This electronic collection of documents is provided for the convenience of the user and is Not a Certified Document –

The documents contained herein were originally issued and sealed by the individuals whose names and license numbers appear on each page, on the dates appearing with their signature on that page.
This file or an individual page shall not be considered a certified document.

09/08/99

T.I.P PROJECT: B–4655

CONTRACT: C203876

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–4655	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
38455.1.2	BRZ–1006(40)	PE
38455.2.1		ROW
38455.2.2		UTILITIES
38455.3.1		CONSTRUCTION

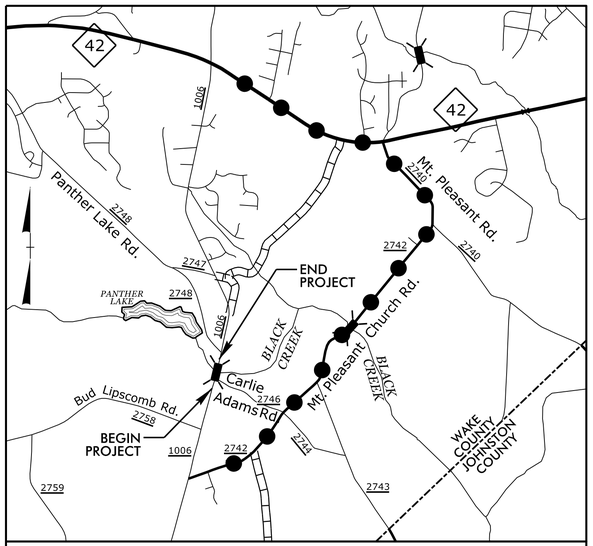
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

LOCATION: ***BRIDGE NO. 277 OVER BLACK CREEK ON SR 1006 (OLD STAGE RD.)***

TYPE OF WORK: ***GRADING, DRAINAGE, PAVING, AND STRUCTURE***

NAD 83/95

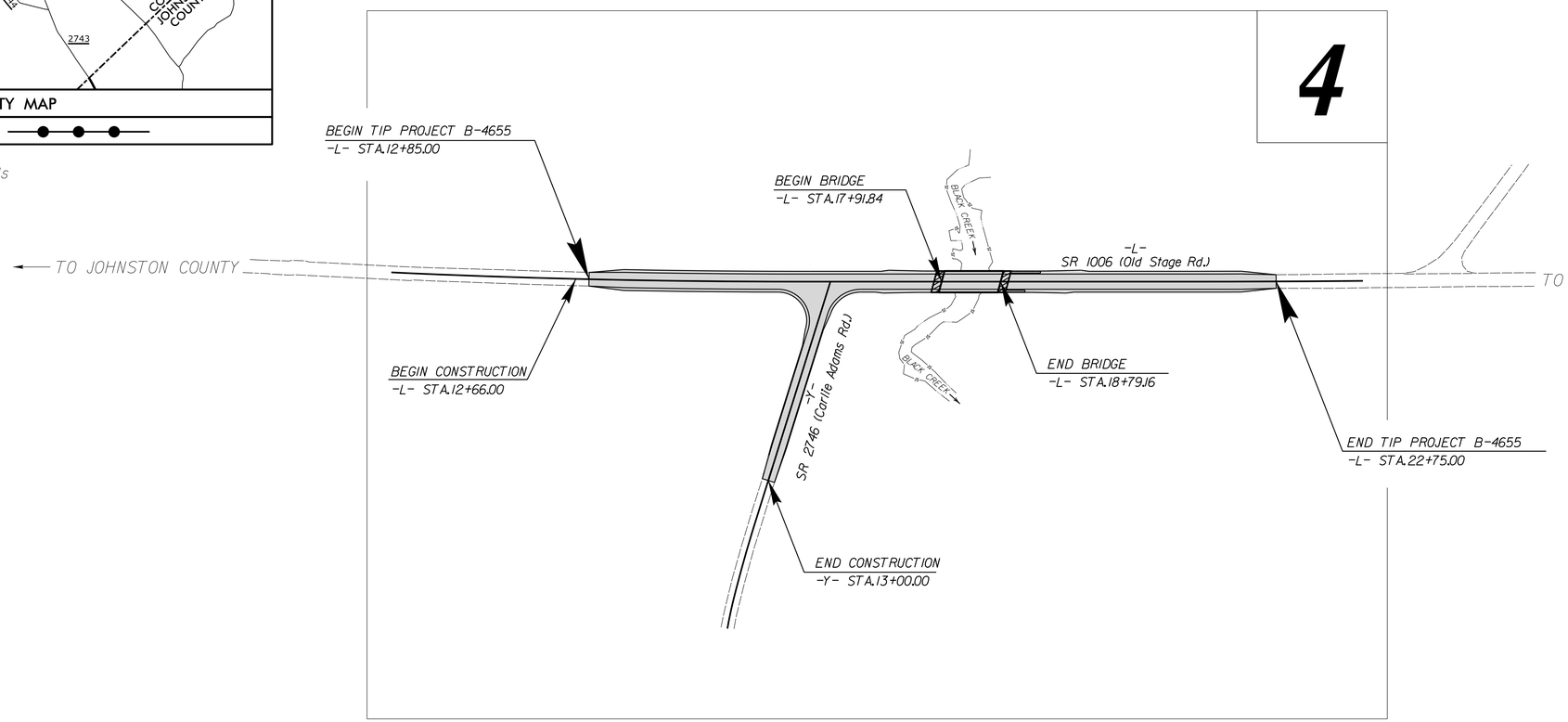


VICINITY MAP

OFF–SITE DETOUR

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

4



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

PLANS: 50 25 0 50 100

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

2017 ADT = 4,822 VPD
2037 ADT = 6,909 VPD
DHV = 9%
D = 70%
T = 3% *
V = 60 MPH
* (TTST 1% + DUAL 2%)
FUNC. CLASS. = RURAL MINOR COLLECTOR
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B–4655	=	0.171 mi.
LENGTH STRUCTURES TIP PROJECT B–4655	=	0.017 mi.
TOTAL LENGTH TIP PROJECT B–4655	=	0.188 mi.

Prepared in the Offices of:

STEWART
421 FAYETTEVILLE ST, STE 400
RALEIGH, NC 27601
T 919.380.8750

NC FIRM LICENSE No: F-1148
1151 SE Cary Parkway, Suite 101
Cary, NC 27518
(919) 557-0929
Firm License #: C-1051
www.stewartinc.com
PROJECT #: I-140116

ECOLOGICAL ENGINEERING

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MARCH 28, 2016

LETTING DATE:
MARCH 21, 2017

ANDY YOUNG, PE
PROJECT ENGINEER

MICHAEL BURNS, EI
PROJECT DESIGN ENGINEER

GARY R. LOVERING, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039102 ENGINEER BRANDON T. BARHAM

DocuSigned by: Brandon Barham 1/3/2017
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 034407 ENGINEER ANDREW P. YOUNG

DocuSigned by: Andrew P. Young 1/3/2017
SIGNATURE: P.E.

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

1/3/2017
...\Roadway\Proj\B4655_RDY_TSH.dgn
USER:Keys

ROADWAY DESIGN ENGINEER

SEAL 034407

ANDREW P. YOUNG

1/16/2017

DocuSigned by: Andrew P. Young

STEWART

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1C-1	SURVEY CONTROL DATA SHEET
2A-1	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
2C-1	GUARDRAIL ANCHOR UNIT DETAIL
3B-1	ROADWAY SUMMARY
3D-1	DRAINAGE SUMMARY
4	PLAN SHEET
5	PROFILE SHEET
TMP-1 THRU TMP-3	TRAFFIC CONTROL PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
RF-1	REFORESTATION PLANS
SIGN-1 THRU SIGN-3	SIGNING PLANS
UO-1 THRU UO-2	UTILITY BY OTHERS PLANS
X-1A	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-8	CROSS-SECTIONS
S-1 THRU S-18	STRUCTURE PLANS

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
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.11	Bridge Approach Fills - Sub Regional Tier
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
840.00	Concrete Base Pad for Drainage Structures
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

GENERAL NOTES:

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

GRADE LINE:
GRADING AND SURFACING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

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

DUKE ENERGY PROGRESS

CENTURYLINK

TIME WARNER CABLE

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

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

04/06/15

PROJECT REFERENCE NO.	SHEET NO.
B-4655	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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

BOUNDARIES AND PROPERTY:

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

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

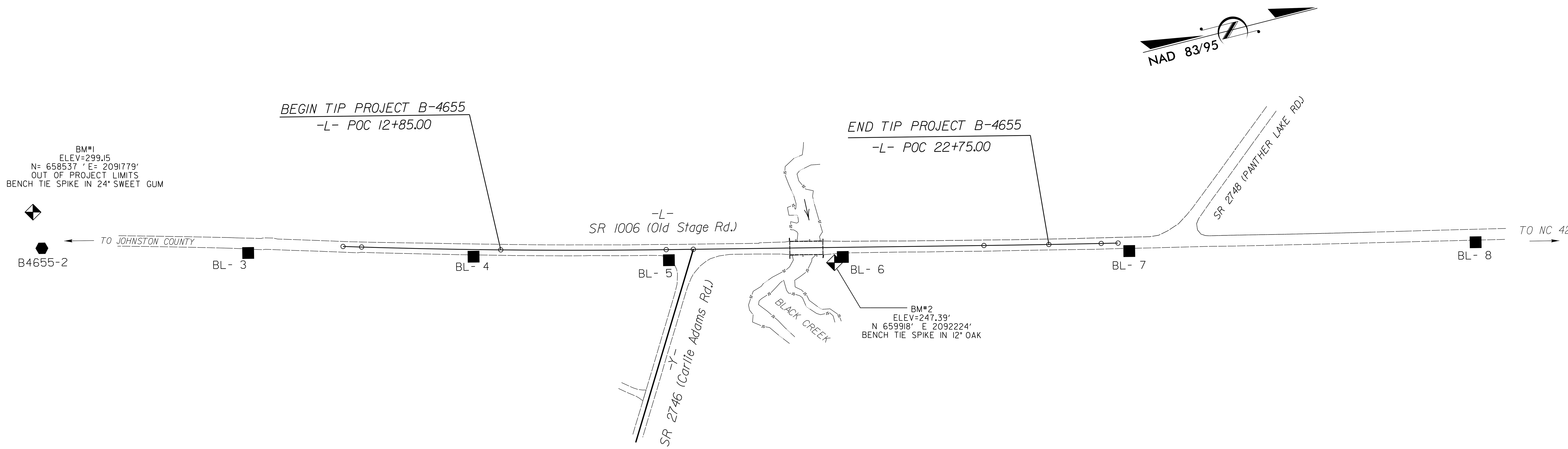
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box (S)
- Utility Unknown U/G Line LOS B (S.U.E.*) (?UTL)
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. (UST)
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole LOS A (S.U.E.*)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

PROJECT REFERENCE NO.	SHEET NO.
B-4655	1C-1
Location and Surveys	

SURVEY CONTROL SHEET B–4655

WAKE COUNTY

LOCATION: BRIDGE NO. 277 OVER BLACK CREEK ON SR 1006 (OLD STAGE RD.)



BL DATA

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
2	B4655-2	658536.9736	2091846.4331	297.34	OUTSIDE PROJECT LIMITS	
3	BL-3	658896.0558	2091946.2501	294.50	OUTSIDE PROJECT LIMITS	
4	BL-4	659288.9806	2092052.9811	276.50	12+36.06	12.82
5	BL-5	659629.3837	2092146.0747	250.67	15+88.49	19.07
6	BL-6	659935.3255	2092217.7714	245.73	19+02.71	17.32
7	BL-7	660439.3206	2092334.8276	247.37	OUTSIDE PROJECT LIMITS	
8	BL-8	661049.5903	2092473.4516	261.93	OUTSIDE PROJECT LIMITS	

BENCHMARK DATA

BM1 ELEVATION = 299.15
N 658537 E 2091779
BL STATION 5+00.00
N 89°33'35" W DIST 67.22
BENCH TIE SPIKE IN 24" SWEET GUM

BM2 ELEVATION = 247.39
N 659918 E 2092224
BL STATION 19+32 10' RIGHT
BENCH TIE SPIKE IN 12" OAK

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4655-2"
WITH NAD 83/95 STATE PLANE GRID COORDINATES OF
NORTHING: 658536.974(ft) EASTING: 2091846.433(ft)
ELEVATION: 297.34(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99988268
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4655-2" TO -L- STATION 12+85.00 IS
N 14° 26' 55.9" E 828.833 (ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

GEOID 03

NOTE: DRAWING NOT TO SCALE

NOTES:

1. *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:
   B4655_LS_CONTROL.txt

   SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. 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.

05/26/15

1/3/2017 ...\Roadway\Proj\B4655_ls_1c.dgn

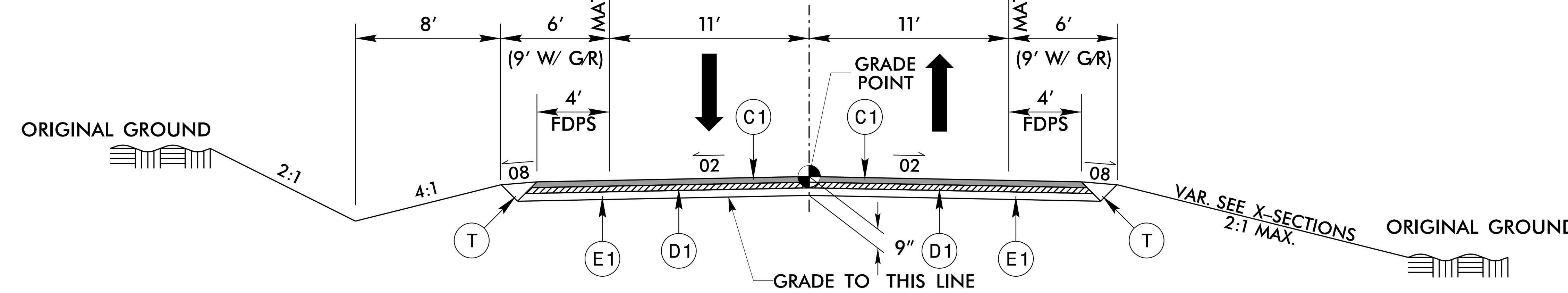
8/17/99

PAVEMENT SCHEDULE

(FINAL PAVEMENT DESIGN)

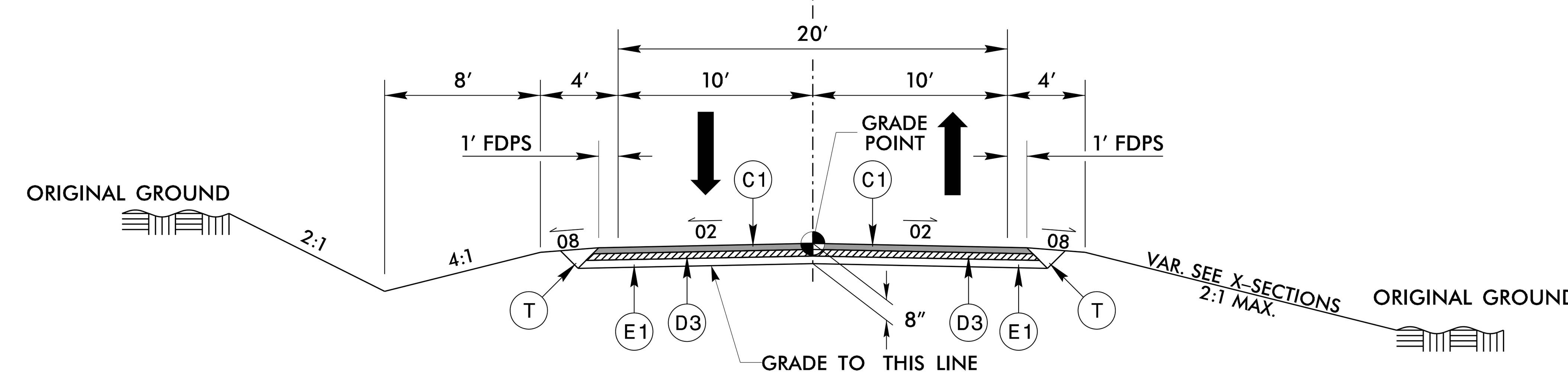
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
D1	PROP. APPROX. 3½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.
D3	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
R	SHOULDER BERM GUTTER
T	EARTH MATERIAL
W	ASPHALT WEDGING (SEE DETAIL)

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



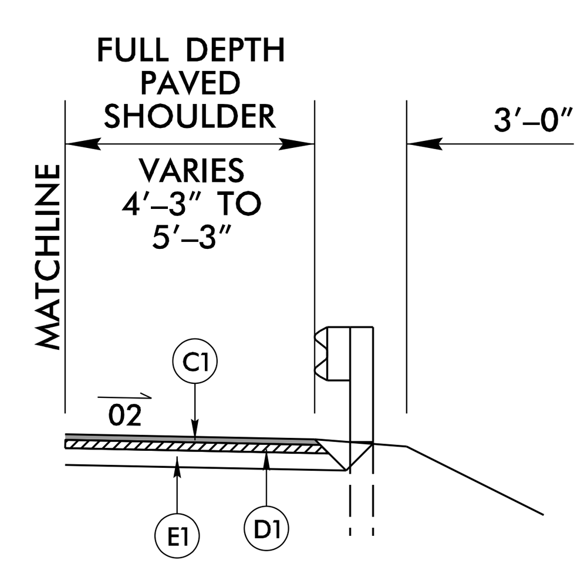
TYPICAL SECTION NO. 1

-L- STA. 12+85.00 TO -L- STA. 17+91.84 (BEGIN BRIDGE)
-L- STA. 18+79.16 (END BRIDGE) TO -L- STA. 22+75.00

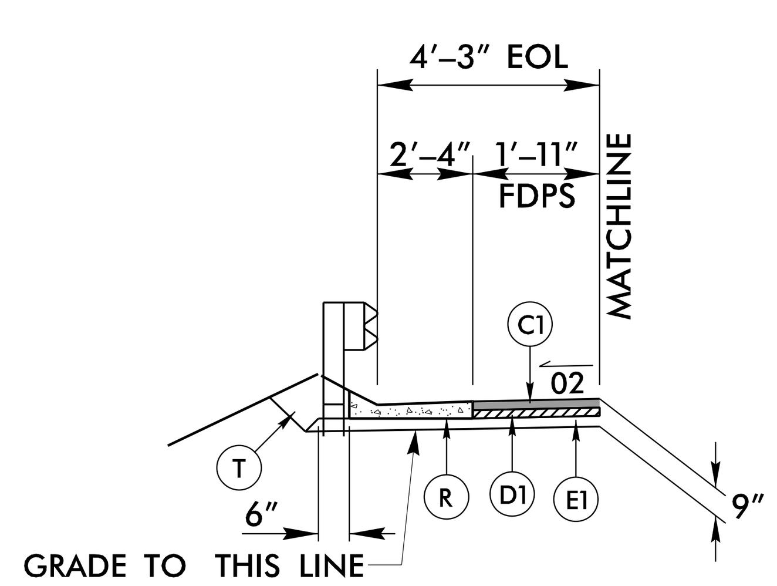


TYPICAL SECTION NO. 2

-Y- STA. 10+11.52 TO -Y- STA. 13+00.00

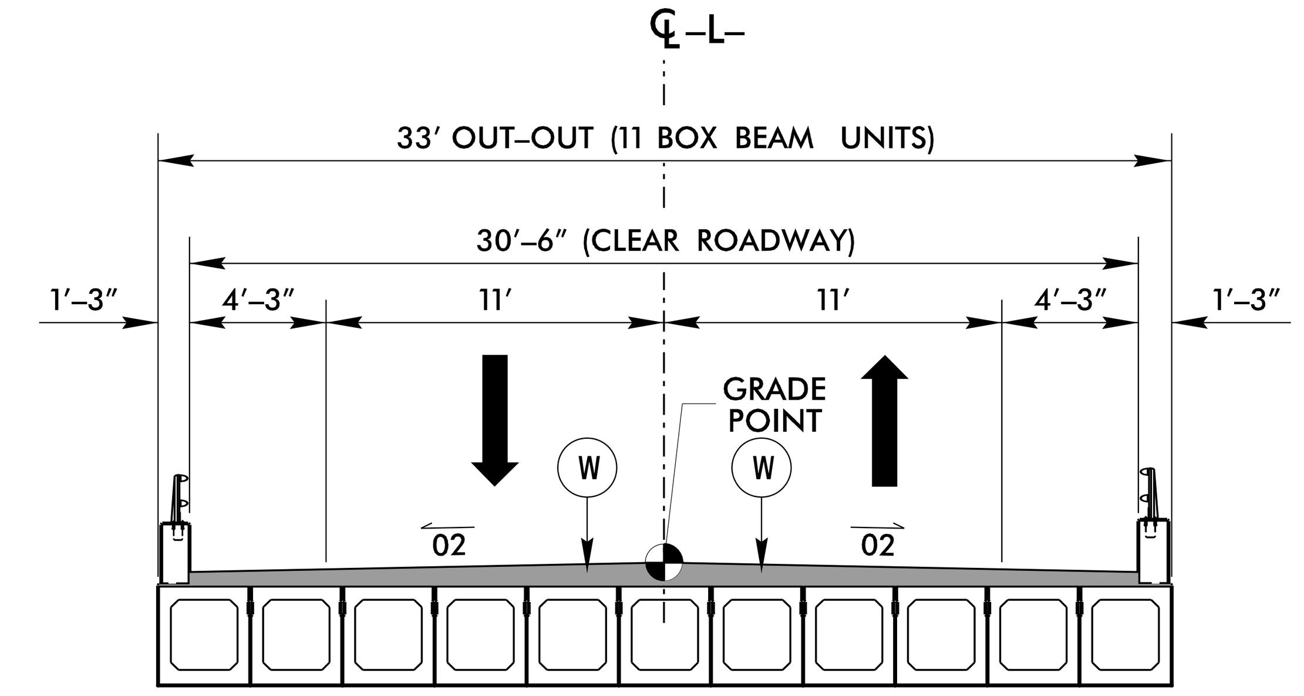


DETAIL SHOWING PAVING TO THE FACE OF GUARDRAIL



DETAIL SHOWING GUARDRAIL WITH SHOULDER BERM GUTTER

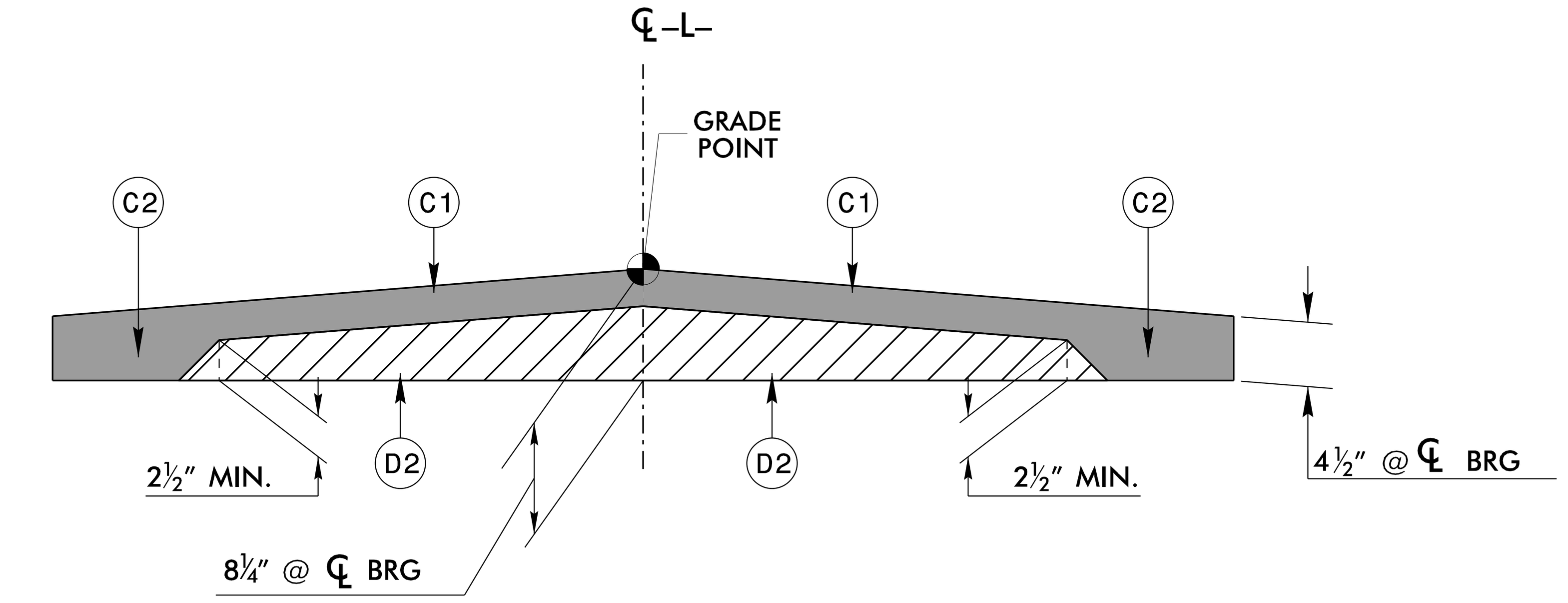
USE SHOULDER BERM GUTTER AT THE FOLLOWING LOCATIONS:
-L- STA. 18+91.16 (END APPROACH SLAB) TO -L- STA. 19+35.48 (LEFT)
-L- STA. 18+91.16 (END APPROACH SLAB) TO -L- STA. 19+13.05 (RIGHT)



TYPICAL SECTION NO. 3

-L- STA. 17+91.84 (BEGIN BRIDGE) TO -L- STA. 18+79.16 (END BRIDGE)

BOX BEAM BRIDGE SEE STRUCTURE PLANS

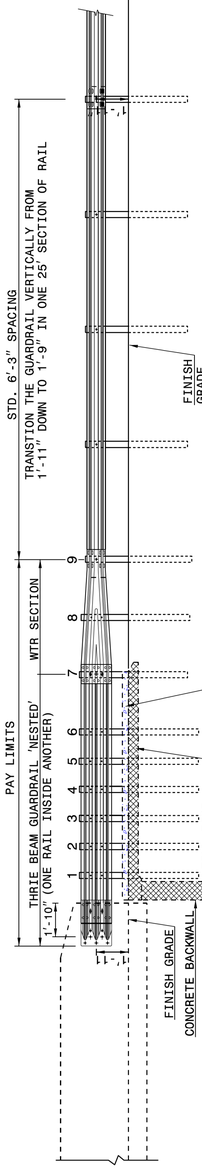


DETAIL SHOWING METHOD OF WEDGING ON BRIDGE

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 3

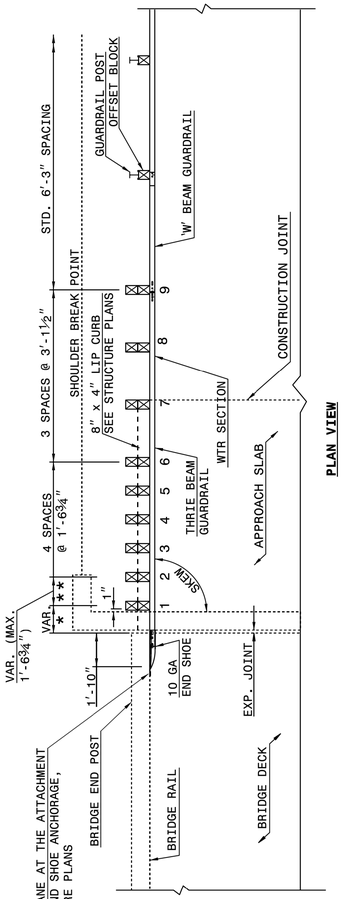
1/3/2017
...\Roadway\Proj\B4655_RDY_TYP.dgn

PROJECT REFERENCE NO.	SHEET NO.
B-4655	2C-1



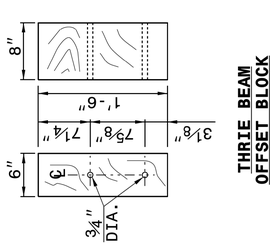
ELEVATION

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 1½" 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.

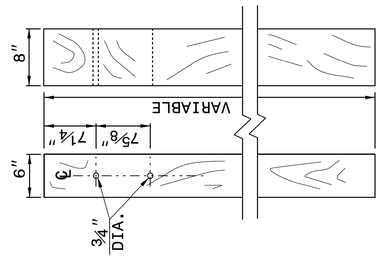


PLAN VIEW

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

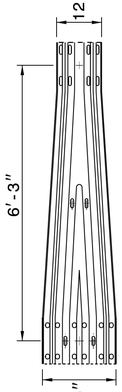


THRIE BEAM OFFSET BLOCK

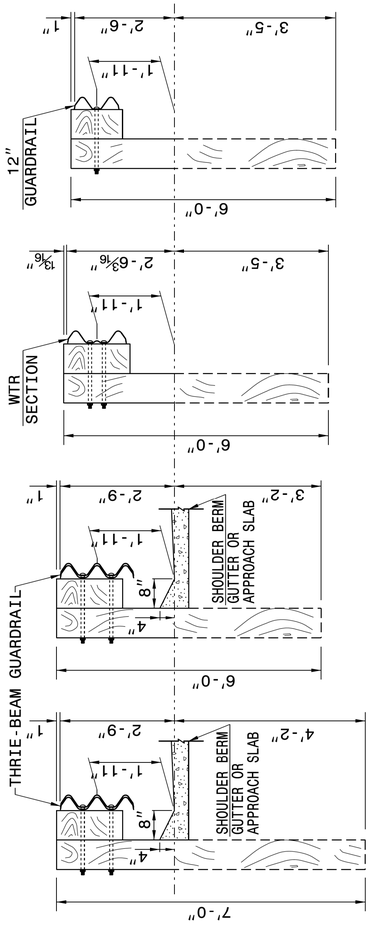


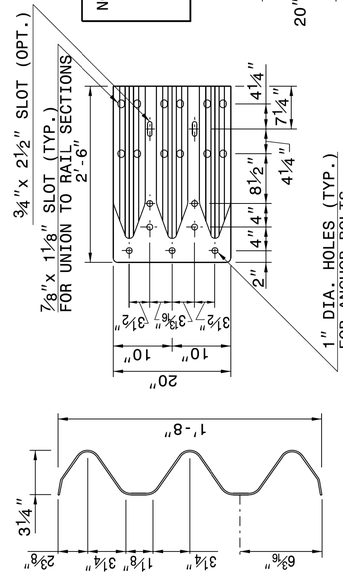
THRIE BEAM LINE POST

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





NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton
Joel Howerton 1/3/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SEE TITLE BLOCK

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

★ SUMMARY OF EARTHWORK

IN CUBIC YARDS

Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
-L- STA. 12+85.00	-L- STA. 17+91.84 BEG. BR.	1884	2351	467	
-Y- STA. 10+50.00	-Y- STA. 13+00.00	238	991	753	
SUBTOTAL:		2122	3342	1220	
-L- STA. 18+79.16 END BR.	-L- STA. 22+75.00	493	305		188
SUBTOTAL:		493	305		188
WASTE IN LIEU OF BORROW				-188	-188
PROJECT TOTALS:		2615	3647	1032	0
EST 5% TO REPLACE TOP SOIL ON BORROW PIT				52	
GRAND TOTALS:		2615		1084	
SAY:		2745		1140	

ESTIMATED UNDERCUT EXCAVATION = 200 C.Y. (CONTINGENCY)
ESTIMATED SELECT GRANULAR MATERIAL = 200 C.Y. (CONTINGENCY)
ESTIMATED GEOTEXTILE FOR SOIL STABILIZATION = 200 S.Y. (CONTINGENCY)

EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

★ PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL	ASPHALT BREAKUP	CONCRETE REMOVAL	CONCRETE BREAKUP
-L-	12+85.00	18+07.09	EXIST. ROAD	1171			
-L-	18+66.88	22+75.00	EXIST. ROAD	924			
-Y-	10+11.93	13+00.00	EXIST. ROAD	717			
		TOTAL:		2812			
		SAY:		2820			

SHOULDER BERM GUTTER SUMMARY

IN LINEAR FEET

LINE	Station	Station	LENGTH
-L- RT	18+86.05	19+13.00	27
-L- LT	18+93.95	19+36.00	41
		TOTAL:	68
		SAY:	75

★ *APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, BORROW EXCAVATION, FINE GRADING, CLEARING AND GRUBBING, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "GRADING"*

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL

GUARDRAIL SUMMARY

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

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL WIDTH	FLARE LENGTH		W		ANCHORS									IMPACT ATTENUATOR TYPE 350		SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	TYPE III	GRAU 350	M-350	XIII	CAT-1	VI MOD	BIC		G	NG				
-L-	17+06.46	17+87.71 (BR)	RT	81.25'			17+87.71		4'-5"	9'	50		1			1	1												TL-3
-L-	17+14.72	17+95.97 (BR)	LT	81.25'				17+95.97	4'-5"	9'		50		1		1	1												TL-3
-L-	18+75.03 (BR)	19+68.78	RT	93.75'				18+75.03	4'-5"	9'		50		1		1	1												TL-3
-L-	18+83.29 (BR)	19+89.54	LT	106.25'			18+83.29		4'-5"	9'	50		1			1	1												TL-3
			SUBTOTAL:	362.50'																									
			LESS ANCHOR DEDUCTIONS:																										
			TYPE III (4 @ 18.75')	-75																									
			GRAU-350 TL-3 (4 @ 50')	-200																									
			TOTAL:	87.50'												4	4											
			SAY:	100.00'																									
			ADDITIONAL GUARDRAIL POSTS = 5 EA																										

8/17/99

REVISIONS

COMPUTED BY: JMK DATE: 9/29/2015

CHECKED BY: BTB DATE: 9/29/2015

PROJECT REFERENCE NO.	SHEET NO.
B-4655	3D-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.

SUBREGIONAL

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

STATION	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) SIZE 12"	15"	18"	24"	30"	36"	42"	48"	DRAINAGE PIPE THICKNESS OR GAUGE DO NOT USE RCP	DO NOT USE CSP	DO NOT USE PVC	DO NOT USE HDPE
19+08 -L-	RT	0401		247.48	244.73														
19+08 -L-	RT	0401	0402		244.73	244.50			16									X	X
19+30 -L-	LT	0403		247.14	244.39														
19+30 -L-	LT	0403	0404		244.39	241.84			16							X		X	X
10+73 -Y-	CL	0405			248.50	243.30													
12+79 -Y-	RT	0406																	
15+04 -L-	LT	0407																	
15+94 -L-	LT	0408																	
22+03 -L-	LT	0409																	
SHEET TOTALS									32										

STATION	C.S. PIPE SIZE 12"	15"	18"	24"	30"	36"	42"	48"	C.S. PIPE THICKNESS OR GAUGE .064	.064	.064	.064	.079	.079	.109	.109
19+08 -L-																
19+08 -L-																
19+30 -L-																
19+30 -L-																
10+73 -Y-																
12+79 -Y-																
15+04 -L-																
15+94 -L-																
22+03 -L-																
SHEET TOTALS																

STATION	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"
19+08 -L-								
19+08 -L-								
19+30 -L-								
19+30 -L-								
10+73 -Y-				72				
12+79 -Y-								
15+04 -L-								
15+94 -L-								
22+03 -L-								
SHEET TOTALS				72				

STATION	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"
19+08 -L-								
19+08 -L-								
19+30 -L-								
19+30 -L-								
10+73 -Y-								
12+79 -Y-								
15+04 -L-								
15+94 -L-								
22+03 -L-								
SHEET TOTALS								

STATION	** "R.C. PIPE (CLASS V)	***" RC PIPE CULVERTS, CONTRACTOR DESIGN	***" RC PIPE CULVERTS, CONTRACTOR DESIGN	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.
19+08 -L-							
19+08 -L-							
19+30 -L-							
19+30 -L-							
10+73 -Y-					44		
12+79 -Y-				36			
15+04 -L-				32			
15+94 -L-					32		
22+03 -L-							
SHEET TOTALS				68	76		

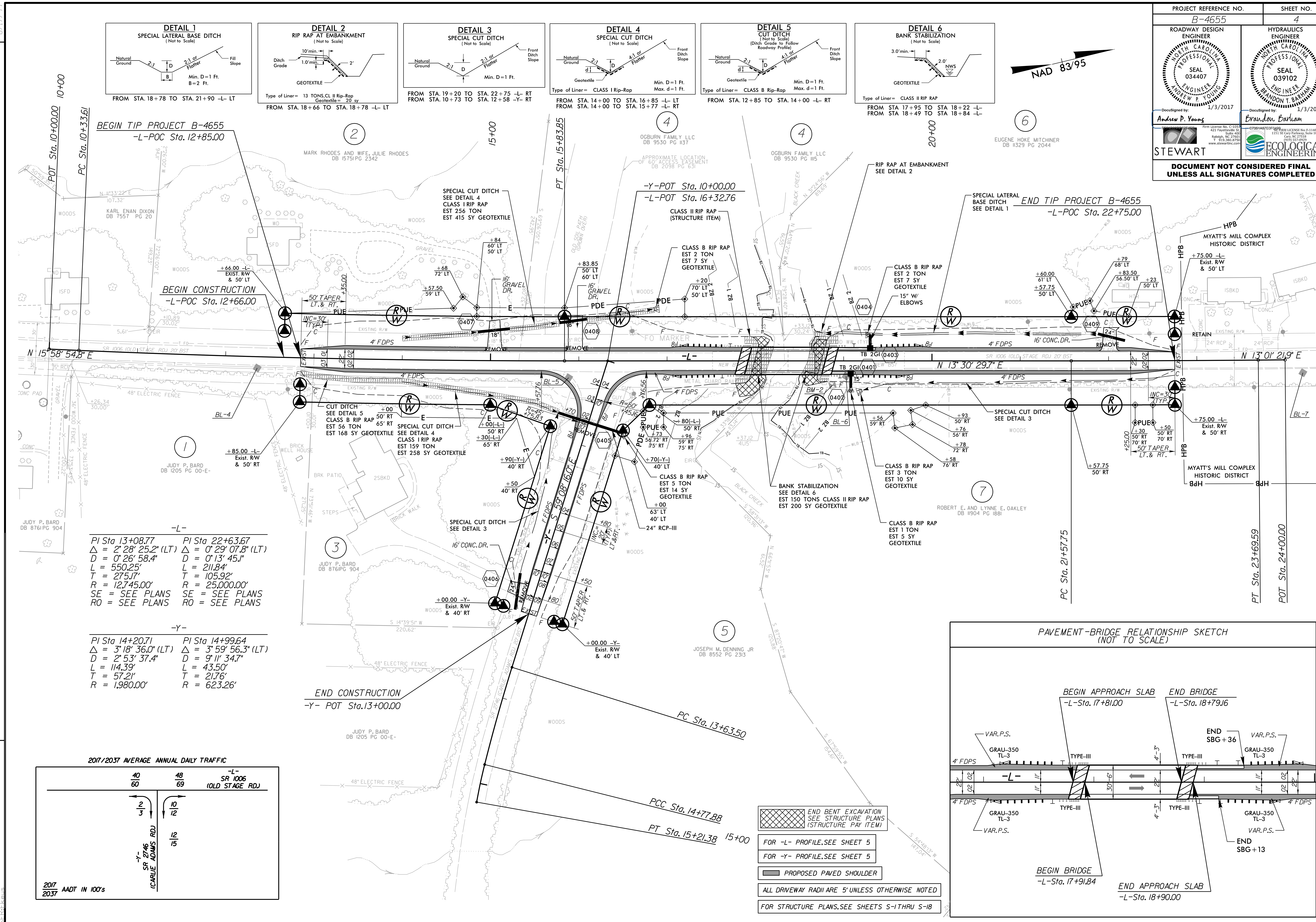
STATION	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME WITH TWO GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	G.D.I. FRAME (N.S. FLAT) W/2 GRATES STD. 840.29	T.B.D.I. STD. 840.35
19+08 -L-	1																		1	1
19+08 -L-																				
19+30 -L-	1																		1	1
19+30 -L-																				
10+73 -Y-																				
12+79 -Y-																				
15+04 -L-																				
15+94 -L-																				
22+03 -L-																				
SHEET TOTALS	2																		2	2

STATION	DRAINAGE PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
19+08 -L-					
19+08 -L-					
19+30 -L-					
19+30 -L-	2 @ 15"				
10+73 -Y-				37	
12+79 -Y-				22	
15+04 -L-				21	
15+94 -L-				34	
22+03 -L-				21	
SHEET TOTALS	2 @ 15"			135	

ABBREVIATIONS

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

1/3/2017
J:\Projects\B4655_RDY_SUM_03D-1.dgn
USER:kaua



-L-

PI Sta 13+08.77	PI Sta 22+63.67
△ = 2° 28' 25.2" (LT)	△ = 0° 29' 07.8" (LT)
D = 0° 26' 58.4"	D = 0° 13' 45.1"
L = 550.25'	L = 211.84'
T = 275.17'	T = 105.92'
R = 12,745.00'	R = 25,000.00'
SE = SEE PLANS	SE = SEE PLANS
RO = SEE PLANS	RO = SEE PLANS

-Y-

PI Sta 14+20.71	PI Sta 14+99.64
△ = 3° 18' 36.0" (LT)	△ = 3° 59' 56.3" (LT)
D = 2° 53' 37.4"	D = 9° 11' 34.7"
L = 114.39'	L = 43.50'
T = 57.21'	T = 21.76'
R = 1,980.00'	R = 623.26'

2017/2037 AVERAGE ANNUAL DAILY TRAFFIC

-L- SR 1006 (OLD STAGE RD): 40/60, 48/69
-Y- SR 2746 (CARLIE ADAMS RD): 2/3, 10/12, 12/15

2017/2037 AADT IN 100's

END BENT EXCAVATION SEE STRUCTURE PLANS (STRUCTURE PAY ITEM)

FOR -L- PROFILE, SEE SHEET 5

FOR -Y- PROFILE, SEE SHEET 5

PROPOSED PAVED SHOULDER

ALL DRIVEWAY RADII ARE 5' UNLESS OTHERWISE NOTED

FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-18

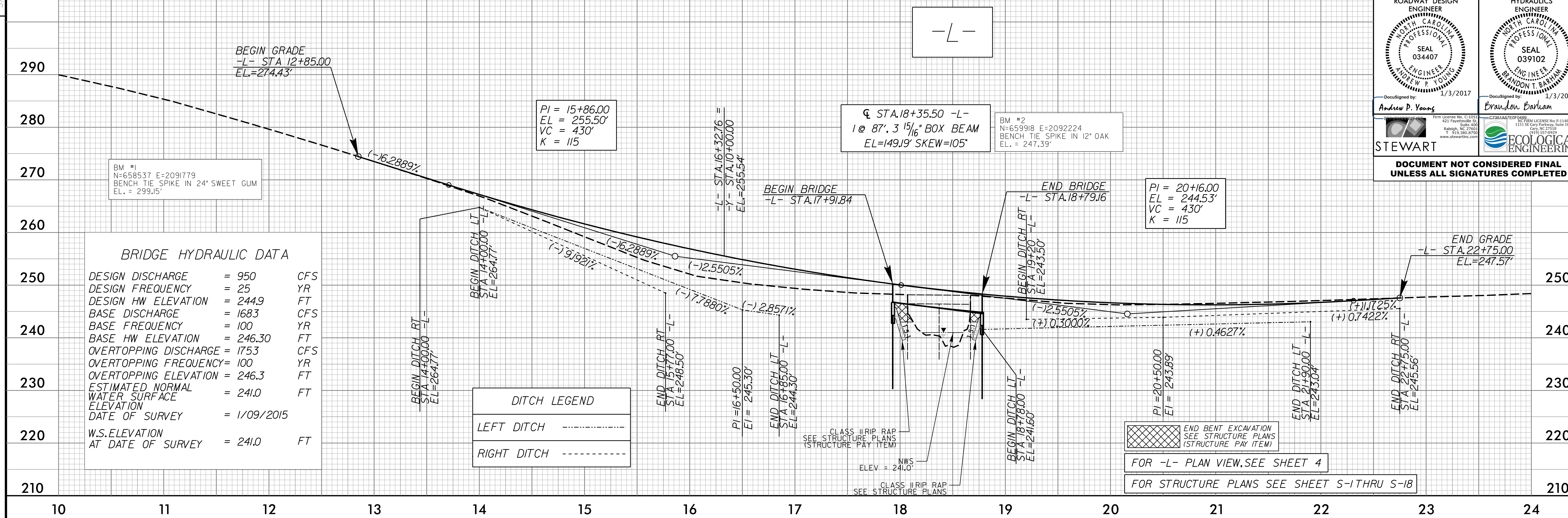
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-4655	5

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 034407 ANDREW P. YOUNG 1/3/2017	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 039102 BRANDON T. BARHAM 1/3/2017
DocuSigned by: Andrew P. Young EF21D93DD62F4EF...	DocuSigned by: Brandon Barham C7351A57E0F0499...
STEWART Firm License No. C-1051 421 Fayetteville St, Suite 400 Raleigh, NC 27601 T 919.380.8750 www.stewartinc.com	ECOLOGICAL ENGINEERING NC FIRM LICENSE No: F-1148 1151 SE Cary Parkway, Suite 101 Cary, NC 27518 (919) 557-0929

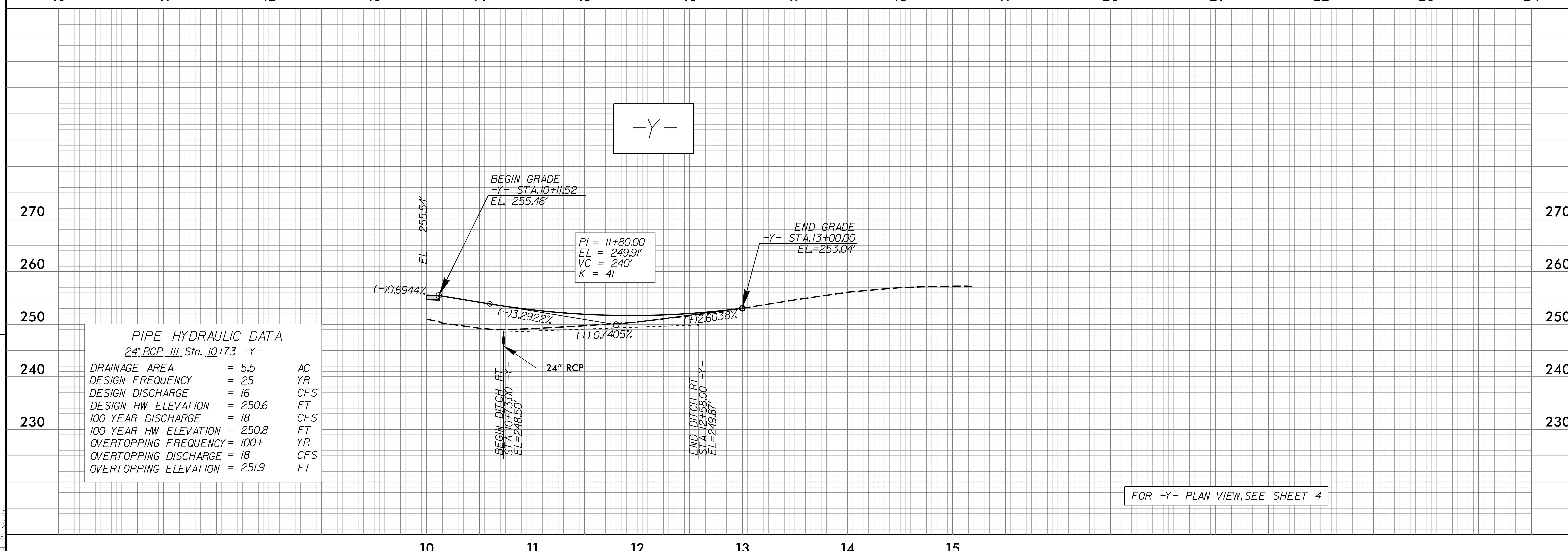
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	950	CFS
DESIGN FREQUENCY	=	25	YR
DESIGN HW ELEVATION	=	244.9	FT
BASE DISCHARGE	=	1683	CFS
BASE FREQUENCY	=	100	YR
BASE HW ELEVATION	=	246.30	FT
OVERTOPPING DISCHARGE	=	1753	CFS
OVERTOPPING FREQUENCY	=	100	YR
OVERTOPPING ELEVATION	=	246.3	FT
ESTIMATED NORMAL WATER SURFACE ELEVATION	=	241.0	FT
DATE OF SURVEY	=	1/09/2015	
W.S.ELEVATION AT DATE OF SURVEY	=	241.0	FT



PIPE HYDRAULIC DATA

24" RCP-III Sta. 10+73 -Y-

DRAINAGE AREA	=	5.5	AC
DESIGN FREQUENCY	=	25	YR
DESIGN DISCHARGE	=	16	CFS
DESIGN HW ELEVATION	=	250.6	FT
100 YEAR DISCHARGE	=	18	CFS
100 YEAR HW ELEVATION	=	250.8	FT
OVERTOPPING FREQUENCY	=	100+	YR
OVERTOPPING DISCHARGE	=	18	CFS
OVERTOPPING ELEVATION	=	251.9	FT

5/28/99

1/3/2017 ...\B4655_RDY_PSH_05.dgn