

ARKANSAS HIGHWAY AND TRANSPORTATION DEPARTMENT
CONSTRUCTION PLANS FOR PROPOSED COUNTY ROAD

DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
							JOB NO.	BR1610
								1
								71

4 BURLINGTON NORTHERN SANTA FE RAILWAY (BONO) (S)

BURLINGTON NORTHERN SANTA FE RAILWAY (BONO) (S)

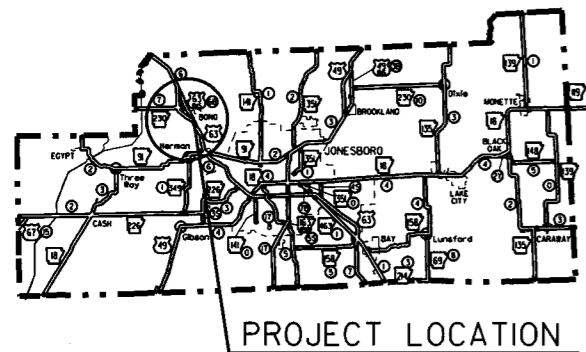
COUNTY ROAD 27 (CCR 352)

CRAIGHEAD COUNTY

JOB BR1610

FED. AID PROJ. STPB-0016(62)

CRAIGHEAD COUNTY



PROJECT LOCATION

VICINITY MAP

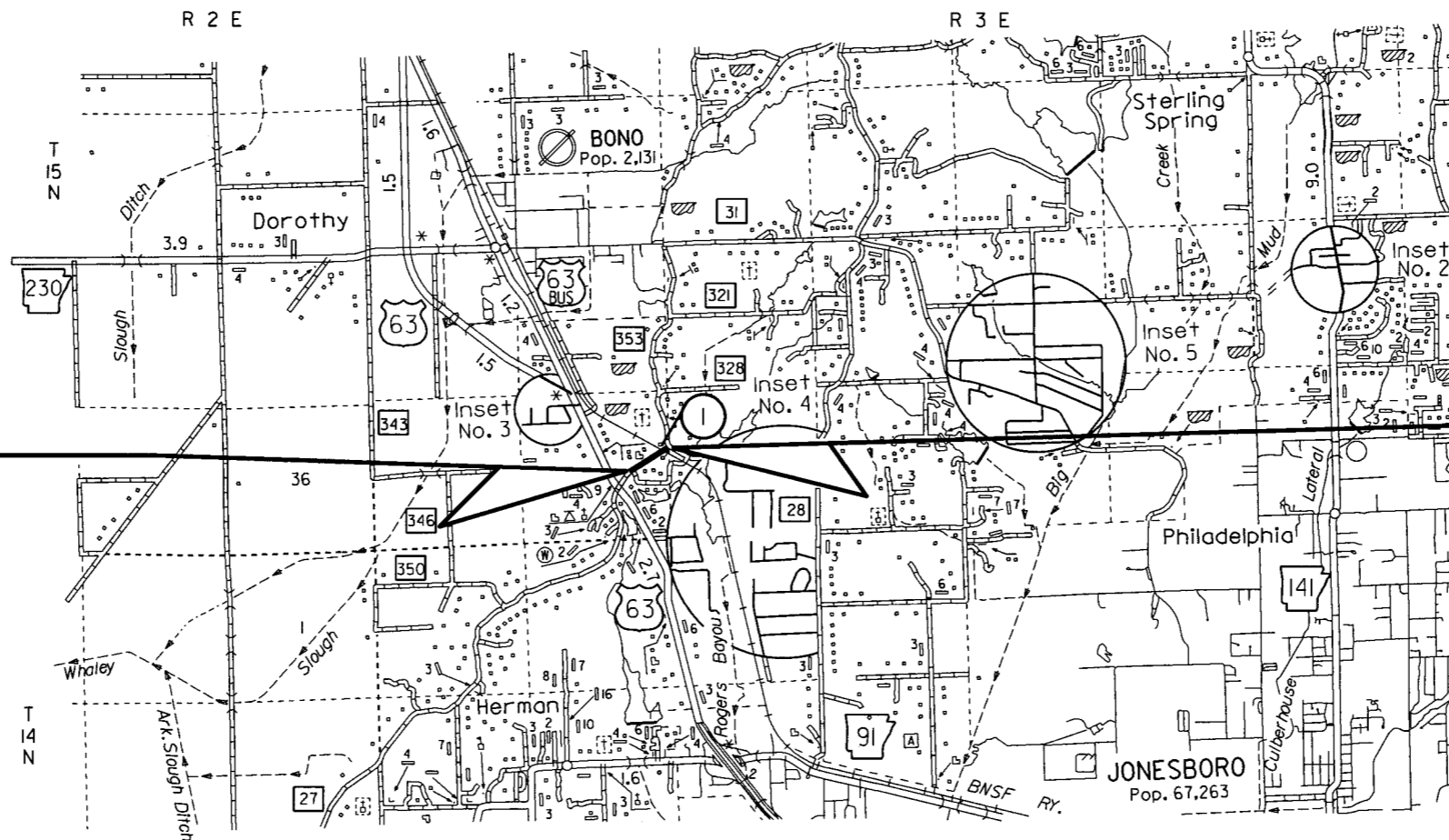


ARKANSAS HIGHWAY DIST. 10



STRUCTURES OVER 20'-0" SPAN

- ① STATION I15+15.68 - BR. BEGIN
290'-0" CONTINUOUS COMPOSITE
PLATE GIRDER UNIT
BRIDGE NO. 04935
292' - 7 3/4" BRIDGE LENGTH
24'-0" CLEAR ROADWAY
TO BE CONSTRUCTED
STATION I18+08.32 - BR. END



STA. 100+00.00

BEGIN JOB BR1610

STA. I18+75.02

END JOB BR1610

DESIGN TRAFFIC DATA

DESIGN YEAR	2036
2016 ADT	160
2036 ADT	210
2036 DHV	32
DIRECTIONAL DISTRIBUTION	0.60
TRUCKS	3%
DESIGN SPEED	40 MPH

APPROVED



8-19-16

DEPUTY DIRECTOR
AND CHIEF ENGINEER

PROJECT COORDINATES

	BEGIN	MID-POINT	END
LAT.	N35°53'10"	N35°53'14"	N35°53'18"
LONG.	W90°47'16"	W90°46'52"	W90°46'58"

GROSS LENGTH OF PROJECT	1875.02	FEET OR	0.355	MILES
NET " " ROADWAY	1582.38	" " "	0.300	"
NET " " BRIDGES	292.64	" " "	0.055	"
NET " " PROJECTS	1875.02	" " "	0.355	"

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				6	ARK.			
							2	71

INDEX OF SHEETS

GOVERNING SPECIFICATIONS

4 INDEX OF SHEETS, GOV. SPECS. & GEN. NOTES

SHEET NO.	TITLE	BRIDGE NO.	DRWG. NO.	DATE
1.	TITLE SHEET			
2.	INDEX OF SHEETS, GOVERNING SPECIFICATIONS, AND GENERAL NOTES			
3-4.	TYPICAL SECTIONS OF IMPROVEMENT AND SPECIAL DETAILS			
5-6.	TEMPORARY EROSION CONTROL DETAILS			
7-8.	QUANTITIES			
9.	SCHEDULE OF BRIDGE QUANTITIES	04935	57529	
10.	SUMMARY OF QUANTITIES AND REVISIONS			
11-13.	SURVEY CONTROL DETAILS			
14-15.	PLAN AND PROFILE SHEETS			
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17.	LAYOUT OF BRIDGE OVER BNSF RAILWAY (SHEET 2 OF 2)	04935	57531	
18.	EXHIBIT A - BNSF RAILWAY (SHEET 1 OF 2)	04935	57532	
19.	EXHIBIT A - BNSF RAILWAY (SHEET 2 OF 2)	04935	57532A	
20.	DETAILS OF BENT NO. 1 (SHEET 1 OF 2)	04935	57533	
21.	DETAILS OF BENT NO. 1 (SHEET 2 OF 2)	04935	57534	
22.	DETAILS OF BENT NOS. 2 & 3 (SHEET 1 OF 2)	04935	57535	
23.	DETAILS OF BENT NOS. 2 & 3 (SHEET 2 OF 2)	04935	57536	
24.	DETAILS OF BENT NO. 4 (SHEET 1 OF 2)	04935	57537	
25.	DETAILS OF BENT NO. 4 (SHEET 2 OF 2)	04935	57538	
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27.	DETAILS OF 290'-0" CONTINUOUS PLATE GIRDER UNIT (SHEET 1 OF 7)	04935	57540	
28.	DETAILS OF 290'-0" CONTINUOUS PLATE GIRDER UNIT (SHEET 2 OF 7)	04935	57541	
29.	DETAILS OF 290'-0" CONTINUOUS PLATE GIRDER UNIT (SHEET 3 OF 7)	04935	57542	
30.	DETAILS OF 290'-0" CONTINUOUS PLATE GIRDER UNIT (SHEET 4 OF 7)	04935	57543	
31.	DETAILS OF 290'-0" CONTINUOUS PLATE GIRDER UNIT (SHEET 5 OF 7)	04935	57544	
32.	DETAILS OF 290'-0" CONTINUOUS PLATE GIRDER UNIT (SHEET 6 OF 7)	04935	57545	
33.	DETAILS OF 290'-0" CONTINUOUS PLATE GIRDER UNIT (SHEET 7 OF 7)	04935	57546	
34.	DETAILS OF CHAIN LINK FENCE	04935	57547	
35.	DETAILS OF TYPE SPECIAL APPROACH GUTTERS	04935	57548	
36.	STANDARD DETAILS FOR EMBANKMENT CONSTRUCTION AND BACKFILL AT BRIDGE ENDS		55000	02-27-14
37.	STANDARD DETAILS FOR DUMPED RIPRAP AND FILTER BLANKET AND COMPUTING EXCAVATION FOR STRUCTURES		55001	02-27-14
38.	STANDARD DETAILS FOR PERMANENT STEEL BRIDGE DECK FORMS FOR STEEL & CONCRETE GIRDER SPANS		55005	03-24-16
39.	STANDARD DETAILS FOR TYPE C BRIDGE NAME PLATES		55011	02-27-14
40.	STANDARD DETAILS FOR CONCRETE FILLED STEEL SHELL PILES AND PILE ENCASEMENTS		55021	03-24-16
41.	STANDARD DETAILS FOR TYPE A APPROACH GUTTERS		55030A	09-02-15
42.	STANDARD DETAILS FOR TYPE A APPROACH SLAB		55040A	02-27-14
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49.	GUARD RAIL DETAILS		GR-10A	07-14-10
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53.	PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)		PCP-1	02-27-14
54.	PLASTIC PIPE CULVERT (PVC F949)		PCP-2	02-27-14
55.	PAVEMENT MARKING DETAILS		PM-1	05-12-16
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57.	STANDARD HIGHWAY SIGNS AND SUPPORT ASSEMBLIES		SHS-1	09-12-13
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59.	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION		TC-1	09-02-15
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61.	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION		TC-3	09-02-15
62.	TEMPORARY EROSION CONTROL DEVICES		TEC-1	12-15-11
63.	TEMPORARY EROSION CONTROL DEVICES		TEC-2	06-02-94
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65.	CHAIN LINK FENCE		WF-3	11-17-10
66-71.	CROSS SECTIONS			

THE FOLLOWING SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS FOR THIS PROJECT SUPPLEMENT THE STANDARD SPECIFICATIONS, EDITION OF 2014. IN CASE OF CONFLICT, THE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL GOVERN.

NUMBER	TITLE
ERRATA	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273	REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS
FHWA-1273	SUPPLEMENT - SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140)
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - FEDERAL STANDARDS
FHWA-1273	SUPPLEMENT - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS
FHWA-1273	SUPPLEMENT - REVISIONS OF FHWA-1273 FOR OFF-SYSTEM PROJECTS
100-3	CONTRACTOR'S LICENSE
108-1	LIQUIDATED DAMAGES
108-2	WORK ALLOWED PRIOR TO ISSUANCE OF WORK ORDER
303-1	AGGREGATE BASE COURSE
400-1	TACK COATS
410-1	CONSTRUCTION REQUIREMENTS AND ACCEPTANCE OF ASPHALT CONCRETE PLANT MIX COURSES
604-1	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
606-1	PIPE CULVERTS FOR SIDE DRAINS
620-1	MULCH COVER
JOB BR1610	BIDDING REQUIREMENTS AND CONDITIONS
JOB BR1610	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB BR1610	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB BR1610	CARGO PREFERENCE ACT REQUIREMENTS
JOB BR1610	DELAY IN RIGHT OF WAY OCCUPANCY
JOB BR1610	DIRECT TENSION INDICATORS FOR HIGH STRENGTH BOLT ASSEMBLIES
JOB BR1610	DOCUMENTATION OF PAYMENTS MADE TO DISADVANTAGED BUSINESS ENTERPRISES
JOB BR1610	GEOSYNTHETIC INTERNAL REINFORCED EMBANKMENT CONSTRUCTION
JOB BR1610	INSURANCE, CONSTRUCTION, AND FLAGGING REQUIREMENTS ON RAILROAD PROPERTY (BNSF)
JOB BR1610	ISSUANCE OF PROPOSALS
JOB BR1610	MANDATORY ELECTRONIC CONTRACT
JOB BR1610	MANDATORY ELECTRONIC DOCUMENT SUBMITTAL
JOB BR1610	PARTNERING REQUIREMENTS
JOB BR1610	PLASTIC PIPE
JOB BR1610	RECYCLED ASPHALT SHINGLES
JOB BR1610	SHORING FOR CULVERTS
JOB BR1610	STORM WATER POLLUTION PREVENTION PLAN
JOB BR1610	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB BR1610	UTILITY ADJUSTMENTS
JOB BR1610	VALUE ENGINEERING
JOB BR1610	WARM MIX ASPHALT
JOB BR1610	WELLHEAD PROTECTION

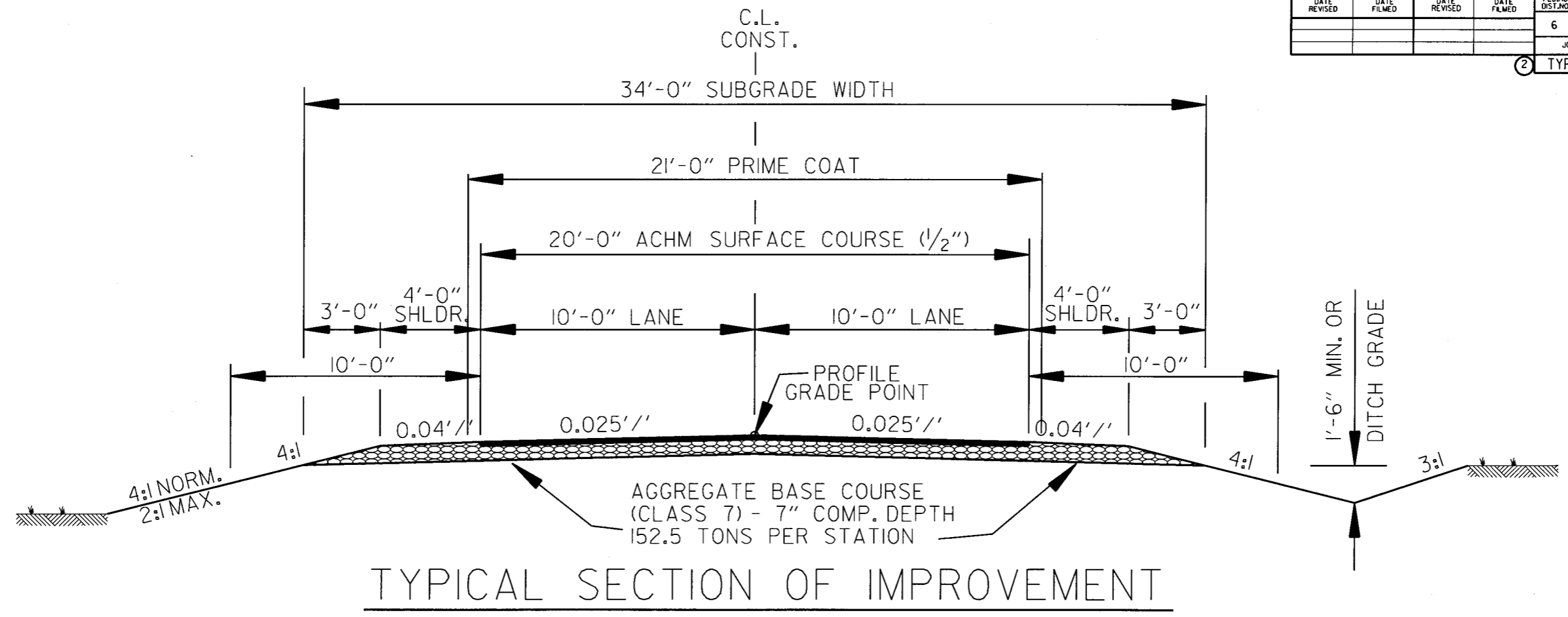
GENERAL NOTES

- GRADE LINE DENOTES FINISHED GRADE WHERE SHOWN ON PLANS.
- UTILITIES INTERFERING WITH CONSTRUCTION SHALL BE MOVED BY THE OWNERS.
- ALL LAND MONUMENTS LOCATED WITHIN THE CONSTRUCTION AREA SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 107.12 OF THE STANDARD SPECIFICATIONS.
- ALL TREES THAT DO NOT DIRECTLY INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE SPARED AS DIRECTED BY THE ENGINEER. CARE AND DISCRETION SHALL BE USED TO INSURE THAT ALL TREES NOT TO BE REMOVED SHALL BE HARMED AS LITTLE AS POSSIBLE DURING THE CONSTRUCTION OPERATIONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A FENCE TO CONTROL LIVESTOCK IN AREAS WHERE PASTURES ARE SEVERED. WIRE FENCE MAY BE CONSTRUCTED INITIALLY, OR IN LIEU THEREOF, THE CONTRACTOR AT HIS OWN EXPENSE, MAY ELECT TO PROVIDE TEMPORARY FENCING SUITABLE TO CONTAIN LIVESTOCK.
- SUPERELEVATION SHALL BE COMPUTED IN ACCORDANCE WITH STD. DRWG. SE-2 USING 40 M.P.H. DESIGN VALUES AND REVOLVE ABOUT THE CENTER POINT UNLESS OTHERWISE SHOWN.
- THIS PROJECT IS PERMITTED UNDER A NATIONWIDE 14 SECTION 404 PERMIT. REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS, EDITION OF 2014, FOR PERMIT REQUIREMENTS.



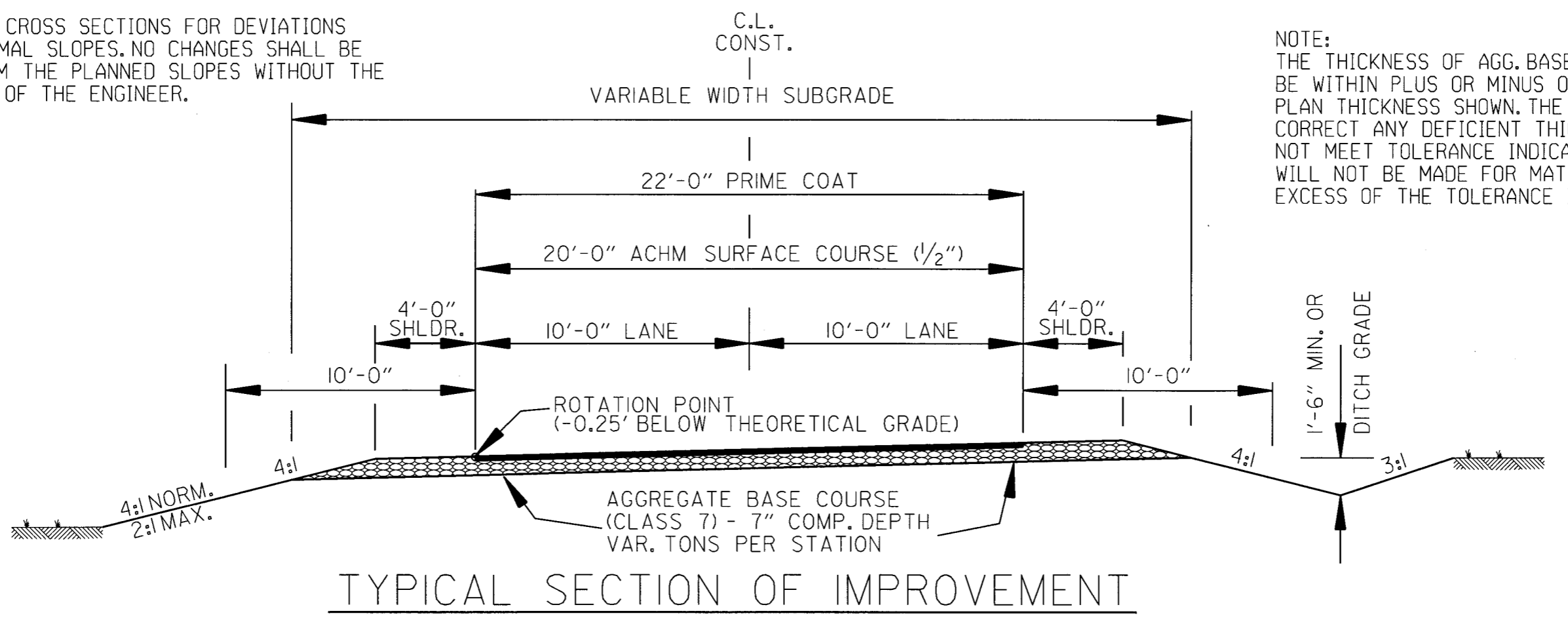
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				JOB NO.	BR1610		3	71

② TYPICAL SECTIONS OF IMPROVEMENT



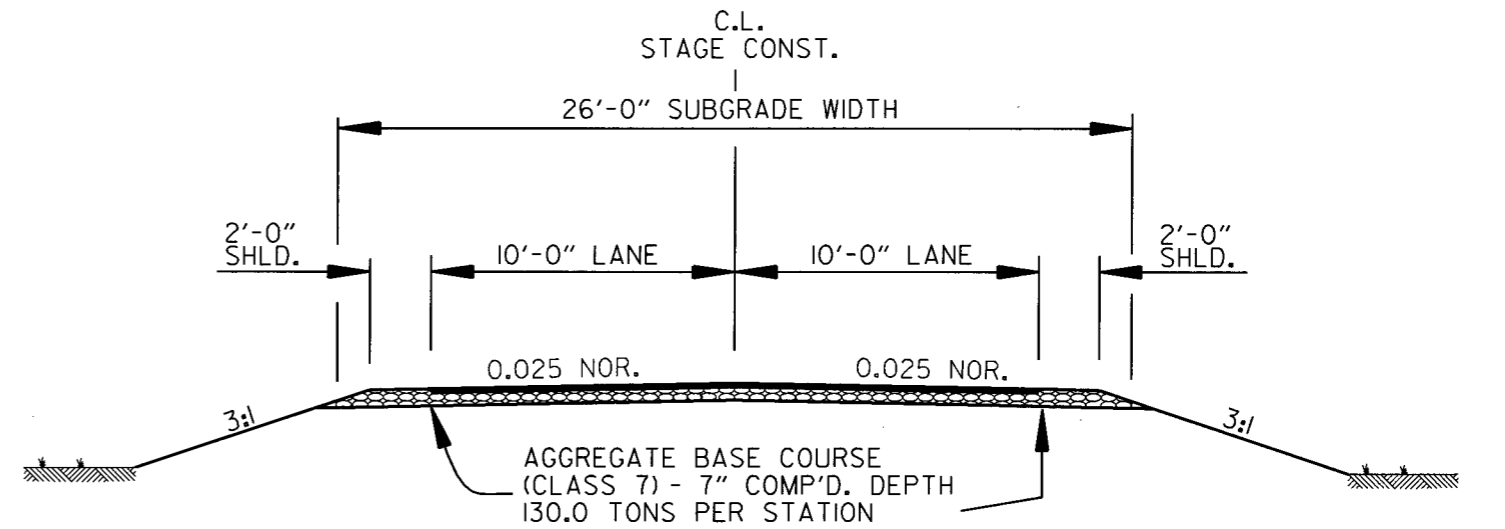
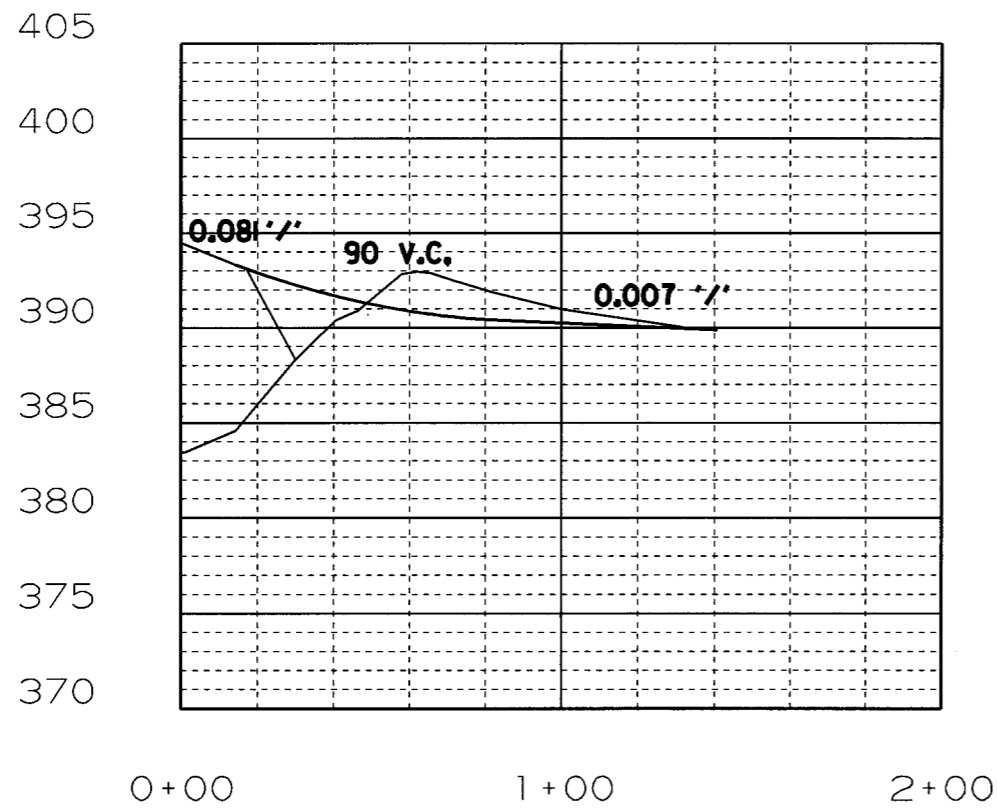
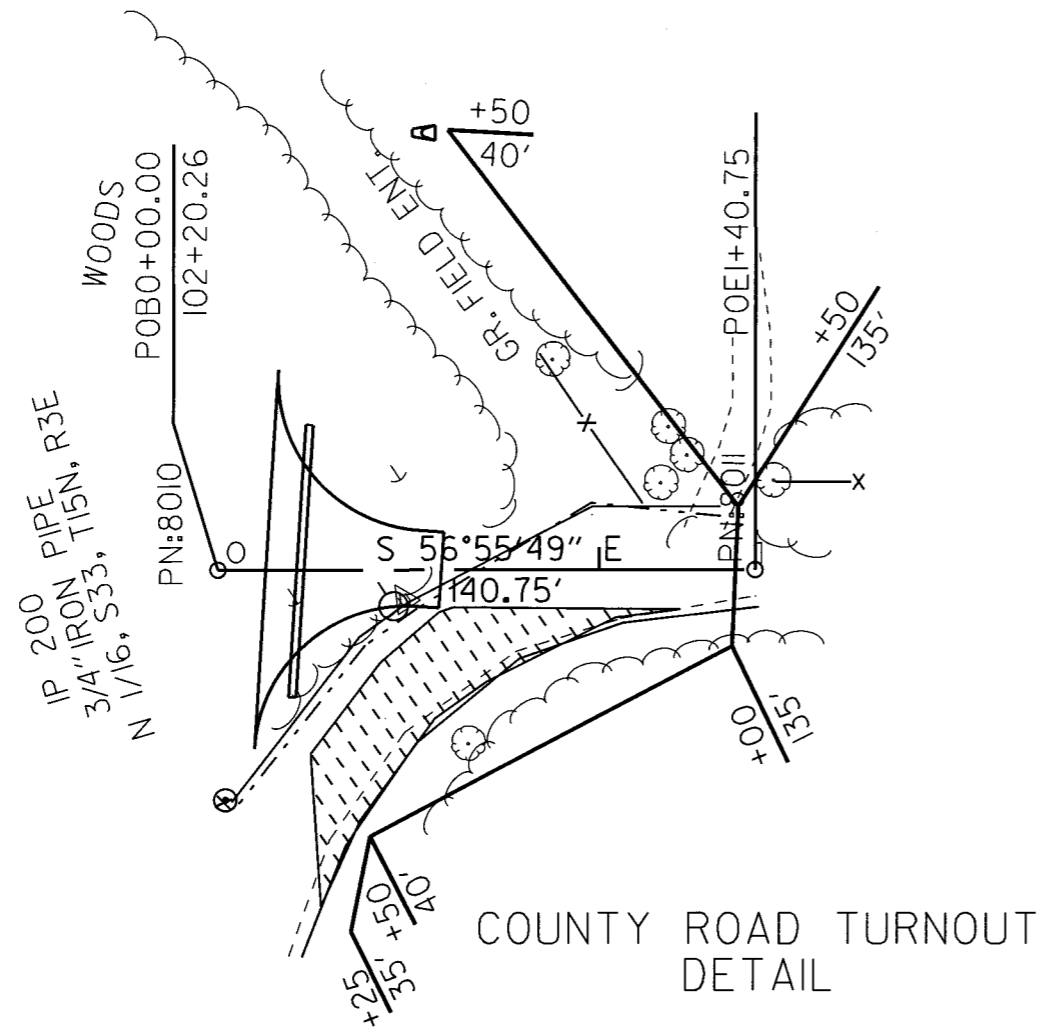
NOTE:
REFER TO CROSS SECTIONS FOR DEVIATIONS FROM NORMAL SLOPES. NO CHANGES SHALL BE MADE FROM THE PLANNED SLOPES WITHOUT THE APPROVAL OF THE ENGINEER.

NOTE:
THE THICKNESS OF AGG. BASE COURSE SHALL BE WITHIN PLUS OR MINUS ONE INCH OF THE PLAN THICKNESS SHOWN. THE CONTRACTOR WILL CORRECT ANY DEFICIENT THICKNESS THAT DOES NOT MEET TOLERANCE INDICATED. PAYMENT WILL NOT BE MADE FOR MATERIAL PLACED IN EXCESS OF THE TOLERANCE INDICATED.

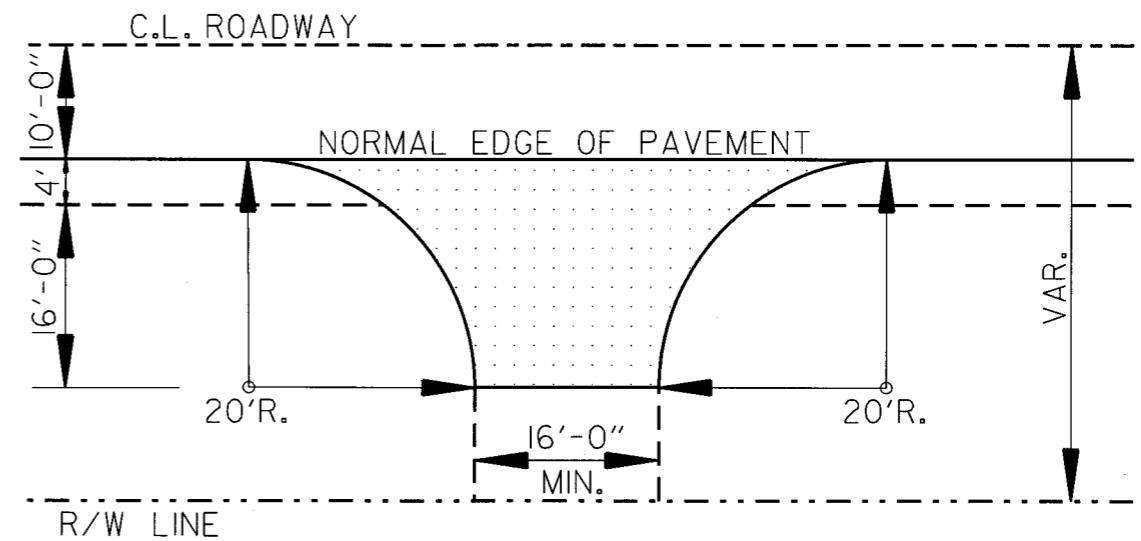


STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
NOVEMBER
No. 5368
DAVID R. MAYO, JR.
8/18/2016

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				6	ARK.				
						JOB NO. BR1610	4	71	
2								SPECIAL DETAILS	



TYPICAL SECTION OF IMPROVEMENT - COUNTY ROAD TURNOUT



DETAIL OF SURFACING FOR PRIVATE ENTRANCE

STATE OF ARKANSAS
 REGISTERED PROFESSIONAL ENGINEER
 DAVID R. MAYR, JR.
 No. 5368
 8/18/2016

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				6	ARK.			
				JOB NO.	BRI610		5	71
TEMPORARY EROSION CONTROL DETAILS								

ROCK DITCH CHECKS (E-6)		SED. REM. & DISP.	
STA. 100+00	LT. & RT.	= 2.8 CU. YDS.	2 CU. YDS.
STA. 101+00	LT. & RT.	= 2.8 CU. YDS.	2 CU. YDS.
STA. 101+50	LT. & RT.	= 2.8 CU. YDS.	2 CU. YDS.
STA. 102+00	LT. & RT.	= 2.8 CU. YDS.	2 CU. YDS.
STA. 102+50	LT. & RT.	= 2.8 CU. YDS.	2 CU. YDS.
STA. 103+00	LT. & RT.	= 2.8 CU. YDS.	2 CU. YDS.
STA. 103+50	LT.	= 1.4 CU. YDS.	1 CU. YD.
STA. 104+00	LT. & RT.	= 2.8 CU. YDS.	2 CU. YDS.
STA. 105+00	LT. & RT.	= 2.8 CU. YDS.	2 CU. YDS.
STA. 106+00	LT. & RT.	= 2.8 CU. YDS.	2 CU. YDS.
STA. 107+00	LT. & RT.	= 2.8 CU. YDS.	2 CU. YDS.
STA. 108+00	LT. & RT.	= 2.8 CU. YDS.	2 CU. YDS.

SAND BAG DITCH CHECKS (E-5)		SED. REM. & DISP.	
STA. 101+75	RT.	= 6 BAGS	1 CU. YD.
STA. 103+40	RT.	= 6 BAGS	1 CU. YD.
STA. 103+60	RT.	= 6 BAGS	1 CU. YD.
STA. 106+05	LT.	= 6 BAGS	1 CU. YD.

SILT FENCE (E-11)		SED. REM. & DISP.	
STA. 101+50 - STA. 103+05	LT.	= 265 LIN. FT.	8 CU. YD.
STA. 103+05 - STA. 104+50	LT.	= 215 LIN. FT.	7 CU. YD.

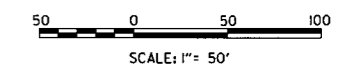
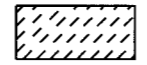
OBLITERATION OF EXISTING ROADWAY
 STA. 101+30 TO STA. 102+03 = 102 CU. YDS.

IP 201
 3/4" IRON PIPE
 N 1/16, S33, T15N, R3E

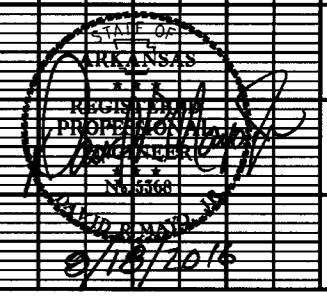
LAND TIE

STA. 100+00.00
 BEGIN JOB BRI610

- LEGEND
- — POWER POLE
 - ◊ — COMBINATION POLE
 - ◊ — POLE W/GUY
 - ◊ — TELEPHONE RISER
 - ◊ — TELEPHONE POLE
 - ⋈ — FIRE HYDRANT
 - ▲ — UNDERGROUND CABLE MKR.
 - — GAS METER
 - — GAS VALVE
 - — WATER METER
 - — WATER VALVE
 - — WELL



REVISION NO.	REVISIONS
1.	_____
2.	_____
3.	_____
4.	_____
5.	_____
6.	_____
7.	_____
8.	_____
9.	_____
10.	_____



108

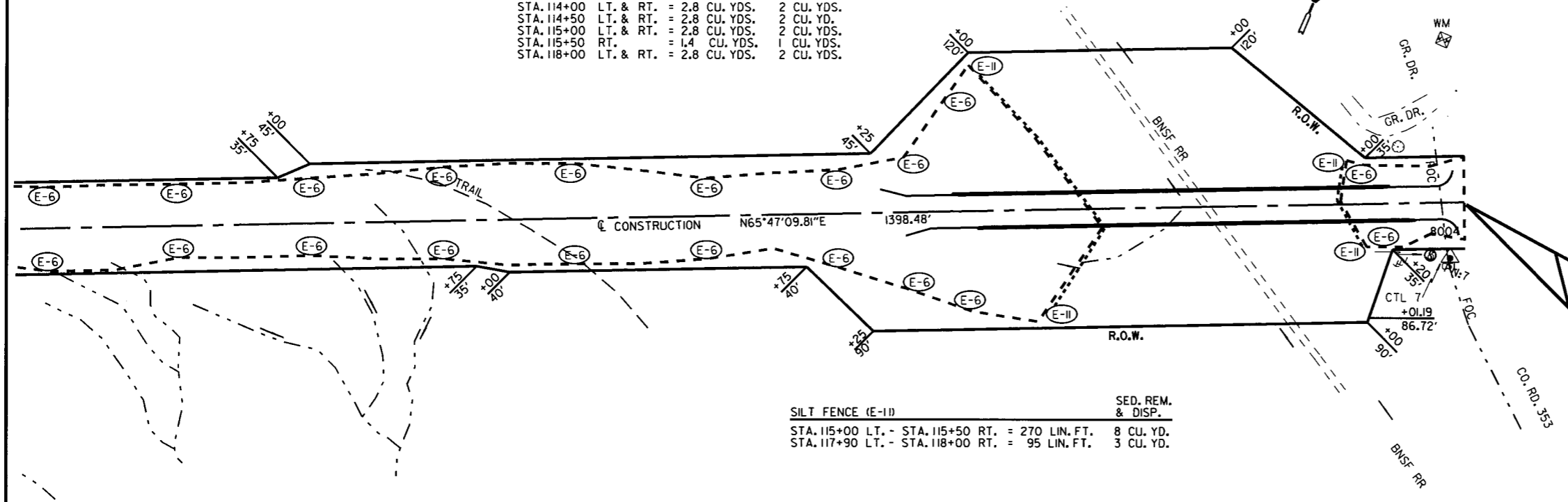
110

ROCK DITCH CHECKS (E-6)		SED. REM. & DISP.
STA. 109+00	LT. & RT. = 2.8 CU. YDS.	2 CU. YDS.
STA. 110+00	LT. & RT. = 2.8 CU. YDS.	2 CU. YDS.
STA. 111+00	LT. & RT. = 2.8 CU. YDS.	2 CU. YDS.
STA. 112+00	LT. & RT. = 2.8 CU. YDS.	2 CU. YDS.
STA. 113+00	LT. & RT. = 2.8 CU. YDS.	2 CU. YDS.
STA. 114+00	LT. & RT. = 2.8 CU. YDS.	2 CU. YDS.
STA. 114+50	LT. & RT. = 2.8 CU. YDS.	2 CU. YD.
STA. 115+00	LT. & RT. = 2.8 CU. YDS.	2 CU. YDS.
STA. 115+50	LT. & RT. = 1.4 CU. YDS.	1 CU. YDS.
STA. 118+00	LT. & RT. = 2.8 CU. YDS.	2 CU. YDS.

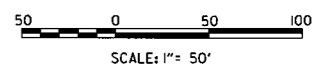
SILT FENCE (E-11)		SED. REM. & DISP.
STA. 115+00 LT. - STA. 115+50 RT.	= 270 LIN. FT.	8 CU. YD.
STA. 117+90 LT. - STA. 118+00 RT.	= 95 LIN. FT.	3 CU. YD.

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4 TEMPORARY EROSION CONTROL DETAILS



STA. 118+75.02
END JOB BR1610



REVISION NO.	REVISIONS
1.	
2.	
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5/18/2016

DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	BRI610		7	71
								4 QUANTITY SHEET

CLEARING AND GRUBBING

STATION	STATION	CLEARING	GRUBBING
		STATION	STATION
100+00	115+80	16	16
118+00	118+75	1	1
TOTALS:		17	17

WIRE FENCE

STATION	STATION	SIDE	4' STEEL CHAIN LINK LIN. FT.
100+65	101+60	LT.	95
TOTAL:			95

STRUCTURES

STATION	DESCRIPTION	SIDE DRAINS 24"	CROSS DRAIN ALTERNATES		F.E.S. ALTERNATES 24"	SELECT PIPE BEDDING CU. YD.	SOLID SODDING SQ. YD.	WATER M. G.	STD. DWG. NO.
			R.C.	C.M./PLASTIC					
			LIN. FT.						
102+20	INSTALL PIPE CULVERT - RT. SIDE DRAIN	48							PCC-1, PCM-1, PCP-1, PCP-2
103+36	CONSTRUCT PIPE CULVERT W/ FES		172	176	2	13	16	0.2	PCC-1, PCM-1, PCP-1, PCP-2
106+25	INSTALL PIPE CULVERT - LT. SIDE DRAIN	36							PCC-1, PCM-1, PCP-1, PCP-2
TOTALS:		84	172	176	2	13	16	0.2	

GUARDRAIL

STATION	STATION	SIDE	THREE BEAM GUARDRAIL TERMINAL EACH	GUARDRAIL (TYPE A) LIN. FT.	TERMINAL ANCHOR POST (TYPE D) EACH
114+37	114+87	LT.	1	50	1
114+48	114+98	RT.	1	50	1
118+19	118+69	LT.	1	50	1
118+38	118+71	RT.	1	50	1
TOTALS:			4	200	4

BASIS OF ESTIMATE:
WATER.....12.6 GALS. PER SQ. YD. (SOLID SODDING)

NOTE: FOR CLASS III R.C. PIPE CULVERT INSTALLATIONS USE TYPE 3 BEDDING UNLESS OTHERWISE NOTED.
FOR C.M. OR PLASTIC PIPE CULVERT INSTALLATIONS USE TYPE 2 BEDDING UNLESS OTHERWISE NOTED.

TEMPORARY EROSION CONTROL

STATION	STATION	SIDE	TEMPORARY SEEDING ACRE	MULCH COVER ACRE	WATER M. GAL.	SAND BAG DITCH CHECKS (E-5) BAG	ROCK DITCH CHECKS (E-6) CU. YDS.	SILT FENCE (E-11) LIN. FT.	SEDIMENT REMOVAL AND DISPOSAL CU. YD.	STANDARD DRAWING NUMBER
ENTIRE PROJECT			6.76	6.76	137.9					TEC-1, 2, 3
100+00		LT. & RT.					2.8		2	TEC-1, 2, 3
101+00		LT. & RT.					2.8		2	TEC-1, 2, 3
101+50	103+05	LT.						265	8	TEC-1, 2, 3
101+50		LT. & RT.					2.8		2	TEC-1, 2, 3
101+75		RT.				6			1	TEC-1, 2, 3
102+00		LT. & RT.					2.8		2	TEC-1, 2, 3
102+50		LT. & RT.					2.8		2	TEC-1, 2, 3
103+00		LT. & RT.					2.8		2	TEC-1, 2, 3
103+05	104+50	LT.						215	7	TEC-1, 2, 3
103+40		RT.				6			1	TEC-1, 2, 3
103+50		LT.					1.4		1	TEC-1, 2, 3
103+60		RT.				6			1	TEC-1, 2, 3
104+00		LT. & RT.					2.8		2	TEC-1, 2, 3
105+00		LT. & RT.					2.8		2	TEC-1, 2, 3
106+00		LT. & RT.					2.8		2	TEC-1, 2, 3
106+05		LT.				6			1	TEC-1, 2, 3
107+00		LT. & RT.					2.8		2	TEC-1, 2, 3
108+00		LT. & RT.					2.8		2	TEC-1, 2, 3
109+00		LT. & RT.					2.8		2	TEC-1, 2, 3
110+00		LT. & RT.					2.8		2	TEC-1, 2, 3
111+00		LT. & RT.					2.8		2	TEC-1, 2, 3
112+00		LT. & RT.					2.8		2	TEC-1, 2, 3
113+00		LT. & RT.					2.8		2	TEC-1, 2, 3
114+00		LT. & RT.					2.8		2	TEC-1, 2, 3
114+50		LT. & RT.					2.8		2	TEC-1, 2, 3
115+00		LT. & RT.					2.8		2	TEC-1, 2, 3
115+00	115+50	LT. & RT.						270	8	TEC-1, 2, 3
115+50		RT.					1.4		1	TEC-1, 2, 3
117+90	118+00	LT. & RT.						95	3	TEC-1, 2, 3
118+00		LT. & RT.					2.8		2	TEC-1, 2, 3
TOTALS:			6.76	6.76	137.9	24	58.8	845	72	

BASIS OF ESTIMATE:
WATER.....20.4 M. GALS. PER ACRE TEMPORARY SEEDING

TEMPORARY EROSION CONTROL DEVICES SHOWN ABOVE AND ON THE PLANS SHALL BE INSTALLED IN SUCH A SEQUENCE AS TO DETER EROSION AND SEDIMENTATION OF U.S. WATERWAYS AS EXPLAINED BY THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT.

PERMANENT SEEDING

STATION	STATION	LIME	SEEDING	MULCH COVER	WATER
		TON	ACRE		M. GAL.
ENTIRE PROJECT		6.76	3.38	3.38	344.8
TOTALS:		6.76	3.38	3.38	344.8

USE: 7
BASIS OF ESTIMATE:
LIME.....2 TONS PER ACRE
WATER.....102.0 M. GALS. PER ACRE PERMANENT SEEDING

REFLECTORIZED PAINT PAVEMENT MARKING

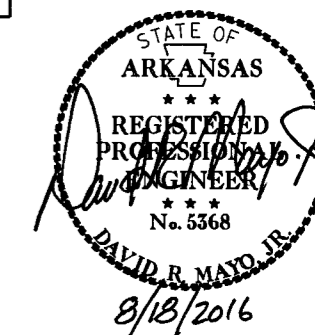
LOCATION	YELLOW	WHITE	STANDARD DRAWING NUMBER
	4" CONTINUOUS	4" CONTINUOUS	
	LIN. FT.		
ENTIRE PROJECT	3750	3750	PM-1
TOTALS:	3750	3750	

NOTE: THIS IS A LOW VOLUME ROAD AS DEFINED IN SECTION 604.03 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, 2014 EDITION.

OBLITERATION OF ABANDONED ROADWAY

STATION	STATION	SIDE	UNCLASSIFIED EXCAVATION CU. YDS.	LIME TON	SEEDING ACRE	MULCH COVER M. GAL.	WATER M. GAL.
101+30	102+30	RT.	102	0.08	0.04	0.04	4.2
TOTALS:			102	0.08	0.04	0.04	4.2

USE:
BASIS OF ESTIMATE:
LIME.....2 TONS PER ACRE
WATER.....102.0 M. GALS. PER ACRE
NOTE: 102 CU. YDS. OF UNCLASSIFIED EXCAVATION TO BE DISPOSED OF AS DIRECTED BY THE ENGINEER.
NOTE: EXCAVATION QUANTITY SHOWN ABOVE IS BASED ON A 1'-6" CROPPING OF THE EXISTING ROADWAY.



4 QUANTITIES

TRAFFIC CONTROL DEVICES

STATION OR LOCATION	W20-1						G20-1	G20-2	RII-2	TRAFFIC DRUMS	BARRICADES	STANDARD DRAWING NUMBER		
	500 FT.		1000 FT.		1500 FT.									
	NO.	SQ. FT.	NO.	SQ. FT.	NO.	SQ. FT.								
STA. 100+00 - WEST	1	16.0	1	16.0	1	16.0	1	10.0	1	8.0		TC-1, 2&3		
STA. 101+50 - STA. 102+00									10			TC-1, 2&3		
STA. 102+00								1	10.0			24 TC-1, 2&3		
STA. 118+75							1	10.0	1	8.0		24 TC-1, 2&3		
TOTALS:	1	16.0	1	16.0	1	16.0	2	20.0	2	16.0	2	20.0	10	48

BASE AND SURFACING QUANTITIES

STATION	STATION	LENGTH	AGGREGATE BASE COURSE (CLASS 7)			PRIME COAT 2 1/2" WIDTH		ACHM SURFACE COURSE (1/2") 20'-0" WIDTH	
			NORMAL	ADD'L.	TOTAL	SQ. YDS.	GALS.	SQ. YDS.	TONS
			TONS			TONS		TONS	
100+00.00	114+85.68	1485.7	2265.7		2265.7	3466.6	1386.6	3301.6	363.2
118+38.32	118+75.02	36.7	56.0	44.9	100.9	195.2	78.1	191.1	21.0
CO. RD. TURNOUT:									
102+20 RT.			130.0	44.9	174.9	344.7	137.9	333.5	36.7
PRIVATE ENTRANCES:									
106+36 LT.				44.7	44.7	54.6	21.8	54.6	6.0
WIDEN FOR GUARDRAIL				43.5	43.5				
WIDEN FOR SUPERELEV.									
100+16			648		131.1	131.1			
TOTALS:			2451.7	309.1	2760.8	1624.4		426.9	
USE:					2761	1624		427	

REMOVAL AND DISPOSAL OF STRUCTURES

STATION	STATION OR SIDE	DESCRIPTION	METAL RISER	FENCE
			EACH	LIN. FT.
104+00	LT.	13' X 25' METAL FRAME	1	
100+62	101+60	CHAIN LINK FENCE ON LT.		100
TOTALS:			1	100

APPROACH GUTTERS

STATION	STATION	SIDE	TYPE	CONCRETE	REINFORCING STEEL-RDWY. (GR. 60)
				CU. YD.	LB.
114+78	115+05	LT.	SPECIAL	2.60	222
115+00	115+27	RT.	SPECIAL	2.70	227
117+97	118+27	LT.	A	3.40	285
118+19	118+49	RT.	A	3.40	285
TOTALS:				12.10	1019

W = 3'

APPROACH SLAB (TYPE A)

STATION	STATION	CONCRETE	REINFORCING STEEL-RDWY. (GR. 60)
		CU. YD.	LB.
114+78	115+27	24.89	1928
117+97	118+49	24.89	1928
TOTALS:		49.78	3856

W = 20'

EARTHWORK

STATION	STATION	UNCLASSIFIED EXCAVATION			COMPACTED EMBANKMENT			COMPACTED EMBANKMENT (SPECIAL)
		NORMAL	APPRS.	TOTAL	NORMAL	APPRS.	TOTAL	
CUBIC YARD								
100+00	115+90	4397	412	4809	1251	394	1645	16839
117+82	118+75	27		27	205		205	
BRIDGE EXCAVATION		115		115				
TOTALS:		4539	412	4951	1456	394	1850	16839

NOTE: EARTHWORK QUANTITIES SHOWN ABOVE SHALL BE PAID FOR AS PLAN QUANTITY.

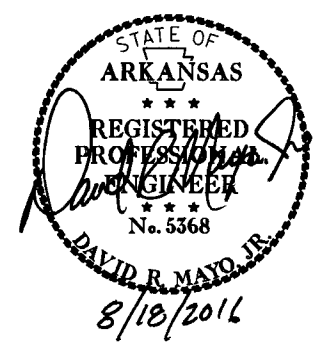
STANDARD HIGHWAY SIGNS AND SUPPORT ASSEMBLIES

STATION	SIDE	STANDARD SIGN NUMBER						SUPPORT ASSEMBLY		STANDARD DRAWING NUMBER	
		W3-1	W1-2R	W1-2L	W3-1	OM-3L	OM-3R	RI-1	TYPE A		TYPE C
		SQ. FT.						EACH			
100+00	RT.	2.25	6.25					1		SHS-1 & 2	
107+00	LT.	2.25		6.25				1		SHS-1 & 2	
115+00	RT.				9.00			1		SHS-1 & 2	
115+06	LT.				3.00			1		SHS-1 & 2	
115+25	RT.					3.00		1		SHS-1 & 2	
117+99	LT.					3.00		1		SHS-1 & 2	
118+18	RT.						3.00	1		SHS-1 & 2	
118+60	RT.						6.25	1		SHS-1 & 2	
TOTALS:		4.50	6.25	6.25	9.00	6.00	6.00	6.25	4	4	

NOTE: ALL STANDARD SIGN BLANKS TO BE 0.080" THICK. REFER TO STD. DWG. SHS-2 FOR CHANNEL POST SPLICING DETAILS.

DUMPED RIPRAP

STATION	SIDE	DUMPED RIPRAP	FILTER BLANKET
		CU. YDS.	SQ. YDS.
103+36	LT.	3	6
114+30 - 115+60	LT.	337	674
114+50 - 115+90	RT.	336	672
TOTALS:		676	1352



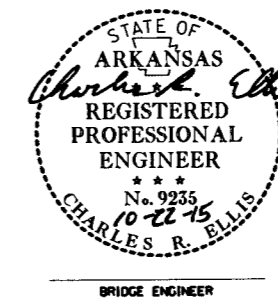
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	BR1610		9	68
				04935 - QUANTITIES - 57529				

SCHEDULE OF BRIDGE QUANTITIES - JOB NO. BR1610

BRIDGE NO.	NAME	PLATE TITLE	UNIT OF STRUCTURE	ITEM NO.	619	801	802	802	803	804	804	805	SP & 807	808	809	812	816	816		
				ITEM	7' STEEL CHAIN LINK FENCE	UNCLASSIFIED EXCAVATION FOR STRUCTURES-BRIDGE	CLASS S CONCRETE-BRIDGE	CLASS S(AE) CONCRETE-BRIDGE	CLASS I PROTECTIVE SURFACE TREATMENT	REINFORCING STEEL-BRIDGE (GRADE 60)	EPOXY COATED REINFORCING STEEL (GRADE 60)	STEEL SHELL PILING (18" DIAMETER)	STRUCTURAL STEEL IN PLATE GIRDER SPANS (M 270, GRADE 50W)	ELASTOMERIC BEARINGS	SILICONE JOINT SEALANT	BRIDGE NAME PLATE (TYPE C)	DUMPED RIPRAP	FILTER BLANKET		
				UNIT	LIN. FT.	CU. YD.	CU. YD.	CU. YD.	GAL.	LB.	LB.	LIN. FT.	LB.	CU. IN.	LIN. FT.	EACH	CU. YD.	SO. YD.		
04935	RAILWAY		END BENT NO. 1				44.25		0.4	4,842	490	315	555	1,856.0			384	744		
			INTERMEDIATE BENT NO. 2		366	176.55					35,723		720		1,740.0					
			INTERMEDIATE BENT NO. 3		399	176.55						35,723		720		1,740.0				
			END BENT NO. 4		35	35.45				0.3	4,062	400	225		555	1,856.0			98	179
			290'-0" CONT. COMP. PLATE GIRDER UNIT	250			258.60	20.1				62,280			236,120		65	1		
TOTALS FOR JOB NO. BR1610				250	800	432.80	258.60	20.8	80,350	63,170	1,980	237,230	7,192.0	65	1	482	923			

① STEEL SHELL PILES SHALL CONFORM TO ASTM A252, GRADE 3, Fy = 45 ksi.

JEFF COVAY
DESIGN SECTION SUPERVISOR



SCHEDULE OF BRIDGE QUANTITIES
BURLINGTON NORTHERN SANTA FE
RAILWAY (BONO) (S)
CRAIGHEAD COUNTY
COUNTY ROAD NO. 27 (CCR 352)
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: EOR DATE: 8/19/2015 FILENAME: bdr1610.qldgn
CHECKED BY: JAC DATE: 8/31/2015 SCALE: NO SCALE
DESIGNED BY: Std DATE: SCALE: NO SCALE
BRIDGE NO. 04935 DRAWING NO. 57529

DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
9-7-16				6	ARK.			
				JOB NO.	BR1610	10	71	

4 SUMMARY OF QUANTITIES & REVISIONS

SUMMARY OF QUANTITIES

ITEM NO.	I T E M	QUANTITY	UNIT
201	CLEARING	17	STA.
201	GRUBBING	17	STA.
202	REMOVAL AND DISPOSAL OF FENCE	100	LIN. FT.
202	REMOVAL AND DISPOSAL OF RISER	1	EACH
210	UNCLASSIFIED EXCAVATION	5053	CU. YD.
210	COMPACTED EMBANKMENT	1850	CU. YD.
SP & 210	COMPACTED EMBANKMENT (SPECIAL)	16839	CU. YD.
SS & 303	AGGREGATE BASE COURSE (CLASS 7)	2761	TON
SS & 401	PRIME COAT	1624	GAL.
SP, SS & 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")	405	TON
SP, SS & 407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2")	22	TON
504	APPROACH GUTTERS	12.10	CU. YD.
504	APPROACH SLABS	49.78	CU. YD.
601	MOBILIZATION	1.00	LUMP SUM
SP & 602	FURNISHING FIELD OFFICE	1	EACH
603	MAINTENANCE OF TRAFFIC	1.00	LUMP SUM
SS & 604	BARRICADES	48	LIN. FT.
SS & 604	SIGNS	104	SQ. FT.
SS & 604	TRAFFIC DRUMS	10	EACH
SP, SS & 606	24" SIDE DRAIN	84	LIN. FT.
606	24" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)	172	LIN. FT.
606	24" ASPHALT COATED CORRUGATED STEEL PIPE CULVERTS (16 GAUGE)	176	LIN. FT.
606	24" ALUMINUM COATED CORRUGATED STEEL PIPE CULVERTS (16 GAUGE)	176	LIN. FT.
606	24" POLYMER PRECOATED METALLIC COATED CORRUGATED STEEL PIPE CULVERTS (16 GAUGE)	176	LIN. FT.
SP & 606	24" HIGH DENSITY POLYETHYLENE PIPE	176	LIN. FT.
SP & 606	24" PVC PIPE	176	LIN. FT.
606	24" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS	2	EACH
606	24" FLARED END SECTIONS FOR CORRUGATED STEEL PIPE CULVERTS	2	EACH
606	SELECTED PIPE BEDDING	13	CU. YD.
617	GUARDRAIL (TYPE A)	200	LIN. FT.
617	TERMINAL ANCHOR POSTS (TYPE 1)	4	EACH
617	THREE BEAM GUARDRAIL TERMINAL	4	EACH
619	4' STEEL CHAIN LINK FENCE	95	LIN. FT.
620	LIME	7	TON
620	WATER	487.1	M. G.
620	SEEDING	3.42	ACRE
SS & 620	MULCH COVER	10.18	ACRE
621	TEMPORARY SEEDING	6.76	ACRE
621	SAND BAG DITCH CHECKS	24	BAG
621	ROCK DITCH CHECKS	59	CU. YD.
621	SILT FENCE	845	LIN. FT.
621	SEDIMENT REMOVAL AND DISPOSAL	72	CU. YD.
624	SOLID SODDING	16	SQ. YD.
635	ROADWAY CONSTRUCTION CONTROL	1.00	LUMP SUM
718	REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (4')	3750	LIN. FT.
718	REFLECTORIZED PAINT PAVEMENT MARKING WHITE (4')	3750	LIN. FT.
726	STANDARD SIGN	44.25	SQ. FT.
729	CHANNEL POST SIGN SUPPORT (TYPE A)	4	EACH
729	CHANNEL POST SIGN SUPPORT (TYPE C)	4	EACH
804	REINFORCING STEEL - ROADWAY (GRADE 60)	4875	POUND
816	FILTER BLANKET	1352	SQ. YD.
816	DUMPED RIPRAP	676	CU. YD.
STRUCTURES OVER 20' - 0" SPAN			
619	7' STEEL CHAIN LINK FENCE	250	LIN. FT.
636	BRIDGE CONSTRUCTION CONTROL	1.00	LUMP SUM
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES - BRIDGE	800	CU. YD.
802	CLASS 5 CONCRETE - BRIDGE	432.80	CU. YD.
802	CLASS 5 (AE) CONCRETE - BRIDGE	258.60	CU. YD.
803	CLASS 1 PROTECTIVE SURFACE TREATMENT	20.8	GAL.
804	REINFORCING STEEL - BRIDGE (GRADE 60)	80350	LB.
804	EPOXY COATED REINFORCING STEEL (GRADE 60)	63170	LB.
805	STEEL SHELL PILING (18" DIAMETER)	1980	LIN. FT.
SP & 807	STRUCTURAL STEEL IN PLATE GIRDER SPANS (M270-GR50W)	237230	LB.
808	ELASTOMERIC BEARINGS	7192	CU. IN.
809	SILICONE JOINT SEALANT	65	LIN. FT.
812	BRIDGE NAME PLATE (TYPE C)	1	EACH
816	FILTER BLANKET	923	SQ. YD.
816	DUMPED RIPRAP	482	CU. YD.

REVISIONS

DATE	REVISION	SHEET NO.
9-7-16	REVISED DESCRIPTION OF GEOSYNTHETIC INTERNAL REINFORCED EMBANKMENT CONSTRUCTION SP	

* DENOTES ALTERNATE BID ITEMS.



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
							JOB NO.	71
							BRI610	11
4 SURVEY CONTROL DETAILS								

SURVEY CONTROL COORDINATES

Project Name: sbr1610
 Date: 8/6/2012
 Coordinate System: ARKANSAS STATE PLANE - NORTH ZONE BASED ON GPS CONTROL,
 PROJECTED TO GROUND.
 Units: U.S. SURVEY FOOT

Point Name	Northing	Easting	Elev	Feature	Description
1	567332.2703	1672889.2654	365.751	CTL	*5/8" Rebar with 2" Aluminum Cap STAMPED PN: 1
2	567761.1128	1672939.4637	342.546	CTL	*5/8" Rebar with 2" Aluminum Cap STAMPED PN: 2
3	567751.5131	1673417.5374	334.573	CTL	*5/8" Rebar with 2" Aluminum Cap STAMPED PN: 3
4	567898.0769	1673520.7363	331.015	CTL	*5/8" Rebar with 2" Aluminum Cap STAMPED PN: 4
5	567733.9560	1673685.4742	323.572	CTL	*5/8" Rebar with 2" Aluminum Cap STAMPED PN: 5
6	567776.5398	1674639.7745	317.720	CTL	*5/8" Rebar with 2" Aluminum Cap STAMPED PN: 6
7	568237.7144	1672956.8769	341.675	CTL	*5/8" Rebar with 2" Aluminum Cap STAMPED PN: 7
8	568957.6521	1672896.0308	375.805	CTL	*5/8" Rebar with 2" Aluminum Cap STAMPED PN: 8
900	561823.3909	1675706.5563	302.040	BM	*NGS BM F 3 PID: FF 0727
901	565061.0647	1675830.8425	348.669	TBM	*X ON SANDSTONE ROCK SW CORNER OF CONC PAD
902	566682.5092	1674964.6190	320.405	TBM	*SQ CUT ON EAST END OF 18" RCP
903	567515.5925	1674946.8569	318.185	TBM	*SQ CUT IN SOUTH HEADWALL OF DW ON WEST SIDE OF CR 371
904	568016.4517	1673330.4897	336.336	TBM	*RR SPIKE IN POWERPOLE *20T NORTH SIDE OF RD
905	567768.7173	1673176.8415	334.123	TBM	*RR SPIKE IN CP N SIDE OF RD

POINT NO.	TYPE	CENTERLINE CONSTRUCTION		EASTING
		STATION	NORTHING	
8000	POB	100+00.00	567361.43	1671358.96
8001	PC	102+03.91	567532.31	1671470.23
8003	PT	104+76.54	567707.23	1671674.52
8004	POE	118+75.02	568280.81	1672949.96

POINT NO.	TYPE	SIDE STREET ON RT.		EASTING
		STATION	NORTHING	
8010	POB	102+20.26	567545.85	1671479.38
8011	POE	102+27.09	567551.42	1671483.34

*Note - Rebar and Cap - Standard - 5/8" Rebar with 2" Aluminum Cap stamped
 *(standard markings common to all caps), or as indicated
 (other markings indicated in the point description of the individual point).
 USE CAF = 1.0 FOR STAKEOUT FOR THIS PROJECT
 A PROJECT CAF OF 0.9999336732 HAS BEEN USED TO COMPUTE THE GROUND COORDINATES LISTED ABOVE.
 THIS CAF IS INTENDED FOR USE WITHIN THE PROJECT LIMITS.
 GRID DISTANCE = GROUND DISTANCE X CAF.
 GRID COORDINATES ARE STORED UNDER FILE NAME sBR1610gi.CTL
 HORIZONTAL DATUM: NAD 83 (1997)
 VERTICAL DATUM: NAVD 88 POSITIONAL ACCURACY THIRD ORDER, UNLESS SPECIFIED OTHERWISE
 AT A SPECIFIC POINT.

REFERENCE POINTS (1500 SERIES) ARE TO BE USED TO ESTABLISH CONTROL
 IF THE PRIMARY CONTROL POINTS LISTED ABOVE HAVE BEEN DESTROYED.
 REFERENCE POINTS ARE NOT TO BE USED FOR VERTICAL CONTROL

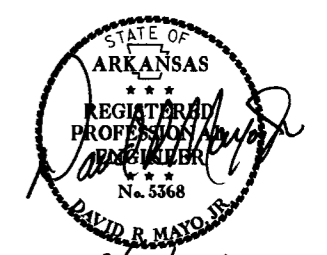
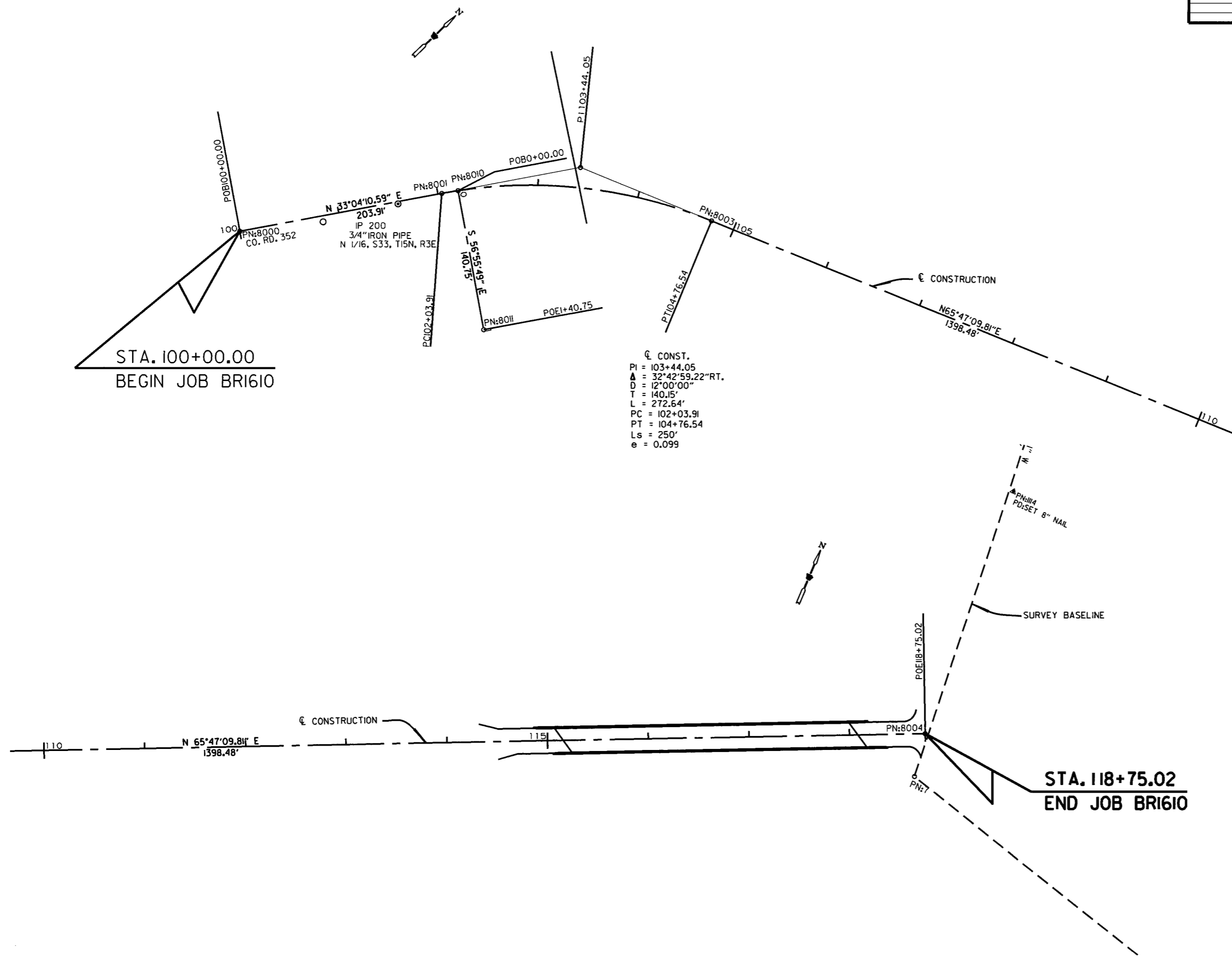
BASIS OF BEARING:
 ARKANSAS STATE PLANE GRID BEARINGS - 0301-NORTH ZONE
 DETERMINED FROM OPUS SOLUTION ON PTS 6 & 8
 CONVERGENCE ANGLE: 00-42-33 RIGHT AT LT: 35-53-12.9 LG: 090-46-52.9
 GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.

APPROX. MID POINT:
 LT: 35-53-14.3
 LG: 090-46-51.6



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
							JOB NO. BR1610	12 71

4 SURVEY CONTROL DETAILS

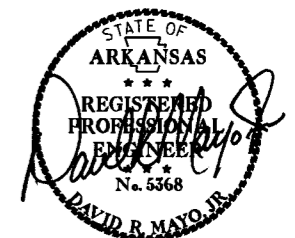
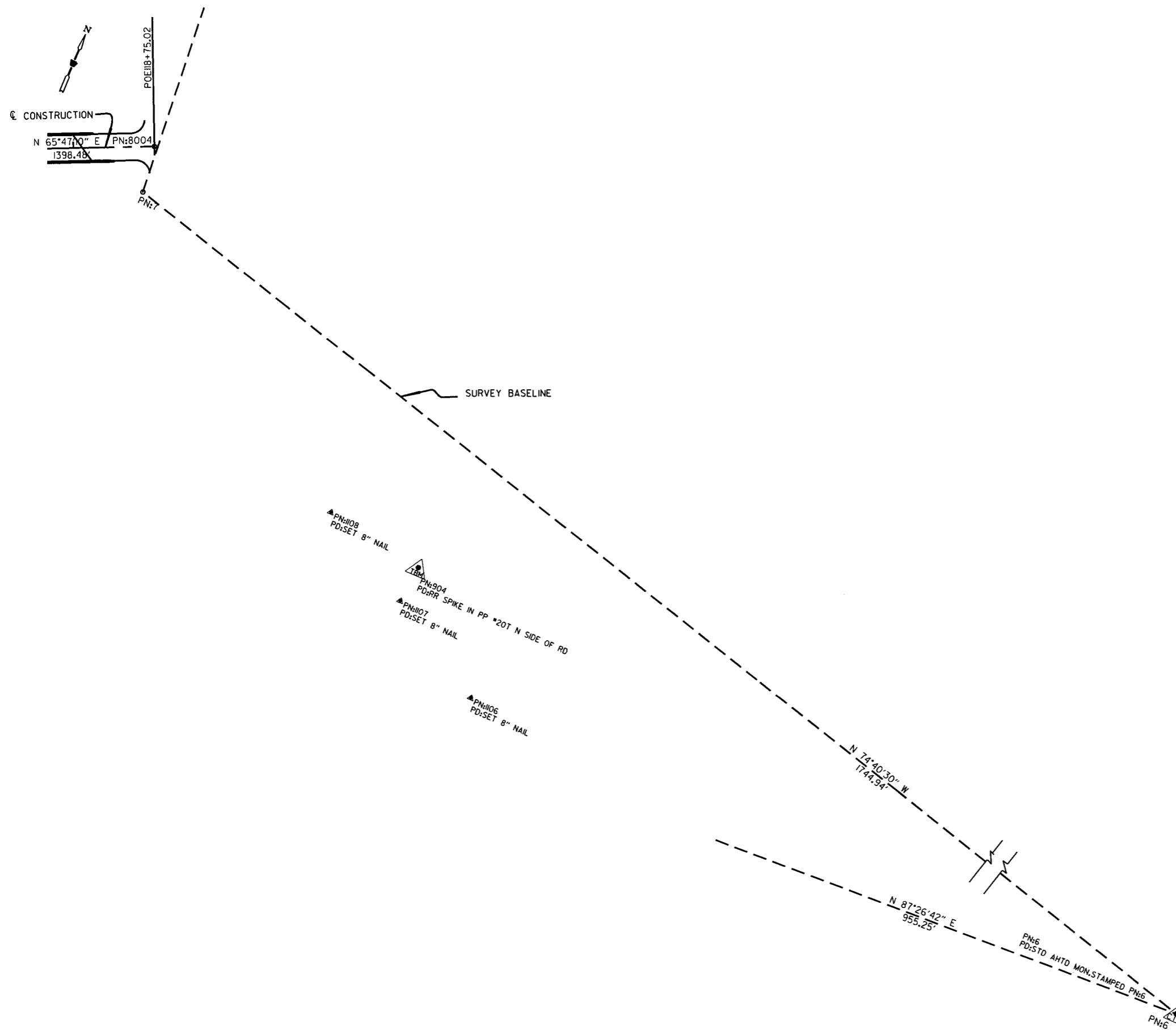


8/18/2016

SURVEY CONTROL DETAILS

DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		BR1610	13	71

4 SURVEY CONTROL DETAILS



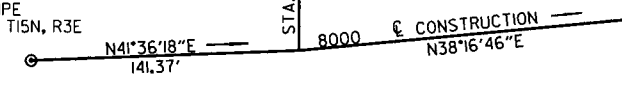
8/18/2016

SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO. BRIG10		SHEET NO. 14		TOTAL SHEETS 71

PLAN & PROFILE STA. 100+00-108+00

IP 201
3/4" IRON PIPE
N 1/16, S33, T15N, R3E



LAND TIE

REMOVAL AND DISPOSAL OF FENCE
STA. 100+62 TO STA. 101+60 ON LT. = 100 LIN. FT.

CHAIN LINK FENCE
STA. 100+65 TO STA. 101+60 ON LT. = 95 LIN. FT.

CONSTRUCT
@ STA. 103+36
24" X 176' PIPE CULVERT
15' RT. FWD. SKEW
D.A. 2 Ac., Q25 = 12 cfs
w/24" F.E.S. - LT. & RT.
24" R.C. PIPE (CL. III) (TY. 3 BEDDING) = 86 LIN. FT.
24" C.M. PIPE (TY. 2 BEDDING) = 90 LIN. FT.
SOLID SODDING - 24 SQ. YDS.
DUMPED RIPRAP (OUTLET) = 3 CU. YDS.
FILTER BLANKET (OUTLET) = 6 SQ. YDS.

STA. 106+25 INSTALL
24" X 36' PIPE CULVERT
LT. SIDE DRAIN
CONST. APPR. = 28 CU. YDS.

STA. 107+00
WI-2L & WI3-1 (40 MPH)
ON LT.

- LEGEND
- — POWER POLE
 - ◊ — COMBINATION POLE
 - ◇ — POLE W/GUY
 - ⊕ — TELEPHONE RISER
 - ◆ — TELEPHONE POLE
 - ⋈ — FIRE HYDRANT
 - ▲ — UNDERGROUND CABLE MKR.
 - — GAS METER
 - ⊙ — GAS VALVE
 - — WATER METER
 - ▣ — WATER VALVE
 - — WELL

STA. 100+00.00
BEGIN JOB BRIG10

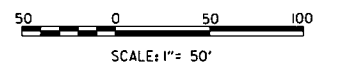
OBLITERATION OF EXISTING ROADWAY
STA. 101+30 TO STA. 102+03 = 102 CU. YDS.

STA. 102+20.26 INSTALL
24" X 48' PIPE CULVERT
RT. SIDE DRAIN
CONST. CO. RD. TURNOUT
366 CU. YDS. COMP. EMBK.
412 CU. YDS. UNCL. EXCAV.

STA. 100+00
WI-2R & WI3-1 (40 MPH)
ON RT.

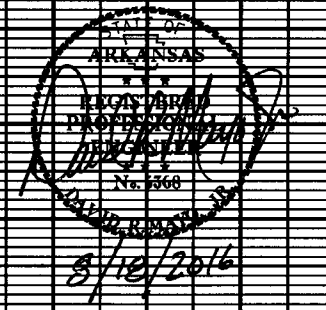
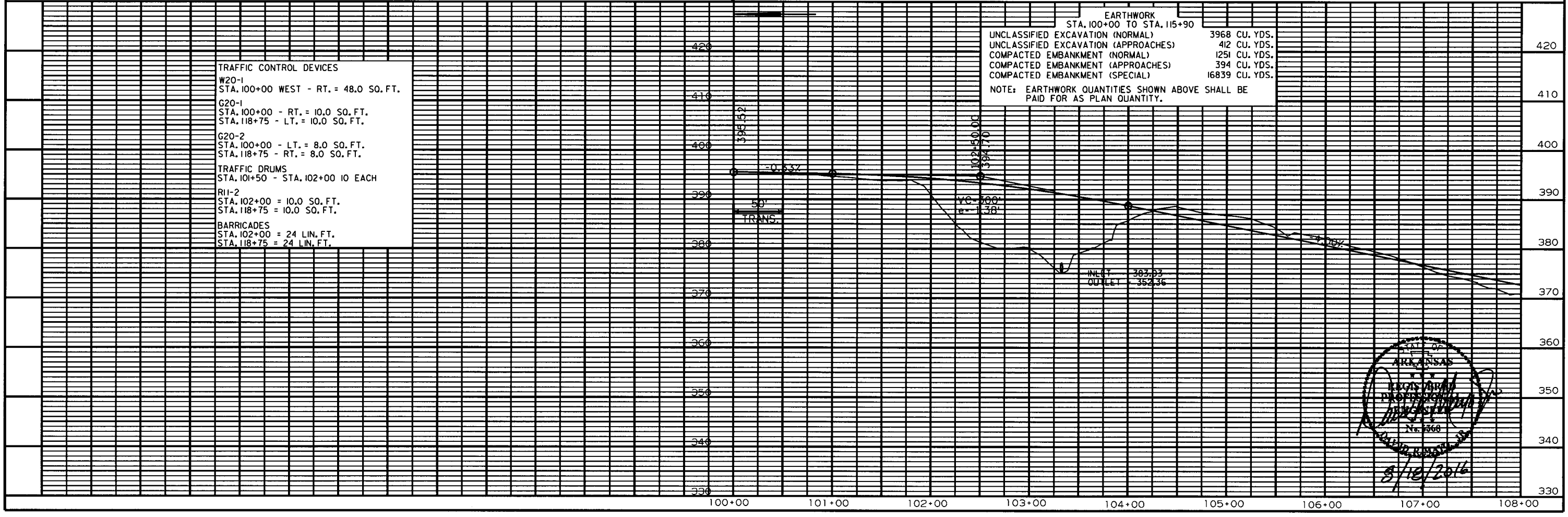
CONST.
PI = 103+44.05
Δ = 32°42'59.22" RT.
D = 12°00'00"
T = 140.15'
L = 272.64'
PC = 102+03.91
PT = 104+76.54
Ls = 250'
e = 0.099

BEGIN SUPER. STA. 100+16
MAX. SUPER. STA. 102+66
MAX. SUPER. STA. 104+14
END SUPER. STA. 106+64



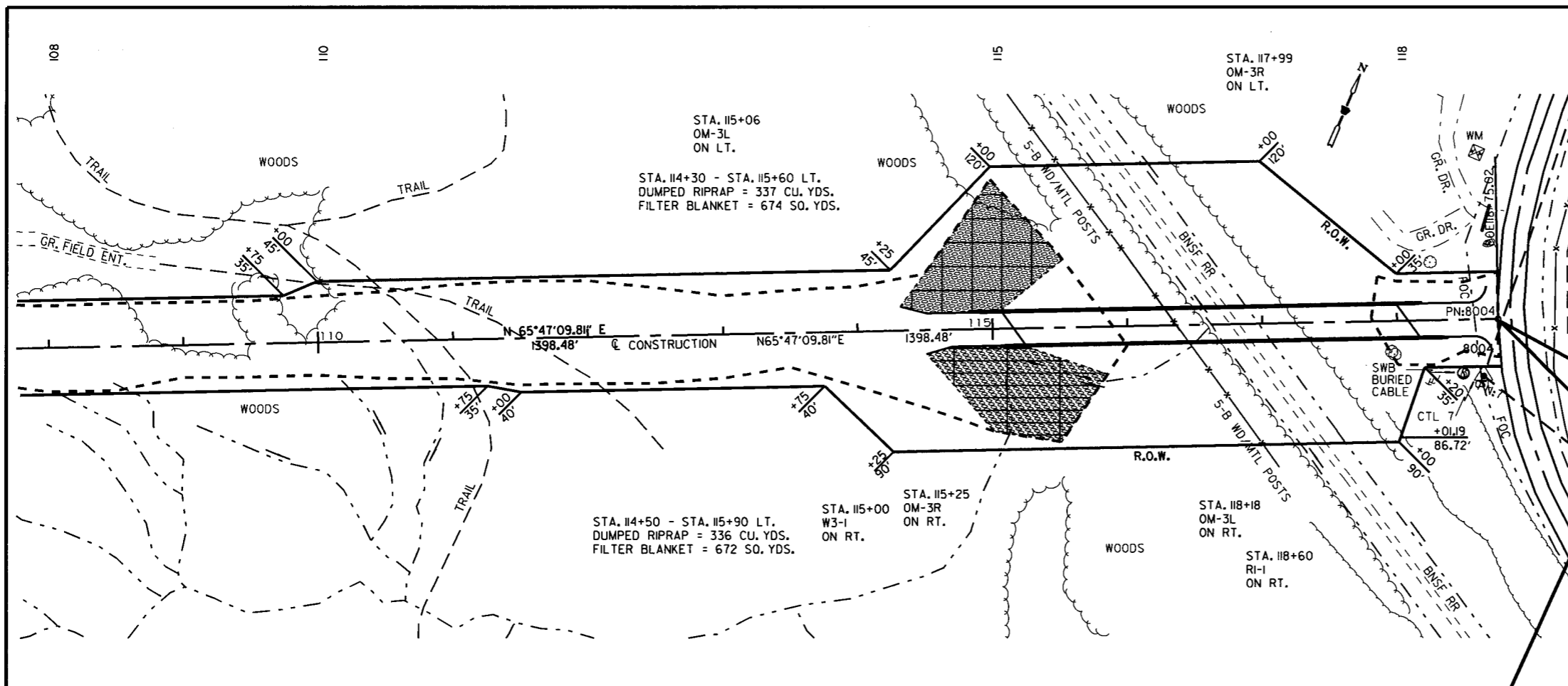
TRAFFIC CONTROL DEVICES
W20-1
STA. 100+00 WEST - RT. = 48.0 SQ. FT.
G20-1
STA. 100+00 - RT. = 10.0 SQ. FT.
STA. 118+75 - LT. = 10.0 SQ. FT.
G20-2
STA. 100+00 - LT. = 8.0 SQ. FT.
STA. 118+75 - RT. = 8.0 SQ. FT.
TRAFFIC DRUMS
STA. 101+50 - STA. 102+00 10 EACH
RII-2
STA. 102+00 = 10.0 SQ. FT.
STA. 118+75 = 10.0 SQ. FT.
BARRICADES
STA. 102+00 = 24 LIN. FT.
STA. 118+75 = 24 LIN. FT.

EARTHWORK
STA. 100+00 TO STA. 115+90
UNCLASSIFIED EXCAVATION (NORMAL) 3968 CU. YDS.
UNCLASSIFIED EXCAVATION (APPROACHES) 412 CU. YDS.
COMPACTED EMBANKMENT (NORMAL) 1251 CU. YDS.
COMPACTED EMBANKMENT (APPROACHES) 394 CU. YDS.
COMPACTED EMBANKMENT (SPECIAL) 16839 CU. YDS.
NOTE: EARTHWORK QUANTITIES SHOWN ABOVE SHALL BE PAID FOR AS PLAN QUANTITY.



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		BRI610	15	71

4 PLAN & PROFILE STA. 108+00-118+80.60

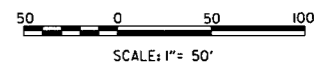


GUARDRAIL	(TYPE A)	THRIE BEAM TERM.
STA. 114+37 - STA. 114+87 LT. =	50 LIN. FT.	1 EACH
STA. 114+48 - STA. 114+98 RT. =	50 LIN. FT.	1 EACH
STA. 118+19 - STA. 118+69 LT. =	50 LIN. FT.	1 EACH
STA. 118+38 - STA. 118+71 RT. =	50 LIN. FT.	1 EACH
TERMINAL ANCHOR POSTS (TYPE II) =		4 EACH

APPROACH GUTTERS (TYPE SPECIAL)	CONC.	REINF. STEEL
STA. 114+78 - STA. 115+05 LT. =	2.6 CU. YDS.	222 LBS.
STA. 115+00 - STA. 115+27 RT. =	2.7 CU. YDS.	227 LBS.

APPROACH GUTTERS (TYPE A)	CONC.	REINF. STEEL
STA. 117+97 - STA. 118+27 LT. =	3.4 CU. YDS.	285 LBS.
STA. 118+19 - STA. 118+49 RT. =	3.4 CU. YDS.	285 LBS.

STA. 118+75.02
END JOB BRI610



EARTHWORK	
UNCLASSIFIED EXCAVATION (NORMAL)	27 CU. YDS.
COMPACTED EMBANKMENT (NORMAL)	182 CU. YDS.
COMPACTED EMBANKMENT (SPECIAL)	23 CU. YDS.

NOTE: EARTHWORK QUANTITIES SHOWN ABOVE SHALL BE PAID FOR AS PLAN QUANTITY.



8/18/2016

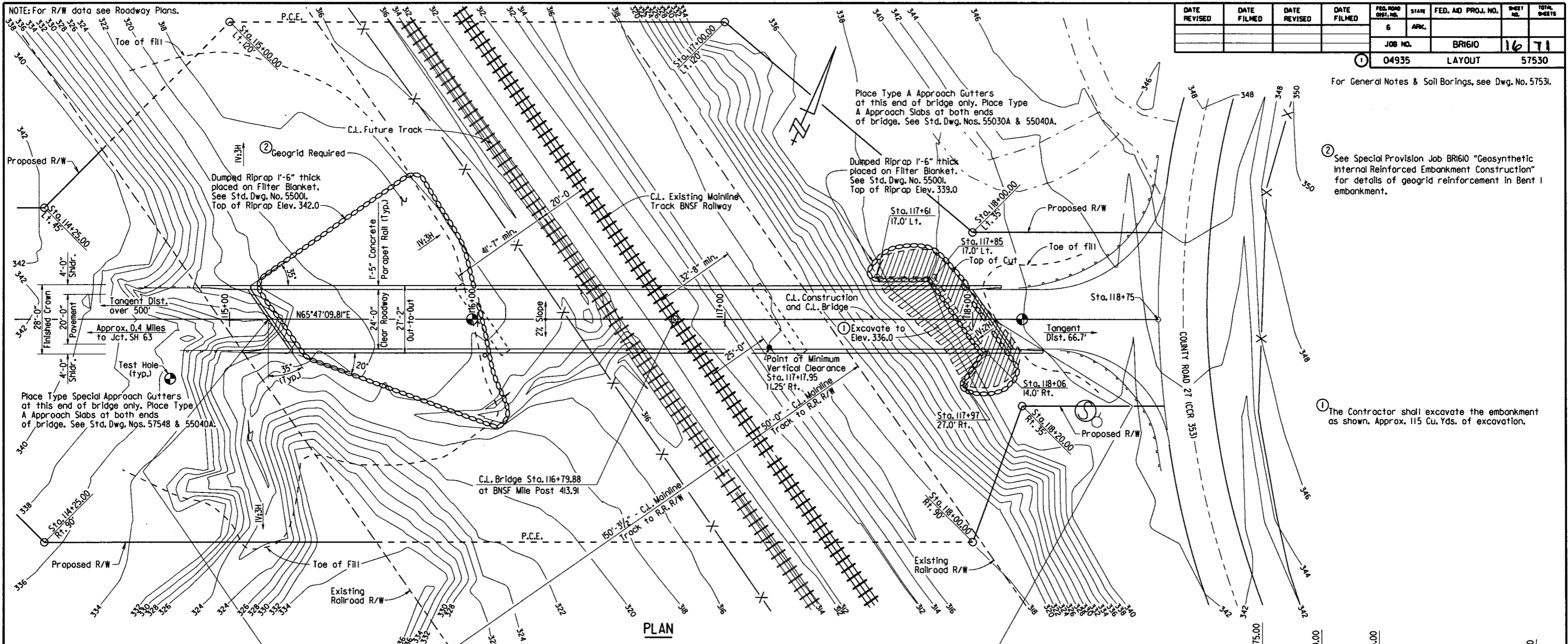
NOTE: For R/W data see Roadway Plans.

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	BR1610		1671	
				04935	LAYOUT		57530	

For General Notes & Soil Borings, see Dwg. No. 57531.

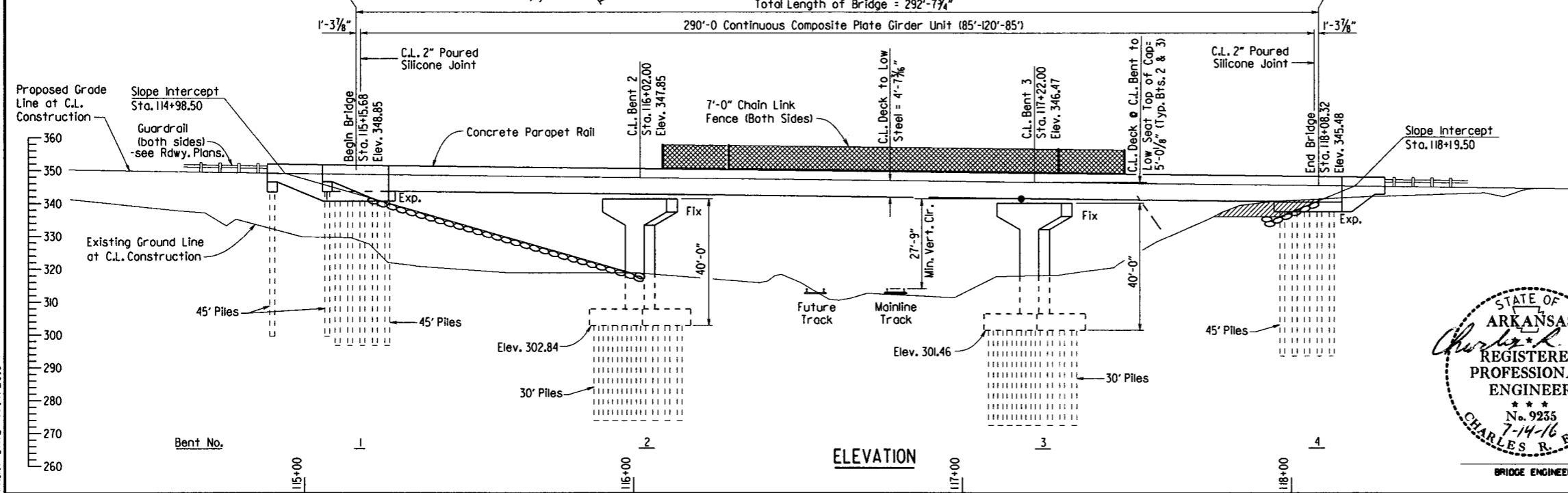
② See Special Provision Job BR1610 "Geosynthetic Internal Reinforced Embankment Construction" for details of geogrid reinforcement in Bent 1 embankment.

① The Contractor shall excavate the embankment as shown. Approx. 115 Cu. Yds. of excavation.

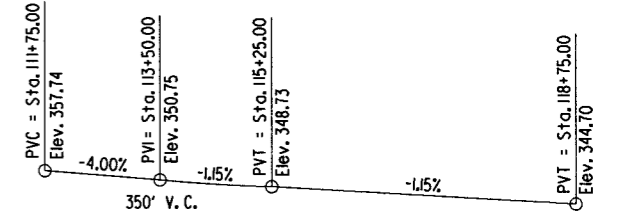


PLAN

Total Length of Bridge = 292'-7 3/4"



ELEVATION

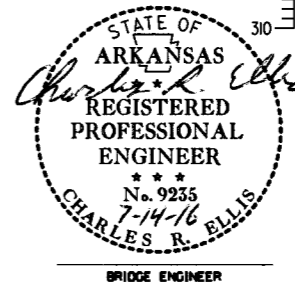


SHEET 1 OF 2
LAYOUT OF BRIDGE OVER BNSF RAILWAY
BURLINGTON NORTHERN SANTA FE
RAILWAY (BONO) (S)
CRAIGHEAD COUNTY

COUNTY ROAD NO. 27 (CCR352)
ARKANSAS STATE HIGHWAY COMMISSION

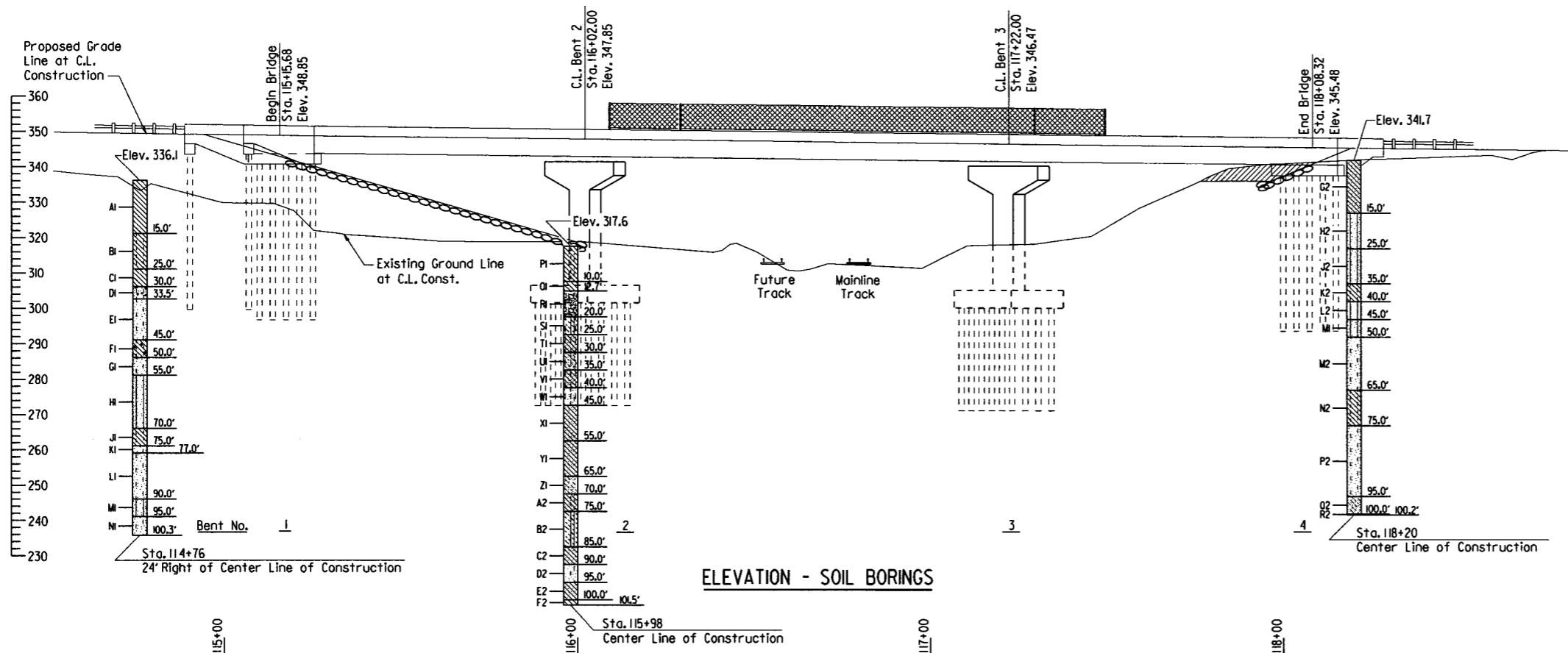
LITTLE ROCK, ARK.

DRAWN BY: MRE DATE: 8-12-15 FILENAME: bbr1610_ldgn
 CHECKED BY: JAC DATE: 10-12-15 SCALE: 1" = 20'-0"
 DESIGNED BY: LJB DATE: 6-13
 BRIDGE NO. 04935 DRAWING NO. 57530



PRINT DATE: 7/14/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		17	20
				JOB NO.	BR1610	LAYOUT	57531	



GENERAL NOTES:

General Notes

BENCH MARK: Vertical Control Data are shown on Survey Control Data Sheet.

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction, 2014 edition, with applicable Supplemental Specifications and Special Provisions. Unless otherwise noted in the plans Section and Subsection refer to the Standard Construction Specifications.

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications, Sixth Edition (2012), with 2013 interim revisions.

LIVE LOADING: HL-93

SEISMIC ZONE: 3

MATERIALS AND STRENGTHS:

Class S(AE) Concrete (superstructure)	f'c = 4,000 psi
Class S Concrete (substructure)	f'c = 3,500 psi
Reinforcing Steel (Grade 60 AASHTO M 31 or M 322, Type A)	fy = 60,000 psi
Structural Steel (AASHTO M 270, Gr. 50W)	Fy = 50,000 psi
Structural Steel (AASHTO M 270, Gr. 36)	Fy = 36,000 psi

BORING LOGS: Boring logs may be obtained from the Construction Contract Procurement Section of the Program Management Division.

PILING: All Piling shall be 18" diameter concrete filled steel shell and shall be driven to a minimum ultimate bearing capacity of 170 tons per pile at Bents 1 & 4 and 225 tons per pile at Bents 2 & 3. All piling shall be driven with an approved air, steam or diesel hammer. Piling in end bents shall be driven after embankment to bottom of cap is in place. Lengths of piling shown are assumed for estimating quantities only. Actual lengths are to be determined in the field. Test piles are not required, but may be driven for the Contractor's information in accordance with Subsection 805.08(g). There will be no additional payment for cut-off or build-up of the piles.

DRIVING SYSTEM: The driving system approval and the ultimate bearing capacity determination for piling shall be based on the requirements of Subsection 805.09(b), "Method B - Wave Equation Analysis (WEAP)". It is estimated that the minimum required rated energy of the hammer to obtain the minimum ultimate bearing capacity on 18" dia. piles will be 40,000 foot pounds per blow at Bents 1 & 4 and 50,000 foot pounds per blow at Bents 2 & 3.

PREBORING: Preboring or other methods approved by the Engineer may be needed to achieve the minimum pile penetration. Any cost associated with achieving the minimum pile penetration shall be incidental to "Steel Shell Piling".

BRIDGE DECK: The concrete bridge deck shall be given a tine finish as specified for final finishing in Subsection 802.19 for Class 5 Tined Bridge Roadway Surface Finish.

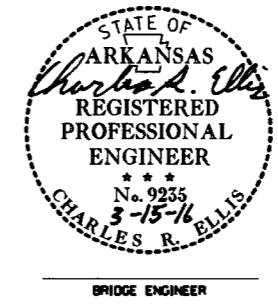
"N" VALUES

Sta. 114+76 - 24' Right of Center Line of Construction	Sta. 118+20 - Center Line of Construction
4.9- 5.9, N=11	4.5- 5.5, N=59
9.9- 10.9, N=9	10.0- 11.0, N=40
15.5- 16.5, N=8	15.5- 16.5, N=69
20.5- 21.5, N=5	20.5- 21.5, N=31
25.5- 26.5, N=10	25.5- 26.5, N=11
30.5- 31.5, N=97	30.5- 31.5, N=12
35.5- 36.5, N=28	35.5- 36.5, N=64
40.5- 41.5, N=36	40.5- 41.5, N=20
45.5- 46.5, N=30	45.5- 45.7, N=60(2')
50.5- 51.5, N=41	50.5- 50.7, N=36(2')
55.5- 56.4, N=80(11')	55.5- 56.2, N=100(8')
60.5- 61.5, N=58	60.5- 61.5, N=84
65.5- 65.7, N=60(2')	65.5- 66.5, N=59
70.5- 71.5, N=25	70.5- 71.5, N=76
75.0- 75.2, N=60(3')	75.5- 75.8, N=60(3')
80.0- 80.2, N=60(2')	80.0- 80.2, N=60(3')
85.5- 85.5, N=60(6')	85.0- 85.3, N=60(4')
90.5- 90.8, N=60(4')	90.0- 90.3, N=60(4')
95.0- 95.2, N=60(2')	95.5- 96.1, N=100(7')
100.0- 100.3, N=60(4')	100.0- 100.2, N=60(2')

Sta. 115+98 - Center Line of Construction
5.1- 6.1, N=10
10.1- 11.1, N=19
15.5- 16.5, N=21
20.5- 21.5, N=28
25.5- 26.4, N=100(11')
30.5- 31.5, N=81
35.5- 36.5, N=52
40.5- 41.5, N=72
45.5- 46.5, N=62
50.5- 51.5, N=39
55.5- 56.5, N=88
60.0- 60.0, N=10(0.01')
65.5- 65.5, N=60(5.5')
70.5- 71.5, N=60
75.5- 76.2, N=82(9')
80.5- 80.8, N=48(3')
85.5- 85.7, N=42(2')
90.5- 91.5, N=77
95.5- 96.5, N=35
100.5- 101.5, N=26

BORING LEGEND

- Al-Moist, Stiff, Reddish Brown Clay
- Bl-Moist, Medium Stiff, Reddish Brown to Brown Silty Clay with some Organic Matter
- Cl-Moist, Stiff, Brown Clay
- Dl-Wet, Very Dense, Brown Silty Sand with Gravel
- El-Alternating Layers of Wet, Medium Dense to Dense, Brown Silty Sand and Silt with Sand
- Fl-Moist, Very Stiff, Brown and Gray Clay with Silt Seams and Organic Matter
- Gl-Moist, Dense, Gray Silt with Sand
- Hl-Alternating Layers of Wet, Very Dense, Gray Sandy Silt and Silty Sand with Trace of Organic Matter
- Jl-Moist, Very Stiff, Gray and Brown Silty Clay
- Kl-Wet, Very Dense, Gray Silty Sand with some Gravel
- Ll-Alternating Layers of Wet, Very Dense, Gray Sand with Silt and Reddish Brown to Gray Silty Sand
- Ml-Moist, Very Dense, Gray Silt with Sand
- Nl-Wet, Very Dense, Brown and Gray to Gray Sand with Silt to Silty Sand
- Pl-Moist, Stiff, Brown Silty Clay
- Ol-Moist, Very Stiff, Reddish Brown to Brown Clay with some Gravel
- Rl-Wet, Medium Dense, Light Brown Sand, Gravel and Cobbles
- Sl-Wet, Medium Dense, Light Gray Sandy Silt
- Tl-Moist, Very Hard, Gray Clay with Sand
- Ul-Wet, Very Dense, Brown and Gray Silty, Clayey Sand
- Vi-Moist, Hard, Brown and Gray Sandy Clay
- Wi-Moist, Very Dense, Gray Sand with Silt
- Xl-Moist, Very Hard to Hard, Gray and Brown to Gray Clay with Sand Seams
- Yl-Moist, Very Hard, Gray Clay with Light Gray Sand
- Zl-Moist, Very Dense, Light Gray Sand with Clay
- A2-Moist, Hard, Light Gray Sandy, Silty Clay with Trace of Lignite
- B2-Alternating Layers of Moist, Very Dense, Light Gray Sandy Silt and Silty Sand
- C2-Moist, Very Hard, Light Gray Clay with Sand
- D2-Wet, Very Dense, Light Gray Silty Sand
- E2-Moist, Hard, Reddish Brown and Light Gray Sandy Clay
- F2-Moist, Very Stiff, Dark Gray Clay with Trace of Lignite
- G2-Dry, Hard, Brown Clay with Sand and some Organic Matter
- H2-Moist, Very Dense to Dense, Brown Sandy Silt
- J2-Moist, Medium Dense, Brown Sandy Silt to Silt
- K2-Moist, Very Hard, Brown Silty Clay with Trace of Gravel
- L2-Moist, Medium Dense, Gray Silt with Trace of Gravel
- M2-Moist, Very Dense, Gray Silty Sand to Silt
- N2-Moist, Hard to Very Hard, Brown and Gray Silty Clay with some Organic Matter
- P2-Moist, Very Dense, Gray Silty Sand
- O2-Wet, Very Dense, Gray Clayey Sand
- R2-Wet, Very Dense, Gray Silty Sand



SHEET 2 OF 2

LAYOUT OF BRIDGE OVER BNSF RAILWAY
BURLINGTON NORTHERN SANTA FE
RAILWAY (BONO) (S)
CRAIGHEAD COUNTY
COUNTY ROAD NO. 27 (CCR352)
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: MRE DATE: 8-12-15 FILENAME: bbr1610_2.dgn
CHECKED BY: JAC DATE: 3-19-16 SCALE: 1" = 20'-0"
DESIGNED BY: CJB DATE: 6-13
BRIDGE NO. 04935 DRAWING NO. 57531

PRINT DATE: 3/15/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		18	71
				JOB NO.	BRIGIO		1871	
				04935 - EXHIBIT A		57532		

Note: For Limits of Right of Way & Joint Use Area, see Sheet 2 of 2.

GENERAL NOTES:

All demolitions within the Railroad's right-of-way and/or demolitions that may impact the Railroad's tracks or operations shall comply with the Railroad's demolition requirements.

Erection over the Railroad's right-of-way shall be designed to cause no interruption to the Railroad's operation. Erection over the Railroad's track shall be developed such that it enables the track(s) to remain open to traffic per the Railroad's requirements.

The Contractor must submit a proposed method of erosion and sediment control and have the method approved by the Railroad prior to beginning any grading on the project site.

Railroad requirements do not allow work within 50 feet of track centerline when a train passes the work site and all personnel must clear the area within 25 feet of the track centerline and secure all equipment when trains are present.

The following statement is in the "Overpass Agreement": The County shall not plow ice, snow, or sleet over the sides of the Overpass Structure. In consideration of this practice, the Carrier waives its request for the State to construct a taller bridge rail or to attach splash boards to sides of the structure.

Shoring shall comply with the BNSF Railway requirements. Construction shall comply with the requirements of SP Job BRIGIO "Insurance, Construction, and Flagging requirements on Railroad Property (Burlington Northern Santa Fe Railway)." Railroad review and approval of Shoring, Erection, and False work is required. Allow a minimum of four weeks for the review and approval of each submittal.

Currently there are no known utilities on the railroad right-of-way other than shown.

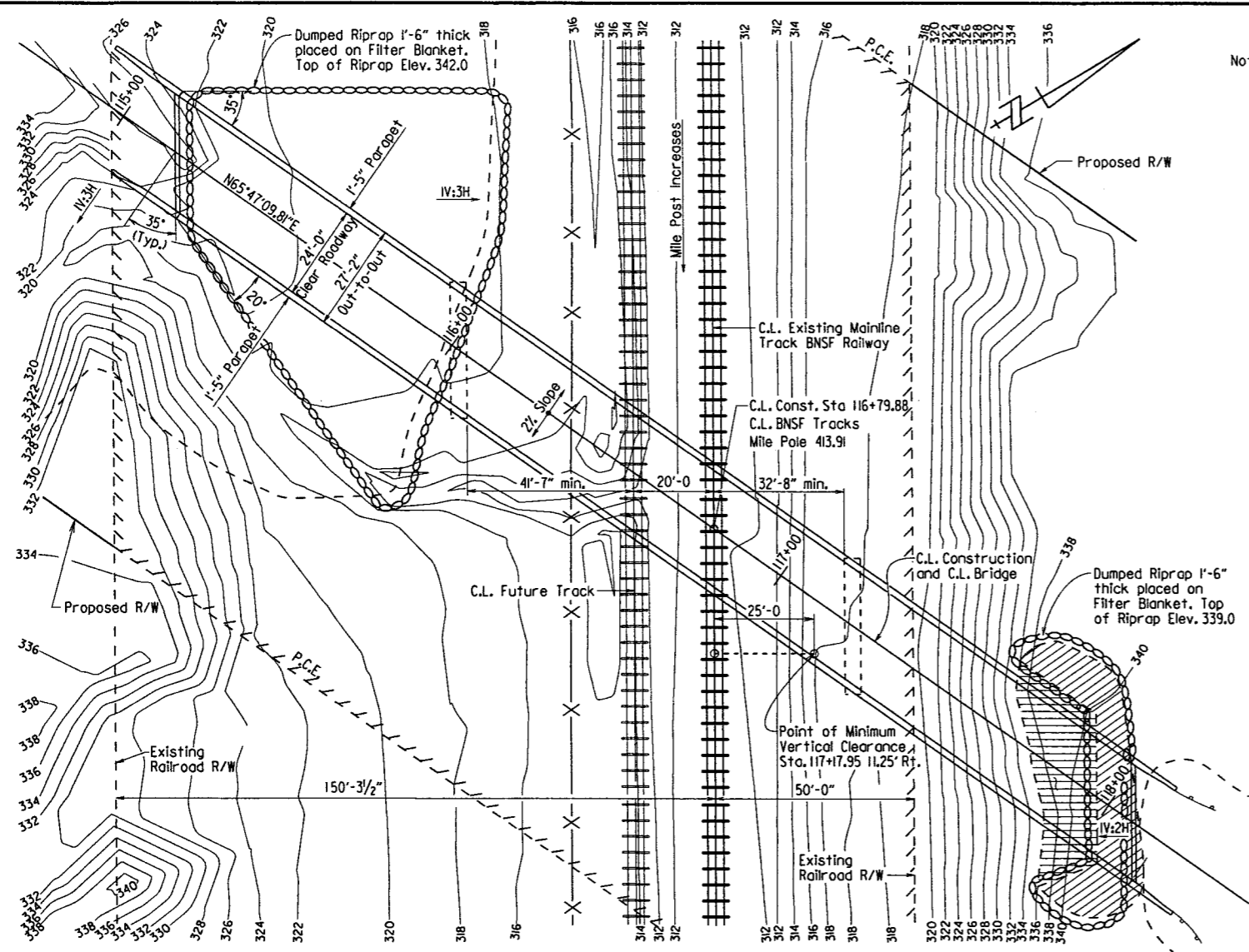
A Chain Link Fence is required on both sides of the Bridge. The Fence is to be mounted on top of the concrete parapet rail and shall extend over the vicinity of the Mainline and Future Tracks. For details of fence, see Dwg. No. 57547.

The proposed bridge construction will not adversely affect the quantity and/or characteristics of the flow within the Railroad right-of-way.

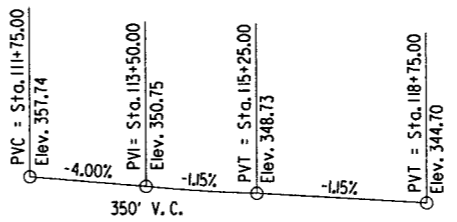
Closed Parapet Railing (No Deck Drains) over center span. Typical both sides of bridge.

All permanent clearances shall be verified before project closing.

For Railroad coordination refer to the Railroad Minimum Requirements of SP Job BRIGIO "Insurance, Construction, and Flagging Requirements on Railroad Property (BNSF)".

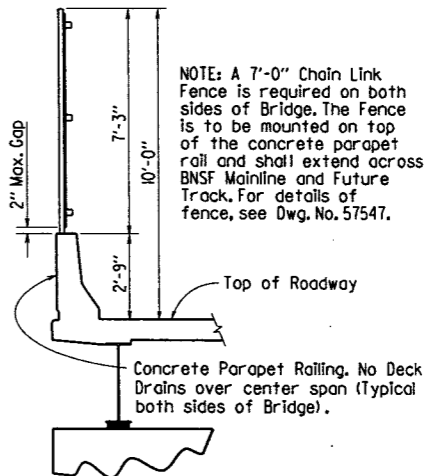


PLAN



VERTICAL CURVE DATA

Along C.L. Construction
NOTE: Stations and Elevations shown are along C.L. Construction and C.L. Bridge. Elevations are at Working Point.

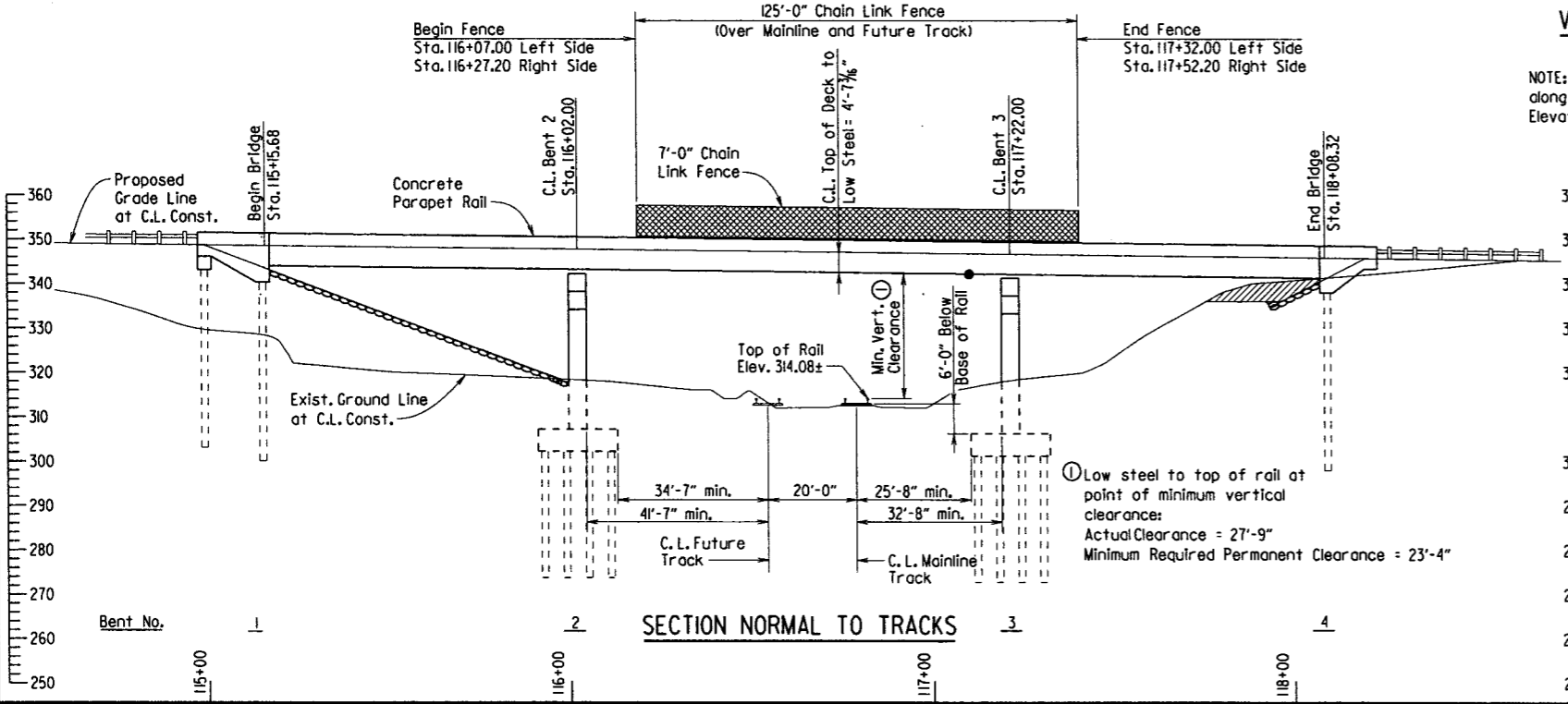


TYPICAL SECTION
No Scale

TOP OF RAIL ELEVATIONS
(Looking in direction of Milepost increase.)

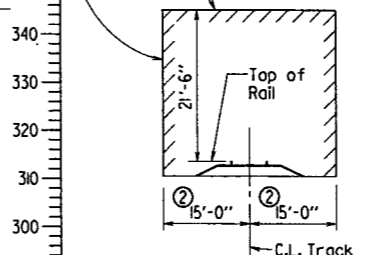
Main Line			
Align: Left Rail		Align: Right Rail	
RR Station	Elevation	RR Station	Elevation
0+00.00	307.68	0+00.00	307.68
2+00.00	308.77	2+00.00	308.76
4+00.00	309.80	4+00.00	309.81
6+00.00	310.69	6+00.00	310.71
8+00.00	311.64	8+00.00	311.64
10+00.00	312.71	10+00.00	312.70
12+00.00	313.69	12+00.00	313.69
12+45.39	313.91	12+41.86	313.87
12+59.15	313.96	12+55.66	313.92
12+72.90	314.02	12+69.39	313.98
12+88.43	314.08	12+88.45	314.06
13+00.00	314.13	13+00.00	314.12
14+00.00	314.57	14+00.00	314.56
16+00.00	315.34	16+00.00	315.34
18+00.00	316.13	18+00.00	316.15
20+00.00	317.06	20+00.00	317.07
22+00.00	318.00	22+00.00	317.94
24+00.00	319.28	24+00.00	319.10

C.L. Left Rail Sta. 12+59.15 = C.L. Const. Sta. 116+82.95
C.L. Right Rail Sta. 12+55.66 = C.L. Const. Sta. 116+76.82
The elevations of the existing top of rail profile shall be verified by the Contractor prior to beginning of construction.



SECTION NORMAL TO TRACKS

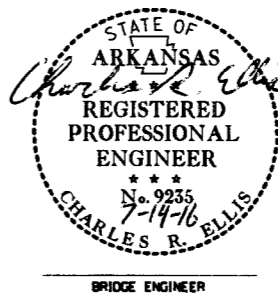
No construction activities or other obstructions may be placed within these limits.



MINIMUM CONSTRUCTION CLEARANCES

No Scale

② Measured Normal to Track



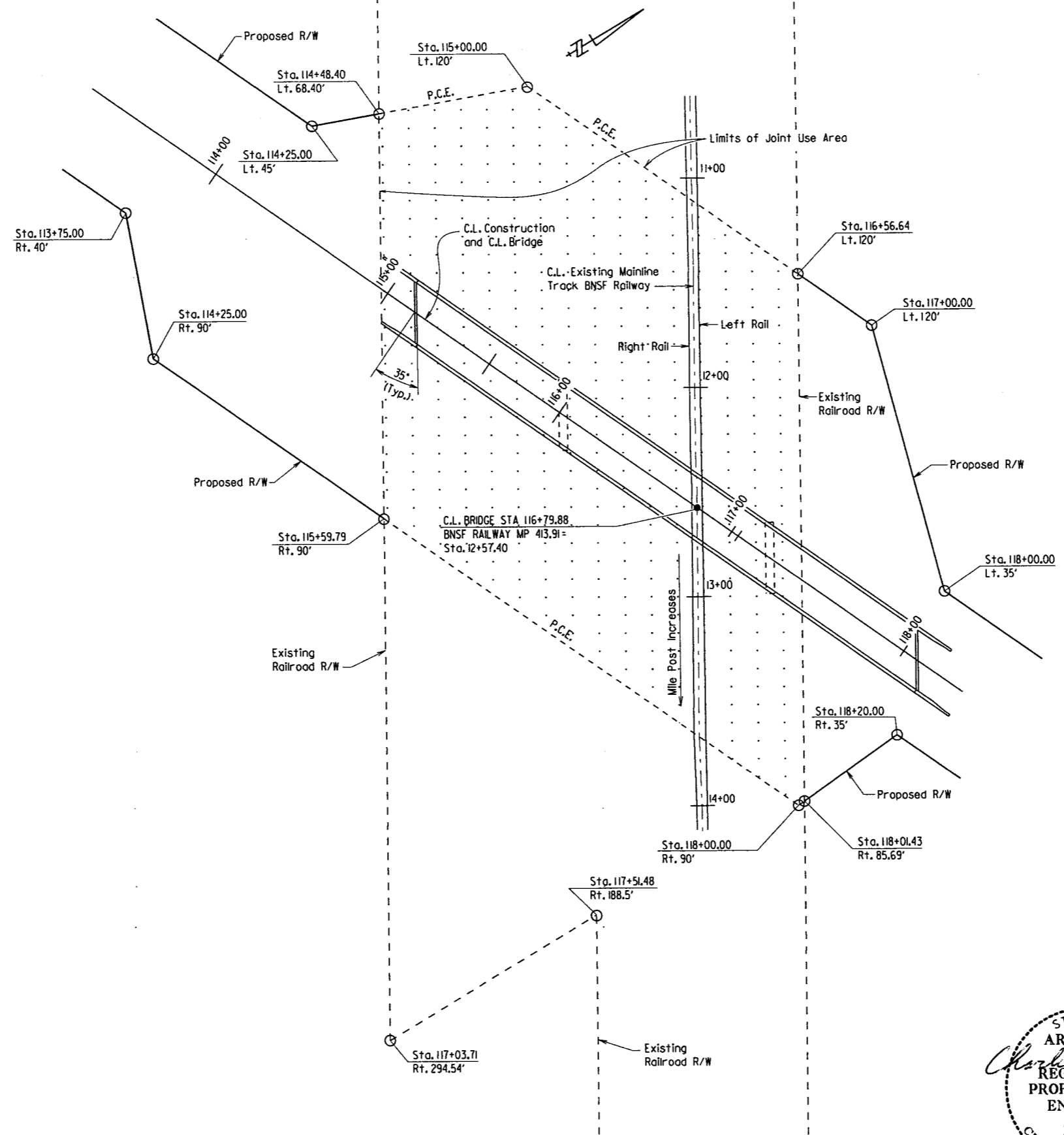
BRIDGE ENGINEER

SHEET 1 OF 2 - EXHIBIT A
BNSF RAILWAY
BURLINGTON NORTHERN SANTA FE RAILWAY (BONO) (S)
CRAIGHEAD COUNTY
COUNTY ROAD NO. 27 (CCR352)
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

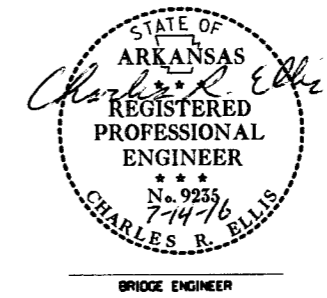
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CHECKED BY: JAC DATE: 10-12-15 SCALE: 1" = 20'-0"
DESIGNED BY: LJB DATE: 6-13 or As Shown
BRIDGE NO. 04935 DRAWING NO. 57532

PRINT DATE: 7/14/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	BRIGIO		19	71
				04935 - EXHIBIT A		57532A		



LIMITS OF RIGHT OF WAY & JOINT USE AREA



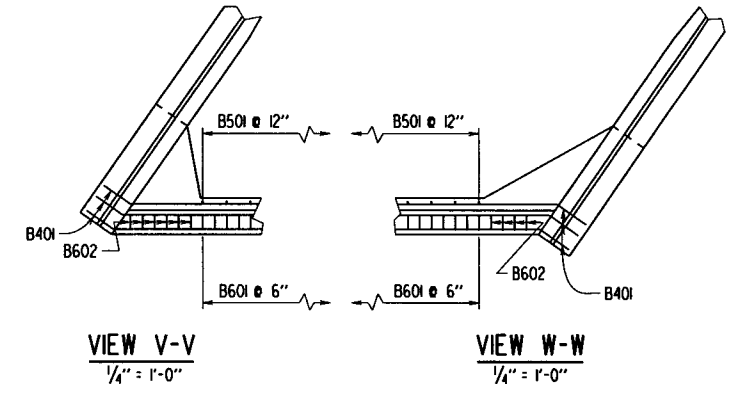
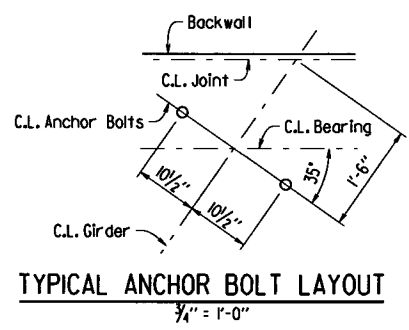
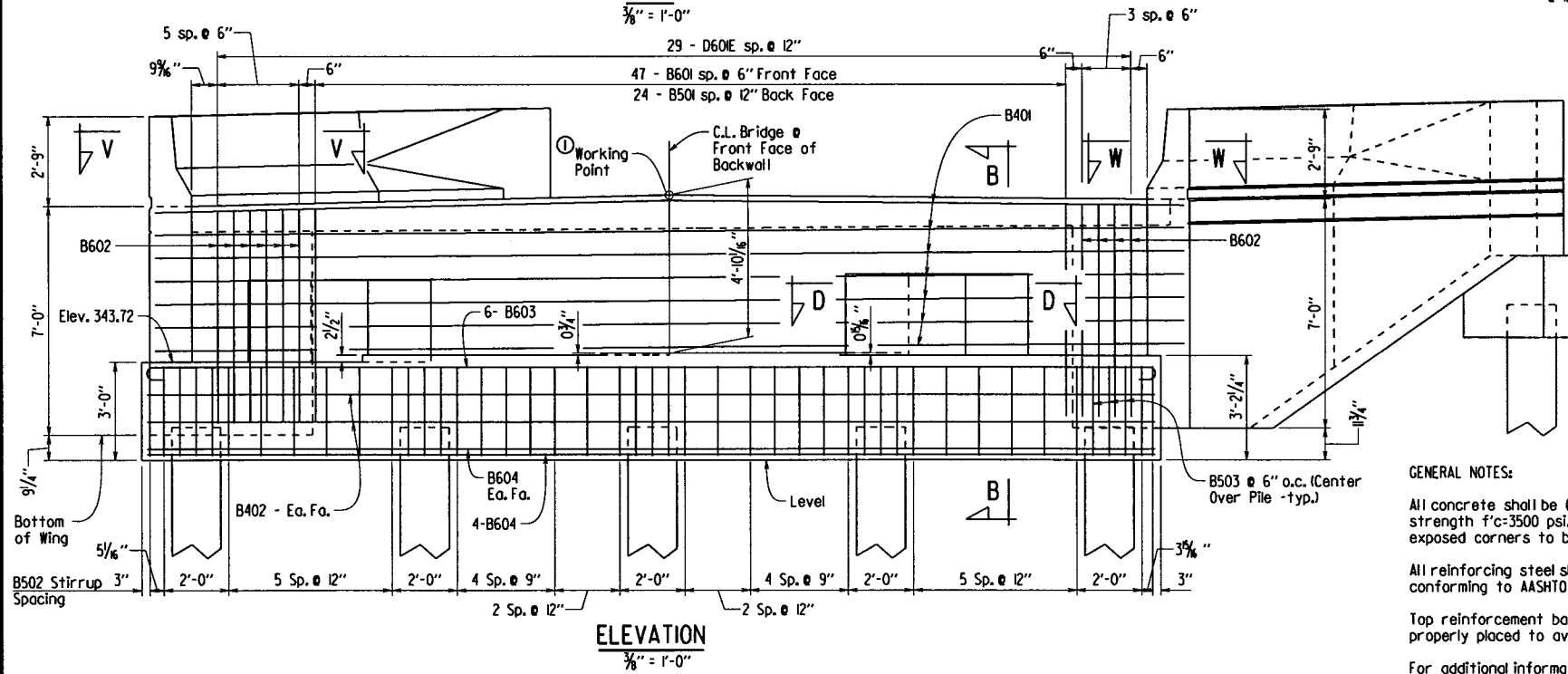
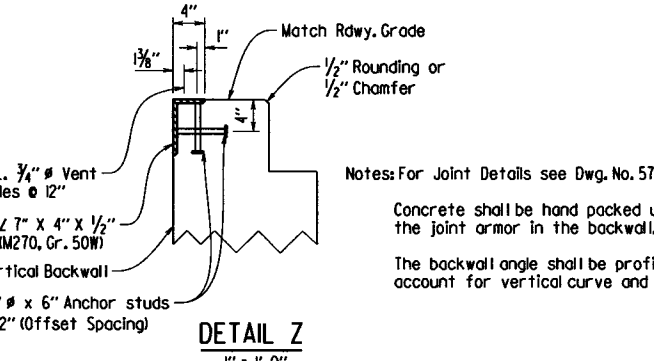
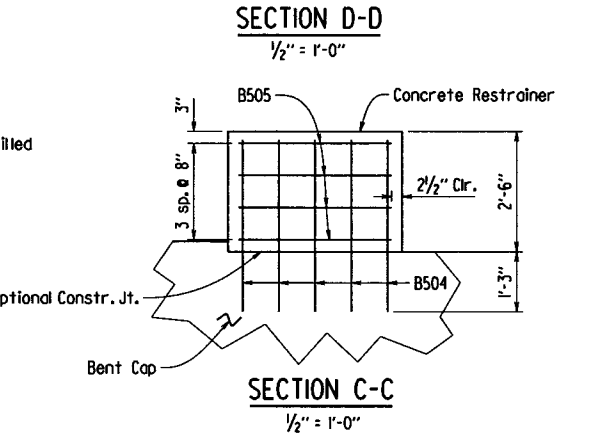
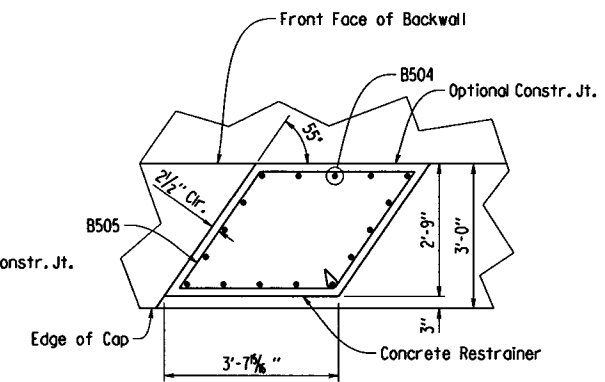
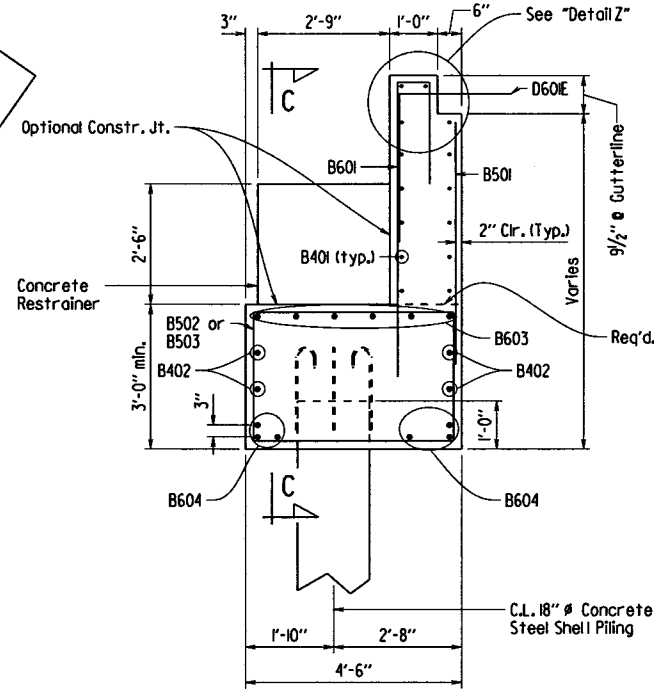
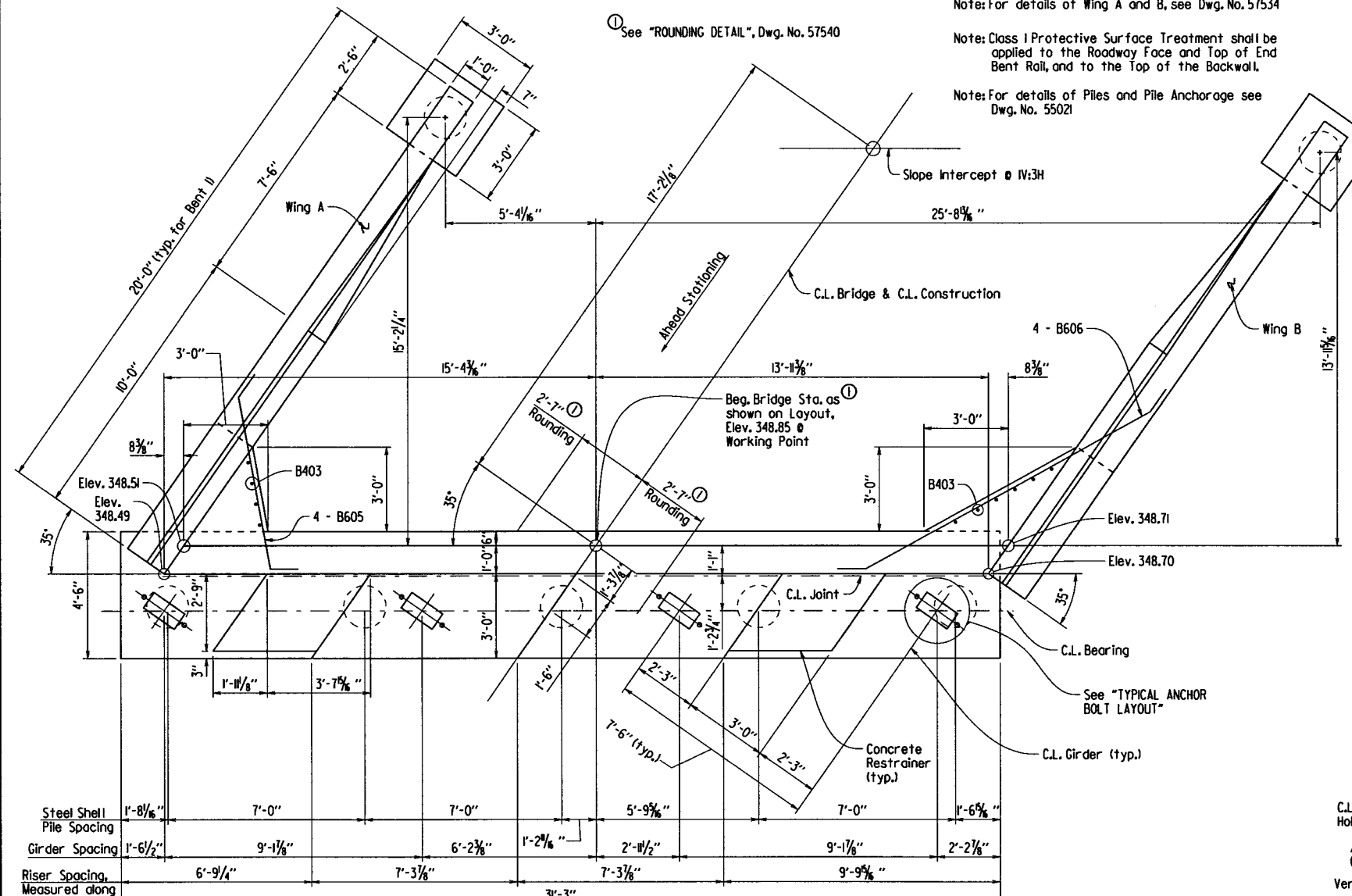
SHEET 2 OF 2 - EXHIBIT A
 BNSF RAILWAY
 BURLINGTON NORTHERN SANTA FE
 RAILWAY (BONO) (S)
 CRAIGHEAD COUNTY
 COUNTY ROAD NO. 27 (CCR352)
 ARKANSAS STATE HIGHWAY COMMISSION
 LITTLE ROCK, ARK.
 DRAWN BY: JAC DATE: 6-10-16 FILENAME: dbr160.Ldgn
 CHECKED BY: JMG DATE: 7/14/16 SCALE: 1" = 30'-0"
 DESIGNED BY: JAC DATE: 6-13
 BRIDGE NO. 04935 DRAWING NO. 57532A

PRINT DATE: 7/14/2016

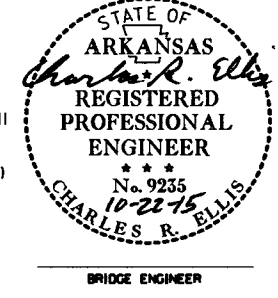
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO.	BR1610	2071

04935 - BENT 1 - 57533

Note: For details of Wing A and B, see Dwg. No. 57534
 Note: Class I Protective Surface Treatment shall be applied to the Roadway Face and Top of End Bent Rail, and to the Top of the Backwall.
 Note: For details of Piles and Pile Anchorage see Dwg. No. 55021



GENERAL NOTES:
 All concrete shall be Class "S" with a minimum 28-Day compressive strength $f'_c=3500$ psi. Concrete shall be poured in the dry and all exposed corners to be chamfered 3/4" unless otherwise noted.
 All reinforcement steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M31 or M322, Type A, with mill test reports.
 Top reinforcement bars and pile anchorage in cap shall be properly placed to avoid interference with anchor bolts.
 For additional information, See Layout.

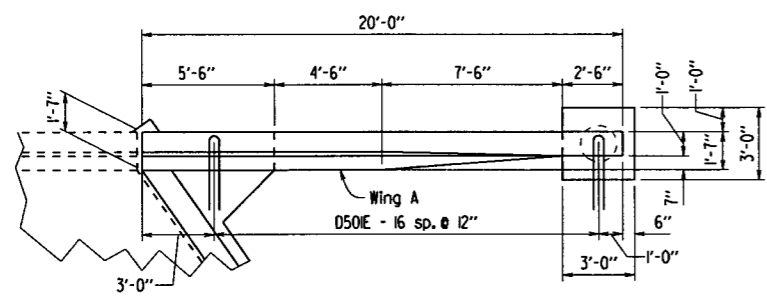


SHEET 1 OF 2
 DETAILS OF BENT NO. 1
 ROUTE SEC.
 ARKANSAS STATE HIGHWAY COMMISSION
 LITTLE ROCK, ARK.
 DRAWN BY: PGT DATE: 8/15 FILENAME: bbr1610.dldgn
 CHECKED BY: LJB DATE: 9/15 SCALE: AS SHOWN
 DESIGNED BY: LJB DATE: 10/14
 BRIDGE NO. 04935 DRAWING NO. 57533

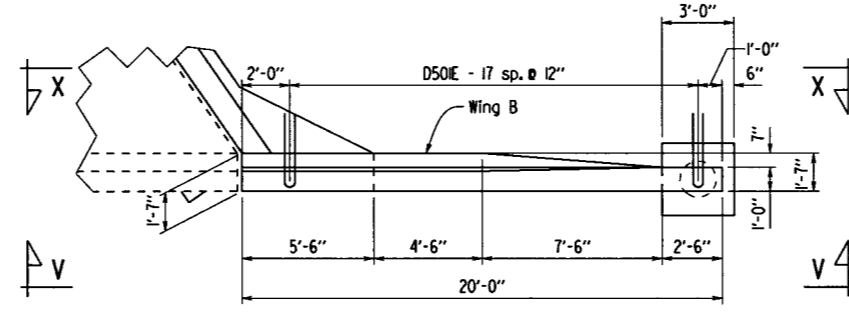
PRINT DATE: 10/20/2015

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO.	BR1610	2171

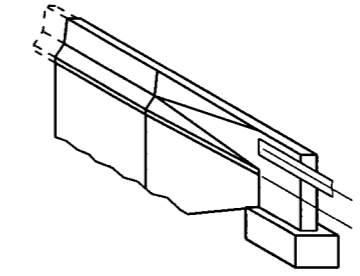
04935 - BENT 1 - 57534



PLAN OF RAIL (WING A)
1/4" = 1'-0"



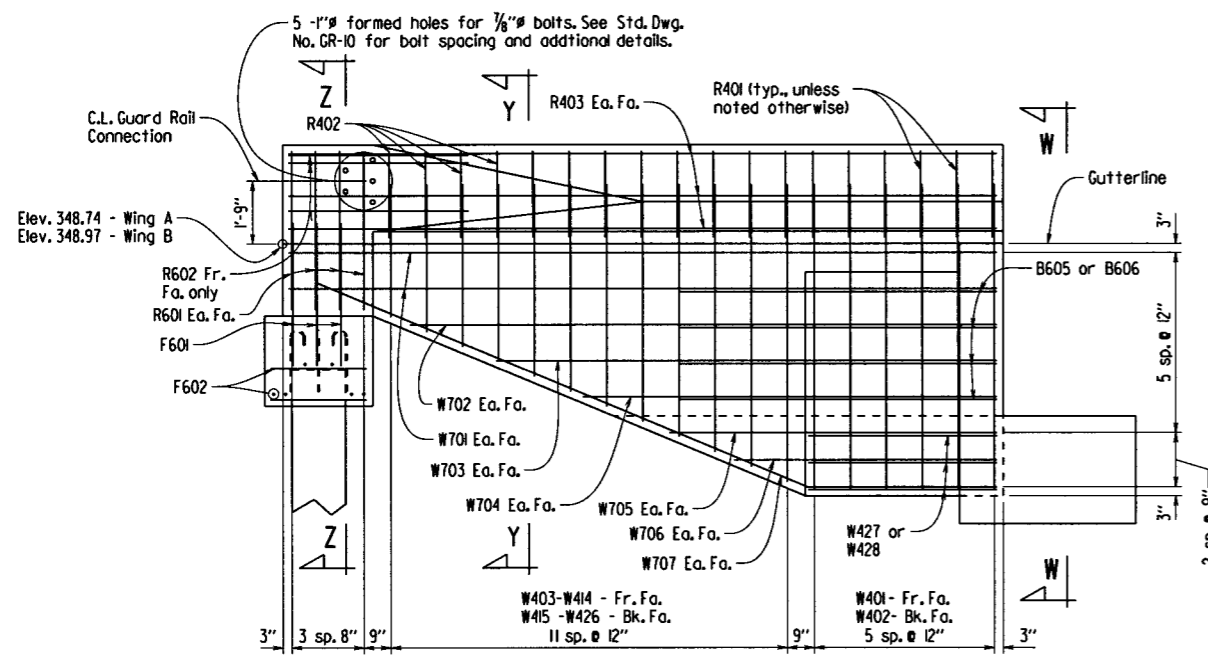
PLAN OF RAIL (WING B)
1/4" = 1'-0"



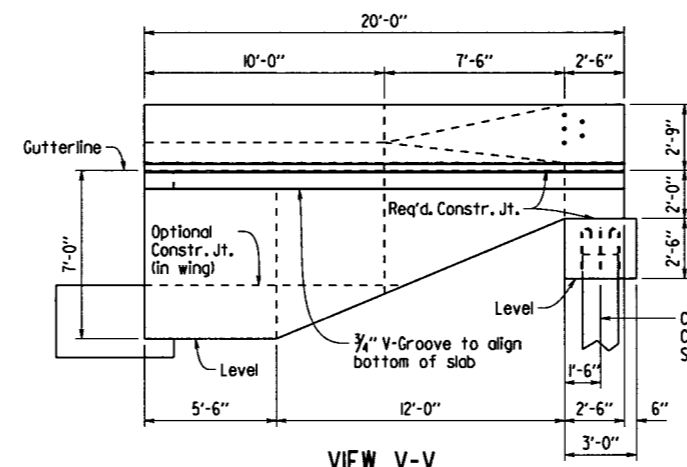
THREE DIMENSIONAL VIEW OF RAIL
No Scale

BAR LIST

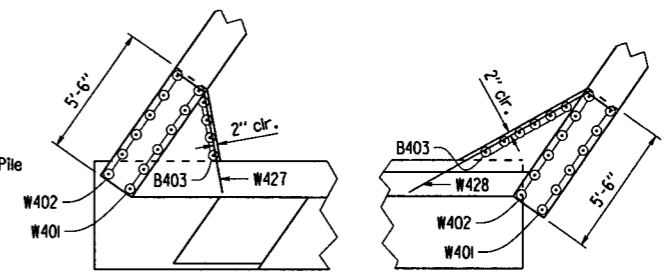
MARK	NO.	REQ'D.	LENGTH	P.D.
B401	14	32'-1/2"	2"	
B402	4	30'-11"	Str.	
B403	10	5'-11"	Str.	
B501	24	6'-5"	Str.	
B502	30	14'-2"	2 1/2"	
B503	15	9'-3"	2 1/2"	
B504	32	3'-7"	Str.	
B505	8	12'-10"	3 3/4"	
B601	47	8'-11"	4 1/2"	
B602	10	12'-10"	4 1/2"	
B603	6	32'-3"	4 1/2"	
B604	6	30'-11"	Str.	
B605	4	8'-2"	4 1/2"	
B606	4	13'-6"	4 1/2"	
D501E	35	6'-4"	3 3/4"	
D601E	29	6'-0"	4 1/2"	
F601	12	4'-11"	4 1/2"	
F602	24	2'-7"	Str.	
R401	28	3'-11"	2"	
R402	8	4'-0"	2"	
R403	12	19'-8"	Str.	
R601	16	4'-7"	Str.	
R602	6	5'-6"	Str.	
W401	12	8'-3"	2"	
W402	12	9'-5"	Str.	
W403-W414	2 ea.	8'-0" to 3'-5"	2"	
W415-W426	2 ea.	9'-2" to 4'-7"	Str.	
W427	3	5'-7"	2"	
W428	3	9'-10"	2"	
W701	8	19'-8"	Str.	
W702-W705	4 ea.	16'-3" to 9'-1"	Str.	
W706	4	7'-3"	Str.	
W707	4	20'-0"	5 1/4"	



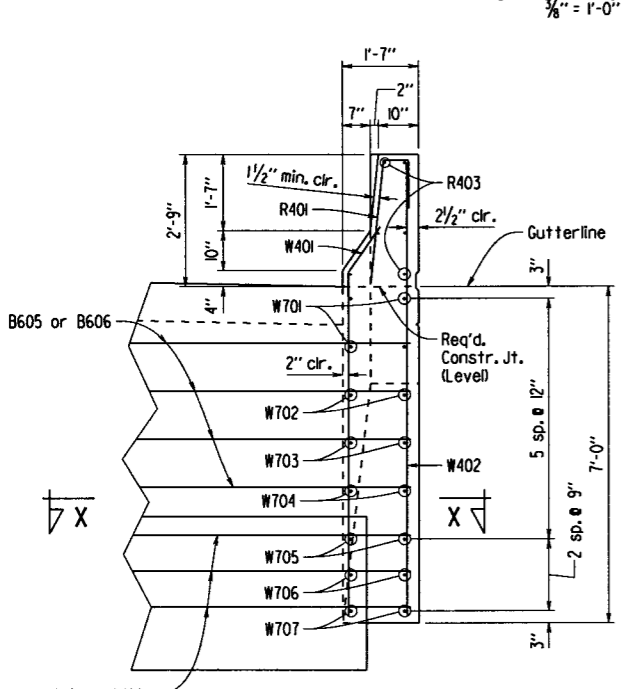
VIEW X-X
(Wing B Shown, Wing A Similar)
3/8" = 1'-0"



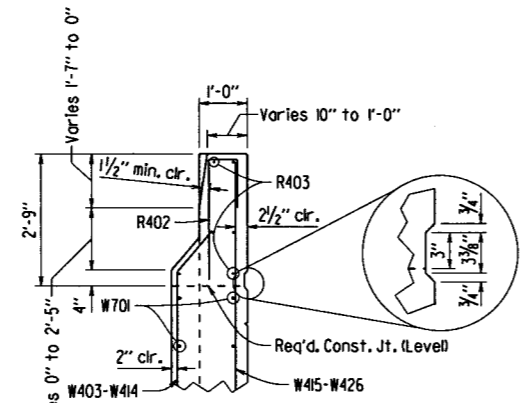
VIEW V-V
(Wing B Shown, Wing A Similar)
1/4" = 1'-0"



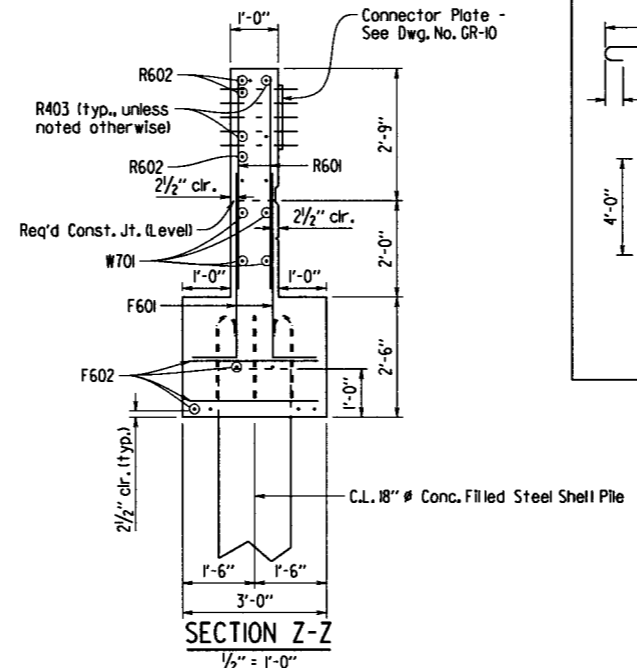
SECTION T-T
1/4" = 1'-0"



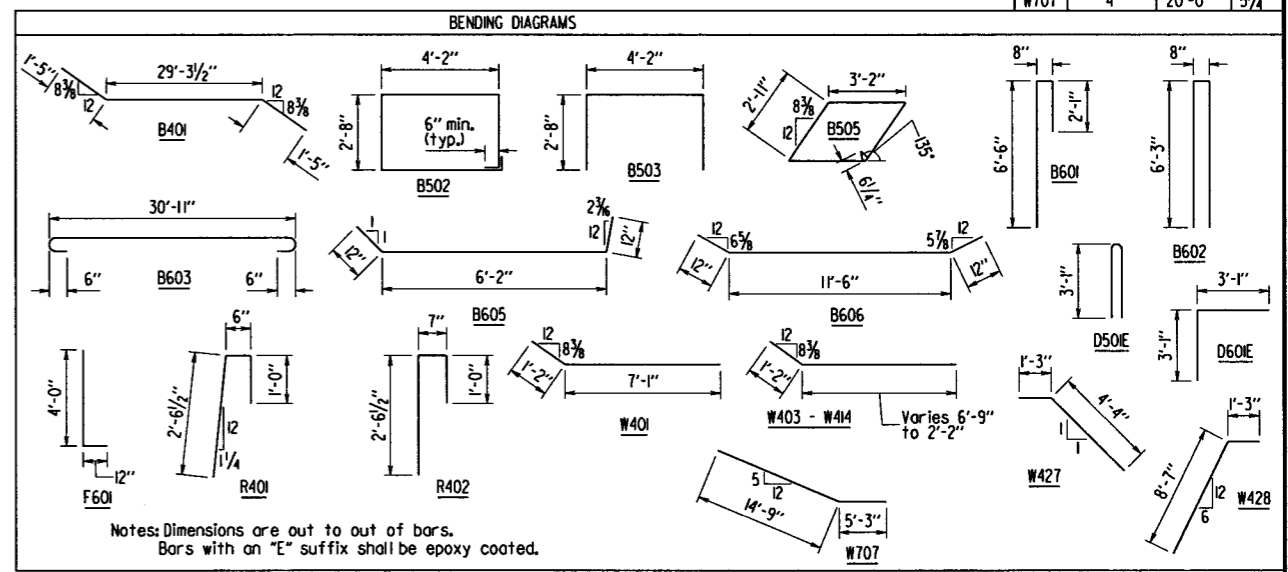
VIEW W-W
1/2" = 1'-0"



SECTION Y-Y
1/2" = 1'-0"



SECTION Z-Z
1/2" = 1'-0"



Notes: Dimensions are out to out of bars.
Bars with an "E" suffix shall be epoxy coated.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
10-22-15
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 2 OF 2
DETAILS OF BENT NO. 1

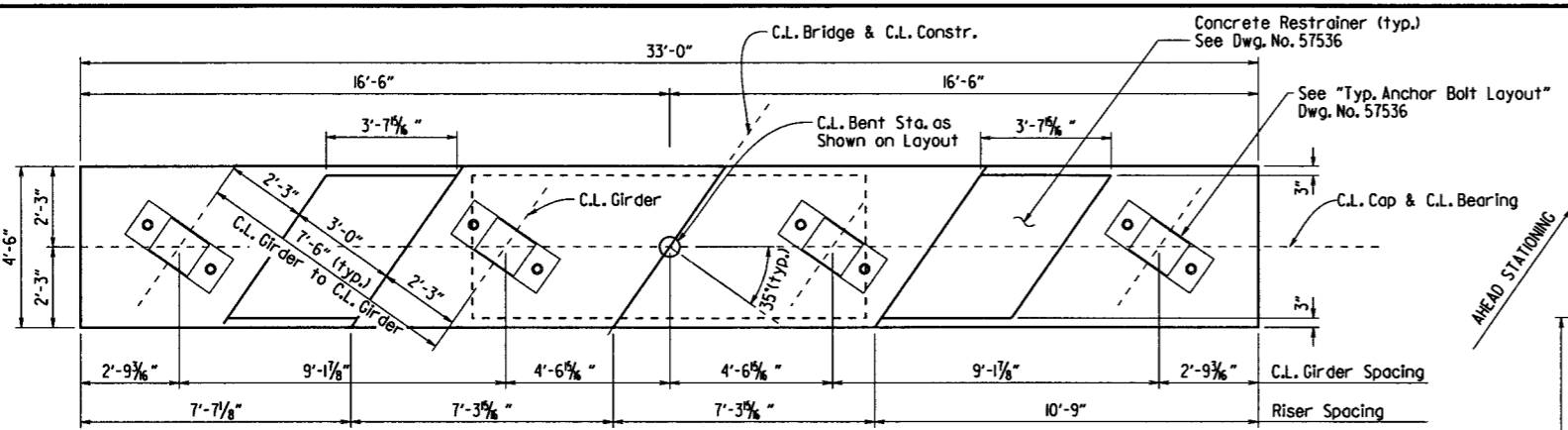
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: PGT DATE: 8/15 FILENAME: bbr1610.dwg
CHECKED BY: YB DATE: 9/15 SCALE: AS SHOWN
DESIGNED BY: LWB DATE: 10/14
BRIDGE NO. 04935 DRAWING NO. 57534

PRINT DATE: 10/15/2015

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	BRIGIO	22	71	

04935 - INT. BENTS - 57535



PLAN
3/8"=1'-0"

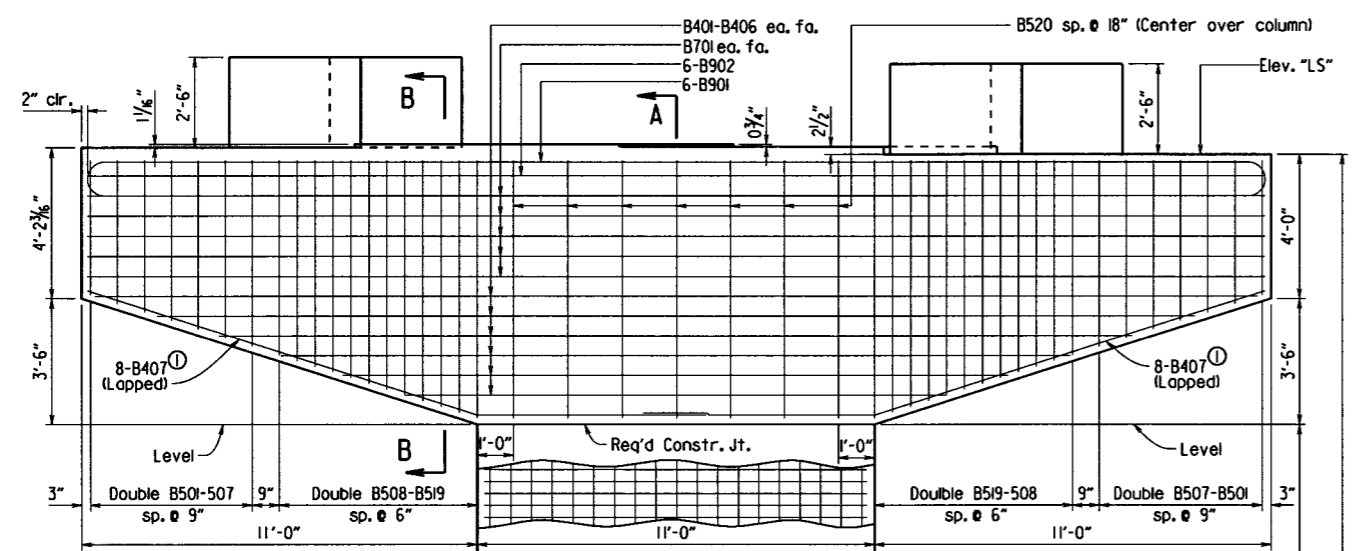
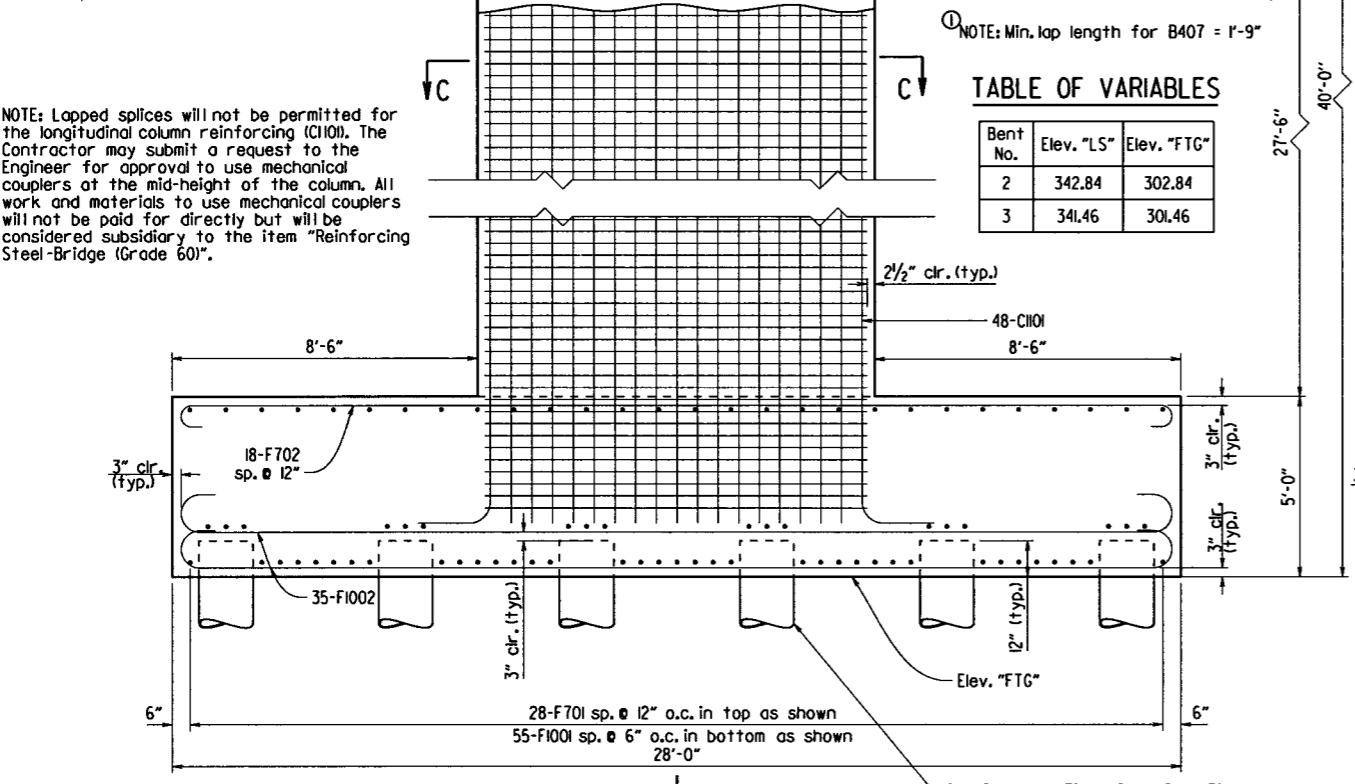


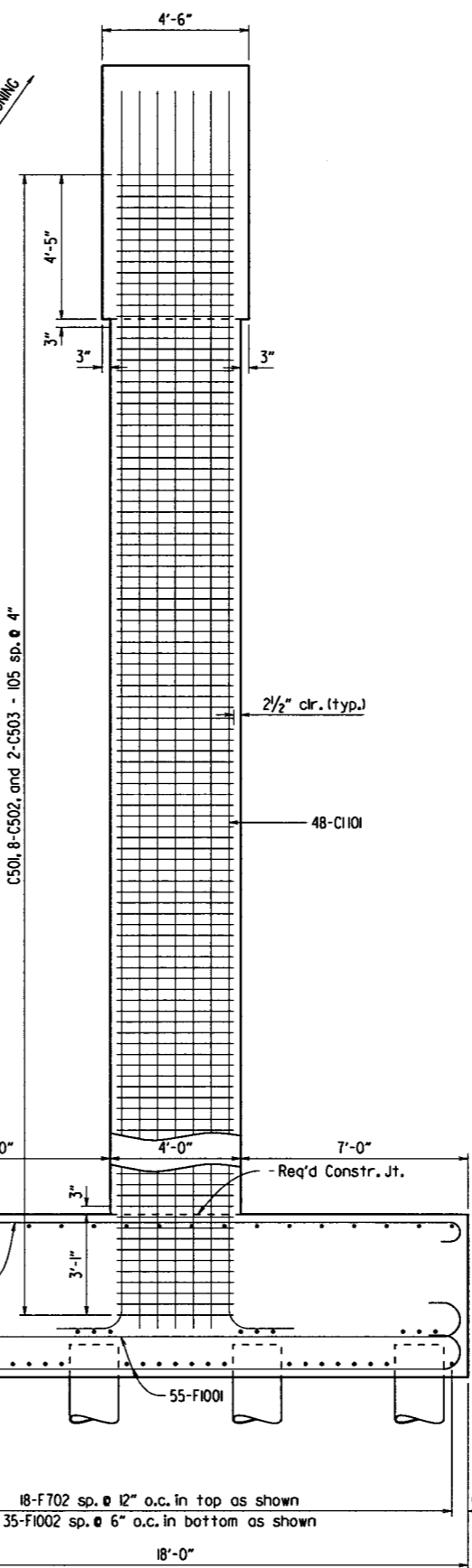
TABLE OF VARIABLES

Bent No.	Elev. "LS"	Elev. "FTG"
2	342.84	302.84
3	341.46	301.46

NOTE: Lapped splices will not be permitted for the longitudinal column reinforcing (C101). The Contractor may submit a request to the Engineer for approval to use mechanical couplers at the mid-height of the column. All work and materials to use mechanical couplers will not be paid for directly but will be considered subsidiary to the item "Reinforcing Steel-Bridge (Grade 60)".



ELEVATION
Looking Ahead (3/8"=1'-0")

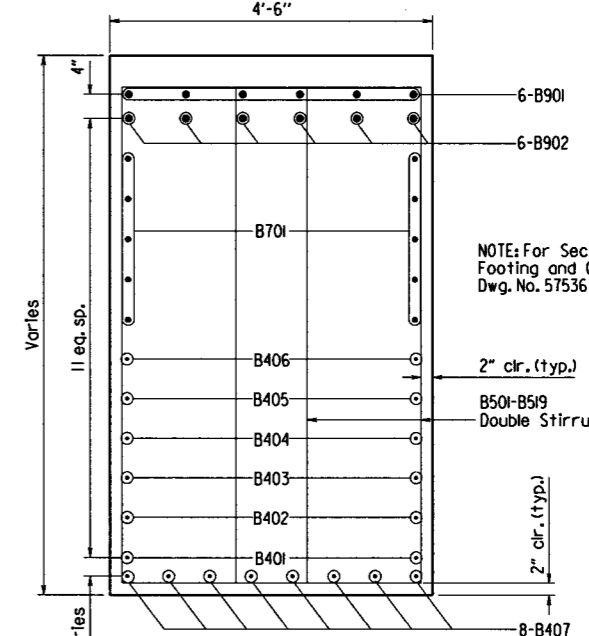
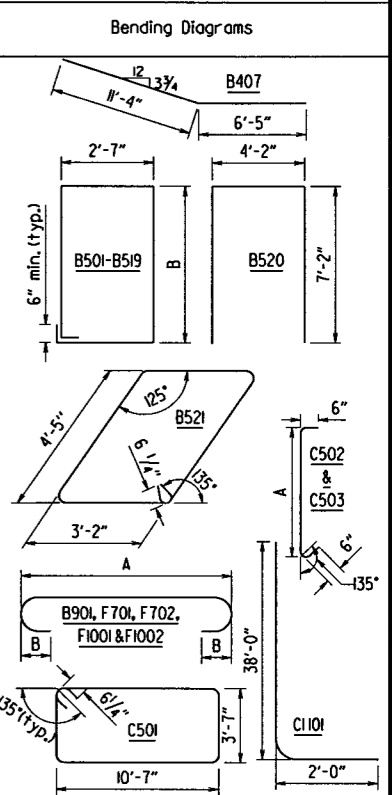


SECTION A-A
3/8"=1'-0"

BAR LIST - PER BENT

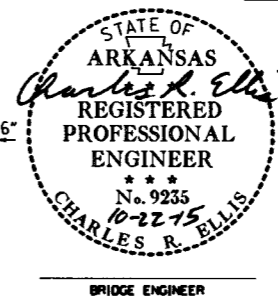
Mark	No. Req'd	Length	A	B	Pin Dia.
B401	2	15'-0"	-	-	Str.
B402	2	18'-5"	-	-	Str.
B403	2	21'-10"	-	-	Str.
B404	2	25'-4"	-	-	Str.
B405	2	28'-9"	-	-	Str.
B406	2	32'-3"	-	-	Str.
B407	16	17'-9"	-	-	3"
B501-B507	4 ea.	13'-2" to 16'-0"	-	3'-9" to 5'-2"	2 1/2"
B508-B519	4 ea.	16'-6" to 20'-0"	-	5'-5" to 7'-2"	2 1/2"
B520	7	18'-3"	-	-	2 1/2"
B521	10	15'-9"	-	-	3 3/4"
B601	28	3'-10"	-	-	Str.
B701	10	32'-8"	-	-	Str.
B901	6	35'-2"	32'-8"	10"	9"
B902	6	32'-8"	-	-	Str.
C501	106	29'-0"	-	-	3 3/4"
C502	848	4'-7"	3'-7"	-	2 1/2"
C503	212	11'-7"	10'-7"	-	2 1/2"
C101	48	39'-8"	-	-	1 1/4"
F701	28	19'-2"	17'-6"	7"	5 1/4"
F702	18	29'-2"	27'-6"	7"	5 1/4"
F1001	55	20'-4"	17'-6"	11 1/2"	10
F1002	35	30'-4"	27'-6"	11 1/2"	10

NOTE: Dimensions are out to out of bars.



SECTION B-B
3/4"=1'-0"

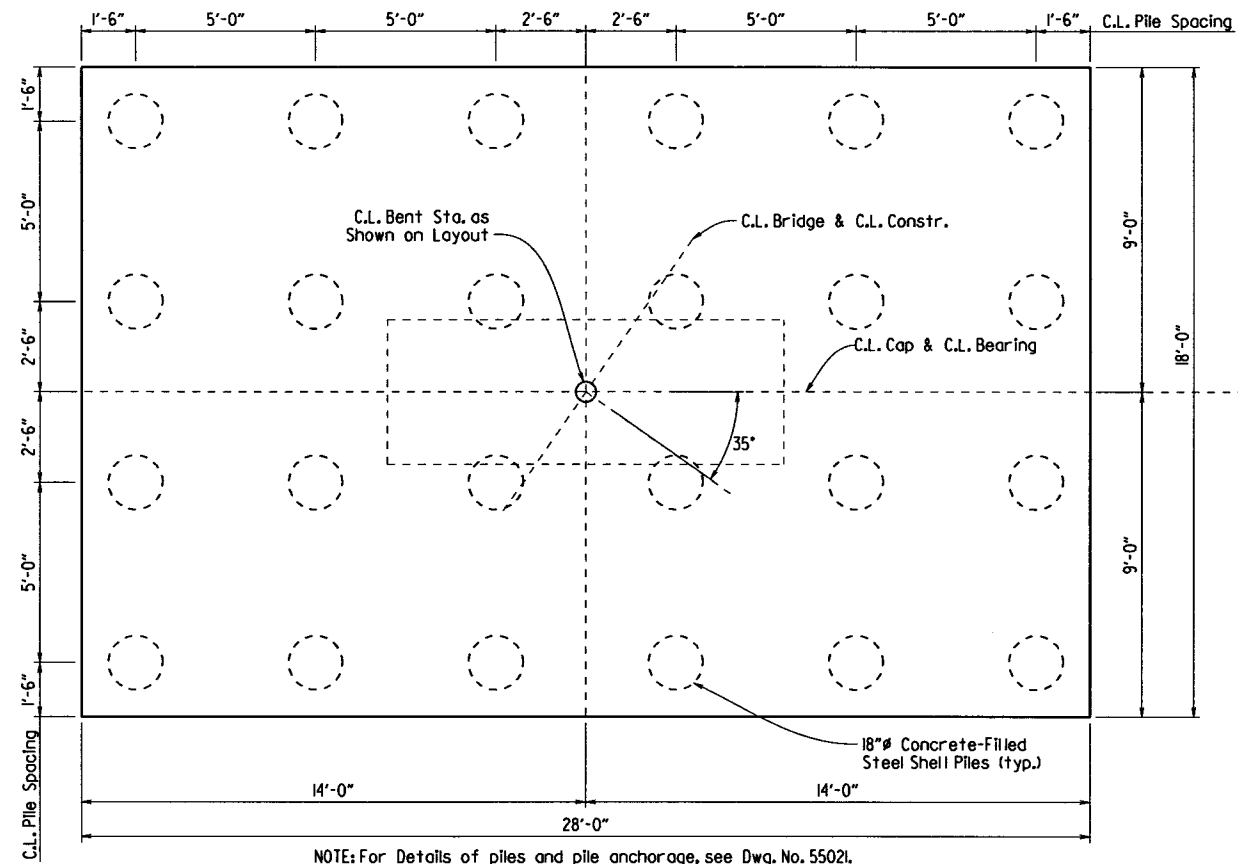
SHEET 1 OF 2
DETAILS OF BENT NOS. 2 & 3



ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.
DRAWN BY: YZ/MAH DATE: 09/02/2015 FILENAME: bbr1610_b2.dgn
CHECKED BY: PGT DATE: 9/15 SCALE: AS SHOWN
DESIGNED BY: WJS DATE: 10/14
BRIDGE NO. 04935 DRAWING NO. 57535

PRINT DATE: 10/14/2015

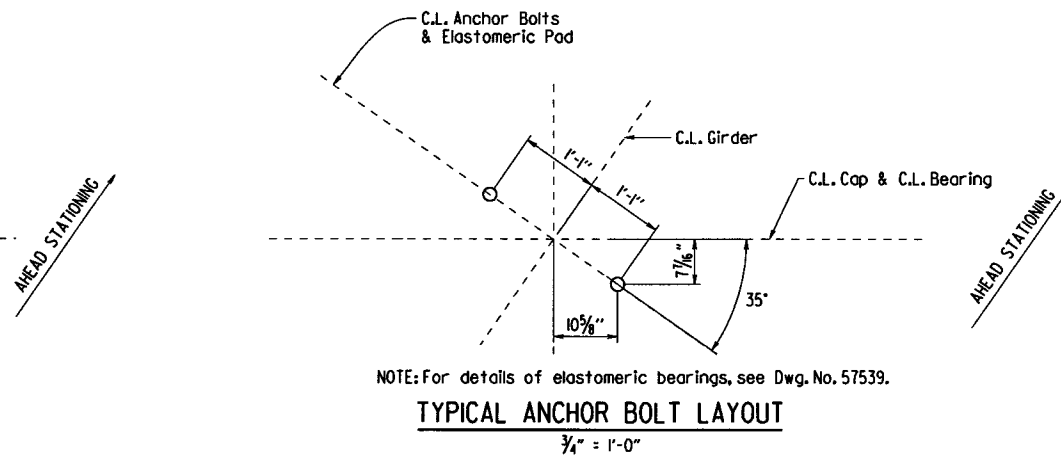
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
							JOB NO.	
							BR1610	23
							04935 - INT. BENTS - 57536	71



NOTE: For Details of piles and pile anchorage, see Dwg. No. 5502L.

PLAN OF FOOTING

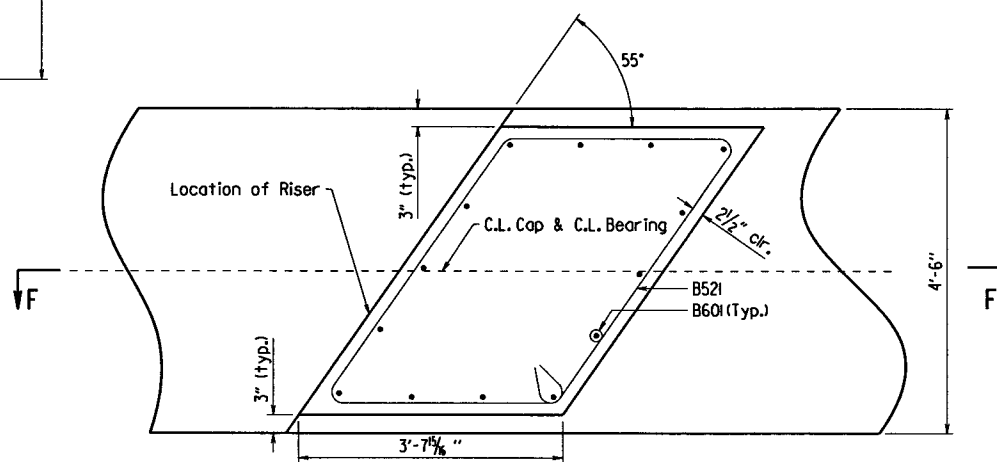
$\frac{3}{4}'' = 1'-0''$



NOTE: For details of elastomeric bearings, see Dwg. No. 57539.

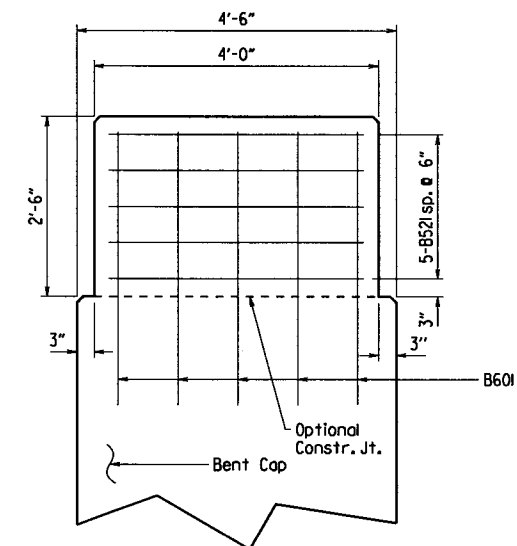
TYPICAL ANCHOR BOLT LAYOUT

$\frac{3}{4}'' = 1'-0''$



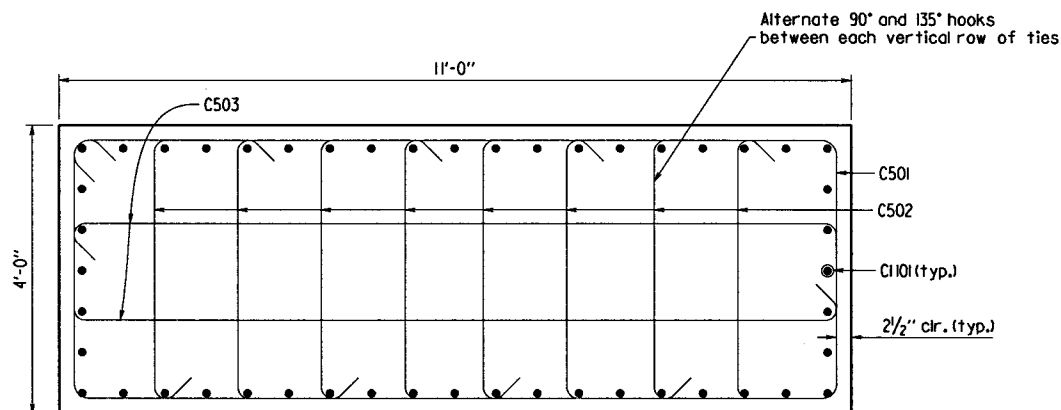
PLAN - CONCRETE RESTRAINER

$\frac{3}{4}'' = 1'-0''$



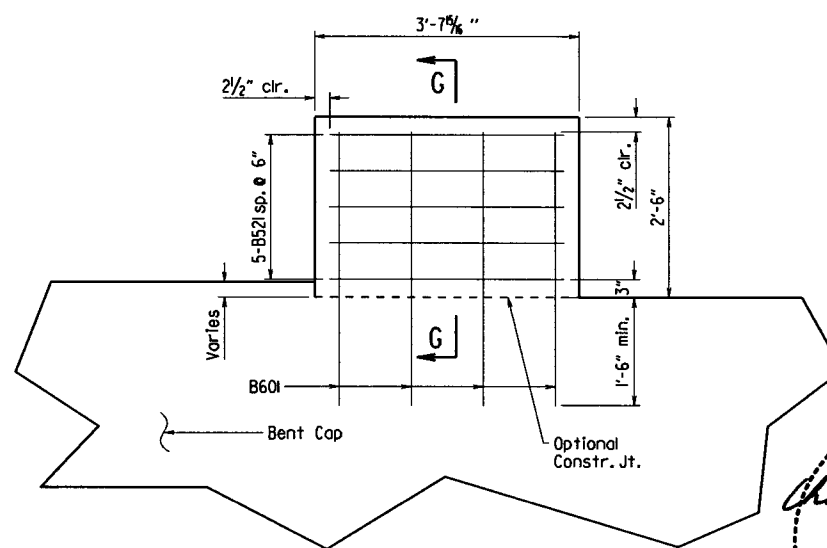
SECTION G-G - CONCRETE RESTRAINER

$\frac{3}{4}'' = 1'-0''$



SECTION C-C

$\frac{3}{4}'' = 1'-0''$



SECTION F-F - CONCRETE RESTRAINER

$\frac{3}{4}'' = 1'-0''$

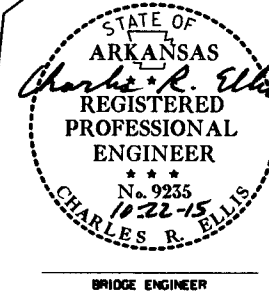
GENERAL NOTES

All concrete shall be Class "S" with a minimum 28 day compressive strength $f'_c = 3500$ psi. Concrete shall be poured in the dry and all exposed corners to be chamfered $\frac{3}{4}''$ unless otherwise noted.

All reinforcing steel shall conform to AASHTO M31 or M53, Grade 60.

If anchor bolts are drilled into cap, top reinforcing bars shall be properly placed to avoid damage.

For additional information, see Layout.



SHEET 2 OF 2
DETAILS OF BENT NOS. 2 & 3

ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: YZ/MAH DATE: 09/02/2015 FILENAME: dbr1610.b2.dgn

CHECKED BY: PGT DATE: 9/15 SCALE: As Shown

DESIGNED BY: LJS DATE: 10/14

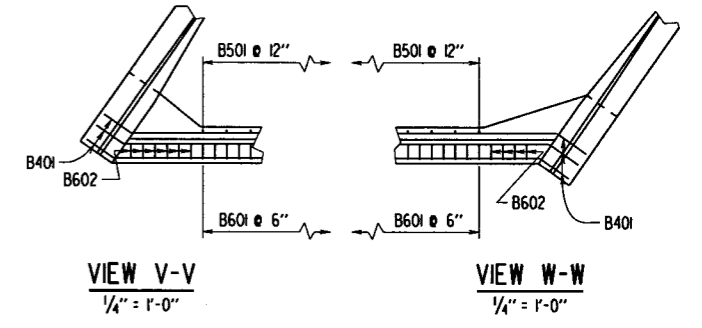
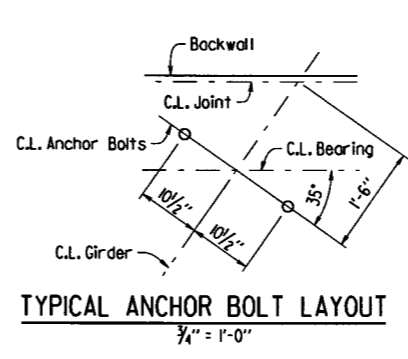
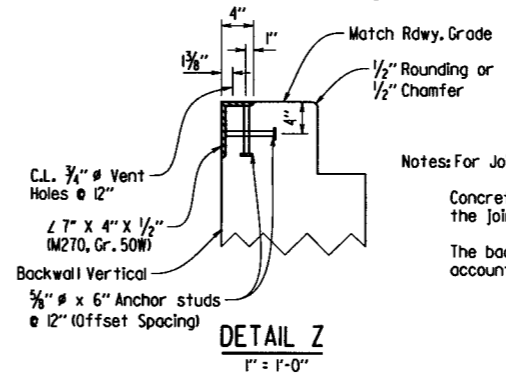
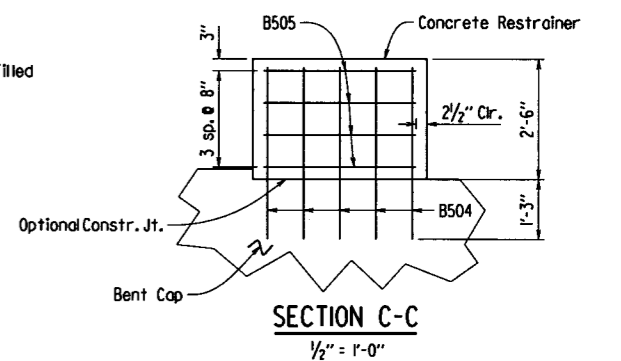
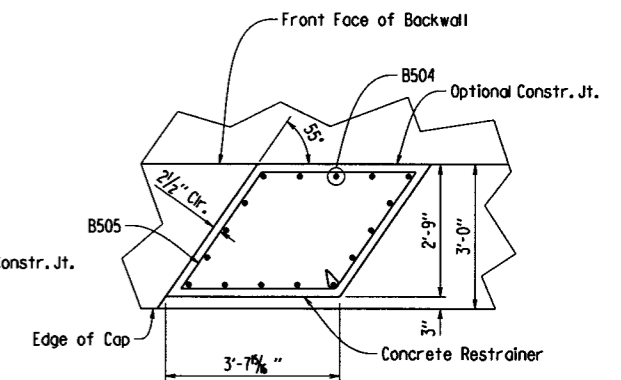
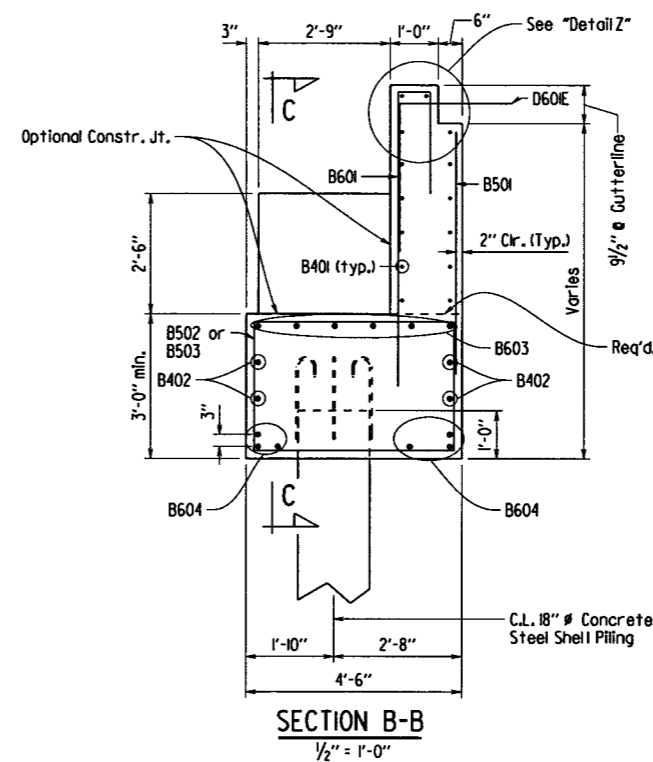
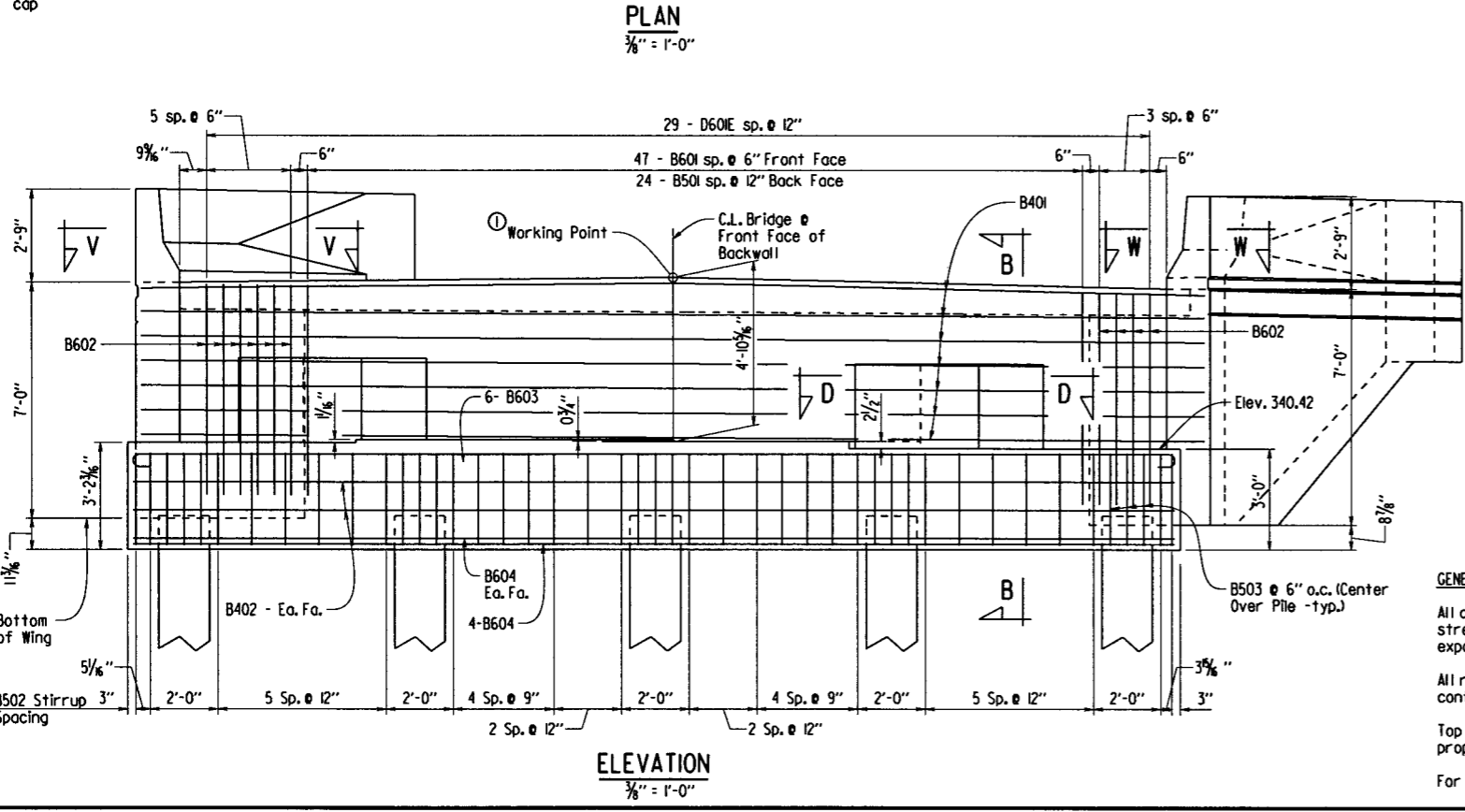
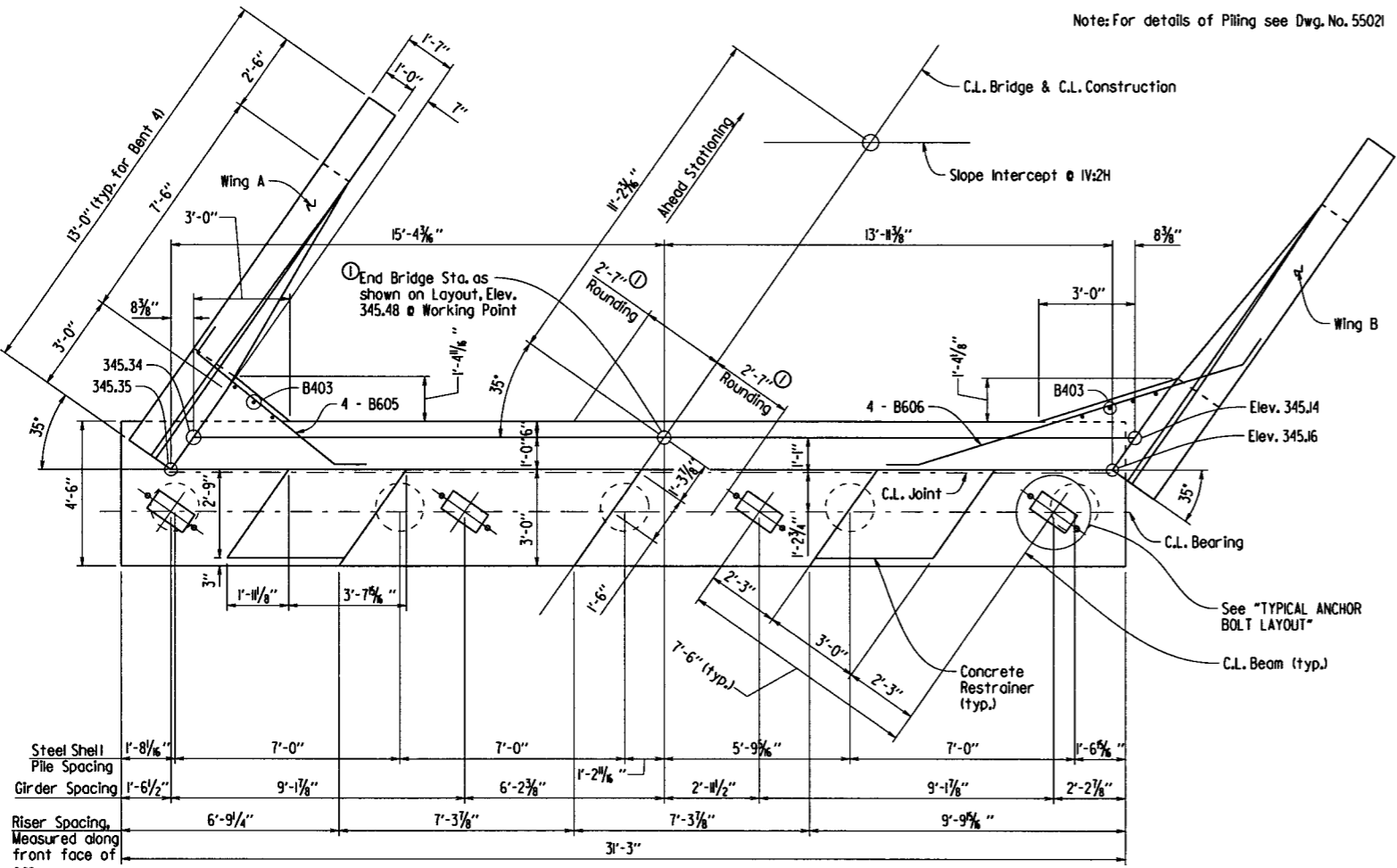
BRIDGE NO. 04935 DRAWING NO. 57536

PRINT DATE: 10/14/2015

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		24	71
				JOB NO. BR1610		O4935 - BENT 4 - 57537		

① See "ROUNDING DETAIL", Dwg. No. 57540

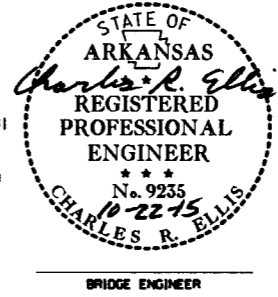
Note: For details of Wing A and B, see Dwg. No. 57538
 Note: Class I Protective Surface Treatment shall be applied to the Roadway Face and Top of Bent Rail, and to the Top of the Backwall.
 Note: For details of Piling see Dwg. No. 55021



Notes: For Joint Details see Dwg. No. 57546.
 Concrete shall be hand packed under the joint armor in the backwall.
 The backwall angle shall be profiled to account for skew.

GENERAL NOTES:

All concrete shall be Class "S" with a minimum 28-Day compressive strength f'_c : 3500 psi. Concrete shall be poured in the dry and all exposed corners to be chamfered $\frac{3}{4}''$ unless otherwise noted.
 All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M31 or M322, Type A, with mill test reports.
 Top reinforcement bars and pile anchorage in cap shall be properly placed to avoid interference with anchor bolts.
 For additional information, See Layout.



SHEET 1 OF 2
 DETAILS OF BENT NO. 4

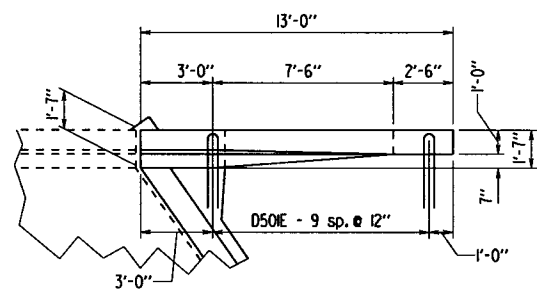
ROUTE SEC.
 ARKANSAS STATE HIGHWAY COMMISSION
 LITTLE ROCK, ARK.
 DRAWN BY: PGT DATE: 8/15
 CHECKED BY: JTB DATE: 9/15
 DESIGNED BY: WJB DATE: 10/14
 BRIDGE NO. 04935 DRAWING NO. 57537

PRINT DATE: 10/20/2015

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO.	BR1610	25 71
04935 - BENT 4 - 57538								

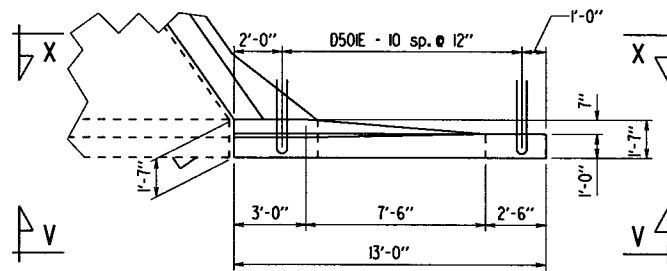
BAR LIST

MARK	NO.	REQ'D.	LENGTH	P.D.
B401	14		32'-1/2"	2"
B402	4		30'-11"	Str.
B403	7		5'-11"	Str.
B501	24		6'-5"	Str.
B502	30		14'-2"	2 1/2"
B503	15		9'-3"	2 1/2"
B504	32		3'-7"	Str.
B505	8		12'-10"	3 3/4"
B601	47		8'-11"	4 1/2"
B602	10		12'-10"	4 1/2"
B603	6		32'-3"	4 1/2"
B604	6		30'-11"	Str.
B605	4		7'-6"	4 1/2"
B606	4		12'-6 1/2"	4 1/2"
D50E	21		6'-4"	3 3/4"
D60E	29		6'-0"	4 1/2"
R401	14		3'-11"	2"
R402	8		4'-0"	2"
R403	12		12'-8"	Str.
R601	16		4'-7"	Str.
R602	6		5'-6"	Str.
W401	8		8'-3"	2"
W402	8		9'-5"	Str.
W403-W409	2 ea.		7'-10" to 3'-5"	2"
W410-W416	2 ea.		9'-0" to 4'-8"	Str.
W417	3		5'-6"	Str.
W418	3		9'-9"	2"
W701	8		12'-8"	Str.
W702-W705	4 ea.		9'-8" to 5'-6"	Str.
W706	4		4'-5"	Str.
W707	4		13'-9"	5 1/4"



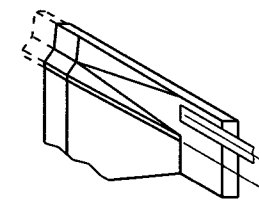
PLAN OF RAIL (WING A)

1/4" = 1'-0"



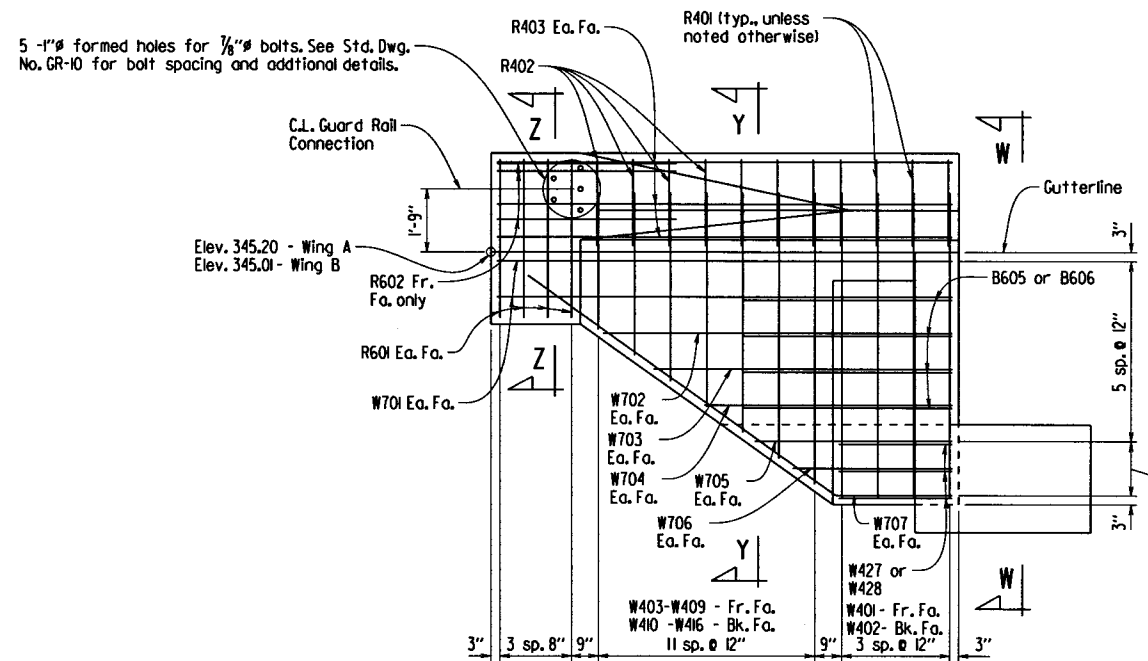
PLAN OF RAIL (WING B)

1/4" = 1'-0"



THREE DIMENSIONAL VIEW OF RAIL

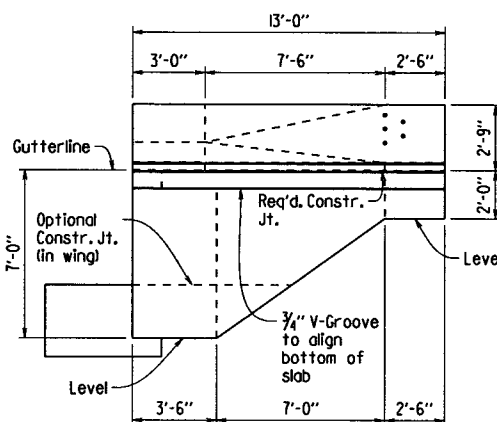
No Scale



VIEW X-X

(Wing B Shown, Wing A Similar)

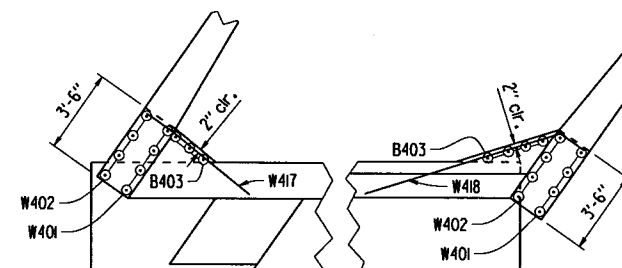
3/8" = 1'-0"



VIEW V-V

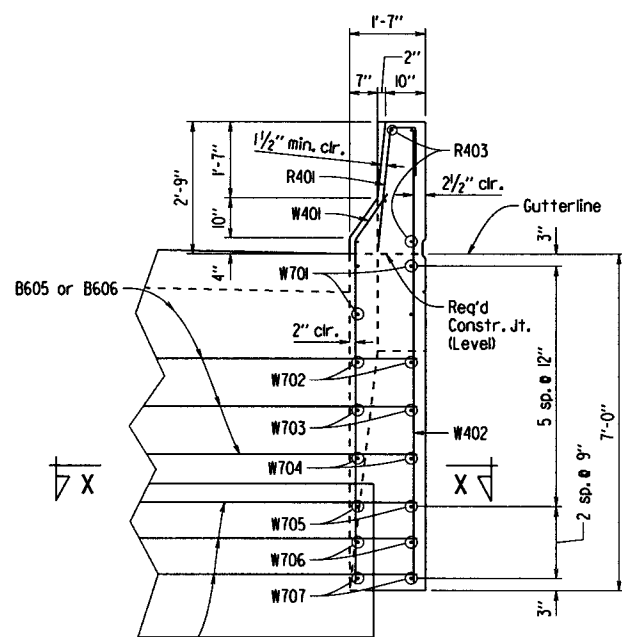
(Wing B Shown, Wing A Similar)

1/4" = 1'-0"



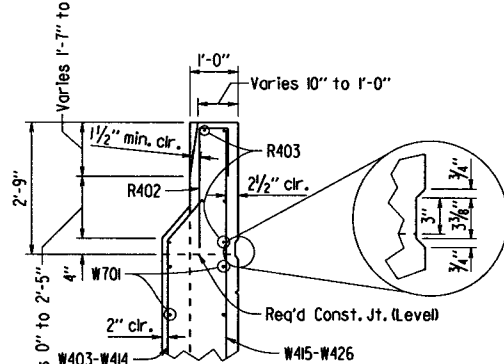
SECTION T-T

1/4" = 1'-0"



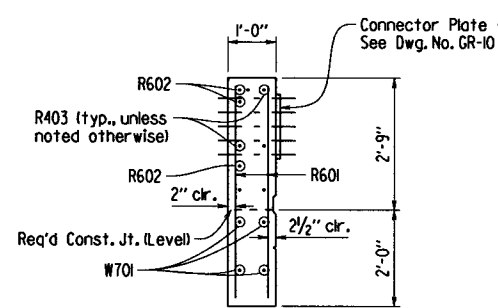
VIEW W-W

1/2" = 1'-0"



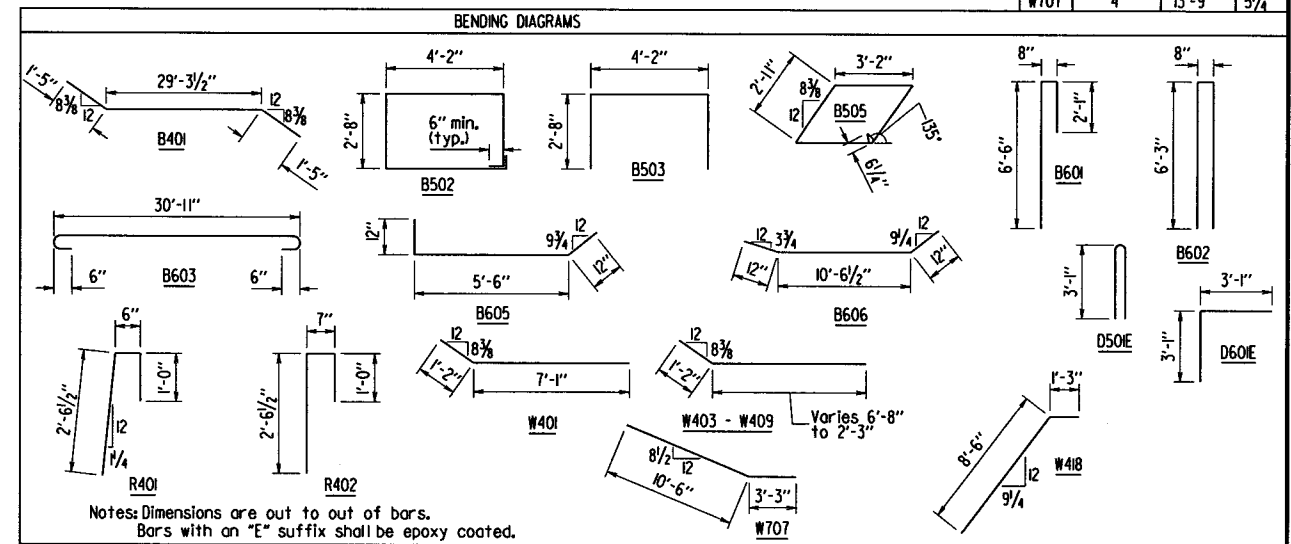
SECTION Y-Y

1/2" = 1'-0"



SECTION Z-Z

1/2" = 1'-0"



Notes: Dimensions are out to out of bars.
Bars with an "E" suffix shall be epoxy coated.

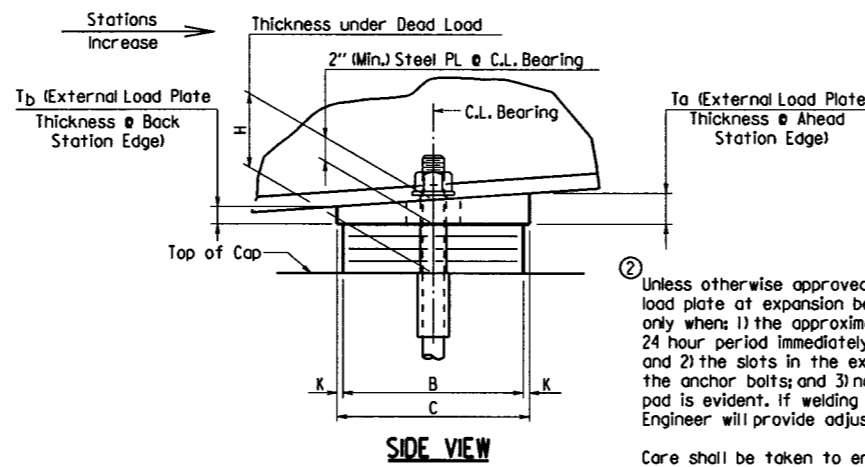
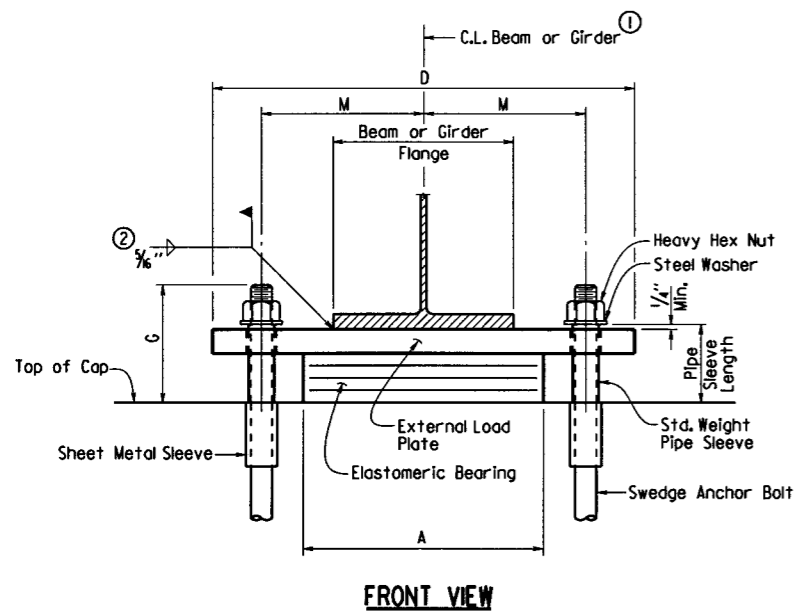


SHEET 2 OF 2
DETAILS OF BENT NO. 4

ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: PGT DATE: 8/15 FILENAME: bdr1610.b3.dgn
CHECKED BY: JF DATE: 9/15 SCALE: As Shown
DESIGNED BY: LGB DATE: 12/14
BRIDGE NO. 04935 DRAWING NO. 57538

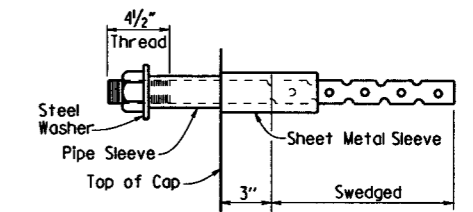
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	BRIGIO	26	71	
04935 - ELASTO BRGS. - 57539								



The direction of bevel of the external load plate may not be accurately depicted with respect to T_a and T_b values shown in the "Table of Fabricator Variables".

Unless otherwise approved by the Engineer, welding of the external load plate at expansion bearings to the beam or girder will be allowed only when: 1) the approximate average air temperature during the 24 hour period immediately preceding welding is between 40° F and 80° F; and 2) the slots in the external load plate are positioned to center on the anchor bolts; and 3) no horizontal deformation of the elastomeric pad is evident. If welding at other temperatures is required, the Engineer will provide adjustment data.

Care shall be taken to ensure that the external load plate is in full and complete contact with the beam or girder flange before welding begins.

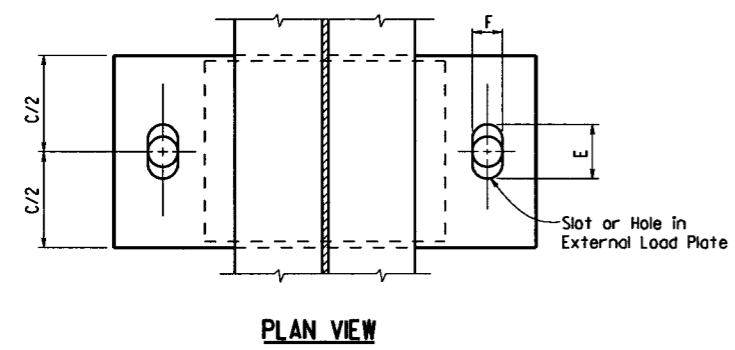


ANCHOR BOLT DETAIL

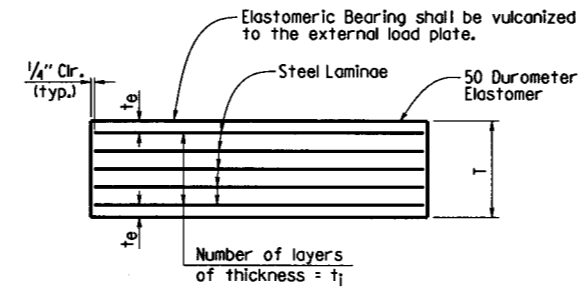
Anchor Bolts may be cast in place or drilled and grouted into place. If Anchor Bolts are to be cast in place, the Galvanized Sheet Metal Sleeves will not be required.

If Anchor Bolts are to be drilled and grouted in place, the Galvanized Sheet Metal Sleeves shall be cast in place as shown. Sleeves shall be dry packed with styrofoam, urethane foam or approved equal prior to pouring of the cap and prior to erection of Structural Steel, the dry pack shall be removed and holes for the anchor bolts shall be accurately drilled into the concrete. Bolts placed in drilled holes shall be accurately set and fixed using a OPL approved epoxy or non-shrink grout that completely fills the holes. Galvanized Sheet Metal Sleeves will not be paid for directly, but will be considered subsidiary to the item "Structural Steel in Plate Girder Spans (M 270, Gr. 50W)"

① C.L. Elastomeric Pad shall be aligned with C.L. Beam or Girder.



PLAN VIEW



ELASTOMERIC BEARING

t_e = Thickness of elastomer cover on top and bottom of pad
 t_i = Thickness of elastomer between steel laminae
 N = Number of elastomer layers of thickness t_i

GENERAL NOTES

Elastomeric Bearings shall conform to Section 808 and shall be paid for at the unit price bid for "Elastomeric Bearings".

External load plates shall conform to AASHTO M 270, Grade 50W. Pipe sleeves shall be ASTM A500, Grade B, and shall be galvanized to conform to AASHTO M 232, Class C or ASTM B695, Class 50.

External load plates shall be completely fabricated (including bevel and bolt holes) and shall be cleaned before vulcanizing to the elastomeric bearing. The surface in contact with the elastomeric bearing shall be cleaned in accordance with Subsection 808.03. Other surfaces shall be blast cleaned in accordance with Subsection 807.84(b) for painted steel and 807.84(e) for unpainted Grade 50W steel.

Anchor Bolts, Washers and Nuts shall conform to Subsection 807.07. The anchor bolt grade of steel shall be as specified in the "Table of Fabricator Variables". Indentations shall be circular with rounded bottoms and staggered as shown in the details.

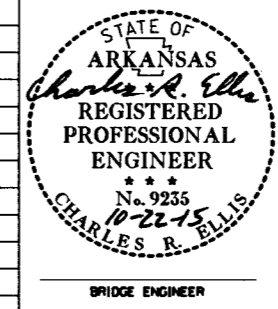
Pipe Sleeves, Anchor Bolts, Washers and Nuts shall be paid for at the unit price bid for "Structural Steel in Plate Girder Spans (M270, Gr. 50W)". External load plates will not be measured and paid for separately, but will be considered incidental to the unit price bid for "Elastomeric Bearings".

Bearings shall be seated in accordance with Subsection 808.08. This work and materials are considered subsidiary to the item "Elastomeric Bearings" and will not be paid for directly.

TABLE OF FABRICATOR VARIABLES

*Maximum Design Load = Service I Limit State

BRIDGE NO.	LOCATION		BEARING TYPE	NO. OF BEARINGS EACH BENT	* MAXIMUM DESIGN LOAD (KIPS)	G	H	ELASTOMERIC PAD					EXTERNAL LOAD PLATE							ANCHOR BOLT							
	BENT NO(S)	BEAM OR GIRDER NO.						A	B	N	t_i	t_e	NO. & THICKNESS OF STEEL LAMINAE	T	C	D	E	F	K	M	T_a	T_b	ANCHOR BOLT		PIPE SLEEVE SIZE	SHEET METAL SLEEVE SIZE	STEEL WASHER SIZE
															(# x L)	GRADE	(# x L)	(# x L)	(# x L)	(# x L)	(# x L)	(# x L)	(# x L)				
04935	1	I-4	Exp.	4	100	8 3/8"	5 3/8"	16"	8"	5	1/2"	1/4"	6 @ 12 Ga.	3 3/8"	9"	27"	5 1/4"	2 3/8"	1/2"	10 1/2"	1.95"	2.05"	1 3/4" x 28 1/2"	55	2" x 5 1/8"	4" x 6"	3 3/8"
	2	I-4	Fix.	4	283	7 5/8"	3 3/4"	20"	12"	2	1/2"	1/4"	3 @ 12 Ga.	1 1/8"	13"	33"	3 3/4"	3 3/4"	1/2"	13"	1.93"	2.07"	2 1/2" x 35"	55	3" x 4 1/8"	4" x 9"	4 1/2"
	3	I-4	Fix.	4	283	7 5/8"	3 3/4"	20"	12"	2	1/2"	1/4"	3 @ 12 Ga.	1 1/8"	13"	33"	3 3/4"	3 3/4"	1/2"	13"	1.93"	2.07"	2 1/2" x 35"	55	3" x 4 1/8"	4" x 9"	4 1/2"
	4	I-4	Exp.	4	100	8 3/8"	5 3/8"	16"	8"	5	1/2"	1/4"	6 @ 12 Ga.	3 3/8"	9"	27"	5 1/4"	2 3/8"	1/2"	10 1/2"	1.95"	2.05"	1 3/4" x 28 1/2"	55	2" x 5 1/8"	4" x 6"	3 3/8"



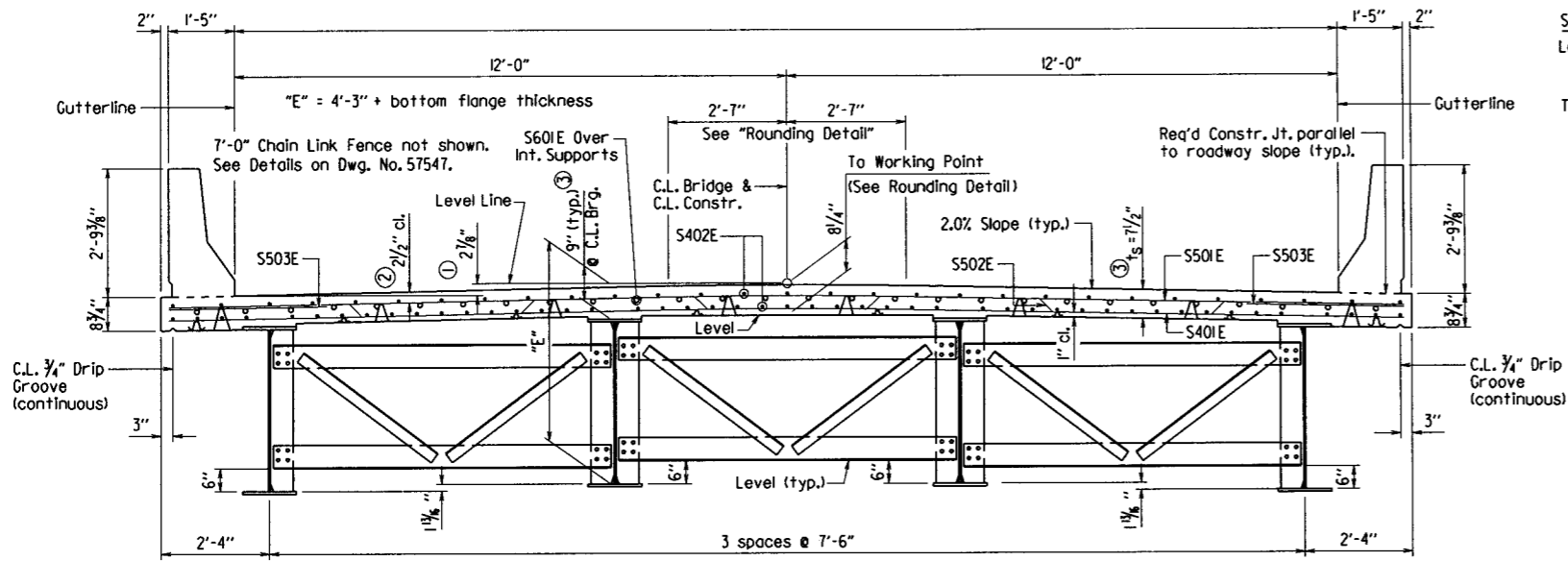
DETAILS OF ELASTOMERIC BEARINGS

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: YZ DATE: 9/02/2015 FILENAME: dbr1610.el.dgn
 CHECKED BY: PGT DATE: 9/15 SCALE: No Scale
 DESIGNED BY: LJB DATE: 9/11
 BRIDGE NO. 04935 DRAWING NO. 57539

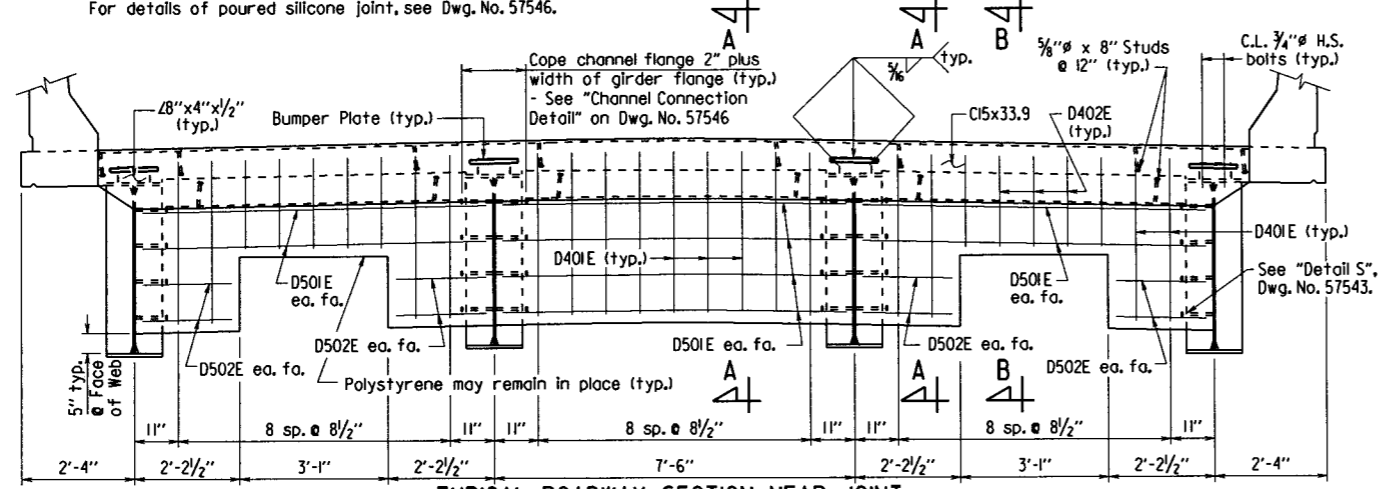
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	BR1610	27	71	
				04935 - 290 FT. UNIT - 57540				



TYPICAL ROADWAY SECTION
1/2" = 1'-0"

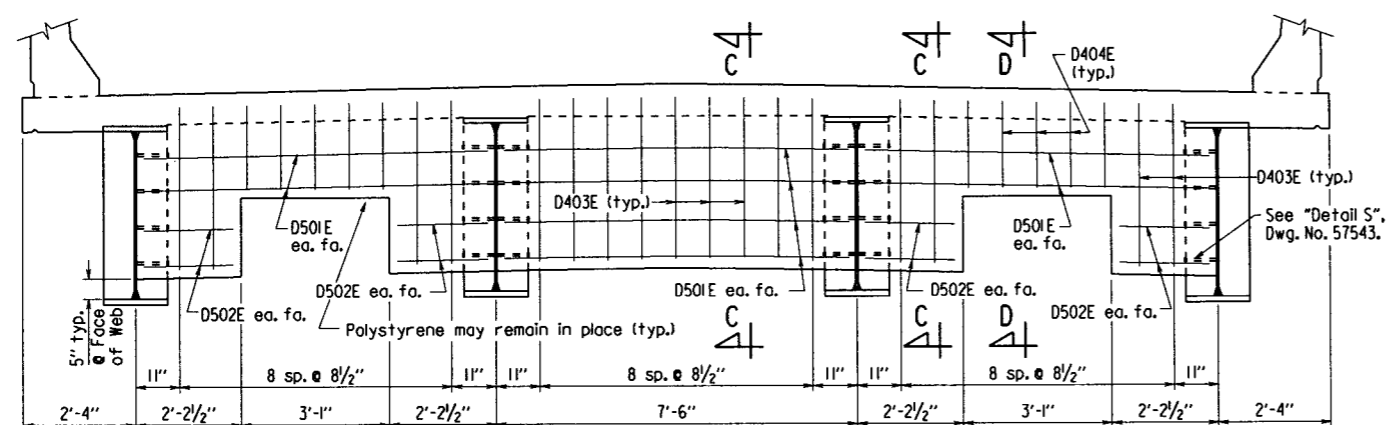
Expansion Device:
Rdwy. Channel - C15x33.9
Conn. L's 8"x4"x 1/2" (Gr. 36)
Detail Device 1/4" high & provide 1/4" shims using 2-1/8" & 1-1/8" PLs

For details of poured silicone joint, see Dwg. No. 57546.



TYPICAL ROADWAY SECTION NEAR JOINT
Looking Back - Bent 1 (Bent 4 Similar)
1/2" = 1'-0"

NOTE: See Dwg. No. 57541 for "SECTION A-A", "SECTION B-B", "SECTION C-C", and "SECTION D-D".



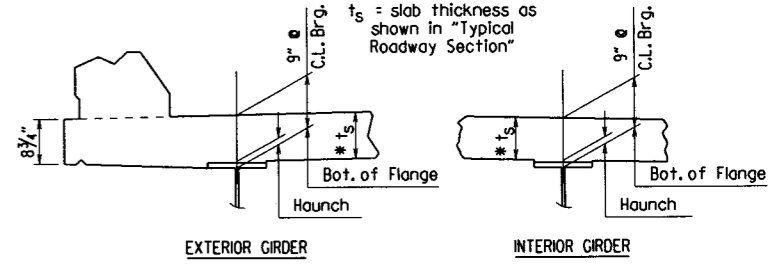
TYPICAL ROADWAY SECTION AT INTERMEDIATE BENTS
1/2" = 1'-0"

Slab Reinforcing:
Longitudinal: S402E as shown
S601E as shown over int. supports, see "Half Reinforcing Plan & Slab Pouring Sequence", Dwg. No. 57544.
Transverse: S502E @ 12" o.c. bent up over Girders
S501E @ 12" o.c. in top, S401E @ 12" o.c. in bottom
S503E @ 6" in top of overhangs (bundled with No. 5 bars)

NOTES: At the Contractor's option, in lieu of providing bars S502E, one epoxy coated No. 5 bar top and bottom may be substituted for each bar. Payment for reinforcing will be based on the weight of bars S502E. Bars in top and bottom shall be epoxy coated.

Bar positions or clearances from the forms shall be maintained by means of stays, ties, hangers or other approved devices per subsection 804.06.

- ① Working point to gutterline.
- ② Tolerance: Minus = 1/4"; Plus equal to the amount of slab thickening used to meet slab thickness tolerance. See "Adjustment for Slab Thickness Tolerance".
- ③ See "Adjustment for Slab Thickness Tolerance".



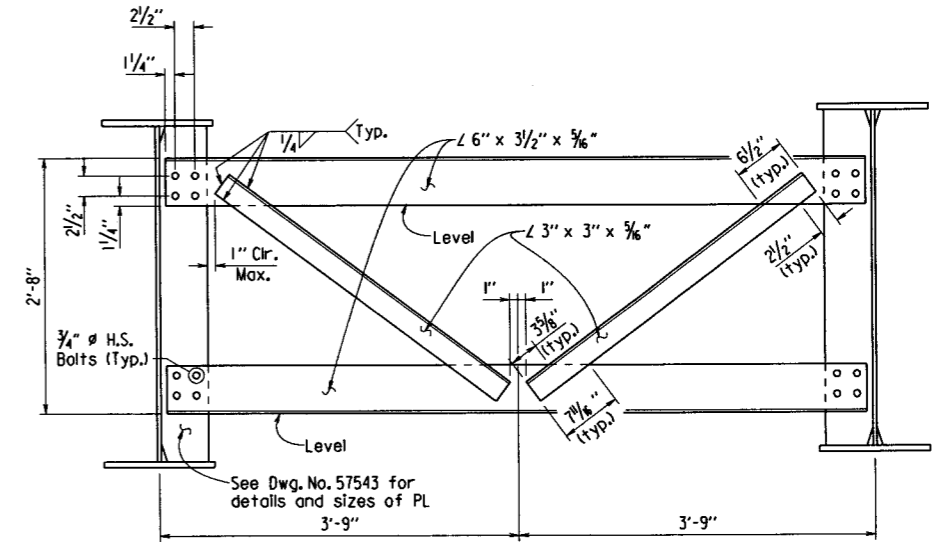
*Tolerance when removable deck forming is used is + 1/2"; - 1/4". Haunch forming is required and shall be adjusted to maintain slab thickness tolerance.

ADJUSTMENT FOR SLAB THICKNESS TOLERANCE

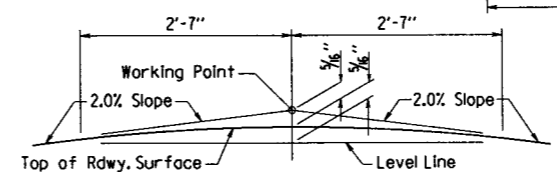
No Scale

NOTES: Haunch dimension may vary within the following limits to maintain the grade and slab thickness tolerance: Minimum occurs when top flange contacts bottom reinforcing steel; Maximum = top flange thickness plus 1 1/4". No increase in concrete and structural steel quantities will be made to maintain tolerances.

Tolerances shown are applicable only when removable deck forming is used. See Std. Dwg. No. 55005 for tolerances when permanent steel deck forms are used. Payment for concrete shall be based on removable deck forming.



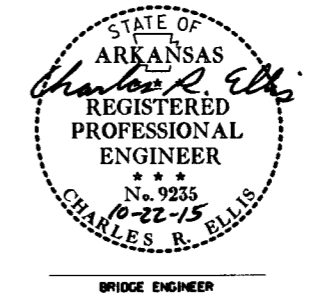
TYPICAL K-FRAME
1" = 1'-0"



NOTE: Working Point matches Theoretical Roadway Grade.

ROUNDING DETAIL

No Scale



SHEET 1 OF 7
DETAILS OF 290'-0"
CONTINUOUS PLATE GIRDER UNIT

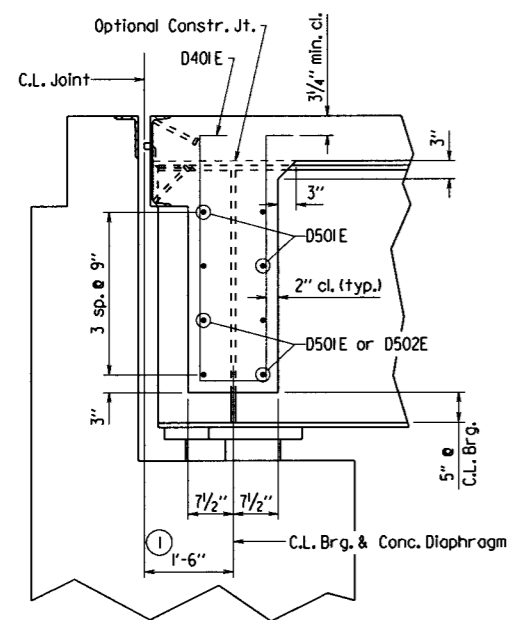
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: LJB DATE: 6/5/2015 FILENAME: bbr1610_sl.dgn
CHECKED BY: PGT DATE: 7/15 SCALE: As Shown
DESIGNED BY: LJB DATE: 9/14
BRIDGE NO. 04935 DRAWING NO. 57540

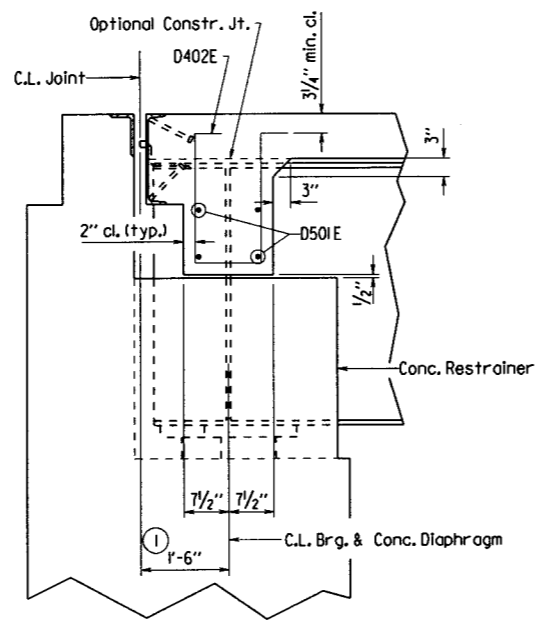
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						JOB NO.	BR1610	29 of 31
						①	04935 - 290 FT. UNIT	- 57541

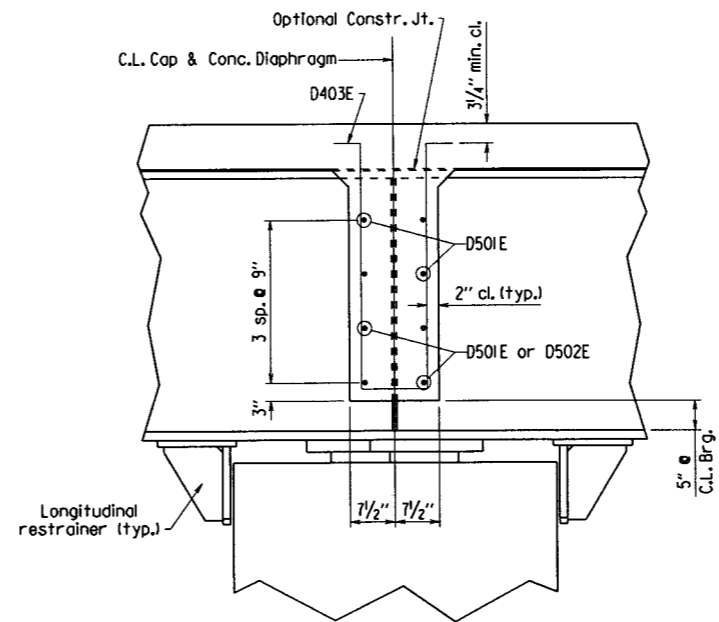
NOTE: 1/2" polystyrene shall be used as a bond breaker between the concrete restrainer and the concrete diaphragm and may remain in place. Polystyrene will not be paid for directly, but will be considered subsidiary to the item "Class (S/AE) Concrete-Bridge".



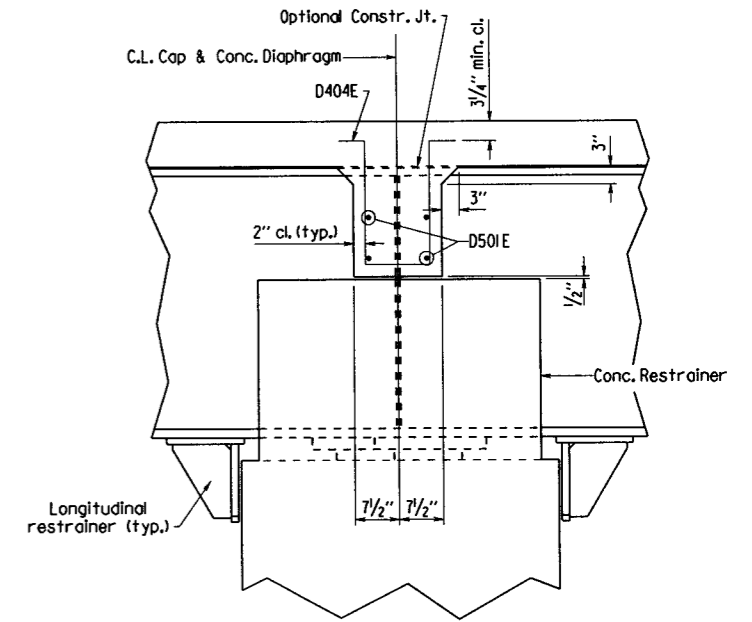
SECTION A-A ① Measured along Girder.
Section taken normal to conc. diaphragm
3/4" = 1'-0"



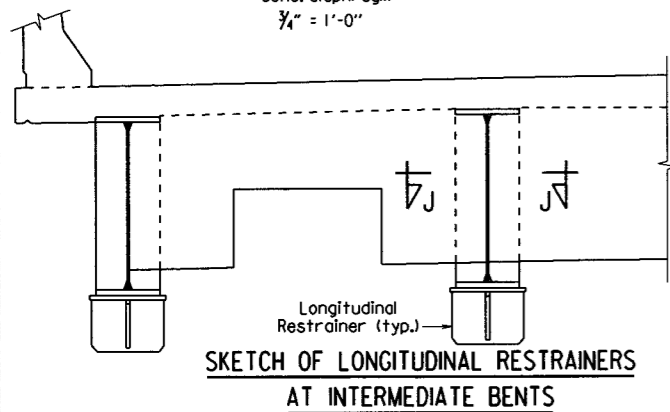
SECTION B-B ① Measured along Girder.
Section taken normal to conc. diaphragm
3/4" = 1'-0"



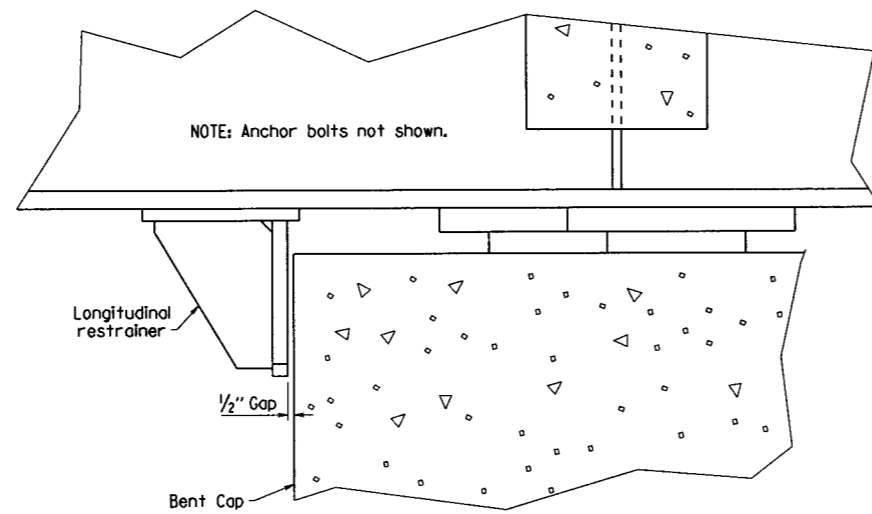
SECTION C-C
Section taken normal to conc. diaphragm
3/4" = 1'-0"



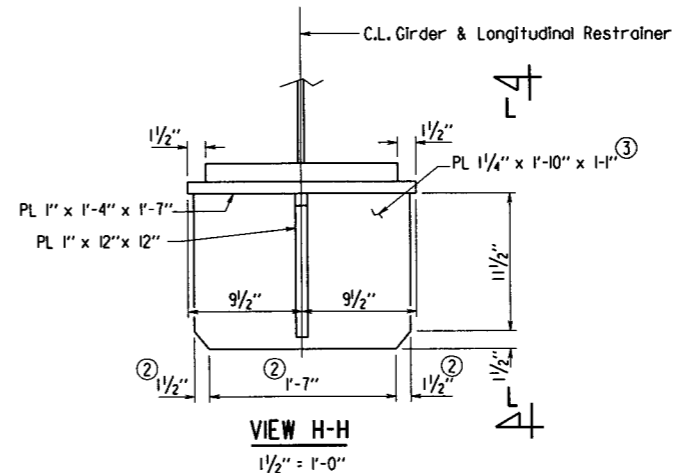
SECTION D-D
Section taken normal to conc. diaphragm
3/4" = 1'-0"



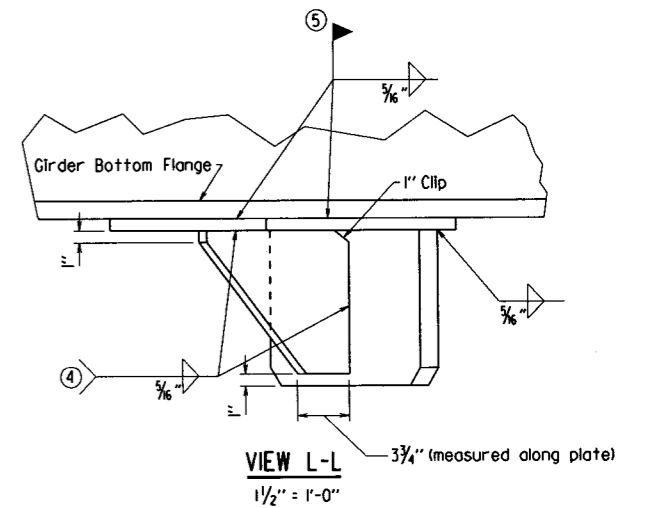
SKETCH OF LONGITUDINAL RESTRAINERS AT INTERMEDIATE BENTS
1/2" = 1'-0"



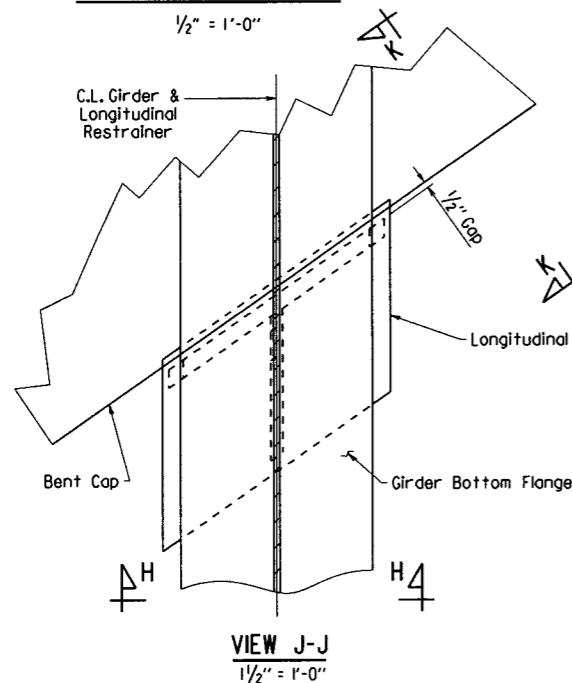
VIEW K-K
1/2" = 1'-0"



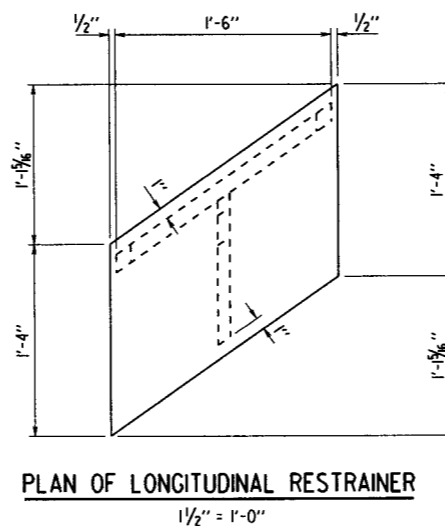
VIEW H-H
1/2" = 1'-0"



VIEW L-L
1/2" = 1'-0"

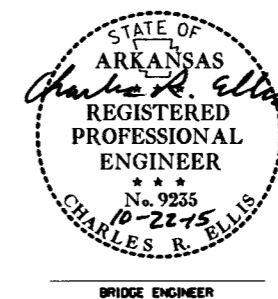


VIEW J-J
1/2" = 1'-0"



PLAN OF LONGITUDINAL RESTRAINER
1/2" = 1'-0"

- ② Measured along face of plate
- ③ Longitudinal restrainer shall be fabricated to account for grade such that the final position of this plate will be vertical.
- ④ Stop weld 1/2" from end of clip.
- ⑤ Weld longitudinal restrainer after deck has been poured.

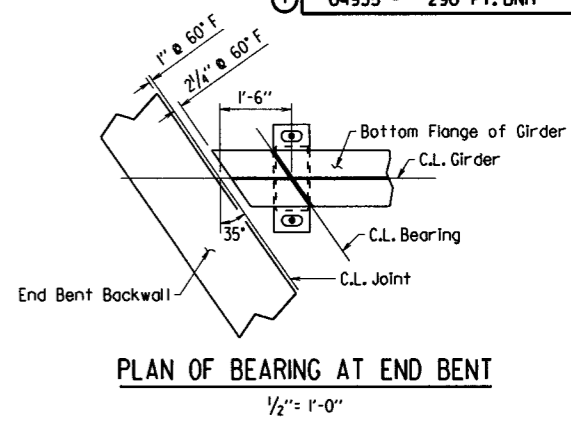
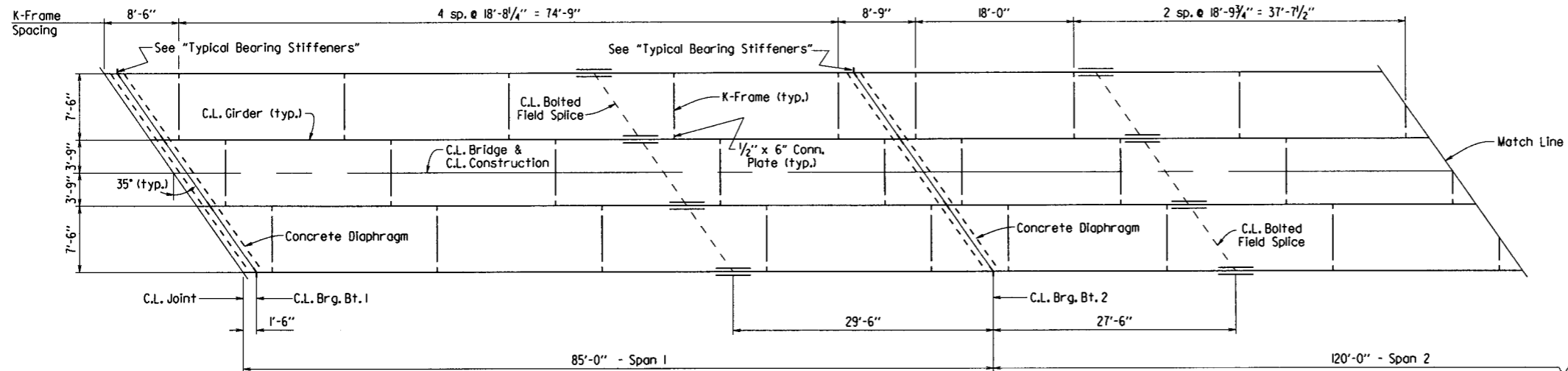


SHEET 2 OF 7
DETAILS OF 290'-0"
CONTINUOUS PLATE GIRDER UNIT

ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: LJB DATE: 6/5/2015 FILENAME: bbr1610_sl.dgn
CHECKED BY: PGT DATE: 7/15 SCALE: As Shown
DESIGNED BY: LJB DATE: 9/14
BRIDGE NO. 04935 DRAWING NO. 57541

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. BRIG10						24	71	
04935 - 290 FT. UNIT						- 57542		



NOTES:
Bolted field splices shown may be eliminated or shop welded splices may be substituted with approval of the Engineer. Payment will be made on the basis of the plan quantities.

All structural steel shall be AASHTO M 270, Grade 50W unless otherwise noted and shall be paid for as "Structural Steel in Plate Girder Spans (M 270, Gr. 50W)", Grade 50W steel shall not be painted. All exposed surfaces shall be cleaned in accordance with Subsection 807.84. Structural steel completely embedded in concrete may be AASHTO M 270, Grade 36 unless otherwise noted.

For Details of Connection Plates and Bearing Stiffeners, see Dwg. No. 57543.

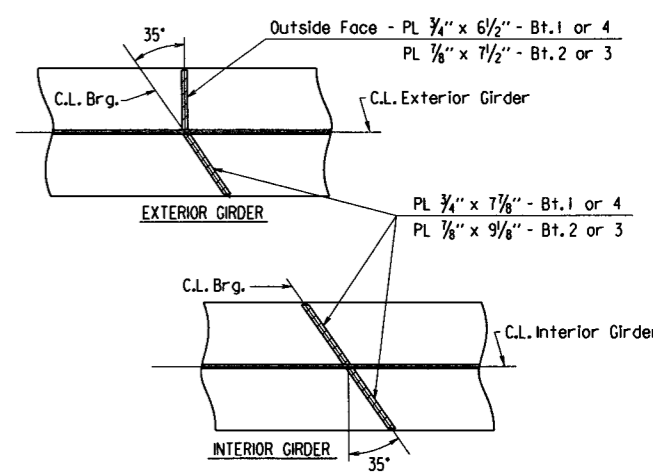
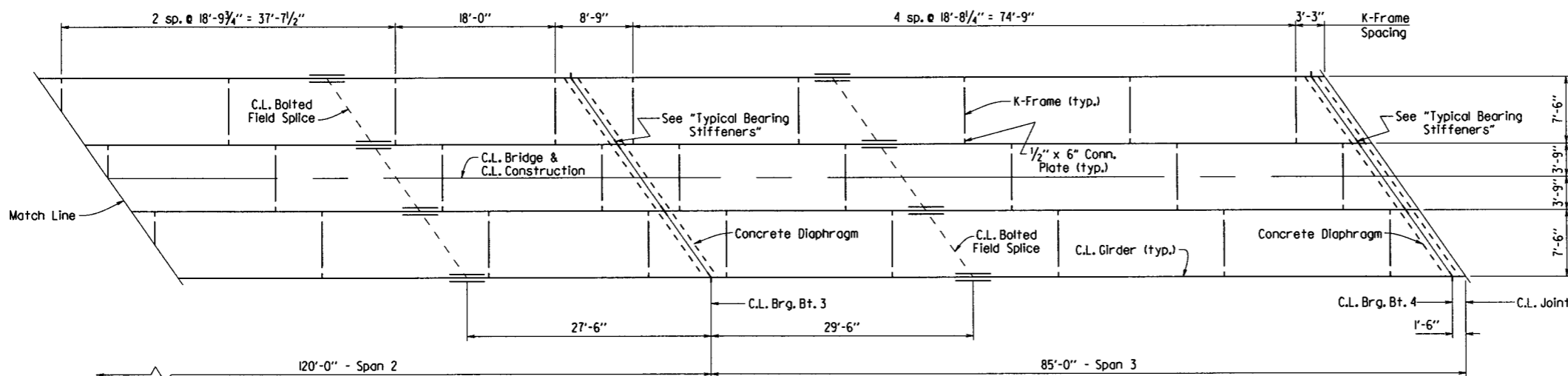
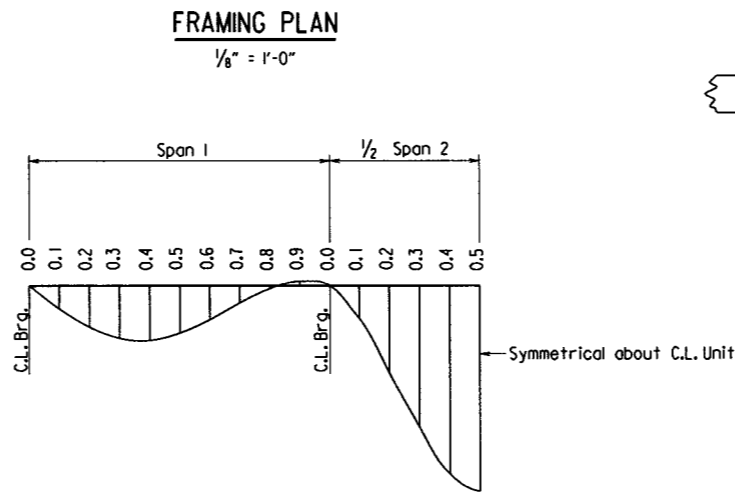


TABLE OF DEAD LOAD DEFLECTIONS (INCHES)

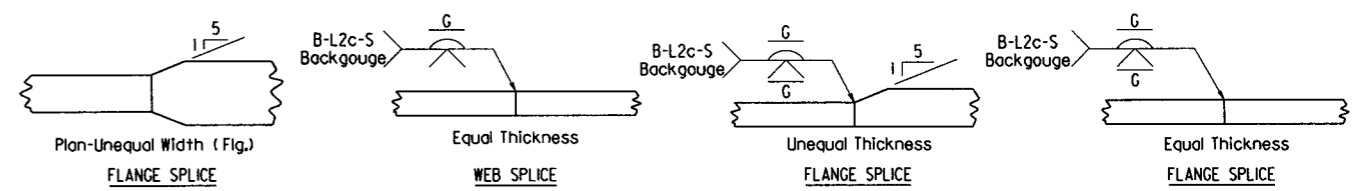
Span	Point of Deflection	Structural Steel		Structural Steel + Slab		Structural Steel + Slab + Parapet	
		Ext. Girder	Int. Girder	Ext. Girder	Int. Girder	Ext. Girder	Int. Girder
Span 1 or 3	0	0	0	0	0	0	0
	0.1	0.045	0.047	0.240	0.289	0.274	0.322
	0.2	0.080	0.083	0.426	0.514	0.488	0.573
	0.3	0.102	0.105	0.540	0.651	0.619	0.726
	0.4	0.105	0.108	0.554	0.667	0.635	0.745
	0.5	0.092	0.094	0.480	0.576	0.551	0.644
	0.6	0.065	0.066	0.336	0.403	0.386	0.452
	0.7	0.034	0.033	0.173	0.204	0.200	0.231
	0.8	0.006	0.006	0.031	0.040	0.037	0.048
	0.9	-0.008	-0.009	-0.041	-0.050	-0.046	-0.054
Span 2	1.0	0	0	0	0	0	0
	1.1	0.068	0.071	0.335	0.401	0.383	0.445
	1.2	0.170	0.184	0.844	1.043	0.964	1.158
	1.3	0.279	0.297	1.393	1.702	1.589	1.891
	1.4	0.365	0.382	1.835	2.205	2.090	2.450
	1.5	0.396	0.414	1.995	2.391	2.269	2.656

Symmetrical about C.L. Unit



DEAD LOAD DEFLECTION DIAGRAM

NOTE: Camber for Dead Load Deflection $\pm 1/4$ " tolerance. Deflections shown are along C.L. Girder from a chord from C.L. Bearing to C.L. Bearing. Negative sign (-) indicates point above chord. Vertical curve correction not included.



DETAILS OF SHOP WELDED SPLICES

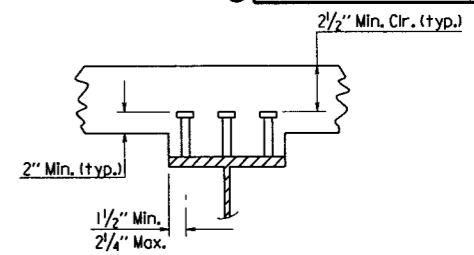
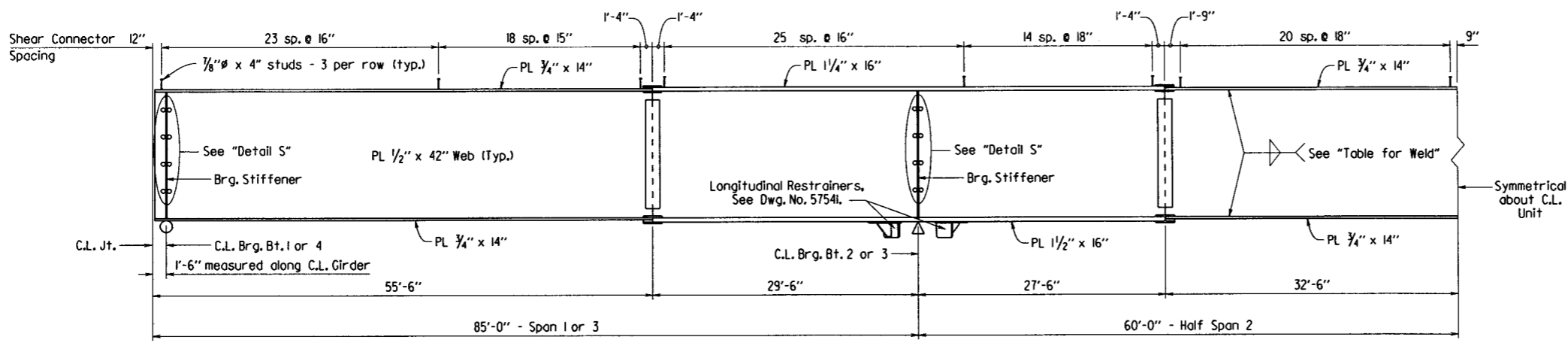
No Scale

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9255
10-22-15
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 3 OF 7
DETAILS OF 290'-0"
CONTINUOUS PLATE GIRDER UNIT
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.
DRAWN BY: LJB DATE: 6/5/2015 FILENAME: bbr1610_sl.dgn
CHECKED BY: PGT DATE: 7/15 SCALE: as noted
DESIGNED BY: LJB DATE: 9/14
BRIDGE NO. 04935 DRAWING NO. 57542

PRINT DATE: 10/23/2015

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO.	BR1610	3071
						04935 -	290 FT. UNIT	- 57543



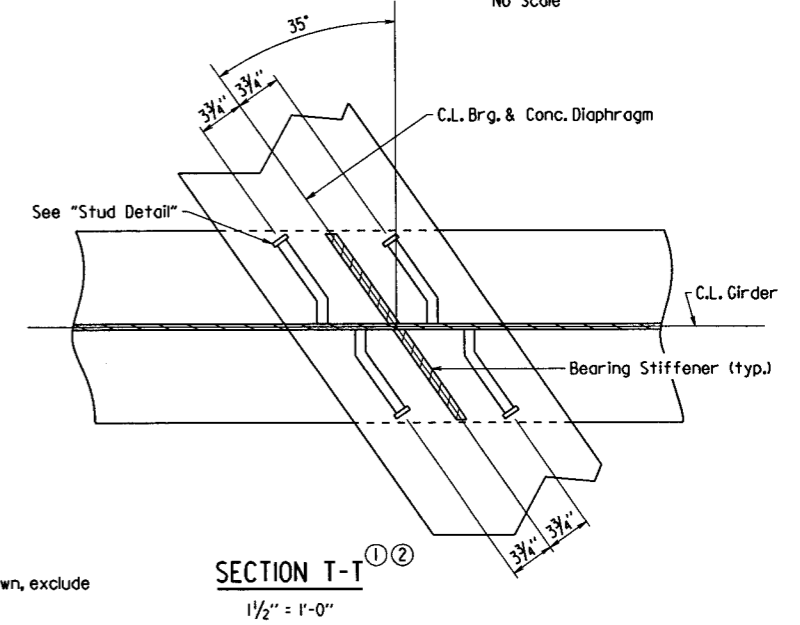
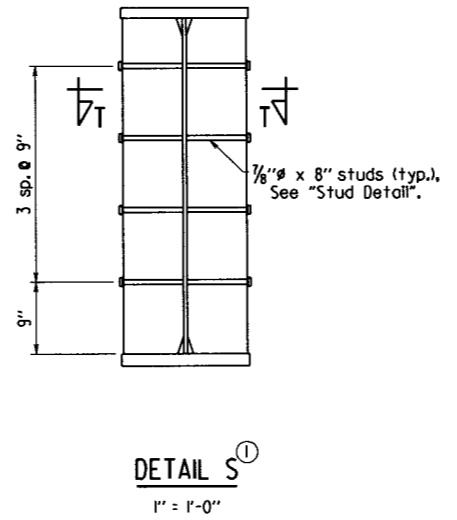
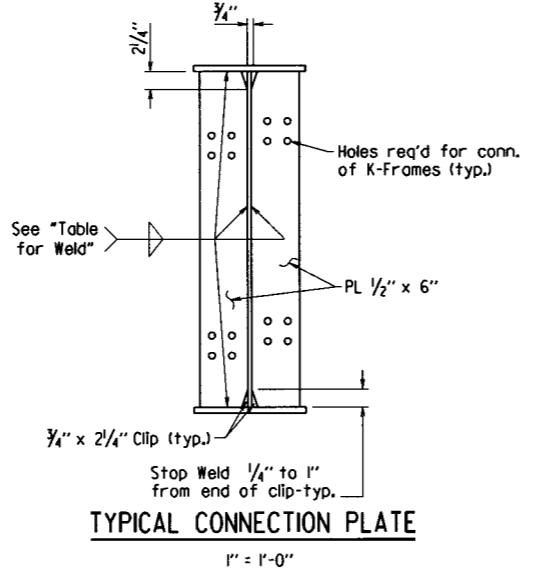
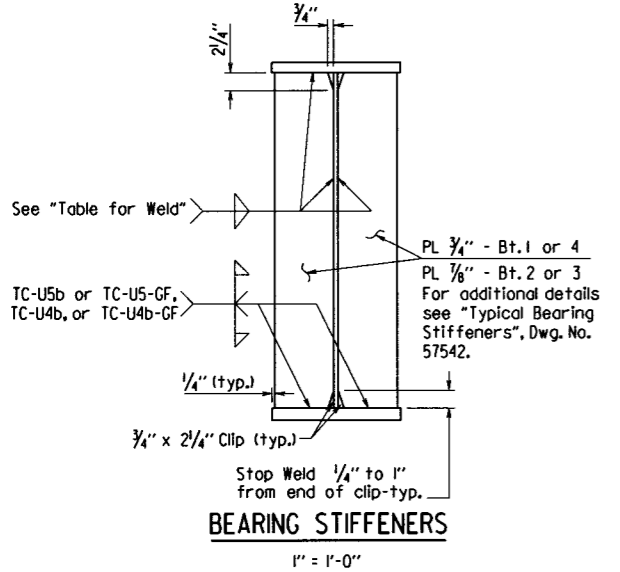
Stud Shear Connectors shown shall be 1/8" x 4" automatically end welded to the girder flange in accordance with the recommendations of the Manufacturer. 3/4" studs may be used in place of the 1/8" studs shown at the ratio of 1.361-3/4" studs in place on one 1/8" stud. 1/8" studs will be used as the basis for measurement of structural steel in shear connectors.

HALF-GIRDER ELEVATION

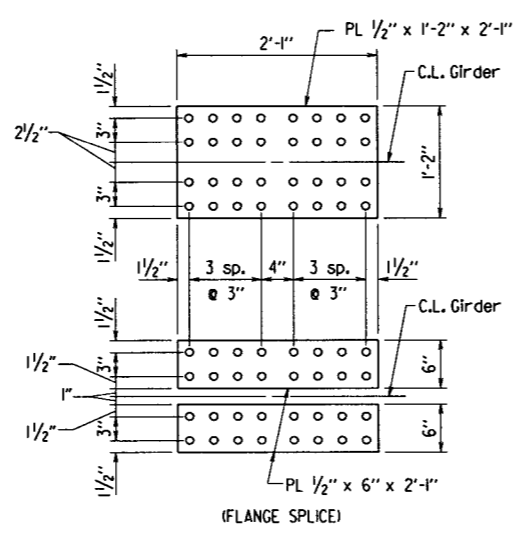
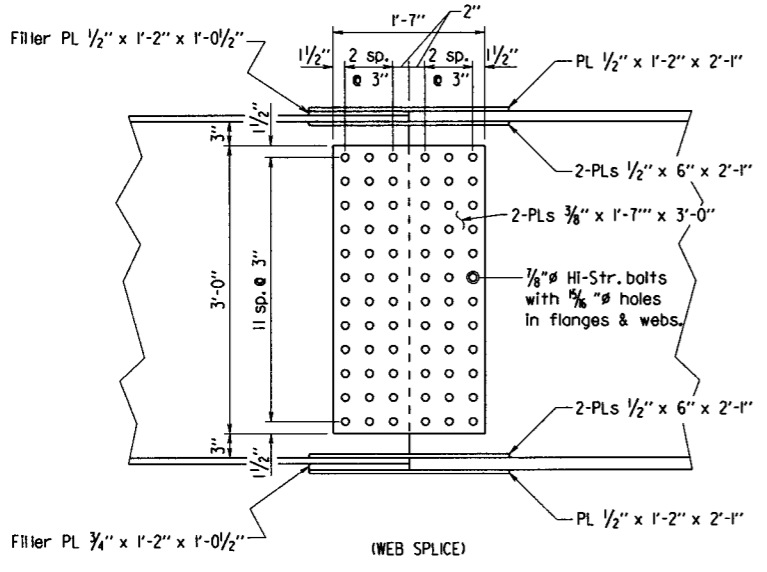
No Scale

SHEAR CONNECTOR DETAIL

No Scale



- ① Stud placement at Interior Girder shown, exclude studs outside of Exterior Girder.
- ② Stud placement at Intermediate Bents shown, placement at End Bents similar.



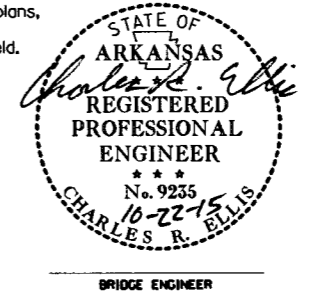
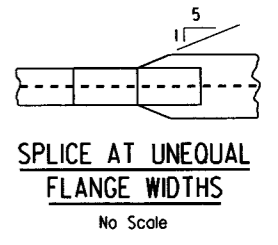
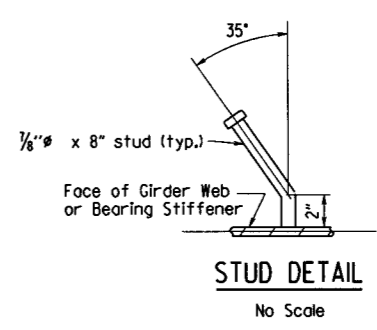
DETAILS OF BOLTED FIELD SPLICE

1" = 1'-0"

TABLE FOR WELD

Material Thickness of Thicker Part Joined (Inches)	Minimum Size of Fillet Weld (Inches)	Single Pass Weld Must Be Used
To 3/4" Inclusive	1/4"	
Over 3/4"	5/16"	

NOTE: When a fillet weld size, as shown on the plans, is larger than the minimum, the first pass shall be that specified for minimum size of fillet weld.



SHEET 4 OF 7
 DETAILS OF 290'-0"
 CONTINUOUS PLATE GIRDER UNIT

ROUTE SEC.
 ARKANSAS STATE HIGHWAY COMMISSION
 LITTLE ROCK, ARK.

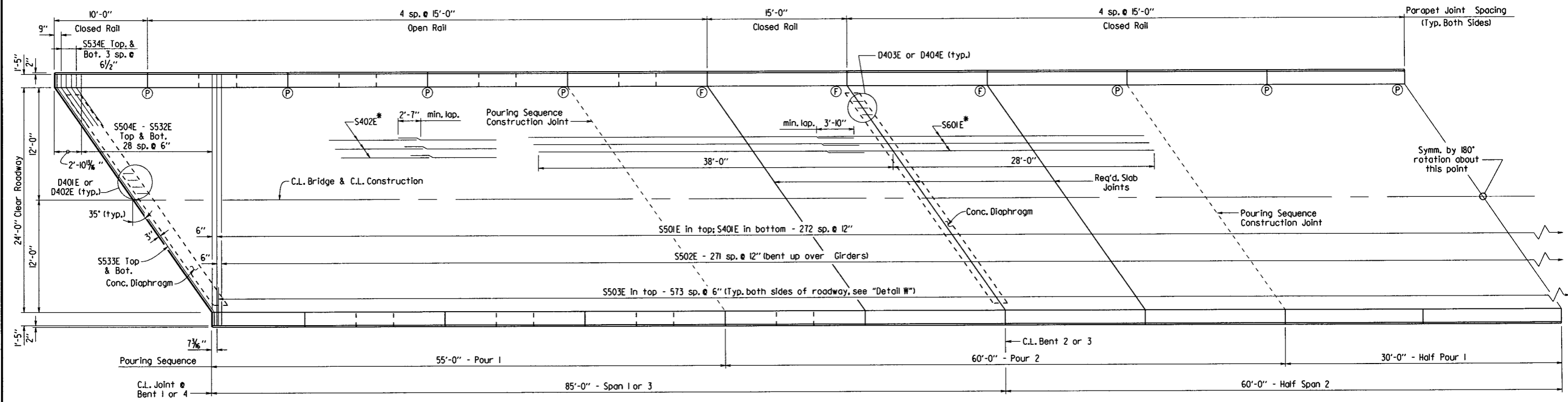
DRAWN BY: LJB DATE: 6/5/2015 FILENAME: bbr1610_sl.dgn
 CHECKED BY: PGT DATE: 7/15 SCALE: As Shown
 DESIGNED BY: LJB DATE: 9/14

BRIDGE NO. 04935 DRAWING NO. 57543

PRINT DATE: 10/23/2015

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO.	BR1610	3171
						①	04935 - 290 FT. UNIT	- 57544

*Placed as shown in "Typical Roadway Section," Dwg. No. 57540.

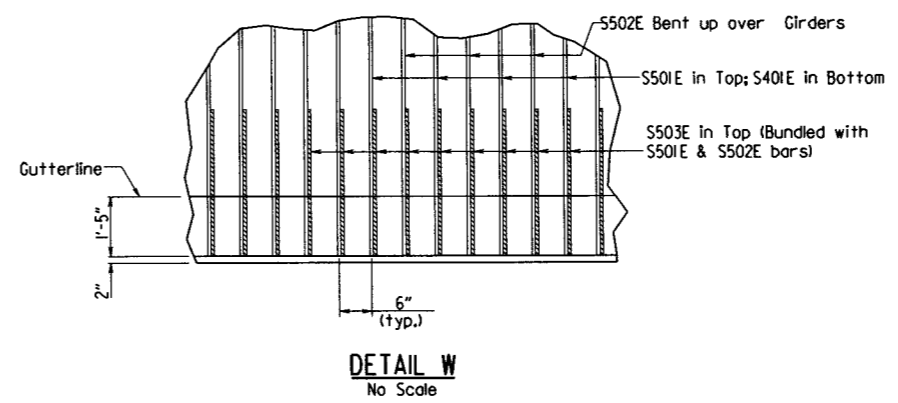


HALF REINFORCING PLAN AND SLAB POURING SEQUENCE
 $\frac{1}{8}'' = 1'-0''$

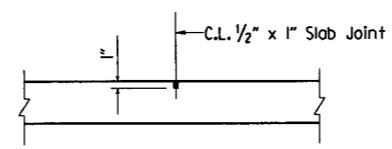
BAR LIST

Mark	No. Req'd.	Length	Pln Dia.	Bending Diagrams (Dimensions are out to out of bars.)
S401E	273	26'-10"	Str.	
S402E	608	38'-6"	Str.	
S501E	273	26'-10"	Str.	
S502E	272	27'-6"	3"	
S503E	1,148	4'-1"	Str.	
S504E - S532E	4 ea.	5'-1" to 25'-1"	Str.	
S533E	4	32'-1"	3 3/4"	
S534E	16	6'-5"	3 3/4"	
S601E	112	34'-11"	Str.	
D401E	34	8'-2"	2"	
D402E	20	5'-2"	2"	
D403E	34	8'-2"	2"	
D404E	20	5'-0"	2"	
D501E	64	8'-9"	Str.	
D502E	64	1'-11"	Str.	
P401E	1,032	5'-6"	3"	
P402E	128	4'-10"	3"	
P403E	104	5'-6"	Str.	
P404E	28	9'-8"	Str.	
P405E	252	14'-8"	Str.	
P501E	1,032	4'-8"	3 3/4"	
D401E				
D402E				
D403E				
D404E				

Bars designated with an "E" are epoxy coated.



DETAIL W
No Scale

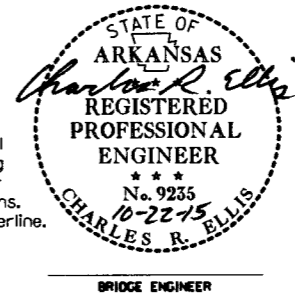


SLAB JOINT DETAIL
No Scale

Use Type 3 or 4 Joint Sealer. See Subsections 50L02(h) and 50L05(j). Backer Rod filler will not be required. Joint Sealer shall be measured and paid for as Class (S/AE) Concrete-Bridge. Slab Joints shall extend to the outside edge of the deck slab and shall align with open joints at the front face of the parapet. Slab joints shall be installed before the parapet railing is poured. If slab joints are to be sawed, they shall be sawed as soon as the concrete has sufficiently set to allow sawing of the joint without damage to the slab. Slab joints shall be placed at all pouring sequence construction joints and required slab joint locations. The joint sealer shall extend across the deck from gutterline to gutterline.

Notes:

- For Parapet Details, See Dwg. No. 57545.
- Req'd. slab joints and pouring sequence joints shall align with open joints in parapet rail of the gutterline.
- Locations of full and partial depth parapet joints shown are typical for both sides of roadway.
- Ⓟ Partial Depth Parapet Joint at this location
- Ⓡ Full Depth Parapet Joint at this location
- Slab Pouring Sequence Notes:
Pours with the same number may be placed simultaneously or separately. All Pours (1) must be placed before Pours (2) can be placed. 48 hours shall elapse between the end of a pour and the start of the next pour. 72 hours shall elapse between adjacent pours.
- If concrete diaphragms are poured separately, a minimum of 48 hours shall elapse between the diaphragm pour and the slab pour.
- Any railing pours made before the entire slab unit has been placed must be approved by the Engineer. The Contractor must obtain approval from the Engineer for any deviations from the pouring sequence shown.



SHEET 5 OF 7
 DETAILS OF 290'-0"
 CONTINUOUS PLATE GIRDER UNIT

ROUTE SEC.
 ARKANSAS STATE HIGHWAY COMMISSION
 LITTLE ROCK, ARK.

DRAWN BY: LJB DATE: 6/5/2015 FILENAME: bbr1610_sl.dgn
 CHECKED BY: PGT DATE: 7/15 SCALE: As Shown
 DESIGNED BY: LJB DATE: 9/11

BRIDGE NO. 04935 DRAWING NO. 57544

PRINT DATE: 10/20/2015

GENERAL NOTES:

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction, 2014 edition, with applicable Supplemental Specifications and Special Provisions.

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications, Sixth Edition (2012), with 2013 Interims.

MATERIALS AND STRENGTHS:

Class S(AE) Concrete
 Reinforcing Steel (Grade 60, AASHTO M 31 or M 322, Type A) f'c = 4,000 psi
 Structural Steel (AASHTO M 270, Gr. 50W) fy = 60,000 psi
 Structural Steel (AASHTO M 270, Gr. 50W) Fy = 50,000 psi
 Structural Steel (AASHTO M 270, Gr. 36) Fy = 36,000 psi

STRUCTURAL STEEL:

Structural Steel shall be AASHTO M 270, Gr. 50W, unless otherwise noted and shall be paid for as "Structural Steel in Plate Girder Spans (M 270, Gr. 50W)". Grade 50W steel shall not be painted. Structural Steel completely embedded in concrete may be AASHTO M 270, Gr. 36 or Gr. 50 unless noted otherwise. All exposed surfaces shall be cleaned in accordance with Subsection 807.84(e).

Requests for substitution of structural steel shapes shown with shapes of greater size must be submitted by the Contractor to the Engineer for approval. Steels of equal or greater strengths will be accepted only when shown on the approved shop drawings. Payment will be based on the basis of shapes and materials shown in the plans, and no additional compensation will be made for any adjustments due to substitutions.

Longitudinal girders and all field splice plates are considered main load carrying members and shall meet the Longitudinal Charpy V-Notch Test specified in Subsection 807.05. This work and material will not be paid for directly but will be considered subsidiary to the item "Structural Steel in Plate Girder Spans (M 270, Gr. 50W)".

Steel plates for main members shall be cut and fabricated so that the primary direction of rolling is parallel to the direction of the main tensile and/or compressive stresses.

Drawings show general features of design only. Shop drawings shall be made in accordance with Subsection 807.04, submitted and approved secured before fabrication is begun. Girder webs may be made by shop splicing with minimum lengths of 25'-0" for sections. Flange plates longer than 50'-0" may be made by shop splicing with minimum lengths of 25'-0" for sections. Material specifications and location of shop-welded splices, if any, shall be shown on the shop drawings. No additional payment for welds for these splices will be made.

All girders shall be blocked in their true position in the shop as specified in Subsection 807.54. The camber, length of sections, distance between bearings and openings of joints shall be measured with the girder in their true position. This information shall become part of the permanent records of this job. The component parts shall be match marked in this assembly and these marks shall be shown on the erection diagram. All girder dimensions are based on a temperature of 60°F. A tolerance of 1/4" +/- is allowed for camber.

All welding that is to be done during fabrication of structural steel, including temporary welds, shall be detailed on the shop drawings and submitted for approval. If additional welds are required, whether permanent or temporary, a formal request with detailed drawings shall be submitted to the Engineer for approval; however, additional welds used for attaching falsework support devices or screed rail supports to the structural steel that do not exceed the limitations of Subsection 802.13 will not require approval prior to construction. All welding shall conform to Subsection 807.26.

Groove welds in web and flange plates shall be Quality Control (Q.C.) tested by nondestructive testing, as required by the governing specifications in Subsection 807.23(b). Fillet welds at flange to web plate connections shall be Q.C. tested by the magnetic particle method. All Quality Control (Q.C.) testing is at the Contractor's expense.

All stud shear connectors shall be granular flux filled, solid fluxed, or equal, and shall be automatically end welded in accordance with recommendations of the manufacturer.

All field connections shall be bolted with high-strength bolts. Bolts in Field Splices shall be 3/8" diameter bolts with 3/8" open holes. Bolts in K-Frame connections shall be 3/4" diameter bolts with 3/4" open holes. Holes for K-Frame connections may be 3/8" diameter if a washer is supplied for use under both the nut and head of bolt. Bolts shall be placed with heads on the outside face of the exterior girder web and on the bottom of the girder flanges.

K-Frames shall be installed as girders are erected unless noted otherwise. All bolts in K-Frames and field splices shall be installed and tightened in accordance with Subsection 807.71 prior to pouring of the concrete deck, unless otherwise noted.

Bearings shall be seated in accordance with Subsection 808.08. This work and material will not be paid for directly but will be considered subsidiary to the item "Elastomeric Bearings".

REINFORCING STEEL:

All reinforcing steel shall be Grade 60 conforming to AASHTO M 31 or M 322, Type A, with mill test reports. The reinforcing steel is to be accurately located in the forms and firmly held in place by steel wire supports, sufficient in number and size to prevent displacement during the course of construction. The wire supports will not be paid for directly, but will be considered subsidiary to the item "Epoxy Coated Reinforcing Steel (Grade 60)".

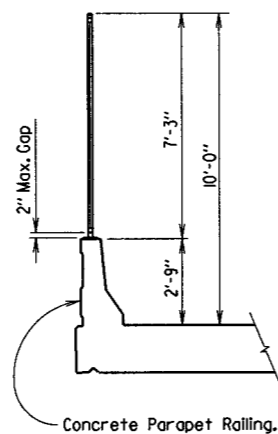
CONCRETE:

All concrete shall be Class S(AE) with a minimum 28 day compressive strength f'c = 4000 psi. Concrete shall be poured in the dry and all exposed corners to be chamfered 3/4" unless otherwise noted.

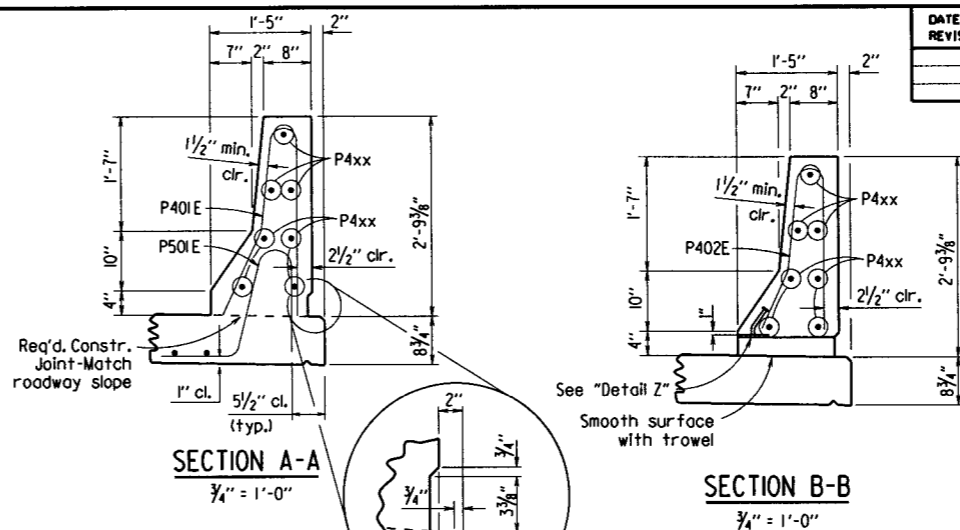
Concrete in bridge superstructure shall be placed, consolidated, and screeded off for the entire pour before any concrete has taken its initial set. This may require the use of a retarding agent.

The concrete deck shall be given a fine finish in accordance with subsection 802.19 for Class 5 Tined Bridge Roadway Surface Finish. Movement of the finishing machine across new concrete shall be on planks placed on the surface and shall be prohibited for 72 hours after finishing the pour. Sufficient concrete must be placed ahead of the strike-off to fully load the strike-off to account for the future dead load deflection due to the ralling. A minimum of 72 hours shall elapse between completion of the slab and the pouring of the parapet railing.

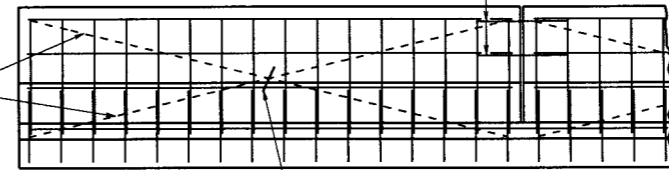
NOTE: A 7'-0" Chain Link Fence is required on both sides of the Bridge. The Fence is to be mounted on top of the concrete parapet rail. For fence details, see Dwg. No. 57547.



TYPICAL SECTION - CHAIN LINK FENCE
 No Scale

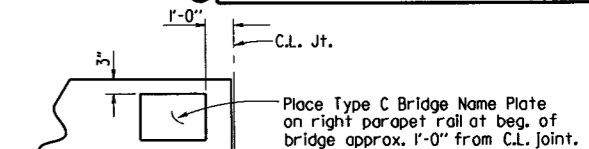


Wire shall be smooth 9 gage, and conform to AASHTO M279, Class 3 galvanization and dimensions.

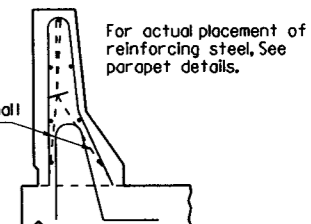


Bar to tighten smooth wire shall be fiberglass or epoxy coated.

All panels shall be braced as required to prevent racking. All open joints shall be sawed as soon as practical to a minimum width of 1/4". To control cracking before sawing, all joints must be grooved before the concrete is set. Sawing of the joints must be controlled so it will follow the grooved joint.



VIEW SHOWING LOCATION OF NAME PLATE
 NTS



All smooth wire bracing shall be placed on the inside faces of the reinforcing

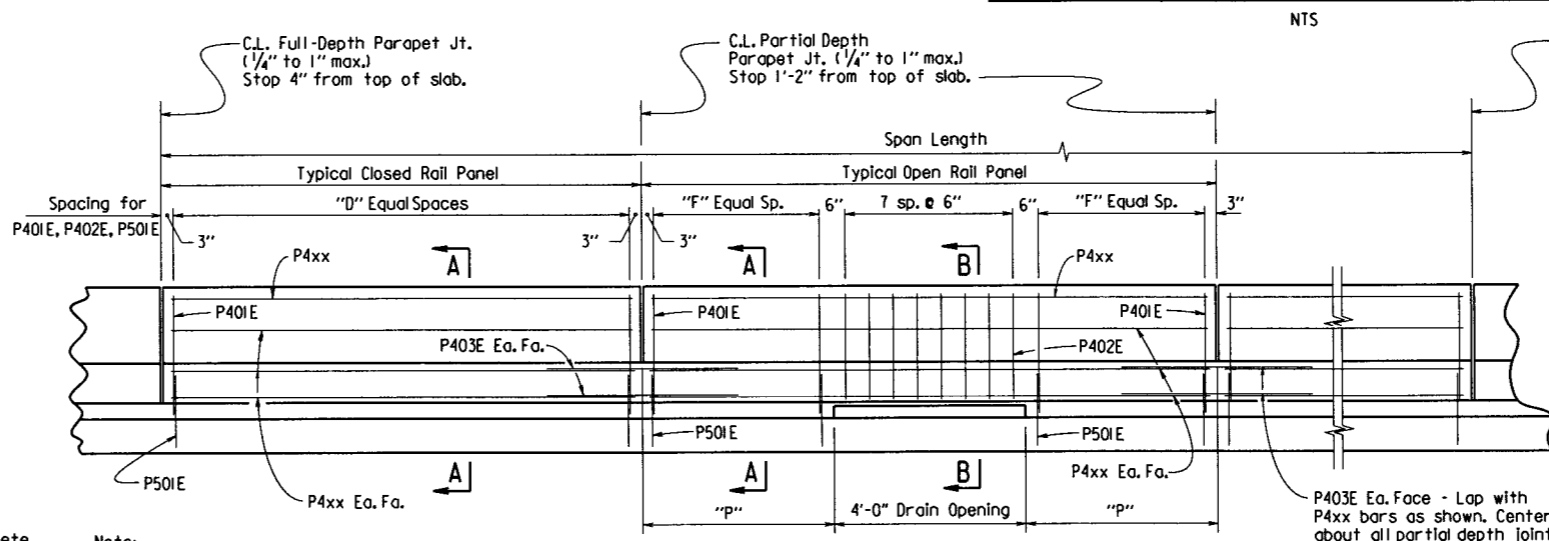
The extruded parapet shall conform to the horizontal and vertical lines shown on the plans or as directed by the Engineer and shall present a smooth, uniform appearance and texture. Unless otherwise noted, exposed surfaces may be given a light brush finish or a Class 3 Textured Coating Finish in place of Class 2 Rubbed Finish.

TABLES OF PARAPET RAIL VARIABLES

Closed Rail Panels		
Panel Length	"D"	P4xx Bar
10'-0"	19	P404E
15'-0"	29	P405E

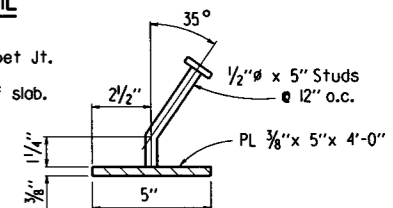
Open Rail Panels			
Panel Length	"F"	"P"	P4xx Bar
15'-0"	10	5'-6"	P405E

DETAILS OF OPTIONAL SLIPFORMING OF CONCRETE PARAPET RAIL



ELEVATION - CONCRETE PARAPET RAIL
 No Scale

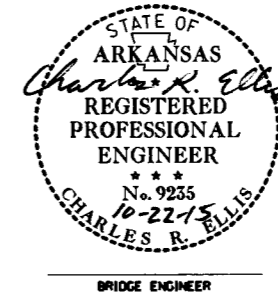
Note: For Location of fixed and partial depth joints, See "Half Reinforcing Plan and Slab Pouring Sequence" on Dwg. No. 57544.



Note: Parapet Studs shall be 5" long, granular flux filled, solid fluxed, or equal, and automatically end welded to the plate. Studs and plate shall meet the requirements of Section 807. Studs and plate shall be measured and paid for as Structural Steel in Plate Girder Spans (M 270, Gr. 50W).

The surfaces of the 3/8" Plates which will not be in contact with concrete shall be painted in accordance with Section 638, or as approved by the Engineer. Only one coat is required and shall be applied in the Fabricator's shop. Painting will not be paid for directly, but will be considered subsidiary to Structural Steel in Plate Girder Spans (M 270, Gr. 50W).

DETAIL Z
 NTS

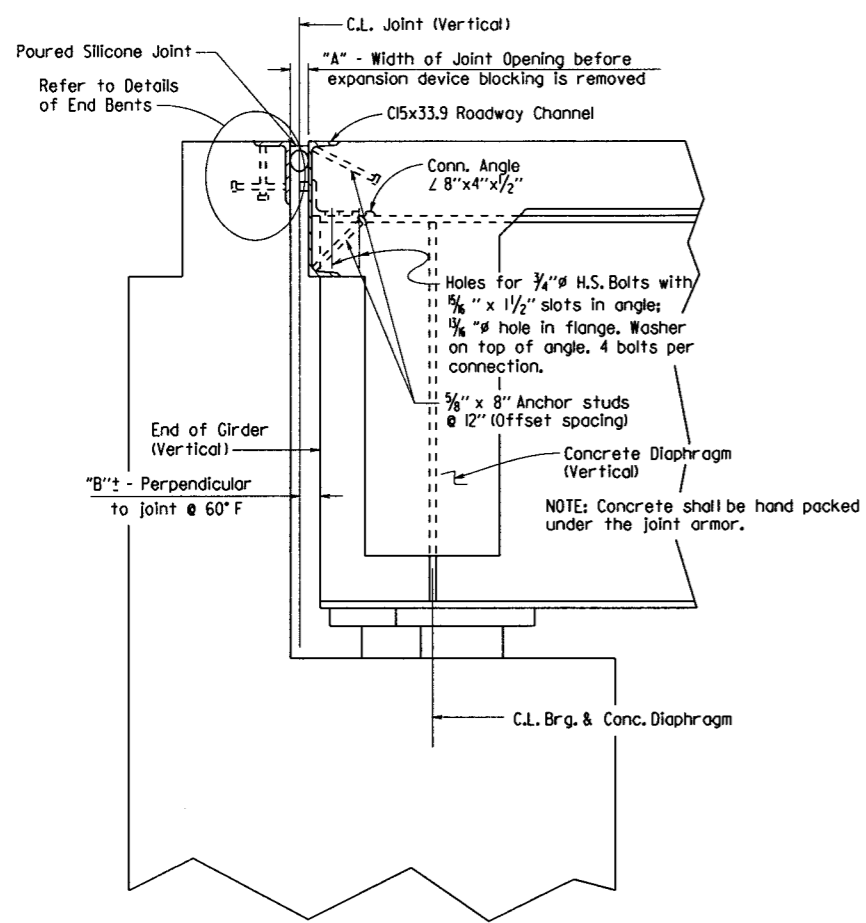


SHEET 6 OF 7
 DETAILS OF 290'-0"
 CONTINUOUS PLATE GIRDER UNIT

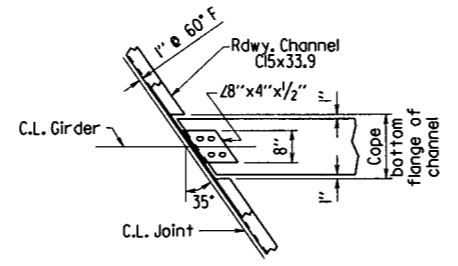
ROUTE SEC.
 ARKANSAS STATE HIGHWAY COMMISSION
 LITTLE ROCK, ARK.

DRAWN BY: LJB DATE: 6/5/2015 FILENAME: bbr1610_sl.dgn
 CHECKED BY: PGT DATE: 7/15 SCALE: As Shown
 DESIGNED BY: LJB DATE: 9/14
 BRIDGE NO. 04935 DRAWING NO. 57545

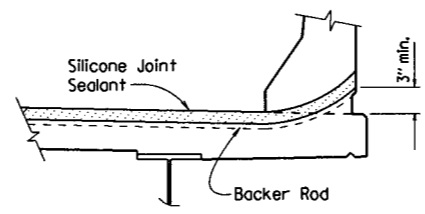
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				6	ARK.			
				JOB NO.	BR1610		33	71
				①	04935 - 290 FT. UNIT			57546



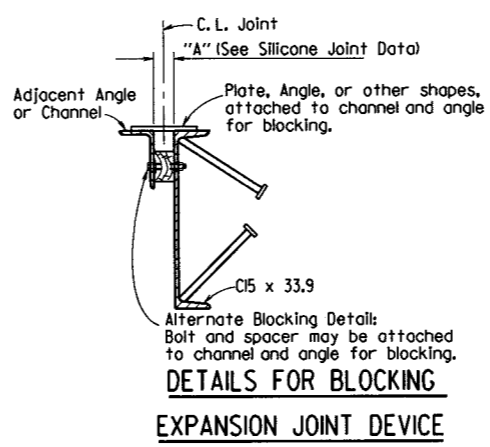
NOTE: Section taken perpendicular to C.L. Joint
SECTION THRU JOINT AT TYPE C END BENT



CHANNEL CONNECTION DETAIL
No Scale



JOINT SEAL PLACEMENT AT CURB

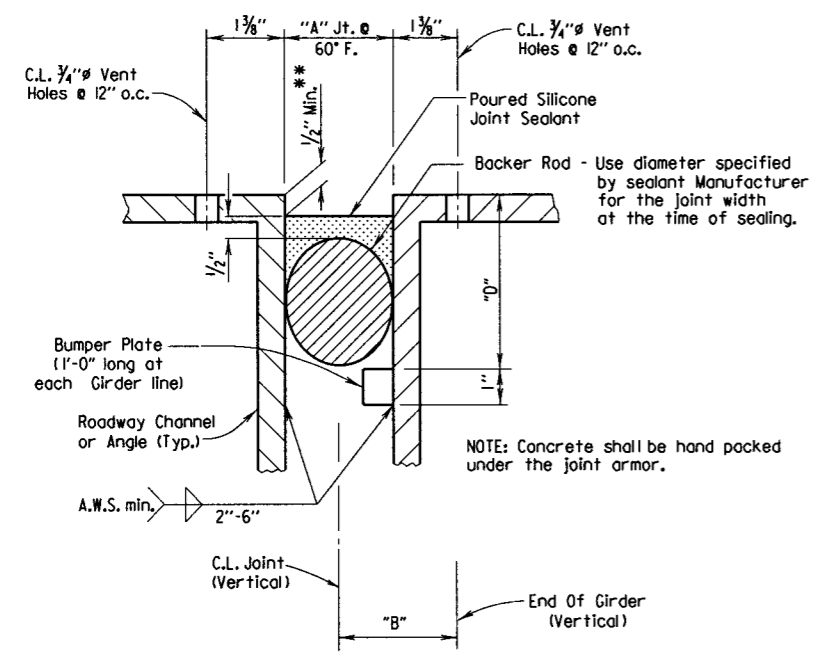


Alternate Blocking Detail:
Bolt and spacer may be attached to channel and angle for blocking.
DETAILS FOR BLOCKING
EXPANSION JOINT DEVICE
Note: Each expansion joint device shall be blocked in the Shop by the Fabricator to the dimension "A" shown for 60° F and the blocking details shall be shown on the shop drawings. Blocking shall be placed within 2 feet of each end of the device and with a maximum spacing of 8 feet.

EXPANSION DEVICE INSTALLATION AT END BENTS:

- The Contractor may elect to install the expansion device using one of the following two alternatives:
- 1) The concrete span pour adjacent to joint shall be placed before the end bent backwall is placed. After the end bent backwall forms are in place and the girders erected, the blocked expansion device shall be installed and adjusted for grade. All connection bolts shall be fully tightened prior to placing the deck concrete adjacent to the bent. Immediately prior to pouring the backwall concrete, the blocking shall be removed, and the opening adjusted for temperature and grade.
 - 2) The backwall shall be poured to the optional construction joint after girders are erected. The blocked expansion device shall be installed and adjusted for grade. All connection bolts shall be fully tightened prior to placing the deck concrete adjacent to the bent. Immediately prior to pouring the remainder of the backwall concrete, the blocking shall be removed and the opening adjusted for temperature and grade.

** Recess depth as recommended by the sealant Manufacturer



DETAIL OF POURED SILICONE JOINT

SILICONE JOINT DATA

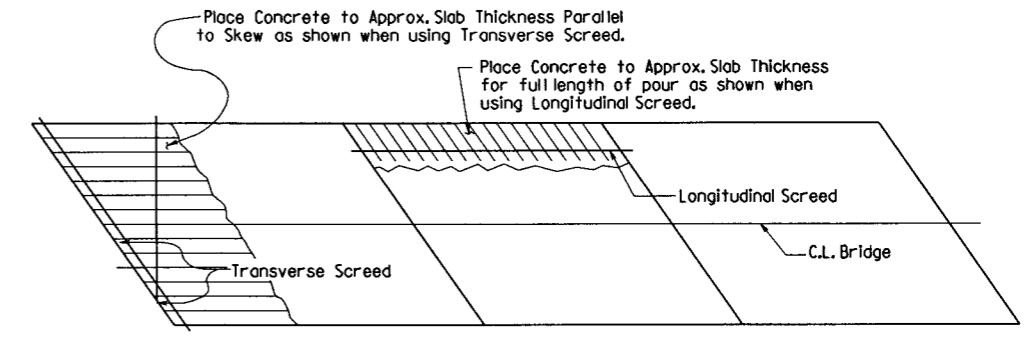
"A" Width Perpendicular to Joint at 24 Hour Average Temperature* Of:	"B" Perpendicular to Joint at 60° F			"D"	Bumper Plate Size
	40° F	60° F	80° F		
2 3/8"	2"	1 1/2"	2 1/4" ±	4 1/2"	1" x 1"

* The temperature used to set the joint opening shall be the approximate average air temperature during the 24 hour period immediately before the bolts are tightened. The Engineer shall establish the temperature. Interpolation of the table may be necessary.

Notes:
The temperature limitations recommended by the sealant Manufacturer shall be observed. The sealant shall be installed only when the average 24 hour air temperature is between 40° and 80° F.

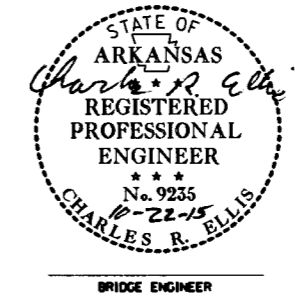
Use an appropriately sized backer rod at the depth shown in the Manufacturer's literature based on the joint width at the time of sealing. Unless otherwise noted, do not install more backer rod than can be sealed in the same day.

The Contractor shall verify separation of the backer rod from the joint material after the joint material has set.



NOTE: At the Contractor's Option, the Transverse Screed may be placed parallel to the skew or perpendicular to C.L. Bridge.

CONCRETE PLACEMENT PROCEDURE
No Scale



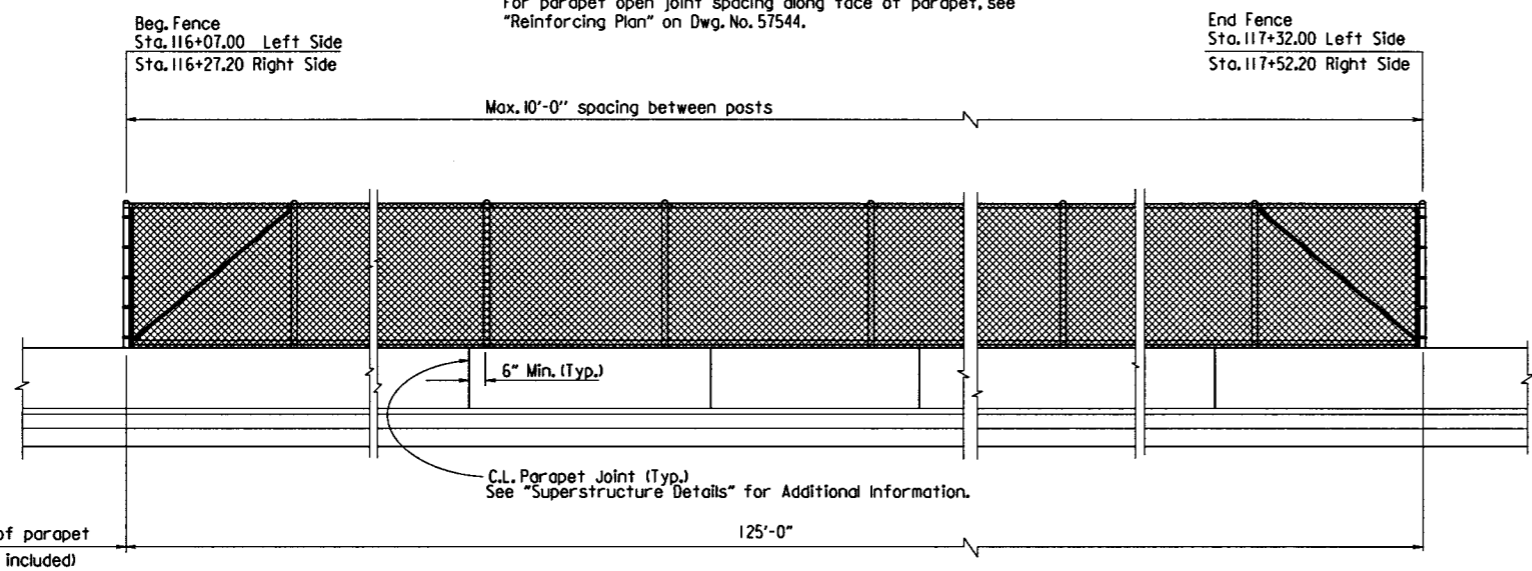
SHEET 7 OF 7
DETAILS OF 290'-0"
CONTINUOUS PLATE GIRDER UNIT

ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: LJB DATE: 6/5/2015 FILENAME: bbr1610_sl.dgn
CHECKED BY: PGT DATE: 7/15 SCALE: as noted
DESIGNED BY: LJB DATE: 9/14
BRIDGE NO. 04935 DRAWING NO. 57546

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. BRIG 0							34	71
① 04935 CHAIN LINK FENCE								57547

Stations and post spacing are shown along CL Construction.
For parapet open joint spacing along face of parapet, see "Reinforcing Plan" on Dwg. No. 57544.



LONGITUDINAL VIEW OF CHAIN LINK FENCE

Notes:

Fence layout shall conform to the vertical and horizontal bridge alignments. Fence posts shall be set plumb (true vertical position). Parapet rail concrete shall be at least 7 days old before stretching and securing fabric to posts.

Cast in place anchor Bolts shall be of stainless steel or High Strength Steel. Stainless steel anchor bolts shall conform to ASTM A193 or A320-Grade B8 with a minimum yield strength of 80,000 psi. High Strength Steel Anchor Bolts shall conform to AASHTO M64 or ASTM A354-Grade BC Galvanized in accordance with AASHTO M232.

Nuts: Nuts shall conform to ASTM A194-Gr. 8 (Stainless Steel) or AASHTO M64 Galvanized in accordance with AASHTO M232.

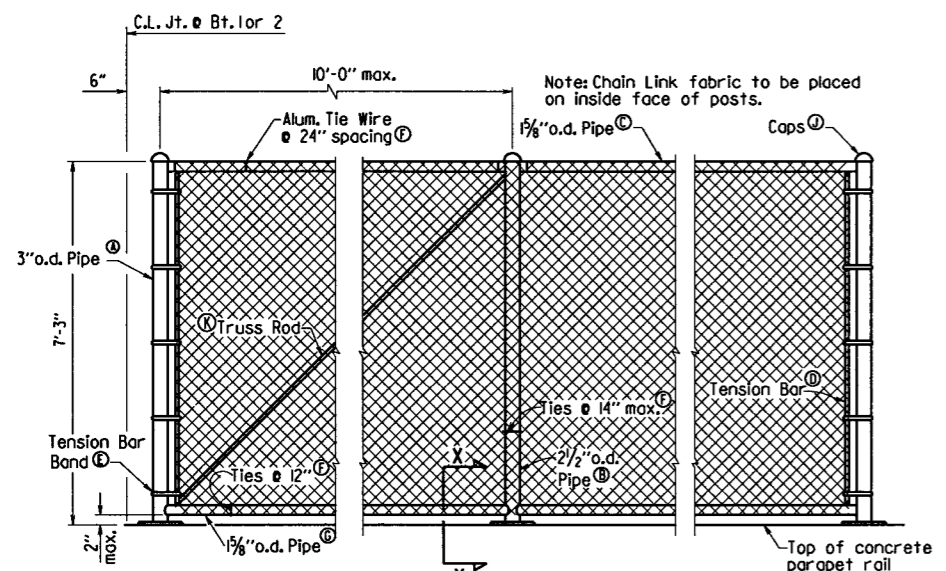
Threads: Threads on bolts, screws, and nuts shall conform to American Standard Course Series, Class 2 Fit, ASA Specification B1.

Washers shall be of High-Strength Steel conforming to AASHTO M270, GR. 36 Galvanized in accordance with AASHTO M232 or of Stainless Steel conforming to ASTM A276 or A167-Type 302.

Shop drawings showing details of the fence shall be submitted and approval secured before fabrication is begun.

Base plates shall not be placed upon areas that are improperly finished, deformed, or irregular.

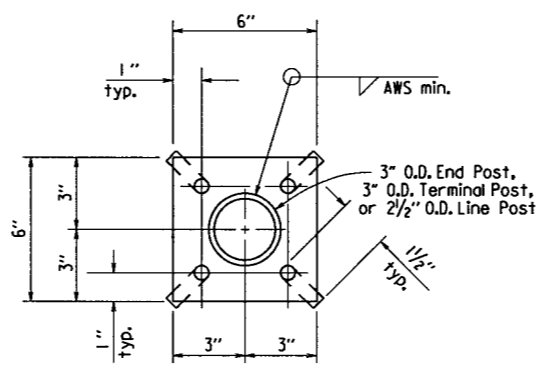
Neoprene pad and template plates shall not be paid for directly, but shall be considered incidental to the unit price bid for item "7' Steel Chain Link Fence".



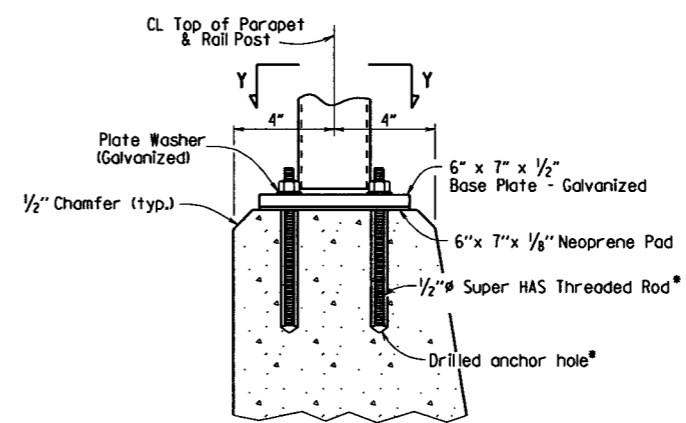
DETAIL OF CHAIN LINK FENCE

- Ⓐ END POST: 3" O.D.
- Ⓑ LINE POST: 2 1/2" O.D.
- Ⓒ TOP RAIL: 1 1/2" O.D.
- Ⓓ TENSION BAR: 3/4" x 3/4" Bar
- Ⓔ TENSION BAR BAND: 3/4" x .074 w/ 3/16" x 1 1/4" Bolt (1 Band Top & Bottom w/ 15" max. spaces)
- Ⓕ TIE WIRE: 9 Ga. Aluminum
- Ⓖ BOTTOM RAIL: 1 1/2" O.D.
- Ⓗ FABRIC: 9 Ga. 2" Mesh w/ Knocklug or Twisting Selvage
- Ⓙ CAPS: All Posts shall be Capped & Shall Conform to ASTM F626-84
- Ⓚ TRUSS ROD: Min. of 3/8" Round with Tighteners and Fittings

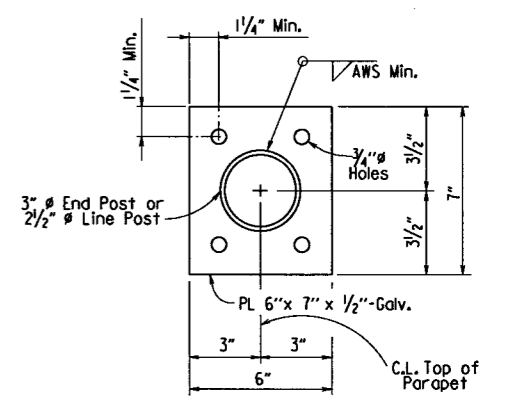
Note: Chain Link Fence attached to Bridge shall be paid for as "7' Steel Chain Link Fence". For additional details of Chain Link Fence see Standard Drawing WF-3.



SECTION Y-Y



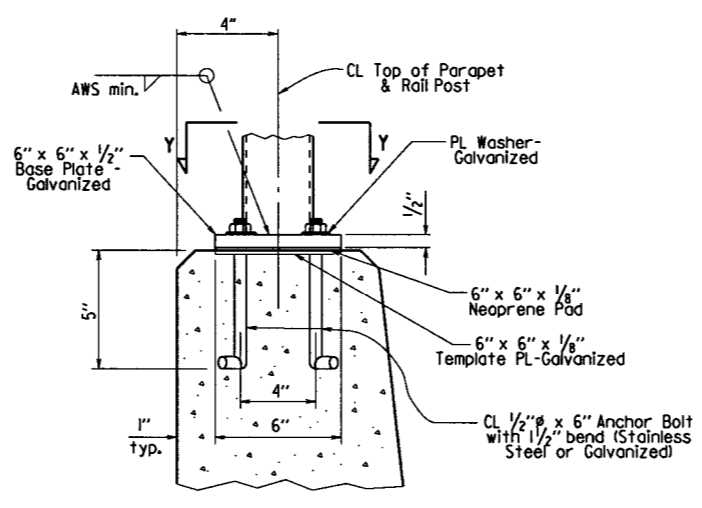
SECTION X-X



SECTION Y-Y

* HILTI HIT RE 500 Epoxy Adhesive Anchor System with 4 1/2" embedment or approved equal. The HILTI Adhesive Anchor System shall be installed in accordance with Manufacturer's recommendation.

DETAILS OF ALTERNATE POST ANCHOR SYSTEM



SECTION X-X



BRIDGE ENGINEER

DETAILS OF CHAIN LINK FENCE

ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: JAC DATE: 11-24-14 FILENAME: BR1610x1.PS.Jt.dgn

CHECKED BY: PLOJ DATE: 8/15 SCALE: No Scale

DESIGNED BY: STD DATE: BRIDGE NO. 04935 DRAWING NO. 57547

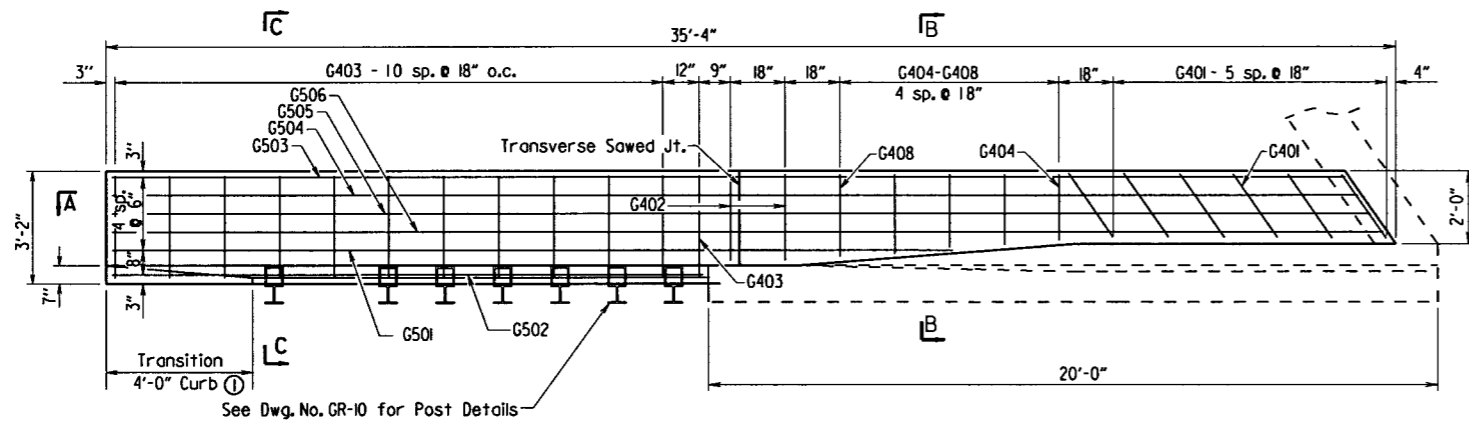
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. BRI 610							3571	

04935 - TYPE SPECIAL GUTTERS - 57548

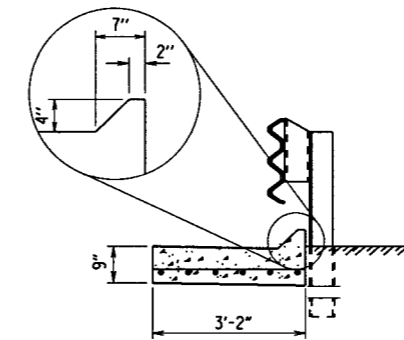
① Construct gutter curb with height-transition as shown if drop inlet is not placed at end of gutter.

Construct gutter curb full height (no height-transition) if drop inlet is placed at end of gutter. Curb height transition placed on drop inlet. See drop inlet details.

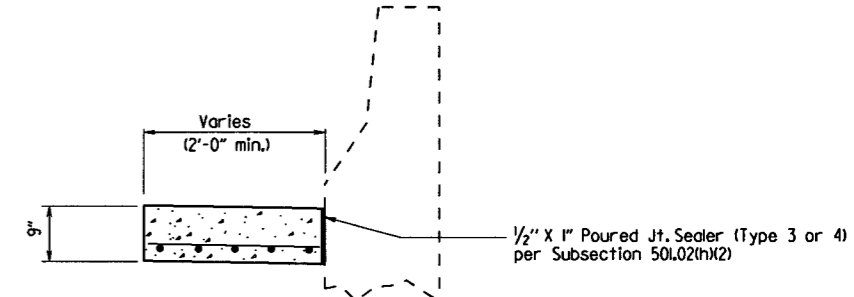
Eliminate or modify curb section to fit where Bridge End Terminals are used. No payment shall be made for eliminating or modifying this curb, compensation shall be considered included in the price bid for "Approach Gutters (Type Special)".



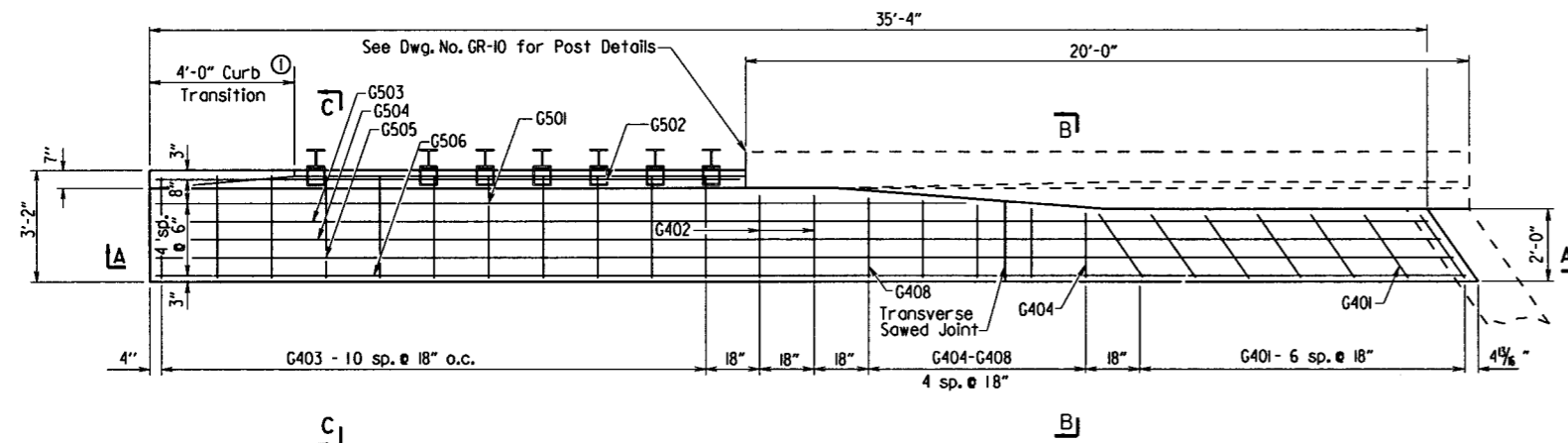
HALF PLAN OF TYPE SPECIAL APPROACH GUTTER AT WING A



SECTION C - C
N.T.S.



SECTION B - B
N.T.S.



HALF PLAN OF TYPE SPECIAL APPROACH GUTTER AT WING B

BAR LIST FOR ONE TYPE SPECIAL GUTTER

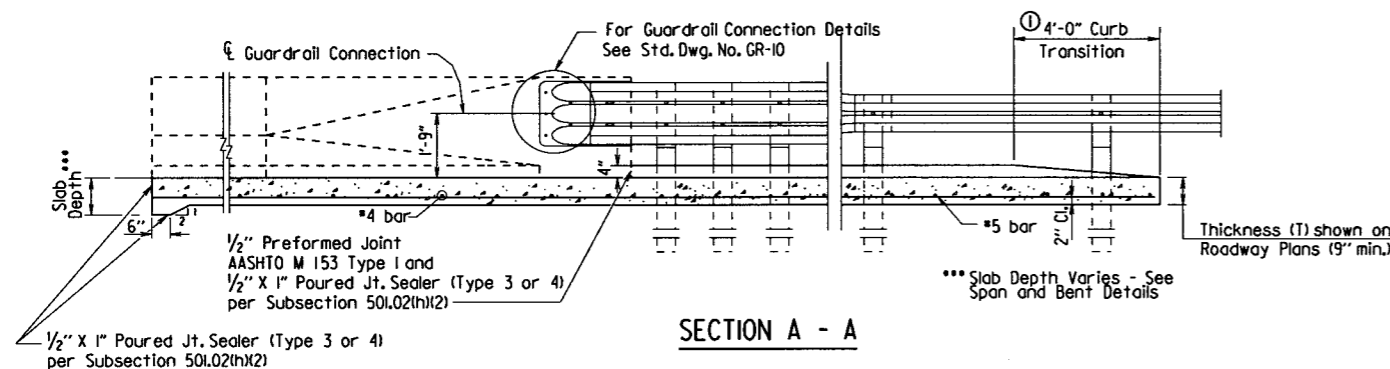
Mark	No. Req'd. for Type Gutter		Length for Type Gutter	
	Wing A	Wing B	Wing A	Wing B
G401	6	7	2'-0"	2'-0"
G402	2	2	2'-3"	2'-3"
G403	12	11	2'-10"	2'-10"
G404-G408	1 each	1 each	1'-8" to 2'-2"	1'-8" to 2'-2"
G501	1	1	21'-0"	21'-0"
G502	1	1	16'-2"	16'-2"
G503-G506	1 each	1 each	33'-9" to 34'-9"	35'-2" to 36'-2"

GENERAL NOTES

All concrete shall be Class S or Class S(AE) or mixture used for Portland Cement Concrete Pavement and shall be poured in the dry.

All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M 31 or M 322, Type A, with mill test reports.

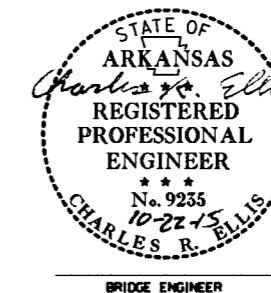
Approach Gutters will be measured and paid for in accordance with Section 504.



SECTION A - A

QUANTITIES FOR ONE TYPE SPECIAL APPROACH GUTTER

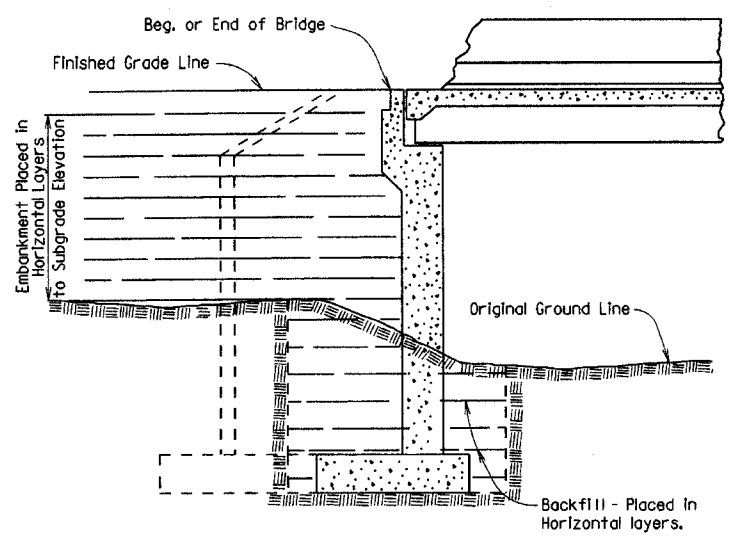
Type Gutter	Reinforcing Steel (lbs.)	Concrete (cubic yards)
Wing A	222	2.6
Wing B	227	2.7



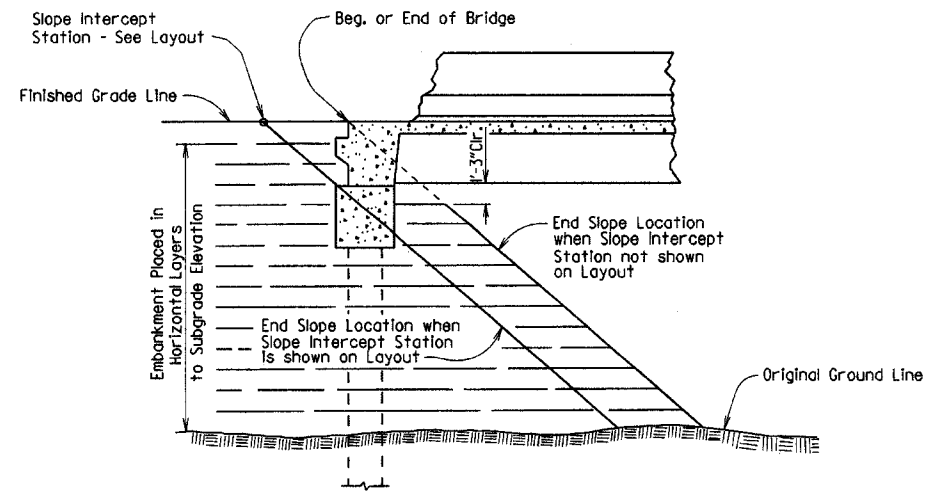
DETAILS OF TYPE SPECIAL APPROACH GUTTERS
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: JAC DATE: 8-27-2015 FILENAME: br1610xl.qldgn
CHECKED BY: JYP DATE: 10-13-15 SCALE: 3/8" = 1'-0"
DESIGNED BY: STD. DATE: — or AS SHOWN
BRIDGE NO. 04935 DRAWING NO. 57548

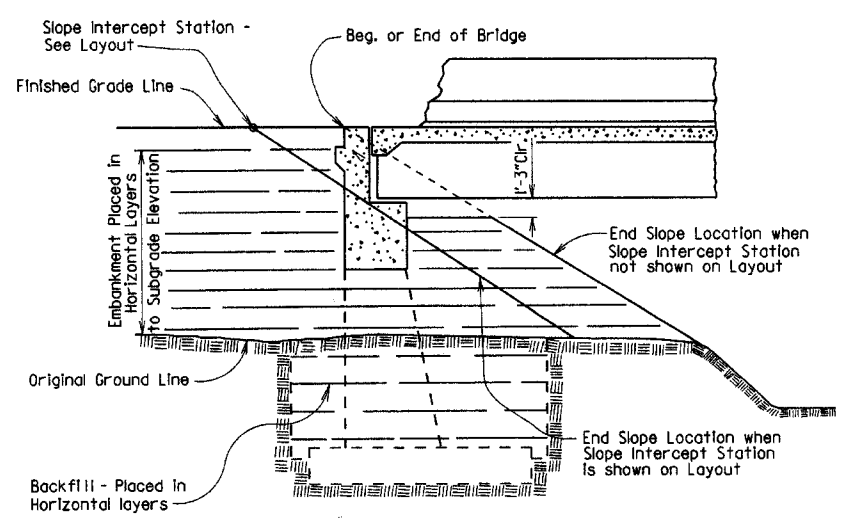
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		36	
							JOB NO.	
							EMBANKMENT & BACKFILL	55000



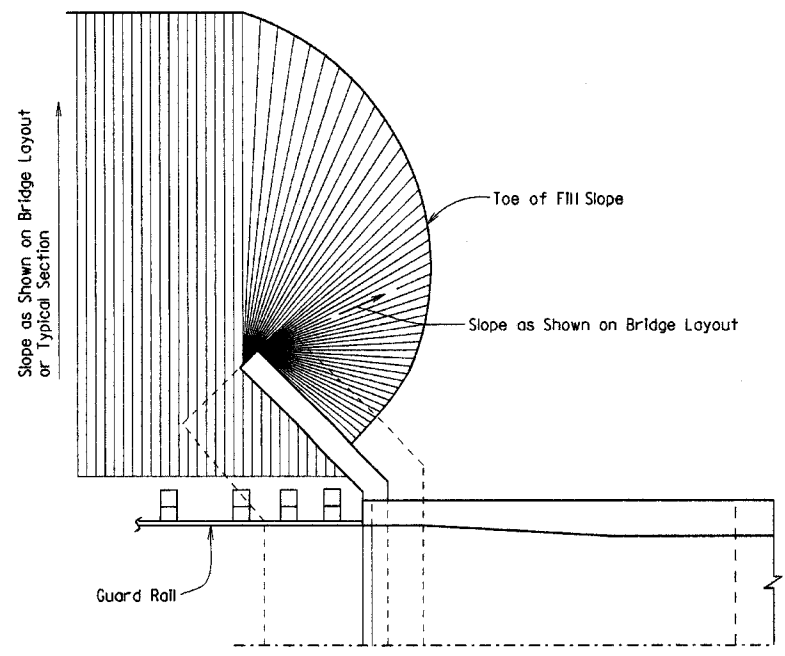
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT VERTICAL WALL ABUTMENTS



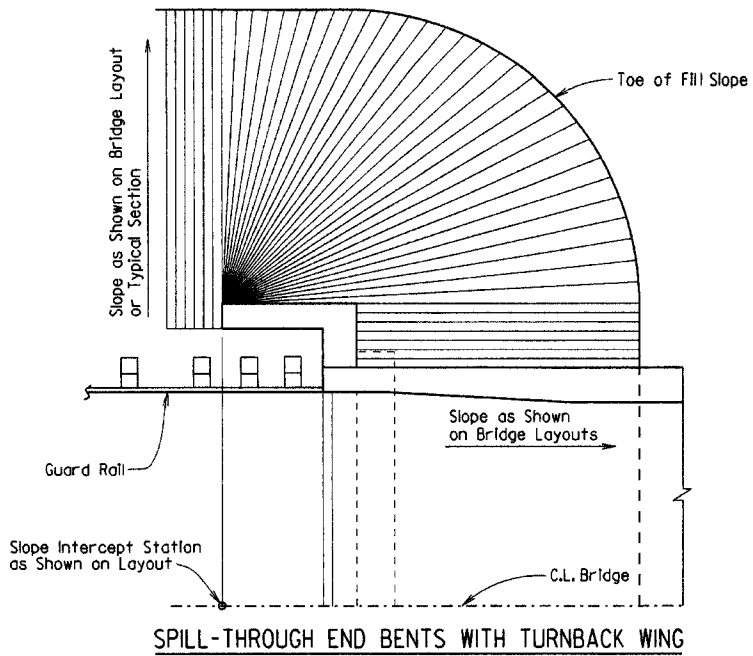
EMBANKMENT CONSTRUCTION AT SPILL-THROUGH PILE END BENTS



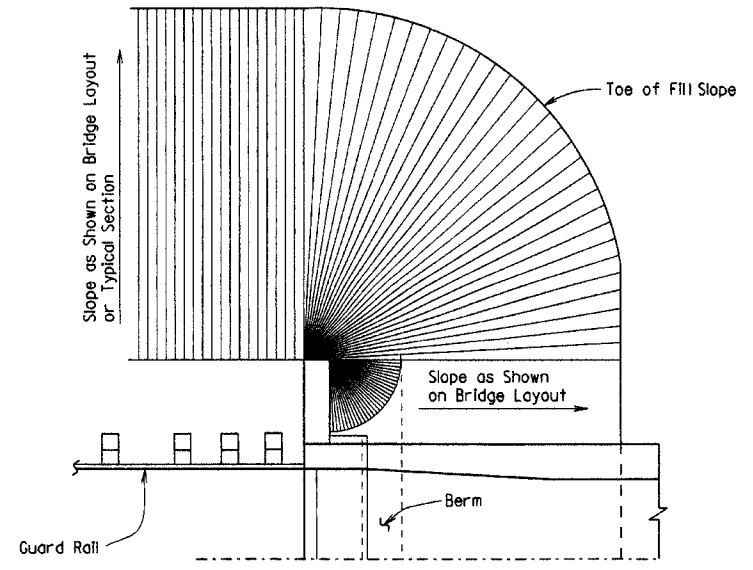
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT SPILL-THROUGH END BENTS



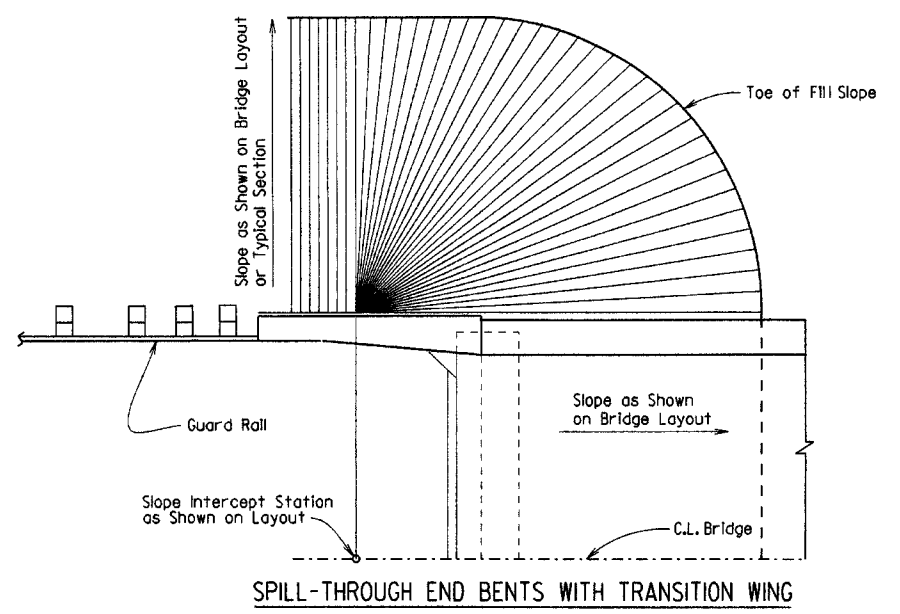
VERTICAL WALL ABUTMENTS



SPILL-THROUGH END BENTS WITH TURNBACK WING



SPILL-THROUGH END BENTS WITH STUB WING



SPILL-THROUGH END BENTS WITH TRANSITION WING

METHOD OF DETERMINING FILL SLOPE LOCATION AT BRIDGE ENDS

GENERAL NOTES

The Bridge End Embankment shall be defined as a section of embankment, not less than 20 feet long adjacent to the bridge end, together with the side slopes and slopes under the bridge end including around the end of wingwalls. Embankment adjacent to structures shall be constructed in 6 inch horizontal layers (loose measure) and compacted by the use of mechanical equipment to the satisfaction of the Engineer. Refer to Subsections 210.09, 210.10 and 80L.08 for construction requirements.

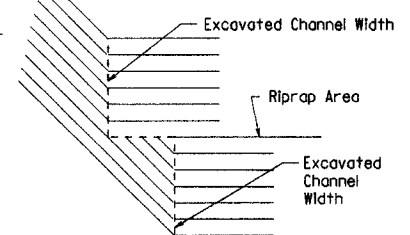
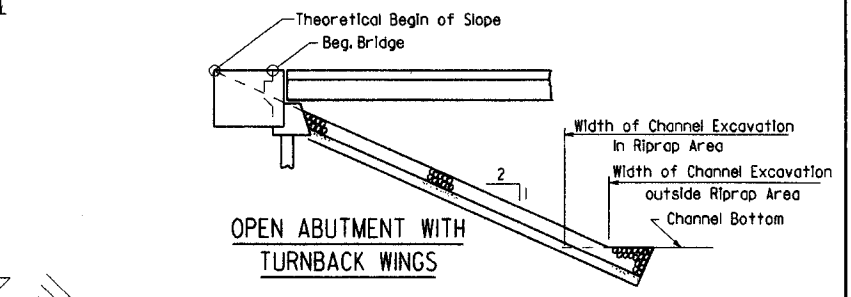
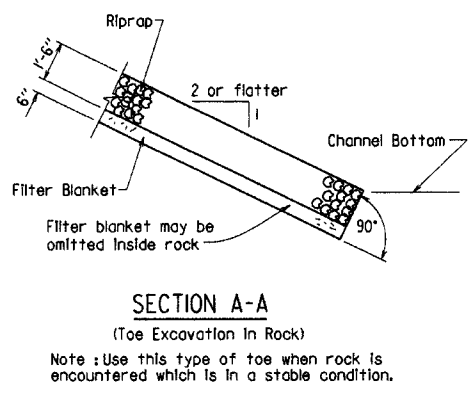
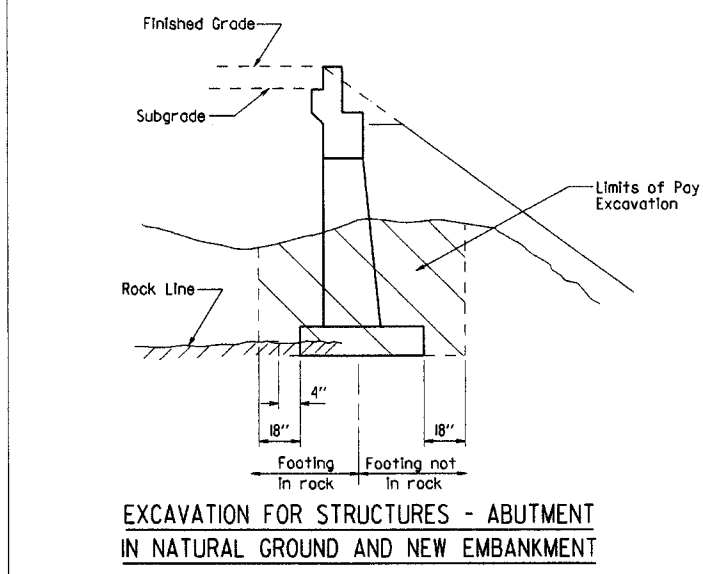
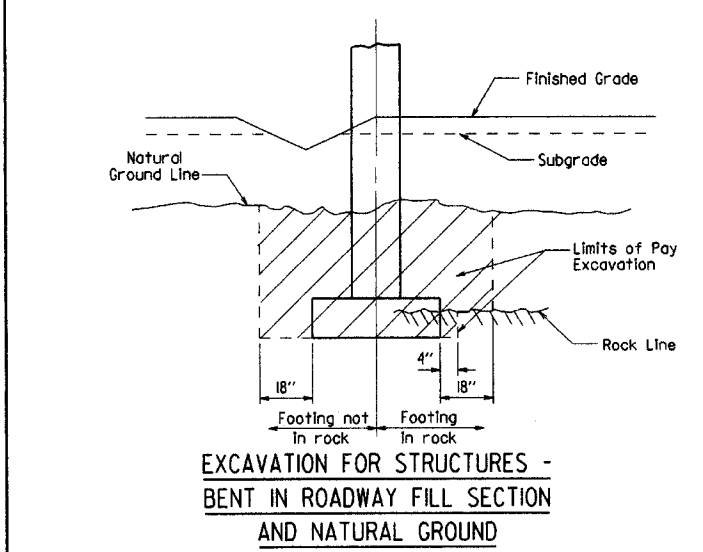
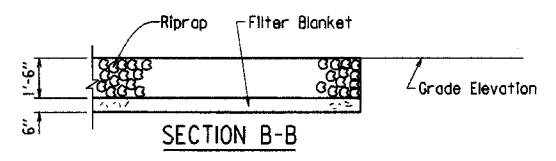
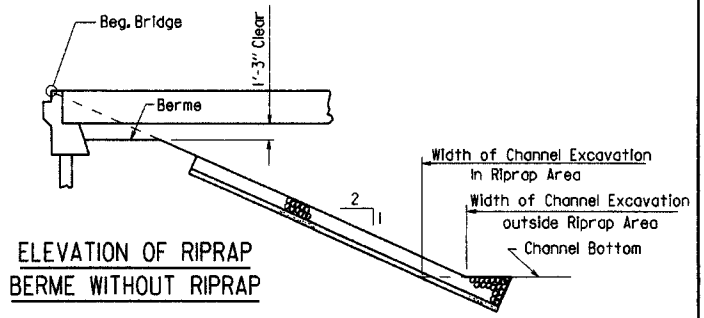
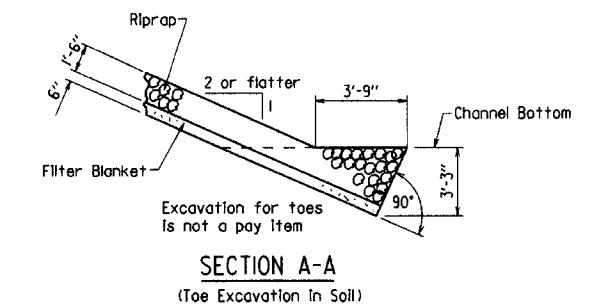
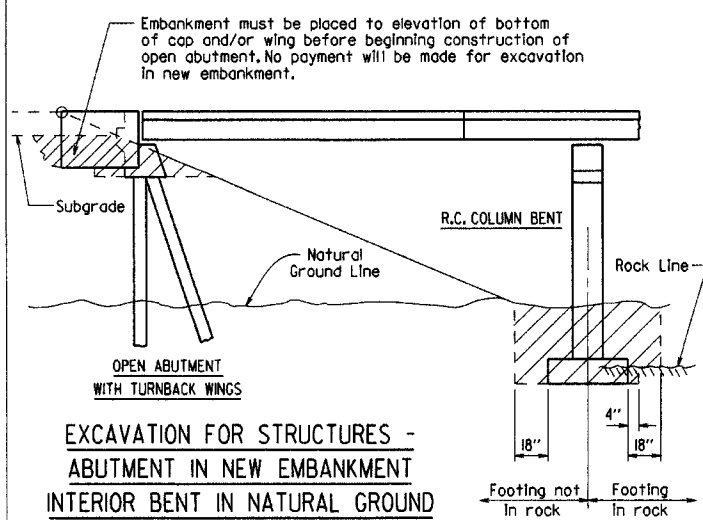
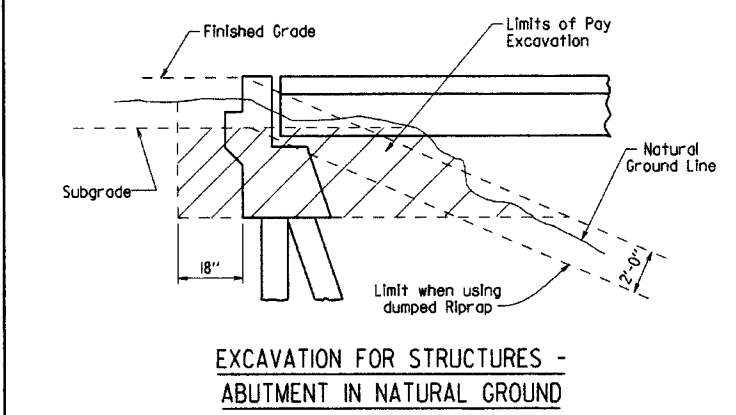
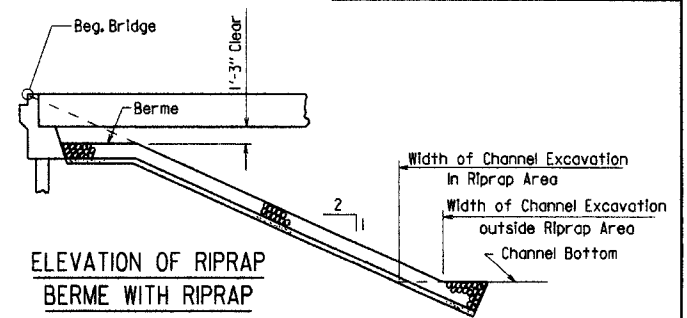
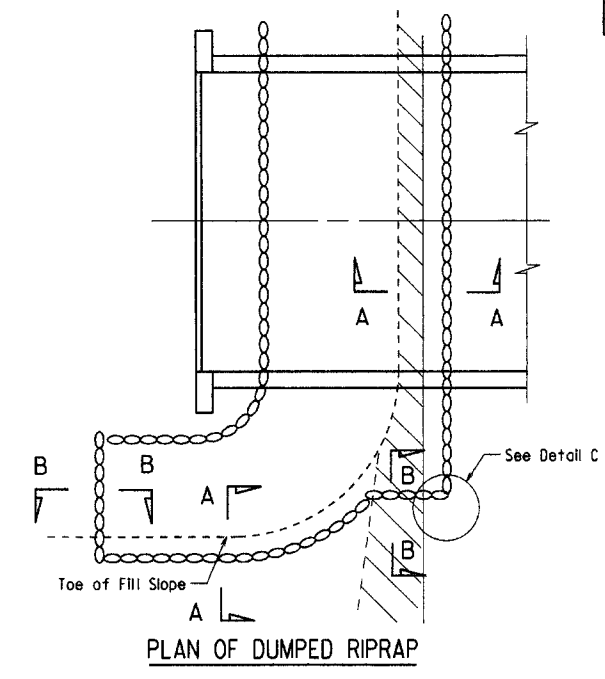
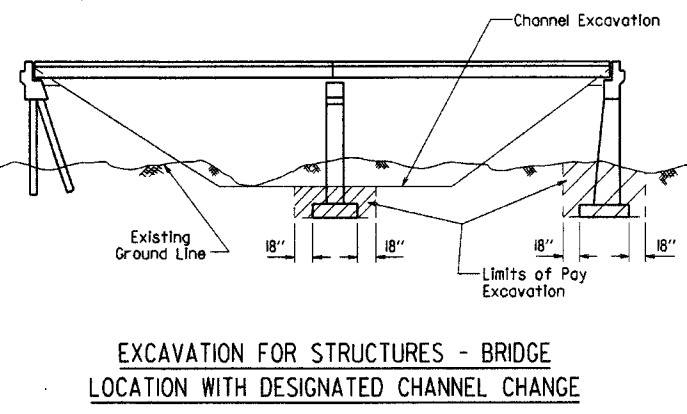
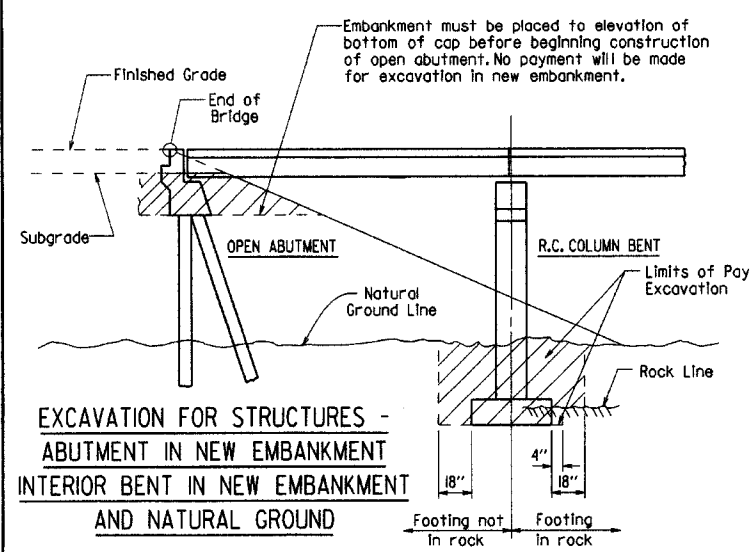
STANDARD DETAILS FOR EMBANKMENT CONSTRUCTION AND BACKFILL AT BRIDGE ENDS

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55000.dgn
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE
DESIGNED BY: STD. DATE: -

DRAWING NO. 55000

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		37	
				JOB NO.				
① RIPRAP & EXCAV. 55001								



Note: Use this type of toe when rock is encountered which is in a stable condition.

Note: In lieu of an aggregate filter blanket, a synthetic fiber geotextile fabric complying with the requirements of Subsection 816.02(e) may be used.

Note: Details for computing excavation for structures are included for information as to how plan quantities were calculated and for use when adjusting quantities when changing footing elevation.

STANDARD DETAILS FOR DUMPED RIPRAP AND FILTER BLANKET AND COMPUTING EXCAVATION FOR STRUCTURES

ARKANSAS STATE HIGHWAY COMMISSION

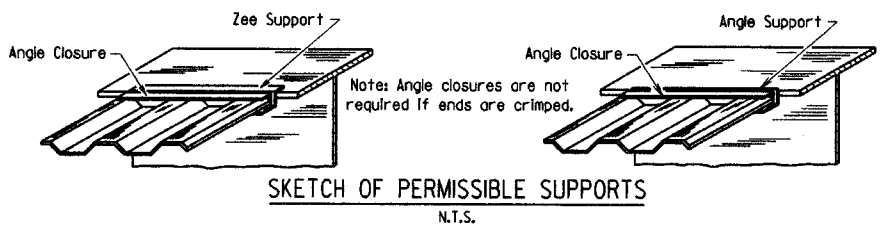
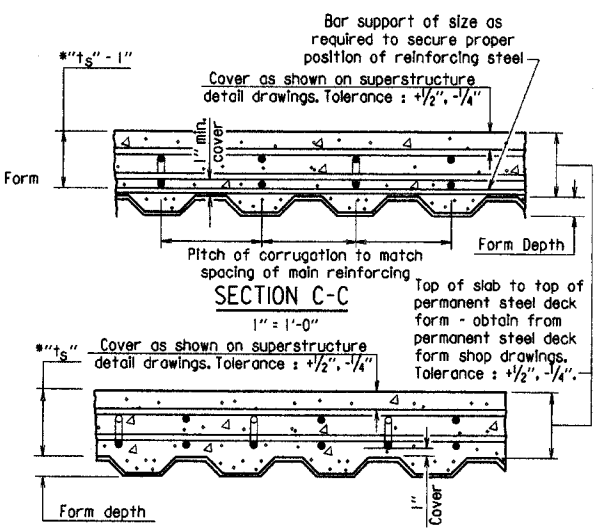
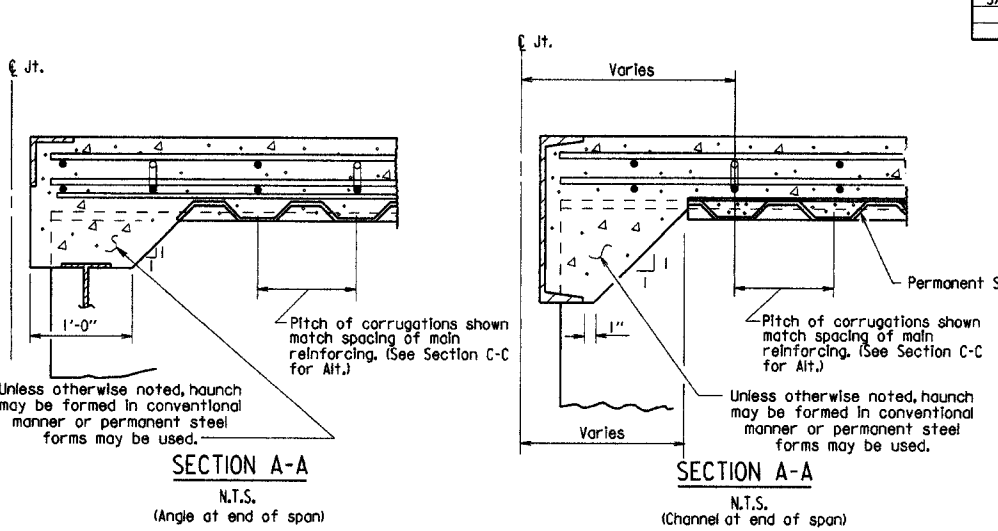
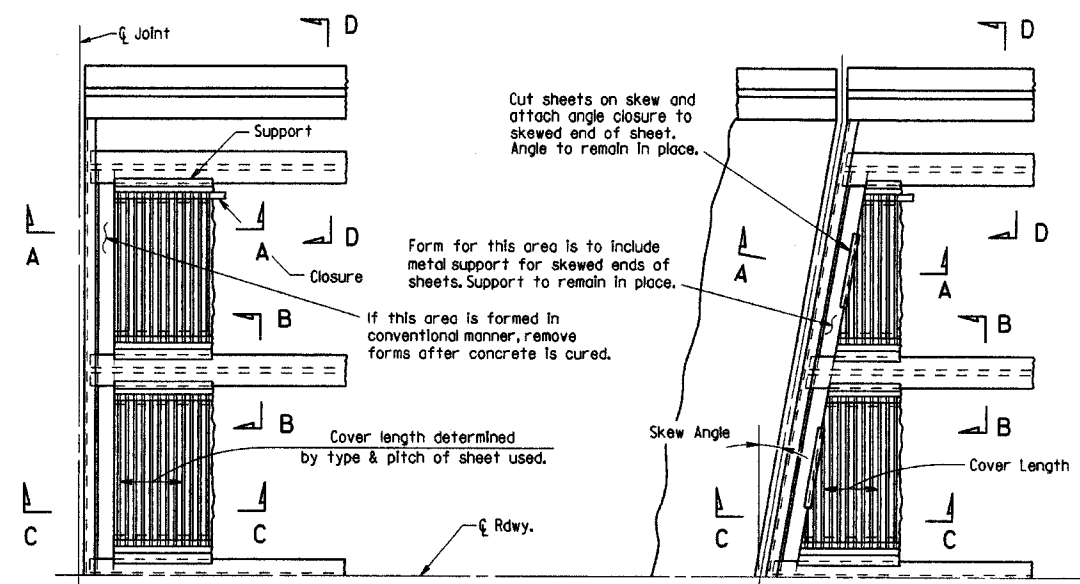
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b5500L.dgn
 CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE
 DESIGNED BY: STD. DATE:

DRAWING NO. 55001

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3/24/16				6	ARK.		38	
							JOB NO.	

BRIDGE DECK FORMS 55005



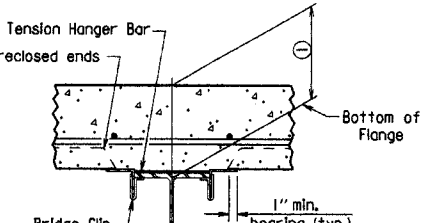
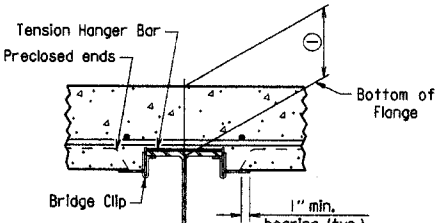
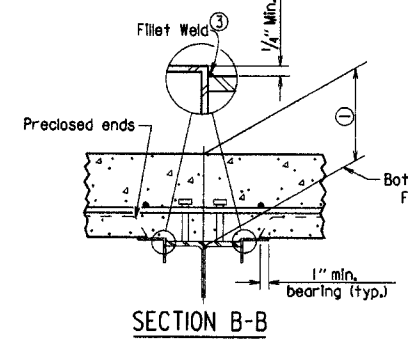
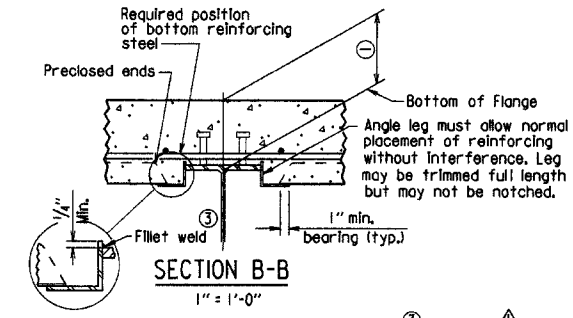
PART PLAN - SQUARE SPAN
3/8" = 1'-0"

PART PLAN - SKEWED SPAN
3/8" = 1'-0"

SECTION A-A
N.T.S.
(Angle at end of span)

SECTION A-A
N.T.S.
(Channel at end of span)

SECTION C-C - ALTERNATE
1" = 1'-0"
(Applicable when corrugations do not match spacing of main reinforcement)

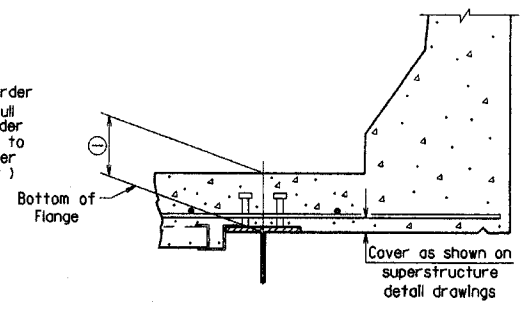
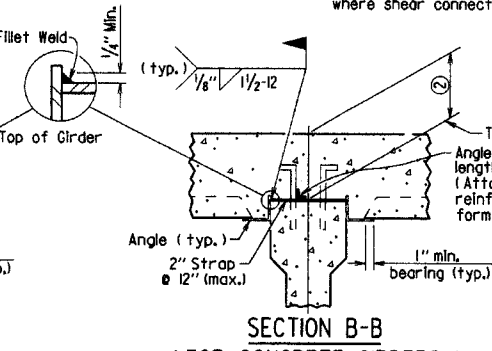
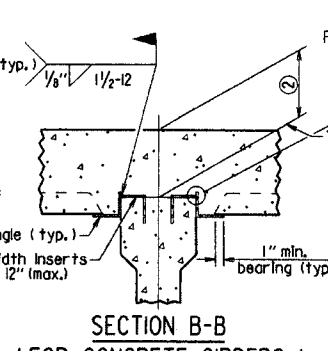
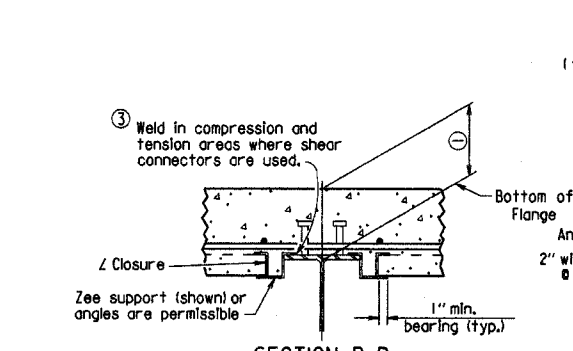


(Showing permissible support for tension flange where shear connectors are used, and for all compression flanges)

(Showing permissible support for tension flange where shear connectors are used and for all compression flanges)

(Showing permissible support for tension flange where shear connectors are not used)

(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B
1" = 1'-0"
(Showing Z Closure)

SECTION B-B
(FOR CONCRETE GIRDERS)
1" = 1'-0"
(Showing support by insert cast in girder)

SECTION B-B
(FOR CONCRETE GIRDERS)
1" = 1'-0"
(Showing support by Strap)

SECTION D-D
1" = 1'-0"

Note: Only Bottom Reinforcing is shown.

③ Minimum weld 1/8" x 1" @ 18". More weld may be required, maximum length per weld = 1 1/2" (typ.)

③ Weld in compression and tension areas where shear connectors are used.

② Distance from top of slab to top of girder as measured at centerline girder and as shown on superstructure detail drawings. This dimension may vary within the following limits to maintain the grade and slab thickness tolerances: Minimum - occurs when either the top of girder or the support angle leg contacts the bottom reinforcing steel; Maximum - value shown on the superstructure detail drawings when removable forms are used. See Section C-C for slab thickness tolerance between adjacent girder flanges.

① Distance from top of slab to bottom of top flange as measured at centerline girder and as shown on superstructure detail drawings. This dimension may vary within the following limits to maintain the grade and slab thickness tolerances: Minimum - occurs when either the top flange or the support angle leg contacts the bottom reinforcing steel; Maximum = $t_s + 1 3/4"$ + flange thickness. See Section C-C for slab thickness tolerance between adjacent girder flanges.

* t_s = slab thickness as shown on superstructure detail drawings.
GENERAL NOTES

Permanent steel deck forms may be used at the Contractor's option and shall be at no additional cost to the Department. Such use may result in changes to the dead load deflection of the girder. Any cost for adjustments due to a change in the dead load deflection will be borne by the Contractor. Payment for deck concrete and structural steel will not be increased due to use of permanent steel deck forms.

Permanent steel deck forms shall conform to Subsection 802.4(b). Detailed plans, including detailed calculations and manufacturer's technical brochure, shall be submitted to and approved by the Engineer before work of forming the bridge deck is started.

Welding of form supports to the tension flange of steel girders will be permitted only in areas where shear connectors are used. When welding is not allowed, the method of fastening Z or L supports to the flange must be approved by the Engineer.

Form sheets shall be fastened to supporting members and to each other with galvanized metal screws sufficient in size and number to provide a secure attachment. Alternate methods of attachment must be approved by the Engineer.

When the pitch of form corrugations match the reinforcing spacing, transversely align form sheets across the bridge to maintain the correct orientation of continuous reinforcing bars in the corrugations.

Bar support rods, when used, shall be sized and spaced to adequately support the bottom reinforcing mat at the required position.

High chairs shall be sized to support the top mat of reinforcing at the proper position. High chairs shall be placed at locations shown on the detail drawings.

Specifications: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2014 Edition), with applicable Supplemental Specifications and Special Provisions.

STANDARD DETAILS FOR PERMANENT STEEL BRIDGE DECK FORMS FOR STEEL & CONCRETE GIRDER SPANS

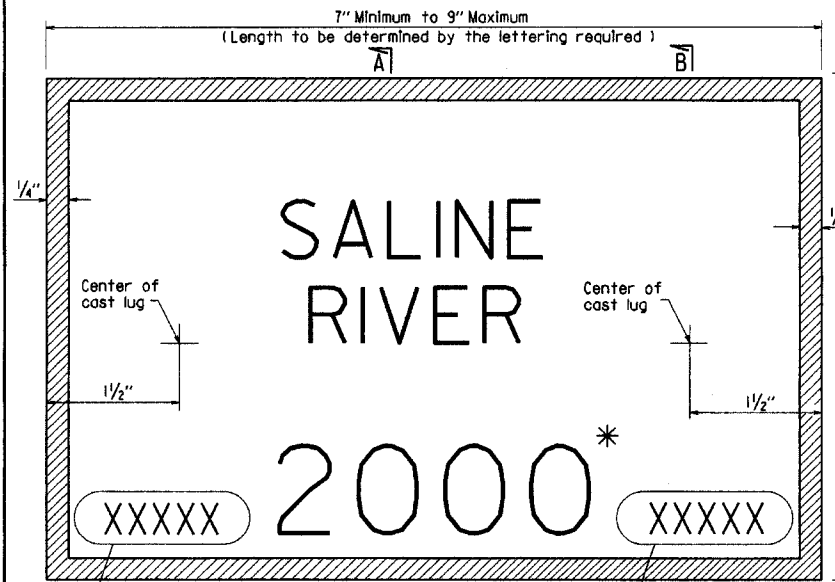
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55005.dgn
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NONE
DESIGNED BY: STD. DATE: ---

DRAWING NO. 55005

Revised weld dimension by KWH, Ck'd by BEF, 3/24/16.

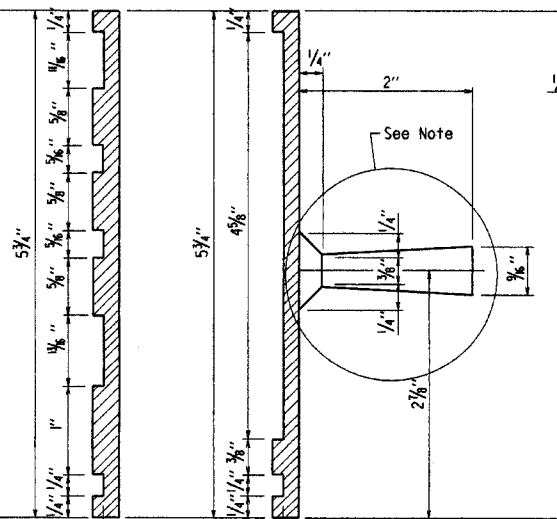
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		39	
JOB NO.							TYPE C NAME PLATE 55011	



Place the design loading here using 1/8" raised letters and numerals 3/8" high. Examples: HS 20 HL-93

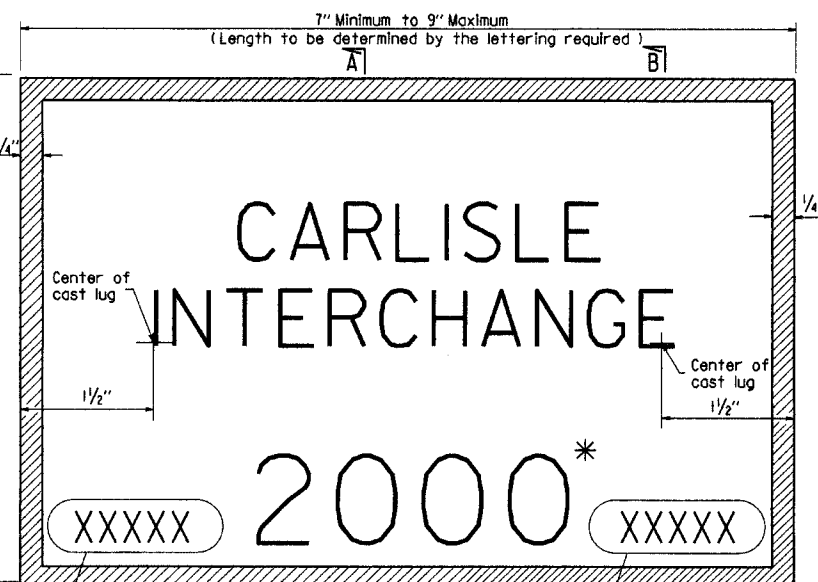
Place the Bridge number here using 1/8" raised letters and numerals 3/8" high. Example: 06275

TYPICAL BRIDGE NAME PLATE-STYLE 1 - FULL SIZE
STREAM CROSSINGS



SECTION A-A SECTION B-B

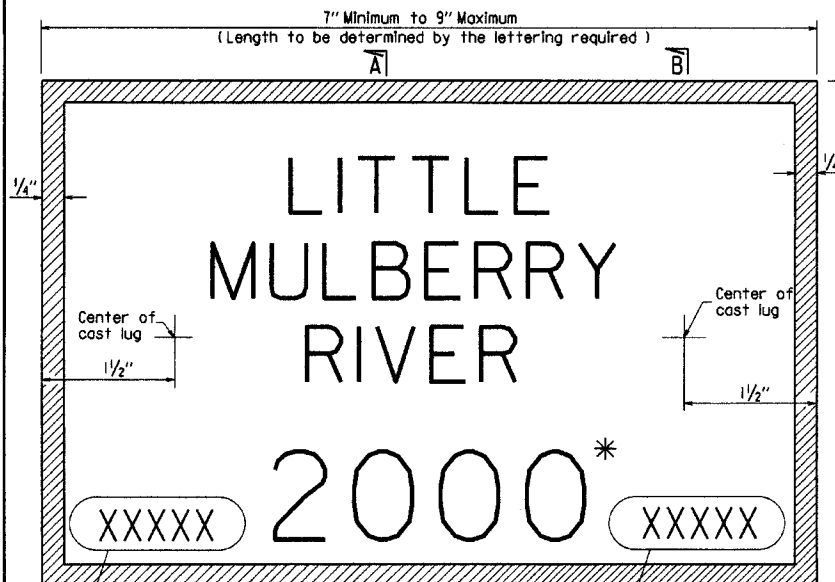
Note: Alternate attachments may be used provided such attachments are submitted and approval secured before fabrication is begun.



Place the design loading here using 1/8" raised letters and numerals 3/8" high. Examples: HS 20 HL-93

Place the Bridge number here using 1/8" raised letters and numerals 3/8" high. Example: 06275

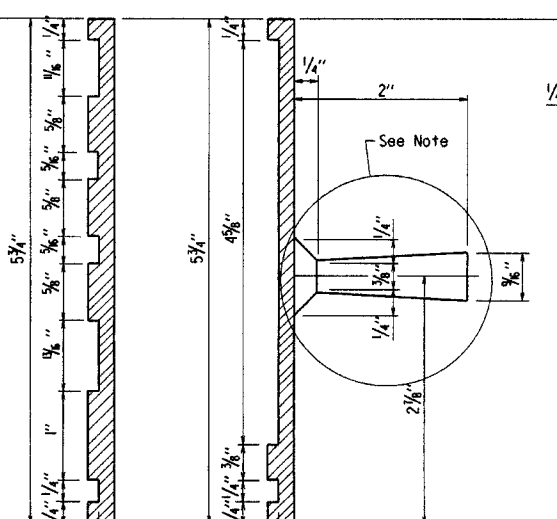
TYPICAL BRIDGE NAME PLATE-STYLE 3 - FULL SIZE
GRADE SEPARATION STRUCTURES



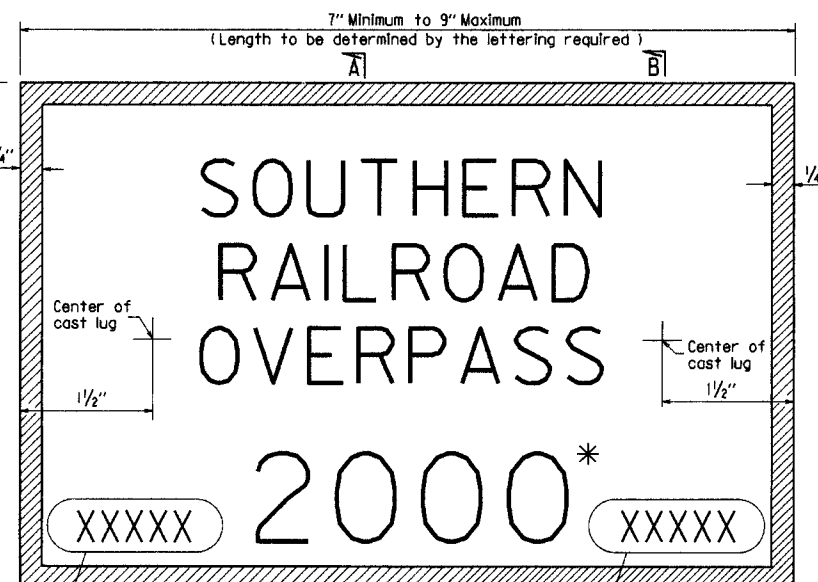
Place the design loading here using 1/8" raised letters and numerals 3/8" high. Examples: HS 20 HL-93

Place the Bridge number here using 1/8" raised letters and numerals 3/8" high. Example: 06275

TYPICAL BRIDGE NAME PLATE-STYLE 2 - FULL SIZE
STREAM CROSSINGS



SECTION A-A SECTION B-B



Place the design loading here using 1/8" raised letters and numerals 3/8" high. Examples: HS 20 HL-93

Place the Bridge number here using 1/8" raised letters and numerals 3/8" high. Example: 06275

TYPICAL BRIDGE NAME PLATE-STYLE 4 - FULL SIZE
GRADE SEPARATION STRUCTURES

GENERAL NOTES

Specifications: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction, (2014 Edition) with applicable Supplemental Specifications and Special Provisions.

Name plates shall be cast bronze and shall meet the material requirements as specified in Section 812.

Body of plate shall be 3/16" thick and shall include two tapering cone lugs 1/8" to 3/16" x 2" long. The border and all lettering shall be raised 1/8" above the face of plate and shall be polished.

All lettering shall be plain gothic, square cut and not tapered.

The number of plates required and the location and name on the plate for each bridge shall be as designated on the plans.

* Year in which contract is awarded.

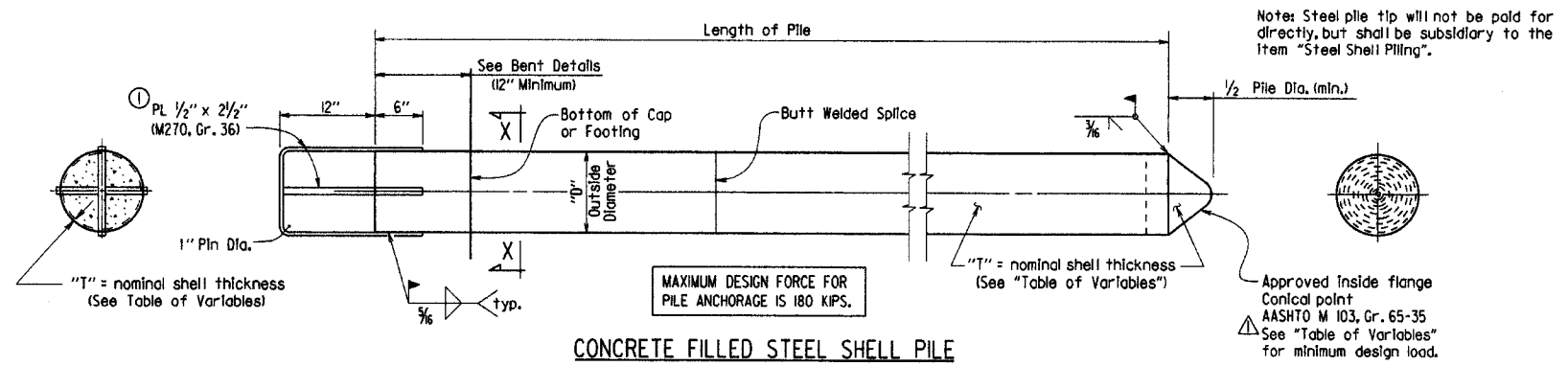
STANDARD DETAILS FOR
TYPE C BRIDGE NAME PLATES

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b5501.dgn
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE
DESIGNED BY: STD. DATE: —

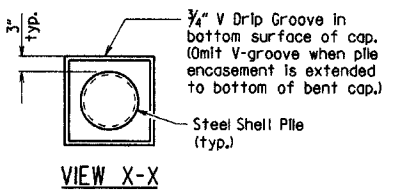
DRAWING NO. 55011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3/24/16				6	ARK.		40	
							JOB NO.	
							STEEL SHELL PILES	55021



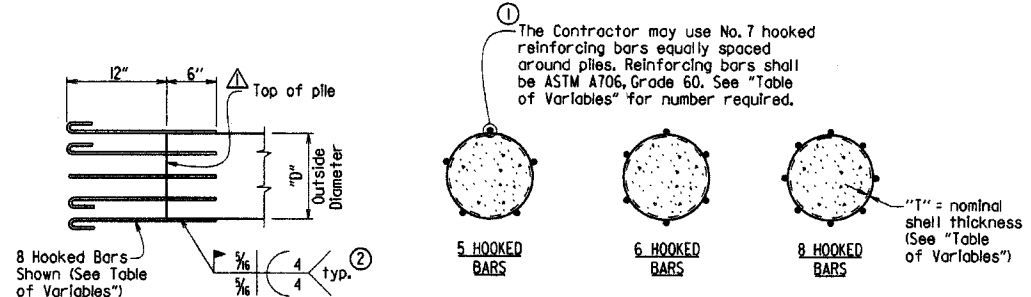
CONCRETE FILLED STEEL SHELL PILE

- ① Pile anchorage shall be placed to minimize interference with anchor bolts and reinforcing in cap or footing.
- ② Welding shall comply with ANSI/AWS D1.4 Structural Welding Code-Reinforcing Steel and applicable portions of ANSI/AWS D1.5 Bridge Welding Code.



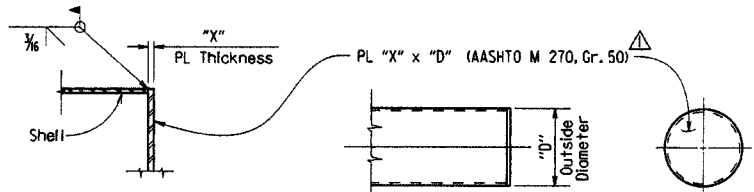
GENERAL NOTES FOR CONCRETE FILLED STEEL SHELL PILES:

Steel shells shall conform ASTM A252, Grade 3 (Fy = 45,000 psi).
 Concrete used for filling of steel shell shall be Class S with a minimum 28-day compressive strength, f'c = 3,500 psi, and shall be poured in the dry.
 Steel shell piling that extends above the ground and is not protected by pile encasement shall be painted in accordance with Subsection 805.02.
 See Bridge Layout for size and estimated length of steel shell piles and for driving information.
 Concrete, structural steel, reinforcing steel (including welding), and painting shall not be paid for directly, but shall be considered subsidiary to the item "Steel Shell Piling".



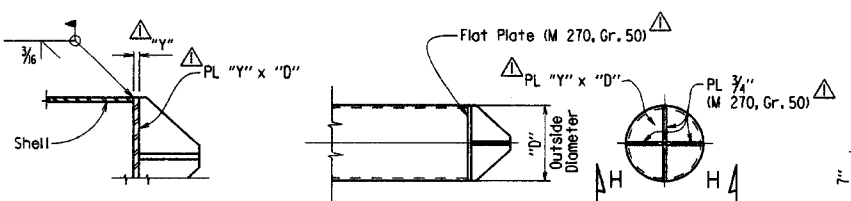
ALTERNATE PILE ANCHORAGE DETAIL

Note: Hooked bars shall be oriented to provide the required concrete clearances shown in the plans.



ALTERNATE FLAT TIP DETAIL

Note: The alternate flat tip detail shall not be used on steel shell piling to be driven through embankments constructed with internal geosynthetic reinforcement.



ALTERNATE VANED TIP DETAIL

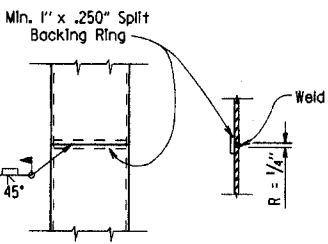
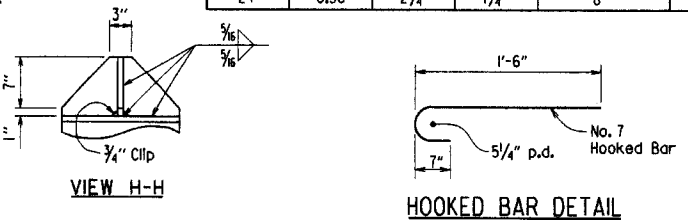


TABLE OF VARIABLES

OUTSIDE DIAMETER "D"	NOMINAL SHELL THICKNESS "T"	PLATE THICKNESS "X"	PLATE THICKNESS "Y"	NO. OF HOOKED BARS FOR ALTERNATE PILE ANCHORAGE	MINIMUM CONICAL TIP DESIGN LOAD (KIPS)
14"	0.50"	2/4"	1 1/2"	5	859
16"	0.50"	2/4"	1 1/2"	5	986
18"	0.50"	2/2"	1 1/2"	6	1,114
20"	0.50"	2/2"	1 3/4"	6	1,241
24"	0.50"	2 3/4"	1 3/4"	8	1,495

Revised and added various details by R.W.Y. CK'd. by BEF, 3/24/16.

GENERAL NOTES FOR PILE ENCASEMENTS:

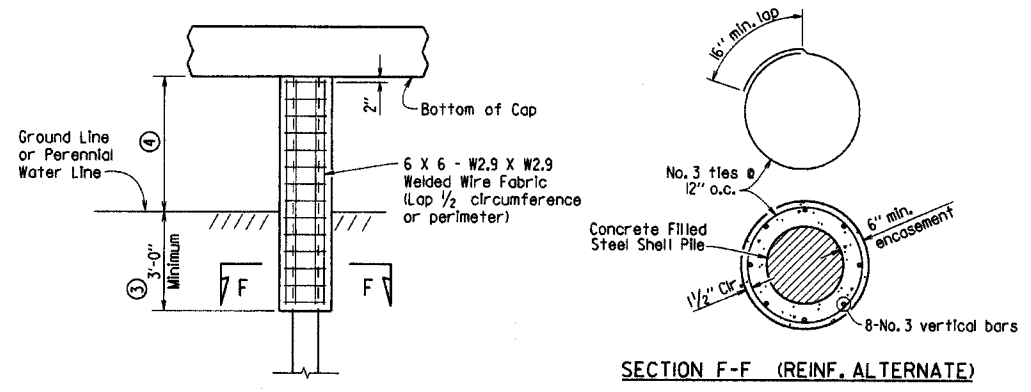
See Bridge Layout for additional notes, any pile encasement restrictions and required location of pile encasements.

Concrete shall be Class S with a minimum 28-day compressive strength, f'c = 3,500 psi. If concrete cannot be placed in the dry, Seal Concrete may be used from top to bottom of encasement.

Reinforcing steel shall be Grade 60 conforming to AASHTO M 31 or M 322, Type A.

Welded wire fabric shall conform to AASHTO M 55 or M 221.

Concrete, welded wire fabric or reinforcing steel, and galvanized pipe shall not be paid for directly, but shall be considered subsidiary to the item "Pile Encasement".

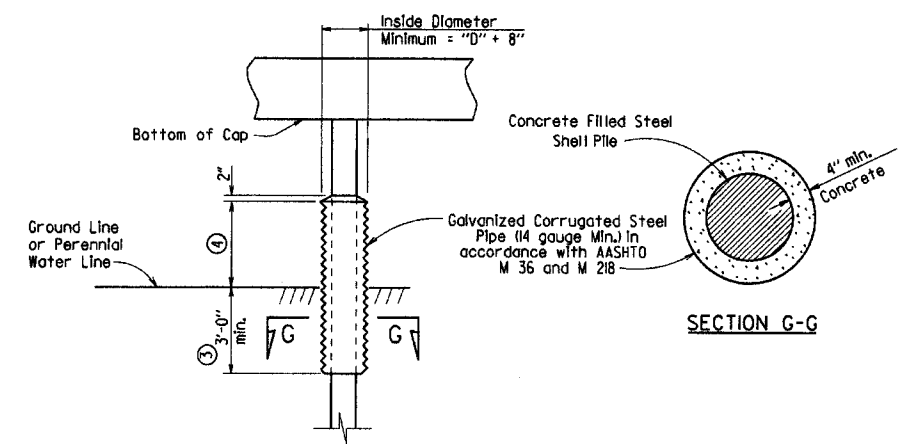


PILE ENCASEMENT DETAIL FOR STEEL SHELL PILES

(Shown with Encasement to Bottom of Cap)

- ③ Unless otherwise noted on Bridge Layout.
- ④ See Bridge Layout for height of pile encasement (3'-0" Minimum).

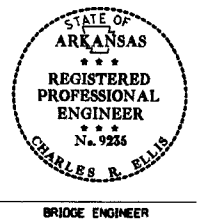
- ⑤ Pile encasement, when not extended to bottom of cap, shall have 2" concrete taper for water runoff as shown in the detail for partial height encasement.



ALTERNATE PILE ENCASEMENT DETAIL FOR STEEL SHELL PILES

(Shown with Partial Height Encasement)

This document was originally issued and sealed by Charles R. Ellis, PE No. 9235, on March 24, 2016. This copy is not a signed and sealed document.



STANDARD DETAILS FOR CONCRETE FILLED STEEL SHELL PILES AND PILE ENCASEMENTS

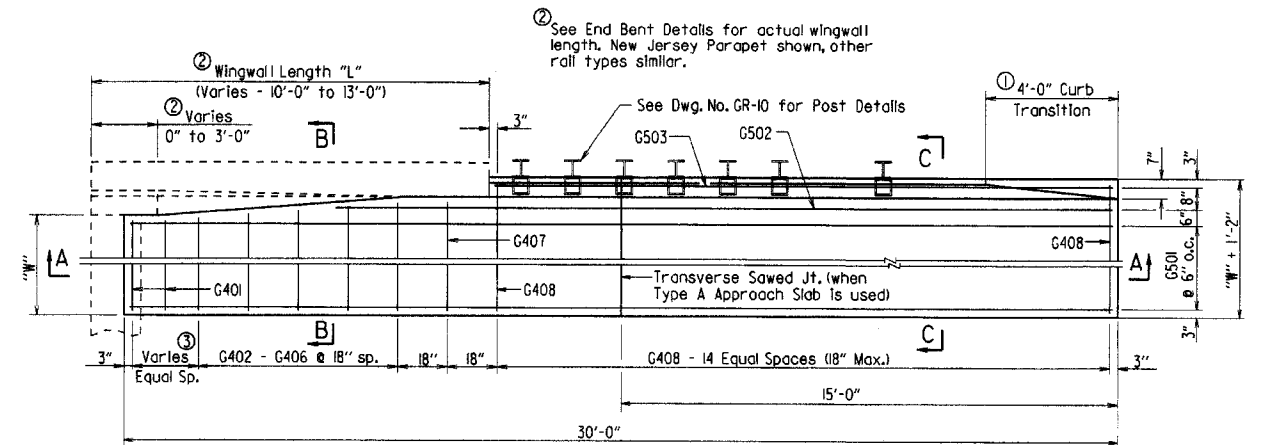
ARKANSAS STATE HIGHWAY COMMISSION
 LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b5502L.dgn
 CHECKED BY: B.E.F. DATE: 2/27/2014 SCALE: NO SCALE
 DESIGNED BY: STD. DATE: —

DRAWING NO. 55021

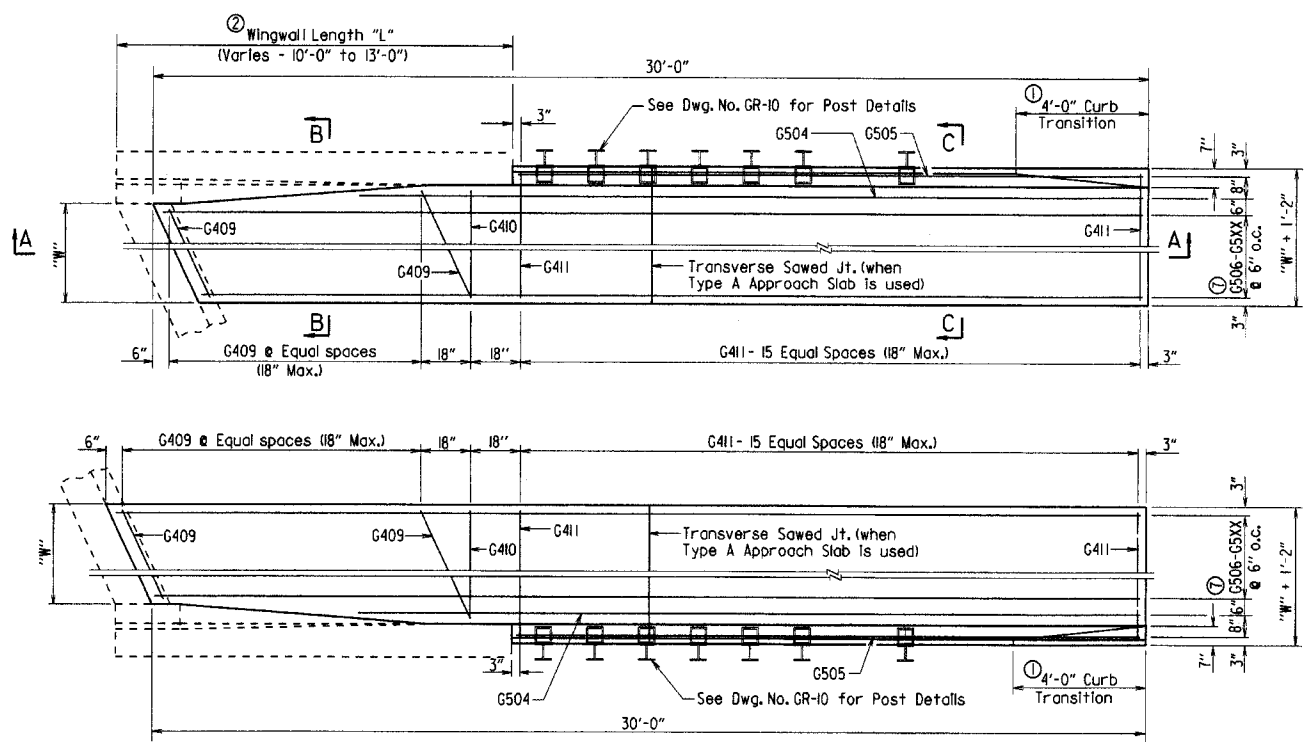
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
9/2/15				6	ARK.		41	

① TYPE A GUTTERS 55030A

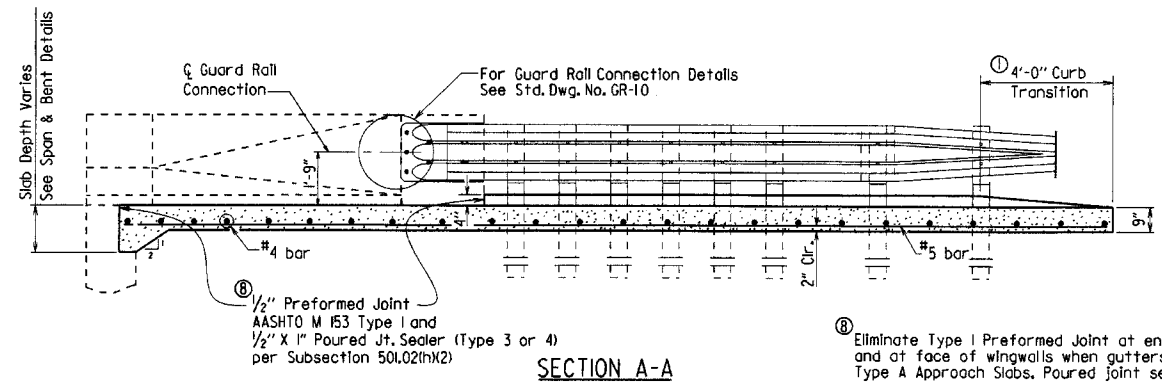


HALF PLAN OF APPROACH GUTTERS FOR SQUARE BRIDGE

③ Number of G401 bars vary with wingwall length - See Bar List



PLAN OF APPROACH GUTTERS FOR SKEWED BRIDGE

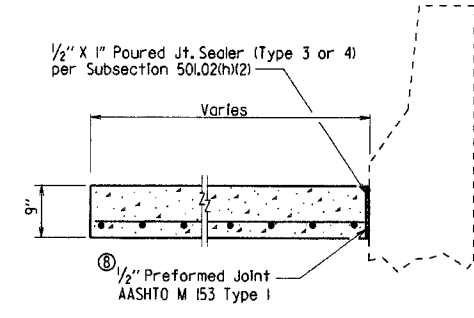


SECTION A-A

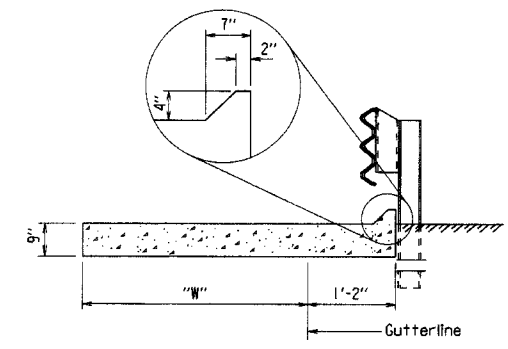
② Eliminate Type I Preformed Joint at end bent backwall and at face of wingwalls when gutters used with Type A Approach Slabs. Poured joint sealer is required, however backer rod shall be eliminated.

Note:
All longitudinal lines within the limits of horizontal curves shall be on curves concentric to C.L. Bridge. Adjustment to longitudinal bar lengths may be required. Transverse reinforcing shall be placed on radial lines to C.L. Bridge.

① Construct gutter curb with height-transition as shown if drop inlet is not placed at end of gutter.
Construct gutter curb full height (no height-transition) if drop inlet is placed at end of gutter. Curb height transition placed on drop inlet. See drop inlet details.



SECTION B-B N.T.S.



SECTION C-C N.T.S.

BAR LIST FOR ONE TYPE A GUTTER

Mark	No. Req'd. for Width "W"					Length
	2'-0"	3'-0"	4'-0"	6'-0"	8'-0"	
G401	④	④	④	④	④	"W" - 4"
G402-G406	1 each	1 each	1 each	1 each	1 each	"W" - 3" to "W" + 2"
G407	1	1	1	1	1	"W" + 3"
G408	15	15	15	15	15	"W" + 10"
G501	4	6	8	12	16	29'-8"
G502	1	1	1	1	1	(35'-5") - "L"
G503	1	1	1	1	1	30'-8" - "L"
G409	⑥	⑥	⑥	⑥	⑥	⑤
G410	1	1	1	1	1	"W" + 3"
G411	16	16	16	16	16	"W" + 10"
G504	1	1	1	1	1	⑤
G505	1	1	1	1	1	⑤
G506-G5XX	1 each	1 each	1 each	1 each	1 each	⑤

- ④ 0 for "L" = 10'
1 for "L" = 11'
2 for "L" = 12'
2 for "L" = 13'
- ⑤ Bar Lengths vary with Skew and Wingwall Length.
- ⑥ No. Req'd. varies with Skew and Wingwall length.
- ⑦ G509 for "W" = 2'
G511 for "W" = 3'
G513 for "W" = 4'
G517 for "W" = 6'
G521 for "W" = 8'

QUANTITIES FOR ONE SQUARE APPROACH GUTTER (FOR INFORMATION ONLY)

"W" Width (ft.)	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
2	210	2.55
3	285	3.40
4	360	4.25
6	515	5.90
8	665	7.55

Quantities are based on "L" = 10'-0".

GENERAL NOTES

All concrete shall be Class S or Class S(AE) or mixture used for Portland Cement Concrete Pavement and shall be poured in the dry.
All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M 31 or M 322, Type A, with mill test reports.
Approach Gutters will be measured and paid for in accordance with Section 504.

STANDARD DETAILS FOR TYPE A APPROACH GUTTERS

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

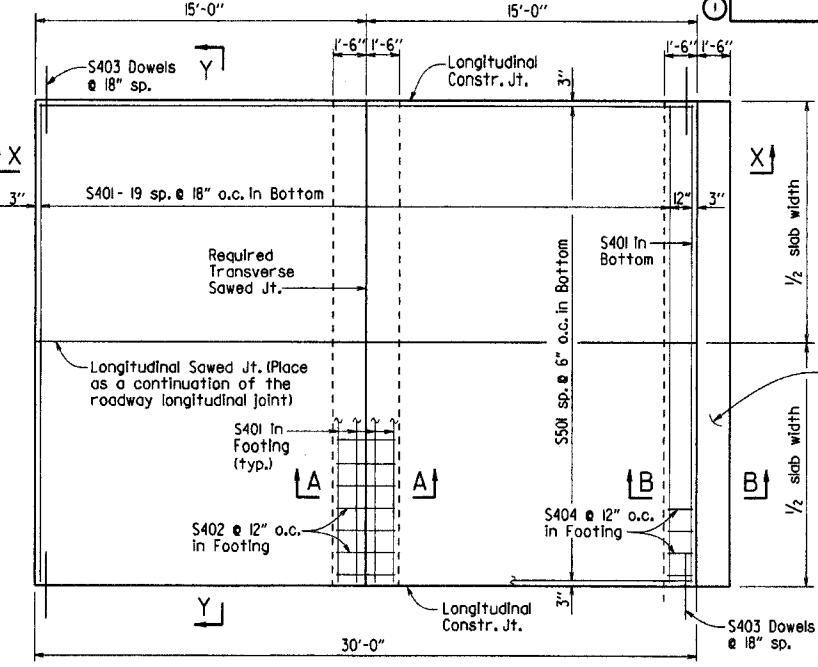
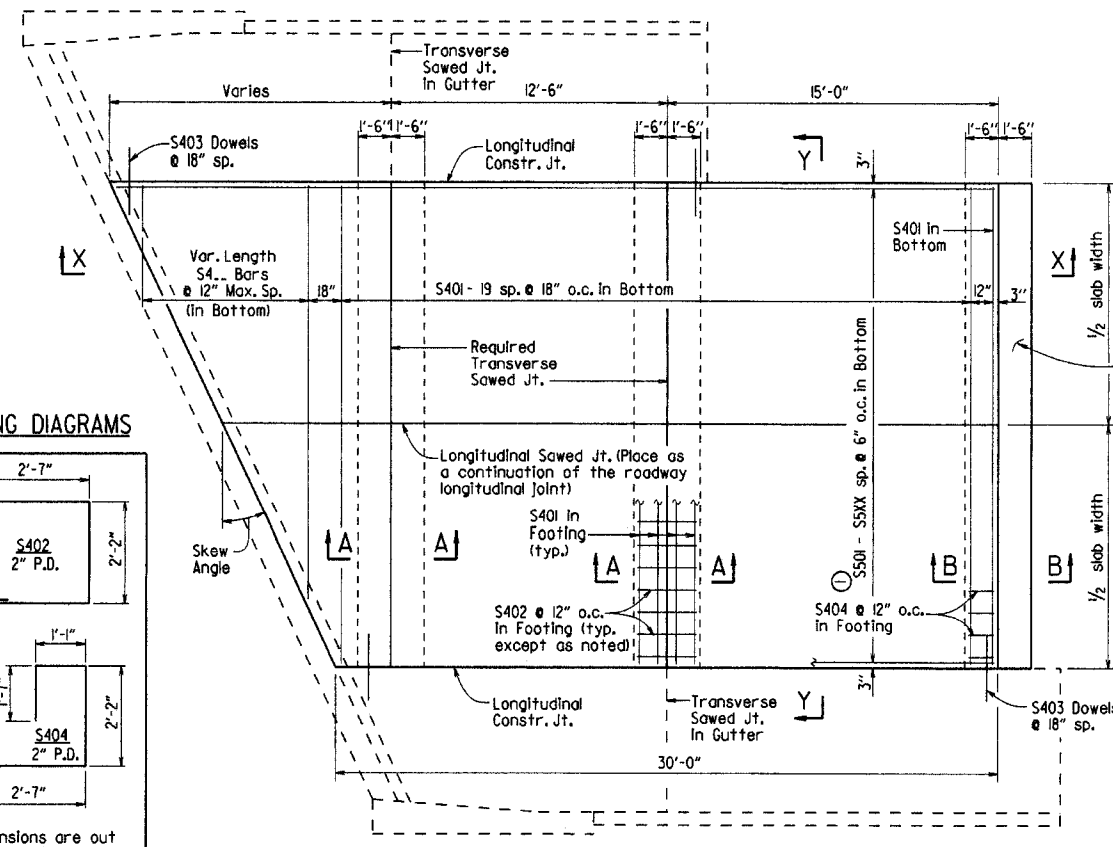
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CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: 3/8" = 1'-0"
DESIGNED BY: STD. DATE: or As Shown

DRAWING NO. 55030A

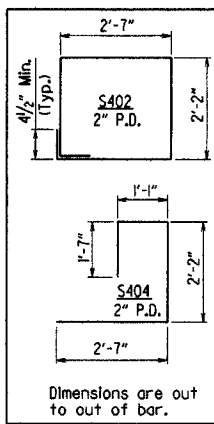
Revised to add "W" = 2'-0"; By LJB
Checked By: K.W.Y. 9/2/15

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		42	
JOB NO.								
TYPE A APPROACH SLAB								55040A

Notes:
The surface finish for Approach Slabs shall match that used on the bridge deck.
All longitudinal lines within the limits of horizontal curves shall be on curves concentric to C.L. Bridge. Adjustment to longitudinal bar lengths may be required. Transverse reinforcing shall be placed on radial lines to C.L. Bridge.



BENDING DIAGRAMS



PLAN - SKEWED APPROACH SLAB WITH APPROACH GUTTERS
1/4" = 1'-0"

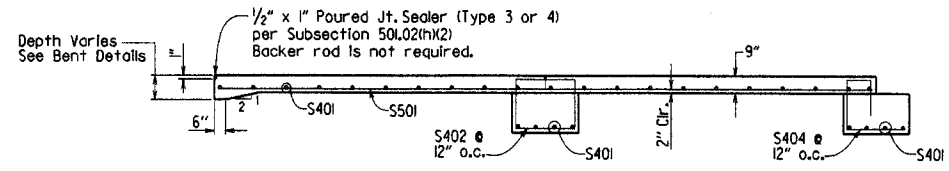
PLAN - SQUARE APPROACH SLAB
1/4" = 1'-0"

BAR LIST

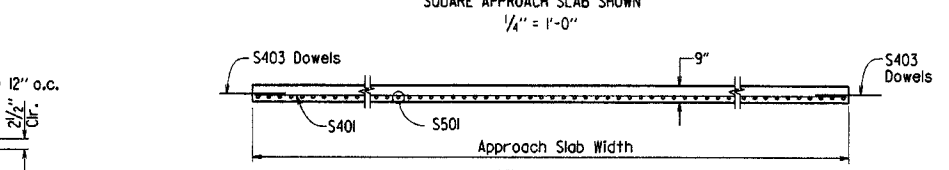
(Square & Skewed Approach Slabs)

Slab Width	Square		Skewed		
	Mark	No. Req'd	Length	No. Req'd	Length
20'-0"	S401	29	19'-8"	33	19'-8"
	S402	20	9'-10"	40	9'-10"
	S403	40	3'-0"	*	3'-0"
	S404	20	7'-2"	20	7'-2"
	S4...	—	—	—	1 Ea.
22'-0"	S401	29	21'-8"	33	21'-8"
	S402	22	9'-10"	44	9'-10"
	S403	40	3'-0"	*	3'-0"
	S404	22	7'-2"	22	7'-2"
	S4...	—	—	—	1 Ea.
24'-0"	S401	29	23'-8"	33	23'-8"
	S402	24	9'-10"	48	9'-10"
	S403	40	3'-0"	*	3'-0"
	S404	24	7'-2"	24	7'-2"
	S4...	—	—	—	1 Ea.
29'-0"	S401	29	35'-8"	33	35'-8"
	S402	36	9'-10"	72	9'-10"
	S403	40	3'-0"	*	3'-0"
	S404	36	7'-2"	36	7'-2"
	S4...	—	—	—	1 Ea.

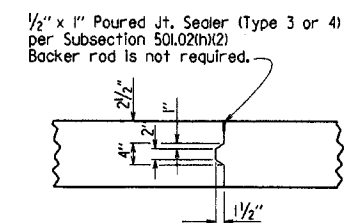
*Varies with skew angle



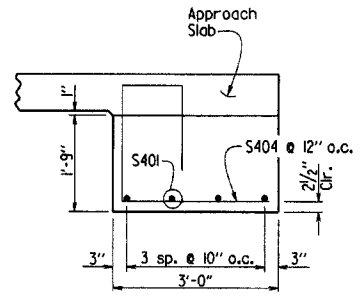
SECTION X-X
SQUARE APPROACH SLAB SHOWN
1/4" = 1'-0"



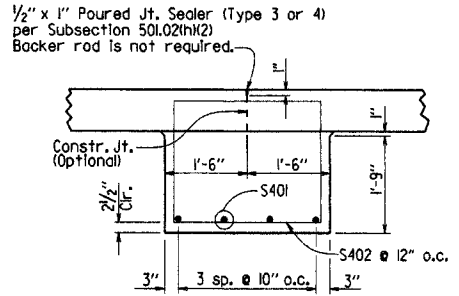
SECTION Y-Y
N.T.S.



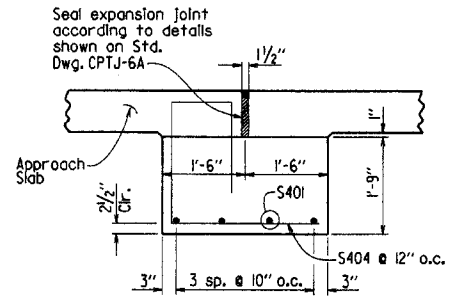
DETAILS OF LONGITUDINAL CONSTRUCTION JOINT
1" = 1'-0"



SECTION B-B
AT ASPHALT APPROACH PAVEMENT
N.T.S.



SECTION A-A
N.T.S.



SECTION B-B
AT CONCRETE APPROACH PAVEMENT
N.T.S.

TABLE OF QUANTITIES FOR ONE SQUARE APPROACH SLAB

(FOR INFORMATION ONLY)

Slab Width	Reinforcing Steel (lbs.)	Concrete (Cu. Yds.)
20'-0"	1925	24.85
22'-0"	2110	27.30
24'-0"	2300	29.90
36'-0"	3410	44.85

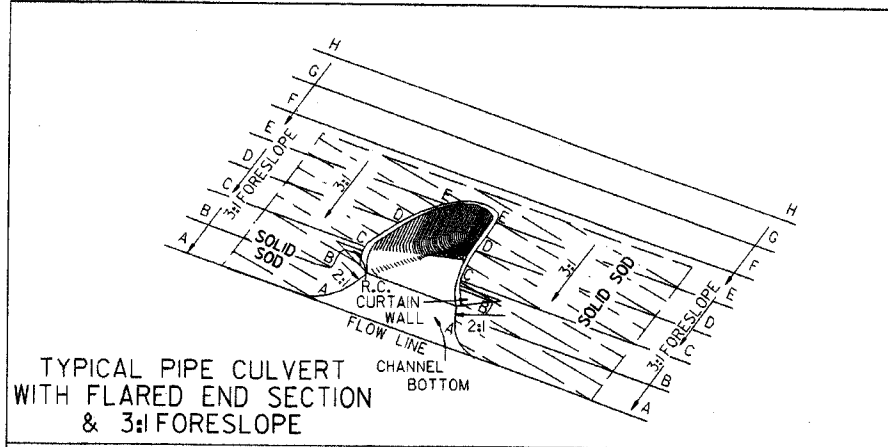
GENERAL NOTES

This drawing shall be used for Approach Slabs in Seismic Performance Zones 2, 3 & 4 and for the maximum skew angles shown below:
 20'-0" Slab Width: Maximum Skew Angle = 45°
 22'-0" Slab Width: Maximum Skew Angle = 45°
 24'-0" Slab Width: Maximum Skew Angle = 40°
 36'-0" Slab Width: Maximum Skew Angle = 30°
 All concrete shall be Class S (AE) with a minimum 28 day compressive strength $f'_c = 4,000$ psi and shall be poured in the dry.
 All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M 31 or M 322, Type A, with mill test reports.
 Approach Slabs will be measured and paid for in accordance with Section 504.

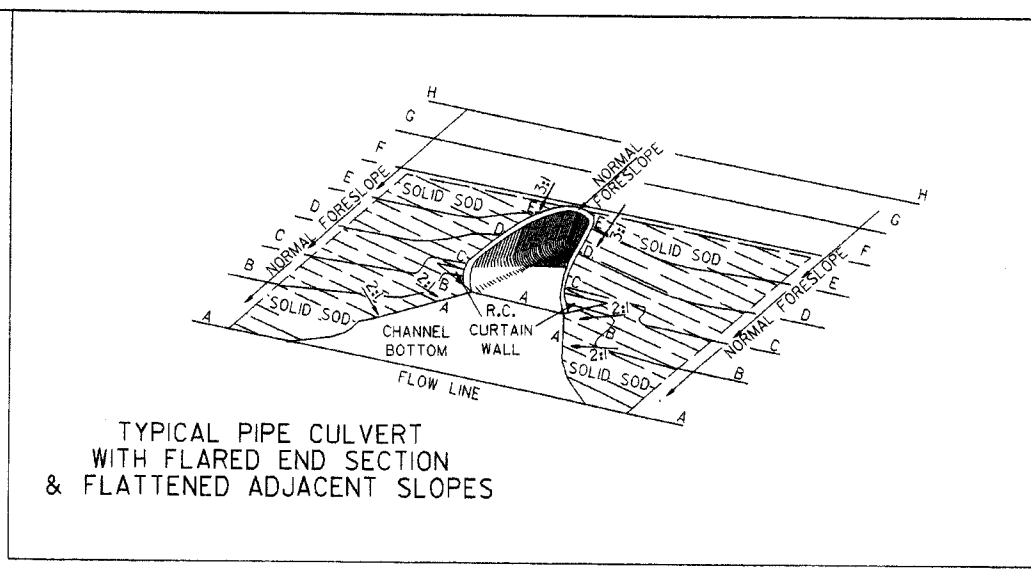
STANDARD DETAILS FOR TYPE A APPROACH SLAB
ARKANSAS STATE HIGHWAY COMMISSION
 LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55040a.dgn
 CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: AS SHOWN
 DESIGNED BY: STD. DATE: _____

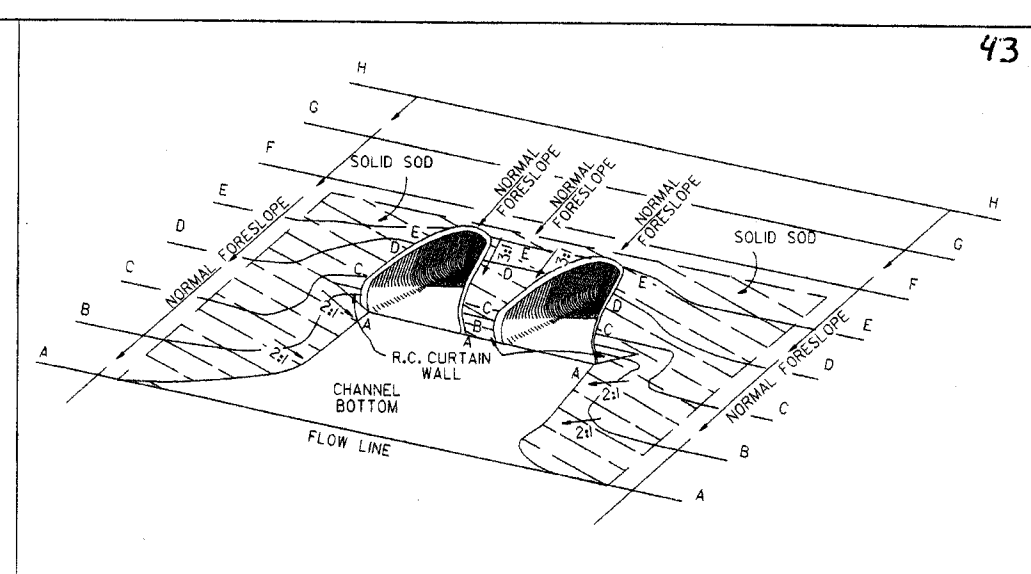
DRAWING NO. 55040A



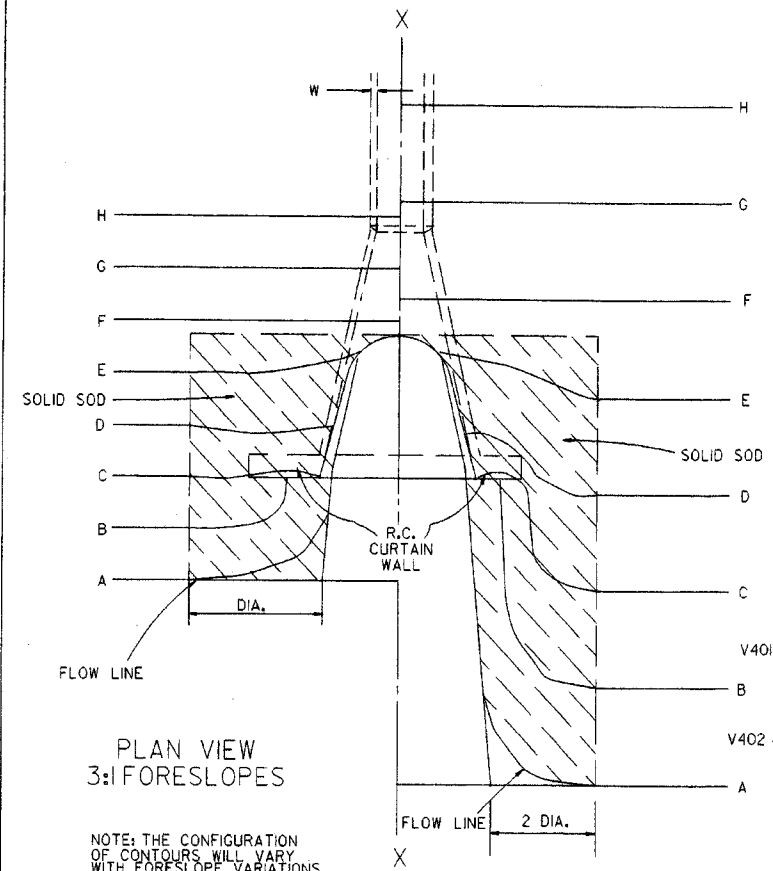
TYPICAL PIPE CULVERT WITH FLARED END SECTION & 3:1 FORESLOPE



TYPICAL PIPE CULVERT WITH FLARED END SECTION & FLATTENED ADJACENT SLOPES



TYPICAL MULTIPLE PIPE CULVERT WITH FLARED END SECTIONS & FLATTENED ADJACENT SLOPES



PLAN VIEW 3:1 FORESLOPES

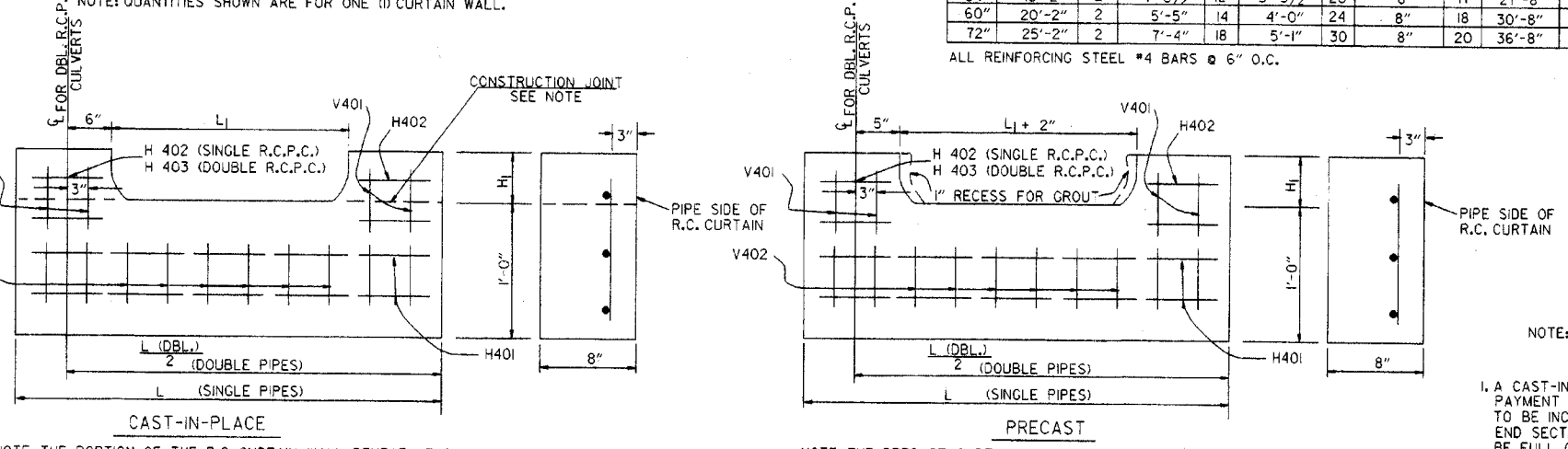
NOTE: THE CONFIGURATION OF CONTOURS WILL VARY WITH FORESLOPE VARIATIONS.

PLAN VIEW FLATTENED FORESLOPES

R.C. CURTAIN WALL DIMENSIONS & QUANTITIES

PIPE DIA.	H ₁	L ₁	L	L (DBL.) 2	SINGLE R.C.P.C.		DOUBLE R.C.P.C.	
					CONC.	REINF. STEEL	CONC.	REINF. STEEL
					CU. YDS.	LBS.	CU. YDS.	LBS.
18"	11-1/2"	3'-5"	8'-0"	6'-3"	0.31	27.7	0.45	39.5
24"	1'-0-1/2"	4'-6"	9'-6"	7'-6"	0.37	33.4	0.53	48.0
30"	1'-3-1/2"	5'-7"	11'-0"	9'-0"	0.45	39.0	0.67	59.0
36"	1'-7"	6'-8"	13'-0"	10'-6"	0.58	52.6	0.83	73.9
42"	2'-1-1/2"	7'-3"	15'-6"	12'-0"	0.82	77.1	1.10	100.7
48"	2'-5"	7'-10"	17'-0"	13'-0"	0.98	94.9	1.27	120.4
54"	2'-9-1/2"	8'-5"	18'-6"	14'-0"	1.16	115.8	1.47	143.7
60"	3'-4"	9'-0"	20'-6"	15'-6"	1.47	149.7	1.84	180.3
72"	4'-5"	10'-2"	25'-6"	18'-6"	2.31	232.6	2.73	271.0

NOTE: QUANTITIES SHOWN ARE FOR ONE (1) CURTAIN WALL.



R.C. CURTAIN WALL DETAILS

NOTE: THE PORTION OF THE R.C. CURTAIN WALL BENEATH THE FLARED END SECTION (LOWER 1'-0") SHALL BE PLACED MONOLITHICALLY. THE FLARED END SECTION SHALL THEN BE SET IN PLACE & THE REMAINING PORTIONS OF THE R.C. CURTAIN WALL PLACED.

NOTE: THE PRECAST CURTAIN WALL WILL BE SET AND BACKFILLED WITH COMPACTED MATERIAL. THE FLARED END SECTION SHALL THEN BE SET IN PLACE AND THE 1" RECESS FILLED WITH GROUT. WHERE "L" EXCEEDS 11' THE CURTAIN WALL MAY BE CAST IN TWO (2) OR MORE SECTIONS. THE METHOD OF JOINING THE SECTIONS FOR INSTALLATION SHALL BE APPROVED BY THE ENGINEER.

REINFORCING STEEL SCHEDULE

PIPE DIA.	SINGLE R.C. PIPE CULVERT								DOUBLE R.C. PIPE CULVERT									
	H401		H402		V401		V402		H401		H402		H403		V401		V402	
	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.
18"	7'-8"	2	1'-11/2"	4	1'-7/2"	8	8"	8	12'-2"	2	1'-11/2"	4	8"	2	1'-7/2"	10	8"	14
24"	9'-2"	2	2'-2"	4	1'-8 1/2"	10	8"	9	14'-8"	2	2'-2"	4	8"	2	1'-8 1/2"	12	8"	18
30"	10'-8"	2	2'-4 1/2"	4	1'-11 1/2"	10	8"	12	17'-8"	2	2'-4 1/2"	4	8"	2	1'-11 1/2"	14	8"	22
36"	12'-8"	2	2'-10"	6	2'-3"	12	8"	14	20'-8"	2	2'-10"	6	8"	3	2'-3"	14	8"	28
42"	15'-2"	2	3'-9 1/2"	8	2'-9 1/2"	16	8"	15	23'-8"	2	3'-9 1/2"	8	8"	4	2'-9 1/2"	18	8"	30
48"	16'-8"	2	4'-3"	10	3'-1"	18	8"	16	25'-8"	2	4'-3"	10	8"	5	3'-1"	20	8"	32
54"	18'-2"	2	4'-8 1/2"	12	3'-5 1/2"	20	8"	17	27'-8"	2	4'-8 1/2"	12	8"	6	3'-5 1/2"	22	8"	34
60"	20'-2"	2	5'-5"	14	4'-0"	24	8"	18	30'-8"	2	5'-5"	14	8"	7	4'-0"	26	8"	36
72"	25'-2"	2	7'-4"	18	5'-1"	30	8"	20	36'-8"	2	7'-4"	18	8"	9	5'-1"	33	8"	40

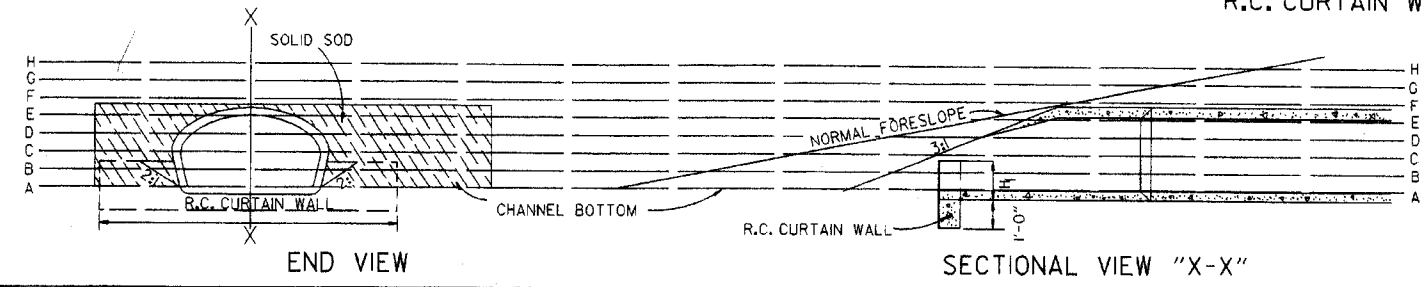
ALL REINFORCING STEEL #4 BARS @ 6" O.C.

SOLID SODDING

PIPE DIA.	SINGLE R.C.P.C.			DOUBLE R.C.P.C.		
	3:1	4:1	6:1	3:1	4:1	6:1
	SO. YDS.					
18"	5	7	12	6	8	13
24"	8	12	19	9	13	20
30"	13	18	29	14	19	30
36"	17	26	41	18	28	43
42"	23	35	55	25	37	57
48"	29	46	68	31	48	70
54"	35	57	85	37	59	87
60"	45	77	114	48	75	107
72"	64	92	156	67	95	159

NOTE: QUANTITIES SHOWN ABOVE ARE FOR ONE (1) END OF F.E.S.

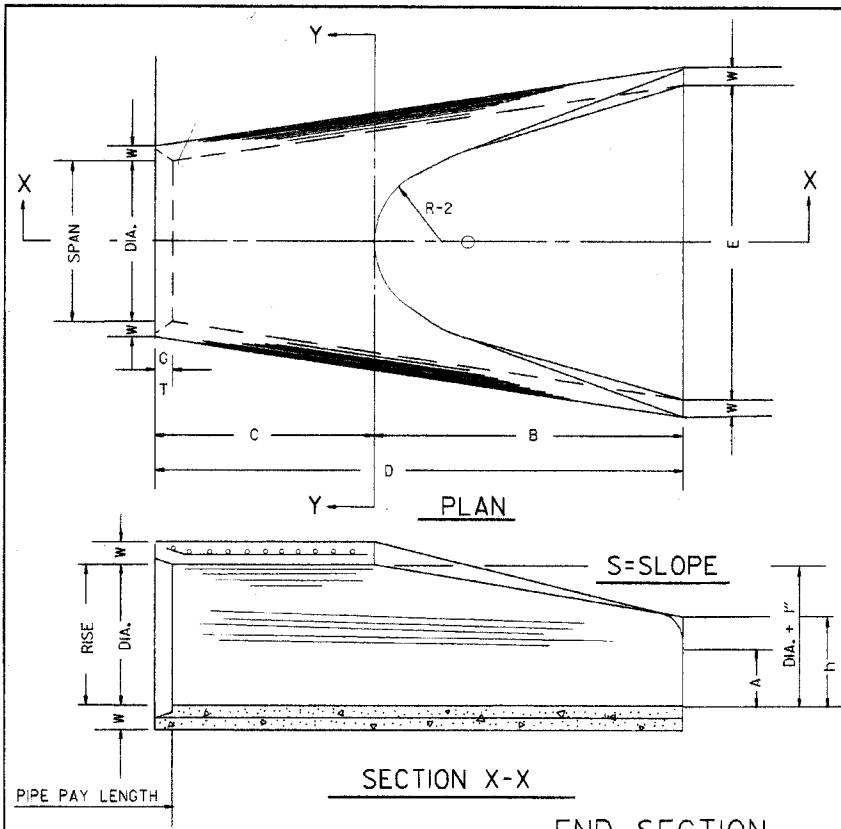
- GENERAL NOTES
1. A CAST-IN-PLACE OR PRECAST CURTAIN WALL MAY BE USED. PAYMENT FOR THE CURTAIN WALL SHALL BE CONSIDERED TO BE INCLUDED IN THE UNIT PRICE BID EACH FOR FLARED END SECTIONS OF THE SEVERAL SIZES, WHICH PRICE SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIALS INCLUDING REINFORCING STEEL AND CONCRETE; FOR FORMS, MIXING AND PLACING; FOR EXCAVATION AND BACKFILL, AND FOR ALL LABOR, TOOLS, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.
 2. ALL EXPOSED EDGES SHALL BE CHAMFERED 3/4".
 3. CONCRETE FOR CURTAIN WALL SHALL MEET THE REQUIREMENTS FOR CLASS A OR S CONCRETE AS PROVIDED IN SECTION 802 OF THE STANDARD SPECIFICATIONS OR FOR PAVING CONCRETE AS PROVIDED IN SECTION 501 OF THE STANDARD SPECIFICATIONS.
 4. WELDED WIRE MESH 3 x 3 W/10 x W10 MAY BE USED IN LIEU OF REINFORCING BARS.



END VIEW

SECTIONAL VIEW "X-X"

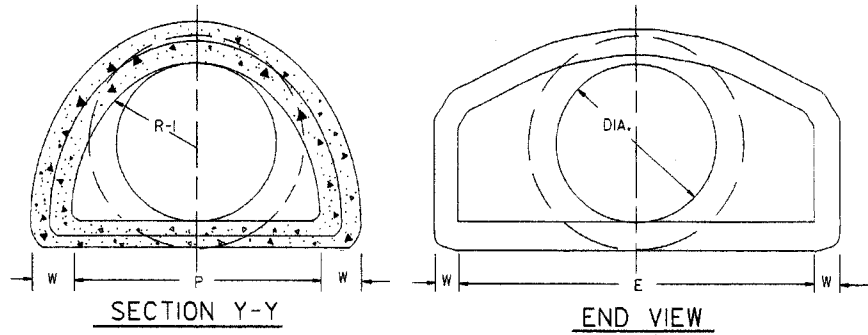
10-18-96 ADDED NOTE TO SOLID SODDING	10-18-96	ARKANSAS STATE HIGHWAY COMMISSION
10-12-95 CORRECTED SPELLING		
11-3-94 ADDED GENERAL NOTE NO. 4		
8-15-91 REV. CURTAIN WALL QUANT. STEEL SCH. & SOLID SOD QUANT.		
3-2-81 ALLOW PRECAST IN 2 OR MORE PIECES CHAMFER EDGES		
5-15-80 ADDED PRECAST WALL & GENERAL NOTES		
10-2-72 REVISED AND REDRAWN		
DATE	REVISION	FILMED
FLARED END SECTION		
STANDARD DRAWING FES-1		



END SECTION FOR REINFORCED CONCRETE PIPE CULVERTS

TABLE OF DIMENSIONS

DIA.	WALL	A	B	C	D	E	S	DIA. + 1"	P	R-1	R-2	G-T	WT.	h
18"	2 1/2"	9"	2'-3"	3'-10"	6'-1"	3'-0"	3:1	19"	29"	15 1/2"	12"	2"	1000	1'-0 1/2"
24"	3"	9 1/2"	3'-7 1/2"	2'-6"	6'-1 1/2"	4'-0"	3:1	25"	33 3/8"	16 1/8"	14"	2 1/2"	1600	1'-1 1/2"
30"	3 1/2"	1'-0"	4'-6"	1'-7 3/4"	6'-1 3/4"	5'-0"	3:1	31"	37"	18 1/2"	15"	3 1/4"	1940	1'-4 5/8"
36"	4"	1'-3"	5'-3"	2'-10 3/4"	8'-1 1/4"	6'-0"	3:1	37"	47 1/8"	24 3/8"	20"	3 1/2"	4100	1'-8"
42"	4 1/2"	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"	3:1	43"	53 3/8"	27 1/2"	22"	3 1/2"	5380	2'-2 1/4"
48"	5"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	3:1	49"	56 1/2"	28 1/2"	22"	3 1/2"	6550	2'-6"
54"	5 1/2"	2'-4"	6'-6"	1'-10"	8'-4"	7'-6"	3:1	55"	65 1/2"	33 1/8"	24"	4"	8750	2'-10 1/2"
60"	6"	2'-10"	6'-6"	1'-10"	8'-4"	8'-0"	3:1	61"	72 1/2"	36 1/8"	24"	4"	9270	3'-5"
72"	7"	3'-10"	6'-6"	1'-10"	8'-4"	9'-0"	3:1	73"	77 1/2"	38 3/8"	24"	5"	13250	4'-6"

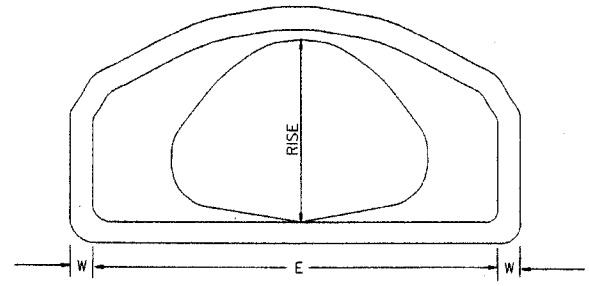


NOTE: TONGUE END ON UPSTREAM SECTION GROOVE END ON DOWNSTREAM SECTION

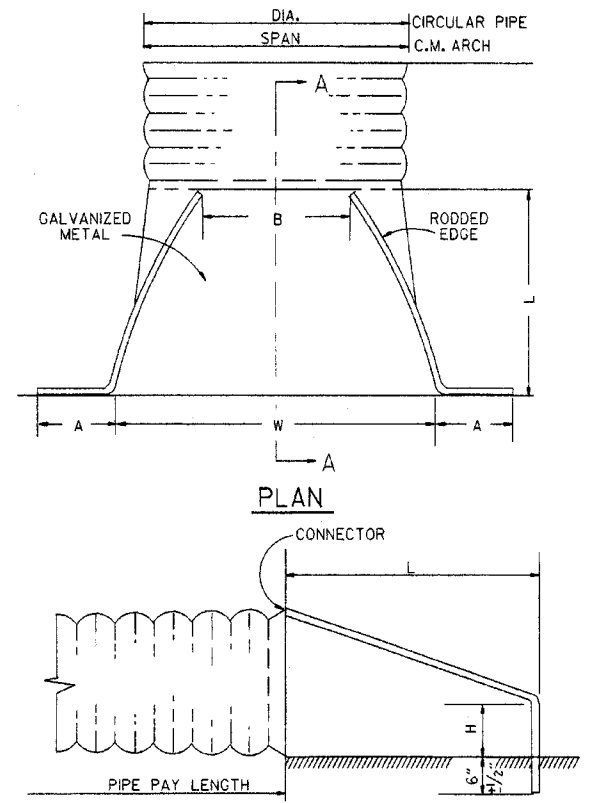
ARCH PIPE

EQUIV. DIA.	SPAN		RISE		W	A	B	C	D	E	P	R2	G-T	S
	AASHTO M 206	AHD NOMINAL	AASHTO M 206	AHD NOMINAL										
15	18	18	11	11	2"	4"	2'-0"	4'-0"	6'-0"	3'-0"	29"	12"	1 1/2"	2 1/2"
18	22	22	13 1/2	14	2 1/2"	5"	2'-0"	4'-1"	6'-1"	3'-6"	32 1/8"	13"	2 1/2"	2 1/2"
21	26	26	15 1/2	16	2 3/4"	7"	2'-3"	3'-10"	6'-1"	4'-0"	34 1/8"	14"	2 1/2"	2 1/2"
24	28 1/2	29	18	18	3"	9"	2'-3"	3'-10"	6'-1"	5'-0"	36 3/8"	15"	2 1/2"	2 1/2"
30	36 1/4	36	22 1/2	23	3 1/2"	10"	3'-1"	3'-0 1/2"	6'-1 1/2"	6'-0"	47 1/8"	20"	3"	2 1/2"
36	43 3/4	44	26 3/8	27	4"	10 1/2"	4'-0"	2'-1 1/2"	6'-1 1/2"	6'-6"	54 3/8"	22"	3 1/2"	2 1/2"
42	51 1/8	51	31 1/8	31	4 1/2"	11 1/2"	4'-7"	1'-10 1/4"	6'-5 1/4"	7'-2"	59 1/2"	23"	3 3/4"	2 1/2"
48	58 1/2	59	36	36	5"	1'-3"	5'-3"	2'-10 3/4"	8'-1 3/4"	7'-10"	70 5/8"	24"	4 1/4"	2 1/2"
54	65	65	40	40	5 1/2"	1'-7"	5'-3"	2'-11"	8'-2"	8'-6"	72 1/8"	24"	4 3/4"	2 1/2"
60	73	73	45	45	6"	1'-10"	5'-6"	2'-8"	8'-2"	9'-0"	77 1/8"	24"	5"	2 1/2"

* THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PER CENT FROM THE VALUES SPECIFIED BY AASHTO M 206.



END VIEW CONCRETE ARCH PIPE

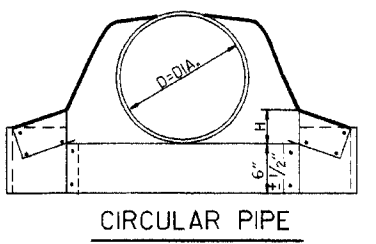


END SECTIONS FOR CORRUGATED METAL PIPE CULVERTS

NOTE: ALTERNATE CONNECTIONS TO THE PIPE CULVERTS, IN ACCORDANCE WITH MANUFACTURER'S STANDARD PRACTICES, MAY BE MADE SUBJECT TO THE APPROVAL OF THE ENGINEER.

CIRCULAR PIPE

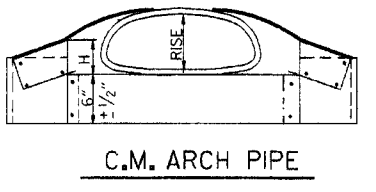
D. DIA.	GAUGE	A	B. MAX.	H	L	W	S
12	16	6	6	6	21	24	2 1/2"
15	16	7	8	6	26	30	2 1/2"
18	16	8	10	6	31	36	2 1/2"
21	16	9	12	6	36	42	2 1/2"
24	16	10	13	6	41	48	2 1/2"
30	14	12	16	8	51	60	2 1/2"
36	14	14	19	9	60	72	2 1/2"
42	12	16	22	11	69	84	2 1/2"
48	12	18	27	12	78	90	2 1/2"
54	12	18	30	12	84	102	2 1/2"
60	12	18	33	12	87	114	1 1/2"
66	12	18	36	12	87	120	1 1/2"
72	12	18	39	12	87	126	1 1/2"



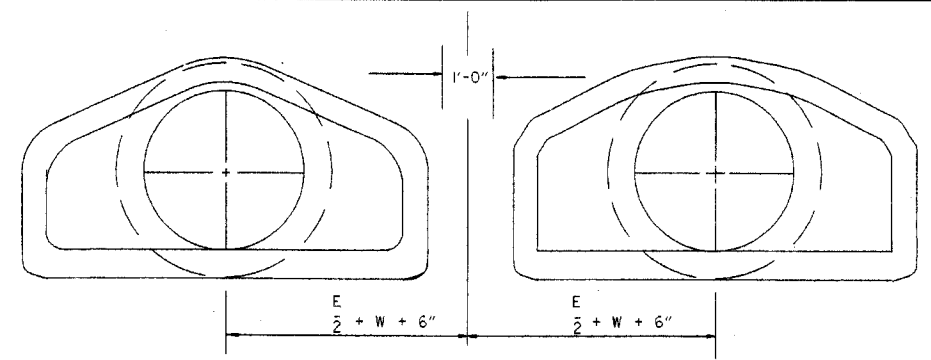
CIRCULAR PIPE

C.M. ARCH PIPE

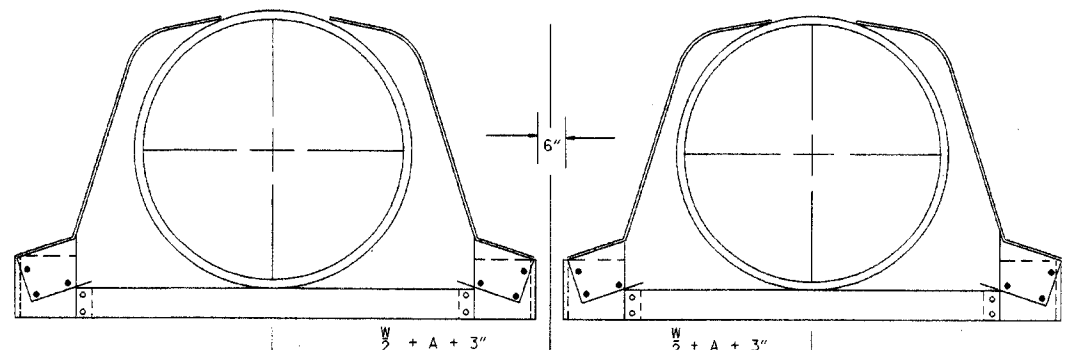
EQUIV. DIA.	SPAN	RISE	A	B. MAX.	H	L	W	S	GAUGE
15"	17	13	7	9	6	19	30	2 1/2"	16
18"	21	15	7	10	6	23	36	2 1/2"	16
21"	24	18	8	12	6	28	42	2 1/2"	16
24"	28	20	9	14	6	32	48	2 1/2"	16
30"	35	24	10	16	6	39	60	2 1/2"	14
36"	42	29	12	18	8	46	75	2 1/2"	14
42"	49	33	13	21	9	53	85	2 1/2"	12
48"	57	38	18	26	12	63	90	2 1/2"	12
54"	64	43	18	30	12	70	102	2 1/4"	12
60"	71	47	18	33	12	77	114	2 1/4"	12



C.M. ARCH PIPE



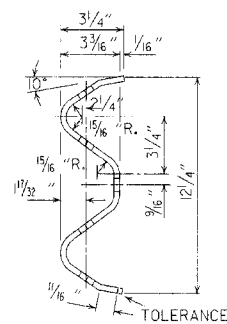
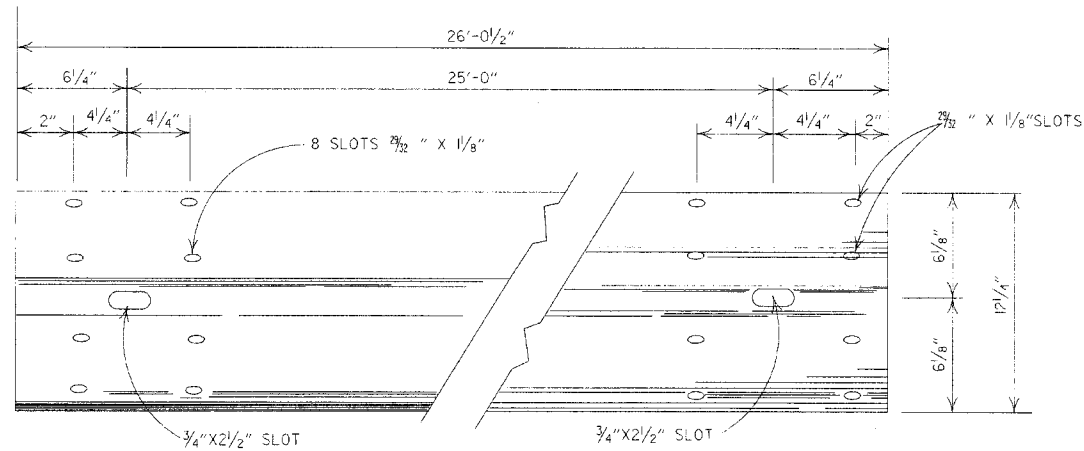
MULTIPLE R.C. PIPE CULVERTS



MULTIPLE C.M. PIPE CULVERTS

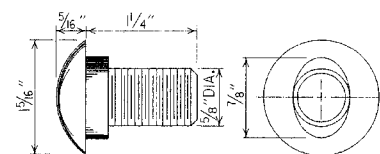
DATE	REVISION	FILE NO.
10-18-96	REVISED ASTM REF. TO AASHTO	16-78-96
5-15-80	REVISED DISTANCE BETWEEN MULTIPLE R.C.P. F.E.S.	664-5-15-80
7-14-78	C.M. ARCH SIZES TO CONFORM WITH AASHTO SIZES	752-7-14-78
8-22-75	ADDED MULTIPLE PIPE CULVERTS	517-8-22-75
12-5-74	REMOVED NOTE RE REINF. FOR R.C. F.E.S.	500-12-5-74
5-24-73	CMP END SECTION, SHOW PIPE PAY LENGTH	627-5-24-73
10-2-72	REVISED AND REDRAWN	760-10-2-72

ARKANSAS STATE HIGHWAY COMMISSION
FLARED END SECTION
STANDARD DRAWING FES-2

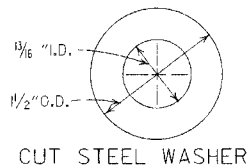


DETAILS OF W-BEAM GUARD RAIL

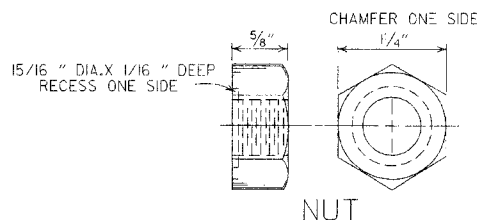
RAIL SECTION OF CLOSELY SIMILAR DIMENSIONS AND COMPARABLE STRENGTH MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.



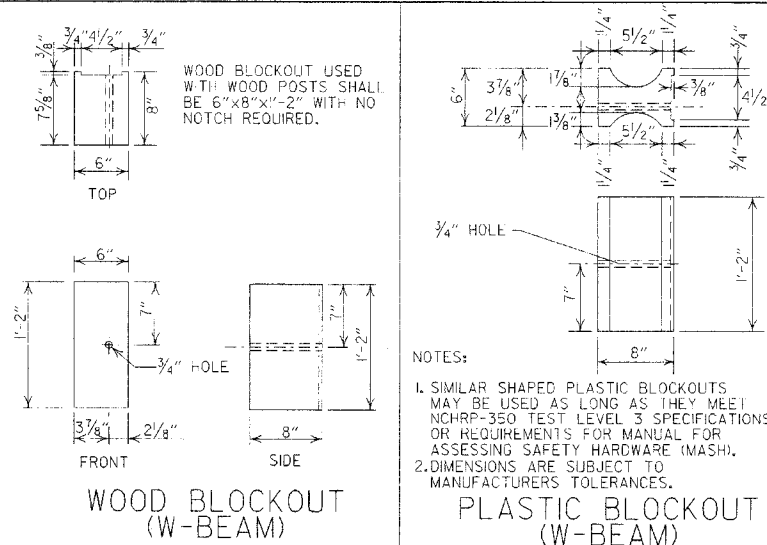
SPLICE BOLT
POST BOLT - SAME EXCEPT LENGTH



CUT STEEL WASHER

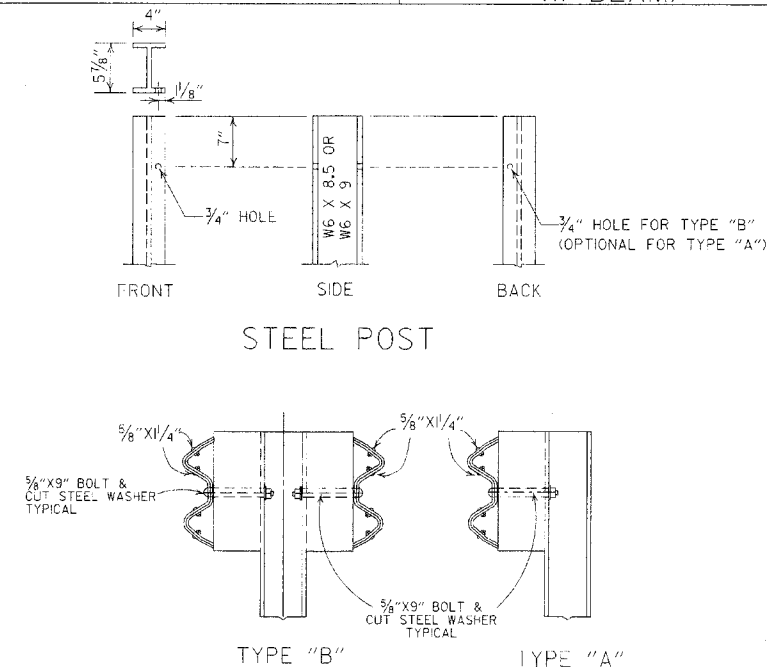


NUT



WOOD BLOCKOUT (W-BEAM)

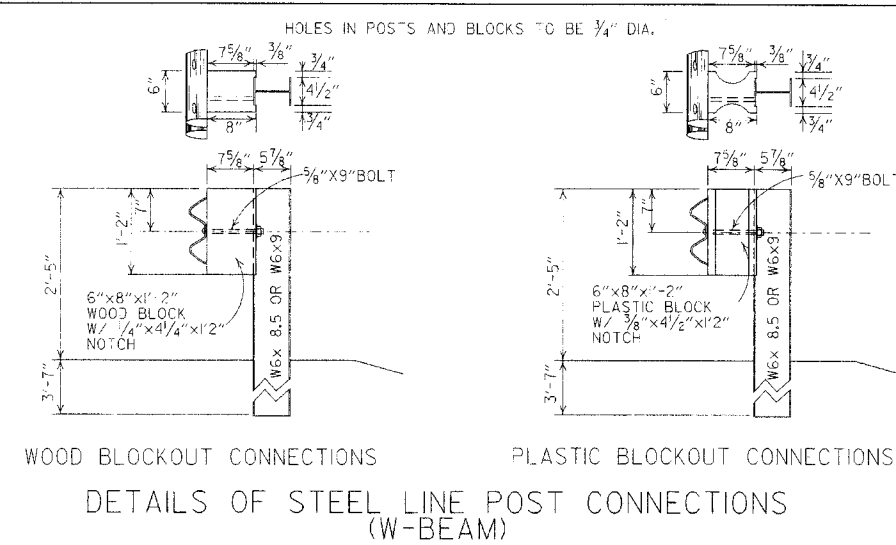
PLASTIC BLOCKOUT (W-BEAM)



STEEL POST

TYPE "B" TYPE "A"

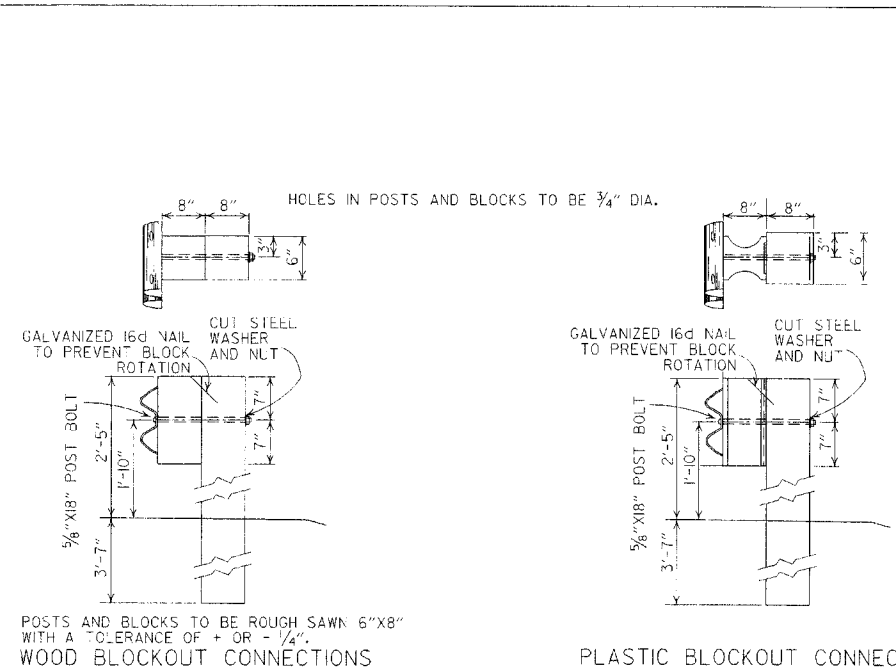
DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)



WOOD BLOCKOUT CONNECTIONS

PLASTIC BLOCKOUT CONNECTIONS

DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)



POSTS AND BLOCKS TO BE ROUGH SAWN 6"X8" WITH A TOLERANCE OF + OR - 1/4"

WOOD BLOCKOUT CONNECTIONS

PLASTIC BLOCKOUT CONNECTIONS

DETAILS OF WOOD LINE POST CONNECTIONS (W-BEAM)

-GENERAL NOTES-

ALL BOLTS SHALL BE SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN 3/4" BEYOND IT.

WHERE W-BEAM GUARD RAIL CONTINUES, THE INTERMEDIATE SECTIONS SHALL HAVE A POST SPACING OF 6'-3" UNLESS OTHERWISE NOTED.

W-BEAM GUARD RAIL REPRESENTING INTERMEDIATE SECTIONS WILL BE MEASURED ALONG THE ROADWAY FACE FROM CENTERLINE OF POST TO CENTERLINE OF POST.

USE W-BEAM GUARD RAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB. FOR EXTENSIONS OR MODIFICATION OF EXISTING GUARD RAIL, W-BEAM GUARD RAIL COMPONENTS OF THE SAME TYPE AS THOSE EXISTING SHALL BE USED.

ANY BACKFILLING UNDER OR AROUND POST SHALL BE DAMP SAND THOROUGHLY TAMPED IN PLACE.

WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7f (1400 F) OR NO. 1 1350 = SOUTHERN PINE.

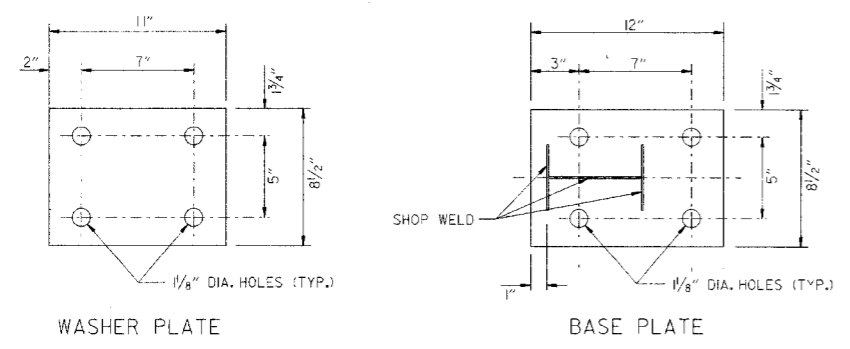
CONTRACTOR SHALL HAVE THE OPTION OF USING WOOD BLOCKOUTS FOR W-BEAM GUARD RAIL OR PLASTIC BLOCKOUTS, AS LONG AS BLOCKOUT USED MEETS NCHRP-350 TEST LEVEL 3 SPECIFICATIONS OR REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) FOR W-BEAM GUARD RAIL.

7-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
10-5-09	ADDED REFERENCE TO MASH-1	
4-10-03	REVISED GENERAL NOTES	
8-22-02	REVISED DIMENSION ON WOOD & PLASTIC BLOCKOUT CONNECTIONS & ON STEEL POST	
11-16-01	REVISED WOOD BLOCKOUT & DETAILS OF WOOD LINE POST CONNECTIONS	
3-30-00	REMOVED GUARD RAIL AT BRIDGE ENDS	
1-12-00	ADDED PLASTIC BLOCKOUT	
8-12-98	REV. BLOCKOUTS TO WOOD, DELETED CONC. POST & REV. GENERAL NOTE, DELETED DET. OF GUARD RAIL REPLACE BEHIND CURB & DET. OF POST PLACE IN SOLID ROCK & ADDED DETAILS OF STEEL LINE POST CONN. REMOVED BACK-UP PLATE, REVISED HOLES IN STEEL POLES	
4-3-97	REMOVED "LAP IN DIRECTION OF TRAFFIC" NOTE & PLACED ARROWS ON WASHERS	
10-18-96	REVISED WOOD POST NOTE	
6-2-94	ADDED ALT. STEEL POST SIZE	
8-5-93	REVISED STEEL POST SIZE	8-5-93
10-1-92	REDRAWN & REVISED	10-1-92
8-15-91	REVISED WASHER NOTE	8-15-91
8-2-90	REV. GEN. NOTE & DEPHT OF ANC. POST IN ROCK	8-2-90
7-15-88	REVISED SECTION 3 & GENERAL NOTES	
3-4-88	REV. ANCHOR POST, ELEV. NOTES & POST IN ROCK	780-3-4-88
10-30-87	REVISED WOOD LINE POST DETAIL	546-10-30-87
10-9-87	REDRAWN & REVISED	802-10-9-87
DATE	REVISION	DATE FILM

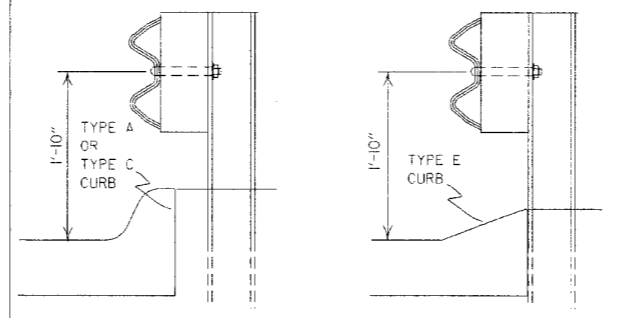
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-8



Note: Bolts, nuts, washers and plates shall be galvanized in accordance with Section 807 of the Standard Specifications.

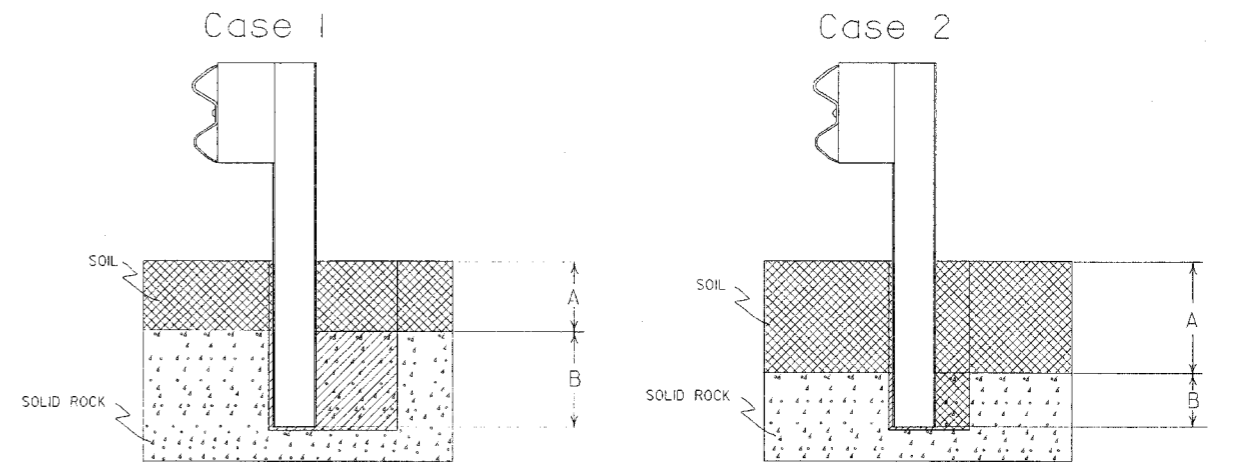


FOR DESIGN SPEEDS OF 50 MPH OR LESS
ALIGN FACE OF GUARD RAIL WITH FACE OF CURB.

FOR DESIGN SPEEDS OF 55 MPH OR MORE
PLACE GUARD RAIL POSTS AGAINST BACK OF CURB.

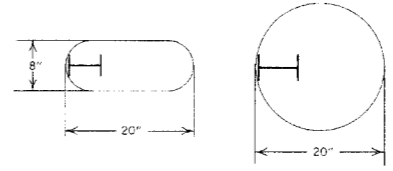
DETAIL OF GUARD RAIL PLACEMENT BEHIND CURB (W-BEAM)

FOR DESIGN SPEEDS OF 50 MPH OR LESS ALL CURB FACES, AS SHOWN ON STD. DRWG. CG-1, MAY BE USED. FOR DESIGN SPEEDS OF 55 MPH OR MORE TYPE "E" CURB FACE SHALL BE USED.



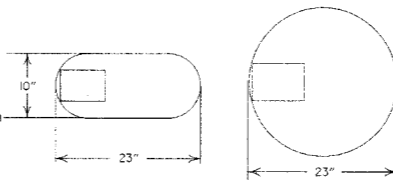
Plan View Steel Posts

Either hole configuration acceptable



Plan View Wood Posts

Either hole configuration acceptable



Notes: For overlying soil depths (A) ranging from 0 to 18", the depth of required drilling (B) is equal to 24".

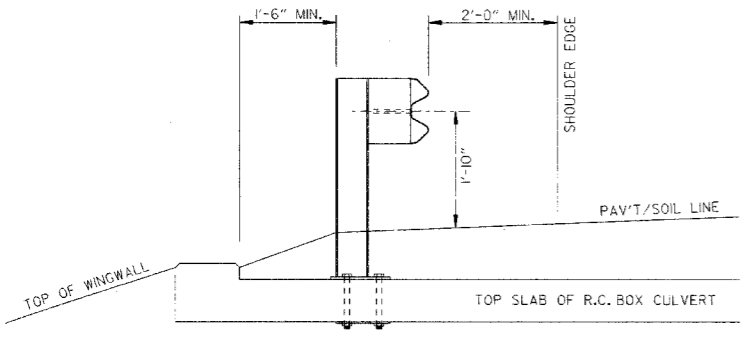
Zone A: Backfill according to Section 617.03(a).

Zone B: Backfill hole in 6" lifts with material meeting the requirements of Section 802.02(c) - Alternate gradation, Compact to 95% maximum dry density per ASTM D-698.

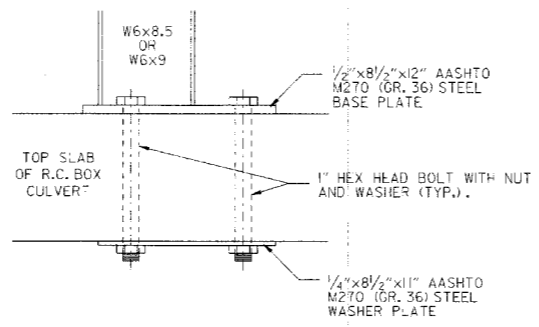
Notes: For overlying soil depths (A) ranging from 18" to 44", the depth of required drilling (B) is equal to either 12" or 44" minus the depth of soil whichever is less.

Zone A & B: Backfill according to Section 617.03(a).

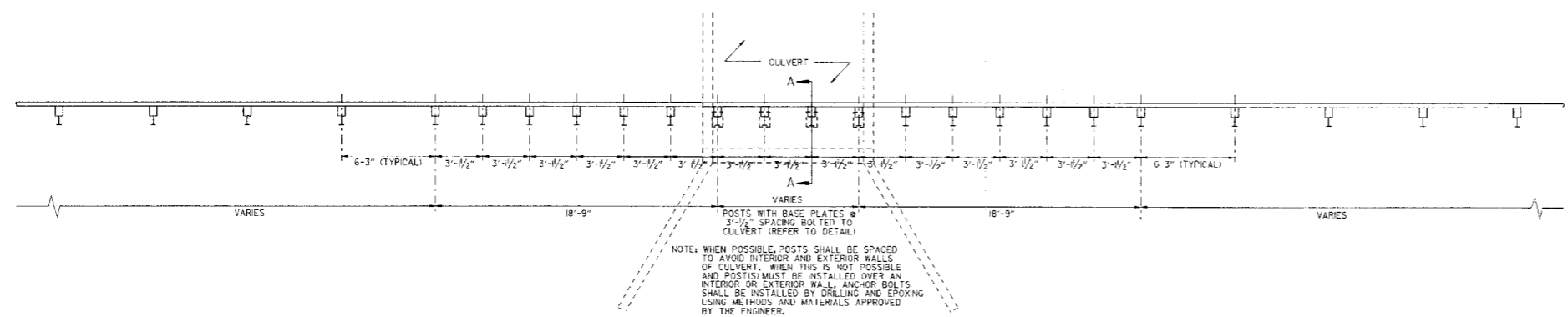
DETAIL OF POST PLACEMENT IN SOLID ROCK (W-BEAM)



SECTION A-A



DETAIL OF CONNECTION



PLAN LAYOUT OF TYPE A GUARD RAIL AT LOW-FILL CULVERTS

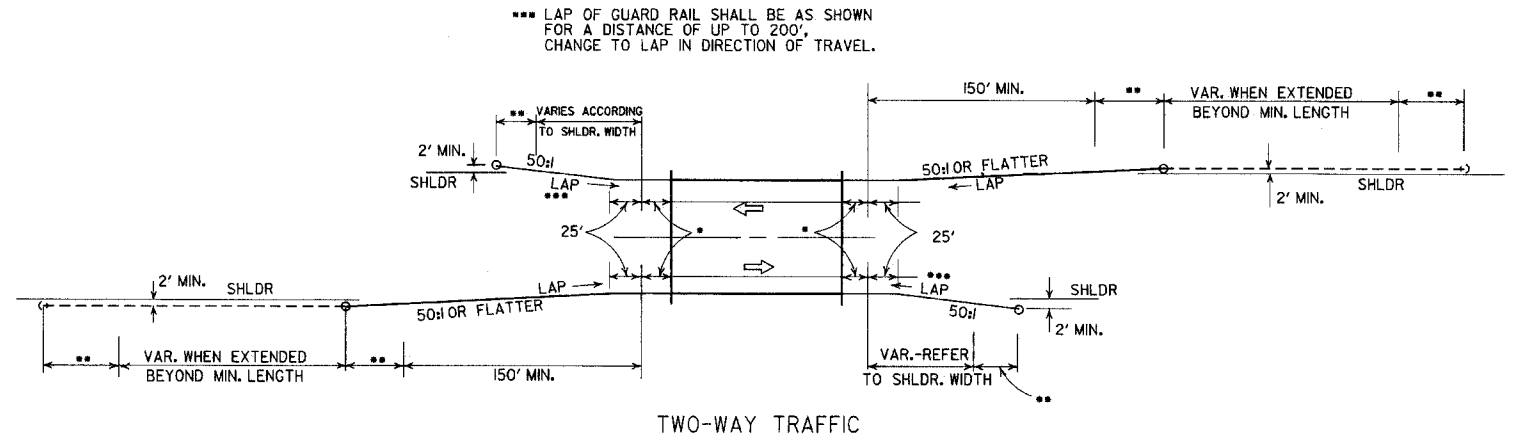
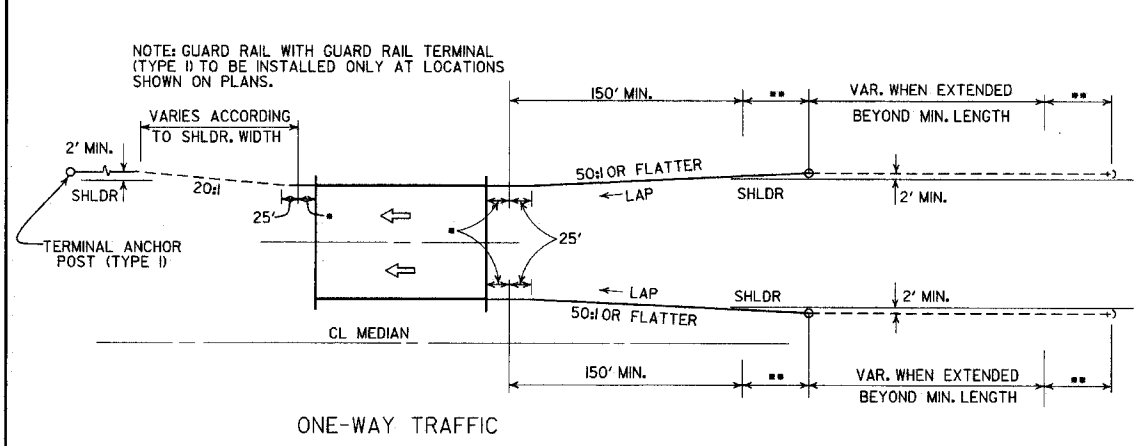
NOTE: THIS DETAIL IS TO BE USED ONLY WHEN THE COVER OVER THE CULVERT DOES NOT PERMIT FULL EMBEDMENT OF GUARD RAIL POSTS AS SHOWN ON STD. DRWG. GR-8.

7-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
4-12-07	REVISED DETAIL OF GUARD RAIL PLACEMENT BEHIND CURB	
1-10-05	ADDED GUARD RAIL PLACEMENT BEHIND CURB; REVISED DETAIL OF CONNECTION	
11-18-04	REVISED POST PLACEMENT IN ROCK & CULVERT CONNECTION DETAILS, ADDED DETAIL FOR GUARD RAIL PLACEMENT AT LOW-FILL CULVERTS	
3-30-00	REMOVED CONCRETE INSERT ANCHOR	
8-12-98	CHANGED STEEL SPACER BLOCK TO WOOD BLOCK; ADD. DET. OF GUARD RAIL CONNECTION TO R.C. BOX CULVT. DELETED DET. OF STEEL LINE POST CONN. & ADDED DET. OF GUARD RAIL PLACE. BEHIND CURB & DET. OF POST PLACE. IN SOLID ROCK	
4-3-96	PLACED ARROWS AT CUT STEEL WASHERS	4-3-96
10-18-96	REV. ASTM REF. TO AASHTO	
11-22-95	ADDED OPTIONAL HOLES	
6-2-94	REVISED ALTERNATE POST SIZE	
8-5-93	REVISED STEEL POST SIZE	
10-1-92	REDRAWN & REVISED	10-1-92
8-2-90	DEL. WASHER ON ANCHOR ASSEMBLY	8-2-90
7-15-88	CONFORMED TO 988 SPECS	
3-4-88	REVISED ANCHOR NOTE	
10-30-87	REVISED ANCHOR ASSEMBLY	7-10-30-87
10-30-87	REVISED PLACEMENT BEHIND CURB	5-10-30-87
10-3-87	REDRAWN & REVISED	803-10-9-87
DATE	REVISION	DATE FILED

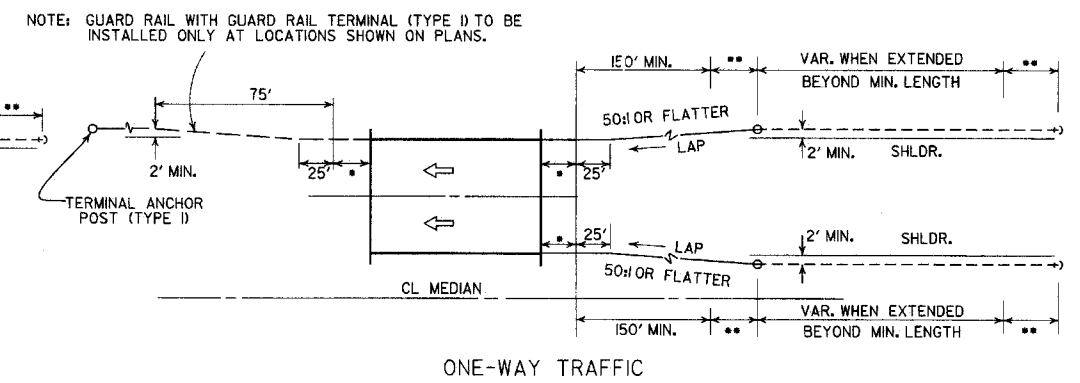
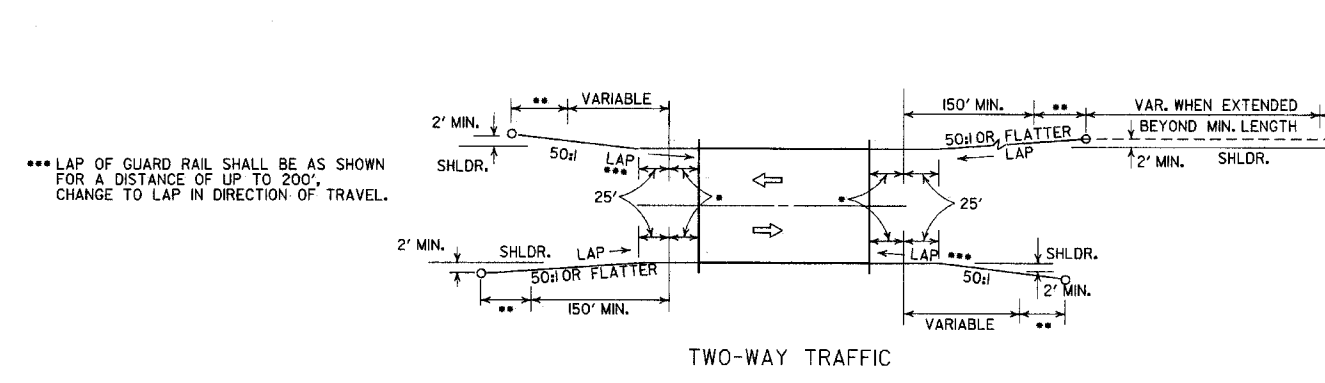
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-8A

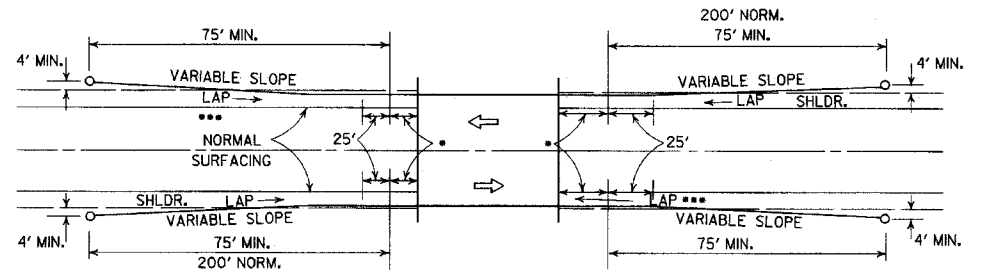


METHODS OF INSTALLATION OF GUARD RAIL AT LESS THAN FULL SHOULDER WIDTH BRIDGES USING GUARD RAIL TERMINAL (TYPE 2)



METHOD OF INSTALLATION OF GUARD RAIL AT FULL SHOULDER WIDTH BRIDGES USING GUARD RAIL TERMINAL (TYPE 2)

*** LAP OF GUARD RAIL SHALL BE AS SHOWN FOR A DISTANCE OF UP TO 200'. CHANGE TO LAP IN DIRECTION OF TRAVEL.



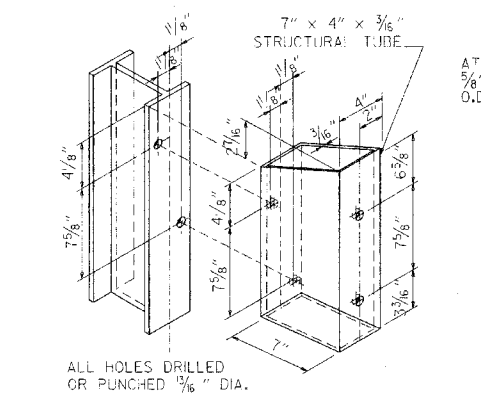
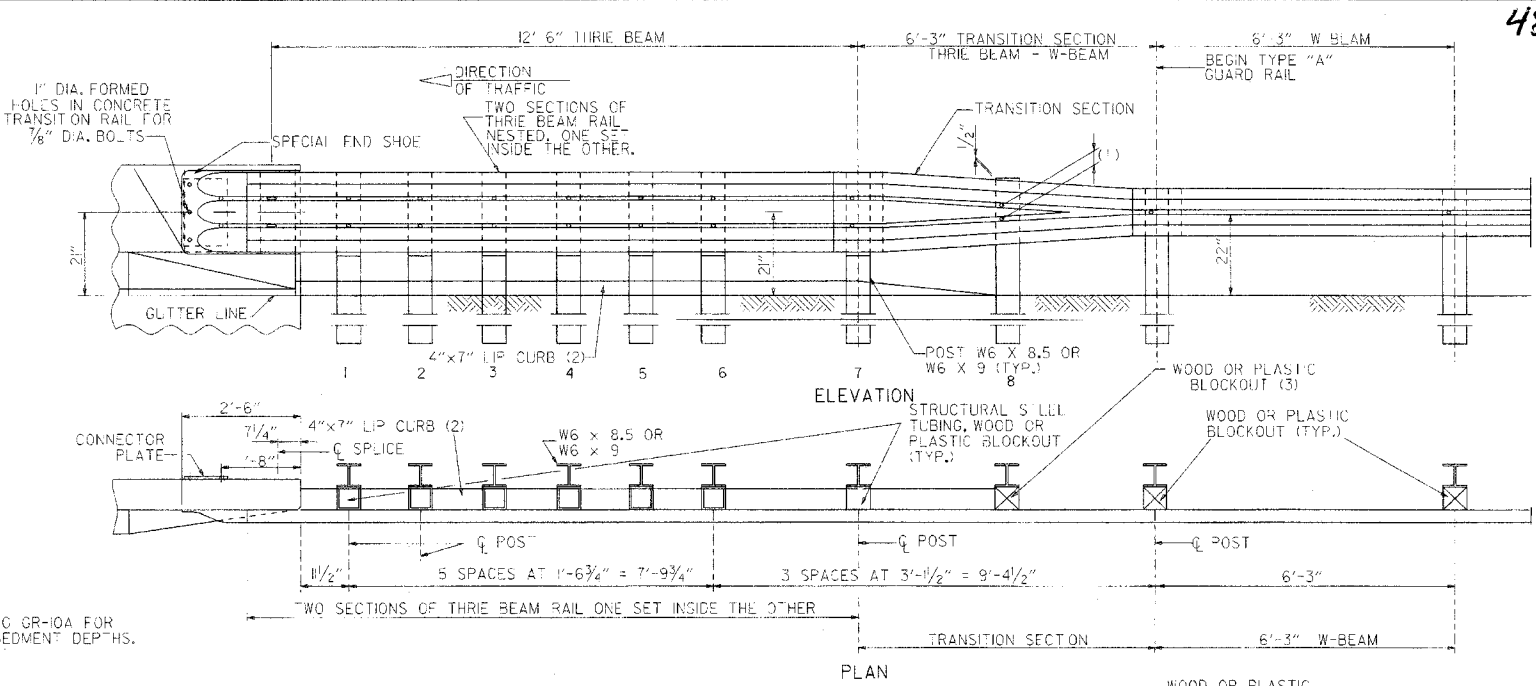
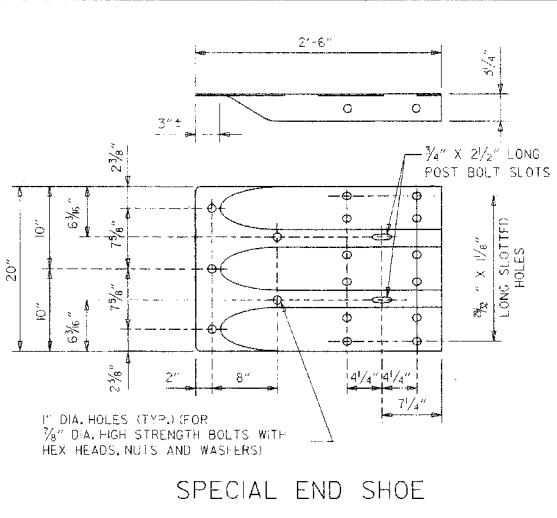
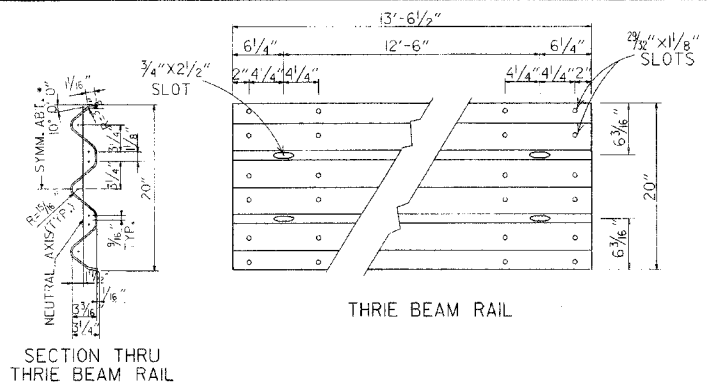
LEGEND

- THRE BEAM GUARD RAIL TERMINAL
- GUARD RAIL TERMINAL (TYPE 2)

METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERMINAL (TYPE I) (FULL SHOULDER WIDTH OR LESS BRIDGES)

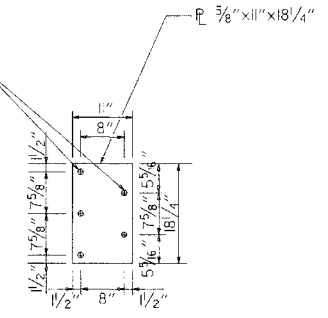
DATE	REVISION	DATE FILM
4-17-08	REVISED LAYOUTS	
11-10-05	REMOVED GUARD RAIL NOTES AND DETAILS	
11-16-01	DELETED NOTE-METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERM. (TY. I)	
1-12-00	ADDED CONSTRUCTION NOTE	1-12-00
6-26-97	REVISED LAYOUT	
10-1-92	REDRAWN & REVISED	10-1-92
10-9-87	ADDED NOTE	
	REDRAWN & REVISED	

ARKANSAS STATE HIGHWAY COMMISSION	
GUARD RAIL DETAILS	
STANDARD DRAWING GR-9	



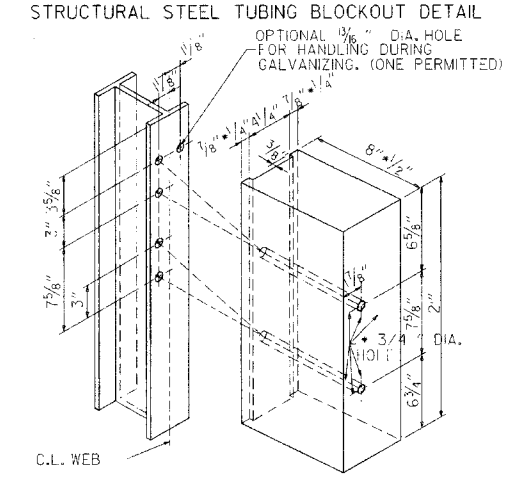
ATTACH BLOCKOUT TO POST USING 5/8" DIA. HEX HEAD BOLTS WITH 1/2" O.D. CUT STEEL WASHERS AND NUT.

1" DIA. HOLES (TYP.) FOR 7/8" DIA. HIGH-STRENGTH BOLTS

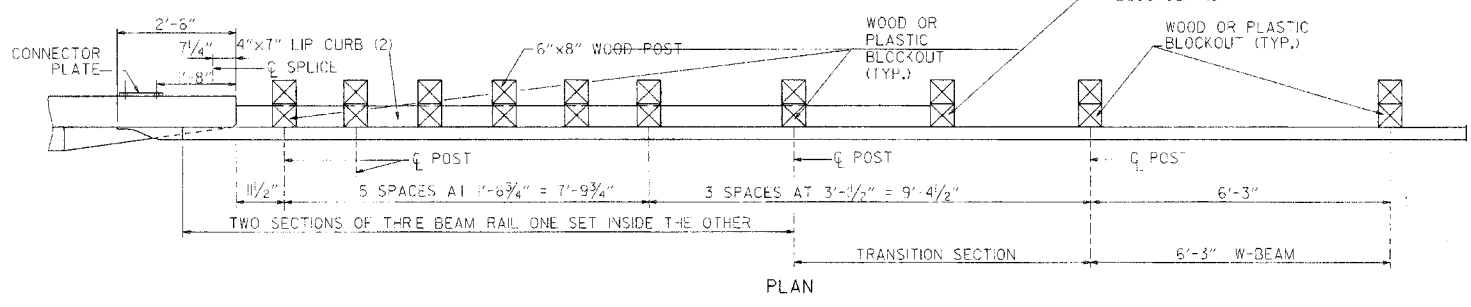
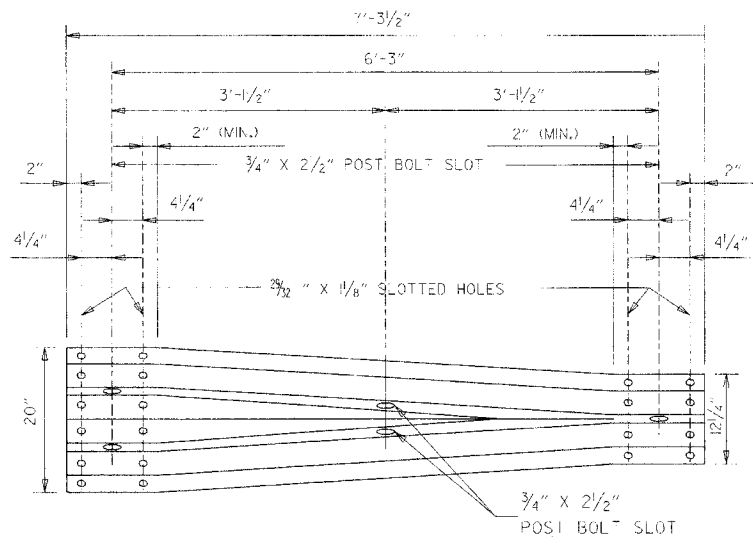
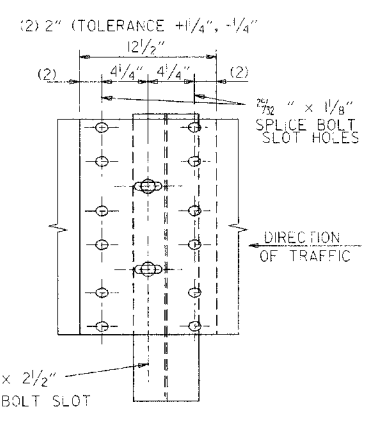


NOTE: SEE STANDARD DRAWING GR-10A FOR GUARD RAIL POST EMBEDMENT DEPTHS.

CONNECTOR PLATE SHALL BE AASHTO M270, GR. 36 AND SHALL BE GALVANIZED AFTER FABRICATION. GALVANIZING SHALL CONFORM TO SUBSECTION 807.9 OF THE STANDARD SPECIFICATIONS. CONNECTOR PLATE TO BE BOLTED TO SPECIAL END SHOE USING 5/8" DIA. HIGH STRENGTH BOLTS, WITH THE HEADS PLACED ON THE TRAFFIC FACE. WASHERS SHALL BE USED UNDER THE HEAD AND NUT. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AND SHALL CONFORM TO SUBSECTION 807.06.



NOTE: BLOCKS SHALL BE THE SAME TYPE THROUGHOUT THE PROJECT LIMITS.



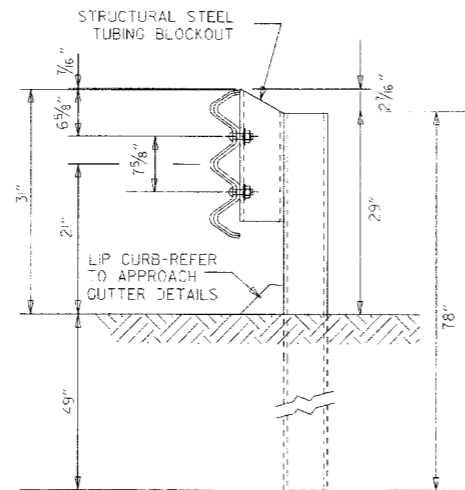
- (1) VERIFY BOLT SPACING FROM RAIL TRANSITION PRODUCER.
- (2) REFER TO APPROACH GUTTER DETAILS.
- (3) LENGTH OF BLOCKOUT ON POST 8 TO BE MODIFIED TO FIT RAIL WIDTH.

THRE BEAM GUARD RAIL CONNECTION AT BRIDGE ENDS

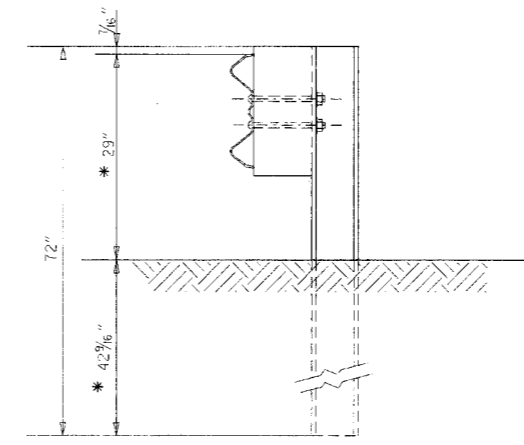
GENERAL NOTES:

THE THRE BEAM RAIL, SPECIAL END SHOE, AND THE TRANSITION SECTION SHALL BE MADE OF STEEL AND SHALL BE 12 GAGE. ZINC COATING SHALL BE TYPE I. RAIL POSTS SHALL BE SET PERPENDICULAR TO THE ROADWAY PROFILE GRADE AND VERTICALLY IN CROSS SECTION. ALL BOLTS SHALL BE SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN 3/4" BEYOND IT. ALL LAP SPLICES, INCLUDING SPECIAL END SHOES, SHALL BE MADE IN THE DIRECTION SHOWN ON STANDARD DRAWINGS GR-9 & GR-11. WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7f (400 f) OR NO. 11350 f SOUTHERN PINE. REFER TO STD. DRWG. GR-10A FOR POST DETAILS. USE THRE BEAM GUARD RAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB. THRE BEAM POSTS SHALL BE SAME MATERIAL AS W-BEAM POSTS FOR ENTIRE JOB.

7-14-10	RAISED HEIGHT OF W-BEAM 1"		ARKANSAS STATE HIGHWAY COMMISSION
8-29-07	ADDED PLASTIC BLOCKOUTS		
11-10-05	ADDED NOTE FOR ATTACHING STEEL BLOCKOUT		GUARD RAIL DETAILS
11-18-04	REVISED GENERAL NOTES		
10-9-03	REVISED GENERAL NOTES		STANDARD DRAWING GR-10
4-10-03	REVISED GENERAL NOTES		
8-22-02	REVISED NOTE (2)		
6-29-00	MOVED DIMENSION LINES		
5-18-00	ADDED NOTE		
3-30-00	DRAWN & ISSUED		
DATE	REVISION	DATE FILM	

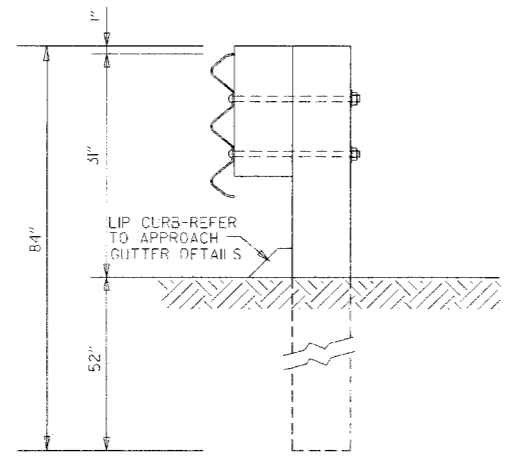


THREE BEAM RAIL WITH STEEL TUBING BLOCKOUT AND STEEL POST
POSTS 1-7

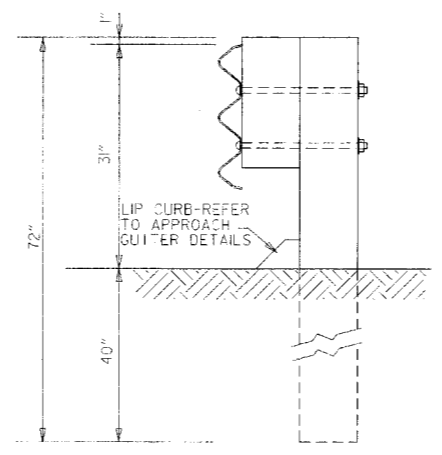


W-BEAM TO THREE BEAM TRANSITION RAIL WITH WOOD OR PLASTIC BLOCKOUT AND STEEL POST
POST 8

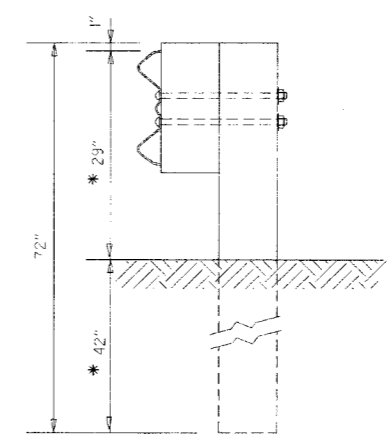
*NOTE:
THESE DIMENSIONS WILL NEED TO BE ADJUSTED IN THE FIELD TO MAKE THE TRANSITION FROM 21" MID POINT OF THREE BEAM TO 22" MID POINT OF W-BEAM.



THREE BEAM RAIL WITH WOOD OR PLASTIC BLOCKOUTS & WOOD POSTS
POSTS 1-6



THREE BEAM RAIL WITH WOOD OR PLASTIC BLOCKOUT & WOOD POST
POST 7



W-BEAM TO THREE BEAM TRANSITION RAIL WITH WOOD OR PLASTIC BLOCKOUT & WOOD POST
POST 8

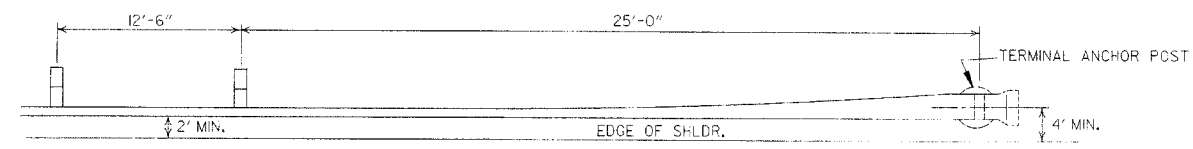
GENERAL NOTES:
RAIL POSTS SHALL BE SET PERPENDICULAR TO THE ROADWAY PROFILE GRADE AND VERTICALLY IN CROSS SECTION.
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7F (400 #) OR NO. 1 (350 #) SOUTHERN PINE.

DATE	REVISION	DATE FILM
7-14-10	REVISED POST & DIMENSIONS	
11-29-07	ADDED PLASTIC BLOCKOUTS	
8-22-02	REVISED LIP CURB NOTE	
3-30-00	DRAWN & ISSUED	

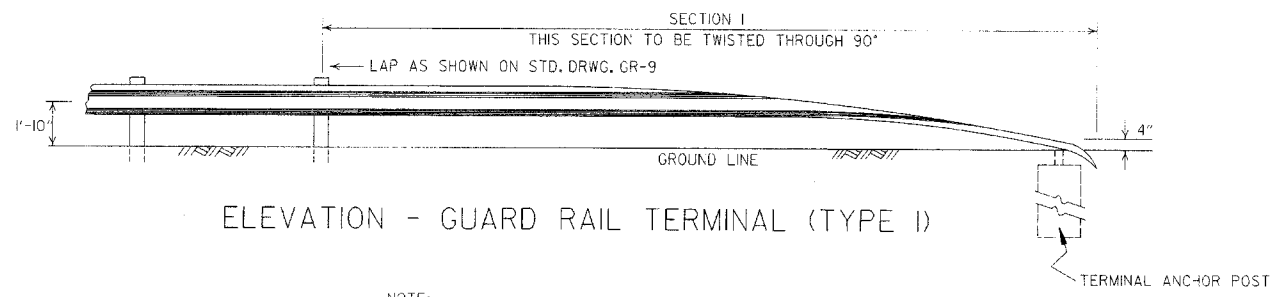
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-10A

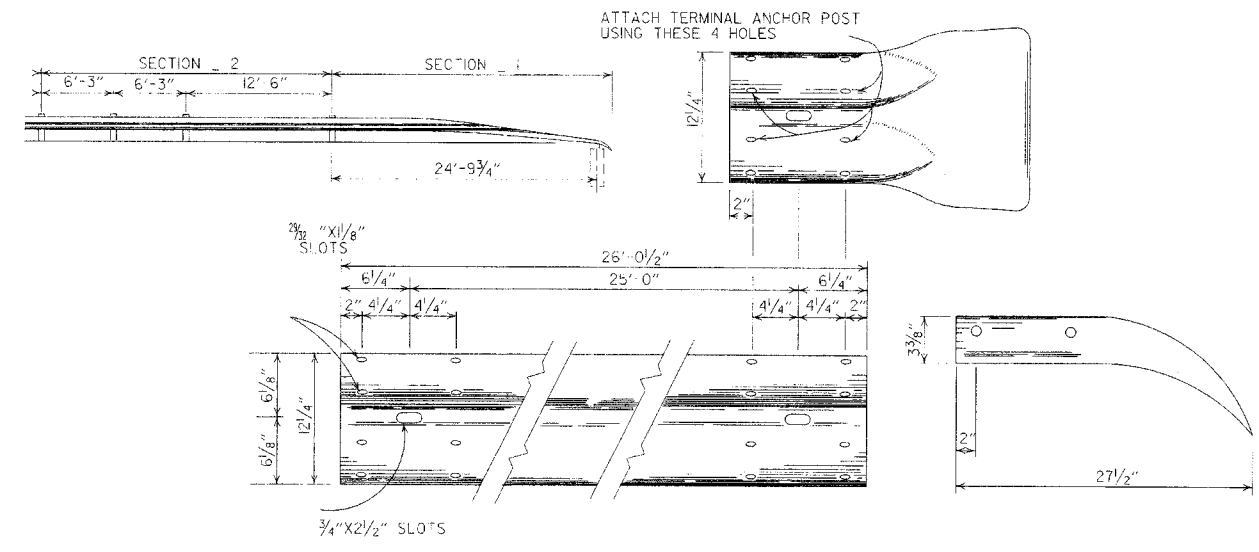


PLAN - GUARD RAIL TERMINAL (TYPE I)



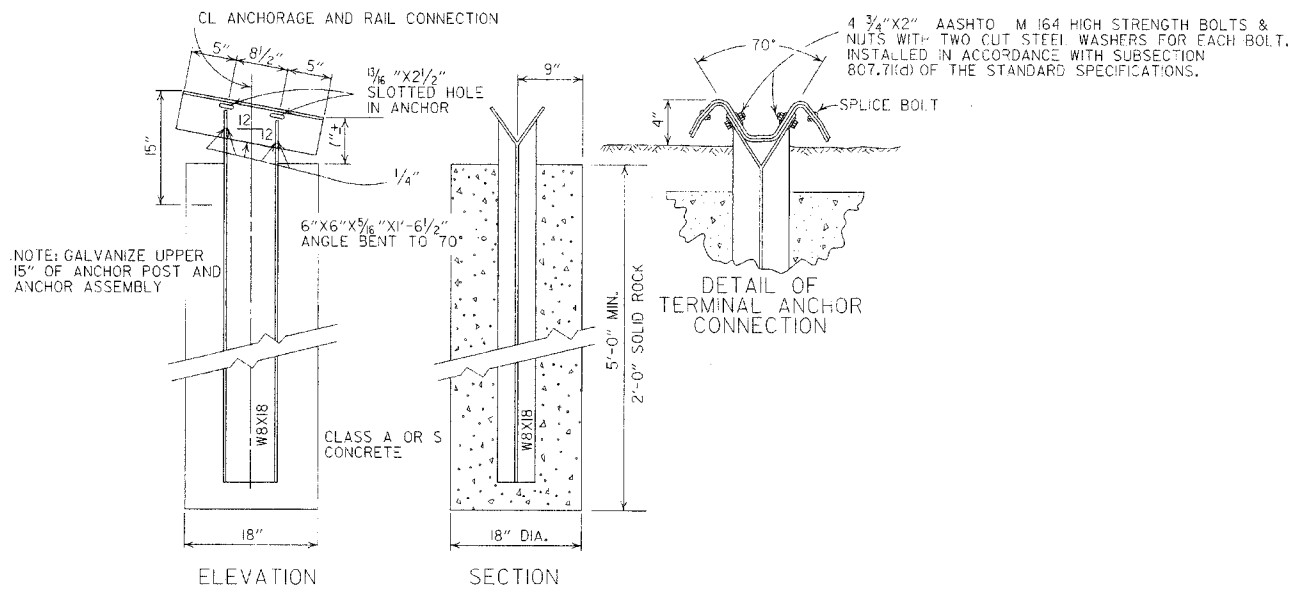
ELEVATION - GUARD RAIL TERMINAL (TYPE I)

NOTE:
SECTIONS 1 AND 2 OF GUARD RAIL TERMINAL SHALL BE PAID FOR AT THE PRICE BID PER LINEAR FOOT OF THE TYPE OF GUARD RAIL SPECIFIED.



SECTION 1

TERMINAL SECTION



NOTE: GALVANIZE UPPER 15" OF ANCHOR POST AND ANCHOR ASSEMBLY

ELEVATION SECTION

NOTE: RAIL MEMBERS MAY BE BOLTED TO ANGLE AT TERMINAL ANCHOR AND THE TWO ASSEMBLIES POSITIONED TO PROPER ALIGNMENT PRIOR TO PLACING CONCRETE AROUND 8 W# 17 POST IF CONTRACTOR SO DESIRES.

DETAIL OF TERMINAL ANCHOR POST (TYPE I)

ARKANSAS STATE HIGHWAY COMMISSION		
GUARD RAIL DETAILS		
STANDARD DRAWING GRT-1		
7-14-10	RAISED HEIGHT OF GUARD RAIL	
6-26-97	REVISED LAP NOTE	
10-18-96	REVISED ASTM REF. TO AASHTO	
11-3-94	DIMENSION TERMINAL DETAIL	
11-11-92	ADDED NOTE FOR PAYMENT	11-11-92
10-1-92	DRAWN & ISSUED	10-1-92
DATE	REVISION	DATE FILM

REINFORCED CONCRETE ARCH PIPE DIMENSIONS

EQUIV. DIA.	SPAN		RISE	
	AASHTO M 206	AHTD NOMINAL	AASHTO M 206	AHTD NOMINAL
INCHES	INCHES			
15	18	18	11	11
18	22	22	13 1/2	14
21	26	26	15 1/2	16
24	28 1/2	29	18	18
30	36 1/4	36	22 1/2	23
36	43 3/8	44	26 5/8	27
42	51 1/8	51	31 3/8	31
48	58 1/2	59	36	36
54	65	65	40	40
60	73	73	45	45
72	88	88	54	54
84	102	102	62	62
90	115	115	72	72
96	122	122	77 1/2	77
108	138	138	87 1/8	87
120	154	154	96 3/8	97
132	168 3/4	169	106 1/2	107

THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PERCENT FROM THE VALUES SPECIFIED BY AASHTO M206.

REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE DIMENSIONS

EQUIV. DIA.	AASHTO M 207	
	SPAN	RISE
INCHES	INCHES	
18	23	14
24	30	19
27	34	22
30	38	24
33	42	27
36	45	29
39	49	32
42	53	34
48	60	38
54	68	43
60	76	48
66	83	53
72	91	58
78	98	63
84	106	68

THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PERCENT FROM THE VALUES SPECIFIED BY AASHTO M207.

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. PLACE AND COMPACT THE HAUNCH AREA UP TO THE MIDDLE OF THE PIPE.
5. COMPLETE BACKFILL ACCORDING TO SUBSECTION 606.03.(F)(1).

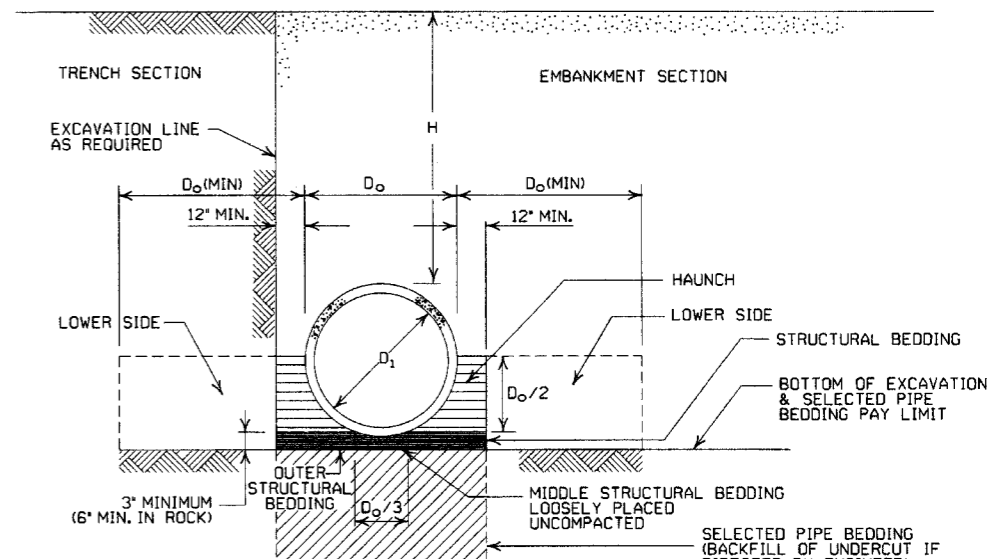
NOTE: HAUNCH AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF CONCRETE PIPE.

- LEGEND -

- D₁ = NORMAL INSIDE DIAMETER OF PIPE
- D_o = OUTSIDE DIAMETER OF PIPE
- H = FILL COVER HEIGHT OVER PIPE (FEET)
- MIN. = MINIMUM
- [Symbol] = UNDISTURBED SOIL

INSTALLATION TYPE	MATERIAL REQUIREMENTS FOR HAUNCH AND STRUCTURAL BEDDING
TYPE 1	AGGREGATE BASE COURSE (CLASS 5 OR CLASS 7)
TYPE 2	SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4) OR TYPE 1 INSTALLATION MATERIAL*
TYPE 3**	AASHTO CLASSIFICATION A-1 THRU A-6 SOIL OR TYPE 1 OR 2 INSTALLATION MATERIAL

- * SM-3 WILL NOT BE ALLOWED.
- ** MATERIALS SHALL NOT INCLUDE ORGANIC MATERIALS OR STONES LARGER THAN 3 INCHES.



EMBANKMENT AND TRENCH INSTALLATIONS

1. MATERIAL IN THE HAUNCH AND OUTER STRUCTURAL BEDDING SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.
2. FOR TRENCHES WITH WALLS OF NATURAL SOIL, THE DENSITY OF THE SOIL IN THE LOWER SIDE ZONE SHALL BE AS FIRM AS THE 95% DENSITY REQUIRED FOR THE HAUNCH. IF THE EXISTING SOIL DOES NOT MEET THIS CRITERIA, IT SHALL BE REMOVED AND RECOMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OF MATERIAL USED.
3. FOR EMBANKMENTS, THE MATERIAL IN THE LOWER SIDE ZONE SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

GENERAL NOTES

1. CONCRETE PIPE CULVERT CONSTRUCTION SHALL CONFORM TO ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION), WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS. UNLESS OTHERWISE NOTED IN THE PLANS, SECTION AND SUBSECTION REFER TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
2. CONCRETE PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. ALL PIPE SHALL CONFORM TO SECTION 606. CIRCULAR R.C. PIPE CULVERTS SHALL CONFORM TO AASHTO M170, R.C. ARCH PIPE CULVERTS SHALL CONFORM TO AASHTO M206 AND HORIZONTAL ELLIPTICAL PIPE CULVERTS SHALL CONFORM TO AASHTO M207.
4. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
5. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
6. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
7. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
8. NOT MORE THAN ONE LIFTING HOLE MAY BE PROVIDED IN CONCRETE PIPE TO FACILITATE HANDLING. HOLE MAY BE CAST IN PLACE, CUT INTO THE FRESH CONCRETE AFTER FORMS ARE REMOVED, OR DRILLED. THE HOLE SHALL NOT BE MORE THAN TWO INCHES IN DIAMETER OR TWO INCHES SQUARE. CUTTING OR DISPLACEMENT OF REINFORCEMENT WILL NOT BE PERMITTED. SPALLED AREAS AROUND THE HOLE SHALL BE REPAIRED IN A WORKMANLIKE MANNER. LIFTING HOLE SHALL BE FILLED WITH MORTAR, CONCRETE, OR OTHER METHOD AS APPROVED BY THE ENGINEER.
9. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
10. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS THE HAUNCH), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."

MINIMUM HEIGHT OF FILL "H" OVER CIRCULAR R.C. PIPE CULVERTS

INSTALLATION TYPE	CLASS OF PIPE			
	CLASS III		CLASS IV	CLASS V
PIPE ID (IN.)	FEET			
12-15	2	2.5	2	1
18-24	2.5	3	2	1
27-33	3	4	2	1
36-42	3.5	5	2	1
48	4.5	5.5	2	1
54-60	5	7	2	1
66-78	6	8	2	1
84-108	7.5	8	2	1

NOTE: FOR MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM OF 12" OF PAVEMENT AND/OR BASE.

MAXIMUM HEIGHT OF FILL "H" OVER CIRCULAR R.C. PIPE CULVERTS

INSTALLATION TYPE	CLASS OF PIPE		
	CLASS III	CLASS IV	CLASS V
TYPE 1	21	32	50
TYPE 2	16	25	39
TYPE 3	12	20	30

NOTE: IF FILL HEIGHT EXCEEDS 50 FEET, A SPECIAL DESIGN CONCRETE PIPE WILL BE REQUIRED USING TYPE 1 INSTALLATION.

MINIMUM HEIGHT OF FILL "H" OVER R.C. ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS

INSTALLATION TYPE	CLASS OF PIPE	
	CLASS III	CLASS IV
TYPE 2 OR TYPE 3	2.5	1.5

NOTE: TYPE 1 INSTALLATION WILL NOT BE ALLOWED FOR ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS.

NOTE: FOR MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM OF 12" OF PAVEMENT AND/OR BASE.

MAXIMUM HEIGHT OF FILL "H" OVER R.C. ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS

INSTALLATION TYPE	CLASS OF PIPE	
	CLASS III	CLASS IV
TYPE 2	13	21
TYPE 3	10	16

NOTE: TYPE 1 INSTALLATION WILL NOT BE ALLOWED FOR ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS.

DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REVISED FOR LRFD DESIGN SPECIFICATIONS	
5-18-00	REVISED TYPE 3 BEDDING & ADDED NOTE	
3-30-00	REVISED INSTALLATIONS	
11-06-97	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCC-1



CORRUGATED STEEL PIPE (ROUND)

PIPE DIAMETER (INCHES)	① MINIMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET)	MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS (INCHES)				
		0.064	0.079	0.109	0.138	0.168
2 3/8 INCH BY 1/2 INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM						
12	1	84	91			
15	1	67	73			
18	1	56	61			
24	1	42	46	59		
30	2	34	36	47		
36	2		30	39	41	
42	2		43	67	70	73
48	2		37	58	61	64
② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, BOLTED, OR HELICAL LOCK-SEAM						
36	1	48	60	88	111	118
42	1	41	51	72	90	102
48	1	36	45	64	77	85
54	2	32	40	59	71	79
60	2	29	36	53	64	71
66	2	26	33	47	58	64
72	2	24	30	44	53	59
78	2		28	41	49	54
84	2		26	38	45	51
90	2		24	35	43	45
96	2		22	33	40	44
102	2			31	38	42
108	2			30	35	39
114	2			28	34	37
120	2			27	32	35

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. COMPLETE STRUCTURAL BACKFILL OPERATION BY WORKING FROM SIDE TO SIDE OF THE PIPE, THE SIDE TO SIDE STRUCTURAL BACKFILL DIFFERENTIAL SHALL NOT EXCEED 24 INCHES OR 1/3 THE SIZE OF THE PIPE, WHICHEVER IS LESS.

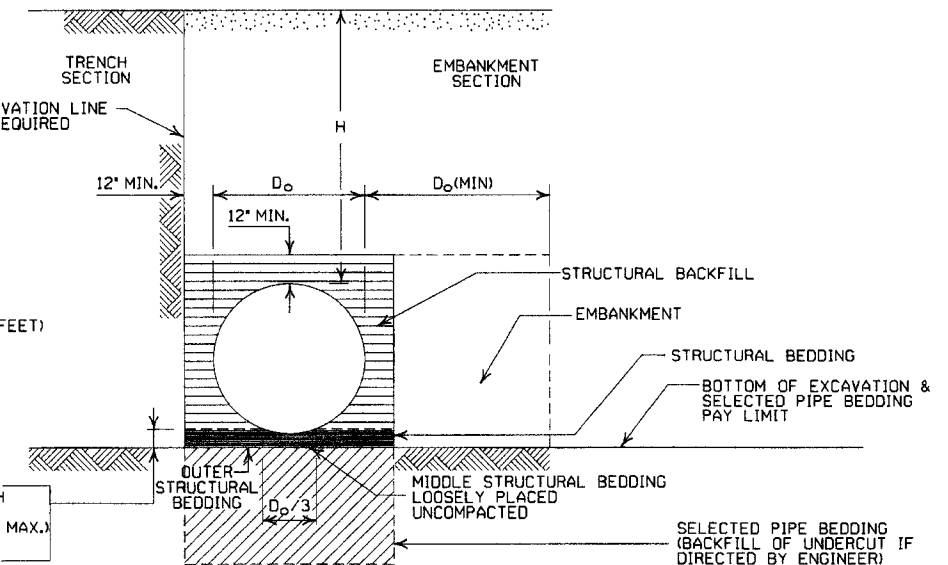
NOTE: STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF METAL PIPE.

INSTALLATION TYPE	MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING
TYPE 1	AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7)
TYPE 2	SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4) OR TYPE 1 INSTALLATION MATERIAL ③

③ SM-3 WILL NOT BE ALLOWED.

- LEGEND -

- D_o = OUTSIDE DIAMETER OF PIPE
- MAX. = MAXIMUM
- MIN. = MINIMUM
- [Hatched Pattern] = STRUCTURAL BACKFILL MATERIAL
- [Diagonal Lines] = UNDISTURBED SOIL
- [Dotted Pattern] = EQUIV. DIA. = EQUIVALENT DIAMETER
- H = FILL COVER HEIGHT OVER PIPE (FEET)



EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.
2. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE (ROUND).
3. INSTALLATION TYPE 1 SHALL BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 2 3/8" X 1/2" CORRUGATION.
4. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 3" X 1" OR 5" X 1" CORRUGATION.

GENERAL NOTES

1. METAL PIPE CULVERT CONSTRUCTION SHALL CONFORM TO ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION), WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS. UNLESS OTHERWISE NOTED IN THE PLANS, SECTION AND SUBSECTION REFER TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
2. METAL PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. METAL PIPE CULVERT MATERIALS AND INSTALLATIONS SHALL CONFORM TO SECTION 606 AND JOB SPECIAL PROVISION "METAL PIPE".
4. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
5. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
6. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
7. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
8. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
9. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."

CORRUGATED ALUMINUM PIPE (ROUND)

PIPE DIAMETER (INCHES)	① MINIMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET)	MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS IN INCHES				
		0.060	0.075	0.105	0.135	0.164
2 3/8 INCH BY 1/2 INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM						
12	1	45	45			
18	2	30	30	52	41	
24	2	22	22	39		34
30	2		18	31	32	
36	2.5		15	26	27	28
42	2			43	43	44
48	2			40	41	43
54	2			35	37	38
60	2				33	34
66	2					31
72	2					29

EQUIVALENT METAL THICKNESSES AND GAUGES

METAL THICKNESS IN INCHES			GAUGE NUMBER
STEEL			
ZINC COATED	UNCOATED	ALUMINUM	
0.064	0.0598	0.060	16
0.079	0.0747	0.075	14
0.109	0.1046	0.105	12
0.138	0.1345	0.135	10
0.168	0.1644	0.164	8

CORRUGATED METAL PIPE ARCHES

EQUIV. DIA. (INCHES)	PIPE DIMENSION SPAN X RISE (INCHES)	MINIMUM CORNER RADIUS (INCHES)	STEEL				ALUMINUM			
			MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.)		MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.)			
				INSTALLATION			INSTALLATION			
				TYPE 1	TYPE 1		TYPE 1	TYPE 1		
2 3/8 INCH BY 1/2 INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM										
15	17x13	3	0.064	2	15	0.060	2	15		
18	21x15	3	0.064	2	15	0.060	2	15		
21	24x18	3	0.064	2.25	15	0.060	2.25	15		
24	28x20	3	0.064	2.5	15	0.075	2.5	15		
30	35x24	3	0.079	3	12	0.075	3	12		
36	42x29	3 1/2	0.079	3	12	0.105	3	12		
42	49x33	4	0.079	3	12	0.105	3	12		
48	57x38	5	0.109	3	13	0.135	3	13		
54	64x43	6	0.109	3	14	0.135	3	14		
60	71x47	7	0.138	3	15	0.135	3	14		
66	77x52	8	0.168	3	15	0.164	3	15		
72	83x57	9	0.168	3	15					
② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM										
			INSTALLATION				INSTALLATION			
			TYPE 2	TYPE 1	TYPE 2	TYPE 1	TYPE 2	TYPE 1	TYPE 2	TYPE 1
36	40x31	5	0.079	3	2	12	15			
42	46x36	6	0.079	3	2	13	15			
48	53x41	7	0.079	3	2	13	15			
54	60x46	8	0.079	3	2	13	15			
60	66x51	9	0.079	3	2	13	15			
66	73x55	12	0.079	3	2	15	15			
72	81x59	14	0.079	3	2	15	15			
78	87x63	14	0.079	3	2	15	15			
84	95x67	16	0.109	3	2	15	15			
90	103x71	16	0.109	3	2	15	15			
96	112x75	18	0.109	3	2	15	15			
102	117x79	18	0.109	3	2	15	15			
108	128x83	18	0.138	3	2	15	15			

① FOR MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM 12" OF PAVEMENT AND/OR BASE.

② WHERE THE STANDARD 2 3/8" X 1/2" CORRUGATION AND GAUGE IS SPECIFIED FOR A GIVEN DIAMETER, A PIPE OF THE SAME DIAMETER WITH A 3" X 1" OR 5" X 1" CORRUGATION MAY BE SUBSTITUTED, PROVIDING IT IS GAUGED FOR A FILL HEIGHT CONDITION EQUAL TO OR GREATER THAN THE MAXIMUM FILL HEIGHT CONDITION FOR THE SPECIFIED GAUGE AND CORRUGATION.

DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1	
12-15-11	REVISED FOR LRFD DESIGN SPECS	
3-30-00	REVISED INSTALLATIONS	
11-06-97	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

METAL PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCM-1



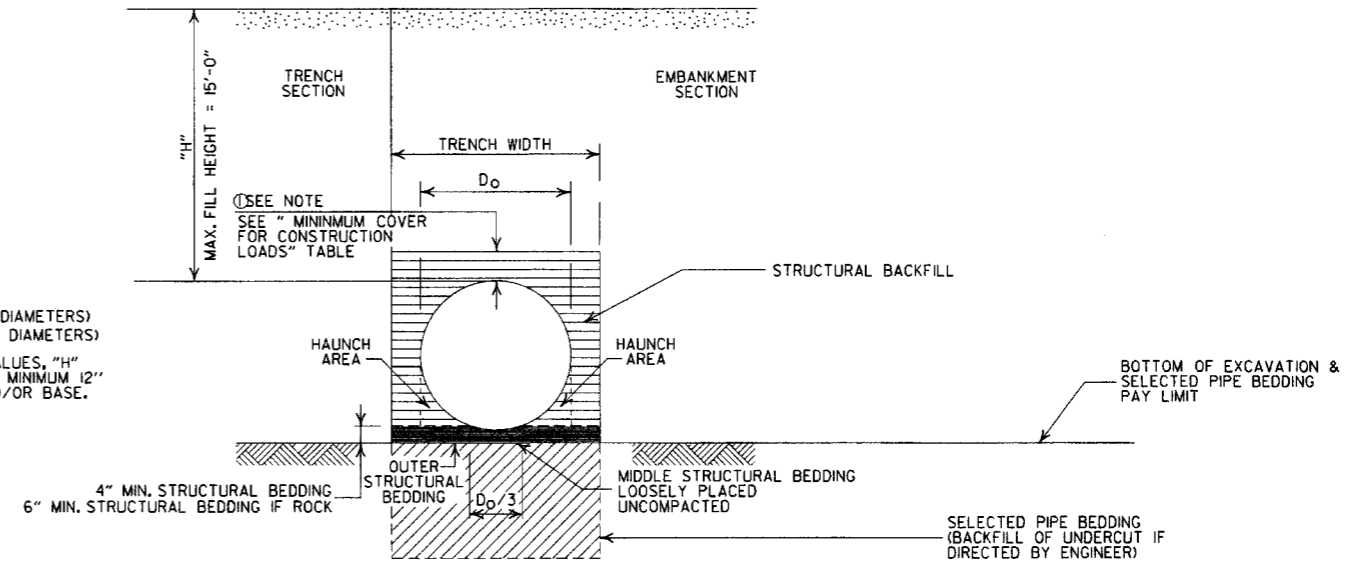
INSTALLATION TYPE	** MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING
TYPE 2	*SELECTED MATERIALS (CLASS SM-1, SM-2 OR SM-4)

- AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.
- SM3 WILL NOT BE ALLOWED.
- STRUCTURAL BEDDING MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE OF INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.
- STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF HDPE PIPE.

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

PIPE DIAMETER	TRENCH WIDTH (FEET)	
	"H" < 10'-0"	"H" > OR = 10'-0"
18"	4'-6"	4'-6"
24"	5'-0"	6'-0"
30"	5'-6"	7'-6"
36"	6'-0"	9'-0"
42"	7'-0"	10'-6"
48"	8'-0"	12'-0"

NOTE:
 18" MIN. (18" - 30" DIAMETERS)
 24" MIN. (36" - 48" DIAMETERS)
 MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM 12" OF PAVEMENT AND/OR BASE.



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

MULTIPLE INSTALLATION OF HIGH DENSITY POLYETHYLENE PIPES

PIPE DIAMETER	CLEAR DISTANCE BETWEEN PIPES
18"	1'-6"
24"	2'-0"
30"	2'-6"
36"	3'-0"
42"	3'-6"
48"	4'-0"

MINIMUM COVER FOR CONSTRUCTION LOADS

PIPE DIAMETER	MIN. COVER (FEET) FOR INDICATED CONSTRUCTION LOADS			
	18.0-50.0 (KIPS)	50.0-75.0 (KIPS)	75.0-110.0 (KIPS)	110.0-175.0 (KIPS)
36" OR LESS	2'-0"	2'-6"	3'-0"	3'-0"
42" OR GREATER	3'-0"	3'-0"	3'-6"	4'-0"

MINIMUM COVER SHALL BE MEASURED FROM TOP OF PIPE TO TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE. THE SURFACE SHALL BE MAINTAINED.

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. THE STRUCTURAL BACKFILL SHALL BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE LAYERS SHALL BE BROUGHT UP EVENLY AND SIMULTANEOUSLY TO THE ELEVATION OF THE MINIMUM COVER.
5. PIPE INSTALLATION MAY REQUIRE THE USE OF RESTRAINTS, WEIGHTING OR OTHER APPROVED METHODS IN ORDER TO HELP MAINTAIN GRADE AND ALIGNMENT.

- LEGEND -

H = FILL HEIGHT (FT.)
 D_o = OUTSIDE DIAMETER OF PIPE
 MAX. = MAXIMUM
 MIN. = MINIMUM

==== = STRUCTURAL BACKFILL MATERIAL
 ===== = UNDISTURBED SOIL

GENERAL NOTES

1. PIPE SHALL CONFORM TO AASHTO M294, TYPE S. INSTALLATION SHALL CONFORM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
4. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
5. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
8. HIGH DENSITY POLYETHYLENE PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR HDPE PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN AASHTO SECTION 26.4.2.4 AND 30.4.2 "AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS." JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REVISED GENERAL NOTES & MINIMUM COVER NOTE	
11-17-10	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION
 PLASTIC PIPE CULVERT
 (HIGH DENSITY POLYETHYLENE)

STANDARD DRAWING PCP-1 

INSTALLATION TYPE	•• MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING
TYPE 2	•SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4)

• AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.
SM3 WILL NOT BE ALLOWED.

•• STRUCTURAL BEDDING MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE OF 1/8 INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.

STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF PVC PIPE.

MAXIMUM FILL HEIGHT
BASED ON STRUCTURAL BACKFILL

PIPE DIAMETER	"H"
18"	45'-0"
24"	45'-0"
30"	40'-0"
36"	40'-0"

① NOTE:
12" MIN. (18" - 36" DIAMETERS)
MINIMUM COVER VALUE, "H"
SHALL INCLUDE A MINIMUM 12"
OF PAVEMENT AND/OR BASE.

MINIMUM TRENCH WIDTH
BASED ON FILL HEIGHT "H"

PIPE DIAMETER	TRENCH WIDTH (FEET)	
	"H" < 10'-0"	"H" > OR = 10'-0"
18"	4'-6"	4'-6"
24"	5'-0"	6'-0"
30"	5'-6"	7'-6"
36"	6'-0"	9'-0"

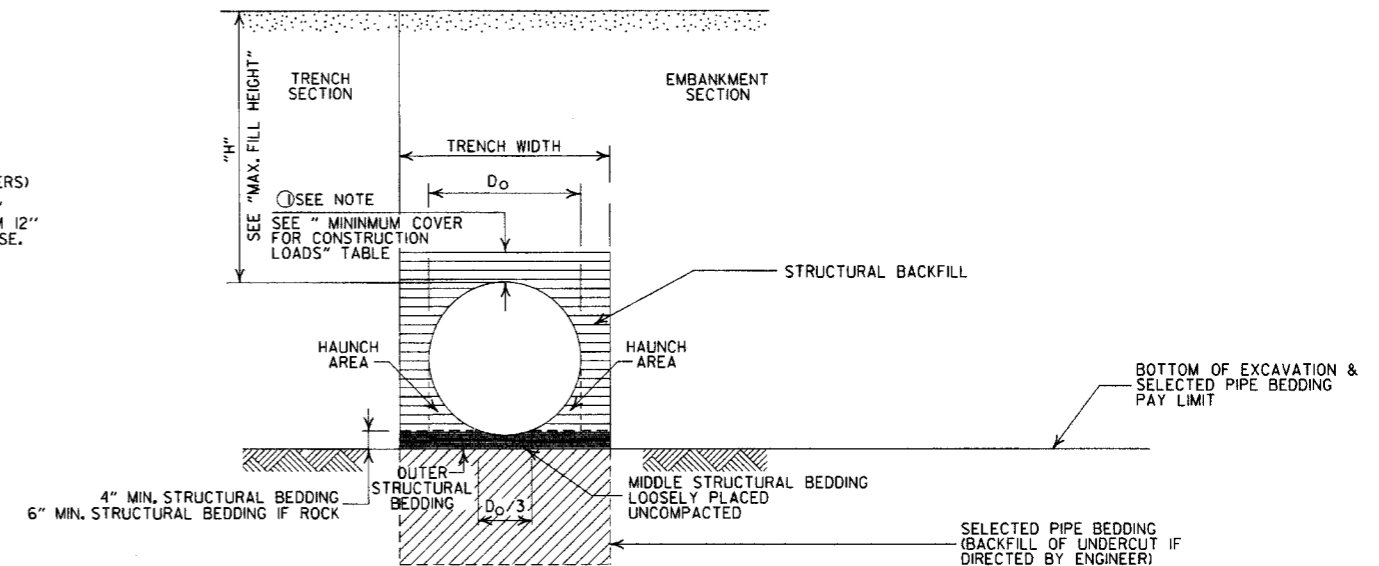
MULTIPLE INSTALLATION OF
PVC PIPES

PIPE DIAMETER	CLEAR DISTANCE BETWEEN PIPES
18"	1'-6"
24"	2'-0"
30"	2'-6"
36"	3'-0"

MINIMUM COVER FOR
CONSTRUCTION LOADS

PIPE DIAMETER	② MIN. COVER (FEET) FOR INDICATED CONSTRUCTION LOADS			
	18.0-50.0 (KIPS)	50.0-75.0 (KIPS)	75.0-110.0 (KIPS)	110.0-175.0 (KIPS)
18" THRU 36"	2'-0"	2'-6"	3'-0"	3'-0"

② MINIMUM COVER SHALL BE MEASURED FROM TOP OF PIPE TO TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE. THE SURFACE SHALL BE MAINTAINED.



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. THE STRUCTURAL BACKFILL SHALL BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE LAYERS SHALL BE BROUGHT UP EVENLY AND SIMULTANEOUSLY TO THE ELEVATION OF THE MINIMUM COVER.
5. PIPE INSTALLATION MAY REQUIRE THE USE OF RESTRAINTS, WEIGHTING OR OTHER APPROVED METHODS IN ORDER TO HELP MAINTAIN GRADE AND ALIGNMENT.

- LEGEND -

H = FILL HEIGHT (FT.)
D_o = OUTSIDE DIAMETER OF PIPE
MAX. = MAXIMUM
MIN. = MINIMUM

==== = STRUCTURAL BACKFILL MATERIAL
===== = UNDISTURBED SOIL

GENERAL NOTES

1. PIPE SHALL CONFORM TO ASTM F949, CELL CLASS 12454. INSTALLATION SHALL CONFORM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
4. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
5. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
8. PVC PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR PVC PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN AASHTO SECTION 26.4.2.4 AND 30.4.2 "AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS." JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

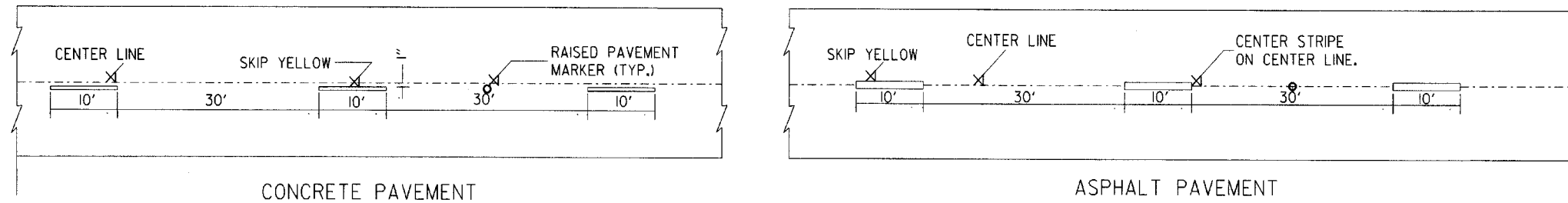
DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REV GENERAL NOTES & MINIMUM COVER NOTE; DELETED SM3 MATERIAL	
11-17-10	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

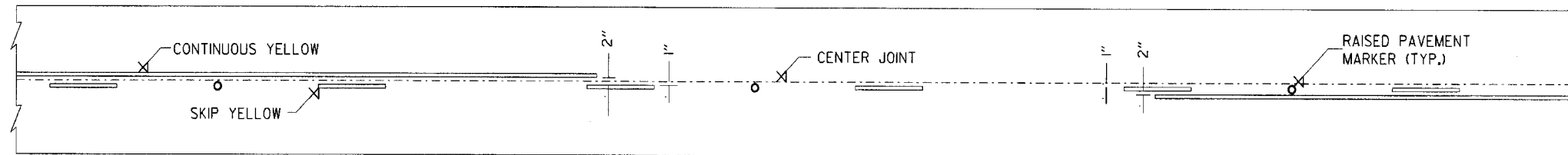
PLASTIC PIPE CULVERT
(PVC F949)

STANDARD DRAWING PCP-2

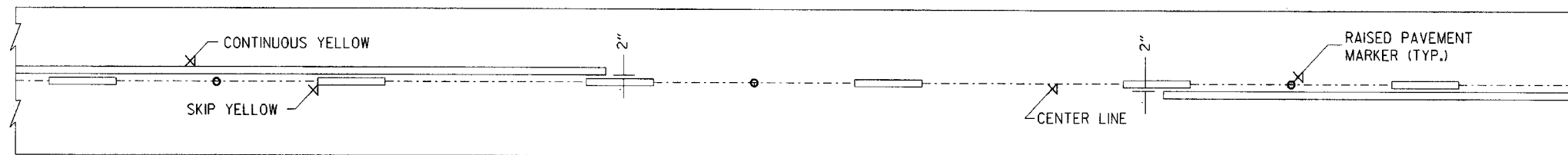




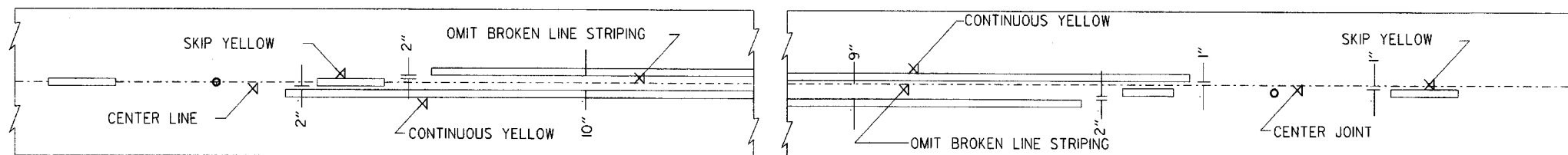
BROKEN LINE STRIPING



SOLID LINE STRIPING ON CONCRETE PAVEMENT



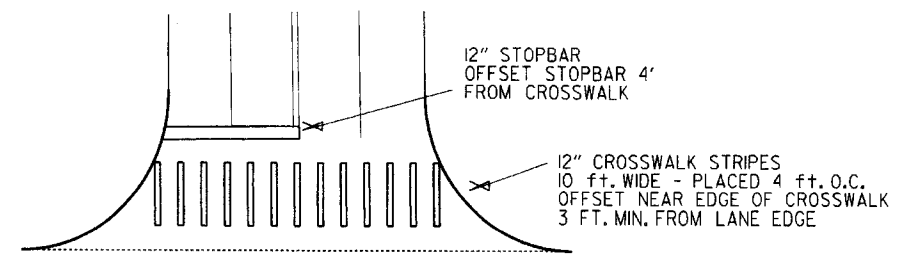
SOLID LINE STRIPING ON ASPHALT PAVEMENT



ASPHALT PAVEMENT

CONCRETE PAVEMENT

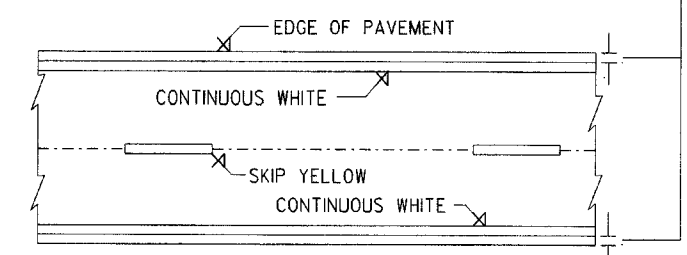
STRIPING AT ADJACENT NO PASSING LANES



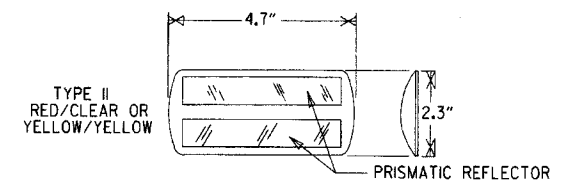
CROSSWALK AND STOPBAR DETAILS

- NOTES:
1. REFER TO THE STRIPING DETAILS FOR PAVEMENT MARKING LINE WIDTHS.
 2. THIS DRAWING SHALL BE USED IN CONJUNCTION WITH THE LATEST REVISED ADDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES."
 3. RAISED PAVEMENT MARKERS SHALL BE PLACED ON AN 80 FEET SPACING UNLESS OTHERWISE SHOWN IN THE PLANS.

2" FOR ASPHALT OR CONCRETE PAVEMENT
6" FOR BITUMINOUS SURFACE TREATMENT



PAVEMENT EDGE LINE MARKING



NOTE:
THE RED LENS OF THE TYPE II R.P.M. SHALL FACE THE INCORRECT TRAFFIC MOVEMENT.



DETAIL OF STANDARD RAISED PAVEMENT MARKERS

NOTE:
DIMENSIONS SHOWN FOR RAISED PAVEMENT MARKERS ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR MARKERS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR SIMILAR MARKERS MAY BE MADE BY REFERRING TO THE AHTD QUALIFIED PRODUCTS LIST.

5-12-16	REVISED LINE WIDTHS, SPACING, & NOTES	
9-12-13	REVISED DETAIL OF STANDARD RAISED PAVEMENT MARKERS	
11-17-10	REVISED GENERAL NOTES & REMOVED PLOWABLE PVMT MRKRS	
11-18-04	REVISED NOTE 2 & GENERAL NOTES	
8-22-02	ADDED CROSSWALK & STOPBAR DTLS.	
7-02-98	ADDED DETAILS OF STD. RAISED PAV'T. MARKERS	
4-26-96	REV. NOTES 3&4; ADDED R.P.M.	
9-30-80	DRAWN	1-9-30-80
DATE	REVISION	FILMED

ARKANSAS STATE HIGHWAY COMMISSION	
PAVEMENT MARKING DETAILS	
STANDARD DRAWING PM-1	

SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

DEGREE OF CURVE	30 MPH		40 MPH		50 MPH		55 MPH		60 MPH		70 MPH	
	MINIMUM	DESIRABLE	MINIMUM	DESIRABLE	MINIMUM	DESIRABLE	MINIMUM	DESIRABLE	MINIMUM	DESIRABLE	MINIMUM	DESIRABLE
0° 15'	N.C.		N.C.		N.C.		N.C.		N.C.		N.C.	
0° 30'	N.C.		N.C.		N.C.		N.C.		N.C.		N.C.	
0° 45'	N.C.		N.C.		N.C.		N.C.		N.C.		N.C.	
1° 00'	N.C.		N.C.		N.C.		N.C.		N.C.		N.C.	
1° 15'	N.C.		N.C.		N.C.		N.C.		N.C.		N.C.	
1° 30'	N.C.		N.C.		N.C.		N.C.		N.C.		N.C.	
1° 45'	N.C.		N.C.		N.C.		N.C.		N.C.		N.C.	
2° 00'	R.C.		R.C.		R.C.		R.C.		R.C.		R.C.	
2° 15'	R.C.		R.C.		R.C.		R.C.		R.C.		R.C.	
2° 30'	0.021		0.021		0.021		0.021		0.021		0.021	
2° 45'	0.023		0.023		0.023		0.023		0.023		0.023	
3° 00'	0.025		0.025		0.025		0.025		0.025		0.025	
3° 15'	0.027		0.027		0.027		0.027		0.027		0.027	
3° 30'	0.029		0.029		0.029		0.029		0.029		0.029	
3° 45'	0.031		0.031		0.031		0.031		0.031		0.031	
4° 00'	0.033		0.033		0.033		0.033		0.033		0.033	
4° 30'	0.037		0.037		0.037		0.037		0.037		0.037	
5° 00'	0.040		0.040		0.040		0.040		0.040		0.040	
5° 30'	0.043		0.043		0.043		0.043		0.043		0.043	
6° 00'	0.046		0.046		0.046		0.046		0.046		0.046	
6° 30'	0.050		0.050		0.050		0.050		0.050		0.050	
7° 00'	0.053		0.053		0.053		0.053		0.053		0.053	
7° 30'	0.056		0.056		0.056		0.056		0.056		0.056	
8° 00'	0.058		0.058		0.058		0.058		0.058		0.058	
8° 30'	0.061		0.061		0.061		0.061		0.061		0.061	
9° 00'	0.063		0.063		0.063		0.063		0.063		0.063	
10° 00'	0.068		0.068		0.068		0.068		0.068		0.068	
11° 00'	0.072		0.072		0.072		0.072		0.072		0.072	
12° 00'	0.076		0.076		0.076		0.076		0.076		0.076	
13° 00'	0.080		0.080		0.080		0.080		0.080		0.080	
14° 00'	0.083		0.083		0.083		0.083		0.083		0.083	
15° 00'	0.086		0.086		0.086		0.086		0.086		0.086	
16° 00'	0.089		0.089		0.089		0.089		0.089		0.089	
17° 00'	0.091		0.091		0.091		0.091		0.091		0.091	
18° 00'	0.093		0.093		0.093		0.093		0.093		0.093	
19° 00'	0.095		0.095		0.095		0.095		0.095		0.095	
20° 00'	0.097		0.097		0.097		0.097		0.097		0.097	
21° 00'	0.098		0.098		0.098		0.098		0.098		0.098	
22° 00'	0.099		0.099		0.099		0.099		0.099		0.099	
23° 00'	0.099		0.099		0.099		0.099		0.099		0.099	
24° 00'	0.100		0.100		0.100		0.100		0.100		0.100	

D MAX = 24' 45"

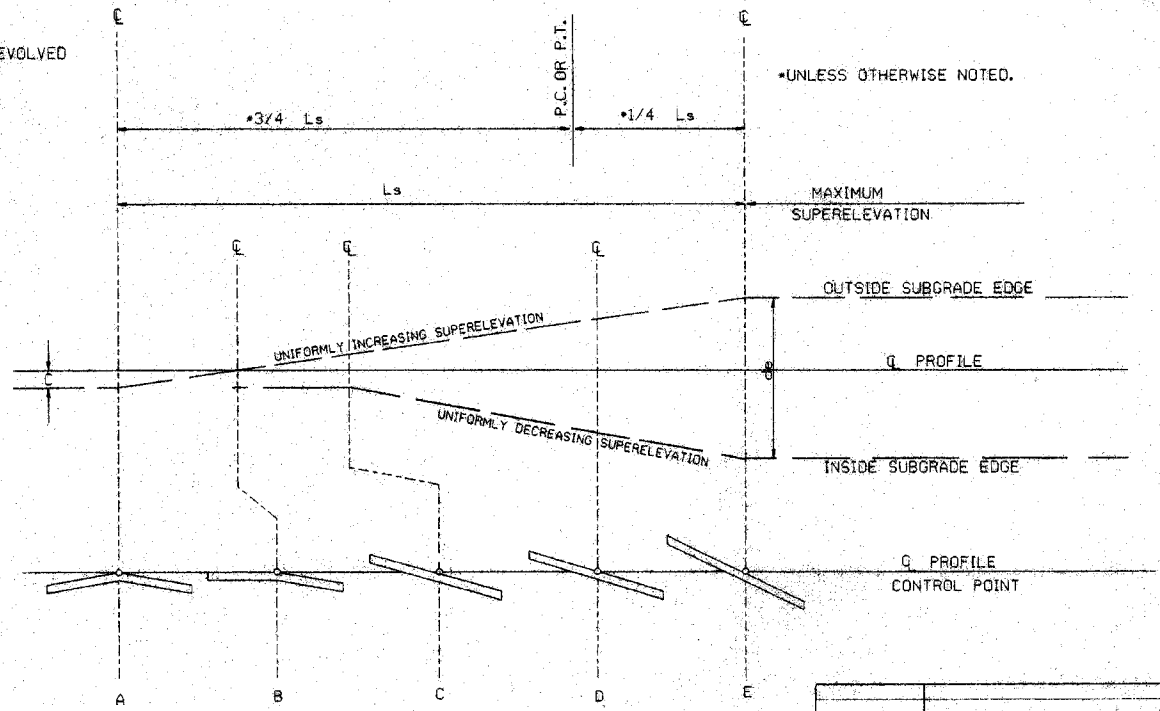
GENERAL NOTES

- ON PAVEMENT WITH TWO-WAY TRAFFIC, THE SUPERELEVATION SHALL BE REVOLVED ON THE INSIDE PAVEMENT EDGE UNLESS OTHERWISE NOTED ON THE PLANS.
- SUPERELEVATION VALUES SHOWN ON THE CROSS SECTIONS ARE VALUES (+) OR (-) TO BE ADDED TO OR SUBTRACTED FROM THE POINT OF CONTROL.
- LENGTHS FOR L MAY BE ROUNDED IN MULTIPLES OF 25 FT. OR 50 FT. TO PERMIT SIMPLER CALCULATIONS.
- PAVEMENTS WIDER THAN 2 LANES SHALL HAVE ADDITIONAL TRANSITION LENGTHS AS FOLLOWS:
 3 LANE UNDIVIDED - - - - +20%
 4 LANE UNDIVIDED - - - - +50%
 5 LANE UNDIVIDED - - - - +80%
 6 LANE UNDIVIDED - - - - +100%

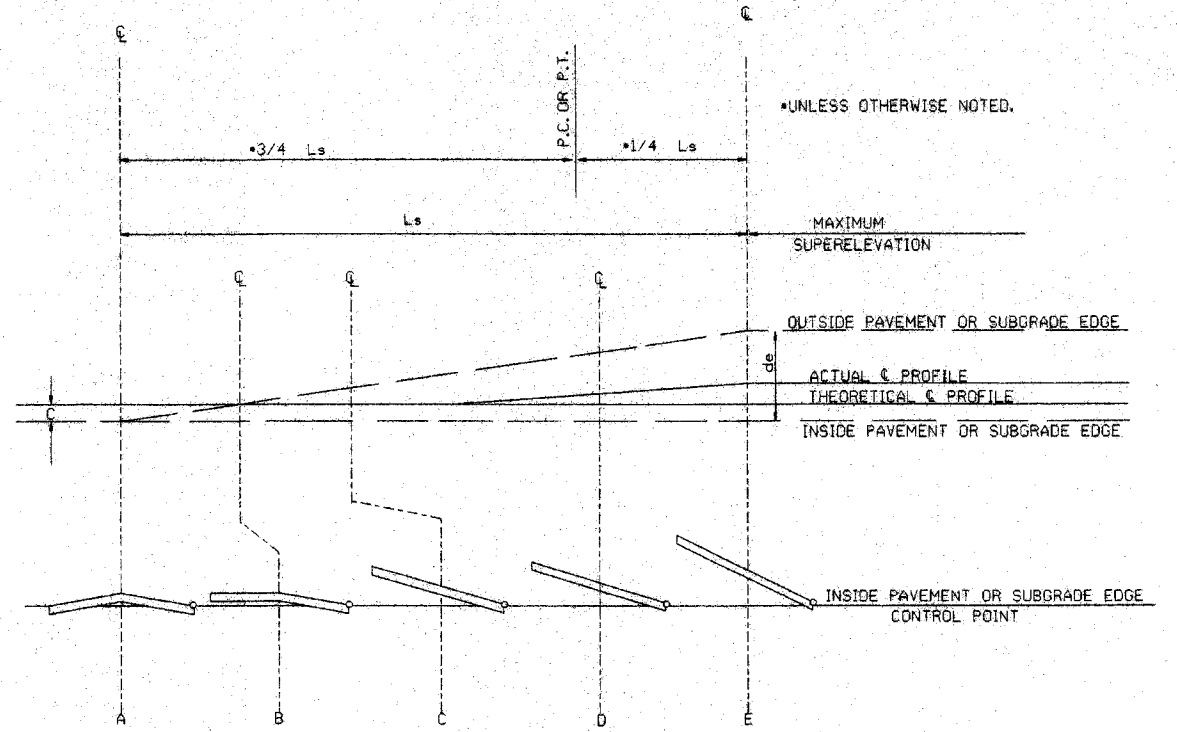
NOTE: MAINTAIN NORMAL CROWN ON INSIDE UNTIL SUPERELEVATION EXCEEDS 2%.
 RATE OF SUPERELEVATION SHALL BE COMPUTED ON STRAIGHT LINE METHOD USING APPLICABLE Ls.

ABBREVIATIONS

- NC - NORMAL CROWN
- RC - REVERSE CROWN, SUPERELEVATION AT NORMAL CROWN SLOPE
- e - RATE OF SUPERELEVATION (FT. PER FT.)
- Ls - LENGTH OF SUPERELEVATION TRANSITION (FT.)
- L - DISTANCE FROM BEGINNING OF SUPERELEVATION TRANSITION TO ANY POINT (FT.)
- d - WIDTH OF PAVEMENT (FT.) OR WIDTH OF SUBGRADE (FT.)
- C - NORMAL CROWN (FT.)



STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND CENTER LINE





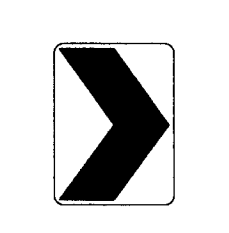
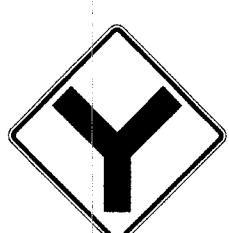


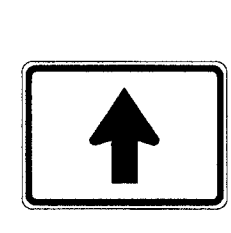
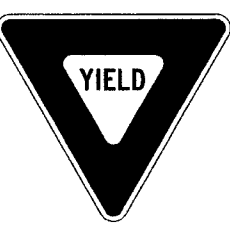

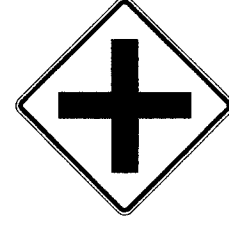



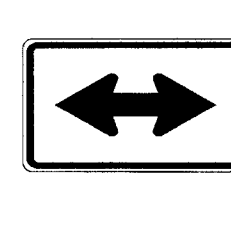
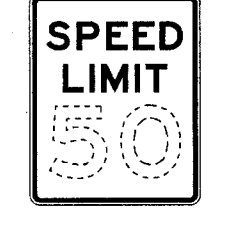

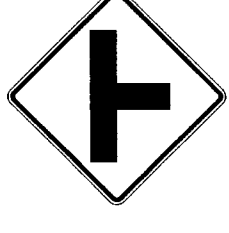


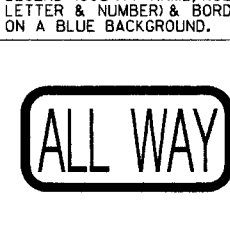
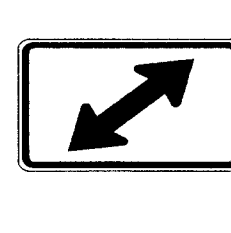

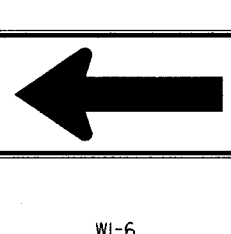
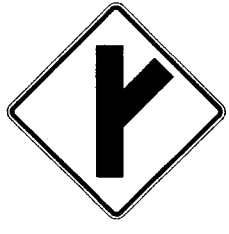

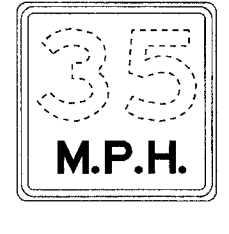
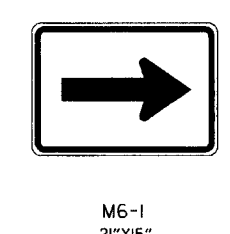
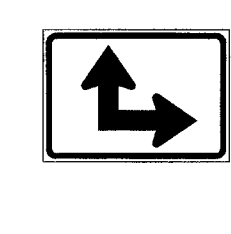

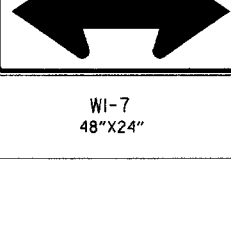
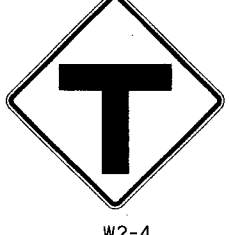

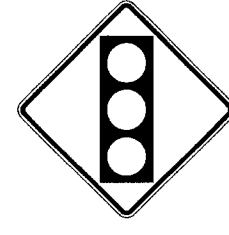
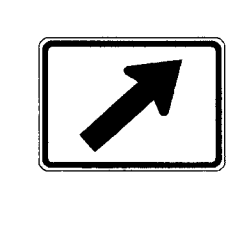
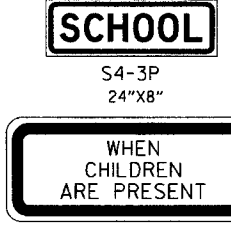
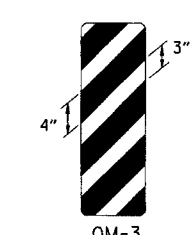
STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND INNER SUBGRADE POINT OR INNER PAVEMENT EDGE

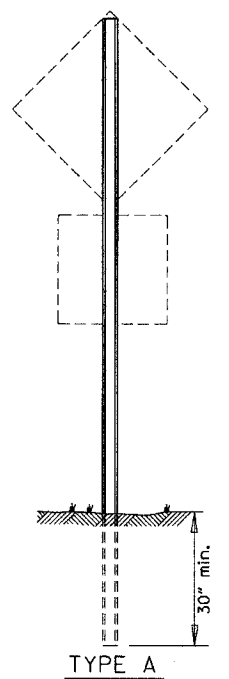
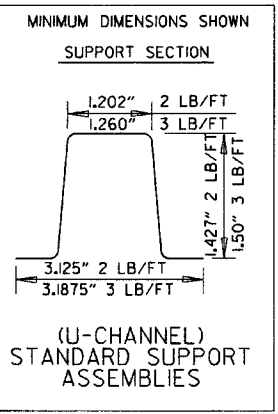
NOTE: MAINTAIN NORMAL CROWN ON INSIDE UNTIL SUPERELEVATION EXCEEDS 2%.

SUPERELEVATION FORMULA = $\frac{Lde}{Ls}$

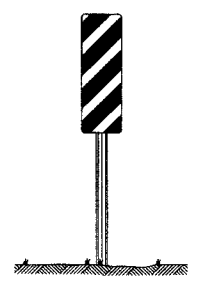
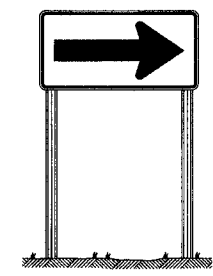
10-18-96	ADDED FORMULA	10-18-96
01-09-87	ISSUED	534-1-9-87
DATE	REVISION	DATE FILMED

ARKANSAS STATE HIGHWAY COMMISSION
 TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC
 STANDARD DRAWING SE-2

 RI-1 30"x30"	 WI-3 30"x30" (LT. OR RT.)	 WI-8 18"x24"	 W2-5 30"x30"	 W3-1 36"x36"	 W5-1 36"x36"	 M6-3 21"x15"
 RI-2 36"x36"x36"	 WI-4 30"x30" (LT. OR RT.)	 W2-1 30"x30"	 SI-1 36"x36"	 W3-2 36"x36"	 MI-6 24"x24" County Route Marker NOTE: REFLECTORIZED YELLOW LEGEND (COUNTY NAME, ROUTE LETTER & NUMBER) & BORDER ON A BLUE BACKGROUND.	 M6-4 21"x15"
 R2-1 24"x30"	 WI-5 30"x30" (LT. OR RT.)	 W2-2 30"x30"	 W5-2 36"x36"	 W8-3 36"x36"	 RI-3P 18"x6"	 M6-5 21"x15"
 WI-1 30"x30" (LT. OR RT.)	 WI-6 48"x24"	 W2-3 30"x30" (LT. OR RT.)	 W5-3 36"x36"	 WI3-1P 18"x18"	 M6-1 21"x15"	 M6-6 21"x15"
 WI-2 30"x30" (LT. OR RT.)	 WI-7 48"x24"	 W2-4 30"x30"	 W10-1 36" DIAMETER	 W3-3 36"x36"	 M6-2 21"x15"	 S4-3P 24"x8" WHEN CHILDREN ARE PRESENT S4-2P 24"x10"
						 OM-3 12"x36" (LT. OR RT.)



NOTE: LENGTH OF SIGN POSTS SHALL BE DETERMINED SO AS TO PROVIDE FOR MINIMUM VERTICAL CLEARANCES AS CALLED FOR IN THE SPECIFICATIONS PLUS A MINIMUM VERTICAL PENETRATION OF 30" IN THE SOIL.



MINIMUM WEIGHT

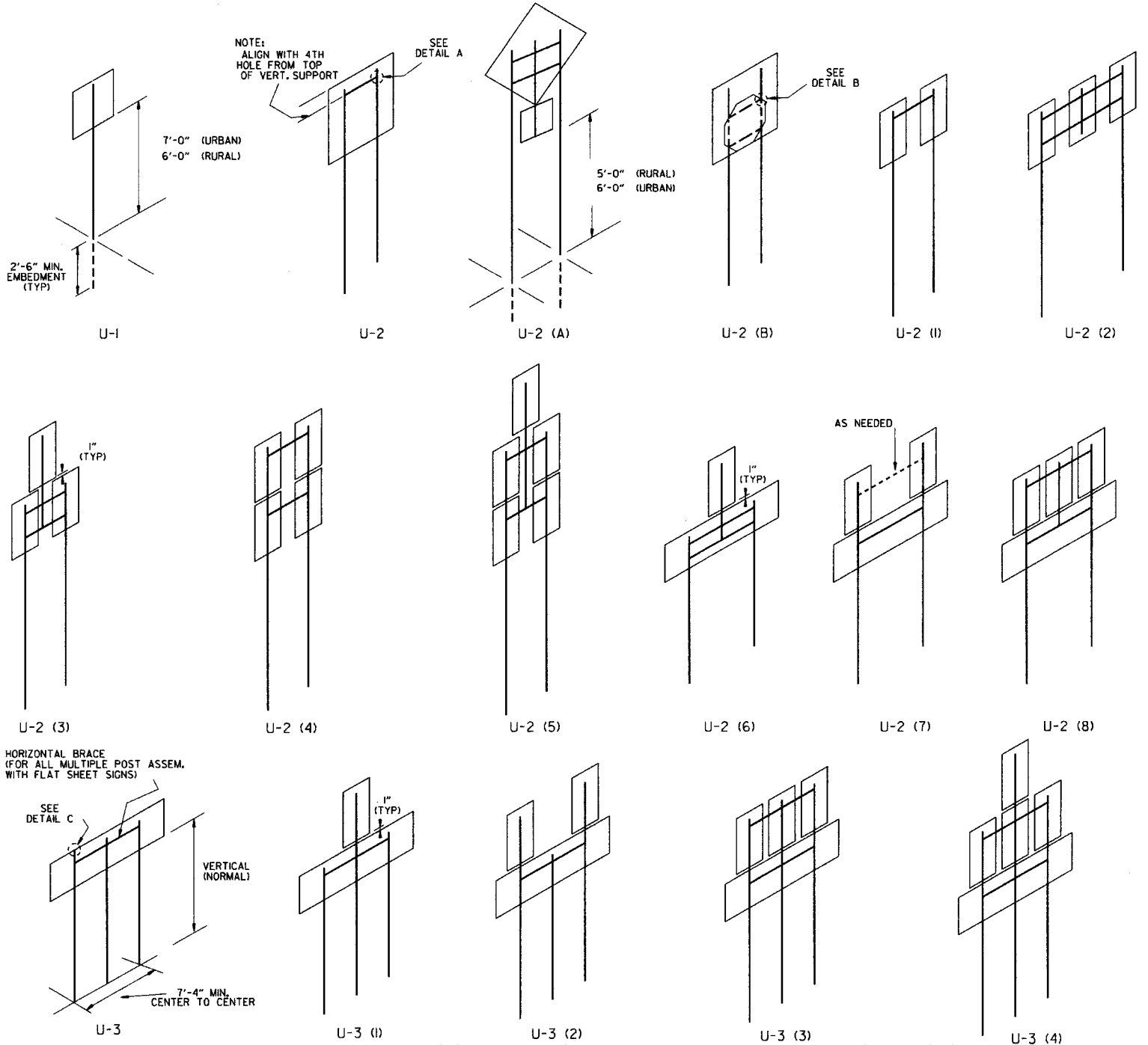
TYPE A & B = 3 LBS./FT.
TYPE C = 2 LBS./FT.

STANDARD HIGHWAY SIGNS

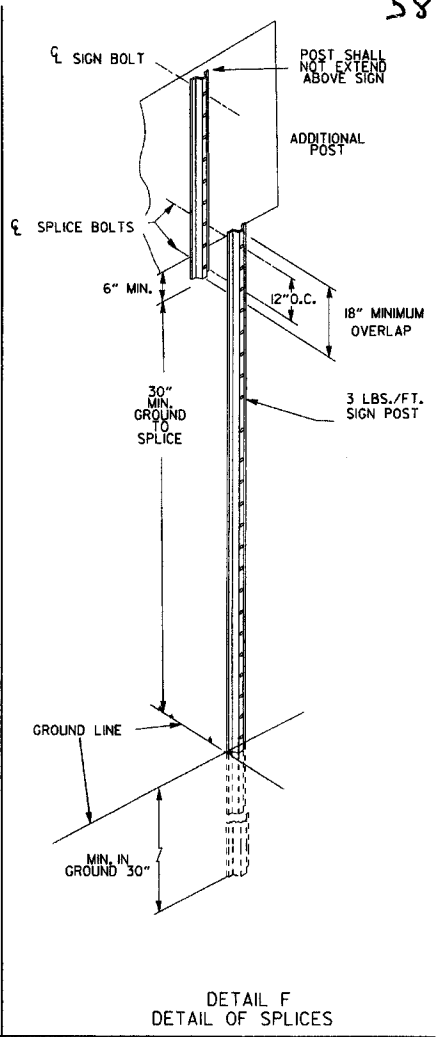
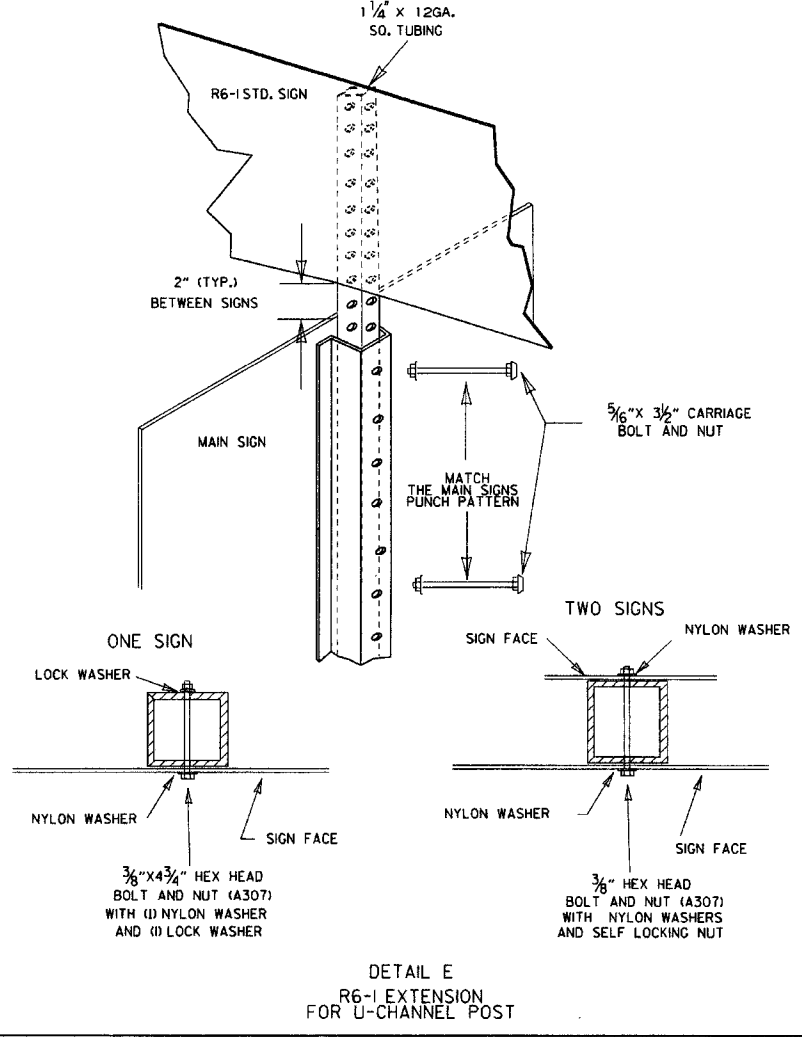
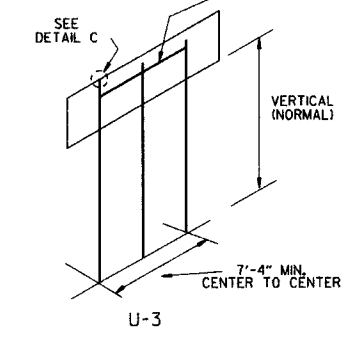
SUPPORT ASSEMBLIES

9-12-13	DELETED JOB NO. BLOCK; REVISED RI-3 TO RI-3P	
4-17-08	REVISED SIGN DESIGNATION - W3-1 & W3-2	
4-10-03	REVISED W5-2, W8-3, OM-3; ADDED WI-8	
1-5-91	REDRAWN	960-1-15-91
9-15-78	ADDED WI-4-3	877-9-15-78
9-2-76	POST WT.	623-9-3-76
5-3-76	STEEL POST WT. FROM 2"-3"; ADDED S4-2 & S4-3	504-5-3-76
8-12-74	REV. HT. TYPE "C" ASSEMBLY	500-8-2-74
12-21-72	ADDED W6-2,3,4,5,6	500-12-21-72
12-1-72	ISSUED	562-12-1-72
DATE	REVISION	DATE FILMED

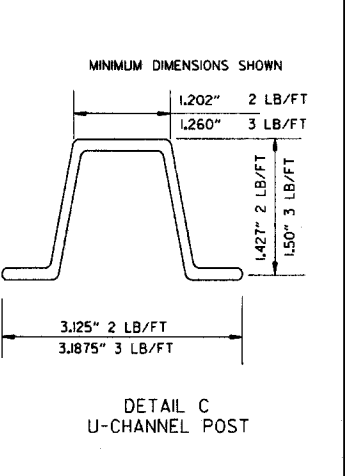
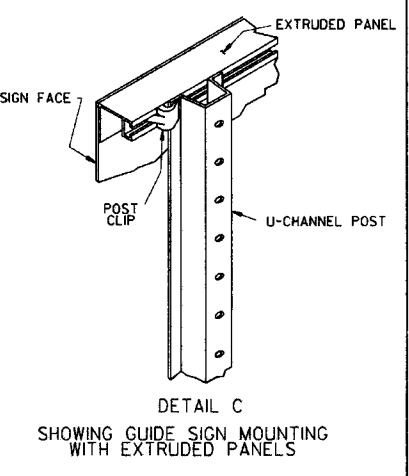
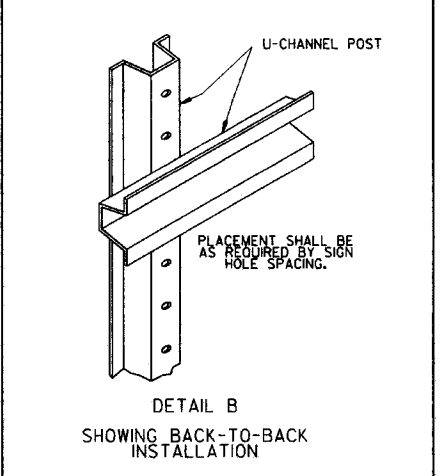
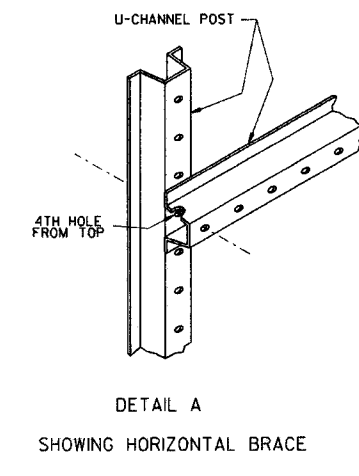
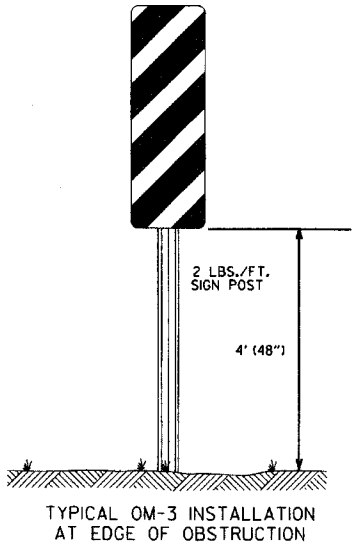
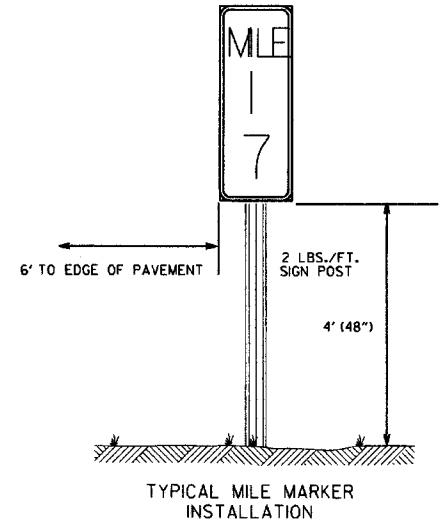
ARKANSAS STATE HIGHWAY COMMISSION
STANDARD HIGHWAY SIGNS
AND SUPPORT ASSEMBLIES
STANDARD DRAWING SHS-1




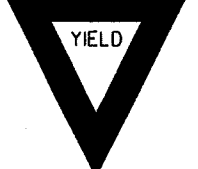
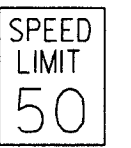


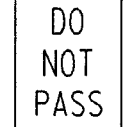
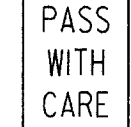

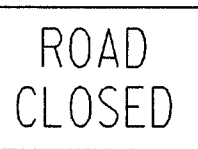
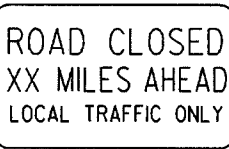


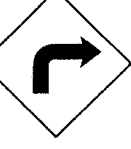





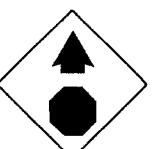

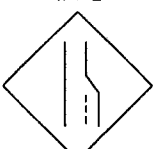

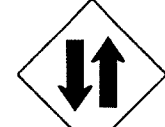




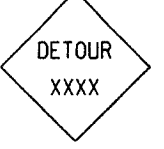










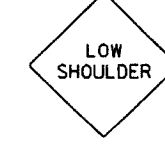
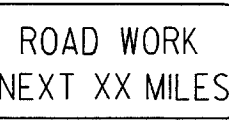
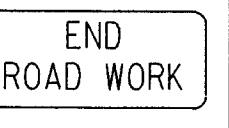
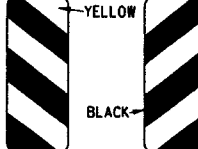


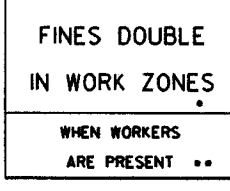
HORIZONTAL BRACE
(FOR ALL MULTIPLE POST ASSEM.
WITH FLAT SHEET SIGNS)



NOTES:
SIGNS AT LEAST 8" IN LENGTH MAY BE INSTALLED ON THREE 3 LB. POST. IN NO CASE SHALL THERE BE MORE THAN TWO 3 LB. POSTS WITHIN A 7' PATH.
SPLICES NECESSARY TO ATTAIN PROPER MOUNTING HEIGHT SHALL BE AS SHOWN IN DETAIL (F).
NORMAL INSTALLATIONS WILL REQUIRE 5/16" DIA. CARRIAGE BOLTS TO MOUNT SIGNS TO POST AND TO ASSEMBLE THE VARIOUS POST SUPPORTS.
ALL SIGN POSTS SHALL BE PLUMB.
THE POST FOR "TYPE U" SUPPORTS SHALL BE HOT DIP GALVANIZED.



ARKANSAS STATE HIGHWAY COMMISSION		
U-CHANNEL POST ASSEMBLIES		
STANDARD DRAWING SHS-2		
DATE	REVISION	
9-12-13	REVISED U-2(3), U-2(6), U-3(1), DETAIL D; ADDED DETAILS E & F; ADDED TYPICAL MARKERS	
10-9-03	REMOVED ROUND POST & REVISED SPACING	
10-12-95	MOVED UPPER SPLICE	
6-8-95	REVISED SPLICE DETAIL	6-8-95
2-2-95	REDRAWN	2-2-95
		FILMED

<p>RI-1</p>  <p>STANDARD 30"x30" EXPRESSWAY 36"x36" SPECIAL 48"x48"</p>	<p>RI-2</p>  <p>STD. 36"x36"x36" EXPWY. 48"x48"x48" FWY. 60"x60"x60"</p>	<p>R2-1</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</p>	<p>W3-5</p>  <p>STD. 36"x36" EXPWY. 48"x48" FWY. 48"x48"</p>	<p>W3-5a</p>  <p>STD. 36"x36" EXPWY. 48"x48" FWY. 48"x48"</p>	<p>R4-1</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</p>	<p>R4-2</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</p>
<p>R5-1</p>  <p>STD. 30"x30" EXPWY. 36"x36" SPECIAL 48"x48"</p>	<p>R11-2</p>  <p>48"x30"</p>	<p>R11-3A</p>  <p>60"x30"</p>	<p>R11-4</p>  <p>60"x30"</p>	<p>RSP-1</p>  <p>48"x30"</p>	<p>W1-1</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>W1-2</p>  <p>STD. 36"x36" FWY. 48"x48"</p>
<p>W1-3</p>  <p>STD. 48"x48"</p>	<p>W1-4</p>  <p>STD. 48"x48"</p>	<p>W1-6</p>  <p>STD. 48"x24" SPECIAL 60"x30"</p>	<p>W1-8</p>  <p>STD. 18"x24" SPECIAL 24"x30" EXPWY. 30"x36" FWY. 36"x48"</p>	<p>W3-1</p>  <p>STD. 36"x36" SPECIAL 48"x48"</p>	<p>W3-2</p>  <p>STD. 36"x36" SPECIAL 48"x48"</p>	<p>W4-2</p>  <p>STD. 36"x36" FWY. 48"x48"</p>
<p>W5-1</p>  <p>STD. 36"x36" SPECIAL 48"x48"</p>	<p>W6-3</p>  <p>EXPWY. 36"x36" SPECIAL 48"x48"</p>	<p>W8-7</p>  <p>EXPWY. 36"x36" FWY. 48"x48"</p>	<p>W9-2</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>W13-1</p>  <p>STD. 24"x24"</p>	<p>W20-1</p>  <p>STD. 48"x48"</p>	<p>W20-2</p>  <p>STD. 48"x48"</p>
<p>W20-4</p>  <p>STD. 48"x48"</p>	<p>W20-5</p>  <p>STD. 48"x48"</p>	<p>W20-7a</p>  <p>500 FEET 24" STD. 36"x36" FWY. 48"x48"</p>	<p>W21-2</p>  <p>STD. 30"x30" SPECIAL 36"x36"</p>	<p>W21-5</p>  <p>STD. 30"x30" SPECIAL 36"x36"</p>	<p>W24-1</p>  <p>STD. 36"x36"</p>	<p>W1-4b</p>  <p>STD. 48"x48"</p>
<p>W20-3</p>  <p>STD. 48"x48"</p>	<p>R56-1</p>  <p>STD. 18"x18"</p>	<p>W8-11</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>W8-9</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>G20-1</p>  <p>60"x24"</p>	<p>G20-2</p>  <p>48"x24"</p>	<p>OM-3L OM-3R</p>  <p>12"x36"</p>
<p>M4-9</p>  <p>STD. 30"x24" SPECIAL 48"x36" SPECIAL 60"x48"</p>	<p>M4-10</p>  <p>48"x18"</p>	<p>R55-1</p>  <p>36"x60" • USE 6" C LETTERS •• USE 4" D LETTERS</p>				

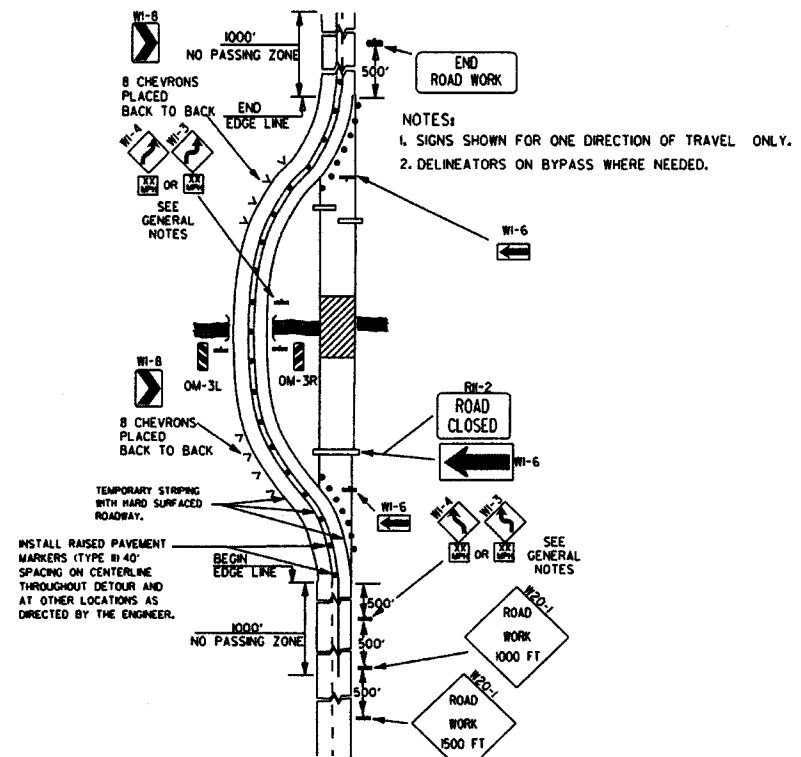
ADVANCE DISTANCES (XXXX)

500 FT	1/2 MILE
1000 FT	3/4 MILE
1500 FT	1 MILE AHEAD

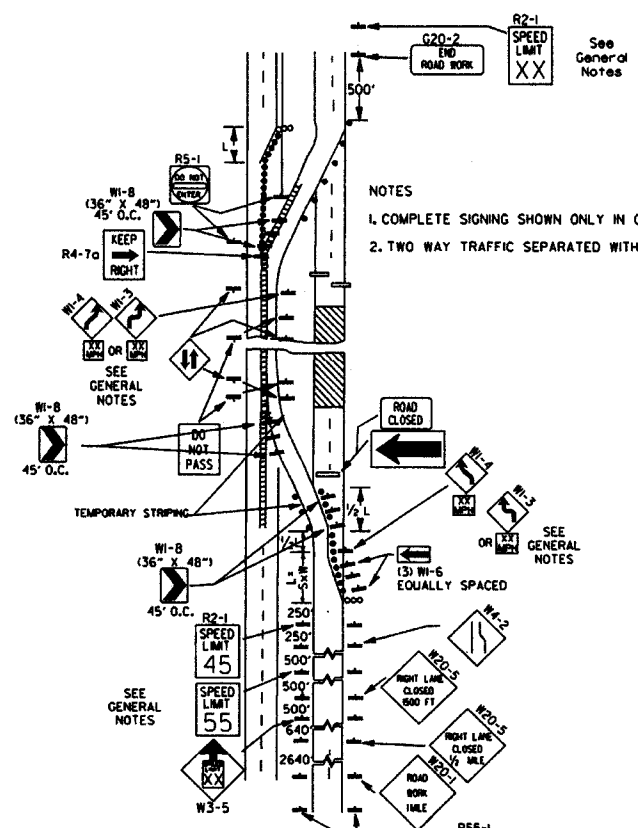
- GENERAL NOTES:
- ALL TRAFFIC CONTROL DEVICES USED ON ROAD CONSTRUCTION SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION, AND TO THE STANDARD HIGHWAY SIGNS, LATEST EDITION, OR AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION.
 - TRAFFIC CONTROL DEVICES SHALL BE SET UP JUST BEFORE THE START OF CONSTRUCTION OPERATIONS AND SHALL BE PROPERLY MAINTAINED DURING THE TIME SUCH CONDITIONS EXIST. THEY SHALL REMAIN IN PLACE ONLY AS LONG AS NEEDED AND REMOVED THEREAFTER.
 - EXISTING SIGNS AND CONSTRUCTION SIGNS SHALL BE KEPT IN PROPER POSITION, AND BE CLEAN AND LEGIBLE AT ALL TIMES. SIGNS THAT DO NOT APPLY TO EXISTING CONDITIONS SHALL BE REMOVED. SIGNS THAT ARE DAMAGED, DEFACED, OR THAT ACCUMULATE DIRT DURING CONSTRUCTION SHALL BE CLEANED, REPAIRED, OR REPLACED.
 - SIGNS ARE USUALLY MOUNTED ON A SINGLE POST, ALTHOUGH THOSE WIDER THAN 36" OR LARGER THAN 10 SQ. FT. SHALL BE MOUNTED ON TWO POSTS OR ABOVE A TYPE III BARRICADE.
 - SIGN POSTS DIRECT BURIED IN SOIL SHALL BE 2 LB. MINIMUM CHANNEL POST OR 4"x4" WOOD POSTS. CHANNEL POSTS SHALL BE PAINTED GREEN. WOOD POSTS SHALL BE PAINTED WHITE. ALL POSTS SHALL BE NEATLY CONSTRUCTED, AND SHALL BE REPLUMBED, CLEANED, OR REPAIRED AS NEEDED FOR THE DURATION OF THE JOB. THERE SHALL NOT BE MORE THAN 2 POSTS IN A 7' PATH FOR WOOD OR CHANNEL POSTS. ANY CHANNEL POST SPLICE SHALL BE IN ACCORDANCE WITH STANDARD DRAWING TC-3.
 - POST MOUNTED SIGNS IN RURAL AREAS SHALL BE CONSTRUCTED WITH THE NEAR EDGE OF THE SIGN FROM 6 TO 12 FEET FROM THE PAVEMENT EDGE. SIGNS IN URBAN AREAS AND BARRICADE MOUNTED SIGNS SHALL BE MOUNTED A MINIMUM OF 2 FEET FROM THE PAVEMENT EDGE.
 - ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN URBAN AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN RURAL AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE, EXCEPT A MINIMUM OF 6' SHALL BE USED WHEN MOUNTING AN ADVISORY SIGN BELOW A WARNING SIGN. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR INTERMEDIATE TERM STATIONARY WORK CONDITIONS. THE SIGNS MINIMUM MOUNTING HEIGHT SHALL BE 5'. RETROREFLECTIVE DEVICES SHALL BE USED. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR SHORT-TERM, SHORT DURATION, AND MOBILE CONDITIONS. THEY SHALL BE NO LESS THAN ONE (1) FOOT ABOVE THE TRAVELED WAY. LONG-TERM STATIONARY SIGNS SHALL BE DIRECT BURIED IN SOIL, UNLESS CONDITIONS NECESSITATE THE USE OF PORTABLE SIGNS, OR AS APPROVED BY THE ENGINEER. CONCRETE PADS, CONCRETE OR ROCK BALLAST, OR OTHER SOLID MATERIALS SHALL NOT BE UTILIZED WITH PORTABLE SIGN SUPPORTS.
 - FLAGGERS SHALL USE REFLECTORIZED STOP-SLOW PADDLES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.
 - MOST OF THE SIGNS SHOWN ARE ORIENTED TO THE RIGHT. HOWEVER, THIS DOES NOT PRECLUDE THE USE OF MIRROR IMAGES OF THESE SIGNS WHERE THE REVERSE ORIENTATION MIGHT BETTER CONVEY TO MOTORISTS THE PROPER DIRECTION OF MOVEMENT.
 - R55-1 SIGNS SHALL BE PLACED AT LEAST 1500' BUT NOT MORE THAN 1 MILE IN ADVANCE OF THE WORK ZONE. IF A SPEED LIMIT REDUCTION IS IN EFFECT, THE SIGN SHALL BE PLACED A MINIMUM OF 500' IN ADVANCE OF THE "REDUCED SPEED AHEAD" SIGN.
- NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) IS REQUIRED FOR ALL PROJECTS.

9-2-15	REVISED REDUCED SPEED LIMIT AHEAD SIGNS	
	REVISED ROAD WORK NEXT XX MILES	
12-15-1	REVISED W24-1	
1-17-10	DELETED W8-9a & ADDED W8-9	
10-15-09	ADDED REFERENCE TO MASH & ADDED SIGN W24-1	
4-17-08	REVISED SIGN DESIGNATIONS	
11-18-04	REVISED NOTES	
10-9-03	REVISED NOTE 1	
11-16-01	REVISED NOTE 7	
9-28-00	REVISED NOTE	
1-18-98	ADDED NOTE	
6-26-97	REVISED NOTE 5	
4-03-97	REVISED NOTE 5	
10-18-96	ADDED CONTROLLED ACCESS HWY. SIGN & TO NOTE 7	
10-12-95	ADDED R55-1	
6-8-95	REVISED TO CORRECT SIGN ILLUSTRATIONS	6-8-95
2-2-95	REVISED PER PART VI, MUTCD SEPT. 3, 1993	
8-15-94	DRAWN AND PLACED IN USE	
DATE	REVISION	FILMED

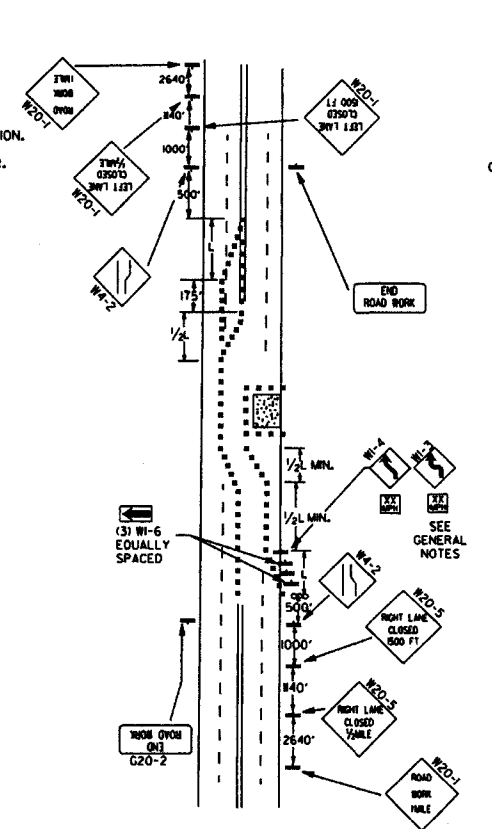
ARKANSAS STATE HIGHWAY COMMISSION
STANDARD TRAFFIC CONTROLS
FOR HIGHWAY CONSTRUCTION
STANDARD DRAWING TC-1



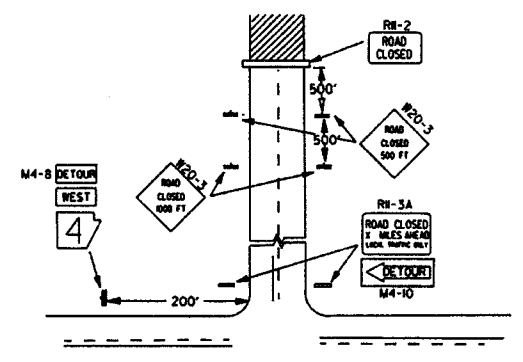
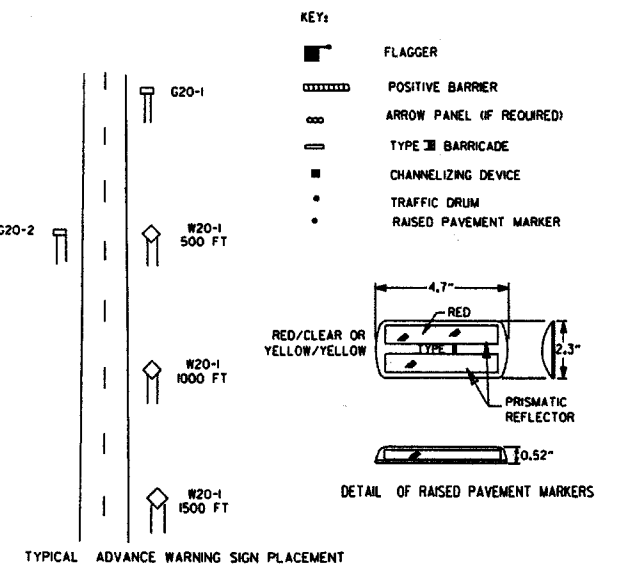
(A) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON A 2-LANE HIGHWAY WHERE THE ENTIRE ROADWAY IS CLOSED AND A BYPASS DETOUR IS PROVIDED.



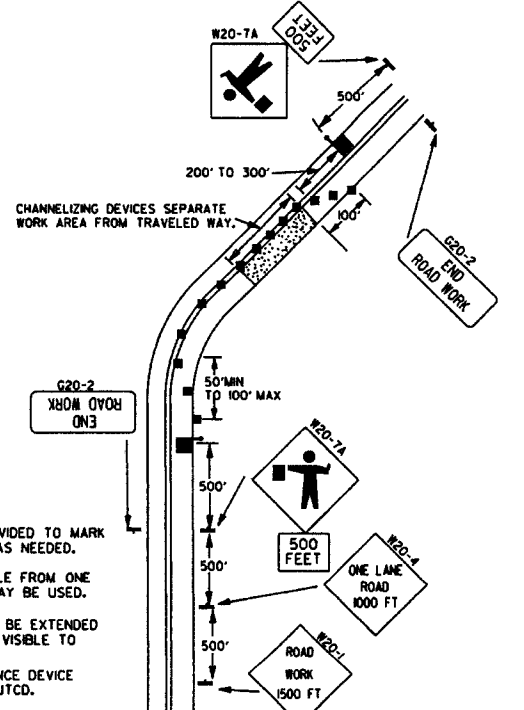
(B) TYPICAL APPLICATION - 4-LANE DIVIDED ROADWAY WHERE ONE ROADWAY IS CLOSED.



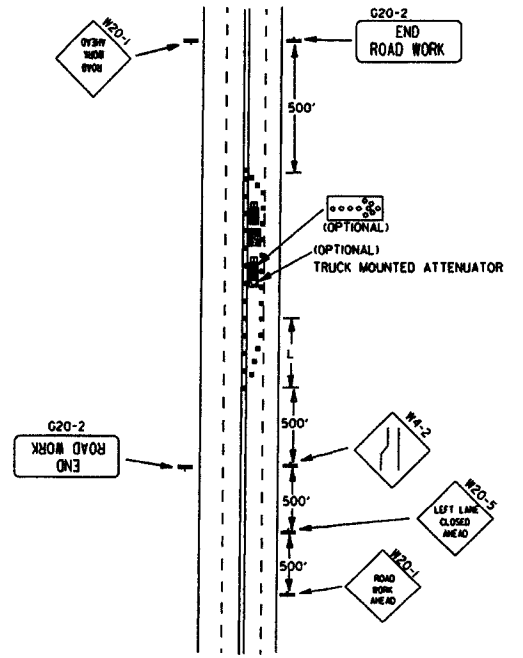
(C) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WHERE HALF OF THE ROADWAY IS CLOSED.



(D) TYPICAL APPLICATION - ROADWAY CLOSED BEYOND DETOUR POINT.



(E) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON 2-LANE HIGHWAY WHERE ONE LANE IS CLOSED AND FLAGGING IS PROVIDED.

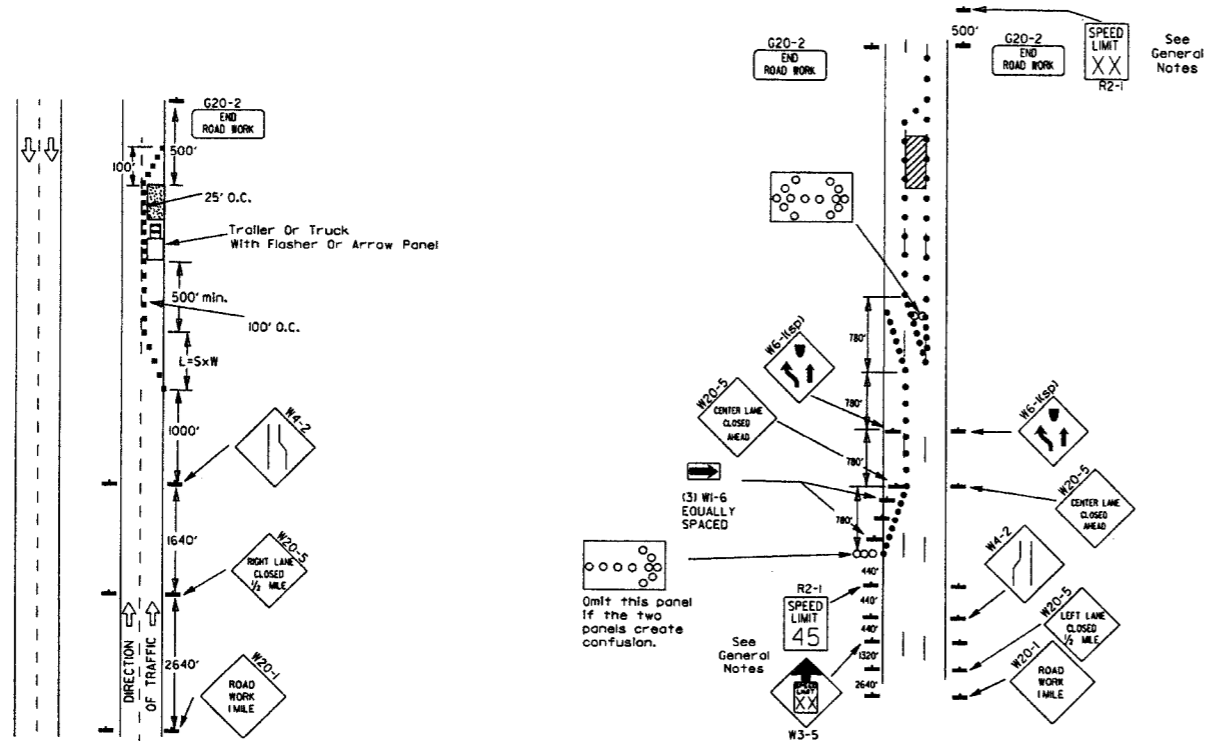


(F) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WITH INSIDE LANE CLOSED.

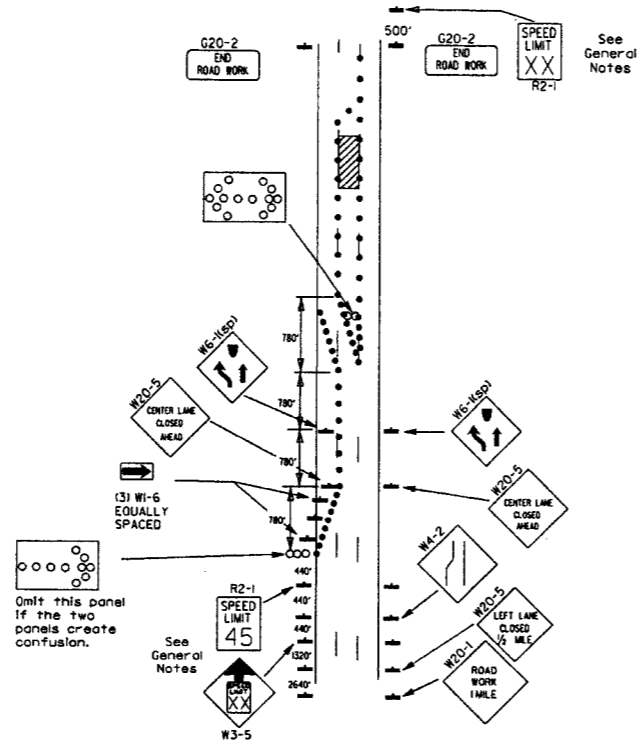
9-2-15	REVISED NOTE 2, ADDED NOTE 8, REVISED DRAWING (A) & REPLACED R2-5A WITH W3-5	
9-12-13	REVISED DETAIL OF RAISED PAVEMENT MARKERS	
3-4-10	ADDED (AFAD)	
11-20-08	REVISED SIGN DESIGNATIONS	
8-18-04	ADDED GENERAL NOTE	
10-18-96	ADDED R55-1	
4-26-96	CORRECTED (a) BEHIND G20-2	
6-8-95	CORRECTED SIGN IDENT. ON W1-4A	6-8-95
2-2-95	REVISED PER PART 14, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	
DATE	REVISION	FILED

ARKANSAS STATE HIGHWAY COMMISSION
 STANDARD TRAFFIC CONTROLS
 FOR HIGHWAY CONSTRUCTION
 STANDARD DRAWING TC-2

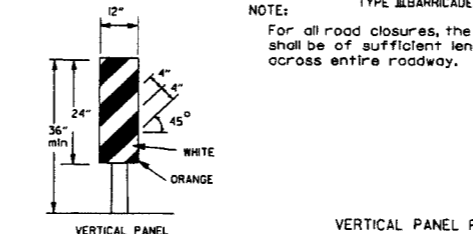
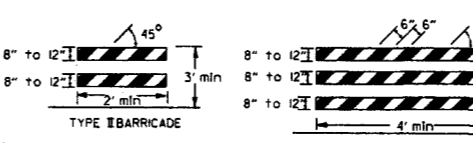
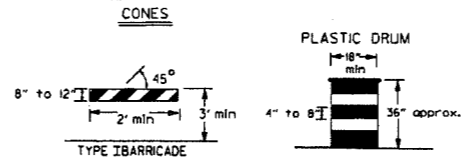
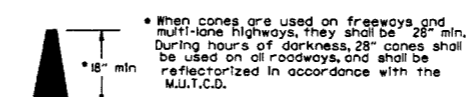
Channelizing devices



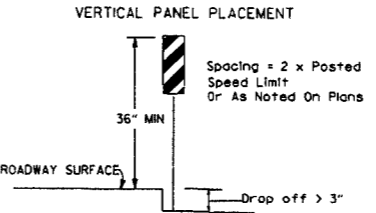
(A) Typical application - daytime maintenance operations of short duration on a 4-lane divided roadway where half of the roadway is closed.



(B) Typical application - 3-lane one-way roadway where center lane is closed.



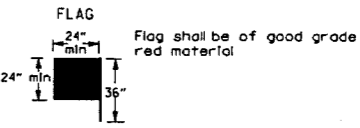
NOTE: For all road closures, the Type III barricades shall be of sufficient length to extend across entire roadway.



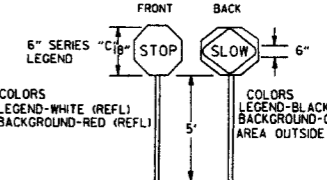
TRAFFIC CONTROL DEVICES FOR VERTICAL PAVEMENT DIFFERENTIALS

VERTICAL DIFFERENTIAL	LOCATIONS	TRAFFIC CONTROL
1" to 3"	Centerline, lane lines	WB-11
1" to 3"	Edge of shoulder	WB-9
Greater than 3"	Lane lines	Standard lane closure required
Greater than 3"	Edge of traveled lane	*RSP-1 and vertical panels, drums or concrete barrier
Greater than 3"	Edge of shoulder	*Vertical panels, drums or concrete barrier

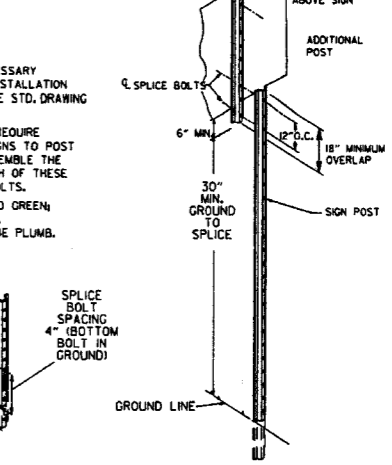
* When shown on the plans concrete barrier will be used. When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.



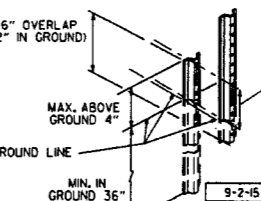
STOP SLOW PADDLE



DETAIL OF SPLICES

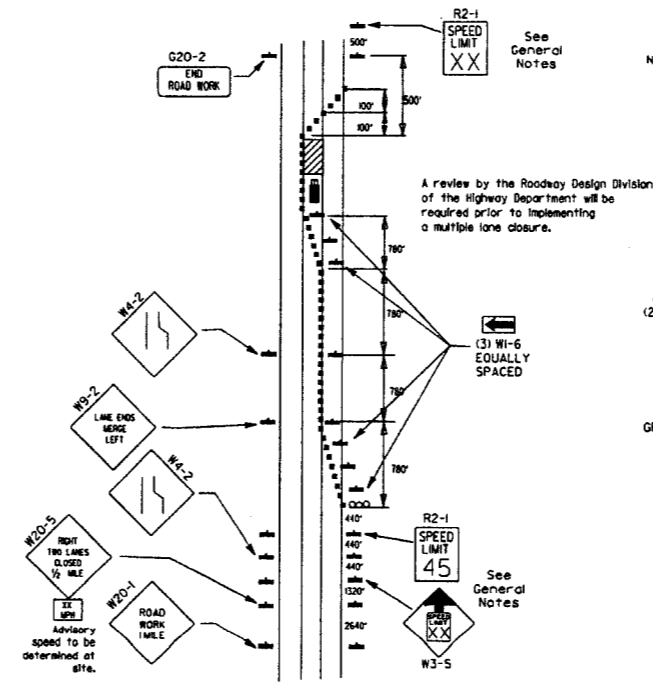


NOTES: USE SPLICES ONLY WHEN NECESSARY FOR INSTALLATION. TYPICAL INSTALLATION SHOULD HAVE NO SPLICES (SEE STD. DRAWING NO. SHS-2). NORMAL INSTALLATIONS WILL REQUIRE 1/4" DIA. BOLTS TO MOUNT SIGNS TO POST AND 5/16" DIA. BOLTS TO ASSEMBLE THE VARIOUS POST SUPPORTS. EACH OF THESE BOLTS SHALL BE CARRIAGE BOLTS. SIGN POSTS SHALL BE PAINTED GREEN; SIGNS SHALL NOT BE PAINTED. AND ALL SIGN POSTS SHALL BE PLUMB.



- KEY:
- Arrow Panel (if Required)
 - Channelizing Device
 - Traffic drum

- GENERAL NOTES:
- A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
 - When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the W3-5 shall be installed at that location. Additional R2-1(45) speed limit signs shall be installed at a maximum of 1 mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
 - When the existing speed limit is 65mph and the plans require a speed limit of 55mph, the R2-1(65) shall be omitted. Additional R2-1(55) speed limit signs shall be installed at a maximum of 1 mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
 - The maximum spacing between channelizing devices in a taper should be approximately equal in feet to the speed limit. Beyond the taper, maximum spacing shall be two times the speed limit or as directed by the Engineer.
 - Warning lights and/or flags may be mounted to signs or channelizing devices at night as needed.
 - Pavement markings no longer applicable which might create confusion in the minds of vehicle operators shall be removed or obliterated as soon as practicable.
 - The G20-1 sign will be required on jobs of over two miles in length. When the lane closure is not at the beginning of the project, the G20-1 sign shall be erected 125' in advance of the job limit. Additional W20-1(1 MILE) signs are not required in advance of lane closures that begin inside the project limits.
 - Flaggers shall use STOP/SLOW paddles for controlling traffic through work zones. Flags may be used only for emergency situations.
 - All plastic drums and cones shall meet the requirements of NCHRP-350 or Manual for Assessing Safety Hardware (MASH).
 - Traffic mounted devices such as arrow panels and portable changeable message signs shall be delineated by affixing conspicuity material in a continuous line on the face of the trailer. When placed on or adjacent to the shoulder and not behind a positive barrier, these devices shall be delineated by placing five (5) traffic drums, equally spaced along the traffic side of the device.

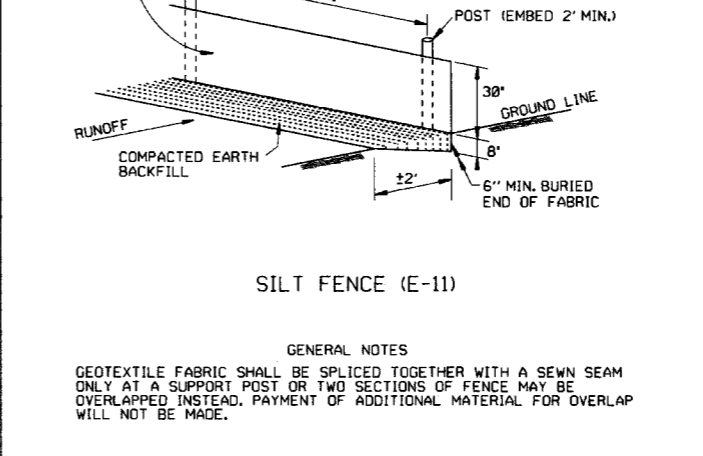
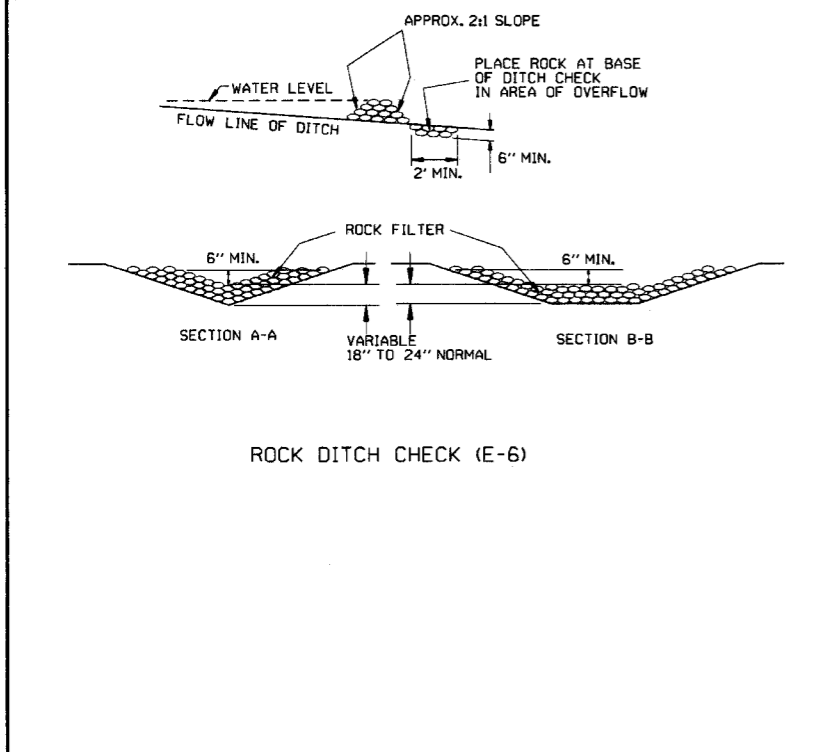
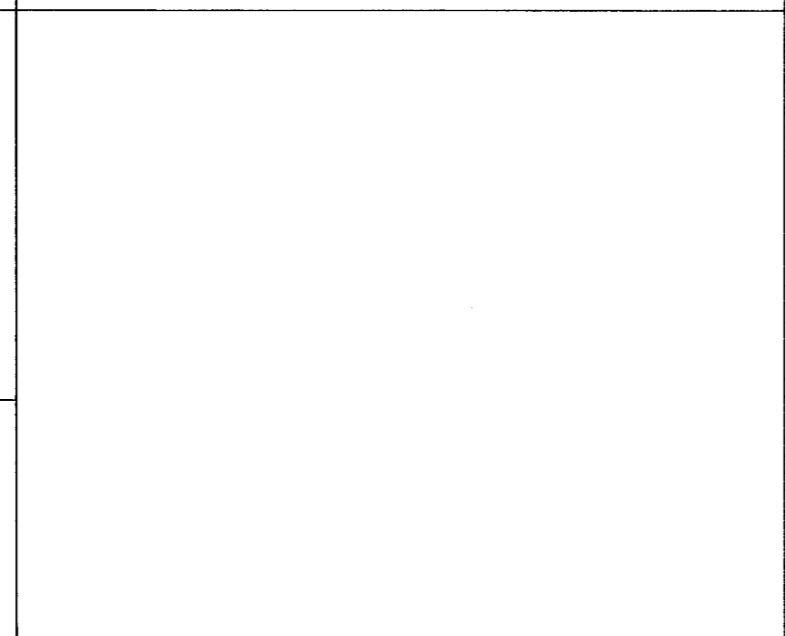
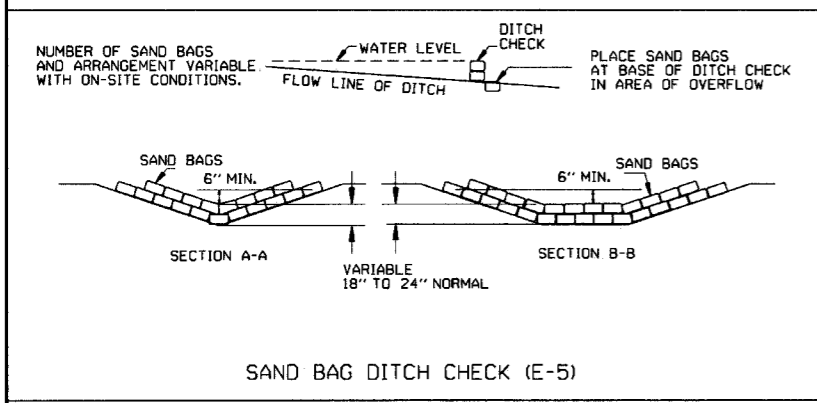
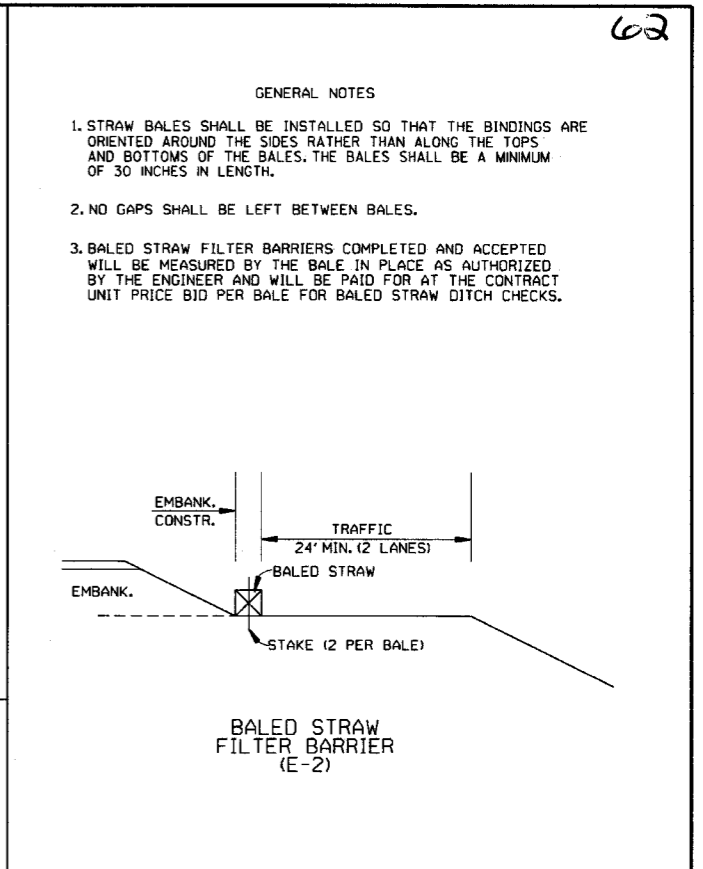
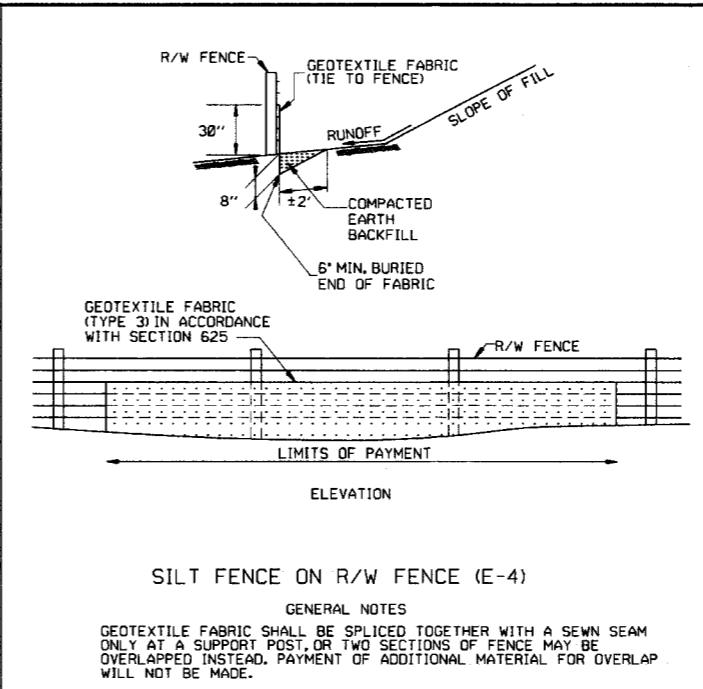
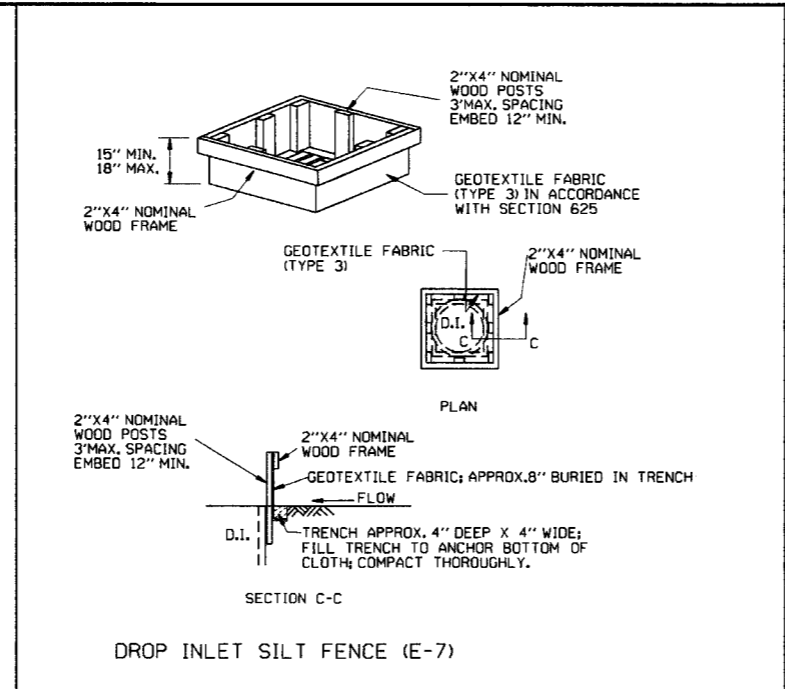
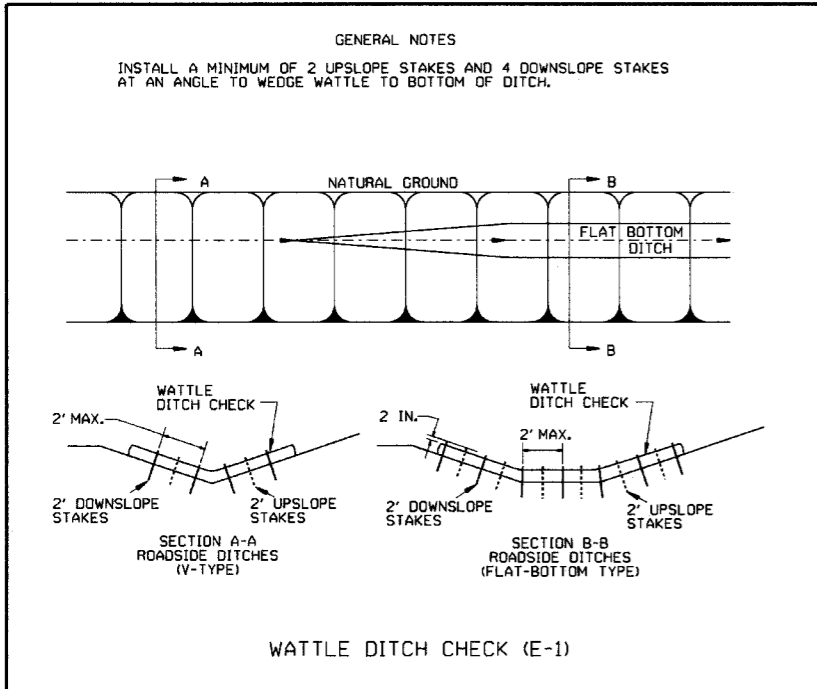


(C) Typical application - construction operations of intermediate to long term duration on a 4-lane divided roadway where half of the roadway is closed.

(D) Typical application - closing multiple lanes of a multilane highway.

DATE	REVISION	FILMED
9-2-45	REVISED NOTE 2 & REPLACED R2-5A WITH W3-5	
10-15-09	ADDED REFERENCE TO MASH	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED NOTE	
10-1-98	ADDED NOTE	
4-03-97	ADDED (SP) TO W6-1 & REVISED TRAFFIC CONTROL DEVICES NOTE	
10-18-96	ADDED R55-1	
10-12-95	MOVED UPPER SPLICE	
6-8-95	REVISED SPLICE DETAIL, TEXT	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

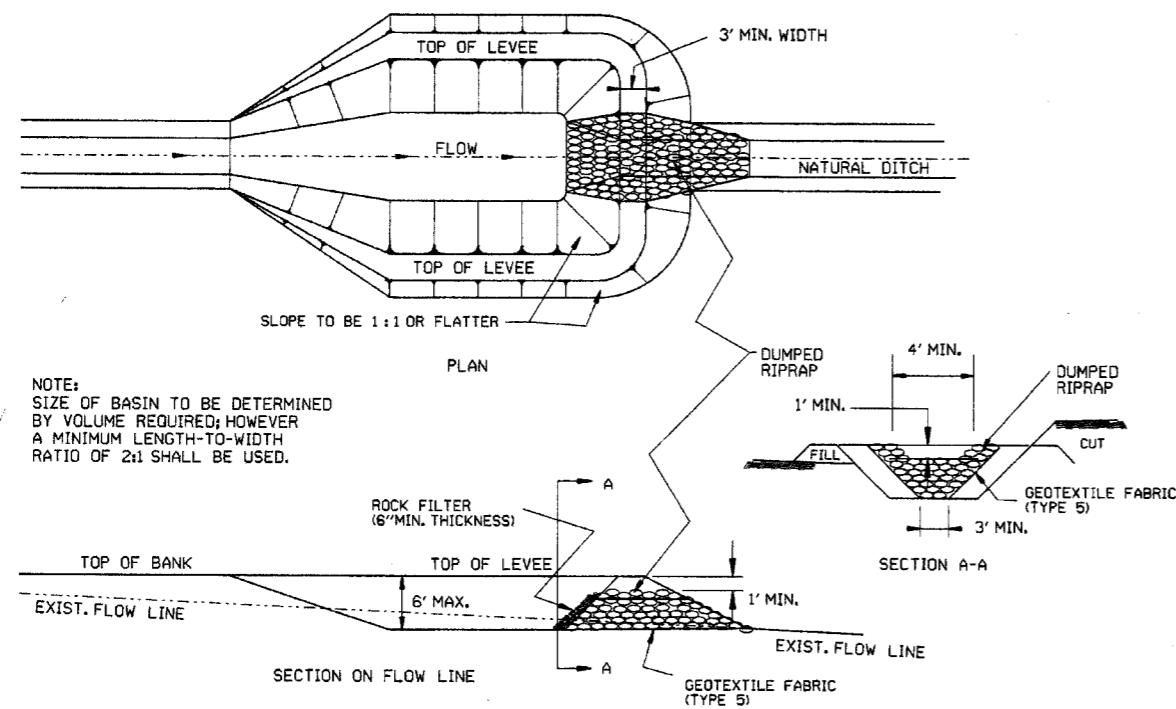
ARKANSAS STATE HIGHWAY COMMISSION
STANDARD TRAFFIC CONTROLS
FOR HIGHWAY CONSTRUCTION
STANDARD DRAWING TC-3



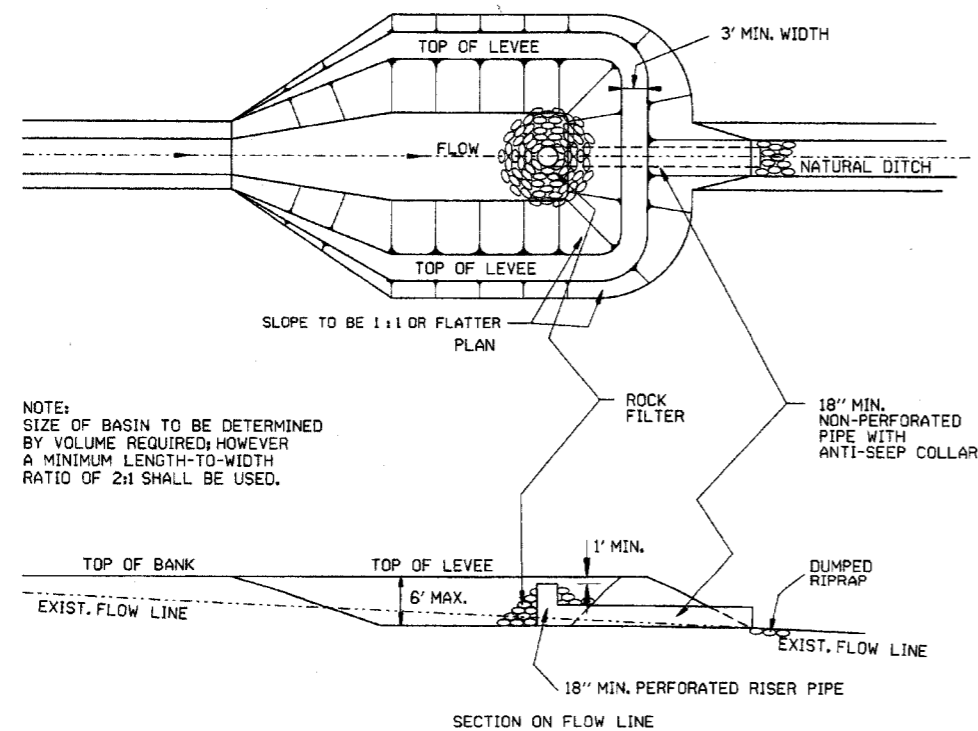
12-15-11	DELETED BALED STRAW DITCH CHECK & ADDED WATTLE DITCH CHECK		ARKANSAS STATE HIGHWAY COMMISSION
11-18-98	ADDED NOTES		
7-02-98	ADDED BALED STRAW FILTER BARRIER (E-2)		
7-20-95	REVISED SILT FENCE E-4 AND E-11	7-20-95	
7-15-94	REV. E-4 & E-11 MIN. 13" BURIED END OF FABRIC		
6-2-94	REVISED E-1, 4, 7 & 11; DELETED E-2 & 3	6-2-94	
4-1-93	REDRAWN		
10-1-92	REDRAWN		
8-2-76	ISSUED R.D.M.	298-7-28-76	
DATE	REVISION	FILMED	

TEMPORARY EROSION CONTROL DEVICES

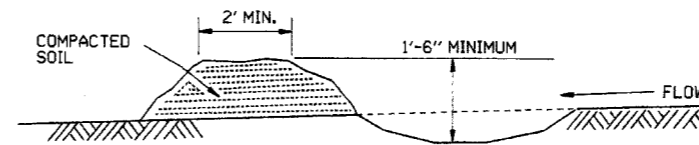
STANDARD DRAWING TEC-1



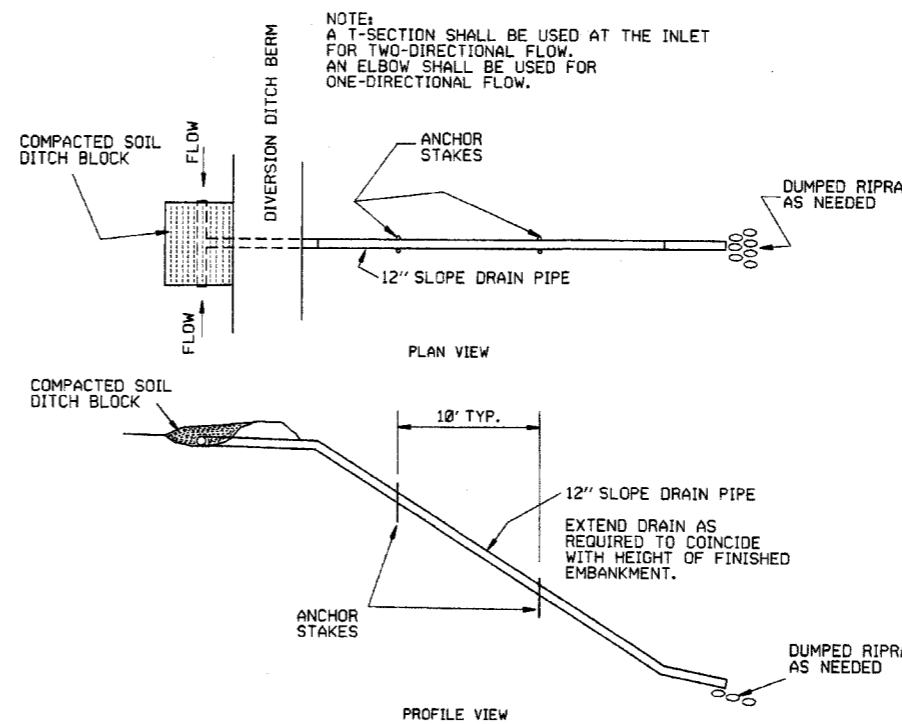
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



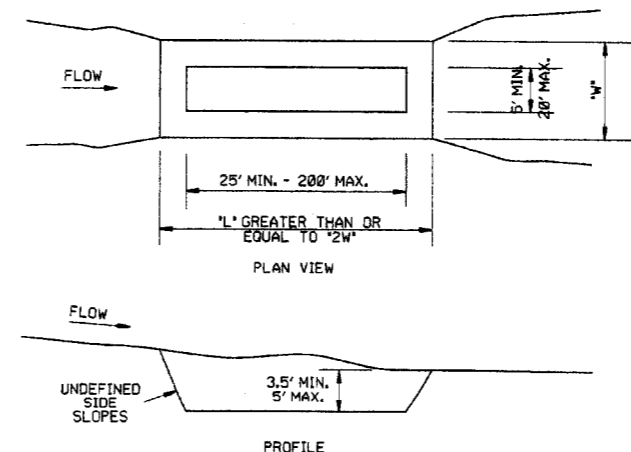
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



DIVERSION DITCH (E-8)



SLOPE DRAIN (E-12)



SEDIMENT BASIN (E-14)

6-2-94	Revised E-8 & E-12; Added E-14 & Deleted E-13		
4-1-93	ISSUED		
DATE	REVISION		FILMED

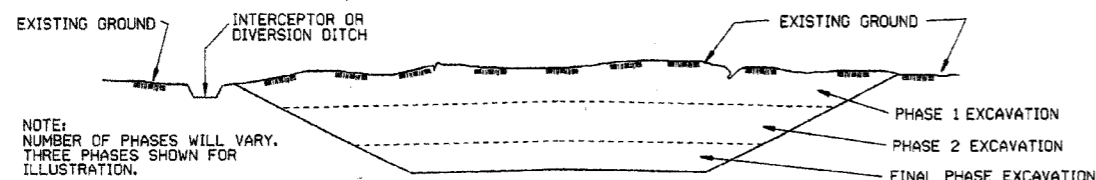
ARKANSAS STATE HIGHWAY COMMISSION
 TEMPORARY EROSION CONTROL DEVICES
 STANDARD DRAWING TEC-2

CLEARING AND GRUBBING

CONSTRUCTION SEQUENCE

1. PLACE PERIMETER CONTROLS (I.E. SILT FENCES, DIVERSION DITCHES, SEDIMENT BASINS, ETC.)
2. PERFORM CLEARING AND GRUBBING OPERATION.

EXCAVATION



NOTE:
NUMBER OF PHASES WILL VARY.
THREE PHASES SHOWN FOR
ILLUSTRATION.

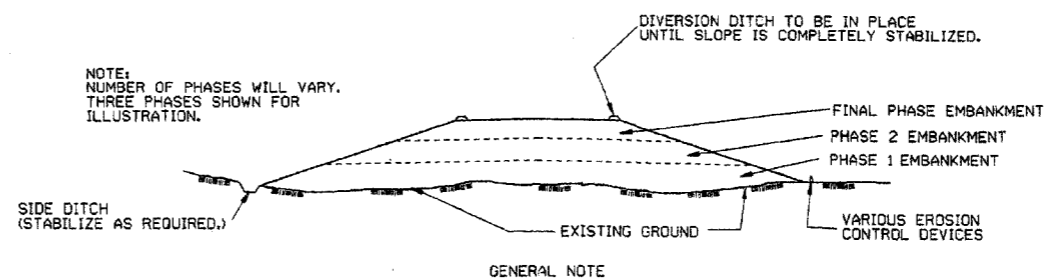
GENERAL NOTE

ALL CUT SLOPES SHALL BE DRESSED, PREPARED, SEEDED, AND MULCHED AS THE WORK PROGRESSES. SLOPES SHALL BE EXCAVATED AND STABILIZED IN EQUAL INCREMENTS NOT TO EXCEED 25 FEET, MEASURED VERTICALLY.

CONSTRUCTION SEQUENCE

1. EXCAVATE AND STABILIZE INTERCEPTOR AND/OR DIVERSION DITCHES.
2. PERFORM PHASE 1 EXCAVATION. PLACE PERMANENT OR TEMPORARY SEEDING.
3. PERFORM PHASE 2 EXCAVATION. PLACE PERMANENT OR TEMPORARY SEEDING.
4. PERFORM FINAL PHASE OF EXCAVATION. PLACE PERMANENT OR TEMPORARY SEEDING. STABILIZE DITCHES. CONSTRUCT DITCH CHECKS, DIVERSION DITCHES, SEDIMENT BASINS, OR OTHER EROSION CONTROL DEVICES AS REQUIRED.

EMBANKMENT



NOTE:
NUMBER OF PHASES WILL VARY.
THREE PHASES SHOWN FOR
ILLUSTRATION.

GENERAL NOTE

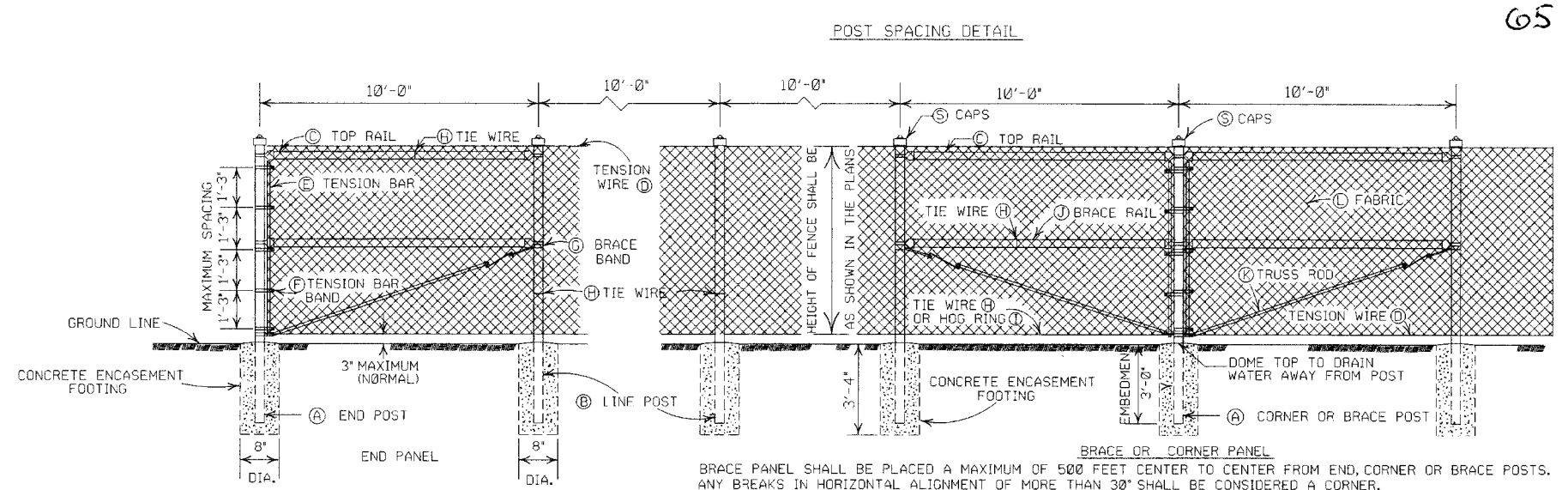
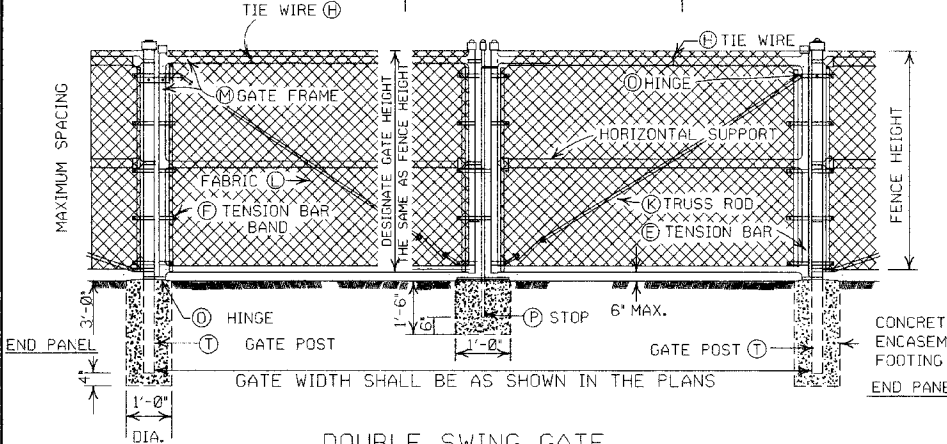
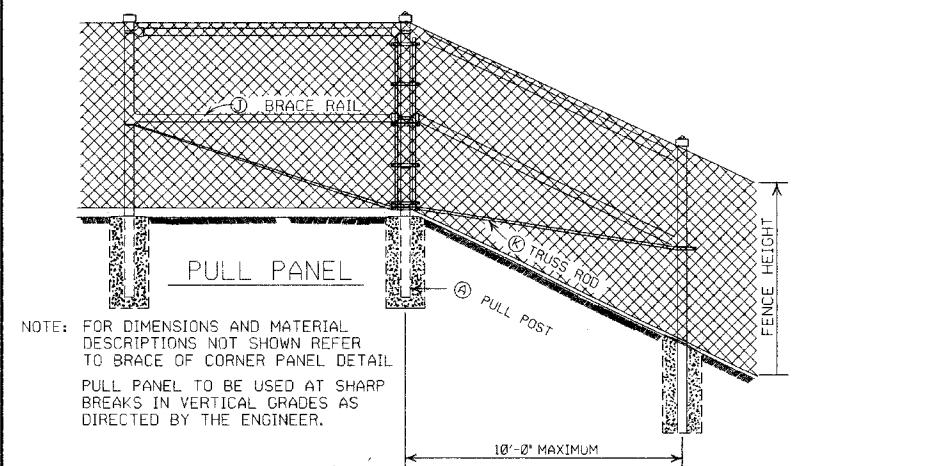
ALL EMBANKMENT SLOPES SHALL BE DRESSED, PREPARED, SEEDED, AND MULCHED AS THE WORK PROGRESSES. SLOPES SHALL BE CONSTRUCTED AND STABILIZED IN EQUAL INCREMENTS NOT TO EXCEED 25 FEET, MEASURED VERTICALLY.

CONSTRUCTION SEQUENCE

1. CONSTRUCT DIVERSION DITCHES, DITCH CHECKS, SEDIMENT BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD OF GREATER THAN 21 DAYS.
3. PLACE PHASE 2 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD OF GREATER THAN 21 DAYS.
4. PLACE FINAL PHASE OF EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PLACE DIVERSION DITCHES AND SLOPE DRAINS AND MAINTAIN UNTIL ENTIRE SLOPE IS STABILIZED.

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ARKANSAS STATE HIGHWAY COMMISSION		
TEMPORARY EROSION CONTROL DEVICES		
STANDARD DRAWING TEC-3		
11-03-94	CORRECTED SPELLING	
6-2-94	Drawn & Issued	6-2-94
DATE	REVISION	FILMED



GENERAL NOTES:

(C) CHAIN LINK FENCE BEING PLACED ON PRIVATE PROPERTY SHALL INCLUDE A TOP RAIL. ALL LABOR, MATERIALS, EQUIPMENT, TOOLS, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER LIN. FT. OF CHAIN LINK FENCE.

(D) TENSION WIRE: SHALL BE SECURED TO ALL TERMINAL, PULL, BRACE OR CORNER POSTS WITH TENSION BAR BANDS.

(J) BRACE RAIL: BRACE RAILS SHALL BE PROVIDED AT ALL TERMINAL, PULL, BRACE OR CORNER POSTS HALFWAY BETWEEN THE TOP RAIL AND GROUND LEVEL WHEN TOPRAIL IS SPECIFIED AND TWELVE INCHES (12") DOWN FROM TOP OF FABRIC WHEN TOP TENSION WIRE IS SPECIFIED. BRACE RAIL SHALL EXTEND FROM SUCH POST TO THE FIRST ADJACENT LINE POST.

(M) GATE FRAMES: SHALL BE CONSTRUCTED OF TUBULAR MEMBERS ASSEMBLED BY USE OF HEAVY PRESSED STEEL, MALLEABLE FITTINGS OR BY WELDING. ALL GATES SHALL HAVE ONE HORIZONTAL SUPPORT EXTENDING THE WIDTH OF THE GATE AT THE MIDPOINTS OF VERTICAL FRAME MEMBERS. THE COMPLETE FRAME SHALL BE RIGID AND HAVE AMPLE STRENGTH TO BE FREE FROM SAG AND TWIST.

(O) HINGES: SHALL BE OF HEAVY PATTERN, OF ADEQUATE STRENGTH FOR GATE, AND WITH LARGE BEARING SURFACES FOR CLAMPING IN POSITION. THE HINGE SHALL BE OF THE PROPER TYPE TO ALLOW FOR THE DESIGNATED DEGREE OF SWING. THE HINGE SHALL NOT TWIST OR TURN UNDER THE ACTION OF THE GATE. THE GATES SHALL BE CAPABLE OF BEING OPENED AND CLOSED EASILY BY ONE PERSON.

(P) LATCHES AND STOPS: SHALL BE PROVIDED FOR ALL GATES. GATES SHALL HAVE A DROP BAR LATCH. LATCHES SHALL BE ARRANGED FOR LOCKING. THE STOP FOR DROP BAR LATCHES SHALL BE SET IN CONCRETE AND ENGAGE THE PLUNGER OF THE BAR LATCH.

(S) CAPS: ALL POSTS, EXCEPT ROLL FORMED POSTS AND 'T' POSTS SHALL BE CAPPED OVER THE EXTERIOR OF THE POST, AND SHALL CONFORM TO ASTM F626.

CONCRETE REQUIRED FOR THE EMBEDMENT OF ALL POSTS SHALL NOT BE PAID FOR DIRECTLY BUT SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR CHAIN LINK FENCE.

POSTS SHALL BE SPACED EQUIDISTANT ON A MAXIMUM OF 10' CENTERS.

EXCAVATION FOR POSTS: IN OTHER THAN ROCK SHALL BE OF THE DIMENSIONS INDICATED. IF ROCK IS ENCOUNTERED BEFORE REACHING THE REQUIRED DEPTH, THE EXCAVATION SHALL BE CONTINUED TO THE DEPTH INDICATED OR 1'-6" INTO THE ROCK, WHICHEVER IS LESS, AND SHALL BE A MINIMUM OF 8 INCHES IN DIAMETER.

(L) FABRIC: SHALL CONFORM TO THE SPECIFICATIONS.

1 1/8" x 1/4" REDWOOD SLATS (LENGTH TO MATCH HEIGHT OF FENCE) (L) FABRIC: SHALL CONFORM TO THE SPECIFICATIONS.

DETAIL OF REDWOOD SLAT INSTALLATION (WHERE APPLICABLE)

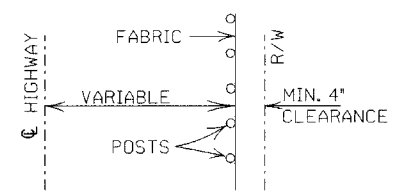
HEIGHT OF FENCE FABRIC	(A) END, PULL CORNER OR BRACE POST		(B) LINE POSTS		(C) TOP RAIL			(D) TENSION WIRE		(E) TENSION BAR		(F) TENSION BAR BAND		(G) BRACE BAND	
	SIZE	TIE SPACING	SIZE	TIE SPACING	SIZE	TIE SPACING	MIN. LENGTH	SIZE	TIE SPACING	SIZE	LENGTH	SIZE	BOLT SIZE	SPACING	SIZE
6' AND LESS	2 1/2" O.D.	2' O.D.	2" O.D.	EVERY 1'-2"	1 1/2" O.D.	1 TIE EVERY 2'-0"	10'-0"	7 GAUGE COIL SPRING WIRE	1 TIE EVERY 1'-0"	MIN. OF 3/16" x 3/4"	MIN. OF 2" LESS THAN FABRIC HEIGHT	MIN. OF 3/4" x 1 1/4"	1 BAND AT TOP AND BOTTOM 15" MAX. INTERVAL BETWEEN BANDS	MIN. OF 3/4" x 0.105	5/8" x 1 1/4"
OVER 6' TO 12' INCL.	3" O.D.	2 1/2" O.D.	2 1/2" O.D.	EVERY 1'-2" OF FABRIC HEIGHT	1 1/2" O.D.	1 TIE EVERY 2'-0"	10'-0"	7 GAUGE COIL SPRING WIRE	1 TIE EVERY 1'-0"	3/16" x 3/4"	2" LESS THAN FABRIC HEIGHT	3/4" x 1 1/4"	1 BAND AT TOP AND BOTTOM 15" MAX. INTERVAL BETWEEN BANDS	3/4" x 0.105	5/8" x 1 1/4"

HEIGHT OF FENCE FABRIC	(H) TIE WIRE	(I) HOG RING	(J) BRACE RAIL		(K) TRUSS ROD	(L) FABRIC		(M) GATE FRAME		(N) HORIZONTAL SUPPORT		(O) HINGE TYPE		(P) GATE POST	
	SIZE	TIE SPACING	SIZE	TIE SPACING	MIN. OF 3/8" ROUND WITH TIGHTENERS AND FITTINGS	SIZE	MESH SELVAGE	SIZE	TIE SPACING	SIZE	TIE SPACING	180° SWING	GATE WIDTH 12" AND LESS	GATE WIDTH OVER 12"	
6' AND LESS	MIN. OF 12 GA. STEEL OR 9 GA. ALUM.	SAME GAUGE AS FABRIC	1 1/2" O.D.	EVERY 2'-0"	MIN. OF 3/8" ROUND WITH TIGHTENERS AND FITTINGS	9 GA.	2"	2" O.D.	1 TIE EVERY 1'-0"	2" O.D.	1 TIE EVERY 1'-0"	OFFSET	3" O.D.	4" O.D.	
OVER 6' TO 12' INCL.	MIN. OF 12 GA. STEEL OR 9 GA. ALUM.	SAME GAUGE AS FABRIC	1 1/2" O.D.	EVERY 2'-0"	MIN. OF 3/8" ROUND WITH TIGHTENERS AND FITTINGS	9 GA.	2"	2" O.D.	1 TIE EVERY 1'-0"	2" O.D.	1 TIE EVERY 1'-0"	OFFSET	3" O.D.	4" O.D.	

NOTE: POST SIZES SHOWN ARE FOR STEEL, WHERE ALUMINUM IS PROVIDED. LINE POSTS SHALL HAVE AN OUT SIDE DIAMETER OF 2 1/2" FOR FENCE HEIGHT OF 6' AND LESS, AN OUTSIDE DIAMETER OF 3" FOR FENCE HEIGHT OF 8' TO 12". END, PULL, CORNER OR BRACE POSTS SHALL HAVE AN OUTSIDE DIAMETER OF 3" FOR FENCE HEIGHT OF 6' AND LESS; AN OUTSIDE DIAMETER OF 3 1/2" FOR FENCE HEIGHTS OF 8' TO 12". GATE POSTS WHERE GATE WIDTH IS 12' AND LESS SHALL HAVE AN OUTSIDE DIAMETER OF 3 1/2" FOR FENCE HEIGHT OF 6' AND LESS, ALUMINUM TENSION WIRE SHALL BE 0.192" IN DIAMETER. MINIMUM THICKNESS OF MATERIAL FROM WHICH EXPANSION SLEEVES SHALL BE MADE WILL BE 0.078". POSTS AND RAILS MAY HAVE ANY CROSS-SECTIONAL SHAPE THAT WILL MEET THE SPECIFICATIONS.

OTHER DETAILS APPLY TO BOTH STEEL AND ALUMINUM FENCE.

ALL MISCELLANEOUS FITTINGS AND HARDWARE SHALL MEET THE REQUIREMENTS AND PRODUCTION TOLERANCES AS SET FORTH IN THE SPECIFICATIONS. 9 GAUGE ALUMINUM WIRE SHALL BE ACCEPTABLE FOR TIEING FABRIC TO TUBULAR AND ROLL FORMED MEMBERS OF STEEL FENCE.



POSTS AND RAILS

SIZE O.D.	GRADE 1 AND ALUMINUM ALLOY				GRADE 2		
	O.D. INCHES	WALL THICKNESS	STEEL LBS. PER LINEAR FT.	ALUMINUM LBS. PER LINEAR FT.	O.D. INCHES	WALL THICKNESS	LBS. PER LINEAR FT.
1 1/8"	1.660	0.140	2.27	0.786	1.660	0.111	1.84
2"	1.900	0.145	2.72	0.940	1.900	0.120	2.28
2 1/2"	2.375	0.154	3.65	1.264	2.375	0.130	3.11
3"	2.875	0.203	5.79	2.004	2.875	0.160	4.64
3 1/2"	3.500	0.216	7.58	2.621	3.500	0.160	5.71
4"	4.000	0.226	9.11	3.151	4.000	0.160	6.56

TOLERANCES ON DIMENSIONS AND WEIGHTS ACCORDING TO AASHTO M 181

DATE	REVISION	FILMED
11-17-10	REVISED TRUSS ROD	
12-10-09	REVISED POSTS & RAILS TABLE	
5-21-09	ADDED TABLE & GEN. NOTE (C)	
8-22-02	REVISED NOTES, REMOVED TABLE, & REMOVED FENCE ALTERNATE	
4-3-97	REVISED BRACE RAIL NOTE	
10-18-96	REVISED AASHTO & ASTM REF.	
11-3-94	REVISED NOTE (L)	
10-1-92	DELETED ALTERNATE POST	10-1-92
8-15-91	DELETED ROLL FORMED POST DETAIL & ADDED NOTE	8-15-91
8-15-91	DELETED CLASS CONCRETE	8-15-91
11-30-89	DELETED O.D. SIZES	11-30-89
11-17-88	GENERAL REVISIONS	668-11-17-88
10-30-87	REVISED TOP RAIL & TENSION WIRE	548-10-30-87
4-20-79	REVISED AND REDRAWN	695-4-20-79
10-2-72		530-10-2-72

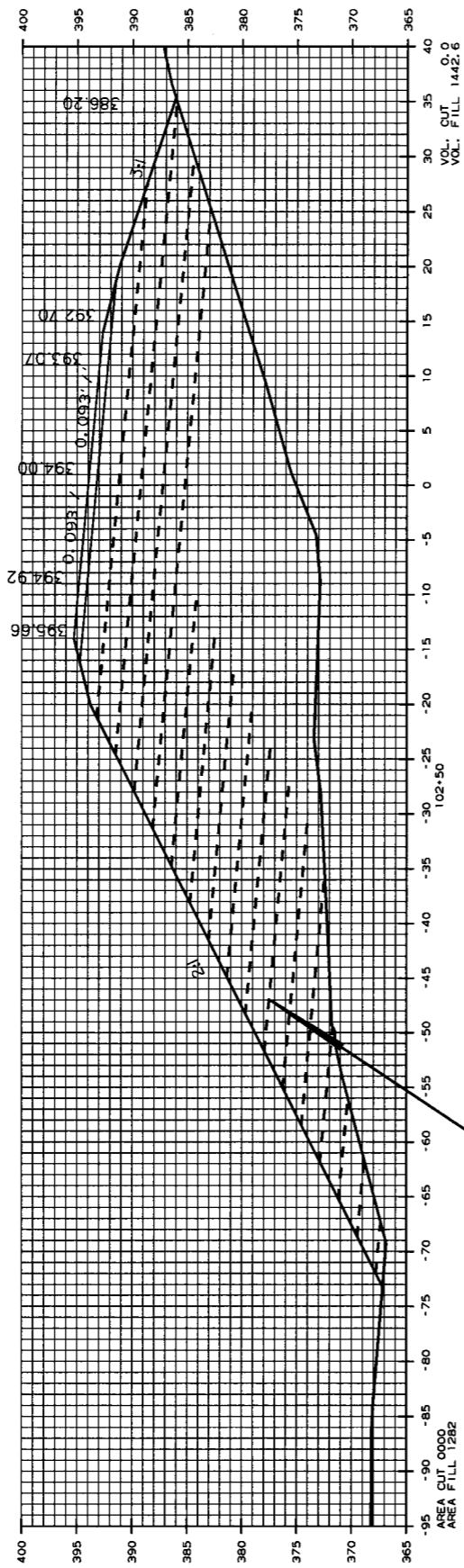
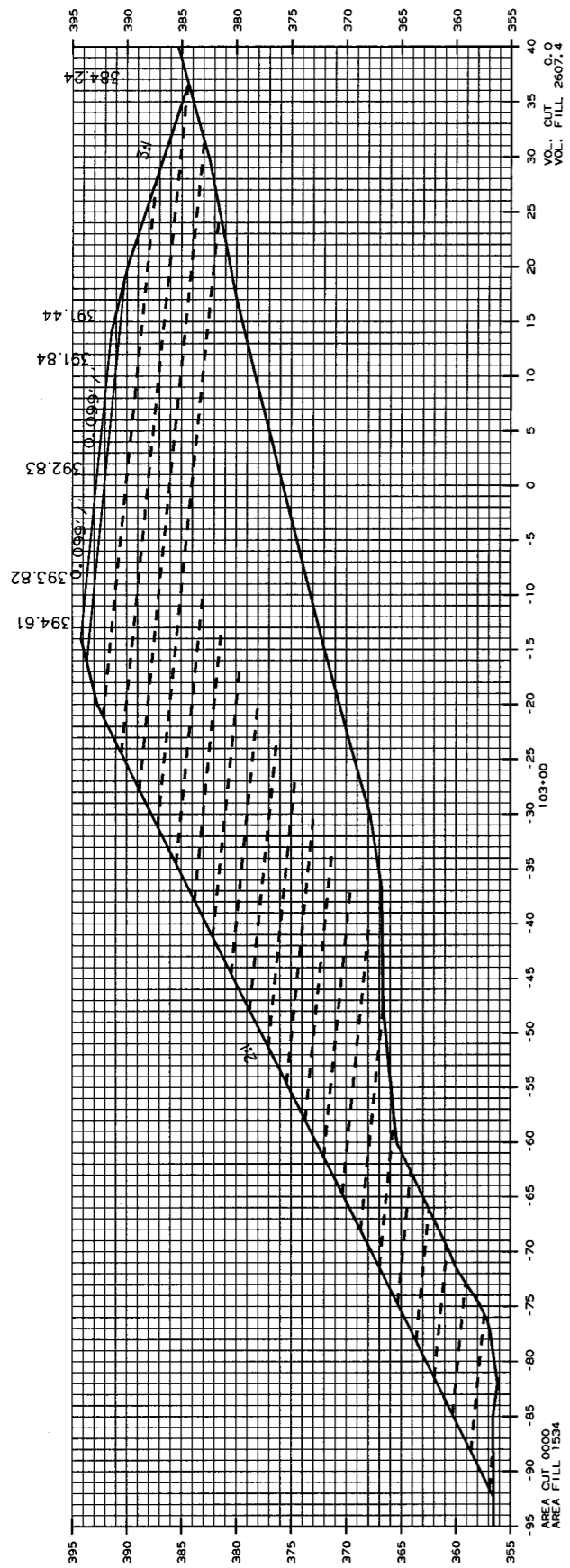
ARKANSAS STATE HIGHWAY COMMISSION

CHAIN LINK FENCE

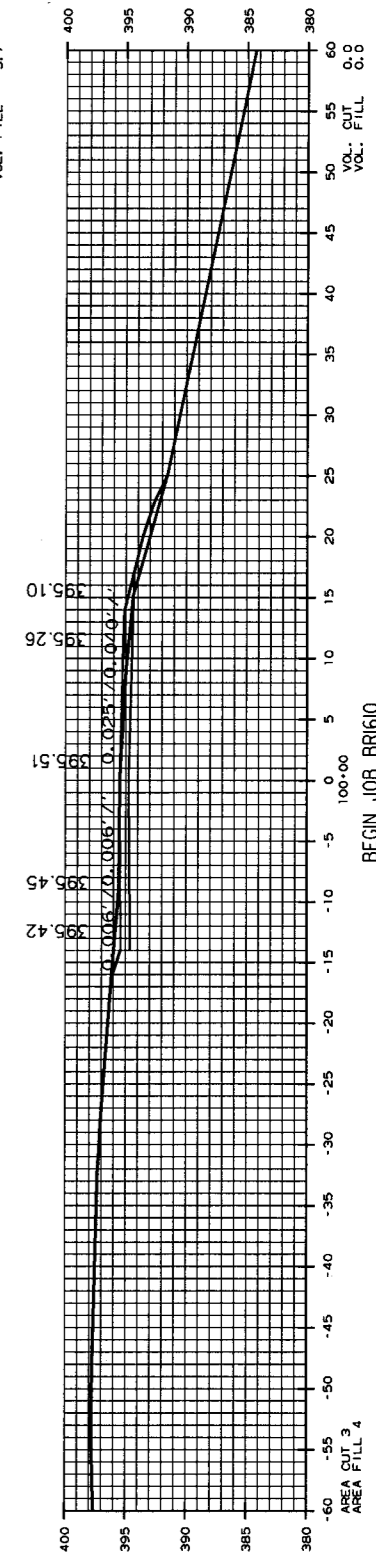
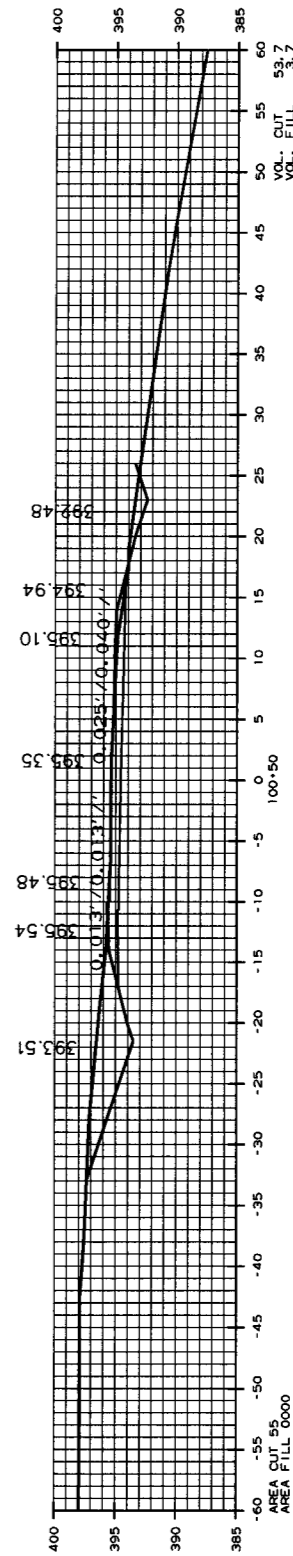
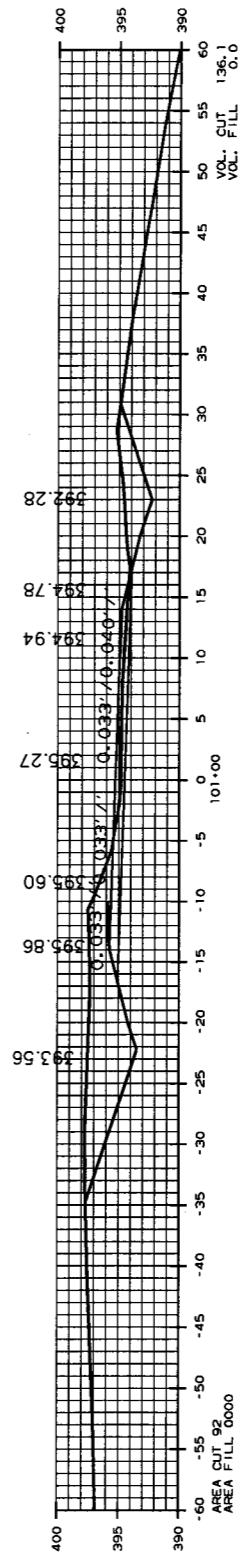
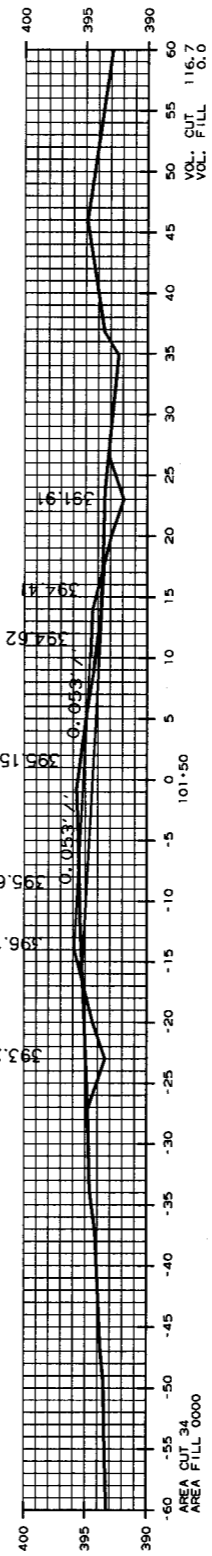
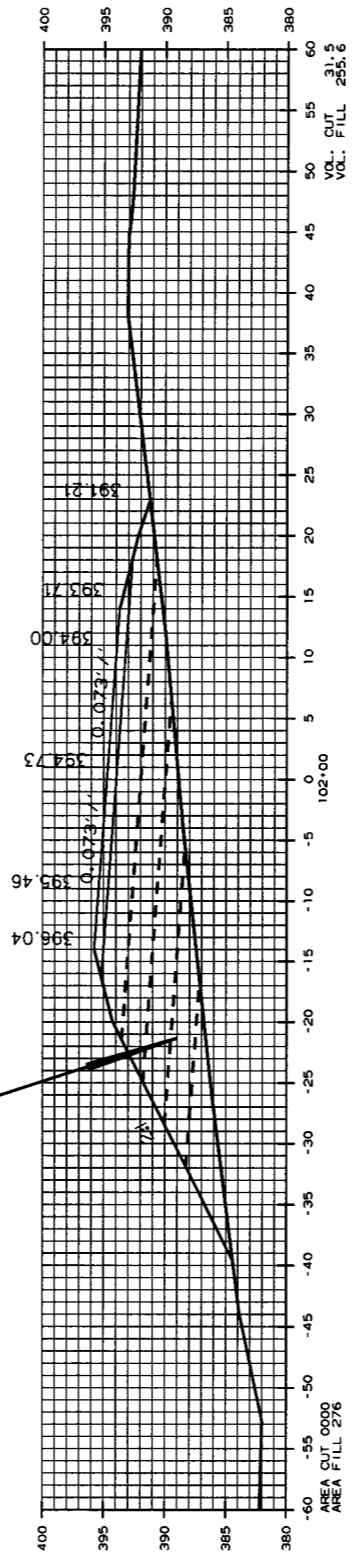
STANDARD DRAWING WF-3

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4 CROSS SECTIONS STA. 100+00 TO STA. 103+00



ROADWAY EMBANKMENT
REINFORCEMENT ZONE

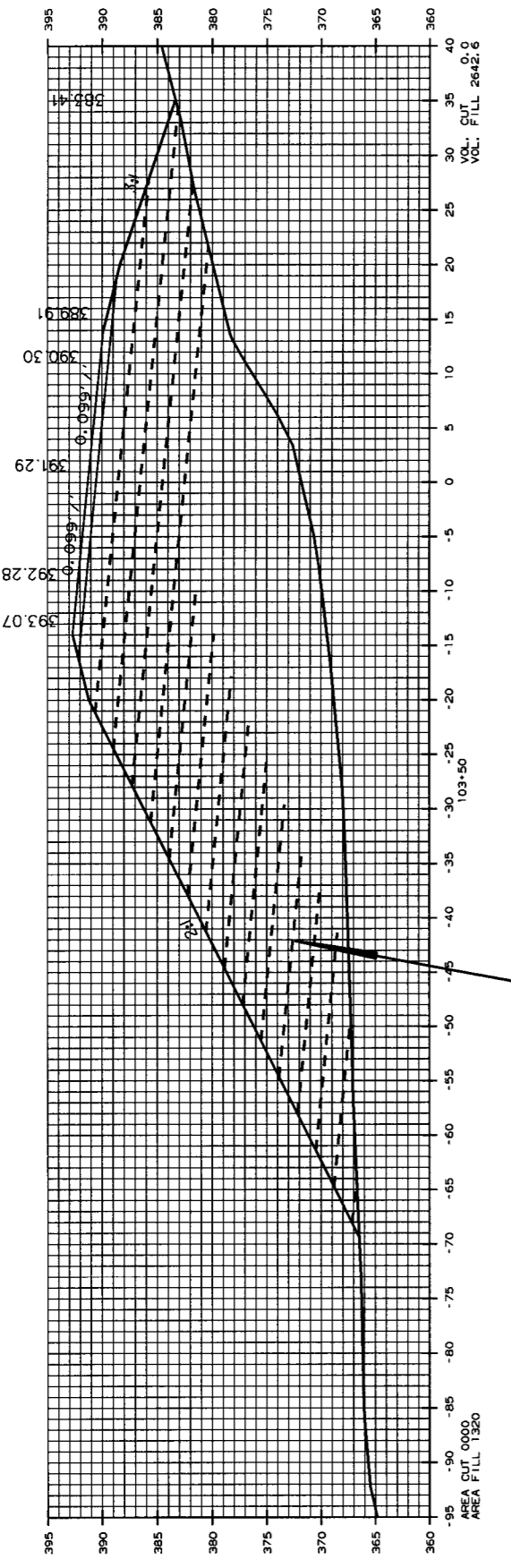


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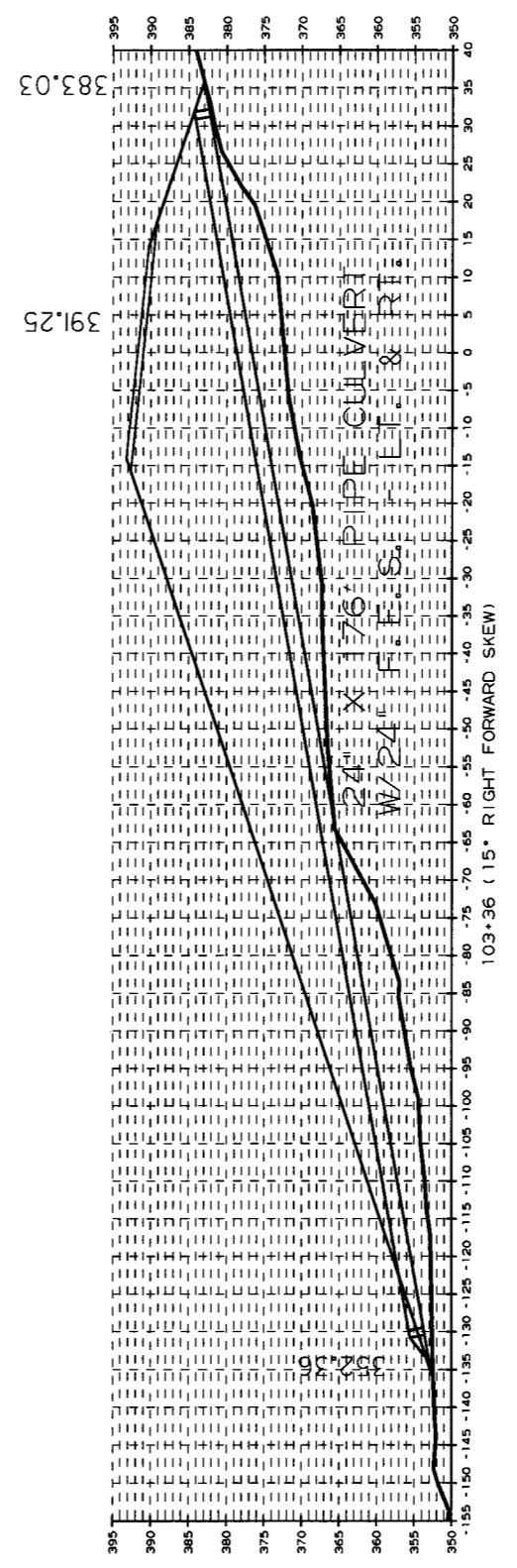
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						JOB NO.	BRIGIO	67

4 CROSS SECTIONS STA. 103+36 TO STA. 103+50

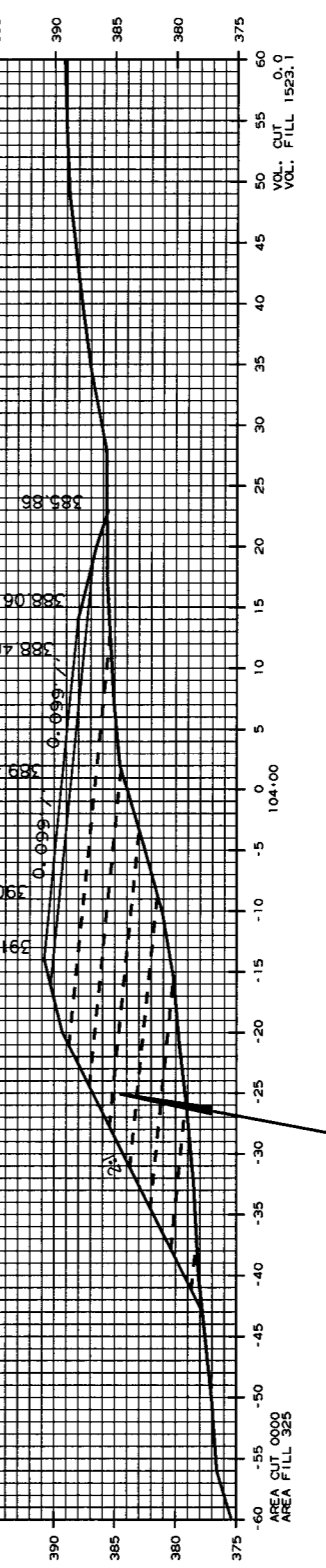
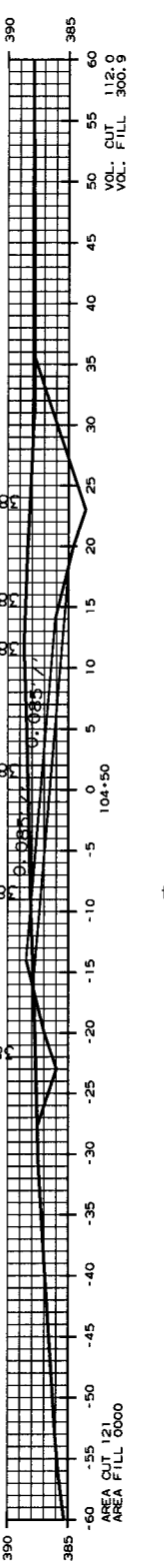
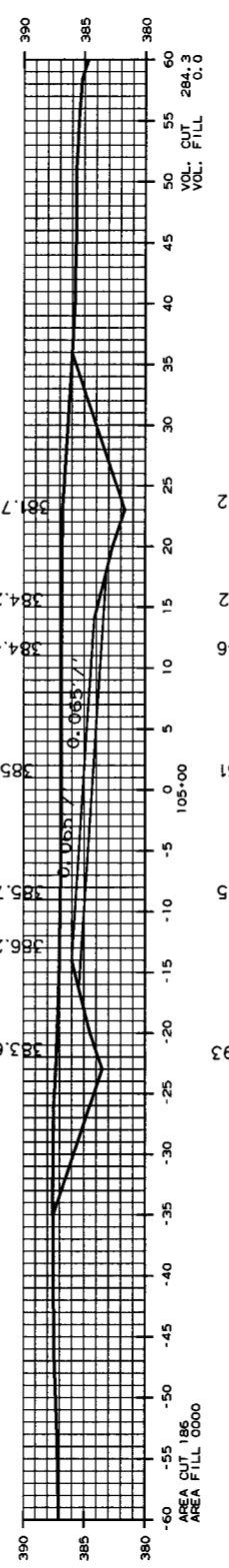
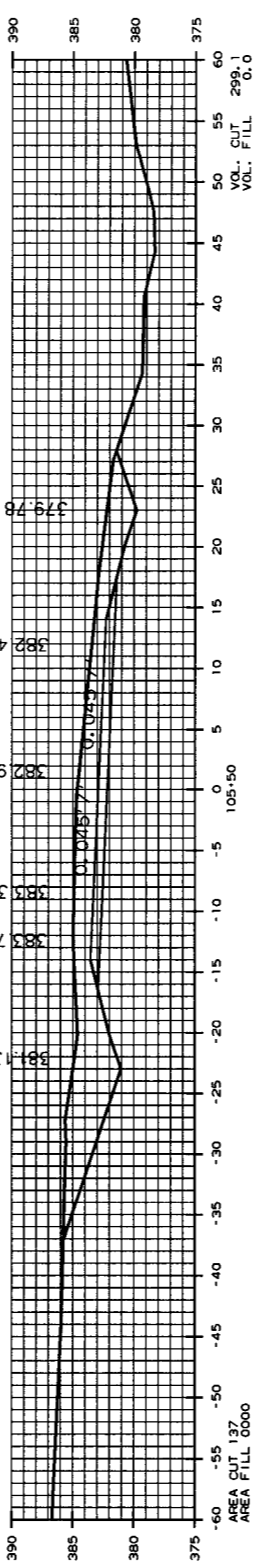
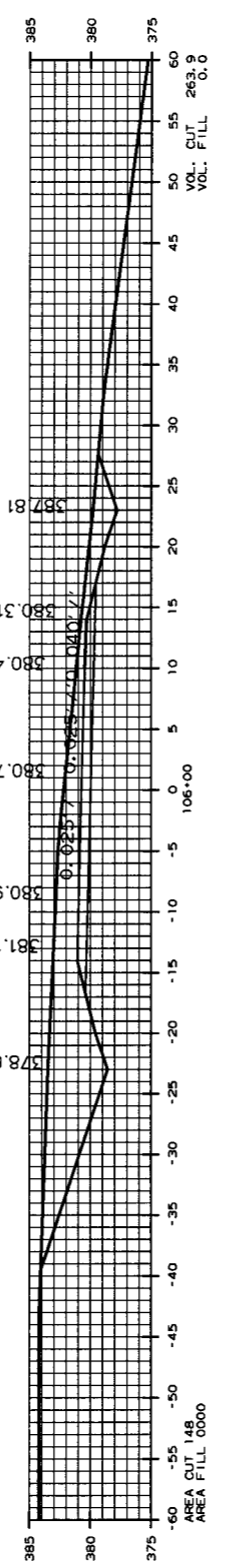
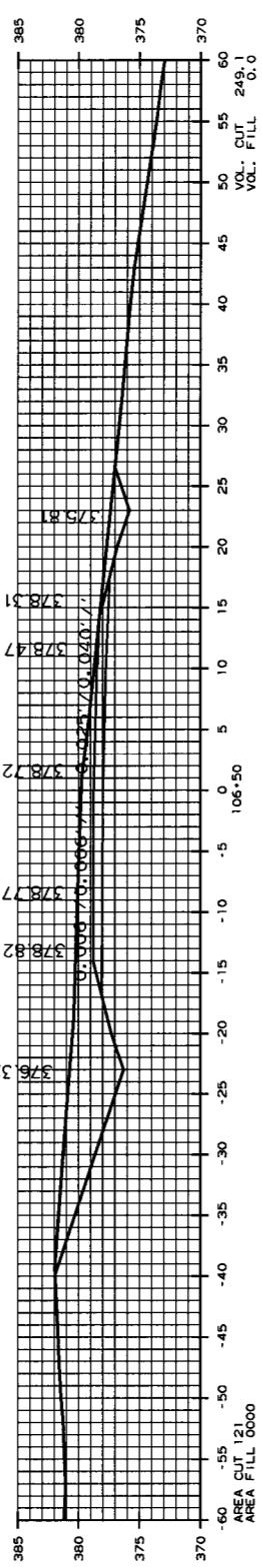
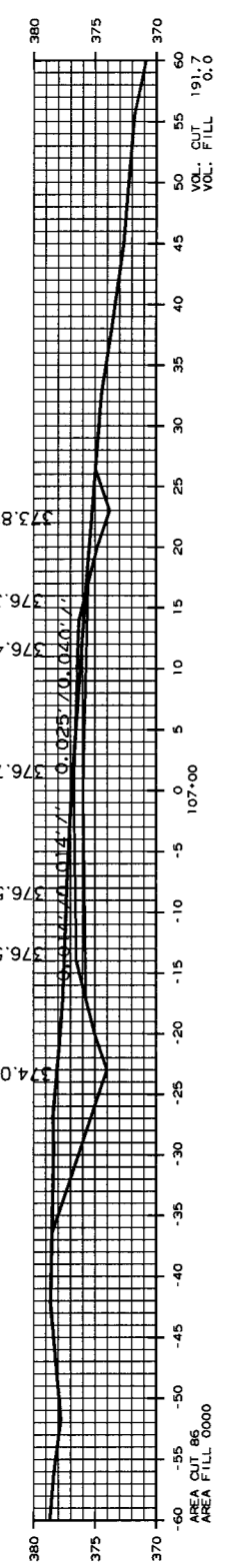
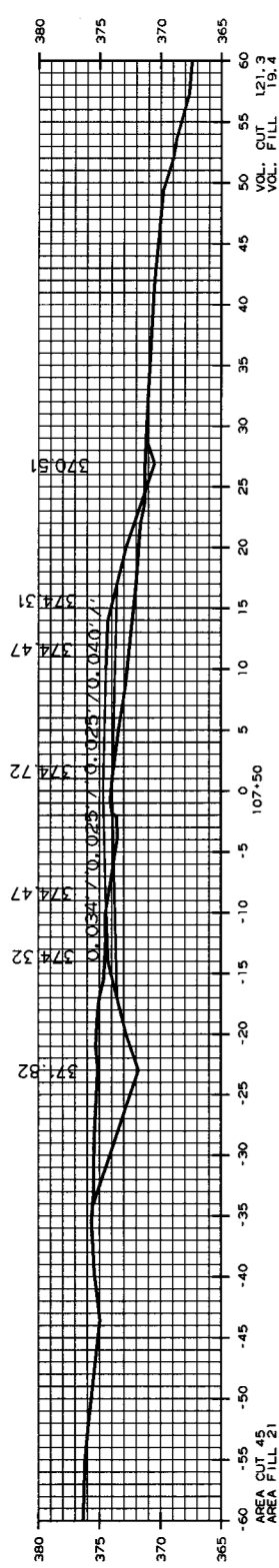


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REINFORCEMENT ZONE



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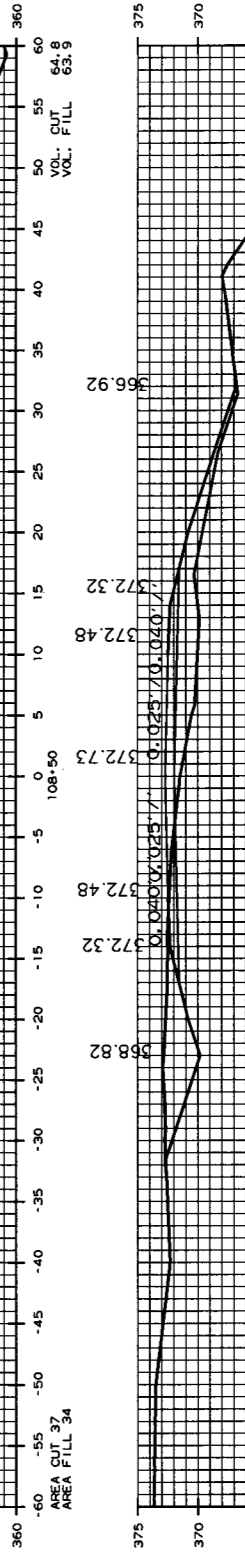
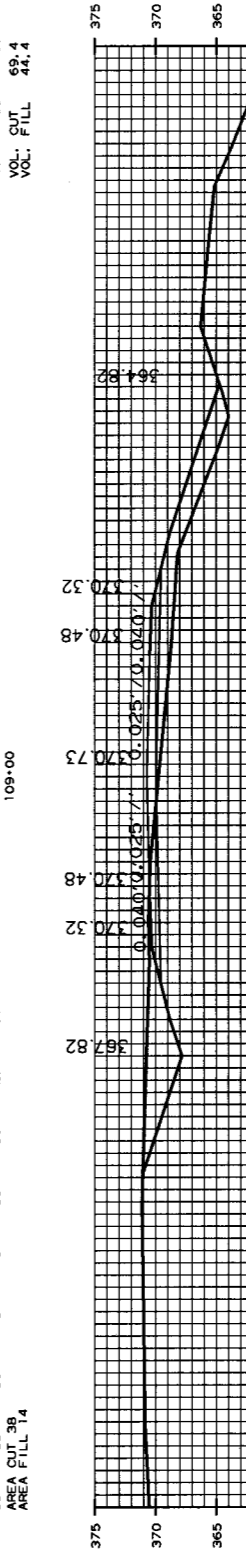
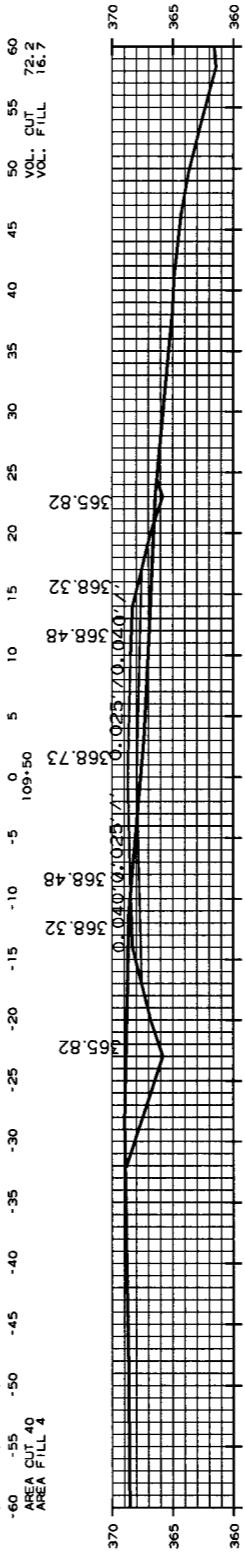
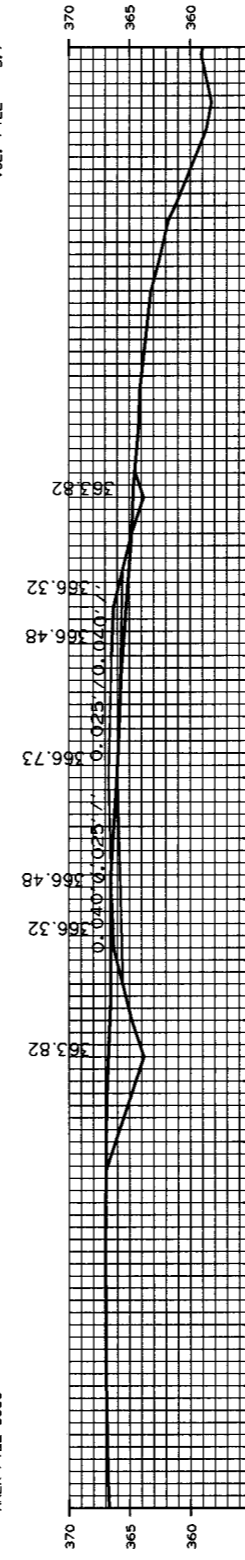
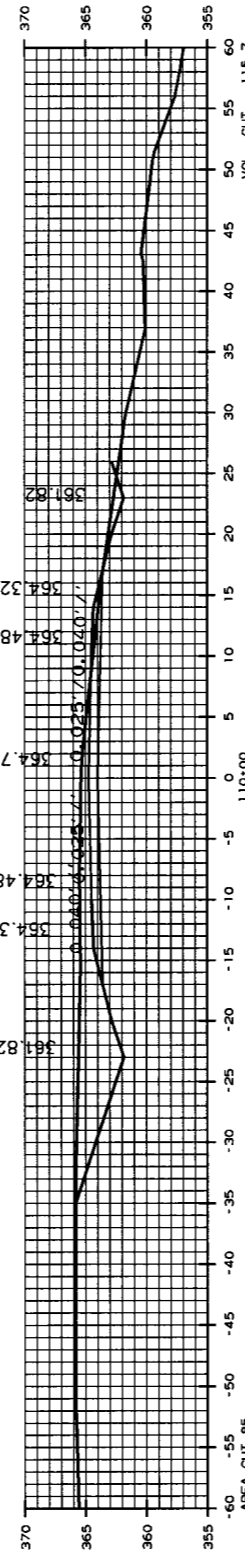
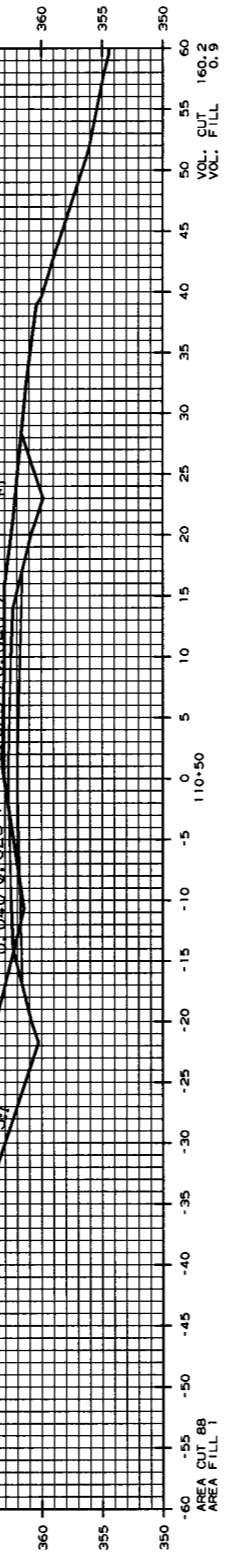
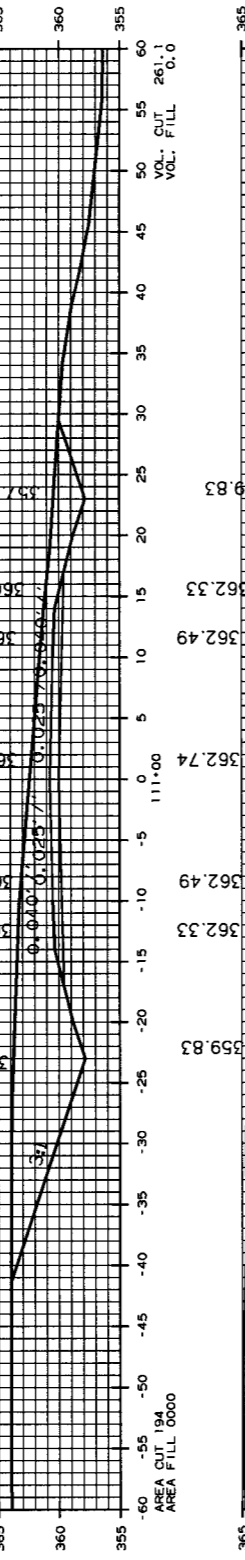
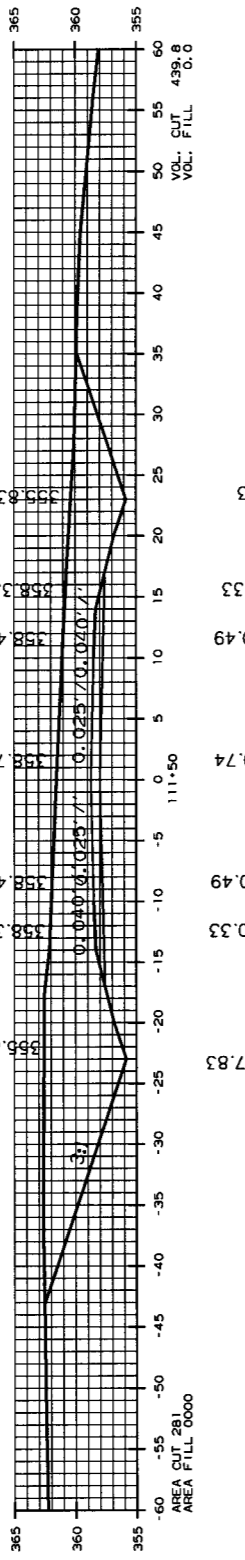
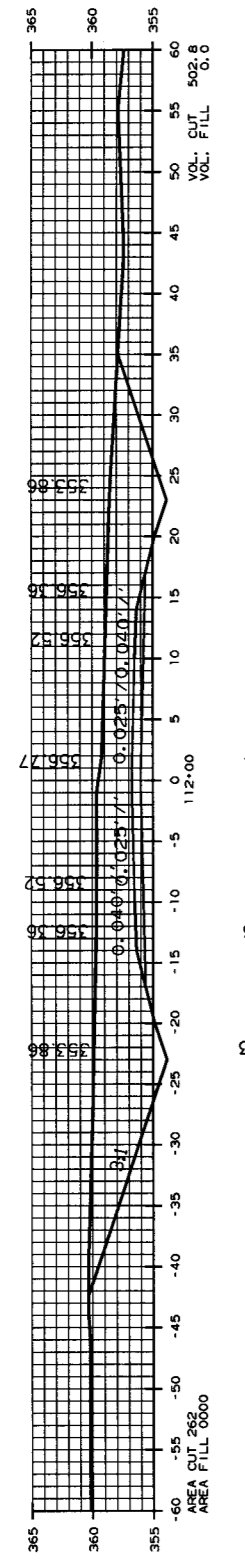
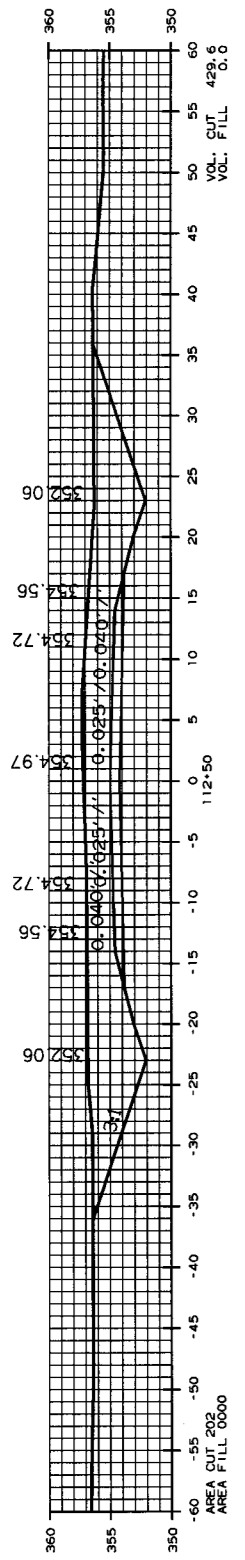
4 CROSS SECTIONS STA. 104+00 TO STA. 107+50



ROADWAY EMBANKMENT
REINFORCEMENT ZONE

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
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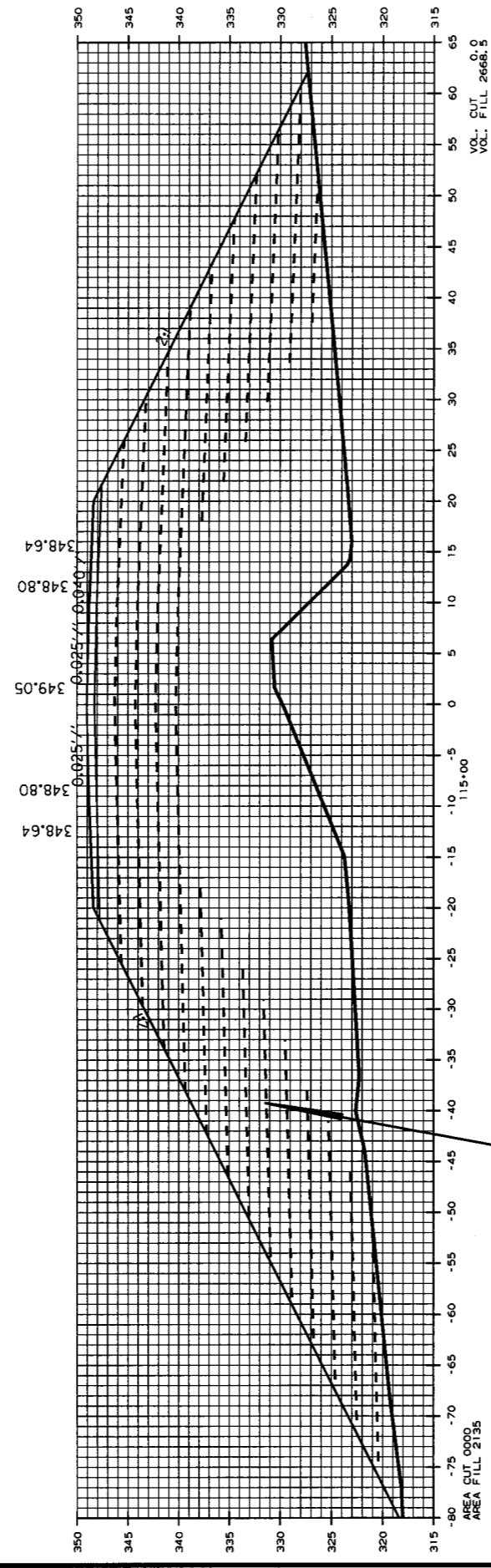
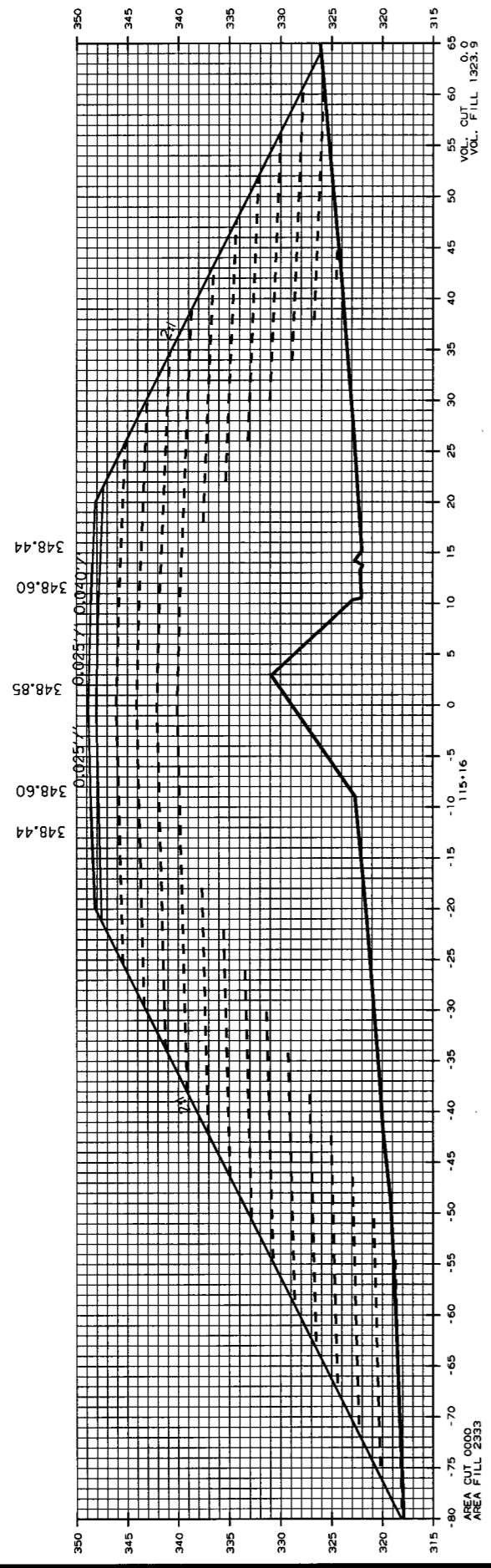
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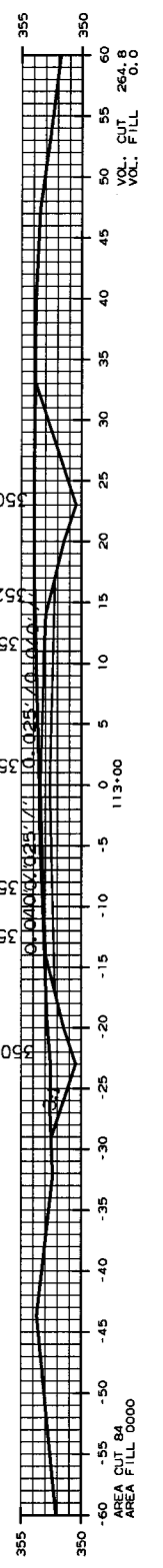
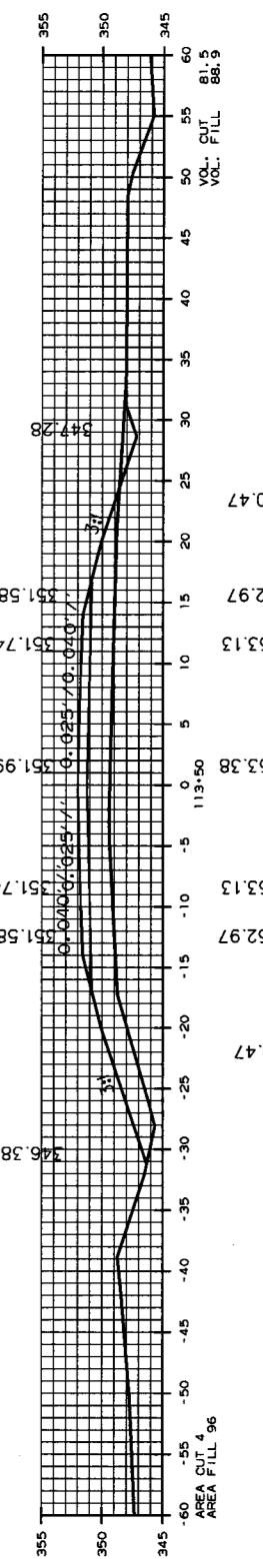
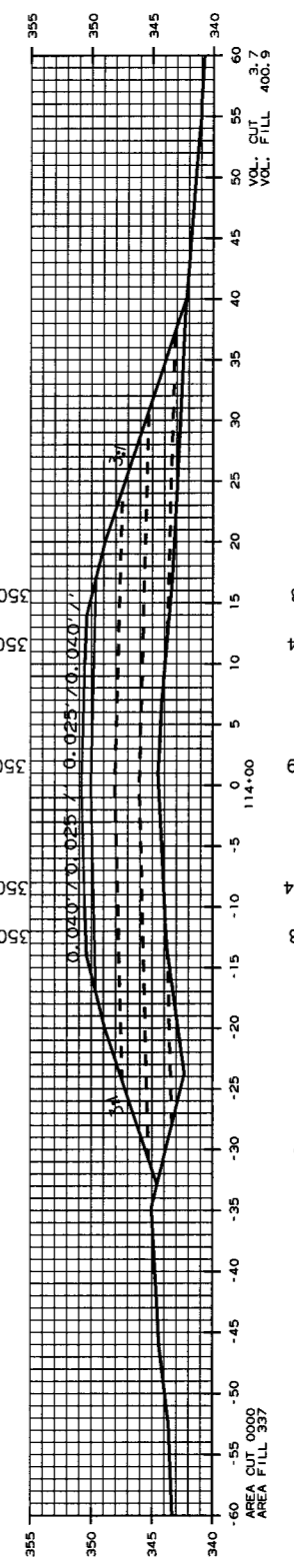
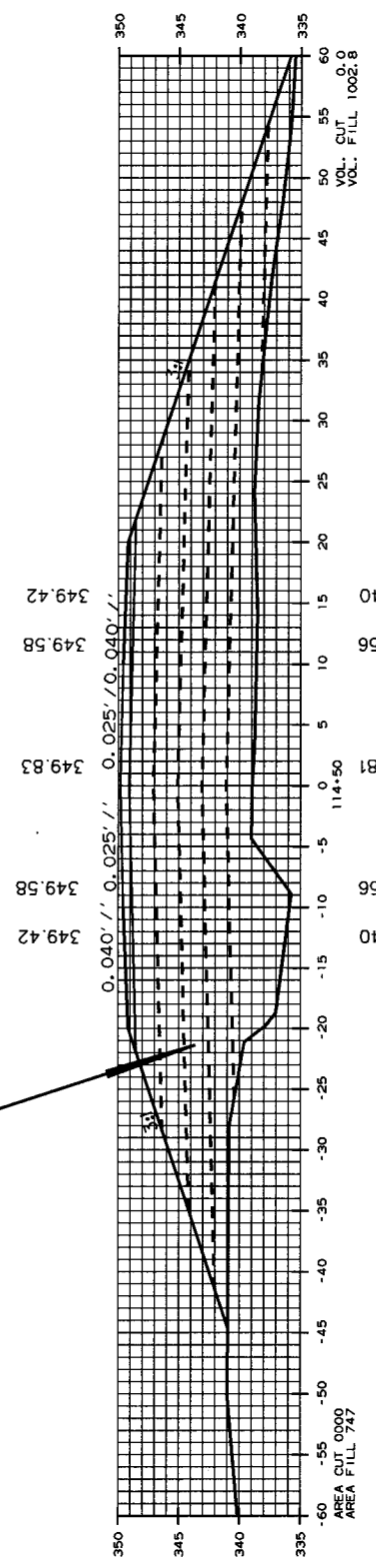
JOB BRIGIO
CROSS SECTION STA. 108+00 TO STA. 112+50

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				JOB NO.		BRIGIO	70	71

4 CROSS SECTIONS STA. 113+00 TO STA. 115+16



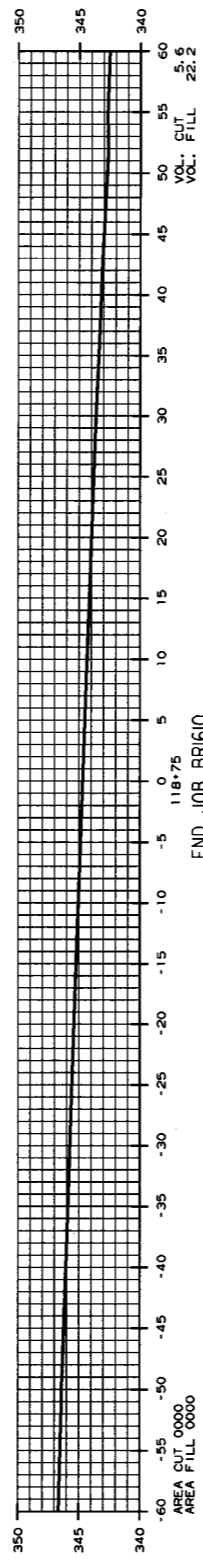
ROADWAY EMBANKMENT
REINFORCEMENT ZONE



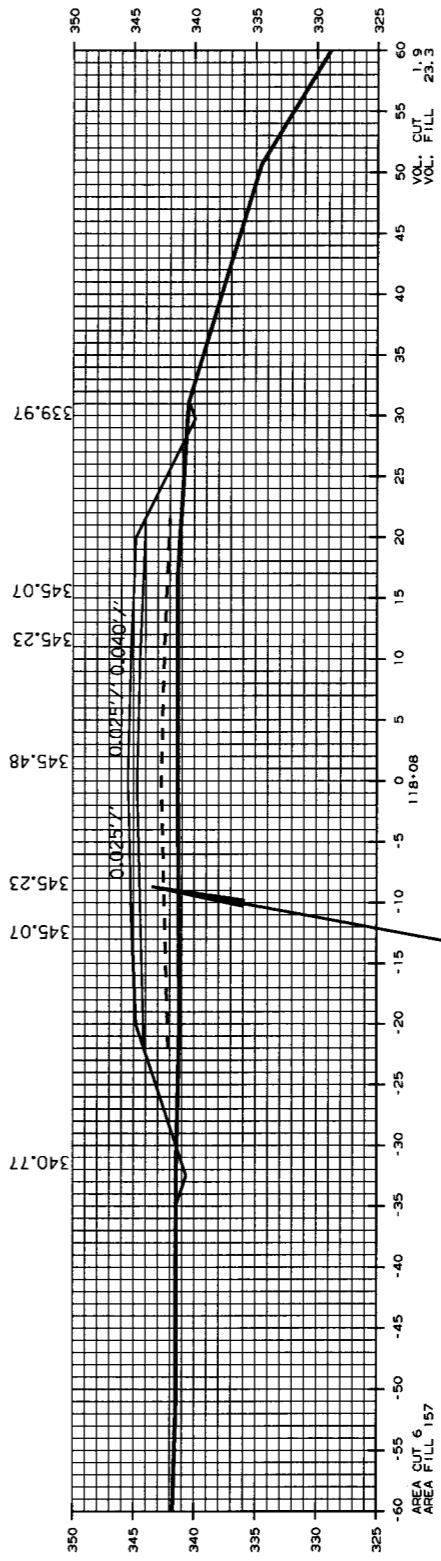
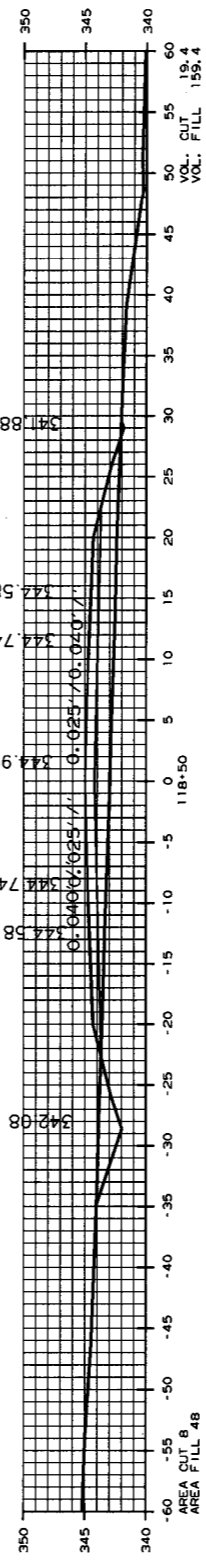
CROSS SECTION STA. 113+00 TO STA. 115+16

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	BR1610		71	71

4 CROSS SECTIONS STA. 118+08 TO STA. 118+75



END JOB BR1610



ROADWAY EMBANKMENT
REINFORCEMENT ZONE

AREA CUT 0
AREA FILL 0

118+08
TOE OF SLOPE

AREA CUT 0
AREA FILL 0

116+00
TOE OF SLOPE