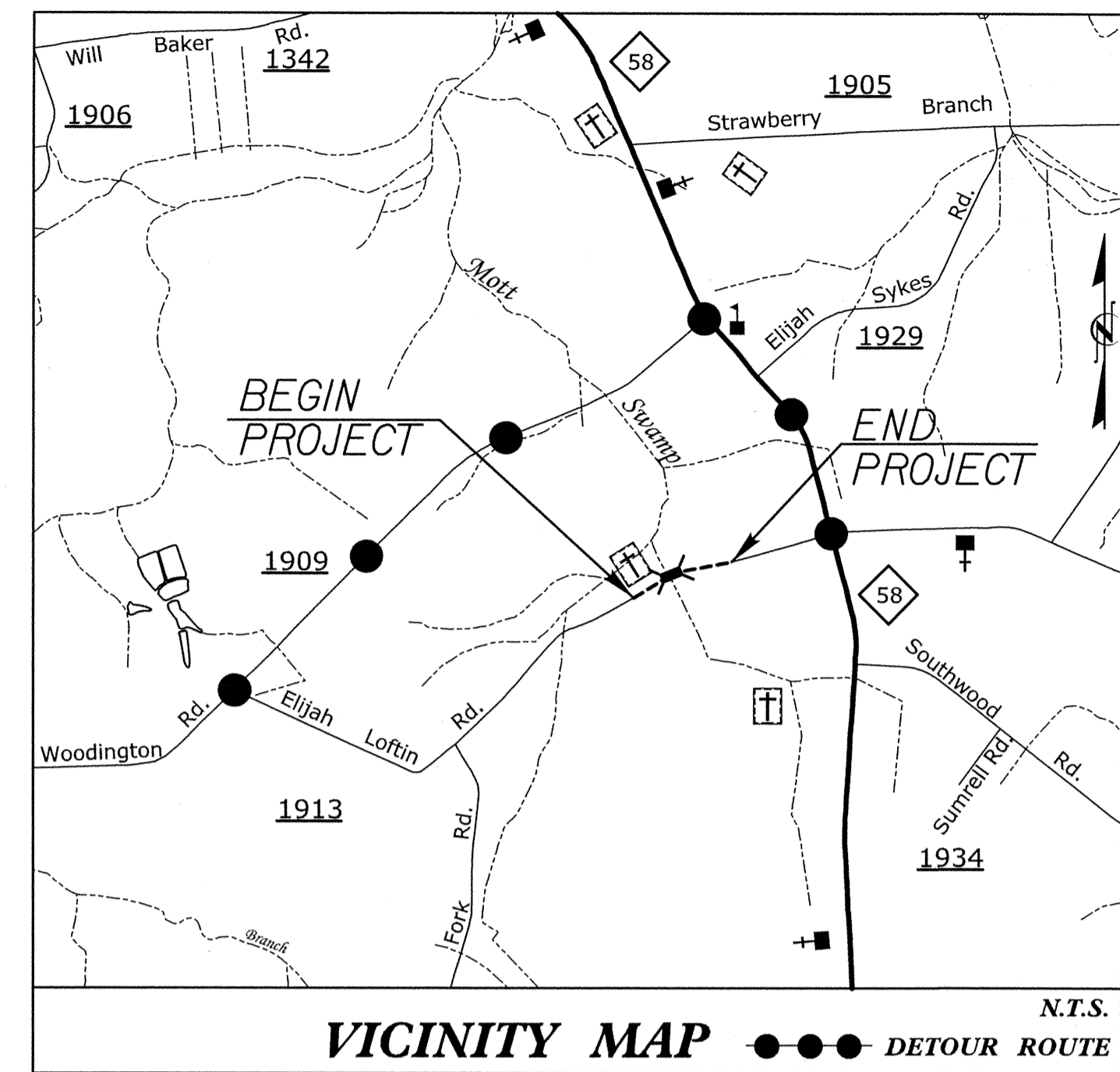


TIP PROJECT: 17BP.2.R.21

CONTRACT:

See Sheet 1-A For Index of Sheets



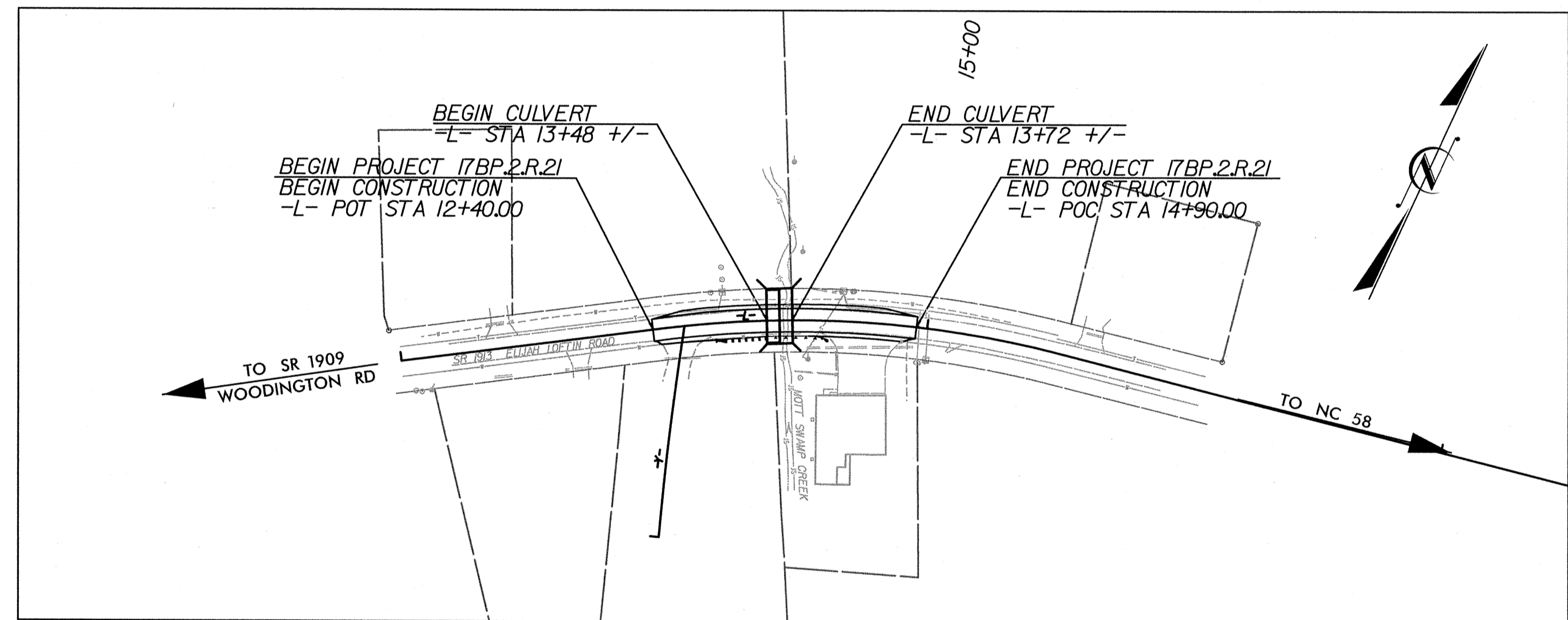
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

LENOIR COUNTY

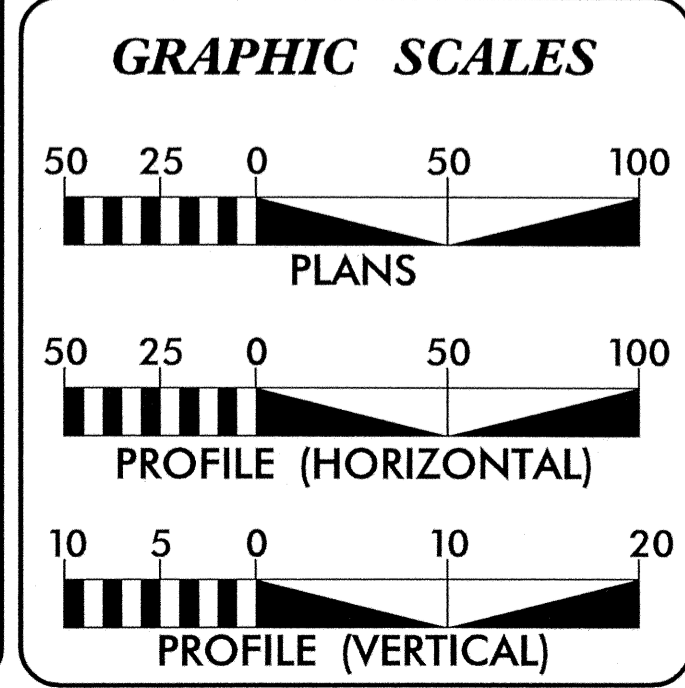
**LOCATION: BRIDGE NO.162 OVER MOTT SWAMP CREEK
ON SR 1913 (ELIJAH LOFTIN RD.)**

TYPE OF WORK: GRADING, PAVING, DRAINAGE & CULVERT

STATE	PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
NC	17BP.2.R.21	1	X
STATE PROJ. NO.		DESCRIPTION	
17BP.2.R.21		CONST	



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



DESIGN DATA

ADT 2008 = 1300
ADT 2035 = 2600
DHV = 10%
D = 60%
T = 6% *
V = 55 MPH STATUTORY
V = 50 MPH ADVISORY
* TTST 2% DUAL 4%

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT 17BP.2.R.21 =	0.04 MI.
LENGTH OF STRUCTURE TIP PROJECT 17BP.2.R.21 =	0.01 MI.
TOTAL LENGTH OF TIP PROJECT 17BP.2.R.21 =	0.05 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	ENRICO A. ROQUE, P.E. PROJECT ENGINEER
RIGHT OF WAY DATE: MAY 15, 2013	ANTHONY THOMPSON, P.E. PROJECT DESIGNER
LETTING DATE: DECEMBER 11, 2013	MARIA ROGERSON, P.E. NCDOT CONTACT

HYDRAULICS ENGINEER

Signature: *James L. Byrd*
10-1-13

ROADWAY DESIGN ENGINEER

Signature: *Enrico A. Roque*
10/9/13

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

***** DATA TEST *****
***** \$\$\$\$ STIMES \$\$\$*

REVISIONS

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
I-A	INDEX OF SHEETS, GENERAL NOTES & LIST OF STANDARDS
I-B	SYMBOLOLOGY SHEET
2	TYPICAL SECTION SHEET
3	EARTHWORK, PAVEMENT REMOVAL, GUARDRAIL SUMMARY, ROW SUMMARY, & DRAINAGE SUMMARY SHEET
4	PLAN & PROFILE SHEET
TMP-1 THRU TMP-2	TRAFFIC CONTROL PLANS
EC-1 THRU EC-6	EROSION CONTROL PLANS
P-1	PERMIT DRAWING
X-1 THRU X-3	-L- CROSS SECTION SHEETS
C-1 THRU C-6	CULVERT PLANS
UO-1 THRU UO-2	UTILITIES BY OTHERS
UC-1 THRU UC-4	UTILITY CONSTRUCTION PLANS

GENERAL NOTES:

2012 SPECIFICATIONS
 EFFECTIVE: 01-17-2012
 REVISED: 07-30-2012

GRADE LINE:
GRADING AND SURFACING:

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

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04
 SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3' RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

SUBSURFACE PLANS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

Power - City of Kinston; Phone - CenturyLink
 Phone - SuddenLink ; Water - Deep Run Water

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.
 UTILITIES BY OTHERS PLANS INCLUDED IN THE PROJECT.)

RIGHT-OF-WAY MARKERS:

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

EFF. 01-17-2012
 REV. 10-30-2012

2012 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
848.02	Driveway Turnout - Radius Type
862.01	Guardrail Placement
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets













Note: Not to Scale

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












STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

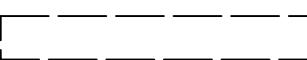









BOUNDARIES AND PROPERTY:

State Line	_____
County Line	_____
Township Line	_____
City Line	_____
Reservation Line	_____
Property Line	_____
Existing Iron Pin	_____ 
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	_____ 






BUILDINGS AND OTHER CULTURE:

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





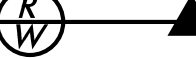








HYDROLOGY:

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 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 Utility Easement	_____ 

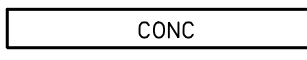
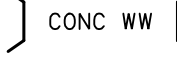
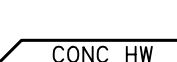
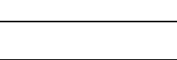
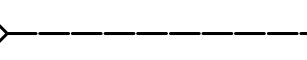
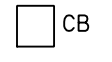
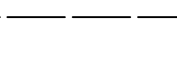
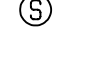
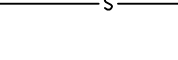
ROADS AND RELATED FEATURES:

Existing Edge of Pavement	_____ 
Existing Curb	_____ 
Proposed Slope Stakes Cut	_____ 
Proposed Slope Stakes Fill	_____ 
Proposed Wheel Chair Ramp	_____ 
Proposed Wheel Chair Ramp Curb Cut	_____ 
Curb Cut for Future Wheel Chair Ramp	_____ 
Existing Metal Guardrail	_____ 
Proposed Guardrail	_____ 
Existing Cable Guiderail	_____ 
Proposed Cable Guiderail	_____ 
Equality Symbol	_____ 
Pavement Removal	_____ 




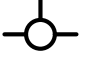



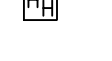



VEGETATION:

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


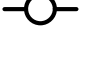

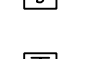
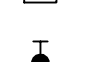
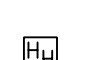
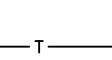
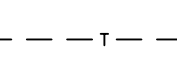
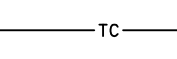
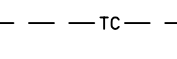
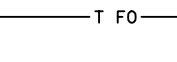
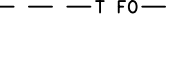

EXISTING STRUCTURES:

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









TELEPHONE:

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






WATER:

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







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:

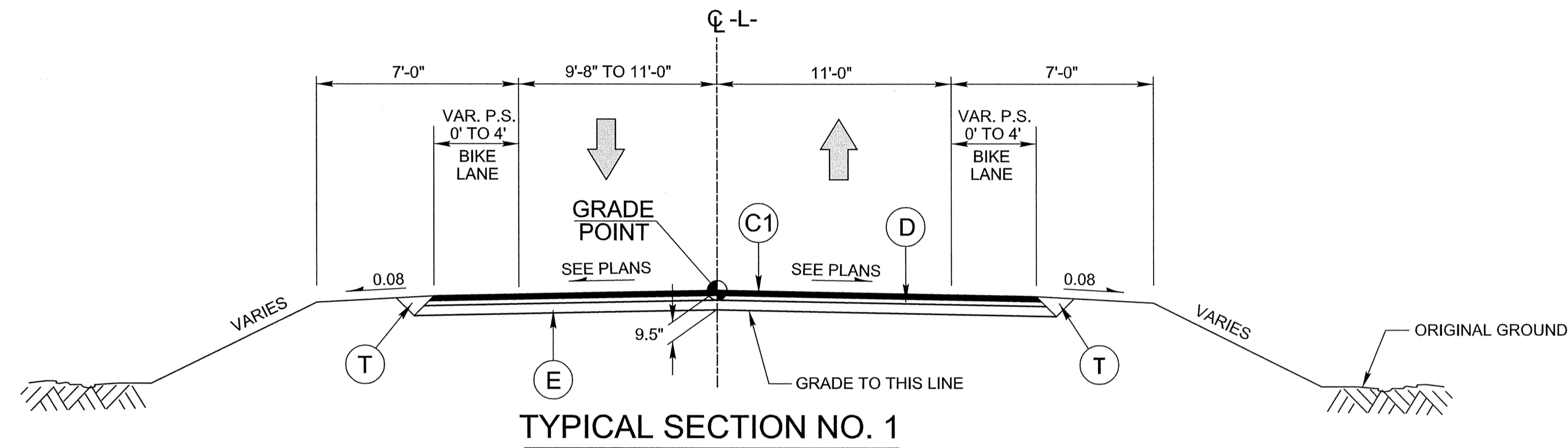
Sanitary Sewer Manhole	_____ 
Sanitary Sewer Cleanout	_____ 
U/G Sanitary Sewer Line	_____ 
Above Ground Sanitary Sewer	_____ 
Recorded SS Forced Main Line	_____ 
Designated SS Forced Main Line (S.U.E.*)	_____ 

MISCELLANEOUS:

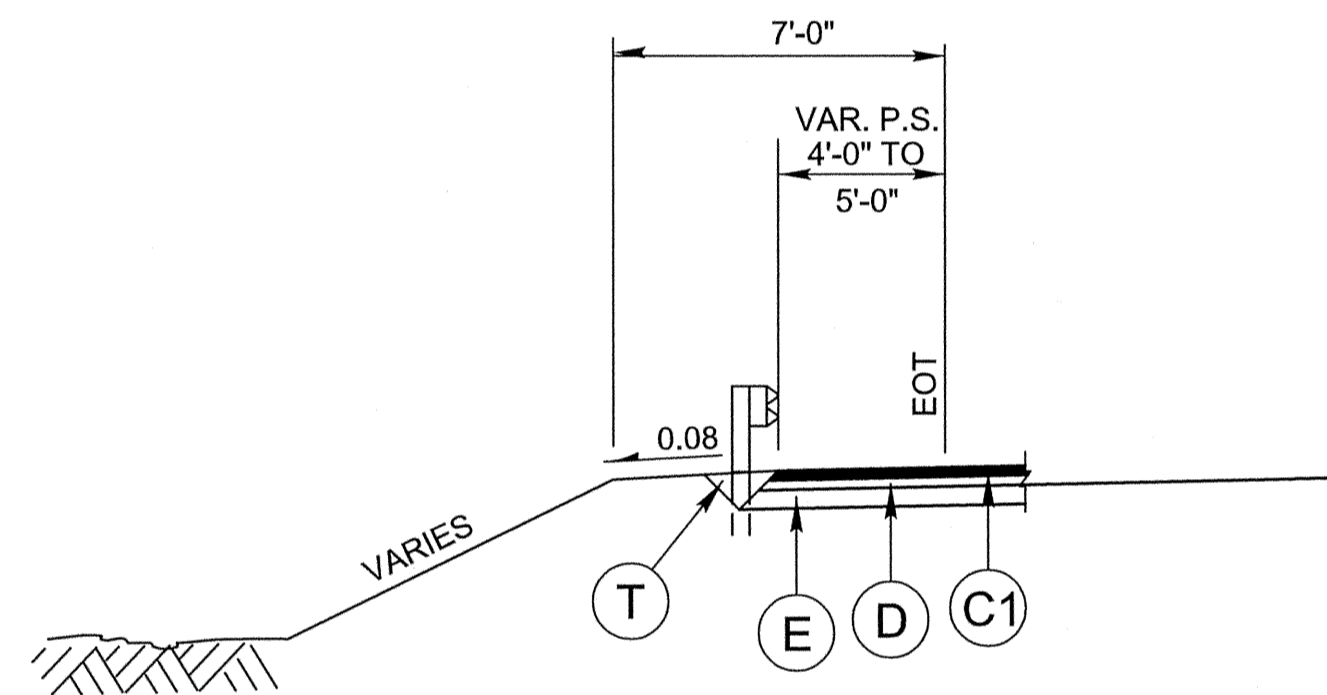
Utility Pole	_____ 
Utility Pole with Base	_____ 
Utility Located Object	_____ 
Utility Traffic Signal Box	_____ 
Utility Unknown U/G Line	_____ 
U/G Tank; Water, Gas, Oil	_____ 
A/G Tank; Water, Gas, Oil	_____ 
U/G Test Hole (S.U.E.*)	_____ 
Abandoned According to Utility Records	_____ 
End of Information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

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 3.0" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YARD IN EACH OF TWO LAYERS.
D	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D1	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YARD.
E1	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)

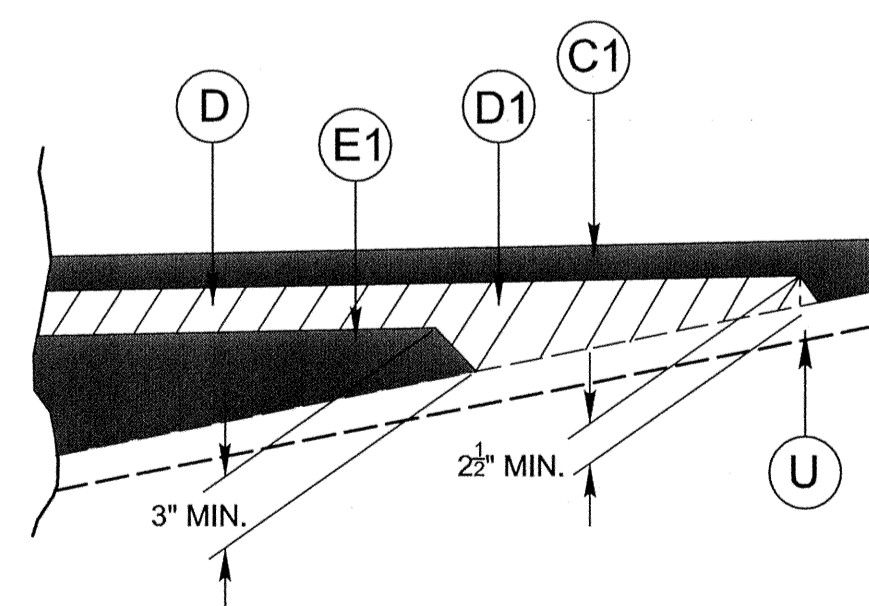
ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE



USE TYPICAL SECTION NO. 1 FROM:
 -L- STA. 12+40.00 TO -L- STA. 14+90.00



DETAIL SHOWING GUARDRAIL PLACEMENT
 SEE PLANS FOR GUARDRAIL LOCATIONS



DETAIL SHOWING METHOD OF WEDGING
 SEE TYPICAL SECTIONS

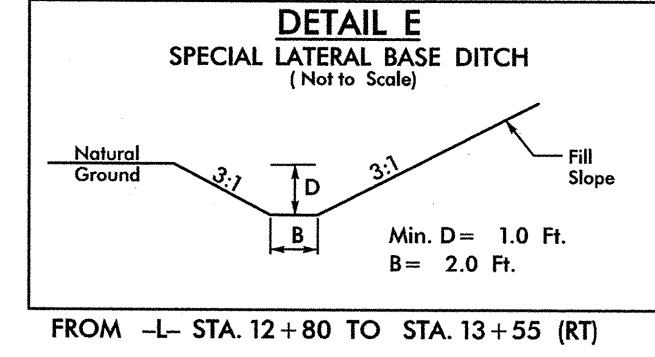
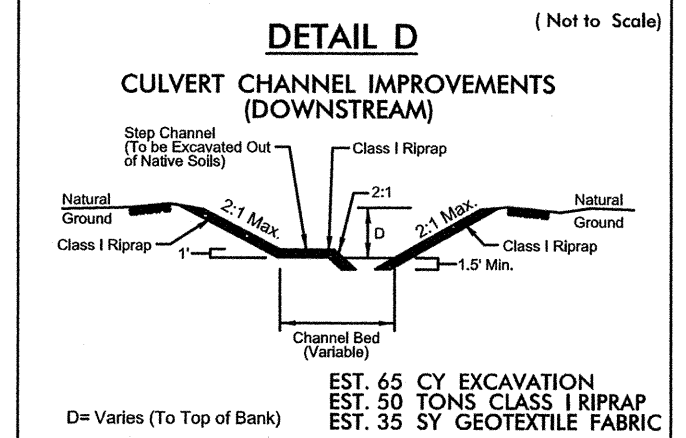
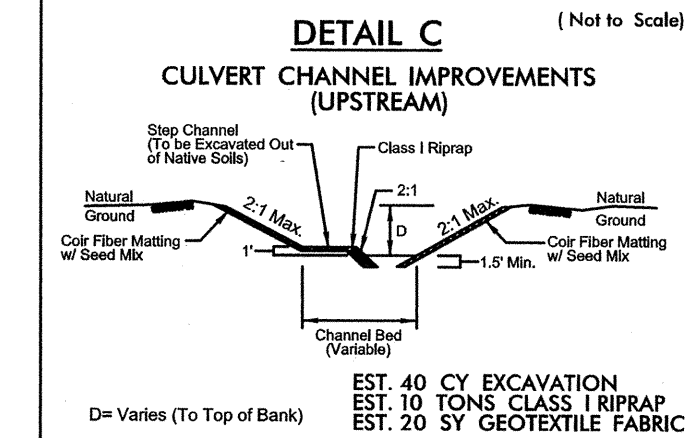
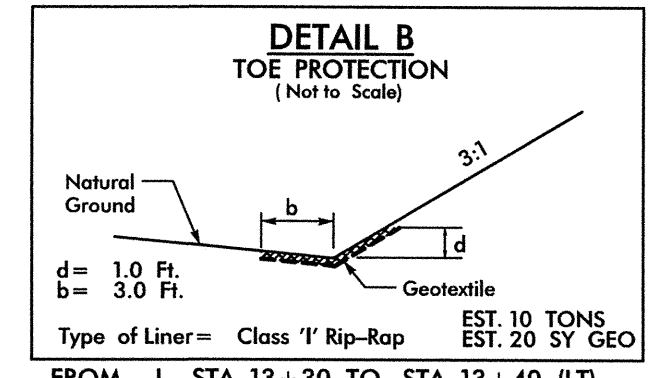
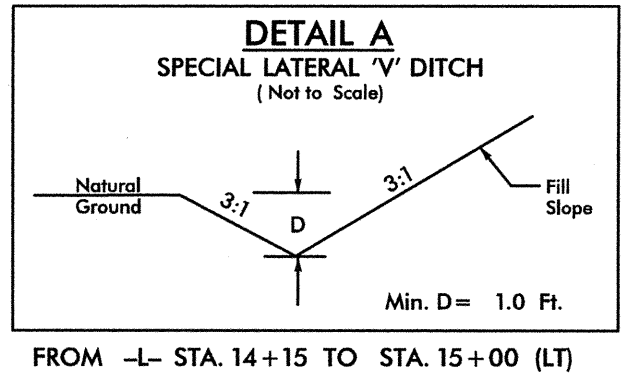
NOTES: * SHOULDER WIDTH INCREASED 3' WITH THE USE OF GUARDRAIL

REVISIONS

\$\$\$\$DATE\$\$\$\$
 \$\$\$CUTLINE\$\$\$
 \$\$\$DCN\$\$\$

-L-
 PI Sta 14+40.84
 $\Delta = 21' 31" 00.0" (RT)$
 $D = 5' 40" 22.3"$
 $L = 379.29'$
 $T = 191.9'$
 $R = 1,010.00'$

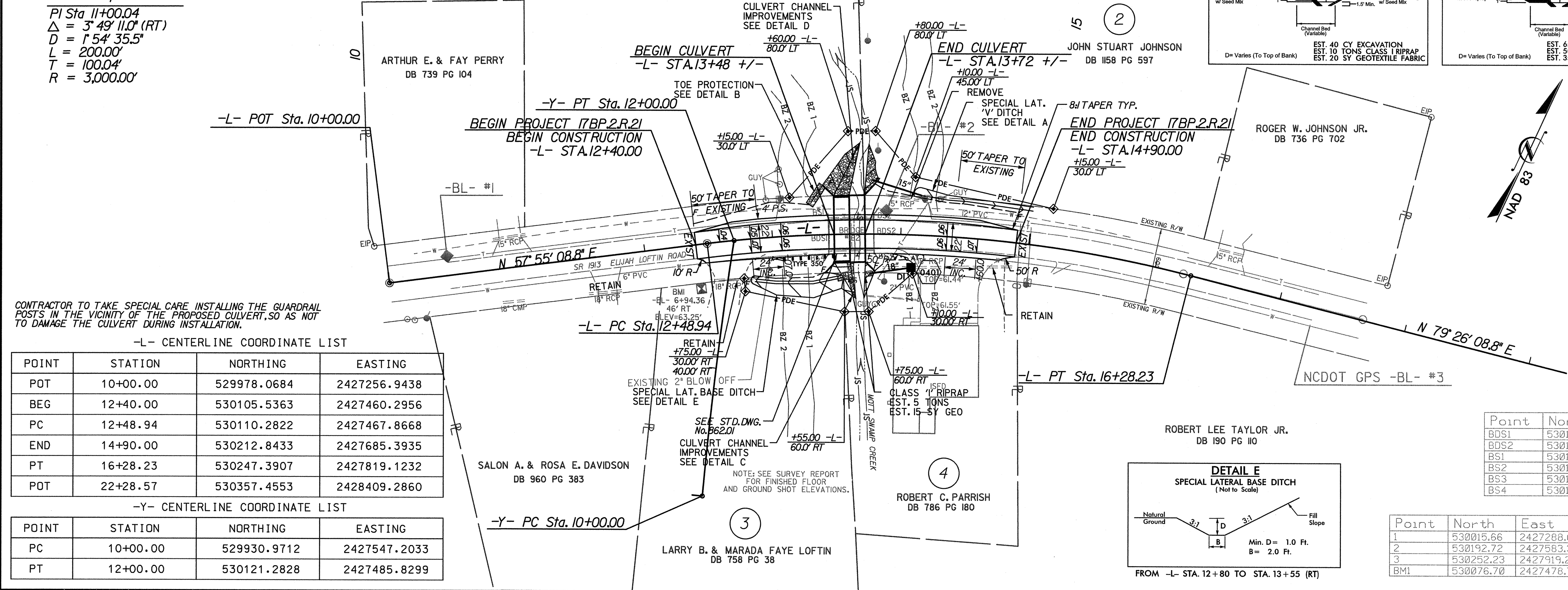
-Y-
 PI Sta 11+00.04
 $\Delta = 3' 49" 11.0" (RT)$
 $D = 1' 54" 35.5"$
 $L = 200.00'$
 $T = 100.04'$
 $R = 3,000.00'$



PLAN

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. 17BP.2.R.21	SHEET NO. 04
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<i>[Signature]</i> 10/9/13	<i>[Signature]</i> 10/9/13



DATUM DESCRIPTION
 THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "GPS-3" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 530252.233(FT) EASTING: 2427919.274(FT) ELEVATION: 68.327(FT) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99987544 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS-3" TO -L- STATION 17+66.23 IS N 58° 57' 59.63" E 41.26' ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

-L- CENTERLINE COORDINATE LIST

POINT	STATION	NORTHING	EASTING
POT	10+00.00	529978.0684	2427256.9438
BEG	12+40.00	530105.5363	2427460.2956
PC	12+48.94	530110.2822	2427467.8668
END	14+90.00	530212.8433	2427685.3935
PT	16+28.23	530247.3907	2427819.1232
POT	22+28.57	530357.4553	2428409.2860

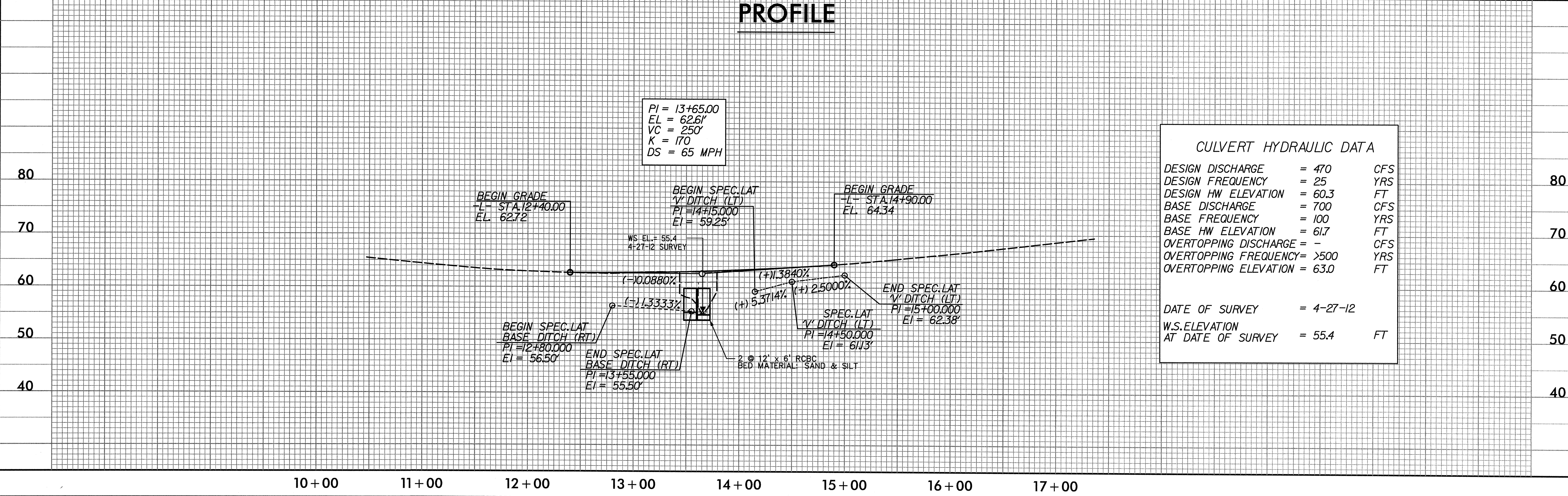
-Y- CENTERLINE COORDINATE LIST

POINT	STATION	NORTHING	EASTING
PC	10+00.00	529930.9712	2427547.2033
PT	12+00.00	530121.2828	2427485.8299

Point	North	East	Elevation	Description
BDS1	530157.05	2427550.55	62.88	CL SHOT @ DECK END
BDS2	530172.25	2427582.27	62.86	CL SHOT @ DECK END
BS1	530169.55	2427545.31	62.06	BRIDGE SEAT #1
BS2	530184.23	2427575.51	62.09	BRIDGE SEAT #2
BS3	530159.85	2427587.40	61.02	BRIDGE SEAT #3
BS4	530145.02	2427556.85	60.92	BRIDGE SEAT #4

Point	North	East	Elevation	Description
1	530015.66	2427288.65	64.74	BL-1
2	530192.72	2427583.31	62.74	BL-2
3	530252.23	2427919.27	68.33	GPS-3
BM1	530076.70	2427478.71	63.25	RR SPIKE SET IN 24" TWIN HARDWOOD

PROFILE



CULVERT HYDRAULIC DATA

DESIGN DISCHARGE = 470 CFS
 DESIGN FREQUENCY = 25 YRS
 DESIGN HW ELEVATION = 60.3 FT
 BASE DISCHARGE = 700 CFS
 BASE FREQUENCY = 100 YRS
 BASE HW ELEVATION = 61.7 FT
 OVERTOPPING DISCHARGE = - CFS
 OVERTOPPING FREQUENCY = >500 YRS
 OVERTOPPING ELEVATION = 63.0 FT

DATE OF SURVEY = 4-27-12
 W.S. ELEVATION AT DATE OF SURVEY = 55.4 FT

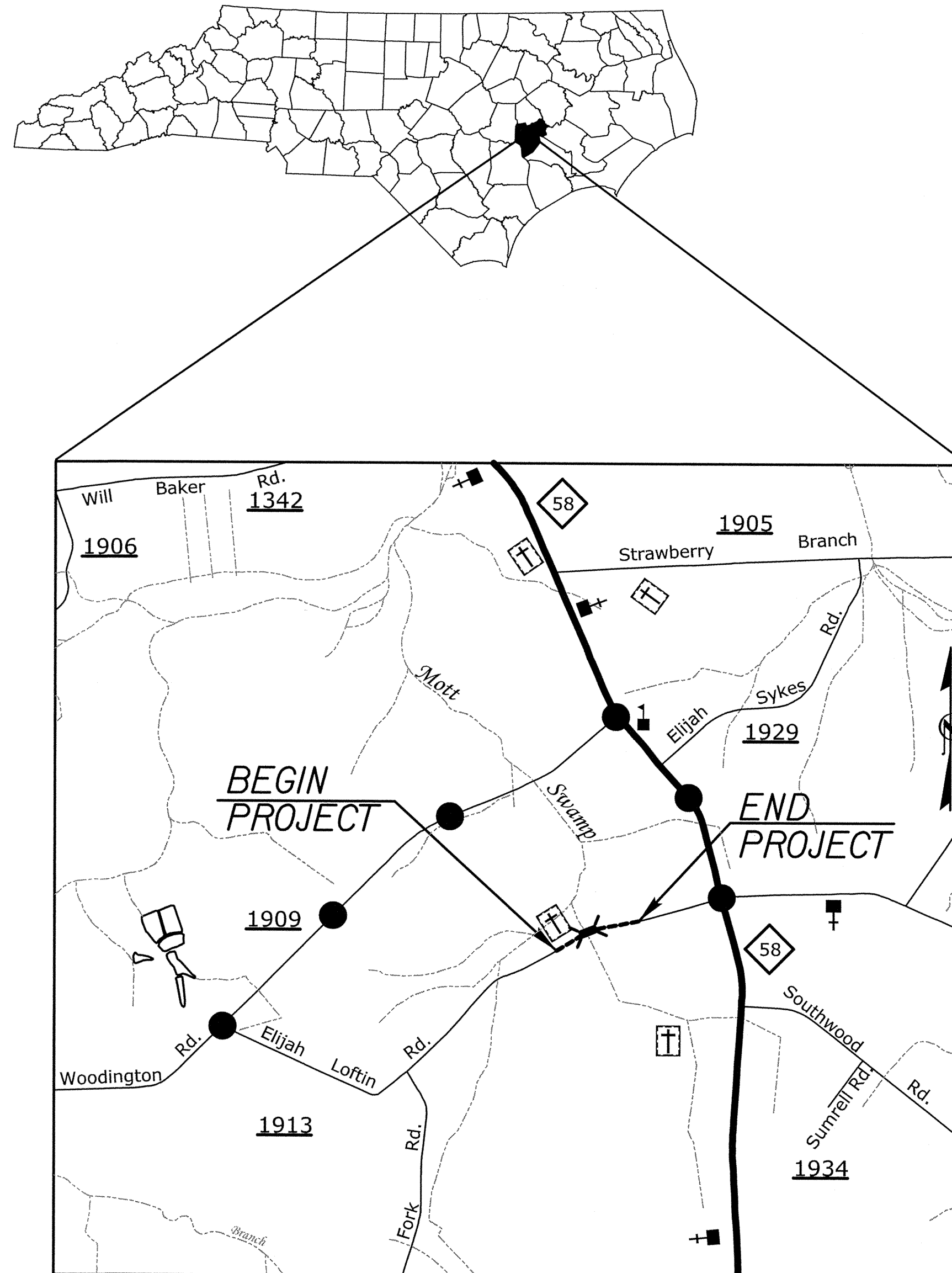
REVISIONS

DATE\$\$\$\$
 SYSTEM\$\$\$\$
 DCON\$\$\$\$

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

LENOIR COUNTY



INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET WITH VICINTY MAP & INDEX OF SHEETS, LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, AND LEGEND
TMP-2	PROJECT NOTES, DETOUR AND PLANS

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
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1145.01	BARRICADES
1150.01	FLAGGING DEVICES

LEGEND

GENERAL

- ← DIRECTION OF TRAFFIC FLOW
- ← DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- +— NORTH ARROW
- PROPOSED PVMT.
- WORK AREA

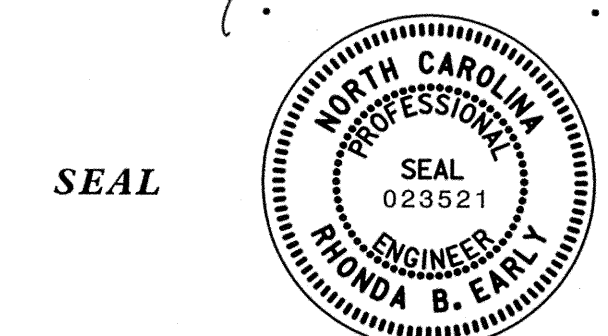
TRAFFIC CONTROL DEVICES

- ▨ BARRICADE (TYPE III)

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

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

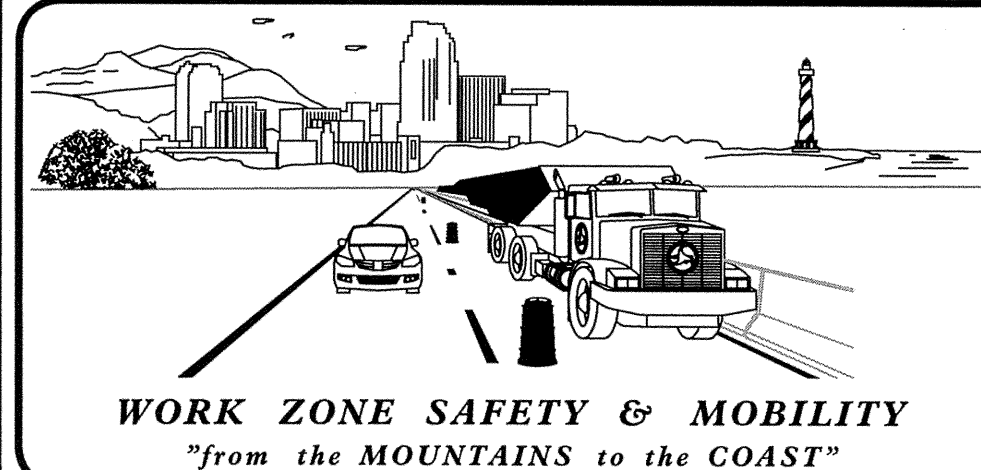
APPROVED: *[Signature]*
DATE: 10-7-13



SEAL

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

STEVEN HAMILTON, PE DIVISION TRAFFIC ENGINEER



17BP.2.R.21

TIP PROJECT:

8/17/99



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Raleigh, North Carolina 27609
NC License No: C-1554

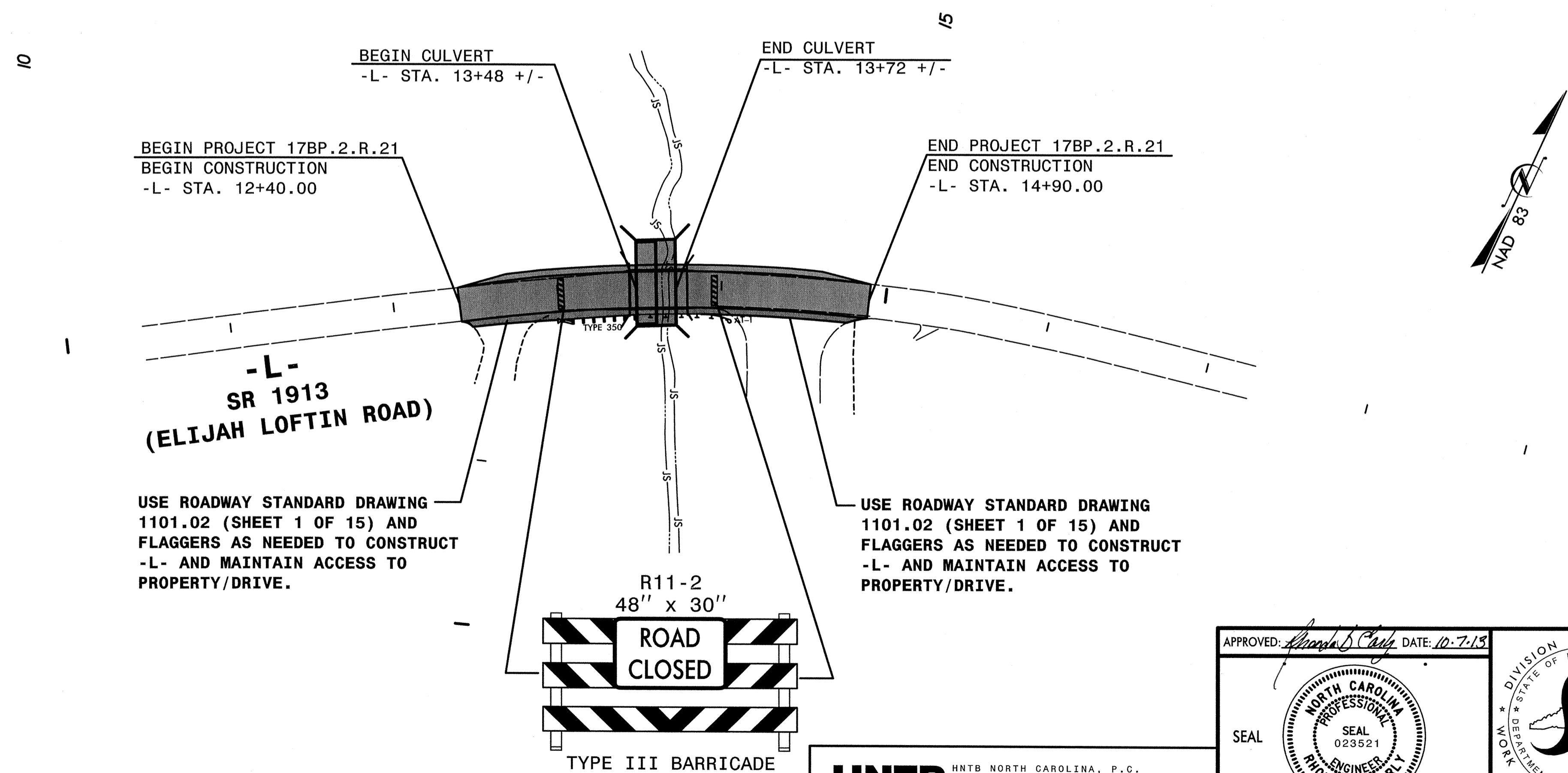
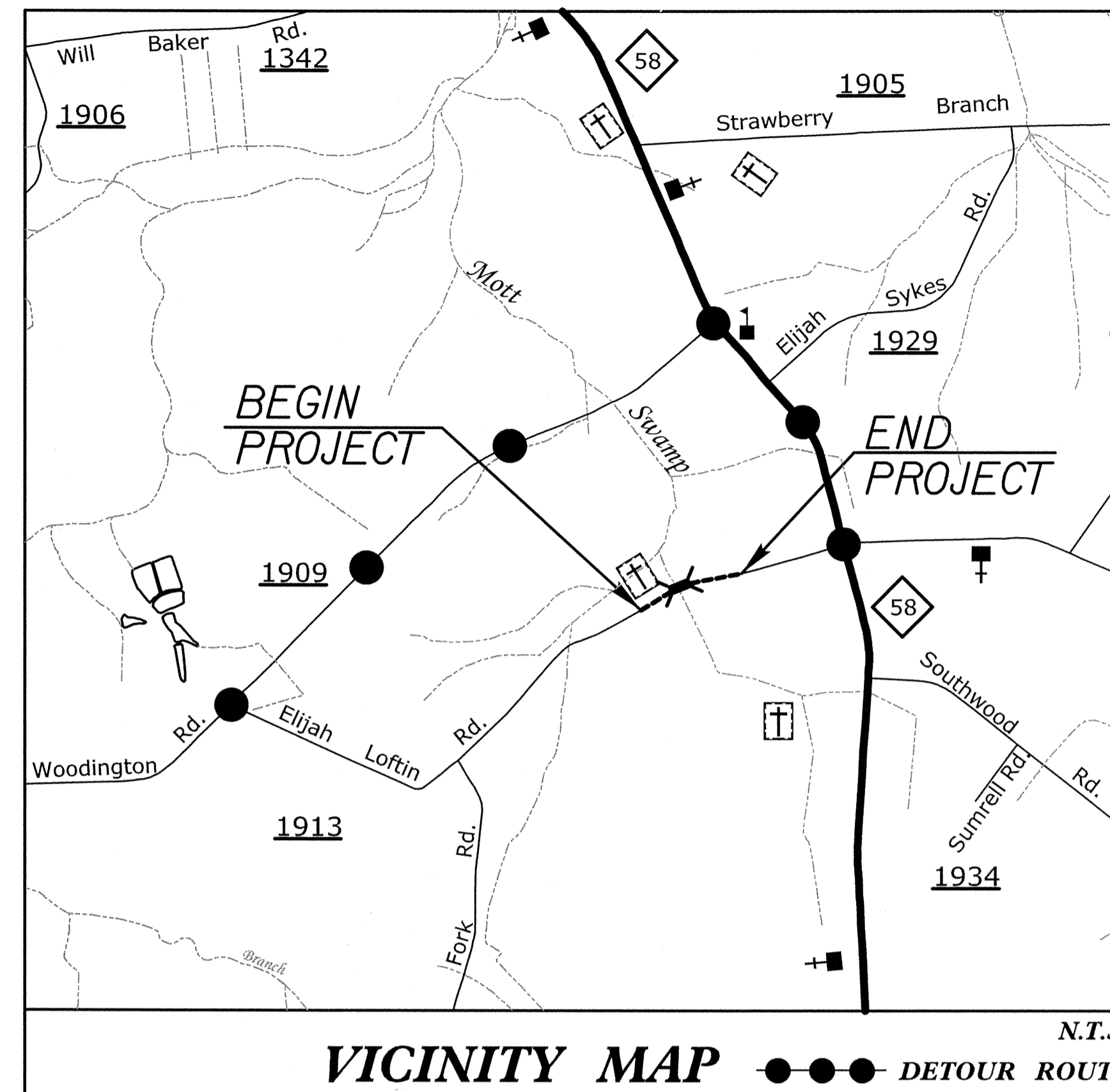
PROJ. REFERENCE NO.	SHEET NO.
17BP.2.R.21	TMP-2

GENERAL NOTES

IMPLEMENT TRAFFIC CONTROL IN ACCORDANCE WITH THE ROADWAY STANDARD DRAWINGS LISTED ON TMP-1.

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. MODIFICATIONS MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING OR REMOVAL OF DEVICES, AS DIRECTED BY THE ENGINEER.

STATE FORCES WILL INSTALL AND MAINTAIN THE PROJECT DETOUR AND THE TYPE III BARRICADES AT THE PROJECT LIMITS.
STATE FORCES WILL INSTALL PAINT AND MARKERS ON THE FINISHED PROJECT.
CALL JIM EVANS AT 252-830-3493 FOR COORDINATION.



2:38:48 PM 17BP.2.R.21.dgn
2:38:48 PM 17BP.2.R.21.dgn
2:38:48 PM 17BP.2.R.21.dgn

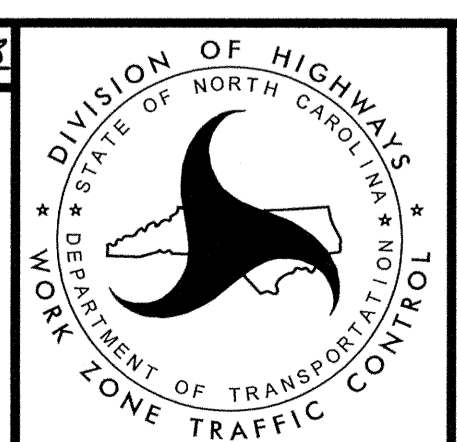
REVISIONS

QA/QC STAGE:

REVIEW:
CONCUR:
REVISE:
VERIFY:

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

APPROVED: *[Signature]* DATE: 10-7-13
SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER
PRONDA B. EARLY
023521



TRANSPORTATION MANAGEMENT PLAN
GENERAL NOTES,
DETOUR
AND DETAIL

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.2.R.21	EC-1	6
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

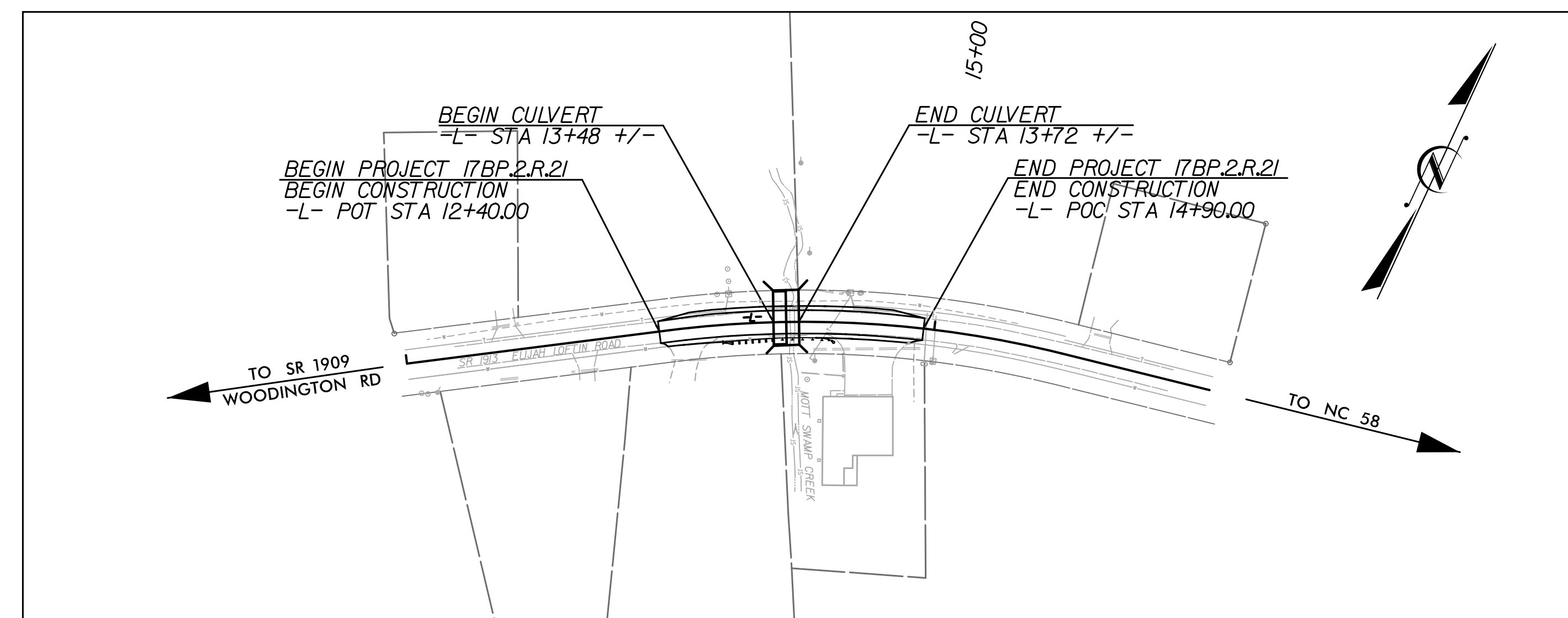
PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

LOCATION: LENOIR COUNTY BRIDGE NO. 162 OVER MOTT SWAMP CREEK ON SR 1913 (ELIJAH LOFTIN RD.)

TYPE OF WORK: GRADING, PAVING, DRAINAGE & CULVERT

EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	ms
1630.05	Temporary Diversion	td
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	▲▲▲
1622.01	Temporary Berms and Slope Drains	—
1633.01	Silt Basin Type B	▨
1633.01	Temporary Rock Silt Check Type-A	⊗
1633.01	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	⊗
1633.01	Temporary Rock Silt Check Type-B	▶
1633.01	Wattle/Coir Fiber Wattle	⌒
1633.01	Wattle/Coir Fiber Wattle with Polyacrylamide (PAM)	⌒
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	▭
1632.01	Rock Inlet Sediment Trap: Type A	A
1632.02	Type B	B
1632.03	Type C	C
1630.04	Skimmer Basin	▭
1630.04	Tiered Skimmer Basin	▭
1630.04	Infiltration Basin	▭



THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

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

TIP PROJECT: 17BP.2.R.21

GRAPHIC SCALE

0
PLANS

0
PROFILE (HORIZONTAL)

0
PROFILE (VERTICAL)

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

BENJAMIN J. HENEGAR, E.I
EROSION CONTROL
LEVEL III-A
CERTIFICATION #641

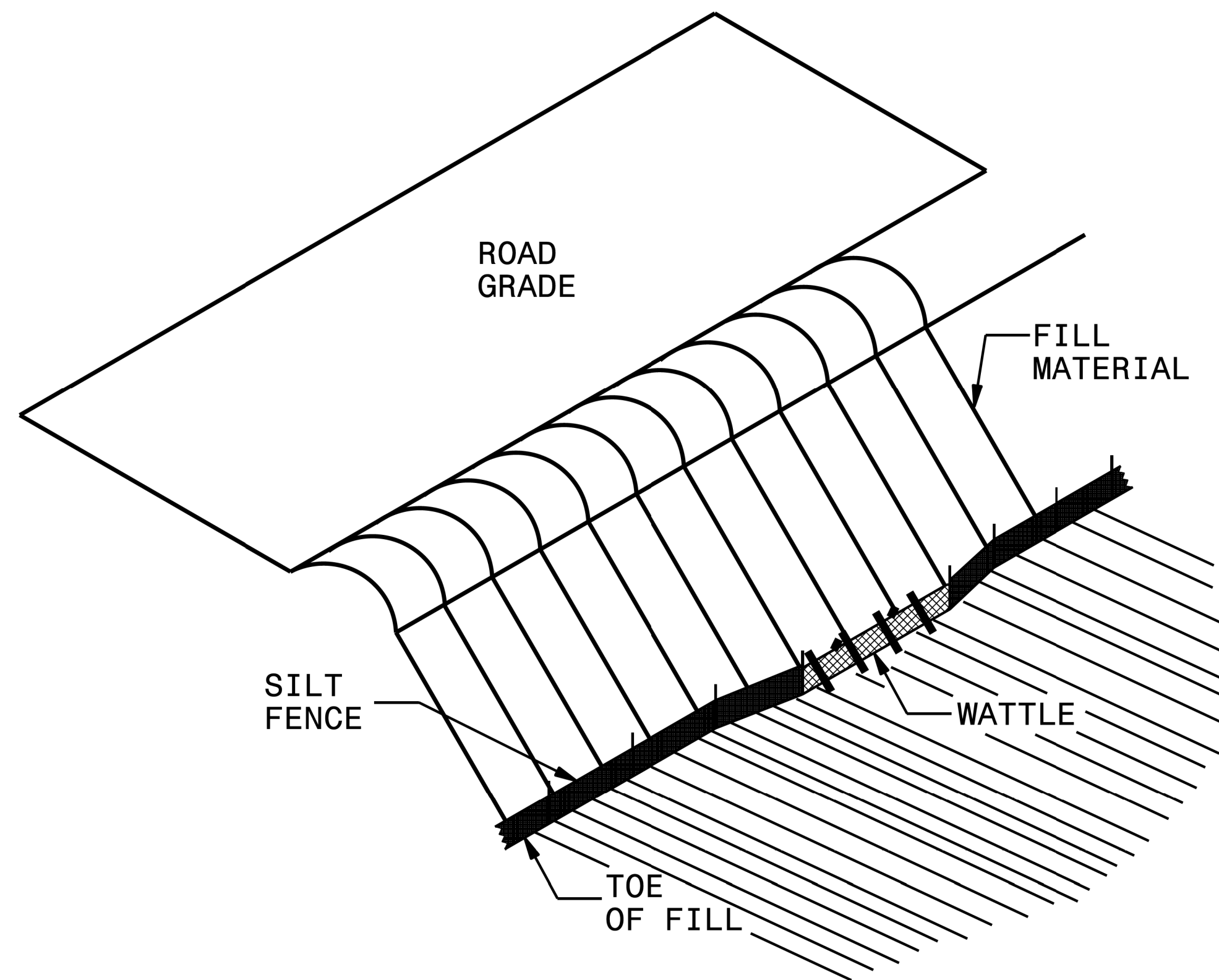
Roadway Standard Drawings

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

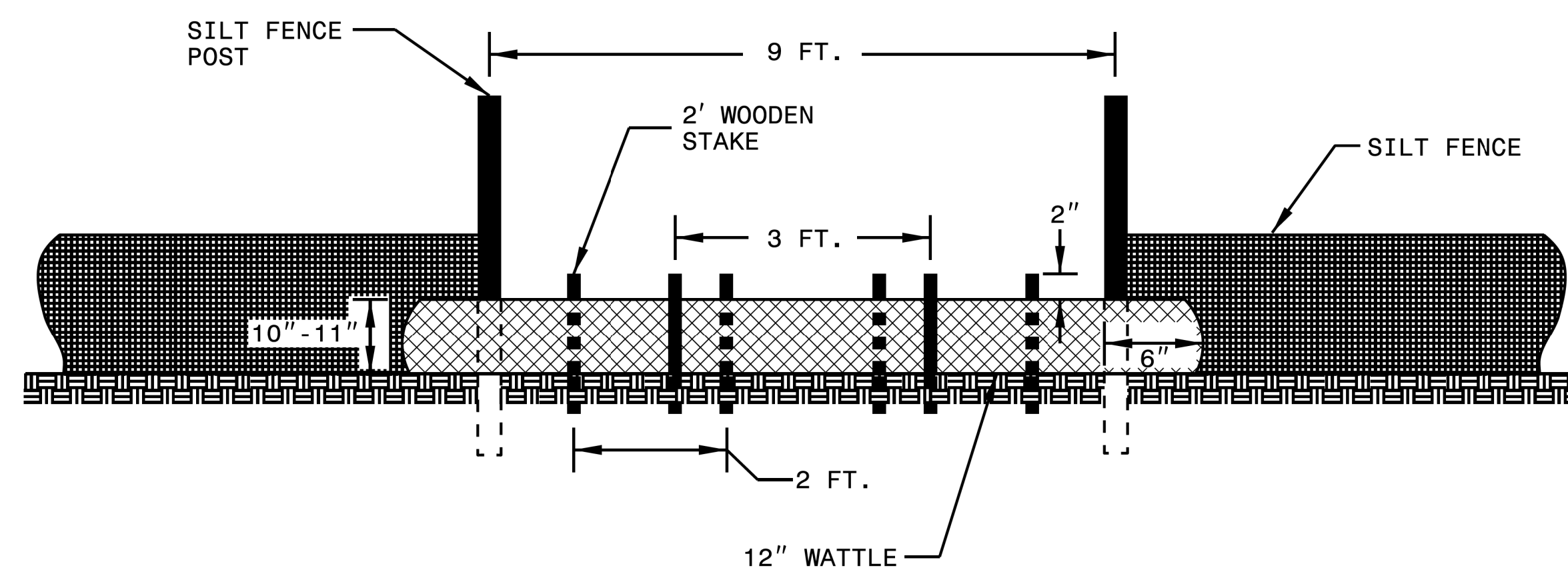
1604.01 Railroad Erosion Control Detail	1632.01 Rock Inlet Sediment Trap Type A
1605.01 Temporary Silt Fence	1632.02 Rock Inlet Sediment Trap Type B
1606.01 Special Sediment Control Fence	1632.03 Rock Inlet Sediment Trap Type C
1607.01 Gravel Construction Entrance	1633.01 Temporary Rock Silt Check Type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

9:56:03 AM 17BP.2.R.21.ec_tsh.dgn
*****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.

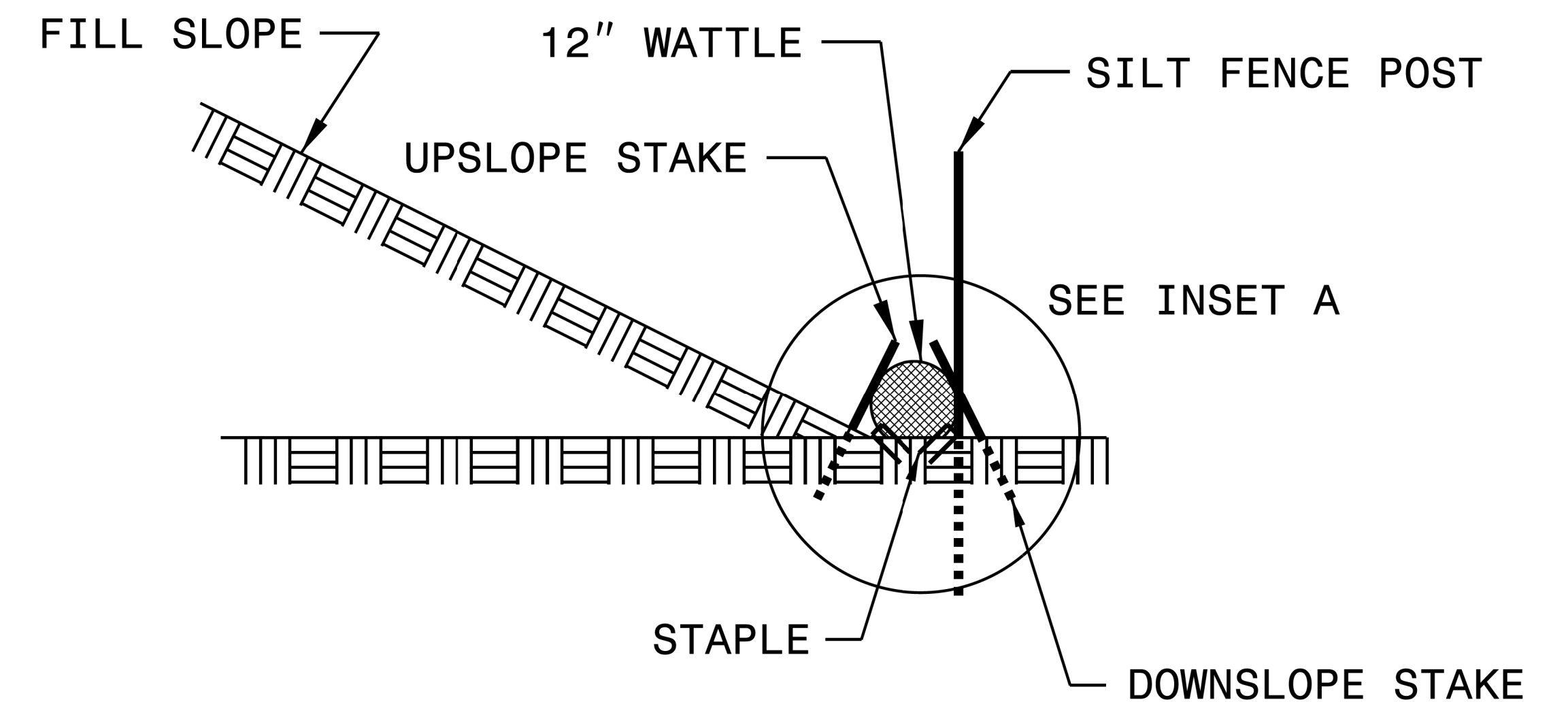
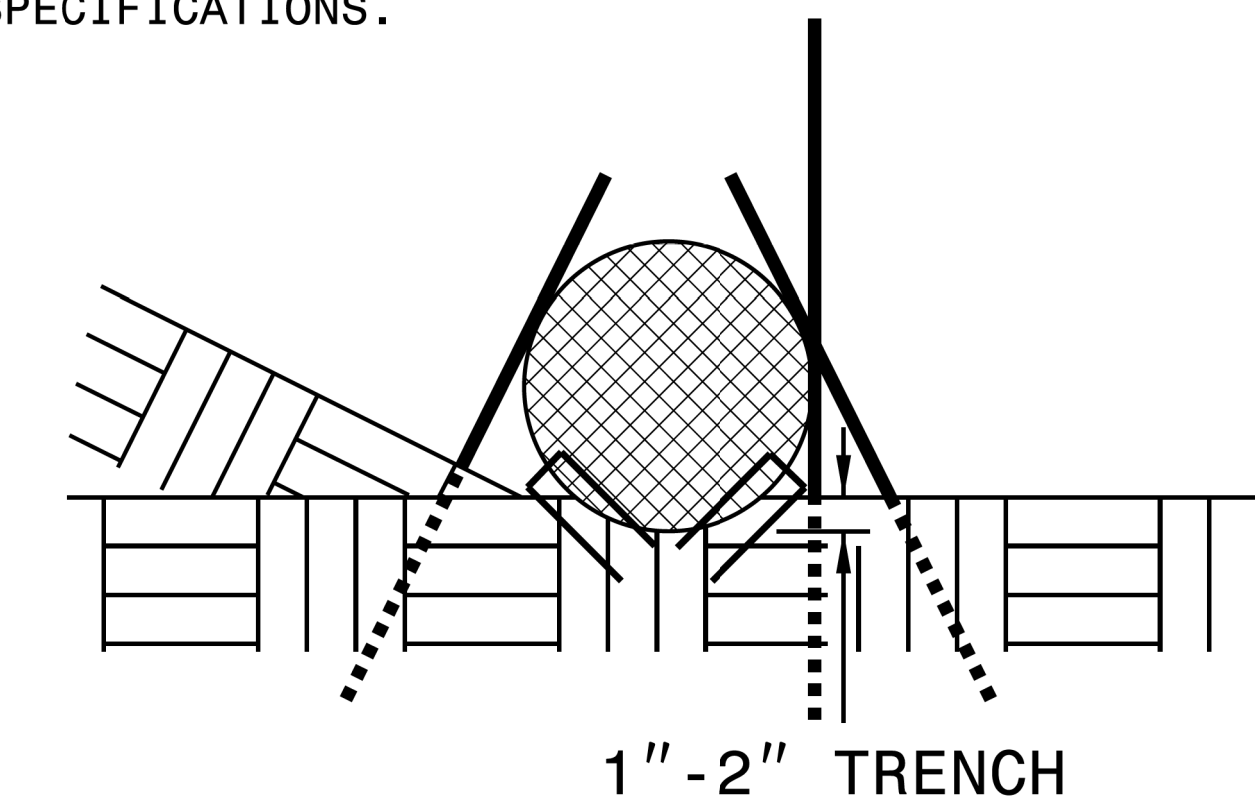
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

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.

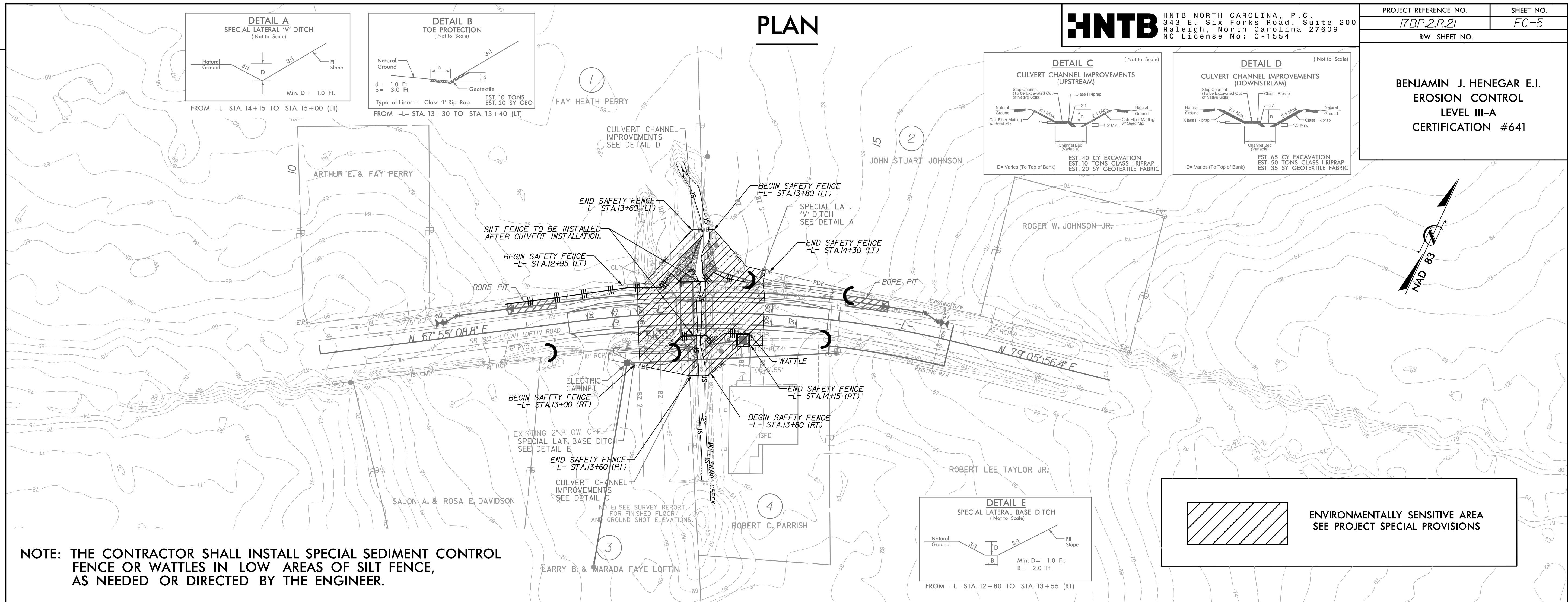
INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.

INSET A

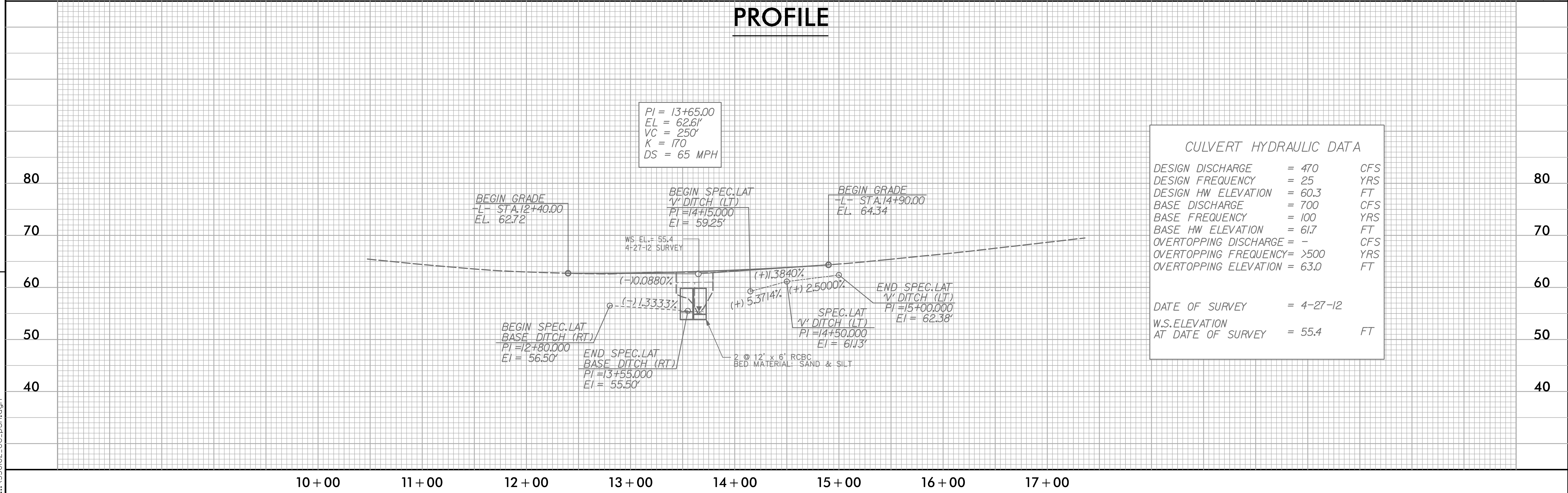


SIDE VIEW

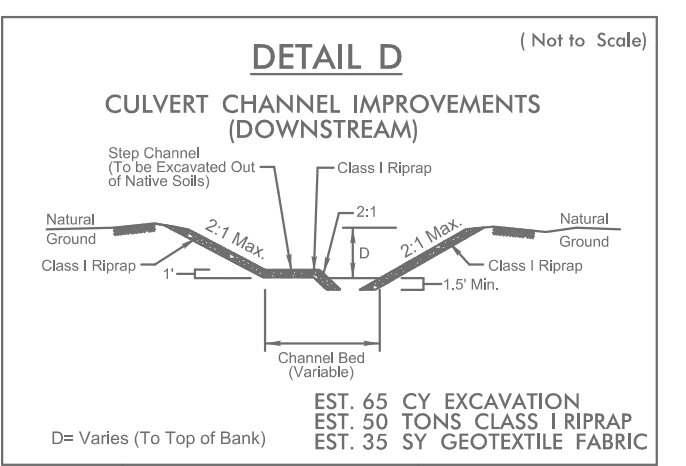
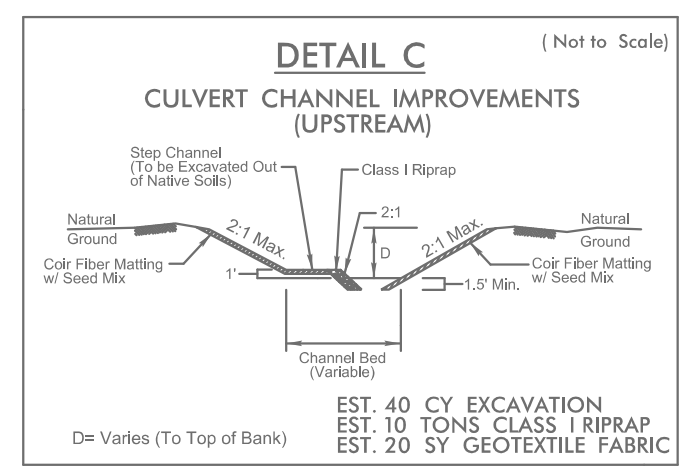
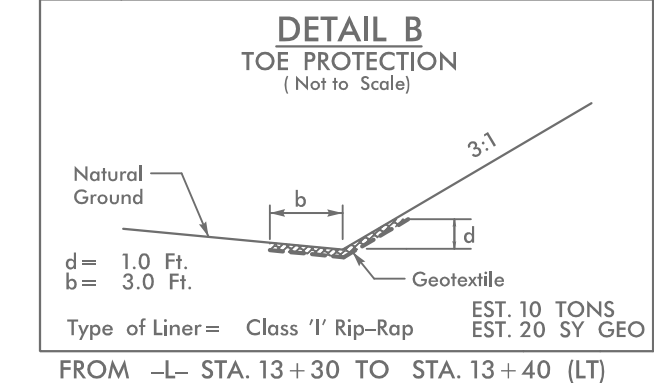
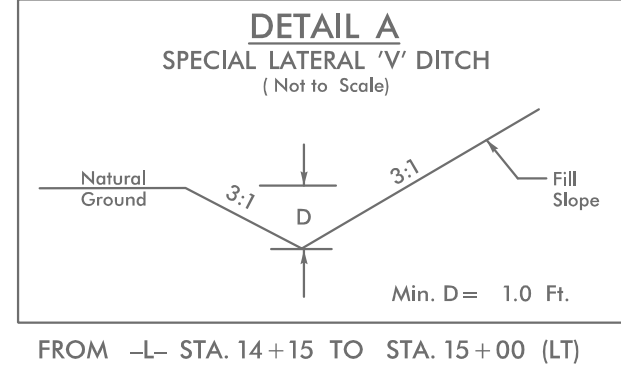
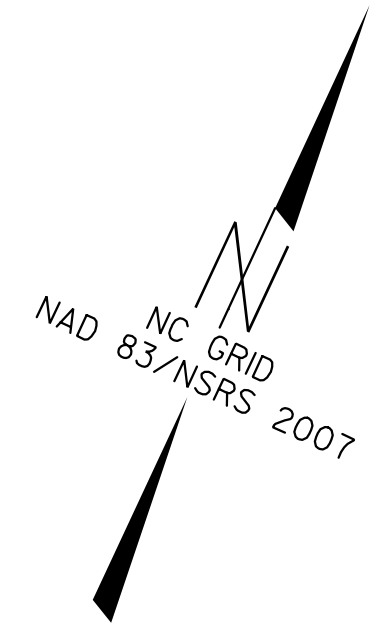
PLAN



PROFILE



REVISIONS

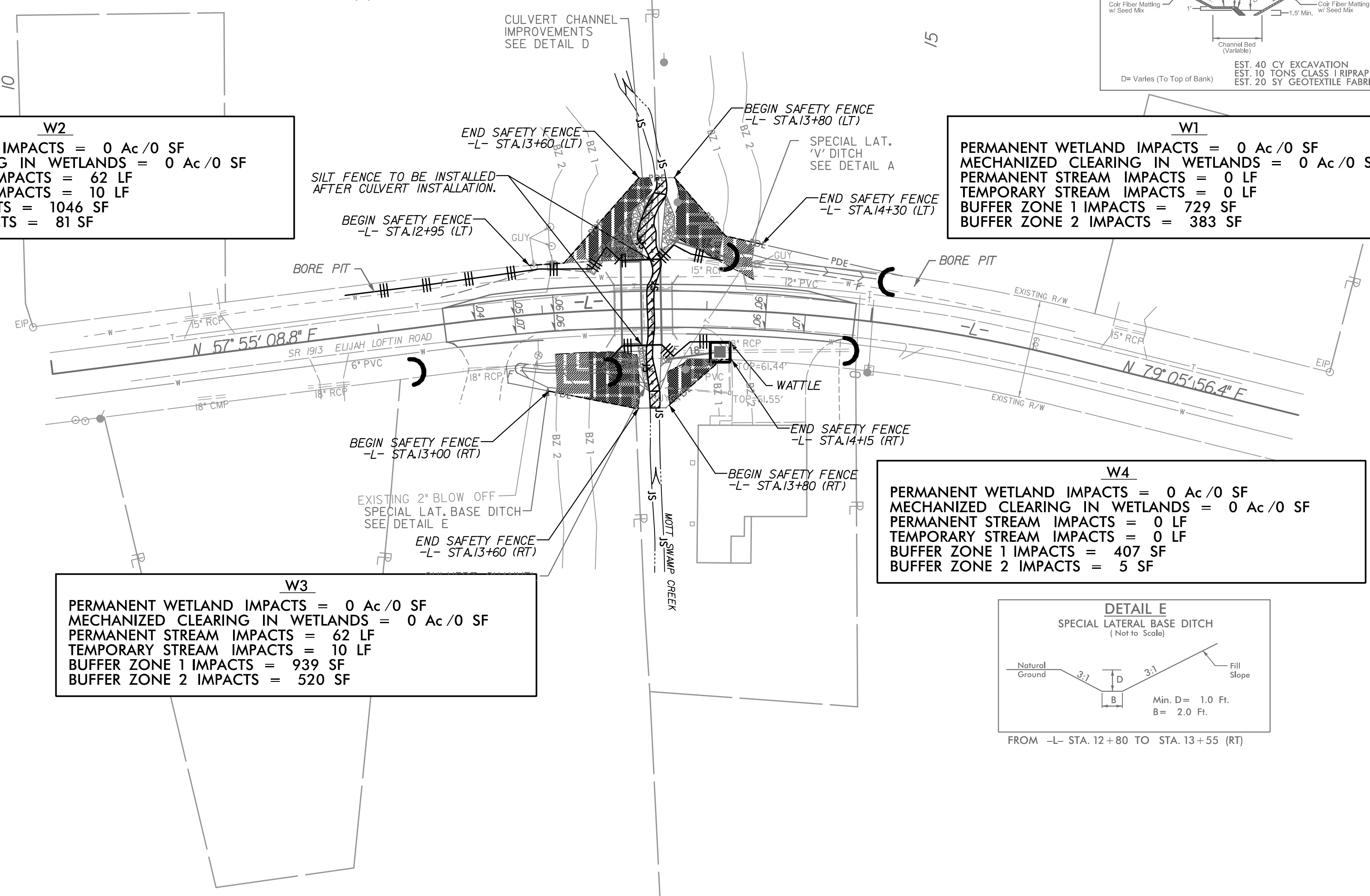
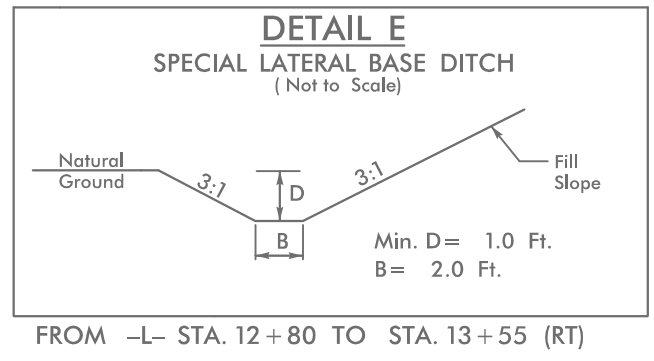


W2
PERMANENT WETLAND IMPACTS = 0 Ac / 0 SF
MECHANIZED CLEARING IN WETLANDS = 0 Ac / 0 SF
PERMANENT STREAM IMPACTS = 62 LF
TEMPORARY STREAM IMPACTS = 10 LF
BUFFER ZONE 1 IMPACTS = 1046 SF
BUFFER ZONE 2 IMPACTS = 81 SF

W1
PERMANENT WETLAND IMPACTS = 0 Ac / 0 SF
MECHANIZED CLEARING IN WETLANDS = 0 Ac / 0 SF
PERMANENT STREAM IMPACTS = 0 LF
TEMPORARY STREAM IMPACTS = 0 LF
BUFFER ZONE 1 IMPACTS = 729 SF
BUFFER ZONE 2 IMPACTS = 383 SF

W4
PERMANENT WETLAND IMPACTS = 0 Ac / 0 SF
MECHANIZED CLEARING IN WETLANDS = 0 Ac / 0 SF
PERMANENT STREAM IMPACTS = 0 LF
TEMPORARY STREAM IMPACTS = 0 LF
BUFFER ZONE 1 IMPACTS = 407 SF
BUFFER ZONE 2 IMPACTS = 5 SF

W3
PERMANENT WETLAND IMPACTS = 0 Ac / 0 SF
MECHANIZED CLEARING IN WETLANDS = 0 Ac / 0 SF
PERMANENT STREAM IMPACTS = 62 LF
TEMPORARY STREAM IMPACTS = 10 LF
BUFFER ZONE 1 IMPACTS = 939 SF
BUFFER ZONE 2 IMPACTS = 520 SF



IMPACT SUMMARY:
404 WETLAND IMPACTS = 0.00 AC
PERMANENT STREAM IMPACTS = 124 LF
TEMPORARY STREAM IMPACT = 20 LF
BUFFER ZONE 1 IMPACT = 3121 SF
BUFFER ZONE 2 IMPACT = 989 SF

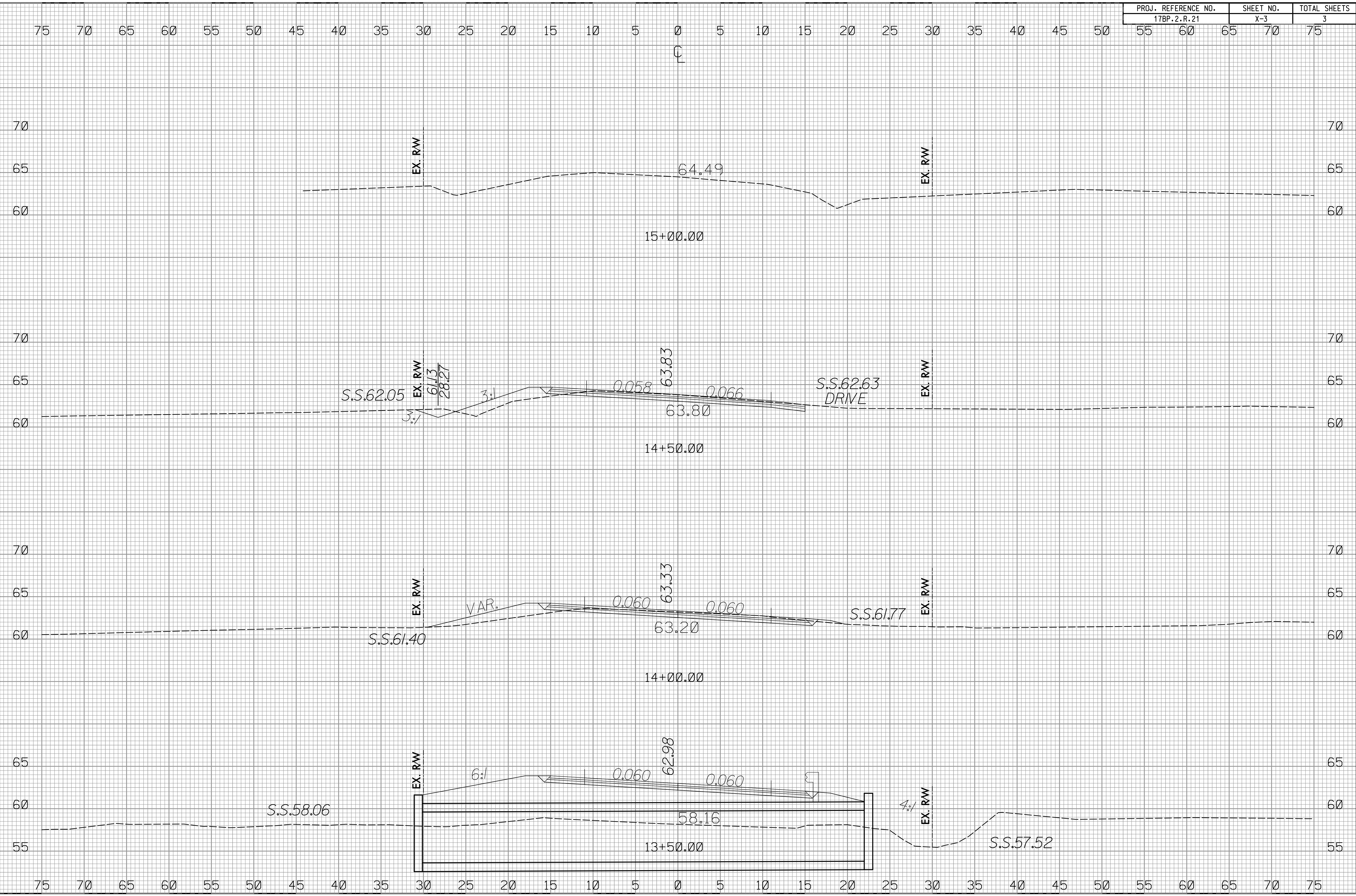
LEGEND

	ALLOWABLE IMPACTS ZONE 1
	ALLOWABLE IMPACTS ZONE 2
	DENOTES IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

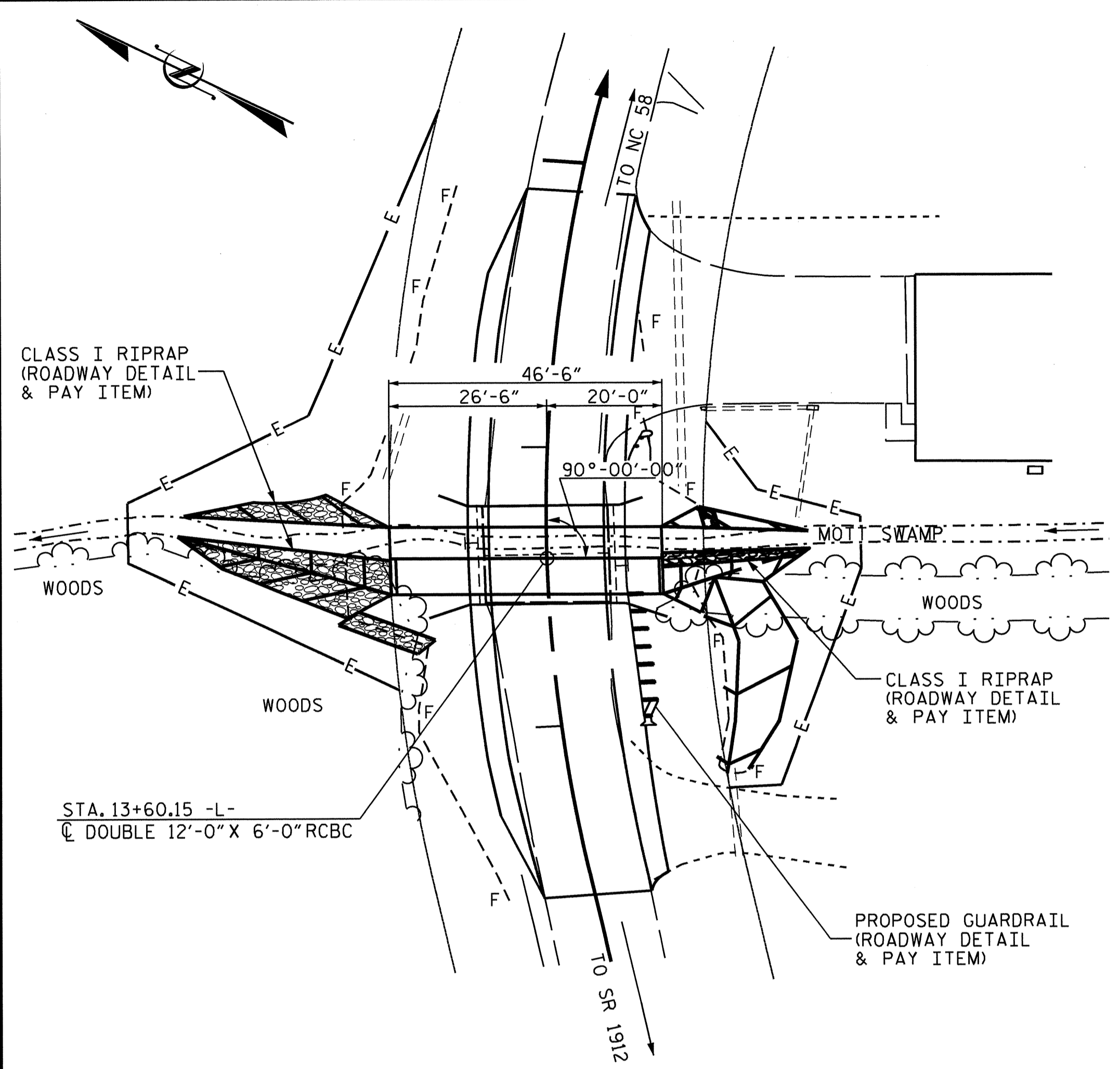
NCDOT
17BP.2.R.21 LENOIR COUNTY
REPLACE BRIDGE NO. 162
SR 1913 (ELIJAH LOFTIN RD.)
OVER MOTT SWAMP CREEK
BETWEEN NC HWY 58
AND SR 1912

SCALE: 1" = 50'
7/22/13
FOR PERMITTING ONLY:
NOT FOR CONSTRUCTION

02/03/98



B.M. "BM1", RAILROAD SPIKE IN 24" TWIN HARDWOOD TREE, 34.21' RT. OF STA. 12+40.29 -L-. EL. 63.25'



LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE	= 470 C.F.S
FREQUENCY OF DESIGN FLOOD	= 25 YR
DESIGN HIGH WATER ELEVATION	= 60.3'
DRAINAGE AREA	= 1.0 SQ. MI.
BASE DISCHARGE (Q100)	= 700 C.F.S
BASE HIGH WATER ELEVATION	= 61.72'

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= ---
FREQUENCY OF OVERTOPPING FLOOD	= >500 YR
OVERTOPPING FLOOD ELEVATION	= 63.0'

TOTAL STRUCTURE QUANTITIES

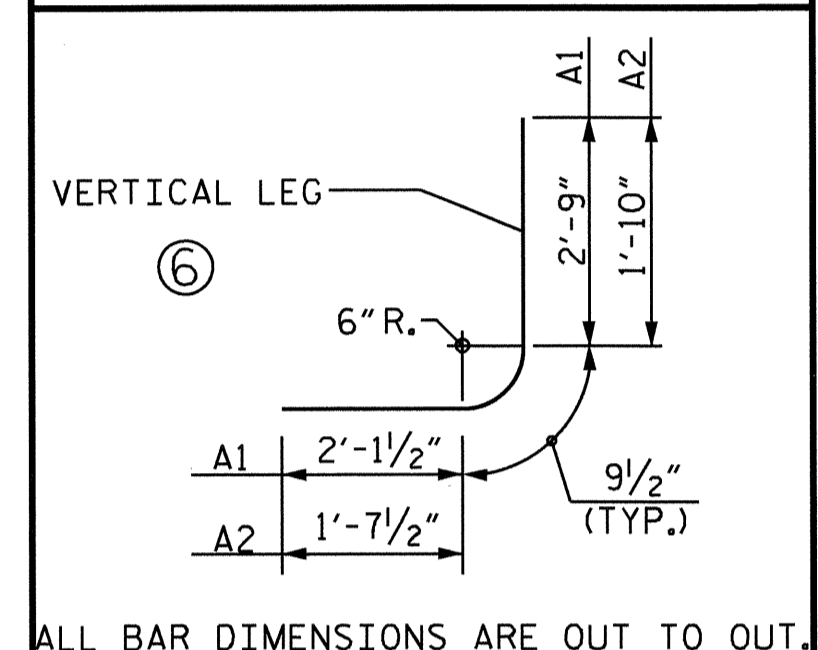
CLASS A CONCRETE			
BARREL @	2.579	CY/FT	120.0 C.Y.
WINGS ETC.			29.5 C.Y.
TOTAL			149.5 C.Y.
REINFORCING STEEL			
BARREL		14,394	LBS.
WINGS ETC.		1,351	LBS.
TOTAL		15,745	LBS.
FOUNDATION CONDITIONING MATERIAL		98	TONS
CULVERT EXCAVATION			LUMP SUM
REMOVAL OF EXISTING STRUCTURE			LUMP SUM

BILL OF MATERIAL

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
A100	139	#4	STR. 25'-8"	2383
A200	101	#4	STR. 25'-8"	1732
A300	123	#4	STR. 25'-8"	2109
A400	111	#5	STR. 25'-8"	2972
B1	94	#4	STR. 7'-9"	487
B2	118	#4	STR. 5'-4"	420
B3	94	#4	STR. 7'-9"	487
C1	172	#4	STR. 24'-1"	2767
D1	8	#6	STR. 2'-0"	24
G1	8	#5	STR. 25'-8"	214

TOTAL REINFORCING STEEL 14,394 LBS.

BAR TYPES



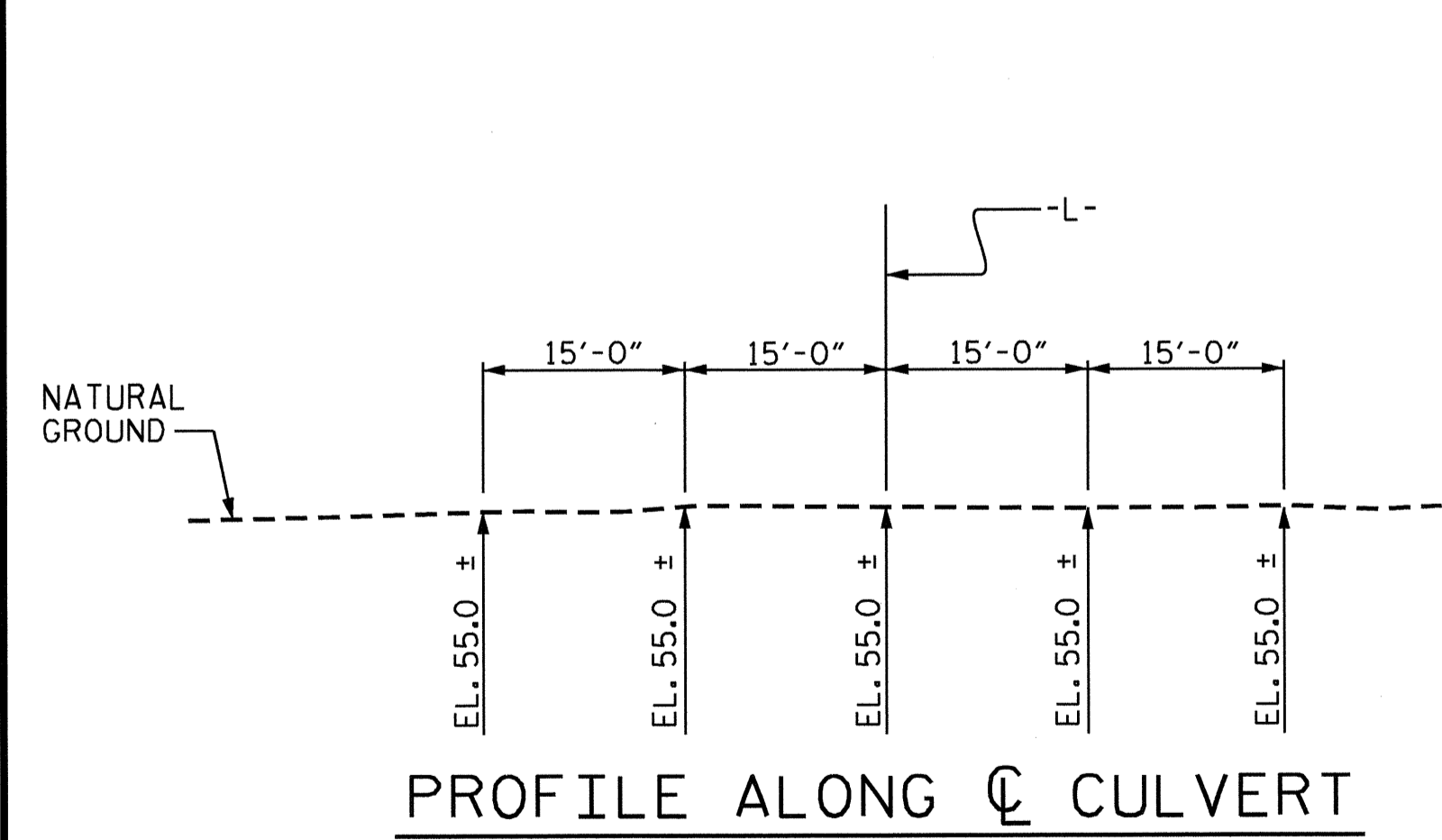
ALL BAR DIMENSIONS ARE OUT TO OUT.

SPLICE CHART

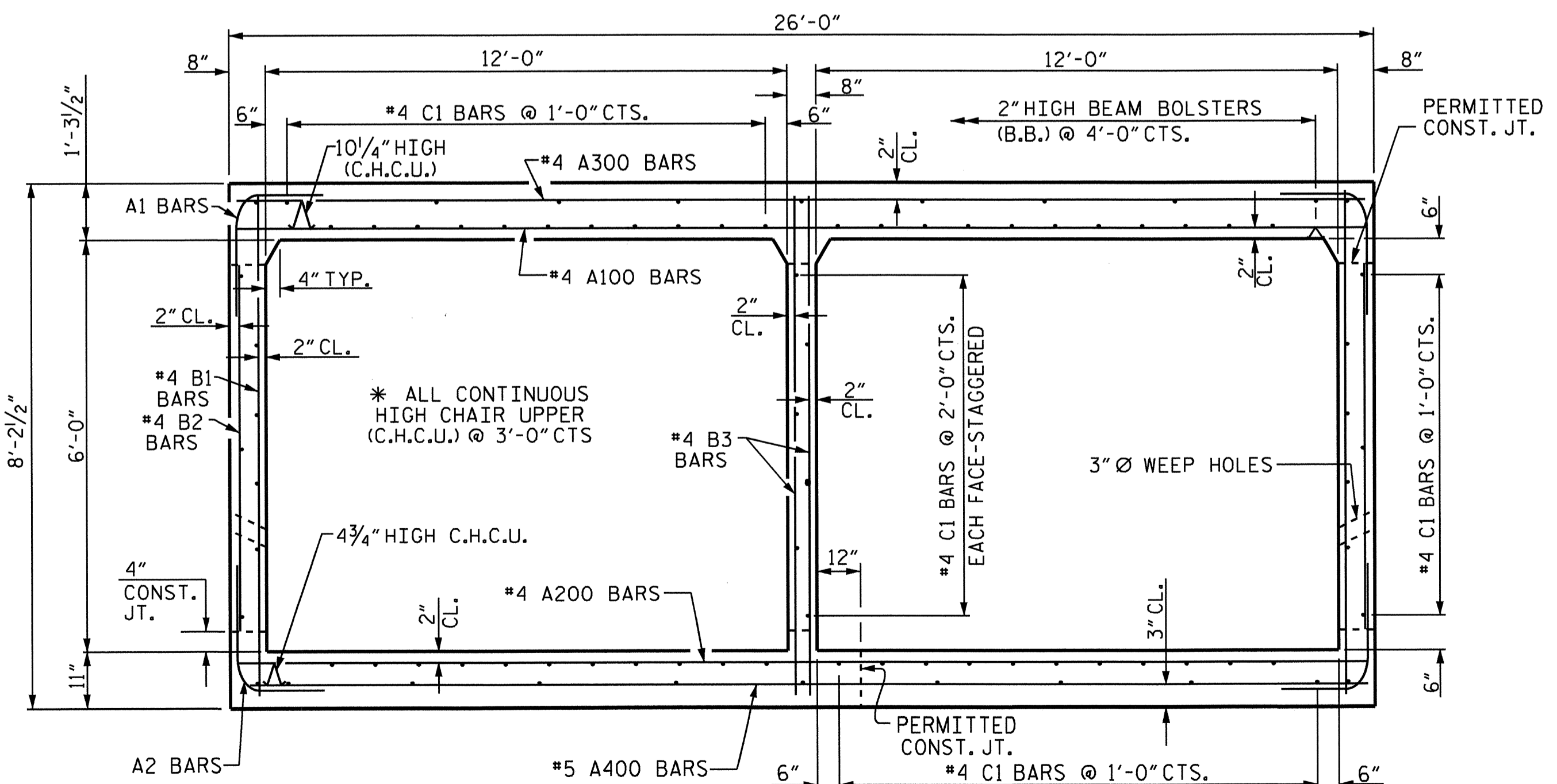
BAR	SIZE	SPLICE LENGTH
B1	#4	1'-9"
C1	#4	1'-11"

NOTES:

ASSUMED LIVE LOAD HL-93 OR ALTERNATE LOADING.
 DESIGN FILL: 2.28'
 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 THE BARREL ARE SHOWN ON THE WING SHEET.
 TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT POURS TO A MAXIMUM OF 70 FT. LOCATION OF THE JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.
 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 SHALL BE PAID FOR BY THE CONTRACTOR.
 AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF THE EXTERIOR WALL AND BOTH FACES OF THE INTERIOR WALLS 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 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.
 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.
 THE EXISTING STRUCTURE CONSISTING OF 2 SPANS, 1 @ 17'-6" AND 1 @ 18'-0", REINFORCED CONCRETE DECK 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.



PROFILE ALONG CULVERT



RIGHT ANGLE SECTION OF BARREL

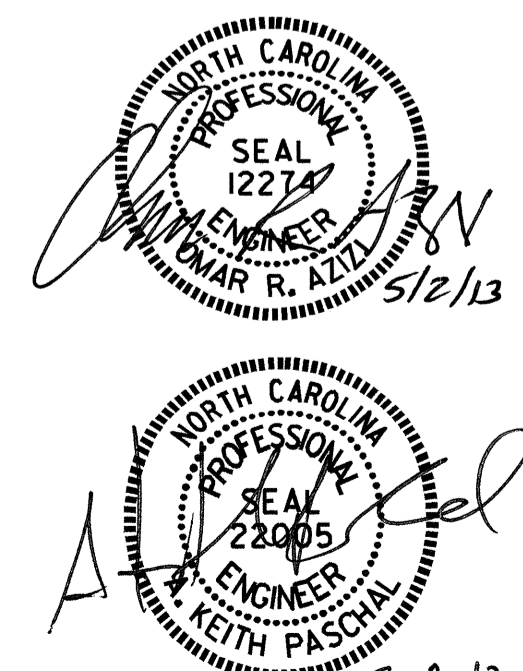
THERE ARE 86 "C" BARS IN SECTION OF BARREL.

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.
 EXCAVATE CULVERT FOOTING IN ACCORDANCE WITH THE DETAILS IN THE PLANS. CHECK FIELD CONDITIONS FOR THE REQUIRED BEARING RESISTANCE OF 3.0 TSF.
 A MINIMUM OF 12 INCHES OF CLASS VI FOUNDATION CONDITIONING MATERIAL IS REQUIRED WHEN THE MATERIAL AT THE PLAN BOTTOM OF THE CULVERT IS NOT ADEQUATE TO SUPPORT THE LOAD.
 SCOUR PROTECTION IS REQUIRED AT BOTH INLET AND OUTLET ENDS OF THE CULVERT. DO NOT PLACE RIP RAP ABOVE THE STREAM BED.
 THE SCOUR CRITICAL ELEVATION IS THE AS-BUILT BOTTOM OF CULVERT FLOOR SLAB ELEVATION. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

PROJECT NO. 17BP.2.R.21
 LENOIR COUNTY
 STATION: 13+60.15 -L-

SHEET 1 OF 5 REPLACES BRIDGE NO. 162

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 DOUBLE 12 FT. X 6 FT.
 CONCRETE BOX CULVERT
 90° SKEW



DRAWN BY: M.D.PISO DATE: 03-20-13
 CHECKED BY: M.M.AHMED DATE: 04-11-13
 DESIGN ENGINEER OF RECORD: B.L.GREEN DATE: 04-17-13

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

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		
						MOMENT				SHEAR						
						LIVE-LOAD FACTORS (LL)	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	1.02	--	1.75	1.35	1	TOP SLAB	5.07	1.02	1	TOP SLAB	11.34		
	HL-93 (OPERATING)	N/A		1.32	--	1.35	1.75	1	TOP SLAB	5.07	1.32	1	TOP SLAB	11.34		
	HS-20 (INVENTORY)	36.000	②	1.22	43.77	1.75	1.41	1	BOTTOM SLAB	12.35	1.22	1	BOTTOM SLAB	11.67		
	HS-20 (OPERATING)	36.000		1.58	56.74	1.35	1.82	1	BOTTOM SLAB	12.35	1.58	1	BOTTOM SLAB	11.67		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.42	32.73	1.40	2.75	1	TOP SLAB	5.38	2.42	1	TOP SLAB	11.34	
		SNGARBS2	20.000		2.27	45.32	1.40	2.57	1	TOP SLAB	5.38	2.27	1	TOP SLAB	11.34	
		SNAGRIS2	22.000		2.21	48.70	1.40	2.56	1	BOTTOM CORNER WALL	6.75	2.21	1	BOTTOM SLAB	11.67	
		SNCOTTS3	27.250		1.29	35.05	1.40	1.69	1	TOP SLAB	5.07	1.29	1	TOP SLAB	11.34	
		SNAGGRS4	34.925		1.40	48.89	1.40	1.57	1	BOTTOM SLAB	12.35	1.40	1	BOTTOM SLAB	11.67	
		SNS5A	35.550		1.38	48.92	1.40	1.54	1	BOTTOM SLAB	12.35	1.38	1	BOTTOM SLAB	11.67	
		SNS6A	39.950		1.37	54.79	1.40	1.52	1	BOTTOM SLAB	12.35	1.37	1	BOTTOM SLAB	11.67	
		SNS7B	42.000		1.29	54.14	1.40	1.48	1	BOTTOM SLAB	12.35	1.29	1	BOTTOM SLAB	11.67	
	TRUCK TRACTOR SEMI-TRAILER (TTS1)	TNAGRIT3	33.000		1.49	49.06	1.40	1.72	1	BOTTOM SLAB	12.35	1.49	1	BOTTOM SLAB	11.67	
		TNT4A	33.075		1.48	48.81	1.40	1.66	1	BOTTOM SLAB	12.35	1.48	1	BOTTOM SLAB	11.67	
		TNT6A	41.600		1.35	56.29	1.40	1.62	1	BOTTOM SLAB	12.35	1.35	1	BOTTOM SLAB	11.67	
		TNT7A	42.000		1.29	54.31	1.40	1.51	1	BOTTOM SLAB	12.35	1.29	1	BOTTOM SLAB	11.67	
		TNT7B	42.000		1.40	58.99	1.40	1.57	1	BOTTOM SLAB	12.35	1.40	1	BOTTOM SLAB	11.67	
		TNAGRIT4	43.000	③	1.14	48.92	1.40	1.30	1	BOTTOM SLAB	12.35	1.14	1	BOTTOM SLAB	11.67	
		TNAGT5A	45.000		1.27	57.10	1.40	1.45	1	BOTTOM SLAB	12.35	1.27	1	BOTTOM SLAB	11.67	
TNAGT5B	45.000		1.16	52.37	1.40	1.35	1	BOTTOM SLAB	12.35	1.16	1	BOTTOM SLAB	11.67			

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	--

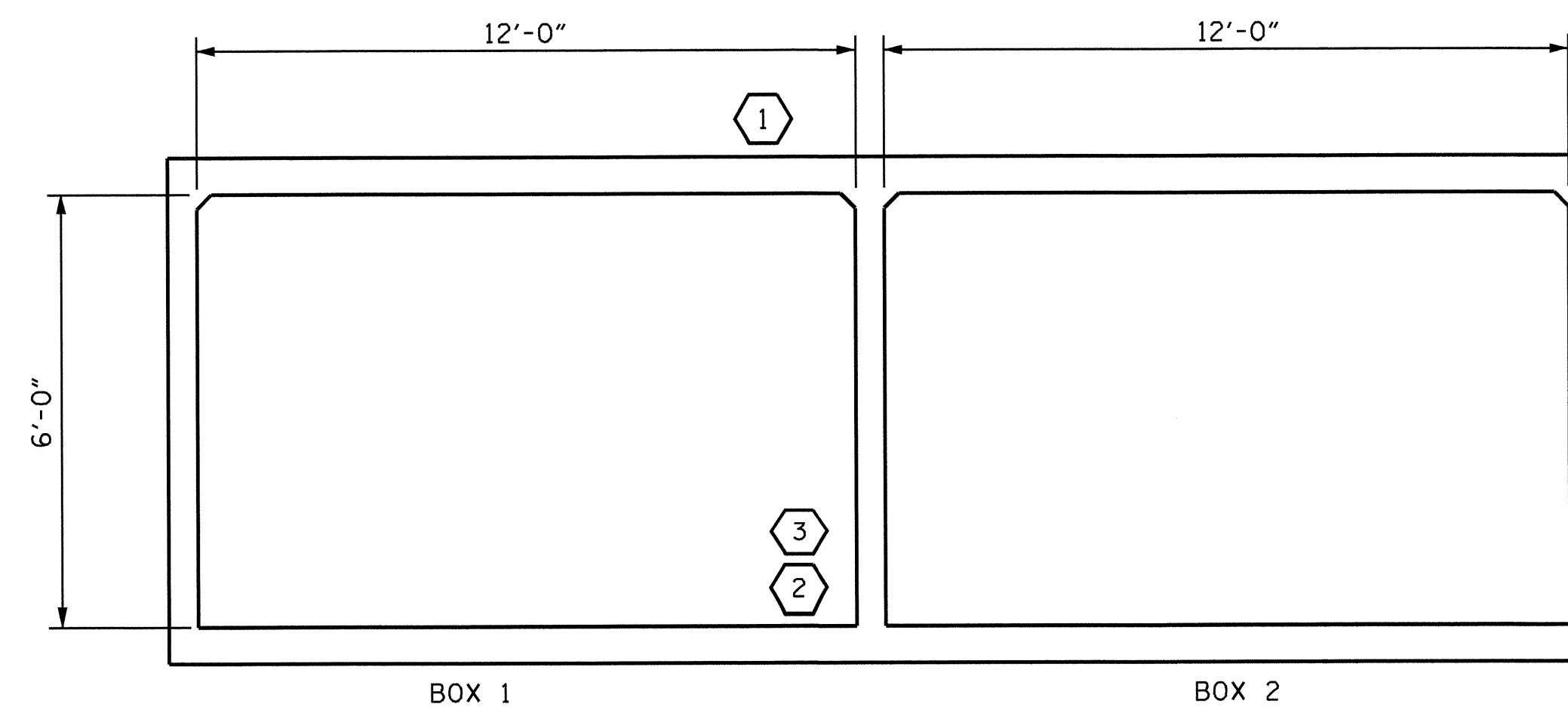
NOTE:

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

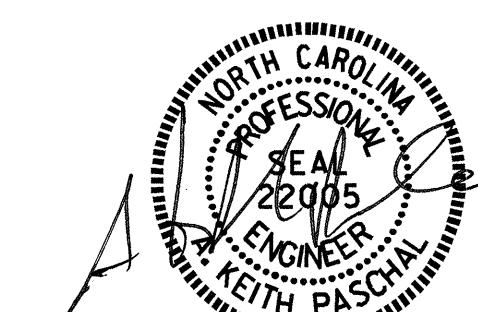


LRFR SUMMARY
(LOOKING DOWNSTREAM)

PROJECT NO. 17BP.2.R.21
LENOIR COUNTY
 STATION: 13+60.15 -L-

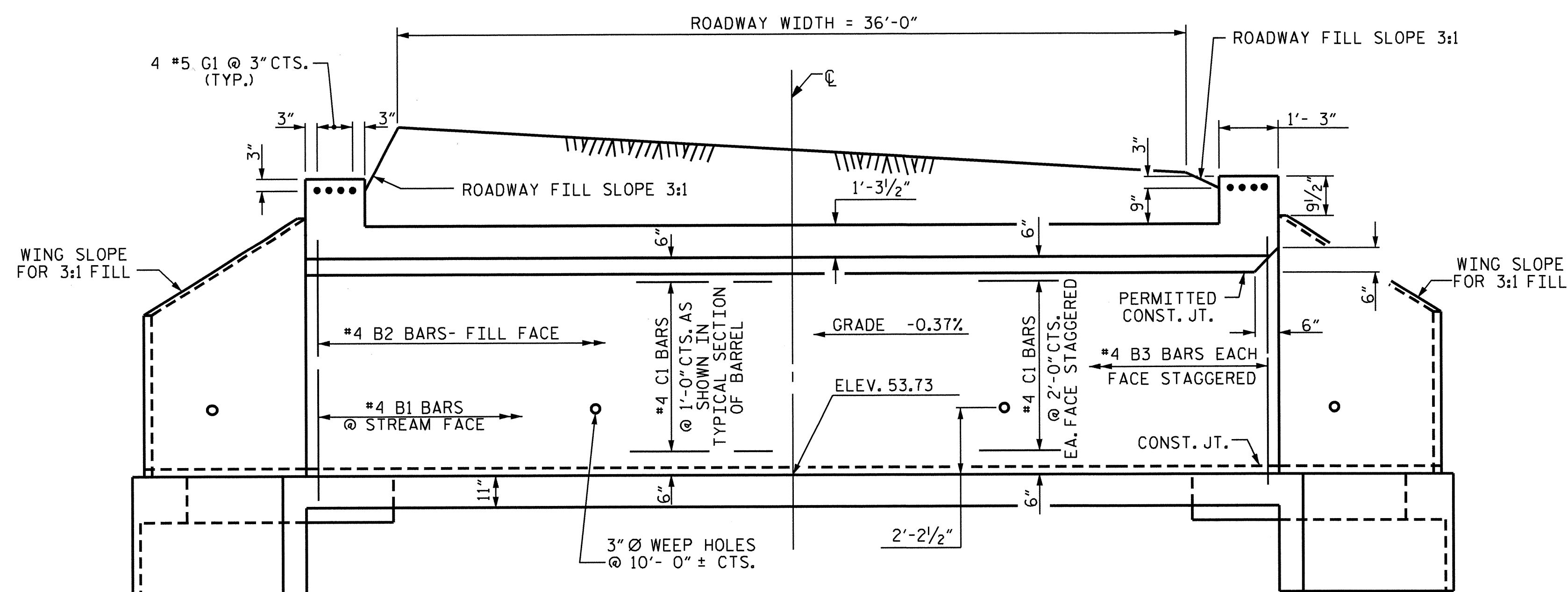
SHEET 2 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 LRFR SUMMARY FOR
 REINFORCED CONCRETE
 BOX CULVERTS
 (NON-INTERSTATE TRAFFIC)

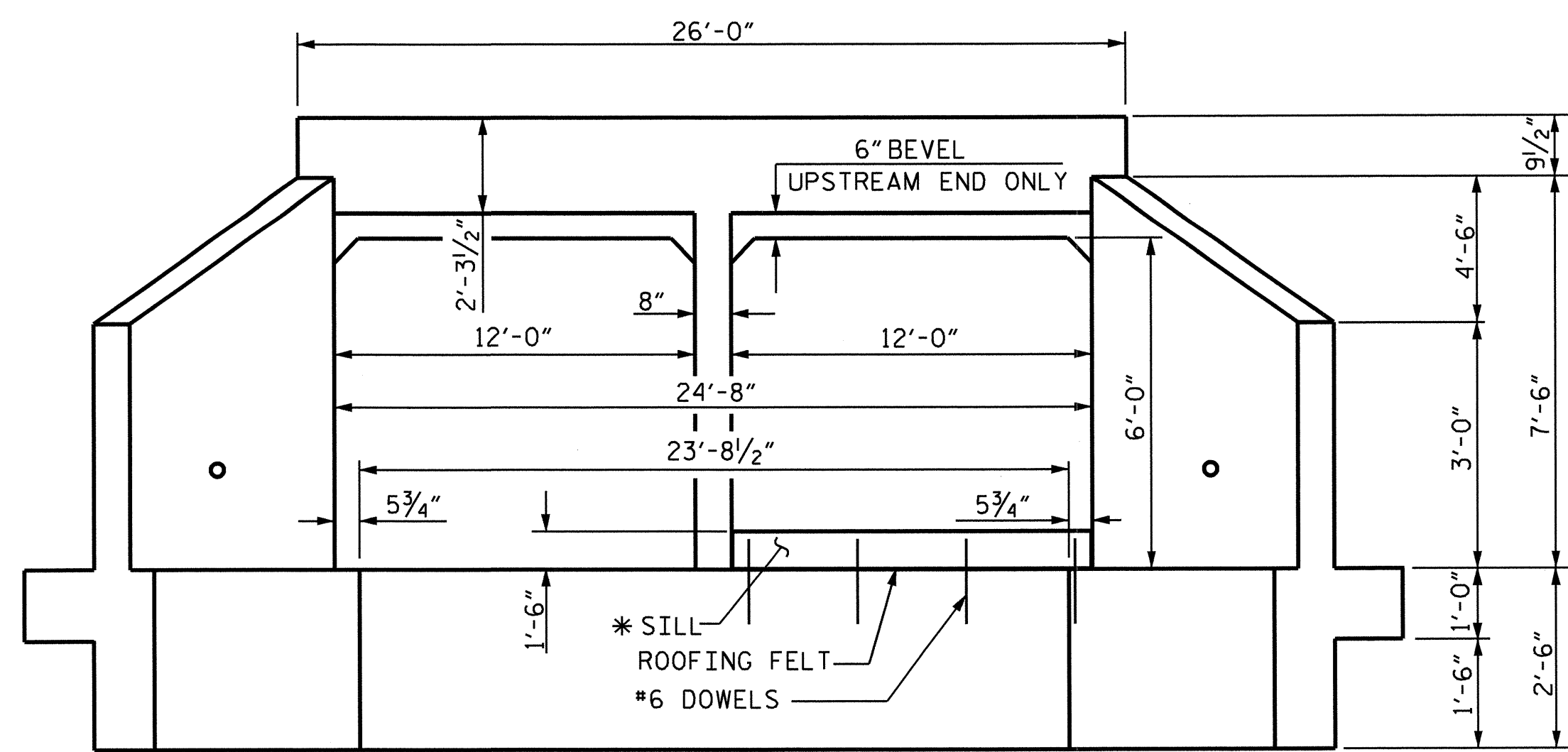


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-2
1			3			TOTAL SHEETS
2			4			5

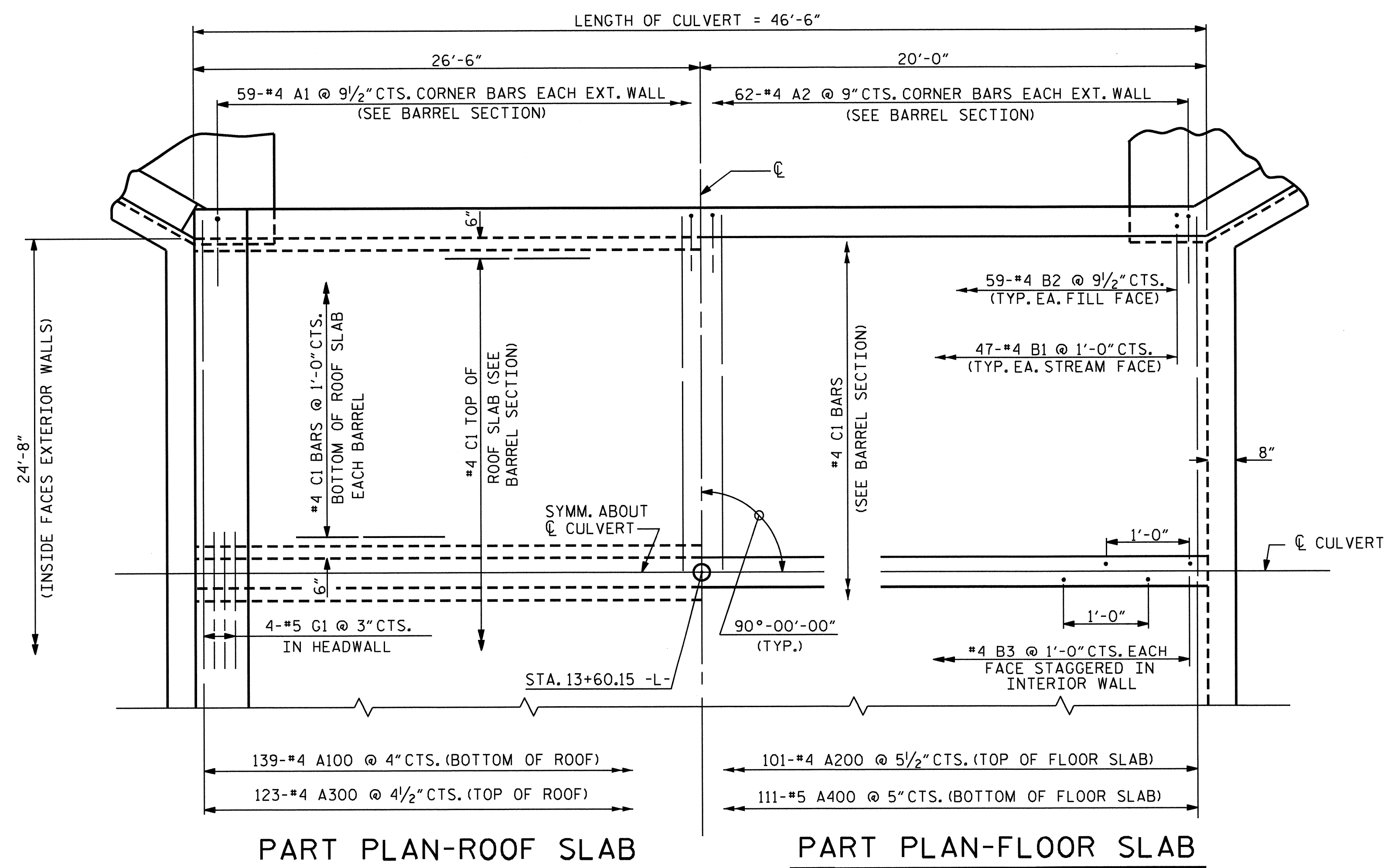
DRAWN BY: M. D. PISO DATE: 03-20-13
 CHECKED BY: M. M. AHMED DATE: 04-11-13
 DESIGN ENGINEER OF RECORD: B. L. GREEN DATE: 04-17-13



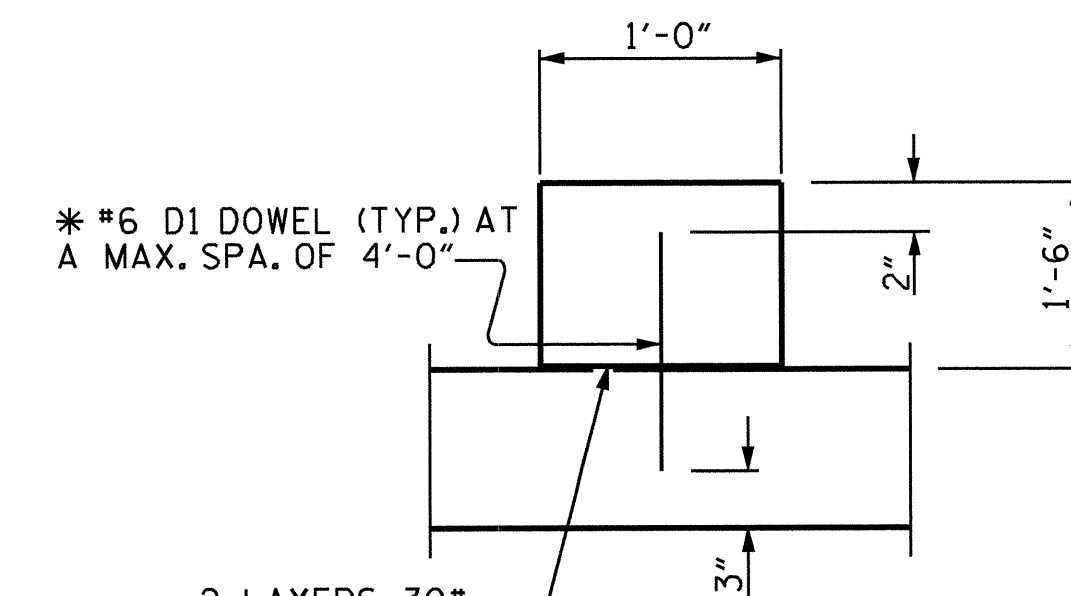
EXTERIOR WALL INTERIOR WALL
CULVERT SECTION NORMAL TO ROADWAY



END ELEVATION
 (SEE DETAIL "A" FOR LOW FLOW SILL)
 * WESTERN BARREL (BOTH ENDS)



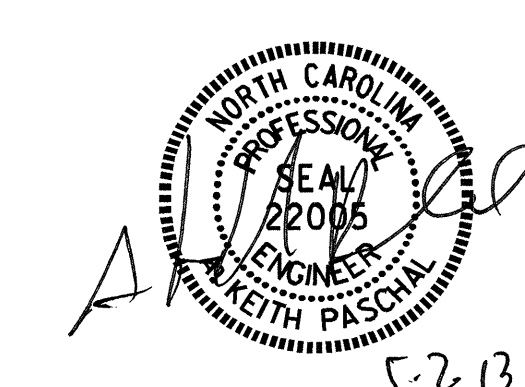
PART PLAN-ROOF SLAB PART PLAN-FLOOR SLAB



DETAIL "A" SECTION THROUGH SILL
 * #6 D1 DOWEL (TYP.) AT A MAX. SPA. OF 4'-0"
 2 LAYERS 30# ROOFING FELT TO PREVENT BOND (TYP.)
 * DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINISHED.

PROJECT NO. 17BP.2.R.21
LENOIR COUNTY
 STATION: 13+60.15 -L-

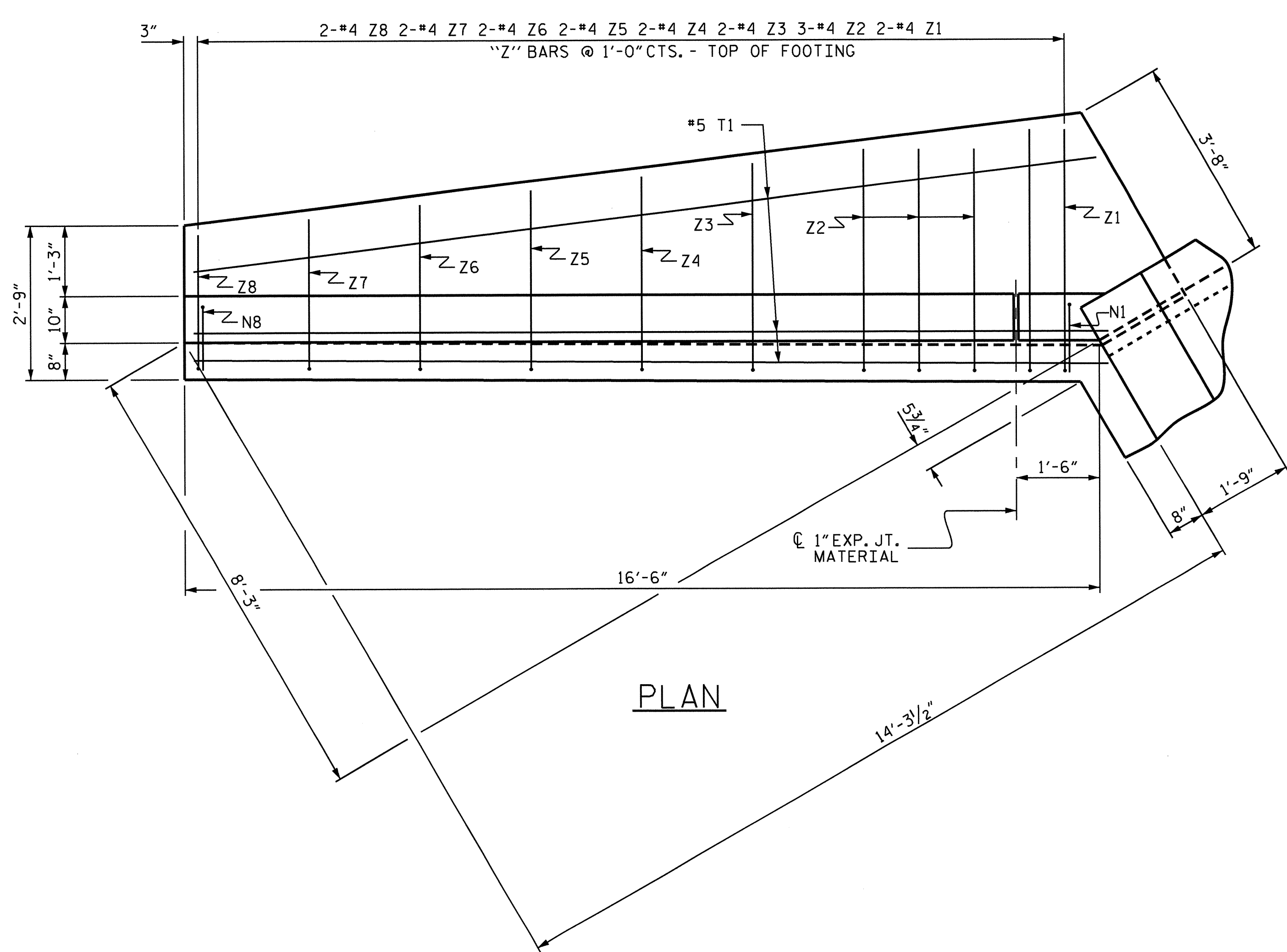
SHEET 3 OF 5
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 BARREL STANDARD
 DOUBLE 12 FT. X 6 FT.
 CONCRETE BOX CULVERT
 90° SKEW



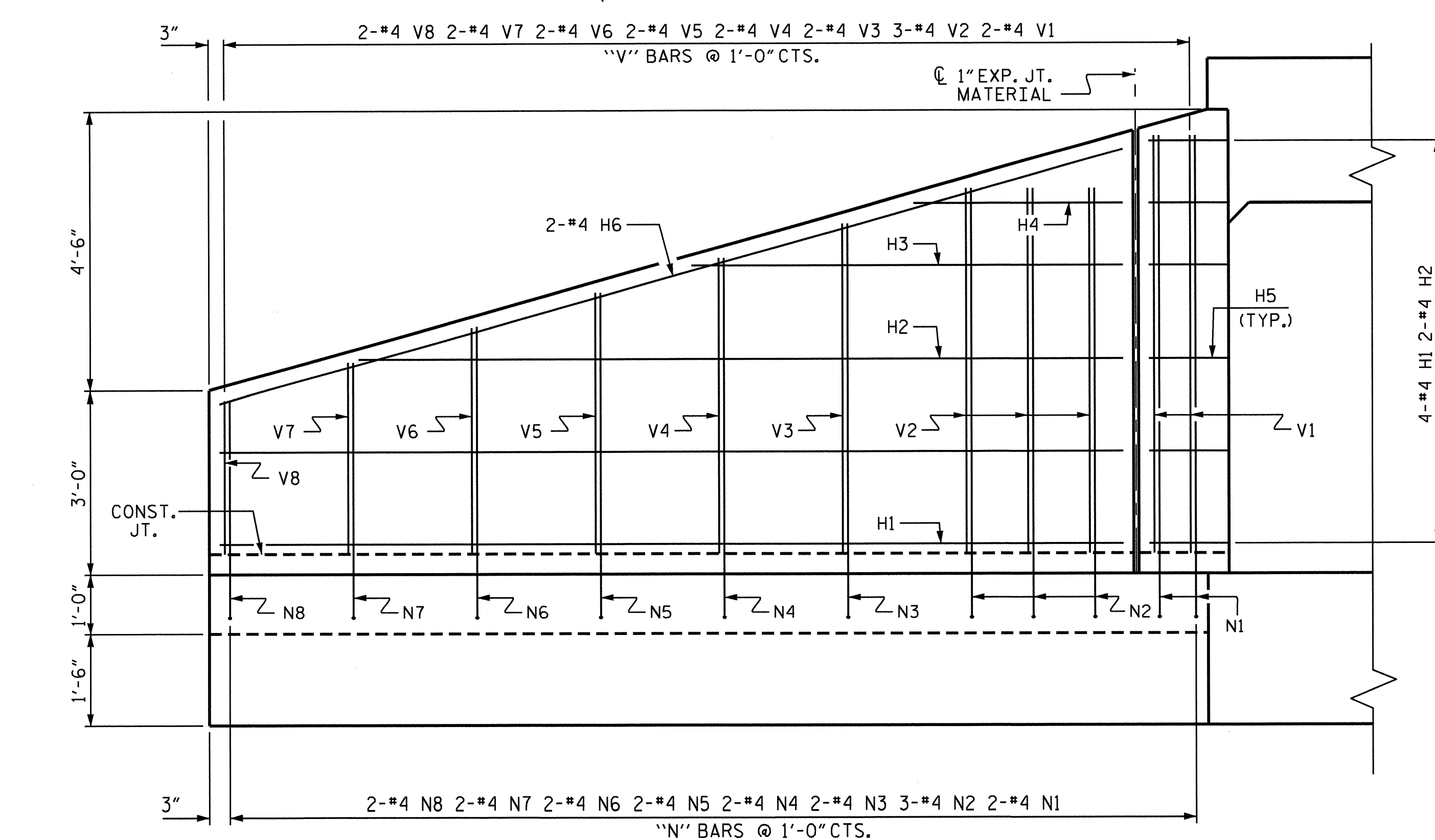
REVISED 11-19-99 BY M.M. CHECKED BY R.W.W.
 REDRAWN NOV. 1990 BY ISS CHECKED BY ARB

DRAWN BY: M. D. PISO DATE: 03-20-13
 CHECKED BY: M. M. AHMED DATE: 04-11-13
 DESIGN ENGINEER OF RECORD: B. L. GREEN DATE: 04-17-13

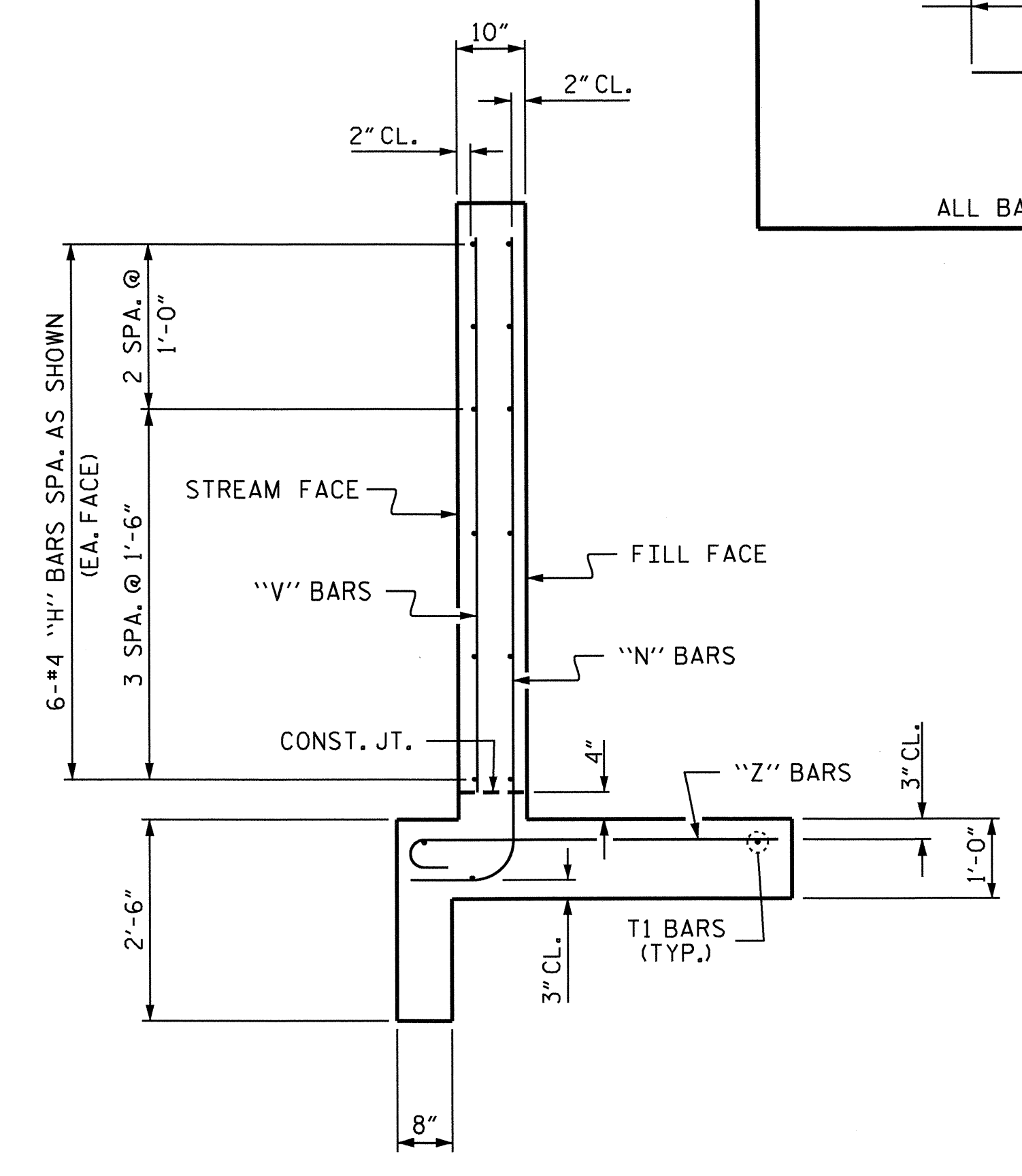
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-3
1			3			TOTAL SHEETS 5
2			4			



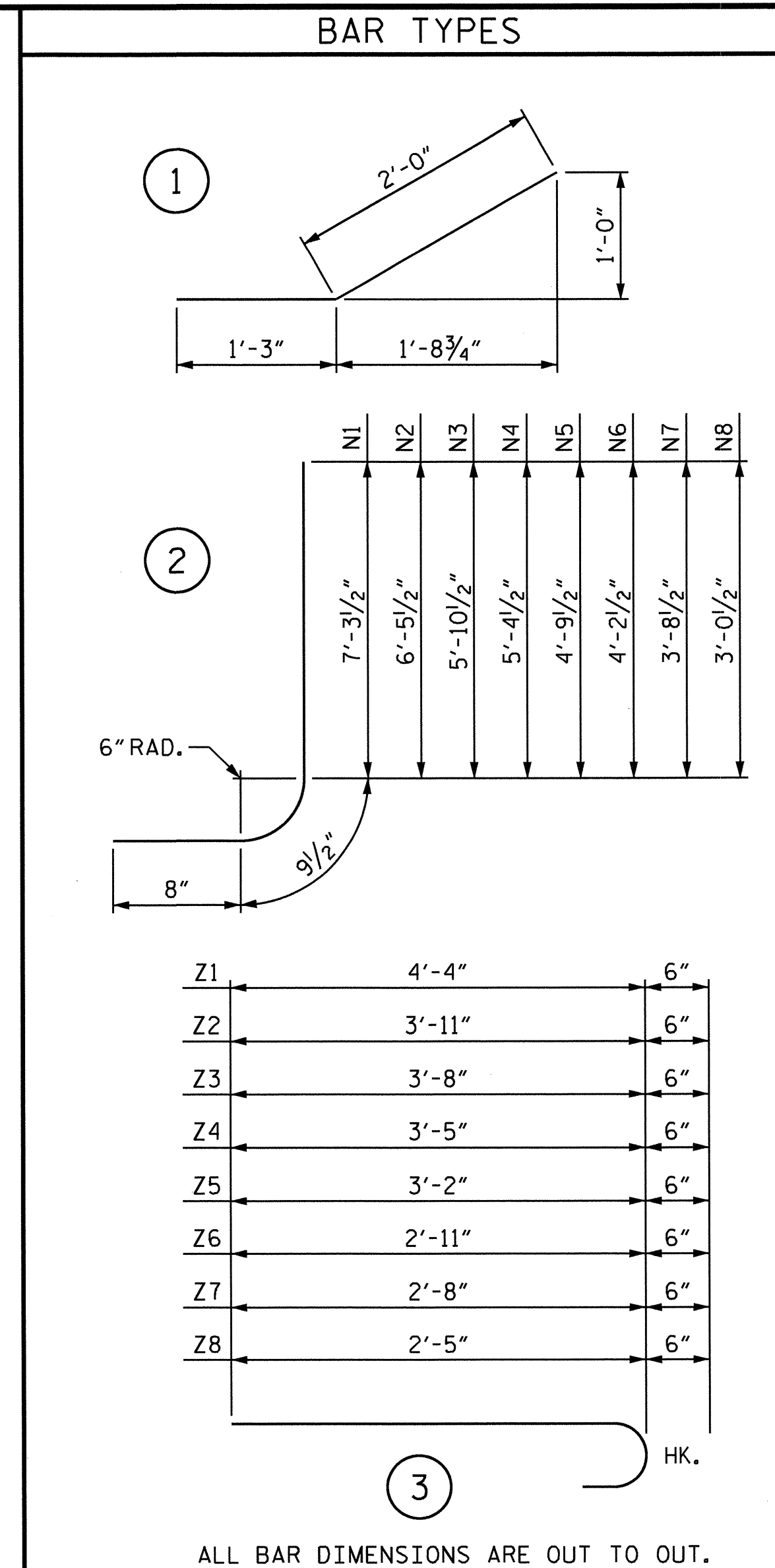
PLAN



ELEVATION



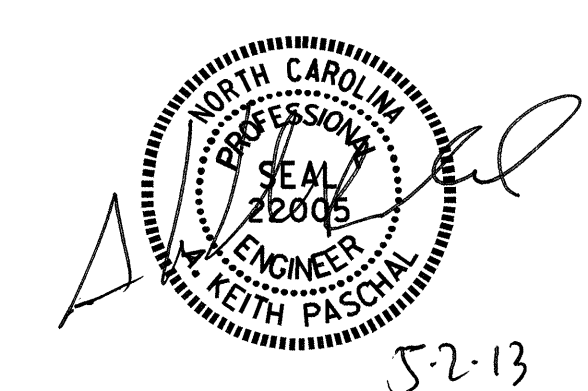
TYPICAL WING SECTION



BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	16	#4	STR	14'-7"	156
H2	8	#4	STR	12'-4"	66
H3	8	#4	STR	6'-11"	37
H4	8	#4	STR	3'-4"	18
H5	48	#4	1	3'-3"	104
H6	8	#4	STR	15'-2"	81
N1	8	#4	2	8'-9"	47
N2	12	#4	2	7'-11"	63
N3	8	#4	2	7'-4"	39
N4	8	#4	2	6'-10"	37
N5	8	#4	2	6'-3"	33
N6	8	#4	2	5'-8"	30
N7	8	#4	2	5'-2"	28
N8	8	#4	2	4'-6"	24
T1	12	#5	STR	16'-5"	205
V1	8	#4	STR	6'-9"	36
V2	12	#4	STR	5'-10"	47
V3	8	#4	STR	5'-4"	29
V4	8	#4	STR	4'-9"	25
V5	8	#4	STR	4'-2"	22
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	12	#4	3	4'-5"	35
Z3	8	#4	3	4'-2"	22
Z4	8	#4	3	3'-11"	21
Z5	8	#4	3	3'-8"	20
Z6	8	#4	3	3'-5"	18
Z7	8	#4	3	3'-2"	17
Z8	8	#4	3	2'-11"	16
REINFORCING STEEL FOR 4 WINGS					1,351 LBS.
CLASS A CONCRETE					
4 WINGS					22.9 CU. YDS.
2 HEADWALL					2.4 CU. YDS.
2 END CURTAIN WALL					2.9 CU. YDS.
2 SILLS					1.3 CU. YDS.
TOTAL					29.5 CU. YDS.

PROJECT NO. 17BP.2.R.21
 LENOIR COUNTY
 STATION: 13+60.15 -L-

SHEET 4 OF 5
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 WINGS FOR
 CONCRETE BOX CULVERT
 H = 6'-0" SLOPE = 3:1
 90° SKEW



DRAWN BY: M. D. PISO DATE: 03-19-13
 CHECKED BY: M. M. AHMED DATE: 04-11-13
 DESIGN ENGINEER OF RECORD: B. L. GREEN DATE: 04-17-13

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

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS SHALL CONSIST OF THE FOLLOWING COMPONENTS :

- 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 GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS DETAIL ARE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 P.S.I. AS AN OPTION, A 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

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 GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CLASS "A" CONCRETE.

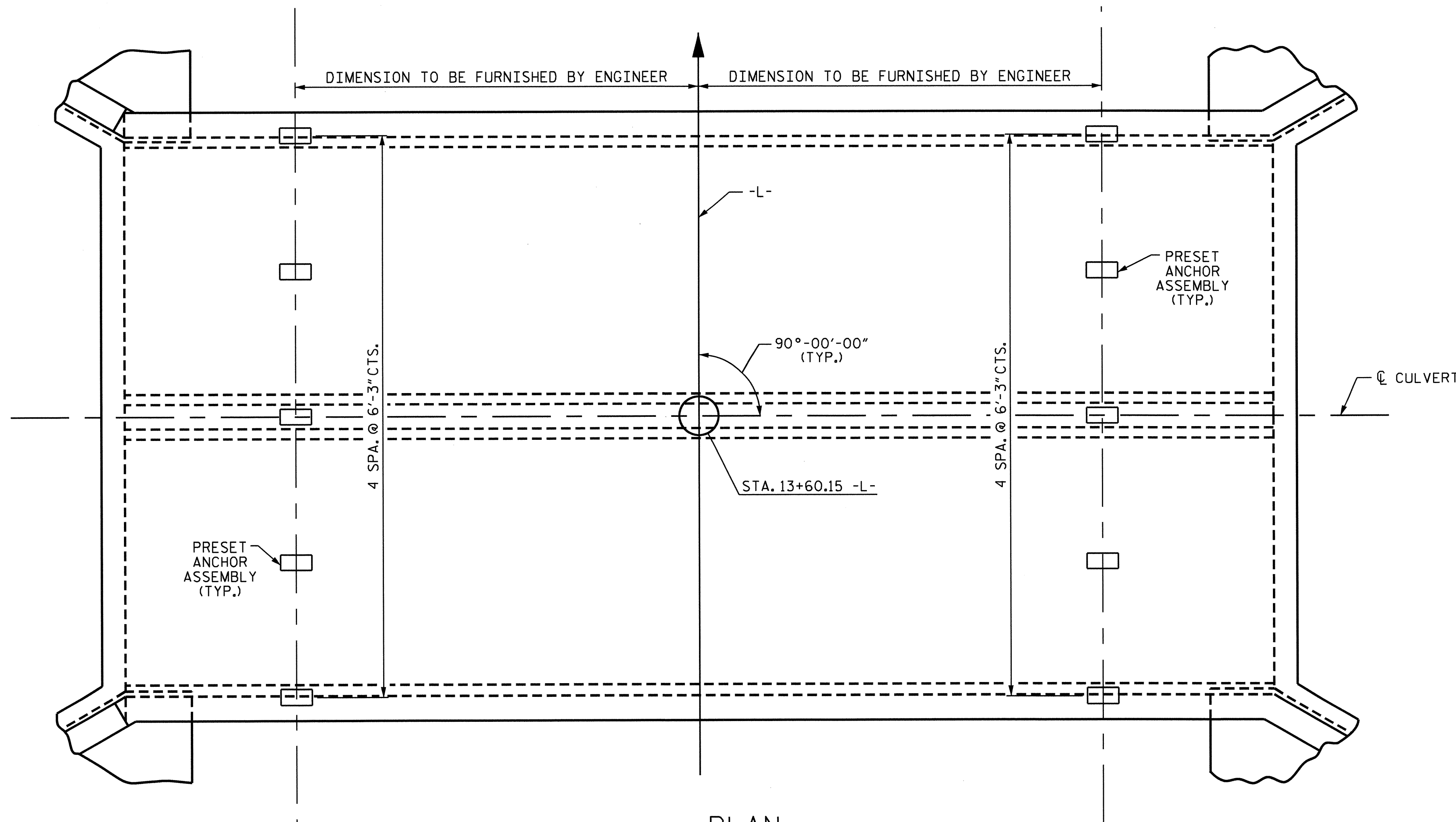
FERRULES TO BE PLUGGED DURING POURING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

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

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

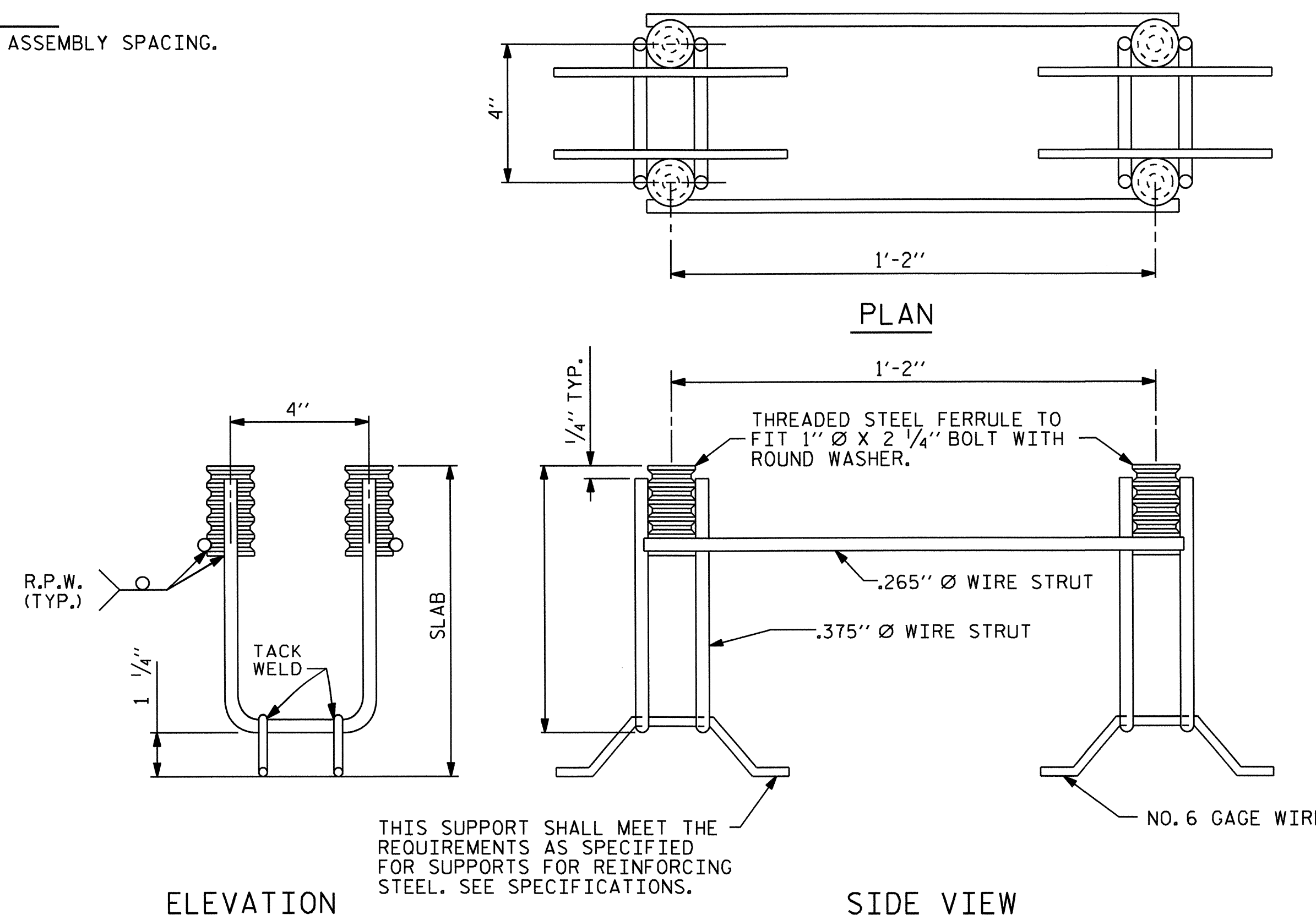
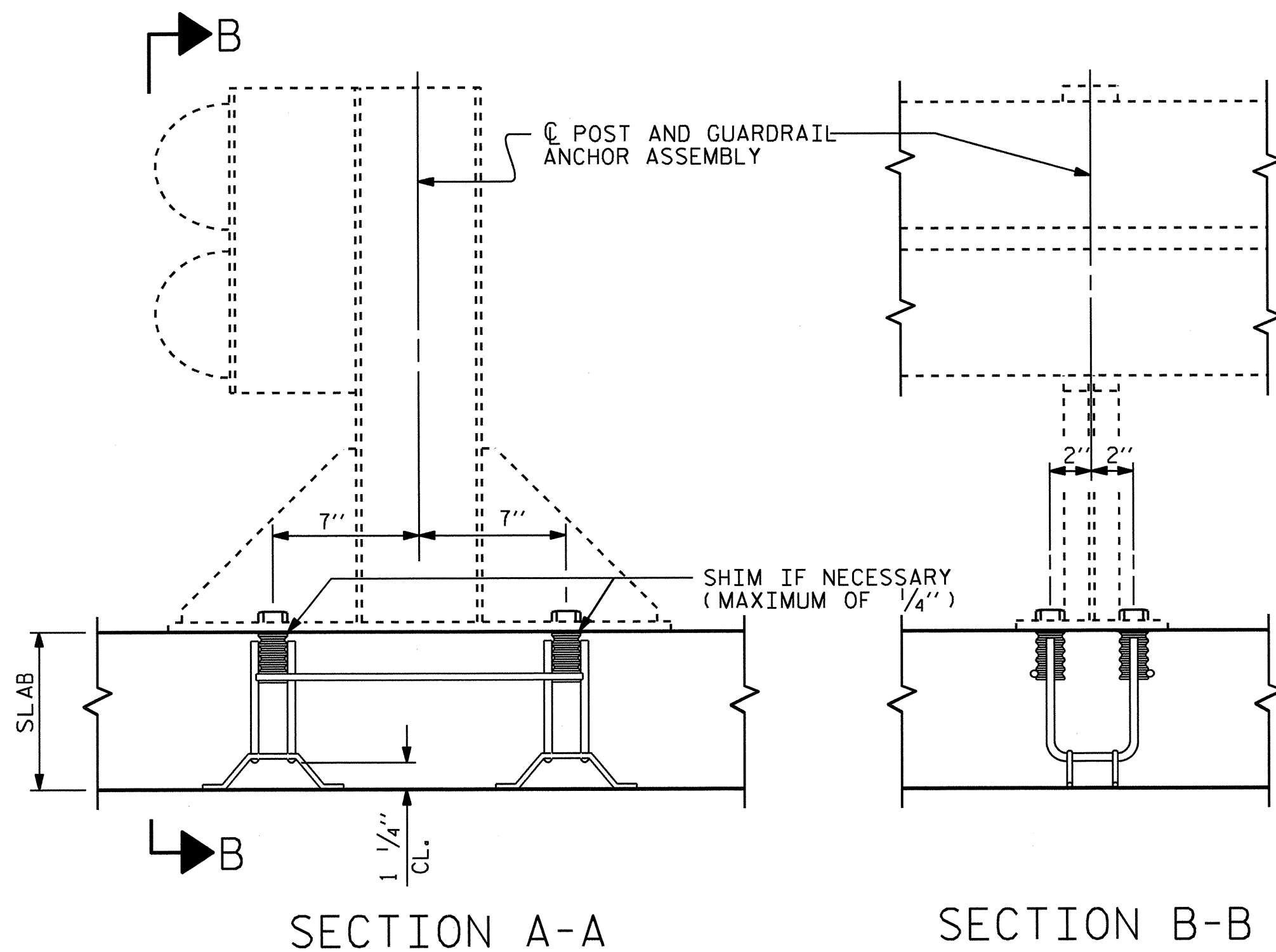
SLAB REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR GUARDRAIL ANCHOR ASSEMBLY. CARE SHOULD BE TAKEN TO KEEP THE SHIFTING OF REINFORCING STEEL TO A MINIMUM.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF GUARDRAIL ANCHOR ASSEMBLY. LEVEL TWO FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 1" Ø BOLT IS 21.8 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS.



PLAN

SHOWING : GUARDRAIL ANCHOR ASSEMBLY SPACING.

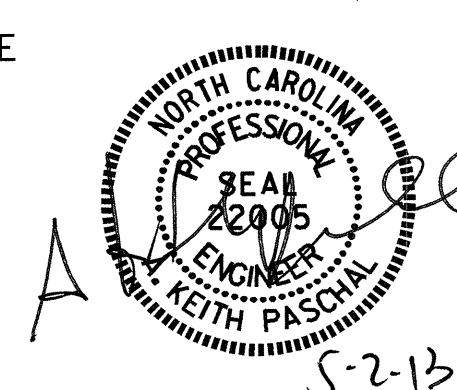


THIS SUPPORT SHALL MEET THE REQUIREMENTS AS SPECIFIED FOR SUPPORTS FOR REINFORCING STEEL. SEE SPECIFICATIONS.

PROJECT NO. 17BP.2.R.21
LENOIR COUNTY
STATION: 13+60.15 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
ANCHORAGE DETAILS FOR
GUARDRAIL ANCHOR ASSEMBLY
FOR CULVERTS



ASSEMBLED BY : B. L. GREEN	DATE : 05-02-13
CHECKED BY : A. K. PASCHAL	DATE : 05-02-13
DRAWN BY : FCJ 6/88	REV. 5/7/03 RWW/JTE
CHECKED BY : ARB 6/88	REV. 5/1/06R KMM/GM
	REV. 10/1/11 MAA/GM

GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

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

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

SPECIAL NOTES:

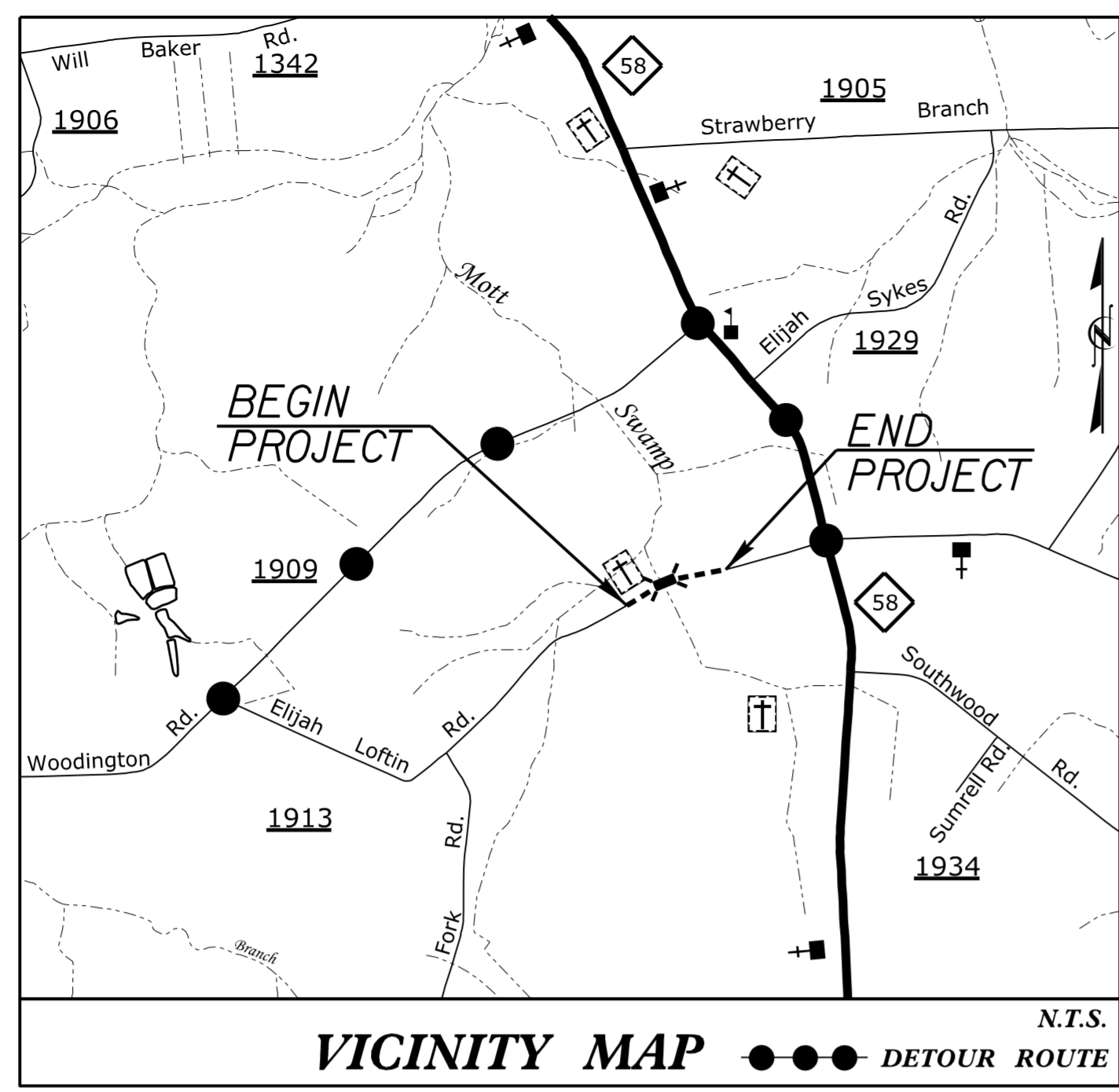
GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

ENGLISH

JANUARY, 1990

09.02B/99

TIP PROJECT: 17BP.2.R.21



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

**UTILITIES BY OTHERS PLANS
LENOIR COUNTY**

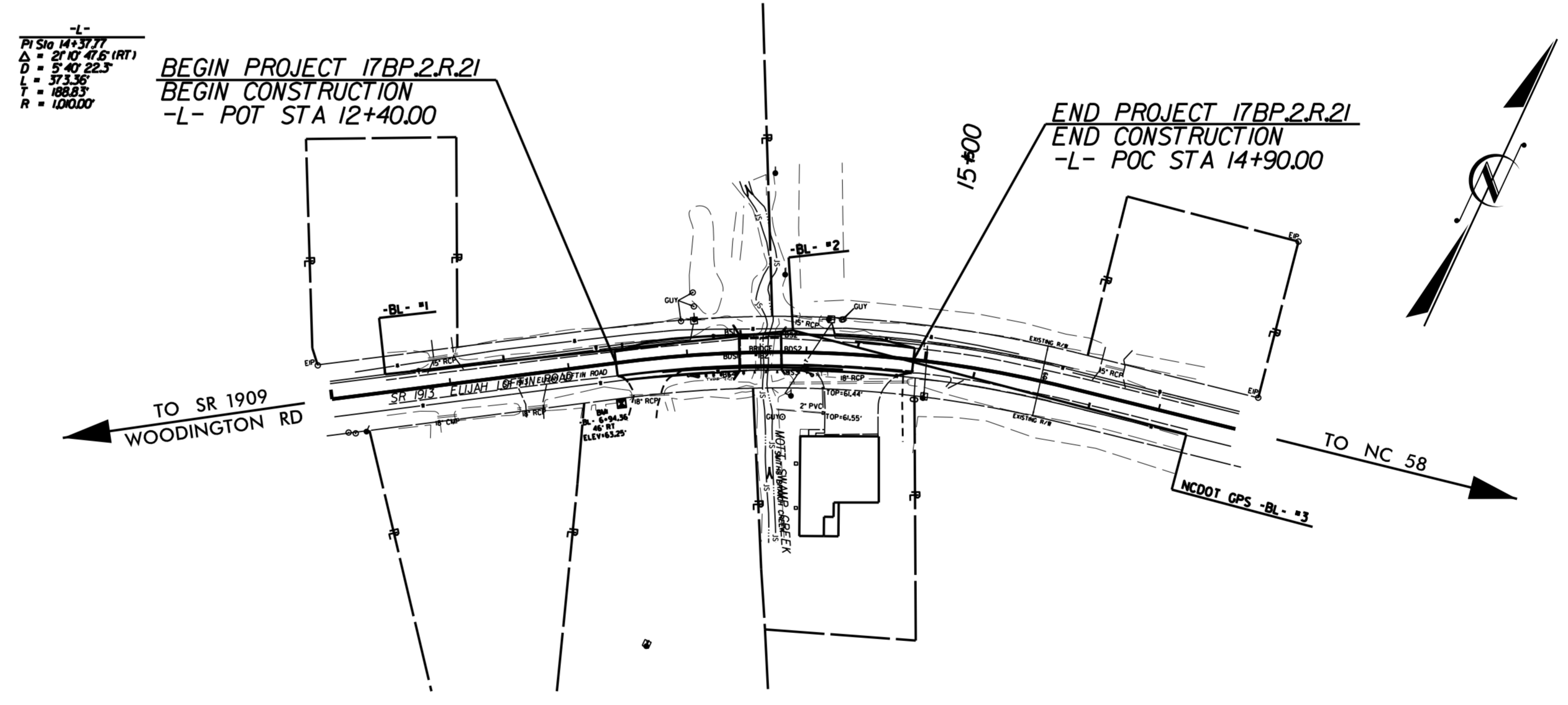
**LOCATION: BRIDGE NO. 162 ON SR 1913 (ELIJAH LOFTIN RD.)
OVER MOTT SWAMP CREEK**

TYPE OF WORK: UTILITY BY OTHERS RELOCATION

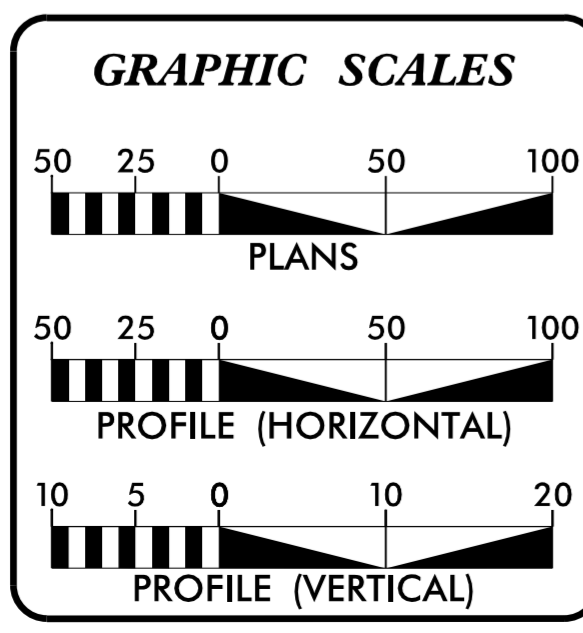
T.I.P. NO.	SHEET NO.
17BP.2.R.21	UO-1

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

DATE: OCTOBER 3, 2013



10/3/2013 2:08:52 PM P:\095\0696\04\13700 - LENOIR 162\Lenoir_BR-162\Utilities\RDy_Ut\Proj\UB0 Plans\530162_UO-01-fsh.dgn



INDEX OF SHEETS

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

UTILITY OWNERS ON PROJECT

- (1) POWER - CITY OF KINSTON
- (2) TELEPHONE - CENTURYLINK
- (3) CABLE TV - SUDDENLINK

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:
MARIA ROGERSON, P.E.

PREPARED FOR:
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION BRIDGE PROGRAM

UTILITIES BY OTHERS

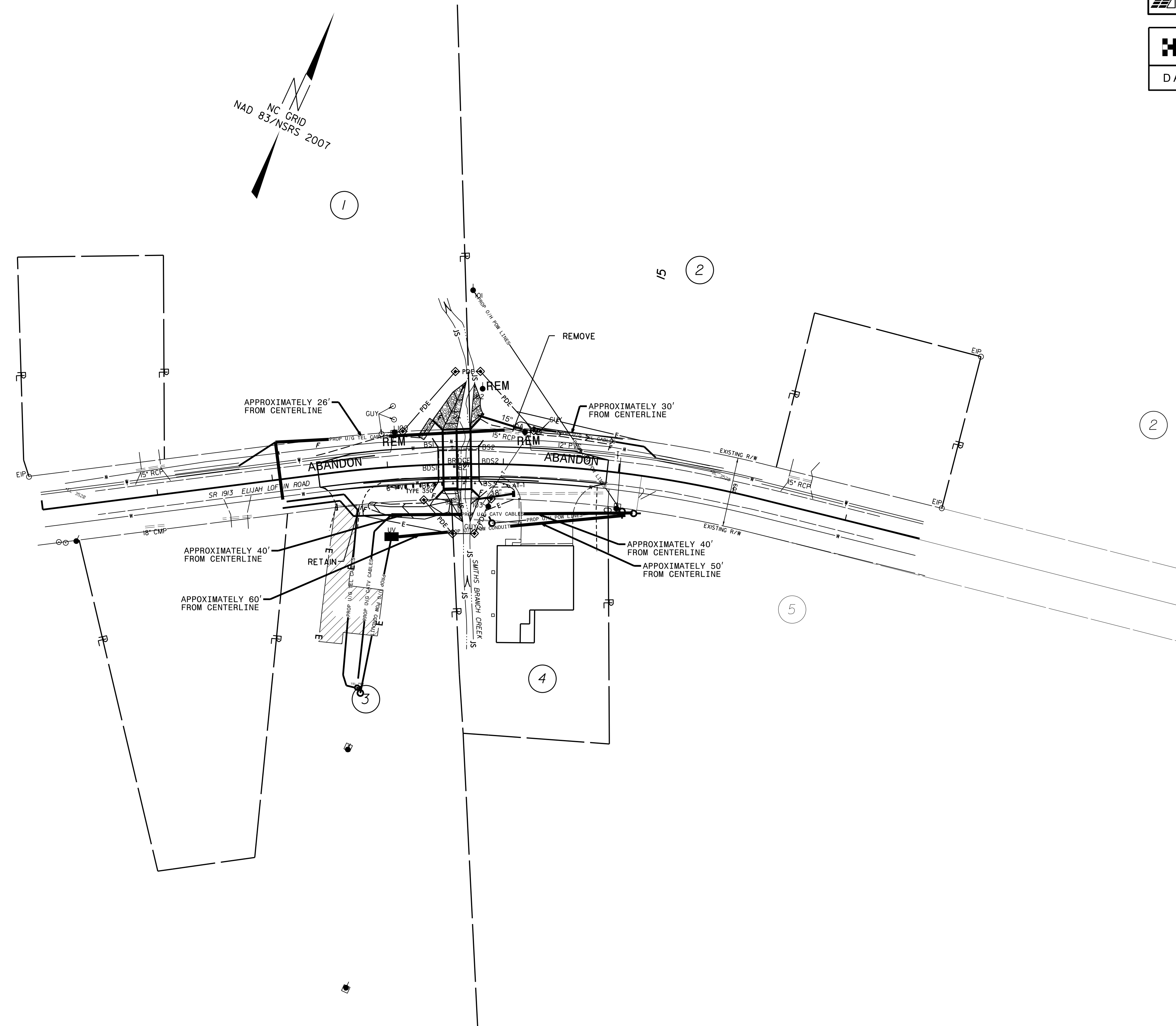
NOTE:
ALL PROPOSED UTILITY WORK
SHOWN ON THIS SHEET WILL
BE DONE BY OTHERS

MA Engineering CONSULTANTS, INC. 598 E. Chatham Street, Suite 137, Cary, N. C. 27511

HNTB HNTB NORTH CAROLINA, P.C. 343 E. SIX FORKS ROAD, SUITE 200, RALEIGH, NORTH CAROLINA 27609, NC LICENSE NO: C-1554

DATE: OCTOBER 3, 2013

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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.2.R.21	UC-01	6

UTILITY DESIGN ENGINEER



2013-MAY-06

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

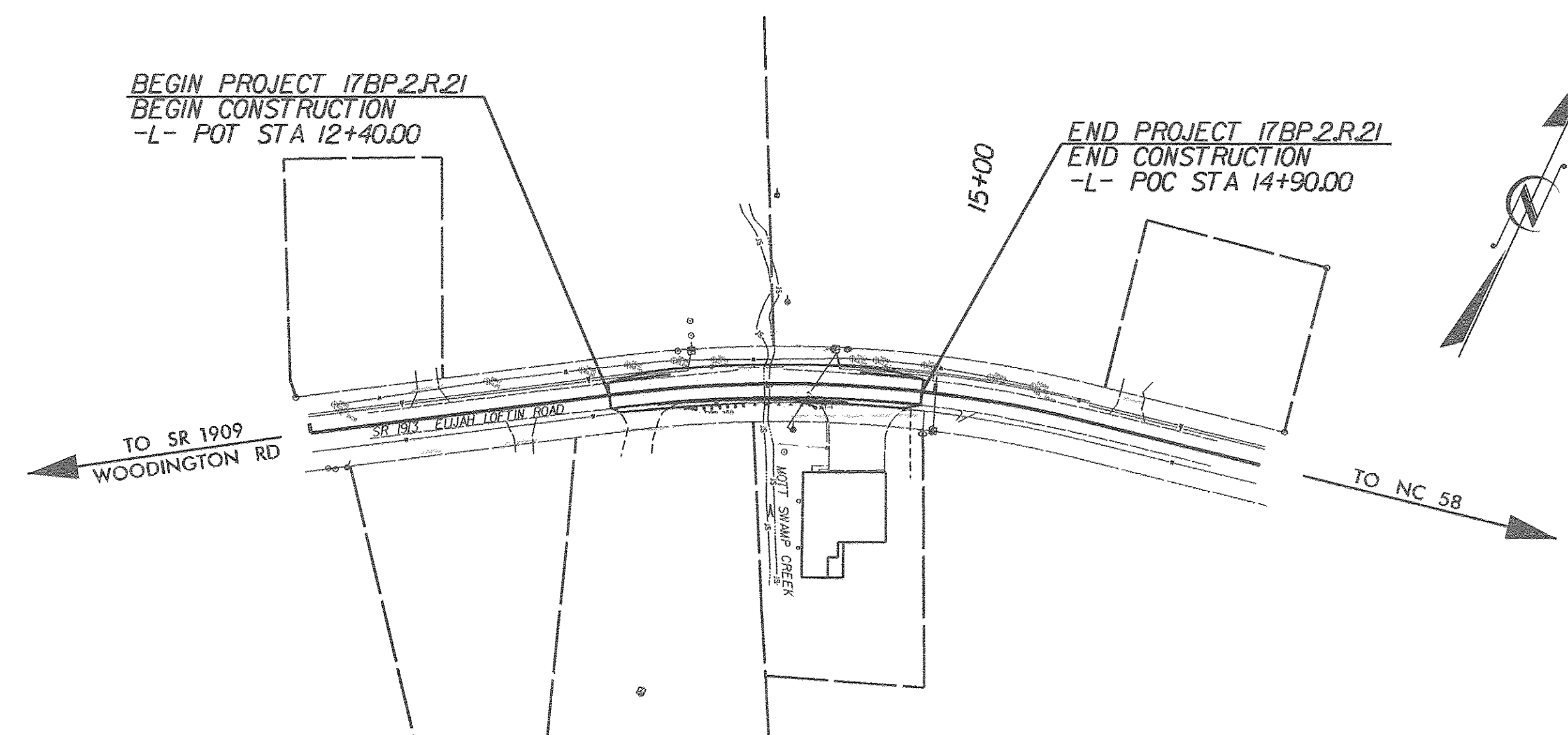
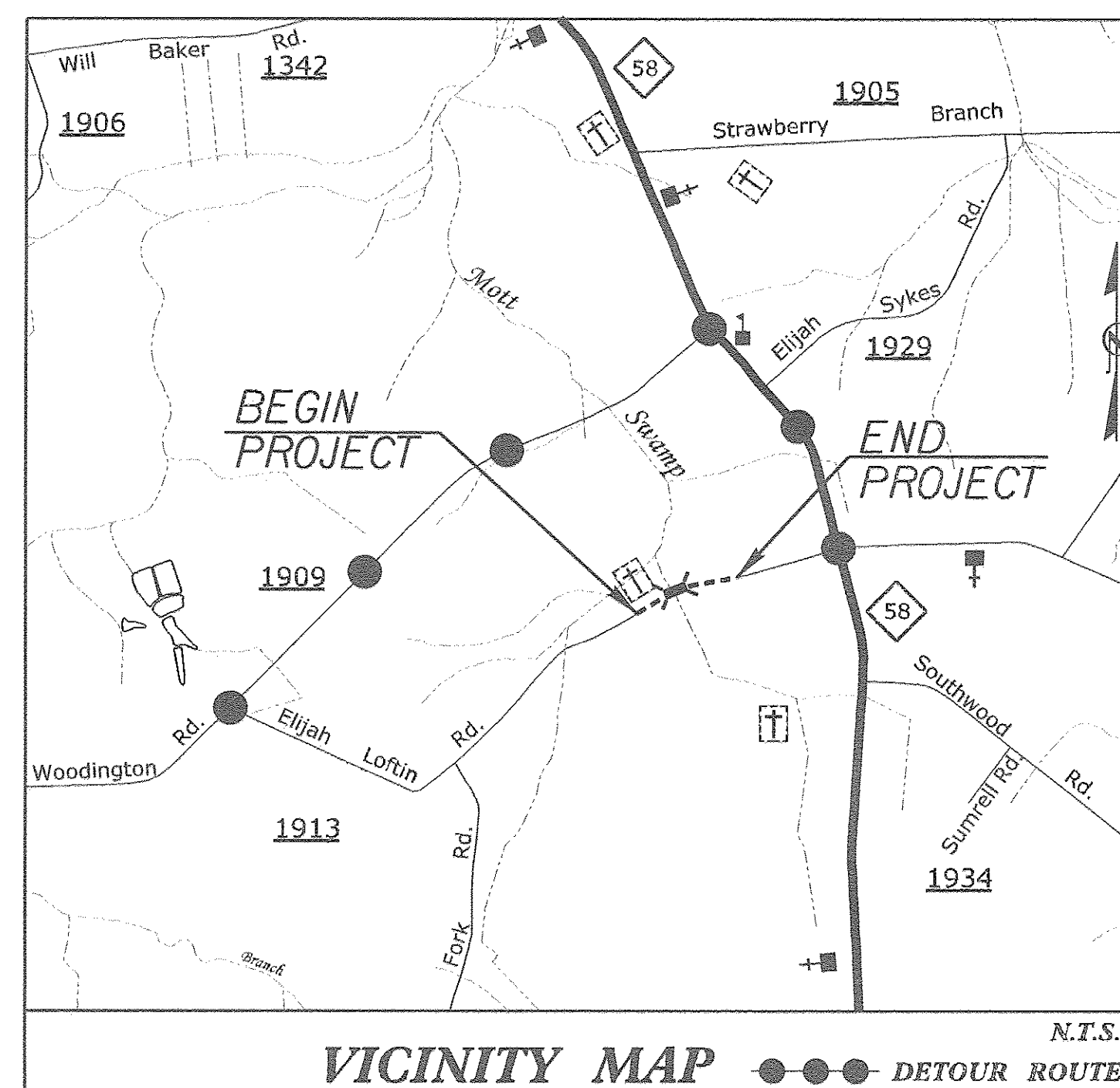
DATE: APRIL 17, 2012

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

LENOIR COUNTY

LOCATION: BRIDGE NO. 162 OVER MOTT SWAMP CREEK
ON SR 1913 (ELIJAH LOFTIN RD.)

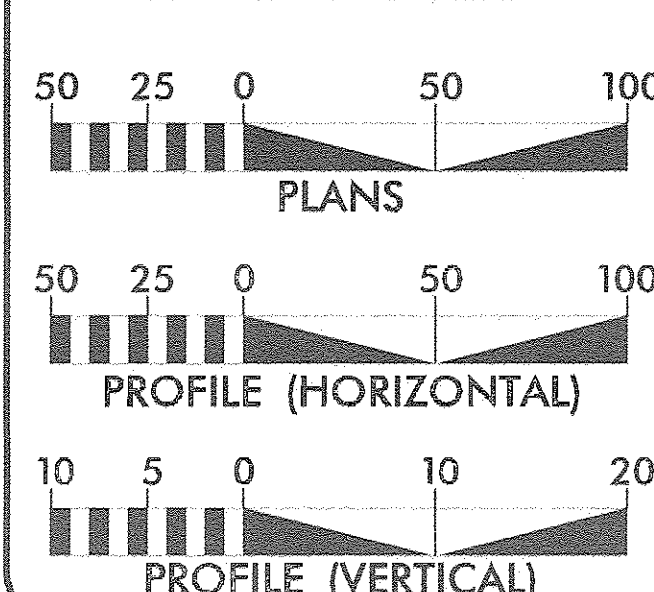
TYPE OF WORK: UTILITIES CONSTRUCTION



CONTRACT: TIP PROJECT: 17BP.2.R.21

CONTRACT: TIP PROJECT: 17BP.2.R.21

GRAPHIC SCALES



PROJECT LENGTH

LENGTH ROADWAY OF TIP PROJECT 17BP.2.R.21 = 0.05 MI.
LENGTH OF STRUCTURE TIP PROJECT 17BP.2.R.21 = 0.00 MI.
TOTAL LENGTH OF TIP PROJECT 17BP.2.R.21 = 0.05 MI.

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
UC-01	TITLE SHEET
UC-02	SYMBOLOLOGY SHEET
UC-03	GENERAL NOTES SHEET
UC-03A TO UC-03B	DETAIL SHEETS
UC-04	PLAN SHEETS

UTILITY OWNERS ON PROJECT

WATER - DEEP RUN WATER CORP.

UTILITY DESIGN BY:

MA Engineering
CONSULTANTS, INC.
598 East Chatham Street, Suite 137 Cary, NC 27511
Phone: 919.297.0220 Fax: 919.297.0221

NC DOT PROJECT ENGINEER:
AMANDA GLYNN, P.E.

PREPARED FOR:
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION BRIDGE PROGRAM

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS



2013-MAY-06

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

Water Line (Sized as Shown)	
11 1/4 Degree Bend	
22 1/2 Degree Bend	
45 Degree Bend	
90 Degree Bend	
Plug	
Tee	
Cross	
Reducer	
Gate Valve	
Butterfly Valve	
Tapping Valve	
Line Stop	
Line Stop with Bypass	
Blow Off	
Fire Hydrant	
Relocate Fire Hydrant	
Remove Fire Hydrant	
Water Meter	
Relocate Water Meter	
Remove Water Meter	
Water Pump Station	
RPZ Backflow Preventer	
DCV Backflow Preventer	
Relocate RPZ Backflow Preventer	
Relocate DCV Backflow Preventer	

PROPOSED SEWER SYMBOLS

Gravity Sewer Line (Sized as Shown)	
Force Main Sewer Line (Sized as Shown)	
Manhole (Sized per Note)	
Sewer Pump Station	

PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

Power Pole	
Telephone Pole	
Joint Use Pole	
Telephone Pedestal	
Utility Line by Others (Type as Shown)	
Trenchless Installation	
Encasement by Open Cut	
Encasement	

EXISTING UTILITIES SYMBOLS

Power Pole	
Telephone Pole	
Joint Use Pole	
Utility Pole	
Utility Pole with Base	
H-Frame Pole	
Power Transmission Line Tower	
Water Manhole	
Power Manhole	
Telephone Manhole	
Sanitary Sewer Manhole	
Hand Hole for Cable	
Power Transformer	
Telephone Pedestal	
CATV Pedestal	
Gas Valve	
Gas Meter	
Located Miscellaneous Utility Object	
Abandoned According to Utility Records	
End of Information	

Thrust Block	
Air Release Valve	
Utility Vault	
Concrete Pier	
Steel Pier	
Plan Note	
Pay Item Note	

*Underground Power Line	
*Underground Telephone Cable	
*Underground Telephone Conduit	
*Underground Fiber Optics Telephone Cable	
*Underground TV Cable	
*Underground Fiber Optics TV Cable	
*Underground Gas Pipeline	
Aboveground Gas Pipeline	
*Underground Water Line	
Aboveground Water Line	
*Underground Gravity Sanitary Sewer Line	
Aboveground Gravity Sanitary Sewer Line	
*Underground SS Forced Main Line	
Underground Unknown Utility Line	
SUE Test Hole	
Water Meter	
Water Valve	
Fire Hydrant	
Sanitary Sewer Cleanout	

*For Existing Utilities
Utility Line Drawn from Record (Type as Shown)
Designated Utility Line (Type as Shown)

REV: 2/1/2012

UTILITY CONSTRUCTION

GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2012.
2. THE EXISTING UTILITIES BELONG TO DEEP RUN WATER CORP.

CONTACT: JAMIE CANNON
PHONE: (252) 939-6270
3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL AND NATURAL RESOURCES, DIVISION OF ENVIRONMENTAL HEALTH. ALL SEWER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES, DIVISION OF WATER QUALITY. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.
4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.
5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPROTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

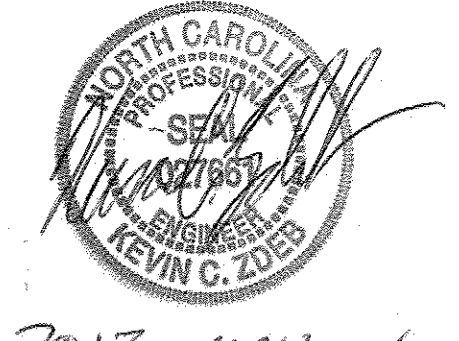
6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITONAL COST TO THE DEPARTMENT.
7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.
8. MAKE CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.
9. ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, " SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.
10. CONTRACTOR SHALL NOT OPERATE ANY VALVES ON THE EXISTING UTILITY SYSTEMS. CONTRACTOR SHALL CONTACT THE UTILITY OWNER TO CONDUCT STRATEGIC OPERATION OF VALVES FOR SERVICE INTERRUPTION IN ORDER TO PERFORM SPECIFIC WORK.

PROJECT SPECIFIC NOTES:

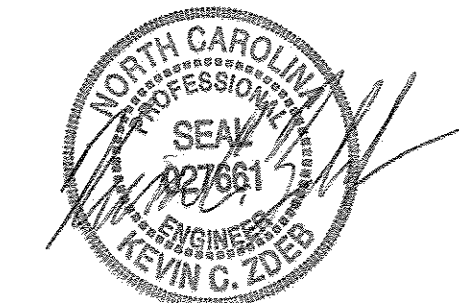
1. PROPOSED 12" WATER LINE SHALL BE DUCTILE IRON RESTRAINED JOINT (D.I.R.J.) PIPE.
2. ALL WATER LINE PIPE FOR TRENCHLESS CONSTRUCTION SHALL BE HDPE DR-9 WITH A MINIMUM INTERNAL DIAMETER EQUAL TO OR GREATER THAN THE INTERNAL DIAMETER OF THE EXISTING PIPE.
3. ALL PROPOSED FITTINGS (BENDS, TEES, CROSSES, REDUCERS, PLUGS, ETC.) SHALL BE ADEQUATELY RESTRAINED BY THE USE OF RESTRAINED JOINT CONSTRUCTION AND/OR CAST IN PLACE CONCRETE THRUST RESTRAINS AS DETAILED ON THESE DRAWINGS, OR AS DIRECTED BY THE RESIDENT ENGINEER.
4. CONTRACTOR'S ATTENTION IS DIRECTED TO SECTIONS 102, 107, AND 1550 OF THE STANDARD SPECIFICATIONS CONCERNING TRENCHLESS INSTALLATION. IT IS CONTRACTOR'S RESPONSIBILITY TO HAVE BORE PATH DESIGNED AND SEALED BY A LICENSED NORTH CAROLINA PROFESSIONAL ENGINEER. NO DAMAGE IS ALLOWED TO RIVER, WETLANDS, OR BUFFER ZONES.
5. IF HDPE PIPE IS INSTALLED BY DIRECTIONAL DRILL. IT SHALL BE FILLED WITH WATER AND NOT BE CONNECTED TO ANY OTHER PIPE OR FITTINGS FOR 24 HOURS FROM THE TIME OF INSTALLATION.
6. THE EXISTING 12" PVC LINE SHALL BE RESTRAINED ON THE PORTION TO REMAIN AFTER VALVE INSTALLATION. THE CONTRACTOR SHALL EXCAVATE THE EXISTING PVC LINE AND INSTALL THE BELL RESTRAINT CLAMPS AT EVERY BELL JOINT FOR THE DISTANCE NOTED IN THE DETAILS ON SHEET UC-3B.
7. PIPE TRANSITION FROM HDPE TO EXISTING PVC LINE SHALL BE MADE USING A MINIMUM OF 2 JOINTS OF DUCTILE IRON PIPE LAID HORIZONTALLY. SEE DETAIL ON SHEET UC-3B.

PROJECT QUANTITIES

Job Name: 17BP.1.R.21		Date: 4/17/2013	
Item Number	Description	Quantity	
5326200000-E	12" WATER LINE	124	LF
5326600000-E	16" WATER LINE	368	LF
5558000000-E	12" VALVE	2	EA
5649000000-N	RECONNECT WATER METER	1	EA
5804000000-E	ABANDON 12" UTILITY PIPE	488	LF
5871900000-E	TRENCHLESS INSTALLATION OF 16" PIPE IN SOIL	184	LF
5871910000-E	TRENCHLESS INSTALLATION OF 16" PIPE NOT IN SOIL	184	LF

PROJECT REFERENCE NO. 17BP.1.R.21	SHEET NO. UC-3
UTILITY DESIGN ENGINEER	
 2013-MAY-06	
MA Engineering CONSULTANTS, INC. 598 E. Chatham Street, Suite 137, Cary, N. C. 27511	
HNTB HNTB NORTH CAROLINA, P. C. 348 E. SIX FORKS ROAD, SUITE 200, RALEIGH, NORTH CAROLINA 27609, NC LICENSE NO: C-1054	
DATE: APRIL 17, 2013	

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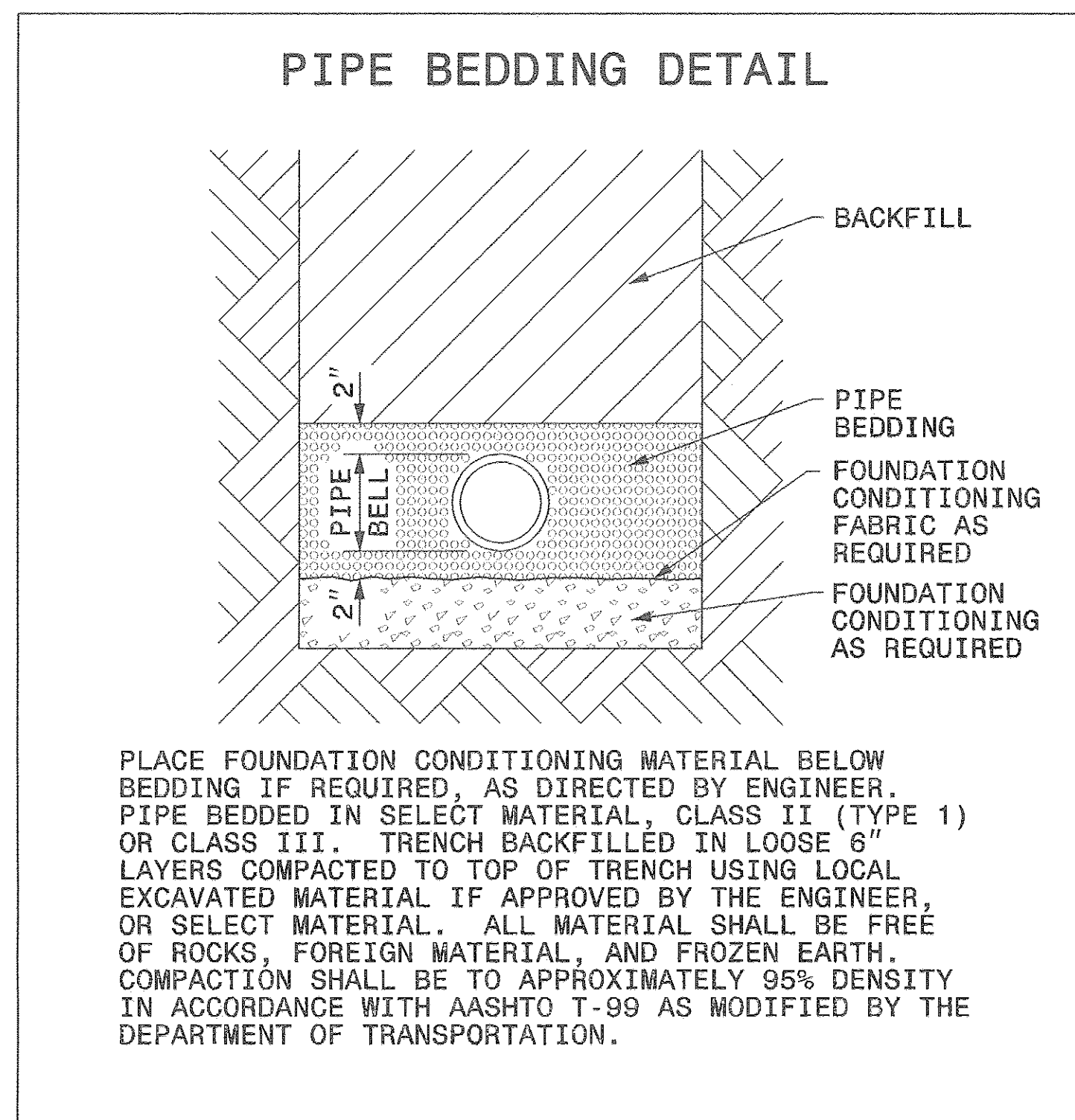
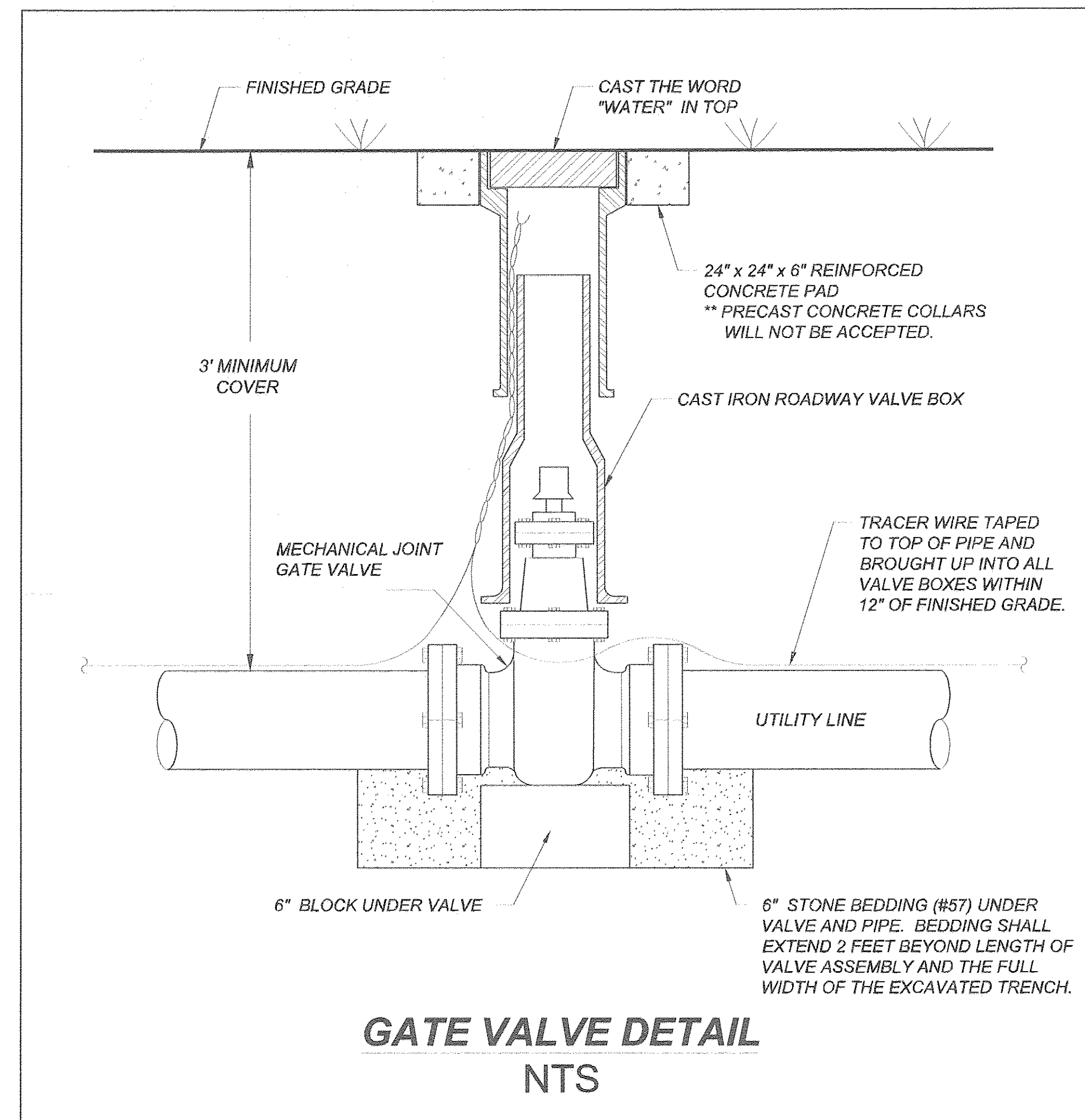
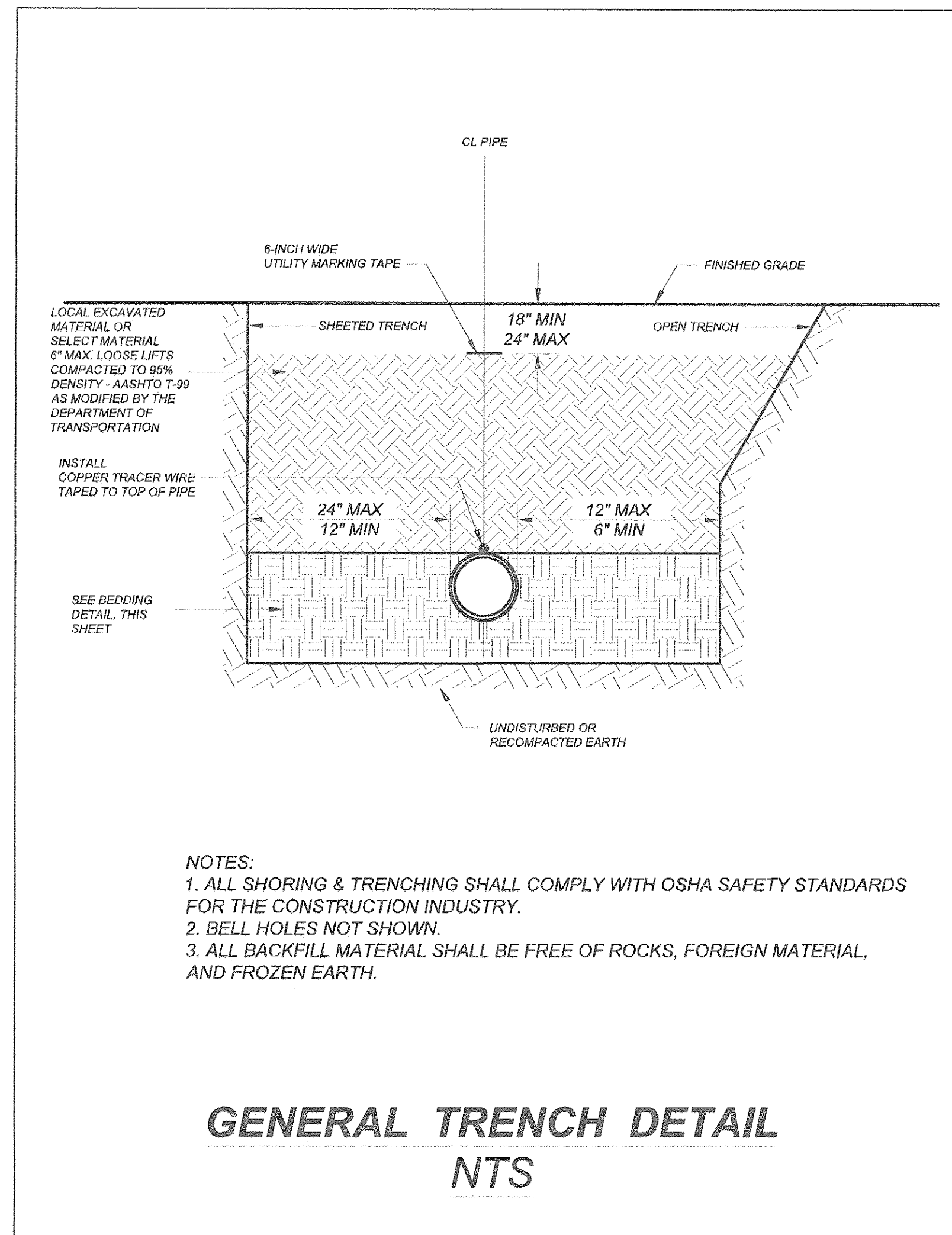


2013-MAY-06

MA Engineering CONSULTANTS, INC. 598 E. Chatham Street, Suite 157, Cary, N. C. 27511

HNTB HNTB NORTH CAROLINA, P.C. 343 E. SIX FORKS ROAD, SUITE 200 RALEIGH, NORTH CAROLINA 27609 NO License No: C-1554

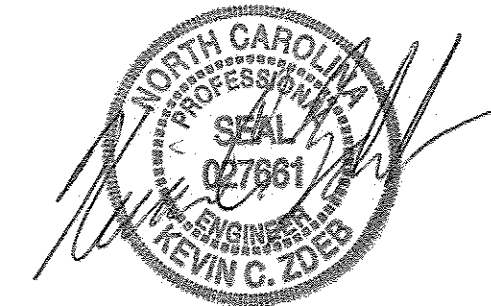
DATE: APRIL 17, 2013



MAXIMUM TRENCH WIDTH AT TOP OF PIPE

NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)	NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)
4	28	20	44
6	30	24	48
8	32	30	54
10	34	36	60
12	36	42	66
14	38	48	72
16	40	54	78
18	42		

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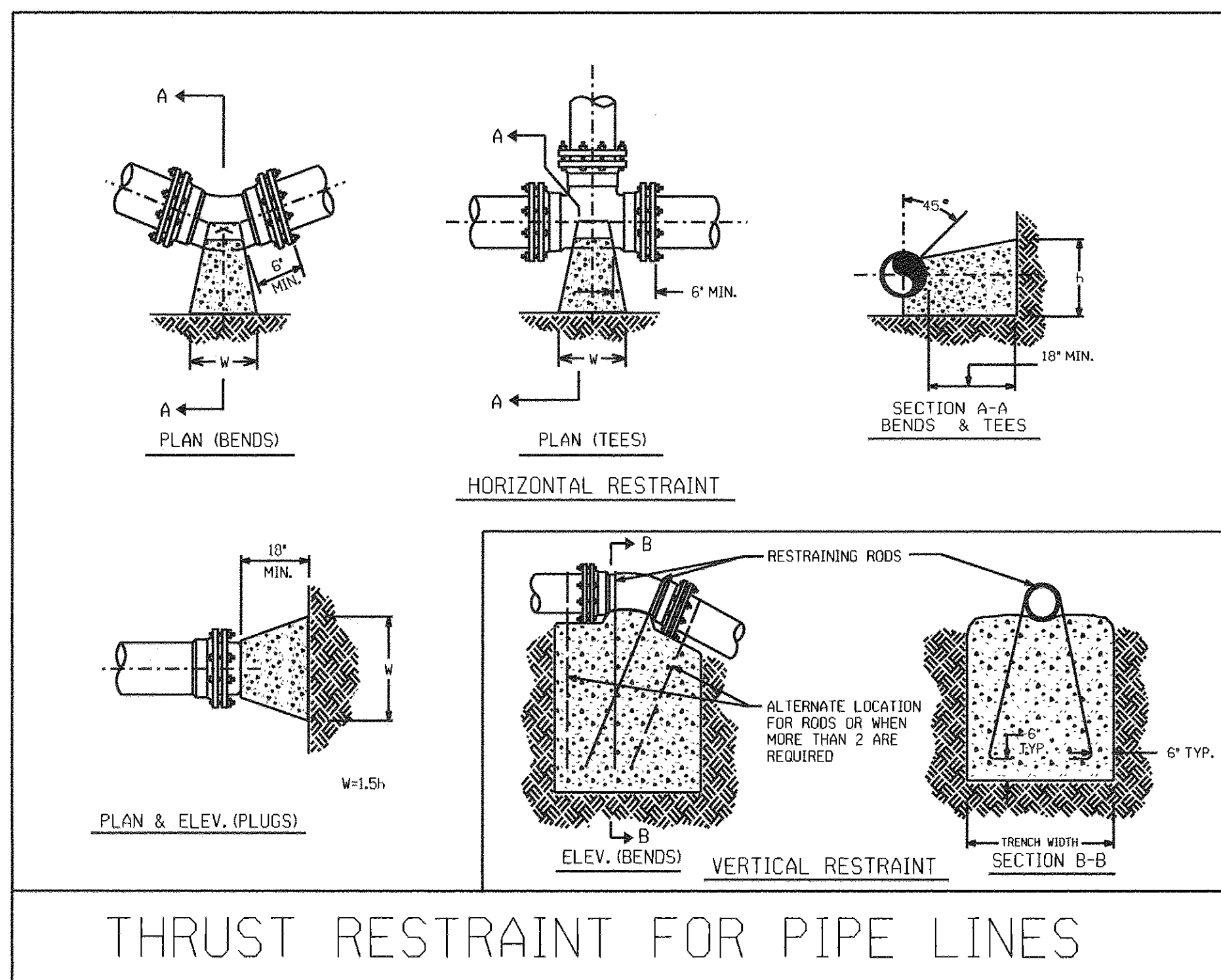


2013-MAY-06

MA Engineering CONSULTANTS, INC. 598 E. Chatham Street, Suite 137, Cary, N. C. 27511

HNTB HNTB NORTH CAROLINA, P.C. 343 E. 9th Street, Suite 200, Raleigh, North Carolina 27609, NC License No. C-1854

DATE: APRIL 17, 2013



PVC PIPE RESTRAINED JOINT DESIGN TABLE

FITTING	REQUIRED RESTRAINED LENGTH (FT) OF PVC PIPE BY DEPTH OF COVER							
	3 FT	4 FT	5 FT	6 FT	7 FT	8 FT	9 FT	10 FT
HORIZONTAL BENDS								
12 INCH DIA - 11.25 DEG	5	4	3	3	3	3	2	2
12 INCH DIA - 22.5 DEG	9	7	7	6	5	5	4	4
12 INCH DIA - 45 DEG	17	15	13	12	10	8	9	8
12 INCH DIA - 90 DEG	41	35	31	27	25	22	20	19
VERTICAL DOWN BENDS								
12 INCH DIA - 11.25 DEG	15	13	11	10	8	8	7	6
12 INCH DIA - 22.5 DEG	31	25	21	19	17	15	14	12
12 INCH DIA - 45 DEG	63	52	44	38	34	31	28	25
VERTICAL UP BENDS								
12 INCH DIA - 11.25 DEG	5	4	3	3	3	3	2	2
12 INCH DIA - 22.5 DEG	9	7	7	6	5	5	4	4
12 INCH DIA - 45 DEG	17	15	13	12	10	10	9	8
DEAD ENDS / VALVES								
12 INCH DIA	118	101	88	79	71	64	59	54

ASSUMPTIONS
 LAYING CONDITION = TYPE 4 DESIGN PRESSURE = 200 PSI (TEST PRESSURE)
 SOIL DESIGNATION = GC = COHESIVE-GRANULAR SAFETY FACTOR = 1.5

- NOTES**
1. RL = RUN LENGTH BETWEEN FIRST JOINTS OF PIPE ALONG THE RUN LINE OF TEE.
 2. RESTRAINED LENGTH IS MEASURED AS FOLLOWS:
 A. HORIZONTAL/VERTICAL BENDS: ALONG EACH SIDE OF BEND.
 B. HORIZONTAL/VERTICAL BENDS - OFFSET: ALONG THE OUTER SIDE OF EACH BEND.
 ALL PIPE BETWEEN THE TWO BENDS SHALL BE RESTRAINED JOINT.
 C. DEAD ENDS: ALONG PIPE FROM THE PLUG.
 D. VALVES: ALONG THE PIPE IN EACH DIRECTION FROM THE VALVE.
 E. REDUCERS: ALONG THE LARGER PIPE.
 F. TEES: ALONG THE BRANCH PIPE FROM THE TEE.
 3. WHEN IT IS NOT POSSIBLE TO INSTALL THE RESTRAINED LENGTHS AS NOTED BY THIS TABLE, CONTRACTOR SHALL INSTALL THE APPROPRIATE CONCRETE THRUST RESTRAINTS AS PER THE DETAILS HEREIN.

BASED ON TEST PRESSURE OF 200 P.S.I.

HORIZONTAL RESTRAINT (ALL AREAS GIVEN ARE IN SQUARE FEET)								VERTICAL RESTRAINT (ALL VOLUMES GIVEN ARE IN CUBIC YARDS)**						
PIPE SIZE	DEGREE OF BEND	LBS. STATIC THRUST *	ALLOWABLE SOIL BEARING (PSF)						PIPE SIZE	NO. REQ'D	DIA.	DEGREE OF BEND		
			1000	2000	3000	4000	5000	6000				7000	8000	1/4"
4"	11/2"	516	1	1	1	1	1	1	4"	2	1/2"	0.25	0.50	0.75
	22 1/2"	1426	2	2	2	2	2	2	6"	2	1/2"	0.50	1.0	1.75
	90"	2,405	4	4	4	4	4	4	8"	2	5/8"	0.75	1.50	3.0
	TEE/PLUG	3,444	4	4	4	4	4	4	10"	2	3/4"	1.25	2.25	4.50
6"	11/2"	1,385	2	2	2	2	2	2	12"	2	7/8"	1.75	3.25	6.50
	22 1/2"	2,769	4	4	4	4	4	4	14"	4	5/8"	2.25	4.50	8.75
	90"	4,908	8	8	8	8	8	8	16"	4	3/4"	3.0	6.0	11.50
	TEE/PLUG	9,293	10	10	10	10	10	10						
8"	11/2"	2,324	3	3	3	3	3	3						
	22 1/2"	4,647	6	6	6	6	6	6						
	90"	9,619	10	10	10	10	10	10						
	TEE/PLUG	17,773	18	18	18	18	18	18						
10"	11/2"	4,846	4	4	4	4	4	4						
	22 1/2"	9,691	8	8	8	8	8	8						
	90"	15,028	15	15	15	15	15	15						
	TEE/PLUG	27,768	28	28	28	28	28	28						
12"	11/2"	8,243	6	6	6	6	6	6						
	22 1/2"	16,486	12	12	12	12	12	12						
	90"	24,729	20	20	20	20	20	20						
	TEE/PLUG	48,457	40	40	40	40	40	40						
14"	11/2"	14,561	8	8	8	8	8	8						
	22 1/2"	29,121	16	16	16	16	16	16						
	90"	43,682	25	25	25	25	25	25						
	TEE/PLUG	87,363	40	40	40	40	40	40						
16"	11/2"	21,841	10	10	10	10	10	10						
	22 1/2"	43,681	20	20	20	20	20	20						
	90"	65,521	30	30	30	30	30	30						
	TEE/PLUG	131,041	50	50	50	50	50	50						

- * INCLUDES 1.25 SAFETY FACTOR
- GENERAL NOTES:
 1. CONCRETE SHALL BE CLASS "B".
 2. CONCRETE SHALL NOT CONTACT BOLTS ENDS OF MECHANICAL JOINT FITTINGS.
 3. CONSULT WITH ENGINEER FOR CONCRETE REQUIREMENTS ON MAINS LARGER THAN 16 INCHES.
 (FOR VERTICAL & HORIZONTAL BENDS)
 4. ALLOWABLE SOIL BEARING SHALL BE DETERMINED BY THE ENGINEER.

REVISIONS	
NO.	DESCRIPTION

THRUST RESTRAINT FOR WATER MAINS

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

