

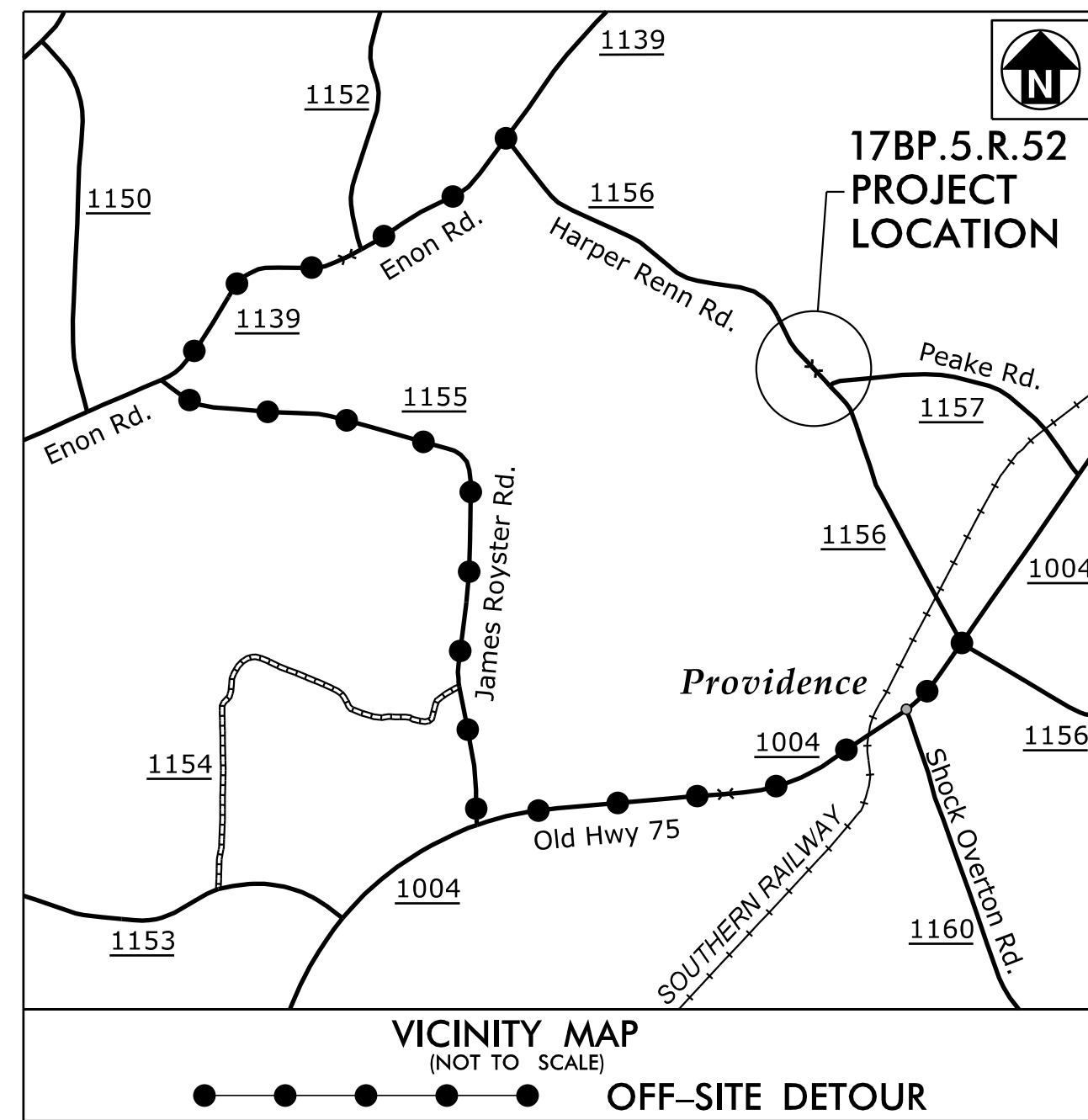
**This electronic collection of documents is provided
for the convenience of the user
and is Not a Certified Document –**

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

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

CONTRACT: TIP PROJECT: 17BP.5.R.52

CONTRACT:

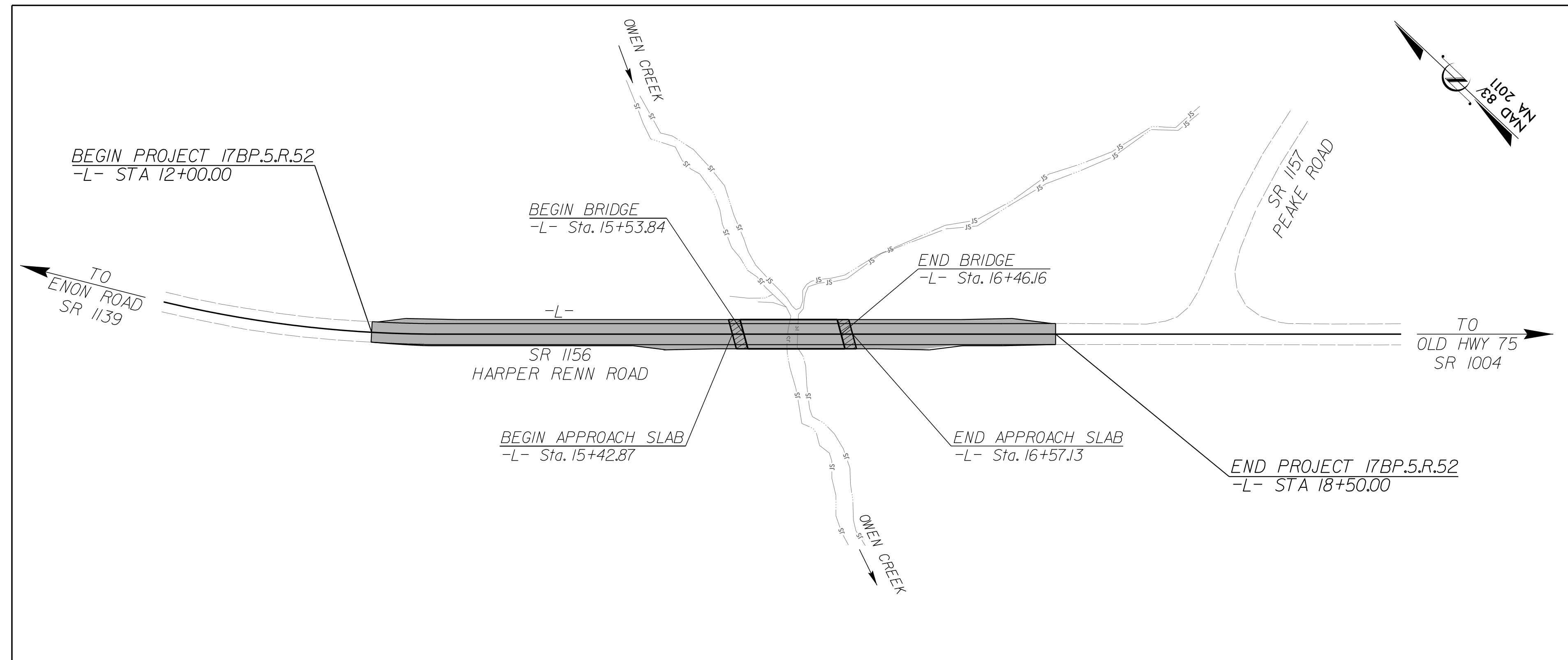


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
GRANVILLE COUNTY

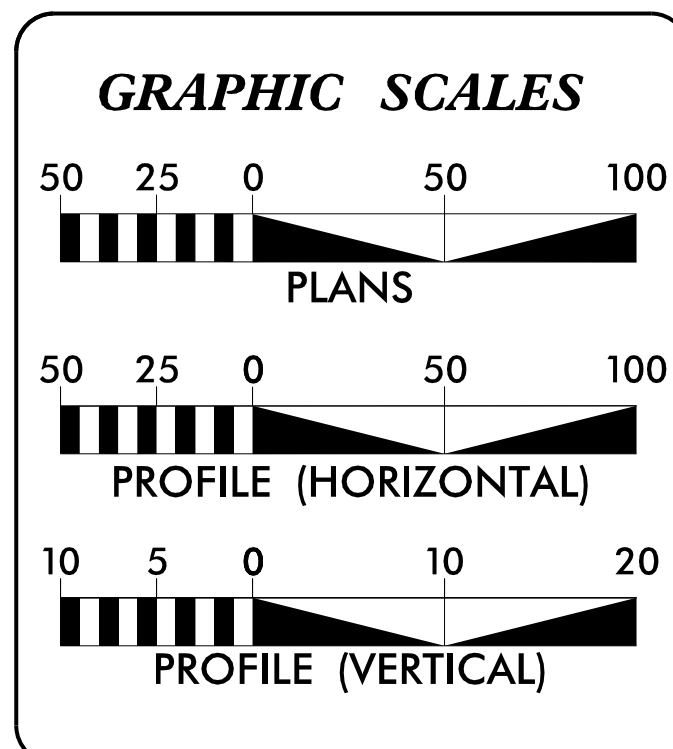
LOCATION: BRIDGE NO. 93 OVER OWEN CREEK ON SR 1156 (HARPER RENN ROAD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.5.R.52	1	
STATE PROJECT NO.	F.A. PROJ. NO.	DESCRIPTION	
17BP.5.R.52			



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



DESIGN DATA

ADT (2011) =	420
ADT (2025) =	560
V =	55 MPH
RURAL LOCAL SUB REGIONAL TIER	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT =	0.106 MILES
LENGTH STRUCTURE TIP PROJECT =	0.017 MILES
TOTAL LENGTH TIP PROJECT =	0.123 MILES

Prepared in the Office of Hatch Mott MacDonald for
DIVISION 5
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2012 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE: SEPTEMBER 30, 2015	TIM JORDAN, PE PROJECT ENGINEER
LETTING DATE: FEBRUARY 10, 2016	TRENT CORMIER, PE HYDRAULICS ENGINEER
NCDOT CONTACT:	LISA GILCHRIST, EI

ROADWAY DESIGN ENGINEER

1/28/2016
P.E.

HYDRAULICS ENGINEER

1/28/2016
P.E.

PLANS PREPARED BY:

Hatch Mott MacDonald
P.O. Box 700
Fuquay-Varina, NC 27526
(919) 552-2253
(919) 552-2254 (Fax)
www.hatchmott.com
LICENSE NO. F-0669

5121 Kingdom Way,
Suite 100
Raleigh, NC 27607
NC License No. F-0258

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

Prepared in the
 Office of:  Hatch Mott MacDonald
P.O. Box 700
 Raleigh, NC 27526
 www.hatchmott.com

GENERAL NOTES

GENERAL NOTES: 2012 SPECIFICATIONS

EFFECTIVE: 01-17-12
 REVISED: 10/31/14

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.

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.

SUBSURFACE PLANS:

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

END BENTS:

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

RIGHT-OF-WAY MARKERS:

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

LIST OF ROADWAY STANDARD DRAWINGS

EFF. 01-17-2012

2012 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO.	TITLE
DIVISION 2 – EARTHWORK	
200.03	Method of Clearing – Method III
225.02	Guide for Grading Subgrade – Secondary and Local
225.04	Method of Obtaining Superelevation – Two Lane Pavement
DIVISION 3 – PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 4 – MAJOR STRUCTURES	
422.11	Reinforced Bridge Approach Fills – Sub Regional Tier
DIVISION 5 – SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction – High Side of Superelevated Curve – Method I
DIVISION 8 – INCIDENTALS	
806.01	Concrete Right-of-way Marker
840.00	Concrete Base Pad for Drainage Structures
840.25	Anchorage for Frames – Brick or Concrete or Precast
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet – for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets

INDEX OF SHEETS

SHEET NUMBER	DESCRIPTION
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C	SURVEY CONTROL SHEET
2	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2-A	DETAIL FOR STRUCTURE ANCHOR UNITS
3	SUMMARY OF DRAINAGE QUANTITIES, GUARDRAIL SUMMARY, SHOULDER BERM GUTTER SUMMARY AND EARTHWORK SUMMARY
4	PLAN SHEET
5	PROFILE SHEET
TMP-1 THRU TMP-4	TRAFFIC MANAGEMENT PLANS
EC-1 THRU EC-4	EROSION CONTROL PLANS
RF-1	REFORESTATION DETAIL SHEET
X-1 THRU X-4	CROSS-SECTIONS
S-1 THRU S-16	STRUCTURE PLANS
SN	STANDARD STRUCTURE NOTES

12/17/2015 7:22:06 AM
 R:\Roadway\Proj\380093_r-dj+psn1A.dgn
 id=66165

Note: Not to Scale

*S.U.E. = *Subsurface Utility Engineering*

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EIP
Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	⑫③
Existing Fence Line	-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-

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○
Well	○
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	WLB
Proposed Lateral, Tail, Head Ditch	→
False Sump	▽

RAILROADS:

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

RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	○ R/W
Proposed Right of Way Line with Iron Pin and Cap Marker	○ R/W
Proposed Right of Way Line with Concrete or Granite Marker	○ R/W
Existing Control of Access	○
Proposed Control of Access	○
Existing Easement Line	-E-
Proposed Temporary Construction Easement	-E-
Proposed Temporary Drainage Easement	-TDE-
Proposed Permanent Drainage Easement	-PDE-
Proposed Permanent Utility Easement	-PUE-

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	-----
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	⊕
Storm Sewer	-----

UTILITIES:

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	⊕
Power Line Tower	⊗
Power Transformer	⊗
U/G Power Cable Hand Hole	⊕
H-Frame Pole	●
Recorded U/G Power Line	-----
Designated U/G Power Line (S.U.E.*)	-----

TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊕
Telephone Booth	□
Telephone Pedestal	⊕
Telephone Cell Tower	⊗
U/G Telephone Cable Hand Hole	⊕
Recorded U/G Telephone Cable	-----
Designated U/G Telephone Cable (S.U.E.*)	-----
Recorded U/G Telephone Conduit	-----
Designated U/G Telephone Conduit (S.U.E.*)	-----
Recorded U/G Fiber Optics Cable	-----
Designated U/G Fiber Optics Cable (S.U.E.*)	-----

WATER:

Water Manhole	⊕
Water Meter	○
Water Valve	⊗
Water Hydrant	⊕
Recorded U/G Water Line	-----
Designated U/G Water Line (S.U.E.*)	-----
Above Ground Water Line	A/G Water

TV:

TV Satellite Dish	⊕
TV Pedestal	⊕
TV Tower	⊗
U/G TV Cable Hand Hole	⊕
Recorded U/G TV Cable	-----
Designated U/G TV Cable (S.U.E.*)	-----
Recorded U/G Fiber Optic Cable	-----
Designated U/G Fiber Optic Cable (S.U.E.*)	-----

GAS:

Gas Valve	◇
Gas Meter	⊕
Recorded U/G Gas Line	-----
Designated U/G Gas Line (S.U.E.*)	-----
Above Ground Gas Line	A/G Gas

SANITARY SEWER:

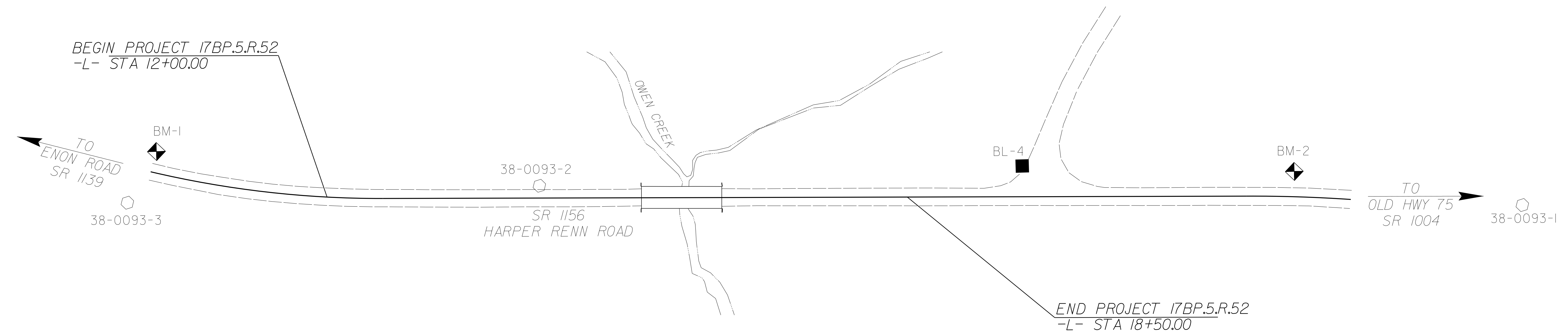
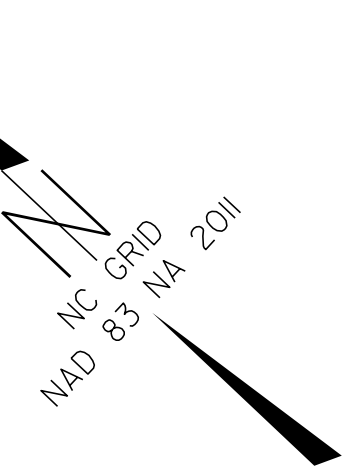
Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	-----
Above Ground Sanitary Sewer	A/G Sanitary Sewer
Recorded SS Forced Main Line	-----
Designated SS Forced Main Line (S.U.E.*)	-----

MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊕
Utility Unknown U/G Line	-----
U/G Tank; Water, Gas, Oil	□
A/G Tank; Water, Gas, Oil	□
U/G Test Hole (S.U.E.*)	⊕
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

SURVEY CONTROL SHEET 38-0093

PROJECT REFERENCE NO.	SHEET NO.
17BP.5.R.52 - GRANVILLE 93	1-C
LOCATION AND SURVEYS	



BASELINE POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	38-0093-1	916471.8570	2098980.5210	409.83	OUTSIDE PROJECT LIMITS	
4	BL-4	916909.3402	2098627.5071	385.44	19+78.91	34.35 LT
2	38-0093-2	917287.5000	2098240.1200	383.37	14+37.94	13.75 LT
3	38-0093-3	917610.1550	2097909.4790	400.69	OUTSIDE PROJECT LIMITS	

BENCH MARK DATA

 BM-1 ELEVATION = 397.29'
 N 917626 E 2097973
 L STATION 10+01.00 24' LT
 NAIL SET IN 22" PINE

 BM-2 ELEVATION = 399.38'
 N 916684 E 2098832
 L STATION 22+83.00 28' LT
 NAIL SET IN 36" OAK

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "39-0093-3" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 917610.155(ft) EASTING: 2097909.479(ft) ELEVATION: 400.691(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9999837600

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "39-0093-3" TO -L- STATION 10+00.00 IS
 N 83°34'20.5"E 43.29 (ft)

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

NOTES:

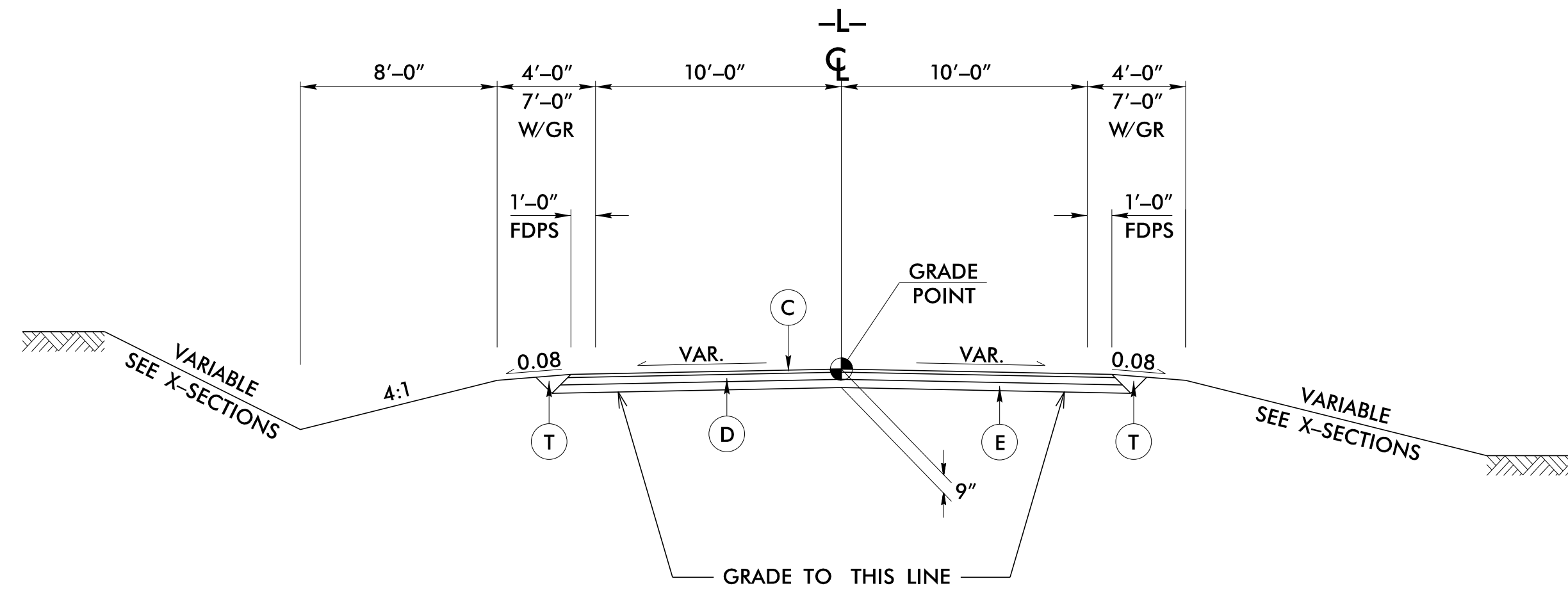
SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

◊ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
 PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
 NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION
 SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

GEOID G12NC
 NOTE: DRAWING NOT TO SCALE

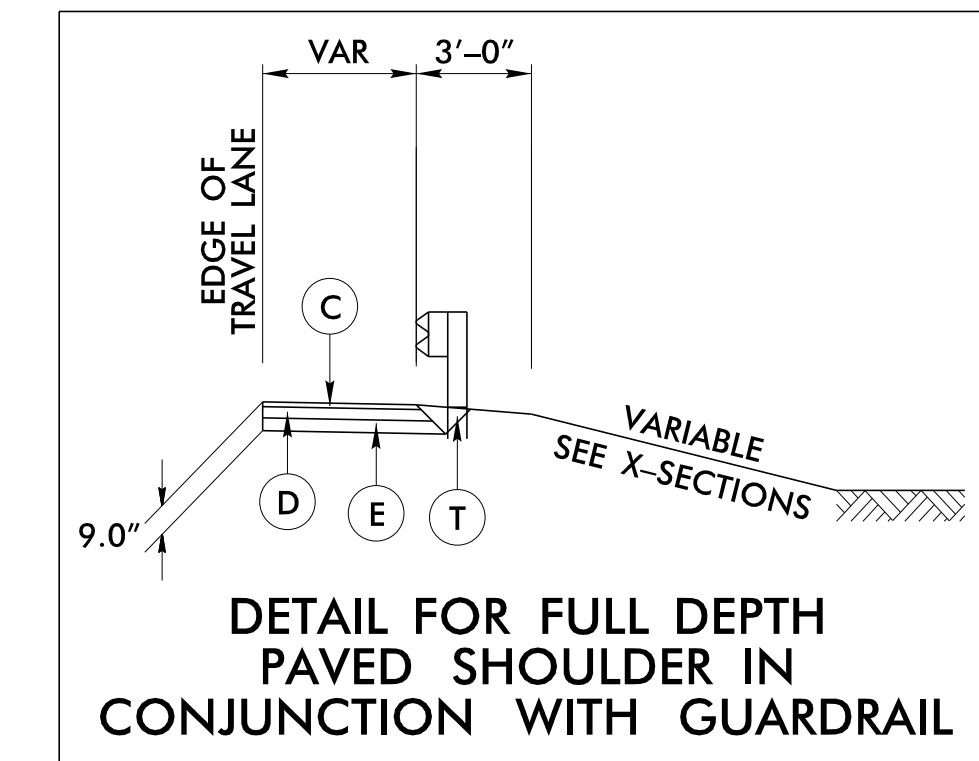
6/2/99
 10:42:27 PM
 P:\Roadwork\Proj\380093_1s_1C.dgn
 10/6/16

PROJECT REFERENCE	SHEET NO.
17BP.5.R.52 - GRANVILLE 93	2
ROADWAY DESIGN ENGINEER	
HATCH MOTT MACDONALD I & E, LLC LICENSE NO. F-06697	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared in the Office of:	Hatch Mott MacDonald P.O. Box 700 Raleigh, NC 27526 www.hatchmott.com

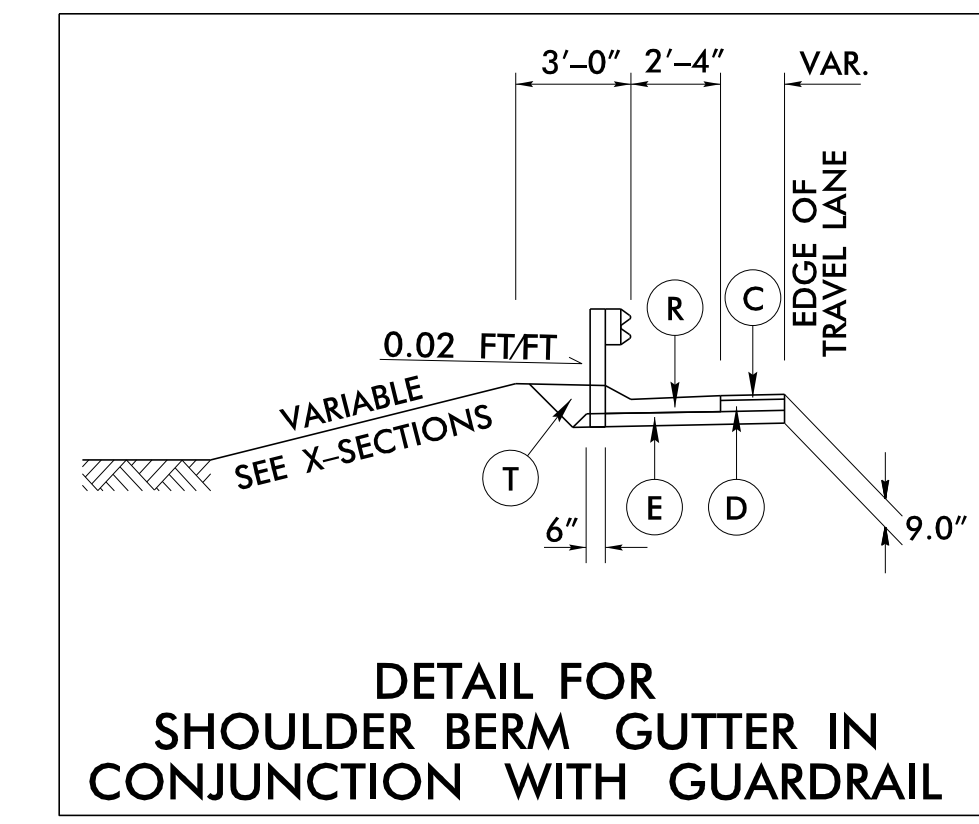


TYPICAL SECTION NO. 1

- TRANSITION FROM EXISTING TO TYPICAL SECTION NO. 1:
 -L- STA 12+00.00 TO 12+50.00
- USE TYPICAL SECTION NO. 1:
 -L- STA 12+50.00 TO 15+53.84 (BEGIN BRIDGE)
 -L- STA 16+46.16 (END BRIDGE) TO 18+00.00
- TRANSITION FROM TYPICAL SECTION NO. 1 TO EXISTING:
 -L- STA 18+00.00 TO 18+50.00

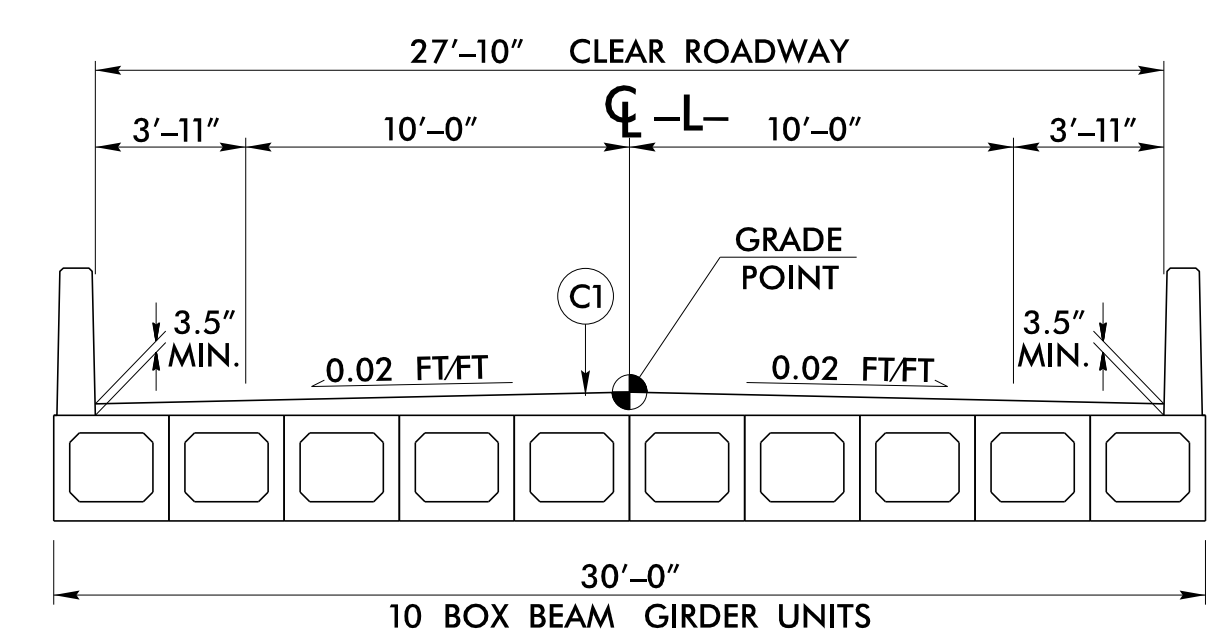


DETAIL FOR FULL DEPTH PAVED SHOULDER IN CONJUNCTION WITH GUARDRAIL



DETAIL FOR SHOULDER BERM GUTTER IN CONJUNCTION WITH GUARDRAIL

- L- STA 16+53.40 TO 17+01.00 LT
 -L- STA 16+60.86 TO 17+01.00 RT



TYPICAL SECTION NO. 2

- USE TYPICAL SECTION NO. 2:
 -L- STA 15+53.84 (BEGIN BRIDGE) TO 16+46.16 (END BRIDGE)

NOTE: SEE STRUCTURE PLANS FOR PAVEMENT DEPTHS ON STRUCTURE

PAVEMENT SCHEDULE	
C	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C1	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT GREATER THAN 2" IN DEPTH.
D	PROP. APPROX. 3 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD.
E	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
R	SHOULDER BERM GUTTER.
T	EARTH MATERIAL.

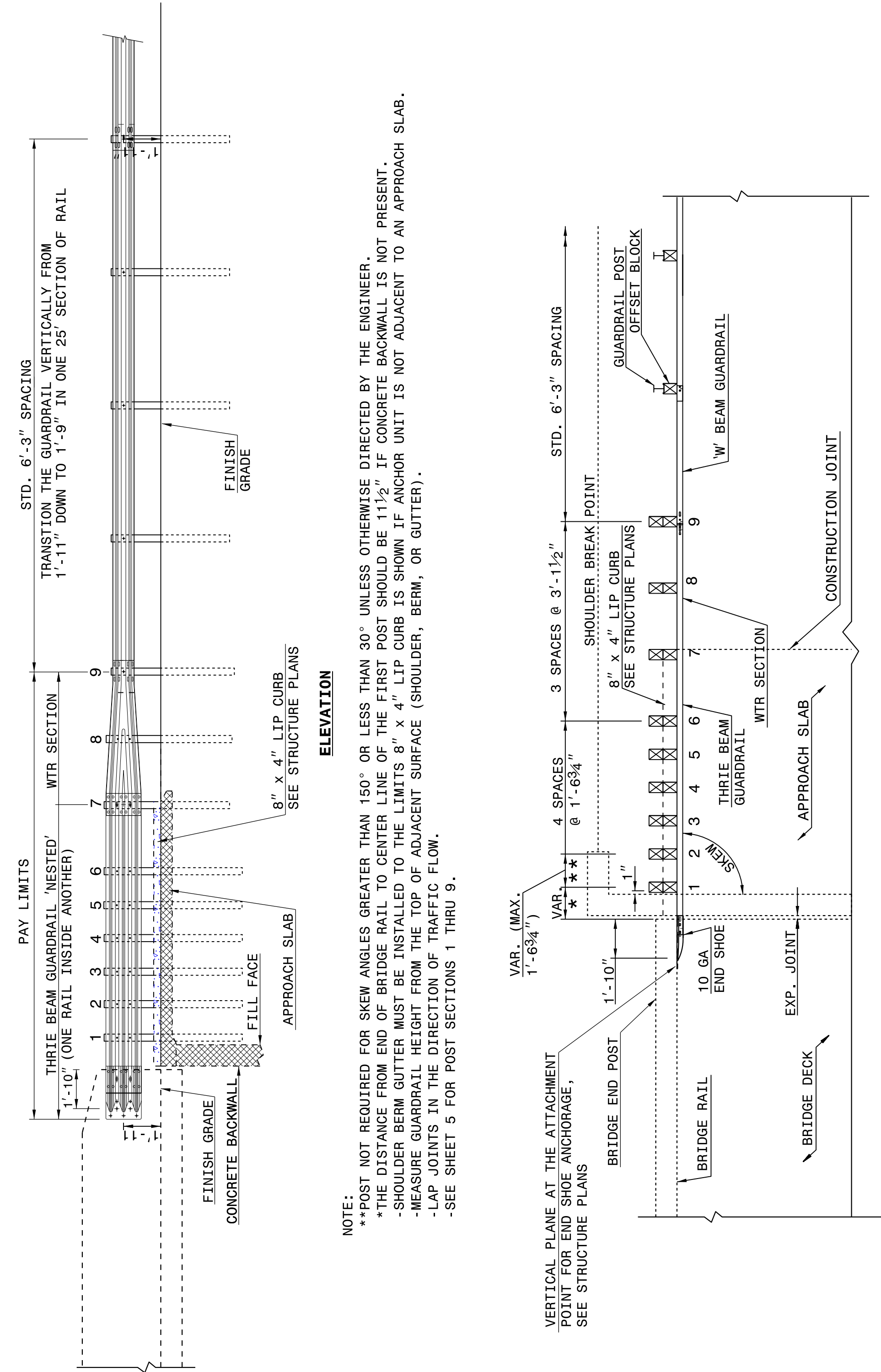
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

12/18/2015 8:38:36 AM
 R:\Roadway\Proj\380093_rdy_tjpd.dgn
 10:66165

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

ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7
862d03



NOTE:
 **POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
 *THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11 1/2" IF CONCRETE BACKWALL IS NOT PRESENT.
 -SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" X 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
 -MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
 -LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
 -SEE SHEET 5 FOR POST SECTIONS 1 THRU 9.

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

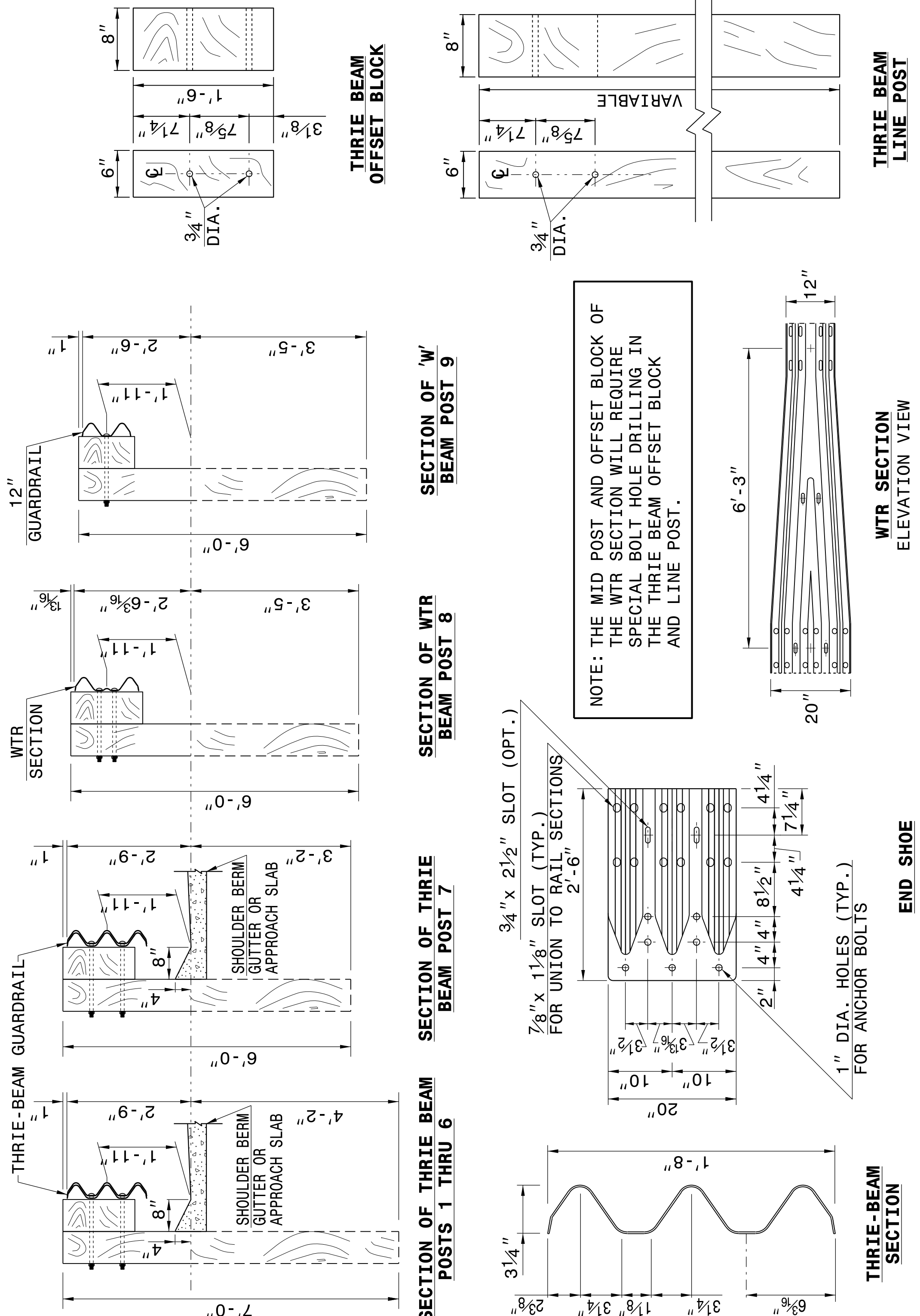
ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7
862d03

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

ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 3 OF 7
862d03



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

ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 3 OF 7
862d03

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

SEE TITLE BLOCK

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

\$\$\$\$\$SYTIME\$\$\$\$\$
 \$\$\$DGN\$\$\$\$\$
 \$\$\$USERNAME\$\$\$\$\$

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

GUARDRAIL SUMMARY

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	REMARKS									
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	AT-1	GRAU 350	TYPE III	PERMITTED													
																		NO.	G	NG											
-L-	14+76.32	15+57.57	RT	81.25'			15+57.57		4'	7'	50'				1	1															
-L-	12+31.36	15+50.11	LT	318.75'			15+50.11	12+50.00	4'	7'	50'			1'																	BREAK WITHIN PROJECT CONSTRUCTION LIMITS
-L-	16+49.89	17+31.14	RT	81.25'				16+49.89	4'	7'	50'			1'																	
-L-	16+42.43	18+11.18	LT	168.75'			17+50.00	16+42.43	4'	7'	50'			1'																	BREAK WITHIN PROJECT CONSTRUCTION LIMITS
SUBTOTAL				650.00'																											
LESS ANCHOR DEDUCTIONS																															
GRAU-350				4 x 50.00'	=	-200.00'																									
TYPE III				4 x 18.75'	=	-75.00'																									
TOTAL				375.00'																											

SUB-REGIONAL & REGIONAL LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)

STATION	LOCATION (L/R, OR CL)	STRUCTURE NO.	TOP ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC)	C.S. PIPE								R.C. PIPE (CLASS III)								R.C. PIPE (CLASS IV)								ENDWALLS	QUANTITIES FOR DRAINAGE STRUCTURES	FRAME, GRATES AND HOOD STANDARD 840.03	CONCRETE TRANSITIONAL SECTION	PIPE REMOVAL UNIT	ABBREVIATIONS												
							12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE PVC	DO NOT USE CAAP	DO NOT USE HDPE	12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"							30"	36"	42"	48"	C.U. YDS.	PER EACH (0 THRU 5.0')	A	B	LIQ. FT.	* TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL 'B')	TYPE OF GRATE	CATCH BASIN
16+96 +/-	LT	401 402	383.8	379.2																																												
16+96 +/-	RT	402 403	383.8	378.9	377.0						X	X	X																																			
TOTAL						28'																																										

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

SUMMARY OF EARTHWORK IN CUBIC YARDS

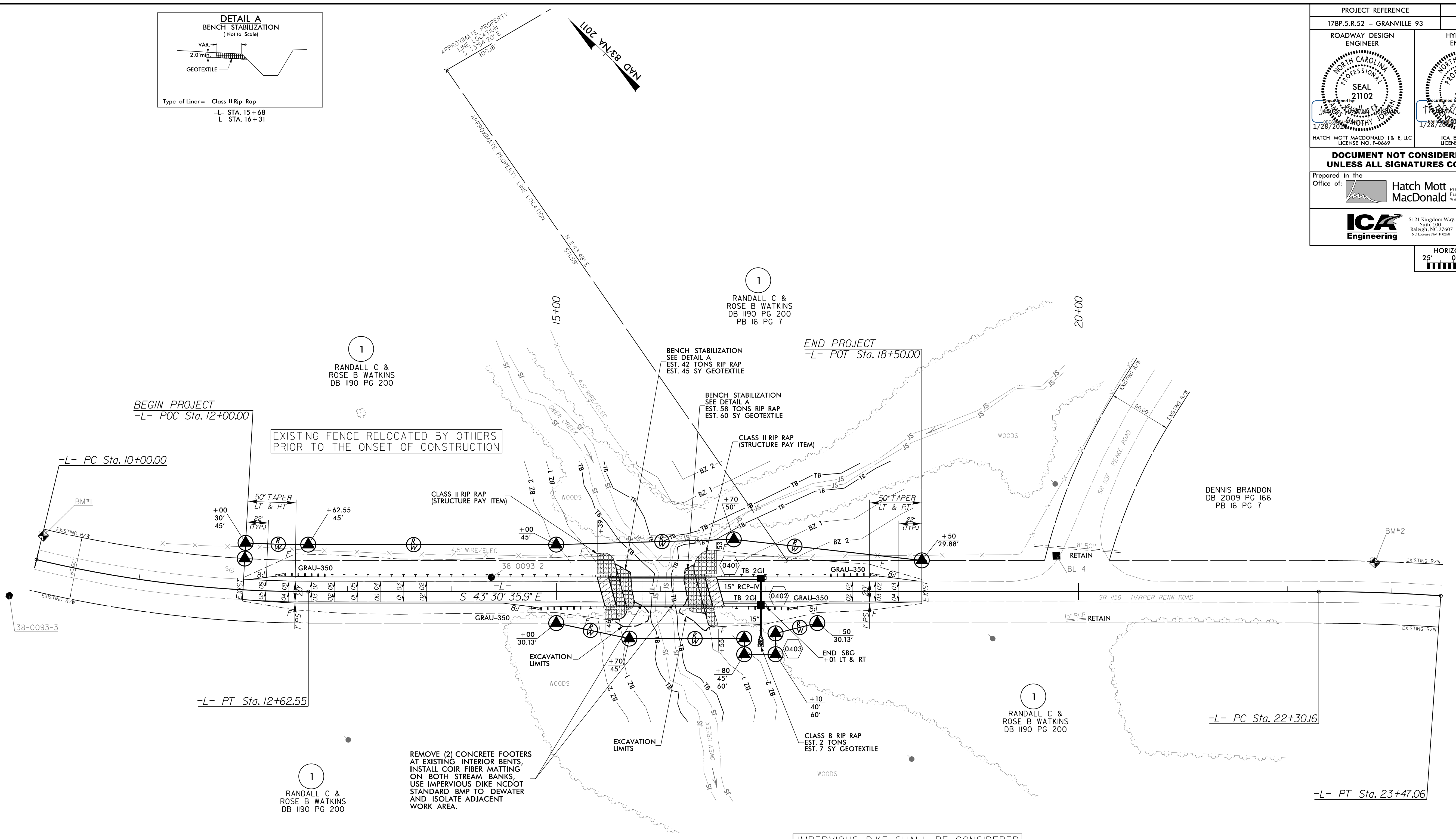
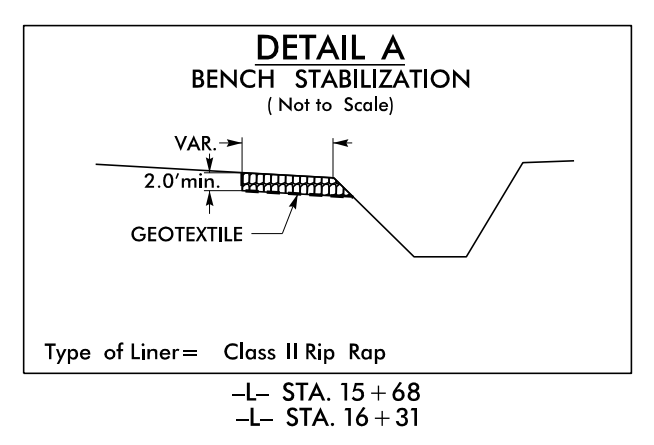
SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LENGTH
-L- LT	16+53.40	17+01.00	47.60'
-L- RT	16+60.86	17+01.00	40.14'
TOTAL			87.74'
SAY			90.00'

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT +%	BORROW	WASTE
-L- 12+00.00 TO 15+53.84 (BEGIN BRIDGE)	86		769	683	0
-L- 16+46.16 (END BRIDGE) TO 18+50.00	82		281	199	0
SUBTOTAL			1050	882	0
WASTE IN LIEU OF BORROW					
PROJECT TOTAL			168	882	
5% TO REPLACE BORROW					44
GRAND TOTAL			168	926	
SAY			180	980	

NOTE: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing and Grubbing and Removal of Existing Asphalt Pavement will be paid for at the contract Lump Sum price for "Grading".

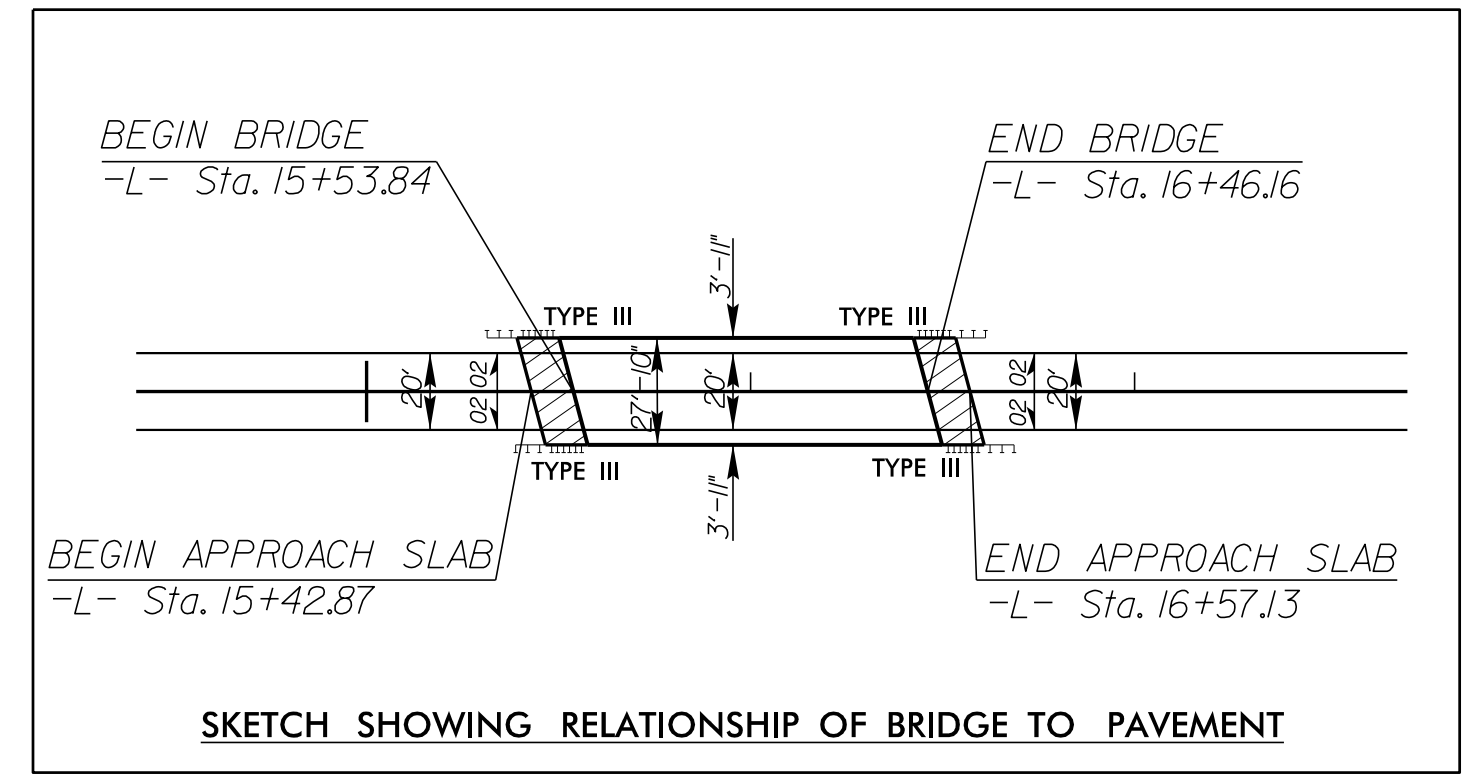
PROJECT REFERENCE		SHEET NO.	
17BP.5.R.52 - GRANVILLE 93		4	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER		
HATCH MOTT MACDONALD I & E, LLC LICENSE NO. F-06697		ICA ENGINEERING LICENSE NO. F-02528	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
Prepared in the Office of: Hatch Mott MacDonald			
		5121 Kingdom Way, Suite 100 Raleigh, NC 27607 NC License No. F-02528	
HORIZONTAL SCALE 25' 0 25' 50'			



QUANTITY FOR EXCAVATION LIMITS IS INCLUDED IN UNCLASSIFIED STRUCTURE EXCAVATION

IMPERVIOUS DIKE SHALL BE CONSIDERED INCIDENTAL TO THE REMOVAL OF THE EXISTING STRUCTURE

REMOVE (2) CONCRETE FOOTERS AT EXISTING INTERIOR BENTS, INSTALL COIR FIBER MATTING ON BOTH STREAM BANKS, USE IMPERVIOUS DIKE NCDOT STANDARD BMP TO DEWATER AND ISOLATE ADJACENT WORK AREA.

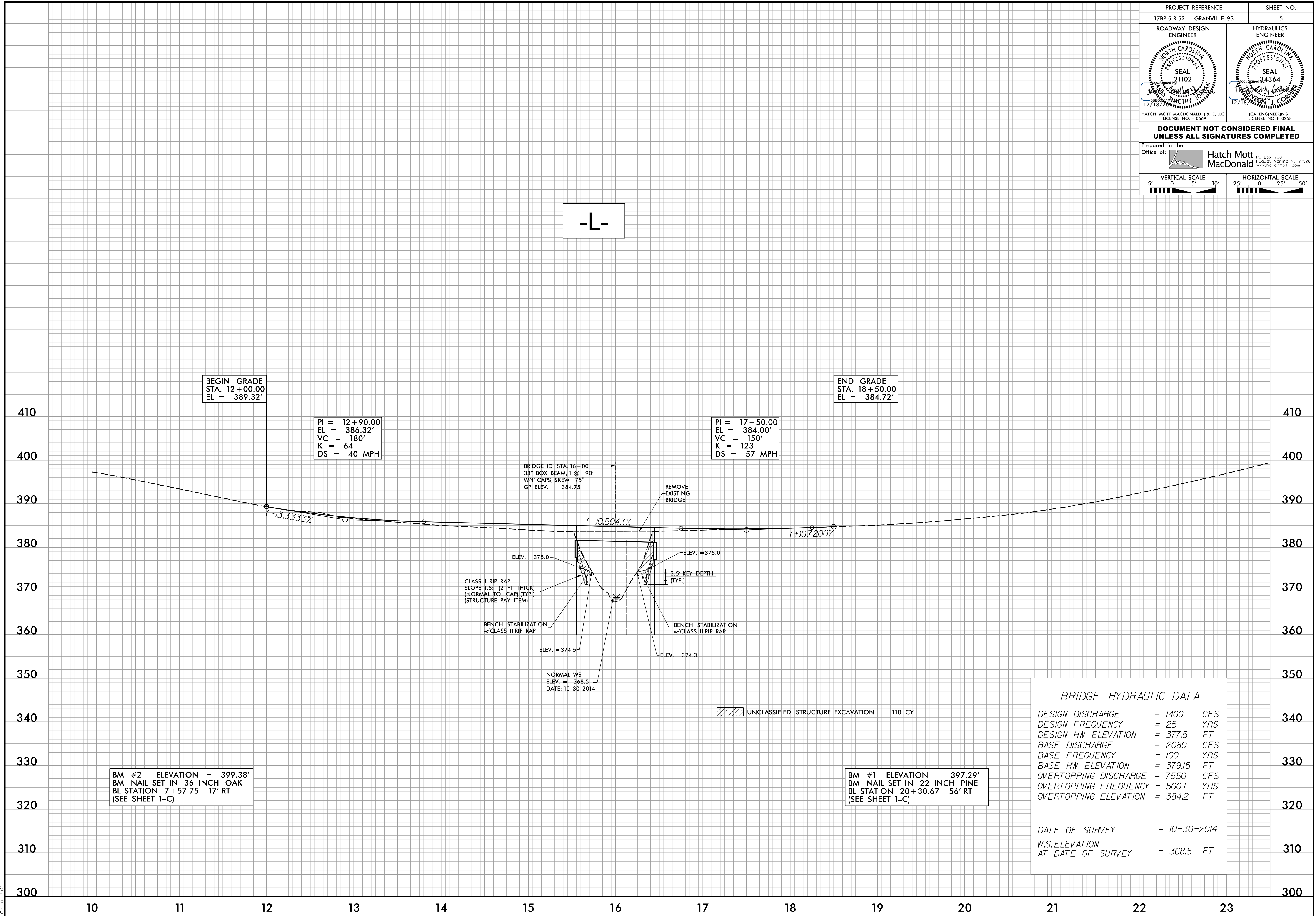


-L-	PI Sta 11+31.88	PI Sta 22+88.64
	$\Delta = 13' 25' 53.1''$ (LT)	$\Delta = 3' 57' 47.8''$ (RT)
	$D = 5' 06' 56.5''$	$D = 3' 23' 25.0''$
	$L = 262.55'$	$L = 116.90'$
	$T = 131.88'$	$T = 58.47'$
	$R = 1120.00'$	$R = 1690.00'$

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

1/28/2016 9:10:08 AM
 R:\Roadway\ProJ\380093_r\dj_psh.dgn
 10:66165

PROJECT REFERENCE 17BP.5.R.52 - GRANVILLE 93	SHEET NO. 5
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER
HATCH MOTT MACDONALD I & E, LLC LICENSE NO. F-0669	
HATCH MOTT MACDONALD I & E, LLC LICENSE NO. F-0258	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared in the Office of: Hatch Mott MacDonald PO Box 700 Fayetteville, NC 27526 www.hatchmott.com	
VERTICAL SCALE 5' 0 5' 10'	HORIZONTAL SCALE 25' 0 25' 50'



BEGIN GRADE
STA. 12+00.00
EL = 389.32'

PI = 12+90.00
EL = 386.32'
VC = 180'
K = 64
DS = 40 MPH

PI = 17+50.00
EL = 384.00'
VC = 150'
K = 123
DS = 57 MPH

END GRADE
STA. 18+50.00
EL = 384.72'

BRIDGE ID STA. 16+00
33" BOX BEAM, 1 @ 90'
W/4' CAPS, SKEW 75°
GP ELEV. = 384.75

ELEV. = 375.0
CLASS II RIP RAP
SLOPE 1.5:1 (2 FT. THICK)
(NORMAL TO CAP) (TYP.)
(STRUCTURE PAY ITEM)

BENCH STABILIZATION
w/CLASS II RIP RAP

ELEV. = 374.5

NORMAL WS
ELEV. = 368.5
DATE: 10-30-2014

ELEV. = 375.0
3.5' KEY DEPTH
(TYP.)

BENCH STABILIZATION
w/CLASS II RIP RAP

ELEV. = 374.3

UNCLASSIFIED STRUCTURE EXCAVATION = 110 CY

BM #2 ELEVATION = 399.38'
BM NAIL SET IN 36 INCH OAK
BL STATION 7+57.75 17' RT
(SEE SHEET 1-C)

BM #1 ELEVATION = 397.29'
BM NAIL SET IN 22 INCH PINE
BL STATION 20+30.67 56' RT
(SEE SHEET 1-C)

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE = 1400 CFS
DESIGN FREQUENCY = 25 YRS
DESIGN HW ELEVATION = 377.5 FT
BASE DISCHARGE = 2080 CFS
BASE FREQUENCY = 100 YRS
BASE HW ELEVATION = 379.15 FT
OVERTOPPING DISCHARGE = 7550 CFS
OVERTOPPING FREQUENCY = 500+ YRS
OVERTOPPING ELEVATION = 384.2 FT

DATE OF SURVEY = 10-30-2014
W.S.ELEVATION AT DATE OF SURVEY = 368.5 FT

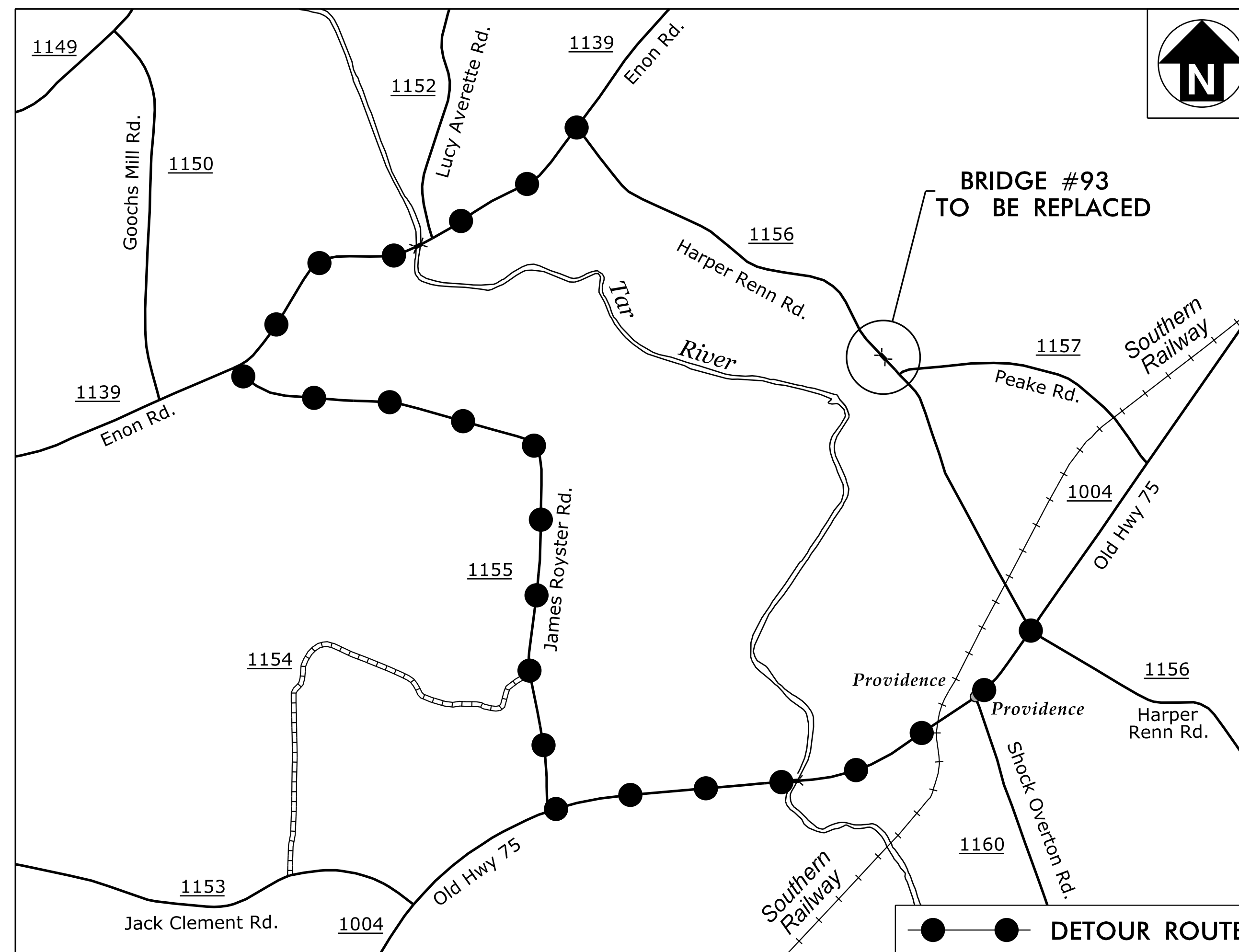
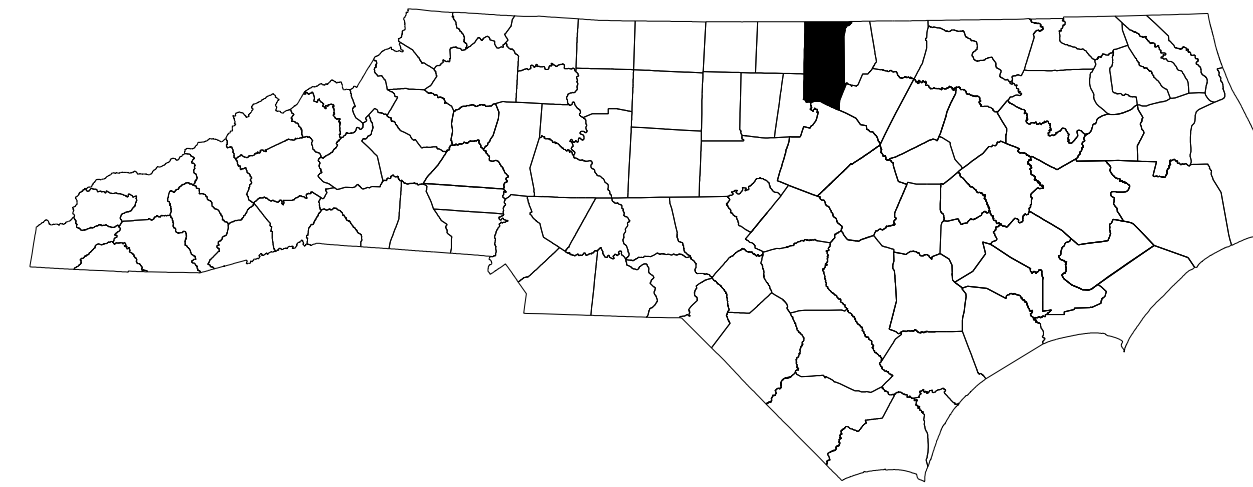
12/17/2015 7:22:19 AM
R:\Roadway\Projects\380093_r-dj-ps-h-pf1.dgn
ID: 66165

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

GRANVILLE COUNTY

BRIDGE NO. 93 OVER OWEN CREEK ON SR 1156 (HARPER RENN ROAD)



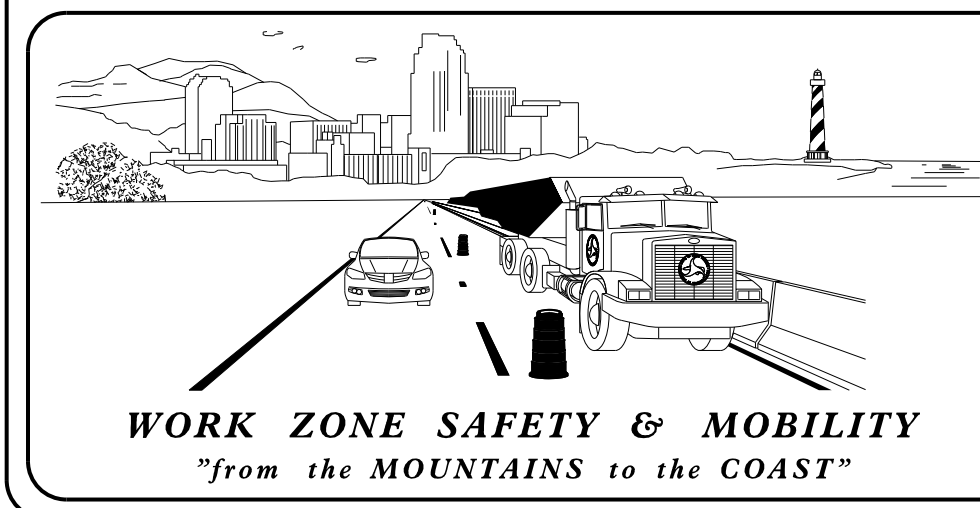
INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET AND INDEX OF SHEETS
TMP-2	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, LEGEND, GENERAL NOTES, PHASING AND FINAL PAVEMENT MARKING SCHEDULE
TMP-3	TEMPORARY TRAFFIC CONTROL PLAN
TMP-4	SPECIAL SIGN DESIGN

17BP.5.R.52

TIP PROJECT:

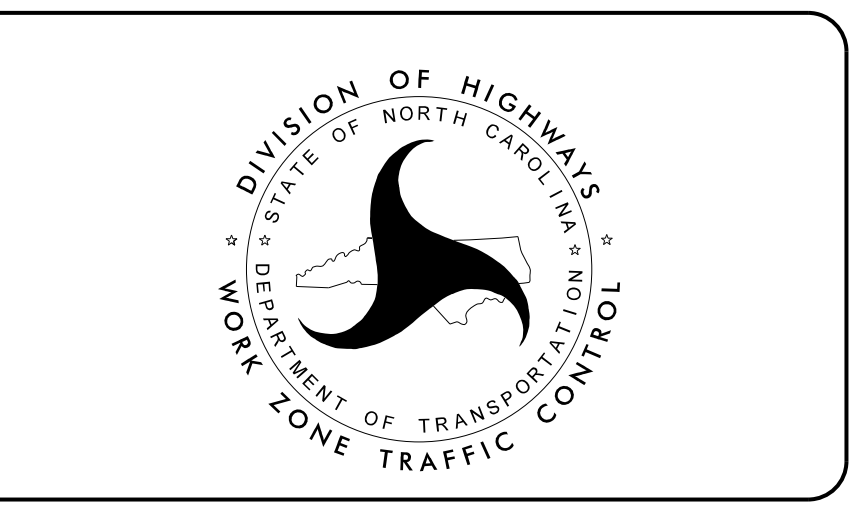
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



PREPARED IN THE OFFICE OF HATCH MOTT MACDONALD
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

TIM JORDAN, PE **TRAFFIC CONTROL PROJECT ENGINEER**

BRIAN PHILLIPS **TRAFFIC CONTROL DESIGN ENGINEER**



Hatch Mott MacDonald

P.O. Box 700
Fuquay-Varina, NC 27526
(919) 552-2253
(919) 552-2254 (Fax)
www.hatchmott.com

LICENSE NO. F-0669

APPROVED: James Timothy Jordan
DATE: 12/18/2015

SEAL

12/17/2015 7:27:57 AM
R:\Roadway\Proj\380093\TC_TMP_1.dgn
jor66165

TRAFFIC MANAGEMENT PLAN

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 UNDESIRABLE 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.

LANE AND SHOULDER CLOSURE REQUIREMENTS

- A) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.

TRAFFIC PATTERN ALTERATIONS

- B) NOTIFY THE ENGINEER THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

- C) 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.

- D) 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.

- E) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

TRAFFIC CONTROL DEVICES

- F) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

PAVEMENT MARKINGS AND MARKERS

- G) INSTALL PAVEMENT MARKINGS AND MARKERS ON THE FINAL SURFACE ACCORDING TO THE ROADWAY STANDARD DRAWINGS.

- H) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

MISCELLANEOUS

- I) MAINTAIN ACCESS TO ALL RESIDENCES AND BUSINESSES BETWEEN THE CLOSURE POINTS AT ALL TIMES DURING CONSTRUCTION.

NCDOT ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - HIGHWAY DESIGN BRANCH- N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1135.01	CONES
1145.01	BARRICADES
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTI-LANE 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


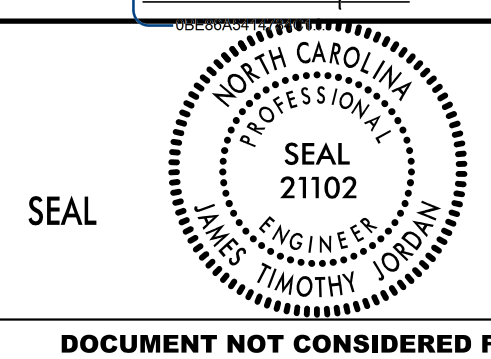
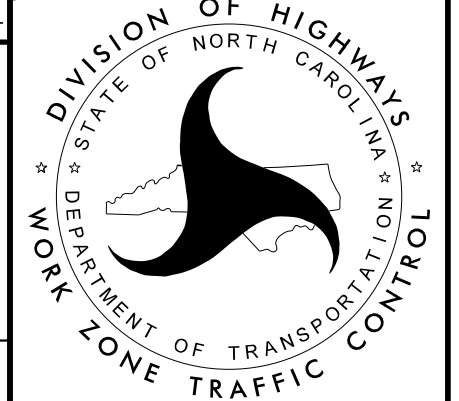
PHASING

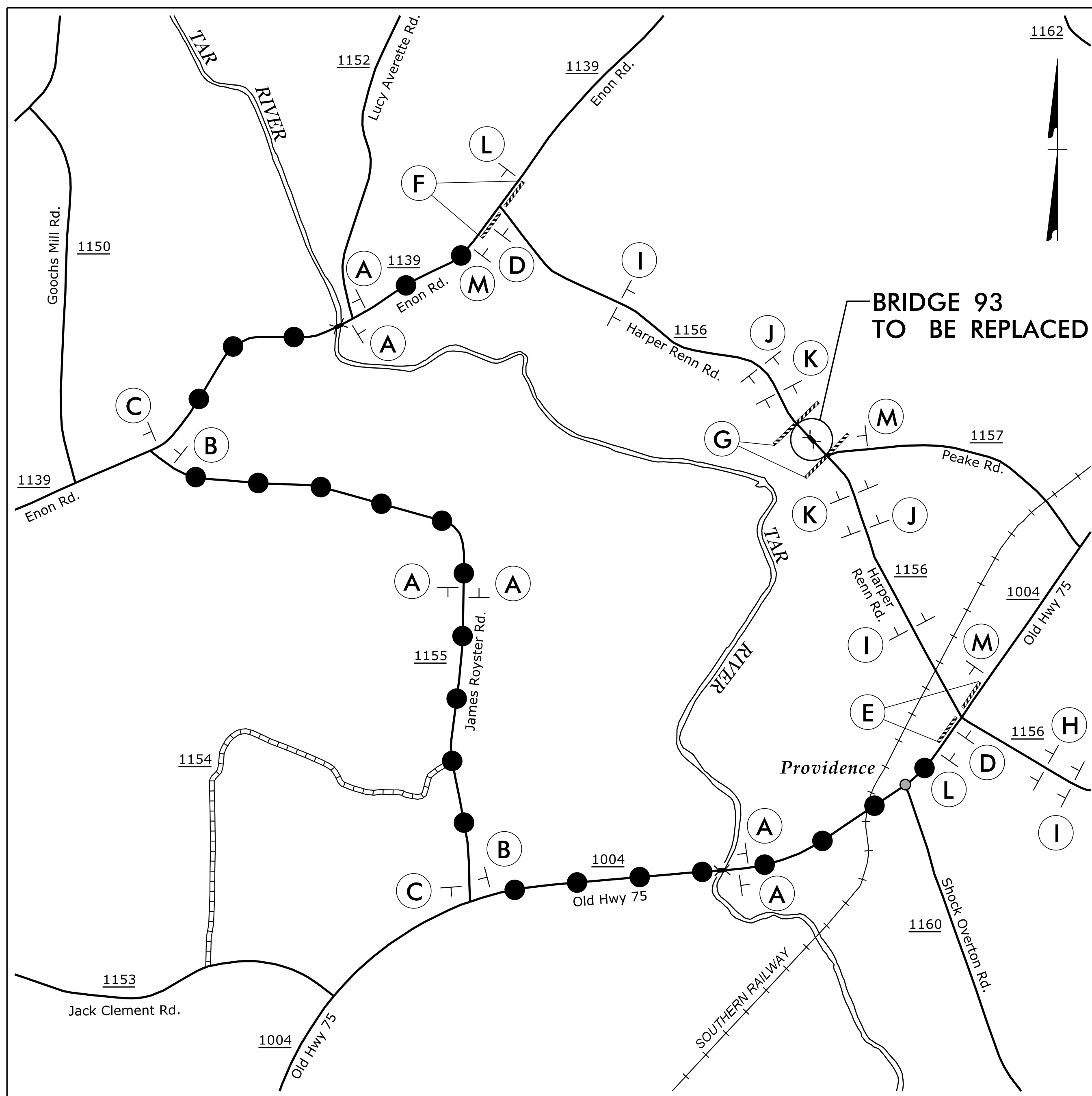
- STEP 1: USING ROADWAY STANDARD DRAWING NUMBERS 1101.04, SHEET 1 OF 1, 1101.11, SHEET 1 OF 4, 1101.03, SHEET 1 OF 9, AND SHEET TMP-3, INSTALL AND COVER DETOUR SIGNING.
- STEP 2: USING ROADWAY STANDARD DRAWING NUMBER 1101.03, SHEET 1 OF 9, UNCOVER OFF-SITE DETOUR SIGNING AND INSTALL TYPE III BARRICADES TO CLOSE LAWRENCE ROAD TO THRU TRAFFIC.
- STEP 3: PLACE TRAFFIC ONTO OFF-SITE DETOUR. PERFORM PROPOSED BRIDGE AND ROADWAY CONSTRUCTION. PLACE FINAL PAVEMENT MARKINGS AND MARKERS.
- STEP 4: REMOVE TYPE III BARRICADES FROM LAWRENCE ROAD AND REOPEN ROADWAY TO TRAFFIC. REMOVE ALL DETOUR SIGNING.

FINAL PAVEMENT MARKING SCHEDULE

DESCRIPTION	QUANTITY
THERMOPLASTIC WHITE EDGELINE (4")	1,300 LF
THERMOPLASTIC YELLOW DOUBLE CENTER (4")	1,300 LF
PERMANENT RAISED PAVEMENT MARKERS (YELLOW & YELLOW)	8 EA

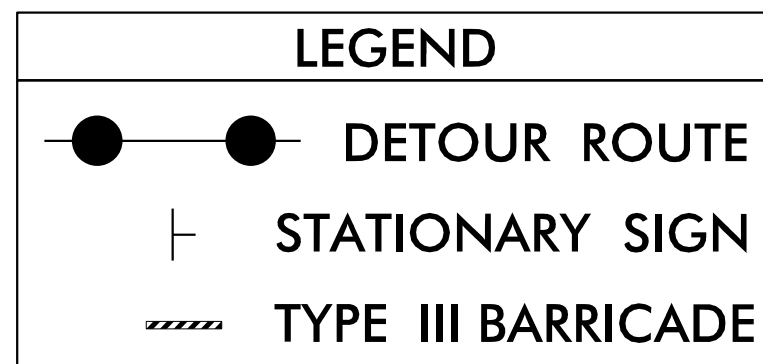
12/29/2015 12:59:05 PM
 R:\Roadway\Proj\380093_TC_TMP-2.dgn
 jor66165

 PO Box 100 Fuquay-Varina, NC 27526 (919) 552-2253 (919) 552-2254 (Fax) www.hatchmott.com LICENSE NO. F-0669	APPROVED: <u>James Timothy Jordan</u> DATE: <u>12/29/2015</u> 		GENERAL NOTES ROADWAY STANDARD DRAWINGS PHASING PAVEMENT MARKING SCHEDULE
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

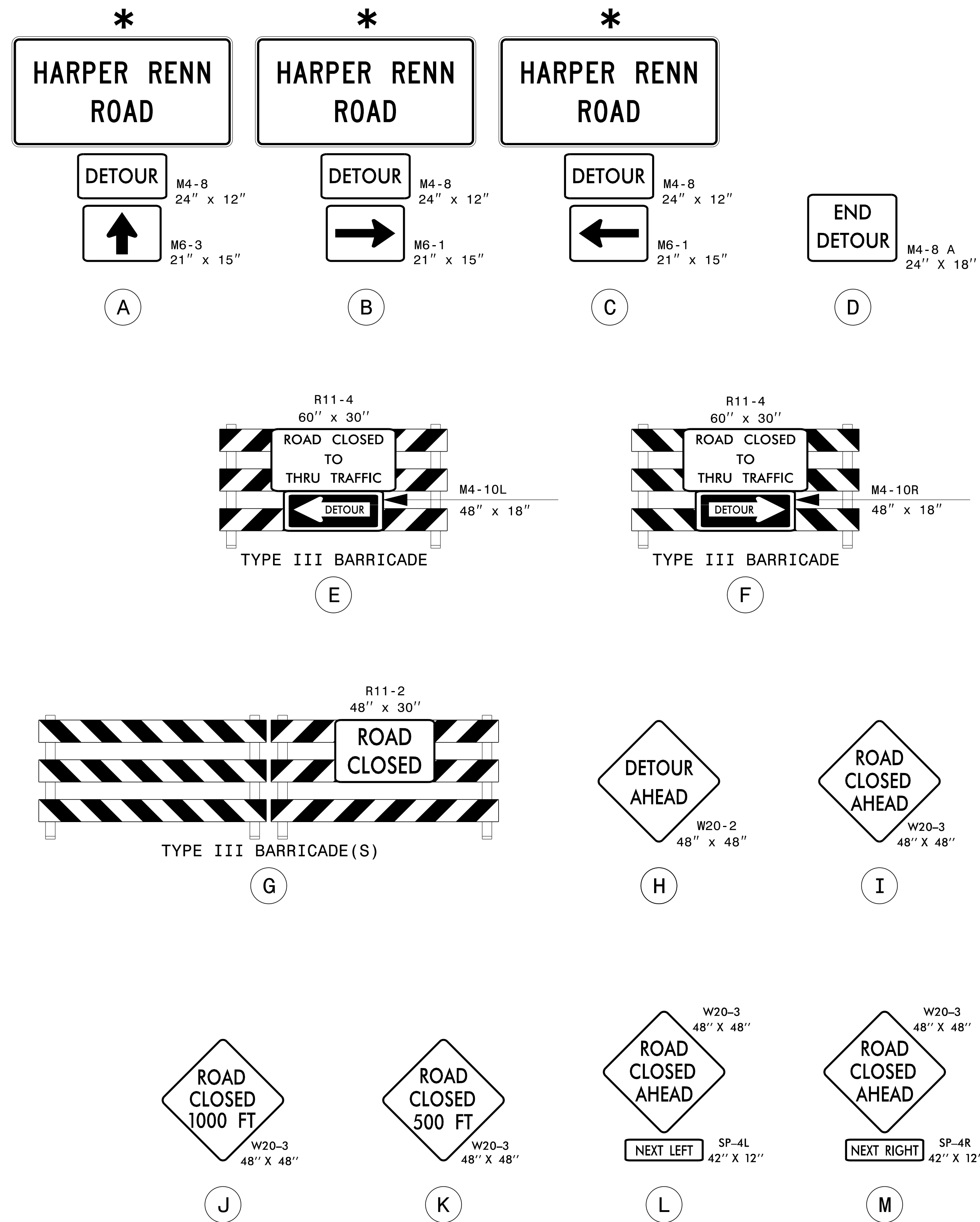


NOTES: REFER TO ROADWAY STANDARD DRAWING NO. 1101.03, SHEETS 1 AND 2 OF 9, FOR ADDITIONAL SIGN SPACING REQUIREMENTS APPROACHING PROJECT SITE CLOSURE POINT.

* SEE SHEET TMP-4 FOR SPECIAL SIGN DESIGNS



TRAFFIC CONTROL TEMPORARY SIGNING AND DEVICES



12/17/2015 7:26:12 AM R:\Roadway\Proj\380093\TC_TMP-3.dgn jor66165

 PO Box 100 Fuquay-Varina, NC 27526 (919) 552-2253 (Fax) www.hatchmott.com LICENSE NO. F-0669	APPROVED: <i>James Timothy Jordan</i> DATE: 12/18/2015 SEAL 	 DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL	HARPER RENN ROAD OFF-SITE DETOUR TRAFFIC CONTROL TEMPORARY SIGNING AND DEVICES
	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

SIGN NUMBER: SD-1 TYPE: D QUANTITY: SEE PLANS SIGN WIDTH: 5'-0" HEIGHT: 2'-6" TOTAL AREA: 12.5 Sq.Ft. BORDER TYPE: INSET RECESS: 0.47" WIDTH: 0.63" RADII: 1.5" NO. Z BARS: LENGTH:	BACKG COLOR: Fluorescent Orange COPY COLOR: Black	DESIGN BY: JTD PROJECT ID: 17BP.5.R.52	CHECKED BY: NKP DIV: 5	DATE: Jul 25, 2014																																																	
	<table border="1"> <thead> <tr> <th>SYMBOL</th> <th>X</th> <th>Y</th> <th>WID</th> <th>HT</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table> MAT'L: 0.125" (3.2 mm) ALUMINUM	SYMBOL	X	Y	WID	HT																																															
SYMBOL	X	Y	WID	HT																																																	
USE NOTES: 1,2 1. Legend and border shall be direct applied black non-reflective sheeting. 2. Background shall be NC GRADE B fluoresent orange retroreflective sheeting.		Spacing Factor is 1 unless specified otherwise																																																			

LETTER POSITIONS

Letter locations are panel edge to lower left corner

											Series/Size		
H	A	R	P	E	R	R	E	N	N			Text Length	
6.1	10.3	15	19.4	23.9	28	31.4	37.4	41.8	45.8	50.5		C 2000	
												47.8	
R	O	A	D										Series/Size
21.7	26	30.2	34.9										C 2000
													16.6

FILENAME: 380093_TC_TMP_SD1

NORTH CAROLINA D.O.T. SIGN DETAIL

12/17/2015 7:26:14 AM
 R:\Roadway\Proj\380093_TC_TMP-4.dgn
 jor66165

 Hatch Mott MacDonald PO Box 100 Fuquay-Varina, NC 27526 (919) 552-2253 (919) 552-2254 (Fax) www.hatchmott.com LICENSE NO. F-0669	APPROVED: <i>Nathan K. Phillips</i> DATE: 12/21/2015 SEAL:	 DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL	SIGN DESIGN
	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

DESIGN EXCEPTION:
SUPERELEVATION

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

PROJECT REFERENCE	SHEET NO.
17BP.5.R.52 - GRANVILLE 93	EC-1/CONST.4
ROADSIDE ENVIRONMENTAL PROJECT ENGINEER	

LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: SEPTEMBER 22, 2015

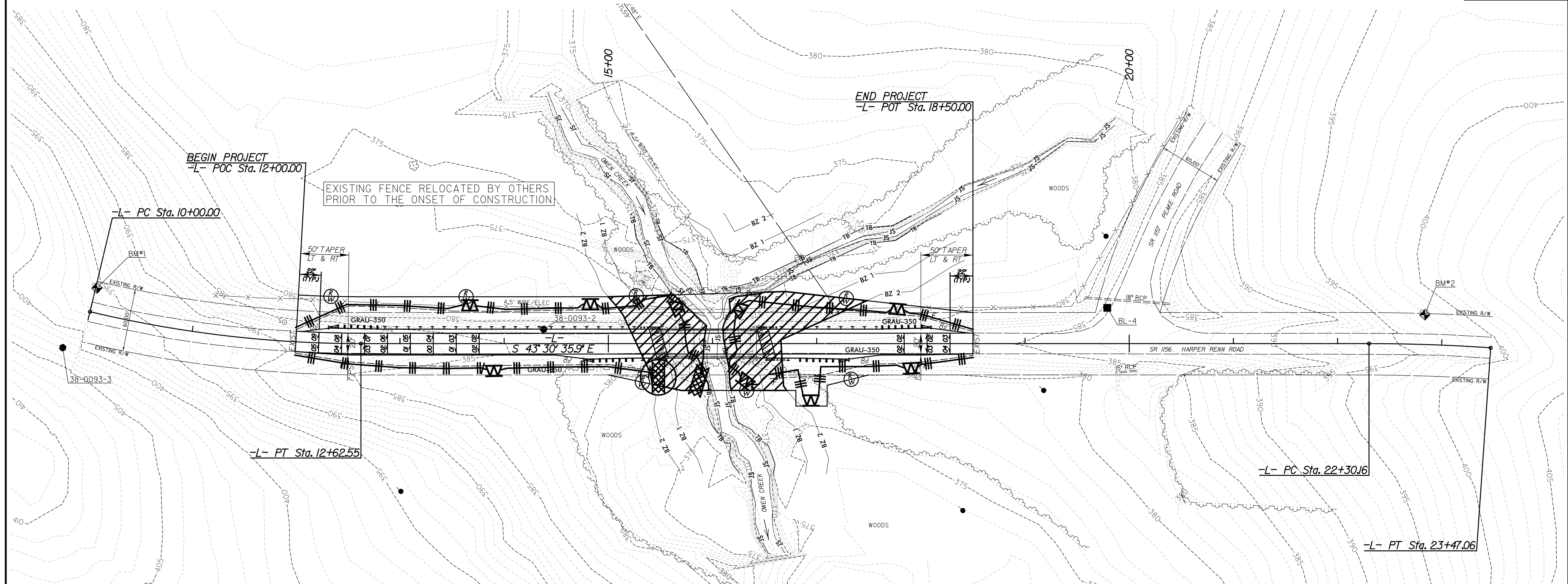
Prepared in the
Office of: **Hatch Mott
MacDonald** P.O. Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com

ICA
Engineering 5121 Kingdom Way,
Suite 100
Raleigh, NC 27607
NC License No. F-0258

HORIZONTAL SCALE
25' 0 25' 50'

EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	▤ ▤ ▤ ▤ ▤ ▤ ▤ ▤ ▤ ▤
1653.01	Temporary Rock Silt Check Type-A	▨ ▨ ▨ ▨ ▨ ▨ ▨ ▨ ▨ ▨
1653.02	Temporary Rock Silt Check Type-B	▩ ▩ ▩ ▩ ▩ ▩ ▩ ▩ ▩ ▩
	Wattle with Polyacrylamide (PAM)	⤵



QUANTITY FOR EXCAVATION LIMITS IS INCLUDED
IN UNCLASSIFIED STRUCTURE EXCAVATION

IMPERVIOUS DIKE SHALL BE CONSIDERED
INCIDENTAL TO THE REMOVAL OF THE
EXISTING STRUCTURE

STACEY H. BAILEY, P.E.
ROADSIDE ENVIRONMENTAL ENGINEER
3074
LEVEL III CERTIFICATION NUMBER
TRENTON J. CORMIER, P.E.
ROADSIDE ENVIRONMENTAL PROJECT ENGINEER
3377
LEVEL III CERTIFICATION NUMBER

THESE EROSION AND SEDIMENT
CONTROL PLANS COMPLY WITH
THE REGULATIONS SET FORTH
BY THE NCG-010000 GENERAL
CONSTRUCTION PERMIT EFFECTIVE
AUGUST 3, 2011 AND ISSUED BY
THE NORTH CAROLINA DEPARTMENT
OF ENVIRONMENT AND NATURAL
RESOURCES DIVISION OF WATER
RESOURCES.

Prepared In the Office of:
ICA ENGINEERING, INC.
5121 KINGDOM WAY, SUITE 100
RALEIGH NC 27607
NC LICENSE NO: F-0258
2012 STANDARD SPECIFICATIONS

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 2012 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	

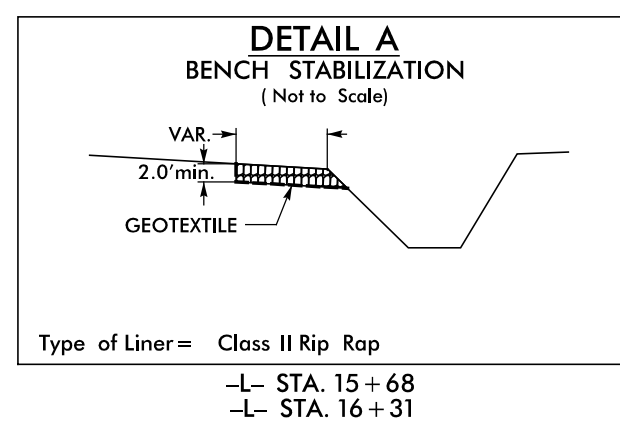
ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT
Refer To E. C. Special Provisions for Special Considerations.

 ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

NOTE:
ALL EROSION CONTROL DEVICES SHOWN ARE LOCATED WITHIN EXISTING R/W OR EASEMENT.

DATE: 9/24/2015
P:\Hydro\Projects\Erosion Control\1380093_hyd_erosion_c&g.dgn
ICA ENGINEERING, INC.

DESIGN EXCEPTION:
SUPERELEVATION



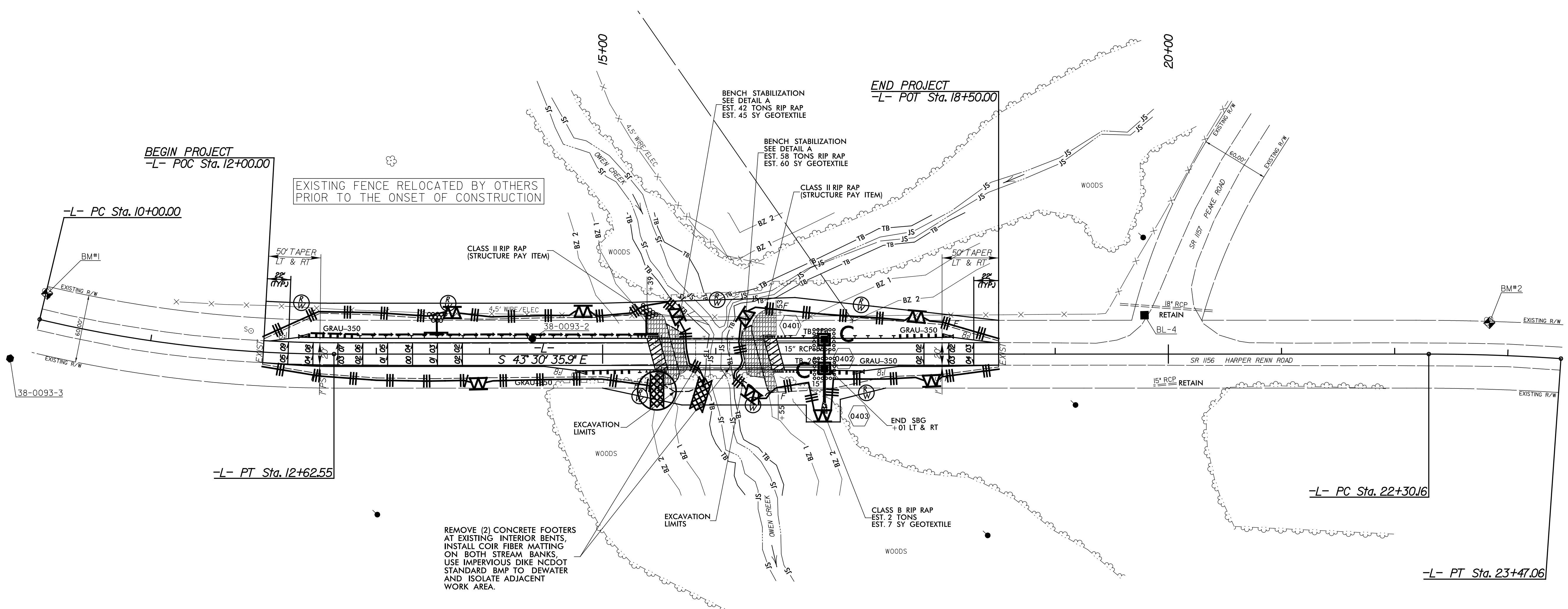
1102 11/28 01N

EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	—▲—
1632.03	Rock Inlet Sediment Trap Type C	□
1633.01	Temporary Rock Silt Check Type-A	▣
1633.02	Temporary Rock Silt Check Type-B	▤
	Wattle with Polyacrylamide (PAM)	⊂

FINAL EROSION CONTROL
FOR CONSTRUCTION SHEET 4

PROJECT REFERENCE 17BP.5.R.52 - GRANVILLE 93	SHEET NO. EC-2/CONST.4
ROADSIDE ENVIRONMENTAL PROJECT ENGINEER	
LEVEL III CERTIFIED BY: STACEY H. BAILEY, PE CERTIFICATION NUMBER: 3074 ISSUED: SEPTEMBER 22, 2015	
Prepared in the Office of: Hatch Mott MacDonald	P.O. Box 700 Fuquay-Varina, NC 27526 www.hatchmott.com
ICA Engineering	5121 Kingdom Way, Suite 100 Raleigh, NC 27607 NC License No. F-0258



THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 3, 2011 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER RESOURCES.

Place Matting for Erosion Control on 2:1 Slope

QUANTITY FOR EXCAVATION LIMITS IS INCLUDED IN UNCLASSIFIED STRUCTURE EXCAVATION

IMPERVIOUS DIKE SHALL BE CONSIDERED INCIDENTAL TO THE REMOVAL OF THE EXISTING STRUCTURE

Prepared in the Office of:

ICA ENGINEERING, INC.
5121 KINGDOM WAY, SUITE 100
RALEIGH NC 27607
NC LICENSE NO: F-0258

2012 STANDARD SPECIFICATIONS

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 2012 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	

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

Refer To E. C. Special Provisions for Special Considerations.

NOTE: ALL EROSION CONTROL DEVICES SHOWN ARE LOCATED WITHIN EXISTING RW OR EASEMENT.

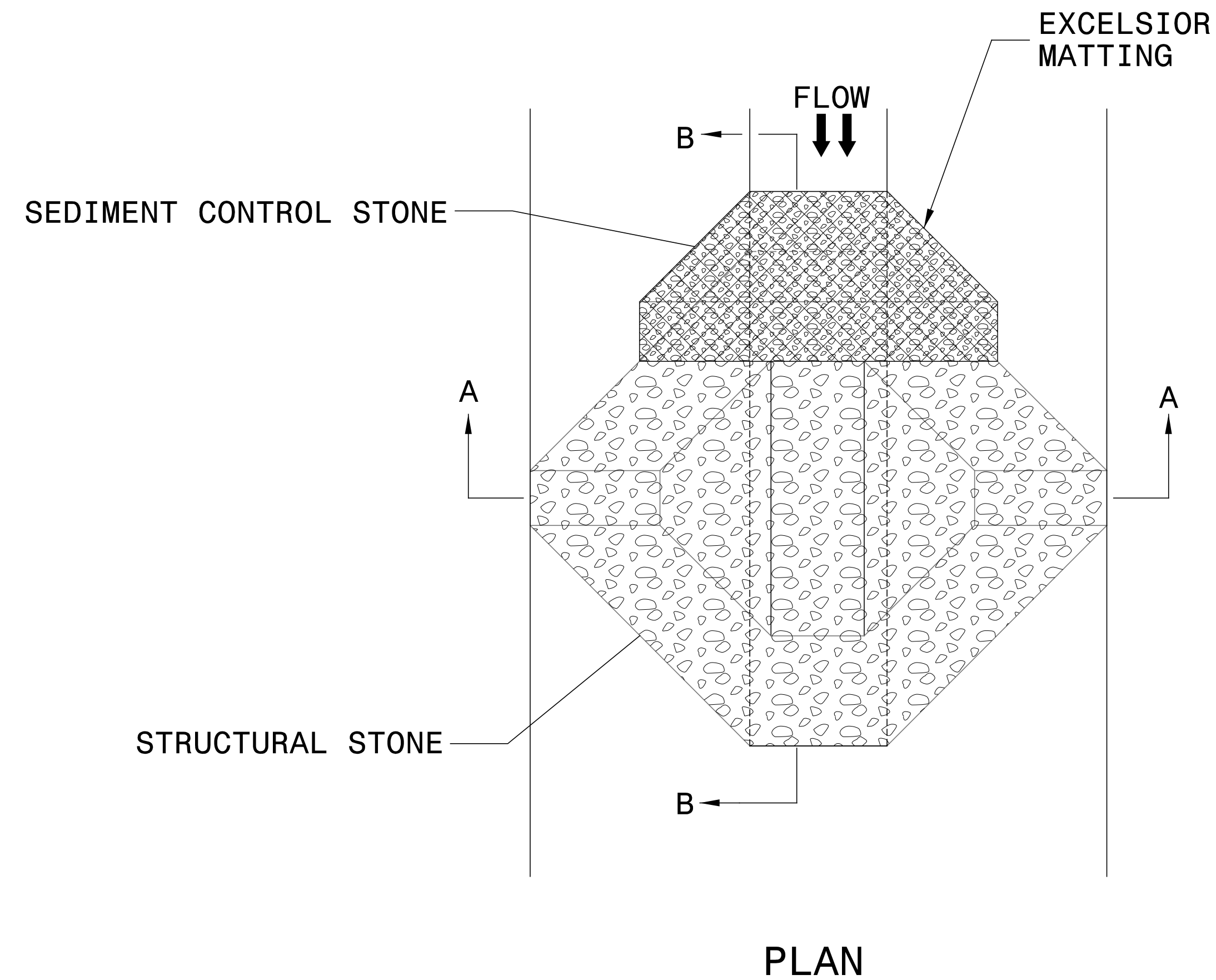
9/22/2015 9:22:20 AM \\s01\cadd\380093_hyd_erosion_f.ina.dgn ICA ENGINEERING, INC.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

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.

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



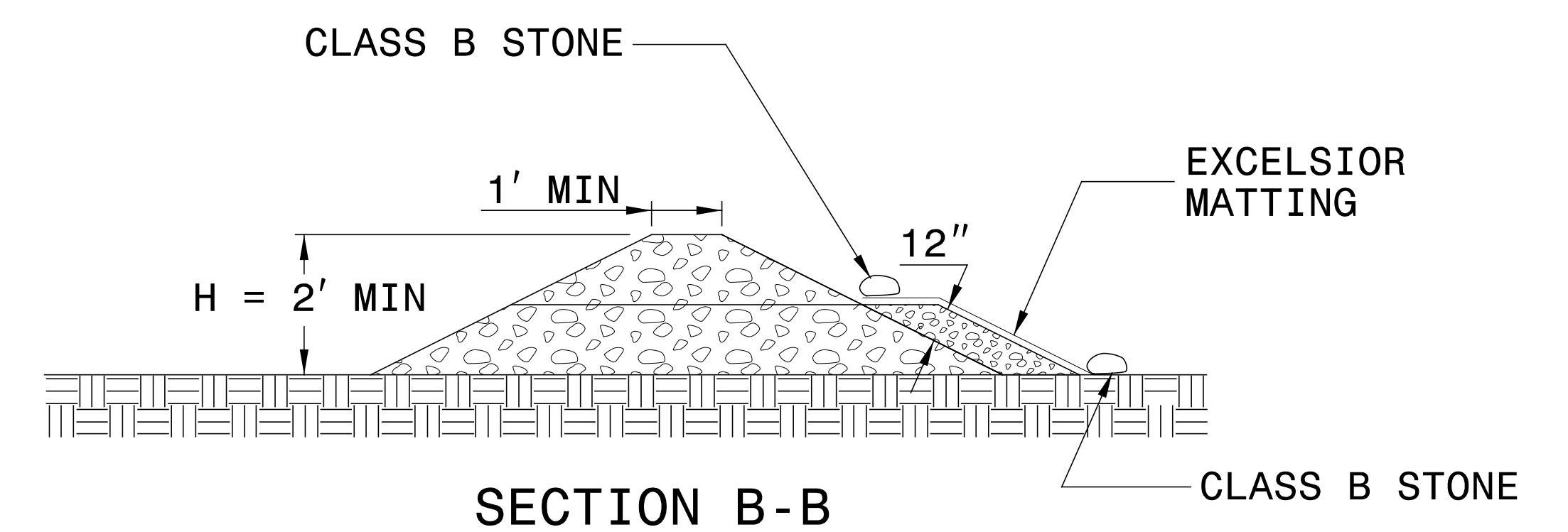
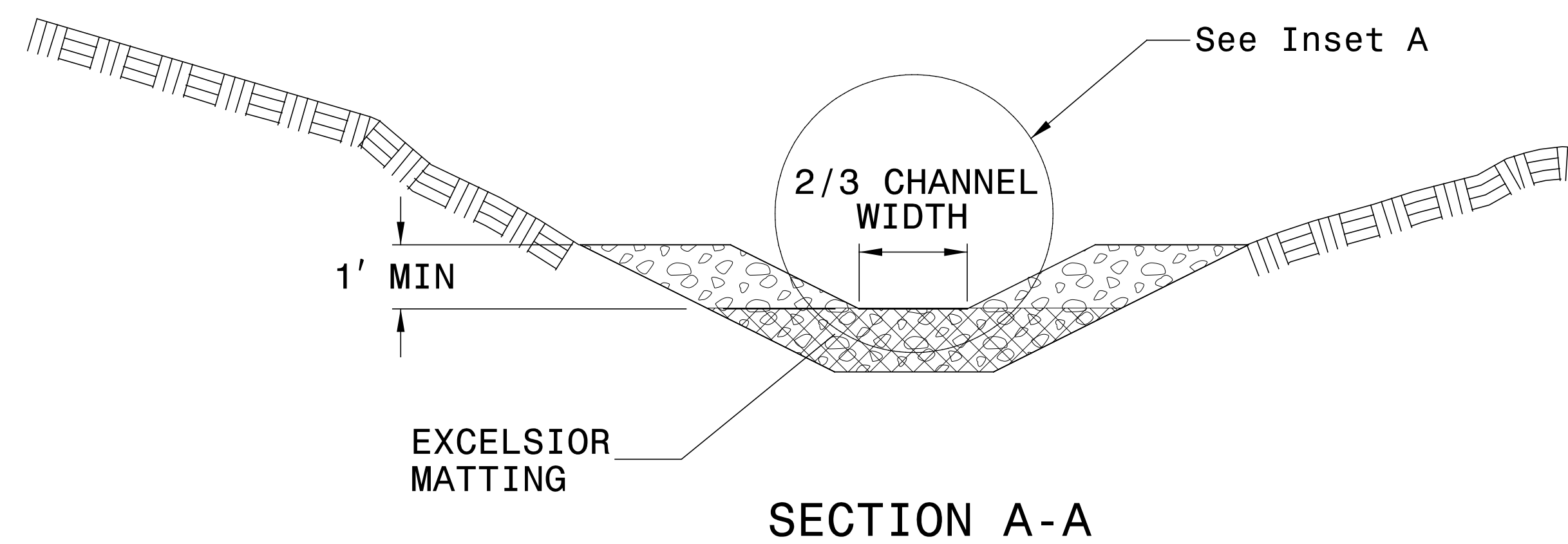
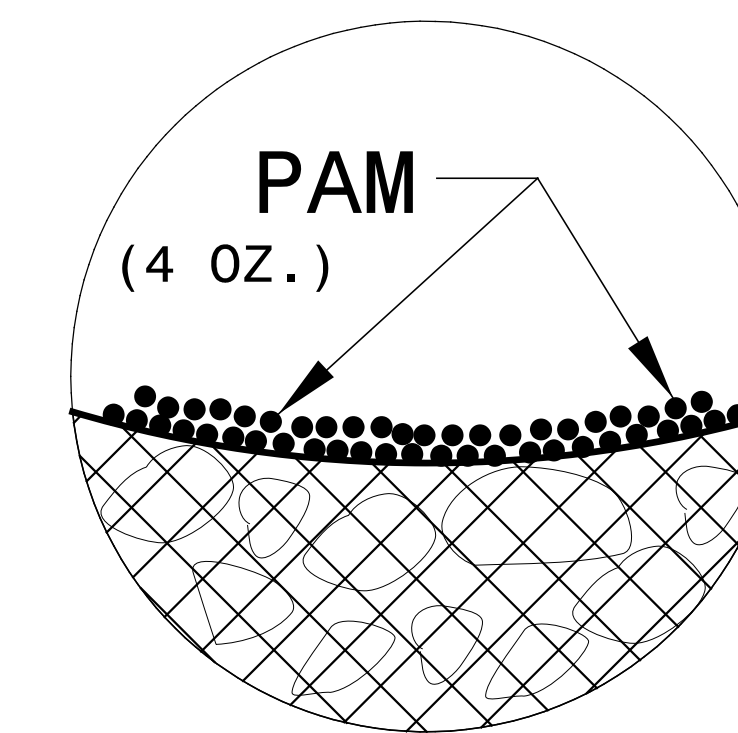
NOTES:

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.



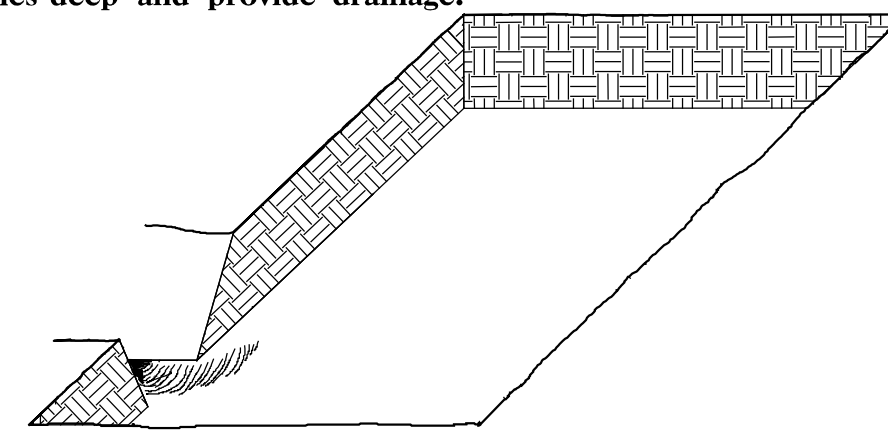
NOT TO SCALE

PLANTING DETAILS

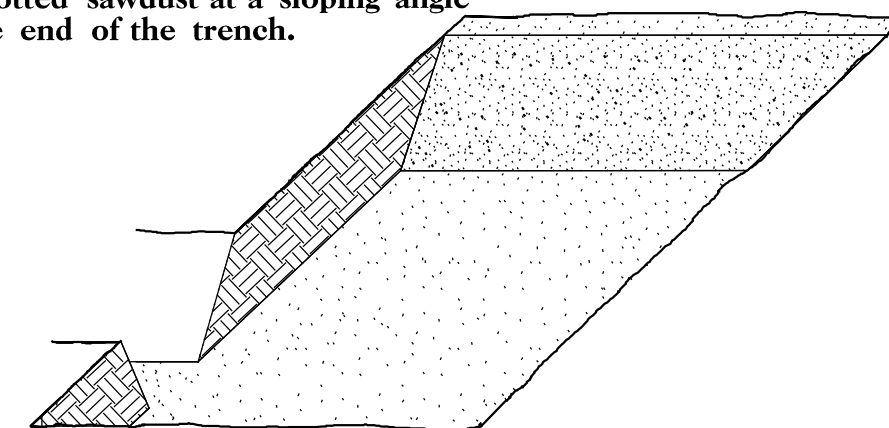
SEEDLING / LINER BAREROOT PLANTING DETAIL

HEALING IN

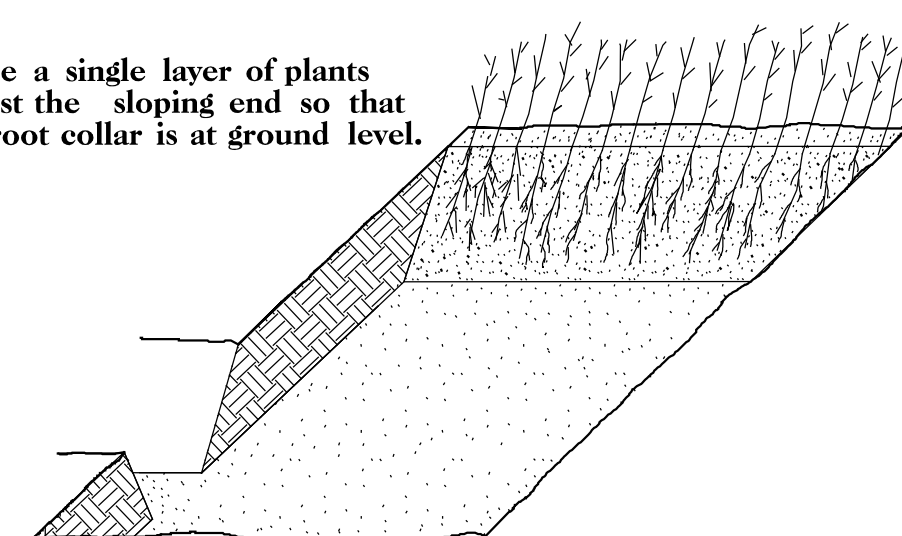
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



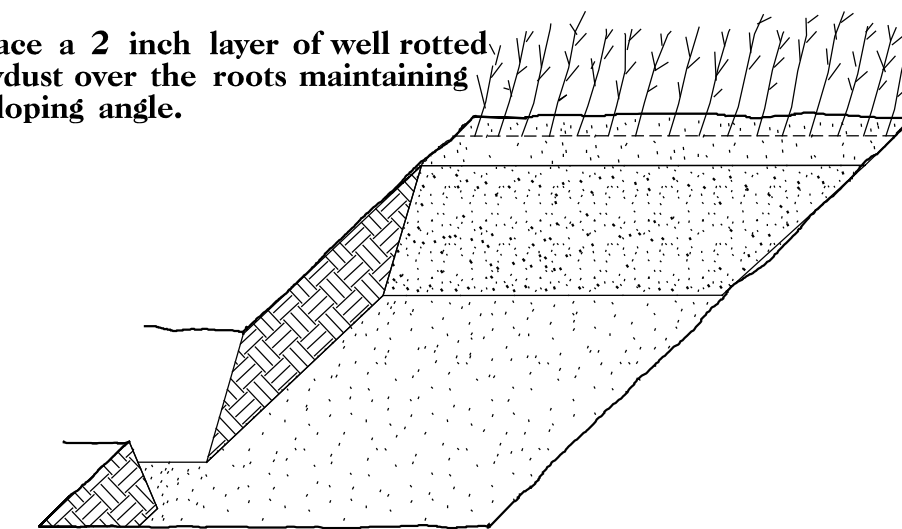
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



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

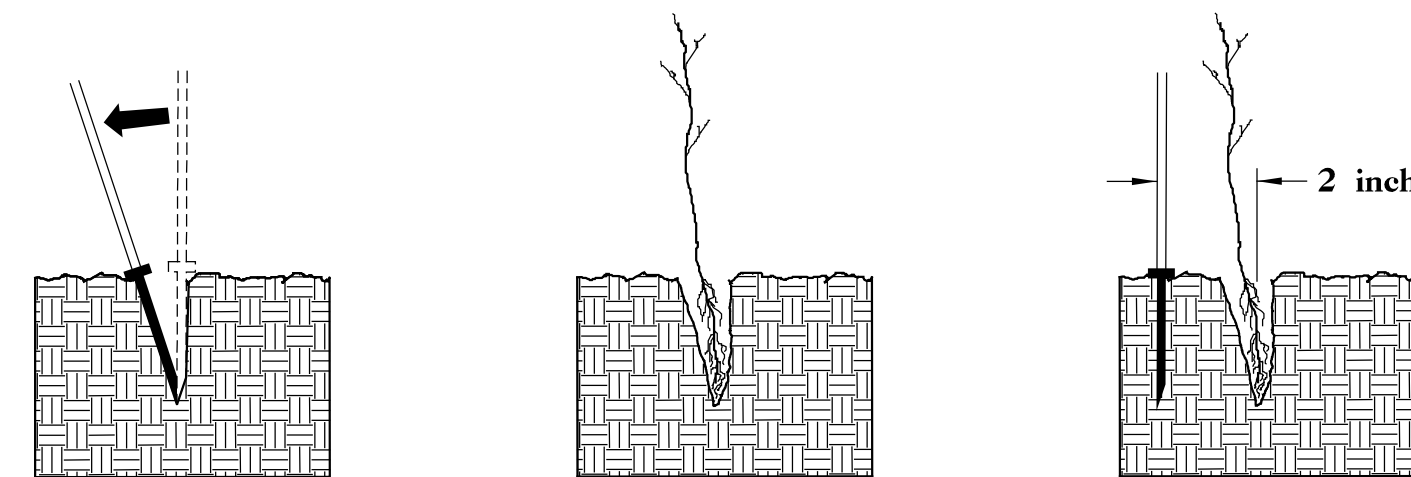


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

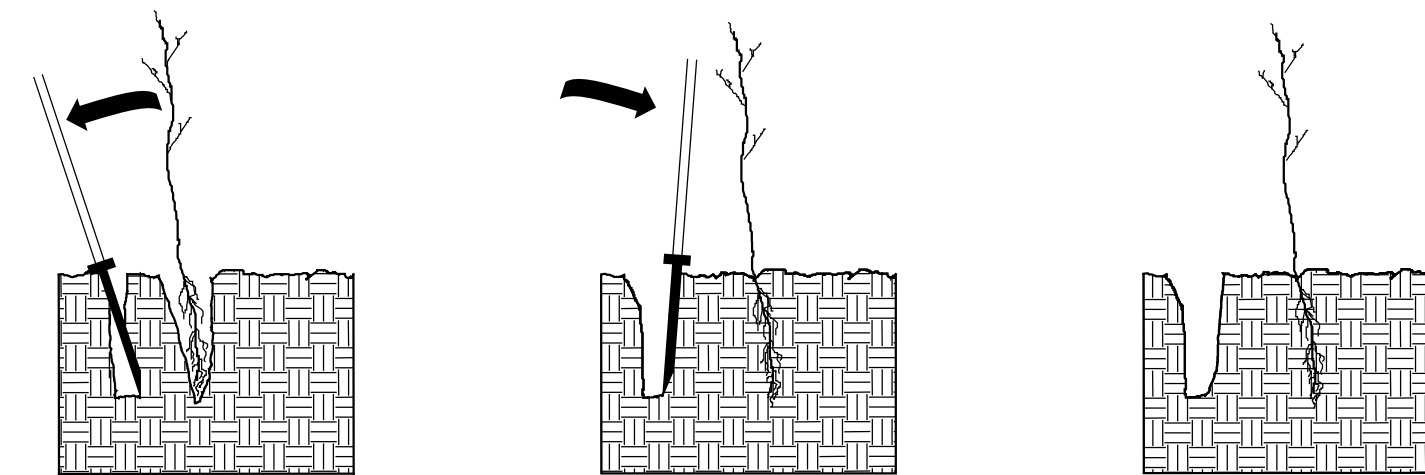


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

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.



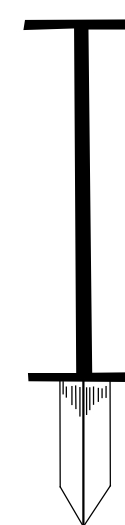
4. Pull handle of bar toward planter, firming soil at bottom.
5. Push handle forward firming soil at top.
6. Leave compaction hole open. Water thoroughly.

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.

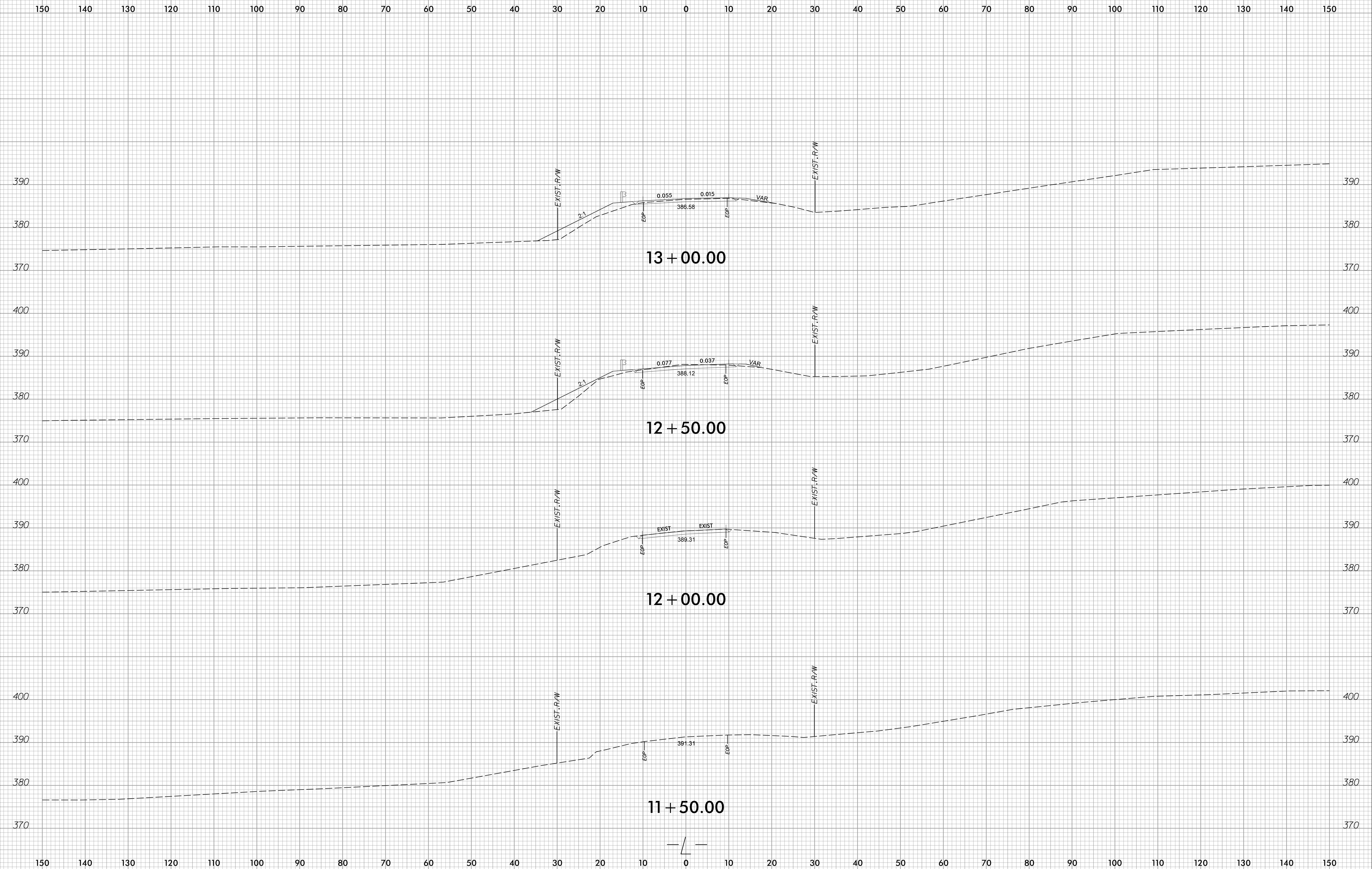
REFORESTATION

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

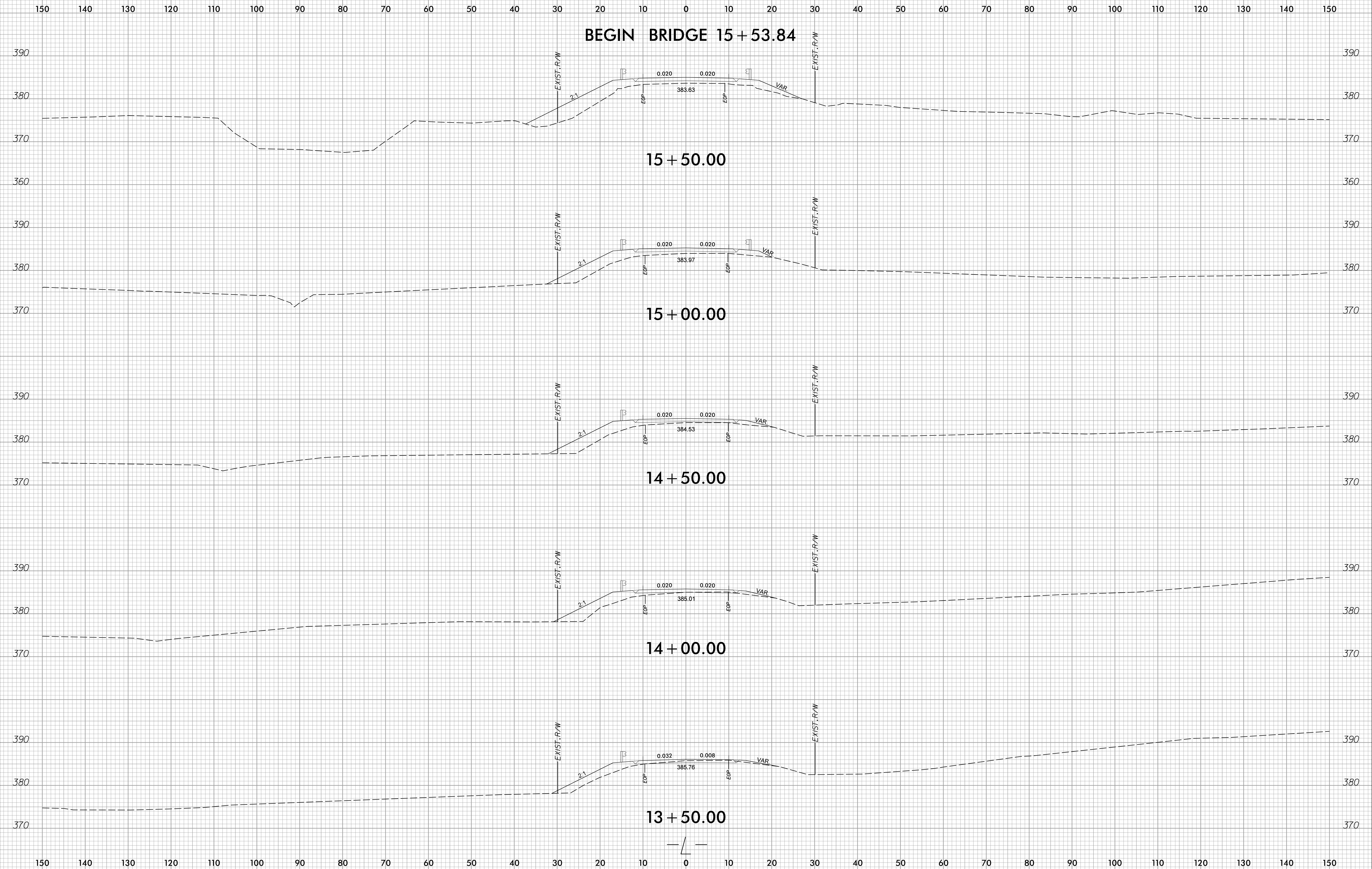
25%	LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in - 18 in BR
25%	PLATANUS OCCIDENTALIS	SYCAMORE	12 in - 18 in BR
25%	FRAXINUS PENNSYLVANICA	GREEN ASH	12 in - 18 in BR
25%	BETULA NIGRA	RIVER BIRCH	12 in - 18 in BR

REFORESTATION DETAIL SHEET

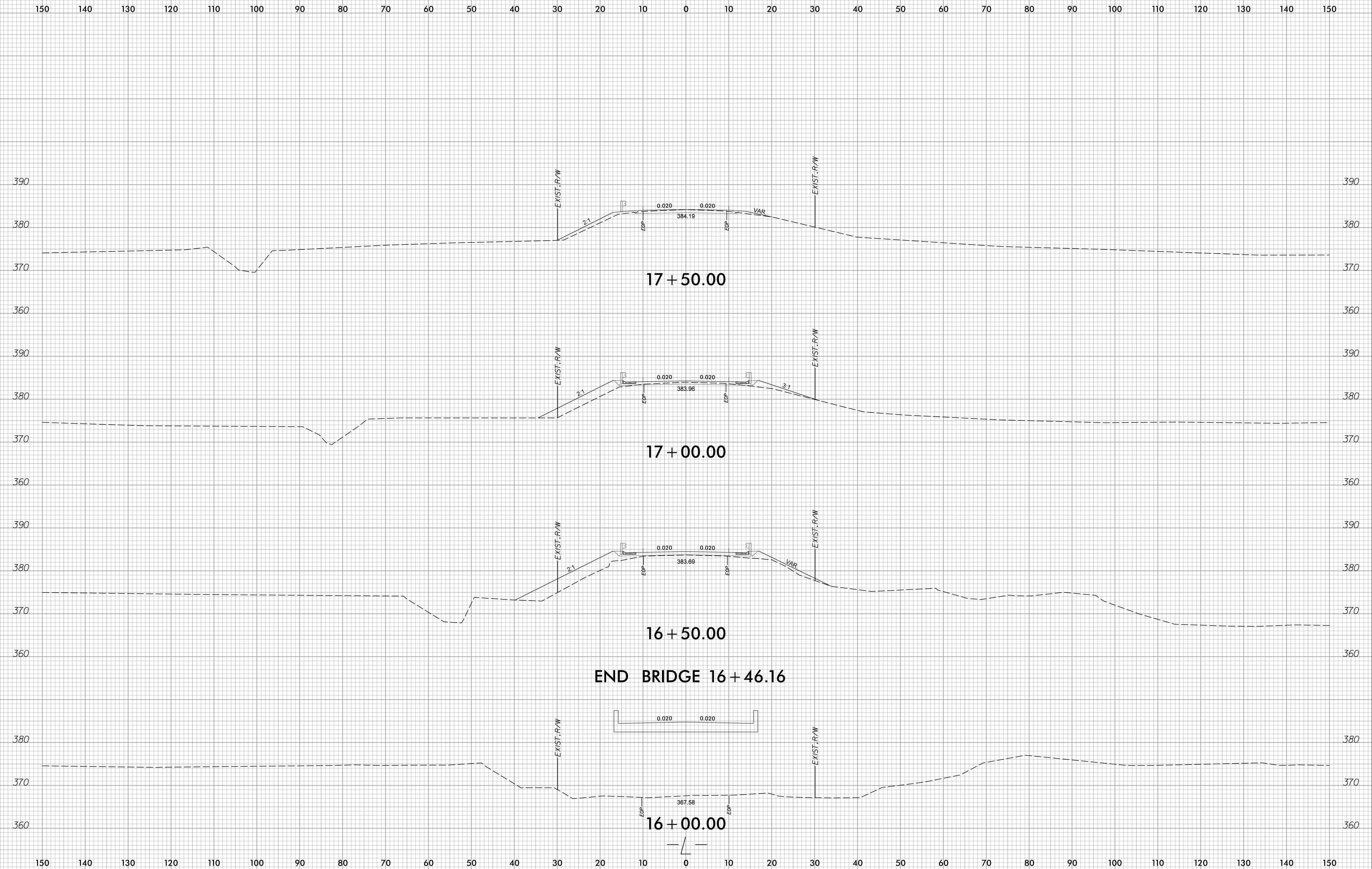
N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT



12/17/2015 7:25:19 AM
 R:\00000000\Xsc\Xpl\380073_r.dwg
 0/0/0/0/0

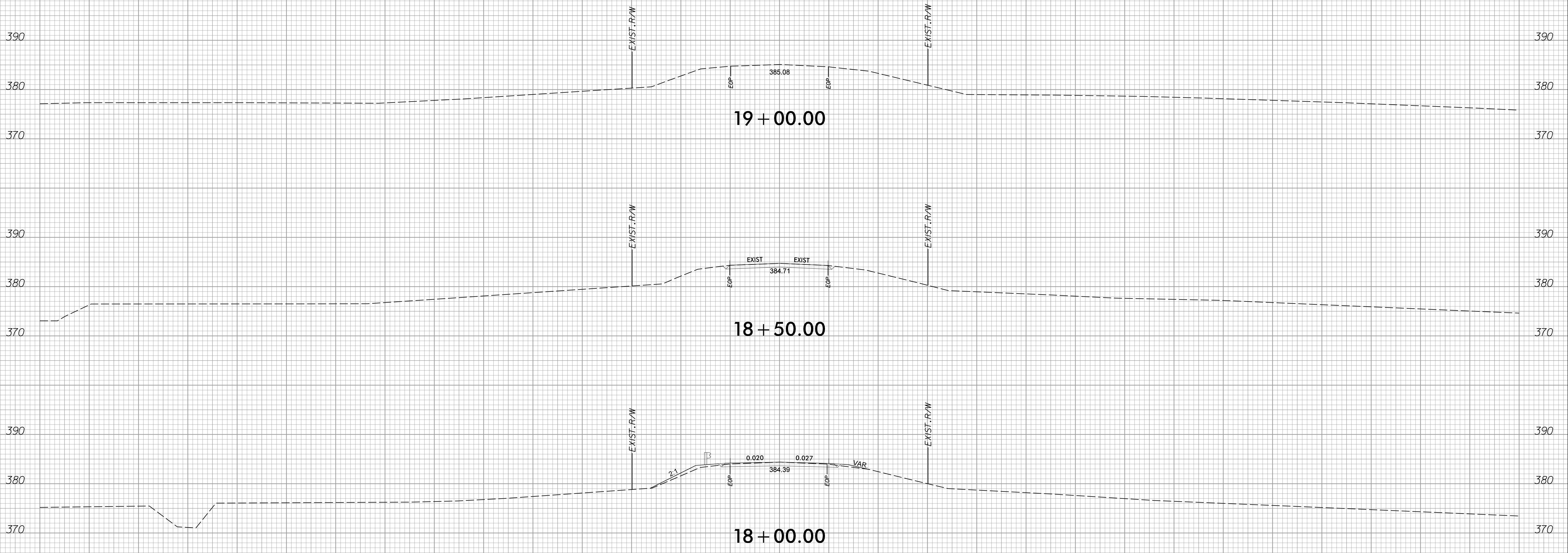


12/17/2015 7:25:19 AM
 R:\060604\Xsc\Xpl\1380073_rdui_xpl.dgn
 0/6/6060



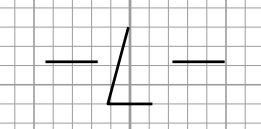
12/17/2015 7:25:19 AM
 R:\00000000\17BP.5.R.52 - GRANVILLE 93 - R.dwg
 0/0/0/0/0

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

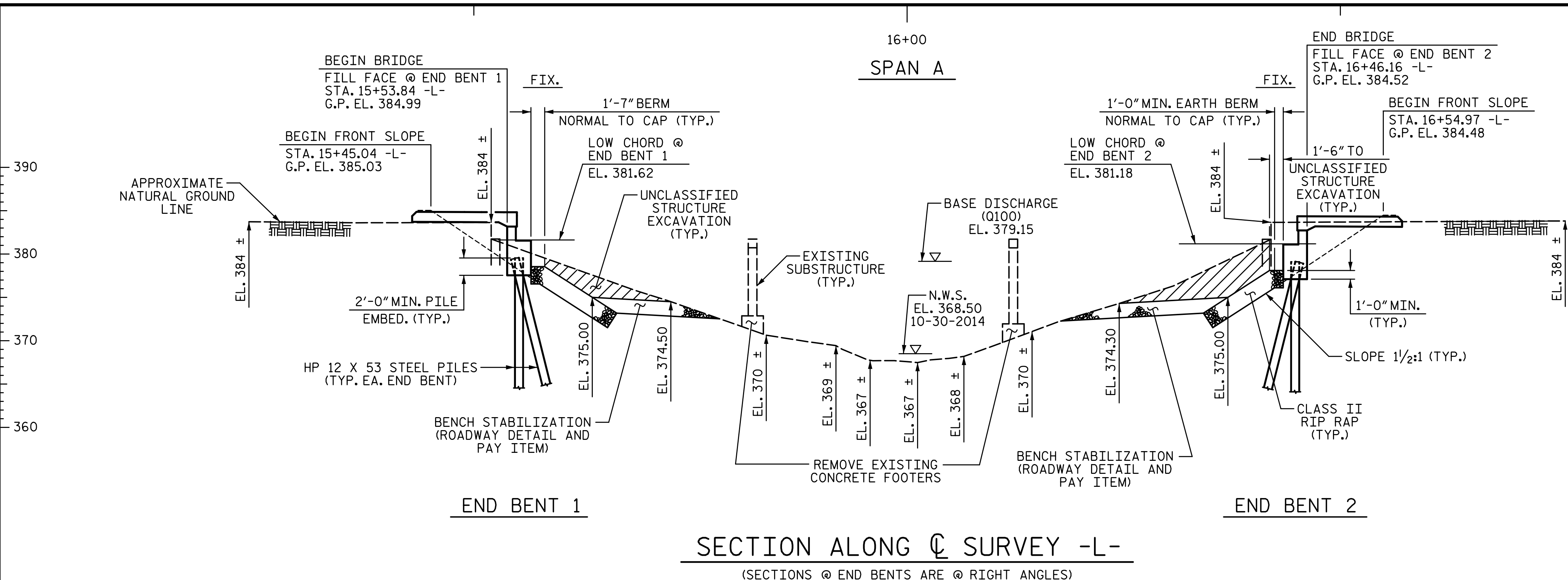
12/17/2015 7:25:50 AM
 R:\00000000\17BP.5.R.52 - GRANVILLE 93 - R.dwg
 0:00:00



12/17/2015 2:29:02 PM G:\Projects\2014\17BP5R52 (Granville 93)\Structures\Drawings\Final\Granville 93_smu_gd.dgn

PROJ:17BP.5.R.52

DRAWN BY: S.D. COOPER DATE: 4-15
CHECKED BY: B.S. COX DATE: 4-15
DESIGN ENGINEER OF RECORD: B.S. COX DATE: 4-15

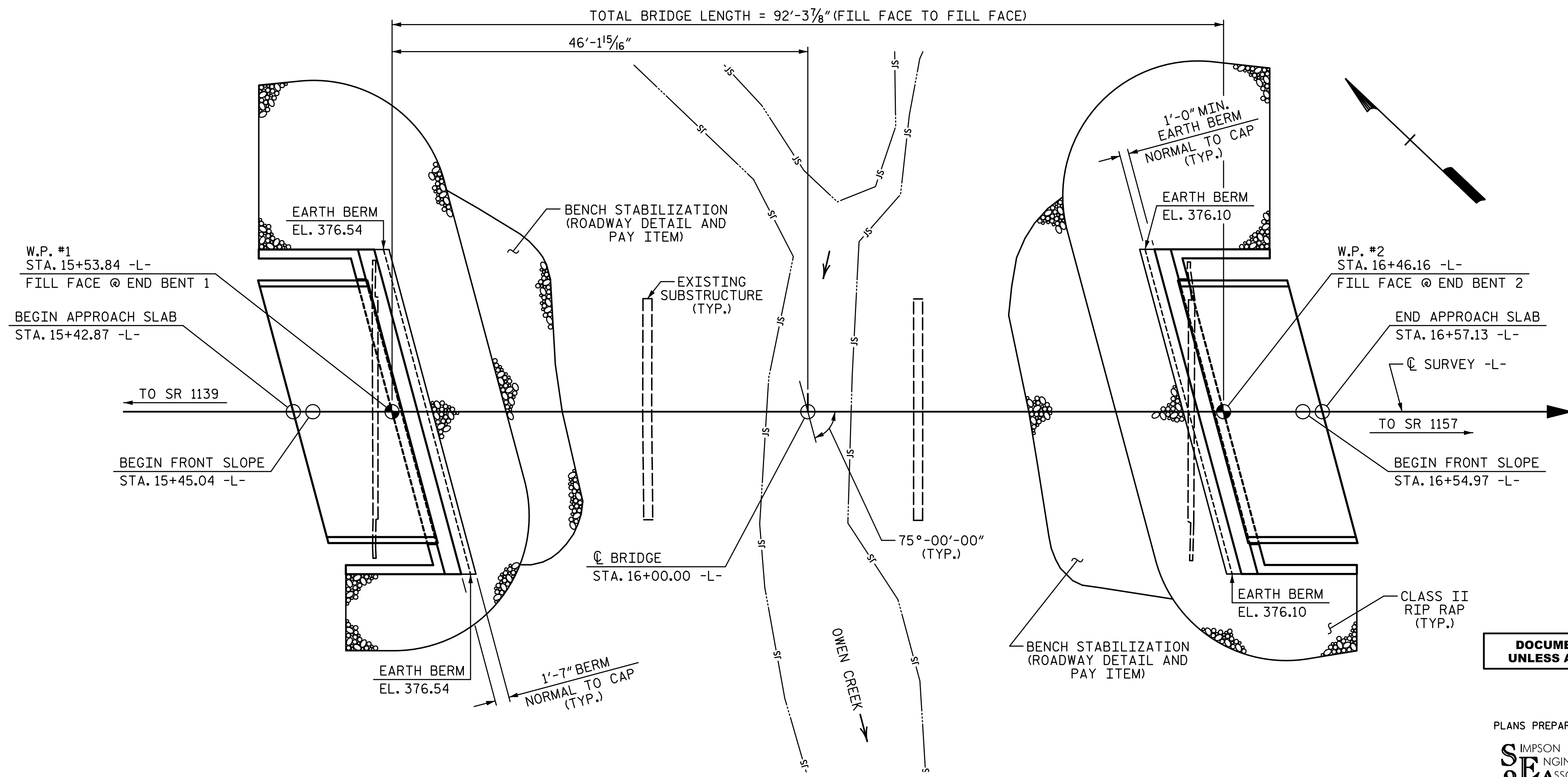


HYDRAULIC DATA:

DESIGN DISCHARGE	= 1400 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YEAR
DESIGN HIGH WATER ELEVATION	= 377.50
DRAINAGE AREA	= 5.0 SQ. MI.
BASE DISCHARGE (Q 100)	= 2080 CFS
BASE HIGH WATER ELEVATION	= 379.15

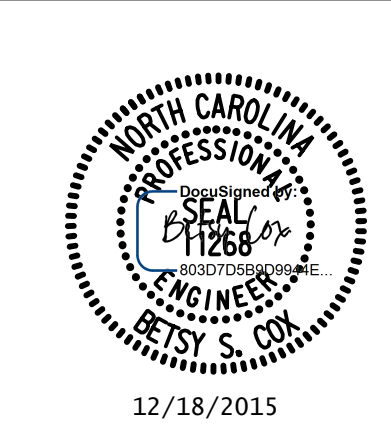
OVERTOPPING FLOOD DATA:

OVERTOPPING DISCHARGE	= 7550 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 500+ YEAR
OVERTOPPING FLOOD ELEVATION	= 384.20 **
** OVERTOPPING OCCURS AT ROADWAY SAG AT STA. 17+37.00 -L-	



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:
S&A
SIMPSON ENGINEERS & ASSOCIATES
5640 Dillard Drive
Suite 200
Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonenr.com
LICENSURE NO. C-2521



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION

PROJECT NO. 17BP.5.R.52
GRANVILLE COUNTY
STATION: 16+00.00 -L-

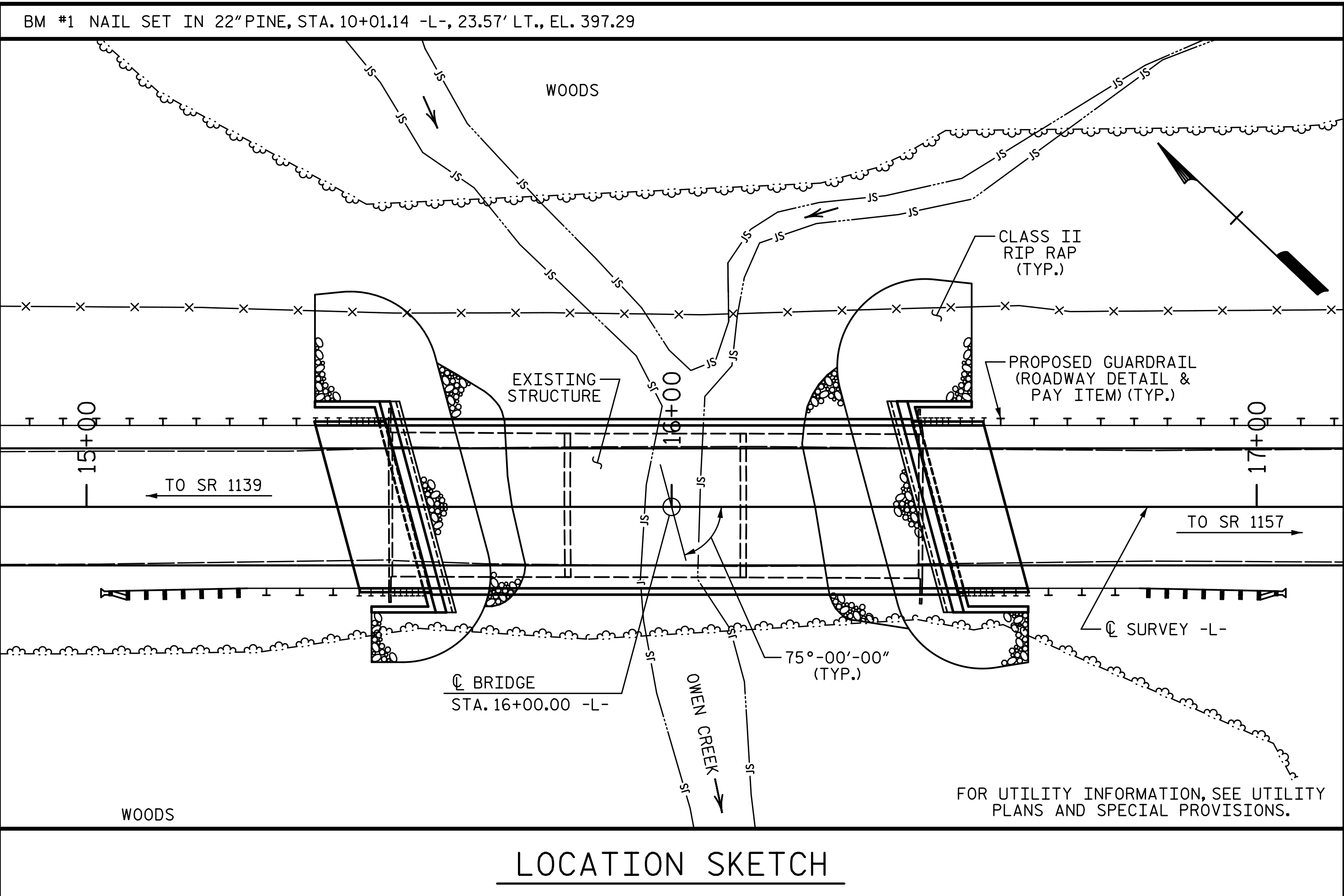
SHEET 1 OF 2 REPLACES BRIDGE #93

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON SR 1156
(HARPER RENN ROAD) OVER
OWEN CREEK BETWEEN
SR 1139 AND SR 1157
27'-10" CLEAR ROADWAY - 75° SKEW

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

SHEET NO. S-1
TOTAL SHEETS 16



NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 25 FT. LEFT AND 35 FT. RIGHT 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.

THE EXISTING STRUCTURE CONSISTS OF 3 SPANS @ 30'-0". THE SUPERSTRUCTURE HAS A CLEAR ROADWAY WIDTH OF 24'-3" ON 10 PRESTRESSED CONCRETE CHANNELS. THE END BENTS CONSIST OF CONCRETE CAPS ON TIMBER PILES AND BULKHEADS. THE INTERIOR BENTS CONSIST OF CONCRETE CAPS ON STEEL PILES WITH CONCRETE COLLARS. THE EXISTING STRUCTURE, WHICH IS LOCATED AT THE SITE OF THE PROPOSED STRUCTURE, SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, THE LOAD LIMIT MAY BE REDUCED AS NECESSARY DURING THE LIFE OF THE PROJECT.

REMOVE CONCRETE FOOTERS AT EXISTING INTERIOR BENTS. SEE ROADWAY PLANS.

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 DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18-EVALUATING SCOUR AT BRIDGES."

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.

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+00.00 -L-."

FOUNDATION NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 130 TONS PER PILE.

DRIVE PILES AT END BENT 1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 220 TONS PER PILE.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT 1 AND 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	HP 12 X 53 STEEL PILES		STEEL PILE POINTS	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 2'-9" PRESTRESSED CONCRETE BOX BEAMS	
	LS	LS	CY	LS	LB	NO.	LF	EA	LF	TON	SY	LS	NO.	LF
SUPERSTRUCTURE				LS					180.0			LS	10	900'-0"
END BENT 1		LS	24.4		3430	5	100	5		120	135			
END BENT 2		LS	24.4		3430	5	75	5		110	125			
TOTAL	LS	LS	48.8	LS	6860	10	175	10	180.0	230	260	LS	10	900'-0"

**PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION**

PROJECT NO. 17BP.5.R.52
GRANVILLE COUNTY
 STATION: 16+00.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

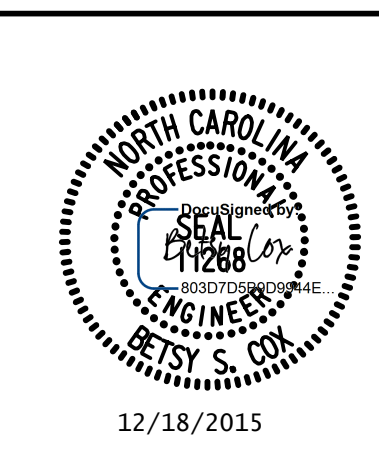
GENERAL DRAWING
 FOR BRIDGE ON SR 1156
 (HARPER RENN ROAD) OVER
 OWEN CREEK BETWEEN
 SR 1139 AND SR 1157

27'-10" CLEAR ROADWAY - 75° SKEW

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

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

PLANS PREPARED BY:
SIMPSON ENGINEERS & ASSOCIATES
 5640 Dillard Drive
 Suite 200
 Cary, NC 27518
 (919) 852-0468
 (919) 852-0598 (Fax)
 www.simpsonengr.com
 LICENSURE NO. C-2521



12/18/2015

12/17/2015 2:29:02 PM G:\Projects\2014\17BP5R52 (Granville 93)\Structures\Drawings\Final\Granville 93_smu_gd.dgn

DRAWN BY: S.D. COOPER DATE: 4-15
 CHECKED BY: B.S. COX DATE: 4-15
 DESIGN ENGINEER OF RECORD: B.S. COX DATE: 4-15

12/17/2015 2:29:03 PM G:\Projects\2014\17BP5R52 (Granville 93)\Structures\Drawings\Granville 93_lr_fr.dgn

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			
						LIVELOAD FACTORS	MOMENT					SHEAR					LIVELOAD FACTORS	MOMENT						
							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)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.126	--	1.75	0.267	1.49	A	EL	44.224	0.584	1.15	A	EL	8.845	0.80	0.267	1.13	A	EL	44.224		
	HL-93(Opr)	N/A	--	1.488	--	1.35	0.267	1.94	A	EL	44.224	0.584	1.49	A	EL	8.845	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.491	53.666	1.75	0.267	2.03	A	EL	44.224	0.584	1.49	A	EL	8.845	0.80	0.267	1.53	A	EL	44.224		
	HS-20(Opr)	36.000	--	1.932	69.567	1.35	0.267	2.63	A	EL	44.224	0.584	1.93	A	EL	8.845	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.573	48.237	1.4	0.267	5.92	A	EL	44.224	0.584	4.53	A	EL	8.845	0.80	0.267	3.57	A	EL	44.224	
		SNGARBS2	20.000	--	2.611	52.229	1.4	0.267	4.33	A	EL	44.224	0.584	3.19	A	EL	8.845	0.80	0.267	2.61	A	EL	44.224	
		SNAGRIS2	22.000	--	2.452	53.948	1.4	0.267	4.07	A	EL	44.224	0.584	2.95	A	EL	8.845	0.80	0.267	2.45	A	EL	44.224	
		SNCOTTS3	27.250	--	1.777	48.412	1.4	0.267	2.95	A	EL	44.224	0.584	2.26	A	EL	8.845	0.80	0.267	1.78	A	EL	44.224	
		SNAGGRS4	34.925	--	1.465	51.163	1.4	0.267	2.43	A	EL	44.224	0.584	1.85	A	EL	8.845	0.80	0.267	1.46	A	EL	44.224	
		SNS5A	35.550	--	1.434	50.974	1.4	0.267	2.38	A	EL	44.224	0.584	1.87	A	EL	8.845	0.80	0.267	1.43	A	EL	44.224	
		SNS6A	39.950	--	1.307	52.234	1.4	0.267	2.17	A	EL	44.224	0.584	1.69	A	EL	8.845	0.80	0.267	1.31	A	EL	44.224	
	SNS7B	42.000	--	1.245	52.283	1.4	0.267	2.06	A	EL	44.224	0.584	1.65	A	EL	8.845	0.80	0.267	1.24	A	EL	44.224		
	TTST	TNAGRIT3	33.000	--	1.592	52.537	1.4	0.267	2.64	A	EL	44.224	0.584	2.02	A	EL	8.845	0.80	0.267	1.59	A	EL	44.224	
		TNT4A	33.075	--	1.597	52.815	1.4	0.267	2.65	A	EL	44.224	0.584	1.98	A	EL	8.845	0.80	0.267	1.60	A	EL	44.224	
		TNT6A	41.600	--	1.298	53.997	1.4	0.267	2.15	A	EL	44.224	0.584	1.74	A	EL	8.845	0.80	0.267	1.30	A	EL	44.224	
		TNT7A	42.000	--	1.3	54.619	1.4	0.267	2.16	A	EL	44.224	0.584	1.71	A	EL	8.845	0.80	0.267	1.30	A	EL	44.224	
		TNT7B	42.000	--	1.335	56.09	1.4	0.267	2.21	A	EL	44.224	0.584	1.62	A	EL	8.845	0.80	0.267	1.34	A	EL	44.224	
		TNAGRIT4	43.000	--	1.278	54.943	1.4	0.267	2.12	A	EL	44.224	0.584	1.57	A	EL	8.845	0.80	0.267	1.28	A	EL	44.224	
TNAGT5A		45.000	--	1.208	54.37	1.4	0.267	2	A	EL	44.224	0.584	1.55	A	EL	8.845	0.80	0.267	1.21	A	EL	44.224		
TNAGT5B	45.000	3	1.197	53.852	1.4	0.267	1.98	A	EL	44.224	0.584	1.5	A	EL	8.845	0.80	0.267	1.20	A	EL	44.224			

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{DC}	γ_{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)

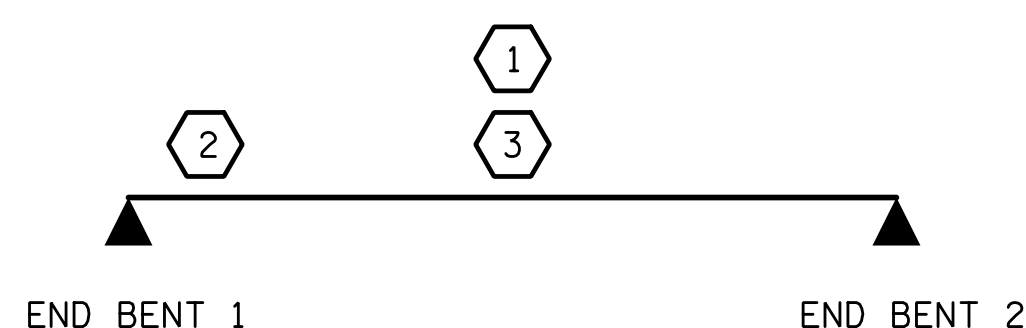
2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



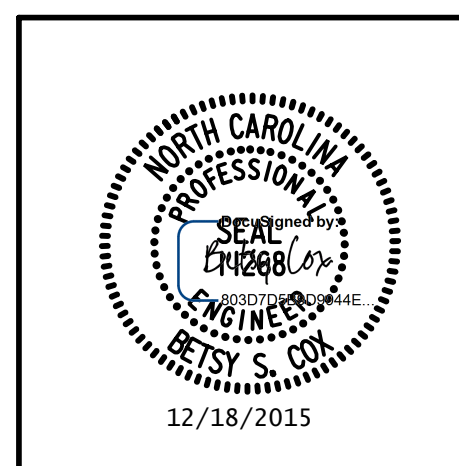
LRFR SUMMARY

**PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION**

PROJECT NO. 17BP.5.R.52
GRANVILLE COUNTY
STATION: 16+00.00 -L-

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

PLANS PREPARED BY:
SIMPSON ENGINEERS & ASSOCIATES
5640 Dillard Drive
Suite 200
Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com
LICENSURE NO. C-2521



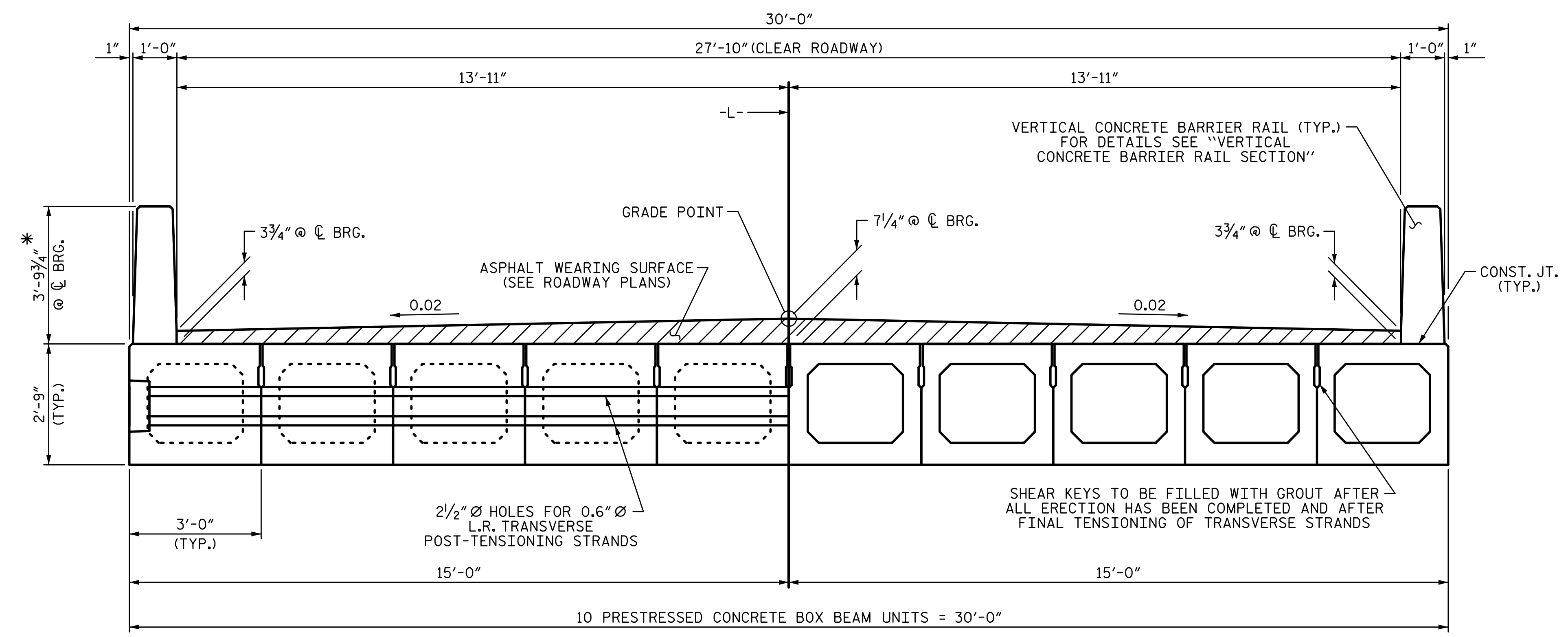
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**LRFR SUMMARY FOR
90'-0" BOX BEAM UNIT
75° SKEW
(NON-INTERSTATE TRAFFIC)**

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

DRAWN BY: S.D. COOPER DATE: 4-15
CHECKED BY: B.S. COX DATE: 4-15
DESIGN ENGINEER OF RECORD: B.S. COX DATE: 4-15

12/17/2015 2:29:03 PM G:\Projects\2014\17BP5R52 (Granville 93)\Structures\Drawings\Final\Granville 93_superstructure.dgn



HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION
THROUGH VOIDS

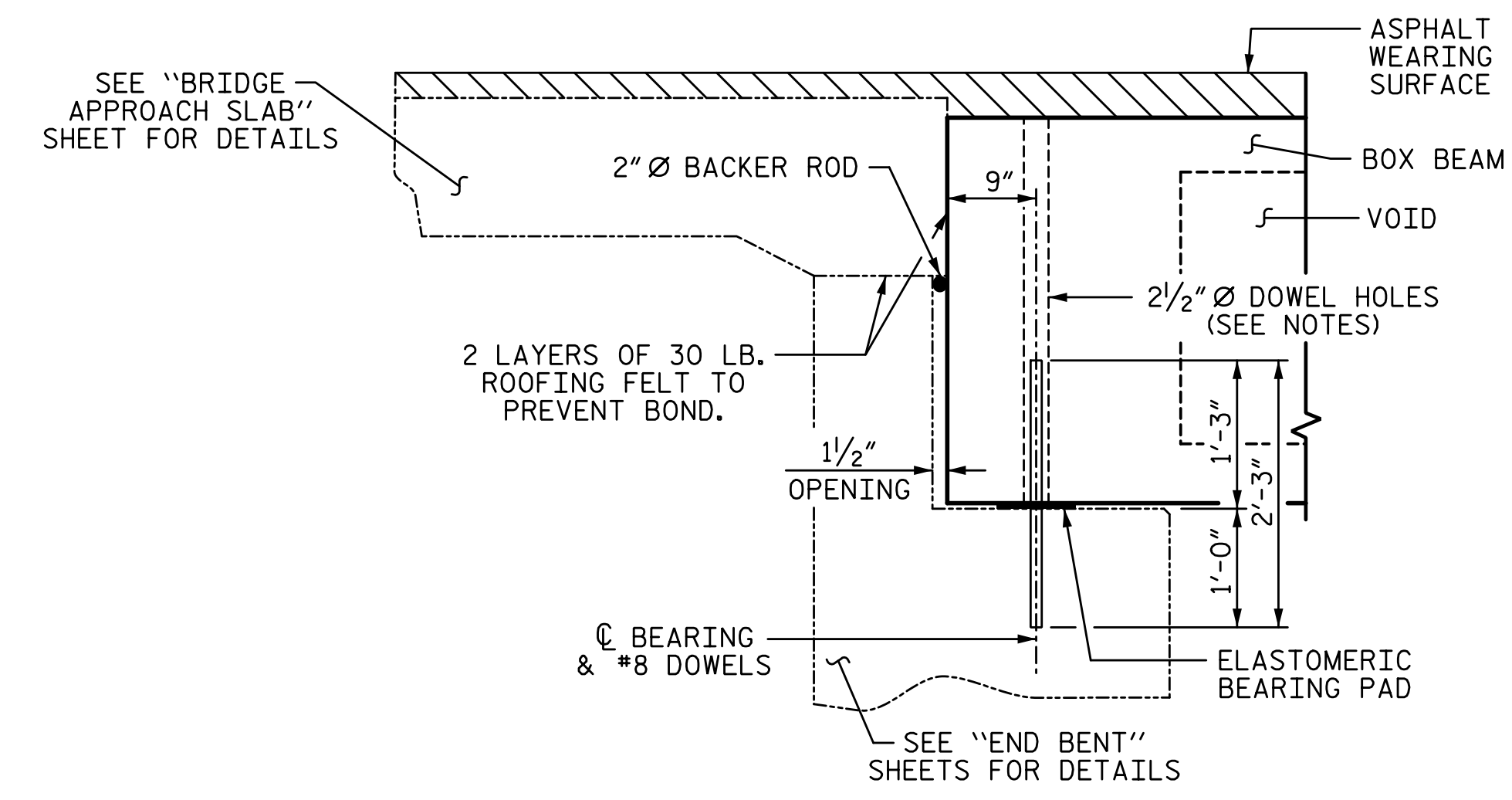
TYPICAL SECTION

* 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.

NOTES:

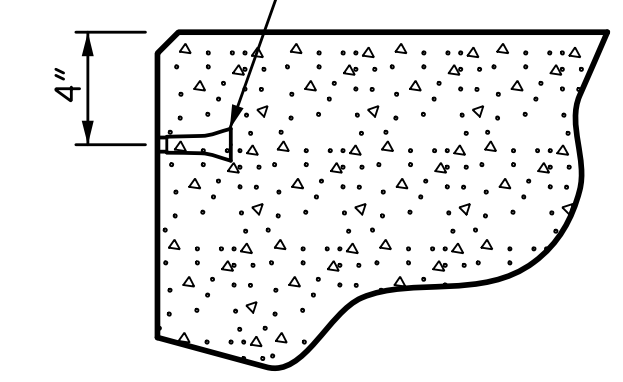
- ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
- ALL REINFORCING STEEL CAST WITH THE BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED 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 6000 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.

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

**PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION**

PROJECT NO. 17BP.5.R.52
GRANVILLE COUNTY
STATION: 16+00.00 -L-

SHEET 1 OF 5

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

PLANS PREPARED BY:
SIMPSON ENGINEERS & ASSOCIATES
5640 Dillard Drive
Suite 200
Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com
LICENSURE NO. C-2521

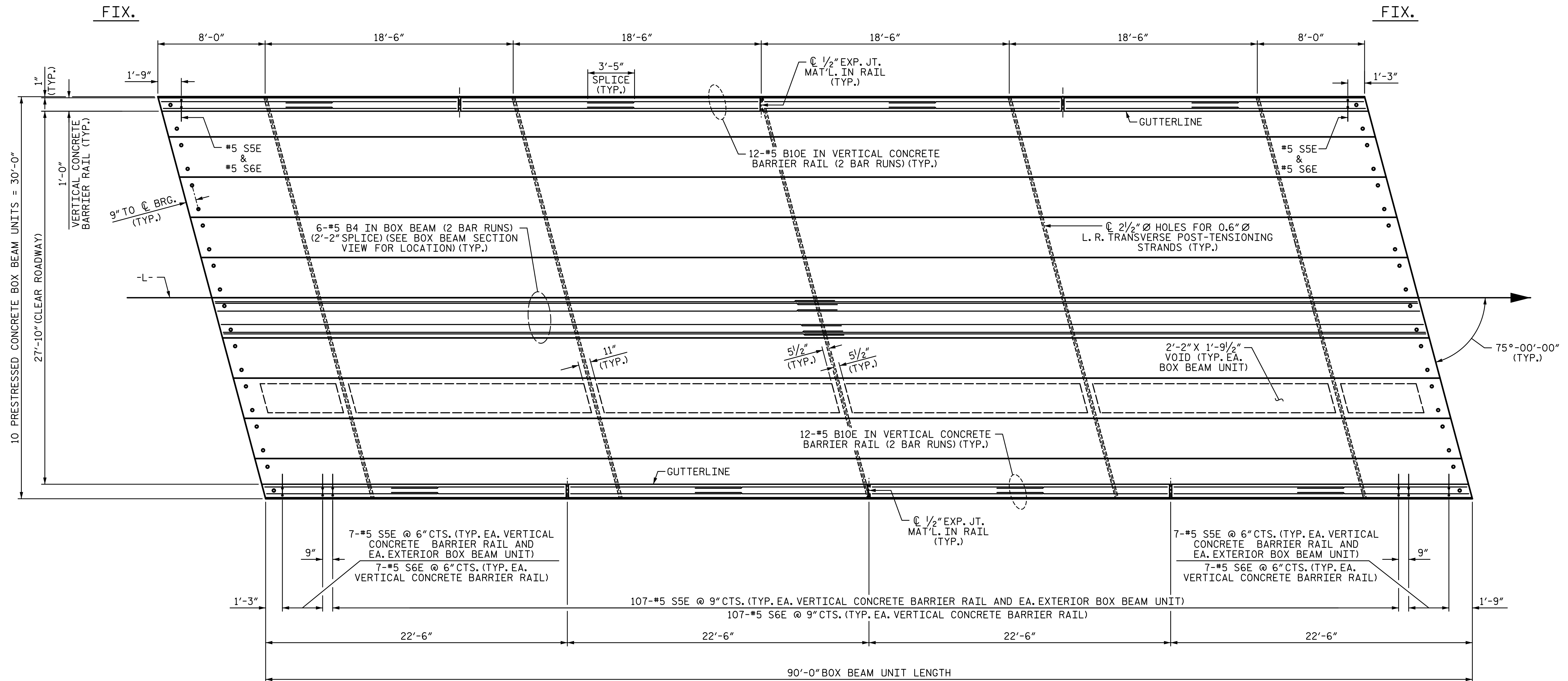


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
3'-0" X 2'-9"
PRESTRESSED CONCRETE
BOX BEAM UNIT
27'-10" CLEAR ROADWAY - 75° SKEW

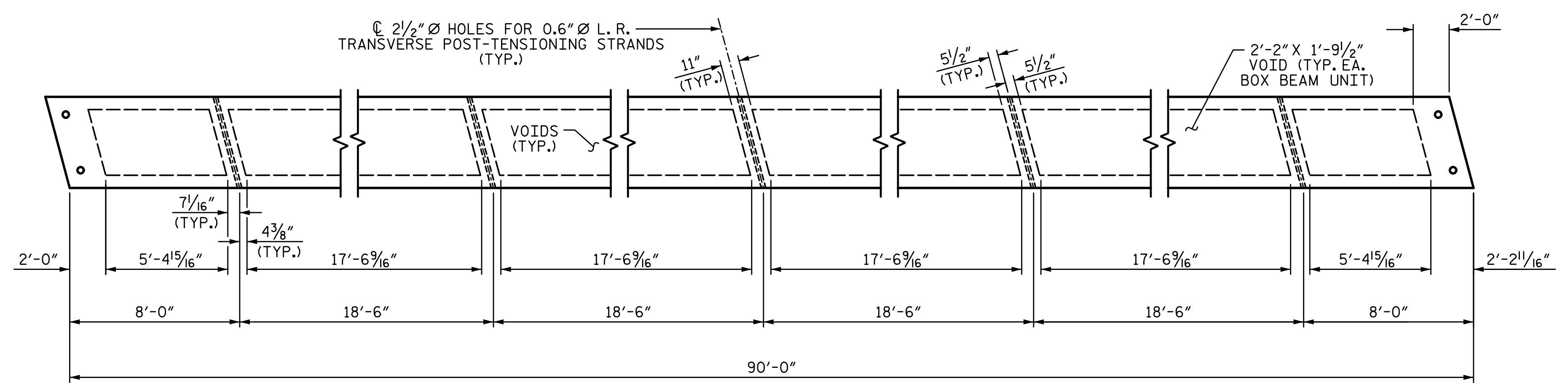
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			16

DRAWN BY: <u>S.D. COOPER</u>	DATE: <u>4-15</u>
CHECKED BY: <u>B.S. COX</u>	DATE: <u>4-15</u>
DESIGN ENGINEER OF RECORD: <u>B.S. COX</u>	DATE: <u>4-15</u>

12/17/2015 2:29:04 PM G:\Projects\2014\17BP5R52 (Granville 93)\Structures\Drawings\Final\Granville 93_superstructure.dgn



PLAN OF UNIT



DIAPHRAGM AND VOID LAYOUT

**PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION**

PROJECT NO. 17BP.5.R.52
GRANVILLE COUNTY
 STATION: 16+00.00 -L-

SHEET 2 OF 5

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

PLANS PREPARED BY:
SIMPSON
 ENGINEERS
 & ASSOCIATES
 5640 Dillard Drive
 Suite 200
 Cary, NC 27518
 (919) 852-0468
 (919) 852-0598 (Fax)
 www.simpsonengr.com
 LICENSURE NO. C-2521



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE

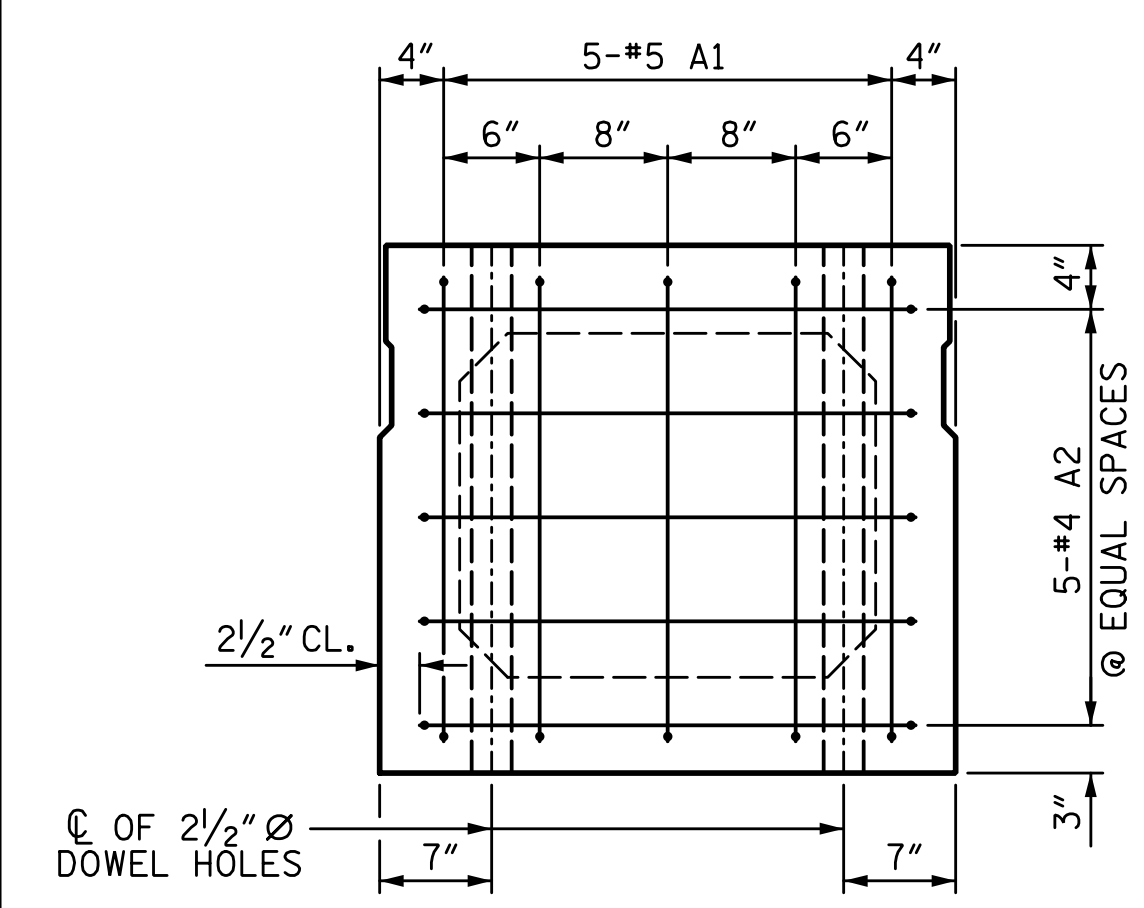
PLAN OF SPAN

27'-10" CLEAR ROADWAY - 75° SKEW

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

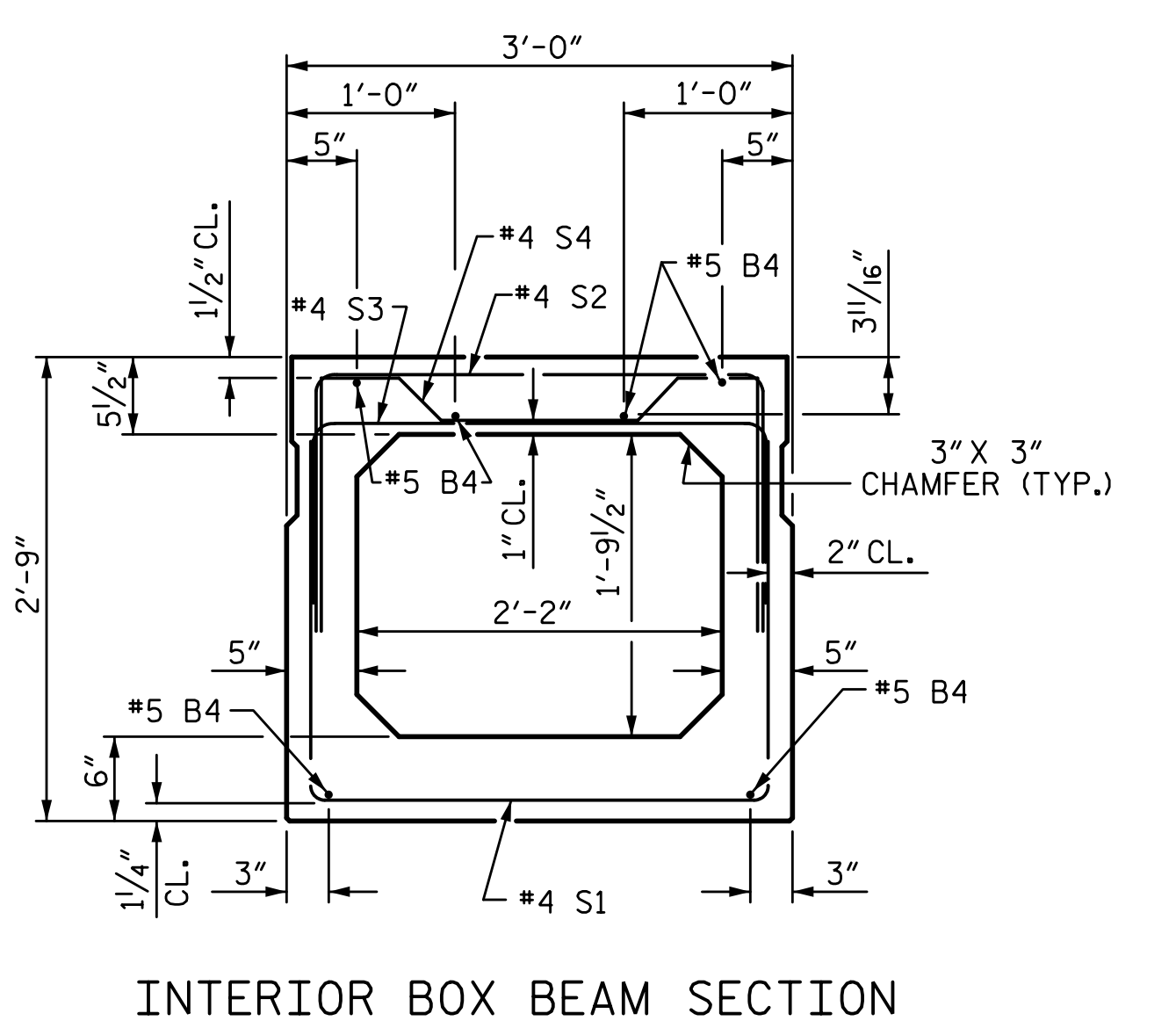
DRAWN BY: S.D. COOPER DATE: 4-15
 CHECKED BY: B.S. COX DATE: 4-15
 DESIGN ENGINEER OF RECORD: B.S. COX DATE: 4-15

12/17/2015 2:29:04 PM G:\Projects\2014\17BP5R52 (Granville) Structures\Drawings\Final\Granville 93\super-structure.dgn

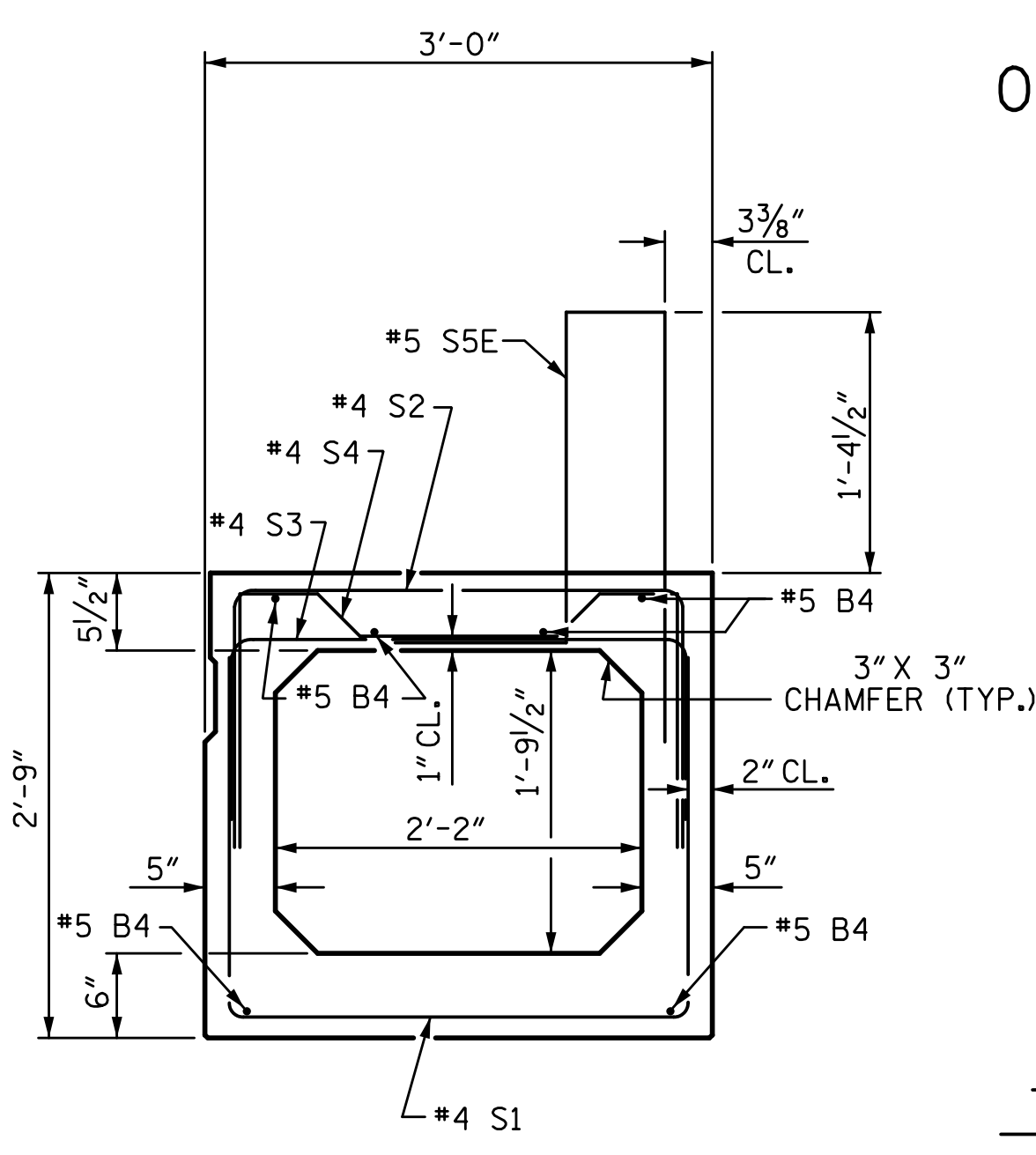


END ELEVATION

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.)

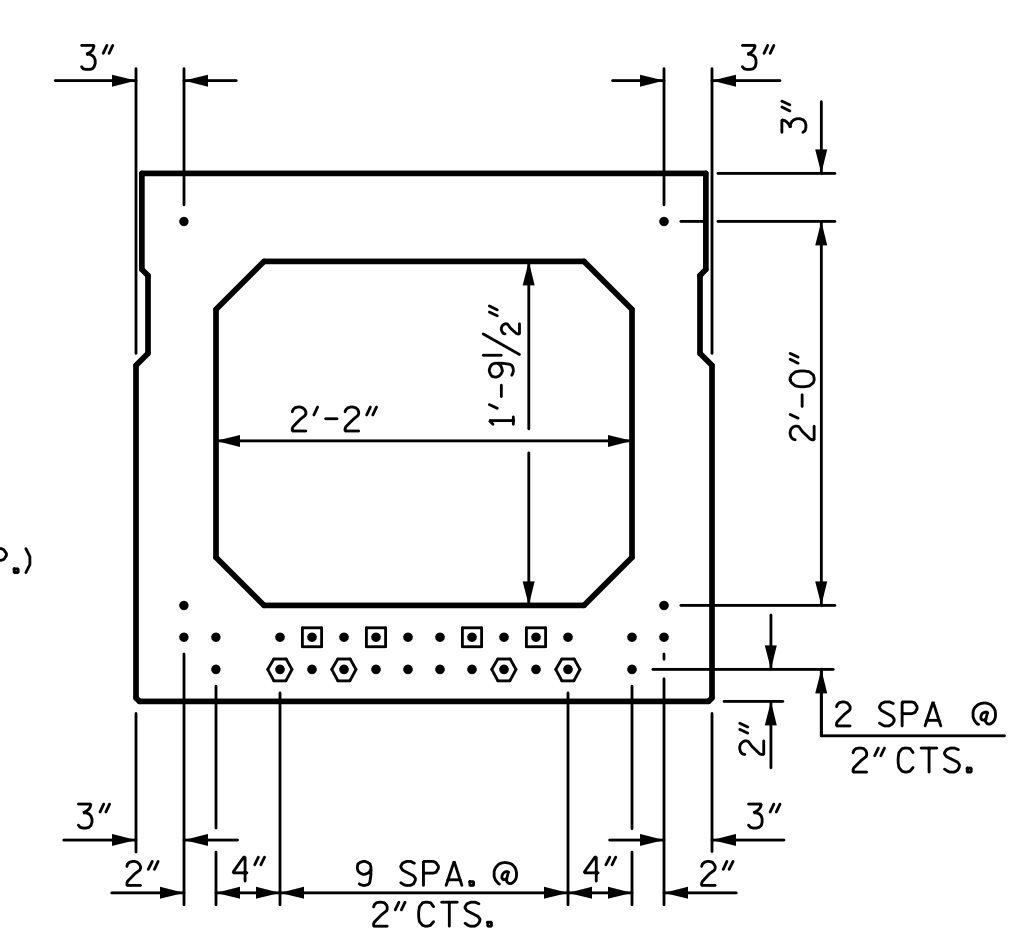


INTERIOR BOX BEAM SECTION (STRAND LAYOUT NOT SHOWN)



EXTERIOR BOX BEAM SECTION (STRAND LAYOUT NOT SHOWN)

0.6" Ø LOW RELAXATION STRAND LAYOUT

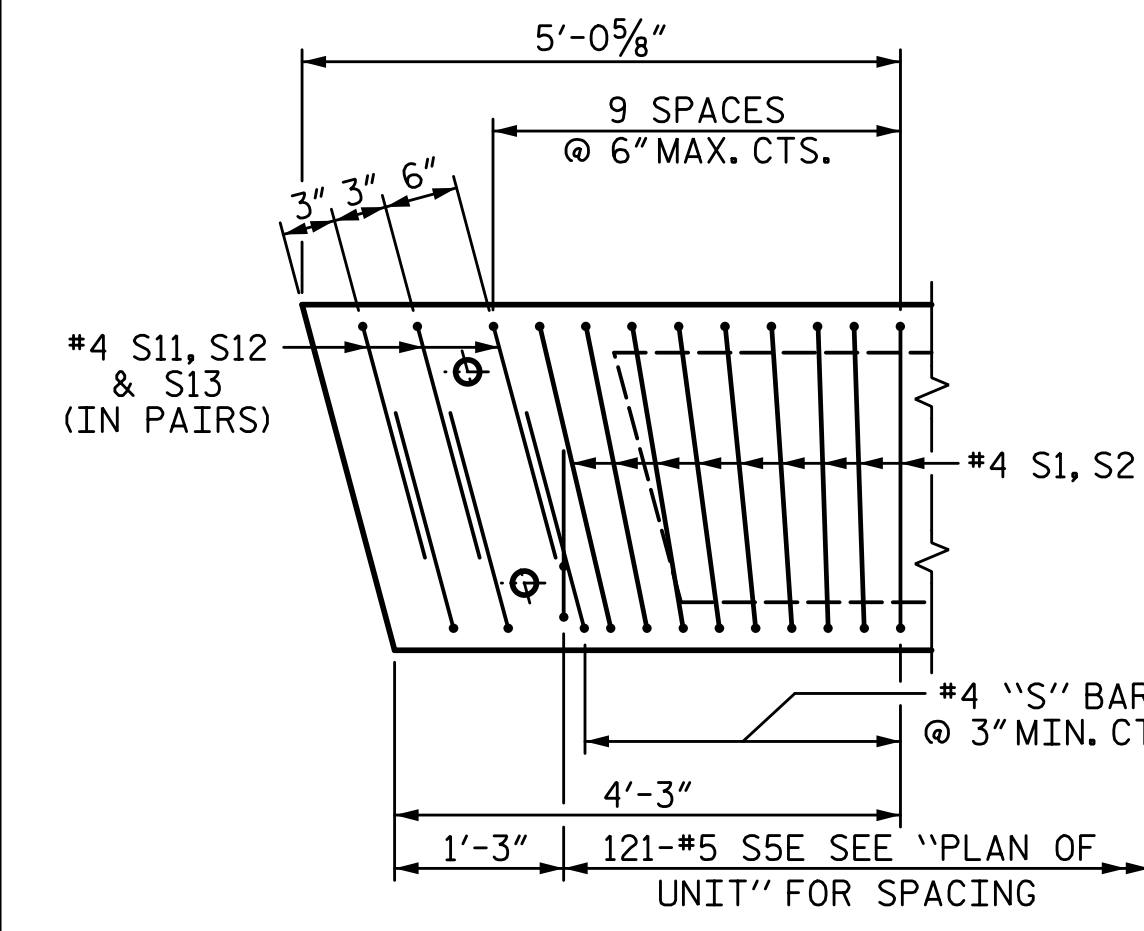


TYPICAL STRAND LOCATION (30 STRANDS REQUIRED)

DEBONDING LEGEND

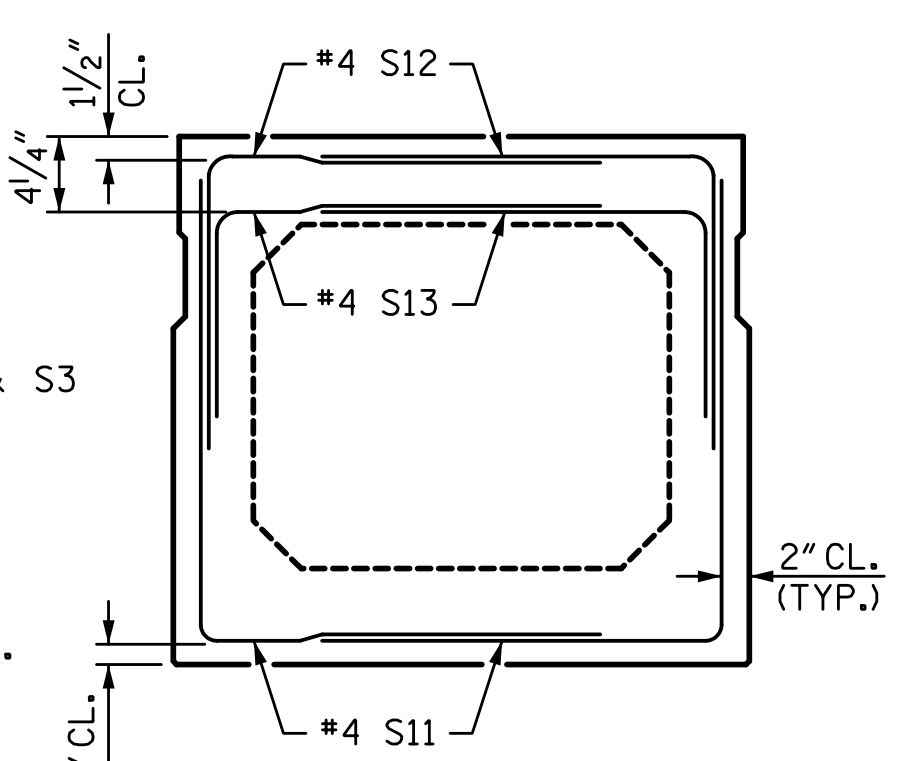
- FULLY BONDED STRANDS
 - ⊠ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
 - ⬡ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
- BOND SHALL BE BROKEN ON STRANDS AS SHOWN FOR THE SPECIFIED LENGTH FROM EACH END OF THE BOX BEAM. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.

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



DETAIL "B"

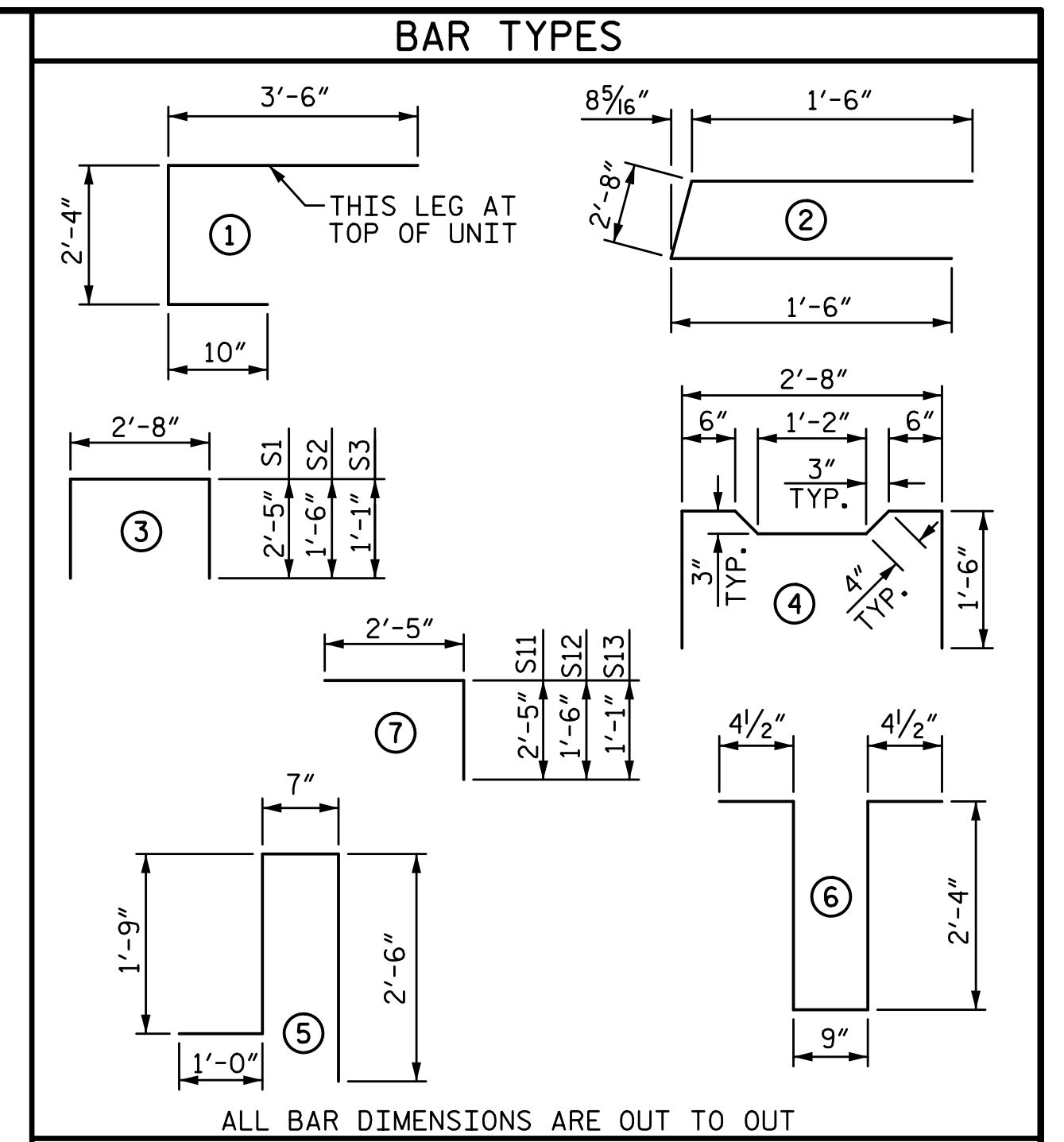
EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5E BARS. "B" BARS AND "A" BARS NOT SHOWN.



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

SHEAR KEY DETAIL

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

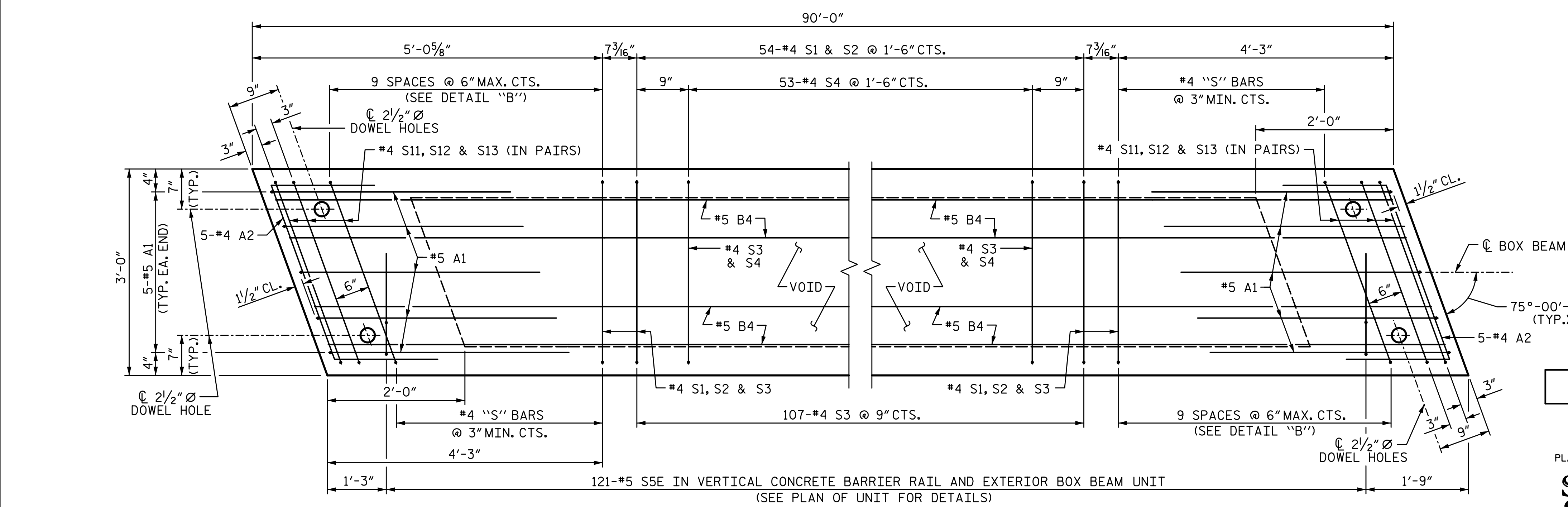


ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE BOX BEAM SECTION							
				EXTERIOR UNIT		INTERIOR UNIT	
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
A1	10	#5	1	6'-8"	70	6'-8"	70
A2	40	#4	2	5'-8"	151	5'-8"	151
B4	12	#5	STR	45'-11"	575	45'-11"	575
K1	15	#4	6	6'-2"	62	6'-2"	62
K2	10	#4	STR	2'-7"	17	2'-7"	17
S1	72	#4	3	7'-6"	361	7'-6"	361
S2	72	#4	3	5'-8"	273	5'-8"	273
S3	125	#4	3	4'-10"	404	4'-10"	404
S4	53	#4	4	5'-10"	207	5'-10"	207
S11	12	#4	7	4'-10"	39	4'-10"	39
S12	12	#4	7	3'-11"	31	3'-11"	31
S13	12	#4	7	3'-6"	28	3'-6"	28
S5E	121	#5	5	5'-10"	736	--	--
REINFORCING STEEL					2218 LB	2218 LB	
"E" EPOXY COATED REINF. STEEL					736 LB	736 LB	
8000 P.S.I. CONCRETE					16.0 CY	15.9 CY	
0.6" Ø L.R. STRANDS				NO. 30		NO. 30	

PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION

PROJECT NO. 17BP.5.R.52
 GRANVILLE COUNTY
 STATION: 16+00.00 -L-
 SHEET 3 OF 5

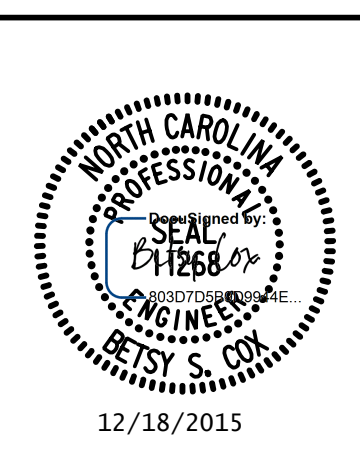


PLAN OF BOX BEAM

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5E 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".

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

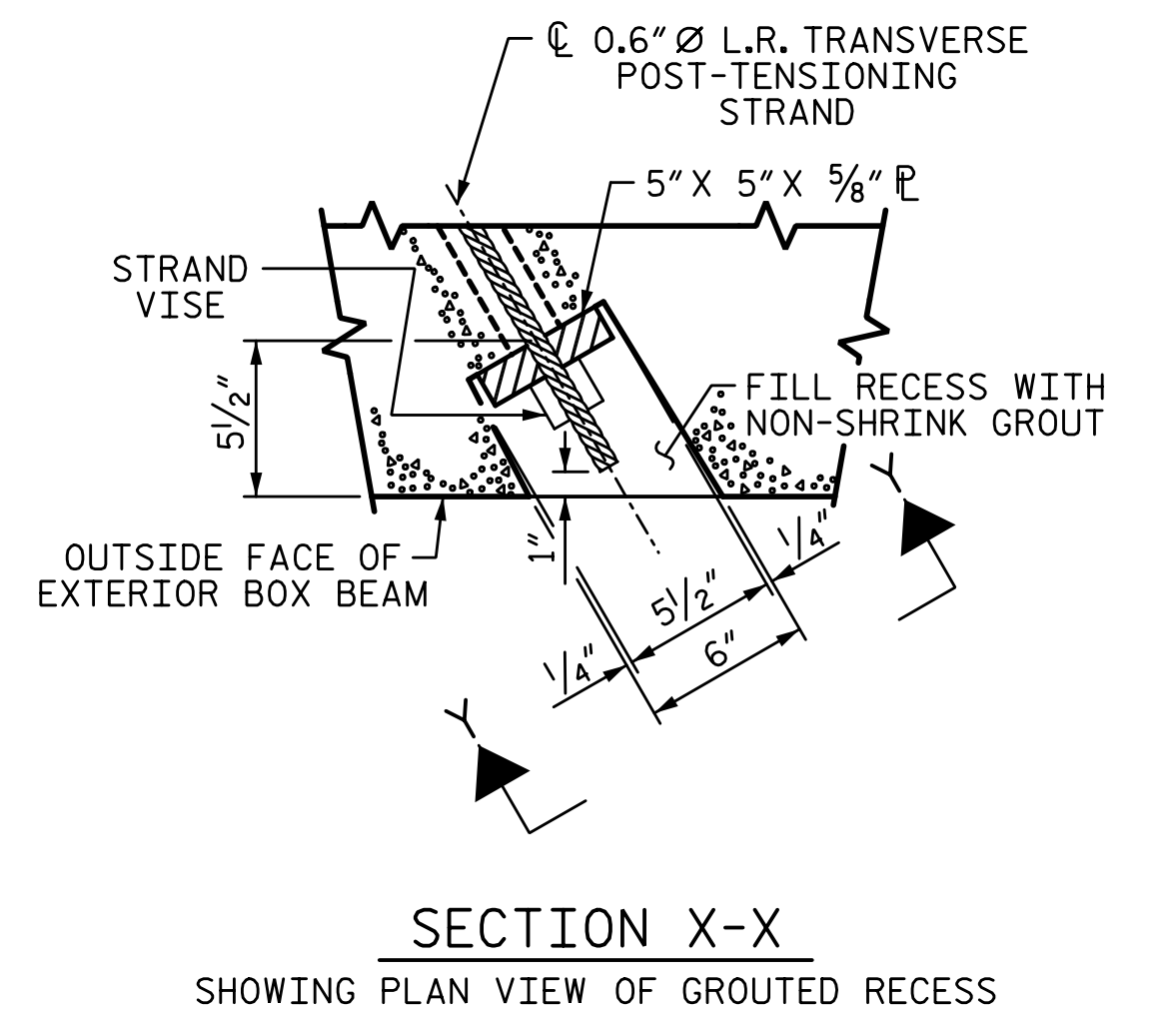
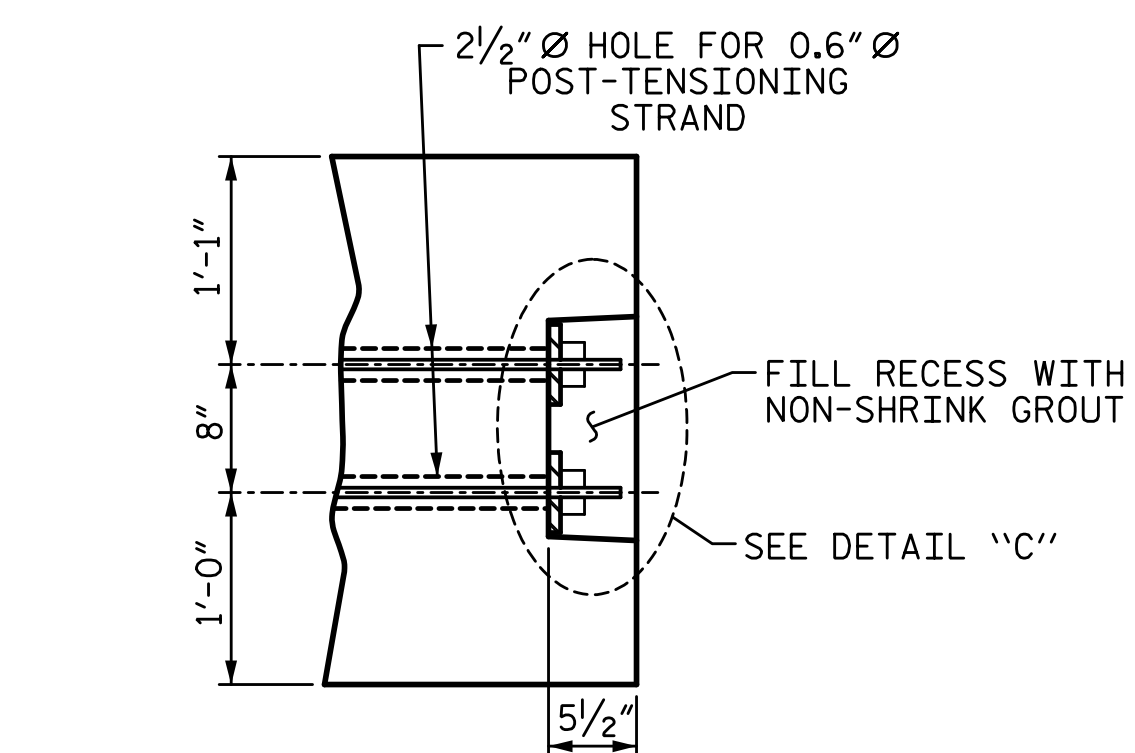
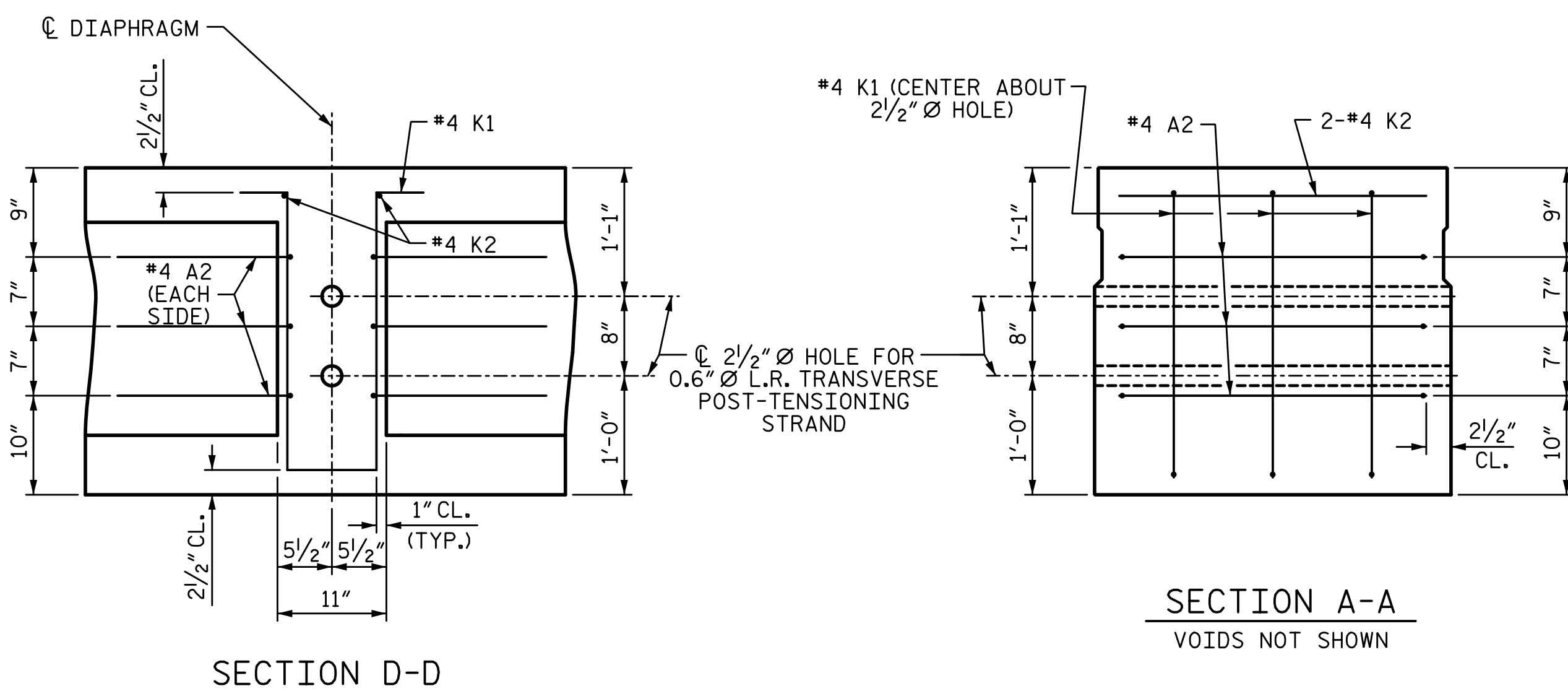
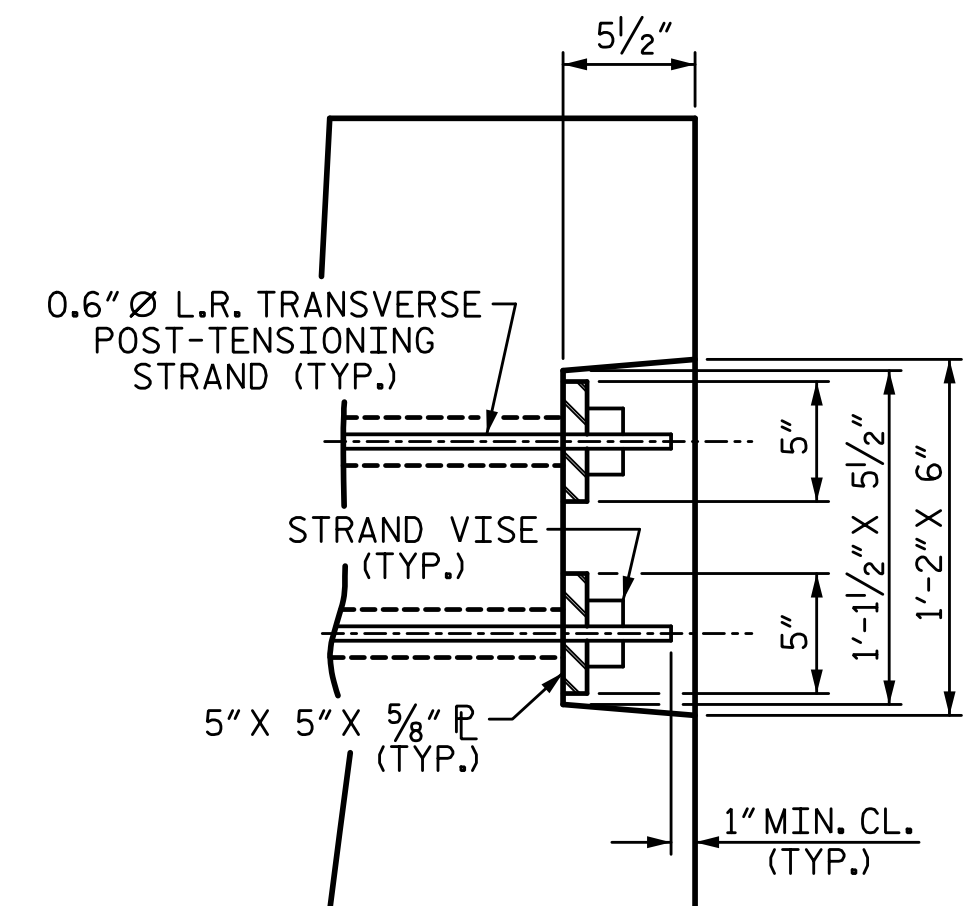
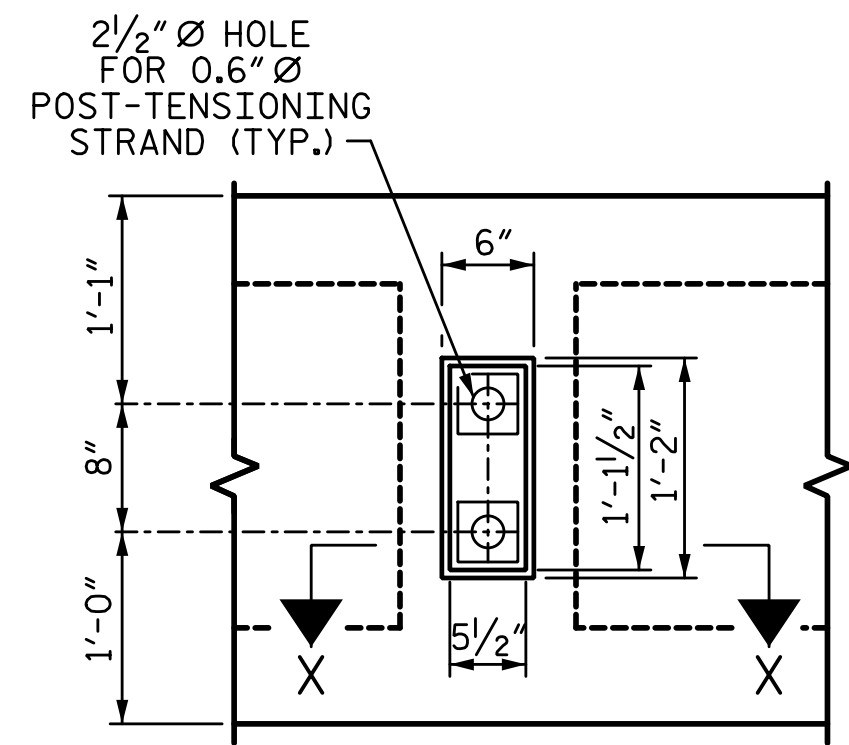
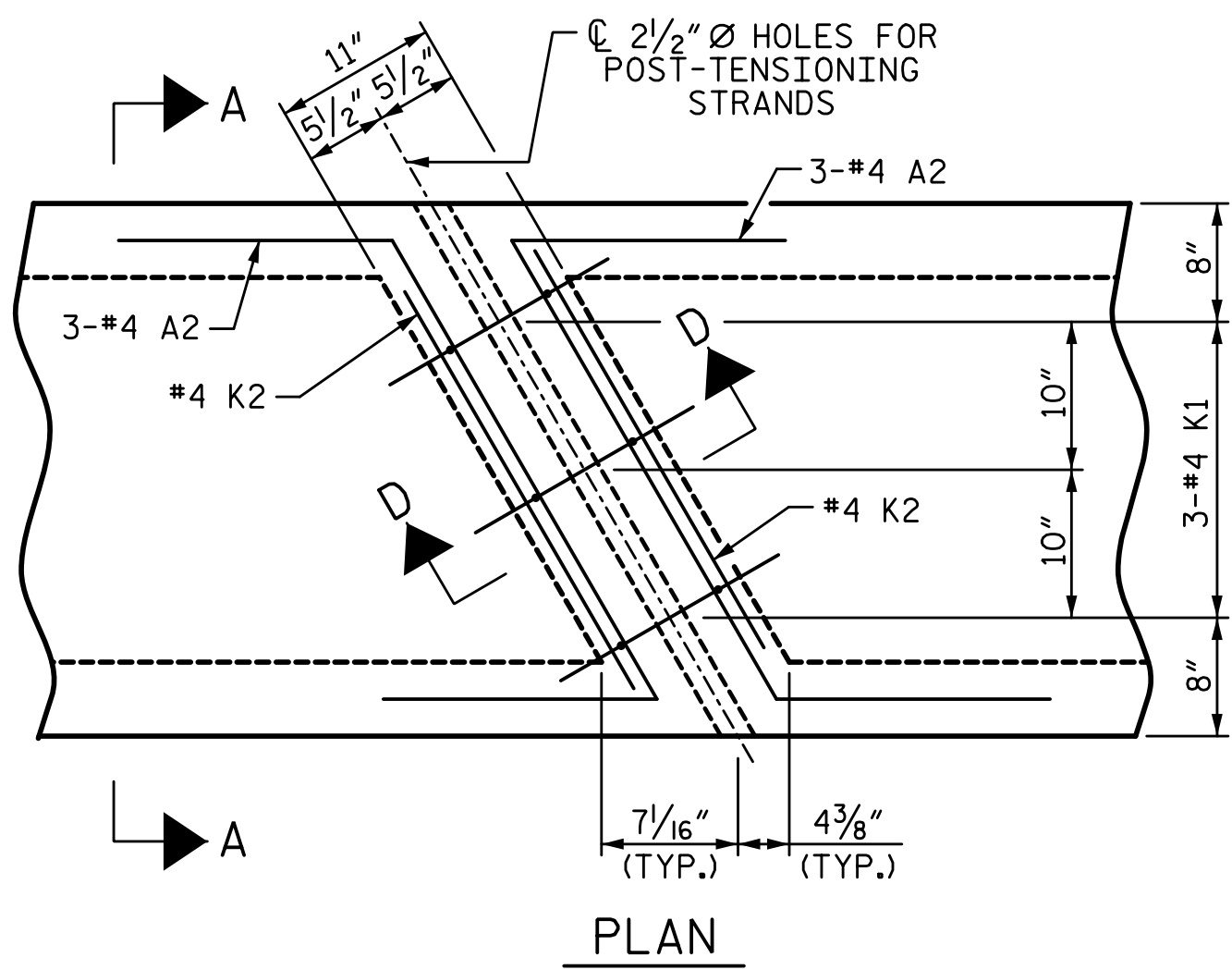
PLANS PREPARED BY:
 SIMPSON ENGINEERS & ASSOCIATES
 5640 Dillard Drive Suite 200 Cary, NC 27518 (919) 852-0468 (919) 852-0598 (Fax) www.simpsonengr.com LICENSURE NO. C-2521



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 3'-0" X 2'-9" PRESTRESSED CONCRETE BOX BEAM UNIT
 75° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS 16
2			4			

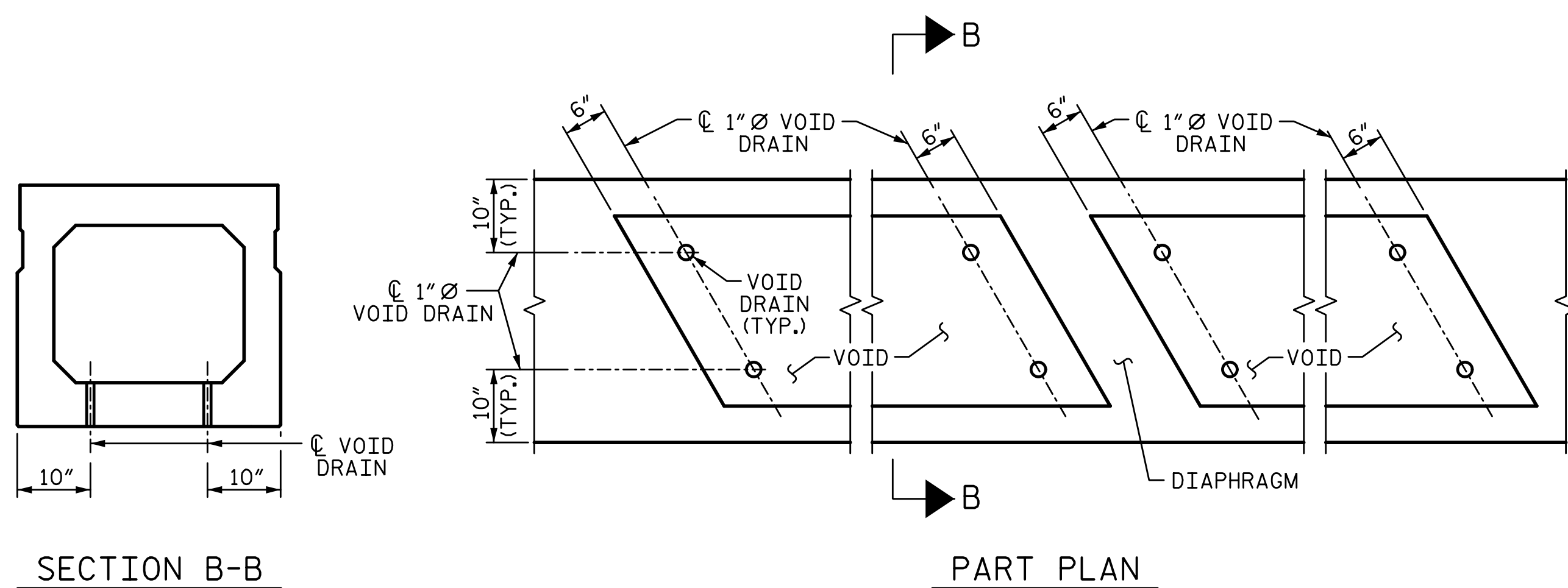
DRAWN BY: S.D. COOPER	DATE: 4-15
CHECKED BY: B.S. COX	DATE: 4-15
DESIGN ENGINEER OF RECORD: B.S. COX	DATE: 4-15



DOUBLE DIAPHRAGM DETAILS

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

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



VOID DRAIN DETAILS

(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)

DEAD LOAD DEFLECTION AND CAMBER	
90' BOX BEAM UNIT	3'-0" x 2'-9" 0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	2 3/4" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	3/4" ↓
FINAL CAMBER	2" ↑

** INCLUDES FUTURE WEARING SURFACE

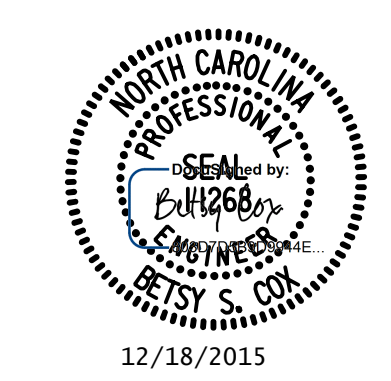
**PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION**

PROJECT NO. 17BP.5.R.52
GRANVILLE COUNTY
 STATION: 16+00.00 -L-

SHEET 4 OF 5

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

PLANS PREPARED BY:
SIMPSON ENGINEERS & ASSOCIATES
 5640 Dillard Drive
 Suite 200
 Cary, NC 27518
 (919) 852-0468
 (919) 852-0598 (Fax)
 www.simpsonengr.com
 LICENSURE NO. C-2521



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 3'-0" X 2'-9"
 PRESTRESSED CONCRETE
 BOX BEAM UNIT
 75° SKEW

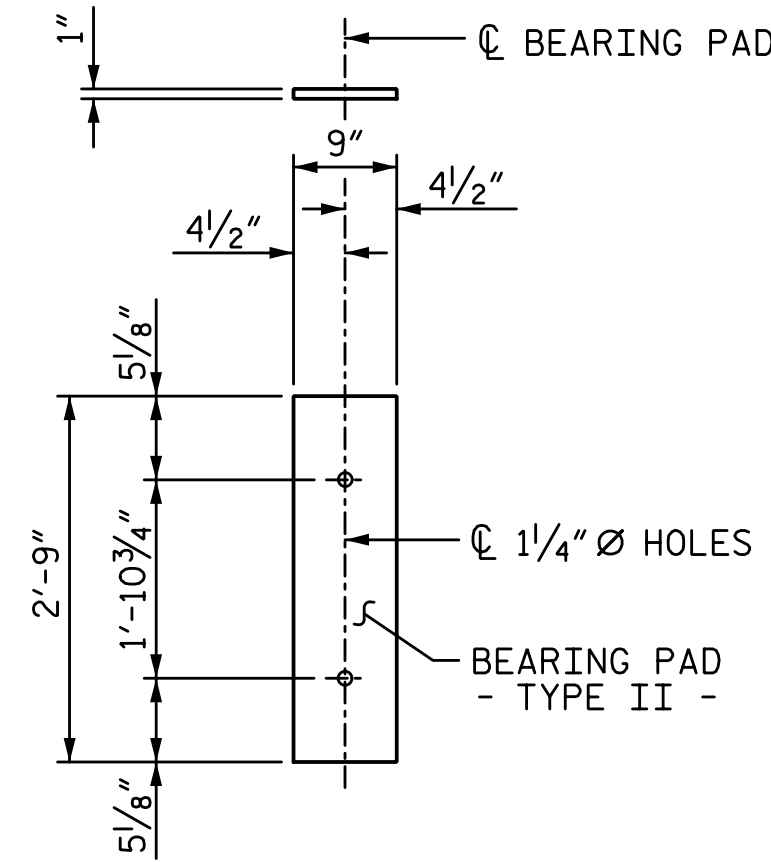
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

TOTAL SHEETS: 16

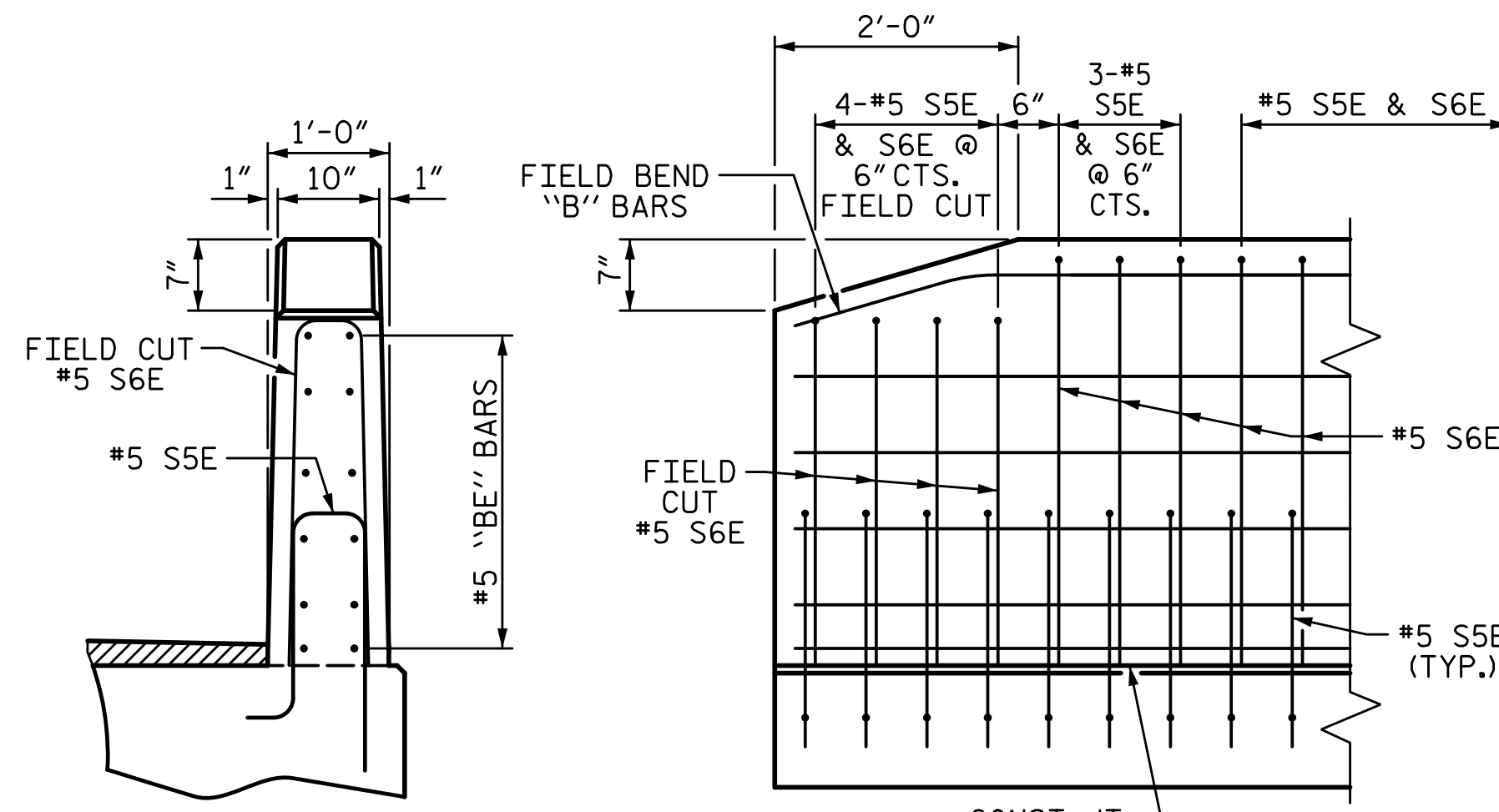
12/17/2015 2:29:04 PM G:\Projects\2014\17BP5R52 (Granville 93)\Structures\Drawings\93_superstructure.dgn

DRAWN BY: S.D. COOPER DATE: 4-15
 CHECKED BY: B.S. COX DATE: 4-15
 DESIGN ENGINEER OF RECORD: B.S. COX DATE: 4-15

12/17/2015 2:29:04 PM G:\Projects\2014\17BP5R52 (Granville) Structures\Drawings\Final\Granville 93_superstructure.dgn



FIXED END
(TYPE II - 20 REQ'D)

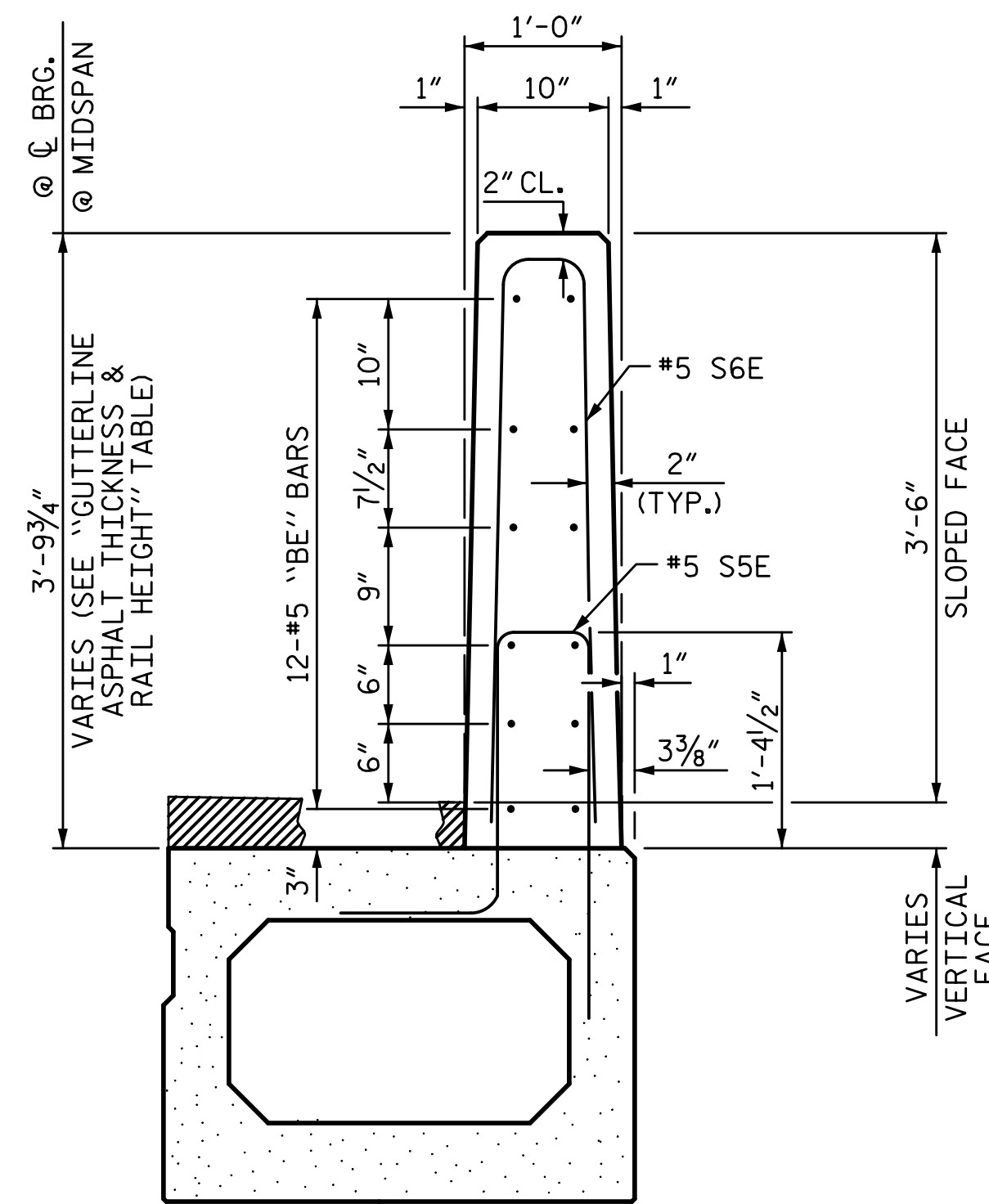


END VIEW **SIDE VIEW**

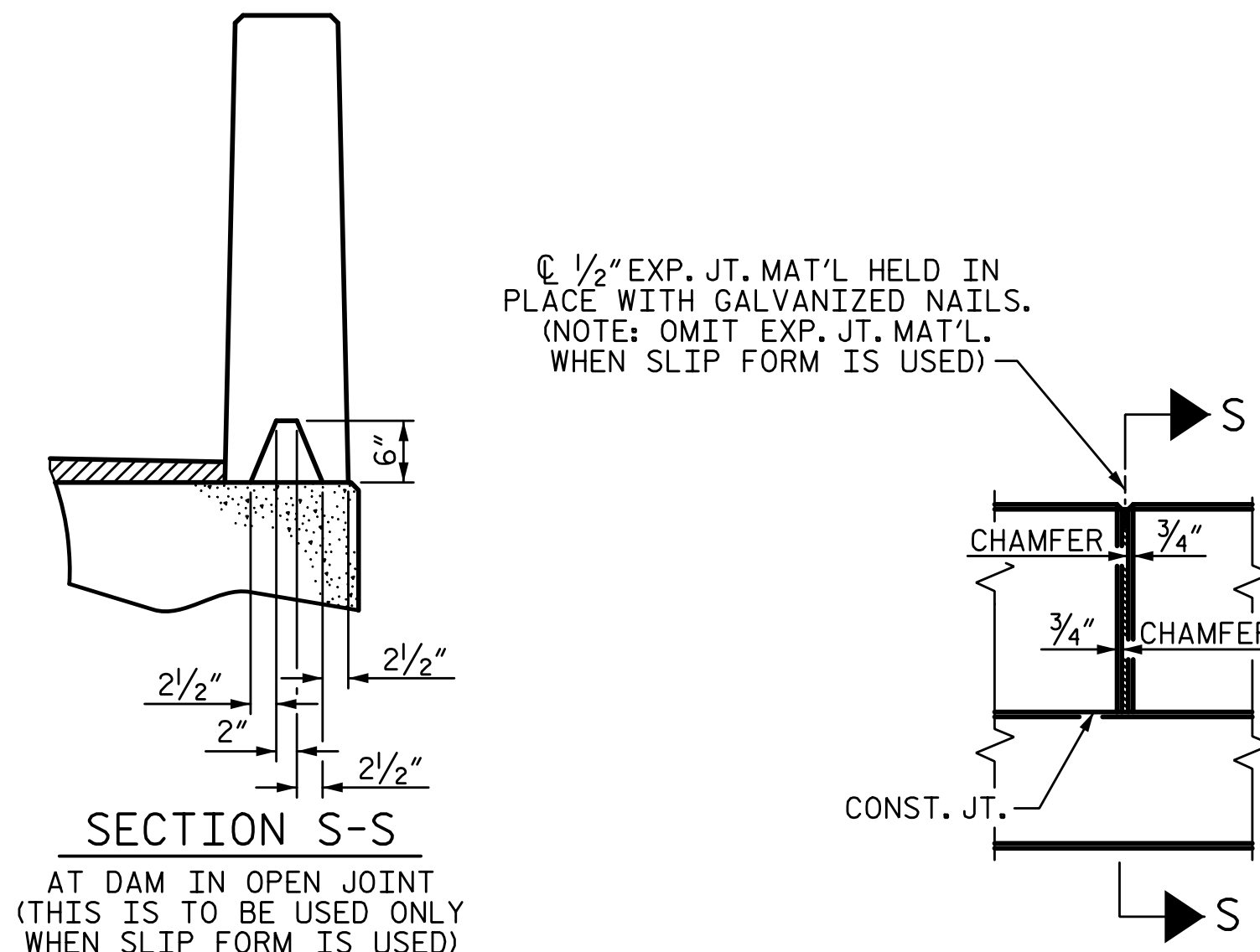
END OF RAIL DETAILS

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.



SECTION THRU RAIL



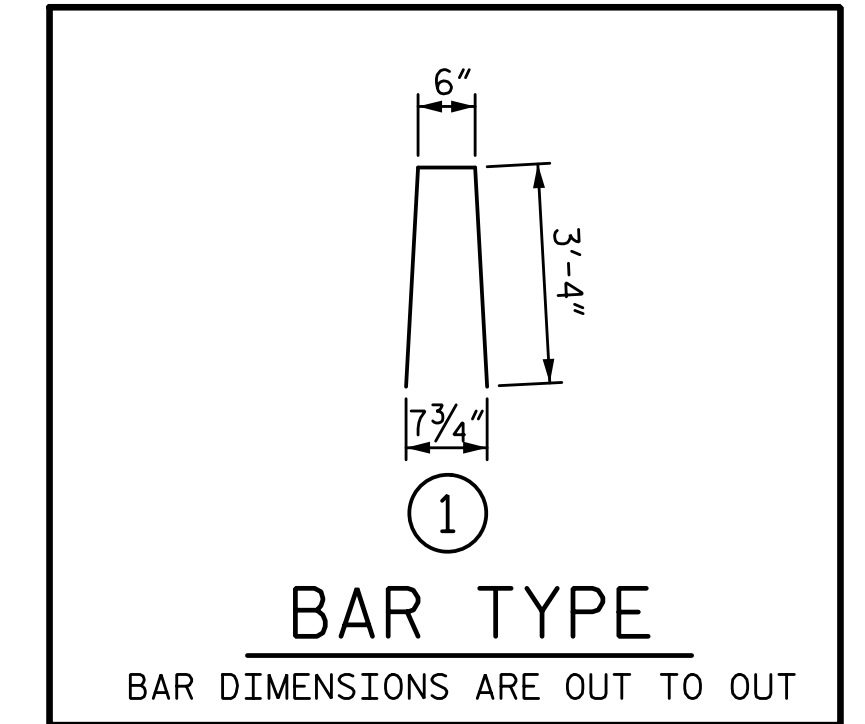
SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY
WHEN SLIP FORM IS USED)

ELEVATION AT EXPANSION JOINTS

VERTICAL CONCRETE BARRIER RAIL DETAILS

BOX BEAM UNITS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	90'-0"	180'-0"
INTERIOR B.B.	8	90'-0"	720'-0"
TOTAL	10		900'-0"



BAR TYPE
BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	SIZE	TYPE	LENGTH	WEIGHT
	90' UNIT				
B10E	192	#5	STR	12'-10"	2570
S6E	242	#5	1	7'-2"	1809
"E" EPOXY COATED REINFORCING STEEL				LB	4379
CLASS AA CONCRETE				CY	23.3
TOTAL VERTICAL CONCRETE BARRIER RAIL				LF	180.0

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
90' UNITS	1 3/4"	3'-7 3/4"

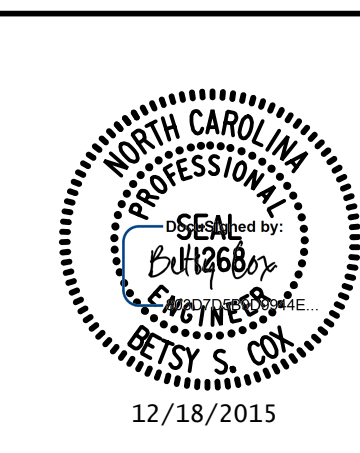
**PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION**

PROJECT NO. 17BP.5.R.52
GRANVILLE COUNTY
STATION: 16+00.00 -L-

SHEET 5 OF 5

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

PLANS PREPARED BY:
SIMPSON ENGINEERS & ASSOCIATES
5640 Dillard Drive
Suite 200
Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com
LICENSURE NO. C-2521

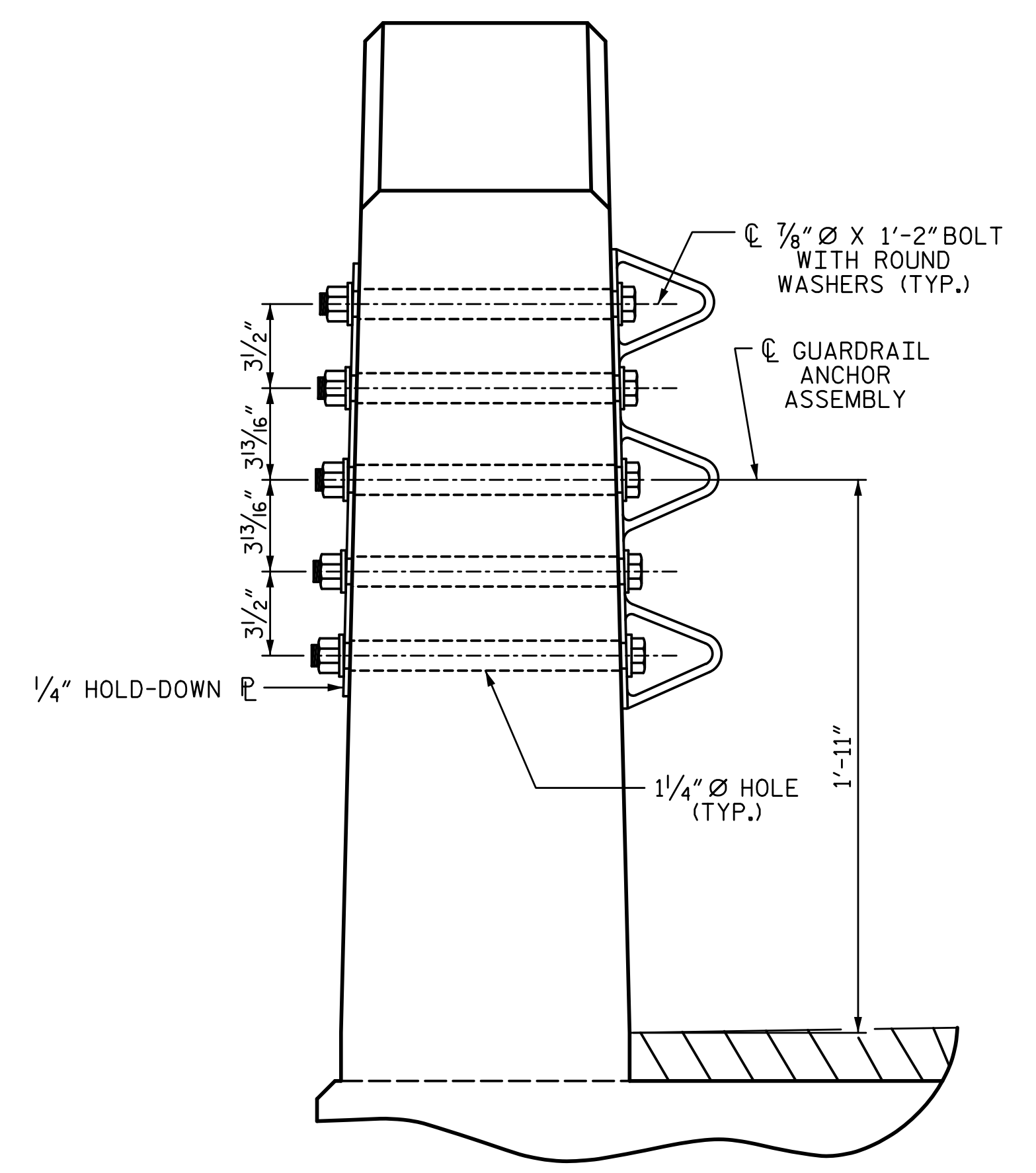
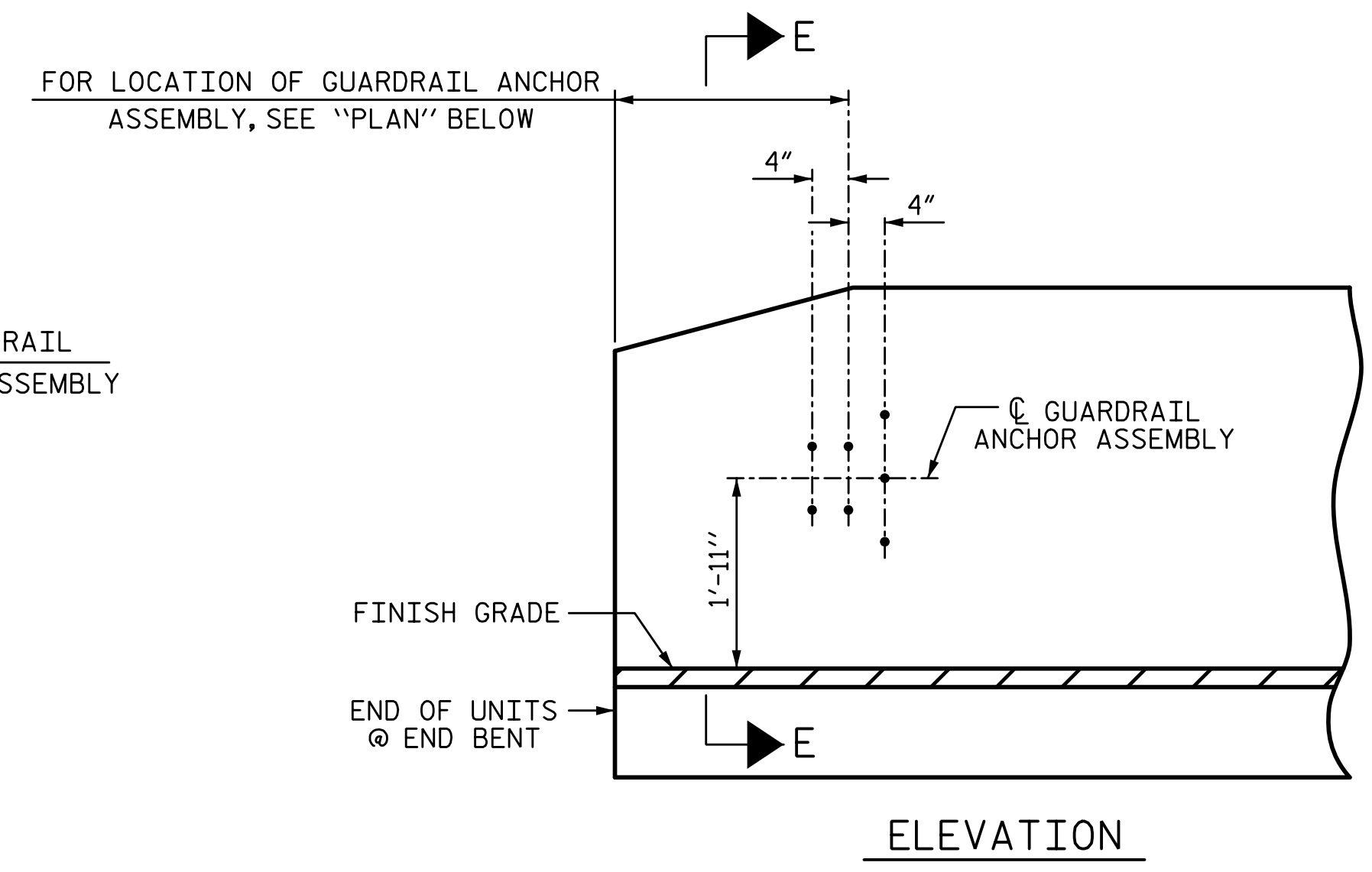
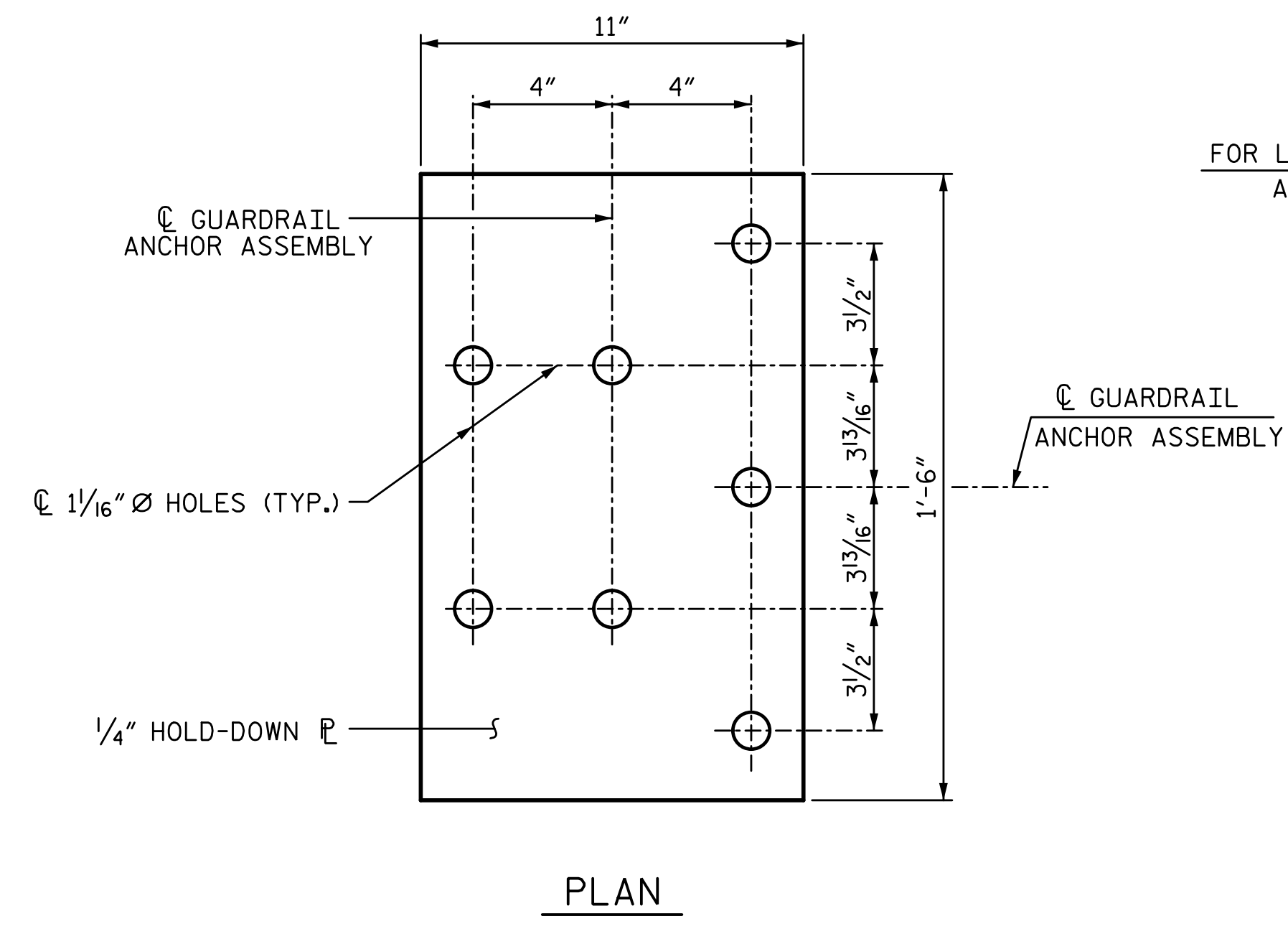


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
3'-0" X 2'-9"
PRESTRESSED CONCRETE
BOX BEAM UNIT
75° SKEW

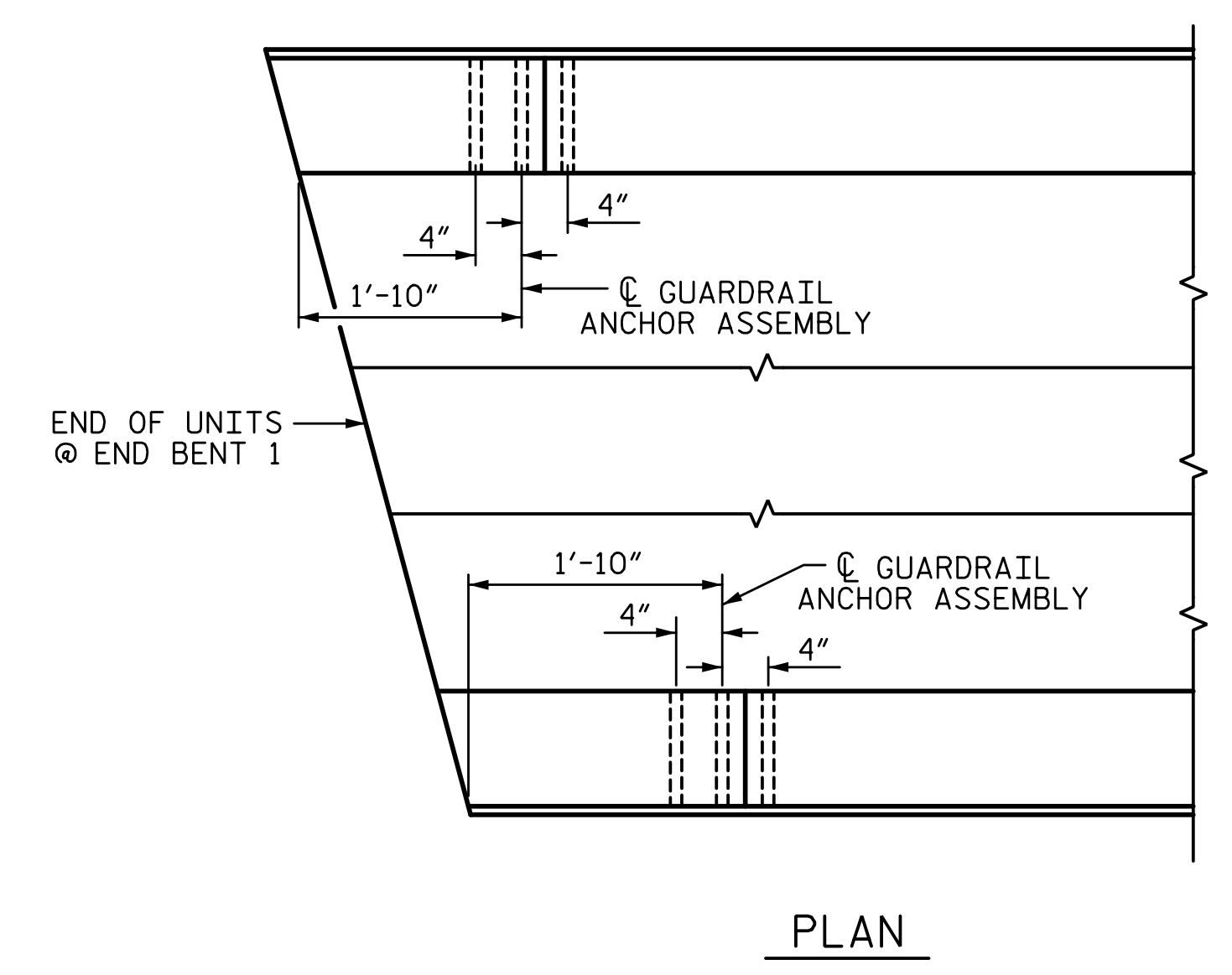
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

TOTAL SHEETS: 16

12/17/2015 2:29:04 PM G:\Projects\2014\17BP5R52 (Granville 93)\Structures\Drawings\Final\Granville 93_superstructure.dgn



SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF ANCHORS FOR GUARDRAIL
END BENT 1 SHOWN, END BENT 2 SIMILAR.

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 ASSEMBLY BOLTS.

THE 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.



SKETCH SHOWING POINTS OF ATTACHMENT
* DENOTES GUARDRAIL ANCHOR ASSEMBLY

**PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION**

PROJECT NO. 17BP.5.R.52
GRANVILLE COUNTY
STATION: 16+00.00 -L-

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

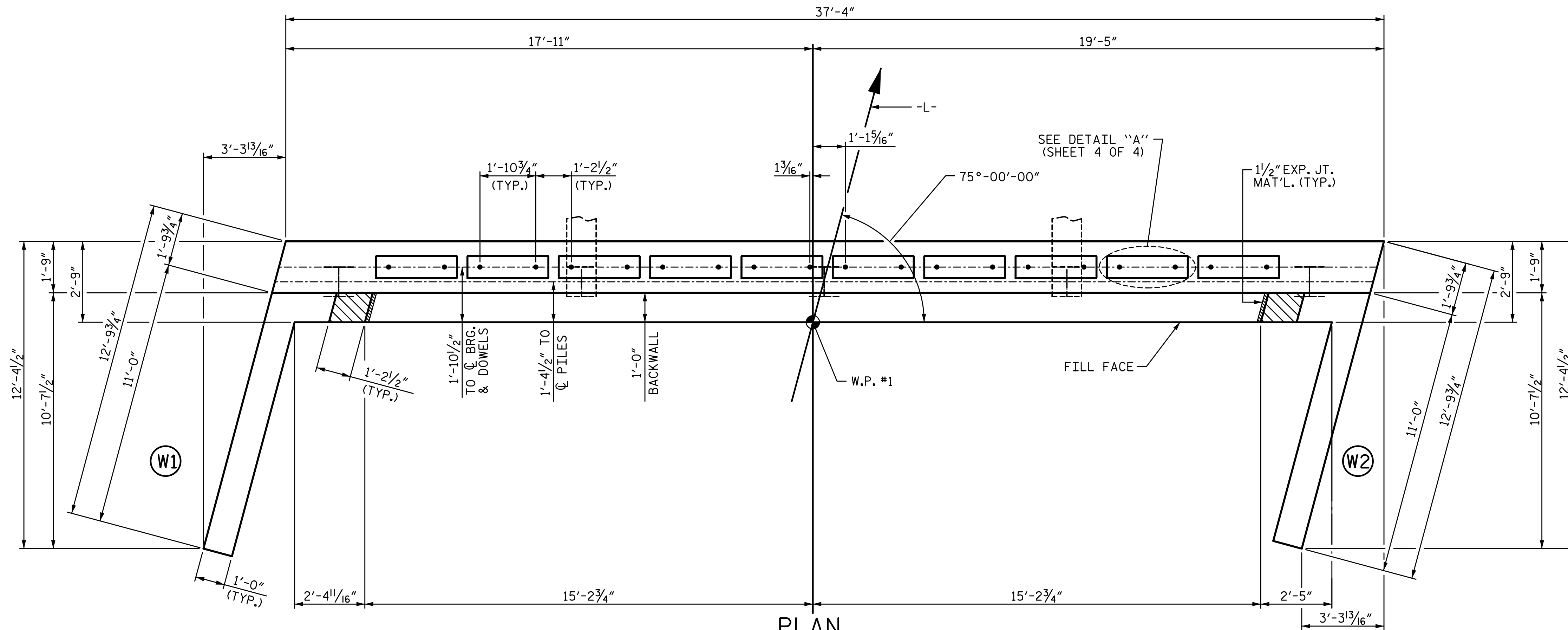
PLANS PREPARED BY:
SIMPSON ENGINEERS & ASSOCIATES
5640 Dillard Drive
Suite 200
Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com
LICENSURE NO. C-2521



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
**GUARDRAIL ANCHORAGE
FOR VERTICAL
CONCRETE BARRIER
RAIL**

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

12/17/2015 2:29:05 PM G:\Projects\2014\17BP5R52 (Granville 93)\Structures\Drawings\Granville 93_endbents.dgn



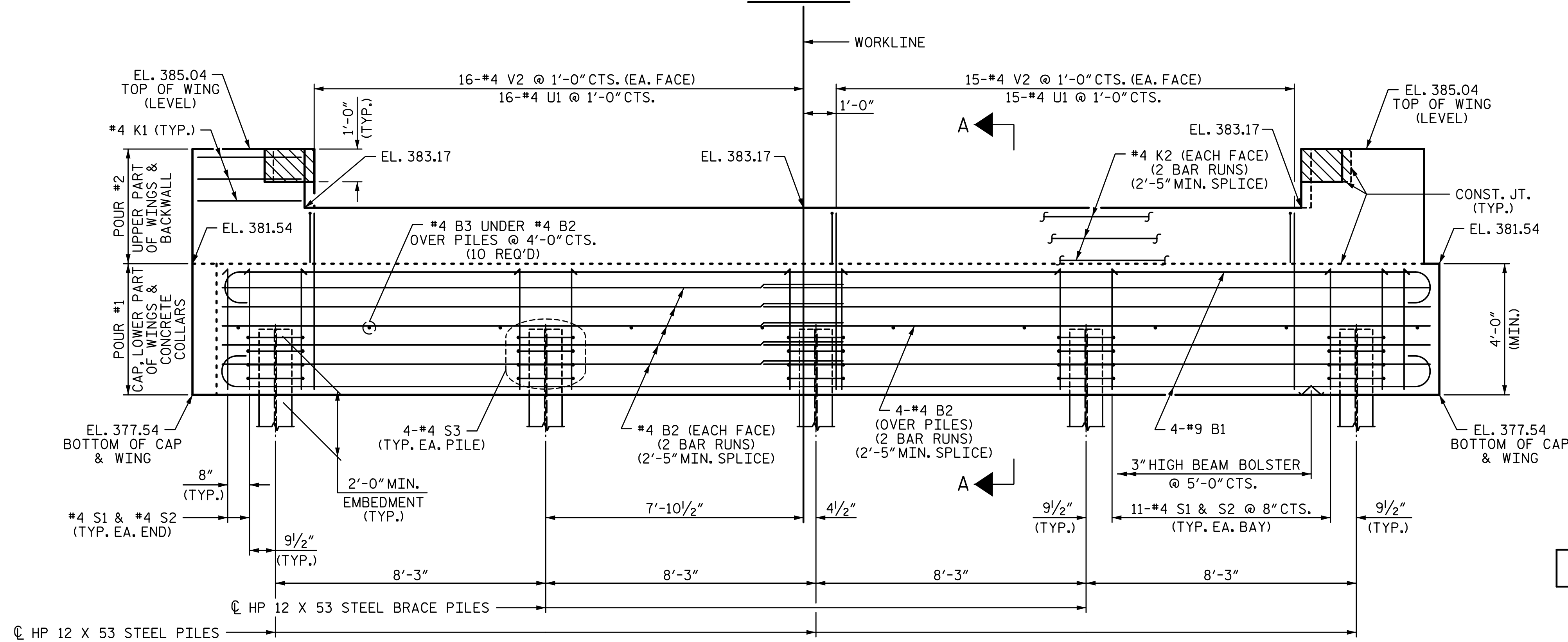
NOTES:

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.



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.

**PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION**

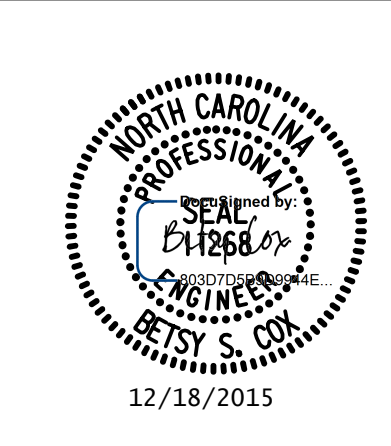
PROJECT NO. 17BP.5.R.52
GRANVILLE COUNTY
 STATION: 16+00.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
END BENT 1

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

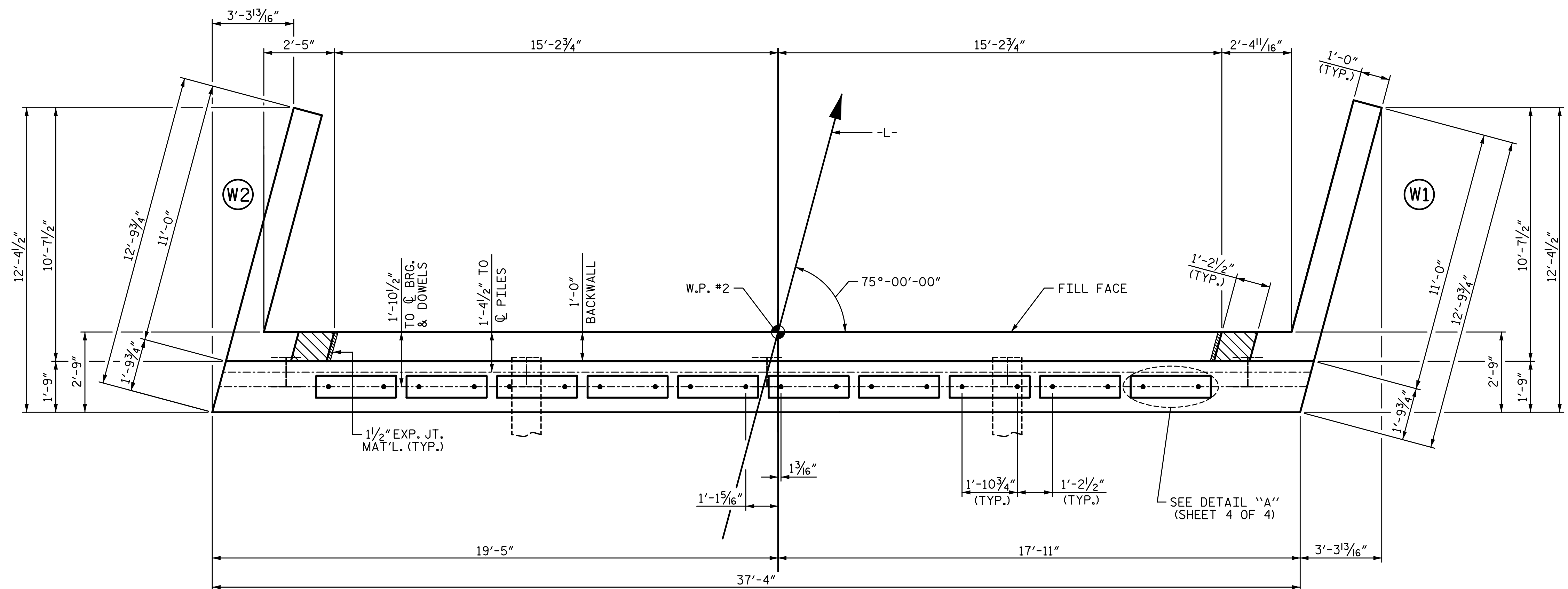
PLANS PREPARED BY:
SIMPSON ENGINEERS & ASSOCIATES
 5640 Dillard Drive
 Suite 200
 Cary, NC 27518
 (919) 852-0468
 (919) 852-0598 (Fax)
 www.simpsonengr.com
 LICENSURE NO. C-2521



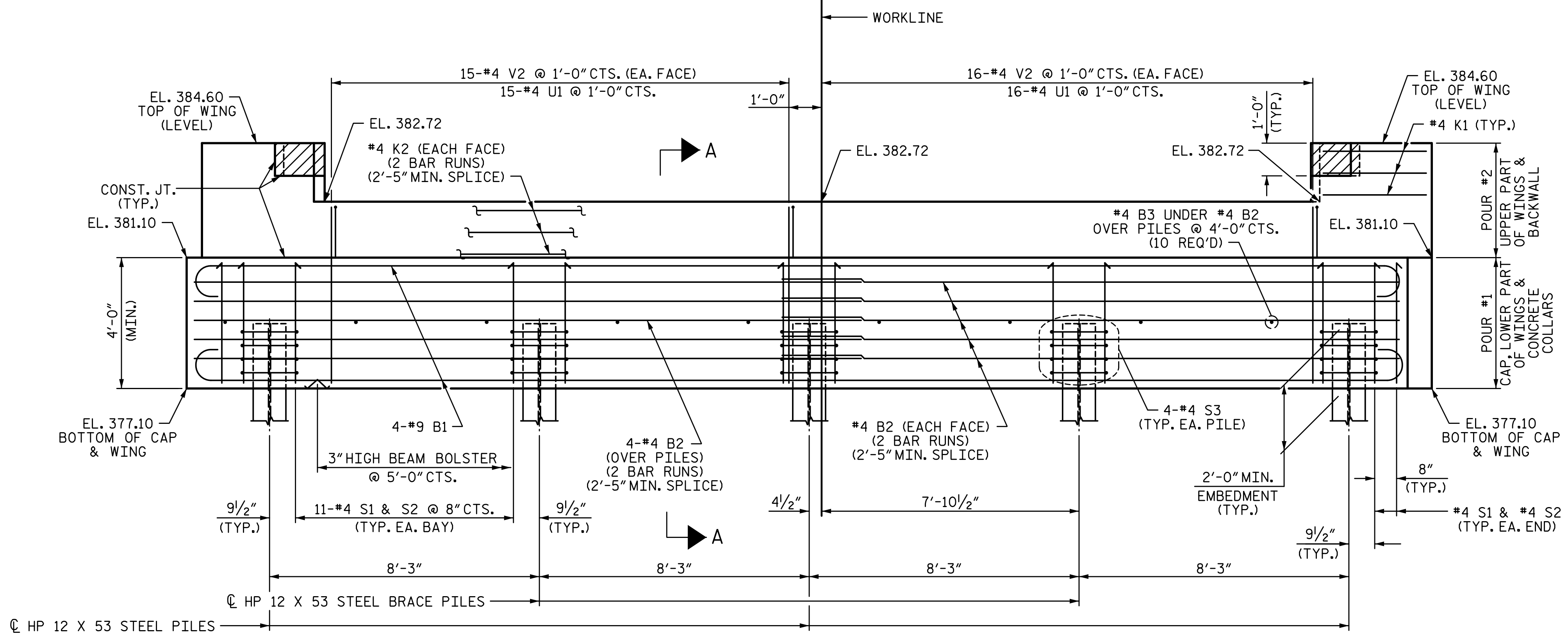
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			16

DRAWN BY: <u>S.D. COOPER</u>	DATE: <u>4-15</u>
CHECKED BY: <u>B.S. COX</u>	DATE: <u>4-15</u>
DESIGN ENGINEER OF RECORD: <u>B.S. COX</u>	DATE: <u>4-15</u>

12/17/2015 2:29:05 PM G:\Projects\2014\17BP5R52 (Granville 93)\Structures\Drawings\Granville 93_endbents.dgn



PLAN



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.

DRAWN BY: S.D. COOPER	DATE: 4-15
CHECKED BY: B.S. COX	DATE: 4-15
DESIGN ENGINEER OF RECORD: B.S. COX	DATE: 4-15

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.

**PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION**

PROJECT NO. 17BP.5.R.52
GRANVILLE COUNTY
 STATION: 16+00.00 -L-

SHEET 2 OF 4

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

PLANS PREPARED BY:
SIMPSON ENGINEERS & ASSOCIATES
 5640 Dillard Drive
 Suite 200
 Cary, NC 27518
 (919) 852-0468
 (919) 852-0598 (Fax)
 www.simpsonengr.com
 LICENSURE NO. C-2521

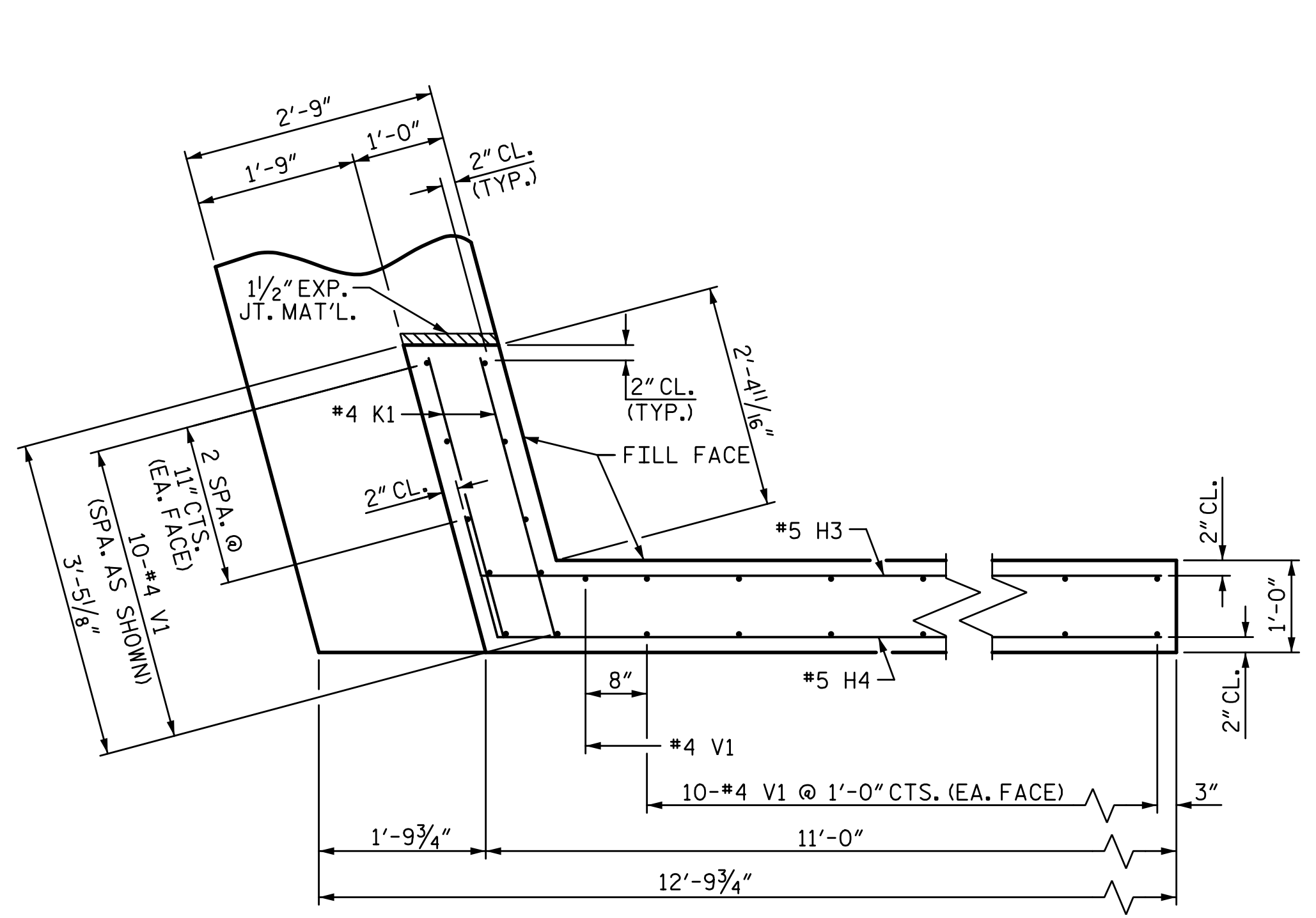


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE

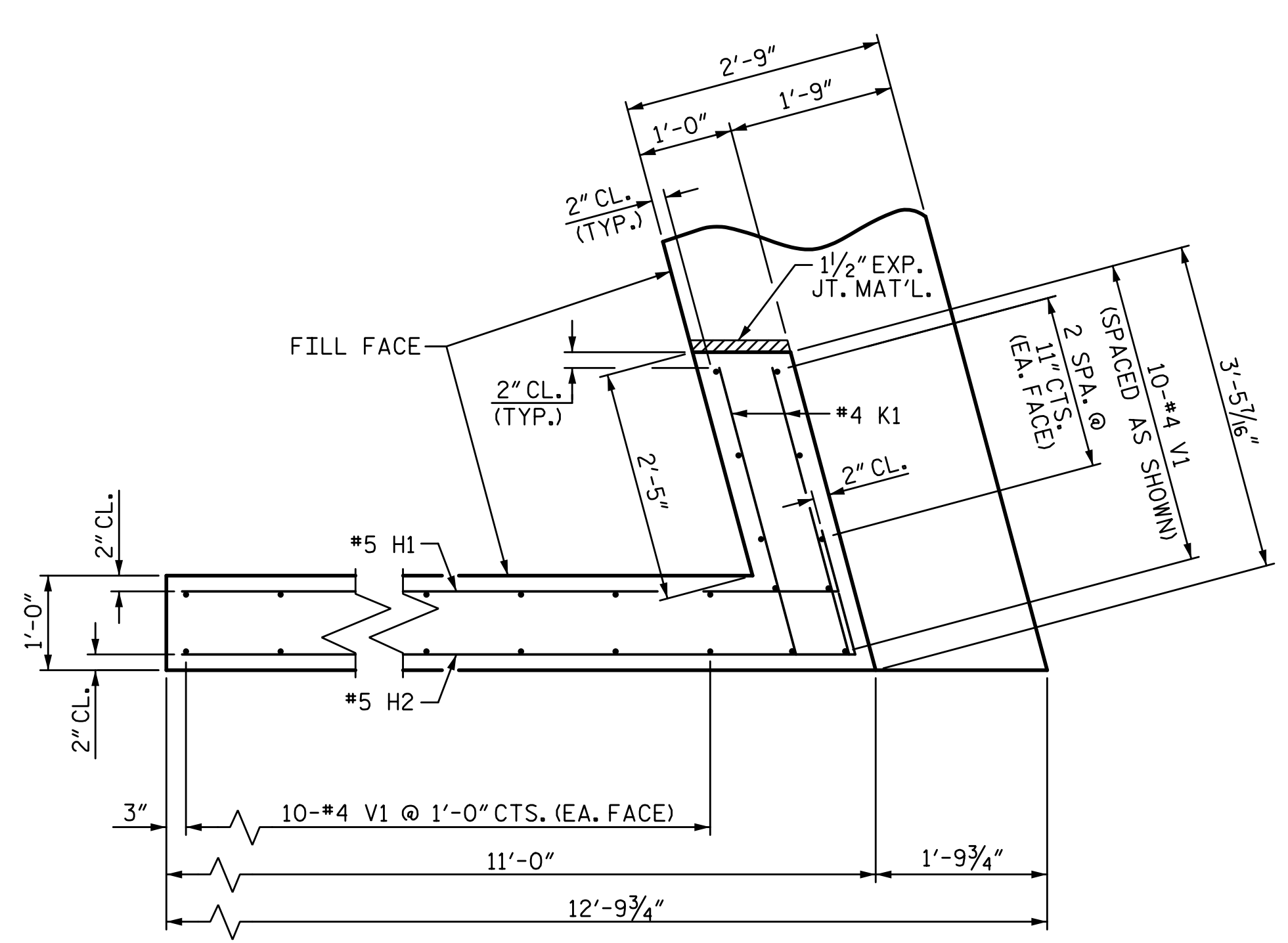
END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			16

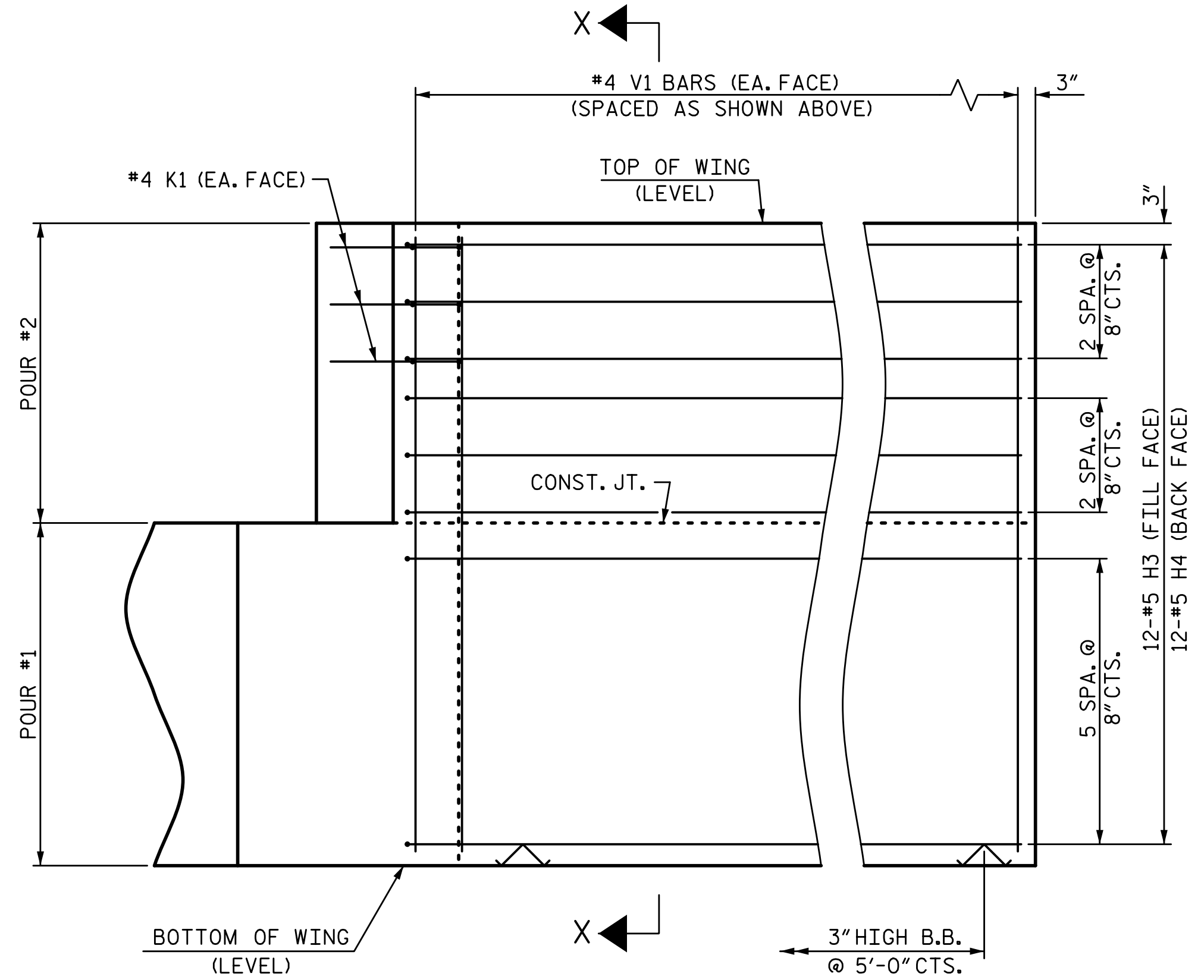
12/17/2015 2:29:05 PM G:\Projects\2014\17BP5R52 (Granville 93)\Structures\Drawings\Granville 93_endbents.dgn



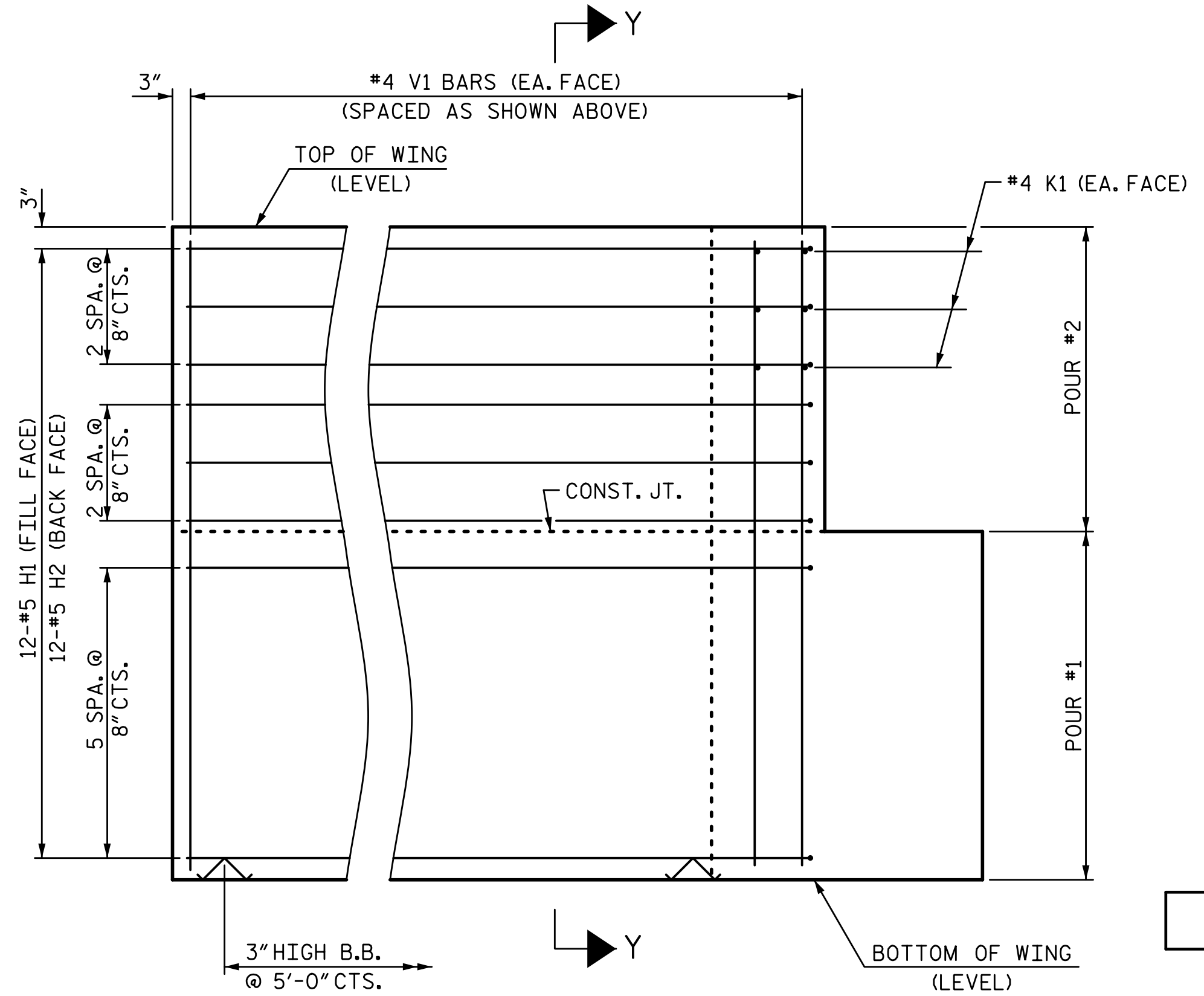
PLAN OF WING (W1)



PLAN OF WING (W2)

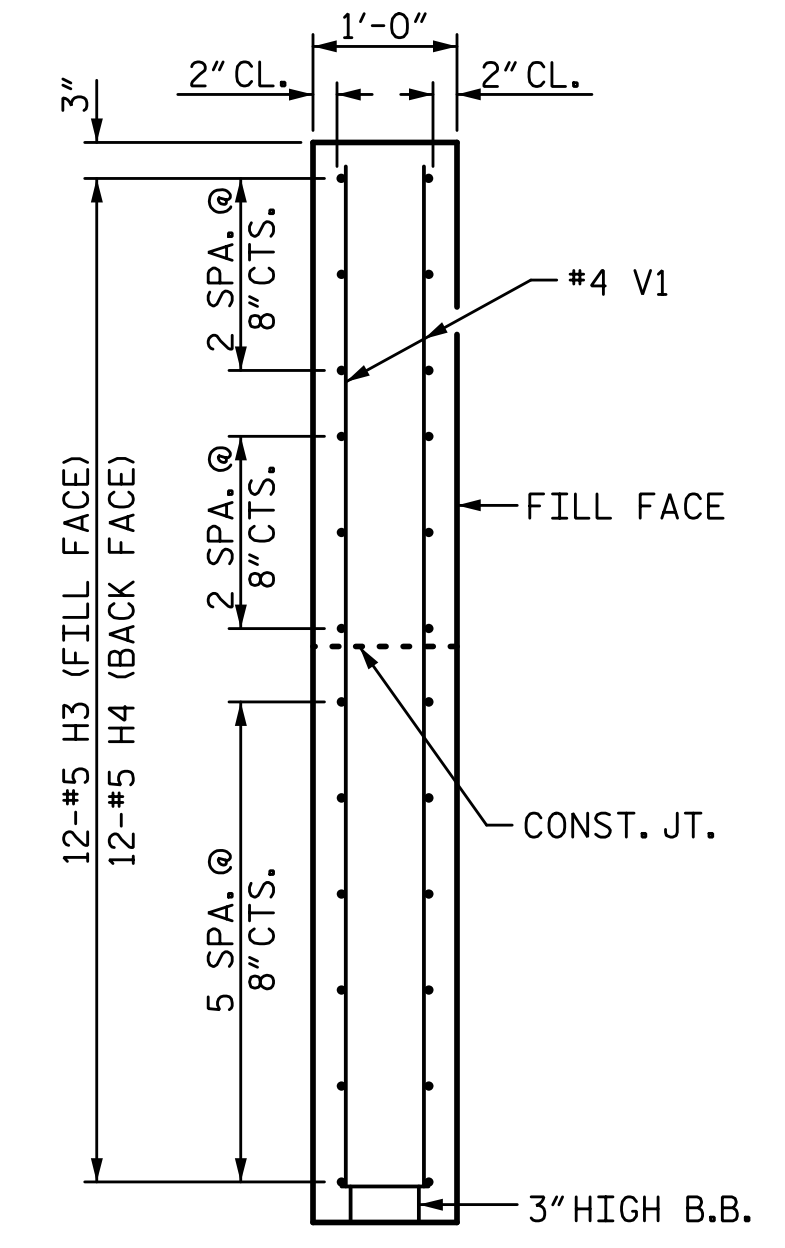


ELEVATION OF WING (W1)

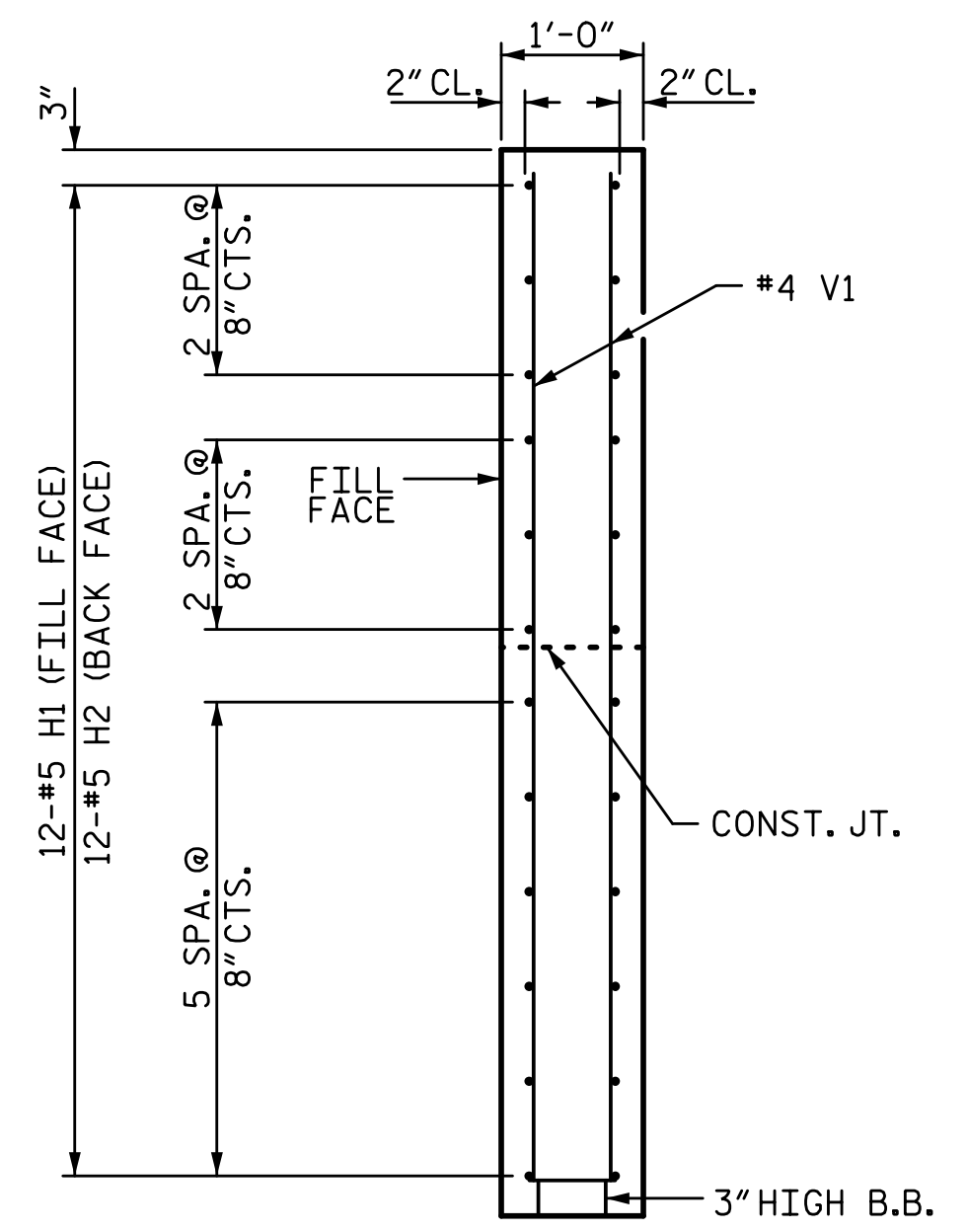


ELEVATION OF WING (W2)

WING DETAILS



SECTION X-X



SECTION Y-Y

PROJECT NO. 17BP.5.R.52
GRANVILLE COUNTY
 STATION: 16+00.00 -L-

SHEET 3 OF 4

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:
SIMPSON & ASSOCIATES
 5640 Dillard Drive
 Suite 200
 Cary, NC 27518
 (919) 852-0468
 (919) 852-0598 (Fax)
 www.simpsonengr.com
 LICENSURE NO. C-2521



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE

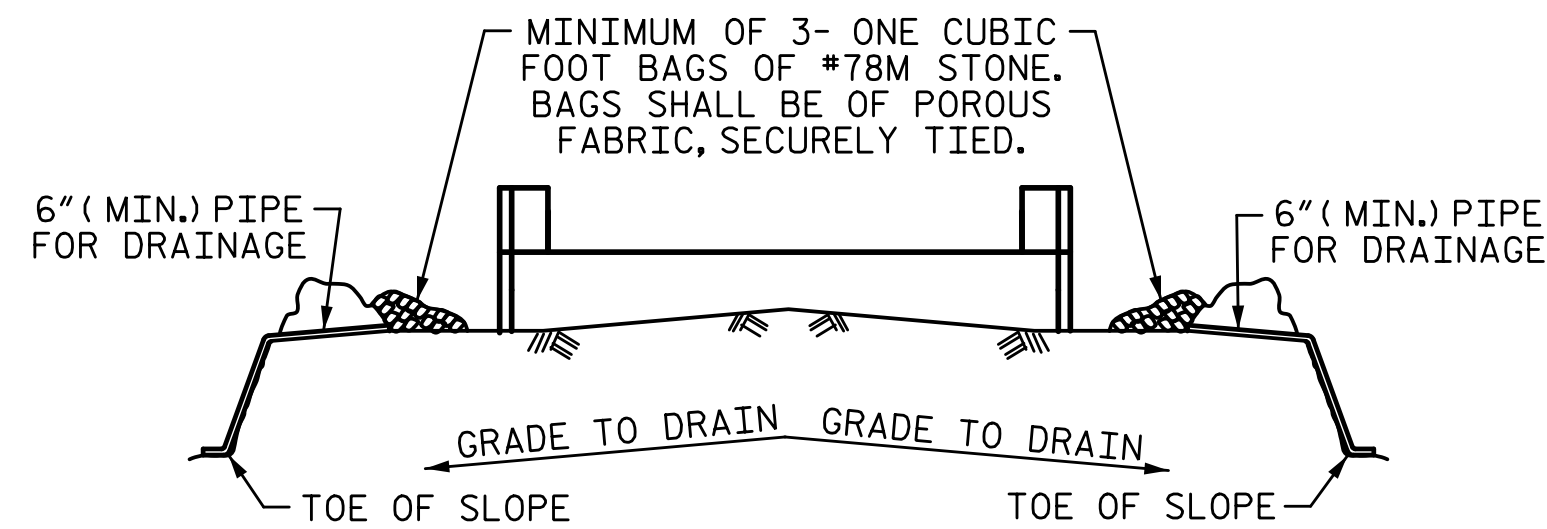
END BENT WING DETAILS

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

SHEET NO. S-12
 TOTAL SHEETS 16

PRELIMINARY PLANS
 DO NOT USE FOR CONSTRUCTION

DRAWN BY: S.D. COOPER DATE: 4-15
 CHECKED BY: B.S. COX DATE: 4-15
 DESIGN ENGINEER OF RECORD: B.S. COX DATE: 4-15

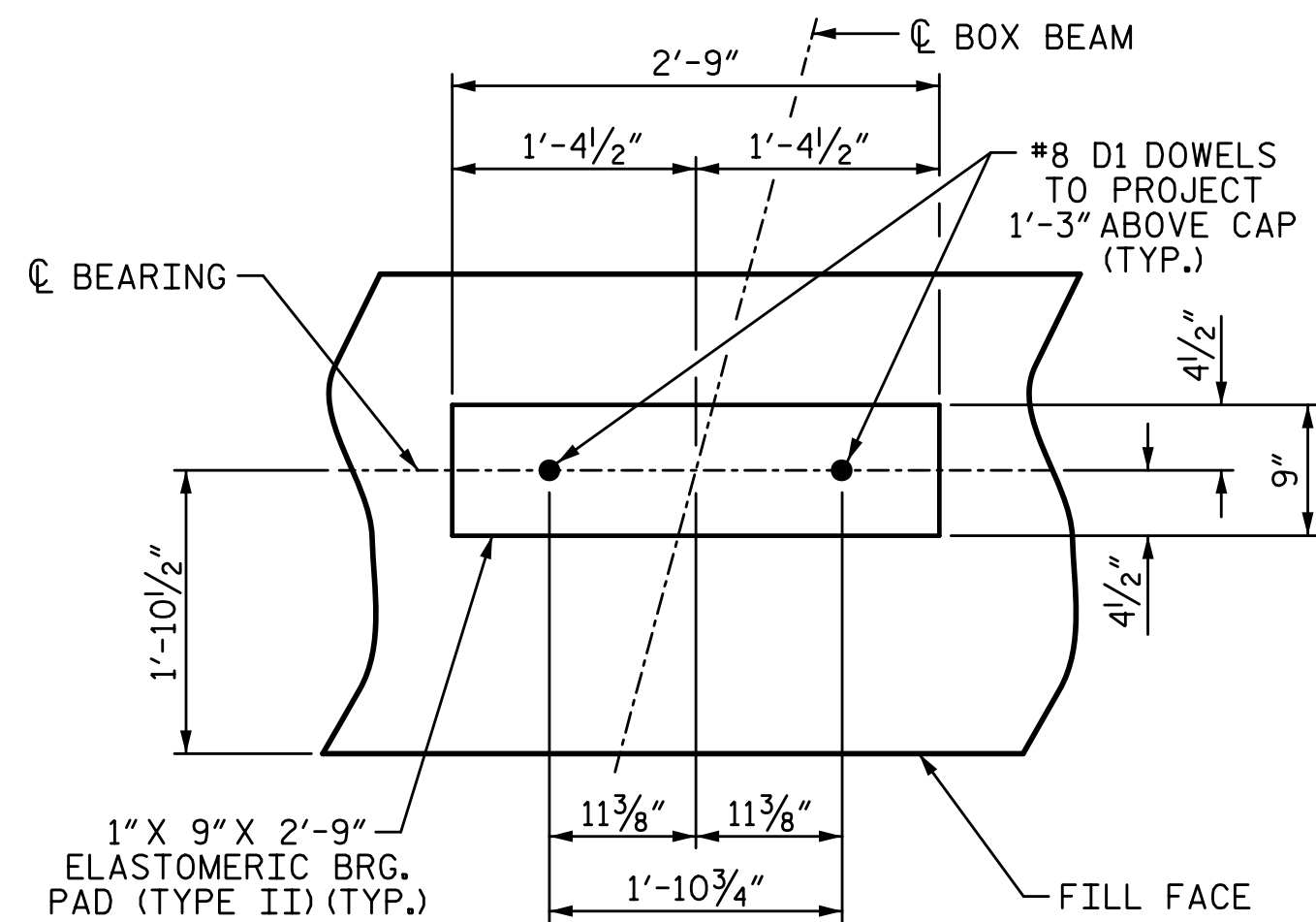


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

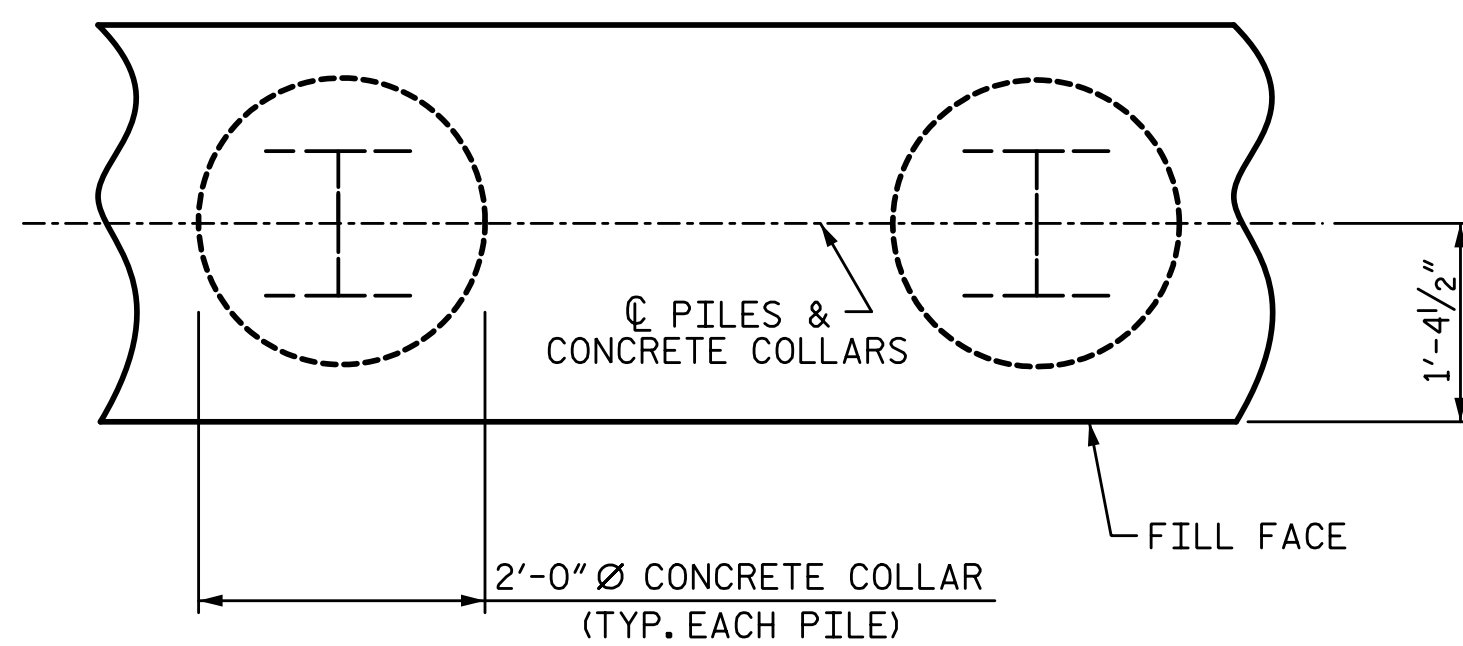
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



DETAIL "A"

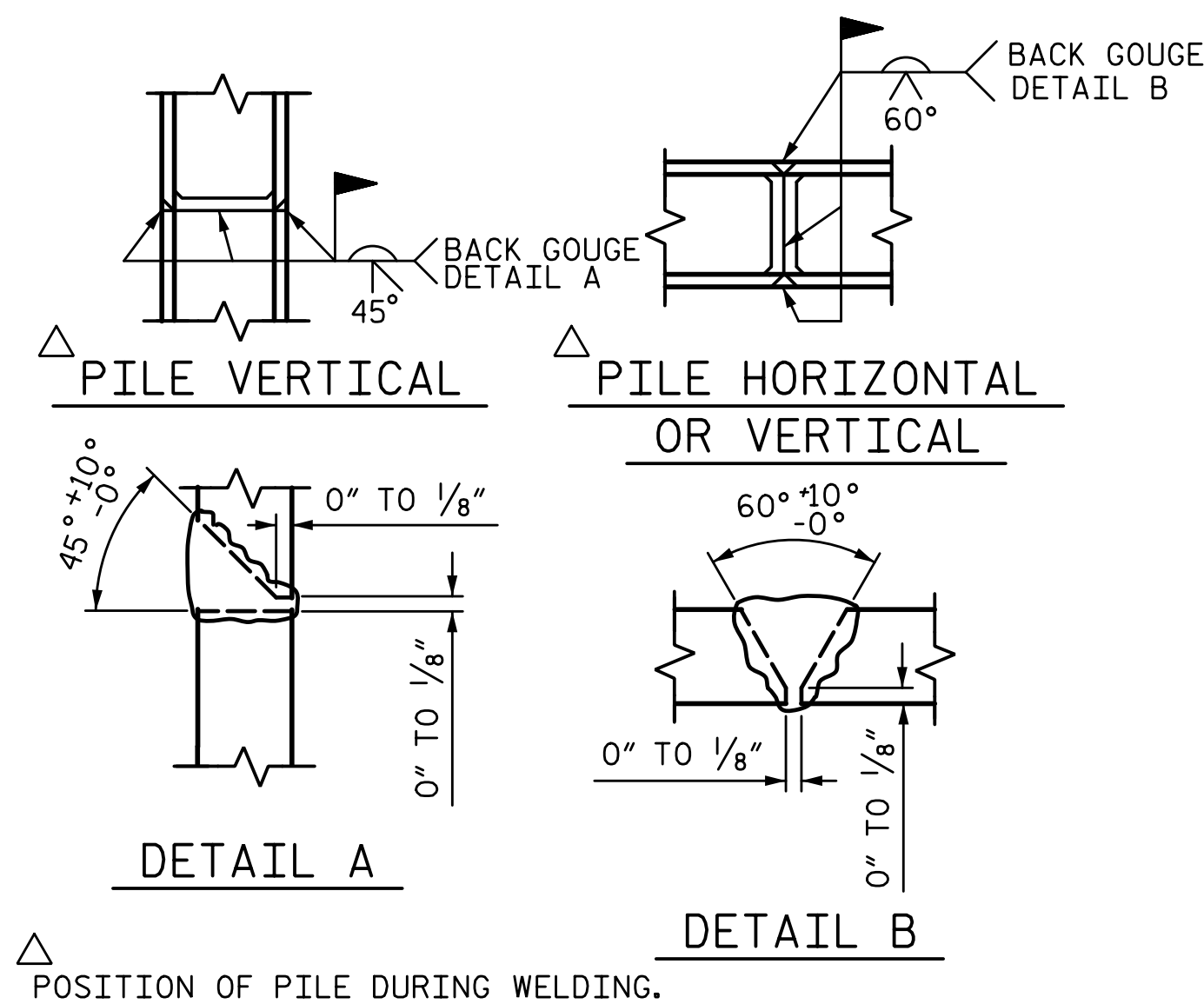
(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)



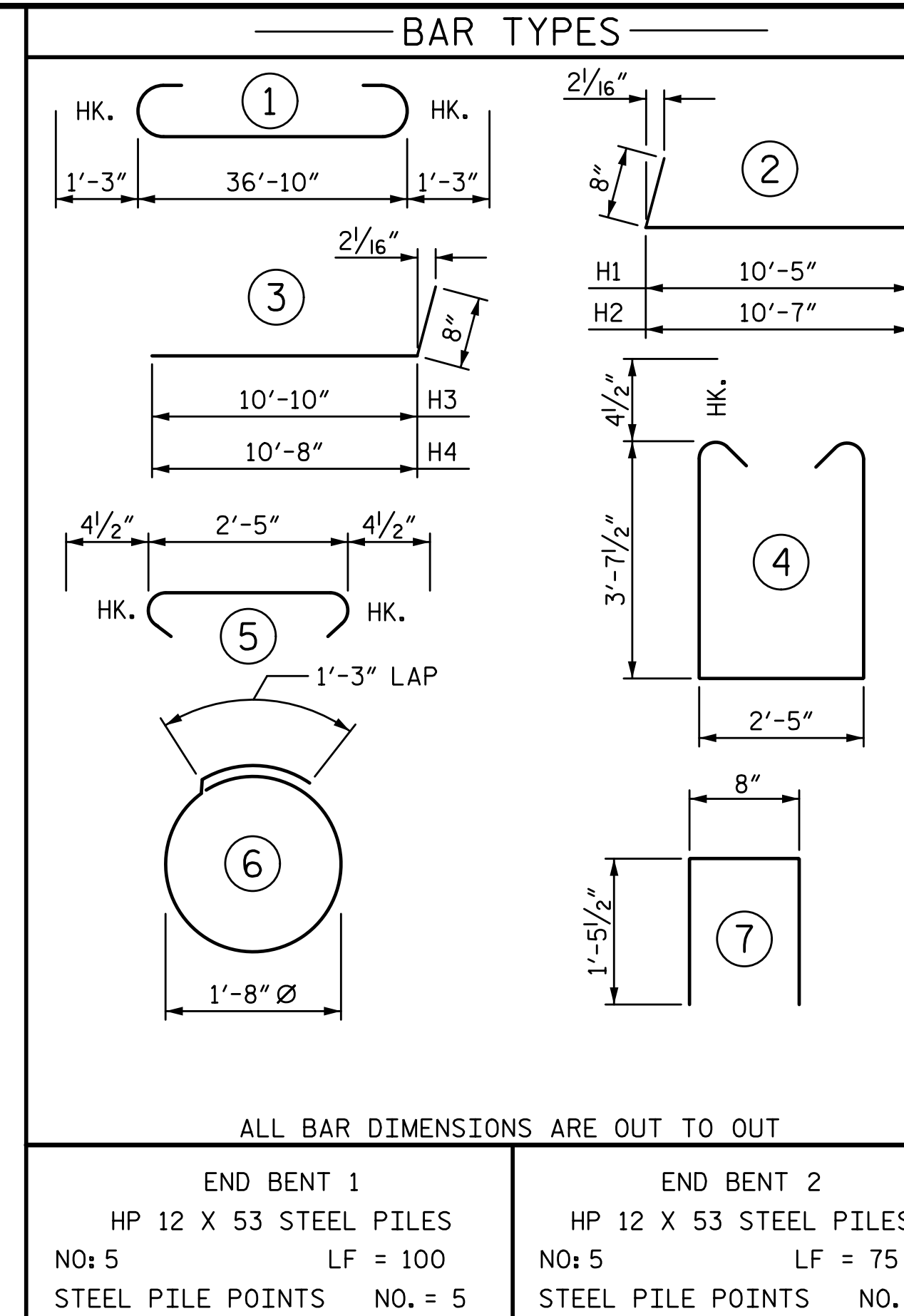
PLAN

CORROSION PROTECTION FOR STEEL PILES DETAIL

(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)



PILE SPLICE DETAILS



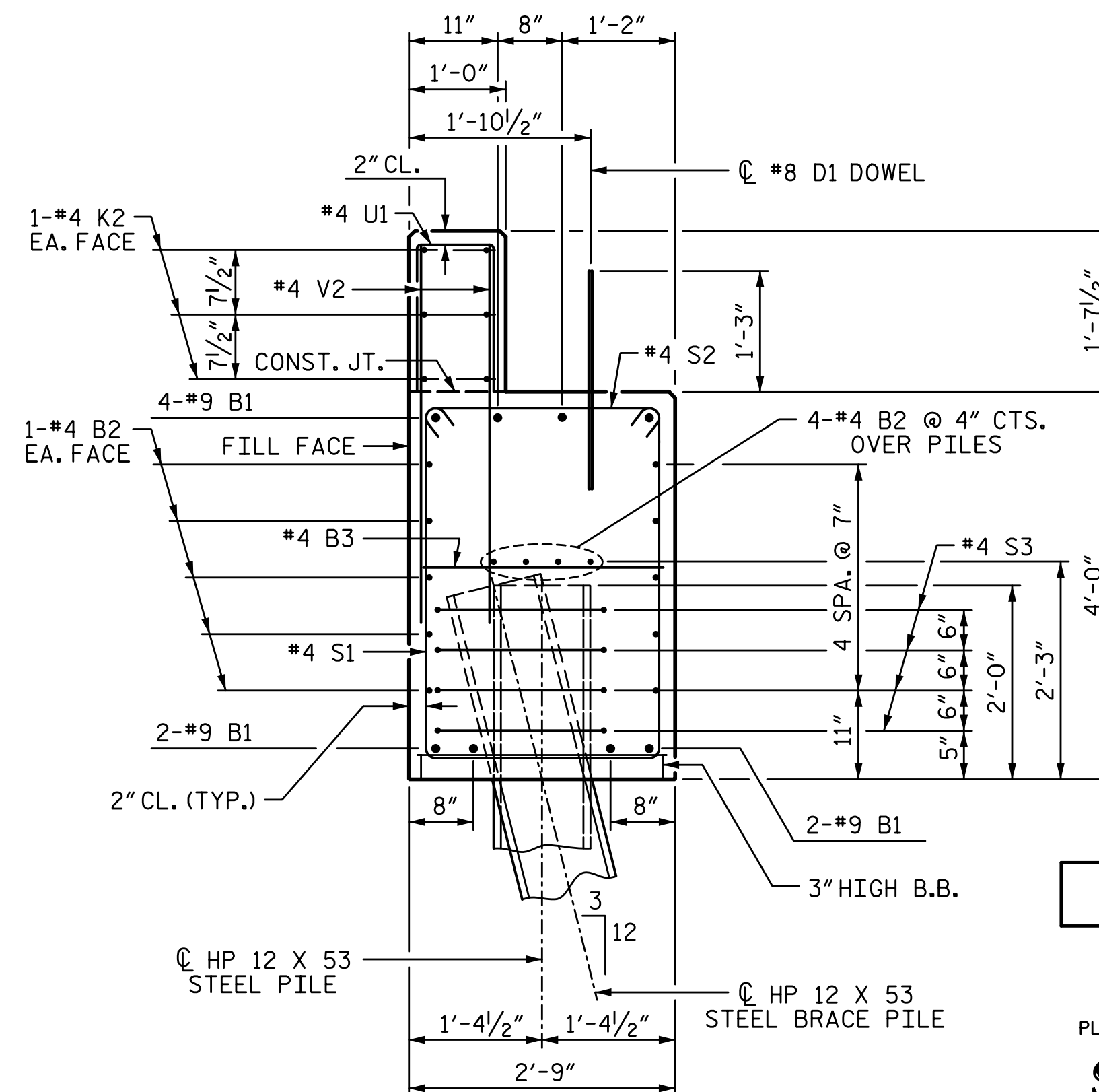
BILL OF MATERIAL FOR ONE END BENT

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9		39'-4"	1070
B2	28	#4	STR	19'-9"	369
B3	10	#4	STR	2'-5"	16
D1	20	#8	STR	2'-3"	120
H1	12	#5	2	11'-1"	139
H2	12	#5	2	11'-3"	141
H3	12	#5	3	11'-6"	144
H4	12	#5	3	11'-4"	142
K1	12	#4	STR	3'-1"	25
K2	12	#4	STR	19'-9"	158
S1	48	#4	4	10'-5"	334
S2	48	#4	5	3'-2"	102
S3	20	#4	6	6'-6"	87
U1	31	#4	7	3'-7"	74
V1	61	#4	STR	7'-2"	292
V2	62	#4	STR	5'-3"	217

REINFORCING STEEL (FOR ONE END BENT) 3430 LB

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1 CAP, LOWER PART OF WINGS & COLLARS	19.1 CY
POUR #2 BACKWALL & UPPER PART OF WINGS	5.3 CY
TOTAL CLASS A CONCRETE	24.4 CY

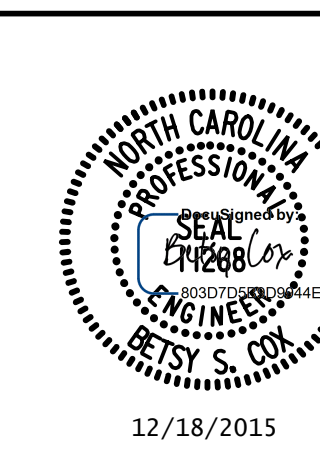


SECTION A-A

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:
S&EA
 SIMPSON ENGINEERS & ASSOCIATES
 5640 Dillard Drive
 Suite 200
 Cary, NC 27518
 (919) 852-0468
 (919) 852-0598 (Fax)
 www.simpsonengr.com
 LICENSURE NO. C-2521



PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION

PROJECT NO. 17BP.5.R.52
 GRANVILLE COUNTY
 STATION: 16+00.00 -L-

SHEET 4 OF 4

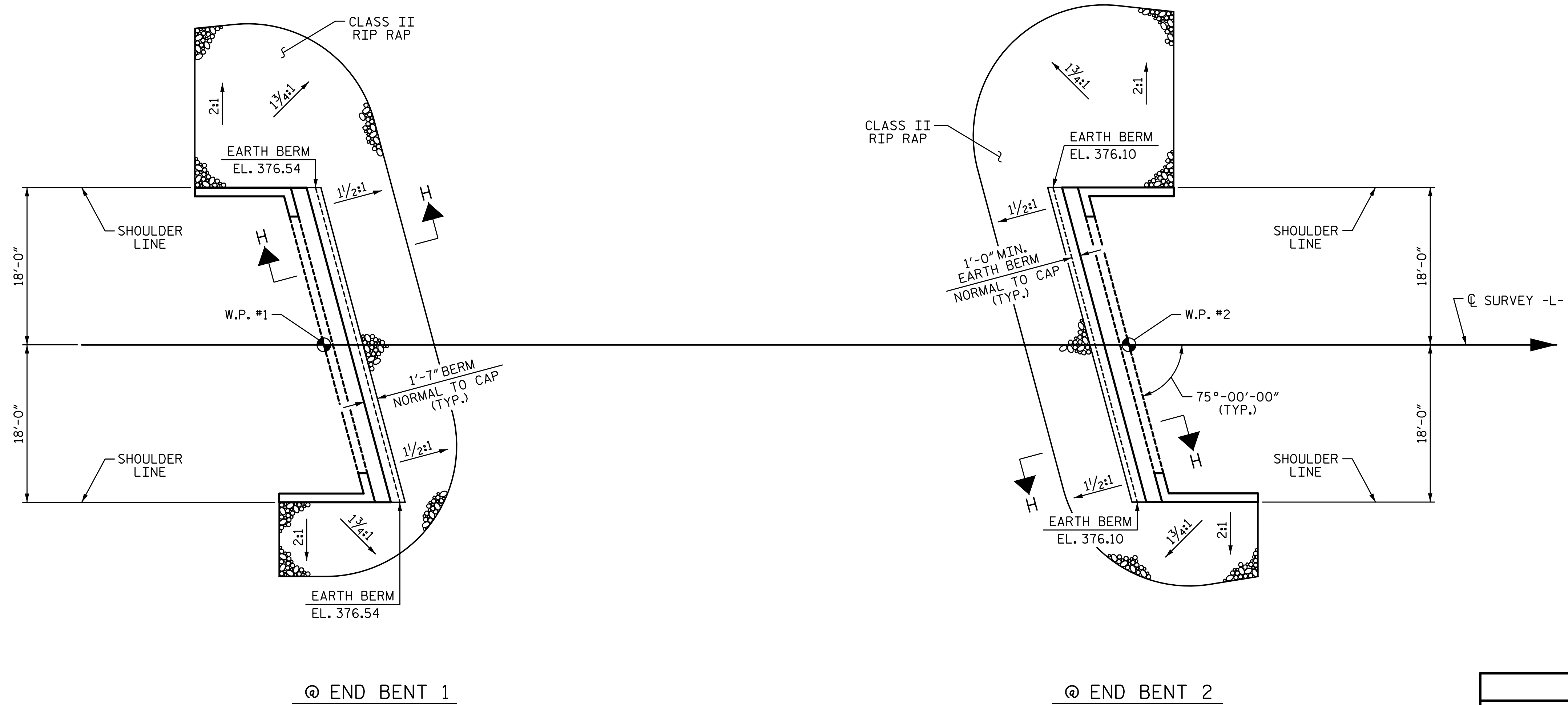
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE

END BENT 1 & 2 DETAILS

REVISIONS

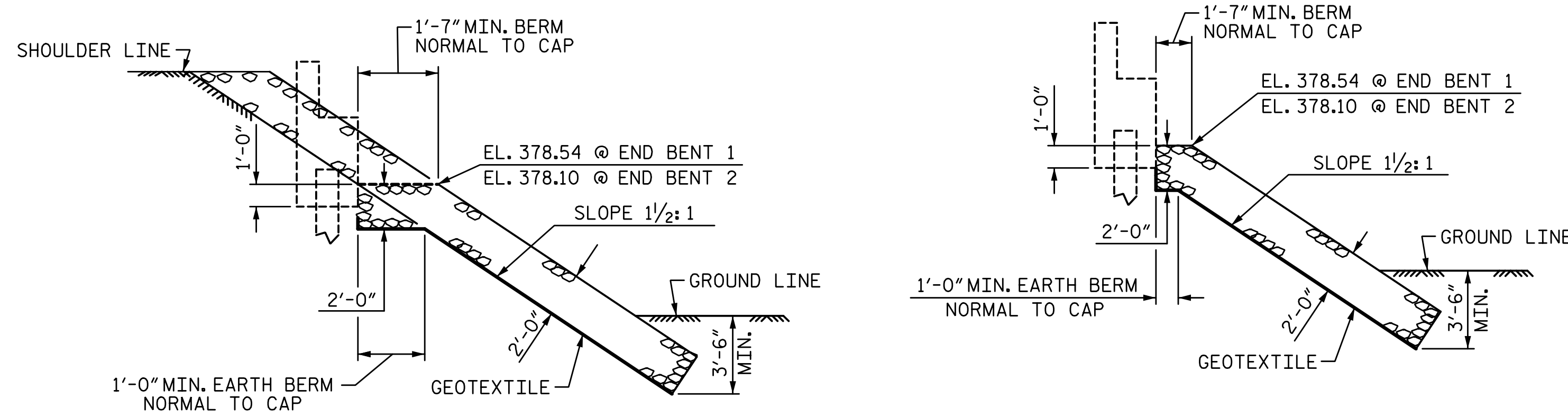
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-13
2			4			TOTAL SHEETS 16

12/17/2015 2:29:06 PM G:\Projects\2014\17BP5R52 (Granville 93)\Structures\Drawings\Granville 93_rr.dgn



PLAN OF RIP RAP

ESTIMATED QUANTITIES		
BRIDGE @ STA. 16+00.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	120	135
END BENT 2	110	125



SECTION H-H

SECTION BERM RIP RAPPED

**PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION**

PROJECT NO. 17BP.5.R.52
GRANVILLE COUNTY
STATION: 16+00.00 -L-

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

PLANS PREPARED BY:
**SIMPSON
& ASSOCIATES**
5640 Dillard Drive
Suite 200
Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com
LICENSURE NO. C-2521



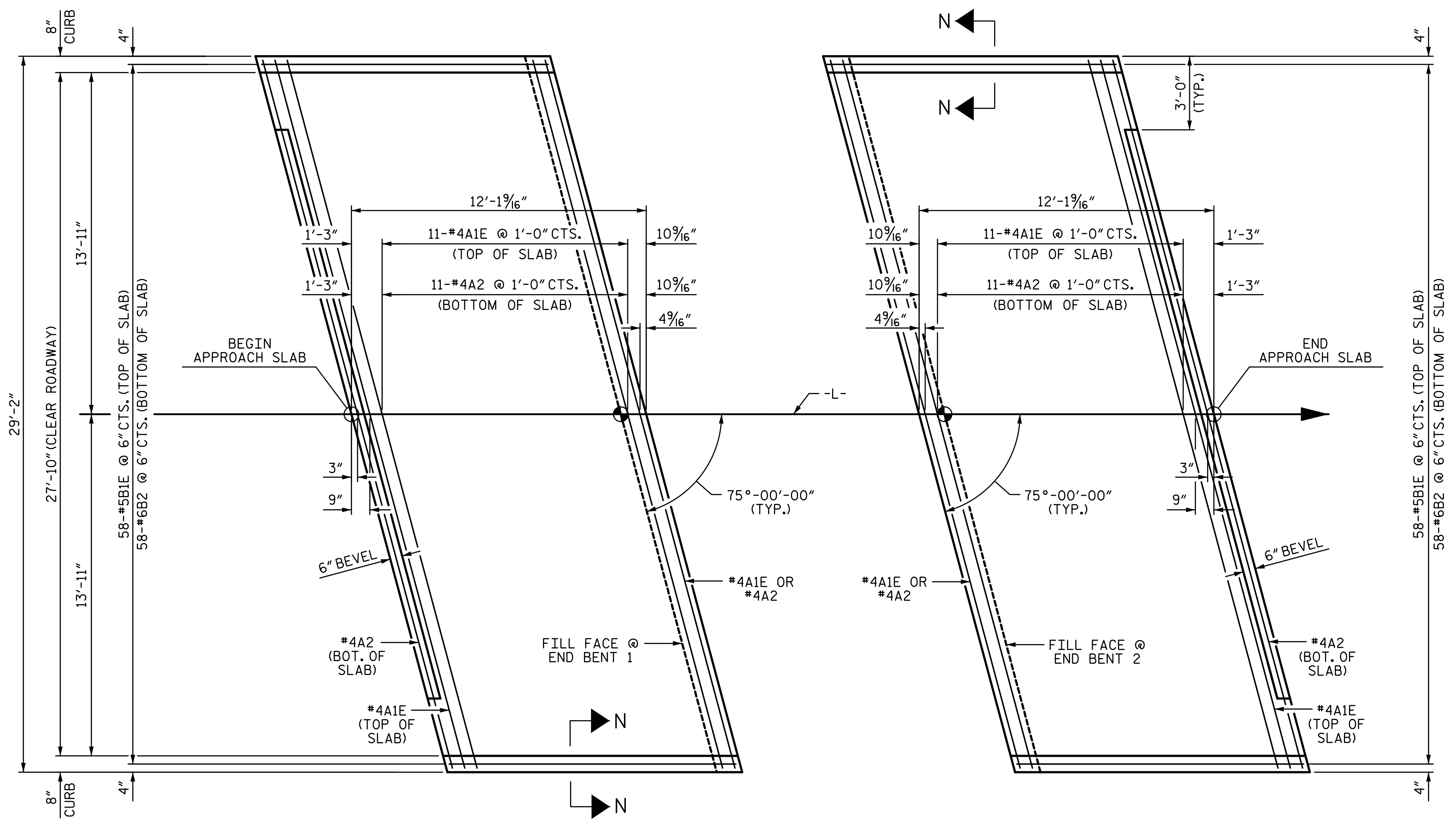
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RIP RAP DETAILS

REVISIONS						SHEET NO. S-14
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 16
2			4			

DRAWN BY: S.D. COOPER DATE: 4-15
CHECKED BY: B.S. COX DATE: 4-15
DESIGN ENGINEER OF RECORD: B.S. COX DATE: 4-15

12/17/2015 2:29:07 PM G:\Projects\2014\17BP5R52 (Granville) Structures\Drawings\Final\Granville 93_as.dgn



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

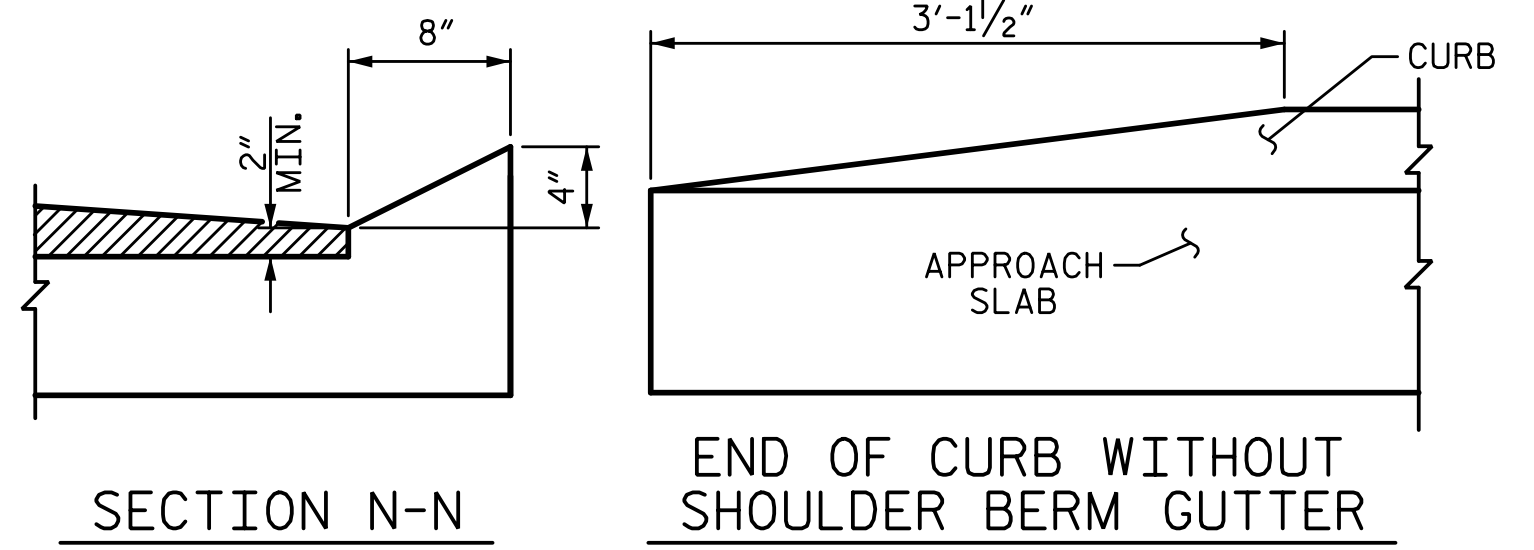
NOTES:

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.
 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.
 APPROACH SLAB GROOVING IS NOT REQUIRED.

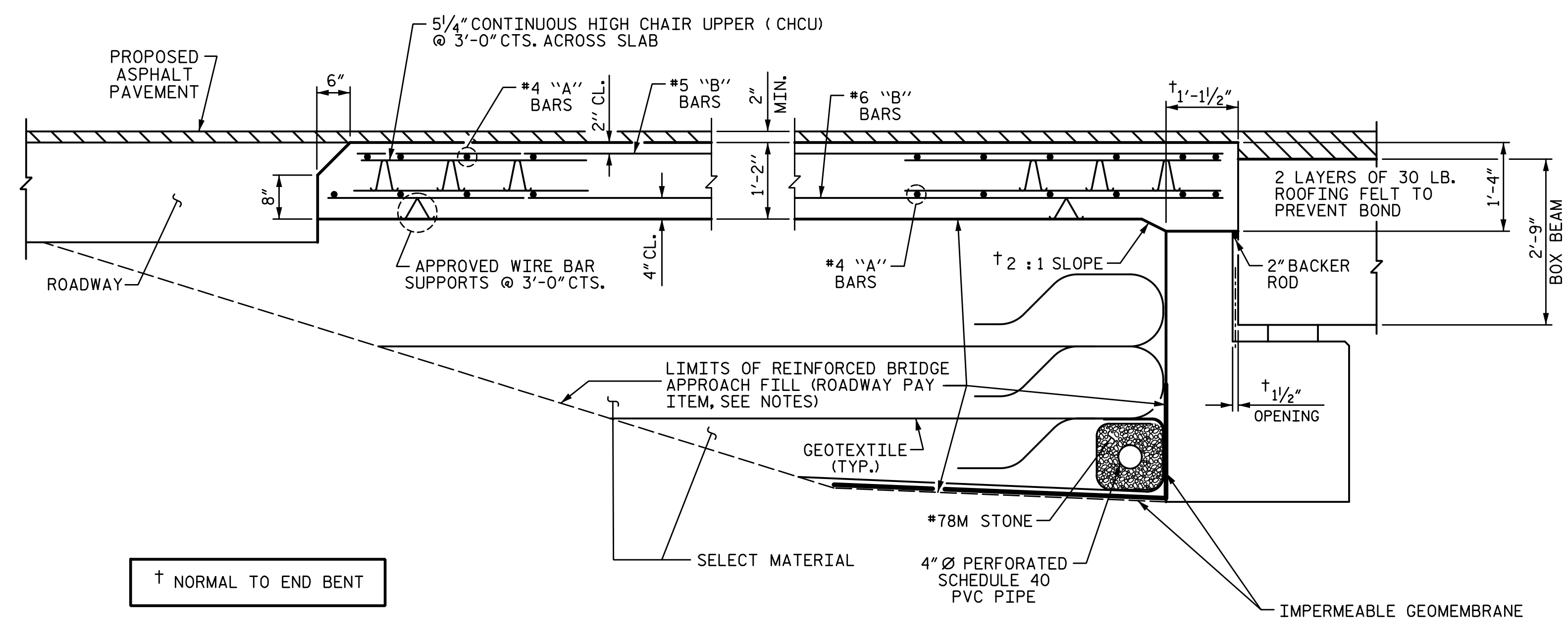
BILL OF MATERIAL					
APPROACH SLAB AT EB 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	13	#4	STR	29'-10"	259
A2	13	#4	STR	29'-10"	259
B1E	58	#5	STR	11'-1"	670
B2	58	#6	STR	11'-7"	1009
REINFORCING STEEL				LB	1268
"E" EPOXY COATED REINFORCING STEEL				LB	929
CLASS "AA" CONCRETE				CY	15.6
APPROACH SLAB AT EB 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	13	#4	STR	29'-10"	259
A2	13	#4	STR	29'-10"	259
B1E	58	#5	STR	11'-1"	670
B2	58	#6	STR	11'-7"	1009
REINFORCING STEEL				LB	1268
"E" EPOXY COATED REINFORCING STEEL				LB	929
CLASS "AA" CONCRETE				CY	15.6

"E" INDICATES EPOXY COATED REINFORCING STEEL

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



CURB DETAILS



SECTION THRU SLAB

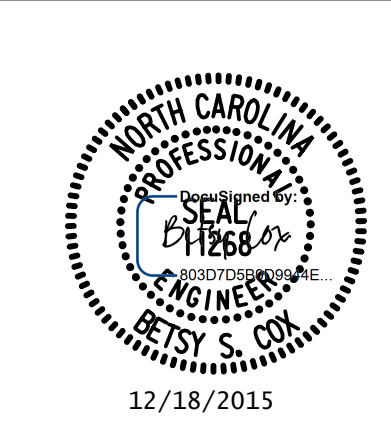
**PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION**

PROJECT NO. 17BP.5.R.52
GRANVILLE COUNTY
 STATION: 16+00.00 -L-

SHEET 1 OF 2

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

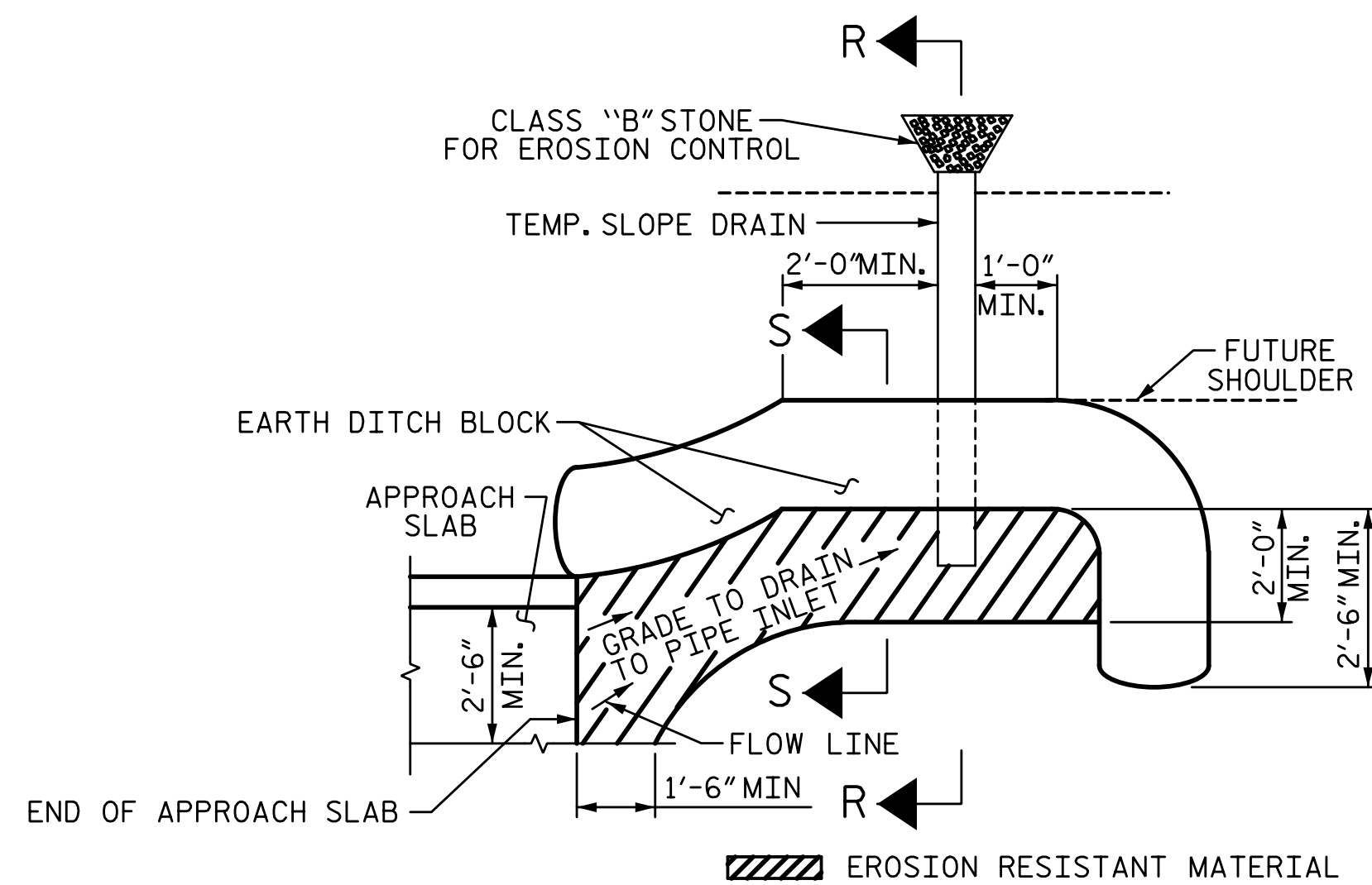
PLANS PREPARED BY:
SIMPSON ENGINEERS & ASSOCIATES
 5640 Dillard Drive
 Suite 200
 Cary, NC 27518
 (919) 852-0468
 (919) 852-0598 (Fax)
 www.simpsonengr.com
 LICENSURE NO. C-2521



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**BRIDGE APPROACH
 SLAB FOR PRESTRESSED
 CONCRETE BOX
 BEAM UNIT**
 (SUB-REGIONAL TIER) - 75° SKEW

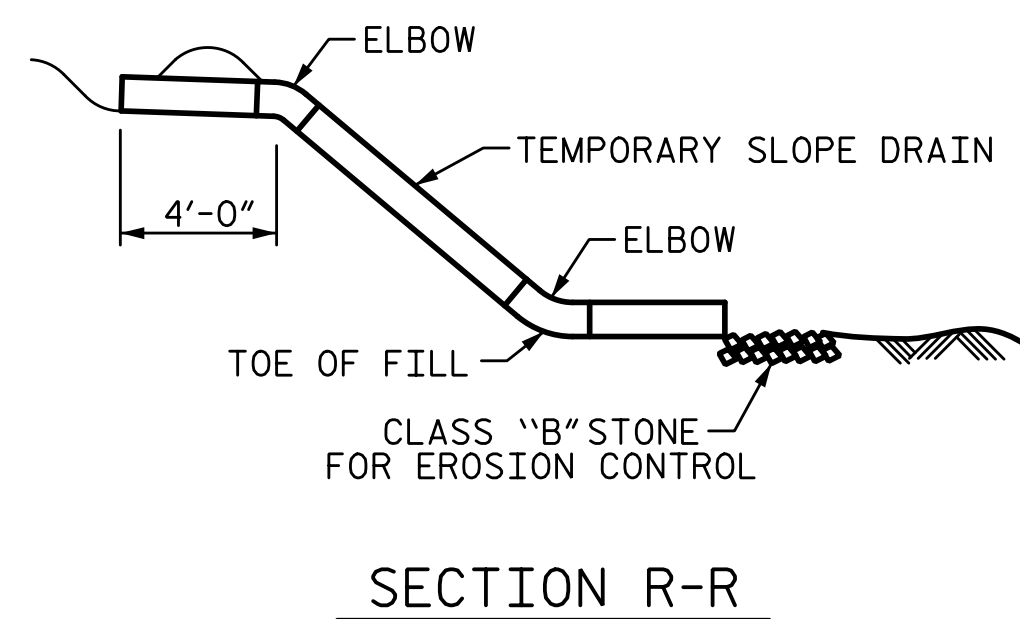
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			16

DRAWN BY: S.D. COOPER DATE: 4-15
 CHECKED BY: B.S. COX DATE: 4-15
 DESIGN ENGINEER OF RECORD: B.S. COX DATE: 4-15

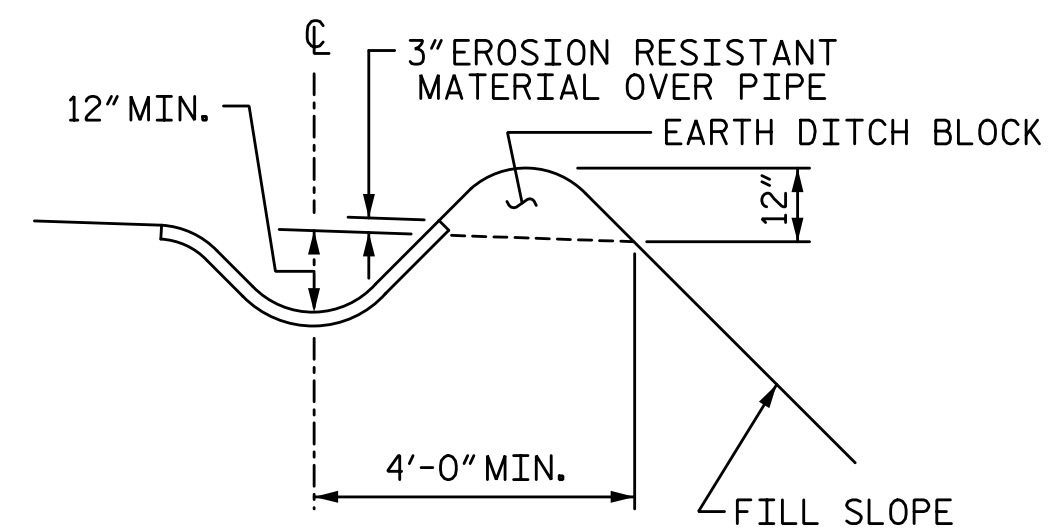


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 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

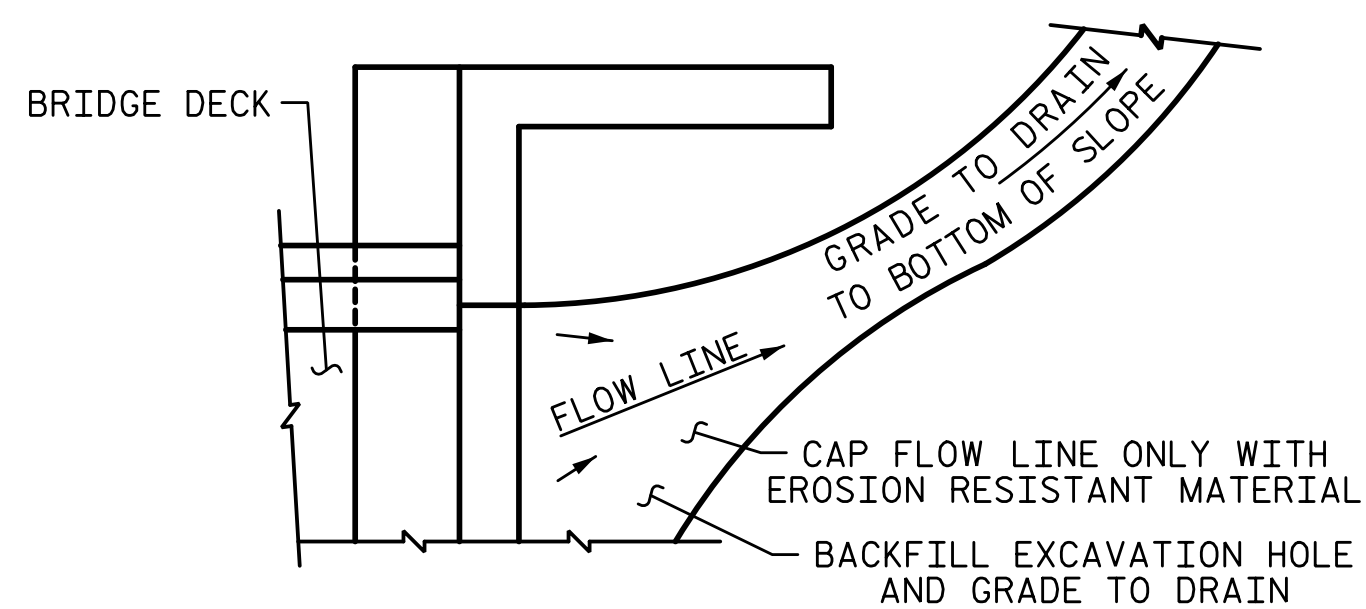


SECTION R-R



TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS 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

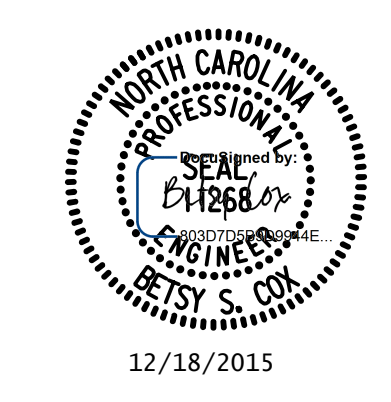
**PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION**

PROJECT NO. 17BP.5.R.52
GRANVILLE COUNTY
STATION: 16+00.00 -L-

SHEET 2 OF 2

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

PLANS PREPARED BY:
SIMPSON ENGINEERS & ASSOCIATES
5640 Dillard Drive
Suite 200
Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com
LICENSURE NO. C-2521



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

(SUB-REGIONAL TIER) - 75° SKEW

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

12/17/2015 2:29:07 PM G:\Projects\2014\17BP5R52 (Granville 93)\Structures\Drawings\Final\Granville 93_as.dgn

DRAWN BY: <u>S.D. COOPER</u>	DATE: <u>4-15</u>
CHECKED BY: <u>B.S. COX</u>	DATE: <u>4-15</u>
DESIGN ENGINEER OF RECORD: <u>B.S. COX</u>	DATE: <u>4-15</u>

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. FINIS 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.

12/17/2015 2:29:07 PM G:\Projects\2014\17BP5R52 (Granville 93)\Structures\Drawings\Final\Granville 93_sn.dgn

ENGLISH

JANUARY, 1990