

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

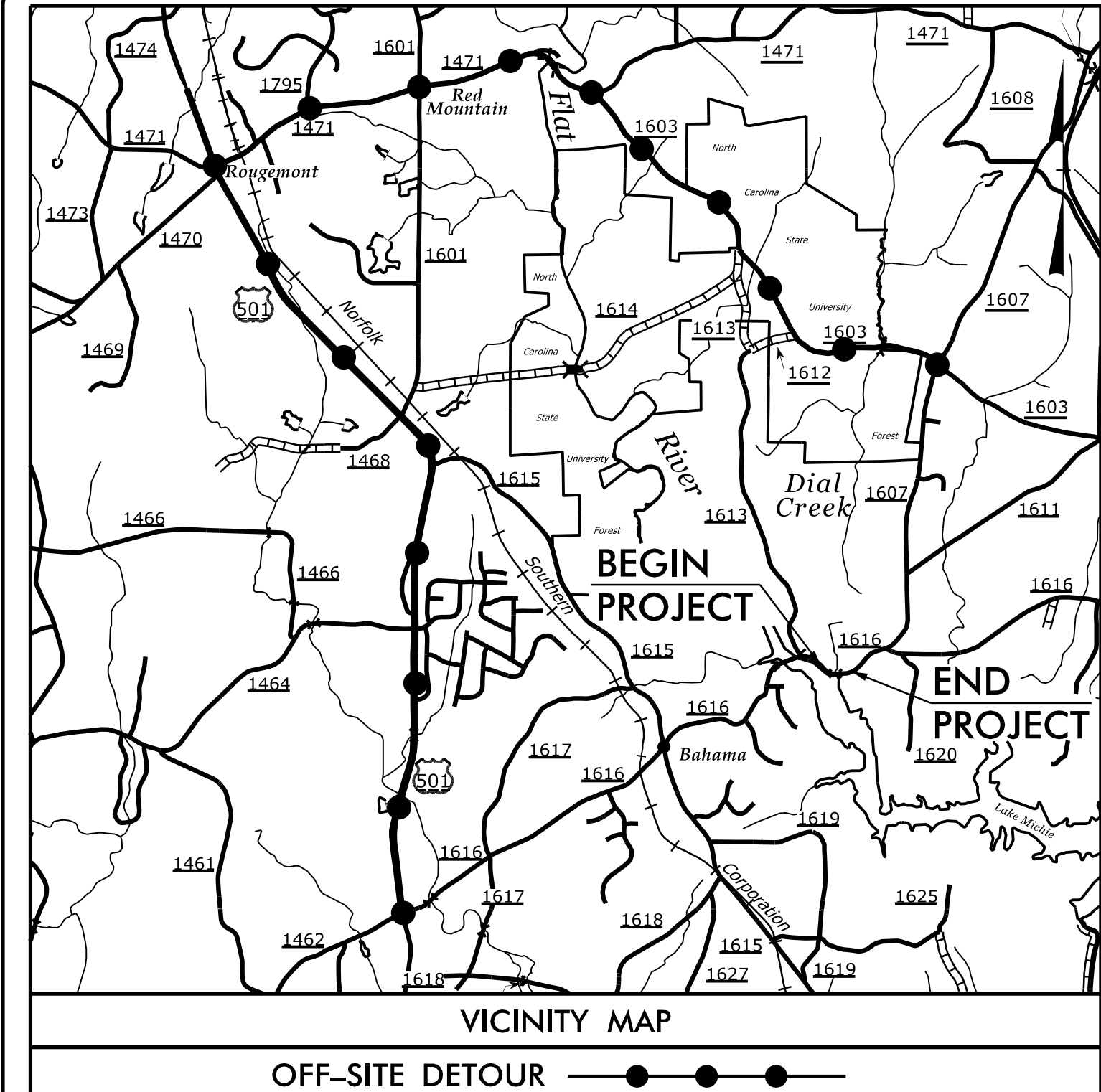
**The documents contained herein were originally issued
and sealed by the individuals whose names and license
numbers appear on each page, on the dates appearing
with their signature on that page.**

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

10/12/2017 1:08:38 PM Roadway\Proj\B4943_RDY_TSH.dgn USER:ayoung

CONTRACT: B-4943

CONTRACT: C203987



VICINITY MAP
OFF-SITE DETOUR

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

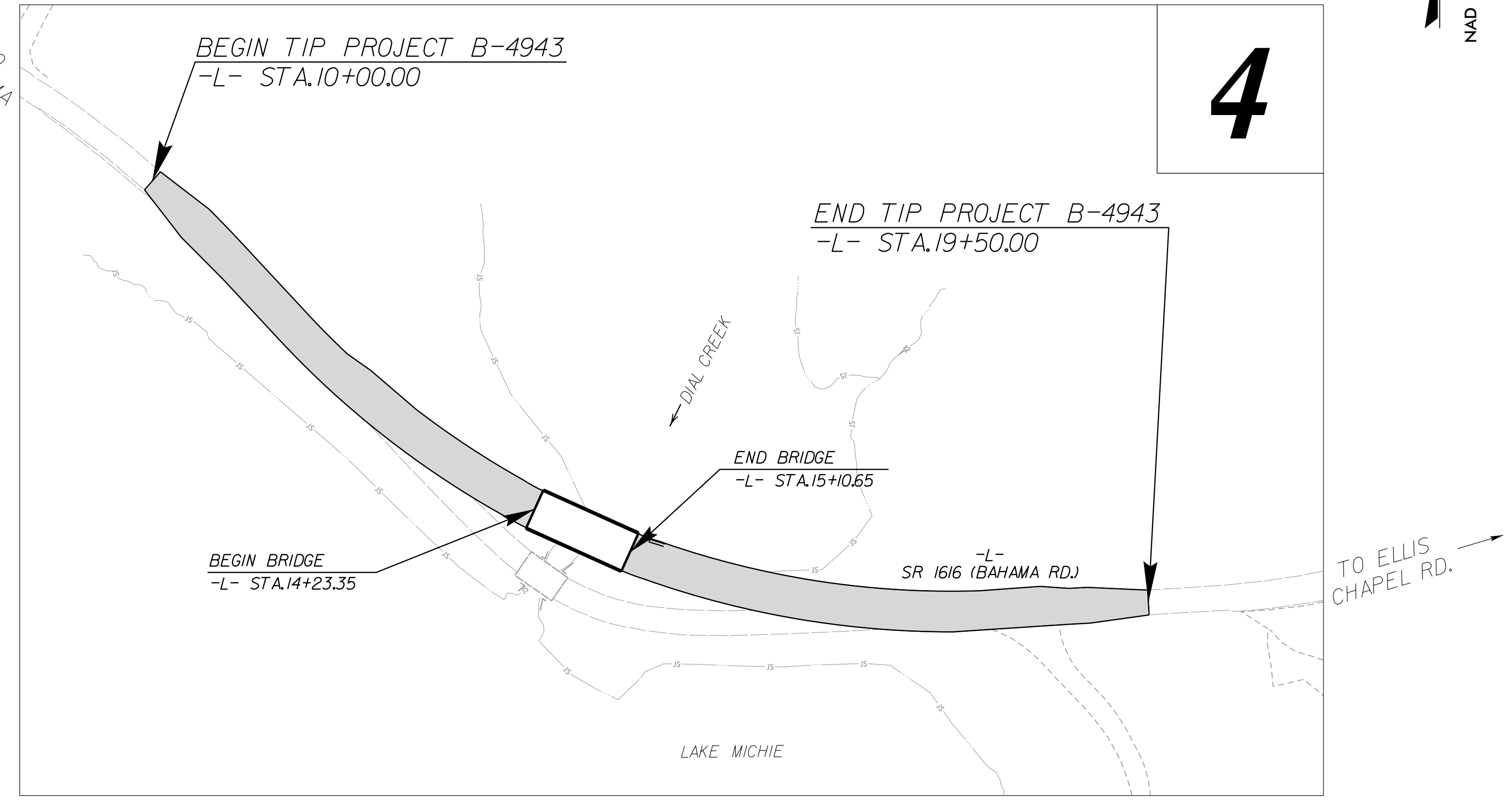
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

DURHAM COUNTY

LOCATION: BRIDGE NO. 20 OVER DIAL CREEK
ON SR 1616 (BAHAMA RD.)

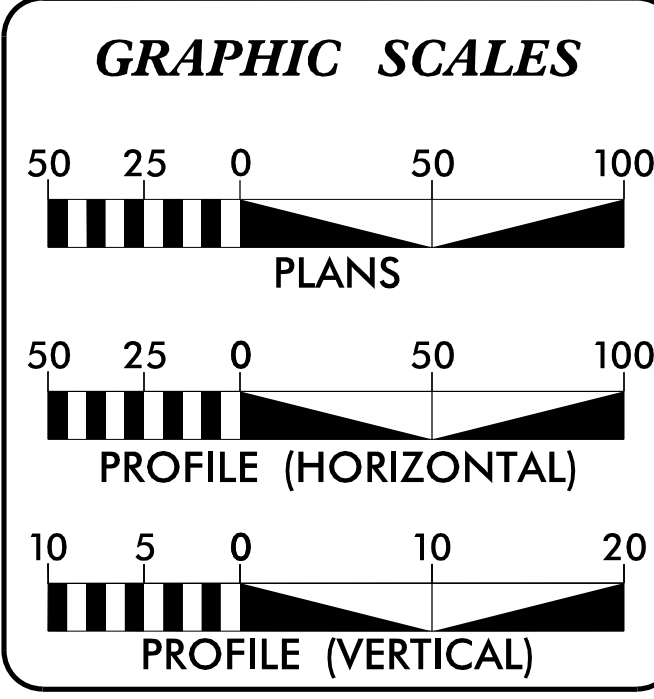
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4943	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
40110.1.1	BRZ-1616(10)	PE	
40110.2.1	BRZ-1616(10)	ROW	
40110.2.2	BRZ-1616(10)	UTILITY	
40110.3.1	BRZ-1616(10)	CONSTRUCTION	



4

**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**



DESIGN DATA
 2018 ADT = 2781 VPD
 2038 ADT = 3627 VPD
 K = 10%
 D = 85%
 T = 6% *
 V = 40 MPH
 * (TTST 1% + DUAL 5%)
 FUNC. CLASS. = RURAL MINOR COLLECTOR
 SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4943	=	0.163 mi.
LENGTH STRUCTURES TIP PROJECT B-4943	=	0.017 mi.
TOTAL LENGTH TIP PROJECT B-4943	=	0.180 mi.

Prepared in the Offices of:

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

NC FIRM LICENSE No. P-1148
1151 SE Cary Parkway, Suite 101
Cary, NC 27518
(919) 557-4029

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
DECEMBER 9, 2016

LETTING DATE:
JANUARY 16, 2018

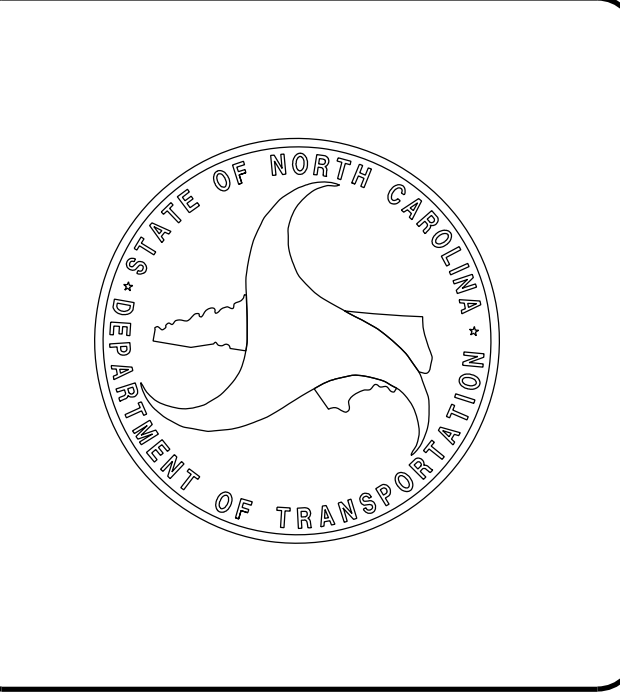
ANDY YOUNG, PE PROJECT ENGINEER
MICHAEL BURNS, PE PROJECT DESIGN ENGINEER
GARY R. LOVERING, PE NCDOT CONTACT

HYDRAULICS ENGINEER

DocuSigned by:
Brandon Barham
10/20/2017
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

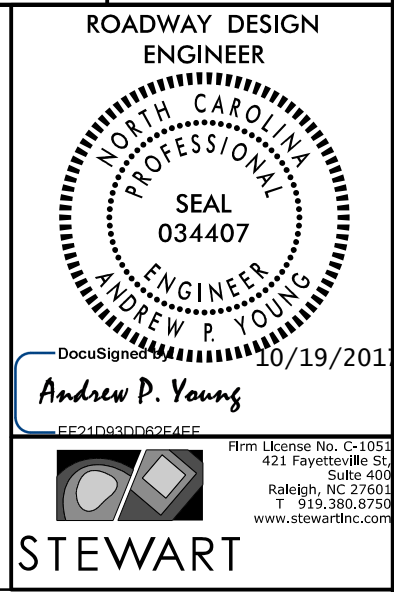
DocuSigned by:
Andrew P. Young
10/19/2017
SIGNATURE: P.E.



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

PROJECT REFERENCE NO. SHEET NO.
B-4943 1A



**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

SHEET NUMBER	SHEET	2018 ROADWAY ENGLISH STANDARD DRAWINGS	EFF. 01-16-2018 REV.
1	TITLE SHEET		
1A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF 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:	
1B	CONVENTIONAL SYMBOLS		
1C-1	SURVEY CONTROL DATA SHEET		
2A-1	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS		
2C-1	GUARDRAIL ANCHOR UNIT, TYPE III SHOP CURVED DETAIL		
2G-1	ROCK EMBANKMENTS & ROCK PLATING PLAN & DETAILS		
2G-2	ROCK EMBANKMENTS & ROCK PLATING NOTES & DETAILS		
3B-1	ROADWAY SUMMARIES		
3D-1	DRAINAGE SUMMARY		
3G-1	GEOTECHNICAL SUMMARIES		
4	PLAN SHEET		
5	PROFILE SHEET		
TMP-1 THRU TMP-4	TRANSPORTATION MANAGEMENT PLANS		
PMP-1	PAVEMENT MARKING PLAN		
EC-1 THRU EC-5	EROSION CONTROL PLANS		
RF-1	REFORESTATION PLAN		
SIGN-1 THRU SIGN-2	SIGNING PLANS		
UD-1 THRU UD-2	UTILITY BY OTHERS PLANS		
X-1A	CROSS-SECTION SUMMARY SHEET		
X-1 THRU X-13	CROSS-SECTIONS		
S-1 THRU S-19	STRUCTURE PLANS		

GENERAL NOTES: 2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018

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

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

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

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

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

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

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

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

UTILITIES:
UTILITY OWNERS ON THIS PROJECT ARE
Frontier Communications (Telephone)
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.

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

12/2/2016

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○ S
Well	○ W
Small Mine	⋈
Foundation	□
Area Outline	□
Cemetery	□
Building	□
School	□
Church	□
Dam	▬

HYDROLOGY:

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

RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○ MILEPOST 35
Switch	□ SWITCH
RR Abandoned	-----
RR Dismantled	-----

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

RIGHT OF WAY & PROJECT CONTROL:

Secondary Horiz and Vert Control Point	■
Primary Horiz Control Point	○
Primary Horiz and Vert Control Point	●
Exist Permanent Easement Pin and Cap	◇
New Permanent Easement Pin and Cap	◇
Vertical Benchmark	⊠
Existing Right of Way Marker	△
Existing Right of Way Line	-----
New Right of Way Line	-----
New Right of Way Line with Pin and Cap	-----
New Right of Way Line with Concrete or Granite RW Marker	-----
New Control of Access Line with Concrete C/A Marker	-----
Existing Control of Access	-----
New Control of Access	-----
Existing Easement Line	----- E
New Temporary Construction Easement	----- E
New Temporary Drainage Easement	----- TDE
New Permanent Drainage Easement	----- PDE
New Permanent Drainage / Utility Easement	----- DUE
New Permanent Utility Easement	----- PUE
New Temporary Utility Easement	----- TUE
New Aerial Utility Easement	----- AUE

ROADS AND RELATED FEATURES:

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

VEGETATION:

Single Tree	○
Single Shrub	○

Hedge	-----
Woods Line	-----
Orchard	-----
Vineyard	----- Vineyard

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	----- CONC
Bridge Wing Wall, Head Wall and End Wall	----- CONC WW
MINOR:	
Head and End Wall	----- CONC HW
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	□ CB
Paved Ditch Gutter	-----
Storm Sewer Manhole	○ S
Storm Sewer	----- S

UTILITIES:

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

TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	○ T
Telephone Pedestal	□ T
Telephone Cell Tower	⊠ T
U/G Telephone Cable Hand Hole	-----
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.*)	-----
U/G Water Line LOS C (S.U.E.*)	-----
U/G Water Line LOS D (S.U.E.*)	-----
Above Ground Water Line	----- A/G Water

TV:

TV Pedestal	□
TV Tower	⊗
U/G TV Cable Hand Hole	-----
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

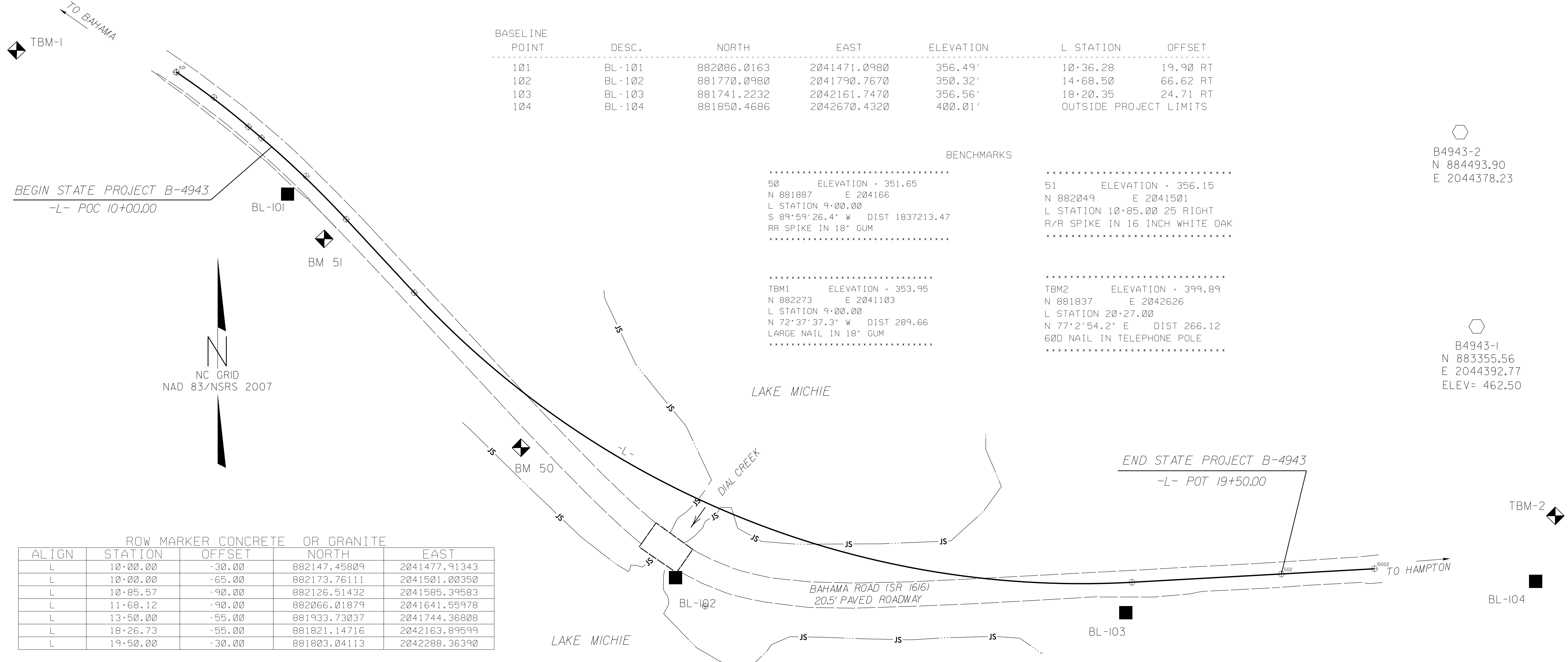
MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	□
Utility Unknown U/G Line LOS B (S.U.E.*)	----- 2UTL
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.

05/22/2017

SURVEY CONTROL SHEET B-4943

PROJECT REFERENCE NO.	SHEET NO.
B-4943	1C-1
Location and Surveys	
FINAL	



BASELINE POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
101	BL-101	882086.0163	2041471.0980	356.49'	10+36.28	19.90 RT
102	BL-102	881770.0980	2041790.7670	350.32'	14+68.50	66.62 RT
103	BL-103	881741.2232	2042161.7470	356.56'	18+20.35	24.71 RT
104	BL-104	881850.4686	2042670.4320	400.01'	OUTSIDE PROJECT LIMITS	

BENCHMARKS

50	ELEVATION = 351.65	51	ELEVATION = 356.15
N 881887	E 204166	N 882049	E 2041501
L STATION 9+00.00		L STATION 10+85.00	25 RIGHT
S 89°59'26.4" W	DIST 1837213.47	R/R SPIKE IN 16 INCH WHITE OAK	
RR SPIKE IN 18" GUM			

TBM1	ELEVATION = 353.95	TBM2	ELEVATION = 399.89
N 882273	E 2041103	N 881837	E 2042626
L STATION 9+00.00		L STATION 20+27.00	
N 72°37'37.3" W	DIST 289.66	N 77°2'54.2" E	DIST 266.12
LARGE NAIL IN 18" GUM		60D NAIL IN TELEPHONE POLE	

B4943-2	N 884493.90	E 2044378.23
B4943-1	N 883355.56	E 2044392.77
ELEV = 462.50		

ROW MARKER CONCRETE OR GRANITE

ALIGN	STATION	OFFSET	NORTH	EAST
L	10+00.00	-30.00	882147.45809	2041477.91343
L	10+00.00	-65.00	882173.76111	2041501.00350
L	10+85.57	-90.00	882126.51432	2041585.39583
L	11+68.12	-90.00	882066.01879	2041641.55978
L	13+50.00	-55.00	881933.73037	2041744.36808
L	18+26.73	-55.00	881821.14716	2042163.89599
L	19+50.00	-30.00	881803.04113	2042288.36390

	L	NORTH	EAST
PC	9+00.00	882186.5106	2041379.4447
PT	9+74.71	882141.3997	2041438.9404
PC	9+88.74	882132.2853	2041449.6087
PT	10+85.57	882065.2798	2041519.4387
PC	11+68.12	882004.7843	2041575.6027
PT	18+26.73	881766.2323	2042166.9547
POT	20+26.74	881777.3551	2042366.6506

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4943-1" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 883355.56(ft) EASTING: 2044392.77(ft) ELEVATION: 462.50(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99998649

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4943-1" TO -L- 10+00.00 IS S 67° 14' 57" W 3,182.24'

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

NOTES:

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.

G03NC
NOTE: DRAWING NOT TO SCALE

10/2/2017 10:25:00 B4943_1s_1C_170607.dgn

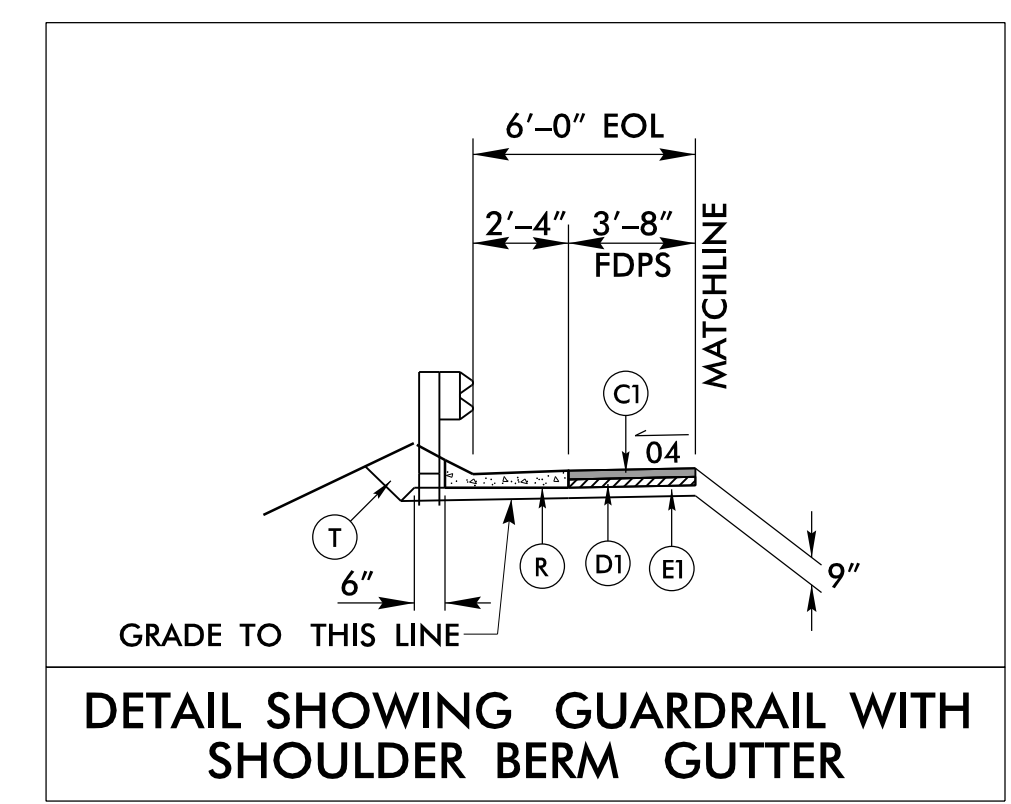
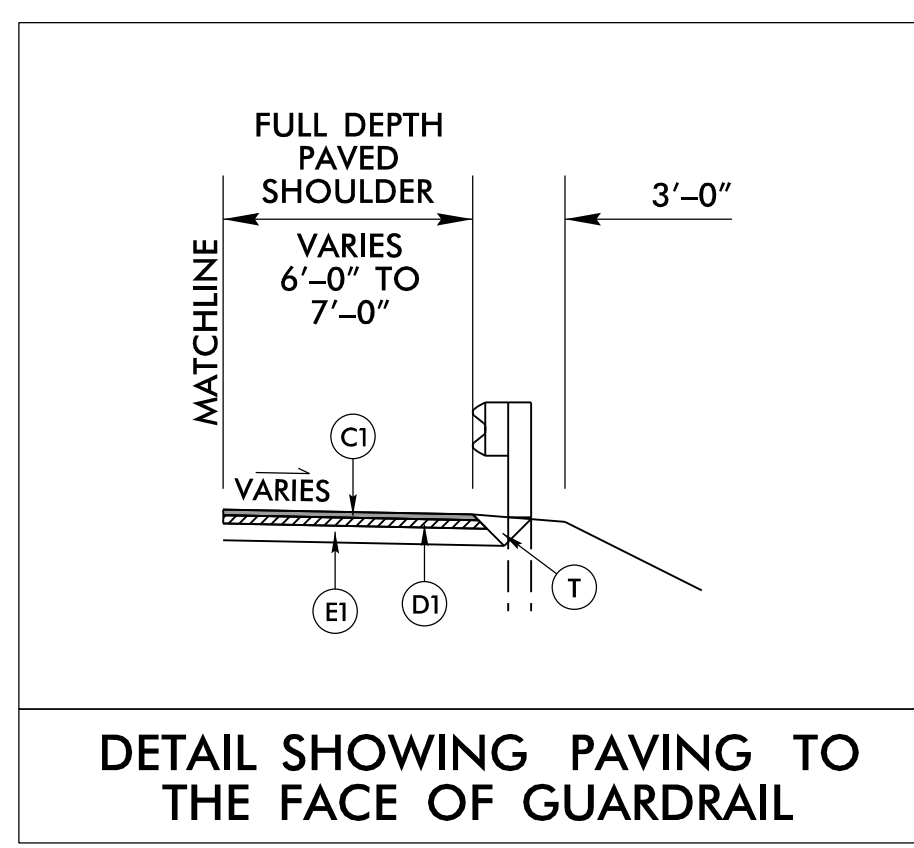
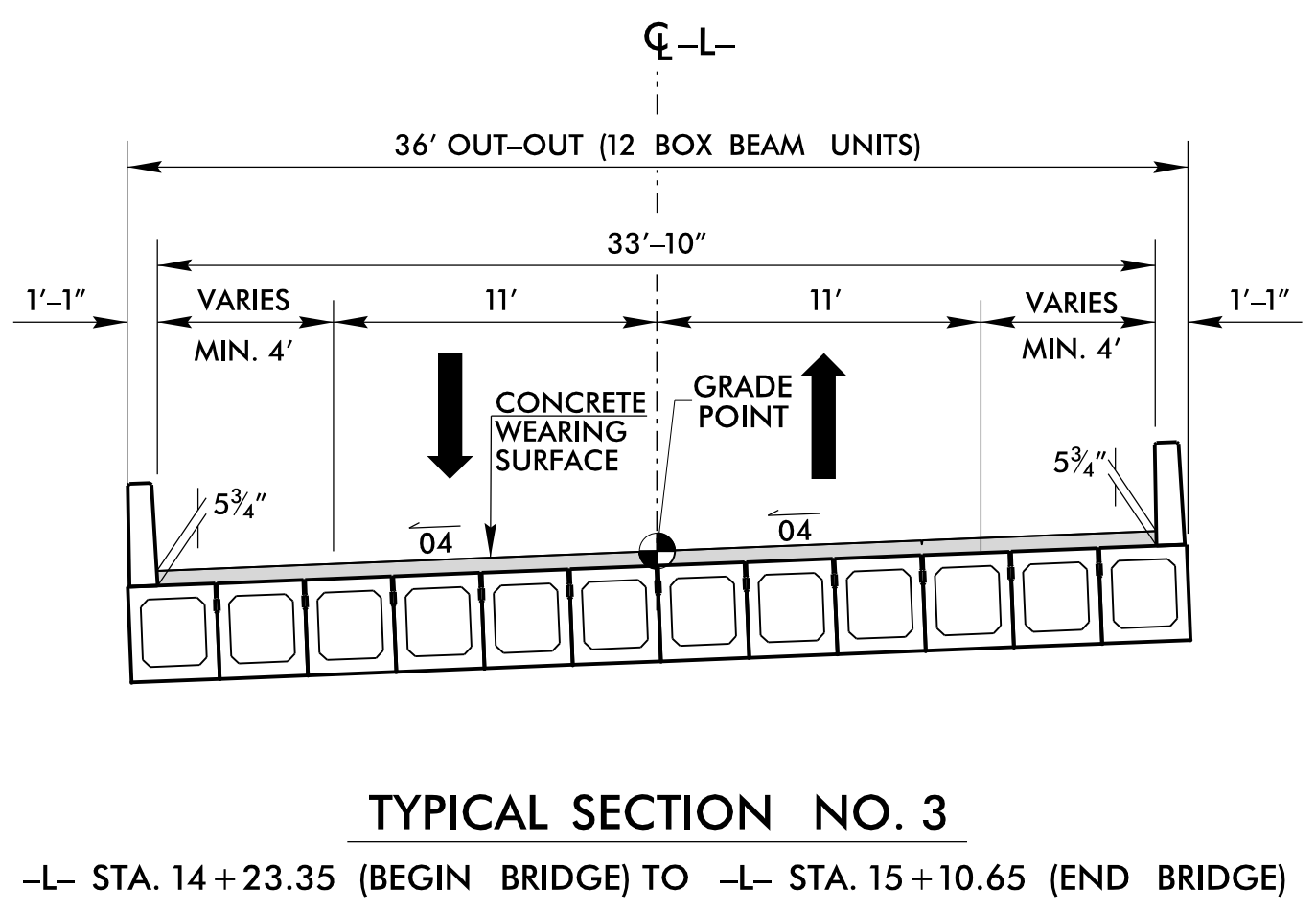
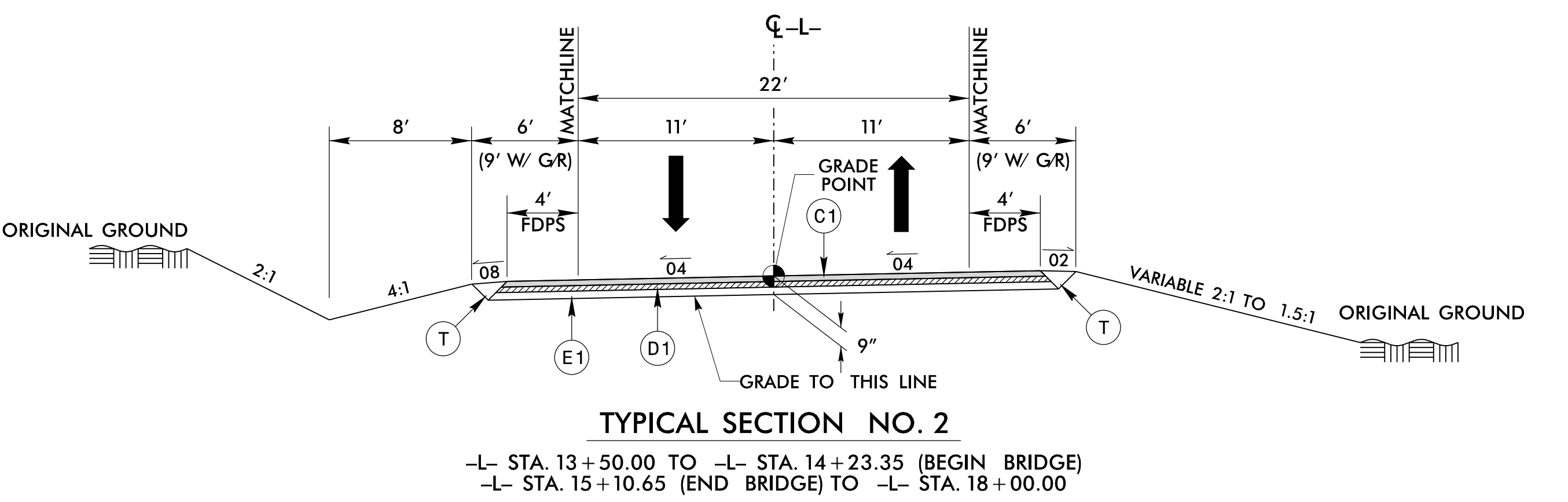
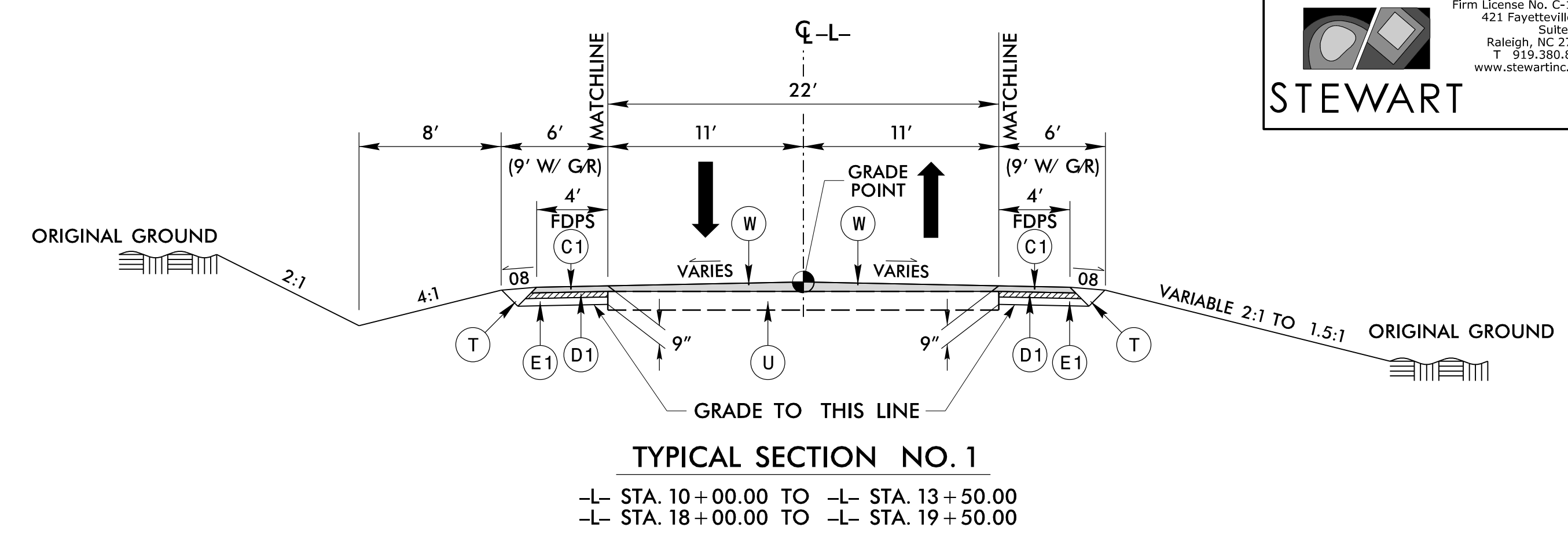
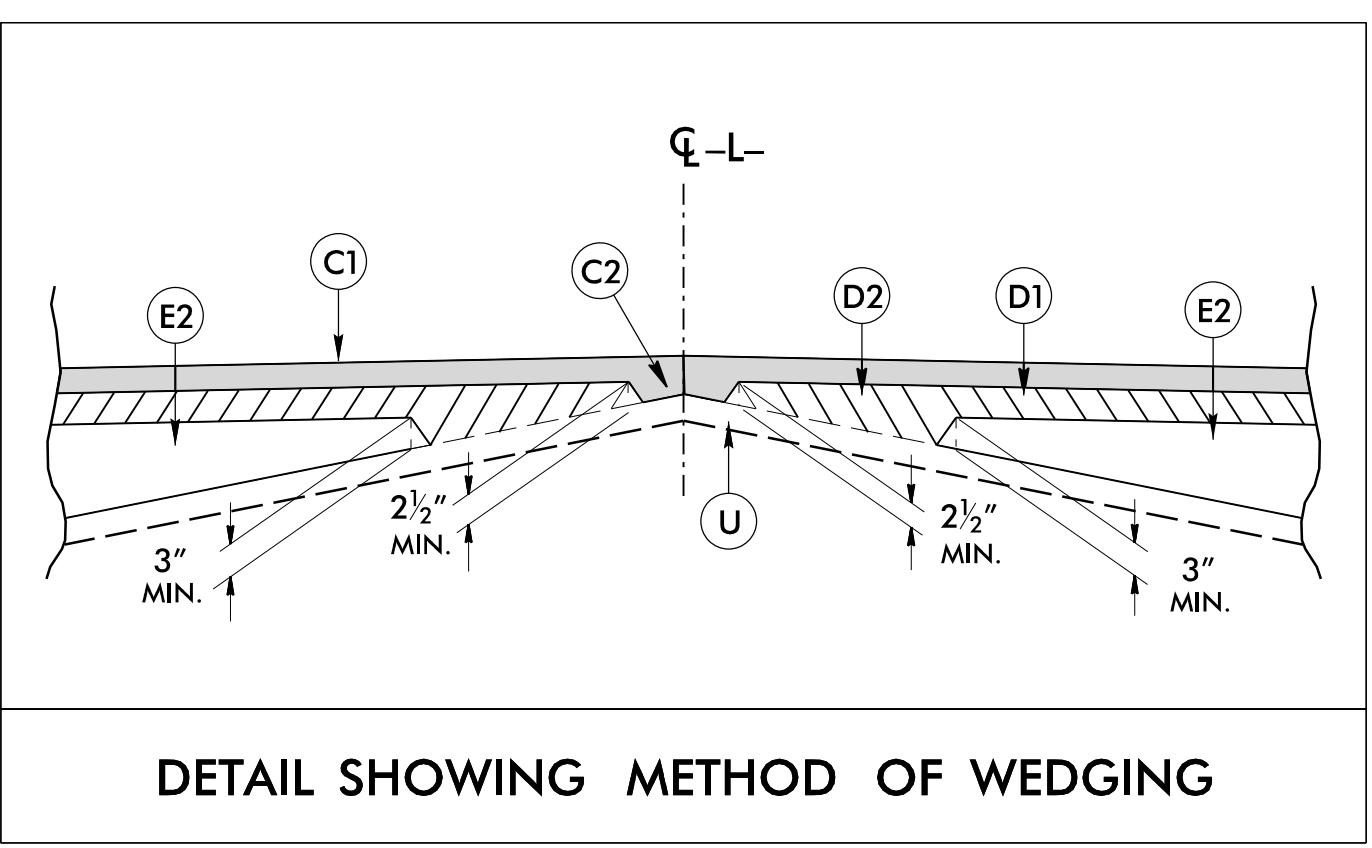
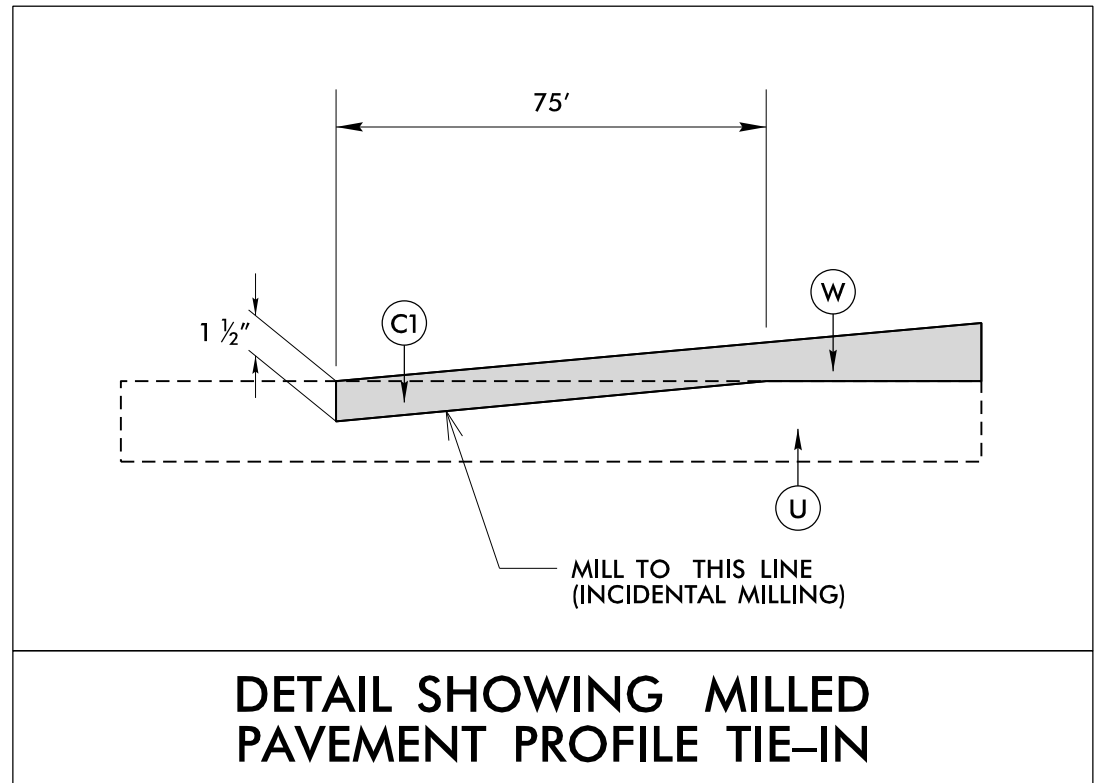
8/17/99

REVISIONS

10/12/2017
 I:\Projects\B4943\RDY_TYP.dgn
 I:\Projects\B4943\RDY.dwg

FINAL PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 1 1/2" IN DEPTH.
D1	PROP. APPROX. 3 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	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 5 1/2" IN DEPTH.
R	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	ASPHALT WEDGING (SEE DETAIL)

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



USE SHOULDER BERM GUTTER AT THE FOLLOWING LOCATIONS:
 -L- STA. 15+21.55 (END APPROACH SLAB) TO -L- STA. 15+37.00 (LEFT)

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

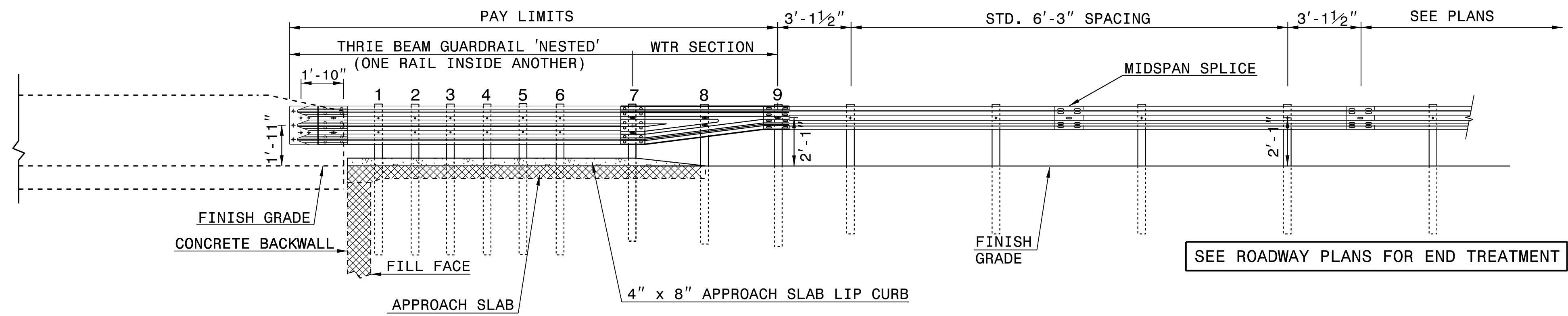
PROJECT REFERENCE NO. B-4943	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER ANDREW P. YOUNG SEAL 034407	PAVEMENT DESIGN ENGINEER CLARK S. MORRISON SEAL 22896
DocuSigned by: Andrew P. Young 10/19/2017 10:26:45 AM	DocuSigned by: Clark Morrison 10/26/2017 10:26:45 AM

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

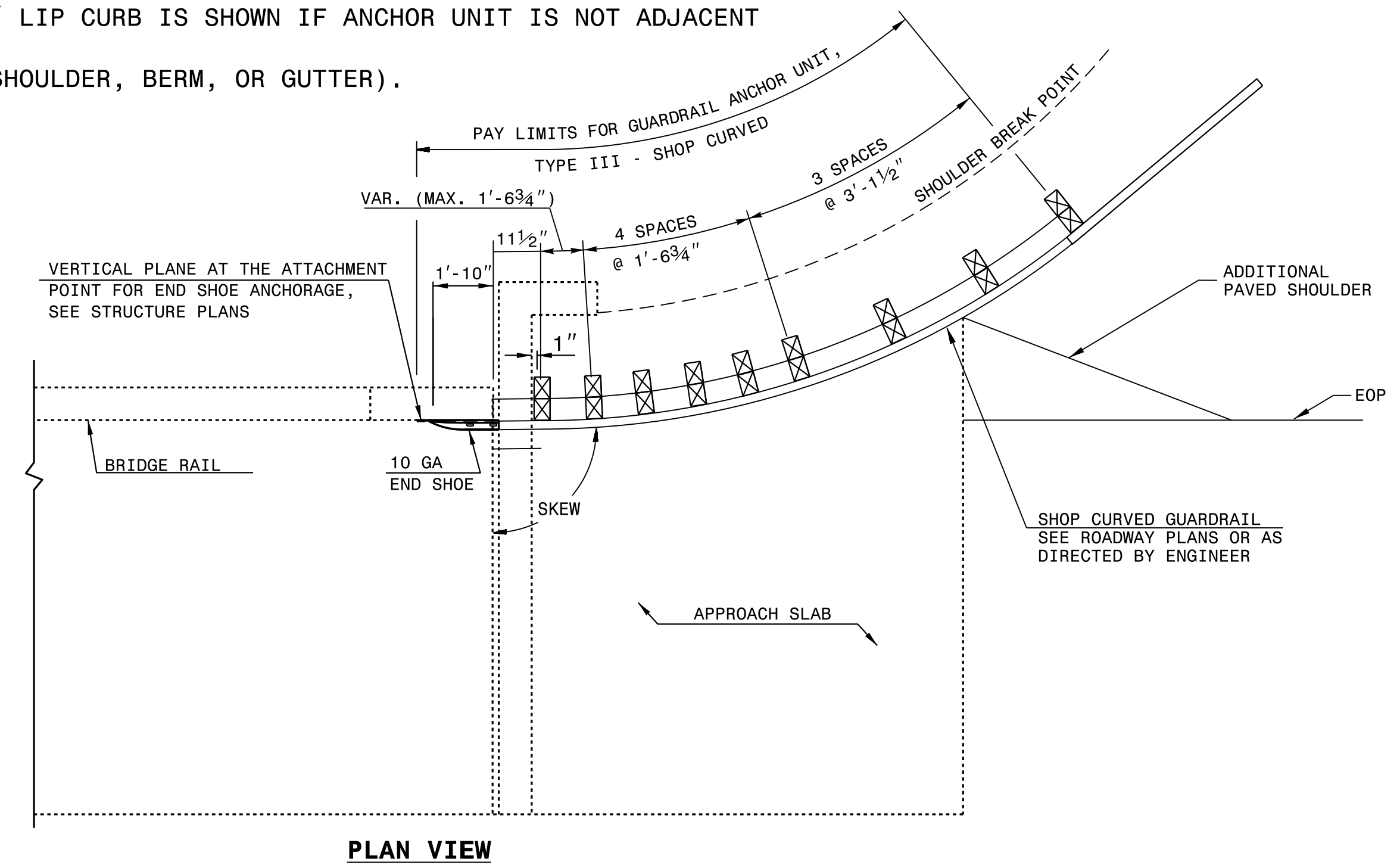
ENGLISH DETAIL DRAWING FOR
**TYPE III - SHOP CURVED
STRUCTURE ANCHOR UNIT**

SHEET 1 OF 1
TYPE III SC



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 11 1/2" 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).
- USE NO STEEL POSTS WITHIN THE GUARDRAIL ANCHOR UNIT LIMITS.
- LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
- SEE STANDARD 862.03 SHEET 4 FOR POST SECTIONS 1 THRU 9.



**GUARDRAIL ANCHOR UNIT, TYPE III - SHOP CURVED
FOR ATTACHMENT TO RAIL ON BRIDGE**

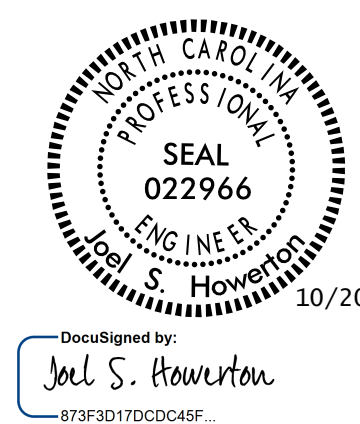
SHEET 1 OF 1
TYPE III SC

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

ENGLISH DETAIL DRAWING FOR
**TYPE III - SHOP CURVED
STRUCTURE ANCHOR UNIT**

5/14/99
26-MAY-2017 16:36
S:\Contracts\Special Details\hover-ton\Guardrail\31 inch Guardrail\type_iii_sc.dgn
hover-ton AT USD-292595

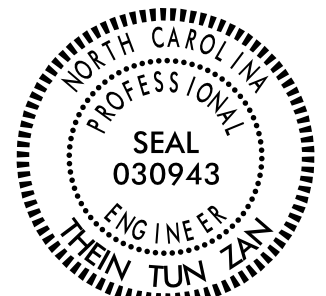
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

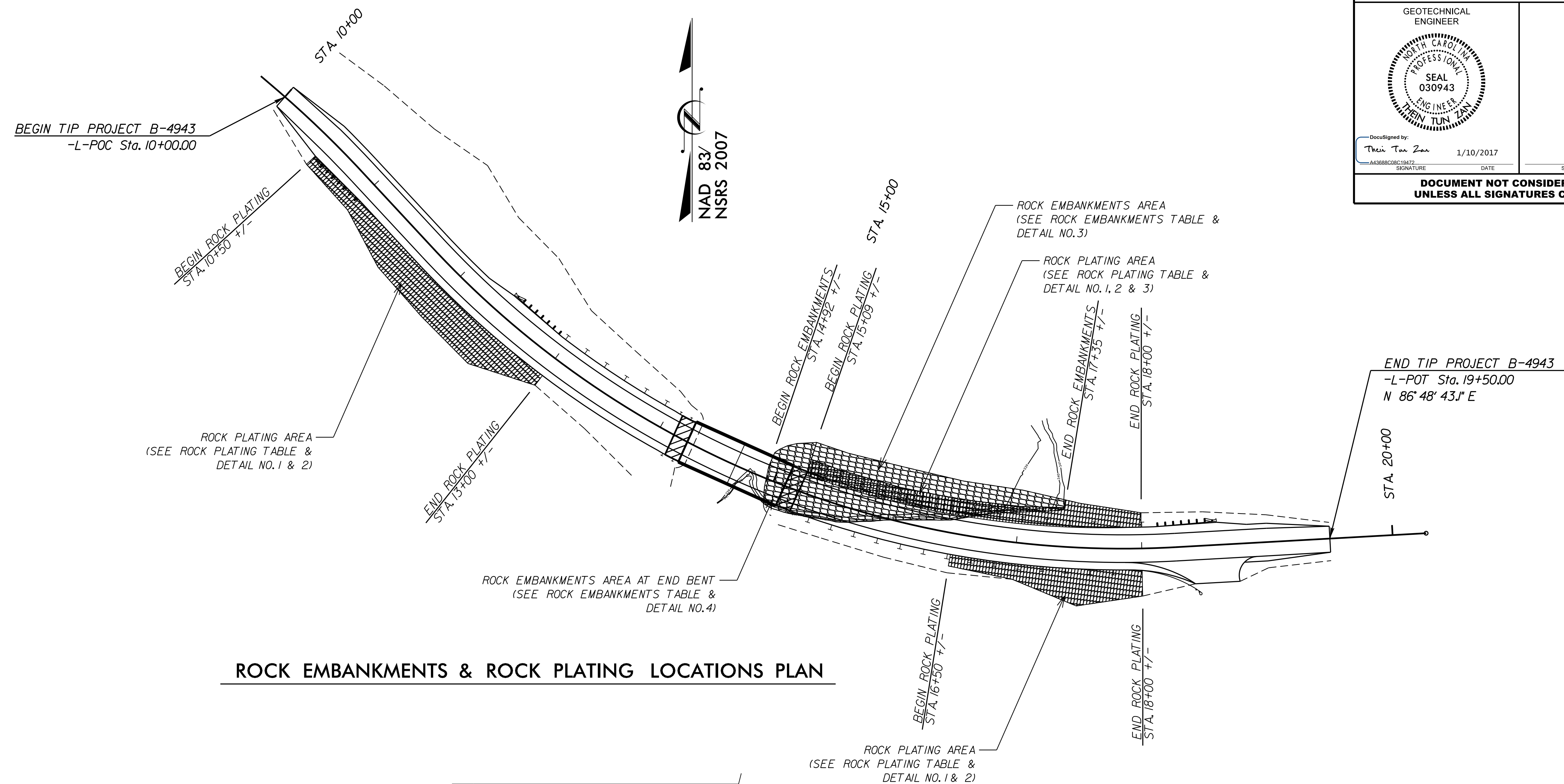


**CONTRACT STANDARDS
AND DEVELOPMENT UNIT**
Office 919-707-6950 FAX 919-250-4119

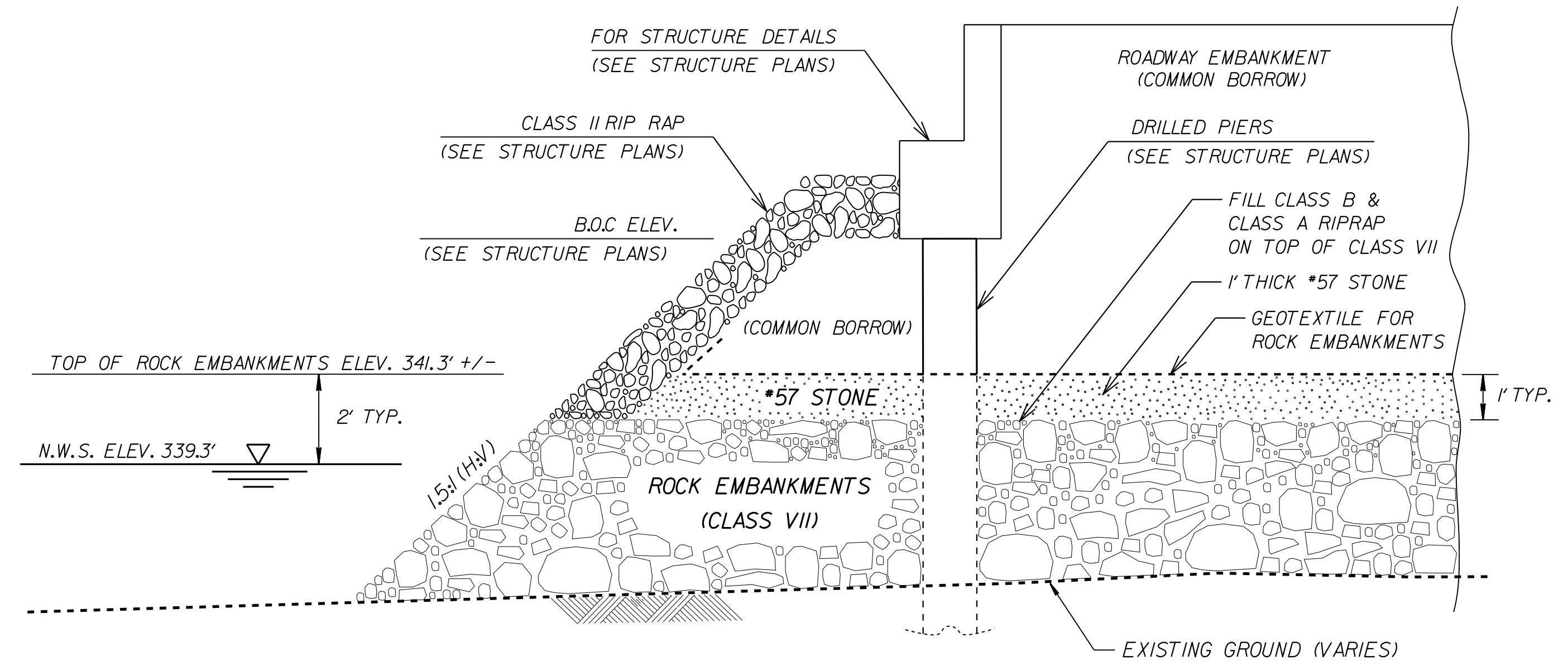
SEE PLATE FOR TITLE

ORIGINAL BY: E.E.Ward	DATE: 4-4-02
MODIFIED BY: T.S.Spell	DATE: 5-29-09
CHECKED BY:	DATE:
FILE SPEC.: ward:\usr\details\stand\862stds\typeiiisc.dgn	

PROJECT REFERENCE NO. B-4943		SHEET NO. 2G-1	
GEOTECHNICAL ENGINEER  Thein Tun Zan 1/10/2017		ENGINEER 	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

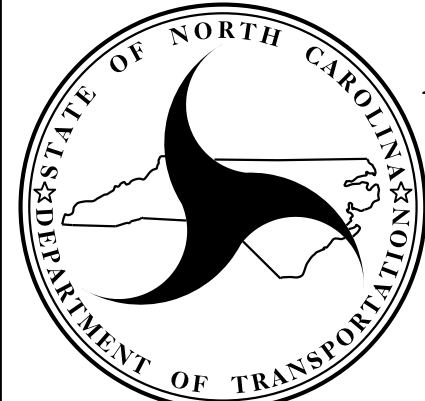


ROCK EMBANKMENTS & ROCK PLATING LOCATIONS PLAN



ROCK EMBANKMENTS DETAIL NO. 4 - TYPICAL SECTION ALONG -L-

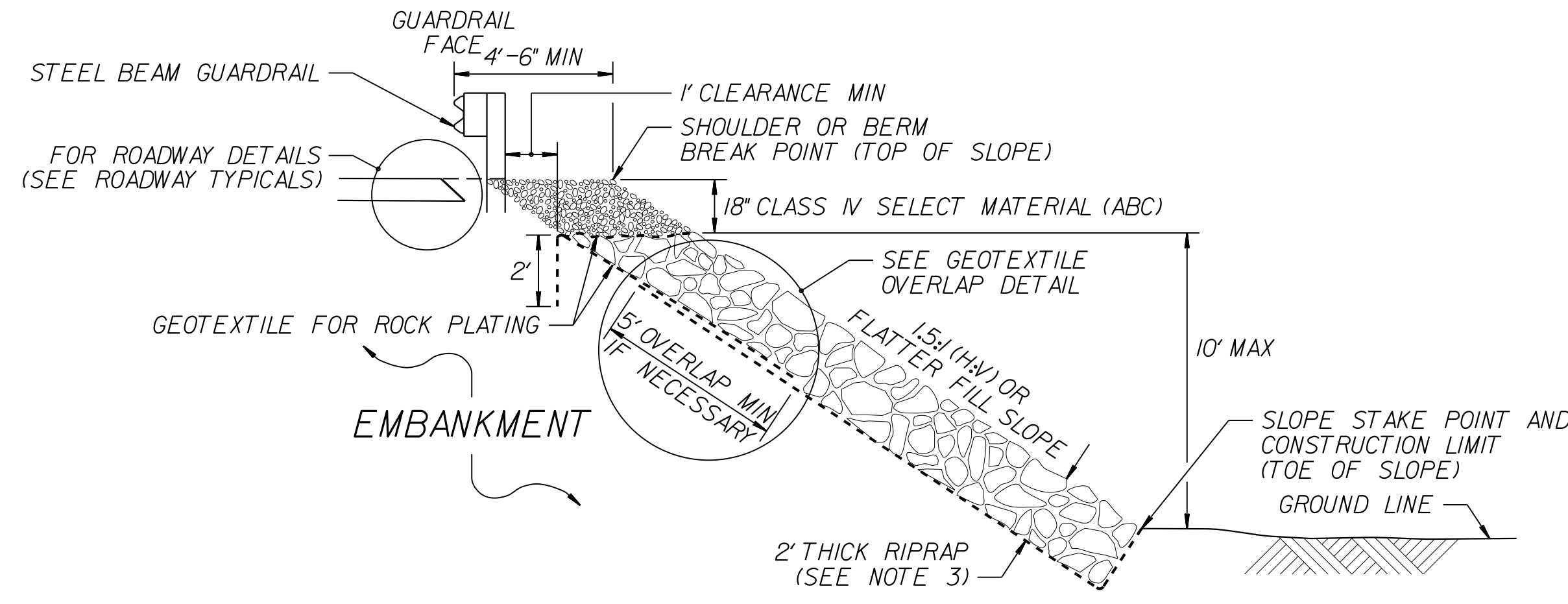
PREPARED BY: THEIN T. ZAN DATE: 01-2017
 REVIEWED BY: JAMES R. BATTS DATE: 01-2017



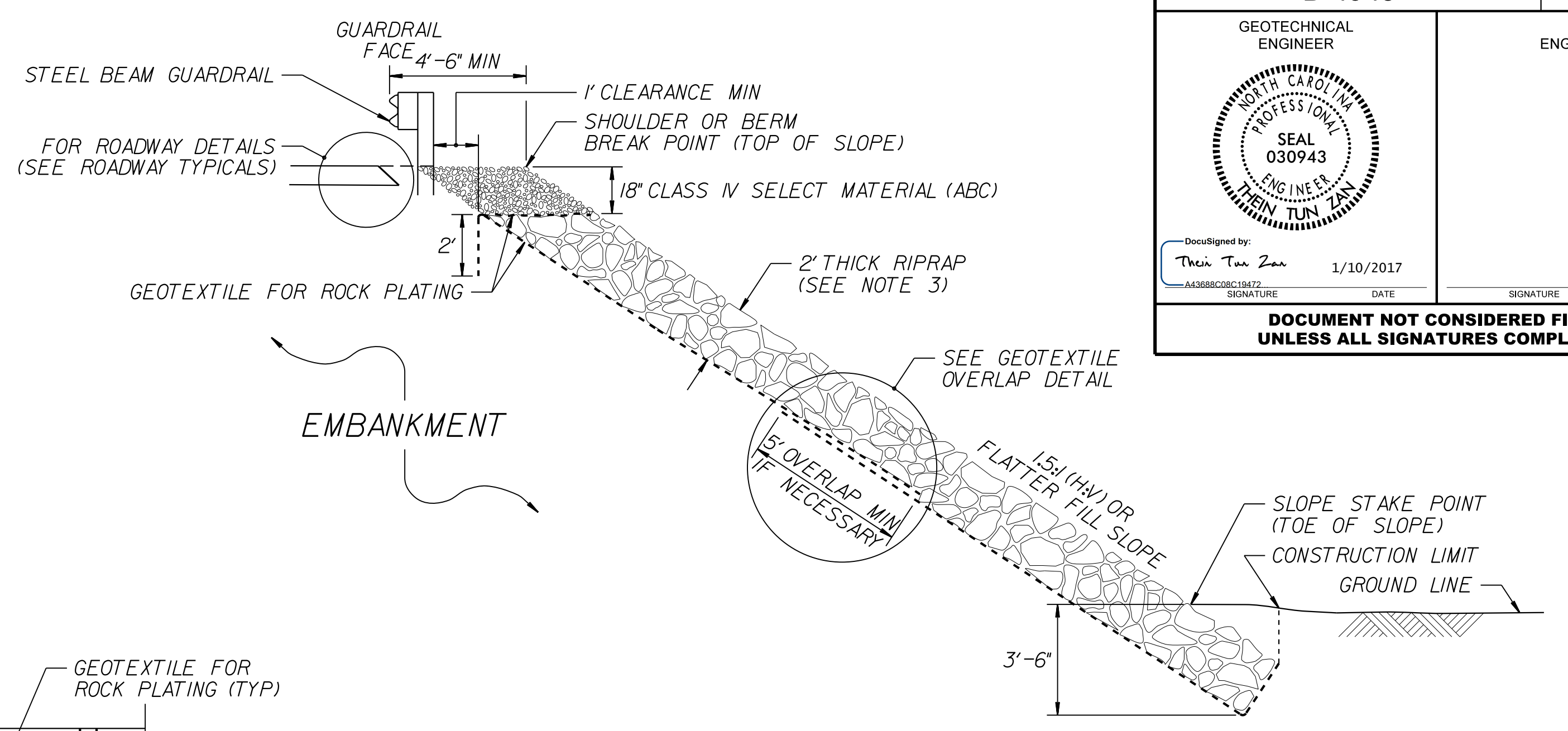
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL
ENGINEERING UNIT

ROCK EMBANKMENTS & ROCK PLATING					
PLAN & DETAILS					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		



ROCK PLATING DETAIL NO. 1 – TYPICAL SECTION



ROCK PLATING DETAIL NO. 2 – TYPICAL SECTION

ROCK PLATING

FOR ROCK PLATING, SEE SECTION 275 OF THE STANDARD SPECIFICATIONS.
 USE ROCK PLATING AT FOLLOWING LOCATIONS:

LINES	BEGINNING SLOPE	APPROX. STATION	ENDING SLOPE	APPROX. STATION	LOCATION LT/RT	ROCK PLATING DETAIL NO. 1/2/3	RIPRAP CLASS* 1/2/B	SY
-L-	2:l	10+50	1.5:l	11+25	RT	1	*	80
-L-	1.5:l	11+25	1.75:l	12+75	RT	2	*	435
-L-	1.75:l	12+75	2:l	13+00	RT	1	*	35
-L-	1.5:l	15+09	1.5:l	17+00	LT	3	*	445
-L-	1.5:l	17+00	1.75:l	17+75	LT	2	*	150
-L-	1.75:l	17+75	2:l	18+00	LT	1	*	30
-L-	2:l	16+50	1.75:l	17+25	RT	1	*	85
-L-	1.75:l	17+25	2:l	18+00	RT	2	*	210

USE CLASS 1,2 OR B RIPRAP FOR ROCK PLATING LOCATIONS.

ESTIMATED TOTAL QUANTITY OF ROCK PLATING = 1,470 SY

ROCK EMBANKMENTS

FOR ROCK EMBANKMENTS, SEE ROCK EMBANKMENTS SPECIAL PROVISION.
 USE ROCK EMBANKMENTS AT FOLLOWING LOCATIONS:

-LINE-	APPROX. BEGINNING STATION	APPROX. ENDING STATION	LOCATION LT/RT
-L-	14+92 +/-	17+35 +/-	-L- LEFT

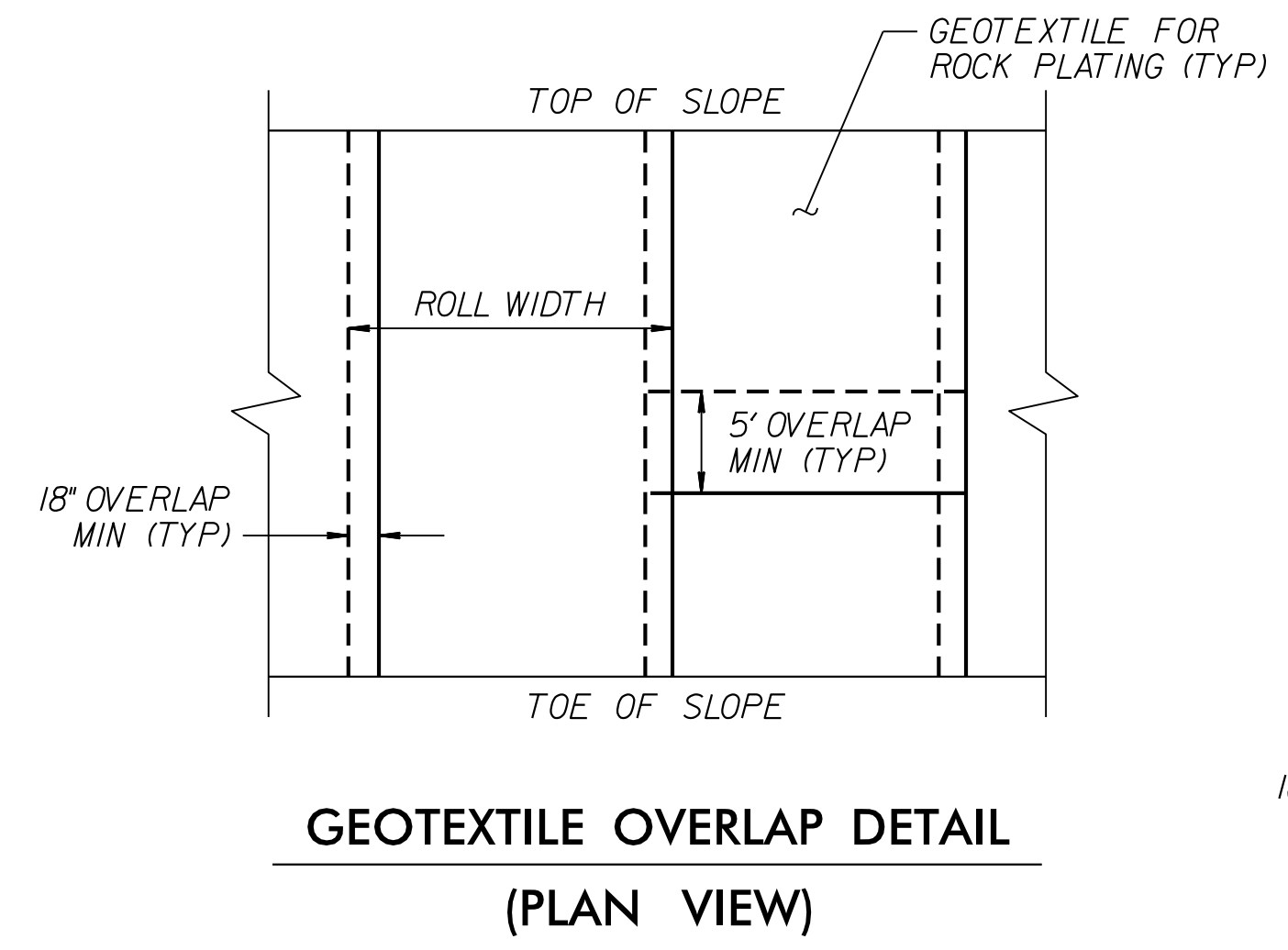
CONSTRUCT ROCK EMBANKMENTS TO THE ELEVATION SHOWN IN THE ROCK EMBANKMENTS & ROCK PLATING DETAIL NO.3 AND DETAIL NO.4 OR 2 FT. ABOVE THE NORMAL WATER SURFACE AND ACCORDING TO THE ROCK EMBANKMENTS SPECIAL PROVISION.

FILL VOIDS IN THE TOP OF ROCK EMBANKMENTS WITH CLASS B AND CLASS A RIP RAP.

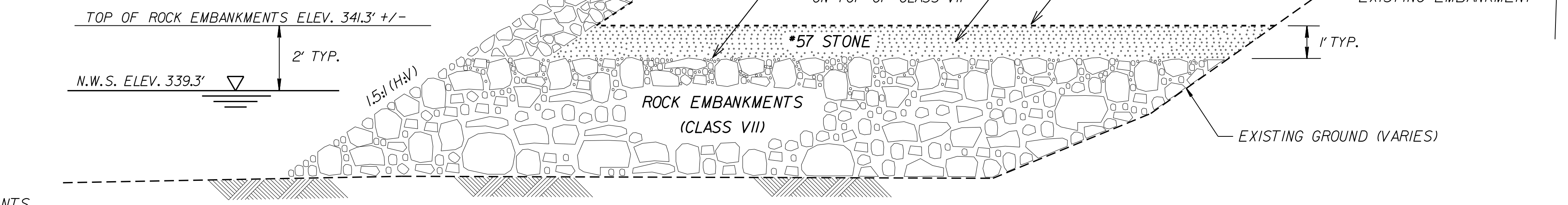
PLACE #57 STONE (SELECT MATERIAL, CLASS VI) UP TO 1 FT. ABOVE ROCK EMBANKMENTS AS SHOWN IN THIS PLAN.

CONSTRUCT ROCK PLATING ABOVE ROCK EMBANKMENTS FROM ELEVATION SHOWN IN THE ROCK EMBANKMENTS & ROCK PLATING DETAIL NO.3 OR 2 FT. ABOVE THE NORMAL WATER SURFACE TO THE SHOULDER HINGE POINT AND ACCORDING TO THE SECTION 275 OF THE STANDARD SPECIFICATIONS..

INSTALL GEOTEXTILE ON TOP OF NO. 57 STONE IN ACCORDANCE WITH THE ARTICLE 270-3 OF THE STANDARD SPECIFICATIONS.

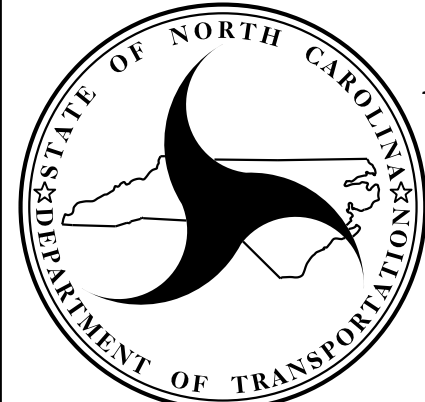


GEOTEXTILE OVERLAP DETAIL (PLAN VIEW)



ROCK EMBANKMENTS & ROCK PLATING DETAIL NO. 3 – TYPICAL SECTION

ESTIMATED MATERIAL QUANTITIES FOR ROCK EMBANKMENTS	
ROCK EMBANKMENTS (SELECT MATERIAL, CLASS VII)	= 3,030 TONS
RIP RAP CLASS A	= 480 TONS
RIP RAP CLASS B	= 480 TONS
#57 STONE (SELECT MATERIAL, CLASS VI)	= 590 TONS
GEOTEXTILE FOR ROCK EMBANKMENTS	= 950 SY



**NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS**

**GEOTECHNICAL
ENGINEERING UNIT**

ROCK EMBANKMENTS & ROCK PLATING					
NOTES & DETAILS					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

8/17/99

COMPUTED BY: BTB DATE: 8/10/2016
CHECKED BY: DGL DATE: 8/10/2016

PROJECT REFERENCE NO. B-4943
SHEET NO. 30-1

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.

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

Table with columns for STATION, LOCATION, STRUCTURE NO., TOP ELEVATION, INVERT ELEVATION, SLOPE CRITICAL, DRAINAGE PIPE, C.S. PIPE, R.C. PIPE CLASS III, R.C. PIPE CLASS IV, ENDWALLS, QUANTITIES FOR DRAINAGE STRUCTURES, FRAME, GRATES, AND HOOD STANDARD, CONCRETE TRANSITIONAL SECTION, and REMARKS. Includes rows for station 15+33-L and SHEET TOTALS.

ABBREVIATIONS table listing symbols for C.B., N.D.I., D.I., G.D.I., J.B., M.H., T.B.D.I., and T.B.J.B. with their corresponding full names like CATCH BASIN, NARROW DROP INLET, etc.

REVISIONS

10/2/2017 B-4943_PDX_SUM_30-1.dgn

**STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS**

SUMMARY OF ROCK PLATING

LINE	Beginning Slope (H:V)	Approx. Station	Ending Slope (H:V)	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/3/4	Riprap Class* 1/2/B	Rock Plating SY
L	2:1	10+50	1.5:1	11+25	RT	1	*	80
L	1.5:1	11+25	1.75:1	12+75	RT	2	*	435
L	1.75:1	12+75	2:1	13+00	RT	1	*	35
L	1.5:1	15+09	1.5:1	17+00	LT	3	*	445
L	1.5:1	17+00	1.75:1	17+75	LT	2	*	150
L	1.75:1	17+75	2:1	18+00	LT	1	*	30
L	2:1	16+50	1.75:1	17+25	RT	1	*	85
L	1.75:1	17+25	2:1	18+00	RT	2	*	210
TOTAL SY:								1470

*Use Class 1, 2 or B riprap if riprap class is not shown for rock plating location.

**SUMMARY OF
 EMBANKMENT WAITING PERIODS**

LINE	Station	Station	MONTHS
L	15+09 ±	18+00 ±	2

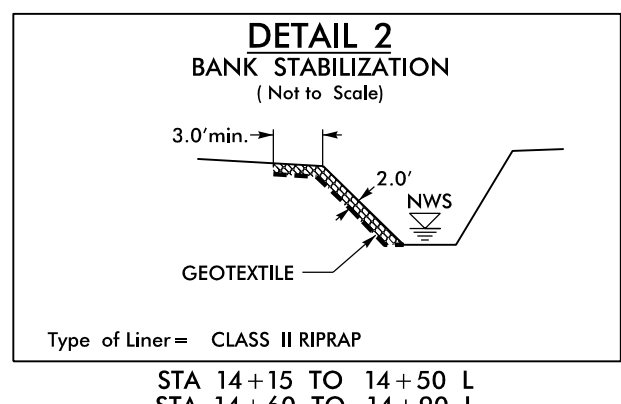
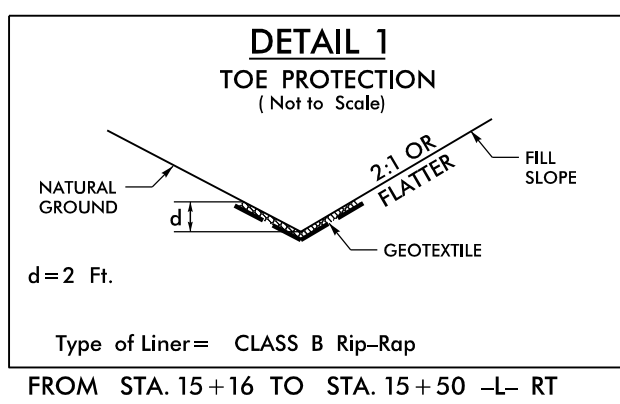
SUMMARY OF BRIDGE WAITING PERIODS

Bridge Description	End Bent No.	MONTHS
Bridge No. 20 on SR 1616 (Bahama Rd.) over Dial Creek	2	2

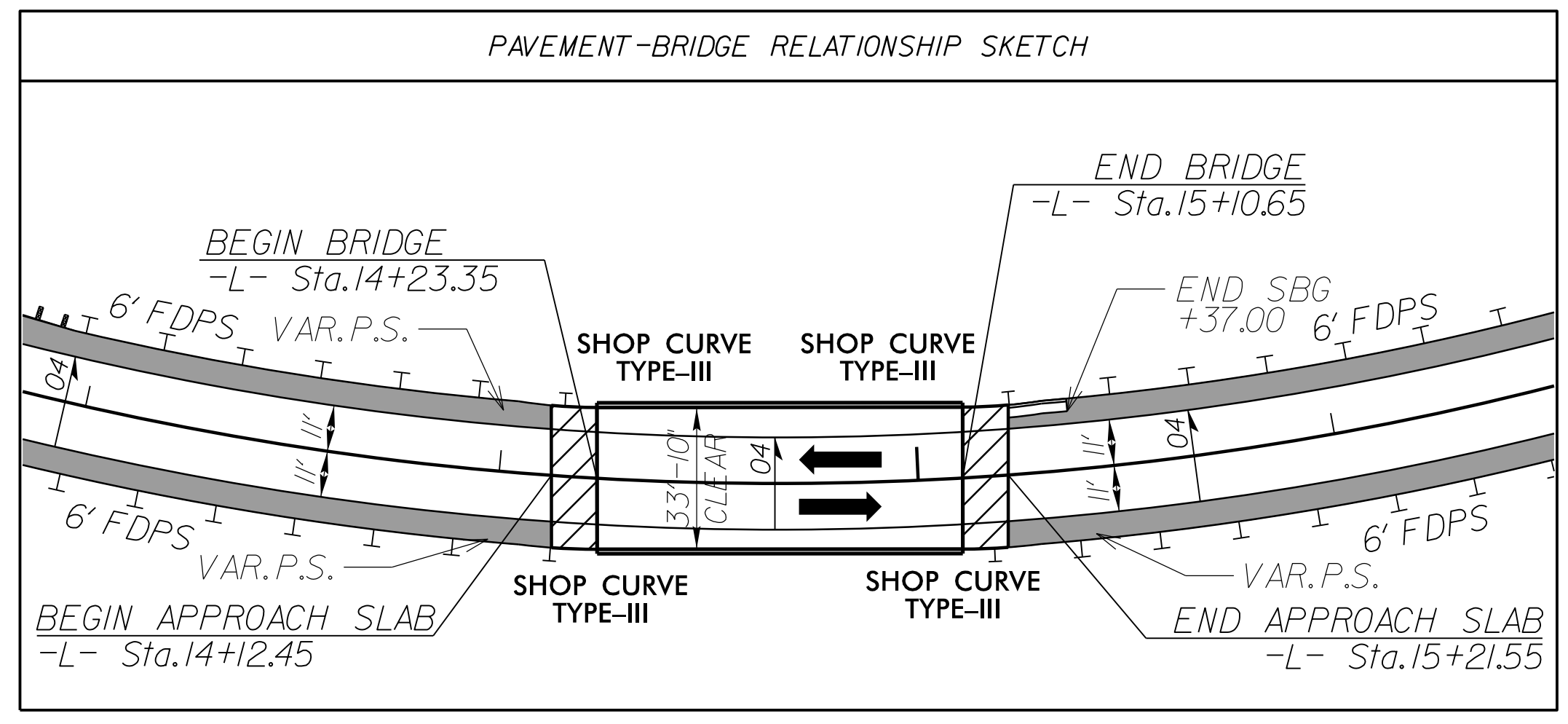
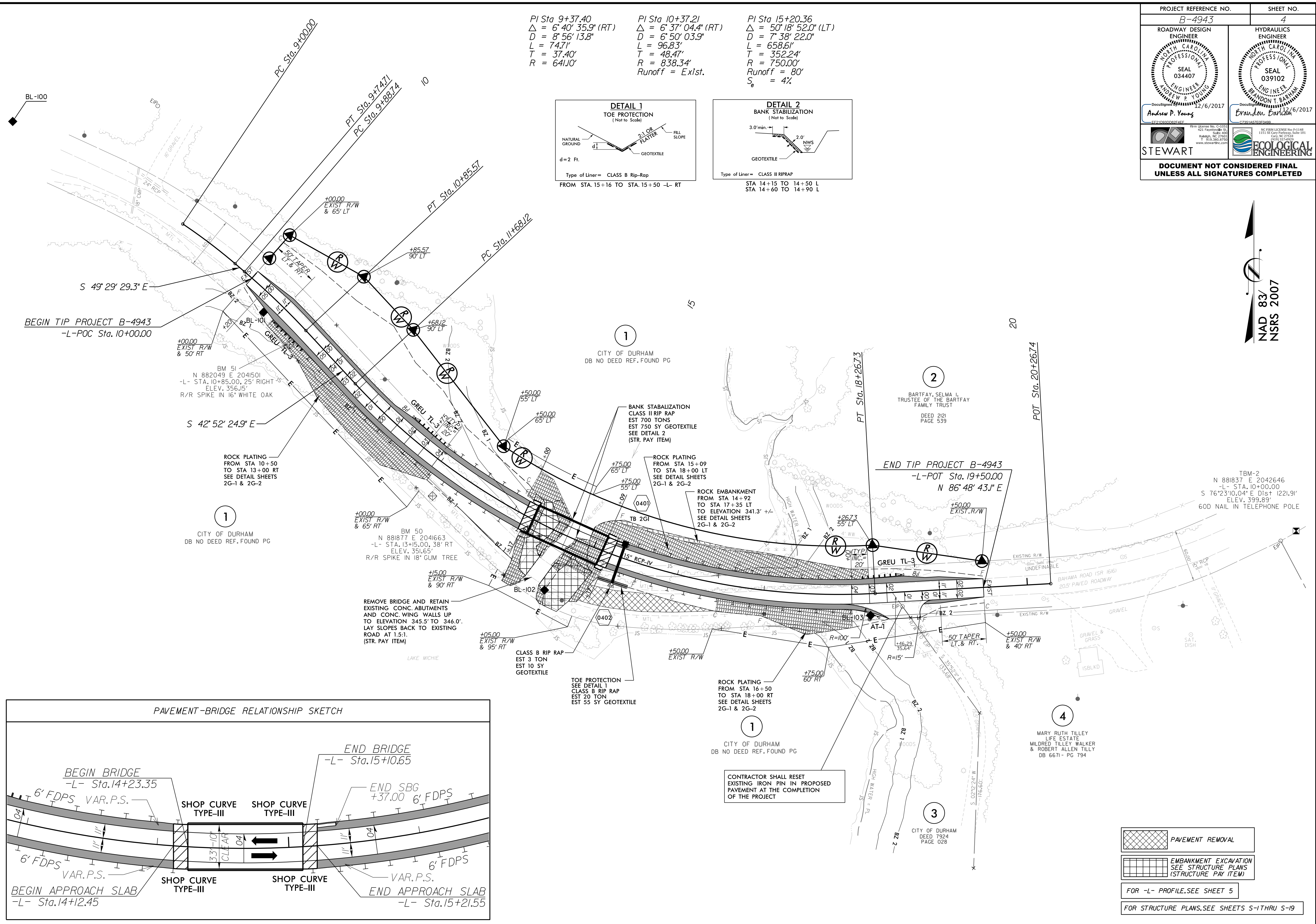
REVISIONS

PROJECT REFERENCE NO. B-4943	SHEET NO. 4
ROADWAY DESIGN ENGINEER ANDREW P. YOUNG SEAL 034407 12/6/2017	HYDRAULICS ENGINEER BRANDON T. BASHAM SEAL 039102 12/6/2017
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PI Sta 9+37.40 Δ = 6° 40' 35.9" (RT) D = 8' 56' 13.8" L = 74.71' T = 37.40' R = 641.0'
 PI Sta 10+37.21 Δ = 6° 37' 04.4" (RT) D = 6' 50' 03.9" L = 96.83' T = 48.47' R = 838.34' Runoff = Exist.
 PI Sta 15+20.36 Δ = 50° 18' 52.0" (LT) D = 7' 38' 22.0" L = 658.61' T = 352.24' R = 750.00' Runoff = 80' S_e = 4%



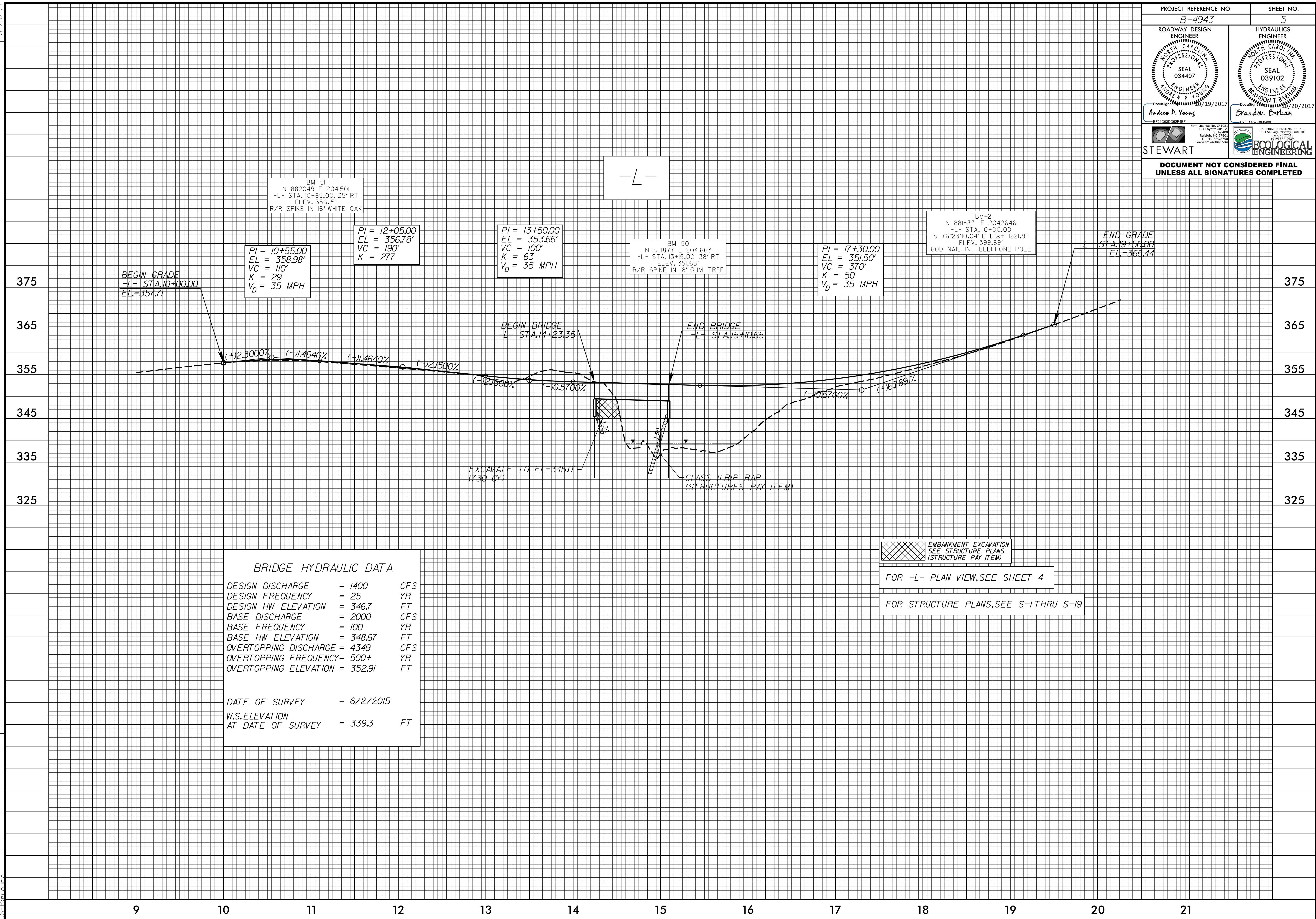
8/17/99
 REVISIONS
 12/6/2017 B:\4943_PDX_PSH04.dgn
 USER:andrew



	PAVEMENT REMOVAL
	EMBANKMENT EXCAVATION SEE STRUCTURE PLANS (STRUCTURE PAY ITEM)
FOR -L- PROFILE, SEE SHEET 5	
FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-19	

5/28/99

REVISIONS



BM 51
N 882049 E 2041501
-L- STA. 10+85.00, 25' RT
ELEV. 356.15'
R/R SPIKE IN 16" WHITE OAK

PI = 10+55.00
EL = 358.98'
VC = 110'
K = 29
V_D = 35 MPH

PI = 12+05.00
EL = 356.78'
VC = 190'
K = 277

PI = 13+50.00
EL = 353.66'
VC = 100'
K = 63
V_D = 35 MPH

BM 50
N 881877 E 2041663
-L- STA. 13+15.00, 38' RT
ELEV. 351.85'
R/R SPIKE IN 18" GUM TREE

PI = 17+30.00
EL = 351.50'
VC = 370'
K = 50
V_D = 35 MPH

TBM-2
N 881837 E 2042646
-L- STA. 10+00.00
S 76°23'10.04" E Dist 1221.91'
ELEV. 399.89'
60D NAIL IN TELEPHONE POLE

END GRADE
-L- STA. 19+50.00
EL = 366.44

BEGIN BRIDGE
-L- STA. 14+23.35

END BRIDGE
-L- STA. 15+10.65

EXCAVATE TO EL=345.0
(730 CY)

CLASS II RIP RAP
(STRUCTURES PAY ITEM)

BRIDGE HYDRAULIC DATA		
DESIGN DISCHARGE	= 1400	CFS
DESIGN FREQUENCY	= 25	YR
DESIGN HW ELEVATION	= 346.7	FT
BASE DISCHARGE	= 2000	CFS
BASE FREQUENCY	= 100	YR
BASE HW ELEVATION	= 348.67	FT
OVERTOPPING DISCHARGE	= 4349	CFS
OVERTOPPING FREQUENCY	= 500+	YR
OVERTOPPING ELEVATION	= 352.91	FT
DATE OF SURVEY	= 6/2/2015	
W.S. ELEVATION AT DATE OF SURVEY	= 339.3	FT

EMBANKMENT EXCAVATION
SEE STRUCTURE PLANS
(STRUCTURE PAY ITEM)

FOR -L- PLAN VIEW, SEE SHEET 4

FOR STRUCTURE PLANS, SEE S-1 THRU S-19

10/12/2017 10:49:43 AM B:\4943_PDX_PS\H05.dgn