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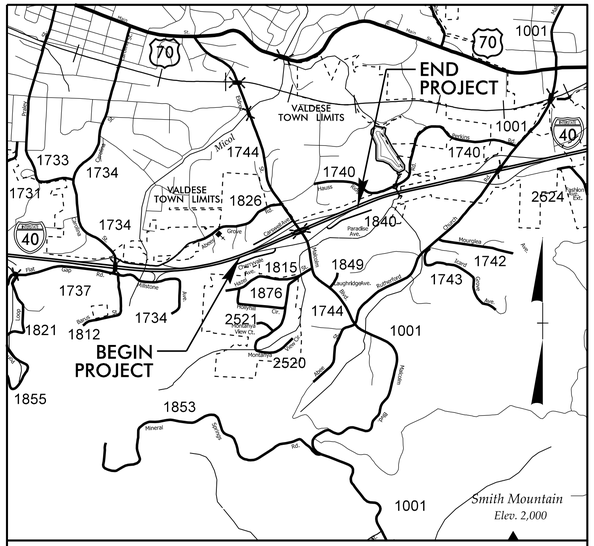
09/08/49

TIP PROJECT: B–4448

CONTRACT: C204072



VICINITY MAP

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BURKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–4448	1	

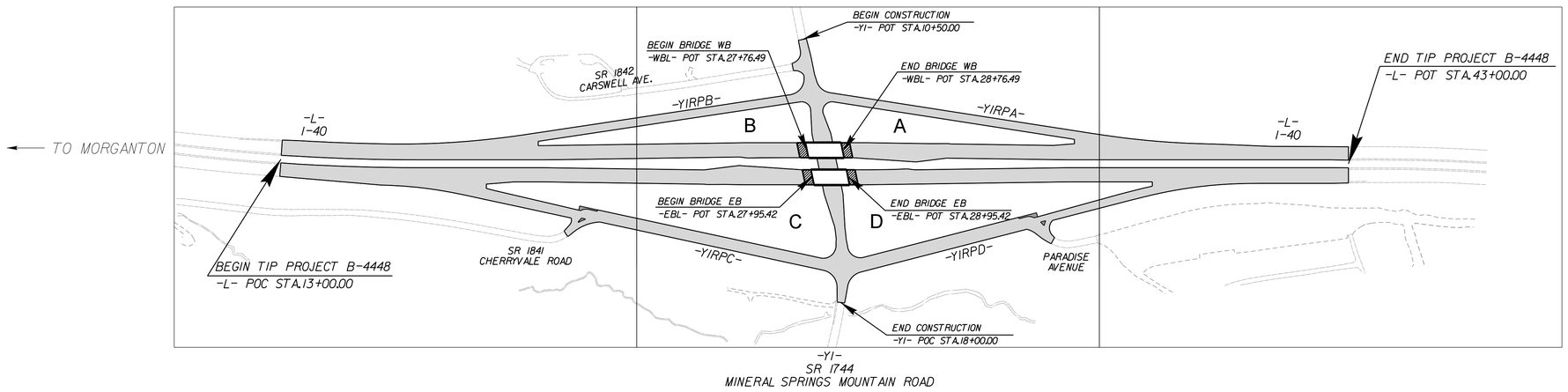
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
38372.1.2		PE
38372.2.1		UTILITIES
38372.2.1		RIGHT OF WAY
38372.3.1		CONSTRUCTION

LOCATION: ***BRIDGE NOS. 149 AND 150 ON I–40 (EXIT NO. 112) OVER SR 1744 (MINERAL SPRINGS MOUNTAIN RD.)***

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

NAD 83

4 5 6



THIS IS A CONTROLLED–ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

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

2018 ADT = 48,260
2038 ADT = 63,300
K = 8%
D = 55%
T = 10%*
V = 70 MPH
(TTST 7% + DUAL 3%)

FUNC. CLASS. = INTERSTATE

STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B–4448	=	0.549 mi.
LENGTH STRUCTURES TIP PROJECT B–4448	=	0.019 mi.
TOTAL LENGTH TIP PROJECT B–4448	=	0.568 mi.

BRIDGE LENGTH BASED ON EASTBOUND BRIDGE

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)557-6929
Firm License #: C-1051
www.stewartpc.com
PROJECT #:IH16016.00

ECOLOGICAL ENGINEERING

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JUNE 19, 2017

LETTING DATE:
JUNE 19, 2018

ANDY YOUNG, PE
PROJECT ENGINEER

MICHAEL BURNS, PE
PROJECT DESIGN ENGINEER

DAVID STUTTS, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

DocuSigned by: Frank F Fleming
B1DD721AA9FA4A6...
5/14/2018
P.E.
SIGNATURE:

NORTH CAROLINA PROFESSIONAL SEAL 20147 ENGINEER FRANK F. FLEMING

ROADWAY DESIGN ENGINEER

DocuSigned by: Andrew P. Young
EE2150D0D82E4EF...
5/14/2018
P.E.
SIGNATURE:

NORTH CAROLINA PROFESSIONAL SEAL 034407 ENGINEER ANDREW P. YOUNG

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

4/11/2018
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USER:ayoung

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-4448	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 034407 ENGINEER ANDREW P. YOUNG

DocuSigned by: Andrew P. Young 5/15/2018

Firm License No. C-1053
421 Fayetteville St.
Suite 400
Raleigh, NC 27601
T: 919.380.8750
www.stewartinc.com

STEWART

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INDEX OF SHEETS

EFF. 01-16-2018
REV.

2018 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
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
225.09	Guide for Shoulder and Ditch Transition at Grade Separations
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 4 - MAJOR STRUCTURES	
422.03	Reinforced Bridge Approach Fills - Type A Alternate Approach Fill for Integral Abutment
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
560.02	Method of Shoulder Construction - High Side of Superelevated Curve - Method II
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
610.03	Guide for Paving Shoulders Under Bridges - Method III
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
815.02	Subsurface Drain
840.00	Concrete Base Pad for Drainage Structures
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.24	Frames and Narrow Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.45	Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
852.01	Concrete Islands
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
866.02	Woven Wire Fence - with Wood Post
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

GENERAL NOTES:

2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADE LINE:
GRADING AND SURFACING:

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

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 & STD. NO. 225.05 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01 AND 560.02

SIDE ROADS:

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

SUBSURFACE DRAINS:

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

GUARDRAIL:

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

TEMPORARY SHORING:

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

SUBSURFACE PLANS:

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

END BENTS:

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-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
CHARTER
CENTURYLINK

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.

5/15/2018
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USER:rdowning

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
B-4448	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 (T 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 (H 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-4448	1C-1
Location and Surveys	

SURVEY CONTROL SHEET B-4448
FINAL

GPS

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
GPS1	GPS1	729759.9930	1243672.7020	1242.40	19+29.49	53.77 RT
GPS2	GPS2	729909.7120	1244690.1780	1188.85	29+23.40	318.00 RT

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	BL1	729494.1040	1242833.1190	1260.27	10+52.03	1.64 RT
2	BL2	729714.2450	1243418.0750	1248.22	16+77.48	4.74 LT
3	BL3	729957.1090	1243991.7140	1236.52	23+00.41	1.35 LT
4	BL4	730190.0050	1244544.7140	1224.14	29+00.44	3.04 RT
5	BL5	730447.4580	1245142.3240	1211.68	35+51.15	2.50 RT
6	BL6	730683.2340	1245694.8680	1200.50	41+51.89	4.07 RT
7	BL7	730914.5600	1246249.8880	1190.13	OUTSIDE PROJECT LIMITS	

BM1 ELEVATION = 1255.18
N 729497 E 1243058
L STATION 12+65.25 68.44' RIGHT
PUNCH HOLE IN CENTER POST OF CONC. BASE OF VALDESE EXIT SIGN

BM2 ELEVATION = 1227.07
N 730136 E 1244430
L STATION 27+73.92 7.58' RIGHT
PUNCH HOLE IN NW COR. OF EB BRIDGE END BENT

BM3 ELEVATION = 1195.10
N 730805 E 1246211
LOCATED S 19°25'37.44" W DIST 116.65'
FROM BL-7
RR SPIKE IN BASE OF 15" WHITE OAK

BY

POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
8	BY8	729401.5190	1244724.8630	1194.83	OUTSIDE PROJECT LIMITS	
9	BY9	729969.4520	1244656.2150	1189.93	16+61.57	38.16 LT
10	BL10	730371.4720	1244316.5090	1220.81	11+42.86	21.89 RT
11	BY11	730791.2160	1244073.4860	1245.28	OUTSIDE PROJECT LIMITS	

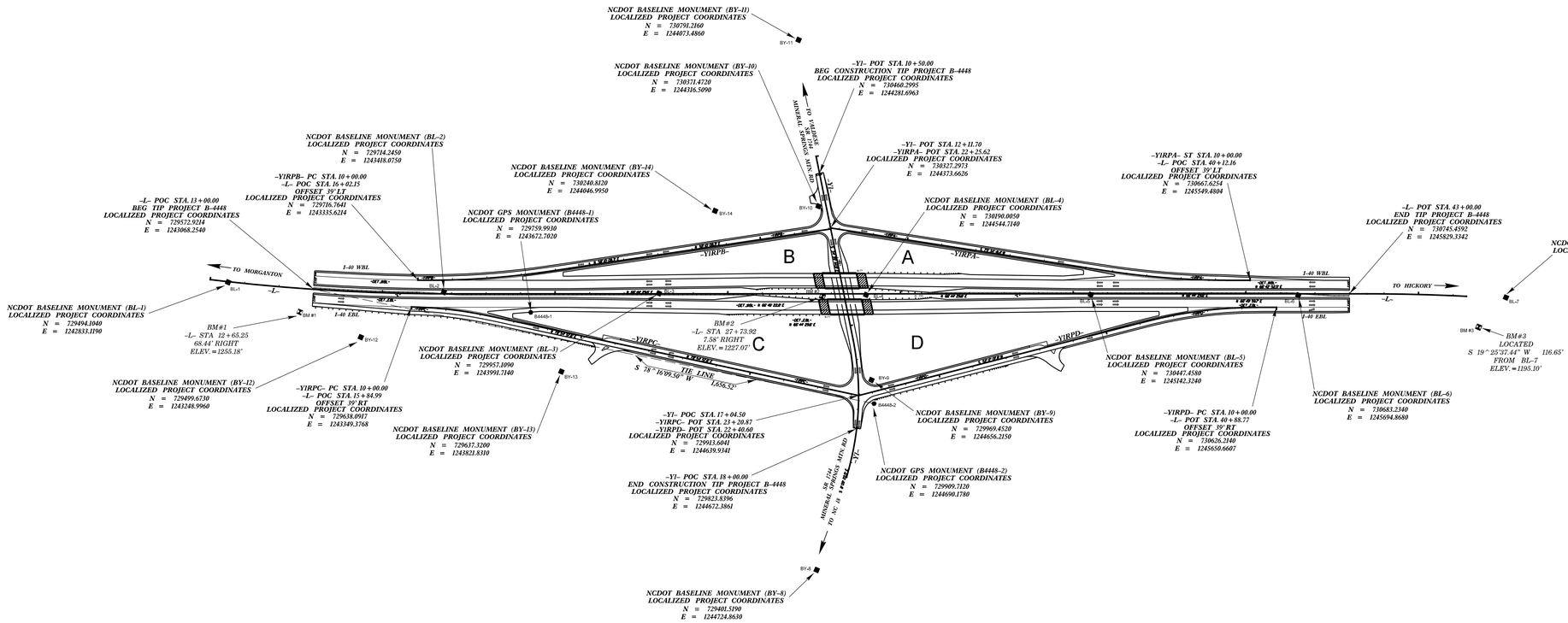
BY1

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
12	BY12	729499.6730	1243248.9960	1242.93	14+42.92	130.93 RT
13	BY13	729637.3200	1243821.8310	1226.04	20+18.06	225.36 RT

BY2

POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
14	BY14	730240.8120	1244046.9950	1259.84	10+97.05	317.88 RT
10	BY10	730371.4720	1244316.5090	1220.81	11+42.86	21.89 RT

NC NAD GRID 83



NOTES:

1. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:*
   HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   B4448_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 NGS ONLINE POSITIONING SERVICE (OPUS)

NOTE: DRAWING NOT TO SCALE

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B-4448-2" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 729909.7120(ft) EASTING: 1244690.1780(ft) ELEVATION: 1188.85(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999856906
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B-4448-2" TO -L- 13+00 STATION IS S 78°16'09.50" W 1,656.52'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

4/1/2018
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USER:Rdavis

PROJECT REFERENCE NO.	SHEET NO.
B-4448	1C-2
Location and Surveys	

SURVEY CONTROL SHEET B-4448
FINAL

DESIGN ALIGNMENTS

L

TYPE	STATION	NORTH	EAST
PC	10+00.00	729480.7671	1242782.7946
PT	16+86.70	729713.5204	1243428.4078
PC	43+50.92	730765.5680	1245876.1198
PT	46+38.88	730872.5802	1246143.4162

EBL

TYPE	STATION	NORTH	EAST
PC	10+00.00	729466.3768	1242787.0276
PT	16+88.50	729699.7394	1243434.3309
PC	43+52.72	730751.7870	1245882.0429
PT	46+39.92	730858.5190	1246148.6396

WBL

TYPE	STATION	NORTH	EAST
PC	10+00.00	729495.1575	1242778.5616
PT	16+84.90	729727.3014	1243422.4846
PC	43+49.13	730779.3490	1245870.1966
PT	46+37.83	730886.6413	1246138.1928

Y1

TYPE	STATION	NORTH	EAST
POT	10+00.00	730501.4253	1244253.2592
PC	15+41.02	730056.4298	1244560.9578
PT	19+19.67	729707.0385	1244697.9486
POT	19+44.67	729682.2914	1244701.4954

Y1RPA

TYPE	STATION	NORTH	EAST
TS	10+00.00	730667.6254	1245549.4804
SC	11+19.99	730621.1974	1245438.8405
CS	13+57.81	730544.4337	1245213.8648
ST	14+77.80	730513.5494	1245097.9213
POT	22+25.62	730327.2973	1244373.6626

Y1RPB

TYPE	STATION	NORTH	EAST
PC	10+00.00	729716.7641	1243335.6214
CS	13+21.13	729859.3274	1243623.0854
ST	14+41.12	729921.7192	1243725.5745
POT	22+05.79	730325.0161	1244375.2399

Y1RPC

TYPE	STATION	NORTH	EAST
PC	10+00.00	729638.0917	1243349.3768
CS	11+63.99	729689.1543	1243505.0650
ST	12+83.98	729714.2637	1243622.3835
POT	23+20.87	729913.6041	1244639.9341

Y1RPD

TYPE	STATION	NORTH	EAST
TS	10+00.00	730626.2140	1245650.6607
SC	11+19.99	730577.0796	1245541.2054
CS	13+15.38	730478.0528	1245373.0009
ST	14+35.37	730406.1869	1245276.9283
POT	22+40.60	729913.6041	1244639.9341

PERMANENT EASEMENT POINTS

PERMANENT EASEMENT-E REBAR & CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y1	18+41.55	17.00	729779.7244	1244666.6716
Y1	18+52.00	55.00	729761.2807	1244631.9777

PERMANENT EASEMENT-E REBAR & CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y1RPC	22+83.00	130.00	729778.7487	1244627.7633

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y1RPD	15+40.00	-130.00	730239.3421	1245273.6823
Y1RPD	15+40.00	-150.00	730223.5207	1245285.9169
Y1RPD	15+75.00	-130.00	730217.9316	1245245.9949
Y1RPD	15+75.00	-150.00	730202.1103	1245258.2295

NOTES:

1. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:*
   HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   B4448_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 NGS ONLINE POSITIONING SERVICE (OPUS)

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B-4448-2" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 729909.7120(ft) EASTING: 1244690.1780(ft) ELEVATION: 1188.85(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999856906
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B-4448-2" TO -L- 13+00 STATION IS S 78°16'09.50" W 1,656.52'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

4/25/2018
C:\Projects\Proj\B4448_LS_1C-2.dgn
USER:Rbarnard

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034407 ENGINEER ANDREW P. YOUNG
DocuSigned by: Andrew P. Young 5/10/2018
EF21D93DD62F4EF...

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK S. MORRISON
DocuSigned by: Clark Morrison 5/12/2018
B0A110DD1E004C4...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

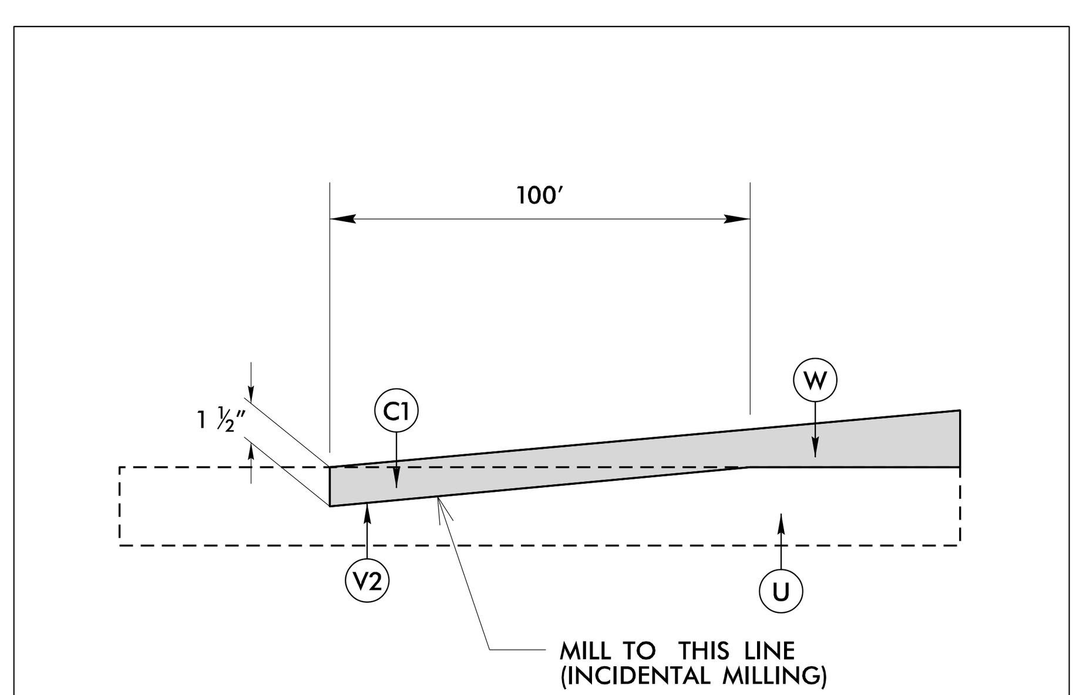
8/17/99

REVISIONS

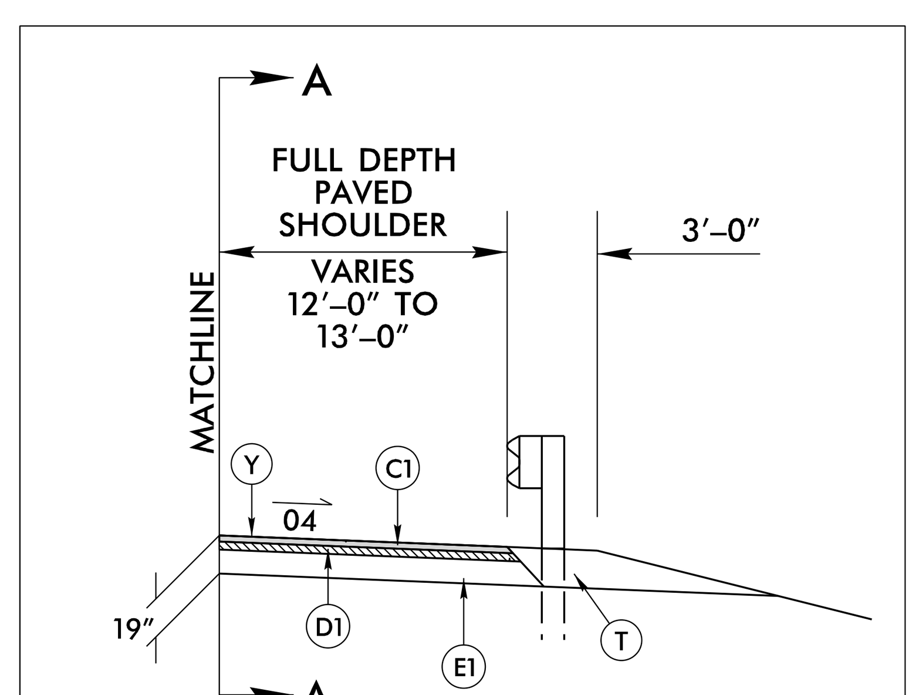
FINAL PAVEMENT SCHEDULE

C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E1	PROP. APPROX. 12" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. IN EACH OF THREE LAYERS.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E2	PROP. APPROX. 3" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
C3	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	E3	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
C4	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	E4	PROP. APPROX. 4½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.
C5	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.	E5	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
C6	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	J1	8" AGGREGATE BASE COURSE.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R1	SHOULDER BERM GUTTER.
D2	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	T	EARTH MATERIAL.
D3	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
D4	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	V1	MILLING ASPHALT PAVEMENT, 0.5" DEPTH. (REMOVAL OF EXISTING ULTRA THIN PAVEMENT)
		V2	MILLING ASPHALT PAVEMENT, 1.5" DEPTH.
		W	ASPHALT WEDGING (SEE DETAIL).
		Y	MILLED RUMBLE STRIPS.

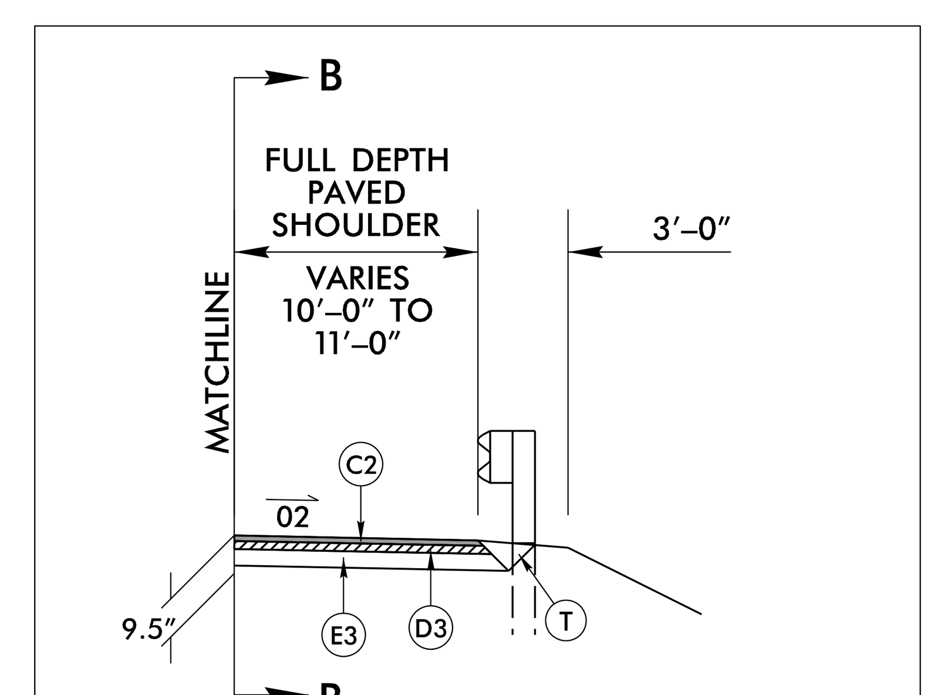
NOTE: PAVEMENT EDGE SLOPES ARE 1:1, UNLESS SHOWN OTHERWISE



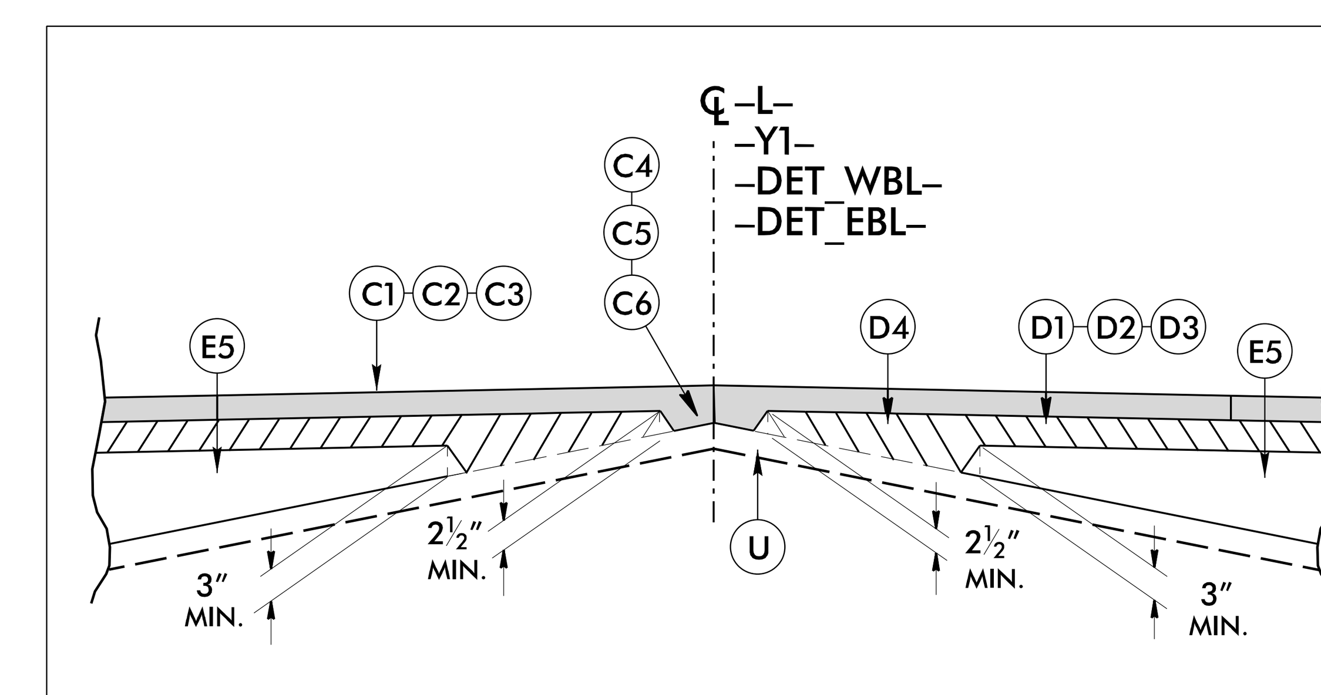
DETAIL SHOWING MILLED PAVEMENT PROFILE TIE-IN



DETAIL SHOWING PAVING TO THE FACE OF GUARDRAIL



DETAIL SHOWING PAVING TO THE FACE OF GUARDRAIL



DETAIL SHOWING METHOD OF WEDGING

4/13/2018
...\Roadway\Proj\B4448_RDY_TYP.dgn

8/17/99

REVISIONS

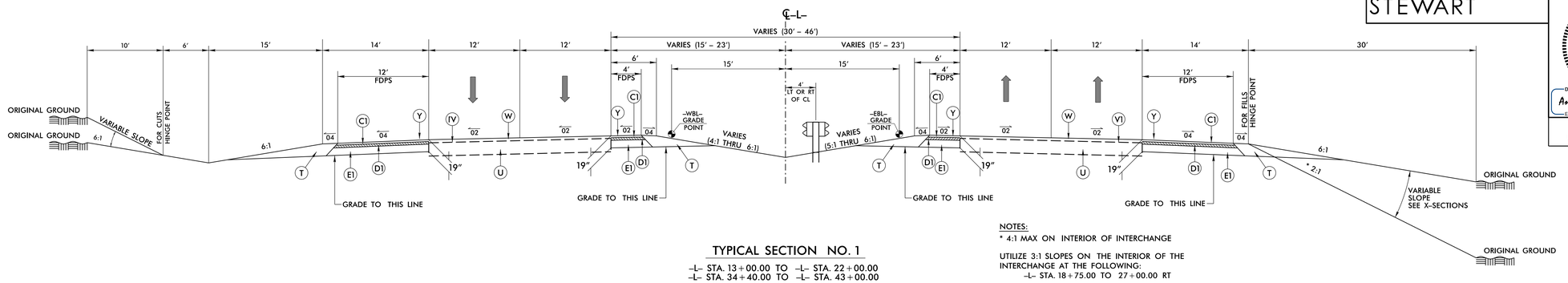
STEWART
Firm License No. C-1051
421 Fayetteville St.
Suite 400
Raleigh, NC 27601
T 919.380.8750
www.stewartinc.com

PROJECT REFERENCE NO.	SHEET NO.
B-4448	2A-2

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034407 ENGINEER ANDREW P YOUNG
DocuSigned by: Andrew P. Young EF21D93DD62F4EF...
5/10/2018

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK MORRISON
DocuSigned by: Clark Morrison B0A110DD1E004C4...
5/12/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



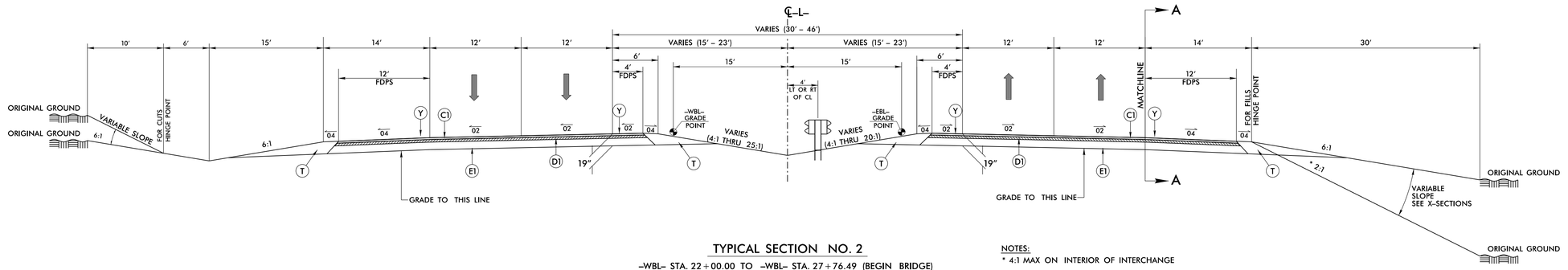
TYPICAL SECTION NO. 1

–L– STA. 13+00.00 TO –L– STA. 22+00.00
–L– STA. 34+40.00 TO –L– STA. 43+00.00

NOTES:
* 4:1 MAX ON INTERIOR OF INTERCHANGE

UTILIZE 3:1 SLOPES ON THE INTERIOR OF THE INTERCHANGE AT THE FOLLOWING:
–L– STA. 18+75.00 TO 27+00.00 RT

EXISTING ULTRA THIN ASPHALT PAVEMENT TO BE MILLED PRIOR TO WEDGING.

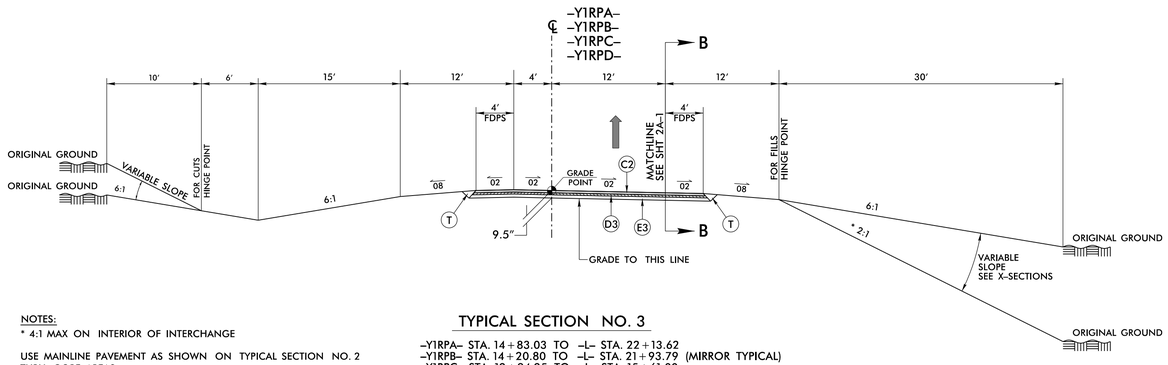


TYPICAL SECTION NO. 2

–WBL– STA. 22+00.00 TO –WBL– STA. 27+76.49 (BEGIN BRIDGE)
–WBL– STA. 28+76.49 (END BRIDGE) TO –WBL– STA. 34+40.00
–EBL– STA. 23+83.00 TO –EBL– STA. 27+95.42 (BEGIN BRIDGE)
–EBL– STA. 28+95.42 (END BRIDGE) TO –EBL– STA. 32+60.00

NOTES:
* 4:1 MAX ON INTERIOR OF INTERCHANGE

UTILIZE 3:1 SLOPES ON THE INTERIOR OF THE INTERCHANGE AT THE FOLLOWING:
–L– STA. 18+75.00 TO 27+00.00 RT

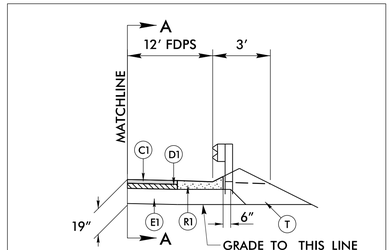


TYPICAL SECTION NO. 3

–Y1RPA– STA. 14+83.03 TO –L– STA. 22+13.62
–Y1RPB– STA. 14+20.80 TO –L– STA. 21+93.79 (MIRROR TYPICAL)
–Y1RPC– STA. 12+94.25 TO –L– STA. 15+61.00
–Y1RPD– STA. 13+40.51 TO –L– STA. 16+74.00 (MIRROR TYPICAL)

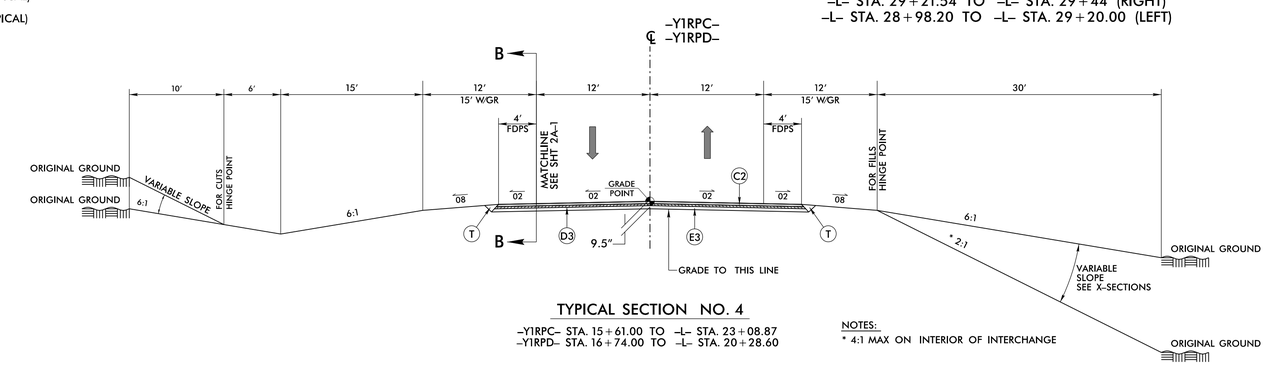
NOTES:
* 4:1 MAX ON INTERIOR OF INTERCHANGE

USE MAINLINE PAVEMENT AS SHOWN ON TYPICAL SECTION NO. 2 THRU GORE AREAS.



DETAIL SHOWING GUARDRAIL WITH SHOULDER BERM GUTTER

–L– STA. 25+50.00 TO –L– STA. 27+73.70 (RIGHT)
–L– STA. 29+21.54 TO –L– STA. 29+44 (RIGHT)
–L– STA. 28+98.20 TO –L– STA. 29+20.00 (LEFT)



TYPICAL SECTION NO. 4

–Y1RPC– STA. 15+61.00 TO –L– STA. 23+08.87
–Y1RPD– STA. 16+74.00 TO –L– STA. 20+28.60

NOTES:
* 4:1 MAX ON INTERIOR OF INTERCHANGE

FINAL PAVEMENT SCHEDULE

C1	3" S9.5D
C2	3" S9.5B
C3	3" TYPE S9.5C
C4	VAR. S9.5D
C5	VAR. S9.5B
C6	VAR. S9.5C
D1	4" I19.0C
D2	3" I19.0C
D3	2.5" I19.0C
D4	VAR. I19.0C
E1	12" B25.0C
E2	3" B25.0C
E3	4" B25.0C
E4	4½" B25.0C
E5	VAR. B25.0C
J1	8" AGGREGATE BASE COURSE.
R1	SHOULDER BERM GUTTER.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V1	0.5" MILLING
V2	1.5" MILLING
W	ASPHALT WEDGING (SEE DETAIL).
Y	MILLED RUMBLE STRIPS.

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

4/13/2018
N:\Roadway\Proj\B4448_RDY_TYP.dgn
USER:Rbruno

8/17/99

REVISIONS

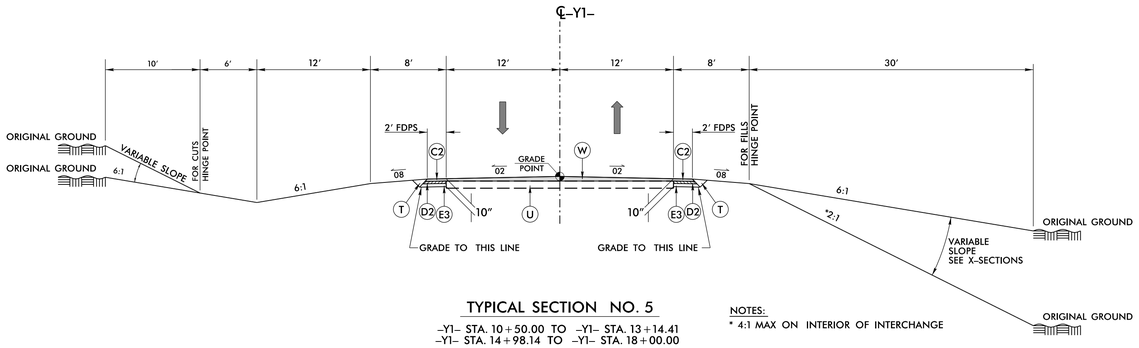
STEWART
Firm License No. C-1051
421 Fayetteville St.
Suite 400
Raleigh, NC 27601
T 919.380.8750
www.stewartinc.com

PROJECT REFERENCE NO.	SHEET NO.
B-4448	2A-3

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034407 ENGINEER ANDREW P YOUNG
DocuSigned by: Andrew P. Young EF21D93D0D6F4EF...
5/10/2018

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK MORRISON
DocuSigned by: Clark Morrison 89A110DD1E004C4...
5/12/2018

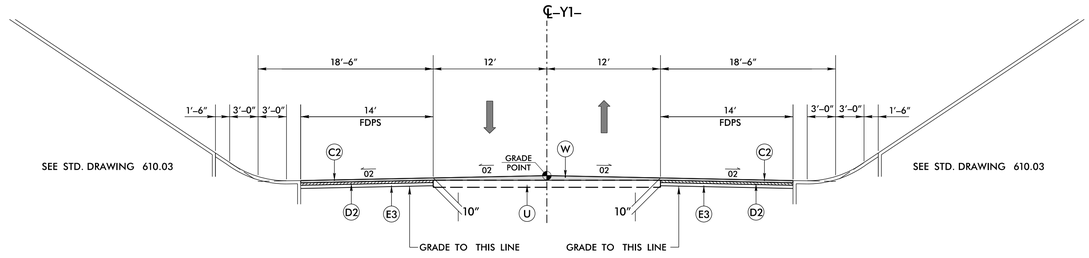
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TYPICAL SECTION NO. 5

–Y1– STA. 10+50.00 TO –Y1– STA. 13+14.41
–Y1– STA. 14+98.14 TO –Y1– STA. 18+00.00

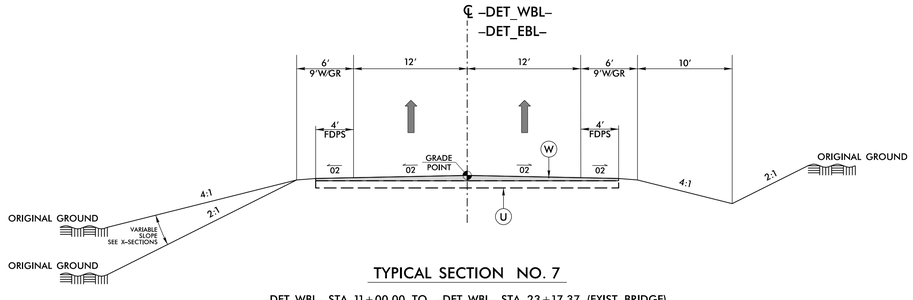
NOTES:
* 4:1 MAX ON INTERIOR OF INTERCHANGE



TYPICAL SECTION NO. 6

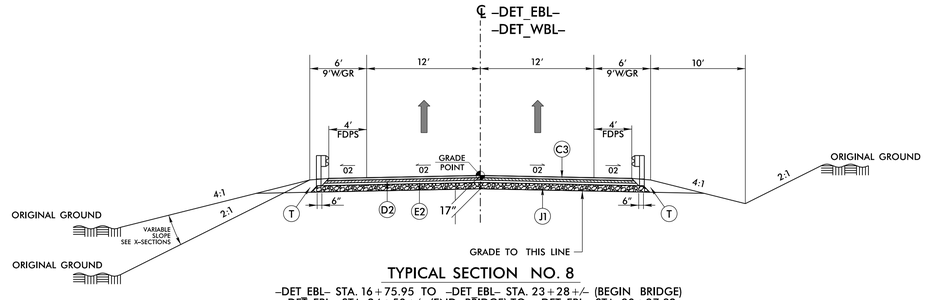
–Y1– STA. 13+14.41 TO –Y1– STA. 14+98.14

NOTES:
14-FOOT FDPS IS PROVIDED FOR FUTURE 3-LANE SECTION



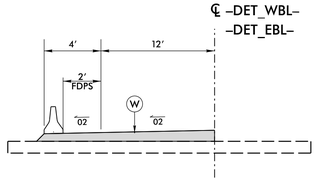
TYPICAL SECTION NO. 7

–DET_WBL– STA. 11+00.00 TO –DET_WBL– STA. 23+17.37 (EXIST. BRIDGE)
–DET_WBL– STA. 24+38.61 (EXIST. BRIDGE) TO –DET_WBL– STA. 35+50.00
–DET_EBL– STA. 10+50.00 TO –DET_EBL– STA. 16+75.95
–DET_EBL– STA. 30+27.82 TO –DET_EBL– STA. 36+50.00



TYPICAL SECTION NO. 8

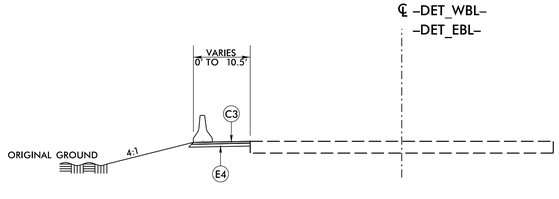
–DET_EBL– STA. 16+75.95 TO –DET_EBL– STA. 23+28 +/– (BEGIN BRIDGE)
–DET_EBL– STA. 24+50 +/– (END BRIDGE) TO –DET_EBL– STA. 30+27.82
–DET_WBL– STA. 16+05.54 TO –DET_WBL– STA. 18+22.33
–DET_WBL– STA. 28+81.70 TO –DET_WBL– STA. 31+00.38



PARTIAL TYPICAL SECTION NO. 7A

–DET_WBL– STA. 15+18 +/– TO –DET_WBL– STA. 17+25 +/– (LEFT)
–DET_WBL– STA. 29+43 +/– TO –DET_WBL– STA. 32+58 (LEFT)
–DET_EBL– STA. 12+46 +/– TO –DET_EBL– STA. 18+61 +/– (LEFT)
–DET_EBL– STA. 28+72 TO –DET_EBL– STA. 34+12 +/– (LEFT)

NOTES:
USE WITH TYPICAL SECTION NO. 7



TYPICAL SECTION NO. 9

–L– STA. 17+09 +/– TO –L– STA. 17+98 +/–
–L– STA. 37+32 +/– TO –L– STA. 44+00 +/–
–L– STA. 31+11 +/– TO –L– STA. 41+15 +/–

FINAL PAVEMENT SCHEDULE

C1	3″ S9.5D
C2	3″ S9.5B
C3	3″ TYPE S9.5C
C4	VAR. S9.5D
C5	VAR. S9.5B
C6	VAR. S9.5C
D1	4″ I19.0C
D2	3″ I19.0C
D3	2.5″ I19.0C
D4	VAR. I19.0C
E1	12″ B25.0C
E2	3″ B25.0C
E3	4″ B25.0C
E4	4½″ B25.0C
E5	VAR. B25.0C
J1	8″ AGGREGATE BASE COURSE.
R1	SHOULDER BERM GUTTER.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V1	0.5″ MILLING
V2	1.5″ MILLING
W	ASPHALT WEDGING (SEE DETAIL).
Y	MILLED RUMBLE STRIPS.

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

5/8/2018
C:\Projects\Proj\B4448_RDY_TYP.dgn
USER:Brandon

-DET_WBL-

PI Sta 11+00.02
△ = 2° 34' 01.5" (LT)
D = 1° 17' 00.8"
L = 200.00'
T = 100.02'
R = 4,463.87'

PI Sta 14+53.69
△ = 6° 31' 32.8" (RT)
D = 1° 17' 15.2"
L = 506.84'
T = 253.69'
R = 4,450.00'
Runoff = 180'
Se = 4%

PI Sta 19+51.38
△ = 6° 17' 27.5" (LT)
D = 1° 17' 15.2"
L = 488.60'
T = 244.55'
R = 4,450.00'
Runoff = 180'
Se = 4%

-DET_EBL-

PI Sta 11+00.02
△ = 2° 57' 09.6" (LT)
D = 1° 28' 34.8"
L = 200.00'
T = 100.02'
R = 3,880.93'

PI Sta 14+63.69
△ = 6° 46' 56.1" (RT)
D = 1° 17' 15.2"
L = 526.76'
T = 263.69'
R = 4,450.00'
Runoff = 180'
Se = 4%

PI Sta 19+77.75
△ = 6° 27' 22.8" (LT)
D = 1° 17' 15.2"
L = 501.45'
T = 250.99'
R = 4,450.00'
Runoff = 180'
Se = 4%

FOR DETOUR CONSTRUCTION ONLY
2018 ADT = 48,260
DESIGN SPEED = 65 MPH

NAD 83

PROJECT REFERENCE NO.	SHEET NO.
B-4448	2B-1

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034407 ENGINEER ANDREW P YOUNG
DocuSigned by: Andrew P. Young 5/14/2018
EF21D93DD6D74EF...

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20147 ENGINEER FRANK F FLEMING
DocuSigned by: Frank F Fleming 5/14/2018
B1DD721AA9FA4A6...

STEWART
Firm License No. C-1051
421 Fayetteville St.
Suite 400
Raleigh, NC 27601
T 919.380.8750
www.stewartinc.com

NC FIRM LICENSE No:P-1148
1151 SE Cary Parkway, Suite 101
Cary, NC 27518
(919) 678-0035

ECOLOGICAL ENGINEERING

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

5/14/18

BENJAMIN BRIDGES DB 1807 PG 905
JAMES E. & DELORES S. STAMEY HEIRS DB 459 PG 259
MARK A. & CAROL V. SMITH DB 823 PG 1995
MARK E. & LORA L. MELOTT DB 919 PG 1738
JAMES D. & TERESA D. RAKESTRAW DB 1144 PG 842
BEN J. & BARBARA B. BRADSHAW DB 1231 PG 332

BEGIN CONSTRUCTION -DET_WBL- POC STA 11+00.00
BEGIN CONSTRUCTION -DET_EBL- POC STA 10+50.00
PC Sta. 10+00.00
PRC Sta. 12+00.00
PRC Sta. 17+06.84
PRC Sta. 17+26.76
MATCHLINE -DET_WBL- STA 18+00.00 SEE SHEET 2B-2
MATCHLINE -DET_EBL- STA 18+00.00 SEE SHEET 2B-2
TIE TO EXISTING DOUBLE FACE G/R
PORT. CONC. BARRIER SEE TMP PLANS
TEMP. B-77
TEMP. GREU TL-3
CHERRYVALE RD, SR1841 18' PAVED ROADWAY
I-40 WB 43.7' BST
I-40 EB 38' BST

FOR -DET_WBL- PROFILE, SEE SHEET 14

FOR -DET_EBL- PROFILE, SEE SHEET 16

5/10/2018
B-4448_RDY_PSH02B-1.dgn
USER:Doug

5/14/99

REVISIONS

-DET_WBL-

PI Sta 19+51.38	PI Sta 27+46.66	PI Sta 32+34.04
Δ = 6° 17' 27.5" (LT)	Δ = 6° 18' 16.5" (LT)	Δ = 6° 14' 46.2" (RT)
D = 1° 17' 15.2"	D = 1° 17' 15.2"	D = 1° 17' 15.2"
L = 488.60'	L = 489.66'	L = 485.12'
T = 244.55'	T = 245.08'	T = 242.80'
R = 4,450.00'	R = 4,450.00'	R = 4,450.00'
Runoff = 180'	Runoff = 180'	Runoff = 180'
Se = 4%	Se = 4%	Se = 4%

-DET_EBL-

PI Sta 19+77.75	PI Sta 27+23.38	PI Sta 32+24.53
Δ = 6° 27' 22.8" (LT)	Δ = 6° 24' 23.7" (LT)	Δ = 6° 29' 53.8" (RT)
D = 1° 17' 15.2"	D = 1° 17' 15.2"	D = 1° 17' 15.2"
L = 501.45'	L = 497.58'	L = 504.70'
T = 250.99'	T = 249.05'	T = 252.62'
R = 4,450.00'	R = 4,450.00'	R = 4,450.00'
Runoff = 180'	Runoff = 180'	Runoff = 180'
Se = 4%	Se = 4%	Se = 4%

FOR DETOUR CONSTRUCTION ONLY
2018 ADT = 48,260
DESIGN SPEED = 65 MPH

PROJECT REFERENCE NO.	SHEET NO.
B-4448	2B-2

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034407 ENGINEER ANDREW P YOUNG
DocuSigned by: Andrew P. Young 5/14/2018
EF21D93DD62E4EE...

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20147 ENGINEER FRANK F FLEMING
DocuSigned by: Frank F Fleming 5/14/2018
B1DD721AA9FA4A6...

STEWART
Firm License No. C-1051
421 Fayetteville St.
Suite 400
Raleigh, NC 27601
T 919.380.8750
www.stewartinc.com

NC FIRM LICENSE No:P-1148
1151 SE Cary Parkway, Suite 101
Cary, NC 27518
T 919.760.0020

ECOLOGICAL ENGINEERING

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83

MATCHLINE -DET_WBL- STA.18+00.00 SEE SHEET 2B-1

MATCHLINE -DET_EBL- STA.18+00.00 SEE SHEET 2B-1

MATCHLINE -DET_WBL- STA.31+00.00 SEE SHEET 2B-3

MATCHLINE -DET_EBL- STA.31+00.00 SEE SHEET 2B-3

PT Sta. 21+95.44

PC Sta. 25+01.58

PRC Sta. 29+91.24

PT Sta. 22+28.20

PC Sta. 24+74.33

PRC Sta. 29+71.91

-DET_WBL- N 66° 46' 22.8" E

-DET_EBL- N 66° 44' 29.6" E

NOTE: IF THE PROPOSED DETOUR STRUCTURE EXCEEDS THE LENGTH SHOWN, WITHOUT DECK DRAINS, WATER MAY ENCROACH INTO THE TRAVEL LANE WHICH IS NOT DESIRED.

(0201) TEMP. 2GI

(0202) TEMP. 15" CSP

(0203) TEMP. 2GI

(0204) TEMP. JB w/MH

(0205) TEMP. 30" CSP

(0206) TEMP. 2GI

(0207) TEMP. JB w/MH

(0208) TEMP. 15" CSP

(0209)

INC.=45' (TYP)

+86.84 +70.00 +40.00 +46.76 +85.00 +91.24 +91.91

TOE PROTECTION SEE DETAIL 2B-2

GRADE TO DRAIN

TEMP. B-77

PORT. CONC. BARRIER SEE TMP PLANS

FALSE SUMP SEE DETAIL 2B-1

CLASS B RIP RAP EST 2 TONS EST 7 SY GEOTEXTILE

TIE EXISTING 30" CMP TO TEMP. JB w/MH

CLASS I RIP RAP EST 11 TONS EST 22 SY GEOTEXTILE

CLASS I RIP RAP EST 3 TONS EST 7 SY GEOTEXTILE

LATERAL 'V' DITCH SEE DETAIL 2B-3

SAG CURVE – LP
-DET_EBL- STA. 29+80.

CREST CURVE – HP
-DET_EBL- STA. 29+80.

DANIEL D. MANN & BILLIE L. YOUNG DB 931PG 707

ROY M. & RHODA J. POE DB 1956 PG 844

GUY E. & BETTY L. STAMEY DB 428 PG 280

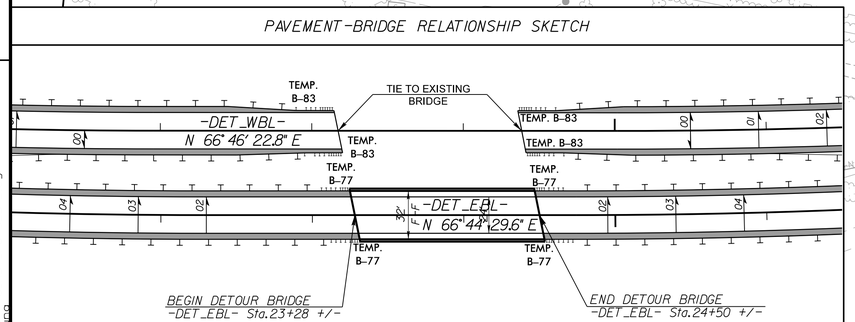
BURKE, H DB 733 PG DB 665 PG

STASH, INC. DB 1626 PG 307

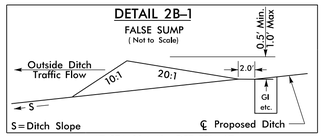
GREENHOUSE

CORNER OBLITERATED

PAVEMENT-BRIDGE RELATIONSHIP SKETCH

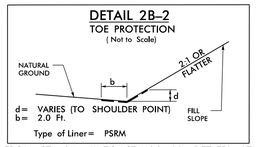


DETAIL 2B–1
FALSE SUMP
(Not to Scale)



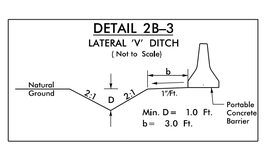
AT STA. 18+48 -DET_EBL- LT
AT STA. 22+58 -DET_EBL- LT

DETAIL 2B–2
TOE PROTECTION
(Not to Scale)



FROM STA. 24+40 TO STA. 26+00 -DET_EBL- LT

DETAIL 2B–3
LATERAL 'V' DITCH
(Not to Scale)



FROM STA. 29+00 TO STA. 32+00 -DET_EBL- LT

FOR -DET_WBL- PROFILE.SEE SHEET 14

FOR -DET_EBL- PROFILE.SEE SHEET 16

5/10/2018
C:\Projects\B4448_RDY_PSH028-2.dgn
USER:Rgoung

PROJECT REFERENCE NO.	SHEET NO.
B-4448	2B-3

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 034407 ANDREW P. YOUNG — Andrew P. Young 5/14/2018

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20147 FRANK F. FLEMING — Frank F. Fleming 5/14/2018

STEWART

ECOLOGICAL ENGINEERING

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REVISIONS

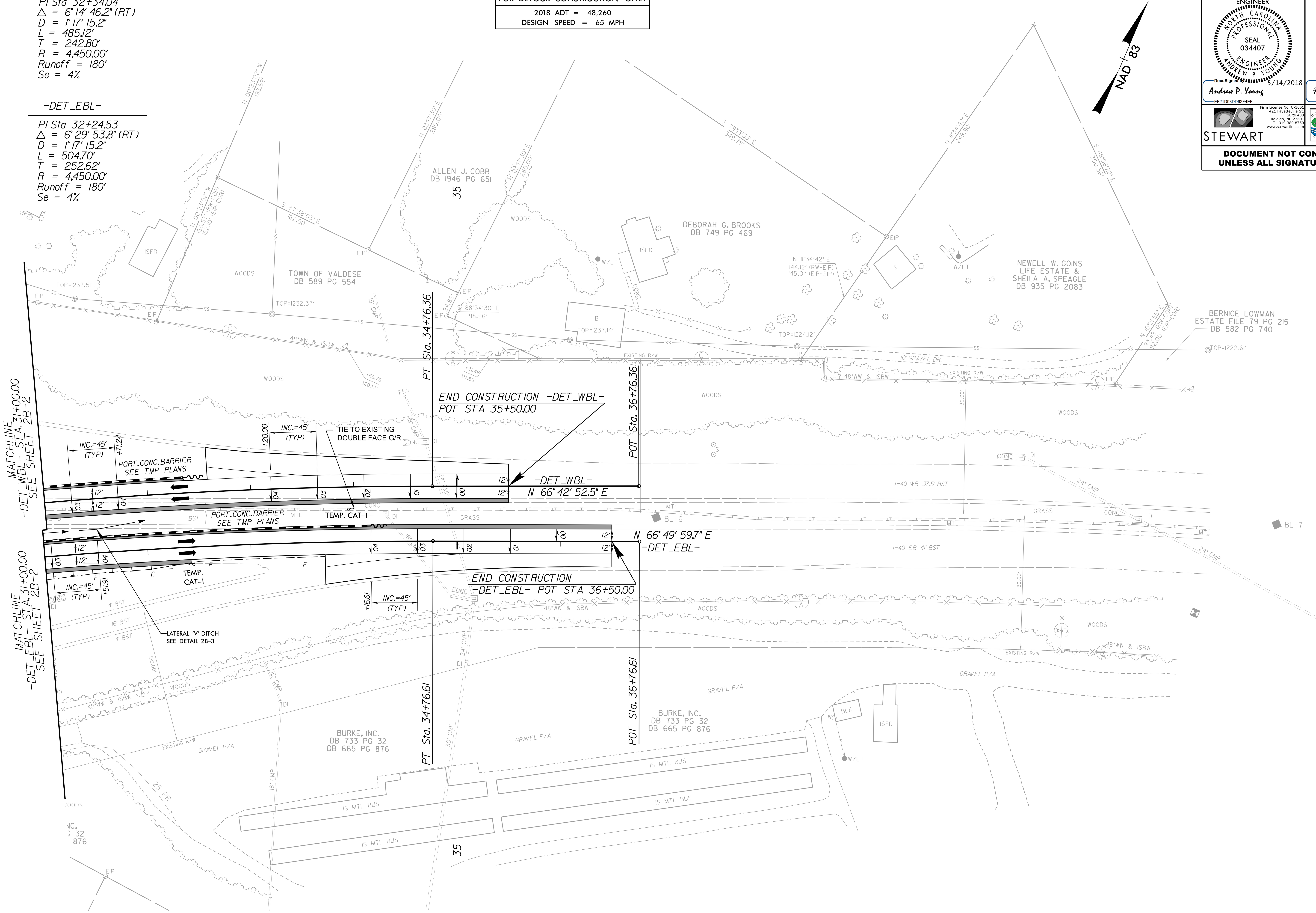
-DET_WBL-

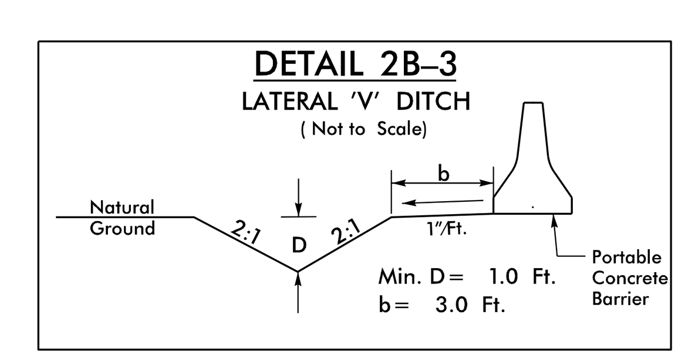
PI Sta 32+34.04
Δ = 6° 14' 46.2" (RT)
D = 1° 17' 15.2"
L = 485.12'
T = 242.80'
R = 4,450.00'
Runoff = 180'
Se = 4%

-DET_EBL-

PI Sta 32+24.53
Δ = 6° 29' 53.8" (RT)
D = 1° 17' 15.2"
L = 504.70'
T = 252.62'
R = 4,450.00'
Runoff = 180'
Se = 4%

FOR DETOUR CONSTRUCTION ONLY
2018 ADT = 48,260
DESIGN SPEED = 65 MPH





FROM STA. 29+00 TO STA. 32+00 -DET_EBL- LT

FOR -DET_WBL- PROFILE,SEE SHEET 15

FOR -DET_EBL- PROFILE,SEE SHEET 17

5/10/2018
...\B4448_RDY_PSH02B-3.dgn

PROJECT REFERENCE NO.	SHEET NO.
B-4448	2C-1

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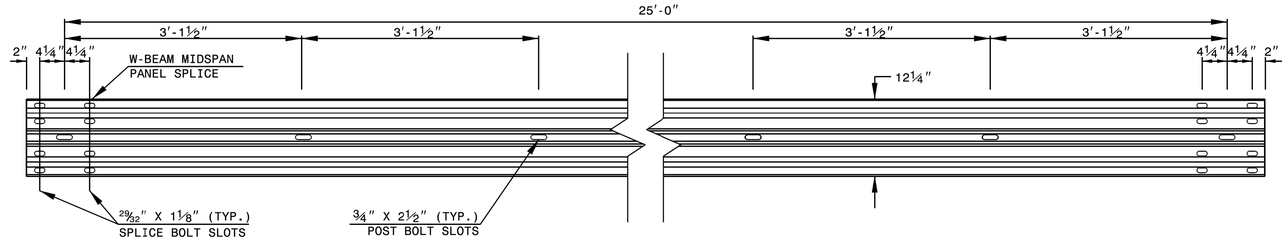
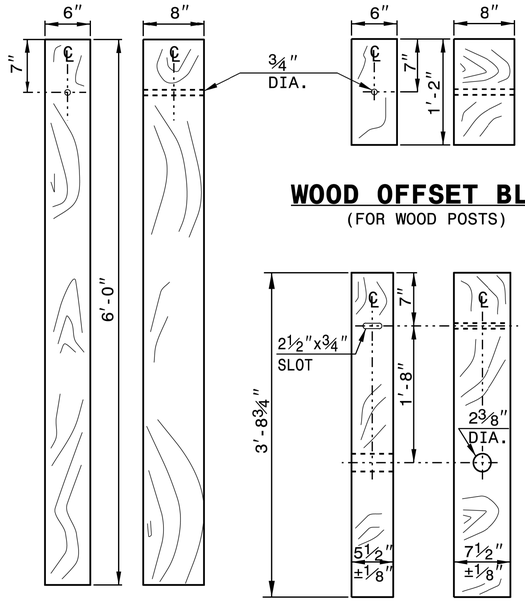
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



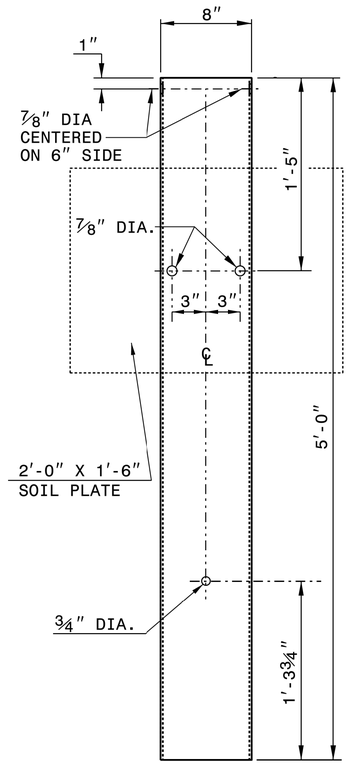
STANDARD W-BEAM GUARDRAIL



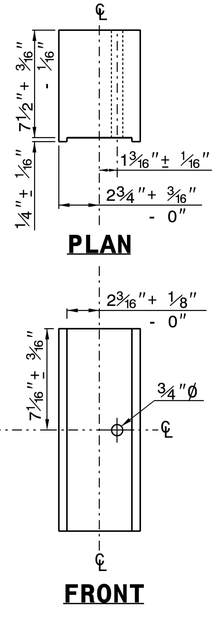
STANDARD LINE POST

WOOD OFFSET BLOCK
(FOR WOOD POSTS)

SHORT WOOD BREAKAWAY POST

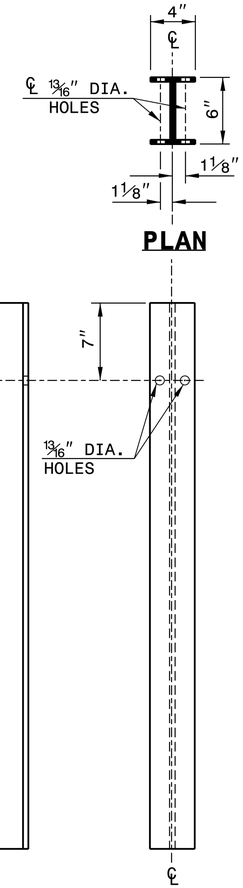


STEEL TUBE
TS 6"x8"x0.1875"



PLAN

SIDE FRONT
ROUTED OFFSET BLOCK



PLAN

SIDE FRONT
"W6" STEEL POST

SYSTEM PARTS

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON
5/10/2018

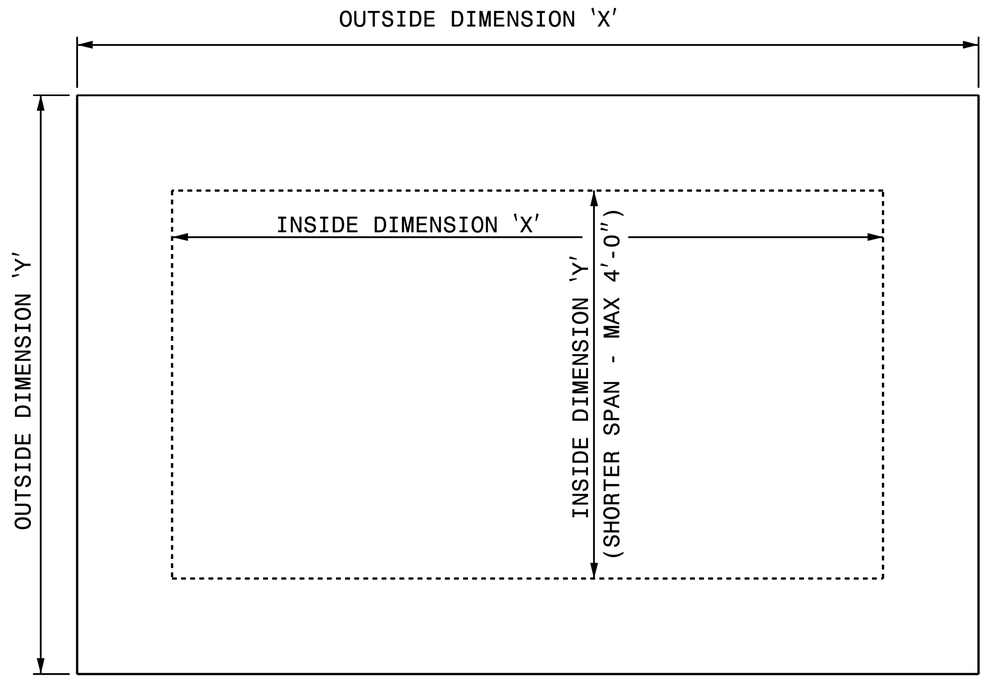
DocuSigned by:
Joel S Howerton
873F3D17DCDC45F...

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

SEE TITLE BLOCK

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

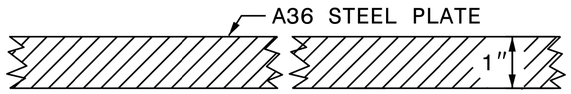
PROJECT REFERENCE NO.	SHEET NO.
B-4448	2C-2



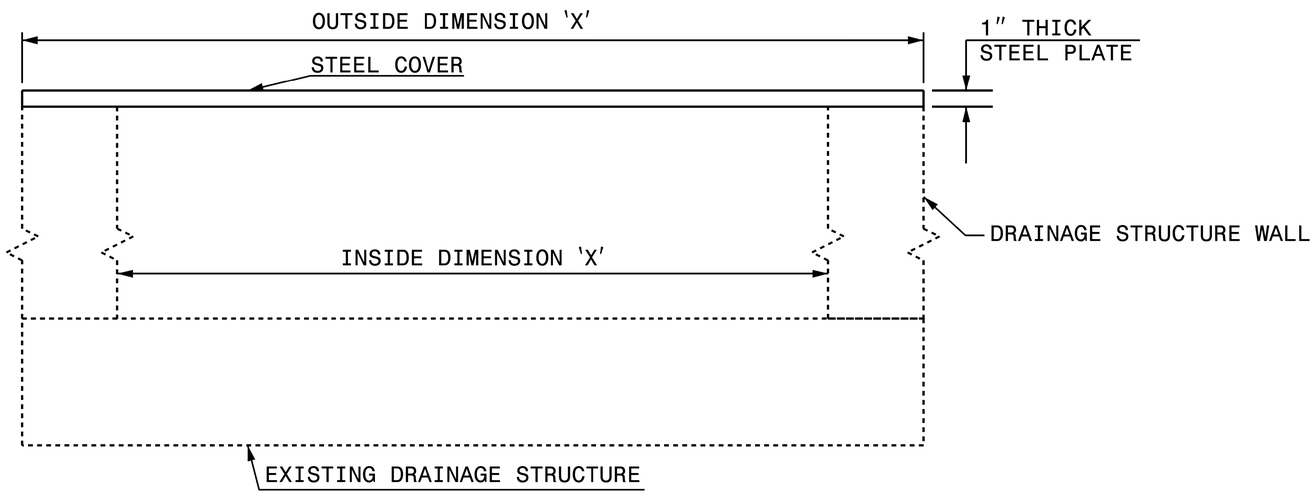
PLAN VIEWS

GENERAL NOTES:

-USE GRADE A36 STEEL
-STEEL COVERS ARE FOR TEMPORARY USE DURING PHASE CONSTRUCTION.
-FILL SHALL BE PLACED DIRECTLY OVER THE STEEL PLATES.
-SEE ROADWAY PLANS AND PROVISIONS FOR LOCATIONS
-QUANTITES TO BE PAID FOR AT THE UNIT PRICE BID PER EACH.



SECTION VIEW OF STEEL TOP PLATE



ELEVATION VIEWS

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

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON

5/10/2018

DocuSigned by:
873F3D17DCDC45F...

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

DETAIL OF TEMPORARY 1" STEEL COVER OVER DRAINAGE STRUCTURE

ORIGINAL BY: E.E. WARD DATE: 2-2-98
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: eric:/usr/details/metric/stand/stlcvr2.dgn

PROJECT REFERENCE NO.	SHEET NO.
B-4448	2D-I

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 20147 ENGINEER FRANK F. FLEMING

DocuSigned by: Frank F Fleming 5/14/2018 B1DD721AA9FA4A6...

STEWART — Firm License No. C-1051, 421 Fayetteville St, Suite 400, Raleigh, NC 27601, T 919.380.8750, www.stewartinc.com

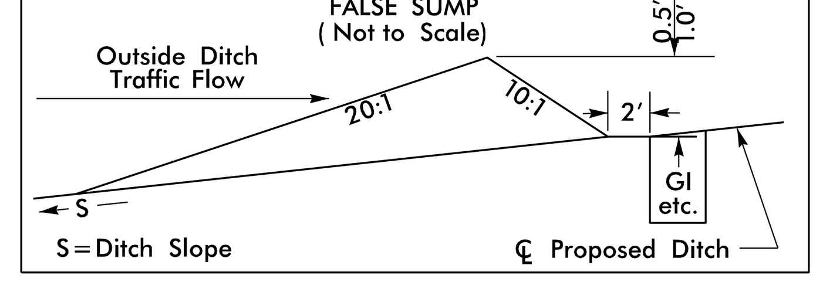
ECOLOGICAL ENGINEERING — NC FIRM LICENSE No: F-1148, 1151 SE Cary Parkway, Suite 101, Cary, NC 27518, (919) 557-0929

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

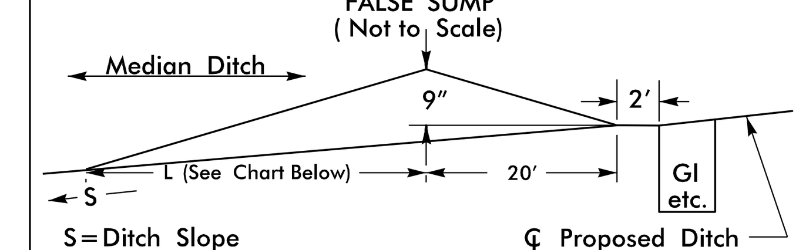
SPECIAL DITCH DETAILS

DETAIL 1
FALSE SUMP
(Not to Scale)



AT STA. 14+59 –L– LT
AT STA. 23+23 –L– LT
AT STA. 10+75.3 –Y1RPA– RT
AT STA. 18+29 –Y1RPB– RT
AT STA. 21+14 – Y1RPB– RT
AT STA. 24+22 –Y1RPB– LT
AT STA. 17+45 –Y1RPC– LT
AT STA. 19+36 –Y1RPC– LT

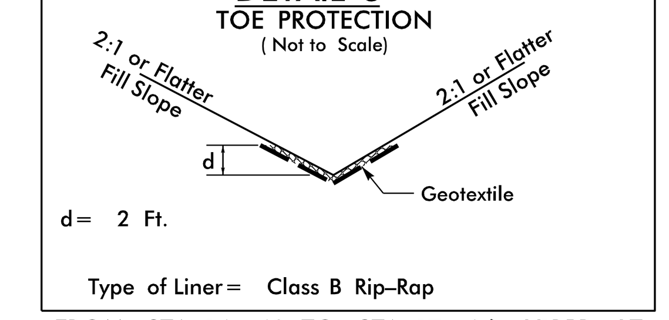
DETAIL 2
FALSE SUMP
(Not to Scale)



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'

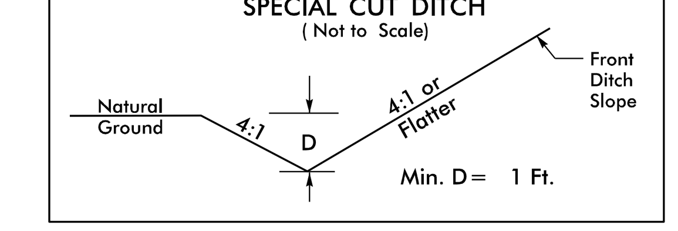
AT STA. 17+79 –L– CL
AT STA. 23+23 –L– CL
AT STA. 27+13 –L– CL
AT STA. 39+62.9 –L– CL

DETAIL 3
TOE PROTECTION
(Not to Scale)



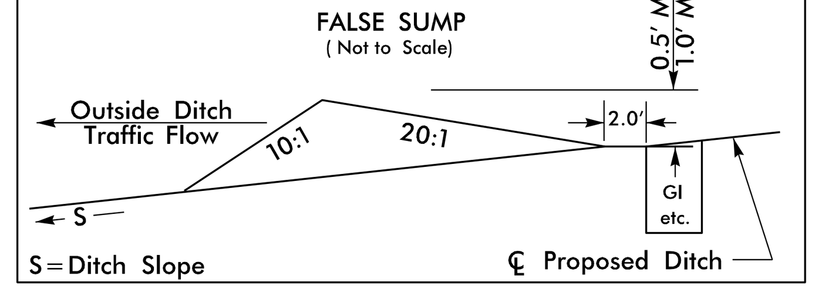
FROM STA. 14+48 TO STA. 17+06 –Y1RPB– LT
FROM STA. 17+06 TO STA. 18+11 –Y1RPB– LT
FROM STA. 19+00 TO STA. 21+65 –Y1RPB– LT

DETAIL 4
SPECIAL CUT DITCH
(Not to Scale)



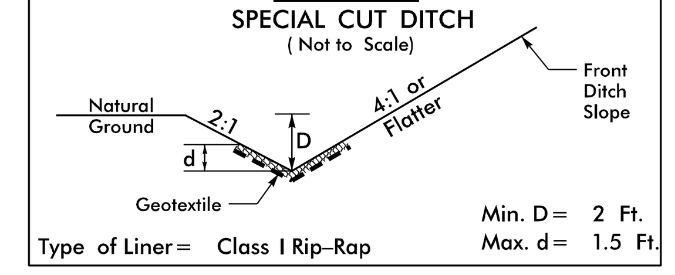
FROM STA. 21+50 TO STA. 23+06 –L– LT
FROM STA. 29+00 –L– TO STA. 31+50 –L– LT
FROM STA. 32+00 TO STA. 35+34 –L– RT
FROM STA. 18+63 –Y1RPA– TO STA. 21+67 –Y1RPA– LT
FROM STA. 21+28 TO STA. 21+88 –Y1RPA– RT
FROM STA. 15+93 TO STA. 19+26 –Y1RPD– RT
FROM STA. 21+03 TO STA. 21+77 –Y1RPD– RT

DETAIL 5
FALSE SUMP
(Not to Scale)



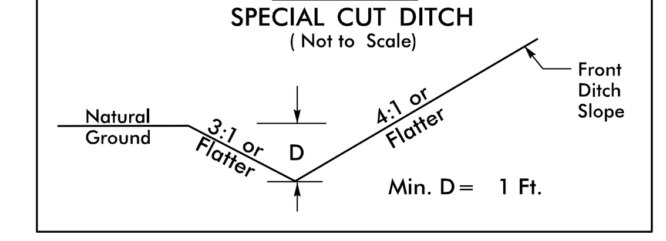
AT STA. 12+63 –Y1– RT
AT STA. 15+13 –Y1– RT
AT STA. 11+02 –Y1RPD– LT
AT STA. 19+40 –Y1RPD– RT

DETAIL 6
SPECIAL CUT DITCH
(Not to Scale)



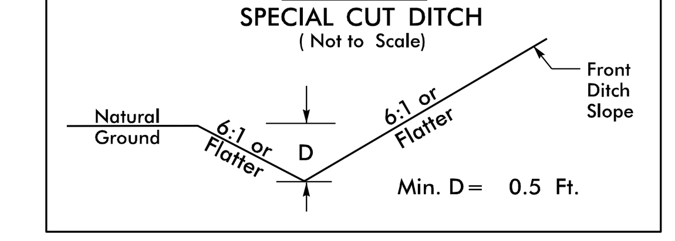
FROM STA. 12+50 TO STA. 13+19 –Y1– LT
FROM STA. 15+50 TO 16+50 –Y1– LT

DETAIL 7
SPECIAL CUT DITCH
(Not to Scale)



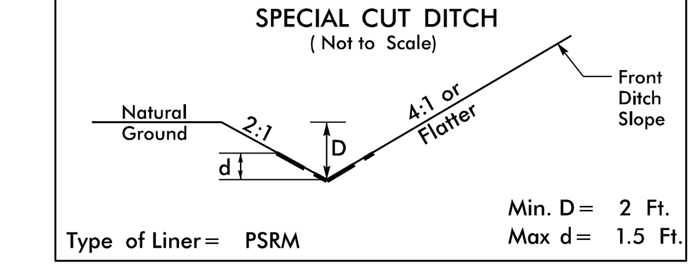
FROM STA. 20+77 TO STA. 22+32 –Y1RPC– LT

DETAIL 8
SPECIAL CUT DITCH
(Not to Scale)



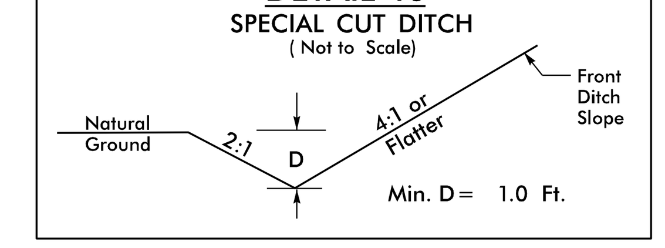
FROM STA. 35+38 TO STA. 37+00 –L– RT

DETAIL 9
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 10+50 TO STA. 11+90 –Y1– LT

DETAIL 10
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 15+00 TO STA. 16+26 –Y1– RT

PROJECT REFERENCE NO.	SHEET NO.
B-4448	2G-1

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 29869 ENGINEER SHANE C CLARK

DocuSigned by: Shane C. Clark 3/29/2018
1F4E87E0BDAD4EA...
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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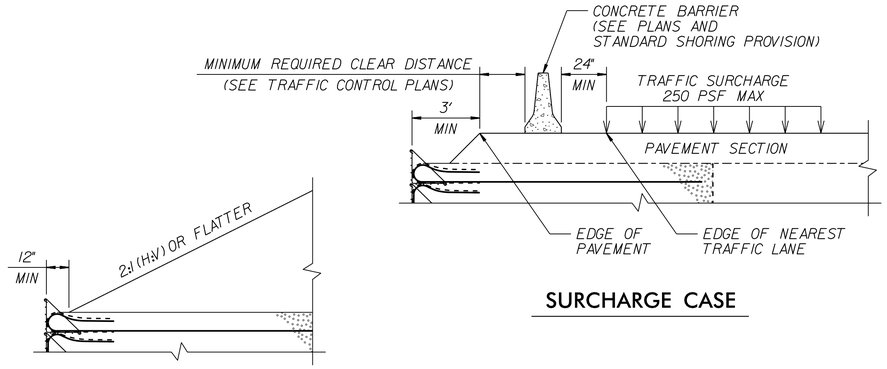
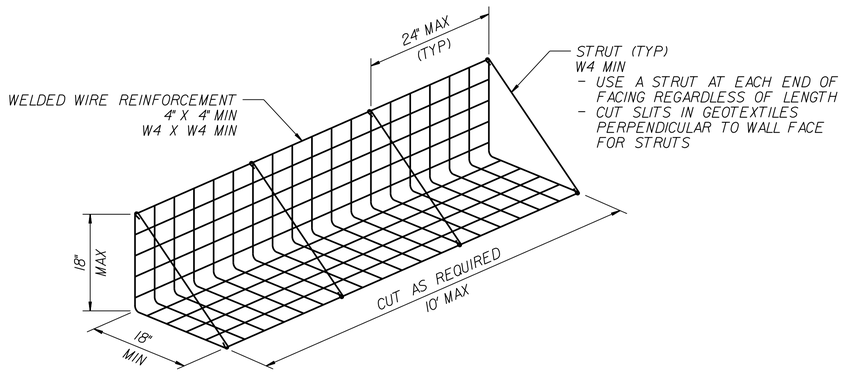
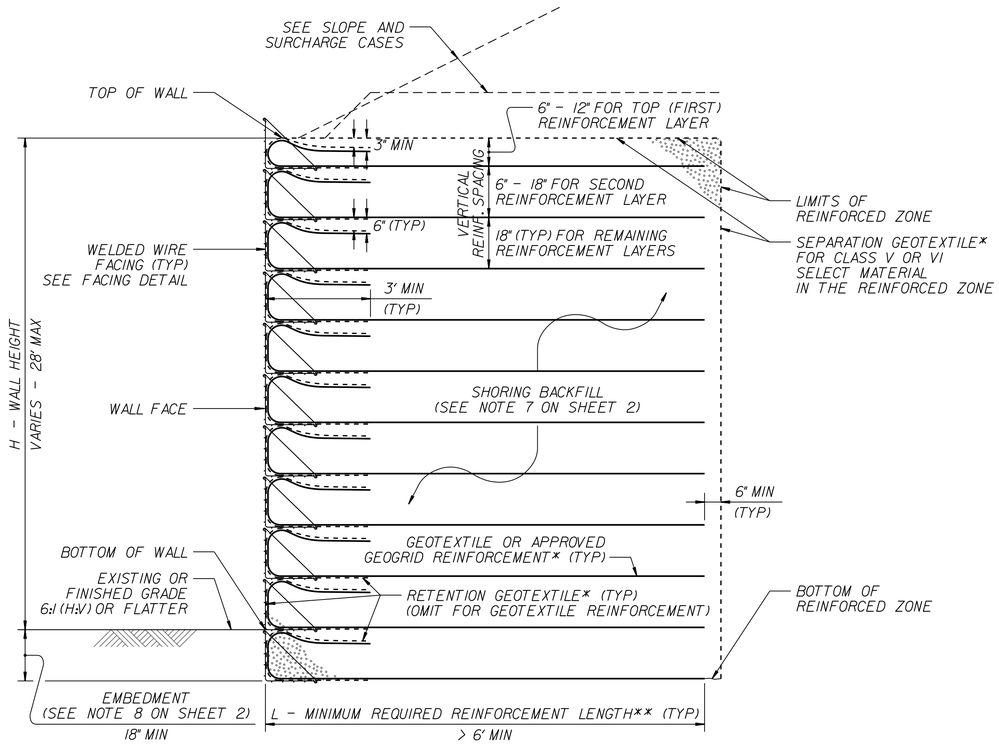


SURCHARGE CASE

SLOPE CASE

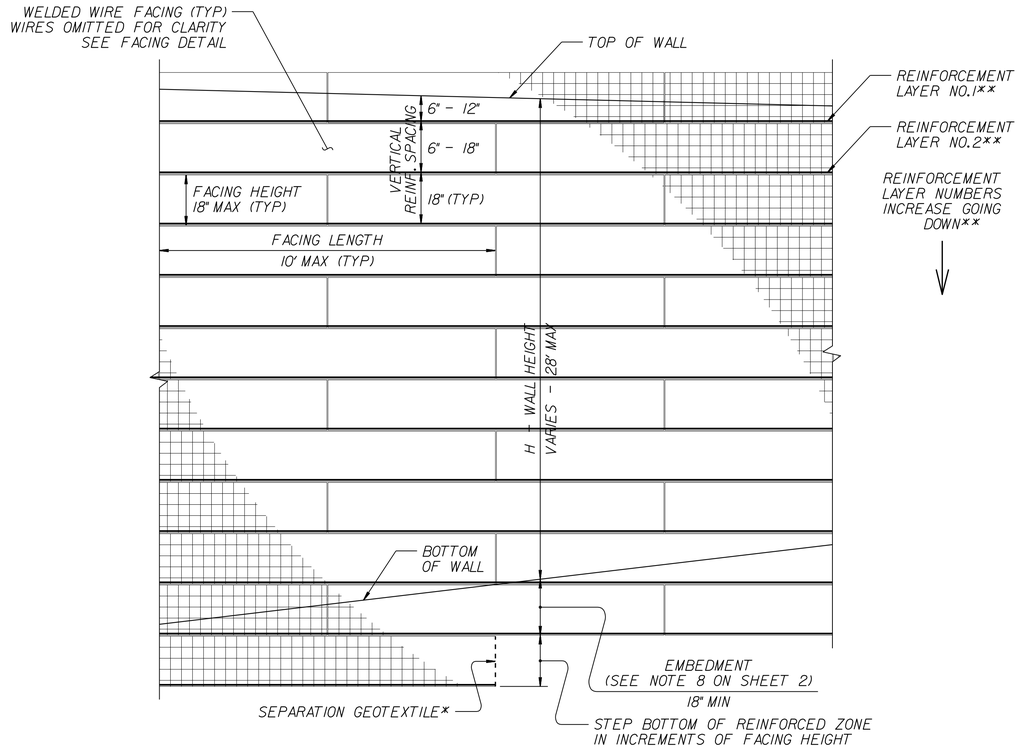


FACING DETAIL



STANDARD TEMPORARY WALL

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



STANDARD TEMPORARY WALL – PARTIAL ELEVATION

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

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD
TEMPORARY WALL
SHEET 1 OF 3

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
B-4448	2G-2

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 29869 ENGINEER SHANE C CLARK

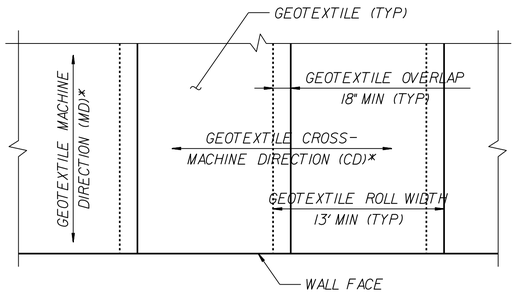
DocuSigned by: Shane C. Clark 3/29/2018

SIGNATURE DATE

ENGINEER

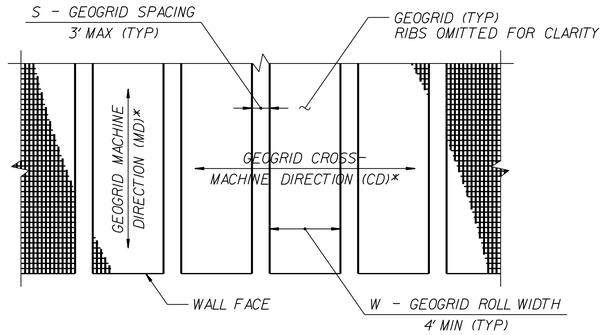
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)

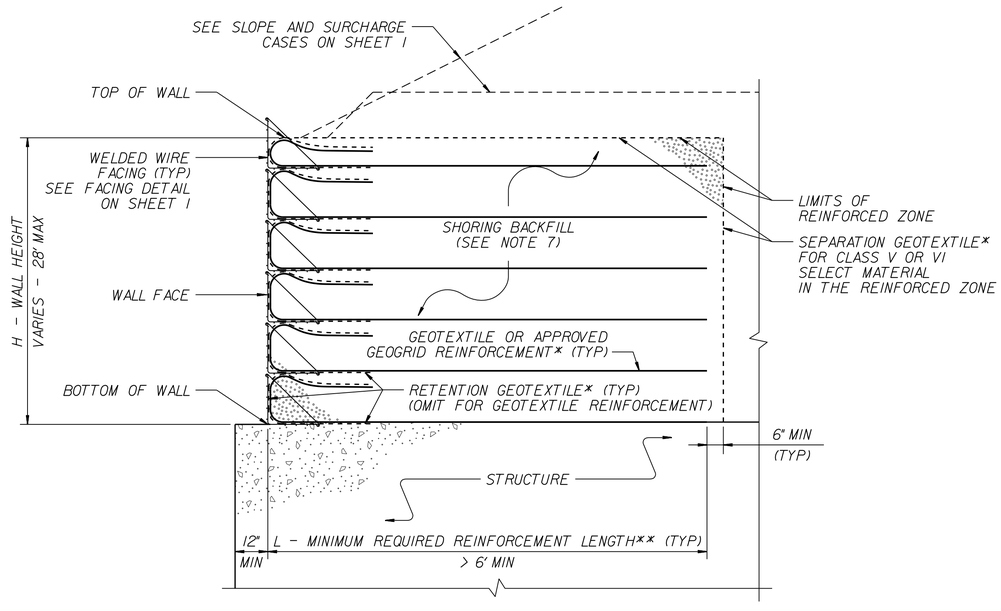


GEOGRID PLACEMENT

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

GEOSYNTHETIC PLACEMENT DETAILS

(PLAN VIEW)
*SEE NOTE 12.



TEMPORARY WALL ON STRUCTURE DETAIL

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

NOTES:

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

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

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD TEMPORARY WALL SHEET 2 OF 3

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
B-4448	2G-3

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 29869 ENGINEER SHANE C CLARK

DocuSigned by: Shane C. Clark 3/29/2018
1F4E87E8D9AD4EA... SIGNATURE DATE

_ ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

L – MINIMUM REQUIRED REINFORCEMENT LENGTH (FT)

(FOR ALL REINFORCEMENT TYPES)

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

GEOTEXTILE REINFORCEMENT
ULTIMATE TENSILE STRENGTH (LB/FT)

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

GEOGRID REINFORCEMENT
SHORT–TERM DESIGN STRENGTH (LB/FT)
(SEE NOTE 10 ON SHEET 2.)

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

*BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 1.

MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD TEMPORARY WALL
SHEET 3 OF 3

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
B-4448	3B-1

SUMMARY OF EARTHWORK

IN CUBIC YARDS

Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
SUMMARY NO. 1					
-DET_EBL- STA 10+50.00	-DET_EBL- STA 23+40+/-	64	8,195	8,131	
-DET_EBL- STA 24+40+/-	-DET_EBL- STA 36+50.00	221	827	606	
-DET_WBL- STA 11+00.00	-DET_WBL- STA 23+17.37	20	164	144	
-DET_WBL- STA 24+38.61	-DET_WBL- STA 35+50.00	16	48	32	
SUBTOTAL:		321	9,234	8,913	
SUMMARY NO. 2					
-L- STA 13+00.00	-L- STA 27+85.96	19,825	7,017		12,808
-L- STA 28+85.96	-L- STA 43+00.00	26,601	9,455		17,146
-Y1- STA 10+50.00	-Y1- STA 13+44.46	1,090	35		1,055
-Y1- STA 14+67.90	-Y1- STA 18+00.00	2,407	166		2,241
SUBTOTAL:		49,923	16,673	0	33,250
SUMMARY NO. 3					
-L- STA 29+00.00 (-Y1RPA- STA. 10+00.00)	-L- STA 35+00.00 (-Y1RPA- STA 22+25.62)	14,973	23		14,950
-L- STA 20+50.00 (-Y1RPB- STA 10+00.00)	-L- STA 27+00.00 (-Y1RPB- STA 22+05.79)	575	236		339
-L- STA 19+00.00 (-Y1RPC- STA 10+00.00)	-L- STA 28+00.00 (-Y1RPC- STA 23+20.87)	5,006	97		4,909
-L- STA 30+00.00 (-Y1RPD- STA 10+00.00)	-L- STA 37+00.00 (-Y1RPD- STA 22+40.60)	2,677	215		2,462
SUBTOTAL:		23,231	571	0	22,660
SUMMARY NO. 4					
-DET_EBL- STA 10+50.00	-DET_EBL- STA 23+40+/-	4,917			4,917
-DET_EBL- STA 24+40+/-	-DET_EBL- STA 36+50.00	496			496
SUBTOTAL:		5,413	0	0	5,413
TOTAL:		78,888	26,478	8,913	61,323
LOSS DUE TO CLEARING AND GRUBBING		-1,100			-1,100
SHOULDER MATERIAL		0	3,692	3,692	
WASTE IN LIEU OF BORROW					
GRAND TOTAL:		77,788		12,605	60,223
SAY:		**81,700**		**13,250**	

UNDERCUT EXCAVATION = 100 CY (Contingency)
SELECT GRANULAR MATERIAL = 100 CY (Contingency)

Note: 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.

SHOULDER BERM GUTTER SUMMARY

IN LINEAR FEET

LINE	Station	Station	LENGTH
-L- (EBL - RT)	25+50.00	27+73.70	223.70
-L- (EBL - RT)	29+21.54	29+44.00	22.46
-L- (WBL - LT)	28+98.20	29+20.00	21.80
		TOTAL:	267.96
		SAY:	270

WOVEN WIRE FENCE, 47" FABRIC

IN LINEAR FEET

STATION TO STATION	LT. OR RT.	FABRIC L.F.	END BRACE	CORNER BRACE	LINE BRACE	4" POSTS	5" POSTS
-L- STA 13+05 TO -L- STA 16+40	RT.	341.00	2		1	21	7
-L- STA 39+13 TO -L- STA 43+00	RT.	407.00	1	1	1	25	8
TOTAL		748.00				46	15
SAY		**750**				**46**	**15**

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL	ASPHALT BREAKUP	CONCRETE REMOVAL	CONCRETE BREAKUP
-L- WB	22+00	27+80	LT	2629.03			
-L- WB	28+80	34+40	LT	2749.57			
-L- EB	23+83	27+89	RT	2104.96			
-L- EB	28+89	32+60	RT	1699.03			
-L- EB	13+00	22+00	RT	2826.17			
-L- EB	34+40	43+00	RT	2430.97			
-L- WB	13+00	23+83	LT	2385.08			
-L- WB	32+60	43+00	LT	2286.91			
-Y1RPA-	14+83	22+14	CL	2022.68			
-Y1RPB-	14+21	21+94	CL	2140.07			
-Y1RPC-	12+94	15+61	CL	738.51			
-Y1RPD-	13+41	16+74	CL	923.29			
-Y1RPC-	15+61	23+09	CL	2735.29			
-Y1RPD-	16+74	20+29	CL	1296.93			
-DET_EBL-	16+76	23+28	CL	2345.01			
-DET_EBL-	24+50	30+28	CL	2088.17			
-DET_WBL-	15+95	18+78	CL	1138.57			
-DET_WBL-	28+45	31+09	CL	1153.48			
Temporary Pavement							
-L-	17+09	17+98	CL	55.89			
-L-	37+32	44+00	CL	236.18			
-L-	31+11	41+15	CL	463.82			
		TOTAL:		36,449.61			
		SAY:		36,460.00			

REVISIONS

8/17/99

5/15/2018
...B4448_RDY_SUM_3B-1.dgn
...Drawing

8/17/99

REVISIONS

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

TEMPORARY GUARDRAIL SUMMARY

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

SURVEY LINE	BEG. STA.	END STA.	LOCATION	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	TEMP. B-77	TEMP. B-83	TEMP. GREU TL-3	M-350	SHOP CURVE TYPE III	TEMP. CAT-1	VI MOD	BIC	AT-1	G	NG				
-DET_EBL-	12+27.00		MEDIAN												1														
-DET_EBL-	14+68.94	23+43.94	RT	875.00'			23+28 +/-		4'	7'	50'		1'		1		1												
-DET_EBL-	18+62.48	23+37.48	LT	475.00'			23+28 +/-		4'	7'					2														
-DET_EBL-	24+45.95	32+45.95	RT	800.00'				24+50 +/-	4'	7'					1					1									
-DET_EBL-	24+39.50	28+77.00	LT	437.50'				24+50 +/-	4'	7'					2														
-DET_WBL-	12+28.00		MEDIAN												1														
-DET_WBL-	17+27.13	23+14.63	LT	587.50'				EXIST BRIDGE	4'	7'					1	1													
-DET_WBL-	18+64.10	23+20.35	RT	456.25'				EXIST BRIDGE	4'	7'		275'		19'	1	1													TIE TO EBL TEMP. G/R
-DET_WBL-	24+35.98	29+48.48	LT	512.50'			EXIST BRIDGE		4'	7'					1	1													
-DET_WBL-	24+41.44	28+66.44	RT	425.00'			EXIST BRIDGE		4'	7'	275'		19'		1	1													TIE TO EBL TEMP. G/R
-DET_WBL-	34+00.00		MEDIAN																	1									
			SUBTOTAL:	4568.75'											12	4	1			2									
			LESS ANCHOR DEDUCTIONS:																										
			TEMP. B-77 (12 @ 22.875')	274.50'																									
			TEMP. B-83 (4 @ 18.75')	75.00'																									
			TEMP GREU TL-3 (1 @ 50')	50.00'																									
			TEMP CAT-1 (2 @ 6.25')	12.50'																									
			TOTAL:	4156.75'																									
			SAY:	4162.50'																									

"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	B-77	XI	GREU TL-3	MEDIAN TL-3	SHOP CURVE TYPE III	CAT-1	VI MOD	BIC	AT-1	G	NG				
-L-	13+00.00	15+84.99	RT	825'			15+50.00		10'	13'		50'		1'			1										285'		
-Y1RPC-	10+00.00	15+40.01	RT																										
-L-	13+00.00	25+87.50	MEDIAN			1287.50'																							
-EBL-	24+99.65	27+99.65	RT	300.00'			27+99.65		12'	15'	50'		1'		1		1												
-EBL-	25+91.18	27+91.18	LT	200.00'			27+91.18		VAR.	VAR.					1												180'		TIE TO PROP. DOUBLE FACE GUARDRAIL -L- STA 25+87.50
-WBL-	26+11.98	27+80.73	RT	168.75'				27+80.73	6'	9'		50'		1'	1		1										171'		
-EBL-	28+91.18	30+59.93	LT	168.75'				28+91.18	6'	9'		50'		1'	1		1												
-WBL-	28+80.73	30+80.73	RT	200.00'			28+80.73		VAR.	VAR.					1												240'		TIE TO PROP. DOUBLE FACE GUARDRAIL -L- STA 30+87.50
-WBL-	28+72.25	31+72.25	LT	300.00'			28+72.25		12'	15'	50'		1'		1		1										485'		
-L-	30+87.50	43+00.00	MEDIAN			1212.50'																							
-Y1RPD-	18+00.00	22+00.00	LT	400.00'			20+00.00		10'	13'	50'	50'	1'	1'			2												
			SUBTOTAL:	2562.50'		2500.00'									6		7												
			LESS ANCHOR DEDUCTIONS:																										
			TYPE B-77 (6 @ 22.875')	137.25'																									
			GREU TL-3 (7 @ 50')	350.00'																									
			TOTAL:	2075.25'		2500.00'																					1361'		
			SAY:	2087.50'		2550.00'																					1365'		
			ADDITIONAL GUARDRAIL POSTS = 5 EA																										

4/11/2018 B4448_RDY_SUM_3B-2.dgn

WKST9

COMPUTED BY: CAC DATE: 2/26/2018

CHECKED BY: Ecological Engineering, LLP DATE: 2/26/2018

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
B-4448	3D-1

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

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

LINE & STATION	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) SIZE 12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
									THICKNESS OR GAUGE												
L 14+04	115	LT	0401		1251.9																
			0401	0402		1249.9	1246.1														
L 14+56	73	LT	0402		1249.6																
			0402	0403		1245.1	1236.0	1.1													
L 17+66	0	CL	0404		1246.1																
			0404	0409		1243.1	1242.6														
Y1RPC 12+57	191	LT	0406		1236.9																
			0406	0407		1234.4	1234.3														
Y1RPB 12+76	34	LT	0407		1242.2																
			0407	0408		1234.3	1219.0	0.7													
Y1RPC 11+86	21	RT	0409		1246.5																
			0409	0405		1242.6	1236.0														
L 23+10	70	LT	0501		1234.7																
			0501	0502		1232.0	1231.7														
L 23+10	0	CL	0502		1236.5																
			0502	0503		1231.7	1231.6														
EBL 23+12	38	RT	0503		1237.9																
			0503	0504		1231.6	1208.8														
Y1RPC 17+32	36	LT	0504		1211.6																
			0504	0505		1208.6	1208.0														
Y1RPB 18+16	28	LT	0506		1225.3																
			0506	0507		1222.5	1222.3														
Y1RPB 18+16	23	RT	0507		1225.2																
			0507	0508		1222.3	1210.1	0.6													
Y1RPB 21+01	34	RT	0508		1212.8																
			0508	0512		1209.6	1206.0	0.7													
L 27+00	0	CL	0509		1230.7																
			0509	0539		1228.0	1227.8														
Y1 10+97	31	RT	0510		1221.7																
			0510	0511		1218.9	1210.5	4.1													
Y1RPB 21+66	40	LT	0511		1215.3																
			0511	0512		1210.0	1205.0	0.4													
Y1 12+50	30	RT	0512		1210.2																
			0512	0513		1205.0	1203.8	0.6													
Y1 13+04	34	RT	0513		1209.0																
			0513	0540		1203.8	1196.4	0.6													
EBL 27+63	43	RT	0514		1231.2																
			0514	0515		1226.9	1192.0														
Y1 15+00	40	RT	0515		1196.0																
			0515	0517		1190.8	1181.3	0.7													
Y1RPC 22+34	29	LT	0516		1186.7																
			0516	0517		1183.7	1182.3														
Y1 16+28	30	RT	0517		1186.5																
			0517	0518		1180.8	1180.1	0.3													
Y1 17+38	33	RT	0518		1186.0																
			0518	0519		1178.1	1175.0	0.4													
Y1RPA 21+84	6	RT	0520	0521		1213.0	1211.0														
Y1 13+19	42	LT	0523		1208.2																
			0523	0541		1206.7	1204.9														
Y1RPD 21+94	31	LT	0526	0527		1185.3	1177.0														
SHEET TOTALS																					

C. S. PIPE THICKNESS OR GAUGE	12	15	18	24	30	36	42	48
	.064	.064	.064	.064	.079	.079	.109	.109
L 14+04								
				68				
L 14+56								
L 17+66								
			76					
Y1RPC 12+57								
Y1RPB 12+76								
Y1RPC 11+86								
			40					
L 23+10								
L 23+10								
EBL 23+12								
		80						
Y1RPC 17+32								
			96					
Y1RPB 18+16								
Y1RPB 18+16								
Y1RPB 21+01								
			76					
L 27+00								
Y1 10+97								
				76				
Y1RPB 21+66								
					76			
Y1 12+50								
					52			
Y1 13+04								
					164			
EBL 27+63								
		75						
Y1 15+00								
					124			
Y1RPC 22+34								
			52					
Y1 16+28								
					104			
Y1 17+38								
					88			
Y1RPA 21+84								
			64					
Y1 13+19								
				32				
Y1RPD 21+94								
				156				
SHEET TOTALS	155	40	76	32	32			

R. C. PIPE CLASS III THICKNESS OR GAUGE	12	15	18	24	30	36	42	48
L 14+04								
L 14+56								
L 17+66								
Y1RPC 12+57								
Y1RPB 12+76								
Y1RPC 11+86								
L 23+10								
L 23+10								
EBL 23+12								
Y1RPC 17+32								
Y1RPB 18+16								
Y1RPB 18+16								
Y1RPB 21+01								
L 27+00								
Y1 10+97								
Y1RPB 21+66								
Y1 12+50								
Y1 13+04								
EBL 27+63								
Y1 15+00								
Y1RPC 22+34								
Y1 16+28								
Y1 17+38								
Y1RPA 21+84								
Y1 13+19					32			
Y1RPD 21+94								
SHEET TOTALS					32		32	

R. C. PIPE CLASS IV THICKNESS OR GAUGE	12	15	18	24	30	36	42	48
L 14+04								
L 14+56								
L 17+66								
Y1RPC 12+57								
Y1RPB 12+76								
Y1RPC 11+86								
L 23+10								
L 23+10	68							
EBL 23+12								
Y1RPC 17+32								
Y1RPB 18+16		96						
Y1RPB 18+16	52							
Y1RPB 21+01								
L 27+00	284							
Y1 10+97								
Y1RPB 21+66		76						
Y1 12+50								
Y1 13+04								
EBL 27+63	60							
Y1 15+00								
Y1RPC 22+34								
Y1 16+28		52						
Y1 17+38								
Y1RPA 21+84		64						
Y1 13+19								
Y1RPD 21+94			156					
SHEET TOTALS	516	364	224	416	192			

	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW	36" C.S. ELBOW	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
L 14+04																																				OPEN END PIPE
L 14+56				1													1																			
L 17+66				1													1																			
Y1RPC 12+57																																				OPEN END PIPE
Y1RPB 12+76				1	2.9																								1		1					
Y1RPC 11+86				1																									1		1					
L 23+10				1													1																			
L 23+10				1													1																			
EBL 23+12				1	1.3																								1		1					
																																2				
Y1RPC 17+32				1													1																			
Y1RPB 18+16				1													1																			
Y1RPB 18+16				1													1																			
Y1RPB 21+01				1													1																			
L 27+00				1													1																			
Y1 10+97																																				OPEN END PIPE
																																	2			
Y1RPB 21+66				1	0.3												1												1							
Y1 12+50				1	0.3												1												1							
Y1 13+04				1	0.3												1												1							
EBL 27+63				1													1		1																	
																																3				
Y1 15+00				1	0.3												1												1							
Y1RPC 22+34				1													1												1							
Y1 16+28				1	0.8												1												1							
Y1 17+38				1	2.9												1												1							
Y1RPA 21+84																																				
Y1 13+19																																				OPEN END PIPE
Y1RPD 21+94																																				
SHEET TOTALS				20	9.1												5	12		1		10		6				3		3	5		2				

ABBREVIATIONS

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

WKST9

COMPUTED BY: CAC DATE: 2/26/2018
CHECKED BY: Ecological Engineering, LLP DATE: 2/26/2018

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
B-4448	3D-2

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

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

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	C. S. PIPE 12 (.064)	15 (.064)	18 (.064)	24 (.064)	30 (.079)	36 (.079)	42 (.109)	48 (.109)	R. C. PIPE CLASS III 12	15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	24" WELDED STEEL PIPE 0.375" THICK, GRADE B IN SOIL	24" WELDED STEEL PIPE 0.375" THICK, GRADE B NOT IN SOIL	30" WELDED STEEL PIPE 0.375" THICK, GRADE B IN SOIL	30" WELDED STEEL PIPE 0.375" THICK, GRADE B NOT IN SOIL	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	CONCRETE TRANSITIONAL SECTION C.B. STD. 852.05	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW	36" C.S. ELBOW	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
WBL 29+06	43	LT	0528		1228.4																																																1										1			1																					
			0528	0522		1225.4	1207.9																76																																																							2									
WBL 29+15	43	LT	0529		1228.2																																																1										1			1																					
			0529	0528		1225.4	1225.4																																8																																																		
EBL 29+33	43	RT	0530		1227.8																																																1	1.6									1			1																					
			0530	0525		1221.3	1196.2																52																																																						2									
EBL 29+42	43	RT	0531		1227.7																																																1										1			1																					
			0531	0530		1224.9	1224.9																																8																																																			
Y1RPD 19+28	49	RT	0532		1194.5																																																1										1					1																			
			0532	0533		1191.3	1180.0																																	112																																																	
Y1RPA 15+13	39	RT	0534		1211.0																																																1										1					1																			
			0534	0535		1207.0	1206.8																																			60																																															
L 35+00	59	LT	0535		1212.4																																																1	0.6									1					1																			
			0535	0536		1206.8	1201.6	0.3																																		144																																																
L 35+36	80	RT	0536		1205.6																																																1										1					1																			
			0536	0537		1201.6	1200.0	0.4																																		100																																																
			0537	0538		1200.0	1187.4	1.7																		78																																																							2						
Y1RPD 15+48	56	LT	0537		1204.0																																																1										1					1																			
Y1RPC 20+71	309	LT	0539		1232.2																																																1																						1		1										
			0539	0508		1227.8	1210.1																76																																																															
Y1 14+68	28	RT	0540		1201.3																																																1																						1		1										
			0540	0515		1196.4	1190.8	0.6																																		32																																																
Y1 13+44	23	LT	0541		1208.8																																																1																						1		1										
			0541	0542		1204.9	1198.0																										132																																																											
Y1 14+77	23	LT	0542		1201.9																																																1																						1		1										
			0542	0524		1198.0	1197.7																										32																																																											
Y1RPA 11+04	72	RT	0601		1210.7																																																																																				OPEN END PIPE
			0601	0602		1208.7	1198.0	1.9																36																																																										2							
Y1RPA 10+99	39	RT	0602		1201.5																																																1										1					1																			
			0602	0603		1197.5	1196.8	0.9																																											41	41																																										
L 39+40	0	CL	0603		1204.2																																																1	2.4									1					1																			
			0603	0604		1196.8	1196.0	1.0																																											41	41																																										
Y1RPD 11+26	39	LT	0604		1200.5																																																1										1					1																			
			0604	0605		1196.0	1193.4																																			64																																															
Y1RPD 11+21	72	LT	0000																																																																																	60	
L 39+52	7	RT	0000																																																																														18				
Y1RPA 10+95	52	RT	0000																																																																																45	
L 14+25	92	LT	0000																																																																																62	
L 14+68	10	RT	0000																																																																														18				
Y1RPB 12+85	49	LT	0000																																																																																31	
L 19+13	33	RT	0000																																																																														45				
Y1RPB 19+58	24	RT	0000																																																																																280	
Y1RPB 21+75	11	LT	0000																																																																																39	
Y1RPB 21+69	37	LT	0000																																																																																7	
Y1RPB 21+72	58	LT	0000																																																																																47	
Y1RPA 21+78	38	LT	0000																																																																																28	
Y1RPC 22+72	43	LT	0000																																																																																22	
Y1RPD 21+99	13	LT	0000																																																																																114	
Y1RPA 14+97	8	RT	0000																																																																																56	
Y1RPA 14+99	21	LT	0000																																																																																23	
SHEET TOTALS																							204		36	78						164							16	112		400						82	82				16	4.6									12			4		8							4		4	4		2	2		81			814	

ABBREVIATIONS

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

WKST9

COMPUTED BY:	CAC	DATE:	2/26/2018
CHECKED BY:	Ecological Engineering, LLP	DATE:	2/26/2018

PROJECT NO.	SHEET NO.
B-4448	3D-3

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET		STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Side Drain Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
L 35+42	14	RT	0000																		
Y1RPD 15+40	12	LT	0000																		
Y1RPD 11+28	40	LT	0000																		
Y1RPD 11+68	5	RT	0000																		
L 27+47	77	LT	0000																		
L 27+14	30	LT	0000																		
Y1RPB 18+05	7	LT	0000																		
Y1RPA 15+12	38	RT	0000																		
L 28+56	0	CL	0000																		
L 28+03	3	LT	0000																		
L 24+64	5	RT	0000																		
L 23+87	106	RT	0000																		
DET_EBL 18+35	20	LT	0201		1235.8																
			0201	0202		1233.0	1220.1	0.5													
DET_EBL 22+45	22	LT	0203		1225.7																
			0203	0209		1222.9	1211.5	0.4													
DET_EBL 23+54	22	LT	0204		1206.8																
			0204	0205		1198.4	1196.0	2.8													
DET_EBL 27+00	21	LT	0206		1217.3																
			0206	0207		1214.5	1210.4	0.3													
DET_EBL 27+00	46	RT	0207		1214.0																
			0207	0208		1210.4	1200.0	0.3		56											
SHEET TOTALS										56											
PROJECT TOTALS										56											

LINE & STATION	FROM	TO	C. S. PIPE 12 .064	15 .064	18 .064	24 .064	30 .079	36 .079	42 .109	48 .109	R. C. PIPE CLASS III 12	15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48
L 35+42	0000																									
Y1RPD 15+40	0000																									
Y1RPD 11+28	0000																									
Y1RPD 11+68	0000																									
L 27+47	0000																									
L 27+14	0000																									
Y1RPB 18+05	0000																									
Y1RPA 15+12	0000																									
L 28+56	0000																									
L 28+03	0000																									
L 24+64	0000																									
L 23+87	0000																									
DET_EBL 18+35	0201																									
	0201	0202		72																						
DET_EBL 22+45	0203																									
	0203	0209		75																						
DET_EBL 23+54	0204																									
	0204	0205					50																			
DET_EBL 27+00	0206																									
	0206	0207		64																						
DET_EBL 27+00	0207																									
	0207	0208																								
SHEET TOTALS				211			50																			
PROJECT TOTALS				570	40	112	128						196		32					532	476	224	816	192		

LINE & STATION	FROM	TO	24" WELDED STEEL PIPE 0.375" THICK, GRADE B IN SOIL	24" WELDED STEEL PIPE 0.375" THICK, GRADE B NOT IN SOIL	30" WELDED STEEL PIPE 0.375" THICK, GRADE B IN SOIL	30" WELDED STEEL PIPE 0.375" THICK, GRADE B NOT IN SOIL	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05
L 35+42	0000																	
Y1RPD 15+40	0000																	
Y1RPD 11+28	0000																	
Y1RPD 11+68	0000																	
L 27+47	0000																	
L 27+14	0000																	
Y1RPB 18+05	0000																	
Y1RPA 15+12	0000																	
L 28+56	0000																	
L 28+03	0000																	
L 24+64	0000																	
L 23+87	0000																	
DET_EBL 18+35	0201									1								
	0201	0202																
DET_EBL 22+45	0203									1								
	0203	0209																
DET_EBL 23+54	0204									1	3.5							
	0204	0205																
DET_EBL 27+00	0206									1								
	0206	0207																
DET_EBL 27+00	0207									1								
	0207	0208																
SHEET TOTALS										5	3.5							
PROJECT TOTALS			83	83	205	205				41	17.2							

LINE & STATION	FROM	TO	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	15" C.S. ELBOW	18" C.S. ELBOW	24" C.S. ELBOW	30" C.S. ELBOW	36" C.S. ELBOW	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
L 35+42	0000																										146	
Y1RPD 15+40	0000																										88	
Y1RPD 11+28	0000																										22	
Y1RPD 11+68	0000																										101	
L 27+47	0000																										76	
L 27+14	0000																										59	
Y1RPB 18+05	0000																										48	
Y1RPA 15+12	0000																										6	
L 28+56	0000																										135	
L 28+03	0000																										172	
L 24+64	0000																										120	
L 23+87	0000																										171	
DET_EBL 18+35	0201			1					1																			TEMPORARY
	0201	0202																									72	TEMPORARY
DET_EBL 22+45	0203			1					1																			TEMPORARY
	0203	0209																									75	TEMPORARY
DET_EBL 23+54	0204															1		1										TEMPORARY
	0204	0205																									50	TEMPORARY
DET_EBL 27+00	0206			1					1																			TEMPORARY
	0206	0207																									64	TEMPORARY
DET_EBL 27+00	0207															1		1										TEMPORARY
	0207	0208																									56	TEMPORARY
SHEET TOTALS				3					3							2		2									1461	
PROJECT TOTALS			5	27			5		21		6					9		9	9		4	2		81			2275	

ABBREVIATIONS

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

PROJECT REFERENCE NO.	SHEET NO.
B-4448	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				SD	100
				TOTAL LF:	100

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

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type ASU/AST	Aggregate Thickness INCHES	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU		100	160	200		
			TOTAL CY/TONS/SY:		100	160	200*	0	0

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

REVISIONS

8/17/99

4/11/2018
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IISEPlotting

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-4448	3P-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	5	CATHY RENEE MCMANUS
2	5	BURKE, INC.
3	5	DANIEL D. MANN
4	5	BURKE, INC.
4	6	BURKE, INC.

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

4/11/2018
B4448_RDY_SUM_3P-1.dgn
USER:gyoung

-L-	-YIRPB-		-YIRPC-	
PI Sta 13+43.76	PI Sta 11+60.82	PIs Sta 13+61.13	PI Sta 10+82.13	PIs Sta 12+04.00
△ = 6° 52' 00.8" (LT)	△ = 7° 55' 50.8" (LT)	Θs = 1° 28' 54.4"	△ = 8° 10' 12.8" (RT)	Θs = 2° 59' 21.6"
D = 1° 00' 00.0"	D = 2° 28' 10.7"	Ls = 120.00'	D = 4° 58' 56.1"	Ls = 120.00'
L = 686.70'	L = 321.13'	LT = 80.00'	L = 163.99'	LT = 80.01'
T = 343.76'	T = 160.82'	ST = 40.00'	T = 82.13'	ST = 40.01'
R = 5,729.65'	R = 2,320.00'		R = 1,150.00'	
Runoff = 175'	Runoff = 180'		Runoff = 120'	
Se = 3.5%	Se = 6%		Se = 4%	
			V_D = 30 MPH	

NAD 83

PROJECT REFERENCE NO.	SHEET NO.
B-4448	4

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034407 ENGINEER ANDREW P YOUNG
DocuSigned by: Andrew P. Young 5/14/2018
EF21D930D62F4EF...

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20147 ENGINEER FRANK F FLEMING
DocuSigned by: Frank F Fleming 5/14/2018
B1DD721AA5EA4A6...

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(919) 760-0655

ECOLOGICAL ENGINEERING

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REVISIONS 5/14/18

BENJAMIN BRIDGES DB 1807 PG 905

JAMES E. & DELORES S. STAMEY HEIRS DB 459 PG 259

MARK A. & CAROL V. SMITH DB 823 PG 1995

MARK E. & LORA L. MELOTT DB 919 PG 1738

JAMES D. & TERESA D. RAKESTRAW DB 1144 PG 842

BEN J. & BARBARA B. BRADSHAW DB 1231 PG 332

PC Sta. 10+00.00

-YIRPB- PC Sta. 10+00.00
-L- POC Sta. 16+02.15 OFFSET 39' LT

PT Sta. 16+86.70

CS Sta. 13+21.13

ST Sta. 14+41.13

-YIRPC- PC Sta. 10+00.00
-L- POC Sta. 15+84.99 OFFSET 39' RT

CS Sta. 11+63.99

ST Sta. 12+83.99

BEGIN TIP PROJECT B-4448
-L- POC STA 13+00.00

BEGIN / TIE PROPOSED DOUBLE FACE G/R TO EXISTING DOUBLE FACE G/R

BEGIN / TIE PROPOSED G/R TO EXISTING G/R

BM #1

+0483 (-L-) EX.R/W RT

BEGIN 47" WOVEN WIRE FENCE (TIE TO EXISTING)

END 47" WOVEN WIRE FENCE (TIE TO EXISTING)

+39.37 (-L-) EX.R/W RT

TOE PROTECTION
SEE DETAIL 3
CLASS B RIP RAP
EST 150 TONS
EST 400 SY GEOTEXTILE

CLASS I RIP RAP
EST 35 TONS
EST 25 SY GEOTEXTILE

CLASS I RIP RAP
EST 7 TONS
EST 15 SY GEOTEXTILE

CLASS I RIP RAP
EST 7 TONS
EST 15 SY GEOTEXTILE

CLASS II RIP RAP
EST 11 TONS
EST 22 SY GEOTEXTILE

FALSE SUMP SEE DETAIL 1

FALSE SUMP SEE DETAIL 2

FILL WITH FLOWABLE FILL

FILL WITH FLOWABLE FILL

SPECIAL CUT DITCH SEE DETAIL 4

REMOVE 30' OF 30" CMP

REMOVE

RETAIN

24" RCP-IV

30" RCP-III

4' FDPS REMOVE

2GI

JB w/MH

18" CSP

TRENCHLESS INSTALLATION 24" WELDED STEEL

TRENCHLESS INSTALLATION 30" WELDED STEEL

50' TAPER LT. & RT.

INC.=30' (TYP)

INC.=50' (TYP)

560' MEDIAN TAPER LT & RT

240' LANE TAPER

PROPOSED MONO. ISLAND

GREU, TL-3

N 58° 10' 08.3" E

N 66° 44' 29.6" E

N 78° 54' 57.6" E

MATCHLINE -L- STA. 23+00.00 SEE SHEET 5

FOR DETOUR CONSTRUCTION, SEE SHEETS 2B-1 THRU 2B-3

FOR DRAINAGE DETAILS SEE SHEET 2D-1

FOR -L- PROFILE (-WBL-), SEE SHEET 7

FOR -L- PROFILE (-EBL-), SEE SHEET 9

FOR -YIRPB- PROFILE, SEE SHEET 12

FOR -YIRPC- PROFILE, SEE SHEET 13

THE ALIGNMENTS FOR VERTICAL PROFILES -WBL- & -EBL- ARE BASED ON OFFSETTING THE HORIZONTAL ALIGNMENT -L- 15 FEET LEFT AND RIGHT.

5/16/2018
B-4448_RDY_PSH04.dgn
USER:Doug

PROJECT REFERENCE NO.	SHEET NO.
B-4448	5

ROADWAY DESIGN ENGINEER — SEAL 034407 — Andrew P. Young — 5/14/2018

HYDRAULICS ENGINEER — SEAL 20147 — Frank F. Fleming — 5/14/2018

STEWART

ECOLOGICAL ENGINEERING

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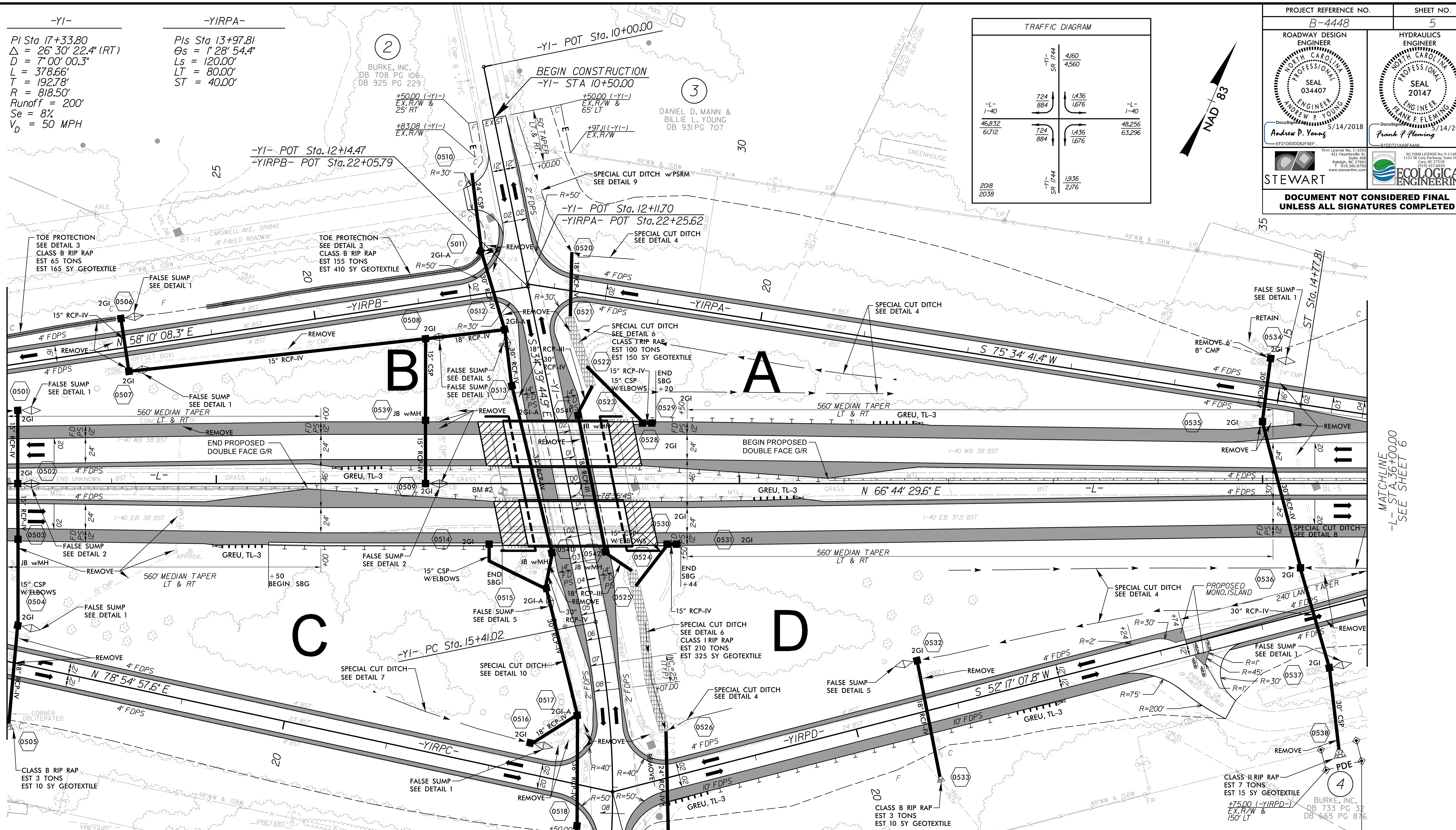
-Y1-

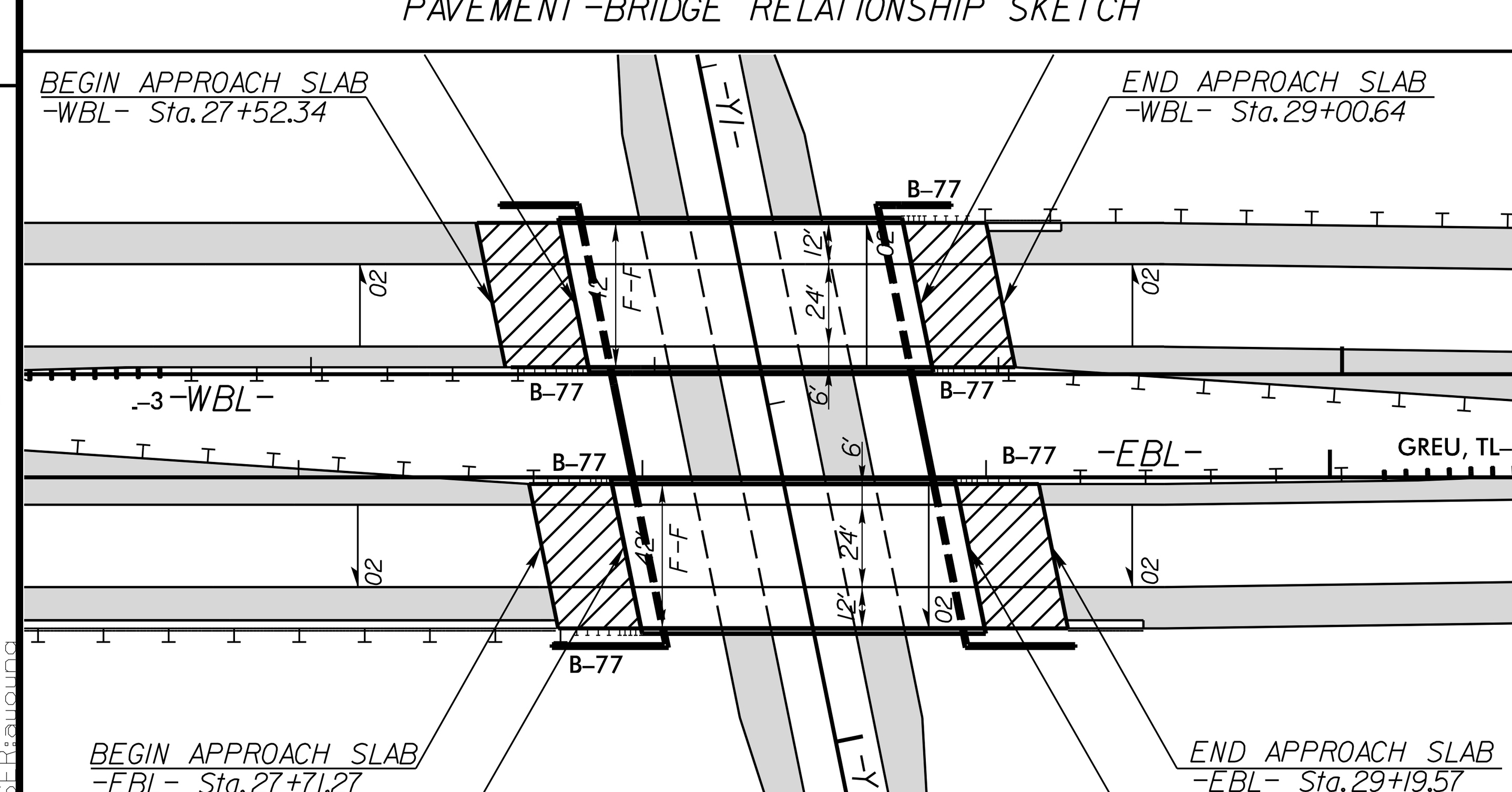
PI Sta 17+33.80
Δ = 26° 30' 22.4" (RT)
D = 7° 00' 00.3"
L = 378.66'
T = 192.78'
R = 818.50'
Runoff = 200'
Se = 8%
V_D = 50 MPH

-Y1RPA-

PIs Sta 13+97.81
θs = 1° 28' 54.4"
Ls = 120.00'
LT = 80.00'
ST = 40.00'



PAVEMENT-BRIDGE RELATIONSHIP SKETCH



FOR DETOUR CONSTRUCTION,SEE SHEETS 2B-1 THRU 2B-3

FOR DRAINAGE DETAILS SEE SHEET 2D-1

FOR -L- PROFILE (-WBL-),SEE SHEET 7

FOR -L- PROFILE (-EBL-),SEE SHEET 9

FOR -Y1- PROFILE,SEE SHEET 11

FOR -Y1RPA- PROFILE,SEE SHEET 12

FOR -Y1RPB- PROFILE,SEE SHEET 12

FOR -Y1RPC- PROFILE,SEE SHEET 13

FOR -Y1RPD- PROFILE,SEE SHEET 13

FOR STRUCTURE No.1 PLANS,SEE SHEETS S1-1 THRU S1-25

FOR STRUCTURE No.2 PLANS,SEE SHEETS S2-1 THRU S2-25

THE ALIGNMENTS FOR VERTICAL PROFILES -WBL- & -EBL- ARE BASED ON OFFSETTING THE HORIZONTAL ALIGNMENT -L- 15 FEET LEFT AND RIGHT.

REVISIONS

5/14/99

5/10/2018 ...\Proj\B4448_RDY_PSH05.dgn

-L-	-YIRPA-		-YIRPD-		
PI Sta 44+94.93	PIs Sta 10+80.00	PI Sta 12+39.01	PIs Sta 13+97.81	PIs Sta 10+80.01	PI Sta 12+17.89	PIs Sta 13+55.39
Δ = 2° 52' 46.1" (RT)	Θs = 1° 28' 54.4"	Δ = 5° 52' 23.0" (RT)	Θs = 1° 28' 54.4"	Θs = 2° 45' 00.7"	Δ = 8° 57' 20.4" (LT)	Θs = 2° 45' 00.7"
D = 1° 00' 00.0"	Ls = 120.00'	D = 2° 28' 10.7"	Ls = 120.00'	Ls = 120.00'	D = 4° 35' 01.2"	Ls = 120.00'
L = 287.95'	LT = 80.00'	L = 237.81'	LT = 80.00'	LT = 80.01'	L = 195.38'	LT = 80.01'
T = 144.01'	ST = 40.00'	T = 119.01'	ST = 40.00'	ST = 40.01'	T = 97.89'	ST = 40.01'
R = 5,729.65'		R = 2,320.00'			R = 1,250.00'	
		Runoff = 180'			Runoff = 180'	
		Se = 6%			Se = 6%	
					V_D = 45 MPH	

NAD 83

PROJECT REFERENCE NO.	SHEET NO.
B-4448	6

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034407 ENGINEER ANDREW P YOUNG
DocuSigned by: Andrew P. Young 5/14/2018
EF21D93DD62F4EF...

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20147 ENGINEER FRANK F FLEMING
DocuSigned by: Frank F Fleming 5/14/2018
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Cary, NC 27518
(919) 760-0037

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EUNICE L. POWELL ESTATE FILE 3 PG 175 DB 416 PG 325 DB 428 PG 124

ALLEN J. COBB DB 1946 PG 651

DEBORAH C. BROOKS DB 749 PG 469

TOWN OF VALDESE DB 589 PG 554

NEWELL W. GOINS LIFE ESTATE & SHEILA A. SPEAGLE DB 935 PG 2083

BERNICE LOWMAN ESTATE FILE 79 PG 215 DB 582 PG 740

BURKE, INC. DB 733 PG 32 DB 665 PG 876

CS Sta. 13+57.81

SC Sta. 11+20.00

ST Sta. 14+35.38

CS Sta. 13+15.38

SC Sta. 11+20.00

-YIRPA- ST Sta. 10+00.00 -L- POT Sta. 40+12.16 OFFSET 39' LT

-YIRPD- ST Sta. 10+00.00 -L- POT Sta. 40+88.77 OFFSET 39' RT

PC Sta. 43+50.92

PT Sta. 46+38.88

END TIP PROJECT B-4448
-L- POT STA 43+00.00

MATCHLINE -L- STA 36+00.00 SEE SHEET 5

RETAIN

RETAIN SYSTEM

REMOVE

24" CSP W/ELBOWS

FALSE SUMP SEE DETAIL 1

FALSE SUMP SEE DETAIL 2

FALSE SUMP SEE DETAIL 5

TRENCHLESS INSTALLATION 30" WELDED STEEL

FILL WITH FLOWABLE FILL

BEGIN 47" WOVEN WIRE FENCE (TIE TO EXISTING)

END 47" WOVEN WIRE FENCE (TIE TO EXISTING)

30" RCP-IV

SPECIAL CUT DITCH SEE DETAIL 8

END / TIE PROPOSED DOUBLE FACE G/R TO EXISTING DOUBLE FACE G/R

I-40 WB 37.5' BST

I-40 EB 41' BST

BM #3

FOR DETOUR CONSTRUCTION. SEE SHEETS 2B-1 THRU 2B-3

FOR DRAINAGE DETAILS SEE SHEET 2D-1

FOR -L- PROFILE (-WBL-), SEE SHEET 8

FOR -L- PROFILE (-EBL-), SEE SHEET 10

FOR -YIRPA- PROFILE, SEE SHEET 12

FOR -YIRPD- PROFILE, SEE SHEET 13

THE ALIGNMENTS FOR VERTICAL PROFILES -WBL- & -EBL- ARE BASED ON OFFSETTING THE HORIZONTAL ALIGNMENT -L- 15 FEET LEFT AND RIGHT.

REVISIONS

5/14/99

5/10/2018
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11:57:19 AM

5/14/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-4448	7

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 034407 ENGINEER ANDREW P YOUNG

Docusigned by: Andrew P. Young 5/14/2018
EF21D93DD6DF4EF...

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 20147 ENGINEER FRANK F FLEMING

Docusigned by: Frank F Fleming 5/14/2018
B1DD721AA9FA4A6...

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ECOLOGICAL ENGINEERING

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-WBL-

BEGIN GRADE
-L- STA. 13+00.00
ELEV. = 1,256.71'

-L- STA. 16+02.15
-YIRPB- STA. 10+00.00, OFFSET 24' LT
ELEV. = 1,250.13'

(-)11.9000%

BM #1 ELEV. = 1255.18'
N 729497 E 1243058
-L- STA. 12+65.25 68.44' RT
PUNCH HOLE IN CENTER POST OF
CONC. BASE OF VALDESE EXIT SIGN

PI = 22+00.00
EL = 1,239.61'
VC = 300'
K = 269

(-)11.9000%

(-)11.9%

BEGIN DITCH GRADE LT
STA 21+50
EL=1,237.17'

FOR PLAN VIEW, SEE SHEET 4

THE ALIGNMENTS FOR VERTICAL PROFILES -WBL- & -EBL- ARE BASED ON OFFSETTING THE HORIZONTAL ALIGNMENT -L- 15 FEET LEFT AND RIGHT.

-WBL-

PI = 22+00.00
EL = 1,239.61'
VC = 300'
K = 269

PI = 25+00.00
EL = 1,237.25'
VC = 300'
K = 247

(-)0.7867%

(-)0.7867%

(-)2.0000%

END DITCH GRADE LT
STA 23+06
EL=1,234.80'

BEGIN BRIDGE
-L- STA. 27+76.49

END BRIDGE
-L- STA. 28+76.49

BM #2 ELEV. = 1227.07'
N 730136 E 1244430
-L- STA. 27+73.92 7.58' RT
PUNCH HOLE IN NW CORNER OF
EB BRIDGE END BENT

(-) 2.2%

BEGIN DITCH GRADE LT
STA 29+00
EL=1,221.87'

PI = 31+50.00
EL = 1,224.25'
VC = 300'
K = 294

(-)2.0000%

(-)3.0200%

END DITCH GRADE LT
STA 31+50
EL=1,216.37'

PI = 34+50.00
EL = 1,215.19'
VC = 300'
K = 268

(-)3.0200%

(-)11.9000%

FOR PLAN VIEW, SEE SHEET 5

FOR STRUCTURE No.1 PLANS, SEE SHEETS S1-1 THRU S1-25

FOR STRUCTURE No.2 PLANS, SEE SHEETS S2-1 THRU S2-25

THE ALIGNMENTS FOR VERTICAL PROFILES -WBL- & -EBL- ARE BASED ON OFFSETTING THE HORIZONTAL ALIGNMENT -L- 15 FEET LEFT AND RIGHT.

5/10/2018
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USER:Raidong

PROJECT REFERENCE NO.	SHEET NO.
B-4448	8

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 034407 ENGINEER ANDREW P. YOUNG

DocuSigned by: Andrew P. Young 5/14/2018

EF21D93DD62F4EF...

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 20147 ENGINEER FRANK F. FLEMING

DocuSigned by: Frank F Fleming 5/14/2018

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Cary, NC 27518
(919) 557-0929

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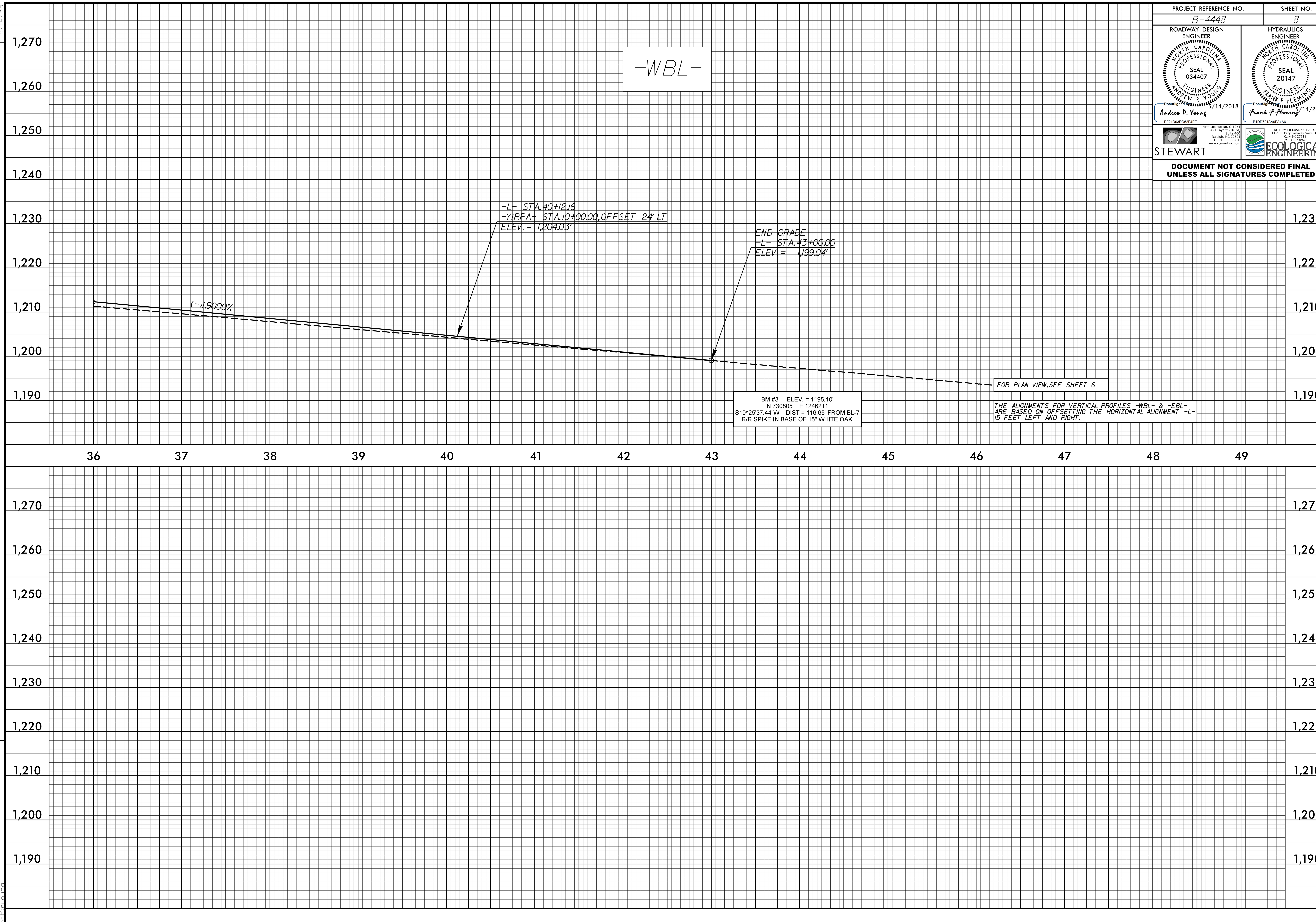

5/14/99

5/10/2018 \Proj\B4448_RDY_PFL08.dgn

PROJECT REFERENCE NO.	SHEET NO.
B-4448	9

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 034407 ENGINEER ANDREW P YOUNG

DocuSigned by: Andrew P. Young 7/14/2018

EF21D93DD6DF4EF...

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 20147 ENGINEER FRANK F FLEMING

DocuSigned by: Frank F Fleming 7/14/2018

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5/14/99

-EBL-

BEGIN GRADE
-L- STA. 13+00.00
ELEV. = 1,256.70'

-L- STA. 15+84.99
-Y1RPC- STA. 10+00.00, OFFSET 24' RT
ELEV. = 1,252.13'

(-)11.9000%

PI = 22+00.00
EL = 1,239.61'
VC = 300'
K = 269

(-)11.9000%

(-)10.7833%

BM #1 ELEV. = 1255.18'
N 729497 E 1243058
-L- STA. 12+65.25 68.44' RT
PUNCH HOLE IN CENTER POST OF
CONC. BASE OF VALDESE EXIT SIGN

PIPE HYDRAULIC DATA
30" RCP Sta. 19+05

DRAINAGE AREA	= 9	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 20.0	CFS
DESIGN HW ELEVATION	= 1236.5	FT
100 YEAR DISCHARGE	= 21.0	CFS
100 YEAR HW ELEVATION	= 1236.6	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 49.2	CFS
OVERTOPPING ELEVATION	= 1240.0	FT

30" RCP

FOR PLAN VIEW.SEE SHEET 4

THE ALIGNMENTS FOR VERTICAL PROFILES -WBL- & -EBL- ARE BASED ON OFFSETTING THE HORIZONTAL ALIGNMENT -L- 15 FEET LEFT AND RIGHT.

-EBL-

PI = 22+00.00
EL = 1,239.61'
VC = 300'
K = 269

PI = 25+00.00
EL = 1,237.25'
VC = 300'
K = 247

BEGIN BRIDGE
-L- STA. 27+95.42

END BRIDGE
-L- STA. 28+95.42

(-)10.7833%

(-)12.0000%

BM #2 ELEV. = 1227.07'
N 730136 E 1244430
-L- STA. 27+73.92 7.58' RT
PUNCH HOLE IN NW CORNER OF
EB BRIDGE END BENT

PI = 31+50.00
EL = 1,224.25'
VC = 300'
K = 302

(-)12.0000%

(-)12.9933%

PI = 34+50.00
EL = 1,215.19'
VC = 300'
K = 274

(-)12.9933%

(-)1.9000%

(-)2.6%

(-)2.9%

(+)3.6%

(+)1.1%

BEGIN DITCH GRADE RT
STA. 32+00
EL=1215.41'

BEGIN DITCH GRADE RT
STA. 35+38.2
EL=1205.85'

PI=35+50.000
EL=1206.27'

PI=34+50.000
EL=1208.15'

PI=35+00.000
EL=1206.85'

END DITCH GRADE RT
STA. 35+34
EL=1205.86'

FOR PLAN VIEW.SEE SHEET 5

THE ALIGNMENTS FOR VERTICAL PROFILES -WBL- & -EBL- ARE BASED ON OFFSETTING THE HORIZONTAL ALIGNMENT -L- 15 FEET LEFT AND RIGHT.

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USER:Raidway

PROJECT REFERENCE NO.	SHEET NO.
B-4448	10

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034407 ENGINEER ANDREW P. YOUNG	NORTH CAROLINA PROFESSIONAL SEAL 20147 ENGINEER FRANK F. FLEMING
DocuSigned by: Andrew P. Young 5/14/2018 EF21D93DD62F4EF...	DocuSigned by: Frank F Fleming 5/14/2018 B1DD721AA9FA4A6...
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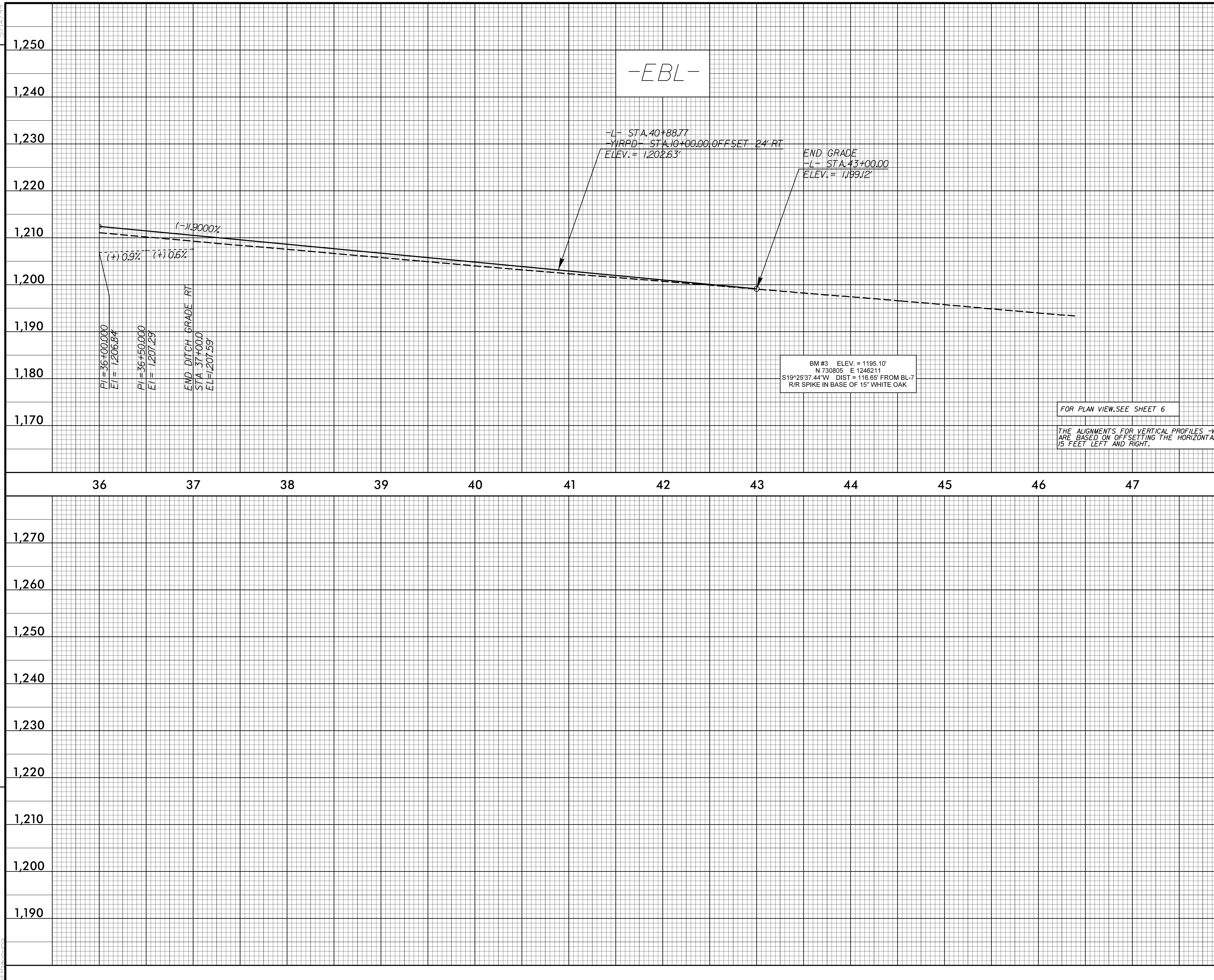

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REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-4448	11

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 034407 ENGINEER ANDREW P YOUNG

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HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 20147 ENGINEER FRANK F FLEMING

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-Y1-

-Y1- STA.12+11.70
-Y1RPA- STA.22+25.62
EL.1,217.06'

-Y1- STA.12+14.47
-Y1RPB- STA.22+05.79
EL.1,216.90'

BEGIN GRADE
-Y1- STA.10+50.00
EL.1,226.67'

(-)5.941/3%

(-)6.4%

BEGIN DITCH GRADE LT
STA.10+50
EL=1,225.04'

END DITCH GRADE LT
STA.11+90
EL=1,213.27'

-Y1- STA.17+04.50
-Y1RPC- STA.23+20.87
-Y1RPD- STA.20+40.60
EL.1,189.37'

END GRADE
-Y1- STA.18+00.00
EL.1,186.48'

(-)7.5%

(-)5.941/3%

(-)12.3000%

PI = 16+80.00
EL = 1,189.24'
VC = 240'
K = 66
V_D = 40 MPH

BEGIN DITCH GRADE RT
STA.15+00
EL=1,196.21'

BEGIN DITCH GRADE LT
STA.15+50
EL=1,192.61'

END DITCH GRADE RT
STA.16+26
EL=1,186.73'

END DITCH GRADE LT
STA.16+50
EL=1,185.31'

FOR PLAN VIEW.SEE SHEET 5

1,250 1,240 1,230 1,220 1,210 1,200 1,190 1,180 1,170 1,160 1,150

10 11 12 13 14 15 16 17 18 19 20

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USER:Rdavis

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PROJECT REFERENCE NO.	SHEET NO.
B-4448	12

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034407 ENGINEER ANDREW P YOUNG
5/14/2018
DocuSigned by: Andrew P. Young EF21D93DD62E4EF...

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20147 ENGINEER FRANK F. FLEMING
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-YIRPA-

BEGIN GRADE
-YIRPA- STA.10+00.00
-L- STA.40+12.17.OFFSET 24' LT
ELEV.= 1,204.03'

PI = 11+40.00
EL = 1,206.69'
VC = 200'
K = 522

PI = 14+25.00
EL = 1,211.01'
VC = 350'
K = 141

PI = 18+00.00
EL = 1,226.01'
VC = 400'
K = 59
V_D = 40 MPH

PI = 21+25.00
EL = 1,216.96'
VC = 150'
K = 64
V_D = 40 MPH

END GRADE
-YIRPA- STA.22+25.62
-Y1- STA.12+11.70
ELEV.= 1,217.06'

PI = 22+12.83
EL = 1,216.56'

(+)11.9000%
(+)11.5169%
(+)11.5169%
(+)14.0000%
(+)14.0000%
(-)12.7863%
(-)12.7863%
(-)10.4531%
(-)11.5%
(-) 2.0%
(+)13.9095%

18" RCP

BEGIN DITCH GRADE RT
STA.21+28
EL=1,213.94'

BEGIN DITCH GRADE LT
STA.18+63
EL=1,216.98'

END DITCH GRADE LT
STA.21+67
EL=1,210.91'

END DITCH GRADE RT
STA.21+89
EL=1,213.03'

PIPE HYDRAULIC DATA
18" RCP Sta. 21+83

DRAINAGE AREA	= 2.2	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 6.0	CFS
DESIGN HW ELEVATION	= 1214.4	FT
100 YEAR DISCHARGE	= 7.0	CFS
100 YEAR HW ELEVATION	= 1214.7	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 16.3	CFS
OVERTOPPING ELEVATION	= 1216.7	FT

FOR PLAN VIEW.SEE SHEET 5 & 6

-YIRPB-

BEGIN GRADE
-YIRPB- STA.10+00.00
-L- STA.16+02.15.OFFSET 24' LT
ELEV.= 1,250.13'

PI = 10+95.00
EL = 1,248.72'
VC = 90'
K = 95
V_D = 50 MPH

PI = 10+25.00
EL = 1,249.59'
VC = 50'
K = 55
V_D = 35 MPH

PI = 15+00.00
EL = 1,239.81'
VC = 280'
K = 156

PI = 20+10.00
EL = 1,219.41'
VC = 350'
K = 139

END GRADE
-YIRPB- STA.22+05.79
-Y1- STA.12+14.47
ELEV.= 1,216.90'

PI = 21+93.77
EL = 1,216.69'

(-)11.2482%
(-)12.1600%
(-)12.1999%
(-)12.1999%
(-)14.0000%
(-)14.0000%
(-)11.4782%
(-)11.4782%
(+)11.7477%

FOR PLAN VIEW.SEE SHEET 4 & 5

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4448	13

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NORTH CAROLINA PROFESSIONAL SEAL 034407 ENGINEER ANDREW P YOUNG
DocuSigned by: Andrew P. Young EF21D92DD62F4EE 5/14/2018

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 20147 ENGINEER FRANK F FLEMING
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-YIRPC-

BEGIN GRADE
-YIRPC- STA.10+00.00
-L- STA.15+84.99 OFFSET 24' RT
ELEV.= 1,252.13'

PI = 10+55.00
EL = 1,251.14'
VC = 90'
K = 86
V_D = 50 MPH

PI = 12+60.00
EL = 1,245.31'
VC = 190'
K = 54
V_D = 40 MPH

(-)11.8000%
(-)12.8426%
(-)12.8426%
(-)16.3854%

BEGIN DITCH GRADE LT
STA 20+77
EL=1,187.42'

END DITCH GRADE LT
STA 22+52
EL=1,186.67'

PI = 21+65.00
EL = 1,187.53'
VC = 280'
K = 40
V_D = 30 MPH

(-)16.3854%
(-)10.5%
(+)0.6859%
(+)1.0036%

END GRADE
-YIRPC- STA.23+20.87
-YI- STA.17+04.50
ELEV.= 1,189.37'

PI = 23+08.59
EL = 1,188.51'

FOR PLAN VIEW, SEE SHEET 4 & 5

-YIRPD-

BEGIN GRADE
-YIRPD- STA.10+00.00
-L- STA.40+88.77 OFFSET 24' RT
ELEV.= 1,202.63'

PI = 11+25.00
EL = 1,204.98'
VC = 155'
K = 265

PI = 16+45.00
EL = 1,211.71'
VC = 420'
K = 85
V_D = 50 MPH

(+)1.8800%
(+)1.2949%
(+)1.2949%
(-)3.6477%
(-)2.4%
(-)4.2%
(-)3.6477%
(-)8.6360%
(-)3.9%

BEGIN DITCH GRADE RT
STA 15+93
EL=1,206.41'

PI=17+42.360
EL= 1,200.81'

END DITCH GRADE RT
STA 19+26
EL=1,195.16'

BEGIN DITCH GRADE RT
STA 21+03
EL=1,188.30'

END DITCH GRADE RT
STA 21+77
EL=1,185.40'

24" RCP-JV

PI = 22+28.21
EL = 1,190.44'

PIPE HYDRAULIC DATA
24" RCP Sta. 21+87

DRAINAGE AREA	= 4.6	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 12.0	CFS
DESIGN HW ELEVATION	= 1187.1	FT
100 YEAR DISCHARGE	= 13.0	CFS
100 YEAR HW ELEVATION	= 1187.3	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 36.0	CFS
OVERTOPPING ELEVATION	= 1191.8	FT

END GRADE
-YIRPD- STA.22+40.60
-YI- STA.17+04.50
ELEV.= 1,189.37'

FOR PLAN VIEW, SEE SHEET 5 & 6

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mSFleming

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PROJECT REFERENCE NO.	SHEET NO.
B-4448	14

ROADWAY DESIGN ENGINEER

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HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 20147 ENGINEER FRANK F FLEMING

DocuSigned by: Frank F Fleming B1DD721AA9FA4A6 5/14/2018

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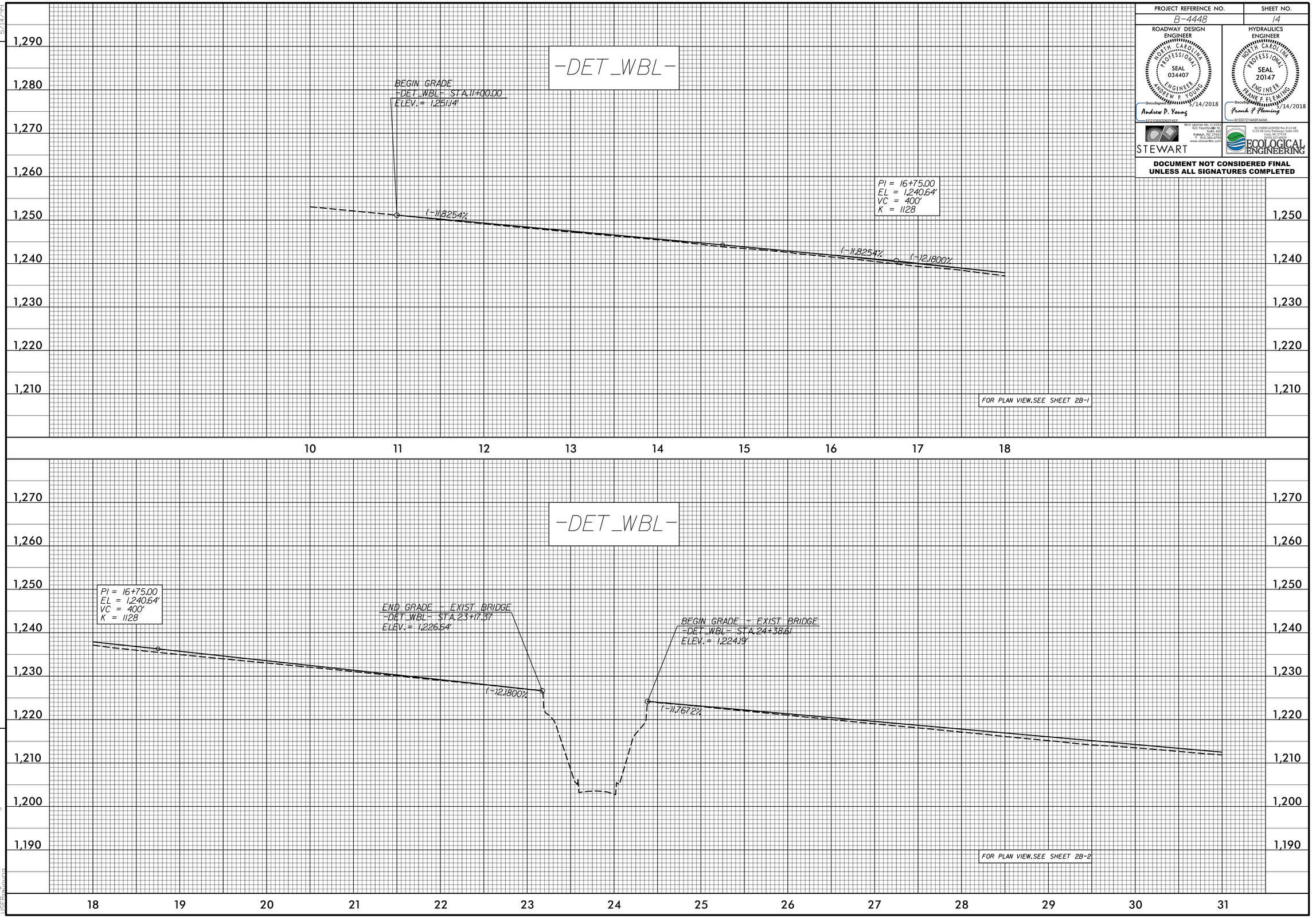

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jtsellers

PROJECT REFERENCE NO.	SHEET NO.
B-4448	15

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034407 ENGINEER ANDREW P. YOUNG	NORTH CAROLINA PROFESSIONAL SEAL 20147 ENGINEER FRANK F. FLEMING
DocuSigned by: Andrew P. Young 5/14/2018 EF21D93DD62F4EF...	DocuSigned by: Frank F Fleming 5/14/2018 B1DD721AA9FA4A6...
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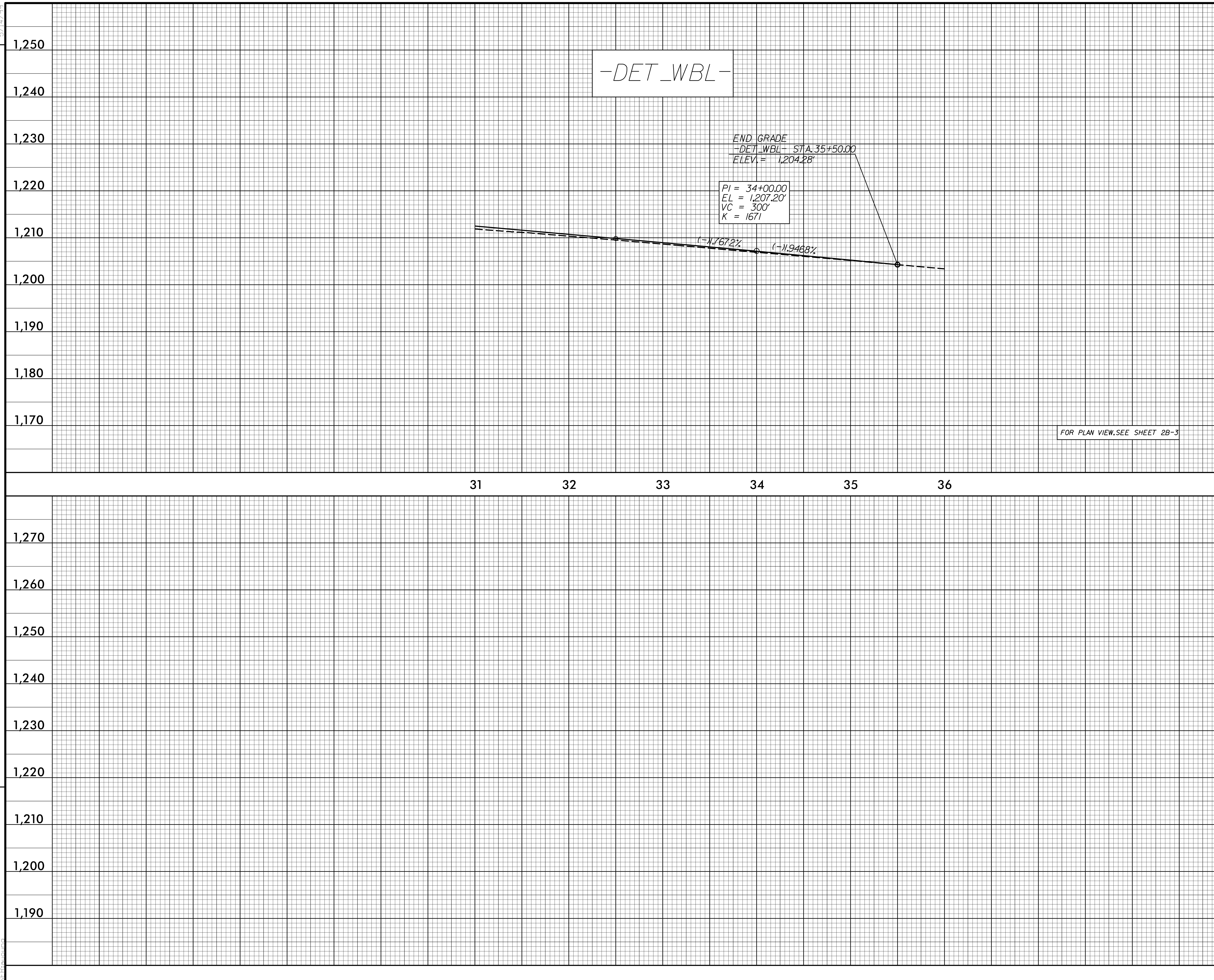

FOR PLAN VIEW,SEE SHEET 2B-3

5/14/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-4448	16

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 034407 ENGINEER ANDREW P YOUNG

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HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 20147 ENGINEER FRANK F FLEMING

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-DET_EBL-

BEGIN GRADE
-DET_EBL- STA.10+50.00
ELEV.= 1,252.63'

PI = 12+00.00
EL = 1,250.01'
VC = 300'
K = 902

(-)1.7500%

(-)12.0824%

FOR PLAN VIEW.SEE SHEET 2B-1

-DET_EBL-

BEGIN TEMPORARY BRIDGE
-DET_EBL- STA.23+40+/-

END TEMPORARY BRIDGE
-DET_EBL- STA.24+40+/-

(-)12.0824%

PI = 28+00.00
EL = 1,216.69'
VC = 360'
K = 617

(-)1.4991%

PI = 32+30.00
EL = 1,210.24'
VC = 500'
K = 1247

(-)11.44%

BEGIN DITCH GRADE LT
STA 29+00.00
EL=1,213.83

FOR PLAN VIEW.SEE SHEET 2B-2

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mstephenson

PROJECT REFERENCE NO.	SHEET NO.
B-4448	17

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 034407 ENGINEER ANDREW P. YOUNG	NORTH CAROLINA PROFESSIONAL SEAL 20147 ENGINEER FRANK F. FLEMING
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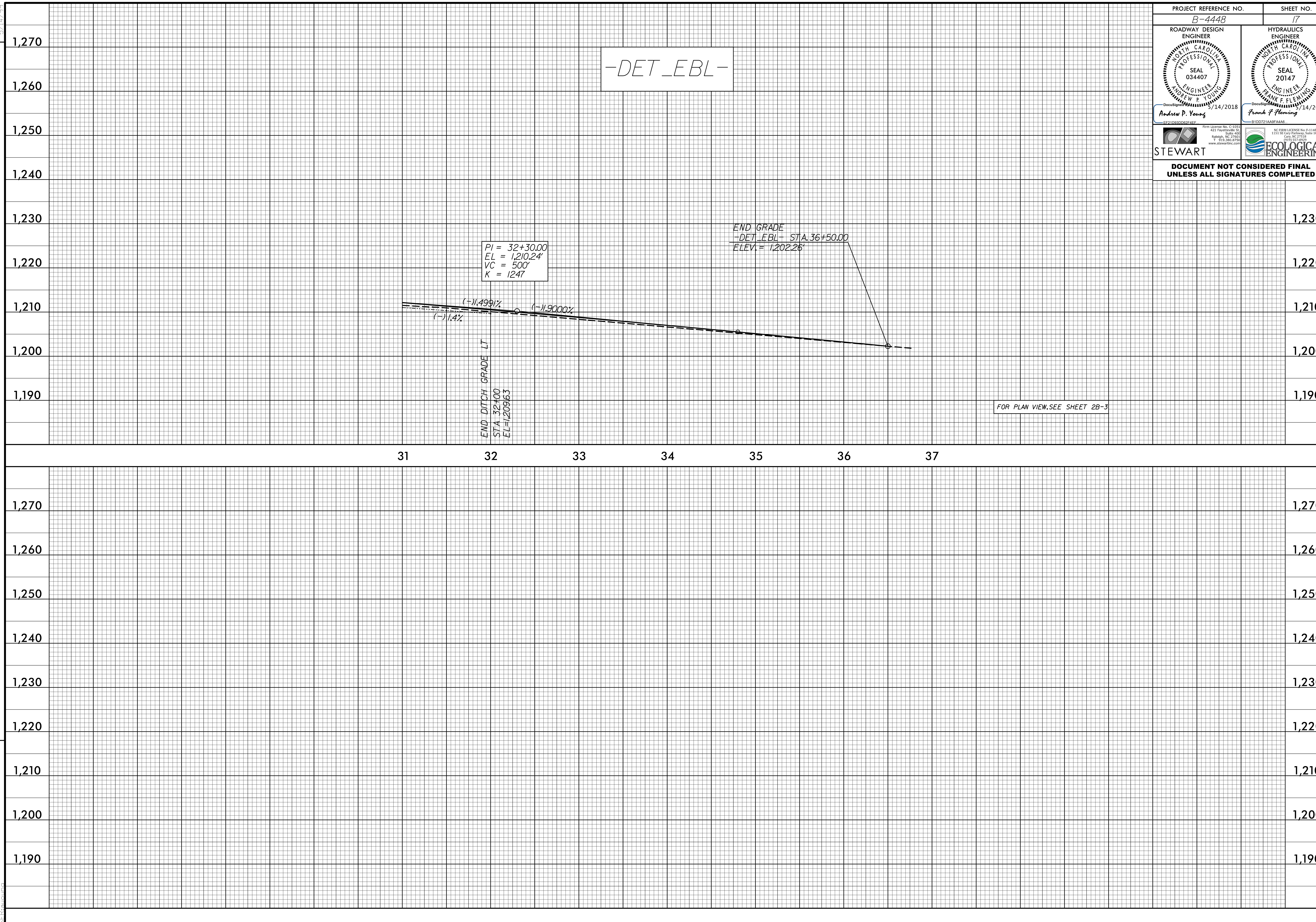

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