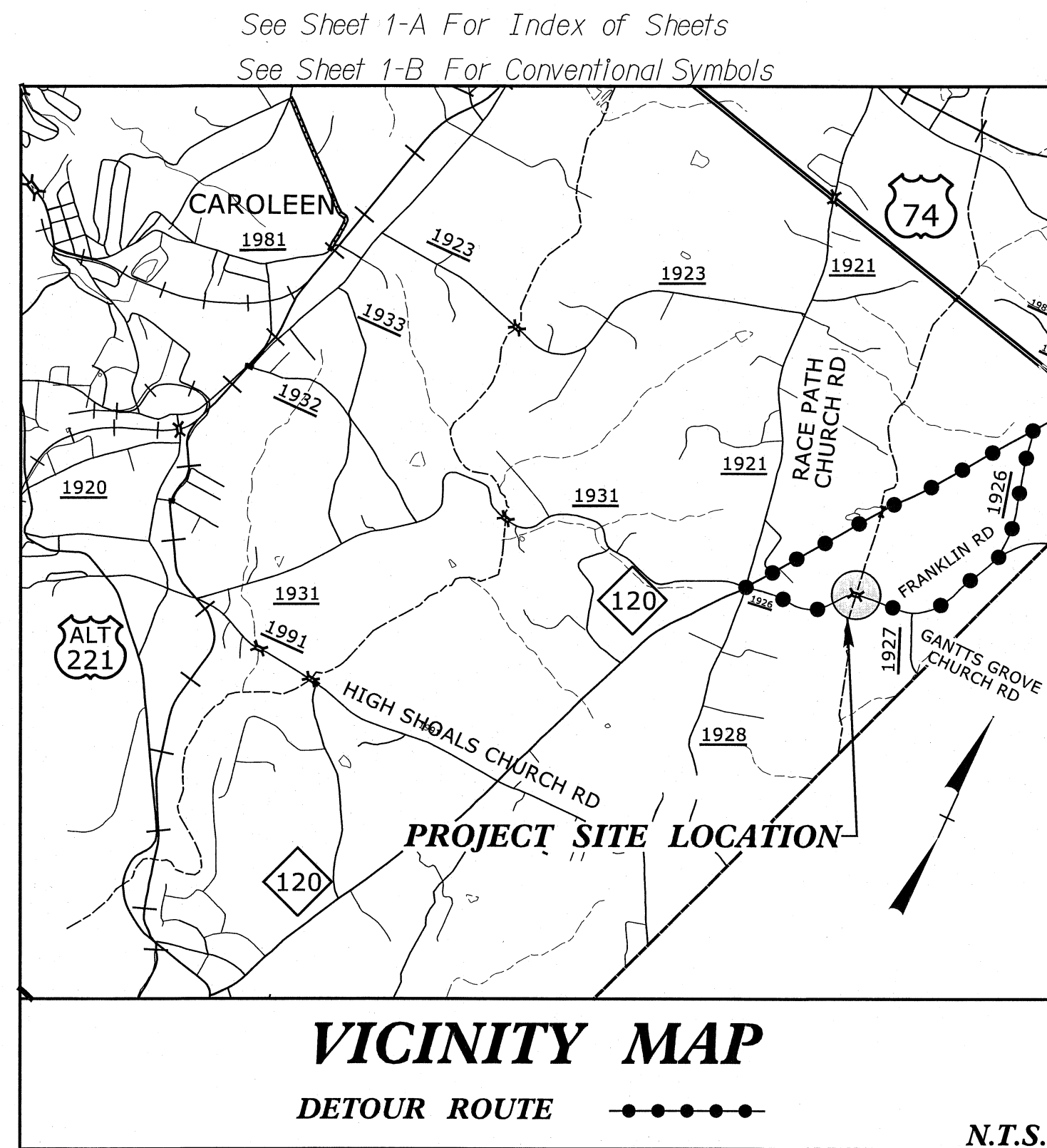


09/05/99

PROJECT: 17BP.13.R.16

CONTRACT:



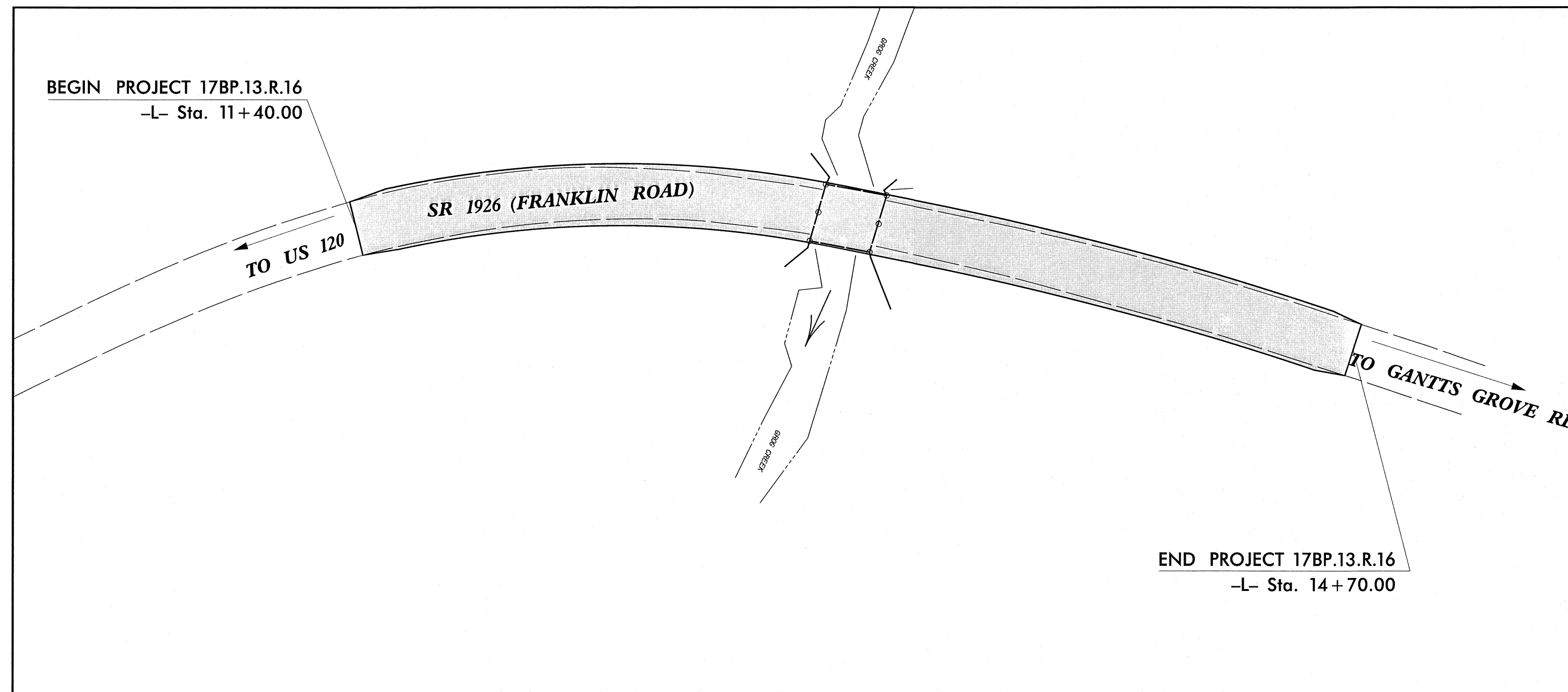
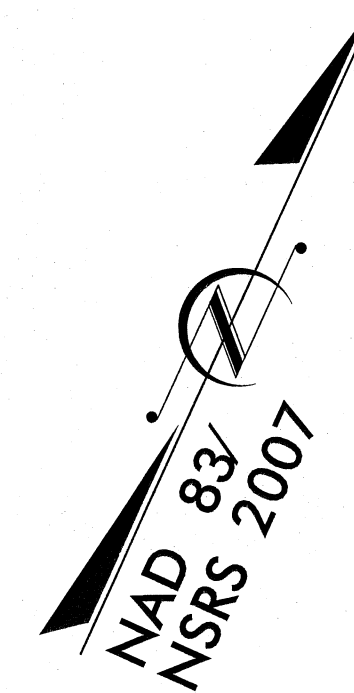
FINAL PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

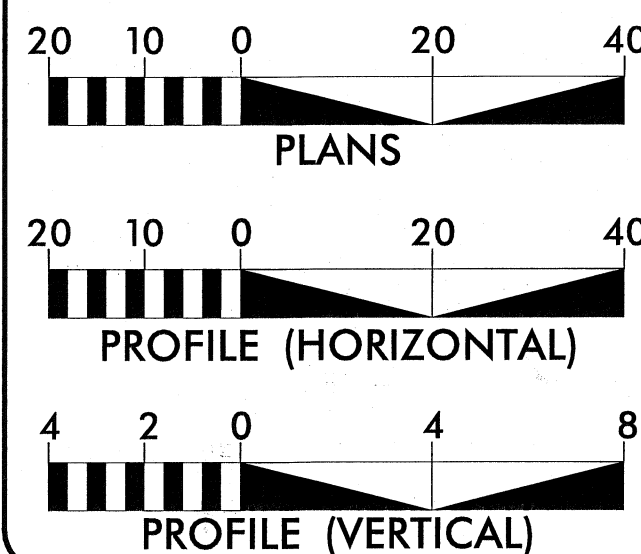
RUTHERFORD COUNTY

LOCATION: BRIDGE NO.109 OVER GROG CREEK ON SR 1926
TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.13.R.16	1	
RUTHERFORD COUNTY #800109			
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
17BP.13.R.16		PE	
17BP.13.R.16		RW & UTILITIES	
17BP.13.R.16		CONST.	



GRAPHIC SCALES



DESIGN DATA

ADT 2007 = 310
ADT 2025 = 620
DHV = N/A %
D = N/A %
T = N/A % *
V = 35 MPH

FUNCTIONAL CLASSIFICATION:
RURAL LOCAL

PROJECT LENGTH

LENGTH ROADWAY PROJECT 17BP.13.R.16 = 0.059 mi
LENGTH STRUCTURE PROJECT 17BP.13.R.16 = 0.004 mi
TOTAL LENGTH OF PROJECT 17BP.13.R.16 = 0.063 mi

PLANS PREPARED BY:
CH ENGINEERING
3220 GLEN ROYAL RD. RALEIGH, NC 27617
TELE 919.788.0224 FAX 919.788.0232
NC LICENSE #P-0189

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
7-2-12

LETTING DATE:

PLANS PREPARED FOR:
DIVISION OF HIGHWAYS
20 Old 74
Asheville, NC 28803

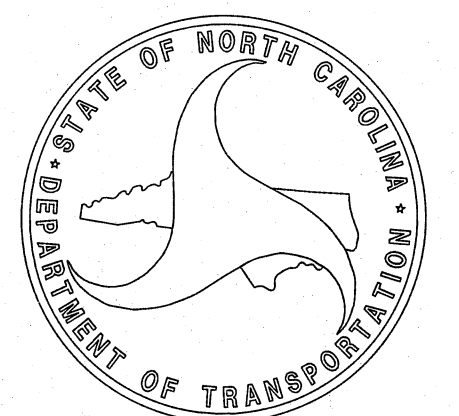
THOMAS R. HEPLER, PE, PLS
PROJECT ENGINEER

ERIC M. TWEED, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

Daniel H. Woods 2/24/14 P.E.
SIGNATURE:
ROADWAY DESIGN ENGINEER
SEAL 10359
THOMAS R. HEPLER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA



GENERAL NOTES: 2012 SPECIFICATIONS
EFFECTIVE: 01-17-12

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

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

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

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.03 AT LOCATIONS DIRECTED BY THE ENGINEER.

STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADII NOTED ON PLANS.

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

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

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

THERE ARE NO UTILITY OWNERS ON THIS PROJECT
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY POINTS INDICATED IN THESE PLANS HAVE BEEN PLACED. AT THE END OF CONSTRUCTION CONTRACTOR IS RESPONSIBLE FOR PLACING CONCRETE MONUMENTS AT POINTS INDICATED ON PLANS. ANY RIGHT-OF-WAY POINTS DESTROYED DURING CONSTRUCTION SHALL BE ACCURATELY RESET BY CONTRACTOR.

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated Jan 17, 2012 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement

DIVISION 3 - PIPE CULVERTS

DIVISION 5 - SUBGRADE, BASES AND SHOULDERS
 560.01 Method of Shoulder Construction - High Side of Superelevated Curve - Method I

DIVISION 8 - INCIDENTALS

806.01	Concrete Right-of-Way Marker
838.22	Reinforced Concrete Endwall
862.01	Guardrail Placement
862.02	Guardrail Installation
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

DIVISION 11 - WORK ZONE TRAFFIC CONTROL
1101.01 Work Zone Advance Warning Signs
1101.03 Temporary Road Closures
1110.01 Stationary Work Zone Signs
1145.01 Barricades - Type III

DIVISION 12 - PAVEMENT MARKINGS, MARKERS AND DELINEATION
1205.01 Pavement Markings - Line Types and Offsets
1205.02 Pavement Markings - Two Lane and Multilane Roadways

Note: Not to Scale

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

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	
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 R/W Marker	
Proposed Control of Access Line with Concrete C/A 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	
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:

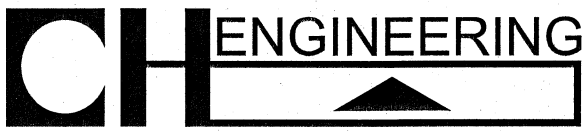
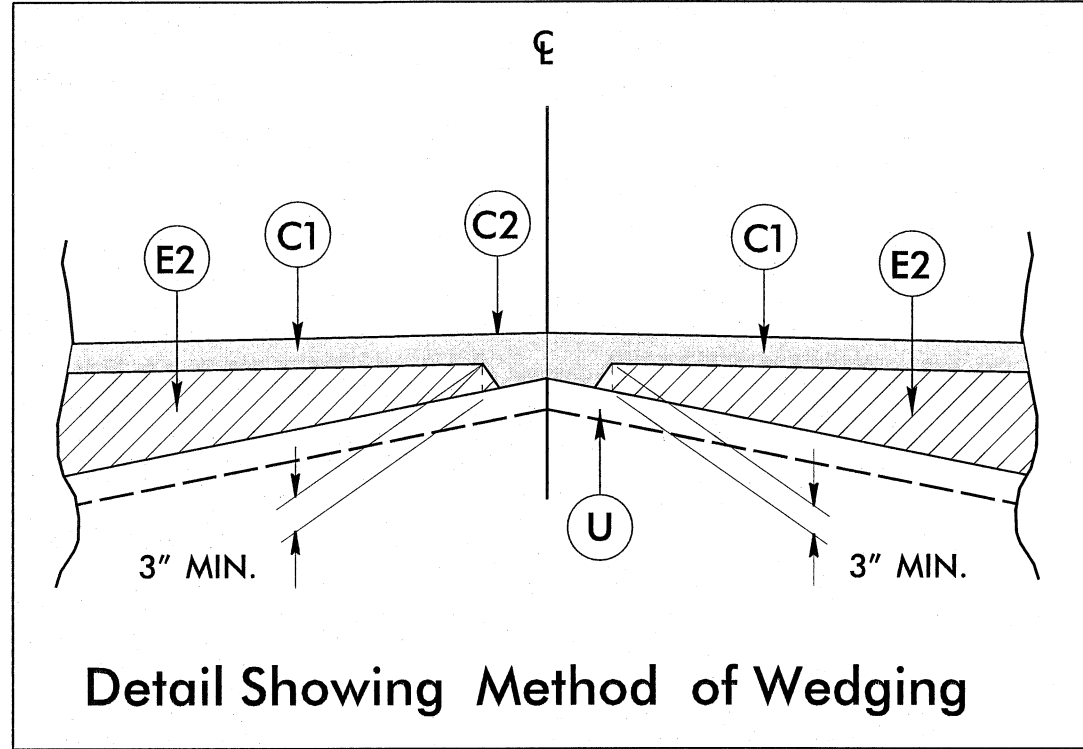
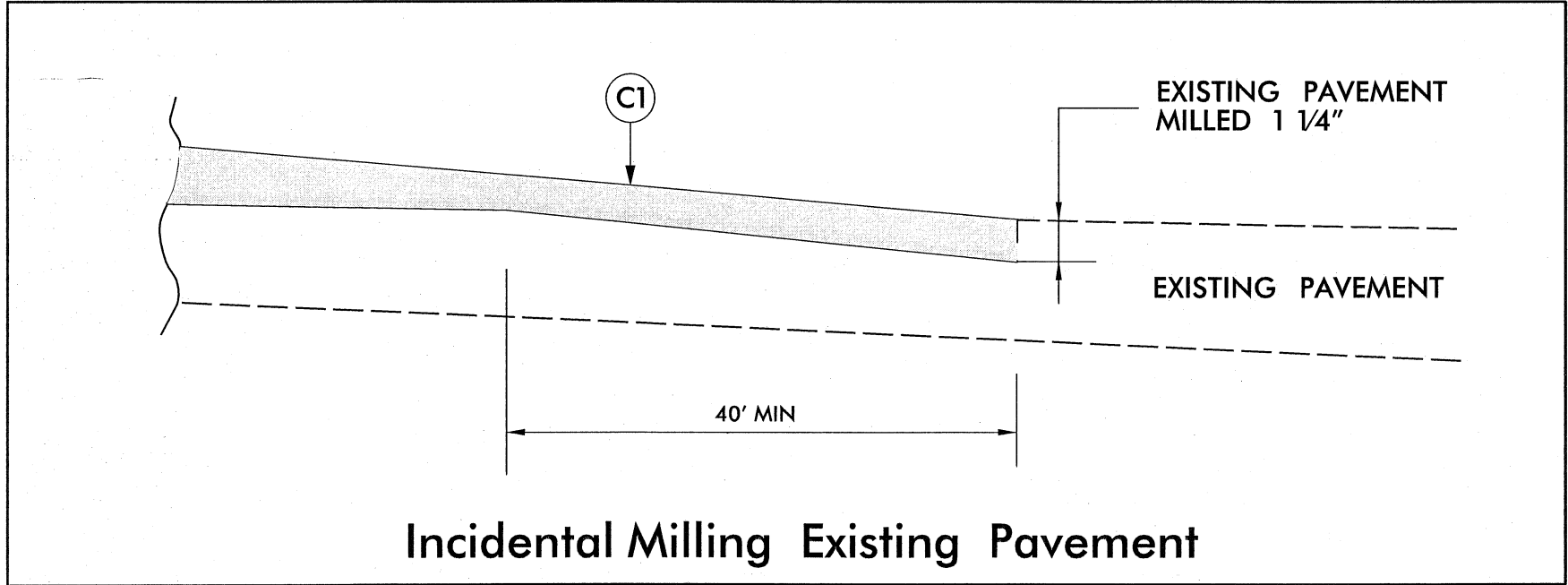
Sanitary Sewer Manhole	
Sanitary Sewer Cleanout	
U/G Sanitary Sewer Line	
Above Ground Sanitary Sewer	
Recorded SS Forced Main Line	
Designated SS Forced Main Line (S.U.E.*)	

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	
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	

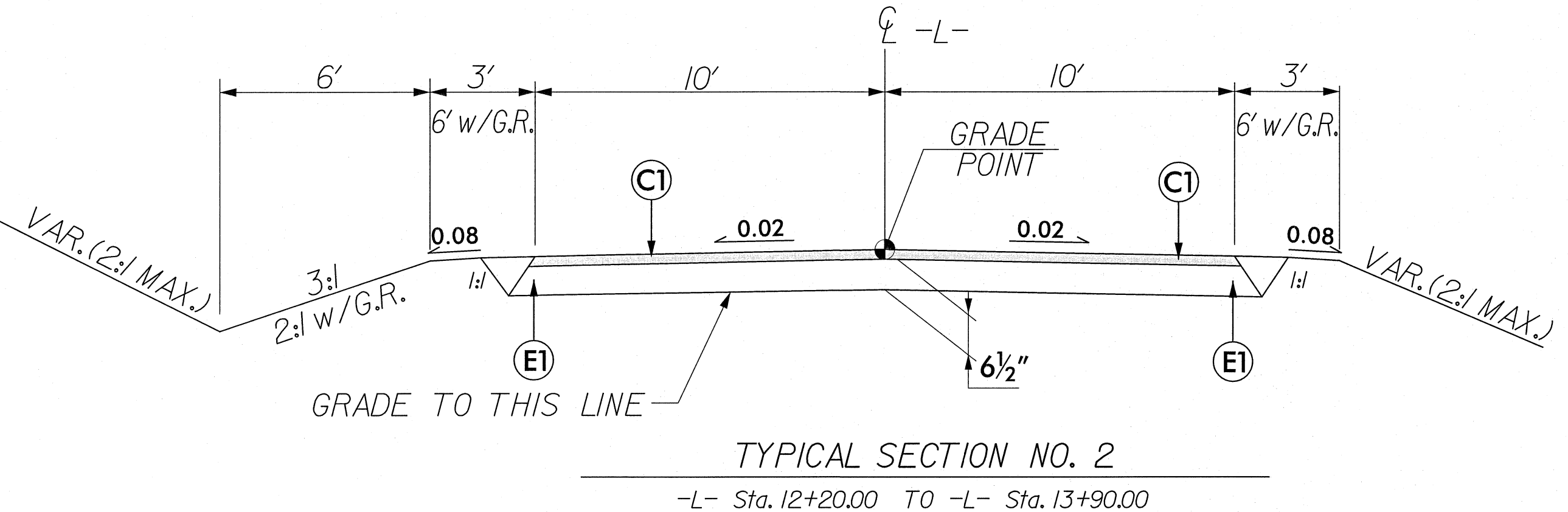
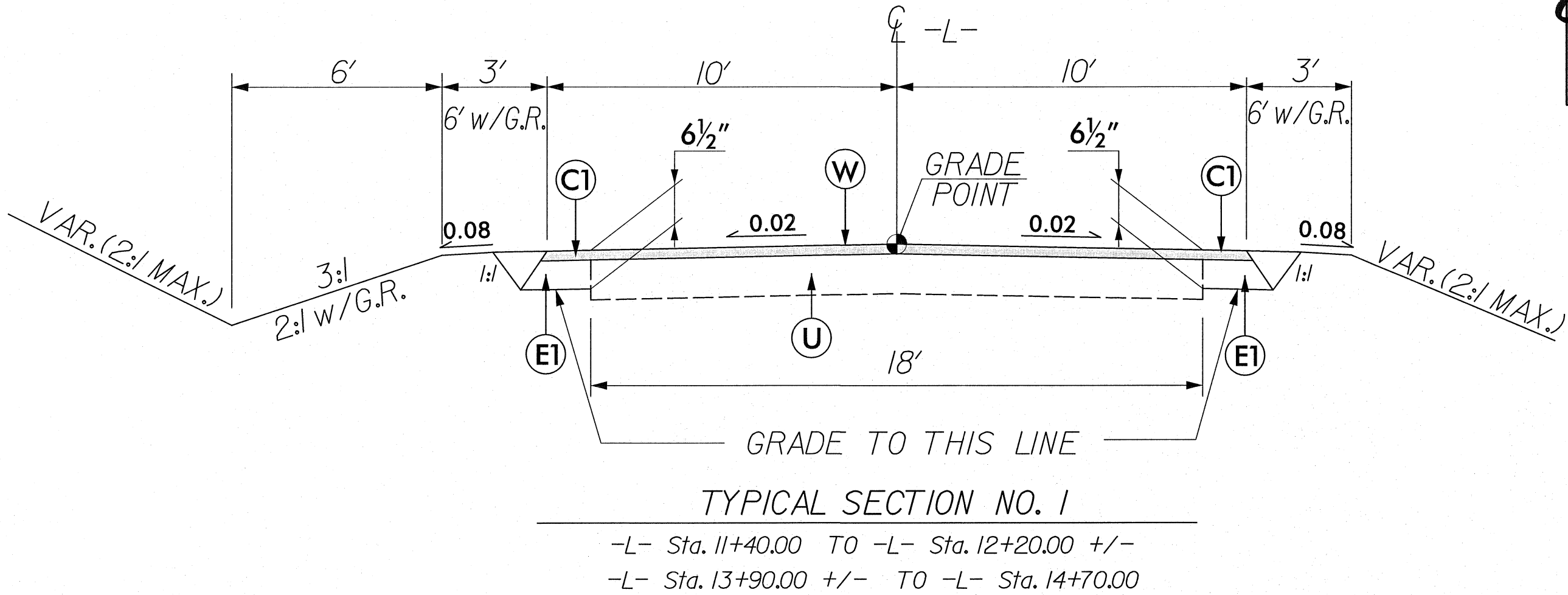
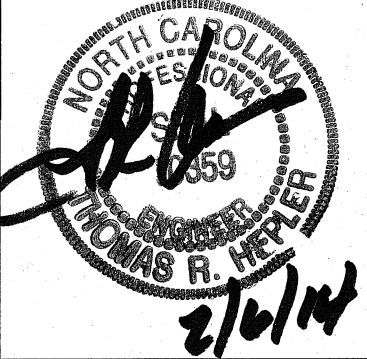
6/2/99

	PAVEMENT SCHEDULE
C1	PROP. APPROX. 3 " ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1½" OR GREATER THAN 2" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
U	EXISTING PAVEMENT



3220 GLEN ROYAL RD. RALEIGH, NC 27617
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NC LICENSE #P-0189

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.16	2
RUTHERFORD COUNTY #800109	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER



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PROJECT NO. 17BP.13.R.16 COUNTY: RUTHERFORD REPLACES BRIDGE NO. 800109
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH
BRIDGE NO. 800109 ON SR 1926 OVER GROG CREEK

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

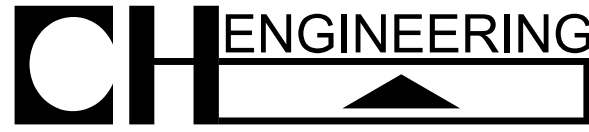
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.16	3
BRIDGE NO. 800109	



CH ENGINEERING

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 NC LICENSE #P-0189



3220 GLEN ROYAL RD. RALEIGH, NC 27617
TELE 919.788.0224 FAX 919.788.0232
NC LICENSE #P-0189

SUMMARY OF EARTHWORK

CHAIN	FROM STATION	TO STATION	SIDE	UNCL EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
-L-	11 + 40	14 + 60	CENTERLINE	1		901	900	0
SUBTOTAL SUMMARY NO. 1				1		901	900	0
-L-								
SUBTOTAL SUMMARY NO. 2								
SUBTOTAL SUMMARY 1-2				1		901	900	0
LOSS DUE TO CLEARING AND GRUBBING								
PROJECT TOTAL								
WASTE IN LIEU OF BORROW								
ESTIMATE 5% FOR TOPSOIL ON BORROW PITS								
GRAND TOTAL				1		901	900	0
SAY				10			950	

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

See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 54" & OVER)

[illegible]

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

GUARDRAIL SUMMARY

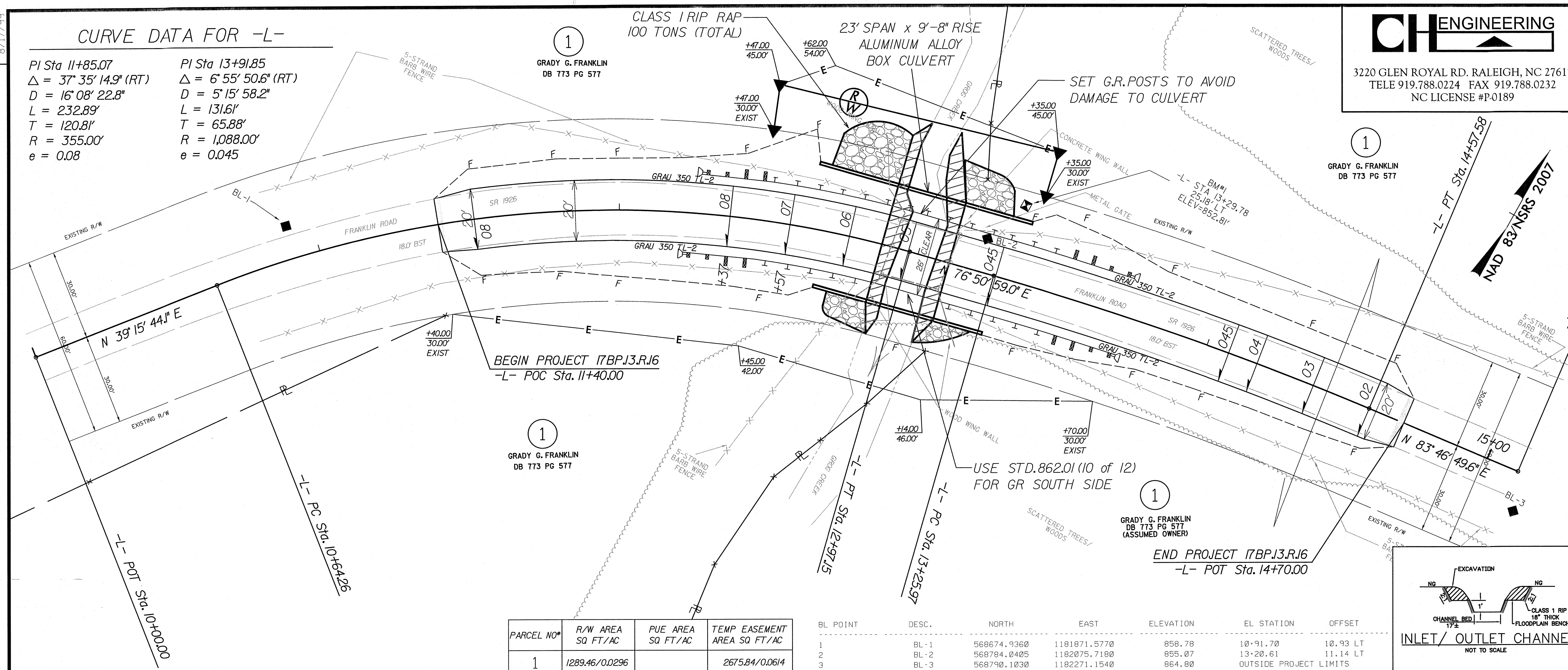
[illegible]

8/17/99

CURVE DATA FOR -L-

PI Sta 11+85.07
 $\Delta = 37^\circ 35' 14.9''$ (RT)
 $D = 16^\circ 08' 22.8''$
 $L = 232.89'$
 $T = 120.81'$
 $R = 355.00'$
 $e = 0.08$

PI Sta 13+91.85
 $\Delta = 6^\circ 55' 50.6''$ (RT)
 $D = 5^\circ 15' 58.2''$
 $L = 131.61'$
 $T = 65.88'$
 $R = 1,088.00'$
 $e = 0.045$

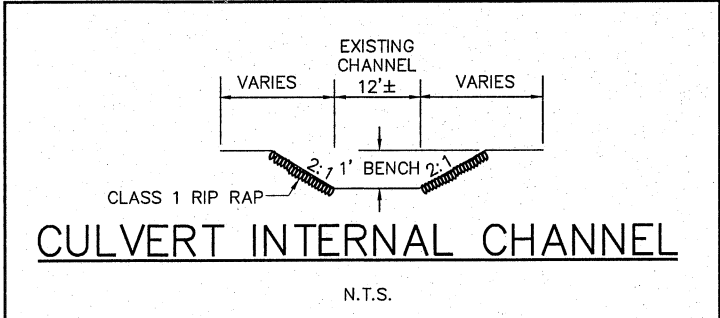
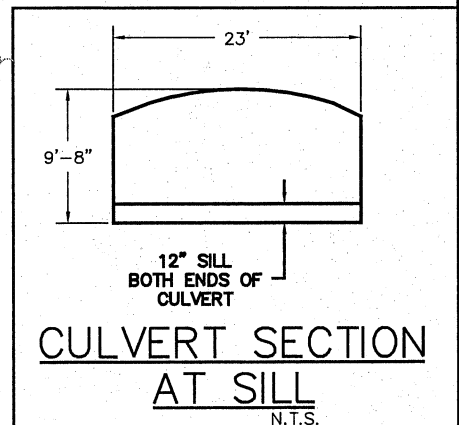


CH ENGINEERING
3220 GLEN ROYAL RD. RALEIGH, NC 27617
TELE 919.788.0224 FAX 919.788.0232
NC LICENSE #P-0189

PROJECT REFERENCE NO. 17BP.13.R.16		SHEET NO. 4	
BRIDGE NO. 800109		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	

Grady G. Franklin DB 773 PG 577

North Carolina Professional Engineer Seal for Thomas R. Hyler, License #032616, dated 8/17/99.



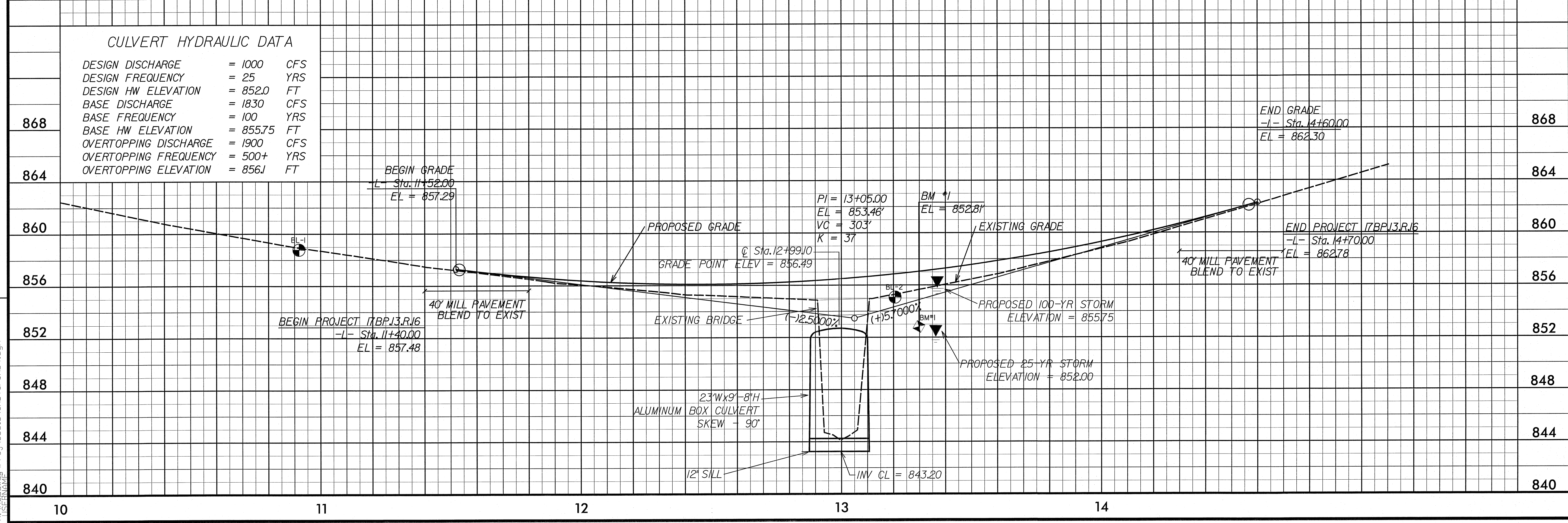
DATUM DESCRIPTION
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NC DOT FOR MONUMENT "80-0109 BL-1" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 568674.94(FT) EASTING: 1181871.58(FT) ELEVATION: 858.78(FT)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99983680
THE N.G. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "80-0109 BL-1" TO -L- 11+40.00 STATION IS N60°07'48"E 50.2021
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

PARCEL NO	R/W AREA SQ FT/AC	PUE AREA SQ FT/AC	TEMP EASEMENT AREA SQ FT/AC
1	1289.46/0.0296		2675.84/0.0614

BL POINT	DESC.	NORTH	EAST	ELEVATION	EL STATION	OFFSET
1	BL-1	568674.9360	1181871.5770	858.78	10+91.70	10.93 LT
2	BL-2	568784.0405	1182075.7180	855.07	13+20.61	11.14 LT
3	BL-3	568790.1830	1182271.1540	864.00		OUTSIDE PROJECT LIMITS

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE = 1000 CFS
DESIGN FREQUENCY = 25 YRS
DESIGN HW ELEVATION = 852.0 FT
BASE DISCHARGE = 1830 CFS
BASE FREQUENCY = 100 YRS
BASE HW ELEVATION = 855.75 FT
OVERTOPPING DISCHARGE = 1900 CFS
OVERTOPPING FREQUENCY = 500+ YRS
OVERTOPPING ELEVATION = 856.1 FT



1/27/2014
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FRANKLIN ROAD (SR 1926) TEMPORARY ROAD CLOSURE

CHENGINEERING

3220 GLEN ROYAL RD. RALEIGH, NC 27617
TELE 919.788.0224 FAX 919.788.0232
NC LICENSE #P-0189

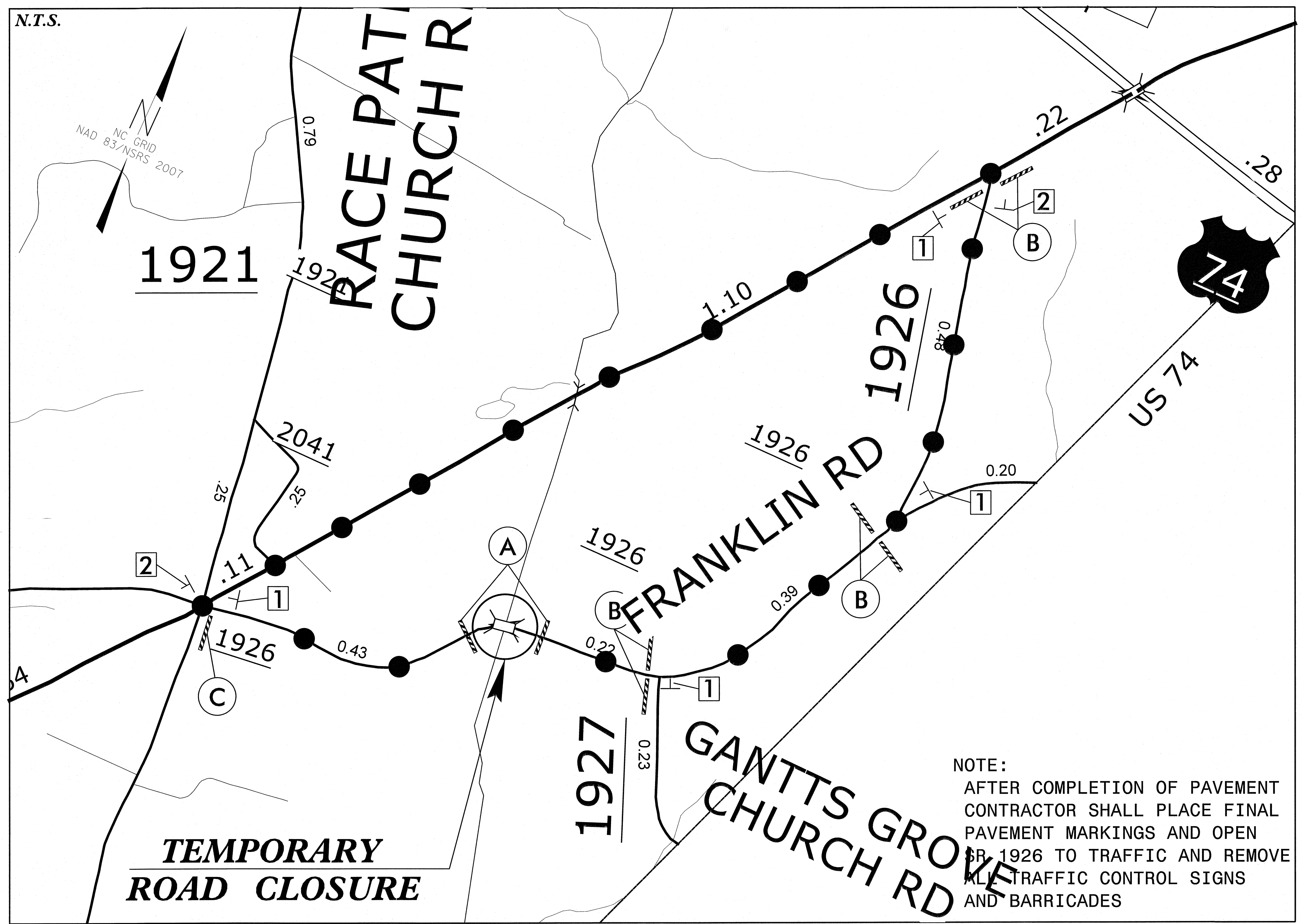
PROJECT REFERENCE NO.
17BP.13.R.16

SHEET NO.
TCP-1

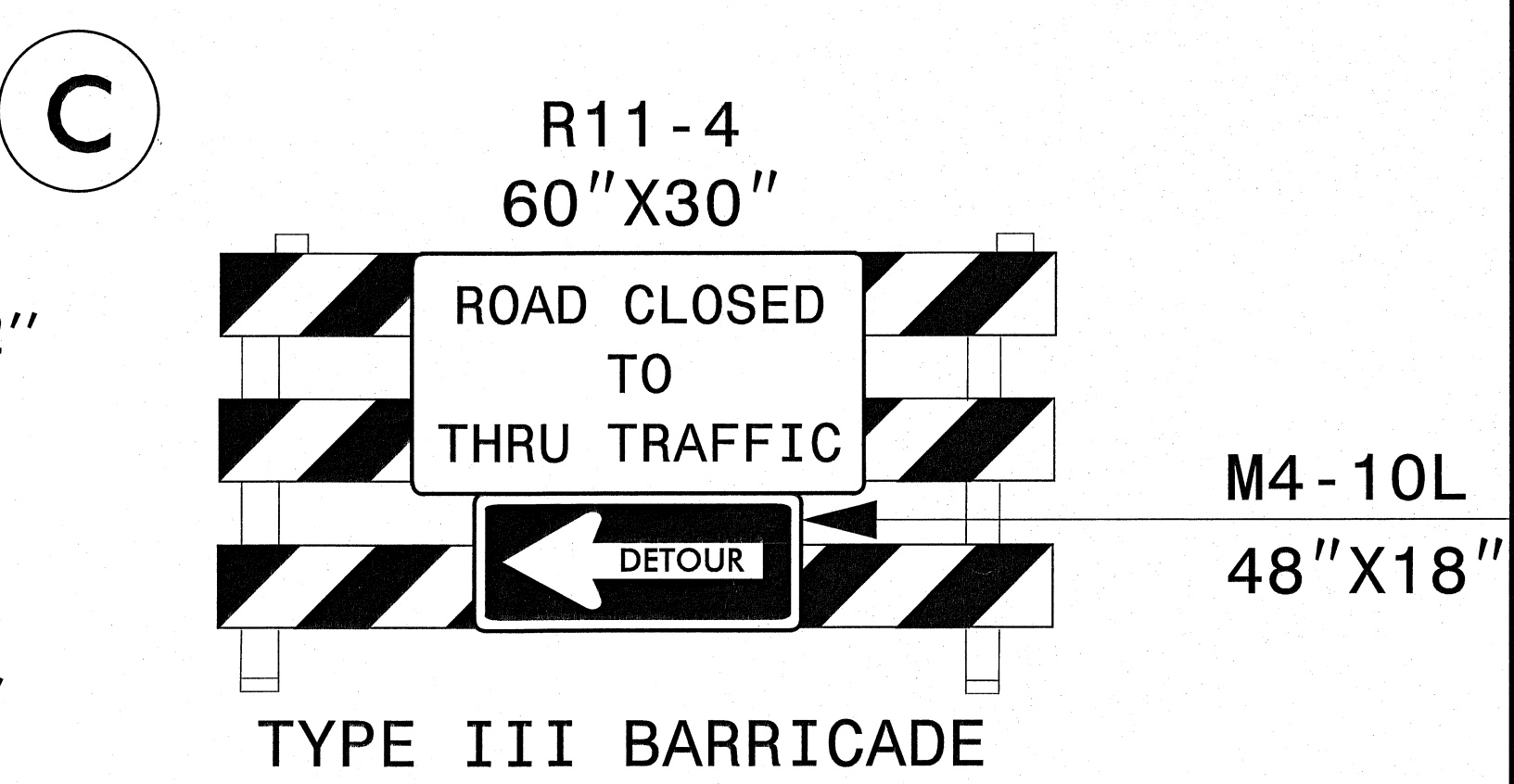
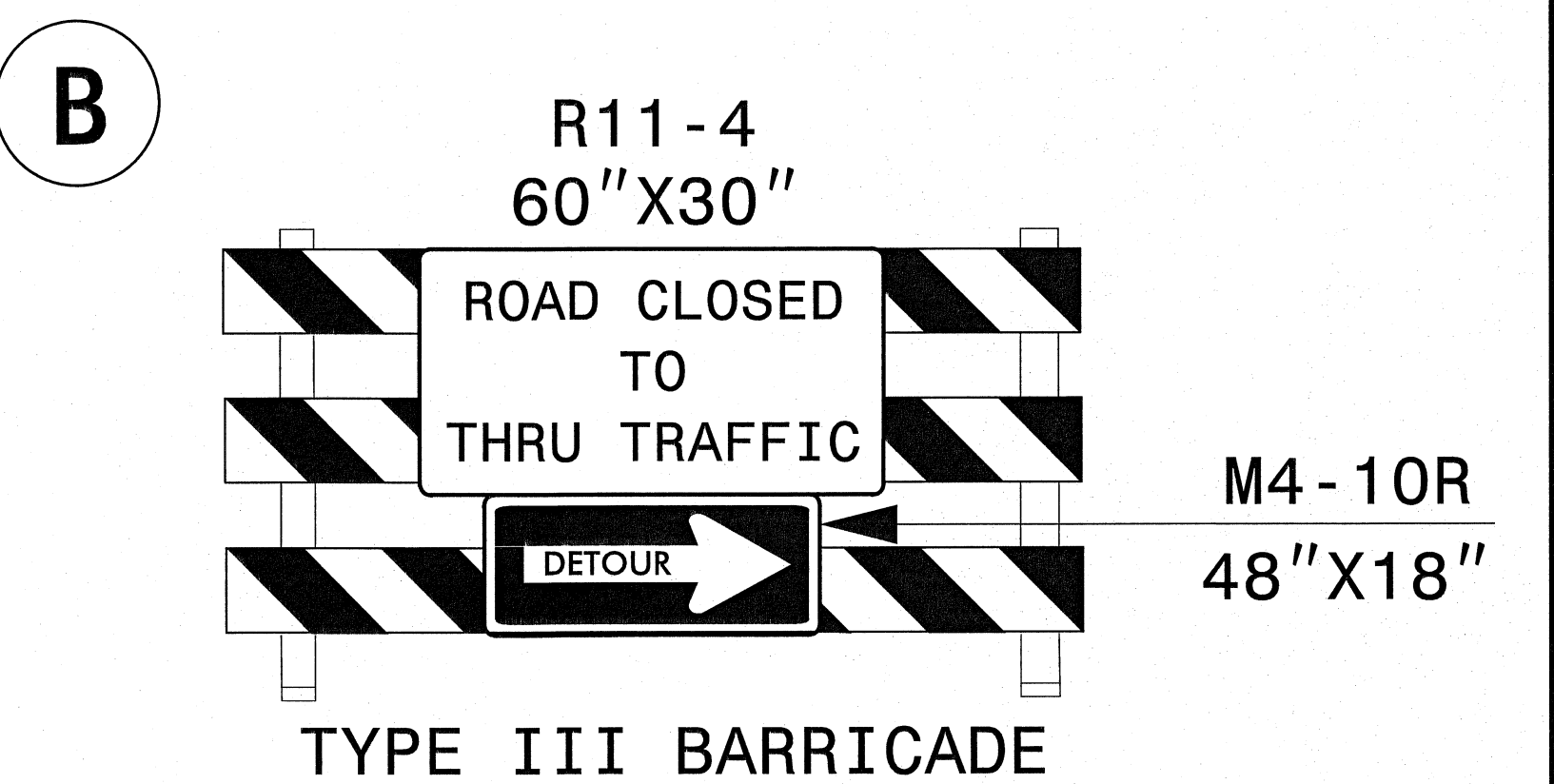
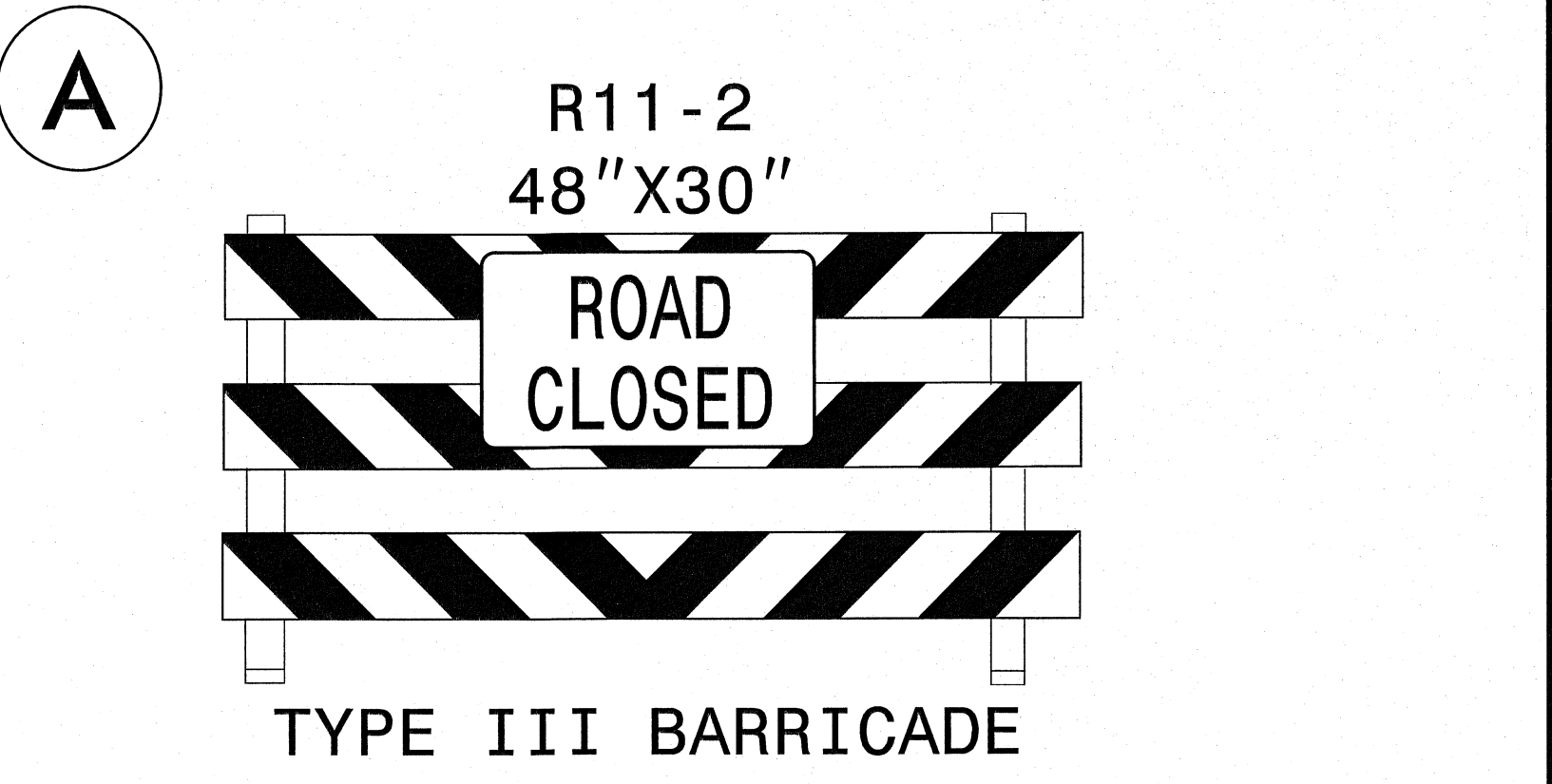
BRIDGE NO. 800109

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER



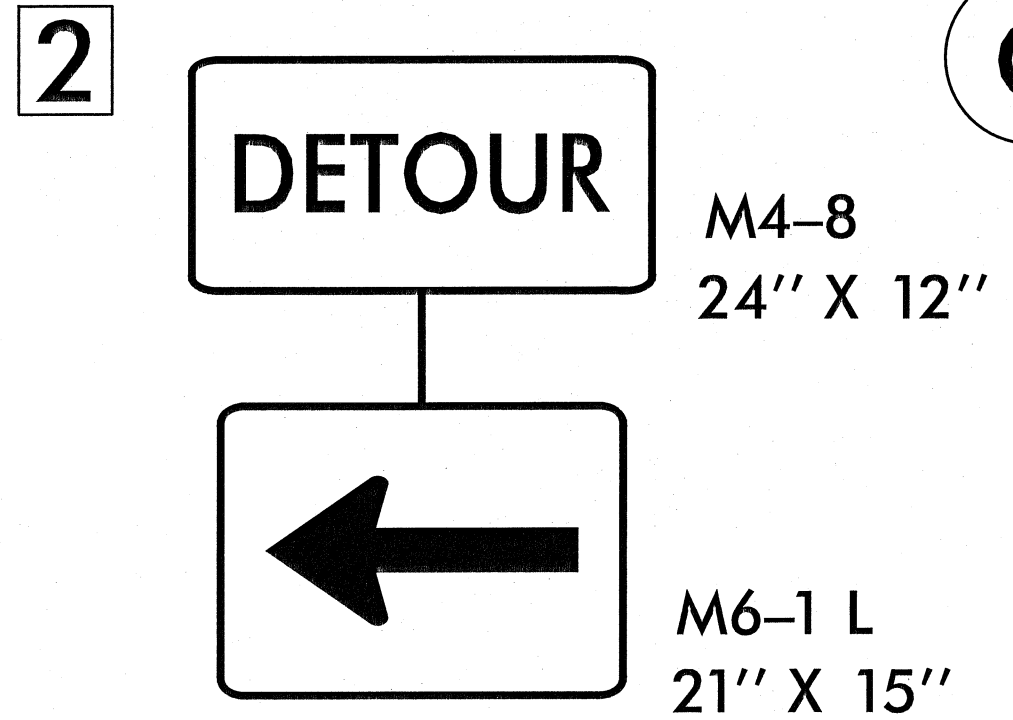
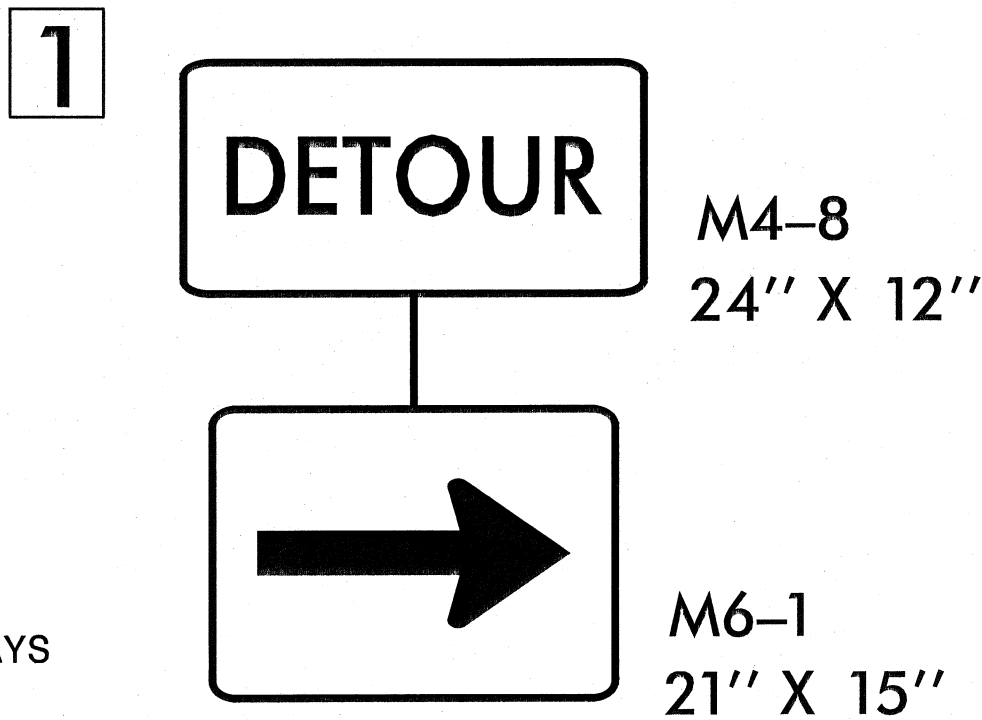
PROPOSED DETOUR
DETOUR ROUTE ●●●●●
DETOUR LENGTH 2.74 MILES



ROADWAY STANDARD DRAWINGS

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

STD. NO.	TITLE
1101.01	WORK ZONE ADVANCED WARNING SIGNS
1101.03	TEMPORARY ROAD CLOSURES
1110.01	STATIONARY WORK ZONE SIGNS
1145.01	BARRICADES - TYPE III
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO LANE AND MULTILANE ROADWAYS

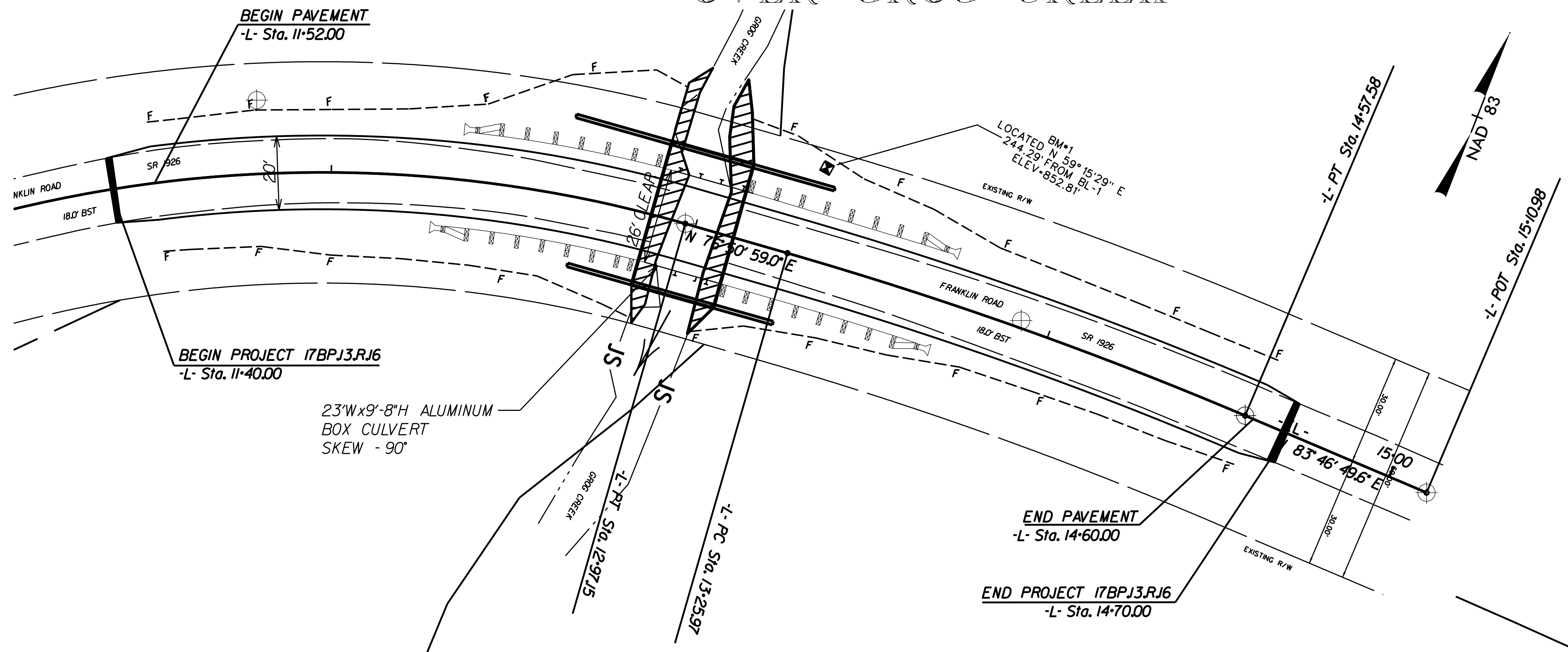


NOTE:
AFTER COMPLETION OF PAVEMENT CONTRACTOR SHALL PLACE FINAL PAVEMENT MARKINGS AND OPEN SR 1926 TO TRAFFIC AND REMOVE ALL TRAFFIC CONTROL SIGNS AND BARRICADES

REVISIONS
REV. 8-17-12
K:\27204\TrafficControl\TCP\800109_R01_TCP_1.dgn

TIP PROJECT: 17.BP.13.R.16

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL
RUTHERFORD COUNTY
CULVERT NO. 800109 ON SR 1926
OVER GROG CREEK



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17.BP.13.R.16	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	HF
1606.01	Special Sediment Control Fence	HF
1622.01	Temporary Berms and Slope Drains	TD
1630.02	Silt Basin Type B	SB
1633.01	Temporary Rock Silt Check Type-A	SC
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	SC
1633.02	Temporary Rock Silt Check Type-B	SC
	Wattle	W
	Wattle with Polyacrylamide (PAM)	W
1634.01	Temporary Rock Sediment Dam Type-A	SD
1634.02	Temporary Rock Sediment Dam Type-B	SD
1635.01	Rock Pipe Inlet Sediment Trap Type-A	ST
1635.02	Rock Pipe Inlet Sediment Trap Type-B	ST
1630.04	Stilling Basin	SB
1630.06	Special Stilling Basin	SB
	Rock Inlet Sediment Trap:	
1632.01	Type A	ST
1632.02	Type B	ST
1632.03	Type C	ST
	Skimmer Basin	SB
	Tiered Skimmer Basin	SB
	Infiltration Basin	SB

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

GRAPHIC SCALE



PLANS



PROFILE (HORIZONTAL)



PROFILE (VERTICAL)

ROADSIDE ENVIRONMENTAL UNIT
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, NC

JEFFREY D. GOODIN
LEVEL III NAME

3023
LEVEL III CERTIFICATION NO.

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

Prepared in the Office of:



ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS

4601 Lake Boone Trail, Ste. 3C Raleigh, NC 27607
Phone 919 981 0310 Fax 919 981 0451
Firm License No. C-1684 www.aogroup.com

2012 STANDARD SPECIFICATIONS

Roadway Standard Drawings

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

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

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.		SHEET NO.	
17BP.13.R.16		EC-3	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	

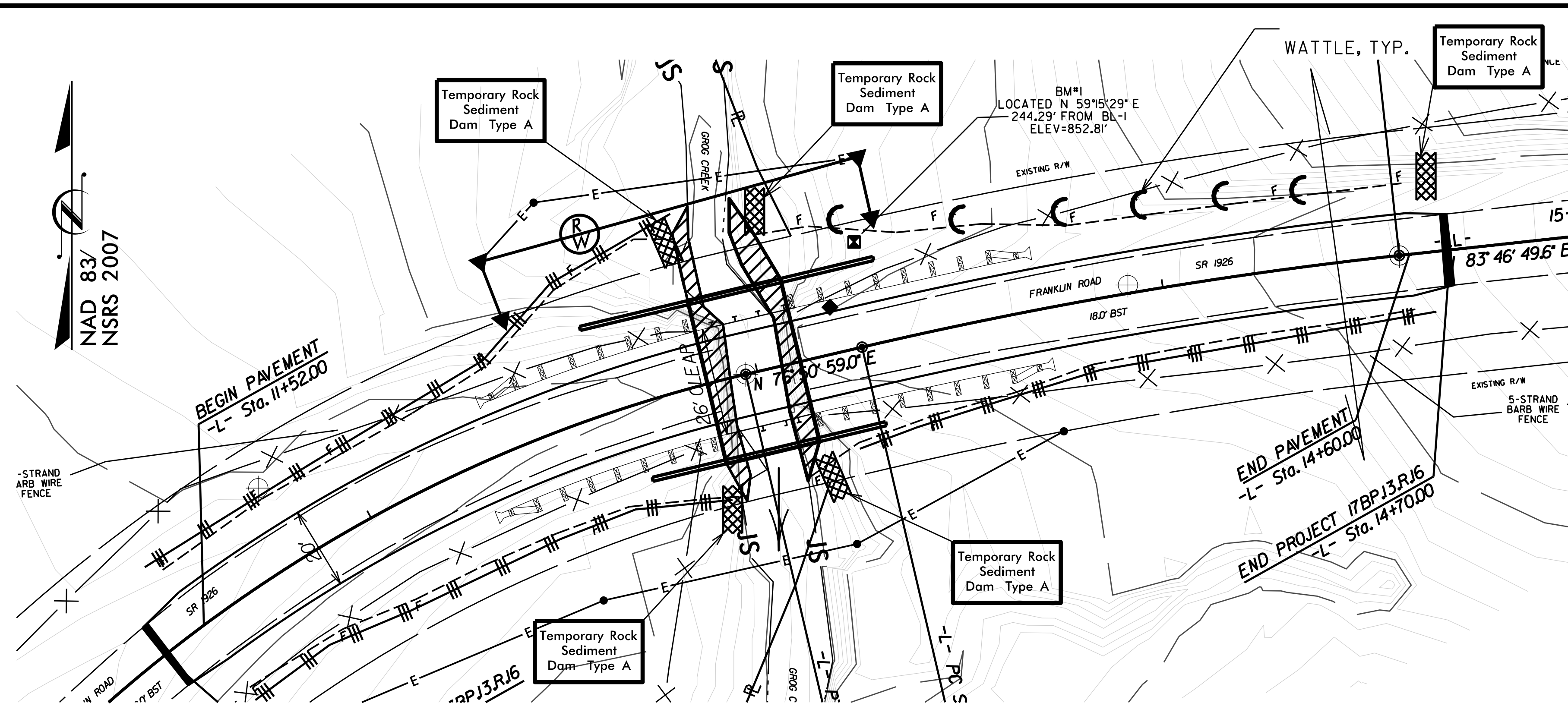
SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
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.



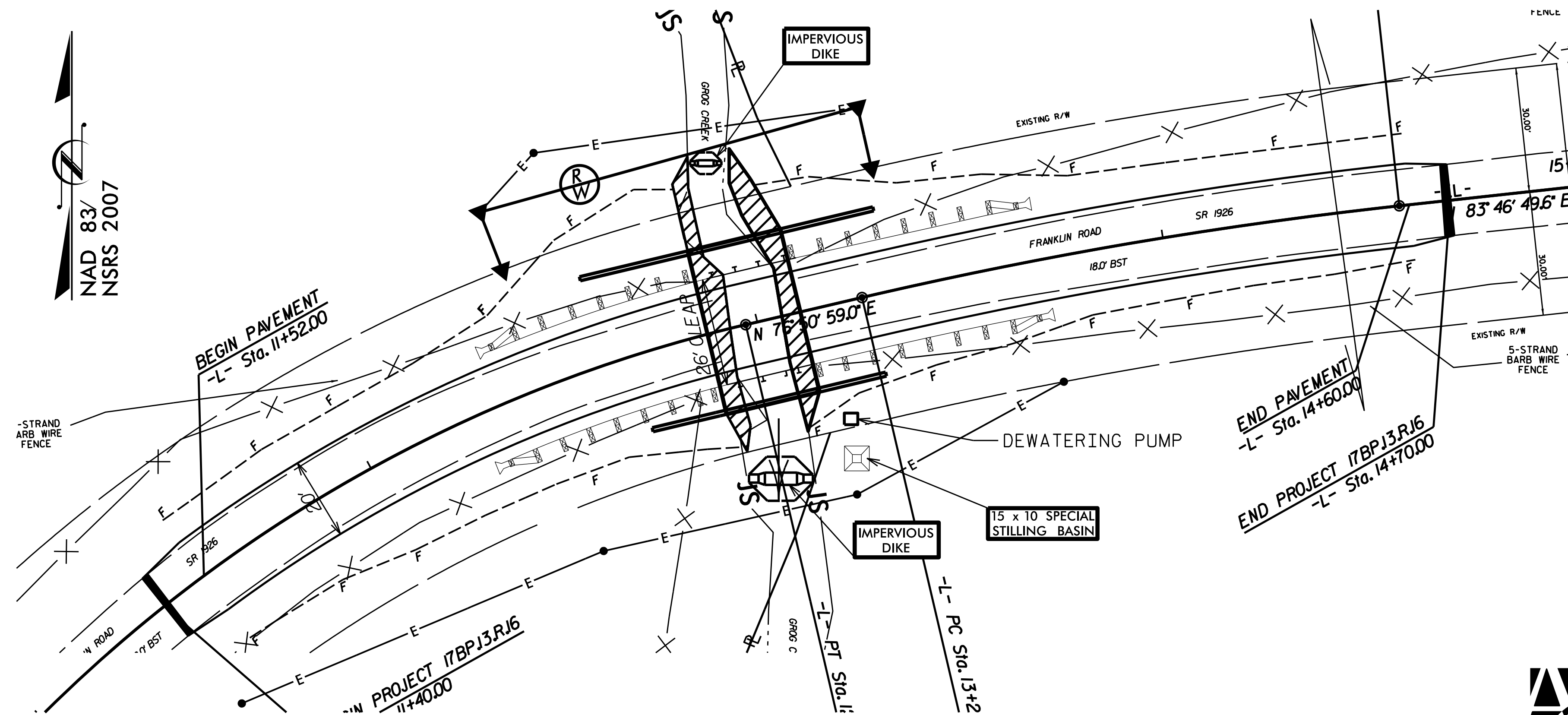
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CIVIL & STRUCTURAL ENGINEERS
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Phone 919 981 0310 Fax 919 981 0451
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PROJECT NO. 17.BP.13.R.16					
RUTHERFORD COUNTY					
STATION: 12+99.10 -L-					
SHEET _ OF _					
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
CULVERT NO. 800109 ON SR 1926 OVER GROG CREEK					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS



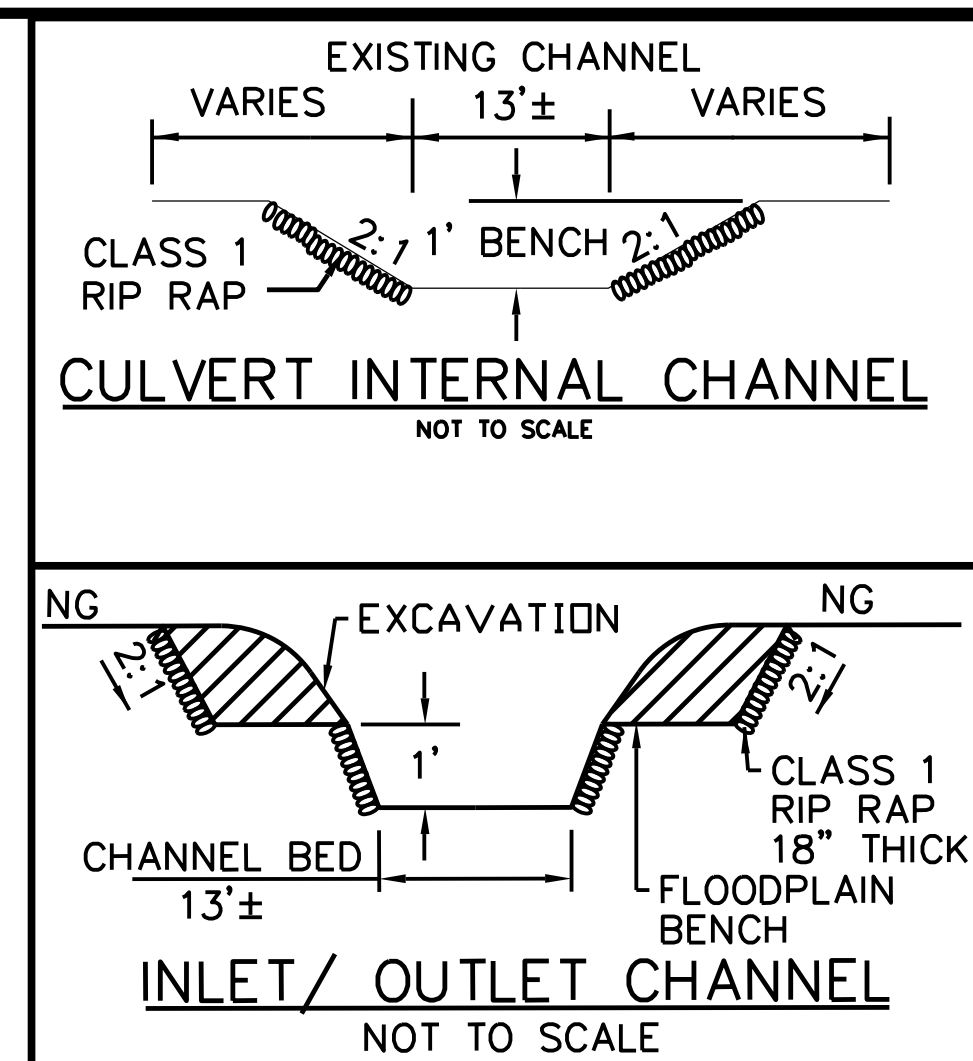
CLEARING AND GRUBBING AND EROSION CONTROL

NOTE: ALL EROSION CONTROL MEASURES SHOWN ARE TO BE PLACED WITHIN EXISTING / PROPOSED RIGHT OF WAY OR EASEMENT.



CONSTRUCTION SEQUENCE

NOTE: THE CONTRACTOR SHALL FILTER ALL SEDIMENT-LADEN WATER THROUGH SPECIAL STILLING BASIN.



NOTES:

1. CULVERT CONSTRUCTION SHALL BE PERFORMED ONLY IN DRY OR ISOLATED SECTIONS OF CHANNEL.
2. ALL GRADED AREAS SHALL BE STABILIZED WITHIN 24 HOURS.
3. MAINTENANCE OF STREAM FLOW OPERATIONS SHALL BE INCIDENTAL TO THE WORK. THIS INCLUDES POLYETHYLENE SHEETING, DIVERSION PIPES, PUMPS, AND HOSES.
4. PUMPS AND HOSES SHALL BE IF SUFFICIENT SIZE TO DEWATER THE WORK AREA.
5. THE CONTRACTOR SHALL NOT PUMP SEDIMENT-LADEN WATER DIRECTLY INTO THE STREAM.

CULVERT CONSTRUCTION SEQUENCE STA. 12+99.10

(ROAD CLOSURE - MAINTENANCE OF TRAFFIC VIA OFFSITE DETOUR.)

1. CONSTRUCT STILLING BASIN FOR PUMPED EFFLUENT (10' X 15' MIN.) FROM DEWATERED SITE.
2. INSTALL IMPERVIOUS DIKES.
3. DIVERT CHANNEL FLOW AROUND CONSTRUCTION VIA BYPASS PUMP.
4. REMOVE EXISTING BRIDGE.
5. INSTALL CULVERT.
6. REMOVE IMPERVIOUS DIKES, STILLING BASIN, AND PUMP DIVERSION.
7. COMPLETE ROADWAY.



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PROJECT REFERENCE NO.	SHEET NO.
17.BP.13.R.16	EC-4
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

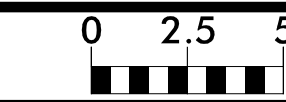
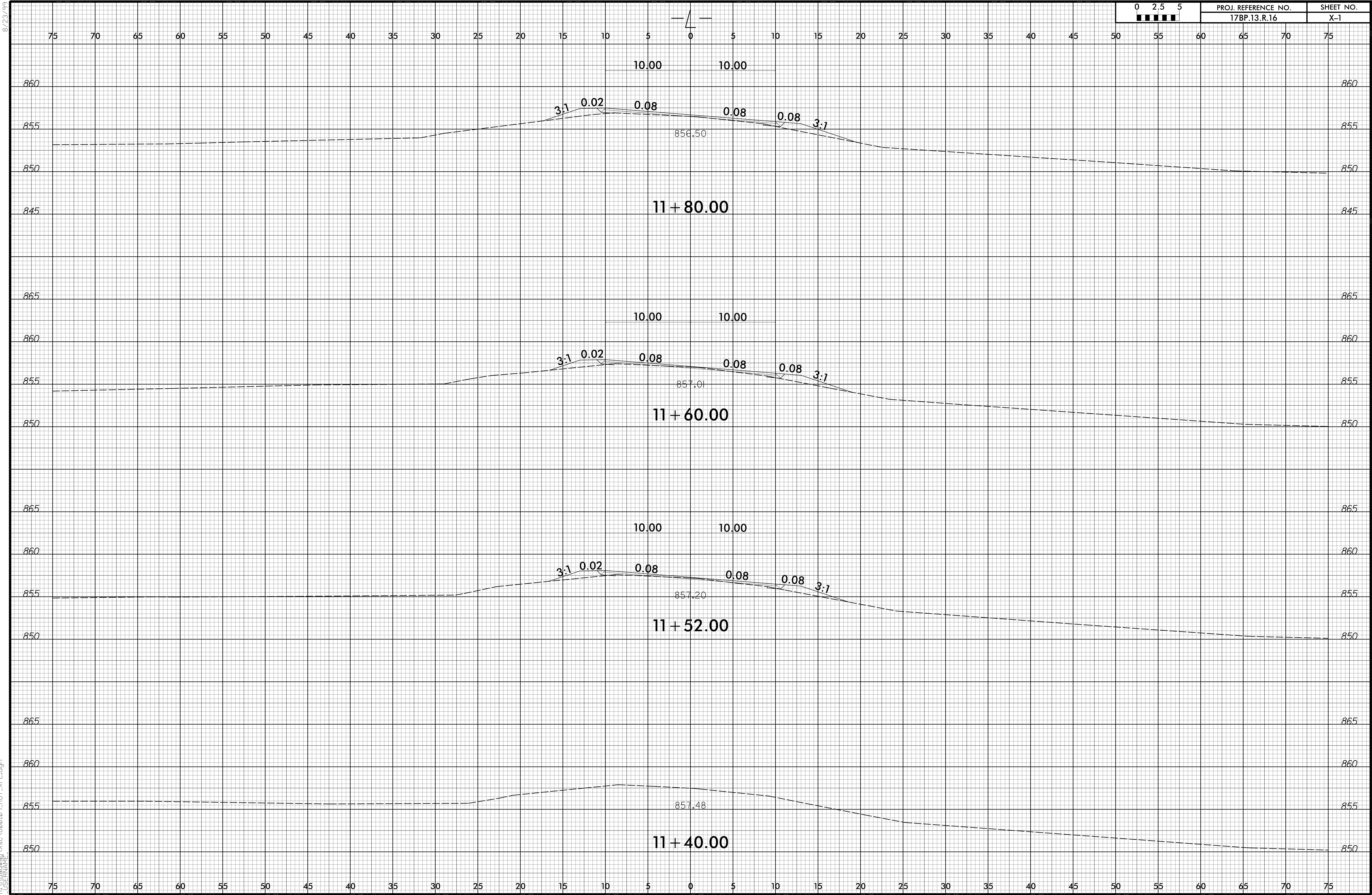
PROJECT NO. 17.BP.13.R.16
RUTHERFORD COUNTY
STATION: 12+99.10 -L-
SHEET _ OF _

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CULVERT NO. 800109
ON SR 1926 OVER
GROG CREEK

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

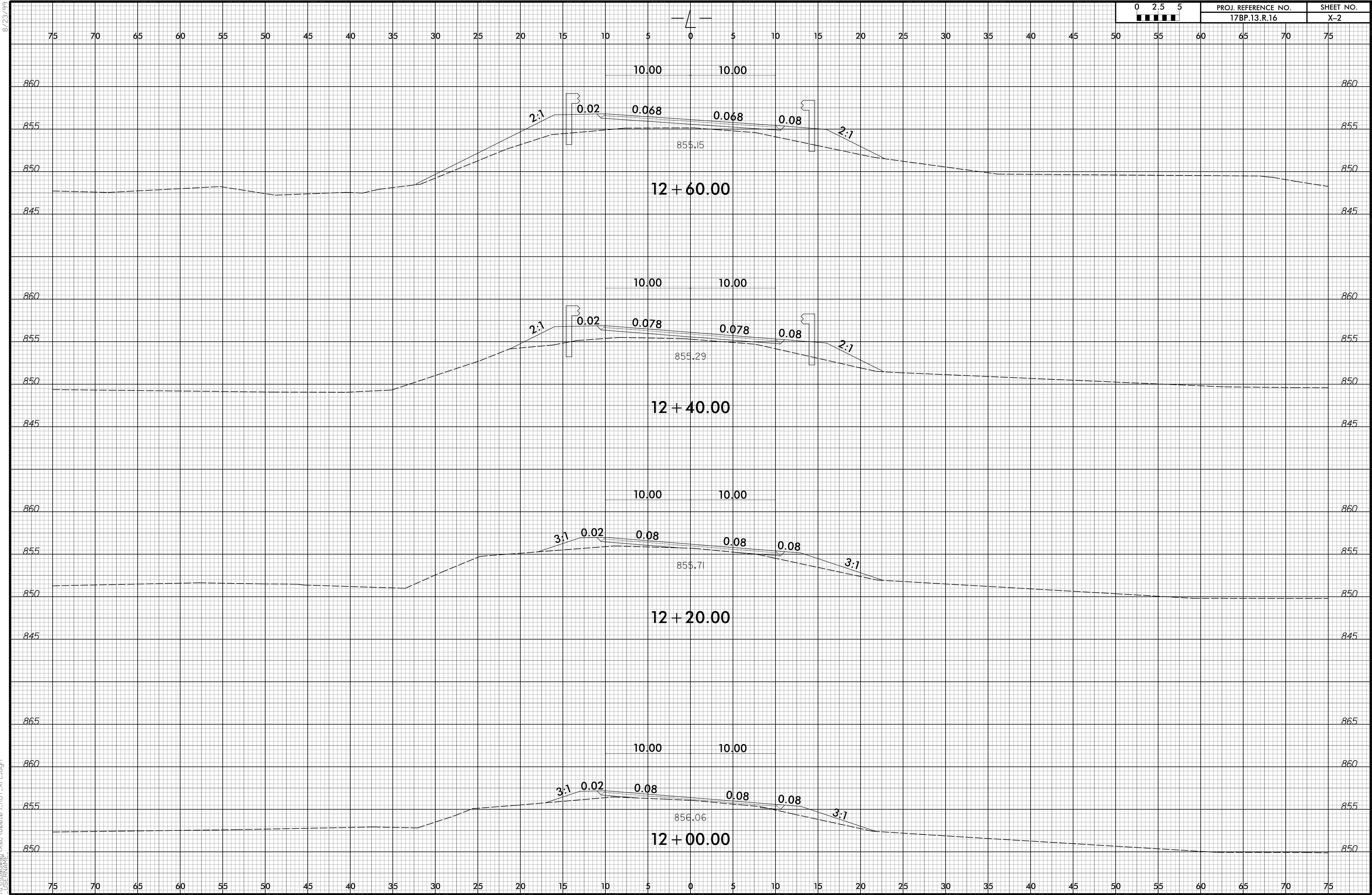
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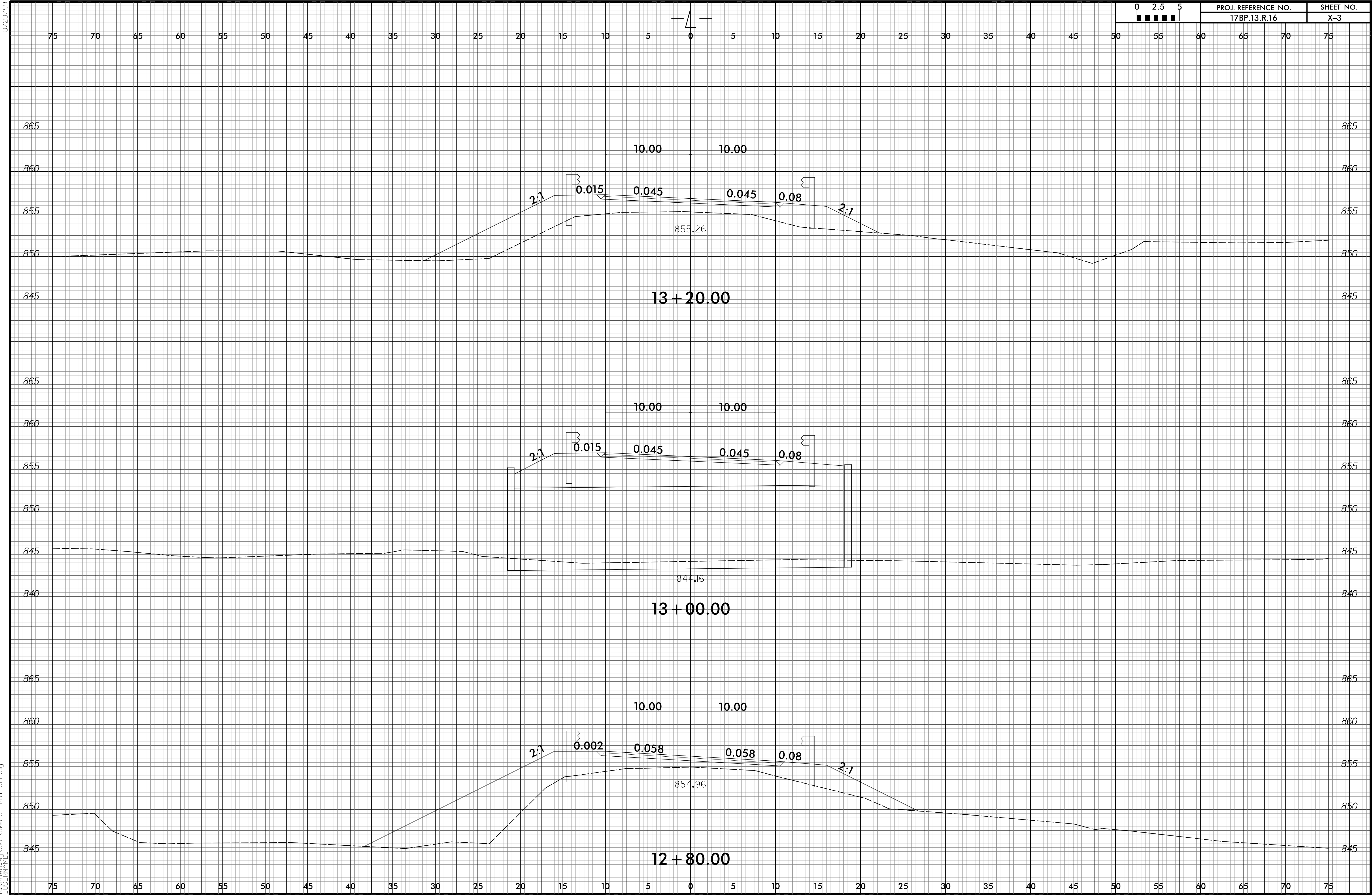
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17BP.13.R.16

SHEET NO.
X-1

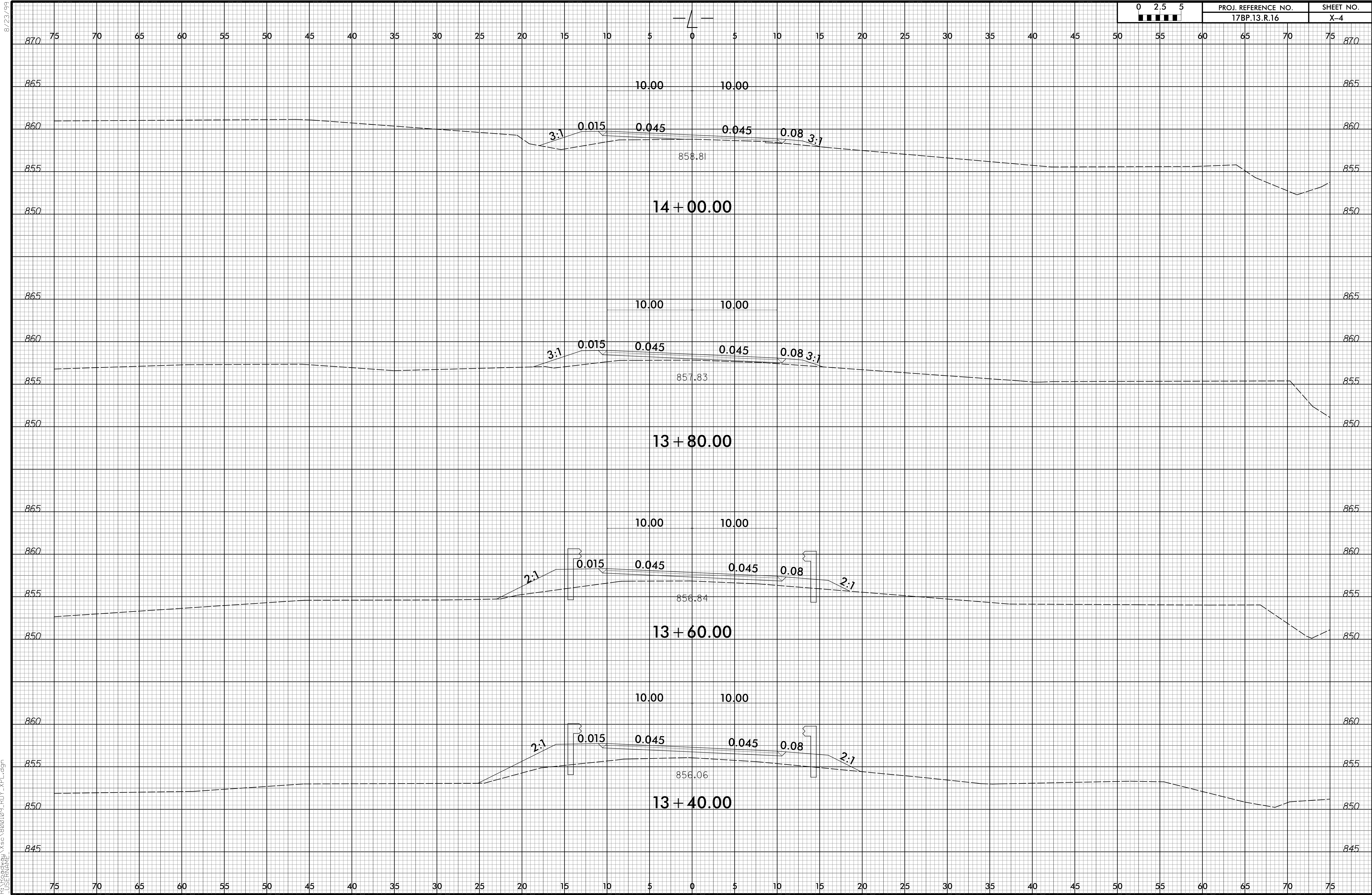
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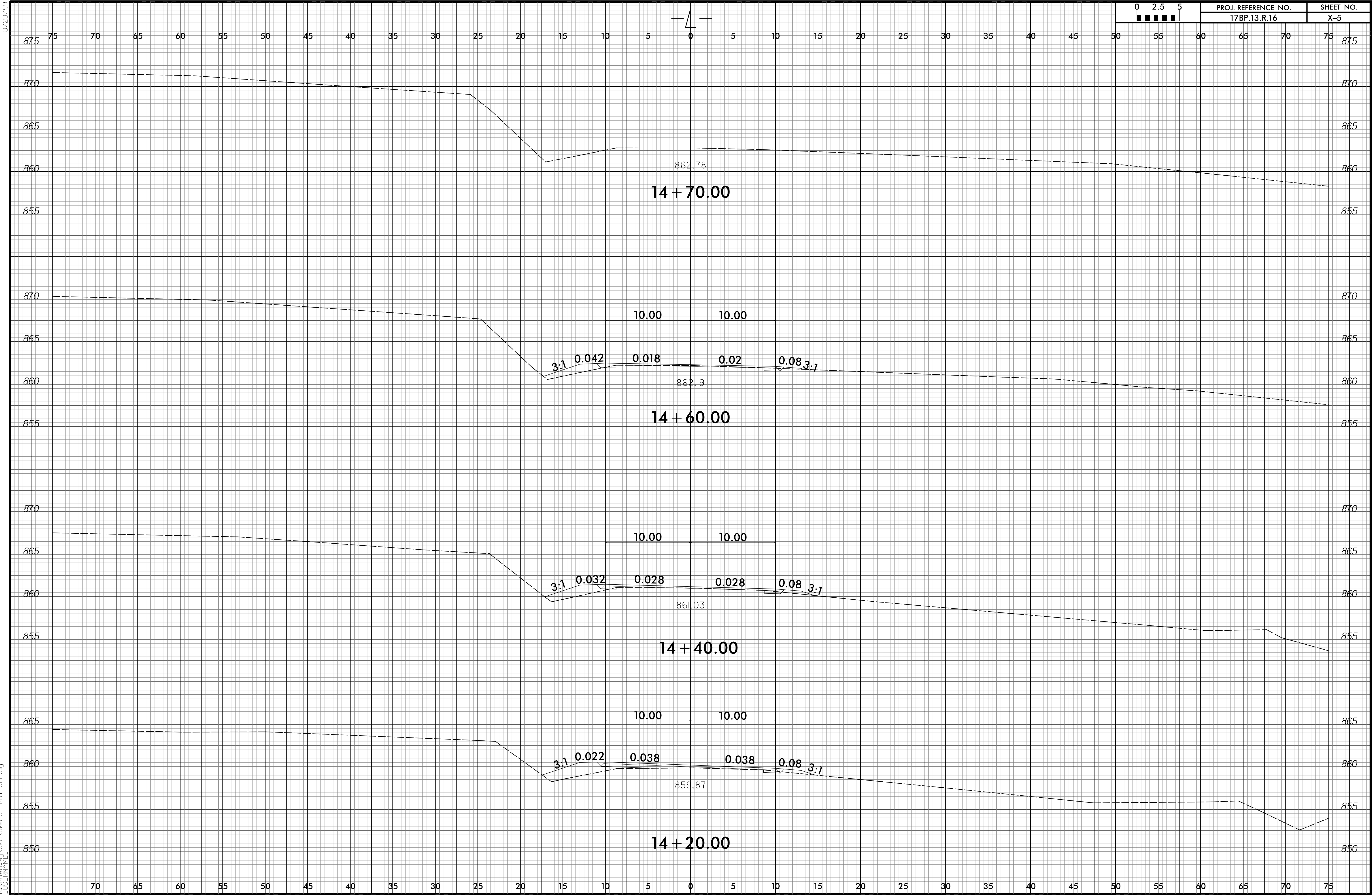
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8/23/99

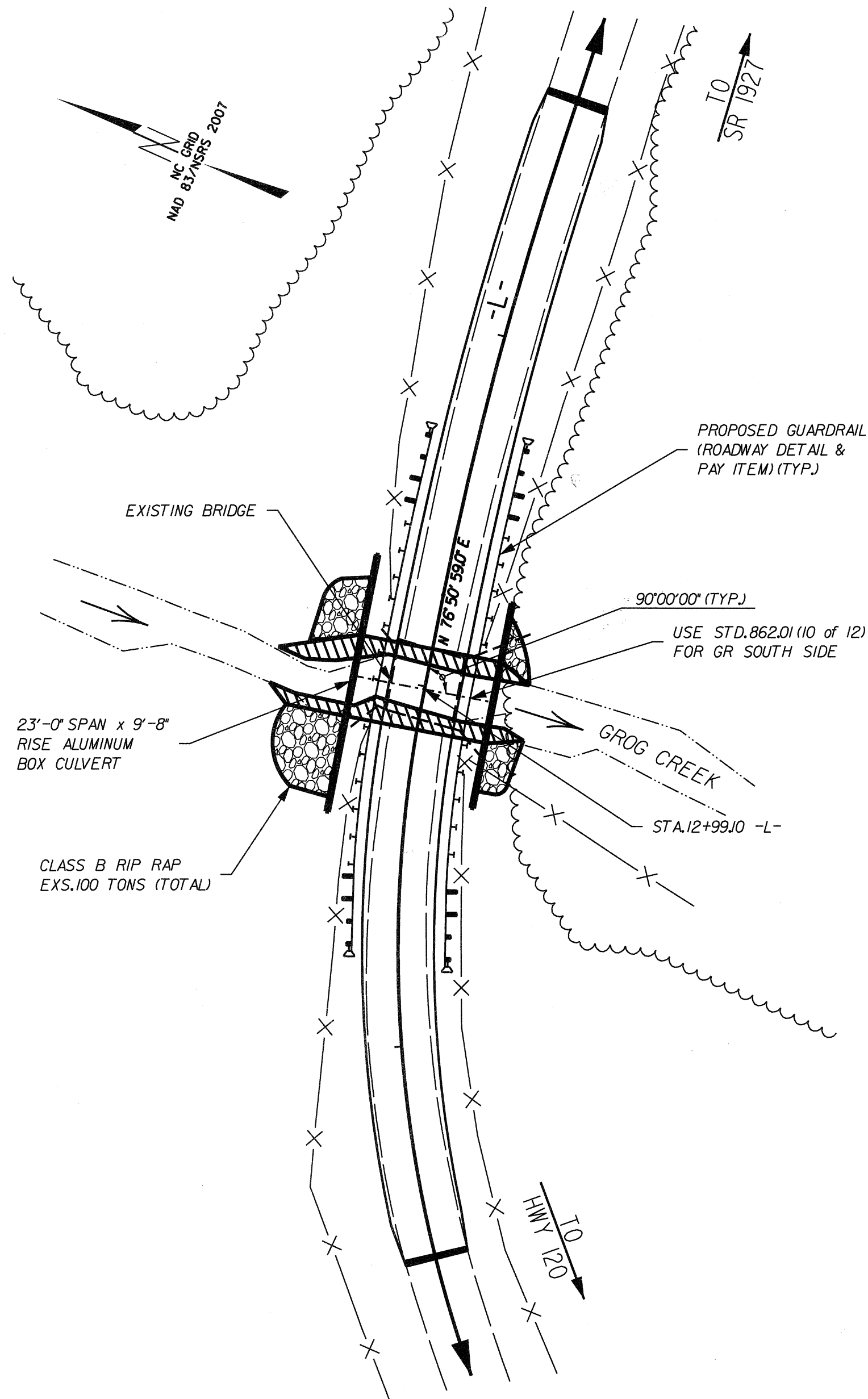


8/23/99



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BM#1 : 8" SPIKE SET IN 30" POPLAR TREE, LOCATED N 59°15'29"E 244.29' FROM BL-1, EL. 852.81'



LOCATION SKETCH

GRADE DATA

GRADE POINT ELEVATION @ STA. 12+99.10 -L- = 856.49'
BED ELEVATION @ STA. 12+99.10 -L- = 843.2'
ROADWAY SLOPES = 2 : 1

HYDRAULIC DATA

DESIGN DISCHARGE = 1000 C.F.S.
FREQUENCY OF DESIGN FLOOD = 25 YEARS
DESIGN HIGH WATER ELEVATION = 852.0'
DRAINAGE AREA = 2.73 SQ. MI.
BASIC DISCHARGE (Q100) = 1830 C.F.S.
BASIC HIGH WATER ELEVATION = 855.75'

OVERTOPPING FLOOD DATA

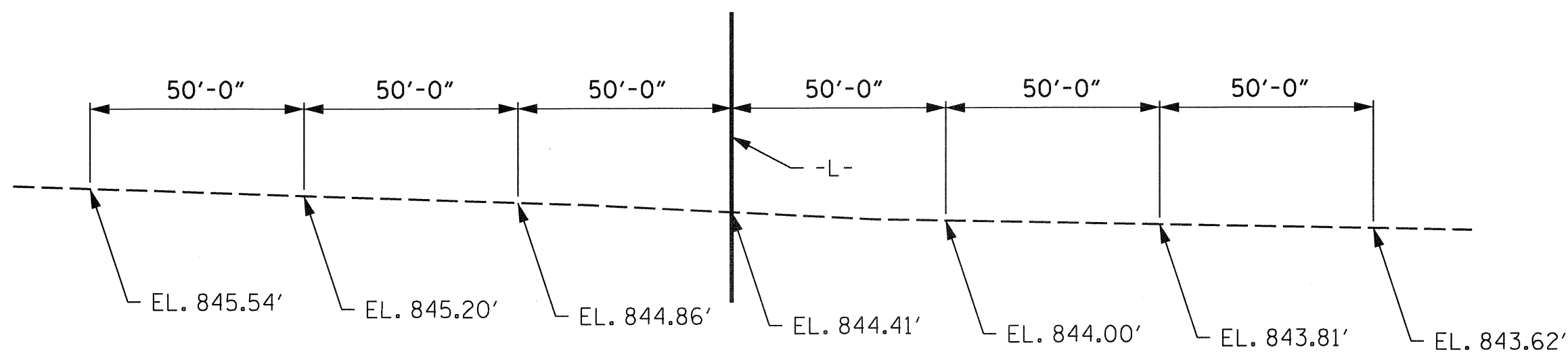
OVERTOPPING DISCHARGE = 1900± C.F.S.
FREQUENCY OF OVERTOPPING FLOOD = 500 + YEARS
OVERTOPPING FLOOD ELEVATION = 856.1'

TOTAL STRUCTURE QUANTITIES	QUANTITY	UNIT
REMOVAL OF EXISTING STRUCTURE	N/A	LS
FOUNDATION EXCAVATION STA. 12+99.10 -L-	N/A	LS
ALUMINUM BOX CULVERT STA. 12+99.10 -L-	N/A	LS

FOUNDATION NOTES

THE SCOUR CRITICAL ELEVATION IS BOTTOM OF THE FOOTING ELEVATION. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

THE MAT FOUNDATION HAS BEEN DESIGNED FOR A FACTORED RESISTANCE OF 2 TSF. CHECK FIELD CONDITIONS FOR THE REQUIRED RESISTANCE OF 4.5 TSF JUST BEFORE PLACING CONCRETE.



PROFILE ALONG CULVERT

NOTES

ASSUMED LIVE LOAD ----- HL-93 OR ALTERNATE LOADING.

DESIGN FILL ----- 4'-6"

FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.

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.

FOR BORING INFORMATION, SEE GEOTECHNICAL REPORT.

SEE ROADWAY PLANS FOR RIP RAP REQUIREMENTS AT CULVERT ENDS.

FOR ADDITIONAL INFORMATION REGARDING DRAINAGE, GRADING, AND ROADWAY, SEE ROADWAY PLANS.

THE DETAILS SHOWN ARE FOR GENERAL LAYOUT ONLY, THE SUPPLIER SHALL PROVIDE DESIGNS AND DETAILS FOR REVIEW AND APPROVAL THAT MEET THE REQUIREMENTS OF AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12, AND ARE SEALED BY A NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER.

UNLESS OTHERWISE INDICATED, THE SUPPLIER SHALL DESIGN, DETAIL, AND FURNISH ALL STRUCTURAL ELEMENTS AND HARDWARE.

THE EXISTING STRUCTURE CONSISTING OF ONE 21' SPAN CONSISTING OF TIMBER FLOOR ON I-BEAMS SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOADLOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", MAY, 2001.

FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.

THE CONTRACTOR SHALL STAKE OUT THE LENGTH OF CULVERT FOR ENGINEER REVIEW PRIOR TO ORDERING CULVERT.

CONTRACTOR WILL MAINTAIN THE ALIGNMENT OF THE ALUMINUM BOTTOMLESS CULVERT SECTIONS DURING BACKFILL.

SEE SPECIAL PROVISIONS FOR CORRUGATED ALUMINUM PIPE CULVERT WITH HEADWALLS AND WINGWALLS.

IN AS MUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR 'REMOVAL OF EXISTING STRUCTURE AT STATION 12+99.10.

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

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.

FOR CURING CONCRETE, SEE SPECIAL PROVISIONS.

PROJECT NO. 17BP.13.R.16

RUTHERFORD COUNTY

STATION: 12+99.10 -L-

SHEET 1 OF 5 REPLACES BRIDGE #109



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
23'-0" X 9'-8"
ALUMINUM
BOX CULVERT
ON SR 1926
AT GROG CREEK

JANUARY 2013			REVISIONS			SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	C-1	TOTAL SHEETS
1			3				5
2			4				

ASSEMBLED BY : C. KING DATE : NOV 2012
CHECKED BY : S. COOK DATE : DEC 2012

SPECIAL

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1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

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DEADMAN ANCHOR ALUMINUM
STRUCTURAL PLATE 0.150"
(1'-8" X 2' 4-3/4") (TYPICAL)

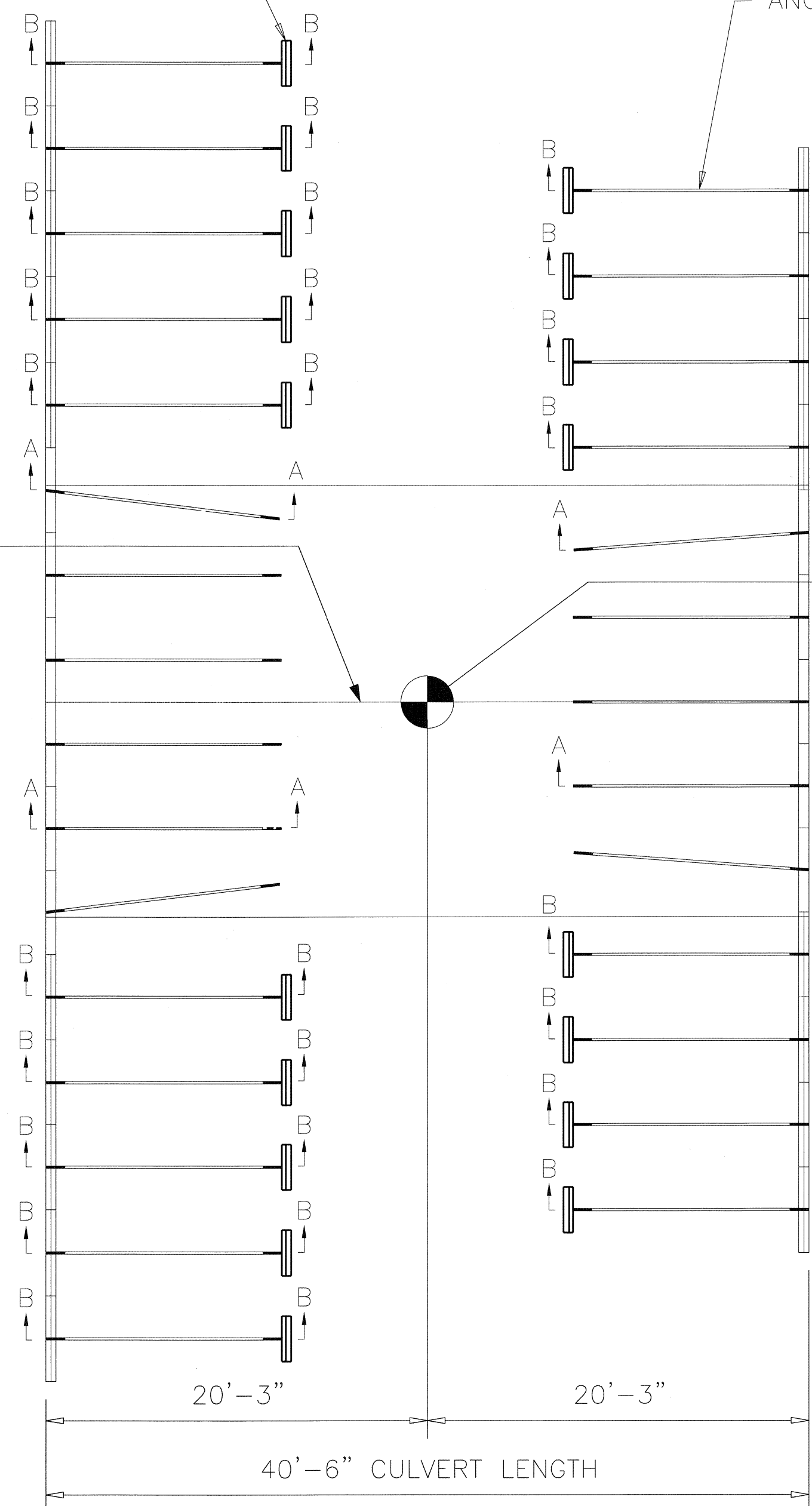
23'-0" SPAN X 9'-8" RISE
ALUMINUM BOX CULVERT
WITH FULL ALUMINUM INVERT

3/4" DIA. x 12'-6"
ANCHOR ROD (TYPICAL)

23'-0" SPAN X 9'-8" RISE
ALUMINUM BOX CULVERT
WITH FULL ALUMINUM INVERT

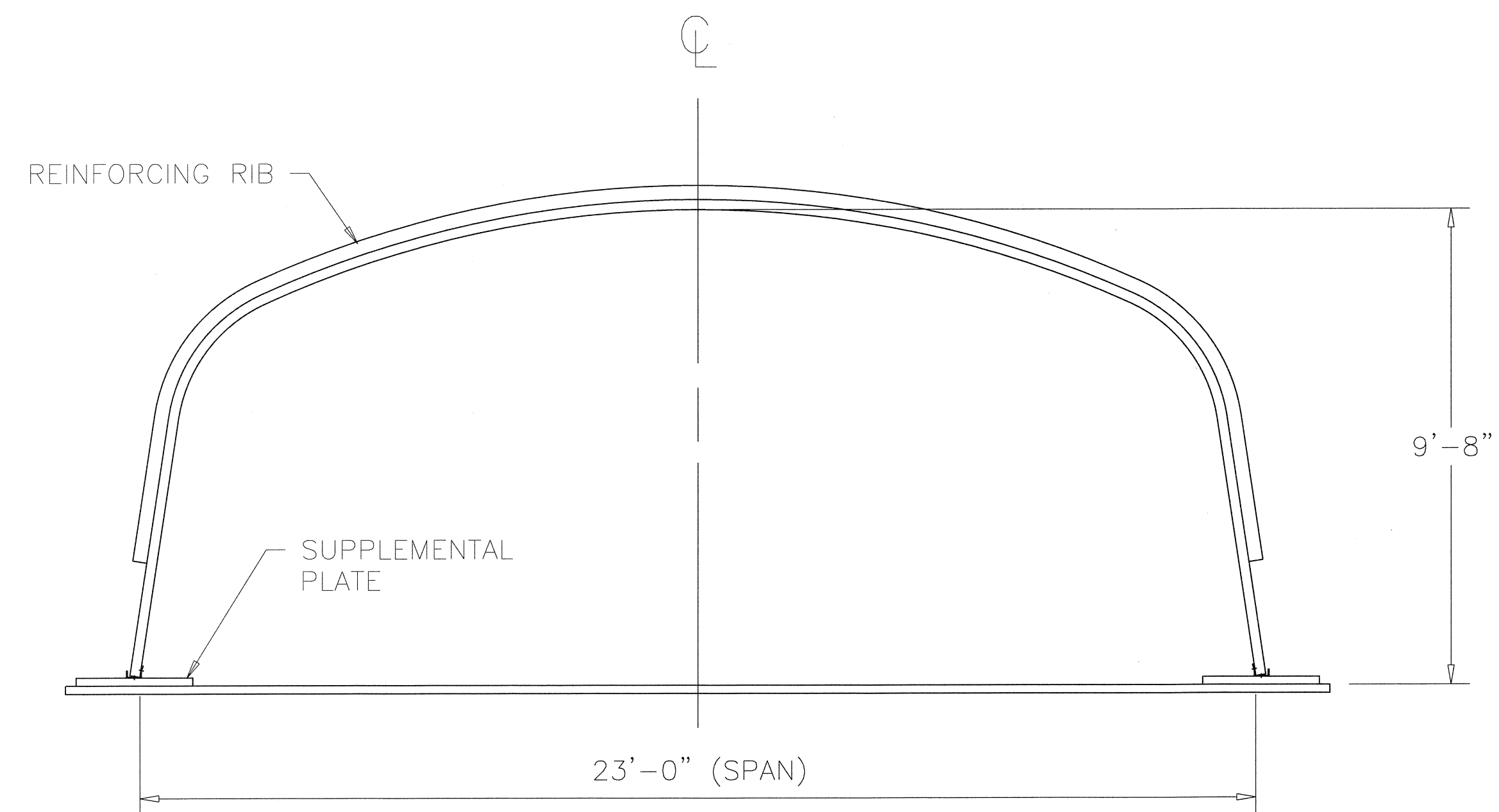
FLOW →

STA. 12+99.10 -L-



PLAN VIEW

FOR SECTION A-A & B-B,
SEE SHEET 4 OF 5



SECTION VIEW

PROPOSED ELEVATIONS	
TOP OF MAXIMUM FILL	857.00
TOP OF HEADWALL	854.37
TOP OF ALUMINUM BOX CULVERT	852.87
TOP OF SILL	844.20
INVERT OF ALUMINUM BOX CULVERT	843.20

PROJECT NO. 17BP.13.R.16
RUTHERFORD COUNTY
STATION: 12+99.10 -L-

SHEET 2 OF 5 REPLACES BRIDGE #109



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
23'-0" X 9'-8"
ALUMINUM
BOX CULVERT
ON SR 1926
AT GROG CREEK

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

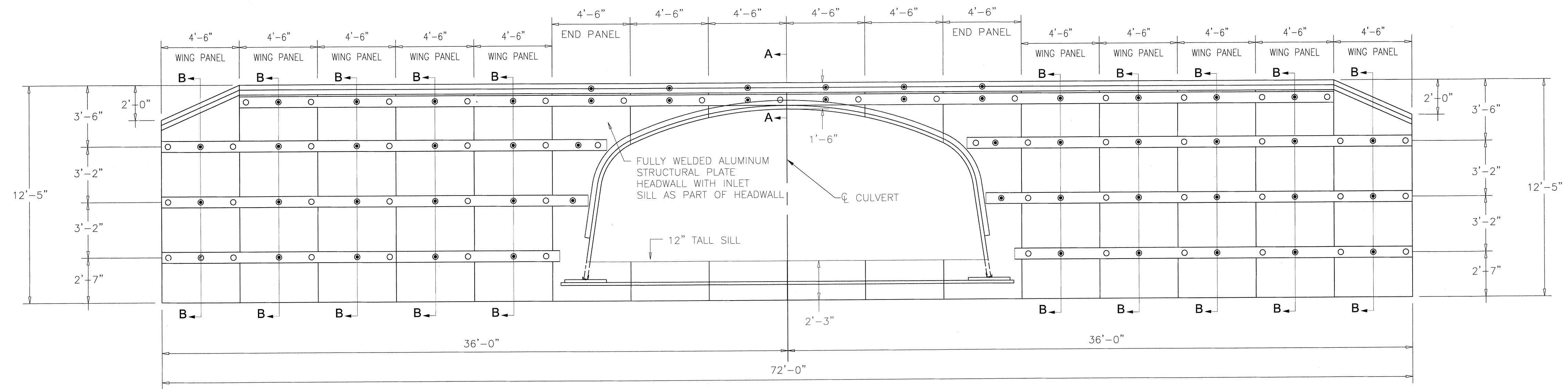
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SHEET NO. C-2
TOTAL SHEETS 5

ASSEMBLED BY : J. CARPENTER DATE : NOV 2012
CHECKED BY : C. BEATTY DATE : DEC 2012

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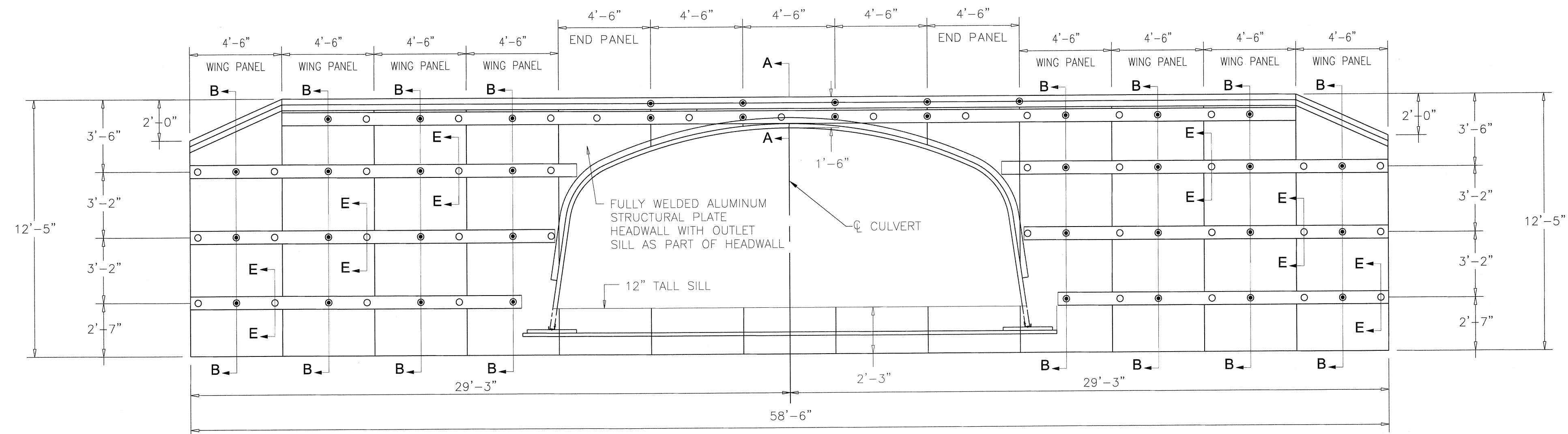
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INLET END VIEW

NOTE: TYPE VI STIFFENER RIB ON TOP & BOTTOM OF BOTH HEADWALLS

NOTES:
FOR SECTIONS, SEE SHEET 4 OF 5.
SILL DETAILS SHALL BE PROVIDED BY MANUFACTURER.



OUTLET END VIEW

NOTE: TYPE VI STIFFENER RIB ON TOP & BOTTOM OF BOTH HEADWALLS

PROJECT NO. 17BP.13.R.16
RUTHERFORD COUNTY
STATION: 12+99.10 -L-

SHEET 3 OF 5 REPLACES BRIDGE #109



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
23'-0" X 9'-8"
ALUMINUM
BOX CULVERT
ON SR 1926
AT GROG CREEK

JANUARY 2013

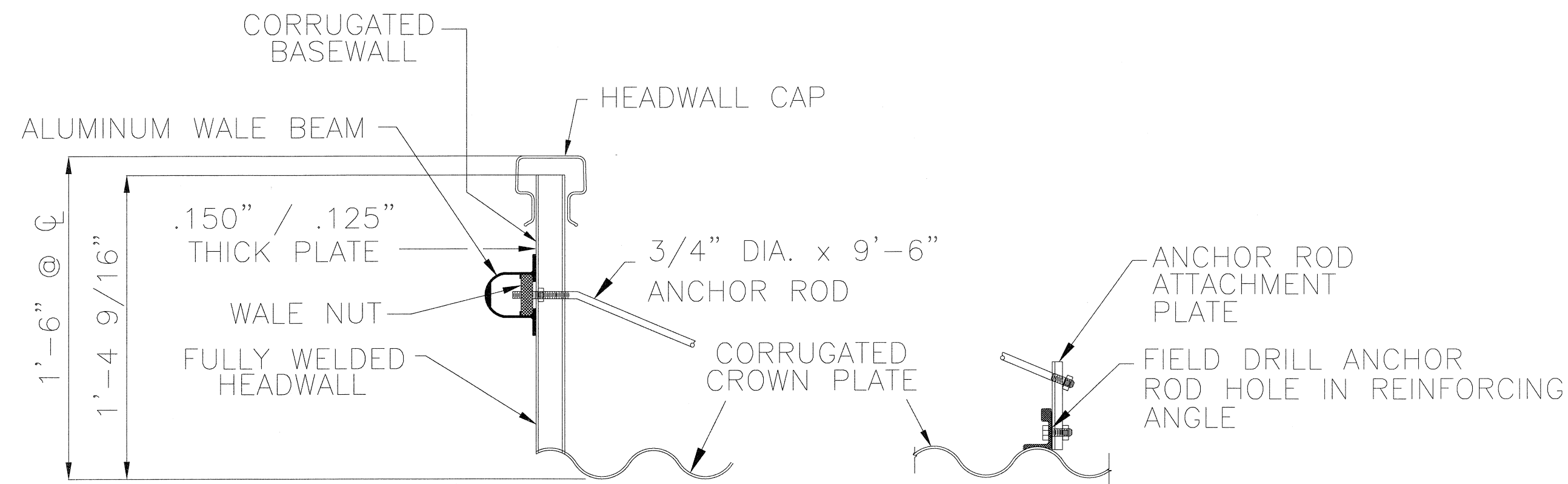
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CHECKED BY : C. BEATTY DATE : DEC 2012

SPECIAL

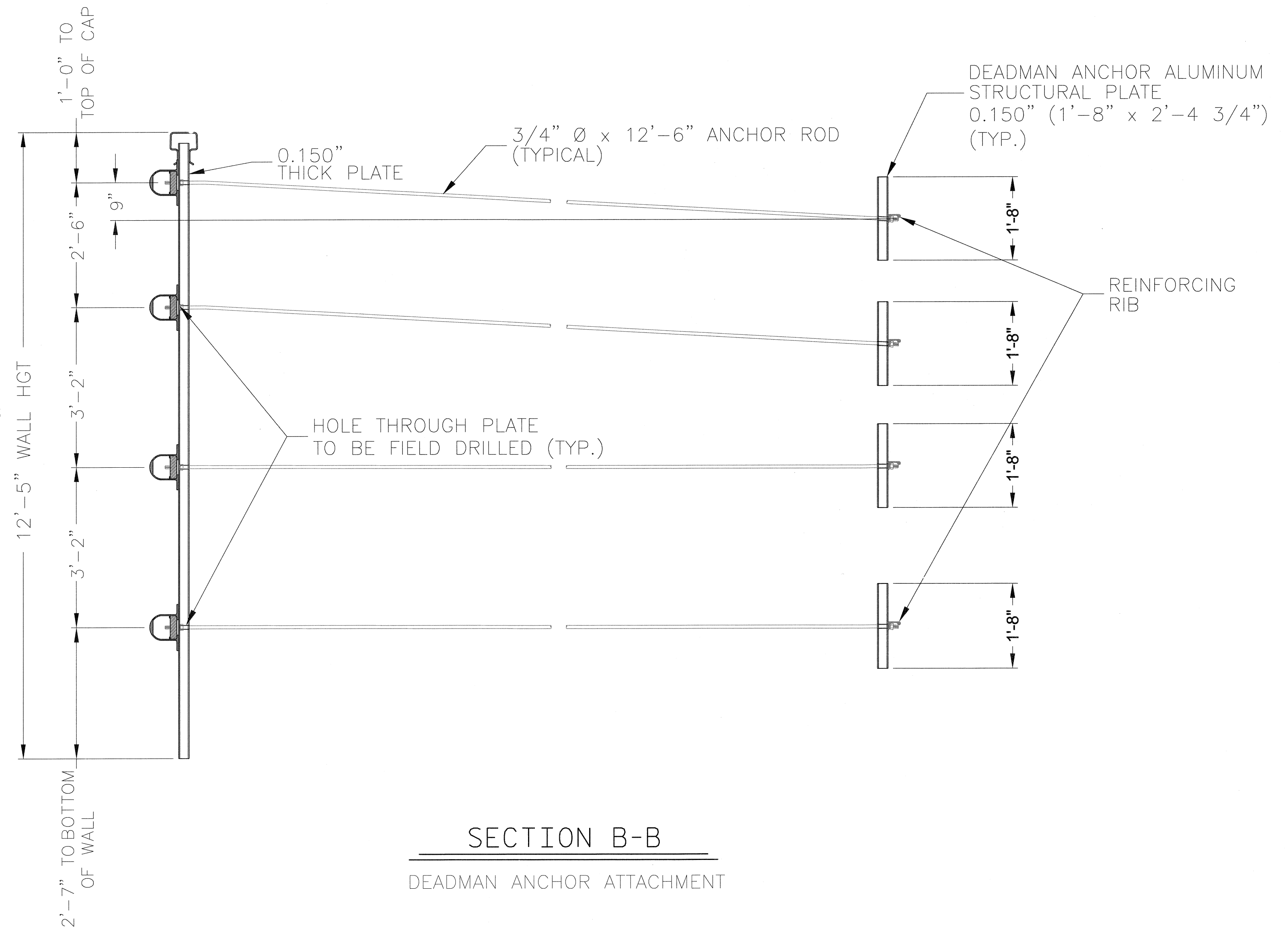
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SECTION A-A

HEADWALL ATTACHMENT TO CROWN OF STRUCTURE



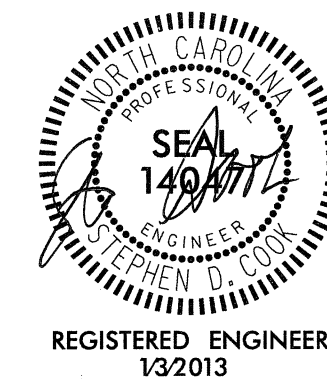
SECTION B-B

DEADMAN ANCHOR ATTACHMENT

NOTE:
THE BACK ROD SPACING AND LENGTH SHALL BE
PROVIDED BY MANUFACTURER.

PROJECT NO. 17BP.13.R.16
RUTHERFORD COUNTY
STATION: 12+99.10 -L-

SHEET 4 OF 5 REPLACES BRIDGE #109



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
23'-0" X 9'-8"
ALUMINUM
BOX CULVERT
ON SR 1926
AT GROG CREEK

JANUARY 2013

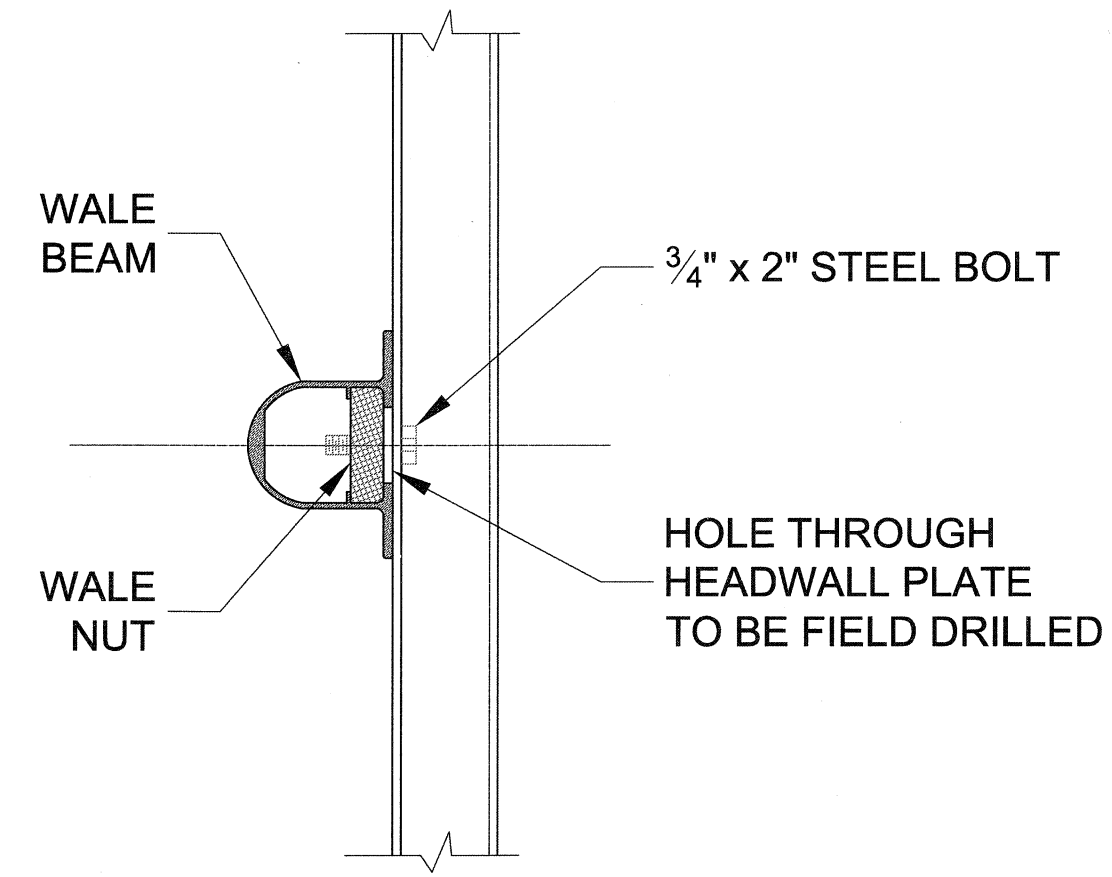
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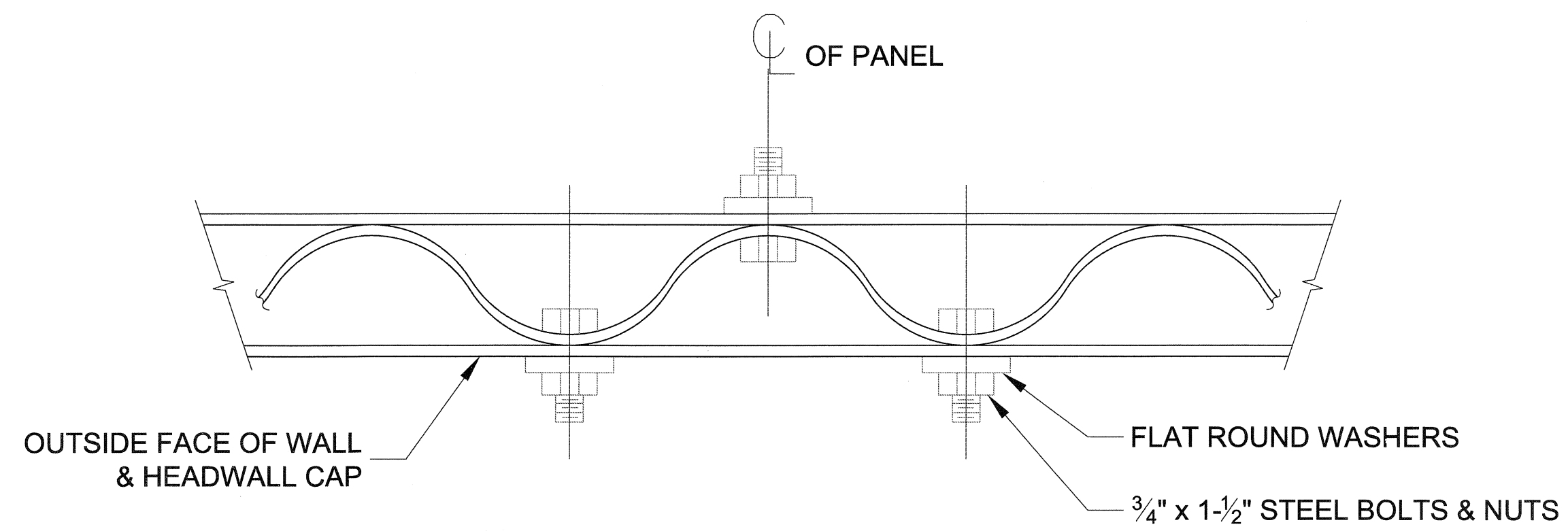
REVISIONS						SHEET NO. C-4 TOTAL SHEETS 5
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2			4			

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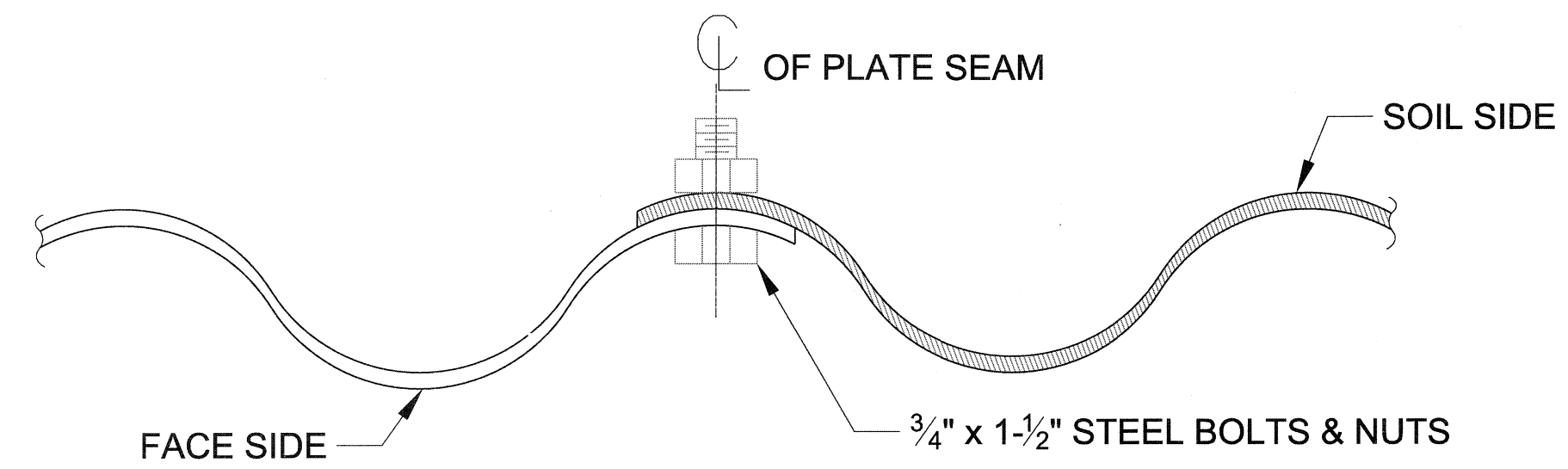


SECTION E-E

WALE BEAM ATTACHMENT



HEADWALL CAP AT ATTACHMENT TO PANEL DETAIL



TYPICAL PANEL LAP DETAIL

PROJECT NO. 17BP.13.R.16
RUTHERFORD COUNTY
STATION: 12+99.10 -L-

SHEET 5 OF 5 REPLACES BRIDGE #109



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
23'-0" X 9'-8"
ALUMINUM
BOX CULVERT
ON SR 1926
AT GROG CREEK

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

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