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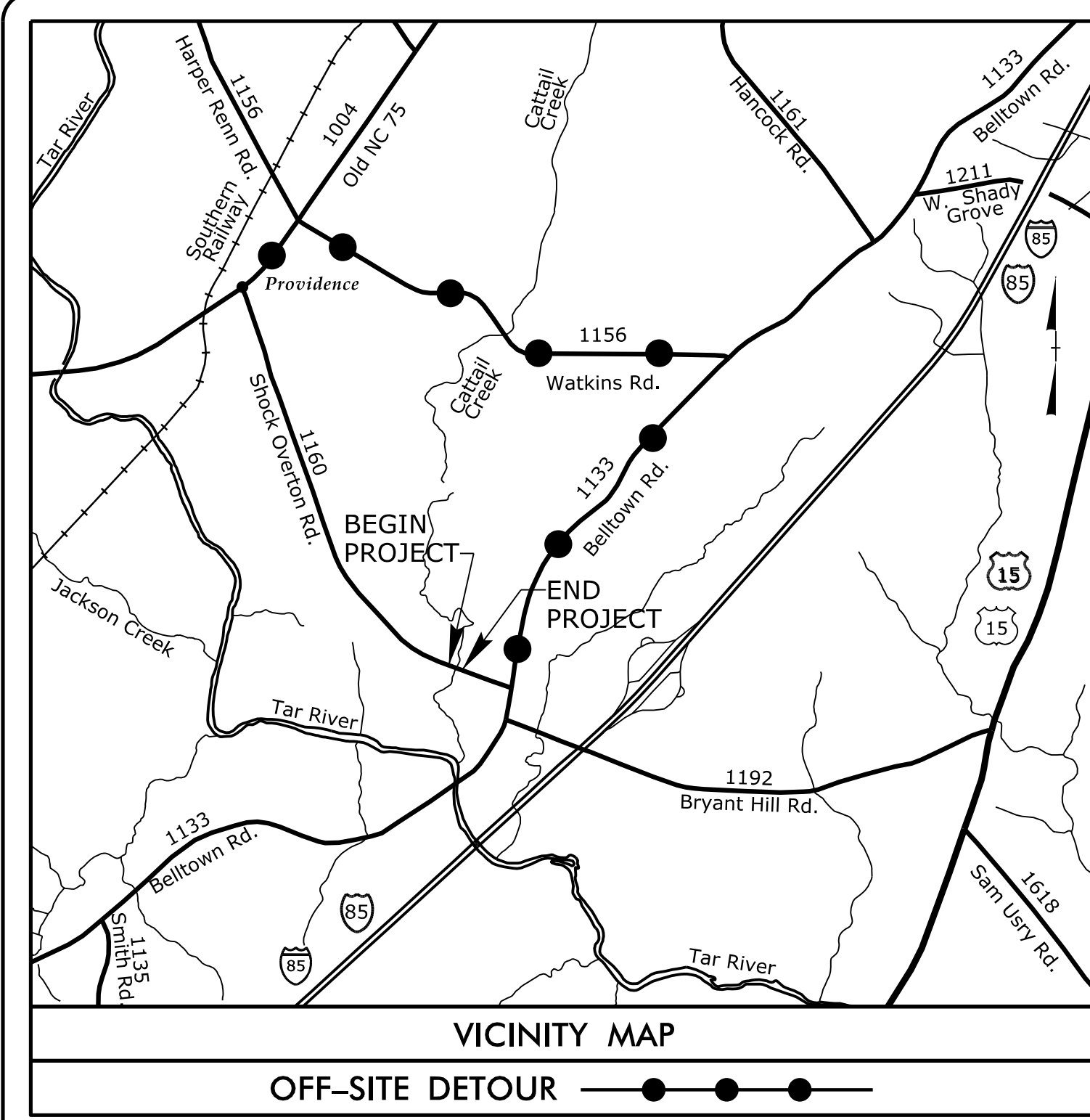
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09_05/19

TIP PROJECT: 17BP.5.C.04

CONTRACT: DE00258

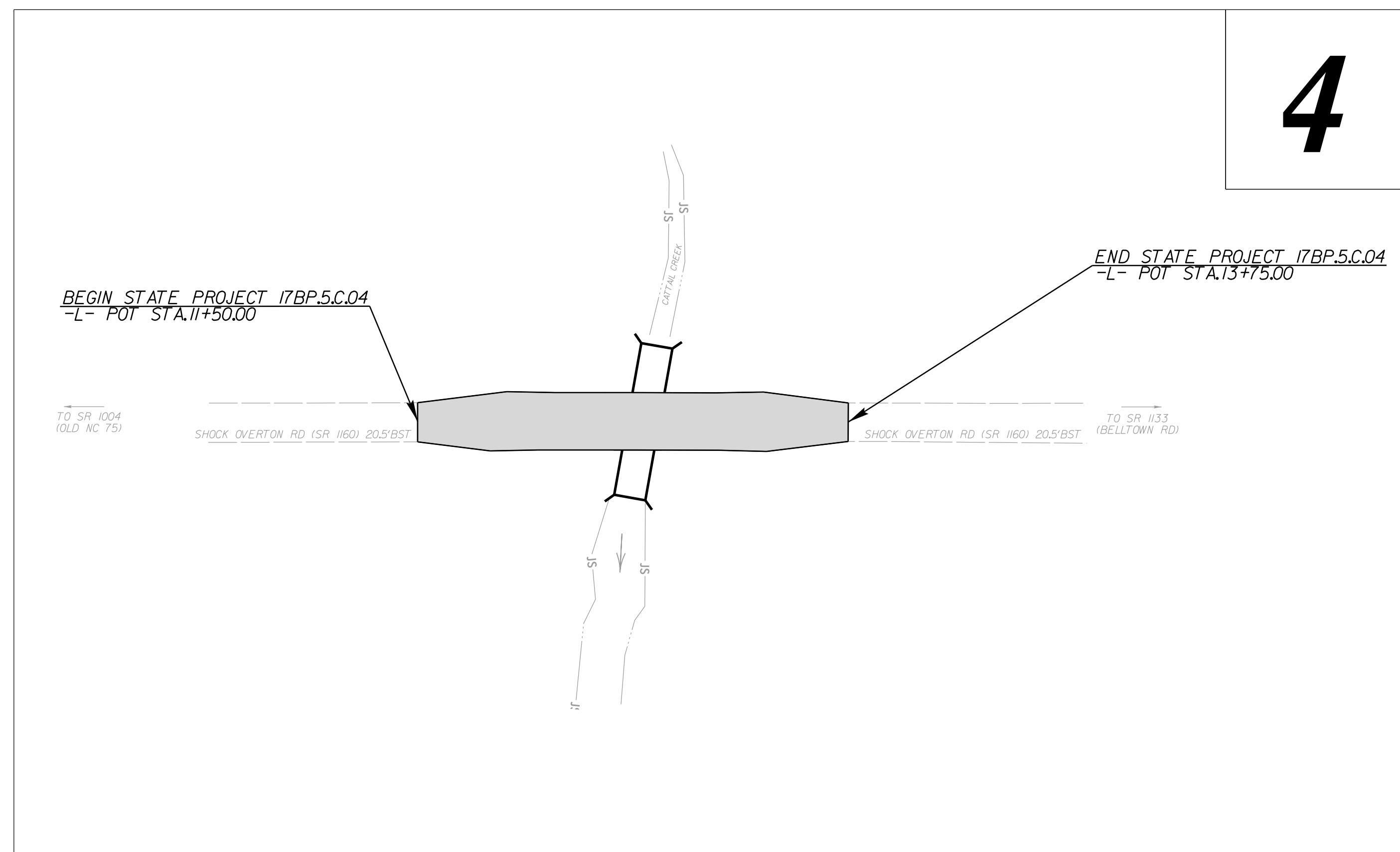
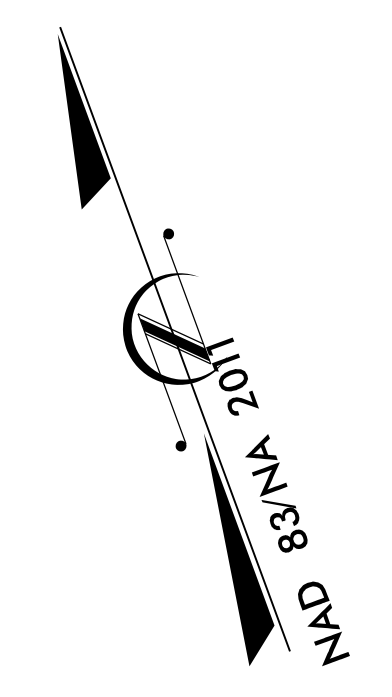


See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols

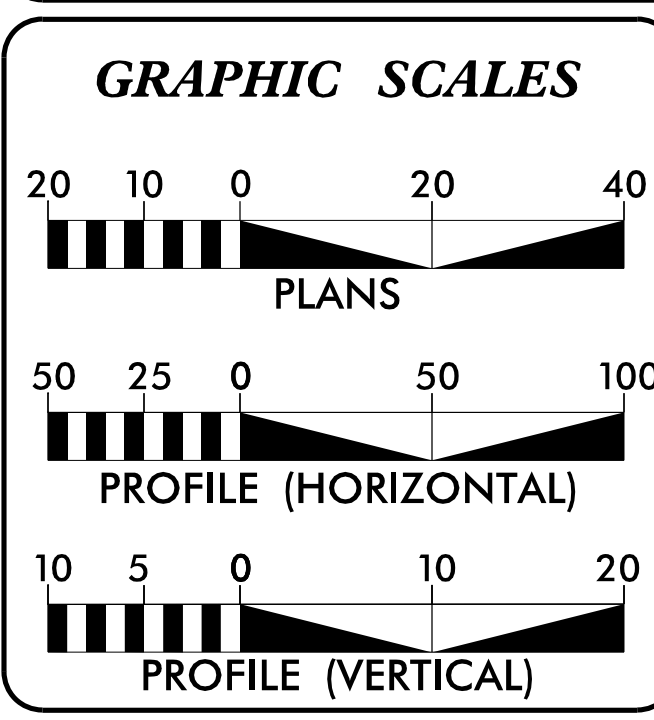
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
GRANVILLE COUNTY

**LOCATION: NON-INVENTORY PIPE AT CATTAIL CREEK
ON SR 1160 (SHOCK OVERTON RD.)**
TYPE OF WORK: DRAINAGE, PAVING AND CULVERT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.5.C.04	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
17BP.5.C.04	N/A	PE	
17BP.5.C.04	N/A	ROW /UTILITY	
17BP.5.C.04	N/A	CONSTRUCTION	



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



DESIGN DATA
ADT = 660+
V = 50 MPH
CLASS = RURAL LOCAL
SUBREGIONAL TIER

PROJECT LENGTH
LENGTH ROADWAY STATE PROJECT 17BP.5.C.04 = 0.043 mi.
LENGTH STRUCTURES STATE PROJECT 17BP.5.C.04 = 0.000 mi.
TOTAL LENGTH STATE PROJECT 17BP.5.C.04 = 0.043 mi.

Prepared in the Offices of:

STEWART
421 FAYETTEVILLE ST, STE 400
RANDOLPH, NC 27601
719.380.8750

ECOLOGICAL ENGINEERING
NC EIRM LICENSE No: P-1148
1151 SR Cary Parkway, Suite 101
CARY, NC 27518
(919) 357-0929

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 14, 2018

RIGHT OF WAY COMPLETE:
MARCH 21, 2018

LETTING DATE:
MAY 23, 2018

ANDY YOUNG, PE
PROJECT ENGINEER

MICHAEL BURNS, PE
PROJECT DESIGN ENGINEER

LISA GILCHRIST, EI
NCDOT CONTACT

HYDRAULICS ENGINEER

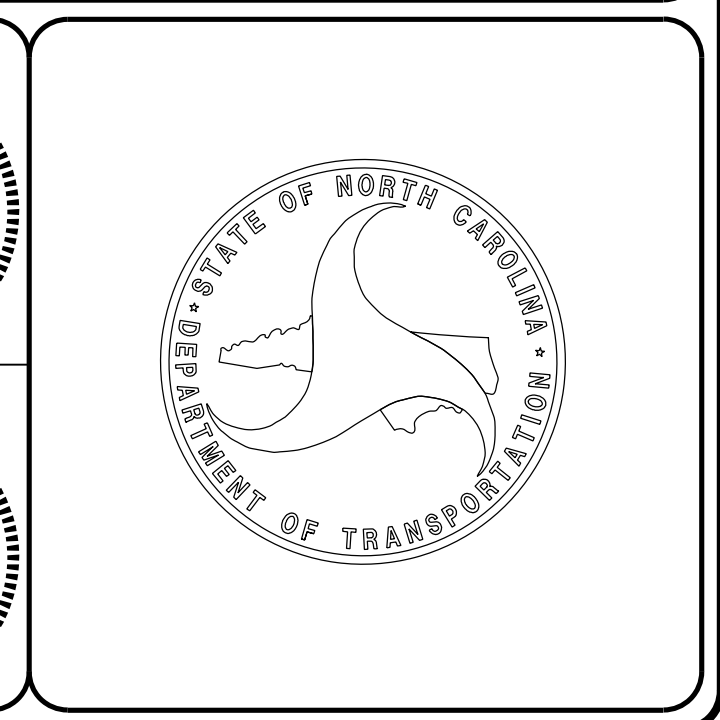
4/25/2018

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Brandon T. Barham
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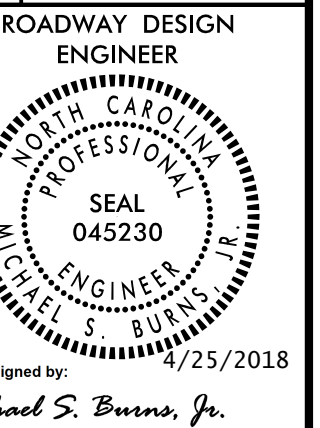
ROADWAY DESIGN ENGINEER

4/25/2018

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Michael S. Burns, Jr.
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	INDEX OF SHEETS		EFF. 01-16-2018
SHEET NUMBER	SHEET	2018 ROADWAY ENGLISH STANDARD DRAWINGS	REV.
1	TITLE SHEET	The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2018 are applicable to this project and by reference hereby are considered a part of these plans:	
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS		
1B	CONVENTIONAL SYMBOLS	STD.NO. TITLE	
1C-1 THRU 1C-3	SURVEY CONTROL SHEETS	DIVISION 2 - EARTHWORK	
1D-1	CENTERLINE COORDINATE LIST	200.03 Method of Clearing - Method III	
1E-1	R/W AND EASEMENT COORDINATE LIST	225.02 Guide for Grading Subgrade - Secondary and Local	
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS	225.04 Method of Obtaining Superelevation - Two Lane Pavement	
2C-1	EXTRA LENGTH GUARDRAIL POST DETAIL	DIVISION 5 - SUBGRADE, BASES, AND SHOULDERS	
2C-2	GUARDRAIL INSTALLATION DETAIL	560.01 Method of Shoulder Construction - High Side of Superelevated Curve - Method I	
2G-1	FAILED SLOPE CONSTRUCTION DETAIL	DIVISION 8 - INCIDENTALS	
3B-1	ROADWAY SUMMARIES	862.01 Guardrail Placement	
4	PLAN SHEET	862.02 Guardrail Installation	
5	PROFILE SHEET	876.01 Rip Rap in Channels	
TMP-1 THRU TMP-3	TRAFFIC MANAGEMENT PLANS		
PMP-1	PAVEMENT MARKING PLANS		
EC-1 THRU EC-4	EROSION CONTROL PLANS		
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS		
X-1A	CROSS SECTION SUMMARY SHEET		
X-1 THRU X-3	CROSS SECTIONS		
C-1 THRU C-2	CULVERT PLANS		

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

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

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

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

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

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

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

UTILITIES:
UTILITY OWNERS ON THIS PROJECT ARE:
Duke Energy - Power
CenturyLink - Fiberoptics
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

12/2/2016

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

Single Tree	○
Single Shrub	○

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

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

EXISTING STRUCTURES:

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

UTILITIES:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

6/2/09

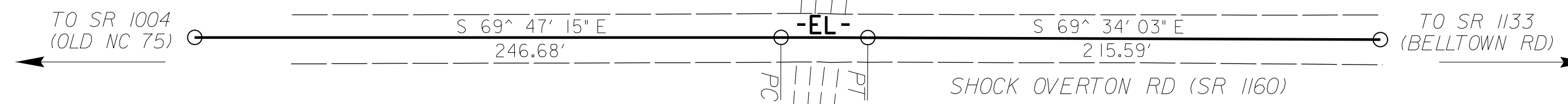
PROJECT REFERENCE NO.	SHEET NO.
17BP.5.C.04	1C-1
Location and Surveys	

SURVEY CONTROL SHEET 38-1160

W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



SR1160-1
 N 905592.319
 E 2102951.697
 ELEV. = 385.95'



BMI
 BENCHTIE IN 10" OAK
 N 905462 E 2103140
 ELEV = 374.25'

SR1160-2
 N 905145.738
 E 2104052.920
 ELEV. = 405.89'

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "SR1160-2"
 WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
 NORTHING: 905145.738 EASTING: 2104052.920
 ELEVATION: 405.89'
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.00000647
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "SR1160-2" TO IS

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

NOTES:

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

NOTE: DRAWING NOT TO SCALE

3/28/2008 3:11:00 PM 1c-1.dgn

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
17BP.5.C.04	1C-2
Location and Surveys	

SURVEY CONTROL SHEET 38-1160
W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

BASELINE

BL POINT	DESC.	NORTH	EAST	ELEVATION
1	SR1160-1	905592.319	2102951.697	385.95'
2	SR1160-2	905145.738	2104052.920	405.89'

 BM1 ELEVATION = 374.25'
 N 905462 E 2103140
 BENCHTIE IN 10" OAK

NOTES:

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

NOTE: DRAWING NOT TO SCALE

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PROJECT REFERENCE NO.	SHEET NO.
17BP.5.C.04	1C-3
Location and Surveys	

SURVEY CONTROL SHEET 38-1160

W/EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

EL		N	E	BEARING	DIST	DELTA	D	L	T	R
POT	POINT	905537.165	2103049.275							
LINE				S 69°47'15.4" E	246.68					
PC		905451.937	2103280.766							
CURVE				S 69°40'39.4" E	36.48	00°13'12.0"(RT)	00°36'11.2"	36.48	18.24	9500.00
PT		905439.268	2103314.972							
LINE				S 69°34'03.4" E	215.59					
POT		905364.005	2103517.000							

NOTES:

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

NOTE: DRAWING NOT TO SCALE

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PROPOSED ALIGNMENT CONTROL SHEET 38-1160

PROJECT REFERENCE NO.	SHEET NO.
17BP.5.C.04	1D-1
Location and Surveys	

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	905537.165	2103049.275							
LINE			S 69°47'15.4" E	246.68					
PC	905451.937	2103280.766							
CURVE			S 69°40'39.4" E	36.48	00°13'12.0"(RT)	00°36'11.2"	36.48	18.24	9500.00
PT	905439.268	2103314.972							
LINE			S 69°34'03.4" E	215.59					
POT	905364.005	2103517.000							

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

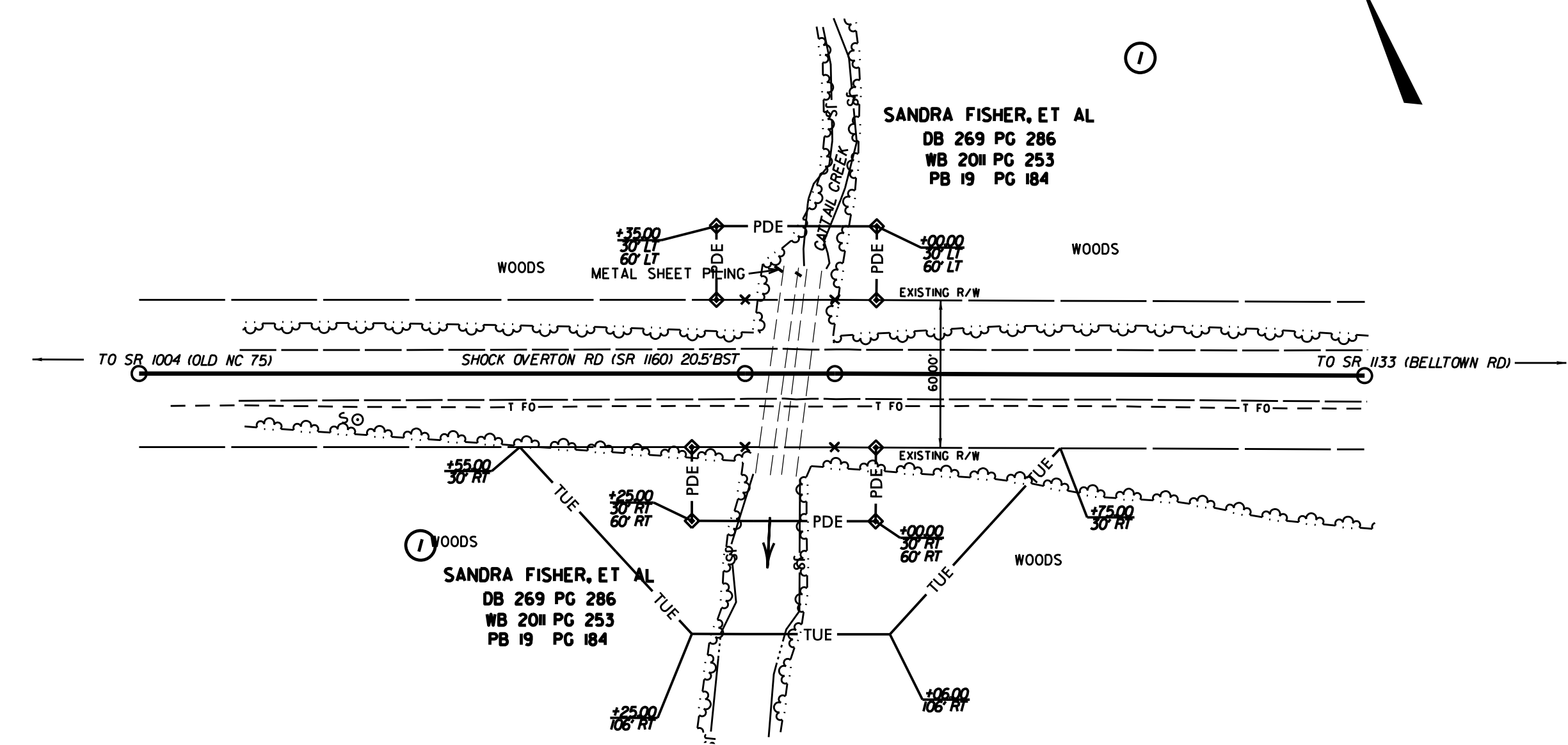
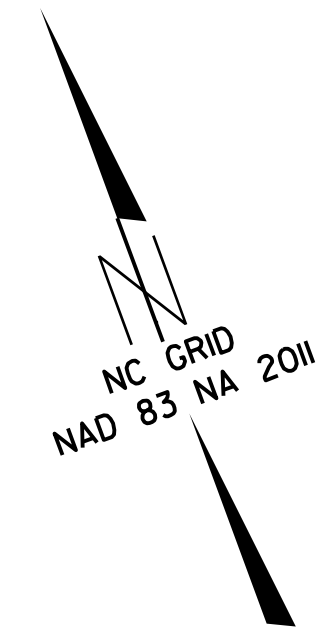
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

NOTE: DRAWING NOT TO SCALE

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PERMANENT EASEMENT REBAR AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
L	12+25.00	30.00	905431.2751	2103250.0544
L	12+25.00	60.00	905403.1226	2103239.6894
L	13+00.00	60.00	905377.1637	2103309.8080
L	13+00.00	30.00	905405.2763	2103320.2810
L	12+35.00	-30.00	905484.1252	2103280.1687
L	12+35.00	-60.00	905512.2778	2103290.5337
L	13+00.00	-30.00	905461.5013	2103341.2271
L	13+00.00	-60.00	905489.6139	2103351.7002



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

I further certify that the data compiled came from available surveys/mapping performed by others and provided to me by NCDOT and do not certify to the accuracy or quality of the individual data sources.

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

Witness my original signature, registration number and seal this 2nd day of March, 2018.

DocuSigned by:
C. Ryan Davenport 3/2/2018
 BA950243039041B
 Professional Land Surveyor PLS #

L-4707
 PLS #

Seal



REVISIONS

6/2/99

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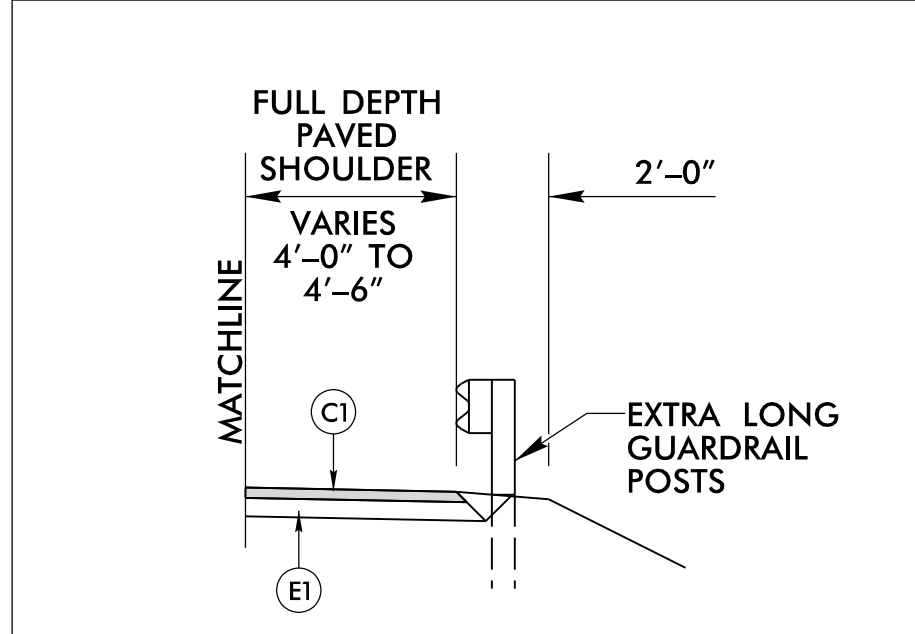
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REVISIONS

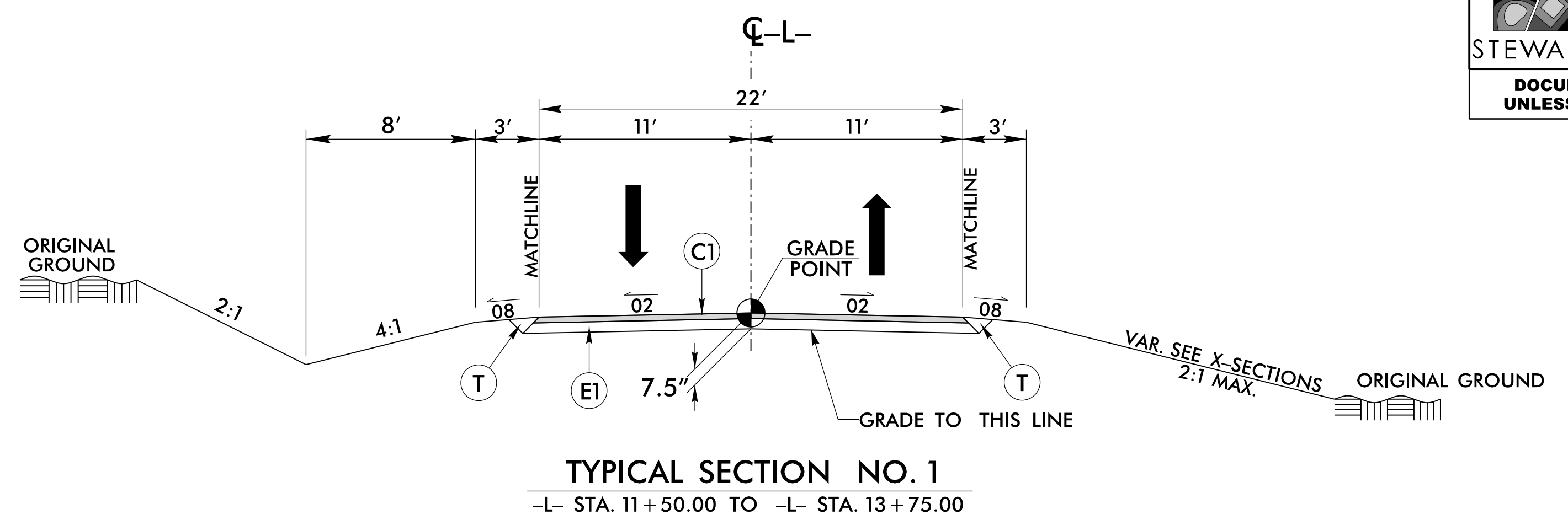
4/20/2018 GRANVILLE.NI.RDY_TYP.dgn
JSE/mburns

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
E1	PROP. APPROX. 4 1/2" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.
T	EARTH MATERIAL

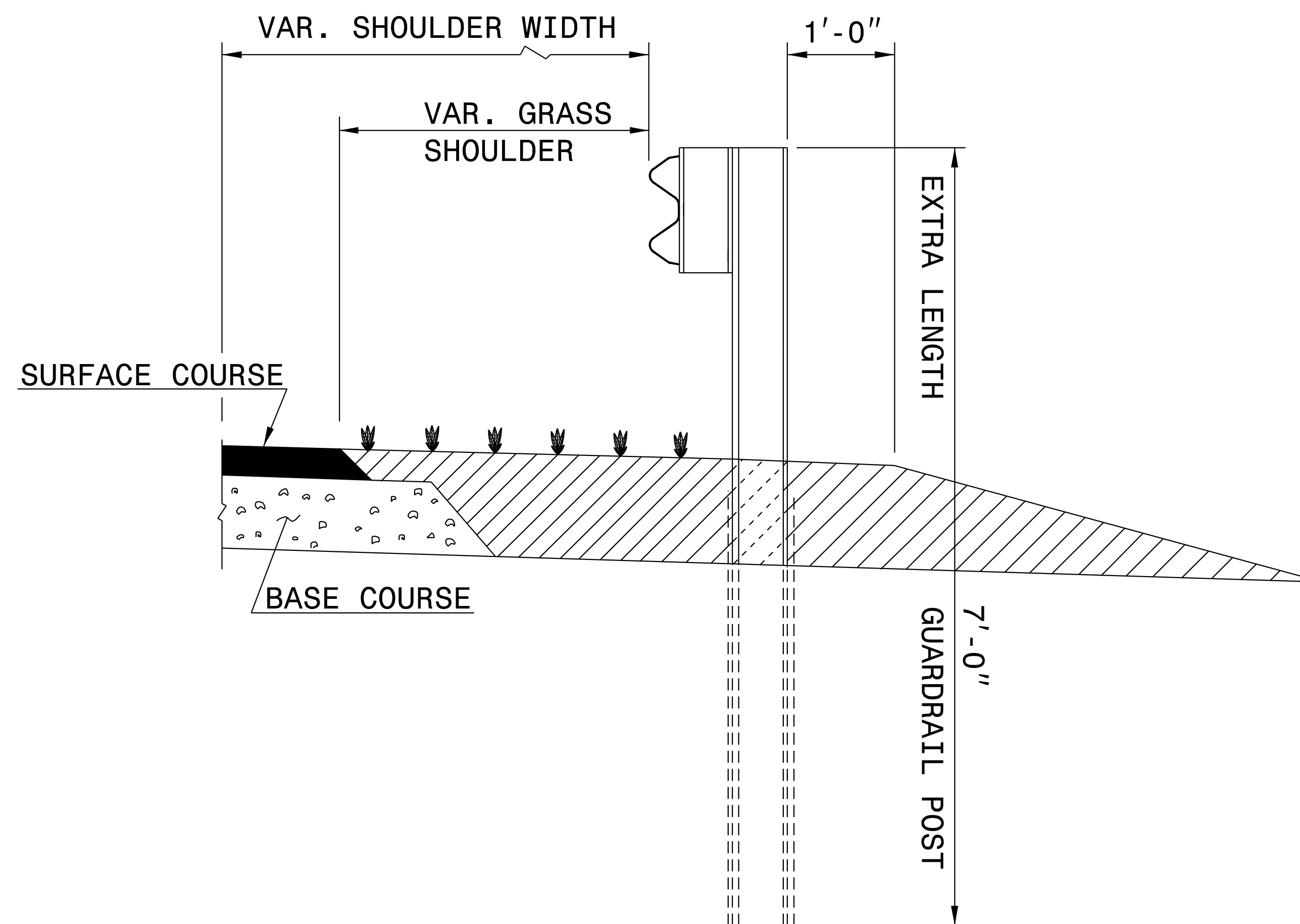
NOTE: PAVEMENT EDGE SLOPES ARE 1:1, UNLESS SHOWN OTHERWISE



DETAIL SHOWING PAVING TO THE FACE OF GUARDRAIL ON -L-



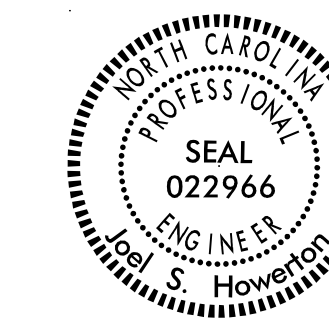
PROJECT REFERENCE NO. 17BP.5.C.04	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER MICHAEL S. BURNS SEAL 045230 DocuSigned by: Michael S. Burns, Jr. 4/20/2018	PAVEMENT DESIGN ENGINEER CLARK S. MORRISON SEAL 22896 DocuSigned by: Clark Morrison 4/28/2018
STEWART ENGINEERING & CONSTRUCTION 421 Fayetteville St. Raleigh, NC 27601 F: 919.386.8750 www.stewartinc.com	
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REFER TO NCDOT STANDARDS 862.01 AND 862.02 FOR PLACEMENT AND INSTALLATION.

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

CONTRACT STANDARDS AND DEVELOPMENT UNIT	
Office 919-707-6950 FAX 919-250-4119	
7' GUARDRAIL POST	
ORIGINAL BY: L. Robinson	DATE: 1995
MODIFIED BY: L. Robinson	DATE: Feb, 1996
CHECKED BY:	DATE:
FILE SPEC.: s:7'postguardrail.dgn	



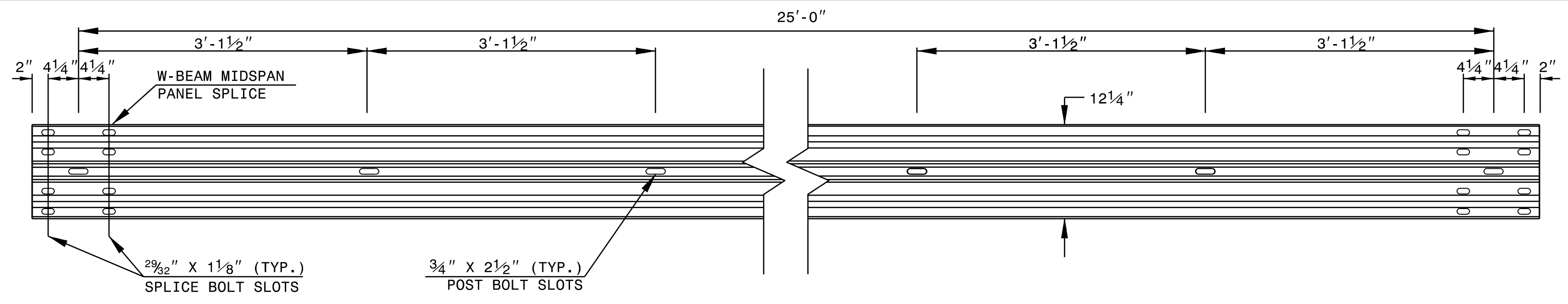
4/23/2018

DocuSigned by:
Dan S Hoyer
173F3D17DCC049F...

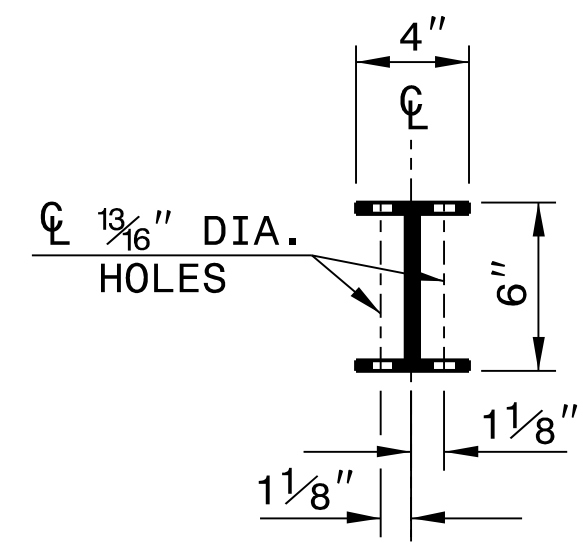
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

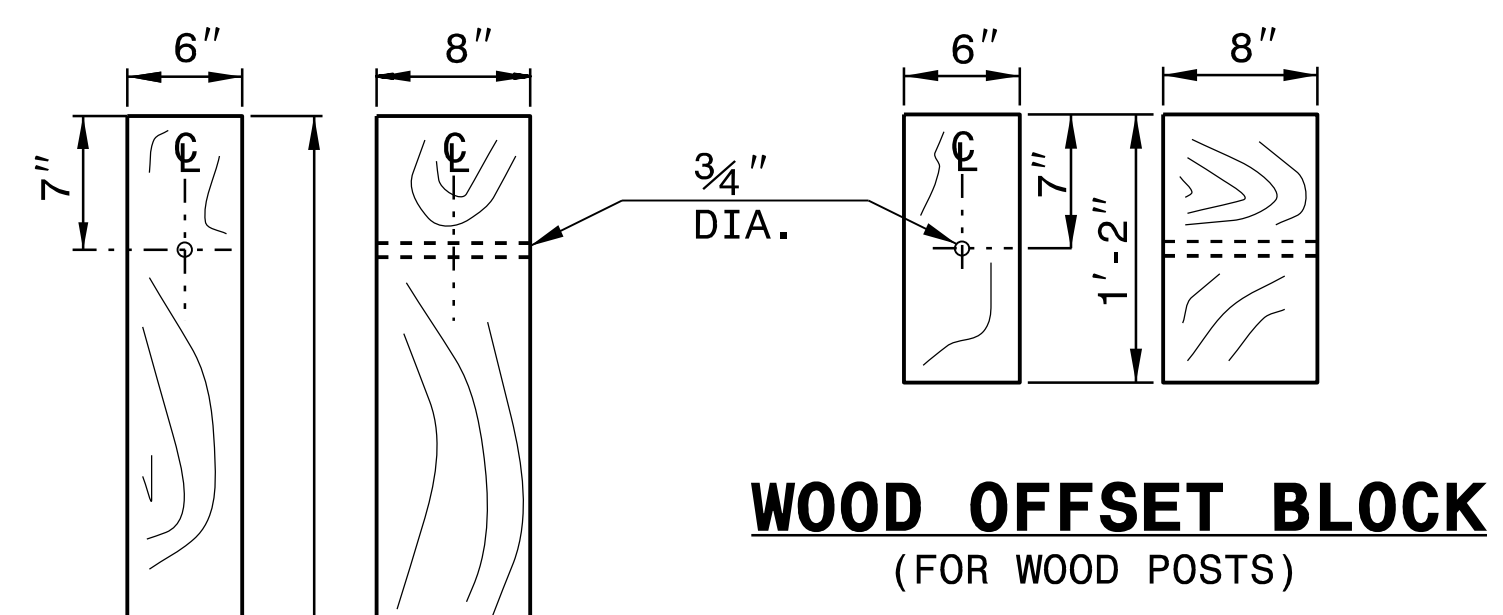
SHEET 6 OF 8
862D02



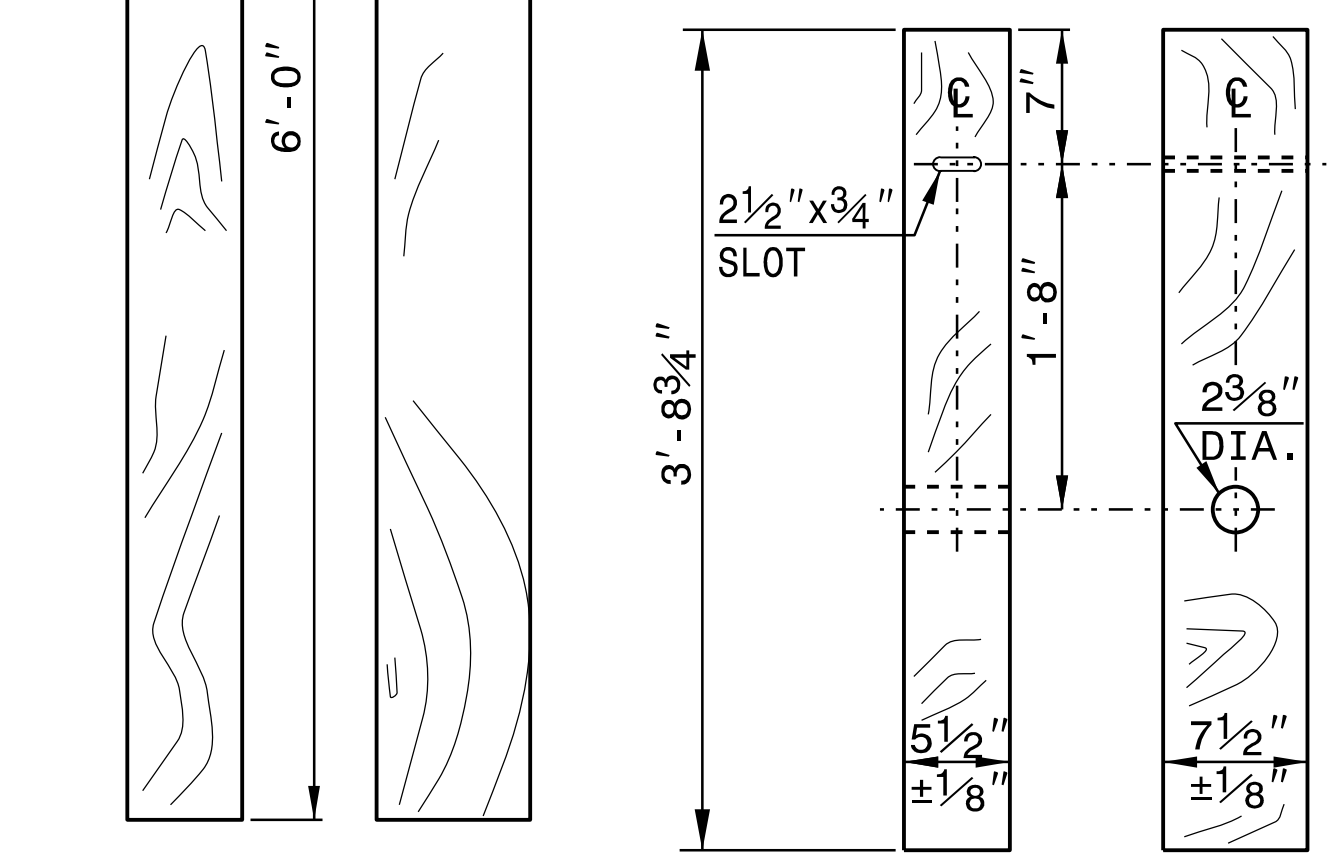
STANDARD W-BEAM GUARDRAIL



PLAN

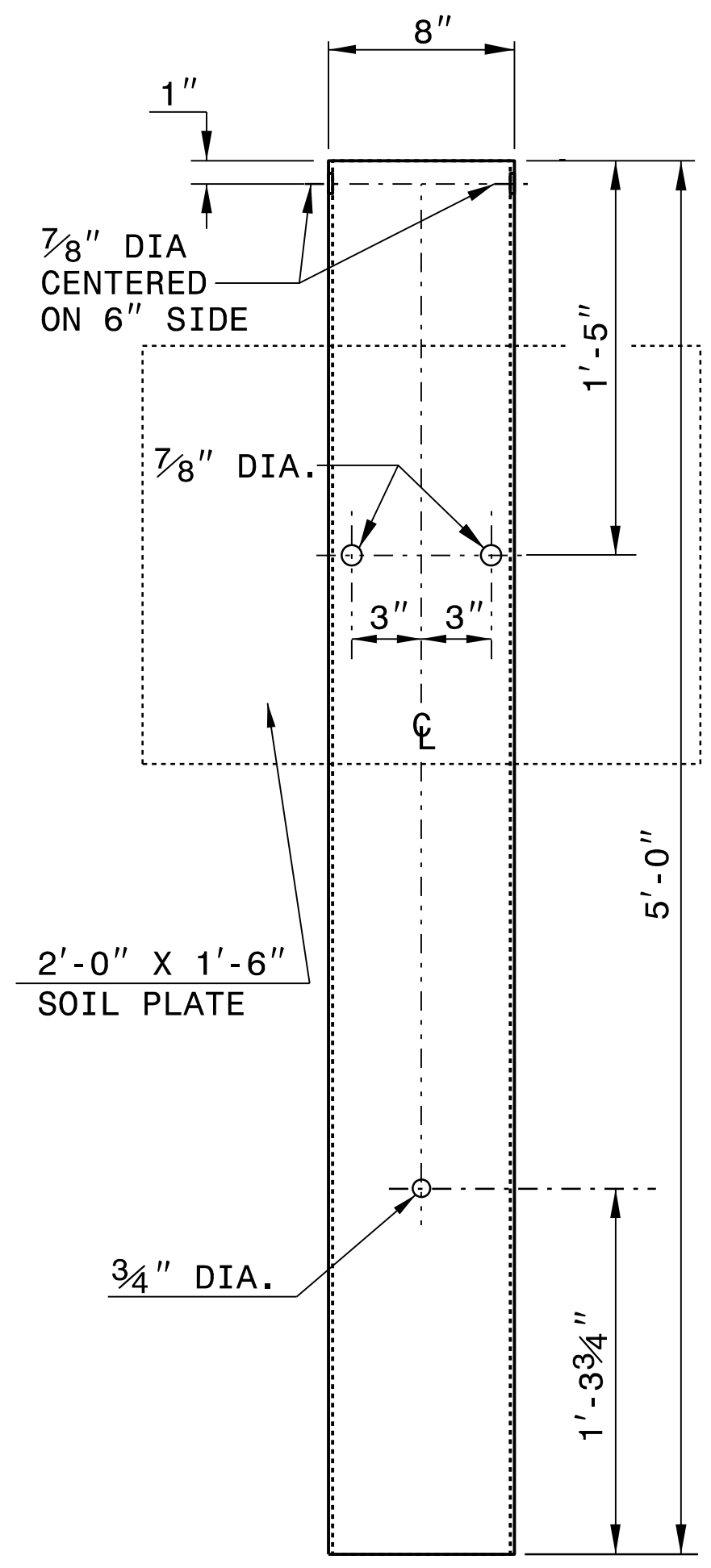


**WOOD OFFSET BLOCK
(FOR WOOD POSTS)**

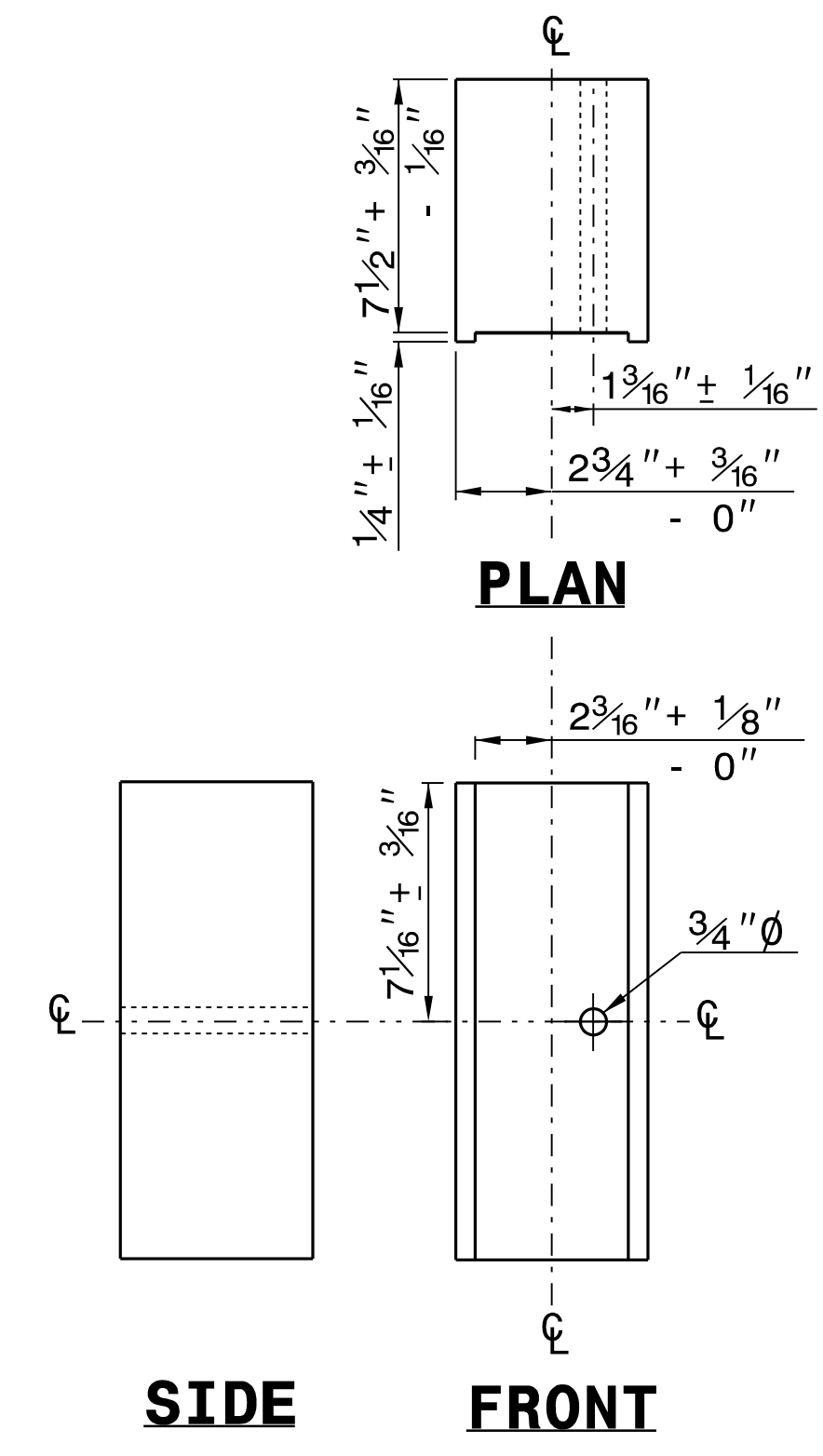


**STANDARD
LINE POST**

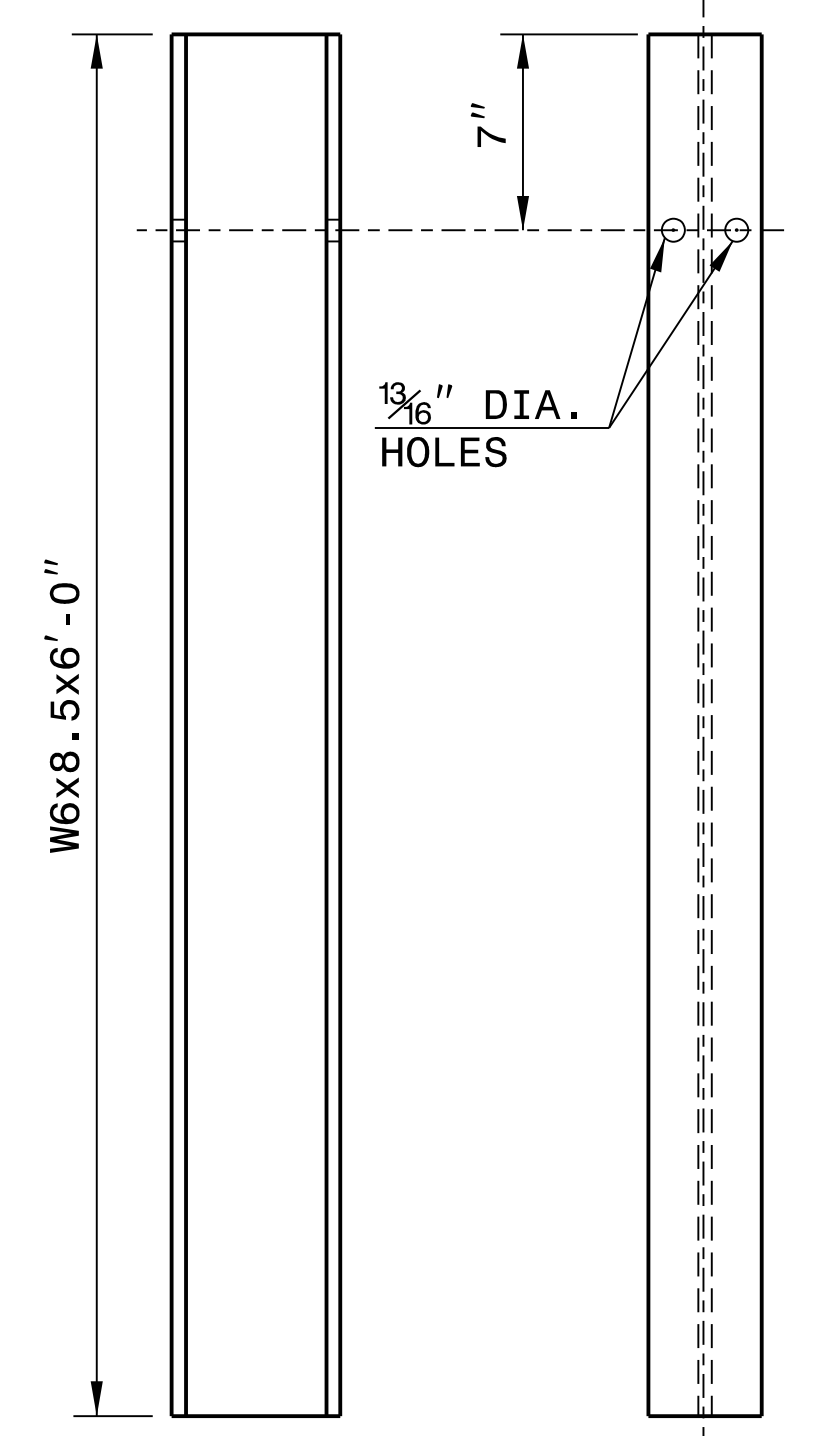
**SHORT WOOD
BREAKAWAY POST**



**STEEL TUBE
TS 6" x 8" x 0.1875"**



**ROUTED
OFFSET BLOCK**



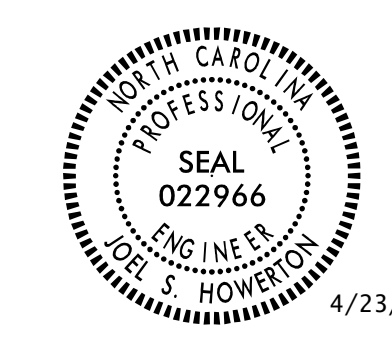
"W6" STEEL POST

SYSTEM PARTS

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02




4/23/2018

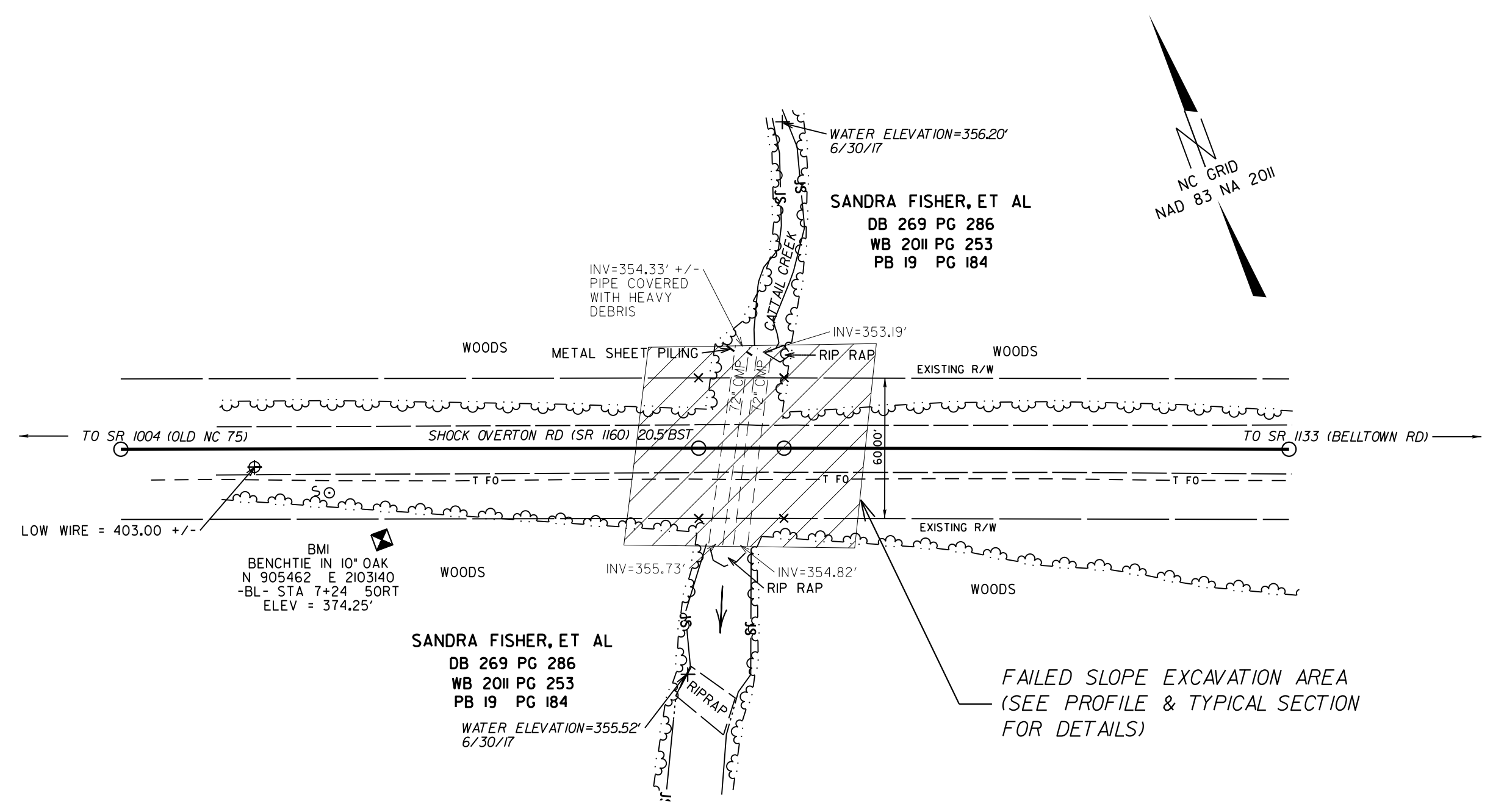
DocuSigned by:
J. S. Howerton

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

SEE TITLE BLOCK

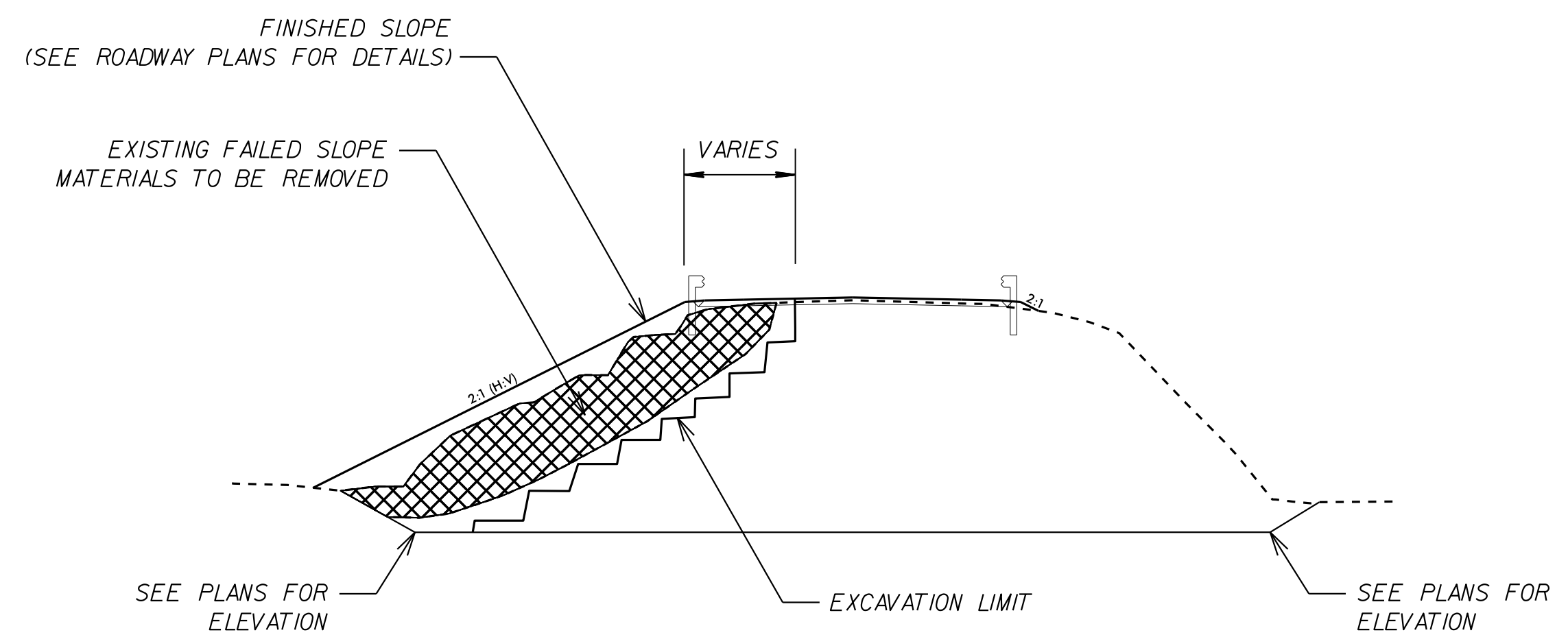
ORIGINAL BY: J. HOWERTON DATE: 3-7-2018
MODIFIED BY: DATE: _____
CHECKED BY: DATE: _____
FILE SPEC.: _____

PROJECT REFERENCE NO. 17BP.5.C.04		SHEET NO. 2G-1	
GEOTECHNICAL ENGINEER  DocuSigned by: Thein T. Zan 4/23/2018 SIGNATURE DATE		ENGINEER SIGNATURE DATE	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



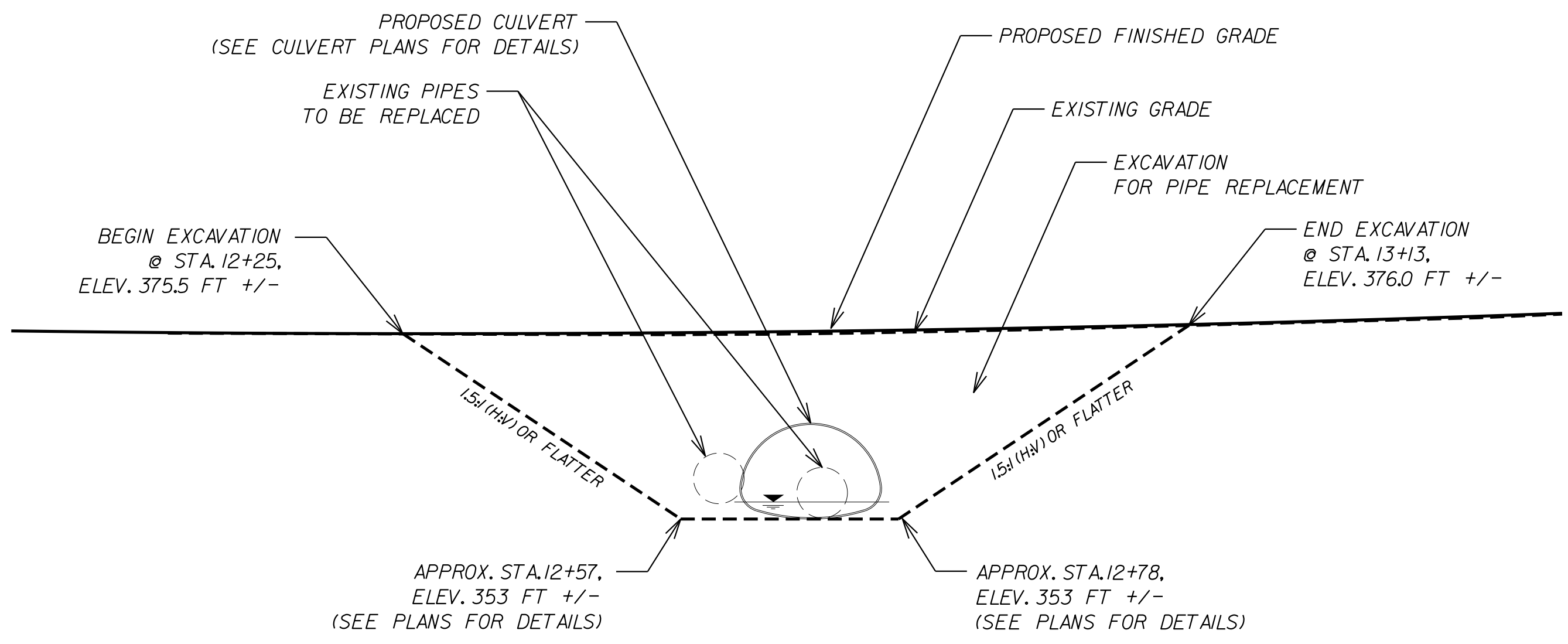
NI-PIPE EXCAVATION LOCATION PLAN

NOT TO SCALE



NI-PIPE EXCAVATION TYPICAL SECTION

NOT TO SCALE

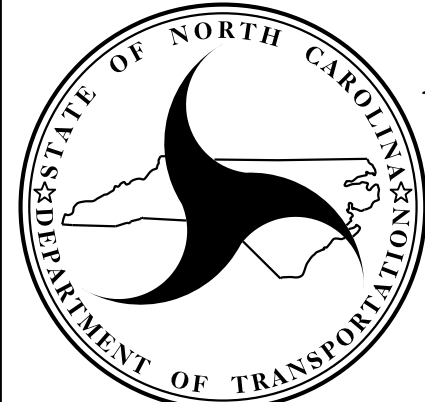


NI-PIPE EXCAVATION LIMIT PROFILE @ CENTER LINE

NOT TO SCALE

FAILED SLOPE CONSTRUCTION:
 FAILED SLOPE MATERIAL SHALL BE REMOVED FIRST AND THEN REMOVE SHEET PILING.
 EXCAVATE FAILED SLOPE FROM STATION 12+25 +/- -L- TO 13+13 +/- -L-, LEFT, AS SHOWN IN THE PLANS AND FAILED SLOPE MATERIALS SHOULD BE WASTED UNLESS ACCEPTED BY THE ENGINEER.
 RECONSTRUCT THE EMBANKMENT IN ACCORDANCE WITH THE ROADWAY PLANS.
 BENCHING FILL INTO THE EXISTING EMBANKMENT IS REQUIRED.
 EXCAVATION FOR THE FAILED SLOPE WILL REQUIRE ADDITIONAL EXCAVATION OUTSIDE THE EXCAVATION NECESSARY FOR THE INSTALLATION OF THE CULVERT.

PREPARED BY: THEIN T. ZAN	DATE: 02-2018
REVIEWED BY: JAMES R. BATTS	DATE: 02-2018



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

**GEOTECHNICAL
ENGINEERING UNIT**

**FAILED SLOPE CONSTRUCTION
ON SR 1160 (SHOCK OVERTON RD)**

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

SUMMARY OF EARTHWORK

IN CUBIC YARDS

Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
-L- Sta. 11+50.00	-L- Sta. 13+75.00	137	118		19
SUBTOTALS:		137	118		19
PROJECT TOTALS:		137	118		19
GRAND TOTALS:		137			
SAY:		150			

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

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

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL	ASPHALT BREAKUP	CONCRETE REMOVAL	CONCRETE BREAKUP
-L-	11+50.00	13+75.00	CL	506.22			
TOTAL:				506.22			
SAY:				510			

REVISIONS

GUARDRAIL SUMMARY

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

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

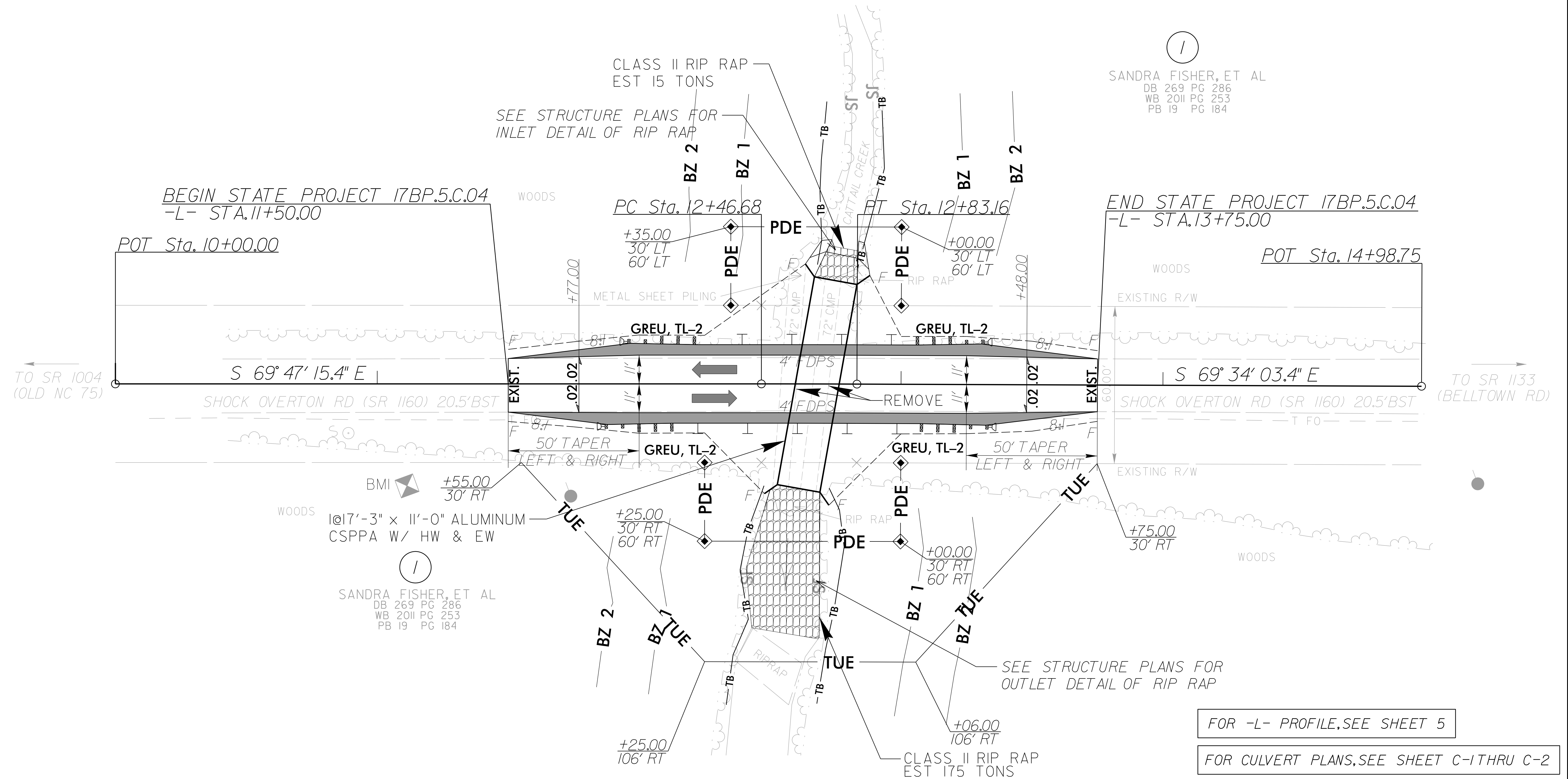
SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS										IMPACT ATTENUATOR TYPE 350	SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	EXTRA LENGTH GUARDRAIL POSTS 7" STEEL	REMARKS					
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	XI	GREU, TL-2	M-350	XIII	CAT-1	TYPE III	BIC	AT-1	G						NG				
-L-	11+96.59	13+30.74	LT	134.15'			12+87.93	12+63.41	4'	6'	0.5'	0.5'	25'	25'																			12	USE EXTRA LONG G/R POSTS, SEE DETAIL SHEET 2C-1
-L-	11+87.93	13+32.38	RT	144.45'			12+47.84	12+72.56	4'	6'	0.5'	0.5'	25'	25'																		12	USE EXTRA LONG G/R POSTS, SEE DETAIL SHEET 2C-1	
SUBTOTAL:				278.60'																												24		
LESS ANCHOR DEDUCTIONS:																																	5	ADDITIONAL EXTRA LENGTH GUARDRAIL POSTS 7" STEEL
GREU, TL-2 (4@25')				100'																														
TOTAL:				178.60'																													29	
SAY:				187.50'																													30	

5/3/2018 11:11:11 AM I:\PROJECTS\17BP.5.C.04\3B-1.dgn

PI Sta 12+64.92
 $\Delta = 0^\circ 13' 12.0''$ (RT)
 $D = 0^\circ 36' 11.2''$
 $L = 36.48'$
 $T = 18.24'$
 $R = 9,500.00'$
 $SE = NC$

NAD 83/NA 2011

(1)
 SANDRA FISHER, ET AL
 DB 269 PG 286
 WB 2011 PG 253
 PB 19 PG 184



BEGIN STATE PROJECT 17BP.5.C.04
 -L- STA. 11+50.00

END STATE PROJECT 17BP.5.C.04
 -L- STA. 13+75.00

TO SR 1004
 (OLD NC 75)

TO SR 1133
 (BELLTOWN RD)

BMI
 +55.00
 30' RT
 1 @ 17'-3" x 11'-0" ALUMINUM
 CSPPA W/ HW & EW

(1)
 SANDRA FISHER, ET AL
 DB 269 PG 286
 WB 2011 PG 253
 PB 19 PG 184

SEE STRUCTURE PLANS FOR
 OUTLET DETAIL OF RIP RAP

FOR -L- PROFILE, SEE SHEET 5

FOR CULVERT PLANS, SEE SHEET C-1 THRU C-2

REVISIONS

4/27/2018
 17BP.5.C.04.L1.L1.RDY_PSH04.dgn
 JSE

5/28/99

PROJECT REFERENCE NO. 17BP.5.C.04	SHEET NO. 5
ROADWAY DESIGN ENGINEER MICHAEL S. BURNS SEAL 045230 DocuSigned by: Michael S. Burns, Jr. 4/25/2018	HYDRAULICS ENGINEER BRANDEN T. BARHAM SEAL 039102 DocuSigned by: Branden T. Barham 4/25/2018
STEWART ENGINEERING & CONSULTANTS, INC. Firm License No. C4253 421 Fayetteville St. Raleigh, NC 27601 www.stewartinc.com	ECOLOGICAL ENGINEERING Firm License No. E-1168 1515 S. Cary Parkway, Suite 101 Cary, NC 27519 www.ecological-engineering.com
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

REVISIONS

390
380
370
360

390
380
370
360

-L-

BM
BENCHTIE IN 10" OAK
N 905462 E 2103140
-BL- STA 7+24.50 RT
ELEV = 374.25'

BEGIN GRADE
-L- STA 11+50.00
EL. 376.11'

PI = 12+70.00
EL = 374.42'
VC = 200'
K = 37
V_D = 30 MPH

END GRADE
-L- STA 13+75.00
EL. 378.55'

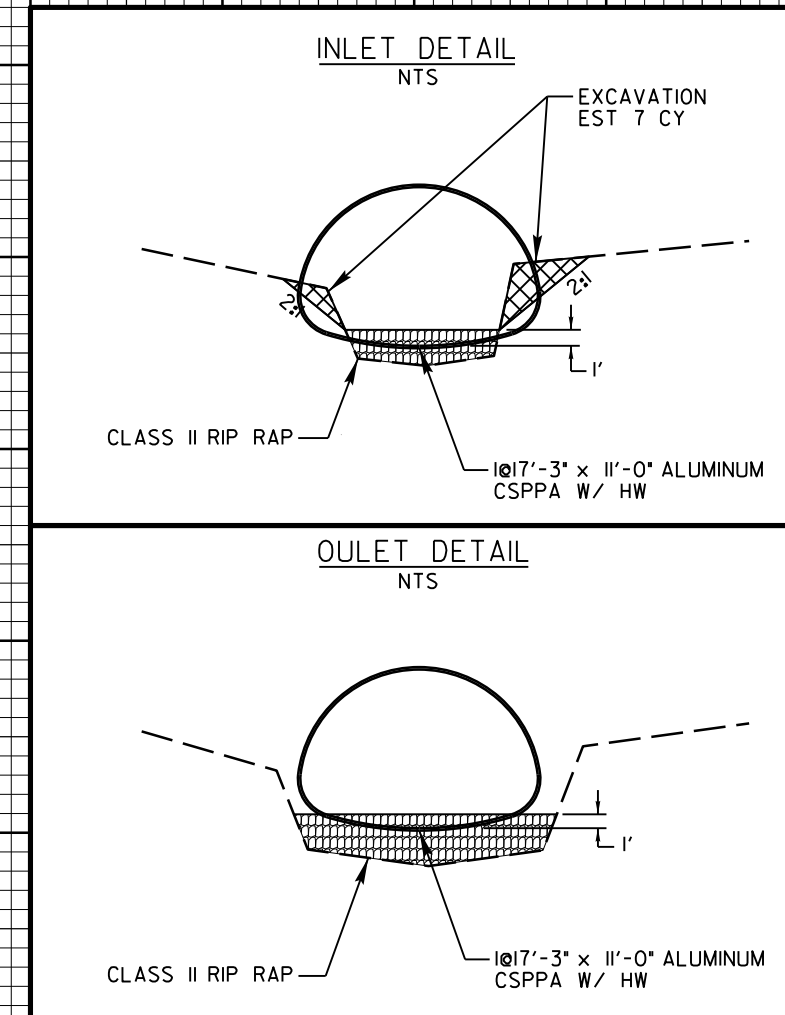
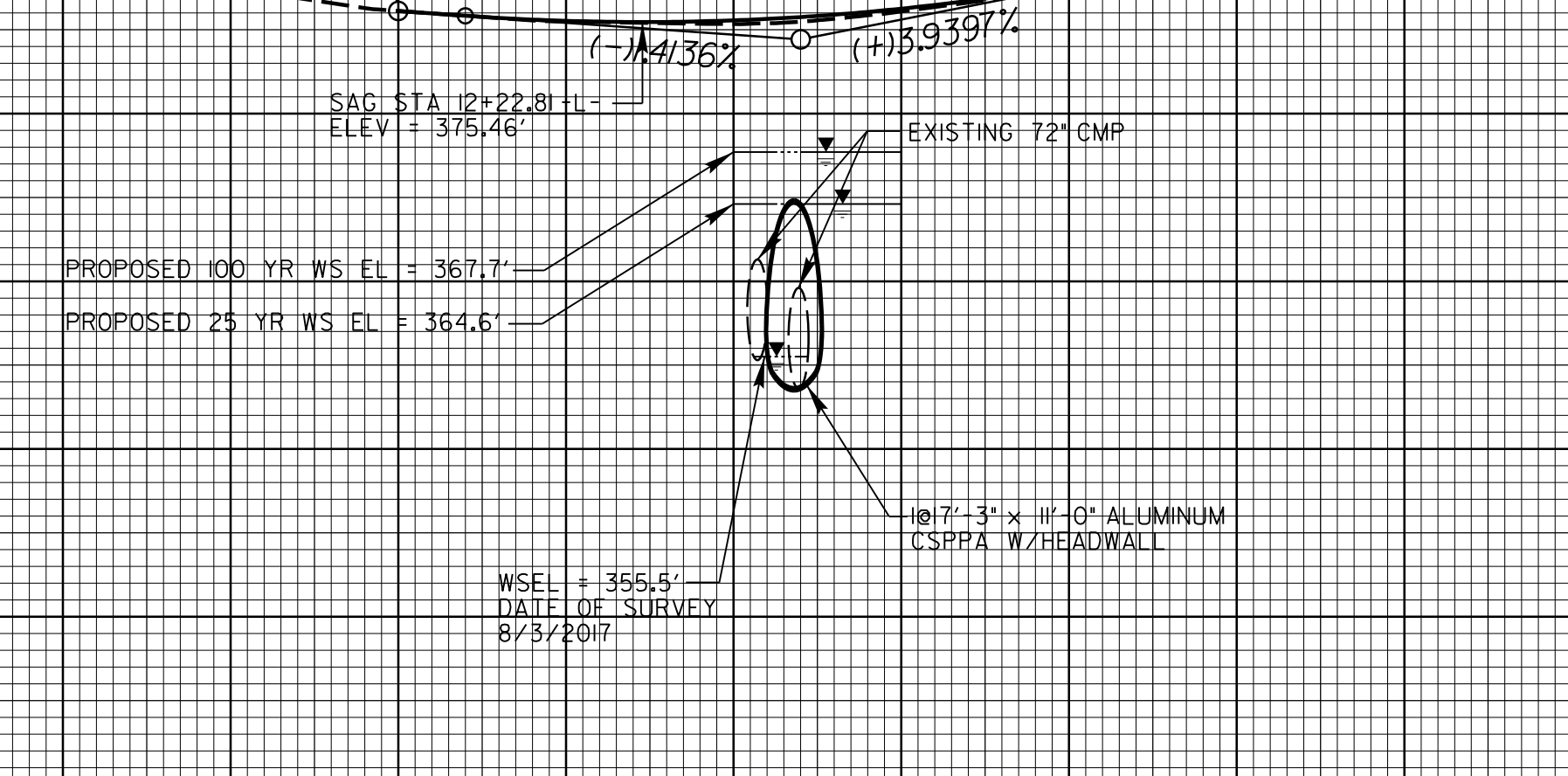
SAG STA 12+22.81+/-
ELEV = 375.46'

EXISTING 72" CMP

PROPOSED 100-YR WS EL = 367.7'
PROPOSED 25-YR WS EL = 364.6'

WSEL = 355.5'
DATE OF SURVEY
8/3/2017

CULVERT HYDRAULIC DATA		
DESIGN DISCHARGE	= 1200	CFS
DESIGN FREQUENCY	= 25	YR
DESIGN HW ELEVATION	= 364.6	FT
BASE DISCHARGE	= 1700	CFS
BASE FREQUENCY	= 100	YR
BASE HW ELEVATION	= 367.7	FT
OVERTOPPING DISCHARGE	= 2300	CFS
OVERTOPPING FREQUENCY	= 500+	YR
OVERTOPPING ELEVATION	= 375.4	FT



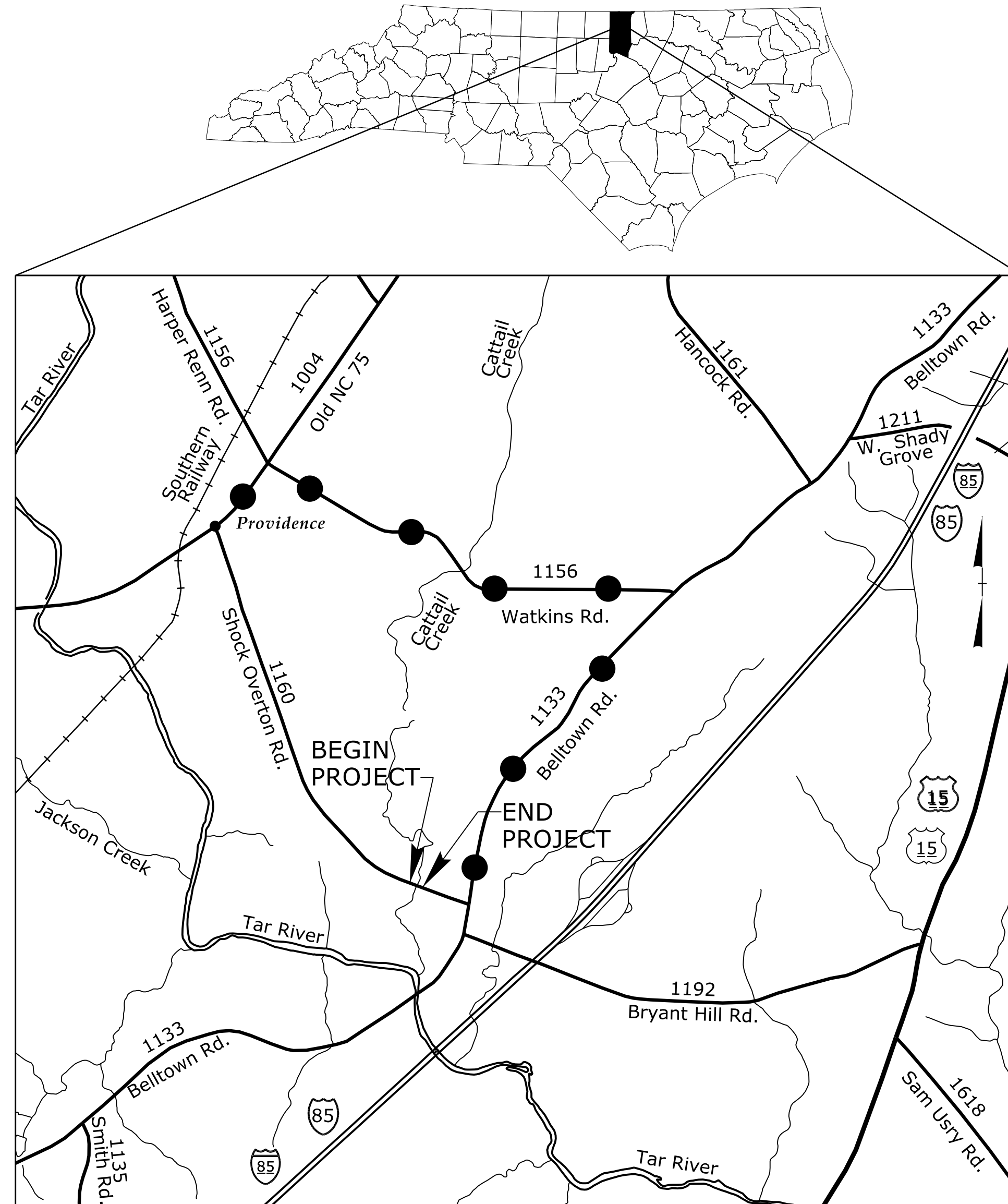
FOR -L- PLAN VIEW, SEE SHEET 4
FOR CULVERT PLANS, SEE SHEET C-1 THRU C-2

4/23/2018
17BP.5.C.04.W.L.L.E.NI.RDY_PSH05.dgn
10:51:00
MS:EBurns

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

GRANVILLE COUNTY



●●●●● OFFSITE DETOUR ROUTE

INDEX OF SHEETS

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

SHEET NO.

TMP-1

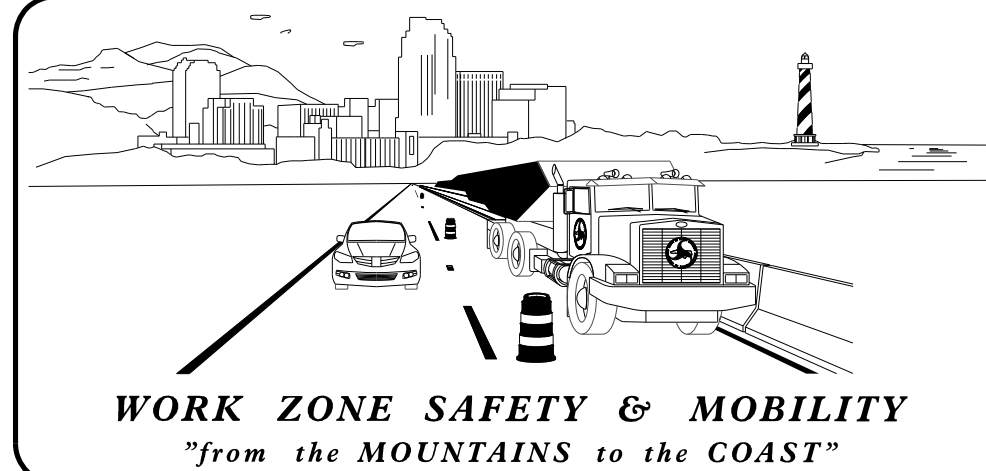
17BP.5.C.04

TIP PROJECT:

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

APPROVED: Michael S. Burns, Jr.
DATE: 4/25/2018

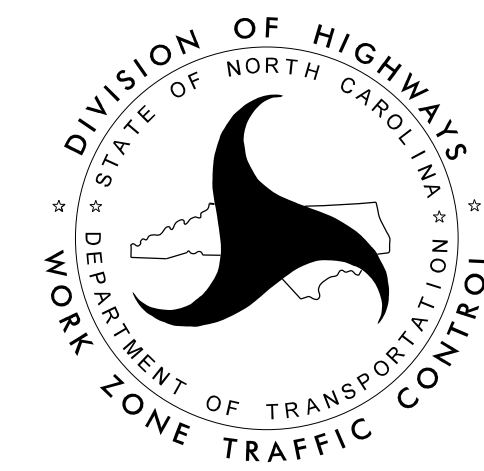
SEAL



PLANS PREPARED BY:



ANDY YOUNG, PE
PROJECT ENGINEER
MICHAEL BURNS, PE
PROJECT DESIGN ENGINEER



ROADWAY STANDARD DRAWINGS

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

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

LEGEND

GENERAL

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

WORK AREA

REMOVAL

SIGNALS

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

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

TRAFFIC CONTROL DEVICES

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

TEMPORARY SIGNING

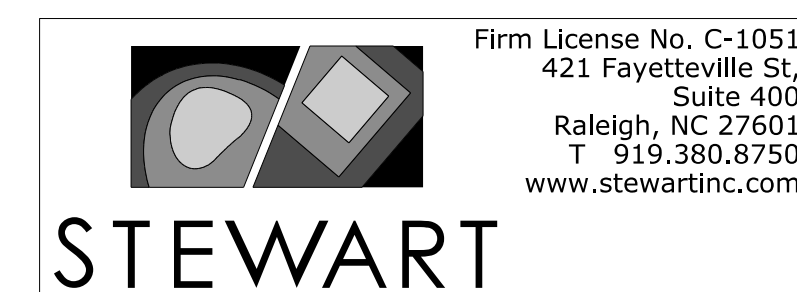
- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

PAVEMENT MARKERS

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

PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

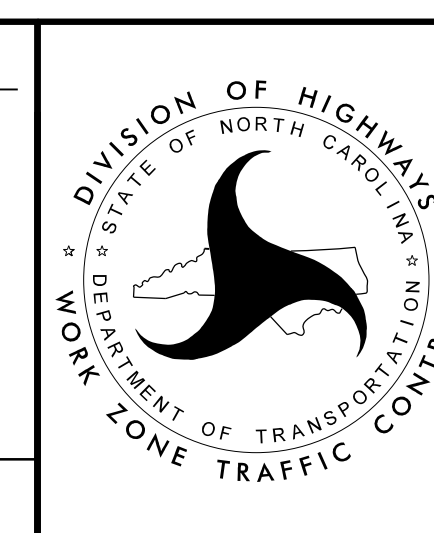


APPROVED:
DocuSigned by: Michael S. Burns, Jr. D425C8CC006F437...

DATE: 4/25/2018

SEAL

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**ROADWAY STANDARD
DRAWINGS & LEGEND**

MANAGEMENT STRATEGIES

DURING CONSTRUCTION OF PROPOSED CULVERT AT CATTAIL CREEK, SR 1160 (SHOCK OVERTON RD.) WILL BE CLOSED TO THROUGH TRAFFIC. THROUGH TRAFFIC ON SR 1160 (SHOCK OVERTON RD.) WILL BE MAINTAINED USING AN OFF-SITE DETOUR.

THE OFF-SITE DETOUR WILL INCLUDE SR 1004, SR 1156, AND SR 1133 (SEE SHEET TMP-3).

GENERAL NOTES

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

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

SIGNING

- A) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRAFFIC CONTROL PLANS.

PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN IN THE TRAFFIC CONTROL PLANS.
- B) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.

COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFF-SITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.
- C) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

LOCAL NOTES

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

PHASING

STEP 1:

PROVIDE AND MAINTAIN CHANGEABLE MESSAGE SIGNS AT EACH END OF SR 1160 (SHOCK OVERTON RD.) FOR FOURTEEN (14) CALENDAR DAYS PRIOR TO ROAD CLOSURE, AS SHOWN ON SHEET TMP-3.

STEP 2:

USING RSD 1101.03, SHEET 1 OF 9, SHEETS TMP-2 AND TMP-3, INSTALL ROAD CLOSURE AND DETOUR SIGNS, PLACE TYPE III BARRICADES TO CLOSE SR 1160 (SHOCK OVERTON RD.) TO THROUGH TRAFFIC, AND DETOUR TRAFFIC OFF-SITE. REMOVE CHANGEABLE MESSAGE SIGNS ONCE DETOUR IS IN PLACE.

STEP 3:

REMOVE EXISTING 72" PIPES.

STEP 4:

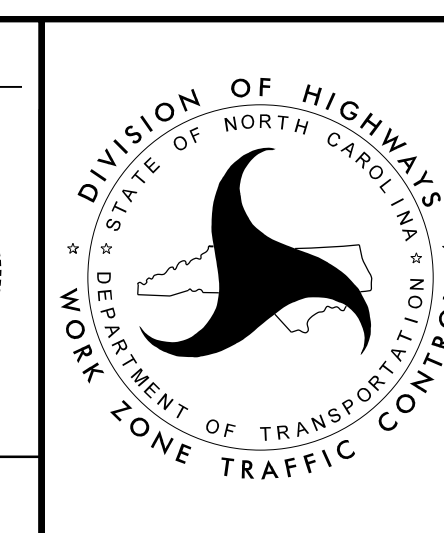
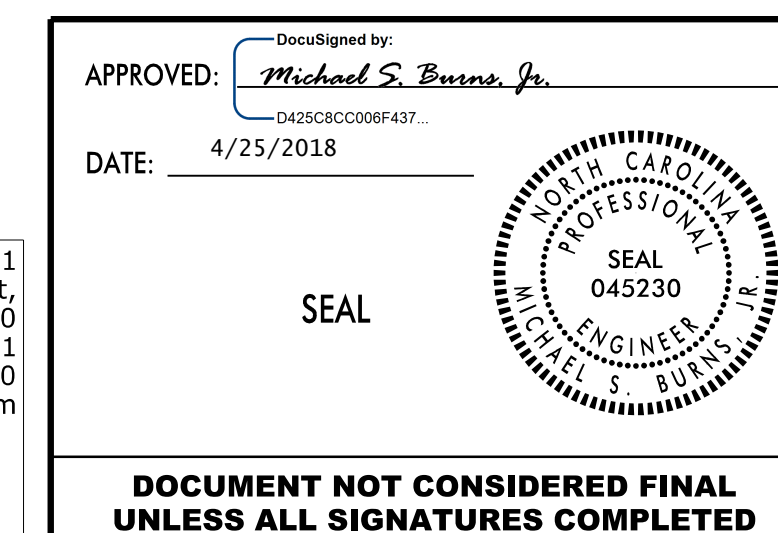
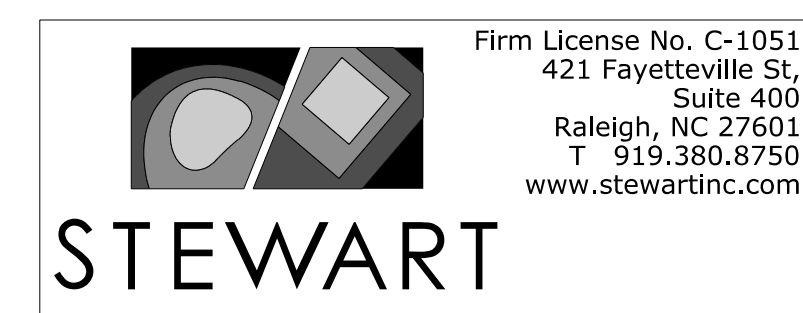
CONSTRUCT THE PROPOSED CULVERT AND ROADWAY.

STEP 5:

PLACE FINAL PAVEMENT MARKINGS ACCORDING TO THE PAVEMENT MARKING PLANS.

STEP 6:

OPEN SR 1160 (SHOCK OVERTON RD.) TO TRAFFIC AND REMOVE ALL WORK ZONE TRAFFIC CONTROL DEVICES.



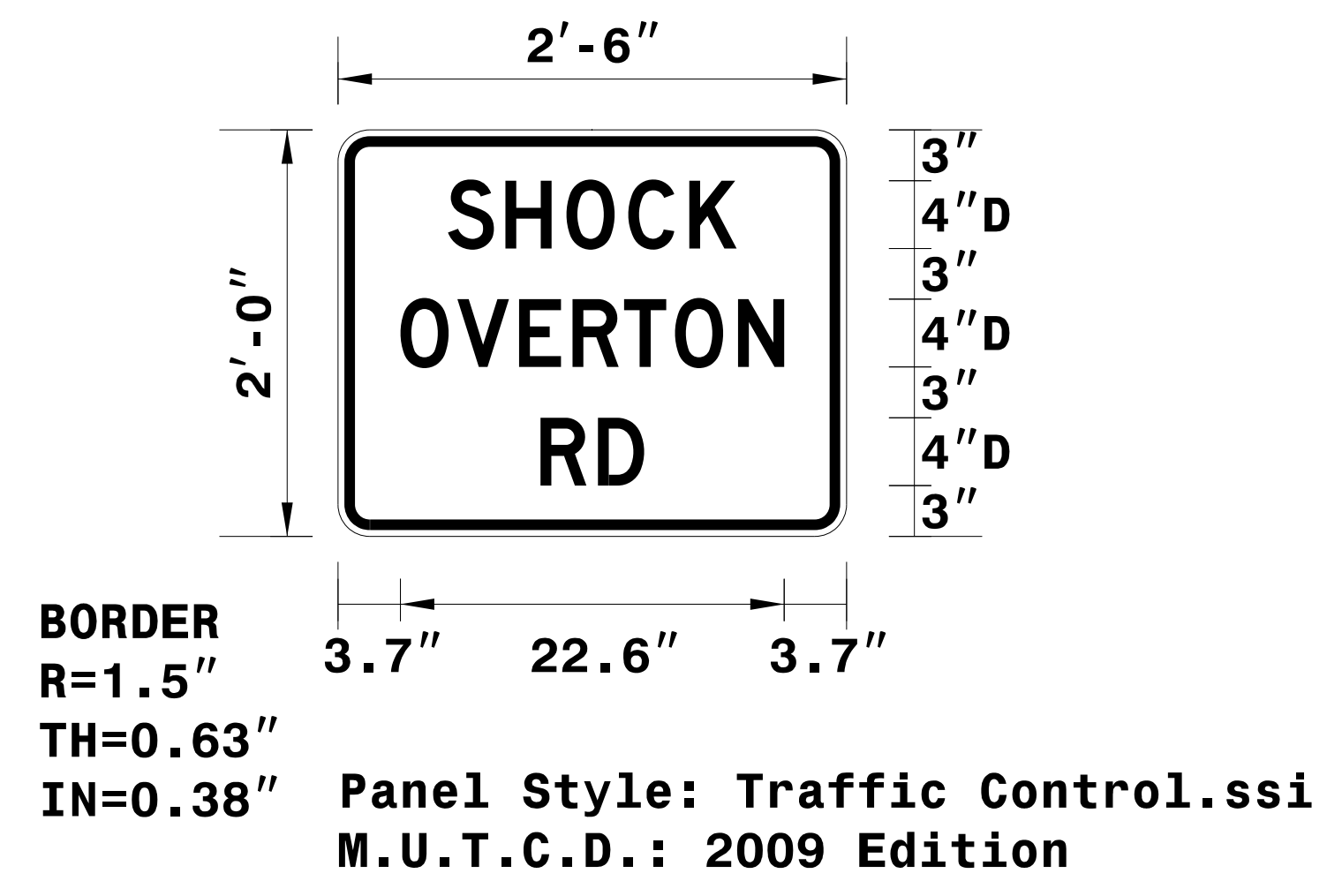
TRANSPORTATION
OPERATIONS
PLAN

SIGN NUMBER: SP-1
 TYPE: STATIONARY
 QUANTITY: SEE PLANS
 SIGN WIDTH: 2'-6"
 HEIGHT: 2'-0"
 TOTAL AREA: 5.0 Sq.Ft.
 BORDER TYPE: INSET
 RECESS: 0.38"
 WIDTH: 0.63"
 RADII: 1.5"
 NO. Z BARS:
 LENGTH:

SYMBOL	X	Y	WID	HT

DESIGN BY: Michael Burns, PE
 PROJECT ID: 17BP.5.R.68
 CHECKED BY: Andy Young, PE
 LOCATION: Franklin County
 Apr 23, 2018
 DIV: 5

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



Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter locations are panel edge to lower left corner

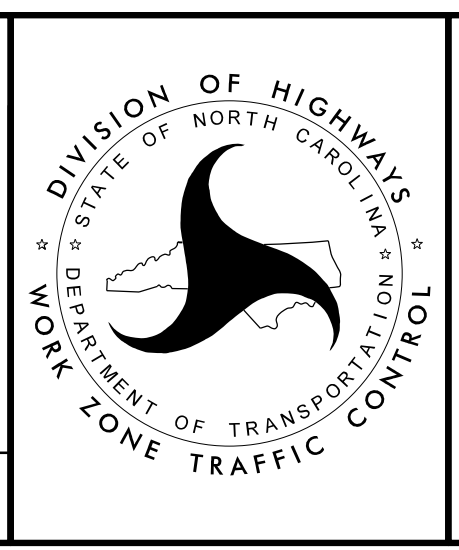
Letter locations are panel edge to lower left corner																	Series/Size
																	Text Length
S	H	O	C	K													D 2000
6.5	9.9	13.5	17.1	20.7													17
O	V	E	R	T	O	N											D 2000
3.7	7	10.7	13.8	16.9	19.9	23.6											22.6
R	D																D 2000
11.9	15.3																6.1

FILENAME: GRANVILLE_NI_TC_TCP-02 NORTH CAROLINA D.O.T. SIGN DETAIL

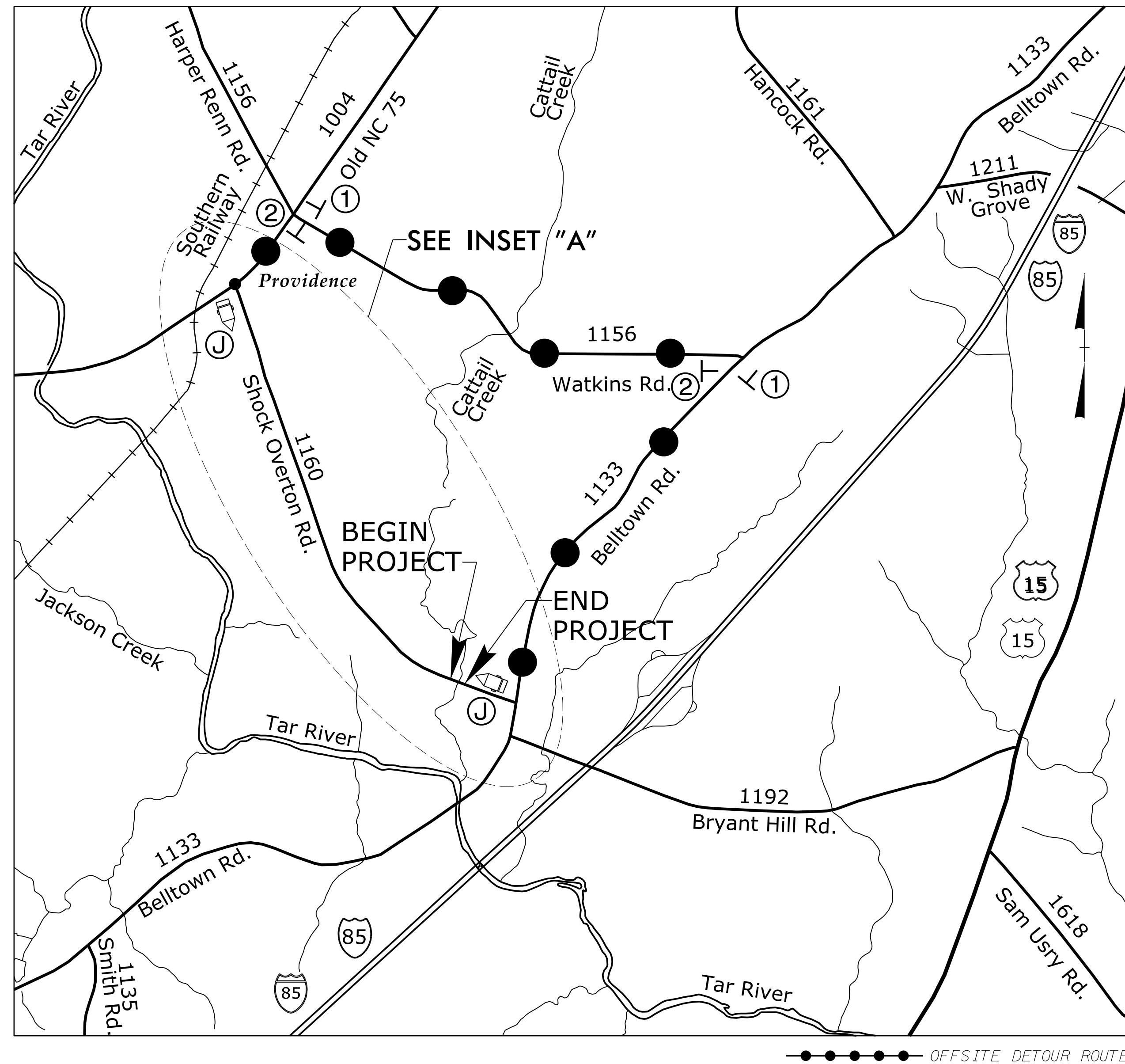
4/23/2018
 \\TCP\GRANVILLE_NI_TC_TCP-02.dgn
 USER:mrburns



APPROVED: *Michael S. Burns, Jr.*
 DATE: 4/25/2018
 SEAL
 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SPECIAL SIGN DESIGN

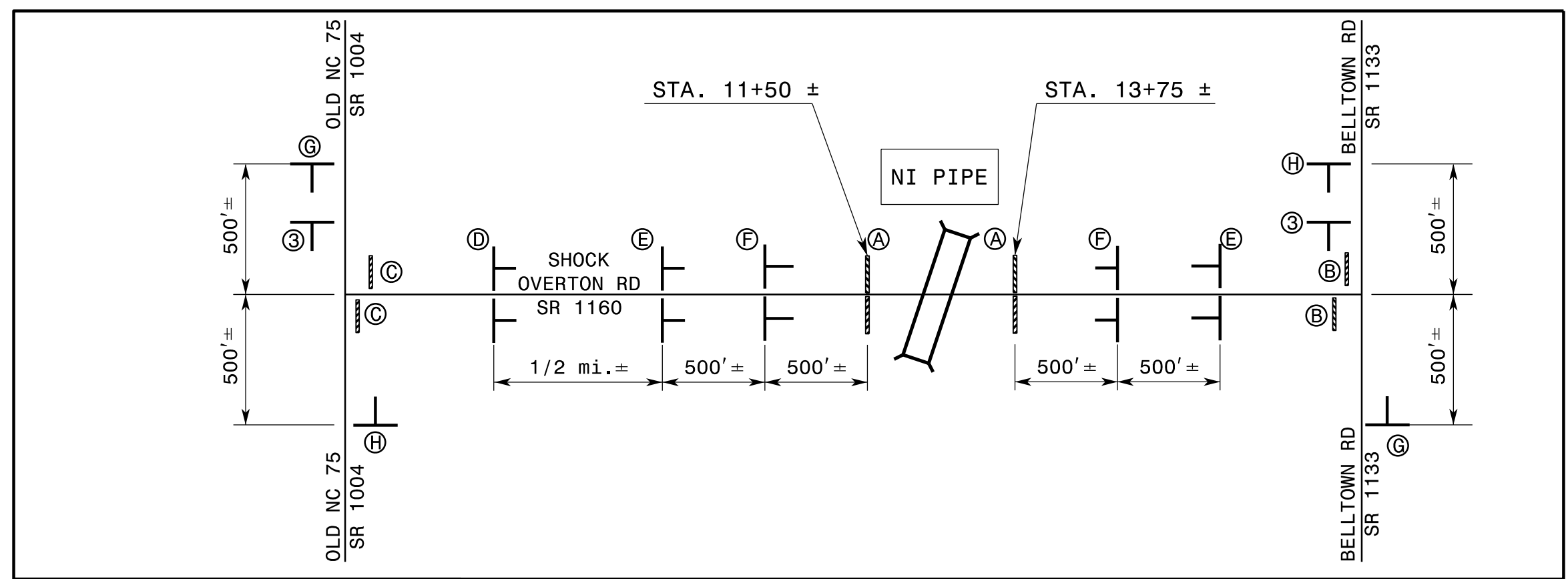


SEE INSET "A"

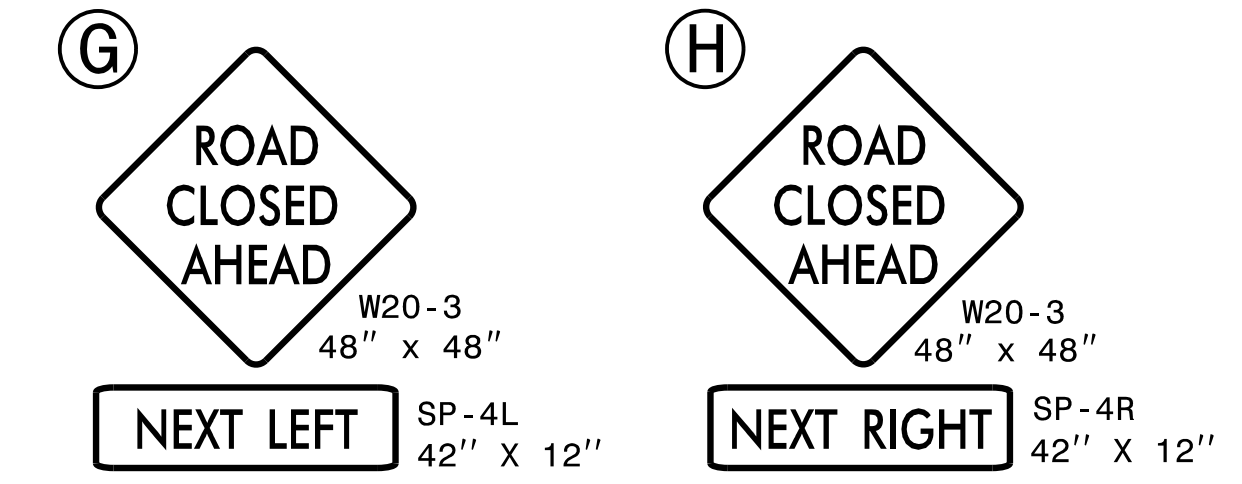
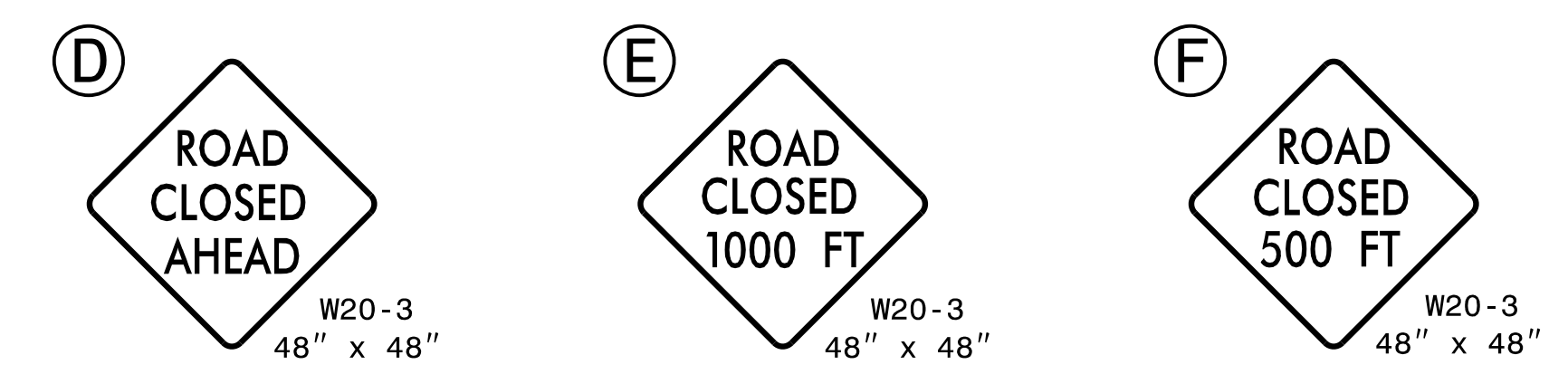
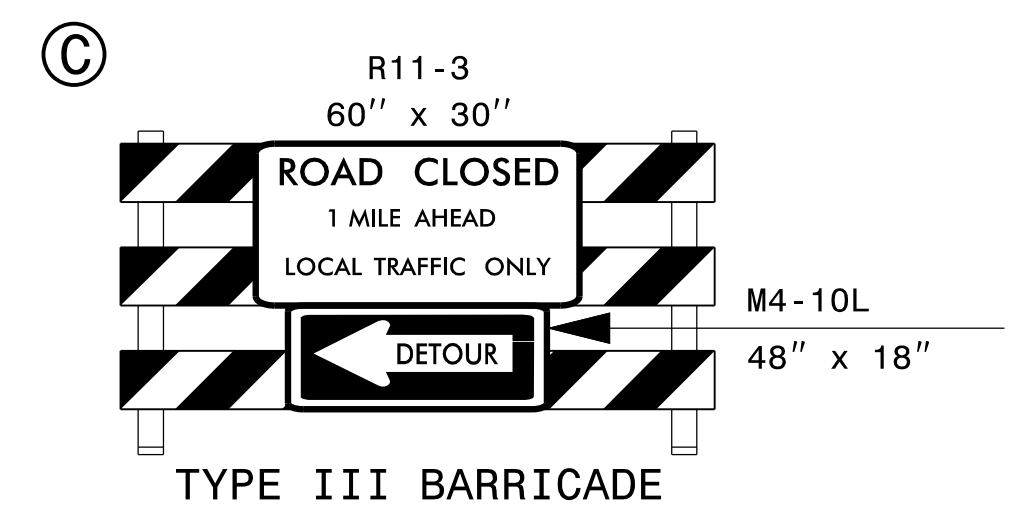
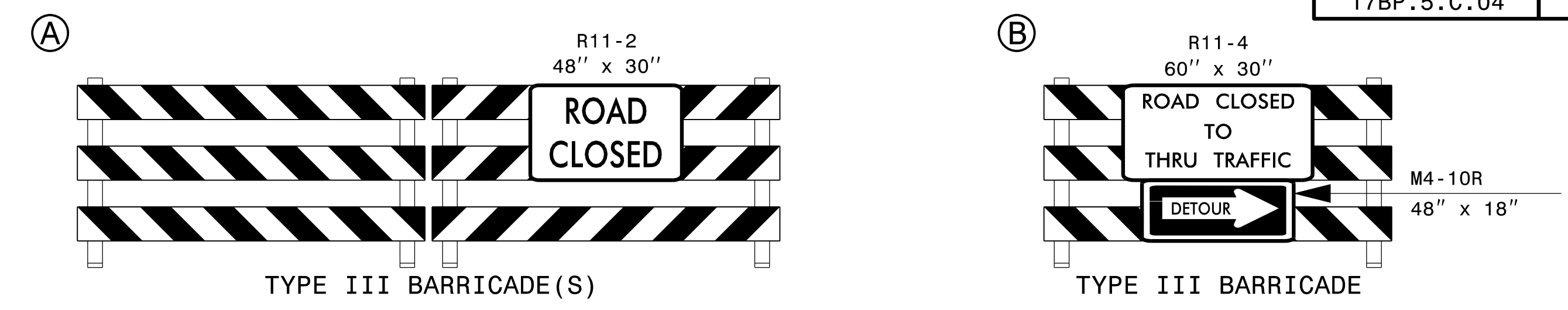
BEGIN PROJECT
END PROJECT

--- OFFSITE DETOUR ROUTE

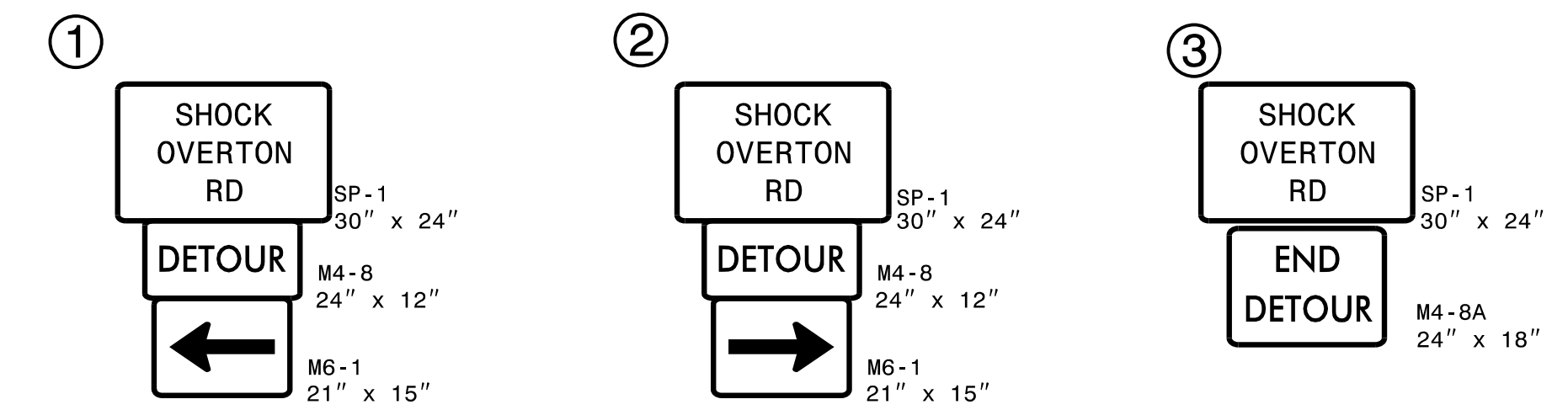
INSET A



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



MESSAGE NO. 1	MESSAGE NO. 2
SHOCK OVERTON ROAD	CLOSED STARTING XX-XX-XX
CHANGEABLE MESSAGE SIGN	



4/23/2018 11:03:00 AM \\TC\N\GRANVILLE_NL_TC_TCP-03.dgn USER:mbruns

STEWART

Firm License No. C-10511
421 Fayetteville St.
Suite 400
Raleigh, NC 27601
T 919.380.8750
www.stewartinc.com

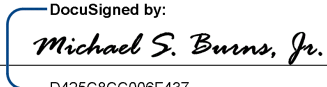

APPROVED: *Michael S. Burns, Jr.*
DATE: 4/25/2018

SEAL

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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

**OFF-SITE
DETOUR**

TIP NO.	SHEET NO.
17BP.5.C.04	PMP - 1
APPROVED:  D425C8C000F437	
DATE: 4/25/2018	
SEAL: 	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

**STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION**

**PAVEMENT MARKING PLAN
GRANVILLE COUNTY**

LOCATION: NON-INVENTORY PIPE AT CATTAIL CREEK ON SR 1160 (SHOCK OVERTON RD.)

TIP.: 17BP.5.C.04

CONTRACT: DE00258

ROADWAY STANDARD DRAWING

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

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

PAVEMENT MARKING SCHEDULE

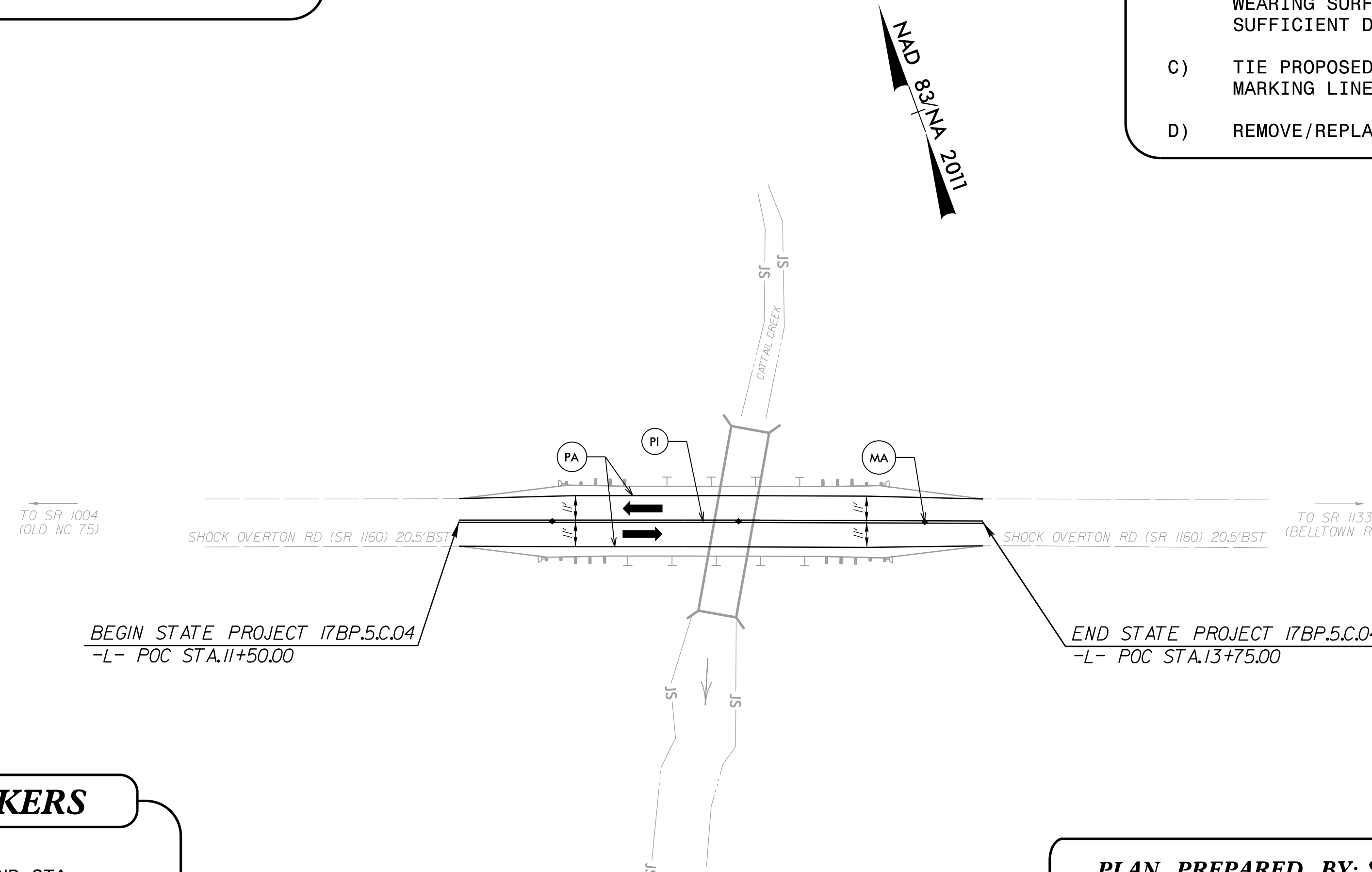
SYMBOL	DESCRIPTION
PA	PAINT, WHITE EDGELINE (4") 2X
PI	PAINT, YELLOW DOUBLE CENTER (4") 2X
MA	YELLOW & YELLOW, PERMANENT RAISED PAVEMENT MARKERS

GENERAL NOTES

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

- A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKER
SHOCK OVERTON RD.	PAINT	RAISED
- B) PLACE TWO APPLICATIONS OF PAINT PAVEMENT MARKINGS ON THE FINAL WEARING SURFACE. PLACE THE SECOND APPLICATION OF PAINT UPON SUFFICIENT DRYING TIME OF THE FIRST.
- C) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
- D) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS.



RAISED PAVEMENT MARKERS

TYP. SPACING	BEGIN STA.	END STA.
80'	11+50 +/-	13+75 +/-

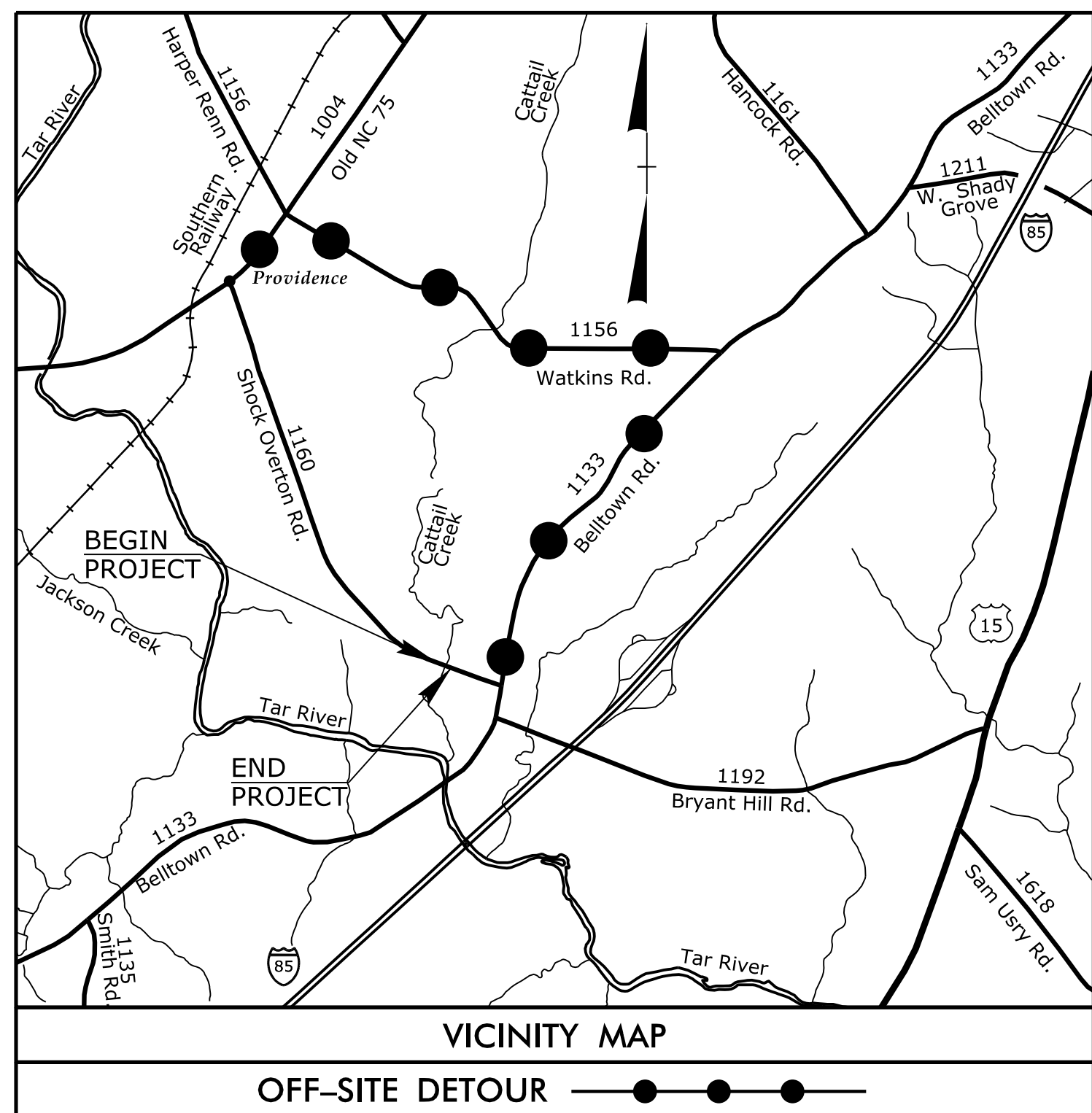
PLAN PREPARED BY: STEWART

ANDY YOUNG, PE PROJECT ENGINEER
MICHAEL BURNS, PE PROJECT DESIGN ENGINEER



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

TIP PROJECT: 17BP.5.C.04



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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

GRANVILLE COUNTY

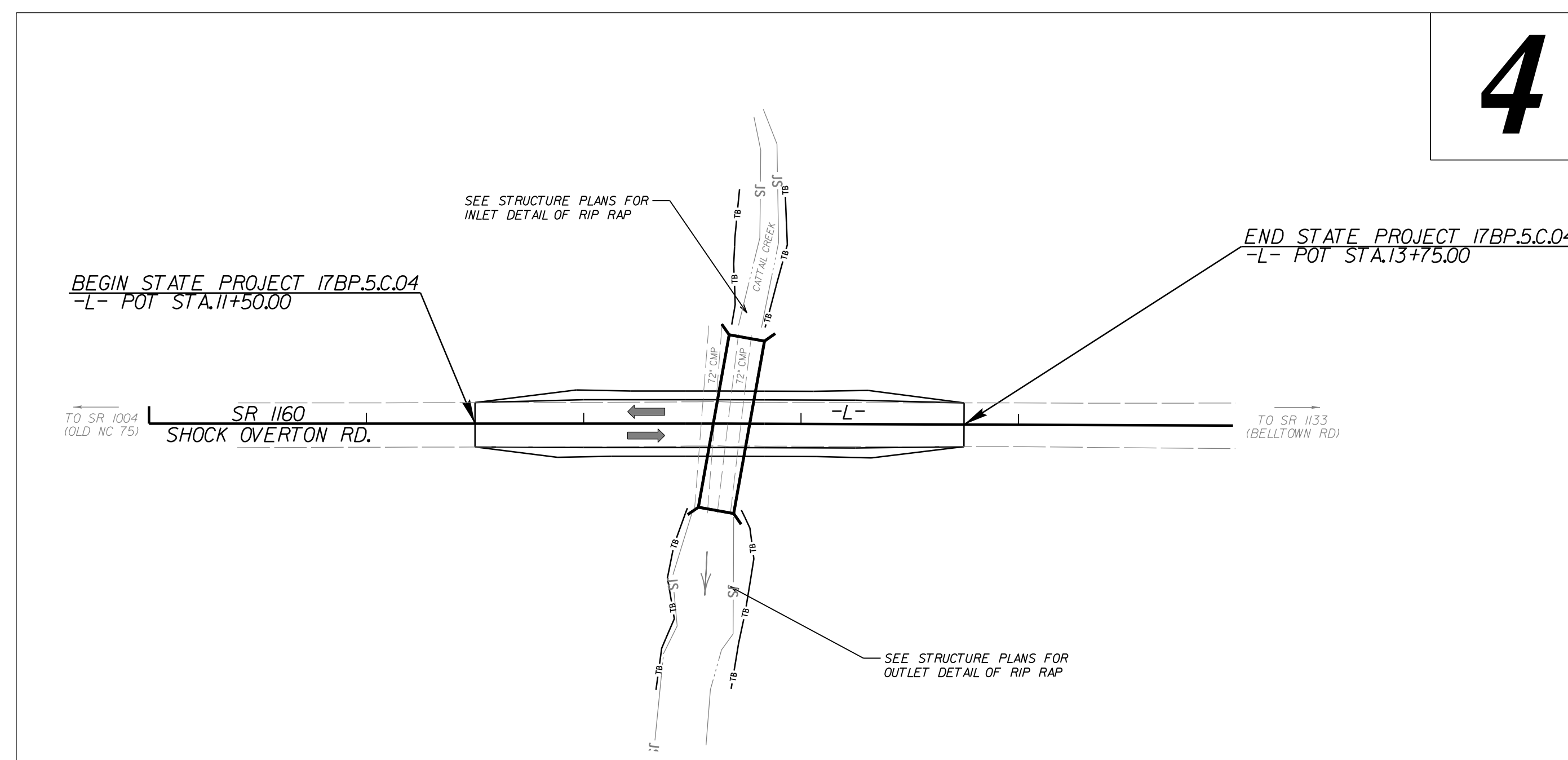
**LOCATION: NON-INVENTORY PIPE AT CATTAIL CREEK
ON SR 1160(SHOCK OVERTON RD.)**

TYPE OF WORK: DRAINAGE AND PAVING

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.5.C.04	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
17BP.5.C.04	N/A	PE	

EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	III III III
1606.01	Special Sediment Control Fence	△△△△△
1622.01	Temporary Berms and Slope Drains	▽▽▽▽
1650.02	Silt Basin Type B	▨
1633.01	Temporary Rock Silt Check Type-A	⊗
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	⊗
1633.02	Temporary Rock Silt Check Type-B	▶
	Wattle/Coir Fiber Wattle	○
	Wattle/Coir Fiber Wattle with Polyacrylamide (PAM)	○
1634.01	Temporary Rock Sediment Dam Type-A	▬
1634.02	Temporary Rock Sediment Dam Type-B	▬
1655.01	Rock Pipe Inlet Sediment Trap Type-A	⊓
1655.02	Rock Pipe Inlet Sediment Trap Type-B	⊓
1630.04	Stilling Basin	▭
1630.06	Special Stilling Basin	▭
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1652.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	▭
	Tiered Skimmer Basin	▭
	Infiltration Basin	▭

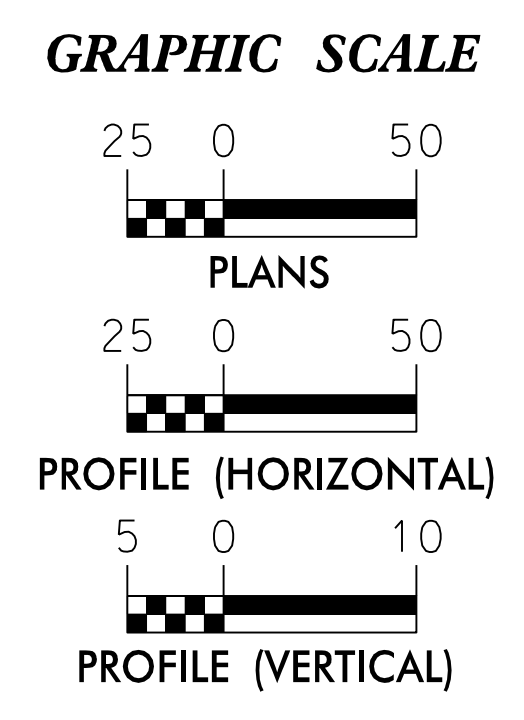


THIS PROJECT CONTAINS EROSION CONTROL PLANS FOR CLEARING AND GRUBBING PHASE OF CONSTRUCTION.

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

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



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

Prepared in the Office of:

ECOLOGICAL ENGINEERING

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

Designed by:

BRANDON BARHAM, PE 3368
NAME LEVEL III CERTIFICATION NO.

Reviewed in the Office of:

ROADSIDE ENVIRONMENTAL UNIT

1 South Wilmington St.
Raleigh, NC 27611

2018 STANDARD SPECIFICATIONS

Reviewed by:

DONALD PEARSON

Roadway Standard Drawings

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

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

4/26/2016 GRANVILLE.NC.REU.TIP.dgn
USE:Road Fault

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.

PROJECT REFERENCE NO. 17BP.5.C.04	SHEET NO. EC-03/CONST.04
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<small>Firm License No. C-2151 421 Fayetteville St. Raleigh, NC 27601 P: 919.386.1750 www.stewartinc.com</small>	<small>NC FIRM LICENSE No. E-1148 1515 S. Cary Parkway, Suite 101 Cary, NC 27513 (919) 552-9292</small>
STEWART	ECOLOGICAL ENGINEERING

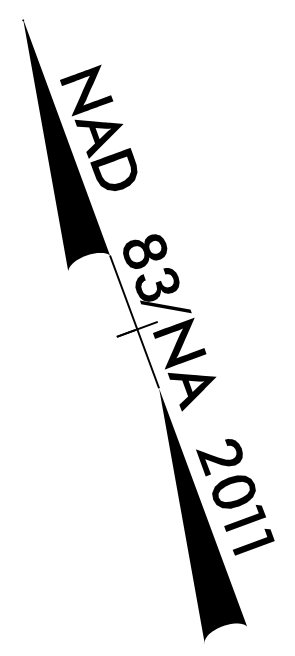
PI Sta 12+64.92
 $\Delta = 0^{\circ}13'12.0''$ (RT)
 $D = 0^{\circ}36'11.2''$
 $L = 36.48'$
 $T = 18.24'$
 $R = 9,500.00'$
 $SE = NC$

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 04

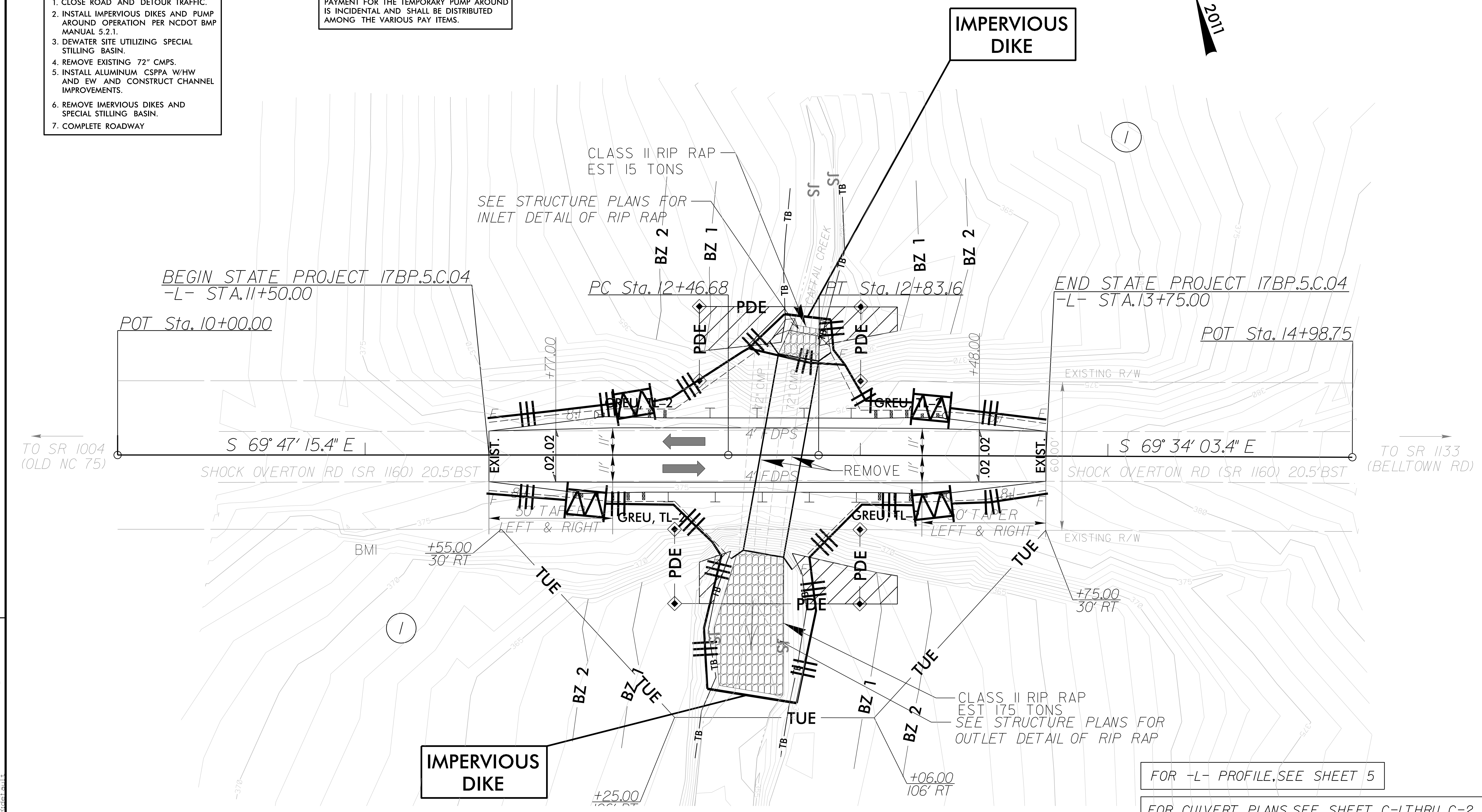
 ENVIRONMENTALLY SENSITIVE AREA
 SEE PROJECT SPECIAL PROVISIONS

NOTE:
 PAYMENT FOR THE TEMPORARY PUMP AROUND
 IS INCIDENTAL AND SHALL BE DISTRIBUTED
 AMONG THE VARIOUS PAY ITEMS.

- CONSTRUCTION SEQUENCE
1. CLOSE ROAD AND DETOUR TRAFFIC.
 2. INSTALL IMPERVIOUS DIKES AND PUMP AROUND OPERATION PER NCDOT BMP MANUAL 5.2.1.
 3. DEWATER SITE UTILIZING SPECIAL STILLING BASIN.
 4. REMOVE EXISTING 72" CMPS.
 5. INSTALL ALUMINUM CSPPA W/HW AND EW AND CONSTRUCT CHANNEL IMPROVEMENTS.
 6. REMOVE IMPERVIOUS DIKES AND SPECIAL STILLING BASIN.
 7. COMPLETE ROADWAY



REVISIONS



TO SR 1004 (OLD NC 75)

TO SR 1133 (BELLTOWN RD)

BEGIN STATE PROJECT 17BP.5.C.04
-L- STA. 11+50.00

PC Sta. 12+46.68 PT Sta. 12+83.6

END STATE PROJECT 17BP.5.C.04
-L- STA. 13+75.00

POT Sta. 10+00.00

POT Sta. 14+98.75

S 69° 47' 15.4" E
SHOCK OVERTON RD (SR 1160) 20.5' BST

S 69° 34' 03.4" E
SHOCK OVERTON RD (SR 1160) 20.5' BST



IMPERVIOUS DIKE

IMPERVIOUS DIKE

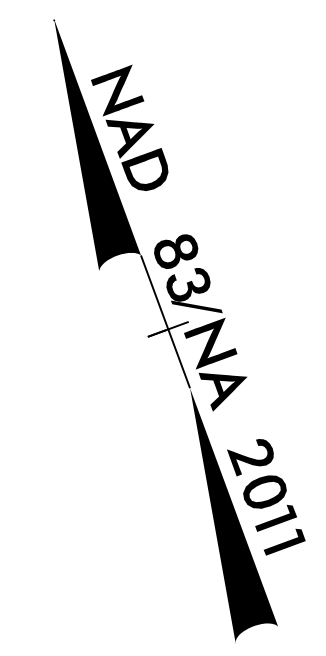
FOR -L- PROFILE, SEE SHEET 5

FOR CULVERT PLANS, SEE SHEET C-1 THRU C-2

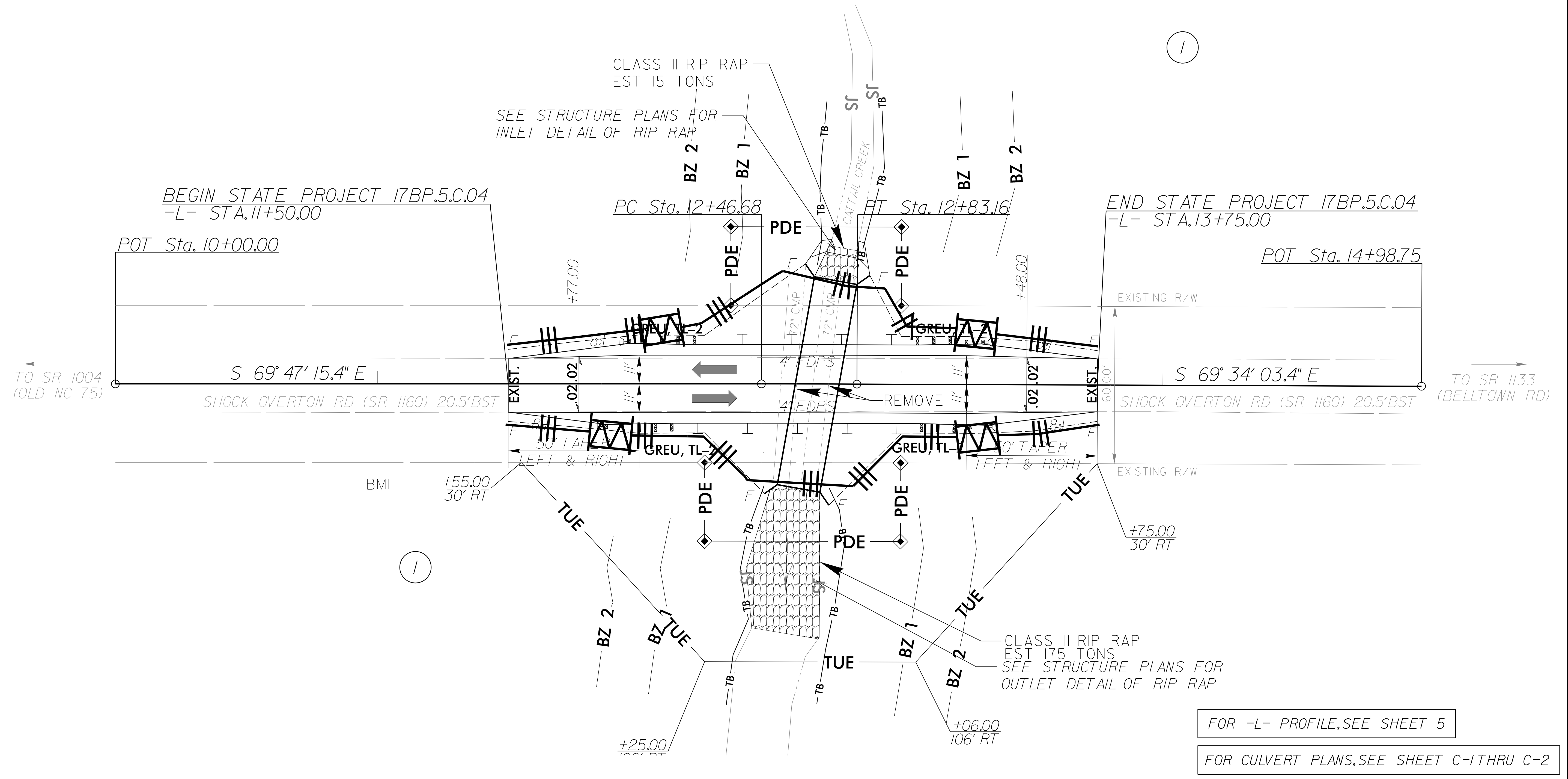
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PROJECT REFERENCE NO. 17BP.5.C.04	SHEET NO. EC-04/CONST.04
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
 STEWART	 ECOLOGICAL ENGINEERING

PI Sta 12+64.92
 $\Delta = 0^\circ 13' 12.0''$ (RT)
 $D = 0^\circ 36' 11.2''$
 $L = 36.48'$
 $T = 18.24'$
 $R = 9,500.00'$
 $SE = NC$



REVISIONS



TO SR 1004 (OLD NC 75)

TO SR 1133 (BELLTOWN RD)

FOR -L- PROFILE, SEE SHEET 5

FOR CULVERT PLANS, SEE SHEET C-1 THRU C-2

4/24/2018 4:24:00 PM LE_NI_REU_FINAL.dgn

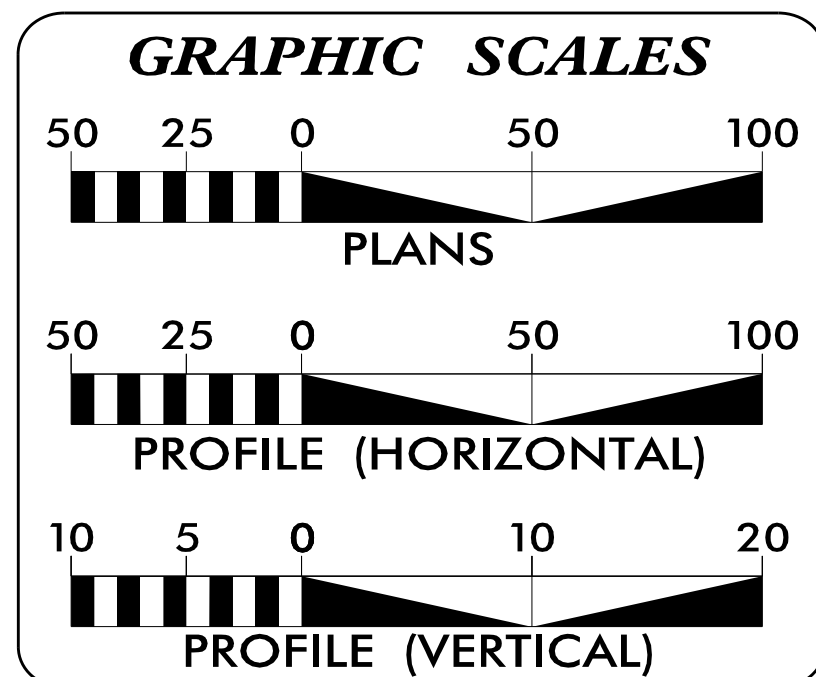
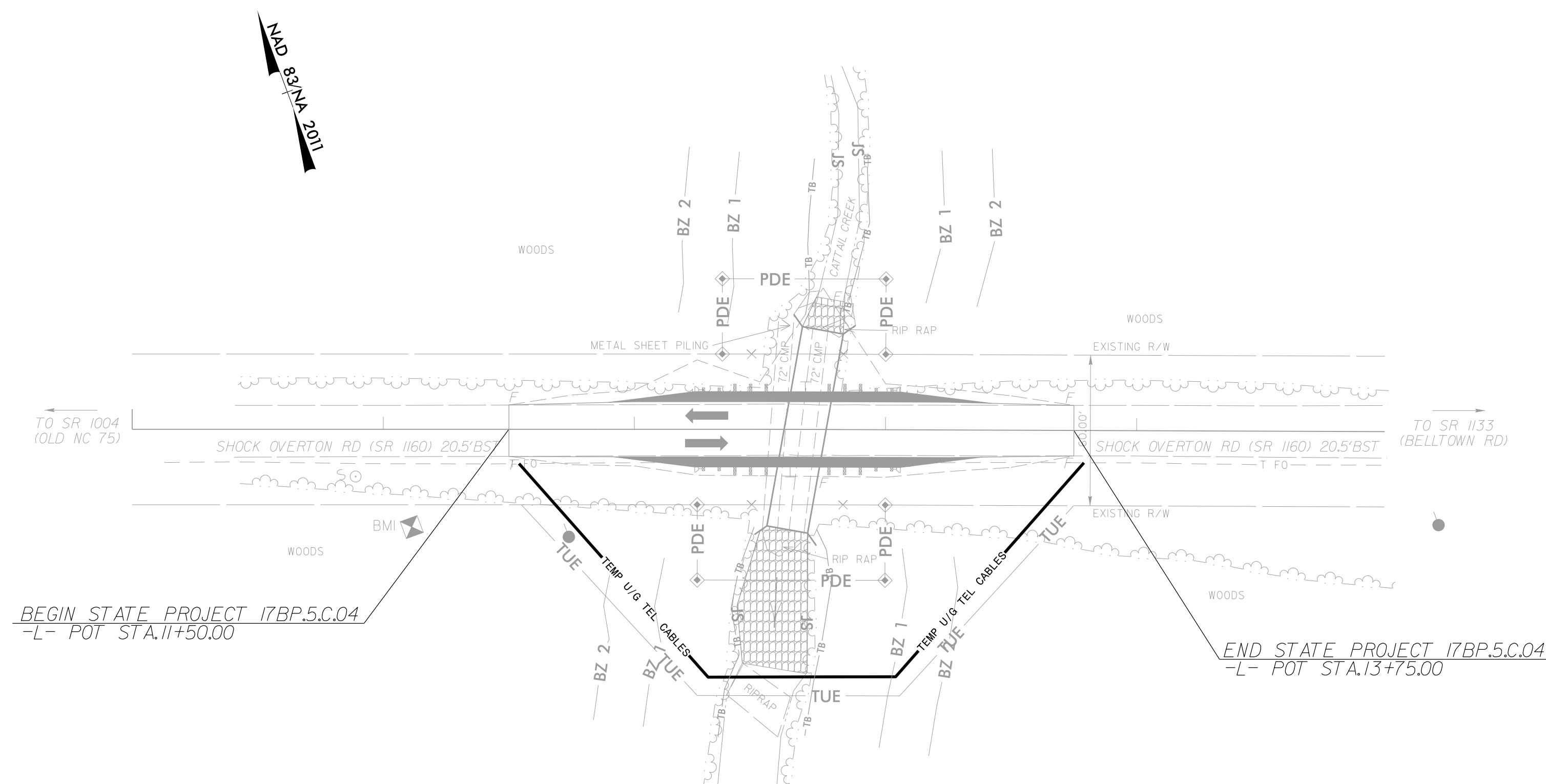
T.I.P. NO.	SHEET NO.
17BP.5.C.04	UO-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

**UTILITIES BY OTHERS PLANS
GRANVILLE COUNTY**

**LOCATION: NON-INVENTORY PIPE AT CATTAIL CREEK
ON SR 1160 (SHOCK OVERTON RD.)**

TYPE OF WORK: TEMPORARY AND PERMANENT FIBER OPTIC RELOCATION



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

UTILITY OWNERS ON PROJECT

(A) CENTURYLINK - FIBER OPTIC

(B) DUKE ENERGY - POWER

PREPARED IN THE OFFICE OF:

STEWART

421 FAYETTEVILLE ST., STE 400
RALEIGH, NC 27601
F 919.386.8750

Firm License #: C-0051
www.stewartinc.com
PROJECT #1811001

DAVID RUGGLES, PE PROJECT ENGINEER

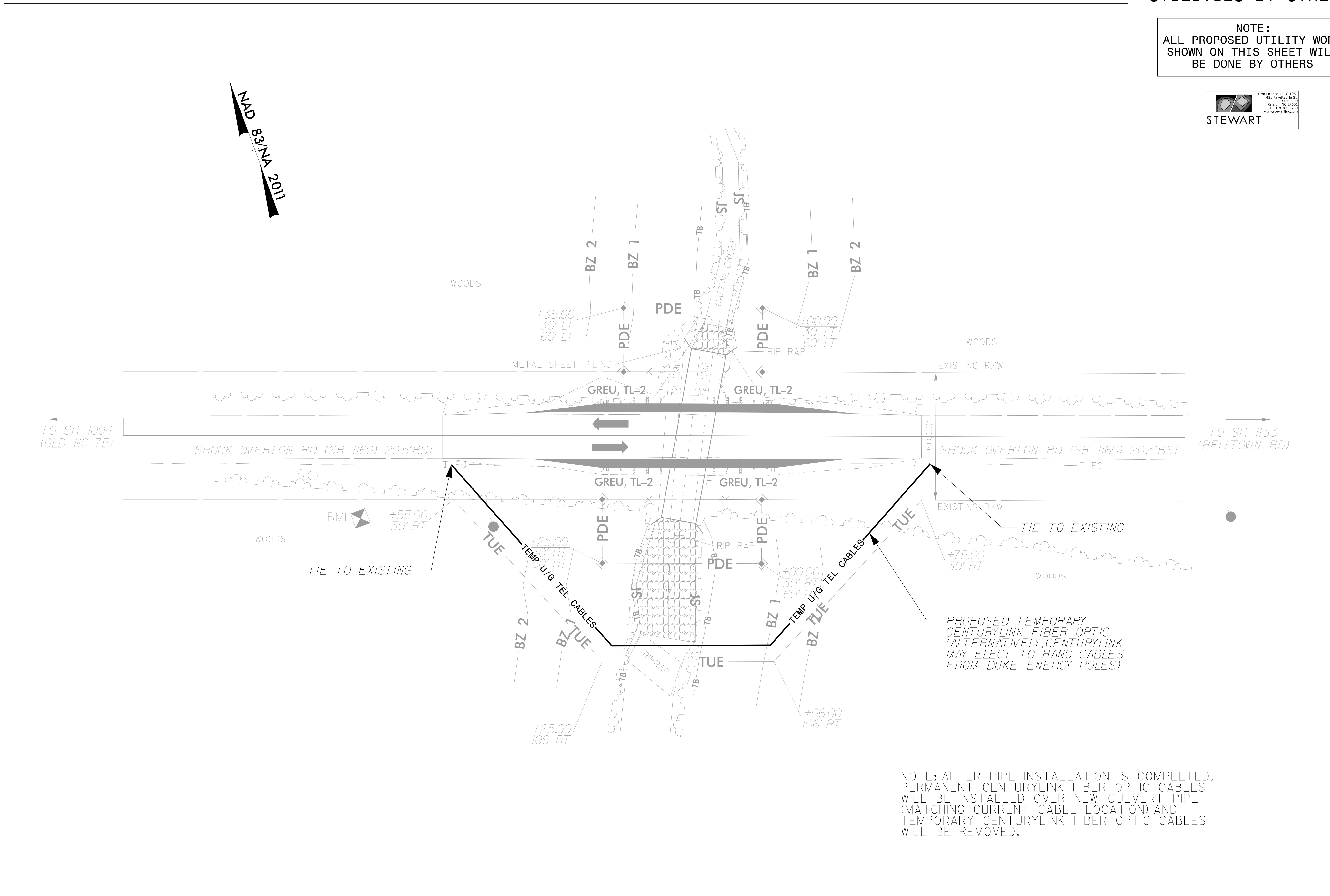
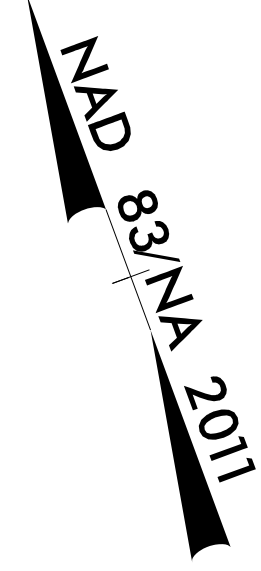
ELIZABETH PHELPS, EI PROJECT DESIGN ENGINEER

UTILITIES BY OTHERS

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



8/17/99



PROPOSED TEMPORARY CENTURYLINK FIBER OPTIC (ALTERNATIVELY, CENTURYLINK MAY ELECT TO HANG CABLES FROM DUKE ENERGY POLES)

NOTE: AFTER PIPE INSTALLATION IS COMPLETED, PERMANENT CENTURYLINK FIBER OPTIC CABLES WILL BE INSTALLED OVER NEW CULVERT PIPE (MATCHING CURRENT CABLE LOCATION) AND TEMPORARY CENTURYLINK FIBER OPTIC CABLES WILL BE REMOVED.

**STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS**

CROSS-SECTION SUMMARY

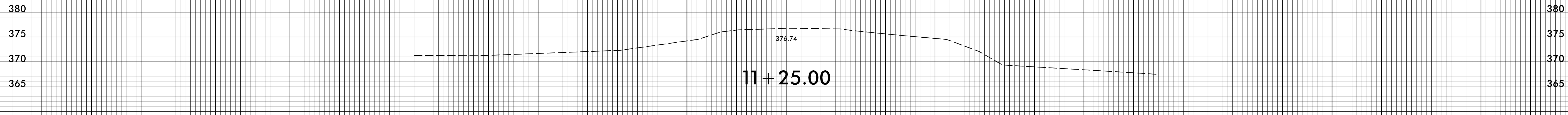
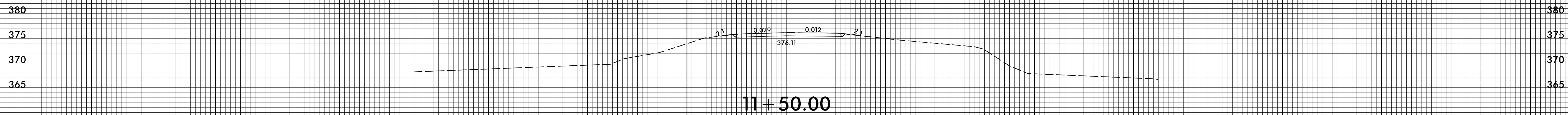
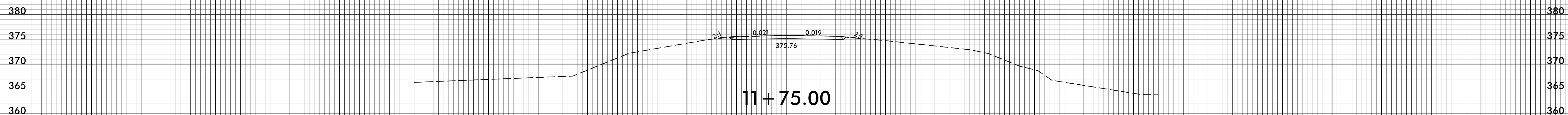
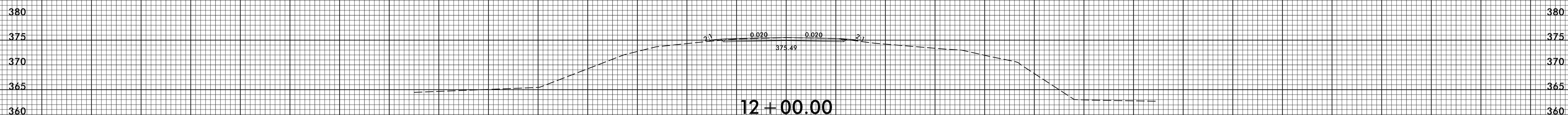
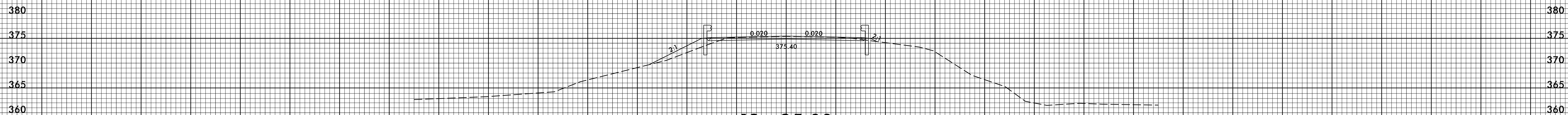
NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

Station	Uncl. Exc.	Embt
L	(cu. yd.)	(cu. yd.)
11+50.00	0	0
11+75.00	13	0
12+00.00	13	0
12+25.00	13	7
12+50.00	12	7
12+75.00	8	56
13+00.00	9	56
13+25.00	12	2
13+50.00	11	2
13+75.00	12	1

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

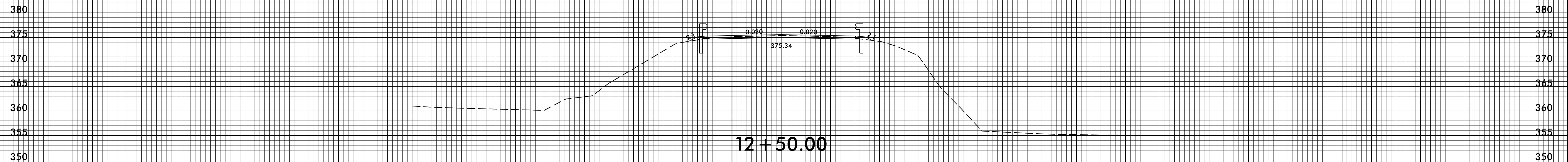
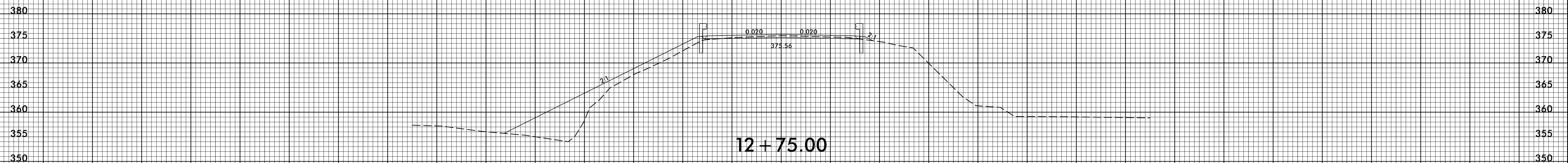
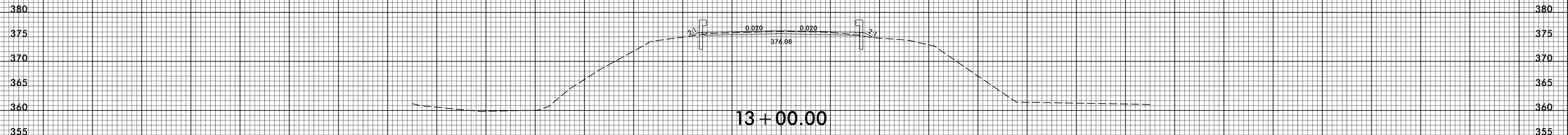
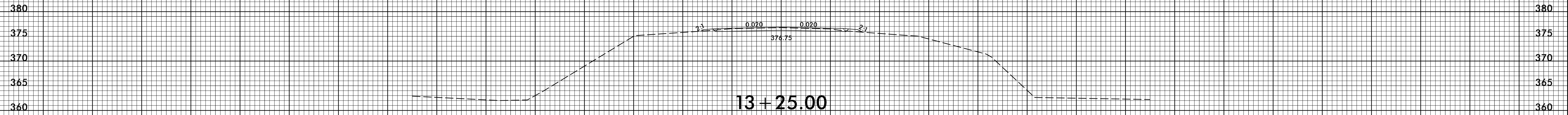
REVISIONS

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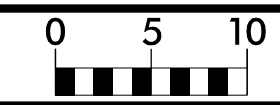
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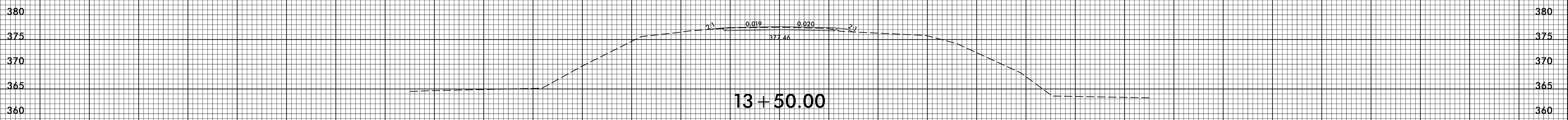
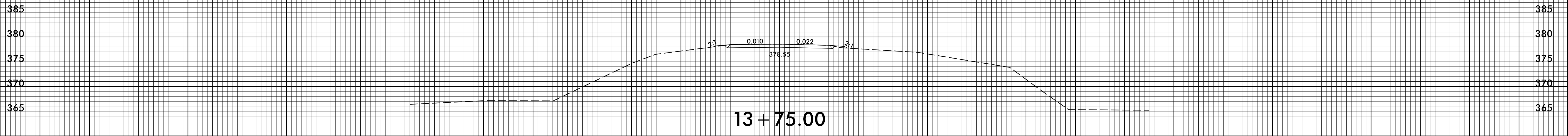
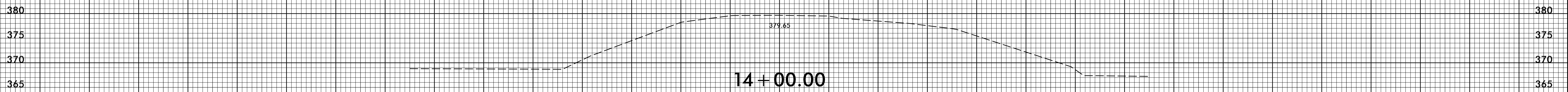


-L-

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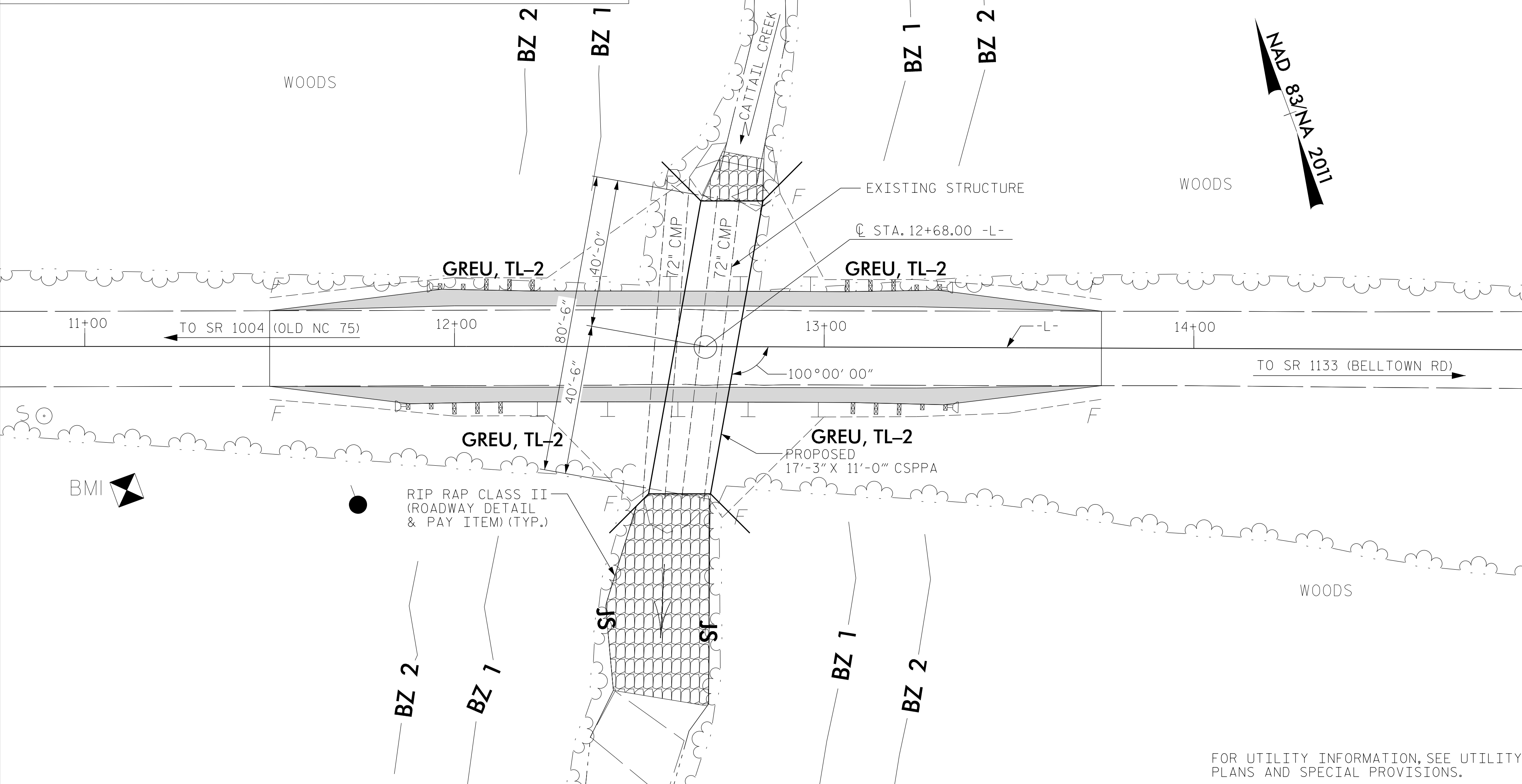
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-L-

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

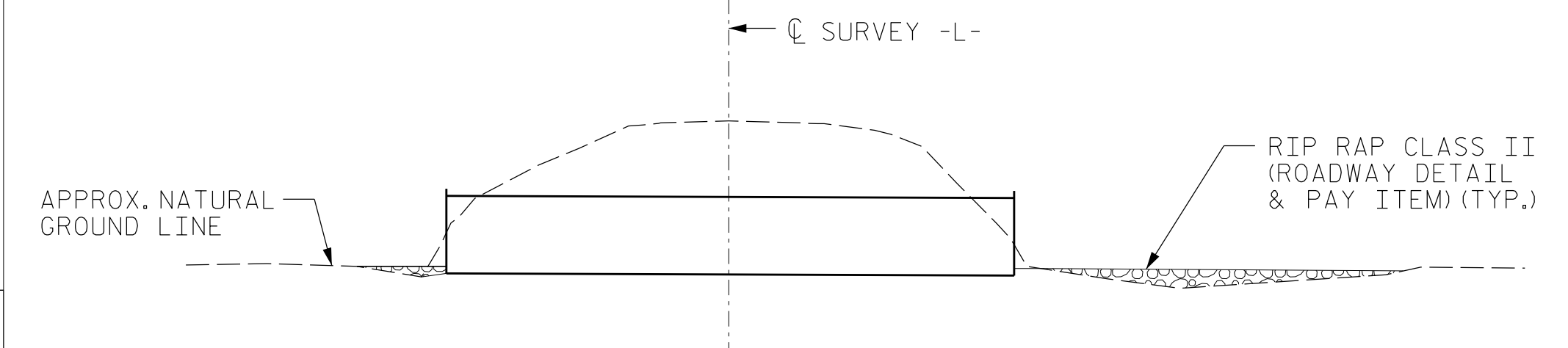
BENCHMARK BMI: BENCHTIE IN 10" OAK 39' RIGHT OF -L- STA. 11+11.00, EL. 374.25



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

1. ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
2. DESIGN FILL IS 11 FEET.
3. THE EXISTING CULVERT 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 CULVERT SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
4. FOR ALUMINUM ALLOY STRUCTURAL PLATE PIPE AND PIPE ARCH, SEE SPECIAL PROVISIONS.
5. FOR OTHER DESIGN DATA AND NOTES, SEE STANDARD NOTES SHEET.
6. FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
7. FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
8. STRUCTURE EXCAVATION SHALL BE EXCAVATED TO THE LIMITS SHOWN ON SHEET 2G-1. FOR STRUCTURE EXCAVATION, SEE SPECIAL PROVISIONS. FILL MATERIAL TO REPLACE EXCAVATED MATERIAL IS PAID FOR UNDER LUMP SUM GRADING PAY ITEM. SUMMARY OF EARTHWORK TABLE ON SHEET 3B-1 DOES NOT INCLUDE FILL MATERIAL REQUIRED TO REPLACE EXCAVATED MATERIAL.
9. HEADWALL SHALL BE DESIGNED FOR LIVE LOAD SURCHARGE.
10. FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
11. THE PROPOSED CULVERT SHALL BE CONSTRUCTED WITH A MINIMUM 12 INCH BLANKET OF FOUNDATION CONDITIONING MATERIAL BELOW THE BOTTOM OF CULVERT.
12. OVERHEAD POWER LINES RUNNING ALONG THE SOUTH SIDE OF ROADWAY WILL REMAIN IN PLACE DURING CONSTRUCTION. CONTRACTOR SHALL PLAN FOR INSTALLATION OF CULVERT THAT WILL ACCOMMODATE THIS CONSTRAINT.



RIP RAP DETAIL FOR INLET AND OUTLET

ROADWAY DATA

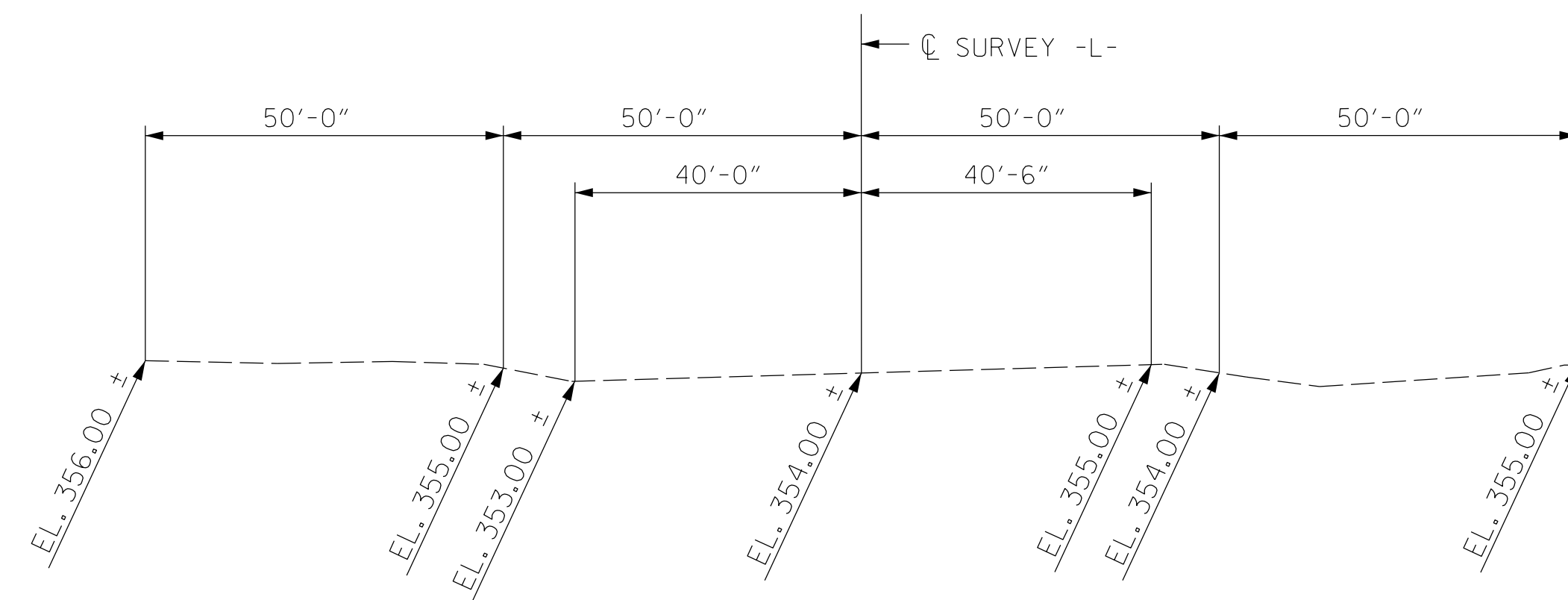
GRADE POINT ELEV. @ STATION 12+68.00 -L- = 375.73
 BED ELEV. @ STATION 12+68.00 -L- = 353.65
 ROADWAY SLOPES 2:1

HYDRAULIC DATA

DESIGN DISCHARGE 1200 CFS
 FREQUENCY OF DESIGN FLOOD 25 YR.
 DESIGN HIGHWATER ELEV. 364.6 FT.
 DRAINAGE AREA 3.6 SQ. MI.
 BASE DISCHARGE (Q100) 1700 CFS
 BASE HIGHWATER ELEV. 367.7 FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE >2300 CFS
 FREQUENCY OF OVERTOPPING FLOOD >500 YR.
 OVERTOPPING FLOOD ELEV. 375.4 FT.
 SAG AT STA. 12+22.81 -L-

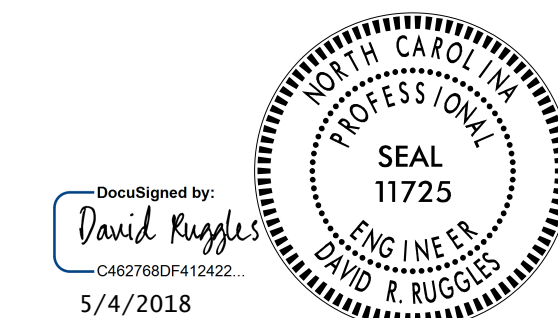


PROFILE ALONG C OF CULVERT

TOTAL STRUCTURE QUANTITIES	
REMOVAL OF EXISTING STRUCTURE @ STA. 12+68.00 -L-	LUMP SUM
ALUMINUM ALLOY STRUCTURAL PLATE PIPE AND PIPE ARCH @ STA. 12+68.00 -L-	80'-6" LIN. FT.
STRUCTURE EXCAVATION @ STA. 12+68.00 -L-	LUMP SUM
FOUNDATION CONDITIONING MATERIAL	110 TONS

PROJECT NO. 17BP.5.C.04
 GRANVILLE COUNTY
 STATION: 12+68.00 -L-

SHEET 1 OF 2



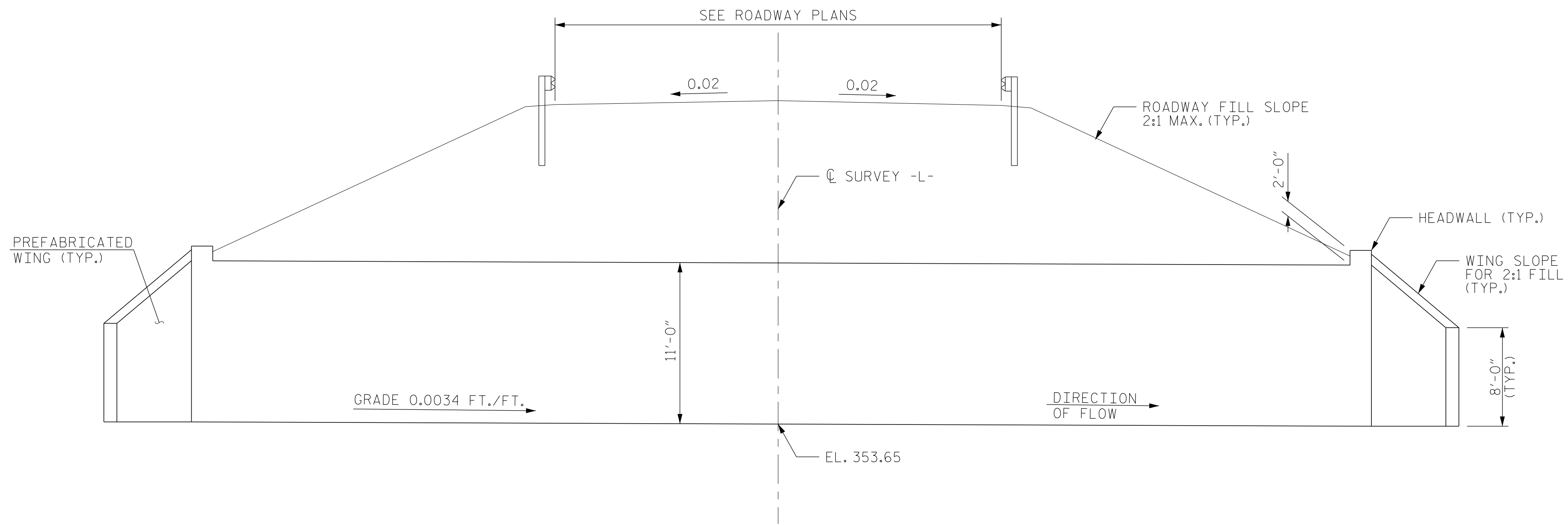
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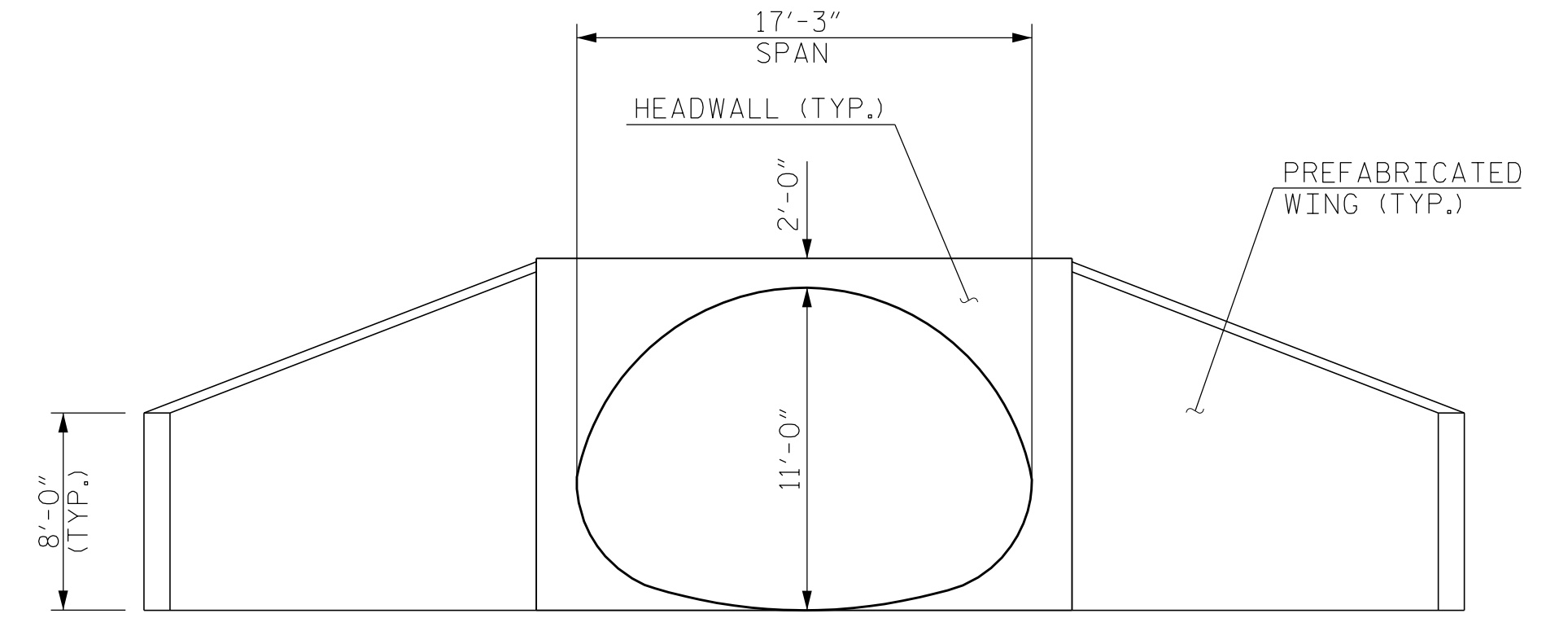
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
17'-3" X 11'-0" ALUMINUM CORRUGATED STRUCTURAL PLATE PIPE ARCH 100° SKEW					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					C-1
					TOTAL SHEETS 2

DRAWN BY: E. PHELPS DATE: 2/18
 CHECKED BY: D. RUGGLES DATE: 3/18
 DESIGN ENGINEER OF RECORD: D. RUGGLES DATE: 3/18

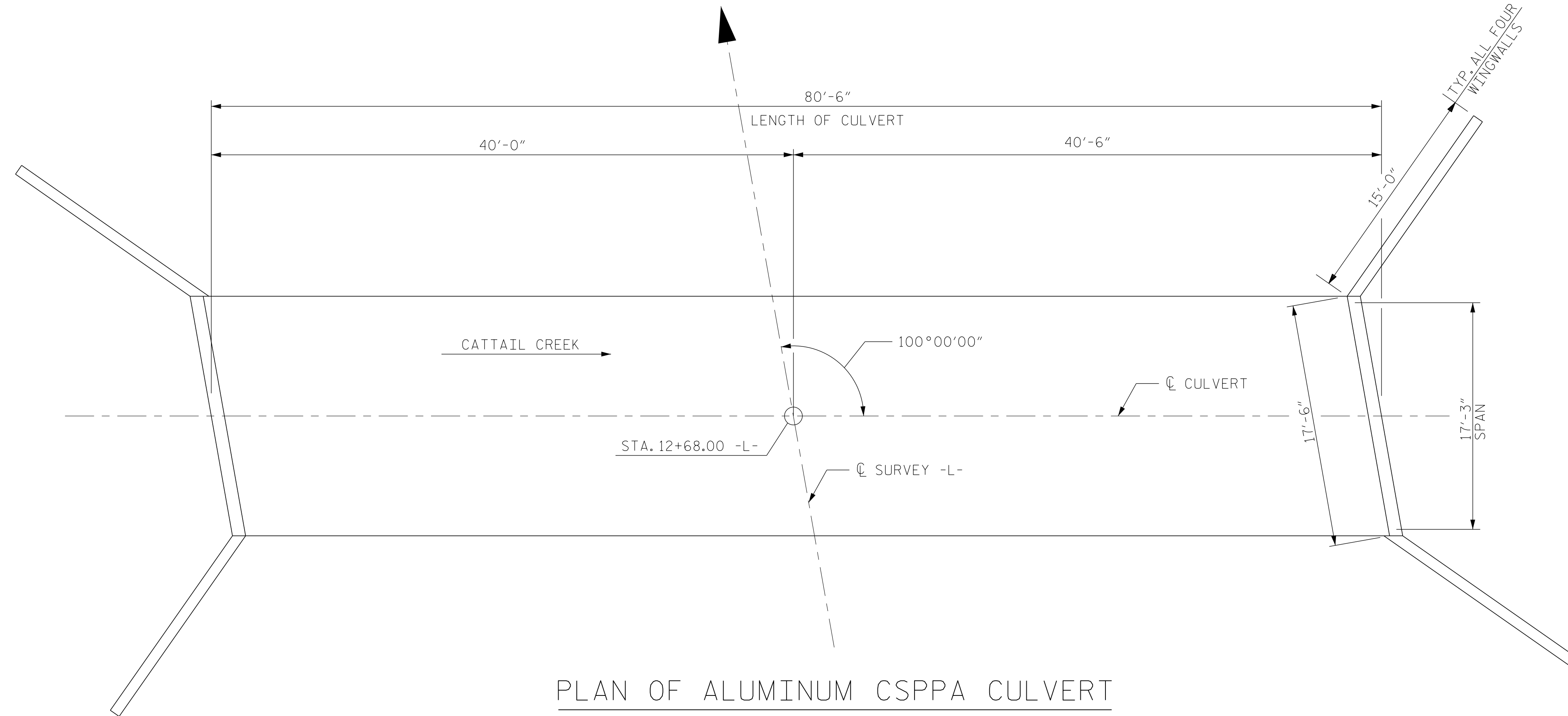
17BP.5.C.04
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 USER:ephelps



CULVERT SECTION NORMAL TO ROADWAY

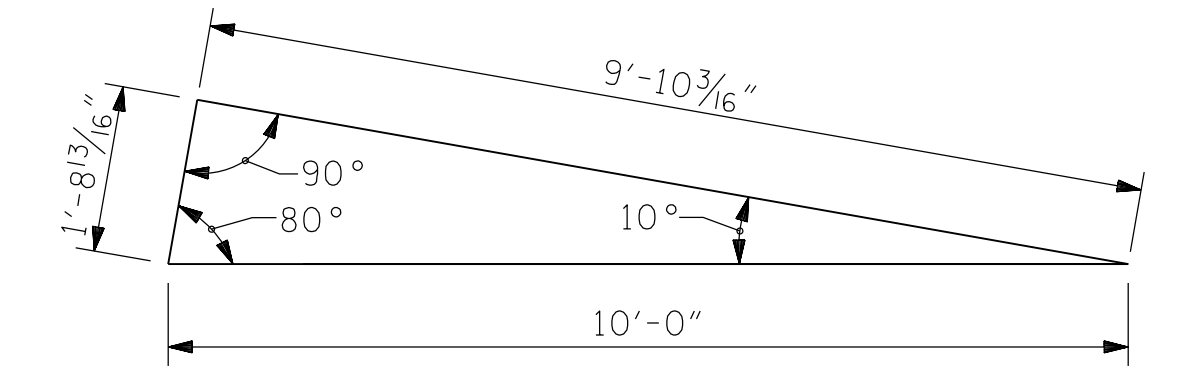


END ELEVATION
(LOOKING DOWNSTREAM)



PLAN OF ALUMINUM CSPPA CULVERT

NOTE: HEADWALLS SHALL BE PARALLEL TO -L-



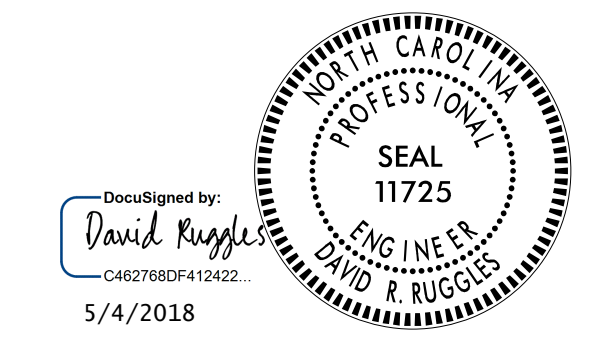
SKEW TRIANGLE

PROJECT NO. 17BP.5.C.04

GRANVILLE COUNTY

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SHEET 2 OF 2



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Raleigh, NC 27601
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

17'-3" X 11'-0" ALUMINUM
CORRUGATED STRUCTURAL
PLATE PIPE ARCH
100° SKEW

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

DRAWN BY: <u>E. PHELPS</u>	DATE: <u>2/18</u>
CHECKED BY: <u>D. RUGGLES</u>	DATE: <u>3/18</u>
DESIGN ENGINEER OF RECORD: <u>D. RUGGLES</u>	DATE: <u>3/18</u>

17BP.5.C.04
 5/4/2018
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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.
	--	27,000 LBS. PER SQ. IN.
	--	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 2018 "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 $\frac{3}{4}$ " WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO $1\frac{1}{2}$ " RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A $\frac{1}{4}$ " 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 $\frac{1}{4}$ " 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 $\frac{7}{8}$ " \emptyset SHEAR STUDS FOR THE $\frac{3}{4}$ " \emptyset STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - $\frac{7}{8}$ " \emptyset STUDS FOR 4 - $\frac{3}{4}$ " \emptyset STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF $\frac{7}{8}$ " \emptyset STUDS ALONG THE BEAM AS SHOWN FOR $\frac{3}{4}$ " \emptyset STUDS BASED ON THE RATIO OF 3 - $\frac{7}{8}$ " \emptyset STUDS FOR 4 - $\frac{3}{4}$ " \emptyset 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 $\frac{3}{16}$ " 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 $\frac{1}{16}$ " 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. FINS 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.

ENGLISH

JANUARY, 1990

STD. NO. SN