

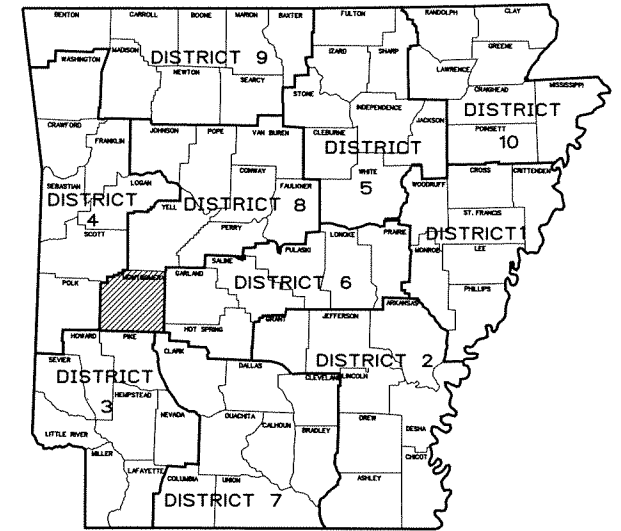
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	FA4902		1	42
				④ HEWING & LICK CREEKS STRS. & APPRS.(S)				

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
CONSTRUCTION PLANS FOR PROPOSED COUNTY ROAD

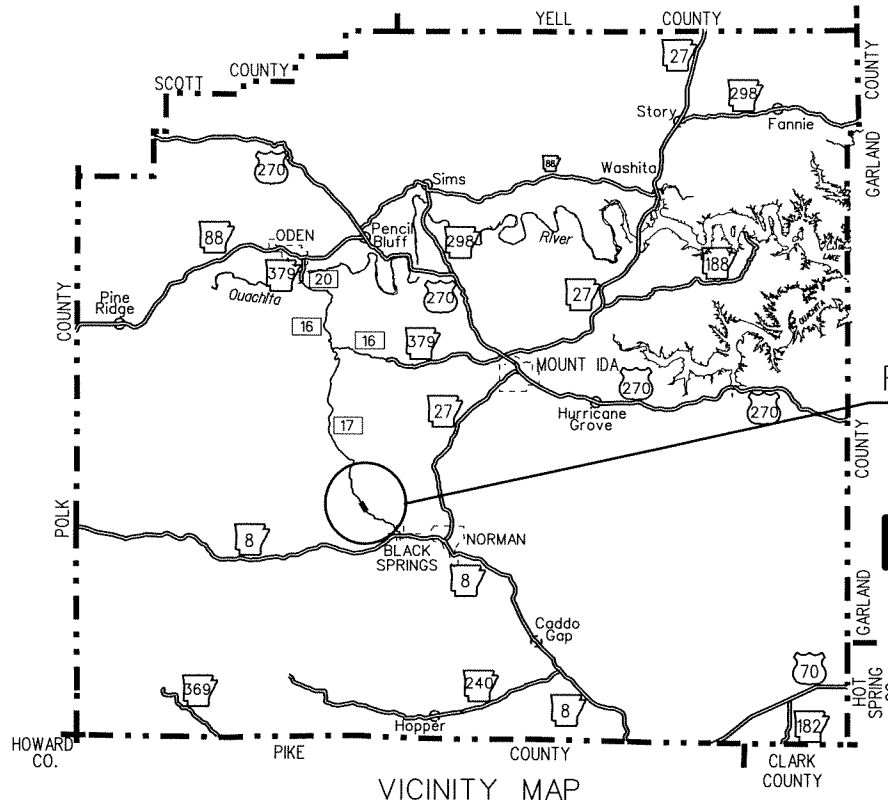
**HEWING & LICK CREEKS  
STRS. & APPRS. (S)**

**COUNTY ROAD 17  
MONTGOMERY COUNTY**

**FED. AID PROJ. STPR-0049(15)  
JOB FA4902**

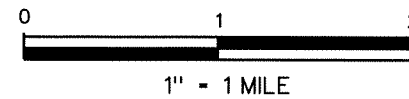


ARK. HWY. DIST. NO. 8



VICINITY MAP

PROJECT  
LOCATION



STRUCTURES OVER 20'-0" SPAN

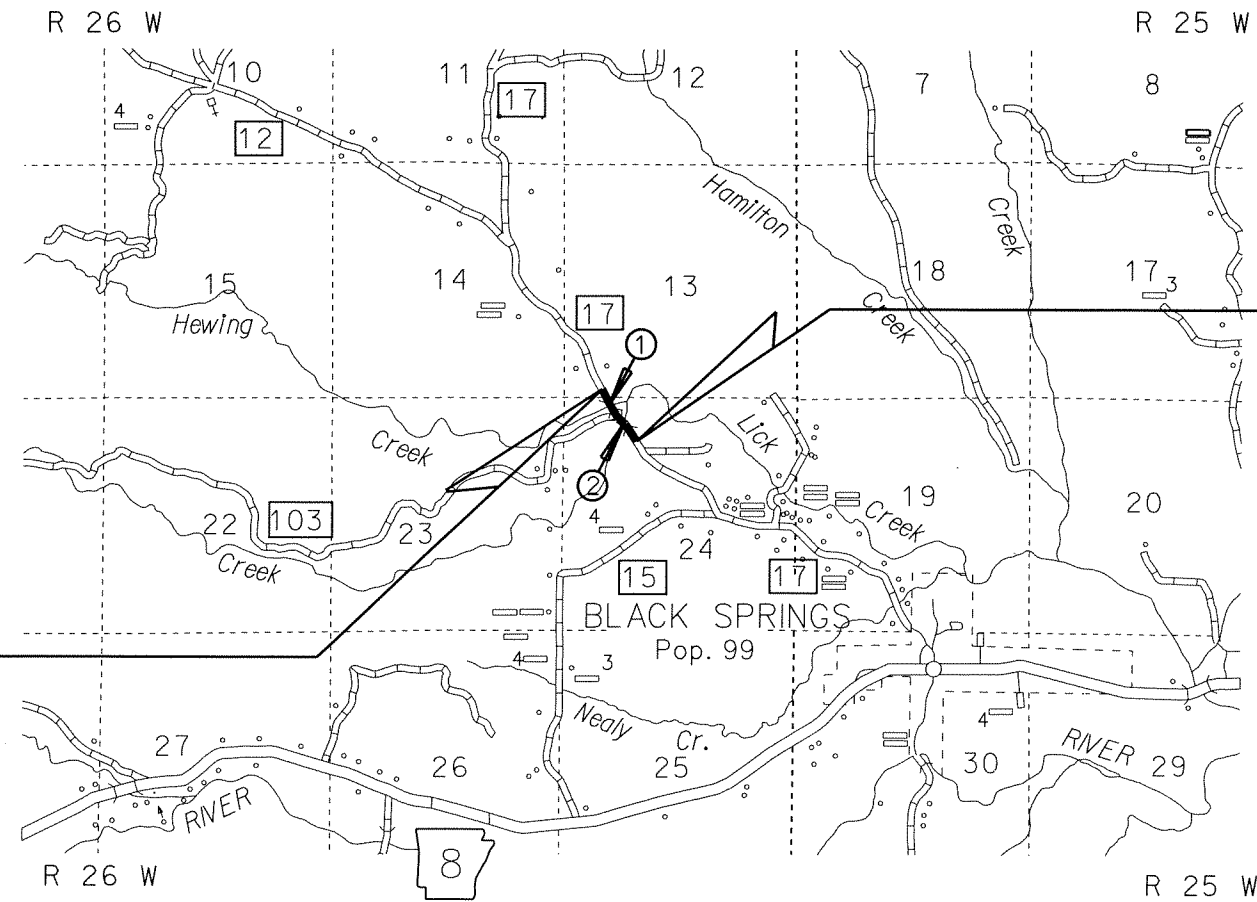
- ① STA. 104+24  
TRIP. 11' x 10' x 64'  
R.C. BOX CULVERT  
45° LT. FWD. SKEW  
SPAN = 49'-6"
- ② STA. 106+05  
QUAD. 12' x 10' x 48'  
R.C. BOX CULVERT  
15° RT. FWD. SKEW  
SPAN = 52'-9 1/2"

DESIGN TRAFFIC DATA

DESIGN YEAR	-----	2032
2012 ADT	-----	130
2032 ADT	-----	170
2032 DHV	-----	26
DIRECTIONAL DISTRIBUTION	-----	20 %
TRUCKS	-----	6 %
DESIGN SPEED	-----	30 MPH

**STA. 110+00 - END JOB FA4902  
FED. AID PROJ. STPR-0049(15)**

**STA. 100+00 - BEGIN JOB FA4902  
FED. AID PROJ. STPR-0049(15)**



APPROVED



*1/5/12*  
DEPUTY DIRECTOR  
AND CHIEF ENGINEER

PROJECT COORDINATES

	BEGIN	MID-POINT	END
LAT.	N 34° 28' 42.0"	N 34° 28' 36.6"	N 34° 28' 34.4"
LONG.	W 93° 44' 15.9"	W 93° 44' 11.9"	W 93° 44' 09.6"

GROSS LENGTH OF PROJECT	1000.00	FEET	OR	0.189	MILES
NET ROADWAY	897.71			0.170	
NET BRIDGES	102.29			0.019	
NET PROJECT	1000.00			0.189	

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	DISTRICT	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NUMBER	FA4902	2
						IND., GOV. SPECS. & GEN. NOTES		

4

GOVERNING SPECIFICATIONS

ARKANSAS STATE HIGHWAY COMMISSION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, EDITION OF 2003 AND THE FOLLOWING SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS:

INDEX OF SHEETS

SHEET NO.	TITLE	BRIDGE NO.	DRWG. NO.	DATE
1	TITLE SHEET			
2	INDEX OF SHEETS, GOVERNING SPECIFICATIONS AND GENERAL NOTES			
3	TYPICAL SECTION OF IMPROVEMENT			
4	SPECIAL DETAILS			
5	GUARDRAIL WIDENING DETAILS			
6	SURVEY CONTROL DETAILS			
7	TEMPORARY EROSION CONTROL DETAILS			
8-9	QUANTITY SHEETS			
10	SUMMARY OF QUANTITIES AND REVISIONS			
11	PLAN AND PROFILE SHEET			
12	GUARD RAIL DETAILS		GR-8	7-14-10
13	GUARD RAIL DETAILS		GR-8A	7-14-10
14	GUARD RAIL DETAILS		GR-9	4-17-08
15	GUARD RAIL DETAILS		GRT-1	7-14-10
16	MAILBOX DETAILS		MB-1	11-18-04
17	PRECAST CONCRETE BOX CULVERTS		PBC-1	12-15-11
18	PAVEMENT MARKING DETAILS		PM-1	11-17-10
19	DETAILS OF PIPE UNDERDRAIN		PU-1	4-10-03
20	REINFORCED CONCRETE BOX CULVERT DETAILS		RCB-1	12-15-11
21	EXCAVATION PAY LIMITS, BACKFILL, & SOLID SODDING FOR BOX CULVERTS		RCB-2	11-20-03
22	TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC		SE-2	10-18-96
23	STANDARD HIGHWAY SIGNS & SUPPORT ASSEMBLIES		SHS-1	4-17-08
24	U-CHANNEL POST ASSEMBLIES		SHS-2	10-09-03
25	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION		TC-1	12-15-11
26	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION		TC-2	3-11-10
27	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION		TC-3	10-15-09
28	TEMPORARY EROSION CONTROL DEVICES		TEC-1	12-15-11
29	TEMPORARY EROSION CONTROL DEVICES		TEC-2	6-02-94
30	TEMPORARY EROSION CONTROL DEVICES		TEC-3	11-03-94
31	WIRE FENCE TYPE C AND D		WF-4	8-22-02
32	DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS - 45° SKEW		W-X45	6-15-64
33	DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS - 45° SKEW		W-X452	6-04-64
34	DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS - 45° SKEW		R-345X-02	7-22-64
35	DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS - 15° SKEW		W-X15	6-13-63
36	DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS - 15° SKEW		W-X152	6-06-63
37	DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS - 15° SKEW		R-415X-0	9-04-63
38-42	CROSS SECTIONS			

NUMBER	TITLE
ERRATA	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273	FHWA-1273 REVISIONS
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 - WAGE RATE DETERMINATION
100-2	MANUAL FOR ASSESSING SAFETY HARDWARE (MASH)
103-1	DETERMINATION OF DBE PARTICIPATION
105-1	CONSTRUCTION CONTROL MARKINGS
105-2	EQUIPMENT AND MATERIAL STORAGE ON BRIDGE STRUCTURES
107-1	WORKER VISIBILITY
108-1	LIQUIDATED DAMAGES
110-1	PROTECTION OF WATER QUALITY AND WETLANDS
303-1	AGGREGATE BASE COURSE
404-1	PRODUCTION VERIFICATION OF ASPHALT CONCRETE HOT MIX
409-1	MINERAL AGGREGATES
410-3	DENSITY TESTING FOR ACHM LEVELING COURSES AND BOND BREAKERS
600-1	WATER FOR VEGETATION
603-1	MAINTENANCE OF TRAFFIC
604-1	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
718-2	REFLECTORIZED PAINT PAVEMENT MARKINGS
723-1	GENERAL REQUIREMENTS FOR SIGNS
804-1	INSTALLATION OF DOWEL BARS AND TIE BARS
JOB FA4902	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB FA4902	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB FA4902	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB FA4902	INTERNET BIDDING
JOB FA4902	NESTING SITE OF MIGRATORY BIRDS
JOB FA4902	RECYCLED ASPHALT SHINGLES
JOB FA4902	STORM WATER POLLUTION PREVENTION PLAN
JOB FA4902	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB FA4902	UTILITY ADJUSTMENTS
JOB FA4902	WARM MIX ASPHALT

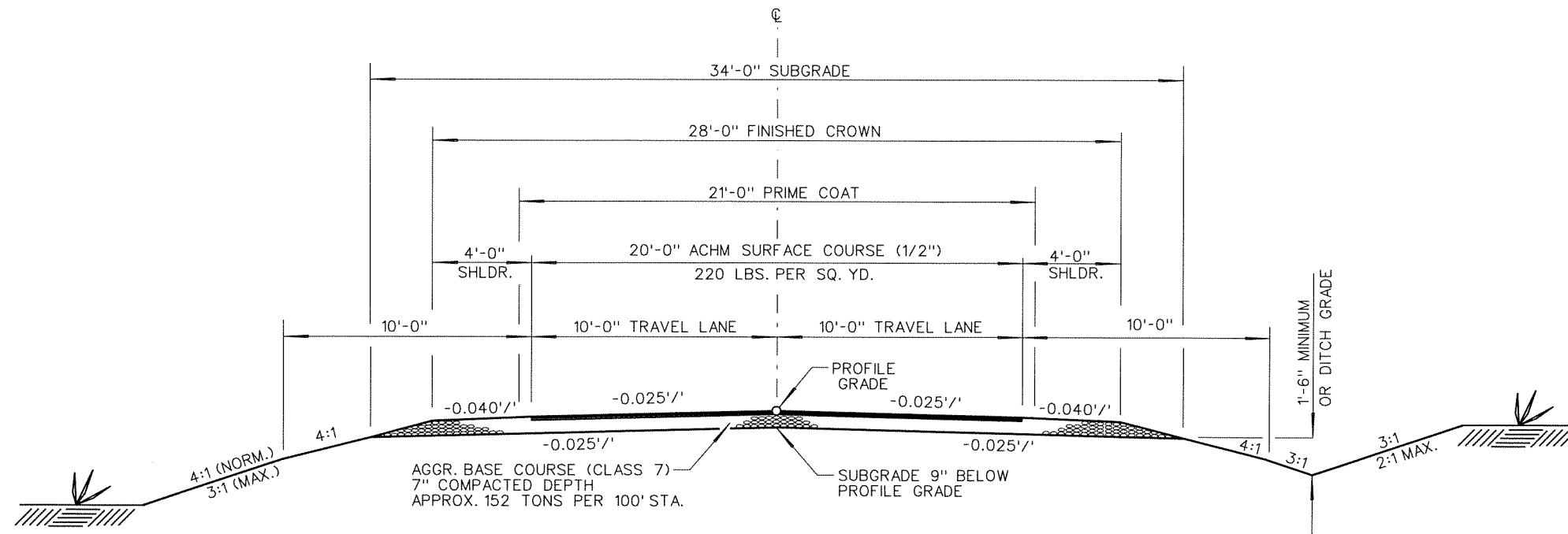
GENERAL NOTES

- GRADE LINE DENOTES FINISHED GRADE WHERE SHOWN ON PLANS.
- UTILITIES INTERFERING WITH CONSTRUCTION SHALL BE MOVED BY THE OWNERS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING U. S. MAILBOXES WITHIN THE PROJECT LIMITS IN SUCH A MANNER THAT THE PUBLIC MAY RECEIVE CONTINUED MAIL SERVICE. PAYMENT WILL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS BID ITEMS.
- 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.
- THIS PROJECT IS COVERED UNDER A NATIONWIDE 14 SECTION 404 PERMIT. REFER TO SUPPLEMENTAL SPECIFICATION 110-1 FOR PERMIT REQUIREMENTS.
- THE ROAD WILL REMAIN OPEN TO LOCAL TRAFFIC DURING CONSTRUCTION. STAGE CONCRUCTION SHALL BE UTILIZED TO PROVIDE FOR PASSAGE OF TRAFFIC THROUGH THE WORK AREA.
- SUPERELEVATION SHALL BE COMPUTED IN ACCORDANCE WITH STANDARD DRAWING SE-2 USING 30 MPH DESIGN VALUES AND REVOLVE ABOUT THE INNER PAVEMENT EDGE POINT UNLESS OTHERWISE SHOWN.
- ALL EXISTING STANDARD SIGNS SHALL BE REMOVED BY THE CONTRACTOR AND REMAIN THE PROPERTY OF MONTGOMERY COUNTY.



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. FA4902	3	42

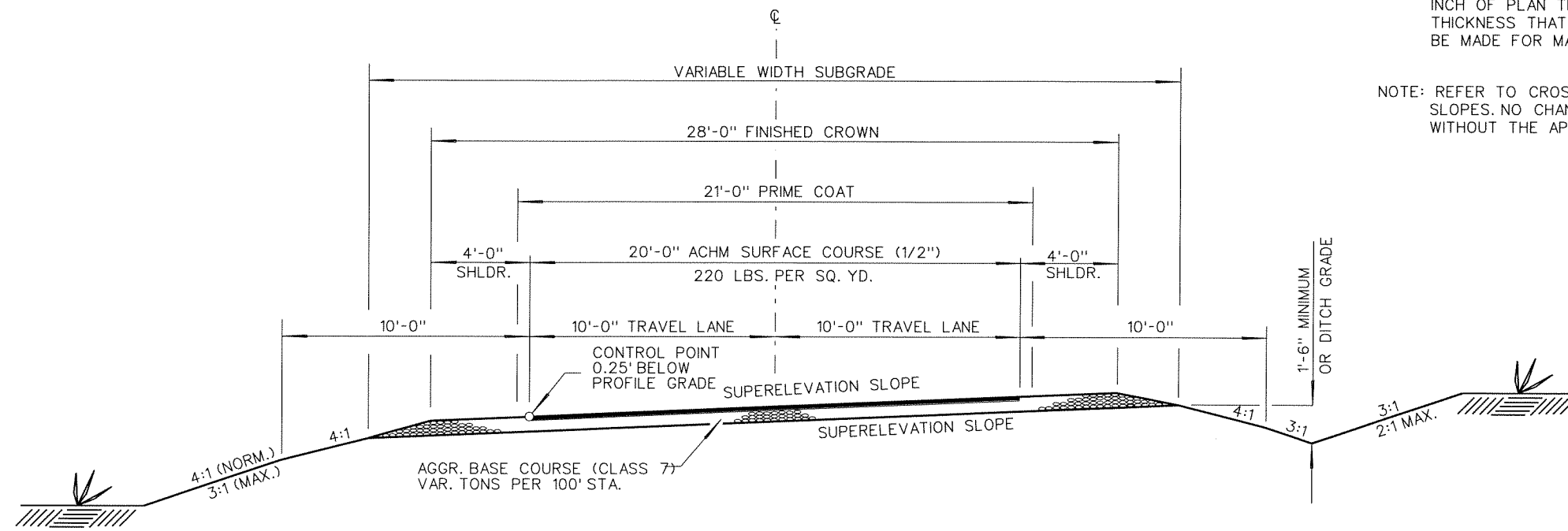
④ TYPICAL SECTION OF IMPROVEMENT



TANGENT SECTION

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

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



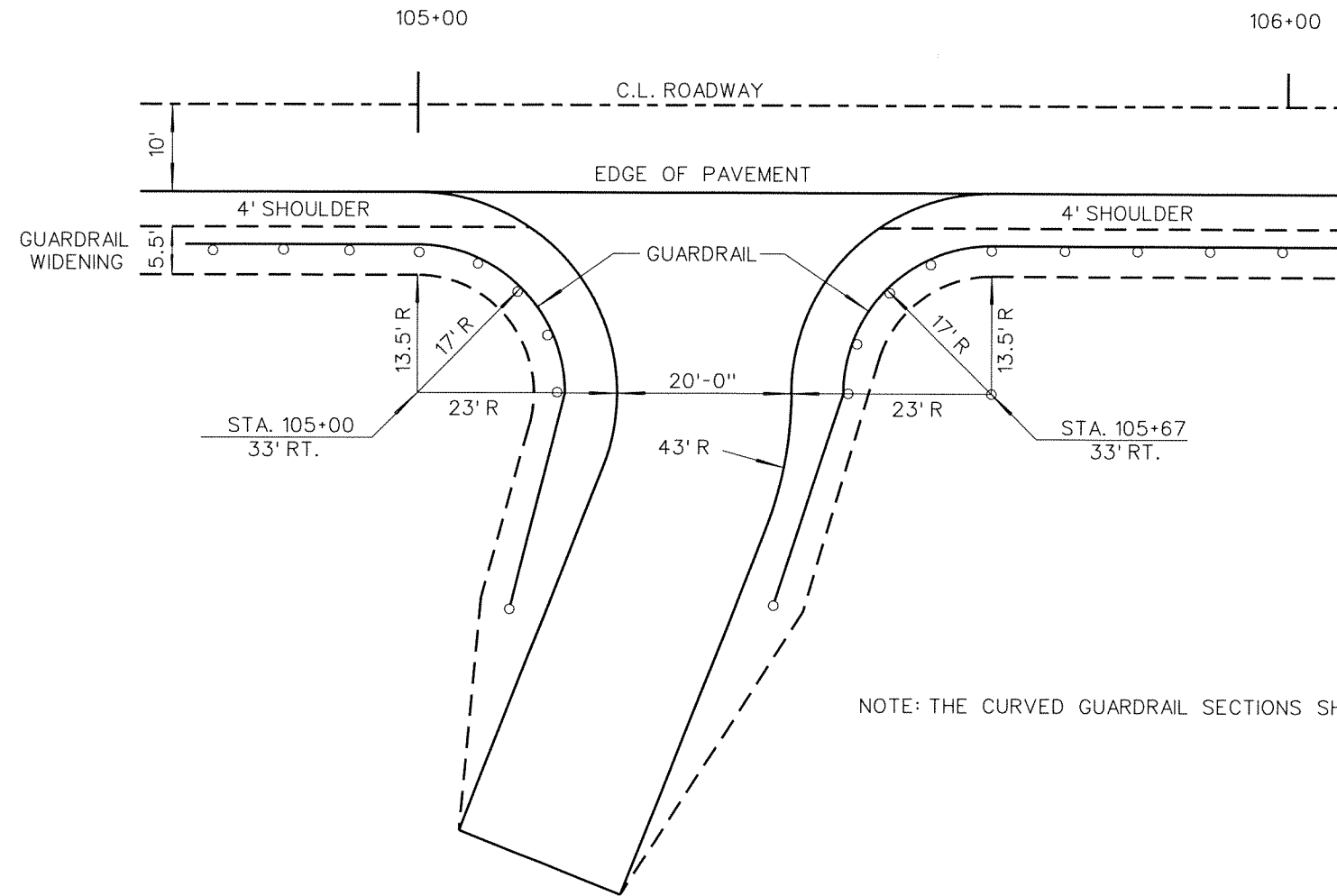
SUPERELEVATION SECTION

TYPICAL SECTION OF IMPROVEMENT



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. FA4902	4	42

④ SPECIAL DETAILS



NOTE: THE CURVED GUARDRAIL SECTIONS SHALL BE SHOP BENT.

STA. 105+30

### DETAIL OF PRIVATE ENTRANCE

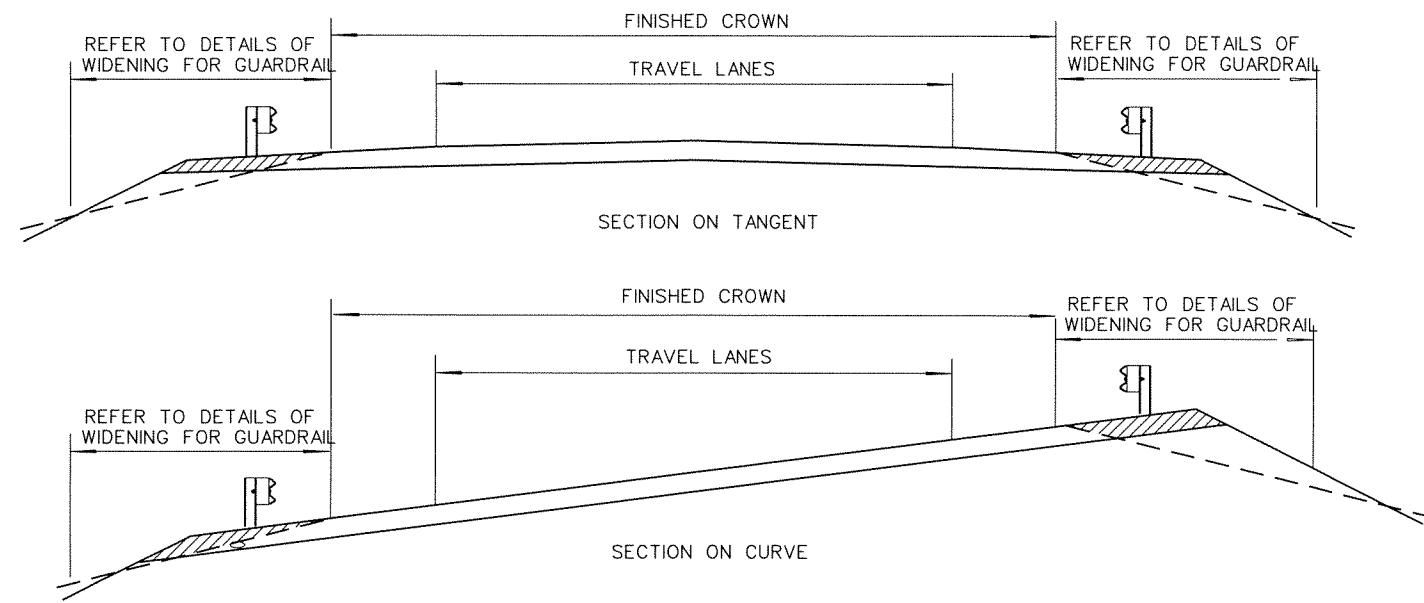
ADDITIONAL BASE COURSE = 70 TONS  
 ADDITIONAL SURFACING = 200 SQ. YDS.

NOTE: THE ABOVE DETAILS MAY BE MODIFIED TO MEET LOCAL CONDITIONS AS DIRECTED BY THE ENGINEER.

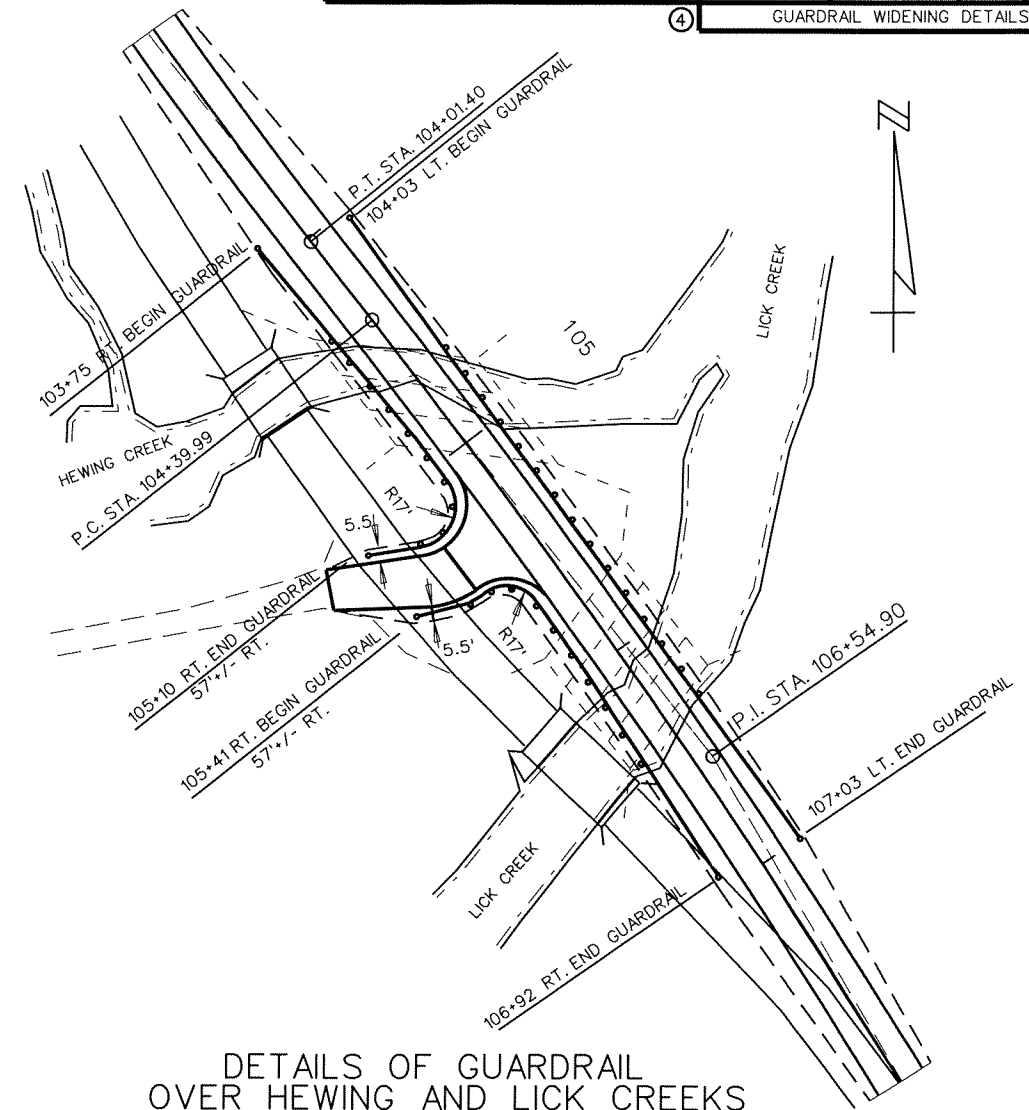
SPECIAL DETAILS



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AD PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	FA4902		5	42
				4 GUARDRAIL WIDENING DETAILS				

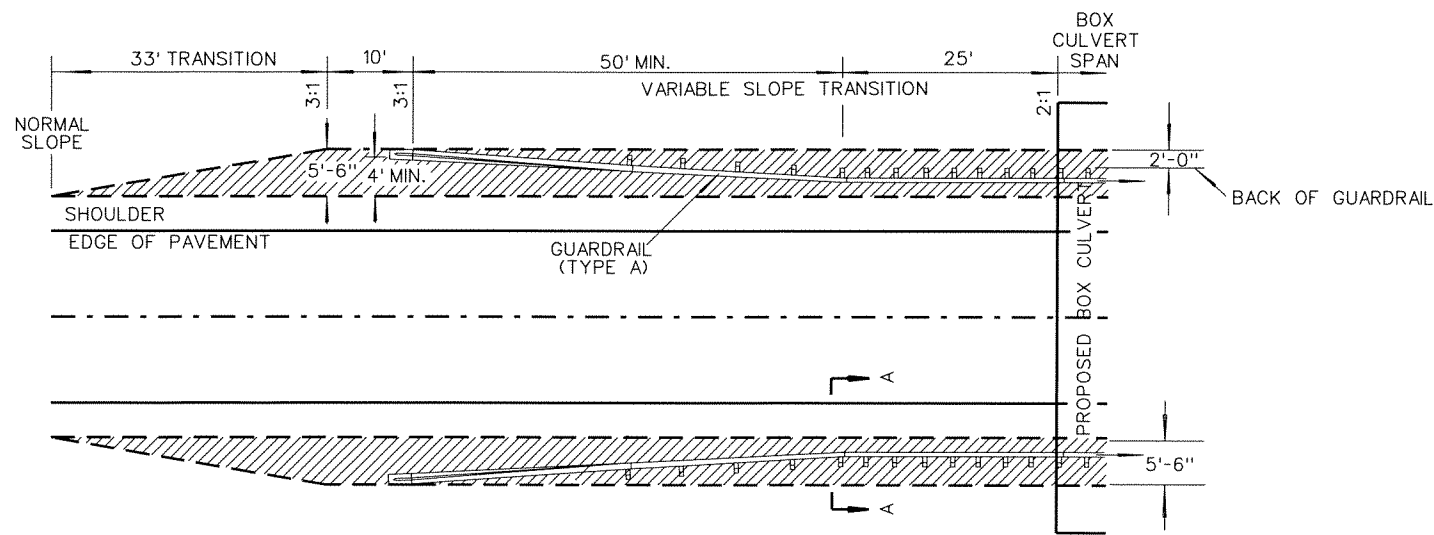


DETAILS SHOWING POSITION OF GUARDRAIL ON ROADWAY



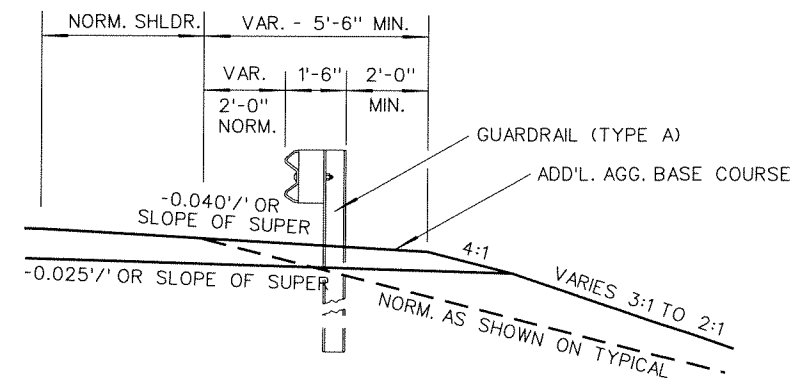
DETAILS OF GUARDRAIL OVER HEWING AND LICK CREEKS

THE CURVED GUARDRAIL SECTIONS SHALL BE SHOP BENT.



DETAILS OF WIDENING FOR GUARDRAIL (OVER BOX CULVERTS)

ADDITIONAL AGGREGATE BASE COURSE (TWO SIDES) = 124.1 SQ. YDS. PLUS ADDITIONAL FOR BOX WIDTH

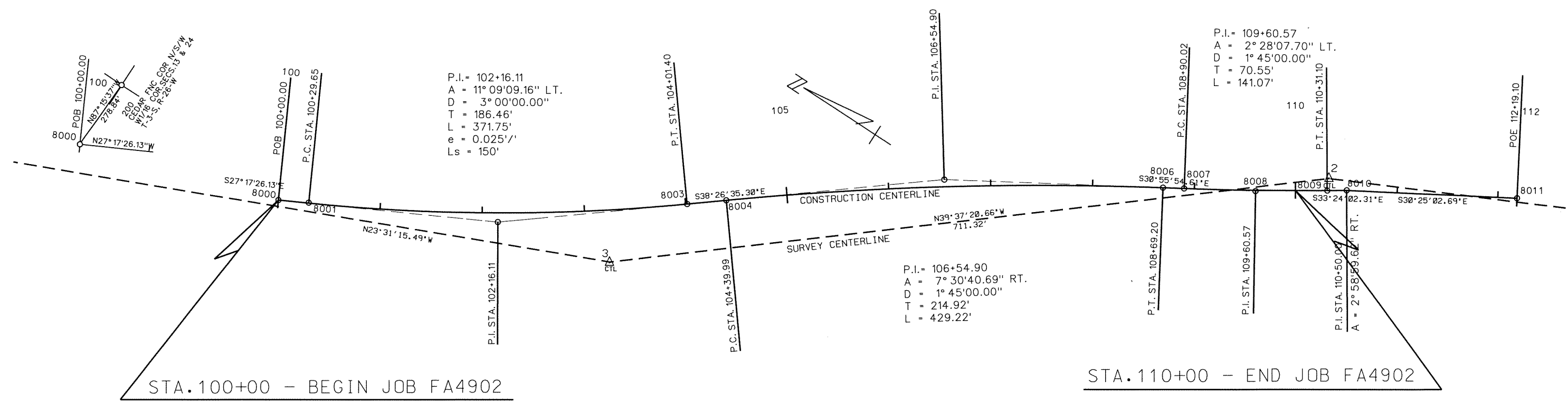


SECTION A-A

GUARDRAIL WIDENING 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.	FA4902		6	42
				4 SURVEY CONTROL DETAILS				



COORDINATES

ARKANSAS STATE PLANE - SOUTH ZONE BASED ON GPS CONTROL, PROJECTED TO GROUND.  
Units: U.S. SURVEY FOOT

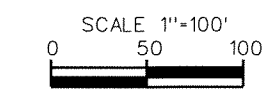
Point	Northing	Easting	Elev	Feature	Description
1	1974832.7457	789543.9524	779.710	CTL	5/8" REBAR W** CAP
2	1975333.7521	789300.3229	762.765	CTL	5/8" REBAR W** CAP
3	1975881.6556	788846.6967	740.654	CTL	5/8" REBAR W** CAP
4	1976542.1451	788559.2202	773.656	CTL	5/8" REBAR W** CAP
5	1974461.2668	789975.1726	791.463	CTL	5/8" REBAR W** CAP, RTK ELEV
100	1969318.1434	802761.5979	706.775	GPS	AHTD GPS 490010A, RTK ELEV
900	1969560.6799	798728.4728	750.162	BM	N END 30 IN RCP
901	1969800.5701	796471.1889	767.610	BM	N END 36 IN OVAL RCP
902	1972055.3028	794666.5001	763.468	BM	5/8 RBR/2IN ALUM CAP
903	1973108.4070	792171.8991	768.565	BM	5/8 RBR/2IN ALUM CAP
904	1974563.2189	789851.7477	789.527	BM	5/8 RBR/2IN ALUM CAP
905	1975588.2636	789031.7501	736.365	BM	5/8 RBR/2IN ALUM CAP
906	1976301.5438	788708.9145	762.983	BM	5/8 RBR/2IN ALUM CAP
990	1969102.8173	800934.6467	711.882	CTL	PN 1 FROM JOB #080378

POINT	STATION	NORTHING	EASTING
8000	100+00.00	1976187.0227	788720.5550
8001	100+29.65	1976160.6731	788734.1495
8003	104+01.40	1975848.9192	788935.5766
8004	104+39.99	1975818.6956	788959.5686
8006	108+69.20	1975466.0165	789203.6612
8007	108+90.02	1975448.1597	789214.3618
8009	110+31.10	1975328.7483	789289.4609
8010	110+50.00	1975312.9677	789299.8666
8011	112+19.10	1975167.1423	789385.4814

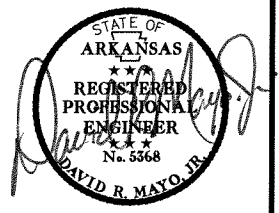
\*Note - Rebar and Cap - Standard - \* Rebar with 2" Aluminum Cap stamped  
\*(standard markings common to all caps), or as indicated  
(other markings indicated in the point description of the individual point).  
ALL DISTANCES ARE GROUND.  
USE CAF = 1.0 FOR STAKEOUT FOR THIS PROJECT.  
A PROJECT CAF OF 0.9999114458 HAS BEEN USED TO COMPUTE THE ABOVE GROUND COORDINATES.  
THIS CAF IS INTENDED FOR USE WITHIN THE PROJECT LIMITS.  
GRID DISTANCE = GROUND DISTANCE X CAF.  
GRID COORDINATES ARE STORED UNDER FILE NAME: sFA4902gi.CTL  
HORIZONTAL DATUM: NAD 83 (1997)  
VERTICAL DATUM: NAVD 88 POSITIONAL ACCURACY THIRD ORDER, UNLESS SPECIFIED OTHERWISE  
AT A SPECIFIC POINT.

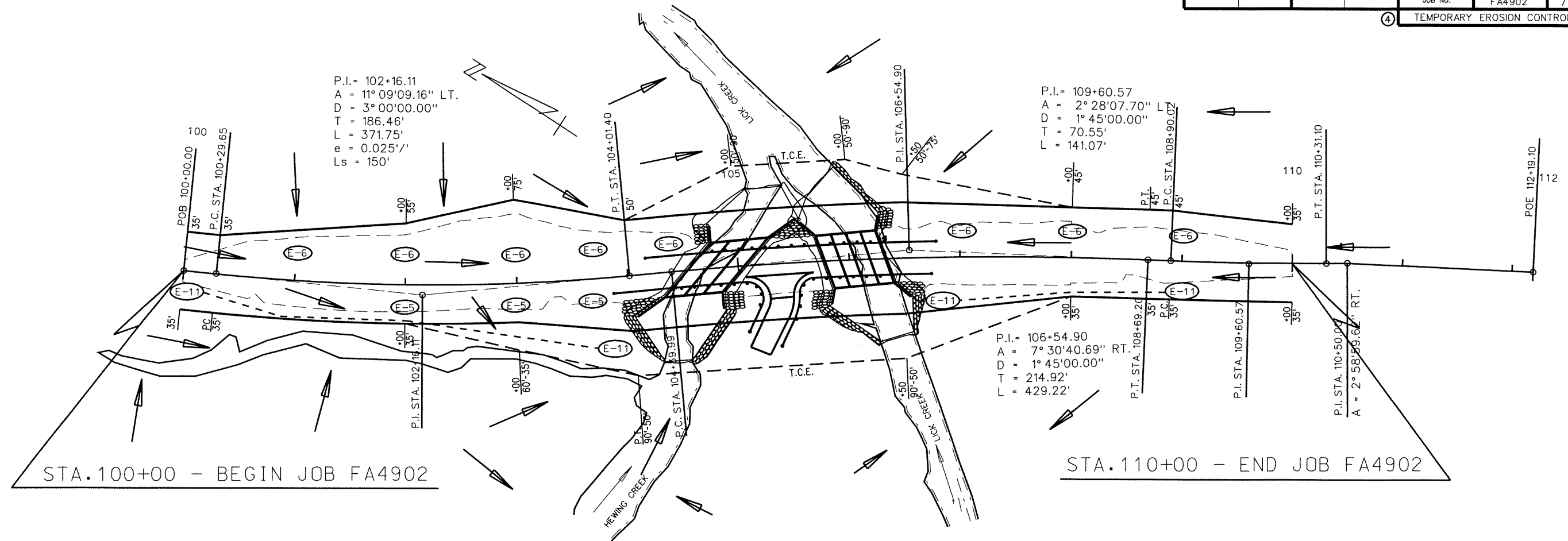
REFERENCE POINTS (1500 SERIES) ARE TO BE USED TO ESTABLISH CONTROL  
IF THE PRIMARY CONTROL POINTS LISTED ABOVE HAVE BEEN DESTROYED.  
REFERENCE POINTS ARE NOT TO BE USED FOR VERTICAL CONTROL

BASIS OF BEARING:  
ARKANSAS STATE PLANE GRID BEARINGS - 0302-SOUTH ZONE  
DETERMINED FROM GPS CONTROL POINTS: ARHP - 490010A  
CONVERGENCE ANGLE: 00 58 17 LEFT AT LT: 34-28-33.5 LG: 093-44-87.4  
GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.



SURVEY CONTROL DETAILS





TEMPORARY EROSION CONTROL REVISIONS

date of revision	revisions

TEMPORARY EROSION CONTROL

ROCK DITCH CHECK (E-6)		SEDIMENT REMOVAL AND DISPOSAL	
STA. 101+00- LT.	= 1 CU. YD.		1 CU. YD.
STA. 102+00- LT.	= 1 CU. YD.		1 CU. YD.
STA. 103+00- LT.	= 1 CU. YD.		1 CU. YD.
STA. 103+70- LT.	= 1 CU. YD.		1 CU. YD.
STA. 104+30- LT.	= 1 CU. YD.		1 CU. YD.
STA. 107+00- LT.	= 1 CU. YD.		1 CU. YD.
STA. 108+00- LT.	= 1 CU. YD.		1 CU. YD.
STA. 109+00- LT.	= 1 CU. YD.		1 CU. YD.
* ENTIRE PROJECT	= 4 CU. YDS.		4 CU. YDS.

SAND BAG DITCH CHECKS (E-5)		SEDIMENT REMOVAL AND DISPOSAL	
STA. 102+00- RT.	= 20 BAGS		1 CU. YD.
STA. 103+00- RT.	= 20 BAGS		1 CU. YD.
STA. 103+70- RT.	= 20 BAGS		1 CU. YD.
* ENTIRE PROJECT	= 40 BAGS		3 CU. YDS.

SILT FENCE (E-11)		SEDIMENT REMOVAL AND DISPOSAL	
STA. 100+00 TO STA. 104+00 - RT.	= 400 LIN. FT.		4 CU. YDS.
STA. 106+70 TO STA. 109+00 - RT.	= 230 LIN. FT.		2 CU. YDS.
* ENTIRE PROJECT	= 200 LIN. FT.		2 CU. YDS.

SEDIMENT BASIN (E-14)		SEDIMENT REMOVAL AND DISPOSAL	
* ENTIRE PROJECT	= 80 CU. YD.		80 CU. YD.

\* ESTIMATED QUANTITY. TEMPORARY EROSION CONTROL DEVICES TO BE CONSTRUCTED IF AND WHERE DIRECTED BY THE ENGINEER. SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

NOTE: EROSION CONTROL ITEMS ARE SUBJECT TO IMMEDIATE PLACEMENT AS DIRECTED BY THE ENGINEER. EXACT LOCATIONS TO BE DETERMINED IN THE FIELD BY THE ENGINEER.

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

TEMPORARY EROSION CONTROL DETAILS



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	DISTRICT	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEET
				6	ARK.			
						JOB NUMBER	FA4902	8
						4		
						QUANTITIES		

### BASE AND SURFACING

STATION	STATION	LOCATION / DESCRIPTION	LENGTH	AGG. BASE COURSE (CLASS 7)	PRIME COAT			ACHM SURFACE COURSE		
					TOTAL WIDTH	SQUARE YARDS	GALLONS	TOTAL WIDTH	SQUARE YARDS	TONS
			FEET	TONS	FEET			FEET		
100+00	110+00	MAIN LANES	1000	1520.0	21	2333.3	933.3	20	2222.2	244.4
1 - PRIVATE ENTRANCE (105+30)				70.0		200.0	80.0		200.0	22.0
GUARDRAIL WIDENING - 377 SQ. YDS.				129.8						
MAINTENANCE GRAVEL				200.0						
TOTALS:				1919.8			1013.3			266.4
USE:				1920			1013			266

**BASIS OF ESTIMATE:**

AGGREGATE BASE COURSE .....152 TONS / STA.  
 PRIME COAT .....0.40 GAL. / SQ. YD.  
 ACHM SURFACE COURSE (1/2").....220 LBS. / SQ. YD.

NMAX = 115

**PROPORTION BY WEIGHT:**

SURFACE:  
 MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2").....94.4% MINERAL AGGREGATE  
 ASPHALT BINDER IN ACHM SURFACE COURSE (1/2").....5.6% ASPHALT BINDER

\* NOTE: QUANTITIES ARE ESTIMATED. TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER. SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

### CLEARING AND GRUBBING

STATION	STATION	SIDE	CLEARING	GRUBBING
			STATION	
100+00	110+00	LT. & RT.	10	10
TOTALS:			10	10

NOTE: CLEARING IS NOT REQUIRED ON THE WEST SIDE OF THE EXISTING ROAD.

### GUARDRAIL

STATION	STATION	SIDE	GUARDRAIL (TYPE A)	TERMINAL ANCHOR POSTS (TYPE 1)
			LIN. FT.	EACH
104+03	107+03	LT.	300	2
103+75	105+10	RT.	175	2
105+41	106+92	RT.	175	2
TOTALS:			650	6

### EARTHWORK

STATION	STATION	LOCATION	UNCLASSIFIED EXCAVATION				**COMPACTED EMBANKMENT		
			NORMAL	OBLIT. OF EX. RDWY.	CHANNEL EXCAV.	TOTAL	NORMAL	PRIVATE ENTRANCE	TOTAL
			CUBIC YARDS				CUBIC YARDS		
100+00	110+00	MAIN LANES	5396	156		5552	4098	32	4130
104+24		HEWING CREEK			348	348			
106+05		LICK CREEK			1150	1150			
TOTALS:						7050			4130

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

NOTE: UNCLASSIFIED EXCAVATION FROM THE R.C. BOX AND CHANNEL CHANGE, IF DEEMED SUITABLE BY THE ENGINEER, MAY BE USED IN THE ROADWAY EMBANKMENT. MATERIAL DEEMED UNSUITABLE IS TO BE DISPOSED OF AS DIRECTED BY THE ENGINEER.

### REMOVAL AND DISPOSAL OF STRUCTURES

STATION	STATION	DESCRIPTION	EXISTING BRIDGE
			LUMP SUM
104+24	104+52	EXISTING BRIDGE (SITE NO. 1)	1.00
106+05	106+47	EXISTING BRIDGE (SITE NO. 2)	1.00
TOTAL:			2.00

### REMOVAL AND DISPOSAL OF FENCE

STATION	STATION	DESCRIPTION	FENCE
			LIN. FT.
106+33	107+12	FENCE ON LT.	104
TOTAL:			104

### STRUCTURES

STATION	DESCRIPTION	SPAN	HEIGHT	LENGTH	CLASS S	REINF. STEEL	UNCL. EXC.	STD. DWG. NOS.
					CONCRETE RDWY.	(GR. 60) RDWY.	FOR STR. RDWY.	
		LINEAR FEET			CU. YDS.	POUNDS	CU. YDS.	
104+24	CONSTRUCT TRIP R.C. BOX CULVERT (45° LT. FWD. SKEW)	11	10	64	275.49	43862	117	W-X45, W-X452-2, R-345X-02, RCB-1, RCB-2, PBC-1
106+05	CONSTRUCT QUAD. R.C. BOX CULVERT (15° RT. FWD. SKEW)	12	10	48	292.86	46531	129	W-X15, W-X152-2, R-415X-0, RCB-1, RCB-2, PBC-1
TOTALS:					568.35	90393	246	

### STANDARD HIGHWAY SIGNS AND SUPPORT ASSEMBLIES

STATION	SIDE	STANDARD SIGN NUMBER			SUPPORT ASSEMBLIES		STD. DWG. NO.
		OM-3L	OM-3R	W1-4L	TYPE A	TYPE C	
		SQ. FT.			EACH		
98+54	RT.			6.25	1		SHS - 1 & 2
103+39	RT.	3.00			1		SHS - 1 & 2
103+68	LT.		3.00		1		SHS - 1 & 2
106+29	LT.	3.00			1		SHS - 1 & 2
106+39	RT.		3.00		1		SHS - 1 & 2
110+44	LT.			6.25	1		SHS - 1 & 2
TOTALS:		6.00	6.00	12.50	2	4	

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

### FENCING

STATION	STATION	SIDE	WIRE FENCE (TYPE D-1)
			LIN. FT.
106+33	107+12	LT.	90
TOTAL:			90

### DUMPED RIPRAP

STATION	STATION	SIDE	DUMPED RIPRAP	FILTER BLANKET
			CU. YDS.	SQ. YDS.
ENTIRE PROJECT			250	500
TOTALS:			250	500

NOTE: QUANTITIES ARE ESTIMATED AND SHALL BE PLACED IF AND WHERE DIRECTED BY THE ENGINEER. SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.





DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	DISTRICT	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEET
				6	ARK.			
						JOB NUMBER	FA4902	9 42

4

**TEMPORARY EROSION CONTROL**

STATION	STATION	LOCATION	TEMPORARY SEEDING	MULCH COVER	WATER	ROCK DITCH CHECKS	SAND BAG DITCH CHECKS	SILT FENCE	SEDIMENT BASIN	OBLIT. OF SEDIMENT BASIN	SEDIMENT REM. & DISPOSAL
			ACRES	ACRES	M. GALS.	CU. YDS	BAG	LIN. FT.	CU. YDS	CU. YDS	CU. YDS.
100+00	110+00	MAIN LANES	1.29	1.29	26.3	8	60	630	80	80	97
* ENTIRE PROJECT						4	40	200			9
TOTALS:			1.29	1.29	26.3	12	100	830	80	80	106

BASIS OF ESTIMATE:  
 WATER.....20.4 M.G. / ACRE OF SEEDING, TEMPORARY SEEDING.  
 SAND BAG DITCH CHECKS.....20 BAGS / LOCATION  
 ROCK DITCH CHECKS.....1 CU.YD. / LOCATION

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

\* QUANTITIES ARE ESTIMATED AND SHALL BE PLACED IF AND WHERE BY THE ENGINEER. SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

**4" PIPE UNDERDRAINS**

LOCATIONS	4" PIPE UNDERDRAINS LIN. FT.
ENTIRE PROJECT	200
TOTAL:	200

NOTE: QUANTITIES ARE ESTIMATED AND SHALL BE PLACED IF AND WHERE BY THE ENGINEER. SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

**QUANTITIES**

**TRAFFIC CONTROL DEVICES**

STATION	DESCRIPTION	W20-1						G20-1		G20-2		R11-2*		BARRICADES (TYPE III) *	TRAFFIC DRUMS*	STD. DWG. NO.
		1500		1000		500		NO.	SQ. FT.	NO.	SQ. FT.	NO.	SQ. FT.			
		NO	SQ. FT.	NO.	SQ. FT.	NO.	SQ. FT.									
85+00	CO. RD. 17	1	16													TC-1,2&3
90+00	CO. RD. 17			1	16											TC-1,2&3
95+00	CO. RD. 17					1	16									TC-1,2&3
100+00								1	10	1	8					TC-1,2&3
110+00								1	10	1	8					TC-1,2&3
105+00	CO. RD. 17					1	16									TC-1,2&3
110+00	CO. RD. 17			1	16											TC-1,2&3
150+00	CO. RD. 17	1	16													TC-1,2&3
* ENTIRE PROJECT								2	20	2	16	2	20	32	24	TC-1,2&3
TOTALS:		2	32	2	32	2	32	2	20	2	16	2	20	32	24	

NOTE: LOCATIONS OF THE TRAFFIC CONTROL DEVICES TO BE AS DIRECTED BY THE ENGINEER.

\* QUANTITIES ARE ESTIMATED AND SHALL BE PLACED IF AND WHERE BY THE ENGINEER. SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

**EROSION CONTROL**

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL			
			SEEDING	LIME	MULCH COVER	WATER
			ACRES	TONS	ACRES	M.GALS.
100+00	110+00	MAIN LANES	1.29	3	1.29	131.1
TOTALS:			1.29	3	1.29	131.1

BASIS OF ESTIMATE:  
 LIME.....2 TONS / ACRE OF SEEDING  
 WATER.....102.0 M.G. / ACRE OF SEEDING, PERMANENT SEEDING

QUANTITIES ARE ESTIMATED AND SHALL BE PLACED IF AND WHERE BY THE ENGINEER. SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

**MAILBOXES**

STATION	SIDE	MAILBOXES	MAILBOX SUPPORTS (SINGLE)
		EACH	EACH
		105+50	RT.
TOTALS:		1	1

**PAVEMENT MARKING**

STATION	STATION	YELLOW MARKING	WHITE MARKING
		4" CONT.	4" CONT.
		LIN. FT.	
100+00	110+00	2000	2000
TOTALS:		2000	2000

NOTE: THIS IS A LOW VOLUME ROAD AS DEFINED IN SECTION 604.03 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, EDITION OF 2003.



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	DISTRICT	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEET
				6	ARK.		10	42
				JOB NUMBER	FA4902			

4

SUMM. OF QUANTS. & REV.

**SUMMARY OF QUANTITIES**

ITEM NUMBER	ITEM	QUANTITY TOTALS	UNIT
201	CLEARING	10	STATION
201	GRUBBING	10	STATION
202	REMOVAL AND DISPOSAL OF FENCE	104	LIN. FT.
210	UNCLASSIFIED EXCAVATION	7050	CU. YD.
210	COMPACTED EMBANKMENT	4130	CU. YD.
SS&303	AGGREGATE BASE COURSE (CLASS 7)	1920	TON
401	PRIME COAT	1013	GALLON
SPSS&407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")	251	TON
SPSS&407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2")	15	TON
601	MOBILIZATION	1.00	LUMP SUM
SP&602	FURNISHING FIELD OFFICE	1	EACH
SS&603	MAINTENANCE OF TRAFFIC	1.00	LUMP SUM
SS&604	SIGNS	152	SQ. FT.
SS&604	TRAFFIC DRUMS	24	EACH
SS&604	BARRICADES	32	LIN. FT.
611	4" PIPE UNDERDRAINS	200	LIN. FT.
SS&617	GUARDRAIL (TYPE A)	650	LIN. FT.
SS&617	TERMINAL ANCHOR POSTS (TYPE 1)	6	EACH
619	WIRE FENCE (TYPE D-1)	90	LIN. FT.
620	LIME	3	TON
620	SEEDING	1.29	ACRE
620	MULCH COVER	2.58	ACRE
SS&620	WATER	157.4	M. GAL.
621	TEMPORARY SEEDING	1.29	ACRE
621	SILT FENCE	830	LIN. FT.
621	SEDIMENT REMOVAL AND DISPOSAL	106	CU. YD.
621	SAND BAG DITCH CHECKS	100	BAG
621	ROCK DITCH CHECKS	12	CU. YD.
621	SEDIMENT BASIN	80	CU. YD.
621	OBLITERATION OF SEDIMENT BASIN	80	CU. YD.
635	ROADWAY CONSTRUCTION CONTROL	1.00	LUMP SUM
637	MAILBOXES	1	EACH
637	MAILBOX SUPPORT (SINGLE)	1	EACH
SS&718	REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (4")	2000	LIN. FT.
SS&718	REFLECTORIZED PAINT PAVEMENT MARKING WHITE (4")	2000	LIN. FT.
SS&726	STANDARD SIGN	24.50	SQ. FT.
729	CHANNEL POST SIGN SUPPORT (TYPE A)	2	EACH
729	CHANNEL POST SIGN SUPPORT (TYPE C)	4	EACH
816	FILTER BLANKET	500	SQ. YD.
816	DUMPED RIPRAP	250	CU. YD.
<b>STRUCTURES OVER 20'-0" SPAN</b>			
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO.1)	1.00	LUMP SUM
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO.2)	1.00	LUMP SUM
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES - ROADWAY	246	CU. YD.
802	CLASS S CONCRETE - ROADWAY	568.35	CU. YD.
SS&804	REINFORCING STEEL - ROADWAY (GRADE 60)	90393	POUND

**REVISIONS**

DATE		SHEET NUMBER



**LEGEND**

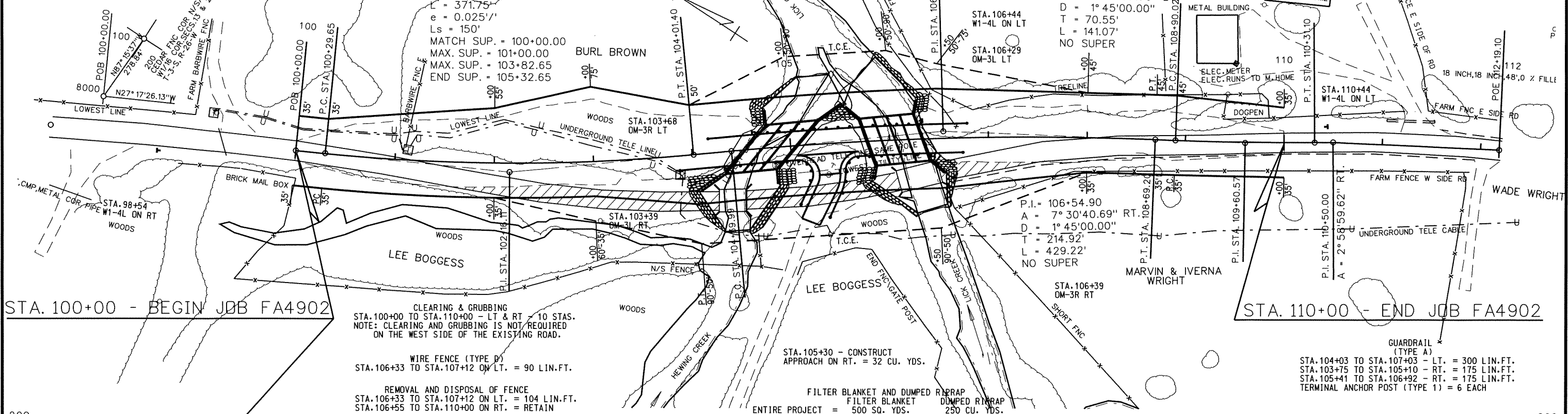
- POWER POLE
- ◇ COMBINATION POLE
- POLE W/GUY
- ◇ TELEPHONE RISER
- ◇ TELEPHONE POLE
- ▲ UNDERGROUND CABLE MKR

OBLITERATION OF EXISTING ROADWAY  
 STA. 101+61 TO STA. 107+55 - RT. = 156 CU. YDS.

STA. 104+24 - STA. 104+52 - IN PLACE  
 22' x 28' BRIDGE ON RT.  
 REMOVE AS EXISTING BRIDGE STRUCTURE  
 (SITE 1) = 1.00 LUMP SUM

STA. 106+05 - STA. 106+47 - IN PLACE  
 23' x 42' BRIDGE ON RT.  
 REMOVE AS EXISTING BRIDGE STRUCTURE  
 (SITE 2) = 1.00 LUMP SUM

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.	FA4902		11	42
PLAN AND PROFILE								



STA. 100+00 - BEGIN JOB FA4902

STA. 110+00 - END JOB FA4902

CLEARING & GRUBBING  
 STA. 100+00 TO STA. 110+00 - LT & RT = 10 STAS.  
 NOTE: CLEARING AND GRUBBING IS NOT REQUIRED ON THE WEST SIDE OF THE EXISTING ROAD.

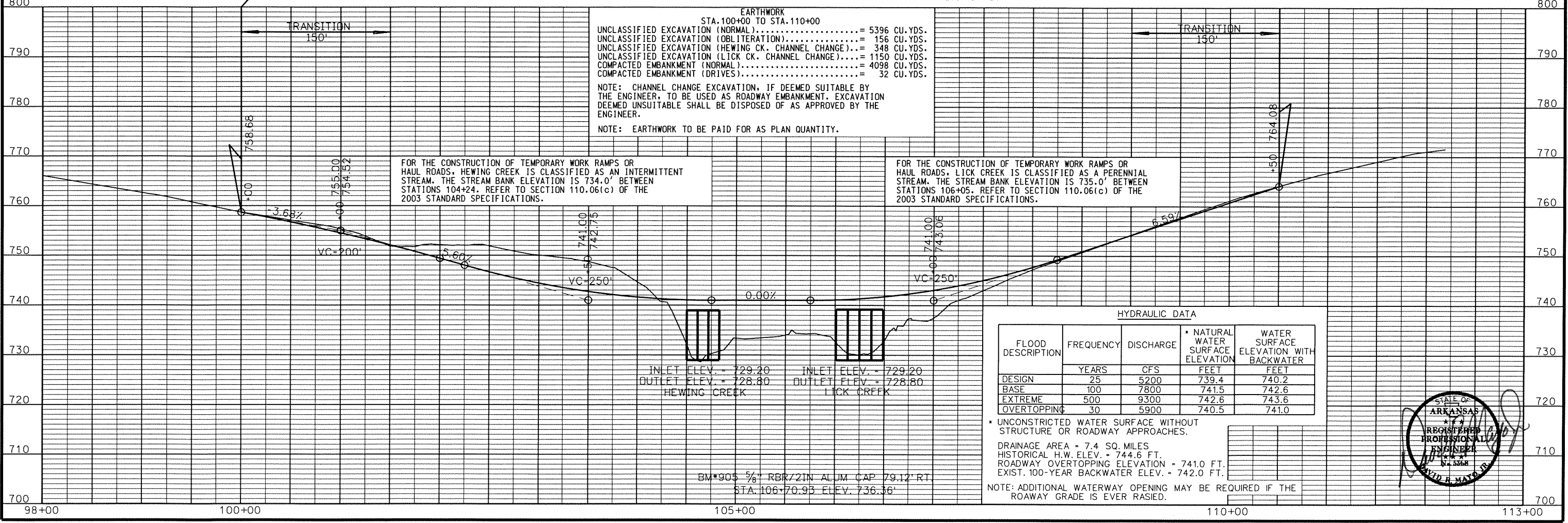
WIRE FENCE (TYPE D)  
 STA. 106+33 TO STA. 107+12 ON LT. = 90 LIN. FT.

REMOVAL AND DISPOSAL OF FENCE  
 STA. 106+33 TO STA. 107+12 ON LT. = 104 LIN. FT.  
 STA. 106+55 TO STA. 110+00 ON RT. = RETAIN

STA. 105+30 - CONSTRUCT APPROACH ON RT. = 32 CU. YDS.

FILTER BLANKET AND DUMPED RIPRAP  
 ENTIRE PROJECT = 500 SQ. YDS.

GUARDRAIL (TYPE A)  
 STA. 104+03 TO STA. 107+03 - LT. = 300 LIN. FT.  
 STA. 103+75 TO STA. 105+10 - RT. = 175 LIN. FT.  
 STA. 105+41 TO STA. 106+92 - RT. = 175 LIN. FT.  
 TERMINAL ANCHOR POST (TYPE 1) = 6 EACH



**EARTHWORK**  
 STA. 100+00 TO STA. 110+00

UNCLASSIFIED EXCAVATION (NORMAL)	= 5396 CU. YDS.
UNCLASSIFIED EXCAVATION (OBLITERATION)	= 156 CU. YDS.
UNCLASSIFIED EXCAVATION (HEWING CK. CHANNEL CHANGE)	= 348 CU. YDS.
UNCLASSIFIED EXCAVATION (LICK CK. CHANNEL CHANGE)	= 1150 CU. YDS.
COMPACTED EMBANKMENT (NORMAL)	= 4098 CU. YDS.
COMPACTED EMBANKMENT (DRIVES)	= 32 CU. YDS.

NOTE: CHANNEL CHANGE EXCAVATION, IF DEEMED SUITABLE BY THE ENGINEER, TO BE USED AS ROADWAY EMBANKMENT. EXCAVATION DEEMED UNSUITABLE SHALL BE DISPOSED OF AS APPROVED BY THE ENGINEER.

NOTE: EARTHWORK TO BE PAID FOR AS PLAN QUANTITY.

FOR THE CONSTRUCTION OF TEMPORARY WORK RAMPS OR HAUL ROADS, HEWING CREEK IS CLASSIFIED AS AN INTERMITTENT STREAM. THE STREAM BANK ELEVATION IS 734.0' BETWEEN STATIONS 104+24. REFER TO SECTION 110.06(c) OF THE 2003 STANDARD SPECIFICATIONS.

FOR THE CONSTRUCTION OF TEMPORARY WORK RAMPS OR HAUL ROADS, LICK CREEK IS CLASSIFIED AS A PERENNIAL STREAM. THE STREAM BANK ELEVATION IS 735.0' BETWEEN STATIONS 106+05. REFER TO SECTION 110.06(c) OF THE 2003 STANDARD SPECIFICATIONS.

INLET ELEV. = 729.20  
 OUTLET ELEV. = 728.80  
 HEWING CREEK

INLET ELEV. = 729.20  
 OUTLET ELEV. = 728.80  
 LICK CREEK

BM\*905 5/8" RBR/2IN ALUM CAP 79.12' RT  
 STA. 106+70.93 ELEV. 736.36'

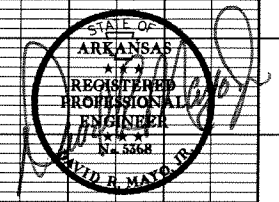
**HYDRAULIC DATA**

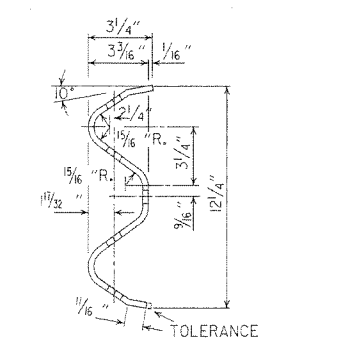
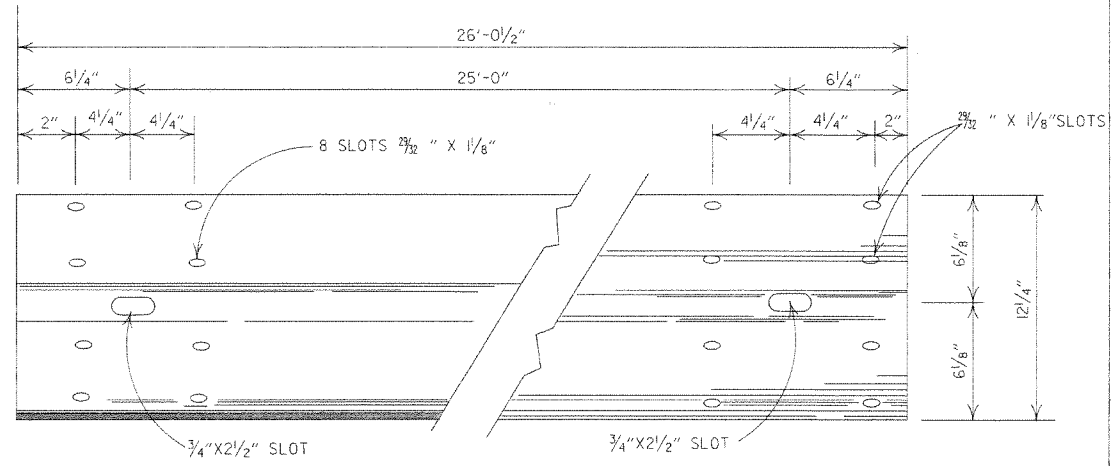
FLOOD DESCRIPTION	FREQUENCY YEARS	DISCHARGE CFS	NATURAL WATER SURFACE ELEVATION FEET	WATER SURFACE ELEVATION WITH BACKWATER FEET
DESIGN	25	5200	739.4	740.2
BASE	100	7800	741.5	742.6
EXTREME	500	9300	742.6	743.6
OVERTOPPING	30	5900	740.5	741.0

\* UNCONSTRICTED WATER SURFACE WITHOUT STRUCTURE OR ROADWAY APPROACHES.

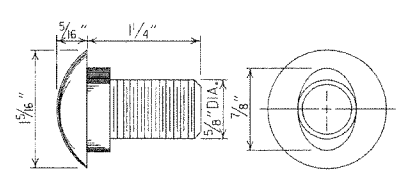
DRAINAGE AREA = 7.4 SQ. MILES  
 HISTORICAL H.W. ELEV. = 744.6 FT.  
 ROADWAY OVERTOPPING ELEVATION = 741.0 FT.  
 EXIST. 100-YEAR BACKWATER ELEV. = 742.0 FT.

NOTE: ADDITIONAL WATERWAY OPENING MAY BE REQUIRED IF THE ROADWAY GRADE IS EVER RAISED.

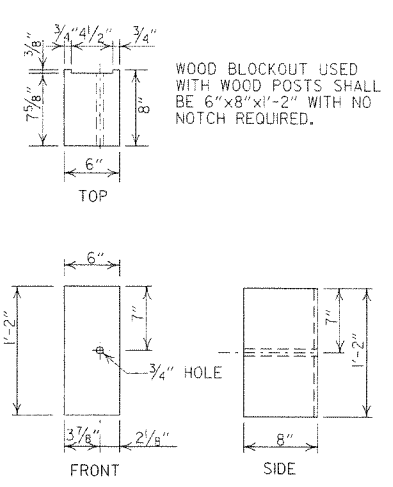
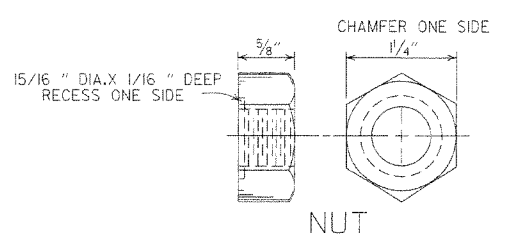
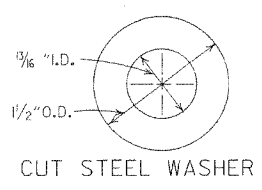




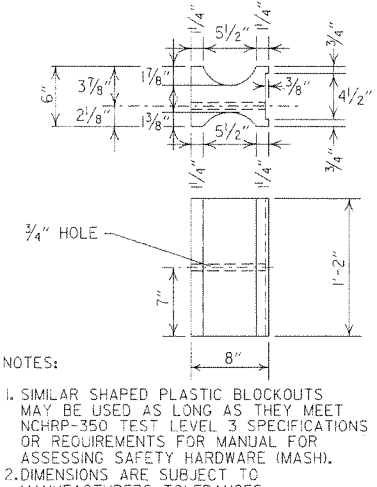
**DETAILS OF W-BEAM GUARD RAIL**  
RAIL SECTION OF CLOSELY SIMILAR DIMENSIONS AND COMPARABLE STRENGTH MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.



**SPLICE BOLT**  
POST BOLT - SAME EXCEPT LENGTH

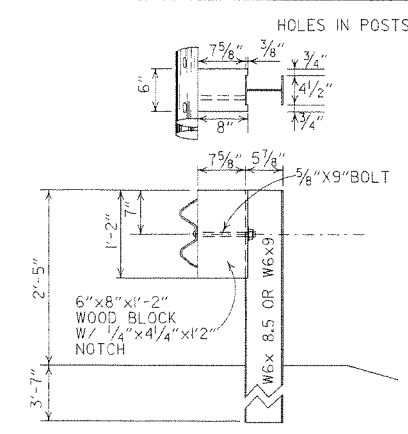


**WOOD BLOCKOUT (W-BEAM)**

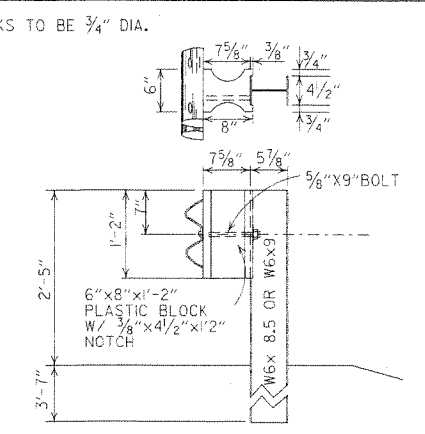


**PLASTIC BLOCKOUT (W-BEAM)**

NOTES:  
1. SIMILAR SHAPED PLASTIC BLOCKOUTS MAY BE USED AS LONG AS THEY MEET NCHRP-350 TEST LEVEL 3 SPECIFICATIONS OR REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).  
2. DIMENSIONS ARE SUBJECT TO MANUFACTURERS TOLERANCES.

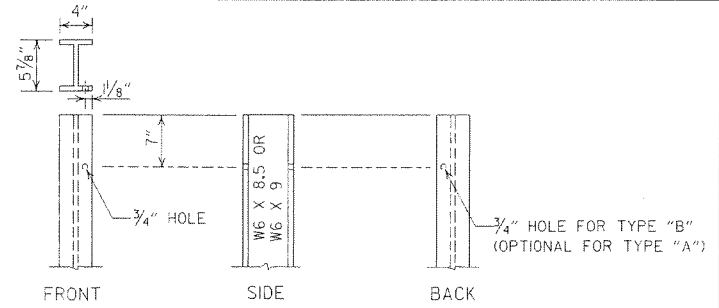


**WOOD BLOCKOUT CONNECTIONS**

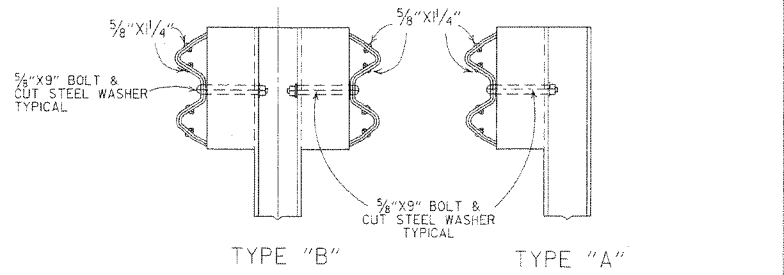


**PLASTIC BLOCKOUT CONNECTIONS**

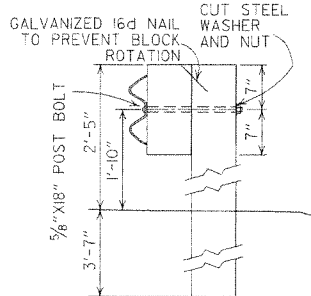
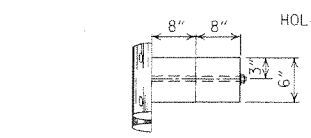
**DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)**



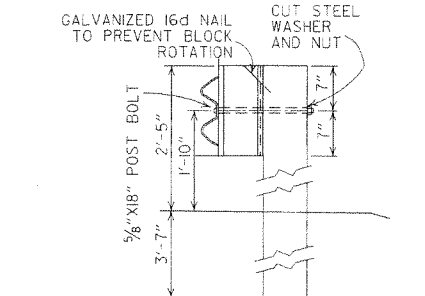
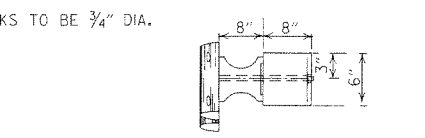
**STEEL POST**



**DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)**



**WOOD BLOCKOUT CONNECTIONS**



**PLASTIC BLOCKOUT CONNECTIONS (W-BEAM)**

**-GENERAL NOTES-**

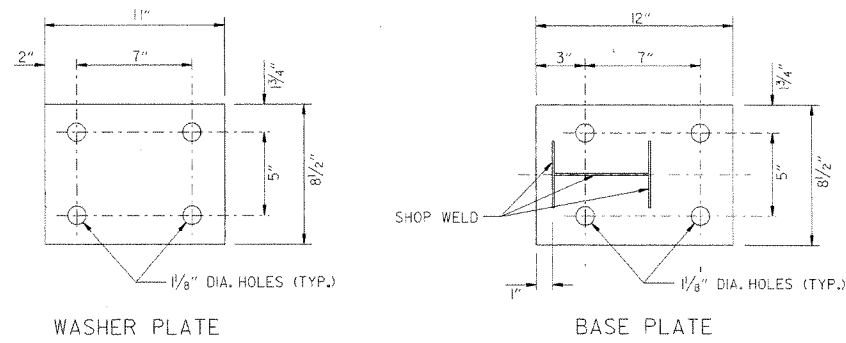
ALL BOLTS SHALL BE SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN 3/4" BEYOND IT.  
WHERE W-BEAM GUARD RAIL CONTINUES, THE INTERMEDIATE SECTIONS SHALL HAVE A POST SPACING OF 6'-3" UNLESS OTHERWISE NOTED.  
W-BEAM GUARD RAIL REPRESENTING INTERMEDIATE SECTIONS WILL BE 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. 1350 F 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.

7-14-90	RAISED HEIGHT OF GUARD RAIL 1"	
10-5-09	ADDED REFERENCE TO MASH	
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 AL. 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 & DEPTH 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
0-9-87	REDRAWN & REVISED	802-10-9-87
DATE	REVISION	DATE FILM

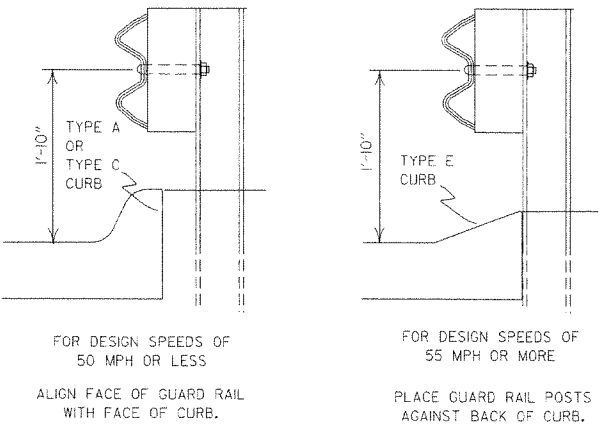
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-8

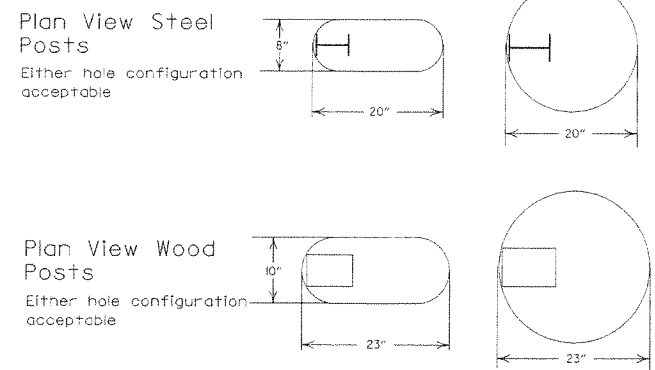
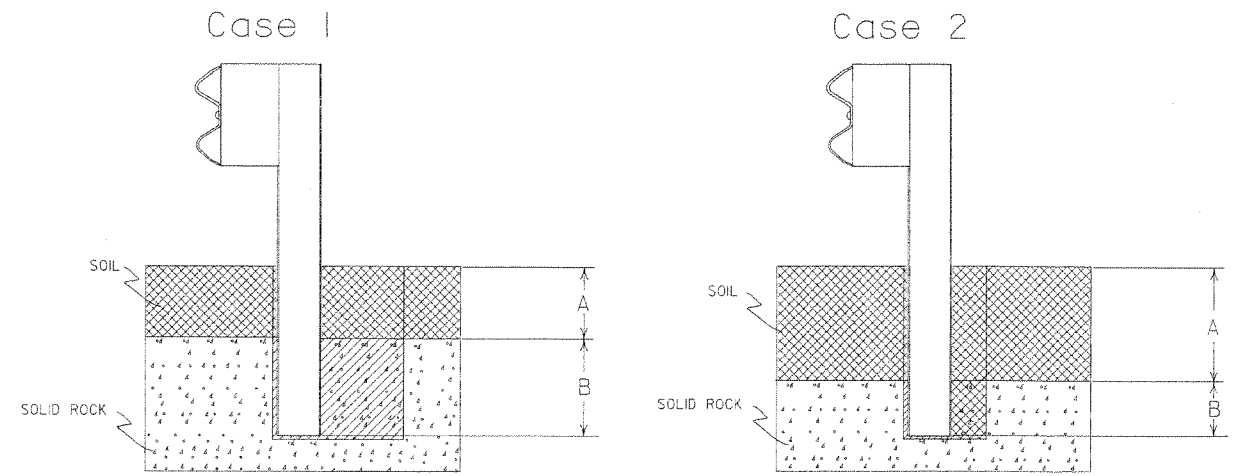


Note: Bolts, nuts, washers and plates shall be galvanized in accordance with Section 807 of the Standard Specifications.



**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.



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

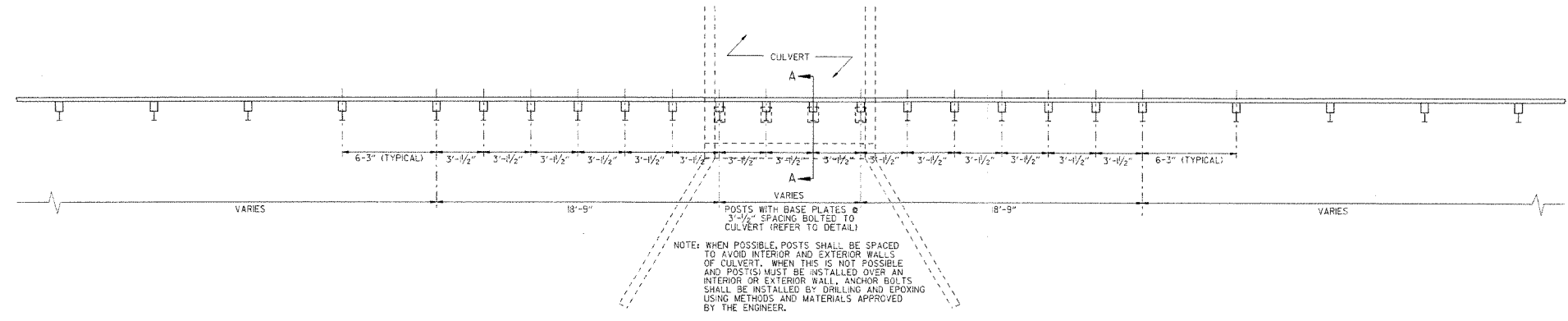
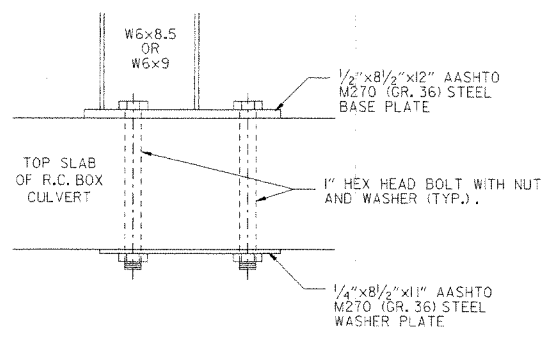
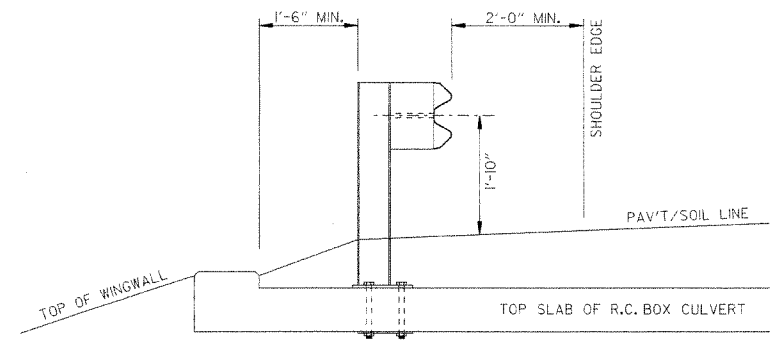
Zone A:  
 Backfill according to Section 617.03(a).

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)**



NOTE: WHEN POSSIBLE, POSTS SHALL BE SPACED TO AVOID INTERIOR AND EXTERIOR WALLS OF CULVERT. WHEN THIS IS NOT POSSIBLE AND POSTS MUST BE INSTALLED OVER AN INTERIOR OR EXTERIOR WALL, ANCHOR BOLTS SHALL BE INSTALLED BY DRILLING AND EPOXYING USING METHODS AND MATERIALS APPROVED BY THE ENGINEER.

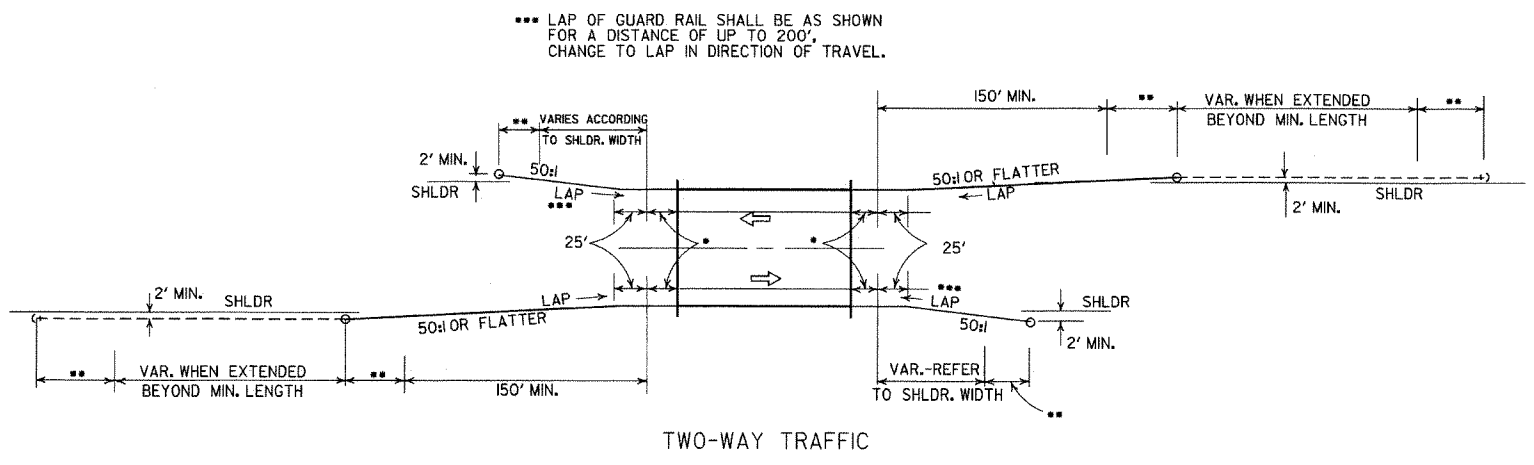
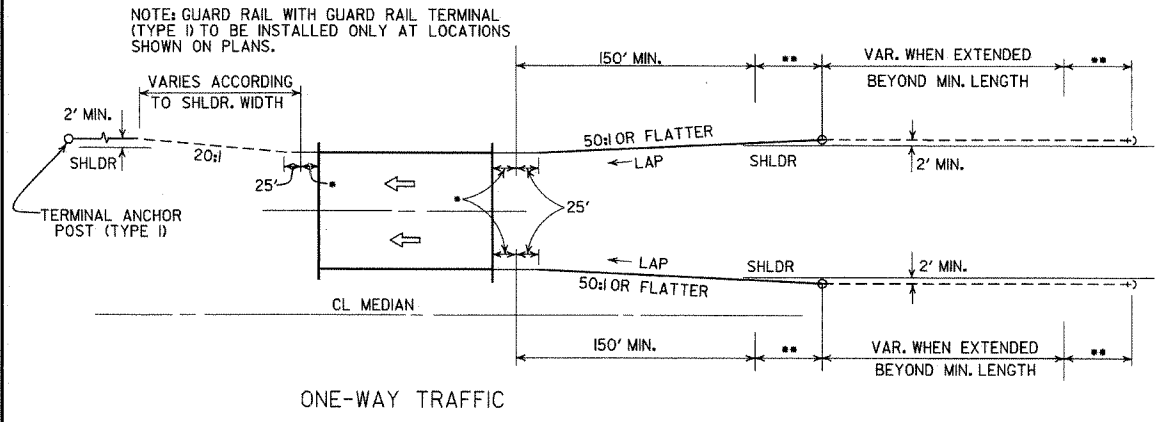
NOTE: THIS DETAIL IS TO BE USED ONLY WHEN THE COVER OVER THE CULVERT DOES NOT PERMIT FULL EMBEDMENT OF GUARD RAIL POSTS AS SHOWN ON STD. DRWG. GR-8.

7-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
4-12-07	REVISED DETAIL OF GUARD RAIL PLACEMENT BEHIND CURB	
11-10-05	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 BLOCKOUT; ADD. DET. OF GUARD RAIL CONNECTION TO R.C. BOX CULV'T. 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 CONFORMED TO 1988 SPECS	8-2-90
7-15-88		
3-4-88	REVISED ANCHOR NOTE	
10-30-87	REVISED ANCHOR ASSEMBLY	712-10-30-87
10-30-87	REVISED PLACEMENT BEHIND CURB	547-10-30-87
10-9-87	REDRAWN & REVISED	803-10-9-87
DATE	REVISION	DATE FILM

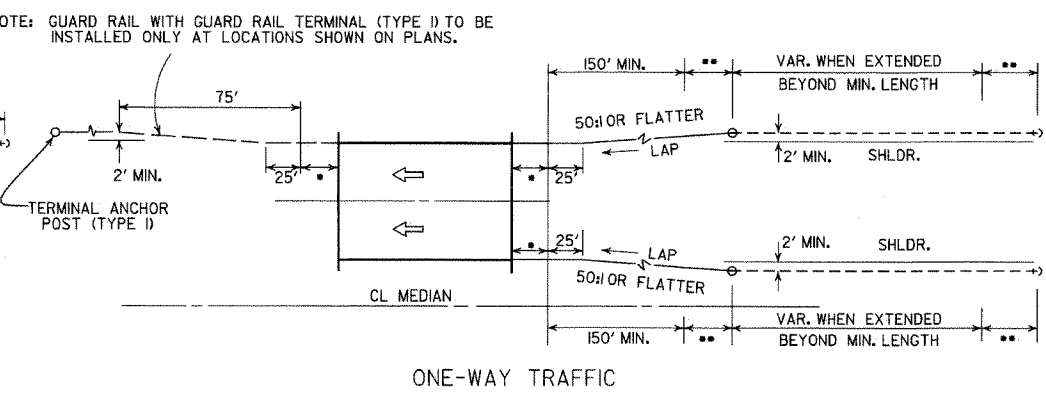
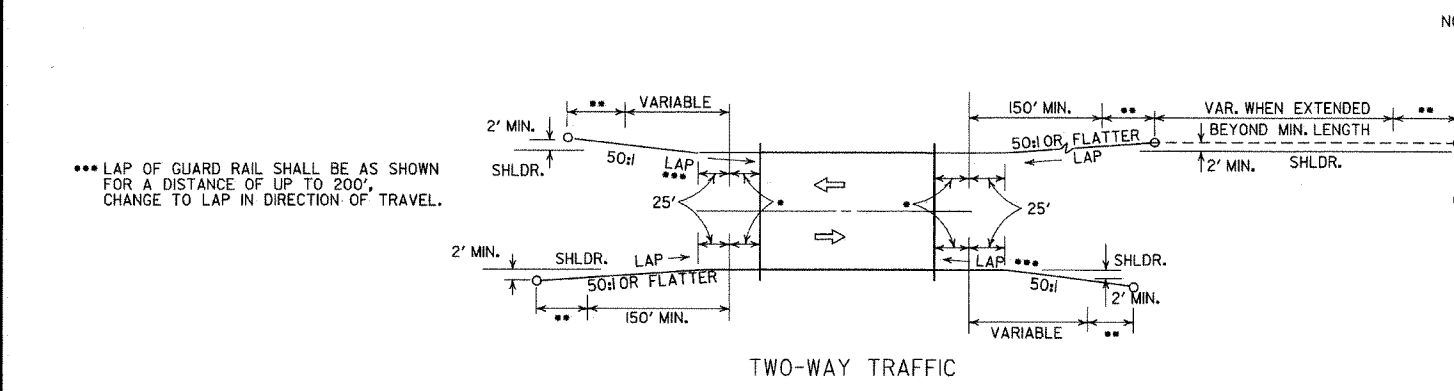
ARKANSAS STATE HIGHWAY COMMISSION

**GUARD RAIL DETAILS**

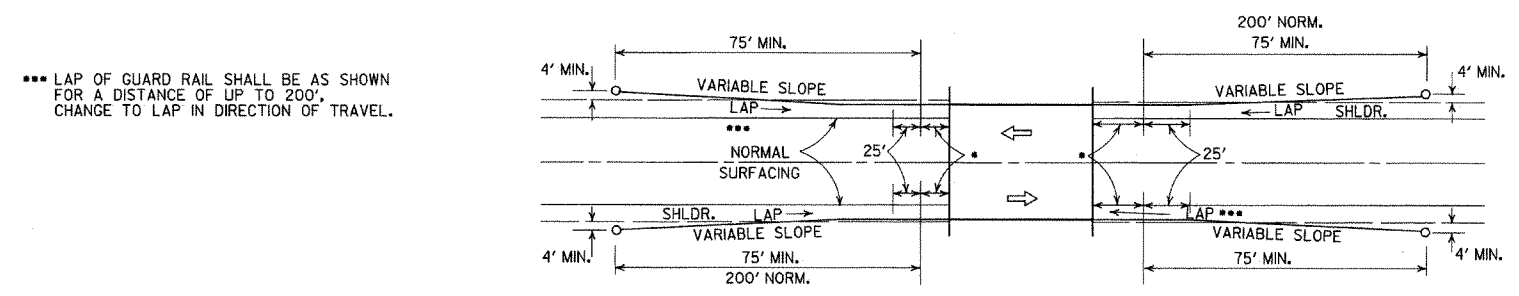
STANDARD DRAWING GR-8A



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)

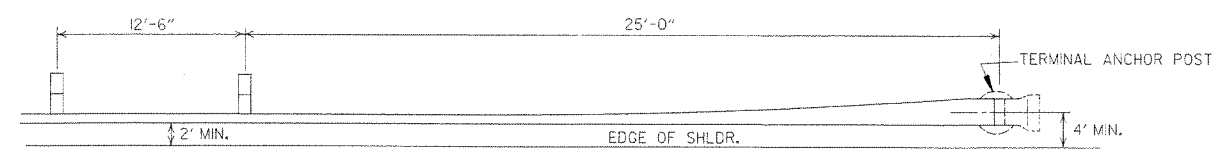


LEGEND

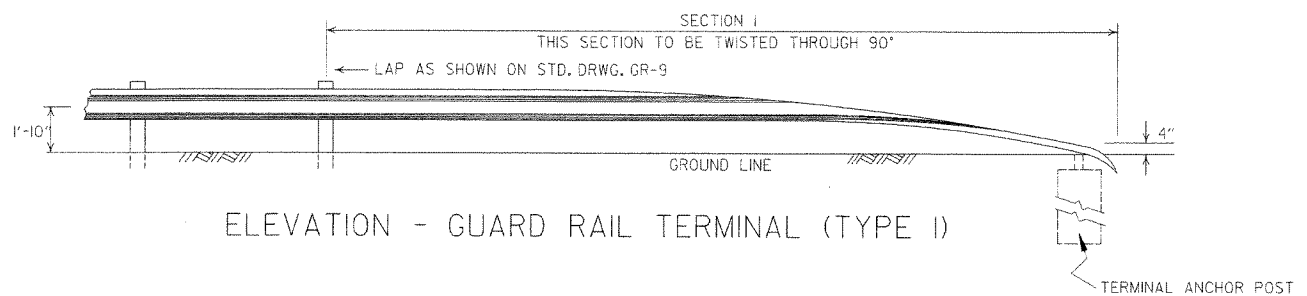
- THRIE BEAM GUARD RAIL TERMINAL
- GUARD RAIL TERMINAL (TYPE 2)

METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERMINAL (TYPE 1) (FULL SHOULDER WIDTH OR LESS BRIDGES)

ARKANSAS STATE HIGHWAY COMMISSION		
GUARD RAIL DETAILS		
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. 1)	
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	
DATE	REVISION	DATE FILM
STANDARD DRAWING GR-9		

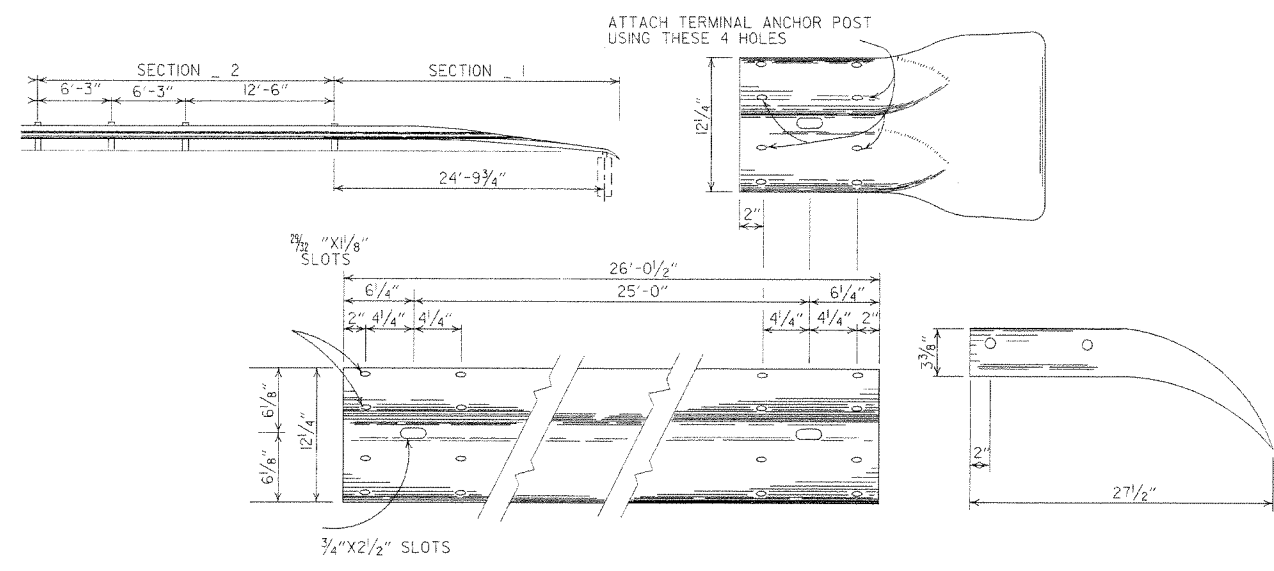


PLAN - GUARD RAIL TERMINAL (TYPE I)



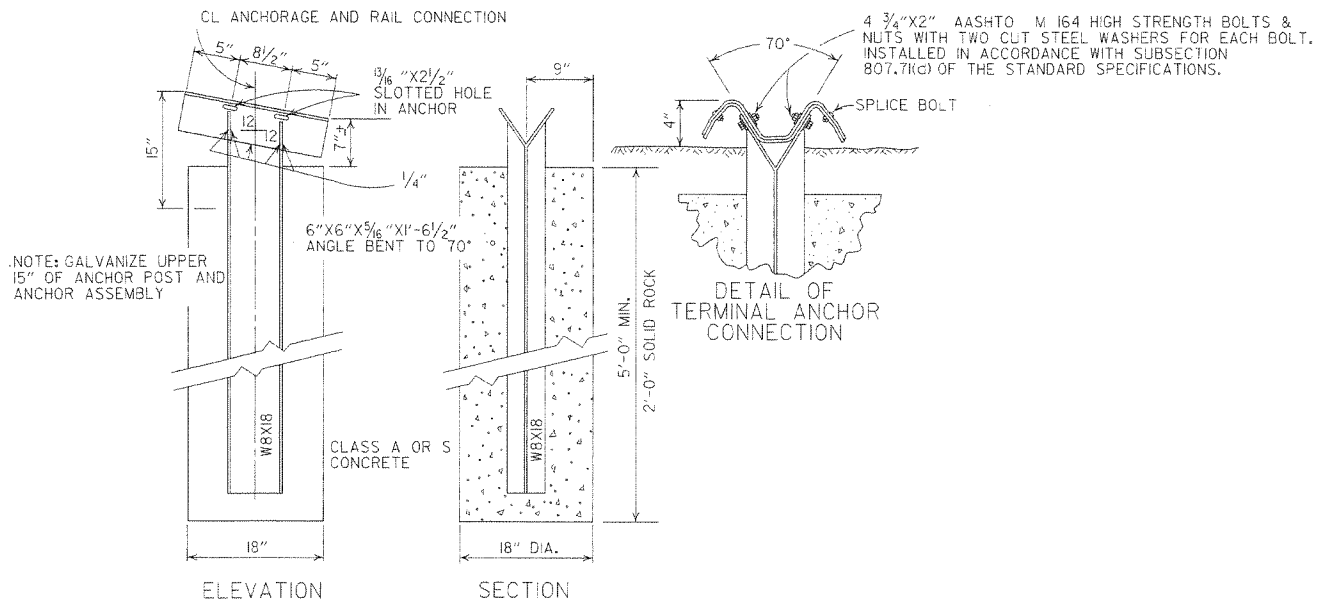
ELEVATION - GUARD RAIL TERMINAL (TYPE I)

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



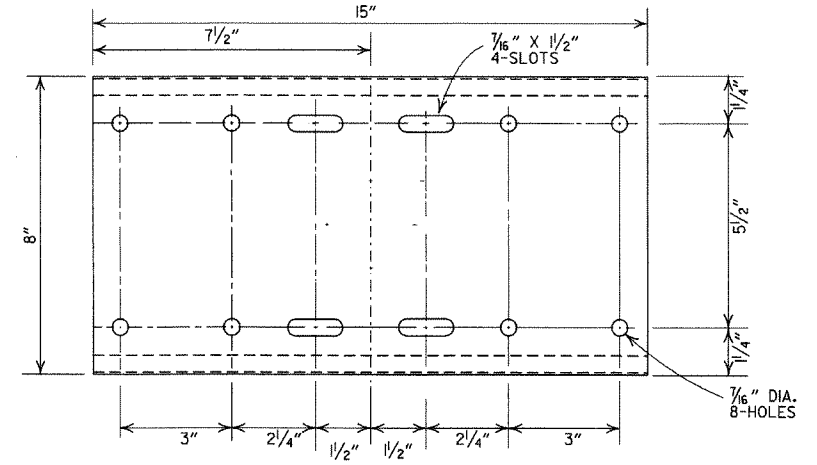
ELEVATION SECTION

DETAIL OF TERMINAL ANCHOR POST (TYPE I)

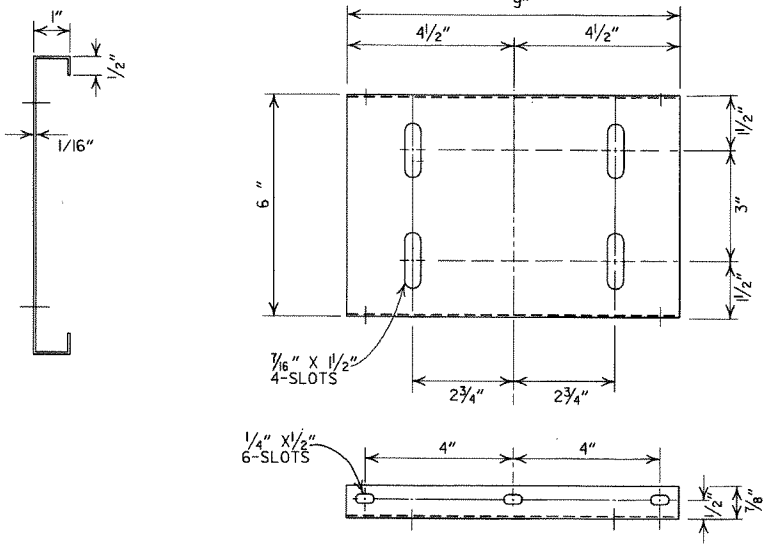
NOTE: GALVANIZE UPPER 15" OF ANCHOR POST AND ANCHOR ASSEMBLY

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.

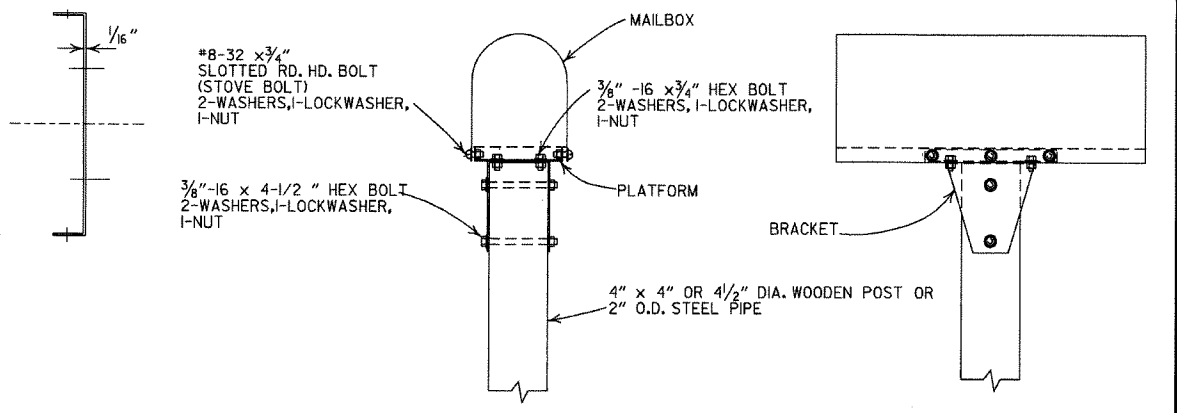
			ARKANSAS STATE HIGHWAY COMMISSION
			GUARD RAIL DETAILS
			STANDARD DRAWING GRT-I
7-14-10	RAISED HEIGHT OF GUARD RAIL 1"		
6-26-97	REVISED LAP NOTE		
10-18-96	REVISED ASTM REF. TO AASHTO		
11-3-94	DIMENSION TERMINAL DETAIL		
11-11-92	ADDED NOTE FOR PAYMENT	11-11-92	
10-1-92	DRAWN & ISSUED	10-1-92	
DATE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



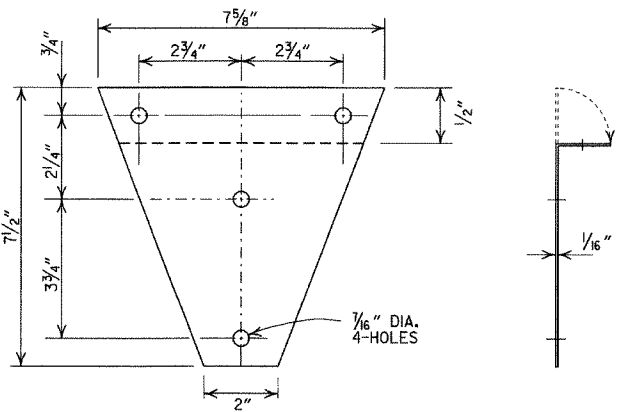
SHELF



PLATFORM

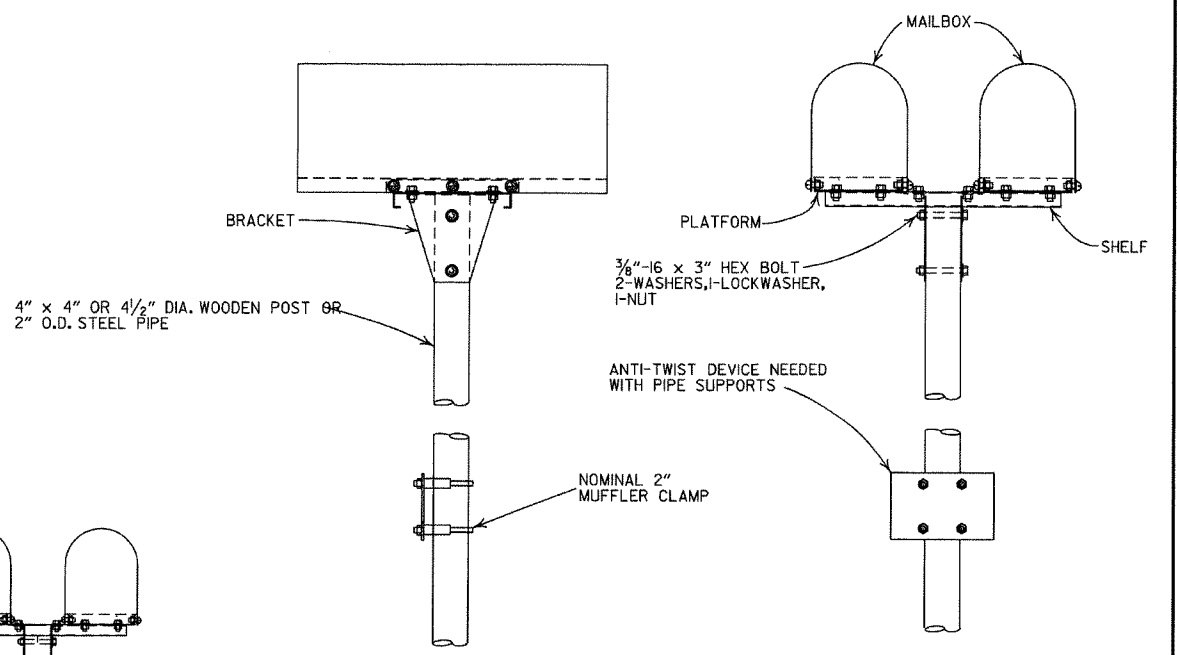


SINGLE INSTALLATION

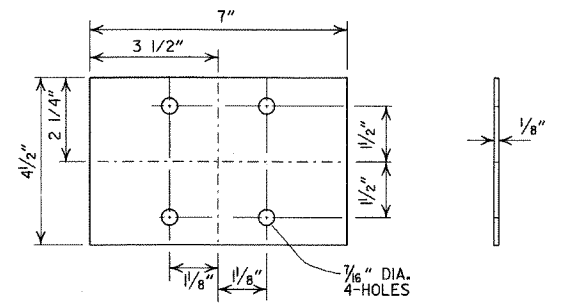


BRACKET

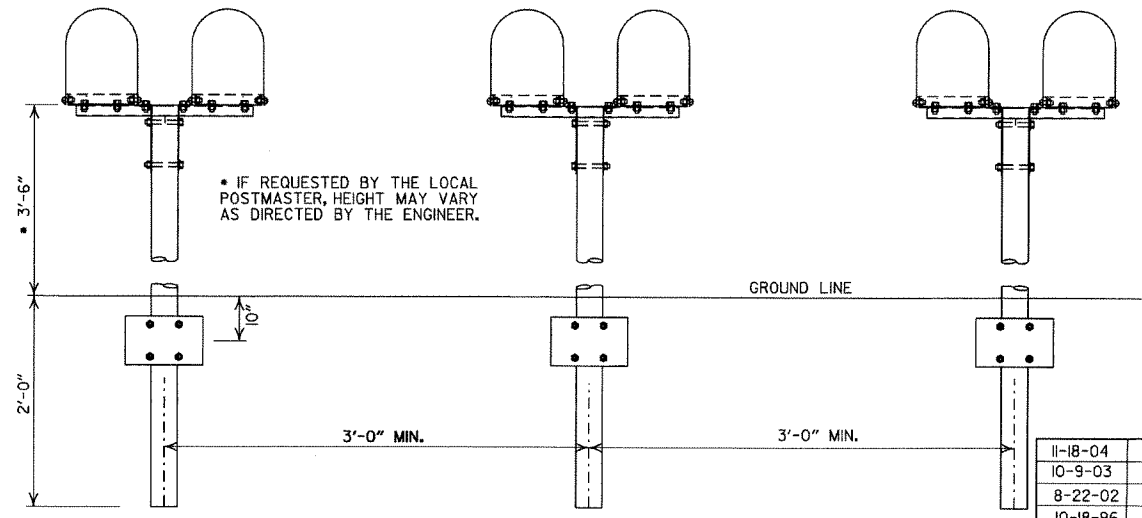
- GENERAL NOTES
1. MAILBOX POSTS MAY BE WOOD OR METAL. WOOD POSTS SHALL BE PRESSURE TREATED FOR GROUND CONTACT IN ACCORDANCE WITH SECTION 637.02 OF THE STANDARD SPECIFICATIONS.
  2. ANTI-TWIST PLATES SHALL BE USED ONLY ON METAL POSTS.
  3. MAILBOX SHELF, BRACKET & PLATFORM SHALL BE GALVANIZED OR PAINTED STEEL, HOWEVER TREATED WOOD MAY BE USED WITH WOODEN POSTS. THE WOODEN SHELF, BRACKET & PLATFORM SHALL BE A MINIMUM OF 3/4" THICK AND SHALL BE ASSEMBLED WITH BOLTS OF THE APPROPRIATE LENGTH WITH SIX 8 x 3/4" FLATHEAD WOOD SCREWS USED TO ATTACH THE MAILBOX TO THE PLATFORM.
  4. THE MAILBOX SHELF AND PLATFORM THAT IS SHOWN IS FOR STANDARD SIZE MAILBOXES. THE SHELF AND PLATFORM SIZE SHALL BE MODIFIED TO FIT MAILBOXES OF A DIFFERENT SIZE.
  5. METAL PIPE FOR MAILBOX SUPPORT SHALL BE 2" OUTSIDE DIAMETER STEEL WITH A WALL THICKNESS OF 0.145" AND A WEIGHT OF 2.72 LBS PER FT. OUTSIDE DIAMETER AND WEIGHT SHALL HAVE A TOLERANCE OF +/- 5% ACCORDING TO AASHTO M 181.
  6. MAILBOX SUPPORT SYSTEM DIFFERING FROM THOSE SHOWN MAY BE USED, PROVIDED THEY ARE ON THE AHTD QUALIFIED PRODUCTS LIST FOR MAILBOX SUPPORTS.



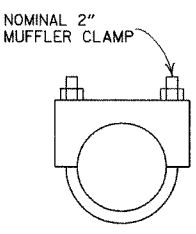
DOUBLE INSTALLATION



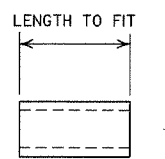
ANTI-TWIST PLATE



SPACING FOR MULTIPLE POST INSTALLATION



CLAMP



SPACER

DATE	REVISION
11-18-04	REVISED NOTES
10-9-03	REVISED NOTE 6
8-22-02	REVISED NOTE 6
10-18-96	CORRECTED AASHTO
10-1-92	CORRECTED SPELLING
9-26-91	NEW PHONE NUMBER
8-15-91	ADDED NOTE
11-30-89	ADJUSTED HEIGHT & ADDED NOTE
2-16-89	DELETED SLOTS FROM SHELF & PLTF
11-17-88	ADJUSTED DIMENSIONS OF STEEL POSTS
7-15-88	ISSUED
120-7-15-88	FILMED

ARKANSAS STATE HIGHWAY COMMISSION

MAILBOX DETAILS

STANDARD DRAWING MB-1



BAR LIST

BAR	NO.	SIZE	LENGTH	BAR BENDING DIAGRAM
H	2	#4	•	
I	•	#4	•	
J	•	#4	1'-5"	
L	•	#4	3'-2"	
M	•	#4	1'-8"	

• NOTE: LENGTH AND NUMBER OF BARS VARIES WITH SIZE OF CULVERT

GENERAL NOTES

WINGS, CURTAIN WALLS AND APRONS SHALL BE TIED TO THE PRECAST CULVERT SECTION BY CASTING BARS IN CULVERT END SECTIONS AS SHOWN OR BY DOWELING AND GROUTING. J BARS AND M BARS SHALL BE EMBEDDED A MINIMUM OF 10" IN PRECAST BOX.

WINGS, FOOTINGS, APRONS AND CURTAIN WALLS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE APPLICABLE WING DRAWING. STEEL AND CONCRETE QUANTITIES WILL BE ADJUSTED TO FIT THE IN-PLACE WIDTH & HEIGHT OF THE PRECAST CONCRETE BOX CULVERTS.

ALL EXPOSED CORNERS TO HAVE 3/4" CHAMFERS.

WINGWALLS AND FOOTINGS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.

ALL CONCRETE, REINFORCING STEEL, LEAN GROUT, MEMBRANE WATERPROOFING, DRAINAGE FILL MATERIAL, GEOTEXTILE FILTER FABRIC, LABOR, MATERIALS AND EQUIPMENT REQUIRED FOR INSTALLING PRECAST BOX CULVERTS WILL NOT BE PAID FOR DIRECTLY BUT WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID FOR THE ITEMS AS SPECIFIED IN SECTION 607 OF THE STANDARD SPECIFICATIONS.

LEAN GROUT SHALL CONSIST OF A SAND CEMENT MIXTURE MEETING THE FOLLOWING REQUIREMENTS:  
 PORTLAND CEMENT SHALL BE TYPE I AND SHALL MEET THE REQUIREMENTS OF AASHTO M 85.  
 SAND SHALL MEET THE REQUIREMENTS OF FINE AGGREGATE AS SPECIFIED IN SECTION 802.02 OF THE STANDARD SPECIFICATIONS. THE SAND CEMENT MIXTURE SHALL CONSIST OF NOT LESS THAN 1.5 SACKS OF PORTLAND CEMENT PER TON OF MATERIAL MIXTURE. THE MIXTURE SHALL CONTAIN SUFFICIENT WATER TO HYDRATE THE CEMENTS. THE SAND CEMENT MIXTURE SHALL BE PLACED IN MAXIMUM 8 INCH THICK LIFTS, LOOSE MEASURE, AND THOROUGHLY RODDED AND TAMPED AROUND BOX TO THOROUGHLY FILL ALL VOIDS.

MEMBRANE WATERPROOFING CONFORMING TO THE REQUIREMENTS OF SECTION 815 OF THE STANDARD SPECIFICATIONS SHALL BE APPLIED TO ALL BOX CULVERT JOINTS.

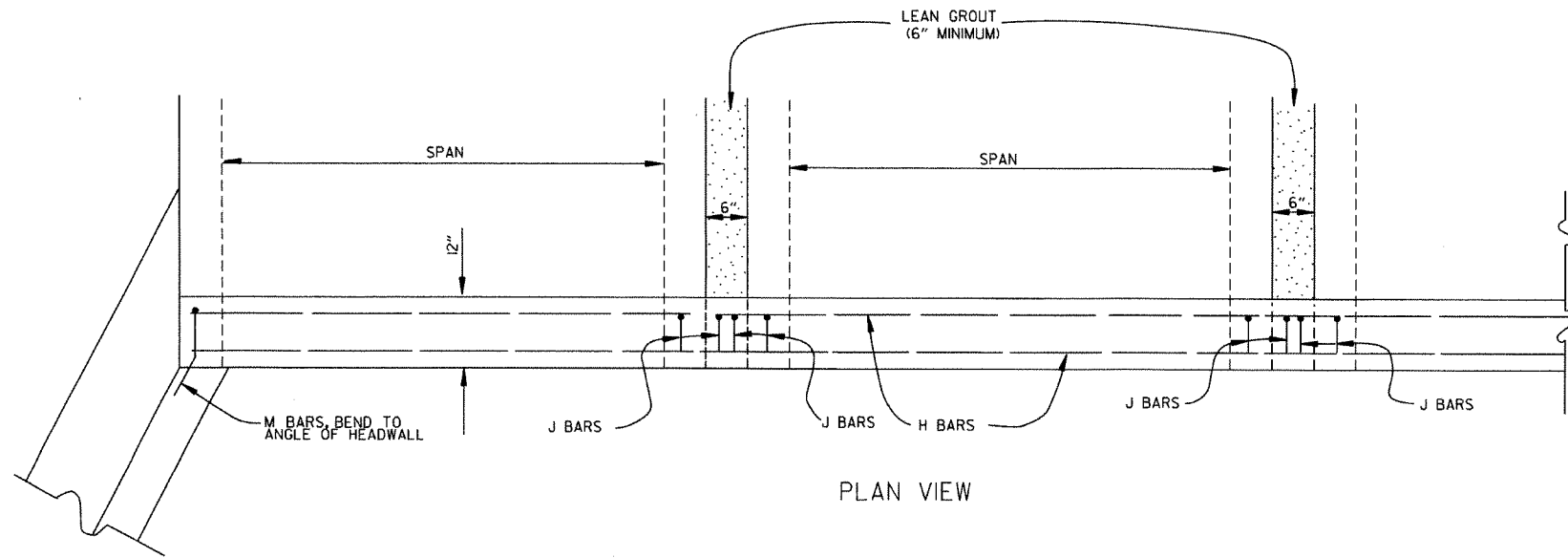
THE MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERNAL JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE CULVERT.

IN OUTER BARRELS, ONE WEEP HOLE IS REQUIRED IN EXTERIOR WALLS OF EACH PRECAST CULVERT SECTION. WEEP HOLES SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 10'-0" IN THE ASSEMBLED CULVERT AND SHALL BE SPACED TO CLEAR ALL REINFORCING STEEL. THE DRAIN OPENING SHALL BE 4" DIAMETER AND SHALL BE PLACED 12" ABOVE THE TOP OF THE BOTTOM SLAB.

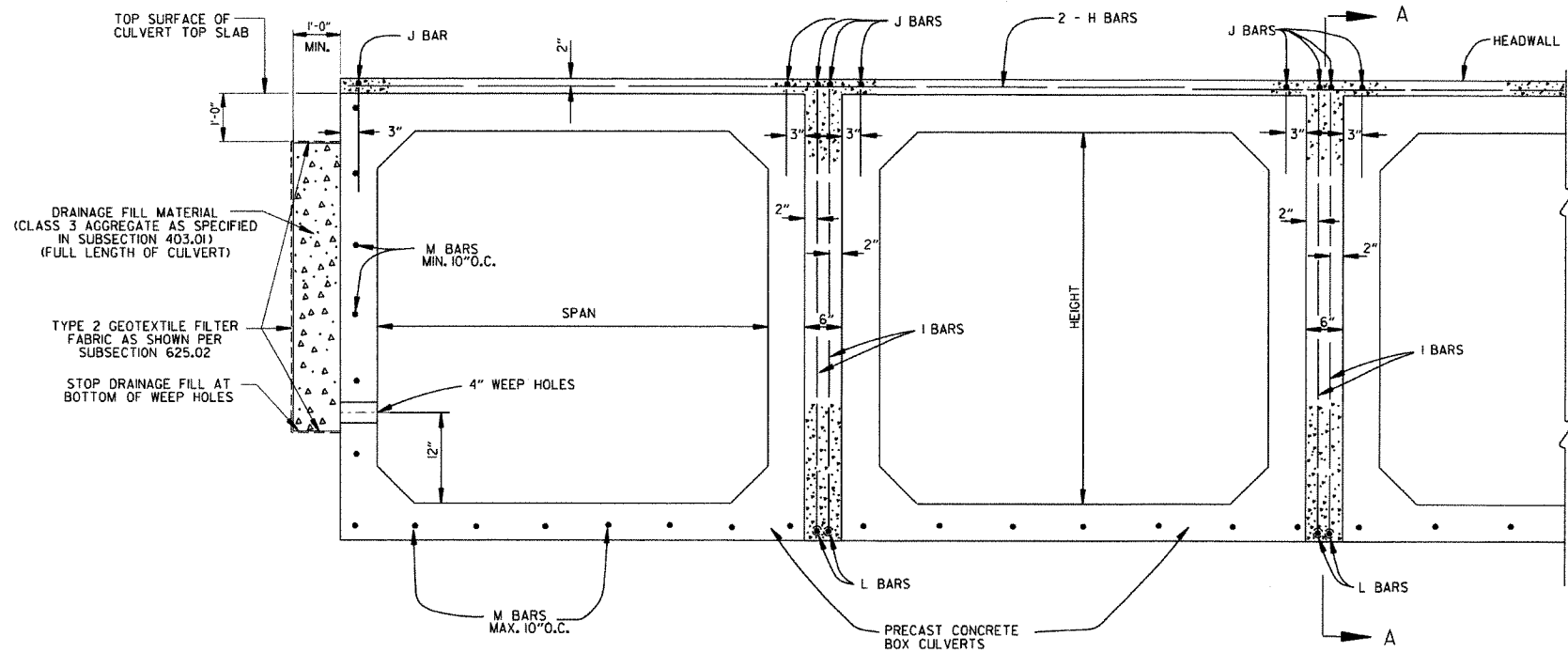
DRAINAGE FILL MATERIAL WITH GEOTEXTILE FABRIC IS REQUIRED AT THE EXTERIOR WALLS OF THE ASSEMBLED CULVERT. SEE DETAILS ON THIS DRAWING.

MINIMUM WIDTH SHALL BE 12" (6" ON EACH SIDE OF JOINT). ON MULTIPLE BARREL CULVERTS, MEMBRANE WATERPROOFING SHALL BE APPLIED TO EACH BARREL AS DESCRIBED ABOVE.

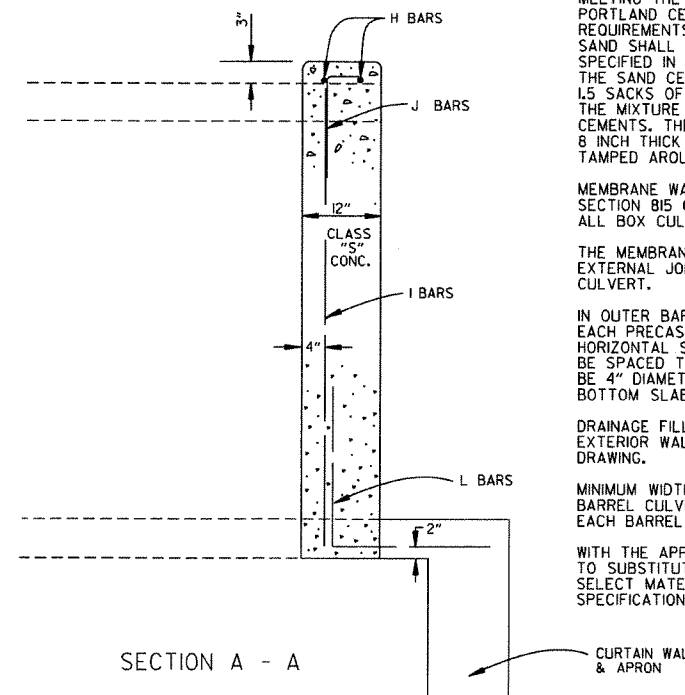
WITH THE APPROVAL OF THE ENGINEER, THE CONTRACTOR WILL BE ALLOWED TO SUBSTITUTE, AT NO ADDITIONAL COST TO THE DEPARTMENT, FLOWABLE SELECT MATERIAL CONFORMING TO SECTION 206 OF THE STANDARD SPECIFICATIONS IN LIEU OF LEAN GROUT.



PLAN VIEW



END VIEW



SECTION A - A

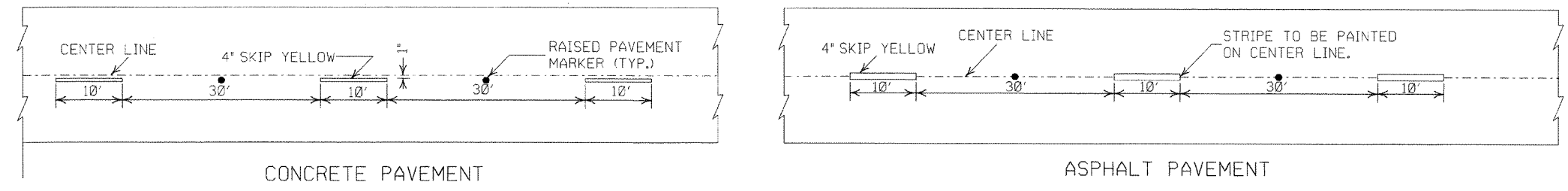
12-15-11	ADDED NOTE & DTLs FOR WEEP HOLE AND DRAINAGE FILL	
10-15-09	ADDED GENERAL NOTE	
11-10-05	REVISED SPACING OF "M" BARS	
4-10-03	REVISED GENERAL NOTES	
10-18-96	CORRECTED AASHTO REF.	
10-1-92	ADDED NOTE FOR MEMBRANE WATERPROOFING	
8-15-91	ADDED NOTE FOR LEAN GROUT	
11-8-90	REVISED FOR 1991 SPECS	
11-30-89	ISSUED; JABE	
DATE	REVISION	DATE FILMED

ARKANSAS STATE HIGHWAY COMMISSION

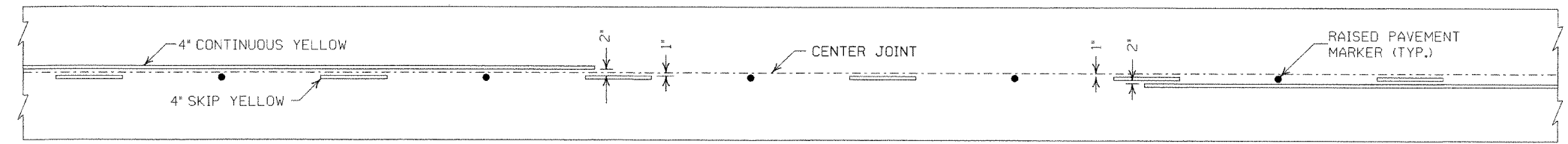
PRECAST CONCRETE BOX CULVERTS

STANDARD DRAWING PBC-1

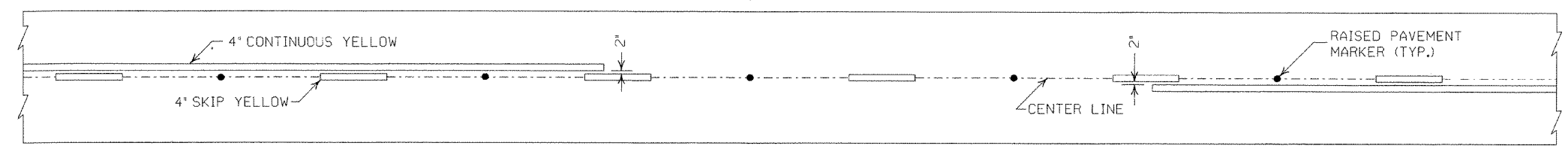
- NOTES:
1. ALL LINES SHALL HAVE A WIDTH OF 4 INCHES.
  2. THE THICKNESS AND RATE OF PAINT APPLICATION SHALL BE AS SPECIFIED IN SECTION 718 OF THE STANDARD SPECIFICATIONS.
  3. THIS DRAWING SHALL BE USED IN CONJUNCTION WITH THE LATEST REVISED ADDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES."
  4. RAISED PAVEMENT MARKERS SHALL BE CENTERED BETWEEN SKIP LINES ON 40 FEET SPACING UNLESS OTHERWISE SHOWN ON THE PLANS.



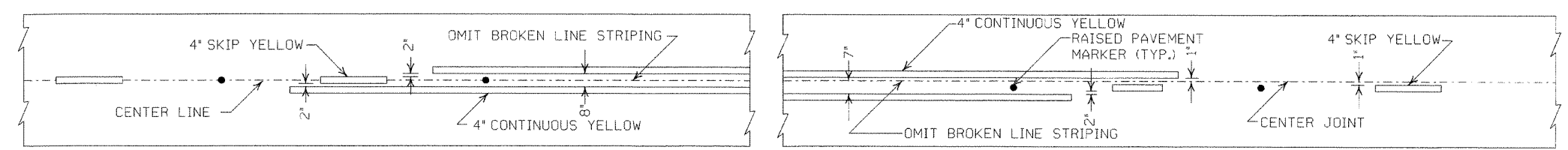
**BROKEN LINE STRIPING**



**SOLID LINE STRIPING ON CONCRETE PAVEMENT**



**SOLID LINE STRIPING ON ASPHALT PAVEMENT**

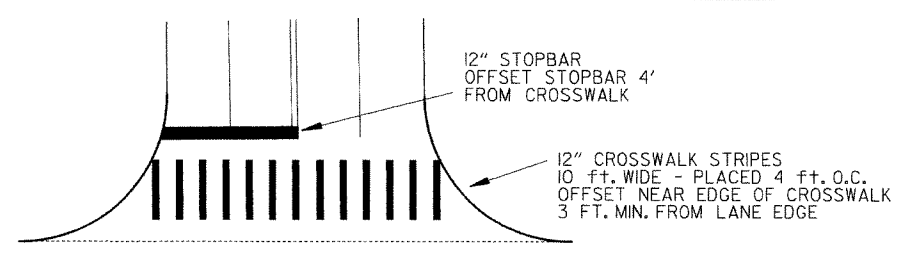


ASPHALT PAVEMENT

CONCRETE PAVEMENT

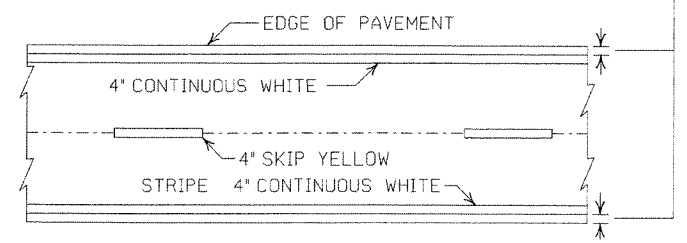
**STRIPING AT ADJACENT NO PASSING LANES**

GENERAL NOTES:  
 THIS DRAWING SHOULD BE CONSIDERED AS TYPICAL ONLY AND THE FINAL LOCATION OF THE STRIPING AND RAISED PAVEMENT MARKERS SHALL BE DETERMINED BY THE ENGINEER.  
 THIS DRAWING SHOULD BE USED IN CONJUNCTION WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST REVISION.  
 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.

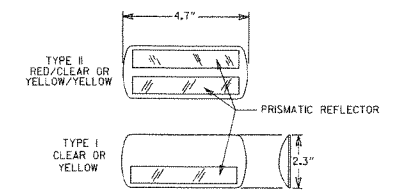


**CROSSWALK AND STOPBAR DETAILS**

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**

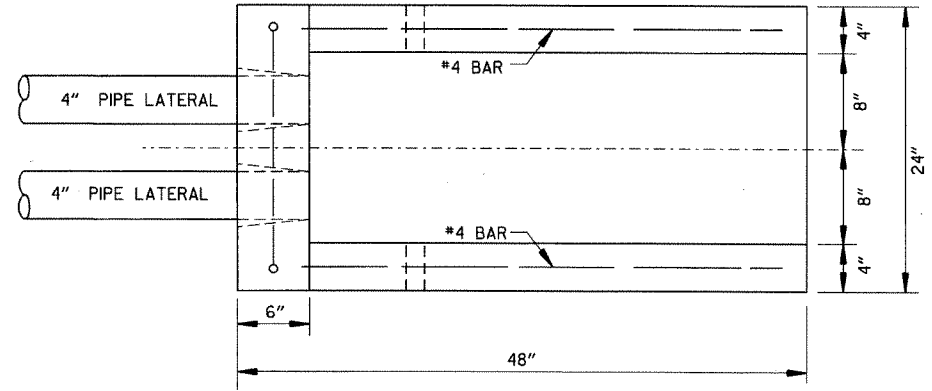
DATE	REVISION	FILMED
11-17-10	REVISED GENERAL NOTES & REMOVED PLOWABLE PAVT MKRS	
11-18-04	REVISED NOTE 2 & GENERAL NOTES	
8-22-02	ADDED CROSSWALK & STOPBAR DTLS.	
7-02-98	ADDED DETAILS OF STD. RAISED PAVT. MARKERS	
4-26-96	REV. NOTES 3&4; ADDED R.P.M.	
9-30-80	DRAWN	1-9-30-80

ARKANSAS STATE HIGHWAY COMMISSION

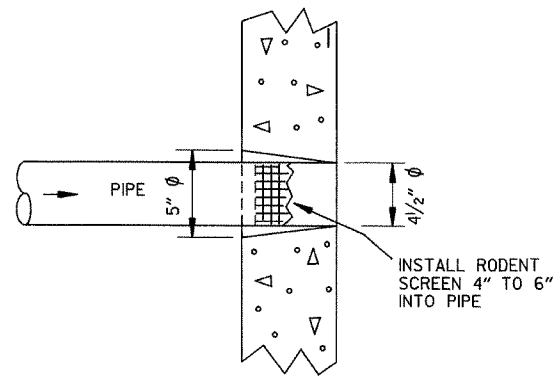
**PAVEMENT MARKING DETAILS**

STANDARD DRAWING PM-1

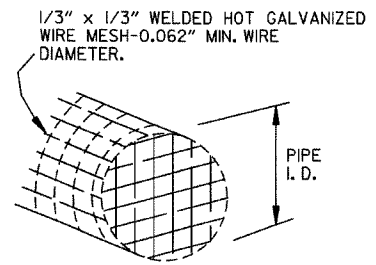
NOTE:  
 1. GRANULAR BACKFILL TO BE SUBSIDIARY TO PIPE UNDERDRAIN.  
 2. UNLESS OTHERWISE SPECIFIED ON THE PLANS, THE UNDERDRAIN COVER SHALL BE THOROUGHLY COMPACTED EARTH AND SHALL BE SUBSIDIARY TO PIPE UNDERDRAIN.  
 3. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC, LAP FABRIC 12" OR THE WIDTH OF THE TRENCH AT THE TOP.



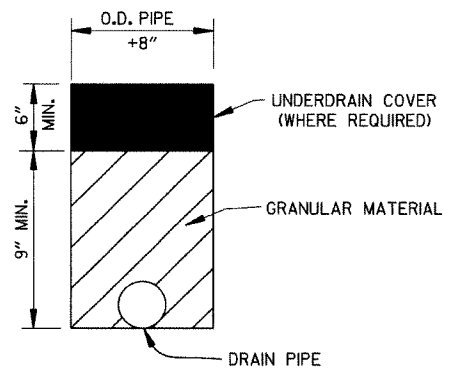
PLAN VIEW



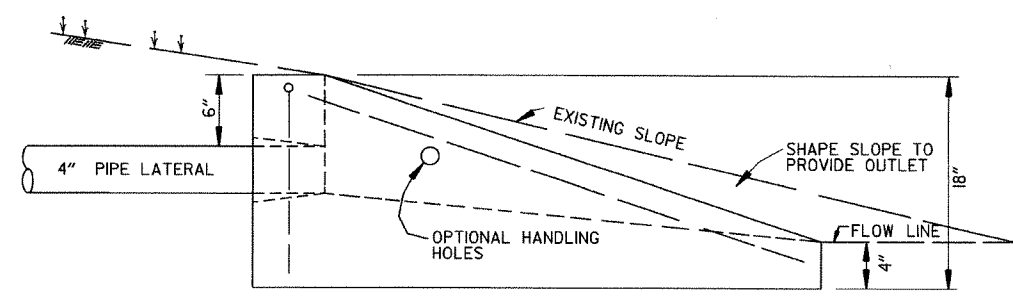
DETAIL OF HOLE FOR 4" PIPE



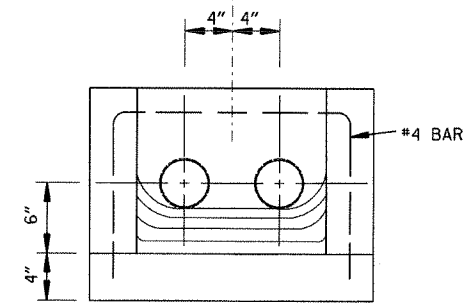
DETAIL OF RODENT SCREEN



DETAILS OF PIPE UNDERDRAIN



SIDE VIEW

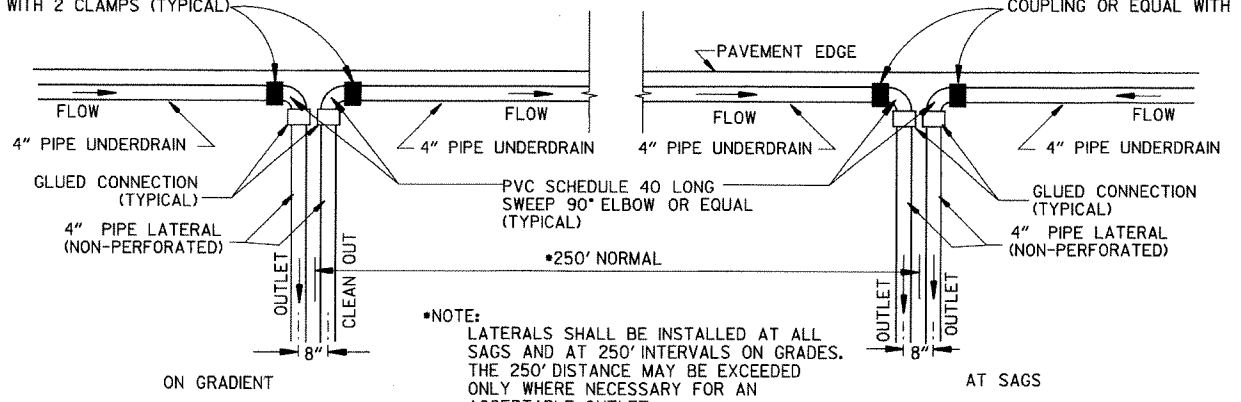


FRONT VIEW

FERNCO 1056-44 (4" CI/PLASTIC) OR  
 FERNCO 1051-44 (4" AC/DIOR 4" CI/PLASTIC)  
 COUPLING OR EQUAL WITH 2 CLAMPS (TYPICAL)

UNDERDRAIN OUTLET PROTECTORS

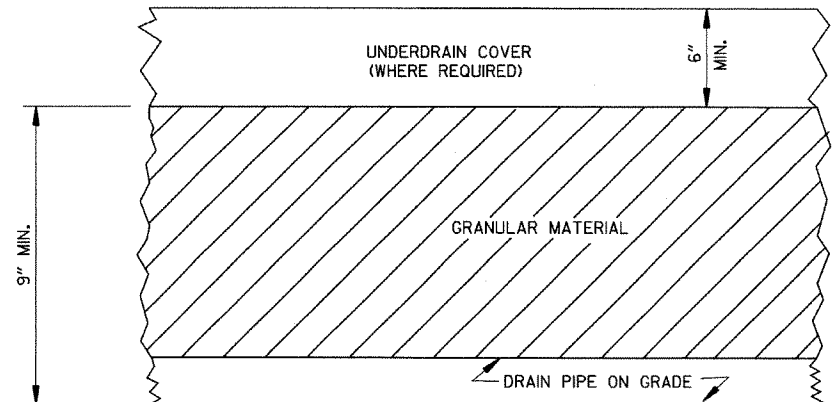
FERNCO 1056-44 (4" CI/PLASTIC) OR  
 FERNCO 1051-44 (4" AC/DIOR 4" CI/PLASTIC)  
 COUPLING OR EQUAL WITH 2 CLAMPS (TYPICAL)



\*NOTE:  
 LATERALS SHALL BE INSTALLED AT ALL SAGS AND AT 250' INTERVALS ON GRADES. THE 250' DISTANCE MAY BE EXCEEDED ONLY WHERE NECESSARY FOR AN ACCEPTABLE OUTLET.

DETAIL OF PIPE UNDERDRAIN LATERALS WHEN PLACED ALONG PAVEMENT EDGE

NOTE: PVC PIPE FOR LATERALS SHALL MEET THE REQUIREMENTS OF ASTM D 1785 (LATEST REVISION) FOR SCHEDULE 40 PIPE.



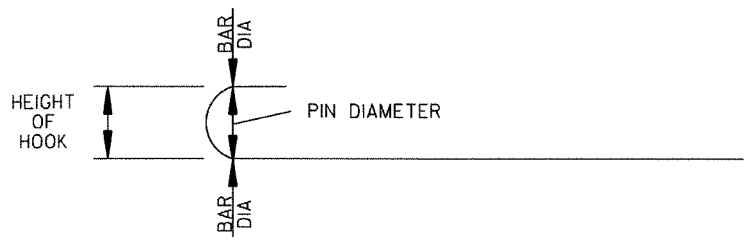
4-10-03	REVISED NOTE 3	
1-12-00	REVISED DETAIL OF UNDERDRAIN LATERALS	
11-18-98	REVISED NOTE	
10-18-96	REVISED MIN. DEPTH & GEOTEXTILE FABRIC	
4-26-96	ADDED LATERAL NOTE; 5 1/2" TO 5"	
11-22-95	REVISED LATERALS	
7-20-95	REVISED LATERALS & ADDED NOTE	
11-3-94	REVISED FOR DUAL LATERALS	11-3-94
10-1-92	SUBSTITUTED GEOTEXTILE	10-1-92
8-15-91	ADDED POLYETHYLENE PIPE	8-15-91
11-8-90	DELETED ALTERNATE NOTE	11-8-90
1-25-89	ADDED 4" SNAP ADAPTER	1-25-89
11-30-89	DEL. (SUBGRADE); ADDED (WHERE REQUIRED)	11-30-89
7-15-88	ISSUED P.L.M.	647-7-15-88
DATE	REVISION	DATE FILED

ARKANSAS STATE HIGHWAY COMMISSION  
 DETAILS OF PIPE UNDERDRAIN  
 STANDARD DRAWING PU-1

STEEL FABRICATION: REINFORCING STEEL FABRICATION SHALL CONFORM TO THE DIMENSIONS LISTED IN THE TABLE BELOW:

BAR SIZE	PIN DIAMETER	HOOK EXTENSION "K"
3	2 1/4"	4"
4	3"	4 1/2"
5	3 3/4"	5"
6	4 1/2"	6"
7	5 1/4"	7"
8	6"	8"

IF THE OVERALL HEIGHT OF THE HOOK (SEE DIAGRAM BELOW) FOR A "b", "b1", "b2" or "b3" BENT BAR IS GREATER THAN THE CORRESPONDING TOP OR BOTTOM SLAB THICKNESS, LESS 2 3/4 INCHES, EACH BENT BAR SHALL BE REPLACED WITH ONE HOOKED BAR AND ONE STRAIGHT BAR, USING LENGTHS AS SHOWN IN THE TABLE BELOW. THE TWO BARS SHALL BE THE SAME DIAMETER AS, AND PLACED AT THE SAME SPACING AS, THE "b", "b1", "b2" OR "b3" BENT BARS THEY REPLACE.



NOTE: DIMENSIONS OF BARS ARE MEASURED OUT TO OUT OF BARS.

OVERALL HEIGHT OF HOOKED BAR DIAGRAM

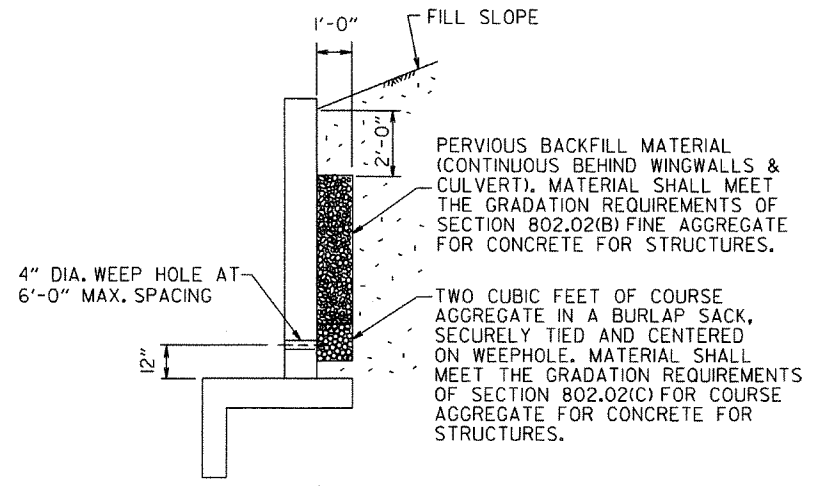
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

FOR SKEWED CULVERTS, THE REPLACEMENT STRAIGHT BAR MAY HAVE TO BE CUT IN FIELD TO FIT.

REPLACEMENT BAR LENGTHS TABLE

BAR SIZE: "b", "b1", "b2" OR "b3"	LENGTH OF HOOKED BAR	LENGTH OF STRAIGHT BAR
#4	L + 1' - 0"	SEE "c" BAR LENGTH
#5	L + 1' - 2"	SEE "c" BAR LENGTH
#6	L + 1' - 4"	SEE "c" BAR LENGTH
#7	L + 1' - 8"	SEE "c" BAR LENGTH
#8	L + 1' - 10"	SEE "c" BAR LENGTH
#9	L + 2' - 6"	SEE "c" BAR LENGTH

L = "OW" - 3 INCHES



WINGWALL & CULVERT DRAINAGE DETAIL

REINFORCED CONCRETE BOX CULVERT GENERAL NOTES

CONCRETE SHALL BE CLASS S WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3500 PSI. REINFORCING STEEL SHALL BE AASHTO M 31 OR M 53, GRADE 60.

CONSTRUCTION AND MATERIALS FOR WINGWALL & CULVERT DRAINAGE, INCLUDING WEEP HOLES AND GRANULAR MATERIAL, SHALL BE SUBSIDIARY TO THE BID ITEM, "CLASS S CONCRETE".

MEMBRANE WATERPROOFING SHALL CONFORM TO THE REQUIREMENTS OF SECTION 815 OF THE STANDARD SPECIFICATIONS.

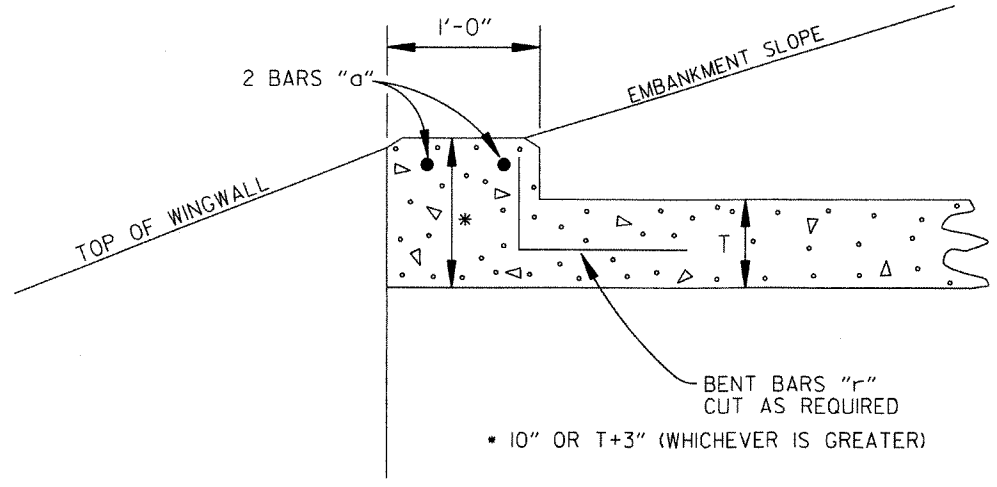
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

REINFORCING STEEL TOLERANCES: THE TOLERANCES FOR REINFORCING STEEL SHALL MEET THOSE LISTED IN "MANUAL OF STANDARD PRACTICE" PUBLISHED BY CONCRETE REINFORCING STEEL INSTITUTE (CRSI) EXCEPT THAT THE TOLERANCE FOR TRUSS BARS SUCH AS FIGURE 3 ON PAGE 7-4 OF THE CRSI MANUAL SHALL BE MINUS ZERO TO PLUS 1/2 INCH.

WEEP HOLES IN BOX CULVERT WALLS SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 10'-0" AND SHALL BE SPACED TO CLEAR ALL REINFORCING STEEL. THE DRAIN OPENING SHALL BE 4" DIAMETER AND SHALL BE PLACED 12" ABOVE THE TOP OF THE BOTTOM SLAB.

WEEP HOLES IN WINGWALLS SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 10'-0" AND SHALL BE SPACED TO CLEAR ALL REINFORCING STEEL. THERE SHALL BE A MINIMUM OF TWO (2) WEEP HOLES IN EACH WINGWALL. THE DRAIN OPENING SHALL BE 4" DIAMETER AND SHALL BE PLACED 12" ABOVE THE TOP OF THE WINGWALL FOOTING.

THE REQUIREMENTS SHOWN ON THIS DRAWING SHALL SUPERCEDE THE CORRESPONDING REQUIREMENTS ON ALL REINFORCED CONCRETE BOX CULVERT STANDARD DRAWINGS.



NOTE: FOR ALL SKEWED R.C. BOX CULVERTS THE LENGTH "K" OF THE MODIFIED HEADWALL SHALL BE EQUAL TO THE ROADWAY LENGTH "RL". THE ENDS OF THE HEADWALL SHALL BE CONSTRUCTED PARALLEL TO THE SKEW ANGLE OF THE BOX CULVERT.

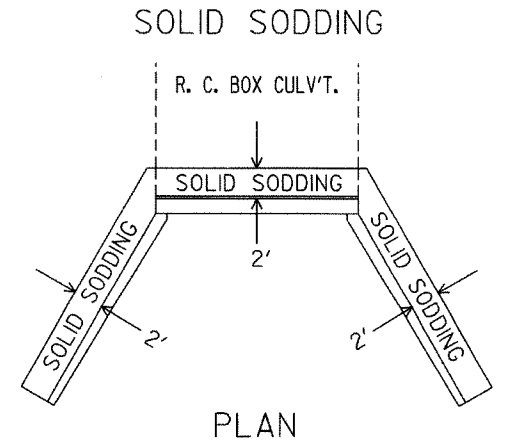
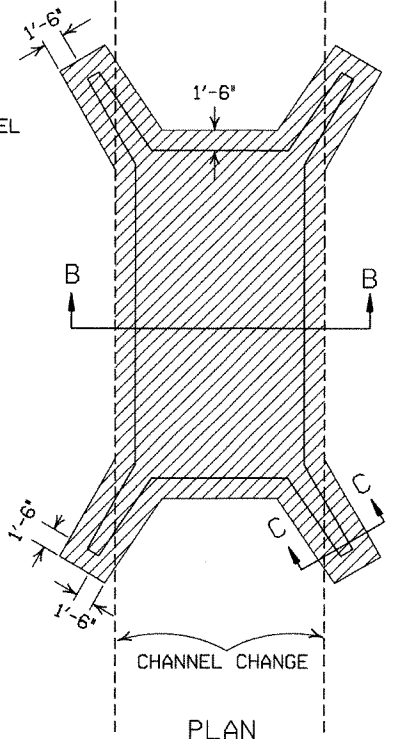
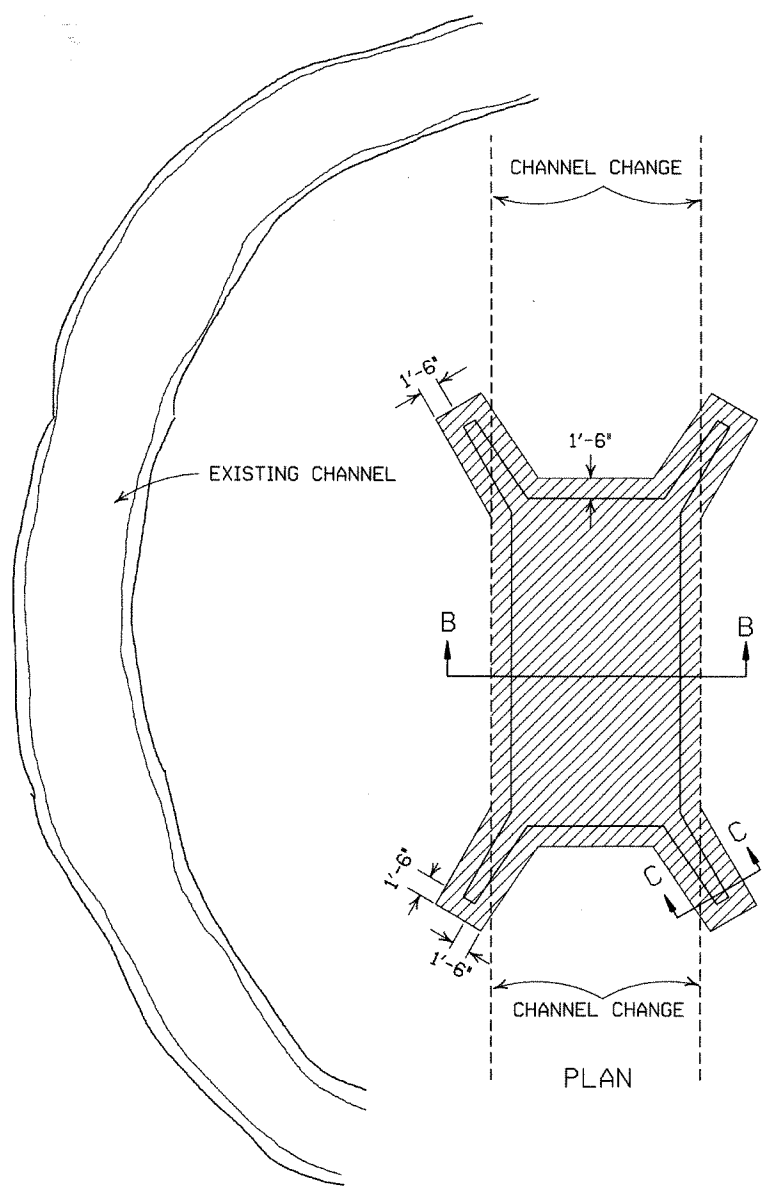
R.C. BOX CULVERT HEADWALL MODIFICATIONS

DATE	REVISION	DATE FILMED
12-15-11	REQUIRE WEEP HOLES IN BOX CULVERT WALLS	
5-25-06	REV. GEN. NOTES AND DETAILS FOR WEEP HOLES; BAR DIAGRAM	
11-16-01	ADDED WINGWALL DRAINAGE DETAIL/EDITED GEN. NOTES	
10-18-96	REV. ASTM REF. TO AASHTO & ADDED BAR DIAGRAM	
10-12-95	MOVED SOLID SODDING DETAIL TO RCB-2	
6-2-94	ADDED SOLID SODDING PLAN DETAIL	
8-5-93	REVISED PIN DIAMETER TO SPECS.	
8-15-91	DRAWN AND ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

REINFORCED CONCRETE BOX CULVERT DETAILS

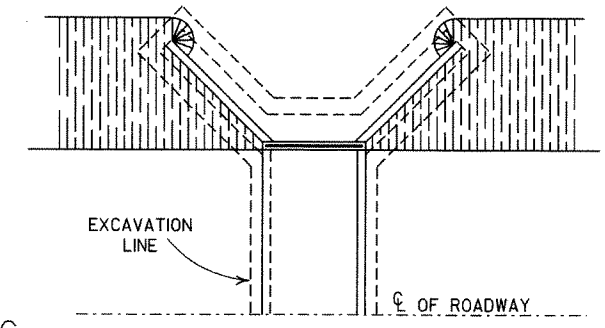
STANDARD DRAWING RCB-1



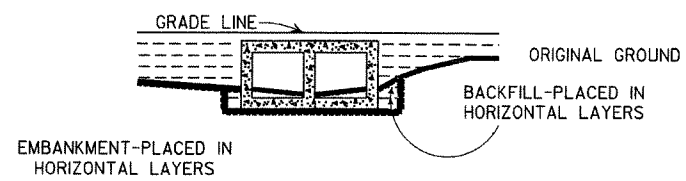
PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

NOTE: LENGTH MEASURED ALONG THE CENTER OF 2' STRIP OF SOLID SODDING.

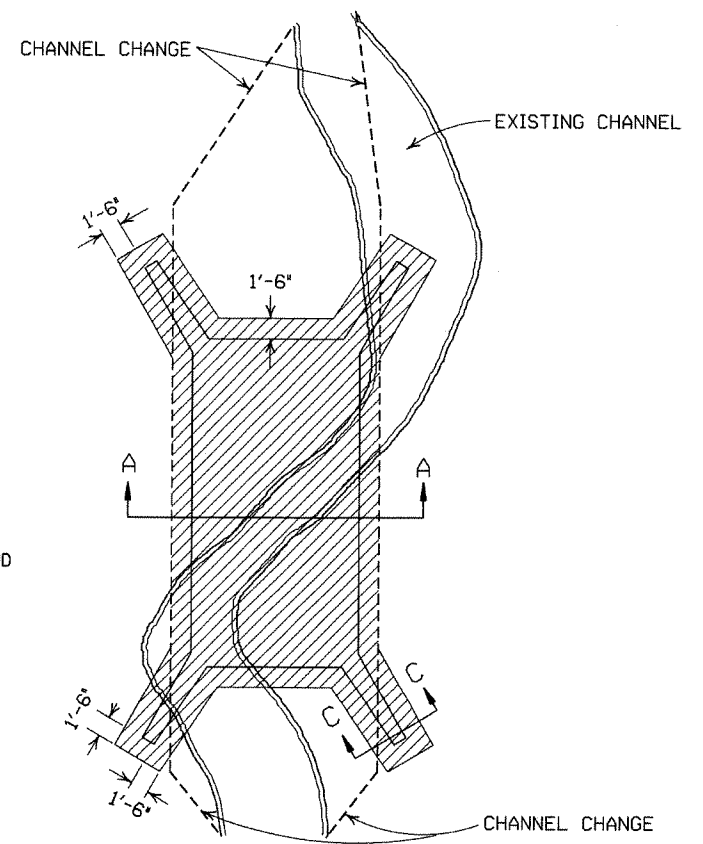


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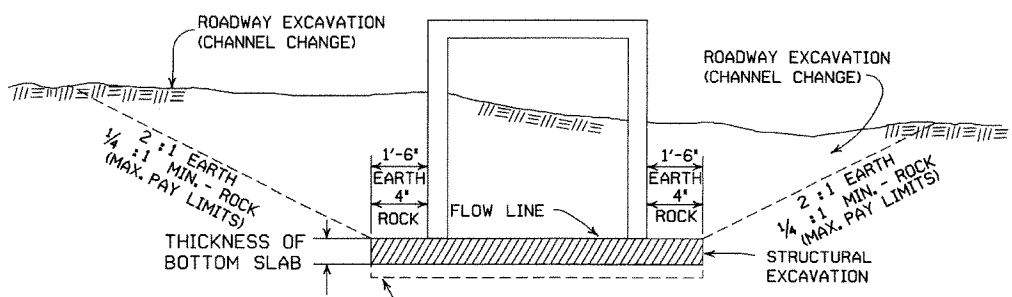


LONGITUDINAL SECTION

BACKFILL DETAILS FOR BOX CULVERT

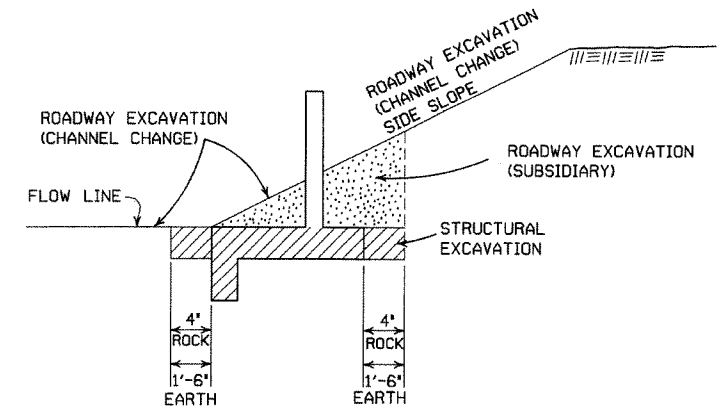


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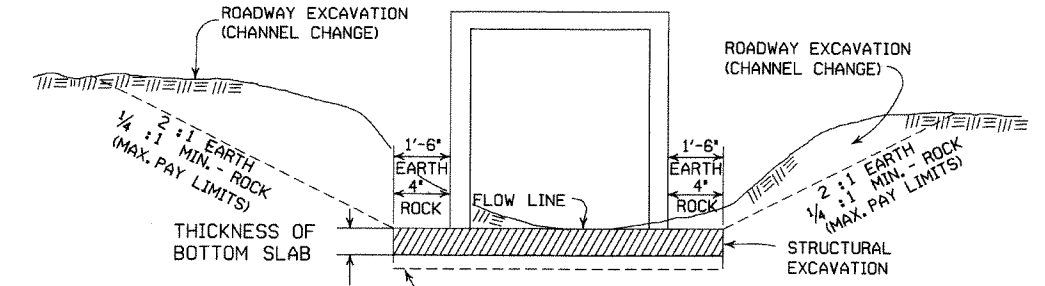


SECTION B-B  
DETAILS FOR NEW CHANNELS

UNDERCUT SHALL BE MEASURED AND PAID FOR ACCORDING TO SECTIONS 801.10 AND 801.11, RESPECTIVELY, OF THE STANDARD SPECIFICATIONS.



SECTION C-C



SECTION A-A  
DETAILS THROUGH EXISTING CHANNELS

UNDERCUT SHALL BE MEASURED AND PAID FOR ACCORDING TO SECTIONS 801.10 AND 801.11, RESPECTIVELY, OF THE STANDARD SPECIFICATIONS.

GENERAL NOTES:

ROADWAY EXCAVATION (CHANNEL CHANGE) WILL BE PAID FOR AT R.C. BOX CULVERT LOCATIONS. IT WILL BE PAID TO THE LIMITS ACTUALLY CUT AND WILL BE CONFINED TO THAT PORTION OF THE INDICATED AREA THAT IS ABOVE THE FLOW LINE. ROADWAY EXCAVATION (CHANNEL CHANGE) SHALL BE MEASURED BY CROSS SECTIONS AND VOLUMES COMPUTED BY AVERAGE END AREA METHOD. ALL CHANNEL CHANGES SHALL BE BROUGHT TO GRADE PRIOR TO MAKING ANY EXCAVATION FOR STRUCTURES.

EXCAVATION FOR STRUCTURES WILL BE PAID FOR AT ALL R.C. BOX CULVERT LOCATIONS. IT WILL BE PAID TO THE LIMITS SHOWN AND SHALL BE CONFINED TO THAT PORTION OF THE INDICATED AREA THAT IS BELOW THE CHANNEL FLOW LINE.

ROADWAY EXCAVATION SHOWN IN SECTION C-C ABOVE AS SUBSIDIARY WILL NOT BE MEASURED OR PAID FOR DIRECTLY, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS OF EXCAVATION.

11-20-03	REVISED SECTION A-A NOTE	
8-22-02	REVISED SECTION B-B NOTE	
10-12-95	COMBINED 1891B AND 1888A	
1-4-83	REVISED GENERAL NOTES AND ADDED MAXIMUM PAY	674-1-4-83
LIMIT NOTES:		
2-2-76	EXCAV. PAY LIMITS	917-2-2-76
10-2-72	REVISED AND REDRAWN	564-10-16-72
DATE	REVISION	FILMED

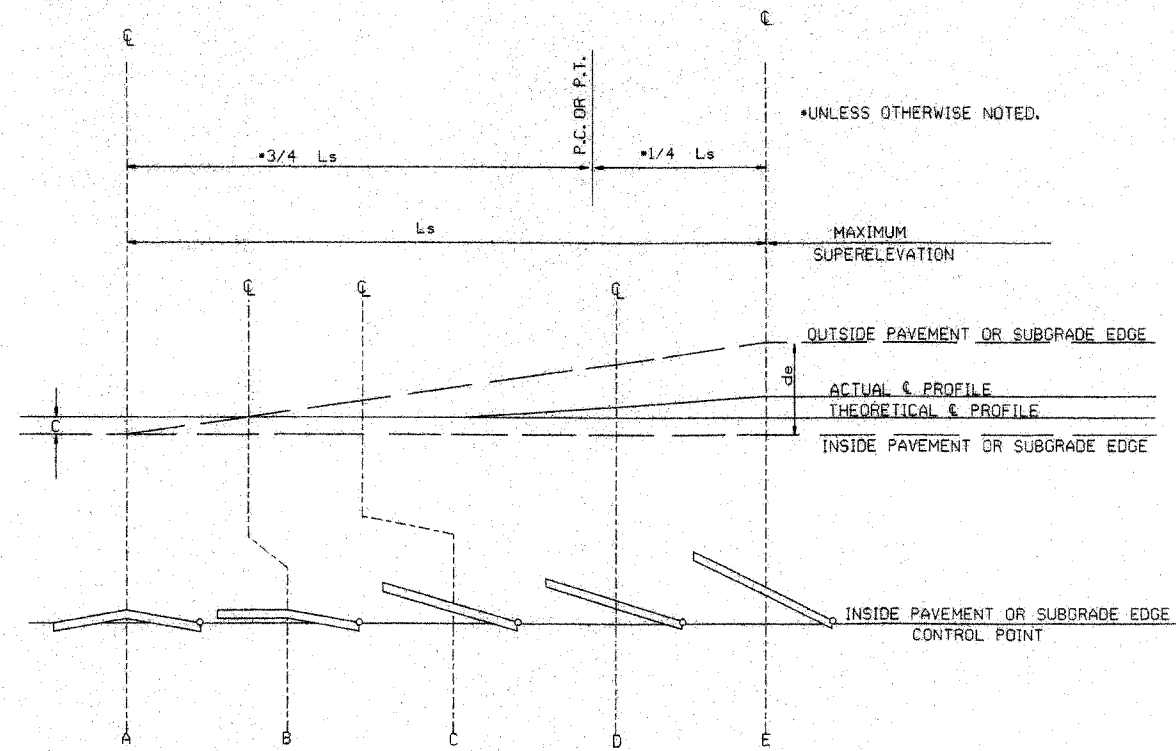
ARKANSAS STATE HIGHWAY COMMISSION

EXCAVATION PAY LIMITS,  
BACKFILL, & SOLID SODDING  
FOR BOX CULVERTS

STANDARD DRAWING RCB-2

SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

DEGREE OF CURVE	30 MPH		40 MPH		50 MPH		55 MPH		60 MPH		70 MPH	
	Ls (FT)		Ls (FT)		Ls (FT)		Ls (FT)		Ls (FT)		Ls (FT)	
	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.		R.C.		0.022		0.023		0.028	
1° 00'	N.C.		N.C.		0.021		0.026		0.030		0.037	
1° 15'	N.C.		R.C.		0.026		0.032		0.037		0.046	
1° 30'	N.C.		0.021	175	0.031	200	0.043	225	0.049	250	0.054	300
1° 45'	N.C.		0.025		0.036		0.048		0.055		0.062	
2° 00'	R.C.		0.028		0.040		0.053	300	0.061	300	0.078	300
2° 15'	R.C.		0.031		0.045	250	0.056		0.067		0.085	350
2° 30'	0.021		0.034		0.049		0.063		0.072		0.091	350
2° 45'	0.022		0.037		0.053		0.067		0.077		0.098	350
3° 00'	0.023		0.040	200	0.057		0.072	230	0.082	260	0.098	360
3° 15'	0.024		0.043		0.061		0.077		0.087	275	0.098	360
3° 30'	0.025		0.046		0.065	205	0.082	245	0.092	285	0.100	360
3° 45'	0.026		0.049		0.069	215	0.086	255	0.096	295	0.100	360
4° 00'	0.027	200	0.051		0.072	225	0.088	260	0.098	305	0.100	360
4° 30'	0.028		0.056		0.078	240	0.087	280	0.096	315		
5° 00'	0.029		0.061		0.083	250	0.091	295	0.098	320		
5° 30'	0.030		0.066	185	0.088	260	0.094	300				
6° 00'	0.031		0.070	190	0.092	270	0.096	305				
6° 30'	0.032		0.074	200	0.095	280	0.096	305				
7° 00'	0.033		0.078	210	0.098	285						
7° 30'	0.034		0.081	215	0.099	290						
8° 00'	0.035		0.084	220	0.100	290						
8° 30'	0.036		0.087	225								
9° 00'	0.037		0.089	230								
10° 00'	0.038	160	0.094	235								
11° 00'	0.039	170	0.097	240								
12° 00'	0.040	175	0.099	245								
13° 00'	0.041	180	0.100	250								
14° 00'	0.042											
15° 00'	0.043											
16° 00'	0.044											
17° 00'	0.045											
18° 00'	0.046											
19° 00'	0.047											
20° 00'	0.048	250										
21° 00'	0.049											
22° 00'	0.050											
23° 00'	0.051											
24° 00'	0.052											



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

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

ABBREVIATIONS

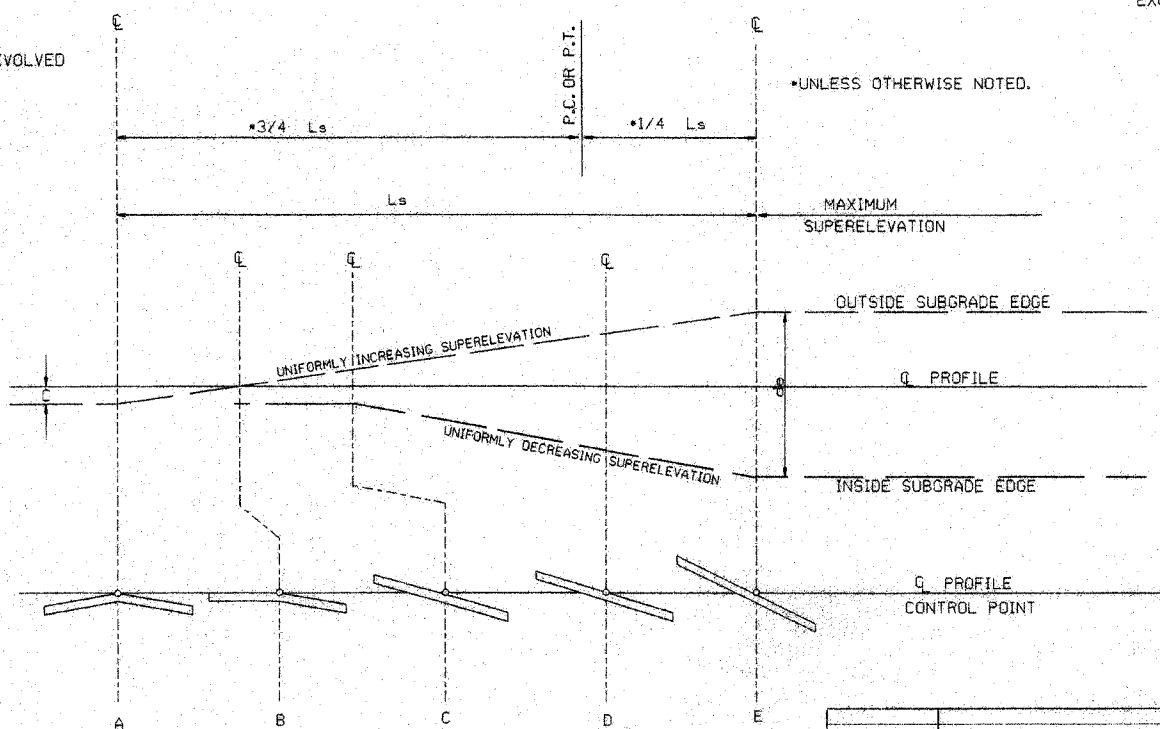
- NC - NORMAL CROWN
- RC - REVERSE CROWN, SUPERELEVATION AT NORMAL CROWN SLOPE
- e - RATE OF SUPERELEVATION (FT. PER FT.)
- L - LENGTH OF SUPERELEVATION TRANSITION (FT.)
- Ls - DISTANCE FROM BEGINNING OF SUPERELEVATION TRANSITION TO ANY POINT (FT.)
- d - WIDTH OF PAVEMENT (FT.) OR WIDTH OF SUBGRADE (FT.)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

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.



STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND CENTER LINE


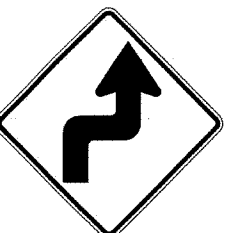
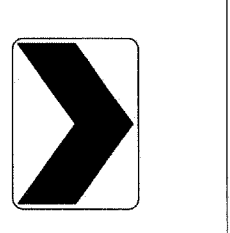



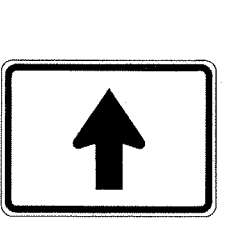
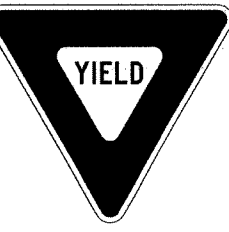

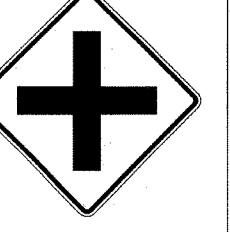


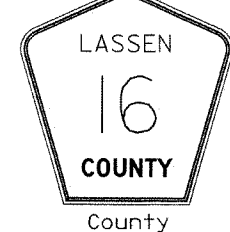
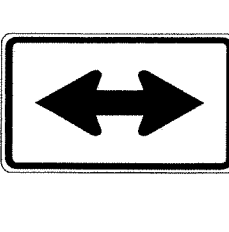
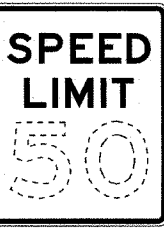

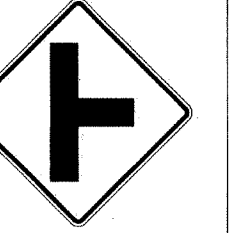


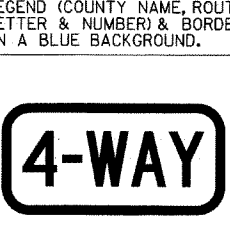
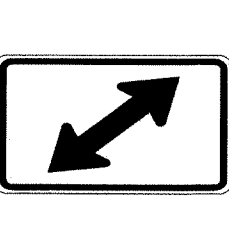
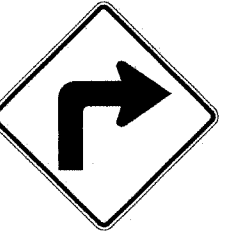
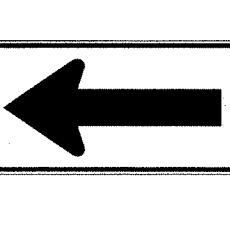
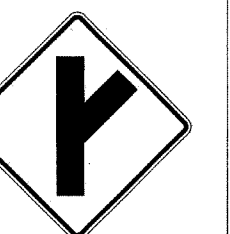

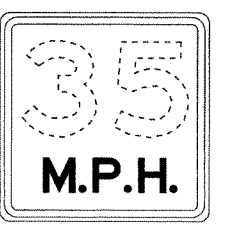
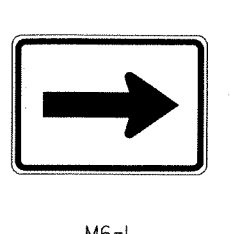
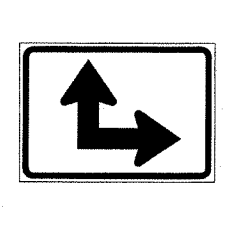

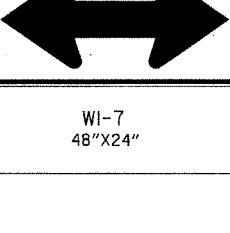
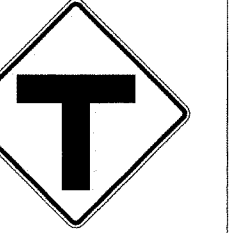

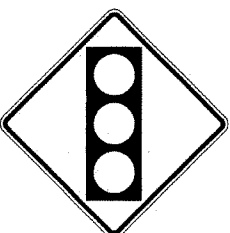
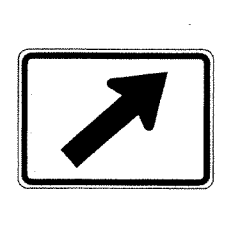
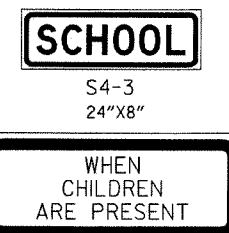

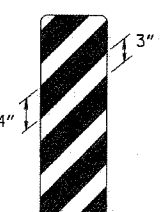
SUPERELEVATION FORMULA =  $\frac{Lde}{Ls}$

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

ARKANSAS STATE HIGHWAY COMMISSION

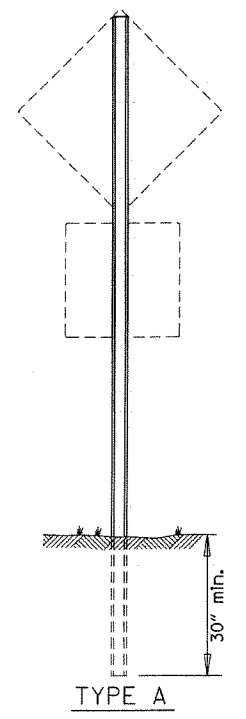
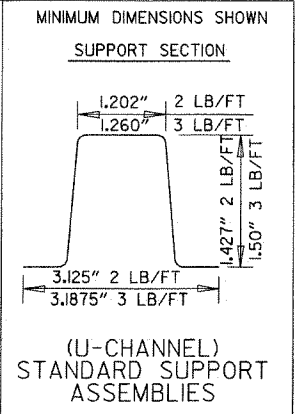
TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

STANDARD DRAWING SE-2

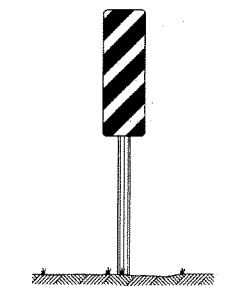
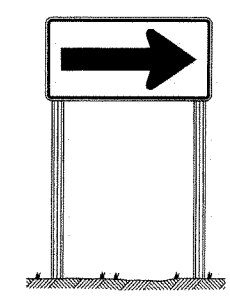
 RI-1 30"x30"	 WI-3 30"x30" (LT. OR RT.)	 WI-8 18"x24"	 W2-5 30"x30"	 W3-1 36"x36"	 W5-1 36"x36"	 M6-3 21"x15"
 RI-2 36"x36"x36"	 WI-4 30"x30" (LT. OR RT.)	 W2-1 30"x30"	 SI-1 36"x36"	 W3-2 36"x36"	 County Route Marker MI-5 24"x24"	 M6-4 21"x15"
 R2-1 24"x30"	 WI-5 30"x30" (LT. OR RT.)	 W2-2 30"x30"	 W5-2 36"x36"	 W8-3 36"x36"	 RI-3 12"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"	 WI3-1 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"	 S4-3 24"x8"
					 S4-2 24"x10"	 OM-3 12"x36" (LT. OR RT.)

NOTE: REFLECTORIZED YELLOW LEGEND (COUNTY NAME, ROUTE LETTER & NUMBER) & BORDER ON A BLUE BACKGROUND.

NOTE: ALL M6 SIGNS TO BE MADE WITH REFLECTORIZED YELLOW ARROW & BORDER WITH BLUE BACKGROUND.



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.

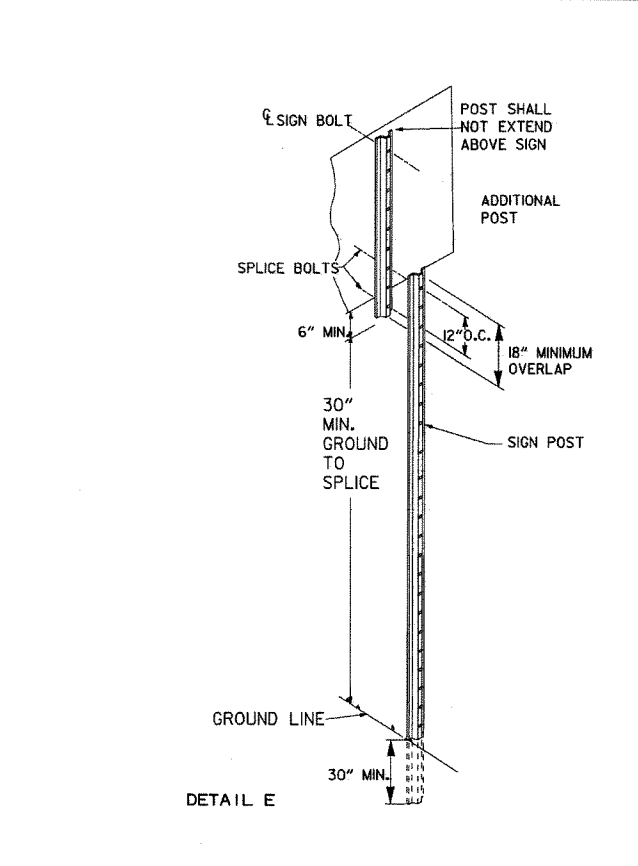
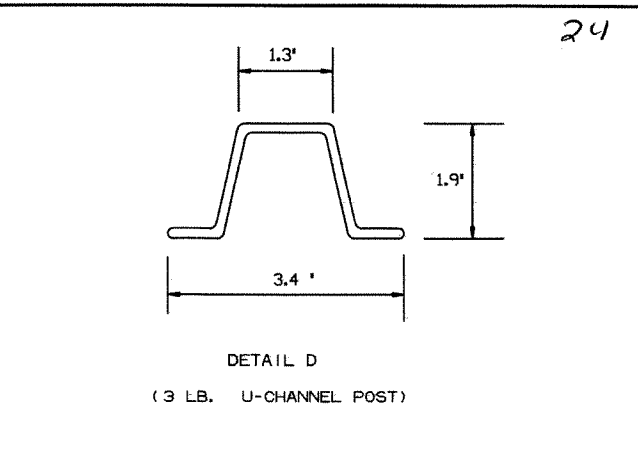
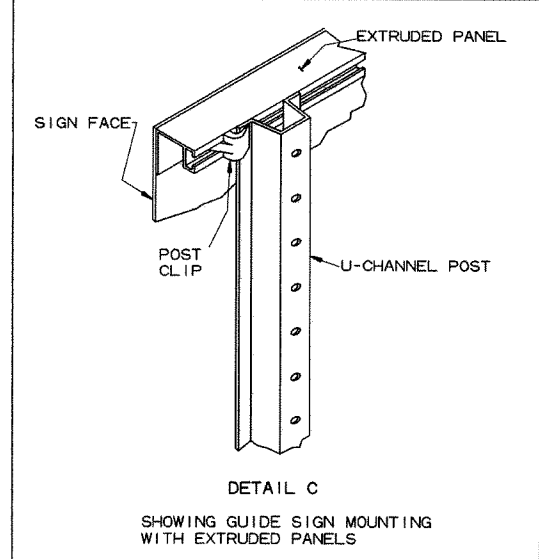
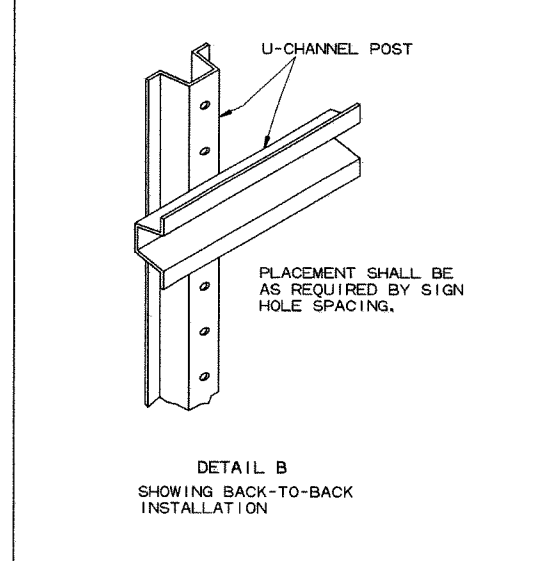
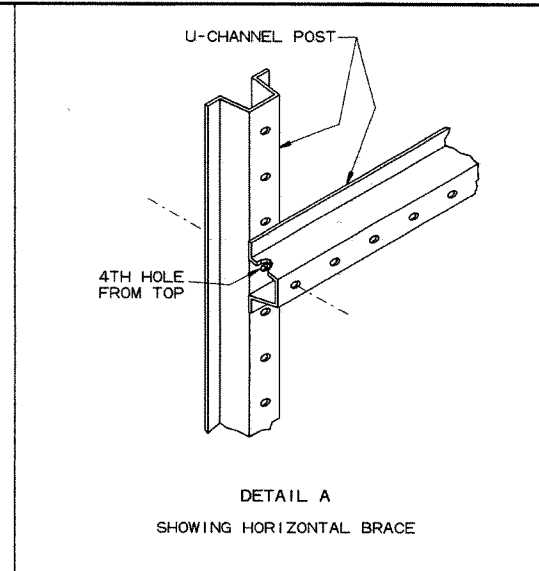
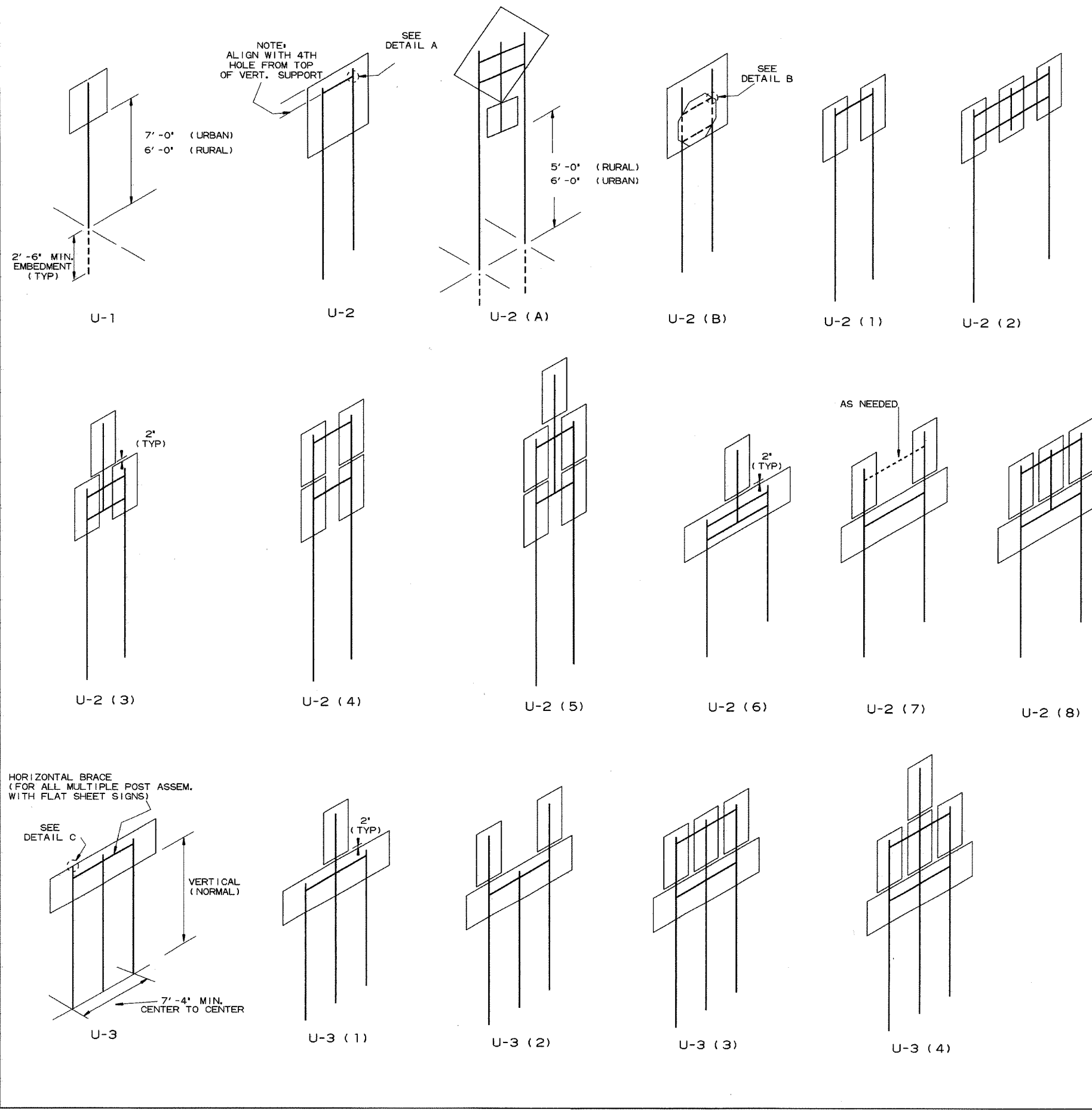


MINIMUM WEIGHT  
TYPE A & B = 3 LBS./FT.  
TYPE C = 2 LBS./FT.

STANDARD HIGHWAY SIGNS

4-17-08	REVISED SIGN DESIGNATION - W3-1 & W3-2	
4-10-03	REVISED W5-2, W8-3, OM-3; ADDED WI-8	
1-5-81	REDRAWN	960-1-15-81
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"	
8-12-74	ADDED S4-2 & S4-3	504-5-3-76
12-21-72	REV. HT. TYPE "C" ASSEMBLY	500-8-21-74
12-1-72	ADDED M6-2,3,4,5,6	500-12-21-72
	ISSUED	562-12-1-72
DATE	REVISION	DATE FILMED

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



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 (E).  
 NORMAL INSTALLATIONS WILL REQUIRE 1/4" DIA. CARRIAGE BOLTS TO MOUNT SIGNS TO POST AND 3/8" DIA. CARRIAGE BOLTS TO ASSEMBLE THE VARIOUS POST SUPPORTS.  
 ALL SIGN POSTS SHALL BE PLUMB.

10-9-03	REMOVED ROUND POST & REVISED SPACING	10-9-03
10-12-95	MOVED UPPER SPLICE	
6-8-95	REVISED SPLICE DETAIL	6-8-95
2-2-95	REDRAWN	2-2-95
DATE	REVISION	FILMED

ARKANSAS STATE HIGHWAY COMMISSION  
 U-CHANNEL POST ASSEMBLIES  
 STANDARD DRAWING SHS-2



ADVANCE DISTANCES (XXXX)

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

GENERAL NOTES:


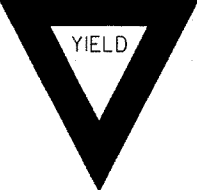
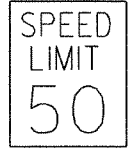
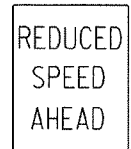




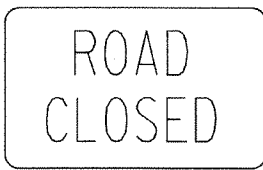
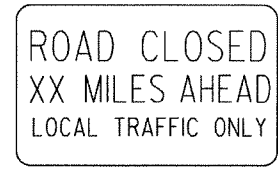
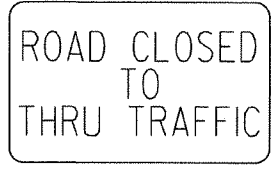
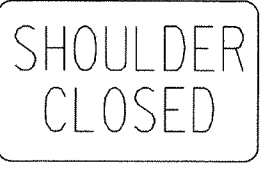
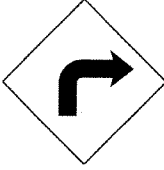

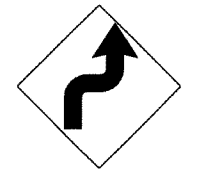



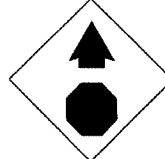
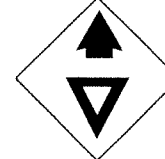
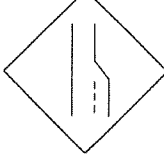



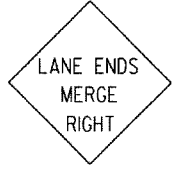
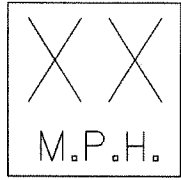

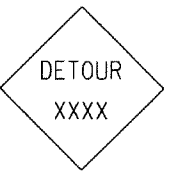


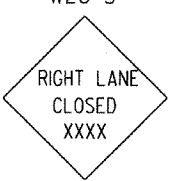


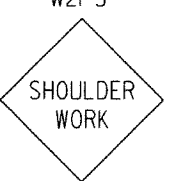
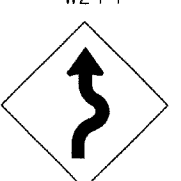
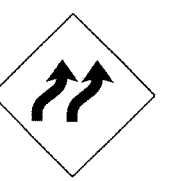


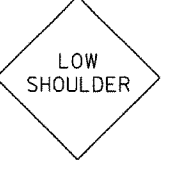
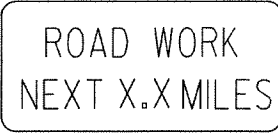
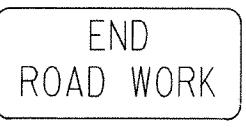
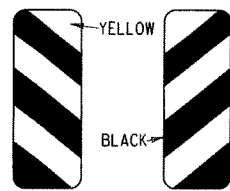


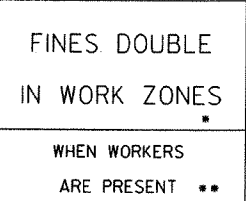
- ALL TRAFFIC CONTROL DEVICES USED ON ROAD CONSTRUCTION SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION, AND TO THE STANDARD HIGHWAY SIGNS, LATEST EDITION, OR AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION.
- TRAFFIC CONTROL DEVICES SHALL BE SET UP JUST BEFORE THE START 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.

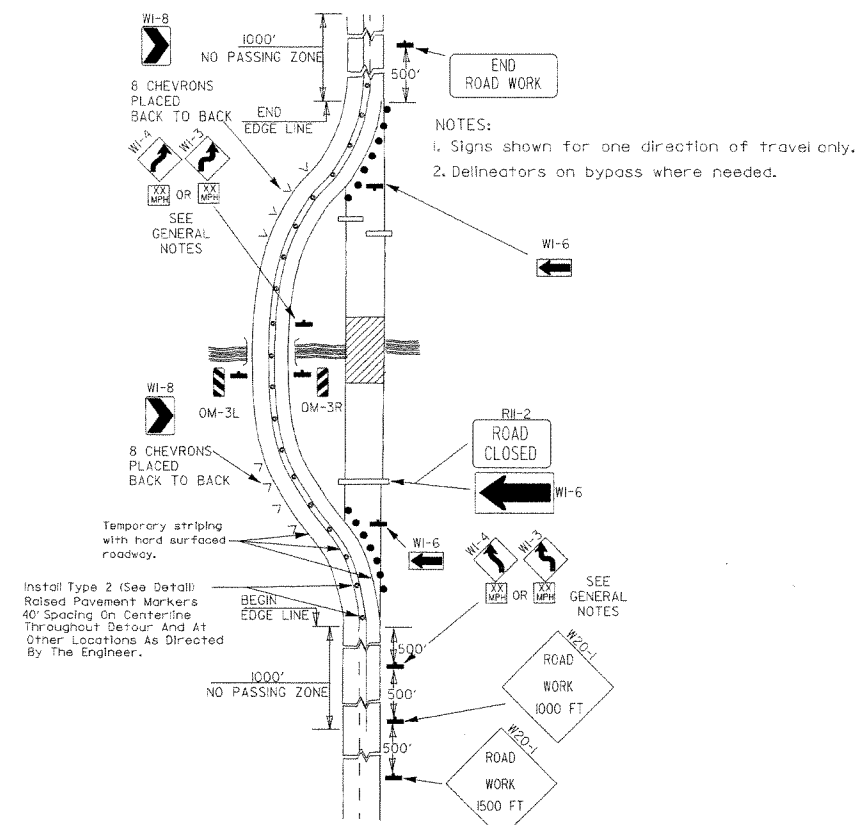
- FLAGGERS SHALL USE REFLECTORIZED STOP-SLOW PADDLES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.
- MOST OF THE SIGNS SHOWN ARE ORIENTED TO THE RIGHT, HOWEVER, THIS DOES NOT PRECLUDE THE USE OF MIRROR IMAGES OF THESE SIGNS WHERE THE REVERSE ORIENTATION MIGHT BETTER CONVEY TO MOTORISTS THE PROPER 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.

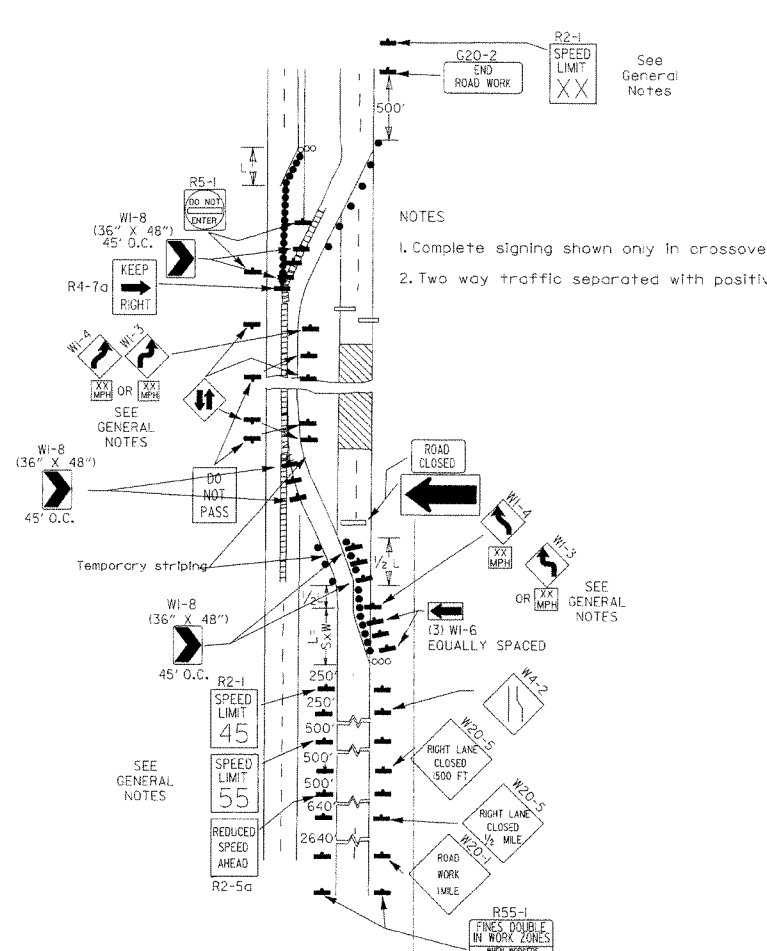
12-15-11	REVISED W24-1	
11-17-10	DELETED W8-9a & ADDED W8-9	
10-15-09	ADDED REFERENCE TO MASH & ADDED SIGN W24-1	
4-17-08	REVISED SIGN DESIGNATIONS	
11-18-04	REVISED NOTES	
10-9-03	REVISED NOTE 1	
11-16-01	REVISED NOTE 7	
9-28-00	REVISED NOTE	
11-18-98	ADDED NOTE	
6-26-97	REVISED NOTE 5	
4-03-97	REVISED 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	
8-15-91	DRAWN AND PLACED IN USE	
DATE	REVISION	FILMED

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

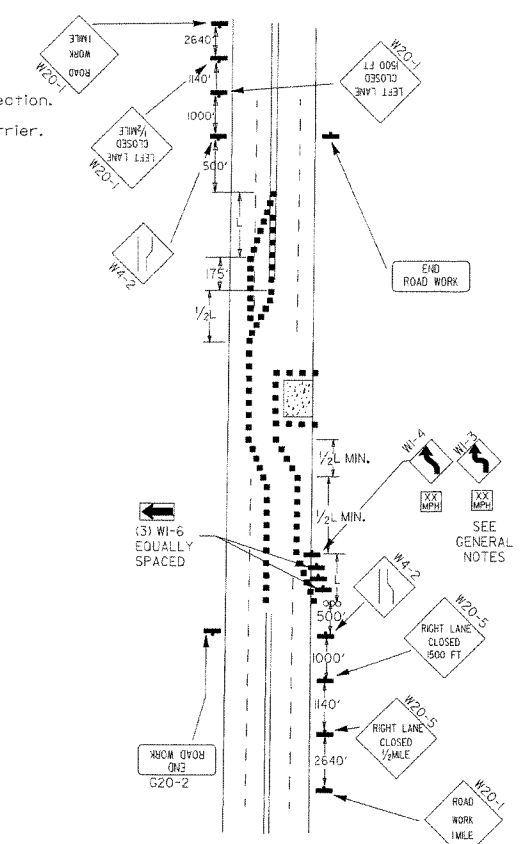
<p>RI-1</p>  <p>STANDARD 30"x30" EXPRESSWAY 36"x36" SPECIAL 48"x48"</p>	<p>RI-2</p>  <p>STD. 36"x36"x36" EXPWY. 48"x48"x48" FWY. 60"x60"x60"</p>	<p>R2-1</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</p>	<p>R2-5A</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</p>	<p>R2-5C</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</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>W20-3</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>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>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"</p> <p>• USE 6" C LETTERS •• USE 4" D LETTERS</p>



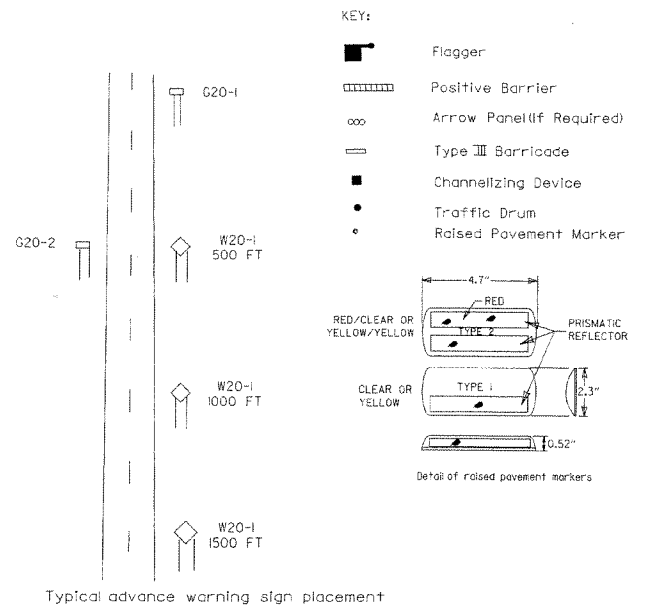
(A) Typical application of traffic control devices on a 2-lane highway where the entire roadway is closed and a bypass detour is provided.



(B) Typical application - 4-lane divided roadway where one roadway is closed.

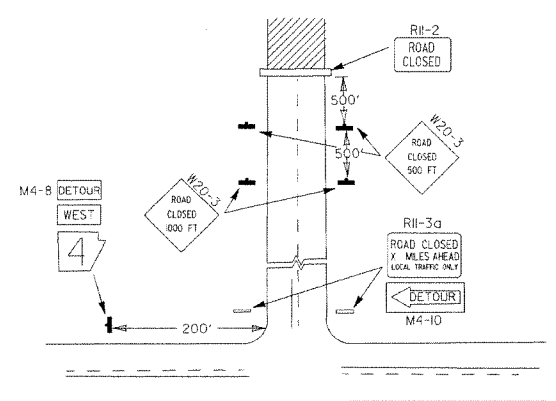


(C) Typical application - 4-lane undivided roadway where half of the roadway is closed.



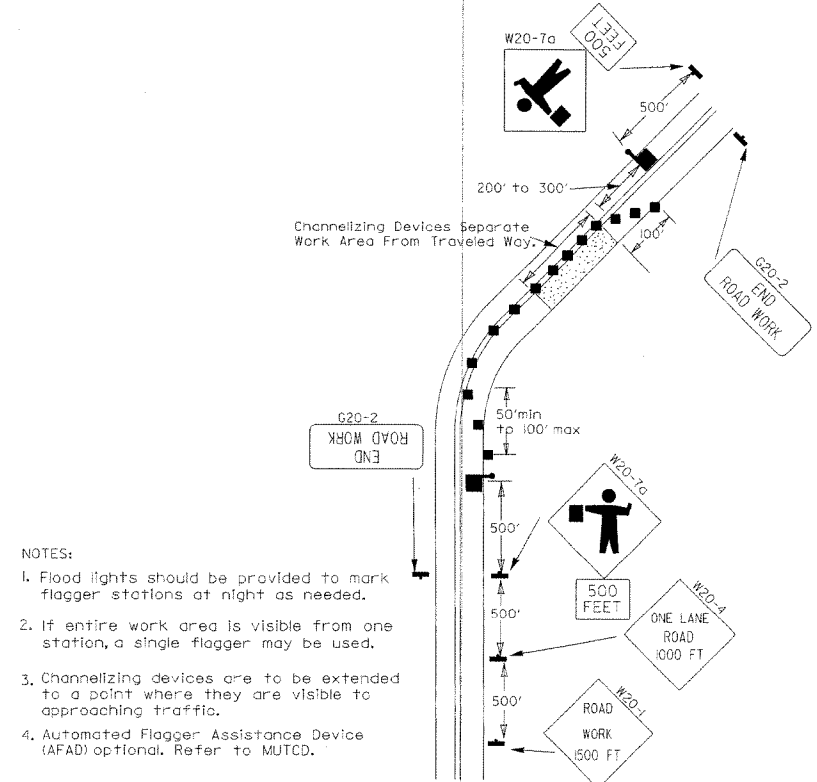
Taper formulae:  
 $L = S \times W$  for speeds of 45mph or more.  
 $L = \frac{WS^2}{60}$  for speeds of 40mph or less.  
 Where:  
 L = Minimum length of taper.  
 S = Numerical value of posted speed limit prior to work or 85th percentile speed.  
 W = Width of offset.

- GENERAL NOTES:
- Advisory speed posted on W1-3 or W1-4 curve warning signs to be determined at site. Use W1-4 when speed is greater than 30mph and W1-3 when 30mph or less.
  - When the existing speed limit is 45mph and the plans require a speed limit of 55mph, the R2-1(45) shall be omitted and the R2-5A shall be installed at that location. Additional R2-145mph speed limit signs shall be installed at a maximum of 1/2 mile intervals. At the end of the work area a R2-1(45) 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(45) shall be omitted. Additional R2-155mph speed limit signs shall be installed at a maximum of 1/2 mile intervals. At the end of the work area a R2-1(45) 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.
  - Trailer 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.

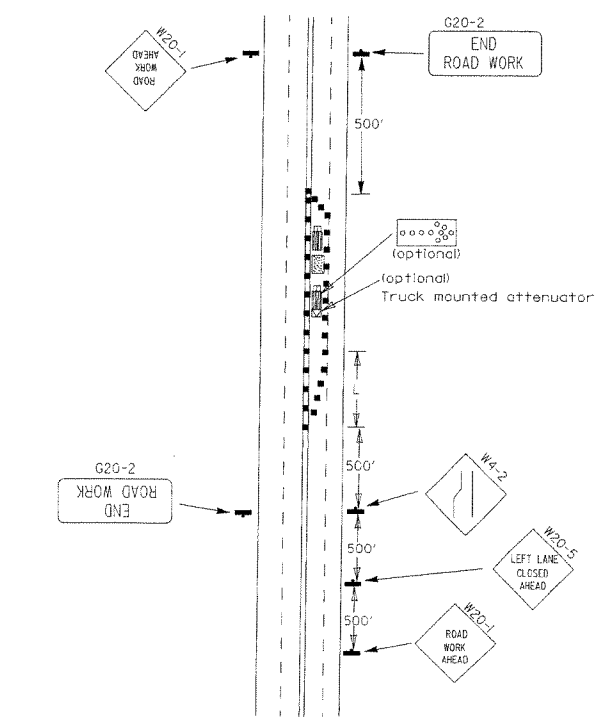


- NOTES:  
 1. Regulatory traffic control devices to be modified as needed for the duration of the detour.  
 2. Street names may be used when desirable for directing detoured traffic.

(D) Typical application - roadway closed beyond detour point.



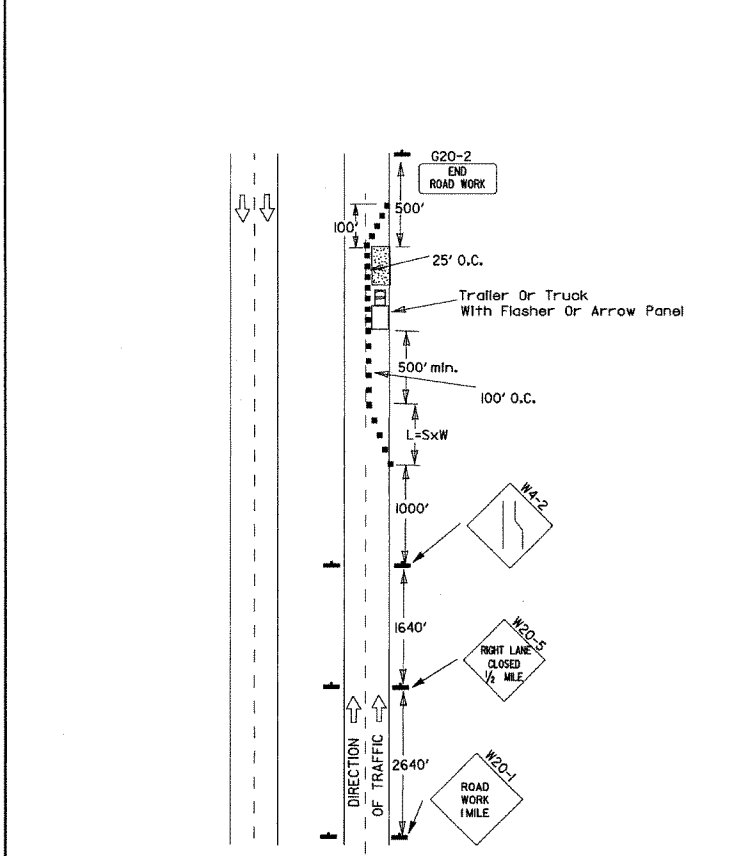
(E) Typical application of traffic control devices on 2-lane highway where one lane is closed and flagging is provided.



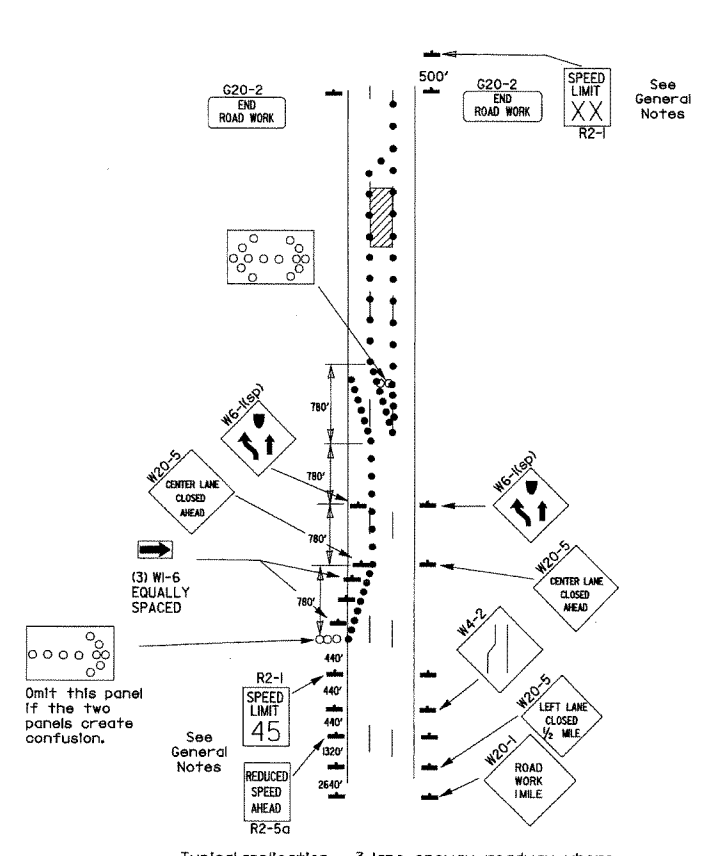
(F) Typical application - 4-lane undivided roadway with inside lane closed.

DATE	REVISION	FILMED
3-11-10	ADDED (AFAD)	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	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 VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

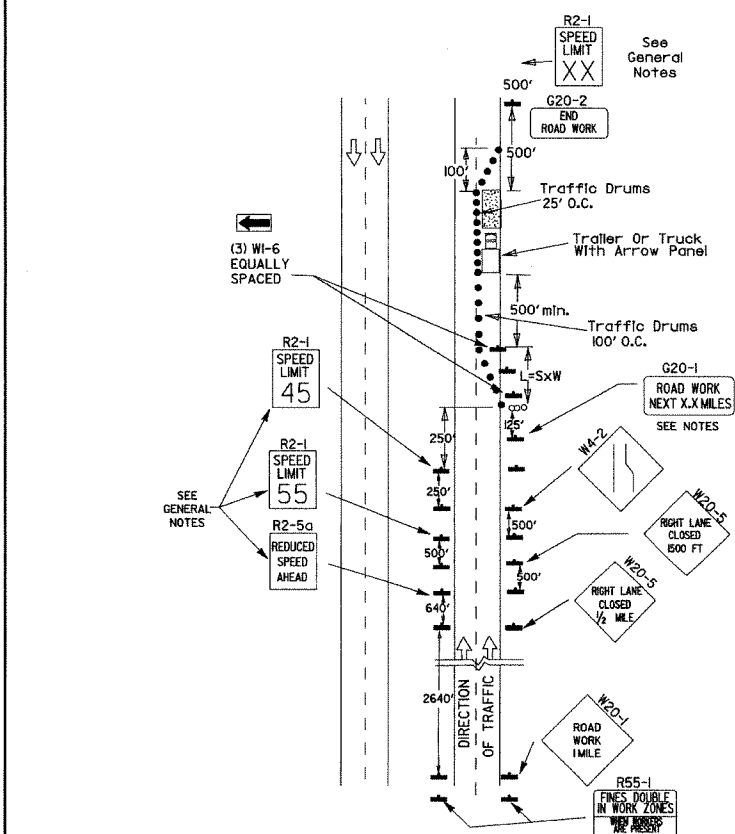
ARKANSAS STATE HIGHWAY COMMISSION  
 STANDARD TRAFFIC CONTROLS  
 FOR HIGHWAY CONSTRUCTION  
 STANDARD DRAWING TC-2



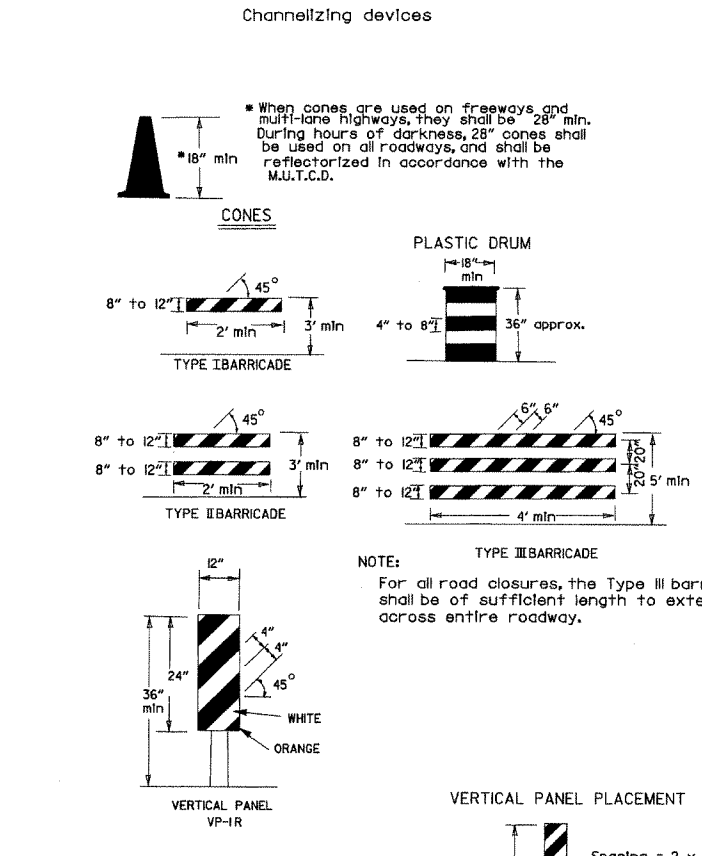
(A) Typical application - daytime maintenance operations of short duration on a 4-lane divided roadway where half of the roadway is closed.



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

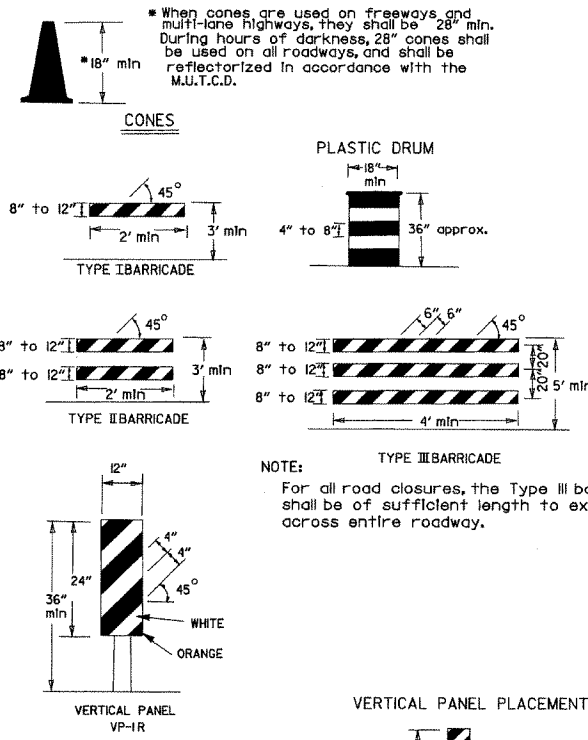


(C) Typical application - construction operations of intermediate to long term duration on a 4-lane divided roadway where half of the roadway is closed.



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

Channelizing devices



TRAFFIC CONTROL DEVICES FOR VERTICAL PAVEMENT DIFFERENTIALS

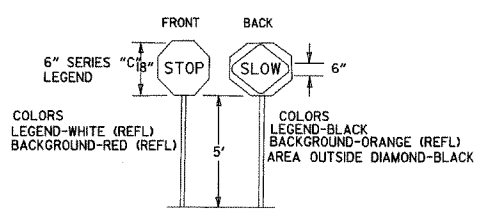
VERTICAL DIFFERENTIAL	LOCATIONS	TRAFFIC CONTROL
1" to 3"	Centerline, lane lines	W8-11
1" to 3"	Edge of shoulder	W8-9
Greater than 3"	Lane lines	Standard lane closure required
Greater than 3"	Edge of traveled lane	*RSP-lane vertical panels, drums or concrete barrier
Greater than 3"	Edge of shoulder	*Vertical panels, drums or concrete barrier

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.

FLAG



STOP SLOW PADDLE

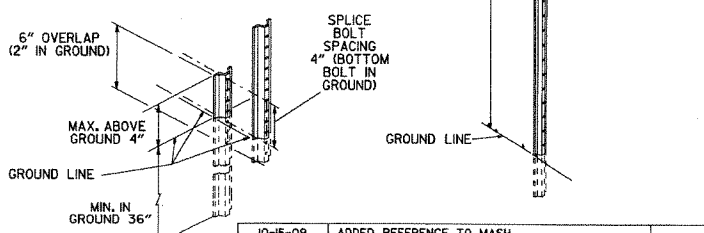


- KEY:
- Arrow Panel (if Required)
  - Channelizing Device
  - Traffic drum

GENERAL NOTES:

1. A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
2. 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 R2-5a shall be installed at that location. Additional R2-145mph speed limit signs shall be installed at a maximum of 1/2 mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
3. When the existing speed limit is 65mph and the plans require a speed limit of 55mph, the R2-1(65) shall be omitted. Additional R2-155mph speed limit signs shall be installed at a maximum of 1/2 mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
4. 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.
5. Warning lights and/or flags may be mounted to signs or channelizing devices at night as needed.
6. Pavement markings no longer applicable which might create confusion in the minds of vehicle operators shall be removed or obliterated as soon as practicable.
7. 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(1/2 MILE) signs are not required in advance of lane closures that begin inside the project limits.
8. Flaggers shall use STOP/SLOW paddles for controlling traffic through work zones. Flags may be used only for emergency situations.
9. All plastic drums and cones shall meet the requirements of NCHRP-350 or Manual for Assessing Safety Hardware (MASH).
10. Trailer 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.

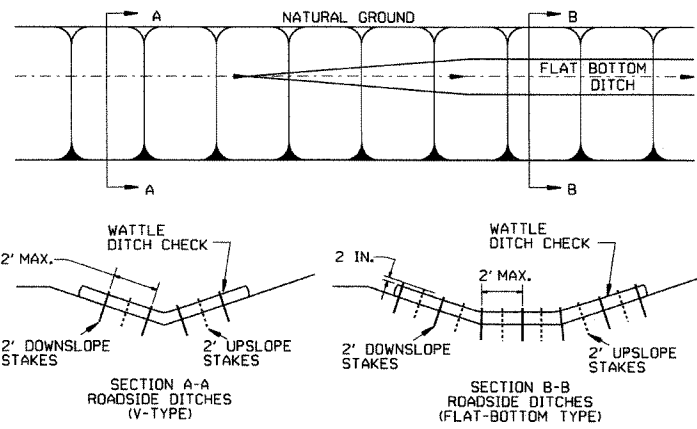
- NOTES:
- USE SPLICES ONLY WHEN NECESSARY FOR INSTALLATION. TYPICAL INSTALLATION SHOULD HAVE NO SPLICES (SEE STD. DRAWING NO. SHS-2)
  - NORMAL INSTALLATIONS WILL REQUIRE 1/4" DIA. BOLTS TO MOUNT SIGNS TO POST AND 5/16" DIA. BOLTS TO ASSEMBLE THE VARIOUS POST SUPPORTS. EACH OF THESE BOLTS SHALL BE CARRIAGE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



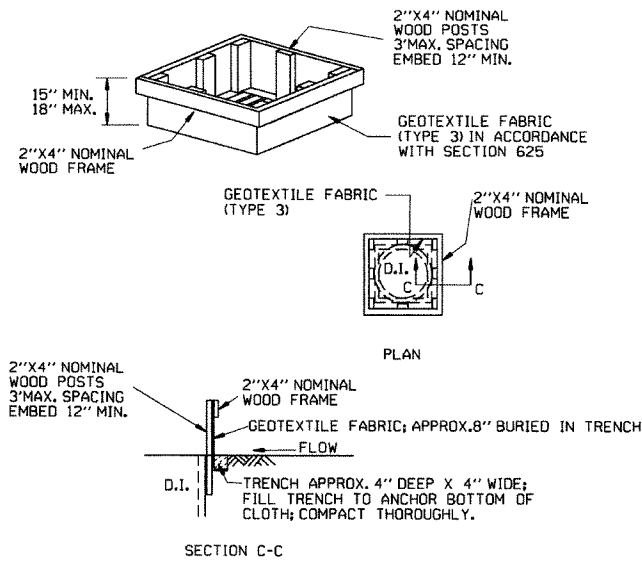
DATE	REVISION	FILMED
10-15-09	ADDED REFERENCE TO MASH	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED NOTE	
10-1-98	ADDED NOTE	
4-03-97	ADDED (SP) TO W6-1& REVISED TRAFFIC CONTROL DEVICES NOTE	
10-18-96	ADDED R55-1	
10-12-95	MOVED UPPER SPLICE	
6-8-95	REVISED SPLICE DETAIL, TEXT	6-8-95
2-2-95	REVISED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

GENERAL NOTES

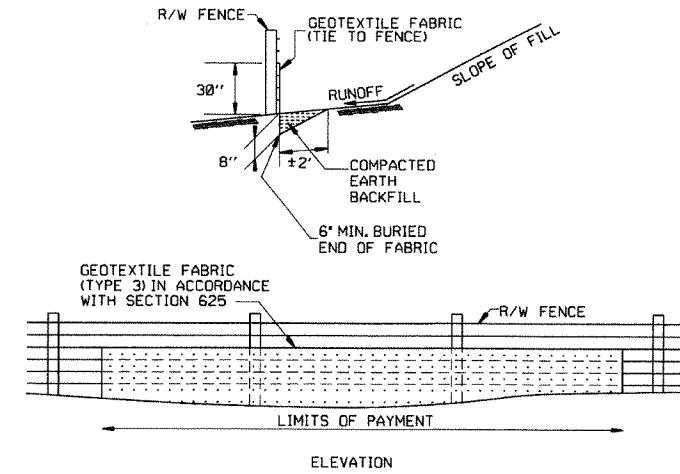
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



WATTLE DITCH CHECK (E-1)



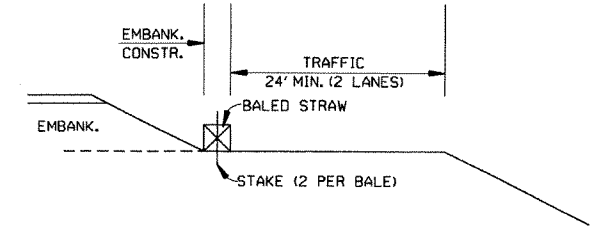
DROP INLET SILT FENCE (E-7)



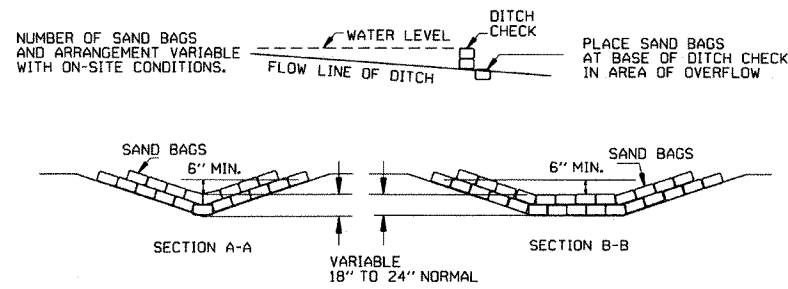
SILT FENCE ON R/W FENCE (E-4)

GENERAL NOTES  
 GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST, OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

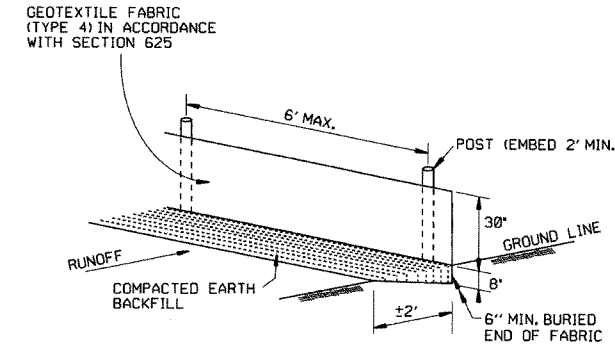
- GENERAL NOTES
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.
  2. NO GAPS SHALL BE LEFT BETWEEN BALES.
  3. BALED STRAW FILTER BARRIERS COMPLETED AND ACCEPTED WILL BE MEASURED BY THE BALE IN PLACE AS AUTHORIZED BY THE ENGINEER AND WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER BALE FOR BALED STRAW DITCH CHECKS.



BALED STRAW FILTER BARRIER (E-2)

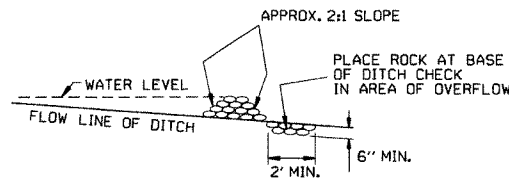


SAND BAG DITCH CHECK (E-5)



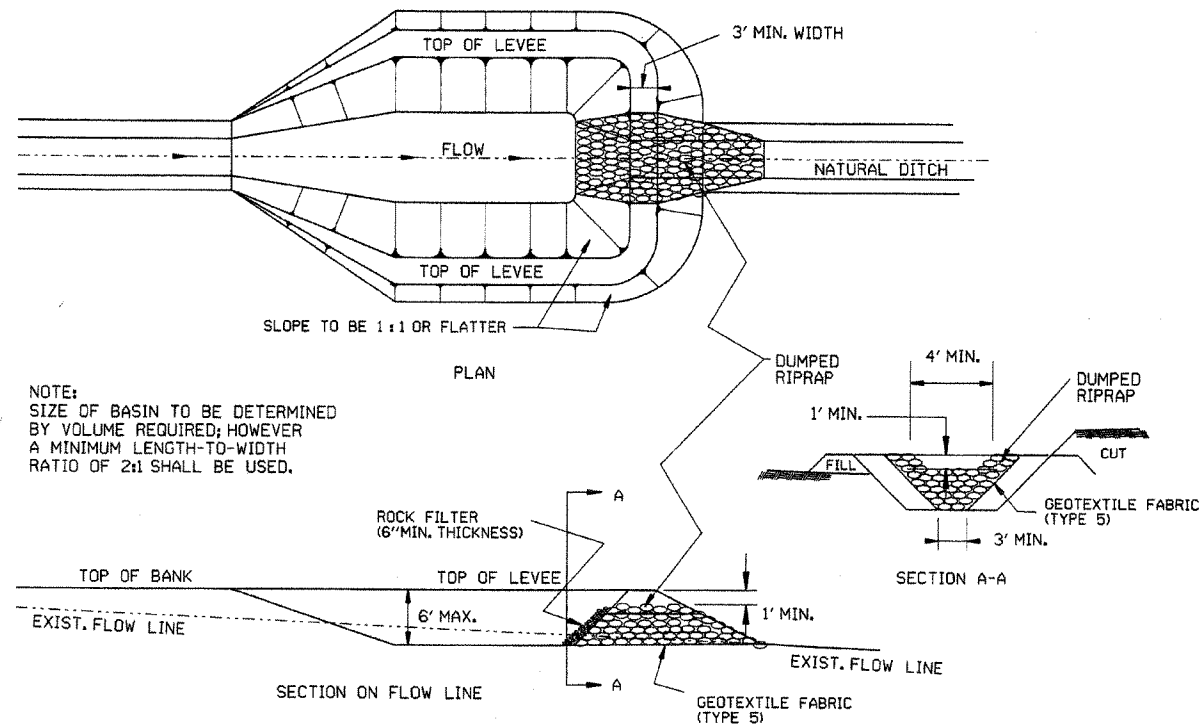
SILT FENCE (E-11)

GENERAL NOTES  
 GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

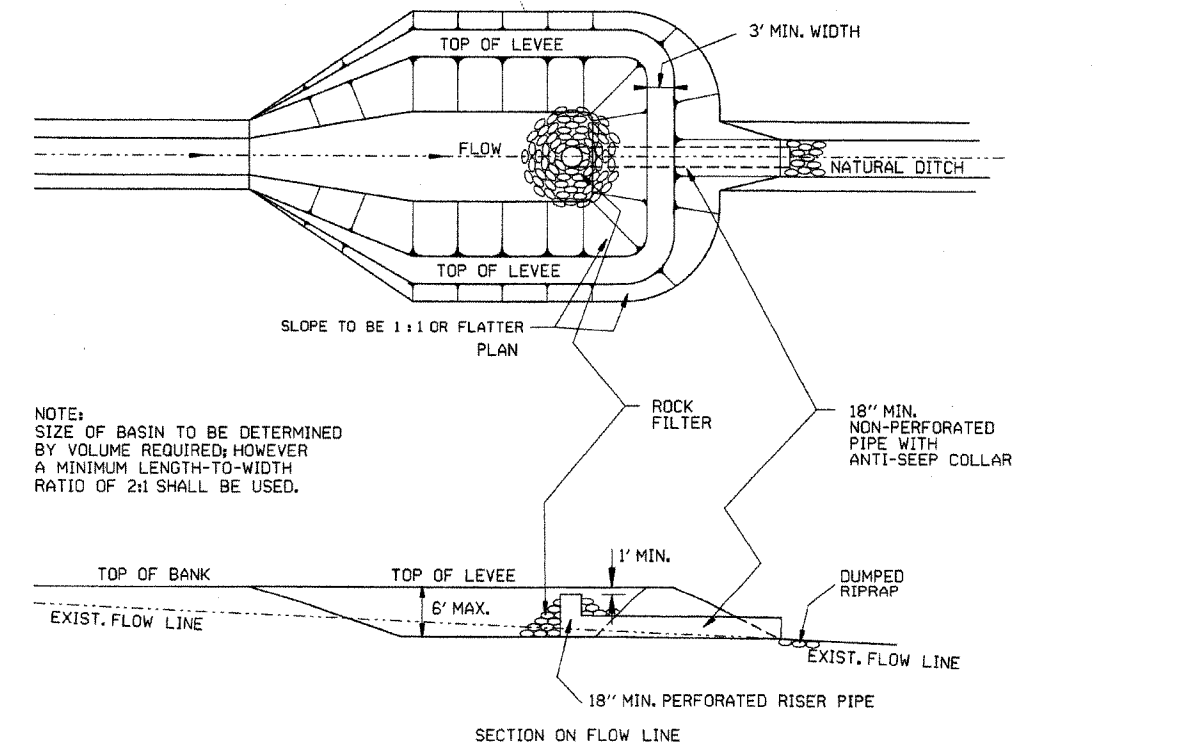


ROCK DITCH CHECK (E-6)

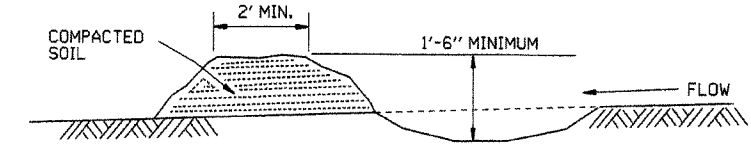
12-15-11	DELETED BALED STRAW DITCH CHECK & ADDED WATTLE DITCH CHECK		ARKANSAS STATE HIGHWAY COMMISSION
11-18-98	ADDED NOTES		TEMPORARY EROSION CONTROL DEVICES
7-02-98	ADDED BALED STRAW FILTER BARRIER (E-2)		
7-20-95	REVISED SILT FENCE E-4 AND E-11	7-20-95	STANDARD DRAWING TEC-1
7-15-94	REV. E-4 & E-11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



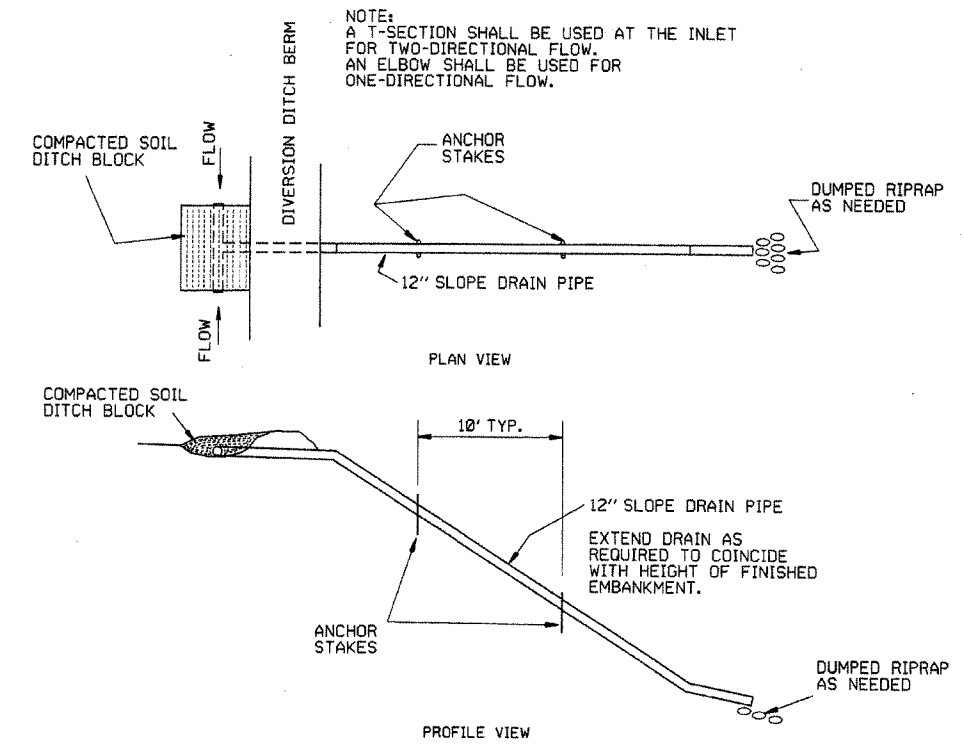
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



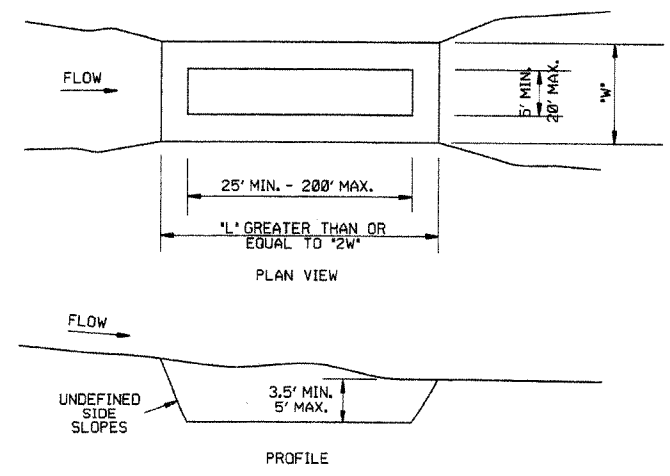
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



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

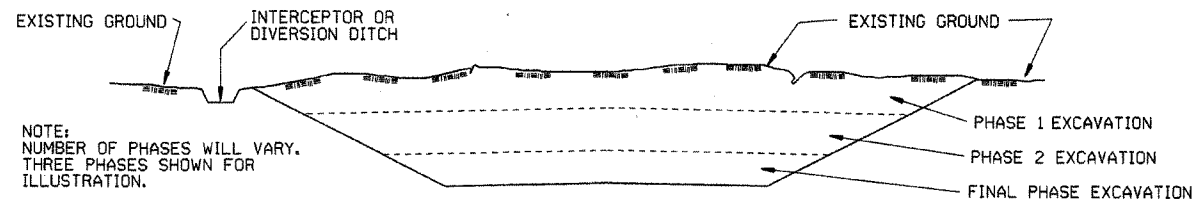
ARKANSAS STATE HIGHWAY COMMISSION  
 TEMPORARY EROSION CONTROL DEVICES  
 STANDARD DRAWING TEC-2

# 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.

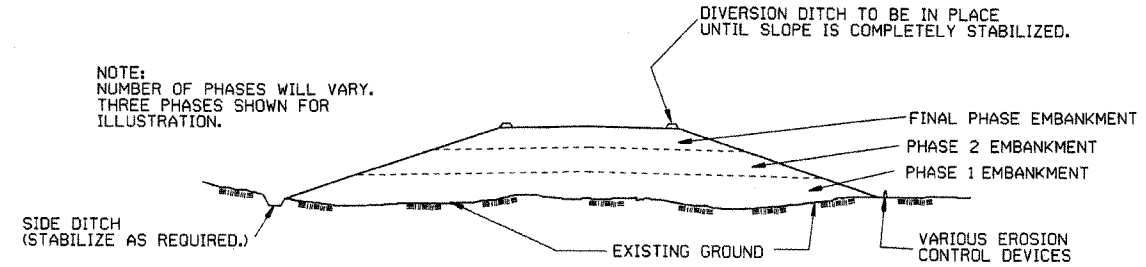
## GENERAL NOTE

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.

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:

STEEL LINE POSTS SHALL BE PAINTED OR GALVANIZED. TUBULAR END, CORNER, PULL, OR DIAGONAL BRACES MUST CONFORM TO THE DIMENSIONS AND WEIGHTS SPECIFIED ON STANDARD DRAWING WF-3 (CHAIN LINK). APPROVED ALTERNATES ARE ACCEPTABLE. AN ACCEPTABLE TOLERANCE IN LENGTH OF TUBULAR OR WOODEN POSTS SHALL BE -1" TO +2". TUBULAR POSTS MUST BE PAINTED OR GALVANIZED.

THE CONTRACTOR SHALL FURNISH AT LEAST 25% OF TIMBER LINE POSTS OF 7 FOOT LENGTHS IN ORDER TO PROVIDE SUFFICIENT SET IN SOFT GROUND OR SMALL DEPRESSIONS.

DRIVEWAY GATES, EITHER SINGLE 12' TO 16' OR DOUBLE 6' TO 8' OPENING OF THE SAME TYPE AS THE PEDESTRIAN GATE, SHALL BE INSTALLED ON THE RIGHT SIDE OF EACH THROUGH LANE ROAD AT LARGE CULVERTS OR BRIDGE CROSS FENCE, FOR USE OF MAINTENANCE EQUIPMENT. LOCATION OF GATES TO BE SHOWN ON PLANS OR AS DESIGNATED BY THE ENGINEER.

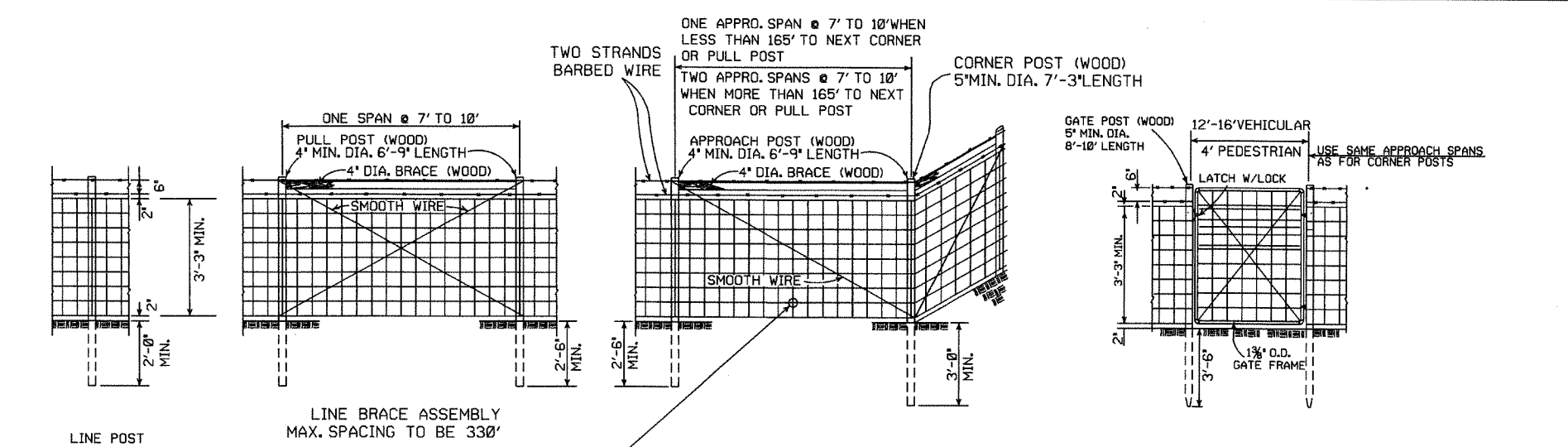
AT STREAM CROSSINGS, THE FENCE SHALL NOT BE CONSTRUCTED ACROSS LARGE STREAMS, WHERE CLEARANCE IS SUFFICIENT FROM THE TOP OF THE BANK TO THE BRIDGE STRUCTURE A CROSS CONNECTION SHALL BE CONSTRUCTED BETWEEN THE FENCE ON EACH SIDE OF THE ROAD, WHERE THE CLEARANCE IS NOT SUFFICIENT, THE FENCE SHALL BE TERMINATED WITH CROSS CONNECTIONS AND END POSTS ADJACENT TO BRIDGE ABUTMENTS OR CULVERT WINGWALLS.

NOTE: USE 3/8" X 1 1/2" LAG BOLT & SHIELD OR AS APPROVED BY THE ENGINEER.

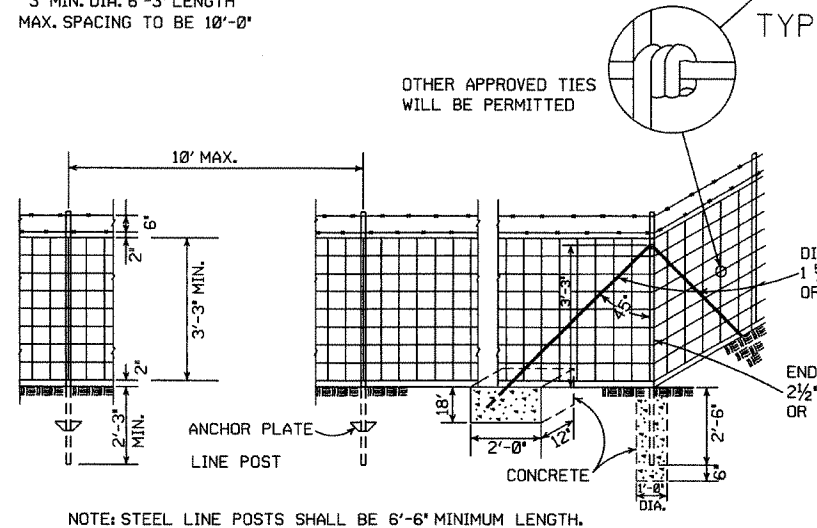
SPLICE FOR BARBED WIRE BETWEEN PULL POST ASSEMBLY SHALL BE BY THE 'EYE METHOD' AS DESCRIBED AS FOLLOWS: THE ENDS OF THE BARBED WIRE SHALL BE BENT TO FORM A LOOP. THE LOOPS SHALL BE CONNECTED. AFTER THE LOOPS ARE CONNECTED THE ENDS OF THE WIRE SHALL BE WRAPPED AROUND THE PROJECTING WIRES A MINIMUM OF 4 TIMES FOR EACH WIRE LOOP.

SPLICE FOR WOVEN WIRE BETWEEN PULL POST SHALL BE BY THE 'WESTERN UNION METHOD' AS DESCRIBED AS FOLLOWS: THE VERTICAL WIRES FOR EACH END OF THE FENCE FABRIC SHALL BE PLACED SIDE BY SIDE AND THE PROJECTING HORIZONTAL WIRES SHALL BE WRAPPED A MINIMUM OF 4 TIMES AROUND THE HORIZONTAL WIRES OF THE FIRST WEB.

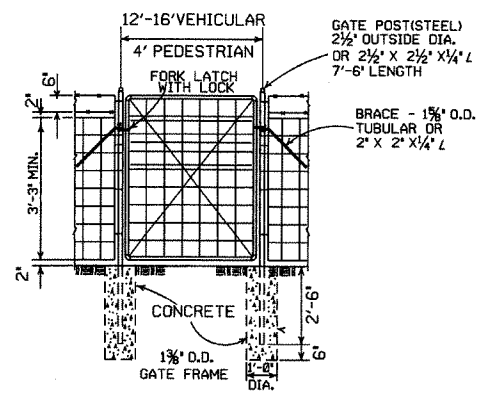
STAPLE AT LEAST TOP, BOTTOM AND ALTERNATE WIRES OF WOVEN FABRIC FOR WOOD LINE POSTS.



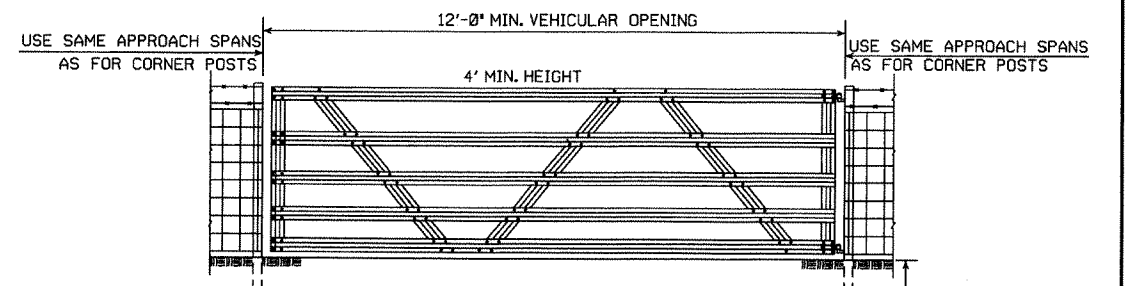
TYPE C FENCE (WOOD POSTS)



TYPE C FENCE (STEEL POSTS)

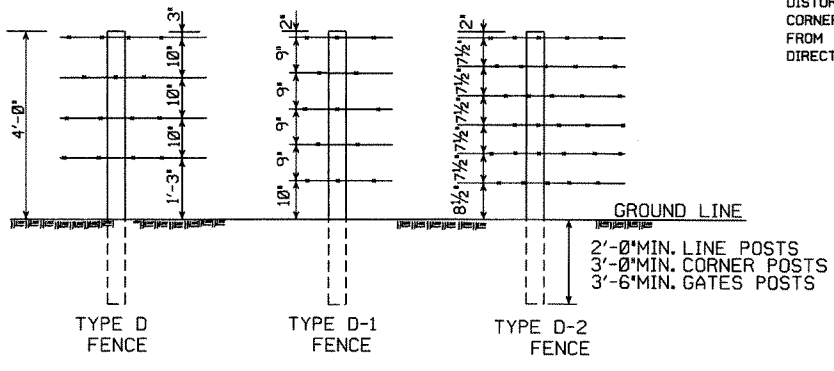


DETAIL OF FENCE CONSTRUCTION AT LARGE CULVERTS (5' IN HEIGHT AND OVER)



OTHER STYLE VEHICULAR GATES MAY BE USED WITH THE APPROVAL OF THE ENGINEER. THE METHOD OF SECURING GATE (LATCH AND/OR LOCK) SHALL MEET THE APPROVAL OF THE ENGINEER.

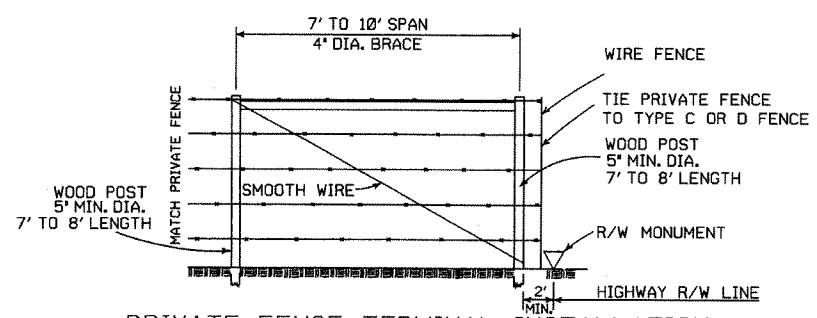
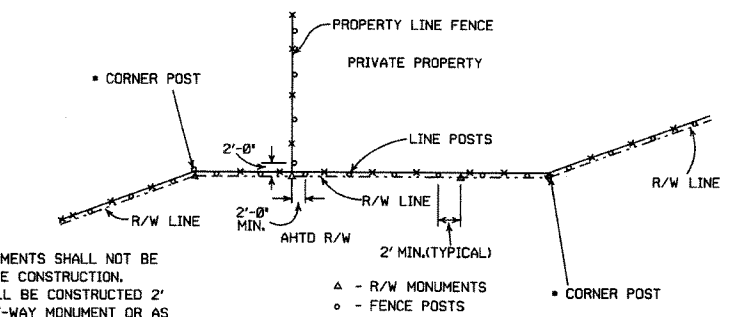
- 4 STRANDS BARBED WIRE (D)
- 5 STRANDS BARBED WIRE (D-1)
- 6 STRANDS BARBED WIRE (D-2)



NOTE: SPACING AND SIZE (EXCEPT LENGTH) OF POSTS, APPROACH SPANS, PULL POST ASSEMBLIES, AND CORNER BRACING FOR TYPE D FENCE SHALL CONFORM TO TYPE C FENCE. USE GALVANIZED STAPLES ON WOOD POSTS AND APPROVED FASTENERS ON STEEL POSTS.

NOTE: RIGHT-OF-WAY MONUMENTS SHALL NOT BE DISTURBED BY FENCE CONSTRUCTION. CORNER POSTS SHALL BE CONSTRUCTED 2' FROM THE RIGHT-OF-WAY MONUMENT OR AS DIRECTED BY THE ENGINEER.

RIGHT-OF-WAY FENCE LOCATION



PRIVATE FENCE TERMINAL INSTALLATION

WHERE EXISTING FENCE CONSISTS OF STEEL POSTS, USE END POST ASSEMBLY AS SHOWN IN TYPE C FENCE OR OTHER END POST ASSEMBLY AS APPROVED BY THE ENGINEER.

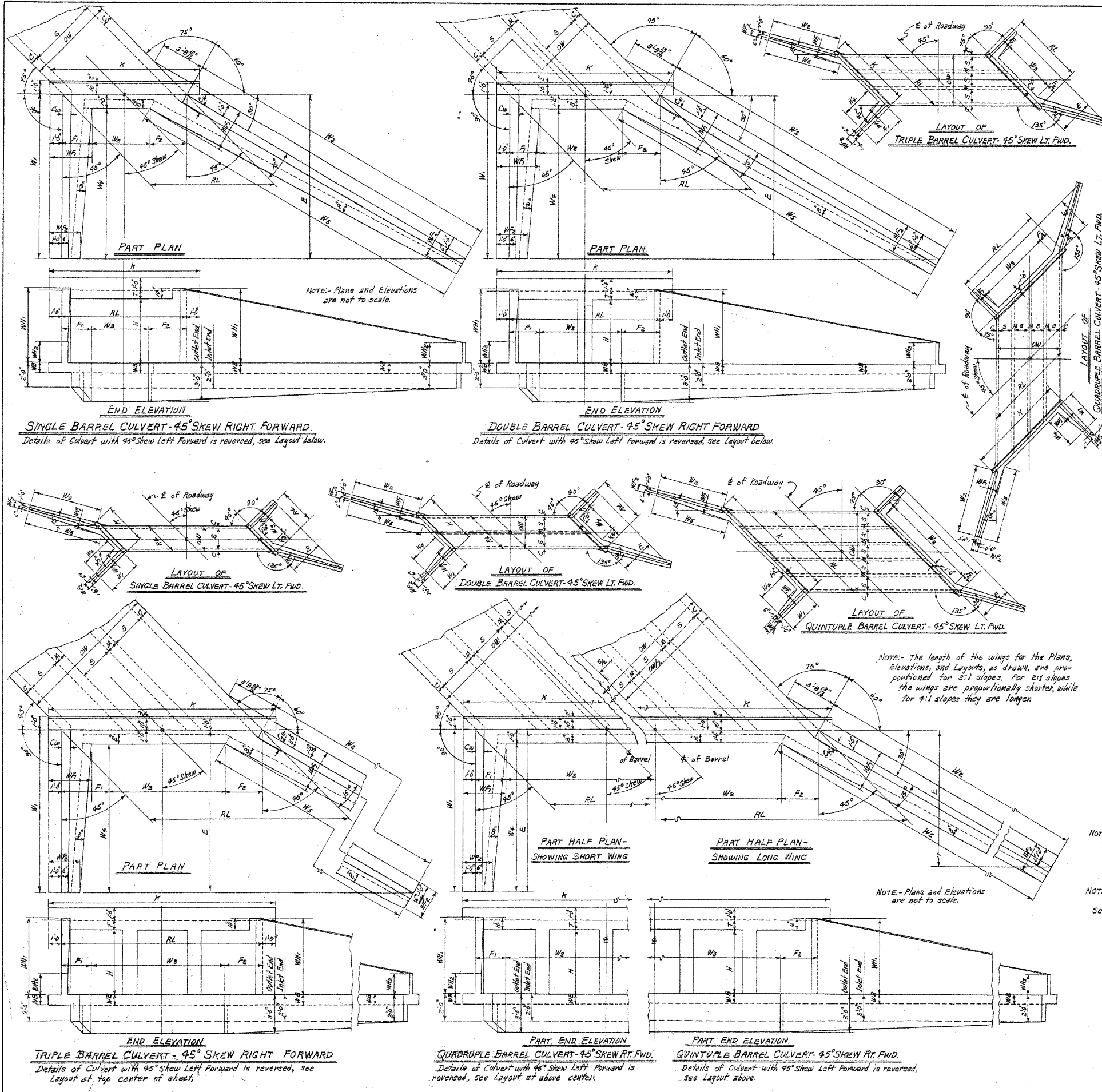
8-22-02	REVISED GENERAL NOTES	
10-18-96	REVISED AASHTO	
11-22-95	REVISED R-O-W LOCATION DETAIL	
6-2-94	REVISED BARB WIRE AND ADDED CORNER POST NOTES	6-2-94
8-5-93	REVISED R/W INSTALLATION FENCE	8-5-93
10-1-92	ADDED STAPLE NOTE	10-1-92
8-15-91	ADDED TYPE D-2 FENCE	8-15-91
11-30-89	DELETED CLASS CONCRETE	11-30-89
7-15-88	ADDED SPLICE NOTE	700-7-15-88
10-30-87	GENERAL REVISIONS	549-10-30-87
11-1-84	MAX. POST SPACING MIN. WIRE GAUGE	507-11-1-84
1-4-83	MIN. DIA. LINE POST	648-1-4-83
3-2-81	TOLERANCE FOR POST LENGTH	722-3-2-81
12-1-72	ADDED D-1 & FENCE INSTALLATION	564-12-1-72
10-2-72	REVISED AND REDRAWN	540-10-2-72
DATE	REVISION	FILMED

ARKANSAS STATE HIGHWAY COMMISSION

WIRE FENCE  
TYPE C AND D

STANDARD DRAWING WF-4

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			32	
JOB No.					



ROADWAY LENGTH RL HEADWALL LENGTH K APRON DIMENSION W<sub>3</sub>

RL = OW x 1.41421 K = RL(2'0) W<sub>3</sub> = RL - (F<sub>1</sub> + F<sub>2</sub>)

USE WITH DRAWING NO.	CLEAR SPAN	CLEAR HEIGHT	SUM OF DIMENSIONS	SINGLE BARREL CULVERT			DOUBLE BARREL CULVERT			TRIPLE BARREL CULVERT			QUADRUPLE BARREL CULVERT			QUINTUPLE BARREL CULVERT		
				OW	RL	K	W <sub>3</sub>	OW	RL	K	W <sub>3</sub>	OW	RL	K	W <sub>3</sub>	OW	RL	K
W-X-452-1, W-X-453-1 or W-X-454-1	4	2	2'-3"	5'-0"	7'-0"	9'-0"	4'-9"	9'-8"	13'-8"	15'-8"	11'-4"	14'-4"	20'-3"	22'-3"	18'-0"	19'-0"	23'-2"	25'-2"

Note: This drawing to be used in conjunction with Standard Wing Drawings for 45° Skews for each slope as listed below.

2:1 Slopes W-X-452-1 or W-X-452-2  
 3:1 Slopes W-X-453-1 or W-X-453-2  
 4:1 Slopes W-X-454-1 or W-X-454-2

Note: This drawing to be used in conjunction with Standard Barrel Sections, Drawing Nos.:

SINGLES	DOUBLES	TRIPLES	QUADRUPLES	QUINTUPLES
R-145X-0	R-245X-01	R-345X-01	R-445X-01	R-545X-01
	R-245X-02	R-345X-02	R-445X-02	R-545X-02
R-145X-1	R-245X-1	R-345X-1	R-445X-1	
	R-245X-2	R-345X-2		

**CLASS 3 CONCRETE**

**ARKANSAS STATE HIGHWAY COMMISSION**  
**DETAILS OF STANDARD WINGS**  
**FOR**  
**REINFORCED CONCRETE BOX CULVERTS**  
**45° SKEW**

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS  
 2:1, 3:1 & 4:1 SLOPES  
 SINGLES, DOUBLES, TRIPLES, ALL DEPTHS OF COVER  
 QUADRUPLES & QUINTUPLES H=2', 3', 4', 5', 6', 7', 8', 9', 10', 11' & 12'

**STANDARD DRAWING No. W-X-45**

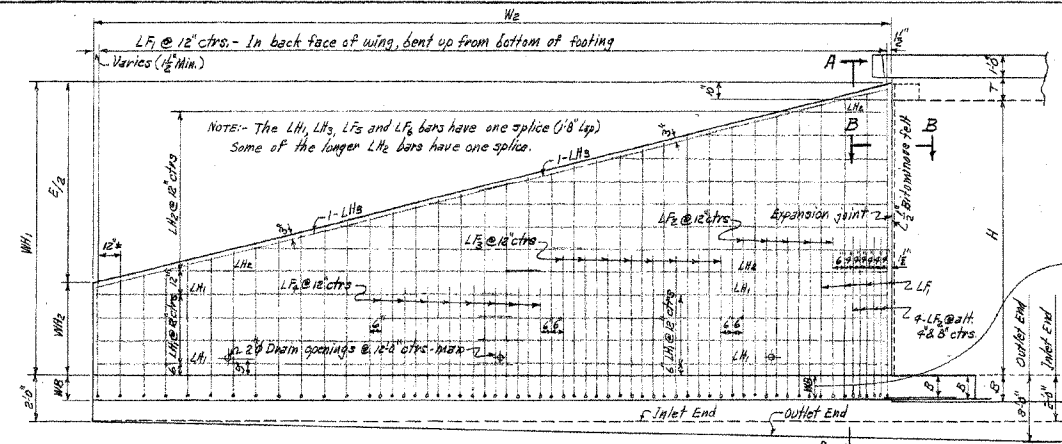
Designed by: W.C.H. 5-16-63  
 Drawn by: W.C.H. 6-16-63  
 Checked by: J.E.M. 6-23-64  
 Checked by: J.E.M. 6-23-64



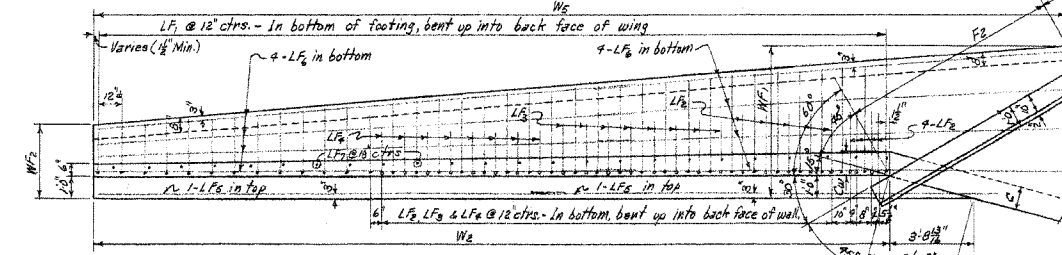
NOTE: This drawing to be used in conjunction with Standard Barrel Sections, Drawing Nos. -

SINGLES	DOUBLES	TRIPLES	QUADRUPLES	QUINTUPLES
R-145X-0	R-245X-01	R-345X-01	R-445X-01	R-545X-01
R-145X-1	R-245X-02	R-345X-02	R-445X-02	R-545X-02
	R-245X-1	R-345X-1	R-445X-1	
	R-245X-2	R-345X-2		

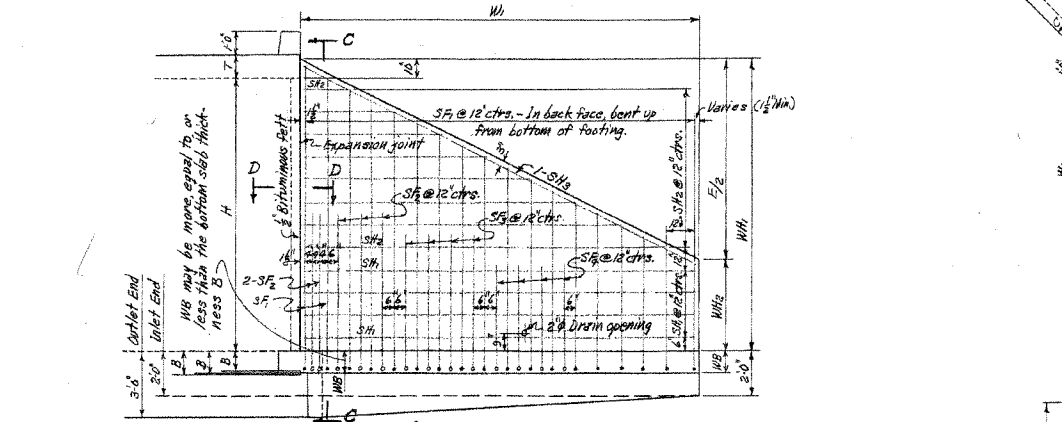
FED. ROAD NO.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
6	ARK.			33	
JOB No.					



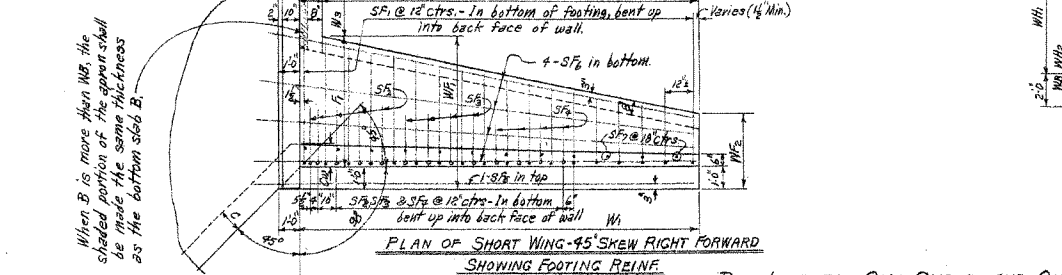
REAR ELEVATION OF LONG WING - 45° SKEW RIGHT FORWARD - SHOWING BACK FACE REINFORCING



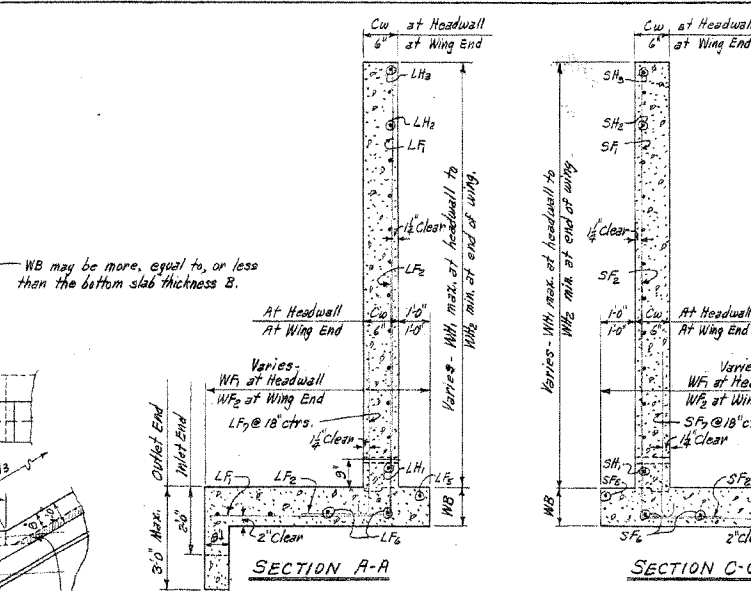
PLAN OF LONG WING - 45° SKEW RIGHT FORWARD - SHOWING FOOTING REINFORCING



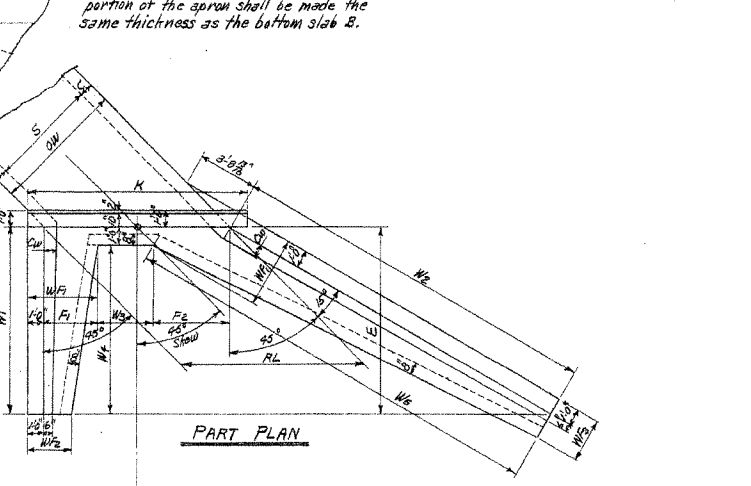
REAR ELEVATION OF SHORT WING - 45° SKEW RIGHT FORWARD - SHOWING BACK FACE REINFORCING



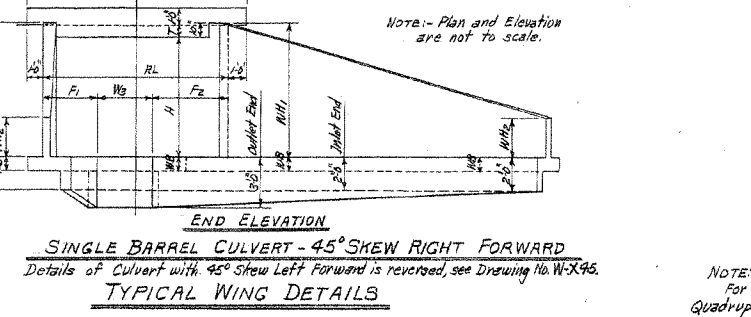
PLAN OF SHORT WING - 45° SKEW RIGHT FORWARD - SHOWING FOOTING REINFORCING



SECTION A-A and SECTION C-C



PART PLAN and END ELEVATION



SINGLE BARREL CULVERT - 45° SKEW RIGHT FORWARD

REGULAR WING DIMENSIONS - 2:1 SLOPES

CLEAR HEIGHT OF BOX	THICKNESS OF WING FOOTING	THICKNESS OF WING WALL	WING WALL HEIGHTS		WIDTHS OF WING FOOTINGS		FOOTING DIMENSIONS - PARALLEL WITH HEADWALL		PARALLEL WITH FACE OF WING	LENGTHS OF WING WALLS		INSIDE FOOTING DIMENSIONS		QUANTITY PER WING				
			AT HEADWALL	AT END OF WING	AT HEADWALL	AT END OF WING	SHORT WING	LONG WING		SHORT WING	LONG WING	SHORT WING	LONG WING	SHORT WING	LONG WING	SHORT WING	LONG WING	SHORT WING
H	WB	CW	WH1	WH2	WF1	WF2	F1	F2	E	W1	W2	W3	W4	W5	CUYD.	CUYD.	CUYD.	CUYD.
9	10	9	9'-0"	3'-0"	5'-2"	2'-10"	4'-2"	6'-7"	13'-8"	13'-8"	27'-4"	12'-8"	32'-6"	9.228	8.991	9.396	9.388	
10	11	10	10'-0"	3'-4"	5'-8"	3'-0"	4'-8"	7'-0"	15'-0"	15'-0"	30'-0"	14'-0"	36'-1"	5.389	11.939	5.576	11.931	
11	12	11	11'-0"	3'-8"	6'-2"	3'-4"	5'-2"	8'-0"	16'-4"	16'-4"	33'-0"	15'-4"	39'-2"	6.750	14.826	6.929	14.821	
12	13	12	12'-0"	4'-0"	6'-6"	3'-8"	5'-6"	9'-0"	17'-8"	17'-8"	35'-4"	16'-8"	42'-2"	8.336	17.674	8.562	18.215	

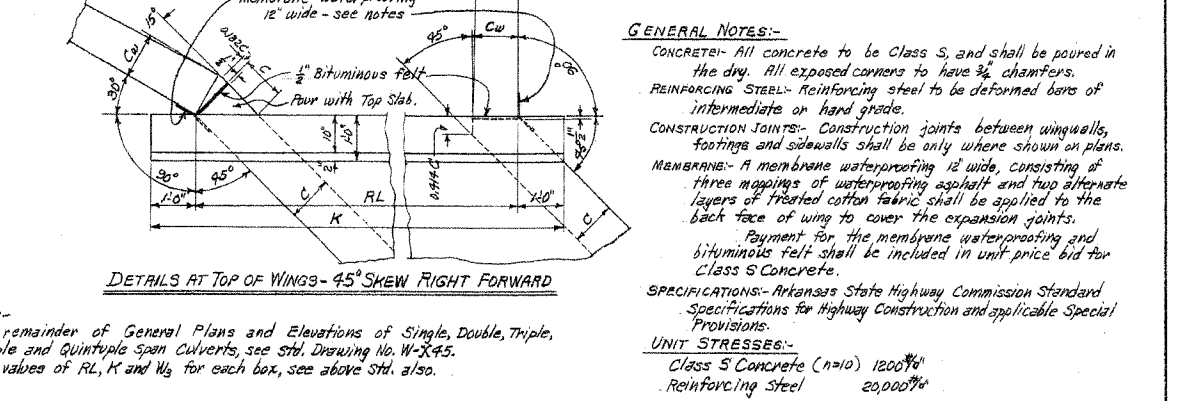
\* Quantity per wing does not include headwall or that portion of apron or toewall for the length W5.

REGULAR WING DIMENSIONS - 2:1 SLOPES

QUANTITIES

CLEAR SPAN	CLEAR HEIGHT	CLASS 5 CONCRETE - 4 WINGS							
		HEADWALLS, WING WALLS, FOOTINGS, TOEWALLS AND APRONS	SINGLE BARREL CULVERT	DOUBLE BARREL CULVERT	TRIPLE BARREL CULVERT	QUADRUPLE BARREL CULVERT			
S	H	CW	WB	LB	CUYD.	CUYD.	CUYD.	CUYD.	CUYD.
9'	9'	10'	19.99	28.10	30.97	32.83	35.21	37.58	
10'	10'	11'	24.59	35.59	38.26	40.99	43.70	46.42	
11'	11'	12'	29.35	42.85	46.20	49.91	53.38	56.94	
12'	12'	13'	34.26	50.35	54.20	58.13	62.02	65.75	
9'	9'	10'	19.99	28.10	30.97	32.83	35.21	37.58	
10'	10'	11'	24.59	35.59	38.26	40.99	43.70	46.42	
11'	11'	12'	29.35	42.85	46.20	49.91	53.38	56.94	
12'	12'	13'	34.26	50.35	54.20	58.13	62.02	65.75	

QUANTITIES



DETAILS AT TOP OF WINGS - 45° SKEW RIGHT FORWARD

BAR LIST FOR ONE SHORT AND ONE LONG WING - 2 EACH REQUIRED

CLEAR HEIGHT	WING LOCATION	SF1 & LF1		SF2 & LF2		SF3 & LF3		SF4 & LF4		SF5 & LF5		SF6 & LF6		SF7 & LF7		SH1 & LH1		SH2 & LH2		SH3 & LH3		BAR BENDING DIAGRAMS	QUANTITY		
		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.				
9'	Short	12"	14"	5'1"	13'11"	12"	14"	5'1"	13'11"	12"	14"	5'1"	13'11"	12"	14"	5'1"	13'11"	12"	14"	5'1"	13'11"	12"	14"		
9'	Long	12"	28"	4'11"	13'8"	12"	14"	5'1"	13'11"	12"	14"	5'1"	13'11"	12"	14"	5'1"	13'11"	12"	14"	5'1"	13'11"	12"	14"		
10'	Short	12"	16"	5'4"	15'4"	12"	14"	5'1"	13'11"	12"	14"	5'1"	13'11"	12"	14"	5'1"	13'11"	12"	14"	5'1"	13'11"	12"	14"		
10'	Long	12"	31"	5'5"	15'4"	12"	14"	5'1"	13'11"	12"	14"	5'1"	13'11"	12"	14"	5'1"	13'11"	12"	14"	5'1"	13'11"	12"	14"		
11'	Short	12"	17"	6'0"	17'0"	12"	14"	5'1"	13'11"	12"	14"	5'1"	13'11"	12"	14"	5'1"	13'11"	12"	14"	5'1"	13'11"	12"	14"		
11'	Long	12"	33"	6'4"	16'8"	12"	14"	5'1"	13'11"	12"	14"	5'1"	13'11"	12"	14"	5'1"	13'11"	12"	14"	5'1"	13'11"	12"	14"		
12'	Short	12"	18"	6'9"	17'8"	12"	14"	5'1"	13'11"	12"	14"	5'1"	13'11"	12"	14"	5'1"	13'11"	12"	14"	5'1"	13'11"	12"	14"		
12'	Long	12"	36"	7'3"	18'2"	12"	14"	5'1"	13'11"	12"	14"	5'1"	13'11"	12"	14"	5'1"	13'11"	12"	14"	5'1"	13'11"	12"	14"		

NOTE: Bars for short wing to be marked with prefix letter 'S', while those for long wing shall be marked with letter 'L'.  
 NOTE: Except as shown at headwall.

CLASS 5 CONCRETE

REINFORCING STEEL PER WING LBS.

SHORT WING	LONG WING
323.1	651.5
411.4	818.2
488.2	979.5
616.4	1237.7

NOTE: Dimensions are to bar centers.

CLASS 5 CONCRETE

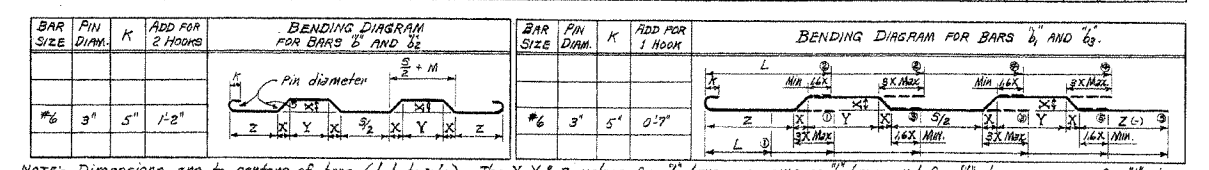
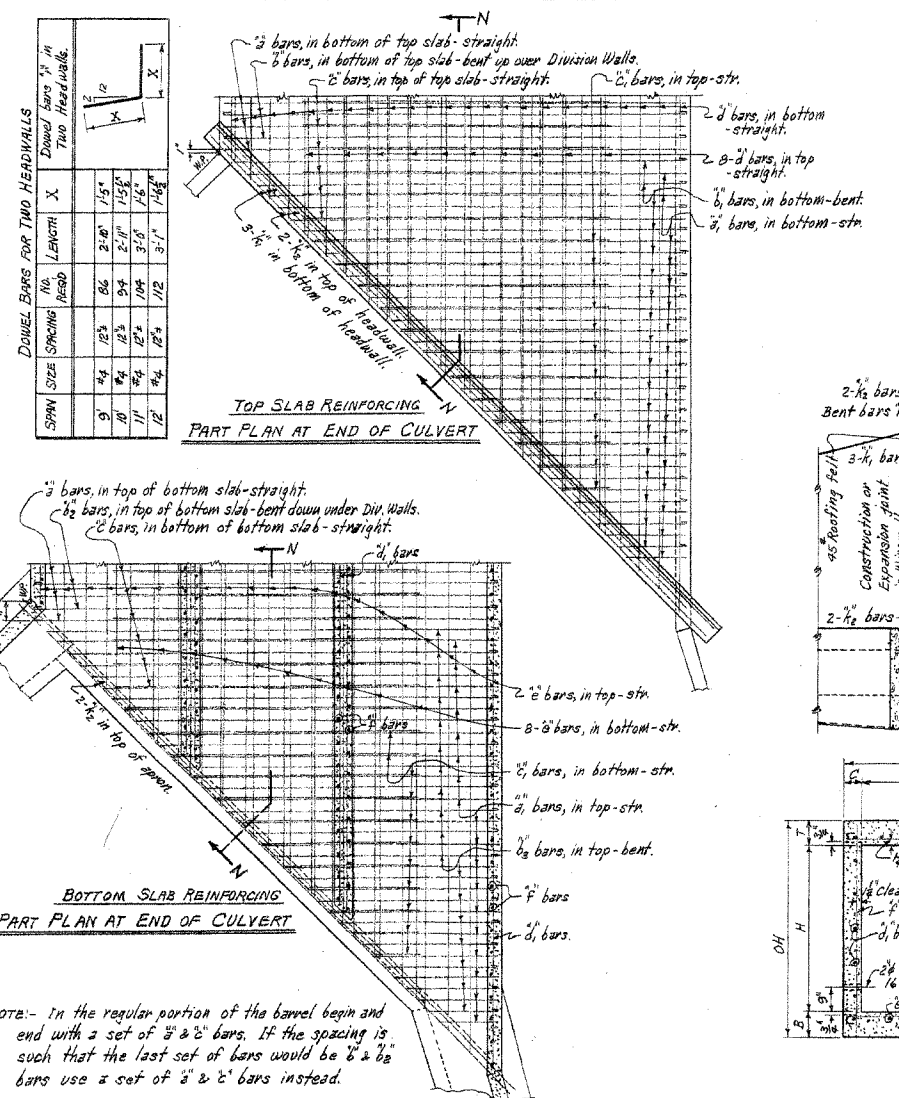
Checked By: W.C.H. 5-16-63  
 Drawn: W.C.H. 6-9-64  
 Checked By: J.E.M. 7-15-64  
 Checked By: J.E.M. 7-14-64  
 Quantities By: W.C.H. 6-30-64

ARKANSAS STATE HIGHWAY COMMISSION  
 DETAILS OF STANDARD WINGS  
 FOR  
 REINFORCED CONCRETE BOX CULVERTS  
 45° SKEW  
 7, 8, 9, 10, 11 & 12 SPANS 2:1 SLOPES  
 SINGLES, DOUBLES, TRIPLES, ALL DEPTHS OF COVER  
 QUADRUPLES & QUINTUPLES. FOR H=9'-0" & OVER  
 STANDARD DRAWING NO. W-X452-2

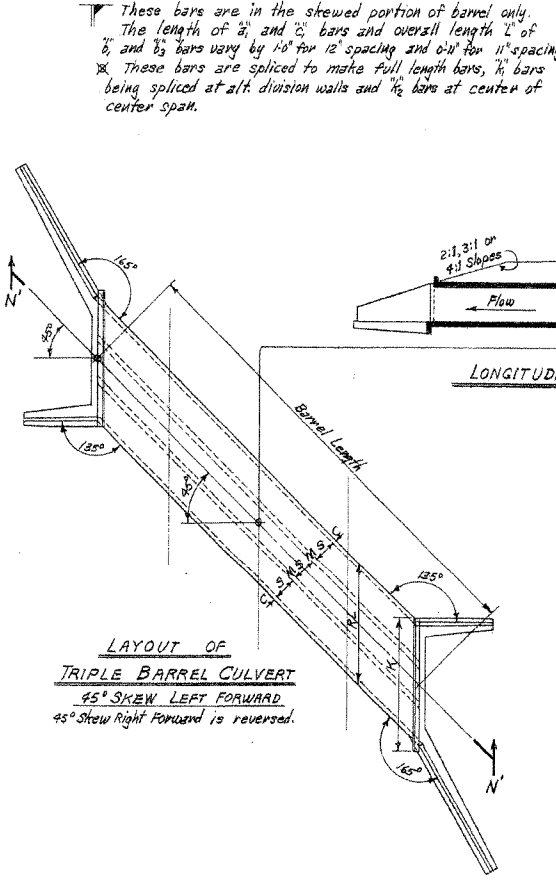
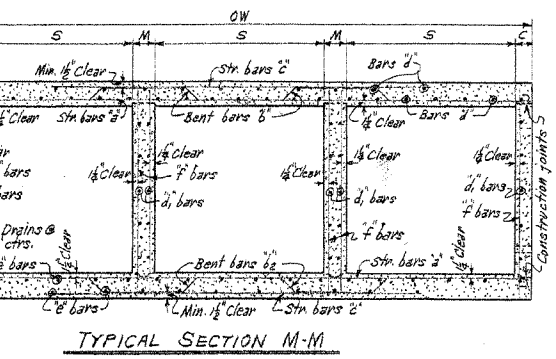
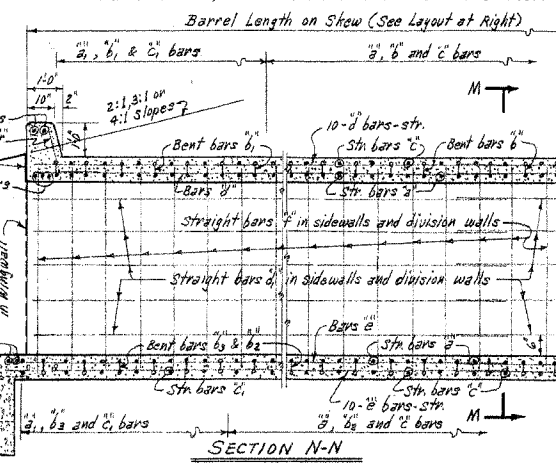
BAR LIST FOR BARREL SECTION 60'-0" IN LENGTH - TWO 45° SKEWED ENDS

Table with columns for bar size, length, and quantity. Includes sub-sections for STRAIGHT and BENT bars, and further categorization by depth of cover (0-10, 10-15, 15-20, 20-25, 25-30, 30-35, 35-40, 40-45, 45-50, 50-55, 55-60).

Table titled 'BARREL DIMENSIONS' and 'QUANTITIES'. Columns include span, height, width, and various reinforcement steel quantities (lb., ft., etc.).



NOTE: Dimensions are to centers of bars. (b1, b2, b3, b4). The X, Y & Z values for b1 bars are same as b2 bars, and for b3 bars same as for b4 bars.



\* For quantities in wings see Standard Wing Drawings listed below. Total steel quantities listed above include one lap of longitudinal bars.

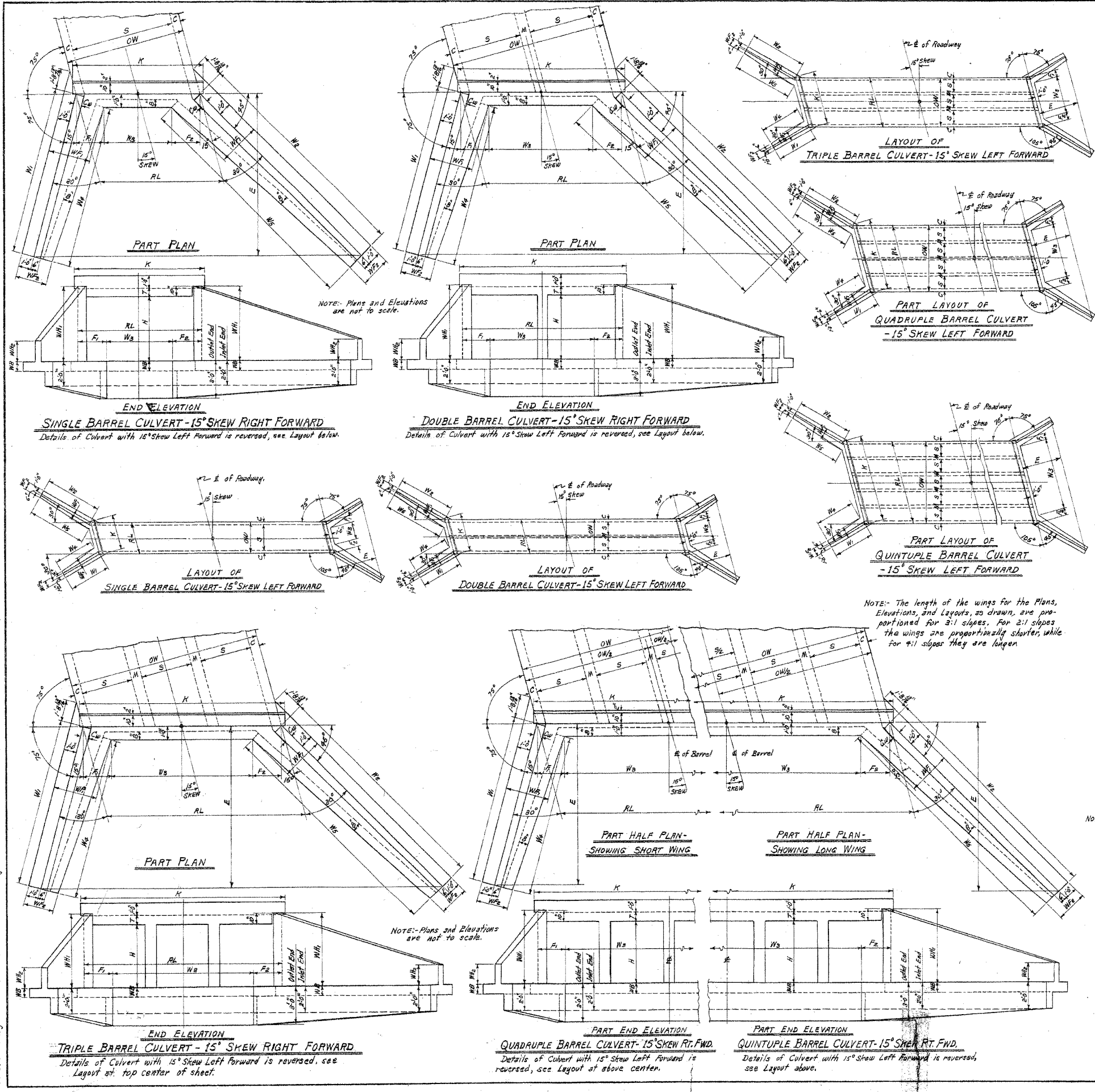
GENERAL NOTES: CONCRETE- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have 3/4 chamfers. REINFORCING STEEL- Reinforcing to be deformed bars of intermediate or hard grade.

DESIGN LIVE LOAD: H20-S16 LOADING A.A.S.H.O 1961 AND SPECIAL MILITARY LOADING. Two 28,000 Lb. Axles @ 9'-0" ctrs.

UNIT STRESSES: Class S Concrete (f'c=10) 1200 psi, Reinforcing Steel 20,000 psi.

CLASS S CONCRETE. ARKANSAS STATE HIGHWAY COMMISSION. DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS. 45° SKEW. 9, 10, 11 AND 12 SPANS. 2:1, 3:1 OR 4:1 SLOPES UNDER 5'-0" COVER. STANDARD DRAWING No. R-345X-02.

Checked by: W.C.H. 1-22-63, W.C.H. 7-22-64, W.C.H. 10-7-64. Drawn by: W.C.H. 1-22-63, W.C.H. 7-22-64, W.C.H. 10-7-64. Quantities by: W.C.H. 1-22-63, W.C.H. 7-22-64, W.C.H. 10-7-64.



USE WITH DRAWING NO.	CLEAR SPAN	SUM OF FOOTING DIMENSIONS	ROADWAY LENGTH RL				HEADWALL LENGTH K				APRON DIMENSION W <sub>3</sub>							
			RL = OW × 1.035276				K = RL × (6 1/2°)				W <sub>3</sub> = RL × (F <sub>1</sub> + F <sub>2</sub> )							
			SINGLE BARREL CULVERT		DOUBLE BARREL CULVERT		TRIPLE BARREL CULVERT		QUADRUPEL BARREL CULVERT		QUINTUPLE BARREL CULVERT							
H	5	5	OW	RL	K	W <sub>3</sub>	OW	RL	K	W <sub>3</sub>	OW	RL	K	W <sub>3</sub>	OW	RL	K	W <sub>3</sub>
4	2	2	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8
5	3	3	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8
6	4	4	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8
7	5	5	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8
8	6	6	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8
9	7	7	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8
10	8	8	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8
11	9	9	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8
12	10	10	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8
13	11	11	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8
14	12	12	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8	5.0	5.2	5.5	5.8

Special case for these boxes. See Detail 'H' and Table 'H' for revised values of F<sub>1</sub>, F<sub>2</sub>, W<sub>3</sub> and W<sub>3</sub>, when apron width is more than 1:0 and W<sub>3</sub> = 0. For Detail 'H' and Table 'H' for each slope, see Drawing Nos. W-X152-1, W-X152-2, or W-X153-1, W-X153-2, or W-X154-1, W-X154-2.

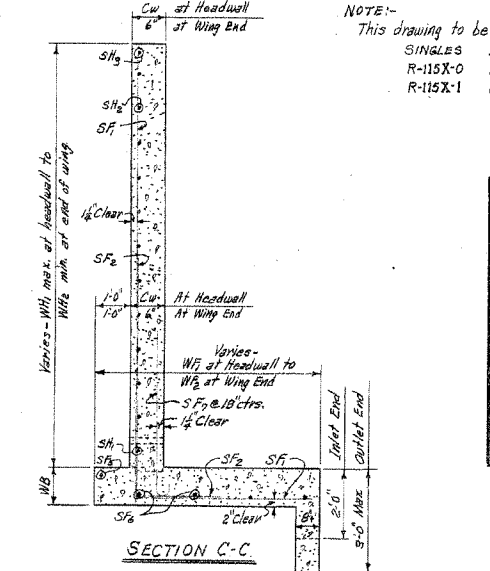
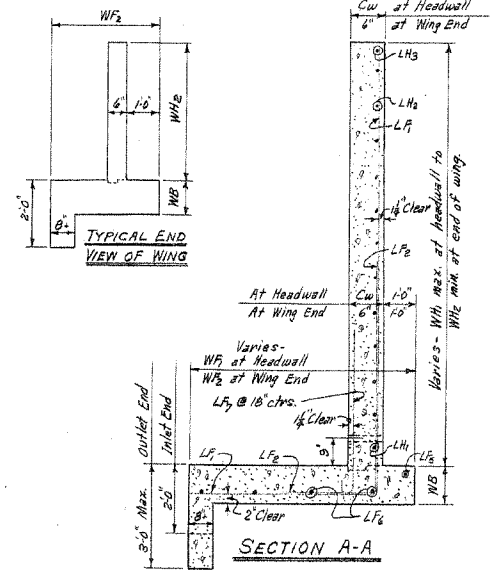
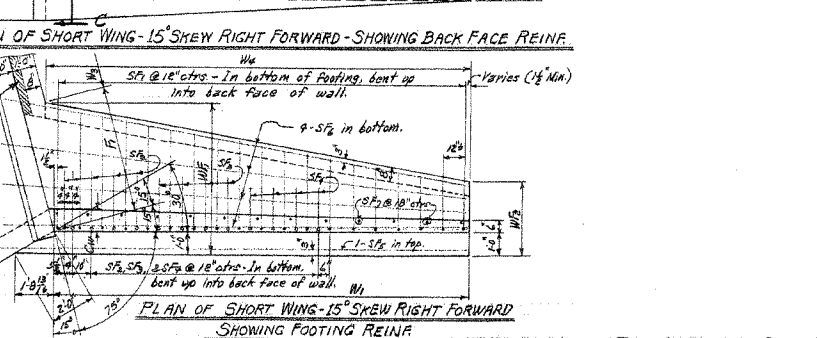
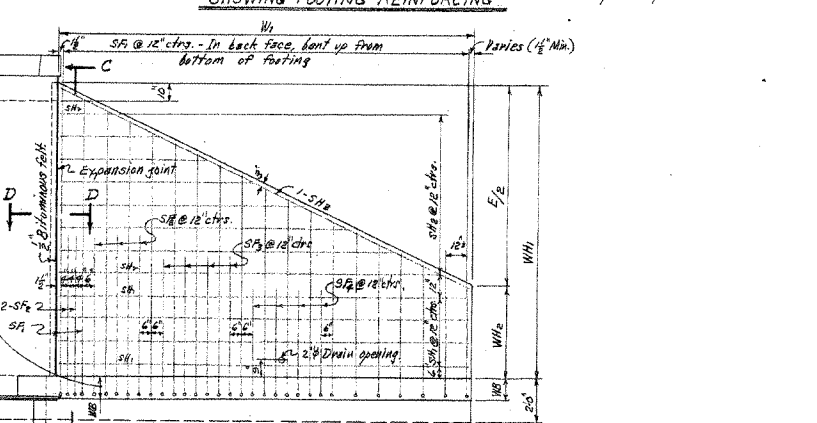
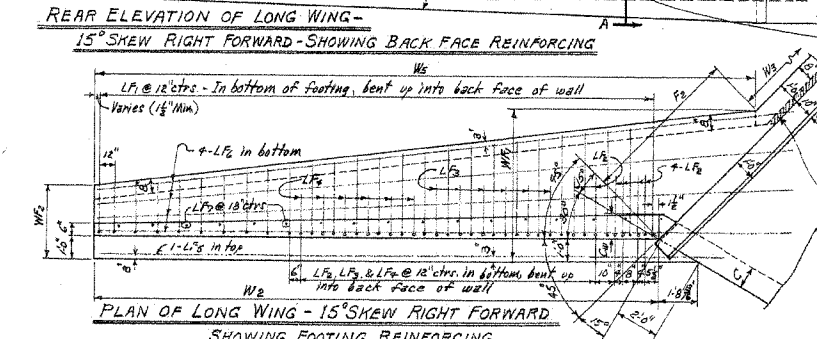
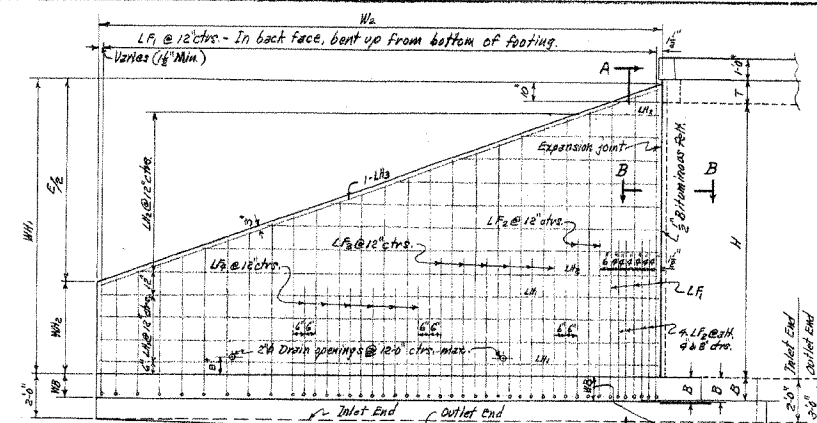
Note: This drawing to be used in conjunction with Standard Wing Drawings for 15° Skews for each slope as listed below.  
 2:1 Slopes  
 W-X152-1 or W-X152-2  
 3:1 Slopes  
 W-X153-1 or W-X153-2  
 4:1 Slopes  
 W-X154-1 or W-X154-2

This drawing to be used in conjunction with Std. Barrel Sections, Drawing Nos.  
 SINGLES R-115X-0 R-215X-0 R-315X-0 R-415X-0 R-515X-0  
 DOUBLES R-115X-1 R-215X-1 R-315X-1 R-415X-1 R-515X-1  
 TRIPLES R-215X-2 R-315X-2

CLASS S CONCRETE  
 ARKANSAS STATE HIGHWAY COMMISSION  
 DETAILS OF STANDARD WINGS  
 FOR  
 REINFORCED CONCRETE BOX CULVERTS  
 15° SKEW  
 4, 5, 6, 7, 8, 9, 10, 11 & 12 SPANS  
 2:1, 3:1 & 4:1 SLOPES  
 SINGLES, DOUBLES, TRIPLES, ALL DEPTHS OF COVER  
 QUADRUPELS & QUINTUPLES. H=2, 3, 4, 5, 6, 7, 8, 9, 10, 11 & 12.  
 STANDARD DRAWING NO. W-X15

Designed by: W.C.H. 5-22-63  
 Traced by: W.C.H. 6-18-63  
 Checked by: J.E.M. 6-20-63  
 Checked by: Quantities by:

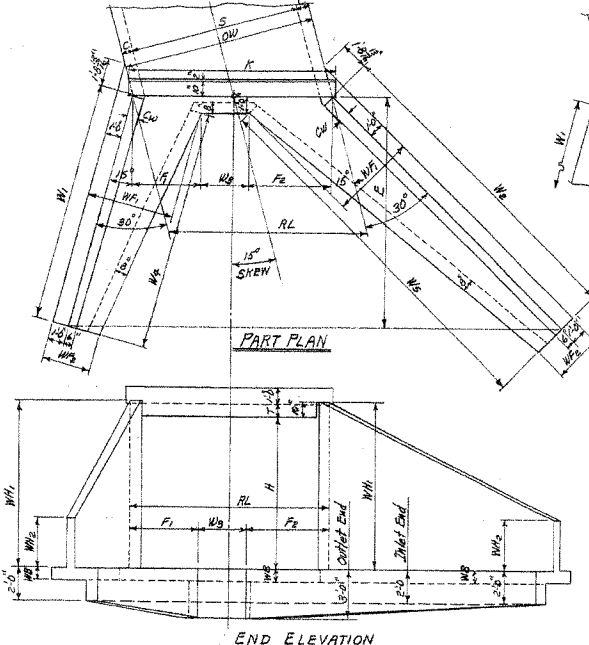
NOTE:-  
This drawing to be used in conjunction with Std. Barrel Sections, Drawing No. 9-W-15-2  
 SINGLES DOUBLES TRIPLES QUADRUPLES QUINTUPLES  
 R-115X-0 R-215X-0 R-315X-0 R-415X-0 R-515X-0  
 R-115X-1 R-215X-1 R-315X-1 R-415X-1 R-515X-1  
 R-215X-2 R-315X-2



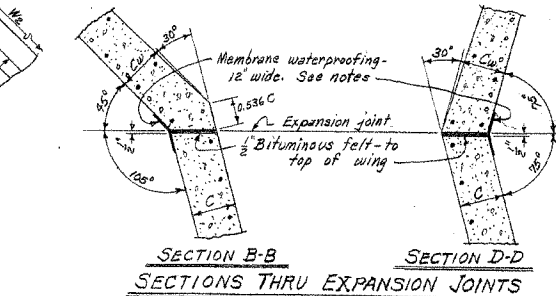
WB may be more, equal to, or less than the bottom slab thickness B.  
 When B is more than WB, the shaded portion of the apron shall be made the same thickness as the bottom slab B.

TABLE A - DIMENSIONS FOR DETAIL "A"

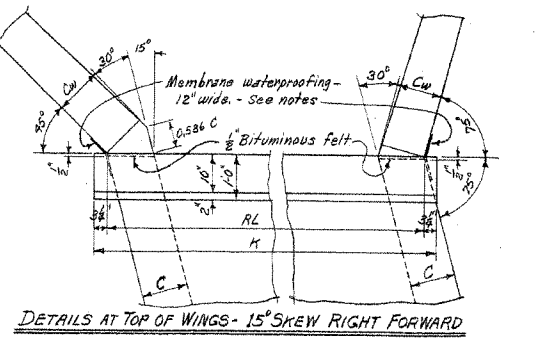
S	H	F <sub>1</sub>	F <sub>2</sub>	W <sub>3</sub>	Y	W <sub>4</sub>	W <sub>5</sub>
7'	9"	4'-0"	4'-9"	0"	1'-0"	14'-0"	21'-0"
8'	10"	4'-6"	5'-5"	0"	1'-0"	15'-0"	22'-0"
9'	11"	5'-0"	6'-0"	0"	1'-0"	16'-0"	23'-0"
10'	12"	5'-6"	6'-6"	0"	1'-0"	17'-0"	24'-0"



SINGLE BARREL CULVERT - 15° SKEW RIGHT FORWARD  
 Details of Culvert with 15° Skew Left Forward is reversed, see Drawing No. W-X15.  
 TYPICAL WING DETAILS



SECTIONS THRU EXPANSION JOINTS



DETAILS AT TOP OF WINGS - 15° SKEW RIGHT FORWARD

REGULAR WING DIMENSIONS - 2:1 SLOPES

CLEAR HEIGHT OF BOX	THICKNESS OF WING FOOTING	THICKNESS OF WING AT HEADWALL	WING WALL HEIGHTS	WIDTH OF WING FOOTING AT HEADWALL	WIDTH OF WING FOOTING AT END OF WING	FOOTING DIMENSION PARALLEL WITH HEADWALL	PARALLEL WITH HEADWALL	PERPENDICULAR TO END OF WING	LENGTHS OF WING WALLS		INSIDE FOOTING DIMENSIONS		* QUANTITY PER WING CLASS 5 CONCRETE				
									SHORT WING	LONG WING	SHORT WING	LONG WING	SHORT WING	LONG WING	SHORT WING	LONG WING	SHORT WING
H	WB	Cw	WH	WH <sub>2</sub>	WF	WF <sub>2</sub>	F <sub>1</sub>	F <sub>2</sub>	E	Y <sub>1</sub>	Y <sub>2</sub>	W <sub>4</sub>	W <sub>5</sub>	CuYd.	CuYd.	CuYd.	CuYd.
9 x 10'	9"	9'-0"	3'-0"	5'-2"	2'-0"	4'-0"	4'-0"	4'-0"	13'-8"	14'-3"	19'-4"	14'-0"	22'-1"	4,480	6,284	4,670	6,545
10 x 11'	10"	10'-0"	3'-4"	5'-8"	3'-0"	4'-6"	4'-6"	5'-7"	15'-0"	15'-6"	21'-2"	15'-9"	24'-5"	5,710	8,005	5,920	8,315
11 x 12'	11"	11'-0"	3'-8"	6'-2"	3'-4"	5'-1"	5'-1"	6'-3"	16'-4"	16'-11"	23'-4"	17'-3"	26'-10"	7,161	10,039	7,390	10,374
12 x 13'	12"	12'-0"	4'-0"	6'-8"	3'-8"	5'-7"	5'-7"	7'-0"	17'-8"	18'-3"	24'-11"	18'-9"	29'-2"	8,690	12,380	9,088	12,750

\* Quantity per wing does not include headwall or that portion of apron or footwall for the length W.  
 See Table A for special values of F<sub>1</sub>, F<sub>2</sub> and W<sub>4</sub>, W<sub>5</sub> for Single 7x9, 8x10, 9x11 and 10x12 Box Culverts.

QUANTITIES

CLEAR SPAN	CLEAR HEIGHT	THICKNESS OF WING AT HEADWALL	THICKNESS OF WING FOOTING	REINFORCING STEEL FOR 4 WINGS	CLASS 5 CONCRETE - 4 WINGS				
					HEADWALLS, WING WALLS, FOOTINGS, TOEWALLS AND APRONS	SINGLE BARREL CULVERT	DOUBLE BARREL CULVERT	TRIPLE BARREL CULVERT	QUADRUPLE BARREL CULVERT
S	H	Cw	WB	LB.	CuYd.	CuYd.	CuYd.	CuYd.	CuYd.
7'	9"	9'	10'	1584	22.59	24.33	26.04	27.80	29.53
8'	10"	10'	11'	1584	22.83	24.79	26.73	28.63	30.64
9'	11"	11'	12'	1584	23.08	25.07	27.00	28.98	31.79
10'	12"	12'	13'	1584	23.28	25.27	27.28	29.35	32.85
11'	13"	13'	14'	1584	23.48	25.47	27.57	29.74	33.92
12'	14"	14'	15'	1584	23.68	25.67	27.86	30.13	35.00

For reinforcing steel in Headwalls and Aprons, see Drawings listed at top of sheet.

GENERAL NOTES:-  
 CONCRETE- All concrete to be Class 5, and shall be poured in the dry. All exposed corners to have 3/8" chamfers.  
 REINFORCING STEEL- Reinforcing steel to be deformed bars of intermediate or hard grade.  
 CONSTRUCTION JOINTS- Construction joints between wingwalls, footings and side walls shall be only where shown on plans.  
 MEMBRANE- A membrane waterproofing 12' wide, consisting of three moppings of waterproofing asphalt and two alternate layers of treated cotton fabric shall be applied to the back face of wing to cover the expansion joints.  
 Payment for the membrane waterproofing and bituminous felt shall be included in unit price bid for Class 5 Concrete.  
 SPECIFICATIONS- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.  
 UNIT STRESSES:-  
 Class 5 Concrete (n=10) 1200 psi  
 Reinforcing Steel 20,000 psi

BAR LIST FOR ONE SHORT AND ONE LONG WING - 2 EACH REQUIRED

CLEAR HEIGHT OF LONG WING	WING LOCATION	SF <sub>1</sub> & LF <sub>1</sub>				SF <sub>2</sub> & LF <sub>2</sub>				SF <sub>3</sub> & LF <sub>3</sub>				SF <sub>4</sub> & LF <sub>4</sub>				SF <sub>5</sub> & LF <sub>5</sub>				SF <sub>6</sub> & LF <sub>6</sub>				SF <sub>7</sub> & LF <sub>7</sub>				SH <sub>1</sub> & LH <sub>1</sub>				SH <sub>2</sub> & LH <sub>2</sub>				SH <sub>3</sub> & LH <sub>3</sub>				BAR BENDING DIAGRAMS	QUANTITY																	
		BENT								BENT								STRAIGHT								STRAIGHT								STRAIGHT										STRAIGHT								STRAIGHT								REINFORCING STEEL PER WING - LBS.
		In bottom of footing, bent up into back face of wing. One bar of each length.								In bottom of footing, bent up into back face of wing. All with F <sub>1</sub> bars.								In bottom of footing, bent up into back face of wing. All with F <sub>1</sub> bars.								Footings dowels extending up into front face of wing.								Horizontal in back face of wing.										Horizontal in back face of wing. One bar of each length.								In back face of wing at top-of-slope.								
9	Short	5	12	15	4-11	10-11	1-6	8-10	3-4	10-2	5	12	3	7-6	2-1	5-6	4	12	4	6-6	1-10	4-9	4	12	1	16-7	4	16-3	4	18	10	4-0	3-6	4	12	3	13-10	4	12	6	12-7	2-2	4	1	15-5	3370	4552													
10	Short	5	12	20	4-11	13-8	1-6	3-6	3-6	10-3	5	12	4	7-6	2-1	6-8	4	12	6	6-6	1-10	4-9	4	12	1	21-0	4	23-6	4	18	13	4-0	3-6	4	12	3	13-8	4	12	6	12-7	3-0	4	1	20-2	4200	5638													
11	Short	5	12	16	5-7	15-6	1-8	4-4	4-0	11-3	6	12	3	8-6	2-4	6-8	4	12	2	7-6	2-1	5-6	4	12	3	7-6	2-1	13-5	4	18	12	4-0	3-0	4	12	3	20-11	4	12	7	20-0	3-0	4	1	22-6	5173	6834													
12	Short	5	12	18	5-10	17-0	1-8	4-9	4-2	12-4	6	12	5	8-6	2-9	6-3	4	12	4	6-6	1-10	4-9	4	12	4	18-5	4	19-5	4	18	12	4-0	3-0	4	12	4	14-7	4	12	7	19-8	2-2	4	1	18-6	6411	8645													
12	Long	5	12	24	5-11	16-9	1-9	4-5	4-3	12-5	6	12	6	8-6	2-9	6-3	4	12	3	7-6	2-1	5-6	4	12	6	6-6	1-10	4-9	4	12	4	18-0	4	12	4	22-10	4	12	7	20-0	3-0	4	1	24-8																
12	Long	5	12	24	6-8	18-3	1-11	4-10	4-8	18-6	7	12	6	8-6	2-9	6-3	4	12	6	6-6	1-10	4-9	4	12	6	6-6	1-10	4-9	4	12	4	18-0	4	12	4	24-8	4	12	8	16-9	2-2	4	1	26-2																

NOTE: Bars for short wing to be marked with prefix letter 'S', while those for long wing shall be marked with letter 'L'.  
 \* Except as shown at headwall.

NOTE: For remainder of General Plans and Elevations of Single, Double, Triple, Quadruple and Quintuple Span Culverts, see Std. Drawing No. W-X15.  
 For values of RL, K and W<sub>3</sub> for each box, see above Std. also.

ARKANSAS STATE HIGHWAY COMMISSION  
 DETAILS OF STANDARD WINGS  
 FOR  
 REINFORCED CONCRETE BOX CULVERTS  
 15° SKEW

7', 8', 9', 10', 11' & 12' SPANS 2:1 SLOPES  
 ALL DEPTHS OF COVER  
 SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES  
 FOR H = 9'-0" & OVER

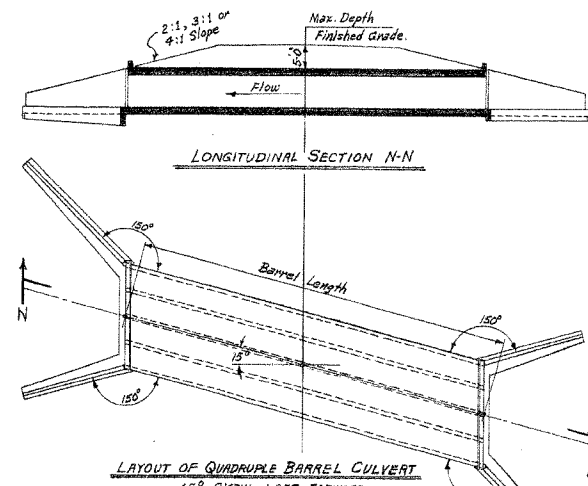
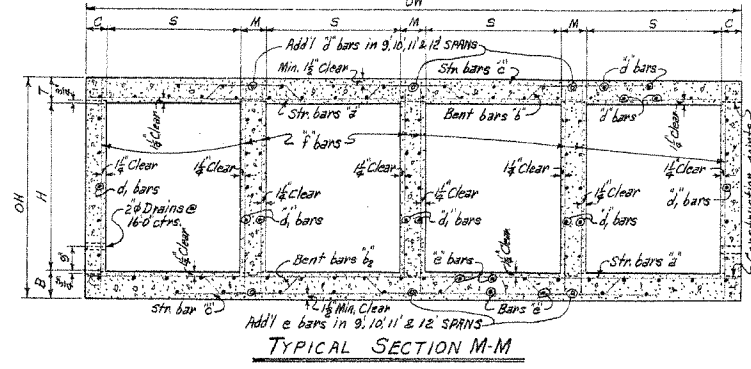
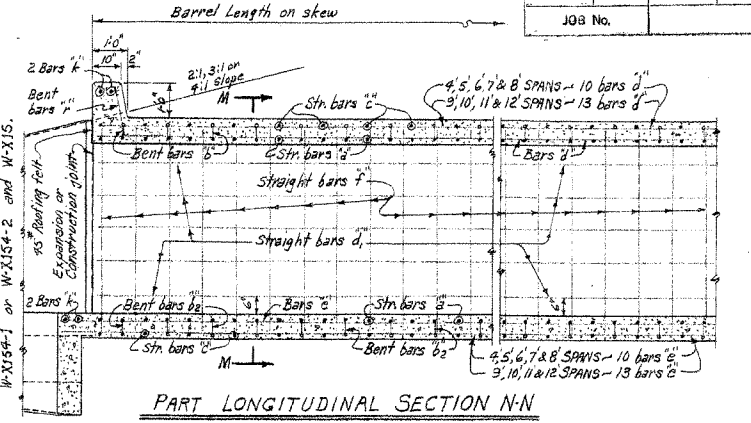
Checked by: M.C.H. 5-18-63  
 Drawn by: M.C.H. 6-6-63  
 Quantities by: M.C.H. 9-17-63

BAR LIST FOR BARREL SECTION 60'-0" IN LENGTH

Table with columns for bar size, spacing, length, and quantity for various bar types (a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z).

DIMENSIONS QUANTITIES

Table with columns for dimensions (D, S, H, A, OW, T, C, M, B, OH, RL, K) and unit quantities (REINFORCING STEEL, PER LONG. LAP, PER HEADWALL & APRONS).



LAYOUT OF QUADRUPLE BARREL CULVERT 15° SKEW LEFT FORWARD 15° SKEW RIGHT FORWARD IS REVERSED.

GENERAL NOTES:-

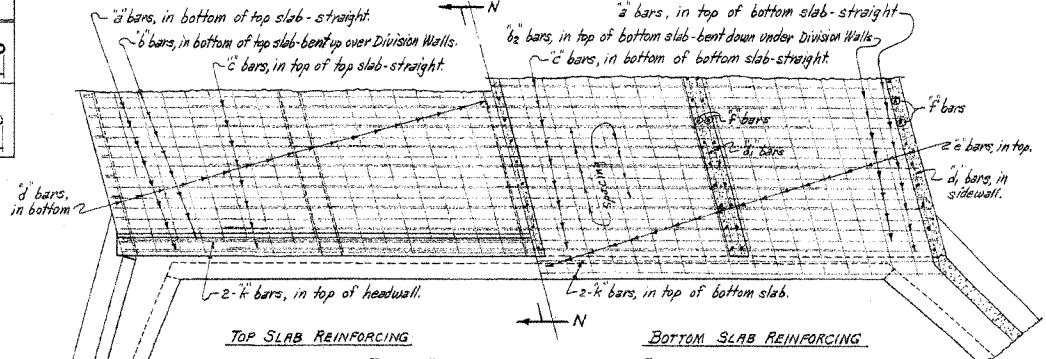
CONCRETE: All concrete to be Class S, and shall be poured in the dry. All exposed corners to have 3/4" chamfers. REINFORCING STEEL: Reinforcing to be deformed bars of intermediate or hard grade. BAR LAP: In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 30'-0". Lap longitudinal bars 30 diameters. CONSTRUCTION JOINTS: Construction joints between wingwalls, sidewalls, division walls and slabs shall be only where shown on plans. SPECIFICATIONS: Arkansas State Highway Commission standard Specifications for Highway Construction and applicable Special Provisions.

DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961 AND SPECIAL MILITARY LOADING Two 28,000 Lb. Axles @ 9'-0" ctrs.

UNIT STRESSES:- Class S Concrete (f'c=10) 1200 psi Reinforcing Steel 20,000 psi

ARKANSAS STATE HIGHWAY COMMISSION DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS 15° SKEW 4, 5, 6, 7, 8, 9, 10, 11 & 12 SPANS 2:1, 3:1 OR 4:1 SLOPES UNDER 5'-0" COVER STANDARD DRAWING NO. R-415X-O



PART PLAN AT END OF CULVERT

Note: The a, b, c, and d bars are to be placed parallel with the headwall. The d bars in top of top slab and e bars in bottom of bottom slab are not shown.

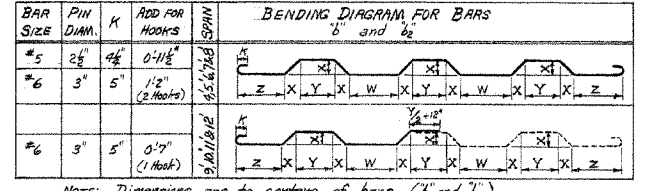
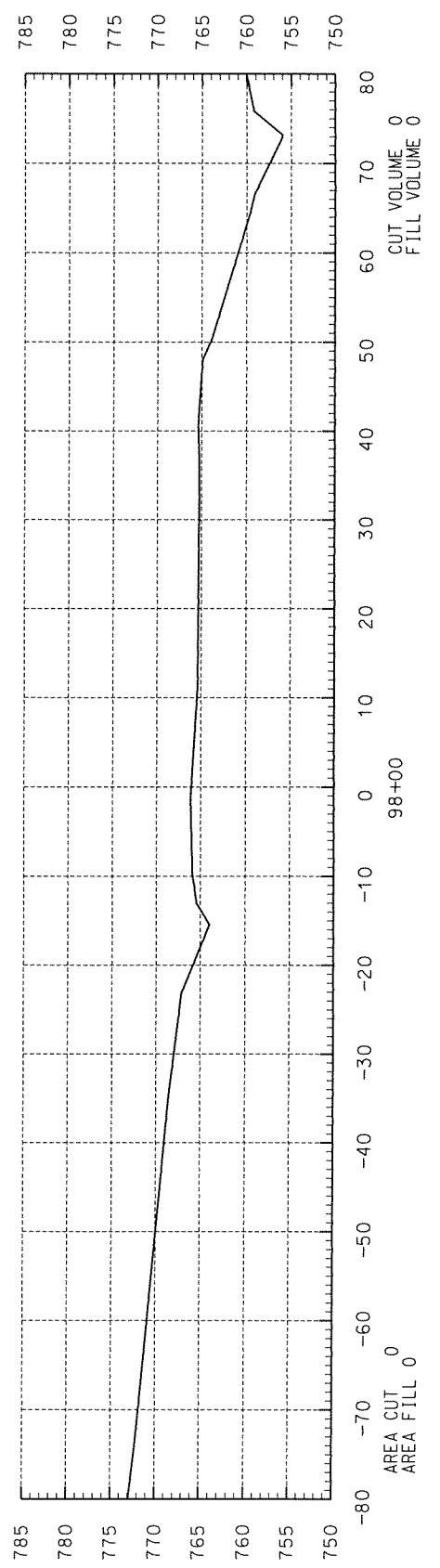
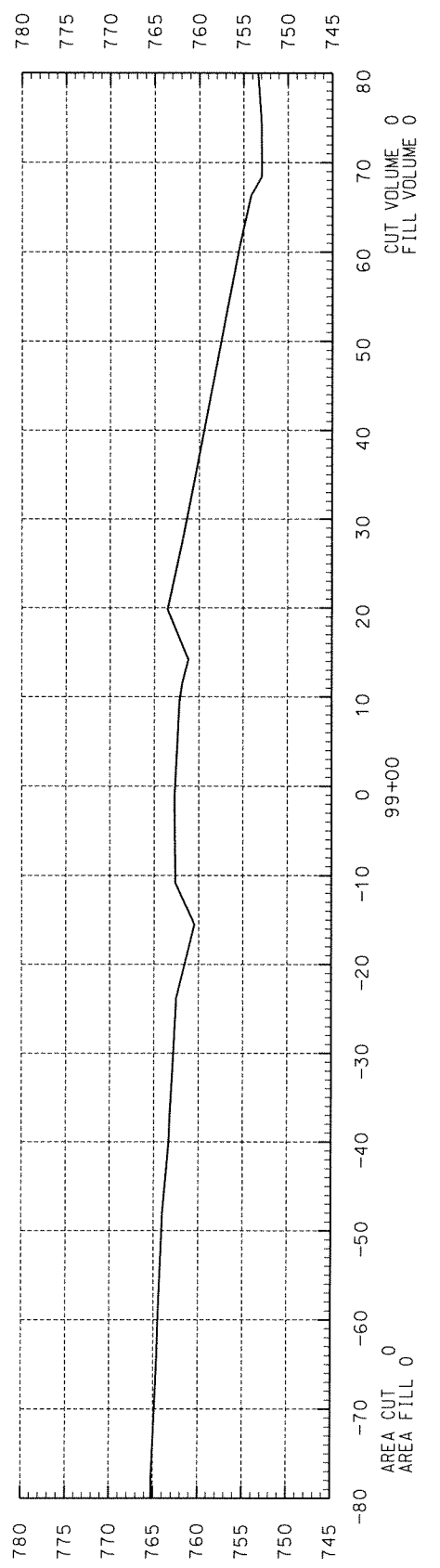
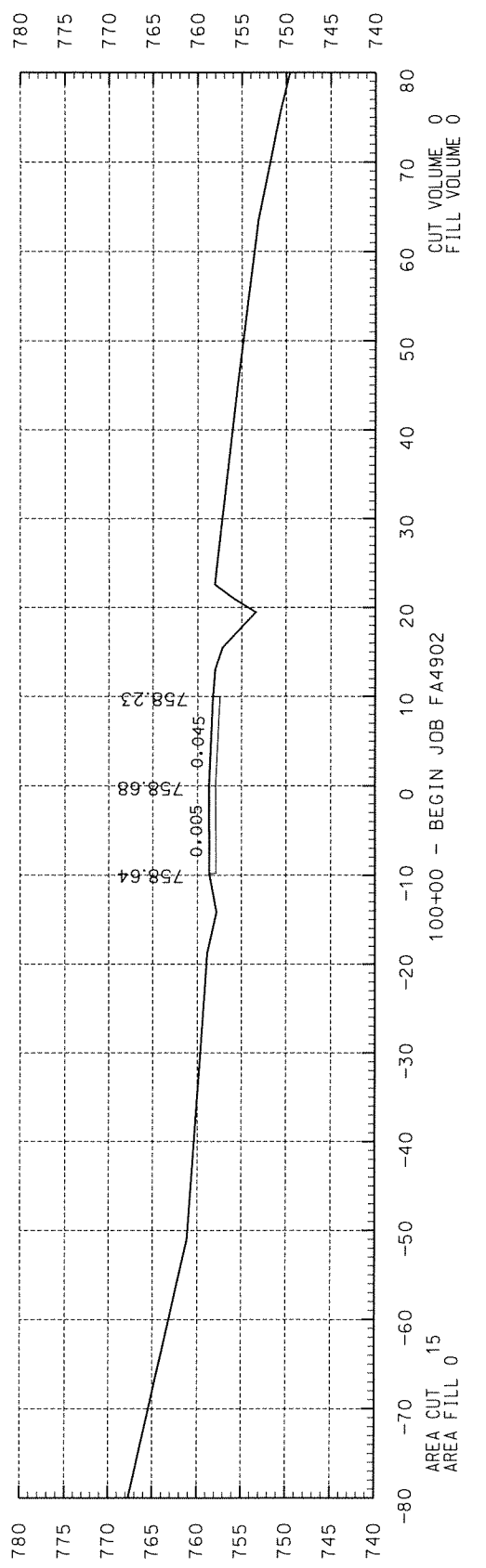
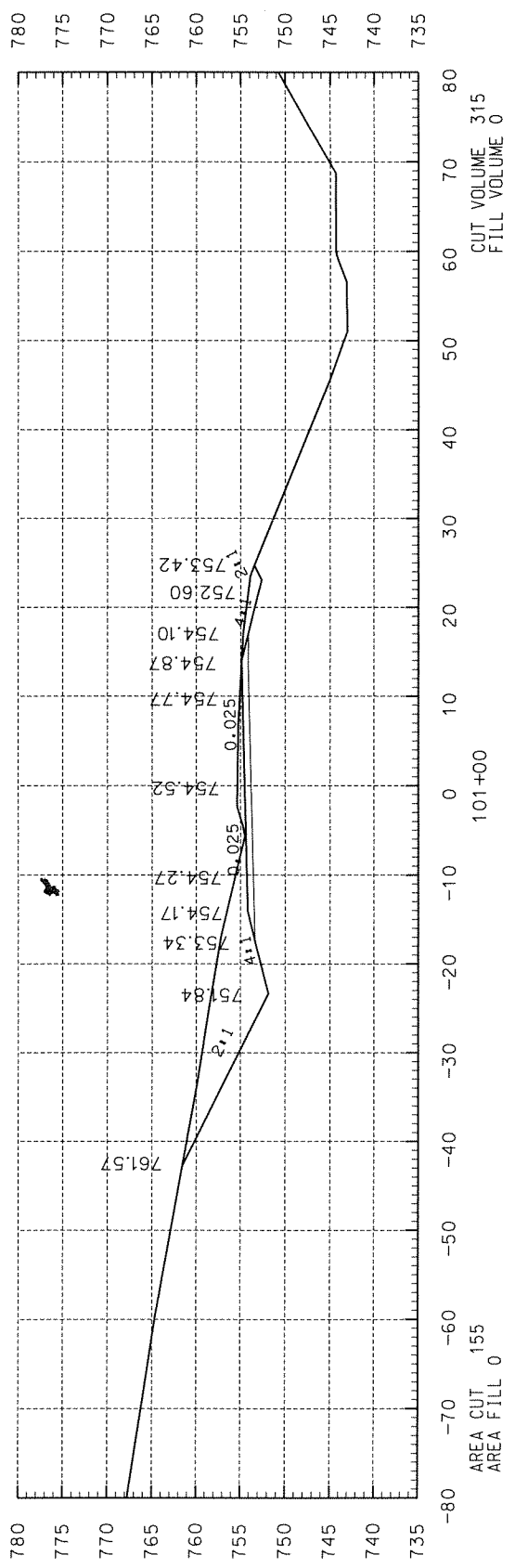


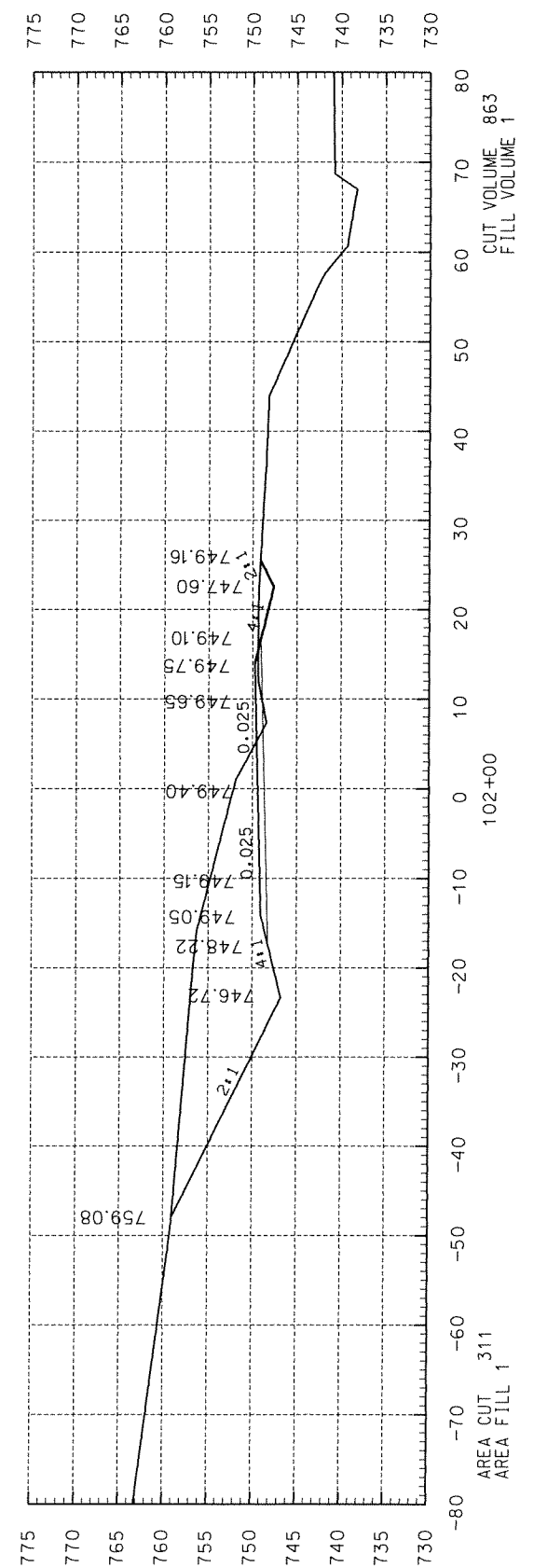
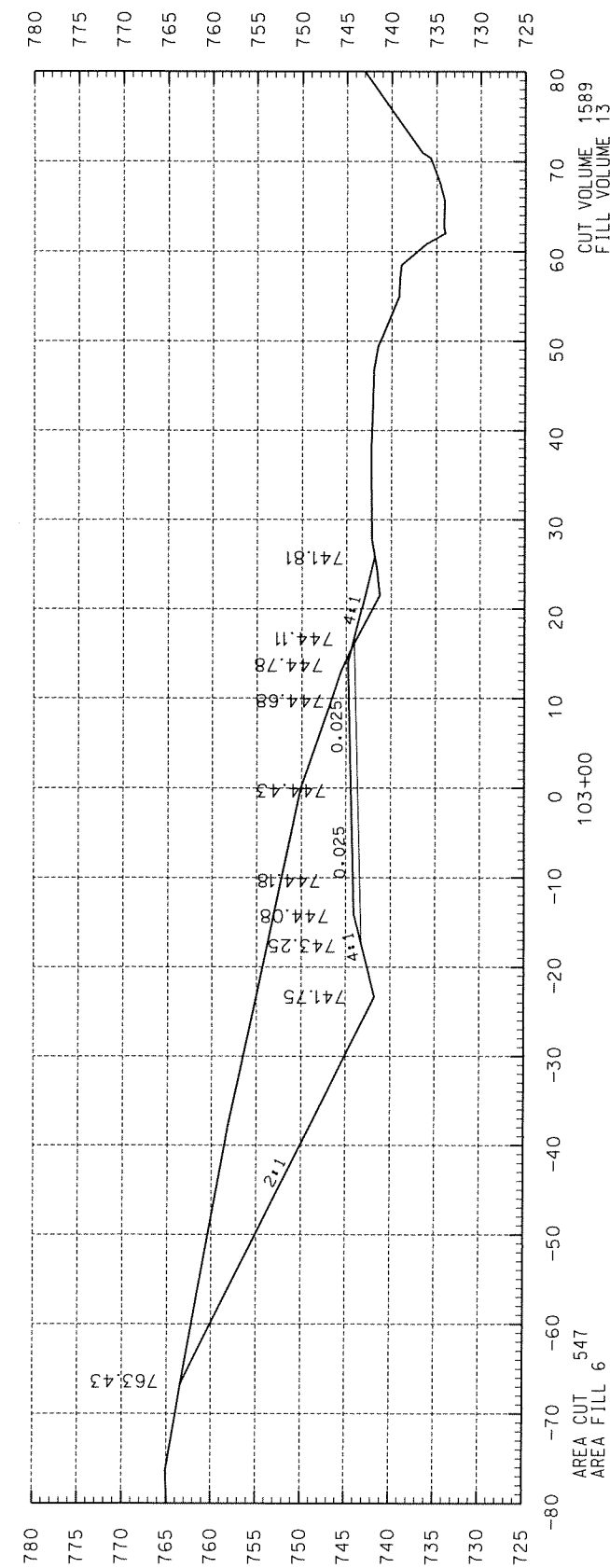
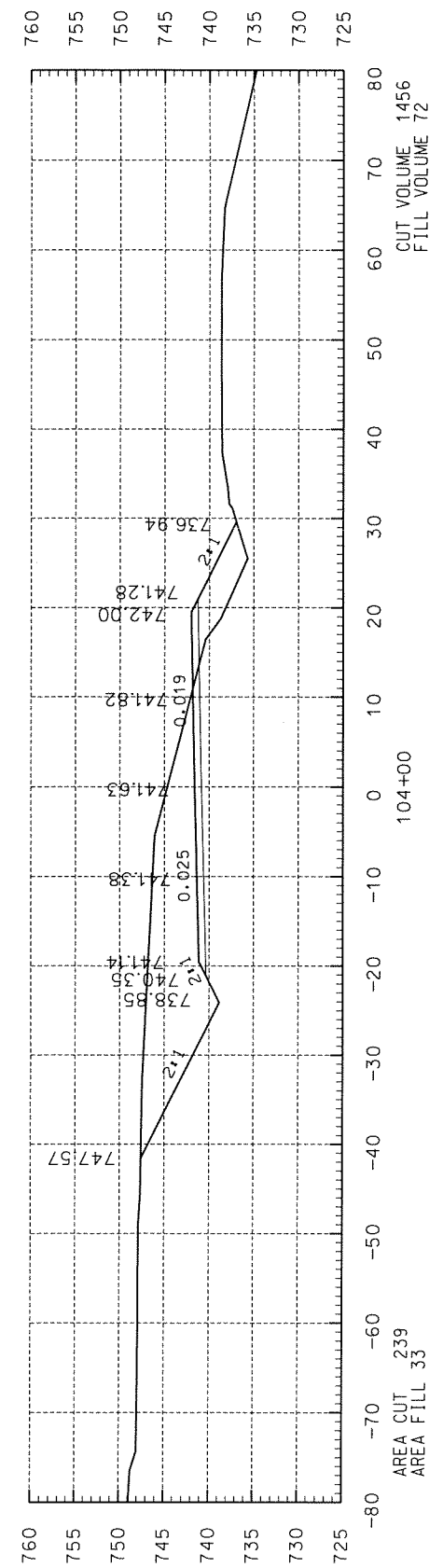
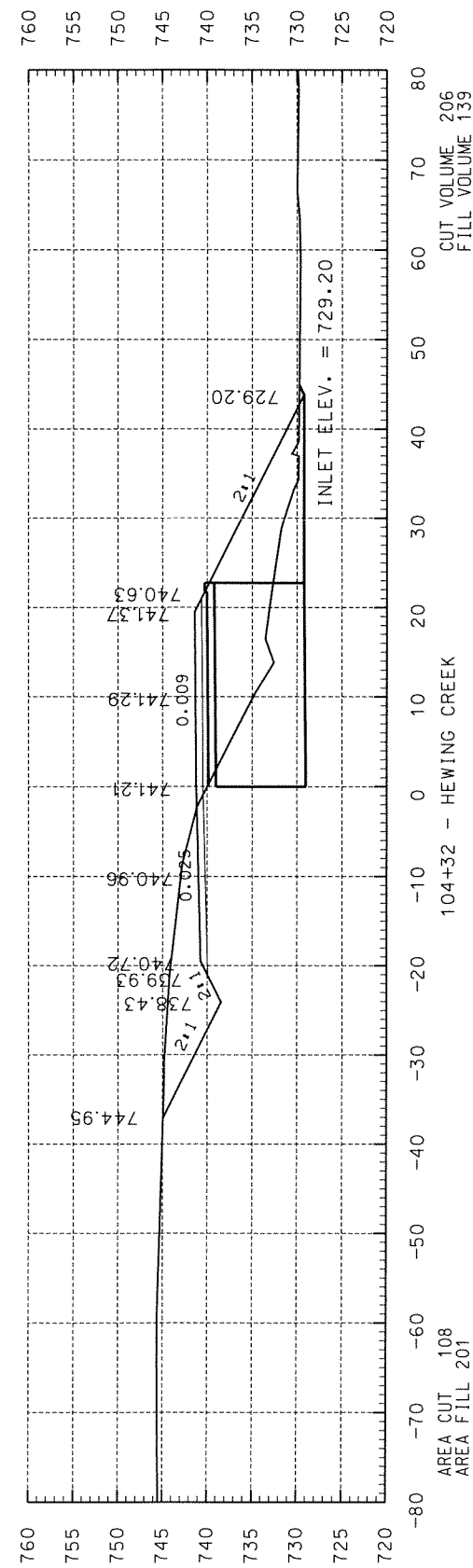
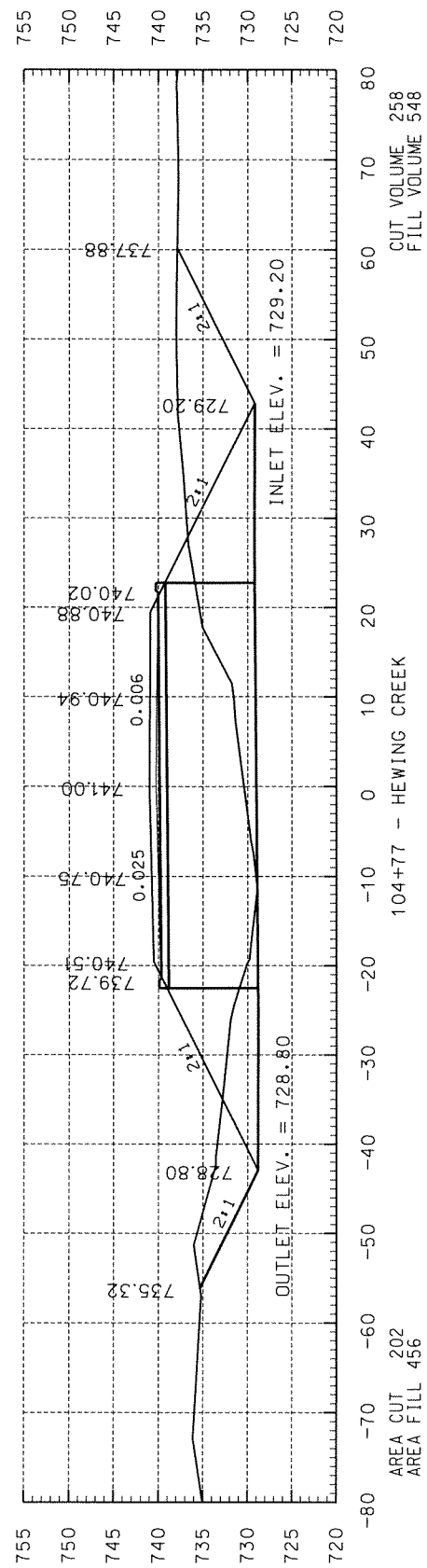
Table for DOWEL BARS FOR TWO HEADWALLS with columns for bar size, spacing, length, and quantity.

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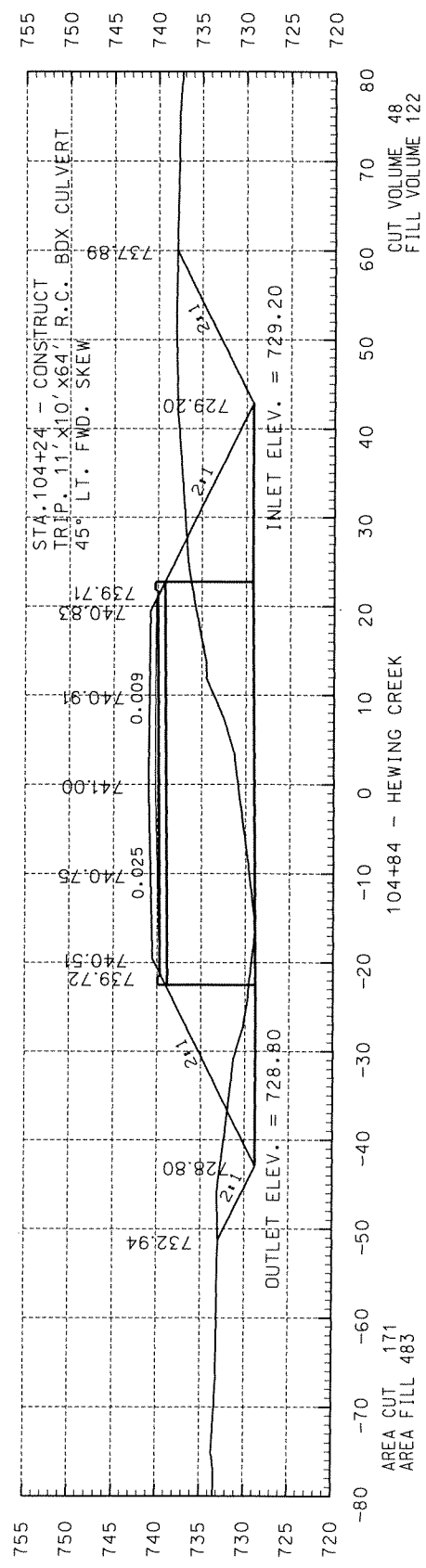
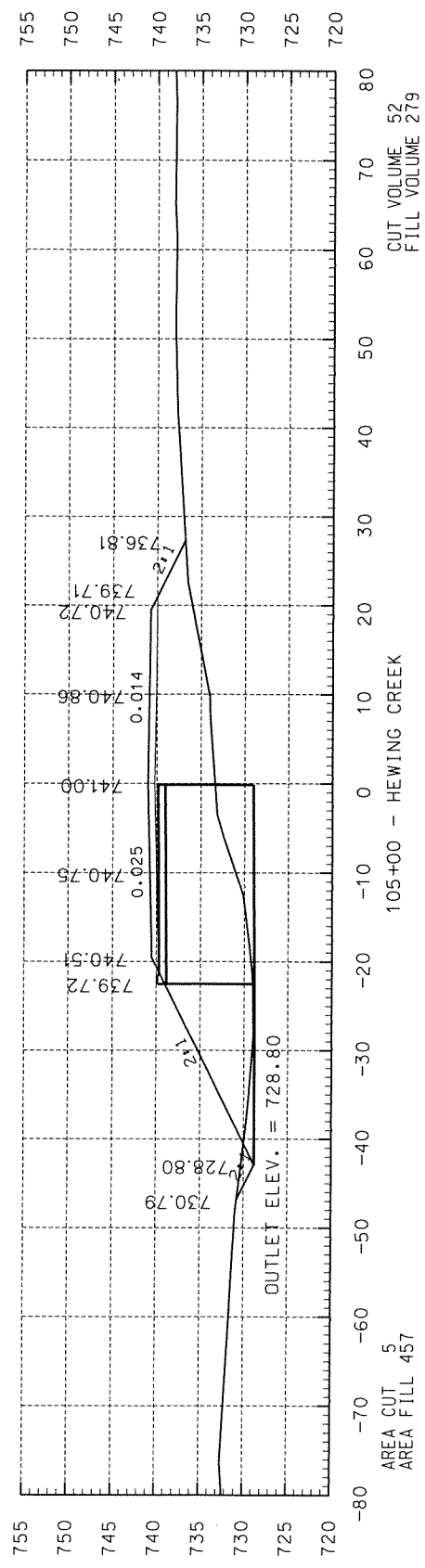
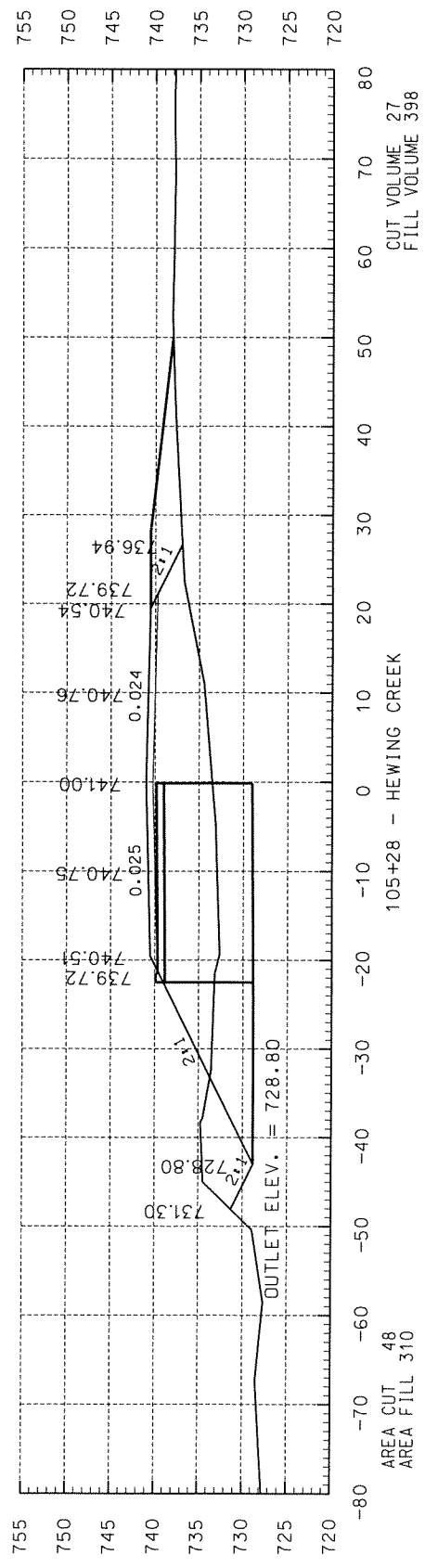
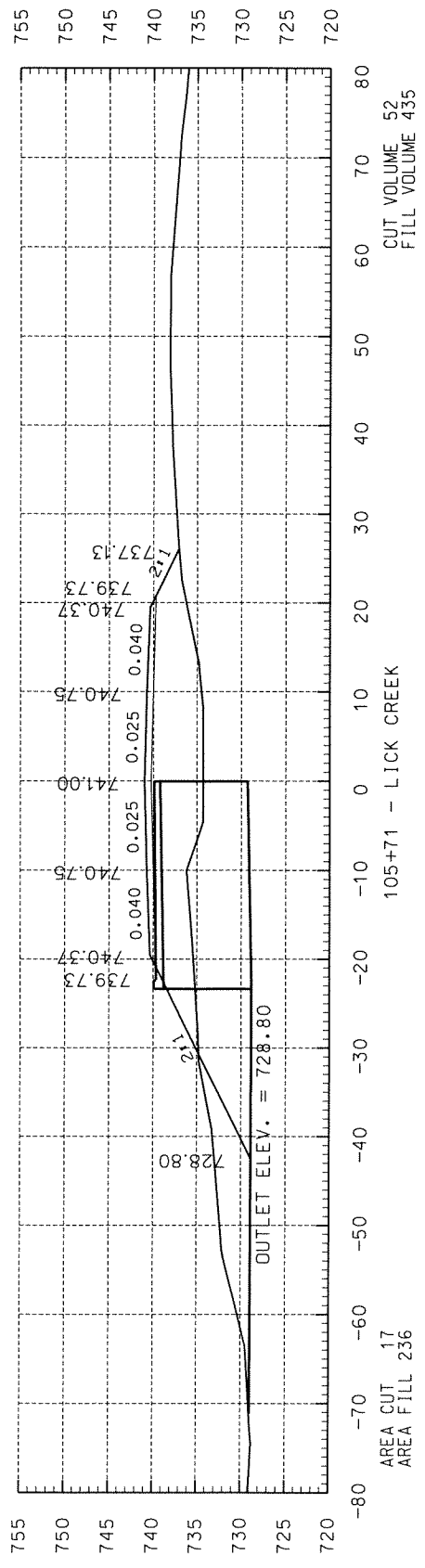
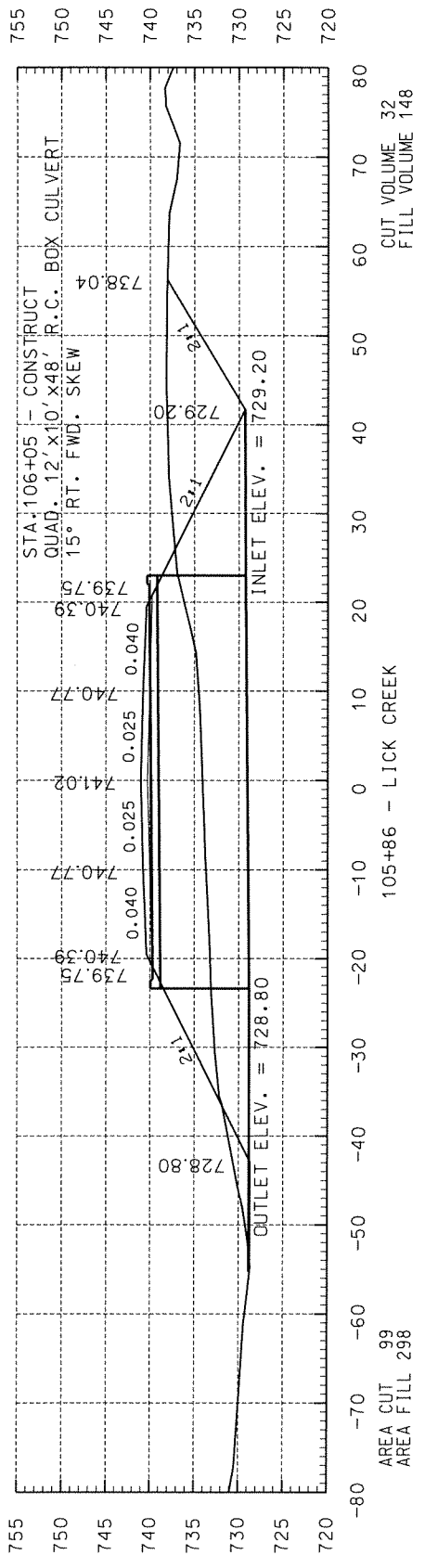
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④ STA. 98+00 - STA. 101+00



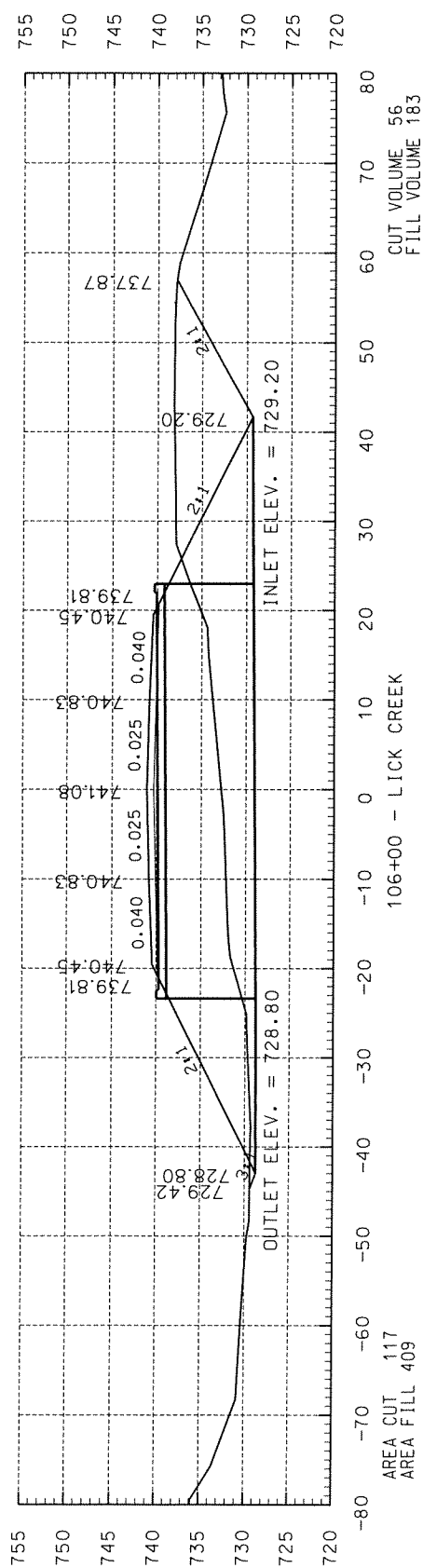
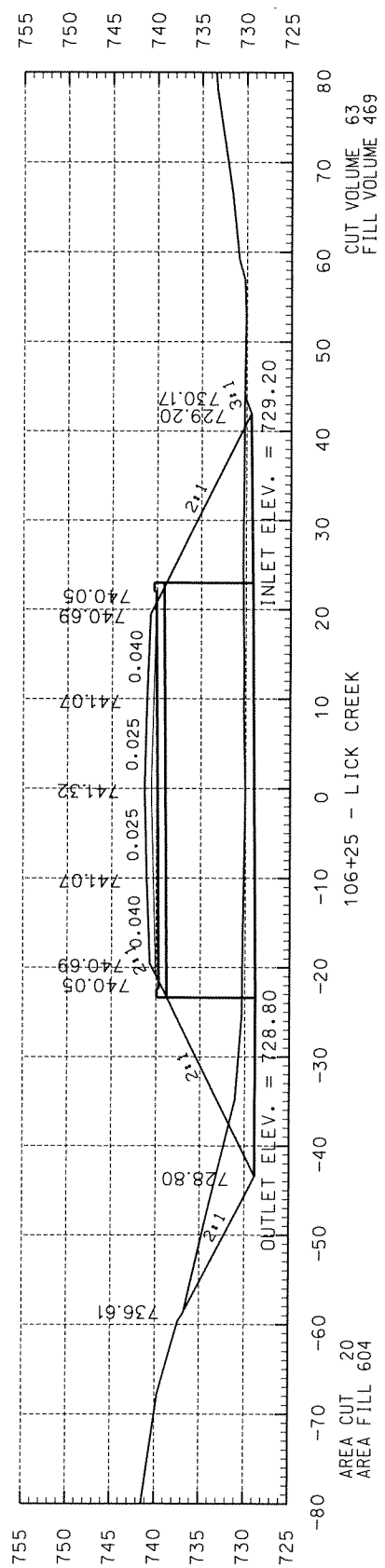
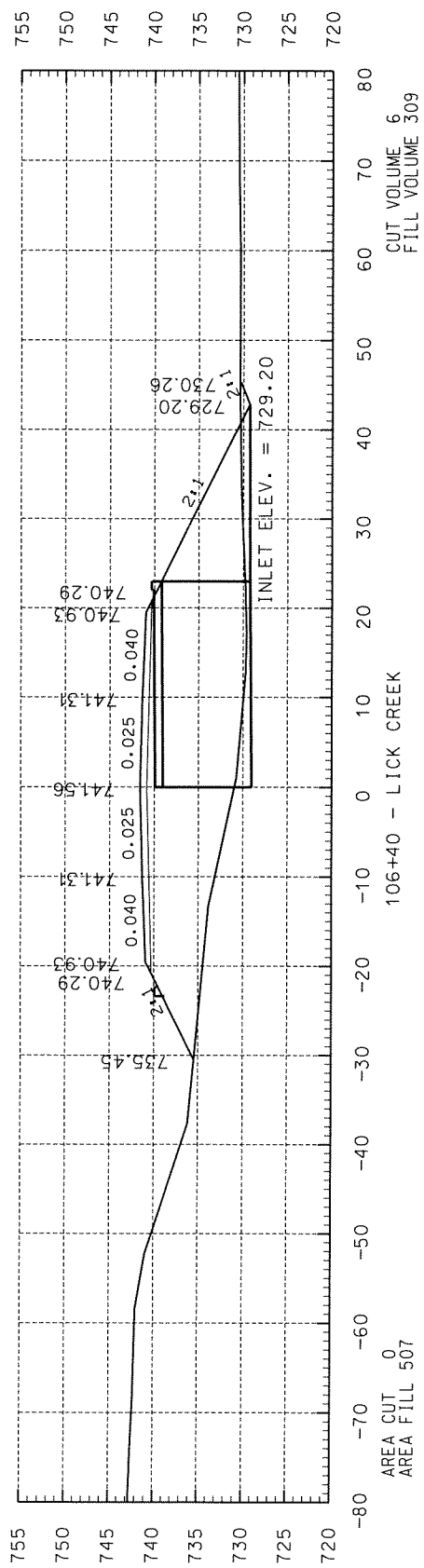
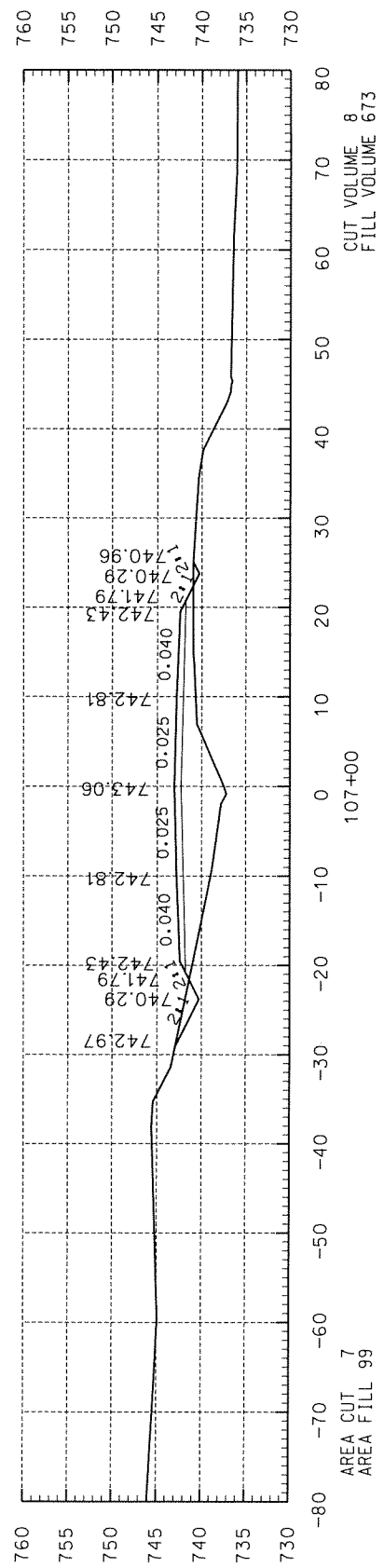
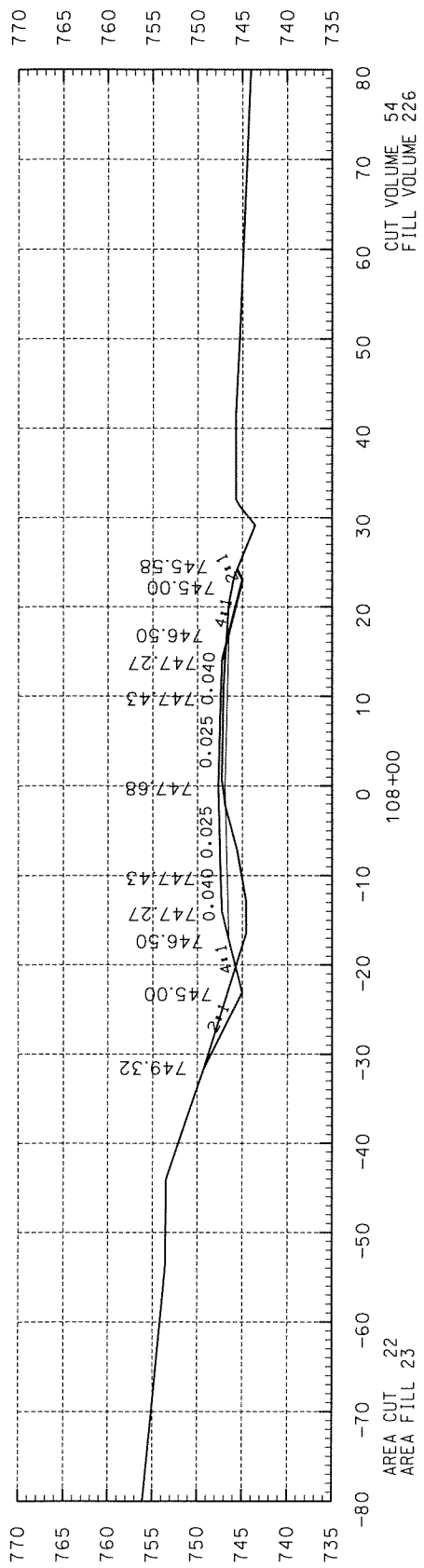


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④ STA. 104+84 - STA. 105+86								





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