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09\_08/2018

TIP PROJECT: B-5322

CONTRACT: DE00243

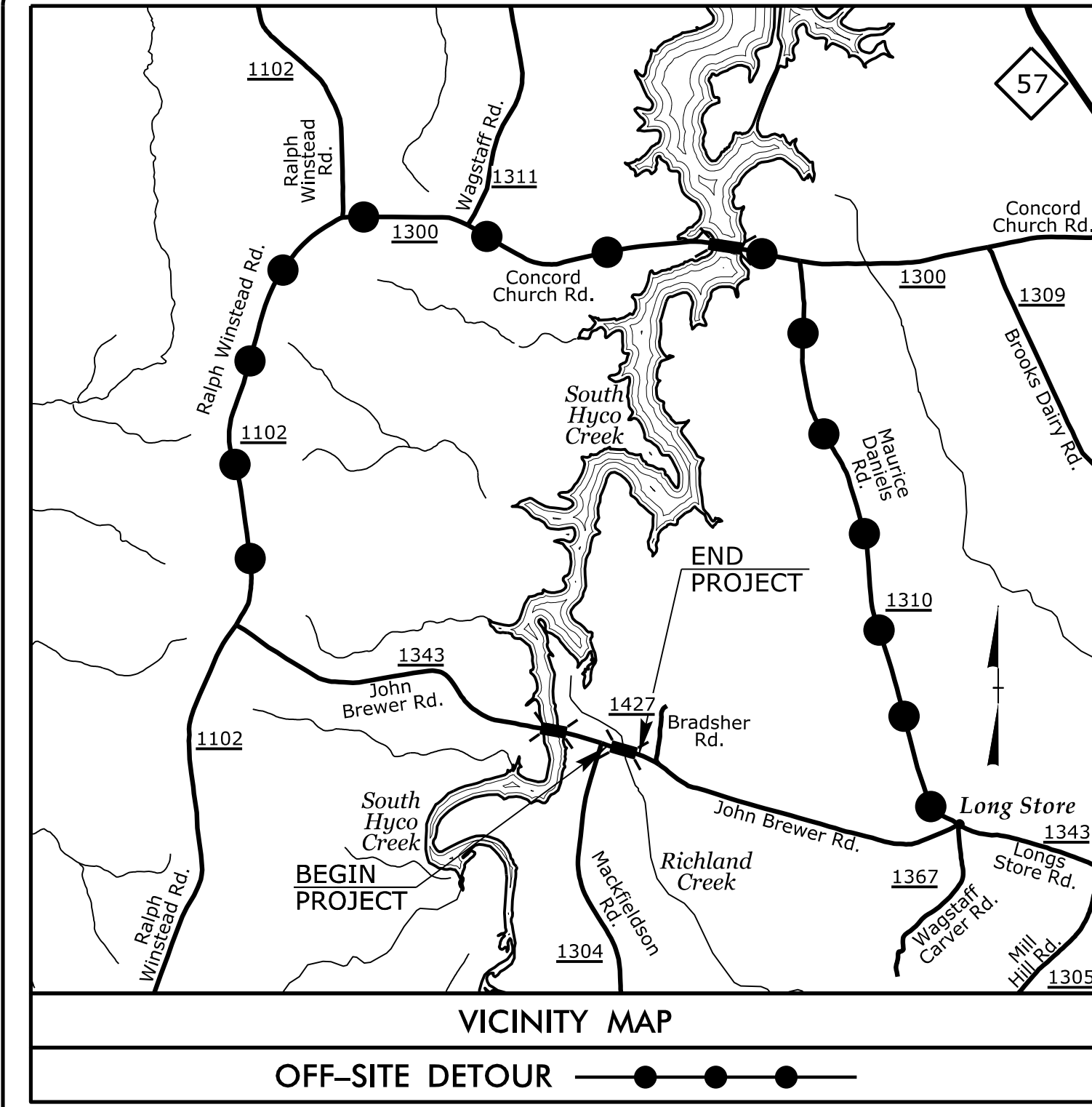
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

PERSON COUNTY

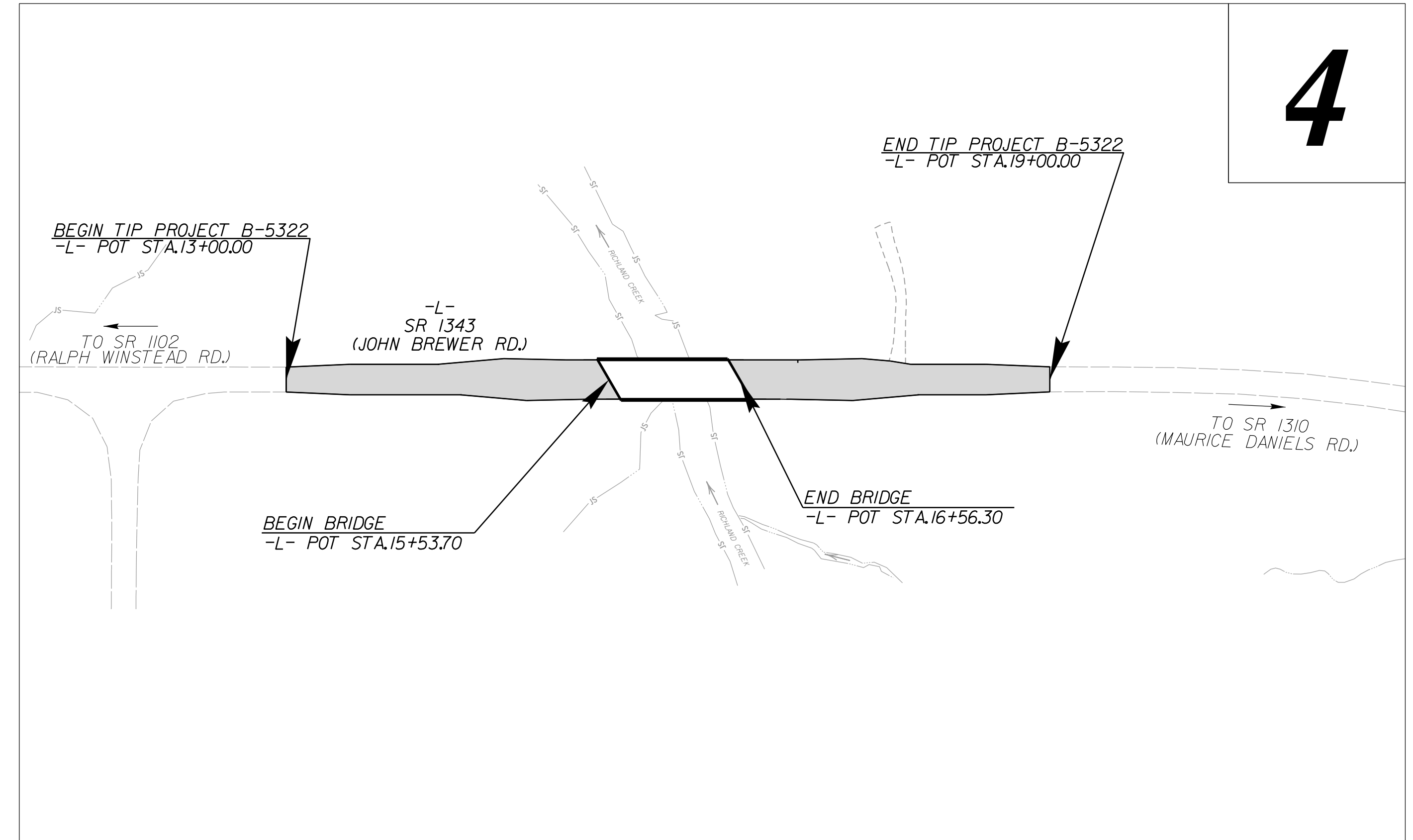
LOCATION: BRIDGE NO. 51 OVER RICHLAND CREEK  
SR 1343 (JOHN BREWER RD.)

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

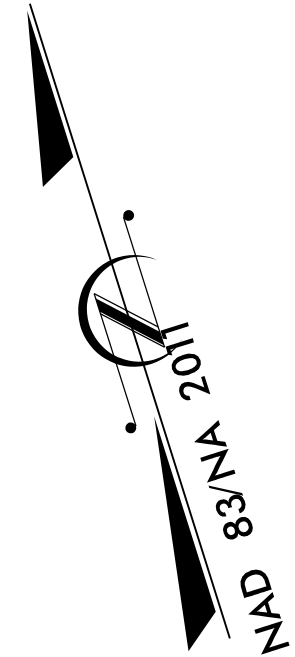
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5322	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
46036.1.1	N/A	PE	
46036.2.1	N/A	ROW /UTILITY	
46036.3.1	N/A	CONSTRUCTION	



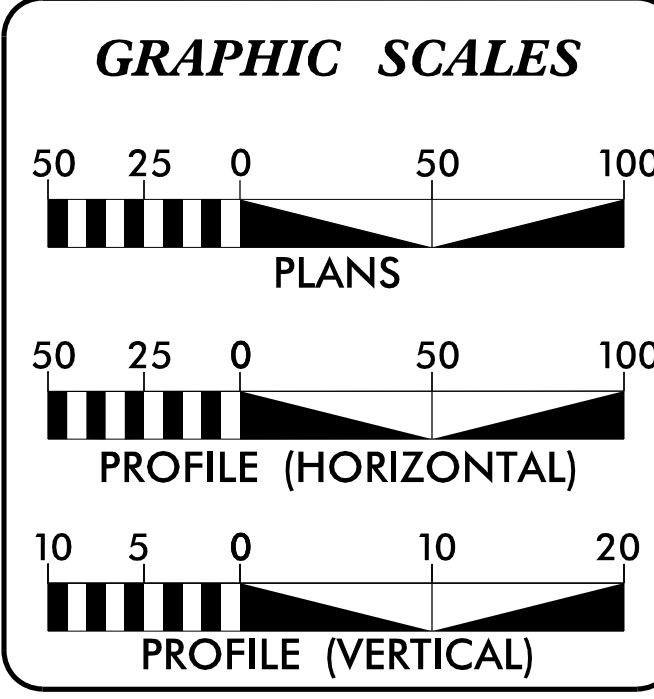
See Sheet 1A For Index of Sheets  
See Sheet 1B For Conventional Symbols



4



DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



**DESIGN DATA**

2018 ADT = 346 VPD
2038 ADT = 528 VPD
V = 60 MPH
CLASS = RURAL LOCAL
SUBREGIONAL TIER

**PROJECT LENGTH**

LENGTH ROADWAY STATE PROJECT	= 0.095 mi.
LENGTH STRUCTURES STATE PROJECT	= 0.019 mi.
TOTAL LENGTH STATE PROJECT	= 0.114 mi.

Prepared in the Offices of:

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

**ECOLOGICAL ENGINEERING**  
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:**  
OCTOBER 30, 2017

**RIGHT OF WAY COMPLETE:**

**LETTING DATE:**  
JUNE 13, 2018

**ANDY YOUNG, PE**  
PROJECT ENGINEER

**MICHAEL BURNS, PE**  
PROJECT DESIGN ENGINEER

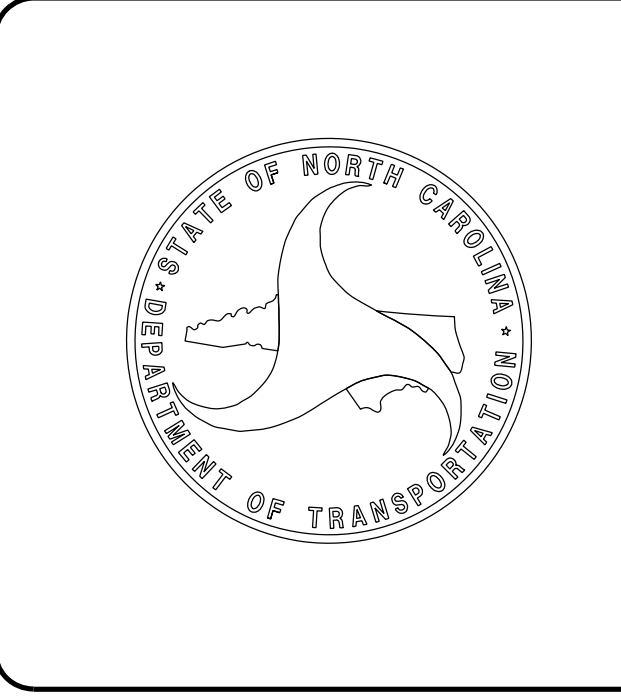
**LISA GILCHRIST, EI**  
NCDOT CONTACT

**HYDRAULICS ENGINEER**

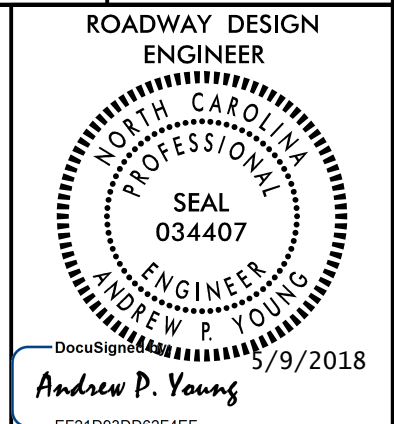
DocuSigned by: Reid B. Robol  
5/10/2018  
7074FD3A5F200470  
SIGNATURE: P.E.

**ROADWAY DESIGN ENGINEER**

DocuSigned by: Andrew P. Young  
5/9/2018  
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SIGNATURE: P.E.



5/1/2018  
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USER:ayoung



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

EFF. 01-16-2018  
REV.

2018 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD. NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Super-elevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.01	Bridge Approach Fills - Type II Modified Approach Fill
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Super-elevated Curve - Method I
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
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
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
1C-1 THRU 1C-3	SURVEY CONTROL SHEETS
1D-1	CENTERLINE COORDINATE LIST
1E-1	R/W & EASEMENT COORDINATE LIST
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2C-1	SHOULDER WEDGE DETAIL
2C-2	W BEAM RAIL DETAIL
3B-1	ROADWAY SUMMARIES
3D-1	DRAINAGE SUMMARIES
3G-1	GEOTECHNICAL SUMMARIES
4	PLAN SHEET
5	PROFILE SHEET
RW04	MODIFIED R/W PLAN SHEET
TMP-1 THRU TMP-3	TRAFFIC MANAGEMENT PLANS
PMP-1	PAVEMENT MARKING PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
RF-1	REFORESTATION PLAN
UD-1 THRU UD-2	UTILITY BY OTHER PLANS
X-1A	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-5	CROSS-SECTIONS
S-1 THRU S-16	STRUCTURE PLANS

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

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

CLEARING:  
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD 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 SURVEYOR SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTIONS PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:  
UTILITY OWNERS FOR 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.



# 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	-----

### 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	○ RW
New Right of Way Line with Concrete or Granite RW Marker	○ RW
New Control of Access Line with Concrete C/A Marker	○ CA
Existing Control of Access	○ CA
New Control of Access	○ CA
Existing Easement Line	----- E
New Temporary Construction Easement	----- E
New Temporary Drainage Easement	----- TDE
New Permanent Drainage Easement	----- PDE
New Permanent Drainage / Utility Easement	----- DUE
New Permanent Utility Easement	----- PUE
New Temporary Utility Easement	----- TUE
New Aerial Utility Easement	----- AUE

### ROADS AND RELATED FEATURES:

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

### VEGETATION:

Single Tree	○
Single Shrub	○

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

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	○ TH
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	□
TV Tower	⊗
U/G TV Cable Hand Hole	○ TH
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

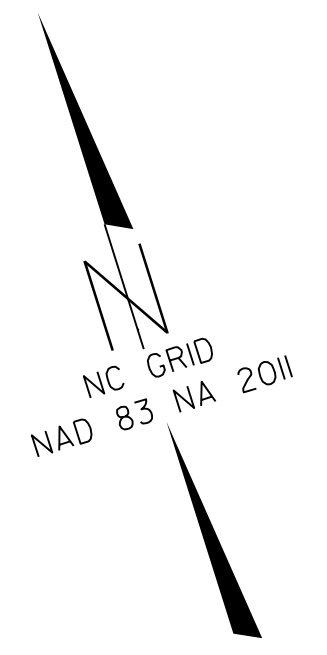
### MISCELLANEOUS:

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



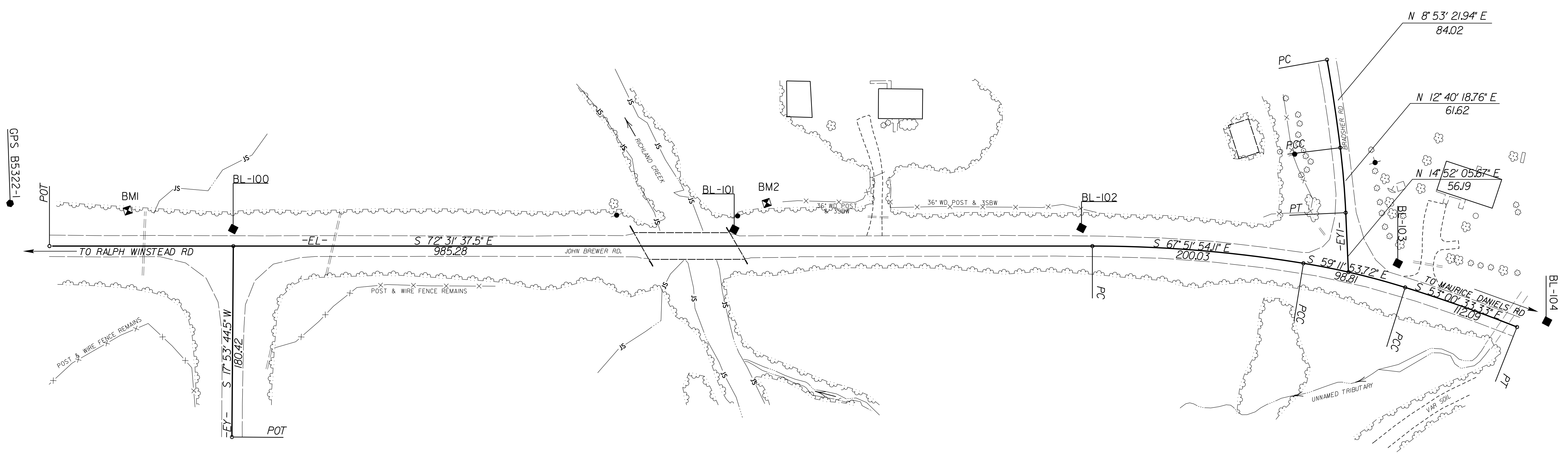
# SURVEY CONTROL SHEET

W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



SEE SHEET 1C-3 FOR FURTHER ALIGNMENT DETAILS

REVISIONS



### NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

# SURVEY CONTROL SHEET

*W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION*

BL	POINT	DESC.	NORTH	EAST	ELEVATION
1		B5322-1	971324.5970	1970009.4480	437.89
100		BL-100	971210.6938	1970371.7490	436.16
101		BL-101	971068.1817	1970823.1466	423.21
102		BL-102	970971.1042	1971136.5179	433.38
103		BL-103	970849.4607	1971411.5277	434.25
104		BL-104	970656.0844	1971646.4521	440.21

```

*****
BM1          ELEVATION = 441.44
N 971257      E 1970282
BM#1 26" OAK
*****

```

```

*****
BM2          ELEVATION = 423.13
N 971083      E 1970860
BM-2 14" MAPLE
*****

```

**NOTES:**

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4/19/18

REVISIONS

# SURVEY CONTROL SHEET

W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

EL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	971247.520	1970201.403							
LINE			S 72°31'37.5" E	985.28					
PC	970951.686	1971141.217							
CURVE			S 67°51'54.4" E	200.03	09°19'26.1"(RT)	04°39'21.9"	200.25	100.35	1230.56
PCC	970876.316	1971326.507							
CURVE			S 59°11'53.7" E	98.81	08°00'35.3"(RT)	08°05'58.0"	98.89	49.53	707.40
PCC	970825.717	1971411.381							
CURVE			S 53°00'33.3" E	112.09	04°22'05.5"(RT)	03°53'45.8"	112.12	56.09	1470.61
PT	970825.717	1971411.381							

EY

POINT	N	E	BEARING	DIST
POT	971195.368	1970367.081		
LINE			S 17°53'44.5" W	180.42
POT	971023.677	1970311.641		

EY1

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	971053.043	1971405.489							
CURVE			S 08°53'21.9" W	84.02	03°10'19.8"(RT)	03°46'30.0"	84.03	42.03	1517.77
PCC	970970.032	1971392.506							
CURVE			S 12°40'18.8" W	61.62	04°23'33.8"(RT)	07°07'35.7"	61.64	30.83	803.97
PT	970909.909	1971378.988							
LINE			S 14°52'05.7" W	56.19					
POT	970855.604	1971364.570							

REVISIONS

**NOTES:**

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- THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.



# SURVEY CONTROL SHEET

## PROPOSED ALIGNMENT CONTROL SHEET B-5322

REVISIONS

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	971247.520	1970201.403							
LINE			S 72°31'37.5" E	985.28					
PC	970951.686	1971141.217							
CURVE			S 67°51'54.4" E	200.03	09°19'26.1"(RT)	04°39'21.9"	200.25	100.35	1230.56
PT	970951.686	1971141.217							

**NOTES:**

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

# RIGHT OF WAY CONTROL SHEET



REVISIONS

### ROW MARKER REBAR AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
L	18+00.00	50.00	970959.6228	1970949.4769
L	18+00.00	30.00	970978.7000	1970955.4820
L	14+50.00	50.00	971064.7121	1970615.6263
L	14+50.00	30.00	971083.7893	1970621.6314
L	14+50.00	-30.00	971141.0208	1970639.6467
L	14+50.00	-50.00	971160.0980	1970645.6518
L	16+95.36	-50.00	971086.4287	1970879.6865
L	17+16.47	-30.00	971061.0105	1970893.8257

I, JEFFREY S. COATS, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item(s) (R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures.

I further certify that the right of way and permanent easement points shown herein and outlined in the tables shown hereon (localized coordinates, station/offset) have been checked and are accurate representations of the right of way and permanent easement points depicted on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been field monumented under my supervision from existing survey control provided by others; that the depicted property data shown herein were surveyed by others; and these monuments denote the right of way and easement boundaries at the time of staking which may be subject to change due to right of way revisions (See deeds for final determination).

Witness my original signature, registration number and seal this 6th day of April, 2018.

L-3994  
 Professional Land Surveyor PLS #

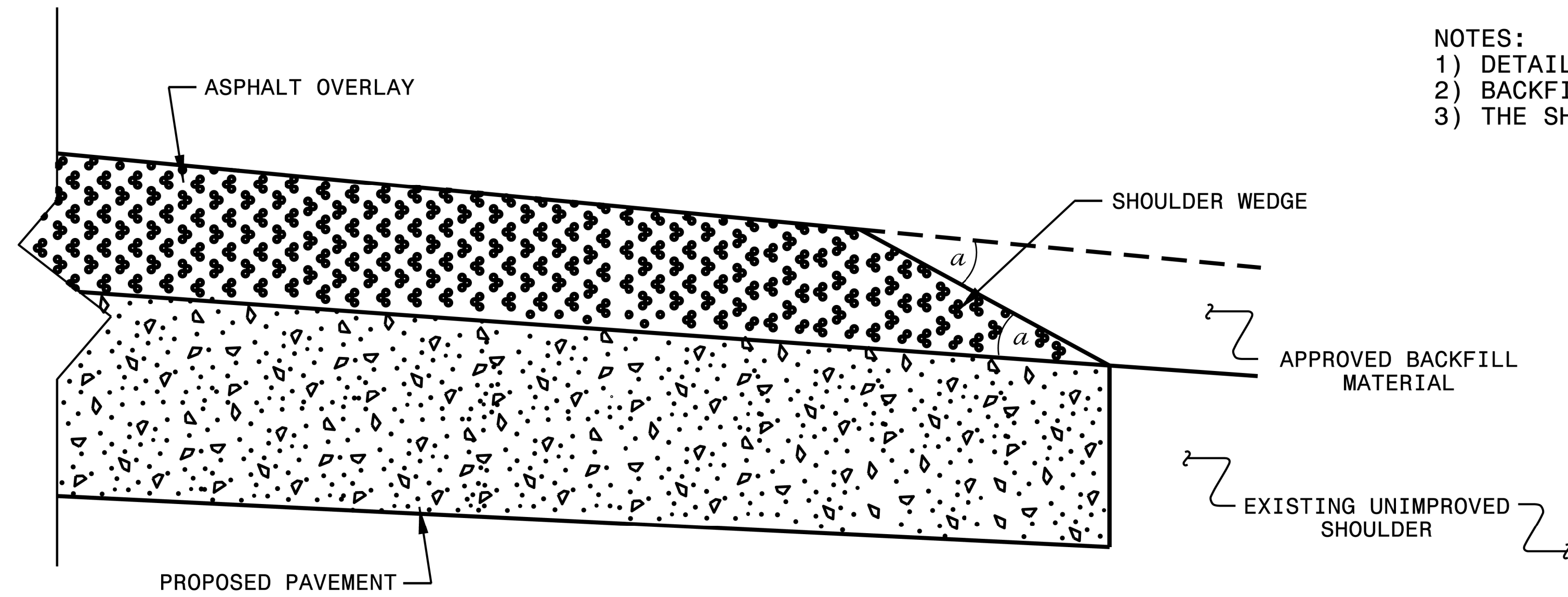


**NOTES:**

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

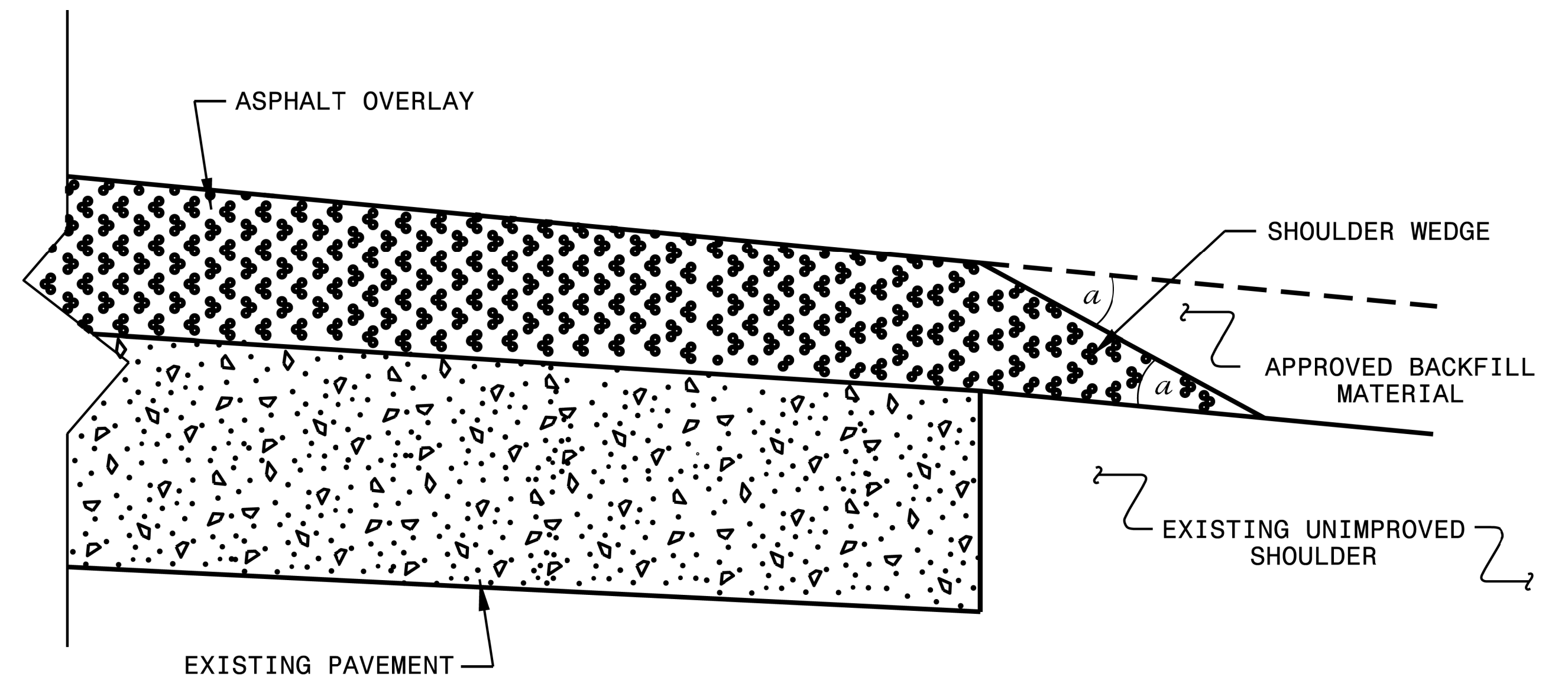




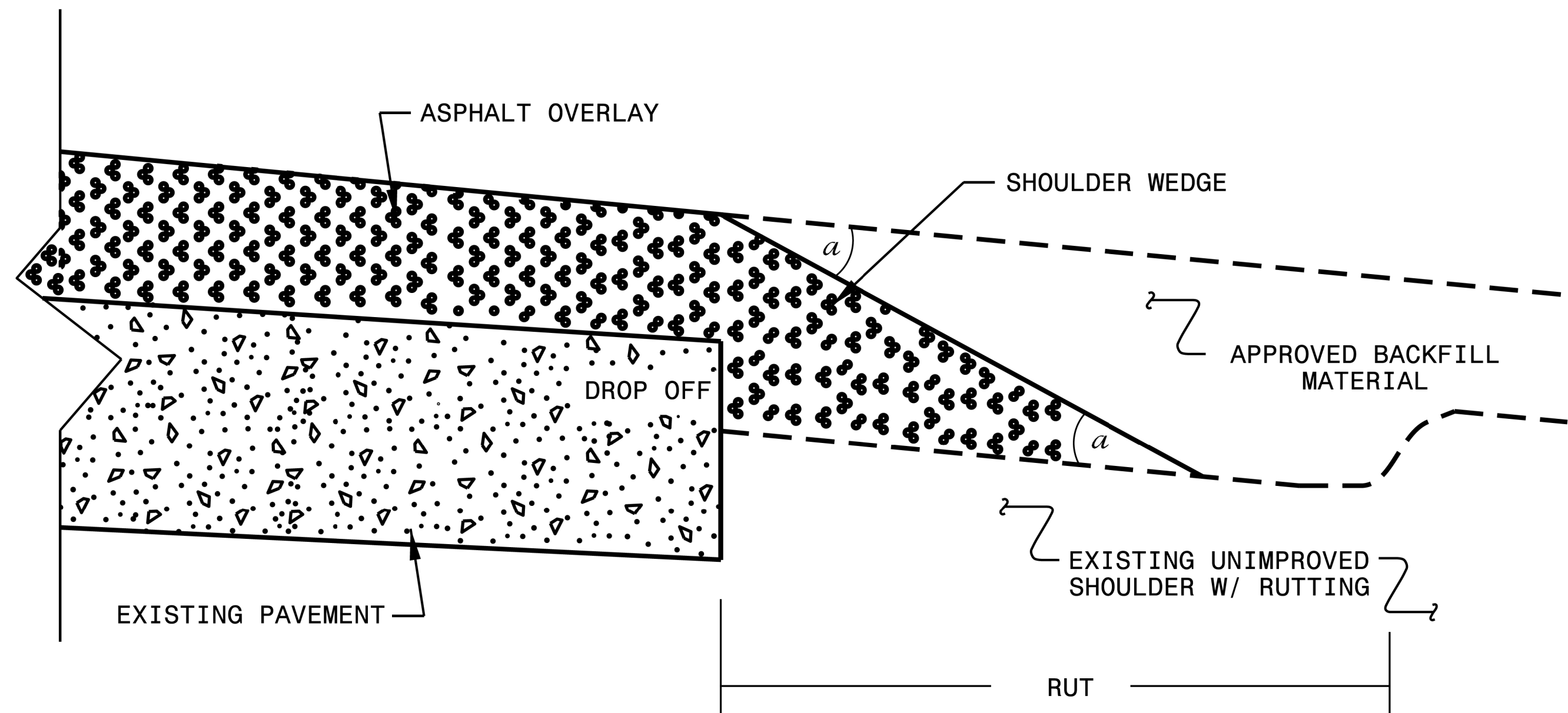


**SHOULDER WEDGE DETAIL**  
 (Resurfacing Projects w/ Widening or  
 with Existing Paved Shoulder having no dropoffs)

- NOTES:
- 1) DETAIL DOES NOT APPLY TO OGAFK AND ULTRA-THIN BONDED WEARING COURSE.
  - 2) BACKFILL SHOULDER WITH APPROVED MATERIAL.
  - 3) THE SHOULDER WEDGE DEVICE MAY BE DISENGAGED AT PAVED DRIVEWAYS AND SIDE STREETS.



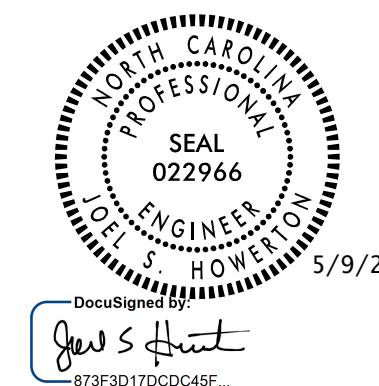
**SHOULDER WEDGE DETAIL**  
 (Resurfacing Projects w/ NO Widening)



**SHOULDER WEDGE DETAIL**  
 (Resurfacing Adjacent to  
 Rutted Shoulder)

- SHOULDER WEDGE ANGLE = 30°

CONTRACT STANDARDS AND DEVELOPMENT UNIT			
Office 919-707-6950		FAX 919-250-4119	
<b>SHOULDER WEDGE DETAILS</b>			
ORIGINAL BY:	T.SPELL	DATE:	7-19-11
MODIFIED BY:		DATE:	10/16/12
CHECKED BY:		DATE:	
FILE SPEC.:	s:\usr\details\stand\shoulderwedgedetail.dgn		

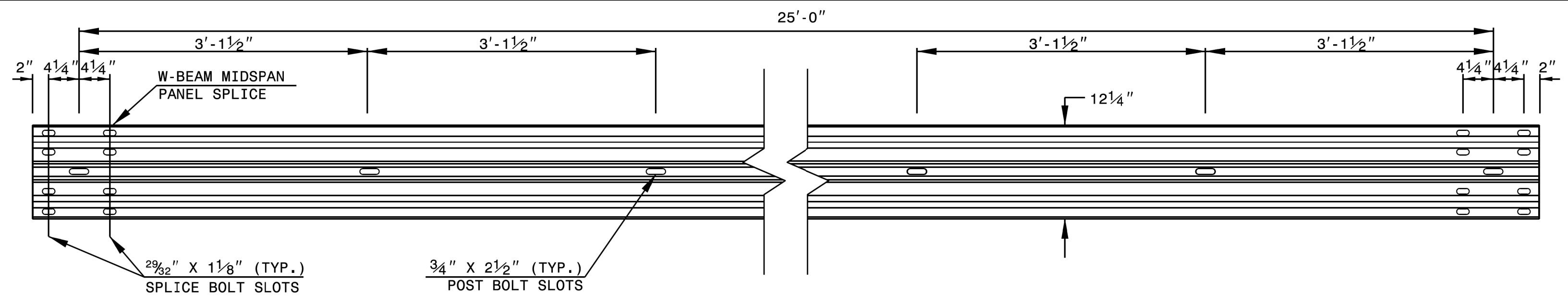


DATE PLOTTED: 10/16/12 10:05 AM  
 PLOT SCALE: 1"=1'-0"  
 PLOT BY: T. SPELL

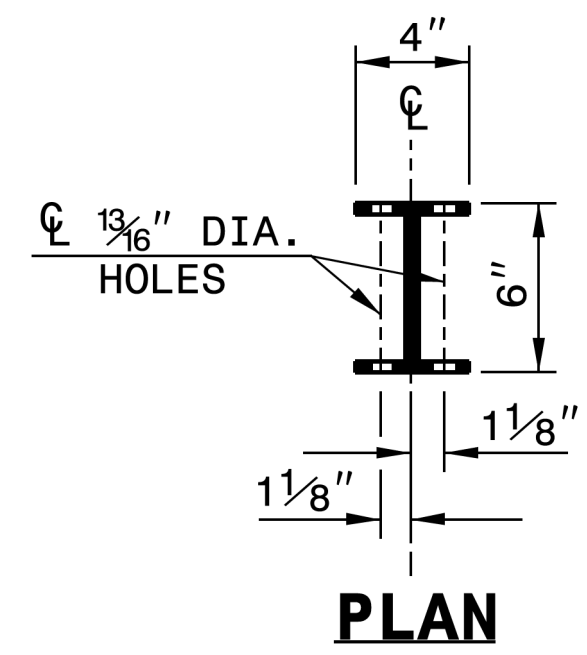
STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

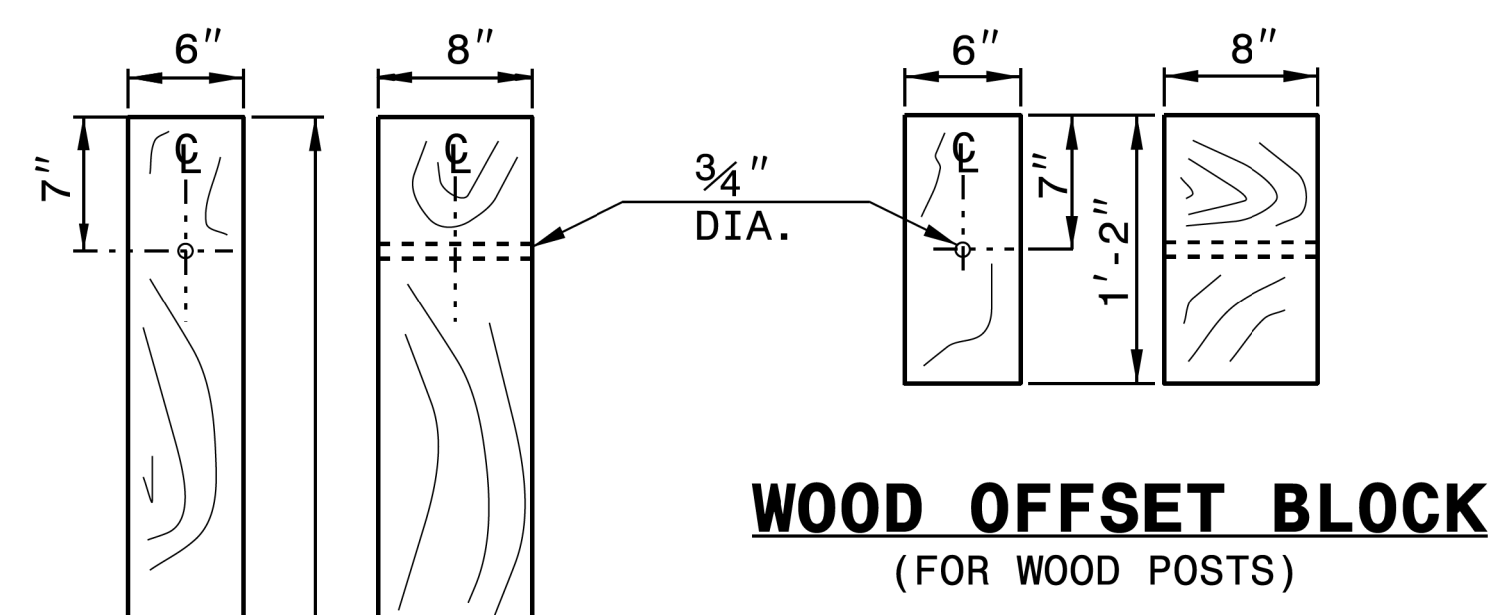
SHEET 6 OF 8  
**862D02**



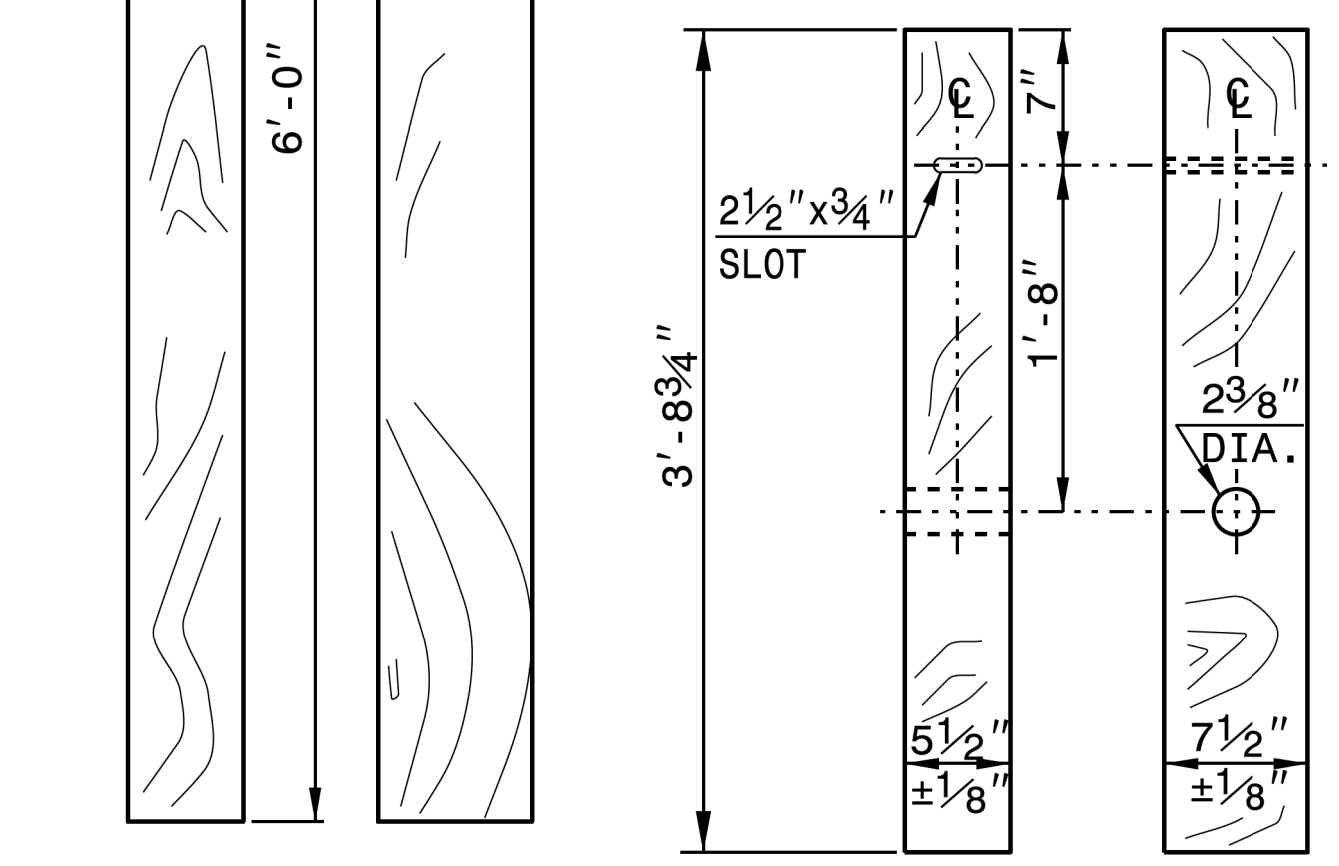
**STANDARD W-BEAM GUARDRAIL**



**PLAN**

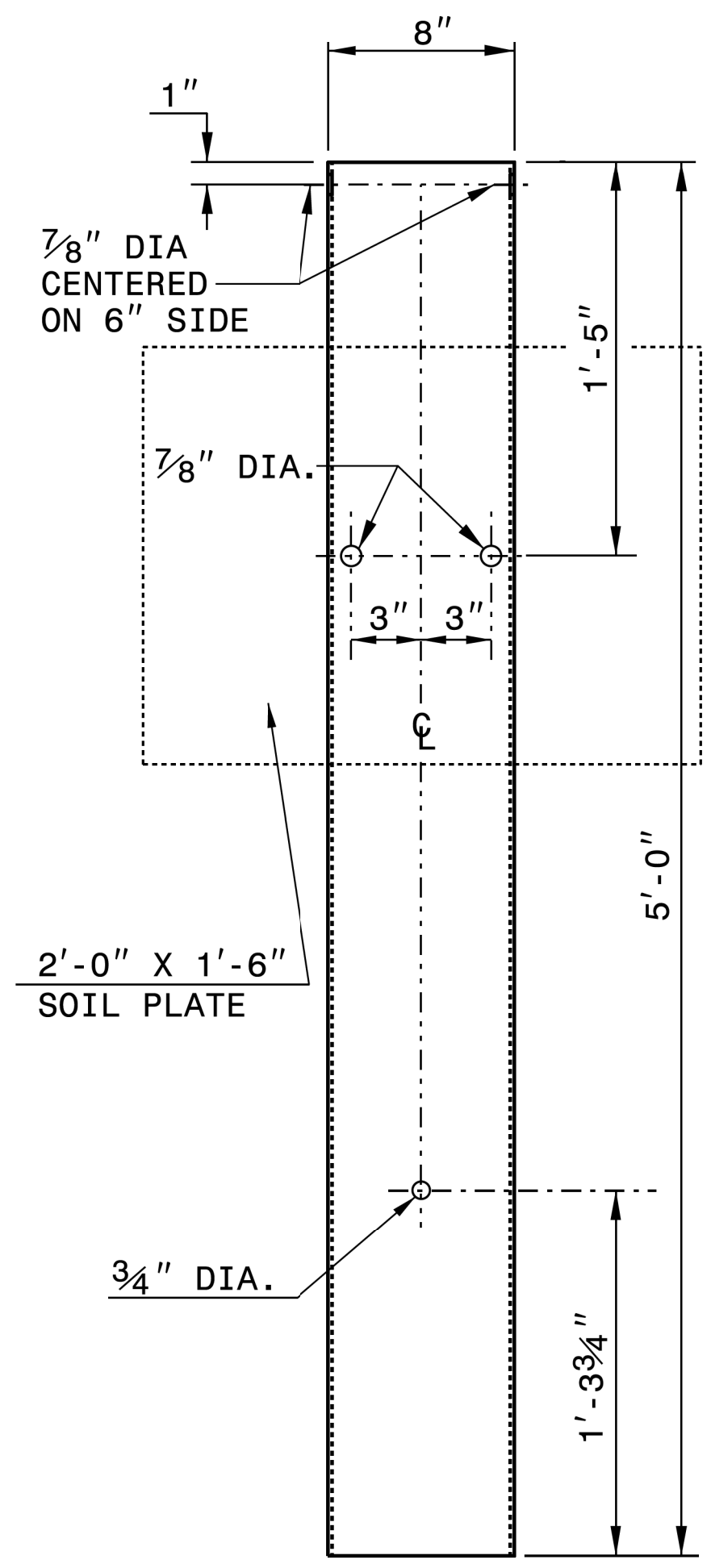


**WOOD OFFSET BLOCK  
(FOR WOOD POSTS)**



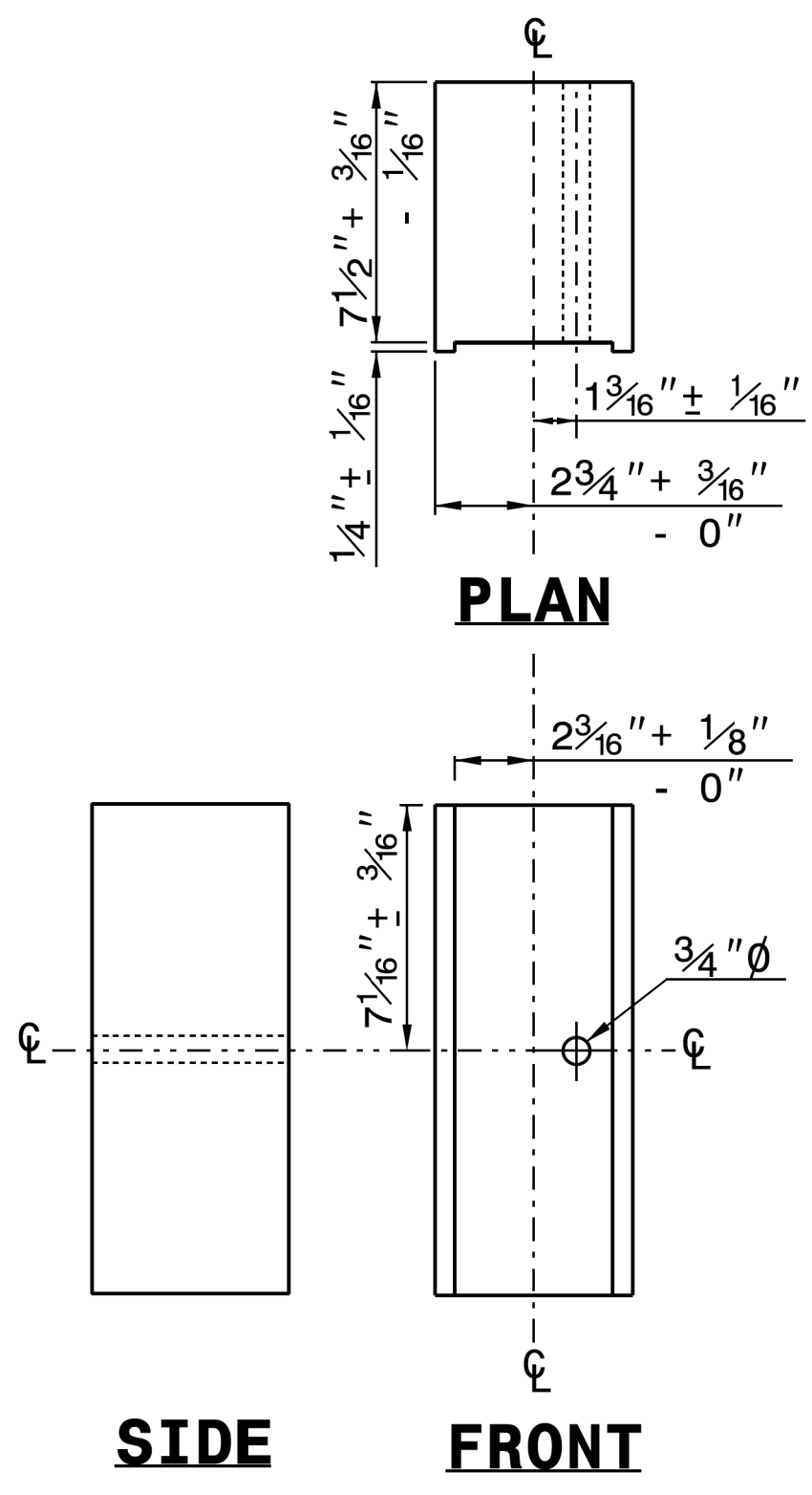
**STANDARD  
LINE POST**

**SHORT WOOD  
BREAKAWAY POST**



**STEEL TUBE  
TS 6"x8"x0.1875"**

2'-0" X 1'-6"  
SOIL PLATE

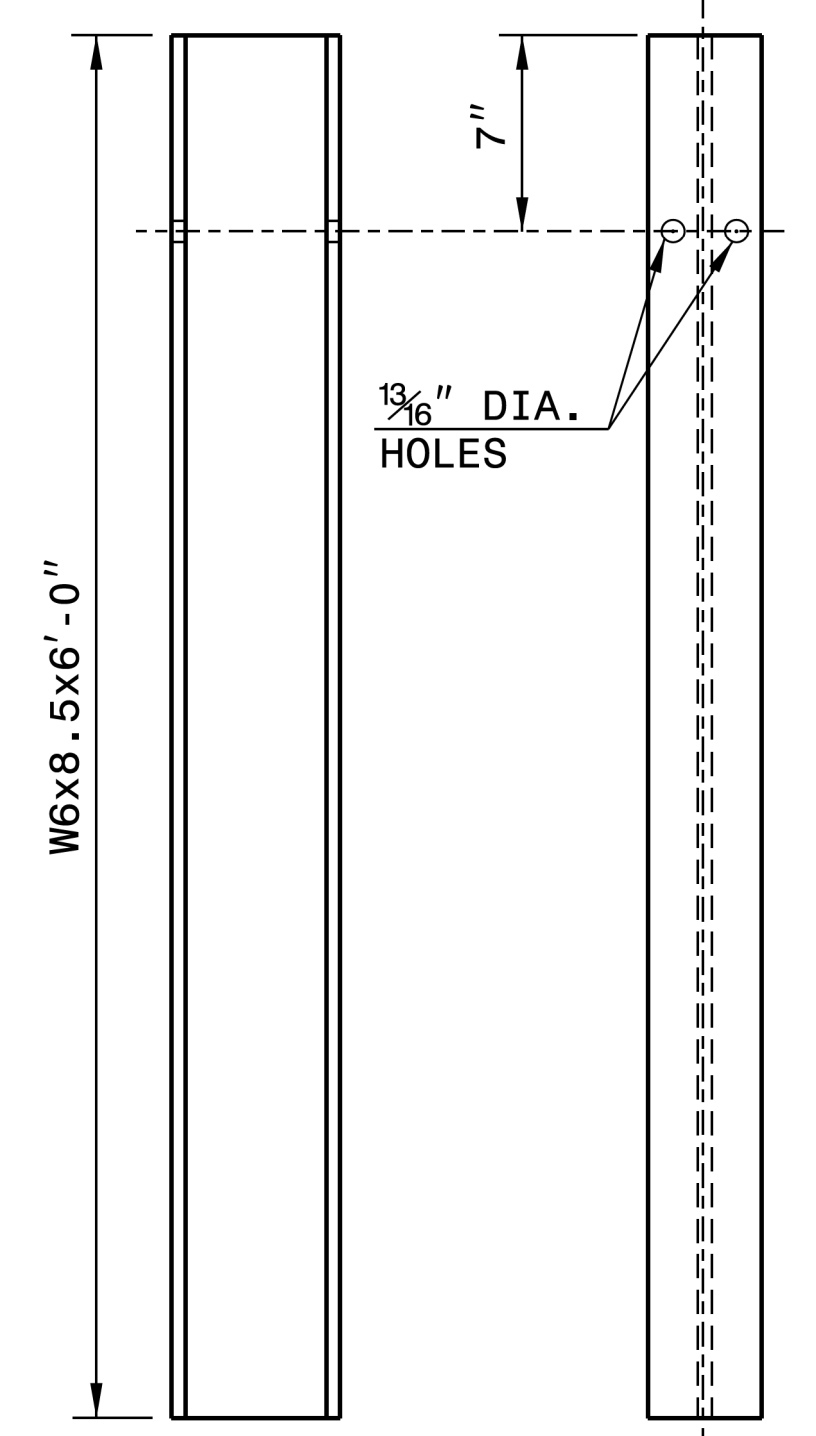


**PLAN**

**SIDE**

**FRONT**

**ROUTED  
OFFSET BLOCK**



**SIDE**

**FRONT**

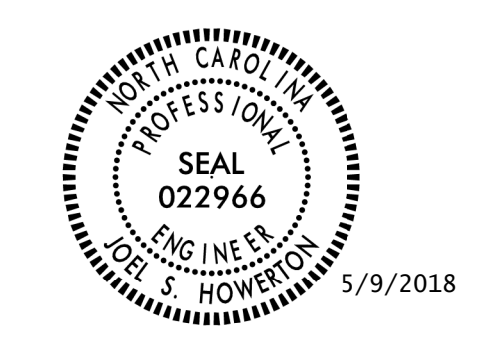
**"W6" STEEL POST**

**SYSTEM PARTS**

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

ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET 6 OF 8  
**862D02**



DocuSigned by:  
*J. Howerton*  
973F3D173CDBC45F

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

**SEE TITLE BLOCK**

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



## SUMMARY OF EARTHWORK

IN CUBIC YARDS

Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
-L- Sta. 13+00.00	-L- Sta. 15+55 +/-	106	276	170	
-L- Sta. 16+55 +/-	-L- Sta. 19+00.00	85	188	83	
<b>SUBTOTAL:</b>		191	464	253	
<b>PROJECT TOTAL:</b>		191	464	253	
<b>EST. 5% REPLACE TOPSOIL ON BORROW PIT</b>				13	
<b>GRAND TOTALS:</b>		191	464	266	
<b>SAY:</b>		<b>220</b>		<b>280</b>	

UNDERCUT = 400 CY (Contingency)  
 SELECT GRANULAR MATERIAL = 400 CY (Contingency)  
 GEOTEXTILE FOR SOIL STABILIZATION = 400 SY (Contingency)

(Total square yards of Geotextile for Soil Stabilization is only the contingent quantity and may only represent a portion of the geotextile quantity shown in the Item Sheets of the Proposal.)

Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Shoulder Borrow, Fine Grading, Clearing and Grubbing, Breaking of Existing Pavement, and Removal of Existing 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.

## PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL	ASPHALT BREAKUP	CONCRETE REMOVAL	CONCRETE BREAKUP
-L-	13+00.00	15+59.16	CL	564.74			
-L-	16+49.93	19+00.00	CL	550.99			
<b>TOTAL:</b>				1115.72			
<b>SAY:</b>				1120			

## SHOULDER BERM GUTTER SUMMARY

IN LINEAR FEET

LINE	Station	Station	LENGTH
-L-	16+59 (App. Slab)	17+02	43
-L-	16+75.85 (App. Slab)	16+93	17.15
<b>TOTAL:</b>			60.15
<b>SAY:</b>			65

## GUARDRAIL SUMMARY

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

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

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOULDER 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	GREU TL-3	M-350	TYPE III	CAT-1	VI MOD	BIC	G	NG													
-L-	14+69.80	15+44.80	LT	75'				15+44.80	5'-5"	8'-5"	50'	50'	1'	1'					1																		
-L-	14+87.60	15+62.60	RT	75'				15+62.60	5'-5"	8'-5"	50'		1'						1																		
-L-	16+47.40	17+22.40	LT	75'				16+47.40	5'-5"	8'-5"	50'		1'						1																		
-L-	16+65.20	17+40.20	RT	75'				16+65.20	5'-5"	8'-5"	50'	50'	1'	1'					1																		
<b>SUBTOTALS:</b>				300'																																	
<b>LESS ANCHOR DEDUCTIONS:</b>																																					
TYPE III (4@18.75')				75'																																	
GREU TL-3 (4@50')				200'																																	
<b>TOTAL:</b>				25'																																	
<b>SAY:</b>				25'																																	
ADDITIONAL GURADRAIL POSTS = 5 EA																																					

REVISIONS

8/17/99

5/1/2008\_B5322\_P0Y\_SUM\_3B-1.dgn  
 USER: JLD





## STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

### SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY					
<b>TOTAL LF:</b>					0

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

### SUMMARY OF BRIDGE WAITING PERIODS

Bridge Description	End Bent/ Bent No.	MONTHS

### SUMMARY OF SETTLEMENT GAUGES

Gauge No.	LINE	Approx. Station	Approx. Offset
<b>TOTAL GAUGES (EACH):</b>			

### SUMMARY OF ROCK PLATING

LINE	Beginning Slope	Approx. Station	Ending Slope	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/3/4	Riprap Class* 1/2/B	SY
<b>TOTAL SY:</b>								0

\*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

### SUMMARY OF SURCHARGES AND SURCHARGE WAITING PERIODS

LINE	Station	Station	Surcharge Height FT	MONTHS

### SUMMARY OF GEOTEXTILE FOR PAVEMENT STABILIZATION

LINE	Station	Station	SY
CONTINGENCY			
<b>TOTAL SY:</b>			0

### SUMMARY OF REINFORCED SOIL SLOPES (RSS)

LINE	Beginning Slope	Approx. Station	Ending Slope	Approx. Station	Location LT/RT	SY
<b>TOTAL SY:</b>						0

### SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type ASU/AST	Aggregate Thickness INCHES	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU		100	200	300		
<b>TOTAL CY/TONS/SY:</b>					100	200	300*	0	0

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

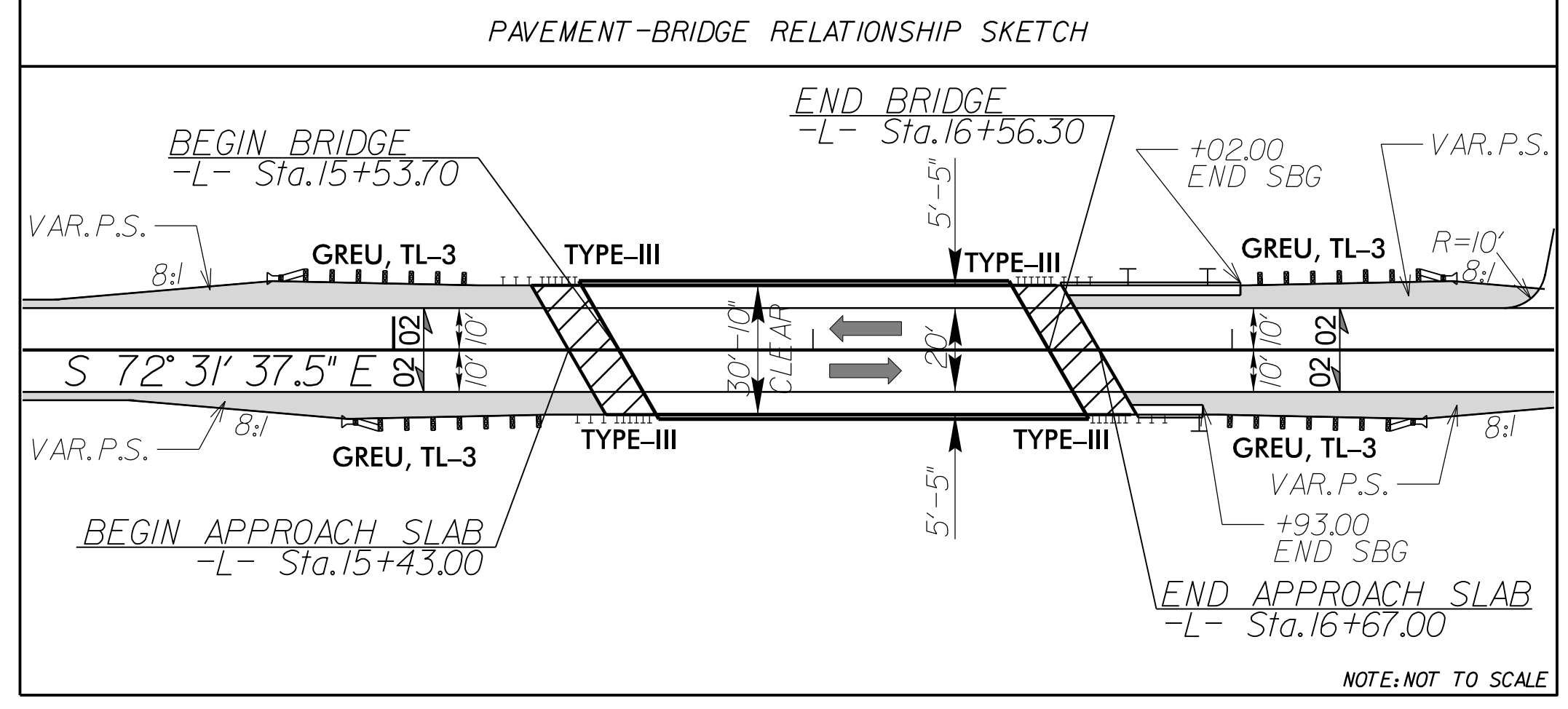
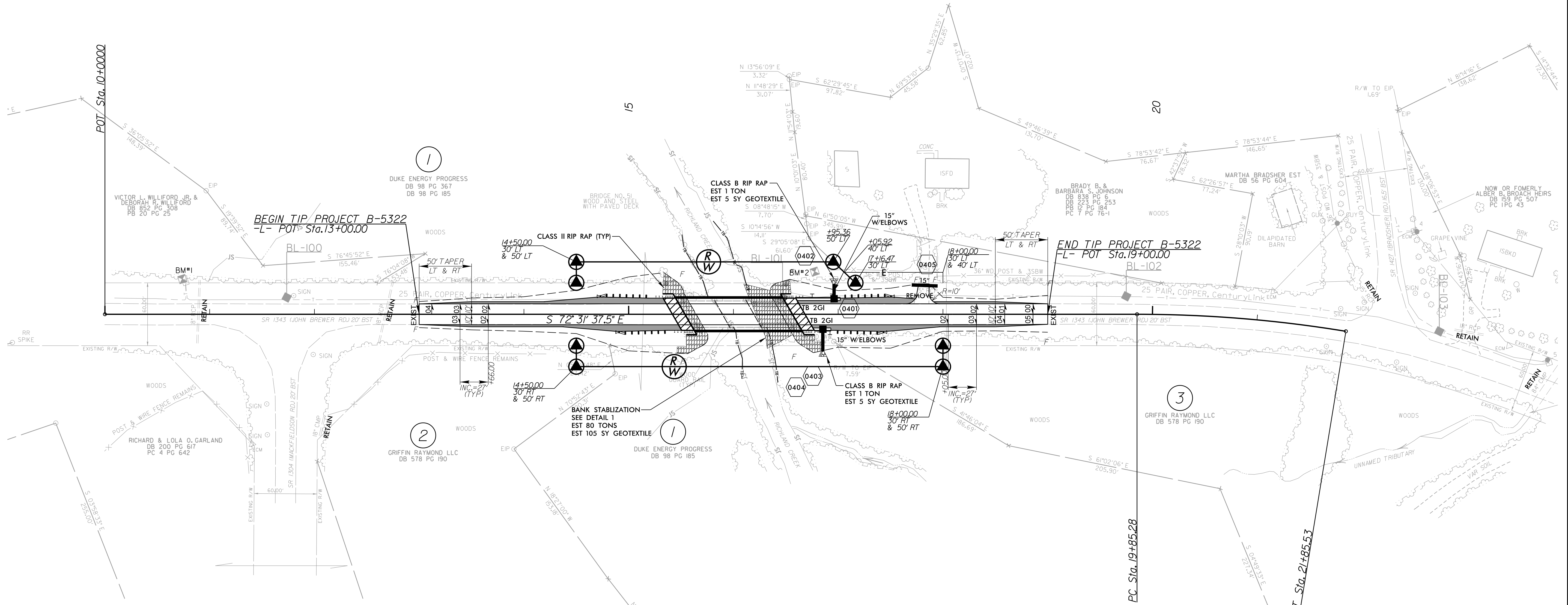
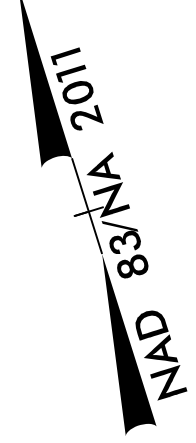
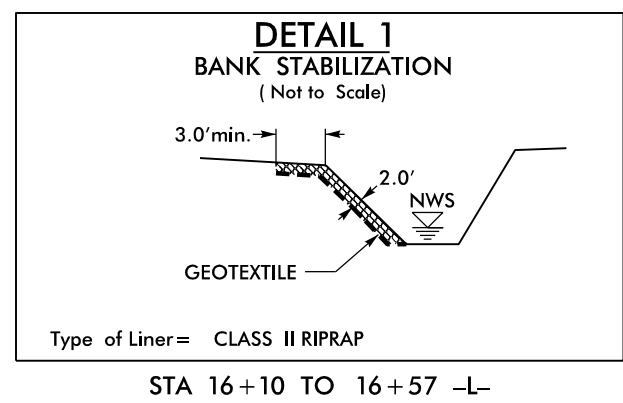
8/17/99

REVISIONS

5/1/2008\_B5322\_P0Y\_SUM\_36-1.dgn  
USFHQ0000



-L-  
 PI Sta 20+85.62  
 $\Delta = 9' 19" 26.1" (RT)$   
 $D = 4' 39" 21.9"$   
 $L = 200.25'$   
 $T = 100.35'$   
 $R = 1,230.56'$   
 $SE = EXIST.$   
 $V_D = 55mph$



FOR -L- PROFILE, SEE SHEET 5  
 FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-16

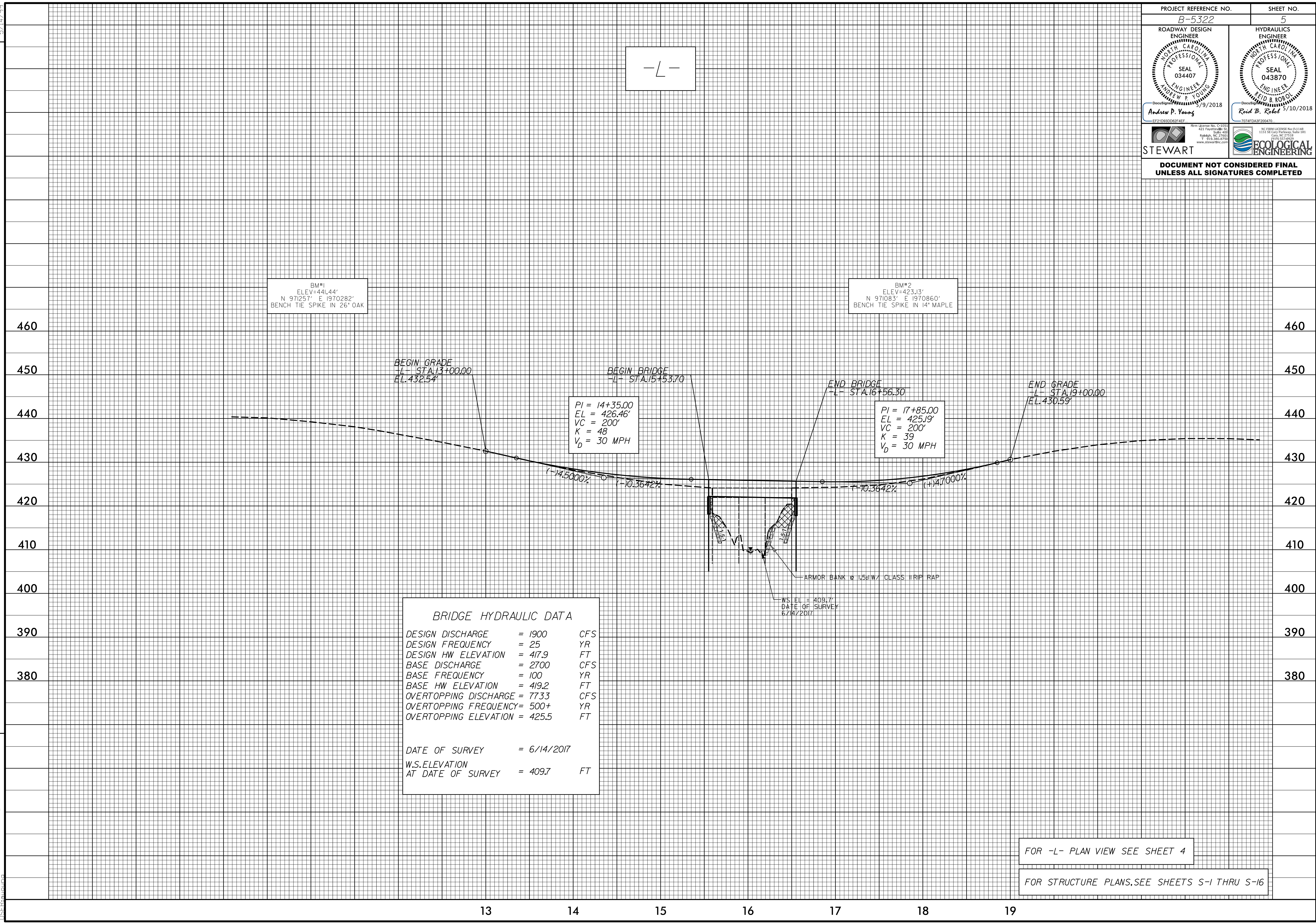
REVISIONS

5/14/19 5/14/2018\_B5322\_PDX\_PSH\_04.dgn



PROJECT REFERENCE NO. <b>B-5322</b>	SHEET NO. <b>5</b>
<b>ROADWAY DESIGN</b> ENGINEER ANDREW P. YOUNG SEAL 034407 PROFESSIONAL ENGINEER NORTH CAROLINA EXPIRES 5/9/2018 Dec 2018 EF2108100024EF	<b>HYDRAULICS</b> ENGINEER REID B. ROBOLO SEAL 043870 PROFESSIONAL ENGINEER NORTH CAROLINA EXPIRES 5/10/2018 Dec 2018 7074F0A3F200470
 <b>STEWART</b> 421 Fayetteville St. Raleigh, NC 27601 P: 919.336.1700 www.stewartinc.com	 <b>ECOLOGICAL</b> ENGINEERING 1513 S. East Parkway, Suite 101 Cary, NC 27515 P: 919.257.9275 www.ecologicaleng.com
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

-L-



BM#1  
ELEV=441.44'  
N 971257' E 1970282'  
BENCH THE SPIKE IN 26" OAK

BM#2  
ELEV=423.13'  
N 971083' E 1970860'  
BENCH THE SPIKE IN 14" MAPLE

BEGIN GRADE  
L- STA.13+00.00  
EL.432.54'

PI = 14+35.00  
EL = 426.46'  
VC = 200'  
K = 48  
V<sub>d</sub> = 30 MPH

BEGIN BRIDGE  
L- STA.15+53.70

END BRIDGE  
L- STA.16+56.30

PI = 17+85.00  
EL = 425.19'  
VC = 200'  
K = 39  
V<sub>d</sub> = 30 MPH

END GRADE  
L- STA.19+00.00  
EL.430.59'

BRIDGE HYDRAULIC DATA		
DESIGN DISCHARGE	= 1900	CFS
DESIGN FREQUENCY	= 25	YR
DESIGN HW ELEVATION	= 417.9	FT
BASE DISCHARGE	= 2700	CFS
BASE FREQUENCY	= 100	YR
BASE HW ELEVATION	= 419.2	FT
OVERTOPPING DISCHARGE	= 77.33	CFS
OVERTOPPING FREQUENCY	= 500+	YR
OVERTOPPING ELEVATION	= 425.5	FT
DATE OF SURVEY	= 6/14/2017	
W.S. ELEVATION AT DATE OF SURVEY	= 409.7	FT

W.S. EL = 409.7'  
DATE OF SURVEY  
6/14/2017

FOR -L- PLAN VIEW SEE SHEET 4

FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-16

REVISIONS

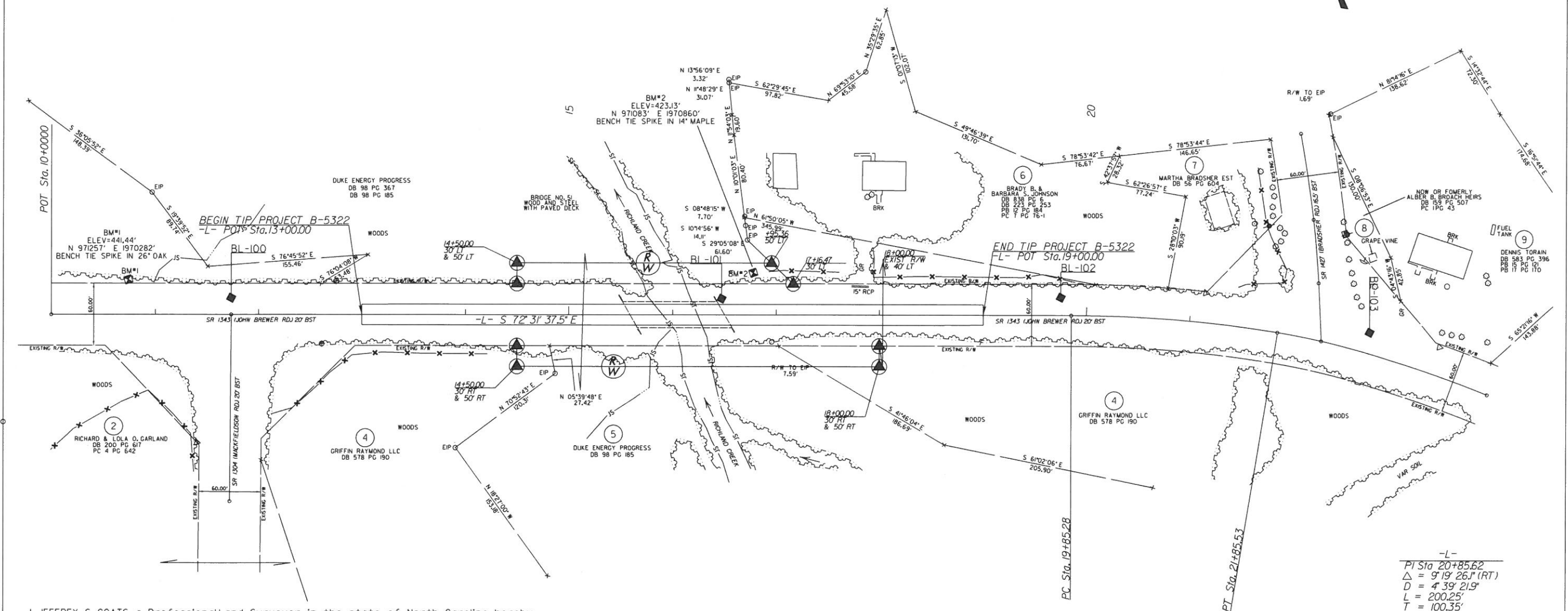
5/14/19

5/14/2018\_B5322\_P01\_PFL\_05.dgn  
USER:JLW

13      14      15      16      17      18      19

# PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO. B-5322	SHEET NO. RW04
Location and Surveys	



-L-  
PI Sta. 20+85.62  
 $\Delta = 9' 19'' 26.1''$  (RT)  
 $D = 4' 39'' 21.9''$   
 $L = 200.25'$   
 $T = 100.35'$   
 $SE = EXIST.$   
 $V_D = 55\text{mph}$

REVISIONS

I, JEFFREY S. COATS, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item(s) (R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures.

I further certify that the right of way and permanent easement points shown herein and outlined in the tables shown hereon (localized coordinates, station/offset) have been checked and are accurate representations of the right of way and permanent easement points depicted on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been field monumented under my supervision from existing survey control provided by others; that the depicted property data shown herein were surveyed by others; and these monuments denote the right of way and easement boundaries at the time of staking which may be subject to change due to right of way revisions (See deeds for final determination).

Witness my original signature, registration number and seal this 6th day of April, 2018.

*Jeffrey S. Coats*  
Professional Land Surveyor

L-3994  
PLS #



## NOTES:

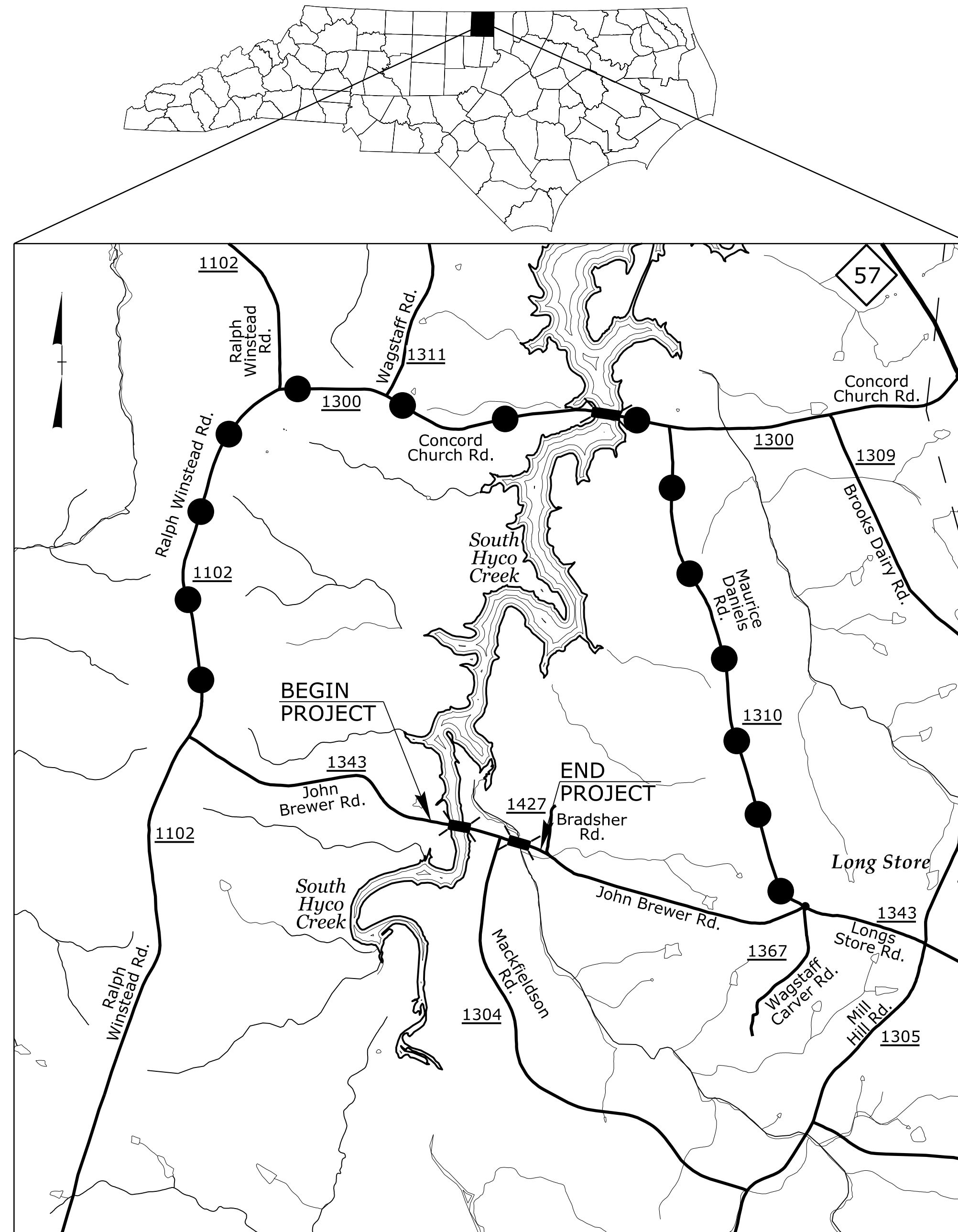
- PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
- THE PROPOSED ALIGNMENT CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**TRANSPORTATION MANAGEMENT PLAN**

**PERSON COUNTY**



—●—●—●—●—●— OFF-SITE DETOUR

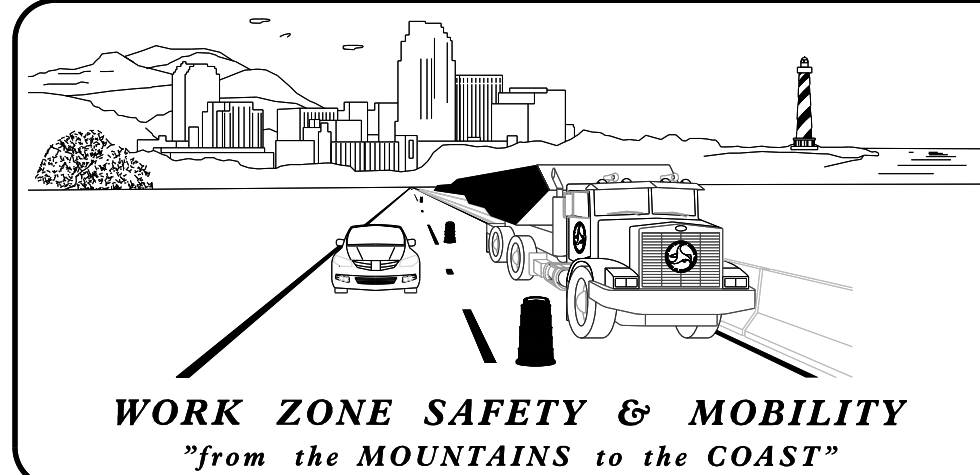
SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, AND LEGEND
TMP-1B	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES, GENERAL NOTES, LOCAL NOTES, AND PHASING)
TMP-2	SPECIAL SIGN DESIGN
TMP-3	OFF-SITE DETOUR

SHEET NO.  
TMP-1

**B-5145 & B-5322**

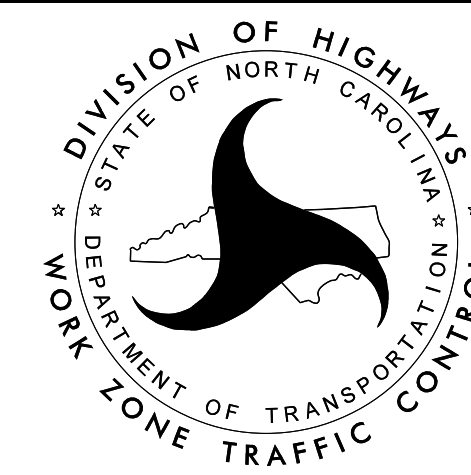
**TIP PROJECT:**

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



**N.C.D.O.T. WORK ZONE TRAFFIC CONTROL**  
1561 MAIL SERVICE CENTER (MSC) RALEIGH, NC 27699-1561  
750 N. GREENFIELD PARKWAY, GARNER, NC 27529 (DELIVERY)  
PHONE: (919) 773-2800 FAX: (919) 771-2745

ANDY YOUNG, PE **TRAFFIC CONTROL PROJECT ENGINEER**  
ELIZABETH PHELPS, EI **TRAFFIC CONTROL DESIGN ENGINEER**



PLANS PREPARED BY:



APPROVED: Andrew P. Young

DATE: 5/9/2018

SEAL



5/9/2018  
\\TC\N\B5145\_B5322\_TC\_TCP-01.dgn  
USER:ayoung




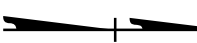

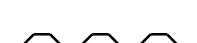
## ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

<u>STD. NO.</u>	<u>TITLE</u>
1101.03	TEMPORARY ROAD CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1130.01	DRUM
1145.01	BARRICADES

## LEGEND







### GENERAL

-  DIRECTION OF TRAFFIC FLOW
-  DIRECTION OF PEDESTRIAN TRAFFIC FLOW
-  EXIST. PVMT.
-  NORTH ARROW
-  PROPOSED PVMT.
-  TEMP. SHORING (LOCATION PURPOSES ONLY)

 WORK AREA

 REMOVAL












### SIGNALS

-  EXISTING
  -  PROPOSED
  -  T
  -  E
  -  M
  -  P
- TEMPORARY




### PAVEMENT MARKINGS

-  EXISTING LINES
-  TEMPORARY LINES




### TRAFFIC CONTROL DEVICES

-  BARRICADE (TYPE III)
-  CONE
-  DRUM
-  SKINNY DRUM
-  TUBULAR MARKER
-  TEMPORARY CRASH CUSHION
-  FLASHING ARROW BOARD
-  FLAGGER
-  LAW ENFORCEMENT
-  TRUCK MOUNTED ATTENUATOR (TMA)
-  CHANGEABLE MESSAGE SIGN

### TEMPORARY SIGNING

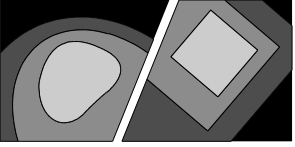
-  PORTABLE SIGN
-  STATIONARY SIGN
-  STATIONARY OR PORTABLE SIGN

### PAVEMENT MARKERS

-  CRYSTAL/CRYSTAL
-  CRYSTAL/RED
-  YELLOW/YELLOW


### PAVEMENT MARKING SYMBOLS

-  PAVEMENT MARKING SYMBOLS




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

STEWART

APPROVED: 

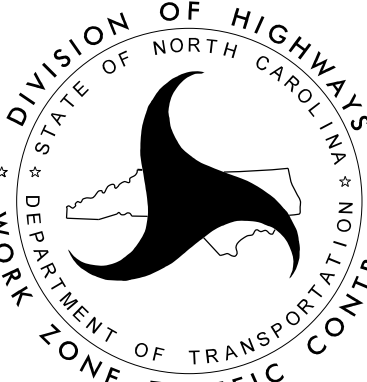
DocuSigned by:  
Andrew P. Young  
EF21083DD02F4EF...

DATE: 5/9/2018



SEAL

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
WORK ZONE TRAFFIC CONTROL

## ROADWAY STANDARD DRAWINGS & LEGEND



## MANAGEMENT STRATEGIES

DURING CONSTRUCTION OF PROPOSED STRUCTURE BRIDGE No. 50 OVER SOUTH HYCO CREEK AND BRIDGE No. 51 OVER RICHLAND CREEK, SR 1343 (JOHN BREWER RD.) WILL BE CLOSED TO THROUGH TRAFFIC. THROUGH TRAFFIC ON SR 1343 (JOHN BREWER RD.) WILL BE MAINTAINED USING AN OFFSITE DETOUR.

THE OFFSITE DETOUR WILL INCLUDE SR 1102, SR 1300, AND SR 1310. (SEE SHEET TMP-3).

ACCESS TO ALL RESIDENCES AND BUSINESSES WITHIN THE PROJECT LIMITS MUST BE MAINTAINED AT ALL TIMES.

## GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

### SIGNING

- A) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRAFFIC CONTROL PLANS.  
  
PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN IN THE TRAFFIC CONTROL PLANS.
- B) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.  
  
COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFF-SITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.
- C) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

## LOCAL NOTES

1. NOTIFY THE ENGINEER AT LEAST 30 DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.
2. NOTIFY THE PERSON COUNTY SCHOOLS TRANSPORTATION DIRECTOR OF THE BRIDGE REMOVAL 30 DAYS PRIOR TO ROAD CLOSURE.
3. NOTIFY THE PERSON COUNTY EMERGENCY MANAGEMENT SERVICES DIRECTOR OF BRIDGE REMOVAL 30 DAYS PRIOR TO ROAD CLOSURE.

## PHASING

### STEP 1:

PROVIDE AND MAINTAIN CHANGEABLE MESSAGE SIGNS AT EACH END OF SR 1343 (JOHN BREWER RD.) FOR FOURTEEN (14) CALENDAR DAYS PRIOR TO ROAD CLOSURE, AS SHOWN ON TMP-3

### STEP 2:

USING RSD 1101.03, SHEET 1 OF 9, SHEETS TMP-2 AND TMP-3, INSTALL ROAD CLOSURE AND DETOUR SIGNS, PLACE TYPE III BARRICADES TO CLOSE SR 1343 (JOHN BREWER RD.) TO THROUGH TRAFFIC, AND DETOUR TRAFFIC OFFSITE. REMOVE CHANGEABLE MESSAGE SIGNS ONCE DETOUR IS IN PLACE.

### STEP 3:

REMOVE THE EXISTING STRUCTURES.

### STEP 4:

CONSTRUCT THE PROPOSED STRUCTURES AND ROADWAY.

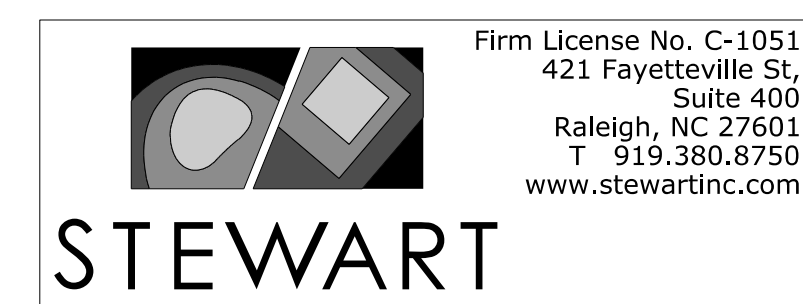
### STEP 5:

PLACE FINAL PAVEMENT MARKINGS ACCORDING TO THE PAVEMENT MARKING PLANS.

### STEP 6:

OPEN SR 1343 (JOHN BREWER RD.) TO TRAFFIC AND REMOVE ALL WORK ZONE TRAFFIC CONTROL DEVICES.

5/9/2018  
\\TCP\B5145\_B5322\_TC\_TCP-01B.dgn  
USER:ayoung

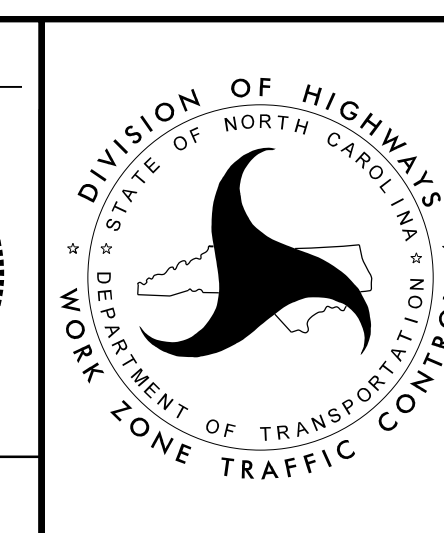


APPROVED: *Andrew P. Young*  
DocuSigned by:  
 Andrew P. Young  
 EF21093DD62F4EF...

DATE: 5/9/2018

SEAL

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





SIGN NUMBER: SP-1  
 TYPE: STATIONARY  
 QUANTITY: SEE PLANS  
 SIGN WIDTH: 3'-0"  
 HEIGHT: 1'-6"  
 TOTAL AREA: 4.5 Sq.Ft.  
 BORDER TYPE: INSET  
 RECESS: 0.38"  
 WIDTH: 0.63"  
 RADII: 1.5"  
 NO. Z BARS:  
 LENGTH:

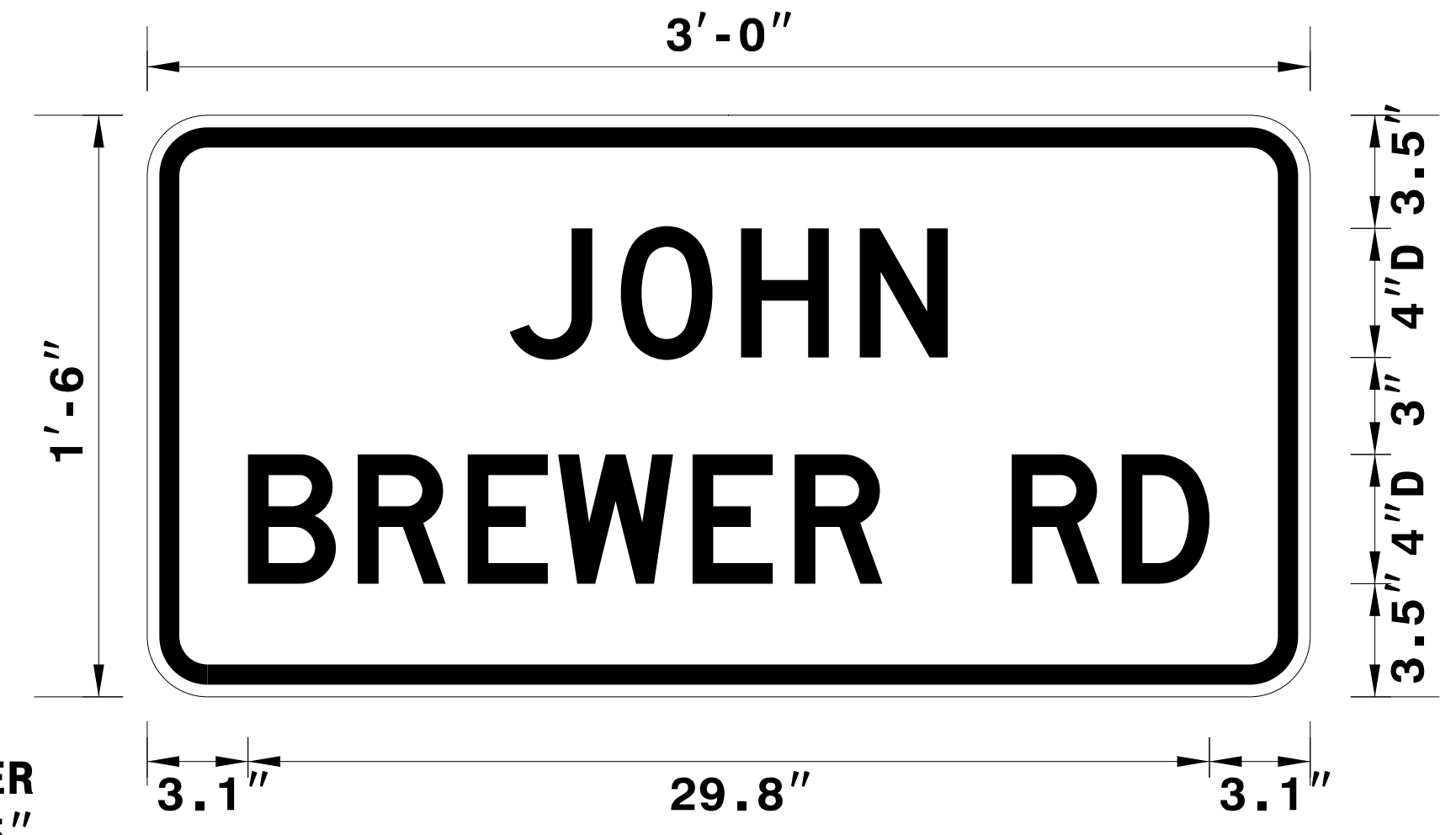
BACKG COLOR: Fluorescent Orange  
 COPY COLOR: Black

SYMBOL	X	Y	WID	HT

MAT'L: 0.080" (2.0 mm) ALUMINUM

USE NOTES: 1,2  
 1. Legend and border shall be direct applied black non-reflective sheeting.  
 2. Background shall be NC GRADE B fluorescent orange retroreflective sheeting.

DESIGN BY: Michael Burns, PE  
 PROJECT ID: B-5145/B-5322  
 CHECKED BY: Andy Young, PE  
 LOCATION: Franklin County  
 Dec 08, 2017  
 DIV: 5



BORDER  
 R=1.5"  
 TH=0.63"  
 IN=0.38"

Panel Style: Traffic Control.ssi  
 M.U.T.C.D.: 2009 Edition  
 Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter locations are panel edge to lower left corner													Series/Size
													Text Length
J	O	H	N										D 2000
11.2	14.7	18.4	22.1										13.6
B	R	E	W	E	R		R	D					D 2000
3.1	6.5	9.9	12.7	16.9	20	22.8	26.8	30.2					29.8

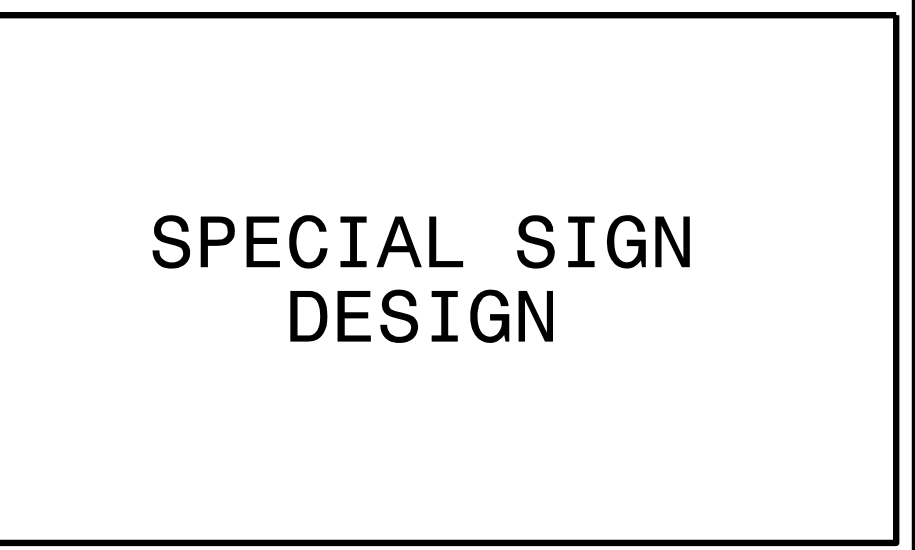
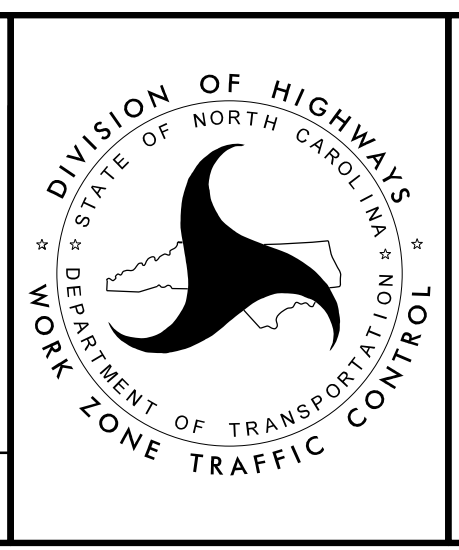
FILENAME: B5145\_B5322\_TC\_TCP-02

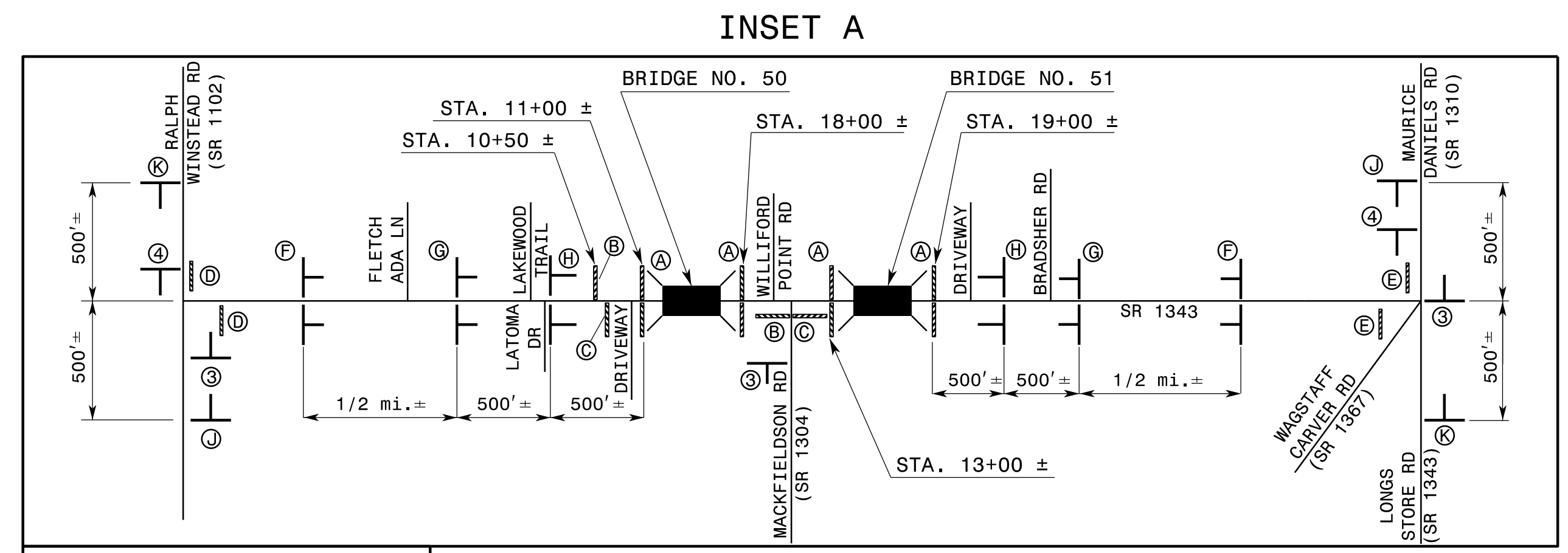
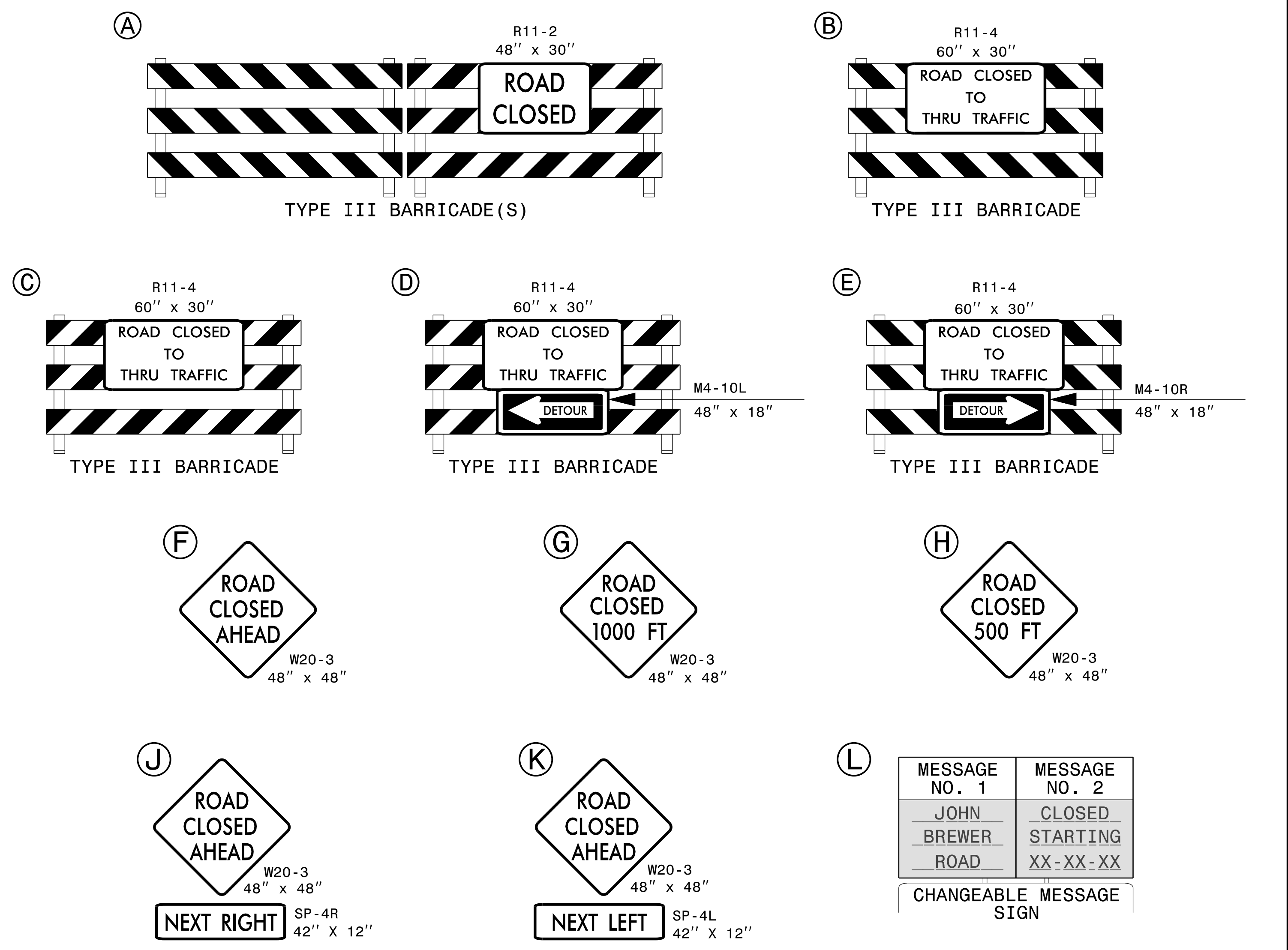
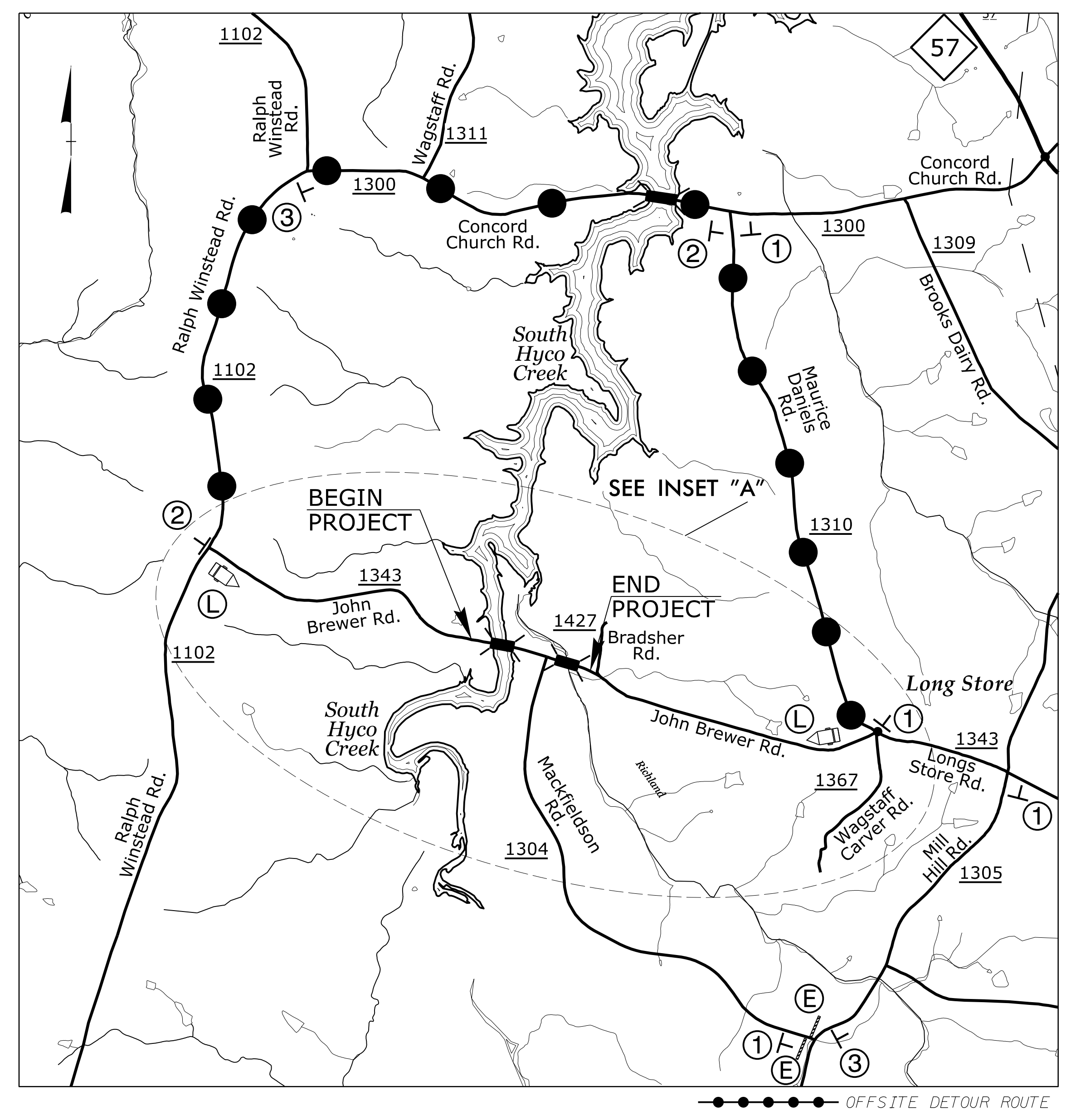
NORTH CAROLINA D.O.T. SIGN DETAIL

5/9/2018  
 \\TCP\B5145\_B5322\_TC\_TCP-02.dgn  
 USER:andyoung

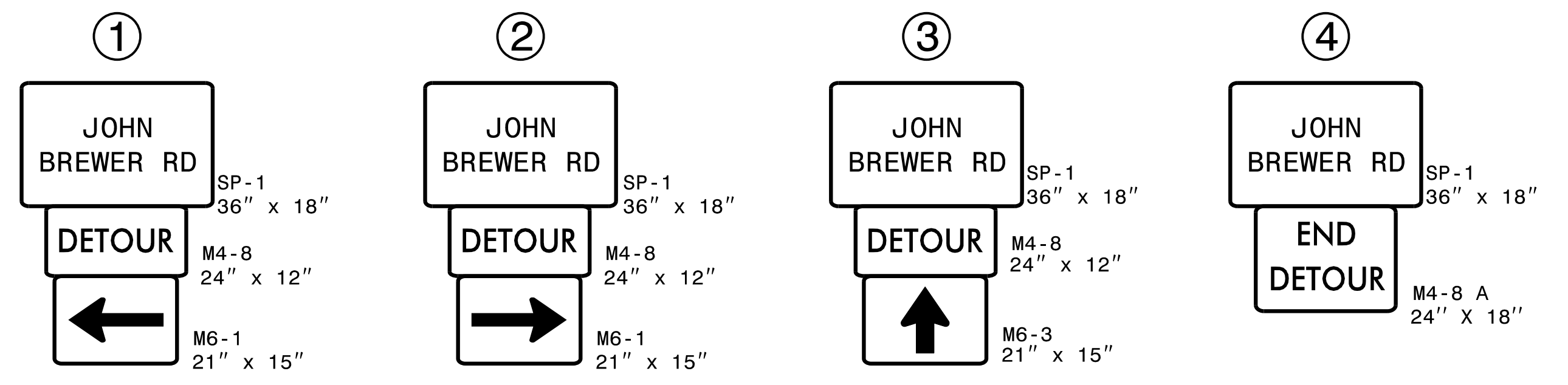


APPROVED: *Andrew D. Young*  
 DATE: 5/9/2018  
 SEAL  
 DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED





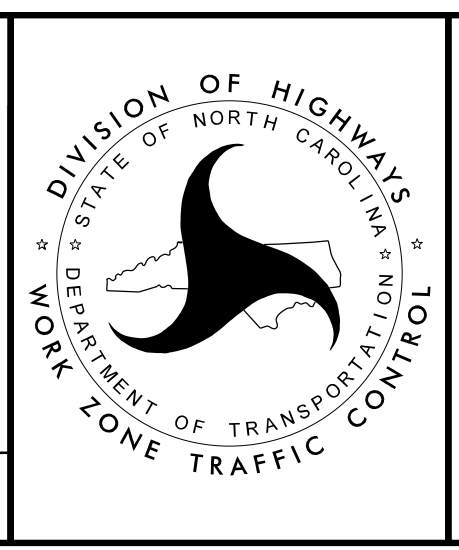
REFER TO ROADWAY STANDARD DRAWING 1101.03, SHEET 1 OF 9 FOR APPLICABLE NOTES.



5/9/2018  
 \\TCP\B5145\_B5322\_TC\_TCP-03.dgn  
 USER:rayoung

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

APPROVED: *Andrew P. Young*  
 DATE: 5/9/2018  
 SEAL  
 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DIVISION OF HIGHWAYS  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 WORK ZONE TRAFFIC CONTROL  
**OFF-SITE DETOUR**



**STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION**

**PAVEMENT MARKING PLAN  
PERSON COUNTY**

LOCATION: BRIDGE NO. 51 OVER RICHLAND CREEK ON SR 1343 (JOHN BREWER RD.)

**T.I.P.: B-5322**

**ROADWAY STANDARD DRAWING**

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

**PAVEMENT MARKING SCHEDULE**

SYMBOL	DESCRIPTION
PA	PAINT WHITE EDGELINE (4") X2
PI	PAINT YELLOW DOUBLE CENTER (4") X2
MA	YELLOW & YELLOW, PERMANENT RAISED PAVEMENT MARKERS

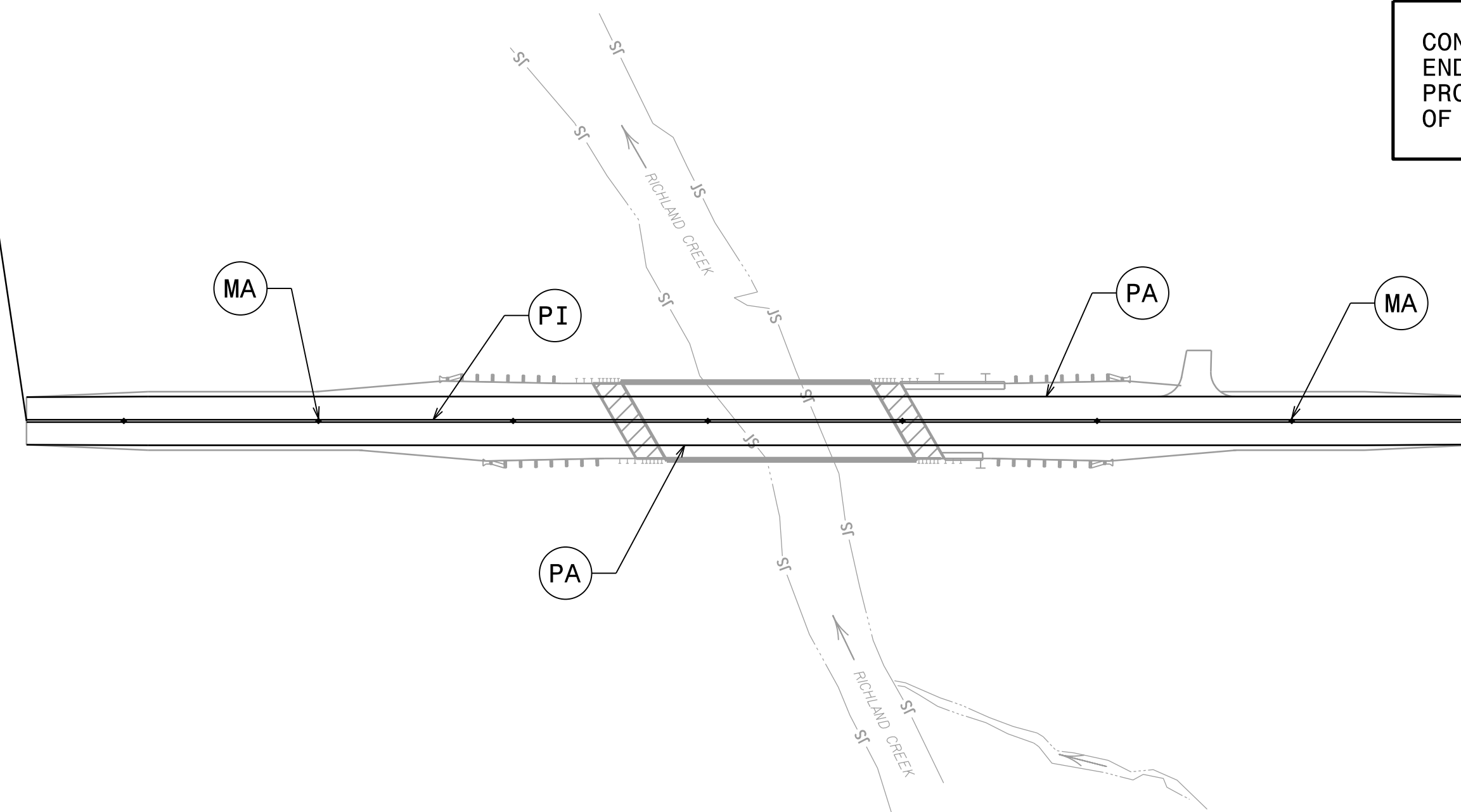
**GENERAL NOTES**

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT, EXCEPT WHEN OTHERWISE NOTED IN THE PLAN, OR DIRECTED BY THE ENGINEER.

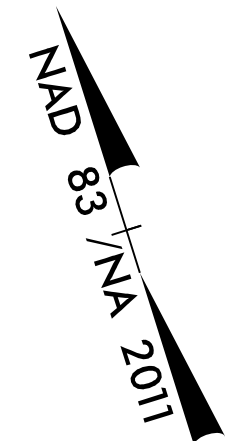
- A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:
- | ROAD NAME       | MARKING | MARKER |
|-----------------|---------|--------|
| JOHN BREWER RD. | PAINT   | RAISED |
- B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
- C) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS.

CONTINUE PROPOSED PAVEMENT MARKINGS FROM END OF TIP PROJECT B-5145 AND TIE TO PROPOSED PAVEMENT MARKINGS AT BEGINNING OF TIP PROJECT B-5322.

BEGIN TIP PROJECT B-5322  
-L- POT Sta.13+00.00



END TIP PROJECT B-5322  
-L- POT Sta.19+00.00



**RAISED PAVEMENT MARKERS**

TYP. SPACING	BEGIN STA.	END STA.
80'	13+00 +/-	19+00 +/-

**PLAN PREPARED BY: STEWART**

**ANDY YOUNG, PE**

PROJECT ENGINEER

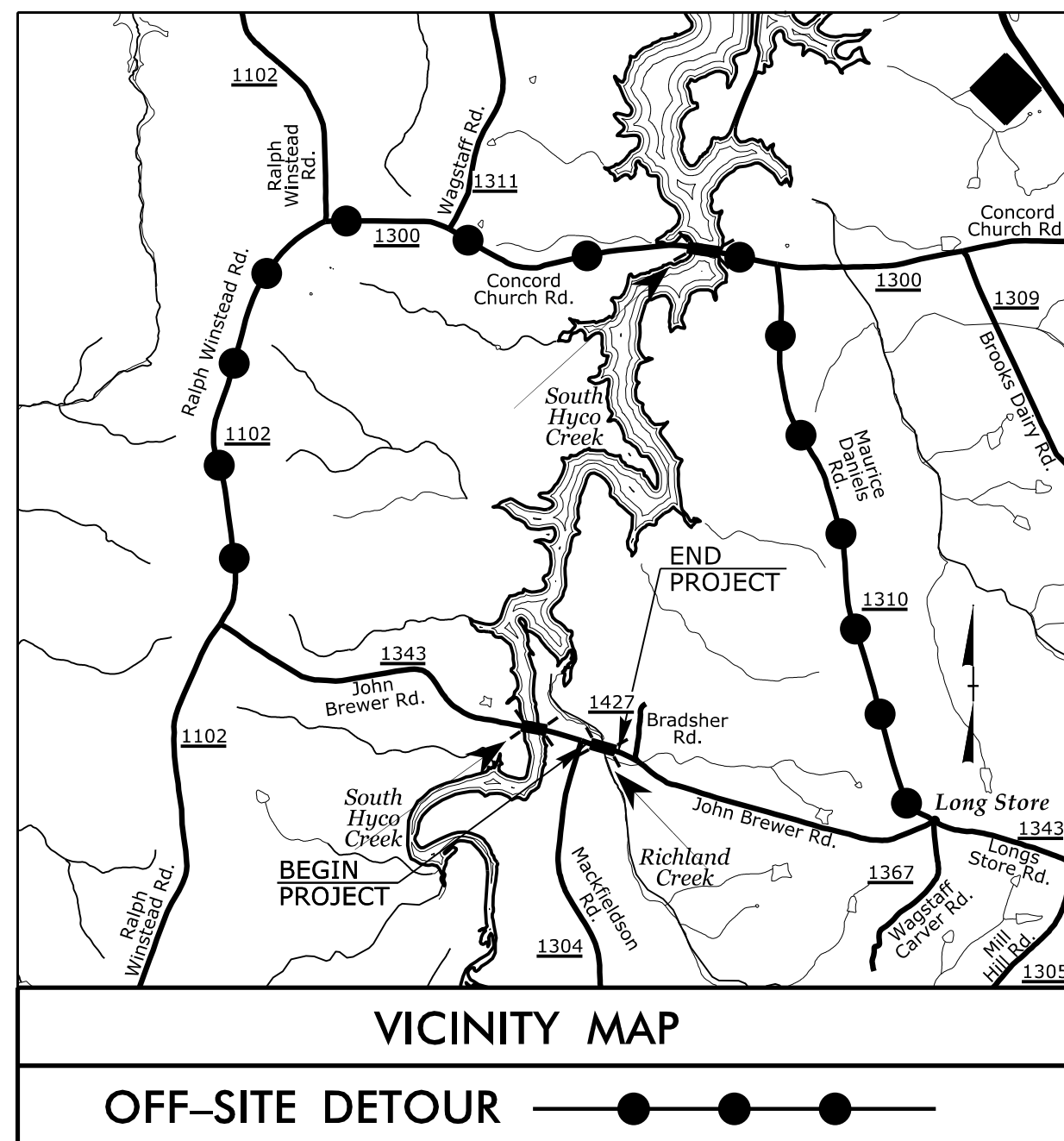
**ELIZABETH PHELPS, EI**

PROJECT DESIGN ENGINEER



**CONTRACT:**

**TIP PROJECT: B-5322**



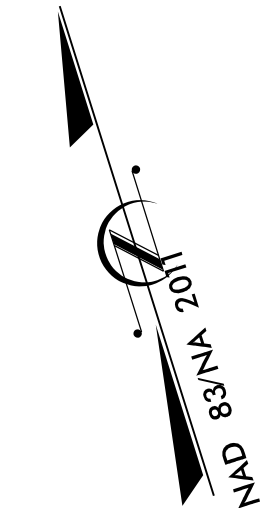
See Sheet 1A For Index of Sheets  
See Sheet 1B For Conventional Symbols

# STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

## PLAN FOR PROPOSED HIGHWAY EROSION CONTROL

**LOCATION: BRIDGE NO. 51 OVER RICHLAND CREEK  
SR 1343 (JOHN BREWER RD.)**

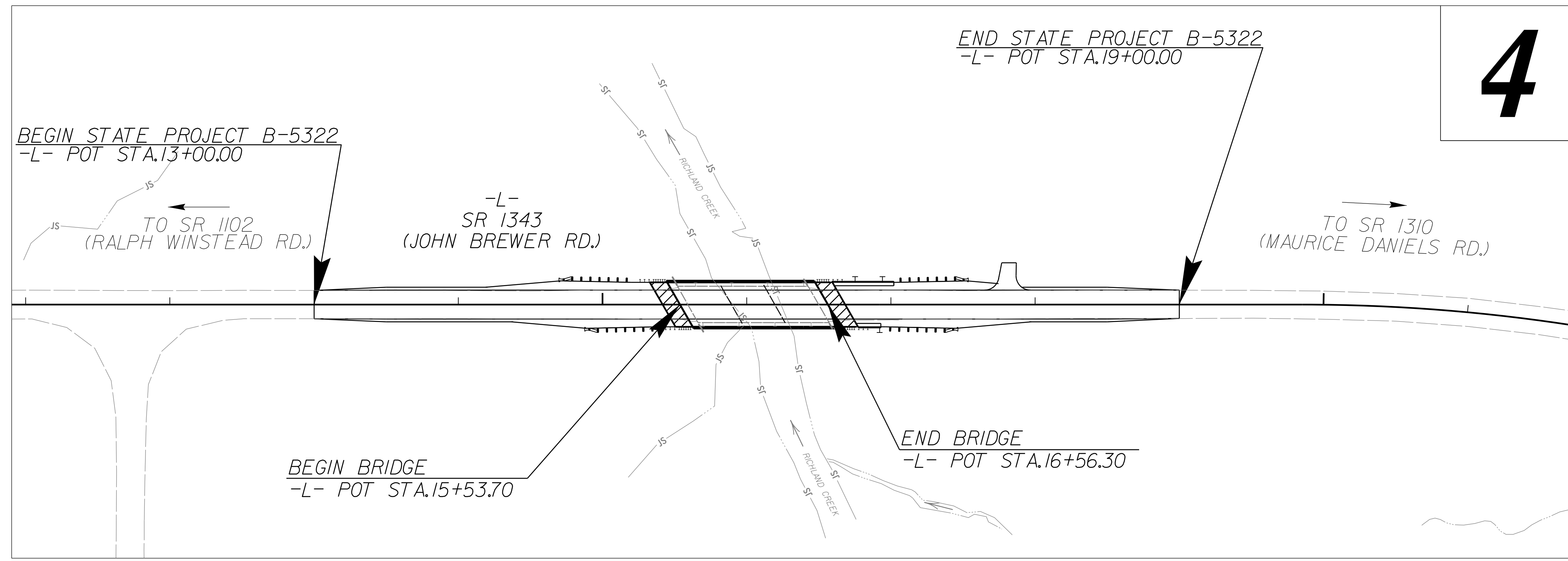
**TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE**



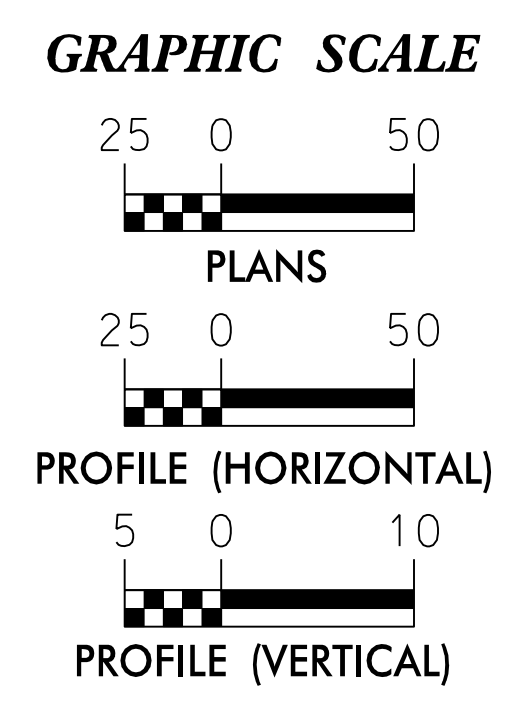
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5322	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
46036.1.1	N/A	PE	

### EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	△△△
1622.01	Temporary Berms and Slope Drains	—
1650.02	Silt Basin Type B	▨
1633.01	Temporary Rock Silt Check Type-A	▩
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	▩
1633.02	Temporary Rock Silt Check Type-B	▩
	Wattle / Coir Fiber Wattle	—
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	—
1634.01	Temporary Rock Sediment Dam Type-A	▩
1634.02	Temporary Rock Sediment Dam Type-B	▩
1655.01	Rock Pipe Inlet Sediment Trap Type-A	⊓
1655.02	Rock Pipe Inlet Sediment Trap Type-B	⊓
1630.04	Stilling Basin	▭
1630.06	Special Stilling Basin	▭
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	▭
	Tiered Skimmer Basin	▭
	Infiltration Basin	▭



**THIS PROJECT CONTAINS  
EROSION CONTROL PLANS  
FOR CLEARING AND  
GRUBBING PHASE OF  
CONSTRUCTION.**



THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 1, 2016 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER RESOURCES.

Prepared in the Office of:

**ECOLOGICAL ENGINEERING**

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

Designed by:

**REID ROBOL, PE**

NAME

**3409**

LEVEL III CERTIFICATION NO.

Reviewed in the Office of:

**ROADSIDE ENVIRONMENTAL UNIT**

1 South Wilmington St.  
Raleigh, NC 27611

**2018 STANDARD SPECIFICATIONS**

Reviewed by:

**DONALD PEARSON**

*Roadway Standard Drawings*

The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2018 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

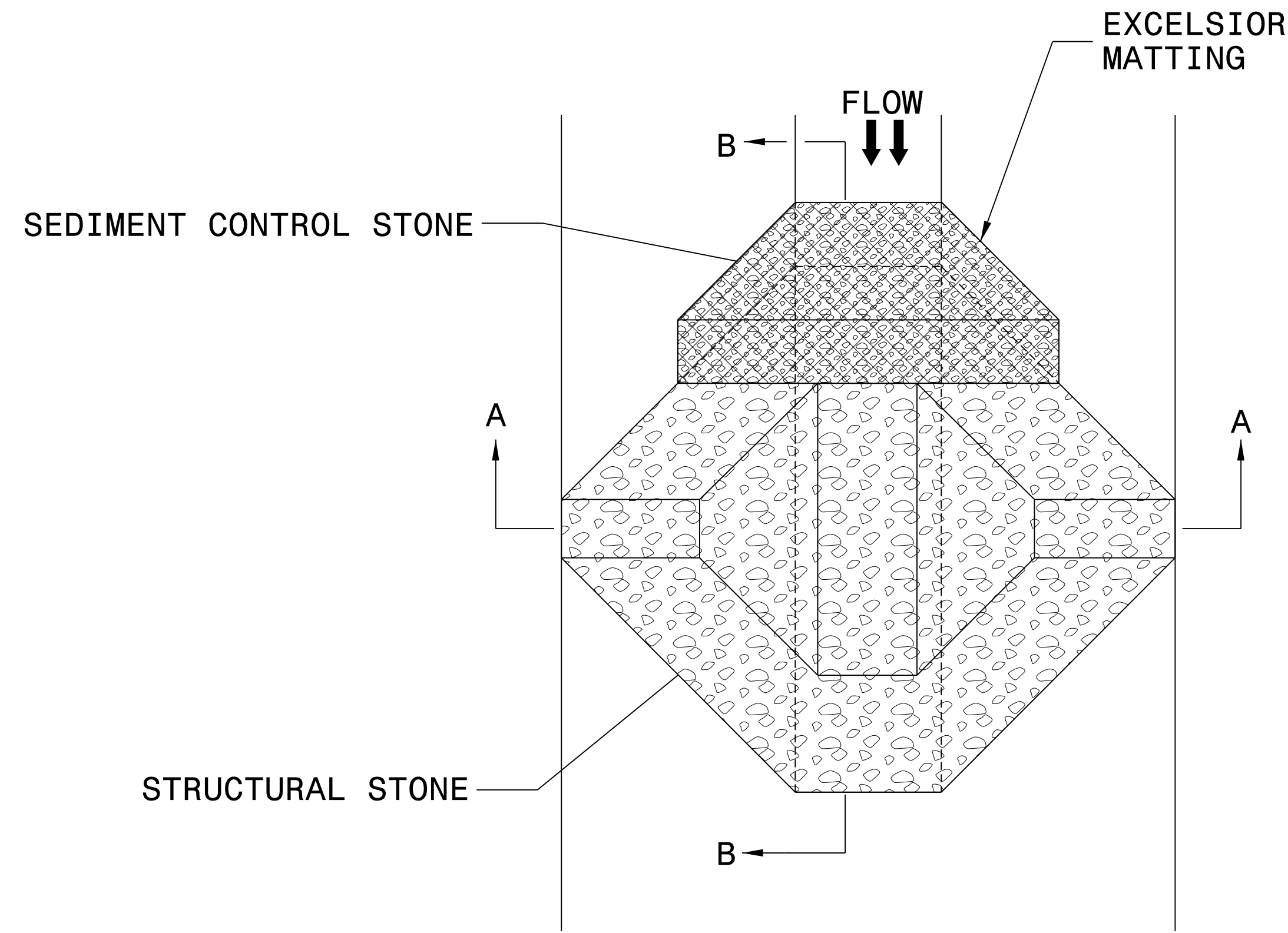
1604.01 Railroad Erosion Control Detail	1632.01 Rock Inlet Sediment Trap Type A
1605.01 Temporary Silt Fence	1632.02 Rock Inlet Sediment Trap Type B
1606.01 Special Sediment Control Fence	1632.03 Rock Inlet Sediment Trap Type C
1607.01 Gravel Construction Entrance	1633.01 Temporary Rock Silt Check Type A
1622.01 Temporary Berms and Slope Drains	1633.02 Temporary Rock Silt Check Type B
1630.01 Riser Basin	1634.01 Temporary Rock Sediment Dam Type A
1630.02 Silt Basin Type B	1634.02 Temporary Rock Sediment Dam Type B
1630.03 Temporary Silt Ditch	1635.01 Rock Pipe Inlet Sediment Trap Type A
1630.04 Stilling Basin	1635.02 Rock Pipe Inlet Sediment Trap Type B
1630.05 Temporary Diversion	1640.01 Coir Fiber Baffle
1630.06 Special Stilling Basin	1645.01 Temporary Stream Crossing
1631.01 Matting Installation	

S:\2018\B5322-REU\EC-TSH.dgn  
10/26/18 10:45:11 AM



PROJECT REFERENCE NO. B-5322	SHEET NO. EC-02
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# TEMPORARY ROCK SILT CHECK TYPE 'A' WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM)



PLAN

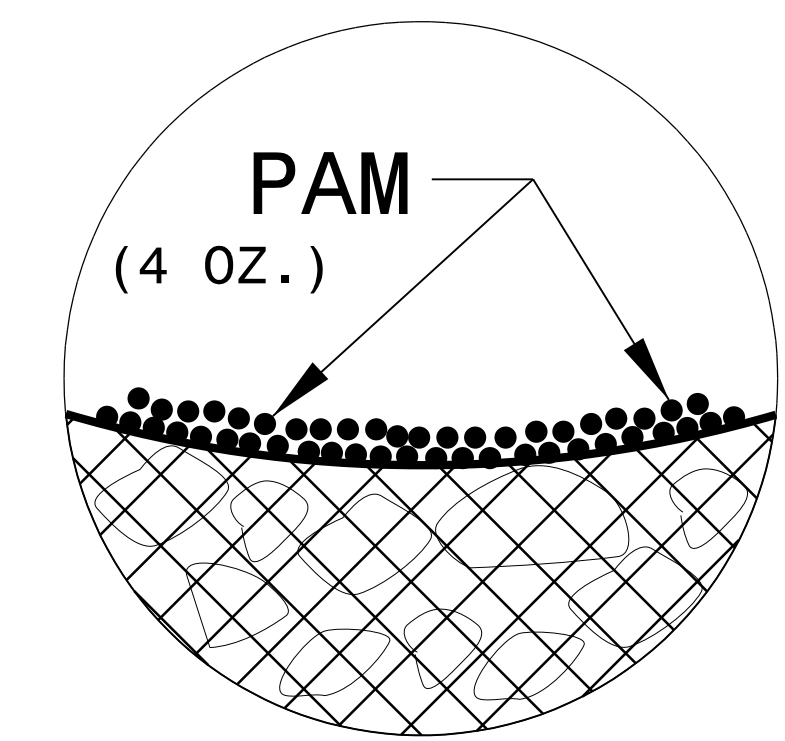
**NOTES:**

INSTALL TEMPORARY ROCK SILT CHECK TYPE A IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1633.01.

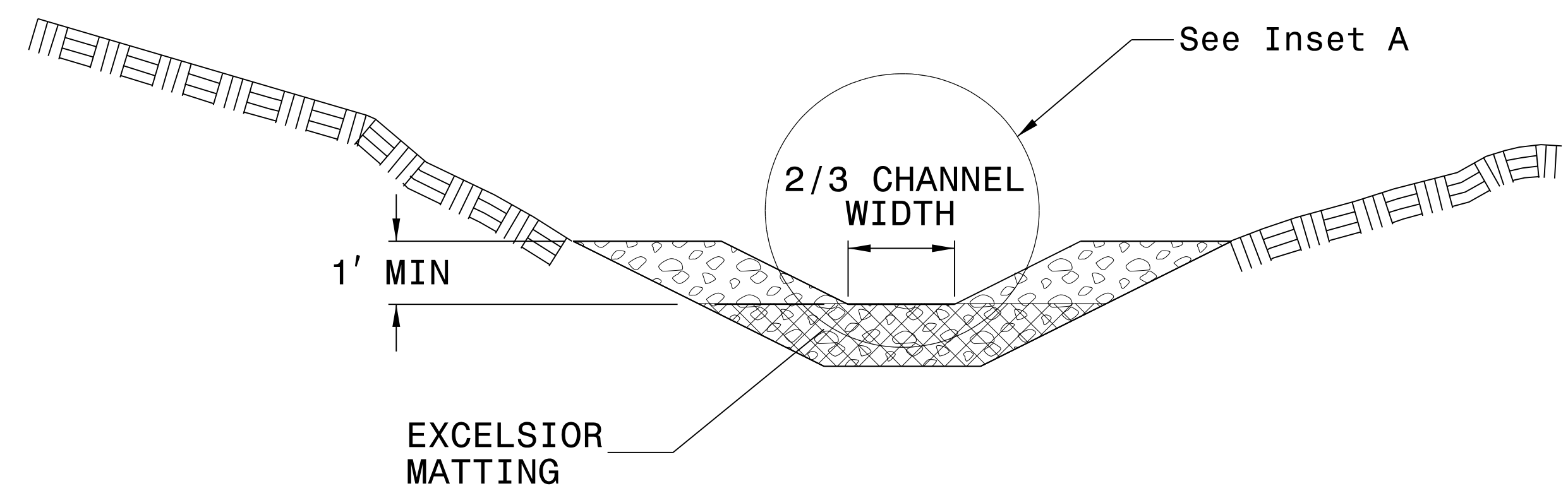
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH ROCK SILT CHECK.

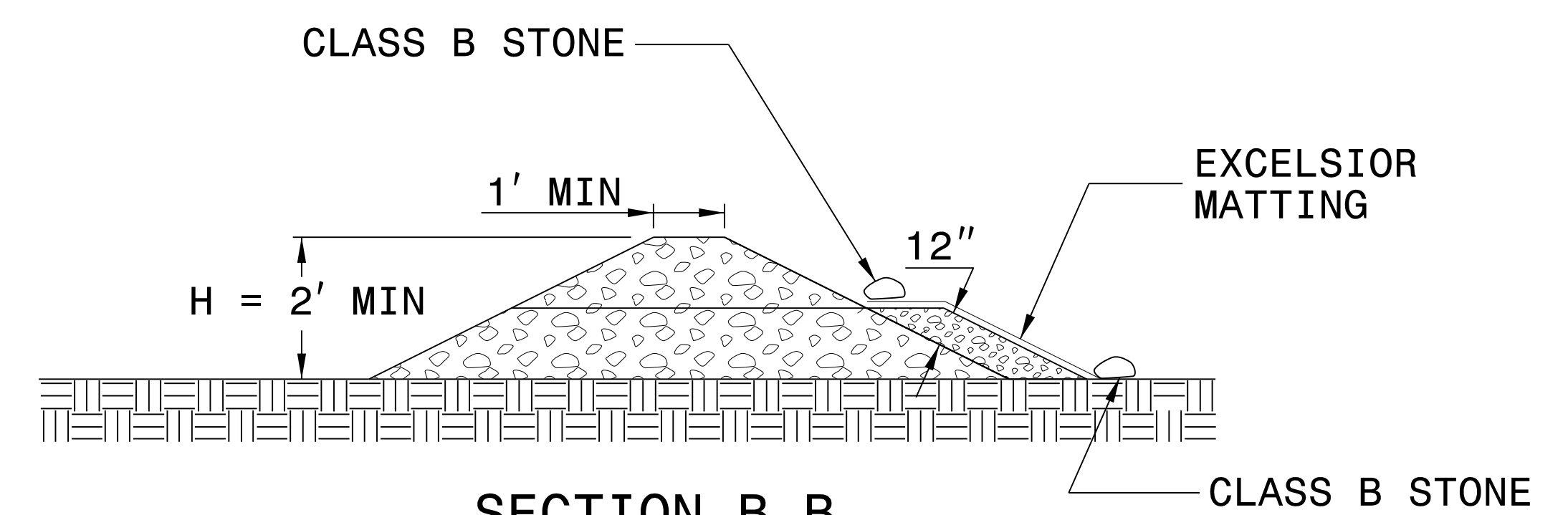
INITIALLY APPLY 4 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



INSET A



SECTION A-A



SECTION B-B

NOT TO SCALE



DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

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## ***SOIL STABILIZATION TIMEFRAMES***

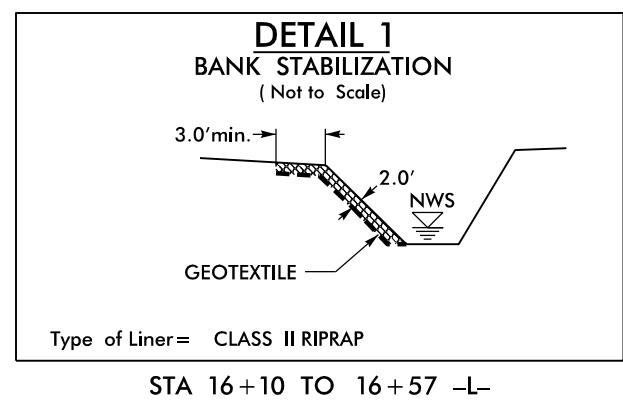
<i>SITE DESCRIPTION</i>	<i>STABILIZATION TIME</i>	<i>TIMEFRAME EXCEPTIONS</i>
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.



PROJECT REFERENCE NO. <b>B-5322</b>	SHEET NO. <b>EC-04/CONST.04</b>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
 STEWART	 ECOLOGICAL ENGINEERING

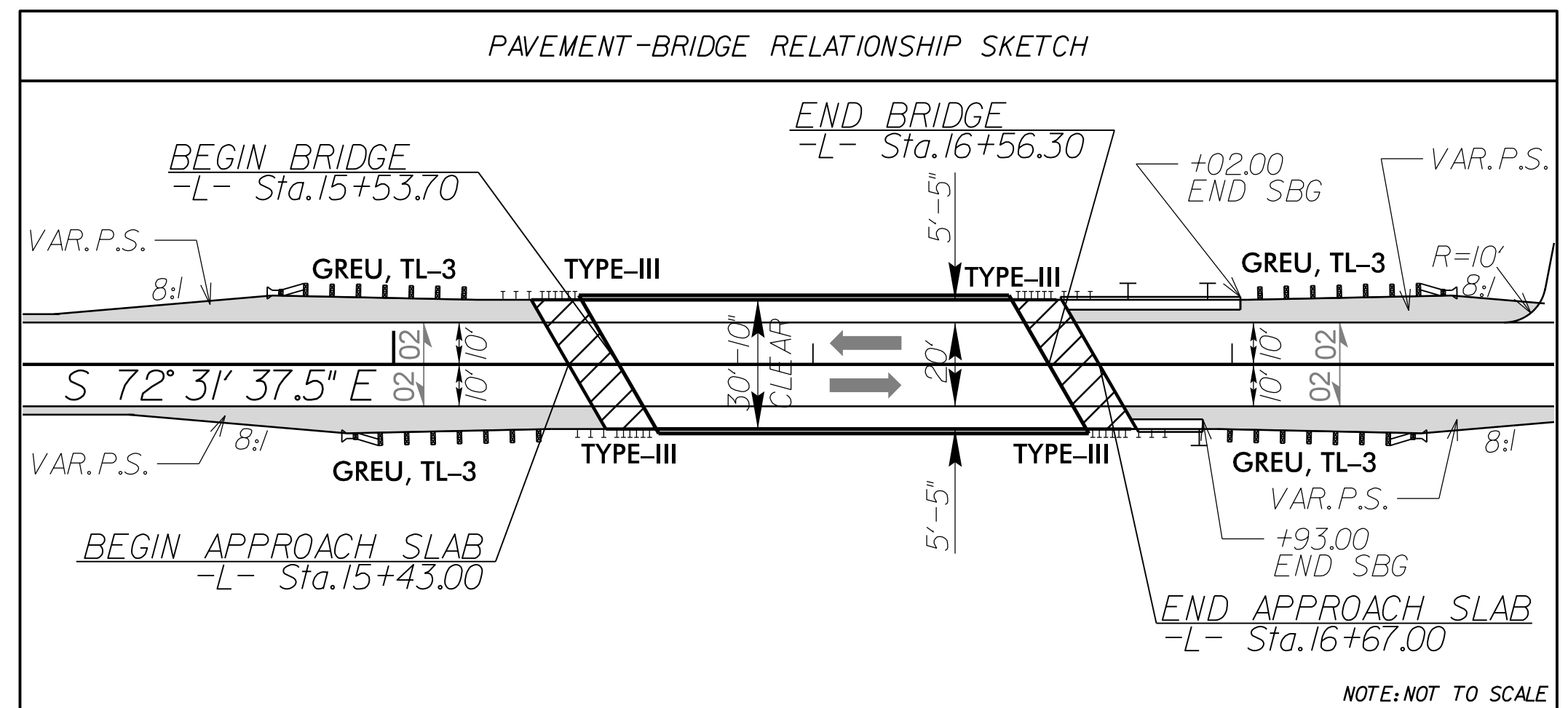
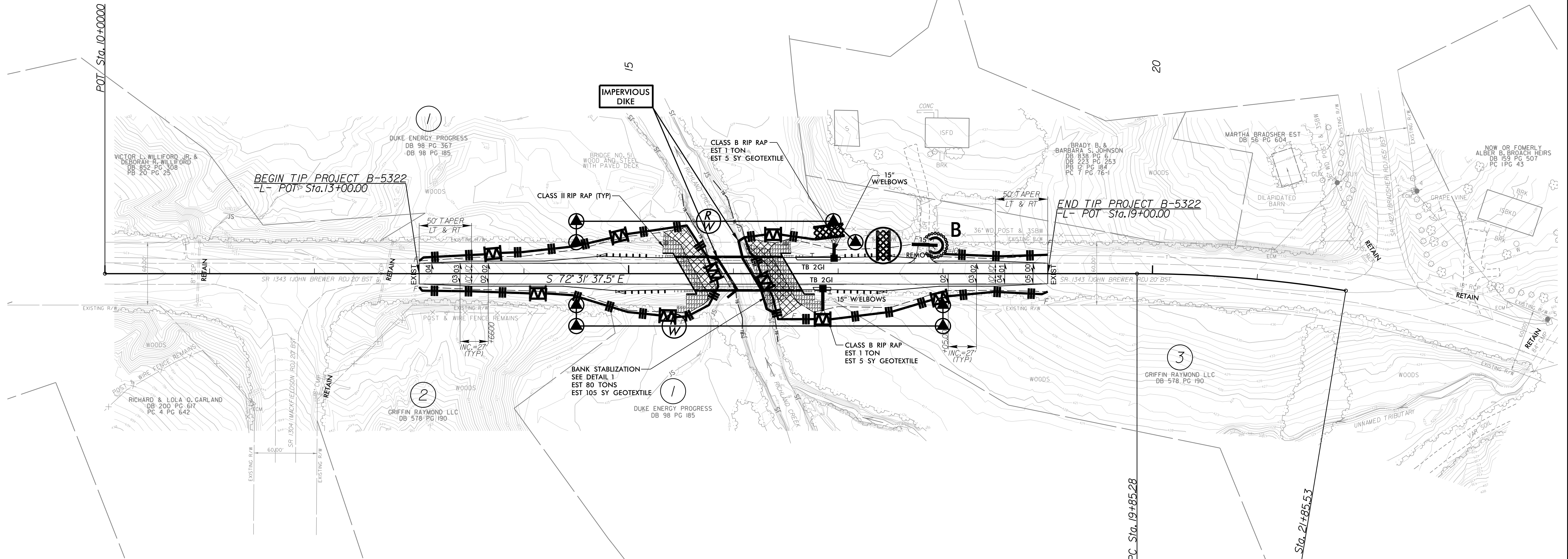
-L-  
 PI Sta 20+85.62  
 $\Delta = 9' 19'' 26.1''$  (RT)  
 $D = 4' 39'' 21.9''$   
 $L = 200.25'$   
 $T = 100.35'$   
 $R = 1,230.56'$   
 $SE = EXIST.$   
 $V_D = 55\text{mph}$

CLEARING AND GRUBBING  
 EROSION CONTROL FOR  
 CONSTRUCTION SHEET 04



1102 VAN  
 838 NAD

REVISIONS



NOTE: THE IMPERVIOUS DIKE IS CONSIDERED INCIDENTAL TO REMOVAL OF THE TIMBER PILES AND INSTALLATION OF RIP RAP BANK STABILIZATION.

FOR -L- PROFILE, SEE SHEET 5  
 FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-16

5/14/99  
 5/1/2018  
 5:\work\B5322.REU.EC.CG.dgn  
 11:58:11 AM



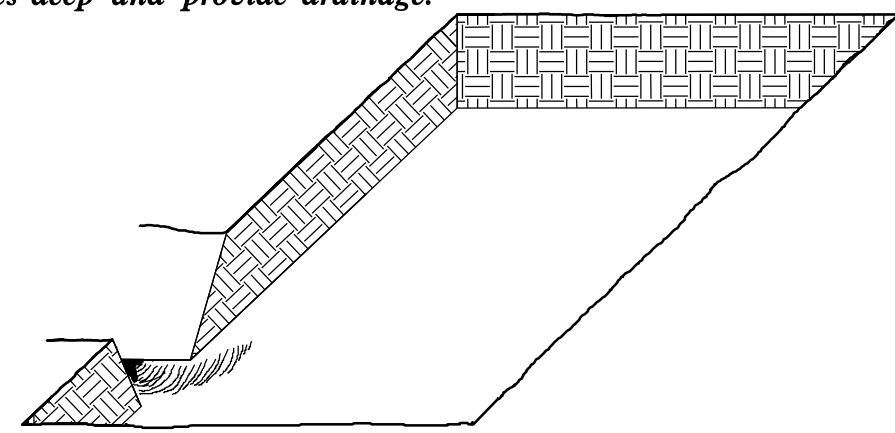


# PLANTING DETAILS

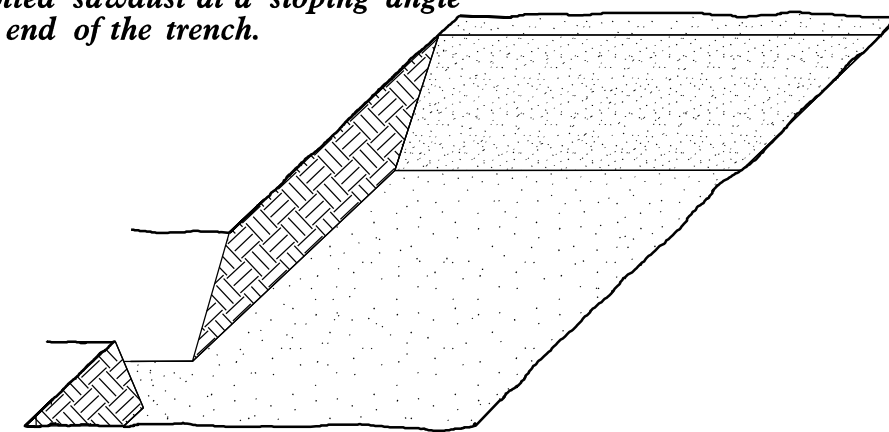
## SEEDLING / LINER BAREROOT PLANTING DETAIL

### HEALING IN

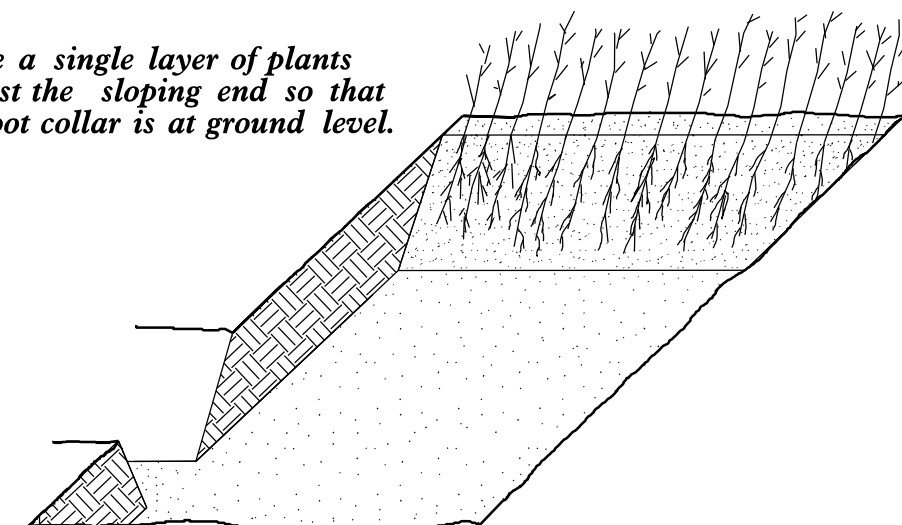
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



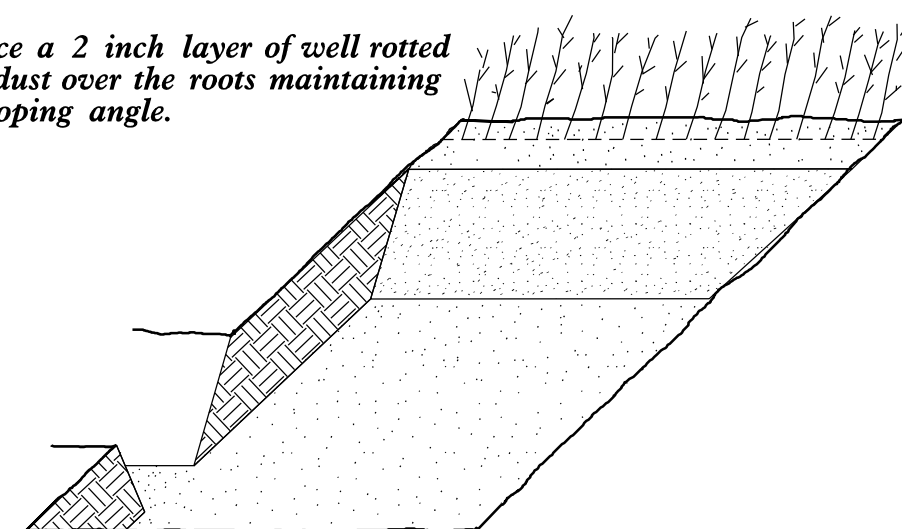
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



4. Place a single layer of plants against the sloping end so that the root collar is at ground level.

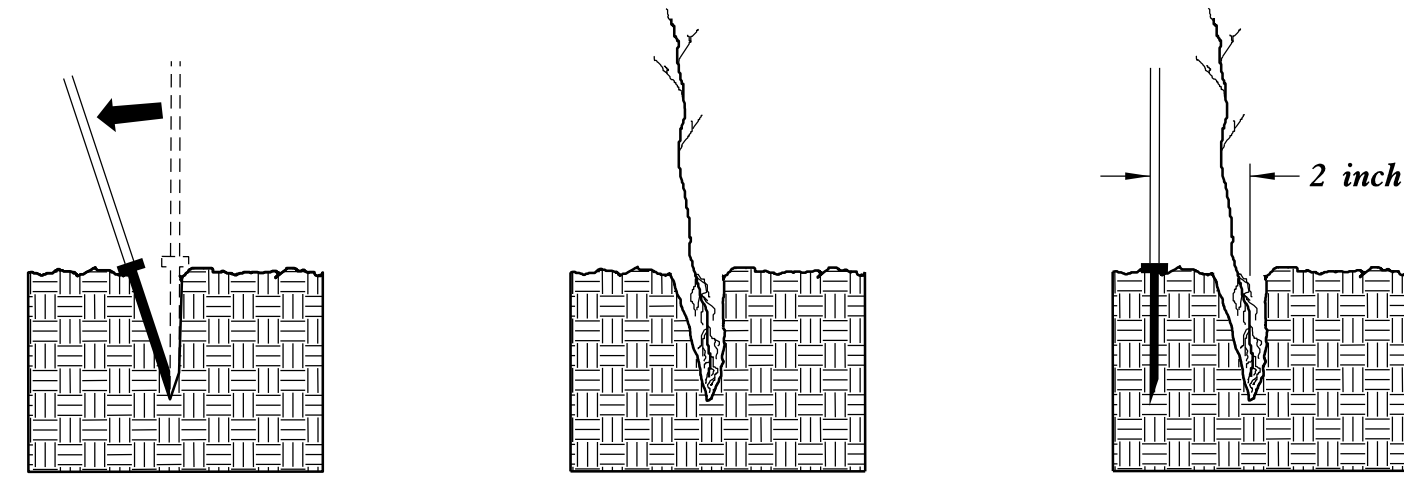


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

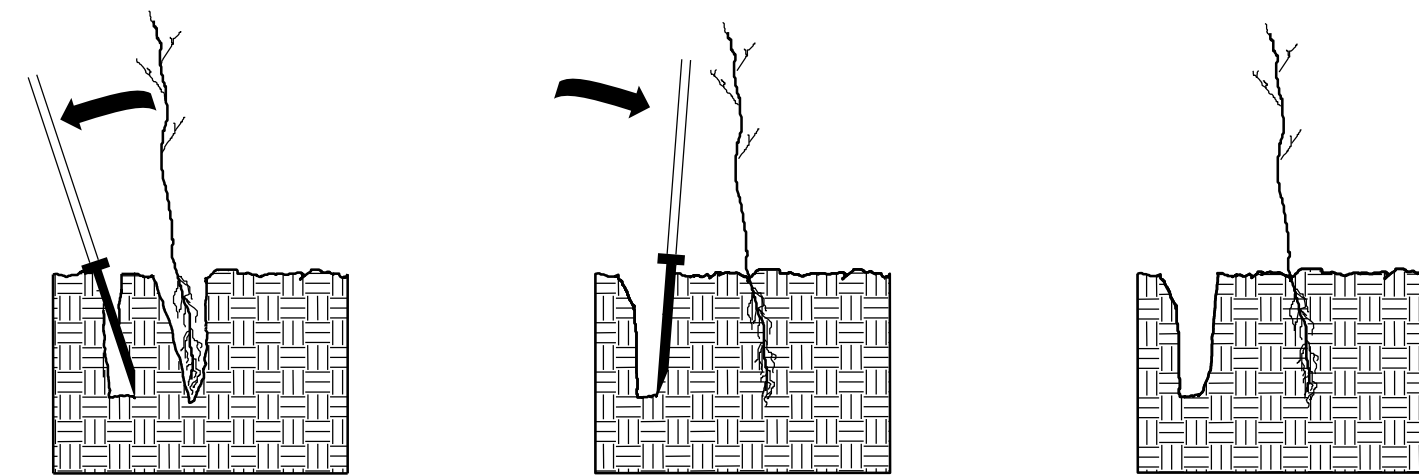


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

### DIBBLE PLANTING METHOD USING THE KBC PLANTING BAR



1. Insert planting bar as shown and pull handle toward planter.
2. Remove planting bar and place seedling at correct depth.
3. Insert planting bar 2 inches toward planter from seedling.



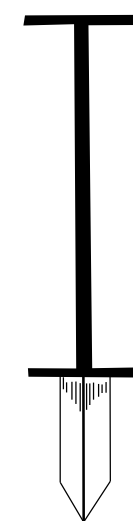
4. Pull handle of bar toward planter, firming soil at bottom.
5. Push handle forward firming soil at top.
6. Leave compaction hole open. Water thoroughly.

### PLANTING NOTES:

**PLANTING BAG**  
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.



**KBC PLANTING BAR**  
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.



**ROOT PRUNING**  
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

## REFORESTATION

- TREE REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

### REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

33%	LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in - 18 in BR
33%	PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	12 in - 18 in BR
34%	BETULA NIGRA	RIVER BIRCH	12 in - 18 in BR

## REFORESTATION DETAIL SHEET

N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT



09.08/99

**TIP PROJECT: B-5322**

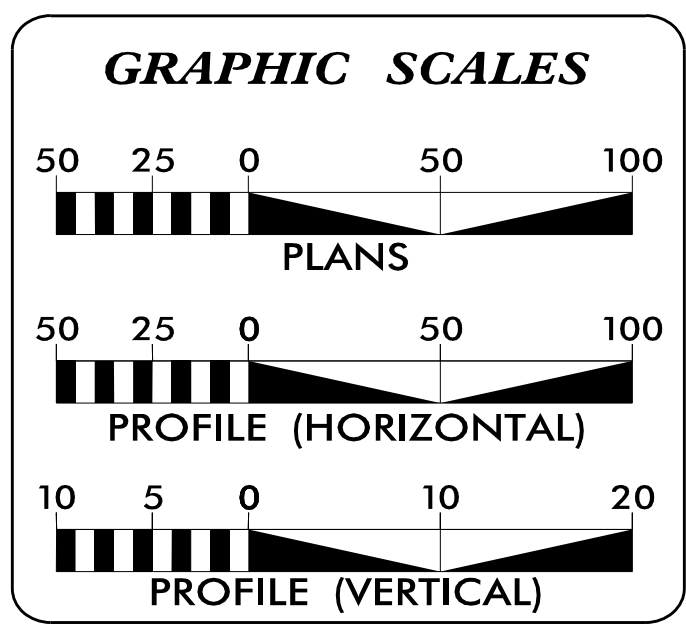
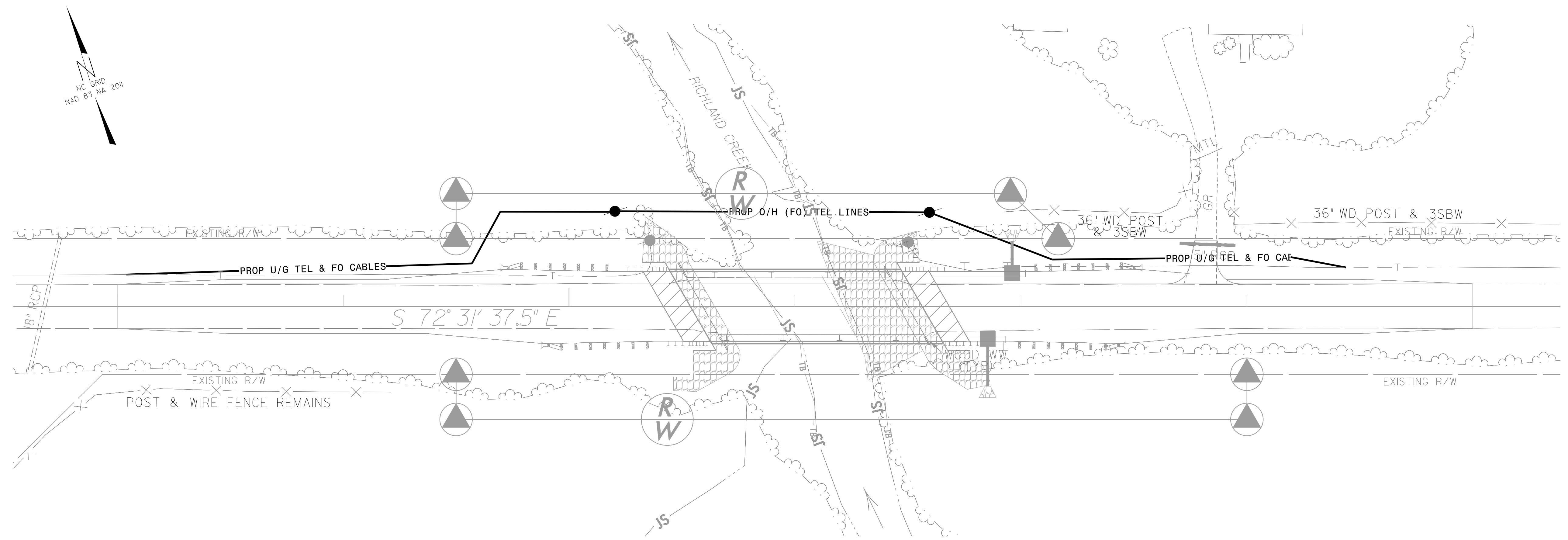
T.I.P. NO.	SHEET NO.
<b>B-5322</b>	<b>UO-1</b>

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**UTILITIES BY OTHERS PLANS  
PERSON COUNTY**

**LOCATION: BRIDGE NO. 51 OVER RICHLAND CREEK  
ON SR 1343 (JOHN BREWER RD)**

**TYPE OF WORK: PERMANENT TELECOMMUNICATIONS  
RELOCATION**



**INDEX OF SHEETS**

SHEET NO.	DESCRIPTION
UO-1	TITLE SHEET
UO-2	UTILITY BY OTHERS PLAN SHEET

**UTILITY OWNERS ON PROJECT**

(A) CENTURY LINK - TELECOMMUNICATIONS

PREPARED IN THE OFFICE OF:

**STEWART**

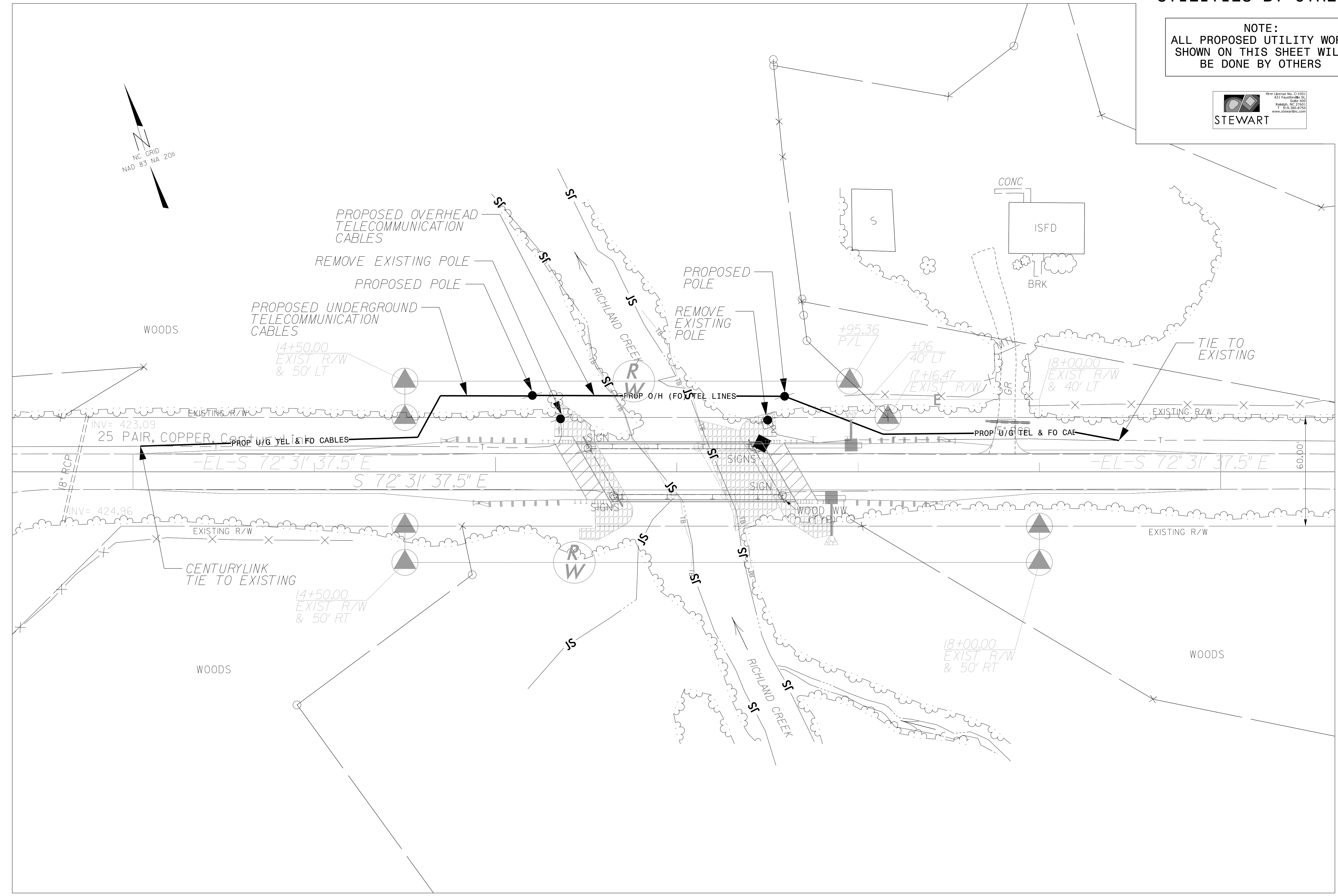
421 FAYETTEVILLE ST., STE 400  
RALEIGH, NC 27601  
TEL: 919.980.0729  
Firm License #: LC-1051  
www.stewartinc.com  
PROJECT #: 0811001

**DAVID RUGGLES, PE** PROJECT ENGINEER  
**ELIZABETH PHELPS, EI** PROJECT DESIGN ENGINEER

1/5/2018 1:50:00 PM I:\720051\UTL\_TSH.dgn

### UTILITIES BY OTHERS

**NOTE:**  
ALL PROPOSED UTILITY WORK  
SHOWN ON THIS SHEET WILL  
BE DONE BY OTHERS



8/17/99

1/5/2008 10:00 PM Proj: A720051\_UTL\_DSND.dgn  
JTS/steve

**STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS**

**CROSS-SECTION SUMMARY**

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

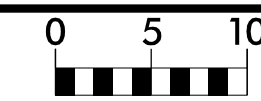
Station	Uncl. Exc.	Embt
L	(cu. yd.)	(cu. yd.)
13+00.00	0	0
13+50.00	44	0
14+00.00	37	0
14+50.00	19	4
15+00.00	6	65
15+50.00	0	145
15+54.00	0	17

Station	Uncl. Exc.	Embt
L	(cu. yd.)	(cu. yd.)
16+56.00	0	0
17+00.00	0	76
17+50.00	0	56
18+00.00	8	25
18+50.00	30	0
19+00.00	47	0

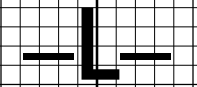
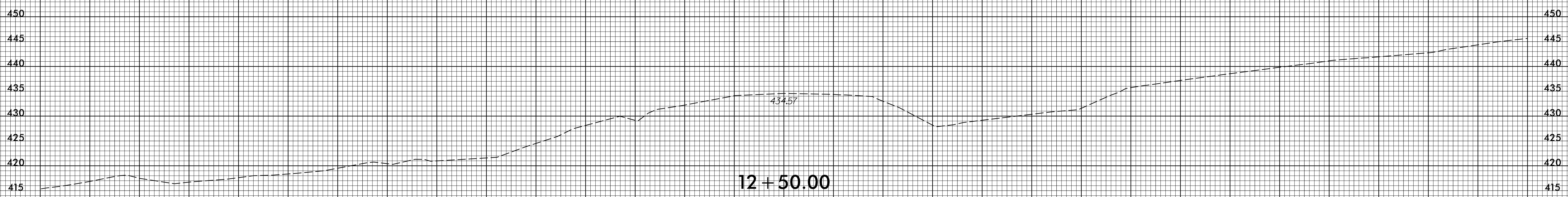
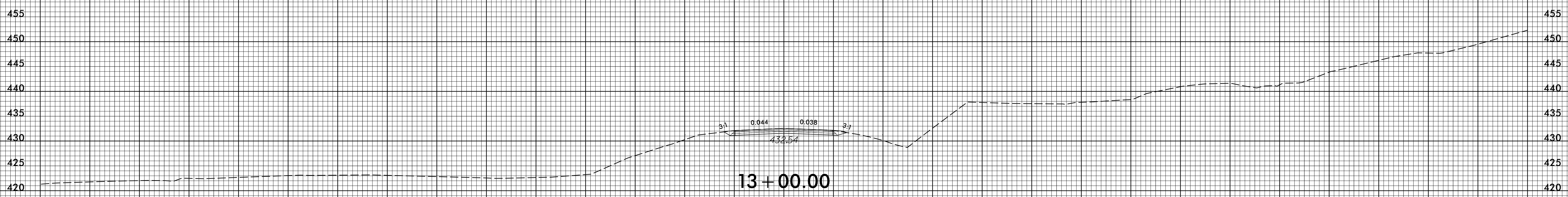
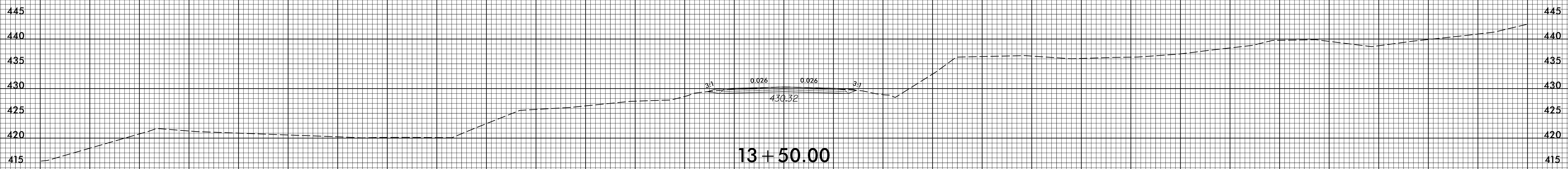
**Approximate quantities only. Unclassified excavation, borrow excavation, shoulder borrow, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the lump sum price for "Grading".**

REVISIONS



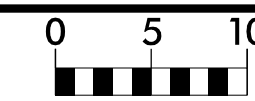


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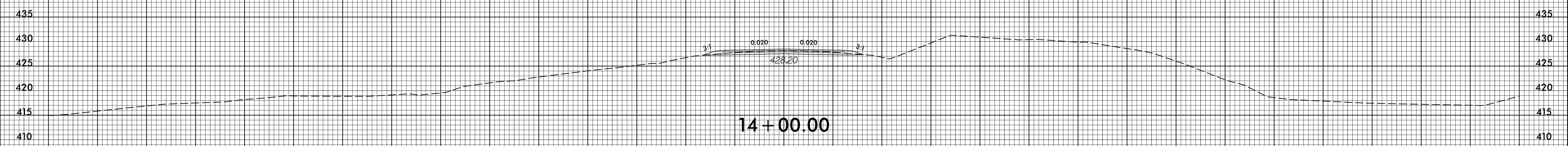
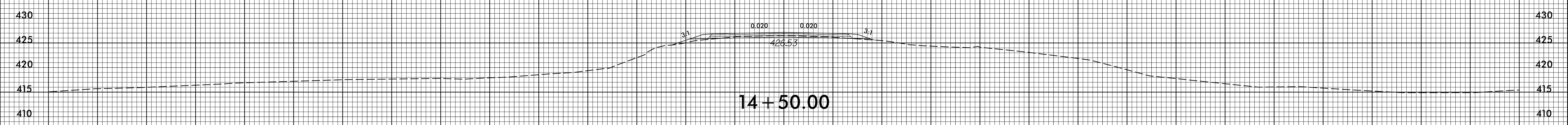
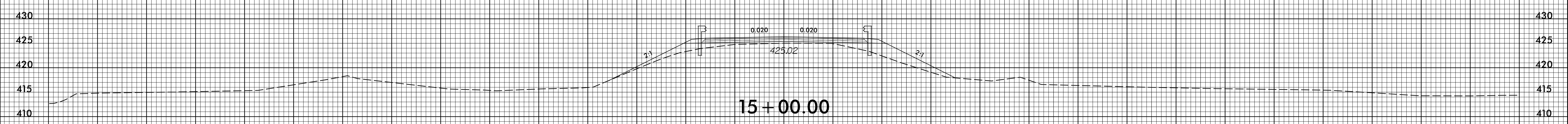
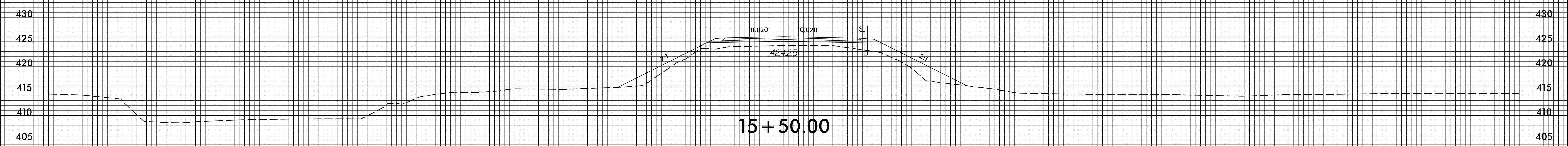
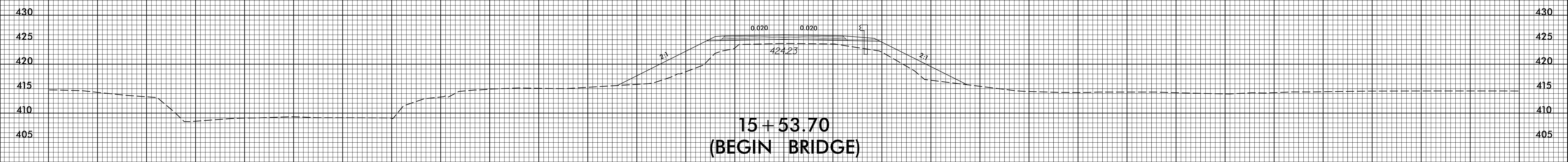
8/23/99



PROJ. REFERENCE NO.  
B-5322

SHEET NO.  
X-2

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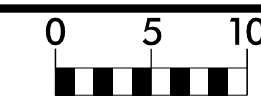


-L-

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5/10/2016  
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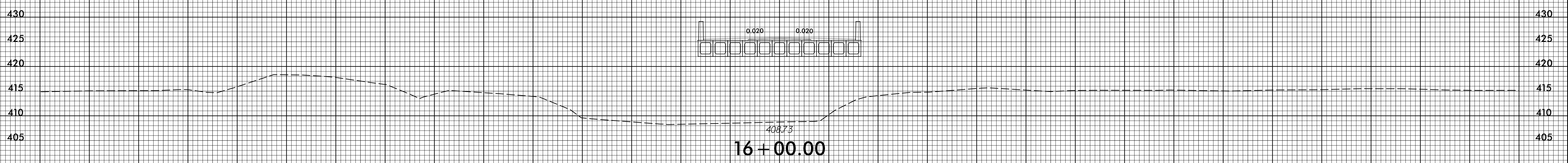
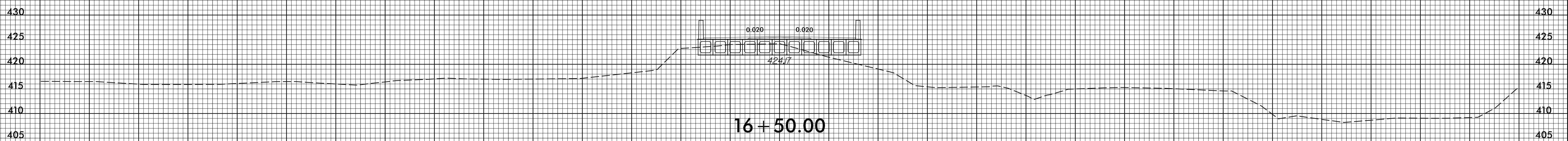
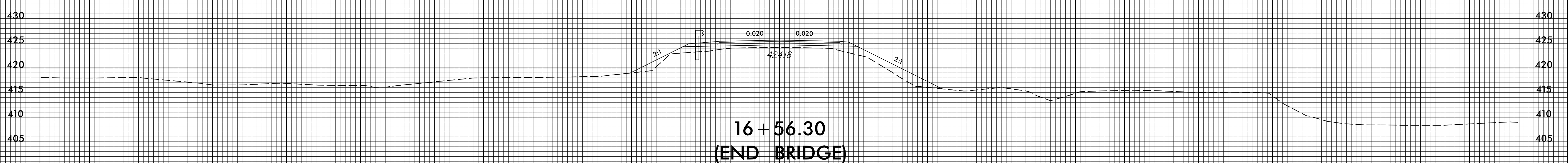
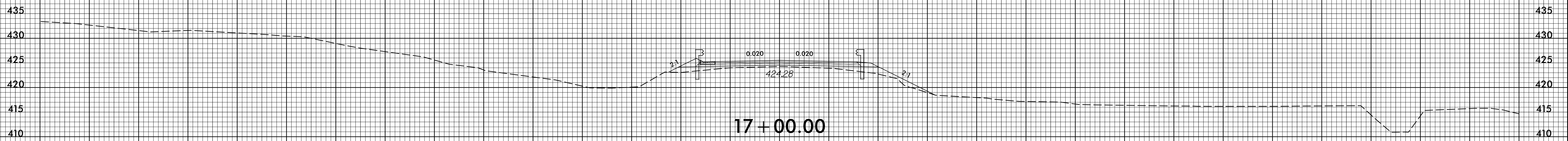
8/23/99



PROJ. REFERENCE NO.  
B-5322

SHEET NO.  
X-3

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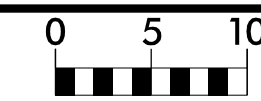
-L-

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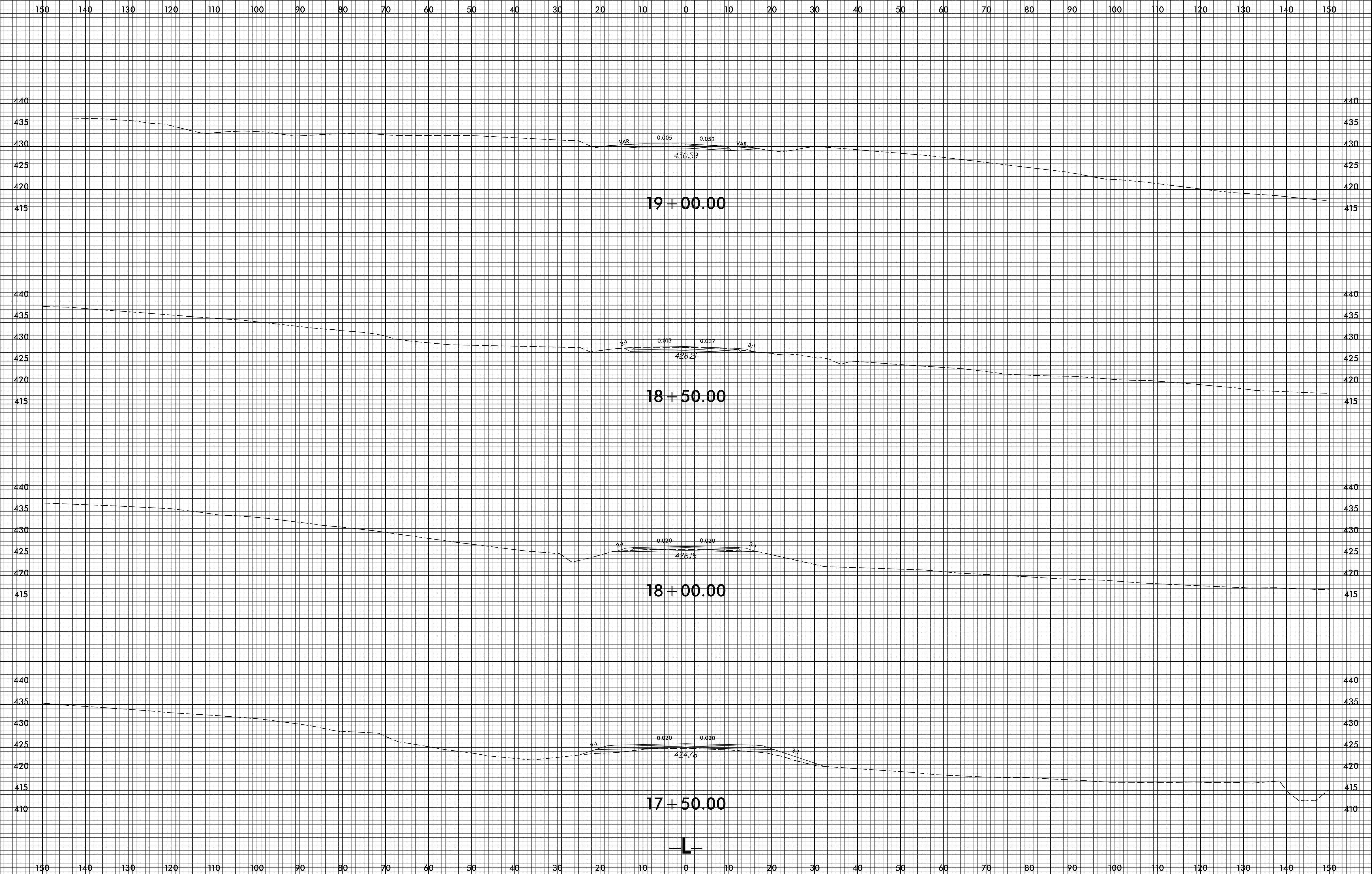


8/23/99



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B-5322

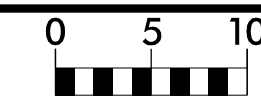
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5/10/2018  
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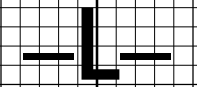
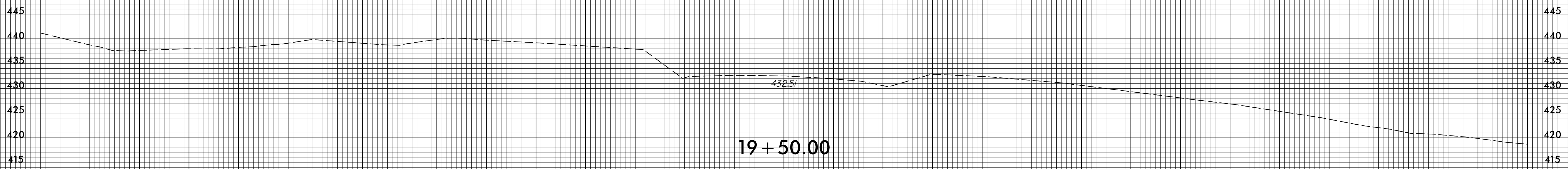
8/23/99



PROJ. REFERENCE NO.
B-5322

SHEET NO.
X-5

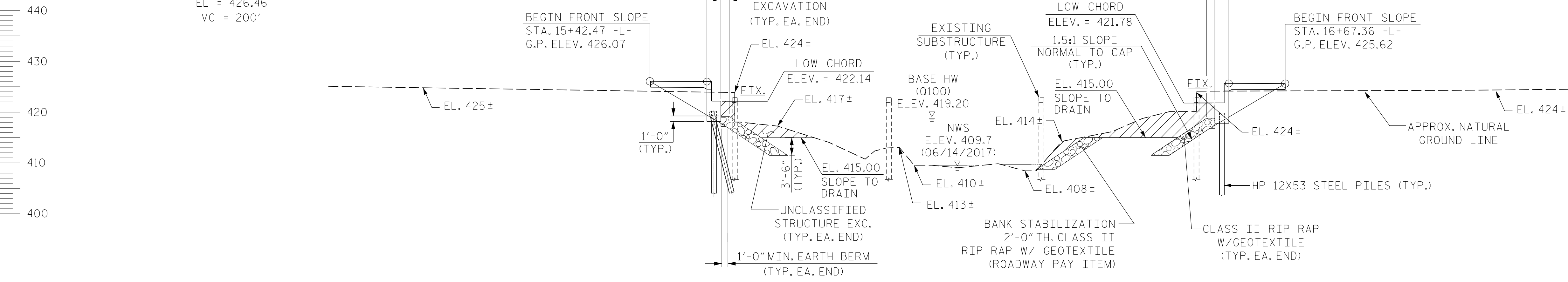
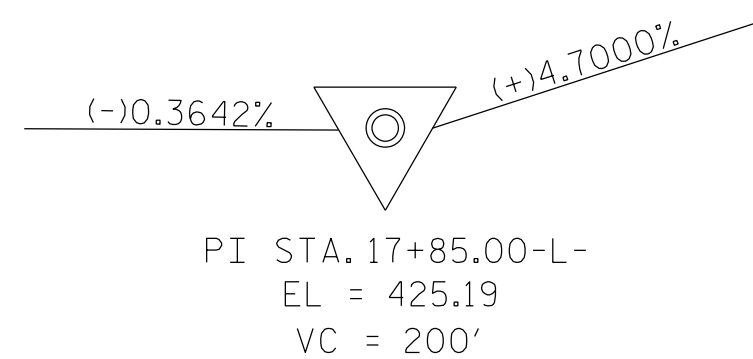
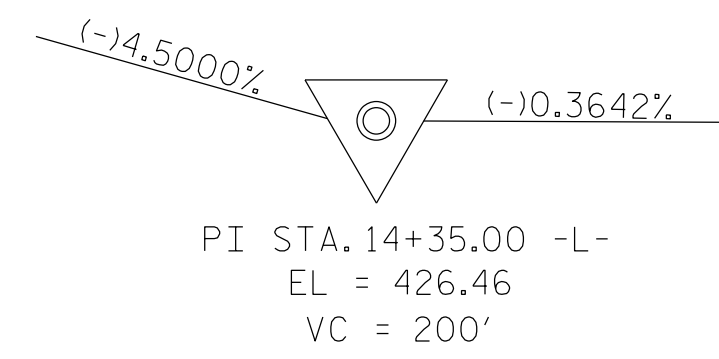
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5/10/2016  
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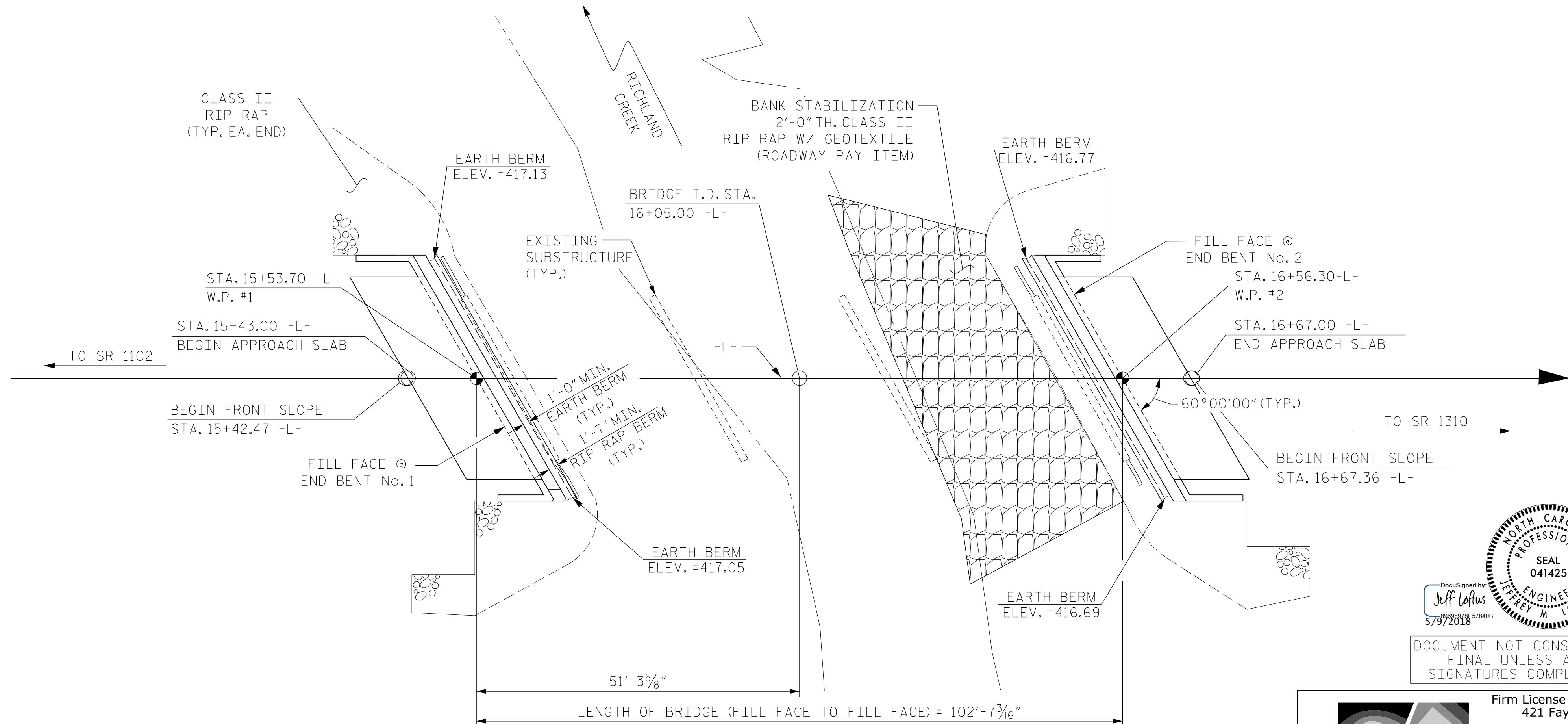
15+00 15+50 16+00 16+50 17+00



SECTION ALONG -L-

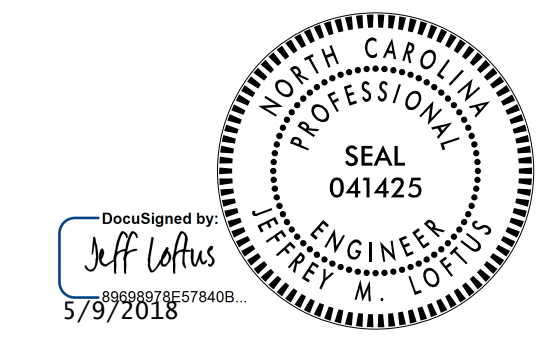
I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

SR 1102 AND SR 1310



PLAN  
(PILES NOT SHOWN FOR CLARITY.)

PROJECT NO. B-5322  
 PERSON \_\_\_\_\_ COUNTY \_\_\_\_\_  
 STATION: 16+05.00 -L-  
 SHEET 1 OF 2 REPLACES BRIDGE 720051



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 T 919.380.8750  
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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 BRIDGE OVER RICHLAND CREEK ON SR 1343  
 (JOHN BREWER RD) BETWEEN SR 1102 AND SR 1310

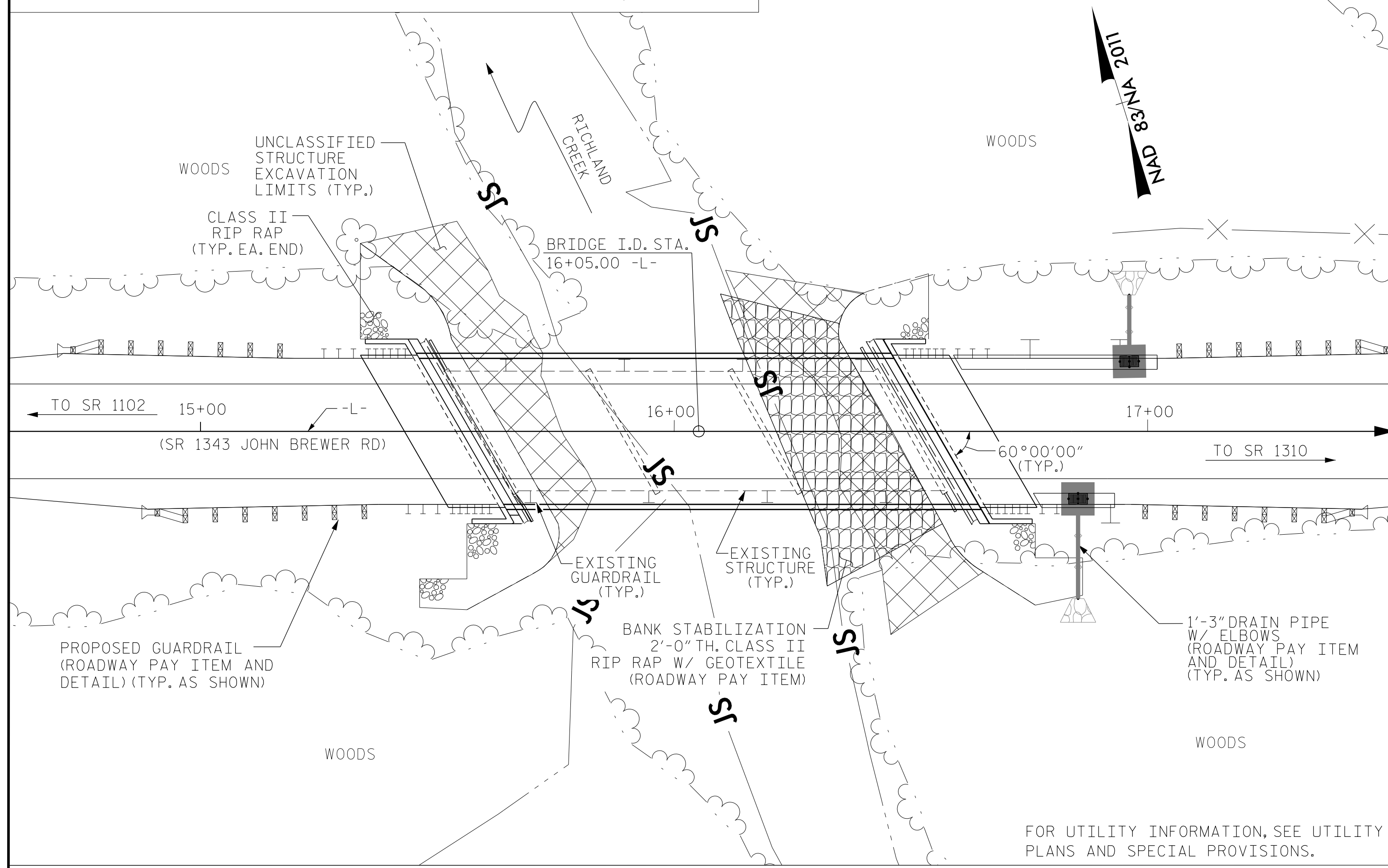
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			16

DRAWN BY: E. PHELPS DATE: 10/17  
 CHECKED BY: J. LOFTUS DATE: 11/17  
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 11/17

PERSON 51  
 4/17/2018  
 \\400\_001\_SMU\_B5322\_GD01.dgn  
 USER: jloftus



BM #2 - BENCH TIE SPIKE IN 14" MAPLE TREE 4' LT. OF -L- STA. 16+78, ELEV. 423.13



LOCATION SKETCH

GENERAL NOTES:

1. ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
2. THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
3. THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
4. THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18 - EVALUATING SCOUR AT BRIDGES."
5. THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCE BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
6. REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
7. FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
8. FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
9. FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
10. FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
11. FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
12. FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
13. ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.
14. THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 45'± FT LEFT SIDE AND 45'± FT RIGHT SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.
15. THE EXISTING STRUCTURE #720051 CONSISTING OF THREE (3) STEEL GIRDER SPANS @ 30'-9", 30'-0", & 30'-9" (91'-6" TOTAL LENGTH), 24"-4" CLEAR ROADWAY WIDTH AND TIMBER DECK WITH AN ASPHALT WEARING SURFACE ON TIMBER END BENTS & BENTS WITH TIMBER PILES AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED IN THEIR ENTIRETY. IF ANY EXISTING TIMBER PILES ARE UNABLE TO BE REMOVED IN THEIR ENTIRETY AND UPON APPROVAL OF ENGINEER, CONTRACTOR SHALL SAW CUT THE UNREMOVED PORTIONS TO ONE FOOT BELOW THE MUD LINE. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
16. INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 16+05.00 -L-."
17. FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

FOUNDATION NOTES:

1. FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
2. PILES AT END BENT NO.1 AND END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.
3. DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 195 TONS PER PILE.
4. STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT NO.1. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
5. DRILLED-IN PILES ARE REQUIRED FOR END BENT NO.2. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 408.0 FT. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
6. CONCRETE OR GROUT IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT END BENT NO.2.

HYDRAULIC DATA	
DESIGN DISCHARGE	1900 CFS
FREQUENCY OF DESIGN FLOOD	25 YR.
DESIGN HIGHWATER ELEV.	417.90 FT.
DRAINAGE AREA	8.0 SQ. MI.
BASE DISCHARGE (Q100)	2700 C.F.S
BASE HIGHWATER ELEV.	419.20 FT
OVERTOPPING FLOOD DATA	
OVERTOPPING DISCHARGE	7733 CFS
FREQUENCY OF OVERTOPPING FLOOD	500+ YR.
OVERTOPPING FLOOD ELEV.	* 425.50 FT.
* OVERTOPPING STA. 17+00.00 -L-	

TOTAL BILL OF MATERIAL

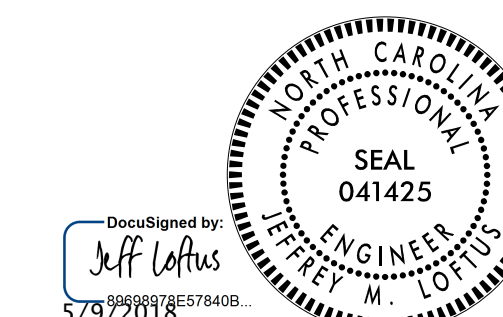
	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	HP 12X53 STEEL PILES	STEEL PILE POINTS	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" x 3'-3" PRESTRESSED CONCRETE BOX BEAMS	
	LUMP SUM	LUMP SUM	LF	LF	LUMP SUM	CY	LUMP SUM	LBS	EACH	No.	LF	LF	TON	SY	LUMP SUM	No.	LF
SUPERSTRUCTURE							LUMP SUM					200.0			LUMP SUM	11	1100.00
END BENT No. 1					LUMP SUM	32.1		4,962	7	7	105	7	115	125			
END BENT No. 2			30	40	LUMP SUM	32.1		4,962		7	70		110	120			
TOTAL	LUMP SUM	LUMP SUM	30	40	LUMP SUM	64.2	LUMP SUM	9,924	7	14	175	7	200.0	245	LUMP SUM	11	1100.00

PROJECT NO. B-5322

PERSON COUNTY

STATION: 16+05.00 -L-

SHEET 2 OF 2



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STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
GENERAL DRAWING  
BRIDGE OVER RICHLAND CREEK ON SR 1343  
(JOHN BREWER RD) BETWEEN SR 1102 AND SR 1310

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-2
1			3			TOTAL SHEETS
2			4			16

DRAWN BY: E. PHELPS DATE: 10/17  
CHECKED BY: J. LOFTUS DATE: 11/17  
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 11/17

4/17/2018  
\\400\_002\_SMU\_B5322\_LS01.dgn  
USER: jloftus

PERSON 51

LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.146	--	1.75	0.246	1.4	A	EL	49.134	0.614	1.15	A	EL	9.827	0.80	0.246	1.15	A	EL	49.134		
	HL-93(Opr)	N/A	--	1.486	--	1.35	0.246	1.81	A	EL	49.134	0.614	1.49	A	EL	9.827	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.519	54.686	1.75	0.246	1.95	A	EL	49.134	0.614	1.52	A	EL	9.827	0.80	0.246	1.60	A	EL	49.134		
	HS-20(Opr)	36.000	--	1.969	70.889	1.35	0.246	2.52	A	EL	49.134	0.614	1.97	A	EL	9.827	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.795	51.239	1.4	0.246	5.76	A	EL	49.134	0.614	4.67	A	EL	9.827	0.80	0.246	3.80	A	EL	49.134	
		SNGARBS2	20.000	--	2.75	55	1.4	0.246	4.18	A	EL	49.134	0.614	3.27	A	EL	9.827	0.80	0.246	2.75	A	EL	49.134	
		SNAGRIS2	22.000	--	2.573	56.599	1.4	0.246	3.91	A	EL	49.134	0.614	3.02	A	EL	9.827	0.80	0.246	2.57	A	EL	49.134	
		SNCOTTS3	27.250	--	1.886	51.405	1.4	0.246	2.86	A	EL	49.134	0.614	2.32	A	EL	9.827	0.80	0.246	1.89	A	EL	49.134	
		SNAGGRS4	34.925	--	1.546	54.002	1.4	0.246	2.35	A	EL	49.134	0.614	1.9	A	EL	9.827	0.80	0.246	1.55	A	EL	49.134	
		SNS5A	35.550	--	1.514	53.825	1.4	0.246	2.3	A	EL	49.134	0.614	1.9	A	EL	9.827	0.80	0.246	1.51	A	EL	49.134	
		SNS6A	39.950	--	1.377	55.004	1.4	0.246	2.09	A	EL	49.134	0.614	1.72	A	EL	9.827	0.80	0.246	1.38	A	EL	49.134	
	SNS7B	42.000	--	1.311	55.05	1.4	0.246	1.99	A	EL	49.134	0.614	1.68	A	EL	9.827	0.80	0.246	1.31	A	EL	49.134		
	TTST	TNAGRIT3	33.000	--	1.675	55.287	1.4	0.246	2.54	A	EL	49.134	0.614	2.06	A	EL	9.827	0.80	0.246	1.68	A	EL	49.134	
		TNT4A	33.075	--	1.679	55.547	1.4	0.246	2.55	A	EL	49.134	0.614	2.02	A	EL	9.827	0.80	0.246	1.68	A	EL	49.134	
		TNT6A	41.600	--	1.362	56.644	1.4	0.246	2.07	A	EL	49.134	0.614	1.76	A	EL	9.827	0.80	0.246	1.36	A	EL	49.134	
		TNT7A	42.000	--	1.362	57.22	1.4	0.246	2.07	A	EL	49.134	0.614	1.73	A	EL	9.827	0.80	0.246	1.36	A	EL	49.134	
		TNT7B	42.000	--	1.395	58.575	1.4	0.246	2.12	A	EL	49.134	0.614	1.65	A	EL	9.827	0.80	0.246	1.39	A	EL	49.134	
		TNAGRIT4	43.000	--	1.338	57.52	1.4	0.246	2.03	A	EL	49.134	0.614	1.6	A	EL	9.827	0.80	0.246	1.34	A	EL	49.134	
TNAGT5A		45.000	--	1.266	56.99	1.4	0.246	1.92	A	EL	49.134	0.614	1.57	A	EL	9.827	0.80	0.246	1.27	A	EL	49.134		
TNAGT5B	45.000	3	1.256	56.51	1.4	0.246	1.91	A	EL	49.134	0.614	1.53	A	EL	9.827	0.80	0.246	1.26	A	EL	49.134			

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	$\gamma_{DC}$	$\gamma_{DW}$
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

# CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

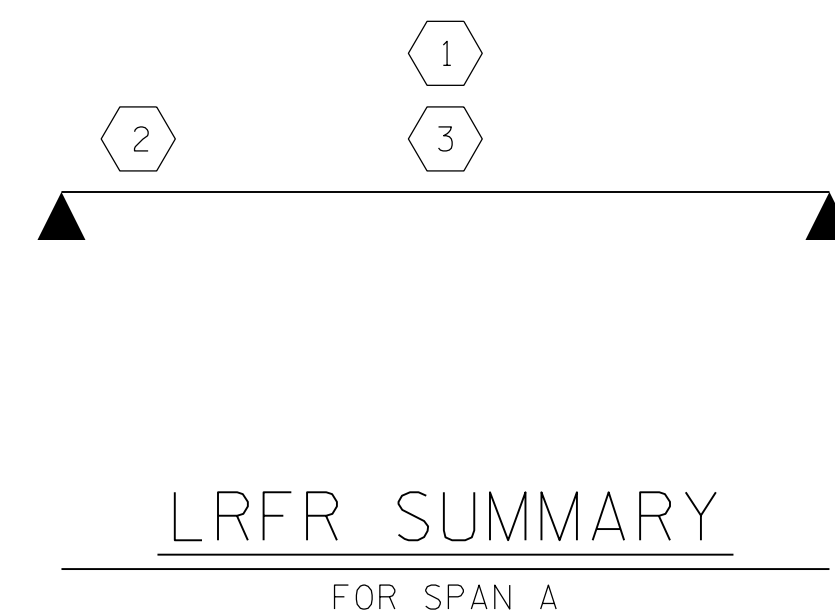
2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING \*\*

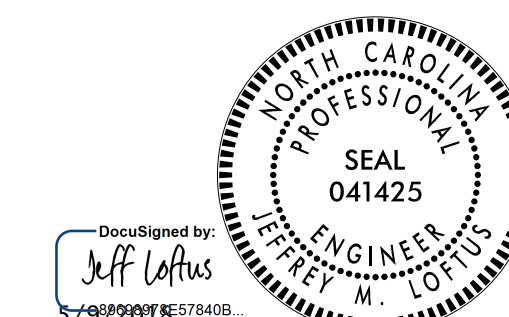
\*\* SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER  
EL - EXTERIOR LEFT GIRDER  
ER - EXTERIOR RIGHT GIRDER



PROJECT NO. B-5322  
PERSON \_\_\_\_\_ COUNTY \_\_\_\_\_  
STATION: 16+05.00 -L-



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STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD  
LRFR SUMMARY FOR  
100' BOX BEAM UNIT  
60° SKEW  
(NON-INTERSTATE TRAFFIC)

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-3  
TOTAL SHEETS 16

DRAWN BY: E. PHELPS DATE: 10/17  
CHECKED BY: J. LOFTUS DATE: 11/17  
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 11/17



NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL CAST WITH THE BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.

FLAME CUTTING OF THE TRANSVERSE POST-TENSIONING STRAND IS NOT ALLOWED.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF BOX BEAM SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

THE BACKER RODS SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER, SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5,500 PSI.

ALL REINFORCING STEEL IN VERTICAL CONCRETE BARRIER RAILS SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS.

VERTICAL GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A VERTICAL CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

THE LOCATION OF THE VOID DRAINS MAY BE SHIFTED SLIGHTLY WHERE NECESSARY TO CLEAR PRESTRESSING STRANDS OR TRANSVERSE REINFORCING STEEL.

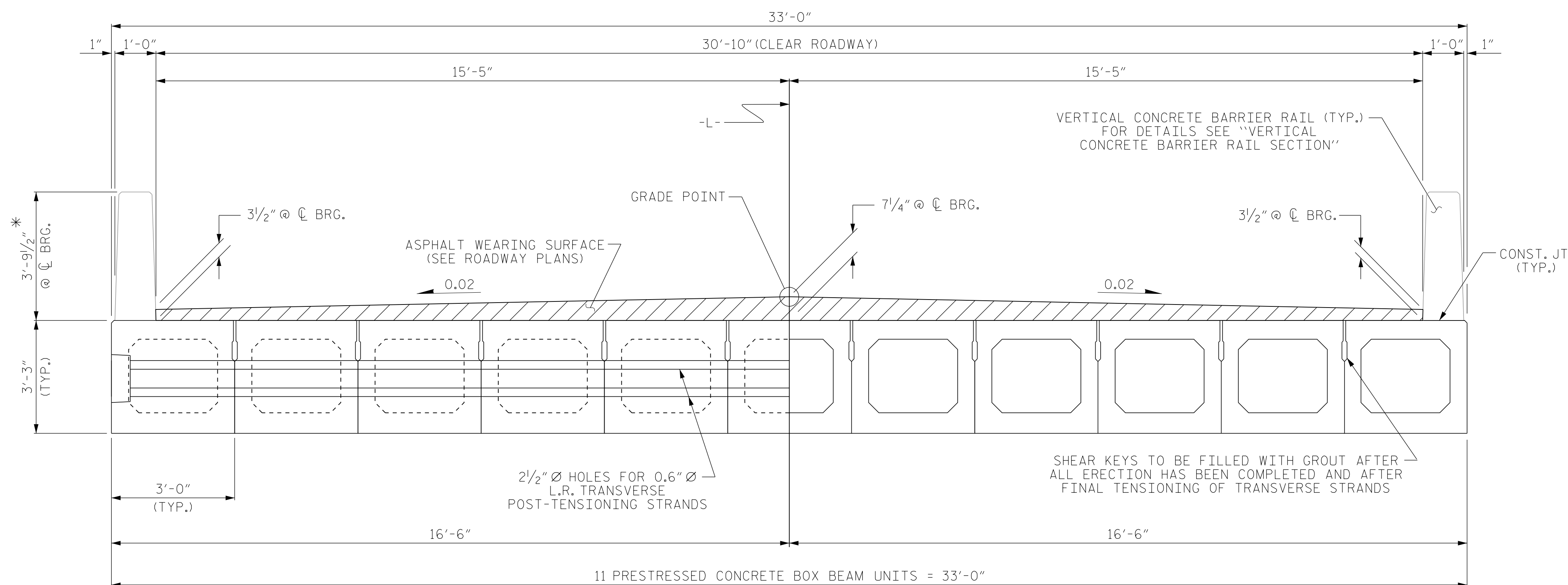
FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE PERMITTED THREADED INSERTS ARE DETAILED AS AN OPTION FOR THE CONTRACTOR TO ATTACH FALSEWORK AND FORMWORK DURING CONSTRUCTION.

THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4'-0" CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

THE PERMITTED THREADED INSERTS SHALL BE GROUTED BY THE CONTRACTOR IMMEDIATELY FOLLOWING REMOVAL OF THE FALSEWORK.

THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.



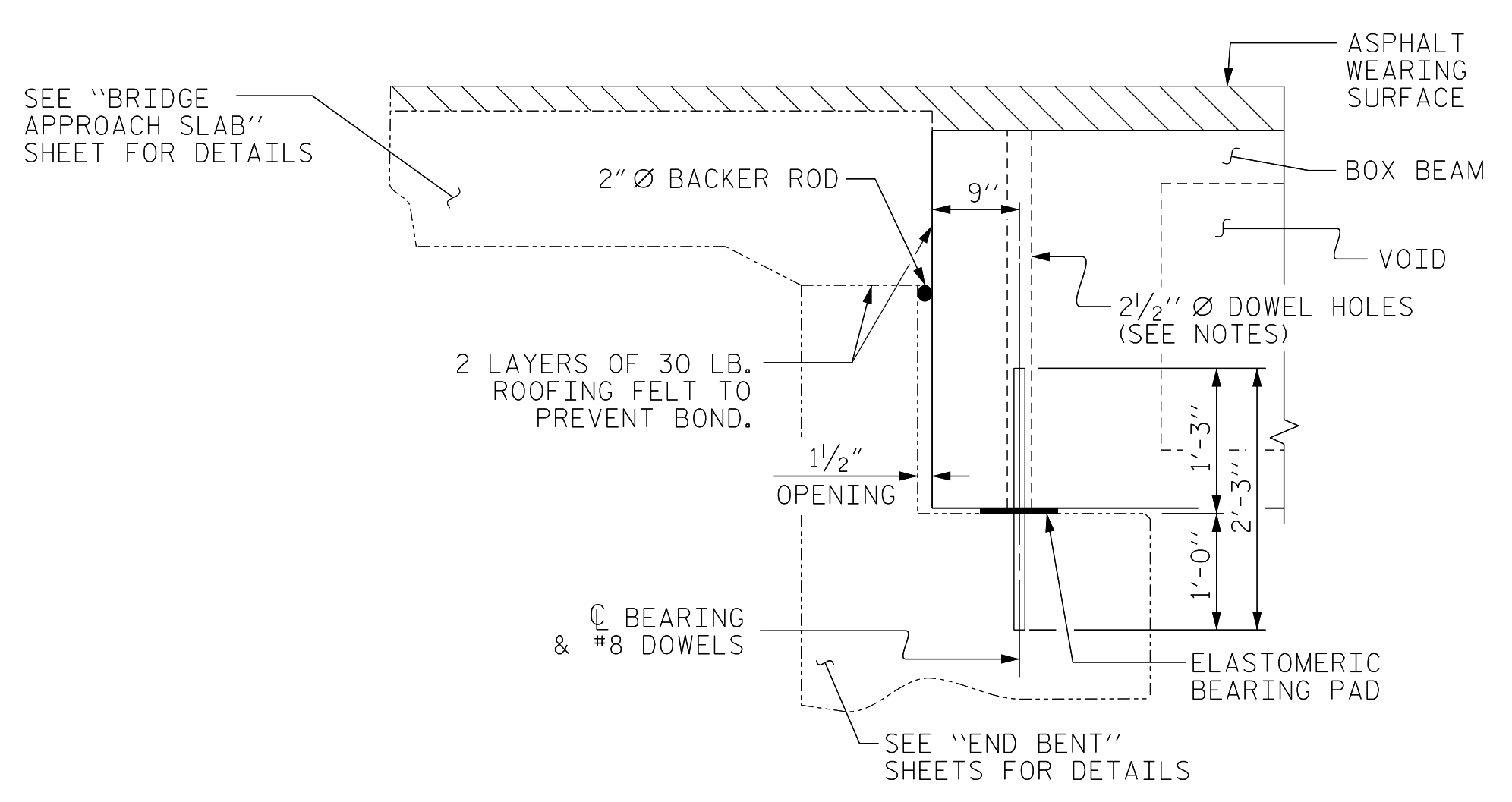
HALF SECTION  
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION  
THROUGH VOIDS

TYPICAL SECTION

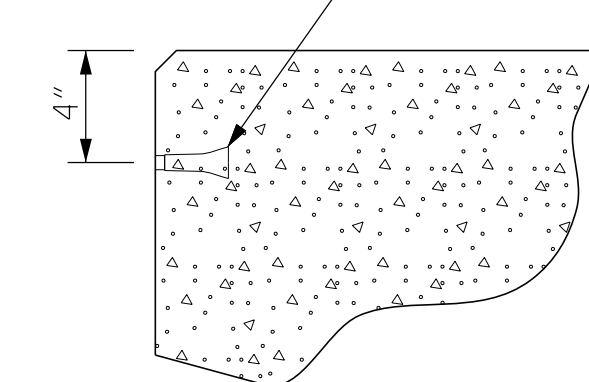
\* - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS, SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.

FIXED END



SECTION AT END BENT

PERMITTED THREADED INSERT  
CAST IN OUTSIDE FACE OF  
EXTERIOR UNIT AND  
RECESSED 3/8" SIZE TO BE  
DETERMINED  
BY CONTRACTOR.



THREADED INSERT DETAIL

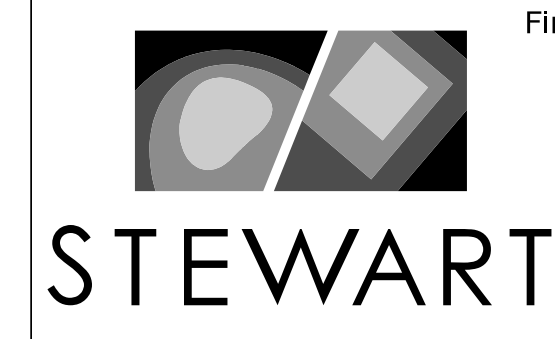
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PERSON \_\_\_\_\_ COUNTY \_\_\_\_\_  
STATION: 16+05.00 -L-

SHEET 1 OF 5



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STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
3'-0" X 3'-3"  
PRESTRESSED CONCRETE  
BOX BEAM UNIT

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS 16

STD. NO. 39PCBB1-33

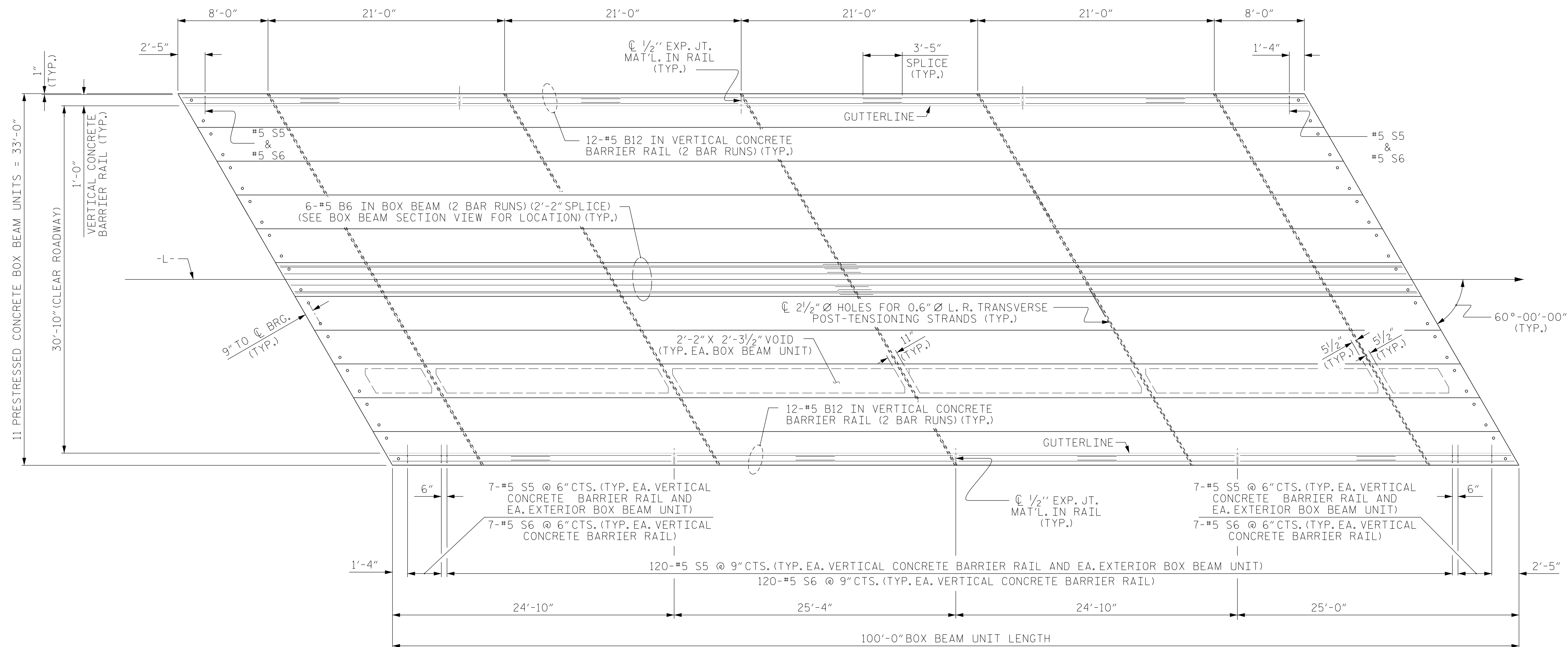
DRAWN BY: E. PHELPS DATE: 10/17  
CHECKED BY: J. LOFTUS DATE: 11/17  
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 11/17

PERSON 51  
4/17/2018  
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USER: jloftus

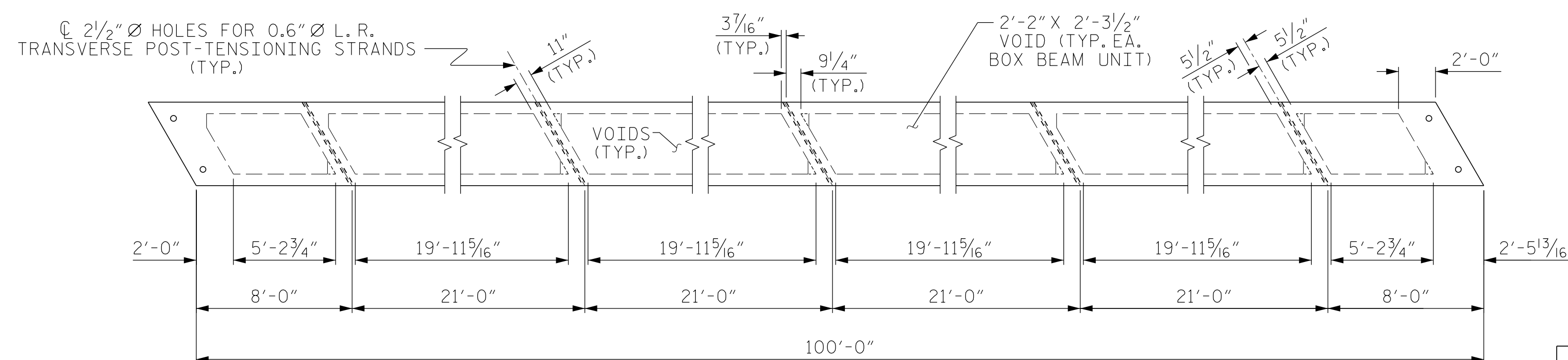


FIX.

FIX.



PLAN OF UNIT



DIAPHRAGM AND VOID LAYOUT

PROJECT NO. B-5322

PERSON COUNTY

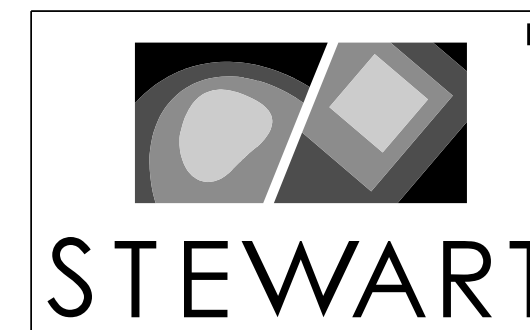
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SHEET 2 OF 5



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STATE OF NORTH CAROLINA  
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 RALEIGH

PLAN OF 100' UNIT  
 30'-10" CLEAR ROADWAY  
 60° SKEW

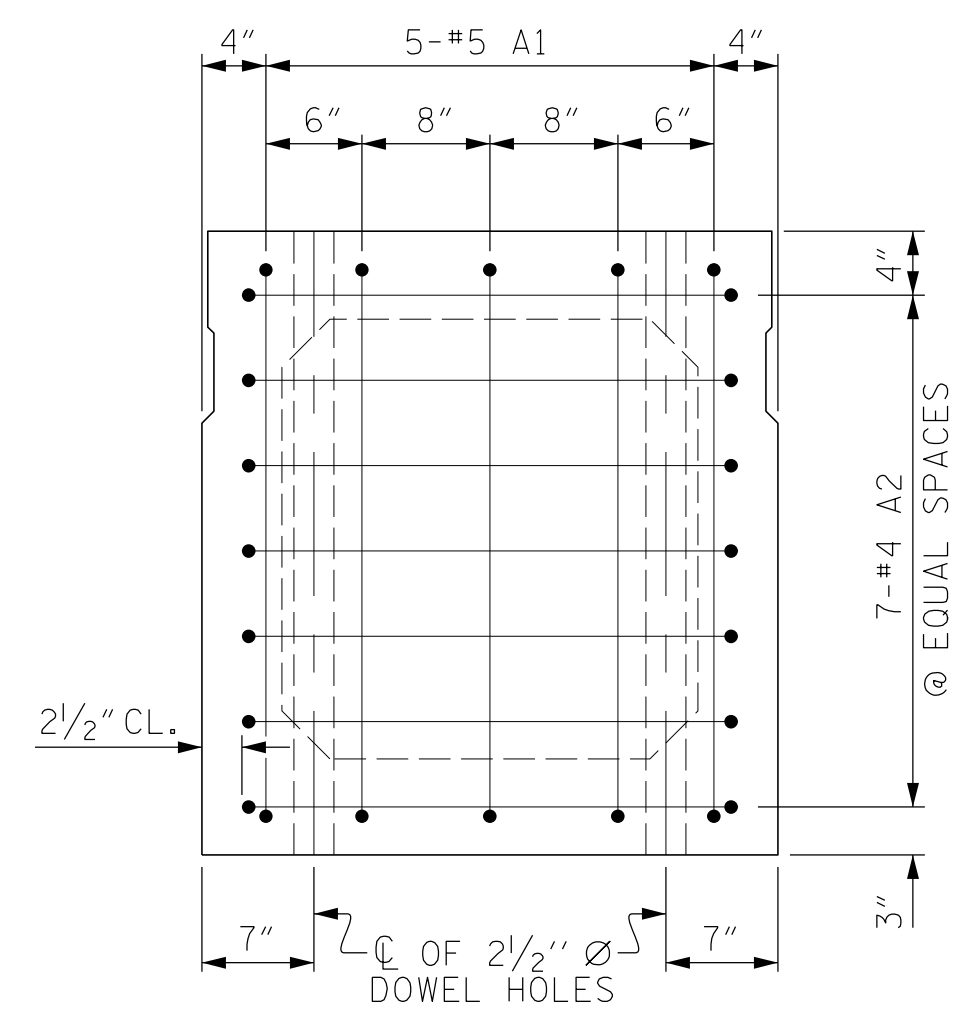
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			16

STD.NO.39PCBB\_33\_60S\_100L

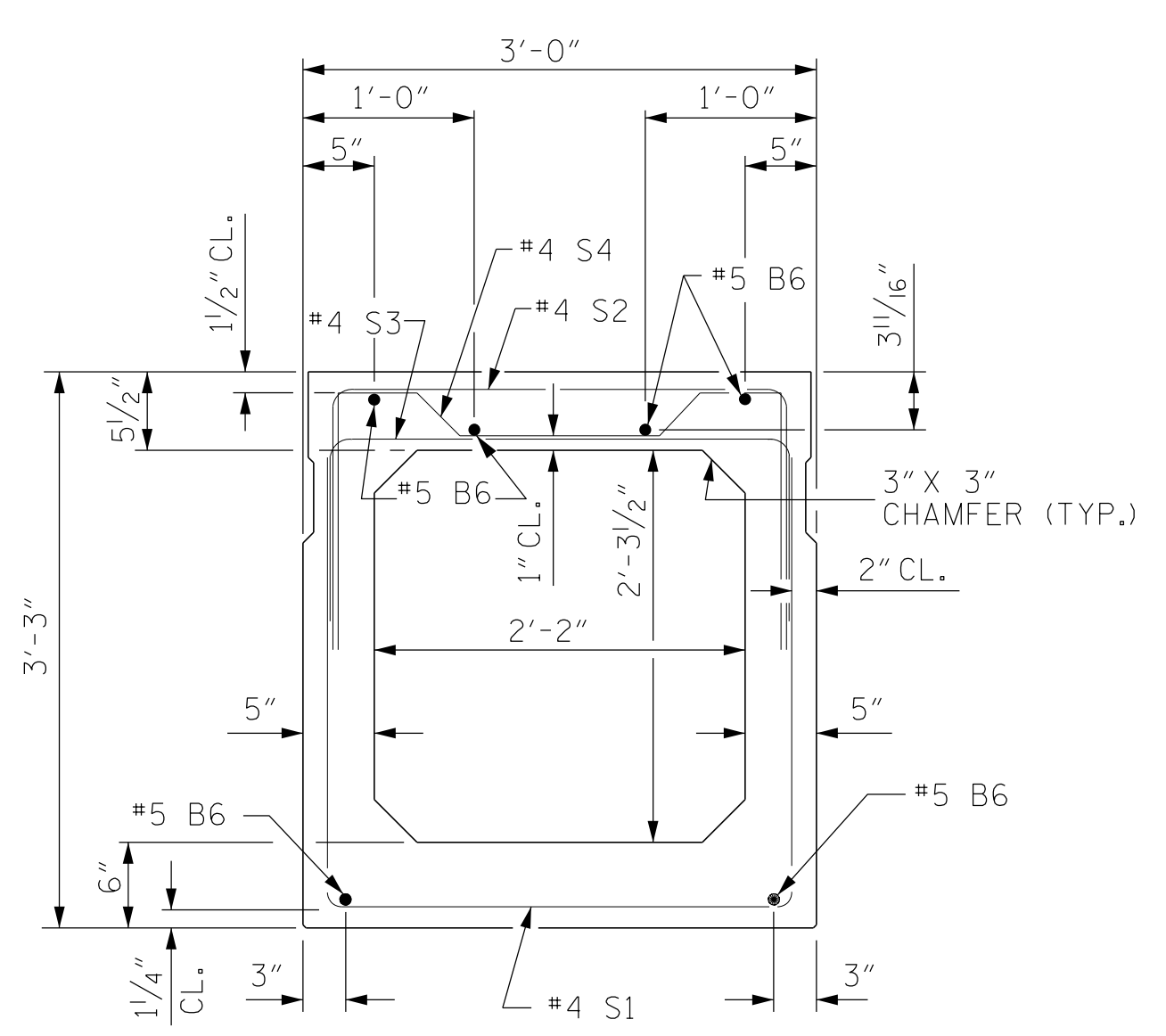
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 USER: jloftus

DRAWN BY: E. PHELPS DATE: 10/17  
 CHECKED BY: J. LOFTUS DATE: 11/17  
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 11/17

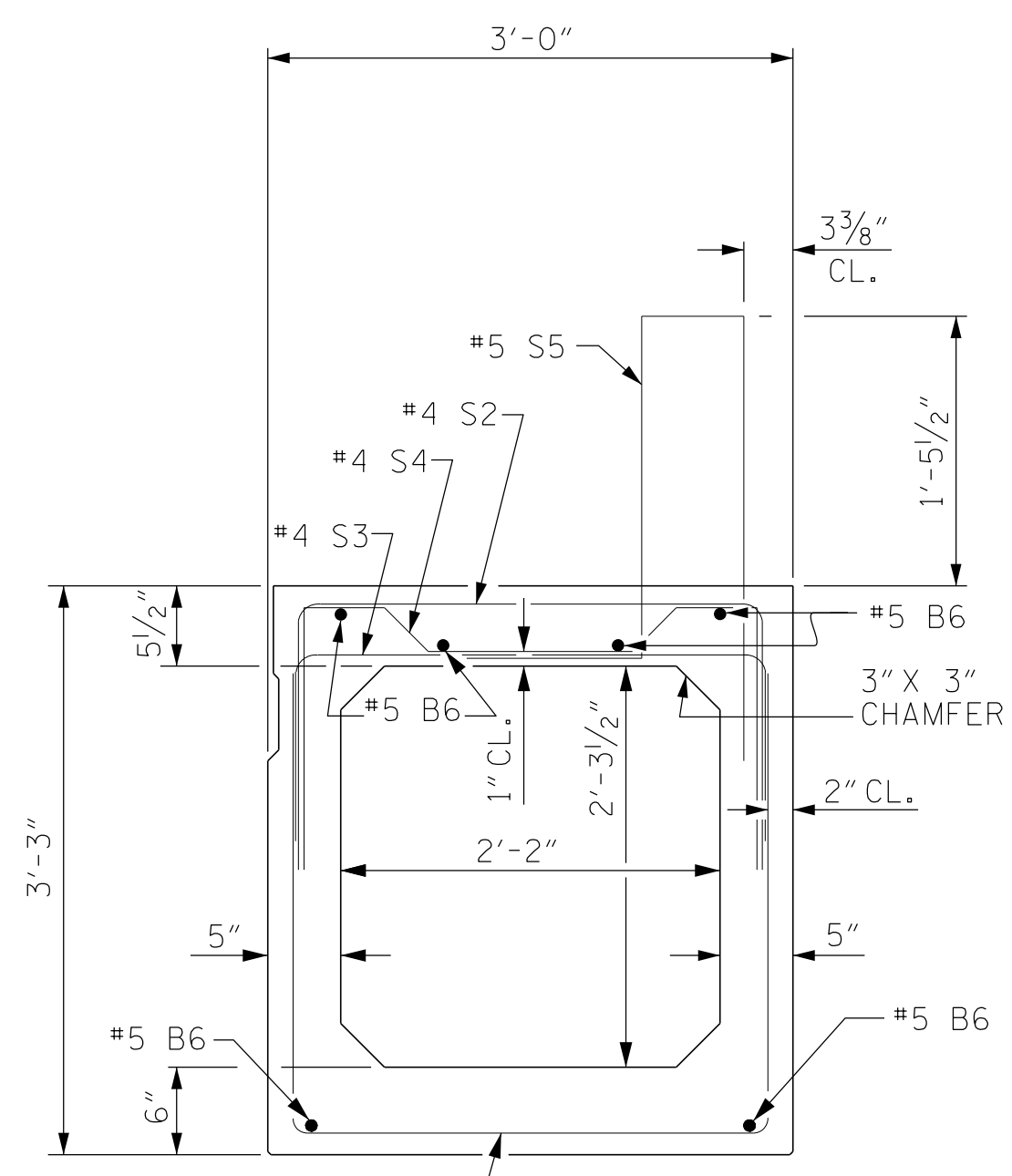
PERSON 51



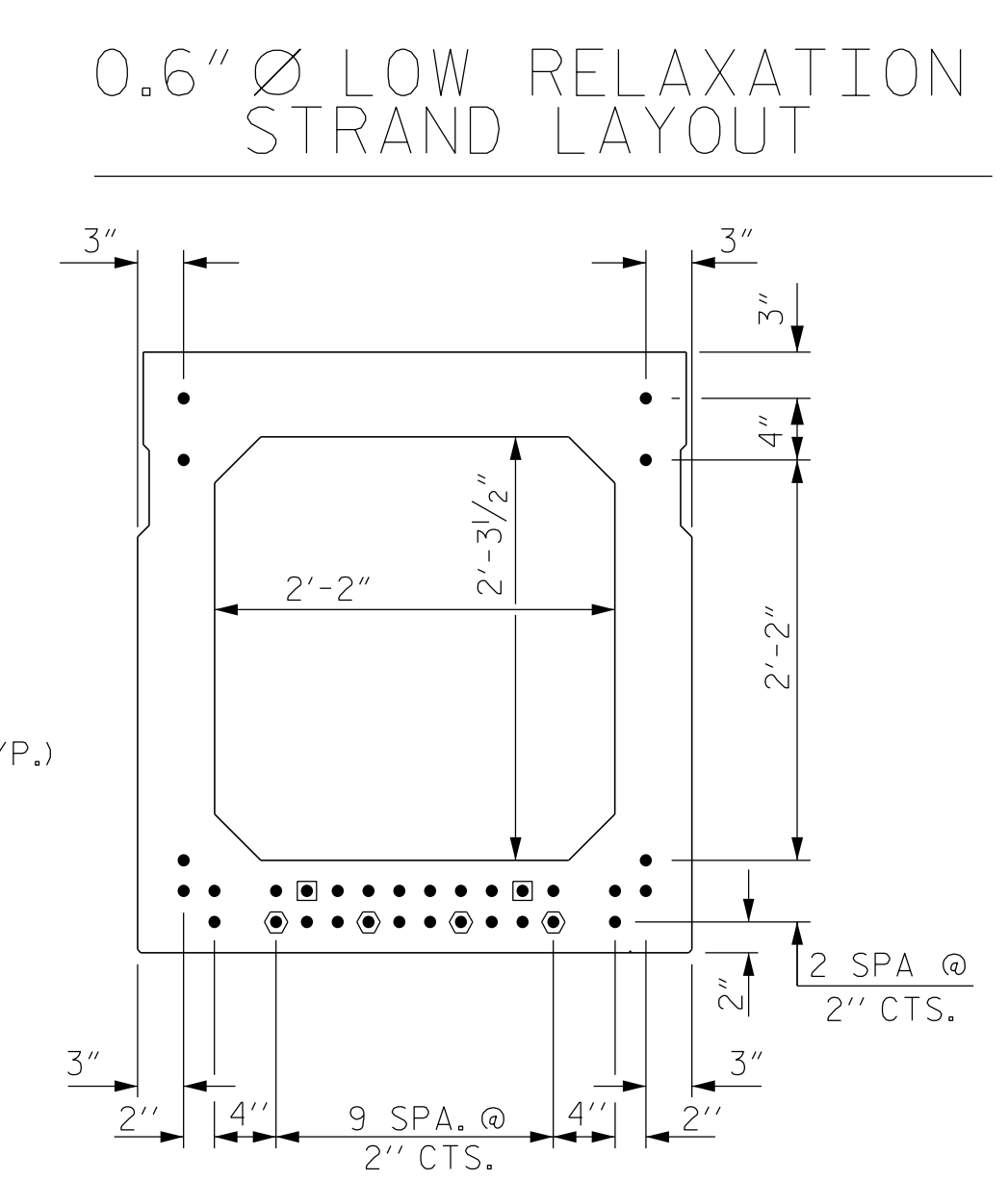
**END ELEVATION**  
 SHOWING PLACEMENT OF #5 & #4 "A" BARS AND LOCATION OF DOWEL HOLES. (INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION. STRAND LAYOUT NOT SHOWN.)



**INTERIOR BOX BEAM SECTION**  
 (STRAND LAYOUT NOT SHOWN)



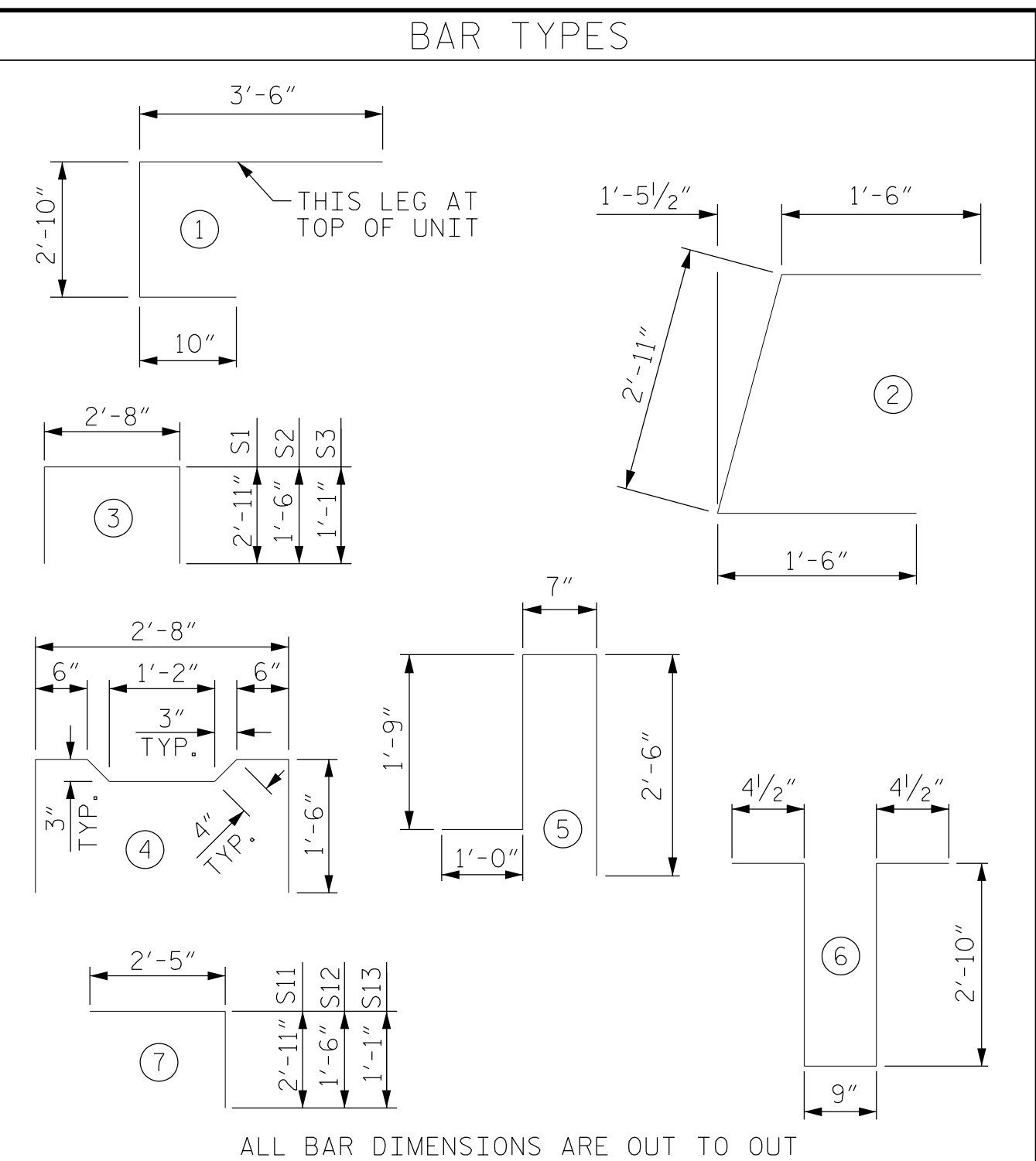
**EXTERIOR BOX BEAM SECTION**  
 (STRAND LAYOUT NOT SHOWN)



**TYPICAL STRAND LOCATION**  
 (32 STRANDS REQUIRED)  
**DEBONDING LEGEND**

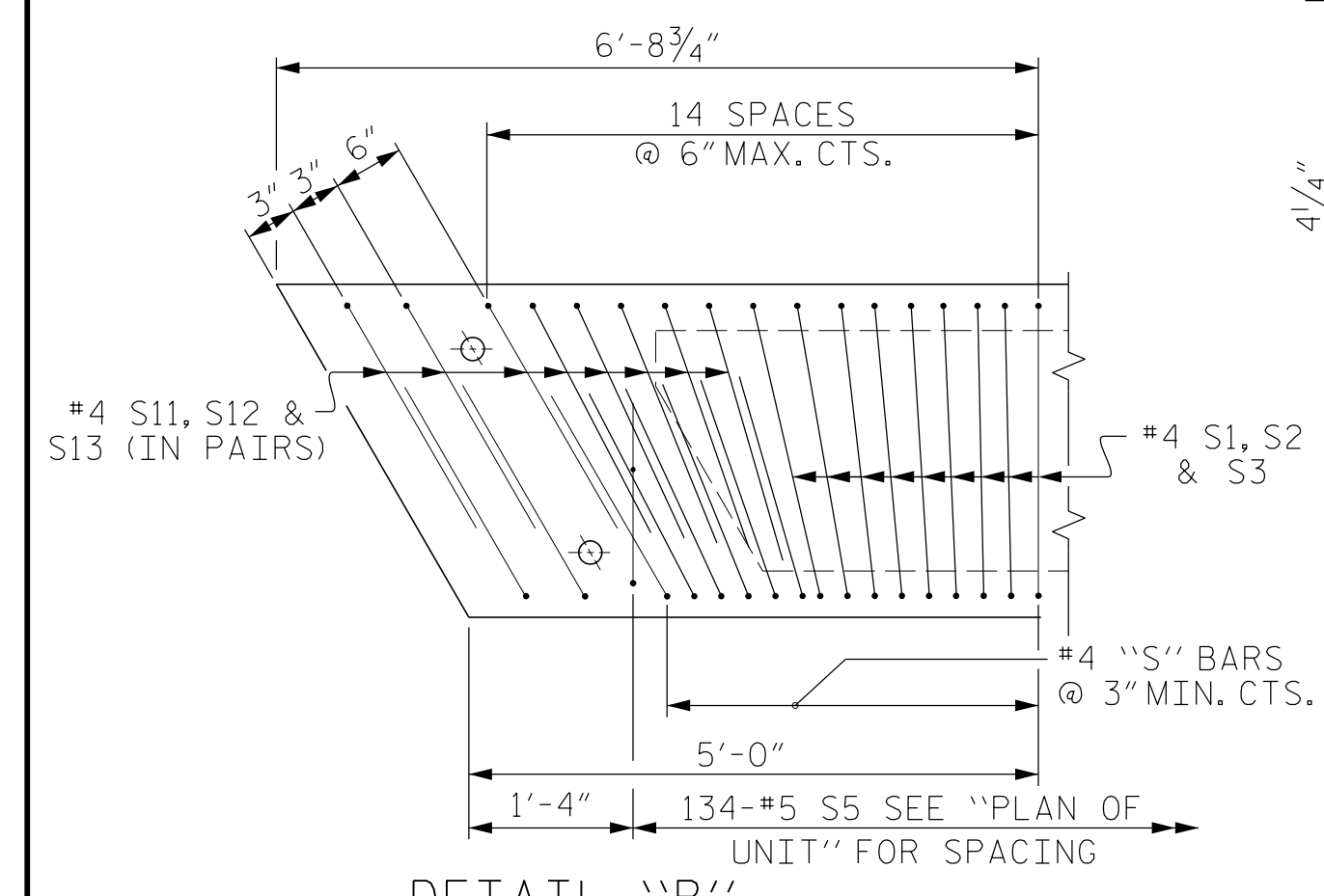
- FULLY BONDED STRANDS
  - ◐ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
  - ◑ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
- BOND SHALL BE BROKEN ON STRANDS AS SHOWN FOR THE SPECIFIED LENGTH FROM EACH END OF THE BOX BEAM. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.

GRADE 270 STRANDS	
	0.6" Ø L.R.
AREA ( SQUARE INCHES )	0.217
ULTIMATE STRENGTH ( LBS. PER STRAND )	58,600
APPLIED PRESTRESS ( LBS. PER STRAND )	43,950

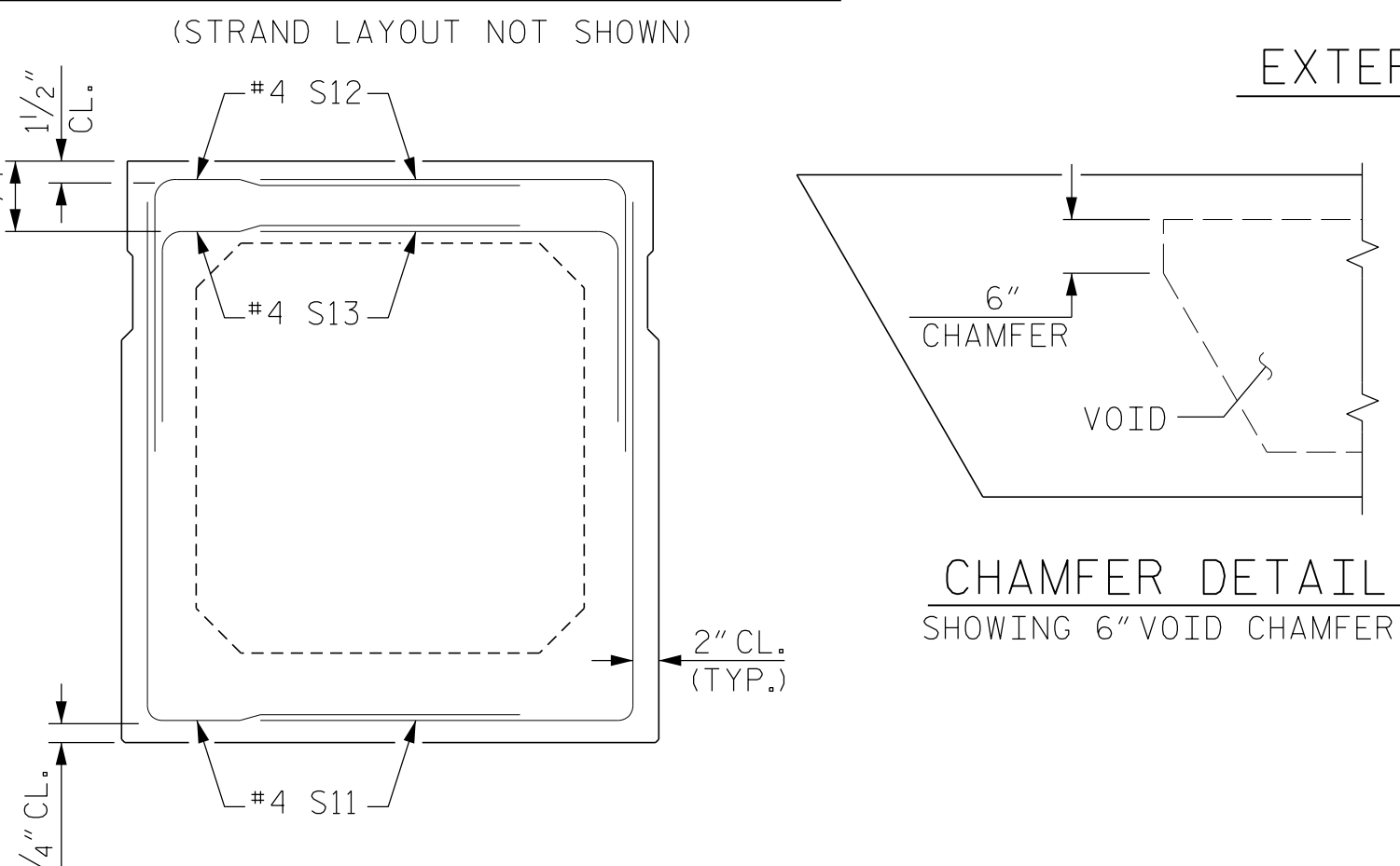


ALL BAR DIMENSIONS ARE OUT TO OUT

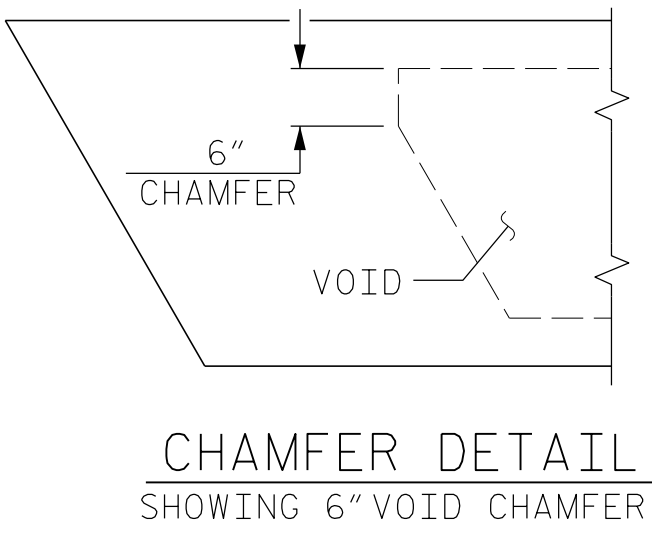
BILL OF MATERIAL FOR ONE BOX BEAM SECTION									
BAR NUMBER	SIZE	TYPE	EXTERIOR UNIT		INTERIOR UNIT				
			LENGTH	WEIGHT	LENGTH	WEIGHT			
A1	10	#5	7'-2"	75	7'-2"	75			
A2	44	#4	5'-11"	174	5'-11"	174			
B6	12	#5	50'-11"	637	50'-11"	637			
K1	15	#4	7'-2"	72	7'-2"	72			
K2	10	#4	2'-10"	19	2'-10"	19			
S1	77	#4	8'-6"	437	8'-6"	437			
S2	77	#4	5'-8"	291	5'-8"	291			
S3	135	#4	4'-10"	436	4'-10"	436			
S4	58	#4	5'-10"	226	5'-10"	226			
S11	32	#4	5'-4"	114	5'-4"	114			
S12	32	#4	3'-11"	84	3'-11"	84			
S13	32	#4	3'-6"	75	3'-6"	75			
* S5	134	#5	5'-10"	815	--	--			
REINFORCING STEEL				2640 LBS.		2640 LBS.			
* EPOXY COATED REINF. STEEL				815 LBS.					
7500 P.S.I. CONCRETE				19.7 CU. YDS.		19.6 CU. YDS.			
0.6" Ø L.R. STRANDS			No.	32	No.	32			



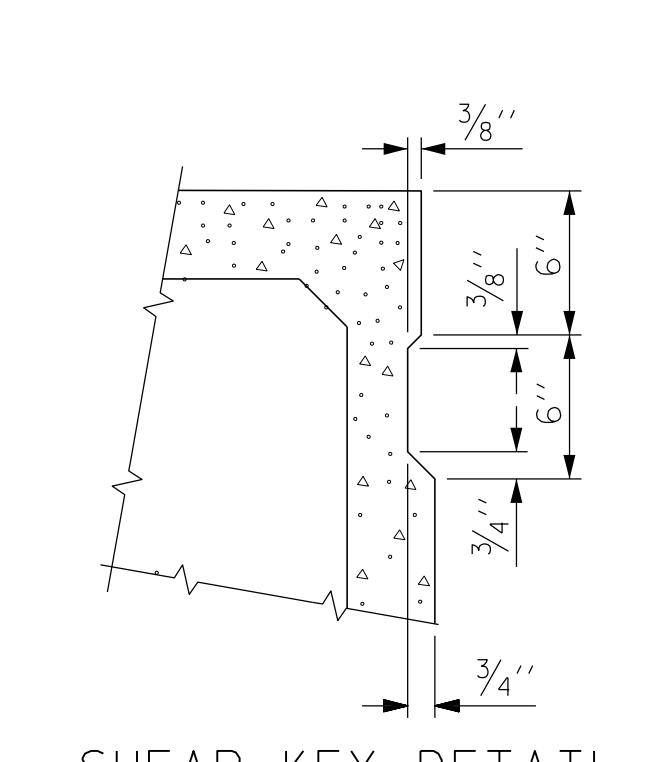
**DETAIL "B"**  
 EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS. "B" BARS AND "A" BARS NOT SHOWN.



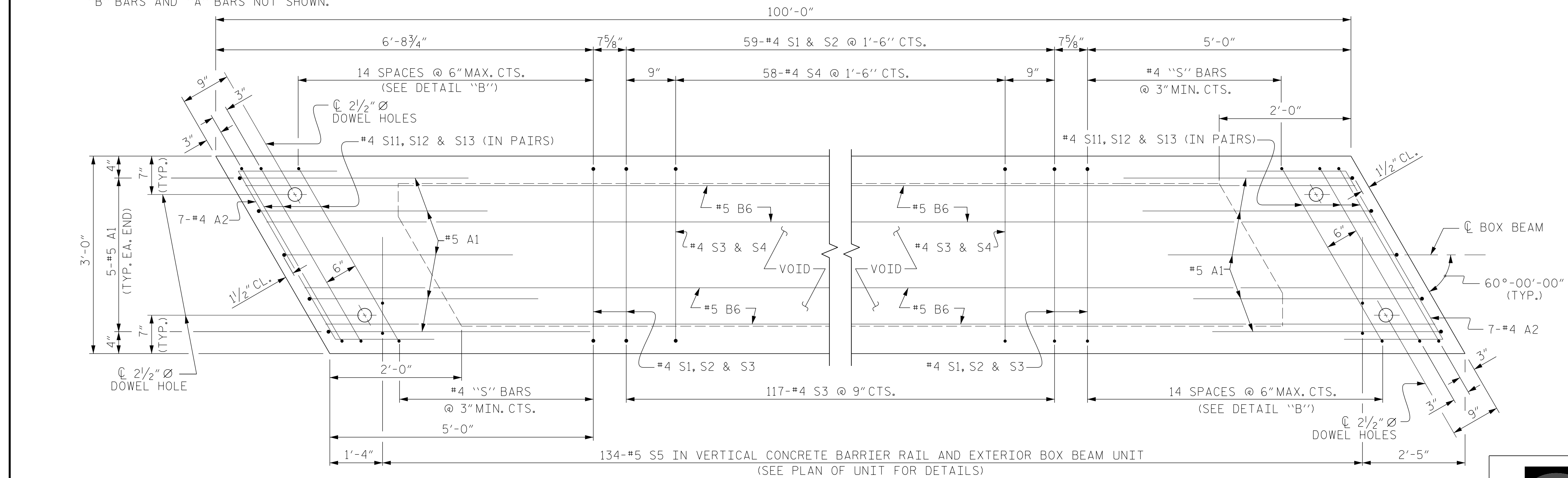
**END VIEW**  
 (SHOWING #4 "S" BARS IN END OF BEAM)



**CHAMFER DETAIL**  
 SHOWING 6" VOID CHAMFER



**SHEAR KEY DETAIL**  
 NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAMS.



**PLAN OF BOX BEAM**  
 EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS. FOR LOCATION OF DIAPHRAGMS, SEE "PLAN OF UNIT". FOR THREADED INSERTS, SEE "THREADED INSERT DETAIL". FOR REINFORCING STEEL IN DIAPHRAGMS, SEE "DOUBLE DIAPHRAGM DETAILS".



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 SHEET 3 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 3'-0" X 3'-3"  
 PRESTRESSED CONCRETE  
 BOX BEAM UNIT

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1			3			TOTAL SHEETS 16
2			4			

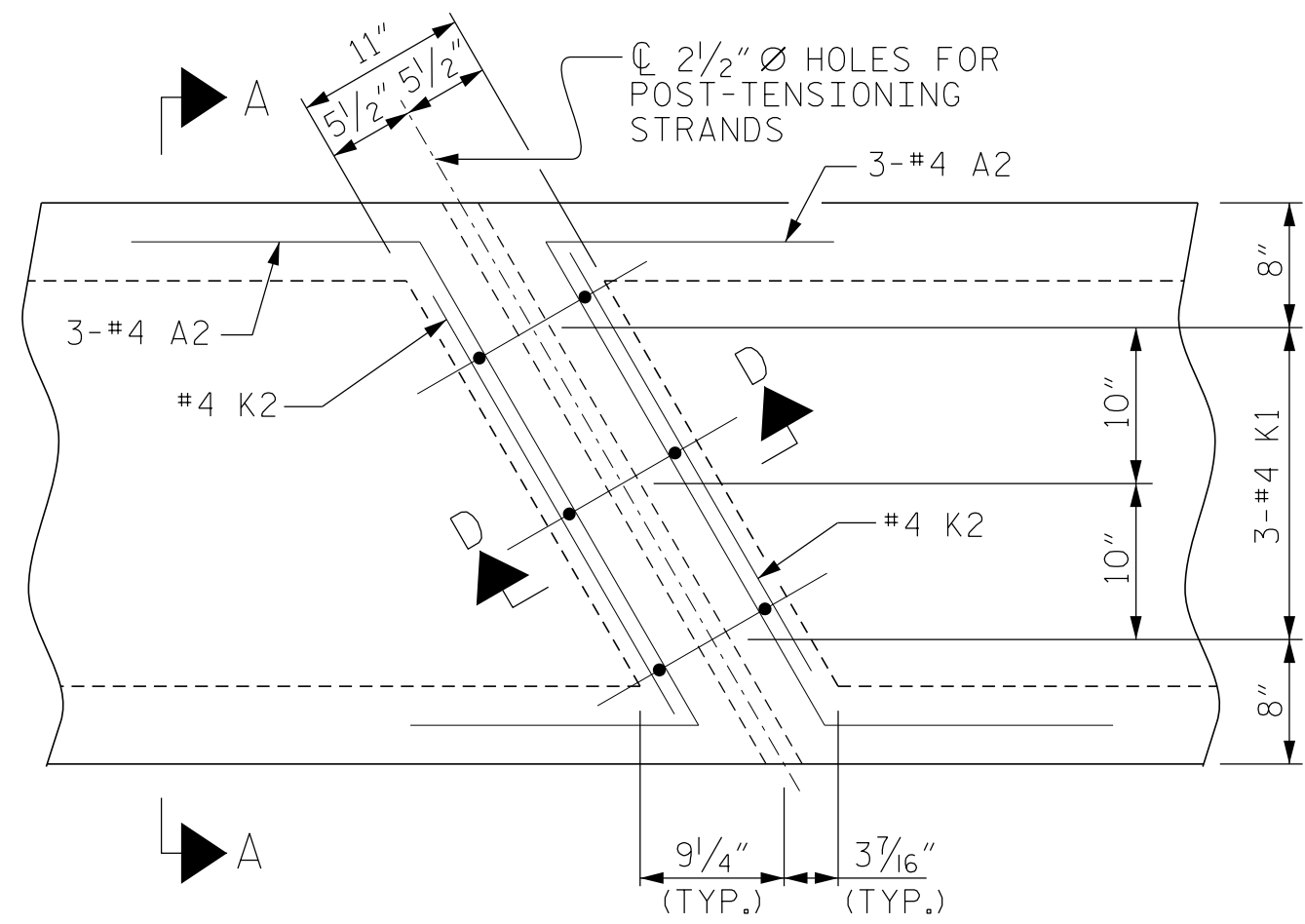
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PERSON 51

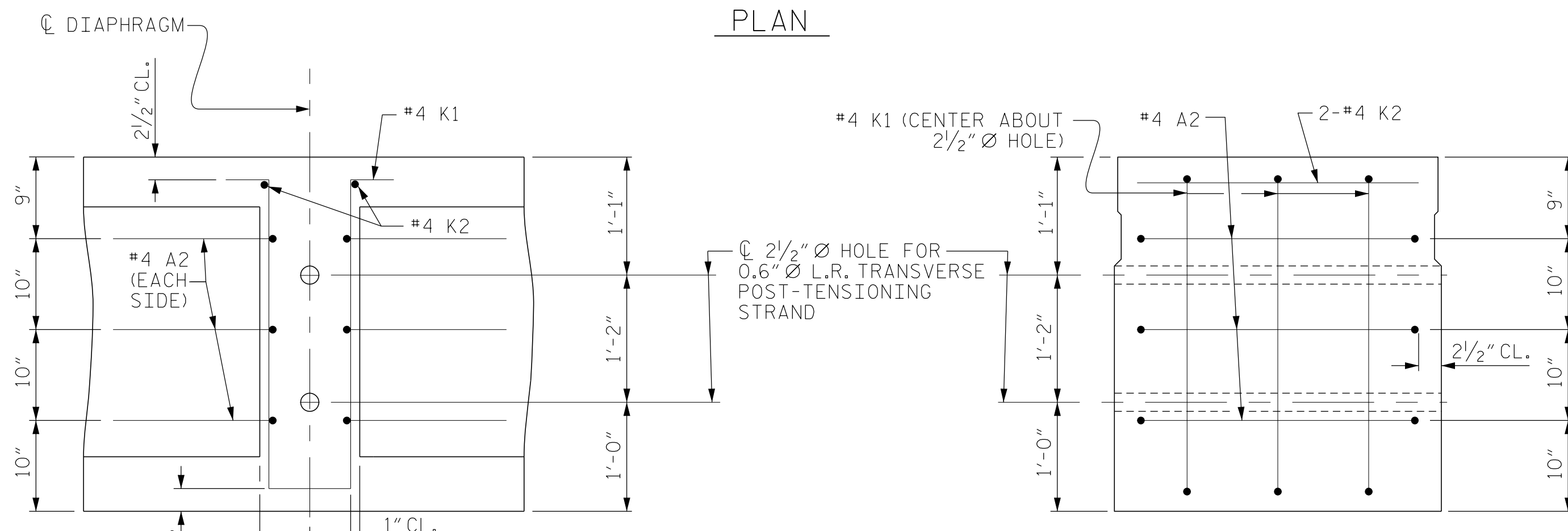
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 USER: jloftus

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 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 11/17





PLAN

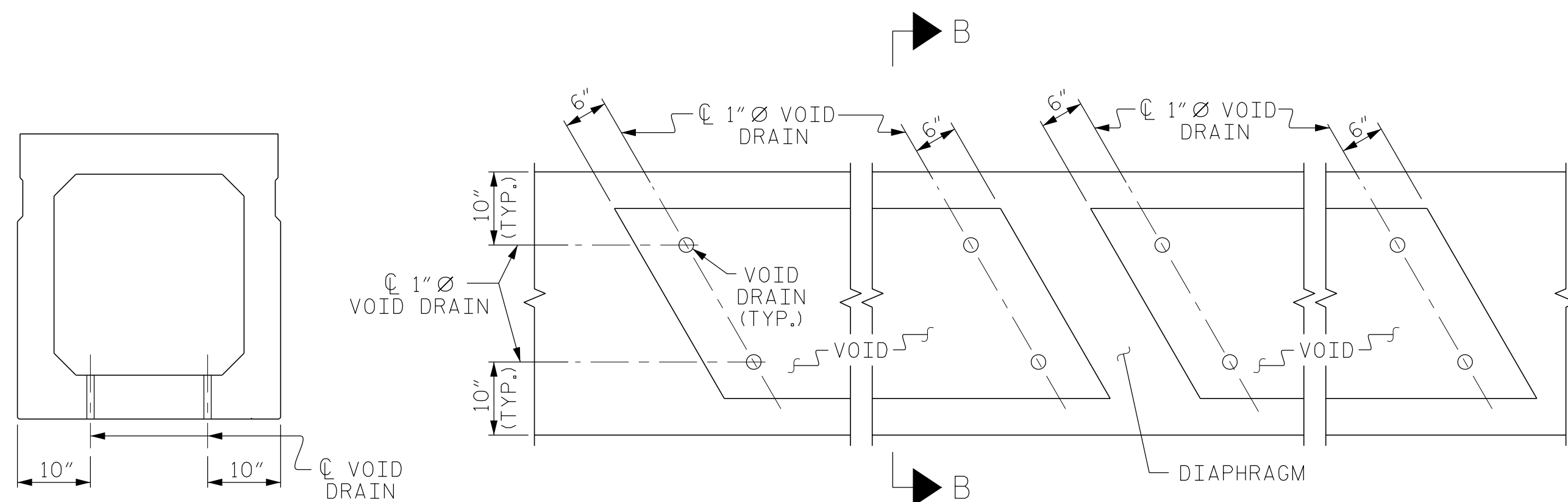


SECTION D-D

SECTION A-A  
VOIDS NOT SHOWN

DOUBLE DIAPHRAGM DETAILS

#4 "S" BARS NOT SHOWN. #4 "S" BARS MAY BE SHIFTED SLIGHTLY TO CLEAR 2 1/2" Ø HOLE.

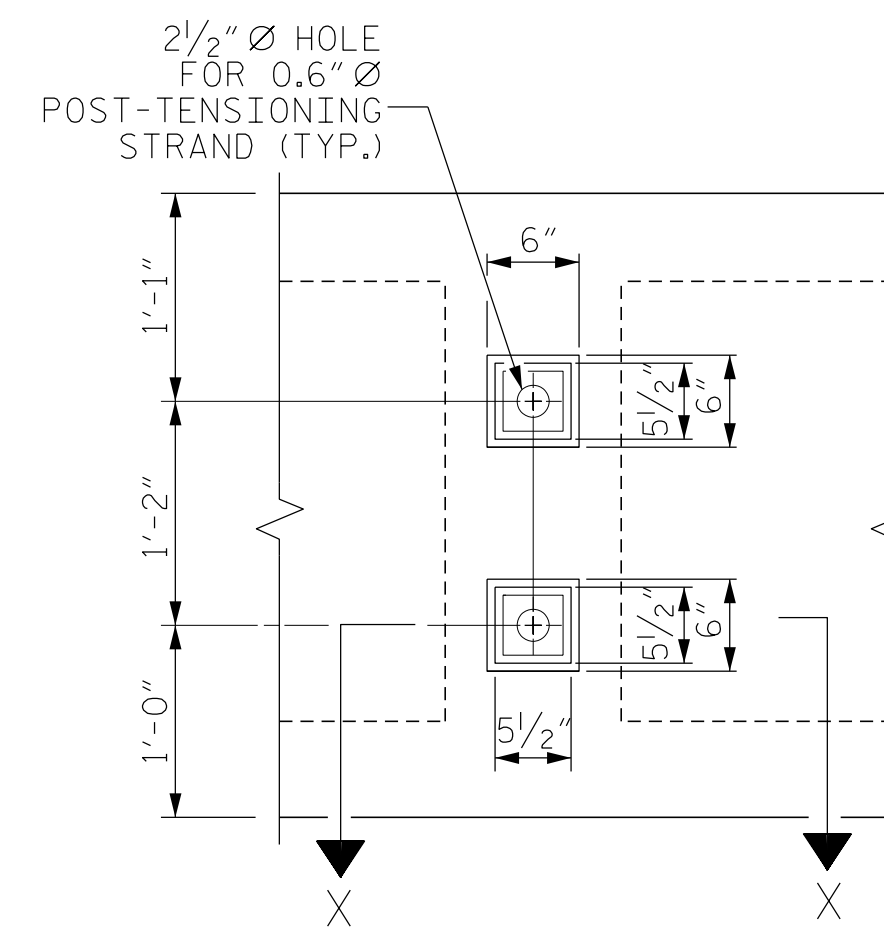


SECTION B-B

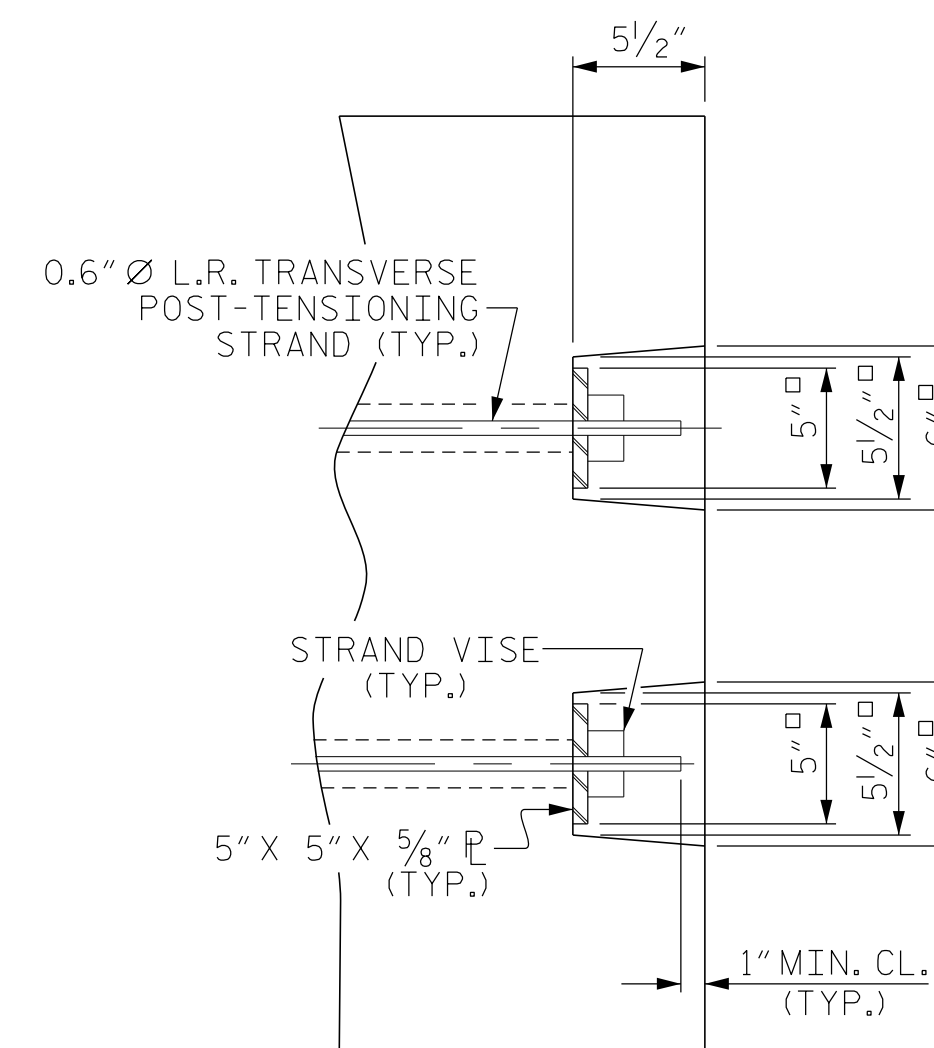
PART PLAN

VOID DRAIN DETAILS

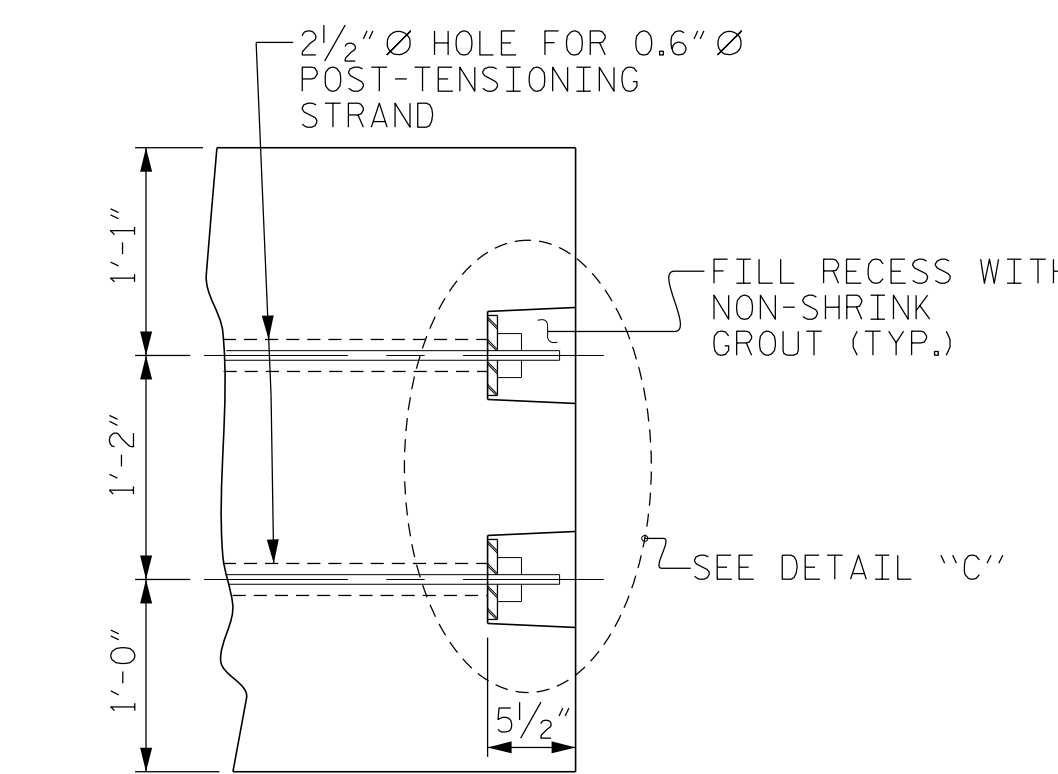
(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)



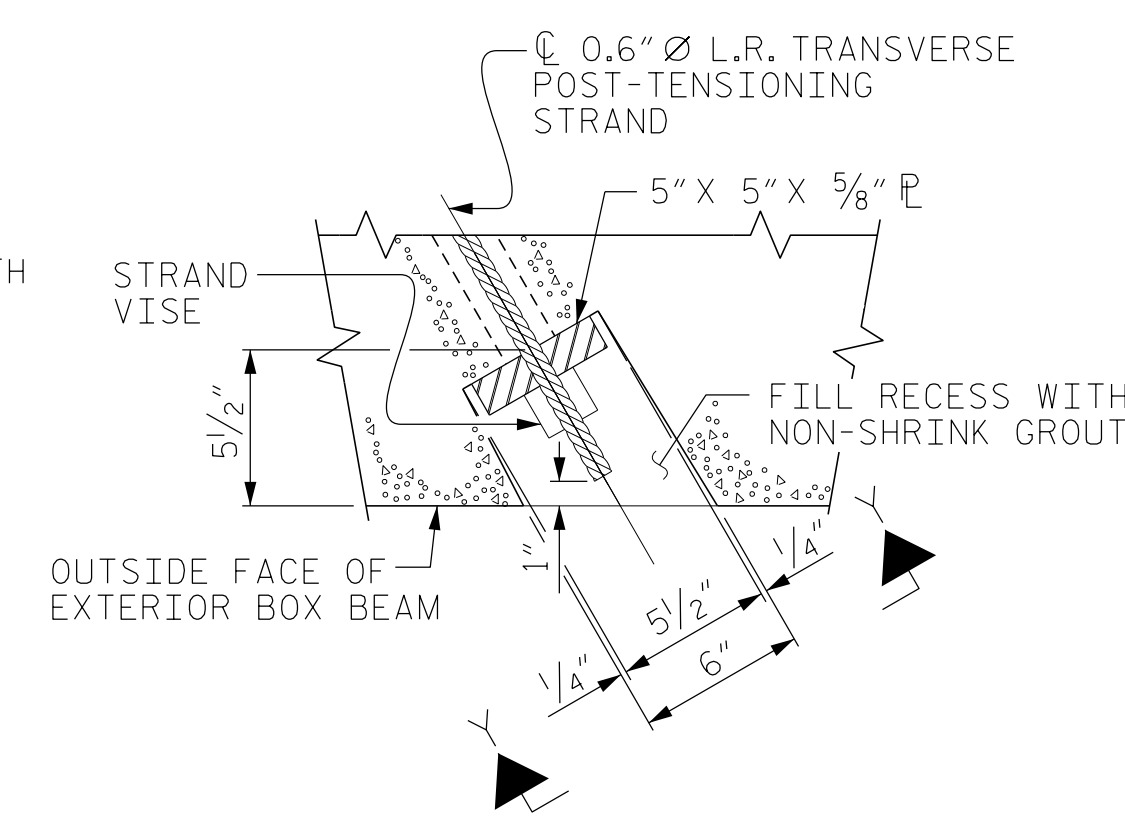
VIEW Y-Y  
SHOWING ELEVATION VIEW OF GROUDED RECESS



DETAIL "C"



PART SECTION AT RECESS



SECTION X-X  
SHOWING PLAN VIEW OF GROUDED RECESS

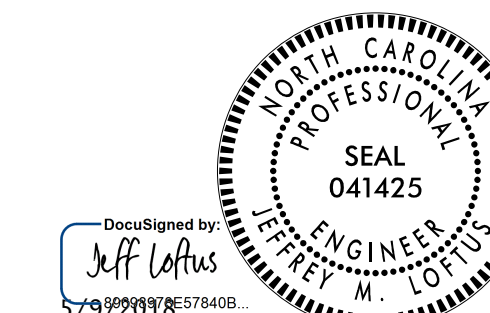
GROUTED RECESS DETAIL AT  
END OF POST-TENSIONED STRANDS  
OF EXTERIOR BOX BEAM

DEAD LOAD DEFLECTION AND CAMBER	
100' BOX BEAM UNIT (NC & SE)	3'-0" x 3'-3"
CAMBER (SLAB ALONE IN PLACE)	2" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	7/8" ↓
FINAL CAMBER	1 1/8" ↑

\*\* INCLUDES FUTURE WEARING SURFACE

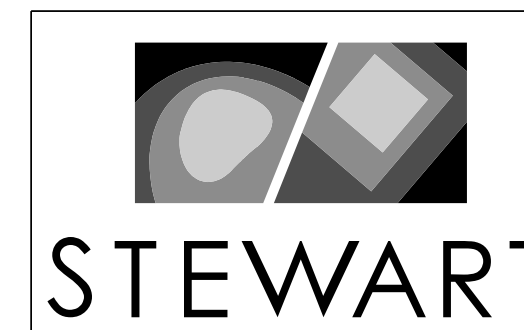
PROJECT NO. B-5322  
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SHEET 4 OF 5



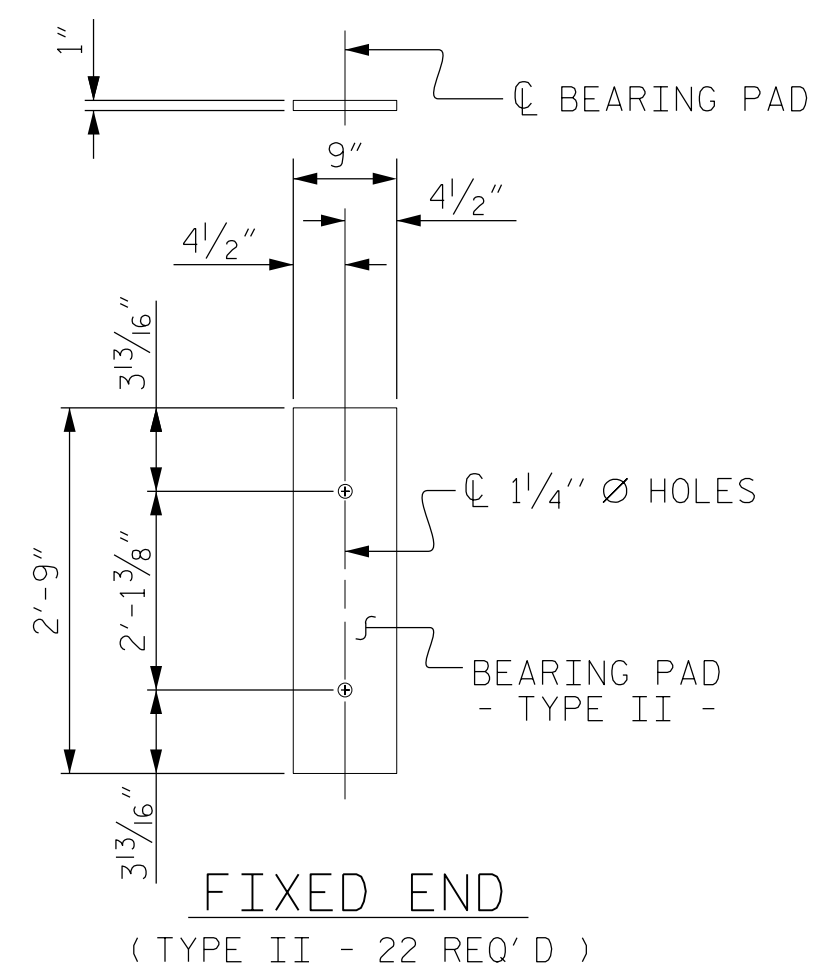
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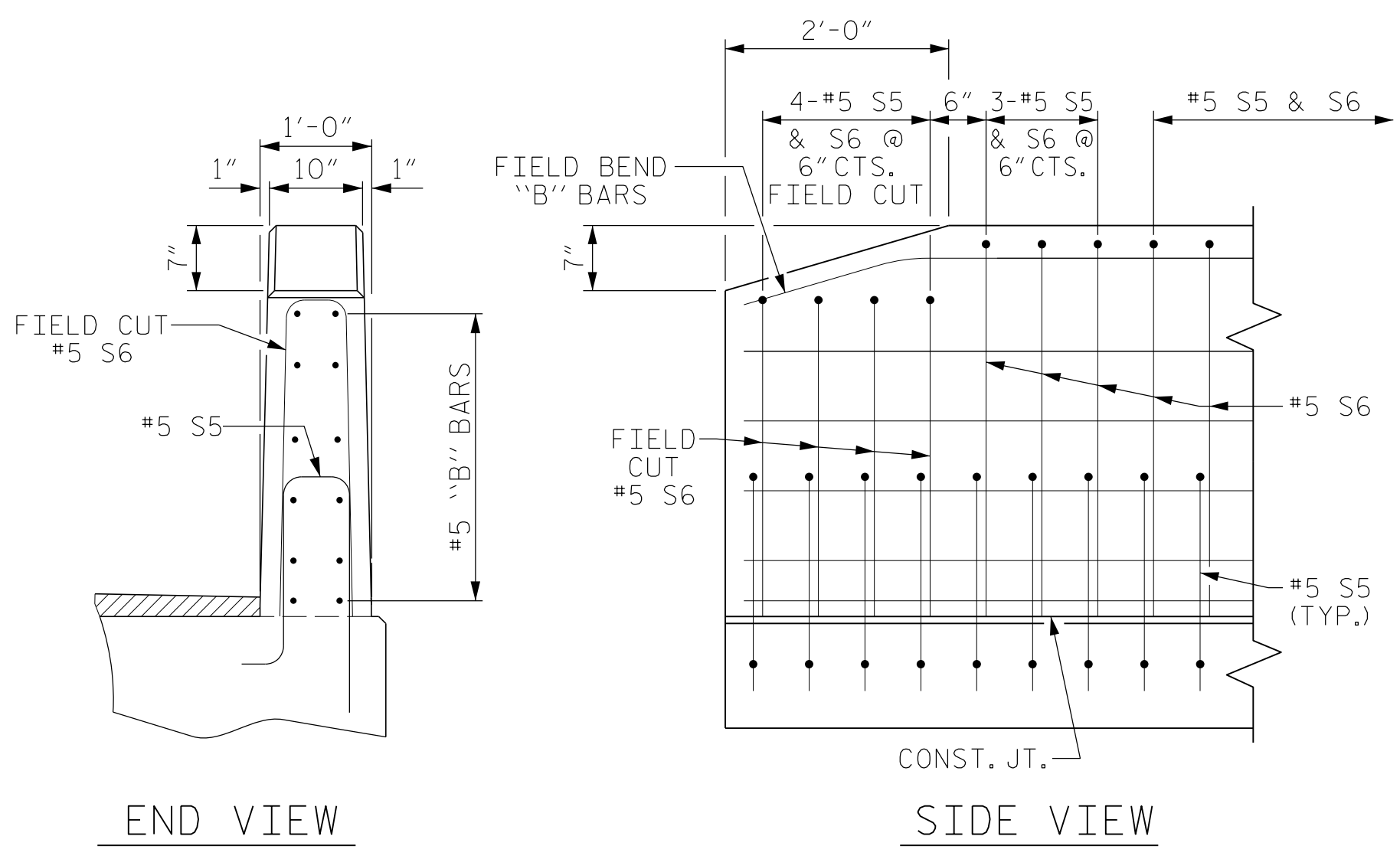
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
3'-0" X 3'-3" PRESTRESSED CONCRETE BOX BEAM UNIT					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-7
					TOTAL SHEETS 16





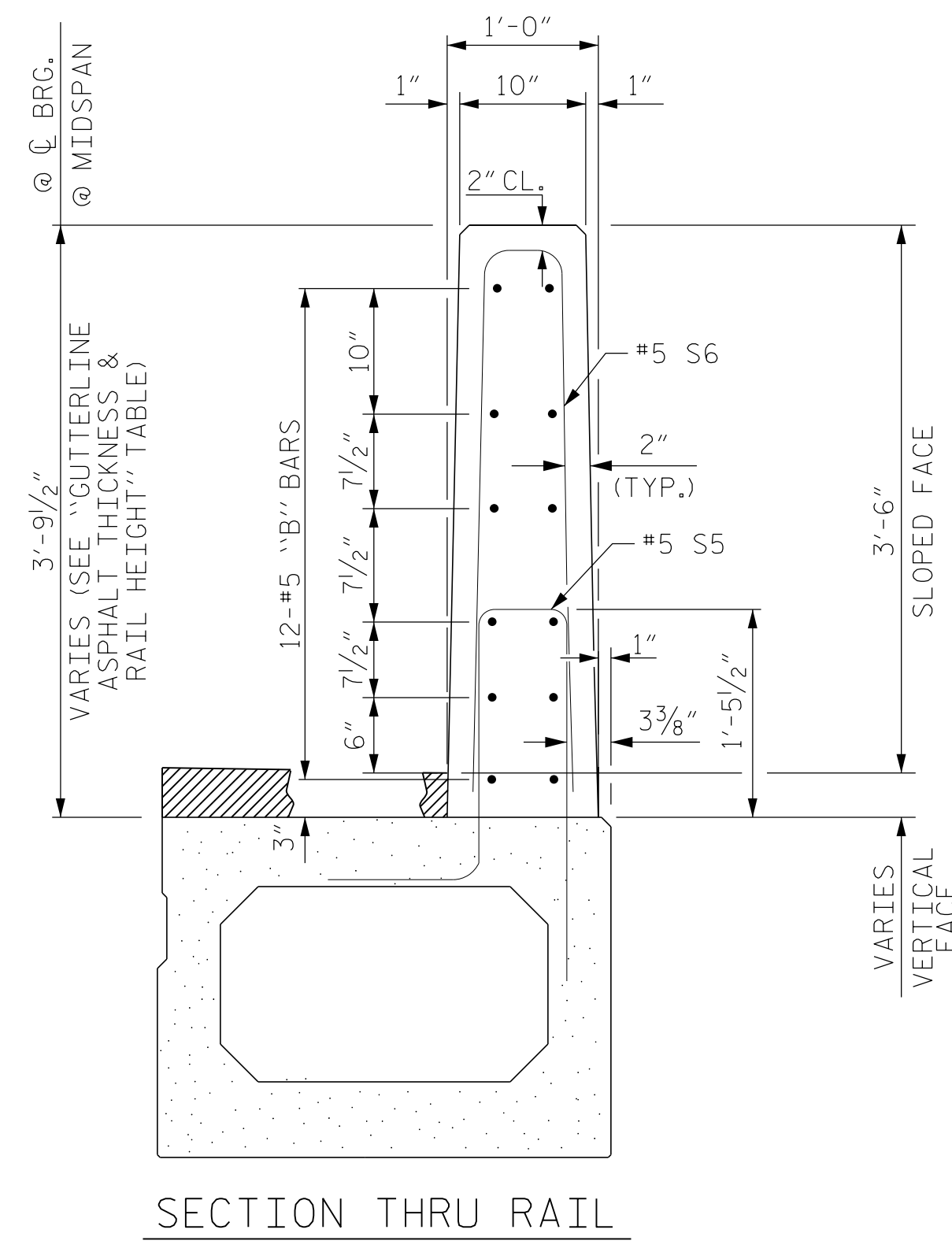
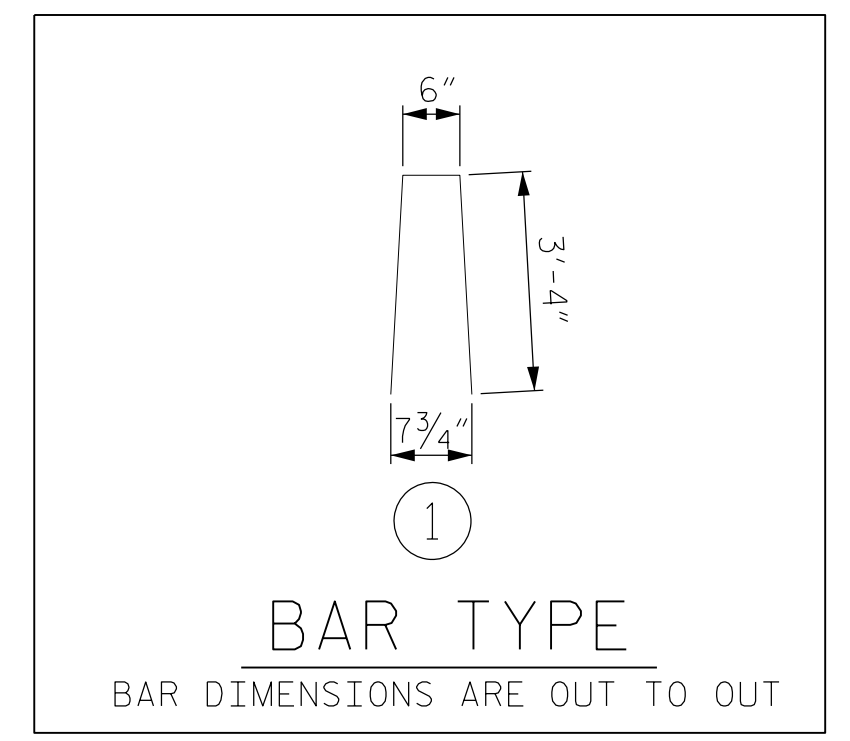
**ELASTOMERIC BEARING DETAILS**

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

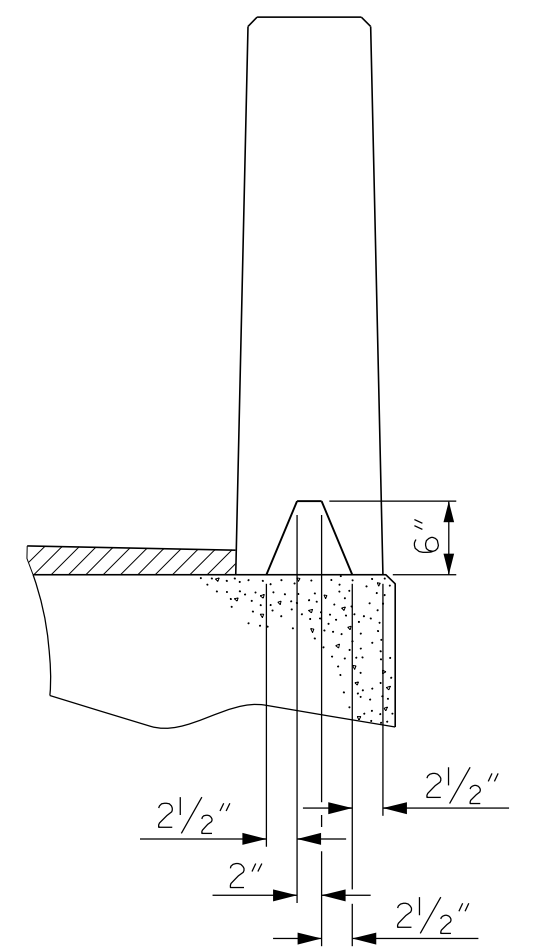


**END OF RAIL DETAILS**

BOX BEAM UNITS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	100'-0"	200'-0"
INTERIOR B.B.	9	100'-0"	900'-0"
TOTAL	11		1100'-0"

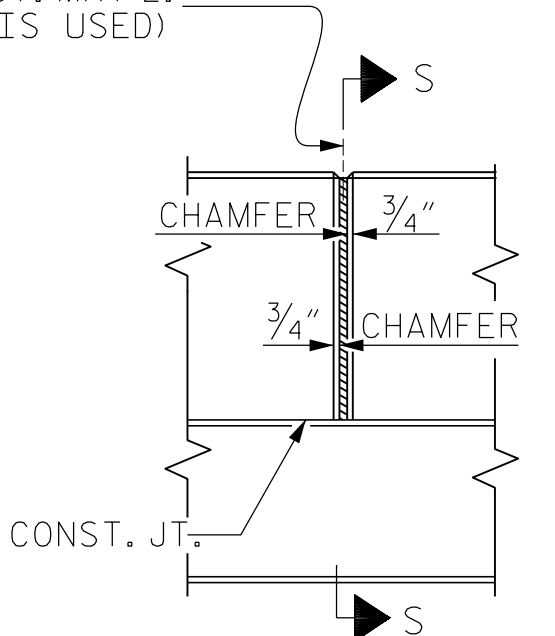


**VERTICAL CONCRETE BARRIER RAIL DETAILS**



SECTION S-S  
AT DAM IN OPEN JOINT  
(THIS IS TO BE USED ONLY  
WHEN SLIP FORM IS USED)

1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS.  
(NOTE: OMIT EXP. JT. MAT'L. WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL					
BAR	BARS PER PAIR OF EXTERIOR UNITS	SIZE	TYPE	LENGTH	WEIGHT
	100' UNIT				
*B12	192	#5	STR	14'-3"	2854
*S6	268	#5	1	7'-2"	2003
*EPOXY COATED REINFORCING STEEL				LBS.	4857
CLASS AA CONCRETE				CU.YDS.	25.9
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.	200.0

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
100' UNITS	2 3/8"	3'-8 3/8"

PROJECT NO. B-5322  
PERSON \_\_\_\_\_ COUNTY \_\_\_\_\_  
STATION: 16+05.00 -L-  
SHEET 5 OF 5



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RALEIGH  
STANDARD  
3'-0" X 3'-3"  
PRESTRESSED CONCRETE  
BOX BEAM UNIT

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS 16
2			4			

STD. NO. 39PCBB8\_60&120S

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CHECKED BY: J. LOFTUS DATE: 11/17  
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 11/17

PERSON 51  
4/17/2018  
\\400\_008\_SMU\_B5322\_SUP04.dgn  
USER: jloftus

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 7/8" Ø BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

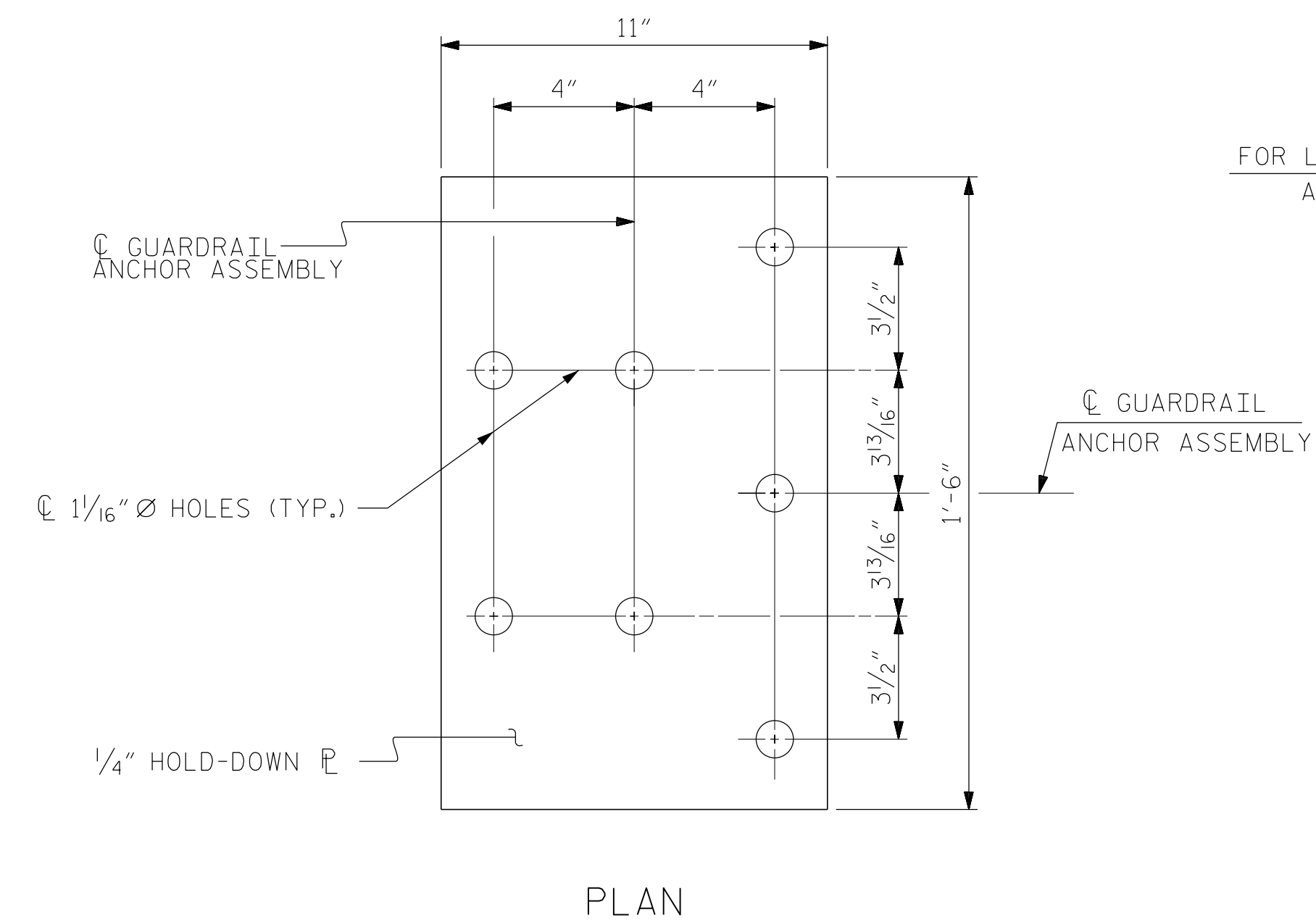
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

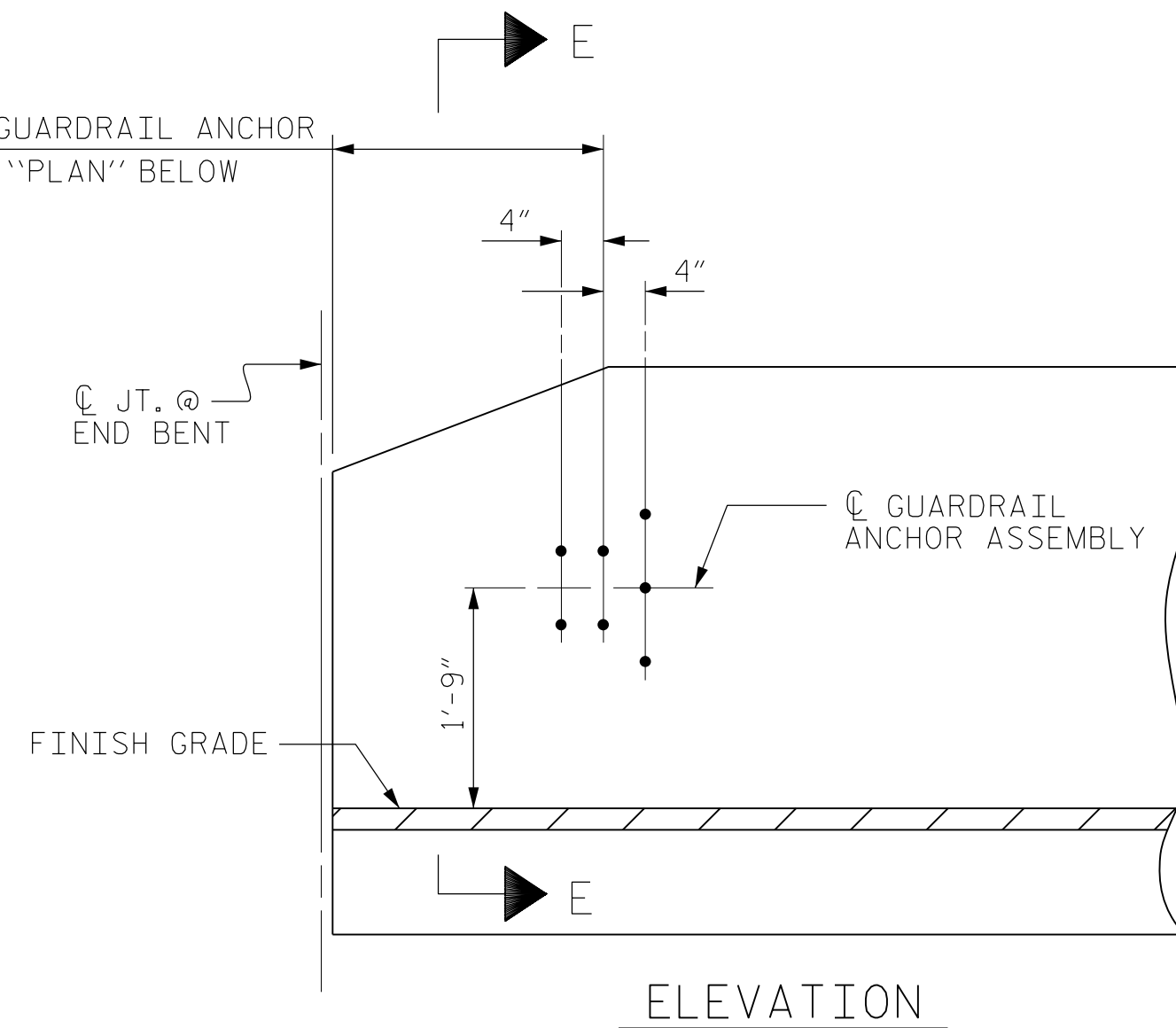
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ANCHOR BOLTS.

THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

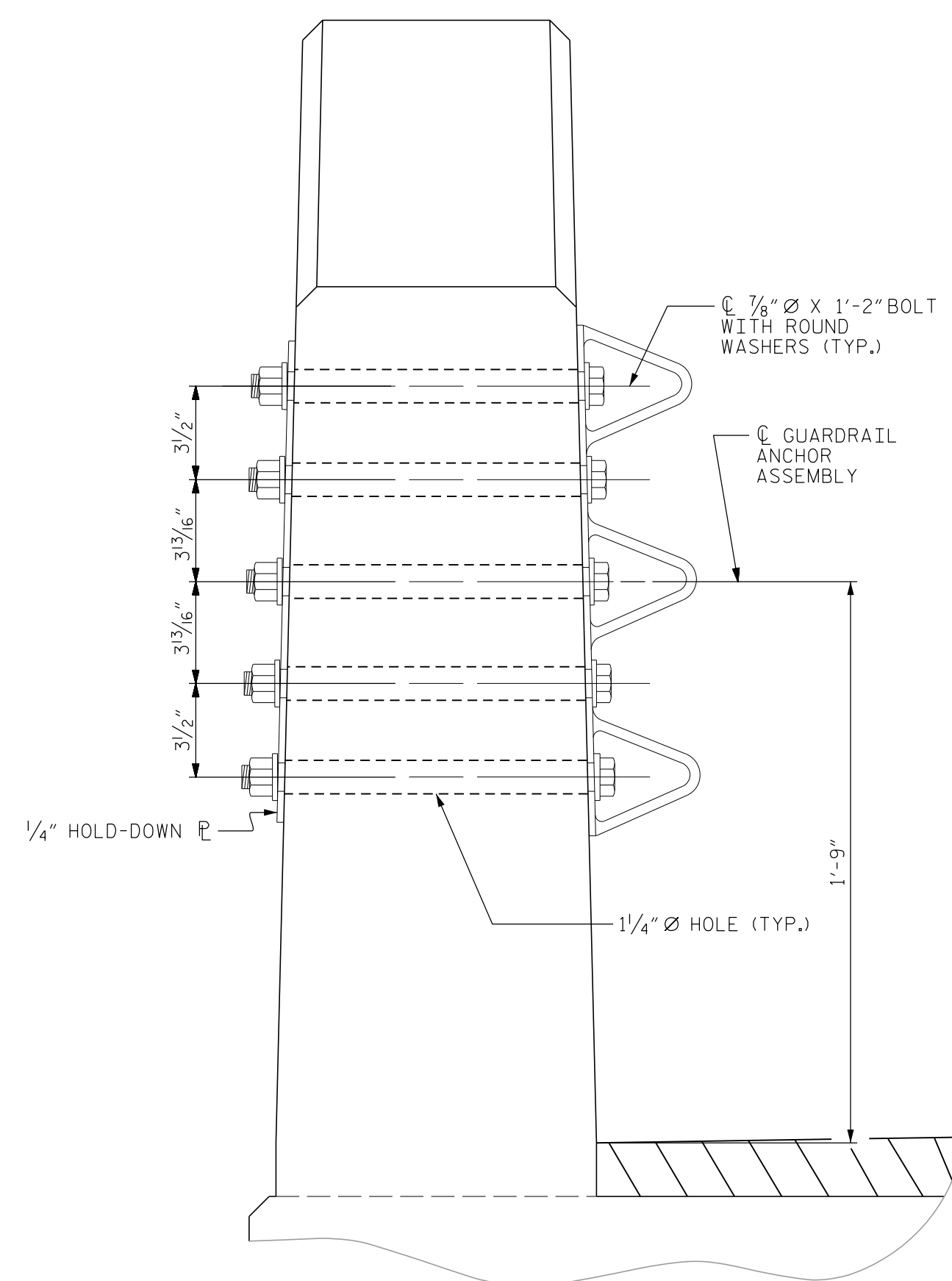


FOR LOCATION OF GUARDRAIL ANCHOR ASSEMBLY, SEE "PLAN" BELOW

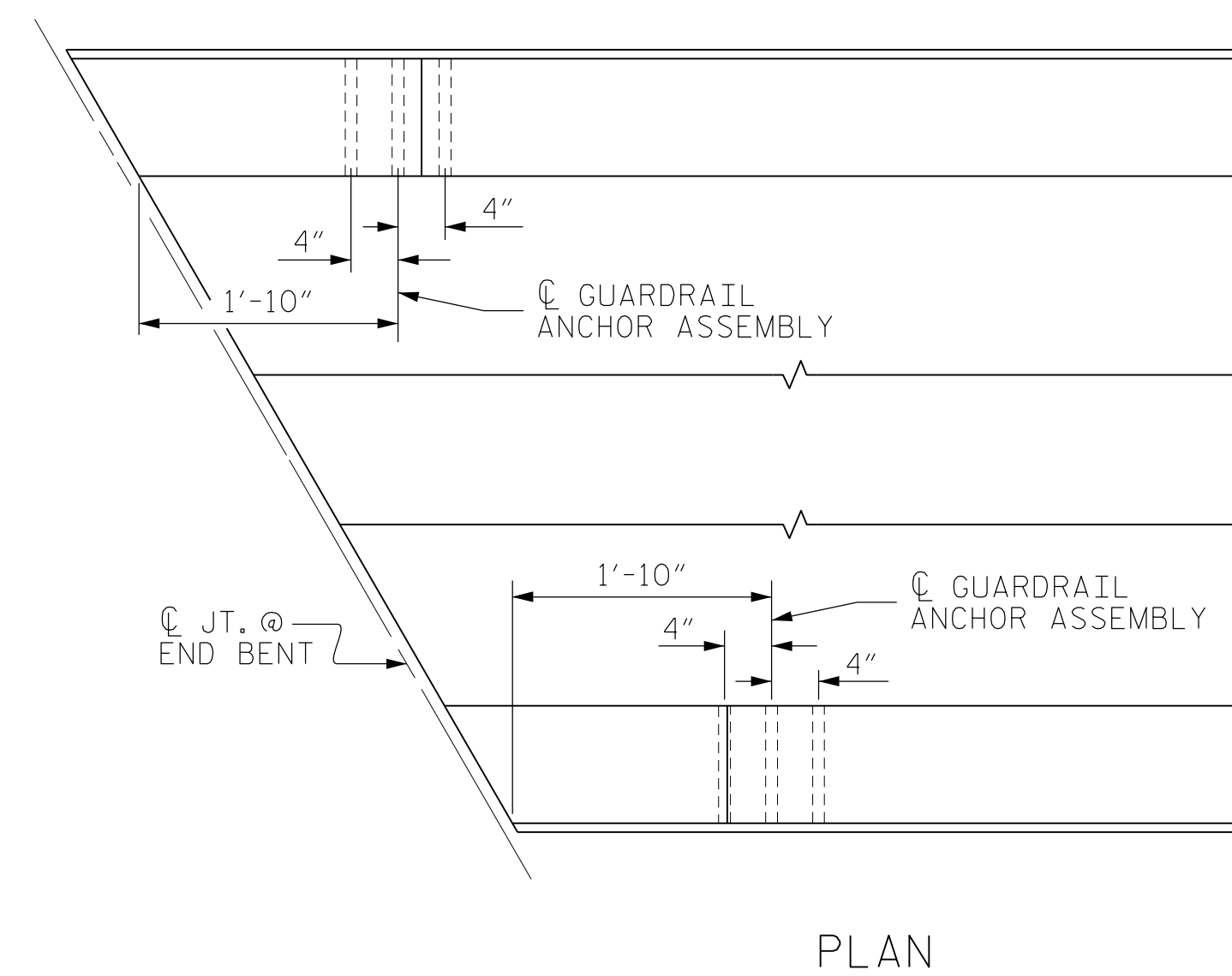


PLAN

ELEVATION

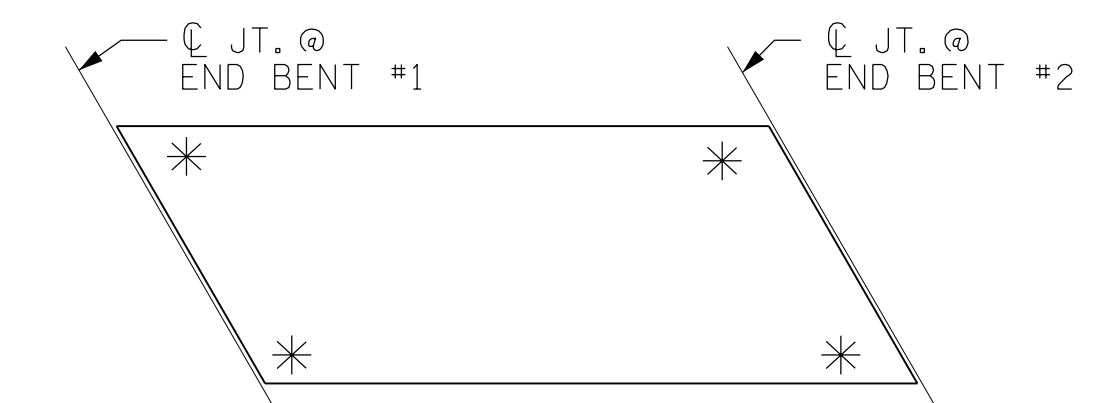


SECTION E-E  
GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF ANCHORS FOR GUARDRAIL

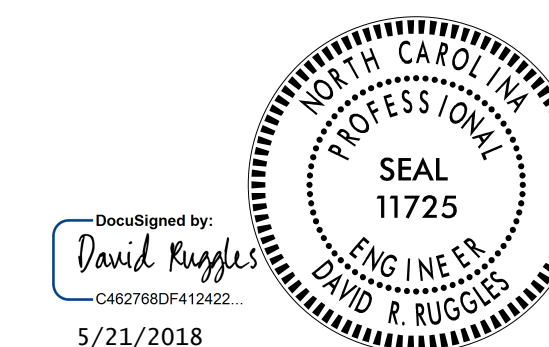
END BENT #1 SHOWN, END BENT #2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENT

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-5322  
PERSON \_\_\_\_\_ COUNTY \_\_\_\_\_  
STATION: 16+05.00 -L-



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STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
GUARDRAIL ANCHORAGE  
DETAILS  
FOR VERTICAL CONCRETE  
BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			16

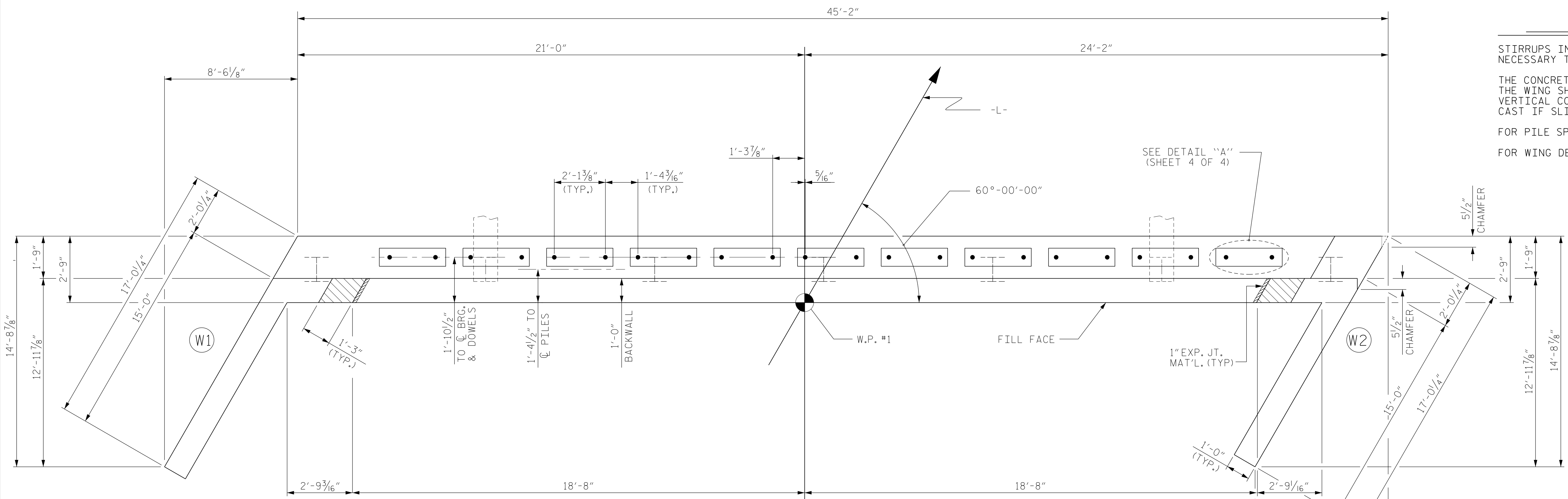
(SHT 1b) STD. NO. GRA3

DRAWN BY: E. PHELPS DATE: 10/17  
CHECKED BY: J. LOFTUS DATE: 11/17  
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 11/17

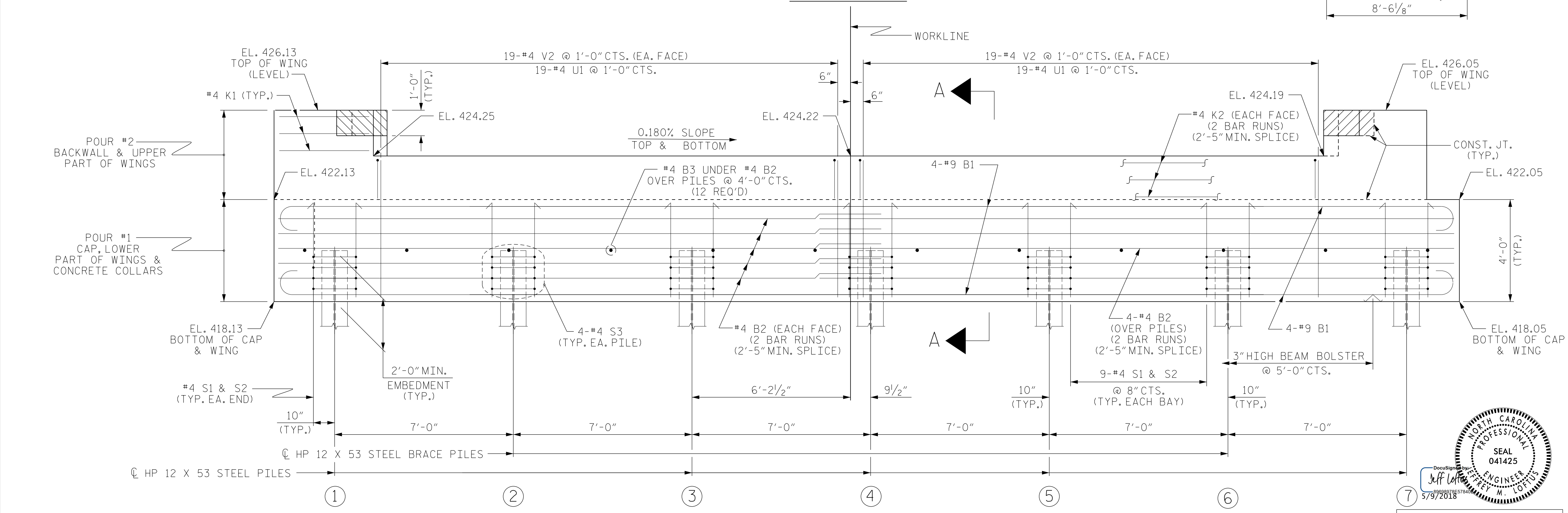
PERSON 51  
5/21/2018  
\\400\_009\_SMU\_B5322.GRA01.dgn  
USERdefault

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.  
 THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.  
 FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.  
 FOR WING DETAILS, SEE SHEET 3 OF 4.



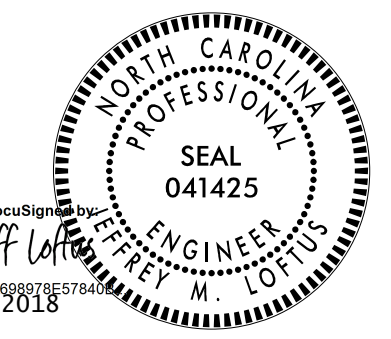
PLAN



ELEVATION

TOP OF PILE ELEVATIONS	
①	420.13
②	420.11
③	420.10
④	420.09
⑤	420.08
⑥	420.06
⑦	420.05

PROJECT NO. B-5322  
 PERSON \_\_\_\_\_ COUNTY \_\_\_\_\_  
 STATION: 16+05.00 -L-  
 SHEET 1 OF 4



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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT No. 1

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-10  
 TOTAL SHEETS 16

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WINGS NOT SHOWN FOR CLARITY.  
 FOR SECTION A-A, SEE SHEET 4 OF 4.  
 CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.  
 SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

DRAWN BY: E. PHELPS DATE: 10/17  
 CHECKED BY: J. LOFTUS DATE: 11/17  
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 11/17

PERSON 51  
 4/17/2018  
 \\400\_010\_SMU\_B5322-SUB01.dgn  
 USER: jloftus



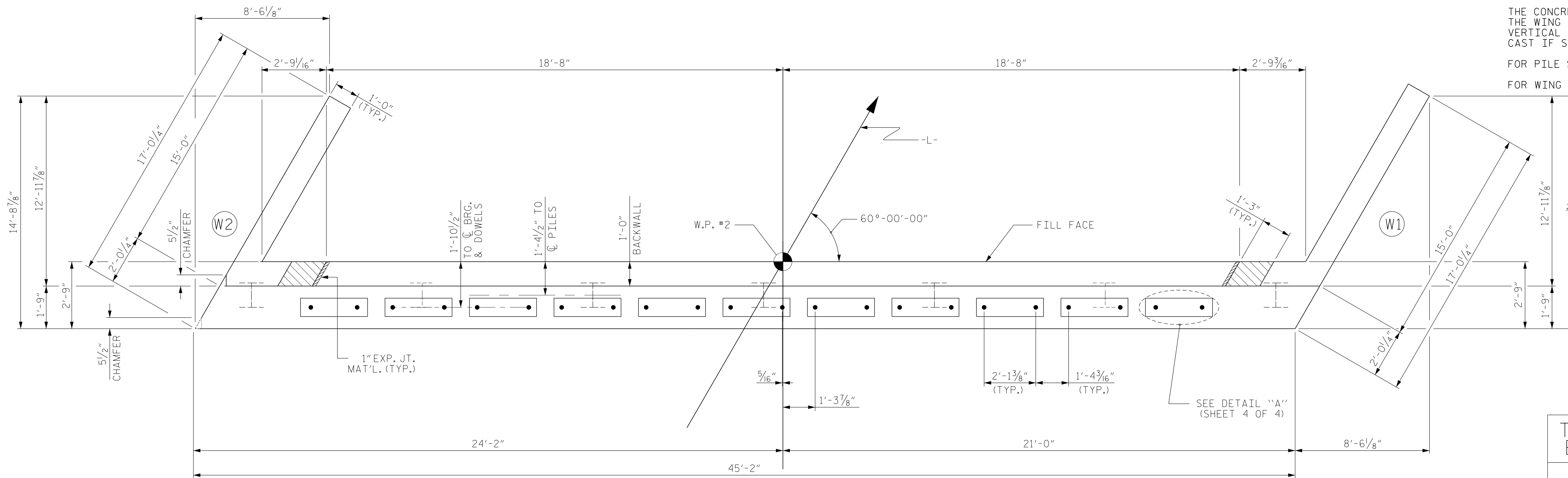
NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

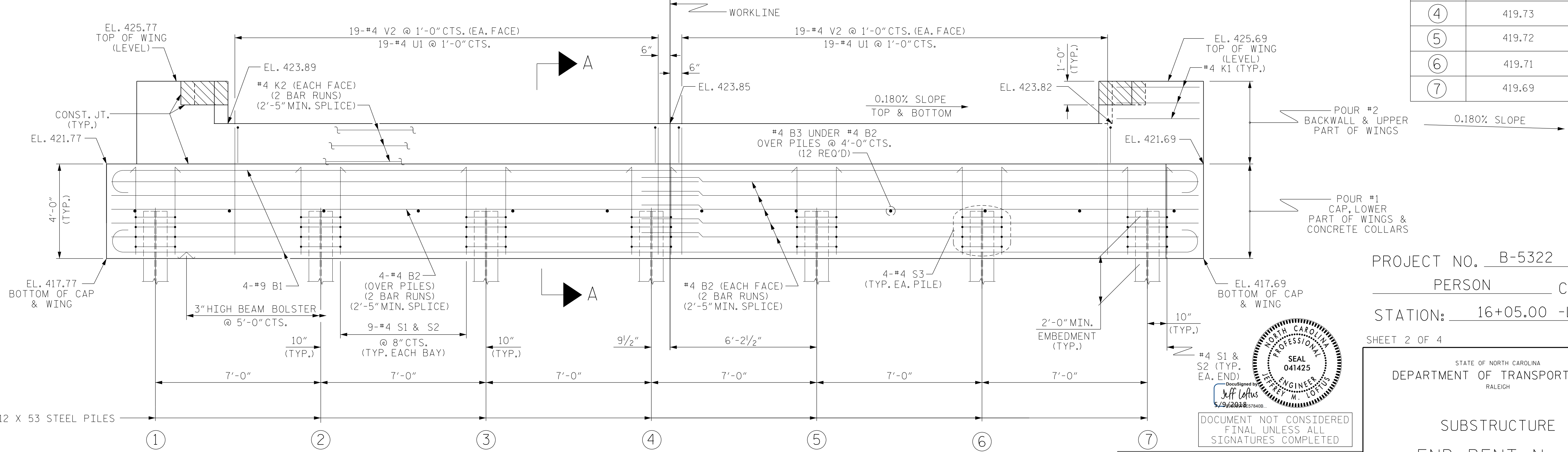
FOR PILE SPlice DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN

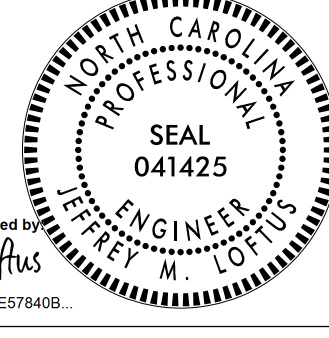
TOP OF PILE ELEVATIONS	
①	419.77
②	419.76
③	419.74
④	419.73
⑤	419.72
⑥	419.71
⑦	419.69



ELEVATION

WINGS NOT SHOWN FOR CLARITY. FOR SECTION A-A, SEE SHEET 4 OF 4.  
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

PROJECT NO. B-5322  
PERSON \_\_\_\_\_ COUNTY \_\_\_\_\_  
STATION: 16+05.00 -L-  
SHEET 2 OF 4



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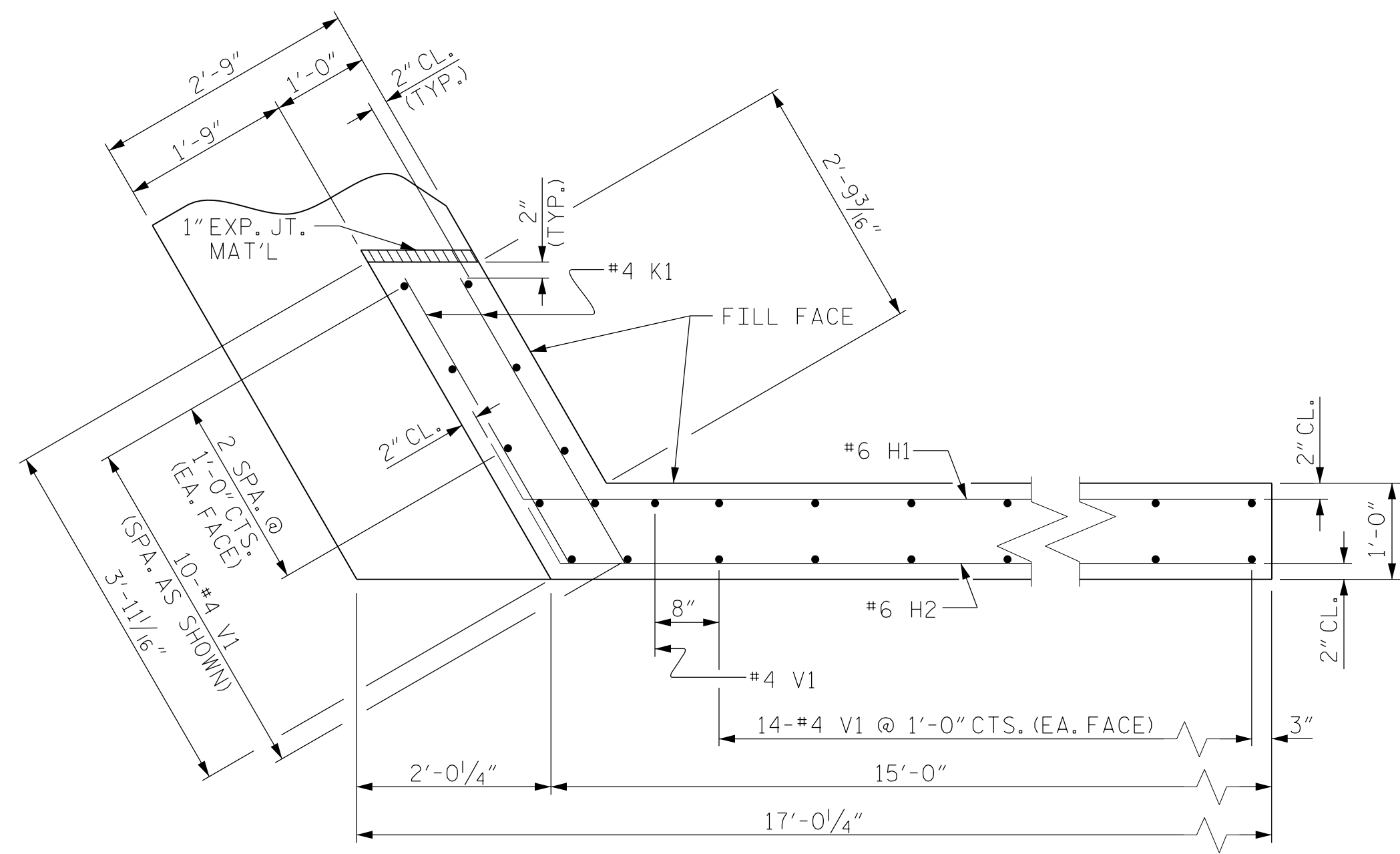
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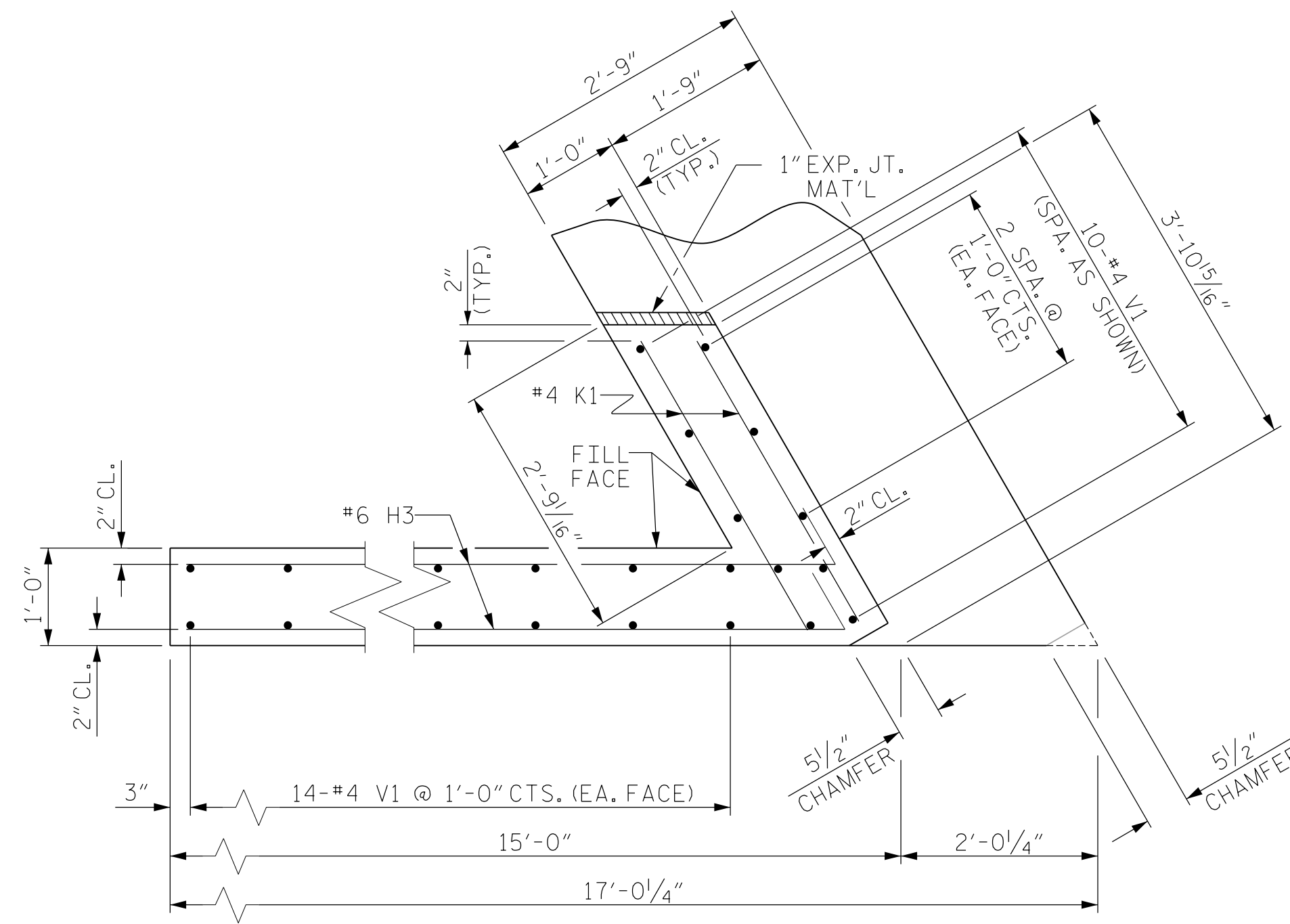
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SUBSTRUCTURE END BENT No. 2		REVISIONS		SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11	
1			3			TOTAL SHEETS	
2			4			16	

PERSON 51  
 4/17/2018  
 \\400\_011\_SMU\_B5322-SUB02.dgn  
 USER: jloftus

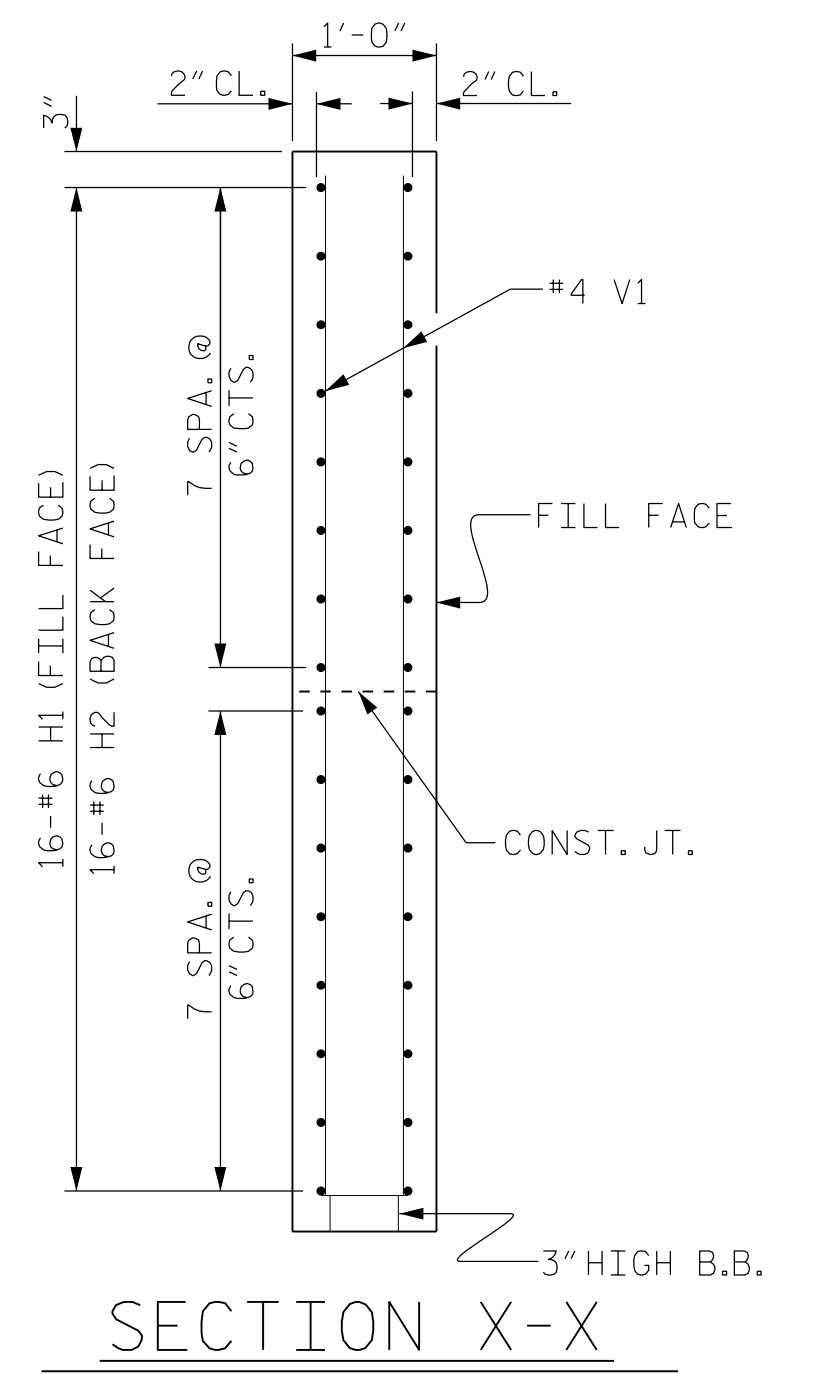
DRAWN BY: E. PHELPS DATE: 10/17  
 CHECKED BY: J. LOFTUS DATE: 11/17  
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 11/17



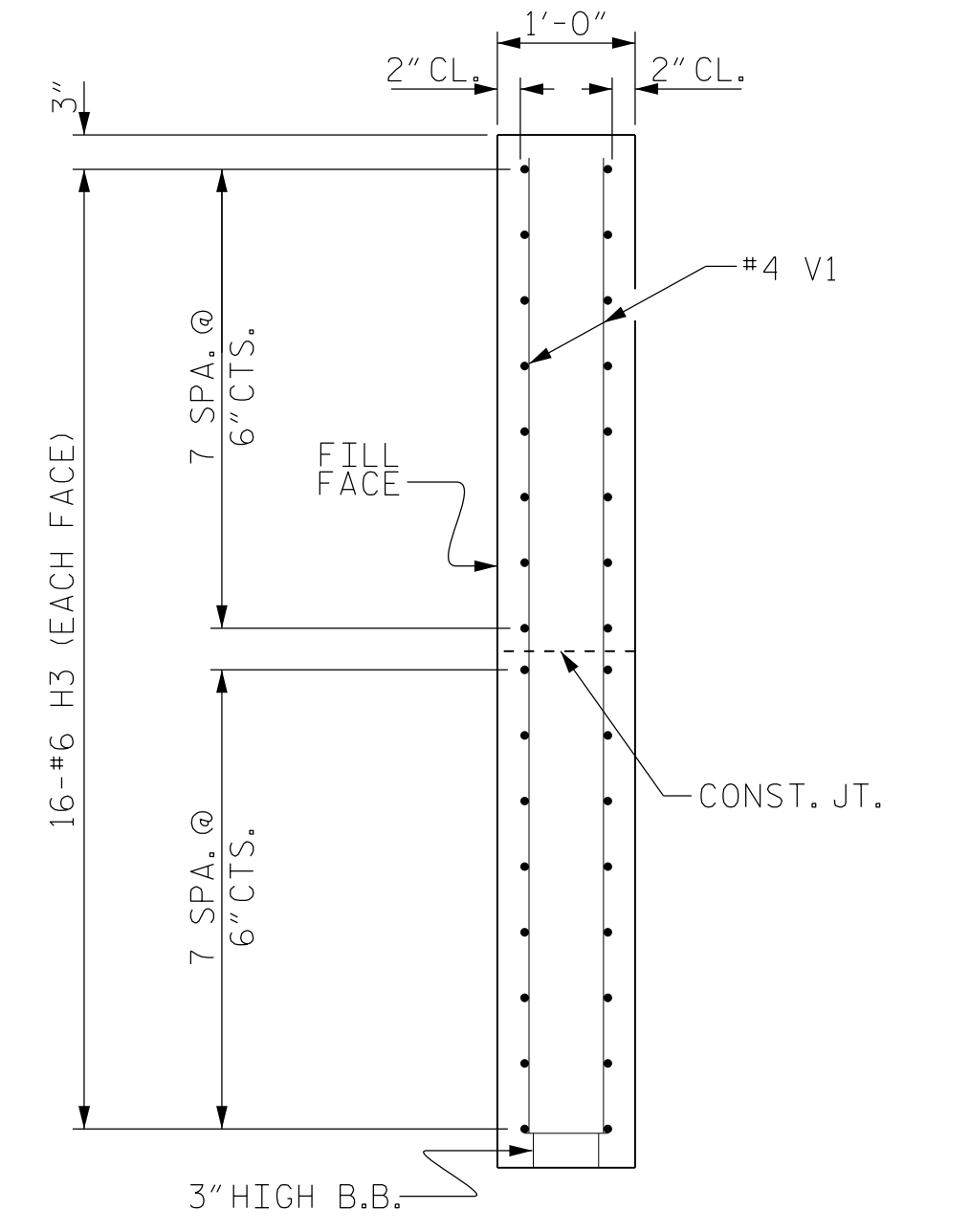
PLAN OF WING (W1)



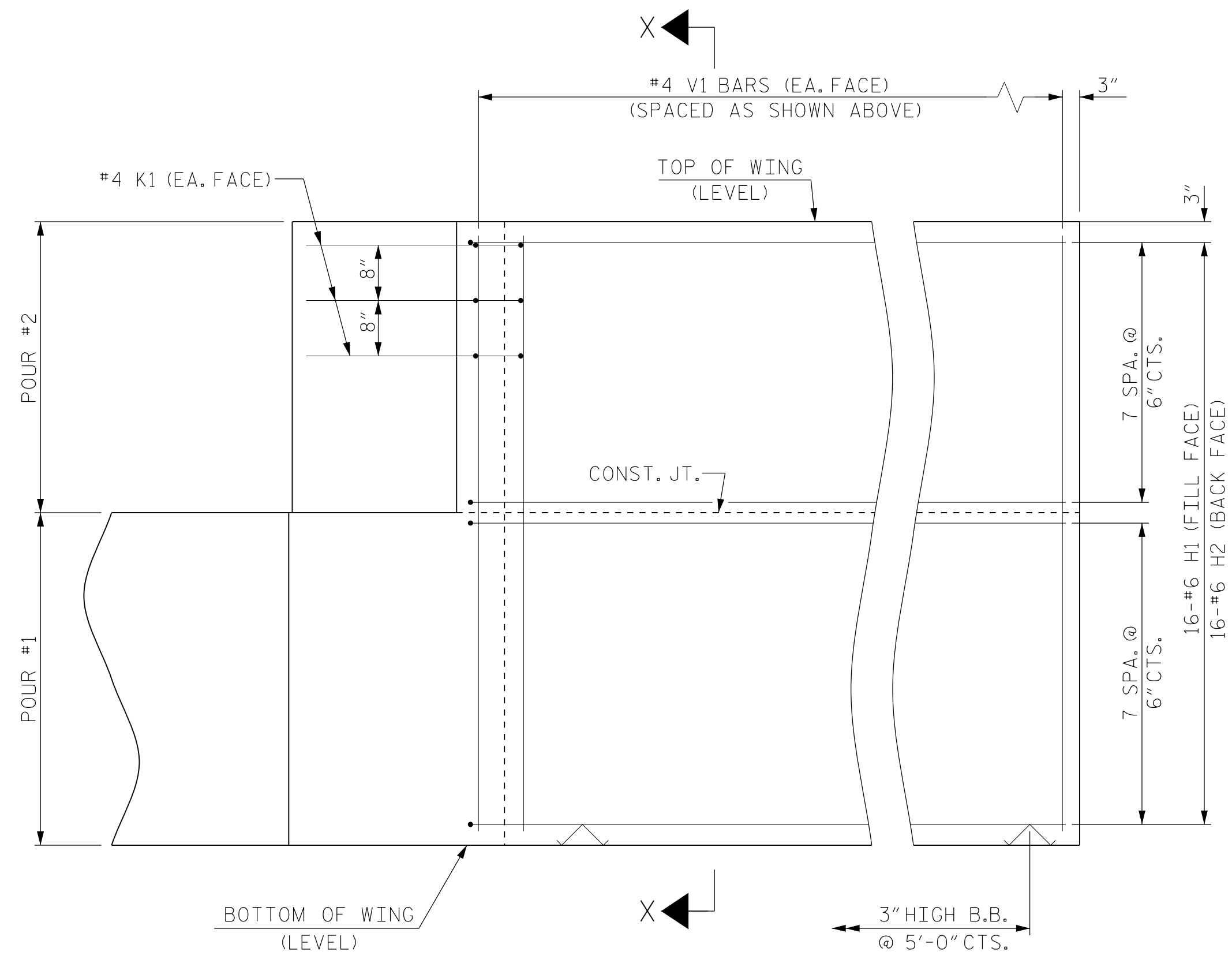
PLAN OF WING (W2)



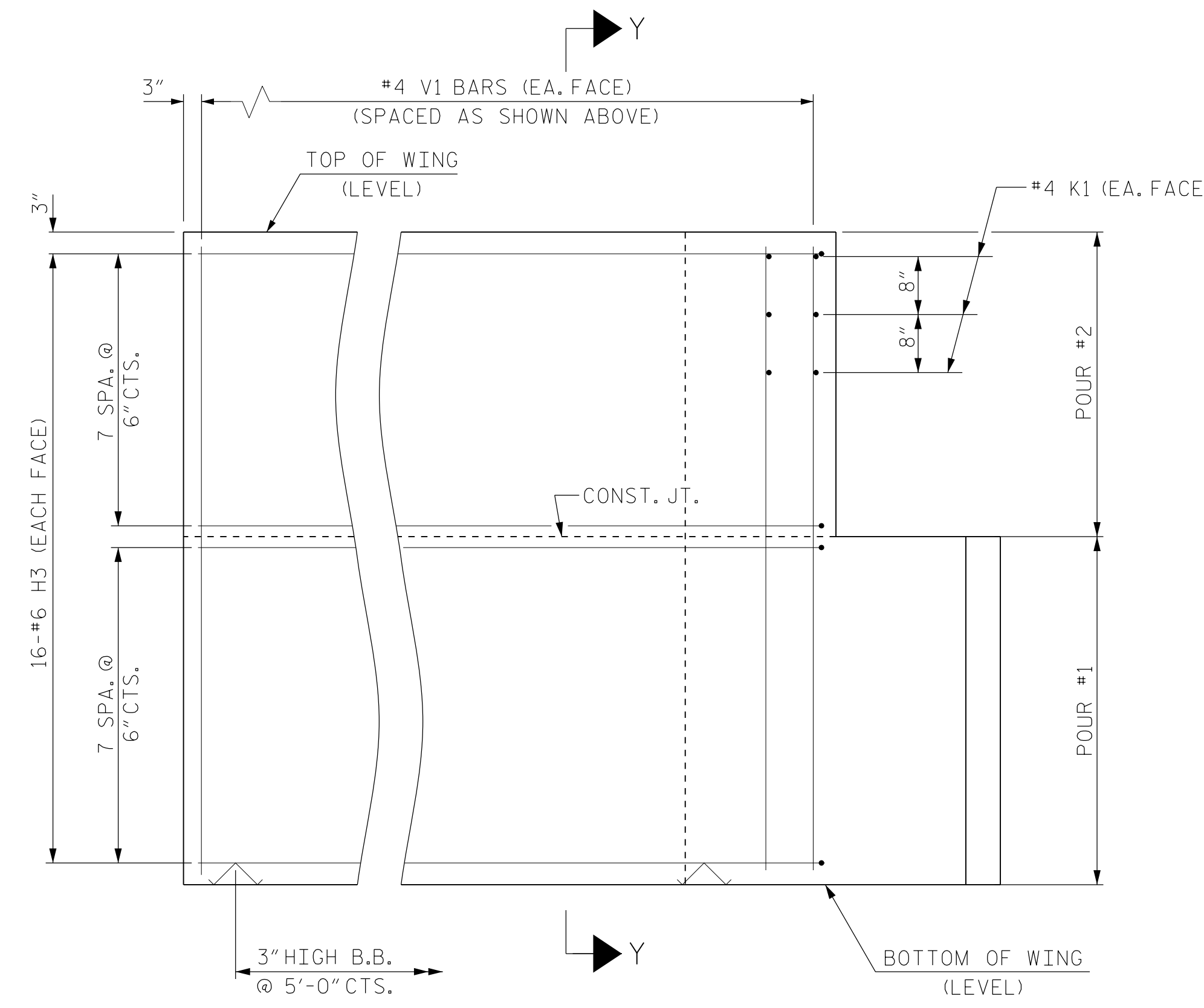
SECTION X-X



SECTION Y-Y



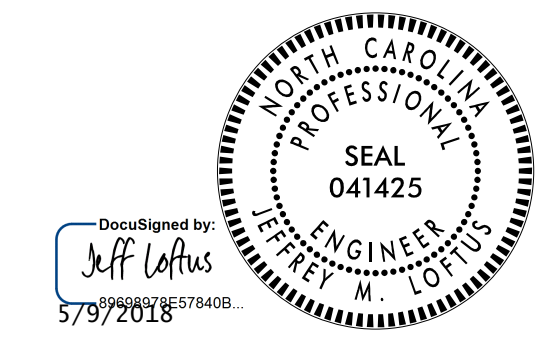
ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

PROJECT NO. B-5322  
 PERSON \_\_\_\_\_ COUNTY \_\_\_\_\_  
 STATION: 16+05.00 -L-  
 SHEET 3 OF 4



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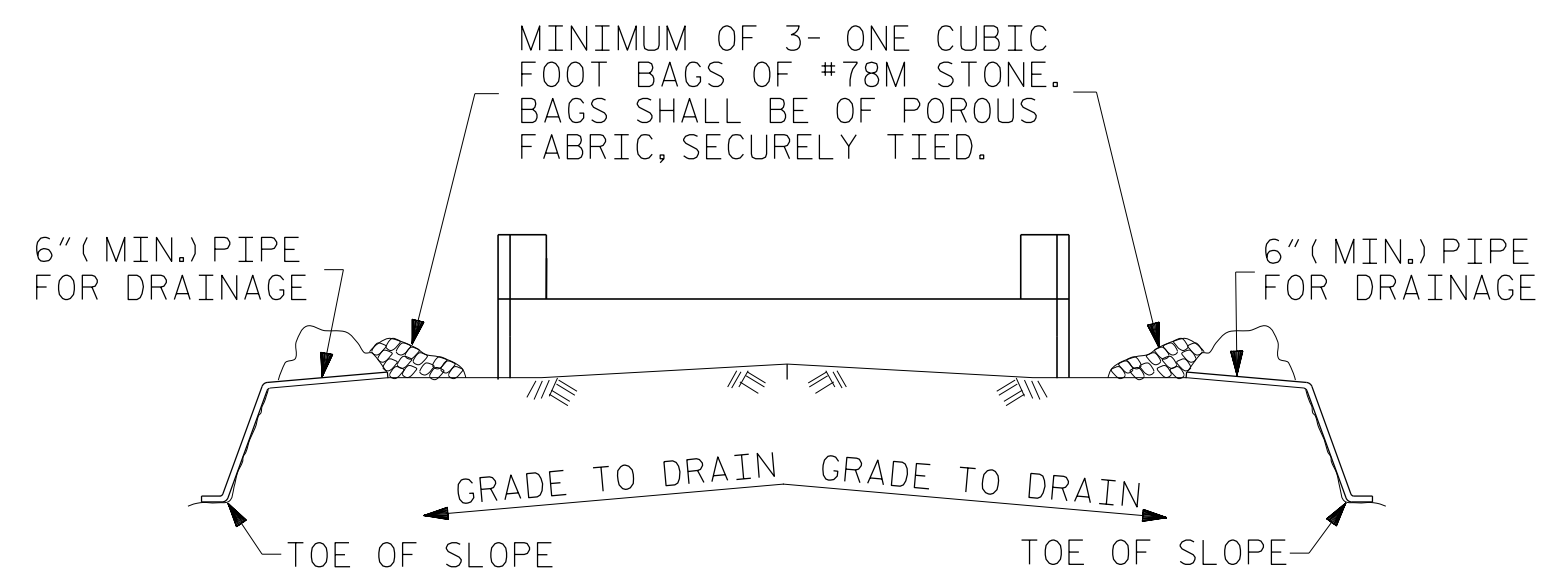
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT WING DETAILS					
SHEET NO. S-12					
TOTAL SHEETS 16					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

DRAWN BY: E. PHELPS DATE: 10/17  
 CHECKED BY: J. LOFTUS DATE: 11/17  
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 11/17

PERSON 51  
 4/17/2018  
 \\400\_012\_SML\_B5322\_SUB03.dgn  
 USER: jloftus



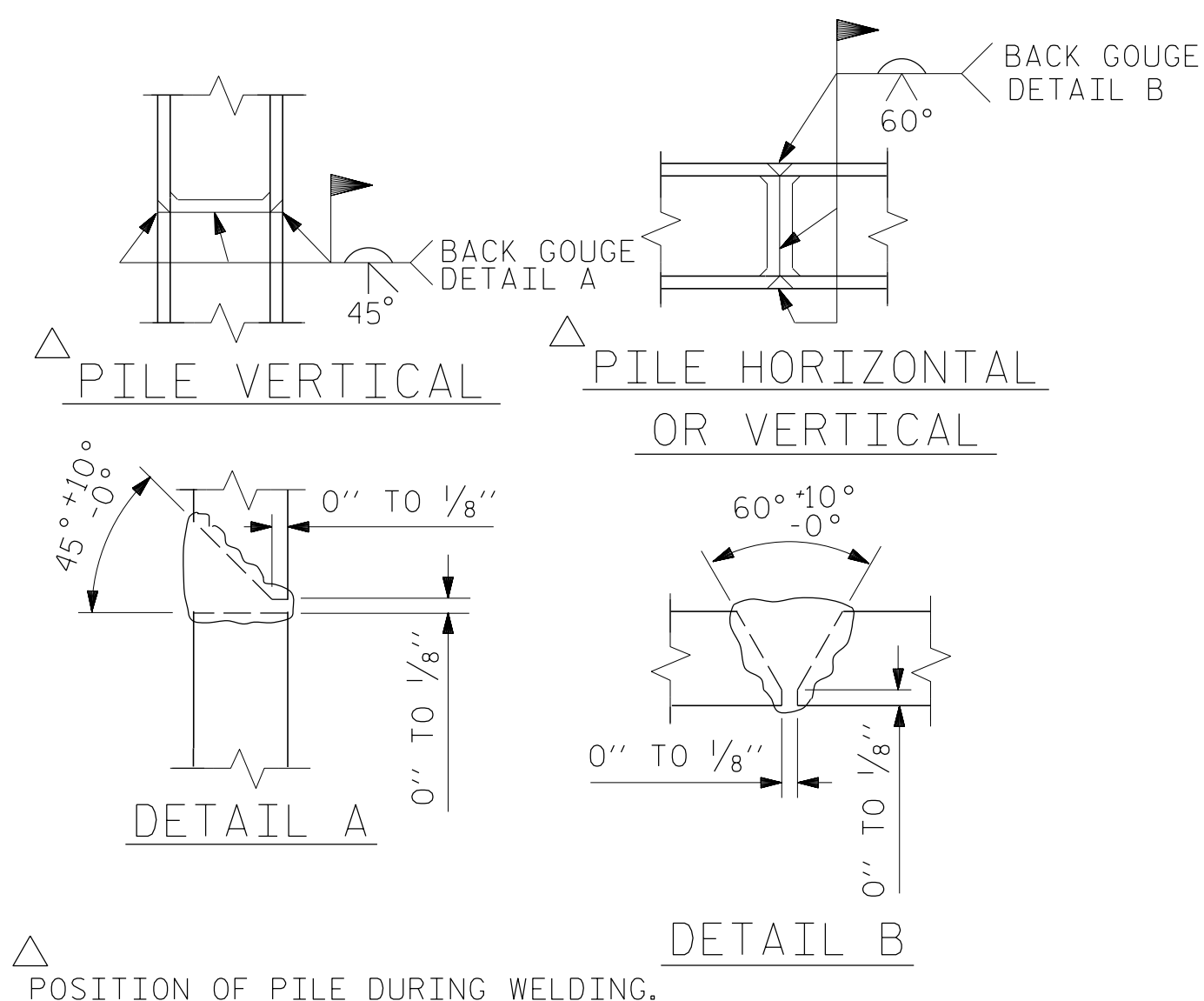


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

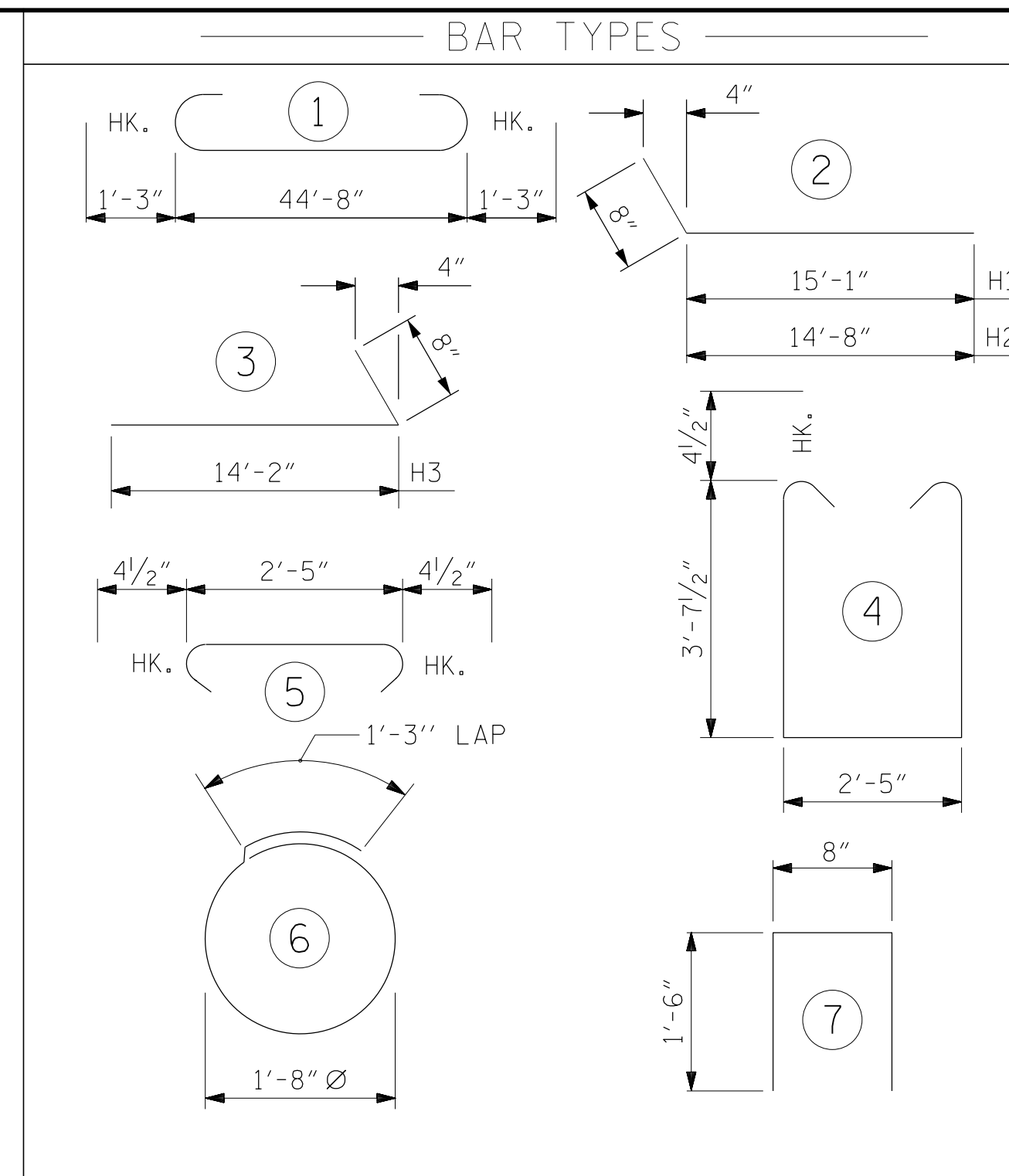
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

### TEMPORARY DRAINAGE AT END BENT



### PILE SPLICE DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT No. 1 HP 12 X 53 STEEL PILES NO: 7	END BENT No. 2 HP 12 X 53 STEEL PILES NO: 7
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 7	PILE EXCAVATION IN SOIL NOT IN SOIL LIN. FT.= 30 LIN. FT.= 40
STEEL PILE POINTS NO: 7	

### BILL OF MATERIAL FOR ONE END BENT

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	#8		47'-2"	1283
B2	#4	STR	23'-8"	443
B3	#4	STR	2'-5"	19
D1	#8	STR	2'-3"	132
H1	#6		15'-9"	379
H2	#6		15'-4"	368
H3	#6		14'-10"	713
K1	#4	STR	3'-3"	26
K2	#4	STR	23'-8"	190
S1	#4		10'-5"	390
S2	#4		3'-2"	118
S3	#4		6'-6"	122
U1	#4		3'-8"	93
V1	#4	STR	7'-8"	394
V2	#4	STR	5'-9"	292

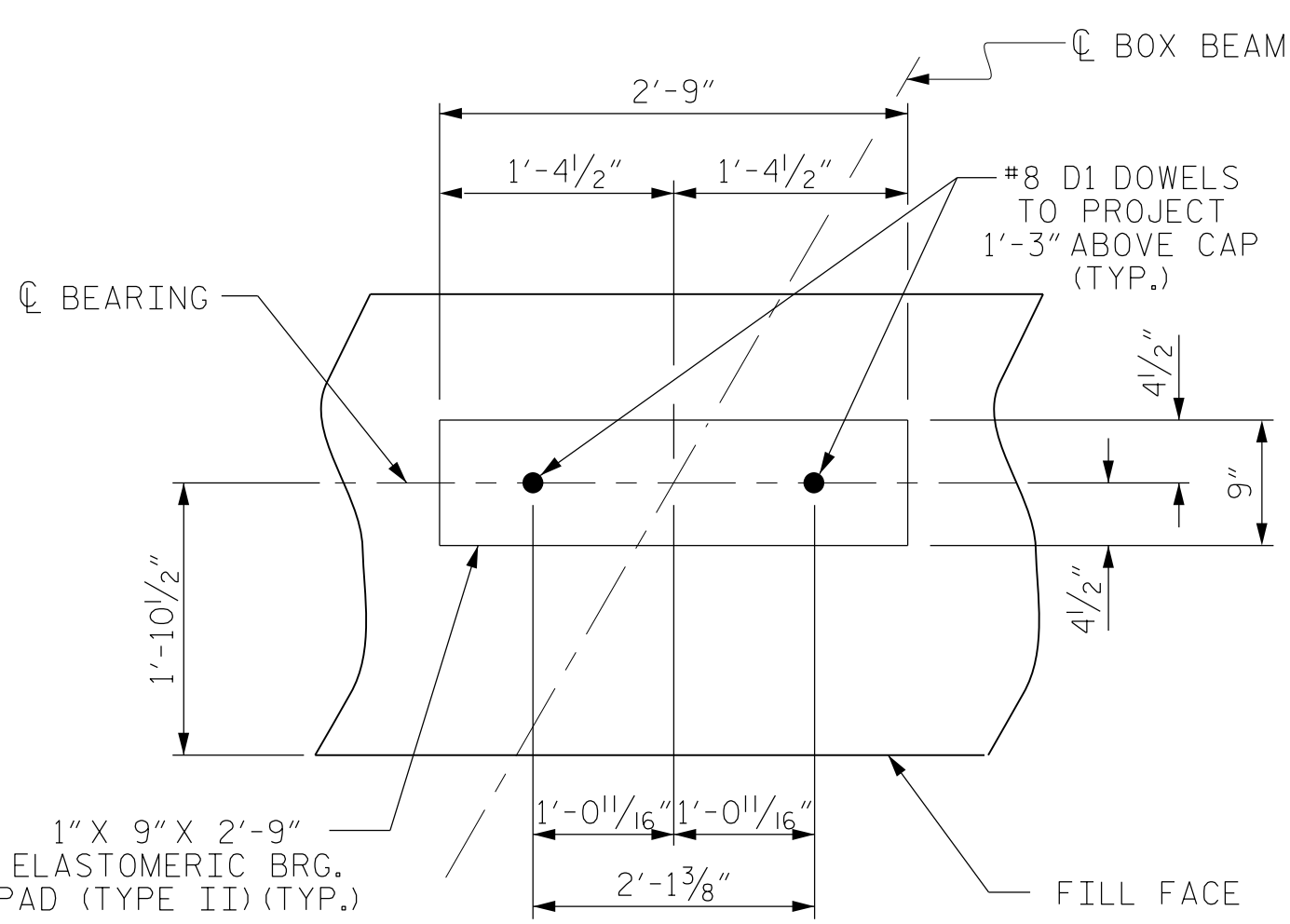
REINFORCING STEEL (FOR ONE END BENT) 4962 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 23.8 C.Y.

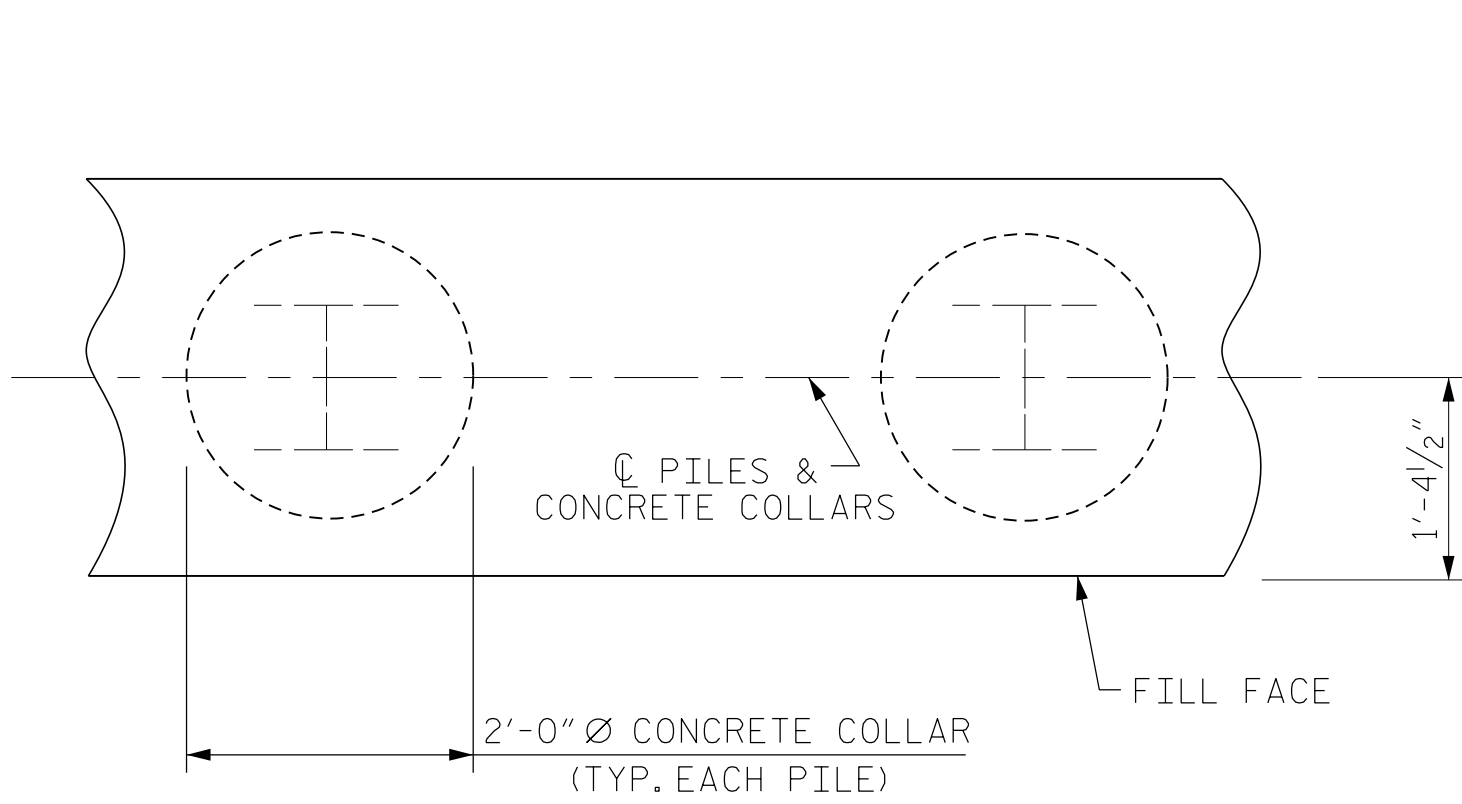
POUR #2 BACKWALL & UPPER PART OF WINGS 8.3 C.Y.

TOTAL CLASS A CONCRETE 32.1 C.Y.



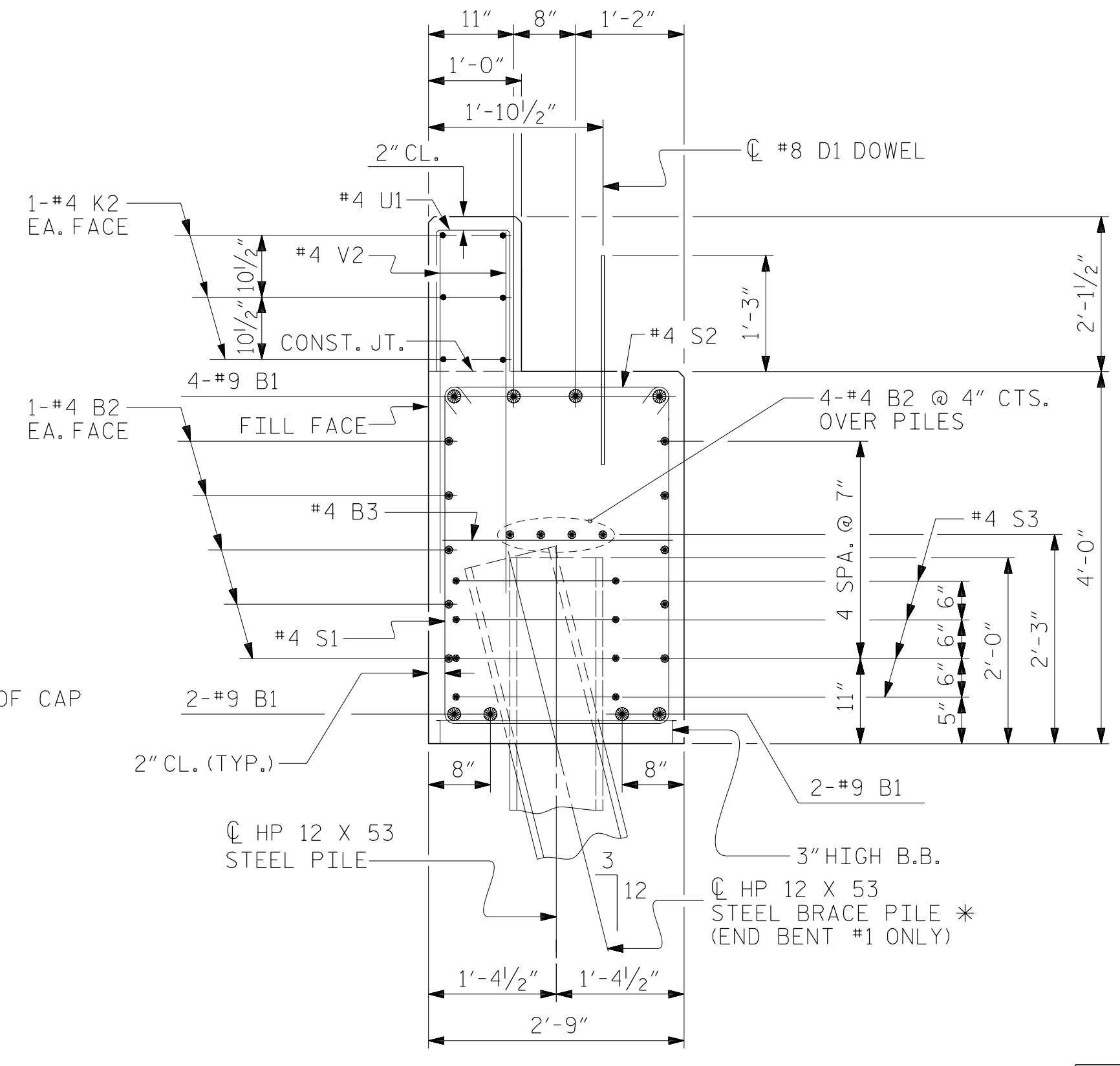
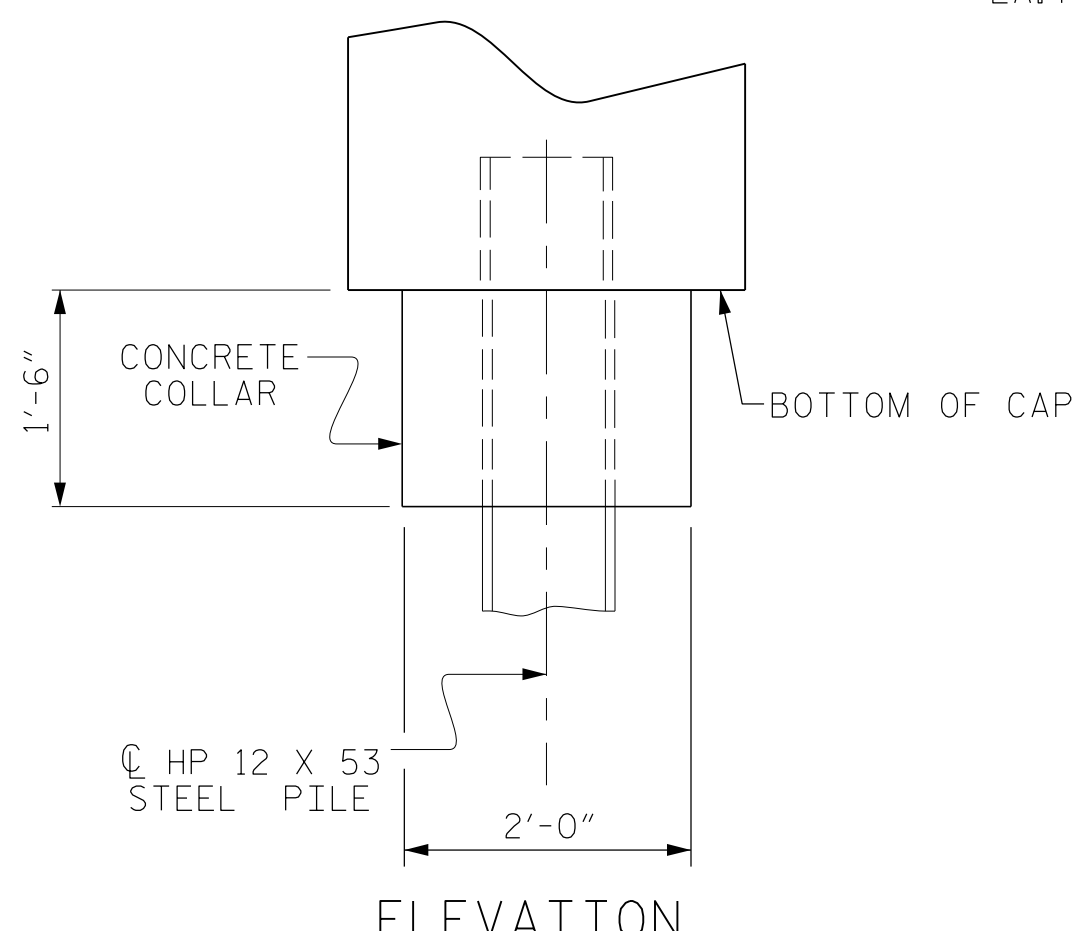
### DETAIL "A"

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



### CORROSION PROTECTION FOR STEEL PILES DETAIL

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)

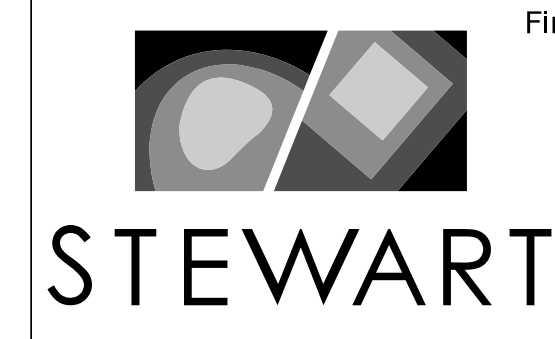


(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")

\* END BENT #2 CONSISTS OF 7 PLUMB PILES



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PROJECT NO. B-5322  
PERSON COUNTY  
STATION: 16+05.00 -L-  
SHEET 4 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
END BENT No. 1 & 2 DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

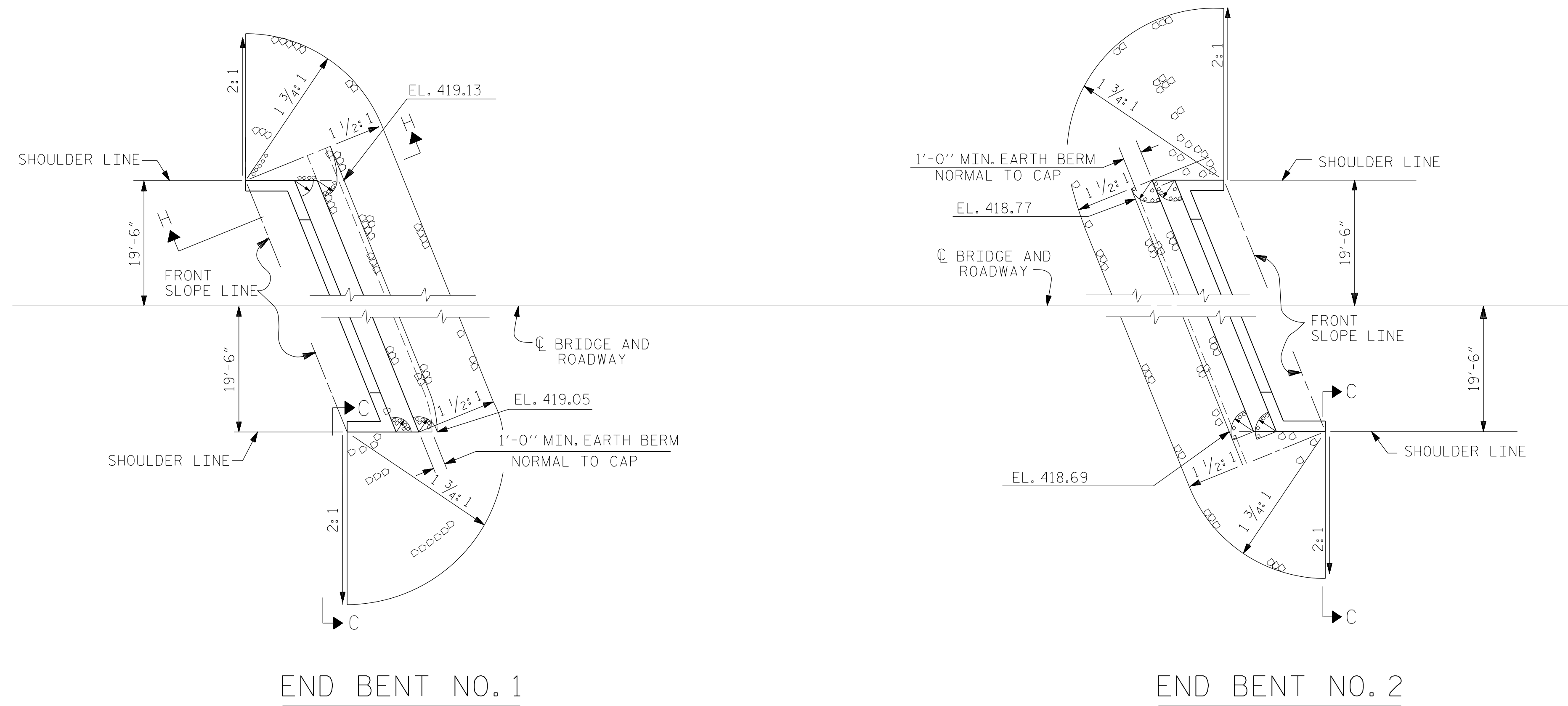
SHEET NO. S-13  
TOTAL SHEETS 16

PERSON 51  
4/17/2018  
\\400\_013\_SML\_B5322\_SUB04.dgn  
USER: jloftus

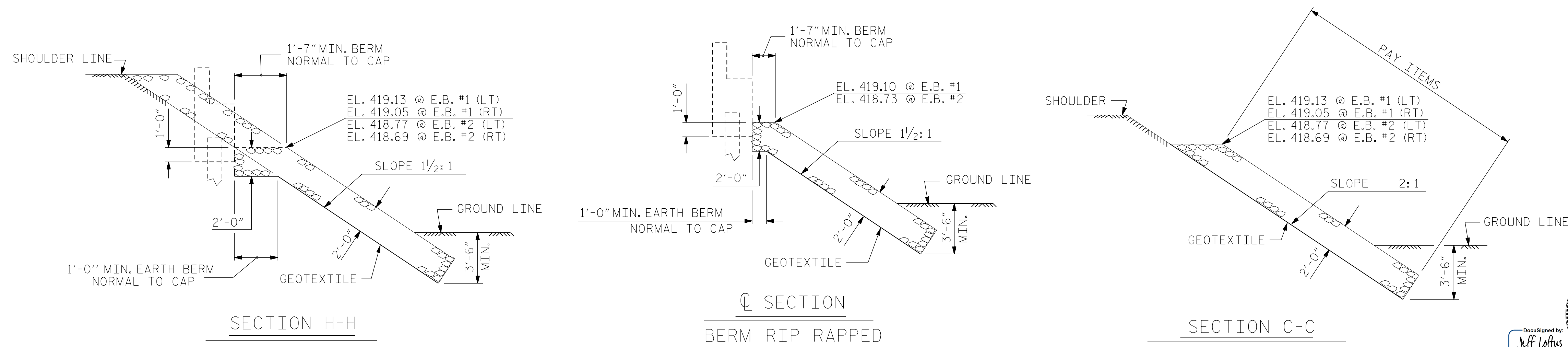
DRAWN BY: E. PHELPS	DATE: 10/17
CHECKED BY: J. LOFTUS	DATE: 11/17
DESIGN ENGINEER OF RECORD: J. LOFTUS	DATE: 11/17



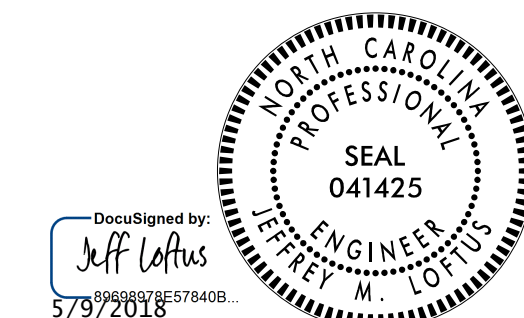
NOTES :  
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.



ESTIMATED QUANTITIES		
BRIDGE @ STA. 16+05.00	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	115	125
END BENT 2	110	120



PROJECT NO. B-5322  
PERSON \_\_\_\_\_ COUNTY \_\_\_\_\_  
STATION: 16+05.00 -L-



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SIGNATURES COMPLETED

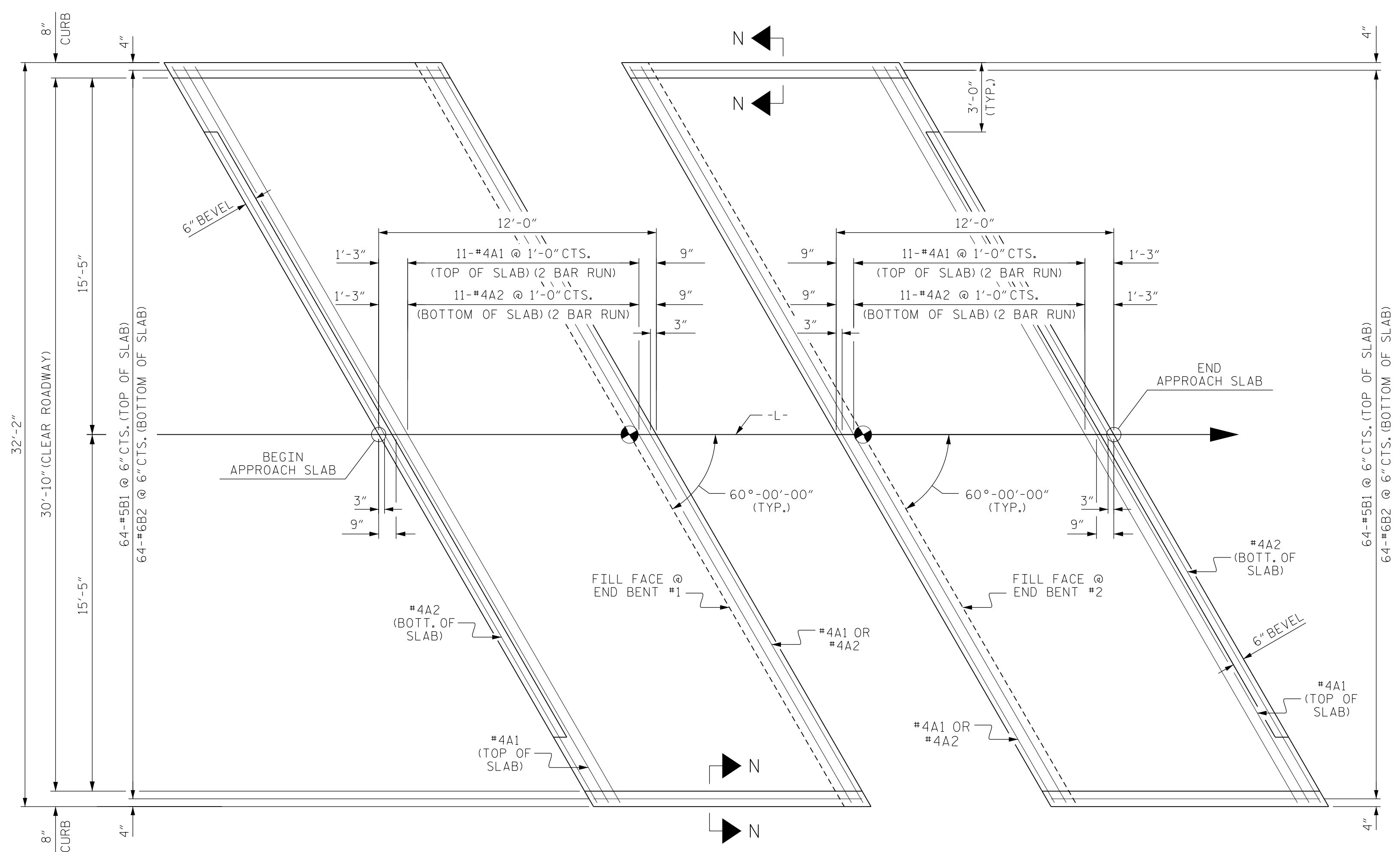
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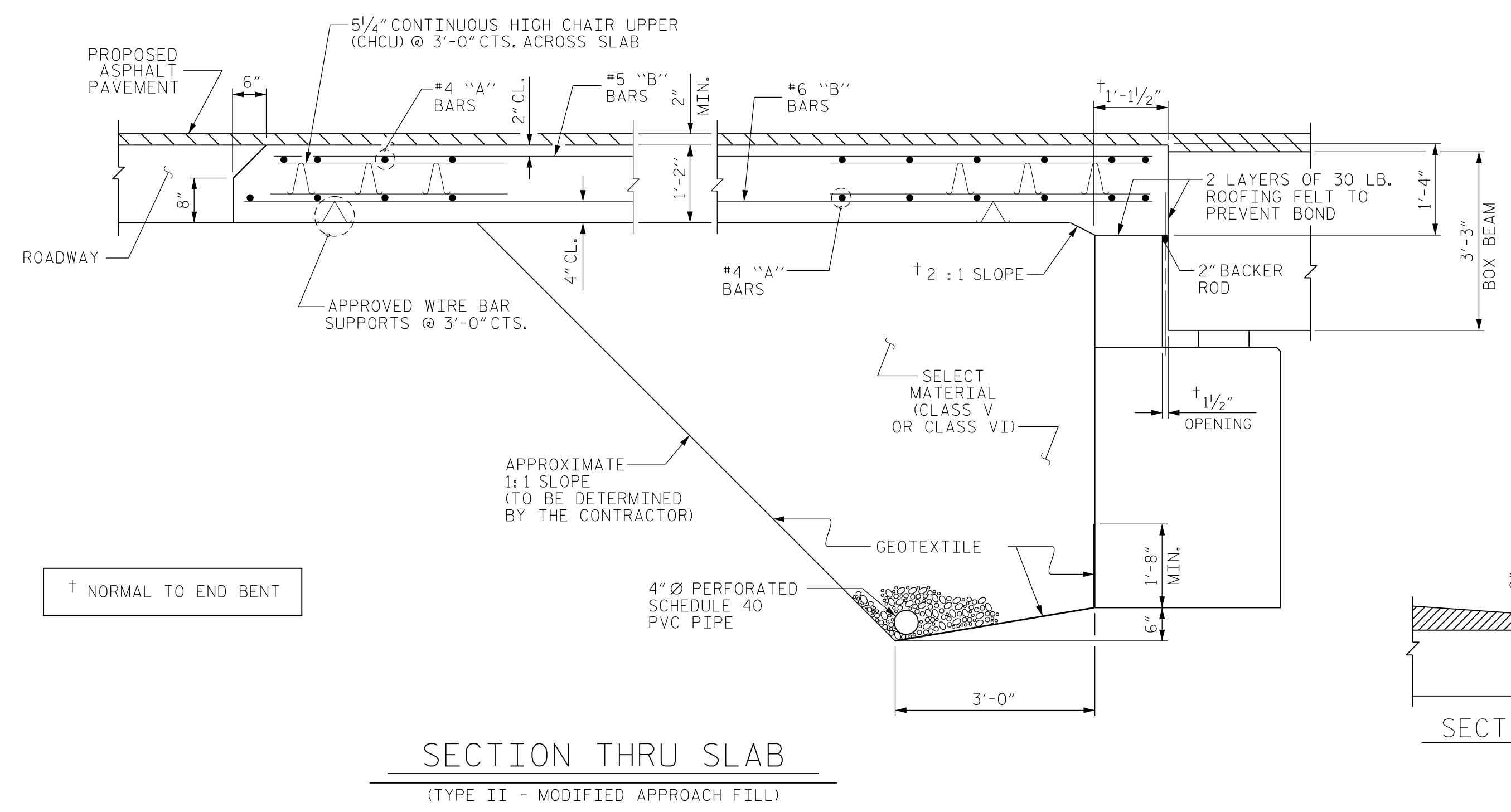
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD = RIP RAP DETAILS =					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-14				
TOTAL SHEETS 16				

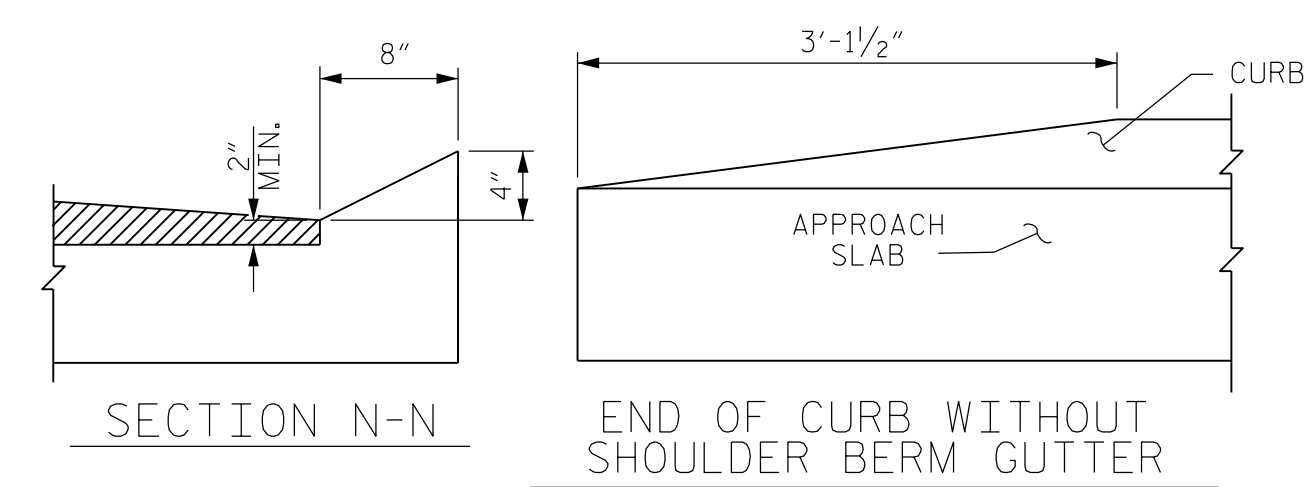
DRAWN BY: E. PHELPS DATE: 10/17  
CHECKED BY: J. LOFTUS DATE: 11/17  
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 11/17



PLAN @ END BENT #1  
 PLAN @ END BENT #2  
 DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



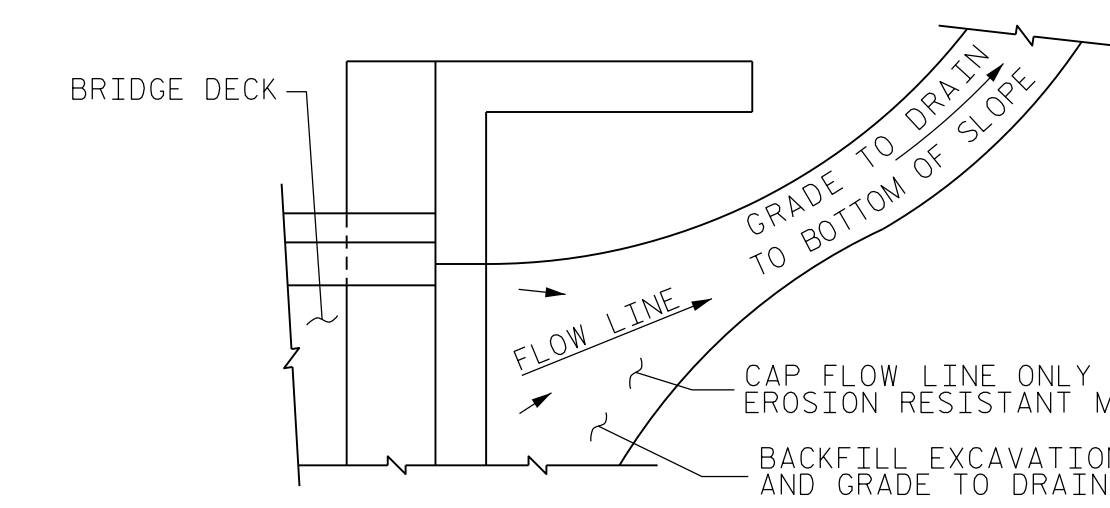
SECTION THRU SLAB  
 (TYPE II - MODIFIED APPROACH FILL)



CURB DETAILS

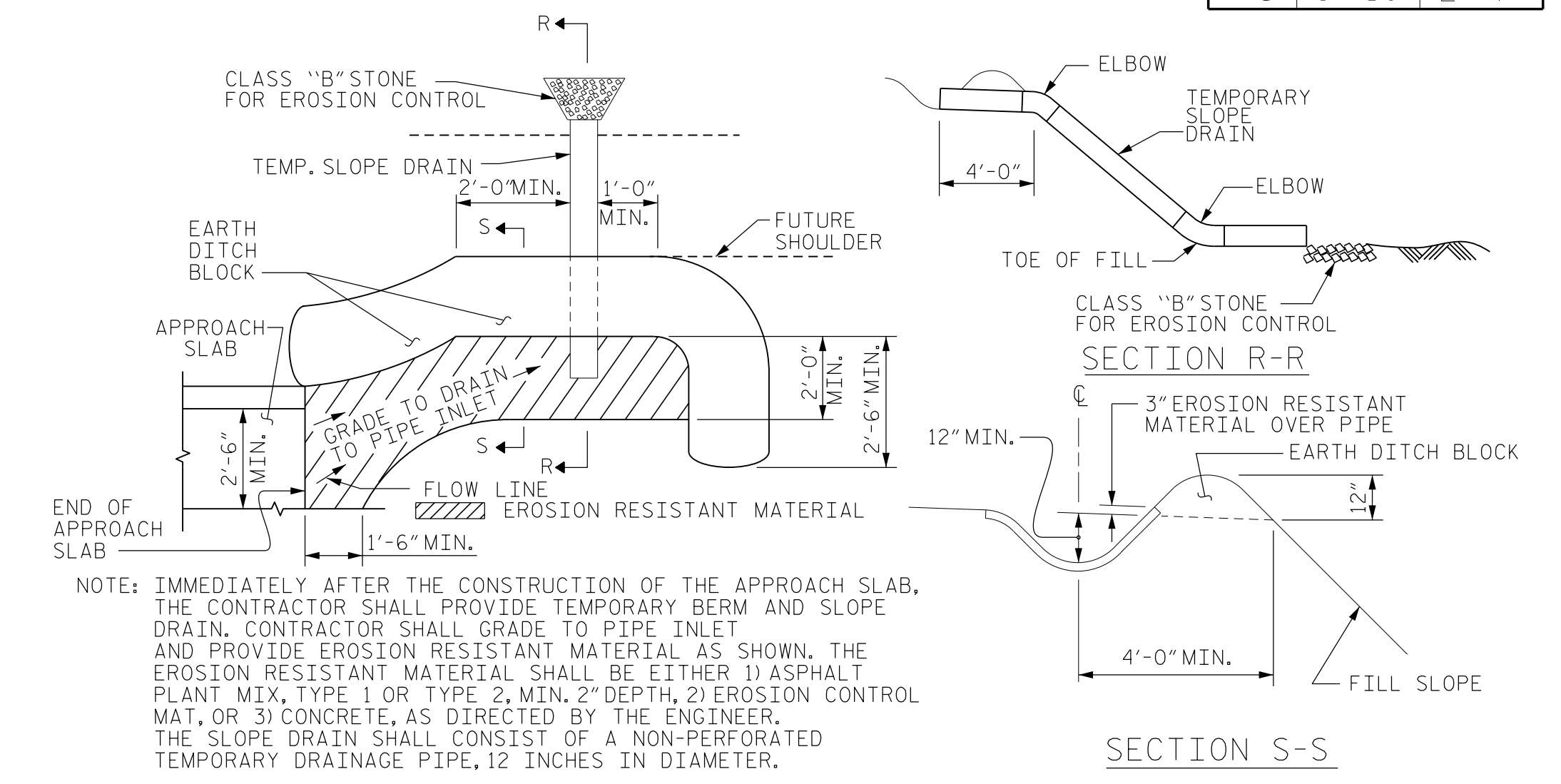
NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.  
 GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.  
 SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.  
 SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.  
 AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.  
 FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.  
 APPROACH SLAB GROOVING IS NOT REQUIRED.



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAIL



NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.

PLAN VIEW  
 TEMPORARY BERM AND SLOPE DRAIN DETAILS  
 (TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

BILL OF MATERIAL						
APPROACH SLAB AT EB #1						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	26	#4	STR	19'-5"	337	
A2	26	#4	STR	19'-4"	336	
*B1	64	#5	STR	11'-1"	740	
B2	64	#6	STR	11'-7"	1113	
REINFORCING STEEL					LBS.	1449
*EPOXY COATED REINFORCING STEEL					LBS.	1077
CLASS AA CONCRETE					C. Y.	17.0
APPROACH SLAB AT EB #2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	26	#4	STR	19'-5"	337	
A2	26	#4	STR	19'-4"	336	
*B1	64	#5	STR	11'-1"	740	
B2	64	#6	STR	11'-7"	1113	
REINFORCING STEEL					LBS.	1449
*EPOXY COATED REINFORCING STEEL					LBS.	1077
CLASS AA CONCRETE					C. Y.	17.0

SPlice LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"

PROJECT NO. B-5322  
 PERSON \_\_\_\_\_ COUNTY \_\_\_\_\_  
 STATION: 16+05.00 -L-



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 BRIDGE APPROACH SLAB  
 FOR PRESTRESSED CONCRETE  
 BOX BEAM UNIT  
 (SUB-REGIONAL TIER)  
 60° SKEW

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.  
 S-15  
 TOTAL SHEETS  
 16

4/17/2018  
 \\\400\_015\_SML\_B5322\_AS01.dgn  
 USER: jloftus  
 DRAWN BY: E. PHELPS DATE: 10/17  
 CHECKED BY: J. LOFTUS DATE: 11/17  
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 11/17



## STANDARD NOTES

### DESIGN DATA:

SPECIFICATIONS	-----	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	-----	SEE PLANS
IMPACT ALLOWANCE	-----	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF		
STRUCTURAL STEEL - AASHTO M270 GRADE 36	-	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	-	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	-	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION		
GRADE 60	--	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	-----	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	-----	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR		
UNTREATED - EXTREME FIBER STRESS	-----	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	-----	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	-----	30 LBS. PER CU. FT.
		(MINIMUM)

### MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

### CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

### CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

### DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

### ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.  
ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

### REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

### STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16" INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

### HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINISHES AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

### SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

PROJECT NO. B-5322  
 \_\_\_\_\_ PERSON \_\_\_\_\_ COUNTY  
 STATION: 16+05.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

### STANDARD NOTES



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

# STEWART

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1			3			TOTAL SHEETS
2			4			16

# ENGLISH

JANUARY, 1990