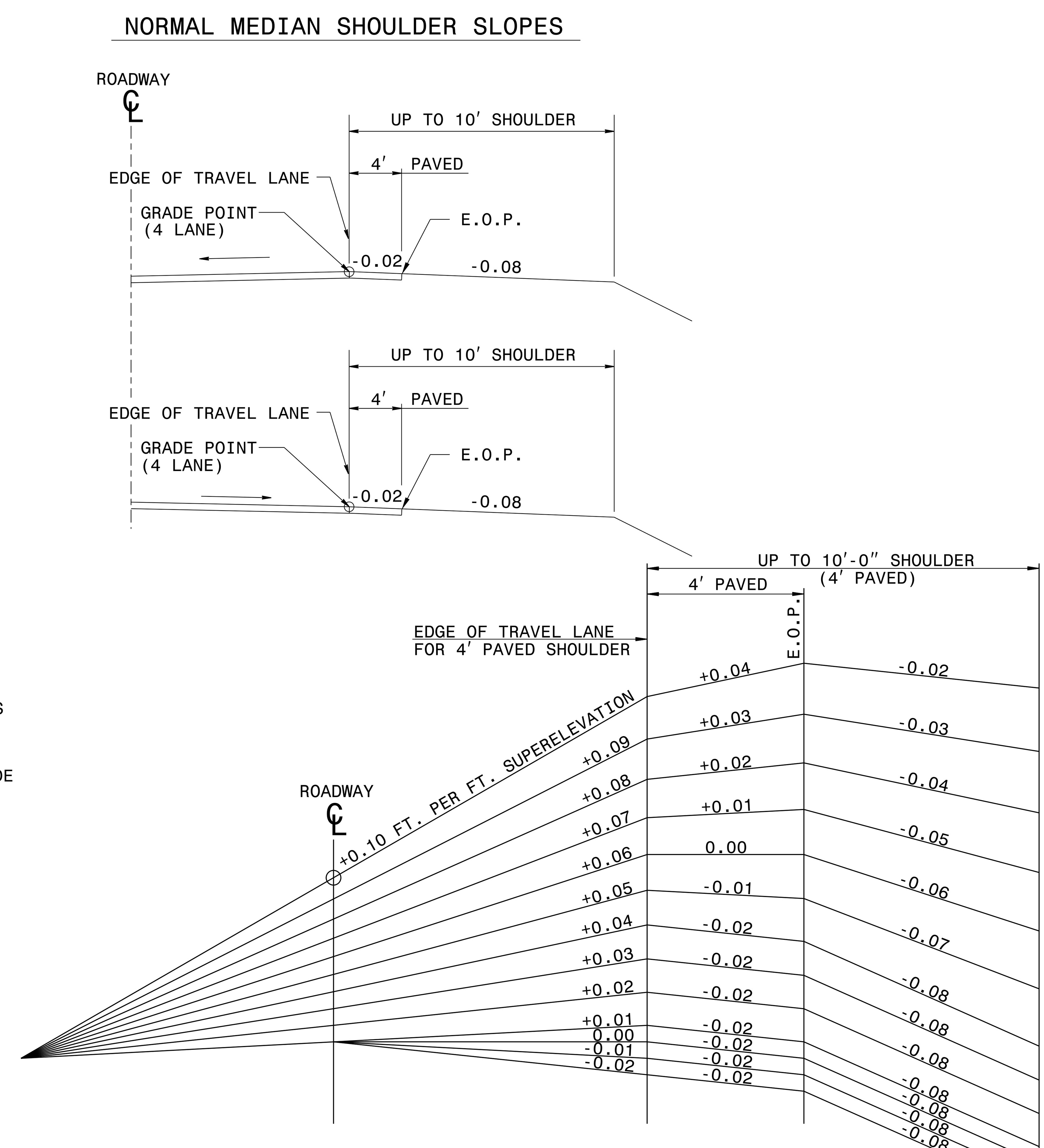
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

SHEET 2 OF 2 — 560D01

NORMAL OUTSIDE SHOULDER SLOPES



NORMAL MEDIAN SHOULDER SLOPES



ROADWAY
UP TO 10′ SHOULDER
4′ PAVED
EDGE OF TRAVEL LANE
GRADE POINT (4 LANE)
E.O.P.
-0.02
-0.08
UP TO 10′-0″ SHOULDER (4′ PAVED)
4′ PAVED
EDGE OF TRAVEL LANE FOR 4′ PAVED SHOULDER
E.O.P.
+0.10 FT. PER FT. SUPERELEVATION
+0.09
+0.08
+0.07
+0.06
+0.05
+0.04
+0.03
+0.02
+0.01
0.00
-0.01
-0.02
+0.04
+0.03
+0.02
+0.01
0.00
-0.01
-0.02
-0.02
-0.02
-0.02
-0.02
-0.02
-0.02
-0.02
-0.03
-0.04
-0.05
-0.06
-0.07
-0.08
-0.08
-0.08
-0.08
-0.08
-0.08
-0.08

NOTE: ON LOW SIDE OF SUPERELEVATED PAVEMENT USE NORMAL SHOULDER SLOPE UNLESS NORMAL SHOULDER SLOPE IS FLATTER THAN SUPERELEVATION, THEN USE SUPER-ELEVATION RATE ON SHOULDER.

NOTE: "ROLL-OVER" ALGEBRAIC DIFFERENCE IN RATES OF CROSS SLOPE NOT TO EXCEED 0.06 AS SHOWN. IF SUPER-ELEVATION IS REVOLVED ABOUT CENTER LINE OF PAVEMENT, SAME APPLIES. ON DIVIDED ROADWAYS, GRADE POINT TO BE AT THE MEDIAN EDGE OF TRAVEL LANE.

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

ENGLISH DETAIL DRAWING FOR METHOD OF SHOULDER CONSTRUCTION HIGH SIDE OF SUPERELEVATED CURVE METHOD I (SHOULDERS UP TO 10′)

SHEET 2 OF 2 — 560D01

8/1/2017

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

DocuSigned by: Joel S. Howerton

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

SEE PLATE FOR TITLE

ORIGINAL BY: KKempf DATE: 5-15-09
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC: c:/ricward/stds/stdstodetails/30001/0300d01.dgn

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2C-3

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

ENGLISH DETAIL DRAWING FOR

METHOD OF SHOULDER CONSTRUCTION

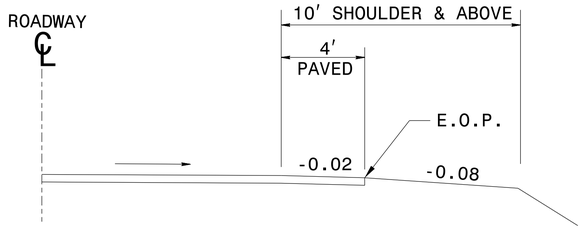
HIGH SIDE OF SUPERELEVATED CURVE

METHOD II (SHOULDERS 10′ AND ABOVE)

SHEET 1 OF 1

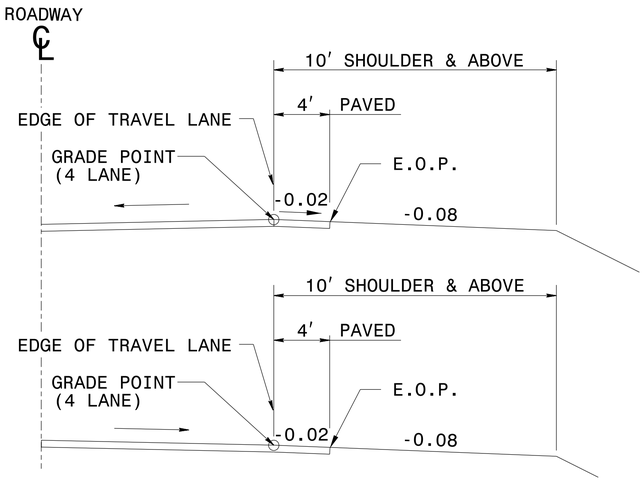
560D02

NORMAL OUTSIDE SHOULDER SLOPES

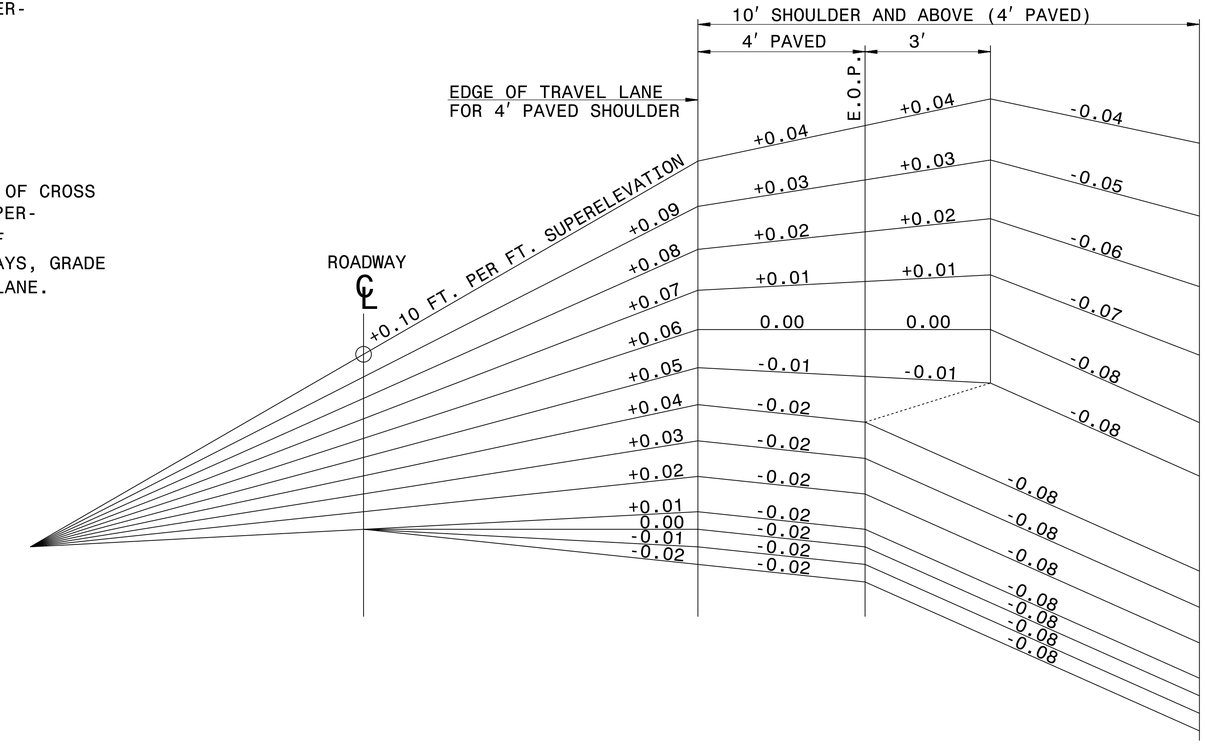


NOTE: ON LOW SIDE OF SUPERELEVATED PAVEMENT USE NORMAL SHOULDER SLOPE UNLESS NORMAL SHOULDER SLOPE IS FLATTER THAN SUPERELEVATION, THEN USE SUPER-ELEVATION RATE ON SHOULDER.

NORMAL MEDIAN SHOULDER SLOPES



NOTE: "ROLL-OVER" ALGEBRAIC DIFFERENCE IN RATES OF CROSS SLOPE NOT TO EXCEED 0.06 AS SHOWN. IF SUPER-ELEVATION IS REVOLVED ABOUT CENTER LINE OF PAVEMENT, SAME APPLIES. ON DIVIDED ROADWAYS, GRADE POINT TO BE AT THE MEDIAN EDGE OF TRAVEL LANE.



8/1/2017

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

DocuSigned by: Joel S. Howerton 873F3D17DC0C45F...

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STATE OF
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ENGLISH DETAIL DRAWING FOR

METHOD OF SHOULDER CONSTRUCTION

HIGH SIDE OF SUPERELEVATED CURVE

METHOD II (SHOULDERS 10′ AND ABOVE)

SHEET 1 OF 1

560D02

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PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2C-4

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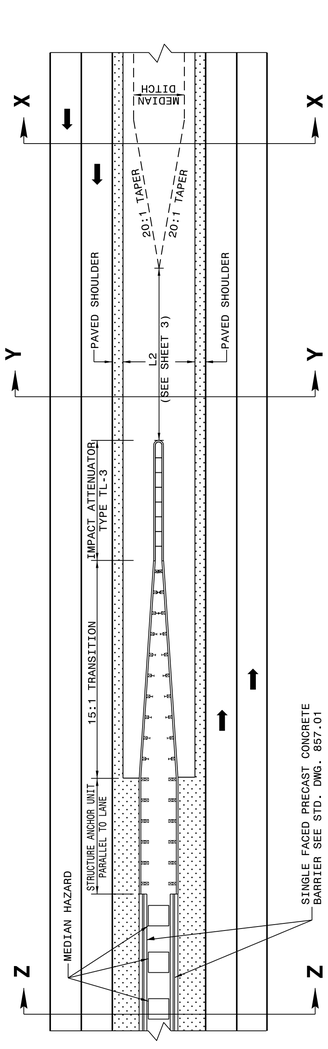
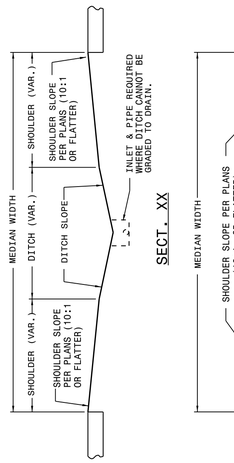
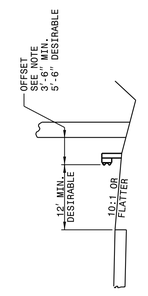
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 1 OF 11
862D01

DETAIL OF RIGHT SIDE GUARDRAIL AT UNDERPASS







NOTE: WHEN OFFSET DISTANCE FROM FACE OF OBSTRUCTION TO FACE OF GUARDRAIL IS BETWEEN 3'-6" AND 5'-6", BEGIN 3'-1½" POST SPACING AT A POINT 25' BEFORE REACHING THE OBSTRUCTION AND CARRY THROUGHOUT ITS LENGTH. IF THE OFFSET IS LESS THAN 3'-6" USE CONCRETE BARRIER.

8/1/2017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 Joel S. Howerton

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

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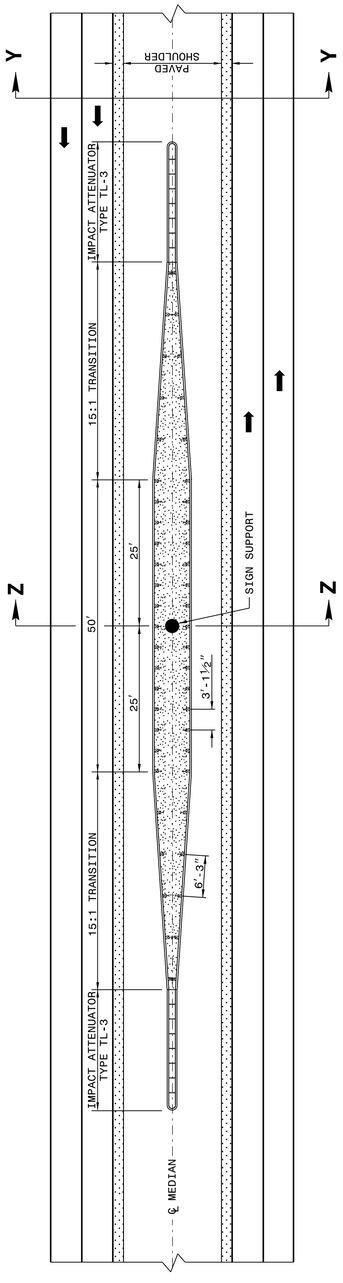
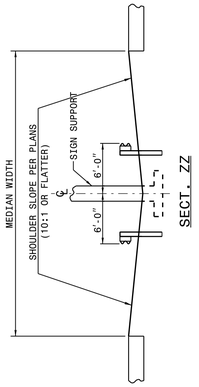
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 2 OF 11
862D01

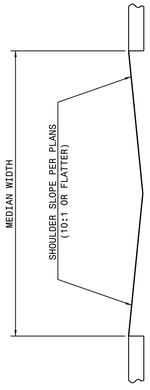
DETAIL OF GUARDRAIL AT MEDIAN SIGN SUPPORT





NOTE SPECIAL LAYER OF PAVEMENT .....

USE 3'-1½" POST SPACING ON THE 50' OF GUARDRAIL PARALLEL TO LANES AND 6'-3" POST SPACING ON 15:1 TRANSITION SECTIONS.
GRADE MEDIAN IN THE VICINITY OF THE SIGN SUPPORT AS ILLUSTRATED IN THE ROADWAY STANDARD DRAWINGS (STARDARD 862D01 SHEET 1 OF 12).



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ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 2 OF 11
862D01

STATE OF NORTH CAROLINA
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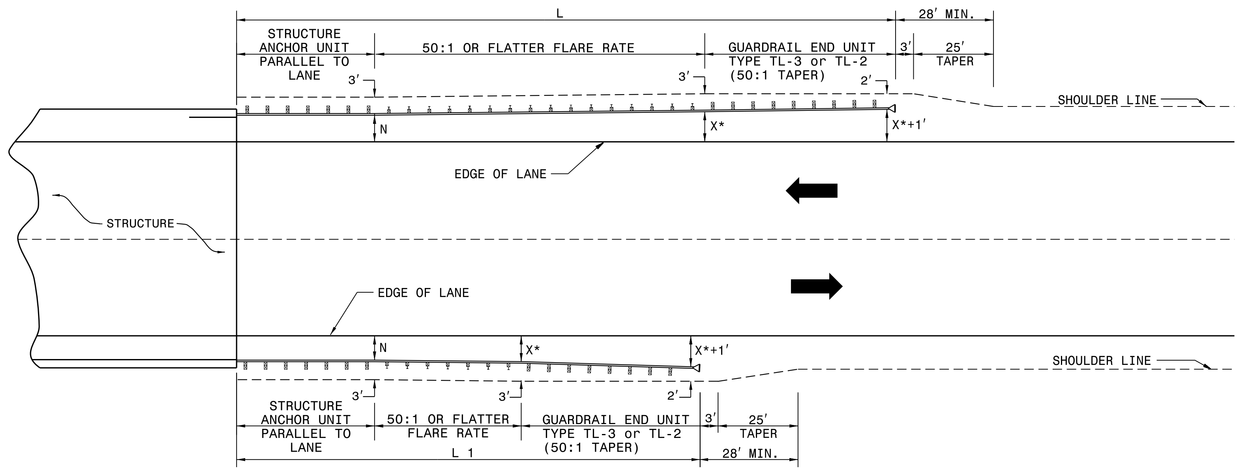
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT



* USE FLARE RATE AS THE CONTROL IF THE "X" DISTANCE IS NOT OBTAINED. ("X" IS BASED ON SHOULDER WIDTHS IN THE HIGHWAY DESIGN BRANCH MANUAL, PART 1, 1-4B, F1).

"N"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.

SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS

FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

GUARDRAIL INSTALLATION AT BRIDGE APPROACHES FOR TWO-LANE, TWO-WAY TRAFFIC

DESIGN SPEED (MPH)	"L" APPROACH LENGTH (FT.)				"L1" TRAILING LENGTH (FT.)			
	DESIGN YEAR ADT		CURRENT YEAR ADT		DESIGN YEAR ADT		CURRENT YEAR ADT	
	OVER 2000	1001-2000	400-1000	UNDER 400	OVER 2000	1001-2000	400-1000	UNDER 400
70	362.5'	362.5'	350.0'	287.5'	187.5'	187.5'	175.0'	75.0'
60	300.0'	287.5	275.0'	225.0'	137.5'	137.5'	100.0'	75.0'
50	212.5'	212.5'	200.0'	162.5'	87.5'	75.0'	75.0'	75.0'
40	175.0'	150.0'	137.5'	112.5'	75.0'	75.0'	75.0'	75.0'
X *	8'	6'	4'	4'	8'	6'	4'	4'

LENGTHS AND OFFSETS FOR PROPOSED GUARDRAIL AT TWO LANE - TWO WAY LOCATIONS

SHEET 4 OF 11
862D01

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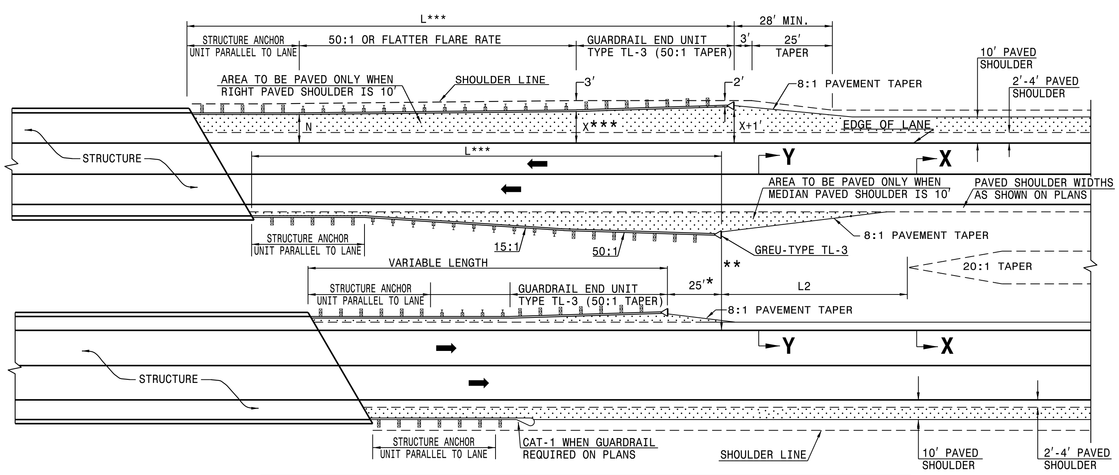
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT



FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

DIMENSIONS FOR LENGTH OF GUARDRAIL APPROACHING DUAL LANE BRIDGES

MEDIAN WIDTH	-L-***						-L2- DIM.
	70 MPH	60 MPH	50 MPH				
30'	300.0'	250.0'	150.0'				80.0'
36'	300.0'	250.0'	150.0'				60.0'
40' & ABOVE	300.0'	250.0'	150.0'				40.0'

NOTES: * MINOR VARIATION TO THE 25'-0" DIMENSION IS PERMISSIBLE TO ACCOMODATE THE 12'-6" IN GUARDRAIL LENGTHS.

** NO GUARDRAIL IS REQUIRED ON THE TRAILING END WHEN THIS DISTANCE EXCEEDS CLEAR ROADSIDE RECOVERY AREA FOR THE APPROPRIATE DESIGN SPEED.

*** BASED ON "X" OF 12'
USE FLARE RATE AS THE CONTROL IF THE "X" DISTANCE IS NOT OBTAINED. ("X" IS BASED ON SHOULDER WIDTHS IN THE HIGHWAY DESIGN BRANCH MANUAL, PART 1, 1-4B, F1A).

"N"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.

THE DESIGN LAYOUT FOR LENGTHS SHOWN ON THIS STANDARD ARE MINIMUM DESIGN LENGTHS.

SEE SHEET 1 OF 12 FOR SECTIONS XX, YY

SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS

DETAIL OF GUARDRAIL APPROACHING DUAL LANE BRIDGES

SHEET 3 OF 11
862D01

STATE OF NORTH CAROLINA
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ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

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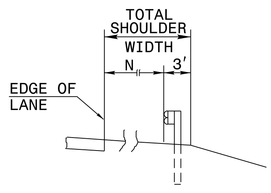
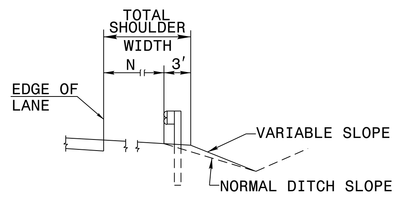
PROJECT REFERENCE NO. U-2579C
SHEET NO. 2C-5

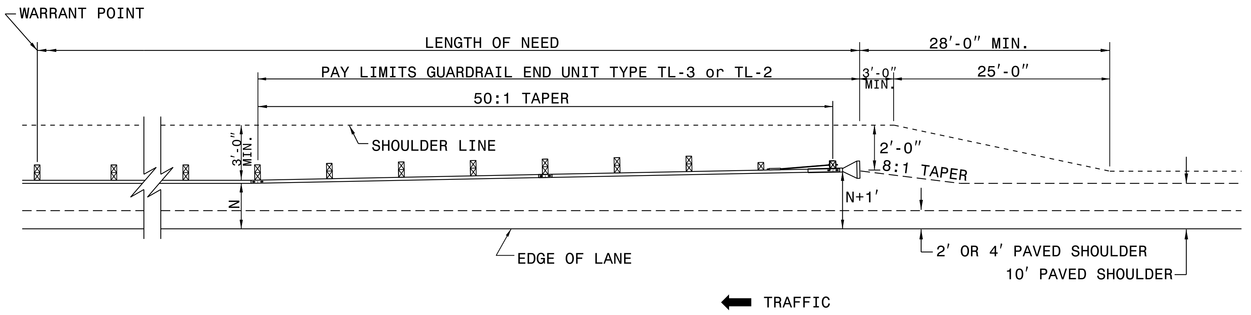


FILL SECTION



CUT SECTION

"N"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.



FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

DETAIL OF BEGINNING OF GUARDRAIL IN CUT OR FILL SECTION

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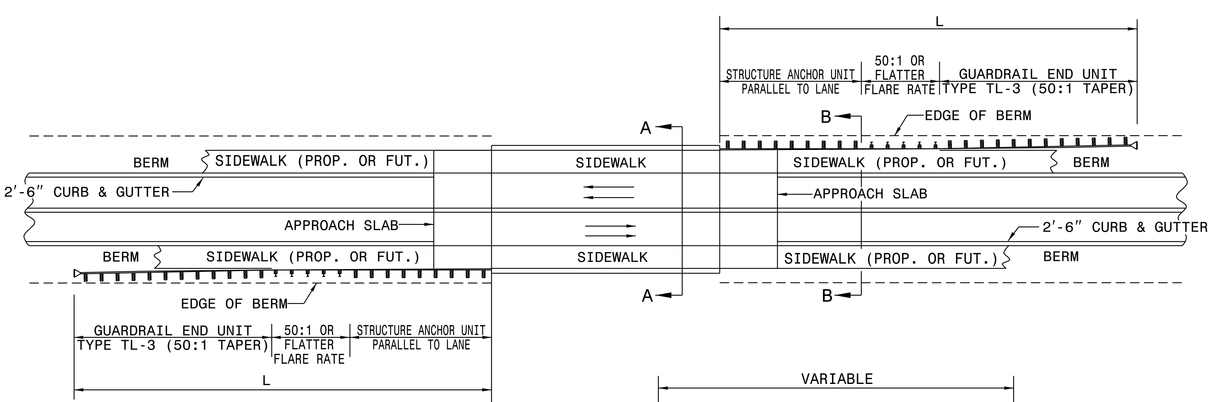
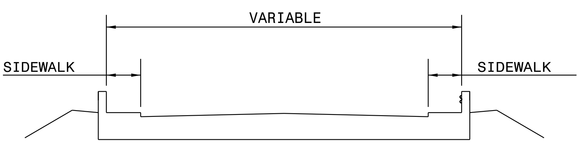
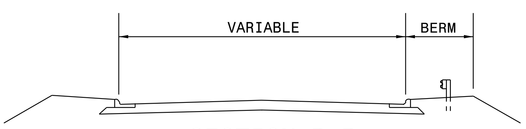
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 6 OF 11
862D01

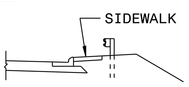




SECTION A-A



SECTION B-B



MINIMUM GUARDRAIL LENGTHS "L" REQUIRED AT BRIDGE APPROACHES ON 2'-6" CONCRETE CURB AND GUTTER ROADWAYS	
DESIGN SPEED (MPH)	"L"
40	150'
50	225'

NOTE: "L" VALUES ARE BASED ON NO HAZARDS OTHER THAN END OF BRIDGE BEING PRESENT WITHIN THE CLEAR ZONE.

SEE STD. 862D03 FOR STRUCTURE ANCHOR UNITS.

FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

STANDARD GUARDRAIL PLACEMENT AT BRIDGES WITH 2'-6" CONCRETE CURB AND GUTTER

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 5 OF 11
862D01

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SHEET NO. 2C-6

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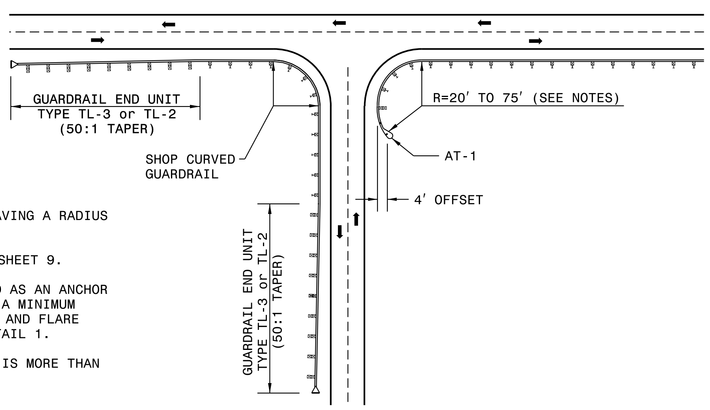
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT



NOTES:

SHOP CURVED GUARDRAIL IS DEFINED AS HAVING A RADIUS OF 150' OR LESS.

WHEN RADIUS IS LESS THAN 20' REFER TO SHEET 9.

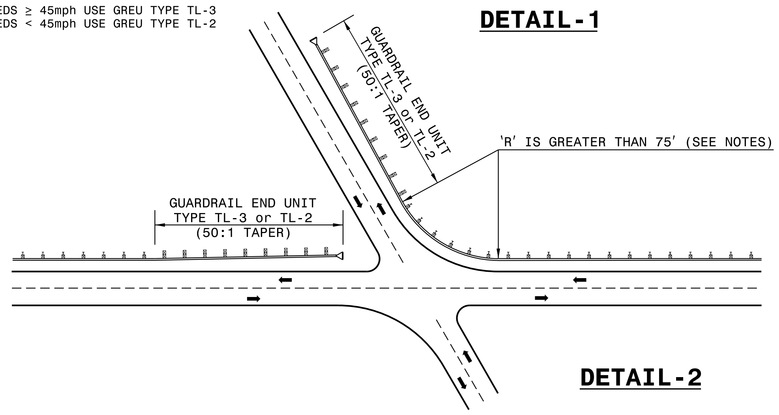
WHENEVER SHOP CURVED GUARDRAIL IS USED AS AN ANCHOR AND THE RADIUS IS FROM 20' TO 75', USE A MINIMUM LENGTH OF 50' OF SHOP CURVED GUARDRAIL AND FLARE WITH AN AT-1 ANCHOR UNIT. REFER TO DETAIL 1.

WHENEVER SHOP CURVED GUARDRAIL RADIUS IS MORE THAN 75', REFER TO DETAIL 2.

MAINTAIN CLEAR SIGHT DISTANCE.

FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

DETAIL-1



DETAIL-2

GUARDRAIL TREATMENT AT INTERSECTIONS

SHEET 8 OF 11
862D01

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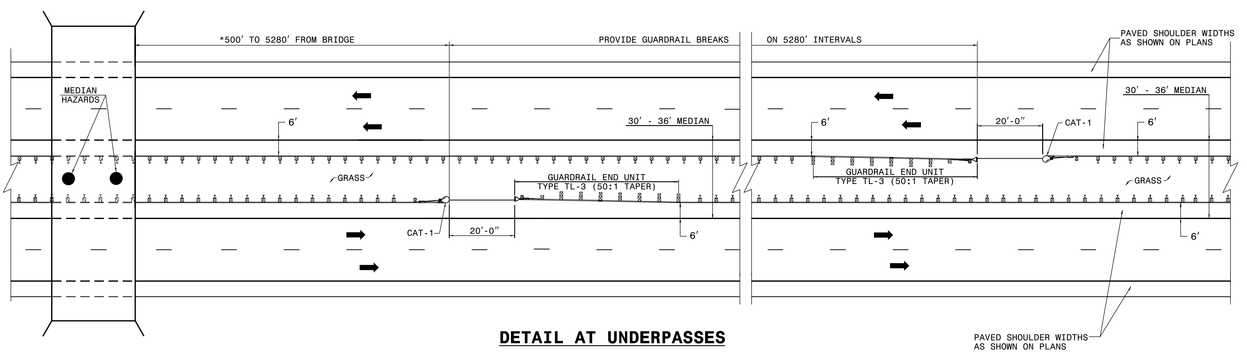
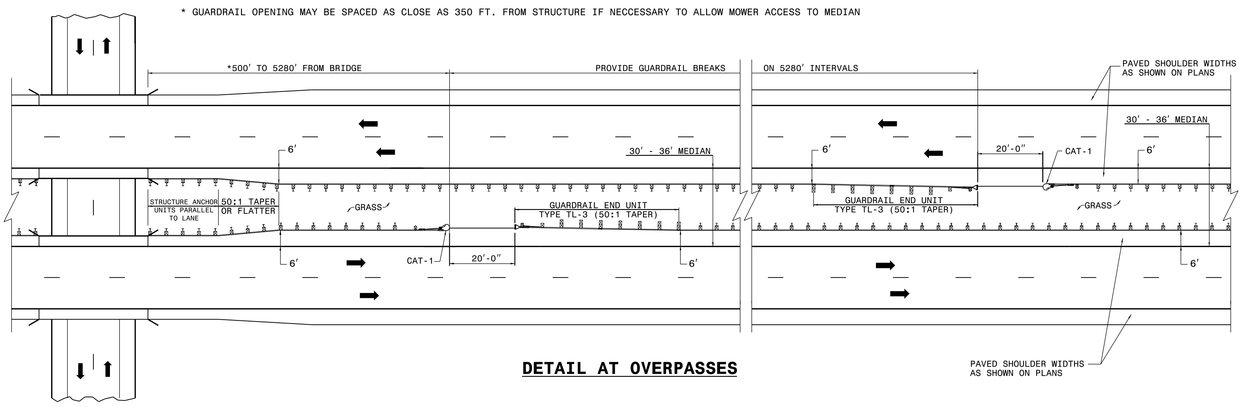
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT



DETAIL AT UNDERPASSES

* GUARDRAIL OPENING MAY BE SPACED AS CLOSE AS 350 FT. FROM STRUCTURE IF NECCESSARY TO ALLOW MOWER ACCESS TO MEDIAN



DETAIL AT OVERPASSES

FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

GUARDRAIL BREAK INTERVALS WITH 30' - 36' MEDIANS

SHEET 7 OF 11
862D01

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ROADWAY DETAIL DRAWING FOR
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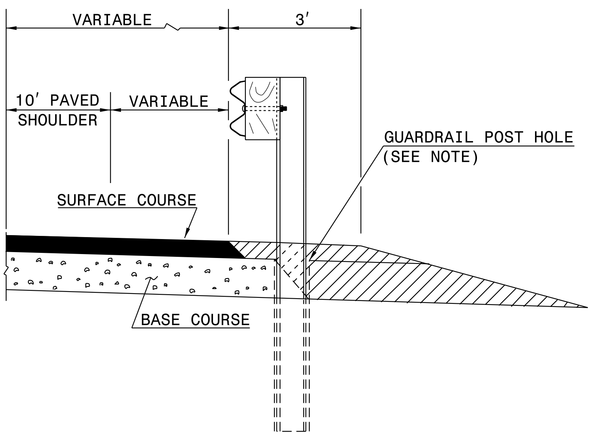
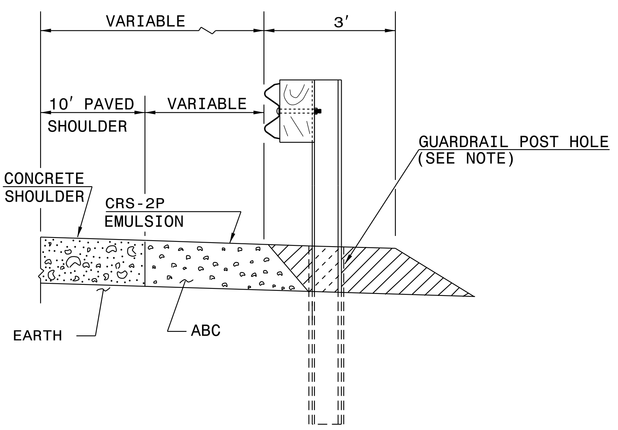
ENGLISH DETAIL DRAWING FOR
GUARDRAIL PLACEMENT



FLEXIBLE PAVED SHOULDER



CONCRETE PAVED SHOULDER

EARTH MATERIAL

NOTE:
WHEN WOODEN GUARDRAIL POSTS ARE USED, DRILL HOLES THROUGH EARTH MATERIAL AND BASE COURSE.THE POST MAY THEN BE DRIVEN TO THE PROPER DEPTH. DRILL THE HOLE OF SUFFICIENT SIZE TO ACCOMMODATE THE PARTICULAR POST BEING USED. BACKFILL AND TAMP HOLES USING THE EXCAVATED MATERIAL.

SHEET 10 OF 11
862D01

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ENGLISH DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 10 OF 11
862D01

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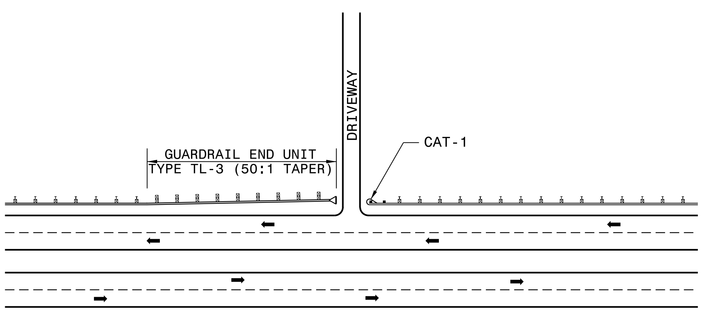
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

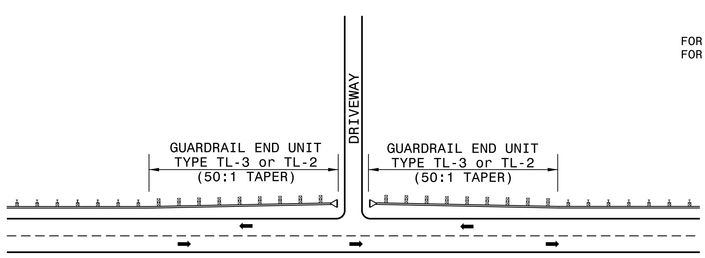


DETAIL-3
DIVIDED HIGHWAY

NOTE: USE DETAIL 3 & 4 WHENEVER 20′ OR LARGER RADIUS CANNOT BE UTILIZED.

MAINTAIN CLEAR SIGHT DISTANCE.

FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2



DETAIL-4
UNDIVIDED HIGHWAY

GUARDRAIL TREATMENT AT DRIVEWAYS

SHEET 9 OF 11
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ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

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PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2C-9

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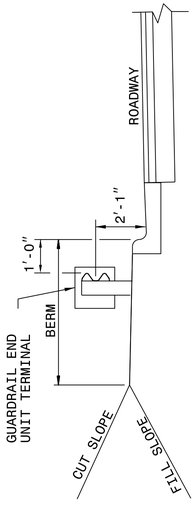
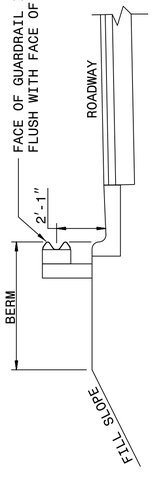
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT
GUARDRAIL TREATMENT AT CURB AND GUTTER

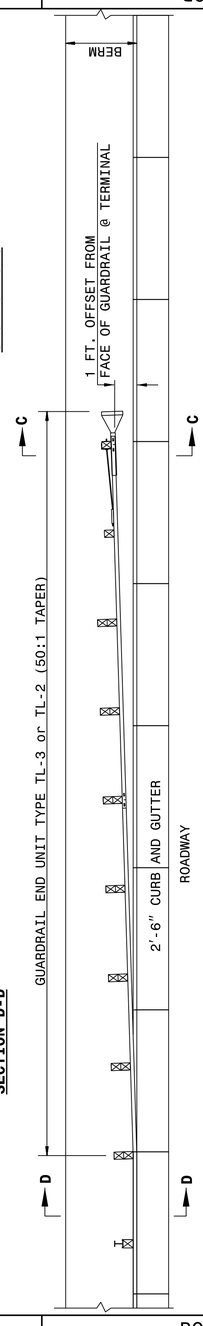
SHEET 11 OF 11
862D01

SECTION C-C



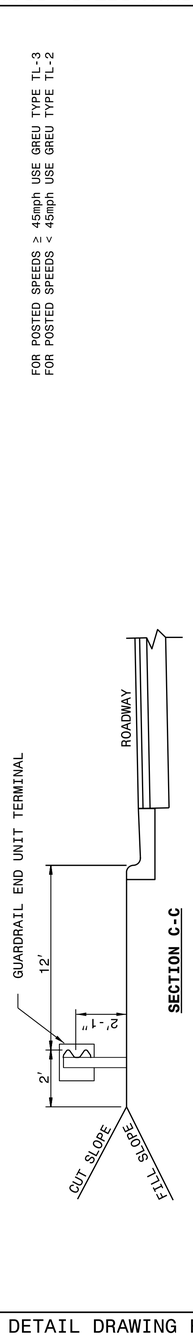
SECTION D-D



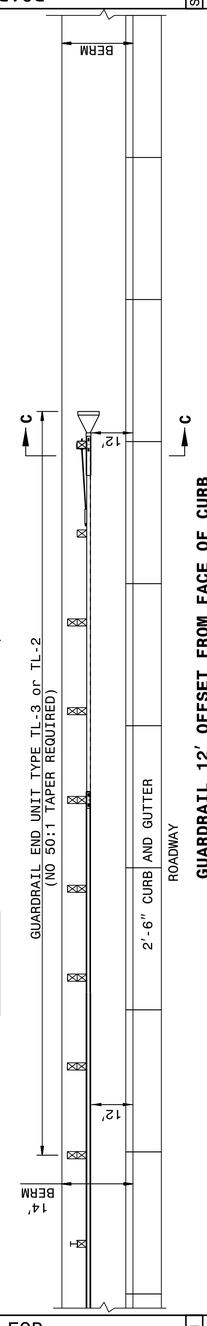


GUARDRAIL AT FACE OF CURB

FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2



SECTION C-C



GUARDRAIL 12' OFFSET FROM FACE OF CURB

8/1/2017

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

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Joel S. Howerton
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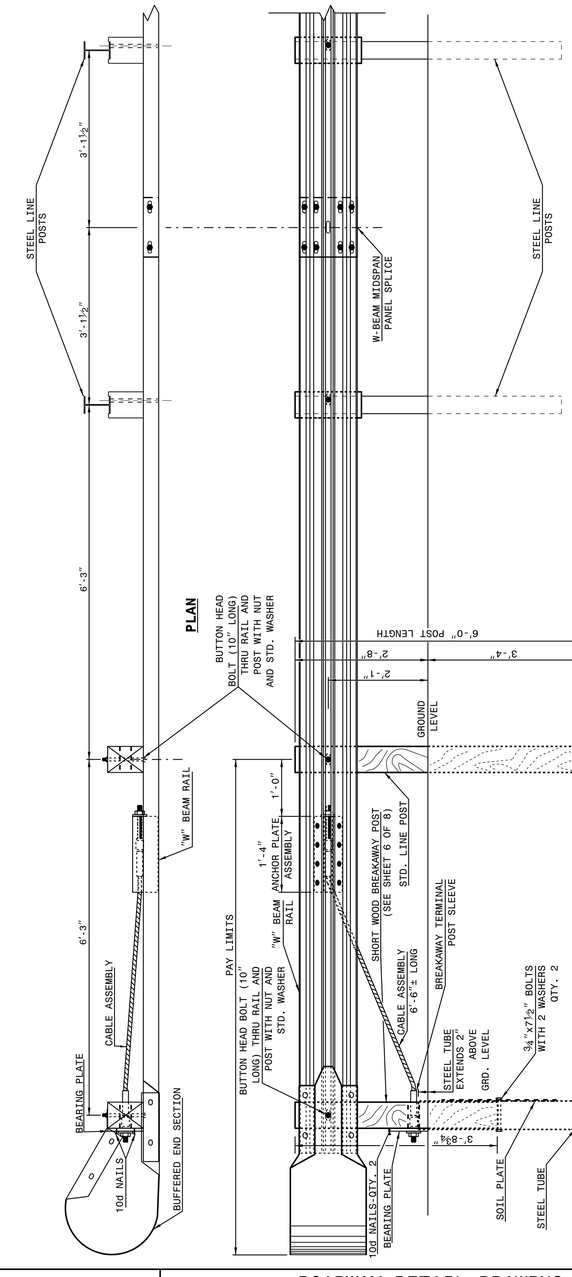
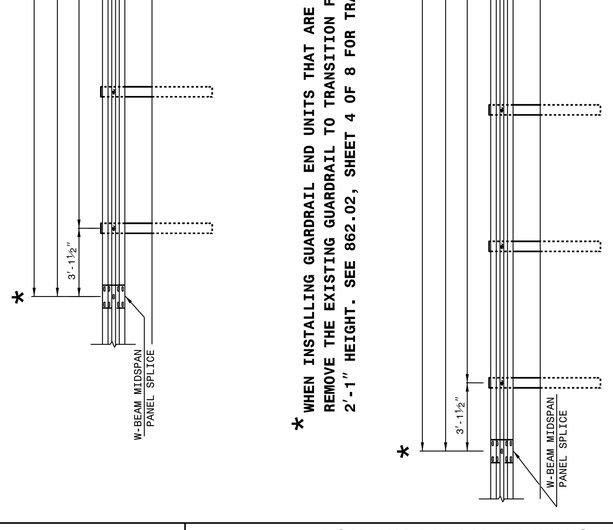
PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2C-10



TRAILING END UNIT ASSEMBLY
C.A.T.-1 SYSTEM



FLARED AND TANGENT
ELEVATION VIEW

FLARED AND TANGENT
ELEVATION VIEW

APPROACH END UNITS

* **WHEN INSTALLING GUARDRAIL END UNITS THAT ARE 2'-1" MOUNTING HEIGHT TO EXISTING GUARDRAIL, REMOVE THE EXISTING GUARDRAIL TO TRANSITION FROM THE EXISTING HEIGHT TO THE PROPOSED 2'-1" HEIGHT. SEE 862.02, SHEET 4 OF 8 FOR TRANSITION DETAILS.**

8/1/2017

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

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

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jhowerton AT CSD-292595

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2C-11

STATE OF
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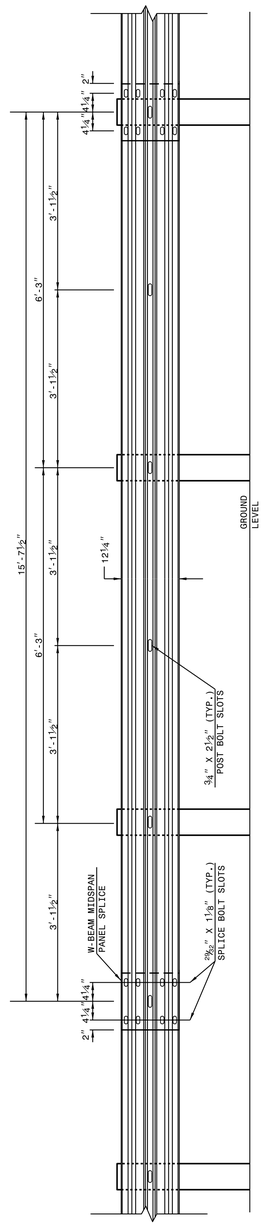
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 3 OF 8
862D02



15'-7½" W-BEAM GUARDRAIL PANEL

NOTE: USE 5-SPACE 15'-7½" W-BEAM GUARDRAIL PANEL AT THE DOWNSTREAM END OF EXISTING GUARDRAIL THAT DOES NOT OFFSET THE W-BEAM PANEL SPLICE TO MIDSPAN

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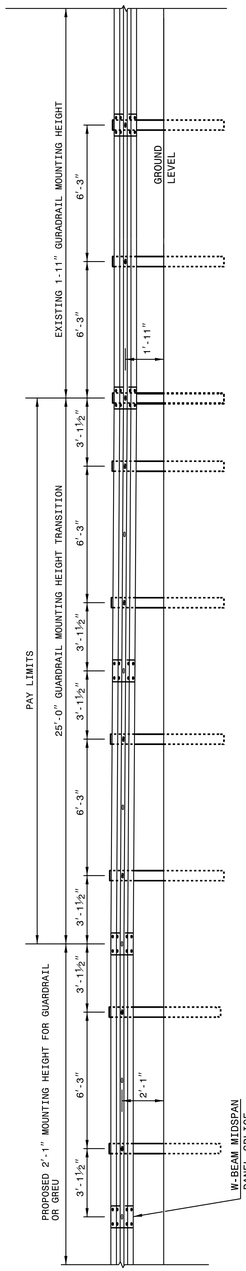
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 4 OF 8
862D02

TRANSITION FROM OR 1'-11" TO 2'-1" W-BEAM GUARDRAIL MOUNTING HEIGHT



ELEVATION VIEW

NOTE: IF EXISTING GUARDRAIL IS LOWER THAN 1'-11", USE AN ADDITIONAL 12'-6" LONG SECTION OF GUARDRAIL, FOR EVERY 1" OF HEIGHT DIFFERENCE, TO TRANSITION FROM EXISTING GUARDRAIL TO PROPOSED 2'-1" GUARDRAIL.

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 4 OF 8
862D02

8/1/2017

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

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PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2C-12

STATE OF
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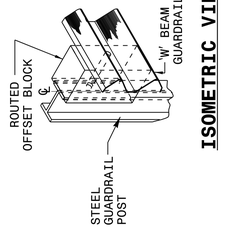
RALEIGH, N.C.

GUARDRAIL INSTALLATION

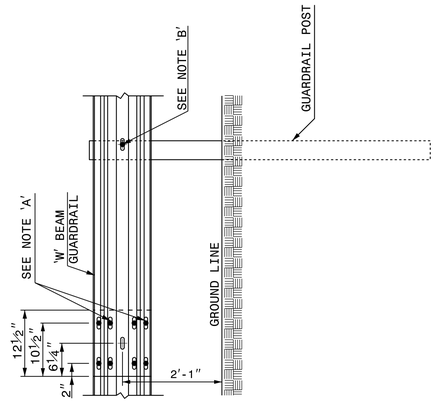
ROADWAY DETAIL DRAWING FOR

SHEET 5 OF 8 — 862D02

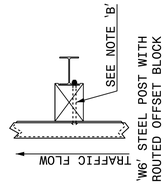
ISOMETRIC VIEW



FRONT - MID SPAN SPLICE

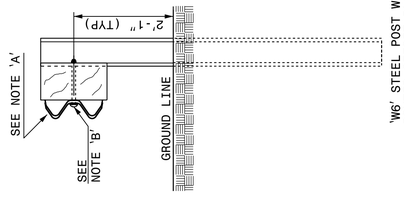


TYPICAL GUARDRAIL AND GUARDRAIL POST ALTERNATIVES



'W6' STEEL POST WITH ROUTED OFFSET BLOCK

PLAN



'W6' STEEL POST WITH ROUTED OFFSET BLOCK

SIDE

NOTES:
A - ⅝" DIA. BUTTON HEAD SPLICE BOLT 1¼" LONG (8 REQ. PER SPLICE JOINT).
B - ⅝" DIA. BUTTON HEAD BOLT 7½"/9" LONG WITH NUT FOR BOLTING 6"/8" ROUTED OFFSET BLOCK TO STEEL POSTS.
C - FIELD PUNCHING OF HOLES INTO GUARDRAIL AS DIRECTED BY THE ENGINEER.

8/1/2017

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

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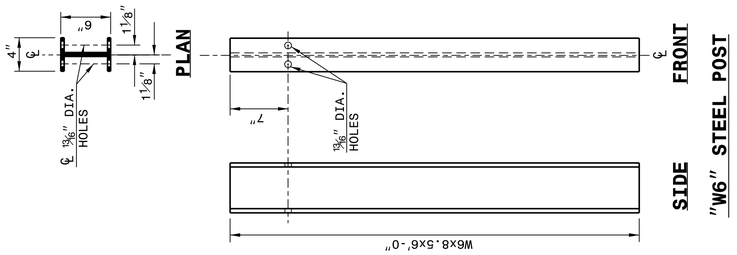
RALEIGH, N.C.

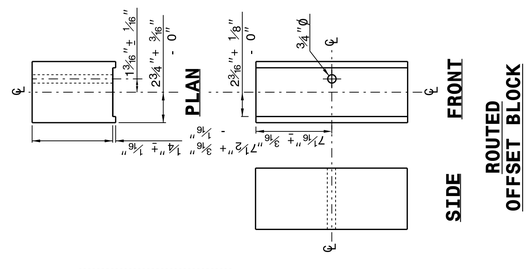
GUARDRAIL INSTALLATION

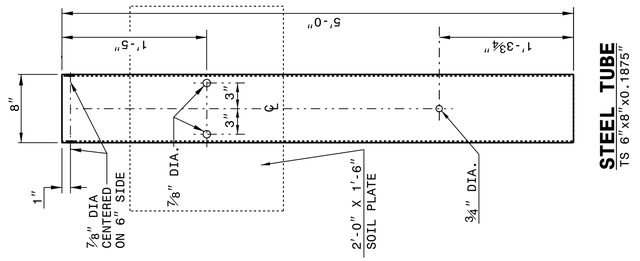
ROADWAY DETAIL DRAWING FOR

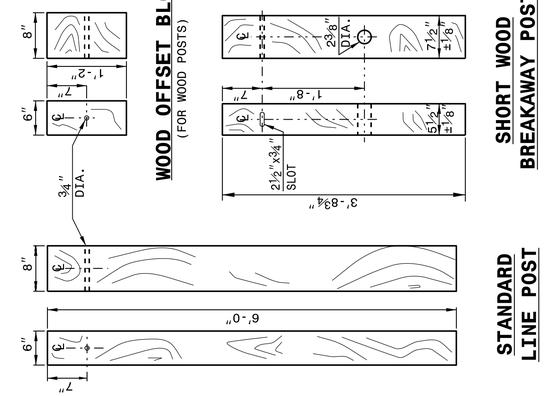
SHEET 6 OF 8 — 862D02

SYSTEM PARTS









STATE OF
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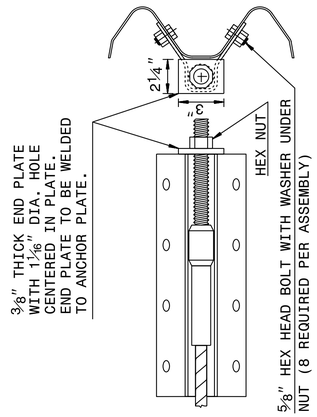
DIVISION OF HIGHWAYS
RALEIGH, N.C.

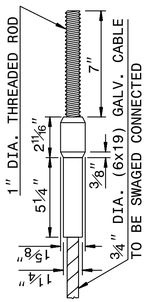
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8 — 862D02

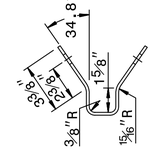
PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2C-13

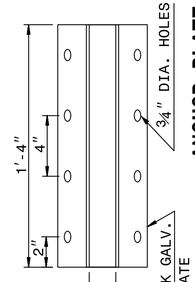


ANCHOR PLATE ASSEMBLY



SWAGED CABLE

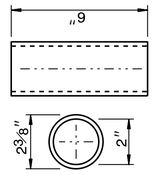




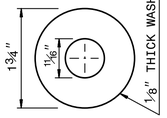
ANCHOR PLATE

CABLE ASSEMBLY

SYSTEM PARTS

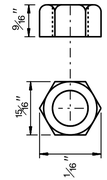


BREAKAWAY TERMINAL POST SLEEVE

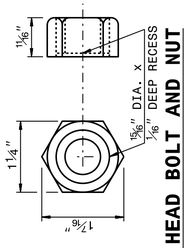


DETAIL OF STANDARD WASHER

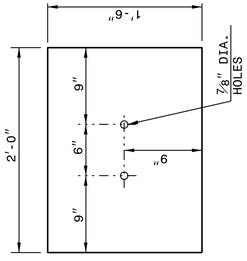
STANDARD WASHER: TYPICAL USE UNDER NUT WITH WOOD POST



DETAIL OF STANDARD HEX BOLT AND NUT

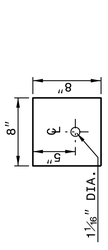


DETAIL OF BUTTON HEAD BOLT AND NUT



SOIL PLATE

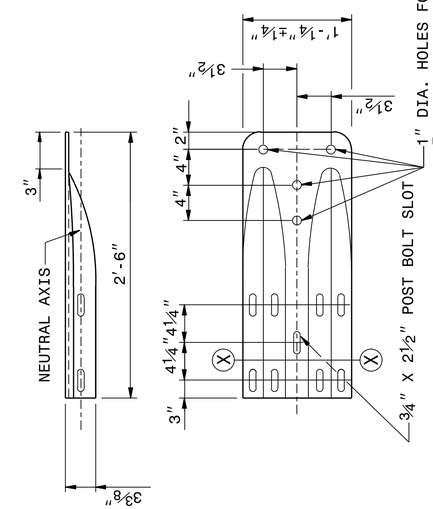
¼" THICK PLATE



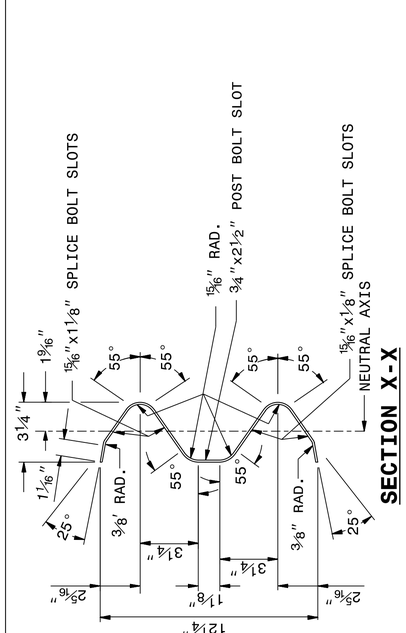
BEARING PLATE

⅝" THICK PLATE

SYSTEM PARTS - GENERAL USE



TYPICAL END SHOE



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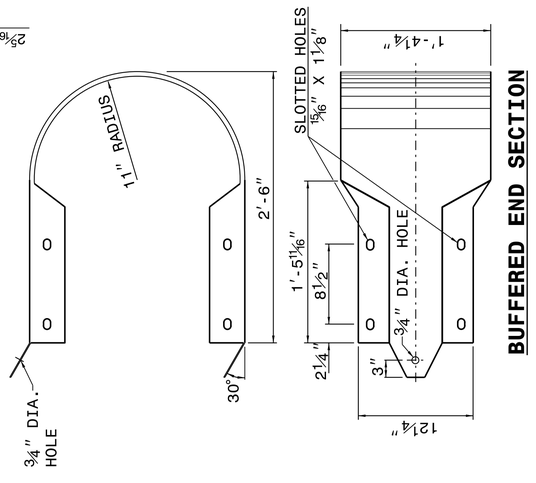

BUFFERED END SECTION

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STATE OF
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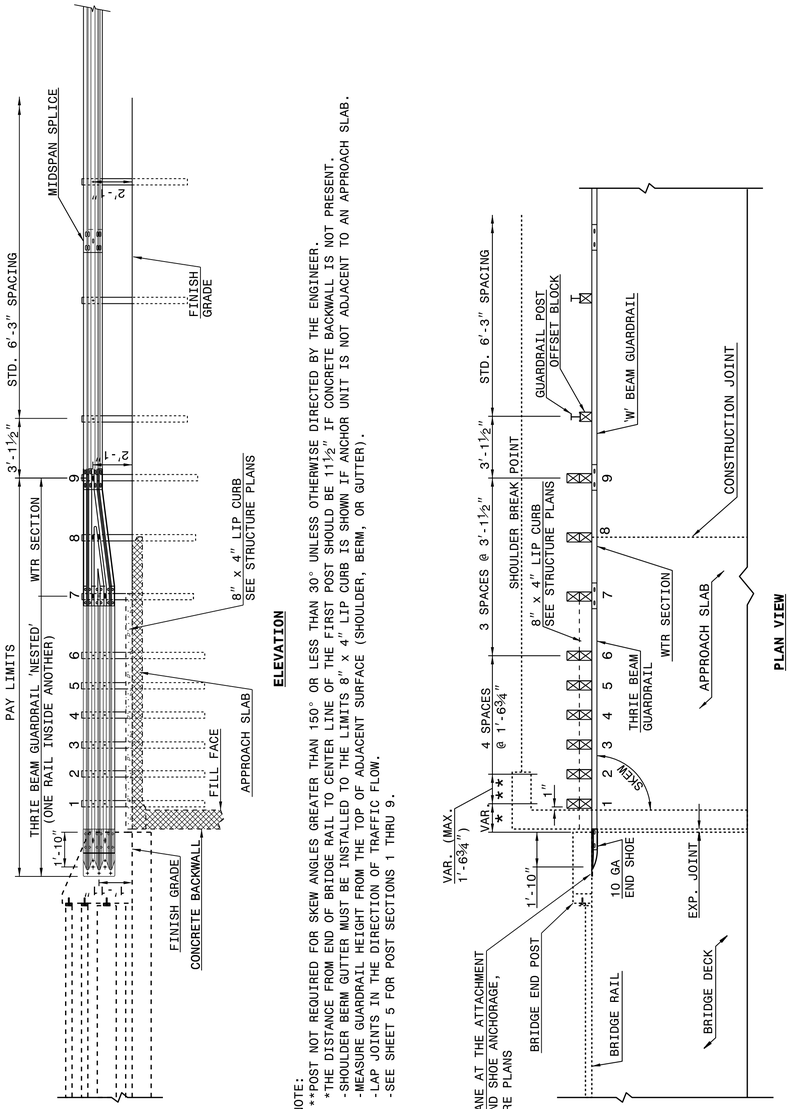
RALEIGH, N.C.

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

SHEET 1 OF 7
862D03



ELEVATION

PLAN VIEW

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

NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 5 FOR POST SECTIONS 1 THRU 9.

8/1/2017

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

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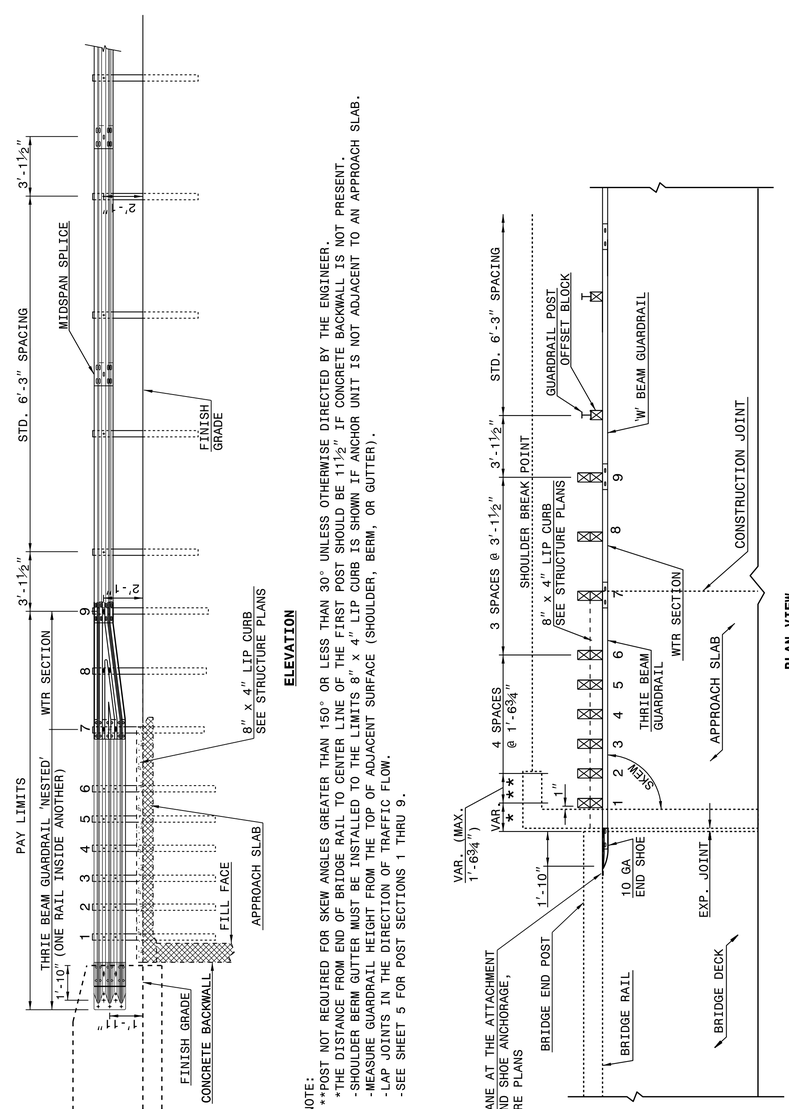
ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7
862D03



ELEVATION

PLAN VIEW

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

NOTE:
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-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 5 FOR POST SECTIONS 1 THRU 9.

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RALEIGH, N.C.

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

SHEET 1 OF 7
862D03

STATE OF
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RALEIGH, N.C.

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

SHEET 2 OF 7
862D03

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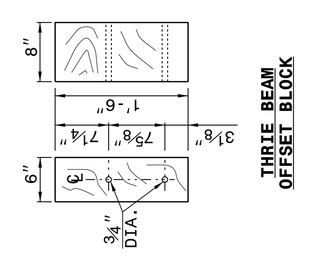
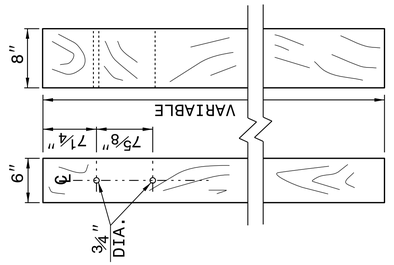
ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III

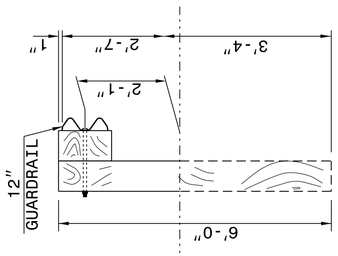
SHEET 3 OF 7
862D03



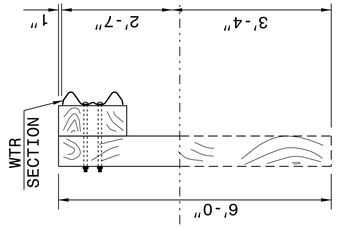
THRIE BEAM OFFSET BLOCK



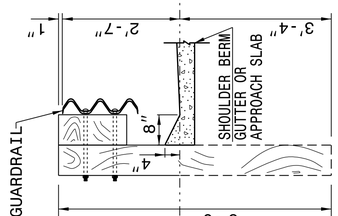
THRIE BEAM LINE POST



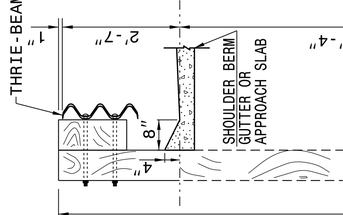
SECTION OF 'W' BEAM POST 9



SECTION OF WTR BEAM POST 8

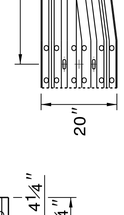


SECTION OF THRIE BEAM POST 7

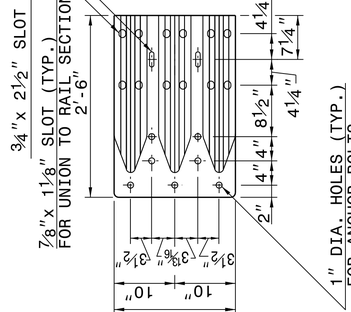


SECTION OF THRIE BEAM POSTS 1 THRU 6

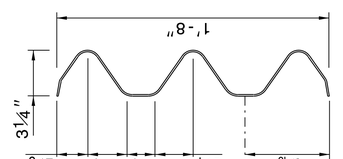
NOTE: THE MID POST AND OFFSET BLOCK OF THE WTR SECTION WILL REQUIRE SPECIAL BOLT HOLE DRILLING IN THE THRIE BEAM OFFSET BLOCK AND LINE POST.



WTR SECTION
ELEVATION VIEW



END SHOE



THRIE-BEAM SECTION

8/1/2017

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

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Joel S. Howerton
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FILE SPEC.:

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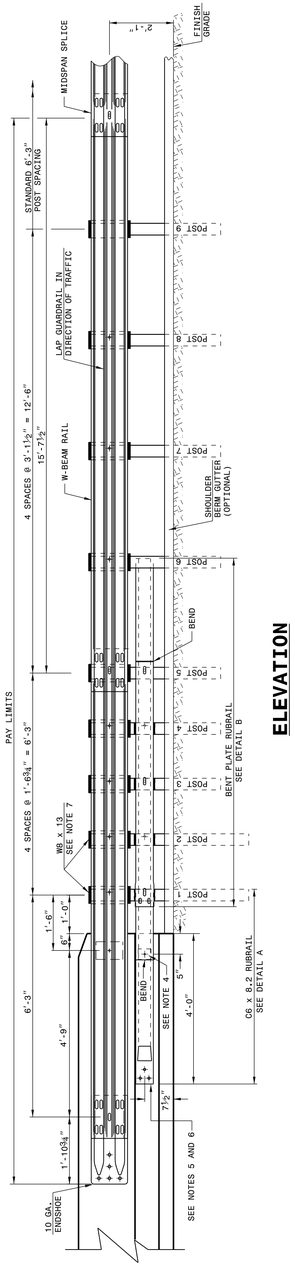
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

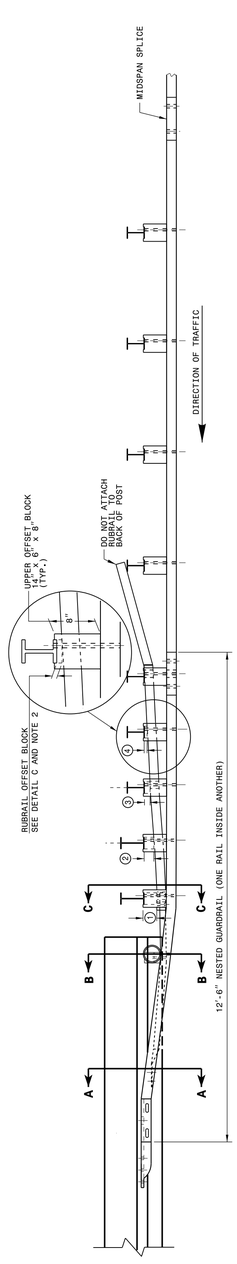
ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNIT
GUARDRAIL ANCHOR UNIT TYPE B-77
FOR F-SHAPE BARRIER

SHEET 4 OF 7
862D03



ELEVATION

GENERAL NOTES:
1) POSTS 1 THROUGH 5 REQUIRE AN ADDITIONAL HOLE TO ATTACH LOWER BLOCKOUTS AND/OR RUBRAIL; SEE CHART FOR BOLT LENGTHS. BLOCKOUTS AND RUBRAIL IS SECURED TO POST 5 WITH A ⅝" BUTTONHEAD BOLT.
2) RUBRAIL BLOCKOUTS CONSIST OF TWO 4" x 8" BLOCKOUTS AS DETAILED ON SHEETS 1 AND 3. RUBRAIL IS SECURED TO POST 5 WITH A ⅝" BUTTONHEAD BOLT. RUBRAIL IS FLARED TO BACK OF POST 6 AND NOT SECURED.
3) SECURE BLOCKS ONLY TO POSTS 2 AND 4. SECURE RUBRAIL AND BLOCKOUTS TO POSTS 1 AND 3. ATTACH TUBE TO GUARDRAIL ONLY WITH A ⅝" BUTTONHEAD BOLT.
4) SEE DETAIL FOR SLOTTED RUBRAIL BLOCKOUT PLACED ON POST 5.
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:
   (a) AT 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".
   (b) 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). A 4 BOLT INSERT ASSEMBLY IS ALLOWED ON PRECAST REINFORCED CONCRETE BARRIER (SEE STD. DWG. 857.01). INSTALL THE W-BEAM END SHOE BEHIND THE NESTED W-BEAM ELEMENTS.
   (c) AT NEW BRIDGE RAIL, ANCHOR RUBRAIL AS DETAILED ON THE STRUCTURE PLANS.
7) POSTS 1 AND 2 ARE W6 x 13, 7'-6" LONG. ALL OTHER POSTS IN THE ANCHOR UNIT ARE W6 x 8.5.



PLAN

GUARDRAIL ANCHOR UNIT TYPE B-77

STATE OF
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RALEIGH, N.C.

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

SHEET 4 OF 7
862D03

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jhowerton AT CSD-292595

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2C-16

STATE OF
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

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

SHEET 5 OF 7
862D03

STATE OF
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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT TYPE B-83

SHEET 6 OF 7
862D03

STATE OF
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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT TYPE B-83

SHEET 6 OF 7
862D03

8/1/2017

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

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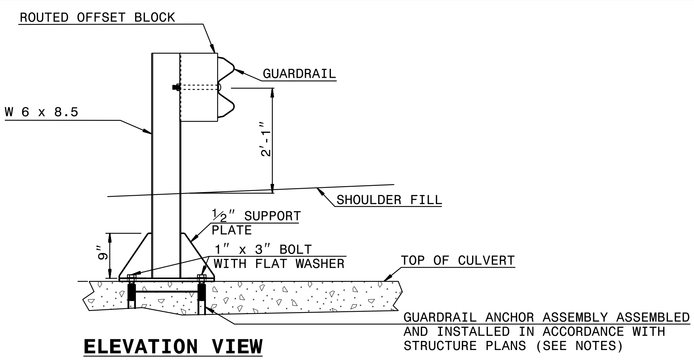
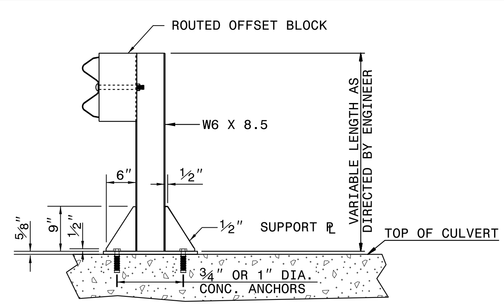
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
ANCHORAGE FOR GUARDRAIL POST ON BOX CULVERT

SHEET 7 OF 7
862D03



ELEVATION VIEW



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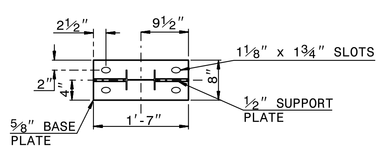
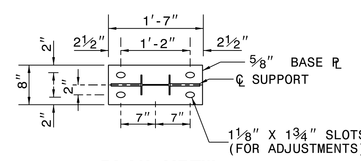


PLAN VIEW



PLAN VIEW

NOTES FOR:
GUARDRAIL POST ANCHORED TO STRUCTURE:
-USE FULL LENGTH ¼" BUTT WELDS AT ALL LOCATIONS OF CONTACT BETWEEN THE BASE PLATE, SUPPORT PLATES AND STEEL POST.
-USE POST AND POST BASE PLATES CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-36 AND GALVANIZED AFTER FABRICATION TO CONFORM TO A.S.T.M. A-123.

NEW STRUCTURES:
-ATTACH POST TO INSERT ASSEMBLY UNITS (USING ANCHOR BOLTS SUPPLIED WITH INSERTS) WHICH HAVE BEEN CAST INTO THE STRUCTURE DURING CONSTRUCTION.

EXISTING STRUCTURES:
-USE CONCRETE ANCHORS CONSISTING OF A STUD BOLT WITH NUT AND WASHER. USE STUDS THREADED ON ONE END AND HAVING AN EXPANDED WEDGE ASSEMBLY POSITIONED AROUND A TAPERED AREA AT THE OTHER END. USE ANCHORS WHICH PROVIDE A MINIMUM SAFE HOLDING POWER OF 2875 LBS. FOR A ¾" OR 1" DIAMETER BOLT. CALCULATE HOLDING POWER BASED ON ¼ THE ACTUAL HOLDING POWER OF THE ANCHOR IN 3500 PSI CONCRETE AS DETERMINED BY AN APPROVED COMMERCIAL TESTING LABORATORY.

-USE ANCHORS GALVANIZED IN ACCORDANCE WITH A.S.T.M. A-153. SIZE HOLES FOR THE CONCRETE ANCHORS IN ACCORDANCE WITH THE ANCHOR MANUFACTURER'S RECOMMENDATIONS. DRILL HOLES WITH A CARBIDE OR DIAMOND TIPPED MASONRY BIT POWERED BY A ROTARY OR ROTARY IMPACT DRILL. NO OTHER IMPACT TOOLS WILL BE PERMITTED. DRILL HOLES VERTICALLY. FURNISH DOCUMENTATION OF HOLE SIZE RECOMMENDED FOR THE SPECIFIED ANCHOR TO THE ENGINEER BEFORE DRILLING HOLES. THOROUGHLY CLEAN HOLES FOR ANCHORS OF ALL CONCRETE CHIPS, DUST, GREASE, OIL, ETC. BEFORE ANCHORS ARE INSTALLED. REPAIR ALL DAMAGE CAUSED BY THIS WORK TO THE SATISFACTION OF THE ENGINEER.

ANCHORAGE FOR GUARDRAIL POST ON BOX CULVERT

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

ROADWAY DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
ANCHORAGE FOR GUARDRAIL POST ON BOX CULVERT

SHEET 7 OF 7
862D03

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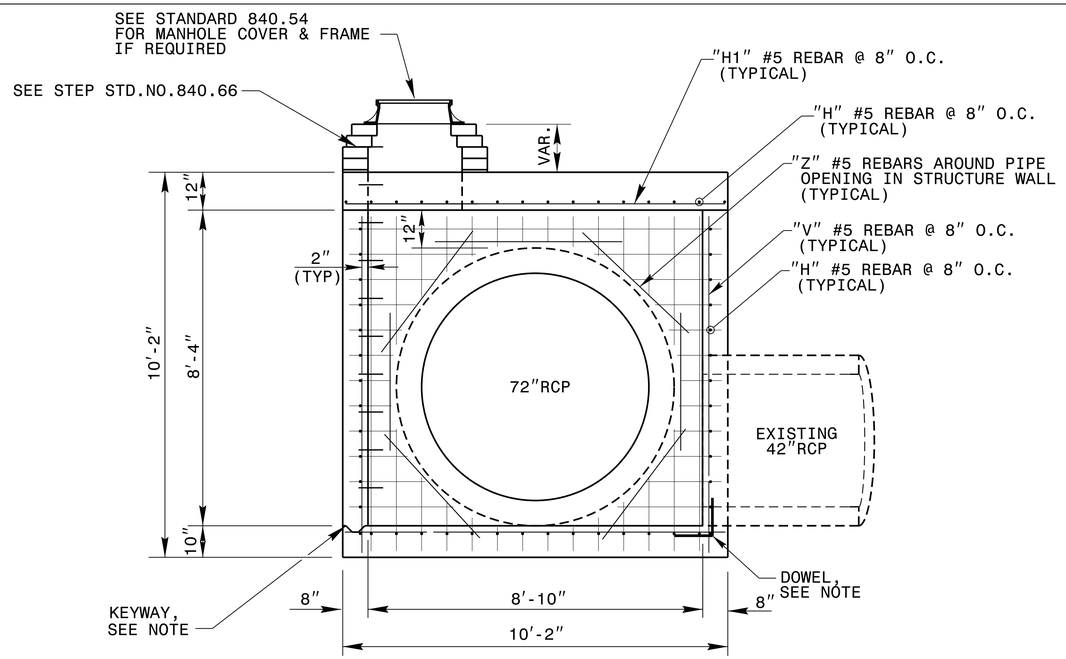
FILE SPEC.:

PROJECT REFERENCE NO. U-2579C
SHEET NO. 20-17

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2C-18



SECTION A-A

GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

PROVIDE ALL JUNCTION BOXES OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.

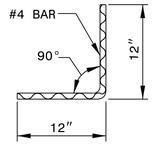
OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

INSTALL MANHOLE IN POSITION AS DIRECTED BY THE ENGINEER. CUT AND BEND ALL REBAR CROSSING THIS OPENING TO ALLOW 2" MINIMUM CONCRETE COVERAGE.

CHAMFER ALL EXPOSED CORNERS 1".

2" MINIMUM CONCRETE COVERAGE ON ALL REBAR.

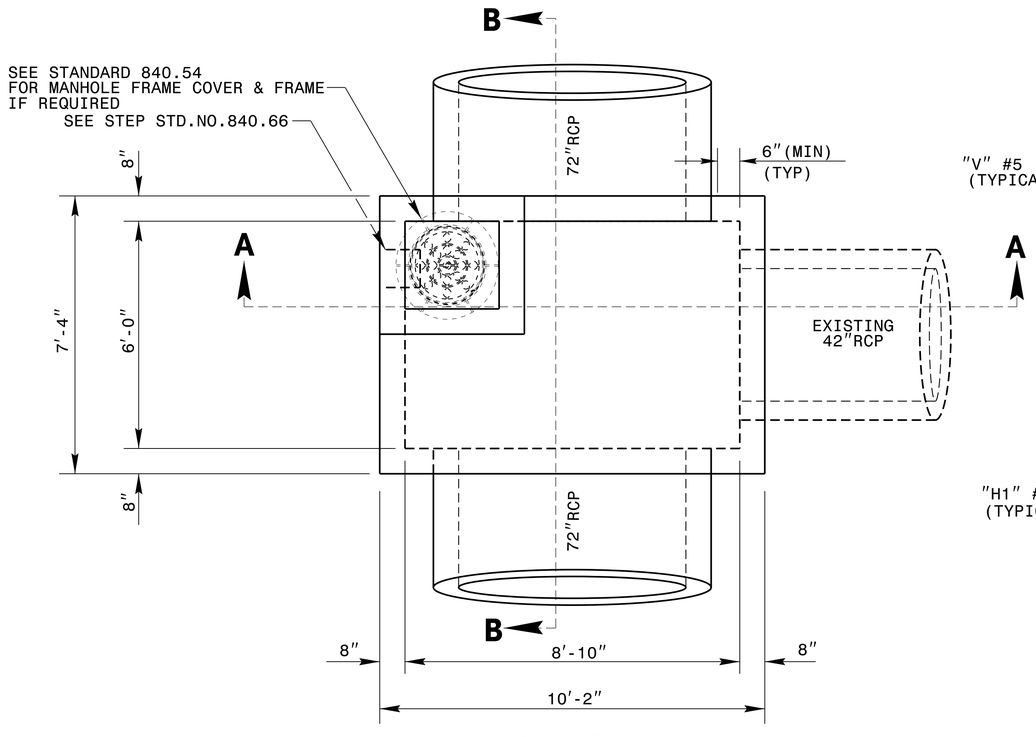


DOWEL

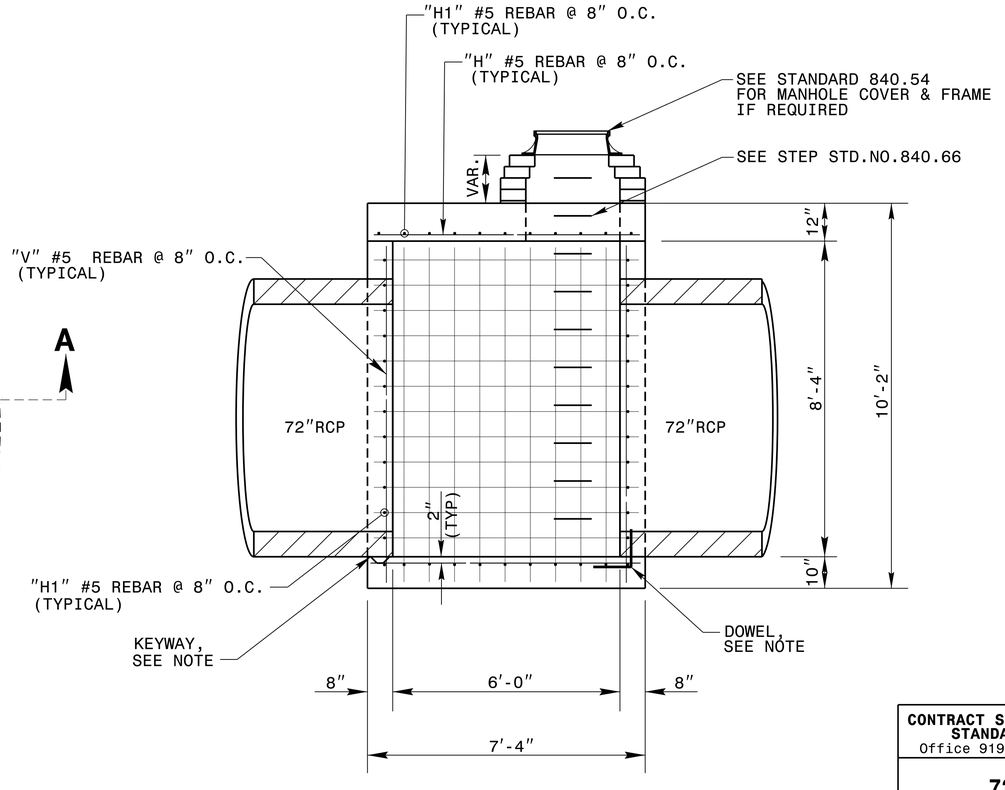
BILL OF MATERIALS

BAR	NO.	SIZE	LENGTH	WEIGHT
H	42	#5	8'-10"	387
H1	48	#5	8'-6"	426
V	54	#5	7'-6"	423
Z	14	#5	5'-0"	74
TOTAL REINF. STEEL (LBS.)				1310
TOTAL CONC. (CU. YDS.)				* 11.8

* NO DEDUCTION HAS BEEN MADE FOR PIPES
* 0.30 CU. YD. PER FOOT OF RISER HEIGHT
* 2.00 CU. YD. DEDUCTION FOR 2-72" RC PIPE
* 0.40 CU. YD. DEDUCTION FOR 1-42" RC PIPE



PLAN VIEW



SECTION B-B

8/1/2017

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

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STANDARDS AND SPECIAL DESIGN
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72"JUNCTION BOX WITH SLAB LID

ORIGINAL BY:		DATE:	
MODIFIED BY:	nbritt	DATE:	04/17/09
CHECKED BY:		DATE:	
FILE SPEC.:	detail/nbritt/english/urban/72 jb.dgn		

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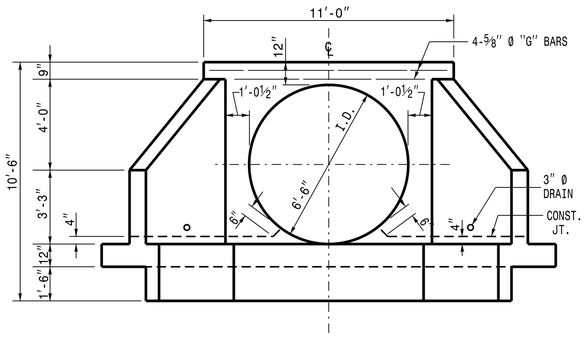
jhowerton AT CSD-292895

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2C-19



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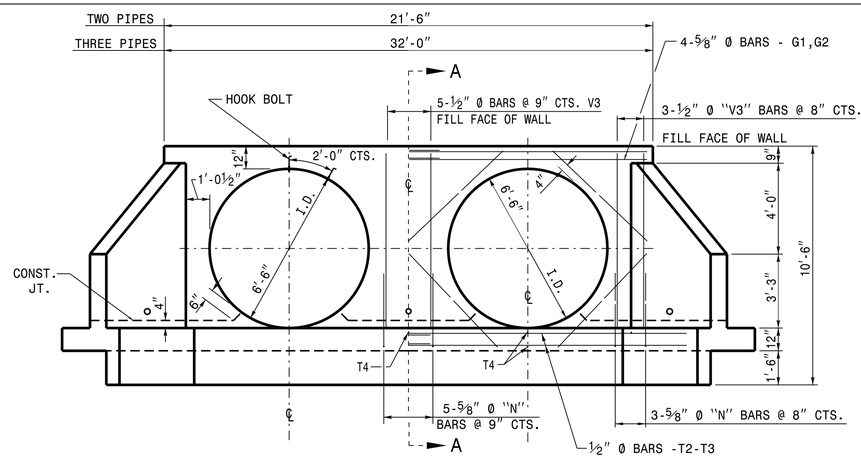

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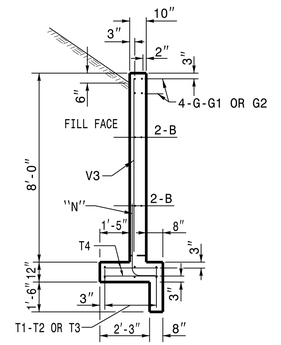


SECTION A-A FOR ALL ENDWALLS

NOTES:

USE CLASS 'A' CONCRETE.

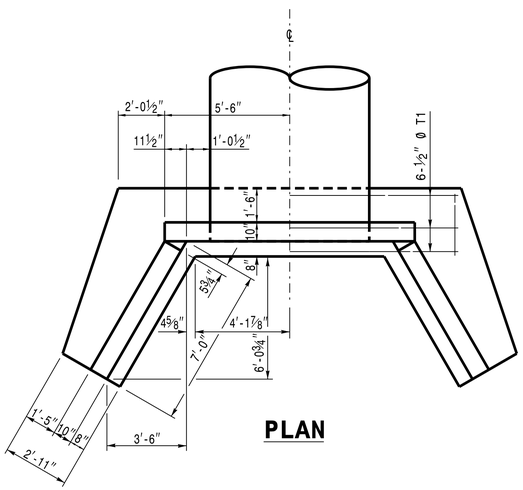
USE ASTM A615-GRADE 60 REINFORCING STEEL.

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

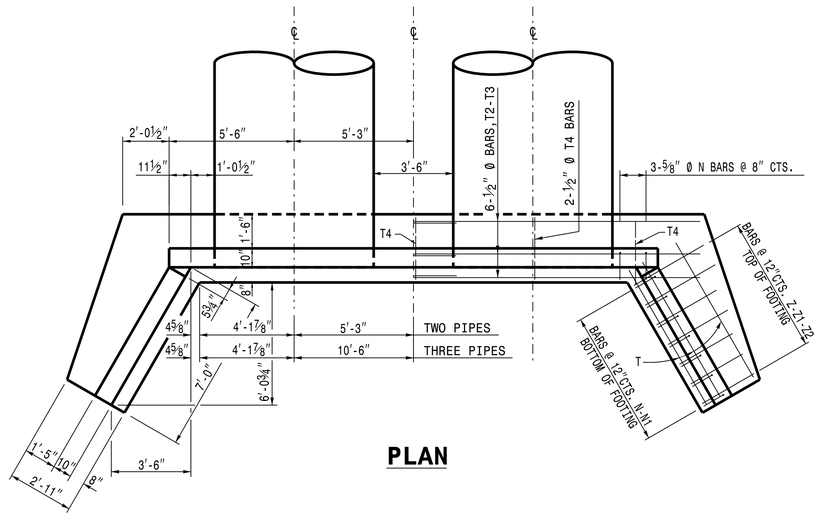
THE FOOTING, CURTAIN WALL AND 4" OF WALL ARE TO BE POURED IN ONE OPERATION ALLOWING NO TIME FOR INITIAL SET TO TAKE PLACE BETWEEN THEM. POUR THE REMAINING WALL IN ONE OPERATION.

CHAMFER ALL EXPOSED CORNERS 1".

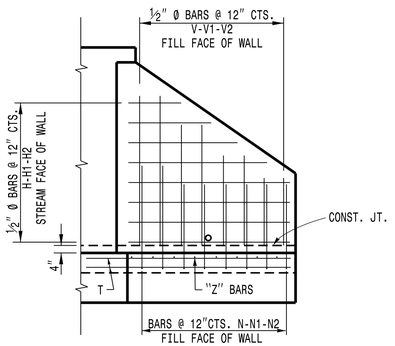
PLACE 3" DIAMETER DRAINS IN WALL AS SHOWN 6" ABOVE NORMAL FLOW LINE.



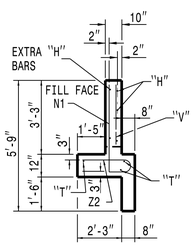
PLAN



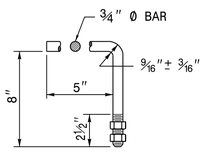
PLAN



ELEVATION OF WING SHOWING REINFORCEMENT

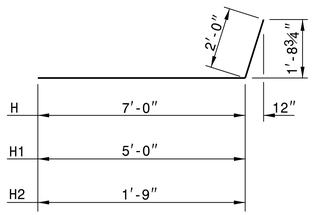


END OF WING

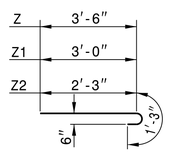


HOOK BOLT

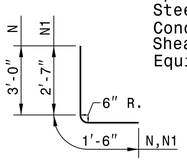
HOOK BOLTS (CONSTRUCT ANCHORS AT 2'-0" CTS. ALONG THE CIRCUMFERENCE OF THE 6'-6" CSP. EMBED THE HOOK BOLTS IN THE CONCRETE ENDWALL 8" IN DEPTH. THE GALVANIZED ¾" DIA. HOOK BOLTS MUST MEET ASTM A-307 OR ASTM A-836. BOTH BOLTS AND NUTS MUST BE IN ACCORDANCE WITH ASTM A-153 FOR GALVANIZING.



BARS H-H1-H2



BARS Z-Z1-Z2



BARS N-N1

BILL OF MATERIAL FOR ONE ENDWALL

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

DESIGN DATA

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

8/1/2017

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

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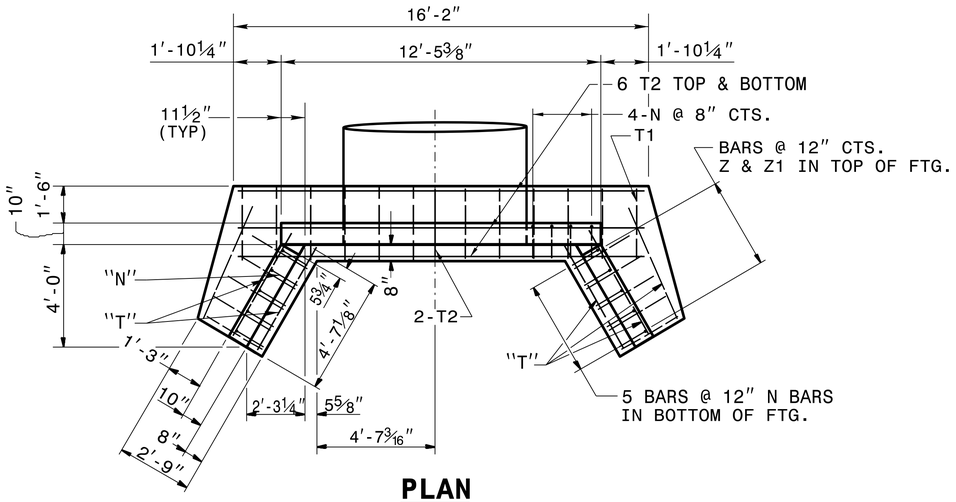
CONTRACT STANDARDS & DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-707-6950 FAX 919-250-4119

DETAIL OF REINFORCED CONCRETE ENDWALL FOR 78" DIAMETER PIPE - 90° SKEW

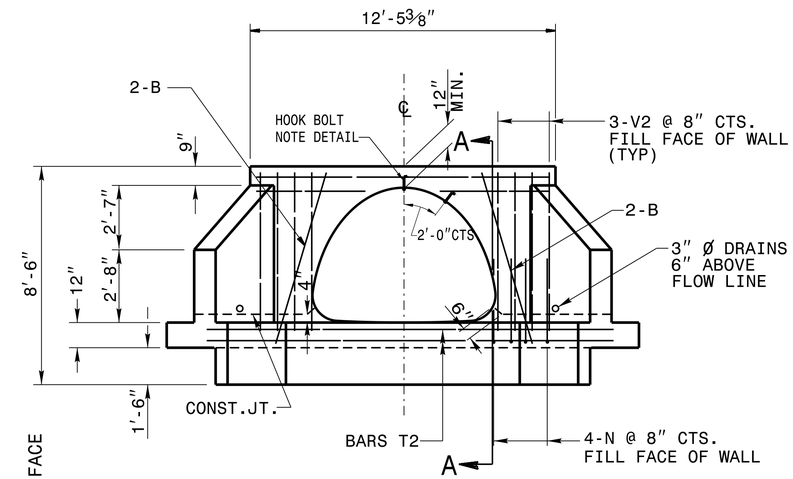
ORIGINAL BY: R.S.WICKER DATE: 6-46
MODIFIED BY: R.E.D.&T.S.S. DATE: 6-96 & 5-00
CHECKED BY: DATE:
FILE SPEC.: w:details/stand/endwpip84sk90.dgn

14-JUN-2017 14:54
S:\Contracts\Special Details\english\hydro\78 endwall 90sk.dgn
jhowerton
AT CSD-292595

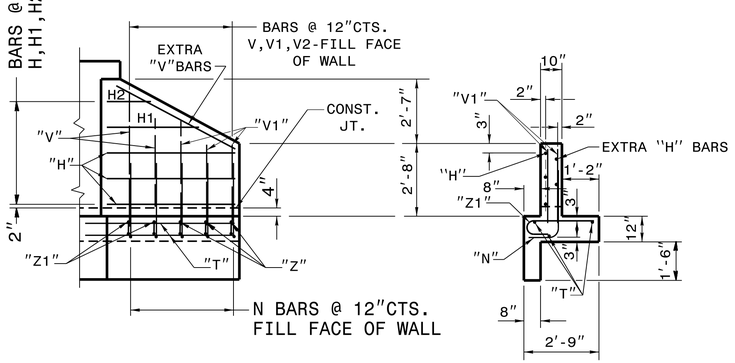
PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2C-20



PLAN

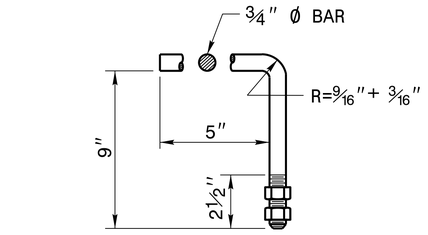


ELEVATION



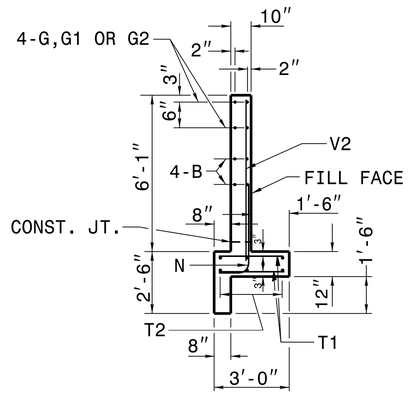
WING ELEVATION

END OF WING

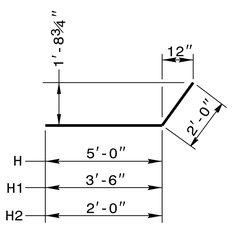


HOOK BOLT

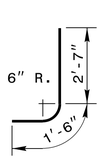
NOTE: CONSTRUCT HOOK BOLTS (ANCHORS) AT 2'-0" CTS. ALONG THE CIRCUMFERENCE OF THE 95"X 67" CMP. EMBED THE HOOK BOLTS 6" IN DEPTH. THE GALVANIZED ¾" DIA. HOOK BOLTS MUST MEET ASTM A-307 OR ASTM A-836. BOTH BOLTS AND NUTS MUST BE IN ACCORDANCE WITH ASTM A-153 FOR GALVANIZING.



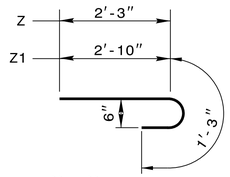
SECTION - AA



"H" BARS



"N" BARS



"Z" BARS

"H", "N", & "Z" BAR DIMENSIONS ARE OUT TO OUT.

NOTES:

ALL CONCRETE TO BE CLASS "A".

ALL REINFORCING STEEL SHALL BE ASTMA615-GRADE 60.

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

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

ALL EXPOSED CORNERS ARE TO BE CHAMFERED 1".

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

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

THE EXTRA BARS ARE PROVIDED FOR HOLDING REINFORCING STEEL IN CORRECT POSITION IN WING.

BILL OF MATERIAL FOR ENDWALL

REINF. STEEL			1 PIPES	
BAR	SIZE	LENGTH	NO.	WEIGHT
B	#4	7'-0"	4	18
H	#4	7'-0"	10	47
H1	#4	5'-6"	2	8
H2	#4	4'-0"	4	11
N	#4	4'-1"	18	50
T	#4	5'-0"	8	27
T1	#4	2'-9"	12	23
T2	#4	15'-10"	6	64
V	#4	5'-3"	8	29
V1	#4	4'-1"	8	22
V2	#4	6'-2"	6	33
Z	#4	3'-6"	5	12
Z1	#4	4'-1"	5	14
REINF. STEEL LBS.				358
TOTAL CON./R.C. CU. YDS.				6.8
95"X 67" CSAP DEDUCTION				0.9
CON./R.C. CU. YDS.				5.9

DESIGN DATA

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

8/1/2017

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

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

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

DETAIL OF REINFORCED CONCRETE ENDWALL FOR 95" X 67"CSAP-90°

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: rnbritt DATE: 3-27-09
CHECKED BY: _____ DATE: _____
FILE SPEC.: details/nbritt/english/hydro/r402_41m x 1_7m csap sk90.dgn

14-JUN-2017 14:48
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jhowerton AT CSD-292595

14-JUN-2017 14:58
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jhowerton AT CSD-292595

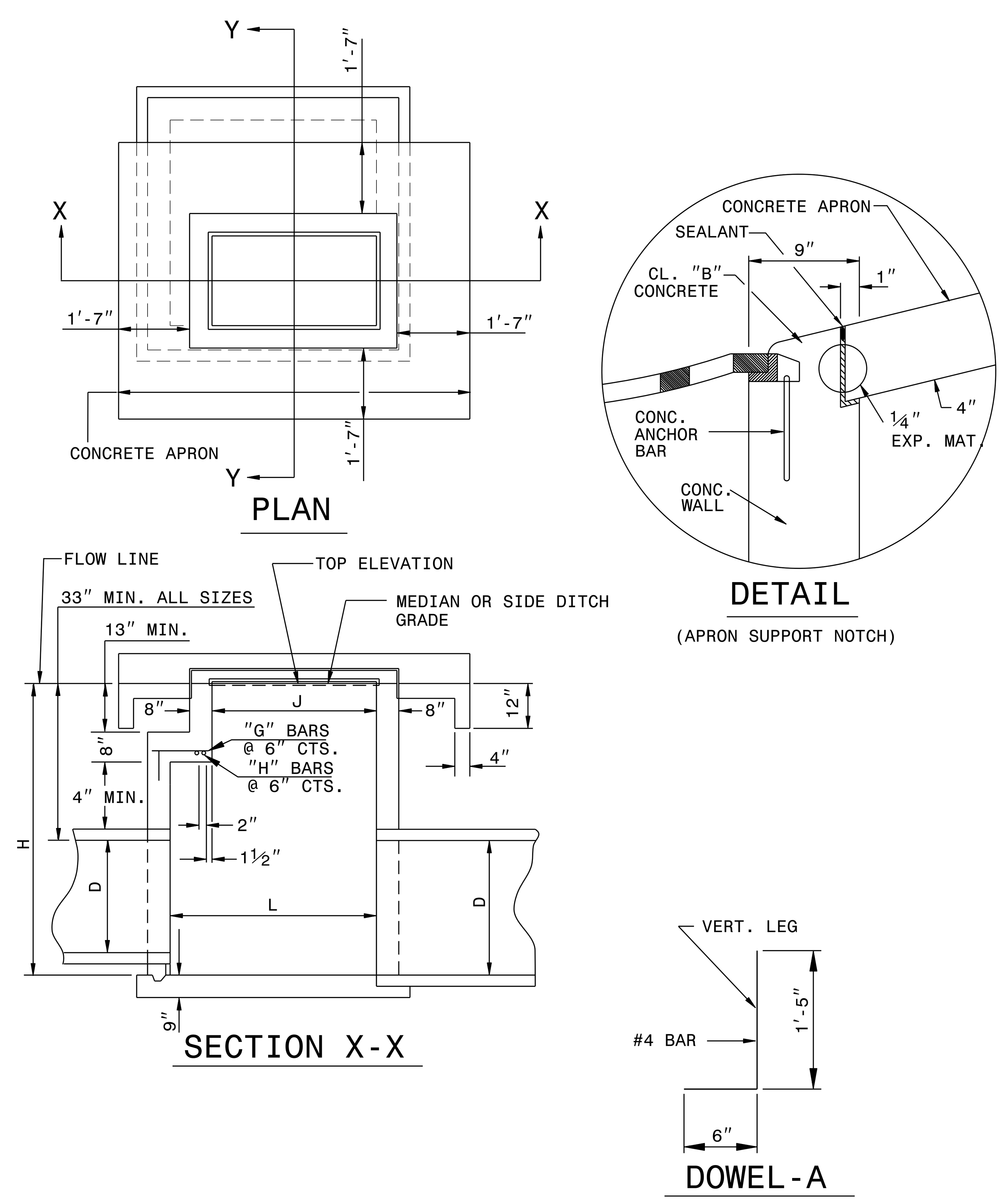
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR

CONCRETE MEDIAN DROP INLET TYPE 'A' EXTRA DEPTH OVER 12' TO 25'

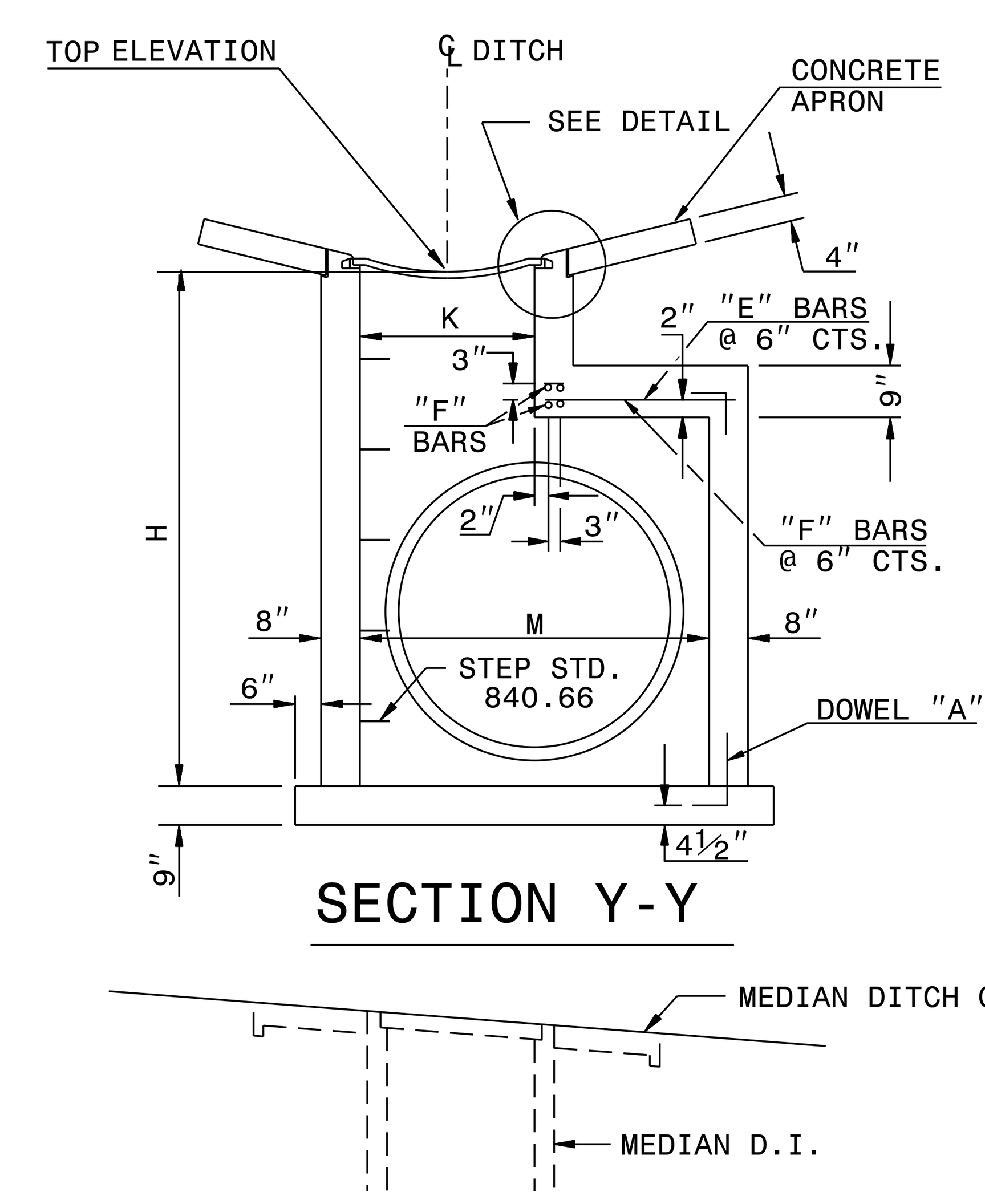
12" THRU 72" PIPE

SHEET 1 OF 2 — 840D17



GENERAL NOTES:

- USE CLASS "B" CONCRETE THROUGHOUT.
- PROVIDE DROP INLETS WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.
- OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.
- USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
- IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.
- WHEN PAYMENT FOR THE DROP INLET IS MADE ON A PER EACH BASIS, THE CONCRETE APRON WILL BE CONSIDERED PART OF THE DROP INLET.
- CONSTRUCT WITH PIPE CROWNS MATCHING.
- USE STANDARD FRAMES AND GRATES 840.22 (SHOWN), 840.24(SHOWN), 840.20, 840.29, AND 840.33.
- SEE STANDARD DRAWING 840.25 FOR ATTACHMENT OF FRAMES AND GRATES NOT SHOWN.
- CHAMFER ALL EXPOSED CORNERS 1".
- DRAWING NOT TO SCALE.
- MAX. DEPTH OF THIS STRUCTURE FROM TOP OF BOTTOM SLAB TO TOP ELEVATION IS 25 FEET.



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

ENGLISH DETAIL DRAWING FOR
CONCRETE MEDIAN DROP INLET TYPE 'A' EXTRA DEPTH OVER 12' TO 25'
12" THRU 72" PIPE
SHEET 1 OF 2 — 840D17

STATE OF NORTH CAROLINA
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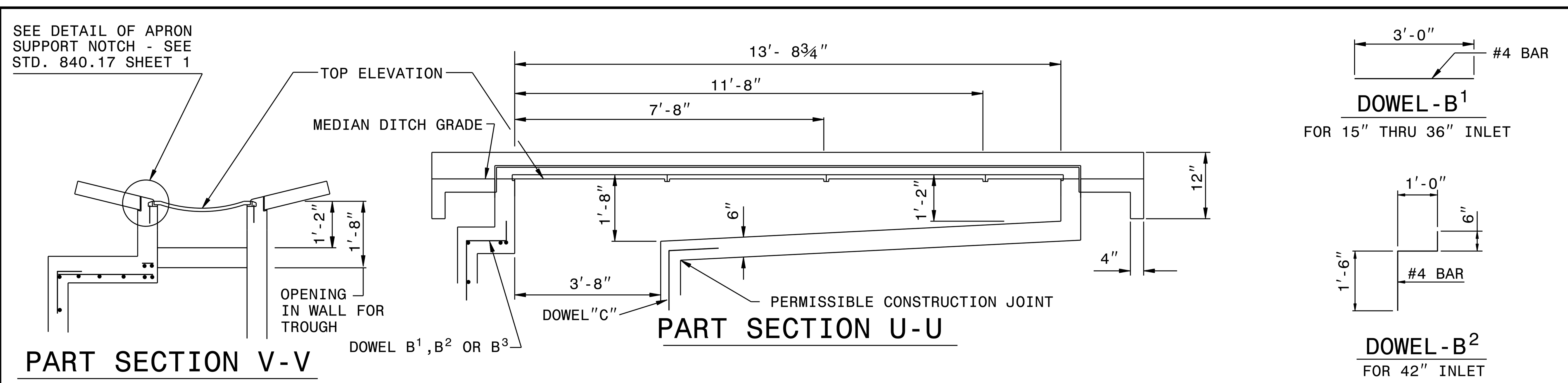
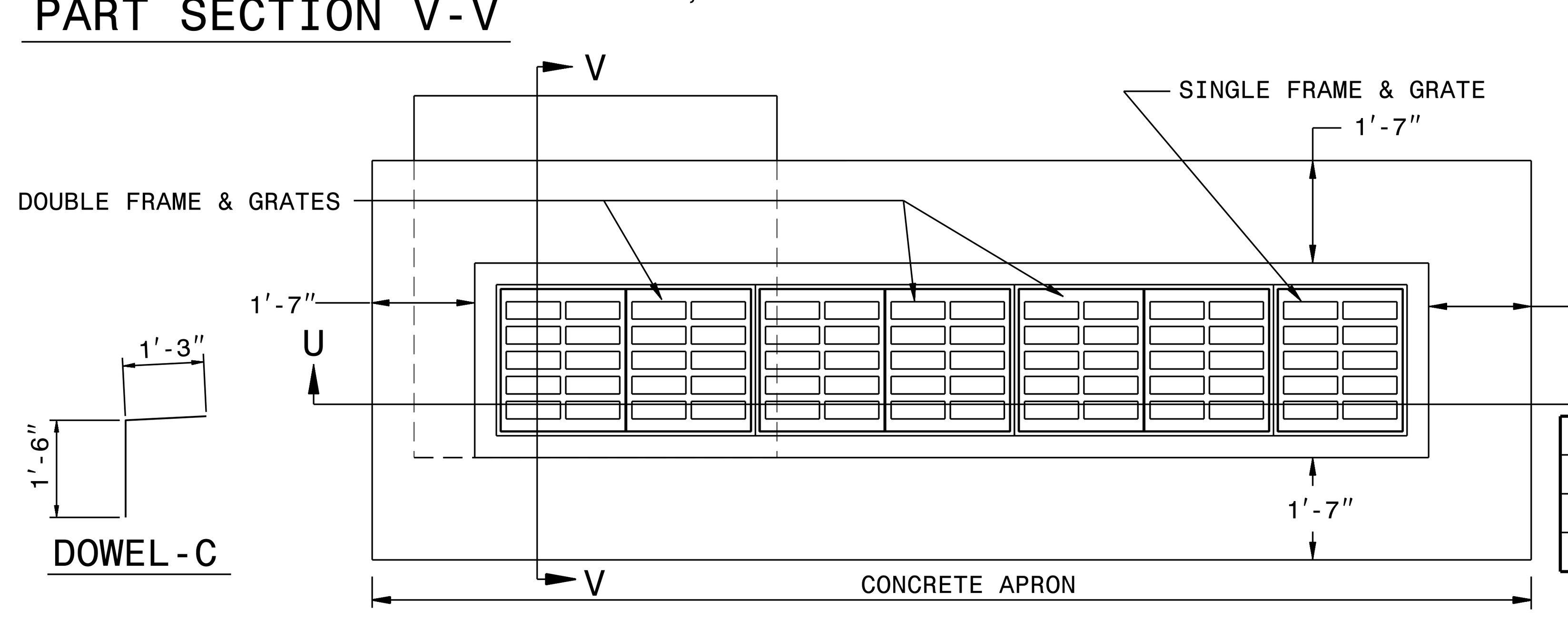
ENGLISH DETAIL DRAWING FOR

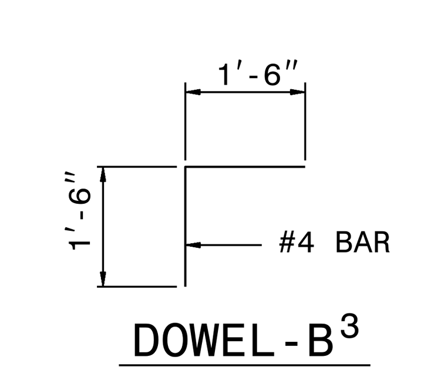
CONCRETE MEDIAN DROP INLET TYPE 'A' EXTRA DEPTH OVER 12' TO 25'

12" THRU 72" PIPE

SHEET 2 OF 2 — 840D17







QUANTITY TO BE ADDED FOR EACH 2' INCREMENT INLET OPENING						
ADDITIONAL INLETS	2'-0"	4'-0"	6'-0"	8'-0"	10'-0"	12'-0"
CONCRETE CU. YDS.	0.191	0.417	0.665	0.897	1.145	1.380
CONCRETE APRON CU. YDS.	0.074	0.148	0.222	0.296	0.370	0.444

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

DIMENSIONS OF BOX AND PIPE						REINFORCING STEEL - NO. 4 BARS									CU YDS CONC. IN BOX					DEDUCTIONS FOR ONE PIPE	
PIPE	SPAN	WIDTH	SPAN	WIDTH	HEIGHT	BARS E		BARS F		BARS G		BARS H		TOTAL	BOTTOM SLAB	H TOTAL	H PER FT HT	APRON	TOTAL		
D	J	K	L	M	H	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	LBS.						C.S.	R.C.
12"	3'-8"	2'-0"	3'-8"	2'-0"	3'-9"	—	—	—	—	—	—	—	—	—	0.362	0.926	0.247	0.395	1.683	0.015	0.024
15"	3'-8"	2'-0"	3'-8"	2'-0"	4'-0"	—	—	—	—	—	—	—	—	—	0.362	0.988	0.247	0.395	1.745	0.023	0.036
18"				2'-0"	4'-3"	—	—	—	—	—	—	—	—	—	0.362	1.050	0.247		1.807	0.033	0.049
24"				2'-10"	4'-9"	8	1'-5"	6	4'-9"	—	—	—	—	27	0.444	1.362	0.278		2.201	0.059	0.085
30"			3'-8"	3'-5"	5'-3"	8	2'-0"	7	4'-9"	—	—	—	—	33	0.502	1.644	0.288		2.541	0.092	0.127
36"			4'-0"	4'-0"	5'-9"	8	2'-5"	8	4'-11"	4	0'-9"	2	4'-11"	47	0.560	1.931	0.321		2.920	0.132	0.178
42"			4'-10"	4'-10"	6'-3"	10	3'-1"	9	5'-7"		1'-5"	3	5'-7"	67	0.704	2.500	0.370		3.677	0.180	0.243
48"			5'-4"	5'-4"	6'-9"	11	3'-7"	10	6'-1"		1'-11"	4	6'-1"	87	0.823	3.013	0.407		4.315	0.235	0.317
54"			6'-0"	6'-0"	7'-3"	12	4'-1"	11	6'-7"		2'-5"	5	6'-7"	107	0.951	3.589	0.444		5.072	0.297	0.401
60"			6'-6"	6'-6"	7'-9"	13	4'-9"	12	7'-3"		3'-1"	6	7'-3"	135	1.311	4.539	0.494		6.170	0.367	0.495
66"			7'-2"	7'-2"	8'-3"	14	5'-4"	14	7'-10"		3'-7"	7	7'-10"	168	1.136	5.061	0.537		6.901	0.444	0.599
72"	3'-8"	2'-0"	7'-8"	7'-8"	8'-9"	15	5'-11"	15	8'-5"	4	4'-3"	8	8'-5"	199	1.500	5.860	0.580	0.395	7.868	0.528	0.713

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

ENGLISH DETAIL DRAWING FOR
CONCRETE MEDIAN DROP INLET TYPE 'A' EXTRA DEPTH OVER 12' TO 25'
12" THRU 72" PIPE
SHEET 2 OF 2 — 840D17

8/1/2017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 Joel S. Howerton

DocuSigned by: Joel S. Howerton

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

SEE PLATE FOR TITLE

ORIGINAL BY: 2002 STD.840.17 DATE:
MODIFIED BY: K.A. KEMPF DATE: 07-06-09
CHECKED BY: DATE:
FILE SPEC.: /stand/840d17 Extra Depth 2GI.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2C-22

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

ENGLISH DETAIL DRAWING FOR

GUIDE FOR PAVING SHOULDERS UNDER BRIDGES

METHOD III

SHEET 1 OF 1

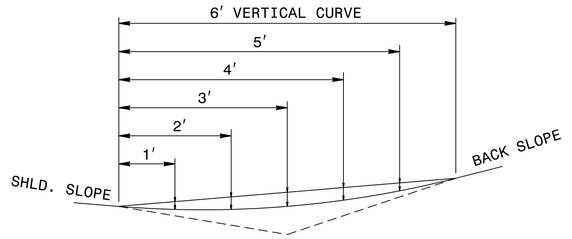
610D03

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′

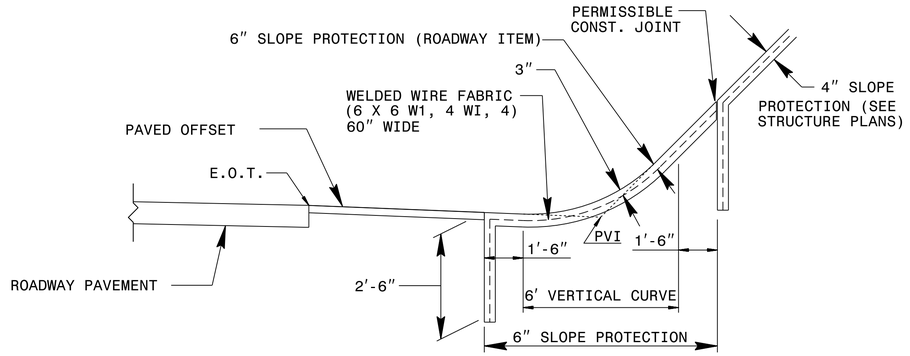
HORZ. DIM.	2:1 BACK SLOPE									
	SHOULDER SLOPE									
	.04	.03	.02	.01	.00	-.01	-.02	-.03	-.04	-.05
1′	0.19′	0.20′	0.20′	0.20′	0.21′	0.21′	0.22′	0.22′	0.23′	0.23′
2′	0.31′	0.31′	0.32′	0.33′	0.33′	0.34′	0.35′	0.35′	0.36′	0.37′
3′	0.35′	0.35′	0.36′	0.37′	0.38′	0.38′	0.39′	0.40′	0.41′	0.41′
4′	0.31′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

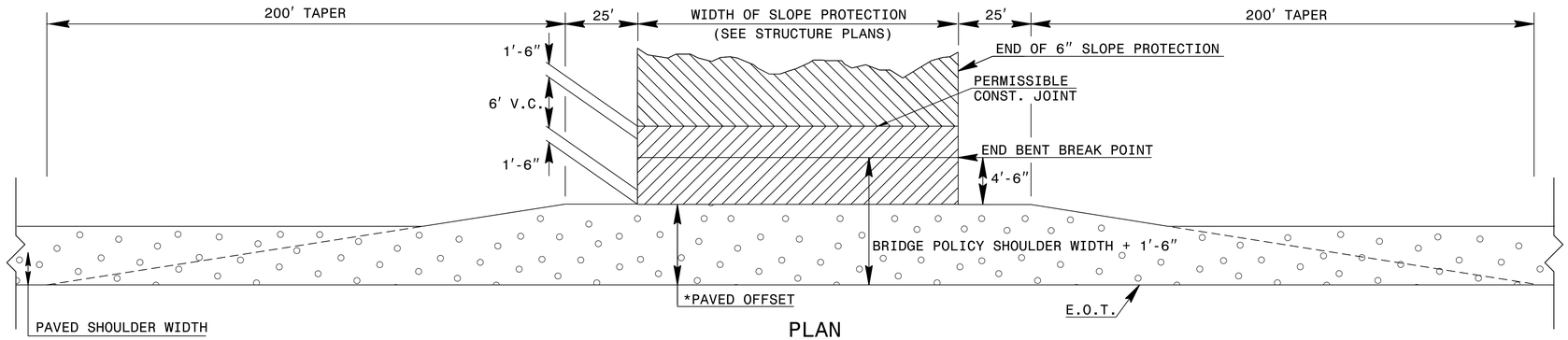
(FOR 6′ V.C. AT BRIDGES)



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

ENGLISH DETAIL DRAWING FOR

GUIDE FOR PAVING SHOULDERS UNDER BRIDGES

METHOD III

SHEET 1 OF 1

610D03

8/1/2017

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

SEE TITLE BLOCK

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

14-JUN-2017 15:01
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jhowerton
AT CSD-2925965

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2D-1
R/W SHEET NO.	
HYDRAULICS ENGINEER	

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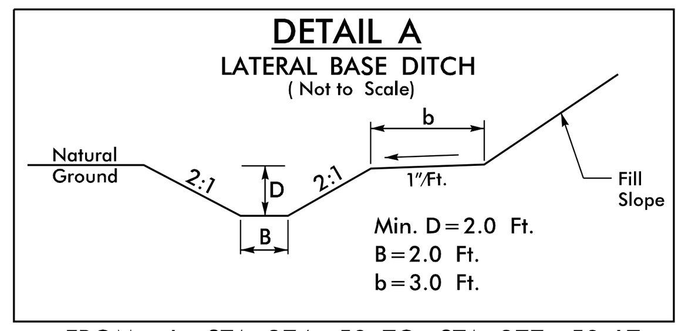
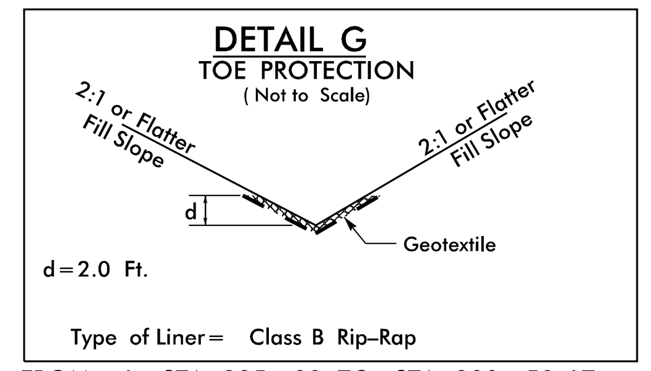
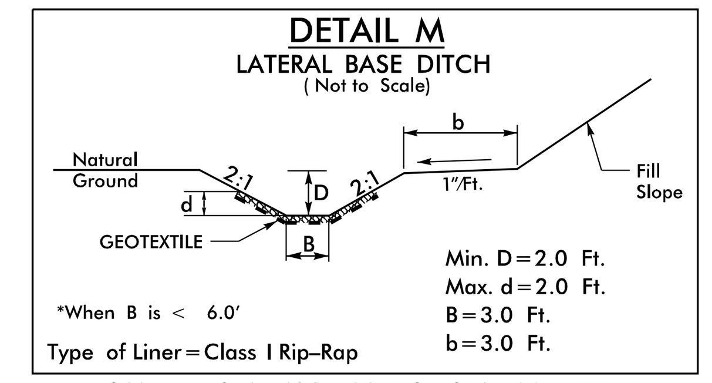
SUNGATE DESIGN GROUP, P.A.

DETAIL A


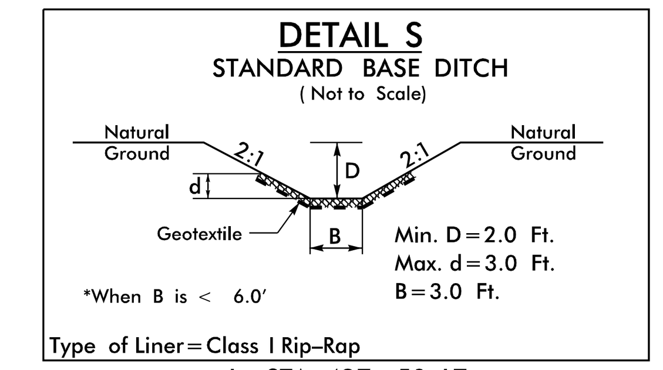
FROM -L- STA 374+50 TO STA 377+50 LT

DETAIL G


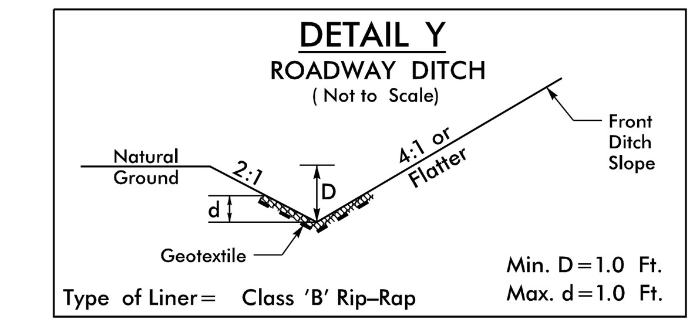
FROM -L- STA 395+00 TO STA 399+50 LT
FROM -L- STA 395+00 TO STA 399+50 RT

DETAIL M


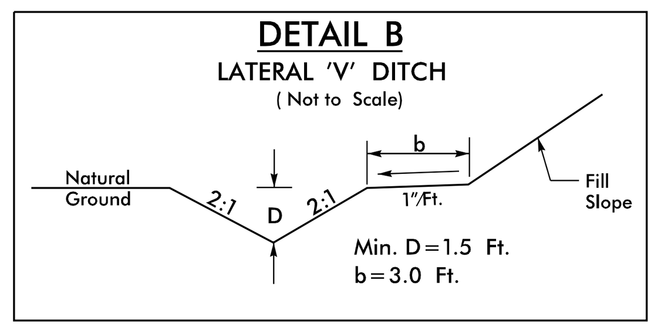
FROM -L- STA 438+00 TO STA 441+77 LT
FROM -Y1RPD- STA 24+50 TO STA 26+40 RT

DETAIL S


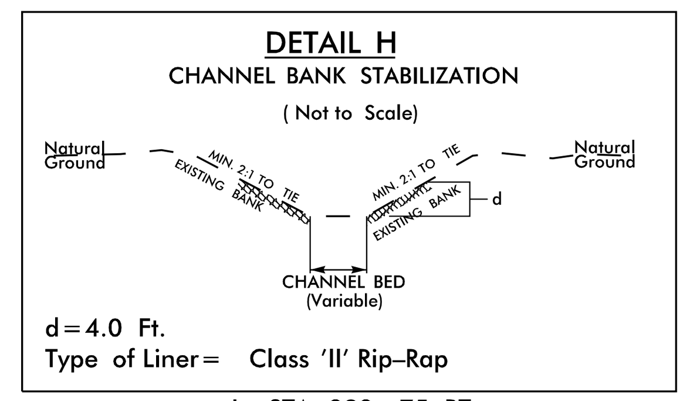
-L- STA 427+50 LT
FROM -L- STA 473+00 TO STA 473+90 RT

DETAIL Y


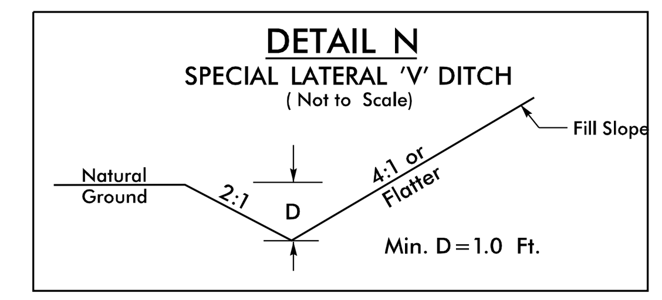
FROM -SRSA- STA 19+50 TO STA 21+50 RT
FROM -SRSA- STA 19+50 TO STA 21+50 LT
FROM -SRSA- STA 24+50 TO STA 29+00 RT
FROM -SRSA- STA 24+50 TO STA 29+00 LT

DETAIL B


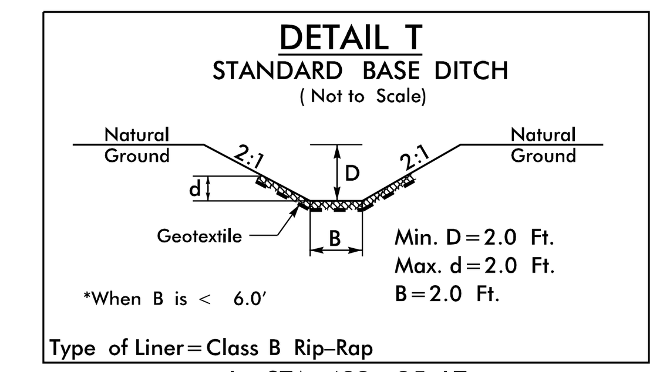
FROM -L- STA 373+00 TO STA 374+50 LT
FROM -Y1DET- STA 24+00 TO STA 29+00 LT

DETAIL H


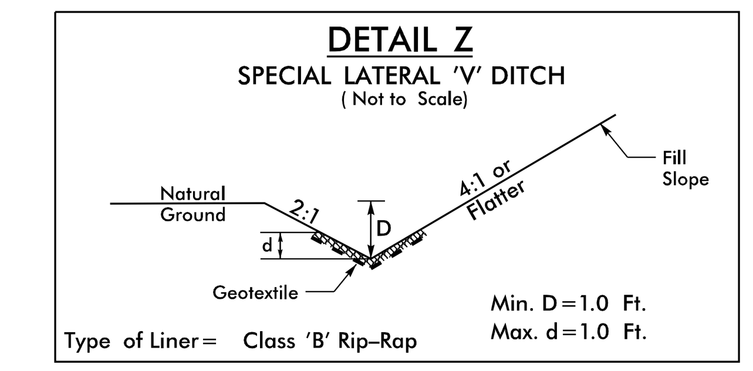
-L- STA 383+75 RT
-L- STA 386+78 LT
-L- STA 388+85 RT
-L- STA 414+19 RT
-Y1RPB- STA 21+75 LT
-SRSA- STA 22+65 RT

DETAIL N


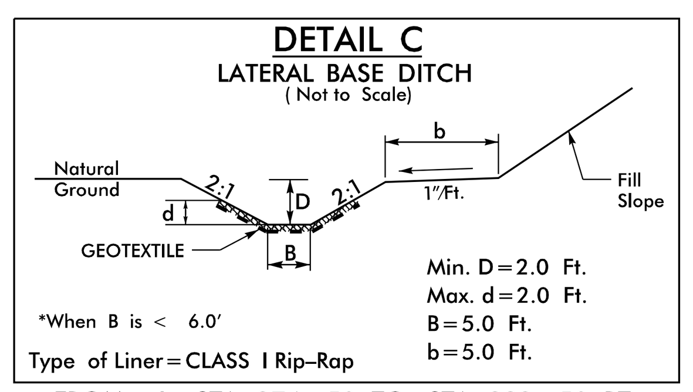
FROM -Y1- STA 39+50 TO STA 42+03 RT
FROM -Y1- STA 43+00 TO STA 46+50 RT
FROM -Y1DET- STA 29+00 TO STA 30+50 LT
FROM -Y2- STA 22+50 TO STA 26+00 LT
FROM -Y2DET- STA 17+50 TO STA 19+50 LT
FROM -Y3- STA 13+30 TO STA 16+00 LT
FROM -Y3- STA 13+25 TO STA 17+00 RT
FROM -Y3- STA 19+60 TO STA 21+40 RT
FROM -Y3- STA 25+30 TO STA 26+50 LT
FROM -Y4- STA 10+10 TO STA 11+20 RT

DETAIL T


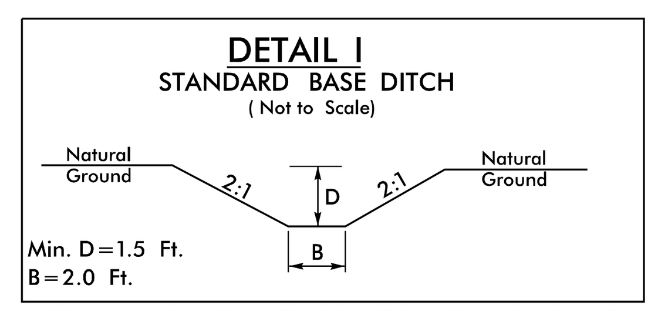
-L- STA 432+25 LT
FROM -Y1- STA 41+00 TO STA 43+50 LT
-Y1RPD- STA 28+30 RT

DETAIL Z


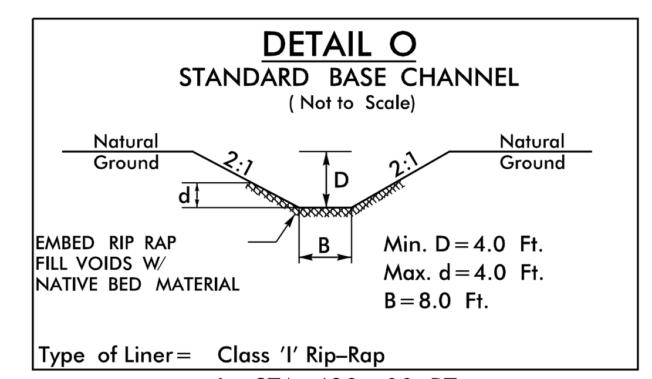
FROM -SRSA- STA 21+50 TO STA 22+55 RT
FROM -SRSA- STA 21+50 TO STA 22+55 LT
FROM -SRSA- STA 22+75 TO STA 24+50 RT
FROM -SRSA- STA 22+80 TO STA 24+50 LT

DETAIL C


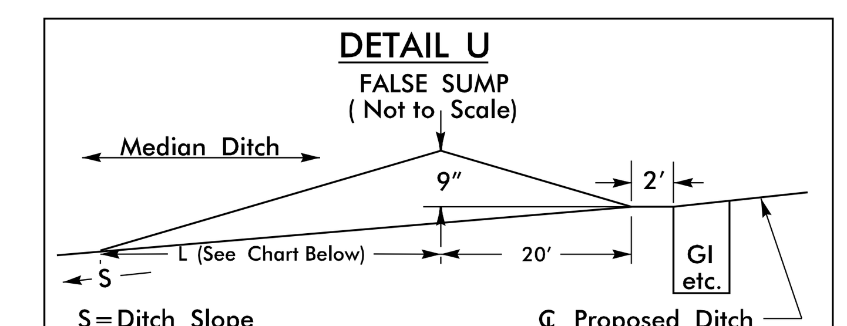
FROM -L- STA 374+50 TO STA 383+50 RT

DETAIL I


FROM -Y1- STA 37+50 TO STA 41+00 LT
-Y1LPB- STA 14+00 LT
-Y2DET- STA 23+50 LT

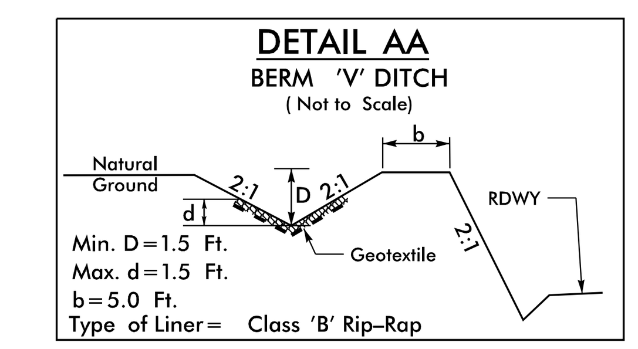
DETAIL O


-L- STA 438+00 RT

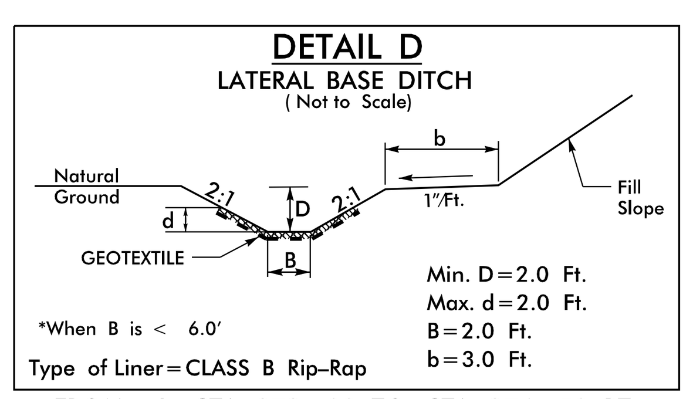
DETAIL U


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

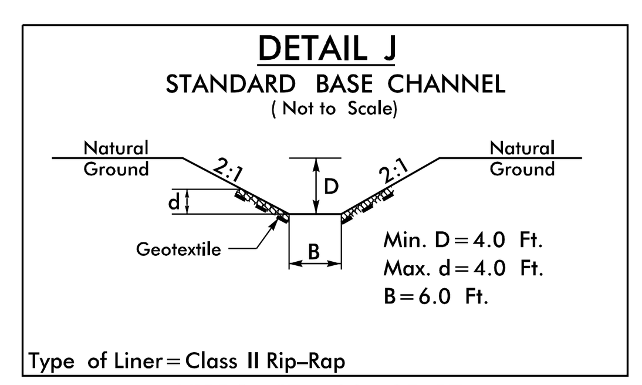
-L- STA 376+15 -L- STA 380+15 -L- STA 384+15
-L- STA 388+15 -L- STA 391+90 -L- STA 396+15
-L- STA 400+15 -L- STA 403+65 -L- STA 413+15
-L- STA 416+85 -L- STA 421+85 -L- STA 427+85
-L- STA 433+00 -L- STA 441+95 -L- STA 451+65
-L- STA 455+15 -L- STA 458+65 -L- STA 462+15
-L- STA 466+15 -L- STA 470+65 -L- STA 471+95

DETAIL AA


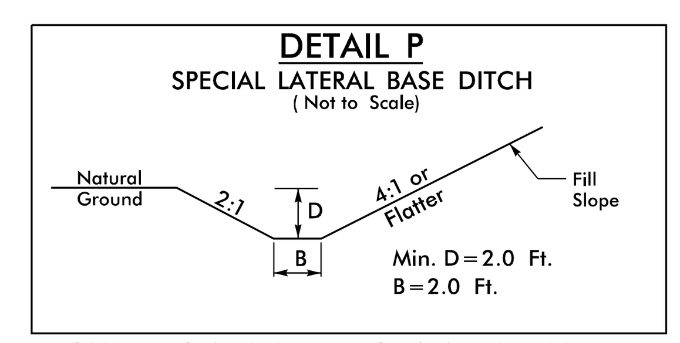
FROM -L- STA 454+50 TO STA 455+50 LT

DETAIL D


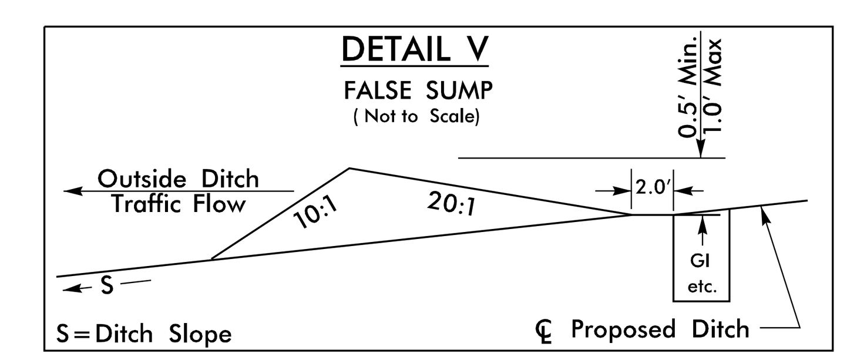
FROM -L- STA 373+00 TO STA 374+50 RT
FROM -L- STA 377+50 TO STA 384+00 LT
FROM -L- STA 385+50 TO STA 386+50 LT
FROM -L- STA 387+00 TO STA 392+00 LT
FROM -L- STA 438+15 TO STA 442+50 RT
FROM -Y1RPB- STA 16+00 TO STA 21+60 LT
FROM -Y1RPC- STA 20+85 TO STA 21+40 RT

DETAIL J


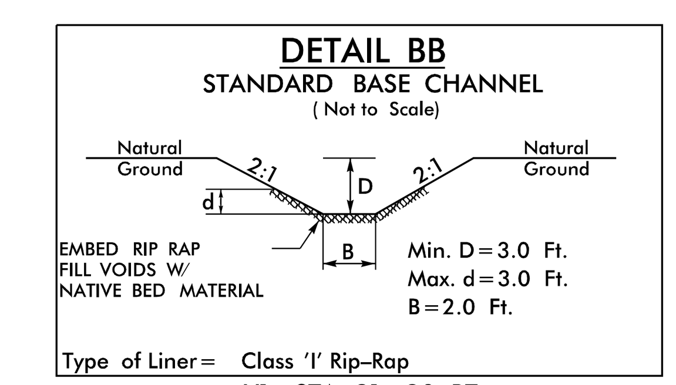
-Y1RPC- STA 20+85 RT

DETAIL P


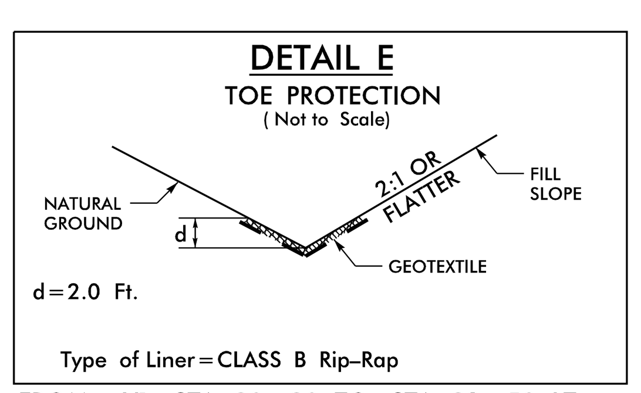
FROM -L- STA 442+50 TO STA 444+00 RT

DETAIL V


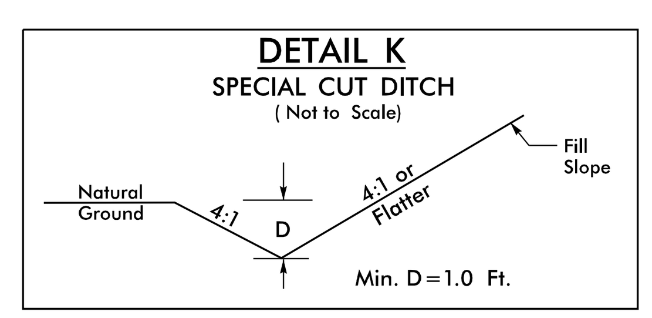
-L- STA 413+15 RT -L- STA 414+85 LT
-L- STA 418+35 LT -L- STA 425+00 LT
-L- STA 427+90 RT -L- STA 451+65 LT
-L- STA 455+15 RT -L- STA 458+65 RT
-L- STA 462+15 RT -L- STA 466+15 RT
-L- STA 470+65 RT -Y1- STA 17+80 LT

DETAIL BB


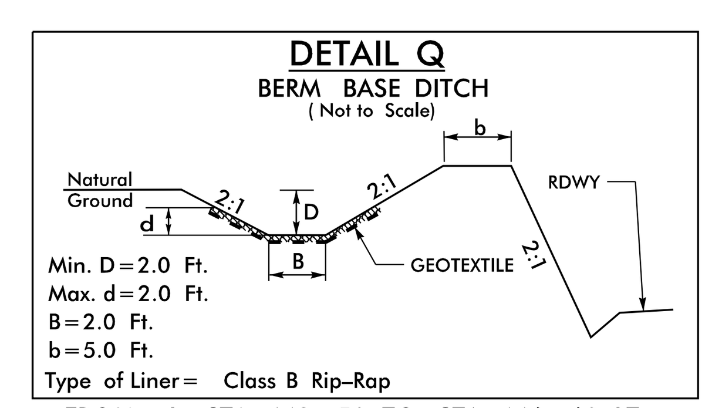
-Y1- STA 31+29 RT

DETAIL E


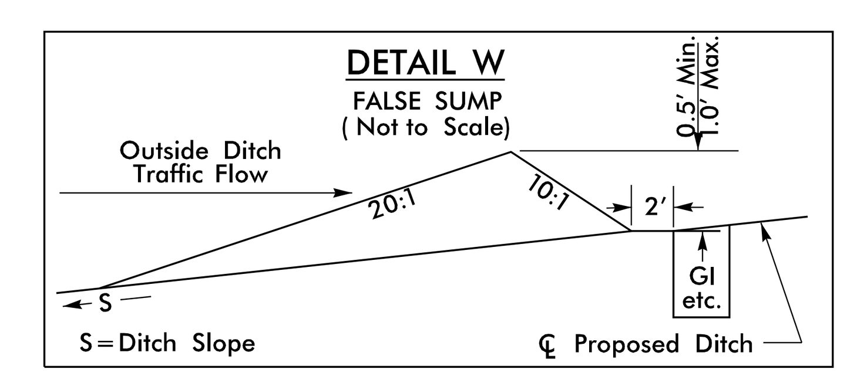
FROM -Y1- STA 30+80 TO STA 32+50 LT
FROM -Y1RPD- STA 26+60 TO STA 28+00 RT
FROM -Y1RPD- STA 26+90 TO STA 30+00 LT
FROM -Y1RPC- STA 17+85 TO STA 20+50 RT
FROM -Y1RPC- STA 21+17 TO STA 24+00 LT
FROM -Y1RPB- STA 22+50 TO STA 24+25 RT
FROM -L- STA 399+50 TO STA 401+00 LT
FROM -L- STA 399+50 TO STA 401+00 RT
FROM -L- STA 413+78 TO STA 414+50 LT
FROM -L- STA 474+86 TO STA 475+80 LT
FROM -Y3- STA 17+00 TO STA 18+70 RT
FROM -SRSA- STA 13+00 TO STA 13+80 LT

DETAIL K


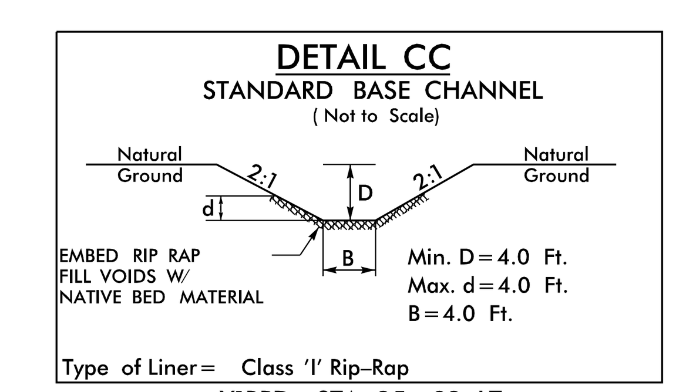
FROM -Y1- STA 12+50 TO STA 14+00 LT
FROM -Y1- STA 26+00 TO STA 27+50 LT
FROM -Y1DET- STA 16+00 TO STA 21+50 LT
FROM -Y1DET- STA 19+50 TO STA 21+50 RT
FROM -Y1LPB- STA 14+00 TO STA 15+00 LT
FROM -Y1RPC- STA 26+00 TO STA 28+50 LT
FROM -Y1RPC- STA 29+75 TO STA 31+00 LT
FROM -L- STA 430+00 TO STA 434+00 LT
FROM -L- STA 469+00 TO STA 470+00 LT
FROM -Y2- STA 14+13 TO STA 17+50 RT
FROM -Y2- STA 15+50 TO STA 16+00 LT
FROM -Y2DET- STA 23+00 TO STA 24+50 RT

DETAIL Q


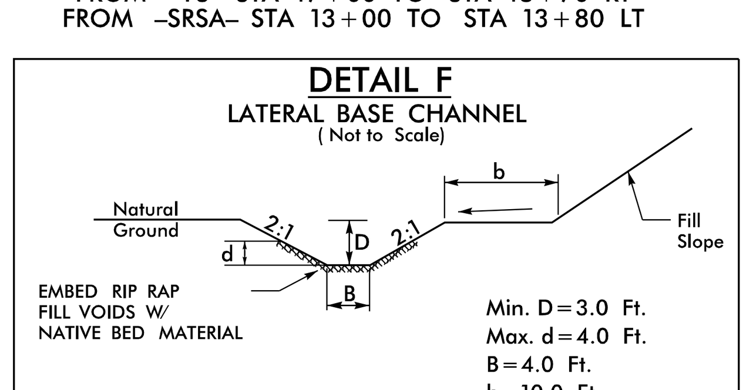
FROM -L- STA 443+50 TO STA 446+60 LT

DETAIL W


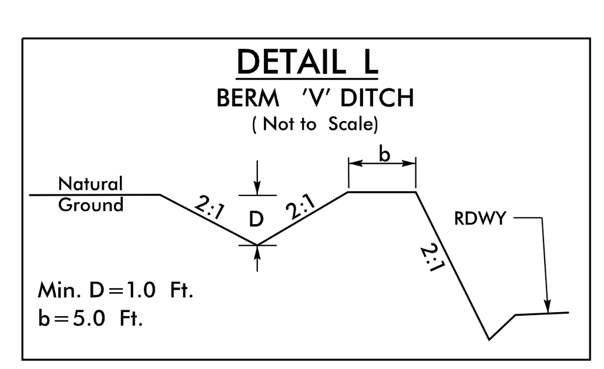
-L- STA 412+65 LT -L- STA 451+65 LT
-L- STA 455+15 LT -L- STA 458+65 LT
-L- STA 462+15 LT -L- STA 466+15 LT
-L- STA 470+15 LT -Y2- STA 22+85 RT
-SRSA- STA 19+20 LT

DETAIL CC


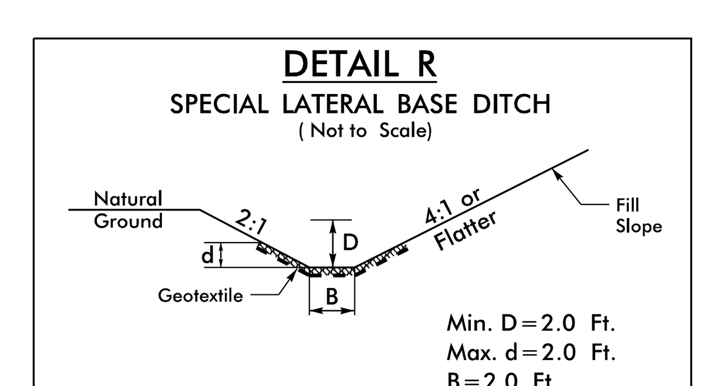
-Y1RPD- STA 25+82 LT
-Y1RPD- STA 26+46 RT

DETAIL F


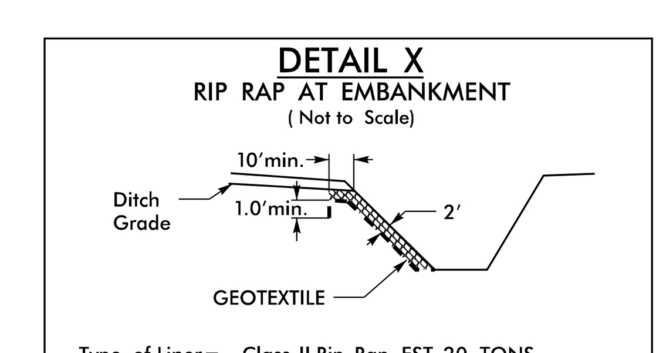
FROM -Y1RPB- STA 21+85 TO STA 24+00 LT

DETAIL L


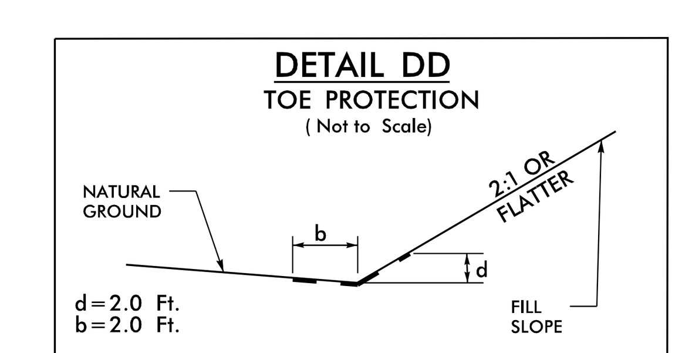
FROM -L- STA 417+00 TO STA 418+50 LT
FROM -L- STA 444+00 TO STA 444+50 RT
FROM -L- STA 451+00 TO STA 454+50 LT
FROM -Y1LPB- STA 13+00 TO STA 14+50 RT

DETAIL R


FROM -L- STA 441+77 TO STA 443+50 LT
FROM -Y1- STA 43+50 TO STA 46+50 LT

DETAIL X


-L- STA 473+90 RT

DETAIL DD


FROM -Y1DET- STA 24+50 TO STA 28+00 RT

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2D-2
R/W SHEET NO.	

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026971 ENGINEER CORALIA G DALTON 7/8/15

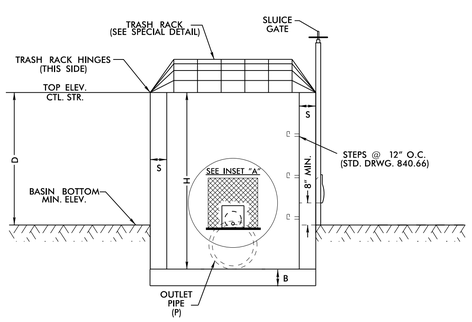
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SUNGATE DESIGN GROUP, P.A.

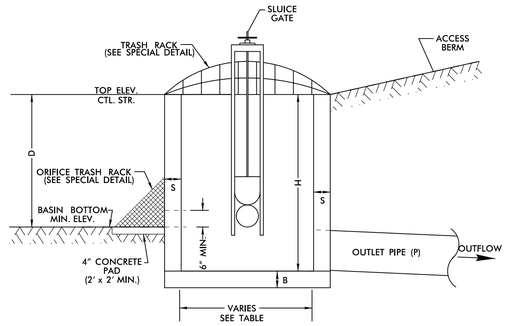
DETAIL EE

DRY DETENTION BASIN DRAWDOWN STRUCTURE

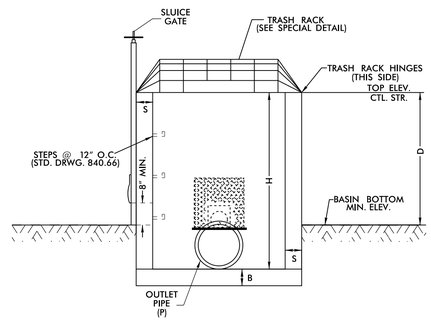
NOT TO SCALE



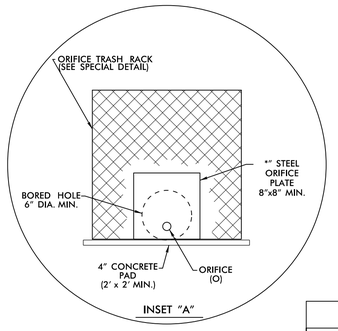
SIDE 1



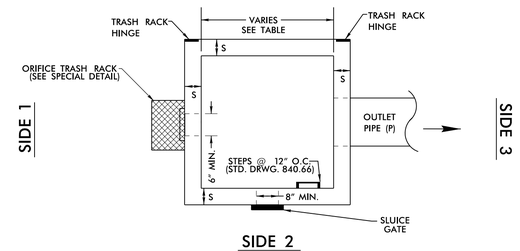
SIDE 2



SIDE 3



INSET "A"



SIDE 2

PLAN VIEW

TRASH RACK NOT SHOWN FOR CLARITY

NOTES:
1. TOP ELEVATION OF CONTROL STRUCTURE (WEIR ELEVATION) SHOULD BE SET AT THE WQv ELEVATION.
2. 15" MINIMUM DIAMETER FOR OUTLET PIPE.
3. 2" MINIMUM DIAMETER ORIFICE. IF ORIFICE IS GREATER THAN 6", A STEEL PLATE IS NOT REQUIRED.
4. NO BEDDING MATERIAL TO BE USED. THEREFORE, DO NOT FOLLOW STANDARD DRAWINGS FOR METHOD OF PIPE INSTALLATION FOR OUTLET PIPE THROUGH EMBANKMENT.
5. SLUICE GATE IS FOR MAINTENANCE AND SHOULD REMAIN CLOSED DURING NORMAL OPERATION. A GATE VALVE MAY BE USED IN LIEU OF THE 8" SLUICE GATE.
6. SLUICE GATE SHALL PROVIDE WATERTIGHT SEAL. PROVIDE ADEQUATE CLEARANCE FOR GATE OPERATION AND FOR PROPER SEATING OF GATE OVER PIPE.
7. SELECT BOX STANDARD AS REQUIRED TO ACCOMMODATE SLUICE GATE AND ORIFICE TRASH RACK WIDTH.
8. ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATE.
9. ADJUST FOOTER DIMENSIONS AS NEEDED FOR ANTI-FLOTATION.
10. PAYMENT OF TRASH RACKS ARE INCIDENTAL TO BASIN DRAWDOWN STRUCTURE.

MINIMUM DIMENSIONS FOR DRY DETENTION BASIN DRAWDOWN STRUCTURE

STATION	STRUCTURE NUMBER	S (INCHES) 6" MIN.	B (INCHES) 6" MIN.	BASIN BOTTOM MINIMUM ELEV.	TOP ELEVATION CONTROL STRUCTURE	MAX. STORAGE DEPTH(D) FEET	INV. ELEV. CTL. STR.	CTL. STR. DIMENSIONS (W x L x H)	ORIFICE DIAMETER (O) INCHES	ORIFICE INV. ELEV.	OUTLET PIPE DIAMETER(P) INCHES
400+00 -L- LT	0623	6"	18"	940.0	944.0	4.0	938.0	5' X 5' X 6'	6"	940.0	24
400+08 -L- RT	0609	6"	15"	947.0	950.0	3.0	945.0	5' x 5' x 5'	6"	947.0	24

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	2D-3
R/W SHEET NO.	

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026971 JOSHUA G. DALTON

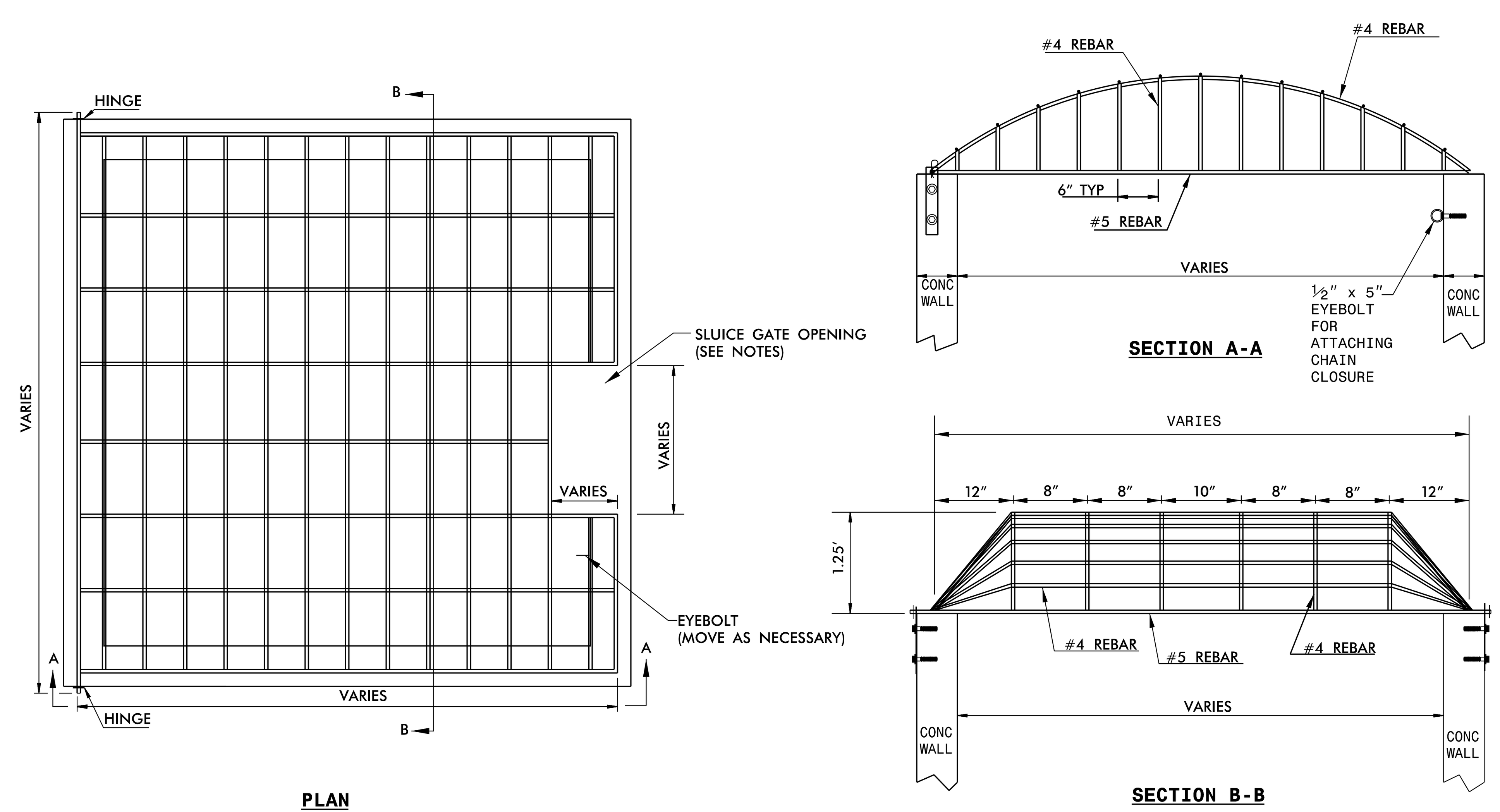
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SUNGATE DESIGN GROUP, P.A.

DETAIL FF

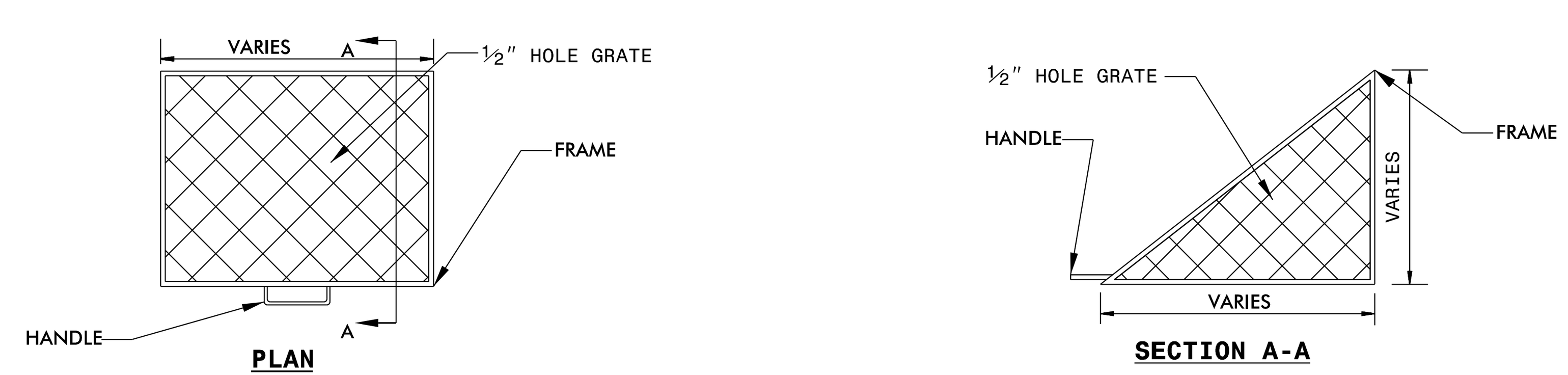
REMOVABLE ORIFICE TRASH RACK

NOT TO SCALE

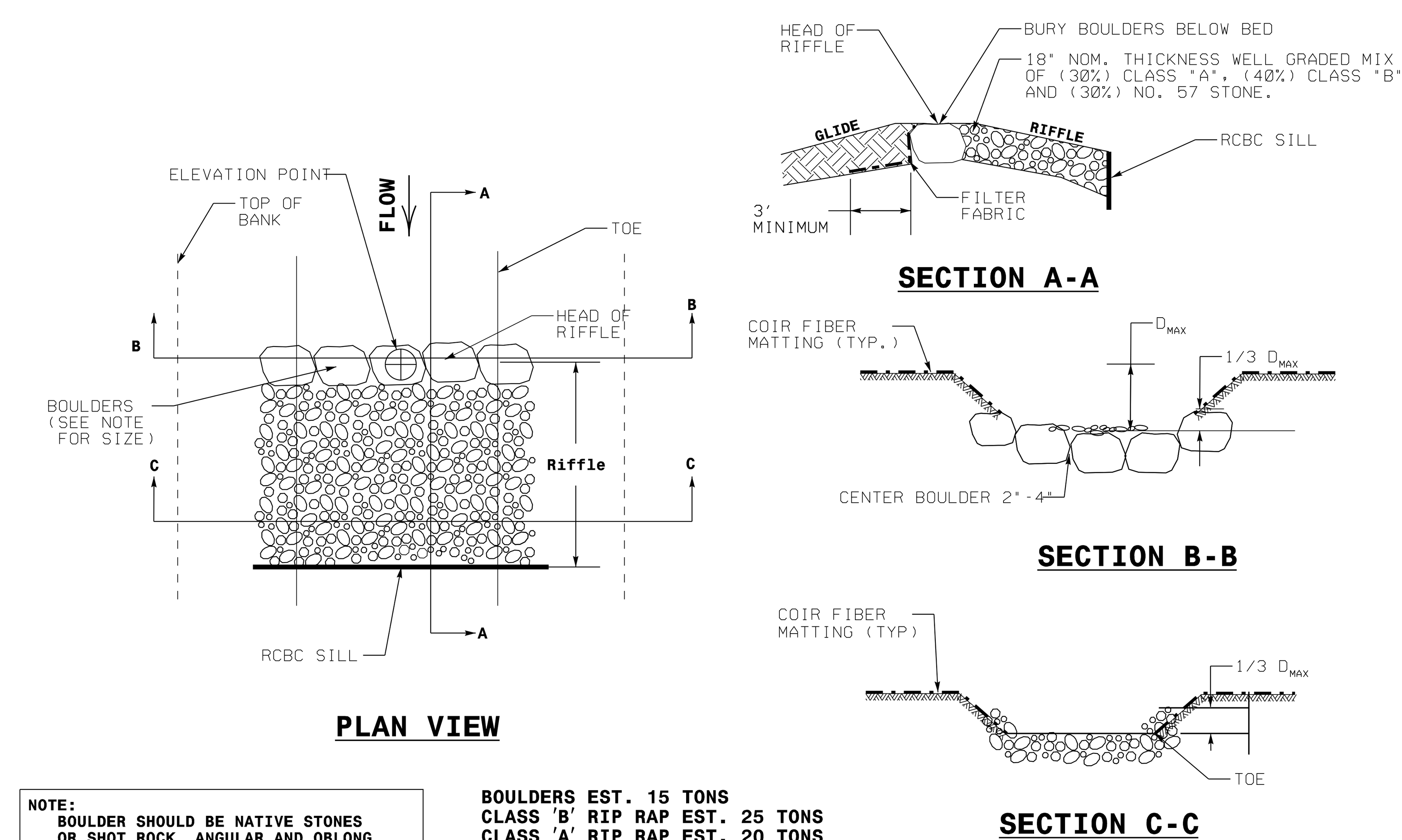


REBAR TRASH RACK
NOT TO SCALE

RISER TRASH RACK NOTES:
1. ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A 1/4" BEAD.
2. IF BOLTS ARE ANCHORED IN CONCRETE, FOLLOW STD. DWG. 862.03 AND 862.04 FOR ANCHORING PROCEDURE.
3. EYEBOLT FOR CHAIN CLOSURE SHALL BE INSTALLED BY THE SAME METHOD AS THE HINGE PLATE BOLTS.
4. RACK AND HARDWARE SHALL BE ALUMINUM OR REBAR AND GALVANIZED IN ACCORDANCE WITH ASTM A-153.
5. PROVIDE OPENING IN TRASH RACK TO ACCOMODATE SLUICE GATE ON THE OUTLET PIPE. ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATES.



ORIFICE TRASH RACK NOTES:
1. ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A 1/4" BEAD.
2. IF BOLTS ARE ANCHORED IN CONCRETE, FOLLOW STD. DWG. 862.03 AND 862.04 FOR ANCHORING PROCEDURE.
3. REMOVEABLE ORIFICE TRASH RACK SHALL BE ATTACHED TO CONCRETE BOX BY HINGE OR SLIDE RAIL SYSTEM.
4. RACK AND HARDWARE SHALL BE ALUMINUM OR GALVANIZED IN ACCORDANCE WITH ASTM A-153.



NOTE:
BOULDER SHOULD BE NATIVE STONES OR SHOT ROCK, ANGULAR AND OBLONG, WITH AN AXIS APPROXIMATELY 3.0 L_x, 2.5' W_x, 2.0' D

BOULDERS EST. 15 TONS
CLASS 'B' RIP RAP EST. 25 TONS
CLASS 'A' RIP RAP EST. 20 TONS
NO. 57 STONE EST. 20 TONS
EST. 50 SY GEOTEXTILE FABRIC

REACH	1
Wbkf (ft)	8.0'
Dmax (ft)	2.0'

CONSTRUCTED RIFFLE DETAIL GG

NOT TO SCALE

5/14/99

DETAIL HH
(NOT TO SCALE)

SINGLE BARREL CULVERT W/SILLS AND BAFFLES

*NOTES:

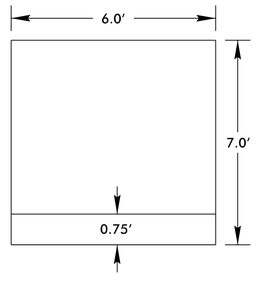
1) NATIVE BED MATERIAL SHALL BE PLACED BETWEEN THE SILLS IN THE CULVERT. NATIVE MATERIALS CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. RIP RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL. IF RIP RAP IS USED, NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FACILITATE ANIMAL PASSAGE. THE TOP SURFACE OF THE NATURAL STREAM BED MATERIAL SHALL BE PLACED AND LEVELED TO A FLAT SURFACE TO ALLOW FOR ANIMAL PASSAGE. NATIVE MATERIAL AND RIP RAP ARE SUBJECT TO APPOVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

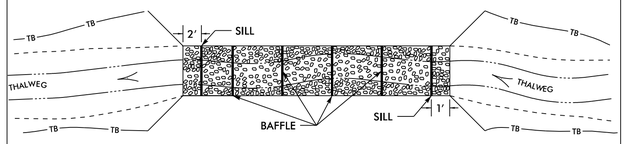
2) SILLS/BAFFLES ARE TO BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

3) TOP OF SILLS/BAFFLES SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

4) DO NOT SET ELEVATION OF SILL/BAFFLES ABOVE BANK FULL.

5) NUMBER OF SILL/BAFFLES DETERMINED BY THE ENGINEER.





NUMBER OF BAFFLES = 16
ON 51 FT CENTERS FROM DOWNSTREAM SILL
(SEE STRUCTURE PLANS)

PLAN VIEW

9/13

6′ X 7′ RCBC AT –L– STA 397+73

DETAIL II
(NOT TO SCALE)

SINGLE BARREL CULVERT W/SILLS

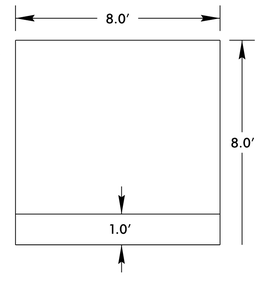
*NOTES:

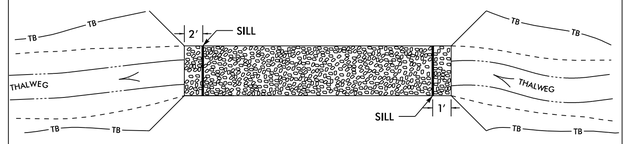
1) NATIVE BED MATERIAL SHALL BE PLACED BETWEEN THE SILLS IN THE CULVERT. NATIVE MATERIALS CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. RIP RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL. IF RIP RAP IS USED, NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FACILITATE ANIMAL PASSAGE. THE TOP SURFACE OF THE NATURAL STREAM BED MATERIAL SHALL BE PLACED AND LEVELED TO A FLAT SURFACE TO ALLOW FOR ANIMAL PASSAGE. NATIVE MATERIAL AND RIP RAP ARE SUBJECT TO APPOVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

2) SILLS/BAFFLES ARE TO BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

3) TOP OF SILLS/BAFFLES SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

4) DO NOT SET ELEVATION OF SILL/BAFFLES ABOVE BANK FULL.

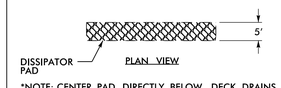




PLAN VIEW

8′ X 8′ RCBC AT –L– STA 437+97

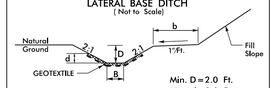
DETAIL JJ
DECK DRAIN DISSIPATOR PAD
(Not to Scale)



Type of Liner = Class B Rip–Rap

FROM –L– STA 472+52 TO STA 472+74 LT
FROM –L– STA 472+96 TO STA 473+08 RT
FROM –L– STA 473+85 TO STA 474+43 LT
FROM –L– STA 474+29 TO STA 474+90 RT

DETAIL LL
LATERAL BASE DITCH
(Not to Scale)



Min. D = 2.0 Ft.
Max. d = 2.0 Ft.
B = 2.0 Ft.
b = 5.0 Ft.

Type of Liner = Class 'I' Rip–Rap

FROM –Y1– STA. 41+00 TO STA. 43+50 LT

PROJECT REFERENCE NO. U-2579C | SHEET NO. 2D-4
R/W SHEET NO.

HYDRAULICS ENGINEER

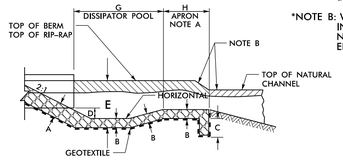
NORTH CAROLINA PROFESSIONAL SEAL 026971 ENGINEER JOSHUA G. DALTON — Digitally signed by Joshua G. Dalton

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

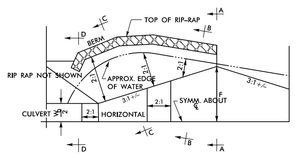
SUNGATE DESIGN GROUP, P.A.

DETAIL KK
RIP–RAPPED ENERGY DISSIPATOR BASIN

℄ SECTION



HALF PLAN

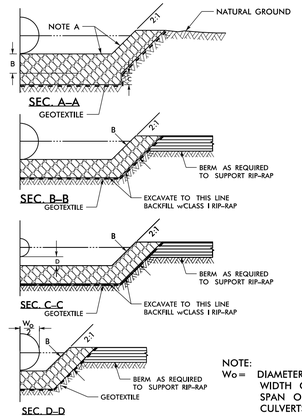


DIM	RIP RAP BASIN # 1	2	3	4	5	6	7	8
A	2′							
B	2′							
C	2′							
D	2′							
E	7′							
F	12′							
G	20′							
H	10′							

*ALL DIMENSIONS APPROXIMATE IN FEET

*NOTE A: IF EXIT VELOCITY OF BASIN IS SPECIFIED, EXTEND BASIN AS REQUIRED TO OBTAIN SUFFICIENT CROSS SECTIONAL AREA AT SECTION A–A SUCH THAT Q des/(CROSS SECTION AREA AT SEC. A–A) = SPECIFIED VELOCITY.

*NOTE B: WARP BASIN TO CONFORM TO NATURAL STREAM CHANNEL. TOP OF RIP–RAP IN FLOOR OF BASIN SHOULD BE AT SAME ELEVATION OR LOWER THAN NATURAL CHANNEL BOTTOM AT SEC. A–A. PROVIDE SMOOTH TRANSITION FROM END OF APRON TO NATURAL CHANNEL WIDTH.



NOTE:
Wo = DIAMETER OF PIPE, WIDTH OF BOX OR SPAN OF PIPE–ARCH CULVERTS

CLASS 'I' RIP RAP
EST. 105 TONS
EST. 190 SY GEOTEXTILE FABRIC
EST. 100 CY DDE

5/05

–L– STA 472+75 RT

12/06/07

COMPUTED BY: SPK DATE: 3/9/17
CHECKED BY: SMK DATE: 3/10/17

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	3B-1

SUMMARY OF ASPHALT PAVEMENT REMOVAL

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	AREA (SY)
-Y1-	18+21.65	46+75.00	LT	7608.93
-L-	401+68.19	407+82.94	RT	2051.75
-Y2-	16+75.00	23+25.00	CL	1588.89
-Y3-	15+75.00	16+50.00	CL	191.67
-Y3-	21+50.00	24+75.00	CL	830.56
-Y1DET-	15+93.03	18+46.17	CL	340.07
-Y1DET-	18+46.17	30+59.90	CL	3506.33
-Y1DET-	30+59.90	33+46.92	CL	335.44
-Y2DET-	15+00.00	16+61.59	CL	159.61
-Y2DET-	16+61.59	26+43.10	CL	2835.47
-Y2DET-	26+43.10	28+03.31	CL	164.92
			TOTAL:	19,613.64
			SAY:	19,620

SUMMARY OF BREAKING ASPHALT PAVEMENT

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	AREA (SY)
-Y3-	16+50.00	21+50.00	CL	1,222.22
-Y4-	12+12.00	12+42.12	CL	3.35
			TOTAL:	1,225.57
			SAY:	1,230

SUMMARY OF SHOULDER BERM GUTTER

SURVEY LINE	STATION	STATION	LENGTH (LF)
-L- LT	385+00.00	386+77.67	177.7
-L- LT	436+50.00	441+80.00	530.0
-L- LT	475+00.00	477+56.00	256.0
-L- RT	413+50.00	415+00.00	150.0
-L- RT	475+43.00	477+50.00	206.8
-Y1RPB- LT	10+00.00	24+55.00	1455.0
-Y1RPC- RT	18+94.00	23+65.00	471.0
-Y1RPD- RT	24+47.00	29+50.00	503.0
-Y1- LT	30+58.62	33+05.00	246.4
-Y1- RT	30+57.82	33+50.00	292.2
		TOTAL:	4,288.2
		SAY:	4,290

SUMMARY OF 47" FABRIC WOVEN WIRE FENCE

SURVEY LINE	STATION	STATION	LOCATION LT/RT	FABRIC (LF)	END BRACE	CORNER BRACE	LINE BRACE	4" POSTS	5" POSTS
-L-/-Y1RPC-	369+63.40	14+08.00	RT.	2,262.42			8	148	24
-Y1RPC-	14+08.00	20+54.14	RT.	595.97	1	2	2	35	14
-Y1RPC-	20+89.69	31+25.00	RT.	1,121.05	1	1	4	71	17
-Y1RPC-/-Y1-	31+25.00	20+65.00	RT./LT.	143.02		1		9	3
-Y1-	16+56.76	20+65.00	LT.	412.28	1		2	25	8
-L-	370+53.03	383+72.00	LT.	1,316.05	1	1	5	83	20
-L-	383+72.00	386+73.65	LT.	315.57	1	2		18	8
-Y1RPB-	10+02.77	16+50.00	LT.	616.05	1	2	2	36	14
-Y1RPB-	16+50.00	21+64.77	LT.	521.12	1	2	2	30	14
-Y1RPB-	21+79.81	31+80.79	LT.	1,158.02	1	3	4	70	23
-Y1RPB-/-Y1-	31+80.79	44+50.00	LT.	658.48	1	1	3	39	14
-Y1-	32+15.00	44+50.00	RT.	1,222.05	1	1	4	78	17
-Y1-	16+08.31	20+75.00	RT.	490.00	1	1	2	29	11
-Y1-/-Y1RPD-	20+75 TO	30+68.00	RT./LT.	142.86		1		9	3
-Y1RPD-	15+80.00	25+78.70	LT.	976.08	1	1	4	60	17
-Y1RPD-	25+84.72	30+68.00	LT.	540.67	1	2	2	31	14
-L-	424+95.41	437+83.80	RT.	1,346.87	1		5	87	17
-L-	410+22.01	413+14.00	LT.	311.74		1		21	3
-L-	413+14.00	437+75.29	LT.	2,396.84	1	6	8	147	44
-L-	438+10.54	447+10.07	LT.	917.51	2	2	3	55	19
-L-	447+44.98	472+20.22	LT.	2,773.97	2	7	9	170	52
-L-	474+30.21	478+00.00	LT.	445.35	2	1	2	25	13
-L-	438+09.20	446+76.04	RT.	910.44	2	1	3	56	16
-L-	447+10.95	472+64.68	RT.	2,540.76	2	2	8	163	34
-L-	474+74.68	478+00.00	RT.	415.12	2	1	2	23	13
			TOTAL:	24,550.29				1,518	432
			SAY:	24,560				1,520	440

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