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TIP PROJECT: B-5123

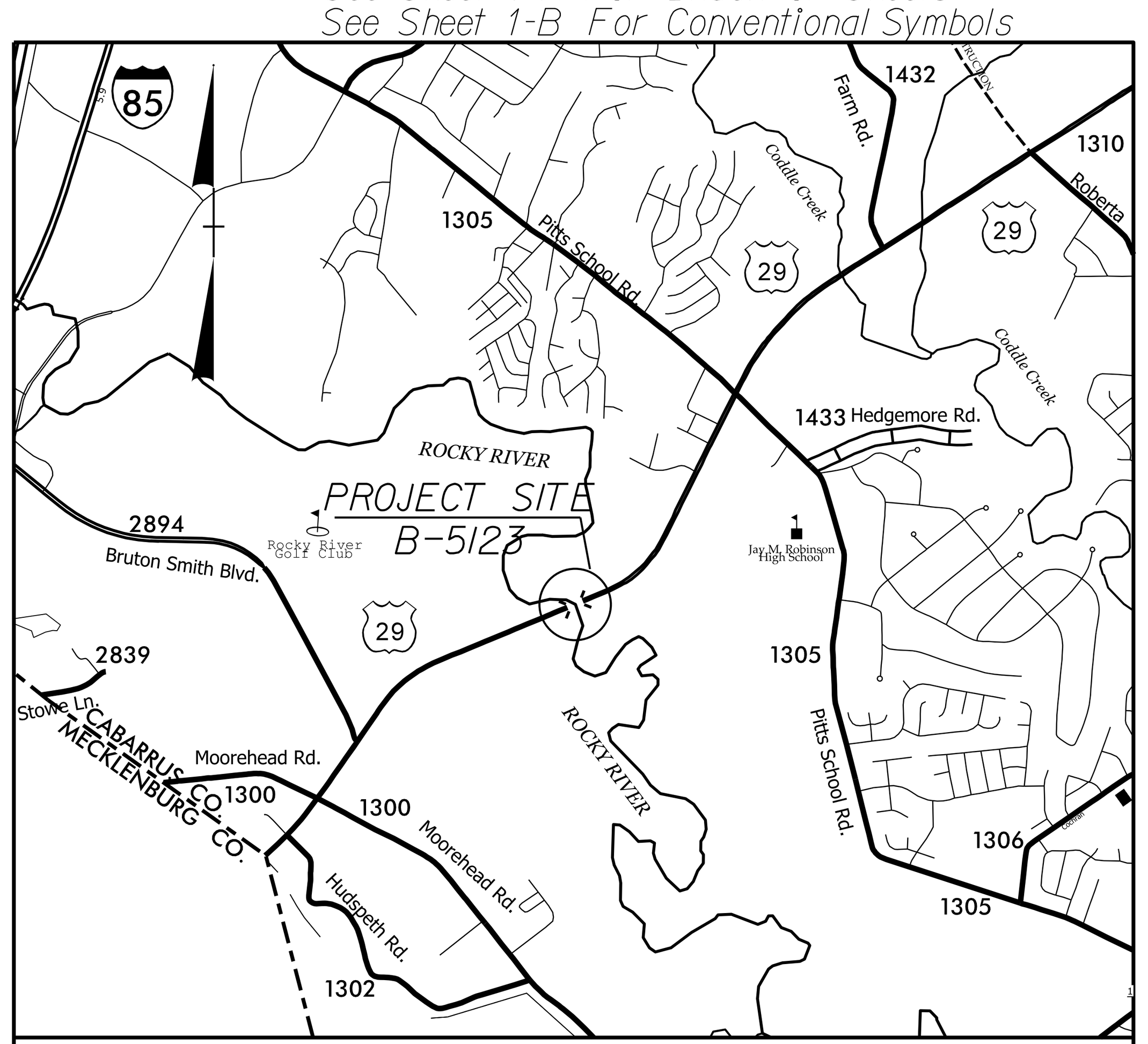
CONTRACT: C203889

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5123	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
42265.1.1	BRSTP-0029(42)	P.E.
42265.2.1	BRSTP-0029(42)	ROW, UTIL.
42265.3.1		CONST.

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



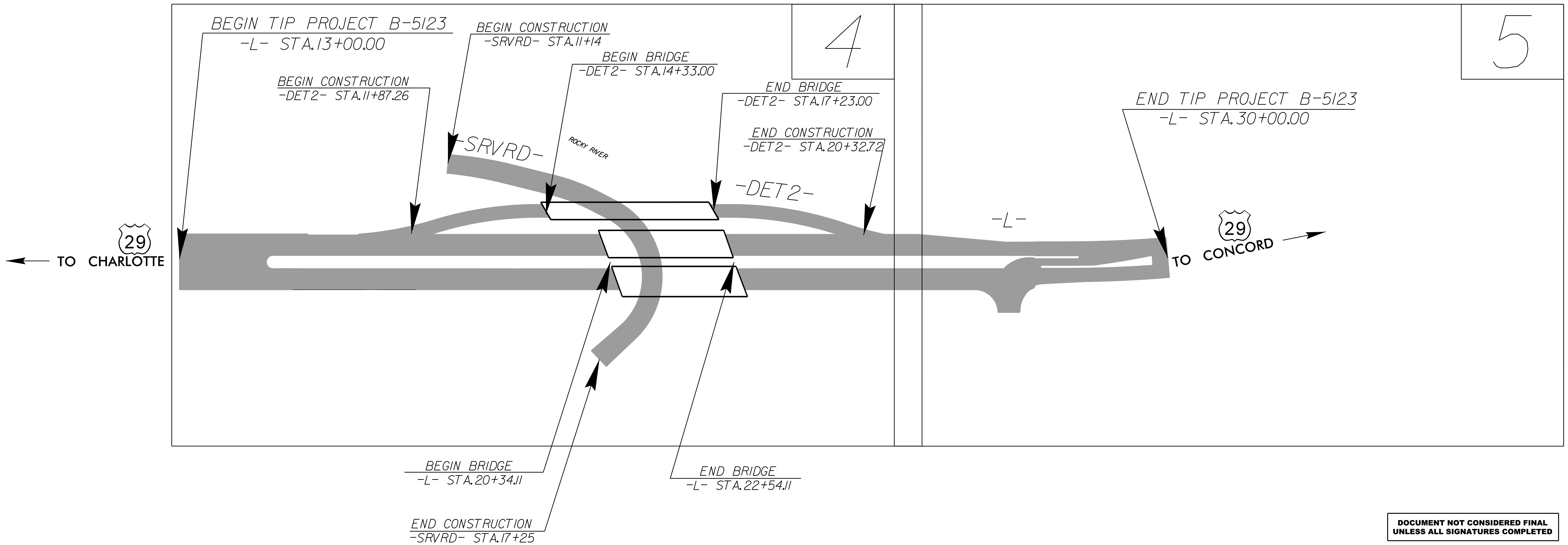
VICINITY MAP

CABARRUS COUNTY

LOCATION: BRIDGES #14 AND #19 OVER ROCKY RIVER AND ACCESS RD ON US 29

TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURES

NC GRID NAD 83/2001



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2016 = 32,300
ADT 2036 = 50,300
DHV = 11 %
D = 65 %
T = 5 % *
V = 50 MPH
* TTST = 2% DUAL 3%
FUNC CLASS = MAJOR ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-5123 = 0.280 MILES

LENGTH OF STRUCTURE TIP PROJECT B-5123 = 0.042 MILES

TOTAL LENGTH OF TIP PROJECT B-5123 = 0.322 MILES

Prepared in the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
APRIL 29, 2015

G.E. BREW, PE
PROJECT ENGINEER

LETTING DATE:
JULY 19, 2016

THAD F. DUNCAN, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
Charles Heafner 5/26/2016 P.E.
SIGNATURE:
SEAL 032312 NORTH CAROLINA PROFESSIONAL ENGINEER CHARLES W. HEAFNER

ROADWAY DESIGN ENGINEER
Thad F. Duncan 5/26/2016 P.E.
SIGNATURE:
SEAL 025477 NORTH CAROLINA PROFESSIONAL ENGINEER Thad F. Duncan

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

24-MAY-2016 14:29
R:\Roadway\Proj\B-5123_Rdy_tsh.dgn
$$$$USERNAME$$$$

09/08/99

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-5123	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 025477 ENGINEER Thad F. Duncan

5/24/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX OF SHEETS

GENERAL NOTES:

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

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

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

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.

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 900 MM RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

STREET TURNOUT:

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

GUARDRAIL:

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

TEMPORARY SHORING:

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

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 :

CITY OF CONCORD POWER, MCI COMMUNICATIONS, WINDSTREAM COMMUNICATIONS

TIME WARNER COMMUNICATIONS, PSNC GAS, DUKE POWER

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 OTHERS.

CURB RAMPS

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

EFF. 01-17-2012
REV. 10-30-2012

2012 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2012 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.10	Reinforced Bridge Approach Fills
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.04	Concrete Open Throat Catch Basin - 12" thru 48" Pipe
840.05	Brick Open Throat Catch Basin - 12" thru 48" Pipe
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.24	Frames and Narrow Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.45	Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.02	Driveway Turnout - Radius Type
848.04	Street Turnout
848.05	Curb Ramp - Proposed Curb & Gutter
850.01	Concrete Paved Ditches
852.01	Concrete Islands
852.04	Method for Placement of Drop Inlets in Grassed Median - Using 1'-6" Curb and Gutter
852.05	Median Curb for Catch Basin - for Use with 1'-6" Curb and Gutter
852.06	Method for Placement of Drop Inlets in Concrete Islands
857.01	Precast Reinforced Concrete Barrier - 41" Single Faced
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units (Beg. March 2013 Letting use detail in lieu of Standard)
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
866.01	Chain Link Fence - 4', 5' and 6' High Fence
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

04/06/15

PROJECT REFERENCE NO.	SHEET NO.
B-5123	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

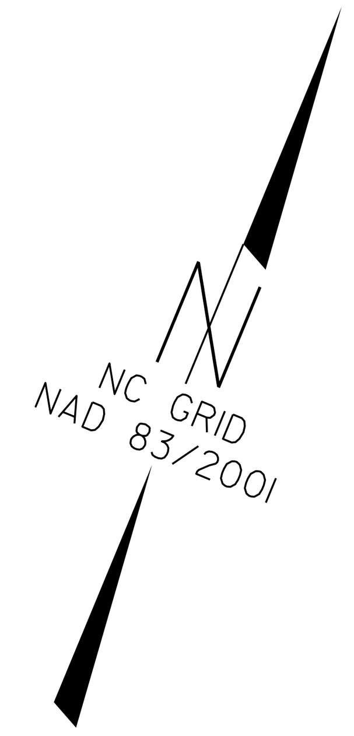
- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- SS Forced Main Line LOS B (S.U.E.*) — FSS
- SS Forced Main Line LOS C (S.U.E.*) — FSS
- SS Forced Main Line LOS D (S.U.E.*) — FSS

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line LOS B (S.U.E.*) — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — 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.

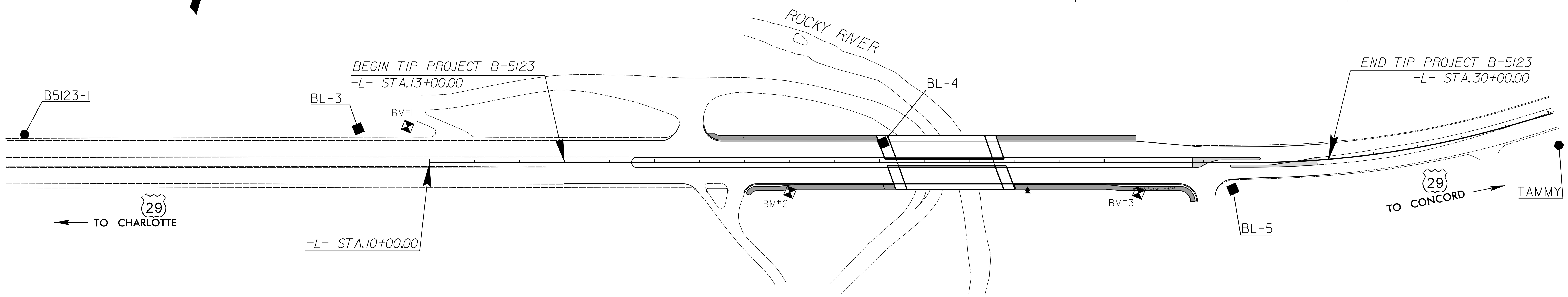
PROJECT REFERENCE NO.	SHEET NO.
B-5123	1C-1
Location and Surveys	

SURVEY CONTROL SHEET
FINAL



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B5123-1"
WITH NAD 83/2001 STATE PLANE GRID COORDINATES OF
NORTHING: 589217.621(ft) EASTING: 1498613.652(ft)
ELEVATION: 679.06(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998740
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B5123-1" TO -L- STATION 10+00.00 IS
N 71° 27′ 27″ E 902.47′
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88



BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	B5123-1	589217.6210	1498613.6520	679.06	OUTSIDE PROJECT LIMITS	
3	BL-3	589513.0960	1499294.1040	644.73	OUTSIDE PROJECT LIMITS	
4	BL-4	589930.5520	1500384.4430	585.73	20+08.49	43.67 LT
5	BL-5	590132.5380	1501142.5960	587.41	27+86.27	59.57 RT
2	TAMMY	590500.1490	1501775.1080	591.04	35+02.61	72.17 RT

BM1 ELEVATION = 639.20
N 589560 E 1499394
L STATION 10+00
N 53°55′32" W DIST 93
RR SPIKE IN BASE OF POWER POLE

BM2 ELEVATION = 587.42
N 589750 E 1500235
L STATION 18+01 66 RIGHT
RR SPIKE IN BASE OF POWER POLE

BM3 ELEVATION = 589.94
N 590045 E 1500953
L STATION 25+77 68 RIGHT
RR SPIKE IN BASE OF POWER POLE

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	589504.6156	1499469.2733
PC	28+30.27	590204.4048	1501160.4828
PT	34+05.76	590496.0427	1501654.3927
POT	35+08.11	590559.9539	1501734.3322

SRVRD

TYPE	STATION	NORTH	EAST
POT	10+00.00	589912.5479	1500001.4673
PC	10+65.08	589936.4038	1500062.0180
PT	12+12.39	589974.4764	1500203.9972
PC	12+95.51	589986.7885	1500286.1974
PT	13+77.22	589989.3921	1500367.6862
PC	14+07.86	589986.7970	1500398.2161
PT	16+55.28	589804.5875	1500506.0551
POT	18+90.29	589589.7390	1500410.8296

NOTES:

1. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT: HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION*

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   B5123_LS_CONTROL.TXT
   B5123_LS_LOCAL.TXT

2. *SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.*

3. *PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM, UTILIZING THE NCGS RTN SYSTEM (VRS).*

   MONUMENTS USED OR SET FOR PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT:

⬣ *INDICATES GEODETIC CONTROL MONUMENTS FOR HORIZONTAL CONTROL*
■ *INDICATES BASELINE MONUMENTS FOR HORIZONTAL PROJECT CONTROL*
⧓ *INDICATES BENCHMARKS FOR VERTICAL CONTROL*

NOTE: DRAWING NOT TO SCALE

19/05/14 TBL
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PROJECT REFERENCE NO.	SHEET NO.
B-5123	1C-2
Location and Surveys	

SURVEY CONTROL SHEET
FINAL

ROW MARKER (IRON PIN AND CAP)

ALIGN	STATION	OFFSET	NORTH	EAST
L	19+35.00	-78.40	589934.5529	1500303.2555
L	19+35.00	-130.00	589982.2278	1500283.5286
L	19+92.00	81.53	589808.5672	1500417.0728
L	19+92.00	135.00	589759.1557	1500437.5183
L	22+80.00	-130.00	590114.1357	1500602.3158
L	22+80.00	-67.50	590056.3844	1500626.2122
L	23+15.00	135.00	589882.6521	1500735.9771
L	23+15.00	65.50	589946.8716	1500709.4043
L	26+97.00	-67.50	590215.8209	1501011.5289
L	26+97.00	-59.34	590208.2765	1501014.6507
L	28+30.00	60.50	590148.4008	1501183.3621
L	28+30.00	65.50	590143.7776	1501185.2752

PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
L	16+79.00	-78.74	589836.9817	1500066.5786
L	16+79.00	-115.00	589870.4880	1500052.7143
L	17+24.00	81.40	589706.2189	1500169.3858
L	17+64.00	81.52	589721.4022	1500206.3923
L	17+75.00	-123.00	589914.5850	1500138.3616
L	17+75.00	-78.45	589873.4217	1500155.3942
L	18+17.00	135.00	589692.2459	1500275.8146
L	18+17.00	81.67	589741.5201	1500255.4259
L	18+25.00	-123.00	589933.7021	1500184.5626
L	18+25.00	-78.30	589892.4008	1500201.6523
L	18+50.00	135.00	589704.8632	1500306.3073
L	18+60.00	147.00	589697.5984	1500320.1356
L	18+74.00	135.00	589714.0394	1500328.4838
L	22+63.00	-151.00	590127.0403	1500578.5783
L	22+63.00	-160.00	590135.3565	1500575.1372
L	22+84.00	-153.00	590136.9176	1500597.2180
L	22+84.00	-148.00	590132.2975	1500599.1297
L	23+73.00	104.00	589933.4726	1500777.7177
L	24+76.00	-67.50	590131.3234	1500807.3203
L	24+76.00	-115.00	590175.2144	1500789.1590
L	25+13.00	82.00	590007.3289	1500898.6691
L	25+13.00	91.00	589999.0127	1500902.1102
L	25+82.00	136.00	589983.8133	1500983.0730
L	25+82.00	149.00	589971.8011	1500988.0435
L	26+01.00	136.00	589991.0778	1501000.6294
L	26+01.00	148.00	589979.9896	1501005.2175
L	26+53.00	79.00	590063.6288	1501026.8851
L	26+75.00	65.50	590084.5146	1501042.0519
L	29+52.00	60.11	590200.2032	1501297.7600
L	29+53.00	88.00	590175.5671	1501310.8811
L	29+70.00	60.06	590208.4101	1501314.3737
L	29+70.00	85.00	590186.0736	1501325.4632

PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
SRVRD	11+04.00	-43.00	589990.4562	1500085.2939
SRVRD	11+23.00	-50.00	590003.1734	1500102.6643
SRVRD	11+27.00	17.00	589939.9870	1500125.3194
SRVRD	11+47.00	10.00	589951.8652	1500142.3905
SRVRD	18+55.00	-48.00	589602.5487	1500469.0106
SRVRD	18+61.00	111.00	589661.4909	1500321.2174
SRVRD	18+75.00	-50.00	589583.4538	1500462.7349
SRVRD	18+90.00	105.00	589632.5471	1500314.9518

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B5123-1"
WITH NAD 83/2001 STATE PLANE GRID COORDINATES OF NORTHING: 589217.621(ft) EASTING: 1498613.652(ft)
ELEVATION: 679.06(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998740
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B5123-1" TO -L- STATION 10+00.00 IS
N 71° 27' 27" E 902.47'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES:

1. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT: HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION*

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   B5123_LS_CONTROL.TXT
   B5123_LS_LOCAL.TXT

2. *SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.*

19/05/14 TBL
08-FEB-2016 11:04
R:\Roadway\Proj\b5123_ls_1c-2.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-5123	2A-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW 2/4/2016	NORTH CAROLINA PROFESSIONAL SEAL 022896 ENGINEER CLARK S. MORRISON 2/4/2016

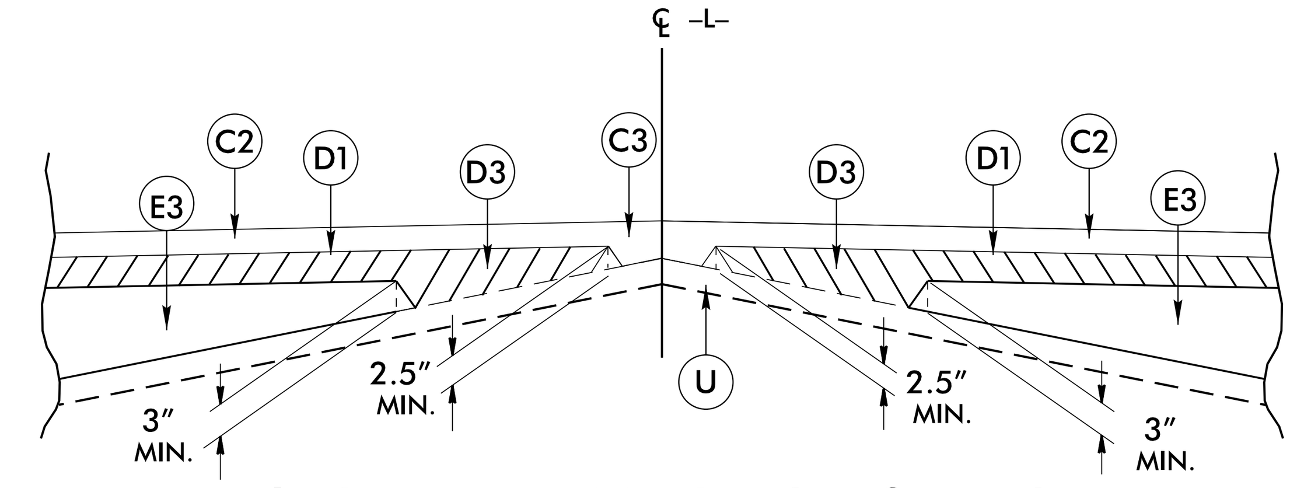
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT SCHEDULE

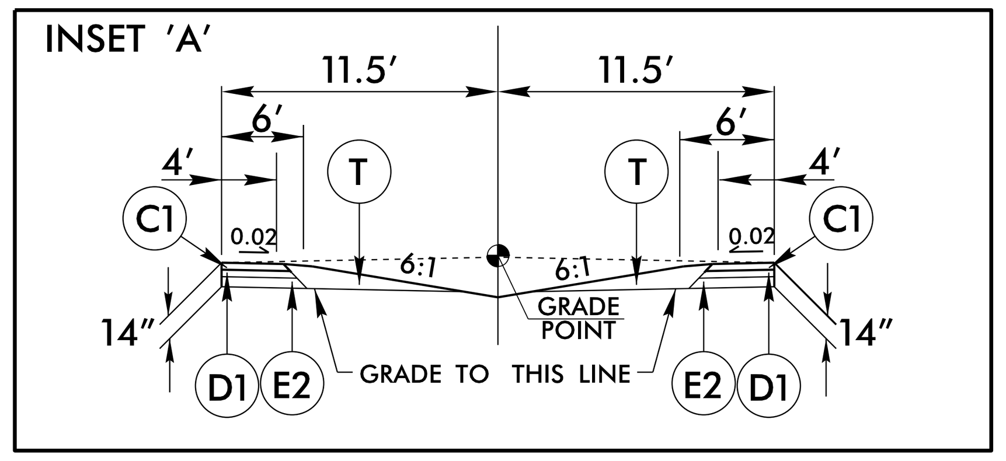
(FINAL PAVEMENT DESIGN)

C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	J2	PROP. 6" AGGREGATE BASE COURSE.
C2	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	P	PRIME COAT AT THE RATE OF 0.35 GAL. PER SQ. YARD.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	R1	1'-6" CONCRETE CURB AND GUTTER.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R2	2'-6" CONCRETE CURB AND GUTTER.
D2	PROP. APPROX. 2 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	R3	CONCRETE SHOULDER BERM GUTTER
D3	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	R4	5" CONCRETE MONOLITHIC ISLAND.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	S	4" CONCRETE MULTIUSE PATH.
E2	PROP. APPROX. 7" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	T	EARTH MATERIAL.
E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.	U	EXISTING PAVEMENT.
J1	PROP. 8" AGGREGATE BASE COURSE.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL).

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

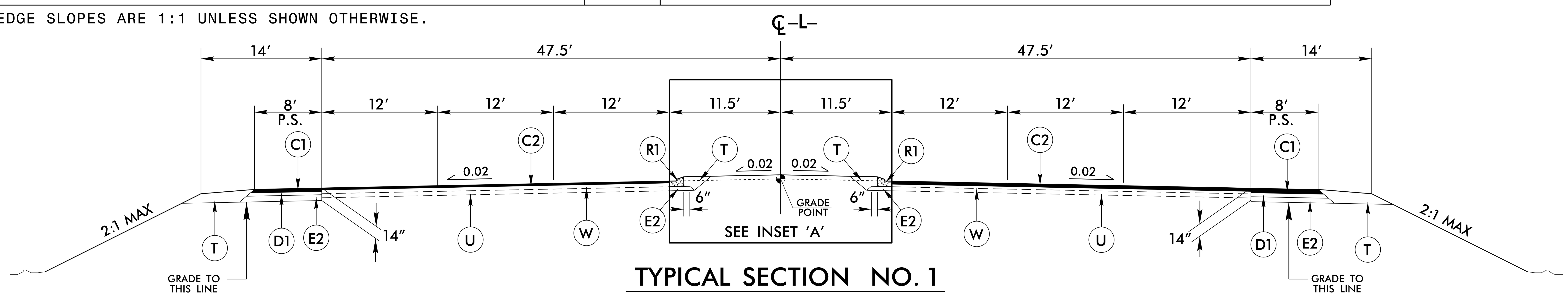


Detail Showing Method of Wedging



USE INSET 'A' IN CONJUNCTION WITH TYP. SECT. NO. 1

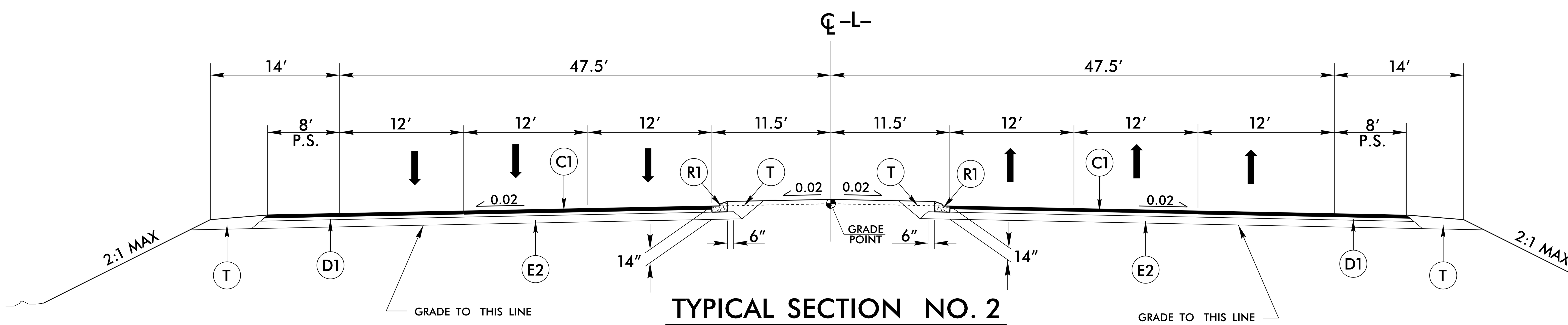
*-L- STA. 13+00.00 TO -L- STA. 13+79.28 (MEDIAN TRANSITION)



TYPICAL SECTION NO. 1

* TRANSITION FROM EXISTING TO TYPICAL SECTION NO.1 FROM -L- STA. 13+00.00 TO -L- STA. 13+79.28

-L- STA. 13+79.28 TO STA. 15+50.00



TYPICAL SECTION NO. 2

-L- STA. 15+50.00 TO -L- STA. 16+50.00

REVISIONS

8/17/99

04-FEB-2016 12:32
R:\Roadway\Proj\B-5123_Rdy_typ.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-5123	2A-2
RW SHEET NO.	

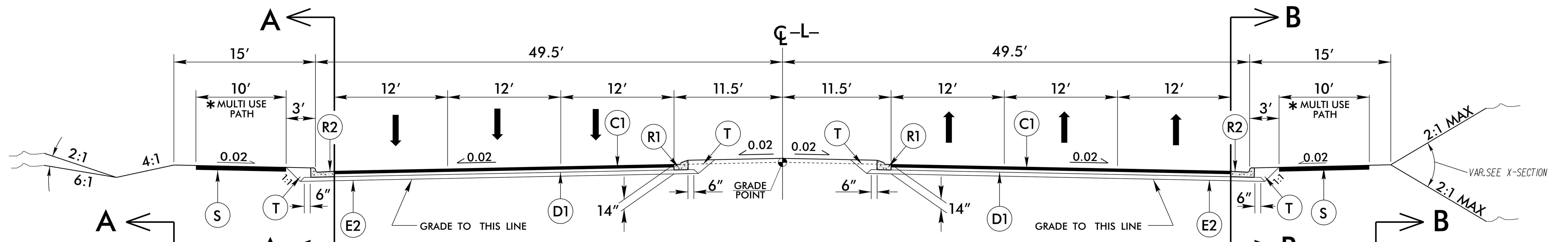
ROADWAY DESIGN ENGINEER — Gregory E. Brew, SEAL 18903, 2/22/2016

HYDRAULICS ENGINEER — Clark S. Morrison, SEAL 022896, 2/19/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

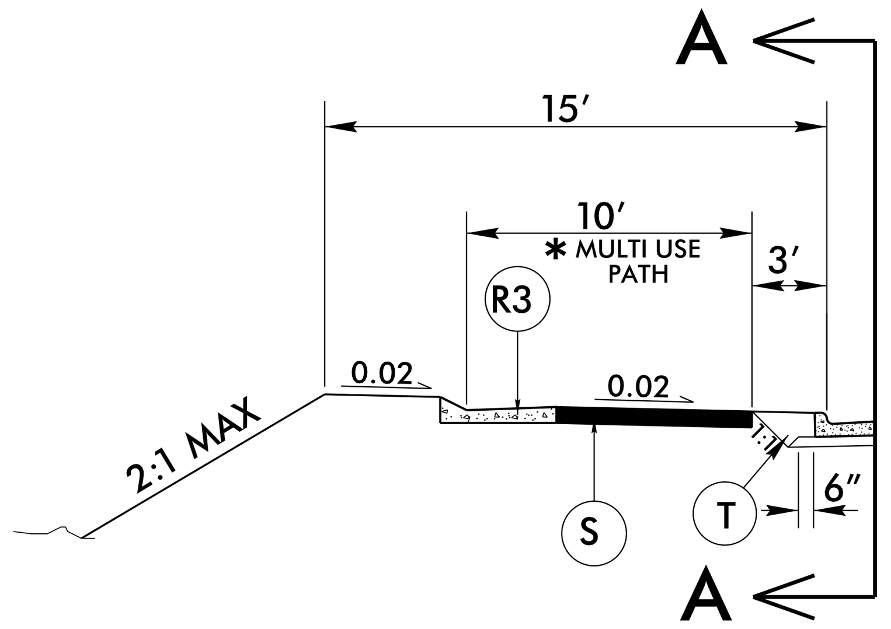
PAVEMENT SCHEDULE

C1	3″ S9.5B
C2	1½″ S9.5B
C3	VAR. S9.5B
D1	4″ I19.0B
D2	2½″ I19.0B
D3	VAR. I19.0B
E1	5″ B25.0B
E2	7″ B25.0B
E3	VAR. B25.0B
J1	8″ ABC
J2	6″ ABC
P	PRIME COAT
R1	1″-6″ C & G
R2	2′-6″ C & G
R3	CONC. SHOULDER BERM GUTTER
R4	5″ CONC. ISLAND
S	4″ CONC. MUTLIUSE PATH
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING



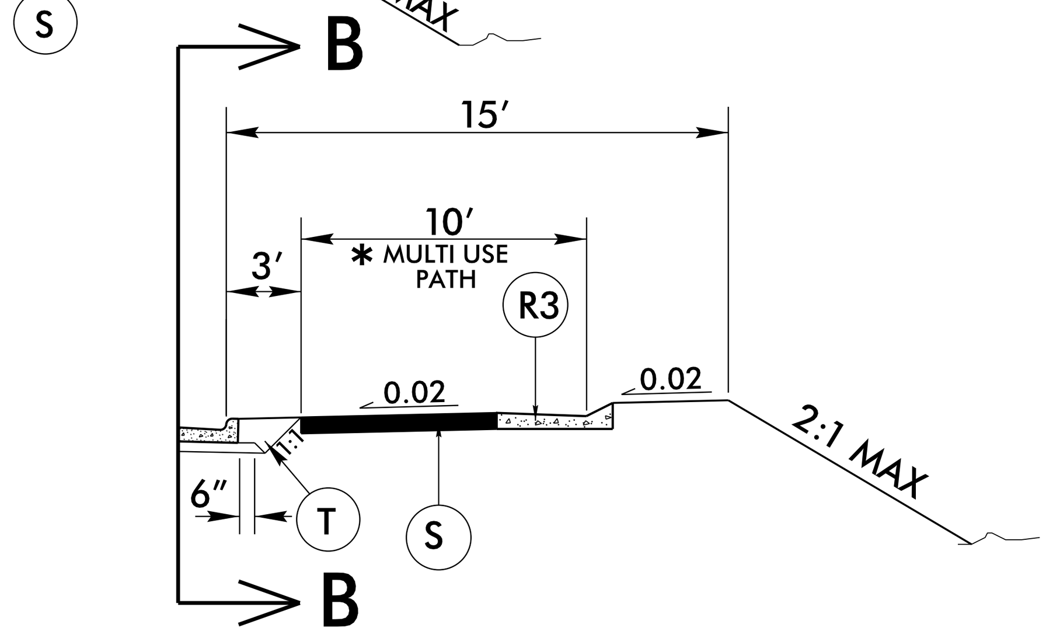
TYPICAL SECTION NO. 3

–L– STA. 16+50.00 TO –L– STA. 20+34.11 (BEGIN BRIDGE)
–L– STA. 22+54.11 (END BRIDGE) TO –L– STA. 25+50.00

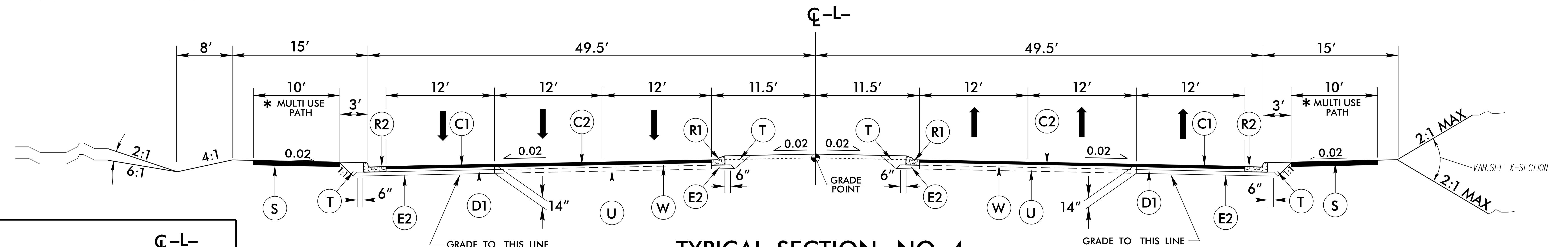


DETAIL OF SHOULDER BERM GUTTER PLACEMENT
–L– STA. 22+56.64 TO 22+86.00 LT.

* SEE PLANS FOR MULTI USE PATH LOCATION

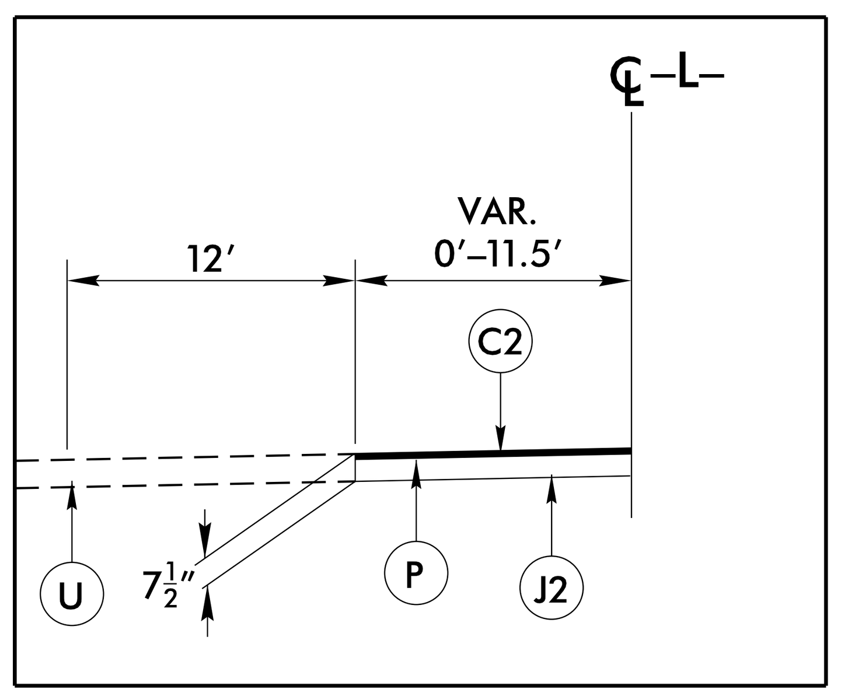


DETAIL OF SHOULDER BERM GUTTER PLACEMENT
–L– STA. 23+01.33 TO 23+24.00 RT.

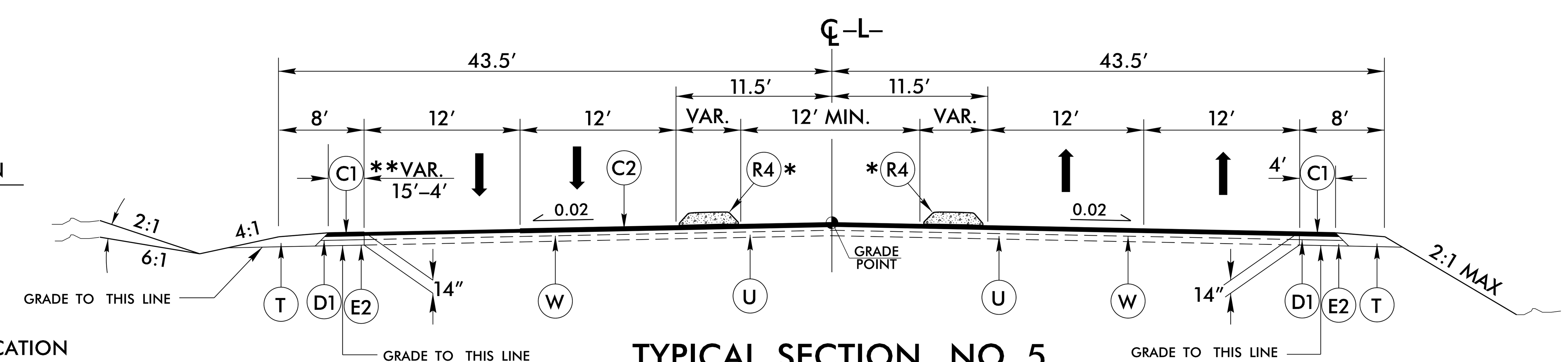


TYPICAL SECTION NO. 4

–L– STA. 25+50.00 TO –L– STA. 26+97.25



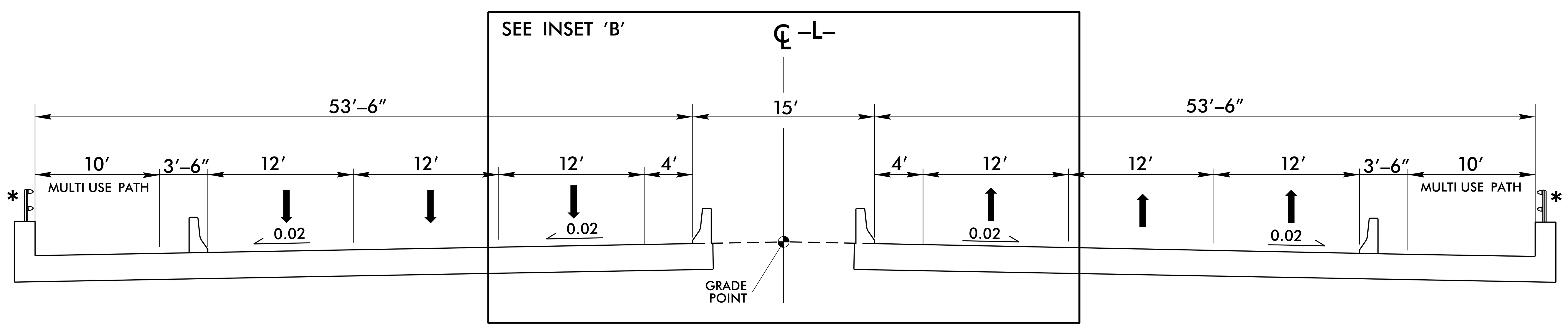
TEMPORARY PAVEMENT FOR PORTABLE CONCRETE BARRIER LOCATED IN MEDIAN
–L– STA. 25+70 +/– LT TO
–L– STA. 27+02 +/– LT
SEE TMP PLANS



* SEE PLANS FOR ISLAND LOCATION
** SEE PLANS FOR PAVED SHOULDER TRANSITION

TYPICAL SECTION NO. 5

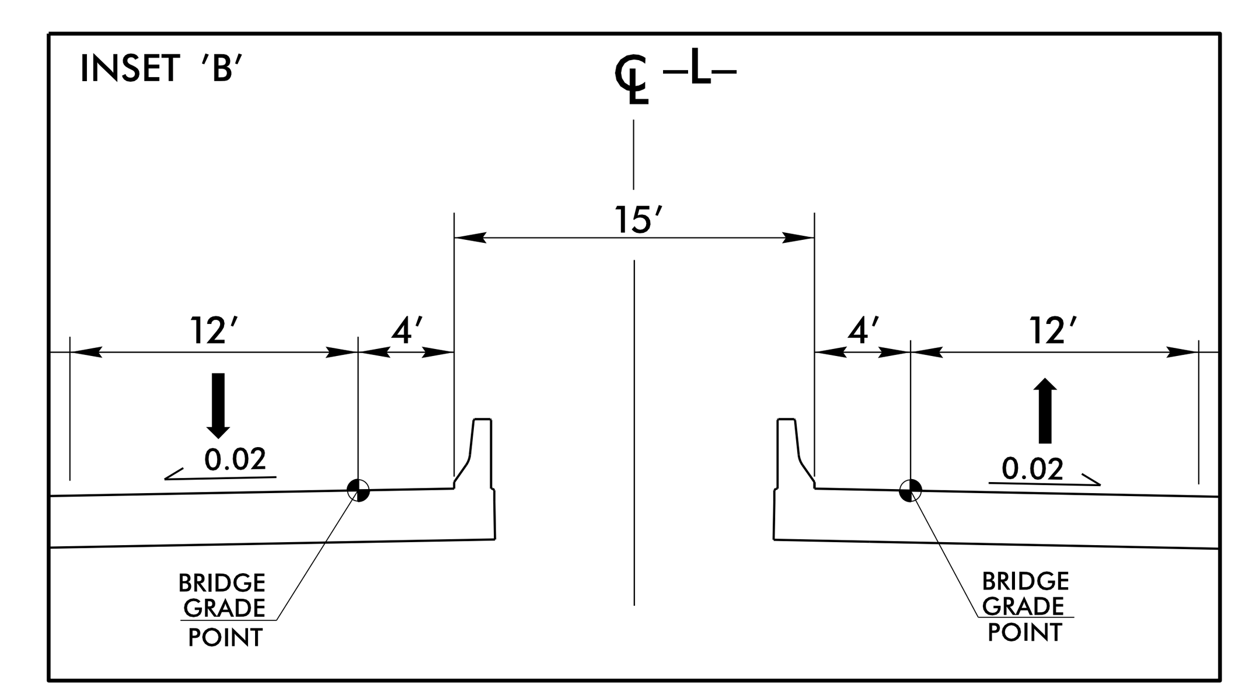
–L– STA. 26+97.25 TO –L– STA. 30+00.00



* BICYCLE SAFETY RAIL TO BE DETERMINED BY STRUCTURE MANAGEMENT UNIT

BRIDGE SECTION

–L– STA. 20+34.11 (BEGIN BRIDGE) TO
–L– STA. 22+54.11 (END BRIDGE)



GRADE POINT SHOWN AT MEDIAN EDGE OF TRAVEL
SEE SHEET 6 FOR GRADE INSET
–L– STA. 20+34.11 (BEGIN BRIDGE) TO
–L– STA. 22+54.11 (END BRIDGE)

REVISIONS

8/17/99

19-FEB-2016 09:11
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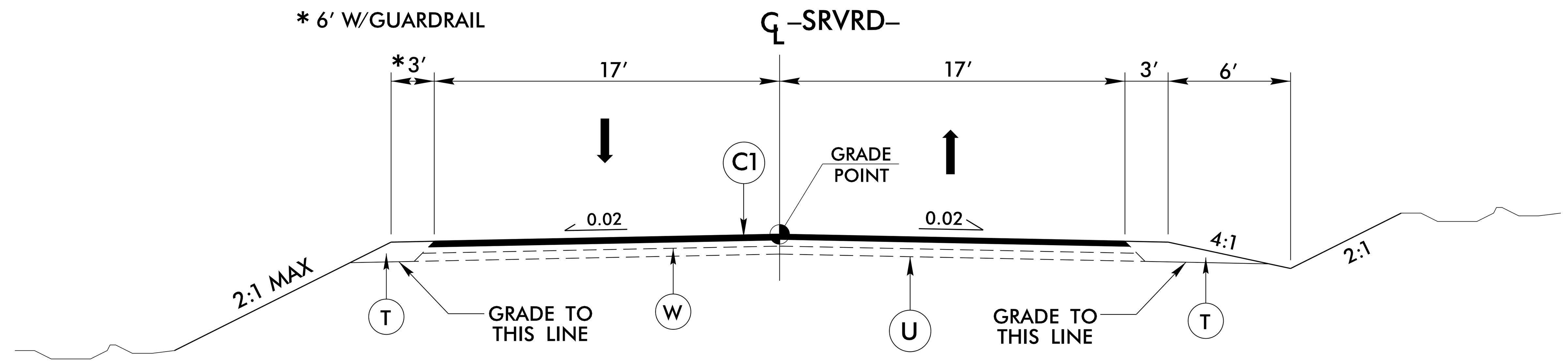
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-5123	2A-3
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 18903 GREGORY E. BREW 2/4/2016	SEAL 022896 CLARK S. MORRISON 2/4/2016

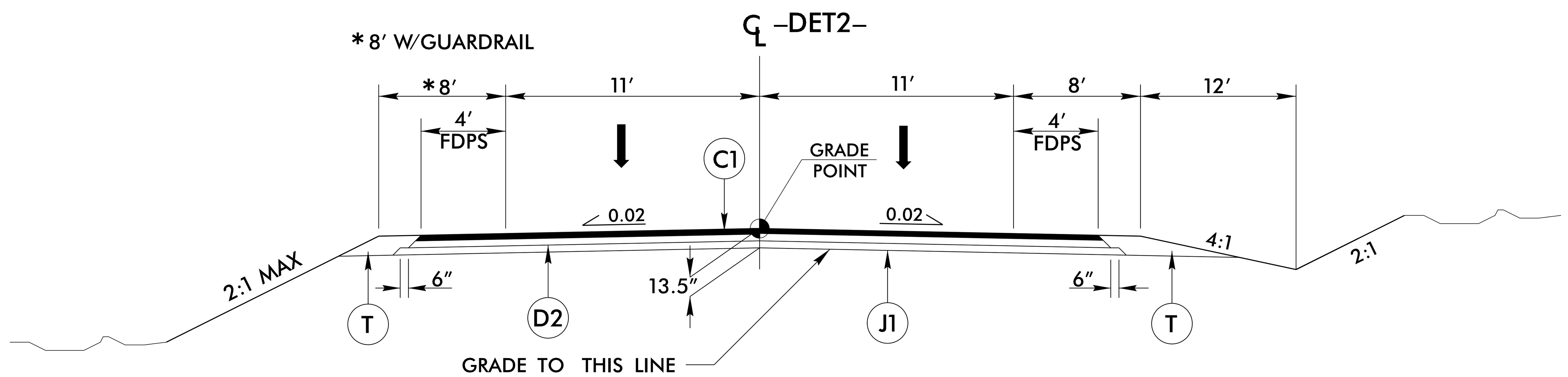
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT SCHEDULE	
C1	3″ S9.5B
C2	1½″ S9.5B
C3	VAR. S9.5B
D1	4″ I19.0B
D2	2½″ I19.0B
D3	VAR. I19.0B
E1	5″ B25.0B
E2	7″ B25.0B
E3	VAR. B25.0B
J1	8″ ABC
J2	6″ ABC
P	PRIME COAT
R1	1′-6″ C & G
R2	2′-6″ C & G
R3	CONC. SHOULDER BERM GUTTER
R4	5″ CONC. ISLAND
S	4″ CONC. MUTLIUSE PATH
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING



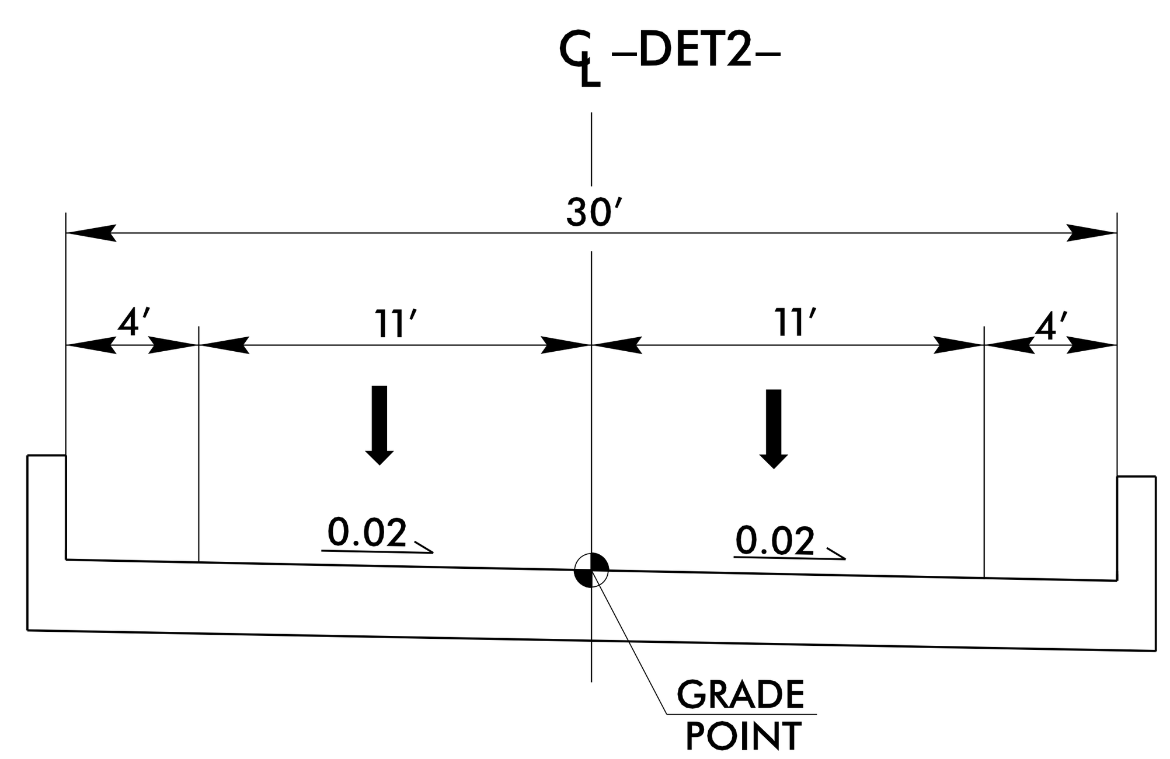
TYPICAL SECTION NO. 6

-SRVRD- STA. 11+14.00 TO -SRVRD- STA. 17+25.00



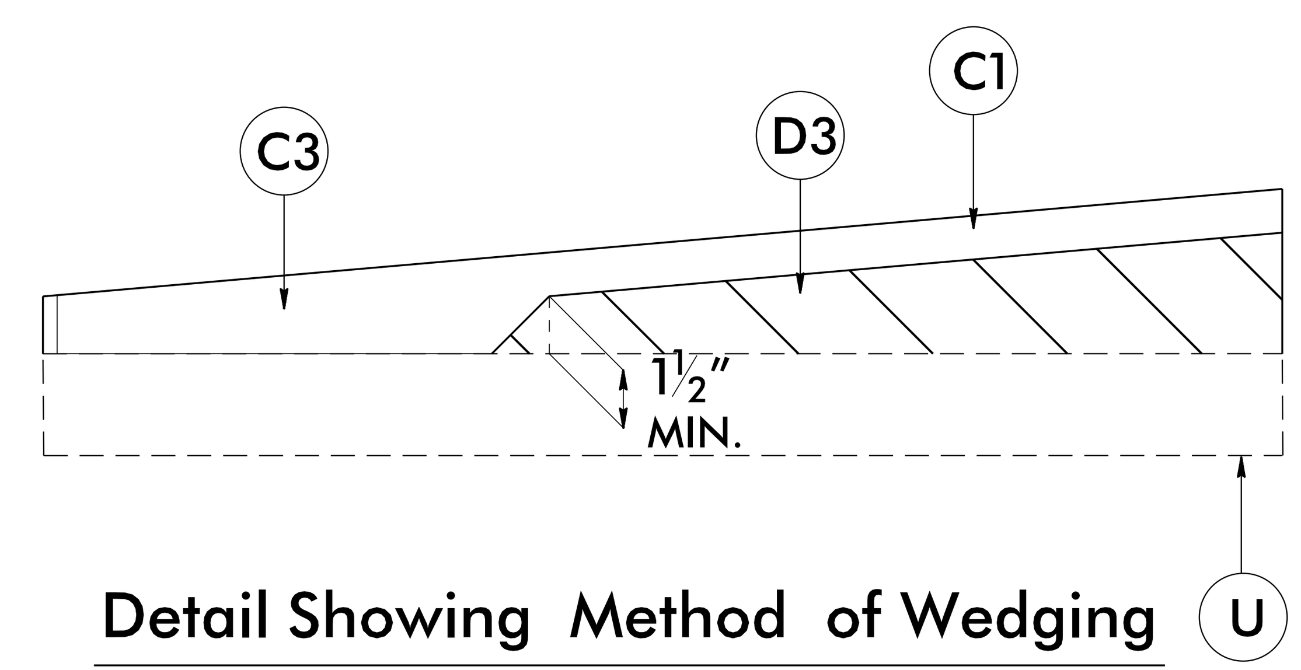
TYPICAL SECTION NO. 7

-DET2- STA. 11+87.26 TO -DET2- STA. 14+33.00 (BEGIN BRIDGE)
-DET2- STA. 17+23.00 (END BRIDGE) TO -DET2- STA. 20+32.72



DETOUR BRIDGE SECTION

-DET2- STA. 14+33.00 (BEGIN BRIDGE) TO
-DET2- STA. 17+23.00 (END BRIDGE)



Detail Showing Method of Wedging

USE WITH TYPICAL SECTION NO. 6

REVISIONS

8/17/99

02-FEB-2016 10:25
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-5123	2A-4

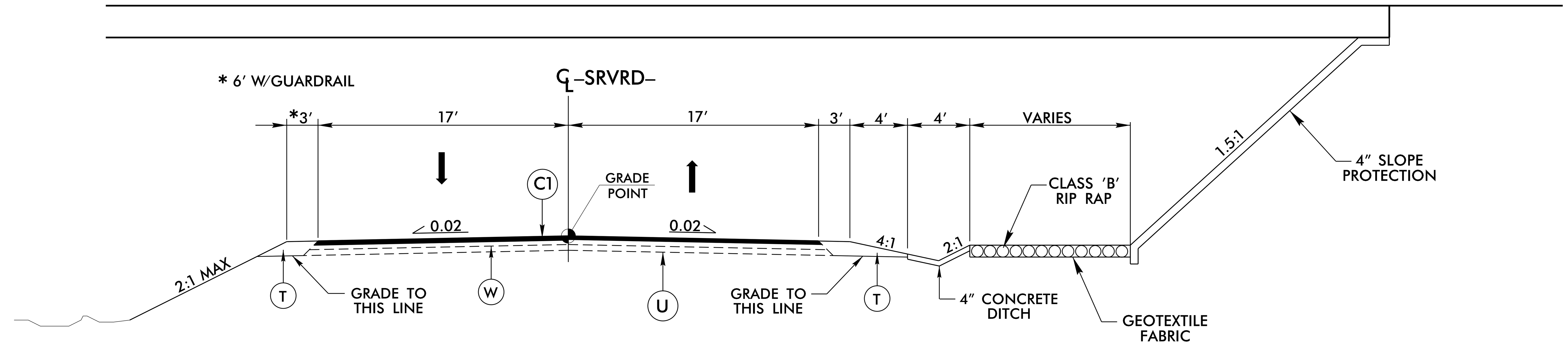
RW SHEET NO.

ROADWAY DESIGN ENGINEER — SEAL 025477 — Thad F. Duncan 3/2/2016

HYDRAULICS ENGINEER — SEAL 022896 — Clark S. Morrison 3/2/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT SCHEDULE	
C1	3″ S9.5B
C2	1½″ S9.5B
C3	VAR. S9.5B
D1	4″ I19.0B
D2	2½″ I19.0B
D3	VAR. I19.0B
E1	5″ B25.0B
E2	7″ B25.0B
E3	VAR. B25.0B
J1	8″ ABC
J2	6″ ABC
P	PRIME COAT
R1	1′-6″ C & G
R2	2′-6″ C & G
R3	CONC. SHOULDER BERM GUTTER
R4	5″ CONC. ISLAND
S	4″ CONC. MUTLIUSE PATH
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING

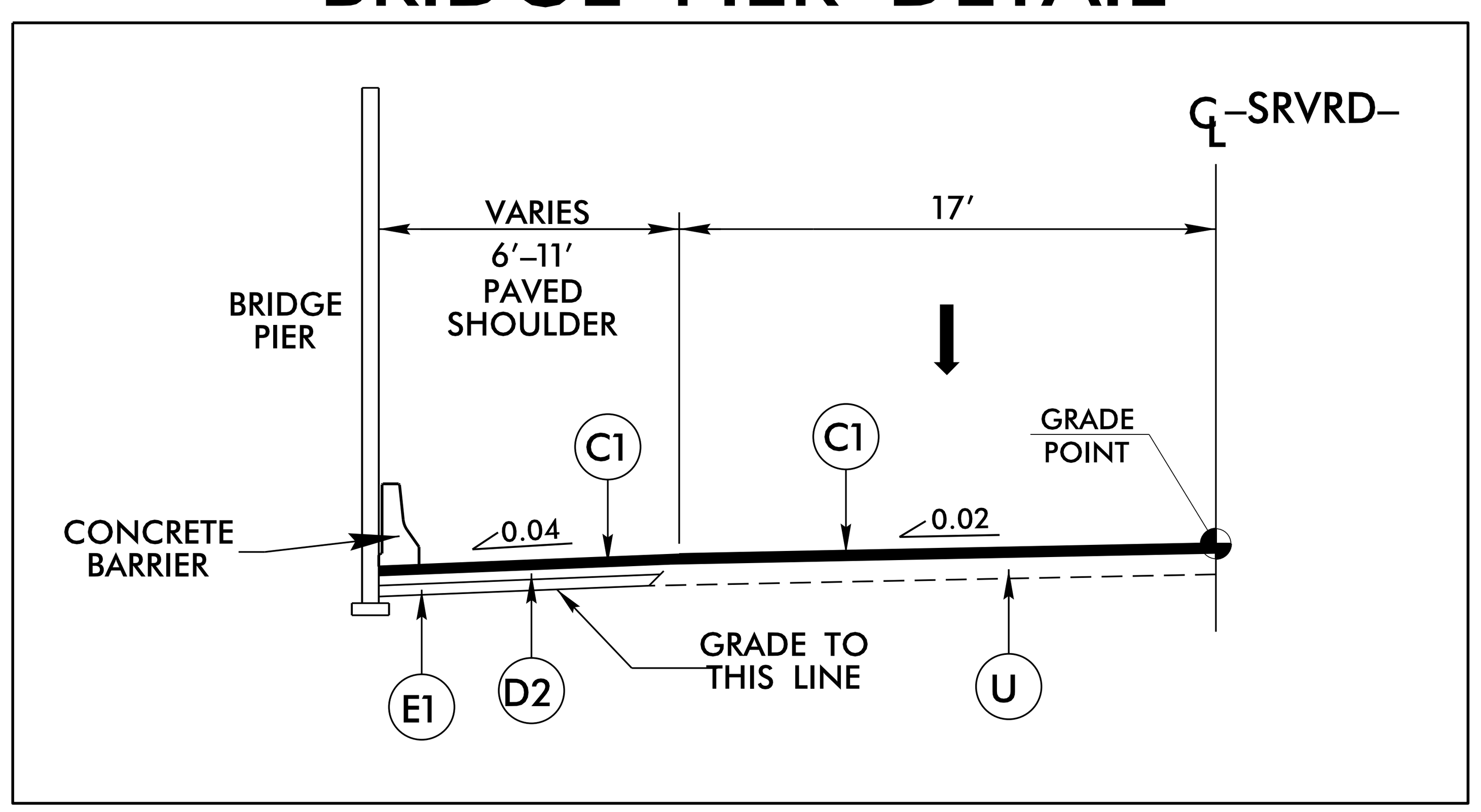


DETAIL OF RIP RAP UNDER BRIDGE

-SRVRD- STA. 14+18.00 TO -SRVRD- STA. 15+90.00 RT.

(USE WITH TYPICAL SECTION NO. 6)

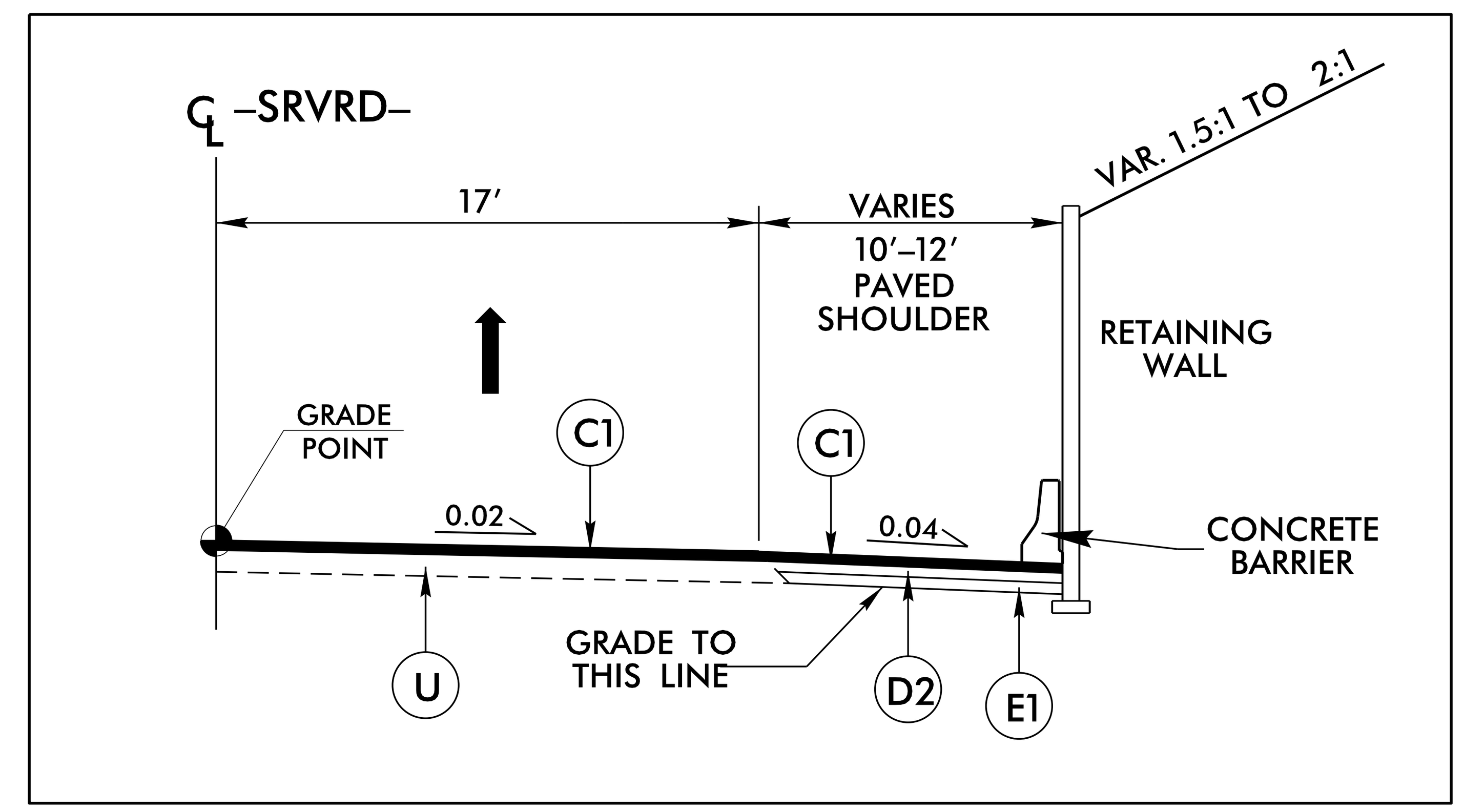
BRIDGE PIER DETAIL



USE IN CONJUNCTION WITH TYPICAL SECTION NO. 6

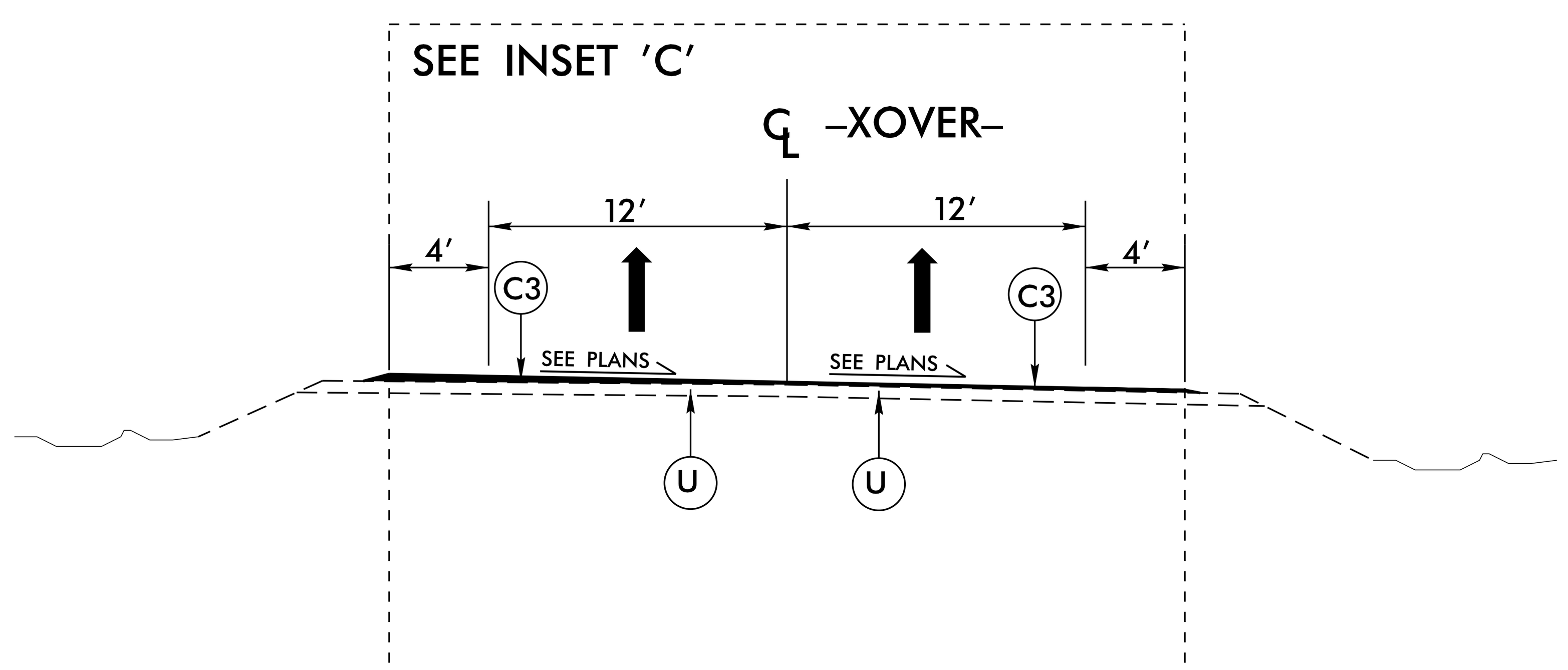
-SRVRD- STA. 14+73.20 LT TO -SRVRD- STA. 15+26.17 LT

RETAINING WALL DETAIL



USE IN CONJUNCTION WITH TYPICAL SECTION NO. 6

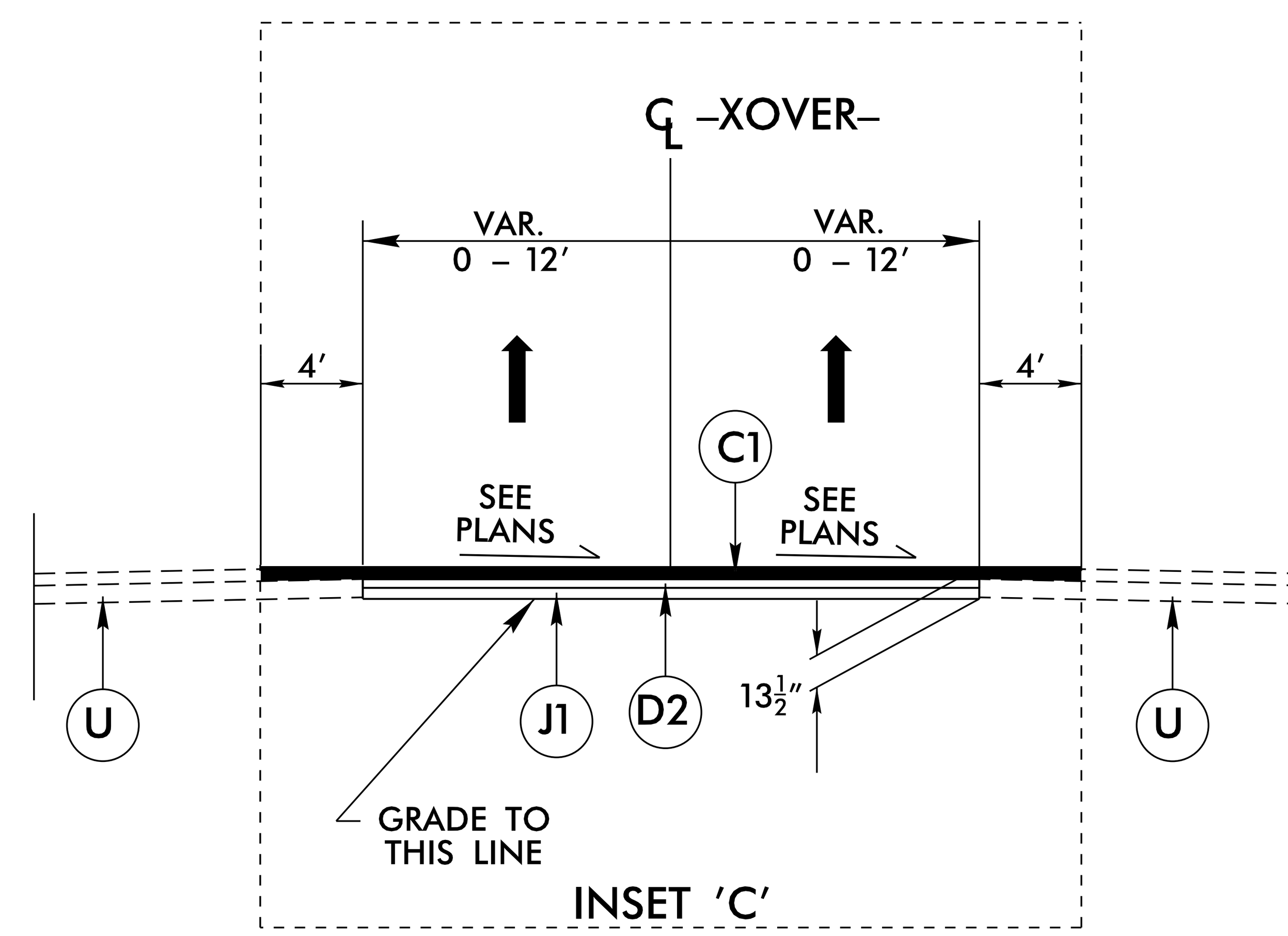
-SRVRD- STA. 13+06.78 RT TO -SRVRD- STA. 14+11.13 RT



TEMPORARY MEDIAN CROSSOVER

-L- STA. 14+00.00 TO -L- STA. 18+30.44

-L- STA. 23+52.32 TO -L- STA. 28+38.37



USE INSET 'C' IN CONJUNCTION WITH TEMPORARY MEDIAN CROSSOVER

REVISIONS

8/17/99

02-MAR-2016 10:56 R:\Roadway\Proj\B-5123_Rdy_typ.dgn $$$$USERNAME$$$$

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-5123	2B-1
R/W SHEET NO.	

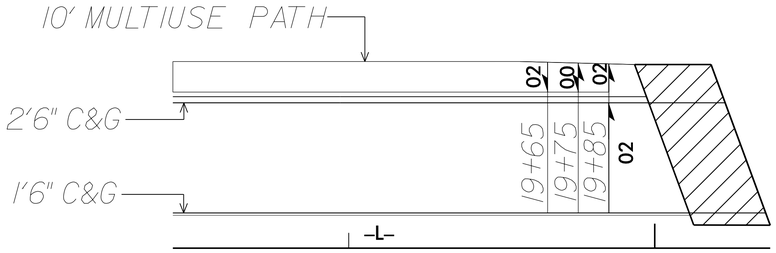
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 38903 GREGORY E. BREW

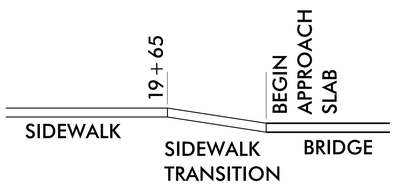
2/3/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

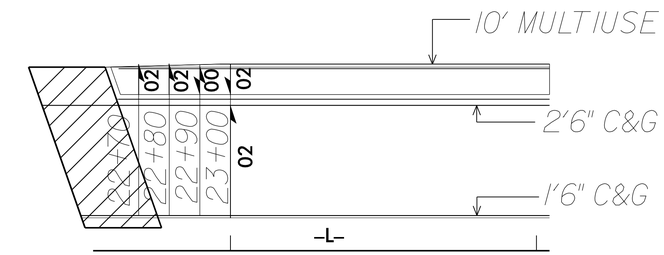
CONCRETE MULTIPURPOSE PATH SLOPE TRANSITION DETAILS



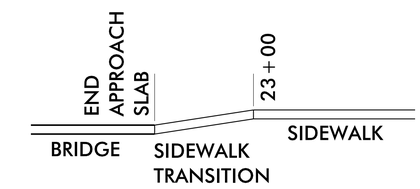
FROM –L– STA. 19+75.00 TO STA. 19+85.00 LT



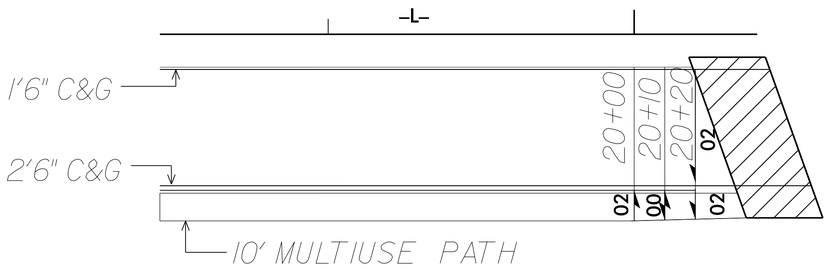
PROFILE OF SIDEWALK TRANSITION TO BRIDGE



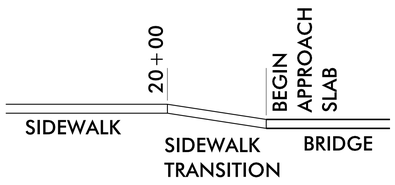
FROM –L– STA. 20+80.00 TO STA. 23+00.00 LT



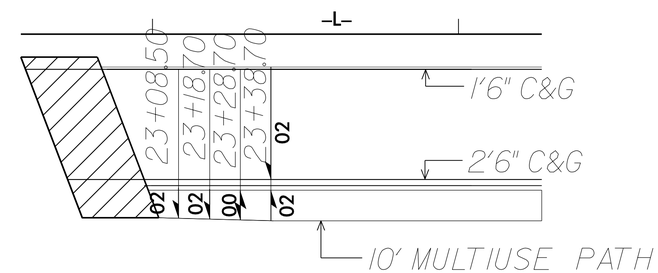
PROFILE OF SIDEWALK TRANSITION TO BRIDGE



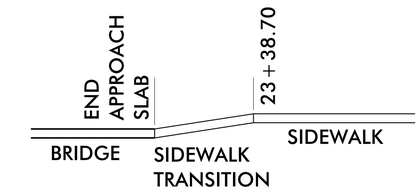
FROM –L– STA. 20+00.00 TO STA. 20+20.00 RT



PROFILE OF SIDEWALK TRANSITION TO BRIDGE



FROM –L– STA. 23+18.70 TO STA. 23+38.70 RT



PROFILE OF SIDEWALK TRANSITION TO BRIDGE

5/14/99

ISLAND DETAIL

10′ 0 20′
SCALE

PROJECT REFERENCE NO.	SHEET NO.
B-5123	2B-2

ROADWAY DESIGN ENGINEER

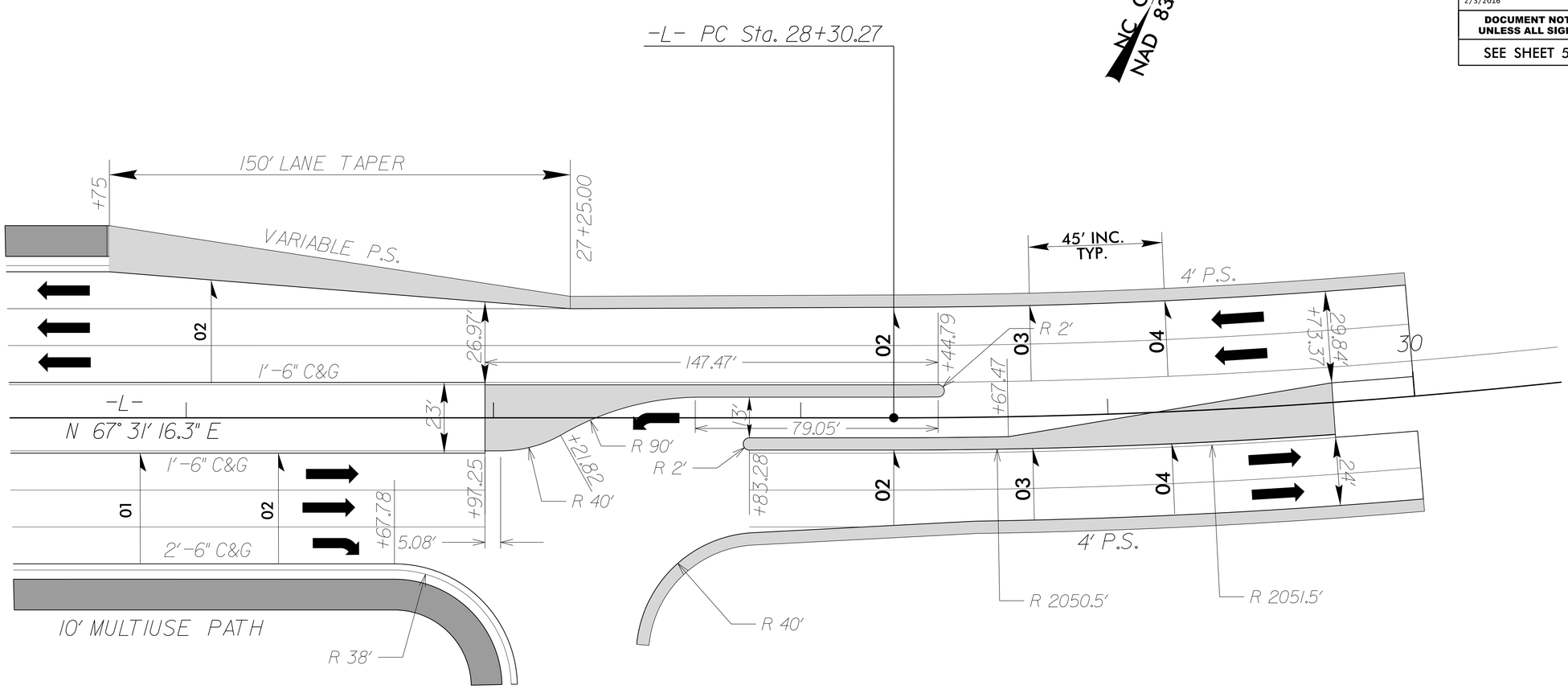
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18903 GREGORY E. BREW

2/3/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEE SHEET 5 FOR PLANS

NC GRID NAD 83/2001



-L-

PI Sta 31+19.94
△ = 16° 09′ 48.0″ (LT)
D = 2° 48′ 31.0″
L = 575.49′
T = 289.67′
R = 2,040.00′
SE = 0.04

PROJECT REFERENCE NO.	SHEET NO.
B-5123	2B-3

ROADWAY DESIGN ENGINEER

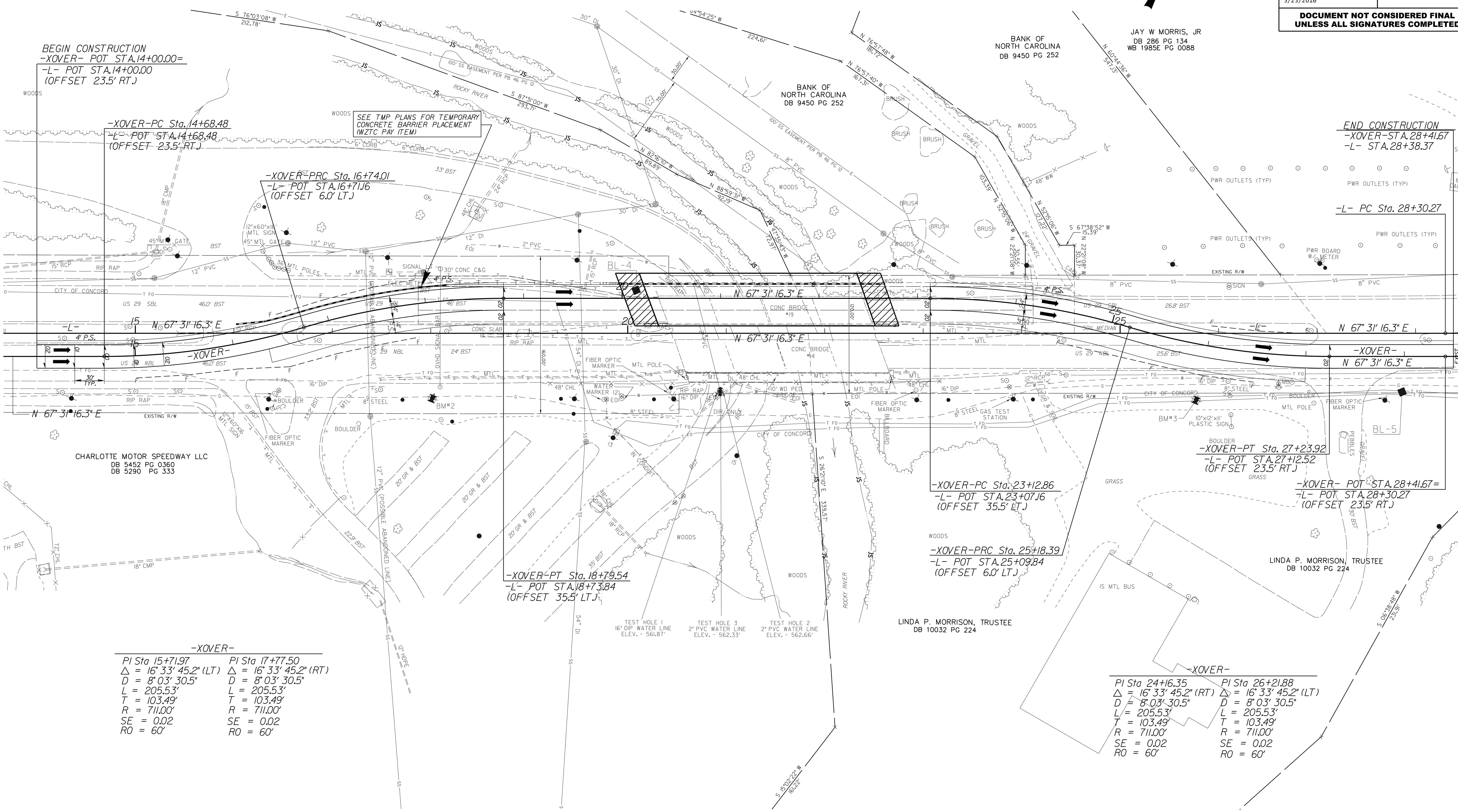
NORTH CAROLINA PROFESSIONAL SEAL 025477 ENGINEER Thad F. Duncan

5/25/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

* CROSSOVER ALIGNMENT DETAIL

CROSSOVER DESIGN SPEED = 45 MPH



-XOVER-

PI Sta 15+71.97	PI Sta 17+77.50
△ = 16° 33' 45.2" (LT)	△ = 16° 33' 45.2" (RT)
D = 8° 03' 30.5"	D = 8° 03' 30.5"
L = 205.53'	L = 205.53'
T = 103.49'	T = 103.49'
R = 711.00'	R = 711.00'
SE = 0.02	SE = 0.02
RO = 60'	RO = 60'

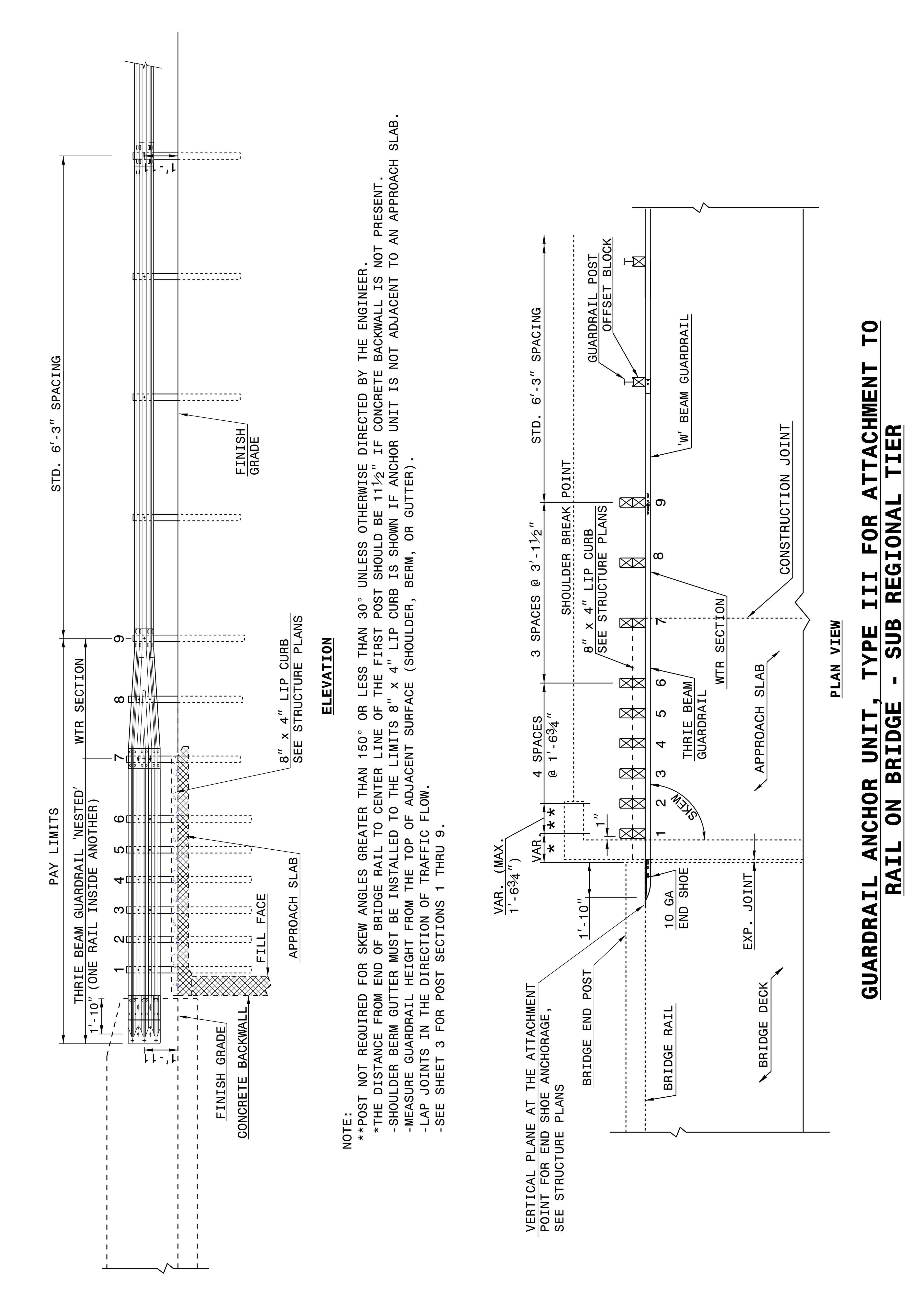
-XOVER-

PI Sta 24+16.35	PI Sta 26+21.88
△ = 16° 33' 45.2" (RT)	△ = 16° 33' 45.2" (LT)
D = 8° 03' 30.5"	D = 8° 03' 30.5"
L = 205.53'	L = 205.53'
T = 103.49'	T = 103.49'
R = 711.00'	R = 711.00'
SE = 0.02	SE = 0.02
RO = 60'	RO = 60'

*** SEE TMP PLANS PHASE 3 DETOUR PATTERN**

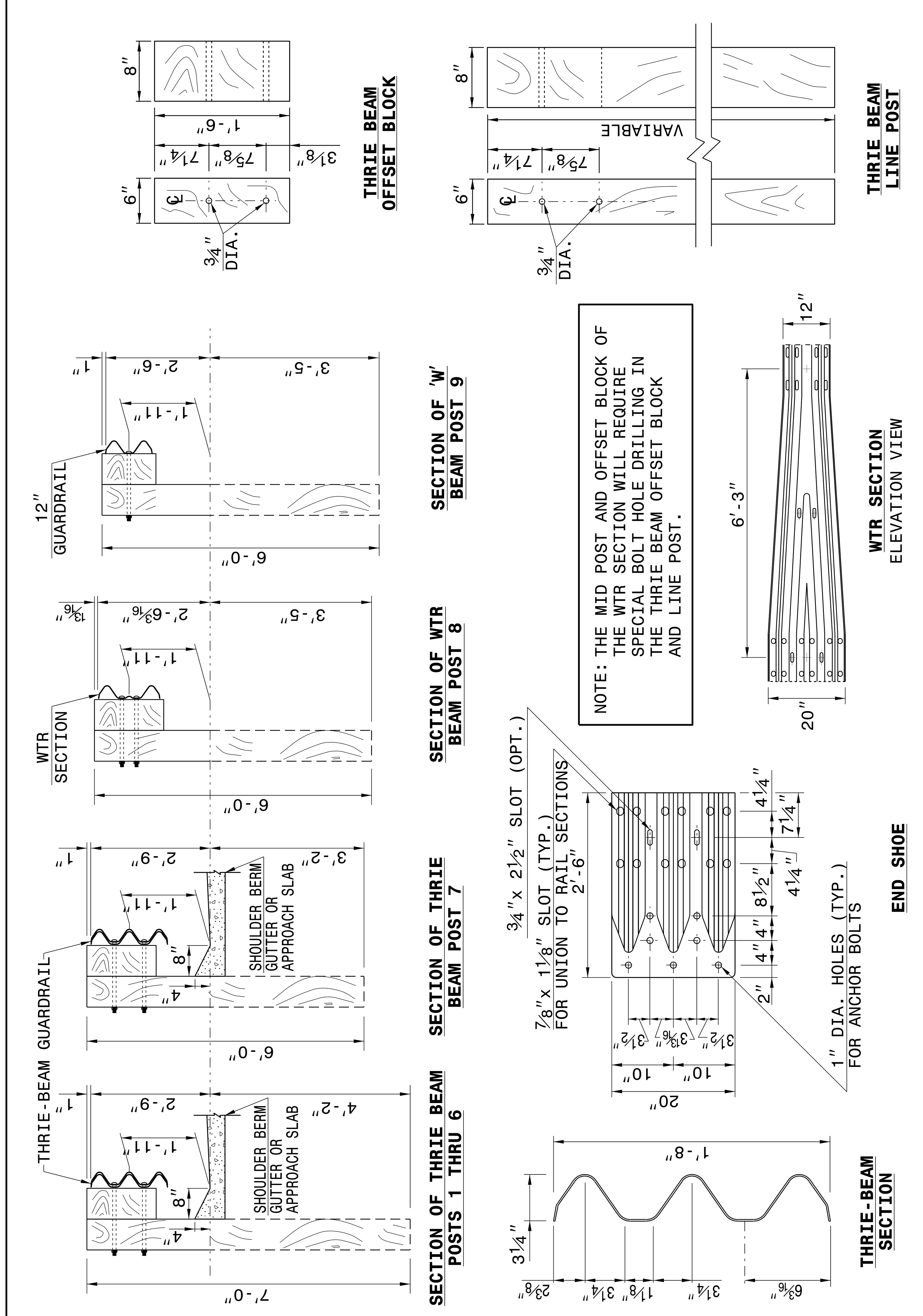
8/17/99

25-MAY-2016 08:44 R:\Roadway\Proj\B-5123_Rdy_Crossover_Detail.dgn $$$$USERNAME$$$$



NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 3 FOR POST SECTIONS 1 THRU 9.

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ENGLISH DETAIL DRAWING FOR **STRUCTURE ANCHOR UNITS** GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER	SHEET 2 OF 7 **862d03**



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ENGLISH DETAIL DRAWING FOR **STRUCTURE ANCHOR UNITS** GUARDRAIL ANCHOR UNIT, TYPE III	SHEET 3 OF 7 **862d03**

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

SEE TITLE BLOCK

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

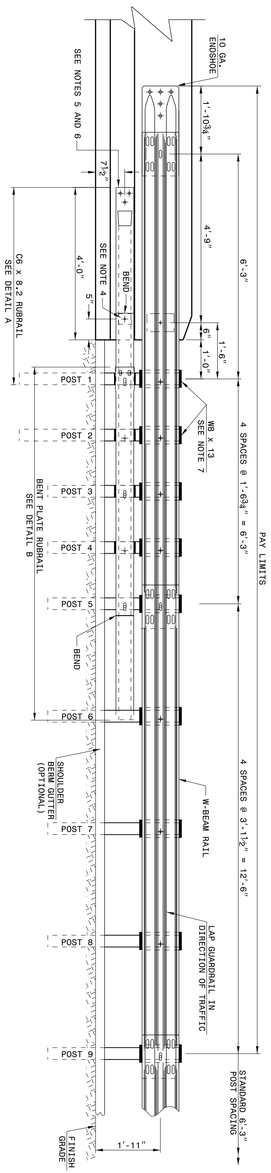
PROJECT REFERENCE NO.	SHEET NO.
B-5123	2C-2

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

SHEET 4 OF 7
862D03

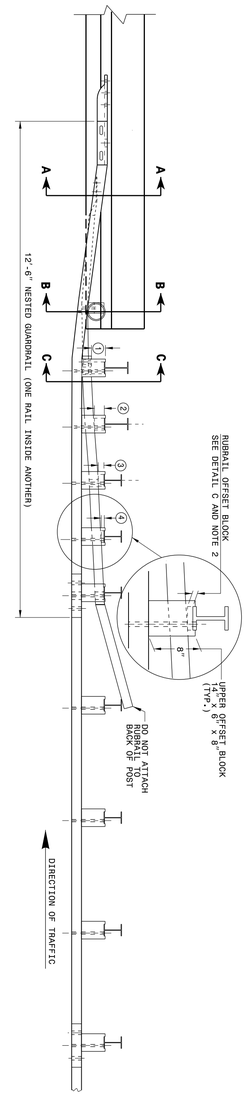
ENGLISH DETAIL DRAWING FOR
GUARDRAIL ANCHOR UNIT
GUARDRAIL ANCHOR UNIT TYPE B-77
FOR F-SHAPE BARRIER

ELEVATION



GENERAL NOTES:
1) THROUGH 5 REQUIRE AN ADDITIONAL HOLE TO ATTACH LOWER BLOCKOUTS AND/OR RUBRAIL.
2) RUBRAIL BLOCKOUTS LOCATED ON POSTS 1 THROUGH 4 ARE OFFSET FOR ELEMENTS WITH 5⅛" BUTTONHEAD BOLTS (SEE CHART FOR BOLT LENGTHS). SECURE BLOCKS ONLY TO POSTS 2 AND 4. SECURE RUBRAIL AND BLOCKOUTS TO POSTS 1 AND 3 WITH A 5⅛" x 4½" BUTTONHEAD BOLT. RUBRAIL IS FLARED TO BACK OF POST 6 AND NOT SECURED.
3) STEEL SPACER TUBE IS A SCHEDULE 40 GALVANIZED PIPE 6" INSIDE DIAMETER x 9" LONG. ATTACH TUBE TO GUARDRAIL ONLY WITH 5⅛" x 4½" BUTTONHEAD BOLT AND WASHER PLATE. WASHER PLATE NOT REQUIRED WITH SLOTTED RUBRAIL.
4) SEE DETAIL D FOR SLOPED RUBRAIL BLOCKOUT. BLOCKOUT IS ATTACHED TO RAIL ELEMENT ONLY. USE ⅜" x 3" LAG BOLT WITH FLAT WASHER.
5) SHOP FABRICATE THE C6 x 8.2 RUBRAIL END TO BE CONSISTENT WITH THE SLOPE OF THE F SHAPE AND ATTACH FLUSH WITH THE SLOPED TOE OF THE BARRIER OR BRIDGE RAIL.
6) ANCHORAGE: FOR EXISTING BRIDGE RAIL AND NEW OR EXISTING BARRIERS, ANCHOR RUBRAIL USING THREE ⅝" x 6" CHEMICALLY ANCHORED BOLTS WITH WASHERS. MAXIMUM PROJECTION FOR BOLTS IS ½".
   (a) AT EXISTING BRIDGE RAIL AND NEW OR EXISTING BARRIERS, ANCHOR THE W-BEAM END SHOE USING A 4 BOLT HOLD DOWN PLATE (SEE STD. DWG. 862.04). INSTALL THE W-BEAM END SHOE BEHIND THE NESTED W-BEAM ELEMENTS.
   (b) AT EXISTING BRIDGE RAIL AND NEW OR EXISTING BARRIERS, A 4 BOLT INSERT ASSEMBLY IS ALLOWED ON PRECAST REINFORCED CONCRETE BARRIER (SEE STD. DWG. 857.01).
   (c) AT BRIDGE RAIL WITH STEEL POSTS, DETAILED ON THE STRUCTURE PLANS.
7) POSTS 1 AND 2 ARE W6 x 15, 7'-6" LONG. ALL OTHER POSTS IN THE ANCHOR UNIT ARE W6 x 8.5.

PLAN



GUARDRAIL ANCHOR UNIT TYPE B-77

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

SEE TITLE BLOCK

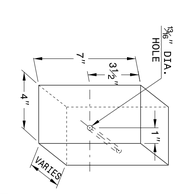
ORIGINAL BY:	J HOWERTON	DATE: 06-22-12
MODIFIED BY:		DATE:
CHECKED BY:		DATE:
FILE SPEC.:		

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

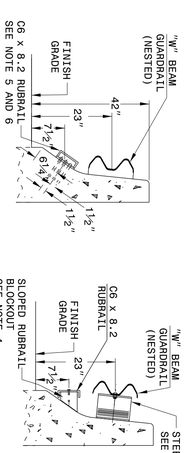
SHEET 5 OF 7
862D03

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

SECTION A-A



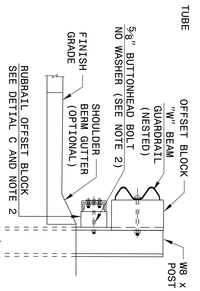
SECTION B-B



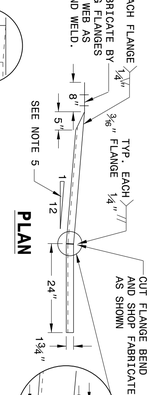
RUBRAIL BLOCKS 7" HIGH x 4" WIDE			
POST	THICKNESS	BOLT LENGTH	
①	4½"	9"	
②	3¼"	5" *	
③	2"	6"	
④	1"	3" *	

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

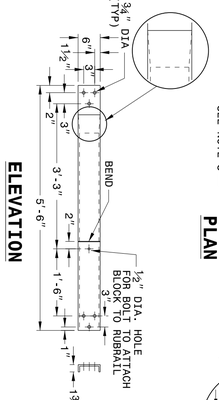
SECTION C-C



DETAIL C
RUBRAIL BLOCKOUT

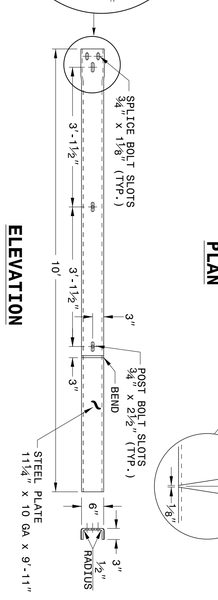


DETAIL A
C6 x 8.2 RUBRAIL

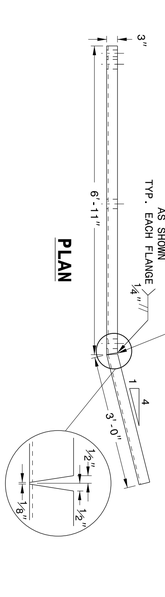


ELEVATION

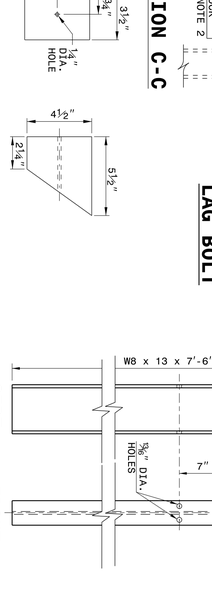
DETAIL B
BENT PLATE RUBRAIL



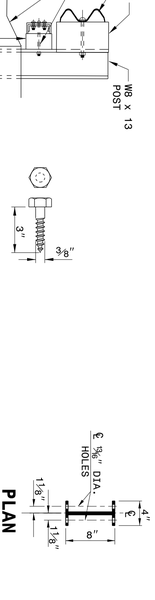
DETAIL D
SLOPED RUBRAIL BLOCKOUT



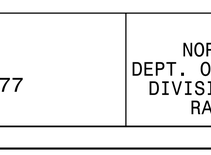
PLAN



DETAIL E
LAG BOLT

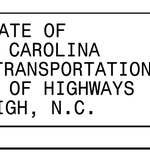


SIDE



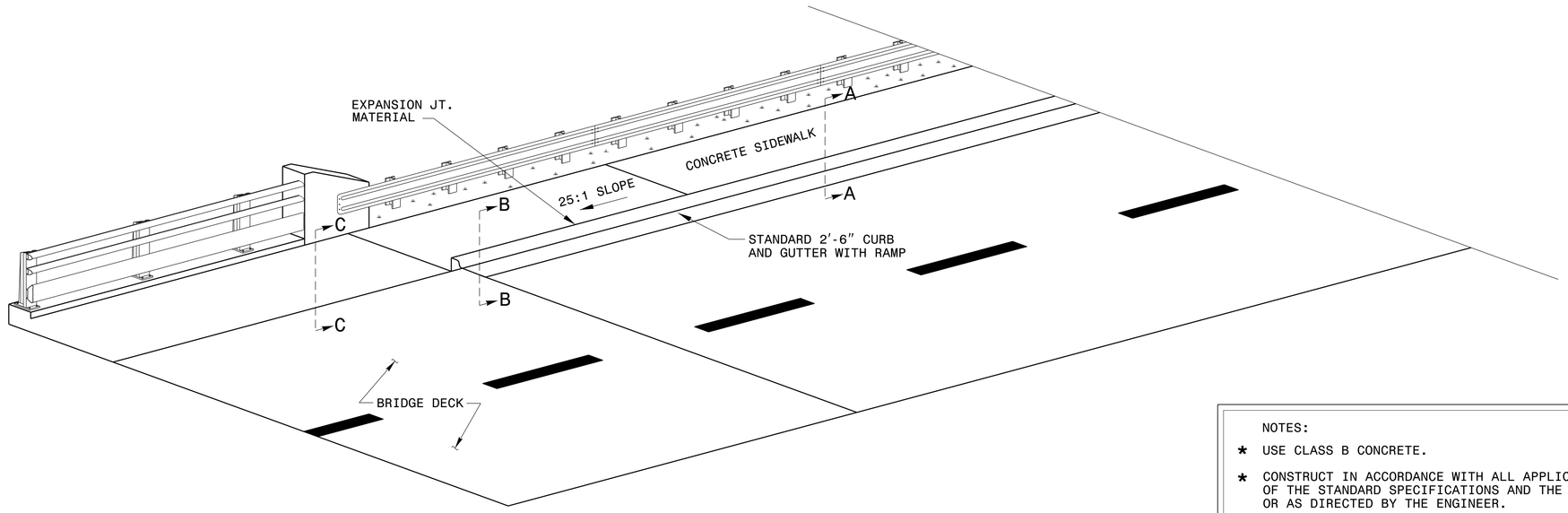
FRONT

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



PLAN

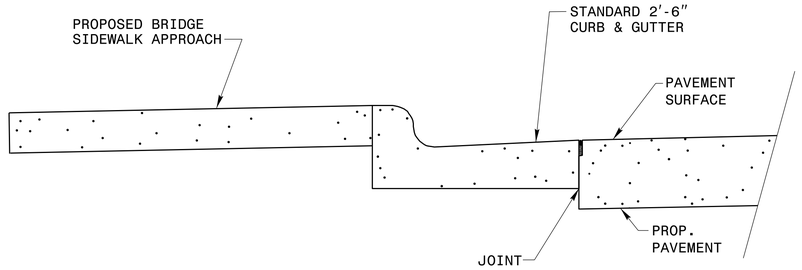
PROJECT REFERENCE NO.	SHEET NO.
B-5123	2C-3



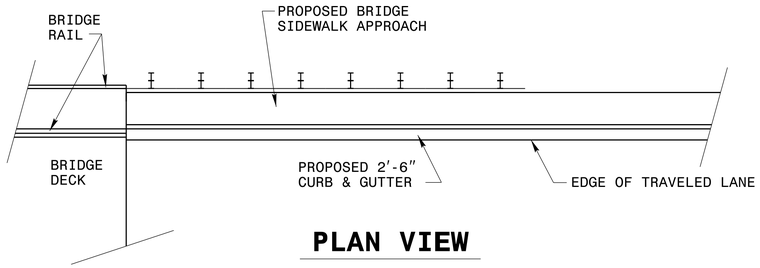
DETAIL OF PROPOSED CONCRETE BRIDGE SIDEWALK APPROACH

NOTES:

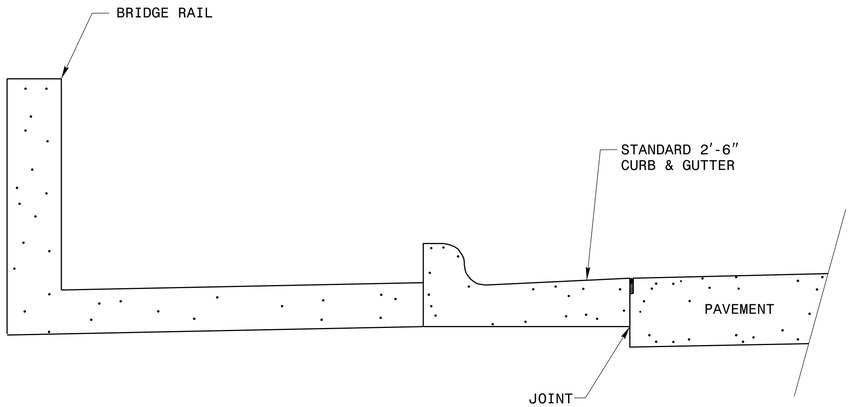
* USE CLASS B CONCRETE.
* CONSTRUCT IN ACCORDANCE WITH ALL APPLICABLE REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE ROADWAY DRAWINGS OR AS DIRECTED BY THE ENGINEER.
* SEE ROADWAY PLANS FOR GUARDRAIL PLACEMENT.
* GUARDRAIL AND BARRIER ADJACENT TO TRAVEL LANE REMOVED FOR CLARITY.



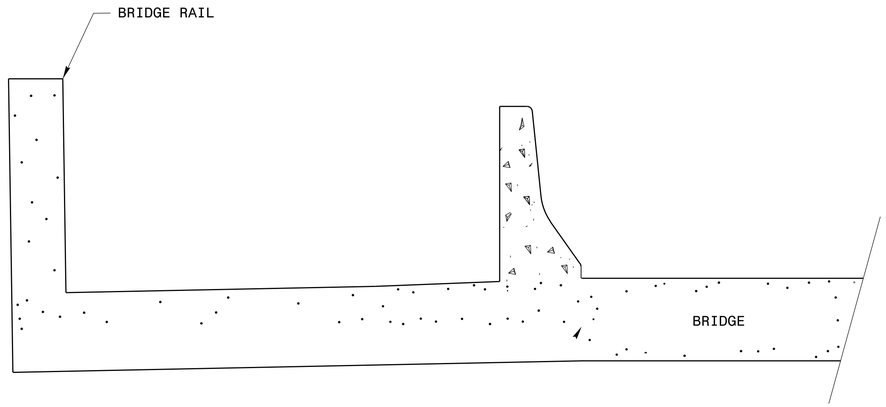
SECTION A-A



PLAN VIEW



SECTION B-B



SECTION C-C

2/4/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

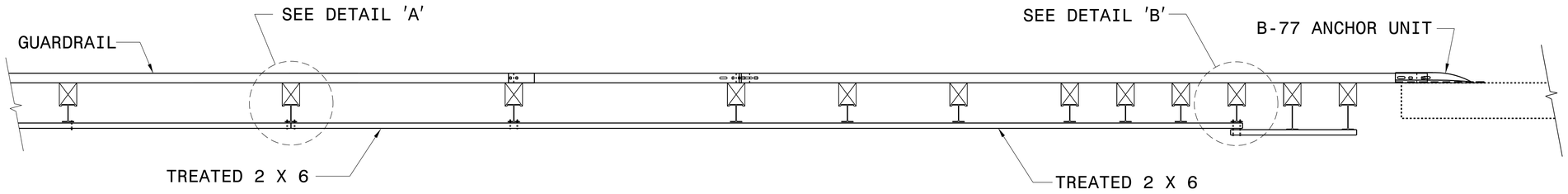
CONTRACT STANDARDS & DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-707-6950 FAX 919-250-4119

DETAIL OF CONCRETE BRIDGE SIDEWALK APPROACH

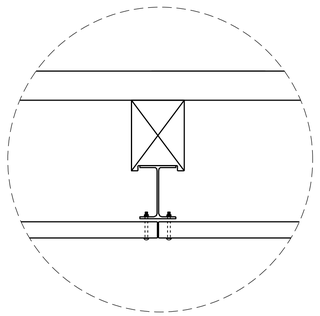
ORIGINAL BY: _____ DATE: _____
MODIFIED BY: rnbritt DATE: 02-02-16
CHECKED BY: _____ DATE: _____
FILE SPEC.: details/nbritt/english/misc/b5123sidewalkapproach.dgn

$$$$USERNAME$$$$
$$$$SYSTIME$$$$
$$$$DGN$$$$
6/10/99

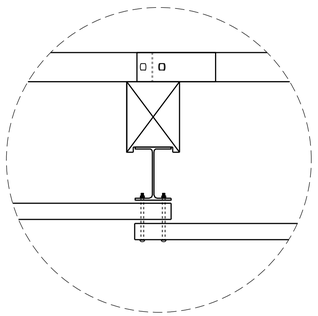
PROJECT REFERENCE NO.	SHEET NO.
B-5123	2C-4



PLAN



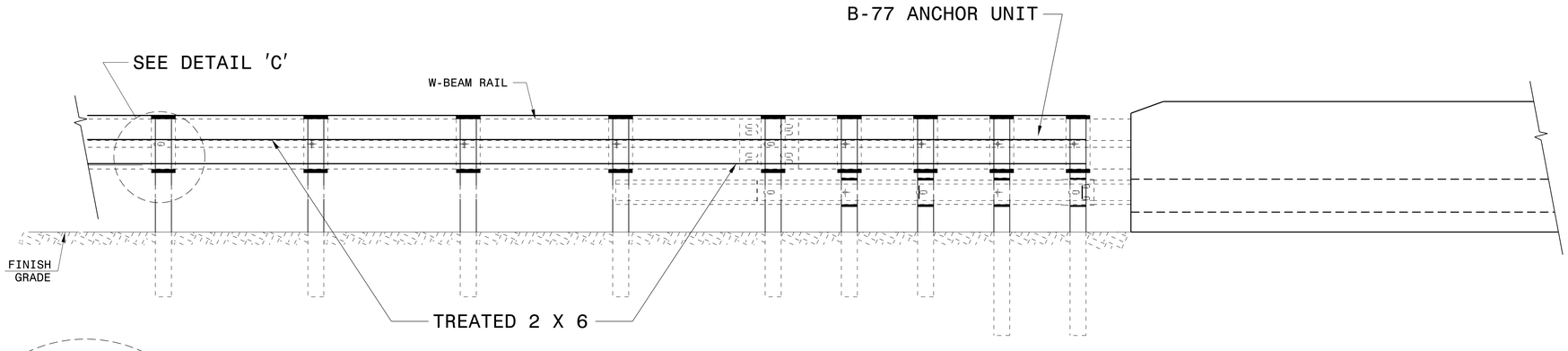
DETAIL 'A'



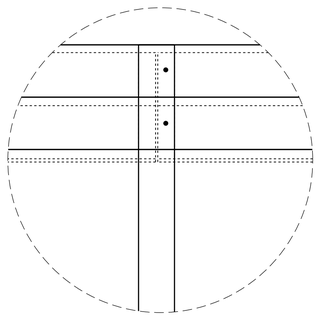
DETAIL 'B'

NOTES:

1. USE #2 SYP TREATED 2 X 6 FOR WOOD RAIL.
2. USE GUARDRAIL BOLTS TO FASTEN WOOD RAIL TO GUARDRAIL POSTS. SEE ROADWAY STD.NO.862.02.
3. THE MOUNTING HEIGHT OF THE WOODRAIL TO BE DETERMINED IN THE FIELD.
4. PLACE THE TREATED 2 X 6 WOODRAIL AS DIRECTED BY THE ENGINEER.



ELEVATION



DETAIL 'C'

2/4/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

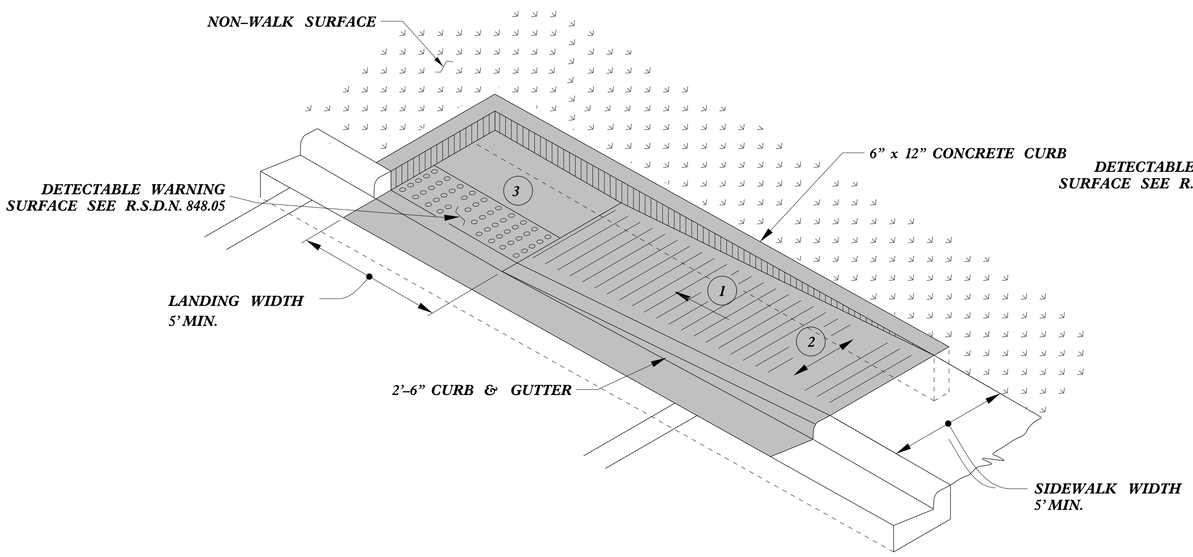
CONTRACT STANDARDS AND DEVELOPMENT UNIT
PLANS AND STANDARDS SECTION
Office 919-707-6950 FAX 919-250-4119

DETAIL OF WOOD RUB RAIL

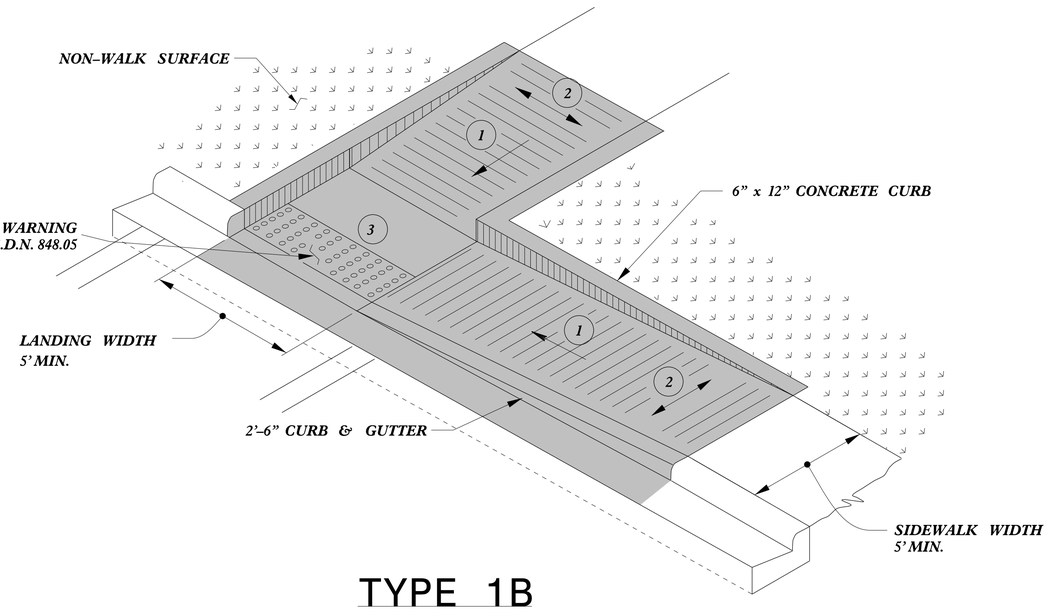
ORIGINAL BY:	STD.862	DATE:	1-25-12
MODIFIED BY:	rnbritt	DATE:	02-03-2016
CHECKED BY:		DATE:	
FILE SPEC.:	details/nbritt/english/bridge/b5123 sidewalk approach.dgn		

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

PROJECT REFERENCE NO.	SHEET NO.
B-5123	2C-5



TYPE 1A



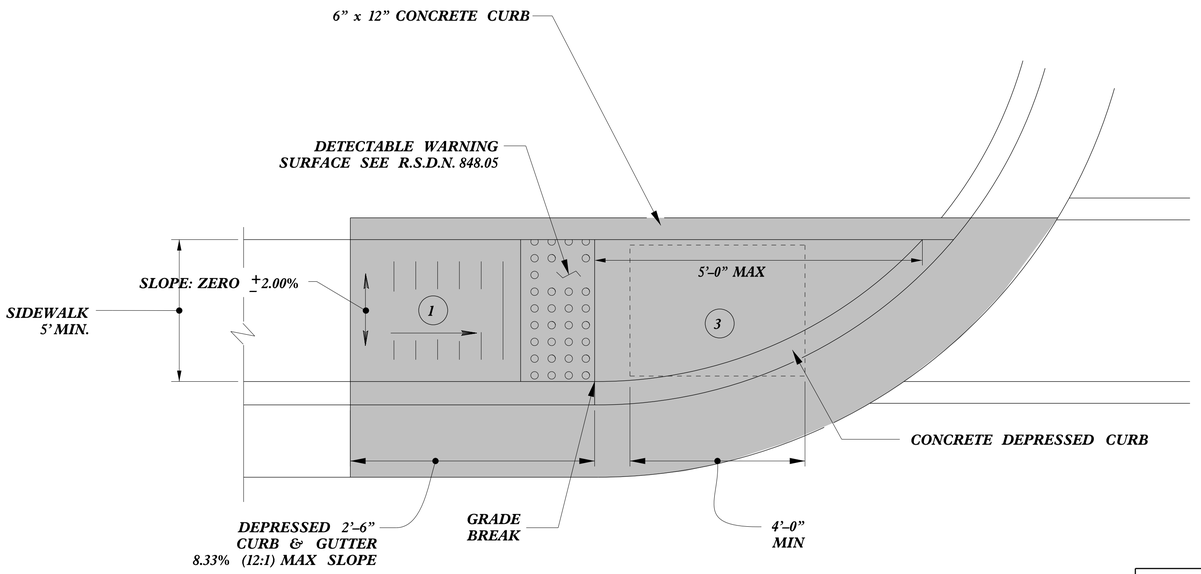
TYPE 1B

PAY LIMITS FOR 1 CURB RAMP

(1) *8.33% (12:1) MAX RAMP SLOPE*

(2) *CROSS SLOPE: 2.00%*

(3) *CURB RAMPS REQUIRE A (4'–0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.*



TYPE 1

REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

2/4/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

CURB RAMPS

Directional Ramps

ORIGINAL BY: J.S. HOWERTON DATE: 7/7/11
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: stds/2012CurbRamp/CurbRampDetails.dgn

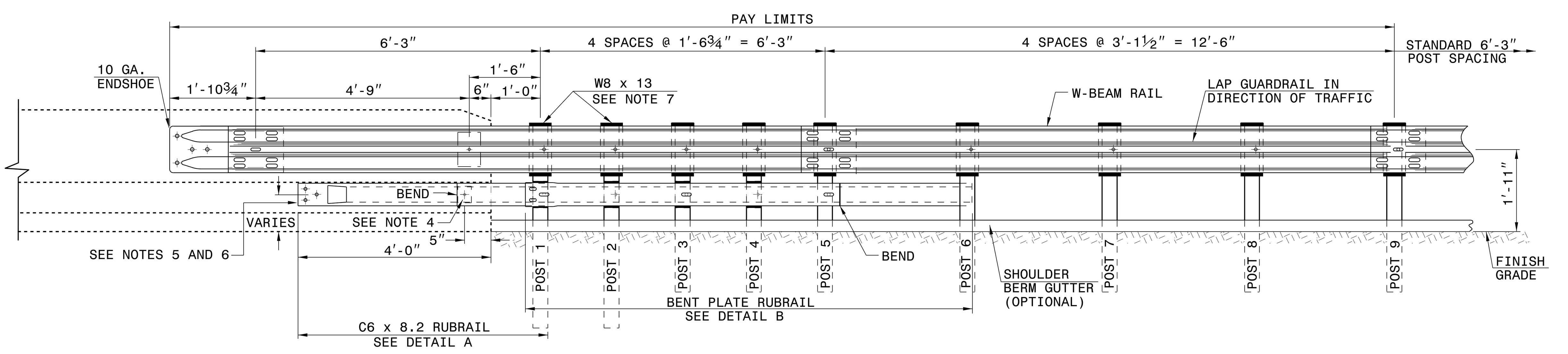
5/14/99

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

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

ENGLISH DETAIL DRAWING FOR
GUARDRAIL ANCHOR UNIT TYPE B-77 SHOP CURVED

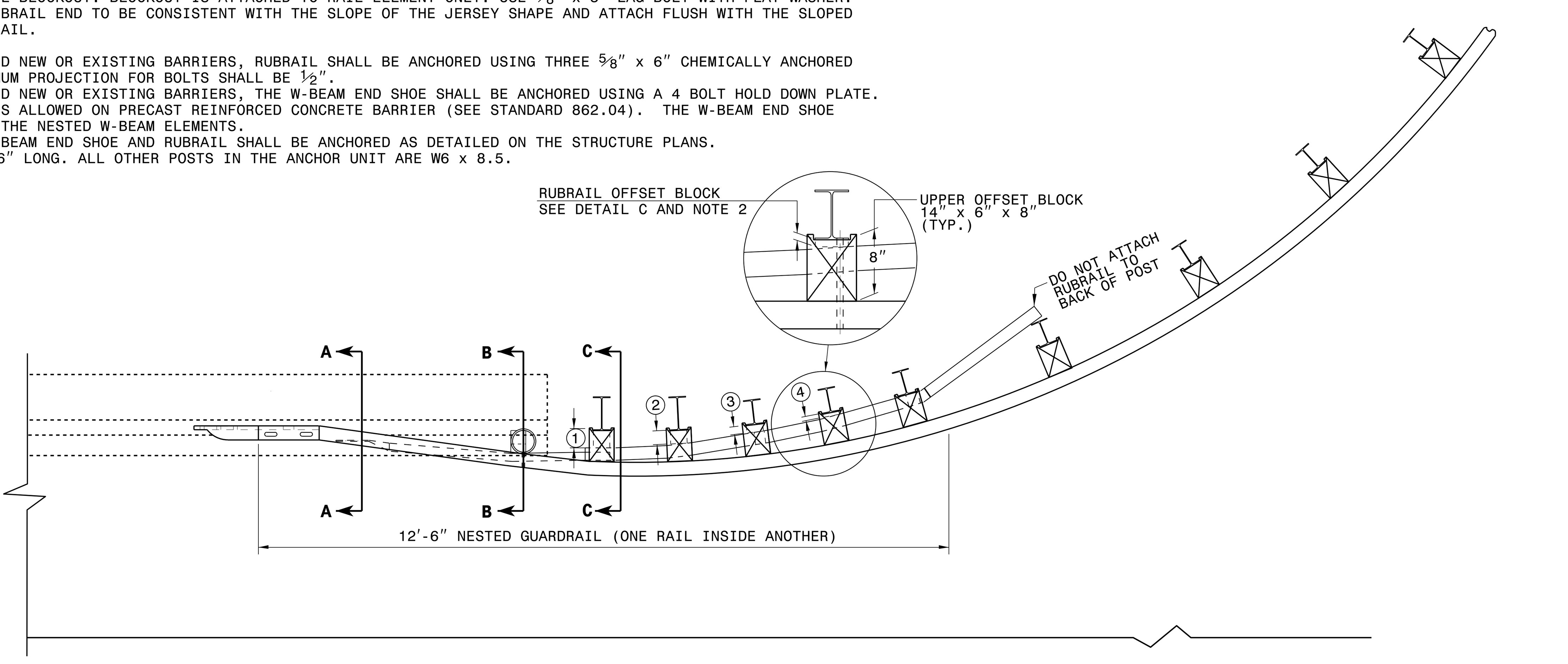
SHEET 1 OF 2
B-77SC



ELEVATION

GENERAL NOTES:
1) POSTS 1 THROUGH 5 REQUIRE AN ADDITIONAL HOLE TO ATTACH LOWER BLOCKOUTS AND/OR RUBRAIL.
2) RUBRAIL BLOCKOUTS LOCATED ON POSTS 1 THROUGH 4 ARE OFFSET DRILLED AND SECURED WITH ⅝" BUTTONHEAD BOLTS (SEE CHART FOR BOLT LENGTHS). SECURE BLOCKS ONLY TO POSTS 2 AND 4. SECURE RUBRAIL AND BLOCKOUTS TO POSTS 1 AND 3. RUBRAIL IS SECURED TO POST 5 WITH A ⅝" x 4½" BUTTONHEAD BOLT. RUBRAIL IS FLARED TO BACK OF POST 6 AND NOT SECURED.
3) STEEL SPACER TUBE IS A SCHEDULE 40 GALVANIZED PIPE 6" INSIDE DIAMETER x 9" LONG. ATTACH TUBE TO GUARDRAIL ONLY WITH ⅝" x 1¼" LONG BUTTONHEAD BOLT AND RECTANGULAR PLATE WASHER.
4) SEE DETAIL D FOR SLOPED RUBRAIL BLOCKOUT. BLOCKOUT IS ATTACHED TO RAIL ELEMENT ONLY. USE ⅜" x 3" LAG BOLT WITH FLAT WASHER.
5) SHOP FABRICATE THE C6 x 8.2 RUBRAIL END TO BE CONSISTENT WITH THE SLOPE OF THE JERSEY SHAPE AND ATTACH FLUSH WITH THE SLOPED TOE OF THE BARRIER OR BRIDGE RAIL.
6) ANCHORAGE:
   (a) AT EXISTING BRIDGE RAIL AND NEW OR EXISTING BARRIERS, RUBRAIL SHALL BE ANCHORED USING THREE ⅝" x 6" CHEMICALLY ANCHORED BOLTS WITH WASHERS. MAXIMUM PROJECTION FOR BOLTS SHALL BE ½".
   (b) AT EXISTING BRIDGE RAIL AND NEW OR EXISTING BARRIERS, THE W-BEAM END SHOE SHALL BE ANCHORED USING A 4 BOLT HOLD DOWN PLATE. A 4 BOLT INSERT ASSEMBLY IS ALLOWED ON PRECAST REINFORCED CONCRETE BARRIER (SEE STANDARD 862.04). THE W-BEAM END SHOE SHALL BE INSTALLED BEHIND THE NESTED W-BEAM ELEMENTS.
   (c) AT NEW BRIDGE RAIL, THE W-BEAM END SHOE AND RUBRAIL SHALL BE ANCHORED AS DETAILED ON THE STRUCTURE PLANS.
7) POSTS 1 AND 2 ARE W8 x 13, 7'-6" LONG. ALL OTHER POSTS IN THE ANCHOR UNIT ARE W6 x 8.5.

SEE ROADWAY PLANS FOR END TREATMENT



PLAN

GUARDRAIL ANCHOR UNIT TYPE B-77

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

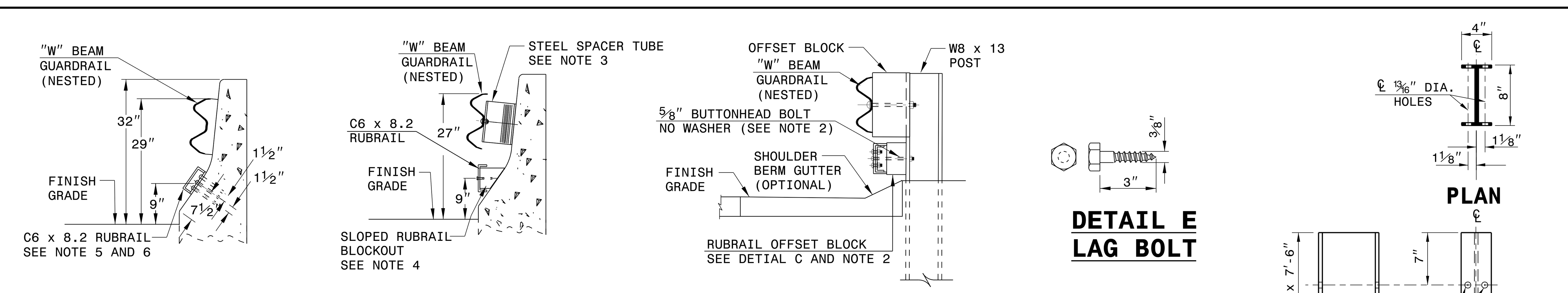
ENGLISH DETAIL DRAWING FOR
GUARDRAIL ANCHOR UNIT TYPE B-77 SHOP CURVED

SHEET 1 OF 2
B-77SC

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

ENGLISH DETAIL DRAWING FOR
GUARDRAIL ANCHOR UNIT TYPE B-77 SHOP CURVED

SHEET 2 OF 2
B-77SC

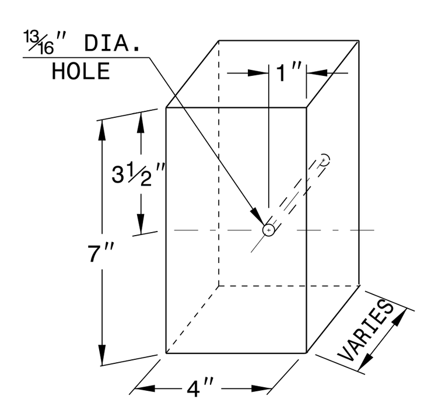


SECTION A-A

SECTION B-B

SECTION C-C

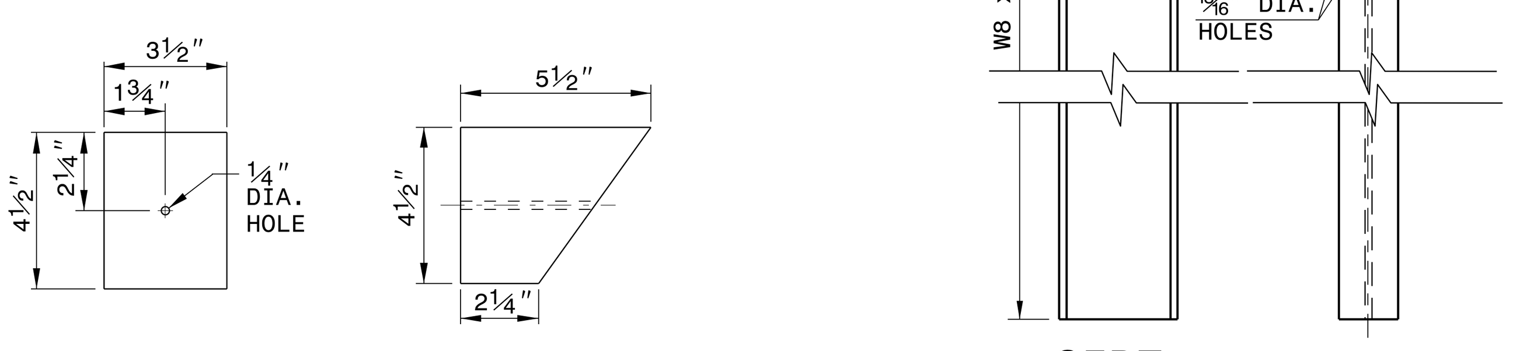
DETAIL E LAG BOLT



RUBRAIL BLOCKS 7" HIGH x 4" WIDE		
POST	THICKNESS	BOLT LENGTH
①	4¼"	9"
②	3¼"	5" *
③	2"	6"
④	1"	3" *

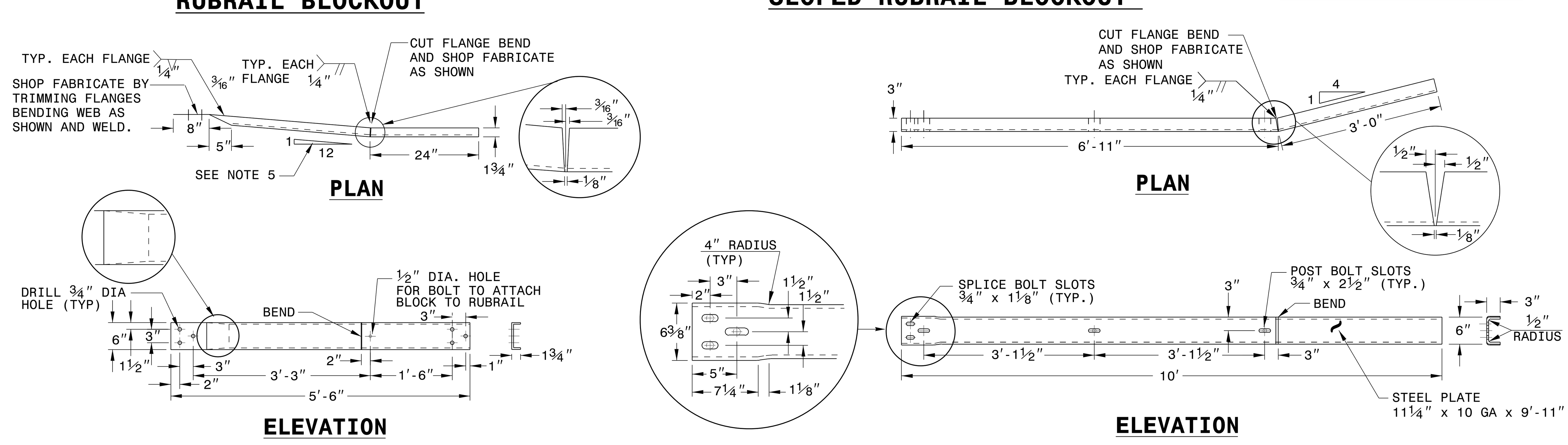
* BOLTS FOR POSTS 2 AND 4 ARE USED TO ATTACH BLOCK TO POST. RUBRAIL NOT ATTACHED TO BLOCK.

DETAIL C
RUBRAIL BLOCKOUT



DETAIL D
SLOPED RUBRAIL BLOCKOUT

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



DETAIL A
C6 x 8.2 RUBRAIL

DETAIL B
BENT PLATE RUBRAIL

GUARDRAIL ANCHOR UNIT TYPE B-77

SHEET 2 OF 2
B-77SC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton
2/24/2016

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

SEE PLATE FOR TITLE

ORIGINAL BY: E.E. WARD DATE: 06-04-04
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: miscguardrail/NCHRP350approved/B-77.dgn

PROJECT REFERENCE NO.	SHEET NO.
B-5123	2C-6

PROJECT REFERENCE NO.	SHEET NO.
B-5123	2G-1

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden 1/21/2016
F760CAE896EC4D3...
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

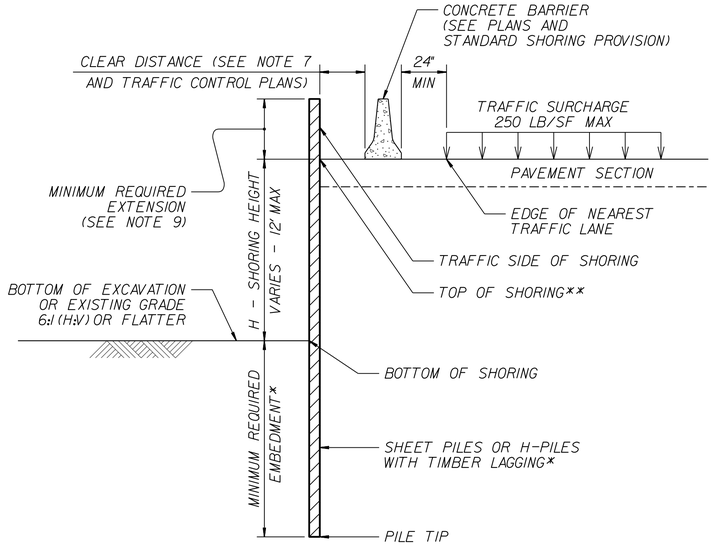
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS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

MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS

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

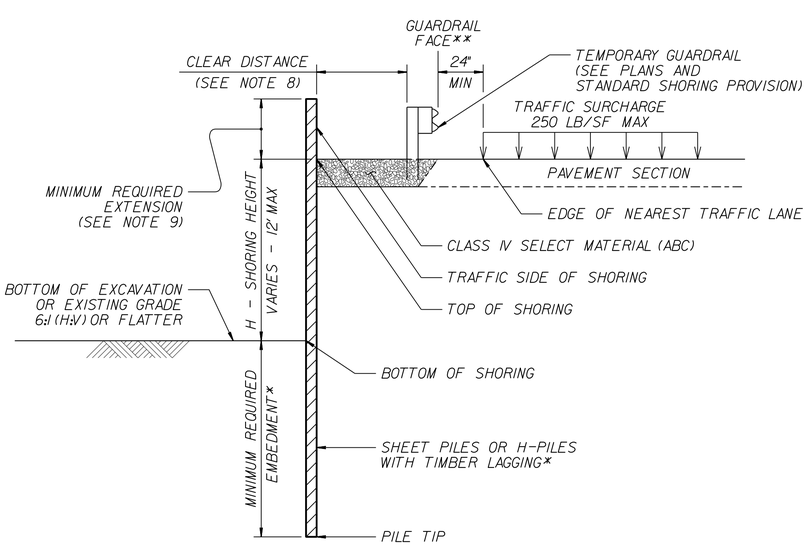
NOTES:

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



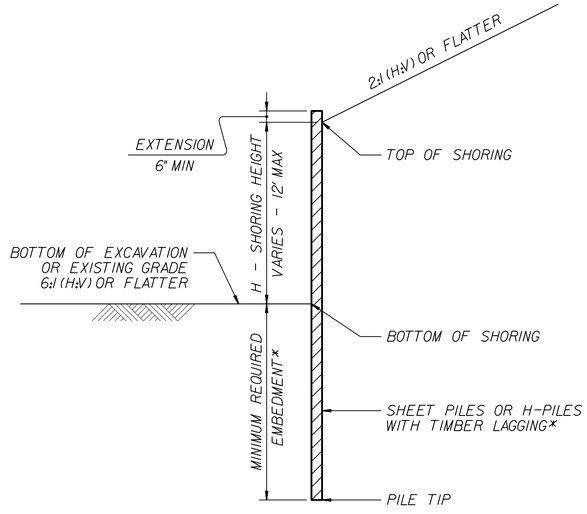
CONCRETE BARRIER

**TOP OF SHORING = EDGE OF PAVEMENT



TEMPORARY GUARDRAIL

**GUARDRAIL FACE = EDGE OF PAVEMENT



STANDARD TEMPORARY SHORING

(SLOPE CASE)
*SEE TABLE ABOVE.

STANDARD TEMPORARY SHORING

(SURCHARGE CASE)
*SEE TABLE ABOVE.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.01

STANDARD TEMPORARY SHORING

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
B-5123	2G-2

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden F760CAEB96EC4D3... SIGNATURE 1/21/2016 DATE

ENGINEER

SIGNATURE DATE

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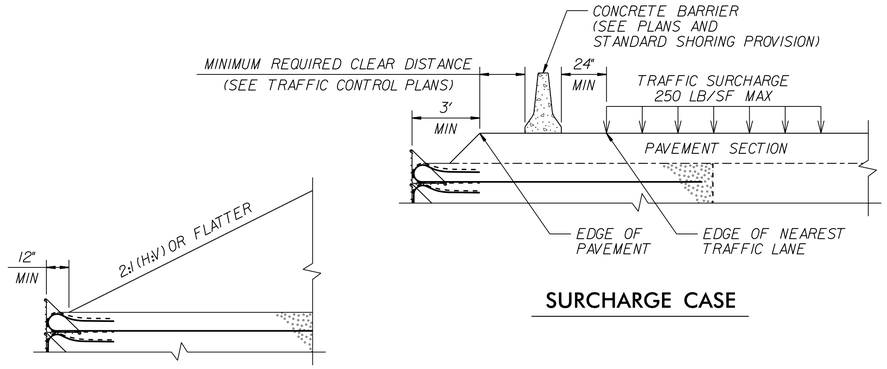
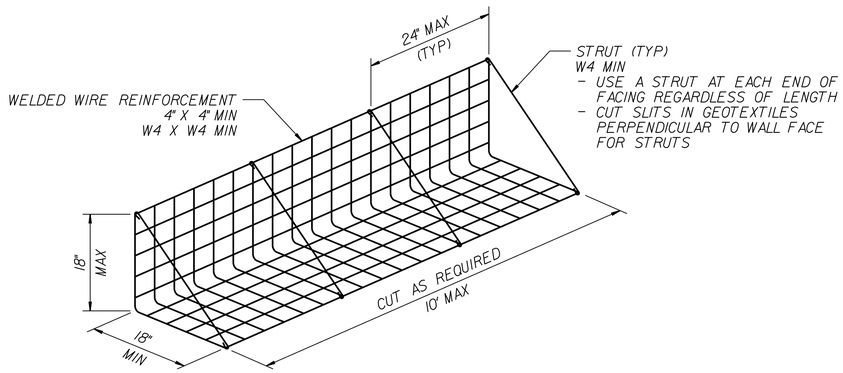
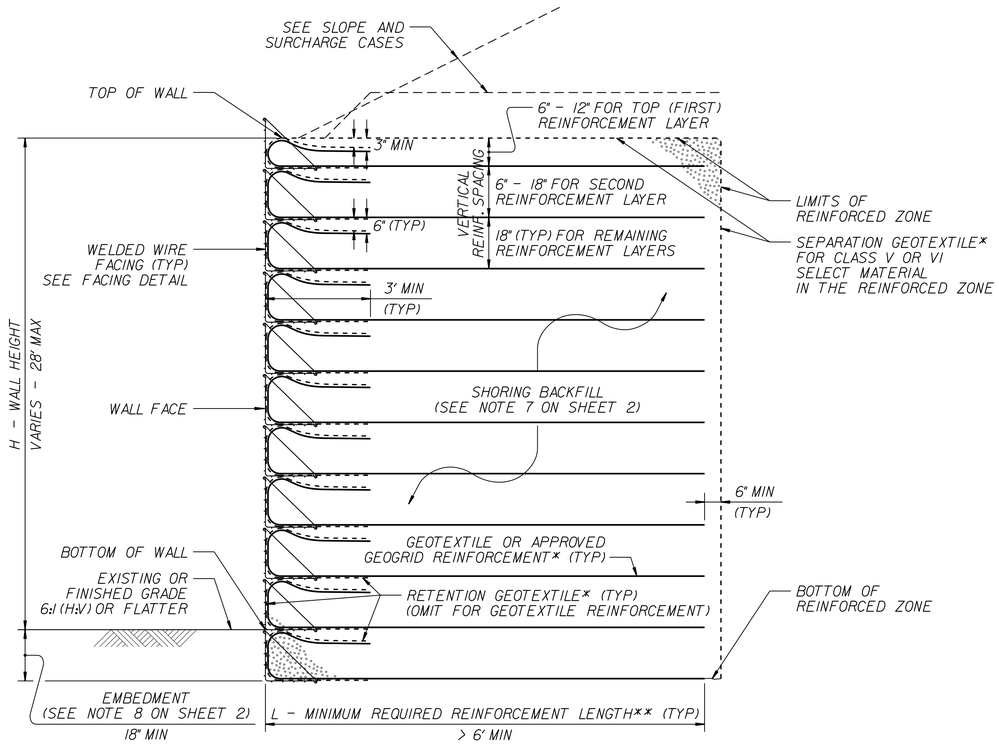


SURCHARGE CASE

SLOPE CASE

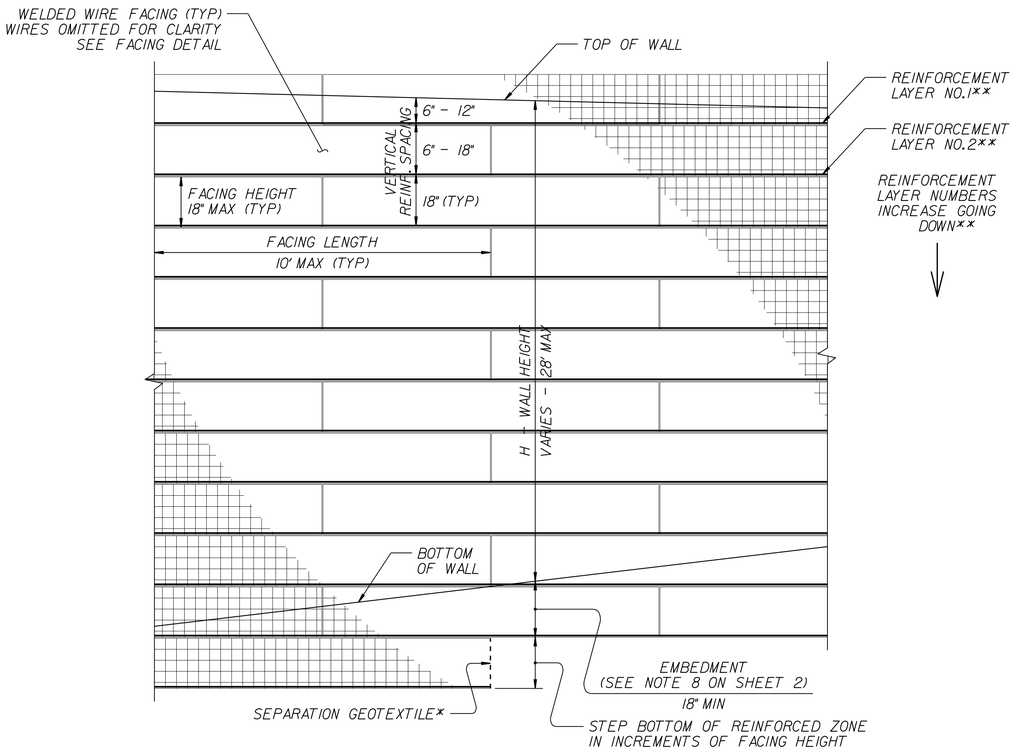


FACING DETAIL



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-5123	2G-3

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden 1/21/2016 E760CAEB96FC4D3...

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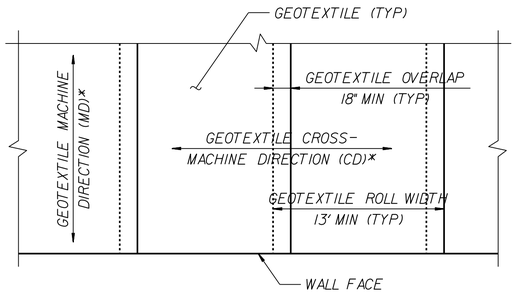
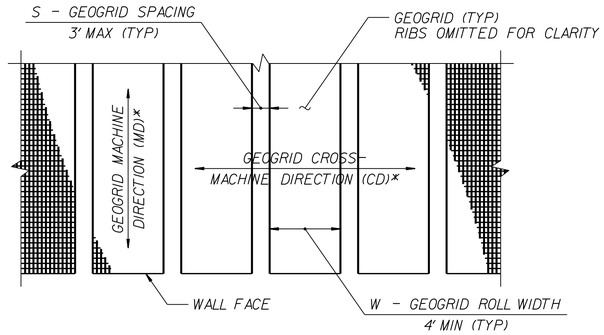


GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)

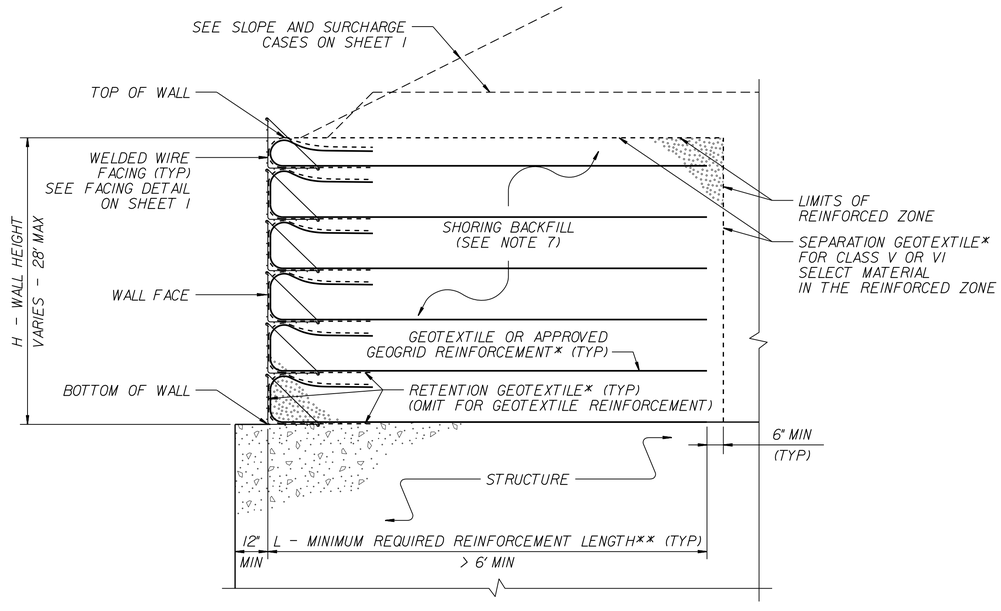


GEOGRID PLACEMENT

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

GEOSYNTHETIC PLACEMENT DETAILS

(PLAN VIEW)
*SEE NOTE 12.



TEMPORARY WALL ON STRUCTURE DETAIL

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

NOTES:

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

MATERIAL TYPE	SHORING BACKFILL
BORROW	A-2-4 SOIL
FINE AGGREGATE	CLASS II, TYPE 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-5123	2G-4

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

DocuSigned by: Scott A. Hidden 1/21/2016 F760CAEB96FC4D3...

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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

L – MINIMUM REQUIRED REINFORCEMENT LENGTH (FT)

(FOR ALL REINFORCEMENT TYPES)

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

GEOTEXTILE REINFORCEMENT
ULTIMATE TENSILE STRENGTH (LB/FT)

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

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

(SEE NOTE 10 ON SHEET 2.)

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

*BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 1.

MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD TEMPORARY WALL
SHEET 3 OF 3

DATE: 11-19-13

COMPUTED BY: KDA DATE: 5/5/2016
CHECKED BY: AKW DATE: 5/9/2016

PROJECT NO.	SHEET NO.
B-5123	3B-1

RD266404

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

CUBIC YARDS

Station to Station	Uncl. Exc. C.Y.	Embank. +% C.Y.	Borrow C.Y.	Waste C.Y.
SUMMARY NO. 1				
-DET2- 11+87.26 TO 14+33.00 (BB)	11	3,602	3,591	
-DET2- 17+23.00 (EB) TO 20+23.72	268	2,475	2,207	
SUMMARY NO. 1 TOTALS	279	6,077	5,798	
SUMMARY NO. 2				
-L- 13+00.00 LT TO 20+29.92 (BB) LT	308	3,697	3,389	
-L- 22+49.92 (EB) LT TO 30+00.00 LT	677	843	166	
-XOVER- 14+00.00 TO 28+41.67	16	822	806	
SUMMARY NO. 2 TOTALS	1,001	5,362	4,361	
SUMMARY NO. 3				
-L- 13+00.00 RT TO 20+38.29 (BB) RT	72	4,301	4,229	
-L- 22+58.29 (EB) RT TO 30+00.00 RT	26	2,806	2,780	
SUMMARY NO. 3 TOTALS	98	7,107	7,009	
SUMMARY NO. 4				
DETOUR REMOVAL & -L- SHLDR.				
CONSTRUCTION LEFT				
-L- 16+07.46 LT TO 19+28.54 (BB) LT	2,753	363		2,390
-L- 22+18.54 (EB) LT TO 26+36.01 LT	2,144	537		1,607
SUMMARY NO. 4 TOTALS	4,897	900		3,997
SUMMARY NO. 5				
-L- 13+00.00 MED TO 20+34.11 (BB) MED	41	1,827	1,786	
-L- 22+54.11 (EB) MED TO 30+00.00 MED	12	1,342	1,330	
-SRVRD- 11+14.00 TO 17+25.00	790	71		719
SUMMARY NO. 5 TOTALS	843	3,240	3,116	719
TOTALS	7,118		20,284	4,716
Estimated Shoulder Material			201	
PROJECT TOTALS	7,118		20,485	4,716
Est. 5% To Replace Topsoil at Borrow Pit			1,024	
GRAND TOTAL	7,118		21,509	
SAY	7,200		21,600	

ESTIMATED UNDERCUT = 1,000 CY
ESTIMATED SHALLOW UNDERCUT = 300 CY
ESTIMATED SELECT GRANULAR MATERIAL = 300 CY
ESTIMATED CLASS IV SUBGRADE STABILIZATION = 540 TONS
ESTIMATED DRAINAGE DITCH EXCAVATION = 300 CY

SUMMARY OF ASPHALT PAVEMENT REMOVAL

Station to Station	LOC LT/RT/CL	Asphalt Removal SQ. YDS.
-DET2- 11+07.53 TO 14+33.00	CL	826.20
-DET2- 17+23.00 TO 21+47.53	CL	1,058.77
-SRVRD- 13+32.00 TO 17+25.00	LT	221.19
-SRVRD- 11+14.00 TO 12+04.05	RT	6.11
-SRVRD- 12+78.62 TO 17+25.00	RT	300.33
TEMPORARY CROSS OVER		
-L- 14+00.00 TO 18+01.55	CL	1,566.73
-L- 24+06.16 TO 28+41.67	CL	1,848.93
EXIST. PAVED SHOULDERS		
-L- 13+00.00 TO 15+31.29	LT	179.26
-L- 17+25.00 TO 30+00.00	LT	164.51
-L- 13+00.00 TO 15+87.22	RT	236.25
-L- 27+50.61 TO 30+00.00	RT	70.71
PROJECT TOTAL		6,478.99
SAY		6,480

SUMMARY OF ASPHALT PAVEMENT BREAKING

Station to Station	LOC LT/RT/CL	Asphalt Breaking SQ. YDS.
-L- 16+00.00 TO 20+40.44	LT	2,004.26
-L- 16+00.00 TO 20+49.26	RT	2,060.71
-L- 22+47.71 TO 25+00.00	LT	720.94
-L- 22+55.39 TO 25+00.00	RT	792.73
PROJECT TOTAL		4,785.91
SAY		4,790

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

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

CHAIN LINK FENCE 48" FABRIC

LINE	STATION TO STATION	LOCATION	FABRIC (Lin. Ft.)	LINE POSTS	TERMINA POSTS
-L-	17+05.45 TO 19+87.56	LT	282.15	23	3
-L-	22+56.64 TO 24+10.00	LT	153.68	13	3
-L-	18+15.44 TO 20+31.86	RT	216.45	18	3
-L-	23+01.33 TO 24+00.00	RT	134.46	11	3
PROJECT TOTAL			786.74		
SAY			790	65	12

GUARDRAIL SUMMARY

"N" = DISTANCE FROM EDGE OF TRAVEL LANE TO FACE OF GUARDRAIL
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

* THE PAYMENT FOR WOOD RUB RAIL IS INCIDENTAL TO STEEL BEAM GUARDRAIL.

LINE	BEG. STA.	END STA.	LOC.	LENGTH (FT.) STRAIGHT	LENGTH (FT.) SHOP CURVED	LENGTH (FT.) WOOD RUB RAIL	WARRANT POINT APPR. END	WARRANT POINT TRAIL. END	"N" DIST. FROM E.O.L.	TOTAL SHLDR WIDTH	FLARE LENGTH APPR. END	FLARE LENGTH TRAIL. END	W APPR. END	W TRAIL. END	ANCHORS GRAU 350 TL-3	ANCHORS TYPE B-77	ANCHORS GRAU 350 TL-2	ANCHORS TYPE B-77 SHOP CURVED	IMPACT ATTEN. TYPE 350 EA	IMPACT ATTEN. TYPE 350 G	IMPACT ATTEN. TYPE 350 NG	REMOVE EXISTING GUARDRAIL	REMARKS
-L-	16+71.98	19+90.73	LT	318.75		268.75		19+90.73	2.5'	14'		50'		1'	1	1						378'	
-L-	22+61.36	24+05.11	LT	143.75		93.75	22+61.36		2.5'	14'	50'		1'		1	1						71'	
-L-	18+87.64	20+31.39	MED LT	143.75				20+31.39								1						382'	
-L-	22+51.33	23+82.58	MED LT	131.25			22+51.33									1					1	385'	
-L-	18+93.11	20+36.86	MED RT	143.75			20+36.86									1					1		
-L-	22+56.89	23+88.14	MED RT	131.25				22+56.89								1							
-L-	17+83.33	20+27.08	RT	243.75		193.75	20+27.08		2.5'	14'	50'		1'		1	1						622'	
-SRVRD-	12+21.04	14+73.20	LT	252.16				14+73.20	3'	6'							1	1					
-SRVRD-	15+26.17	15+76.38	LT	56.25			15+26.17		8'	12'							1	1					
-SRVRD-	12+46.50	13+06.78	RT	60.28			13+06.78		6'	9'						1	1						
		SUB-TOTALS		1,624.94		556.25									3	8	3	2			2	1,838	
DEDUCTION FOR ANCHOR UNITS		(3 GRAU TL-3 @ 50')		-150.00																			
		(8 TYPE B-77 @ 18.75')		-150.00																			
		(3 GRAU TL-2 @ 25')		-75.00																			
		(2 B-77SC @ 18.75')		-37.50																			
		PROJECT TOTAL		1,212.44		556.25									3	8	3	2				1,838	
		SAY		1,225.00		* 560.00																2,300	
ADDITIONAL GUARDRAIL POSTS = 5 EA																							

TEMPORARY GUARDRAIL SUMMARY

LINE	BEG. STA.	END STA.	LOC.	LENGTH (FT.) STRAIGHT	LENGTH (FT.) SHOP CURVED	LENGTH (FT.) DOUBLE FACED	WARRANT POINT APPR. END	WARRANT POINT TRAIL. END	"N" DIST. FROM E.O.L.	TOTAL SHLDR WIDTH	FLARE LENGTH APPR. END	FLARE LENGTH TRAIL. END	W APPR. END	W TRAIL. END	ANCHORS GRAU 350 TL-2	ANCHORS TYPE M 350	ANCHORS TYPE III	IMPACT ATTEN. TYPE 350 EA	IMPACT ATTEN. TYPE 350 G	IMPACT ATTEN. TYPE 350 NG	REMOVE EXISTING GUARDRAIL	REMARKS
-DET2-	12+43.09	14+24.34	LT	181.25				14+24.34	4'	8'		25'		1'	1		1					
-DET2-	17+14.34	17+70.59	LT	56.25			17+14.34		4'	8'	25'		1'		1		1					
-DET2-	13+22.91	14+41.66	RT	118.75				14+41.66	4'	8'		37.5'	1'			1	1					
-DET2-	17+31.66	18+25.41	RT	93.75			17+31.66		4'	8'	37.5'			1'		1	1					
		SUB-TOTALS		450.00											2	2	4					
DEDUCTION FOR ANCHOR UNITS		(2 GRAU TL-2 @ 25')		-50.00																		
		(2 M-350 @ 37.5')		-75.00																		
		(4 TYPE III @ 18.75')		-75.00																		
		PROJECT TOTAL		250.00											2	2	4					
		SAY		275.00																		

COMPUTED BY:	JMB	DATE:	2/13/15
CHECKED BY:	AKW	DATE:	12/17/2015

PROJECT NO.	SHEET NO.
B-5123	3D-1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.
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 %	Drainage 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 (0.064" THICK) 15 .064	R. C. PIPE CLASS IV 15	15" SIDE DRAIN PIPE	DRAINAGE STRUCTURE MASONRY EACH	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	5' THRU 10' (A) LIN. FT.	10' AND ABOVE (B) LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	15" C.S. ELBOW	PREFORMED SCOUR HOLE (PER EACH)	PIPE REMOVAL LIN. FT.	REMARKS
L 18+50	49 RT	0404		591.0																				1	1			1		1													
		0404	0401		587.7	586.1																100																					
L 19+50	49 RT	0401		589.3																				1	1			1		1													
		0401	0402		586.1	585.5																68																					
L 20+20	49 RT	0402		588.8																				1	1			1		1													
		0402	0422		585.5	563.8	0.6														56																			2			
L 20+20	106 RT	0422		566.8																				1	1									1									
		0422	0403		563.8	562.8				120																																	
L 19+85	50 LT	0405		589.0																				1	1			1			1												
		0405	0406		585.6	585.1																84																					
L 19+00	50 LT	0406		590.0																				1	1			1			1												
		0406	0407		585.1	584.6																100																					
L 18+00	50 LT	0407		592.2																				1	1	2.6		1			1												
		0407	0408		584.6	572.6	0.9														52																			2			
L 18+00	99 LT	0408		575.8																																					1		SEE PSH 4, DETAIL A
L 25+69	50 LT	0416		587.1																				1	1			1			1												
		0416	0417		583.9	583.5																68																					
L 25+00	50 LT	0417		587.3																				1	1			1			1												
		0417	0418		583.5	583.0																100																					
L 24+00	50 LT	0418		587.6																				1	1			1			1												
		0418	0419		583.0	582.3																128																					
L 22+65	49 LT	0419		588.7																				1	1	1.4		1			1												
		0419	0420		582.3	582.2	0.4															12																					
L 22+73	60 LT	0426		587.8																				1	1												1		1				
		0426	0420		584.6	584.4																8																					
L 22+65	60 LT	0420		587.8																				1	1	0.6											1		1				
		0420	0421																		88																			2		28	Remove 28' Temporary Pipe Extension
L 26+90	10 RT	0501		587.8																				1	1			1			1		1										
		0501	0506		584.8	584.5																56																					
L 26+35	9 RT	0506		588.1																				1	1			1			1		1										
		0506	0409		584.5	584.2																48																					
L 25+85	10 RT	0409		588.2																				1	1			1			1		1										
		0409	0410		584.2	584.1																40																					
L 25+85	49 RT	0410		588.2																				1	1			1		1													
		0410	0427		584.1	583.6																84																					
L 25+00	50 RT	0427		587.9																				1	1			1		1													
		0427	0411		583.6	583.4																48																					
L 24+50	49 RT	0411		587.5																				1	1			1		1													
		0411	0412		583.4	583.1																48																					
L 24+00	49 RT	0412		587.6																				1	1			1		1													
		0412	0413		583.1	582.6																92																					
L 23+09	49 RT	0413		587.8																				1	1	0.2		1		1													
		0413	0414		582.6	582.5	0.4															12																					
L 23+17	60 RT	0425		587.7																				1	1												1		1				
		0425	0414		584.4	584.2																8																					
L 23+09	60 RT	0414		587.7																				1	1	0.2											1		1				
		0414	0415		582.5	565.1	2.2														52																			2			
L 22+94	111 RT	0415		566.4																																					1		
L 28+40	7 LT	0502		587.2																				1	1							1			1	1							
		0502	0504		583.9	583.3																120																					
					SHEET TOTALS					120											248	1224		24	24	5.0		18		8	10	1	3	1	1	1	4		4	8	2	28	

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

RD266193

COMPUTED BY:	JMB	DATE:	2/13/15
CHECKED BY:	AKW	DATE:	12/17/2015

PROJECT NO.	SHEET NO.
B-5123	3D-2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION	OFFSET		STRUCTURE NUMBER FROM	TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage 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 (0.064" THICK) 15 (.064)	R. C. PIPE CLASS IV 15	15" SIDE DRAIN PIPE	DRAINAGE STRUCTURE MASONRY EACH	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	15" C.S. ELBOW	PREFORMED SCOUR HOLE (PER EACH)	PIPE REMOVAL LIN. FT.	REMARKS
L 29+80	0	CL	0503		586.9																				1	1												1		1				
			0503	0504		584.2	583.3	0.4															24																					
L 29+60	9	RT	0504		587.4																				1	1							1			1	1							
			0504	0505		583.3	582.0	0.6															60																					
SRVRD 15+72	26	RT	0428		564.8																				1	1												1	1					
			0428	0429		562.0	561.6			88																																	
SRVRD 11+62	23	RT	0430		574.5																				1	1										1	1							Tempoary Drop Inlet
			0430	0423		571.2	565.4			44																																44	Temporary Pipe
DET2 13+08	22	LT	0408	0430		575.8	571.2															40																					40	Temporary Pipe
SRVRD 12+07	32	RT	0423		569.4																				1	1									1									
			0423	0424		565.4	565.0					92																															
L 29+46	1	RT																																									68	Remove Existing 18" CMP
L 28+45	45	LT																																									40	Remove Existing 12" CMP
SRVRD 16+19	23	RT																																									44	Remove Existing 18" CMP
L 19+57	45	LT																																									40	Remove Existing 15" RCP
L 28+50	55	LT	0507																					52																				Driveway Pipe
L 26+38	0	CL	0508	0416	585.4	583.9																	84																				84	Temporary Pipe
UTILITIES																											5.0																	
SHEET TOTALS										132		92										40	168	52	5	5	5.0						1		1	2	2	2	1	1			360	
PROJECT TOTALS										132	120	92										288	1392	52	29	29	10.0		18		8	10	2	3	2	3	3	6	1	5	8	2	388	

ABBREVIATIONS

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

COMPUTED BY:	KDA	DATE :	12/15/2015
CHECKED BY:	TFD	DATE :	1/12/2016

PROJECT NO.	SHEET NO.
B-5123	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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					300	540	600		
			TOTAL CY/TONS/SY:		300	540	600		

***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.**

PROJ. REFERENCE NO.	SHEET NO.
B-5123	3P-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4-A & 4	CHARLOTTE MOTOR SPEEDWAY, LLC
2	4-A & 4	BANK OF NORTH CAROLINA
3	4-A & 4	HEATHER MORRIS JONES AND DONALD ALLEN JONES
4	4-A, 4 & 5	JAY W. MORRIS, JR.
5	4-A, 4 & 5	LINDA P. MORRISON, TRUSTEE
6	5	AB&T PROPERTIES / NC PARTNERSHIP

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

PROJECT REFERENCE NO.	SHEET NO.
B-5123	4

RW SHEET NO.

ROADWAY DESIGN ENGINEER — SEAL 18903 — GREGORY E. BREW — 2/17/2016

HYDRAULICS ENGINEER — SEAL 032312 — CHARLES W. HEAFNER — 2/17/2016

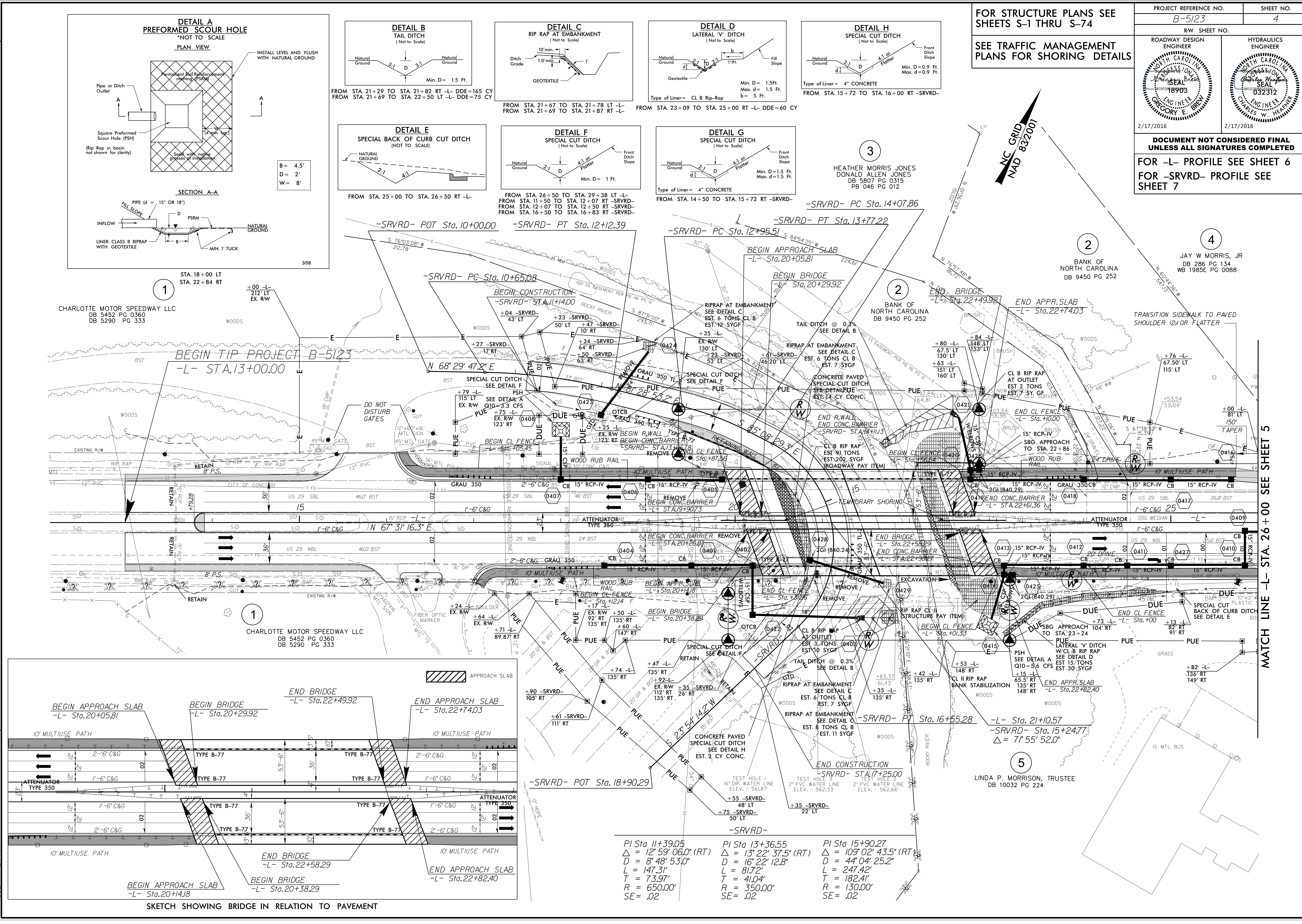
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

FOR STRUCTURE PLANS SEE SHEETS S-1 THRU S-74

SEE TRAFFIC MANAGEMENT PLANS FOR SHORING DETAILS

FOR -L- PROFILE SEE SHEET 6

FOR -SRVRD- PROFILE SEE SHEET 7



DETAIL A
PREFORMED SCOUR HOLE
*NOT TO SCALE
PLAN VIEW
SECTION A-A
B= 4.5'
D= 2'
W= 8'
STA. 18+00 LT
STA. 22+84 RT
DETAIL B
TAIL DITCH
(Not to Scale)
Min. D = 1.5 Ft.
FROM STA. 21+29 TO STA. 21+82 RT -L- DDE=165 CY
FROM STA. 21+69 TO STA. 22+50 LT -L- DDE=75 CY
DETAIL C
RIP RAP AT EMBANKMENT
(Not to Scale)
FROM STA. 21+67 TO STA. 21+78 LT -L-
FROM STA. 21+69 TO STA. 21+87 RT -L-
DETAIL D
LATERAL 'V' DITCH
(Not to Scale)
Type of Liner= CL B Rip-Rap
FROM STA. 23+09 TO STA. 25+00 RT -L- DDE=60 CY
DETAIL H
SPECIAL CUT DITCH
(Not to Scale)
Type of Liner= 4" CONCRETE
FROM STA. 15+72 TO STA. 16+00 RT -SRVRD-
DETAIL E
SPECIAL BACK OF CURB CUT DITCH
(NOT TO SCALE)
FROM STA. 25+00 TO STA. 26+50 RT -L-
DETAIL F
SPECIAL CUT DITCH
(Not to Scale)
FROM STA. 26+50 TO STA. 29+38 LT -L-
FROM STA. 11+50 TO STA. 12+07 RT -SRVRD-
FROM STA. 12+07 TO STA. 12+50 RT -SRVRD-
FROM STA. 16+50 TO STA. 16+83 RT -SRVRD-
DETAIL G
SPECIAL CUT DITCH
(Not to Scale)
Type of Liner= 4" CONCRETE
FROM STA. 14+50 TO STA. 15+72 RT -SRVRD-
NC GRID NAD 83/2001
1 CHARLOTTE MOTOR SPEEDWAY LLC DB 5452 PG 0360 DB 5290 PG 333
2 BANK OF NORTH CAROLINA DB 9450 PG 252
3 HEATHER MORRIS JONES DONALD ALLEN JONES DB 5807 PG 0315 PB 046 PG 012
4 JAY W MORRIS, JR DB 286 PG 134 WB 1985E PG 0088
5 LINDA P. MORRISON, TRUSTEE DB 10032 PG 224
BEGIN TIP PROJECT B-5123
-L- STA.13+00.00
-SRVRD- POT Sta. 10+00.00
-SRVRD- PT Sta. 12+12.39
-SRVRD- PC Sta. 12+95.51
-SRVRD- PT Sta. 13+77.22
-SRVRD- PC Sta. 14+07.86
-SRVRD- PC Sta. 10+65.08
BEGIN CONSTRUCTION -SRVRD- STA.11+14.00
BEGIN APPROACH SLAB -L- Sta.20+05.81
BEGIN BRIDGE -L- Sta.20+29.92
END BRIDGE -L- Sta.22+49.92
END APPR. SLAB -L- Sta.22+74.03
TRANSITION SIDEWALK TO PAVED SHOULDER 12:1 OR FLATTER
-SRVRD- PT Sta. 16+55.28
-L- Sta. 21+10.57
-SRVRD- Sta. 15+24.77
△ = 71° 55' 52.0"
END CONSTRUCTION -SRVRD- STA.17+25.00
-SRVRD- POT Sta. 18+90.29
MATCH LINE -L- STA. 26+00 SEE SHEET 5
SKETCH SHOWING BRIDGE IN RELATION TO PAVEMENT
APPROACH SLAB
BEGIN APPROACH SLAB -L- Sta.20+05.81
BEGIN BRIDGE -L- Sta.20+29.92
END BRIDGE -L- Sta.22+49.92
END APPROACH SLAB -L- Sta.22+74.03
END BRIDGE -L- Sta.22+58.29
BEGIN BRIDGE -L- Sta.20+38.29
END APPROACH SLAB -L- Sta.22+82.40
BEGIN APPROACH SLAB -L- Sta.20+14.18
10' MULTIUSE PATH
TYPE B-77
ATTENUATOR TYPE 350
-SRVRD-
PI Sta 11+39.05
△ = 12° 59' 06.0" (RT)
D = 8° 48' 53.0"
L = 147.31'
T = 73.97'
R = 650.00'
SE= .02
PI Sta 13+36.55
△ = 13° 22' 37.5" (RT)
D = 16° 22' 12.8"
L = 81.72'
T = 41.04'
R = 350.00'
SE= .02
PI Sta 15+90.27
△ = 109° 02' 43.5" (RT)
D = 44° 04' 25.2"
L = 247.42'
T = 182.41'
R = 130.00'
SE= .02

REVISIONS

8/17/99

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8/17/99

REVISIONS

DETOUR DESIGN SPEED = 45 MPH

USE THIS SHEET FOR DETOUR CONSTRUCTION ONLY

SEE TRAFFIC MANAGEMENT PLANS FOR SHORING DETAILS

PROJECT REFERENCE NO.	SHEET NO.
B-5123	4-A
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 025477 ENGINEER Brad F. Duncan

5/24/2016

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032312 ENGINEER CHARLES W. HEFFNER

5/24/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

FOR –DET2– PROFILE SEE SHEET 7

NC GRID NAD 83/2001

INSTALL OTCB, TEMPORARY PIPE AND DI BEFORE DETOUR BRIDGE CONSTRUCTION. INSTALL STEEL PLATE IN PLACE OF OTCB TOP. AFTER DETOUR BRIDGE AND EMBANKMENT IS REMOVED REPLACE STEEL PLATE WITH CONCRETE OTCB TOP AND REMOVE TEMPORARY PIPE AND DI.

–DET2– PT Sta. 14+20.72

BEGIN BRIDGE
–DET2– Sta.14+33.00

INSTALL PROPOSED PIPE PRIOR TO DETOUR BRIDGE CONSTRUCTION. INSTALL TEMPORARY PIPE EXTENSION TO ALLOW FOR MAINTENANCE OF FLOWS DURING CONSTRUCTION OF PROPOSED STORMDRAIN SYSTEM. AFTER DETOUR BRIDGE AND EMBANKMENT IS REMOVED REMOVE PIPE EXTENSION AND INSTALL RIP RAP OUTLET PROTECTION

–DET2– PC Sta. 17+52.34

–DET2– PRC Sta. 12+42.57

–DET2– PC Sta. 10+64.42

INSTALL PROPOSED PIPE PRIOR TO DETOUR BRIDGE CONSTRUCTION. INSTALL TEMPORARY PIPE EXTENSION TO ALLOW FOR MAINTENANCE OF FLOWS DURING CONSTRUCTION OF PROPOSED STORMDRAIN SYSTEM. AFTER DETOUR BRIDGE AND EMBANKMENT IS REMOVED REMOVE PIPE EXTENSION AND INSTALL PREFORMED SCOUR HOLE.

RIPRAP AT EMBANKMENT SEE DETAIL C
EST. 6 TONS CL B
EST. 12 SYD F

END BRIDGE
–DET2–
Sta.17+23.00

INSTALL PROPOSED DRAINAGE SYSTEM BEFORE DETOUR BRIDGE CONSTRUCTION. INSTALL STEEL PLATES IN PLACE OF CB FRAME, GRATE, & HOODS. AFTER DETOUR IS REMOVED, REPLACE STEEL PLATES WITH FRAME, GRATE, & HOOD

–DET2– PRC Sta. 19+49.95

–DET2– PT Sta. 21+47.57

–DET2– POT Sta. 23+09.25
–L– POT Sta. 27+97.69
(OFFSET = 23.5' LT)

–DET2– POT Sta. 10+00.00
–L– POT Sta. 15+00.76
(OFFSET = 35.5' LT)

–DET2– POT Sta. 11+87.26
BEGIN CONST.

–DET2– POT Sta. 20+32.72
END CONST.

INSTALL TEMPORARY 15" PIPE PRIOR TO CROSSOVER CONSTRUCTION

DO NOT DISTURB GATES

TEMPORARY SHORING

–DET2–
N 67° 31' 16.3" E

–L–
N 67° 31' 16.3" E

3
HEATHER MORRIS JONES
DONALD ALLEN JONES
DB 5807 PG 0315
PB 046 PG 012

2
BANK OF NORTH CAROLINA
DB 9450 PG 252

4
JAY W MORRIS, JR
DB 286 PG 134
WB 1985E PG 0088

1
CHARLOTTE MOTOR SPEEDWAY LLC
DB 5452 PG 0360
DB 5290 PG 333

5
LINDA P. MORRISON, TRUSTEE
DB 10032 PG 224

LINDA P. MORRISON, TRUSTEE
DB 10032 PG 224

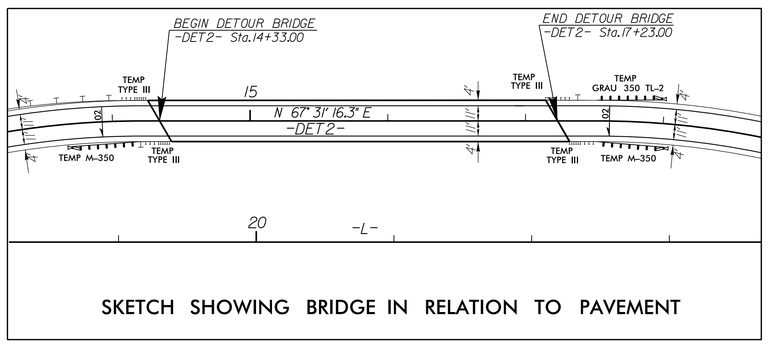
TEST HOLE 1
16" DIP WATER LINE
ELEV. - 561.87'

TEST HOLE 3
2" PVC WATER LINE
ELEV. - 562.33'

TEST HOLE 2
2" PVC WATER LINE
ELEV. - 562.66'

BEGIN DETOUR BRIDGE
–DET2– Sta.14+33.00

END DETOUR BRIDGE
–DET2– Sta.17+23.00



SKETCH SHOWING BRIDGE IN RELATION TO PAVEMENT

PI Sta 11+54.16
△ = 17° 00' 43.0" (LT)
D = 9° 32' 57.5"
L = 178.15'
T = 89.73'
R = 600.00'
SE = 0.02
R = 60'

PI Sta 13+32.31
△ = 17° 00' 43.0" (RT)
D = 9° 32' 57.5"
L = 178.15'
T = 89.73'
R = 600.00'
SE = 0.02
R = 60'

PI Sta 18+52.05
△ = 18° 52' 15.1" (RT)
D = 9° 32' 57.5"
L = 197.62'
T = 99.71'
R = 600.00'
SE = 0.02
R = 60'

PI Sta 20+49.66
△ = 18° 52' 15.1" (LT)
D = 9° 32' 57.5"
L = 197.62'
T = 99.71'
R = 600.00'
SE = 0.02
R = 60'

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8/17/99

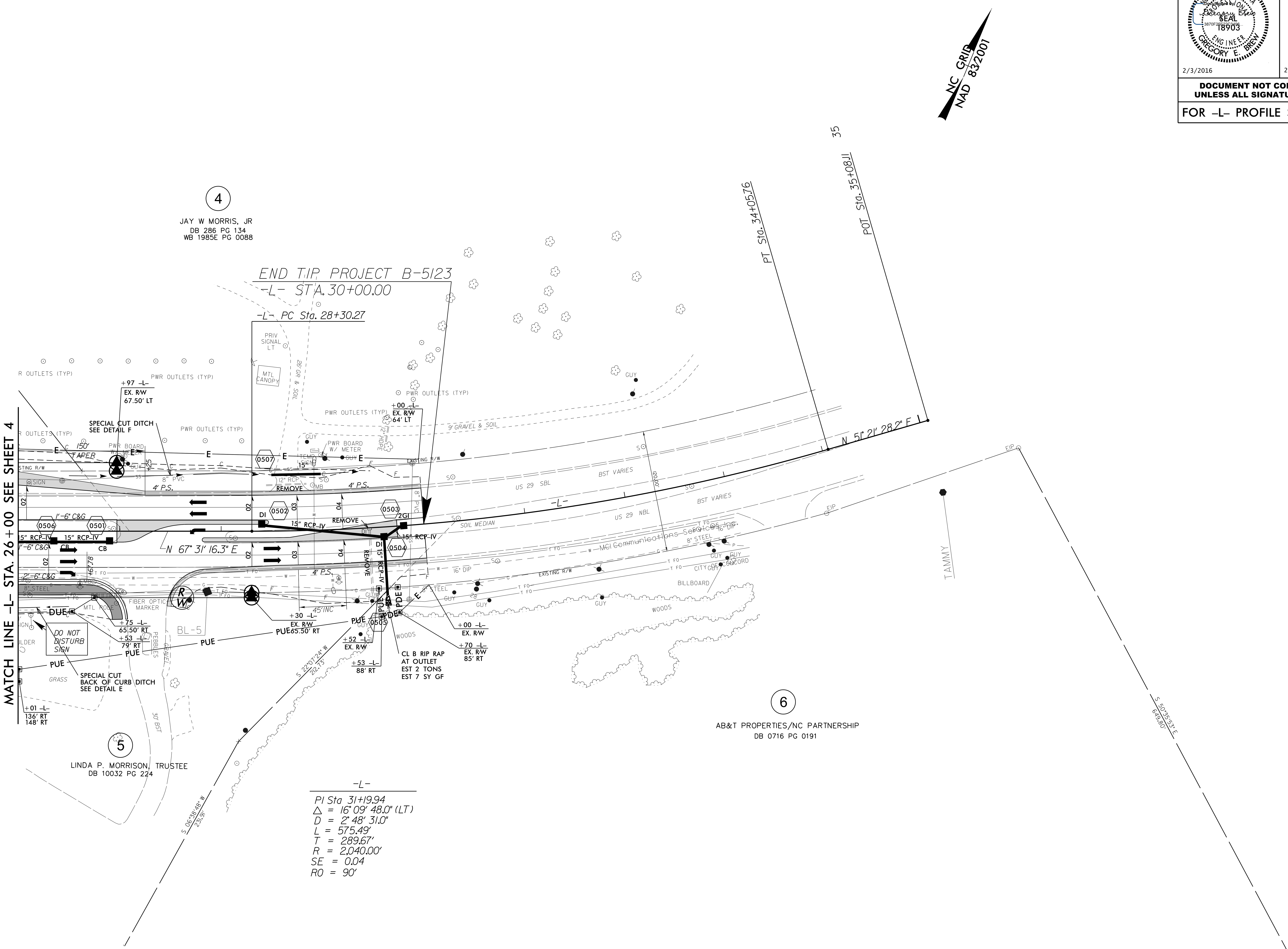
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-5123	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW	NORTH CAROLINA PROFESSIONAL SEAL 032312 ENGINEER CHARLES W. HEAFNER
2/3/2016	2/3/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

FOR -L- PROFILE SEE SHEET 6



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PROJECT REFERENCE NO. B-5123
SHEET NO. 6
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18903 ENGINEER GREGORY E. BREW
2/3/2016
NORTH CAROLINA PROFESSIONAL SEAL 032312 ENGINEER CHARLES W. HEAFNER
2/3/2016
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
FOR -L- PLAN VIEW SEE SHEETS 4 & 5
FOR STRUCTURE PLANS SEE SHEETS S-1 THRU S-74
DITCH LEGEND
LEFT DITCH
RIGHT DITCH
BM #2 RR SPIKE IN BASE OF POWER POLE -L- STA.18+01.44, 66.38' RT. ELEV. 587.42
-L-
BEGIN GRADE -L- STA.13+00.00 EL.= 618.25
PI = 17+36.79 EL = 590.99' VC = 576' K = 97
BEGIN BRIDGE -L- STA.20+34.10
END BRIDGE -L- STA.22+53.18
(-)6.2411%
(-)0.3000%
(-)0.3000%
588.70
BRIDGE HYDRAULIC DATA
DESIGN DISCHARGE = 10,070 CFS
DESIGN FREQUENCY = 50 YRS
DESIGN HW ELEVATION = 576.1 FT
BASE DISCHARGE = 12,060 CFS
BASE FREQUENCY = 100 YRS
BASE HW ELEVATION = 577.21 FT
OVERTOPPING DISCHARGE = 33,000 CFS
OVERTOPPING FREQUENCY = 500 YRS
OVERTOPPING ELEVATION = 588.9 FT
= FT
DATE OF SURVEY = 9/14/2010
W.S. ELEVATION AT DATE OF SURVEY = 599.0 FT
4" CONCRETE SLOPE PROTECTION (STRUCTURE PAY ITEM)
1.5:1
EXCAVATE TO EL 568.0 EST. 190 CY
CL II RIP RAP KEYED IN 3.5' (TYP.) (STRUCTURE PAY ITEM)
1.5:1
EXCAVATE TO EL 568.0 EST. 60 CY
CL II RIP RAP ON BANKS 160 TONS
WSE 559.0 DATE OF SURVEY (9/14/2010)
(+)18.80%
(+)14.86%
(+)2.71%
PI =23+50 EL =575.71
PI =24+00 RT EL =583.14
BEGIN LATERAL 'V' DITCH STA.23+09 EL =568.00
640 630 620 610 600 590 580 570 560 550
11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
BM #3 RR SPIKE IN BASE OF POWER POLE -L- STA.25+77.03, 68.05' RT. ELEV. 589.94
-L-
END GRADE -L- STA.30+00.00 EL.= 587.20
(-)0.3000%
(+)2.48%
(+)1.18%
(-)1.10%
588.70
END SPECIAL BACK OF CURB CUT DITCH STA.26+50 RT ELEV =587.68
END SPECIAL BACK OF CURB CUT DITCH BEGIN LATERAL 'V' DITCH STA.25+00 RT EL =585.91
PI =25+50 RT EL =587.15
BEGIN SPECIAL CUT DITCH STA 26+50 LT EL =584.48
PI= 29+00 LT EL =581.73
END SPECIAL CUT DITCH STA 29+38 LT EL =581.31
25 26 27 28 29 30 31
GRADE INSET -L- (LT & RT)
FOR -L- LINE BRIDGES WITH GRADE POINT LOCATED AT MEDIAN EDGE OF TRAVEL SEE INSET 'C' ON SHEET 2A-2
BEGIN GRADE (OFFSET LT -11.5') (OFFSET RT 11.5') -L- STA.19+85.00 EL.= 590.10'
PI = 20+04.90 EL = 589.96' VC = 39.79'
(-)0.7101%
(-)0.3002%
END GRADE (OFFSET LT -11.5') (OFFSET RT 11.5') -L- STA.23+00.00 EL.= 589.07'
19 20 21 22 23 24 25
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PROJECT REFERENCE NO.	SHEET NO.
B-5123	7

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18903, GREGORY E. BREW — DocuSigned by: Gregory Brew — 3870F25E22C3496... — 2/3/2016

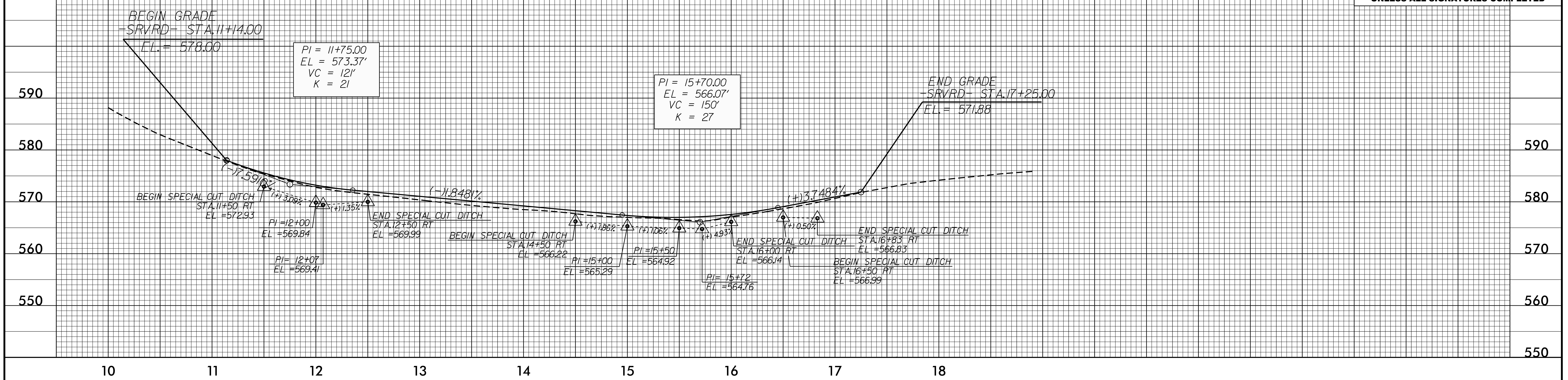
HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032312, CHARLES W. HEAFNER — DocuSigned by: Charles Heafner — 96CE2BBB21E8471... — 2/3/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

FOR -SRVRD- PLAN VIEW SEE SHEET 4

-SRVRD-

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



FOR -DET2- PLAN VIEW SEE SHEET 4-A

-DET2-

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	4870	CFS
DESIGN FREQUENCY	=	5	YRS
DESIGN HW ELEVATION	=	572.2	FT
BASE DISCHARGE	=	12060	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	577.4	FT
OVERTOPPING DISCHARGE	=	N/A	CFS
OVERTOPPING FREQUENCY	=	N/A	YRS
OVERTOPPING ELEVATION	=	N/A	FT
	=		FT
DATE OF SURVEY	=	9/14/2010	
W.S.ELEVATION AT DATE OF SURVEY	=	599.0	FT

5/28/99

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PROJECT REFERENCE NO.	SHEET NO.
B-5123	8

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 025477 Thad F. Duncan — DocuSigned by: Thad F. Duncan 12B4BCAA851748E... — 5/24/2016

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032312 CHARLES W. HEAFNER — DocuSigned by: Charles Heafner 96CE2B8B21E8471... — 5/24/2016

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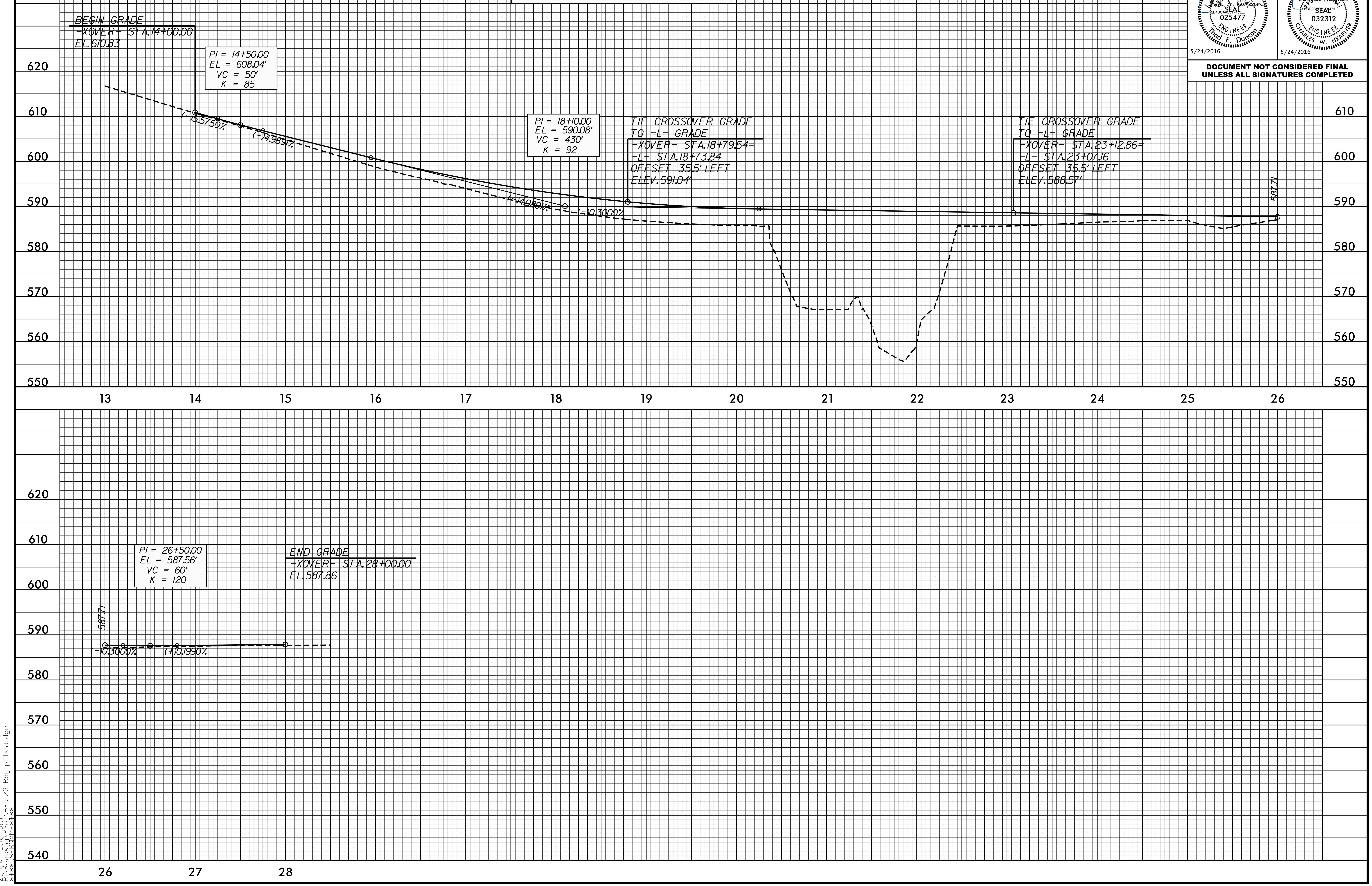
FOR –XOVER– PLAN VIEW SEE DETAIL 2–B3

–XOVER–



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