

09/08/99

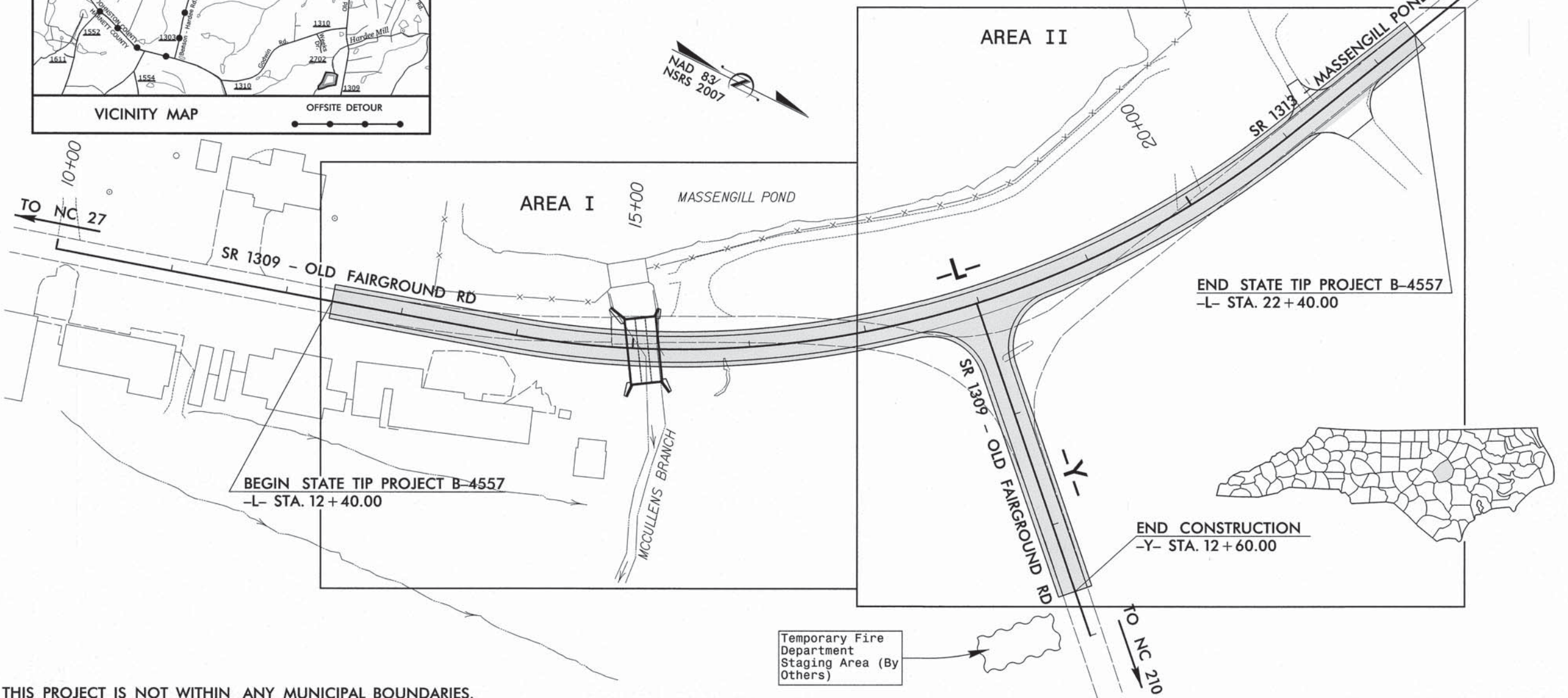
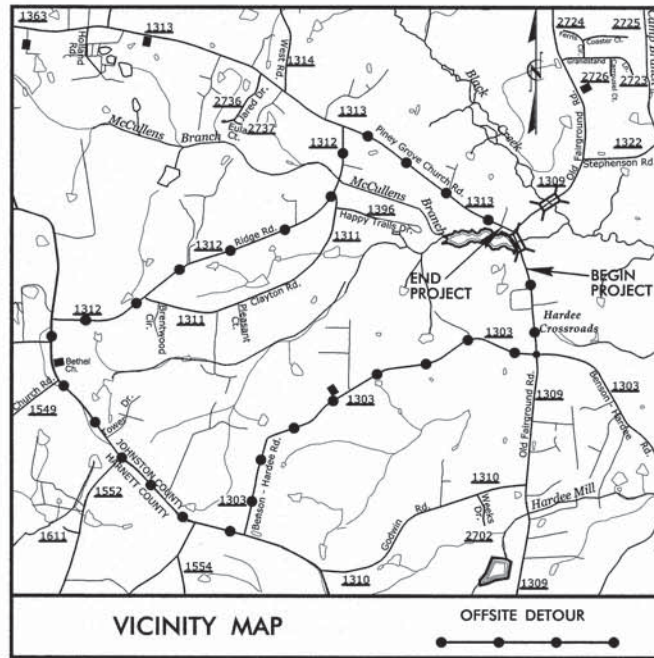
TIP PROJECT: 17BP.4.R.51

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

JOHNSTON COUNTY

LOCATION: REPLACEMENT OF BRIDGE NO. 113 ON SR 1309 (OLD FAIRGROUND RD) OVER MCCULLENS BRANCH
TYPE OF WORK: GRADING, DRAINAGE, PAVING, & CULVERT

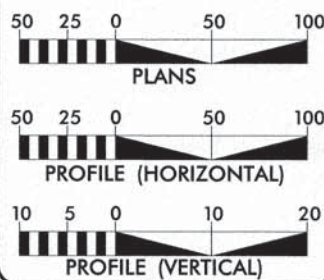
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.4.R.51	1	
STATE WBS ELEMENT	F.A. PROJ. NO.	DESCRIPTION	
17BP.4.R.51		PE	



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

See Sheet 1-A For Index of Sheets

GRAPHIC SCALES



DESIGN DATA

ADT 2011 = 2,300
ADT 2025 = 3,250
T = 6%
V = 50 MPH
FUNC CLASS =
RURAL MIN. COLLECTOR
SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4557 = 0.184 MILES
LENGTH STRUCTURE TIP PROJECT B-4557 = 0.005 MILES
TOTAL LENGTH TIP PROJECT B-4557 = 0.189 MILES

Prepared For:
HIGHWAY DIVISION 4
509 Ward Blvd.
Wilson, NC 27895

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

LETTING DATE:

Prepared by:
MULKEY ENGINEERS & CONSULTANTS
PO Box 22187
Raleigh, N.C. 27636
(919) 871-1010 (FAX)
WWW.MULKEYINC.COM
NC License No. C1027

L. KEVIN AUSTIN, PE
PROJECT ENGINEER

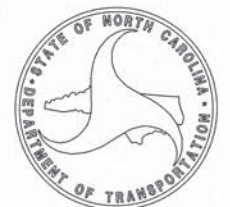
W. CRAIG PARKER, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

[Signature]
PE 20147

ROADWAY DESIGN ENGINEER

[Signature]
PE 25474
3/3/14



3/3/2014 R:\CLIENT\Roadway\Proj\Johnston 113_rdy_tsh.dgn 2:14:48 PM

CONTRACT:

04/16/11

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO. 17BP.4.R.51	SHEET NO. 1-A
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INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARDS

SHEET #	DESCRIPTION	GENERAL NOTES:	2012 SPECIFICATIONS EFFECTIVE: 01-17-2012 REVISED: 07-30-2012	2012 ROADWAY ENGLISH STANDARD DRAWINGS	EFF. 01-17-2012 REV. 10-30-2012
1	TITLE SHEET				
1-A	INDEX OF SHEETS, GENERAL NOTES, & LIST OF STANDARDS	GRADE LINE: GRADING AND SURFACING:			
1-B	CONVENTIONAL SYMBOLS				
2	PAVEMENT SCHEDULE & TYPICAL SECTIONS				
2-A	DETAIL FOR TEMPORARY CONTAINMENT OF CONTAMINATED SOIL				
4	PLAN	CLEARING:			
5	PROFILE				
EC-1 THRU EC-6	EROSION CONTROL PLANS				
X-1 THRU X-8	CROSS-SECTIONS				
C-1 THRU C-8	CULVERT PLANS				
		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.		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	
				225.06 METHOD OF GRADING SIGHT DISTANCE AT INTERSECTIONS	
				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	
				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	
		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			
		SIDE ROADS:			
		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.			
		GUARDRAIL:			
		THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.			
		SUBSURFACE PLANS:			
		NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.			
		ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.			
		RIGHT-OF-WAY MARKERS:			
		ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY OTHERS.			

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

BOUNDARIES AND PROPERTY:

State Line	_____
County Line	_____
Township Line	_____
City Line	_____
Reservation Line	_____
Property Line	_____
Existing Iron Pin	○
Property Corner	⊕
Property Monument	EDM
Parcel/Sequence Number	123
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	W.B.
Proposed Wetland Boundary	W.B.
Existing Endangered Animal Boundary	EAB
Existing Endangered Plant Boundary	EPB
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	JS
Buffer Zone 1	BZ 1
Buffer Zone 2	BZ 2
Flow Arrow	←
Disappearing Stream	→
Spring	⊙
Wetland	⊕
Proposed Lateral, Tail, Head Ditch	▭
False Sump	▭

RAILROADS:

Standard Gauge	_____
RR Signal Milepost	CSX TRANSPORTATION MILEPOST 35
Switch	SWITCH
RR Abandoned	_____
RR Dismantled	_____

RIGHT OF WAY:

Baseline Control Point	⊕
Existing Right of Way Marker	△
Existing Right of Way Line	_____
Proposed Right of Way Line	_____
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	E
Proposed Temporary Construction Easement	E
Proposed Temporary Drainage Easement	TDE
Proposed Permanent Drainage Easement	PDE
Proposed Permanent Drainage / Utility Easement	DUE
Proposed Permanent Utility Easement	PUE
Proposed Temporary Utility Easement	TUE
Proposed Aerial Utility Easement	AUE
Proposed Permanent Easement with Iron Pin and Cap Marker	⊕

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	_____
Existing Curb	_____
Proposed Slope Stakes Cut	C
Proposed Slope Stakes Fill	F
Proposed Curb Ramp	CR
Curb Cut Future Ramp	CCFR
Existing Metal Guardrail	_____
Proposed Guardrail	_____
Existing Cable Guiderail	_____
Proposed Cable Guiderail	_____
Equality Symbol	⊕
Pavement Removal	⊗

VEGETATION:

Single Tree	⊕
Single Shrub	⊕
Hedge	_____
Woods Line	_____

Orchard	⊕
Vineyard	Vineyard

EXISTING STRUCTURES:

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

UTILITIES:

POWER:	
Existing Power Pole	⊕
Proposed Power Pole	⊕
Existing Joint Use Pole	⊕
Proposed Joint Use Pole	⊕
Power Manhole	⊕
Power Line Tower	⊕
Power Transformer	⊕
U/G Power Cable Hand Hole	_____
H-Frame Pole	_____
Recorded U/G Power Line	P
Designated U/G Power Line (S.U.E.*)	P

TELEPHONE:

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

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	A/G Water

TV:

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

GAS:

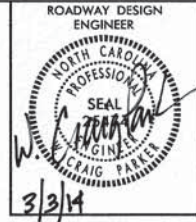
Gas Valve	⊕
Gas Meter	⊕
Recorded U/G Gas Line	G
Designated U/G Gas Line (S.U.E.*)	G
Above Ground Gas Line	A/G Gas

SANITARY SEWER:

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

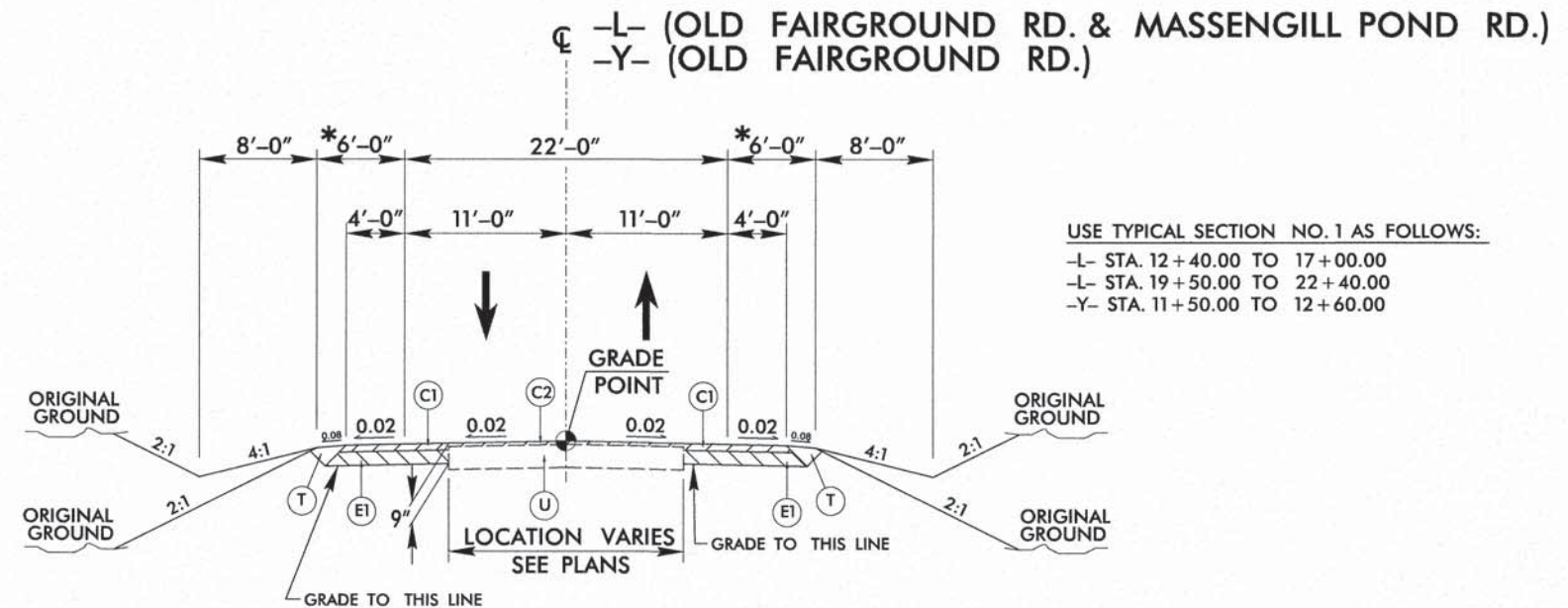
MISCELLANEOUS:

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



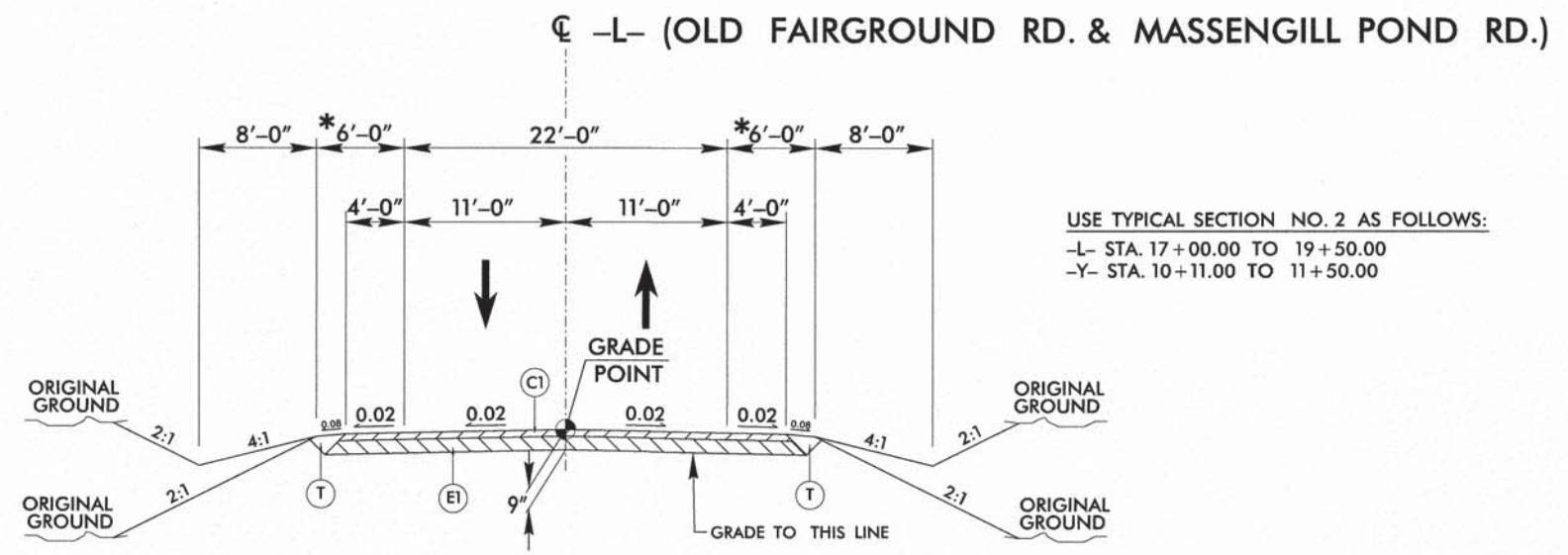
PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1.5" IN DEPTH.
E1	PROP. APPROX. 6" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 228 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.

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



TYPICAL SECTION No. 1

*** 9'-0" WITH GUARDRAIL**

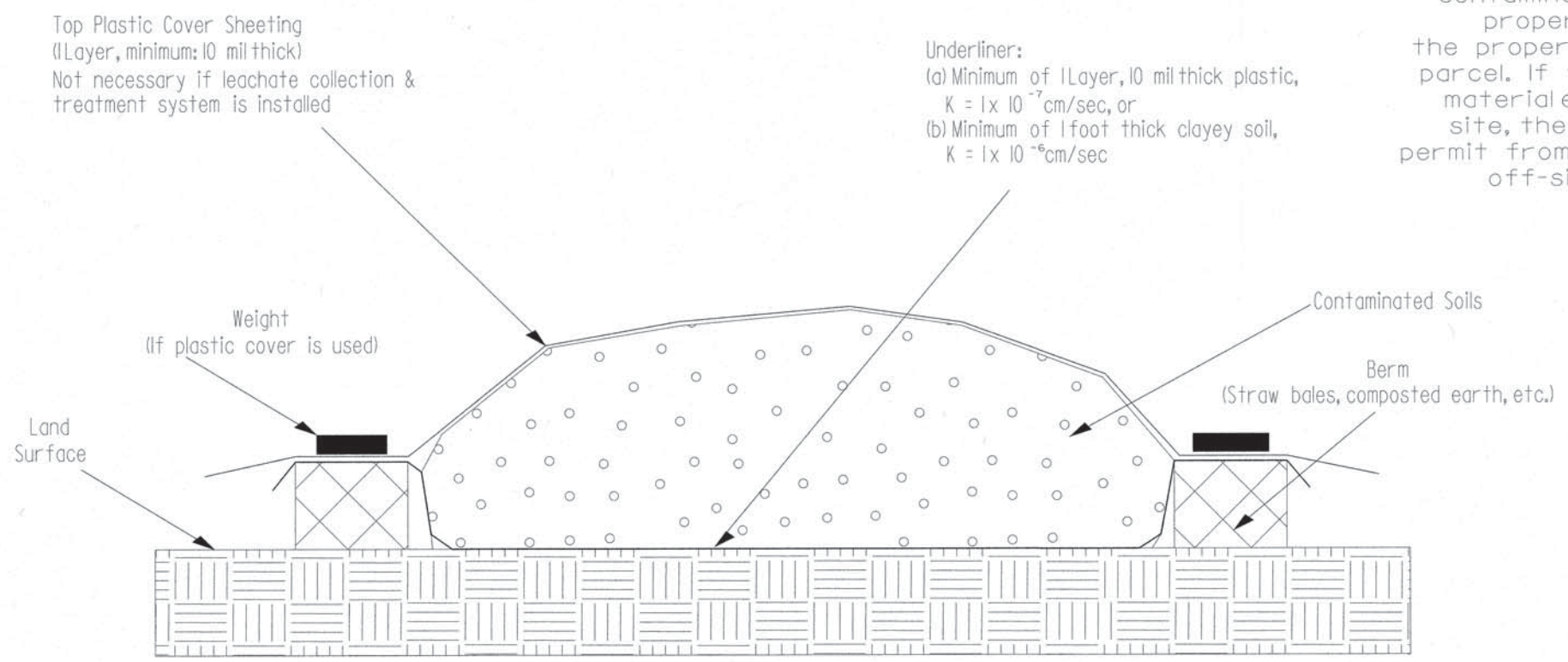


TYPICAL SECTION No. 2

PROJECT REFERENCE NO.	SHEET
17BP.4.R.51	2-A

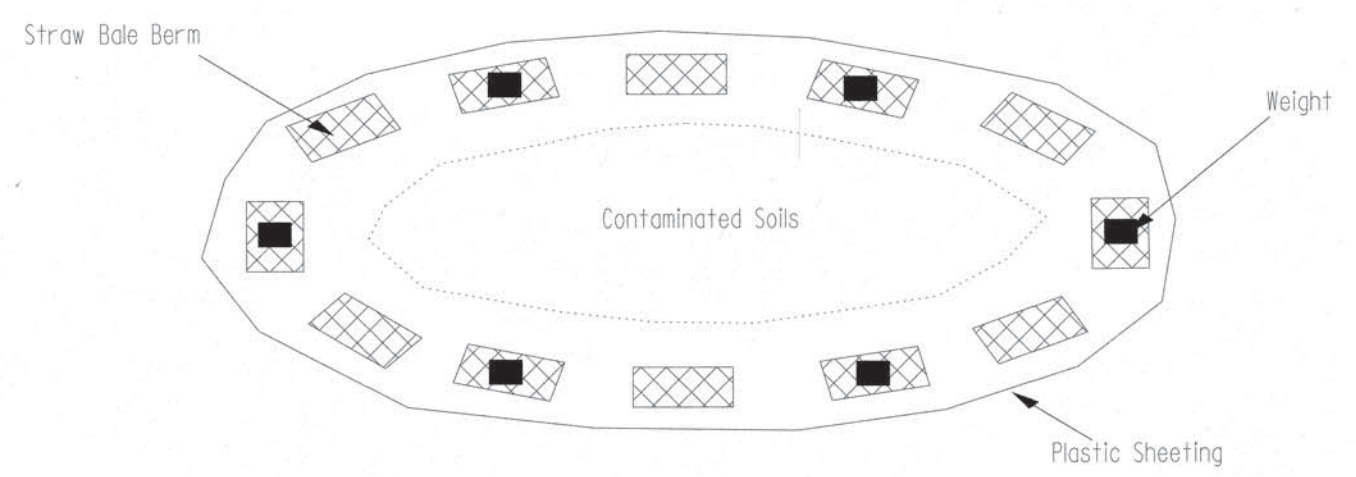
Detail for Temporary Containment of Contaminated Soil

Cross-Section View



NOTE:
The Contractor shall stockpile all contaminated soil excavated from a property in a location within the property boundaries of the source parcel. If the volume of contaminated material exceeds available space on site, the Contractor shall obtain a permit from the NCDENR UST Section for off-site temporary storage.

Map View



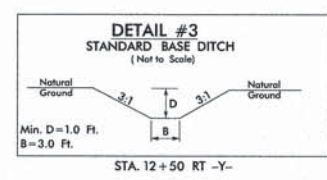
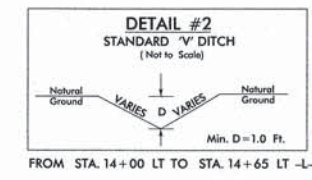
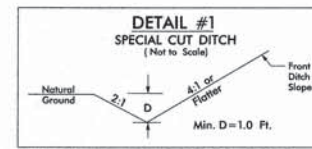
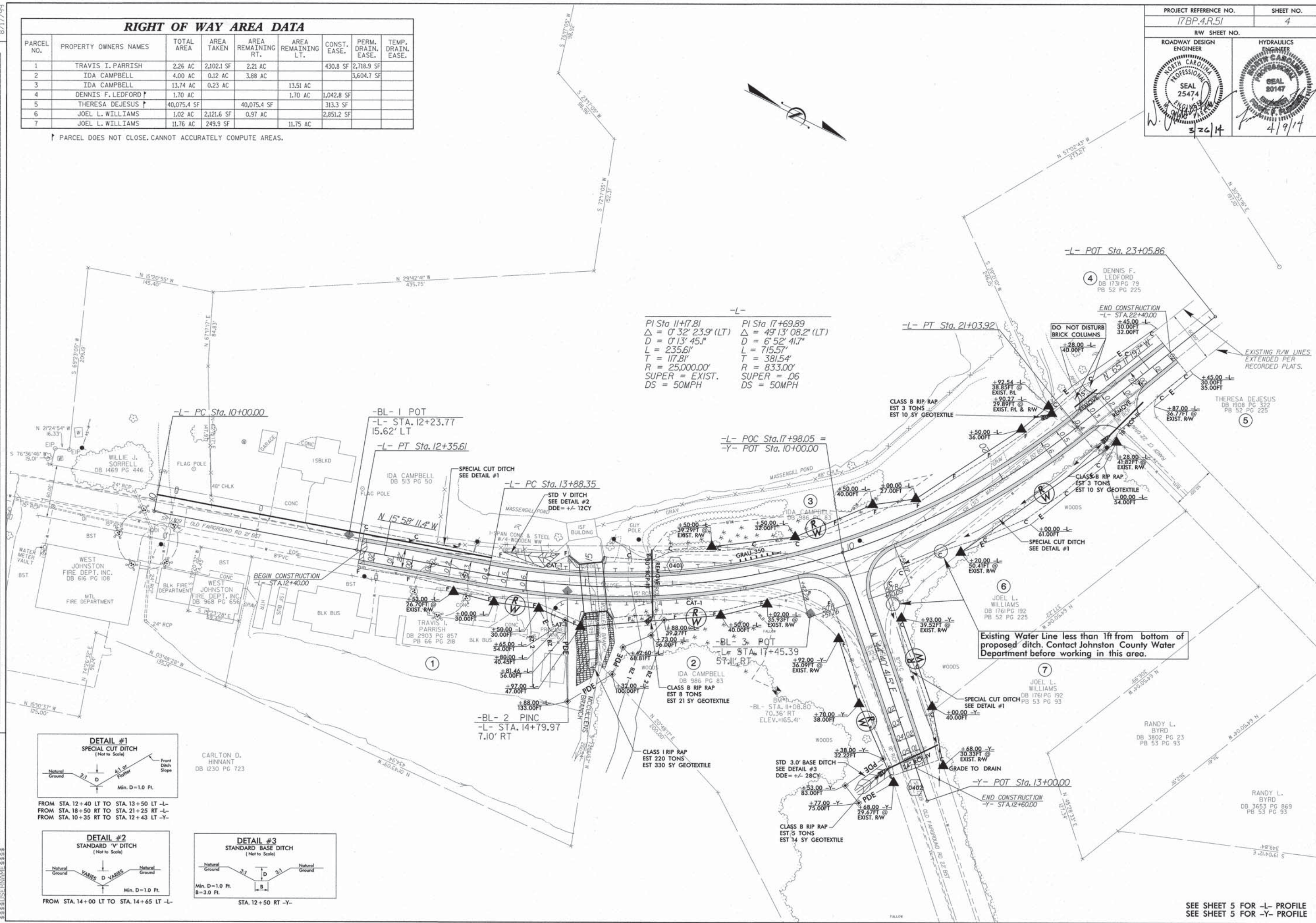
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RIGHT OF WAY AREA DATA								
PARCEL NO.	PROPERTY OWNERS NAMES	TOTAL AREA	AREA TAKEN	AREA REMAINING RT.	AREA REMAINING LT.	CONST. EASE.	PERM. DRAIN. EASE.	TEMP. DRAIN. EASE.
1	TRAVIS I. PARRISH	2.26 AC	2,102.1 SF	2.21 AC		430.8 SF	2,718.9 SF	
2	IDA CAMPBELL	4.00 AC	0.12 AC	3.88 AC			3,604.7 SF	
3	IDA CAMPBELL	13.74 AC	0.23 AC		13.51 AC			
4	DENNIS F. LEDFORD	1.70 AC			1.70 AC	1,042.8 SF		
5	THERESA DEJESUS	40,075.4 SF		40,075.4 SF		313.3 SF		
6	JOEL L. WILLIAMS	1.02 AC	2,121.6 SF	0.97 AC		2,851.2 SF		
7	JOEL L. WILLIAMS	11.76 AC	249.9 SF		11.75 AC			

↑ PARCEL DOES NOT CLOSE. CANNOT ACCURATELY COMPUTE AREAS.

PROJECT REFERENCE NO. 17BP-4R-51	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER

REVISIONS

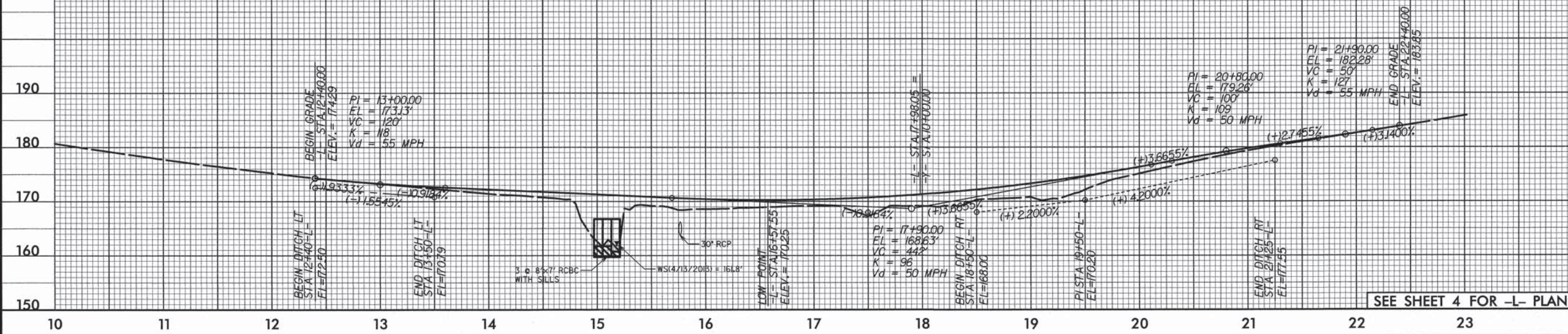


SEE SHEET 5 FOR -L- PROFILE
SEE SHEET 5 FOR -Y- PROFILE

5/28/99

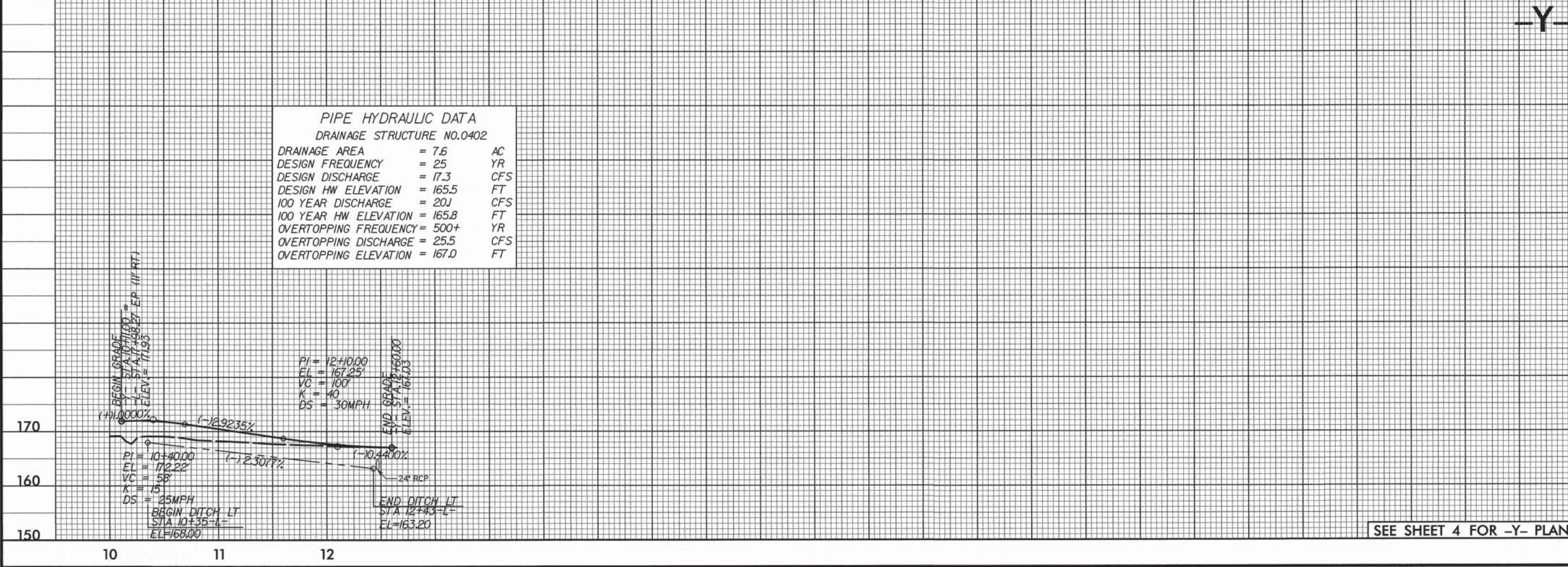
PROJECT REFERENCE NO. 17BP.4R.51	SHEET NO. 5
ROADWAY DESIGN ENGINEER W. CRAIG PARK	HYDRAULICS ENGINEER

CULVERT HYDRAULIC DATA		PIPE HYDRAULIC DATA	
		DRAINAGE STRUCTURE NO.0401	
DESIGN DISCHARGE	= 400 CFS	DRAINAGE AREA	= 17 AC
DESIGN FREQUENCY	= 25 YR	DESIGN FREQUENCY	= 25 YR
DESIGN HW ELEVATION	= 166J FT	DESIGN DISCHARGE	= 4.6 CFS
BASE DISCHARGE	= 1002 CFS	DESIGN HW ELEVATION	= 165.0 FT
BASE FREQUENCY	= 100 YR	100 YEAR DISCHARGE	= 5.3 CFS
BASE HW ELEVATION	= 167.52 FT	100 YEAR HW ELEVATION	= 165J FT
OVERTOPPING DISCHARGE	= 1200 CFS	OVERTOPPING FREQUENCY	= 500+ YR
OVERTOPPING FREQUENCY	= 500+ YR	OVERTOPPING DISCHARGE	= 5.9 CFS
OVERTOPPING ELEVATION	= 170.9 FT	OVERTOPPING ELEVATION	= 170.5 FT



SEE SHEET 4 FOR -L- PLAN

PIPE HYDRAULIC DATA	
DRAINAGE STRUCTURE NO.0402	
DRAINAGE AREA	= 7.6 AC
DESIGN FREQUENCY	= 25 YR
DESIGN DISCHARGE	= 17.3 CFS
DESIGN HW ELEVATION	= 165.5 FT
100 YEAR DISCHARGE	= 20J CFS
100 YEAR HW ELEVATION	= 165.8 FT
OVERTOPPING FREQUENCY	= 500+ YR
OVERTOPPING DISCHARGE	= 25.5 CFS
OVERTOPPING ELEVATION	= 167.0 FT



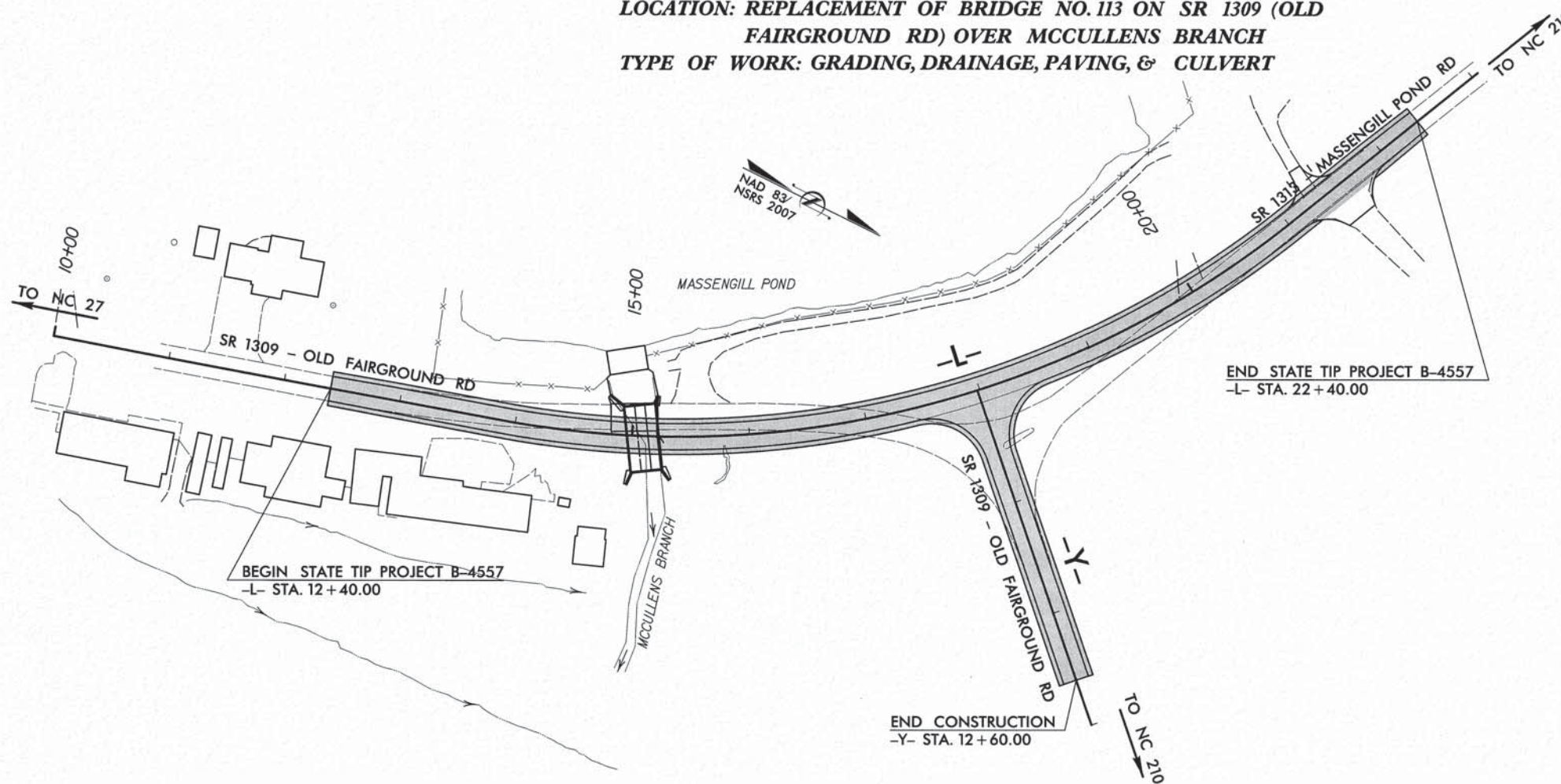
SEE SHEET 4 FOR -Y- PLAN

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TIP PROJECT: 17BP.4.R.51

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

LOCATION: REPLACEMENT OF BRIDGE NO. 113 ON SR 1309 (OLD FAIRGROUND RD) OVER MCCULLENS BRANCH
TYPE OF WORK: GRADING, DRAINAGE, PAVING, & CULVERT



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.4.R.51	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

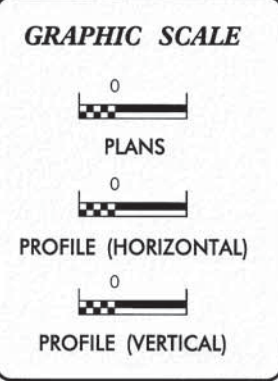
EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	TSF
1606.01	Special Sediment Control Fence	TSF
1622.01	Temporary Berms and Slope Drains	TBD
1630.02	Silt Basin Type B	SBS
1633.01	Temporary Rock Silt Check Type-A	TRSCA
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	TRSCA-PAM
1633.02	Temporary Rock Silt Check Type-B	TRSCB
	Wattle / Coir Fiber Wattle	WCFW
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	WCFW-PAM
1634.01	Temporary Rock Sediment Dam Type-A	TRSDA
1634.02	Temporary Rock Sediment Dam Type-B	TRSDA
1635.01	Rock Pipe Inlet Sediment Trap Type-A	RPISTRA
1635.02	Rock Pipe Inlet Sediment Trap Type-B	RPISTRA
1630.04	Stilling Basin	SB
1630.06	Special Stilling Basin	SSB
	Rock Inlet Sediment Trap:	
1632.01	Type A	RIA
1632.02	Type B	RIAB
1632.03	Type C	RIAC
	Skimmer Basin	SKB
	Tiered Skimmer Basin	TSKB
	Infiltration Basin	IB

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

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

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



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:
ROADSIDE ENVIRONMENTAL UNIT
 1 South Wilmington St.
 Raleigh, NC 27611
2012 STANDARD SPECIFICATIONS

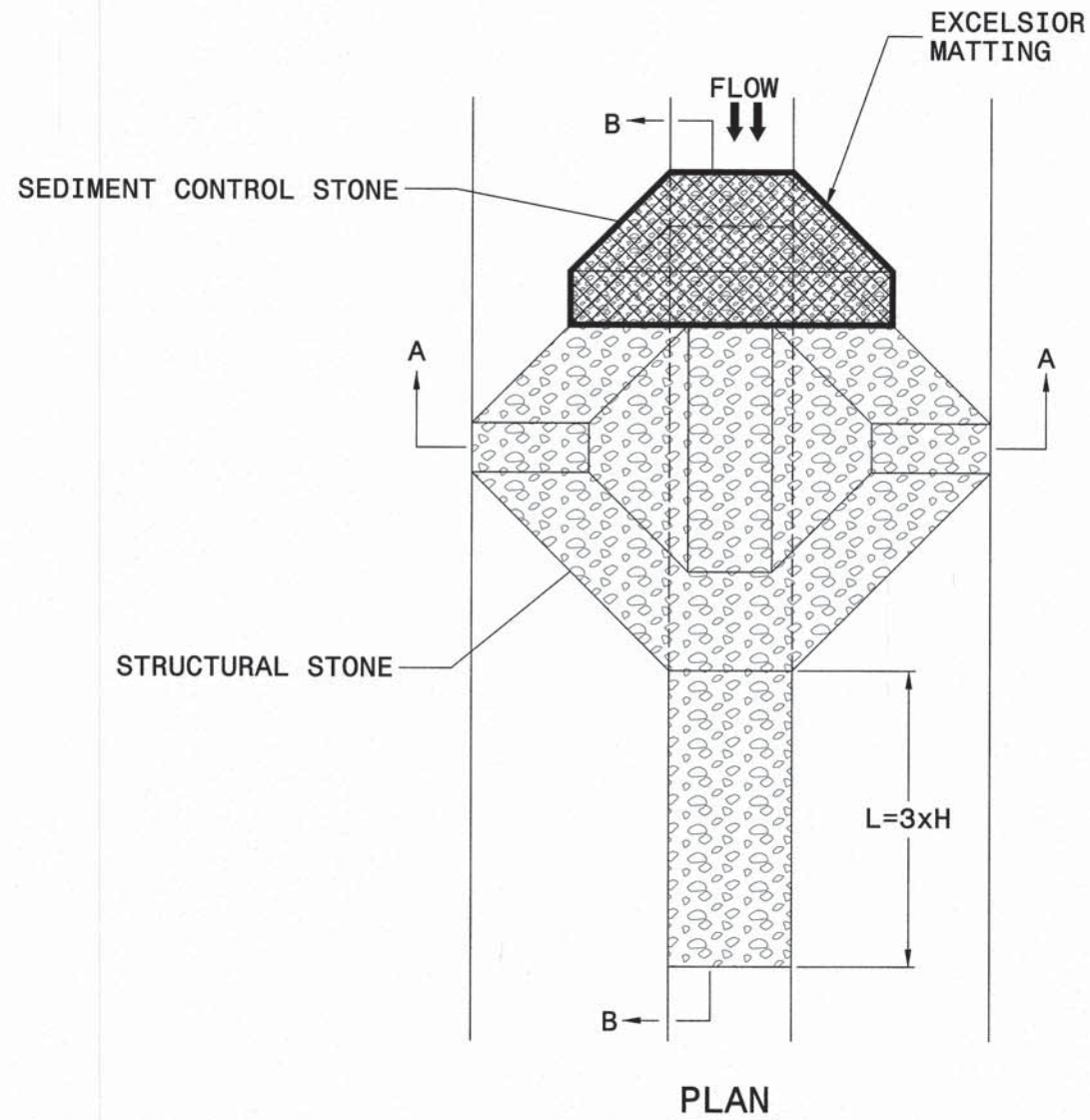
Roadway Standard Drawings

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 Coir Fiber Baffle
1630.06 Special Stilling Basin	1645.01 Temporary Stream Crossing
1631.01 Matting Installation	

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TEMPORARY ROCK SILT CHECK TYPE 'A' WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM)

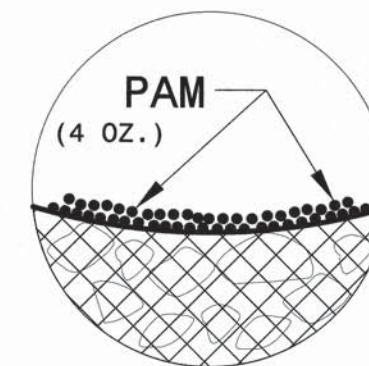


NOTES

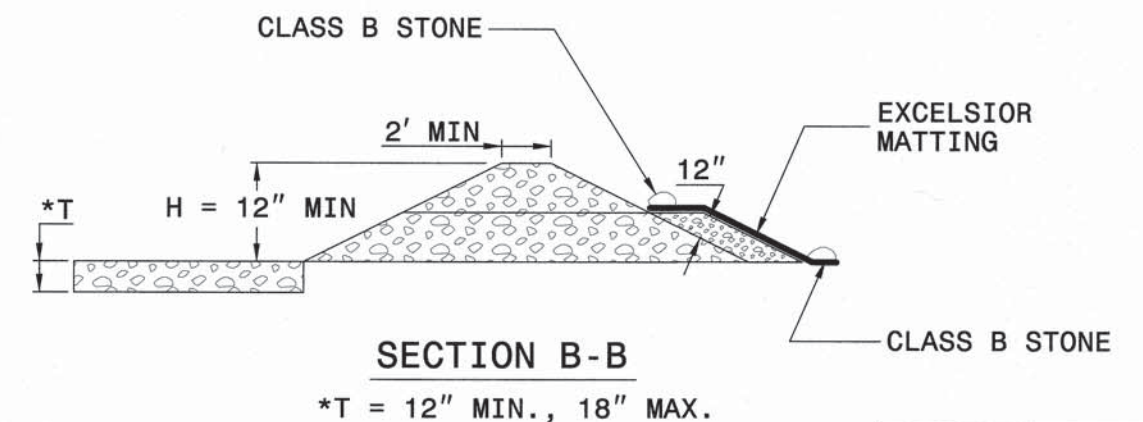
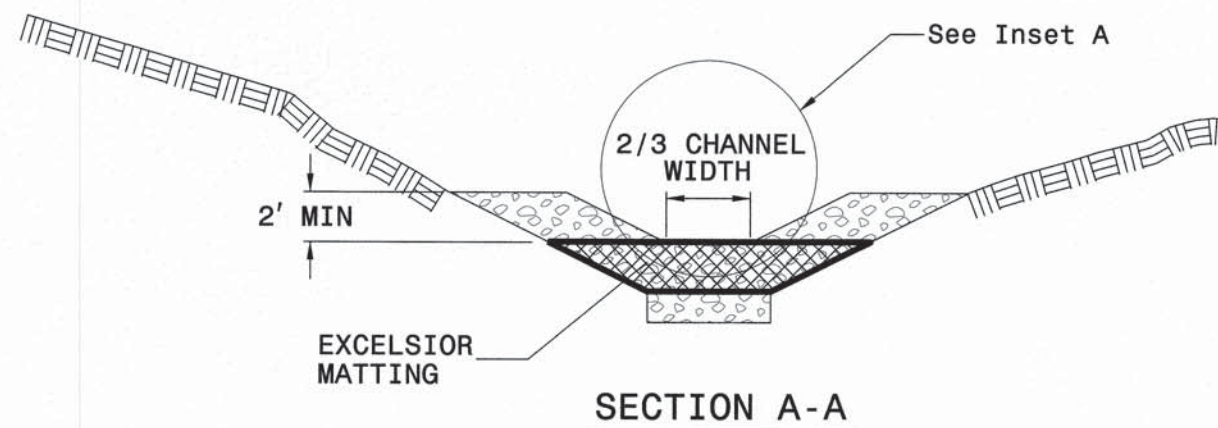
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH ROCK SILT CHECK.

INITIALLY APPLY 4 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.

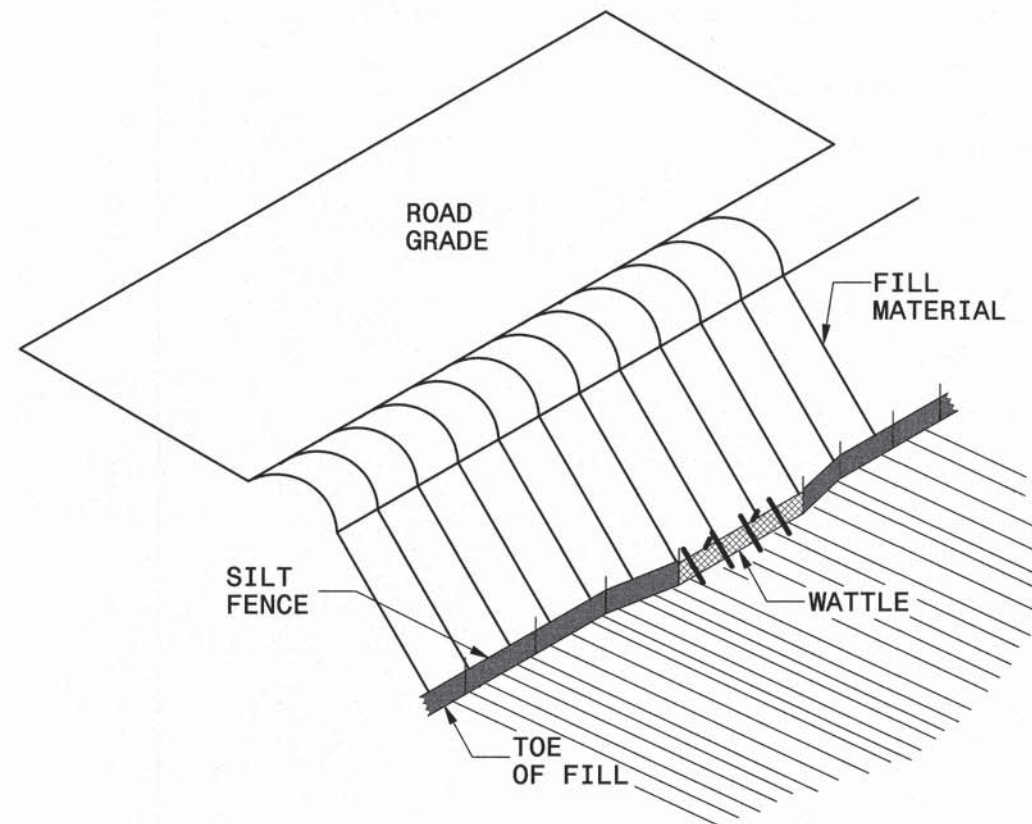


INSET A

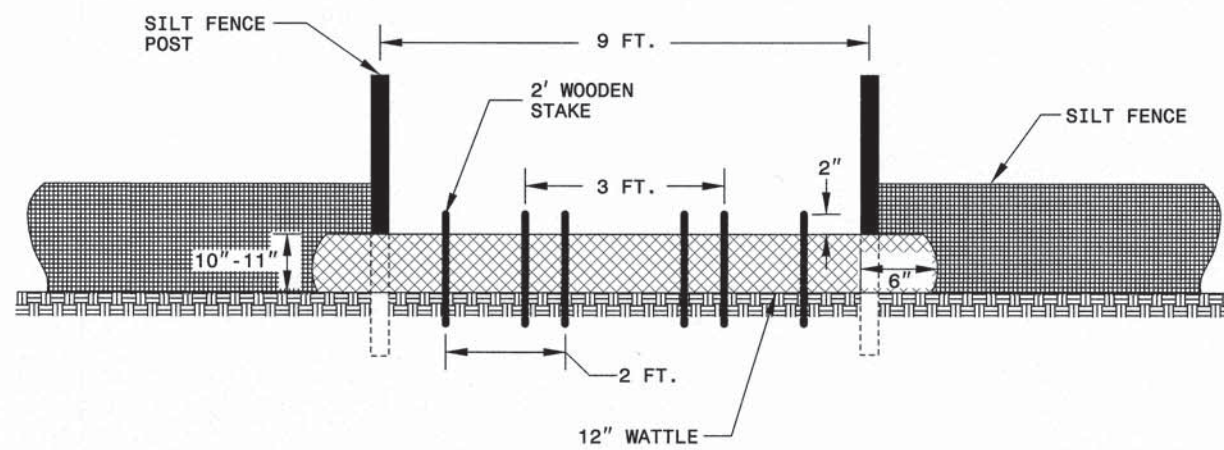


NOT TO SCALE

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.

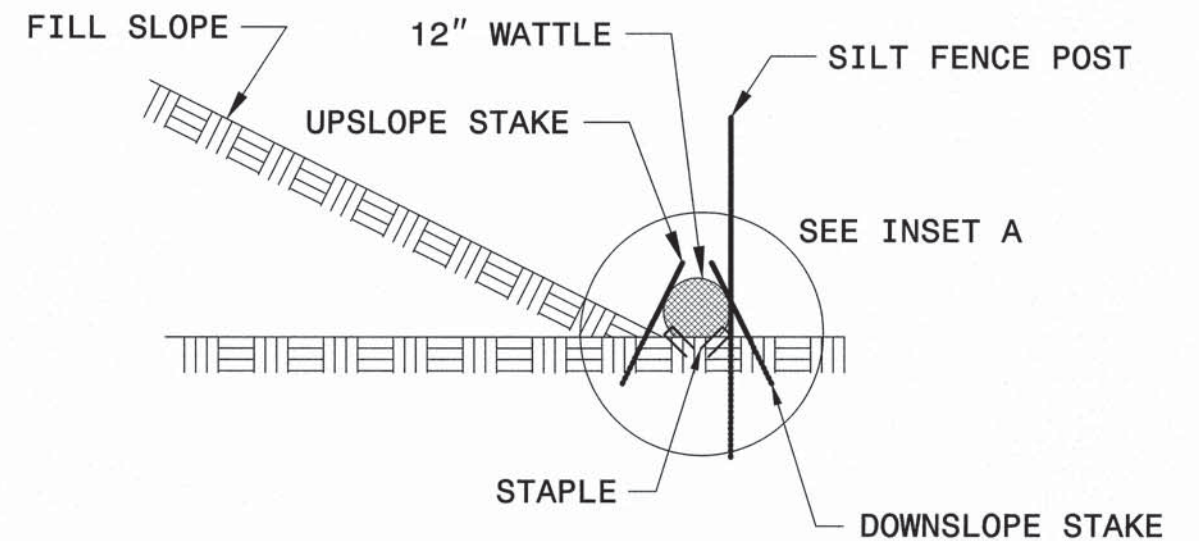
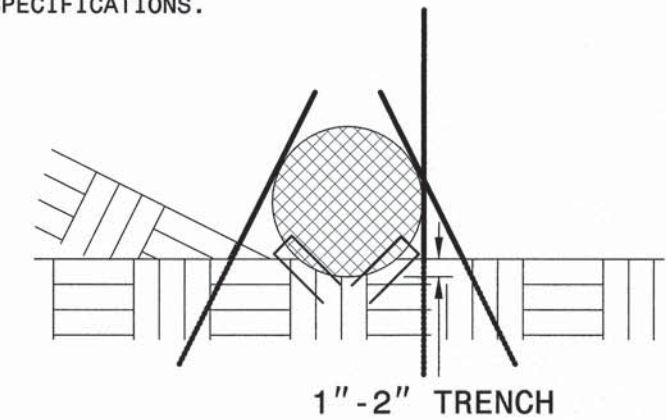
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

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

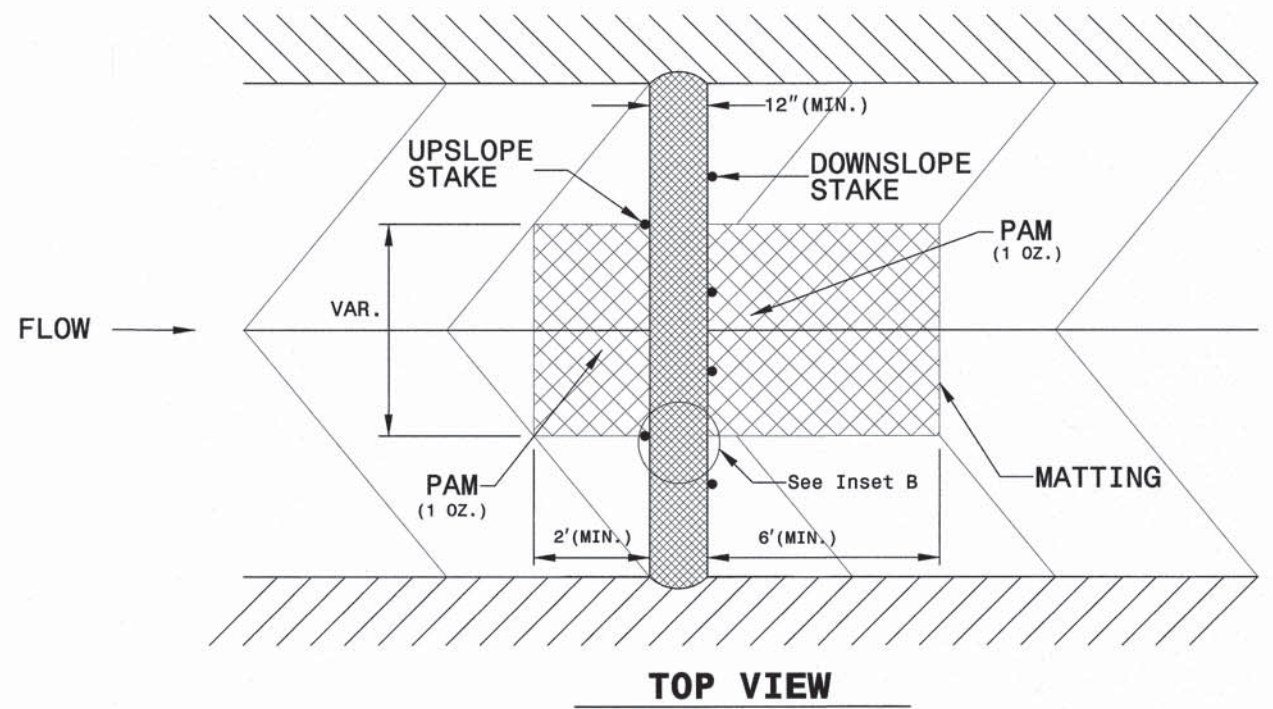
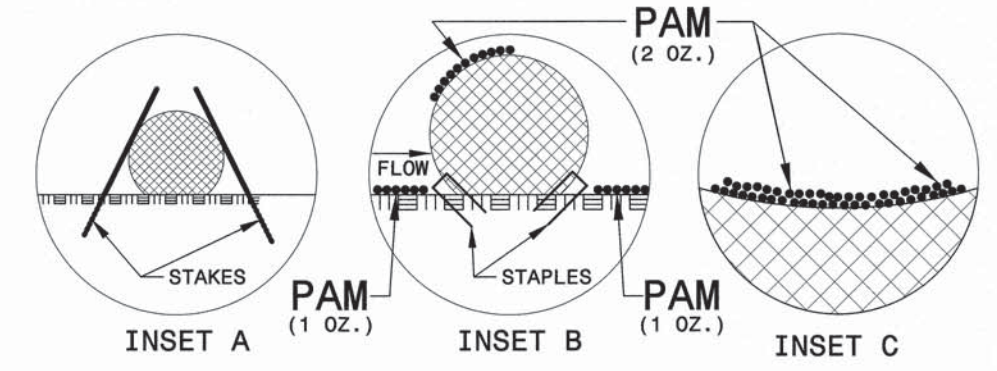
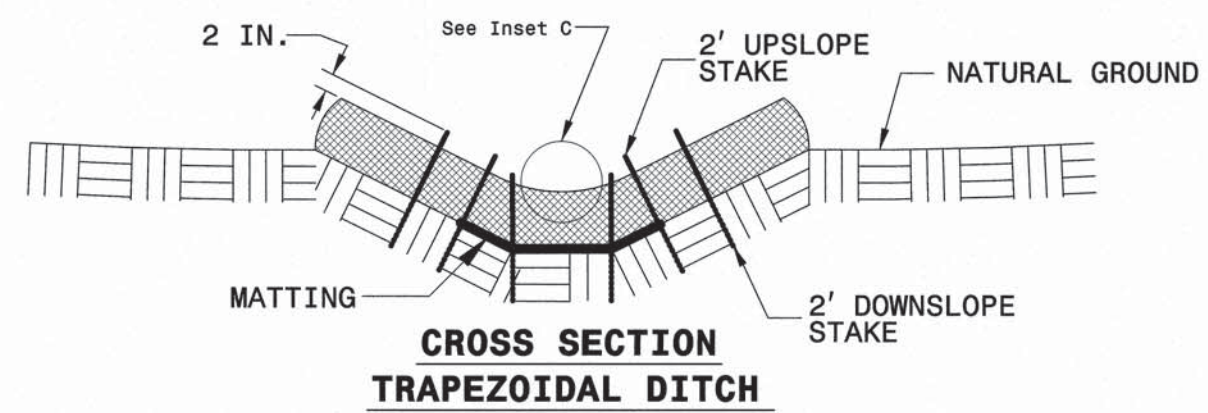
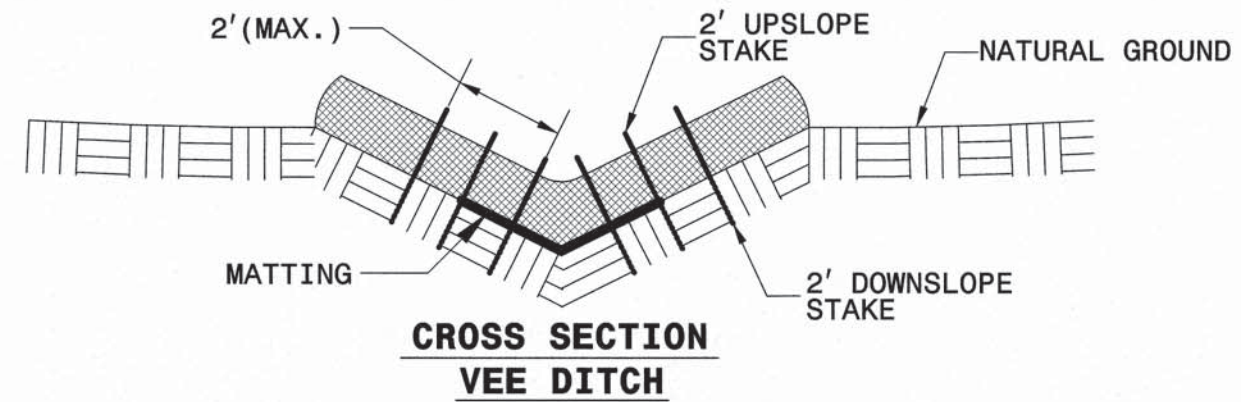
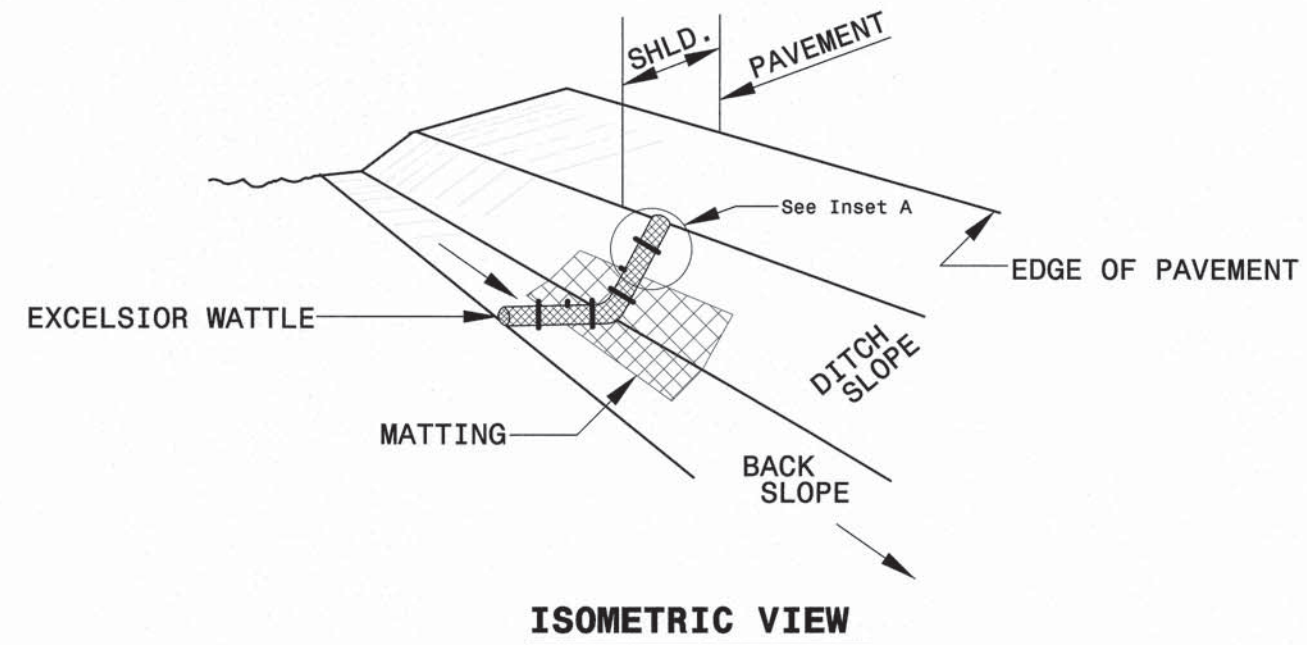


SIDE VIEW

WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL

NOTES:

- USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE.
- USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.
- ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.
- INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.
- 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.
- INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.
- PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH WATTLE.
- INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALLY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE OF PAM ON MATTING ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.



DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

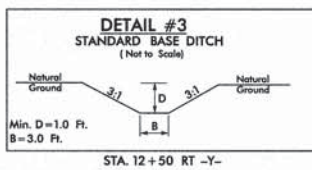
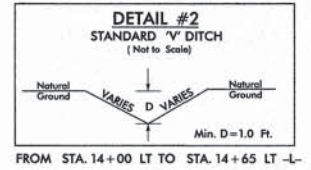
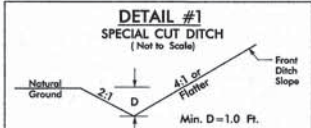
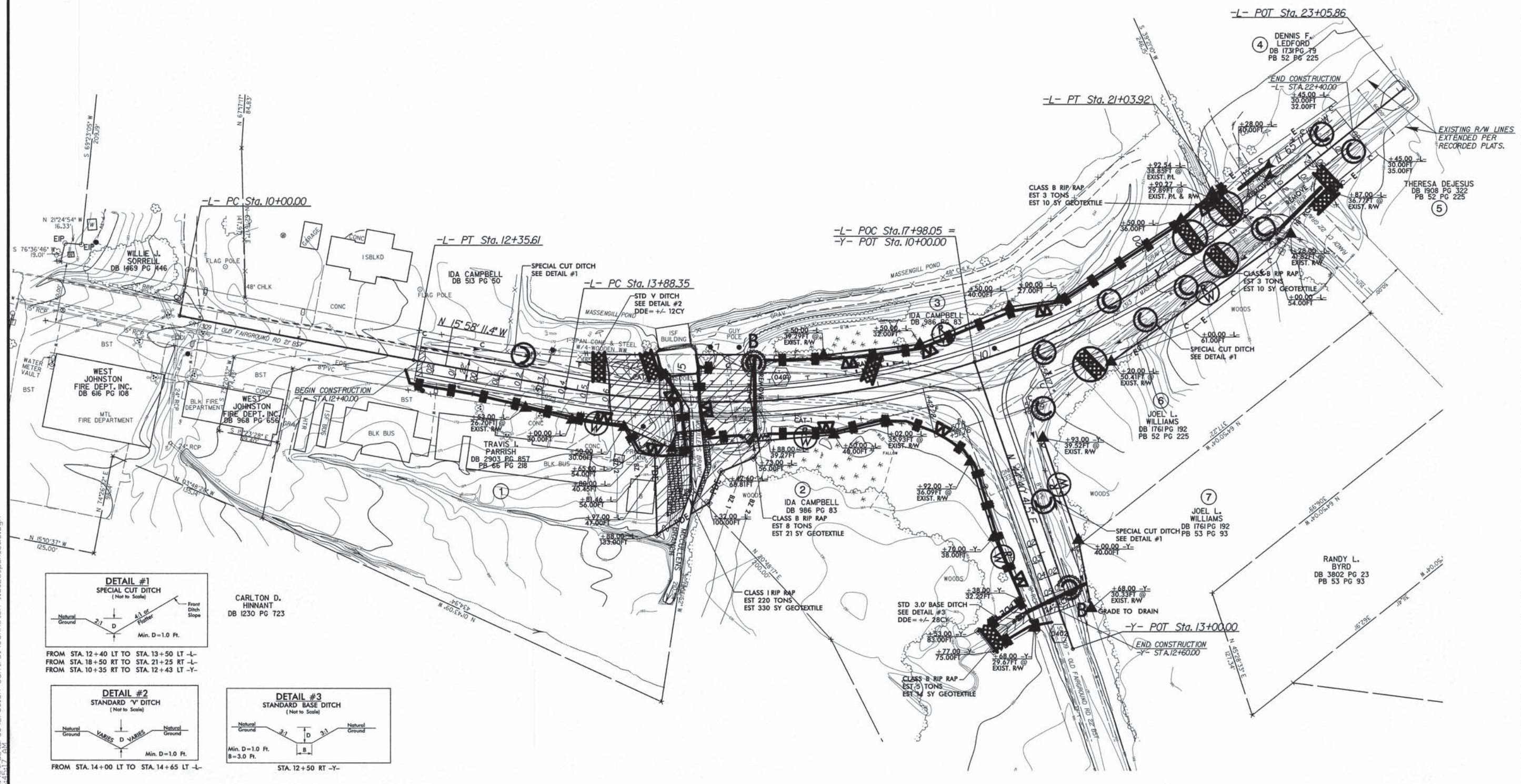
SOIL STABILIZATION TIMEFRAMES

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

 ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B
AND TEMPORARY ROCK SILT CHECKS TYPE - A AT
DRAINAGE OUTLETS.

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

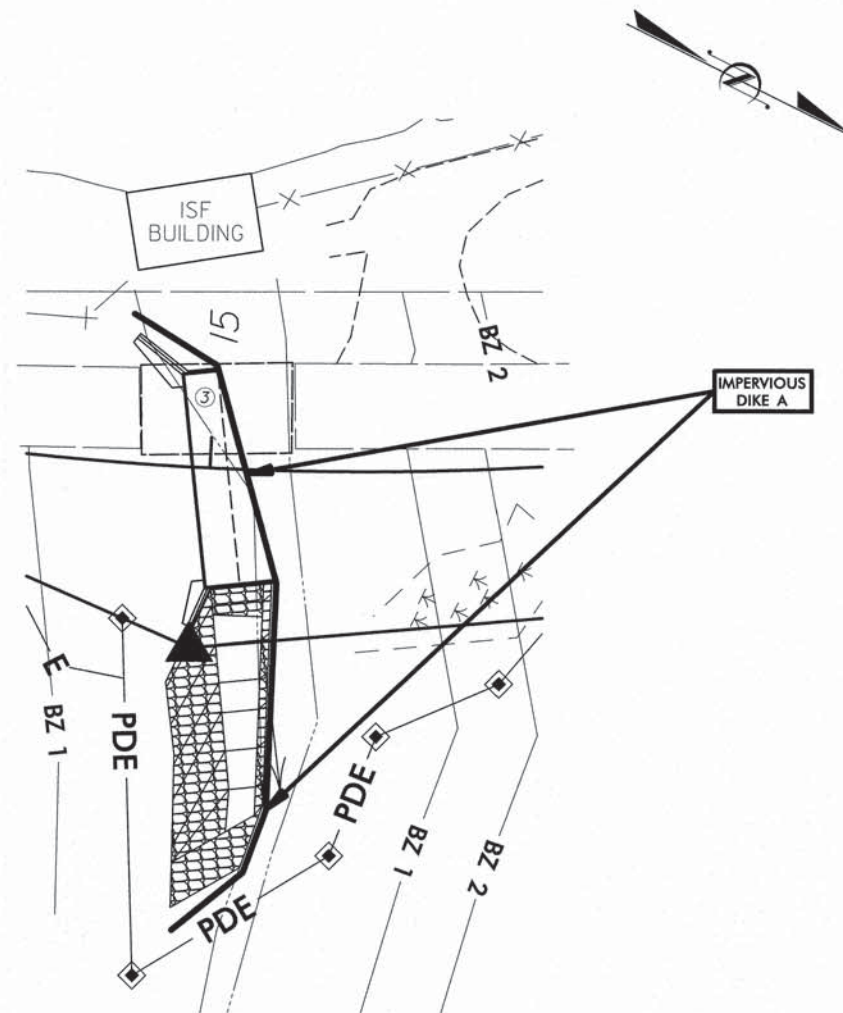


8/17/99
3/1/2014
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CULVERT CONSTRUCTION SEQUENCE STA. 15+00 -L-

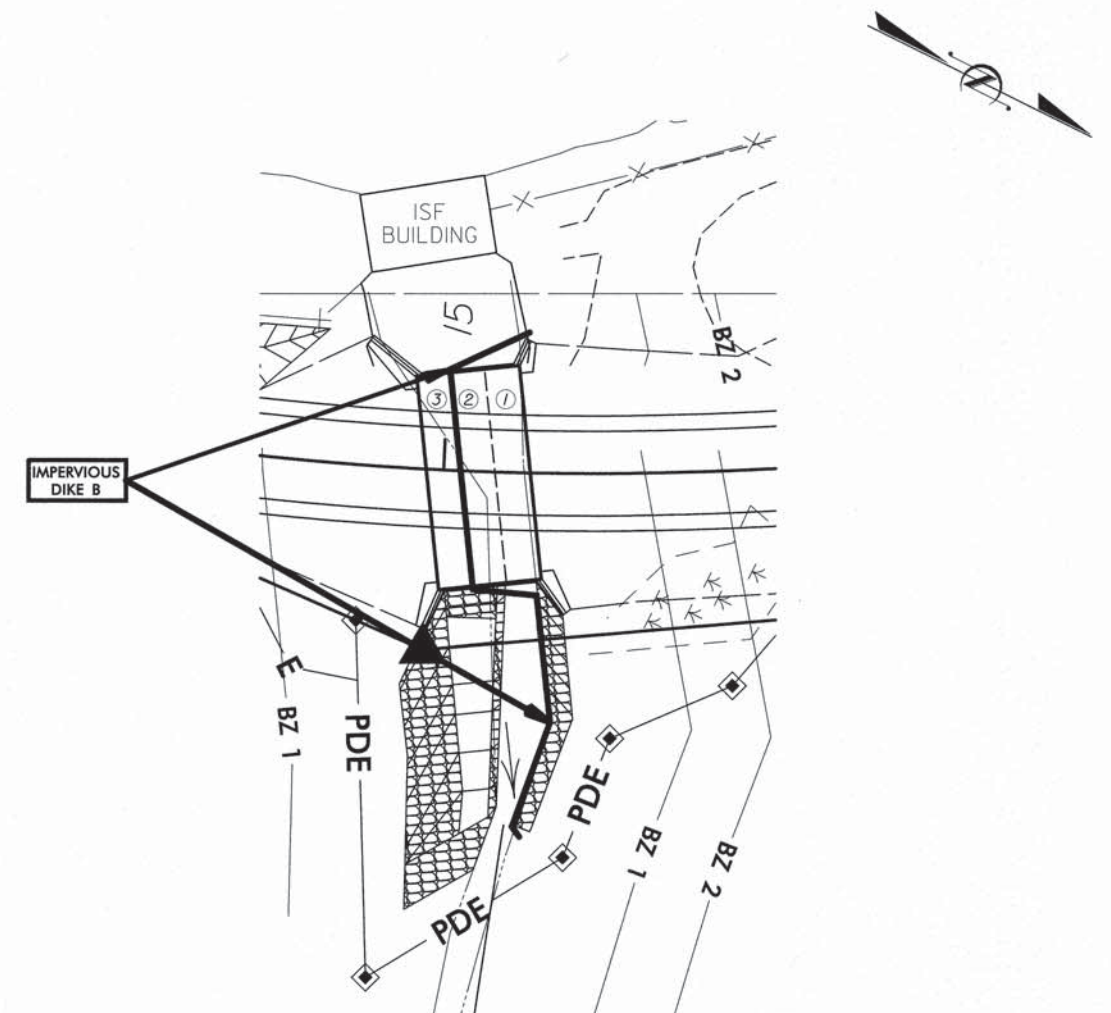
PHASE I

1. INSTALL SPECIAL STILLING BASIN
2. REMOVE EXISTING BRIDGE
3. CONSTRUCT IMPERVIOUS DIKE A TO MAINTAIN FLOW THROUGH EXISTING CHANNEL
4. CONSTRUCT BARREL #3 WHILE PUMPING EFFULENT INTO SPECIAL STILLING BASIN
5. CONSTRUCT INLET AND OUT CHANNEL AND STABILIZE AT BARREL #3
6. REMOVE IMPERVIOUS DIKE A
7. START PHASE II



PHASE II

8. INSTALL IMPERVIOUS DIKE B TO DIVERT FLOW THROUGH BARREL #3
9. CONSTRUCT BARRELS #1 AND #2 WHILE PUMPING EFFULENT INTO SPECIAL STILLING BASIN
10. CONSTRUCT INLET AND OUTLET CHANNEL AT BARRELS #1 AND #2 AND STABILIZE
11. REMOVE IMPERVIOUS DIKE B
12. COMPLETE ROADWAY

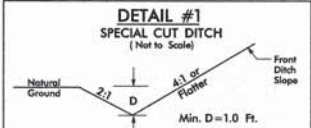
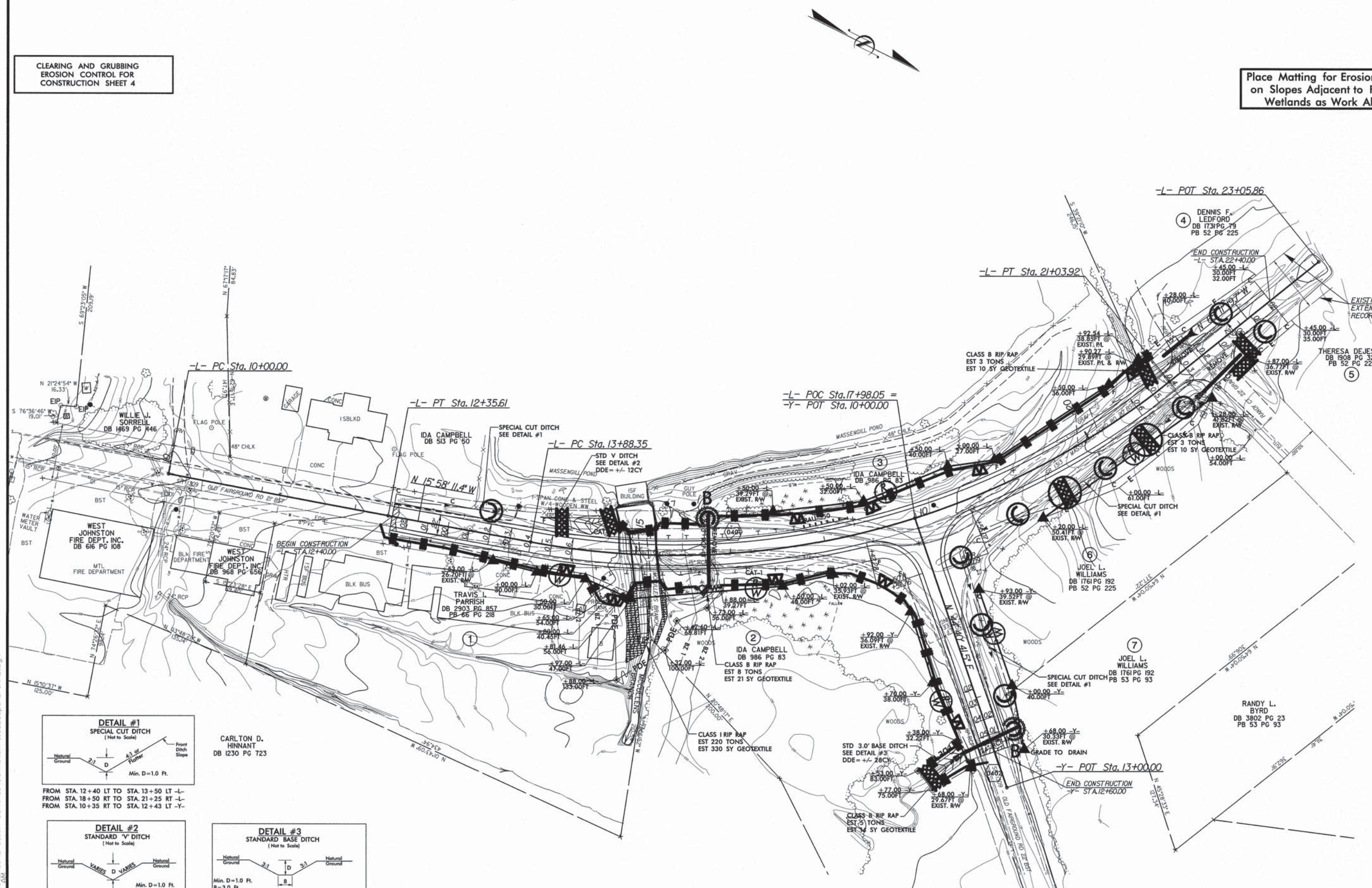


CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

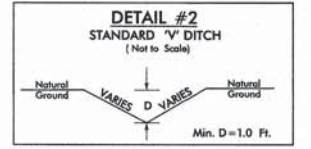
Place Matting for Erosion Control
on Slopes Adjacent to Permitted
Wetlands as Work Allows.

8/17/99

2/4/2014 10:45:00 AM C:\Users\eroston\Control\Johnston 113.EC.psh.FINAL.dgn
 2/28/14 10:45:00 AM

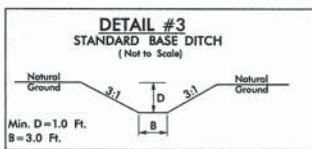


FROM STA. 12+40 LT TO STA. 13+50 LT -L-
FROM STA. 18+50 RT TO STA. 21+25 RT -L-
FROM STA. 10+35 RT TO STA. 12+43 LT -Y-



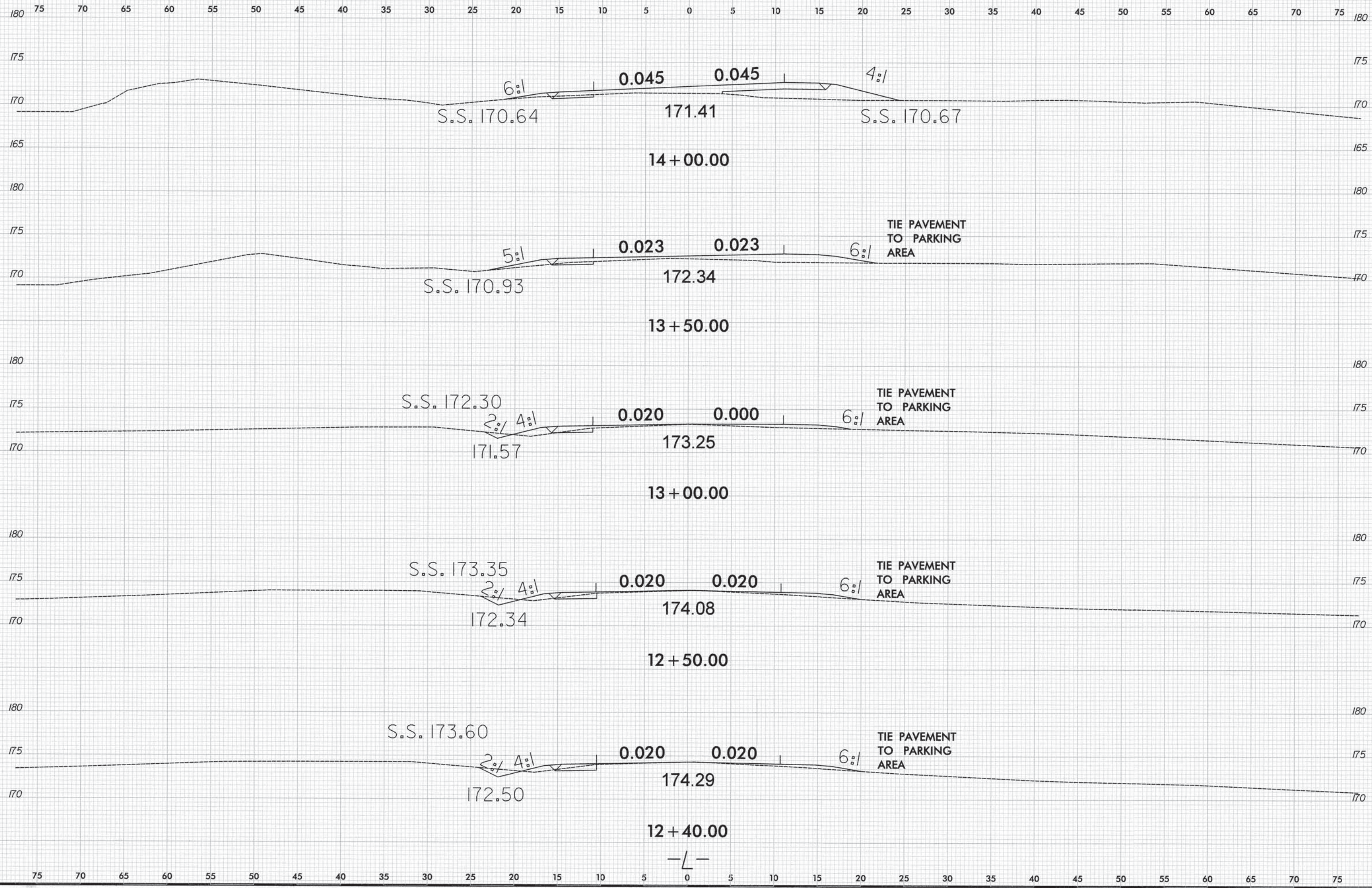
FROM STA. 14+00 LT TO STA. 14+65 LT -L-

CARLTON D.
HINNANT
DB 1230 PG 723



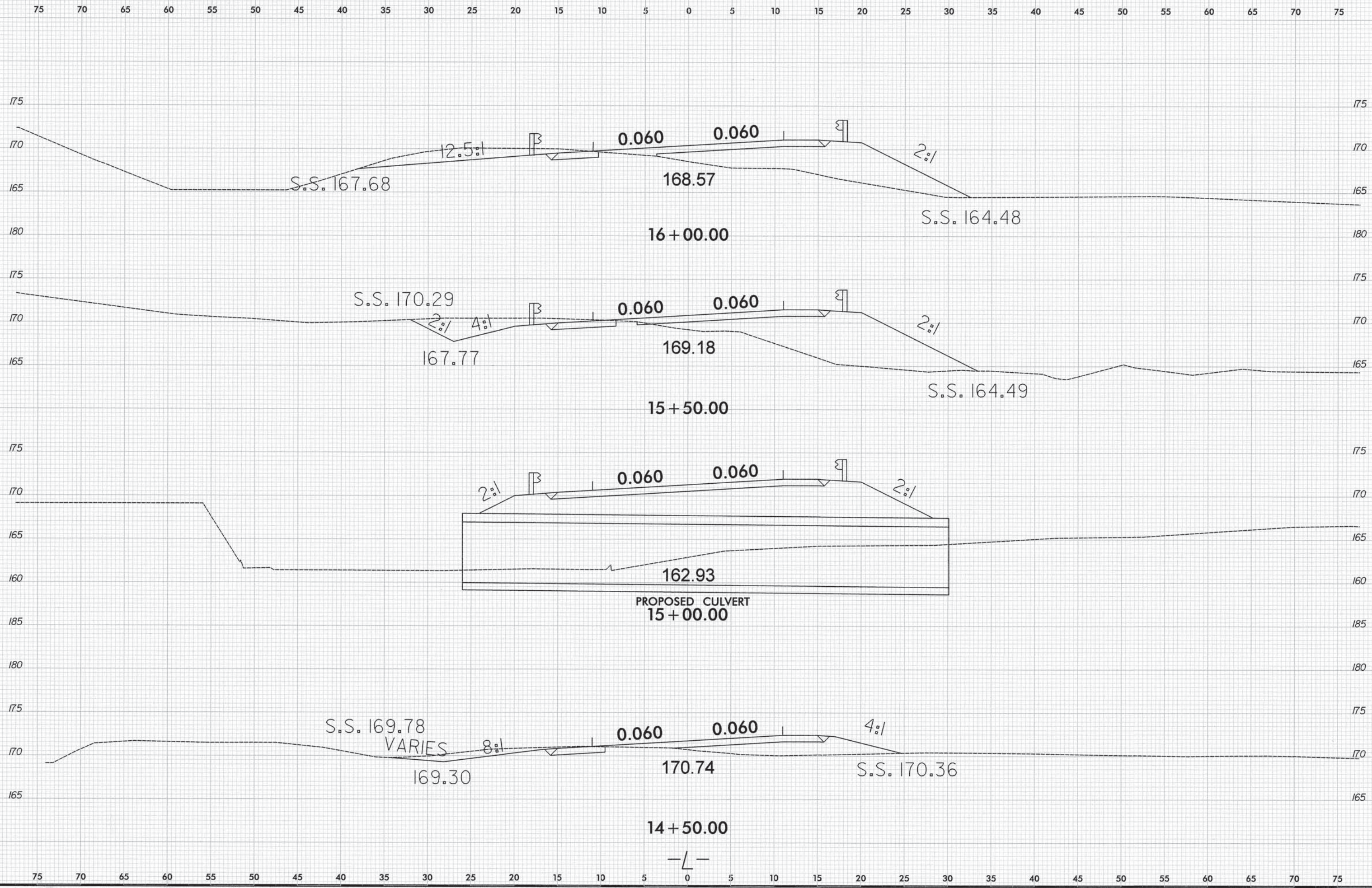
STA. 12+50 RT -Y-

8/23/99



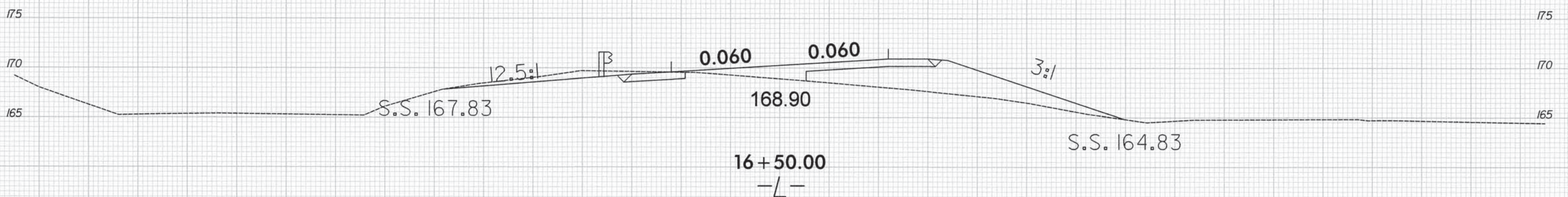
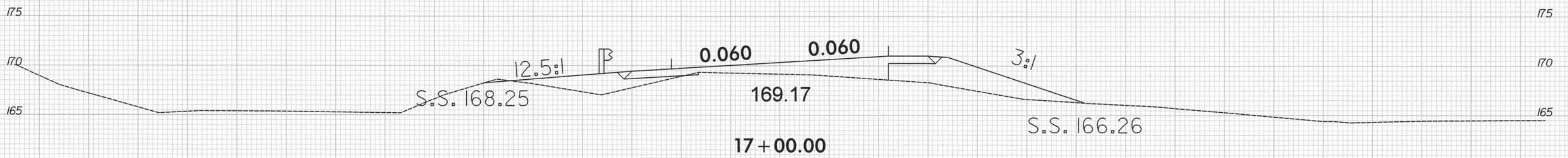
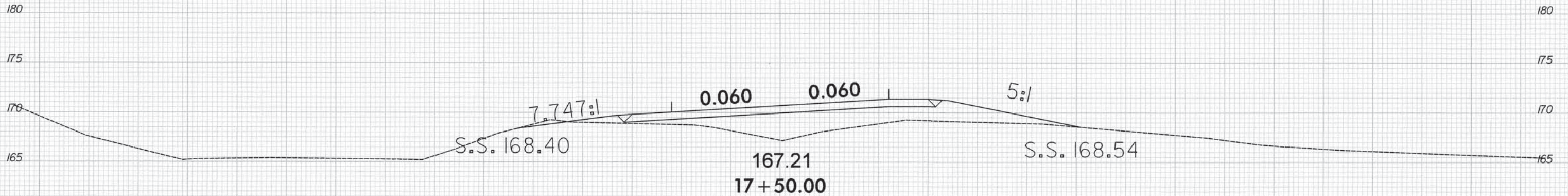
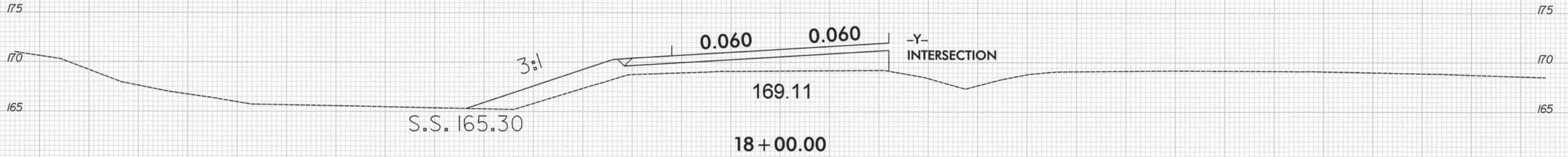
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8/23/99

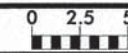


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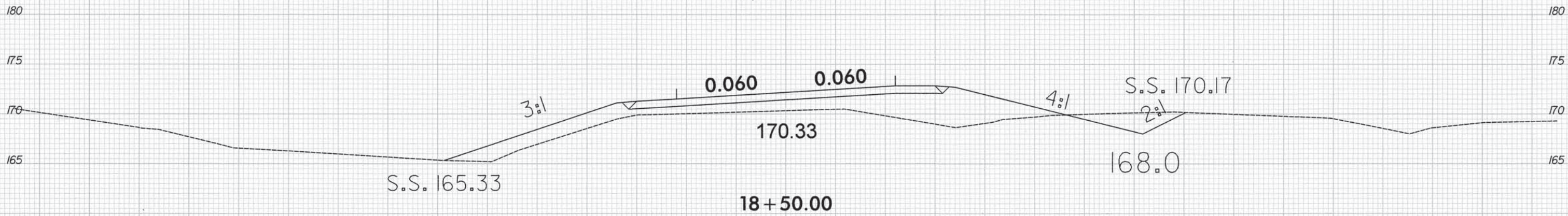
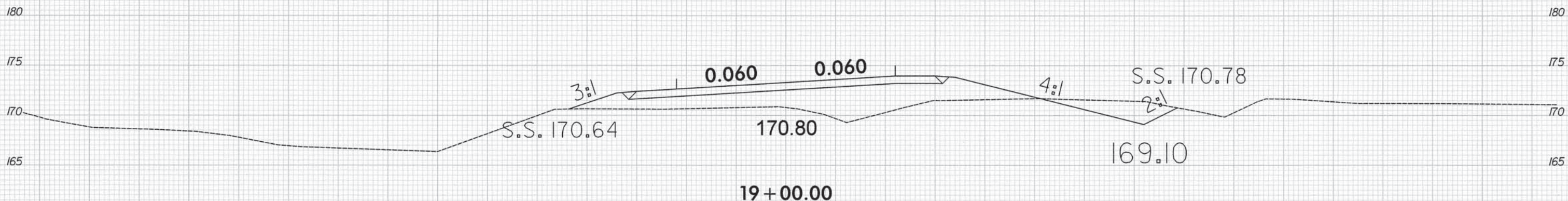
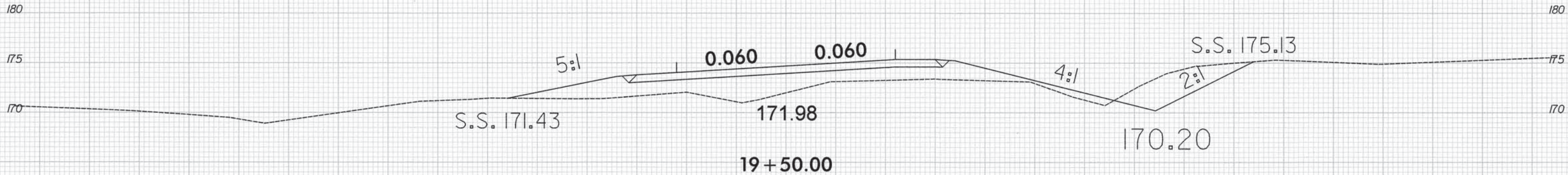
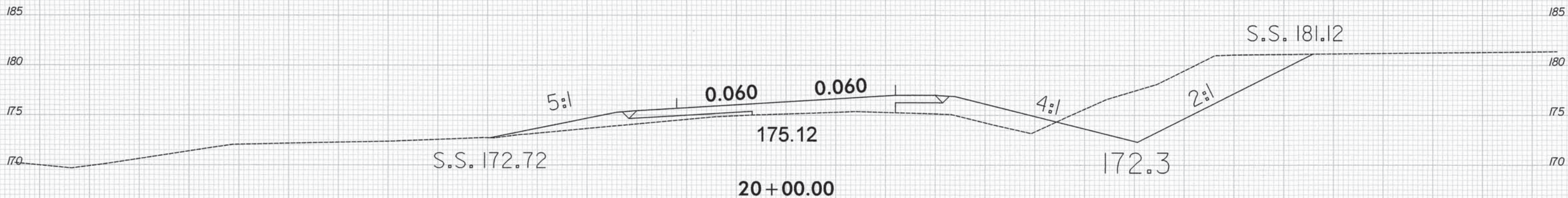
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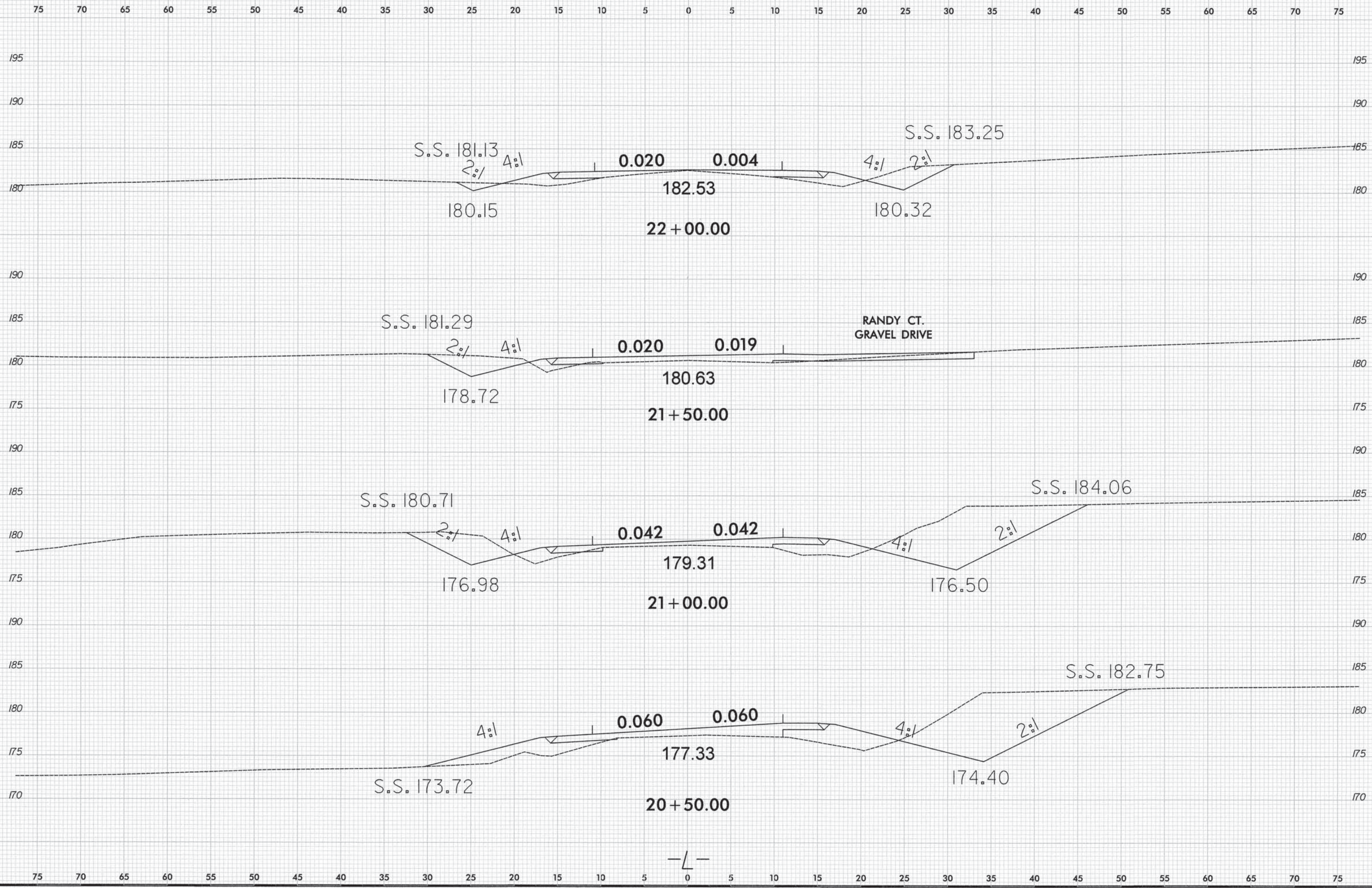
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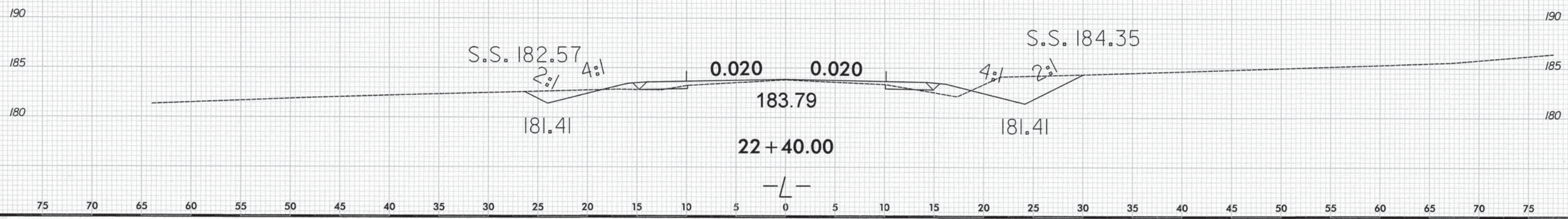
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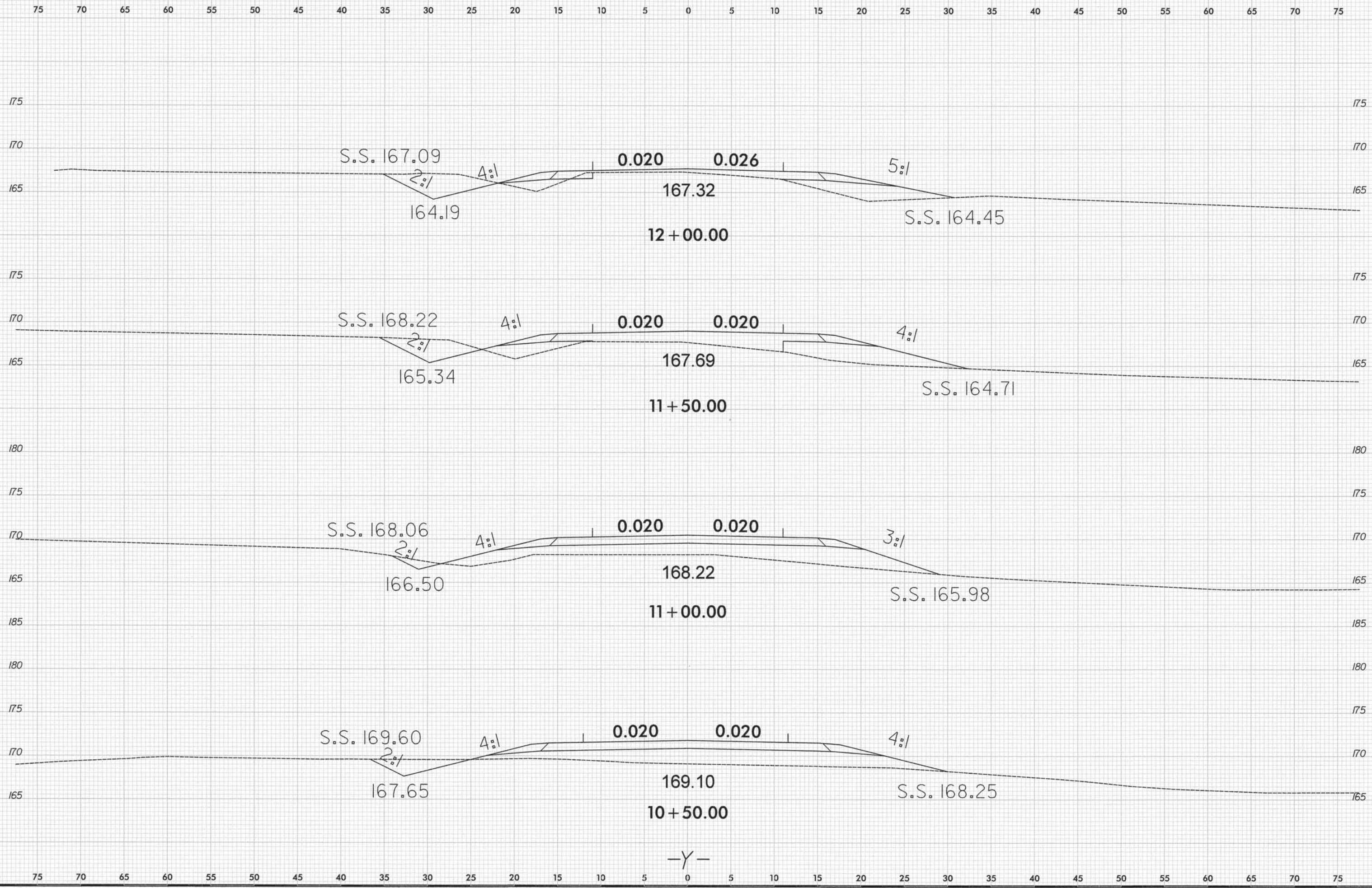
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-Y-

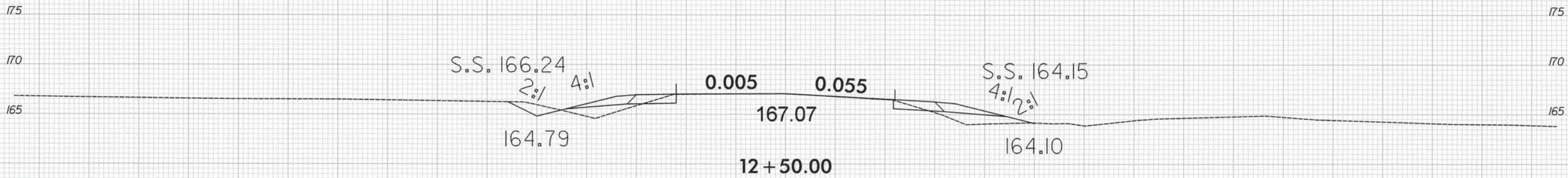
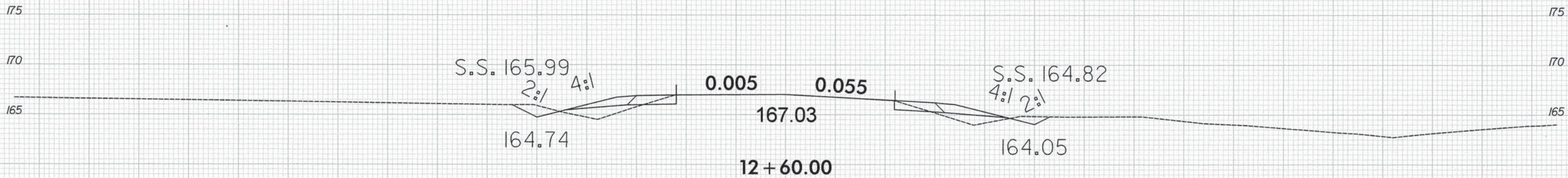
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PROJ. REFERENCE NO.
17BP.4.R.51

SHEET NO.
X-8

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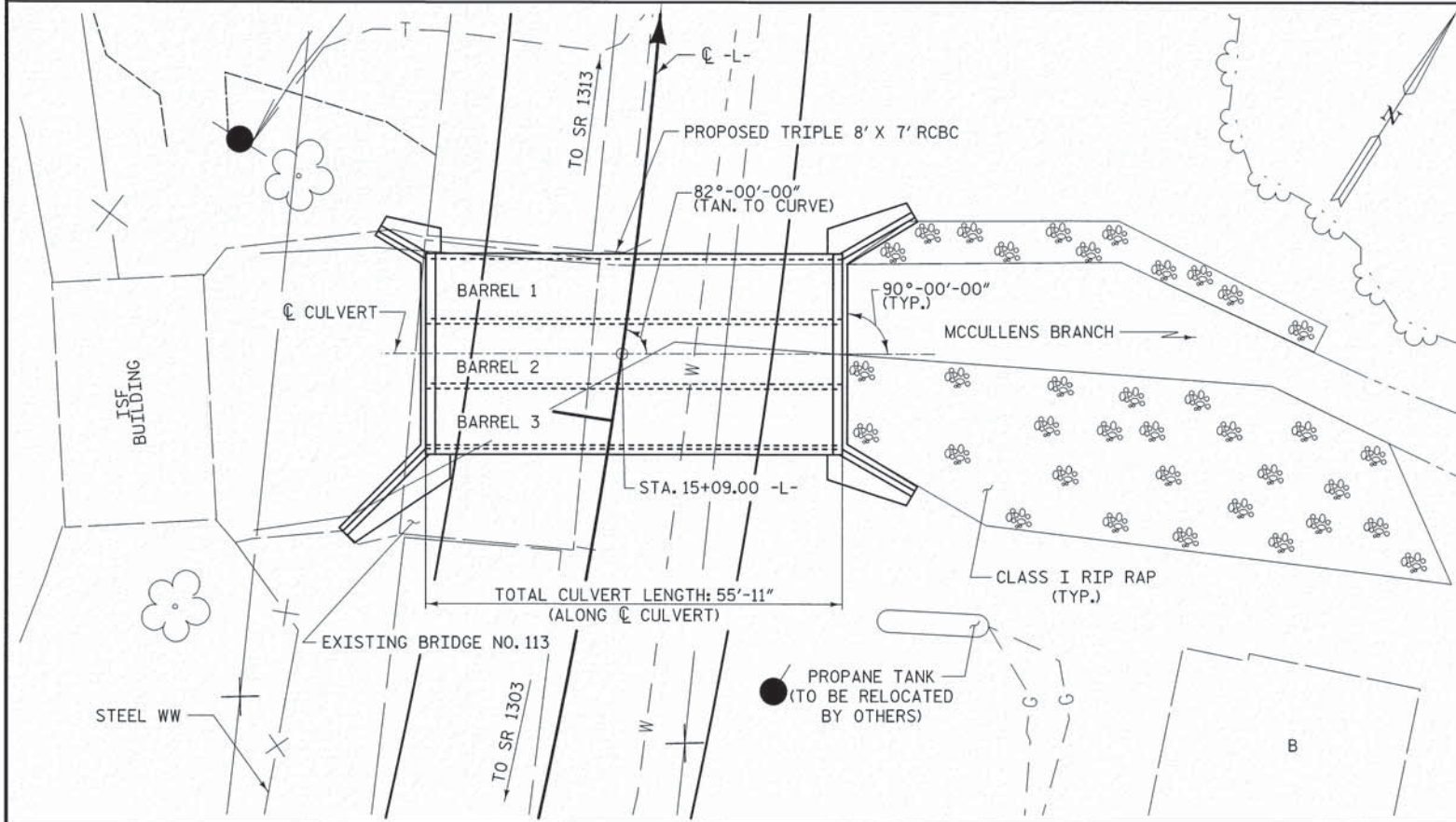


-Y-

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BM #1: RAILROAD SPIKE IN TREE, STA. 16+94.87 -L- 135.05' RIGHT, ELEV. 165.41'



LOCATION SKETCH

GRADE DATA

GRADE POINT EL. @ STA. 15+09.00 -L- = 171.211
 BED EL. @ STA. 15+09.00 -L- = 159.730 FT
 ROADWAY SLOPES = 2:1

HYDRAULIC DATA

DESIGN DISCHARGE = 400 C.F.S.
 FREQUENCY OF DESIGN FLOOD = 25 YRS.
 DESIGN HIGH WATER ELEVATION = 166.1 FT
 DRAINAGE AREA = 3.90 SQ. MI.
 BASE DISCHARGE (Q100) = 1002 C.F.S.
 BASE HIGH WATER ELEVATION = 167.52 FT

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE = 1200 + C.F.S.
 FREQUENCY OF OVERTOPPING FLOOD = 500 ± YRS.
 OVERTOPPING FLOOD ELEVATION = 170.90 FT

STRUCTURE QUANTITIES

CLASS A CONCRETE			
BARREL @ 2.569	CY/FT	143.7	C.Y.
WINGS, SILLS, ETC.		28.5	C.Y.
TOTAL		172.2	C.Y.
REINFORCING STEEL			
BARREL		16,665	LBS.
WINGS ETC.		1,414	LBS.
TOTAL		18,079	LBS.

CULVERT EXCAVATION	LUMP SUM
FOUNDATION COND. MAT'L.	125 TONS
PLAIN RIP RAP, CLASS I	330 TONS
GEOTEXTILE	330 S.Y.
REMOVAL OF EXISTING STRUCTURE	LUMP SUM

NOTES

- ASSUMED LIVE LOAD -----HL-93 OR ALTERNATE LOADING.
- DESIGN FILL-----2.01' MIN. 4.72' MAX.
- 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.
 3. ROOF SLAB AND HEADWALLS. (PHASE II, ONLY)
- THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.
- DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL AND BOTH FACES OF 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.

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.

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

A THREE FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

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 THE DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

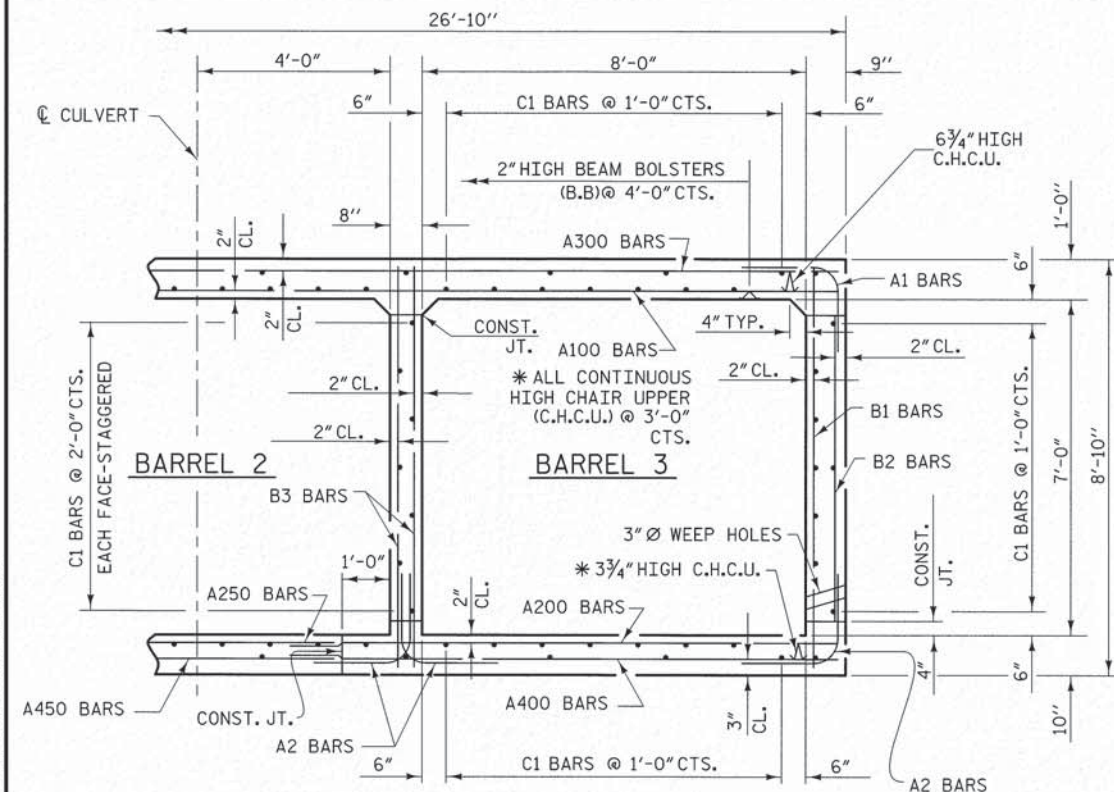
THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED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

THE EXISTING STRUCTURE CONSISTING OF ONE SPAN @ 40'-6", STEEL PLANK FLOOR ON I BEAMS, TIMBER PILE AND CAP END BENTS SHALL BE REMOVED.

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

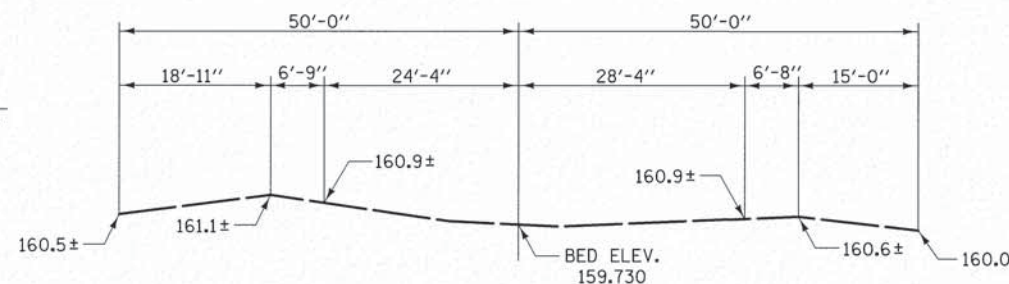
FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.



RIGHT ANGLE SECTION OF BARREL

THERE ARE 98 "C" BARS IN SECTION OF BARREL



PROFILE ALONG CULVERT

PHASE I PHASE II



CONSTRUCTION SEQUENCE (LOOKING DOWNSTREAM)

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PLANS PREPARED BY:
MULKEY
 ENGINEERS & CONSULTANTS
 PO BOX 32127
 RALEIGH, N.C. 27638
 (919) 881-1111
 (919) 881-1918 FAX
 WWW.MULKEYINC.COM
 NC LICENSE NO. 0-1021

PROJECT NO. 17BP.4.R.51
 JOHNSTON COUNTY
 STATION: 15+09.00 -L-
 SHEET 1 OF 8 REPLACES BRIDGE NO. 113

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 TRIPLE 8 FT. X 7 FT.
 CONCRETE BOX CULVERT

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

TOTAL SHEETS 8

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ASSEMBLED BY: Z. H. BROWN DATE: 6/17/13
 CHECKED BY: W. A. DAVIS DATE: 10/28/13
 DRAWN BY: J. E. MANGUM DATE: 10/25/89
 CHECKED BY: A. R. BISSETTE DATE: AUG. 1989

SPECIAL
STANDARD

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE								COMMENT NUMBER		
						LIVE-LOAD FACTORS (LL)	MOMENT				SHEAR					
							RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE		DISTANCE FROM LEFT END OF ELEMENT (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.55	--	1.75	1.61	1	TOP SLAB	4.750	1.55	1	TOP SLAB	8.030		
	HL-93 (OPERATING)	N/A		2.01	--	1.35	2.09	1	TOP SLAB	4.750	2.01	1	TOP SLAB	8.030		
	HS-20 (INVENTORY)	36.000	②	1.55	55.80	1.75	1.64	1	TOP SLAB	4.750	1.55	1	TOP SLAB	8.030		
	HS-20 (OPERATING)	36.000		2.01	72.36	1.35	2.13	1	TOP SLAB	4.750	2.01	1	TOP SLAB	8.030		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		1.94	26.19	1.40	2.11	1	TOP SLAB	4.750	1.94	1	TOP SLAB	8.030	
		SNGARBS2	20.000		1.94	38.80	1.40	2.11	1	TOP SLAB	4.750	1.94	1	TOP SLAB	8.030	
		SNAGRIS2	22.000		1.94	42.68	1.40	2.11	1	TOP SLAB	4.750	1.94	1	TOP SLAB	8.030	
		SNCOTTS3	27.250		1.94	52.87	1.40	2.10	1	TOP SLAB	4.750	1.94	1	TOP SLAB	8.030	
		SNAGGRS4	34.925		1.94	67.75	1.40	2.11	1	TOP SLAB	4.750	1.94	1	TOP SLAB	8.030	
		SNS5A	35.550		1.94	68.97	1.40	2.11	1	TOP SLAB	4.750	1.94	1	TOP SLAB	8.030	
		SNS6A	39.950		1.94	77.50	1.40	2.11	1	TOP SLAB	4.750	1.94	1	TOP SLAB	8.030	
		SNS7B	42.000		1.94	81.48	1.40	2.11	1	TOP SLAB	4.750	1.94	1	TOP SLAB	8.030	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.94	64.02	1.40	2.11	1	TOP SLAB	4.750	1.94	1	TOP SLAB	8.030	
		TNT4A	33.075		1.94	64.17	1.40	2.11	1	TOP SLAB	4.750	1.94	1	TOP SLAB	8.030	
		TNT6A	41.600		1.94	80.70	1.40	2.11	1	TOP SLAB	4.750	1.94	1	TOP SLAB	8.030	
		TNT7A	42.000		1.94	81.48	1.40	2.04	1	BOTTOM SLAB	4.750	1.94	1	TOP SLAB	8.030	
		TNT7B	42.000		1.94	81.48	1.40	2.11	1	TOP SLAB	4.750	1.94	1	TOP SLAB	8.030	
		TNAGRIT4	43.000	③	1.86	79.98	1.40	1.86	1	BOTTOM SLAB	4.750	1.94	1	TOP SLAB	8.030	
		TNAGT5A	45.000		1.93	86.85	1.40	2.06	1	BOTTOM SLAB	8.750	1.93	1	TOP SLAB	8.030	
TNAGT5B	45.000		1.91	85.95	1.40	1.91	1	BOTTOM SLAB	4.750	1.94	1	TOP SLAB	8.030			

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	--

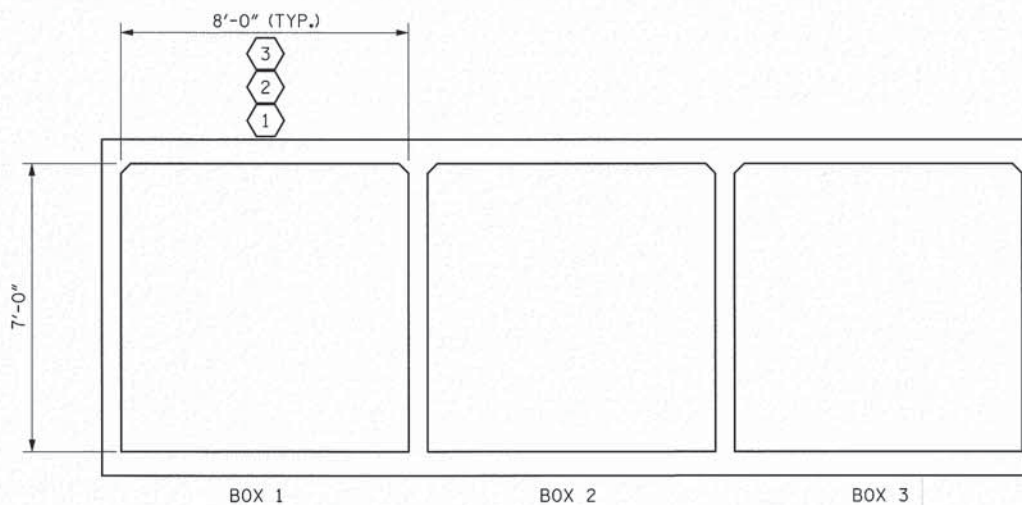
NOTE:

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.4.R.51
JOHNSTON COUNTY
 STATION: 15+09.00 -L-

SHEET 2 OF 8

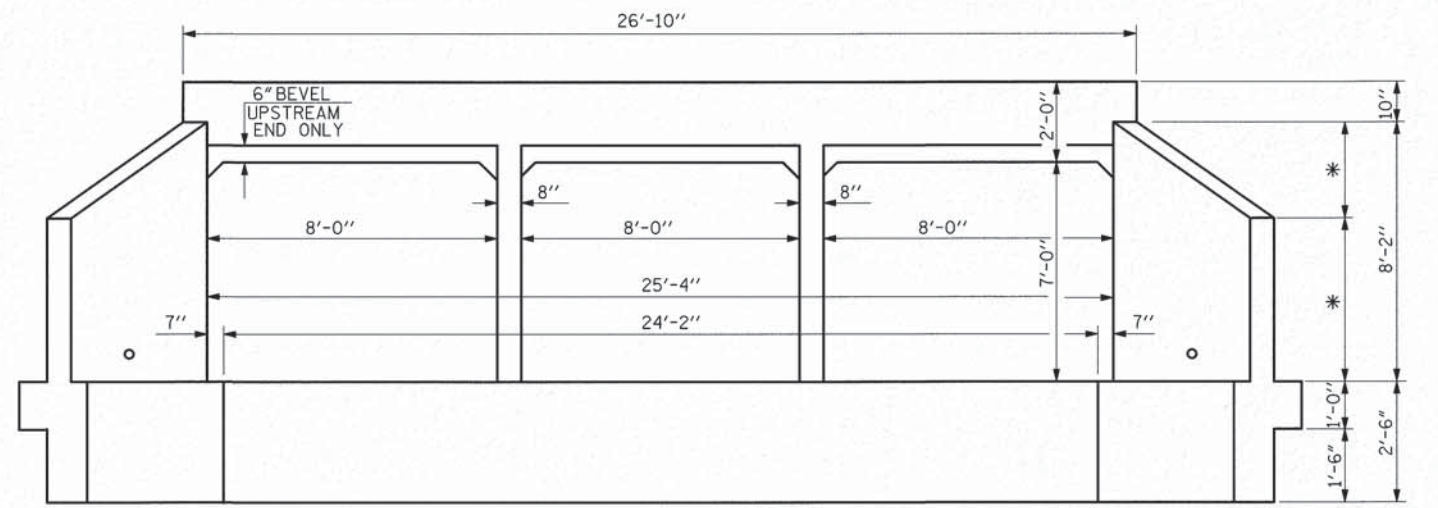
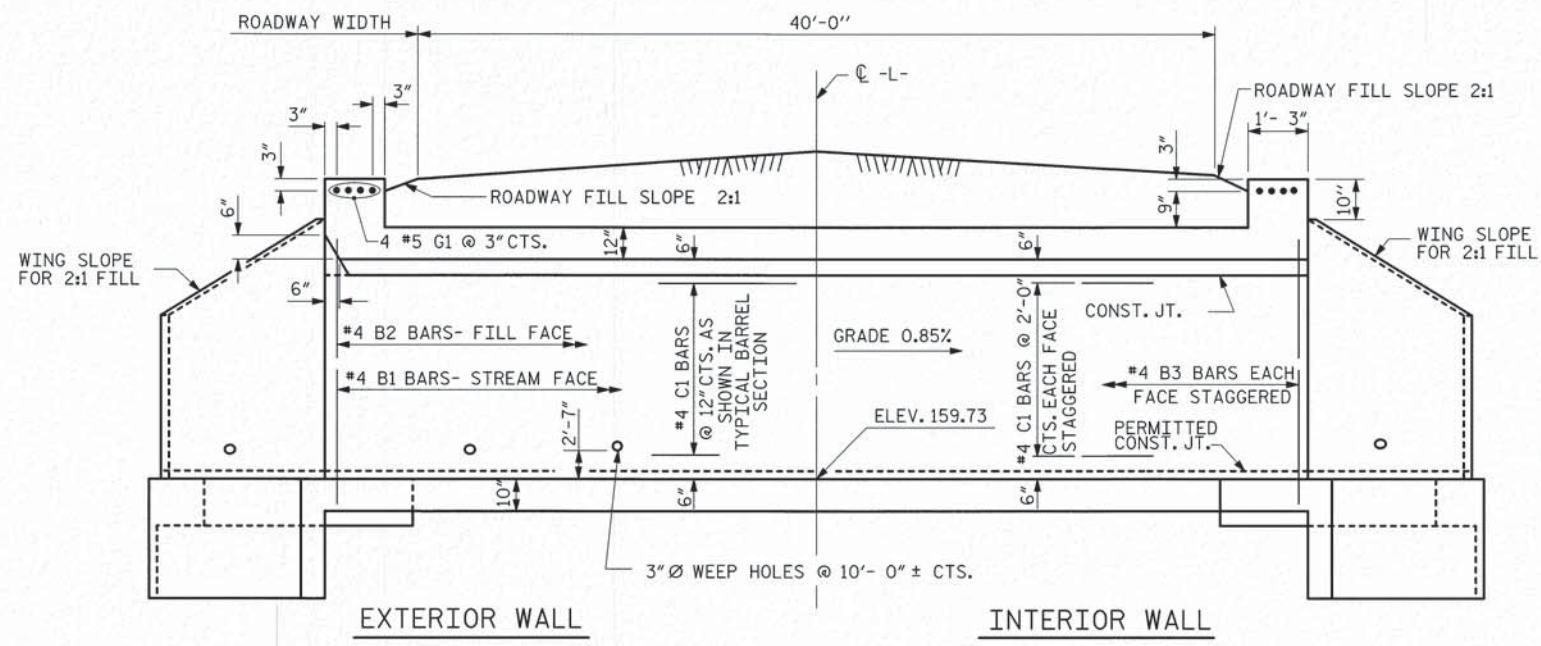


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 LRFR SUMMARY FOR
 REINFORCED CONCRETE
 BOX CULVERTS
 (NON-INTERSTATE TRAFFIC)

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

STD. NO. LRFR5

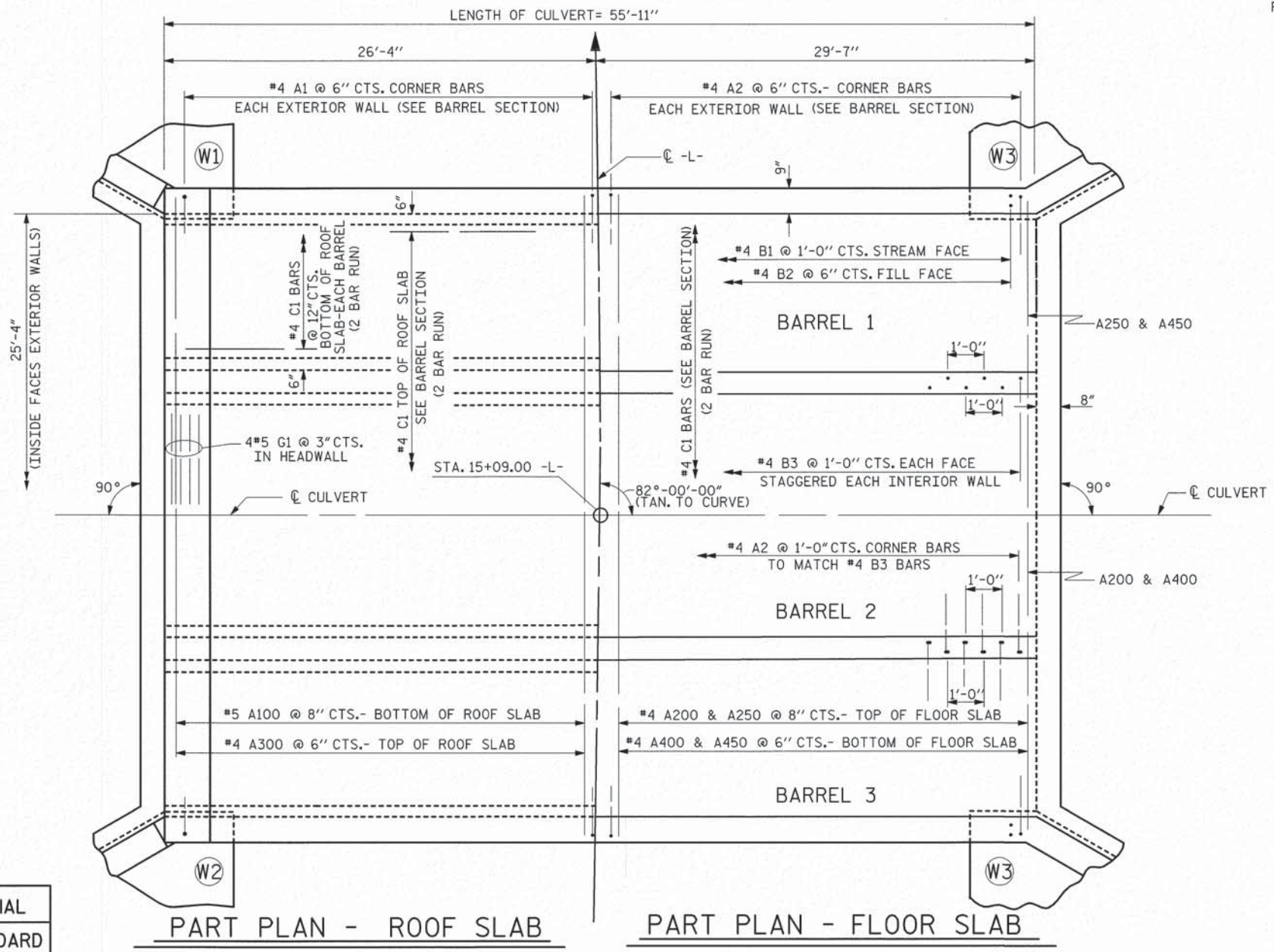
ASSEMBLED BY: Z. H. BROWN	DATE: 6/19/13
CHECKED BY: W. A. DAVIS	DATE: 7/3/13
DRAWN BY: WMC	7/11
CHECKED BY: GM	7/11
REV. 10/1/11	MAA/GM



CULVERT SECTION NORMAL TO ROADWAY

END ELEVATION

* SEE WING SHEET FOR DIMENSIONS.



PART PLAN - ROOF SLAB

PART PLAN - FLOOR SLAB

PROJECT NO. 17BP.4.R.51
 JOHNSTON COUNTY
 STATION: 15+09.00 -L-
 SHEET 3 OF 8



PLANS PREPARED BY:
MULKEY
 ENGINEERS & CONSULTANTS
 P.O. Box 22127
 Raleigh, N.C. 27626
 (919) 851-1912 (FAX)
 WWW.MULKEYINC.COM
 NO. LICENSE NO. C-1021

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**BARREL STANDARD
 TRIPLE 8 FT. X 7 FT.
 CONCRETE BOX CULVERT**

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

STD. NO. CB13

12/20/2003 10:02:48 AM R:\Structures\Johnston 13_CULVERT.dwg

ASSEMBLED BY: Z. H. BROWN	DATE: 6/17/13	SPECIAL
CHECKED BY: W. A. DAVIS	DATE: 10/28/13	
DRAWN BY: JOEL JOHNSON	DATE: MAR. 1971	STANDARD
CHECKED BY: GARY BROOME	DATE: MAR. 1971	

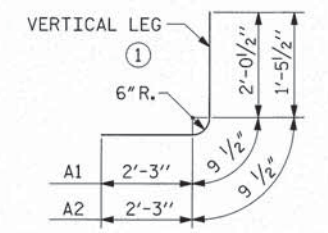
NOTES:

SILLS ARE TO BE 1' WIDE AND CAST SEPARATELY AND ATTACHED BY DOWELS.

SILL CONCRETE QUANTITY IS INCLUDED IN CLASS 'A' CONCRETE ON SHEET C-1.

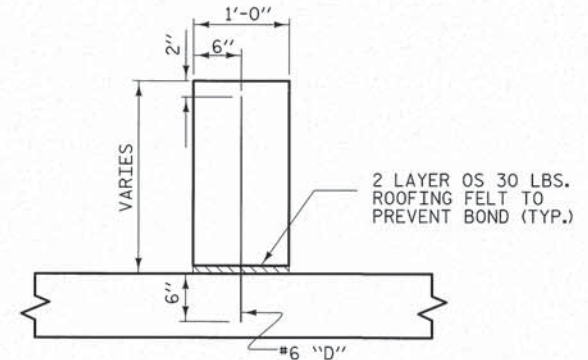
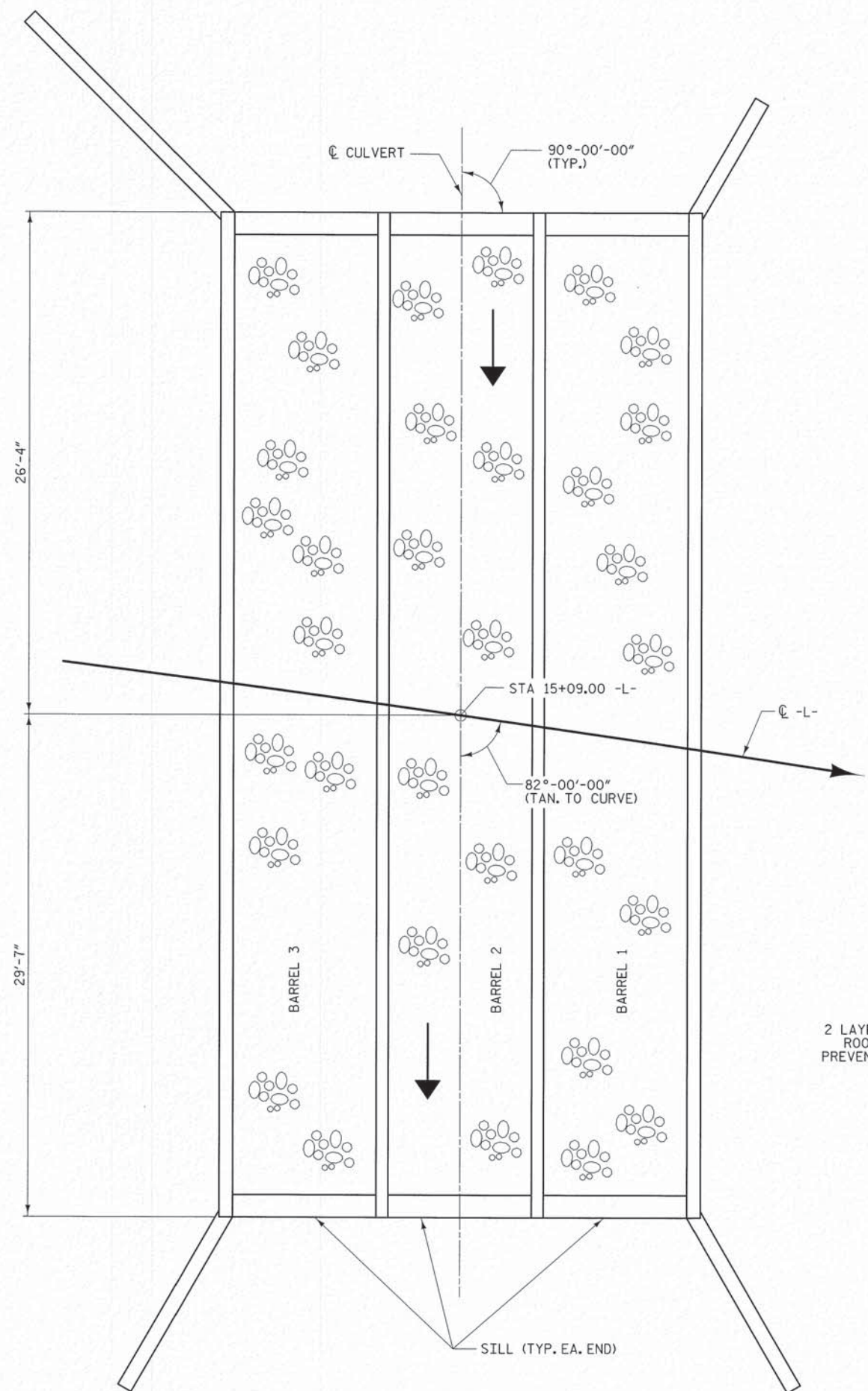
BACKFILL THE CULVERT BARRELS WITH CLASS I RIP RAP TO THE 1' AND 2' SILL HEIGHTS.

BAR TYPE		BILL OF MATERIAL				
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
A1	224	#4	1	5'-1"	761	
A2	336	#4	1	4'-6"	1010	
A100	84	#5	STR	26'-5"	2314	
A200	84	#4	STR	12'-2"	683	
A250	84	#4	STR	16'-1"	902	
A300	112	#4	STR	26'-5"	1976	
A400	112	#4	STR	12'-2"	910	
A450	112	#4	STR	16'-1"	1203	
B1	112	#4	STR	8'-4"	623	
B2	224	#4	STR	6'-8"	998	
B3	224	#4	STR	8'-4"	1247	
C1	196	#4	STR	28'-9"	3764	
D1	12	#6	STR	2'-4"	42	
D2	6	#6	STR	1'-4"	12	
G1	8	#5	STR	26'-4"	220	
REINFORCING STEEL				16,665 LBS		
CLASS I RIP RAP				110 TONS		



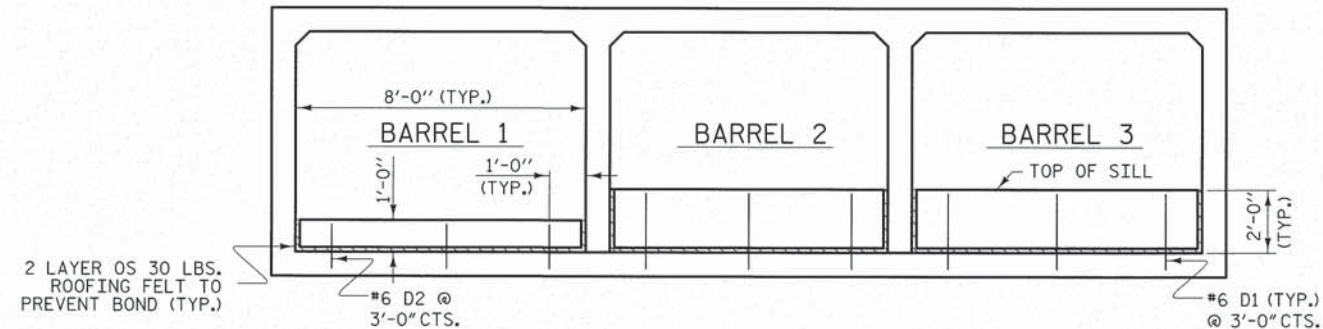
BAR DIMENSIONS ARE OUT TO OUT

SPLICE LENGTH CHART		
BAR	SIZE	SPLICE LENGTH
A250	#4	1'-9"
A450	#4	1'-9"
B1	#4	1'-9"
B3	#4	1'-9"
C1	#4	1'-11"



SECTION THROUGH SILL

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



SILL DETAILS

(LOOKING DOWNSTREAM)
OUTLET SIMILAR

PROJECT NO. 17BP.4.R.51
JOHNSTON COUNTY
STATION: 15+09.00 -L-
SHEET 4 OF 8

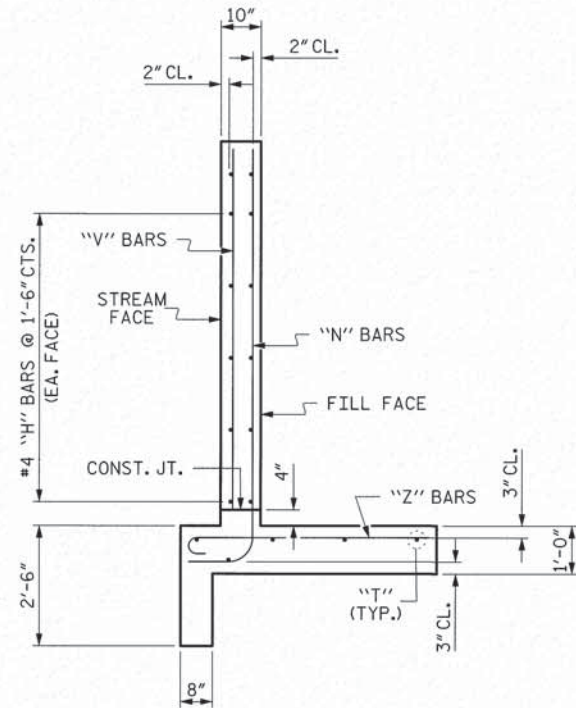
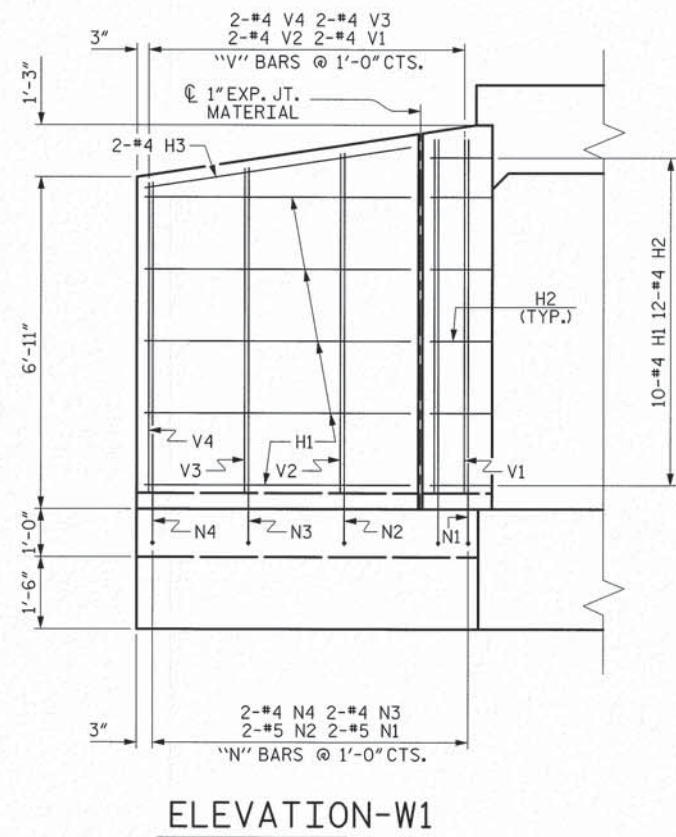
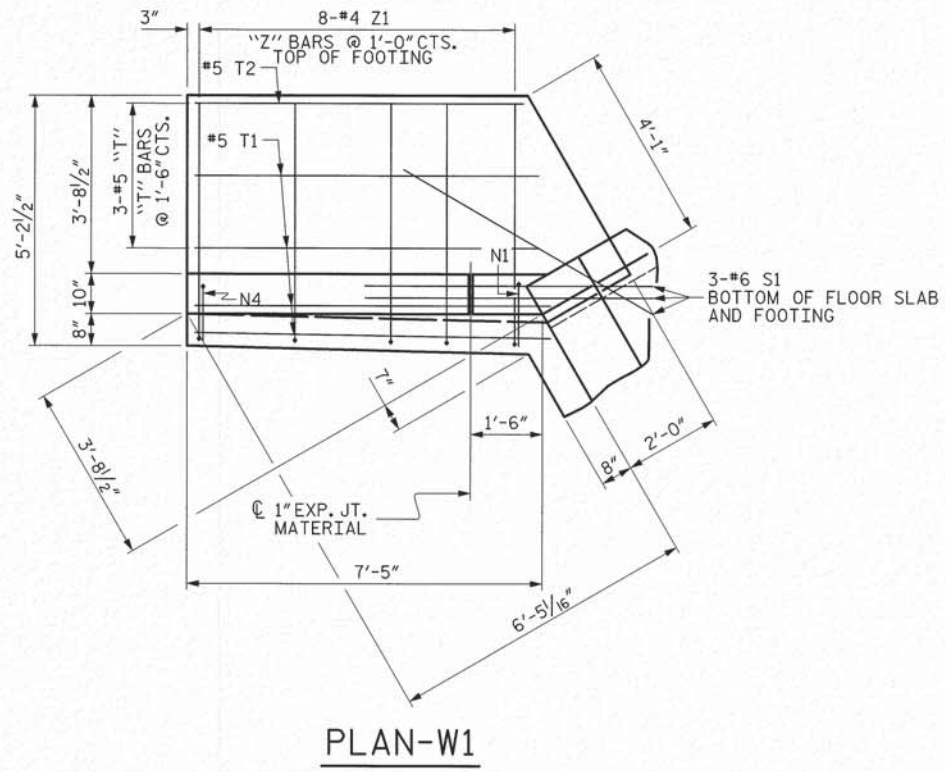


PLANS PREPARED BY:
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(919) 881-1912
(919) 881-1918 (FAX)
WWW.MULKEYINC.COM
NC LICENSE NO. 0-1021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
**TRIPLE 8 FT. X 7 FT.
CONCRETE BOX CULVERT**

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

TOTAL SHEETS: 8



BAR TYPES				BILL OF MATERIAL			
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT		
H1	10	#4	STR	5'-6"	37		
H2	12	#4	1	3'-3"	26		
H3	2	#4	STR	5'-7"	7		
N1	2	#5	2	9'-5"	20		
N2	2	#5	2	9'-1"	19		
N3	2	#4	2	8'-9"	12		
N4	2	#4	2	8'-6"	11		
S1	3	#6	STR	6'-0"	27		
T1	4	#5	STR	7'-2"	30		
T2	1	#5	STR	6'-10"	7		
V1	2	#4	STR	7'-4"	10		
V2	2	#4	STR	7'-0"	9		
V3	2	#4	STR	6'-9"	9		
V4	2	#4	STR	6'-5"	9		
Z1	8	#4	3	5'-6"	29		
TOTAL REINFORCING STEEL FOR 1 WING					262 LBS		
CLASS A CONCRETE							
1 WING					3.5	CY	
1 HEADWALL					1.2	CY	
1 END CURTAIN WALL					2.2	CY	
TOTAL					6.9	CY	

NOTE: WING DIMENSIONS AND HEIGHTS ARE LAYED OUT TO TIE TO EXISTING WALLS EXTENDING FROM MILL. ADJUST AS DIRECTED BY THE ENGINEER TO MATCH.

PROJECT NO. 17BP.4.R.51
 JOHNSTON COUNTY
 STATION: 15+09.00 -L-
 SHEET 5 OF 8



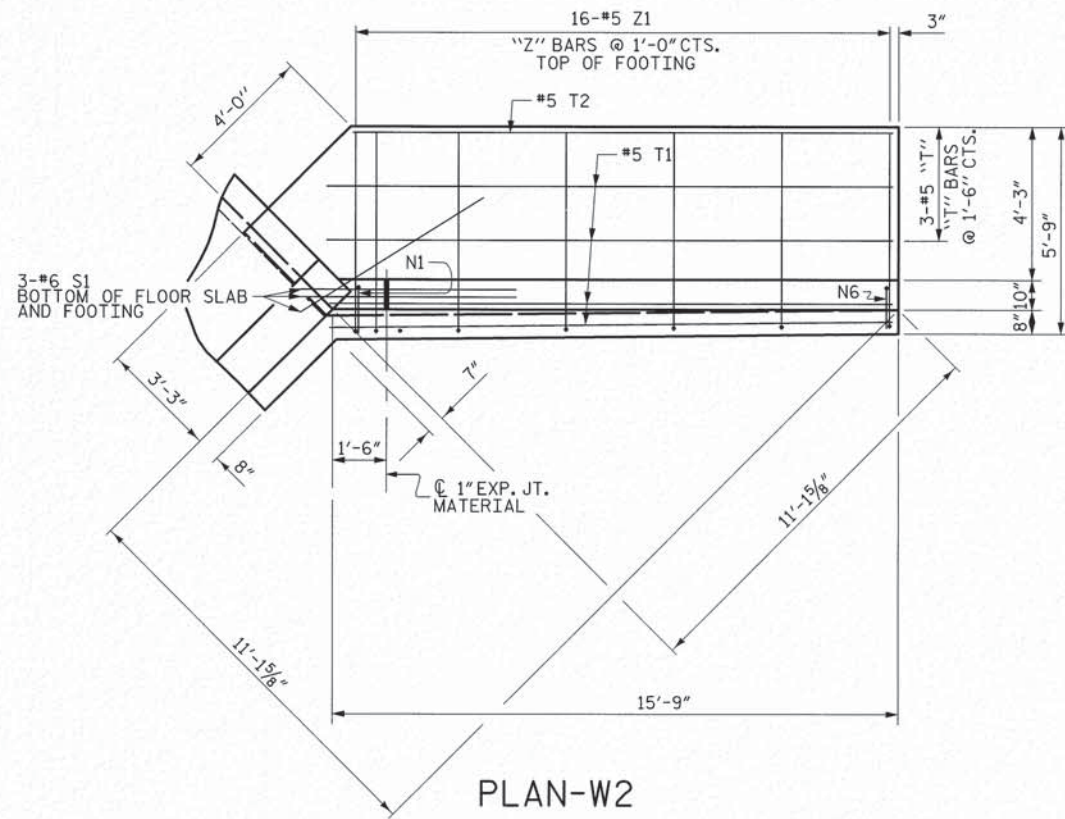
PLANS PREPARED BY:
MULKEY
 ENGINEERS & CONSULTANTS
 PO Box 32127
 RALEIGH, NC 27626
 (919) 851-1912
 (919) 851-1913 FAX
 WWW.MULKEYINC.COM
 NC LICENSE NO. C-1021

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**WING FOR
 CONCRETE BOX CULVERT
 INLET END BARREL 1**

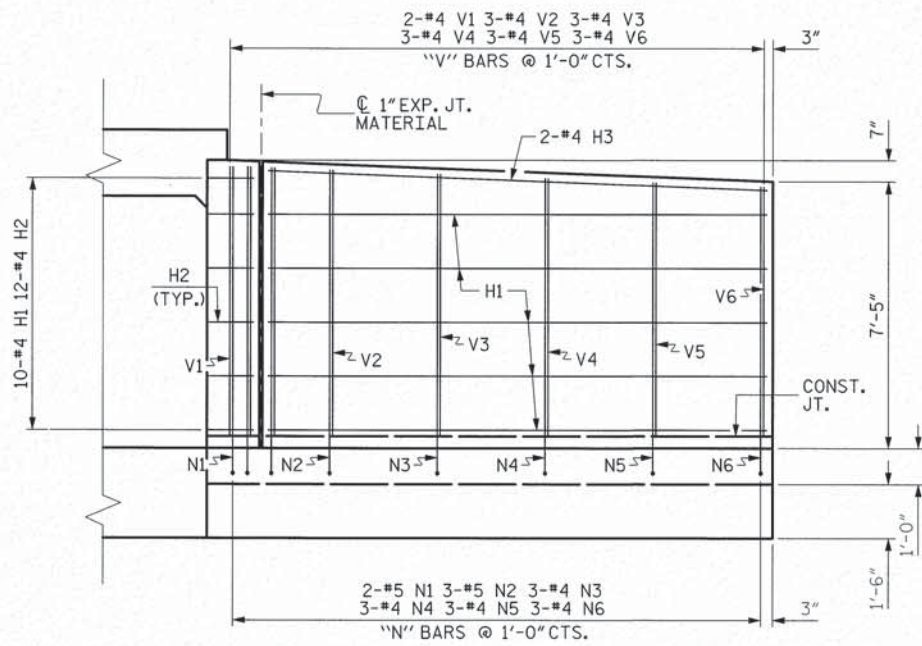
H = 7'-0" SLOPE = 2:1

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

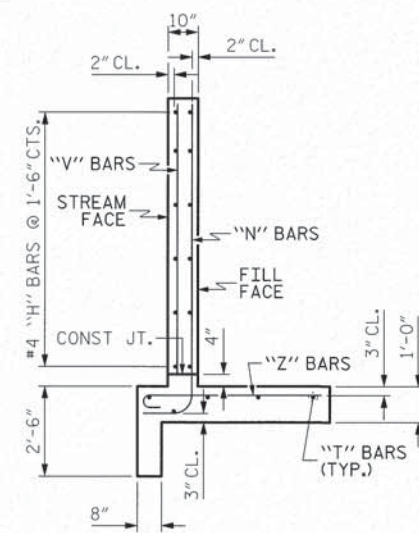
C-5
 TOTAL SHEETS 8



PLAN-W2



ELEVATION-W2



TYPICAL WING SECTION

BAR TYPES				BILL OF MATERIAL			
ALL BAR DIMENSIONS ARE OUT TO OUT.							
1							
2							
3							
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT		
H1	10	#4	STR	13'-10"	92		
H2	12	#4	1	3'-3"	26		
H3	2	#4	STR	13'-10"	18		
N1	2	#5	2	9'-6"	20		
N2	3	#5	2	9'-5"	29		
N3	3	#4	2	9'-4"	19		
N4	3	#4	2	9'-2"	18		
N5	3	#4	2	9'-1"	18		
N6	3	#4	2	8'-11"	18		
S1	3	#6	STR	6'-0"	27		
T1	4	#5	STR	15'-8"	65		
T2	1	#5	STR	15'-0"	16		
V1	2	#4	STR	7'-5"	10		
V2	3	#4	STR	7'-4"	15		
V3	3	#4	STR	7'-3"	15		
V4	3	#4	STR	7'-1"	14		
V5	3	#4	STR	7'-0"	14		
V6	3	#4	STR	6'-11"	14		
Z1	16	#5	3	6'-1"	102		
REINFORCING STEEL FOR 1 WING					550	LBS	
CLASS A CONCRETE 1 WING					7.8	CY	
TOTAL					7.8	CY	

NOTE: WING DIMENSIONS AND HEIGHTS ARE LAYED OUT TO TIE TO EXISTING WALLS EXTENDING FROM MILL. ADJUST AS DIRECTED BY THE ENGINEER TO MATCH.

PROJECT NO. 17BP.4.R.51
 JOHNSTON COUNTY
 STATION: 15+09.00 -L-
 SHEET 6 OF 8



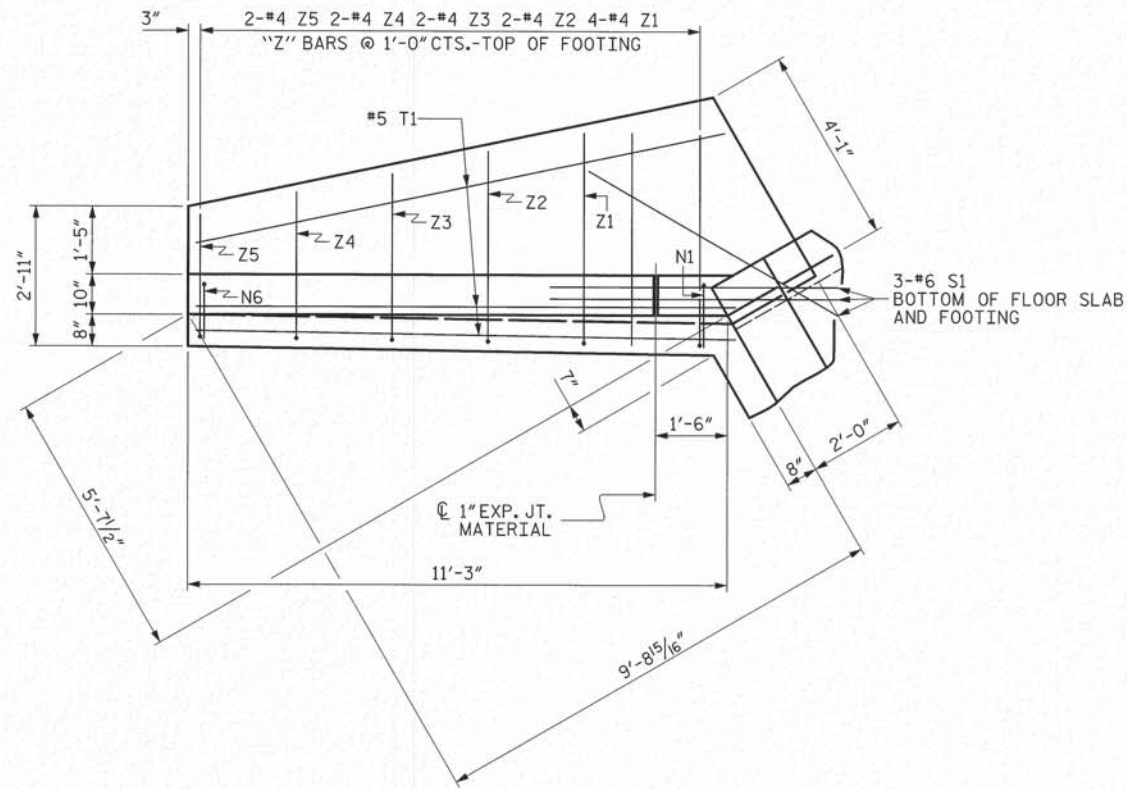
PLANS PREPARED BY:
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 RALEIGH, NC 27636
 (919) 881-1912
 (919) 881-1913 (FAX)
 WWW.MULKEYINC.COM
 NO LICENSE NO. 0-1021

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
WINGS FOR CONCRETE BOX CULVERT INLET END BARREL 3
 H = 7'-0" SLOPE = 2:1

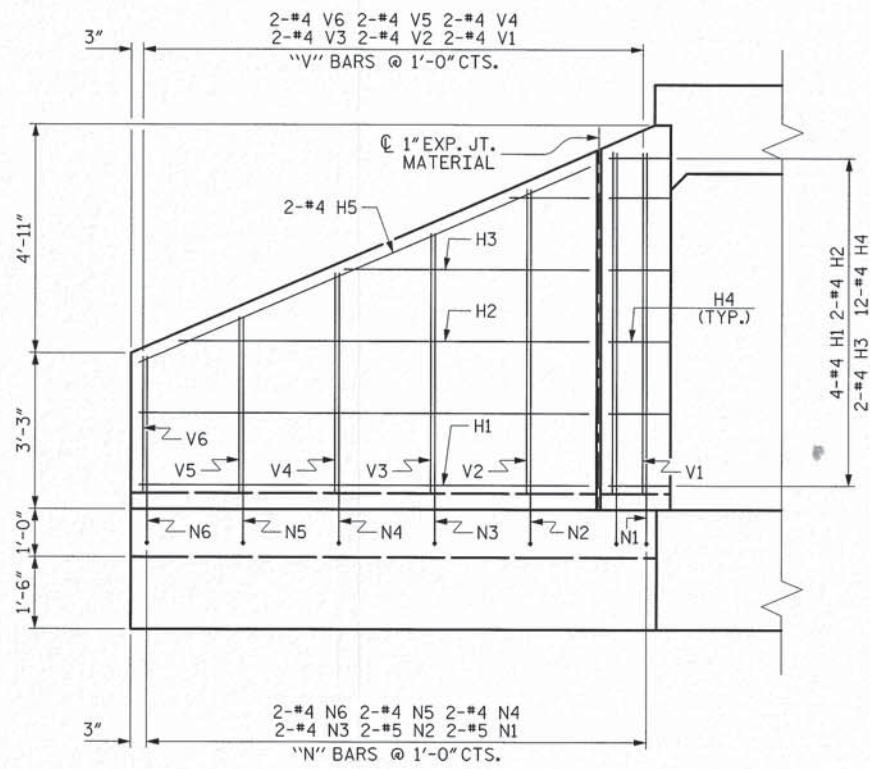
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	DATE:	TOTAL SHEETS
1			3		8
2			4		

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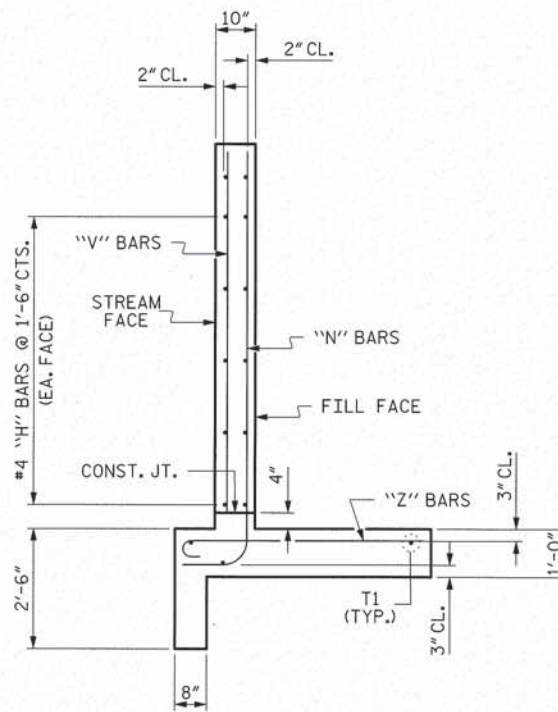
ASSEMBLED BY: Z. H. BROWN DATE: 6/27/13
 CHECKED BY: W. B. ALLEN DATE: 6/28/13



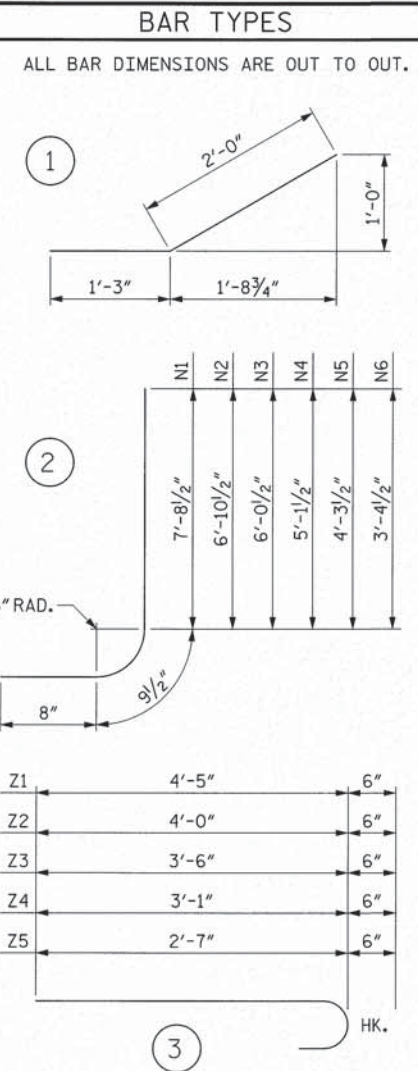
PLAN-W3



ELEVATION-W3



TYPICAL WING SECTION



BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	8	#4	STR	9'-4"	50
H2	4	#4	STR	8'-6"	23
H3	4	#4	STR	5'-1"	14
H4	24	#4	1	3'-3"	52
H5	4	#4	STR	10'-3"	27
N1	4	#5	2	9'-2"	38
N2	4	#5	2	8'-4"	35
N3	4	#4	2	7'-6"	20
N4	4	#4	2	6'-7"	18
N5	4	#4	2	5'-9"	15
N6	4	#4	2	4'-10"	13
S1	6	#6	STR	6'-0"	54
T1	6	#5	STR	11'-3"	70
V1	4	#4	STR	7'-1"	19
V2	4	#4	STR	6'-4"	17
V3	4	#4	STR	5'-5"	14
V4	4	#4	STR	4'-7"	12
V5	4	#4	STR	3'-8"	10
V6	4	#4	STR	2'-10"	8
Z1	8	#4	3	4'-11"	52
Z2	4	#4	3	4'-6"	12
Z3	4	#4	3	4'-0"	11
Z4	4	#4	3	3'-7"	10
Z5	4	#4	3	3'-1"	8

TOTAL REINFORCING STEEL FOR 2 WINGS 602 LBS

CLASS A CONCRETE
 2 WINGS 8.6 CY
 1 HEADWALL 1.2 CY
 1 END CURTAIN WALL 1.0 CY
 TOTAL 10.8 CY

PROJECT NO. 17BP.4.R.51
 JOHNSTON COUNTY
 STATION: 15+09.00 -L-
 SHEET 7 OF 8



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD WINGS
 FOR
 CONCRETE BOX CULVERT
 OUTLET END
 H = 7'-0" 90° SKEW SLOPE = 2:1

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

STD. NO. CW9007

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ASSEMBLED BY: Z. H. BROWN DATE: 3/25/13
 CHECKED BY: W. A. DAVIS DATE: 7/3/13
 DRAWN BY: CCJ 10/99
 CHECKED BY: RWW 03/00

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 7/16" 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.

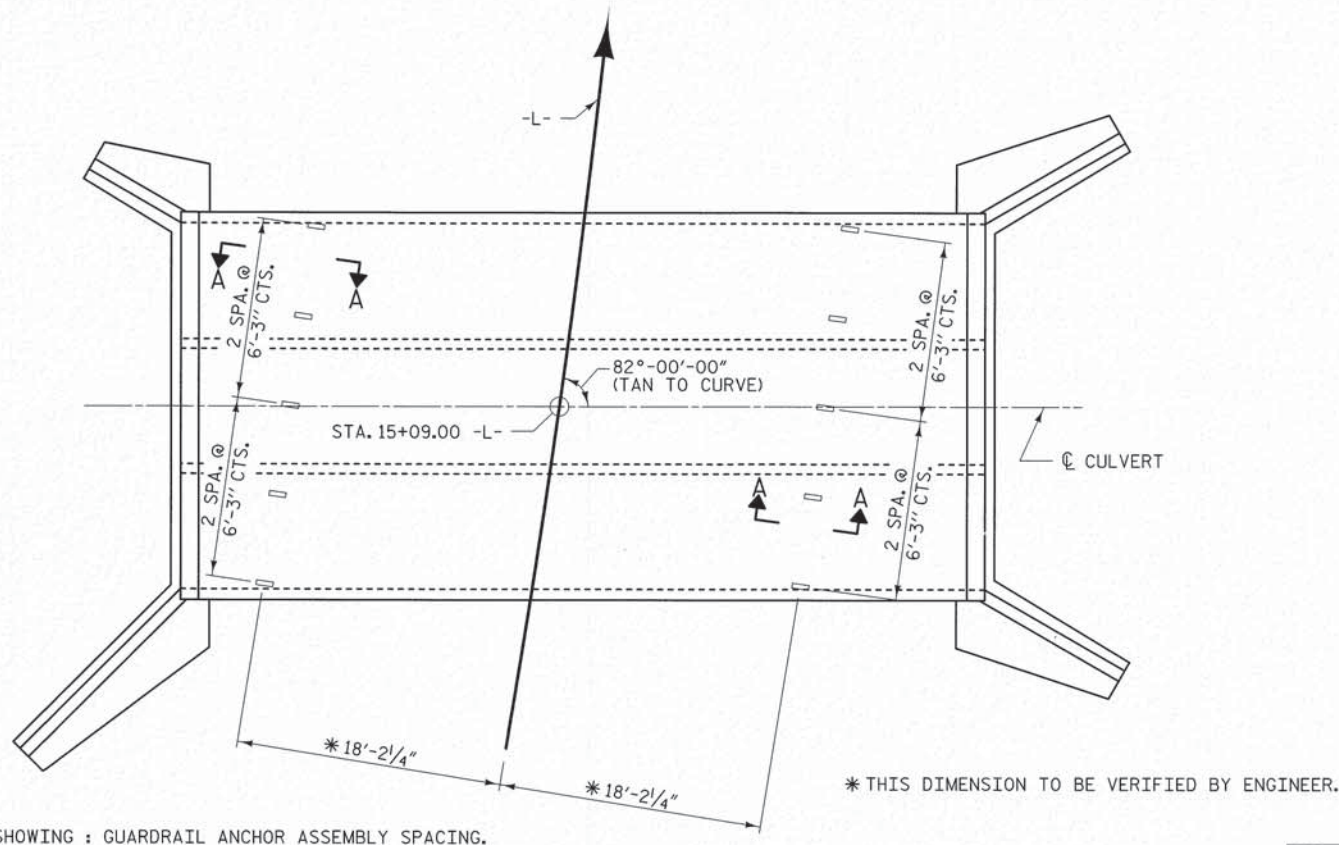
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CLASS "A" CONCRETE.

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.

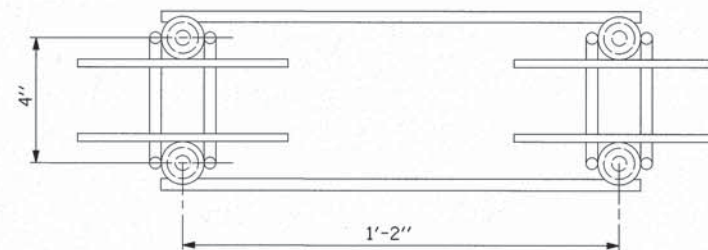
SLAB REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR GUARDRAIL ANCHOR ASSEMBLY. CARE SHOULD BE TAKEN TO KEEP THE SHIFTING OF REINFORCING STEEL TO A MINIMUM.

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.

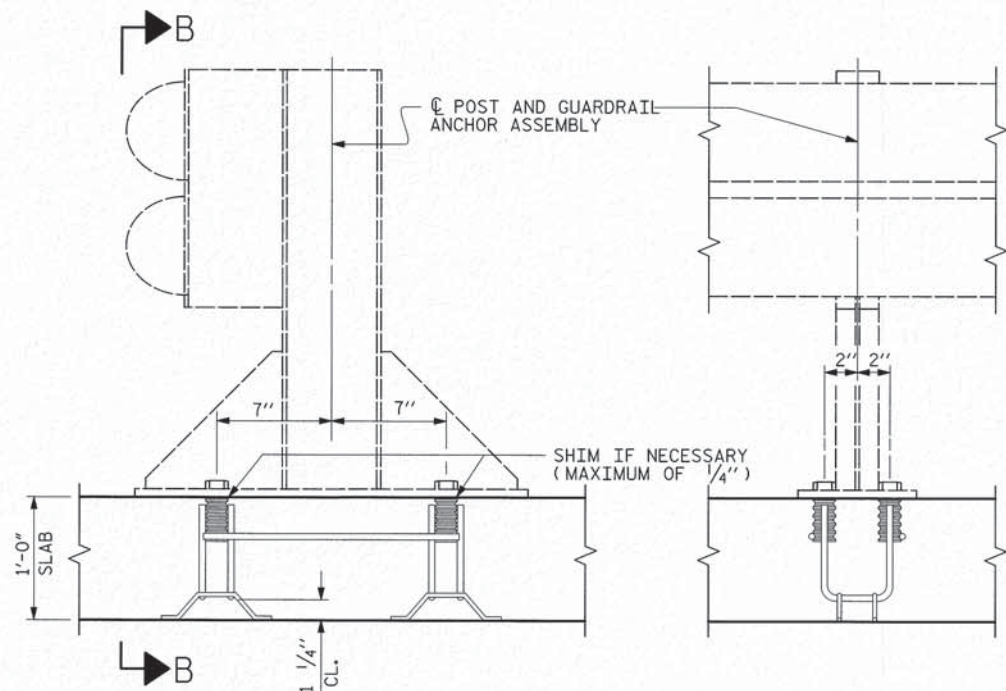


SHOWING : GUARDRAIL ANCHOR ASSEMBLY SPACING.

PLAN
SHOWING : GUARDRAIL ANCHOR ASSEMBLY SPACING.

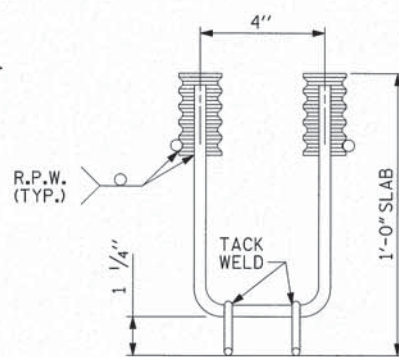


PLAN

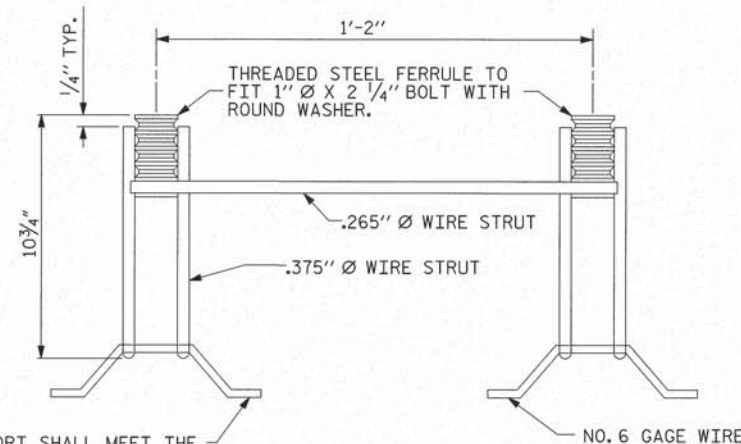


SECTION A-A

SECTION B-B



ELEVATION



SIDE VIEW

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

GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

PROJECT NO. 17BP.4.R.51

JOHNSTON COUNTY

STATION: 15+09.00 -L-

SHEET 8 OF 8

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



PLANS PREPARED BY:



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

STD. NO. GRA1

12/20/2003 10:05:22 AM RA:\Structures\Johnston IS.CULVERT.dwg

ASSEMBLED BY : Z. H. BROWN	DATE : 6/25/13
CHECKED BY : W. A. DAVIS	DATE : 7/3/13
DRAWN BY : FCJ 6/88	REV. 7/10/01 LES/RDR
CHECKED BY : ARB 6/88	REV. 5/7/03 RWW/JTE
	REV. 5/1/06R KMM/GM