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This file or an individual page shall not be considered a certified document.

09/08/99

TIP PROJECT: B–5157

CONTRACT: C203723

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

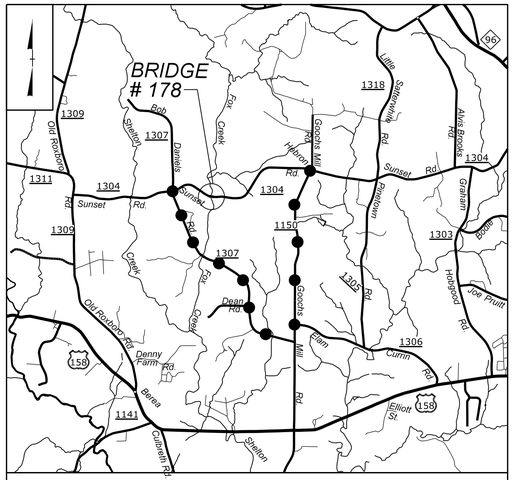
GRANVILLE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–5157	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
42332.1.1	BRZ–1304(10)	P.E.
42332.2.FD1	BRZ–1304(10)	R/W & UTILITIES
42332.3.FD1	BRZ–1304(10)	CONSTR.

LOCATION: BRIDGE NO. 178 OVER FOX CREEK ON SR 1304 (SUNSET ROAD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE

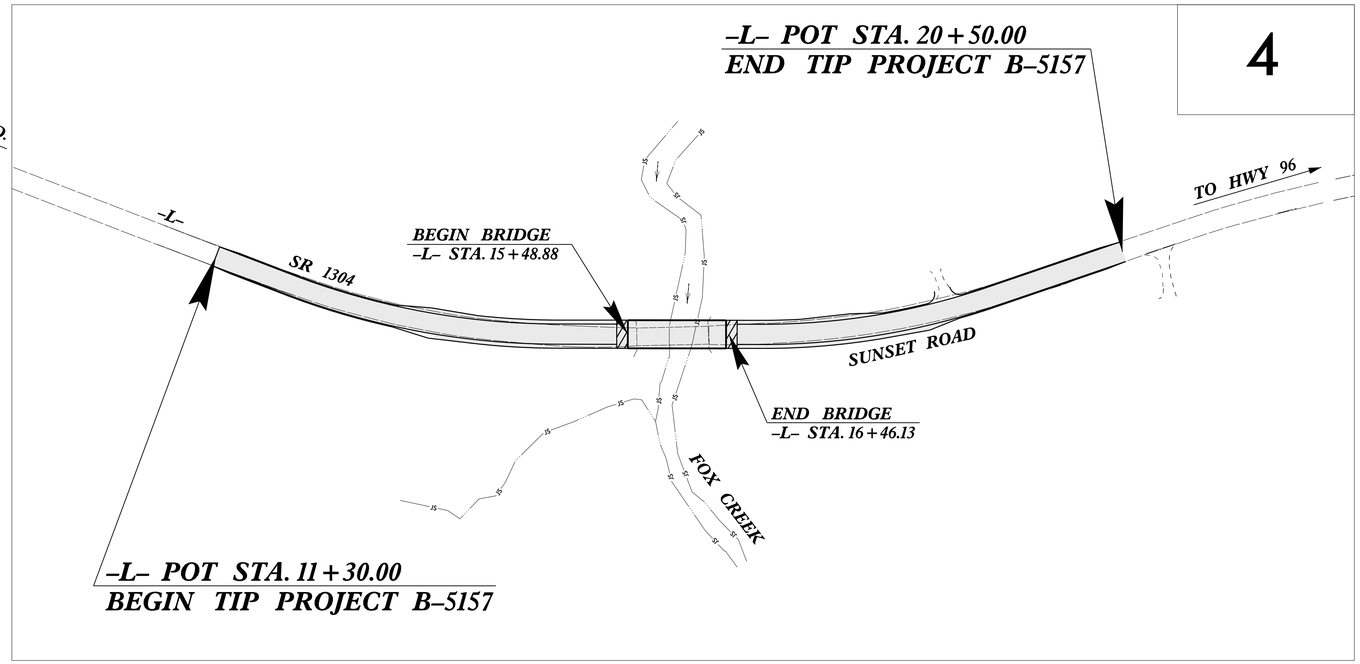


VICINITY MAP

DENOTES OFF-SITE DETOUR

NC GRID (NAD 83/NSRS 2007)

4



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 = 225
ADT 2036 = 305
K = 10 %
D = 60 %
T = 5 % *
V = 35 MPH
* TTST = 2% DUAL 3%
FUNC CLASS = RURAL LOCAL
SUB–REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B–5157	=	0.156 MILES
LENGTH OF STRUCTURE TIP PROJECT B–5157	=	0.018 MILES
TOTAL LENGTH TIP PROJECT B–5157	=	0.174 MILES

Prepared In the Office of:

SUNGATE DESIGN GROUP, P.A.
915 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 FAX (919) 859-6258
ENG FIRM LICENSE NO. C-890

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672

for the North Carolina Department of Transportation

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: APRIL 23, 2015

LETTING DATE: APRIL 19, 2016

STANTEC CONTACT
STEVE SMALLWOOD, P.E.
PROJECT ENGINEER

NCDOT CONTACT:
REKHA PATEL, P.E.

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

1/15/2016

DocuSigned by: Joshua G. Dalton 1089ADBC14994C *P.E.*

SIGNATURE:

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022037 ENGINEER STEPHEN T. SMALLWOOD

1/15/2016

DocuSigned by: Stephen T Smallwood BF6326A1616144 *P.E.*

SEAL NOT VALID UNLESS SIGNED AND DATED

SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

1/5/2016
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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-5157	1A

ROADWAY DESIGN ENGINEER

SEAL NOT VALID UNLESS SIGNED AND DATED

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND MILLING DETAILS
2C-1	STRUCTURE ANCHOR DETAIL
3B-1	SUMMARY OF EARTHWORK, PAVEMENT REMOVAL, BREAKUP OF EXISTING PAVEMENT, SHOULDER BERM GUTTER, AND GUARDRAIL
3D-1	SUMMARY OF DRAINAGE QUANTITIES
4	PLAN SHEET
5	PROFILE SHEET
TMP-1 THRU TMP-4	TRAFFIC MANAGEMENT PLANS
PM-1	PAVEMENT MARKING PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
RF-1	REFORESTATION PLAN
SIGN-1 THRU SIGN-2	SIGNING PLANS
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
X-1A	CROSS SECTION SUMMARY SHEET
X-1 THRU X-5	CROSS-SECTIONS
S-1 THRU S- 15	STRUCTURE PLANS

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

200.03 Method of Clearing – Method III
225.02 Guide for Grading Subgrade – Secondary and Local
225.04 Method of Obtaining Superelevation – Two Lane Pavement

DIVISION 3 – PIPE CULVERTS

300.01 Method of Pipe Installation
310.10 Driveway pipe construction

DIVISION 4 – MAJOR STRUCTURES

422.11 Reinforced Bridge Approach Fills–Sub Regional Tier

DIVISION 5 – SUBGRADE, BASES AND SHOULDERS

560.01 Method of Shoulder Construction – High Side of Superelevated Curve – Method I

DIVISION 8 – INCIDENTALS

806.01 Concrete Right–of–Way Marker
806.02 Granite Right–of–Way Marker
840.00 Concrete Base Pad for Drainage Structures
840.25 Anchorage for Frames – Brick or Concrete or Precast
840.29 Frames and Narrow Slot Flat grates
840.35 Traffic Bearing Grated Drop Inlet–for Cast Iron Double Frame and Grates
840.46 Traffic Bearing Precast Drainage Structure
840.66 Drainage Structure Steps
846.01 Concrete Curb, Gutter and Curb & Gutter
846.04 Drop Installation in Shoulder Berm Gutter
862.01 Guardrail Placement
862.02 Guardrail Installation
876.01 Rip Rap in Channels
876.02 Guide for Rip Rap at Pipe Outlets

GENERAL NOTES: 2012 SPECIFICATIONS

EFFECTIVE: 01–17–2012
REVISED: 10–31–2014

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

GUARDRAIL:

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

TEMPORARY SHORING:

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

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

CENTURYLINK

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT–OF–WAY MARKERS:

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

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stsmallwood

04/06/15

PROJECT REFERENCE NO.	SHEET NO.
B-5157	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.

07/09/2015

PROJECT REFERENCE NO.	SHEET NO.
B-5157	1C-1
Location and Surveys	
FINAL	

SURVEY CONTROL SHEET B-5157

GRANVILLE COUNTY

LOCATION: BRIDGE NO. 178 OVER FOX CREEK ON SR 1304 (SUNSET ROAD)

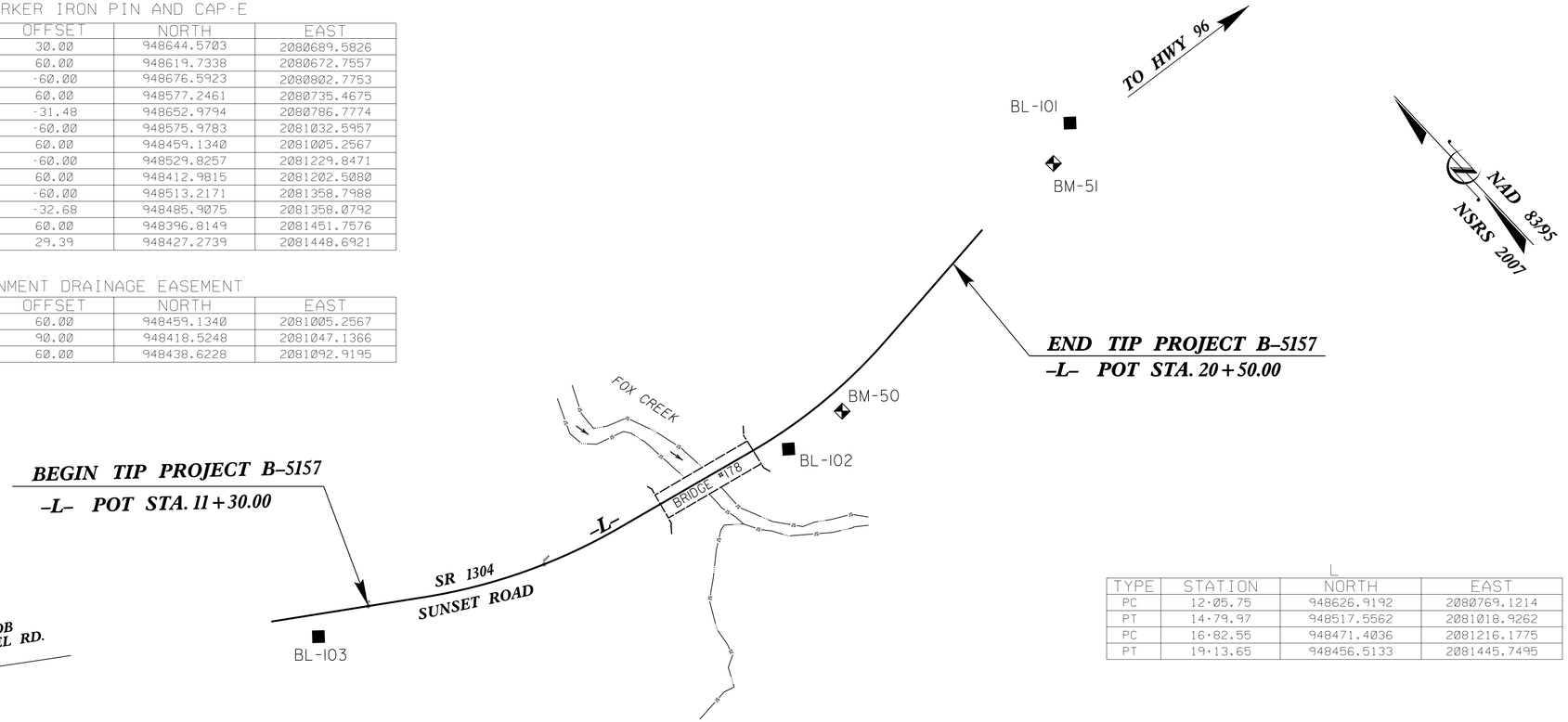
NCDOT GPS STATION B5157-1
LOCALIZED PROJECT COORDINATES
N=948420.115
E=2082402.543

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	11+30.00	30.00	948644.5703	2080689.5826
L	11+30.00	60.00	948619.7338	2080672.7557
L	12+05.75	-60.00	948676.5923	2080802.7753
L	12+05.75	60.00	948577.2461	2080735.4675
L	12+05.75	-31.48	948652.9794	2080786.7774
L	14+79.97	-60.00	948575.9783	2081032.5957
L	14+79.97	60.00	948459.1340	2081005.2567
L	16+82.55	-60.00	948529.8257	2081229.8471
L	16+82.55	60.00	948412.9815	2081202.5080
L	18+25.00	-60.00	948513.2171	2081358.7988
L	18+25.00	-32.68	948485.9075	2081358.0792
L	19+13.65	60.00	948396.8149	2081451.7576
L	19+13.65	29.39	948427.2739	2081448.6921

PERMANMENT DRAINAGE EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
L	14+79.97	60.00	948459.1340	2081005.2567
L	15+30.00	90.00	948418.5248	2081047.1366
L	15+70.00	60.00	948438.6228	2081092.9195



L

TYPE	STATION	NORTH	EAST
PC	12+05.75	948626.9192	2080769.1214
PT	14+79.97	948517.5562	2081018.9262
PC	16+82.55	948471.4036	2081216.1775
PT	19+13.65	948456.5133	2081445.7495

CONTROL DATA

BASELINE

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
3	B5157-3	948788.684	2080558.495	489.76'	OUTSIDE PROJECT LIMITS	
103	BL-103	948573.637	2080830.381	469.33'	12+85.02	14.01' RT
102	BL-102	948468.005	2081169.677	447.18'	16+38.04	13.90' RT
101	BL-101	948462.750	2081885.846	487.96'	OUTSIDE PROJECT LIMITS	

BENCHMARK DATA

```
*****************************************
50       ELEVATION = 446.10
N 948438      E 2081232
L STATION 17+05 29' RIGHT
RRS IN 30" GUM
*****************************************
*****************************************
51       ELEVATION = 485.74
N 948443      E 2081862
L STATION 13+70
S 83°32'19" E  DIST   954'
RRS IN 24" POPLAR
*****************************************
```

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "B5157-1" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 948420.115(ft) EASTING: 2082402.543(ft) ELEVATION: 514.12'(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.00003903
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B5157-1" TO -L- STATION 11+30 IS N 81° 38' 19" W 1,714.36'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

GEOID 03

NOTE: DRAWING NOT TO SCALE

NOTES:

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

   THE FILES TO BE FOUND ARE AS FOLLOWS: B5157_LS_CONTROL.TXT

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

● *INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.*
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

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Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

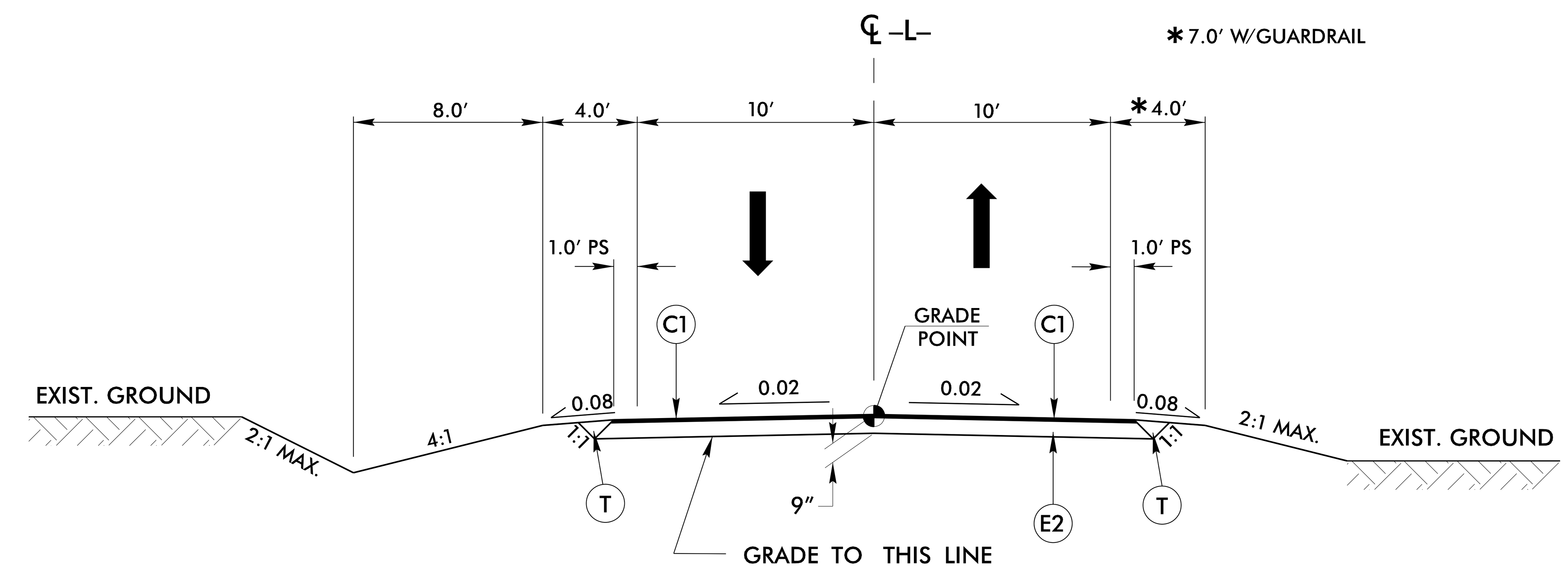
SUNGATE DESIGN GROUP, P.A.
915 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 FAX (919) 859-6258
ENG FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
B-5157	2A-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022… STEPHEN T. SMALLWOOD — DocuSigned by: Stephen T. Smallwood — 1/15/2016	NORTH CAROLINA PROFESSIONAL SEAL 022896 ENGINEER CLARK S. MORRISON — DocuSigned by: Clark S. Morrison
SEAL NOT VALID UNLESS SIGNED AND DATED	

FINAL PAVEMENT SCHEDULE

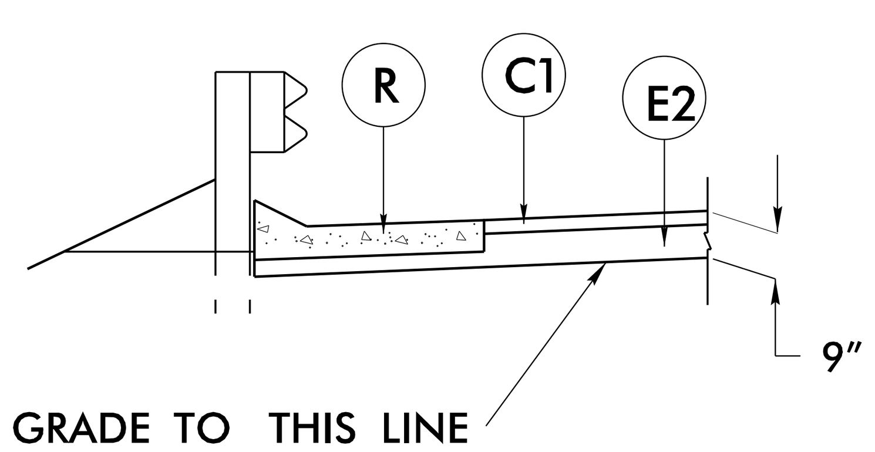
C1	PROP. APPROX. 1½″ ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 2½″ ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. APPROX. 7½″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD. IN TOP LAYER AND AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. IN BOTTOM LAYER.
R	SHOULDER BERM GUTTER.
T	EARTH MATERIAL.

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



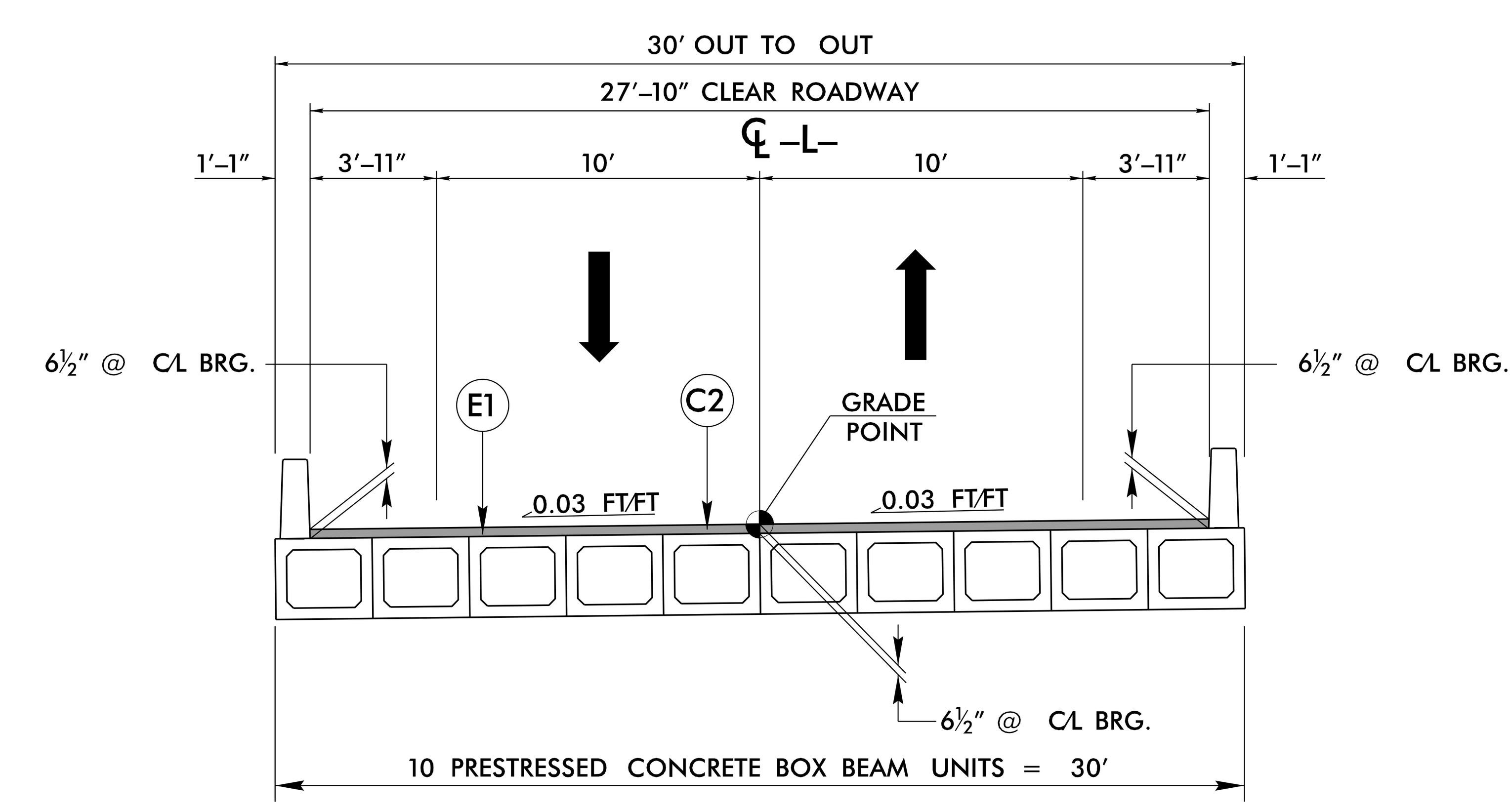
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
-L- STA. 11+30.00 TO -L- STA. 15+48.88 (BEGIN BRIDGE)
-L- STA. 16+46.13 (END BRIDGE) TO -L- STA. 20+50.00



DETAIL SHOWING SHOULDER BERM GUTTER (SBG) ON TOP OF SUBGRADE

-L- STA. 16+57.13 (END APPROACH SLAB) TO -L- STA. 16+92.00 LT



TYPICAL SECTION ON STRUCTURE

(SEE STRUCTURE PLANS)
-L- STA. 15+48.88 TO -L- STA. 16+46.13

6/2/99
1/5/2016
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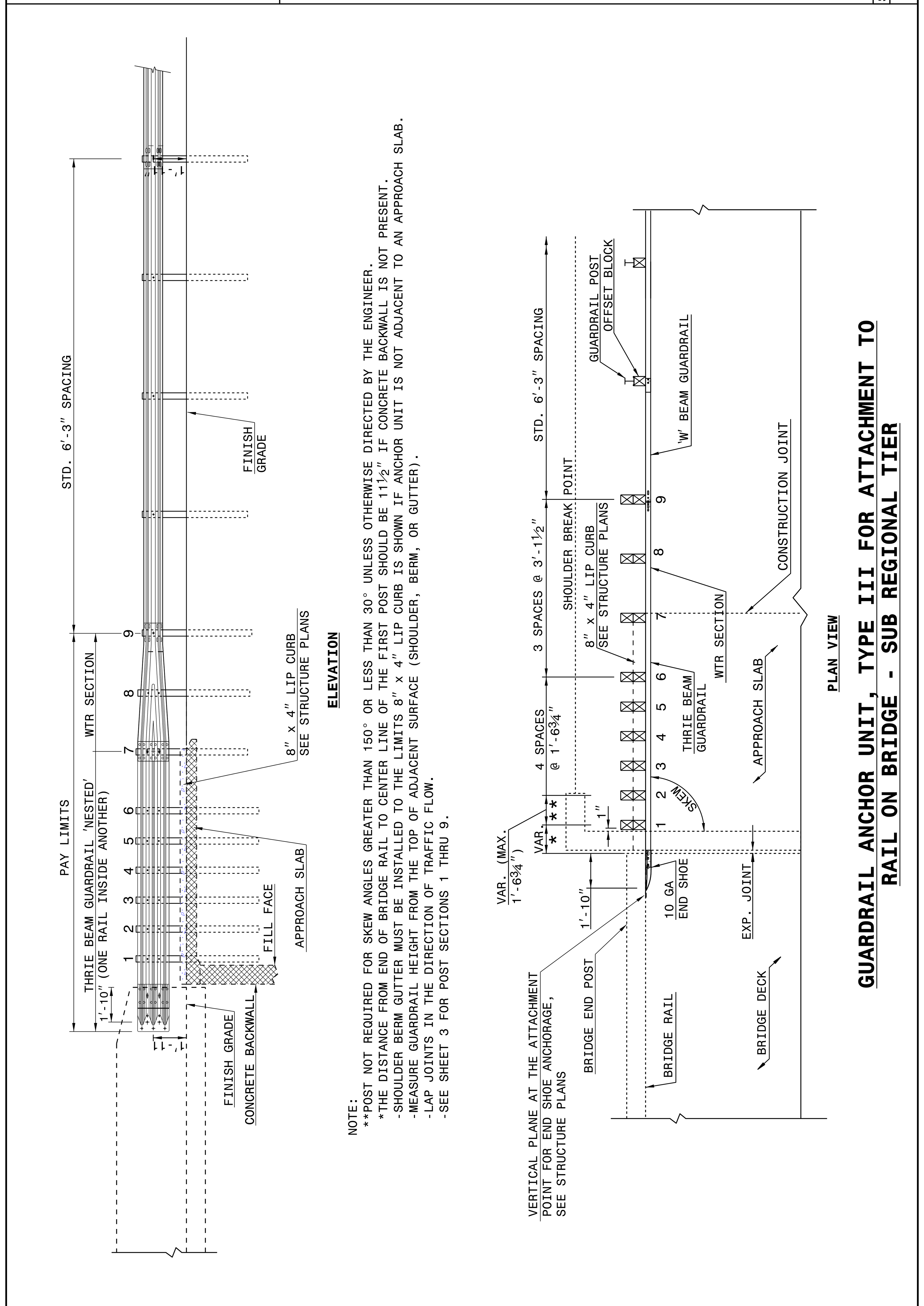
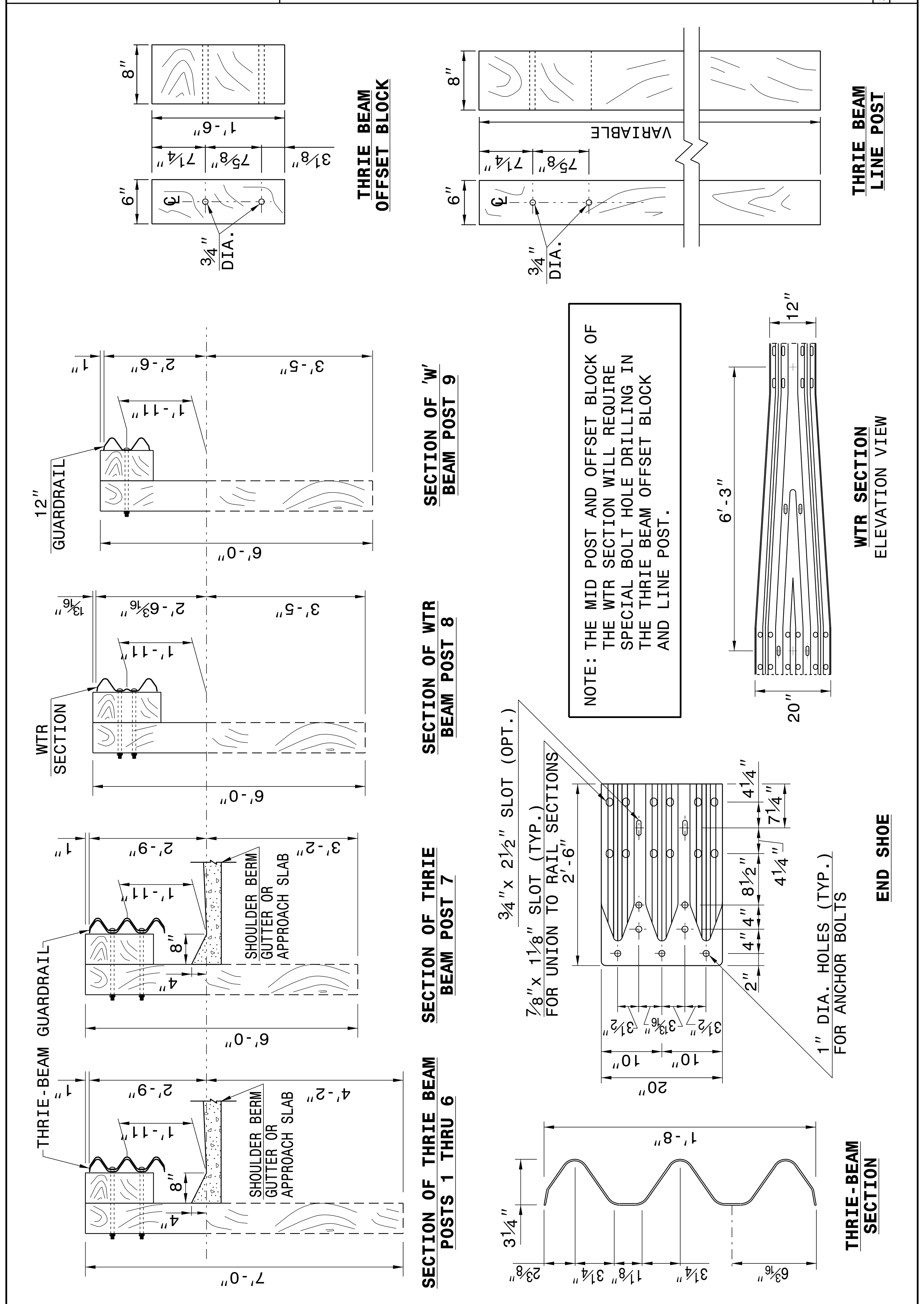
PROJECT REFERENCE NO.	SHEET NO.
B-5157	2C-1



GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER
ELEVATION
PLAN VIEW
STD. 6'-3" SPACING
PAY LIMITS
THRIE BEAM GUARDRAIL 'NESTED' (ONE RAIL INSIDE ANOTHER)
WTR SECTION
FINISH GRADE
CONCRETE BACKWALL
APPROACH SLAB
FILL FACE
8" x 4" LIP CURB SEE STRUCTURE PLANS
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.
VERTICAL PLANE AT THE ATTACHMENT POINT FOR END SHOE ANCHORAGE, SEE STRUCTURE PLANS
BRIDGE END POST
BRIDGE RAIL
BRIDGE DECK
EXP. JOINT
10 GA END SHOE
CONSTRUCTION JOINT
'W' BEAM GUARDRAIL
GUARDRAIL POST OFFSET BLOCK
SHOULDER BREAK POINT
3 SPACES @ 3'-1½"
4 SPACES @ 1'-6¾"
THRIE BEAM GUARDRAIL
SKEW

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



THRIE BEAM OFFSET BLOCK
THRIE BEAM LINE POST
SECTION OF 'W' BEAM POST 9
SECTION OF WTR BEAM POST 8
SECTION OF THRIE BEAM POST 7
SECTION OF THRIE BEAM POSTS 1 THRU 6
WTR SECTION ELEVATION VIEW
END SHOE
THRIE-BEAM SECTION
NOTE: THE MID POST AND OFFSET BLOCK OF THE WTR SECTION WILL REQUIRE SPECIAL BOLT HOLE DRILLING IN THE THRIE BEAM OFFSET BLOCK AND LINE POST.
¾" x 2½" SLOT (OPT.)
⅞" x 1⅛" SLOT (TYP.) FOR UNION TO RAIL SECTIONS
1" DIA. HOLES (TYP.) FOR ANCHOR BOLTS
VARIABLE
SHOULDER BERM GUTTER OR APPROACH SLAB

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

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SEE TITLE BLOCK

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

$$$$SYSTIME$$$$ $$$$DGN$$$$ $$$$USERNAME$$$$

COMPUTED BY: ___SS_____ DATE: 9/30/2015
CHECKED BY: _____ DATE: _____

PROJECT NO.	SHEET NO.
B-5157	3B-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

*SUMMARY OF EARTHWORK

IN CUBIC YARDS

Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
SUMMARY #1					
-L-BEG					
11+30.00	15+48.88	346	3054	2708	0
	(BRIDGE)				
TOTAL SUMMARY #1		346	3054	2708	0
SUMMARY #2					
-L- END					
16+46.13	20+50.00	58	2071	2013	0
(BRIDGE)					
TOTAL SUMMARY #2		58	2071	2013	0
PROJECT TOTALS:		404	5125	4721	0
ESTIMATED 5% TO REPLACE SOIL ON BORROW PIT				236	
GRAND TOTALS:		404		4957	
SAY:		500		5300	

*Note: Approximate quantities only. Unclassified Excavation, Fine Grading, Clearing and Grubbing, Breaking and Removal of Asphalt Pavement will be paid for at the contract lump sum price for grading.

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.

EST. DDE = 277 CY
EST. UNDERCUT = 300 CY
SELECT GRANULAR MATERIAL(CONTINGENCY) =300 CY
GEOTEXTILE FOR SOIL STABILIZATION(CONTINGENCY) =300 SY

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL
-L-	11+30.00	12+50.00	CL	270
-L-	15+37.88	15+57.71	CL	45
-L-	16+29.25	16+57.13	CL	60
-L-	18+50.00	20+50.00	CL	470
		TOTAL:		845
		SAY:		850

SHOULDER BERM GUTTER SUMMARY

LINE	Station	Station	LENGTH
-L-	16+57.13	16+92.00	34.87
		TOTAL:	34.87
		SAY:	35

SUMMARY OF BREAKING EXISTING ASPHALT

IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT BREAKUP
-L-	12+50.00	15+57.71	CL	645
-L-	16+57.13	18+50.00	CL	445
		TOTAL:		1090
		SAY:		1100

GUARDRAIL SUMMARY

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

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

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL WIDTH	FLARE LENGTH		W		ANCHORS									IMPACT ATTENUATOR TYPE 350		SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	XI	GRAU 350	M-350	III	CAT-1	VI MOD	BIC		G	NG				
	13+48.88	15+48.88(BRIDGE)	RT	200			14+25		3'-11"	7	50		1				1		1										
	16+46.13(BRIDGE)	18+46.13	RT	200				17+75	3'-11"	7		50		1			1		1										
	16+46.13(BRIDGE)	17+71.13	LT	125			17+00		3'-11"	7	50		1				1		1										
	13+48.88	15+48.88(BRIDGE)	LT	200				14+25	3'-11"	7		50		1			1		1										
SUBTOTAL				725													4		4										
LESS ANCHOR DEDUCTIONS																													
GRAU-350 4@50				-200																									
TYPE III 4@18.75				-75																									
TOTAL				450																									
SAY				462.5			5 ADDITIONAL GUARDRAIL POSTS																							

COMPUTED BY: SS DATE: 9/30/2015

CHECKED BY: DATE:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
B-5157	3D-1

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

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

STATION	LOCATION (LT, RT, OR CL)*	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) SIZE	DRAINAGE PIPE THICKNESS OR GAUGE	C.S. PIPE SIZE	C.S. PIPE THICKNESS OR GAUGE	R.C. PIPE CLASS III	R.C. PIPE CLASS IV	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	ENDWALLS CU. YARDS C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' +(1.3 X COL. 'B') PER EACH (0' THRU 5.0')	LIN. FT. A 5.0' THRU 10.0'	LIN. FT. B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME WITH TWO GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	T.B.D.I. STD. 840.35	DRAINAGE PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
-L- 16+66	LT	401		453.3	450.3											1																1	1					
		401	402		450.3	450							20																									
-L- 16+90	LT	402		453.3	450											1																1	1					
		402	403		450	443.2		28						X																								
-L- 18+67	LT	404						28																													20	REMOVE EXIST. 15" PIPE
SHEET TOTALS								56					20			2																2	2				20	

ABBREVIATIONS

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

COMPUTED BY: TTZ DATE: 07-20-2015	(4-21-15)	PROJECT NO.	SHEET NO.
CHECKED BY: _____ DATE: _____		B-5157	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF
BRIDGE WAITING PERIODS

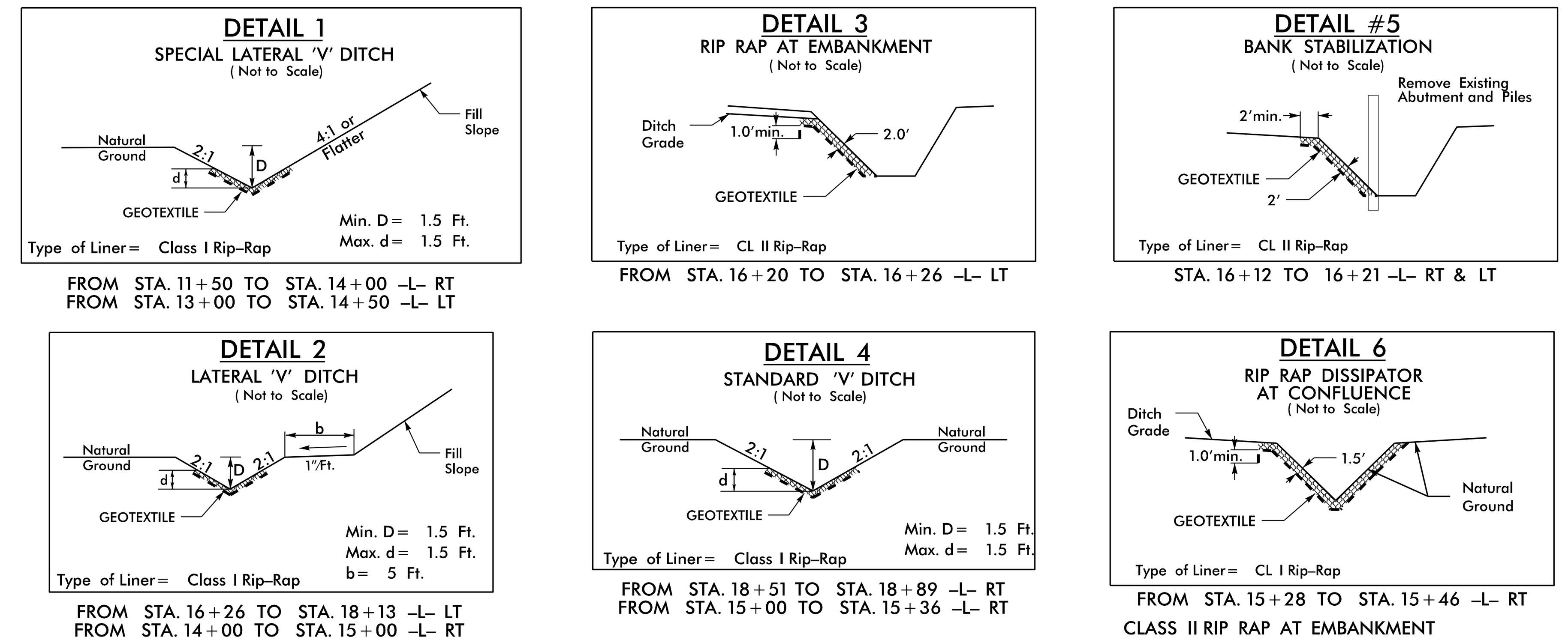
Bridge Description	End Bent/ Bent No.	MONTHS
BR# 178 over Fox Creek on SR 1304	EB2	2

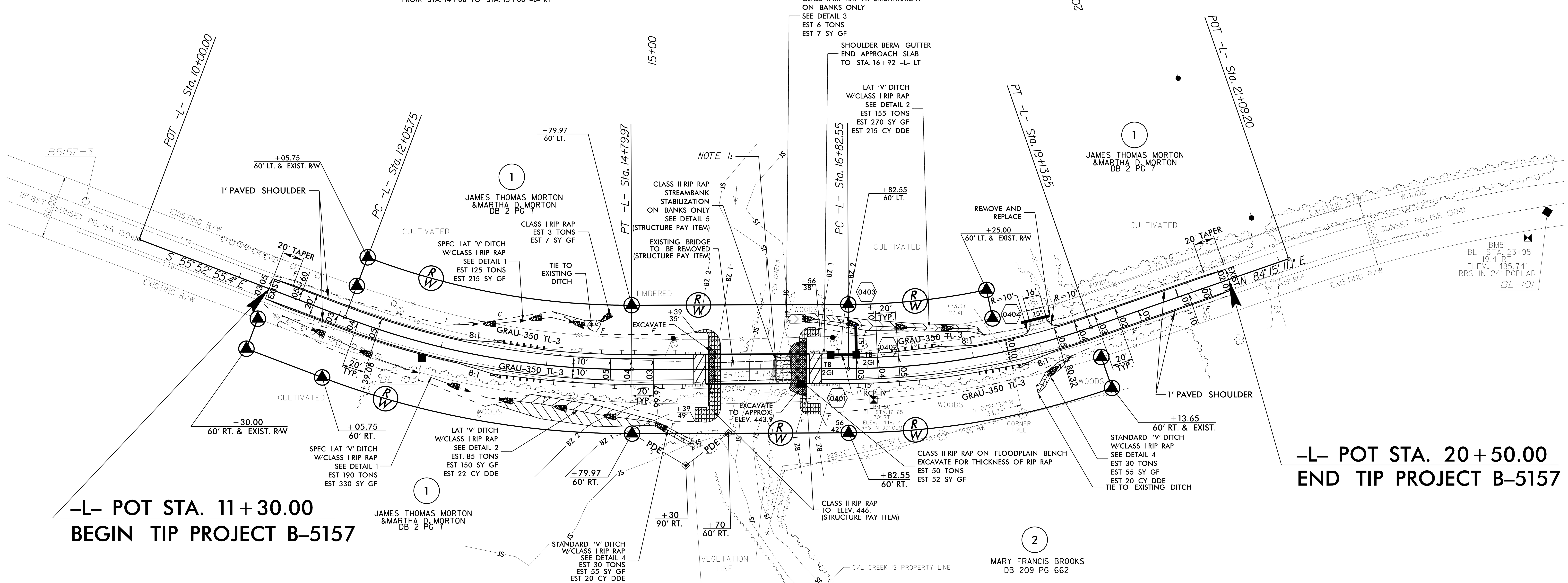
PROJECT REFERENCE NO.	SHEET NO.
B-5157	4
R/W SHEET NO.	

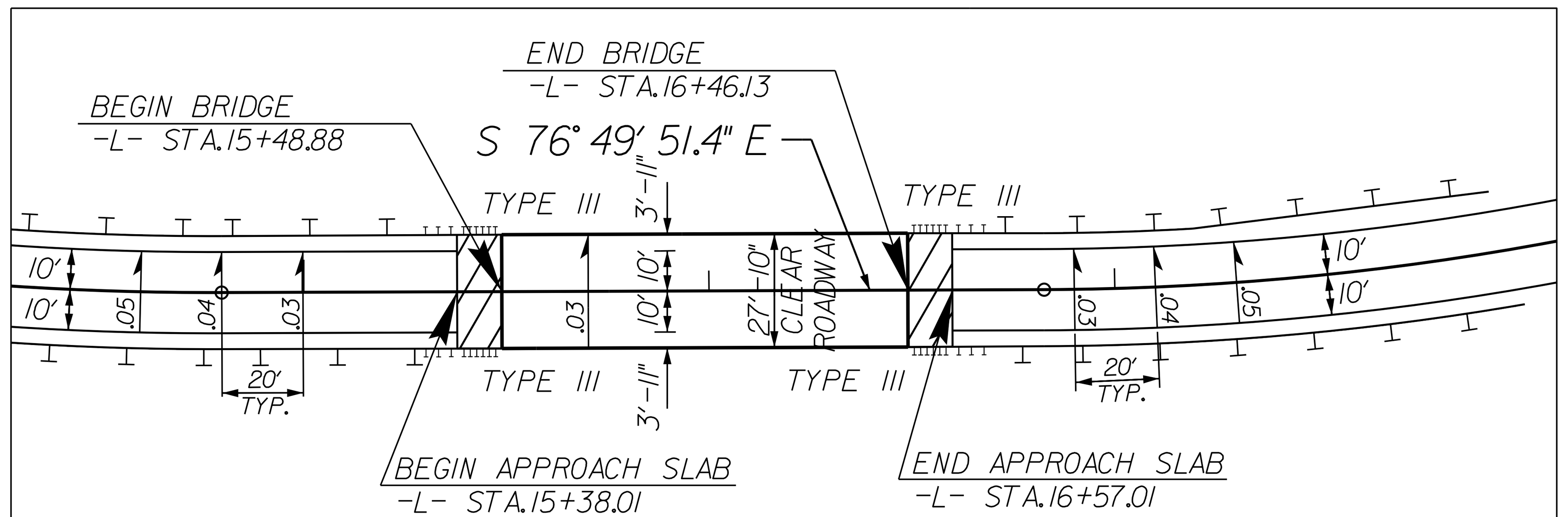
Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

SUNGATE DESIGN GROUP, P.A.
915 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 FAX (919) 859-6258
ENG FIRM LICENSE NO. C-890

ROADWAY DESIGN ENGINEER — 2/23/2016 — SEAL 022037 — Stephen Smallwood
HYDRAULICS ENGINEER — 2/23/2016 — SEAL 26971 — Joshua G. Dalton
SEAL NOT VALID UNLESS SIGNED AND DATED







SKETCH SHOWING ROADWAY IN RELATION TO STRUCTURE

-L- CURVE DATA

PI Sta 13+44.41	PI Sta 17+99.16
Δ = 20° 56' 56.0" (LT)	Δ = 18° 54' 57.6" (LT)
D = 7° 38' 22.0"	D = 8° 11' 06.4"
L = 274.22'	L = 231.10'
T = 138.66'	T = 116.61'
R = 750.00'	R = 700.00'
DS = 35 MPH	DS = 35 MPH
SE = .05	SE = .05

NOTE 1: REMOVAL OF EXISTING STRUCTURE CONCRETE FOOTER TO BE CONSIDERED INCIDENTAL TO STRUCTURE REMOVAL WORK.

DO NOT DISTURB STREAM BEYOND STREAM IMPACT AREA

DENOTES APPROACH SLAB

FOR -L- PROFILE SEE SHEET 5

SEE SHEETS S-1 THRU S-15 FOR STRUCTURE PLANS

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-5157	5

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866 Fax. (919) 851-7024
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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 FAX (919) 859-6258
ENG FIRM LICENSE NO. C-890

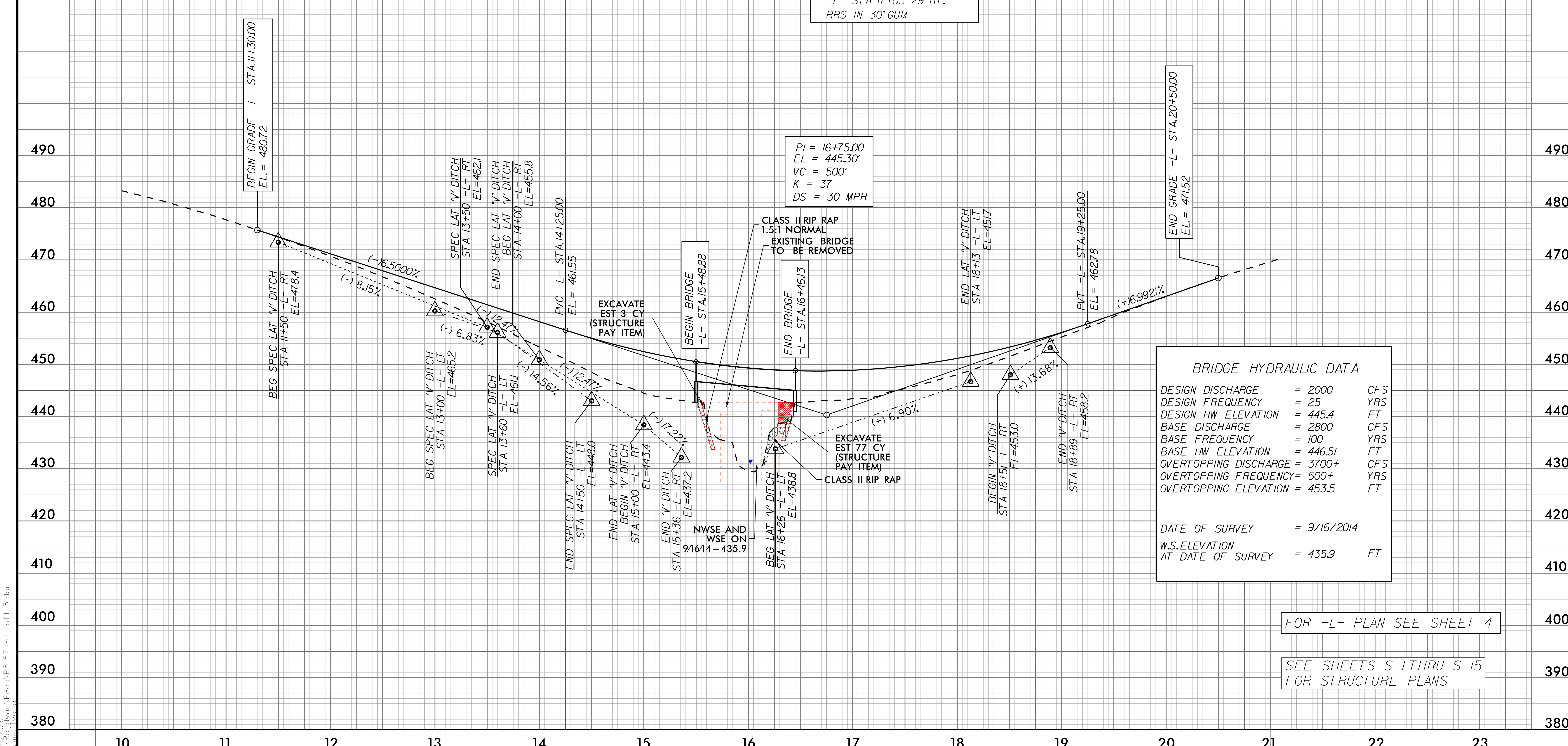
ROADWAY DESIGN ENGINEER
DocuSigned by: Stephen T. Smallwood
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022037
STEPHEN T. SMALLWOOD
1/15/2016
SEAL NOT VALID UNLESS SIGNED AND DATED

HYDRAULICS ENGINEER
DocuSigned by: Joshua G. Dalton
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971
JOSHUA G. DALTON
1/15/2016

–L–

-·-·-·- LEFT DITCH GRADE
--------- RIGHT DITCH GRADE

B.M.*50 ELEV.= 446.10'
N 948438 E 2081232
–L– STA. 17+05 29' RT.
RRS IN 30" GUM



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	2000	CFS
DESIGN FREQUENCY	=	25	YRS
DESIGN HW ELEVATION	=	445.4	FT
BASE DISCHARGE	=	2800	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	446.51	FT
OVERTOPPING DISCHARGE	=	3700+	CFS
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING ELEVATION	=	453.5	FT
DATE OF SURVEY	=	9/16/2014	
W.S. ELEVATION AT DATE OF SURVEY	=	435.9	FT

FOR –L– PLAN SEE SHEET 4

SEE SHEETS S-1 THRU S-15 FOR STRUCTURE PLANS

1/14/2016
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