

TIP PROJECT: BD-5114P

CONTRACT: DN00083

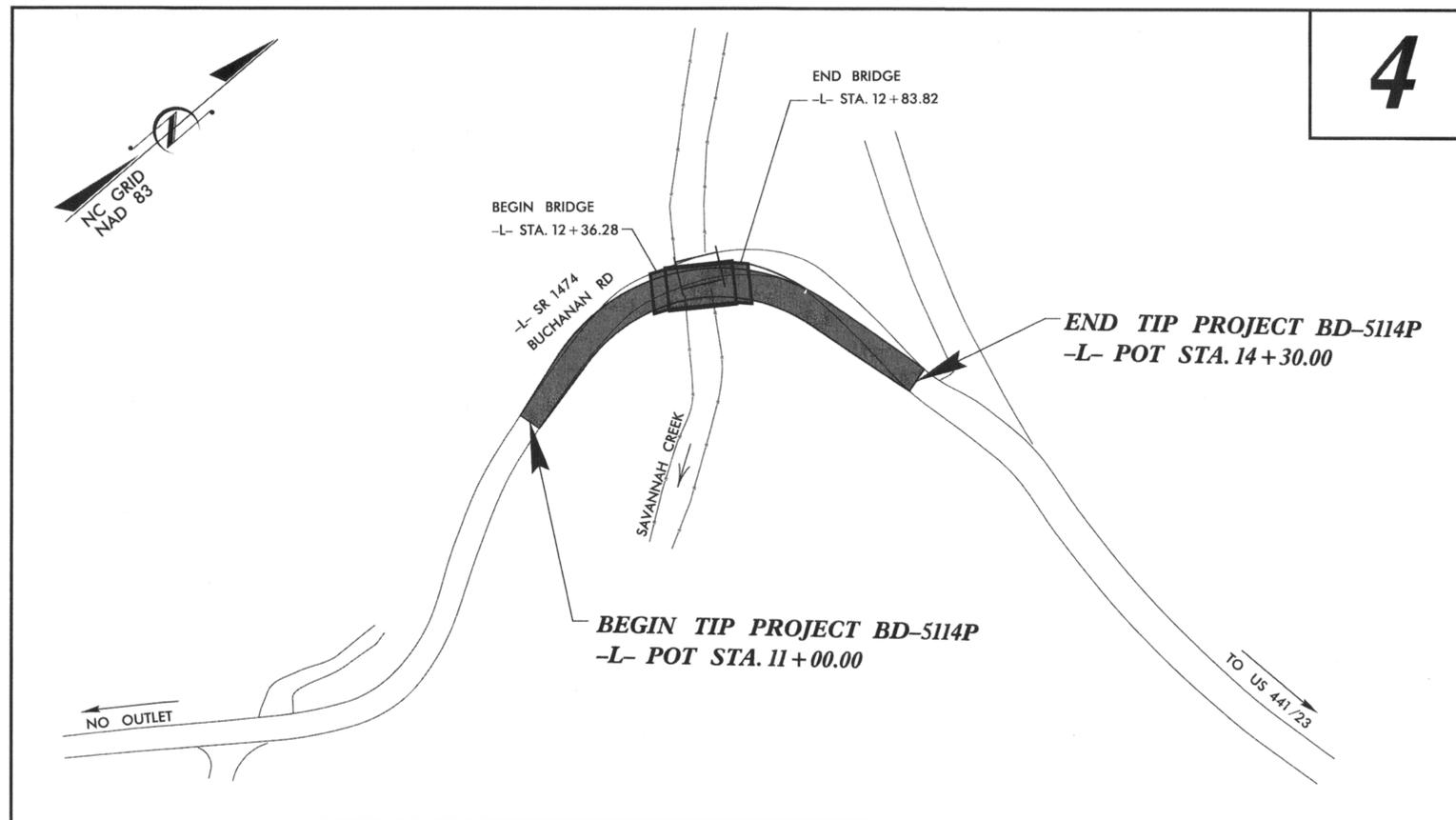
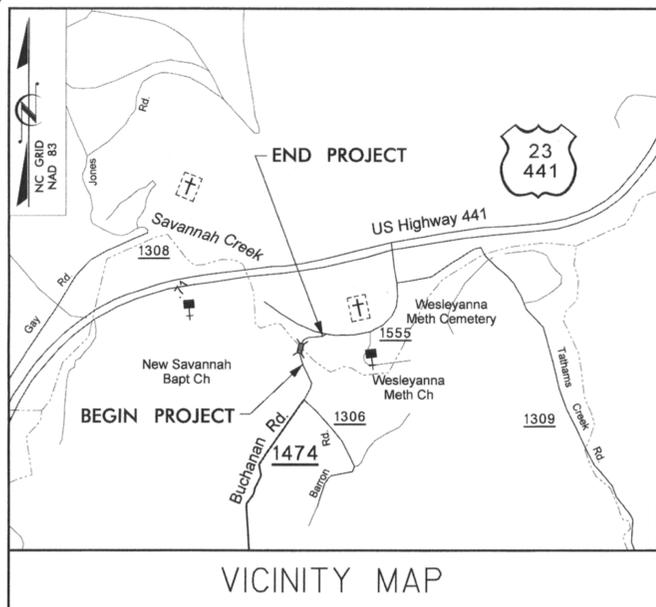
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

JACKSON COUNTY

**LOCATION: BRIDGE NO. 70 OVER SAVANNAH CREEK
ON SR 1474 (BUCHANAN RD)**

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BD-5114P	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
45360.1.16	BRZ-1474(2)	P.E.	
45360.2.16	BRZ-1474(2)	RW	
45360.3.16	BRZ-1474(2)	CONST.	

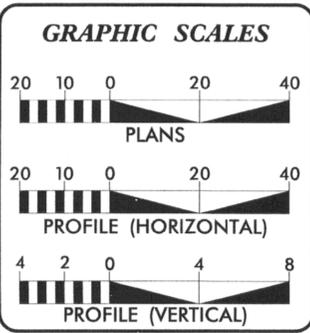


4

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Consulting Engineers

Charlotte, North Carolina 784-257-9498
Tri-Cities, Tennessee 423-467-8600
Knoxville, Tennessee 865-546-6800
Middlesboro, Kentucky 606-248-6600
Asheville, North Carolina 828-253-2796
Spartanburg, South Carolina 864-574-4775

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DESIGN DATA

ADT 2000 =	150
ADT 2025 =	500
T =	6%
V =	25 MPH
FUNC CLASS =	RURAL LOCAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BD-5114P =	0.054 MI
LENGTH STRUCTURE TIP PROJECT BD-5114P =	0.009 MI
TOTAL LENGTH OF TIP PROJECT BD-5114P =	0.063 MI

Prepared in the Office of:
VAUGHN & MELTON
1318-F PATTON AVE.
ASHEVILLE NC, 28806
FOR THE NORTH CAROLINA DIVISION OF HIGHWAYS

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
OCTOBER 21, 2011

LETTING DATE:
APRIL 9, 2013

NC DOT CONTACT:
JOSH DEYTON, PE
PROJECT ENGINEER - ROADWAY DESIGN

HYDRAULICS ENGINEER

Signature: *Reece Schuler*

ROADWAY DESIGN ENGINEER

12/4/12

Signature: *Aaron Carver*

**DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA**

\$\$\$\$\$ SYSTEMS \$\$\$
\$\$\$\$\$ DGN \$\$\$
\$\$\$\$\$ USERNAME \$\$\$

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	○ _{EP}
Property Corner	_____x
Property Monument	□ _{ECM}
Parcel/Sequence Number	①23
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	-o-o-o-
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	○ _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	○
Swamp Marsh	⌵
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	○ _{CA}
Proposed Control of Access	○ _{CA}
Existing Easement Line	_____E
Proposed Temporary Construction Easement	_____E
Proposed Temporary Drainage Easement	_____TDE
Proposed Permanent Drainage Easement	_____PDE
Proposed Permanent 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
Proposed Wheel Chair Ramp Curb Cut	_____WCC
Curb Cut for Future Wheel Chair Ramp	_____CCFR
Existing Metal Guardrail	_____
Proposed Guardrail	_____
Existing Cable Guiderail	_____
Proposed Cable Guiderail	_____
Equality Symbol	⊕
Pavement Removal	_____

VEGETATION:

Single Tree	○
Single Shrub	○
Hedge	_____
Woods Line	_____
Orchard	_____
Vineyard	_____Vineyard

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	_____CONC
Bridge Wing Wall, Head Wall and End Wall	_____CONC WW
MINOR:	
Head and End Wall	_____CONC HW
Pipe Culvert	_____
Footbridge	_____
Drainage Box: Catch Basin, DI or JB	_____CB
Paved Ditch Gutter	_____
Storm Sewer Manhole	○ _S
Storm Sewer	_____S

UTILITIES:

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

TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	○ _T
Telephone Booth	□
Telephone Pedestal	□
Telephone Cell Tower	⌵
U/G Telephone Cable Hand Hole	□ _{PH}
Recorded U/G Telephone Cable	_____T
Designated U/G Telephone Cable (S.U.E.*)	_____T
Recorded U/G Telephone Conduit	_____TC
Designated U/G Telephone Conduit (S.U.E.*)	_____TC
Recorded U/G Fiber Optics Cable	_____T FO
Designated U/G Fiber Optics Cable (S.U.E.*)	_____T FO

WATER:

Water Manhole	○ _W
Water Meter	○
Water Valve	⊗
Water Hydrant	○ _W
Recorded U/G Water Line	_____W
Designated U/G Water Line (S.U.E.*)	_____W
Above Ground Water Line	_____A/G Water

TV:

TV Satellite Dish	⌵
TV Pedestal	□
TV Tower	⊗
U/G TV Cable Hand Hole	□ _{PH}
Recorded U/G TV Cable	_____TV
Designated U/G TV Cable (S.U.E.*)	_____TV
Recorded U/G Fiber Optic Cable	_____TV FO
Designated U/G Fiber Optic Cable (S.U.E.*)	_____TV FO

GAS:

Gas Valve	◇
Gas Meter	◇
Recorded U/G Gas Line	_____G
Designated U/G Gas Line (S.U.E.*)	_____G
Above Ground Gas Line	_____A/G Gas

SANITARY SEWER:

Sanitary Sewer Manhole	○ _{SS}
Sanitary Sewer Cleanout	○ _{SS}
U/G Sanitary Sewer Line	_____SS
Above Ground Sanitary Sewer	_____A/G Sanitary Sewer
Recorded SS Forced Main Line	_____FSS
Designated SS Forced Main Line (S.U.E.*)	_____FSS

MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	□ _S
Utility Unknown U/G Line	_____2UTL
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.

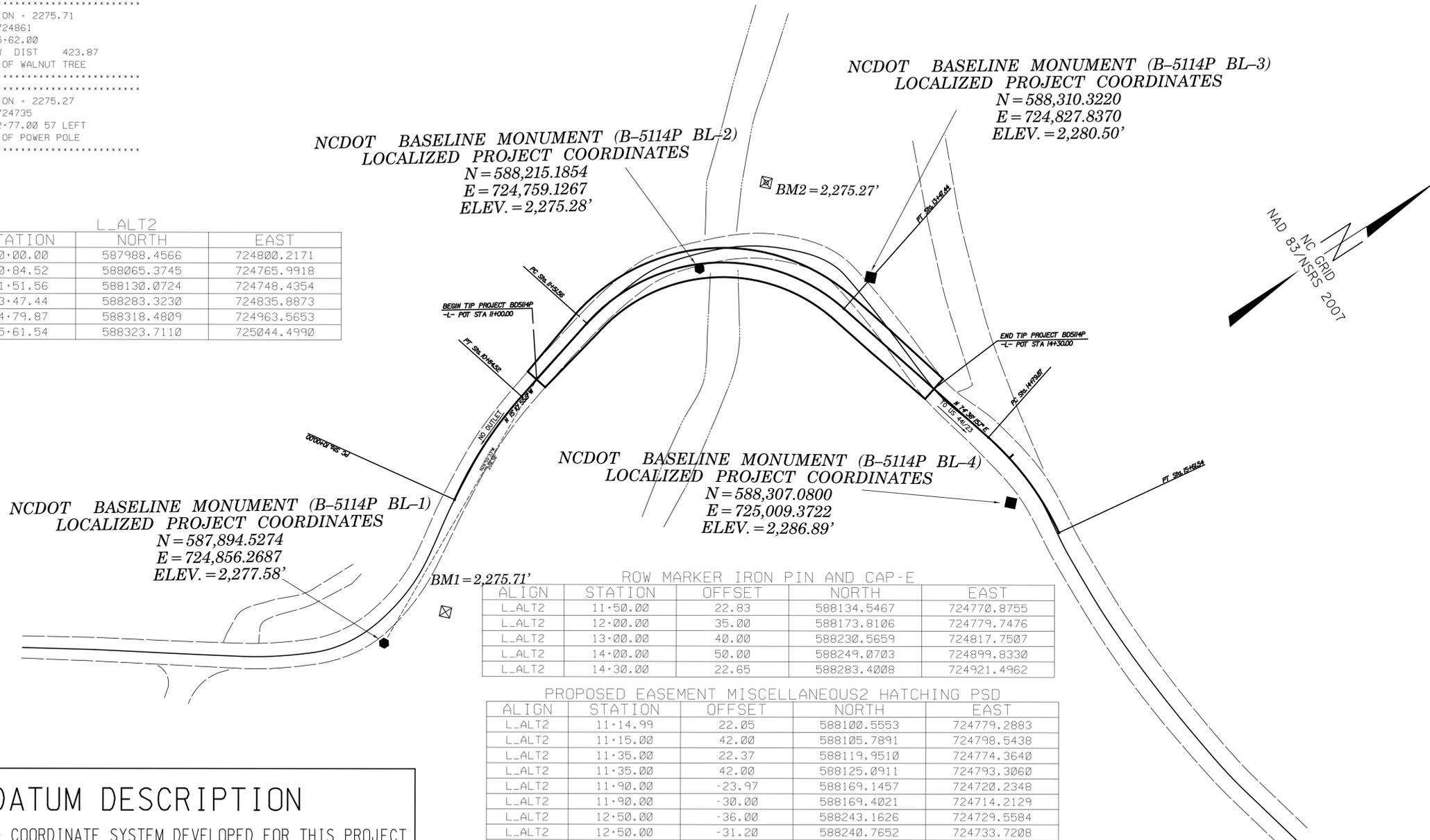
SURVEY CONTROL SHEET BD-5114P

BL	POINT	DESC.	NORTH	EAST	ELEVATION	L_ALT2 STATION	OFFSET
1	BL-1		587894.5274	724856.2687	2277.58	OUTSIDE PROJECT LIMITS	
2	BL-2		588215.1854	724759.1267	2275.28	12+40.25	3.22 RT
3	BL-3		588310.3220	724827.8370	2280.50	13+46.96	28.17 LT
4	BL-4		588307.0800	725009.3722	2286.89	15+25.58	18.43 RT

 BM1 ELEVATION = 2275.71
 N 587942 E 724861
 L_ALT2 STATION 15+62.00
 S 25°37'19.26" W DIST 423.87
 8" SPIKE IN BASE OF WALNUT TREE

 BM2 ELEVATION = 2275.27
 N 588286 E 724735
 L_ALT2 STATION 12+77.00 57 LEFT
 8" SPIKE IN BASE OF POWER POLE

TYPE	STATION	L_ALT2 NORTH	EAST
PC	10+00.00	587988.4566	724800.2171
PT	10+84.52	588065.3745	724765.9918
PC	11+51.56	588130.0724	724748.4354
PT	13+47.44	588283.3230	724835.8873
PC	14+79.87	588318.4809	724963.5653
PT	15+61.54	588323.7110	725044.4990



ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
L_ALT2	11+50.00	22.83	588134.5467	724770.8755
L_ALT2	12+00.00	35.00	588173.8106	724779.7476
L_ALT2	13+00.00	40.00	588230.5659	724817.7507
L_ALT2	14+00.00	50.00	588249.0703	724899.8330
L_ALT2	14+30.00	22.65	588283.4008	724921.4962

PROPOSED EASEMENT MISCELLANEOUS2 HATCHING PSD

ALIGN	STATION	OFFSET	NORTH	EAST
L_ALT2	11+14.99	22.05	588100.5553	724779.2883
L_ALT2	11+15.00	42.00	588105.7891	724798.5438
L_ALT2	11+35.00	22.37	588119.9510	724774.3640
L_ALT2	11+35.00	42.00	588125.0911	724793.3060
L_ALT2	11+90.00	-23.97	588169.1457	724720.2348
L_ALT2	11+90.00	-30.00	588169.4021	724714.2129
L_ALT2	12+50.00	-36.00	588243.1626	724729.5584
L_ALT2	12+50.00	-31.20	588240.7652	724733.7208

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "BL-1"

WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
 NORTHING: 587,894.5274(ft) EASTING: 724856.2687(ft)
 ELEVATION: 2277.5800(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS:
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "BL-1" TO -L- STATION 11+00.00 IS
 N26°55'33"W 208.38'

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

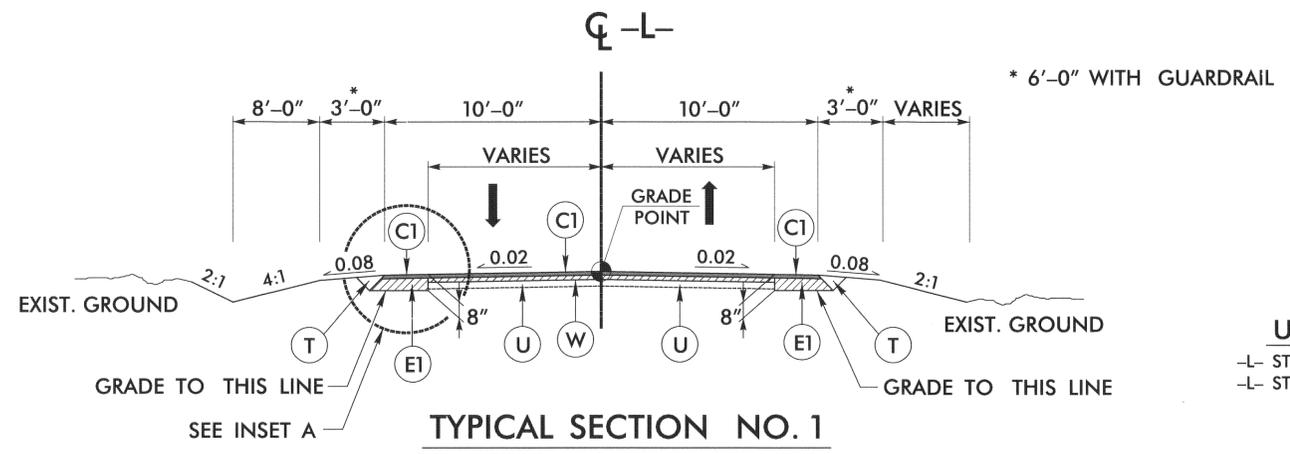
NOTES:

- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.org/doh/preconstruct/highway/location/project/)
 THE FILES TO BE FOUND ARE AS FOLLOWS:
 TIPBD-5114P_LS_CONTROL_DATA.HTML

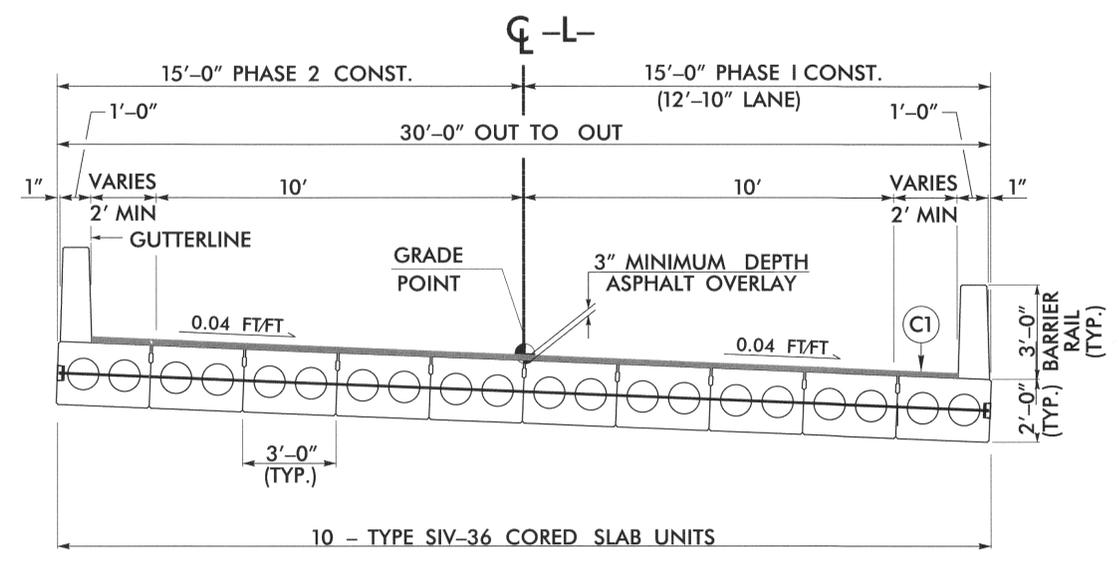
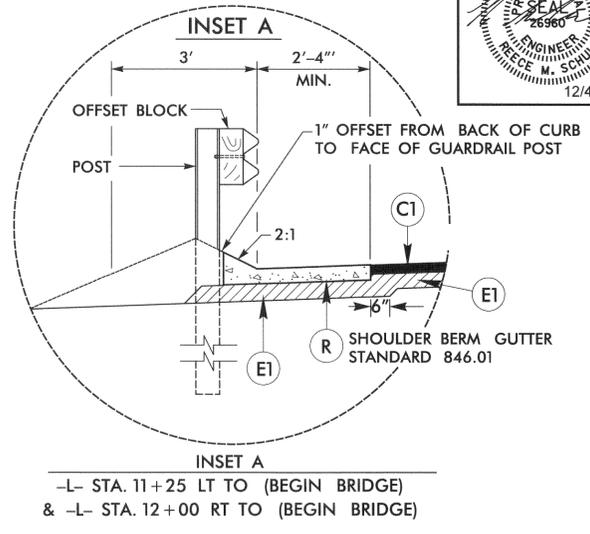
SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE DDC UNIT.

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

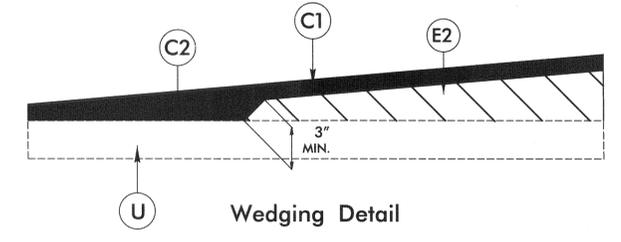
GEOIDAL MODEL - G09NC
 NOTE: DRAWING NOT TO SCALE



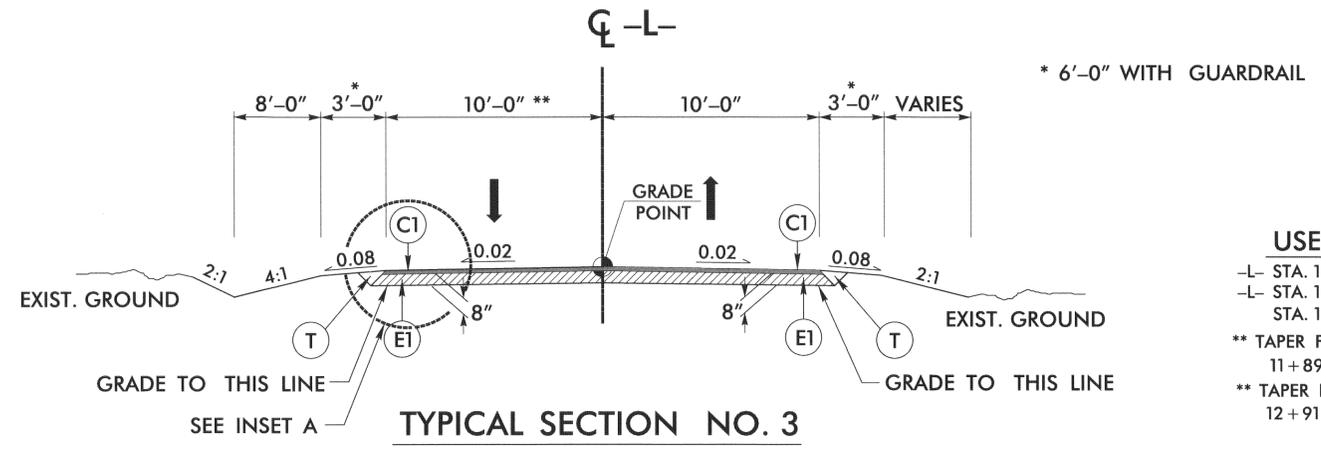
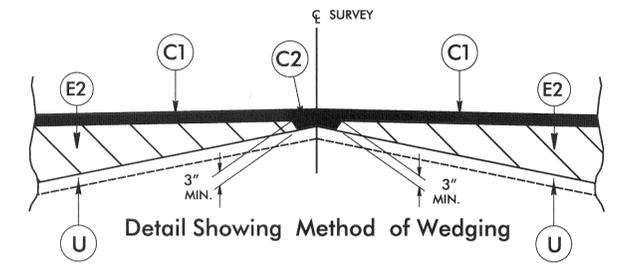
USE TYPICAL SECTION NO. 1
 -L- STA. 11+00 TO STA. 11+89.04
 -L- STA. 13+80.00 (END FULL DEPTH) TO STA. 14+30.00



USE TYPICAL SECTION NO. 2
 -L- STA. 12+36.28 (BEGIN BRIDGE) TO
 -L- STA. 12+83.82 (END BRIDGE)



NOTE: SEE TRAFFIC CONTROL PLANS FOR FURTHER INFORMATION REGARDING THE PHASES FOR CONSTRUCTION



USE TYPICAL SECTION NO. 3
 -L- STA. 11+89.04 TO STA. 12+36.28 (BEGIN BRIDGE)
 -L- STA. 12+83.82 (END BRIDGE) TO STA. 13+80.00 (END FULL DEPTH)
 ** TAPER FROM 10' TO 11.45' FROM 11+89.04 TO 12+29.04 LT
 ** TAPER FROM 14.5' TO 10' FROM 12+91.62 TO 13+31.16 LT

PAVEMENT SCHEDULE	
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.
C2	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 TO EXCEED 2" IN DEPTH.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.
R	PROP. SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	PROPOSED WEDGING (SEE APPROPRIATE DETAILS)

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

DIVISION OF HIGHWAYS
 STATE OF NORTH CAROLINA

SUMMARY OF EARTHWORK
 IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
SUMMARY NO.1					
-L- STA. 11+00.00 TO STA. 12+36.28 (BEG. BRIDGE)	4		67	63	
SUBTOTAL SUMMARY NO.1	4		67	63	
SUMMARY NO.2					
-L- STA. 12+83.82 (END BRIDGE) TO STA. 14+30.00	5		743	738	
SUBTOTAL SUMMARY NO.2	5		743	738	
PROJECT SUBTOTAL	9		810	801	
EST.5% FOR REPLACING TOP SOIL ON BORROW PITS				40	
GRAND TOTAL	9		810	841	
SAY	10			900	

CONTINGENCY ITEMS:
 INCIDENTAL STONE = 50 TONS
 UNDERCUT EXCAVATION = 50 CY
 SELECT GRANULAR MATERIAL = 50 CY
 CLASS IV SUBGRADE STABILIZATION = 50 TONS
 GEOTEXTILE FOR SOIL STABILIZATION = 50 SY

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

8/17/99

DATUM DESCRIPTION

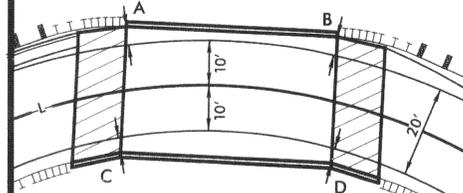
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THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99978945

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "BL-1" TO -L- STATION 11+00.00 IS N 26°55'33" W 208.38'

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

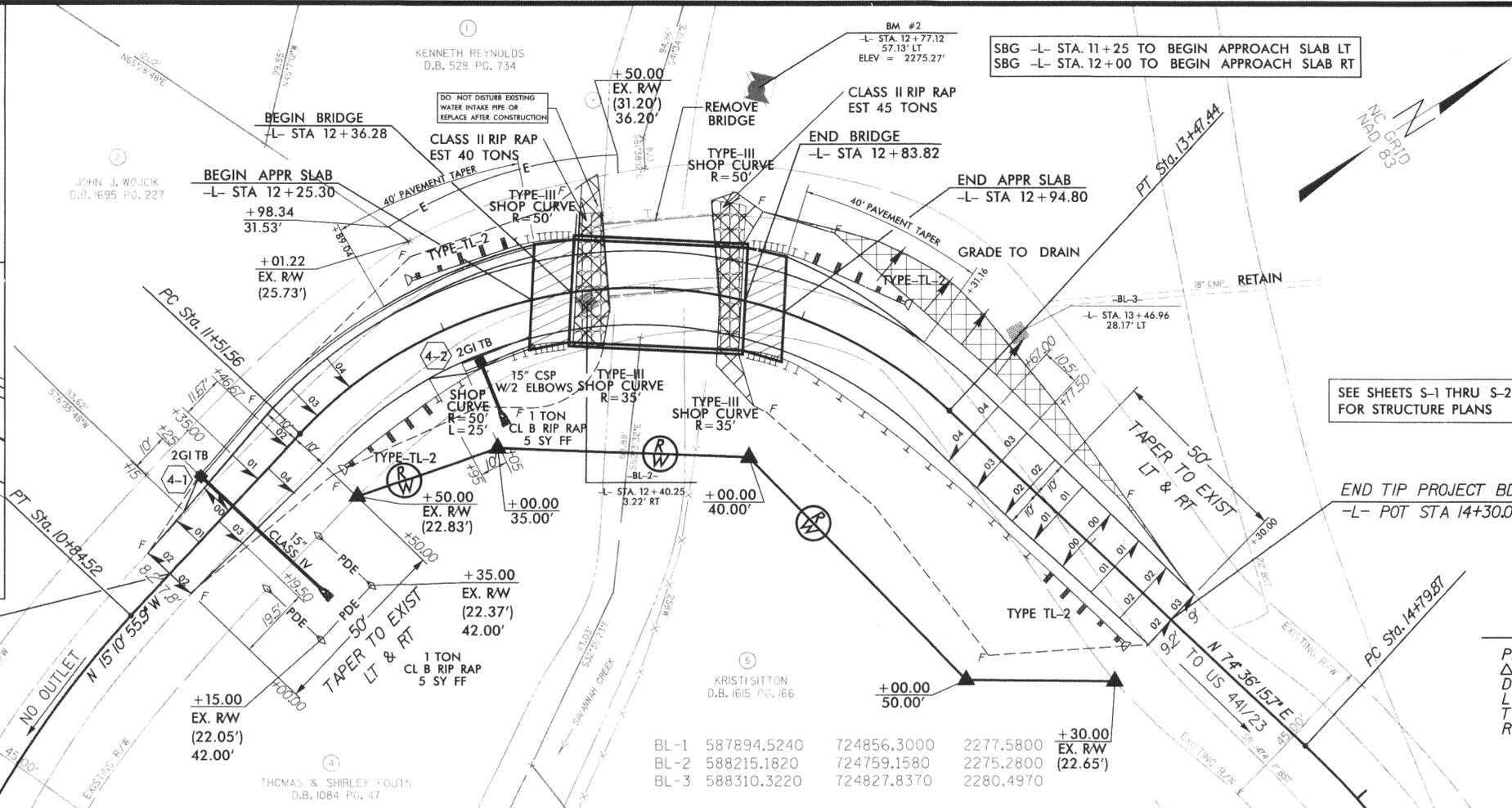
SKETCH SHOWING RELATIONSHIP OF PAVEMENT WIDTH TO BRIDGE WIDTH (2' MINIMUM SHOULDER)



MINIMUM DISTANCE MEASURED BETWEEN PROPOSED EOP & FACE OF BRIDGE BARRIER CORNERS:

BEGIN TIP PROJECT BD5114P
-L- POT STA 11+00.00

JOHN J. WOJCIK
D.B. 1600 PG. 103



PROJECT REFERENCE NO. BD-5114P	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER [Signature]	HYDRAULICS ENGINEER [Signature]
12/4/12	

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Vaughn & Melton
Consulting Engineers

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Knoxville, Tennessee
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Middlesboro, Kentucky
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Spartanburg, South Carolina
864-574-4775

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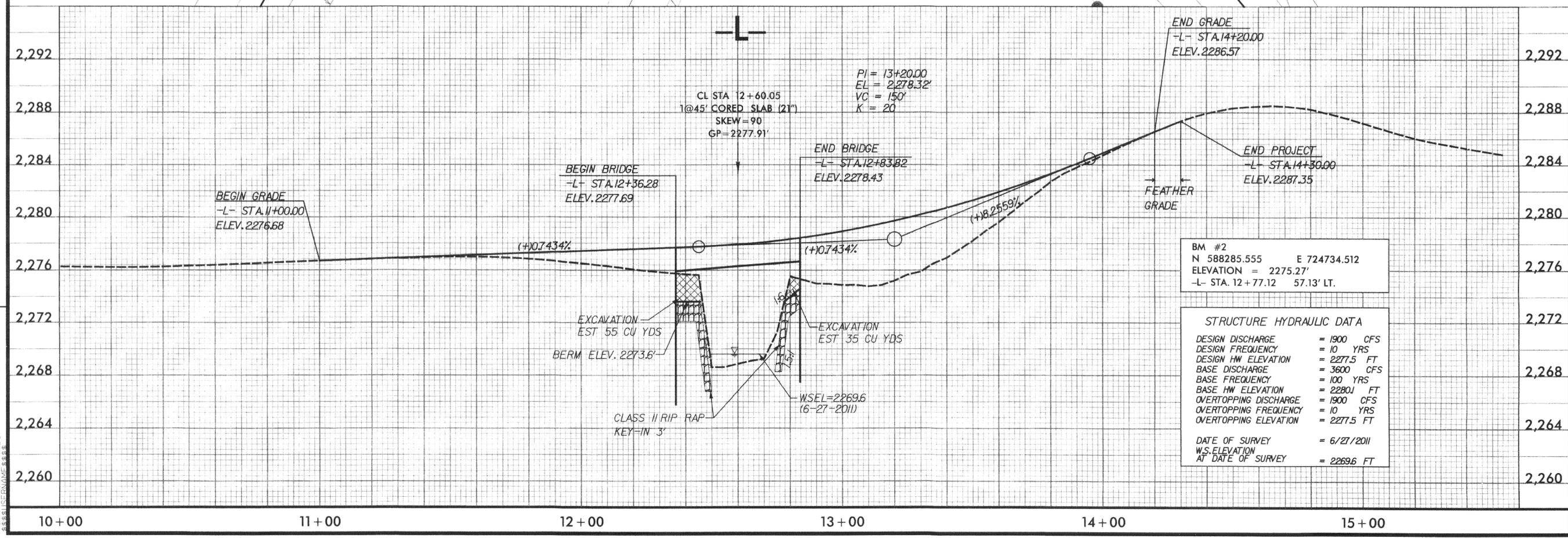
SEE SHEETS S-1 THRU S-22 FOR STRUCTURE PLANS



-L- DESIGN DATA

PI Sta 10+42.60 Δ = 17° 36' 35.2" (RT) D = 20' 50" 05.4" L = 84.52' T = 42.60' R = 275.00'	PI Sta 12+76.09 Δ = 89° 47' 11.6" (RT) D = 45' 50" 11.8" L = 195.88' T = 124.54' R = 125.00' SE = 0.04 RO = 21.00'
---	---

BL-1	587894.5240	724856.3000	2277.5800	+30.00 EX. RW (22.65')
BL-2	588215.1820	724759.1580	2275.2800	
BL-3	588310.3220	724827.8370	2280.4970	



BM #2
N 588285.555 E 724734.512
ELEVATION = 2275.27'
-L- STA. 12+77.12 57.13' LT.

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 1900 CFS
DESIGN FREQUENCY	= 10 YRS
DESIGN HW ELEVATION	= 2277.5 FT
BASE DISCHARGE	= 3600 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 2280.1 FT
OVERTOPPING DISCHARGE	= 1900 CFS
OVERTOPPING FREQUENCY	= 10 YRS
OVERTOPPING ELEVATION	= 2277.5 FT
DATE OF SURVEY	= 6/27/2011
W.S. ELEVATION AT DATE OF SURVEY	= 2269.6 FT

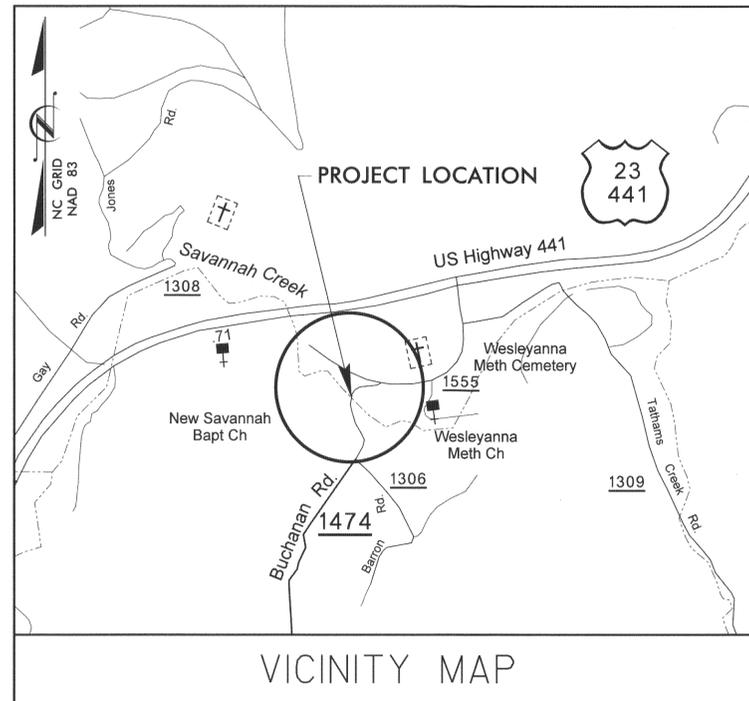
REVISIONS

DATE PLOTTED: 12/14/12

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

JACKSON COUNTY
DIVISION 14



LOCATION: BRIDGE NO. 70 OVER SAVANNAH CREEK ON SR 1474 (BUCHANAN RD)

INDEX OF SHEETS

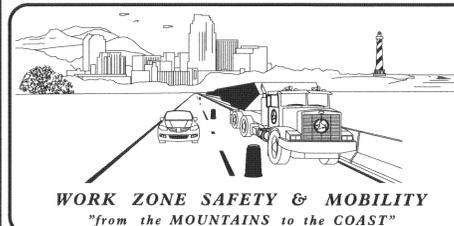
SHEET NO.	TITLE
TMP-1	TITLE SHEET, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, LEGEND, AND TEMPORARY PAVEMENT MARKING
TMP-1B	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES, GENERAL NOTES AND LOCAL NOTES)
TMP-2	TEMPORARY TRAFFIC CONTROL PHASING
TMP-3	TEMPORARY TRAFFIC CONTROL PHASE I DETAIL
TMP-4	TEMPORARY TRAFFIC CONTROL PHASE II DETAIL
SIG-1	PORTABLE TRAFFIC SIGNAL PLAN

SHEET NO.

TMP-1

TIP PROJECT: BD-5114P

\$\$\$\$\$SYTIME\$\$\$\$\$
\$\$\$\$\$DNAME\$\$\$\$\$
\$\$\$\$\$USERNAME\$\$\$\$\$



N.C.D.O.T. WORK ZONE TRAFFIC CONTROL
1580 MAIL SERVICE CENTER (MSC) RALEIGH, NC 27699-1580
1020 BIRCH RIDGE DRIVE, RALEIGH, NC 27610 (DELIVERY)
PHONE: (919) 250-4094 FAX: (919) 250-4098

J. S. BOURNE, P.E. STATE TRAFFIC MANAGEMENT ENGINEER
LLOYD D. BROWN, P.E. TRAFFIC CONTROL PROJECT ENGINEER
AARON CARVER, P.E. TRAFFIC CONTROL PROJECT DESIGN ENGINEER
AARON CARVER, P.E. TRAFFIC CONTROL DESIGN ENGINEER



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Consulting Engineers
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PROJECT ENGINEER LLOYD D. BROWN, P.E.
DESIGN ENGINEER AARON CARVER, P.E.

Asheville, North Carolina 828-253-2796
Charlotte, North Carolina 704-357-0488

APPROVED: *[Signature]*
DATE: November 29, 2012

SEAL

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 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1115.01	FLASHING ARROW PANELS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1160.01	TEMPORARY CRASH CUSHION
1165.01	TRUCK MOUNTED IMPACT ATTENUATOR
1170.01	PORTABLE CONCRETE BARRIER
1180.01	SKINNY-DRUM
1205.01	PAVEMENT MARKINGS - LINE TYPES & OFFSETS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.08	PAVEMENT MARKINGS - SYMBOLS & WORD MESSAGES
1205.12	PAVEMENT MARKINGS - BRIDGES
1261.01	GUARDRAIL & BARRIER DELINEATOR SPACING
1261.02	GUARDRAIL & BARRIER DELINEATOR TYPES
1262.01	GUARDRAIL END DELINEATION

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- WORK AREA
- TEMPORARY PAVEMENT

TEMPORARY PAVEMENT MARKING

SYMBOL	DESCRIPTION
PAINT	
PA	WHITE EDGE LINE (4")
PI	YELLOW DOUBLE CENTER (4")
P4	STOP BAR (24" WHITE)

TRAFFIC CONTROL DEVICES

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

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

SIGNALS

- EXISTING PROPOSED TEMPORARY
- PORTABLE TRAFFIC SIGNAL

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

Vaughn & Melton
Consulting Engineers

Charlotte, North Carolina 704-357-0488	Tri-Cities, Tennessee 423-467-8401	Knoxville, Tennessee 865-546-5800
Asheville, North Carolina 828-253-2796	Middlesboro, Kentucky 606-248-6600	Spartanburg, South Carolina 864-574-4775

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APPROVED: DATE: 1/19/12

DIVISION OF HIGHWAYS
DEPARTMENT OF TRANSPORTATION
WORK ZONE TRAFFIC CONTROL

ROADWAY STANDARD DRAWINGS & LEGEND

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

GENERAL NOTES / LOCAL 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.

LANE AND SHOULDER CLOSURE REQUIREMENTS

- A) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.
- B) 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.
- C) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO A DIVIDED FACILITY AND WITHIN 10 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.
- D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.
- E) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.

PAVEMENT EDGE DROP OFF REQUIREMENTS

- F) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:

BACKFILL DROP-OFFS THAT EXCEED 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.

BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.
- G) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

- H) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

- I) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
- J) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.
- K) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 100 ft IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC BARRIER

- L) INSTALL TEMPORARY BARRIER ACCORDING TO THE TRANSPORTATION MANAGEMENT PLANS A MAXIMUM OF TWO (2) WEEKS PRIOR TO BEGINNING WORK IN ANY LOCATION. ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION PROCEED IN A CONTINUOUS MANNER TO COMPLETE THE PROPOSED WORK IN THAT LOCATION UNLESS OTHERWISE STATED IN THE TRANSPORTATION MANAGEMENT PLANS OR AS DIRECTED BY THE ENGINEER.

DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE.

ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION AND NO WORK IS PERFORMED BEHIND THE TEMPORARY BARRIER FOR A PERIOD LONGER THAN TWO (2) MONTHS, REMOVE / RESET TEMPORARY BARRIER AT NO COST TO THE DEPARTMENT UNLESS OTHERWISE STATED IN THE TRANSPORTATION MANAGEMENT PLANS, TEMPORARY BARRIER IS PROTECTING A HAZARD, OR AS DIRECTED BY THE ENGINEER.

INSTALL TEMPORARY BARRIER WITH THE TRAFFIC FLOW BEGINNING WITH THE UPSTREAM SIDE OF TRAFFIC. REMOVE TEMPORARY BARRIER AGAINST THE TRAFFIC FLOW BEGINNING WITH THE DOWNSTREAM SIDE OF TRAFFIC.

INSTALL AND SPACE DRUMS NO GREATER THAN TWICE THE POSTED SPEED LIMIT (MPH) TO CLOSE OR KEEP THE SECTION OF THE ROADWAY CLOSED UNTIL THE TEMPORARY BARRIER CAN BE PLACED OR AFTER THE TEMPORARY BARRIER IS REMOVED.

- M) PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER AT ALL TIMES DURING THE INSTALLATION AND REMOVAL OF THE BARRIER BY EITHER A TRUCK MOUNTED ATTENUATOR (MAXIMUM 72 HOURS) OR A TEMPORARY CRASH CUSHION.

PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER FROM ONCOMING TRAFFIC AT ALL TIMES BY A TEMPORARY CRASH CUSHION UNLESS THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER IS OFFSET FROM ONCOMING TRAFFIC AS FOLLOWS OR AS SHOWN IN THE PLANS: (SEE ALSO 1101.05)

POSTED SPEED LIMIT	MINIMUM OFFSET
40 OR LESS	15 FT
45 - 50	20 FT
55	25 FT
60 MPH or HIGHER	30 FT

TRAFFIC CONTROL DEVICES

- N) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.
- O) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

PAVEMENT MARKING

- P) INSTALL TEMPORARY PAVEMENT MARKINGS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

ROAD NAME	MARKING	MARKER
SR 1474	PAINT	NONE

- Q) PLACE ONE APPLICATION OF PAINT FOR TEMPORARY TRAFFIC PATTERNS. PLACE A SECOND APPLICATION OF PAINT SIX (6) MONTHS AFTER THE INITIAL APPLICATION AND EVERY SIX MONTHS AS DIRECTED BY THE ENGINEER.
- R) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
- S) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS BY THE END OF EACH DAY'S OPERATION.

MISCELLANEOUS

- T) IN THE EVENT A TIE-IN CANNOT BE MADE IN ONE DAY'S TIME, BRING THE TIE-IN AREA TO AN APPROPRIATE ROADWAY ELEVATION AS DETERMINED BY THE ENGINEER. PLACE BLACK ON ORANGE "LOOSE GRAVEL" SIGNS (W8-7) AND BLACK ON ORANGE "PAVEMENT ENDS" SIGNS (W8-3) 100 ft AND 200 ft RESPECTIVELY IN ADVANCE OF THE UNEVEN AREAS. USE DRUMS TO DELINEATE THE EDGE OF ROADWAY ALONG UNPAVED AREAS.

MANAGEMENT STRATEGIES

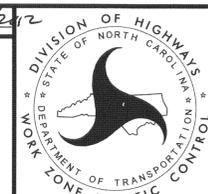
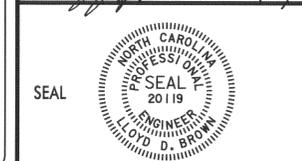
TRAFFIC WILL BE MAINTAINED ON THE EXISTING ROAD, BUT REDUCED TO ONE LANE USING TEMPORARY SIGNALS AS NEW ALIGNMENT IS CONSTRUCTED. PHASE 2 SHOWS TRAFFIC SHIFTED TO ONE LANE ON THE NEW ALIGNMENT USING TEMPORARY SIGNALS AND PAVEMENT MARKINGS WHILE THE REMAINDER IS CONSTRUCTED. A FLAGGING OPERATION WILL BE USED TO CONSTRUCT THE NEW TIE-INS.

Charlotte, North Carolina 704-357-0488
Tri-Cities, Tennessee 423-467-8404
Knoxville, Tennessee 865-546-5800
Middlesboro, Kentucky 606-248-6600
Spartanburg, South Carolina 864-574-4775

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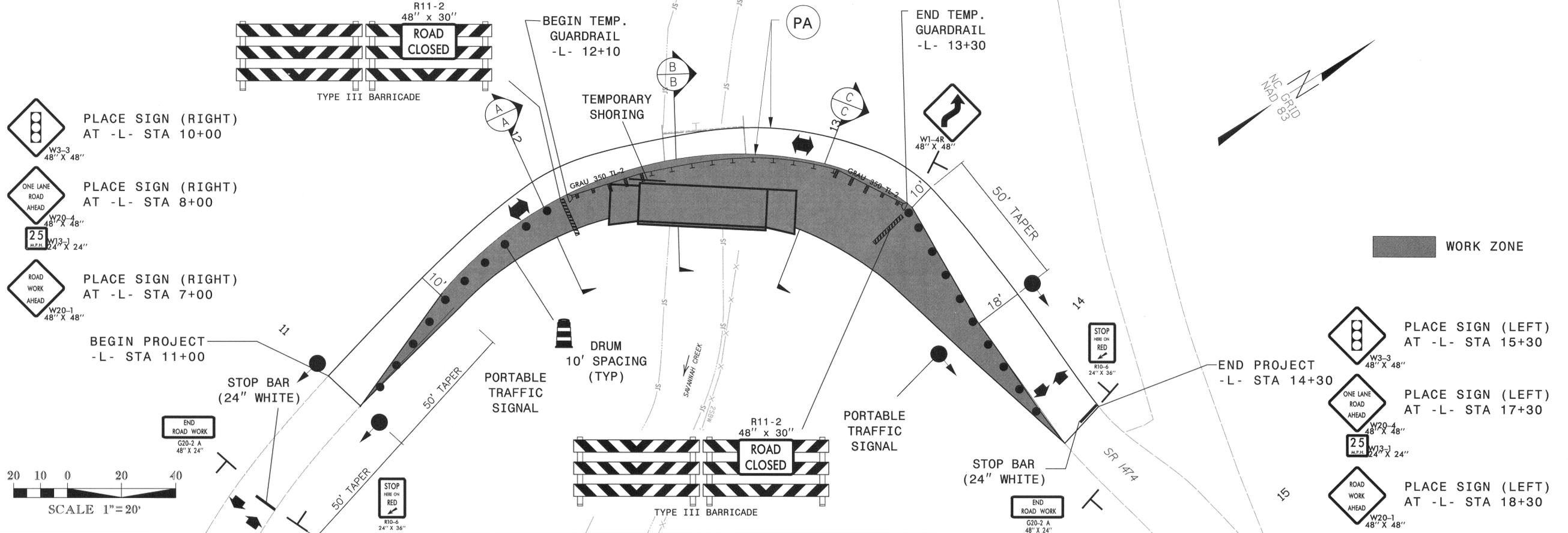
APPROVED: DATE: 11/29/12



TRANSPORTATION OPERATIONS PLAN
(MANAGEMENT STRATEGIES & GENERAL NOTES)

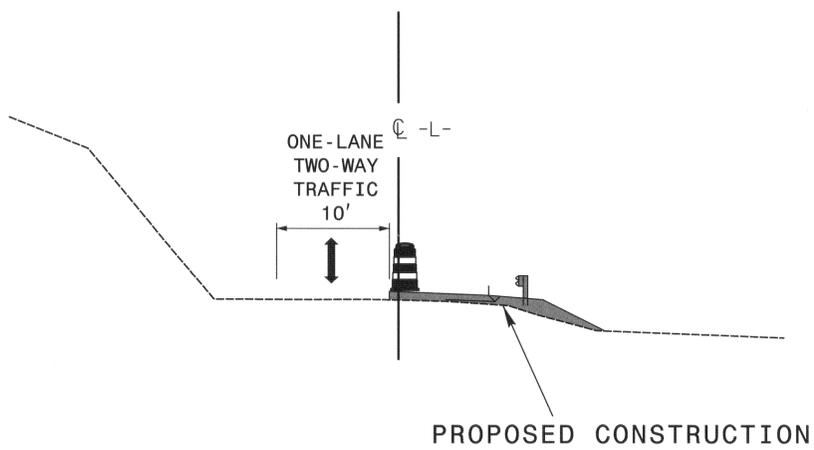
\$\$\$\$\$SYTIME\$\$\$\$\$
\$\$\$\$\$USERNAME\$\$\$\$\$

NOTES:
 1. ADVISORY SPEED PANEL (25 MPH, SIGN W13-1) SHALL PORTRAY A SPEED AS DETERMINED BY THE ENGINEER.
 2. REFER TO TRAFFIC CONTROL DETAIL DRAWINGS FOR PLACEMENT OF PAVEMENT MARKINGS.



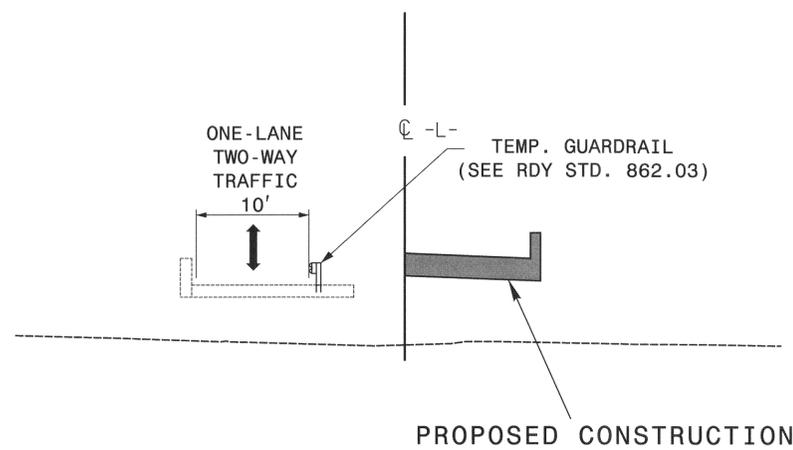
SECTION A-A

-L- STA 12+00



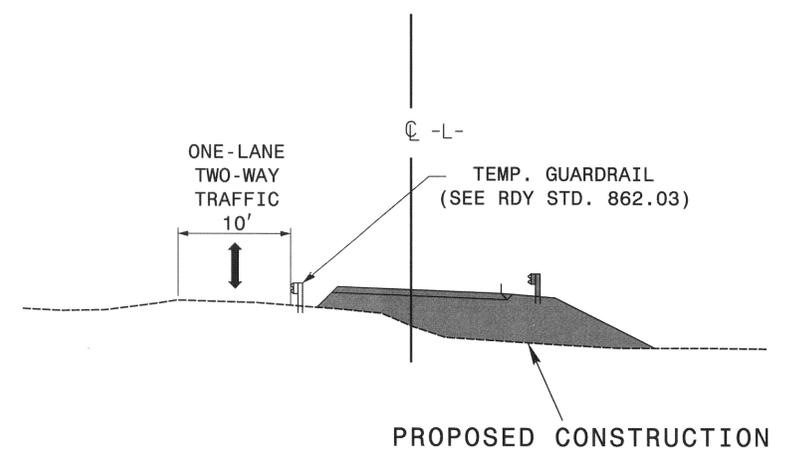
SECTION B-B

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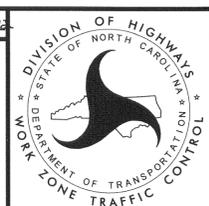


SECTION C-C

-L- STA 13+00



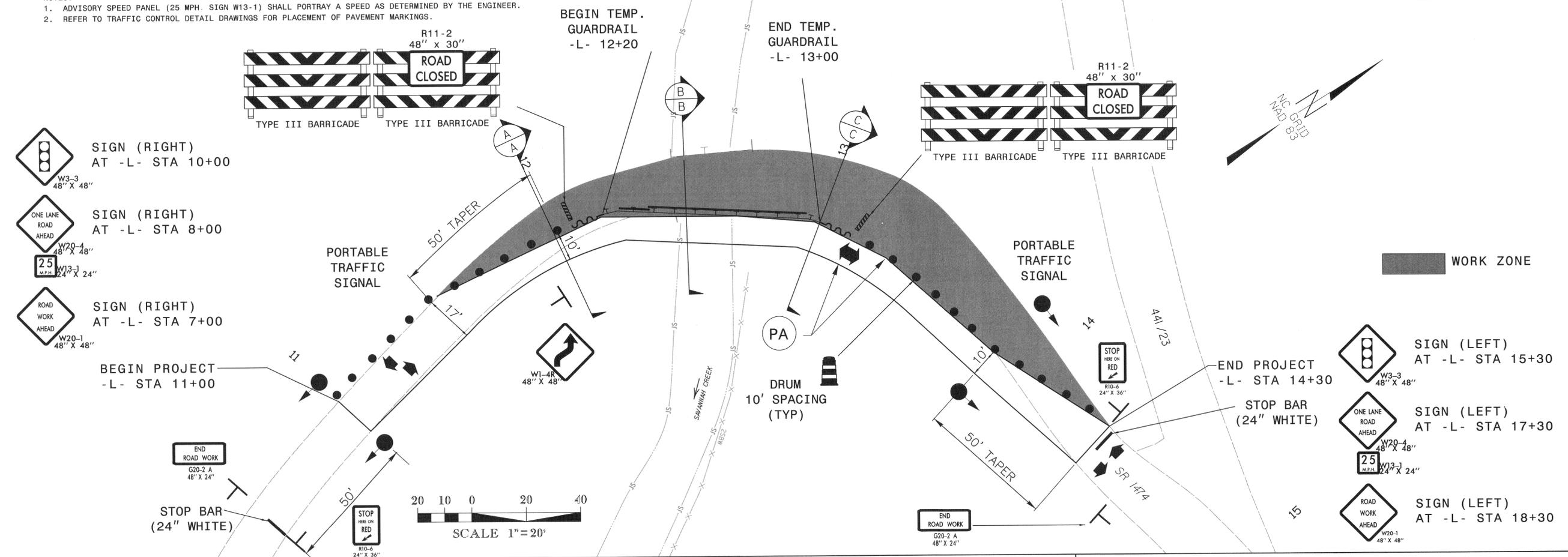
APPROVED: *[Signature]* DATE: 1/29/2019



PHASE 1

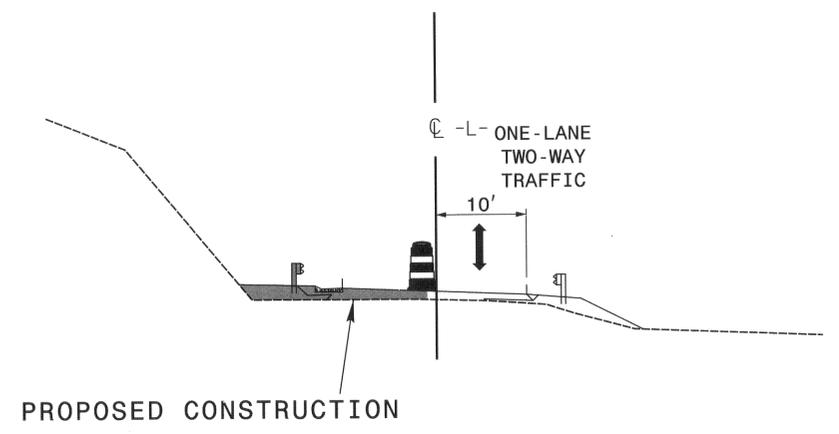
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 \$\$\$\$\$\$ DATE \$\$\$\$\$\$
 \$\$\$\$\$\$ DRAWN \$\$\$\$\$\$
 \$\$\$\$\$\$ CHECKED \$\$\$\$\$\$
 \$\$\$\$\$\$ APPROVED \$\$\$\$\$\$
 \$\$\$\$\$\$ SUBMITTED \$\$\$\$\$\$

NOTES:
 1. ADVISORY SPEED PANEL (25 MPH. SIGN W13-1) SHALL PORTRAY A SPEED AS DETERMINED BY THE ENGINEER.
 2. REFER TO TRAFFIC CONTROL DETAIL DRAWINGS FOR PLACEMENT OF PAVEMENT MARKINGS.



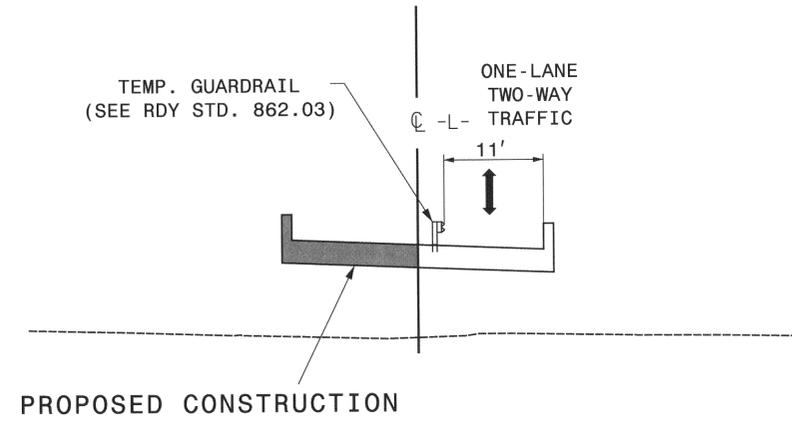
SECTION A-A

-L- STA 12+00



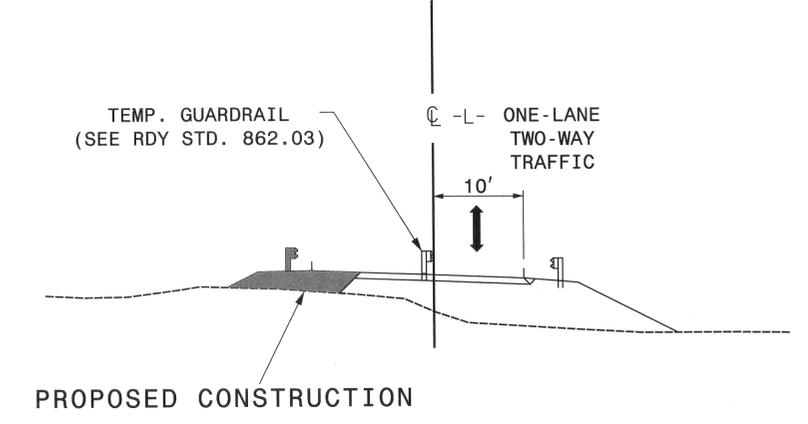
SECTION B-B

-L- STA 12+50



SECTION C-C

-L- STA 13+00



APPROVED: *[Signature]* DATE: 1/29/12

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER
 LLOYD D. BROWN
 20119

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

PHASE 2

\$\$\$\$\$SYTIME\$\$\$\$\$
 \$\$\$DCN\$\$\$\$\$
 \$\$\$B_USERNAME\$\$\$\$\$

EROSION CONTROL PLAN

PROJECT REFERENCE NO. BD-5114P	SHEET NO. EC-1/CONST.A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Anne Gamber LEVEL IIIA NAME
3022 LEVEL IIIA CERTIFICATION NO.

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

NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

ROADSIDE ENVIRONMENTAL UNIT
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

2012 STANDARD SPECIFICATIONS

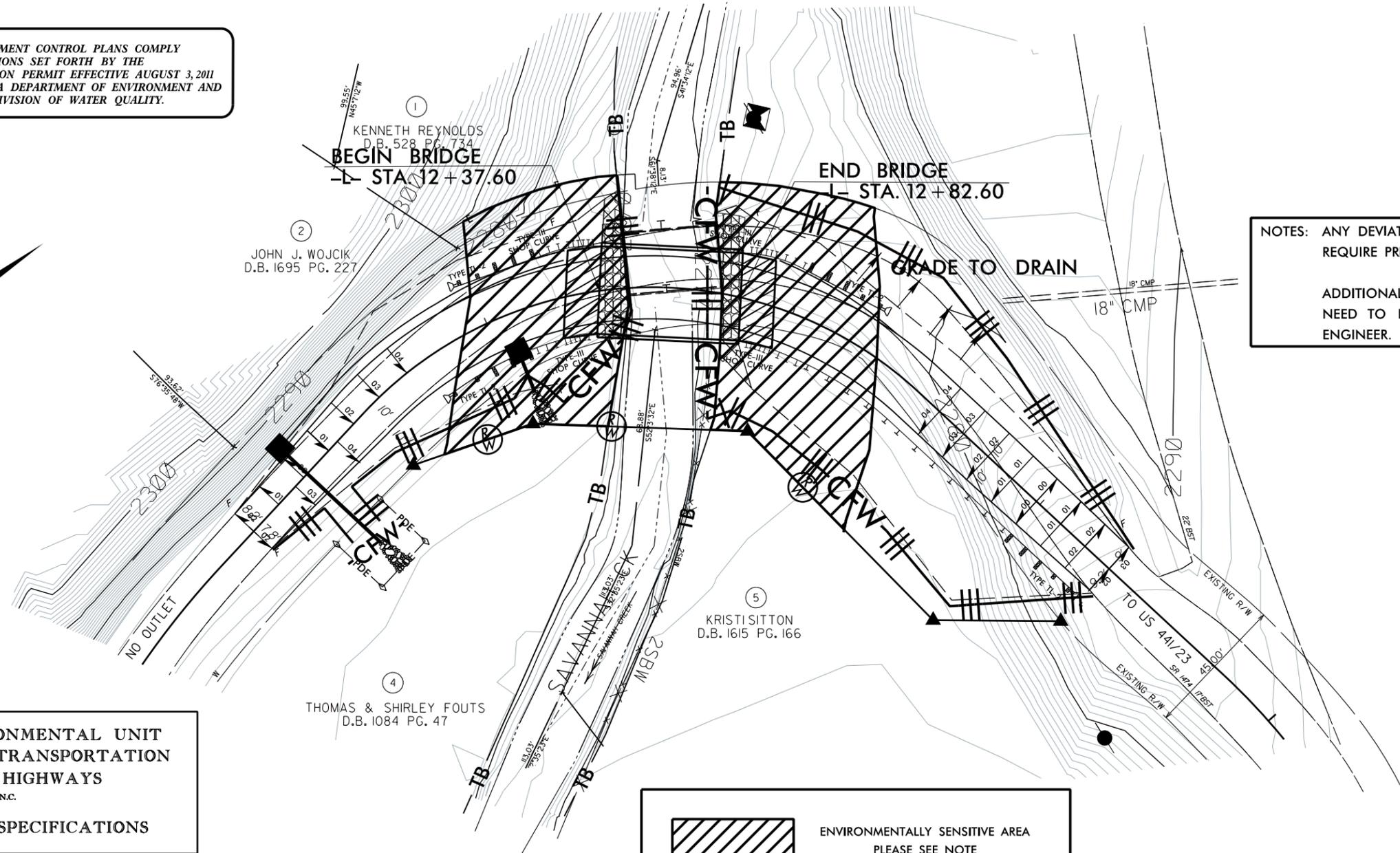
Std. #	Description	Symbol
1605.01	Temporary Silt Fence	— —
1632.03	Rock Inlet Sediment Trap Type C	□
1633.01	Temporary Rock Silt Check Type-A	▨
	Coir Fiber Wattle	-CFW-

 ENVIRONMENTALLY SENSITIVE AREA
PLEASE SEE NOTE

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

2012 STANDARD DRAWINGS

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	



REVISIONS

8/17/99
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EROSION CONTROL PLAN

PROJECT REFERENCE NO. BD-5114P	SHEET NO. EC-2/CONST.A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Anne Gamber
LEVEL IIIA NAME
3022
LEVEL IIIA CERTIFICATION NO.

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

FINAL EROSION CONTROL FOR CONSTRUCTION SHEET 4

NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

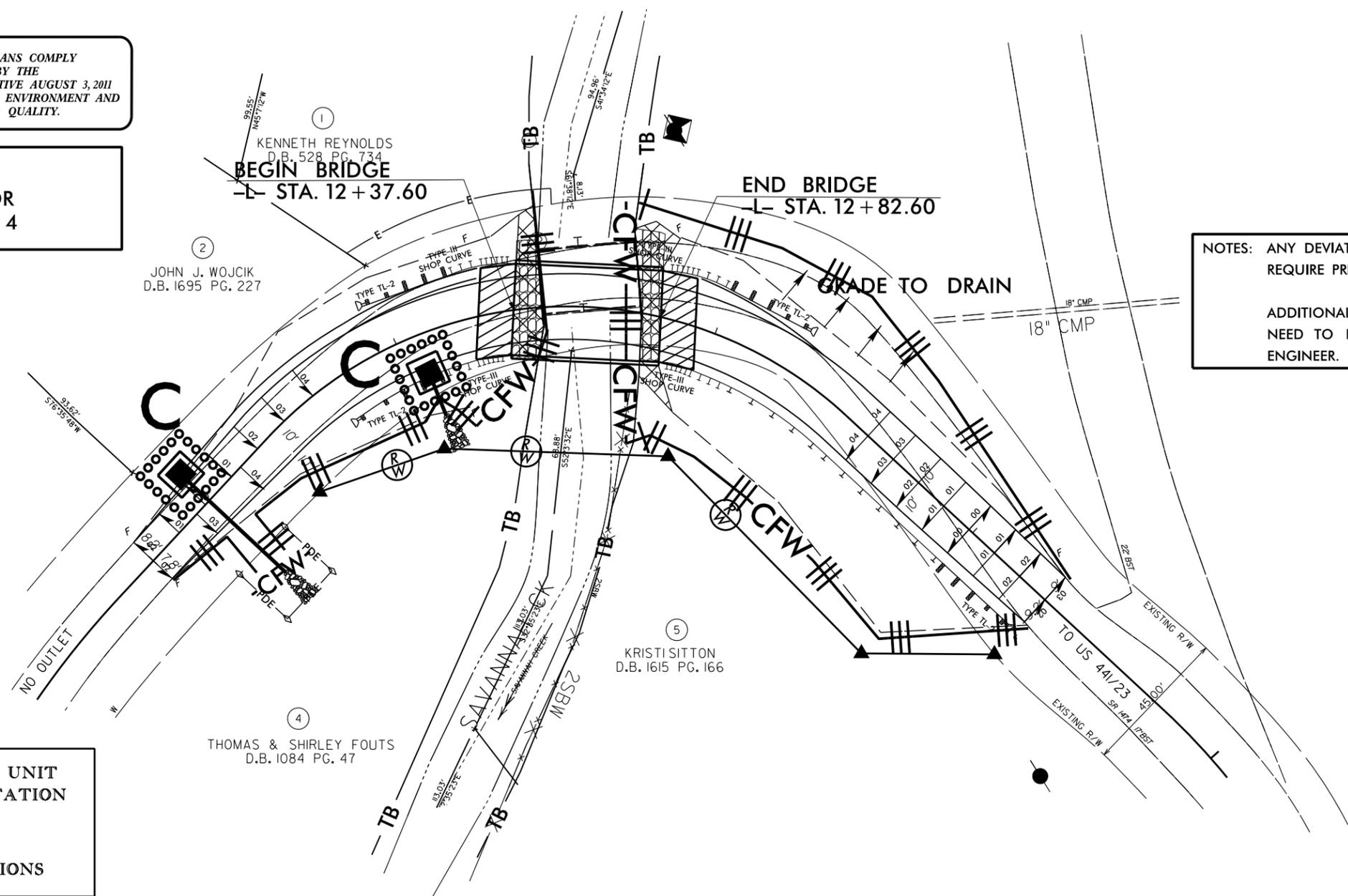
ROADSIDE ENVIRONMENTAL UNIT
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

2012 STANDARD SPECIFICATIONS

Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1632.03	Rock Inlet Sediment Trap Type C	□
1633.01	Temporary Rock Silt Check Type-A	▨
	Coir Fiber Wattle	-CFW-

2012 STANDARD DRAWINGS

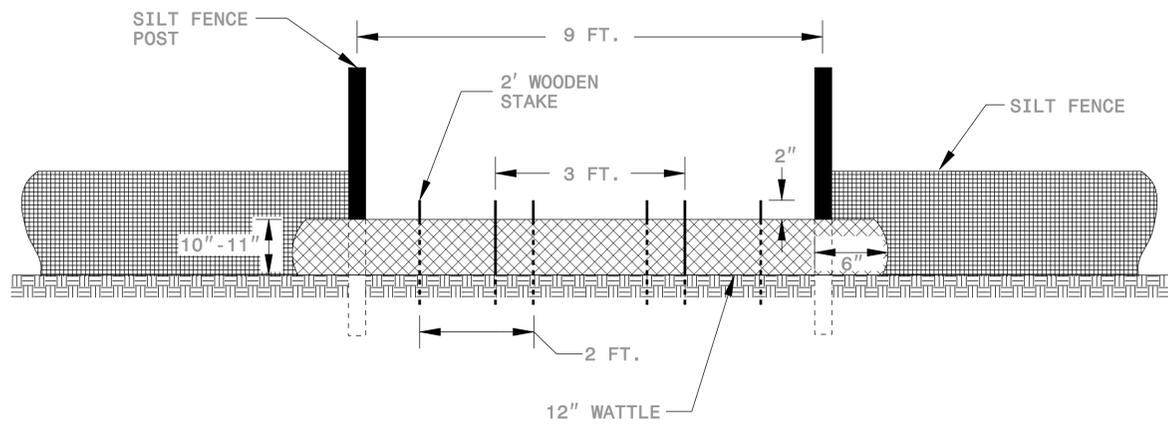
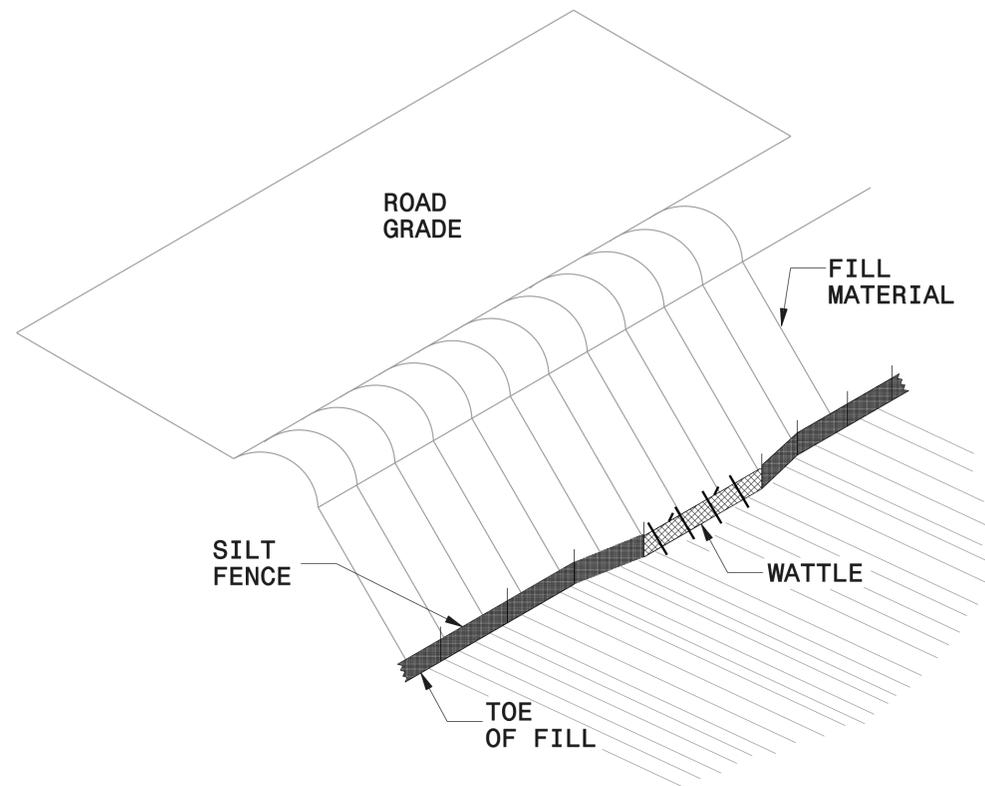
1604.01	Railroad Erosion Control Detail	1632.01	Rock Inlet Sediment Trap Type A
1605.01	Temporary Silt Fence	1632.02	Rock Inlet Sediment Trap Type B
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1607.01	Gravel Construction Entrance	1633.01	Temporary Rock Silt Check Type 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		



8/17/99
 REVISIONS
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 8/28/2012

SILT FENCE COIR FIBER WATTLE BREAK DETAIL

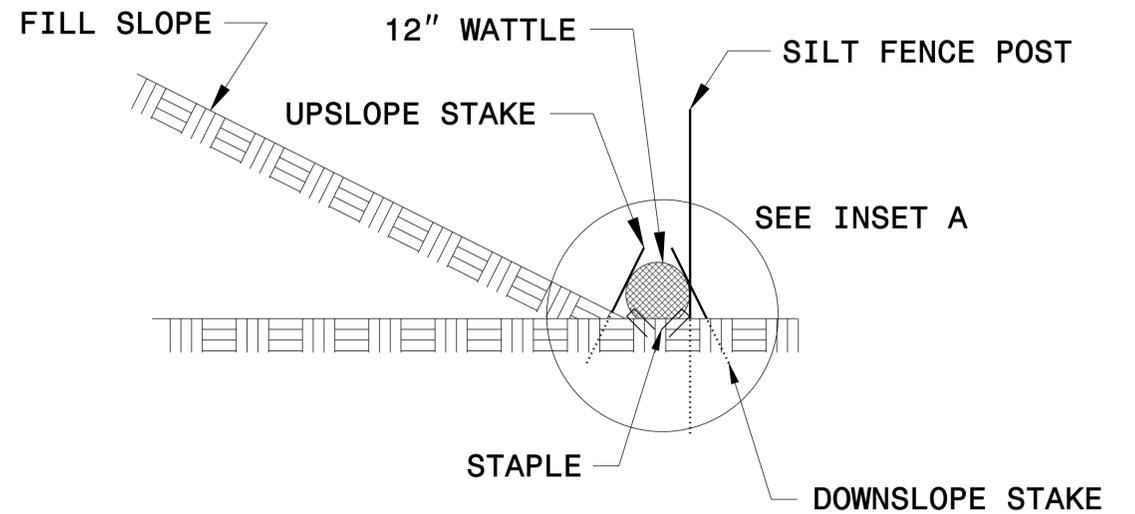
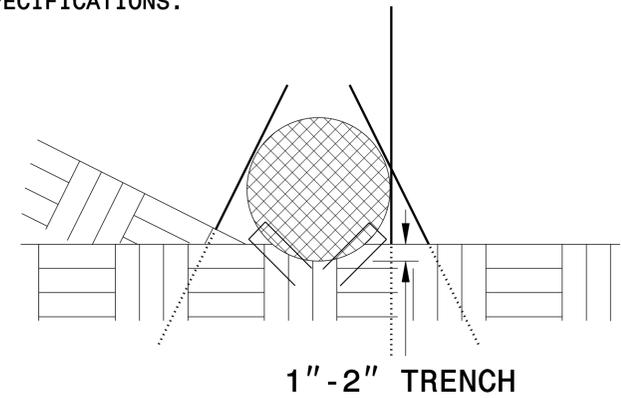
PROJECT REFERENCE NO. <i>BD-5114P</i>	SHEET NO. <i>EC-3</i>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



NOTES:

- USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE AND LENGTH OF 10 FT.
- EXCAVATE A 1 TO 2 INCH TRENCH FOR WATTLE TO BE PLACED.
- DO NOT PLACE WATTLE ON TOE OF SLOPE.
- USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.
- INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.
- PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.
- INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.
- WATTLE INSTALLATION CAN BE ON OUTSIDE OF THE SILT FENCE AS DIRECTED.
- INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.

INSET A



DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO. <i>BD-5114P</i>	SHEET NO. <i>EC-5</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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.

09/08/99
 CONTRACT: DN00083
 TIP PROJECT: BD-5114P
 \$\$\$SYTIME\$\$\$\$\$
 \$\$\$DN\$\$\$\$\$
 \$\$\$USERNAME\$\$\$\$\$

CONTRACT: DN00083
 TIP PROJECT: BD-5114P

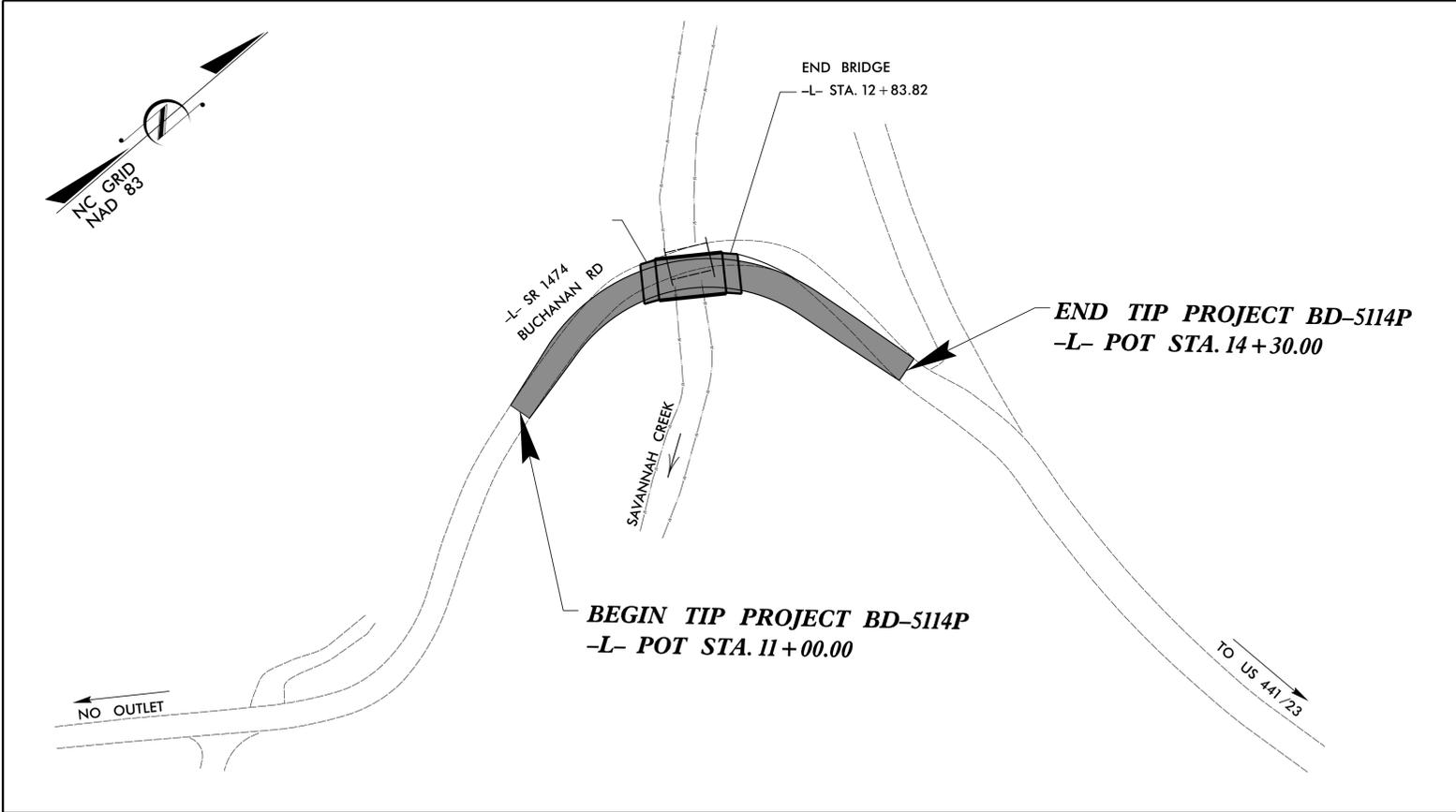
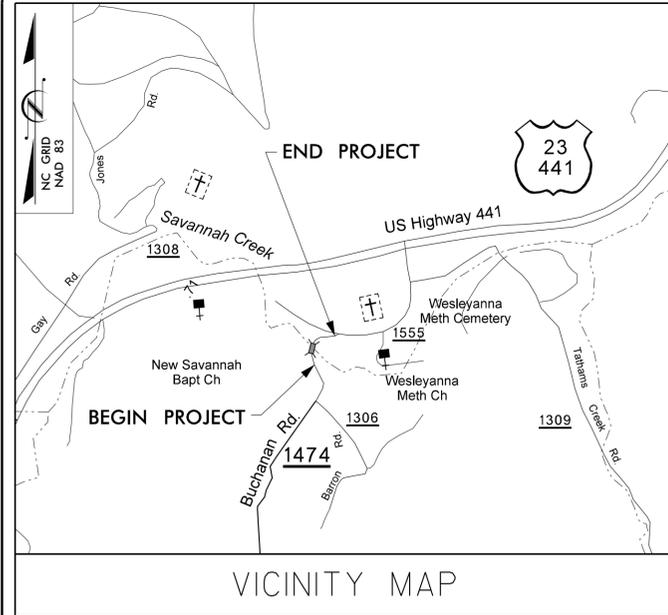
STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

T.I.P. NO.	SHEET NO.
BD-5114P	UO-1

UTILITIES BY OTHERS PLANS
JACKSON COUNTY

LOCATION: BRIDGE NO. 70 OVER SAVANNAH CREEK
 ON SR 1474 (BUCHANAN RD)

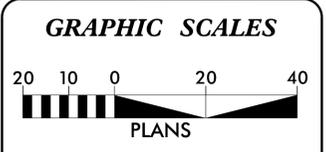
TYPE OF WORK: AERIAL CABLE TV & TELEPHONE



V&M
 Vaughn & Melton
 Consulting Engineers

Asheville, NC 828-253-2796
 Tri-Cities, TN 423-467-8401
 Knoxville, TN 865-546-8800
 Middlesboro, KY 606-248-6500
 Charlotte, NC 704-357-0488
 Spartanburg, SC 864-574-4715

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INDEX OF SHEETS

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

- UTILITY OWNERS ON PROJECT
- (1) CABLE TV - MORRIS BROADBAND
 - (2) TELEPHONE - FRONTIER COMMUNICATIONS

SEAL
 NORTH CAROLINA
 PROFESSIONAL ENGINEER
 REECE M. SCHULER
 2/4/13

V&M
 Vaughn & Melton
 Consulting Engineers
 3089-L Beam Road
 Charlotte, NC 28217
 704-357-0488

DEPARTMENT OF TRANSPORTATION

PREPARED IN THE OFFICE OF:
 DIVISION OF HIGHWAYS
 UTILITIES ENGINEERING SECTION

1591 MAIL SERVICES CENTER
 RALEIGH NC 27699-1591
 PHONE (919) 250-4128
 FAX (919) 250-4119

Roger Worthington, P.E. UTILITIES SECTION ENGINEER
 Xxxxx Xxxxx, P.E. UTILITIES SQUAD LEADER PROJECT ENGINEER
 Reece Schuler, PE UTILITIES PROJECT DESIGNER

DIVISION OF HIGHWAYS
 STATE OF NORTH CAROLINA

CROSS SECTION SUMMARY
 IN CUBIC YARDS

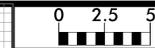


-L- LOCATION	UNCLASSIFIED EXCAVATION	EMBT
11+00	0	0
11+50	2	2
12+00	2	26
12+36.28 BEGIN BRIDGE	0	30
12+83.82 END BRIDGE	0	0
13+00	0	51
13+50	0	288
14+00	3	250
14+30	2	57

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT.

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

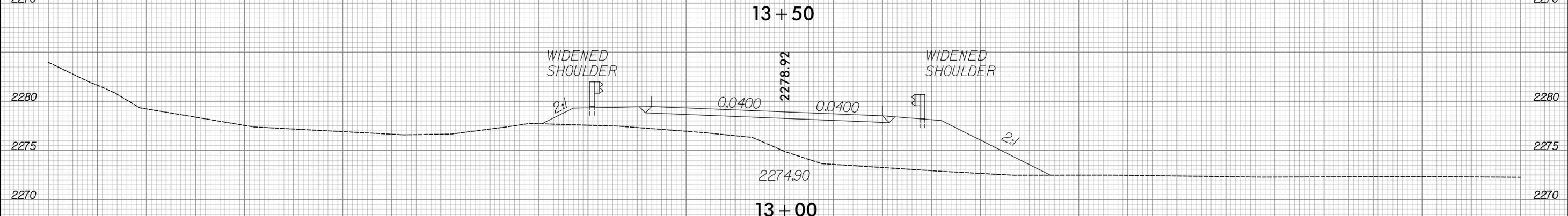
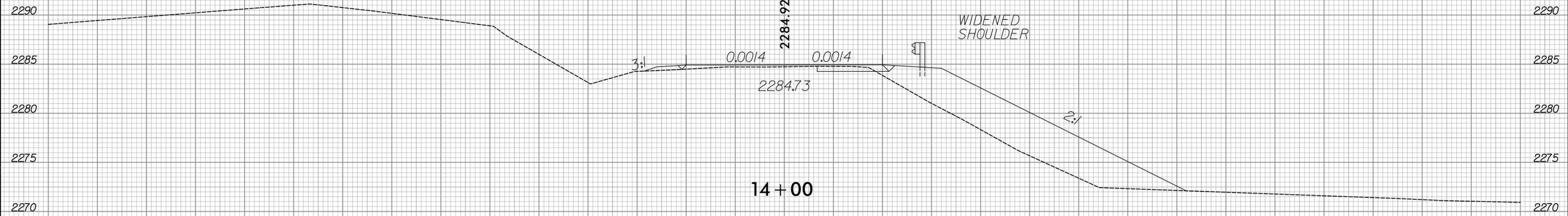
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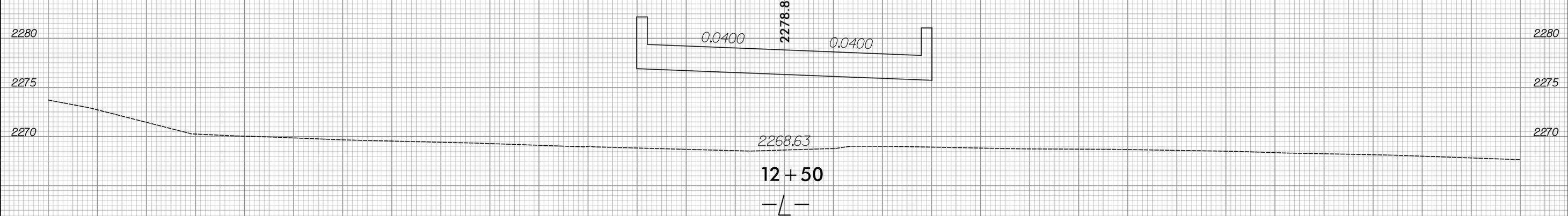
PROJ. REFERENCE NO. BD-5114P	SHEET NO. X-2
---------------------------------	------------------

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

END TIP PROJECT BD-5114P
-L- POT STA. 14+30.00



END BRIDGE -L- STA. 12+83.82



75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

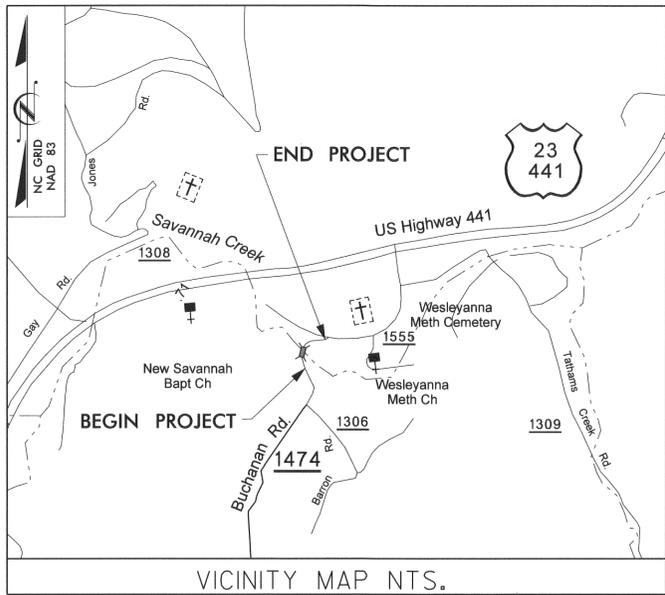
SYTIME
DGN
DATE

TIP NO: BD-5114P

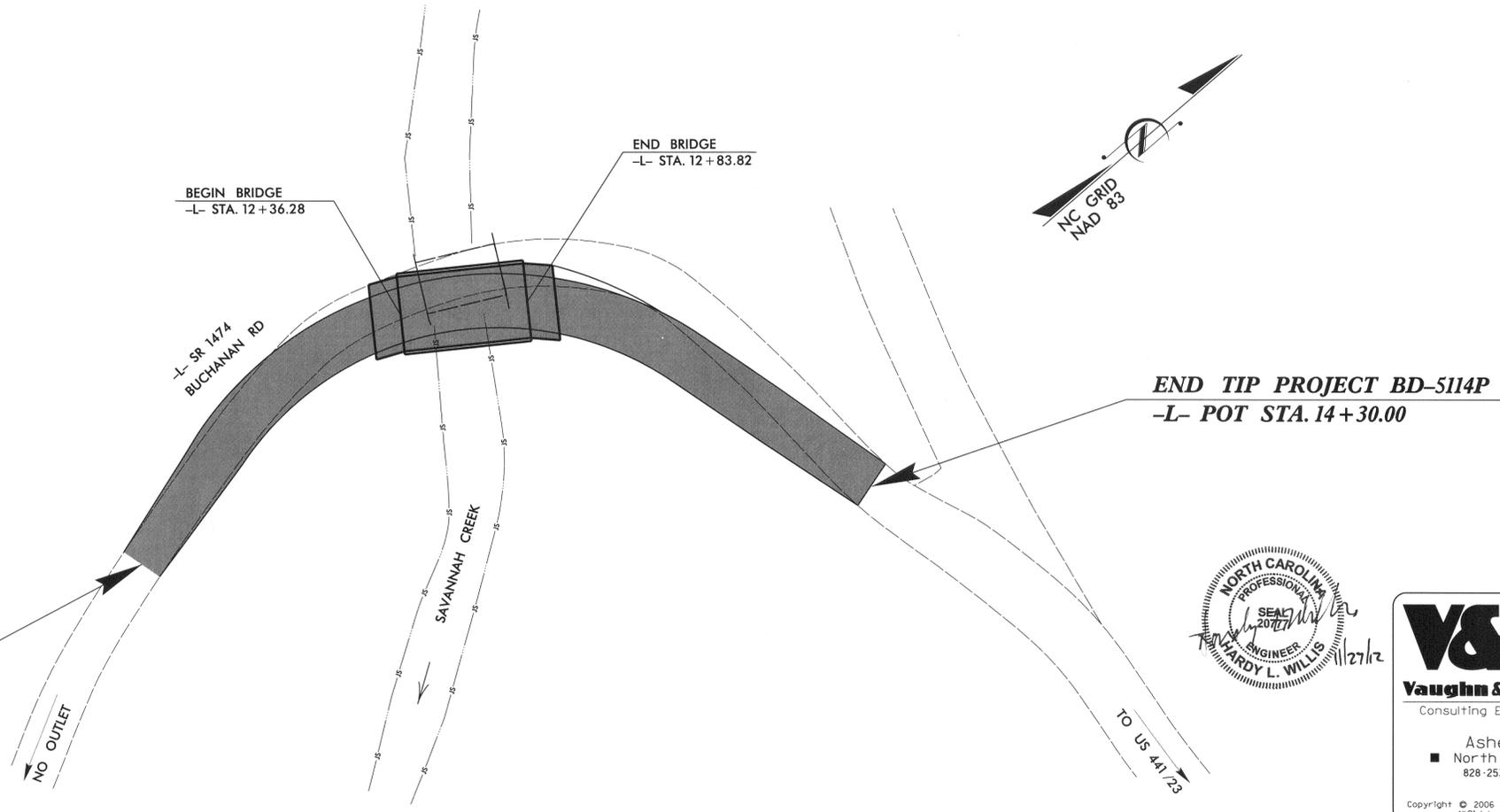
CONTRACT: DN00083

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BD-5114P	0	22
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
45360.1.16	BRZ-1474(2)	P.E.	
45360.2.16	BRZ-1474(2)	RW	
45360.3.16	BRZ-1474(2)	CONST.	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
JACKSON COUNTY



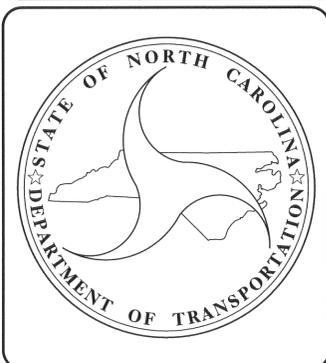
STRUCTURES



V&M
Vaughn & Melton
Consulting Engineers

Charlotte, North Carolina 704-351-0488
Tri-Cities, Tennessee 423-467-8401
Knoxville, Tennessee 865-546-5800
Asheville, North Carolina 828-253-2796
Middlesboro, Kentucky 606-248-6600
Spartanburg, South Carolina 864-574-4775

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DESIGN DATA

ADT 2000	=	150
ADT 2025	=	500
T	=	6%
V	=	25 MPH
FUNC CLASS	=	RURAL LOCAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BD-5114P	=	0.054 MI
LENGTH STRUCTURE TIP PROJECT BD-5114P	=	0.009 MI
TOTAL LENGTH OF TIP PROJECT BD-5114P	=	0.063 MI

Prepared in the Office of:
VAUGHN & MELTON
1318-F. PATTON AVE.
ASHEVILLE, NC, 28806

FOR THE NORTH CAROLINA DIVISION OF HIGHWAYS

2012 STANDARD SPECIFICATIONS

LETTING DATE :
JANUARY 30, 2013

REECE SCHULER, PE
PROJECT ENGINEER

HARDY WILLIS, PE
PROJECT DESIGN ENGINEER

STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

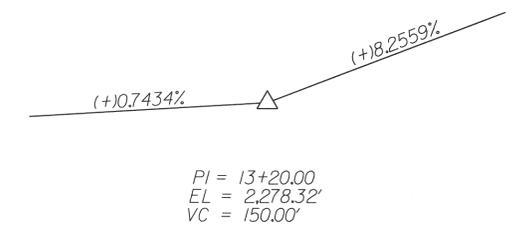
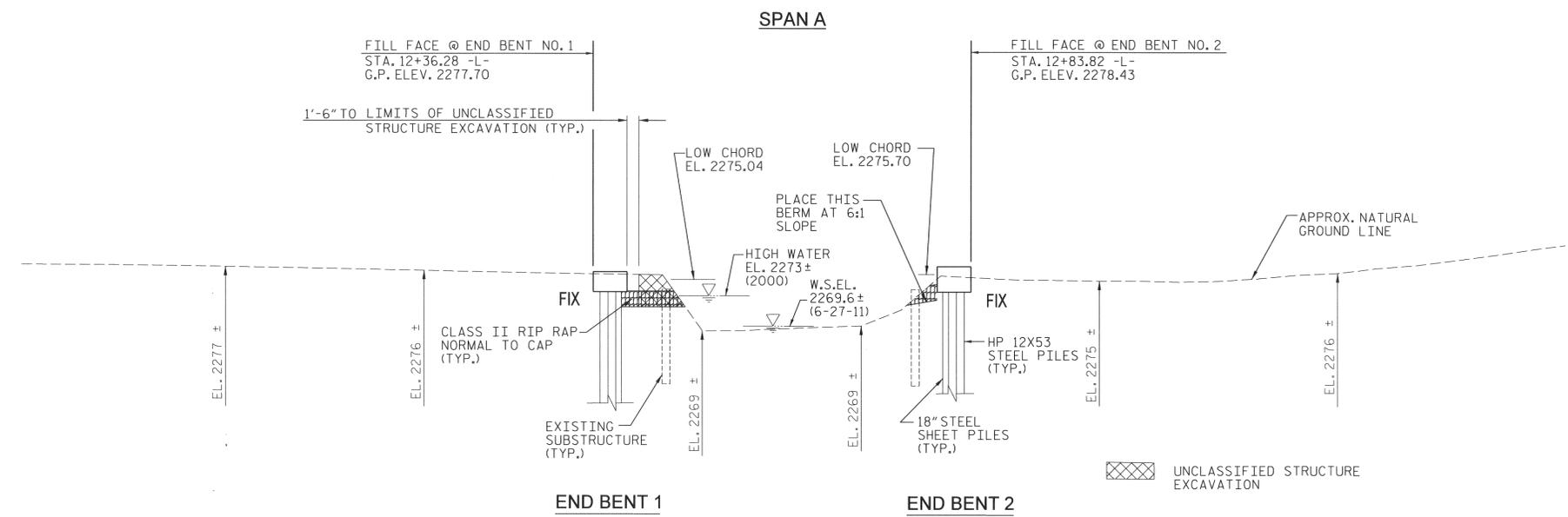
JOSH DEYTON, PE P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

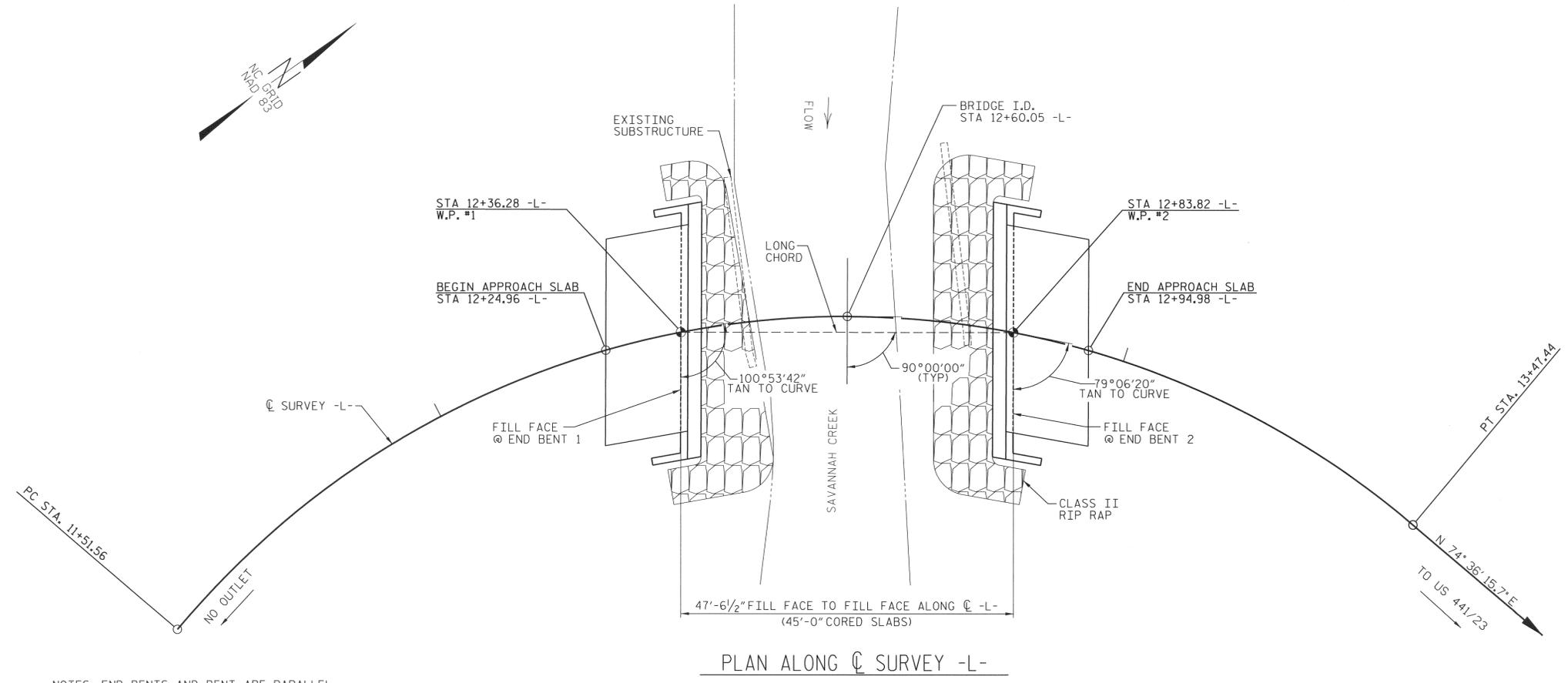
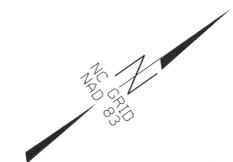
APPROVED _____ DATE _____
DIVISION ADMINISTRATOR

11+50 12+00 12+50 13+00 13+50

2,290
2,280
2,270
2,260



SECTION ALONG C SURVEY -L-
SECTIONS AT END BENTS ARE AT RIGHT ANGLES.
NOTE: THE APPROXIMATE GROUND LINE ELEVATIONS ARE ALONG THE EDGE OF BRIDGE ON THE UPSTREAM SIDE.



NOTES: END BENTS AND BENT ARE PARALLEL.
CORED SLABS ARE PARALLEL TO LONG CHORD.
PILES ARE NOT SHOWN IN PLAN VIEW FOR CLARITY.



PROJECT NO. BD-5114P
JACKSON COUNTY
STATION: 12+60.05 -L-
SHEET 1 OF 3 REPLACES BRIDGE NO. 70

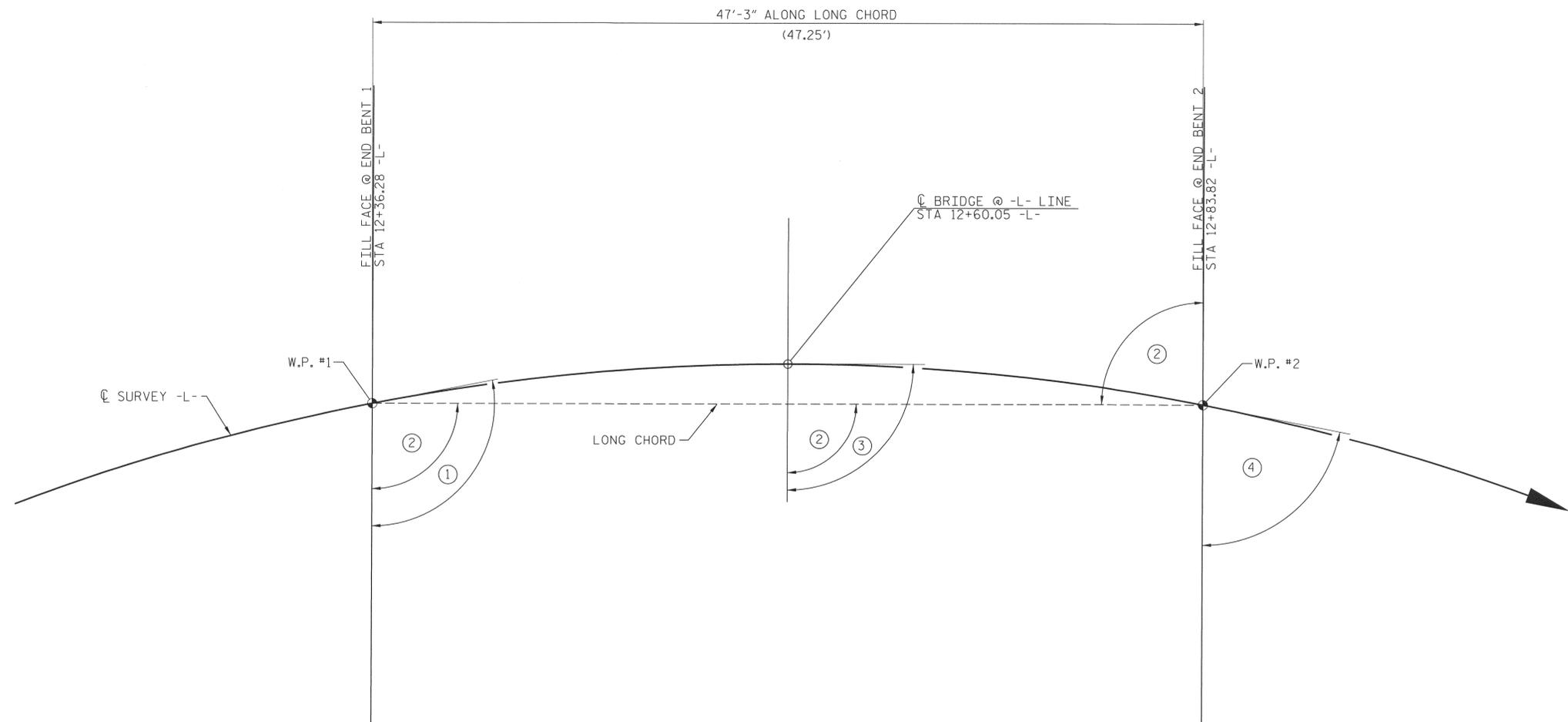


DRAWN BY: MAF DATE: SEPT. 2012
CHECKED BY: HLW DATE: SEPT. 2012

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE over SAVANNAH CREEK
on SR 1474 (BUCHANAN RD.)
BETWEEN NO OUTLET & US 23/441

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			22



LONG CHORD LAYOUT
END BENTS ARE PARALLEL.

PI Sta 12+76.09
 $\Delta = 89^\circ 47' 11.8''$ (RT)
 $D = 45' 50'' 11.8''$
 $L = 195.88'$
 $T = 124.54'$
 $R = 125.00'$

HORIZONTAL CURVE DATA -L-

- ① $100^\circ 53' 42''$ TAN TO CURVE, CL SURVEY -L-
- ② $90^\circ 00' 00''$ TO LONG CHORD
- ③ $90^\circ 00' 00''$ TAN TO CURVE, CL SURVEY -L-
- ④ $79^\circ 06' 20''$ TAN TO CURVE, CL SURVEY -L-

PROJECT NO. BD-5114P
JACKSON COUNTY
 STATION: 12+60.05 -L-



SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

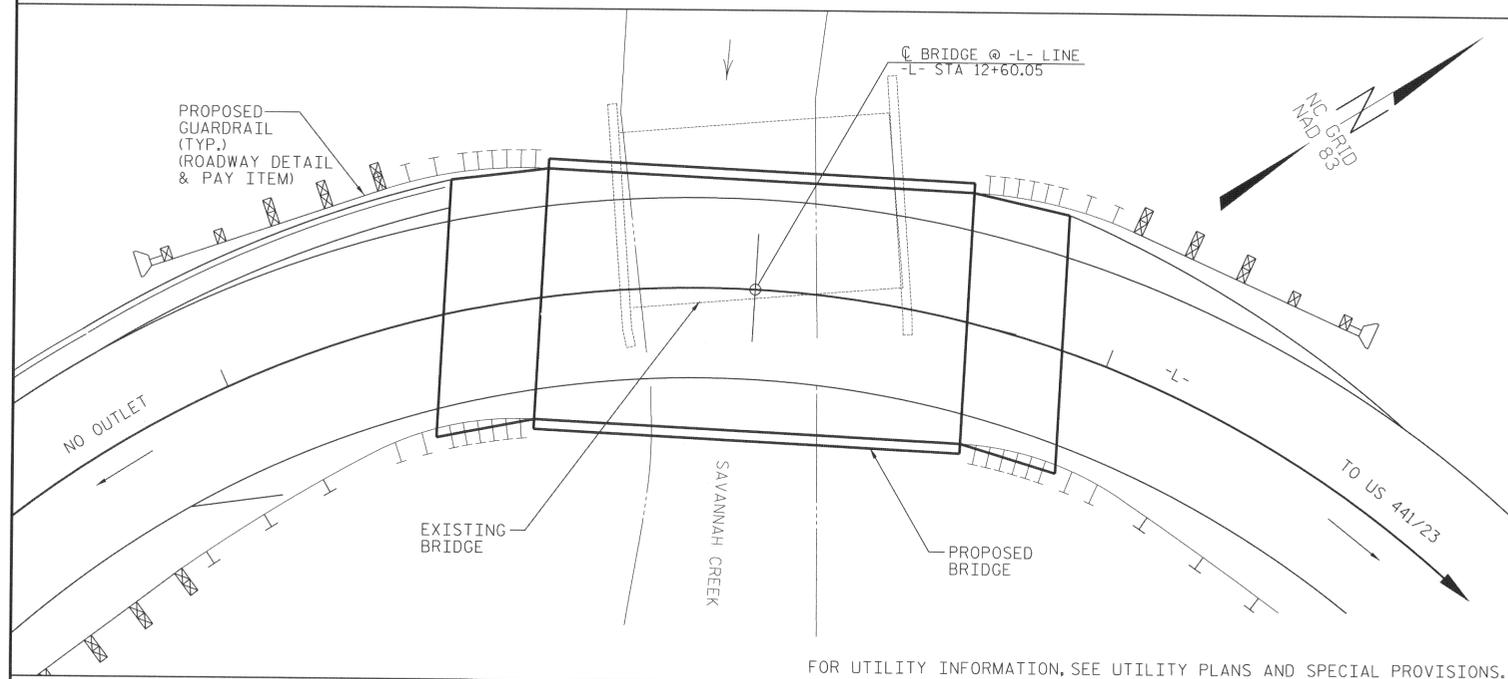
GENERAL DRAWING
 FOR BRIDGE over SAVANNAH CREEK
 on SR 1474 (BUCHANAN RD.)
 BETWEEN NO OUTLET & US 23/441



DRAWN BY: MAF DATE: SEPT. 2012
 CHECKED BY: HLW DATE: SEPT. 2012

REVISIONS						SHEET NO. S-2
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 22
2			4			

BM #2 N 588285.5545 E 724734.5122 ELEV. = 2275.27 -L- STATION 12+77.12 57.14' LT



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

GENERAL NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF 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.

THE EXISTING STRUCTURE, CONSISTING OF A SINGLE SPAN, 31 FOOT LONG TIMBER DECK ON STEEL I-BEAMS, 20-FOOT WIDE, ON TIMBER POSTS AND SILLS, AND LOCATED AT THE PROPOSED STRUCTURE, SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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 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.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 25 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

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

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

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 12+60.05."

FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 75 TONS PER PILE.

DRIVE PILES AT END BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 125 TONS PER PILE.

PILES AT END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 75 TONS PER PILE.

DRIVE PILES AT END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 125 TONS PER PILE.

PZ-27 SHEET PILES ARE TO BE PLACED IN FRONT OF HP12X53 PILES AT END BENT NO. 1.

SHEET PILES SHALL BE INSTALLED TO AN ELEVATION OF 2258.0 FT AT END BENT NO. 1 TO ACCOUNT FOR THE SCOUR IMPACT AT END BENT NO. 1.

PZ-27 SHEET PILES ARE TO BE PLACED IN FRONT OF HP12X53 PILES AT END BENT NO. 2.

SHEET PILES SHALL BE INSTALLED TO AN ELEVATION OF 2263.0 FT AT END BENT NO. 2 TO ACCOUNT FOR THE SCOUR IMPACT AT END BENT NO. 2.

HYDROGRAPHIC DATA

DESIGN DISCHARGE	= 1900 CFS
DESIGN FREQUENCY	= 10 YRS
DESIGN HW ELEVATION	= 2277.5 FT
BASE DISCHARGE	= 3600 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 2280.1 FT

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 1900 CFS
OVERTOPPING FREQUENCY	= 10 YRS
OVERTOPPING ELEVATION	= 2277.5 FT

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		18" STEEL SHEET PILES	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" x 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT		
						NO.	LIN. FT.						NO.	LIN. FT.	
	LUMP SUM	LUMP SUM	CU. YARDS	LUMP SUM	LBS.								LUMP SUM		
SUPERSTRUCTURE				LUMP SUM					90.25				LUMP SUM	10	450.0
END BENT 1		LUMP SUM	20.3		2,385	5	100	850		50	56				
END BENT 2		LUMP SUM	20.3		2,385	5	75	712		55	62				
TOTAL	LUMP SUM	LUMP SUM	40.6	LUMP SUM	4,770	10	175	1,562	90.25	105	118	LUMP SUM	10	450.0	



PROJECT NO. BD-5114P
JACKSON COUNTY
 STATION: 12+60.05 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE over SAVANNAH CREEK
 on SR 1474 (BUCHANAN RD.)
 BETWEEN NO OUTLET & US 23/441



DRAWN BY: MAF DATE: SEPT. 2012
 CHECKED BY: HLW DATE: SEPT. 2012

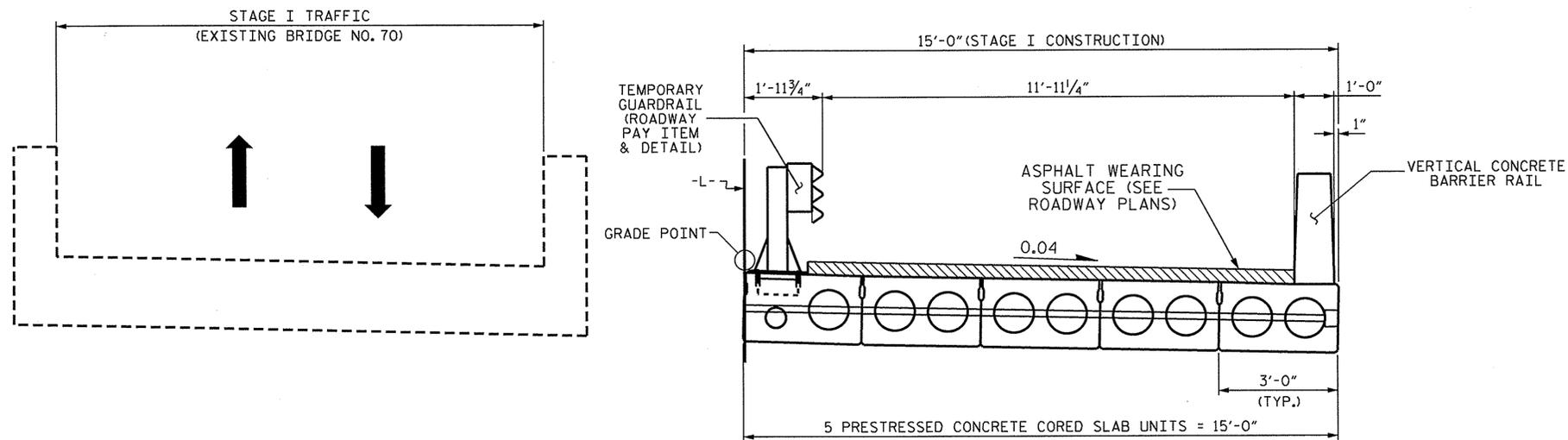
REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
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2			4		

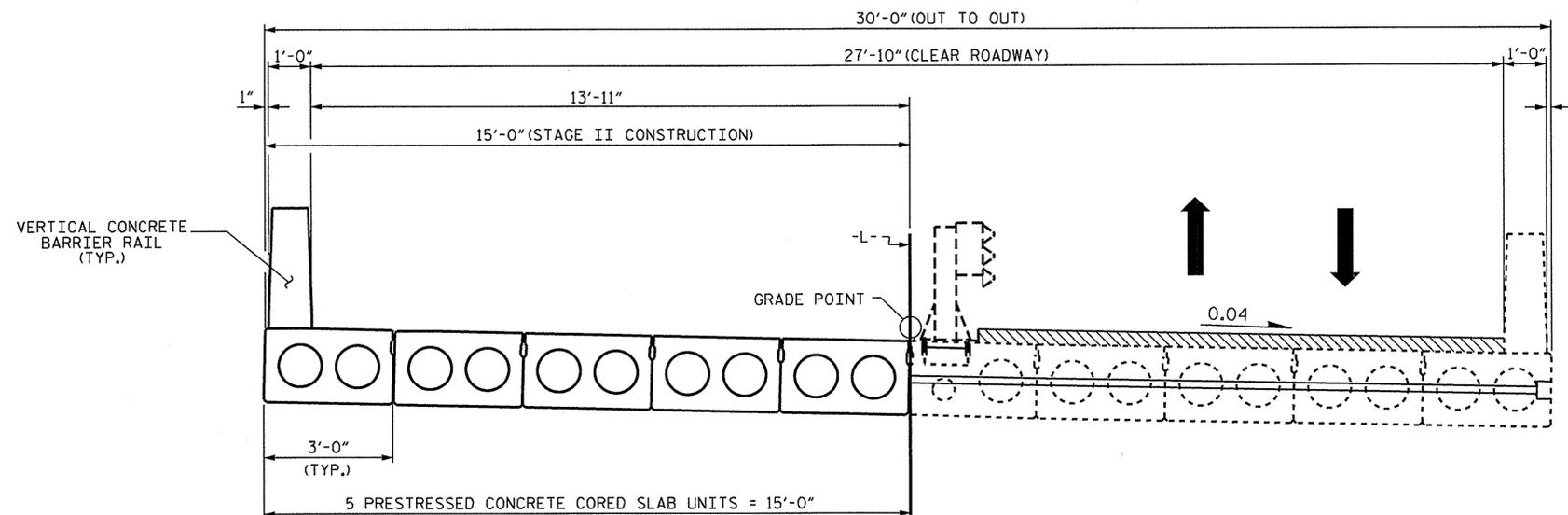
SHEET NO.
 S-3
 TOTAL SHEETS
 22

NOTES

FOR TEMPORARY GUARDRAIL DETAILS AND PAY ITEM, SEE ROADWAY PLANS.



STAGE I



STAGE II

STAGING SEQUENCE

PROJECT NO. BD-5114P
JACKSON COUNTY
 STATION: 12+60.05 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

CONSTRUCTION STAGING



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-4
2			4			22

DRAWN BY : V.X. NGUYEN DATE : 8/12
 CHECKED BY : J.R. DUGGINS DATE : 8/12

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.088	--	1.75	0.277	1.34	45'	EL	22	0.539	1.23	45'	EL	2.2	0.80	0.277	1.09	45'	EL	22		
	HL-93(Opr)	N/A	--	1.590	--	1.35	0.277	1.74	45'	EL	22	0.539	1.59	45'	EL	2.2	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.336	48.104	1.75	0.277	1.65	45'	EL	22	0.539	1.45	45'	EL	2.2	0.80	0.277	1.34	45'	EL	22		
	HS-20(Opr)	36.000	--	1.882	67.763	1.35	0.277	2.14	45'	EL	22	0.539	1.88	45'	EL	2.2	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.611	35.252	1.4	0.277	4.02	45'	EL	22	0.539	4.01	45'	EL	2.2	0.80	0.277	2.61	45'	EL	22	
		SNGARBS2	20.000	--	2.108	42.166	1.4	0.277	3.25	45'	EL	22	0.539	2.94	45'	EL	2.2	0.80	0.277	2.11	45'	EL	22	
		SNAGRIS2	22.000	--	2.067	45.466	1.4	0.277	3.15	45'	EL	17.6	0.539	2.77	45'	EL	2.2	0.80	0.277	2.07	45'	EL	22	
		SNCOTTS3	27.250	--	1.304	35.527	1.4	0.277	2.01	45'	EL	22	0.539	2.01	45'	EL	2.2	0.80	0.277	1.30	45'	EL	22	
		SNAGGRS4	34.925	--	1.150	40.181	1.4	0.277	1.77	45'	EL	22	0.539	1.74	45'	EL	2.2	0.80	0.277	1.15	45'	EL	22	
		SNS5A	35.550	--	1.121	39.841	1.4	0.277	1.73	45'	EL	22	0.539	1.79	45'	EL	2.2	0.80	0.277	1.12	45'	EL	22	
	TTST	SNS6A	39.950	--	1.056	42.175	1.4	0.277	1.63	45'	EL	22	0.539	1.67	45'	EL	2.2	0.80	0.277	1.06	45'	EL	22	
		SNS7B	42.000	3	1.006	42.268	1.4	0.277	1.55	45'	EL	22	0.539	1.68	45'	EL	2.2	0.80	0.277	1.01	45'	EL	22	
		TNAGRIT3	33.000	--	1.296	42.759	1.4	0.277	2	45'	EL	22	0.539	1.96	45'	EL	2.2	0.80	0.277	1.30	45'	EL	22	
		TNT4A	33.075	--	1.309	43.305	1.4	0.277	2.02	45'	EL	22	0.539	1.88	45'	EL	2.2	0.80	0.277	1.31	45'	EL	22	
		TNT6A	41.600	--	1.099	45.712	1.4	0.277	1.69	45'	EL	22	0.539	1.83	45'	EL	2.2	0.80	0.277	1.10	45'	EL	22	
		TNT7A	42.000	--	1.120	47.043	1.4	0.277	1.73	45'	EL	22	0.539	1.69	45'	EL	2.2	0.80	0.277	1.12	45'	EL	22	
		TNT7B	42.000	--	1.166	48.975	1.4	0.277	1.8	45'	EL	22	0.539	1.61	45'	EL	2.2	0.80	0.277	1.17	45'	EL	22	
TNAGRIT4	43.000	--	1.111	47.757	1.4	0.277	1.71	45'	EL	22	0.539	1.55	45'	EL	2.2	0.80	0.277	1.11	45'	EL	22			
TNAGT5A	45.000	--	1.033	46.505	1.4	0.277	1.59	45'	EL	22	0.539	1.59	45'	EL	2.2	0.80	0.277	1.03	45'	EL	22			
TNAGT5B	45.000	--	1.009	45.408	1.4	0.277	1.56	45'	EL	22	0.539	1.47	45'	EL	2.2	0.80	0.277	1.01	45'	EL	22			

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.

COMMENTS:

- 1.
- 2.
- 3.
- 4.

CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

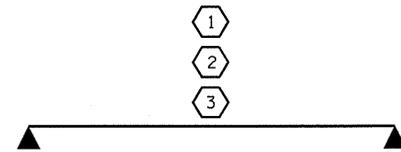
2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY
FOR SPAN A

PROJECT NO. BD-5114P
JACKSON COUNTY
 STATION: 12+60.05 -L-

ASSEMBLED BY : BMATHEW DATE : 12/2011
 CHECKED BY : S.W. PEARCE DATE : 8/2012
 DRAWN BY : CVC 6/10
 CHECKED BY : DNS 6/10

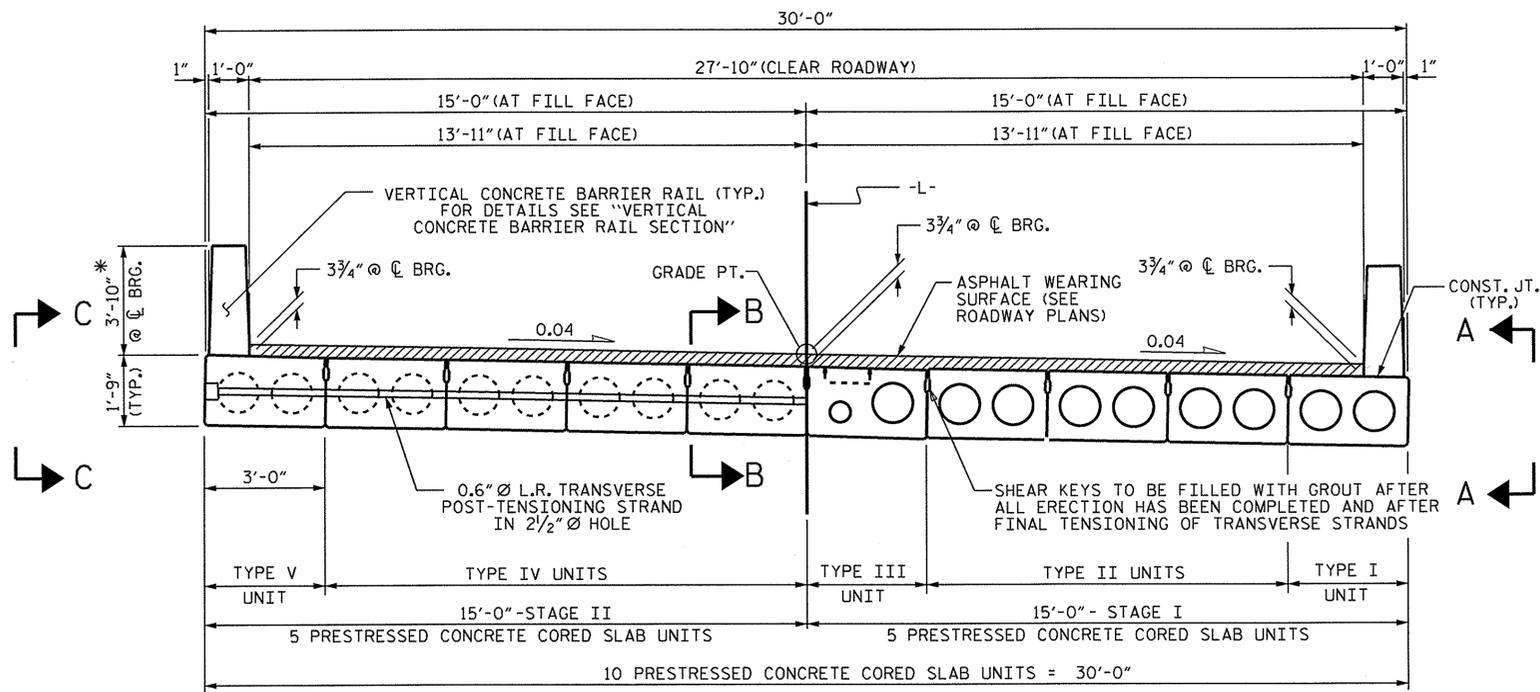
05-SEP-2012 16:04
 S:\DPC4\John\LIBR_Files\BD-5114P\Final_Plans\BD5114P_SD_LRFR.dgn
 jduggins



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 LRFR SUMMARY FOR
 45' CORED SLAB UNIT
 90° SKEW
 (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5
2			4			22

STD. NO. 21LRFR1_90S_45L



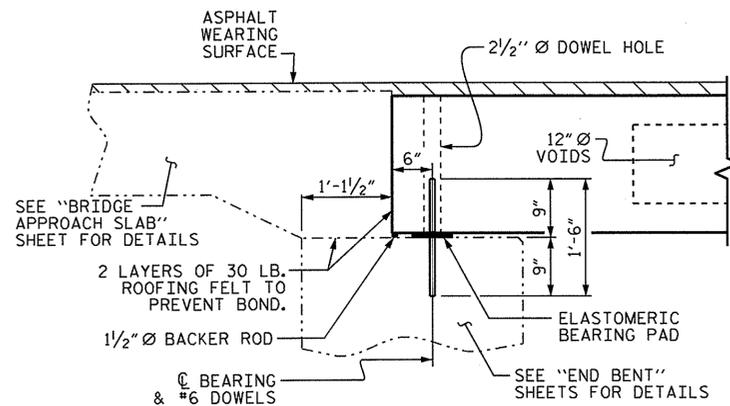
HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION
THROUGH VOIDS

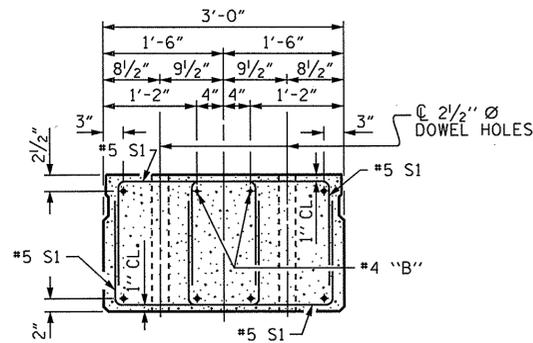
TYPICAL SECTION

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

FIXED END

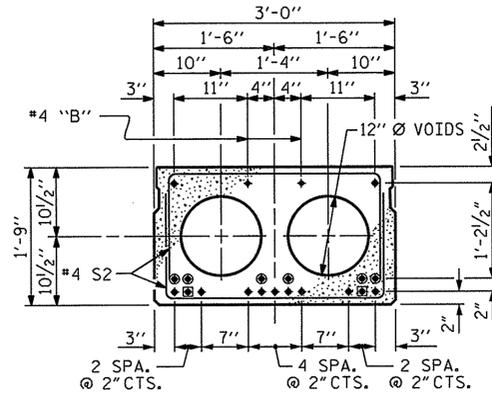


SECTION AT END BENT

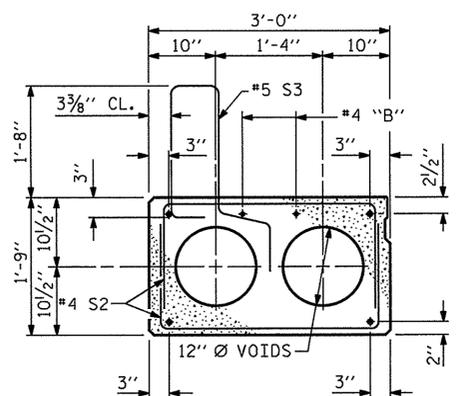


END ELEVATION

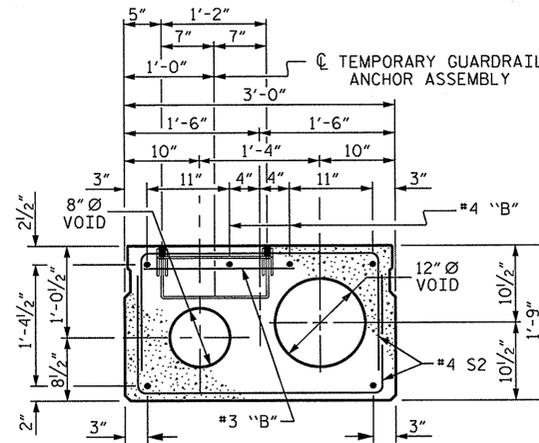
SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN). INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.



STRAND LAYOUT FOR 45' UNIT
TYPE II & IV
(13 STRANDS REQUIRED)



EXTERIOR SLAB SECTION
TYPE I & V
(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION - TYPE II & TYPE IV)



INTERIOR SLAB SECTION

TYPE III
(FOR PRESTRESSED STRAND LAYOUT, SEE 'INTERIOR SLAB SECTION - TYPE II & IV')

FOR TEMPORARY GUARDRAIL ANCHOR ASSEMBLY LOCATION, SEE SECTION OF ANCHOR ASSEMBLY LOCATION ON "ANCHORAGE DETAILS FOR TEMPORARY GUARDRAIL ANCHOR ASSEMBLY FOR TYPE III CORED SLAB UNIT" SHEET.

- ▲ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
- BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 2'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
- OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED, IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND

PROJECT NO. BD-5114P
JACKSON COUNTY
STATION: 12+60.05 -L-

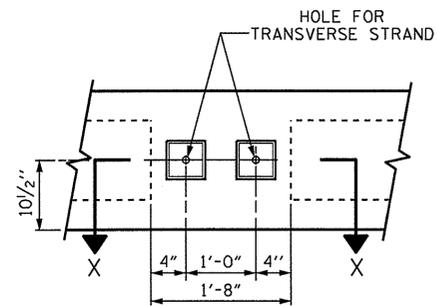
SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
3'-0" X 1'-9"
PRESTRESSED CONCRETE
CORED SLAB UNIT
90° SKEW

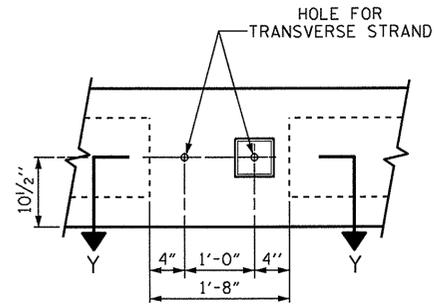
REVISIONS						SHEET NO. S-6
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 22
2			4			



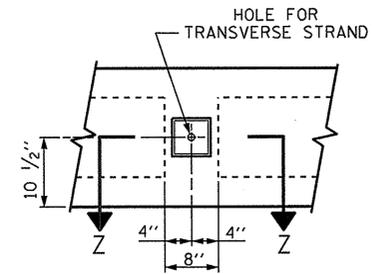
ASSEMBLED BY : BMATHEW DATE : 11/2011
CHECKED BY : S.W. PEARCE DATE : 8/2012
DRAWN BY : DGE 3/09
CHECKED BY : BCH 3/09



VIEW A-A
SEE SHEET 1 OF 5

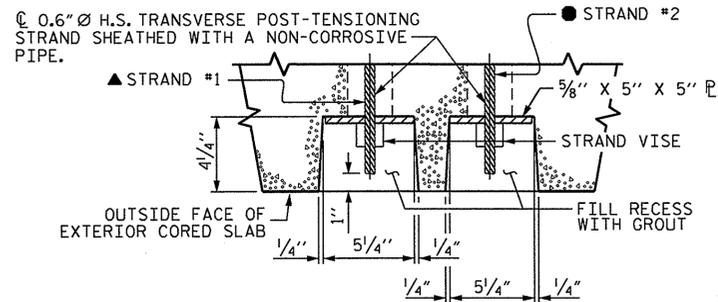


VIEW B-B
SEE SHEET 1 OF 5



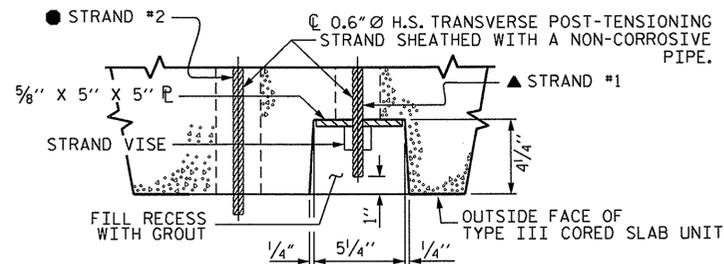
VIEW C-C
SEE SHEET 1 OF 5

- ▲ STRAND #1 GOES THRU 5 CORED SLAB UNITS (TO BE TENSIONED DURING STAGE I CONSTRUCTION)
- STRAND #2 GOES THRU ALL 10 CORED SLAB UNITS (TO BE TENSIONED DURING STAGE II CONSTRUCTION)



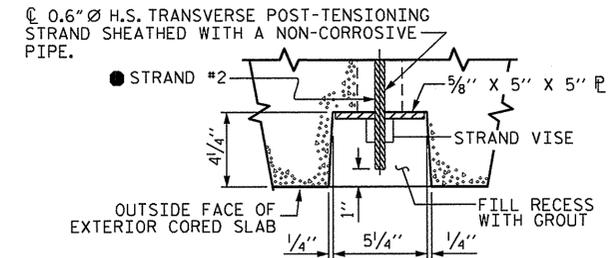
SECTION X-X
(TYPE I UNIT)

UP STATION →



SECTION Y-Y
(TYPE III UNIT)

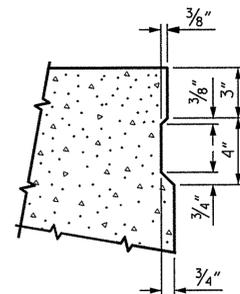
← UP STATION



SECTION Z-Z
(TYPE V UNIT)

← UP STATION

GRouted RECESS AT END OF POST-TENSIONED STRAND



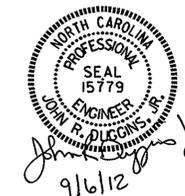
SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.

PROJECT NO. BD-5114P
JACKSON COUNTY
 STATION: 12+60.05 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 3'-0" X 1'-9"
 PRESTRESSED CONCRETE
 CORED SLAB UNIT

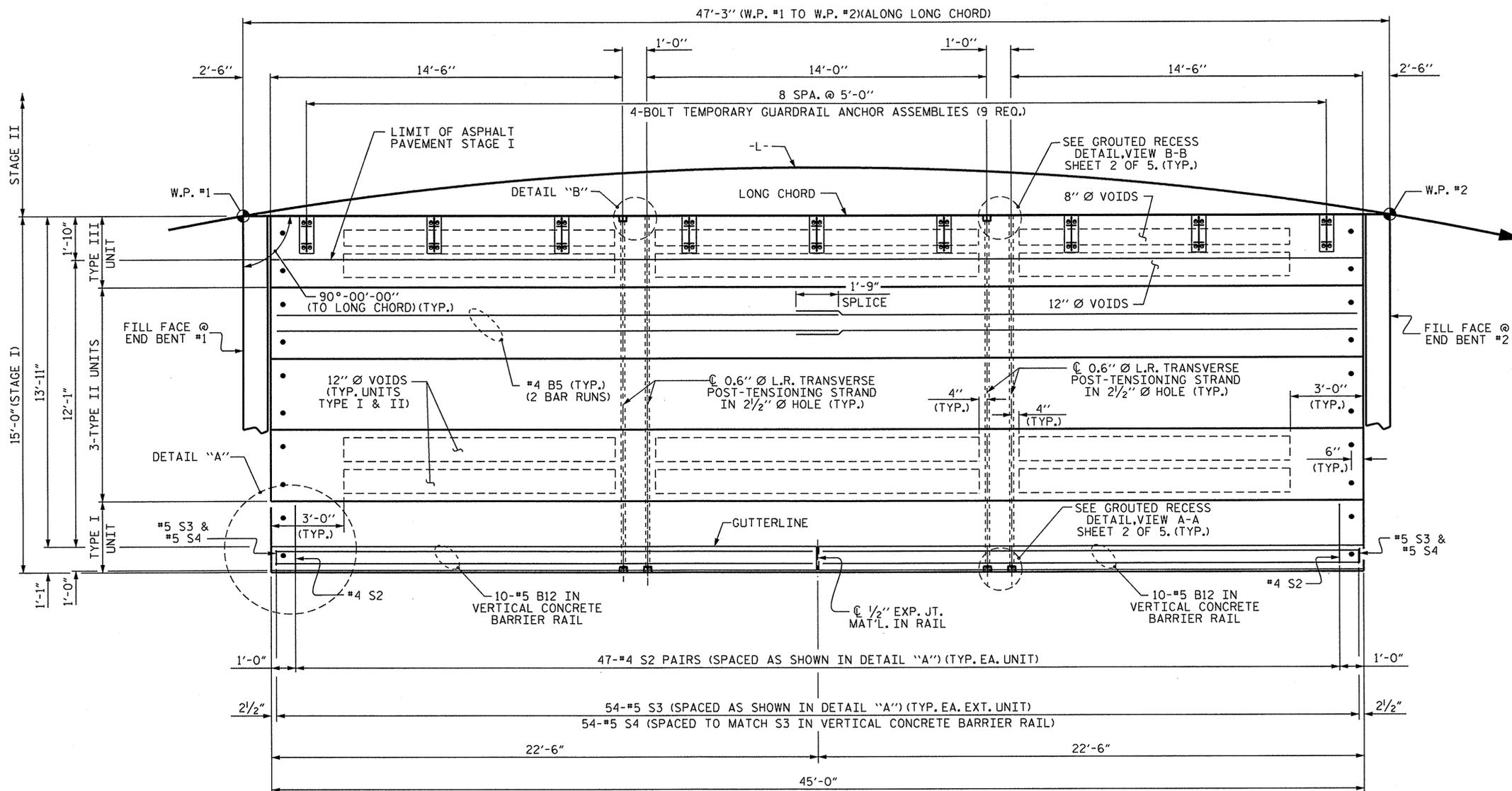


DRAWN BY: B. MATHEW DATE: 11/11
 CHECKED BY: S.W. PEARCE DATE: 8/2012

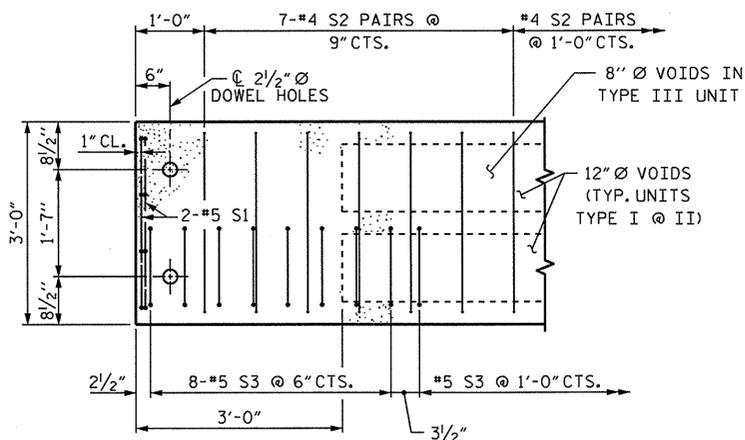
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 jduggins

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-1
1			3			TOTAL SHEETS
2			4			22

NC006

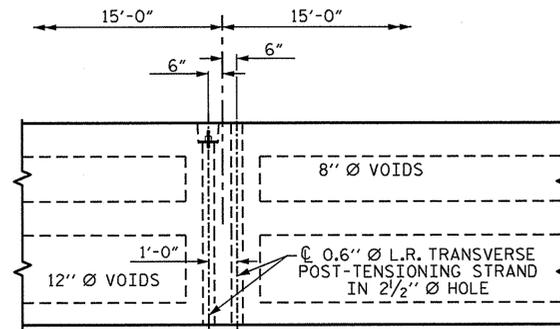


PLAN OF UNIT
(STAGE I)



DETAIL "A"

NOTE: EXTERIOR SECTION SHOWN-INTERIOR SECTION
SIMILAR EXCEPT OMIT S3 BARS



DETAIL "B"

#4 S2 BARS MAY BE SHIFTED AS NECESSARY
TO MAINTAIN 1" CLEAR TO GROUTED RECESS AND
2 1/2" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

ASSEMBLED BY : B.MATHEW DATE : 11/2011
CHECKED BY : S.W. PEARCE DATE : 8/2012
DRAWN BY : DGE 3/09
CHECKED BY : BCH 3/09

06-SEP-2012 14:25
S:\DPG4\John\LIBR.Files\BD-5114P\Final.Plans\BD5114P_SD_CS.dgn
jduggins

PROJECT NO. BD-5114P
JACKSON COUNTY
STATION: 12+60.05 -L-

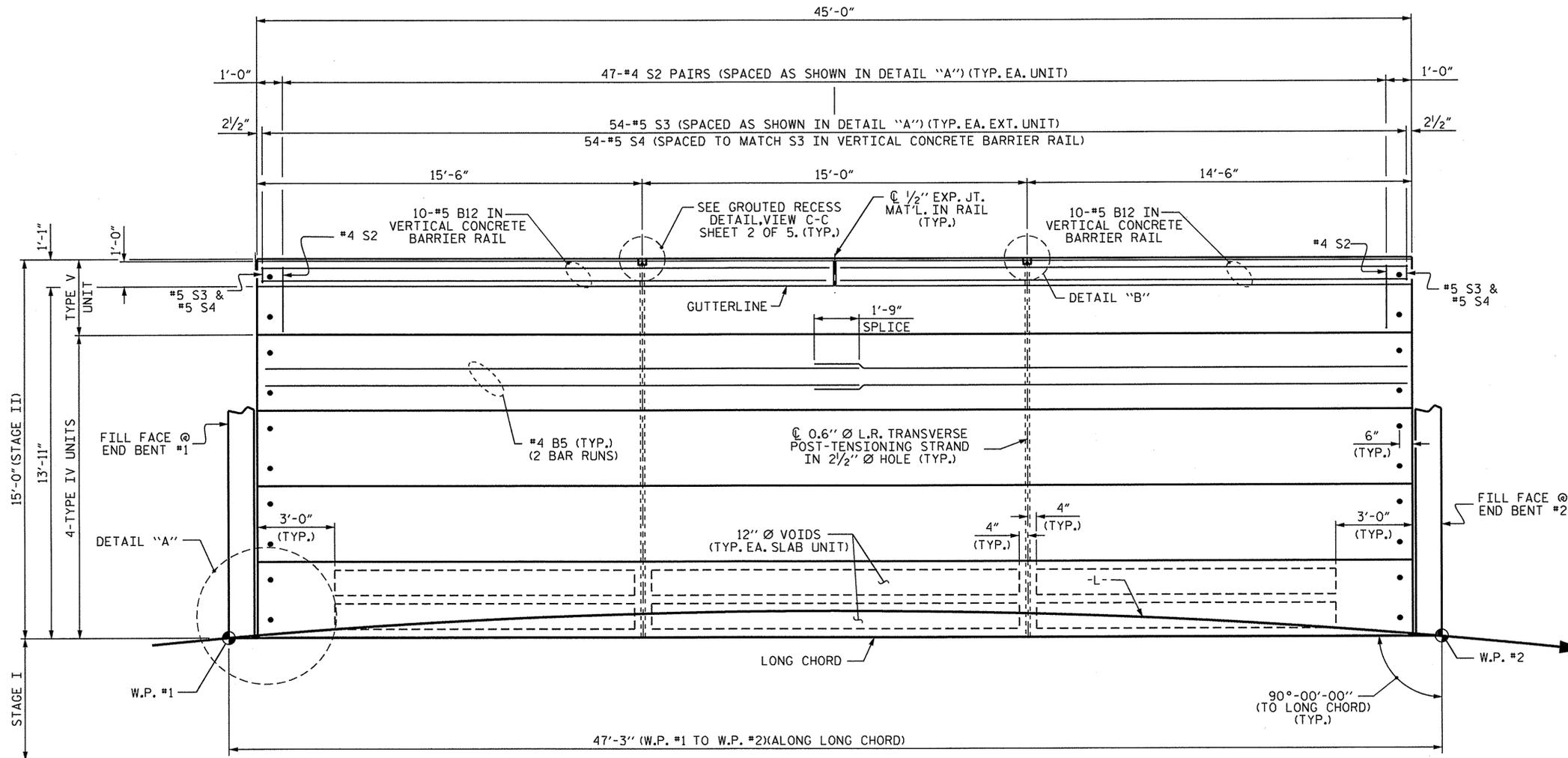
SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

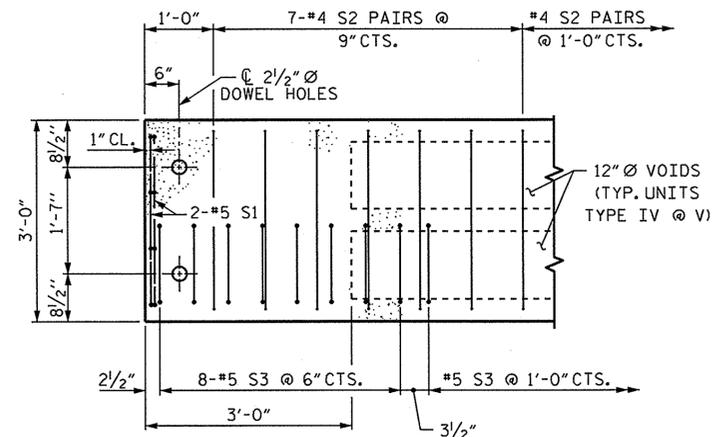
PLAN OF 45' UNIT
STAGE I



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			8
2			4			22

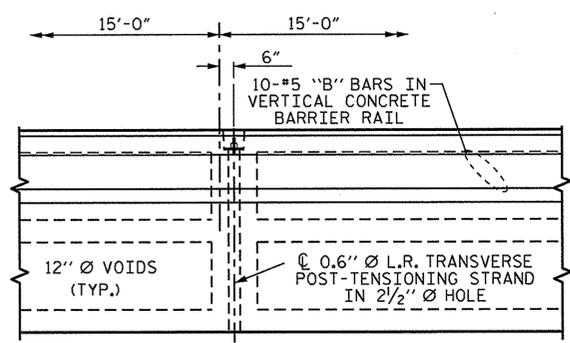


PLAN OF UNIT
(STAGE II)



DETAIL "A"

NOTE: EXTERIOR SECTION SHOWN-INTERIOR SECTION SIMILAR EXCEPT OMIT S3 BARS



DETAIL "B"

#4 S2 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUDED RECESS AND 2 1/2" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

PROJECT NO. BD-5114P
JACKSON COUNTY
STATION: 12+60.05 -L-

SHEET 4 OF 5

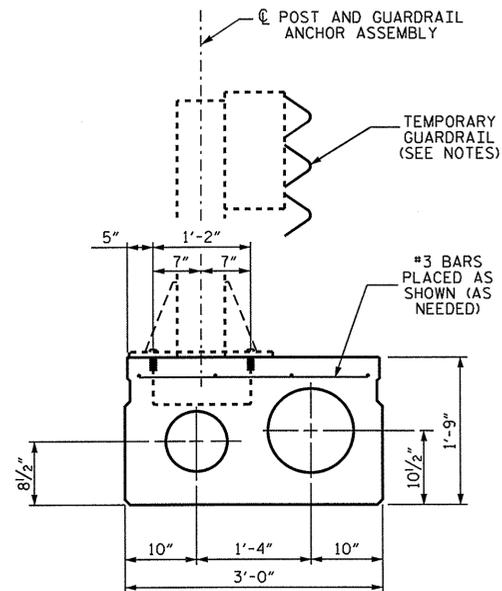
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 45' UNIT
STAGE II



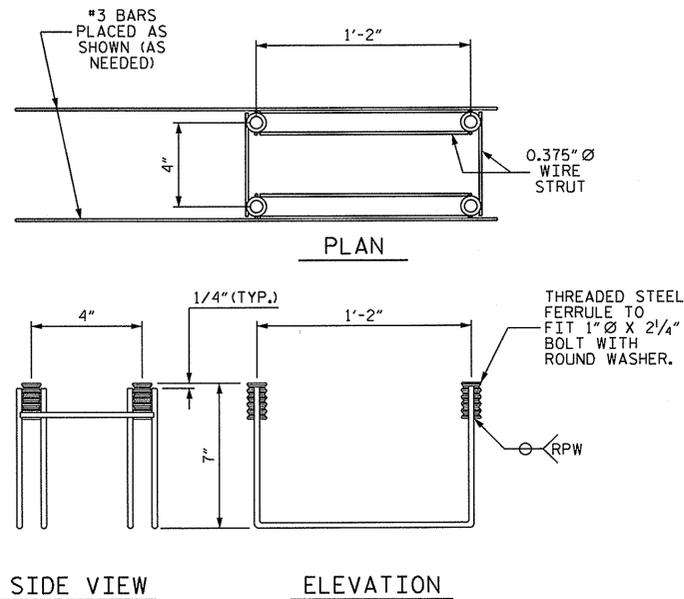
ASSEMBLED BY: B.MATHEW	DATE: 11/2011
CHECKED BY: S.W. PEARCE	DATE: 8/2012
DRAWN BY: DGE 3/09	
CHECKED BY: BCH 3/09	

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			22
2			4			



SECTION OF ANCHOR ASSEMBLY LOCATION

(TYPE III UNIT OF STAGE I)
 THE #3 BARS ARE INCIDENTAL AND THEIR COST SHALL BE INCLUDED IN THE PRICE BID FOR THE PRESTRESSED CONCRETE CORED SLABS.



TEMPORARY GUARDRAIL ANCHOR ASSEMBLY

(9 ASSEMBLIES REQUIRED IN THE TYPE III CORED SLAB UNITS)
 (6 ASSEMBLIES REQUIRED IN THE APPROACH SLABS)

MINIMUM LENGTH OF THREADS IN INSERT (FERRULE): 2 1/2"

NOTES

- THE TEMPORARY GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2 1/2".
 - B. 4 - 1" Ø X 2 1/4" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1" Ø X 2 1/4" GALVANIZED BOLTS 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.
 - C. WIRE STRUTS SHOWN IN THE TEMPORARY GUARDRAIL ANCHOR ASSEMBLY DETAIL ARE THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI.

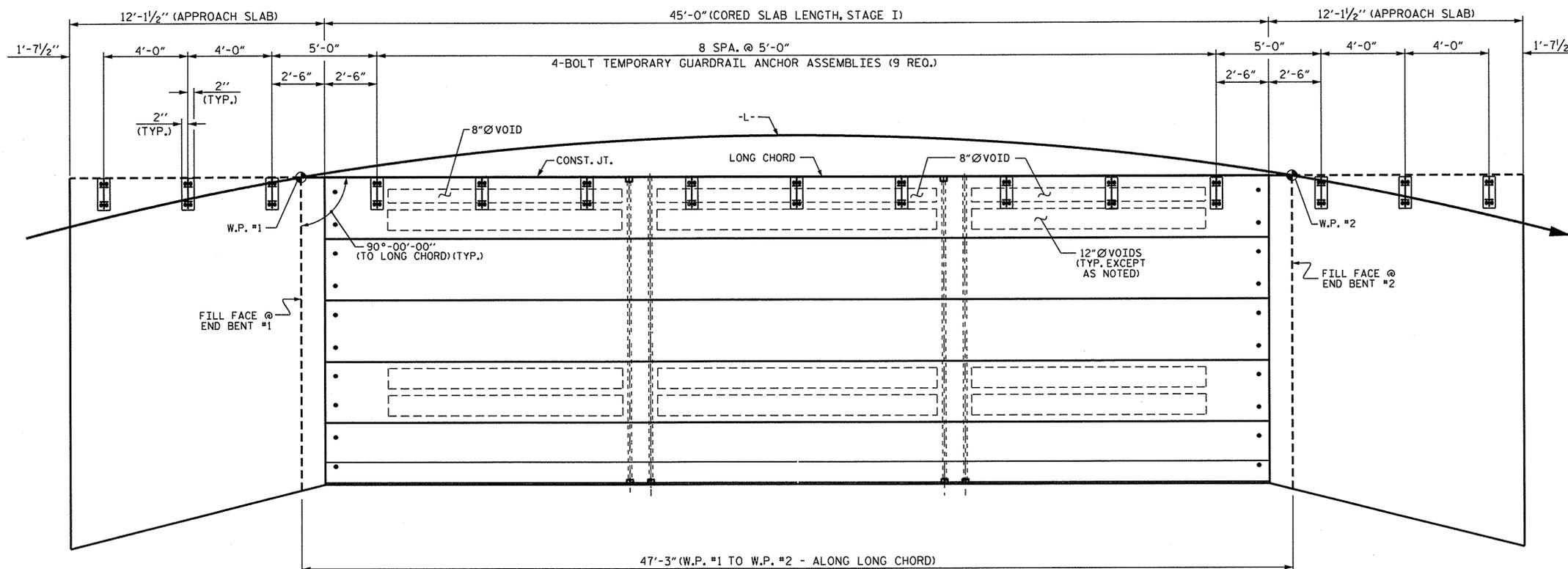
TEMPORARY GUARDRAIL ANCHOR ASSEMBLY WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY TO INSURE FIT.

THE COST OF THE TEMPORARY GUARDRAIL ANCHOR ASSEMBLY COMPLETE IN PLACE, SHALL BE INCLUDED, AS APPLICABLE, IN THE UNIT CONTRACT PRICE BID FOR 3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB OR LUMP SUMP PRICE BID FOR APPROACH SLABS.

FERRULES TO BE PLUGGED DURING CASTING OF THE CORED SLAB UNITS OR POURING OF APPROACH SLAB AS RECOMMENDED BY THE MANUFACTURER.

AT THE CONTRACTOR'S OPTION, FERRULES WITH OPEN OR CLOSED ENDS MAY BE USED.

PAYMENT FOR TEMPORARY GUARDRAIL, POST, AND POST BASE PLATES IS INCLUDED IN ROADWAY PAY ITEMS.



RAIL POST SPACING FOR TEMPORARY GUARDRAIL - STAGE I

PROJECT NO. BD-5114P
JACKSON COUNTY
 STATION: 12+60.05 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 ANCHORAGE DETAILS FOR
 TEMPORARY GUARDRAIL
 ANCHOR ASSEMBLY FOR
 TYPE III CORED
 SLAB UNIT STAGE I

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	9-11	TOTAL SHEETS
1			3			22	
2			4				

DRAWN BY : V.X. NGUYEN DATE : 9/4/12
 CHECKED BY : J.R. DUGGINS DATE : 9/20/12

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.)

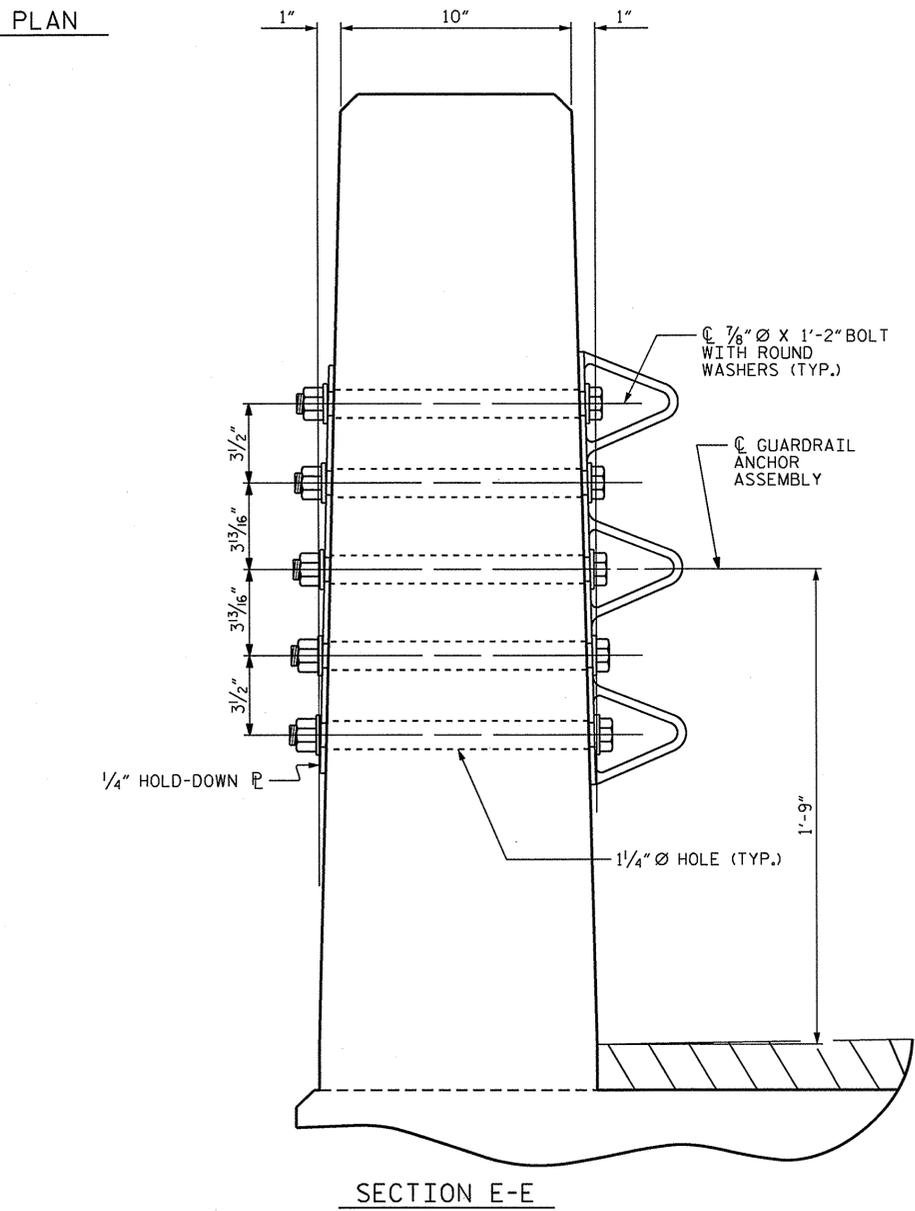
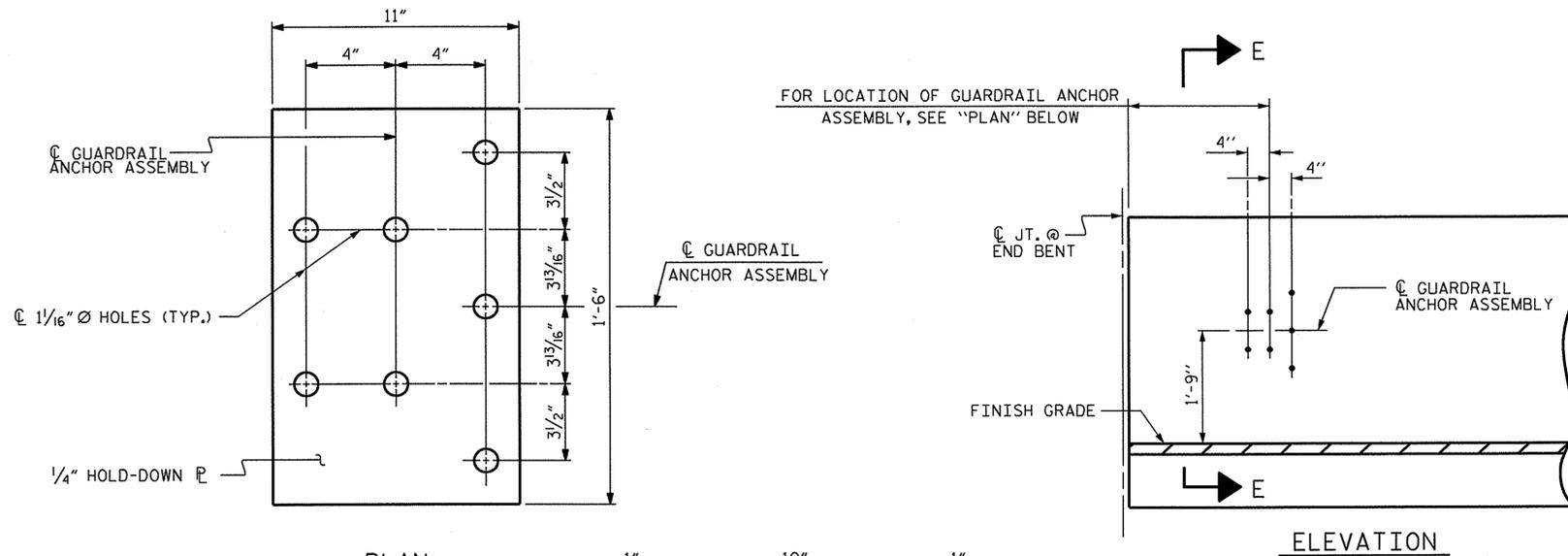
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

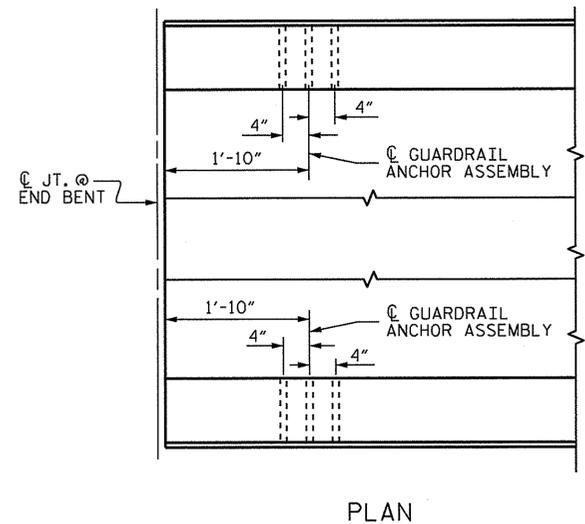
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

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

THE 1 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.

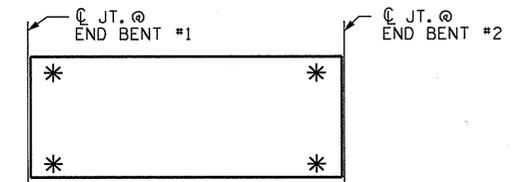


SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF ANCHORS FOR GUARDRAIL

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

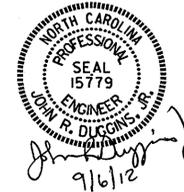


SKETCH SHOWING POINTS OF ATTACHMENT

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. BD-5114P
JACKSON COUNTY
 STATION: 12+60.05 -L-

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



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			22

ASSEMBLED BY : V.X. NGUYEN	DATE : 8/2012
CHECKED BY : J.R. DUGGINS	DATE : 8/2012
DRAWN BY : MAA 5/10	ADDED 5/6/10
CHECKED BY : GM 5/10	REV. 10/1/11
	REV. 12/5/11
	MAA/GM
	MAA/GM

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 7 OF 7.

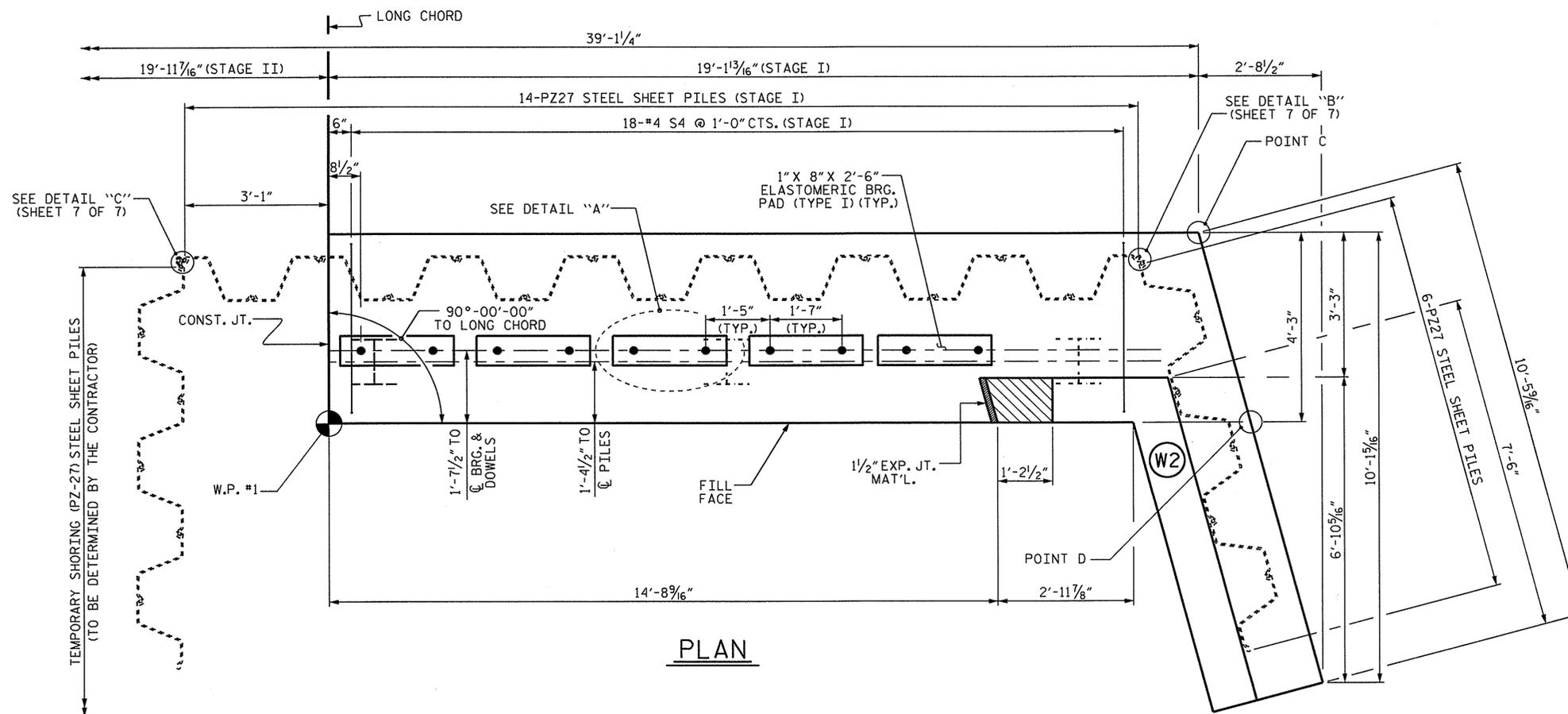
FOR WING DETAILS, SEE SHEET 3 OF 7.

TOP OF PILE ELEVATIONS

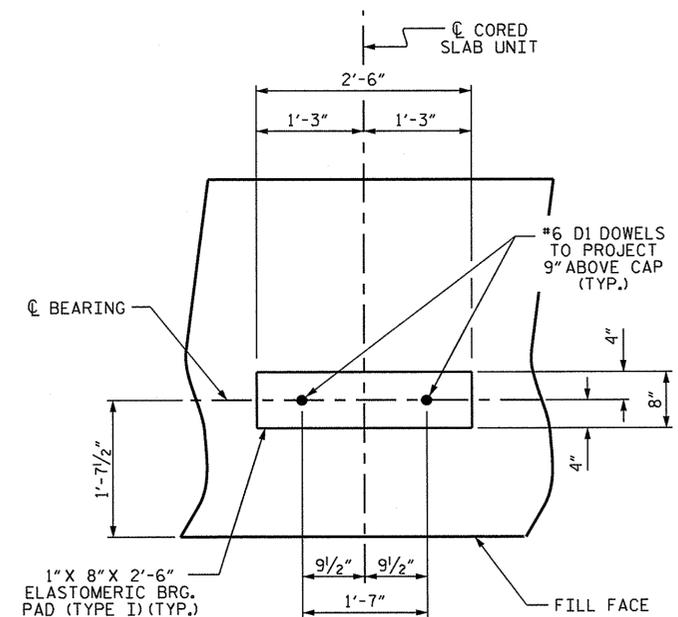
③	2274.04
④	2273.73
⑤	2273.42

CAP ELEVATIONS

POINT	TOP OF CAP ELEVATIONS	BOTTOM OF CAP ELEVATIONS
ⓐ	2274.80	2272.30
ⓓ	2274.75	2272.25



PLAN



DETAIL "A"

SHEET PILES NOT SHOWN

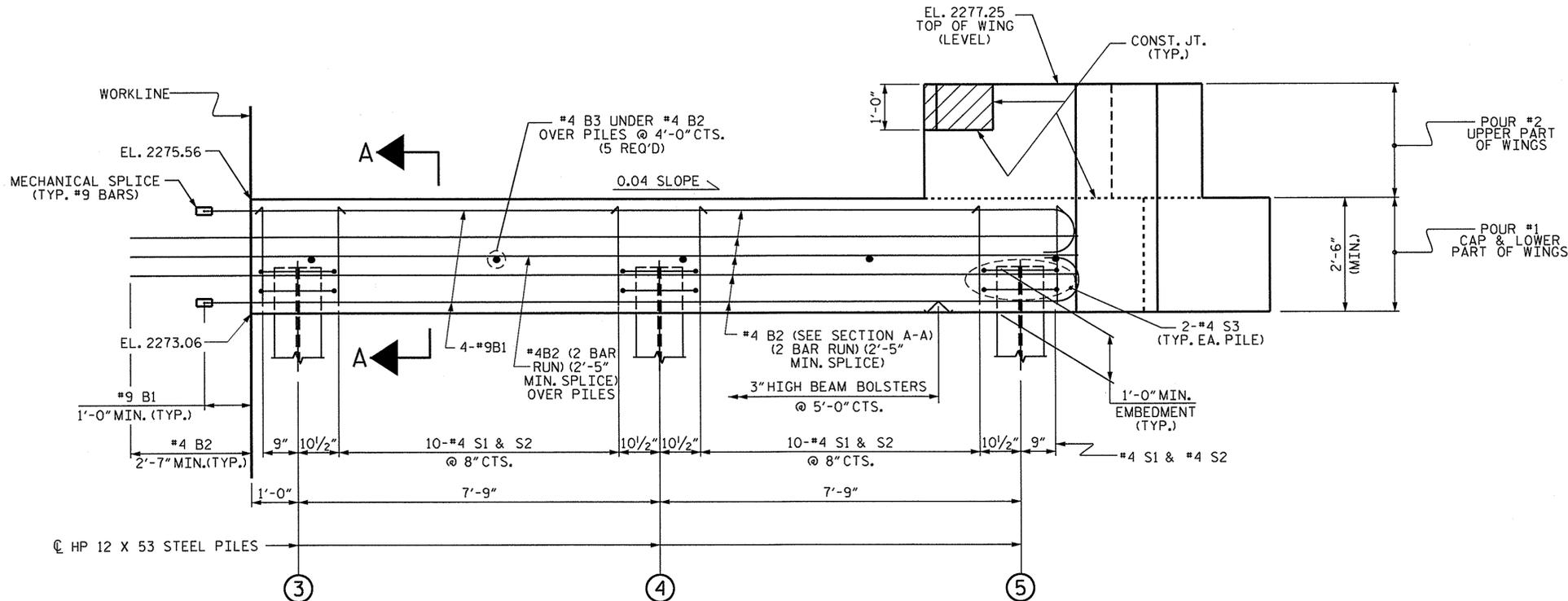
PROJECT NO. BD-5114P
JACKSON COUNTY
 STATION: 12+60.05 -L-

SHEET 1 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT No. 1
 STAGE I

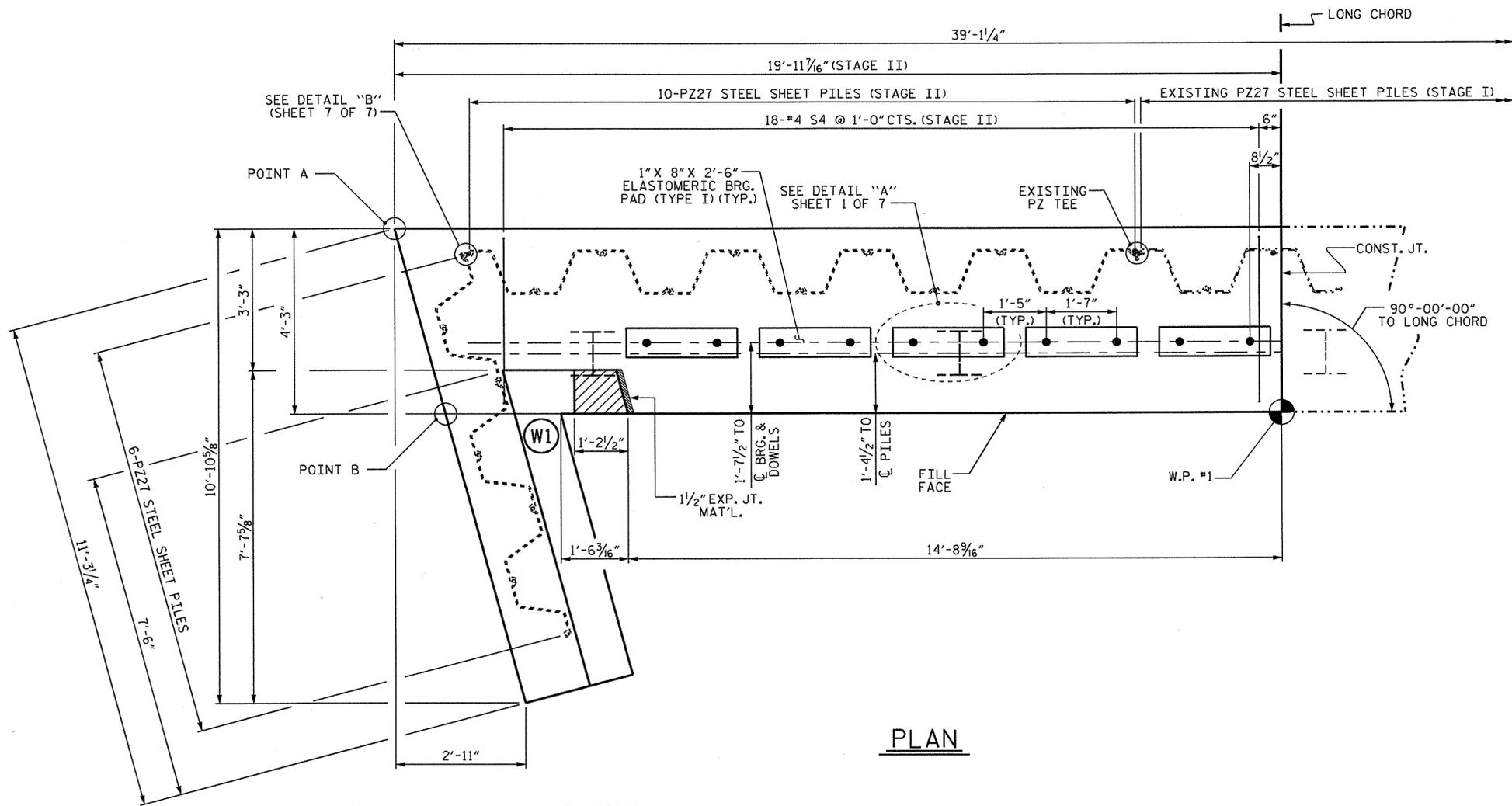
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS 22
2			4			



ELEVATION

FOR SECTION A-A, SEE SHEET 7 OF 7.
 STEEL SHEET PILES NOT SHOWN FOR CLARITY

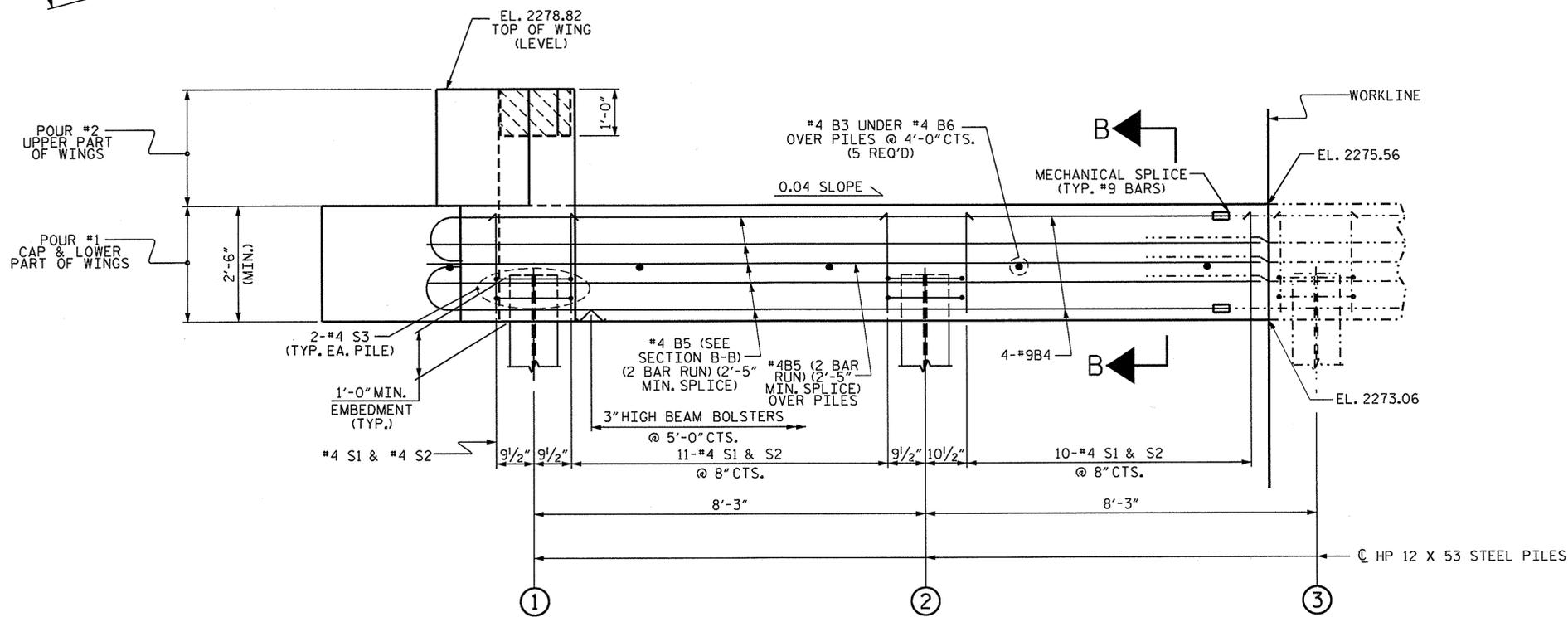
DRAWN BY: H. T. BARBOUR DATE: 8-22-12
 CHECKED BY: J. R. DUGGINS DATE: 8-12



PLAN

TOP OF PILE ELEVATIONS	
①	2274.04
②	2274.37
③	2274.70

CAP ELEVATIONS		
POINT	TOP OF CAP ELEVATIONS	BOTTOM OF CAP ELEVATIONS
Ⓐ	2276.37	2273.87
Ⓑ	2276.32	2273.82



ELEVATION

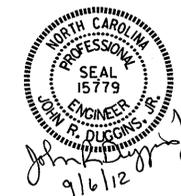
FOR SECTION B-B, SEE SHEET 7 OF 7.
STEEL SHEET PILES NOT SHOWN FOR CLARITY

PROJECT NO. BD-5114P
JACKSON COUNTY
 STATION: 12+60.05 -L-

SHEET 2 OF 7

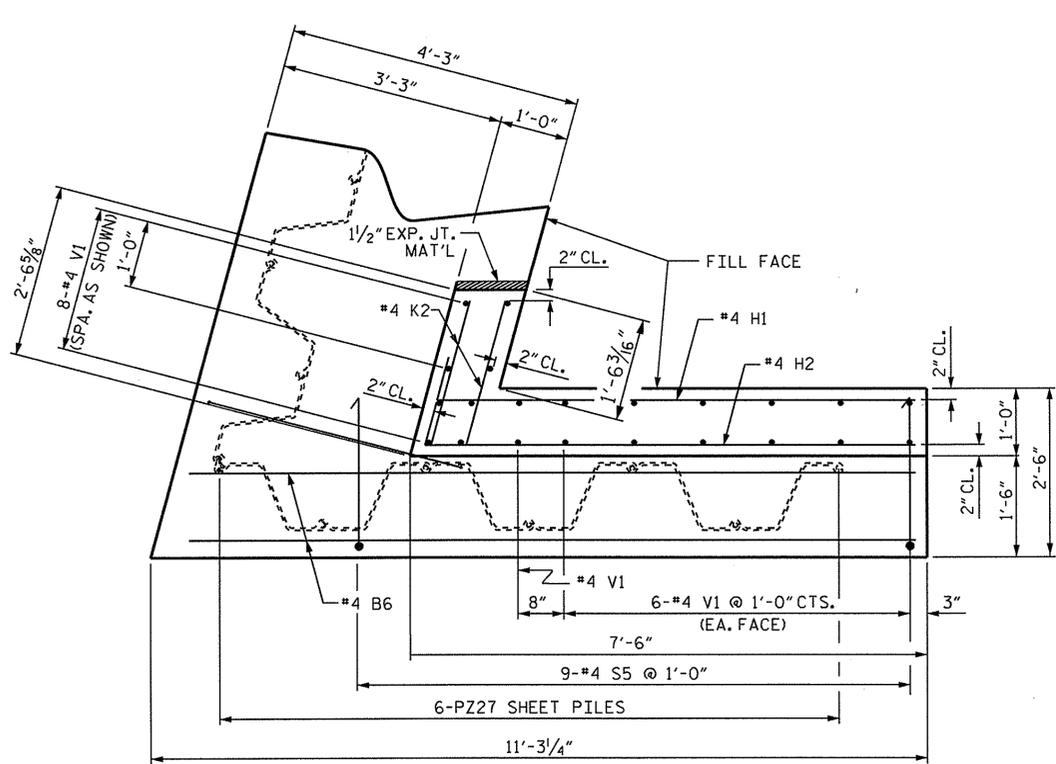
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT No. 1
 STAGE II

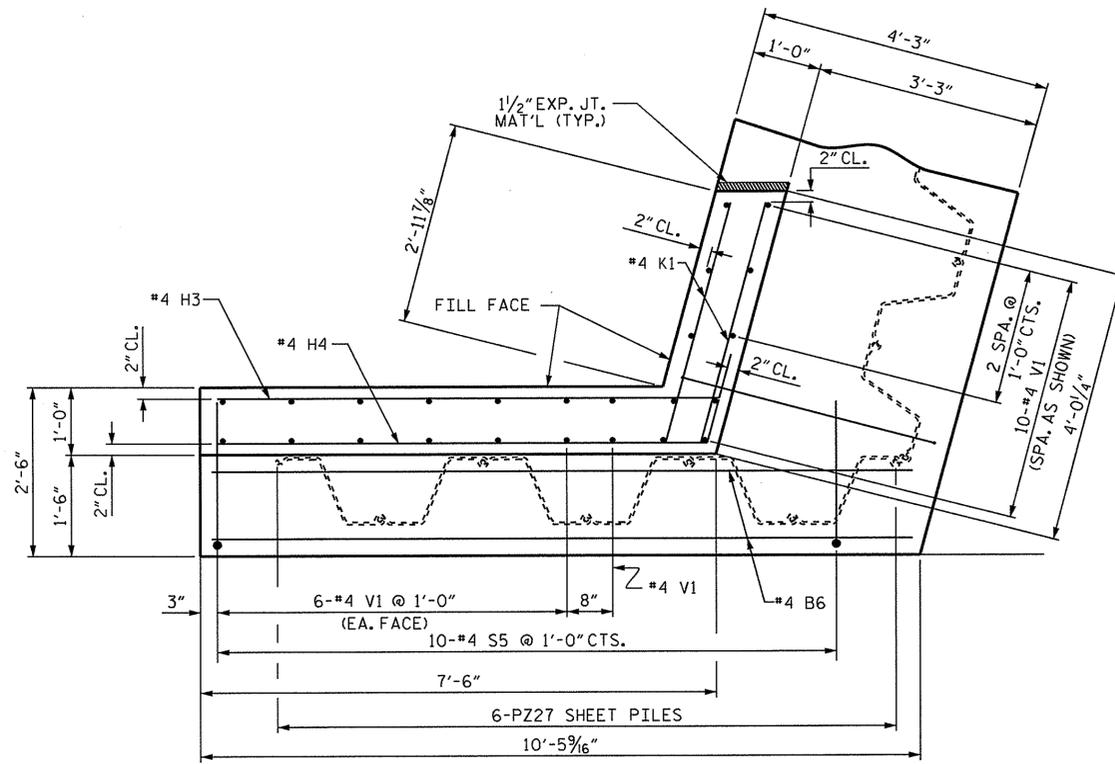


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			22

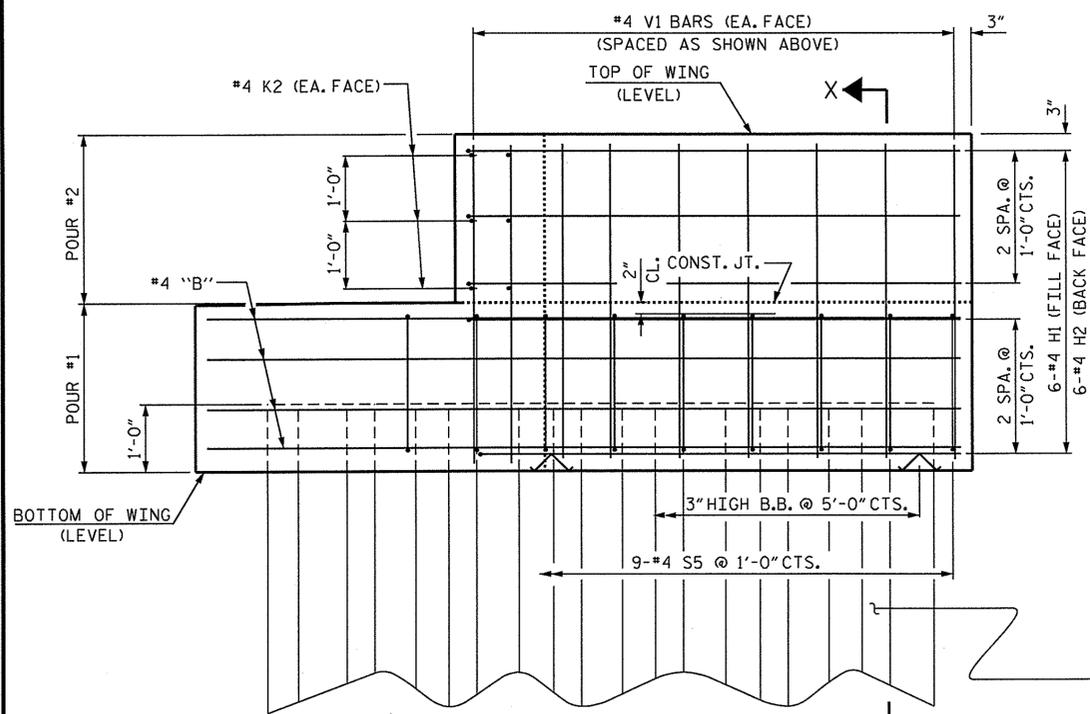
DRAWN BY: H. T. BARBOUR DATE: 8-22-12
 CHECKED BY: J. R. DUGGINS DATE: 8-12



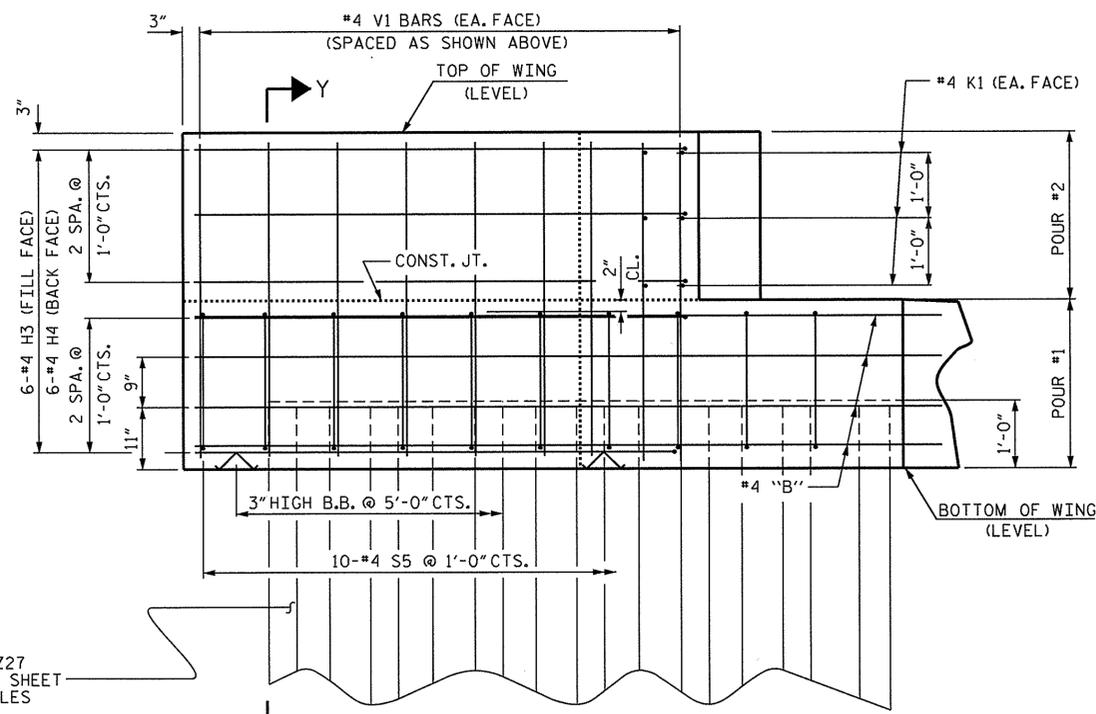
PLAN OF WING (W1) (STAGE II)



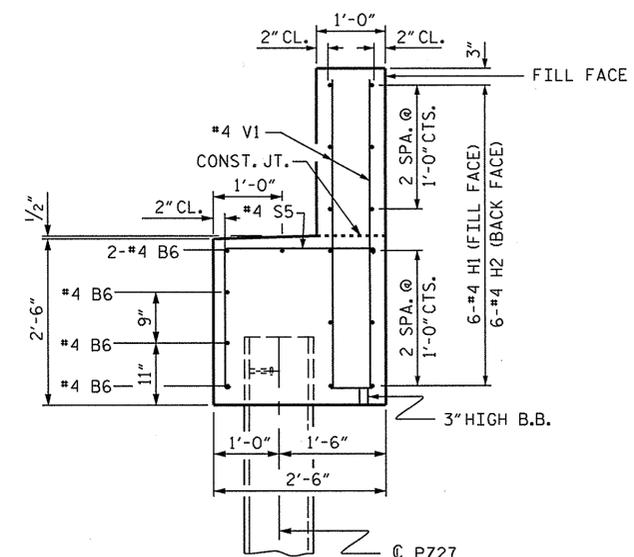
PLAN OF WING (W2) (STAGE I)



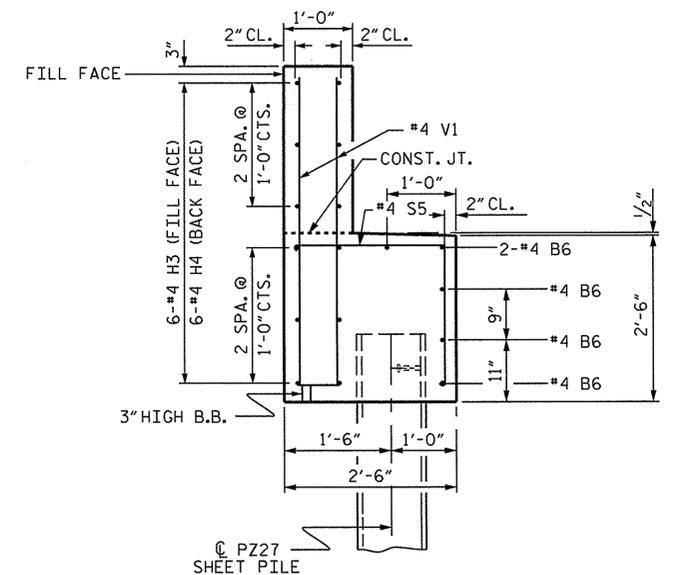
ELEVATION OF WING (W1) (STAGE II)



ELEVATION OF WING (W2) (STAGE I)



SECTION X-X



SECTION Y-Y

PROJECT NO. BD-5114P
JACKSON COUNTY
 STATION: 12+60.05 -L-

SHEET 3 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT No. 1



REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS	
1			3			S-15	
2			4			22	

DRAWN BY: H. T. BARBOUR DATE: 8-27-12
 CHECKED BY: J. R. DUGGINS DATE: 8-12

05-SEP-2012 15:54
 S:\DPG4\John\LIBR\Files\BD-5114P\Final\Plans\BD5114P_SD_AB.dgn
 jduggins

NC005

NOTES

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

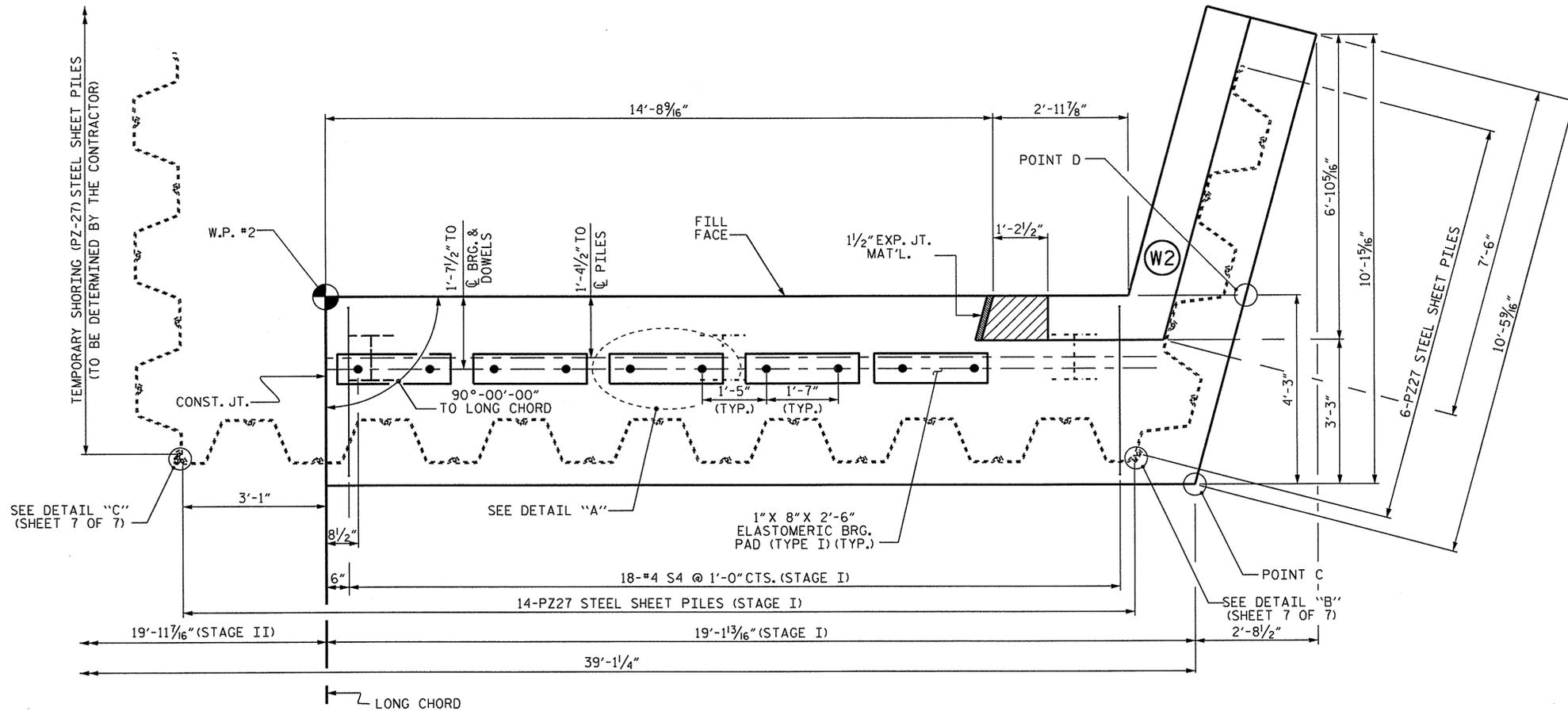
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 7 OF 7.

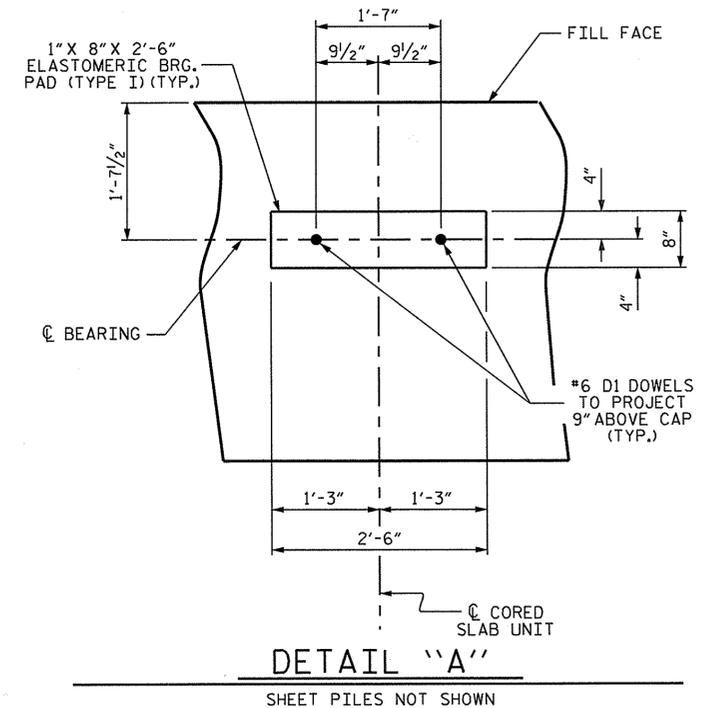
FOR WING DETAILS, SEE SHEET 6 OF 7.

TOP OF PILE ELEVATIONS	
③	2274.70
④	2274.39
⑤	2274.09

CAP ELEVATIONS		
POINT	TOP OF CAP ELEVATIONS	BOTTOM OF CAP ELEVATIONS
Ⓒ	2275.46	2272.96
Ⓓ	2275.41	2272.91



PLAN



DETAIL "A"

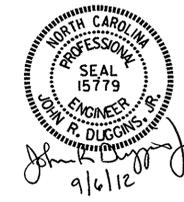
SHEET PILES NOT SHOWN

PROJECT NO. BD-5114P
JACKSON COUNTY
 STATION: 12+60.05 -L-

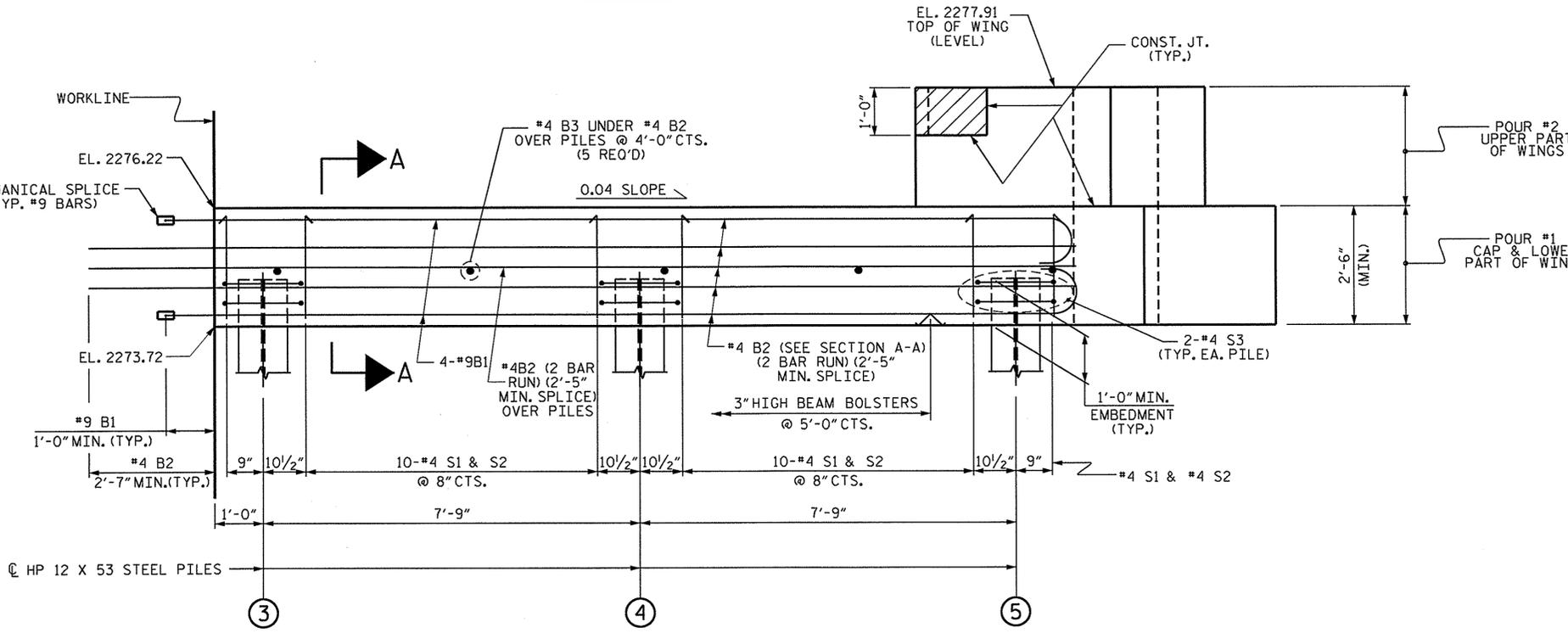
SHEET 4 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT No. 2
 STAGE I



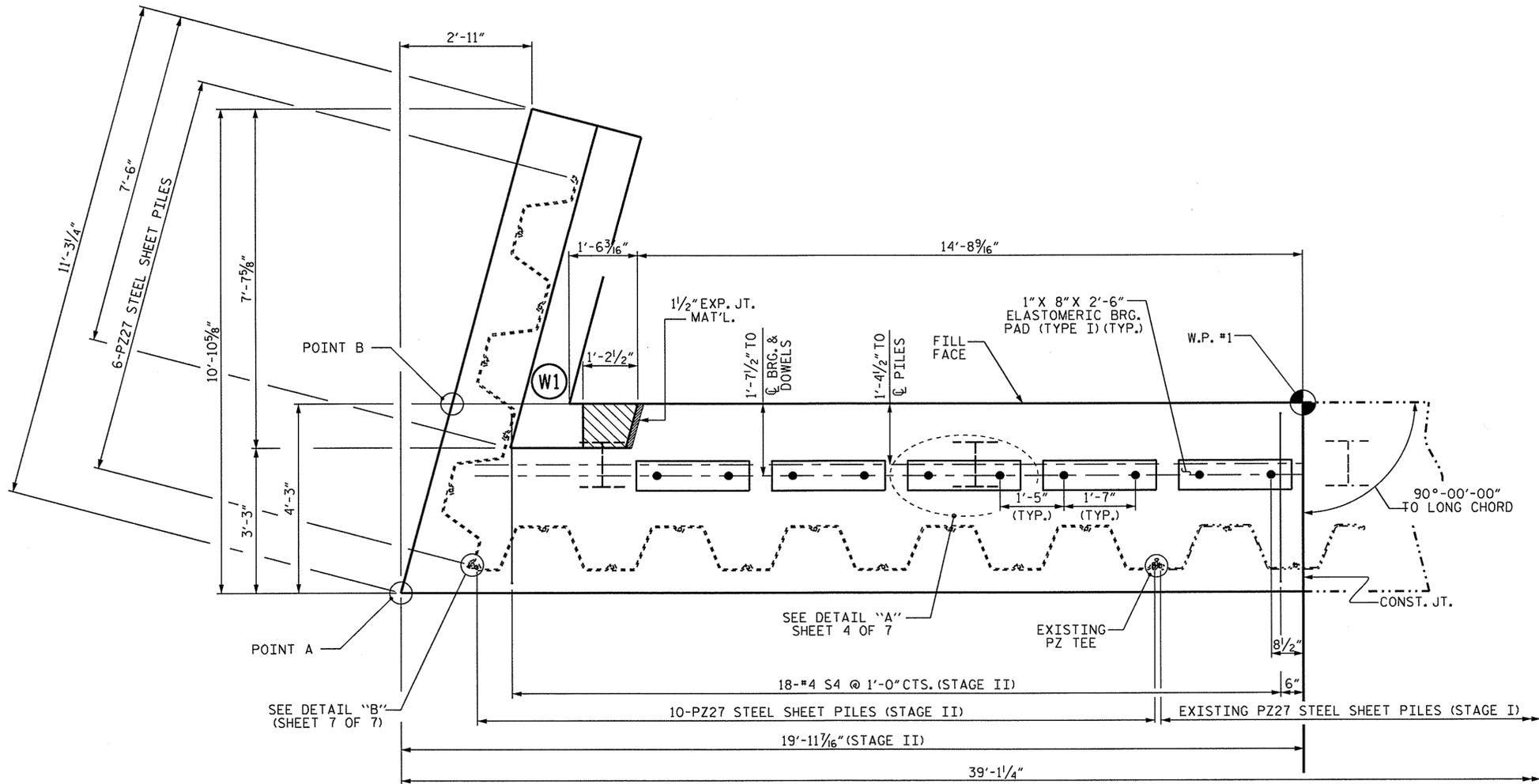
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			16
2			4			22



ELEVATION

FOR SECTION A-A, SEE SHEET 7 OF 7.
 STEEL SHEET PILES NOT SHOWN FOR CLARITY

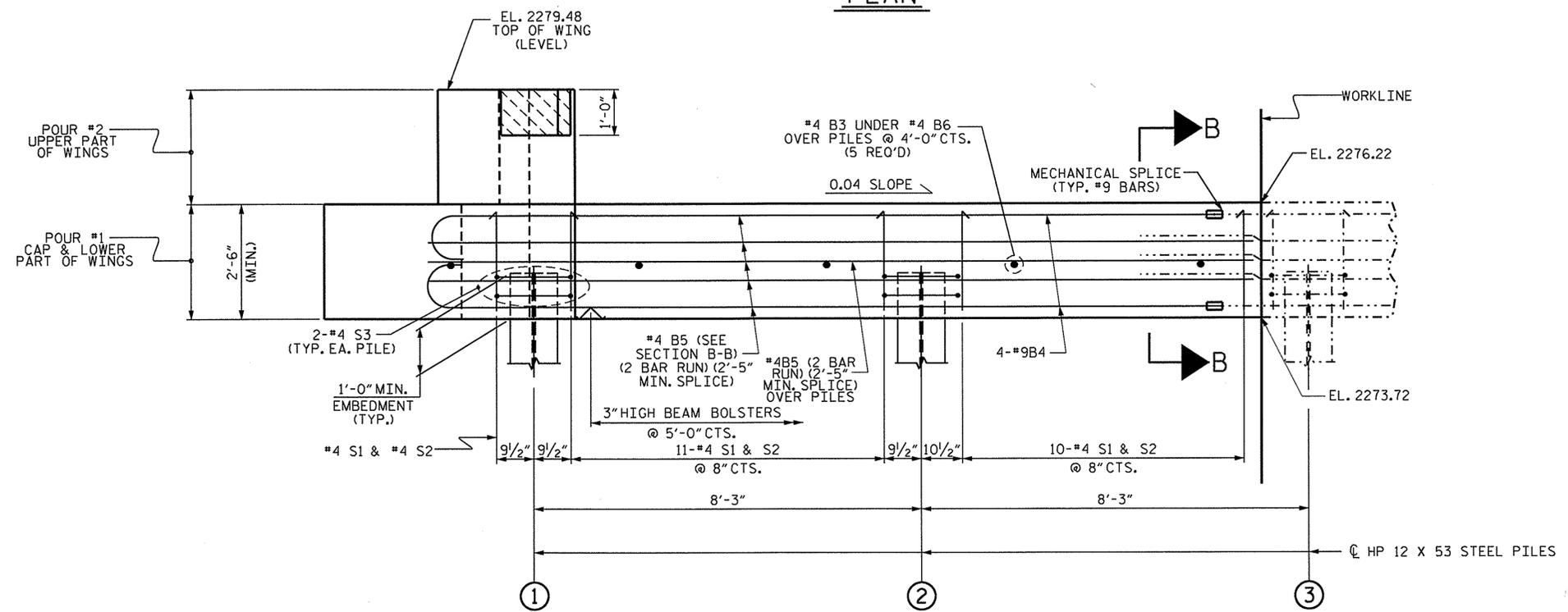
DRAWN BY: H. T. BARBOUR DATE: 8-28-12
 CHECKED BY: J. R. DUGGINS DATE: 8-12



PLAN

TOP OF PILE ELEVATIONS	
①	2275.36
②	2275.03
③	2274.70

CAP ELEVATIONS		
POINT	TOP OF CAP ELEVATIONS	BOTTOM OF CAP ELEVATIONS
Ⓐ	2277.03	2274.53
Ⓑ	2276.98	2274.48



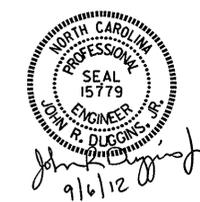
ELEVATION

FOR SECTION B-B, SEE SHEET 7 OF 7.
STEEL SHEET PILES NOT SHOWN FOR CLARITY

PROJECT NO. BD-5114P
JACKSON COUNTY
 STATION: 12+60.05 -L-
 SHEET 5 OF 7

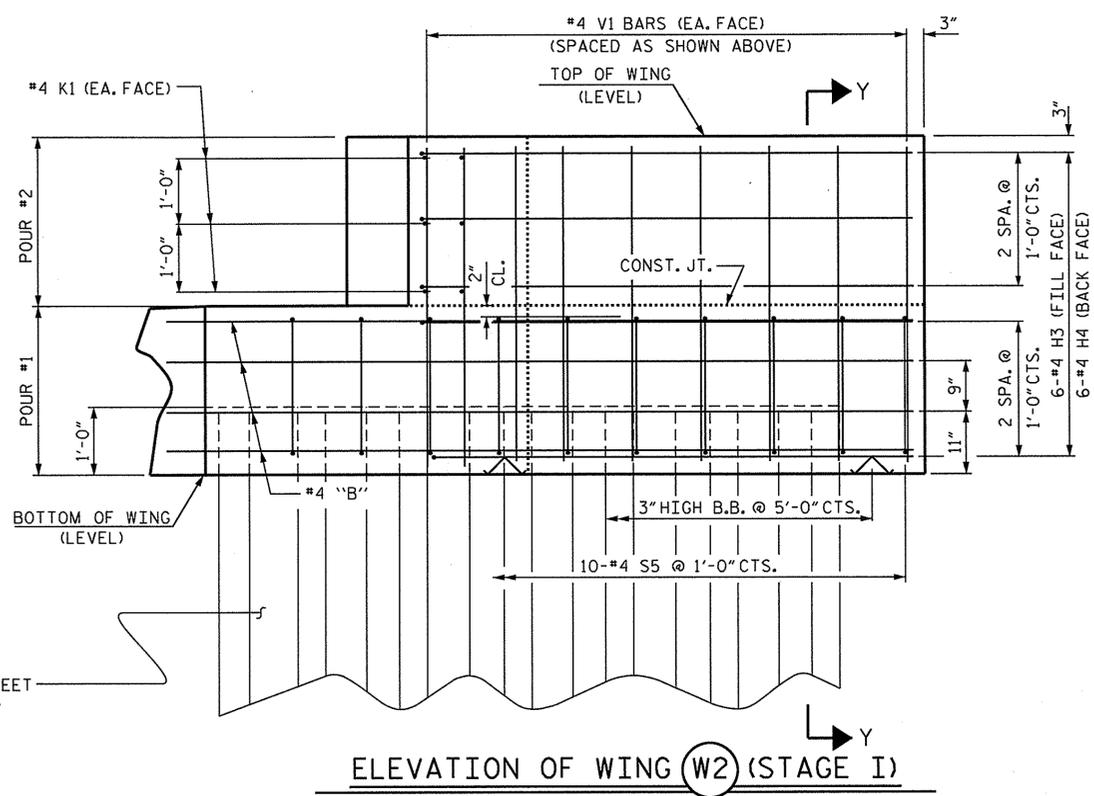
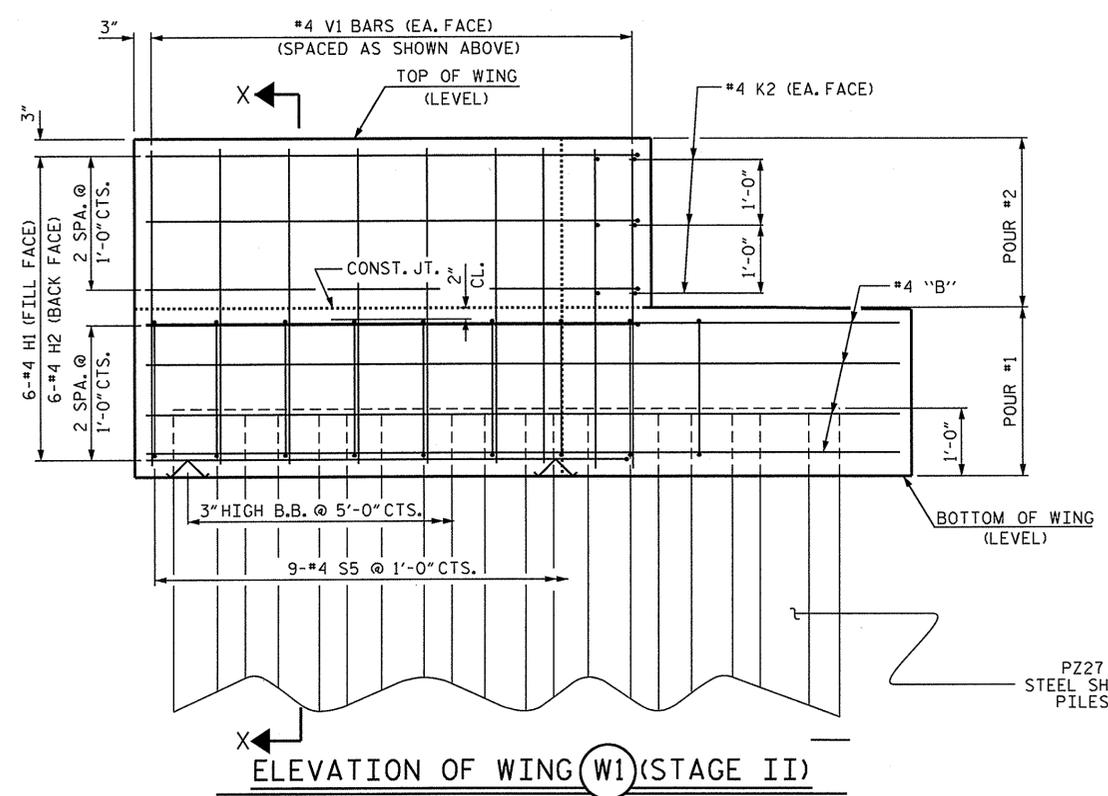
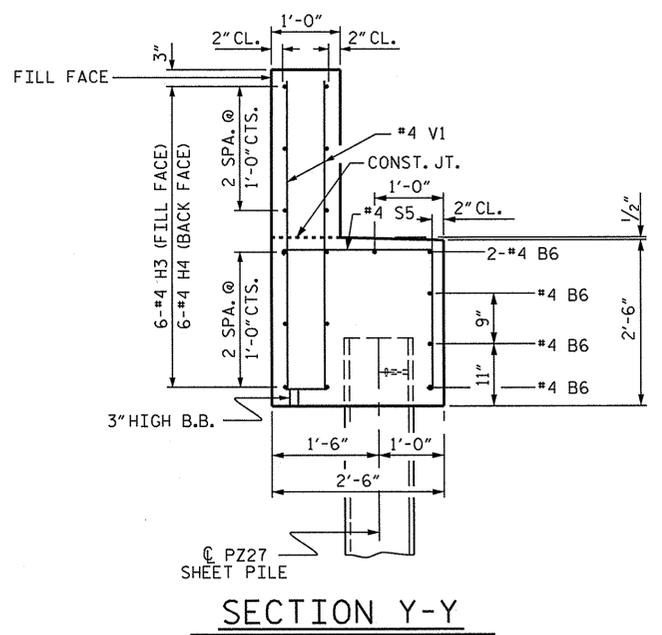
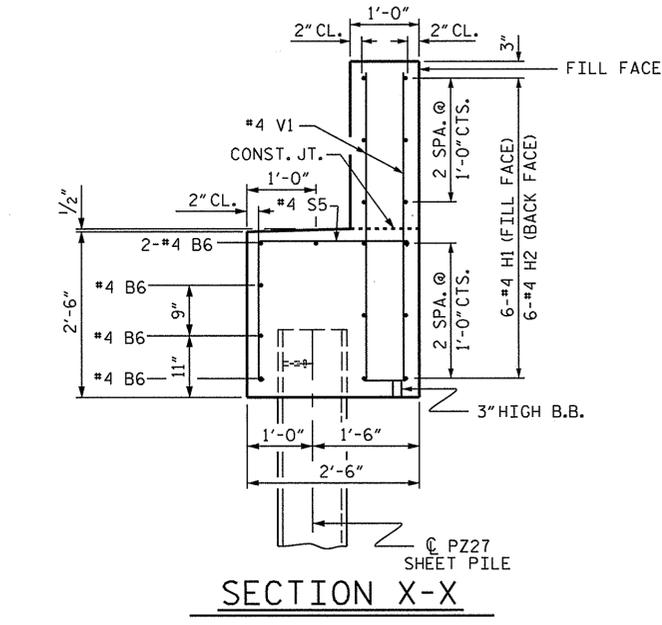
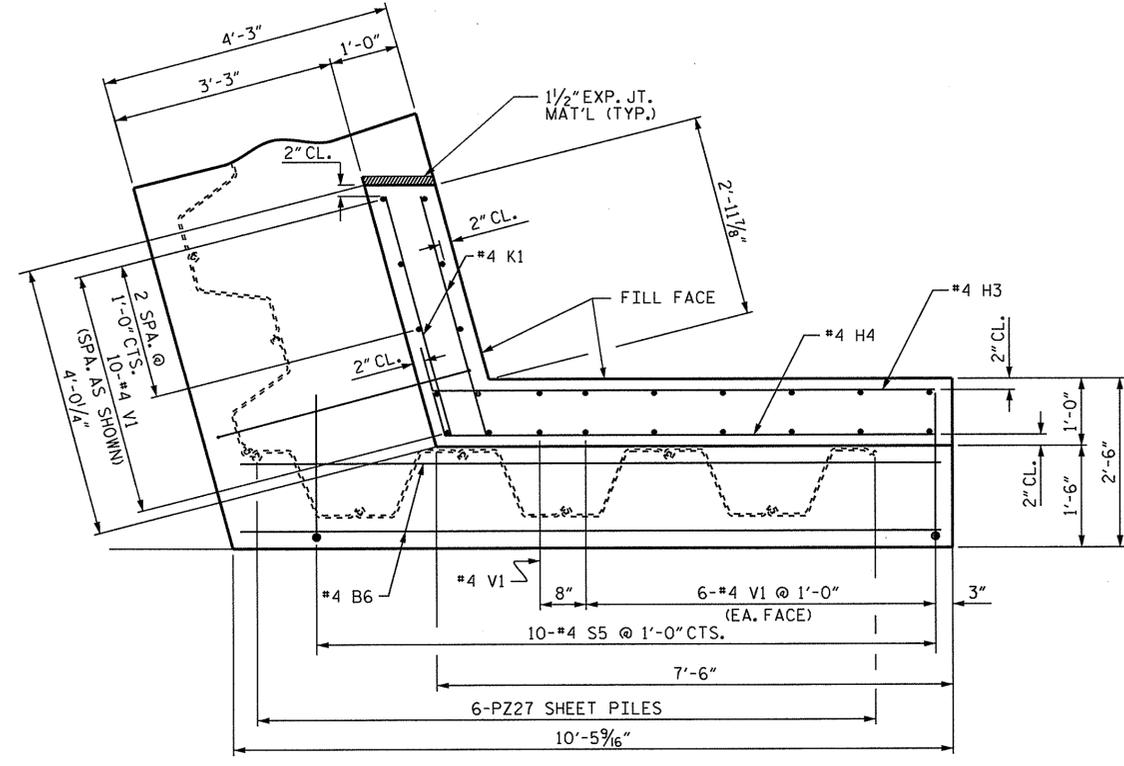
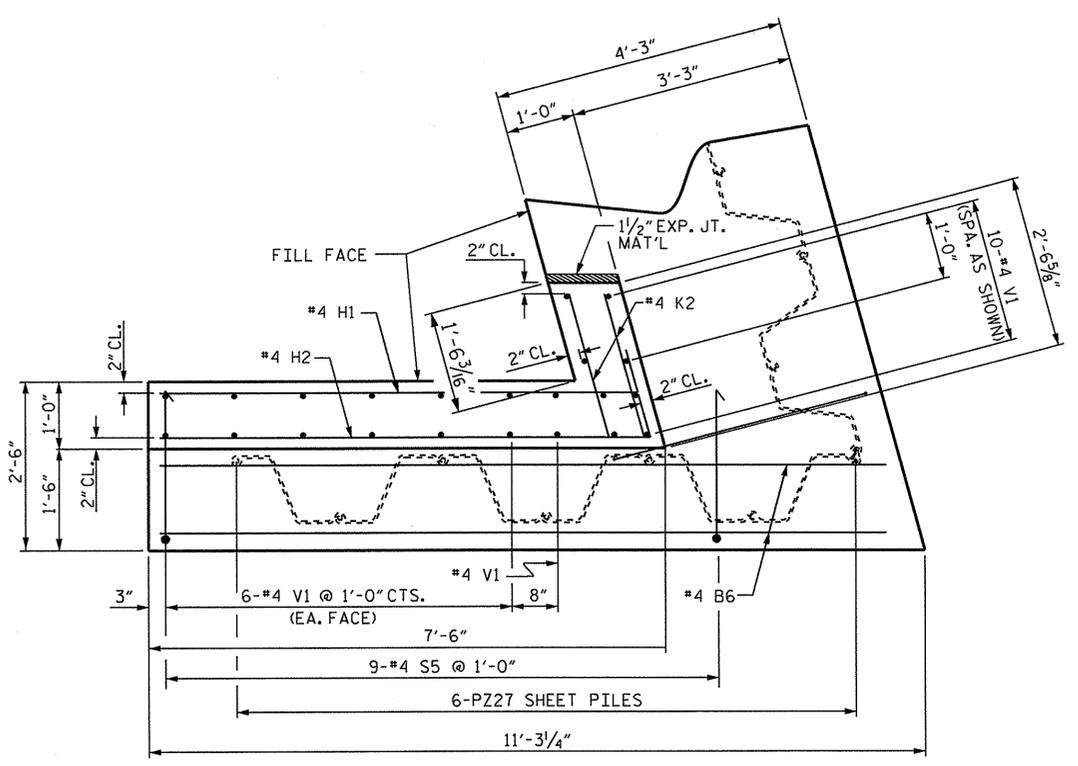
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 END BENT No. 2
 STAGE II**



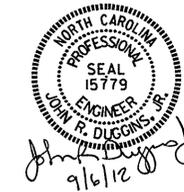
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			22
2			4			

DRAWN BY: H. T. BARBOUR DATE: 8-28-12
 CHECKED BY: J. R. DUGGINS DATE: 8-12



DRAWN BY : H. T. BARBOUR DATE : 8-29-12
 CHECKED BY : J. R. DUGGINS DATE : 8-12

05-SEP-2012 15:53
 SA:\PC4\John.LIBR.Files\BD-5114P\Final.Plans\BD5114P_SD_AB.dgn
 jduggins

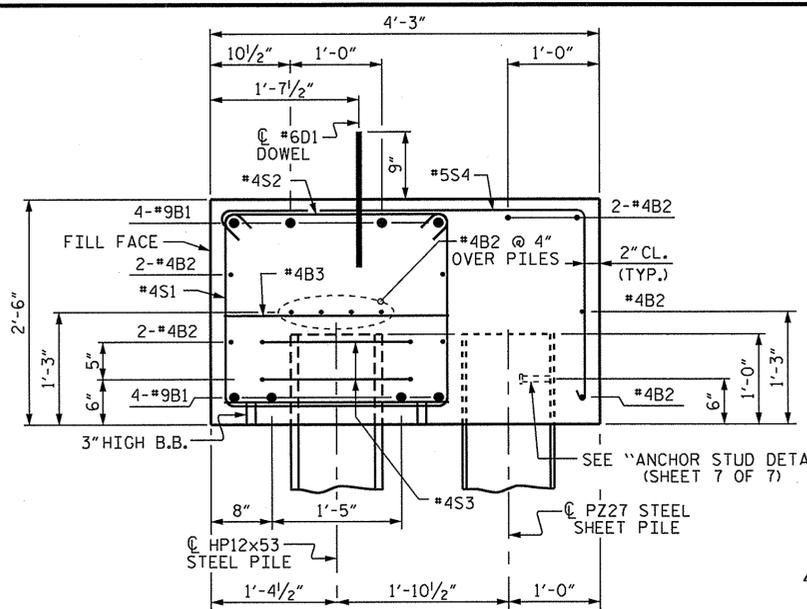


PROJECT NO. BD-5114P
 JACKSON COUNTY
 STATION: 12+60.05 -L-

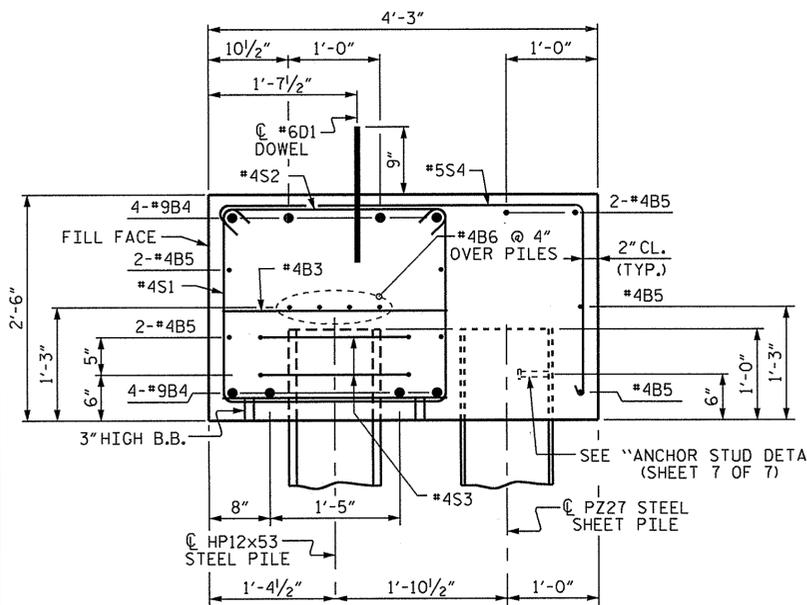
SHEET 6 OF 7

REVISIONS						SHEET NO. S-18
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 22
2			4			

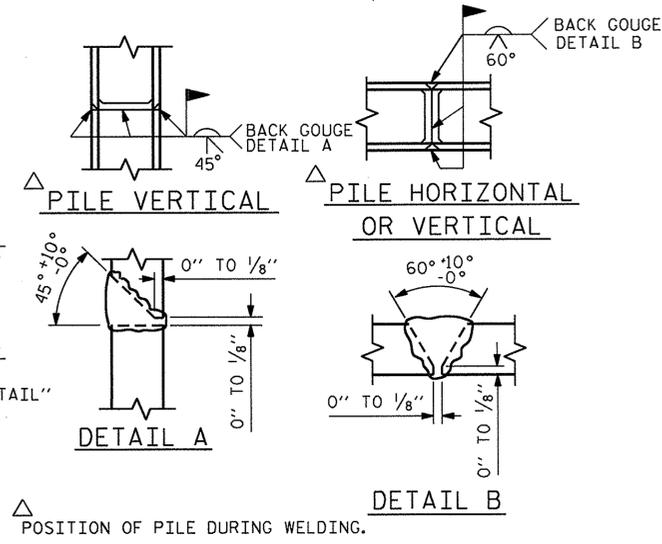
NCB06



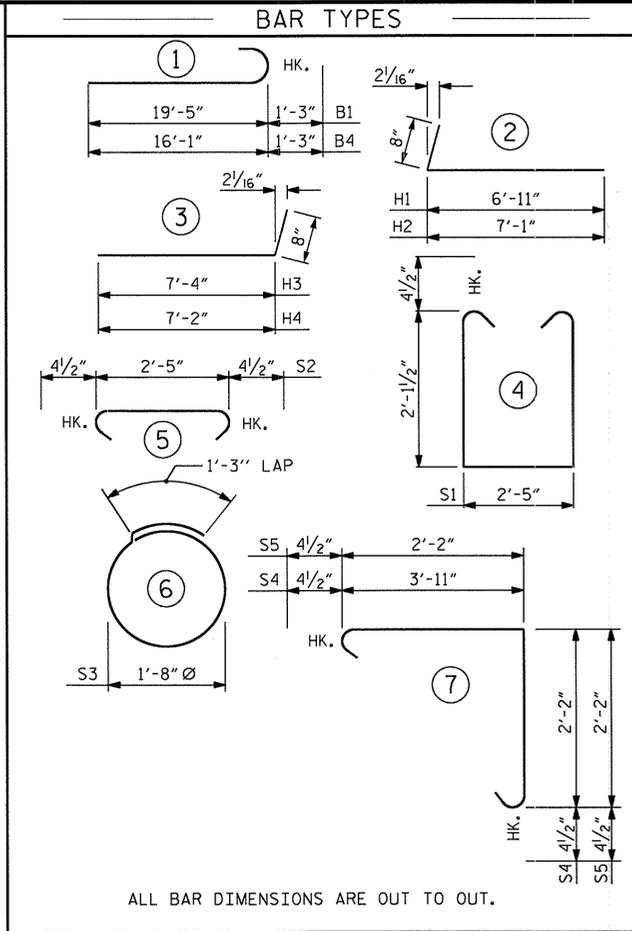
SECTION A-A



SECTION B-B



PILE SPLICE DETAILS



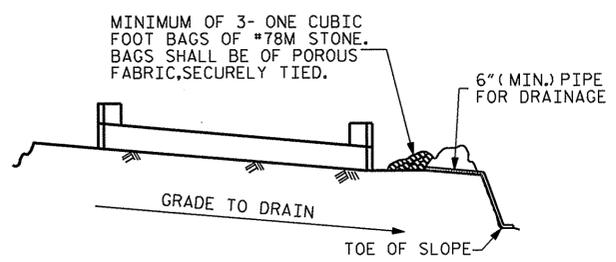
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR ONE END BENT											
STAGE I					STAGE II						
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		
B1	8	#9	1	20'-8"	562	B3	5	#4	STR	2'-5"	8
B2	24	#4	STR	11'-9"	188	B4	8	#9	1	17'-4"	471
B3	5	#4	STR	2'-5"	8	B5	24	#4	STR	10'-0"	160
B6	5	#4	STR	10'-2"	34	B6	5	#4	STR	10'-2"	34
D1	10	#6	STR	1'-6"	23	D1	10	#6	STR	1'-6"	23
H3	6	#4	3	8'-0"	32	H1	6	#4	2	7'-7"	30
H4	6	#4	3	7'-10"	31	H2	6	#4	2	7'-9"	31
K1	6	#4	STR	3'-8"	15	K2	6	#4	STR	2'-2"	9
S1	22	#4	4	7'-5"	109	S1	22	#4	4	7'-5"	109
S2	22	#4	5	3'-2"	47	S2	22	#4	5	3'-2"	47
S3	6	#4	6	6'-6"	26	S3	4	#4	6	6'-6"	17
S4	18	#4	7	6'-10"	82	S4	18	#4	7	6'-10"	82
S5	10	#4	7	5'-1"	34	S9	9	#4	7	5'-1"	31
V1	24	#4	STR	4'-8"	75	V1	22	#4	STR	4'-8"	67
REINFORCING STEEL 1266 LBS.					REINFORCING STEEL 1119 LBS.						

CLASS A CONCRETE BREAKDOWN		CLASS A CONCRETE BREAKDOWN			
POUR #1	CAP, LOWER PART OF WING #1	9.2 C.Y.	POUR #1	CAP, LOWER PART OF WINGS & COLLARS	9.1 C.Y.
POUR #2	UPPER PART OF WING #2	1.0 C.Y.	POUR #2	UPPER PART OF WINGS	1.0 C.Y.
TOTAL CLASS A CONCRETE		10.2 C.Y.	TOTAL CLASS A CONCRETE		10.1 C.Y.

END BENT No. 1 (STAGE I) HP 12 X 53 STEEL PILES NO: 3 LIN. FT.= 60		END BENT No. 1 (STAGE II) HP 12 X 53 STEEL PILES NO: 2 LIN. FT.= 40	
END BENT No. 2 (STAGE I) HP 12 X 53 STEEL PILES NO: 3 LIN. FT.= 45		END BENT No. 2 (STAGE II) HP 12 X 53 STEEL PILES NO: 2 LIN. FT.= 30	
18" STEEL SHEET PILES (STAGE I) No. PZ 27 = 40 No. PZ 90 = 2 No. PZ TEE = 2 TOTAL = 44		18" STEEL SHEET PILES (STAGE II) No. PZ 27 = 32 No. PZ 90 = 2 TOTAL = 34	
END BENT #1 472 SQ. FT. END BENT #2 340 SQ. FT.		END BENT #1 378 SQ. FT. END BENT #2 372 SQ. FT.	
TEMPORARY SHORING			
END BENT #1 212 SQ. FT.		END BENT #2 154 SQ. FT.	

	TOTAL BILL OF MATERIAL					
	CLASS A CONCRETE	REINFORCING STEEL	HP 12 X 53 STEEL PILES	18" STEEL SHEET PILES	TEMPORARY SHORING	
	CU. YDS.	LBS.	No.	LIN. FT.	SQ. FT.	SQ. FT.
END BENT #1	20.3	2385	5	100	850	212
END BENT #2	20.3	2385	5	75	712	154
TOTAL	40.6	4770	10	175	1562	366



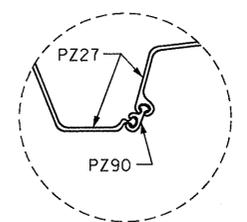
MINIMUM OF 3- ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.

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.

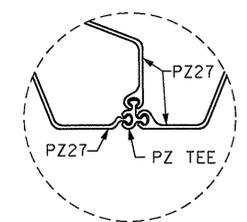
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

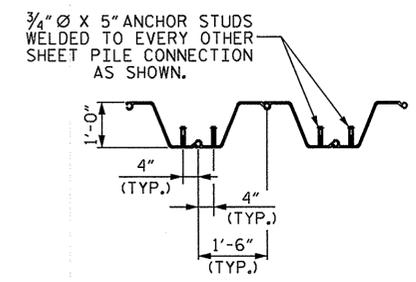
TEMPORARY DRAINAGE AT END BENT



DETAIL "B"



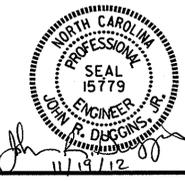
DETAIL "C"



ANCHOR STUD DETAIL

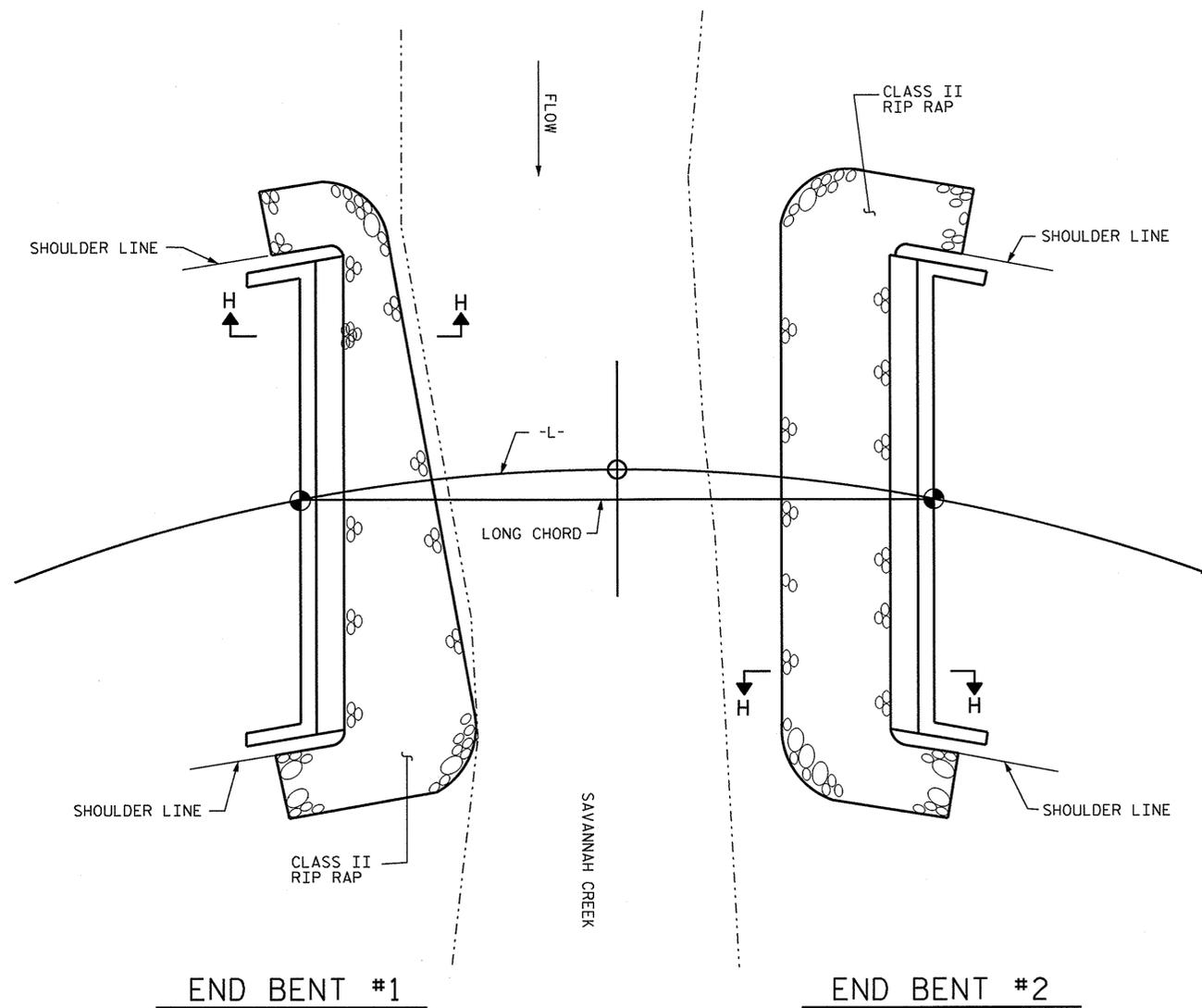
PROJECT NO. BD-5114P
JACKSON COUNTY
 STATION: 12+60.05 -L-

SHEET 7 OF 7
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT No. 1 & 2
 DETAILS

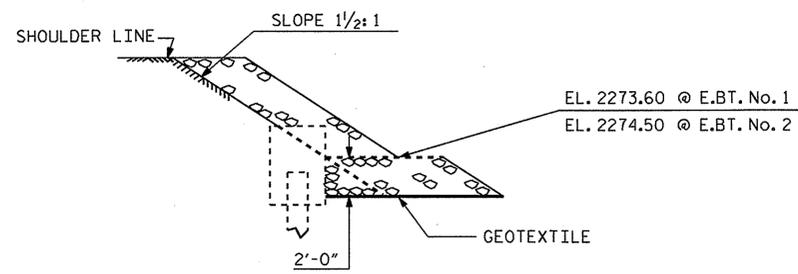


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-19
2			4			22

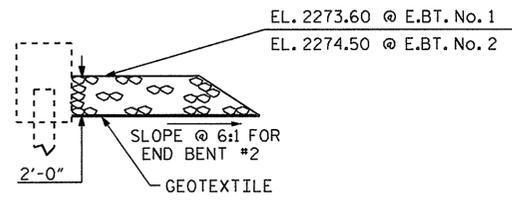
ASSEMBLED BY: H. T. BARBOUR DATE: 8-26-12
 CHECKED BY: J. R. DUGGINS DATE: 8-12
 DRAWN BY: DGE 12/09
 CHECKED BY: MKT 01/10



PLAN



SECTION H-H



SECTION BERM RIP RAPPED

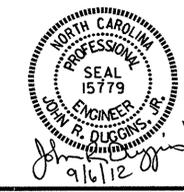
NOTES :
PLACE RIP RAP ALONG STREAM BANKS AS SHOWN

ESTIMATED QUANTITIES		
BRIDGE @ STA. 12+60.05 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	50	56
END BENT 2	55	62

PROJECT NO. BD-5114P
JACKSON COUNTY
STATION: 12+60.05 -L-

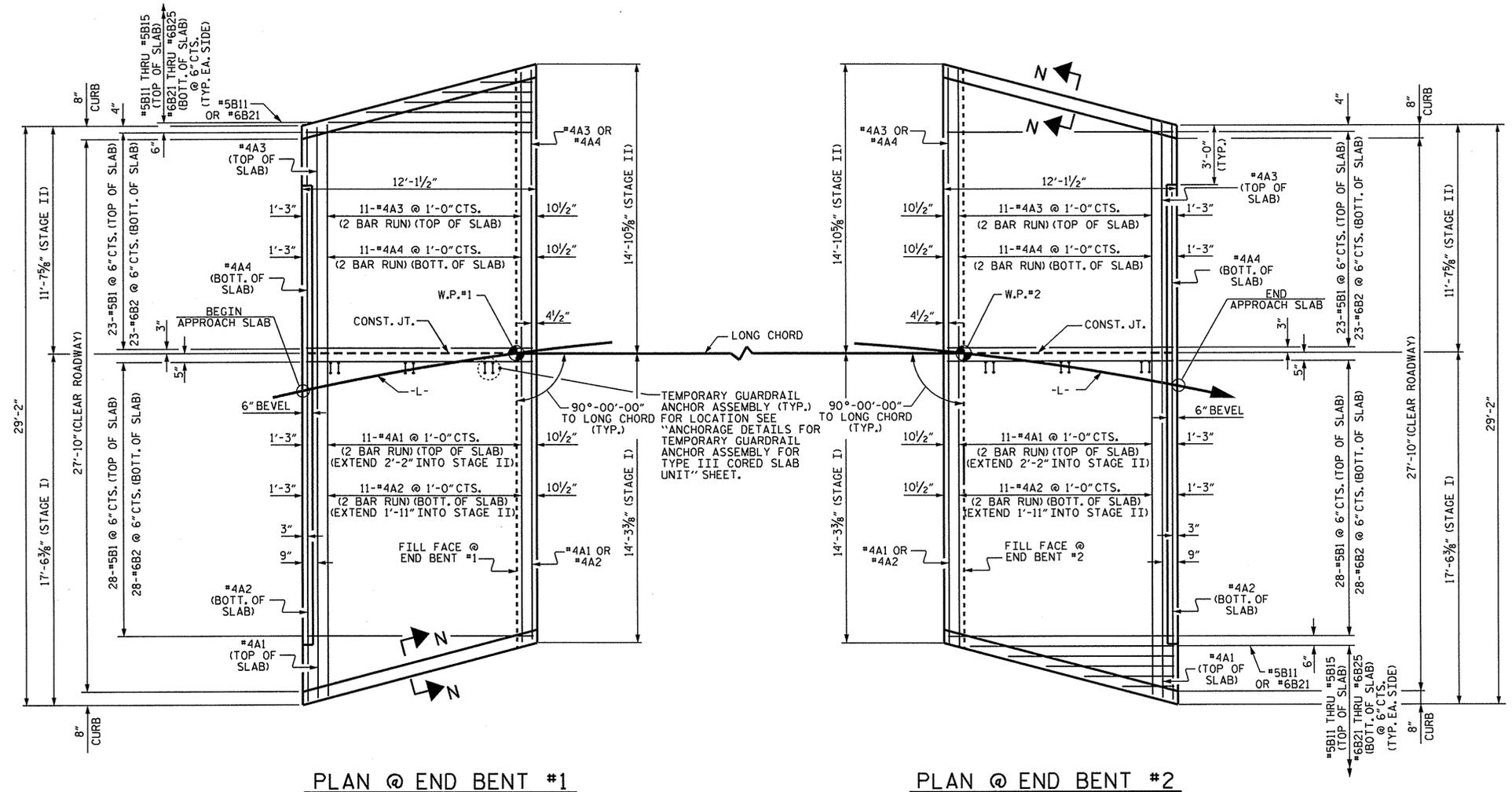
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

= RIP RAP DETAILS =



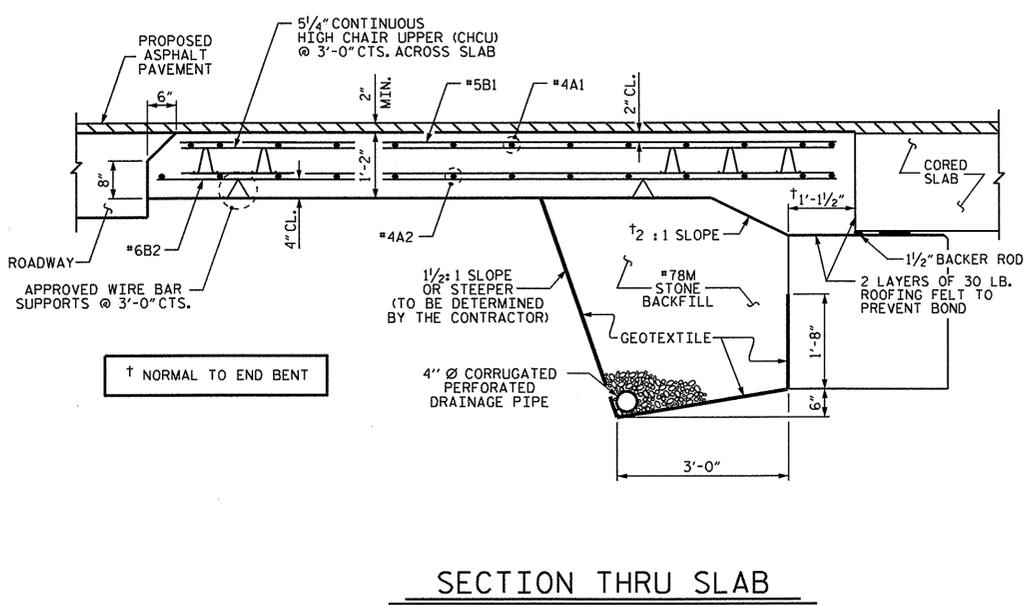
REVISIONS						SHEET NO. S-20
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 22
2			4			

ASSEMBLED BY : V.X. NGUYEN	DATE : 9/12
CHECKED BY : J.R. DUGGINS	DATE : 9/12
DRAWN BY : REK 1/84	REV. 5/1/06R TLA/GM
CHECKED BY : RDU 1/84	REV. 10/1/11 MAA/GM
	REV. 12/21/11 MAA/GM

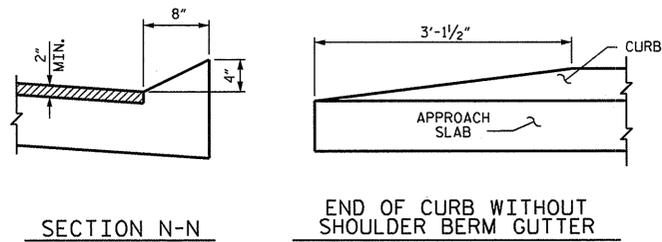


PLAN @ END BENT #1

PLAN @ END BENT #2



SECTION THRU SLAB



CURB DETAILS

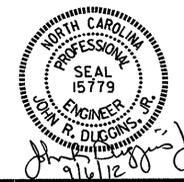
BILL OF MATERIAL											
APPROACH SLAB AT E.B.T.1 STAGE I					APPROACH SLAB AT E.B.T.2 STAGE I						
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		
*A1	26	#4	STR 10'-9"	187	*A1	26	#4	STR 10'-9"	187		
A2	26	#4	STR 10'-6"	182	A2	26	#4	STR 10'-6"	182		
*B1	28	#5	STR 11'-2"	326	*B1	28	#5	STR 11'-2"	326		
B2	28	#6	STR 11'-8"	491	B2	28	#6	STR 11'-8"	491		
*B11	1	#5	STR 10'-8"	11	*B11	1	#5	STR 10'-8"	11		
*B12	1	#5	STR 8'-10"	9	*B12	1	#5	STR 8'-10"	9		
*B13	1	#5	STR 6'-11"	7	*B13	1	#5	STR 6'-11"	7		
*B14	1	#5	STR 5'-1"	5	*B14	1	#5	STR 5'-1"	5		
*B15	1	#5	STR 3'-3"	3	*B15	1	#5	STR 3'-3"	3		
B21	1	#6	STR 10'-8"	16	B21	1	#6	STR 10'-8"	16		
B22	1	#6	STR 8'-10"	13	B22	1	#6	STR 8'-10"	13		
B23	1	#5	STR 6'-11"	10	B23	1	#5	STR 6'-11"	10		
B24	1	#5	STR 5'-1"	8	B24	1	#5	STR 5'-1"	8		
B25	1	#6	STR 3'-3"	5	B25	1	#6	STR 3'-3"	5		
REINFORCING STEEL				LBS.	725	REINFORCING STEEL				LBS.	725
* EPOXY COATED REINFORCING STEEL				LBS.	548	* EPOXY COATED REINFORCING STEEL				LBS.	548
CLASS AA CONCRETE				C. Y.	9.2	CLASS AA CONCRETE				C. Y.	9.2
APPROACH SLAB AT E.B.T.1 STAGE II					APPROACH SLAB AT E.B.T.2 STAGE II						
*A3	26	#4	STR 8'-3"	143	*A3	26	#4	STR 8'-3"	143		
A4	26	#4	STR 8'-1"	140	A4	26	#4	STR 8'-1"	140		
*B1	23	#5	STR 11'-2"	268	*B1	23	#5	STR 11'-2"	268		
B2	23	#6	STR 11'-8"	403	B2	23	#6	STR 11'-8"	403		
*B11	1	#5	STR 10'-8"	11	*B11	1	#5	STR 10'-8"	11		
*B12	1	#5	STR 8'-10"	9	*B12	1	#5	STR 8'-10"	9		
*B13	1	#5	STR 6'-11"	7	*B13	1	#5	STR 6'-11"	7		
*B14	1	#5	STR 5'-1"	5	*B14	1	#5	STR 5'-1"	5		
*B15	1	#5	STR 3'-3"	3	*B15	1	#5	STR 3'-3"	3		
B21	1	#6	STR 10'-8"	16	B21	1	#6	STR 10'-8"	16		
B22	1	#6	STR 8'-10"	13	B22	1	#6	STR 8'-10"	13		
B23	1	#5	STR 6'-11"	10	B23	1	#5	STR 6'-11"	10		
B24	1	#6	STR 5'-1"	8	B24	1	#6	STR 5'-1"	8		
B25	1	#6	STR 3'-3"	5	B25	1	#6	STR 3'-3"	5		
REINFORCING STEEL				LBS.	595	REINFORCING STEEL				LBS.	595
* EPOXY COATED REINFORCING STEEL				LBS.	446	* EPOXY COATED REINFORCING STEEL				LBS.	446
CLASS AA CONCRETE				C. Y.	7.7	CLASS AA CONCRETE				C. Y.	7.7

* THESE BARS ARE EPOXY COATED

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

BRIDGE NO. BD-5114P
JACKSON COUNTY
 STATION: 12+60.05 -L-

SHEET 1 OF 2
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 BRIDGE APPROACH SLAB
 FOR PRESTRESSED CONCRETE
 CORED SLAB UNIT
 (SUB-REGIONAL TIER)
 90° SKEW



REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21	
1			3			TOTAL SHEETS	
2			4			22	

ASSEMBLED BY : BMATHEW DATE : 12/2011
 CHECKED BY : J. R. DUGGINS DATE : 8/2012
 DRAWN BY : SHS/MAA 5-09 REV. 12-11 MAA/AAC
 CHECKED BY : BCH 5-09

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND #78M STONE BACKFILL, SEE ROADWAY PLANS.

GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

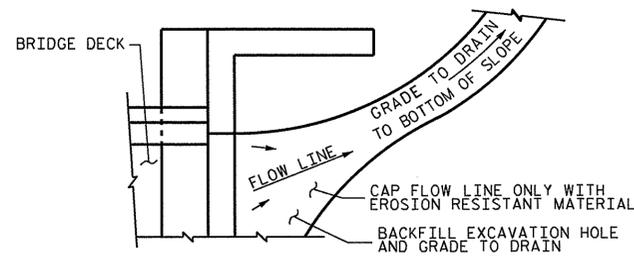
*78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

*78M STONE BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

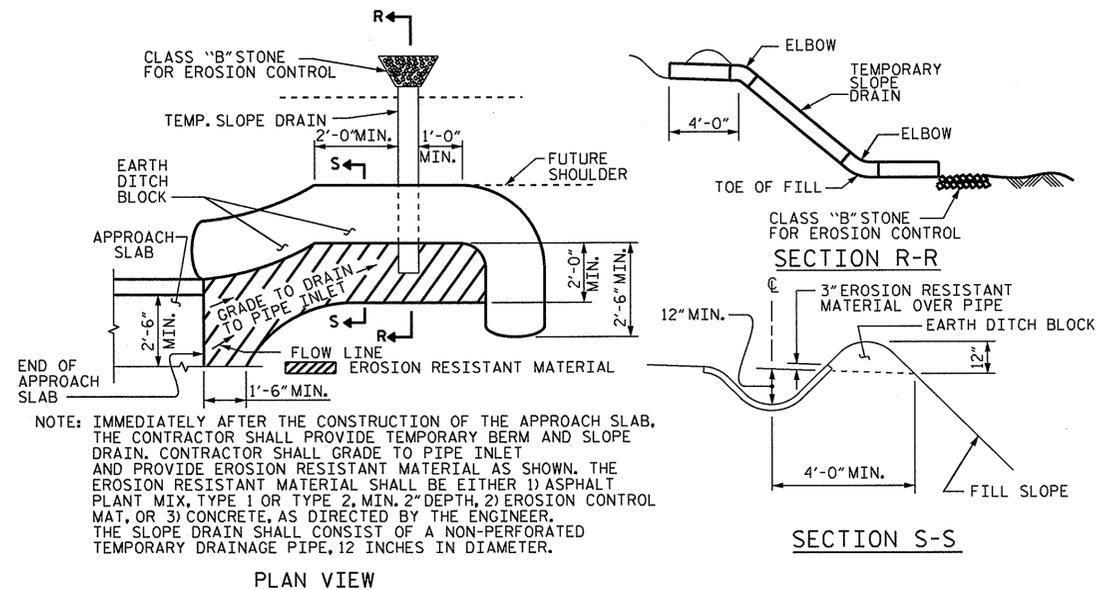
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.



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

TEMPORARY DRAINAGE DETAIL



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

PLAN VIEW
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

PROJECT NO. BD-5114P
JACKSON COUNTY
STATION: 12+60.05 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB
FOR PRESTRESSED CONCRETE
CORED SLAB UNIT



DRAWN BY : B. MATHEW DATE : 12/2011
CHECKED BY : J. R. DUGGINS DATE : 8/2012

05-SEP-2012 15:50
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jduggins

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			22
2			4			22

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 45360.1.16 (BD-5114P) F.A. PROJ. _____
COUNTY JACKSON
PROJECT DESCRIPTION BRIDGE No. 70 ON SR-1474
OVER SAVANNAH CREEK

SITE DESCRIPTION _____

CONTENTS

<u>SHEET</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE
5	CROSS SECTIONS
6	BORE LOG & CORE REPORTS
10	SCOUR REPORT
11	CORE PHOTOGRAPHS

PROJECT: 45360.1.16 ID: BD-5114P

CAUTION NOTICE

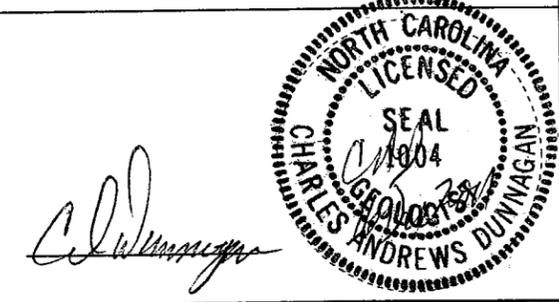
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (ON-PLACED) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

PERSONNEL
D C ELIOT
C J COFFEY
L E RIDDLE

INVESTIGATED BY C A DUNNAGAN
CHECKED BY W D FRYE, Jr
SUBMITTED BY W D FRYE, Jr
DATE DECEMBER 2011



DRAWN BY: C A DUNNAGAN

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

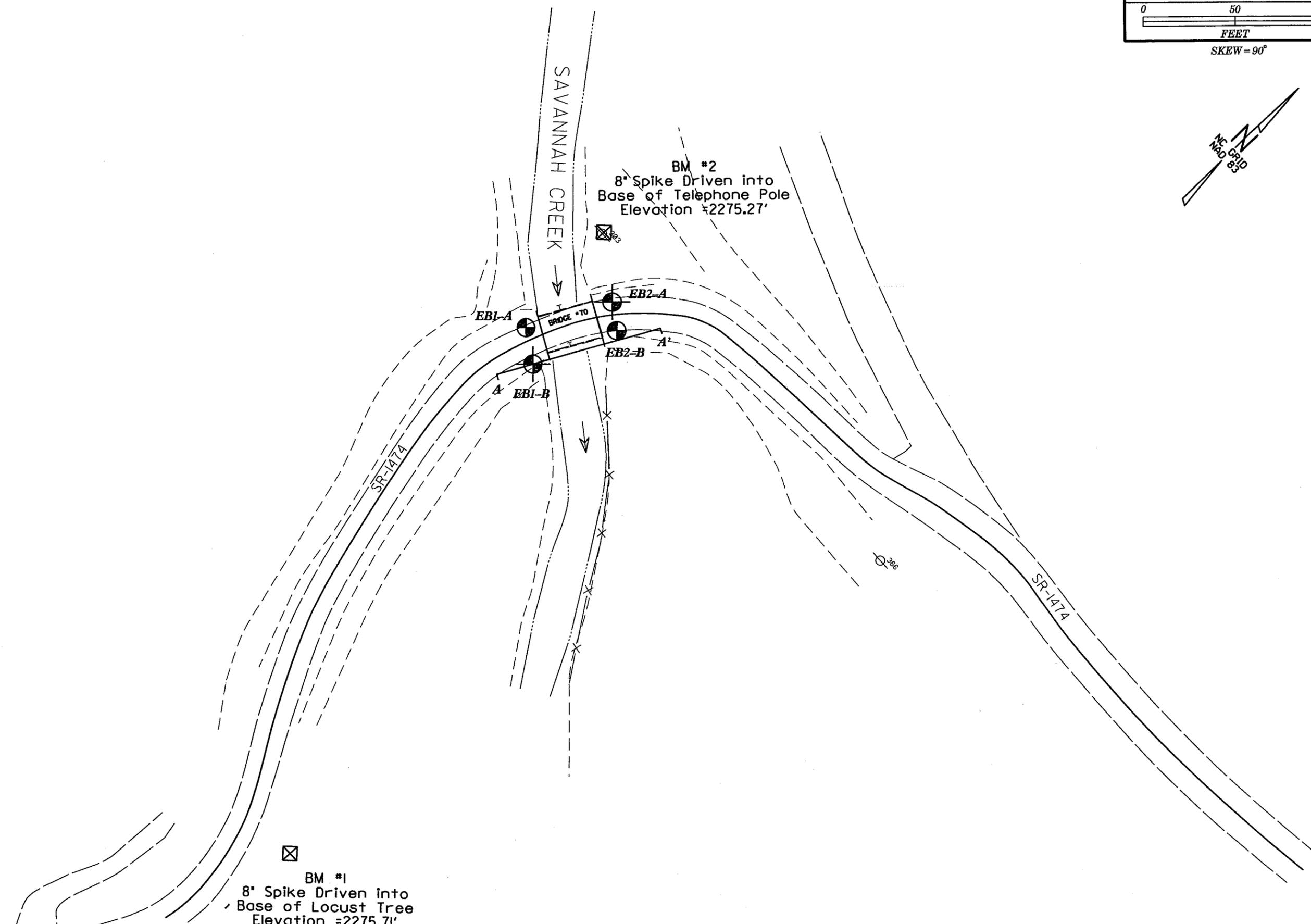
SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS																																																																																																																																																																																																																																																																																																									
<p>SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T296, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:</p> <p style="text-align: center;"><i>VERY STIFF, GRAY SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HEAVY PLASTIC, A-7-5</i></p>	<p>WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)</p> <p>GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p style="text-align: center;">ANGULARITY OF GRAINS</p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</p>	<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.</p> <p>ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p> <p>WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.</p> <p>CRYSTALLINE ROCK (CR) FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL. IF TESTED, ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.</p> <p>NON-CRYSTALLINE ROCK (NCR) FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.</p> <p>COASTAL PLAIN SEDIMENTARY ROCK (CP) COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.</p>	<p>ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.</p> <p>AQUIFER - A WATER BEARING FORMATION OR STRATA.</p> <p>ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.</p> <p>ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.</p> <p>ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.</p> <p>CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.</p> <p>COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.</p> <p>CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.</p> <p>DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.</p> <p>DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.</p> <p>DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.</p> <p>FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.</p> <p>FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.</p> <p>FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL.</p> <p>FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.</p> <p>FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.</p> <p>JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.</p> <p>LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.</p> <p>LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.</p> <p>MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.</p> <p>PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.</p> <p>RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.</p> <p>ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.</p> <p>SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.</p> <p>SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.</p> <p>SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.</p> <p>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS IN OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.</p> <p>STRATA CORE RECOVERY (SCRC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.</p> <p>STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.</p> <p>TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																																																																																																																																																																																																																																									
<p style="text-align: center;">SOIL LEGEND AND AASHTO CLASSIFICATION</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>GENERAL CLASS.</th> <th colspan="4">GRANULAR MATERIALS (<= 35% PASSING #200)</th> <th colspan="4">SILT-CLAY MATERIALS (> 35% PASSING #200)</th> <th colspan="4">ORGANIC MATERIALS</th> </tr> <tr> <th>GROUP CLASS.</th> <th>A-1-a</th> <th>A-1-b</th> <th>A-2-4</th> <th>A-2-5</th> <th>A-2-6</th> <th>A-2-7</th> <th>A-4</th> <th>A-5</th> <th>A-6</th> <th>A-7</th> <th>A-1, A-2</th> <th>A-3</th> <th>A-4, A-5</th> <th>A-6, A-7</th> </tr> <tr> <th>SYMBOL</th> <td></td> </tr> <tr> <th>% PASSING</th> <td>10 40 200</td> </tr> <tr> <th>LIQUID LIMIT</th> <td>50</td> </tr> <tr> <th>PLASTIC INDEX</th> <td>6</td> </tr> <tr> <th>GROUP INDEX</th> <td>0</td> </tr> <tr> <th>USUAL TYPES OF MAJOR MATERIALS</th> <td colspan="2">STONE FRAGS. GRAVEL AND SAND</td> <td colspan="2">FINE SAND</td> <td colspan="2">SILTY OR CLAYEY GRAVEL AND SAND</td> <td colspan="2">SILTY SOILS</td> <td colspan="2">CLAYEY SOILS</td> <td colspan="2">SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER</td> <td colspan="2">HIGHLY ORGANIC SOILS</td> </tr> <tr> <th>GENERATING AS A SUBGRADE</th> <td colspan="4">EXCELLENT TO GOOD</td> <td colspan="4">FAIR TO POOR</td> <td colspan="2">POOR</td> <td colspan="4">UNSATURABLE</td> </tr> </table> <p style="text-align: center;">PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30</p>	GENERAL CLASS.	GRANULAR MATERIALS (<= 35% PASSING #200)				SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS				GROUP CLASS.	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7	SYMBOL															% PASSING	10 40 200	LIQUID LIMIT	50	50	50	50	50	50	50	50	50	50	50	50	50	50	PLASTIC INDEX	6	6	6	6	6	6	6	6	6	6	6	6	6	6	GROUP INDEX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL AND SAND		FINE SAND		SILTY OR CLAYEY GRAVEL AND SAND		SILTY SOILS		CLAYEY SOILS		SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS		GENERATING AS A SUBGRADE	EXCELLENT TO GOOD				FAIR TO POOR				POOR		UNSATURABLE				<p style="text-align: center;">MINERALOGICAL COMPOSITION</p> <p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p> <p style="text-align: center;">COMPRESSIBILITY</p> <p>SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50</p> <p style="text-align: center;">PERCENTAGE OF MATERIAL</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th></th> <th>ORGANIC MATERIAL</th> <th>GRANULAR SOILS</th> <th>SILT-CLAY SOILS</th> <th>OTHER MATERIAL</th> </tr> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>3 - 5%</td> <td></td> <td>TRACE 1 - 10%</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td></td> <td>LITTLE 10 - 20%</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td></td> <td>SOME 20 - 35%</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>>10%</td> <td>>20%</td> <td></td> <td>HIGHLY 35% AND ABOVE</td> </tr> </table> <p style="text-align: center;">GROUND WATER</p> <p> WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING</p> <p> STATIC WATER LEVEL AFTER 24 HOURS</p> <p> PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA</p> <p> SPRING OR SEEP</p> <p style="text-align: center;">MISCELLANEOUS SYMBOLS</p> <p> ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</p> <p> SOIL SYMBOL</p> <p> ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</p> <p> INFERRED SOIL BOUNDARY</p> <p> INFERRED ROCK LINE</p> <p> ALLUVIAL SOIL BOUNDARY</p> <p> DIP & DIP DIRECTION OF ROCK STRUCTURES</p> <p> SOUNDING ROD</p> <p> SPT TEST BORING</p> <p> AUGER BORING</p> <p> CORE BORING</p> <p> MONITORING WELL</p> <p> PIEZOMETER INSTALLATION</p> <p> SLOPE INDICATOR INSTALLATION</p> <p> SPT N-VALUE</p> <p> SPT REFUSAL</p> <p style="text-align: center;">ABBREVIATIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>AR - AUGER REFUSAL</td> <td>HL - HIGHLY</td> <td>W - MOISTURE CONTENT</td> </tr> <tr> <td>BT - BORING TERMINATED</td> <td>MED. - MEDIUM</td> <td>V - VERY</td> </tr> <tr> <td>CL - CLAY</td> <td>MICA - MICACEOUS</td> <td>VST - VANE SHEAR TEST</td> </tr> <tr> <td>CPT - CONE PENETRATION TEST</td> <td>MOD. - MODERATELY</td> <td>WEA. - WEATHERED</td> </tr> <tr> <td>CSE. - COARSE</td> <td>NP - NON PLASTIC</td> <td>W - UNIT WEIGHT</td> </tr> <tr> <td>DMT - DILATOMETER TEST</td> <td>ORG. - ORGANIC</td> <td>W% - DRY UNIT WEIGHT</td> </tr> <tr> <td>DPT - DYNAMIC PENETRATION TEST</td> <td>PMT - PRESSUREMETER TEST</td> <td>FIAD - FILLED IMMEDIATELY AFTER DRILLING</td> </tr> <tr> <td>e - VOID RATIO</td> <td>SAP. - SAPROLITIC</td> <td>WH - WEIGHT OF HAMMER</td> </tr> <tr> <td>F - FINE</td> <td>SD. - SAND, SANDY</td> <td></td> </tr> <tr> <td>FOSS. - FOSSILIFEROUS</td> <td>SL. - SILT, SILTY</td> <td></td> </tr> <tr> <td>FRAC. - FRACTURED, FRACTURES</td> <td>SLI. - SLIGHTLY</td> <td></td> </tr> <tr> <td>FRAGS. - FRAGMENTS</td> <td>TCR - TRICONE REFUSAL</td> <td></td> </tr> </table>		ORGANIC MATERIAL	GRANULAR SOILS	SILT-CLAY SOILS	OTHER MATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%		TRACE 1 - 10%	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%		LITTLE 10 - 20%	MODERATELY ORGANIC	5 - 10%	12 - 20%		SOME 20 - 35%	HIGHLY ORGANIC	>10%	>20%		HIGHLY 35% AND ABOVE	AR - AUGER REFUSAL	HL - HIGHLY	W - MOISTURE CONTENT	BT - BORING TERMINATED	MED. - MEDIUM	V - VERY	CL - CLAY	MICA - MICACEOUS	VST - VANE SHEAR TEST	CPT - CONE PENETRATION TEST	MOD. - MODERATELY	WEA. - WEATHERED	CSE. - COARSE	NP - NON PLASTIC	W - UNIT WEIGHT	DMT - DILATOMETER TEST	ORG. - ORGANIC	W% - DRY UNIT WEIGHT	DPT - DYNAMIC PENETRATION TEST	PMT - PRESSUREMETER TEST	FIAD - FILLED IMMEDIATELY AFTER DRILLING	e - VOID RATIO	SAP. - SAPROLITIC	WH - WEIGHT OF HAMMER	F - FINE	SD. - SAND, SANDY		FOSS. - FOSSILIFEROUS	SL. - SILT, SILTY		FRAC. - FRACTURED, FRACTURES	SLI. - SLIGHTLY		FRAGS. - FRAGMENTS	TCR - TRICONE REFUSAL		<p style="text-align: center;">WEATHERING</p> <p>FRESH - ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.</p> <p>VERY SLIGHT (V SL.) - ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY, ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.</p> <p>SLIGHT (SL.) - ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.</p> <p>MODERATE (MOD.) - SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.</p> <p>MODERATELY SEVERE (MOD. SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i></p> <p>SEVERE (SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <i>IF TESTED, YIELDS SPT N VALUES > 100 BPF</i></p> <p>VERY SEVERE (V SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, YIELDS SPT N VALUES < 100 BPF</i></p> <p>COMPLETE - ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.</p> <p style="text-align: center;">ROCK HARDNESS</p> <p>VERY HARD - CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.</p> <p>HARD - CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.</p> <p>MODERATELY HARD - CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.</p> <p>MEDIUM HARD - CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.</p> <p>SOFT - CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.</p> <p>VERY SOFT - CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.</p>	<p style="text-align: center;">CONSISTENCY OR DENSENESS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>PRIMARY SOIL TYPE</th> <th>COMPACTNESS OR CONSISTENCY</th> <th>RANGE OF STANDARD PENETRATION RESISTANCE (B-VALUE)</th> <th>RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)</th> </tr> <tr> <td>GENERALLY GRANULAR MATERIAL (NON-COHESIVE)</td> <td>VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE</td> <td><4 4 TO 10 10 TO 30 30 TO 50 >50</td> <td>N/A</td> </tr> <tr> <td>GENERALLY SILT-CLAY MATERIAL (COHESIVE)</td> <td>VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD</td> <td><2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 >30</td> <td><0.25 0.25 TO 0.50 0.5 TO 1.0 1 TO 2 2 TO 4 >4</td> </tr> </table> <p style="text-align: center;">TEXTURE OR GRAIN SIZE</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>U.S. STD. 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<p style="text-align: center;">EQUIPMENT USED ON SUBJECT PROJECT</p> <p>DRILL UNITS:</p> <p><input type="checkbox"/> MOBILE B- _____</p> <p><input type="checkbox"/> BK-51</p> <p><input type="checkbox"/> CM-45C</p> <p><input checked="" type="checkbox"/> CM-550</p> <p><input type="checkbox"/> PORTABLE HOIST</p> <p><input type="checkbox"/> _____</p> <p><input type="checkbox"/> _____</p> <p>ADVANCING TOOLS:</p> <p><input type="checkbox"/> CLAY BITS</p> <p><input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER</p> <p><input type="checkbox"/> 8" HOLLOW AUGERS</p> <p><input type="checkbox"/> HARD FACED FINGER BITS</p> <p><input type="checkbox"/> TUNG-CARBIDE INSERTS</p> <p><input checked="" type="checkbox"/> CASING <input checked="" type="checkbox"/> W/ ADVANCER</p> <p><input type="checkbox"/> TRICONE _____ *STEEL TEETH</p> <p><input type="checkbox"/> TRICONE _____ *TUNG-CARB.</p> <p><input type="checkbox"/> CORE BIT</p> <p><input type="checkbox"/> _____</p> <p><input type="checkbox"/> _____</p> <p>HAMMER TYPE:</p> <p><input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL</p> <p>CORE SIZE:</p> <p><input type="checkbox"/> B- _____</p> <p><input checked="" type="checkbox"/> N-XWL</p> <p><input type="checkbox"/> H- _____</p> <p>HAND TOOLS:</p> <p><input type="checkbox"/> POST HOLE DIGGER</p> <p><input type="checkbox"/> HAND AUGER</p> <p><input type="checkbox"/> SOUNDING ROD</p> <p><input type="checkbox"/> VANE SHEAR TEST</p> <p><input type="checkbox"/> _____</p> <p><input type="checkbox"/> _____</p>	<p style="text-align: center;">FRACTURE SPACING</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>SPACING</th> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FEET</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> </tr> </table> <p style="text-align: center;">BEDDING</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>THICKNESS</th> </tr> <tr> <td>VERY THICKLY BEDDED</td> <td>> 4 FEET</td> </tr> <tr> <td>THICKLY BEDDED</td> <td>1.5 - 4 FEET</td> </tr> <tr> <td>THINLY BEDDED</td> <td>0.16 - 1.5 FEET</td> </tr> <tr> <td>VERY THINLY BEDDED</td> <td>0.03 - 0.16 FEET</td> </tr> <tr> <td>THICKLY LAMINATED</td> <td>0.008 - 0.03 FEET</td> </tr> <tr> <td>THINLY LAMINATED</td> <td>< 0.008 FEET</td> </tr> </table> <p style="text-align: center;">INDURATION</p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <p>FRIABLE - RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</p> <p>MODERATELY INDURATED - GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</p> <p>INDURATED - GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</p> <p>EXTREMELY INDURATED - SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</p>	TERM	SPACING	VERY WIDE	MORE THAN 10 FEET	WIDE	3 TO 10 FEET	MODERATELY CLOSE	1 TO 3 FEET	CLOSE	0.16 TO 1 FEET	VERY CLOSE	LESS THAN 0.16 FEET	TERM	THICKNESS	VERY THICKLY BEDDED	> 4 FEET	THICKLY BEDDED	1.5 - 4 FEET	THINLY BEDDED	0.16 - 1.5 FEET	VERY THINLY BEDDED	0.03 - 0.16 FEET	THICKLY LAMINATED	0.008 - 0.03 FEET	THINLY LAMINATED	< 0.008 FEET																																																																																																																																																																																																																																																																																	
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<p style="text-align: center;">NOTES:</p> <p>REFERENCED TO BM#2 EL=2275.27</p>	<p style="text-align: center;">BENCH MARK: BOLT IN WOODEN CURB AT NW CORNER OF BRIDGE, ADJACENT TO *70* PLACARD.</p> <p style="text-align: center;">ASSUMED ELEVATION: 2274.98 FT.</p>																																																																																																																																																																																																																																																																																																											

BRIDGE No. 70 ON SR-1474 OVER SAVANNAH CREEK

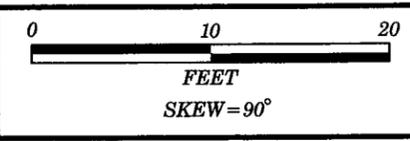
PROJECT REFERENCE NO.	SHEET
45360.1.16 (BD-5114P)	3/12
SITE PLAN	
0 50 100 FEET	
SKEW = 90°	



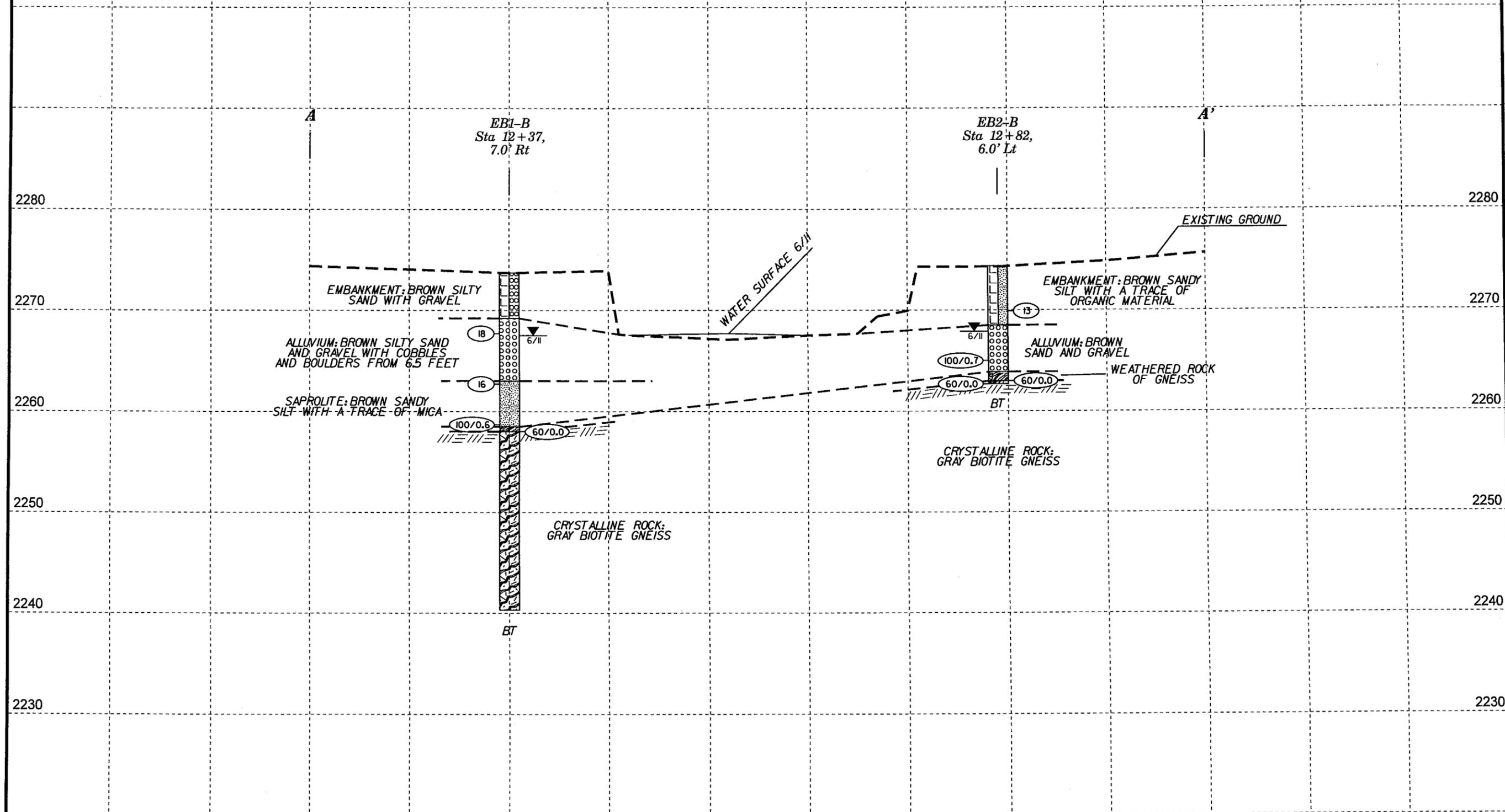
☒ BM #1
8" Spike Driven into
Base of Locust Tree
Elevation = 2275.71'

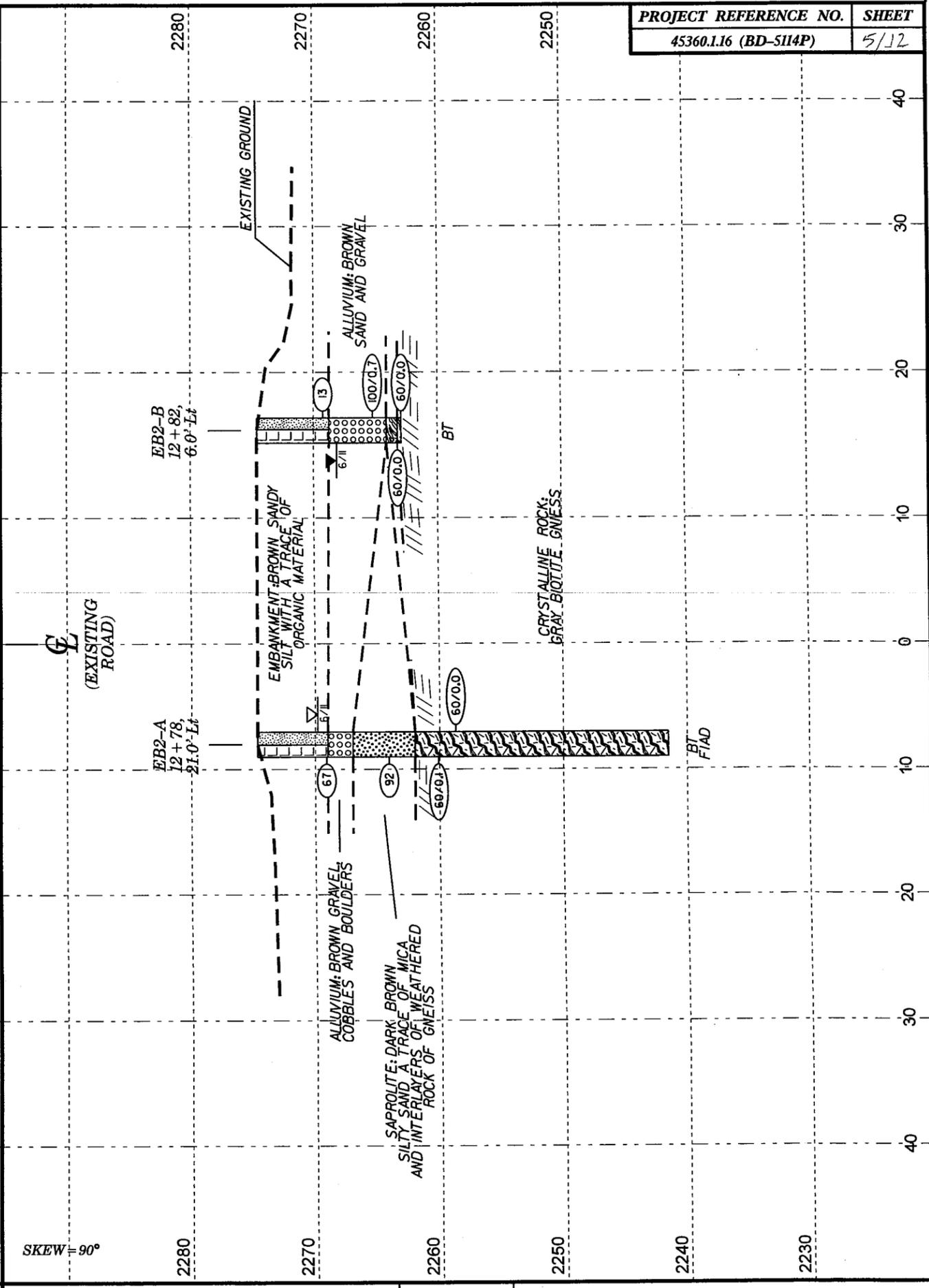
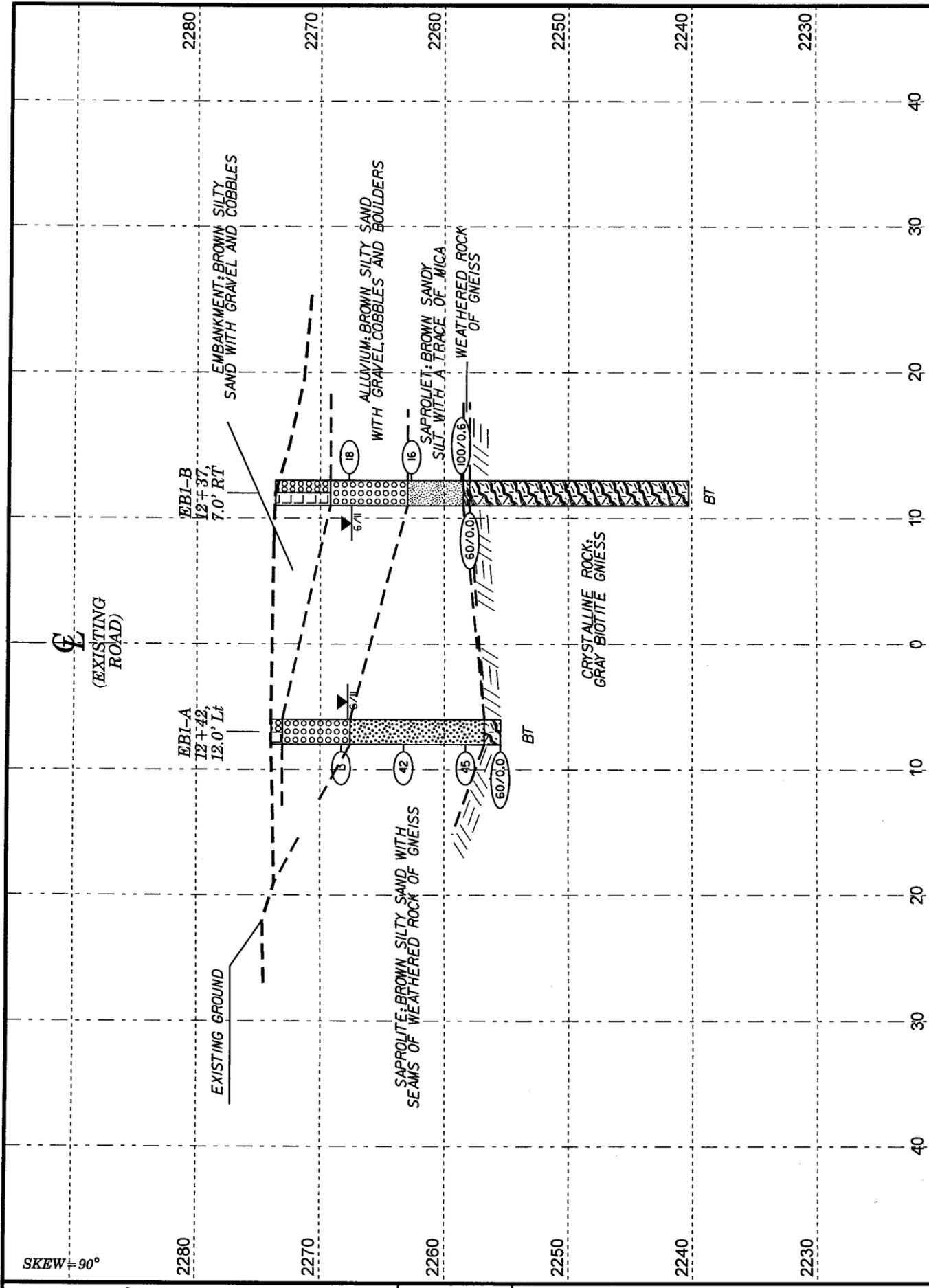
☒ BM #2
8" Spike Driven into
Base of Telephone Pole
Elevation = 2275.27'

BRIDGE No. 70 ON SR-1474 OVER SAVANNAH CREEK



PROJECT REFERENCE NO.	SHEET
45360.116 (BD-5114P)	4/12
PROFILE THROUGH A TO A' (SEE PLAN VIEW)	







NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 45360.1.16		TIP BD-5114P		COUNTY JACKSON		GEOLOGIST Elliott, D. C.									
SITE DESCRIPTION Bridge No. 70 on SR-1474 over Savannah Creek.							GROUND WTR (ft)								
BORING NO. B-1		STATION 12+42		OFFSET 12 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 2,274.0 ft		TOTAL DEPTH 18.5 ft		NORTHING 588,221		EASTING 724,743									
DRILL RIG/HAMMER EFF./DATE AFO0071 CME-550X 72% 09/03/2009				DRILL METHOD NW Casing w/ SPT		HAMMER TYPE Automatic									
DRILLER Coffey, Jr., C.		START DATE 06/14/11		COMP. DATE 06/14/11		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2275														2,274.0	0.0
														2,273.1	0.9
2270	2,269.3	4.7	2	1	2										
2265	2,264.3	9.7	26	18	24										
2260	2,259.3	14.7	19	17	28										
	2,255.5	18.5	60/0.0											2,256.8	17.2
														2,255.5	18.5

NCDOT BORE SINGLE BORELOGS.GPJ NC.DOT.GDT 12/15/11



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 45360.1.16		TIP BD-5114P		COUNTY JACKSON		GEOLOGIST Elliott, D. C.									
SITE DESCRIPTION Bridge No. 70 on SR-1474 over Savannah Creek.							GROUND WTR (ft)								
BORING NO. B-4		STATION 12+82		OFFSET 6 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 2,274.4 ft		TOTAL DEPTH 11.7 ft		NORTHING 588,255		EASTING 724,776									
DRILL RIG/HAMMER EFF./DATE AFO0071 CME-550X 72% 09/03/2009				DRILL METHOD NW Casing w/ SPT		HAMMER TYPE Automatic									
DRILLER Coffey, Jr., C.		START DATE 06/14/11		COMP. DATE 06/14/11		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2275														2,274.4	0.0
														2,274.4	
2270	2,270.0	4.4												2,268.5	5.9
			WOH	1	12										
2265	2,265.0	9.4												2,263.9	10.5
														2,263.0	11.4
	2,263.0	11.4												2,263.0	
	2,262.7	11.7	60/0.0											2,262.7	11.7
			60/0.0												

NCDOT BORE SINGLE BORELOGS.GPJ NC DOT.GDT 12/15/11

WEATHERED ROCK
Weathered rock of gneiss.

CRYSTALLINE ROCK
Gray biotite gneiss.

Boring Terminated with Standard Penetration Test Refusal at Elevation 2,262.7 ft in gray biotite gneiss.



FIELD SCOUR REPORT

WBS: 45360.1.16 TIP: BD-5114P COUNTY: Jackson

DESCRIPTION(1): Bridge No. 70 on SR-1474 over Savannah Creek.

EXISTING BRIDGE

Information from: Field Inspection Microfilm _____ (reel _____ pos: _____)
 Other (explain) _____

Bridge No.: 70 Length: 31.0ft Total Bents: 2 Bents in Channel: 0 Bents in Floodplain: 2
 Foundation Type: Footings (on piles(?))

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: None noted.

Interior Bents: N/A

Channel Bed: None noted.

Channel Bank: Some undercutting of the bank upstream of EB1-A (southwest corner of existing bridge).
 Some undercutting of the bank downstream of EB2-B (northeast corner).

EXISTING SCOUR PROTECTION

Type(3): Pile and panel wooden end bent walls.

Extent(4): End bent walls extend 4.0 to 6.0 feet beyond outside edge of bridge, with additional boulder rip-rap at EB1-A.

Effectiveness(5): Good.

Obstructions(6): None noted.

INSTRUCTIONS

- 1 Describe the specific site's location, including route number and body of water crossed.
- 2 Note scour evidence at existing end bents or abutments (e.g. undermining, sloughing, degradations).
- 3 Note existing scour protection (e.g. rip rap).
- 4 Describe extent of existing scour protection.
- 5 Describe whether or not the scour protection appears to be working.
- 6 Note obstructions such as dams, fallen trees, debris at bents, etc.
- 7 Describe the channel bed material based on observation and/or samples. Include any lab results with report.
- 8 Describe the channel bank material based on observation and/or samples. Include any lab results with report.
- 9 Describe the material covering the banks (e.g. grass, trees, rip rap, none).
- 10 Determine the approximate floodplain width from field observation or a topographic map.
- 11 Describe the material covering the floodplain (e.g. grass, trees, crops).
- 12 Use professional judgement to specify if the stream is degrading, aggrading, or static.
- 13 Describe potential and direction of the stream to migrate laterally during the bridge's life (approx. 100 years).
- 14 Give the design scour elevation (DSE) expected over the life of the bridge (approx. 100 years). This elevation can be given as a range across the site, or for each bent. Discuss the relationship between the Hydraulics Unit theoretical scour and the DSE. If the DSE is dependent on scour counter measures, explain (e.g. rip rap armoring on slopes). The DSE is based on the erodability of materials, giving consideration to the influence of joints, foliation, bedding characteristics, % core recovery, % RQD, differential weathering, shear strength, observations at existing structures, other tests deemed appropriate, and overall geologic conditions at the site.

DESIGN INFORMATION

Channel Bed Material(7): Sand, gravel and cobbles.

Channel Bank Material(8): Silty sand and gravel.

Channel Bank Cover(9): EB1-B (SE) grass; otherwise trees.

Floodplain Width(10): EB1-A: 15.0ft; EB1-B: >50.0ft; EB2-A: 0.0ft; EB2-B: >50.0ft.

Floodplain Cover(11): EB1-A and EB2-A: Trees; EB1-B and EB2-B: Grass.

Stream is(12): Aggrading _____ Degrading Static _____

Channel Migration Tendency(13): South

Observations and Other Comments: _____

Reported by: C A Dunnagan Date: 6/3/2011

DESIGN SCOUR ELEVATIONS(14)

Feet _____ Meters _____

BENTS

Comparison of DSE to Hydraulics Unit theoretical scour:
 We agree with the scour elevations presented in the Hydraulics Unit's report.

DSE determined by: _____ Date: _____

SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

Bed or Bank																				
Sample No.																				
Retained #4																				
Passed #10																				
Passed #40																				
Passed #200																				
Coarse Sand																				
Fine Sand																				
Silt																				
Clay																				
LL																				
PI																				
AASHTO																				
Station																				
Offset																				
Depth																				



**FIELD
 SCOUR REPORT**

WBS: 45360.1.16 TIP: BD-5114P COUNTY: Jackson

DESCRIPTION(1): Bridge No. 70 on SR-1474 over Savannah Creek.

EXISTING BRIDGE

Information from: Field Inspection Microfilm _____ (reel _____ pos: _____)
 Other (explain) _____

Bridge No.: 70 Length: 31.0ft Total Bents: 2 Bents in Channel: 0 Bents in Floodplain: 2
 Foundation Type: Footings (on piles(?))

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: None noted.

Interior Bents: N/A

Channel Bed: None noted.

Channel Bank: Some undercutting of the bank upstream of EB1-A (southwest corner of existing bridge).
 Some undercutting of the bank downstream of EB2-B (northeast corner).

EXISTING SCOUR PROTECTION

Type(3): Pile and panel wooden end bent walls.

Extent(4): End bent walls extend 4.0 to 6.0 feet beyond outside edge of bridge, with additional boulder rip-rap at EB1-A.

Effectiveness(5): Good.

Obstructions(6): None noted.

INSTRUCTIONS

- 1 Describe the specific site's location, including route number and body of water crossed.
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- 3 Note existing scour protection (e.g. rip rap).
- 4 Describe extent of existing scour protection.
- 5 Describe whether or not the scour protection appears to be working.
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- 7 Describe the channel bed material based on observation and/or samples. Include any lab results with report.
- 8 Describe the channel bank material based on observation and/or samples. Include any lab results with report.
- 9 Describe the material covering the banks (e.g. grass, trees, rip rap, none).
- 10 Determine the approximate floodplain width from field observation or a topographic map.
- 11 Describe the material covering the floodplain (e.g. grass, trees, crops).
- 12 Use professional judgement to specify if the stream is degrading, aggrading, or static.
- 13 Describe potential and direction of the stream to migrate laterally during the bridge's life (approx. 100 years).
- 14 Give the design scour elevation (DSE) expected over the life of the bridge (approx. 100 years). This elevation can be given as a range across the site, or for each bent. Discuss the relationship between the Hydraulics Unit theoretical scour and the DSE. If the DSE is dependent on scour counter measures, explain (e.g. rip rap armoring on slopes). The DSE is based on the erodability of materials, giving consideration to the influence of joints, foliation, bedding characteristics, % core recovery, % RQD, differential weathering, shear strength, observations at existing structures, other tests deemed appropriate, and overall geologic conditions at the site.

DESIGN INFORMATION

Channel Bed Material(7): Sand, gravel and cobbles.

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Channel Bank Cover(9): EB1-B (SE) grass; otherwise trees.

Floodplain Width(10): EB1-A: 15.0ft; EB1-B: >50.0ft; EB2-A: 0.0ft; EB2-B: >50.0ft.

Floodplain Cover(11): EB1-A and EB2-A: Trees; EB1-B and EB2-B: Grass.

Stream is(12): Aggrading _____ Degrading Static _____

Channel Migration Tendency(13): South

Observations and Other Comments: _____

Reported by: C A Dunnagan Date: 6/3/2011

DESIGN SCOUR ELEVATIONS(14)

Feet _____ Meters _____

BENTS

	EB1	EB2											
Elevation	2262	2268.5											

Comparison of DSE to Hydraulics Unit theoretical scour:
 We agree with the scour elevations presented in the Hydraulics Unit's report. Note that scour will impact both end-bents.

DSE determined by: W D Frye, Jr Date: 12/19/2011

SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

Bed or Bank													
Sample No.													
Retained #4													
Passed #10													
Passed #40													
Passed #200													
Coarse Sand													
Fine Sand													
Silt													
Clay													
LL													
PI													
AASHTO													
Station													
Offset													
Depth													



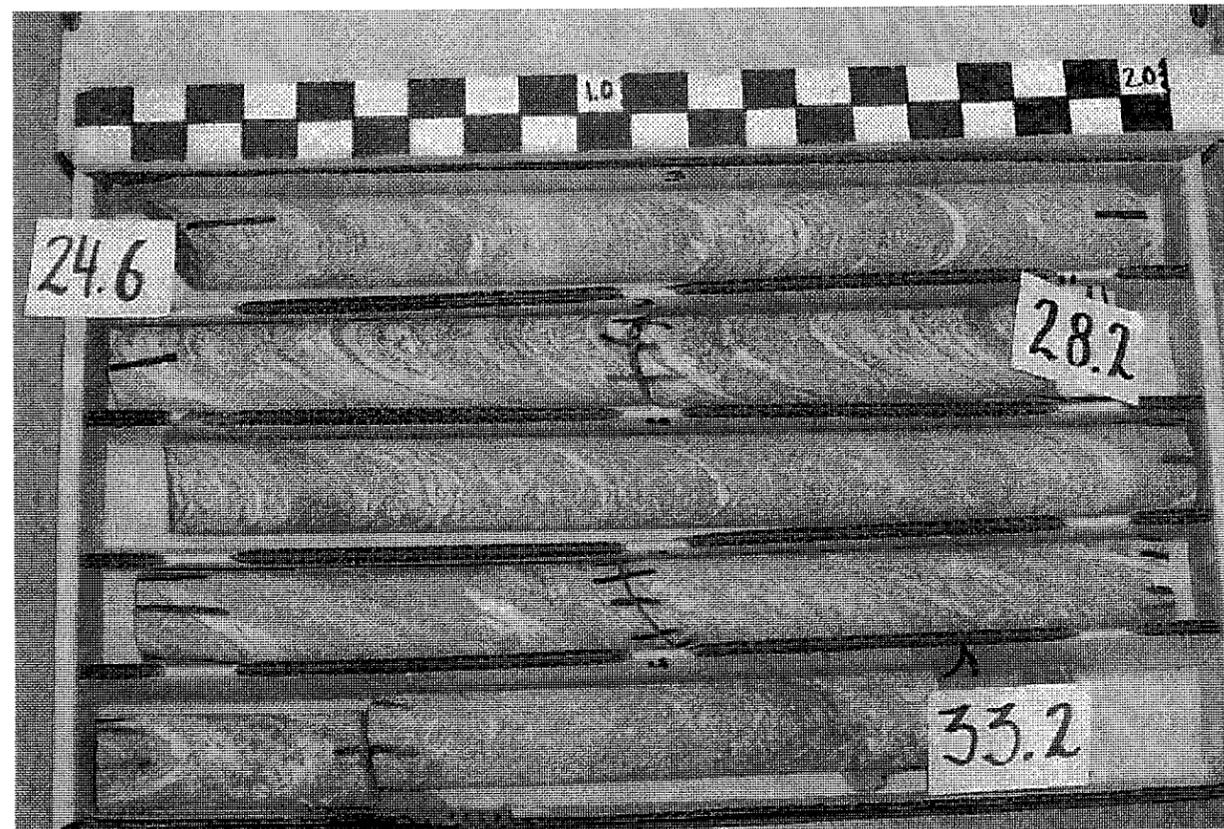
45360.1.16 (BD-5113P)
 Jackson Co.
 Bridge No. 70 on SR-1474
 Over Savannah Creek
 B-2
 Box 1 of 2



45360.1.16 (BD-5114P)
 Jackson Co.
 Bridge No. 70 on SR-1474
 Over Savannah Creek
 B-2
 Box 2 of 2



45360.1.16 (BD-5113P)
 Jackson Co.
 Bridge No. 70 on SR-1474
 Over Savannah Creek
 B-3
 Box 1 of 2



45360.1.16 (BD-5114P)
 Jackson Co.
 Bridge No. 70 on SR-1474
 Over Savannah Creek
 B-3
 Box 2 of 2