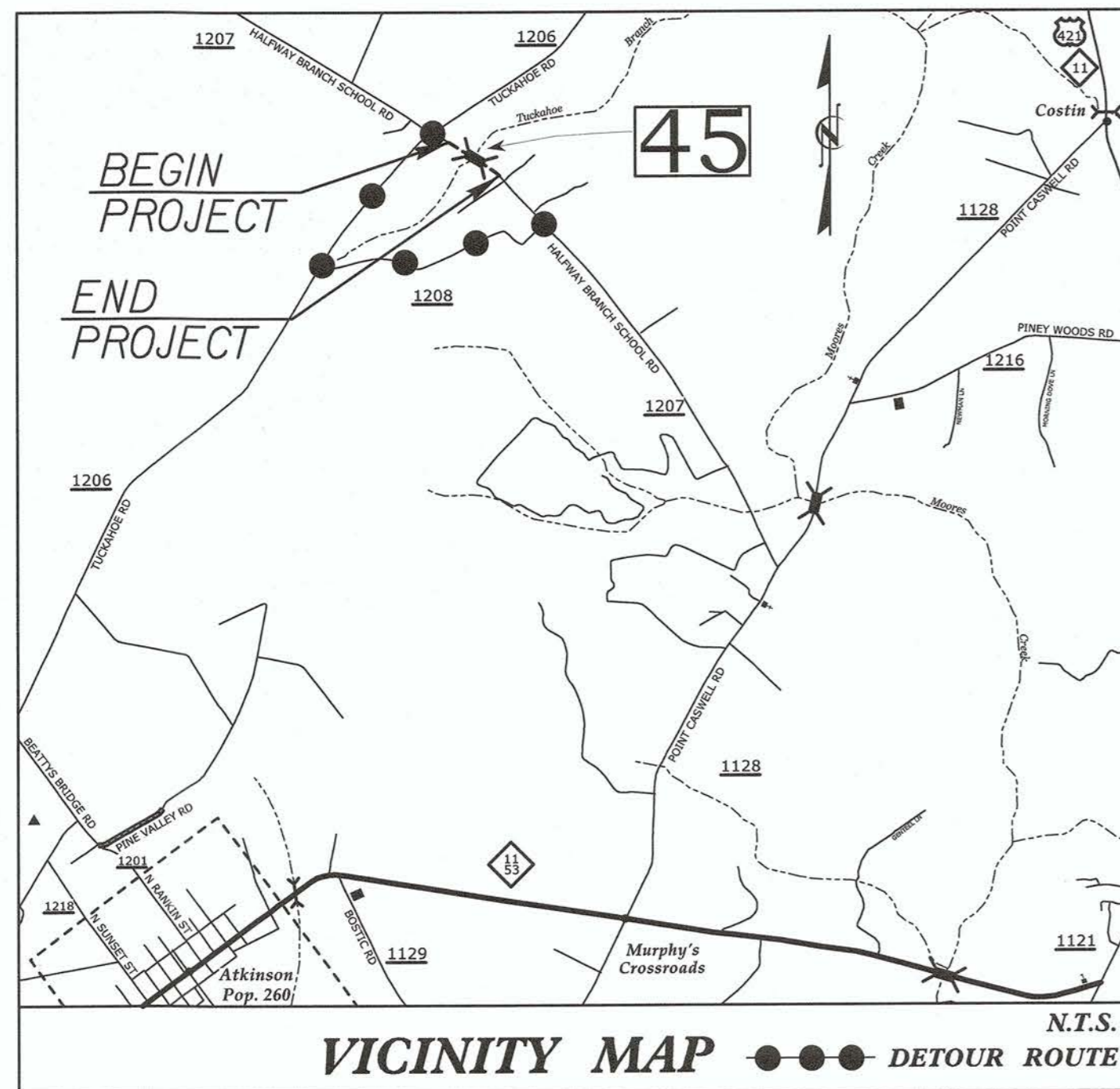


TIP PROJECT: 17BP.3.R.33

CONTRACT: DC00102

4/13/2015 12:45:38 PM  
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See Sheet 1-A For Index of Sheets



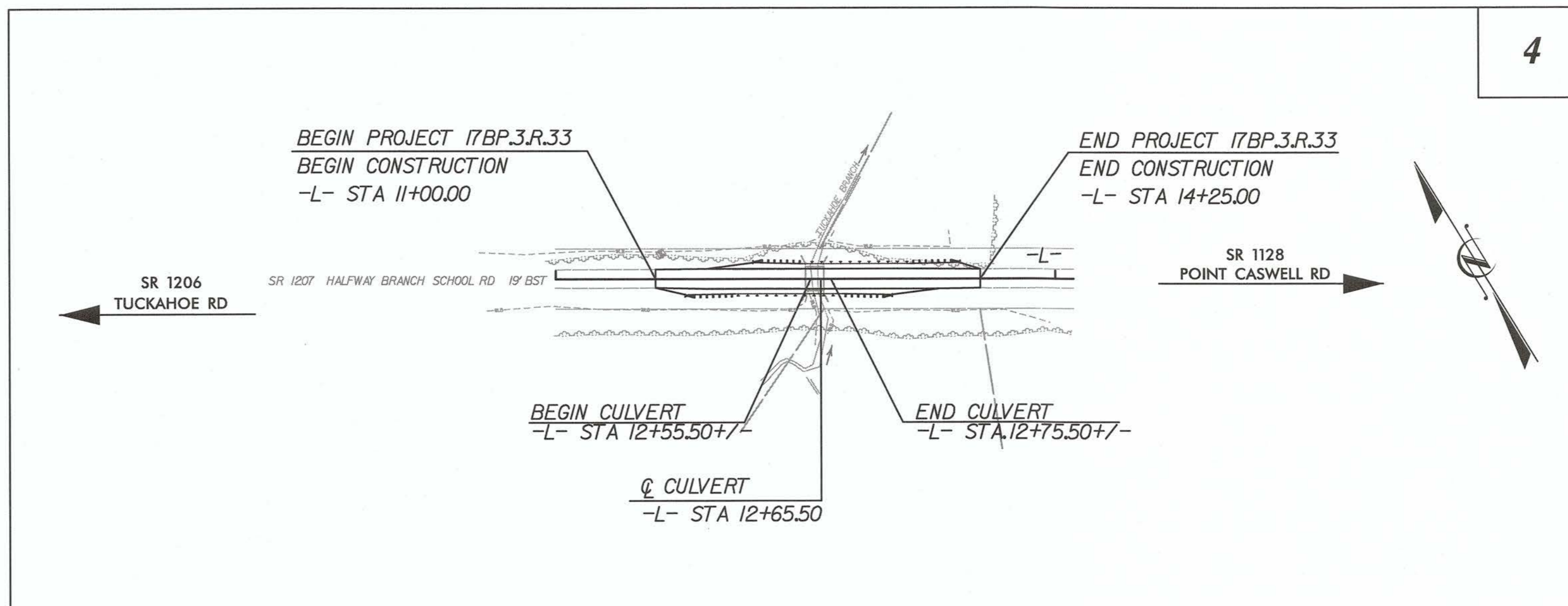
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**PENDER COUNTY**

**LOCATION: BRIDGE NO. 045 OVER TUCKAHOE BRANCH  
ON SR 1207 (HALFWAY BRANCH SCHOOL ROAD)**

**TYPE OF WORK: GRADING, PAVING, GUARDRAIL, DRAINAGE & STRUCTURE**

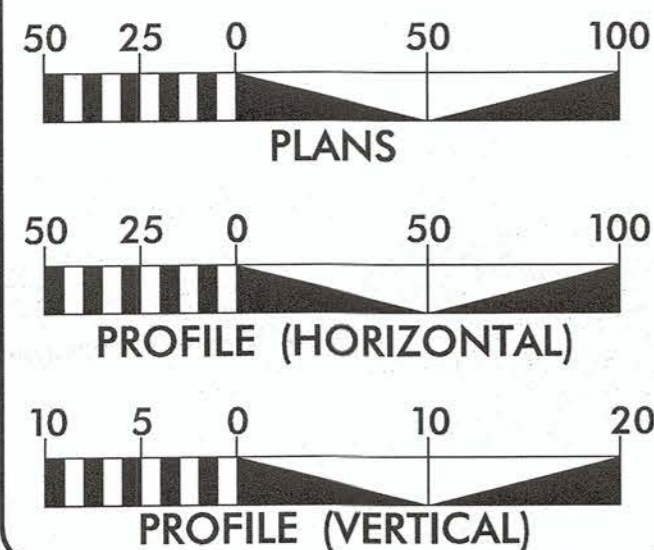
STATE	PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
NC	17BP.3.R.33	1	24
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
17BP.3.R.33		CONST.	



NOTE:

- CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.
- THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

GRAPHIC SCALES



DESIGN DATA

ADT 2010 = 400  
ADT 2035 = 800  
DHV = 10%  
D = 60%  
T = 6% \*  
V = 60 MPH  
\* TTST 2% DUAL 4%  
CLASSIFICATION: LOCAL  
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT 17BP.3.R.33 = 0.058 MI.  
LENGTH OF STRUCTURE TIP PROJECT 17BP.3.R.33 = 0.004 MI.  
TOTAL LENGTH OF TIP PROJECT 17BP.3.R.33 = 0.062 MI.

Prepared In the Office of:

**HNTB** HNTB NORTH CAROLINA, P.C.  
343 E. Six Forks Road, Suite 200  
Raleigh, North Carolina 27609  
NC License No: C-1554

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:  
MARCH 6, 2014

LETTING DATE:  
MAY 21, 2015

ENRICO A. ROQUE, P.E.  
PROJECT ENGINEER

MONICA J. DuVAL  
PROJECT DESIGNER

AMANDA GLYNN, P.E.  
NCDOT CONTACT

HYDRAULICS  
ENGINEER

Signature: James C. Byrd, P.E.  
4/13/15

ROADWAY  
DESIGN  
ENGINEER

Signature: Enrica A. Roque, P.E.  
4/13/15

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA



STATE HIGHWAY DESIGN ENGINEER



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS













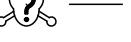

# CONVENTIONAL PLAN SHEET SYMBOLS

*Note: Not to Scale*





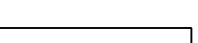
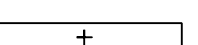
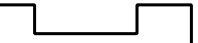
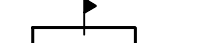



\*S.U.E. = *Subsurface Utility Engineering*

12/05/11

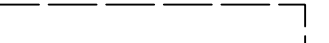









### BOUNDARIES AND PROPERTY:

State Line	_____
County Line	_____
Township Line	_____
City Line	_____
Reservation Line	_____
Property Line	_____
Existing Iron Pin	_____ 
Property Corner	_____ 
Property Monument	_____ 
Parcel/Sequence Number	_____ 
Existing Fence Line	_____ 
Proposed Woven Wire Fence	_____ 
Proposed Chain Link Fence	_____ 
Proposed Barbed Wire Fence	_____ 
Existing Wetland Boundary	_____ 
Proposed Wetland Boundary	_____ 
Existing Endangered Animal Boundary	_____ 
Existing Endangered Plant Boundary	_____ 
Known Soil Contamination: Area or Site	_____ 
Potential Soil Contamination: Area or Site	_____ 

### BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	_____ 
Sign	_____ 
Well	_____ 
Small Mine	_____ 
Foundation	_____ 
Area Outline	_____ 
Cemetery	_____ 
Building	_____ 
School	_____ 
Church	_____ 
Dam	_____ 


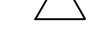






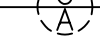

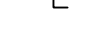







### HYDROLOGY:

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

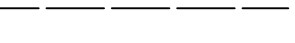




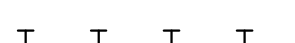
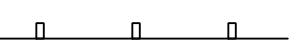
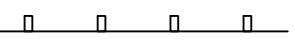



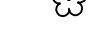



### RAILROADS:

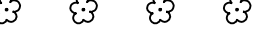
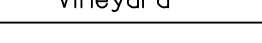
Standard Gauge	_____ 
RR Signal Milepost	_____ 
Switch	_____ 
RR Abandoned	_____ 
RR Dismantled	_____ 

### RIGHT OF WAY:

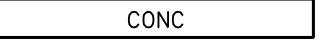
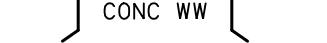
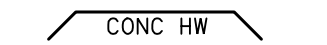
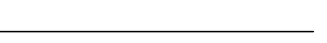
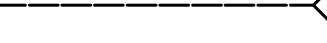
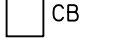
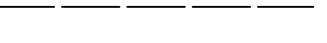


Baseline Control Point	_____ 
Existing Right of Way Marker	_____ 
Existing Right of Way Line	_____ 
Proposed Right of Way Line	_____ 
Proposed Right of Way Line with Iron Pin and Cap Marker	_____ 
Proposed Right of Way Line with Concrete or Granite RW Marker	_____ 
Proposed Control of Access Line with Concrete CA Marker	_____ 
Existing Control of Access	_____ 
Proposed Control of Access	_____ 
Existing Easement Line	_____ 
Proposed Temporary Construction Easement	_____ 
Proposed Temporary Drainage Easement	_____ 
Proposed Permanent Drainage Easement	_____ 
Proposed Permanent Drainage / Utility Easement	_____ 
Proposed Permanent Utility Easement	_____ 
Proposed Temporary Utility Easement	_____ 
Proposed Aerial Utility Easement	_____ 
Proposed Permanent Easement with Iron Pin and Cap Marker	_____ 

### ROADS AND RELATED FEATURES:



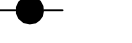




Existing Edge of Pavement	_____ 
Existing Curb	_____ 
Proposed Slope Stakes Cut	_____ 
Proposed Slope Stakes Fill	_____ 
Proposed Curb Ramp	_____ 
Existing Metal Guardrail	_____ 
Proposed Guardrail	_____ 
Existing Cable Guiderail	_____ 
Proposed Cable Guiderail	_____ 
Equality Symbol	_____ 
Pavement Removal	_____ 
VEGETATION:	
Single Tree	_____ 
Single Shrub	_____ 
Hedge	_____ 
Woods Line	_____ 

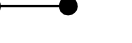


Orchard	_____ 
Vineyard	_____ 

### EXISTING STRUCTURES:

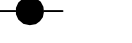


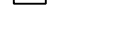

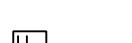

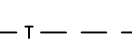
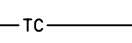
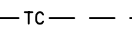
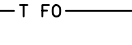
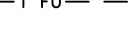

MAJOR:	
Bridge, Tunnel or Box Culvert	_____ 
Bridge Wing Wall, Head Wall and End Wall	_____ 
MINOR:	
Head and End Wall	_____ 
Pipe Culvert	_____ 
Footbridge	_____ 
Drainage Box: Catch Basin, DI or JB	_____ 
Paved Ditch Gutter	_____ 
Storm Sewer Manhole	_____ 
Storm Sewer	_____ 

### UTILITIES:








POWER:	
Existing Power Pole	_____ 
Proposed Power Pole	_____ 
Existing Joint Use Pole	_____ 
Proposed Joint Use Pole	_____ 
Power Manhole	_____ 
Power Line Tower	_____ 
Power Transformer	_____ 

H-Frame Pole	_____ 
Recorded U/G Power Line	_____ 
Designated U/G Power Line (S.U.E.*)	_____ 






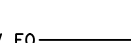
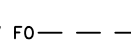

### TELEPHONE:

Existing Telephone Pole	_____ 
Proposed Telephone Pole	_____ 
Telephone Manhole	_____ 
Telephone Booth	_____ 
Telephone Pedestal	_____ 
Telephone Cell Tower	_____ 
U/G Telephone Cable Hand Hole	_____ 
Recorded U/G Telephone Cable	_____ 
Designated U/G Telephone Cable (S.U.E.*)	_____ 
Recorded U/G Telephone Conduit	_____ 
Designated U/G Telephone Conduit (S.U.E.*)	_____ 
Recorded U/G Fiber Optics Cable	_____ 
Designated U/G Fiber Optics Cable (S.U.E.*)	_____ 






### WATER:

Water Manhole	_____ 
Water Meter	_____ 
Water Valve	_____ 
Water Hydrant	_____ 
Recorded U/G Water Line	_____ 
Designated U/G Water Line (S.U.E.*)	_____ 
Above Ground Water Line	_____ 



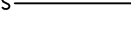
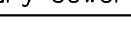


### TV:

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











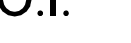

### GAS:

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

### SANITARY SEWER:

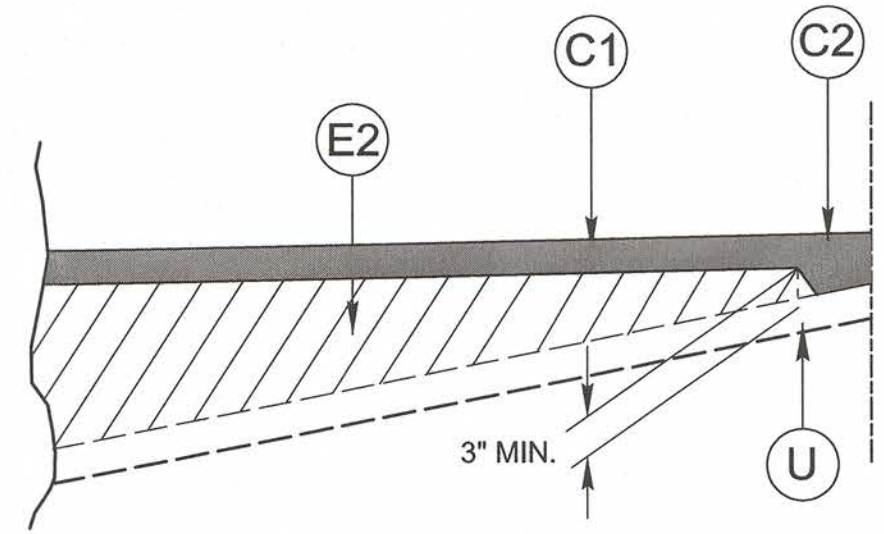
Sanitary Sewer Manhole	_____ 
Sanitary Sewer Cleanout	_____ 
U/G Sanitary Sewer Line	_____ 
Above Ground Sanitary Sewer	_____ 
Recorded SS Forced Main Line	_____ 
Designated SS Forced Main Line (S.U.E.*)	_____ 

### MISCELLANEOUS:

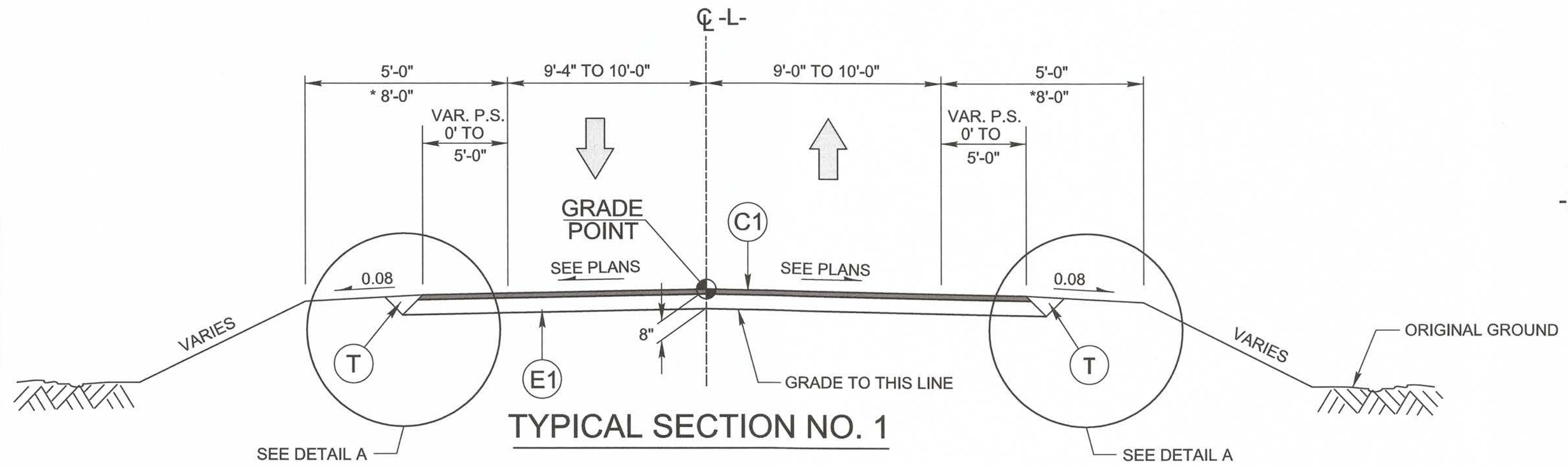
Utility Pole	_____ 
Utility Pole with Base	_____ 
Utility Located Object	_____ 
Utility Traffic Signal Box	_____ 
Utility Unknown U/G Line	_____ 
U/G Tank; Water, Gas, Oil	_____ 
Underground Storage Tank, Approx. Loc.	_____ 
A/G Tank; Water, Gas, Oil	_____ 
Geoenvironmental Boring	_____ 
U/G Test Hole (S.U.E.*)	_____ 
Abandoned According to Utility Records	_____ 
End of Information	_____ 

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YARD IN EACH OF TWO LAYERS.
C2	PROP. VARIABLE DEPTH ASPHALT CONCRETE BASE COURSE, TYPE SF9.5A AT AN AVERAGE RATE OF 110 LBS. PER SQ. YARD PER INCH DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1" IN DEPTH OR GREATER THAN 1.5" IN DEPTH.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YARD.
E2	PROP. VARIABLE DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B AT AN AVERAGE RATE OF 114 LBS. PER SQ. YARD PER INCH DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5.5" IN DEPTH.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING (SEE DETAIL)

ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE

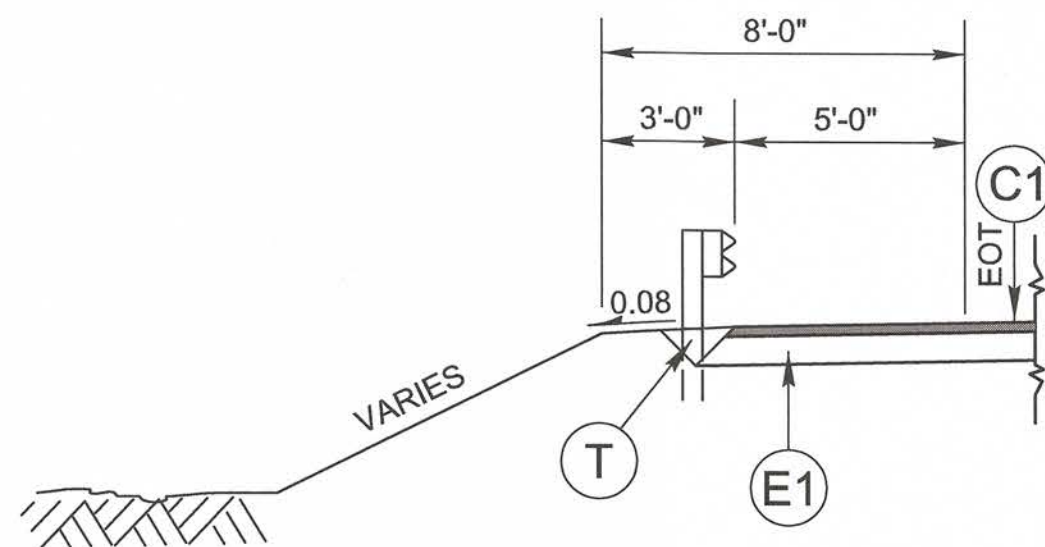


**DETAIL SHOWING METHOD OF WEDGING**  
 SEE TYPICAL SECTIONS



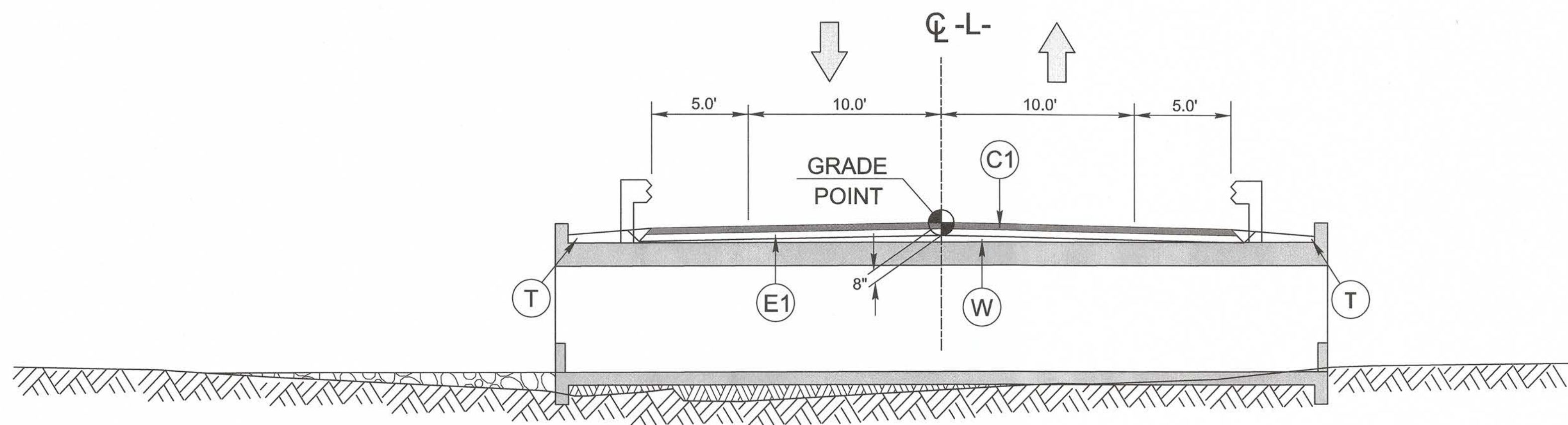
USE TYPICAL SECTION NO. 1 FROM:  
 -L- STA. 11+00.00 TO -L- STA. 14+25.00

NOTES: \* SHOULDER WIDTH INCREASED 3' WITH THE USE OF GUARDRAIL



**DETAIL A**  
 GUARDRAIL LOCATIONS

-L- STA. 11+29.46 TO -L- STA. 13+37.15 RT  
 -L- STA. 11+97.33 TO -L- STA. 14+05.02 LT

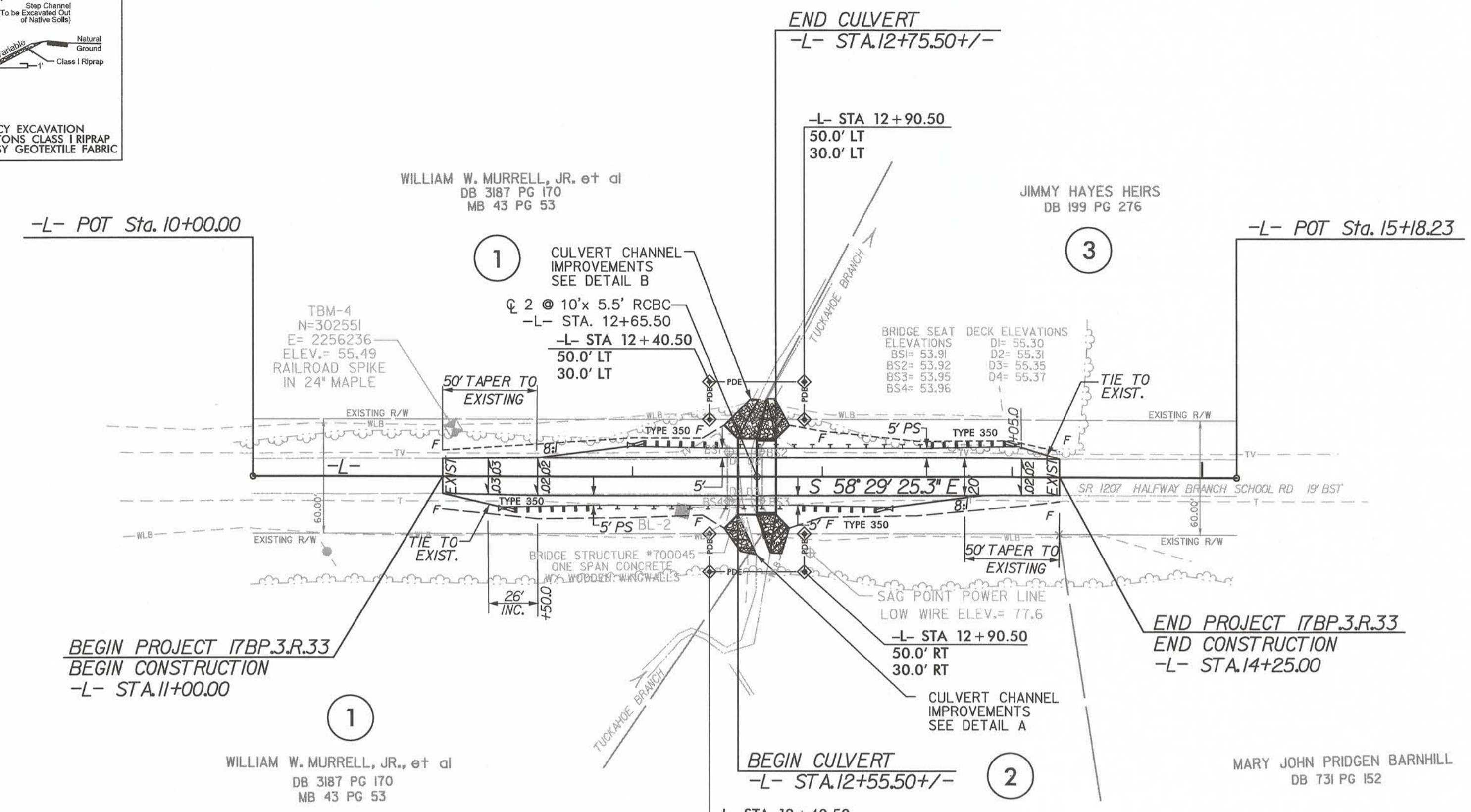
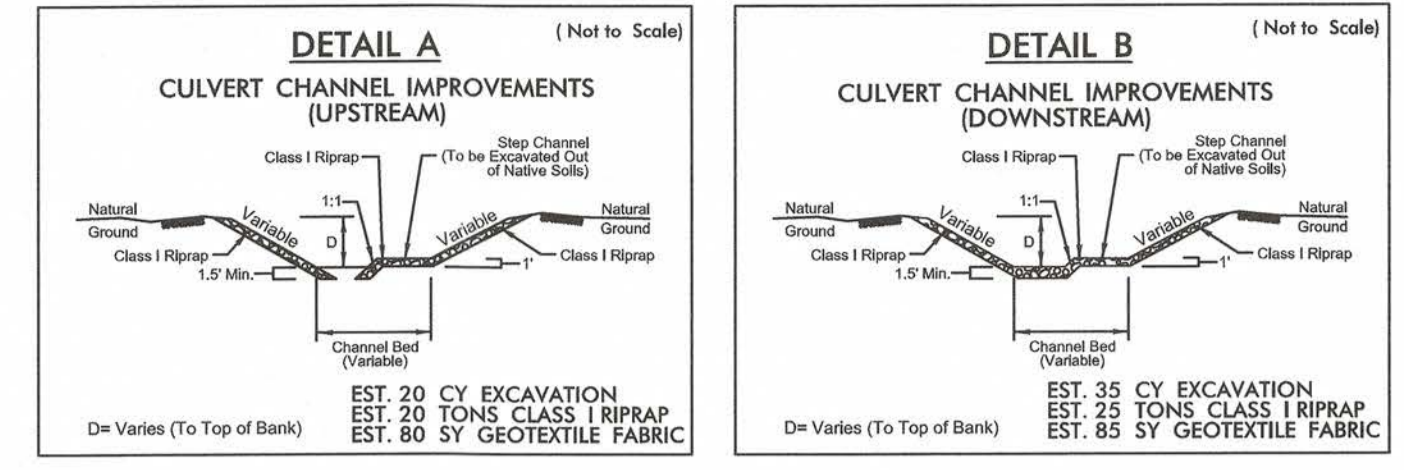


**CULVERT DETAIL**  
 CENTERLINE OF CULVERT -L- STA 12+65.50

REVISIONS

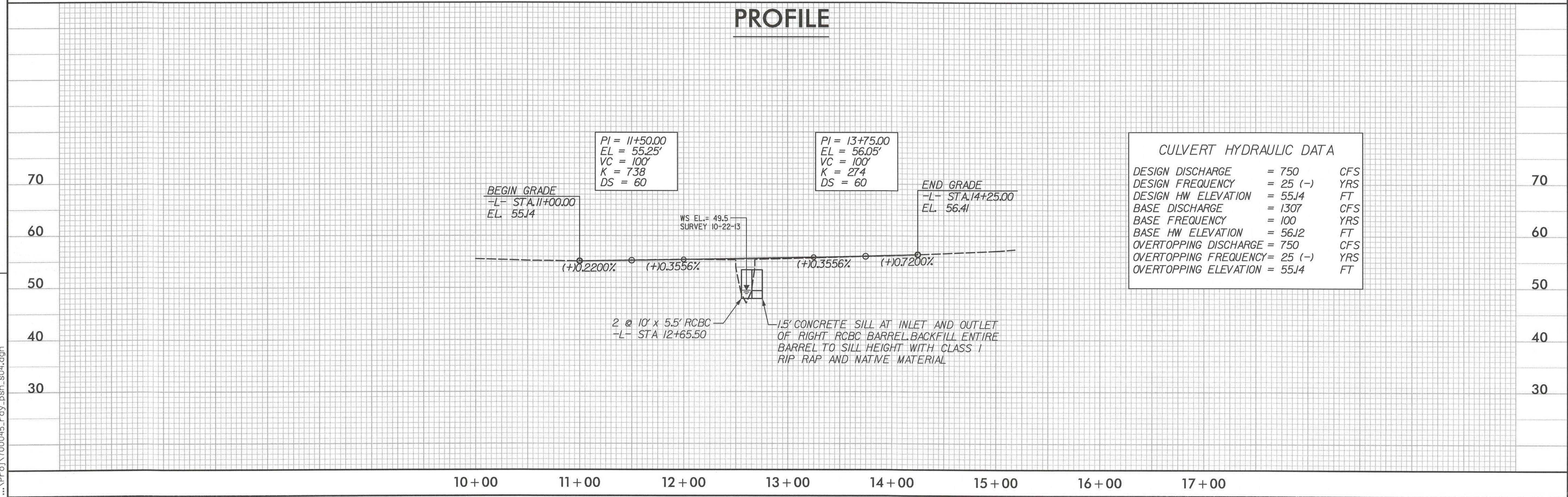


**PLAN**



**DATUM DESCRIPTION**  
 THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "050-2" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 424312.785(ft) EASTING: 2437972.510(ft) ELEVATION: 32.98(ft)  
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.0001052780  
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "050-2" TO -L- STATION IS  
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
 VERTICAL DATUM USED IS NAVD 88

**PROFILE**



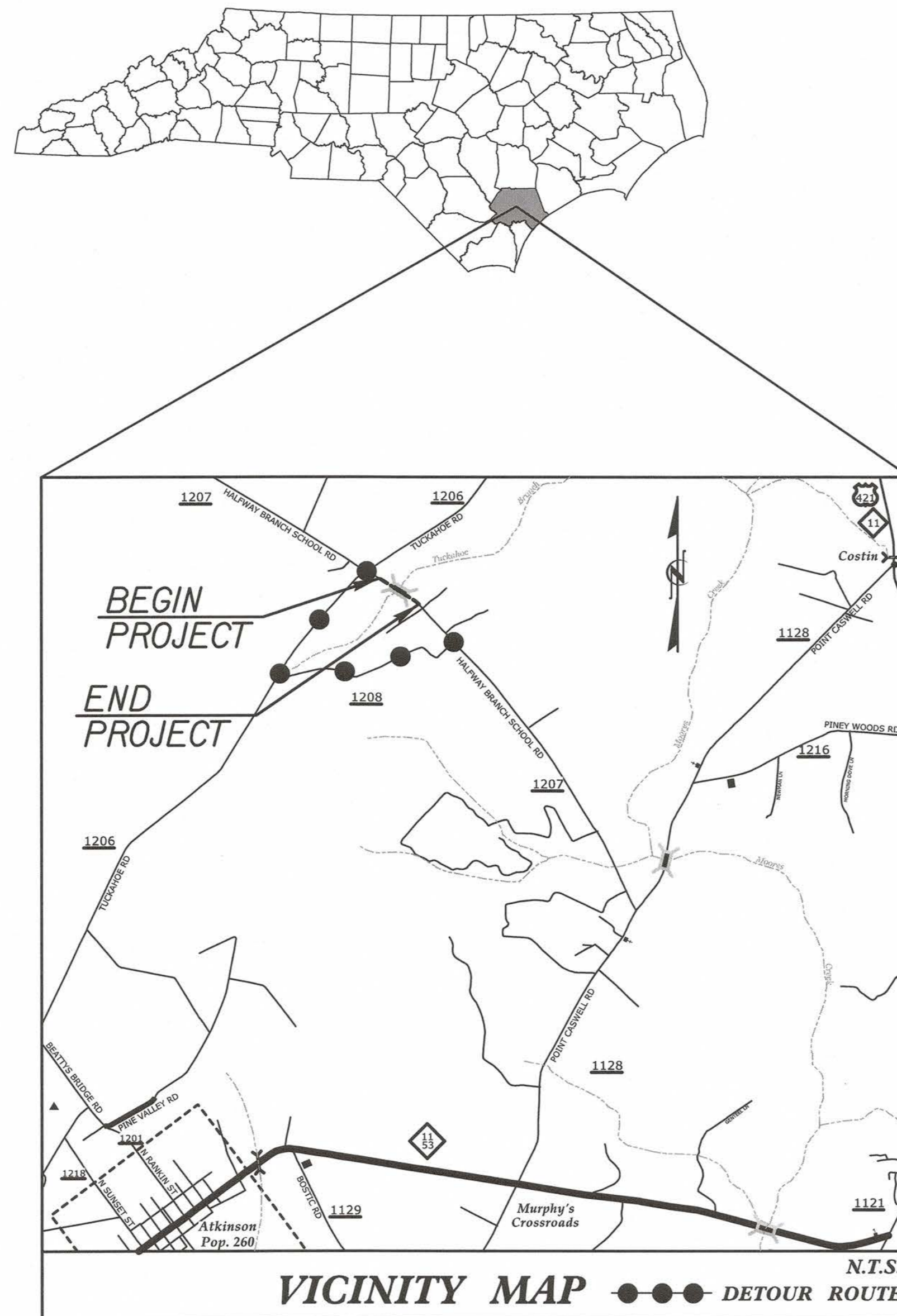
REVISIONS

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STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

PENDER COUNTY



VICINITY MAP ●●●● DETOUR ROUTE

SHEET NO.  
TMP-1

**INDEX OF SHEETS**

SHEET NO.	TITLE
TMP-1	TITLE SHEET, INDEX OF SHEETS AND LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS
TMP-2	GENERAL NOTES, PHASING AND DETOUR SIGNING

**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 JAN 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
1101.03	TEMPORARY ROAD CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1145.01	BARRICADES
1205.01	PAVEMENT MARKINGS - LINE TYPES & OFFSETS
1205.02	PAVEMENT MARKINGS - 2 LANE & MULTILANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	PAVEMENT MARKER SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1261.01	GUARDRAIL AND BARRIER DELINEATOR SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATOR TYPE
1262.01	GUARDRAIL END DELINEATION

**HNTB** HNTB NORTH CAROLINA, P.C.  
343 E. Six Forks Road, Suite 200  
Raleigh, North Carolina 27609  
NC License No: C-1554

R. B. EARLY, PE \_\_\_\_\_ TRAFFIC CONTROL PROJECT ENGINEER  
J. A. PHILLIPS \_\_\_\_\_ TRAFFIC CONTROL DESIGN ENGINEER

APPROVED: *[Signature]*  
DATE: 8-27-14

SEAL

**WORK ZONE SAFETY & MOBILITY**  
"from the MOUNTAINS to the COAST"

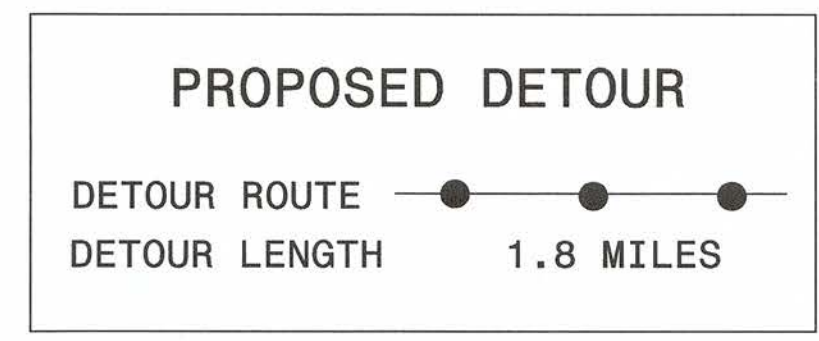
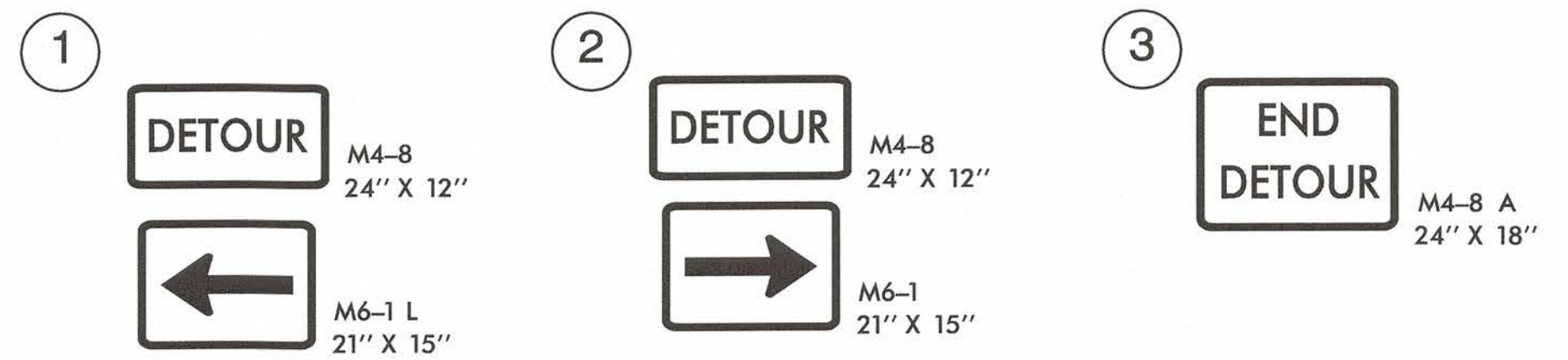
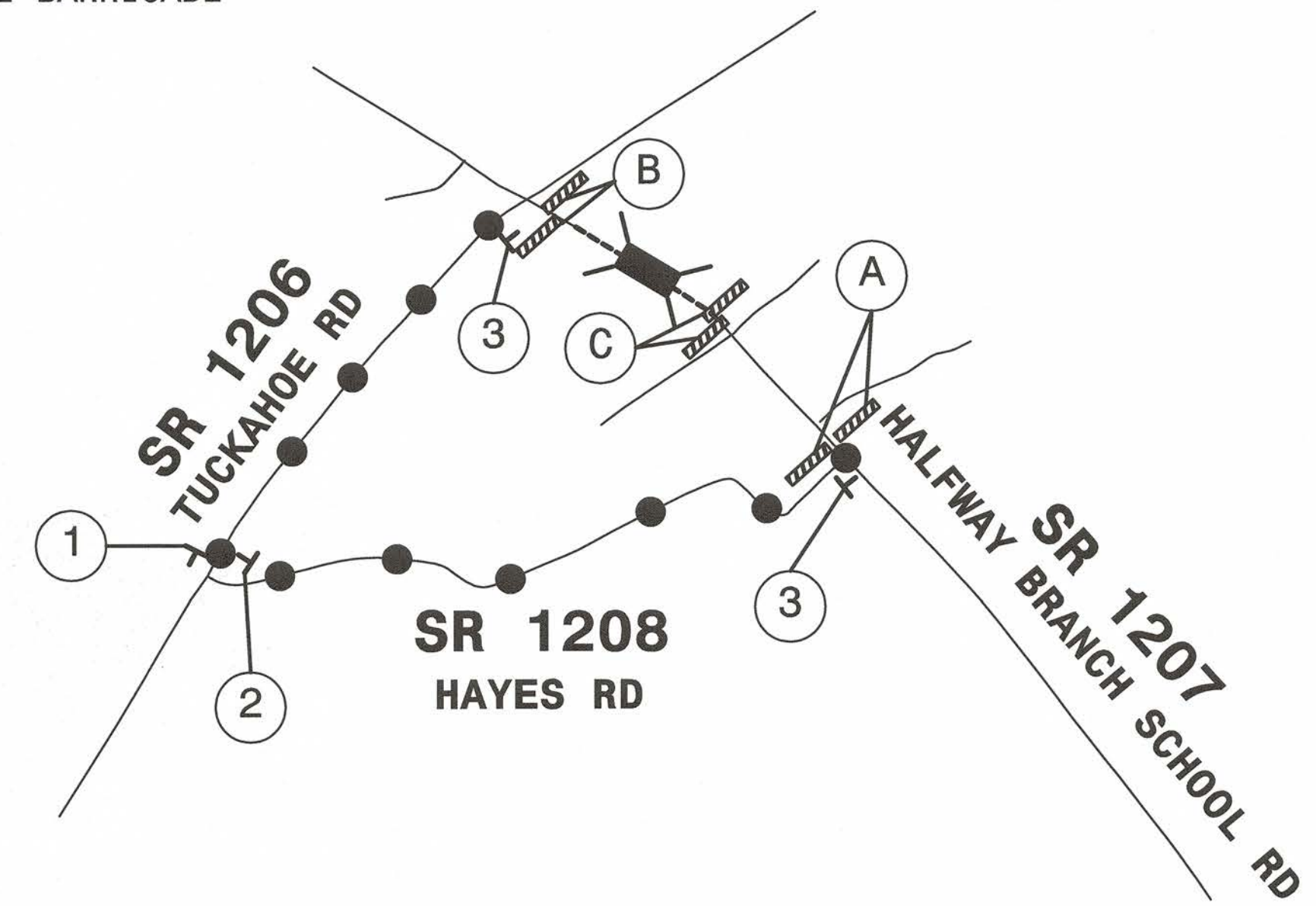
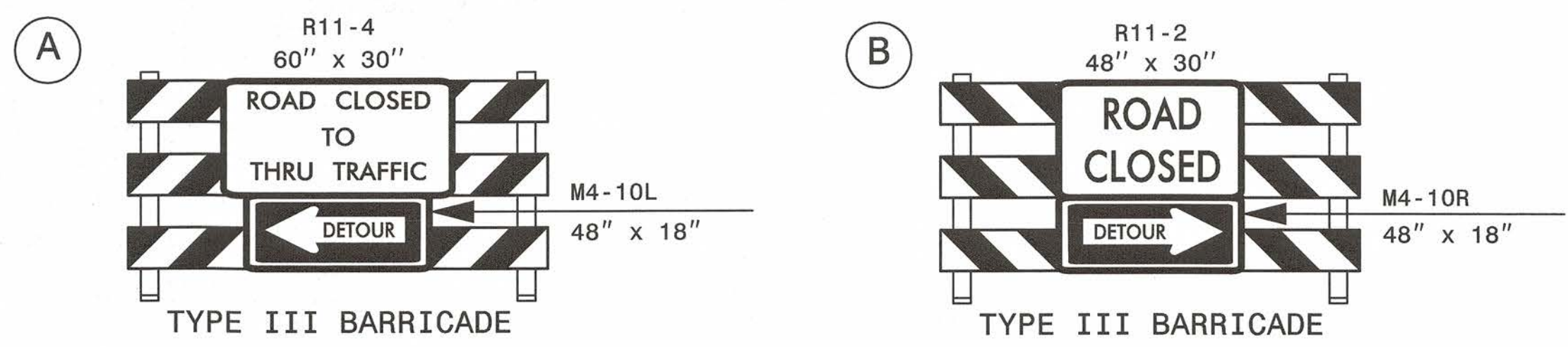
N.C.D.O.T. WORK ZONE TRAFFIC CONTROL  
1561 MAIL SERVICE CENTER (MSC) RALEIGH, NC 27699-1561  
750 N. GREENFIELD PARKWAY, GARNER, NC 27529 (DELIVERY)  
PHONE: (919) 773-2800 FAX: (919) 771-2745

KATHERINE HITE, PE \_\_\_\_\_ DIVISION TRAFFIC ENGINEER

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

I:\0415 AM\1500045\_tc\_TCP\_01\_title.dgn  
\$\$\$\$\$USERNAME\$\$\$\$\$

17BP.3.R.33  
TIP PROJECT:



**GENERAL NOTES**

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

THE FOLLOWING GENERAL NOTES APPLY AT ALL THE 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.

TRAFFIC PATTERN ALTERATIONS

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

SIGNING

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

PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN ON THIS SHEET.

- F) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.
- G) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

TRAFFIC CONTROL DEVICES

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

PAVEMENT MARKING AND MARKERS

- I) INSTALL PAVEMENT MARKINGS ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKERS
SR 1207 (HALFWAY BRANCH SCHOOL RD)	PAINT	RAISED

- J) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
- K) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS.
- L) PASSING ZONE WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

**PHASING**

PHASE I

PRIOR TO ANY CONSTRUCTION OPERATIONS, PLACE AND COVER OFF-SITE DETOUR SIGNS AS SHOWN ON TMP-2 AND IN ACCORDANCE WITH RSD 1101.03 (SHEETS 1 AND 3 OF 9).

PHASE II

USING OFF-SITE DETOUR, UNCOVER DETOUR SIGNS, CLOSE -L- (SR 1207 / HALFWAY BRANCH SCHOOL RD) TO TRAFFIC AND CONSTRUCT BRIDGE, APPROACHES AND ROADWAY UP TO AND INCLUDING THE FINAL LAYER OF SURFACE COURSE.

PHASE III

UPON COMPLETION OF BRIDGE, APPROACHES AND ROADWAY, PLACE FINAL PAVEMENT MARKINGS AND MARKERS IN ACCORDANCE WITH RSD 1205.01, 1250.01, 1205.02, 1205.12 AND 1251.01. REMOVE BARRICADES AND DETOUR SIGNS AND OPEN -L- (SR 1207 / HALFWAY BRANCH SCHOOL RD) TO TRAFFIC.

I:\0455\_Alt\0455\_Alt\_TCP\_detour.dgn  
 3/3/2015 10:58:58 AM  
 Q:\QC STAGE:

REVIEW: \_\_\_\_\_  
 CONCUR: \_\_\_\_\_  
 REVISE: \_\_\_\_\_  
 VERIFY: \_\_\_\_\_

APPROVED: *Donald G. Early* DATE: 8-27-14

TRANSPORTATION  
 MANAGEMENT PLAN  
**PROJECT NOTES,  
 PHASING  
 AND DETOUR SIGNING**

**HNTB**  
 HNTB NORTH CAROLINA, P.C.  
 349 E. SIX FORKS ROAD, SUITE 200  
 RALEIGH, NORTH CAROLINA 27609  
 NC LICENSE NO: C-1554



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.3.R.33	EC-1	5
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

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

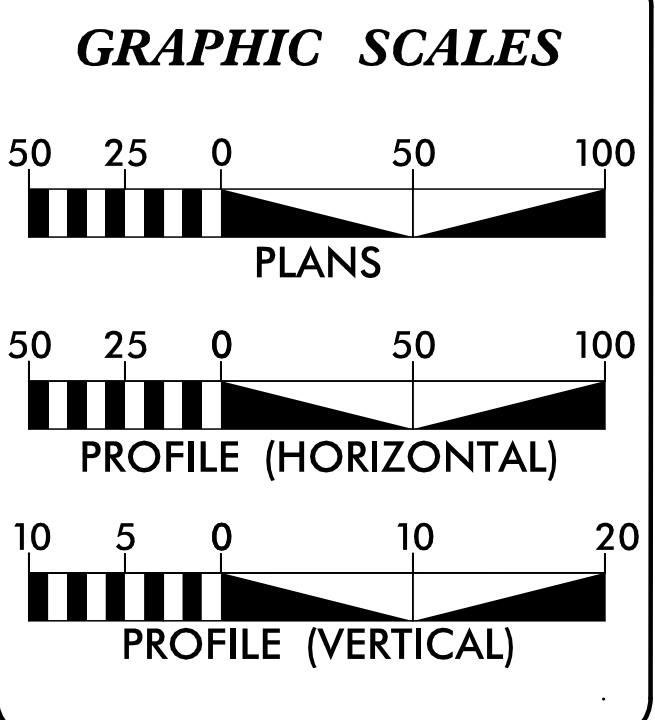
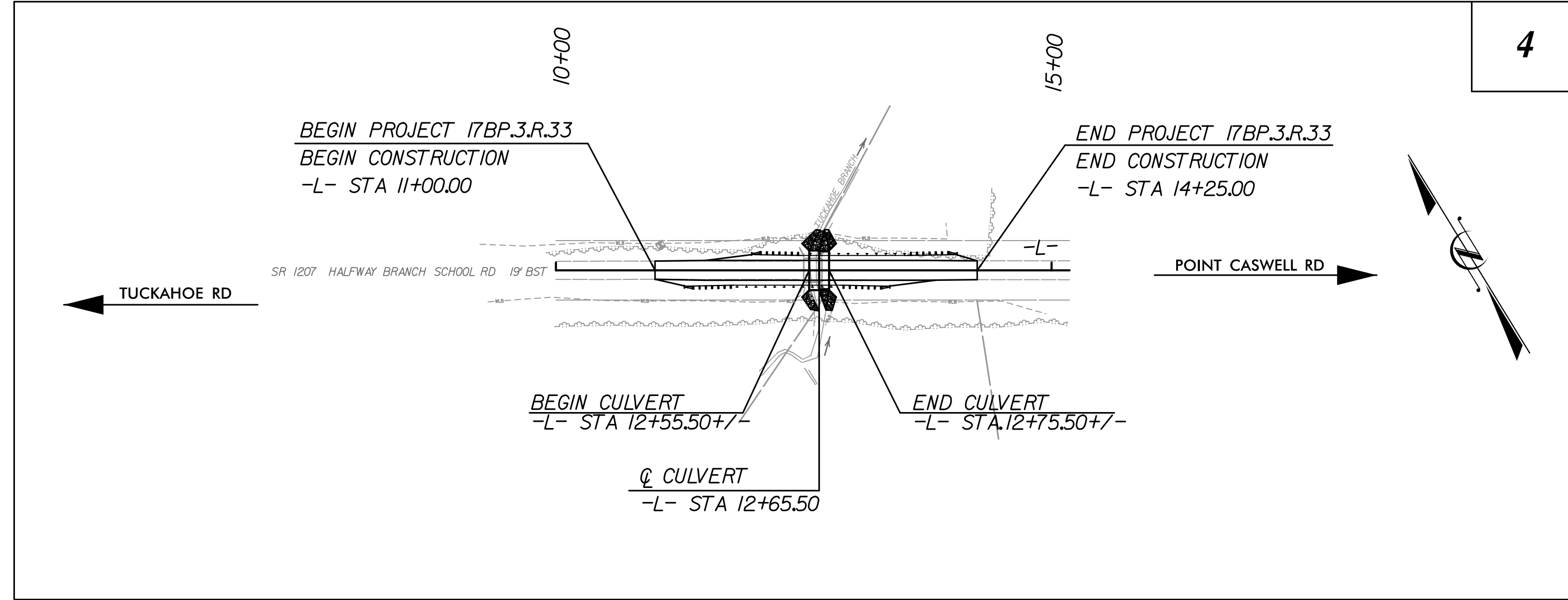
**LOCATION: PENDER COUNTY BRIDGE NO. 045 OVER TUCKAHOE BRANCH  
ON SR 1207 (HALFWAY BRANCH SCHOOL ROAD)**

**TYPE OF WORK: GRADING, PAVING, GUARDRAIL, DRAINAGE & STRUCTURE.**

**EROSION AND SEDIMENT CONTROL MEASURES**

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	— m —
1630.05	Temporary Diversion	— m —
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	▲▲▲▲▲▲▲▲
1622.01	Temporary Berms and Slope Drains	— m —
1630.01	Silt Basin Type B	▨
1633.01	Temporary Rock Silt Check Type-A	▨
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	▨
	Temporary Rock Silt Check Type-B	▨
	Wattle / Coir Fiber Wattle	— m —
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	— m —
1634.01	Temporary Rock Sediment Dam Type-A	▨
1634.02	Temporary Rock Sediment Dam Type-B	▨
1635.01	Rock Pipe Inlet Sediment Trap Type-A	⊓
1635.02	Rock Pipe Inlet Sediment Trap Type-B	⊓
1630.04	Stilling Basin	▭
1630.06	Special Stilling Basin	▭
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	▭
	Tiered Skimmer Basin	▭
	Infiltration Basin	▭

**TIP PROJECT: 17BP.3.R.33**



ROADSIDE ENVIRONMENTAL UNIT  
DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

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.

Prepared in the Office of:

**HNTB** HNTB NORTH CAROLINA, P.C.  
343 E. Six Forks Road, Suite 200  
Raleigh, North Carolina 27609  
NC License No: C-1554

**2012 STANDARD SPECIFICATIONS**

BENTON R. CARROLL, E.I.  
EROSION CONTROL  
LEVEL III  
CERTIFICATION #3180

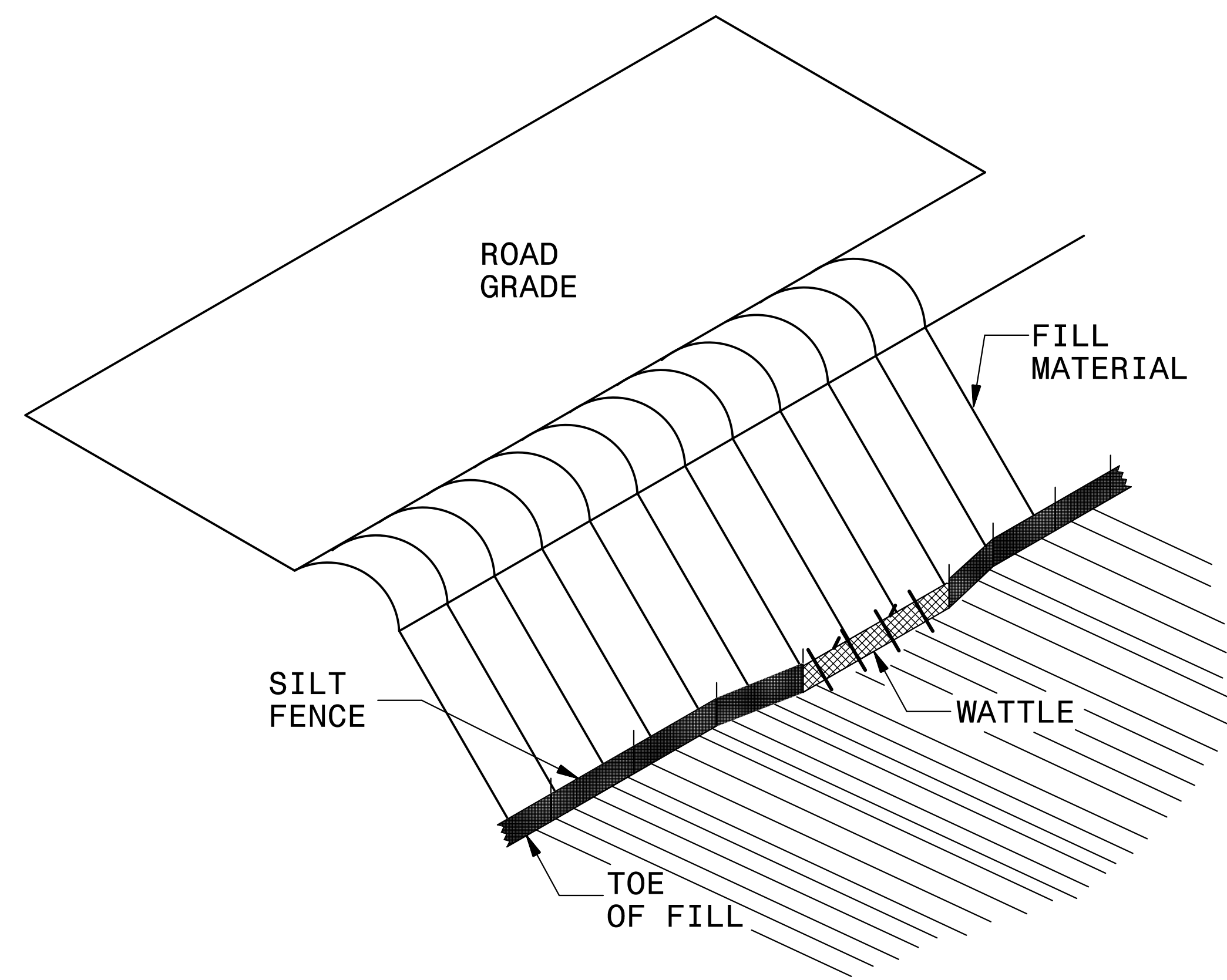
Highway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2012 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

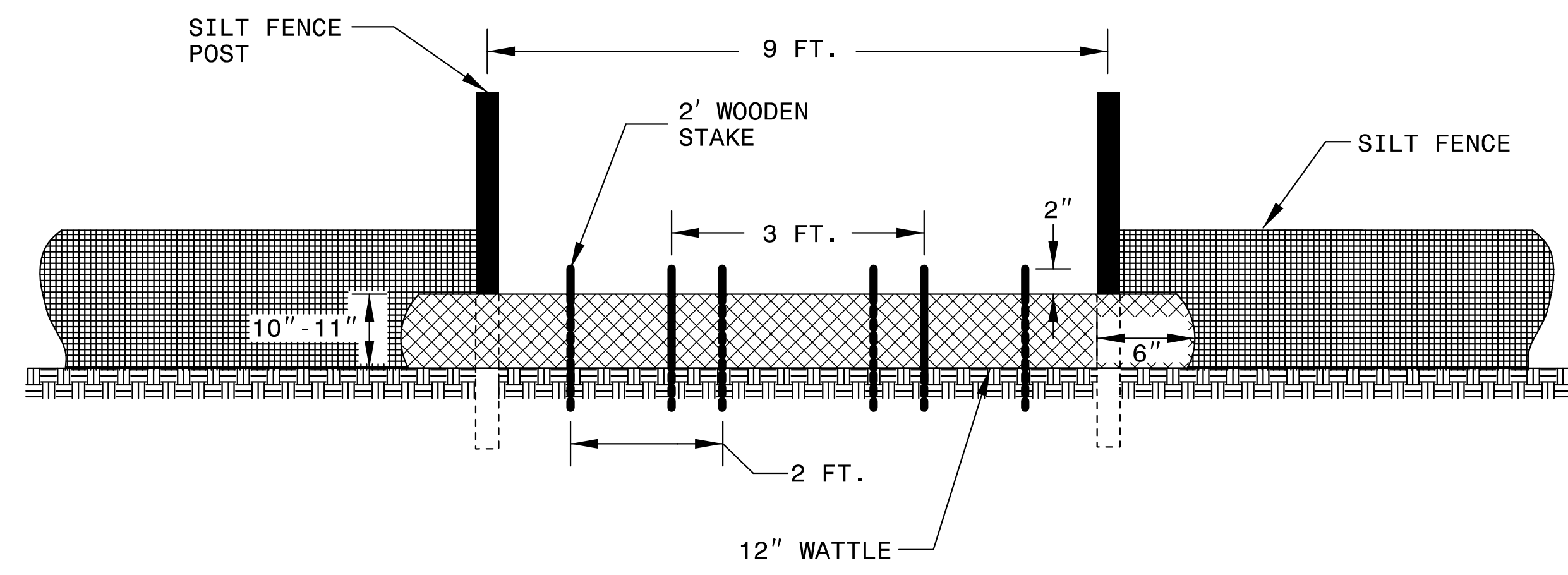
1604.01 Railroad Erosion Control Detail	1632.01 Rock Inlet Sediment Trap Type A
1605.01 Temporary Silt Fence	1632.02 Rock Inlet Sediment Trap Type B
1606.01 Special Sediment Control Fence	1632.03 Rock Inlet Sediment Trap Type C
1607.01 Gravel Construction Entrance	1633.01 Temporary Rock Silt Check Type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

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\*\*\*\*\*USERNAME\*\*\*\*\*

# SILT FENCE COIR FIBER WATTLE BREAK DETAIL



**ISOMETRIC VIEW**



**VIEW FROM SLOPE**

**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.

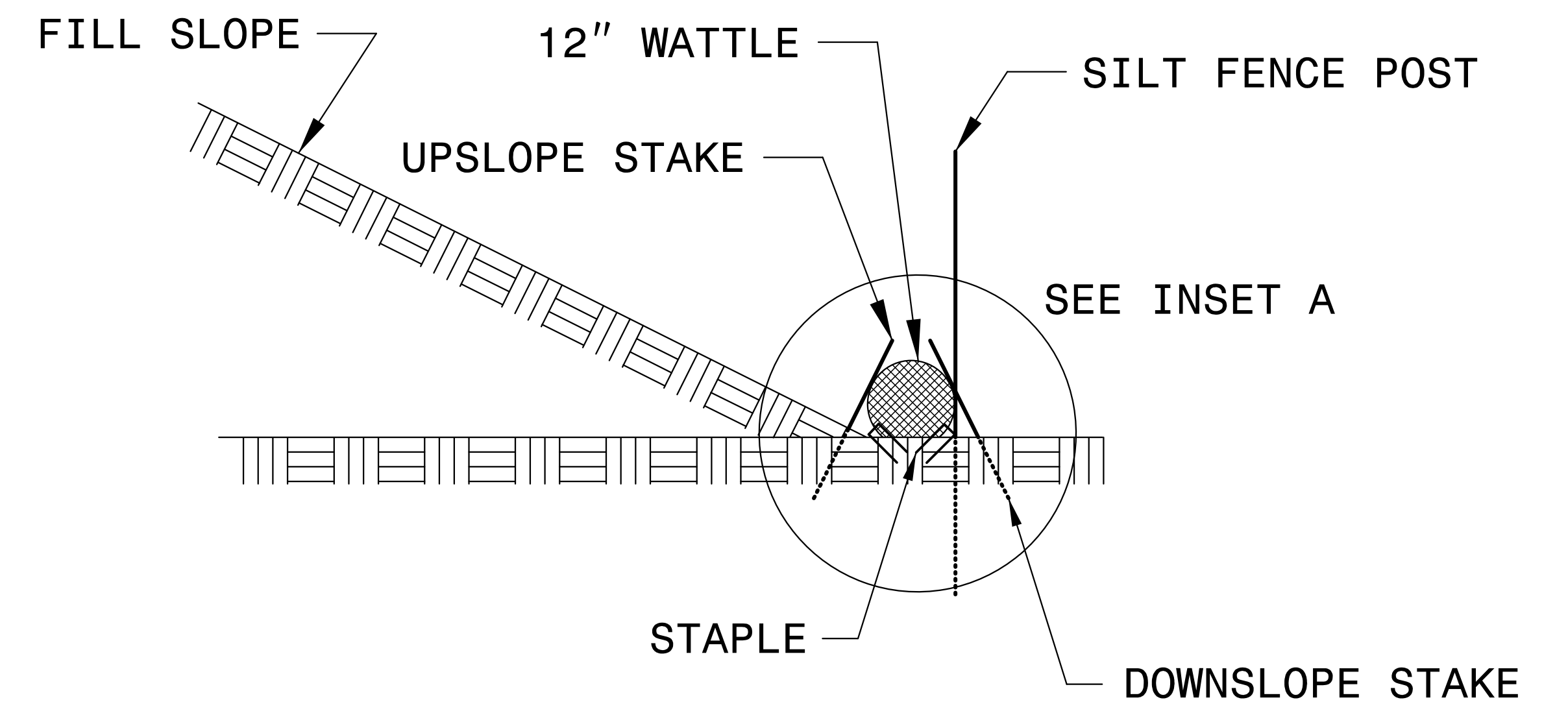
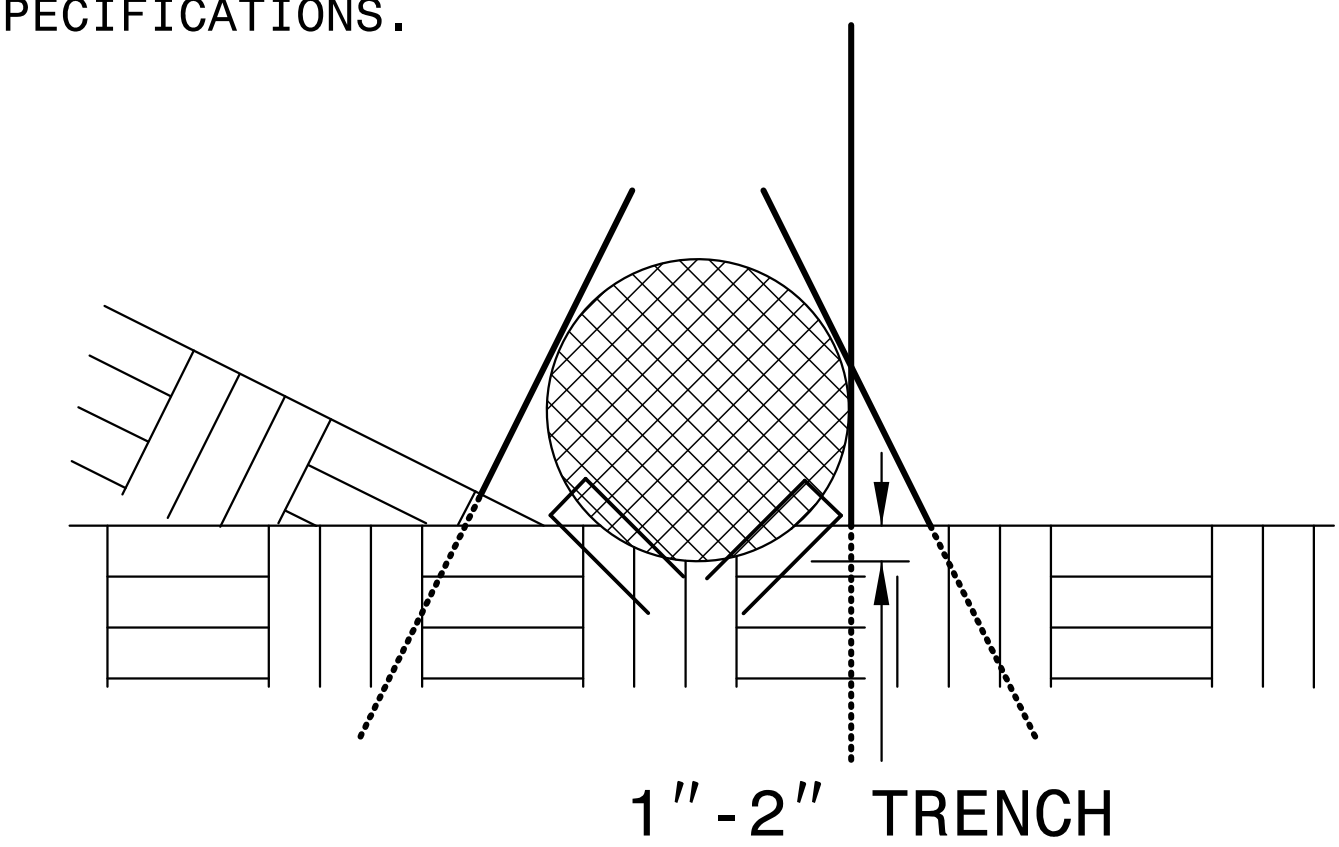
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

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**



**SIDE VIEW**

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

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## ***SOIL STABILIZATION TIMEFRAMES***

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

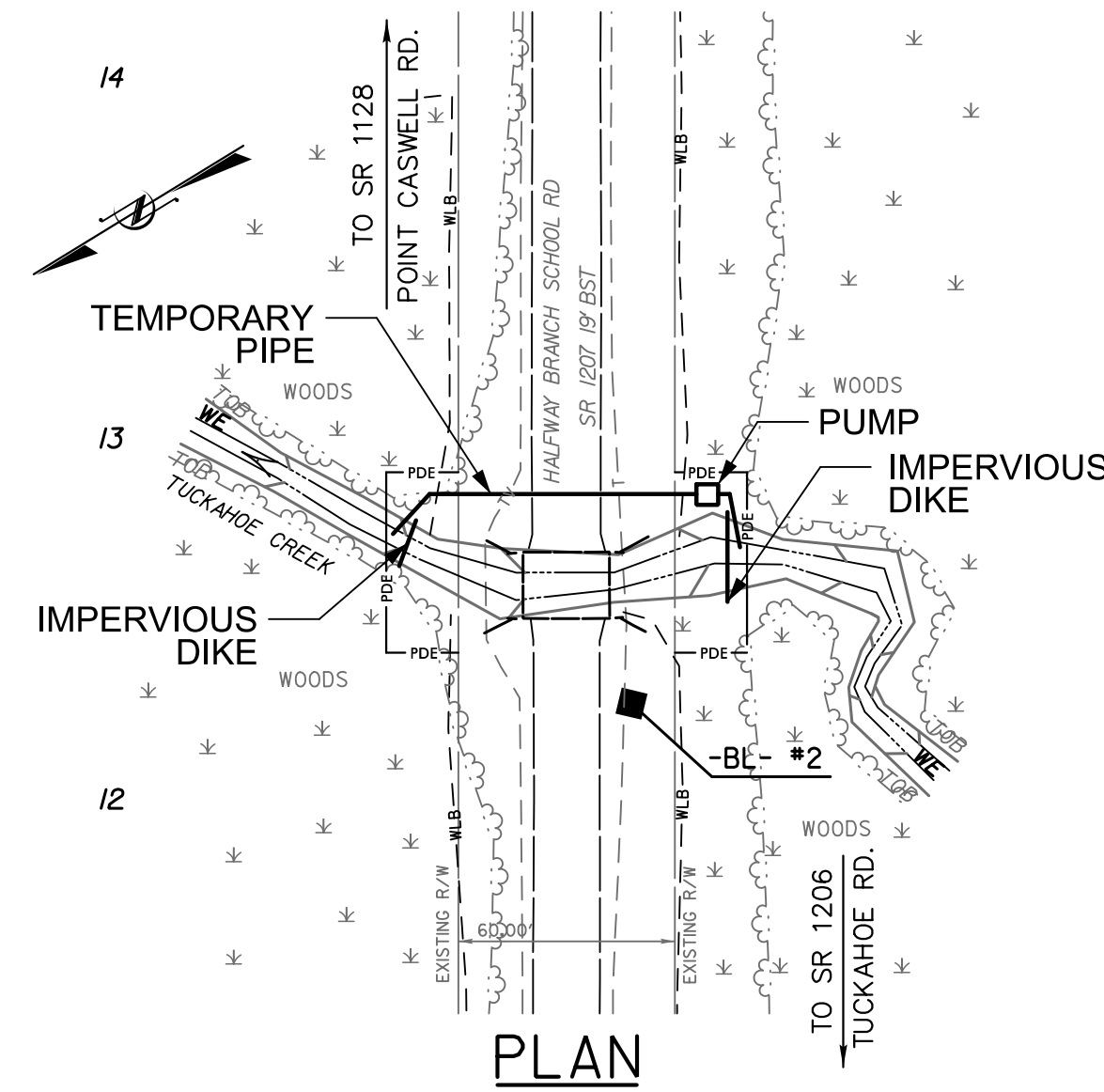


# 17BP.3.R.33 CULVERT PHASING TUCKAHOE BRANCH PENDER COUNTY

**HNTB** HNTB NORTH CAROLINA, P.C.  
343 E. Six Forks Road, Suite 200  
Raleigh, North Carolina 27609  
NC License No: C-1554

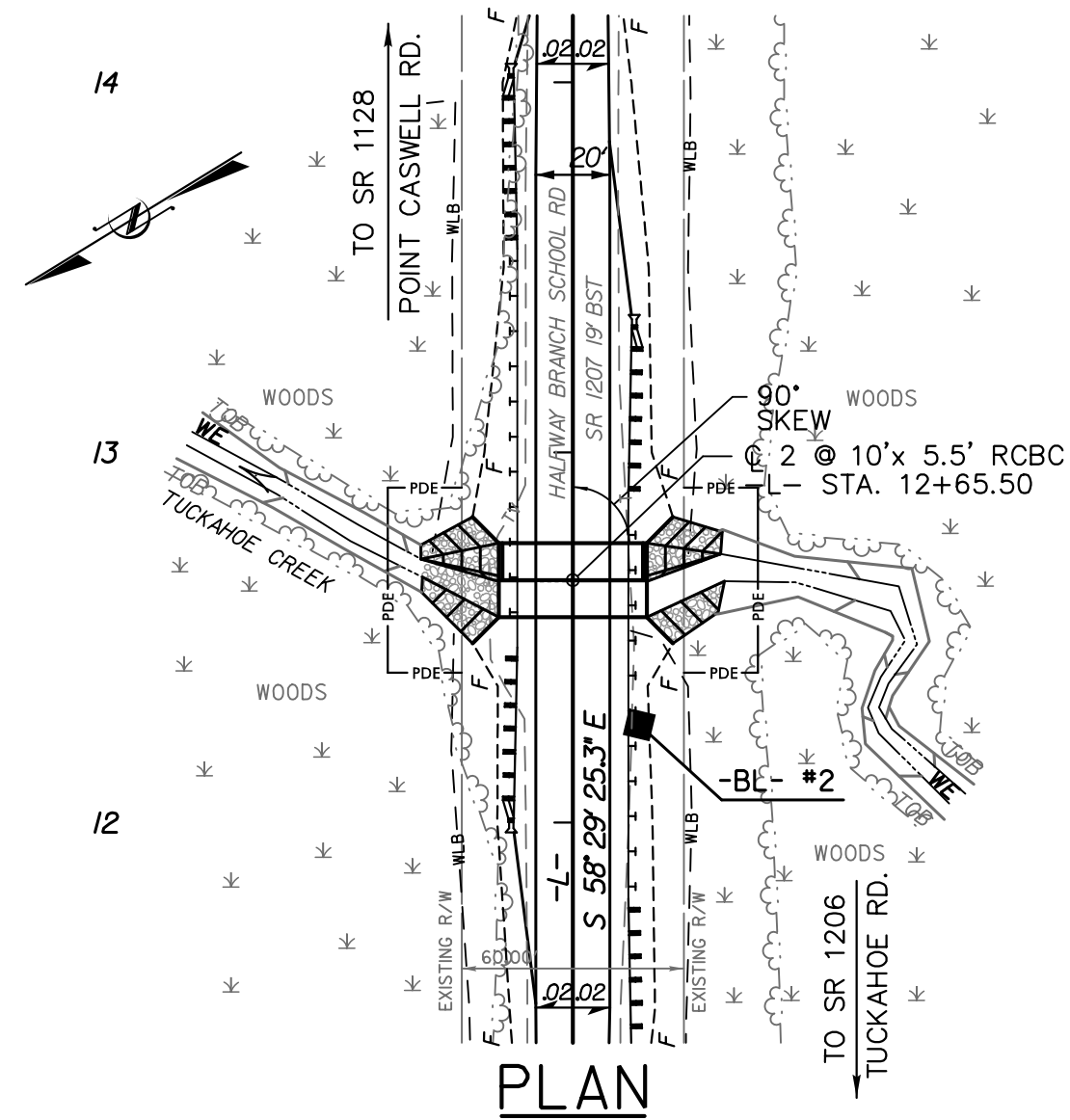
PROJECT REFERENCE NO.	SHEET NO.
17BP.3.R.33	EC-5
RW SHEET NO.	

BENTON R. CARROLL E.I.  
EROSION CONTROL  
LEVEL III  
CERTIFICATION #3180



## PHASE I

1. INSTALL IMPERVIOUS DIKES AS SHOWN.
2. INSTALL PIPE AND PUMP. THEN PUMP TUCKAHOE BRANCH AROUND CONSTRUCTION AREA.
3. DEWATER CONSTRUCTION AREA INTO SPECIAL STILLING BASIN(S).



## PHASE II

1. REMOVE EXISTING BRIDGE IN ITS ENTIRETY.
2. CONSTRUCT CONCRETE BOX CULVERT & REQUIRED CHANNEL IMPROVEMENTS.
3. DEWATER CONSTRUCTION AREA INTO SPECIAL STILLING BASIN(S) AS NEEDED.
4. REMOVE IMPERVIOUS DIKES, PUMP AND TEMP. PIPE.

09/08/99

TIP PROJECT: 17BP.3.R.33

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

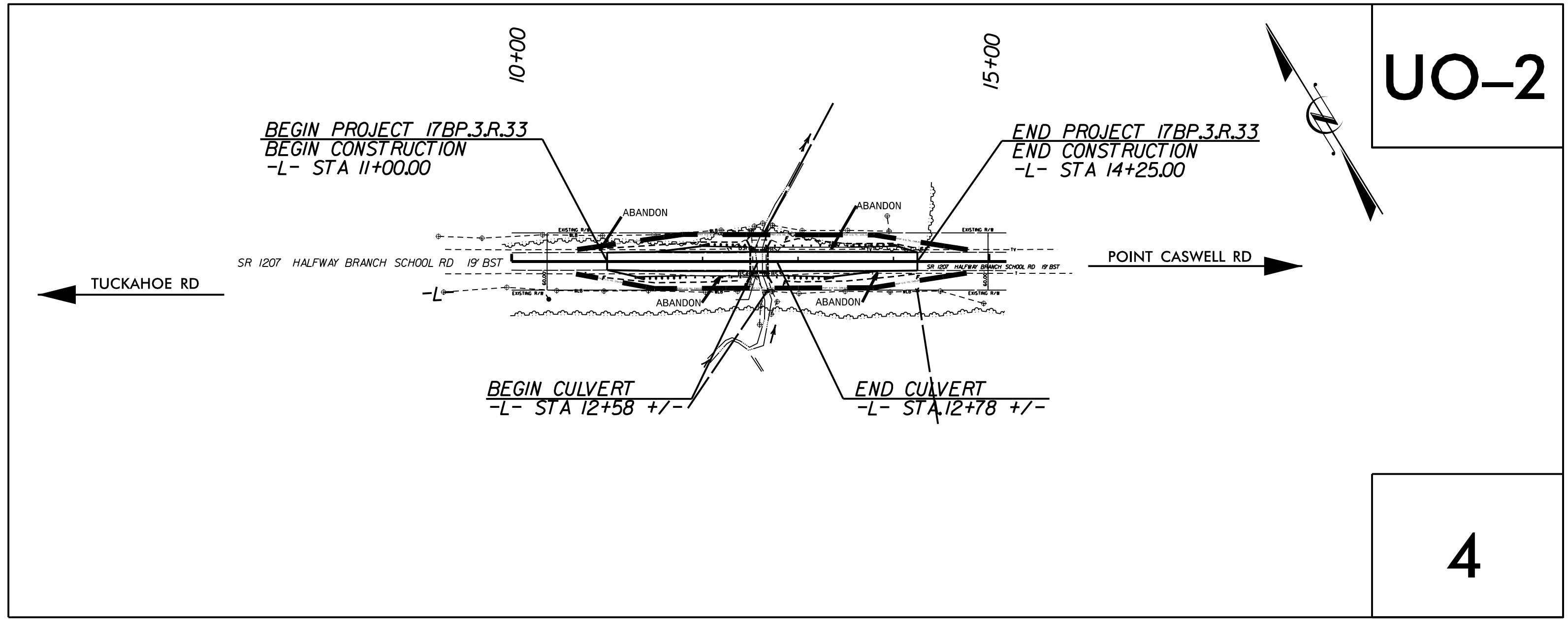
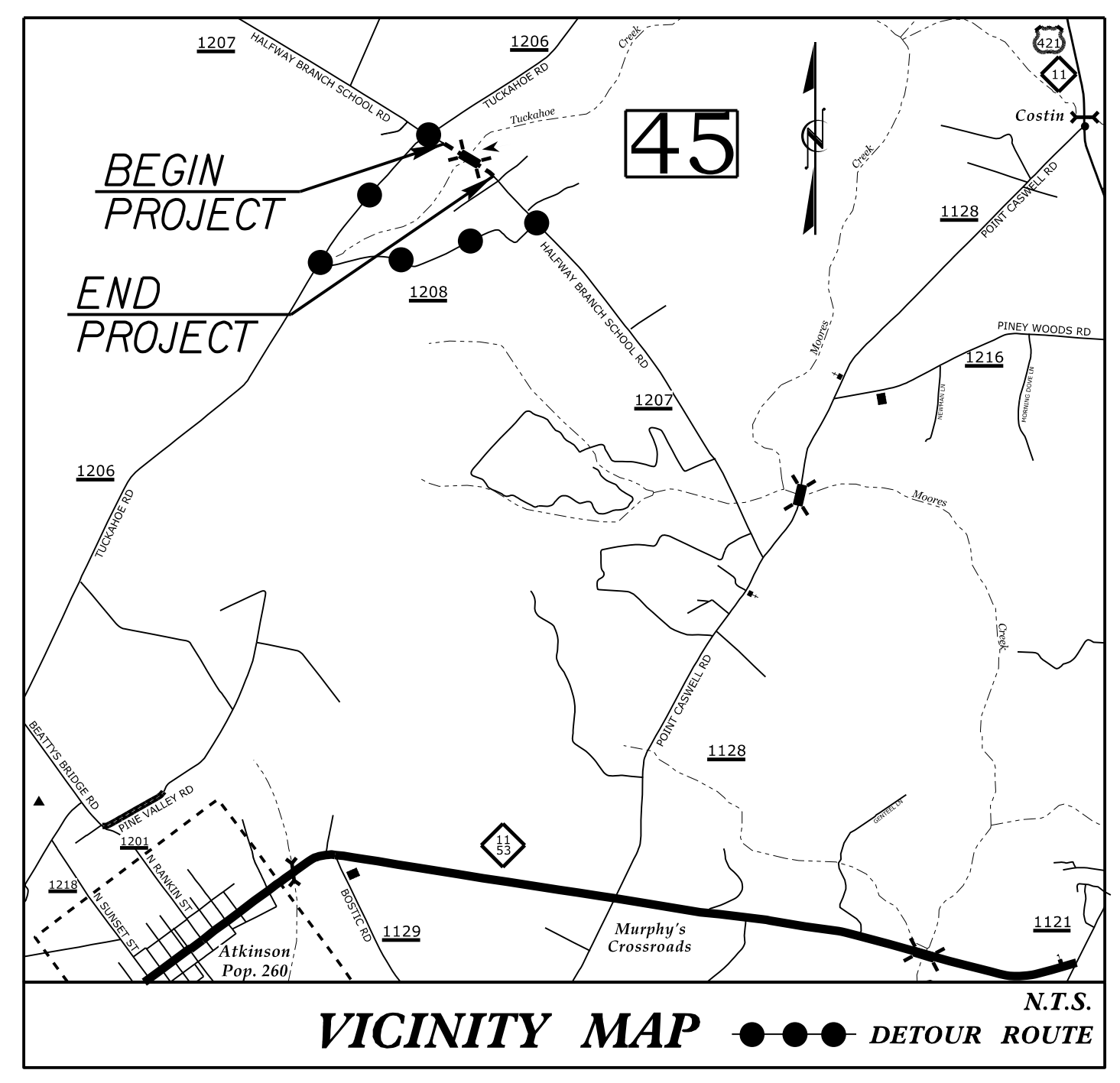
T.I.P. NO.	SHEET NO.
17BP.3.R.33	UO-1

**HNTB** HNTB NORTH CAROLINA, P.C.  
343 E. Six Forks Road, Suite 200  
Raleigh, North Carolina 27609  
NC License No: C-1554

DATE: APRIL 17, 2012

**UTILITIES BY OTHERS PLANS  
PENDER COUNTY**

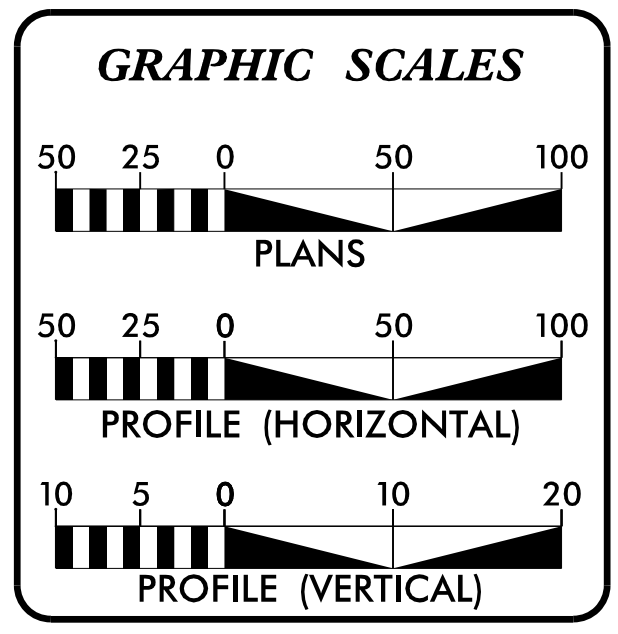
**LOCATION: BRIDGE NO. 045 OVER TUCKAHOE CREEK  
ON SR 1207 (HALFWAY BRANCH SCHOOL RD.)**  
**TYPE OF WORK: UTILITY BY OTHERS RELOCATION**



UO-2

4

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\$\$\$\$\$DCN\$\$\$\$\$  
\$\$\$\$\$USERNAME\$\$\$\$\$



**INDEX OF SHEETS**

SHEET NO.	DESCRIPTION
UO-1	TITLE SHEET
UO-2	PLAN SHEET

**UTILITY OWNERS ON PROJECT**

(1) Phone - AT&T  
Shannon Coston  
(910) 619-5500

UTILITY DESIGN BY:

**MA Engineering**  
CONSULTANTS, INC.  
598 East Chatham Street Suite 137 Cary, NC 27511  
Phone: 919 297 0220 Fax: 919 297 0221

NCDOT PROJECT ENGINEER:  
AMANDA GLYNN, P.E.

PREPARED FOR:  
NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
DIVISION BRIDGE PROGRAM

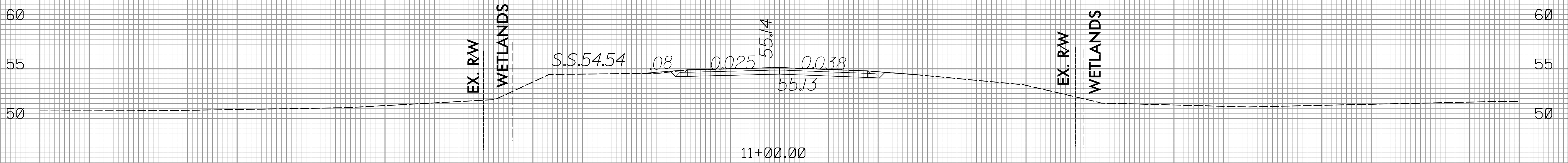
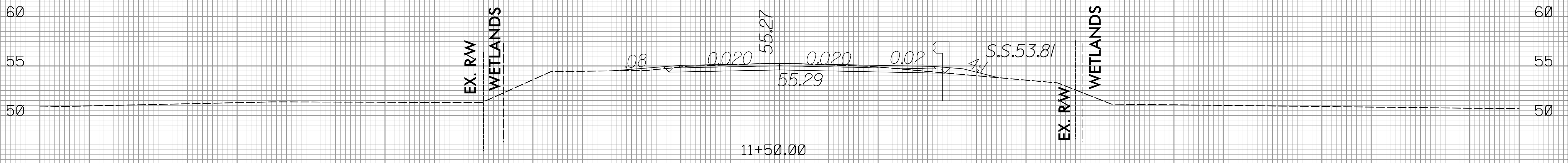


02/03/98

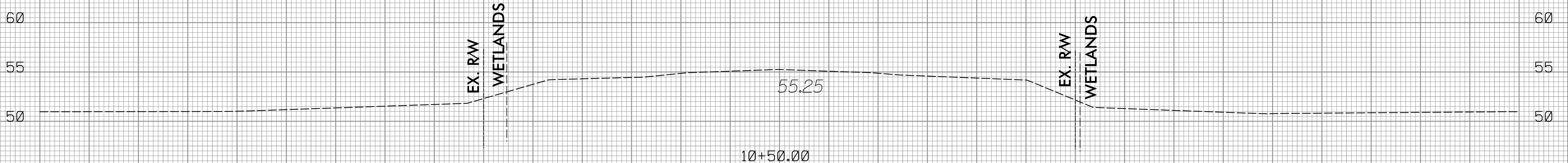
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17BP.3.R.33	X-1	3

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

Note: 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."



BEGIN PROJECT 17BP.3.R.33  
-L- STA 11+00.00



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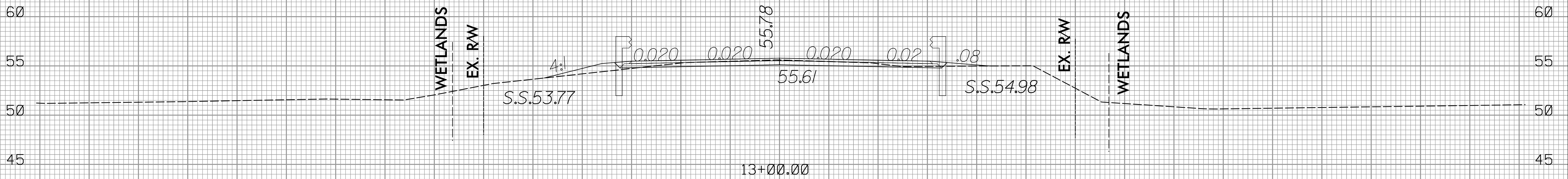
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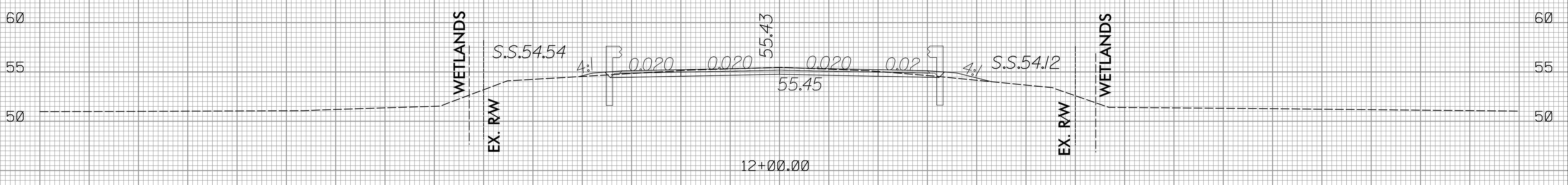
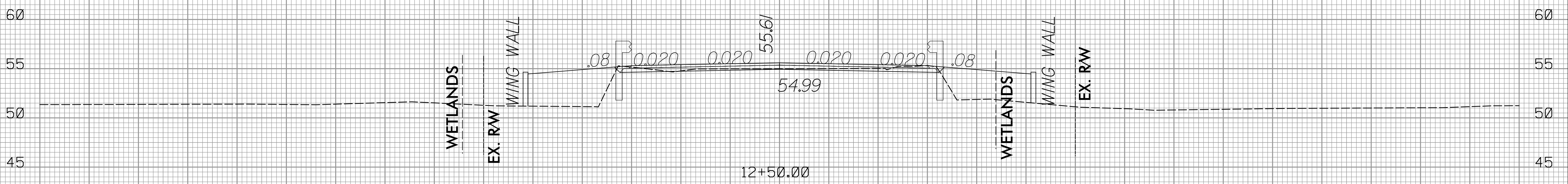
02/03/98

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17BP.3.R.33	X-2	3

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☐ OF CULVERT  
-L- STA 12+65.50



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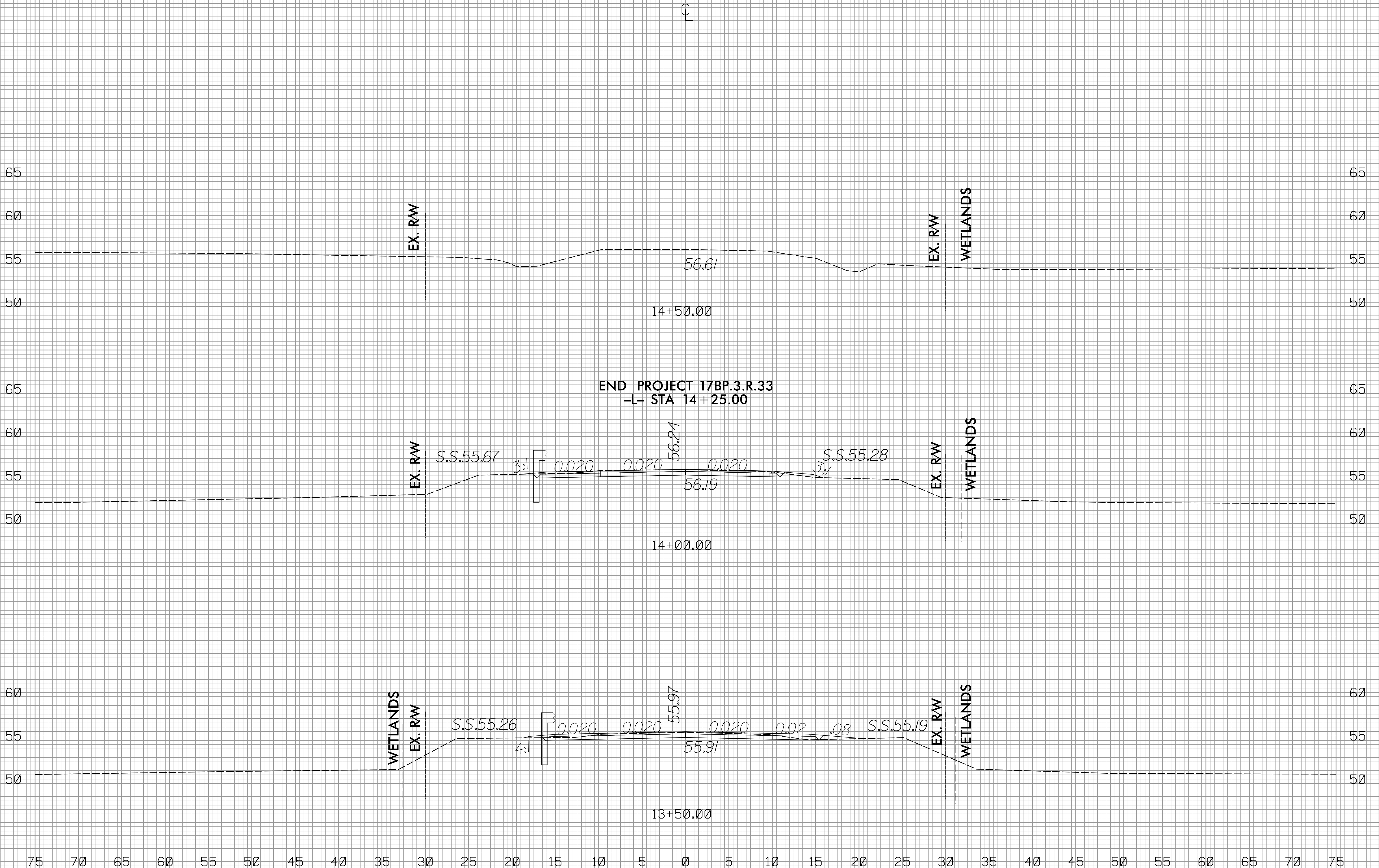
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PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
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55 60 65 70 75

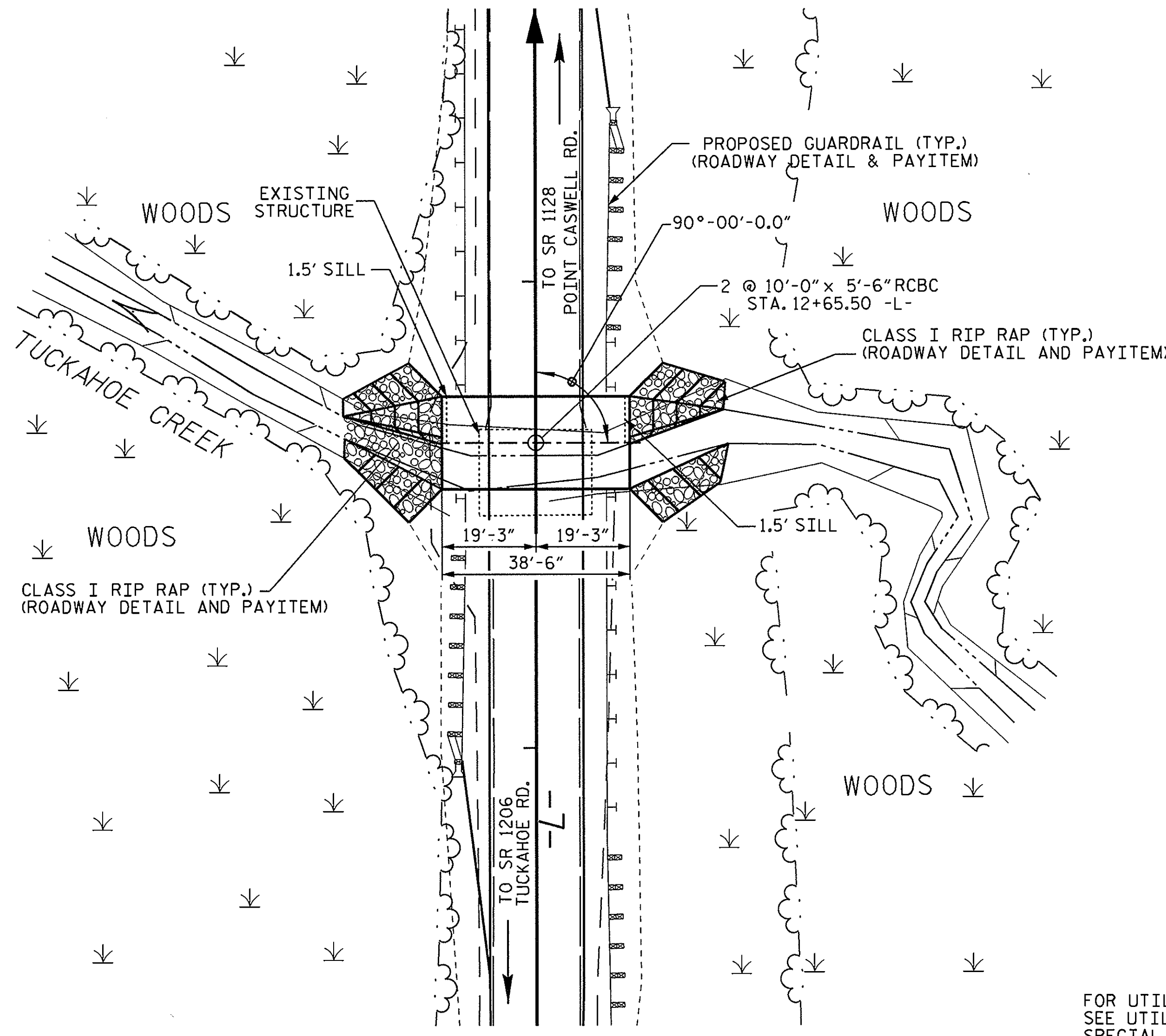
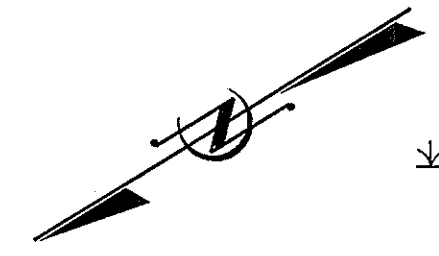


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7:55:35 AM 10/04/95 rdy\_xpl.L.dgn

\$\$\$\$\$USER NAME\$\$\$\$\$

BENCH MARK : "BM4" RR SPIKE IN 24" MAPLE TREE; LOCATED AT STA. 11+05.67 -L- 25.37' LT., EL. 55.49'



**HYDRAULIC DATA**

DESIGN DISCHARGE = 750 C.F.S.  
 FREQUENCY OF DESIGN FLOOD = 25 YEARS  
 DESIGN HIGH WATER ELEVATION = 55.14  
 DRAINAGE AREA = 3.6 SQ. MI.  
 BASE DISCHARGE (Q100) = 1307 C.F.S.  
 BASE HIGH WATER ELEVATION = 56.12

**OVERTOPPING FLOOD DATA**

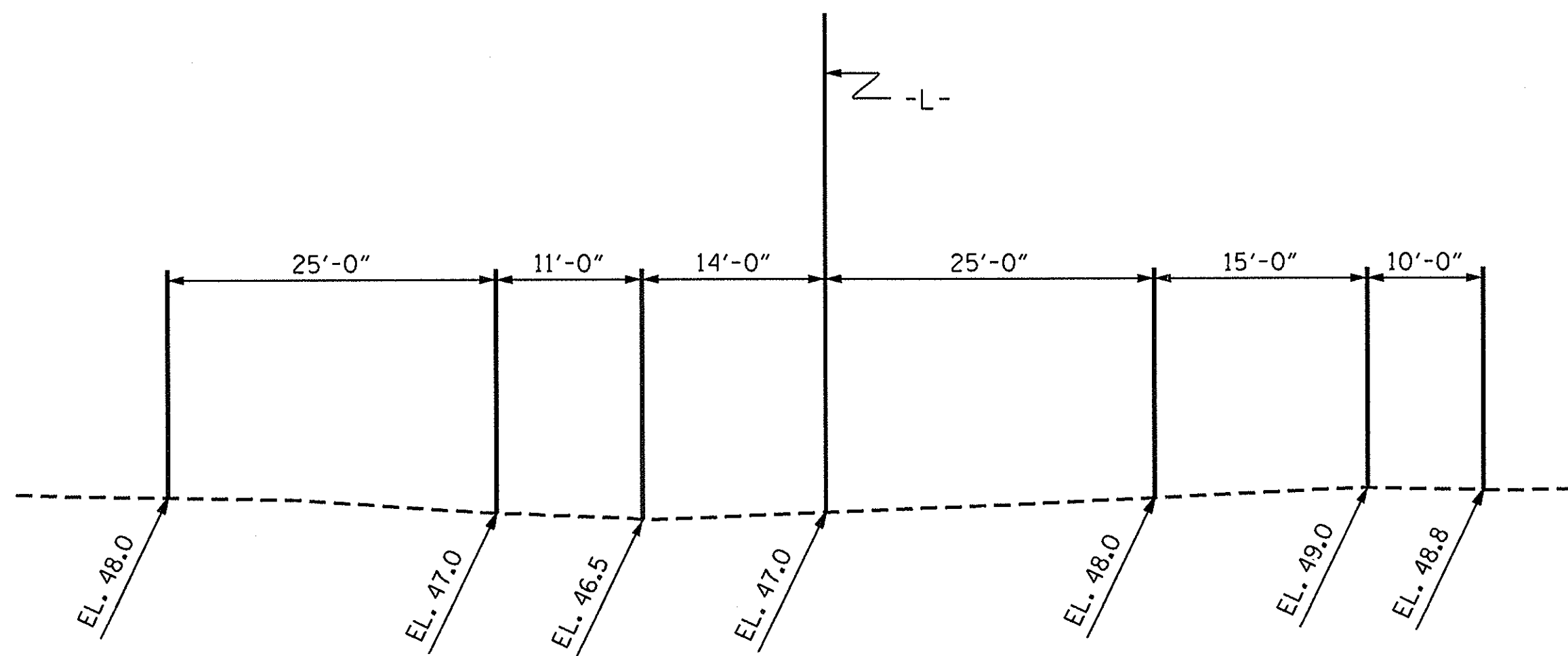
OVERTOPPING DISCHARGE = 750 CFS.  
 FREQUENCY OF OVERTOPPING FLOOD = 25 YEARS  
 OVERTOPPING FLOOD ELEVATION = 55.14

**GRADE DATA**

GRADE PT. ELEV. @ STA. 12+65.50 -L- = 55.66  
 BED ELEV. @ STA. 12+65.50 -L- = 47.94  
 ROADWAY SLOPES = 3:1

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

**LOCATION SKETCH**



**PROFILE ALONG CULVERT**

**TOTAL STRUCTURE QUANTITIES**

CLASS A CONCRETE	
BARREL @ 2.079 CY/FT	80.0 C.Y.
WING ETC.	25.9 C.Y.
TOTAL	105.9 C.Y.
REINFORCING STEEL	
BARREL	9,804 LBS.
WINGS ETC.	1197 LBS.
TOTAL	11,001 LBS.
FOUNDATION CONDITIONING MATERIAL 149.0 TONS	
PLAIN RIP RAP, CLASS I (IN BARREL ONLY) 29 TONS.	
CULVERT EXCAVATION ----- LUMP SUM	
REMOVAL OF EXISTING STRUCTURE ----- LUMP SUM	

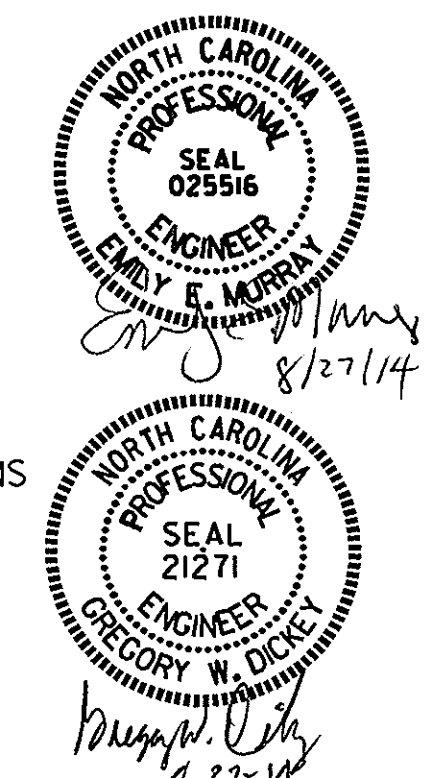
**NOTES**

- ASSUMED LIVE LOAD -----HL93 OR ALTERNATE LOADING.
- DESIGN FILL -----2.26'
- FOR OTHER DESIGN DATA AND NOTES, SEE STANDARD NOTE SHEET.
- 3" Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
- CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:
  1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
  2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.
- THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.
- DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.
- AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.
- FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.
- A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.
- 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 EXISTING STRUCTURE CONSISTING OF 1 SPAN, 1 @ 18'-6", REINFORCED CONCRETE FLOOR WITH A CLEAR ROADWAY WIDTH OF 24.0' ON TIMBER JOISTS, CAPS AND PILES AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED.
- REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
- AT THE CONTRACTOR'S OPTION HE MAY SUBMIT, TO THE ENGINEER FOR APPROVAL, DESIGN AND DETAIL DRAWINGS FOR A PRECAST REINFORCED CONCRETE BOX CULVERT IN LIEU OF THE CAST-IN-PLACE CULVERT SHOWN ON THE PLANS. THE DESIGN SHALL PROVIDE THE SAME SIZE AND NUMBER OF BARRELS AS USED ON THE CAST-IN-PLACE DESIGN. FOR OPTIONAL PRECAST REINFORCED CONCRETE BOX CULVERT, SEE SPECIAL PROVISIONS.
- STEEL IN THE BOTTOM SLAB MAY BE SPLICED AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTOR'S OPTION. EXTRA WEIGHT OF STEEL DUE TO SPLICES WILL BE PAID BY THE CONTRACTOR.

BACKFILL ENTIRE RIGHT BARREL TO SILL HEIGHT WITH CLASS I RIP RAP AND NATIVE MATERIAL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. PLACE NATIVE MATERIAL ON TOP OF RIP RAP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

UNDERCUT UNSUITABLE SOFT FOUNDATION MATERIAL TO BOTTOM OF MUCK LAYER AT APPROXIMATE ELEVATION OF 45 FT. OR AS DIRECTED BY THE ENGINEER AND BACKFILL TO THE PLAN BOTTOM OF THE CULVERT WITH A MINIMUM OF 12 INCHES OF CLASS VI FOUNDATION CONDITIONING MATERIAL, MEETING THE REQUIREMENTS OF SECTION 1016 OF THE STANDARD SPECIFICATIONS. NO SEPARATE PAYMENT WILL BE MADE FOR ANY TEMPORARY SHEETING, UNDERCUT, OR UNSUITABLE MATERIAL REPLACEMENT AS REQUIRED TO CONSTRUCT THE PROPOSED CULVERT. PAYMENT IS INCLUDED IN THE LUMP SUM PRICE FOR CULVERT EXCAVATION.

PROJECT NO. 17BP.3.R.33  
PENDER COUNTY  
 STATION: 12+65.50 -L-  
 SHEET 1 OF 5 REPLACES BRIDGE NO. 45.



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS.

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**BARREL STANDARD  
 DOUBLE 10 FT. X 5.5 FT.  
 CONCRETE BOX CULVERT  
 90° SKEW**

DRAWN BY : M.M. AHMED DATE : 3/18/14  
 CHECKED BY : REZA KOUCHEKI DATE : 3/26/14  
 DESIGN ENGINEER OF RECORD : M.M. AHMED DATE : 3/26/14

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

**LOAD AND RESISTANCE FACTOR RATING (LRFR)  
SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS**

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE								COMMENT NUMBER		
						LIVE-LOAD FACTORS (Y <sub>LL</sub> )	MOMENT				SHEAR					
							RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (FT)	RATING FACTOR	BOX NO.	ELEMENT TYPE		DISTANCE FROM LEFT END OF ELEMENT (FT)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.04	--	1.75	1.48	1	Top Slab	4.27	1.04	1	Top Slab	9.41		
	HL-93 (OPERATING)	N/A		1.34	--	1.35	1.92	1	Top Slab	4.27	1.34	1	Top Slab	9.41		
	HS-20 (INVENTORY)	36,000	②	1.17	42.18	1.75	1.53	1	Top Slab	4.53	1.17	1	Bottom Slab	9.73		
	HS-20 (OPERATING)	36,000		1.52	54.68	1.35	1.98	1	Top Slab	4.53	1.52	1	Bottom Slab	9.73		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13,500		2.29	30.97	1.40	2.80	1	Top Slab	4.53	2.29	1	Top Slab	9.41	
		SNGARBS2	20,000		2.14	42.89	1.40	2.61	1	Top Slab	4.53	2.14	1	Top Slab	9.41	
		SNAGRIS2	22,000		2.13	46.84	1.40	2.79	1	Top Slab	4.53	2.13	1	Bottom Slab	9.73	
		SNCOTTS3	27,250		1.31	35.59	1.40	1.85	1	Top Slab	4.27	1.31	1	Top Slab	9.41	
		SNAGRS4	34,925		1.35	47.08	1.40	1.74	1	Bottom Slab	9.87	1.35	1	Bottom Slab	9.73	
		SNS5A	35,550		1.47	52.27	1.40	1.90	1	Bottom Slab	9.87	1.47	1	Top Slab	9.41	
		SNS6A	39,950		1.33	53.12	1.40	1.81	1	Bottom Slab	9.87	1.33	1	Bottom Slab	9.73	
		SNS7B	42,000		1.29	54.36	1.40	1.75	1	Bottom Slab	9.87	1.29	1	Bottom Slab	9.73	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33,000		1.44	47.44	1.40	1.94	1	Bottom Slab	9.87	1.44	1	Bottom Slab	9.73	
		TNT4A	33,075		1.56	51.67	1.40	2.19	1	Bottom Slab	9.87	1.56	1	Top Slab	9.41	
		TNT6A	41,600		1.48	61.66	1.40	1.89	1	Bottom Slab	9.87	1.48	1	Top Slab	9.41	
		TNT7A	42,000		1.46	61.51	1.40	1.99	1	Bottom Slab	9.87	1.46	1	Bottom Slab	9.73	
		TNT7B	42,000		1.54	64.50	1.40	2.01	1	Bottom Slab	9.87	1.54	1	Top Slab	9.41	
		TNAGRIT4	43,000		1.44	62.04	1.40	1.87	1	Bottom Slab	9.87	1.44	1	Bottom Slab	9.73	
TNAGT5A	45,000		1.22	54.96	1.40	1.61	1	Bottom Slab	9.87	1.22	1	Bottom Slab	9.73			
TNAGT5B	45,000		③	1.12	50.52	1.40	1.49	1	Bottom Slab	9.87	1.12	1	Bottom Slab	9.73		

**LOAD FACTORS:**

DESIGN LOAD RATING FACTORS

LOAD TYPE	MAX FACTOR	MIN FACTOR
DC	1.25	0.90
DW	1.50	0.65
EV	1.30	0.90
EH	1.35	0.90
ES	1.35	0.90
LS	1.75	--
WA	1.00	--

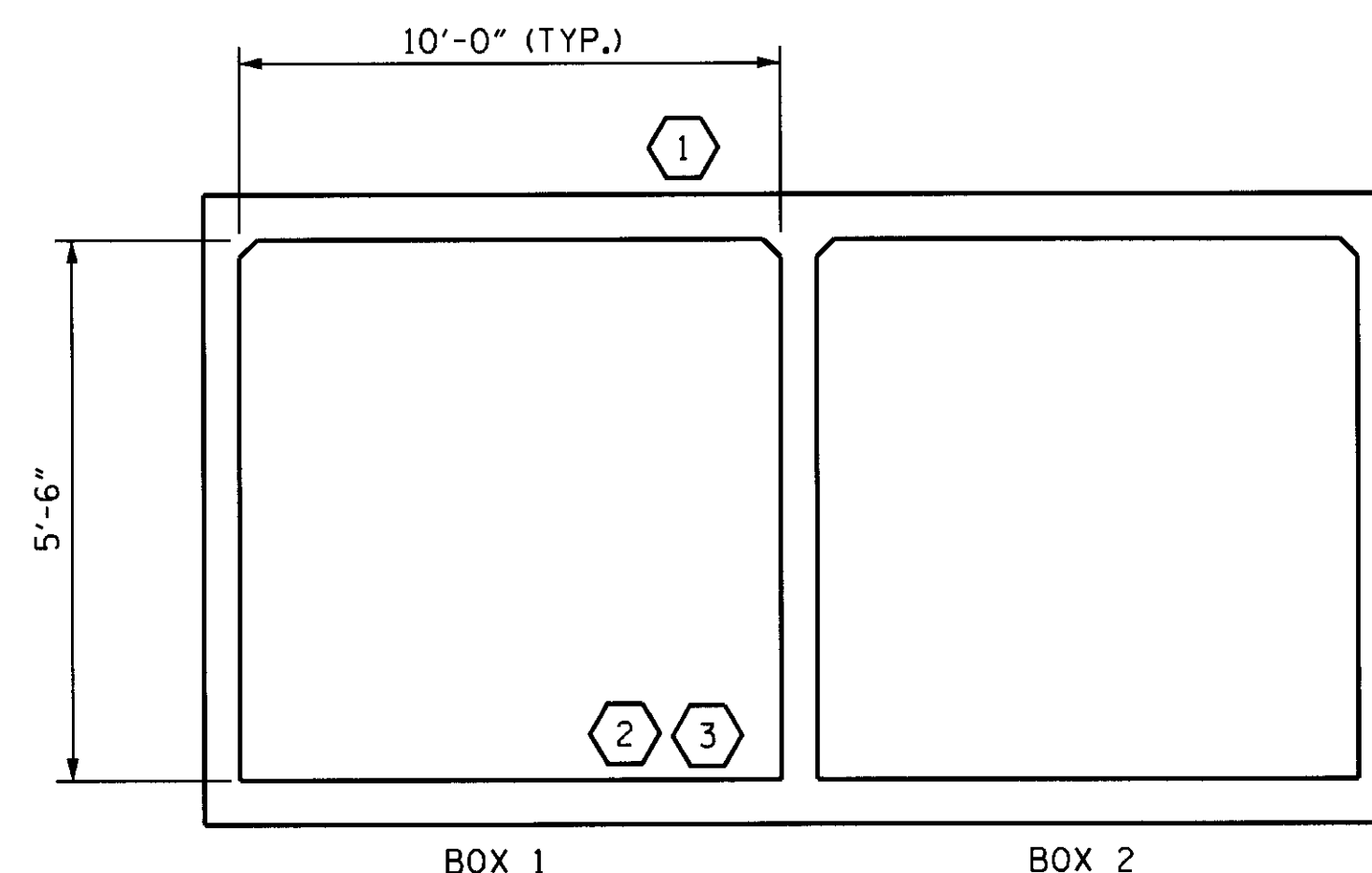
**NOTE:**

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

**COMMENTS:**

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

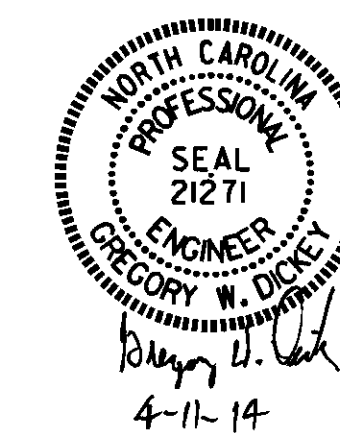
#	CONTROLLING LOAD RATING
①	DESIGN LOAD RATING (HL-93)
②	DESIGN LOAD RATING (HS-20)
③	LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	



**LRFR SUMMARY**  
(LOOKING DOWNSTREAM)

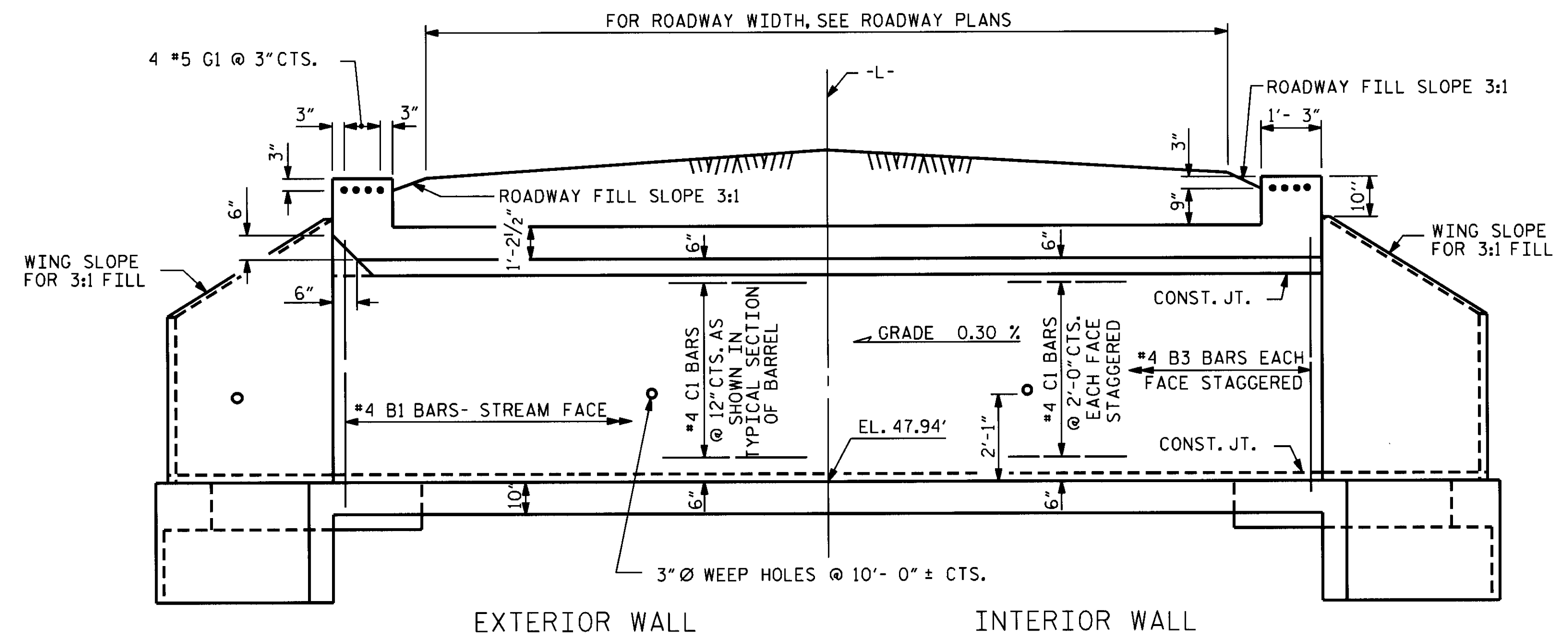
PROJECT NO. 17BP.3.R.33  
PENDER COUNTY  
 STATION: 12+65.50 -L-

SHEET 2 OF 5

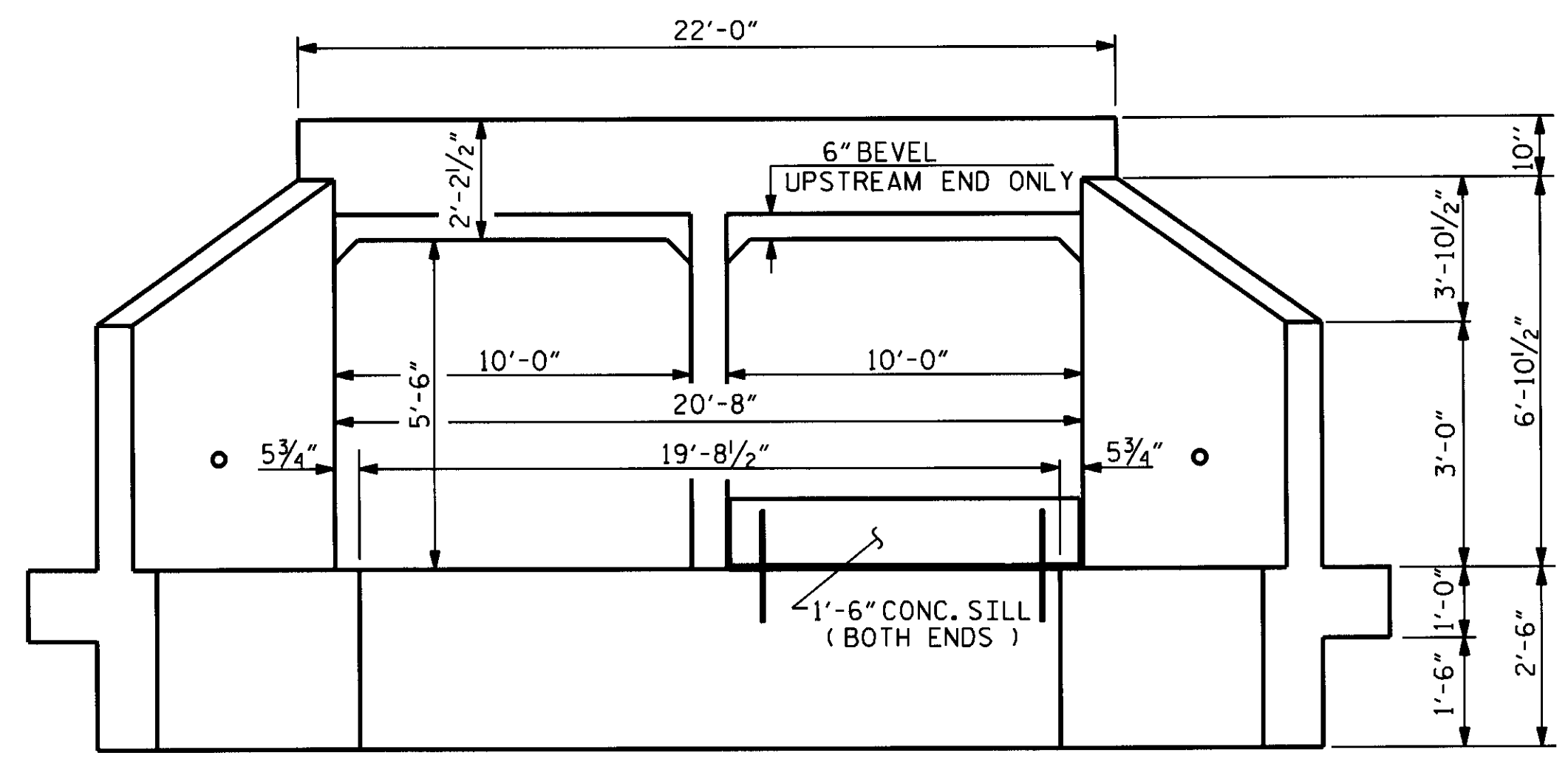


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
STANDARD LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS (NON-INTERSTATE TRAFFIC)						
REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			4
2			4			

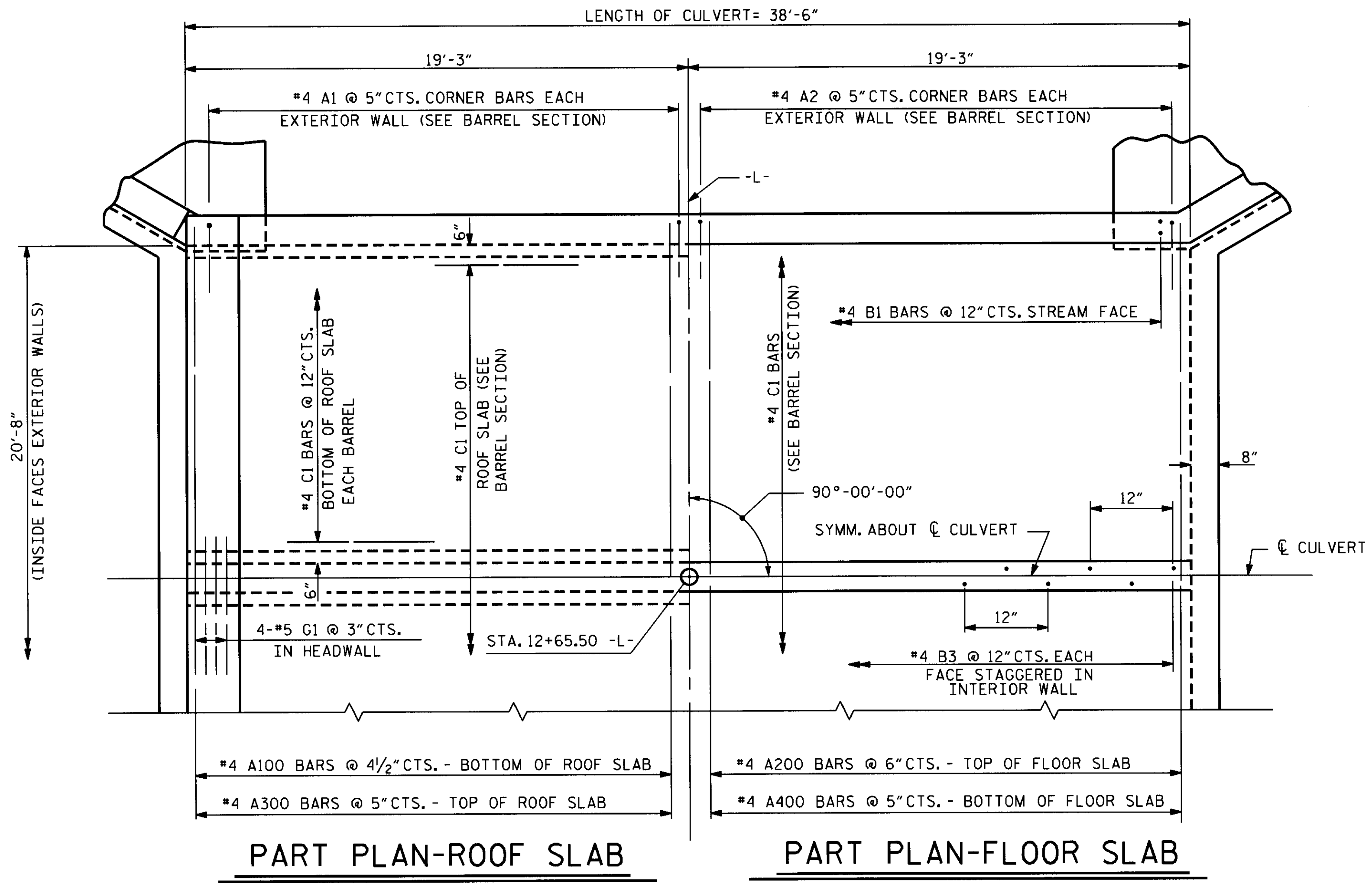
ASSEMBLED BY: M.M. AHMED DATE: 3/20/14  
 CHECKED BY: REZA KOUCHEKI DATE: 3/20/14  
 DRAWN BY: WMC 7/11 REV. 10/1/11 MAA/GM  
 CHECKED BY: CM 7/11



**CULVERT SECTION NORMAL TO ROADWAY**



**INLET END ELEVATION**



**PART PLAN-ROOF SLAB**

**PART PLAN-FLOOR SLAB**

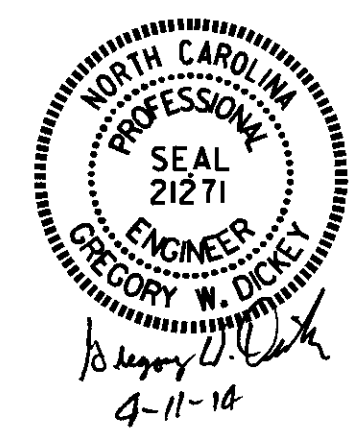
CONCRETE SILLS NOT SHOWN.  
 SEE SHEET 4 OF 5

PROJECT NO. 17BP.3.R.33  
PENDER COUNTY  
 STATION: 12+65.50 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

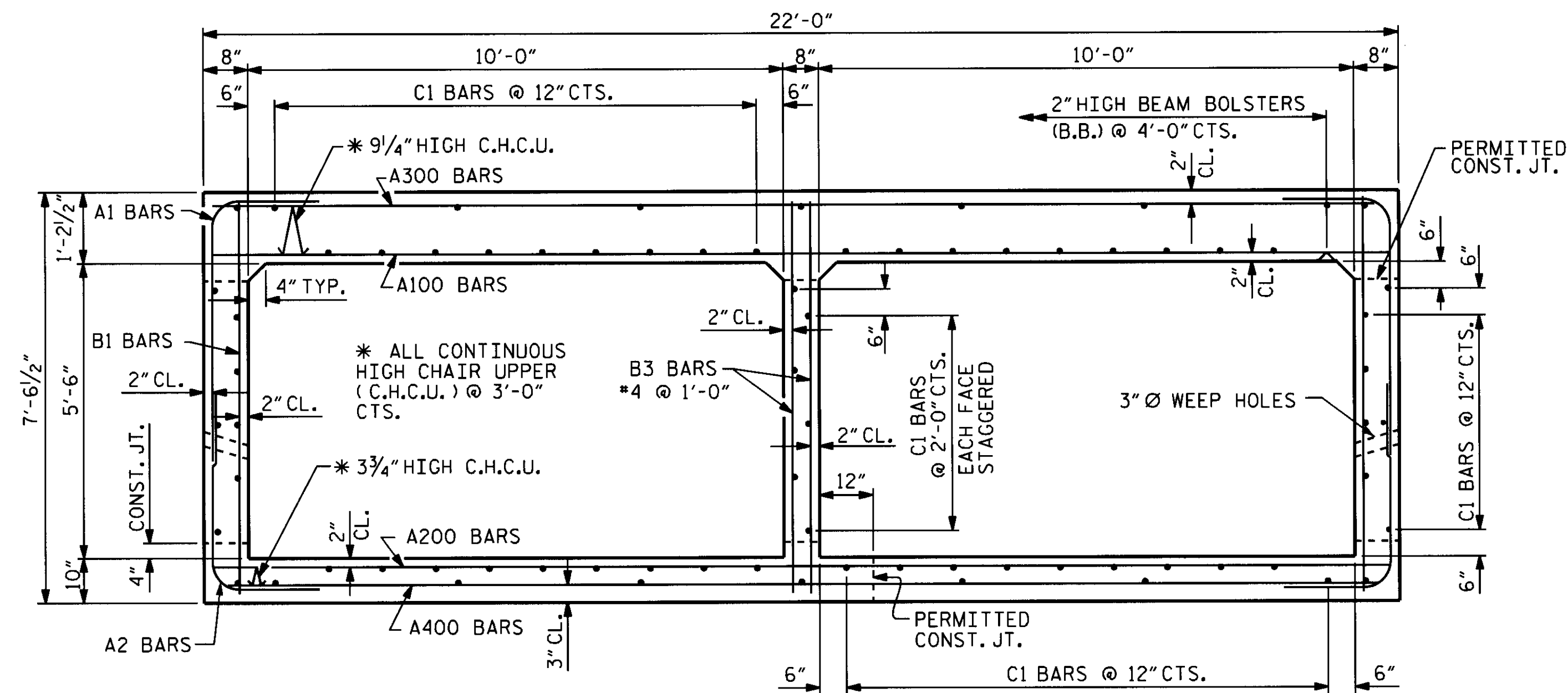
**BARREL STANDARD  
 DOUBLE 10 FT. X 5.5 FT.  
 CONCRETE BOX CULVERT  
 90° SKEW**



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

REVISED 11-9-99 BY M.M. AHMED CHECKED BY R.M.W.  
 REDRAWN NOV. 1990 BY T.S.S. CHECKED BY ARB

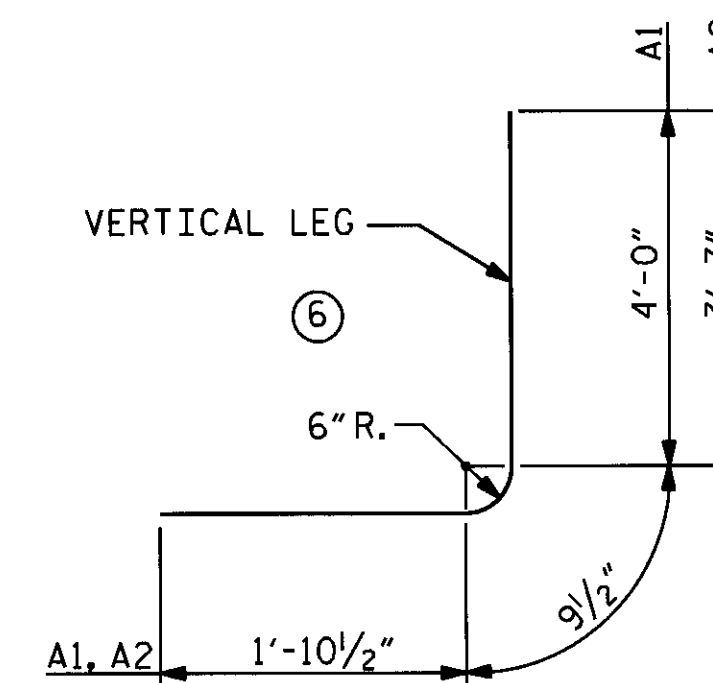
ASSEMBLED BY: <u>M.M. AHMED</u> DATE: <u>3/18/14</u>	<b>SPECIAL</b>
CHECKED BY: <u>REZA KOUCHEKI</u> DATE: <u>3/26/14</u>	
DRAWN BY: <u>RALPH D. UNDERWOOD</u> DATE: <u>MAY 1971</u>	<b>STANDARD</b>
CHECKED BY: <u>JOEL A. JOHNSON</u> DATE: <u>JULY 1971</u>	



**RIGHT ANGLE SECTION OF BARREL**

THERE ARE 74 "C" BARS IN SECTION OF BARREL.

**BAR TYPE**



DIMENSIONS ARE OUT TO OUT

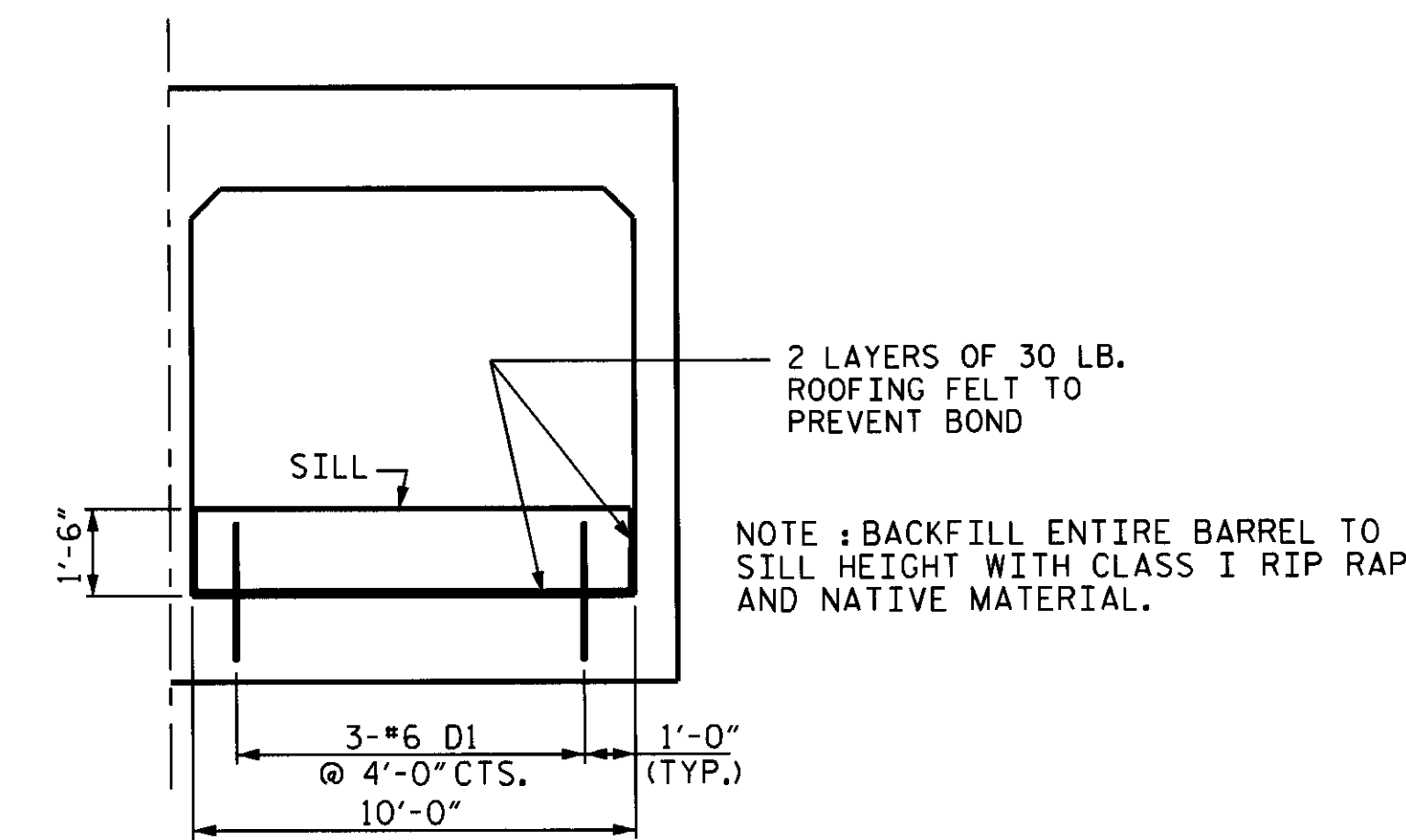
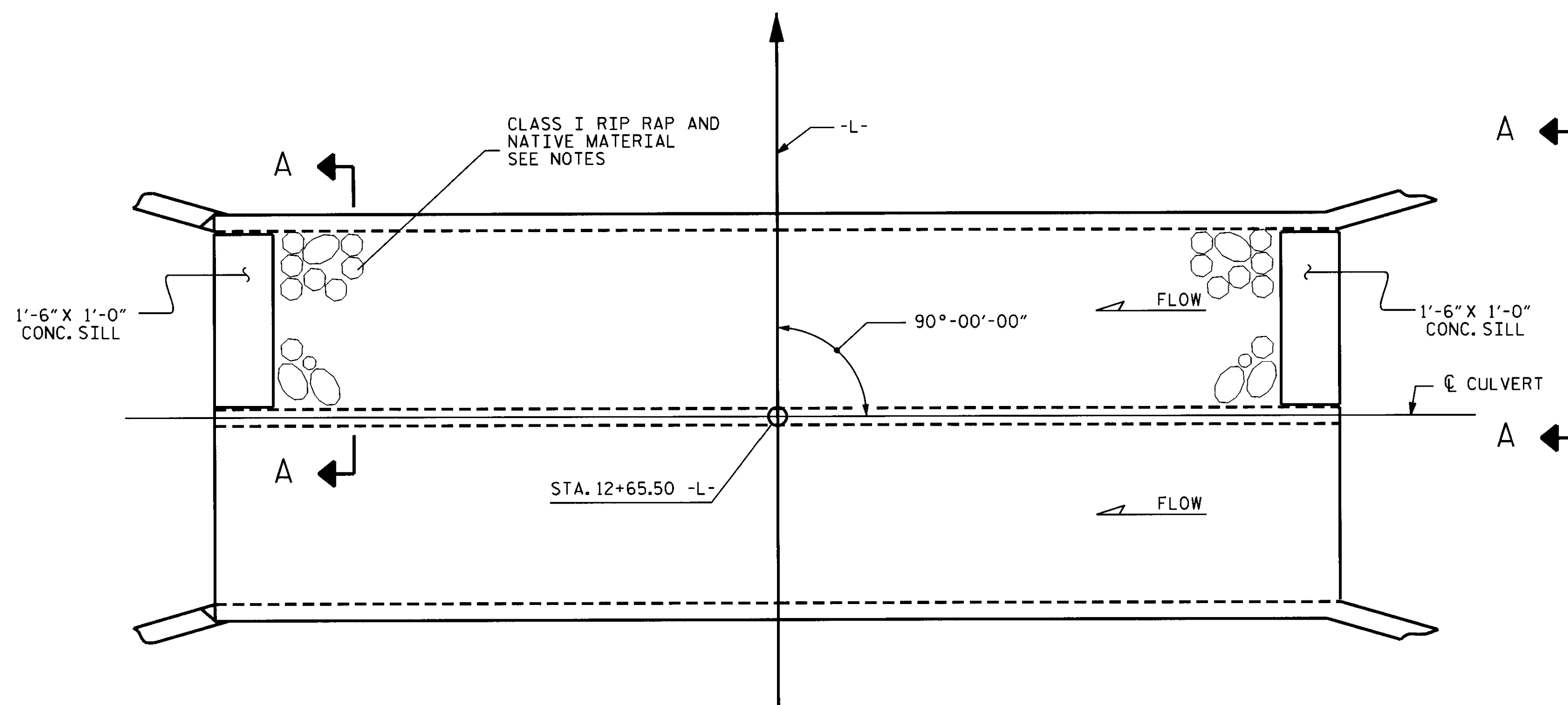
**SPLICE LENGTH CHART**

BAR	SIZE	SPLICE LENGTH
A200	#4	1'-5"
A400	#4	1'-9"
B1	#4	1'-5"
B3	#4	1'-5"
C1	#4	1'-11"

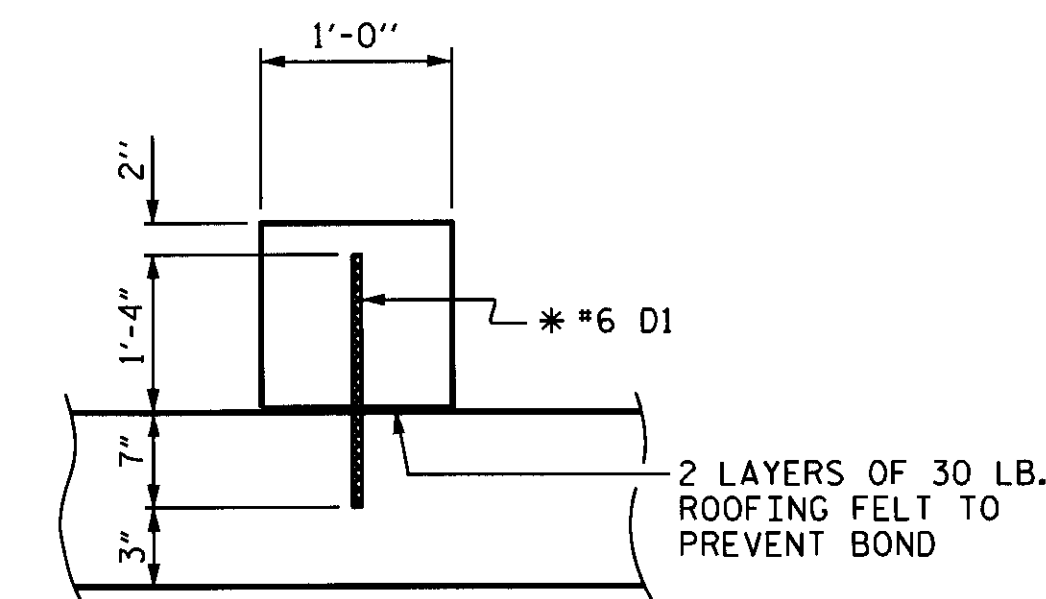
**BILL OF MATERIAL**

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
A100	103	#4	STR	21'-7"	1485
A200	77	#4	STR	21'-7"	1110
A300	93	#4	STR	21'-7"	1341
A400	93	#4	STR	21'-7"	1341
A1	186	#4	6	6'-8"	828
A2	186	#4	6	6'-3"	777
B1	78	#4	STR	7'-0"	365
B3	78	#4	STR	7'-0"	365
C1	148	#4	STR	20'-2"	1994
D1	6	#6	STR	1'-11"	17
G1	8	#5	STR	21'-8"	181

TOTAL REINFORCING STEEL 9,804 LBS



**VIEW A-A**



**SECTION THROUGH SILL**

\* DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINISHED.

PROJECT NO. 17BP.3.R.33  
PENDER COUNTY  
 STATION: 12+65.50 -L-

SHEET 4 OF 5

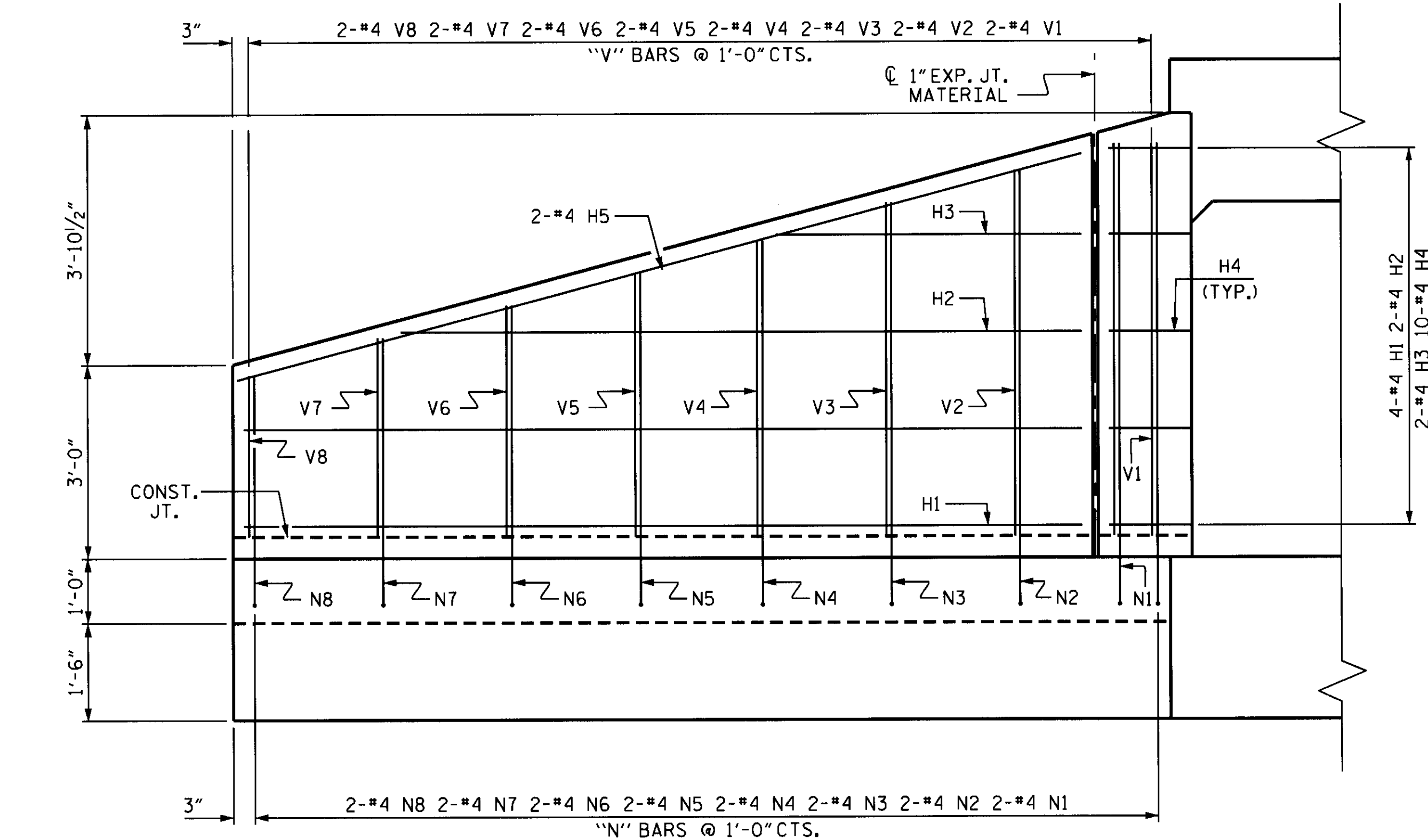
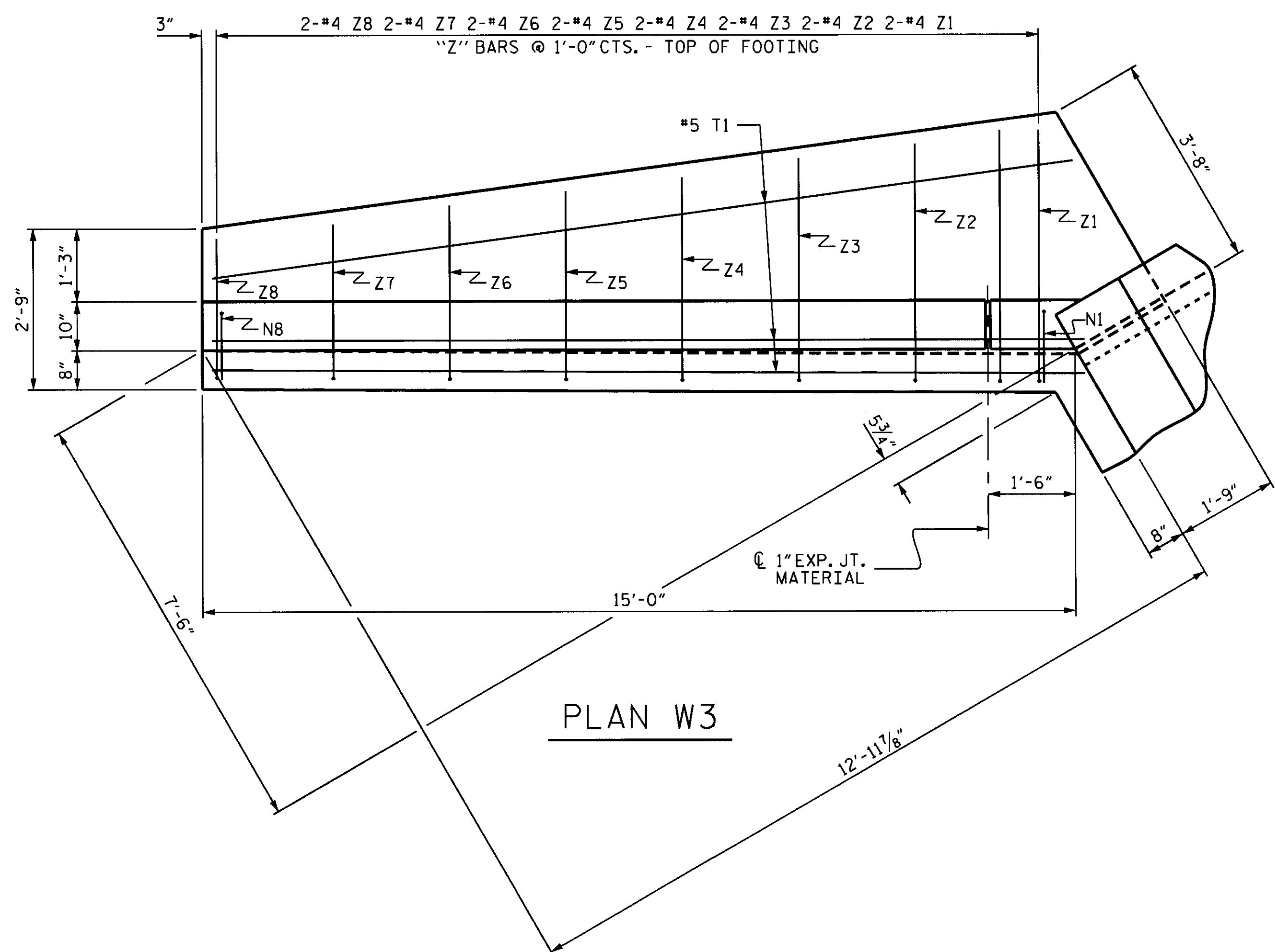
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**BARREL STANDARD**  
 DOUBLE 10 FT. X 5.5 FT.  
 CONCRETE BOX CULVERT  
 90° SKEW



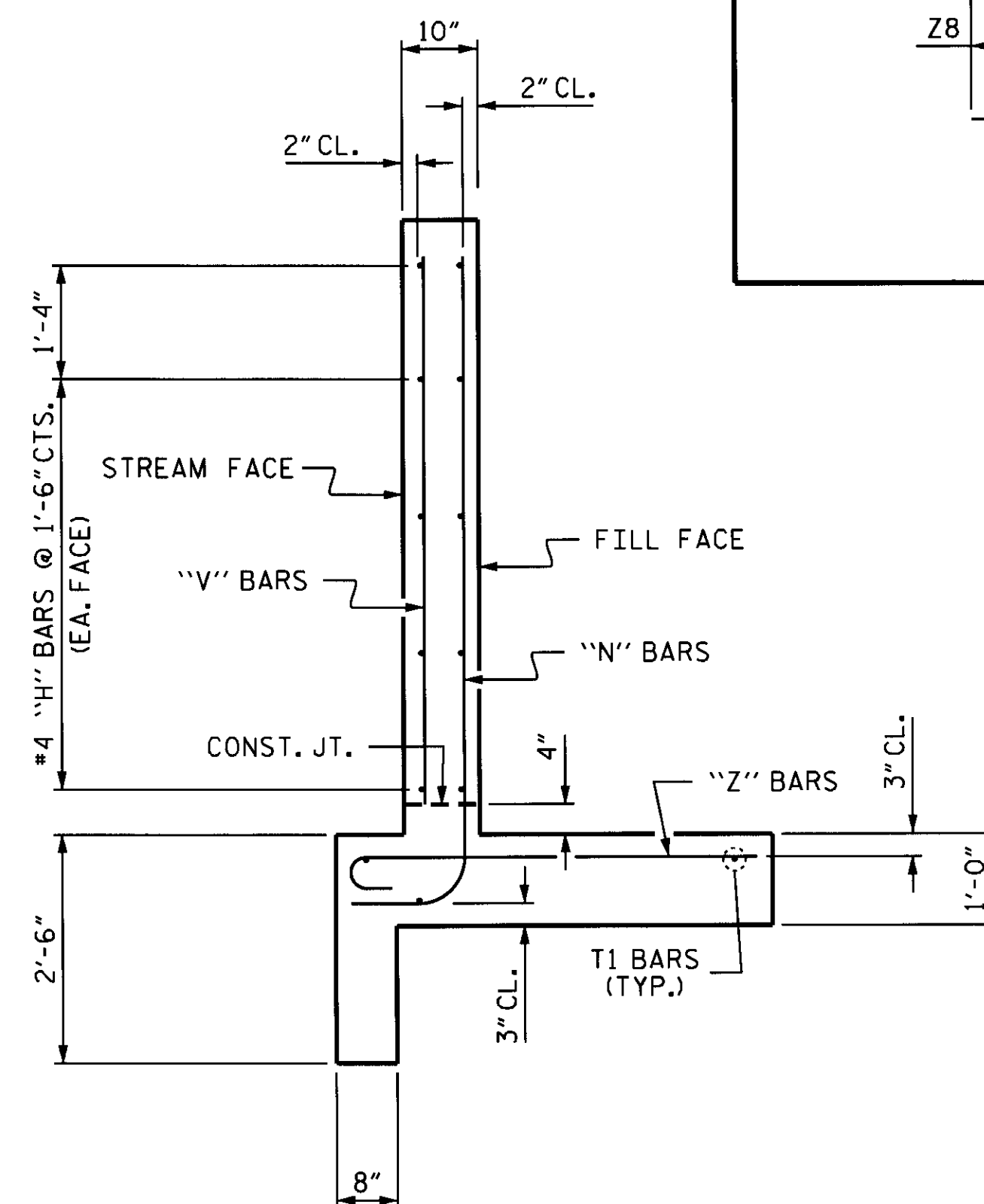
DRAWN BY: M.M. AHMED DATE: 3/19/14  
 CHECKED BY: REZA KOUCHEKI DATE: 3/26/14  
 DESIGN ENGINEER OF RECORD: M.M. AHMED DATE: 3/26/14

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

STD. NO. CB221A



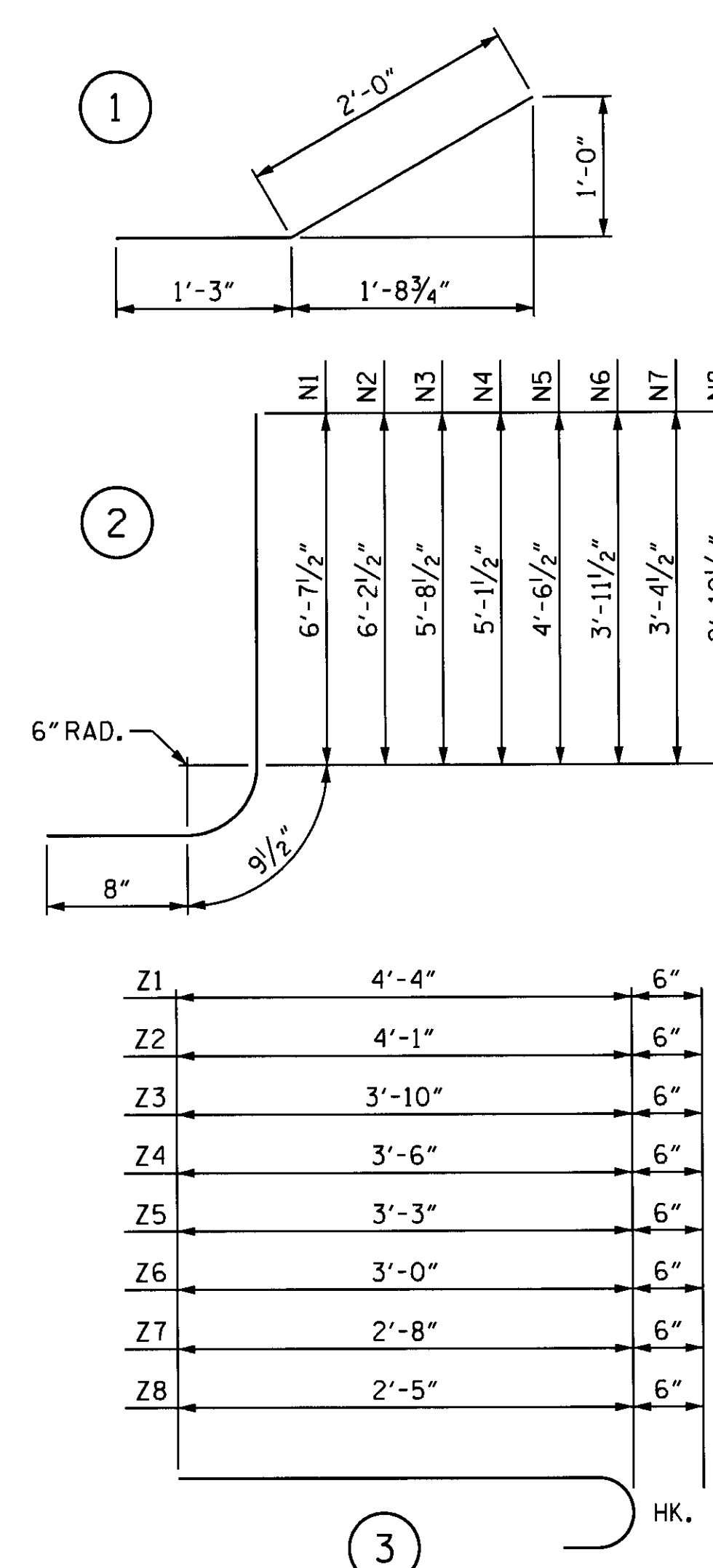
ELEVATION W3



TYPICAL WING SECTION

BAR TYPES

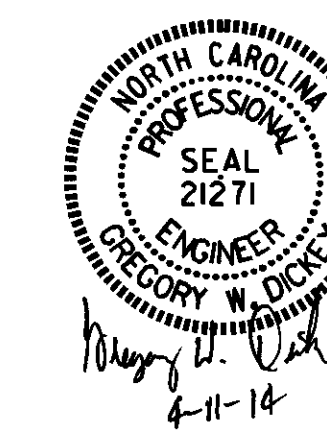
ALL BAR DIMENSIONS ARE OUT TO OUT.



BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	16	#4	STR	13'-0"	139
H2	8	#4	STR	10'-7"	57
H3	8	#4	STR	5'-4"	29
H4	40	#4	1	3'-3"	87
H5	8	#4	STR	13'-7"	73
N1	8	#4	2	8'-1"	43
N2	8	#4	2	7'-8"	41
N3	8	#4	2	7'-2"	38
N4	8	#4	2	6'-7"	35
N5	8	#4	2	6'-0"	32
N6	8	#4	2	5'-5"	29
N7	8	#4	2	4'-10"	26
N8	8	#4	2	4'-4"	23
T1	12	#5	STR	14'-10"	186
V1	8	#4	STR	6'-4"	34
V2	8	#4	STR	5'-11"	32
V3	8	#4	STR	5'-4"	29
V4	8	#4	STR	4'-10"	26
V5	8	#4	STR	4'-3"	23
V6	8	#4	STR	3'-8"	20
V7	8	#4	STR	3'-1"	16
V8	8	#4	STR	2'-6"	13
Z1	8	#4	3	4'-10"	26
Z2	8	#4	3	4'-7"	24
Z3	8	#4	3	4'-4"	23
Z4	8	#4	3	4'-0"	21
Z5	8	#4	3	3'-9"	20
Z6	8	#4	3	3'-6"	19
Z7	8	#4	3	3'-2"	17
Z8	8	#4	3	2'-11"	16

REINFORCING STEEL FOR 4 WINGS			LBS.	1197
CLASS A CONCRETE				
4 WINGS	CU. YDS.	20.4		
2 HEADWALL	CU. YDS.	2.0		
2 END CURTAIN WALL	CU. YDS.	2.4		
2 SILLS	CU. YDS.	1.1		
TOTAL	CU. YDS.	25.9		

ASSEMBLED BY: M.M. AHMED DATE: 3/19/14  
 CHECKED BY: REZA KOUCHEKI DATE: 3/26/14  
 DESIGN ENGINEER OF RECORD: M.M. AHMED DATE: 3/26/14  
 DRAWN BY: L.E. SUTTON DATE: 3/18/08  
 CHECKED BY: A.S. CALLAWAY DATE: 3/19/08



PROJECT NO. 17BP.3.R.33  
 PENDER COUNTY  
 STATION: 12+65.50 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

WINGS FOR  
 CONCRETE BOX CULVERT  
 H = 5'-6" SLOPE = 3:1  
 90° SKEW

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

## STANDARD NOTES

### DESIGN DATA:

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

### MATERIAL AND WORKMANSHIP:

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

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

### CONCRETE:

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

### CONCRETE CHAMFERS:

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

### DOWELS:

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

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

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

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

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

### REINFORCING STEEL:

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

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

### STRUCTURAL STEEL:

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

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

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

### HANDRAILS AND POSTS:

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

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

### SPECIAL NOTES:

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

# ENGLISH

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