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.		110646	1	48
				(2)	CYPRESS CREEK & CANAL STRS. & APPRS. (S)			

ARKANSAS DEPARTMENT OF TRANSPORTATION
CONSTRUCTION PLANS FOR STATE HIGHWAY

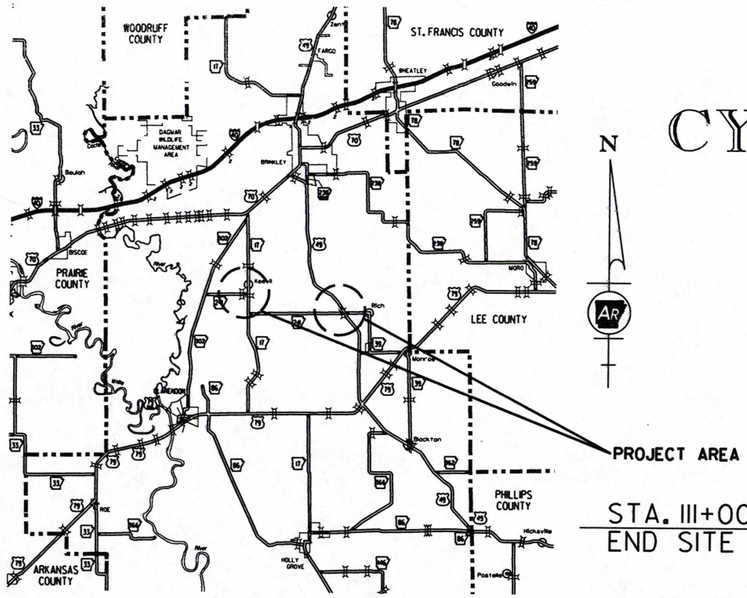
CYPRESS CREEK & CANAL STRS. & APPRS. (S)

MONROE COUNTY

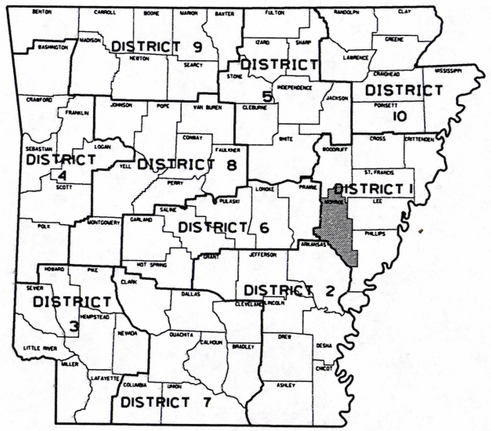
ROUTE 241 SECTIONS 1 & 2

FEDERAL AID PROJ. NHPP-0048(27)

JOB 110646

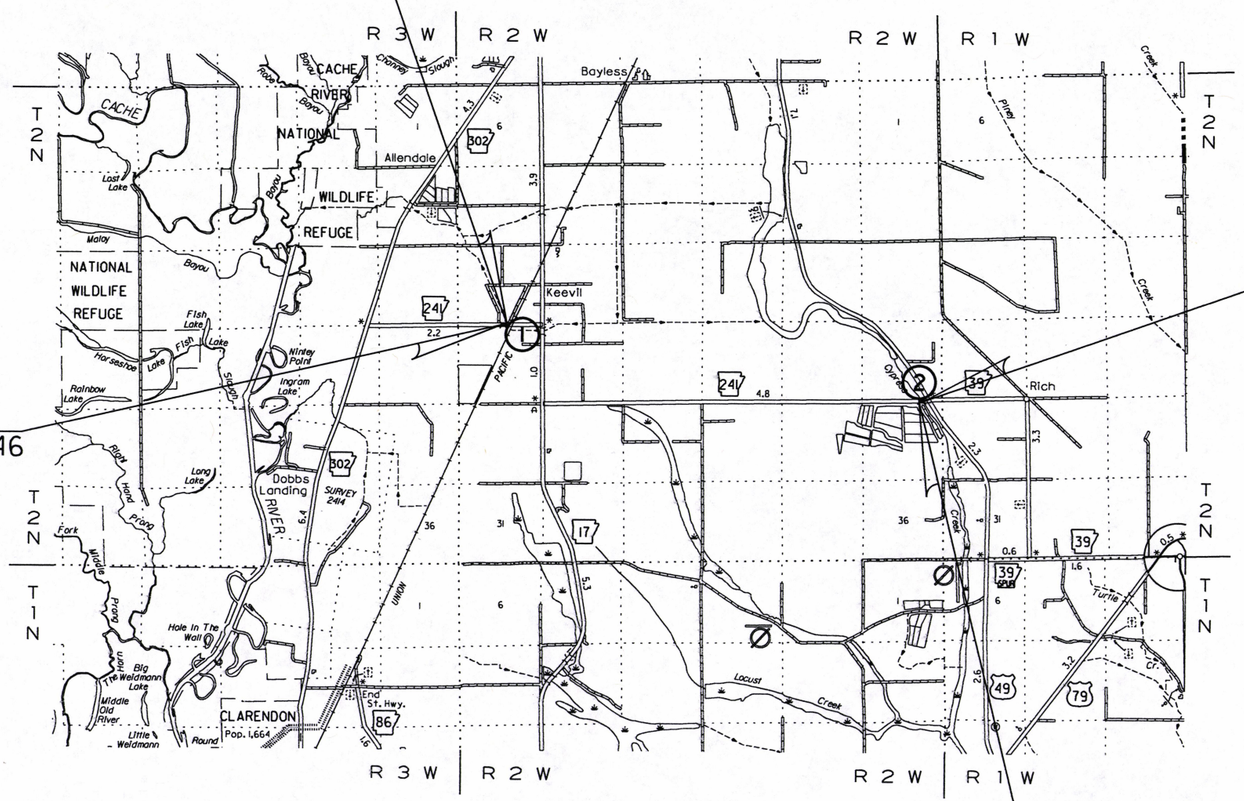


VICINITY MAP



ARK. HWY. DIST. NO. 1

NOT TO SCALE



STA. 111+00.00
END SITE 1

STA. 110+00.00
BEGIN JOB 110646
BEGIN SITE 1
LOG MILE 1.76

STA. 214+10.77
END SITE 2
END JOB 110646

STA. 206+83.56
BEGIN SITE 2
LOG MILE 4.73

STRUCTURES OVER 20'-0" SPAN

(1) STA. 110+53 CONSTRUCT
QUINT. 8' X 4' X 48' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
025 = 500 CFS D.A. = 1.2 SQ. MI.
SPAN = 43'-8"

(2) STA. 210+48 CONSTRUCT
QUINT. 10' X 5' X 48' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
025 = 1260 CFS D.A. = 20.5 SQ.MI.
SPAN = 53'-8"

DESIGN TRAFFIC DATA

	SITE 1	SITE 2
DESIGN YEAR	2038	2038
2018 ADT	50	300
2038 ADT	60	340
2038 DHV	7	37
DIRECTIONAL DISTRIBUTION	0.60	0.60
TRUCKS	15%	15%
AVERAGE RUNNING SPEED	54 MPH	56 MPH

	BEGIN SITE 1	MID-POINT OF SITE 1	END SITE 1
LATITUDE	N 34°46'51"	N 34°46'51"	N 34°46'51"
LONGITUDE	W 91°15'08"	W 91°15'08"	W 91°15'07"
	BEGIN SITE 2	MID-POINT OF SITE 2	END SITE 2
LATITUDE	N 34°45'53"	N 34°45'53"	N 34°45'53"
LONGITUDE	W 91°09'43"	W 91°09'37"	W 91°09'33"

LENGTH OF PROJECT CALCULATED ALONG C.L.

GROSS LENGTH OF	PROJECT	827.21	FEET	OR	0.157	MILES
NET	ROADWAY	729.87			0.138	MILES
NET	BRIDGES	97.34			0.019	MILES
NET	PROJECT	827.21			0.157	MILES

APPROVED

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 7836
M.E. BANKS

8-31-18

DEPUTY DIRECTOR
AND CHIEF ENGINEER

10/21/2016

R110646.DGN

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.		110646	2	48

(2) INDEX OF SHEETS AND STANDARD DRAWINGS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-31-18

INDEX OF SHEETS

SHEET NO.		TITLE
1		TITLE SHEET
2		INDEX OF SHEETS AND STANDARD DRAWINGS
3		GOVERNING SPECIFICATIONS AND GENERAL NOTES
4 - 5		TYPICAL SECTIONS OF IMPROVEMENT
6 - 14		SPECIAL DETAILS
15 - 20		TEMPORARY EROSION CONTROL DETAILS
21 - 26		MAINTENANCE OF TRAFFIC DETAILS
27 - 28		PERMANENT PAVEMENT MARKING DETAILS
29 - 32		QUANTITIES
33		SUMMARY OF QUANTITIES AND REVISIONS
34 - 37		SURVEY CONTROL DETAILS
38 - 39		PLAN AND PROFILE SHEETS
40		DETOUR PLAN AND PROFILE SHEETS
41 - 48		CROSS SECTIONS

ROADWAY STANDARD DRAWINGS

DRWG.NO.	TITLE	DATE
PBC-1	PRECAST CONCRETE BOX CULVERTS	01-28-15
PCC-1	CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING	02-27-14
PCM-1	METAL PIPE CULVERT FILL HEIGHTS & BEDDING	02-27-14
PCP-1	PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)	02-27-14
PCP-2	PLASTIC PIPE CULVERT (PVC F949)	02-27-14
PM-1	PAVEMENT MARKING DETAILS	06-01-17
PU-1	DETAILS OF PIPE UNDERDRAIN	12-08-16
RCB-1	REINFORCED CONCRETE BOX CULVERT DETAILS	07-26-12
RCB-2	EXCAVATION PAY LIMITS, BACKFILL, & SOLID SODDING FOR BOX CULVERTS	11-20-03
RRS-1	PAVEMENT MARKING FOR RAILROAD CROSSING	12-08-16
SE-2	TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC	10-18-96
TC-1	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	04-13-17
TC-2	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	09-02-15
TC-3	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	09-02-15
TEC-1	TEMPORARY EROSION CONTROL DEVICES	11-16-17
TEC-2	TEMPORARY EROSION CONTROL DEVICES	06-02-94
TEC-3	TEMPORARY EROSION CONTROL DEVICES	11-03-94
TEC-4	TEMPORARY EROSION CONTROL DEVICES	07-26-12

6/26/2018

R110646.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
11/1/18				6	ARK.			
11/16/18				JOB NO.		110646	3	48
				(2) GOVERNING SPECS. AND GENERAL NOTES				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-16-18

GOVERNING SPECIFICATIONS

ARKANSAS STATE HIGHWAY COMMISSION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, EDITION OF 2014, AND THE FOLLOWING SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS:

NUMBER	TITLE
ERRATA_____	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273__	REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS
FHWA-1273__	SUPPLEMENT - SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140)
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - FEDERAL STANDARDS
FHWA-1273__	SUPPLEMENT - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS
FHWA-1273__	SUPPLEMENT - WAGE RATE DETERMINATION
100-3_____	CONTRACTOR'S LICENSE
100-4_____	DEPARTMENT NAME CHANGE
102-2_____	ISSUANCE OF PROPOSALS
108-1_____	LIQUIDATED DAMAGES
108-2_____	WORK ALLOWED PRIOR TO ISSUANCE OF WORK ORDER
110-1_____	PROTECTION OF WATER QUALITY AND WETLANDS
303-1_____	AGGREGATE BASE COURSE
306-1_____	QUALITY CONTROL AND ACCEPTANCE
400-1_____	TACK COATS
400-4_____	DESIGN AND QUALITY CONTROL OF ASPHALT MIXTURES
400-5_____	PERCENT AIR VOIDS FOR ACHM MIX DESIGNS
400-6_____	LIQUID ANTI-STRIP ADDITIVE
410-1_____	CONSTRUCTION REQUIREMENTS AND ACCEPTANCE OF ASPHALT CONCRETE PLANT MIX COURSES
410-2_____	DEVICES FOR MEASURING DENSITY FOR ROLLING PATTERNS
600-2_____	INCIDENTAL CONSTRUCTION
604-1_____	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
606-1_____	PIPE CULVERTS FOR SIDE DRAINS
620-1_____	MULCH COVER
800-1_____	STRUCTURES
802-3_____	CONCRETE FOR STRUCTURES
JOB 110646__	BIDDING REQUIREMENTS AND CONDITIONS
JOB 110646__	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 110646__	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 110646__	CARGO PREFERENCE ACT REQUIREMENTS
JOB 110646__	CONSTRUCTION IN SPECIAL FLOOD HAZARD AREAS
JOB 110646__	DELAY IN RIGHT OF WAY OCCUPANCY
JOB 110646__	DISADVANTAGED BUSINESS ENTERPRISE BIDDER'S RESPONSIBILITIES
JOB 110646__	FLEXIBLE BEGINNING OF WORK
JOB 110646__	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 110646__	MAINTENANCE OF TRAFFIC
JOB 110646__	MANDATORY ELECTRONIC CONTRACT
JOB 110646__	MANDATORY ELECTRONIC DOCUMENT SUBMITTAL
JOB 110646__	NESTING SITES OF MIGRATORY BIRDS
JOB 110646__	PLASTIC PIPE
JOB 110646__	REMOVING AND STOCKPILING EXISTING AGGREGATE BASE COURSE (CLASS 7)
JOB 110646__	SETTLEMENT AGREEMENTS
JOB 110646__	SHORING FOR CULVERTS
JOB 110646__	SOIL STABILIZATION
JOB 110646__	STORM WATER POLLUTION PREVENTION PLAN
JOB 110646__	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 110646__	UTILITY ADJUSTMENTS
JOB 110646__	WARM MIX ASPHALT

GENERAL NOTES

1. GRADE LINE DENOTES FINISHED GRADE WHERE SHOWN ON PLANS.
2. ALL PIPE LINES, POWER, TELEPHONE, AND TELEGRAPH LINES TO BE MOVED OR LOWERED BY THE RESPECTIVE OWNERS AS PER AGREEMENT WITH SUCH OWNERS.
3. ANY EQUIPMENT OR APPURTENANCE THAT INTERFERES WITH THE PROPOSED CONSTRUCTION AND WHICH MAY BE THE PROPERTY OF UTILITY SERVICE ORGANIZATIONS SHALL BE MOVED BY THE OWNERS UNLESS OTHERWISE PROVIDED.
4. ALL LAND MONUMENTS LOCATED WITHIN THE CONSTRUCTION AREA SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 107.12 OF THE STANDARD SPECIFICATIONS.
5. 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.
6. THIS PROJECT IS COVERED UNDER A SECTION 404 NATIONWIDE 23 PERMIT. REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS, EDITION OF 2014, FOR PERMIT REQUIREMENTS.
7. ALL FLEXIBLE BASE AND ASPHALTIC PAVEMENTS REMOVED SHALL BE PAID FOR UNDER THE ITEM NO. 210 - UNCLASSIFIED EXCAVATION.
8. THE EXISTING ASPHALT PAVEMENT TO BE REMOVED FROM THE REMAINING PAVEMENT SHALL BE SEPARATED BY SAWING ALONG A NEAT LINE. AFTER SAWING, THE PAVEMENT TO BE REMOVED SHALL BE CAREFULLY REMOVED IN A MANNER THAT WILL NOT DAMAGE THE PAVEMENT THAT IS TO REMAIN. ANY DAMAGE OF THE ASPHALT PAVEMENT THAT IS TO REMAIN IN PLACE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

6/26/2018

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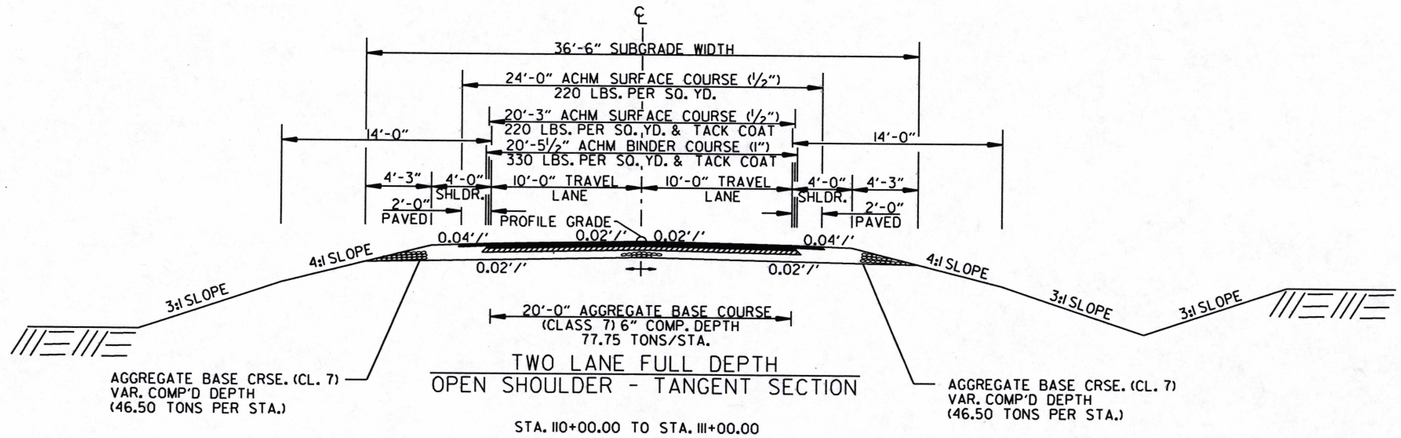
				6	ARK.			
				JOB NO.		110646	4	48

(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-31-18



TWO LANE FULL DEPTH
OPEN SHOULDER - TANGENT SECTION

STA. 110+00.00 TO STA. 111+00.00

STA. 207+70.00 TO STA. 211+17.91
STA. 213+68.66 TO STA. 213+80.00

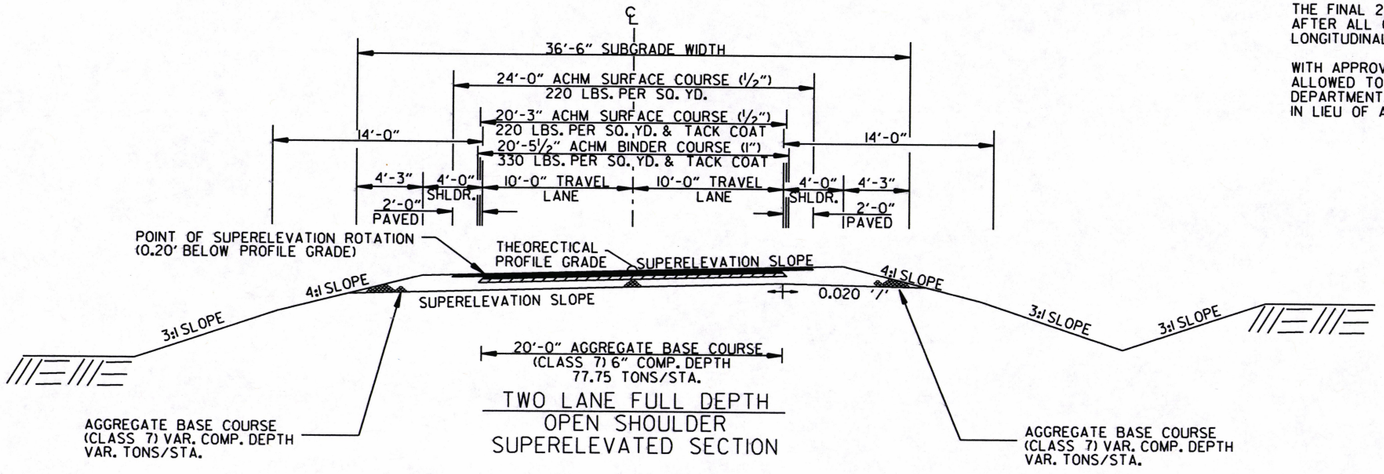
NOTES:

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

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

THE FINAL 2" OF SURFACE COURSE IS TO BE PLACED AFTER ALL OTHER COURSES HAVE BEEN LAID. LONGITUDINAL JOINTS SHALL BE AT LANE LINES.

WITH APPROVAL OF THE ENGINEER, THE CONTRACTOR WILL BE ALLOWED TO SUBSTITUTE AT NO ADDITIONAL COST TO THE DEPARTMENT, THE FIRST LIFT OF ACHM SURFACE COURSE (½") IN LIEU OF AGGREGATE BASE COURSE ON THE SHOULDERS.



TWO LANE FULL DEPTH
OPEN SHOULDER
SUPERELEVATED SECTION

STA. 211+17.91 TO STA. 213+68.66

6/26/2018

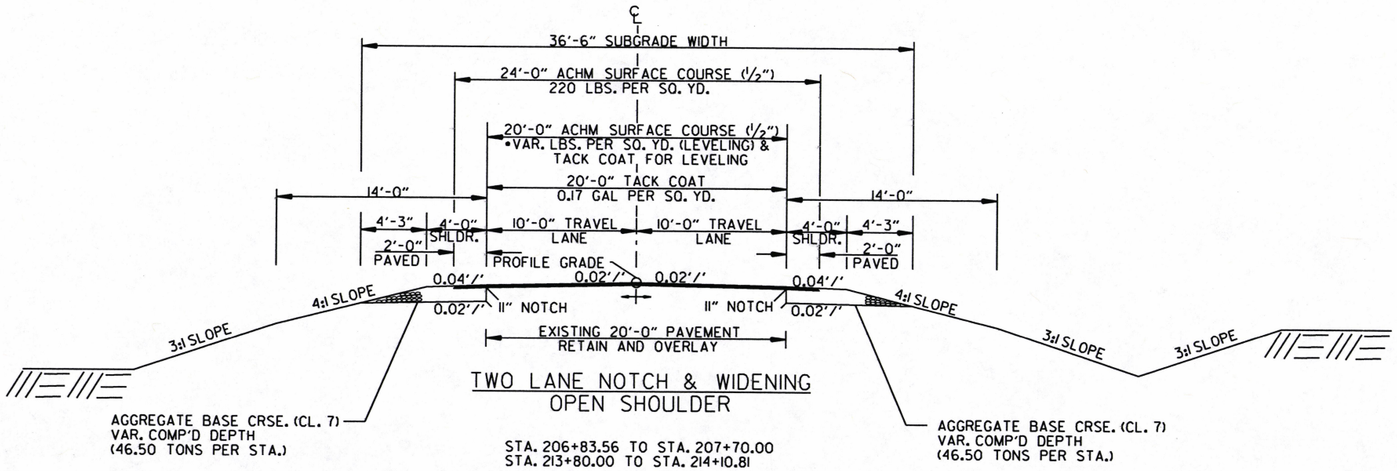
R110646.DGN

TYPICAL SECTIONS 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.		110646	5	48

(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-31-18



TWO LANE NOTCH & WIDENING
OPEN SHOULDER

STA. 206+83.56 TO STA. 207+70.00
STA. 213+80.00 TO STA. 214+10.81

•TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.

NOTES:

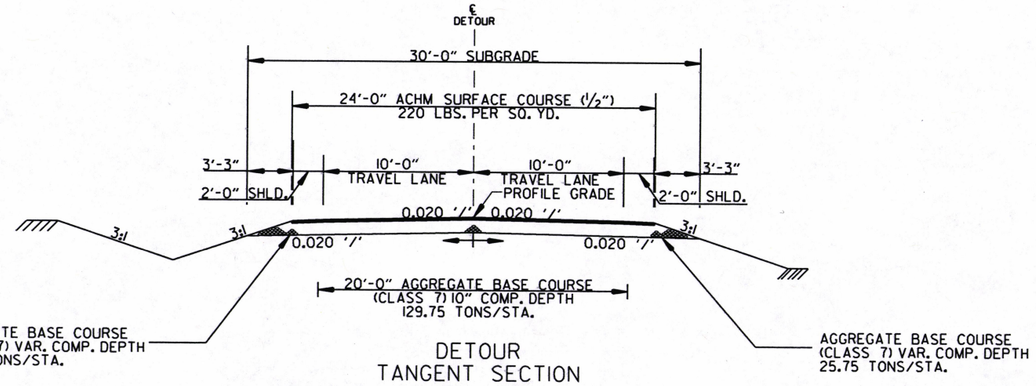
REFER TO CROSS SECTIONS FOR DEVIATION FROM THE NORMAL SLOPES. NO CHANGES SHALL BE MADE FROM THE PLANNED SLOPES WITHOUT THE APPROVAL OF THE ENGINEER.

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

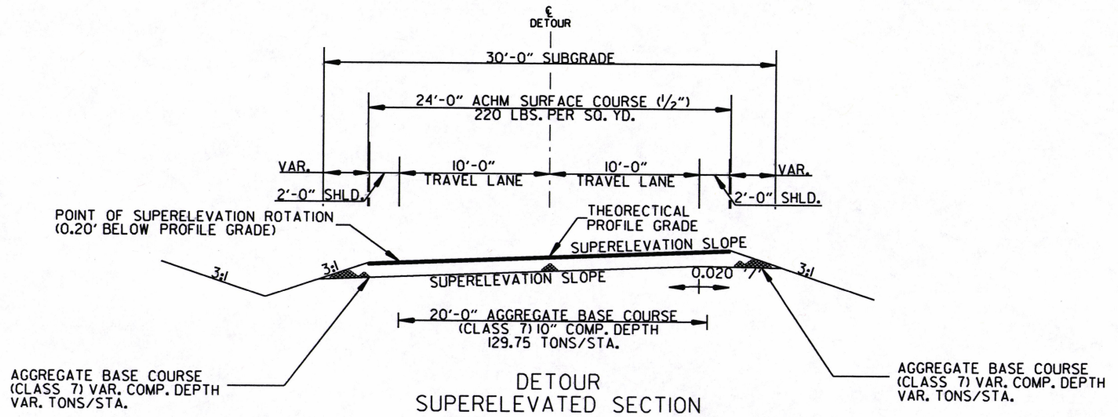
ASPHALT FOR LEVELING OF EXISTING PAVEMENT SHALL BE PLACED ONLY IF AND WHERE DIRECTED BY THE ENGINEER. CALCULATIONS SHALL BE PERFORMED BEFORE CONSTRUCTING NOTCH AND WIDENING. CALCULATIONS WILL NOT BE PAID FOR DIRECTLY, BUT PAYMENT WILL BE CONSIDERED INCLUDED IN THE VARIOUS PAY ITEMS.

THE FINAL 2" OF SURFACE COURSE IS TO BE PLACED AFTER ALL OTHER COURSES HAVE BEEN LAID. LONGITUDINAL JOINTS SHALL BE AT LANE LINES.

WITH APPROVAL OF THE ENGINEER, THE CONTRACTOR WILL BE ALLOWED TO SUBSTITUTE AT NO ADDITIONAL COST TO THE DEPARTMENT, THE FIRST LIFT OF ACHM SURFACE COURSE (1/2") IN LIEU OF AGGREGATE BASE COURSE ON THE SHOULDERS.



DETOUR
TANGENT SECTION



DETOUR
SUPERELEVATED SECTION

6/26/2018

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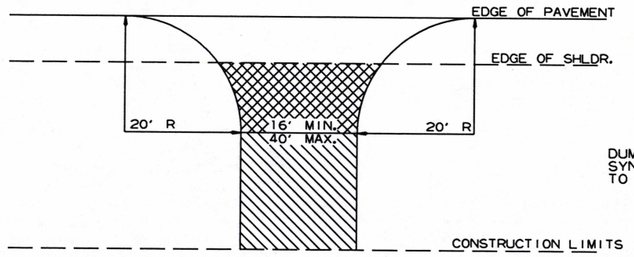
TYPICAL SECTIONS OF IMPROVEMENT

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
11/1/18				6	ARK.			
				JOB NO.		110646	6	48

(2) SPECIAL DETAILS

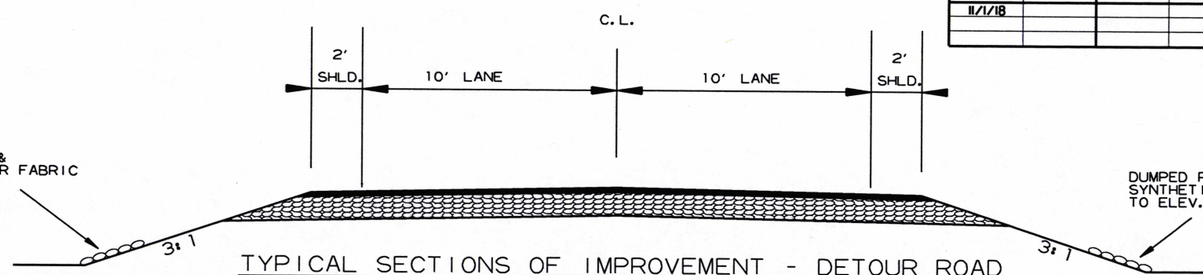


ASPHALT CONCRETE HOT MIX SURFACE COURSE (220 LBS. PER SQ. YD.)
AGGREGATE BASE COURSE (CLASS 7)
7" COMP. DEPTH

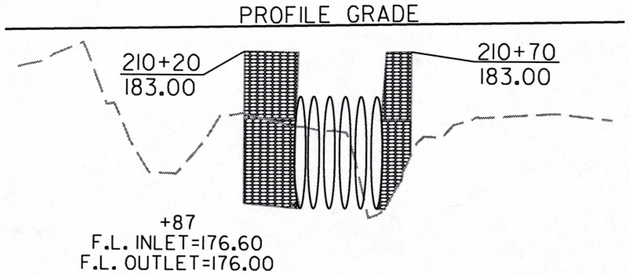
AGGREGATE BASE COURSE (CLASS 7)
9" COMP. DEPTH OR CONFORM TO EXISTING DRIVEWAY

DETAIL FOR DRIVEWAY TURNOUTS

NOTE: TURNOUTS AND PRIVATE DRIVES SHALL BE MODIFIED WHERE NECESSARY TO MEET LOCAL CONDITIONS AS DIRECTED BY THE ENGINEER.



TYPICAL SECTIONS OF IMPROVEMENT - DETOUR ROAD
STA. 210+20 - STA. 210+70



STATE OF ARKANSAS
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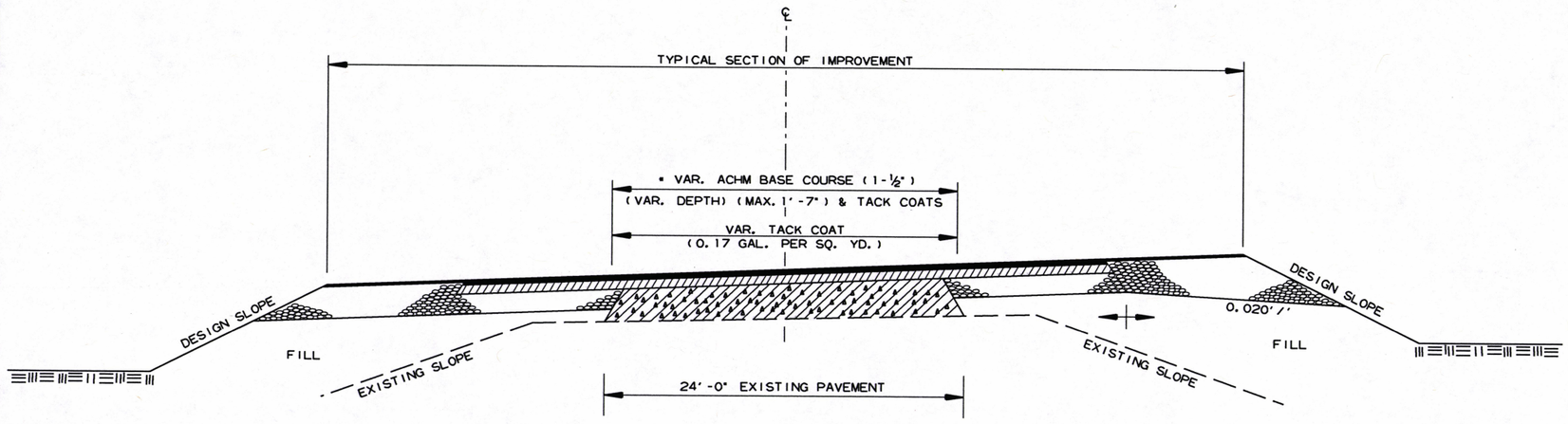
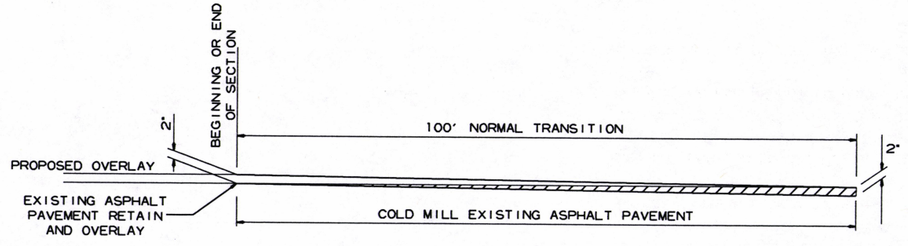
No. 11425
TRINITY D. SMITH
11-6-18

THIS STREAM IS CLASSIFIED AS AN PERENNIAL STREAM. THE PERENNIAL STREAM BANK ELEVATION IS 183.0 FT. MSL.



* 7" AGGREGATE BASE COURSE (CLASS 7) TO BE REPLACED WITH ACHM BASE COURSE (1-½")

METHOD OF RAISING GRADE



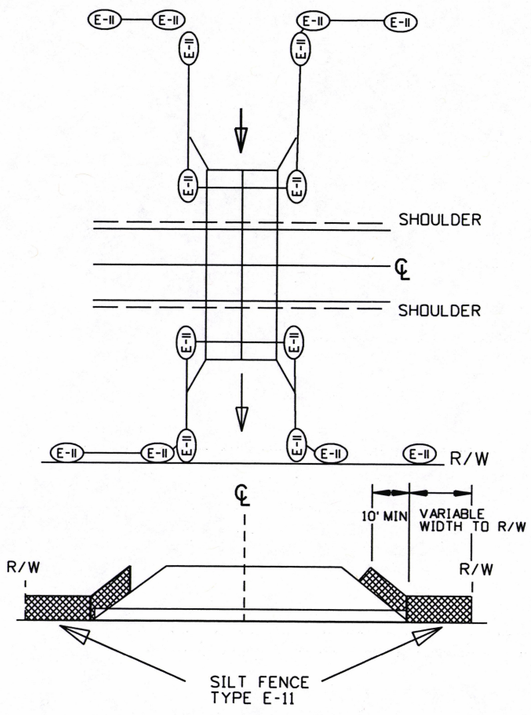
DETAIL FOR TRANSITIONS

NOTES:

(1) THIS DETAIL TO BE USED ONLY WHERE DIRECTED BY THE ENGINEER.

(2) QUANTITIES FOR METHOD OF GRADE RAISE USING ASPHALT WERE CALCULATED ON THIS PROJECT AT LOCATIONS WHERE THE DISTANCE BETWEEN THE EXISTING ASPHALT ROADWAY AND THE PROPOSED SUBGRADE WAS ONE FOOT OR LESS.

(3) IN LOCATIONS WHERE THE DISTANCE BETWEEN THE PROPOSED SUBGRADE AND THE EXISTING ASPHALT ROADWAY IS MORE THAN ONE FOOT, SCARIFICATION OF THE EXISTING ASPHALT ROADWAY WILL BE REQUIRED AS STATED IN SECTION 210, SUBSECTION 210.09 OF THE STANDARD SPECIFICATIONS.



DETAIL OF SILT FENCE AT R.C. BOX

6/26/2018

R110646.DGN

SPECIAL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110646	7	48

① SPECIAL DETAILS

INLET WINGWALL TABLE

OVER ALL WIDTH	CLEAR HEIGHT	FOOTING THK.	WING WALL THK.	BOX SKEW (DEG.)	SLOPE	HDWL LENGTH	HEEL	WALL HEIGHT AT HDWL	WALL HEIGHT AT WING END	WINGWALL ANGLE (DEGREE) WING A	WINGWALL ANGLE (DEGREE) WING B	FOOTING WIDTH AT WALL END	WIDTH OF WING FOOTINGS AT HDWL WING A	WIDTH OF WING FOOTINGS AT HDWL WING B	FOOTING DIMENSION PARALLEL WITH HDWL WING A	FOOTING DIMENSION PARALLEL WITH HDWL WING B	LENGTH OF WINGWALLS WING A	LENGTH OF WINGWALLS WING B	LENGTH OF FOOTING HEEL WING A	LENGTH OF FOOTING HEEL WING B
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	AF1	AF2	WE	WF1	WF2	G1	G2	W1	W2	W3	W4
43'-8"	4'-0"	0'-9"	0'-8"	0	3:1	42'-8"	1'-0"	4'-10"	1'-4"	30	30	2'-2"	2'-5 3/4"	2'-5 3/4"	0'-4 3/8"	0'-4 3/8"	12'-0"	12'-0"	13'-10 5/8"	13'-10 5/8"

CLASS "S" CONCRETE (Includes apron)	REINFORCING STEEL (Includes apron and laps if required)
INLET	INLET
CU.YD	LBS.
6.59	492

WING			F1 BAR SIZE	F1 MAX. SPACING	F1 NO. REQ'D	F1 LENGTHS VARY	F2 BAR SIZE	F2 SPACING	F2 NO. REQ'D	F2 LENGTHS	F3 BAR SIZE	F3 SPACING	F3 NO. REQ'D	F3 LENGTHS	F4 BAR SIZE	F4 SPACING	F4 NO. REQ'D	F4 LENGTHS VARY	F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY
WING A	L	Min	4	12	12	2'-6"	-	-	-	-	-	-	-	-	4	18	4	Min 3'-10"	4	18	2	11'-8"	4	18	8	3'-2"
	L	Max				6'-0"																				6'-3"
	X	Min				0'-9"				-				-												1'-4"
	X	Max				1'-1"												Max 9'-0"								1'-4"
	Y	Min				1'-10"				-				-												1'-11"
	Y	Max				5'-0"																				5'-0"
WING B	L	Min	4	12	12	2'-6"	-	-	-	-	-	-	-	-	4	18	4	Min 3'-10"	4	18	2	11'-8"	4	18	8	3'-2"
	L	Max				6'-0"																				6'-3"
	X	Min				0'-9"				-				-												1'-4"
	X	Max				1'-1"												Max 9'-0"								1'-4"
	Y	Min				1'-10"				-				-												1'-11"
	Y	Max				5'-0"																				5'-0"

WING	F7 BAR SIZE	F7 NO. REQ'D	F7 LENGTHS	F8 BAR SIZE	F8 SPACING	F8 NO. REQ'D	F8 LENGTHS VARY	F9 BAR SIZE	F9 SPACING	F9 NO. REQ'D	F9 LENGTHS	F10 BAR SIZE	F10 NO. REQ'D	F10 LENGTHS	F11 BAR SIZE	F11 NO. REQ'D	F11 LENGTHS	F12 BAR SIZE	F12 SPACING	F12 NO. REQ'D		F12 LENGTHS	REINF. STEEL QTY. PER WING (LBS)
WING A	4	6	14'-9"	4	18	8	Min 1'-8"	-	-	-	Min -	4	2	12'-0"	4	2	13'-4"	6	12	4	L	3'-4"	246
							Max 2'-0"				Max -										X	1'-8"	
WING B	4	6	14'-9"	4	18	8	Min 1'-8"	-	-	-	Min -	4	2	12'-0"	4	2	13'-4"	6	12	4	L	3'-4"	246
							Max 2'-0"				Max -										X	1'-8"	

MID-SECTION BAR LAP TABLE

# of Long. Laps Req'd.	SL = Section Length
0	< 40.0 ft
1	>40.0 ft - 78.0 ft
2	>78.0 ft - 116.0 ft
3	>116.0 ft - 154.0 ft
4	>154.0 ft - 192.0 ft
5	>192.0 ft - 230.0 ft
6	>230.0 ft - 268.0 ft
7	>268.0 ft - 306.0 ft
8	>306.0 ft -344.0 ft

Min. Bar Lap Length	
#4	1'-9"
#5	2'-2"
#6	2'-7"
#7	3'-6"
#8	4'-7"

Bar Pin Dia. Table	
#4	3"
#5	3 3/4"
#6	4 1/2"
#7	5 1/4"
#8	6"

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
7-2-18

TABULAR DATA BY: JWP DATE: 06/08/2018
CHECKED BY: CLD DATE: 6/8/2018

This drawing to be used in conjunction with
SHEET 1 OF 4, "GENERAL DETAILS OF R.C. BOX CULVERT", 'GENERAL NOTES & LONGITUDINAL SECTION LENGTH SCHEDULE',
SHEET 3 OF 4, "GENERAL DETAILS OF R.C. BOX CULVERT", 'DETAILS OF MULTI-BARREL R.C. BOX CULVERT',
SHEET 4 OF 4, "GENERAL DETAILS OF R.C. BOX CULVERT", 'DETAILS OF WINGWALLS', and
STANDARD DRAWING RCB-2.
For additional information and outlet sections, see Sheet 2 of 2.

INLET SKEWED END SECTION

SKEW (DEGREE) SK	SLOPE SL	DESIGN FILL DEPTH (FT.) D	CLEAR SPAN (FT.) S	CLEAR HEIGHT (FT.) H	SECTION LENGTH LL	TOP SLAB THK. T	HDWL DEPTH HD	BOTTOM SLAB THK. B	SIDE WALL THK. C	INTERIOR WALL THK. W	OVERALL WIDTH OW	OVERALL HEIGHT OH	TOP SLAB "a" SIZE	"a" SPACING	"a" LENGTHS VARY	"a" NO. REQ'D	TOP SLAB "c" SIZE	"c" SPACING	"c" LENGTHS VARY	"c" NO. REQ'D	BOTTOM SLAB "d" SIZE	"d" SPACING	"d" LENGTHS VARY	"d" NO. REQ'D	BOTTOM SLAB "f" SIZE	"f" SPACING	"f" LENGTHS VARY	"f" NO. REQ'D	SIDE WALL "f0" SIZE	"f0" SPACING	"f0" NO. REQ'D	"f0" LENGTH	INTERIOR WALL "f1" SIZE	"f1" SPACING	"f1" NO. REQ'D	"f1" LENGTH	TOP SLAB DISTRIBUTION "g" SIZE	"g" SPACING	"g" NO. REQ'D	"g" LENGTHS VARY	BOTTOM SLAB DISTRIBUTION "e" SIZE	"e" SPACING	"e" NO. REQ'D	"e" LENGTHS VARY	SIDE WALL DISTRIBUTION "d1" SIZE	"d1" SPACING	"d1" NO. REQ'D	"d1" LENGTH	INTERIOR WALL DISTRIBUTION "d2" SIZE	"d2" SPACING	"d2" NO. REQ'D	"d2" LENGTH	CLASS "S" CONCRETE (Includes HDWL) CU. YDS.	① REINFORCING STEEL (GR 60) (Includes HDWL) LBS.
															Max				Max				Max				Max													Max				Max				LONG				LONG		
															Min				Min				Min				Min													Min				Min				SHORT				MID		
																																																				SHORT		

"k1" HDWL BARS SIZE	"k1" LENGTH	"k1" NO. REQ'D	"k2" HDWL BARS SIZE	"k2" LENGTH	"k2" NO. REQ'D	"h" HDWL BARS SIZE	"h" LENGTH	"h" Y	"h" NO. REQ'D

① Any Bar Lap Required for the Skewed End Section shall be considered subsidiary to the item "Reinforcing Steel - Roadway (Gr. 60)."

INLET SLOPE SECTION(S)

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.) D	CLEAR SPAN (FT.) S	CLEAR HEIGHT (FT.) H	TOP SLAB THK. T	BOTTOM SLAB THK. B	SIDE WALL THK. C	INTERIOR WALL THK. W	OVER ALL WIDTH OW	OVER ALL HEIGHT OH	SECTION LENGTH (FT.) SL	TOP SLAB REINFORCING STEEL (LENGTH = OW - 4" + BENDS) "a" SIZE	"a" L	Bent "b" SIZE	Bent "b" L	"c" SIZE	"c" L	SPACING	NO. REQ'D	BOTTOM SLAB REINFORCING STEEL (LENGTH = OW - 4" + BENDS) "d" SIZE	"d" L	Bent "b1" SIZE	Bent "b1" L	"f" SIZE	"f" L	SPACING	NO. REQ'D	SIDE WALL REINFORCING STEEL "f0" (LENGTH = OH - 4") SIZE	SPACING	NO. REQ'D	LENGTH	INTERIOR WALL REINFORCING STEEL "f1" (LENGTH = OH - 4") SIZE	SPACING	NO. REQ'D	LENGTH	TOP SLAB DISTRIBUTION REINF. STEEL "g" (LENGTH = SL) SIZE	SPACING	NO. REQ'D	BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" (LENGTH = SL) SIZE	SPACING	NO. REQ'D	SIDE WALL DISTRIBUTION REINF. STEEL "d1" (LENGTH = SL) SIZE	SPACING	NO. REQ'D	INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" (LENGTH = SL) SIZE	SPACING	NO. REQ'D

CLASS "S" CONCRETE CU. YDS.	REINFORCING STEEL (GR. 60) LBS.
TOTAL	
0.40	110

HDWL DEPTH HD	ADDITIONAL REINF. FOR HDWL LBS.	"h" HDWL BARS SIZE	"h" Y	"h" LENGTH	"h" NO. REQ'D
3"	58	4	0'-9"	1'-9"	45

Design Fill Depth	Range of Actual Fill Depth
2	0.0 ft - 2.0 ft
5	>2.0 ft - 5.0 ft
10	>5.0 ft - 10.0 ft
15	>10.0 ft - 15.0 ft
20	>15.0 ft - 20.0 ft
25	>20.0 ft - 25.0 ft
30	>25.0 ft - 30.0 ft
35	>30.0 ft - 35.0 ft
40	>35.0 ft - 40.0 ft

Data shown for Mid-Section, Slope Section(s), and Skewed End Section is based on the design fill depth shown in the table, see PLAN AND PROFILE SHEETS for actual fill depth.

MID-SECTION

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.) D	CLEAR SPAN (FT.) S	CLEAR HEIGHT (FT.) H	TOP SLAB THK. T	BOTTOM SLAB THK. B	SIDE WALL THK. C	INTERIOR WALL THK. W	OVER ALL WIDTH OW	OVER ALL HEIGHT OH	SECTION LENGTH (FT.) SL	TOP SLAB REINFORCING STEEL (LENGTH = OW - 4" + BENDS) "a" SIZE	"a" L	Bent "b" SIZE	Bent "b" L	"c" SIZE	"c" L	SPACING	NO. REQ'D	BOTTOM SLAB REINFORCING STEEL (LENGTH = OW - 4" + BENDS) "d" SIZE	"d" L	Bent "b1" SIZE	Bent "b1" L	"f" SIZE	"f" L	SPACING	NO. REQ'D	SIDE WALL REINFORCING STEEL "f0" (LENGTH = OH - 4") SIZE	SPACING	NO. REQ'D	LENGTH	INTERIOR WALL REINFORCING STEEL "f1" (LENGTH = OH - 4") SIZE	SPACING	NO. REQ'D	LENGTH	TOP SLAB DISTRIBUTION REINF. STEEL "g" (LENGTH = SL) SIZE	SPACING	NO. REQ'D	BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" (LENGTH = SL) SIZE	SPACING	NO. REQ'D	SIDE WALL DISTRIBUTION REINF. STEEL "d1" (LENGTH = SL) SIZE	SPACING	NO. REQ'D	INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" (LENGTH = SL) SIZE	SPACING	NO. REQ'D	CLASS "S" CONCRETE CU. YDS.	REINFORCING STEEL (GR. 60) LBS.
A	5	8	4	10	10	6	8	43'-8"	5'-8"	48	4	43'-4"	8	44'-4"	5	43'-4"	18	32	4	43'-4"	4	44'-3"	4	43'-4"	13	44	4	9	128	5'-4"	4	12	384	5'-4"	4	11	99	4	11	99	4	12	8	4	12	32	155.46	20425

SHEET 1 OF 2
DETAILS OF R.C. BOX CULVERT
QUINTUPLE BARREL BOX CULVERT
Sta. 110+53

SPECIAL DETAILS

LRFD

Ver. 1.9 14bl10646_cl.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110646	8	48

① SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
7-2-18

TABULAR DATA BY: JWP DATE: 06/08/2018
CHECKED BY: CLD DATE: 6/11/2018

OUTLET WINGWALL TABLE

OVER ALL WIDTH	CLEAR HEIGHT	FOOTING THK.	WING WALL THK.	BOX SKEW (DEG.)	SLOPE	HDWL LENGTH	HEEL	WALL HEIGHT AT HDWL	WALL HEIGHT AT WING END	WINGWALL ANGLE (DEGREE) WING A	WINGWALL ANGLE (DEGREE) WING B	FOOTING WIDTH AT WALL END	WIDTH OF WING FOOTINGS AT HDWL WING A	WIDTH OF WING FOOTINGS AT HDWL WING B	FOOTING DIMENSION PARALLEL WITH HDWL WING A	FOOTING DIMENSION PARALLEL WITH HDWL WING B	LENGTH OF WINGWALLS WING A	LENGTH OF WINGWALLS WING B	LENGTH OF FOOTING HEEL WING A	LENGTH OF FOOTING HEEL WING B
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	AF1	AF2	WE	WF1	WF2	G1	G2	W1	W2	W3	W4
43'-8"	4'-0"	0'-9"	0'-8"	0	3:1	42'-8"	1'-0"	4'-10"	1'-4"	30	30	2'-2"	2'-5 3/4"	2'-5 3/4"	0'-4 3/8"	0'-4 3/8"	12'-0"	12'-0"	13'-10 5/8"	13'-10 5/8"

CLASS "S" CONCRETE (Includes apron)	REINFORCING STEEL (Includes apron and laps if required)
OUTLET	OUTLET
CU.YD	LBS.
7.90	492

WING	F1 BAR SIZE	F1 MAX. SPACING	F1 NO. REQ'D	F1 LENGTHS VARY			F2 BAR SIZE	F2 SPACING	F2 NO. REQ'D	F2 LENGTHS		F3 BAR SIZE	F3 SPACING	F3 NO. REQ'D	F3 LENGTHS		F4 BAR SIZE	F4 SPACING	F4 NO. REQ'D	F4 LENGTHS VARY
WING A	4	12	12	L	Min	2'-6"	-	-	-	L	-	-	-	-	L	-	4	18	4	Min
					Max	6'-0"														3'-10"
				X	Min	0'-9"				X	-				X	-				Max
					Max	1'-1"														9'-0"
				Y	Min	1'-10"				Y	-				Y	-				
					Max	5'-0"														
WING B	4	12	12	L	Min	2'-6"	-	-	-	L	-	-	-	-	L	-	4	18	4	Min
					Max	6'-0"														3'-10"
				X	Min	0'-9"				X	-				X	-				Max
					Max	1'-1"														9'-0"
				Y	Min	1'-10"				Y	-				Y	-				
					Max	5'-0"														

WING	F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY			F7 BAR SIZE	F7 NO. REQ'D	F7 LENGTHS	F8 BAR SIZE	F8 SPACING	F8 NO. REQ'D	F8 LENGTHS VARY			F9 BAR SIZE	F9 SPACING	F9 NO. REQ'D	F9 LENGTHS		F10 BAR SIZE	F10 NO. REQ'D	F10 LENGTHS	F11 BAR SIZE	F11 NO. REQ'D	F11 LENGTHS	F12 BAR SIZE	F12 SPACING	F12 NO. REQ'D	F12 LENGTHS		REINF. STEEL QTY. PER WING (LBS)
WING A	4	18	2	11'-8"	4	18	8	L	Min	3'-2"	4	6	14'-9"	4	18	8	Min			-	-	-	Min		4	2	12'-0"	4	2	13'-4"	6	12	4	L	3'-4"	246
									Max	6'-3"							1'-8"						-													
								X	Min	1'-4"							Max						Max											X	1'-8"	
									Max	1'-4"							2'-0"						-												
								Y	Min	1'-11"																										
									Max	5'-0"																										
WING B	4	18	2	11'-8"	4	18	8	L	Min	3'-2"	4	6	14'-9"	4	18	8	Min			-	-	-	Min		4	2	12'-0"	4	2	13'-4"	6	12	4	L	3'-4"	246
									Max	6'-3"							1'-8"						-												
								X	Min	1'-4"							Max						Max											X	1'-8"	
									Max	1'-4"							2'-0"						-												
								Y	Min	1'-11"																										
									Max	5'-0"																										

Min. Bar Lap Length	
#4	1'-9"
#5	2'-2"
#6	2'-7"
#7	3'-6"
#8	4'-7"

Bar Pin Dia. Table	
#4	3"
#5	3 3/4"
#6	4 1/2"
#7	5 1/4"
#8	6"

① Any Bar Lap Required for the Skewed End Section shall be considered subsidiary to the item "Reinforcing Steel - Roadway (Gr. 60)."

OUTLET SKEWED END SECTION

SKEW (DEGREE)	SLOPE	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	SECTION LENGTH	TOP SLAB THK.	HDWL DEPTH	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVERALL WIDTH	OVERALL HEIGHT	TOP SLAB REINF. STEEL "a" SIZE	"a" SPACING	"a" LENGTHS VARY	"a" NO. REQ'D	TOP SLAB REINF. STEEL "c" SIZE	"c" SPACING	"c" LENGTHS VARY	"c" NO. REQ'D	BOTTOM SLAB REINF. STEEL "d" SIZE	"d" SPACING	"d" LENGTHS VARY	"d" NO. REQ'D	BOTTOM SLAB REINF. STEEL "f" SIZE	"f" SPACING	"f" LENGTHS VARY	"f" NO. REQ'D	SIDE WALL REINF. STEEL "f0" SIZE	"f0" SPACING	"f0" NO. REQ'D	"f0" LENGTH	INTERIOR WALL REINF. STEEL "f1" SIZE	"f1" SPACING	"f1" NO. REQ'D	"f1" LENGTH	TOP SLAB DISTRIB. REINF. STEEL "g" SIZE	"g" SPACING	"g" NO. REQ'D	"g" LENGTHS VARY	BOTTOM SLAB DISTRIB. REINF. STEEL "e" SIZE	"e" SPACING	"e" NO. REQ'D	"e" LENGTHS VARY	SIDE WALL DISTRIB. REINF. STEEL "d1" SIZE	"d1" SPACING	"d1" NO. REQ'D	"d1" LENGTH	INTERIOR WALL DISTRIB. REINF. STEEL "d2" SIZE	"d2" SPACING	"d2" NO. REQ'D	"d2" LENGTH
SK	SL	D	S	H	LL	T	HD	B	C	W	OW	OH	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTHS VARY	SIZE	SPACING	NO. REQ'D	LENGTHS VARY	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH
															Max				Max				Max				Max											Max				Max							LONG				LONG
															Min				Min				Min				Min											Min				Min							SHORT				MID
																																																				SHORT

"k1" HDWL BARS			"k2" HDWL BARS			"h" HDWL BARS			
SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	Y	NO. REQ'D

CLASS "S" CONCRETE (Includes HDWL.)	① REINFORCING STEEL (GR 60) (Includes HDWL.)
CU. YDS.	LBS.

OUTLET SLOPE SECTION(S)

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	TOP SLAB THK.	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT	SECTION LENGTH (FT.)	TOP SLAB REINF. STEEL LENGTH = OW - 4" + BENDS "a" SIZE	"a" L	Bent "b" SIZE	Bent "b" L	"c" SIZE	"c" L	"c" SPACING	"c" NO. REQ'D	BOTTOM SLAB REINF. STEEL LENGTH = OW - 4" + BENDS "d" SIZE	"d" L	Bent "b1" SIZE	Bent "b1" L	"f" SIZE	"f" L	"f" SPACING	"f" NO. REQ'D	SIDE WALL REINF. STEEL "f0" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	INTERIOR WALL REINF. STEEL "f1" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	TOP SLAB DISTRIB. REINF. STEEL "g" LENGTH = SL SIZE	SPACING	NO. REQ'D	BOTTOM SLAB DISTRIB. REINF. STEEL "e" LENGTH = SL SIZE	SPACING	NO. REQ'D	SIDE WALL DISTRIB. REINF. STEEL "d1" LENGTH = SL SIZE	SPACING	NO. REQ'D	INTERIOR WALL DISTRIB. REINF. STEEL "d2" LENGTH = SL SIZE	SPACING	NO. REQ'D
D	S	H	T	B	C	W	OW	OH	SL																																											

HDWL DEPTH	ADDITIONAL REINF. FOR HDWL	"h" BARS			
HD	LBS.	SIZE	Y	LENGTH	NO. REQ'D
3"	58	4	0'-9"	1'-9"	45

CLASS "S" CONCRETE	REINFORCING STEEL (GR. 60)
CU. YDS.	LBS.
TOTAL	
0.40	110

The required number of bars and lengths shown are for estimating purpose only. The actual number and length required shall be determined in field.

Unless otherwise noted, all dimensions are in inches.

SHEET 2 OF 2
DETAILS OF R.C. BOX CULVERT
QUINTUPLE BARREL BOX CULVERT
Sta. 110+53

SPECIAL DETAILS

bll0646_cl.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110646	9	48

① SPECIAL DETAILS

INLET WINGWALL TABLE

OVER ALL WIDTH	CLEAR HEIGHT	FOOTING THK.	WING WALL THK.	BOX SKEW (DEG.)	SLOPE	HDWL LENGTH	HEEL	WALL HEIGHT AT HDWL	WALL HEIGHT AT WING END	WINGWALL ANGLE (DEGREE) WING A	WINGWALL ANGLE (DEGREE) WING B	FOOTING WIDTH AT WALL END	WIDTH OF WING FOOTINGS AT HDWL WING A	WIDTH OF WING FOOTINGS AT HDWL WING B	FOOTING DIMENSION PARALLEL WITH HDWL WING A	FOOTING DIMENSION PARALLEL WITH HDWL WING B	LENGTH OF WINGWALLS WING A	LENGTH OF WINGWALLS WING B	LENGTH OF FOOTING HEEL WING A	LENGTH OF FOOTING HEEL WING B	CLASS "S" CONCRETE (Includes apron) INLET	REINFORCING STEEL (Includes apron and laps if required) INLET
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	AF1	AF2	WE	WF1	WF2	G1	G2	W1	W2	W3	W4	CU.YD	LBS.
53'-8"	5'-0"	0'-9"	0'-8"	0	3:1	52'-8"	1'-0"	5'-10"	1'-8"	30	30	2'-2"	2'-11 3/4"	2'-11 3/4"	0'-11 1/4"	0'-11 1/4"	14'-0"	14'-0"	15'-10 5/8"	15'-10 5/8"	8.49	628

WING	F1 BAR SIZE	F1 MAX. SPACING	F1 NO. REQ'D	F1 LENGTHS VARY			F2 BAR SIZE	F2 SPACING	F2 NO. REQ'D	F2 LENGTHS	F3 BAR SIZE	F3 SPACING	F3 NO. REQ'D	F3 LENGTHS	F4 BAR SIZE	F4 SPACING	F4 NO. REQ'D	F4 LENGTHS VARY	F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY			F7 BAR SIZE	F7 NO. REQ'D	F7 LENGTHS	F8 BAR SIZE	F8 SPACING	F8 NO. REQ'D	F8 LENGTHS VARY	F9 BAR SIZE	F9 SPACING	F9 NO. REQ'D	F9 LENGTHS	F10 BAR SIZE	F10 NO. REQ'D	F10 LENGTHS	F11 BAR SIZE	F11 NO. REQ'D	F11 LENGTHS	F12 BAR SIZE	F12 SPACING	F12 NO. REQ'D	F12 LENGTHS		REINF. STEEL QTY. PER WING (LBS)
WING A	4	12	14	L	Min	2'-10"	-	-	-	L -	-	-	-	L -	4	18	6	Min	4	18	2	13'-8"	4	18	10	L	Min	3'-3"	4	6	16'-9"	4	18	10	Min	-	-	-	Min	4	2	14'-2"	4	2	15'-8"	6	12	5	L	3'-4"	314
					Max	7'-6"												2'-1"									Max	7'-3"							1'-8"														
				X	Min	0'-9"				X -				X -				Max								X	Max	1'-4"							Max														
					Max	1'-7"												12'-2"									Min	1'-4"							2'-6"														
				Y	Min	2'-2"				Y -				Y -												Y	Min	2'-0"																					
					Max	6'-0"																					Max	6'-0"																					
WING B	4	12	14	L	Min	2'-10"	-	-	-	L -	-	-	-	L -	4	18	6	Min	4	18	2	13'-8"	4	18	10	L	Min	3'-3"	4	6	16'-9"	4	18	10	Min	-	-	-	Min	4	2	14'-2"	4	2	15'-8"	6	12	5	L	3'-4"	314
					Max	7'-6"												2'-1"									Max	7'-3"							1'-8"														
				X	Min	0'-9"				X -				X -				Max								X	Max	1'-4"							Max														
					Max	1'-7"												12'-2"									Min	1'-4"							2'-6"														
				Y	Min	2'-2"				Y -				Y -												Y	Min	2'-0"																					
					Max	6'-0"																					Max	6'-0"																					

MID-SECTION BAR LAP TABLE

# of Long. Laps Req'd.	SL = Section Length
0	< 40.0 ft
1	>40.0 ft - 78.0 ft
2	>78.0 ft - 116.0 ft
3	>116.0 ft - 154.0 ft
4	>154.0 ft - 192.0 ft
5	>192.0 ft - 230.0 ft
6	>230.0 ft - 268.0 ft
7	>268.0 ft - 306.0 ft
8	>306.0 ft -344.0 ft

Min. Bar Lap Length	
#4	1'-9"
#5	2'-2"
#6	2'-7"
#7	3'-6"
#8	4'-7"

Bar Pin Dia. Table	
#4	3"
#5	3 3/4"
#6	4 1/2"
#7	5 1/4"
#8	6"

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 9235 CHARLES R. ELLIS 7-2-18

TABULAR DATA BY: CLD DATE: 06/08/2018
CHECKED BY: CRE DATE: 06/8/2018

This drawing to be used in conjunction with
SHEET 1 OF 4, "GENERAL DETAILS OF R.C. BOX CULVERT", 'GENERAL NOTES & LONGITUDINAL SECTION LENGTH SCHEDULE',
SHEET 3 OF 4, "GENERAL DETAILS OF R.C. BOX CULVERT", 'DETAILS OF MULTI-BARREL R.C. BOX CULVERT',
SHEET 4 OF 4, "GENERAL DETAILS OF R.C. BOX CULVERT", 'DETAILS OF WINGWALLS', and
STANDARD DRAWING RCB-2.
For additional information and outlet sections, see Sheet 2 of 2.

INLET SKEWED END SECTION

SKEW (DEGREE)	SLOPE	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	SECTION LENGTH	TOP SLAB THK.	HDWL DEPTH	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVERALL WIDTH	OVERALL HEIGHT	TOP SLAB REINFORCING STEEL "a" SIZE	"a" SPACING	"a" LENGTHS VARY	"a" NO. REQ'D	TOP SLAB REINFORCING STEEL "c" SIZE	"c" SPACING	"c" LENGTHS VARY	"c" NO. REQ'D	BOTTOM SLAB REINFORCING STEEL "d" SIZE	"d" SPACING	"d" LENGTHS VARY	"d" NO. REQ'D	BOTTOM SLAB REINFORCING STEEL "f" SIZE	"f" SPACING	"f" LENGTHS VARY	"f" NO. REQ'D	SIDE WALL REINFORCING STEEL "f0" SIZE	"f0" SPACING	"f0" NO. REQ'D	"f0" LENGTH	INTERIOR WALL REINFORCING STEEL "f1" SIZE	"f1" SPACING	"f1" NO. REQ'D	"f1" LENGTH	TOP SLAB DISTRIBUTION REINFORCING STEEL "g" SIZE	"g" SPACING	"g" NO. REQ'D	"g" LENGTHS VARY	BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" SIZE	"e" SPACING	"e" NO. REQ'D	"e" LENGTHS VARY	SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" SIZE	"d1" SPACING	"d1" NO. REQ'D	"d1" LENGTH	INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" SIZE	"d2" SPACING	"d2" NO. REQ'D	"d2" LENGTH	CLASS "S" CONCRETE (Includes HDWL) CU. YDS.	① REINFORCING STEEL (GR 60) (Includes HDWL) LBS.
SK	SL	D	S	H	LL	T	HD	B	C	W	OW	OH			Max / Min				Max / Min						Max / Min															Max / Min							Max / Min				LONG / SHORT			LONG / MID / SHORT		

"k1" HDWL BARS SIZE	"k1" LENGTH	"k1" NO. REQ'D	"k2" HDWL BARS SIZE	"k2" LENGTH	"k2" NO. REQ'D	"h" HDWL BARS SIZE	"h" LENGTH	"h" Y	"h" NO. REQ'D

① Any Bar Lap Required for the Skewed End Section shall be considered subsidiary to the item "Reinforcing Steel - Roadway (Gr. 60)."

INLET SLOPE SECTION(S)

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	TOP SLAB THK.	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT	SECTION LENGTH (FT.)	TOP SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "a" SIZE	"a" L	Bent "b" SIZE	Bent "b" L	"c" SIZE	"c" L	SPACING	NO. REQ'D	BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "d" SIZE	"d" L	Bent "b1" SIZE	Bent "b1" L	"f" SIZE	"f" L	SPACING	NO. REQ'D	SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL SIZE	SPACING	NO. REQ'D	BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL SIZE	SPACING	NO. REQ'D	SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL SIZE	SPACING	NO. REQ'D	INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL SIZE	SPACING	NO. REQ'D	CLASS "S" CONCRETE CU. YDS.	REINFORCING STEEL (GR. 60) LBS.
D	S	H	T	B	C	W	OW	OH	SL																																											

HDWL DEPTH HD	ADDITIONAL REINF. FOR HDWL LBS.	"h" HDWL BARS SIZE	"h" Y	"h" LENGTH	"h" NO. REQ'D
3"	71	4	0'-11"	1'-11"	55

CLASS "S" CONCRETE CU. YDS.	REINFORCING STEEL (GR. 60) LBS.
TOTAL	
0.50	142

Design Fill Depth	Range of Actual Fill Depth
2	0.0 ft - 2.0 ft
5	>2.0 ft - 5.0 ft
10	>5.0 ft - 10.0 ft
15	>10.0 ft - 15.0 ft
20	>15.0 ft - 20.0 ft
25	>20.0 ft - 25.0 ft
30	>25.0 ft - 30.0 ft
35	>30.0 ft - 35.0 ft
40	>35.0 ft - 40.0 ft

Data shown for Mid-Section, Slope Section(s), and Skewed End Section is based on the design fill depth shown in the table, see PLAN AND PROFILE SHEETS for actual fill depth.

MID-SECTION

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	TOP SLAB THK.	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT	SECTION LENGTH (FT.)	TOP SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "a" SIZE	"a" L	Bent "b" SIZE	Bent "b" L	"c" SIZE	"c" L	SPACING	NO. REQ'D	BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "d" SIZE	"d" L	Bent "b1" SIZE	Bent "b1" L	"f" SIZE	"f" L	SPACING	NO. REQ'D	SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL SIZE	SPACING	NO. REQ'D	BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL SIZE	SPACING	NO. REQ'D	SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL SIZE	SPACING	NO. REQ'D	INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL SIZE	SPACING	NO. REQ'D	CLASS "S" CONCRETE CU. YDS.	REINFORCING STEEL (GR. 60) LBS.
D	S	H	T	B	C	W	OW	OH	SL																																											
A	5	10	5	12	12	6	8	53'-8"	7'-0"	48	5	53'-4"	7	54'-9"	4	53'-4"	17	33	4	53'-4"	4	54'-8"	4	53'-4"	11	52	4	5.5	208	6'-8"	4	12	384	6'-8"	4	9	149	4	9	149	4	12	10	4	12	40	223.41	27277

SHEET 1 OF 2
DETAILS OF R.C. BOX CULVERT
QUINTUPLE BARREL BOX CULVERT
Sta. 210+48

SPECIAL DETAILS

Ver. 1.9 14 bl0646_c2 .dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110646	10	48

① SPECIAL DETAILS

OUTLET WINGWALL TABLE

OVER ALL WIDTH	CLEAR HEIGHT	FOOTING THK.	WING WALL THK.	BOX SKEW (DEG.)	SLOPE	HDWL LENGTH	HEEL	WALL HEIGHT AT HDWL	WALL HEIGHT AT WING END	WINGWALL ANGLE (DEGREE) WING A	WINGWALL ANGLE (DEGREE) WING B	FOOTING WIDTH AT WALL END	WIDTH OF WING FOOTINGS AT HDWL WING A	WIDTH OF WING FOOTINGS AT HDWL WING B	FOOTING DIMENSION PARALLEL WITH HDWL WING A	FOOTING DIMENSION PARALLEL WITH HDWL WING B	LENGTH OF WINGWALLS WING A	LENGTH OF WINGWALLS WING B	LENGTH OF FOOTING HEEL WING A	LENGTH OF FOOTING HEEL WING B
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	AF1	AF2	WE	WF1	WF2	G1	G2	W1	W2	W3	W4
53'-8"	5'-0"	0'-9"	0'-8"	0	3:1	52'-8"	1'-0"	5'-10"	1'-8"	30	30	2'-2"	2'-11 3/4"	2'-11 3/4"	0'-11 1/4"	0'-11 1/4"	14'-0"	14'-0"	15'-10 5/8"	15'-10 5/8"

CLASS "S" CONCRETE (Includes apron) OUTLET	REINFORCING STEEL (Includes apron and laps if required) OUTLET
CU.YD	LBS.
10.08	628

WING	F1 BAR SIZE	F1 MAX. SPACING	F1 NO. REQ'D	F1 LENGTHS VARY	F2 BAR SIZE	F2 SPACING	F2 NO. REQ'D	F2 LENGTHS	F3 BAR SIZE	F3 SPACING	F3 NO. REQ'D	F3 LENGTHS	F4 BAR SIZE	F4 SPACING	F4 NO. REQ'D	F4 LENGTHS VARY	F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY	F7 BAR SIZE	F7 NO. REQ'D	F7 LENGTHS	F8 BAR SIZE	F8 SPACING	F8 NO. REQ'D	F8 LENGTHS VARY	F9 BAR SIZE	F9 SPACING	F9 NO. REQ'D	F9 LENGTHS	F10 BAR SIZE	F10 NO. REQ'D	F10 LENGTHS	F11 BAR SIZE	F11 NO. REQ'D	F11 LENGTHS	F12 BAR SIZE	F12 SPACING	F12 NO. REQ'D	F12 LENGTHS	REINF. STEEL QTY. PER WING (LBS)
WING A	4	12	14	L Min 2'-10" Max 7'-6"; X Min 0'-9" Max 1'-7"; Y Min 2'-2" Max 6'-0"	-	-	-	L -; X -; Y -	-	-	-	L -; X -; Y -	4	18	6	Min 2'-1"; Max 12'-2"	4	18	2	13'-8"	4	18	10	L Min 3'-3" Max 7'-3"; X Min 1'-4" Max 1'-4"; Y Min 2'-0" Max 6'-0"	4	6	16'-9"	4	18	10	Min 1'-8"; Max 2'-6"	-	-	-	Min -; Max -	4	2	14'-2"	4	2	15'-8"	6	12	5	L 3'-4"; X 1'-8"	314
WING B	4	12	14	L Min 2'-10" Max 7'-6"; X Min 0'-9" Max 1'-7"; Y Min 2'-2" Max 6'-0"	-	-	-	L -; X -; Y -	-	-	-	L -; X -; Y -	4	18	6	Min 2'-1"; Max 12'-2"	4	18	2	13'-8"	4	18	10	L Min 3'-3" Max 7'-3"; X Min 1'-4" Max 1'-4"; Y Min 2'-0" Max 6'-0"	4	6	16'-9"	4	18	10	Min 1'-8"; Max 2'-6"	-	-	-	Min -; Max -	4	2	14'-2"	4	2	15'-8"	6	12	5	L 3'-4"; X 1'-8"	314

Min. Bar Lap Length	
#4	1'-9"
#5	2'-2"
#6	2'-7"
#7	3'-6"
#8	4'-7"

Bar Pin Dia. Table	
#4	3"
#5	3 3/4"
#6	4 1/2"
#7	5 1/4"
#8	6"

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 9235 CHARLES R. ELLIS 7-2-18

TABULAR DATA BY: CLD DATE: 06/08/2018
CHECKED BY: JWP DATE: 06/08/2018

① Any Bar Lap Required for the Skewed End Section shall be considered subsidiary to the item "Reinforcing Steel - Roadway (Gr. 60)."

OUTLET SKEWED END SECTION

SKEW (DEGREE)	SLOPE	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	SECTION LENGTH	TOP SLAB THK.	HDWL DEPTH	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVERALL WIDTH	OVERALL HEIGHT
SK	SL	D	S	H	LL	T	HD	B	C	W	OW	OH

TOP SLAB REINFORCING STEEL "a" SIZE	"a" SPACING	"a" LENGTHS VARY	"a" NO. REQ'D	"c" SIZE	"c" SPACING	"c" LENGTHS VARY	"c" NO. REQ'D	BOTTOM SLAB REINFORCING STEEL "d" SIZE	"d" SPACING	"d" LENGTHS VARY	"d" NO. REQ'D	"f" SIZE	"f" SPACING	"f" LENGTHS VARY	"f" NO. REQ'D
		Max				Max				Max				Max	
		Min				Min				Min				Min	

SIDE WALL REINFORCING STEEL "f0" SIZE	SPACING	NO. REQ'D	LENGTH	INTERIOR WALL REINFORCING STEEL "f1" SIZE	SPACING	NO. REQ'D	LENGTH	TOP SLAB DISTRIBUTION REINFORCING STEEL "g" SIZE	SPACING	NO. REQ'D	LENGTHS VARY	BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" SIZE	SPACING	NO. REQ'D	LENGTHS VARY
											Max				Max
											Min				Min

SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" SIZE	SPACING	NO. REQ'D	LENGTH	INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" SIZE	SPACING	NO. REQ'D	LENGTH	CLASS "S" CONCRETE (Includes HDWL) CU. YDS.	① REINFORCING STEEL (GR 60) (Includes HDWL) LBS.
			LONG				LONG		
			SHORT				MID		
							SHORT		

"k1" HDWL BARS SIZE	LENGTH	NO. REQ'D	"k2" HDWL BARS SIZE	LENGTH	NO. REQ'D	"h" HDWL BARS SIZE	LENGTH	Y	NO. REQ'D

OUTLET SLOPE SECTION(S)

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	TOP SLAB THK.	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT	SECTION LENGTH (FT.)
	D	S	H	T	B	C	W	OW	OH	SL

TOP SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "a" SIZE	"a" L	Bent "b" SIZE	Bent "b" L	"c" SIZE	"c" L	SPACING	NO. REQ'D	BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "d" SIZE	"d" L	Bent "b1" SIZE	Bent "b1" L	"f" SIZE	"f" L	SPACING	NO. REQ'D

SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL SIZE	SPACING	NO. REQ'D	BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL SIZE	SPACING	NO. REQ'D	SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL SIZE	SPACING	NO. REQ'D	INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL SIZE	SPACING	NO. REQ'D

CLASS "S" CONCRETE CU. YDS.	REINFORCING STEEL (GR. 60) LBS.
TOTAL	
0.50	142

HDWL DEPTH HD	ADDITIONAL REINF. FOR HDWL LBS.	"h" BARS SIZE	Y	LENGTH	NO. REQ'D
3"	71	4	0'-11"	1'-11"	55

The required number of bars and lengths shown are for estimating purpose only. The actual number and length required shall be determined in field.

Unless otherwise noted, all dimensions are in inches.

SHEET 2 OF 2

DETAILS OF R.C. BOX CULVERT

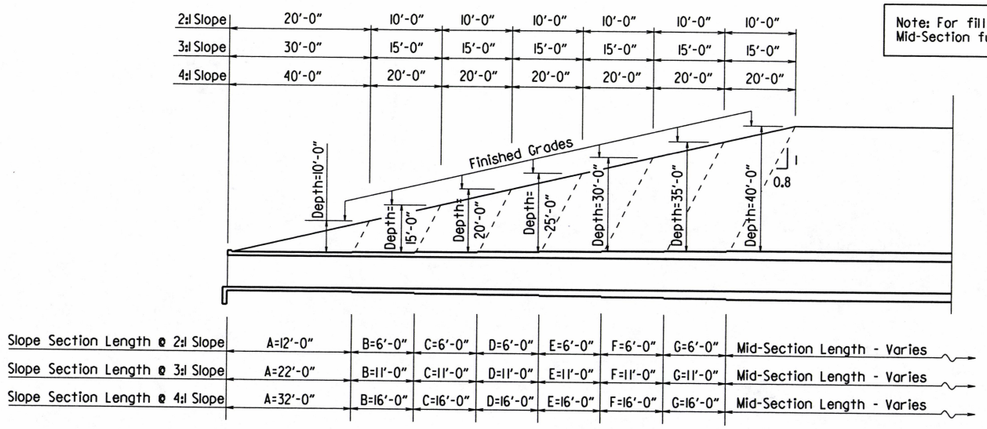
QUINTUPLE BARREL BOX CULVERT

Sta. 210+48

SPECIAL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110646	11	48

SPECIAL DETAILS

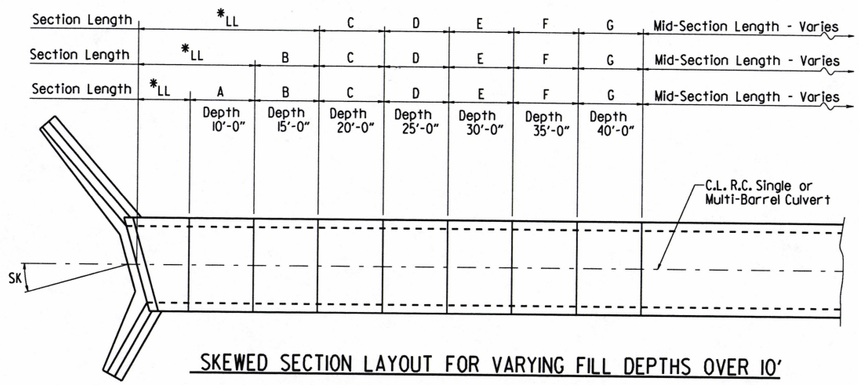


Note: For fill depths 10' and under, use Mid-Section full length of box culvert.

LONGITUDINAL SECTION LENGTH SCHEDULE FOR VARYING FILL DEPTHS OVER 10'

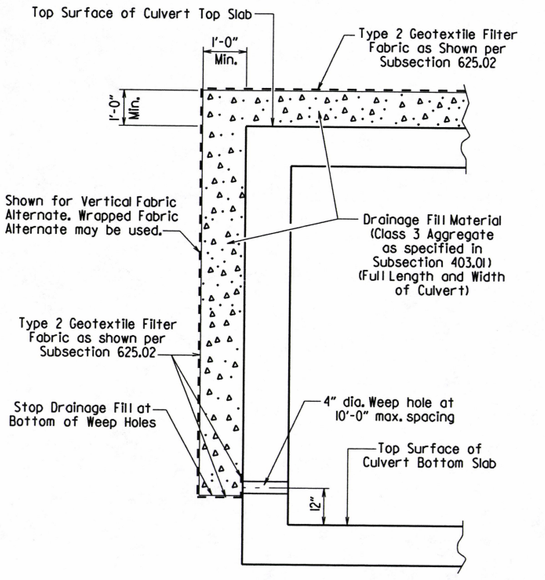
Lengths for Non-Skewed Boxes

*LL = Skewed End Section Length - See "Skewed End Section Details" Length LL varies with skew angle, overall box width and fill depth and may eliminate the need for some slope section lengths as shown.



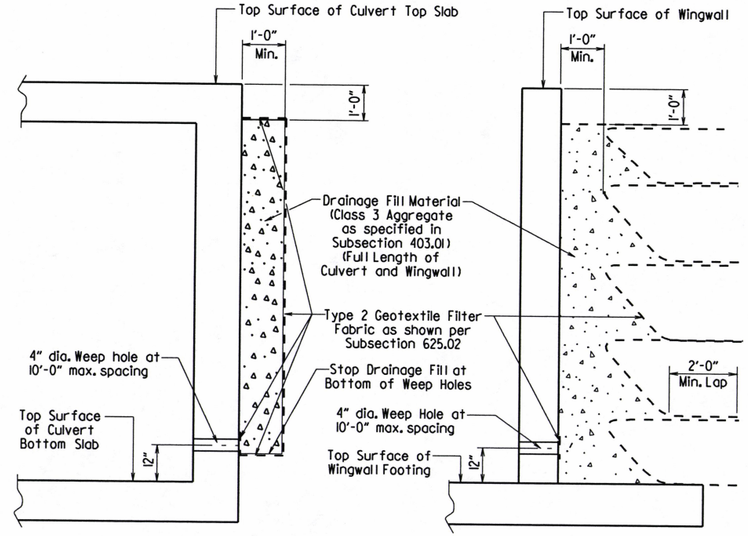
SKEWED SECTION LAYOUT FOR VARYING FILL DEPTHS OVER 10'

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
7-2-18
CHARLES R. ELLIS



CULVERT DRAINAGE DETAIL FOR ROCK FILL

This detail shall be used when rock fill is specified for embankment construction.



VERTICAL FABRIC ALTERNATE
(Shown for Culvert, Similar for Wingwall)

WRAPPED FABRIC ALTERNATE
(Shown for Wingwall, Similar for Culvert)

For Details of Excavation and Pay Limits, see Standard Drawing RCB-2.

WINGWALL & CULVERT DRAINAGE DETAIL

GENERAL NOTES:

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

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications, Fifth Edition (2010) with 2010 interim revisions.

LIVE LOADING: HL-93

All concrete shall be Class S with a minimum 28-day compressive strength of 3,500 psi and shall be poured in the dry. All exposed corners to have ¾" chamfers.

Reinforcing Steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M31 or M322, Type A, with mill test reports.

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.

Excavation and backfilling shall be in accordance with the requirements of Section 801.

Membrane Waterproofing shall conform to the requirements of Section 815. Membrane Waterproofing shall be Type C and as directed by the Engineer applied to all construction joints in the top slab and the sidewalls of R.C. Box culverts and to the construction joint between wingwalls and R.C. Box culvert walls.

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 barrel components of the culvert may be constructed using continuous pours. For longer culvert construction, the Contractor may use multiple pours with transverse construction joints spaced a minimum of 50 feet apart unless superseded by stage construction or site constraints as approved by the Engineer. Construction joints between footings and walls shall be made only where shown in the Plans. Joints shall be normal to the centerline of barrel and shall be keyed. Longitudinal reinforcing shall be continuous through joints unless shown otherwise. All longitudinal construction joints shall be submitted to the Engineer for approval.

Membrane Waterproofing, Weep Holes, Geotextile Filter Fabric, and Drainage Fill Material will not be paid for directly but shall be considered subsidiary to Class S Concrete.

When the top slab of the box culvert serves as finished roadway surface, curing and finishing shall be in accordance with subsections 802.17 and 802.20 for bridge roadway surface and a tine finish shall be applied in accordance with subsection 802.19 for Class 5 Tined Bridge Roadway Surface Finish. Curing and finishing shall not be paid for directly, but shall be considered incidental to the item "Class S Concrete-Roadway". Class 1 Protective Surface Treatment shall be applied to the roadway surface and this work shall be paid for under the unit price bid for "Class 1 Protective Surface Treatment".

When precast reinforced concrete box culverts are substituted for cast in place box culverts, they shall be manufactured according to ASTM C 1577 and meet the requirements of Section 607. When the top slab of the box culvert serves as the finished roadway surface, a precast reinforced concrete box culvert substitution is not allowed.

SHEET 1 OF 4

GENERAL DETAILS OF R.C. BOX CULVERT

GENERAL NOTES &
LONGITUDINAL SECTION LENGTH SCHEDULE

SPECIAL DETAILS

LRFD

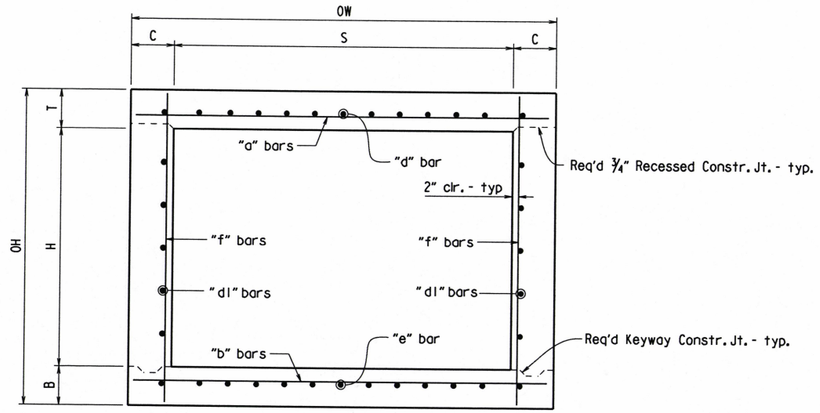
v 1.14 bil0646_culvert.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110646	12	48

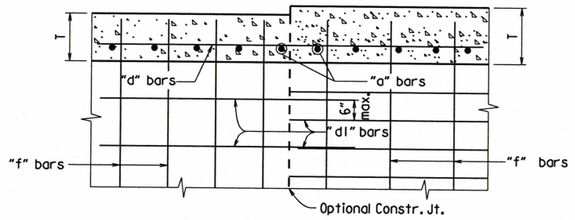
SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
7-28

Note: When top slab of culvert serves as finished roadway surface, see General Notes on Sheet 1 of 4.



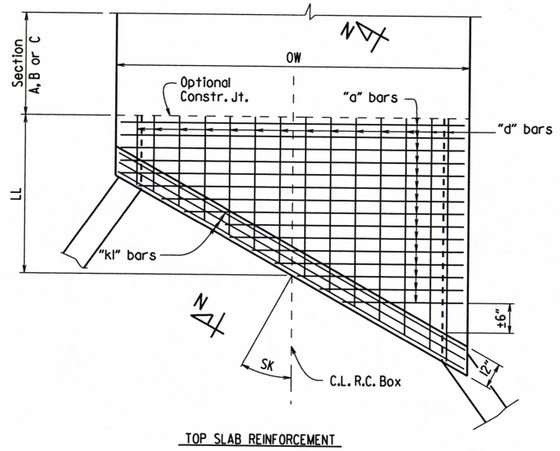
TYPICAL SECTION M-M



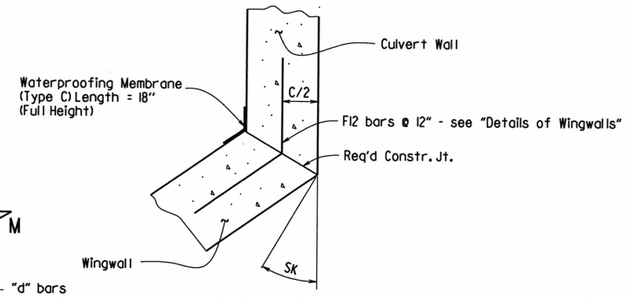
Longitudinal Bar Spacing at individual sections shall be maintained, which may result in noncontact bar laps.

LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

TOP SLAB SHOWN, BOTTOM SLAB SIMILAR

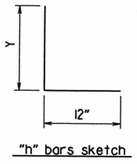


TOP SLAB REINFORCEMENT

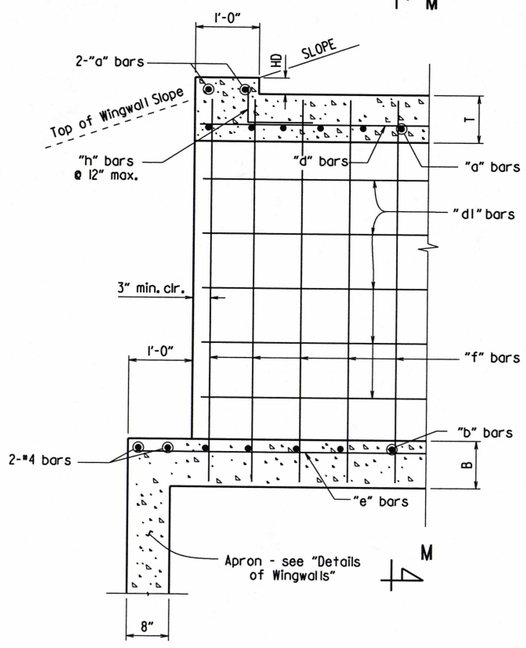


WINGWALL ATTACHMENT

See "Details of Wingwalls" for additional information and wingwall details.

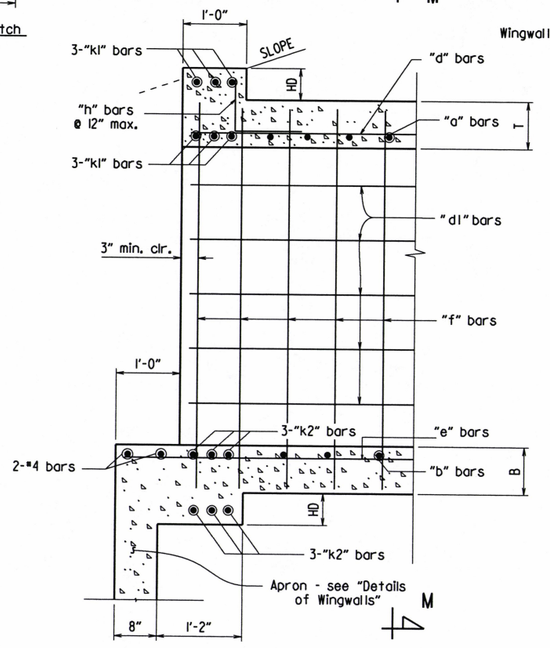


"h" bars sketch



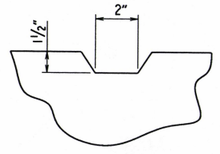
PART LONGITUDINAL SECTION

(Non-Skewed Ends)



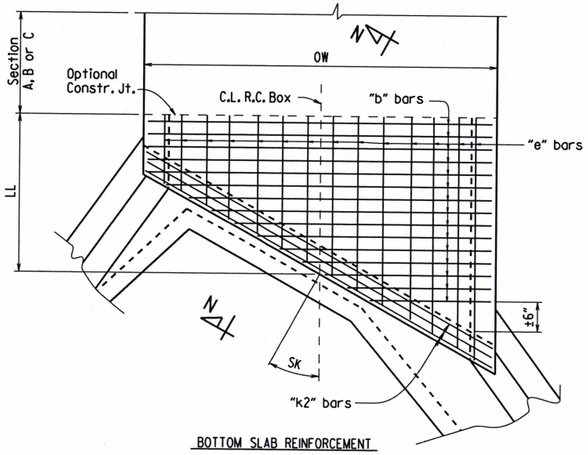
PART LONGITUDINAL SECTION N-N

(Skewed Ends)



TYPICAL KEYWAY DETAIL

(All Construction Joints)



BOTTOM SLAB REINFORCEMENT

SKEWED END SECTION DETAILS

SHEET 2 OF 4
GENERAL DETAILS OF R.C. BOX CULVERT

DETAILS OF SINGLE BARREL R.C. BOX CULVERT

SPECIAL DETAILS

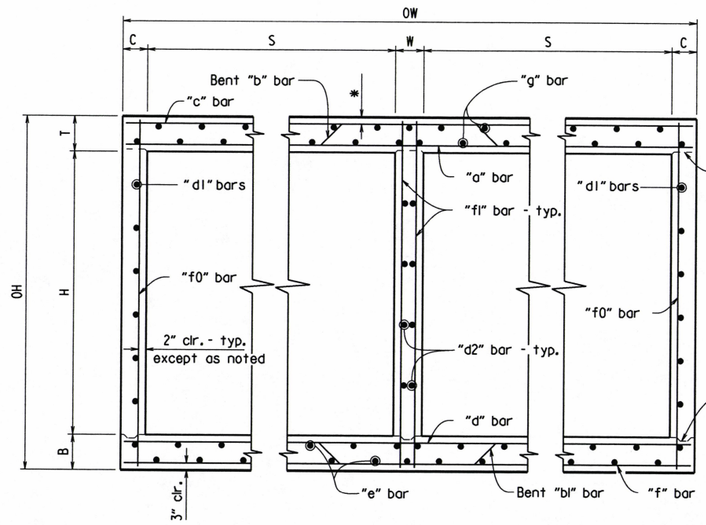
bil0646_culvert.dgn

DATE REVISED	DATE FILMED	REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110646	13	48

1 SPECIAL DETAILS

*2" clr. for fill depth (D) greater than 2 ft.
2½" clr. for fill depth (D) equal to or less than 2 ft.

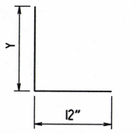
Note: When top slab of culvert serves as finished roadway surface, see General Notes on Sheet 1 of 4.



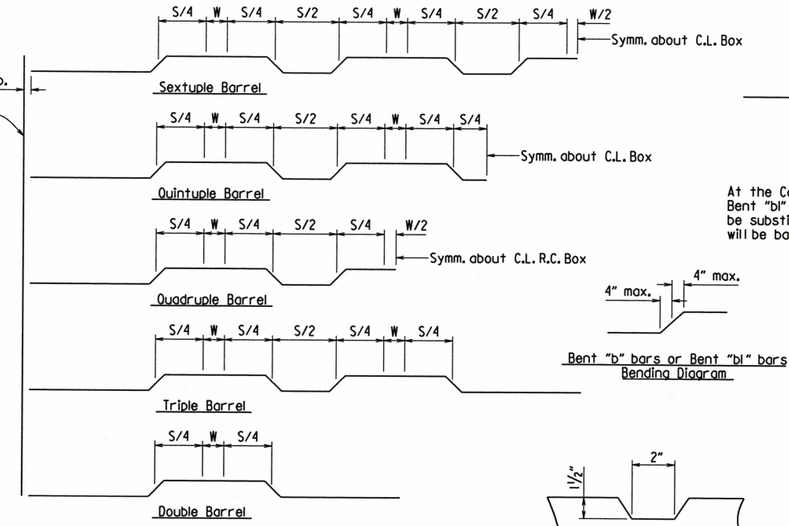
TYPICAL SECTION M-M

Top Slab
Straight "c" bars shall alternate with Bent "b" bars in top.
Straight "a" bars shall alternate with Bent "b" bars in bottom.

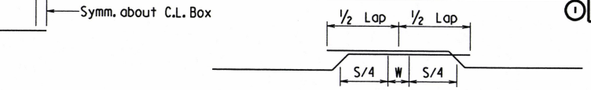
Bottom Slab
Straight "d" bars shall alternate with Bent "b1" bars in top.
Straight "f" bars shall alternate with Bent "b1" bars in bottom.



"h" bars sketch



Bent "b" bars or Bent "b1" bars sketch

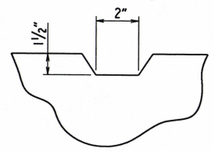


Lap Detail
For Bent "b" bars and Bent "b1" bars

At the Contractor's option in lieu of providing Bent "b" or Bent "b1" bars, one bar top and bottom of equivalent size may be substituted for each bent bar. Payment for the reinforcing will be based on the weight of the "b" or "b1" bar.

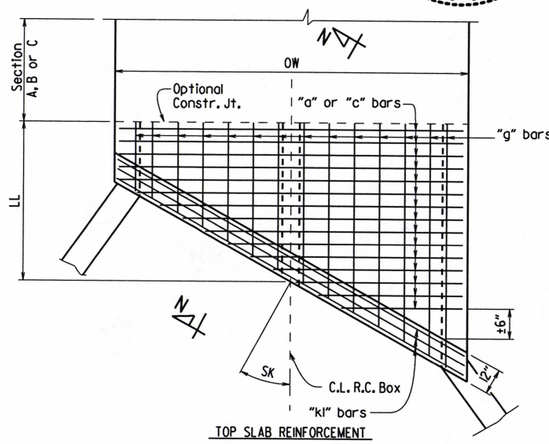
Bent "b" bars or Bent "b1" bars Bending Diagram

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
7-2-18
CHARLES R. ELLIS

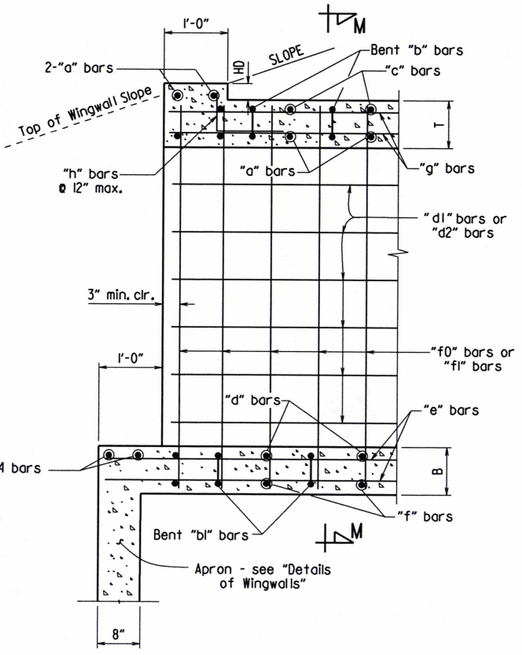


TYPICAL KEYWAY DETAIL

(All Construction Joints)

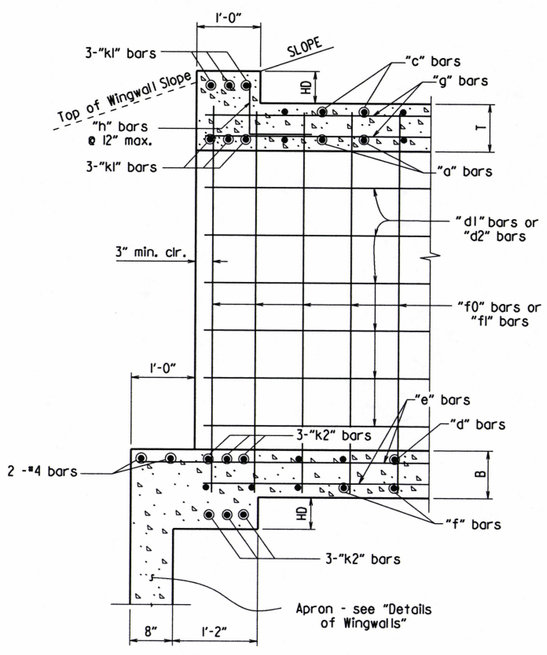


TOP SLAB REINFORCEMENT
Straight "c" bars in top.
Straight "a" bars in bottom.



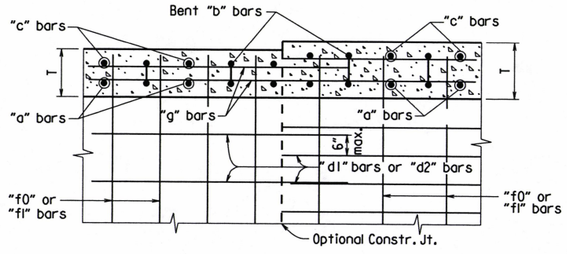
PART LONGITUDINAL SECTION

(Non-Skewed Ends)



PART LONGITUDINAL SECTION N-N

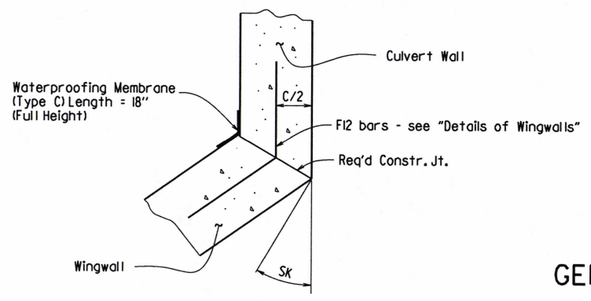
(Skewed Ends)



Longitudinal Bar Spacing at individual sections shall be maintained, which may result in noncontact bar laps.

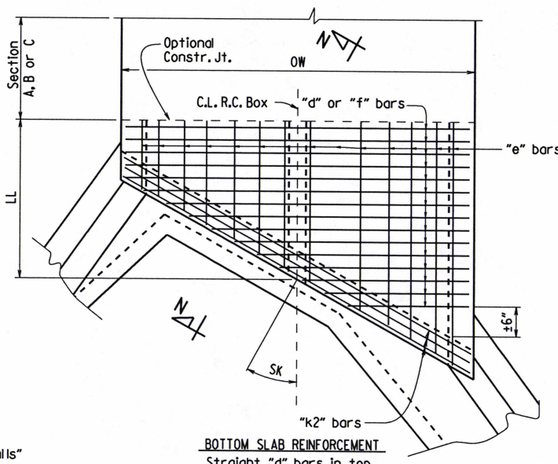
LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

TOP SLAB SHOWN, BOTTOM SLAB SIMILAR



WINGWALL ATTACHMENT

See "Details of Wingwalls" for additional information and wingwall details.



BOTTOM SLAB REINFORCEMENT
Straight "d" bars in top.
Straight "f" bars in bottom.

SKEWED END SECTION DETAILS

SHEET 3 OF 4
GENERAL DETAILS OF R.C. BOX CULVERT

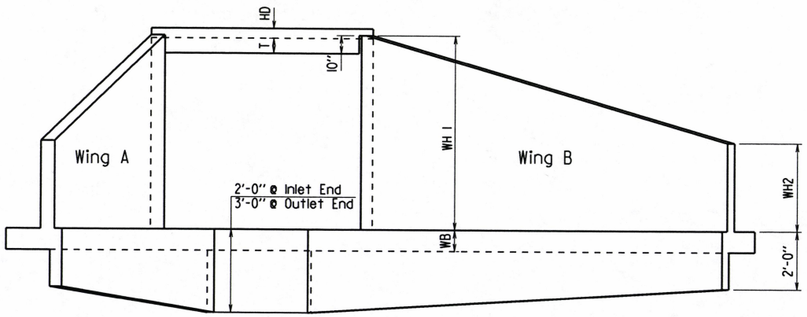
DETAILS OF MULTI-BARREL
R.C. BOX CULVERT

SPECIAL DETAILS

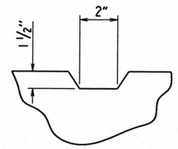
bil0646_culvert.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110646	14	48

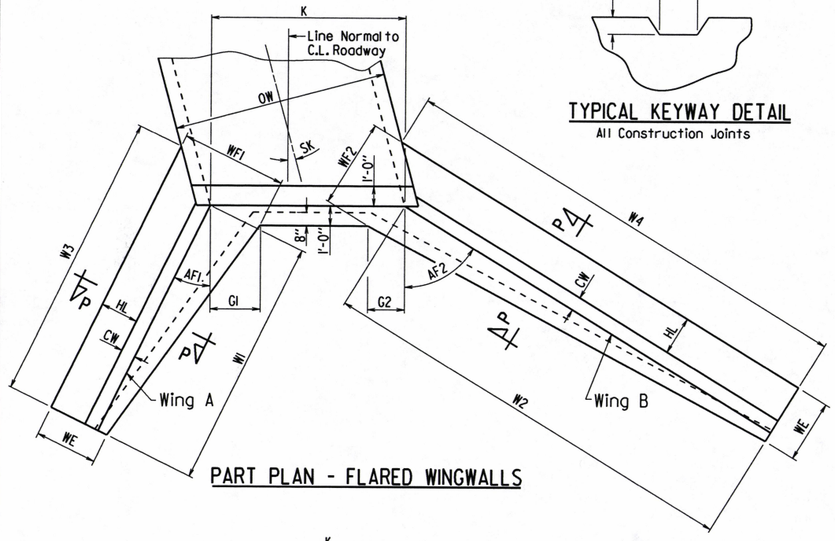
1 SPECIAL DETAILS



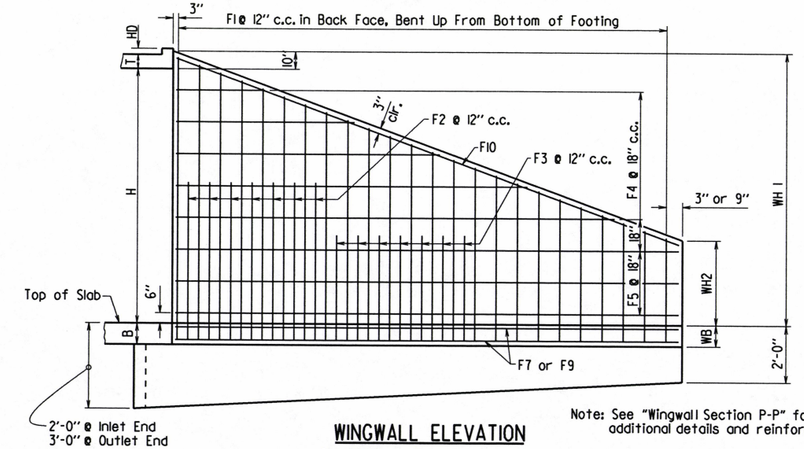
END ELEVATION
Flared Wingwalls Shown



TYPICAL KEYWAY DETAIL
All Construction Joints

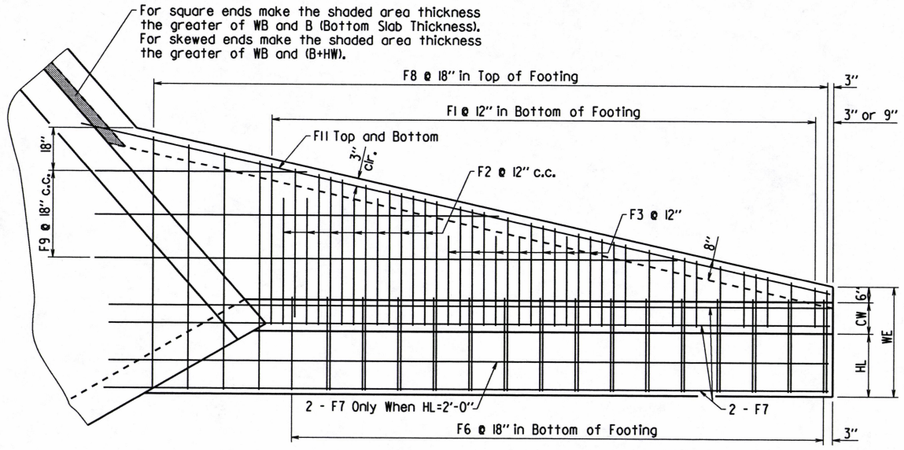


PART PLAN - FLARED WINGWALLS

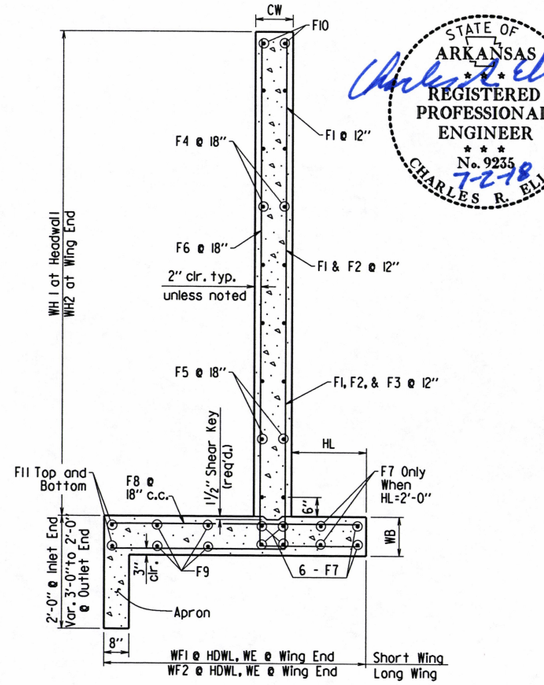


WINGWALL ELEVATION
Showing Back Face Reinforcement

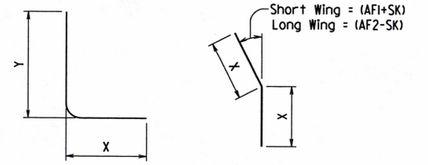
Note: See "Wingwall Section P-P" for additional details and reinforcing.



PLAN - FLARED WINGWALLS
Showing Footing Reinforcement



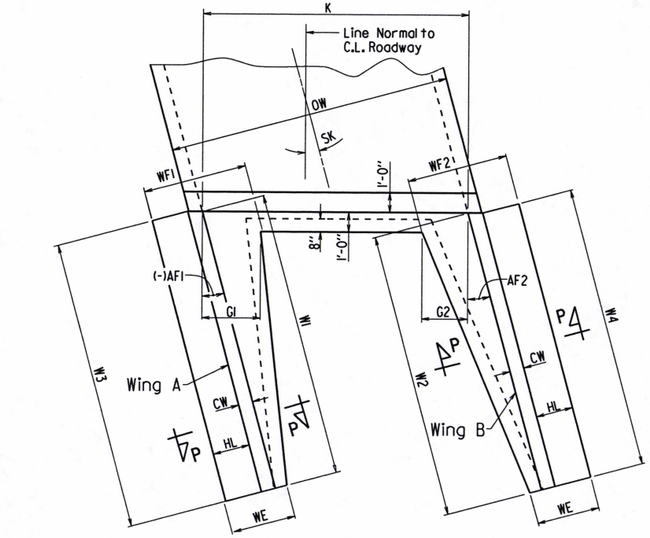
WINGWALL SECTION P-P



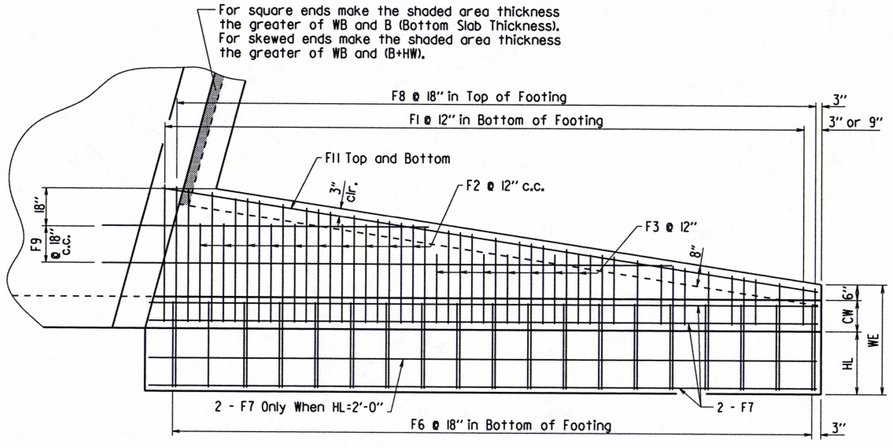
F1, F2, F3, & F6 BARS

*F12 BAR

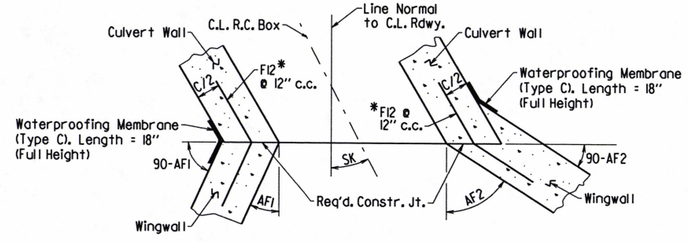
*F12 is a straight bar for parallel wingwalls



PART PLAN - PARALLEL WINGWALLS



PLAN - PARALLEL WINGWALLS
Showing Footing Reinforcement



CONSTRUCTION JOINTS
Flared Wingwalls Shown

SHEET 4 OF 4
GENERAL DETAILS OF R.C. BOX CULVERT
DETAILS OF WINGWALLS
SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
7-2-18

bll0646_culvert.dgn

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.		110646	15	48

(2) TEMPORARY EROSION CONTROL DETAILS

LEGEND

E-II — E-II SILT FENCE

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED. MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-31-18

PN:II00A
PD:8" SPIKE SET UNDER JOB 110646

STA. 109+52 43' LT.
IN PLACE PINE TREE
RETAIN

STA. 109+98 56' LT.
IN PLACE OAK TREE
RETAIN

STA. 109+35 - STA. 110+30 LT.
INSTALL E-II = 133 LIN. FT.

STA. 110+67 - STA. 111+96 LT.
INSTALL E-II = 179 LIN. FT.

105

CULTIVATED FIELD

110

115

CULTIVATED FIELD

P.I. 107+48.70
Δ = 1°52' 16" LT.

P.I. 108+93.39
Δ = 0°21' 42" RT.

P.I. 112+05.38
Δ = 0°46' 48" LT.

28.00
40.06

104.38
70.00

98.00
70.00

102.00
41.59

25' BUFFER

PROPOSED ROW

EXIST. ROW

BELL TELETELEPHONE

WOOD POST 188

200 CPS

S 88°50' 29" E

S 89°12' 53" E

S 88°37' 45" E

S 89°22' 28" E

E-II

AEC/WL RD.

RR SIGNAL BOX

PN:II350
PD:TBM 900

28.00
39.94

93.00
80.00

98.00
80.00

98.00
38.41

STA. 110+00.00
BEGIN JOB 110646
BEGIN SITE I
LOG MILE 1.76

CULTIVATED FIELD

STA. 109+32 - STA. 110+46 RT.
INSTALL E-II = 170 LIN. FT.

STA. 110+74 - STA. 111+97 RT.
INSTALL E-II = 175 LIN. FT.

STA. 111+00.00
END SITE I

CULTIVATED FIELD

PN:II01A
PD:8" SPIKE SET UNDER JOB 110646

PN:II02A
PD:8" SPIKE SET UNDER JOB 110646

GATE FOR BAR DITCH

CULTIVATED FIELD

CULTIVATED FIELD

PN:II03A
PD:8" SPIKE SET UNDER JOB 110646

REVISIONS

DATE OF REVISION	REVISION

6/7/2018

R110646.DGN

SITE I - CLEARING AND GRUBBING TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110646	16	48

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-31-18

LEGEND

E-II — E-II SILT FENCE

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED. MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

N

STA. 209+67 - STA. 210+38 LT.
INSTALL E-II = 95 LIN. FT.

STA. 210+86 - STA. 211+42 LT.
INSTALL E-II = 79 LIN. FT.

STA. 206+83.56
BEGIN SITE 2
LOG MILE 4.73

STA. 214+10.81
END SITE 2
END JOB 110646

HWY. 241 - STA. 214+22.82 =
HWY. 241 DETOUR - STA. 411+40.01
Δ = 12°19'13"

HWY. 49 - STA. 504+26.41 =
HWY. 241 DETOUR - STA. 411+39.58
Δ = 78°28'38"

HWY. 241 - STA. 214+22.38 =
HWY. 49 - STA. 504+26.52
Δ = 66°09'25"

STA. 401+42.55 CL DETOUR =
STA. 204+42.63 CL CONST.
BEGIN SITE 2 DETOUR

STA. 205+55 - STA. 209+65 RT.
INSTALL E-II = 522 LIN. FT.

STA. 210+98 - STA. 213+67 RT.
INSTALL E-II = 362 LIN. FT.

REVISIONS

DATE OF REVISION	REVISION

6/7/2018

R110646.DGN

SITE 2 - CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110646	17	48

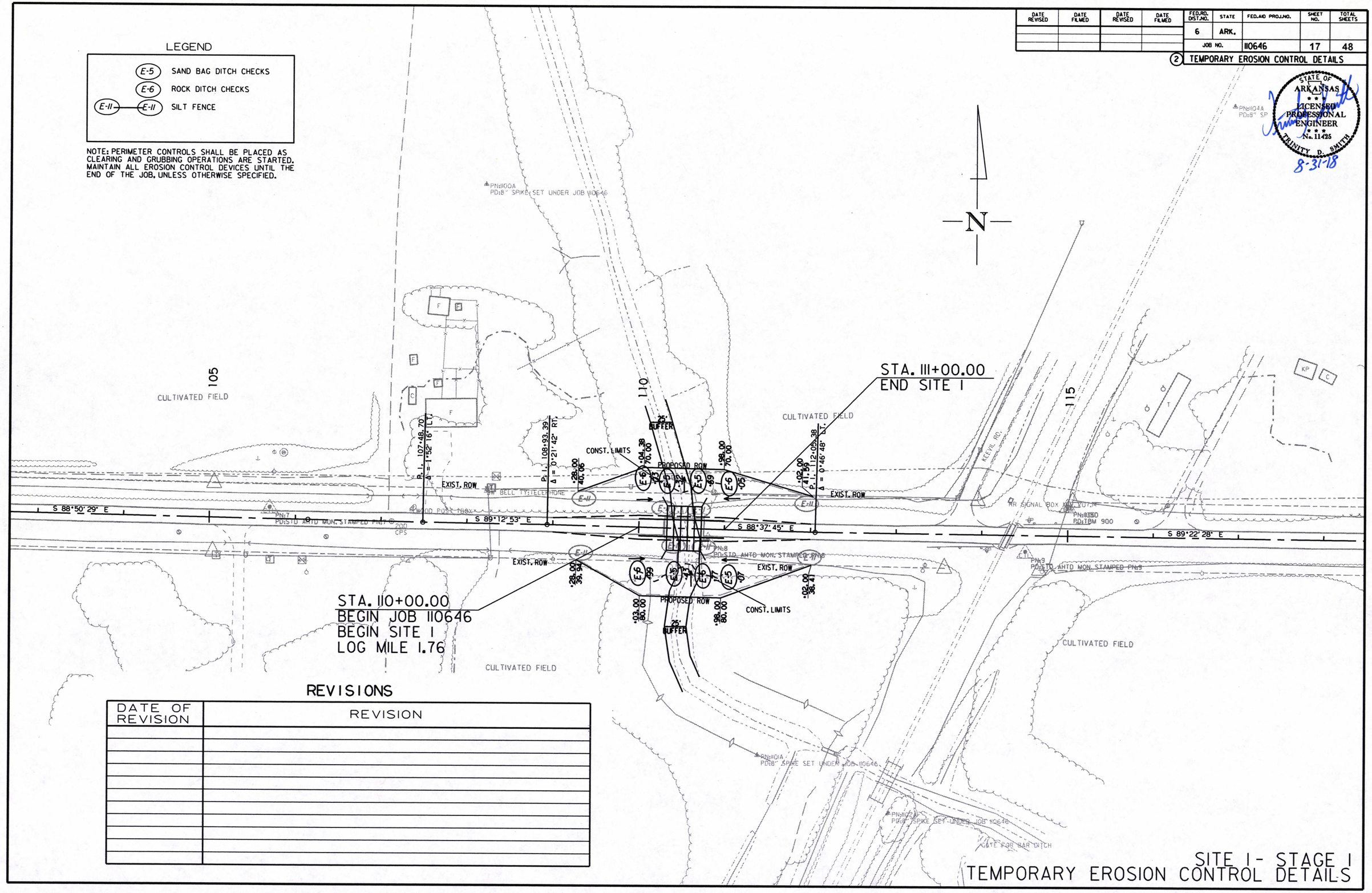
(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-31-18

LEGEND

- E-5 SAND BAG DITCH CHECKS
- E-6 ROCK DITCH CHECKS
- E-11 SILT FENCE

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED. MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.



REVISIONS

DATE OF REVISION	REVISION

6/7/2018

R110646.DGN

SITE 1 - STAGE 1
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110646	18	48

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-31-18

LEGEND

- E-5 — SAND BAG DITCH CHECKS
- E-6 — ROCK DITCH CHECKS
- E-11 — SILT FENCE

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED. MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

N

STA. 401+42.55 =
STA. 204+42.63 CL CONST.
BEGIN SITE 2 DETOUR

STA. 411+28.82 =
END SITE 2 DETOUR

HWY. 241 - STA. 214+22.82 =
HWY. 241 DETOUR - STA. 411+40.01
Δ = 12°19'13"

HWY. 49 - STA. 504+26.41 =
HWY. 241 DETOUR - STA. 411+39.58
Δ = 78°28'38"

HWY. 241 - STA. 214+22.38 =
HWY. 49 - STA. 504+26.52
Δ = 66°09'25"

STA. 209+64 - STA. 209+89 LT.
INSTALL E-11 = 25 LIN. FT.

STA. 210+85 - STA. 212+39 LT.
INSTALL E-11 = 157 LIN. FT.

STA. 204+92 - STA. 205+40 RT.
INSTALL E-11 = 48 LIN. FT.

STA. 212+32 - STA. 212+98 RT.
INSTALL E-11 = 73 LIN. FT.

STA. 206+83.56
BEGIN SITE 2
LOG MILE 4.73

STA. 214+10.87
END SITE 2
END JOB 110646

POB 400+00.00
PC 204+42.63
PI 402+70.68
PC 404+61.47
PT 208+63.51
PT 406+34.12
PC 407+59.06
PC 211+36.20
PI 408+93.40
PT 213+50.37
PC401+42.55
PI 206+53.08
PT 403+97.75
PI 405+48.22
PI 408+77.30
PI 212+43.08
POE 214+22.82
POE 411+40.01
POE 500+00.00
PNI103 POB" SPIKE SET UNDER JOB 110615
PNI102 POB" SPIKE SET UNDER JOB 110615
PROP. PLASTIC POST
EXIST. ROW
PROPOSED ROW
CONST. LIMITS
T.C.E.
BUFFER
TELEPHONE
POND
DOUBLE
EVERGOOD
BARB WOOD CN:POOR
BARB WOOD
PINE WARREN
SCRUB SCRUB
IVATED FIELD

REVISIONS

DATE OF REVISION	REVISION

6/7/2018

R110646.DGN

SITE 2 - STAGE I
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110646	19	48

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-31-18

LEGEND

- E-5 — SAND BAG DITCH CHECKS
- E-6 — ROCK DITCH CHECKS
- E-11 — SILT FENCE
- TRIANGULAR SILT DIKES

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED. MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

N

STA. 401+42.55 =
STA. 204+42.63 CL CONST.
BEGIN SITE 2 DETOUR

STA. 411+28.82 =
END SITE 2 DETOUR

HWY. 241 - STA. 214+22.82 =
HWY. 241 DETOUR - STA. 411+40.01
Δ = 12°19'13"

HWY. 49 - STA. 504+26.41 =
HWY. 241 DETOUR - STA. 411+39.58
Δ = 78°28'38"

HWY. 241 - STA. 214+22.38 =
HWY. 49 - STA. 504+26.52
Δ = 66°09'25"

STA. 211+20 - STA. 212+96 LT.
INSTALL E-11 = 173 LIN. FT.

STA. 211+01 - STA. 211+64 RT.
INSTALL E-11 = 63 LIN. FT.

STA. 206+83.56
BEGIN SITE 2
LOG MILE 4.73

STA. 214+10.77
END SITE 2
END JOB 110646

REVISIONS

DATE OF REVISION	REVISION

6/7/2018

R110646.DGN

SITE 2 - STAGE 2
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110646	20	48

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-31-18

LEGEND

- E-5 — SAND BAG DITCH CHECKS
- E-6 — ROCK DITCH CHECKS
- E-11 — SILT FENCE
- TRIANGULAR SILT DIKES

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED. MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

N

STA. 401+42.55 =
STA. 204+42.63 CL CONST.
BEGIN SITE 2 DETOUR

STA. 411+28.82 =
END SITE 2 DETOUR

HWY. 241 - STA. 214+22.82 =
HWY. 241 DETOUR - STA. 411+40.01
Δ = 12°19'13"

HWY. 49 - STA. 504+26.41 =
HWY. 241 DETOUR - STA. 411+39.58
Δ = 78°28'38"

HWY. 241 - STA. 214+22.38 =
HWY. 49 - STA. 504+26.52
Δ = 66°09'25"

STA. 206+83.56
BEGIN SITE 2
LOG MILE 4.73

STA. 214+10.77
END SITE 2
END JOB 110646

STA. 211+01 - STA. 211+64 RT.
INSTALL E-11 = 63 LIN. FT.

REVISIONS

DATE OF REVISION	REVISION

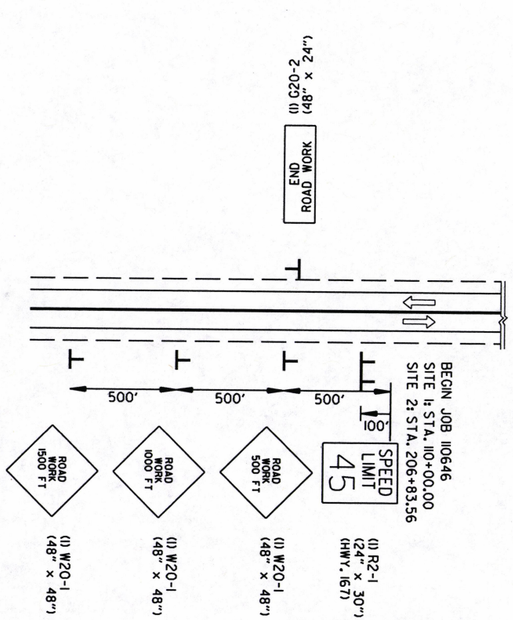
6/7/2018

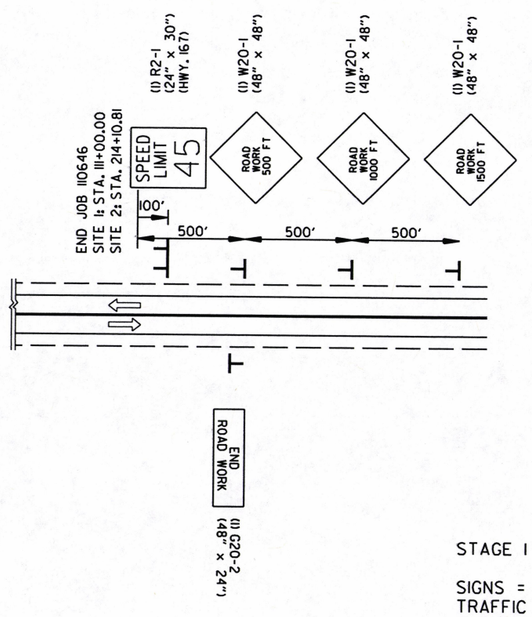
R110646.DGN

SITE 2 - STAGE 3
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110646	21	48
				(2) MAINTENANCE OF TRAFFIC DETAILS				

ADVANCE WARNING (ALL STAGES)





(2) W21-5a 36"X36"

ALL STAGES TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

(2) R4-1 (24" X 30")

ALL STAGES TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

(2) W8-1 (30" X 30")

ALL STAGES TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

STAGE I QUANTITIES

SIGNS = 262.3 SQ. FT.
TRAFFIC DRUMS = 9 EACH
VERTICAL PANELS = 8 EACH
TYPE III BARRICADE-RT. = 32 LIN. FT.
TYPE III BARRICADE-LT. = 32 LIN. FT.

STAGE 2 QUANTITIES

SIGNS = 198.5 SQ. FT.
TRAFFIC DRUMS = 37 EACH
VERTICAL PANELS = 3 EACH
TYPE III BARRICADE-RT. = 32 LIN. FT.
TYPE III BARRICADE-LT. = 32 LIN. FT.

STAGE 3 QUANTITIES

SIGNS = 182.5 SQ. FT.
TRAFFIC DRUMS = 13 EACH
VERTICAL PANELS = 7 EACH
TYPE III BARRICADE-RT. = 32 LIN. FT.
TYPE III BARRICADE-LT. = 32 LIN. FT.

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-31-18

SITE 1:

INSTALL SIGNS FOR APPROVED DETOUR AS SHOWN IN THE DETOUR MAINTENANCE OF TRAFFIC DETAILS.

DETOUR TRAFFIC ONTO APPROVED DETOUR ROUTE.

CONSTRUCT EMBANKMENT AND STRUCTURES LT. & RT. FROM STA. 110+00.00 TO STA. 111+00.00.

PLACE FINAL LIFT OF ACHM SURFACE COURSE, CONSTRUCT TRANSITIONS, AND INSTALL PERMANENT PAVEMENT MARKINGS.

SITE 2:

STAGE 1 CONSTRUCTION SEQUENCE

INSTALL ADVANCE WARNING SIGNS, END ROAD WORK SIGNS, AND INSTALL ROAD WORK AHEAD (W20-1) SIGN AS SHOWN ON THE ADVANCE WARNING MAINTENANCE OF TRAFFIC DETAIL.

USE VERTICAL PANELS AND TRAFFIC DRUMS SPACED 45' ON CENTER TO DELINEATE THE WORK ZONE. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

CONSTRUCT DETOUR FROM STA. 401+42.55 TO STA. 411+28.82 AS SHOWN IN THE STAGE 1 MAINTENANCE OF TRAFFIC DETAILS.

STAGE 2 CONSTRUCTION SEQUENCE

MAINTAIN ADVANCE WARNING SIGNS AS SHOWN ON THE ADVANCE WARNING MAINTENANCE OF TRAFFIC DETAIL.

SHIFT TRAFFIC ONTO THE DETOUR AS SHOWN IN THE STAGE 2 MAINTENANCE OF TRAFFIC DETAILS.

USE VERTICAL PANELS AND TRAFFIC DRUMS SPACED 45' ON CENTER TO DELINEATE THE WORK ZONE. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

CONSTRUCT STRUCTURES AND EMBANKMENT LT. & RT. FROM STA. 206+83.56 TO STA. 213+10.81, AND EMBANKMENT LT. FROM STA. 213+10.81 TO STA. 214+10.81 AS SHOWN IN THE STAGE 2 MAINTENANCE OF TRAFFIC DETAILS. STAGE 2 CONSTRUCTION WILL CONSIST OF ONLY WINGWALLS ON THE NORTH SIDE OF THE R.C. BOX CULVERT.

STAGE 3 CONSTRUCTION SEQUENCE

MAINTAIN ADVANCE WARNING SIGNS AS SHOWN ON THE ADVANCE WARNING MAINTENANCE OF TRAFFIC DETAIL.

SHIFT TRAFFIC ONTO THE NEW ROADWAY AS SHOWN IN THE STAGE 3 MAINTENANCE OF TRAFFIC DETAILS.

USE VERTICAL PANELS AND TRAFFIC DRUMS SPACED 45' ON CENTER TO DELINEATE THE WORK ZONE. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

OBLITERATE DETOUR AND CONSTRUCT FINAL PORTIONS OF EMBANKMENT RT. FROM STA. 213+10.81 TO STA. 214+10.81, STRUCTURES, AND DRIVEWAYS AS SHOWN IN THE STAGE 3 MAINTENANCE OF TRAFFIC DETAILS.

5/17/2018

R110646.DGN

ADVANCE WARNING
MAINTENANCE OF TRAFFIC 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.		110646	22	48

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-31-18

Allendale

WILDLIFE

3.9

END DETOUR (1) M4-8A (24" X 18")

HWY. 241 (1) D3-1 (36"x12")
DETOUR (1) M4-8 (24" X 12")
(1) M6-1 (21" X 15")

ROAD CLOSED (1) R11-2 (48" X 30")
16' BARR. TYP. III RT.
16' BARR. TYP. III LT.

HWY. 241 (1) D3-1 (36"x12")
DETOUR (1) M4-8 (24" X 12")
(1) M6-3 (21" X 15")

241

2.2

ROAD CLOSED 1.75 MILES AHEAD LOCAL TRAFFIC ONLY (1) R11-4 (60" X 30")

WORK ZONE

END DETOUR (1) M4-8A (24" X 18")

HWY. 241 (1) D3-1 (36"x12")
DETOUR (1) M4-8 (24" X 12")
(1) M6-1 (21" X 15")

ROAD CLOSED TO THRU TRAFFIC (1) R11-4 (60" X 30")

Keevil

HWY. 241 (1) D3-1 (36"x12")
DETOUR (1) M4-8 (24" X 12")
(1) M6-3 (21" X 15")

ROAD CLOSED (1) R11-2 (48" X 30")
16' BARR. TYP. III RT.
16' BARR. TYP. III LT.

PACIFIC

1.0

241

4.8

SITE 1- DETOUR
MAINTENANCE OF TRAFFIC

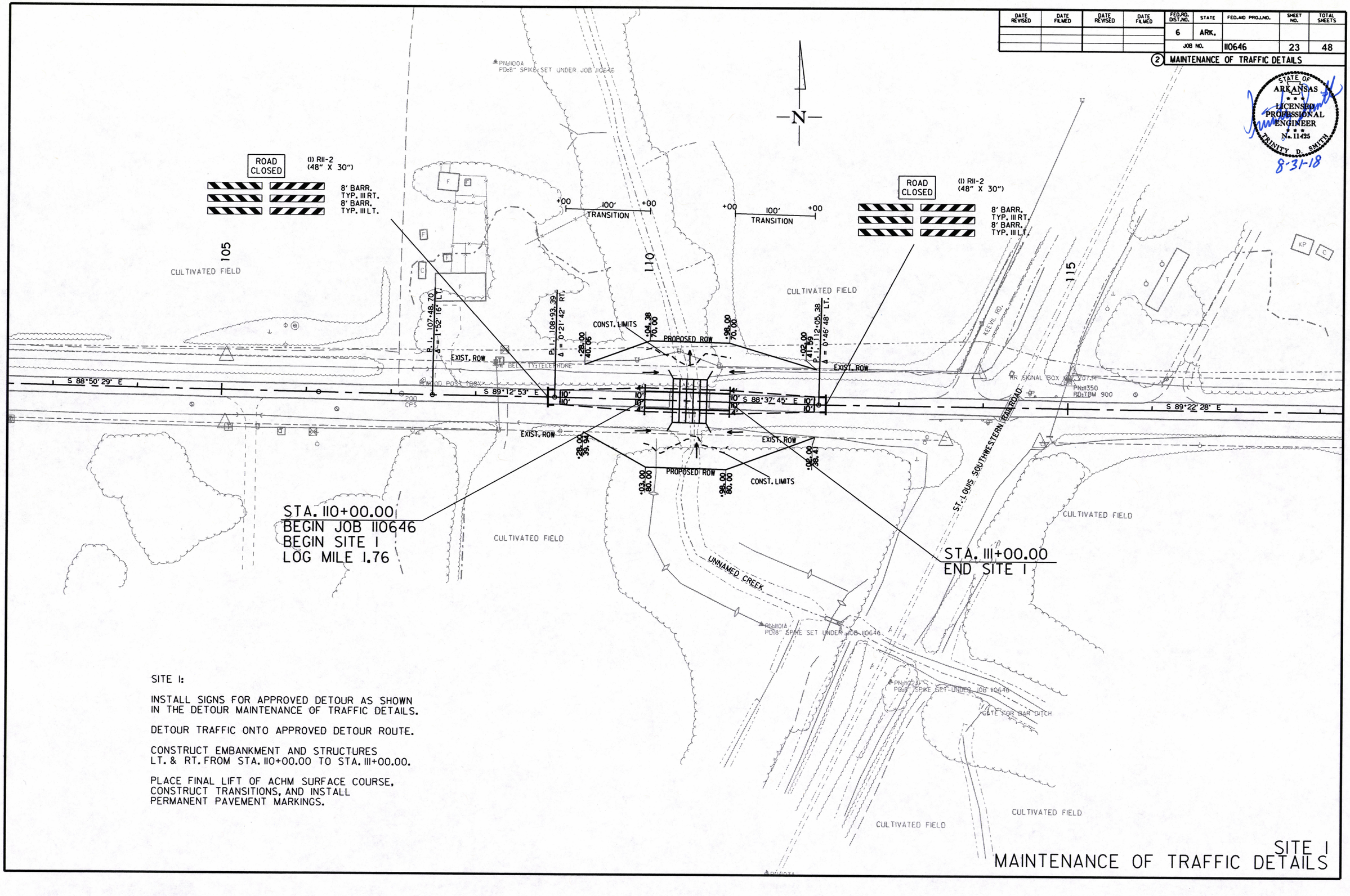
5/17/2018

R110646.DGN

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.		110646	23	48

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-31-18



SITE 1:

INSTALL SIGNS FOR APPROVED DETOUR AS SHOWN IN THE DETOUR MAINTENANCE OF TRAFFIC DETAILS.

DETOUR TRAFFIC ONTO APPROVED DETOUR ROUTE.

CONSTRUCT EMBANKMENT AND STRUCTURES LT. & RT. FROM STA. 110+00.00 TO STA. 111+00.00.

PLACE FINAL LIFT OF ACHM SURFACE COURSE, CONSTRUCT TRANSITIONS, AND INSTALL PERMANENT PAVEMENT MARKINGS.

5/17/2018

R110646.DGN

SITE 1
MAINTENANCE OF TRAFFIC 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.		110646	24	48

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-31-18

(1) R11-2 (48" X 30")
ROAD CLOSED
16' BARR. TYP. III LT.

(9) TRAFFIC DRUMS SPACED 45' ON CENTER

(5) VERTICAL PANELS SPACED 45' ON CENTER

+83.56 100' +83.56 TRANSITION

STA. 206+83.56
BEGIN SITE 2
LOG MILE 4.73

STA. 214+10.77
END SITE 2
END JOB 110646

STA. 411+28.82 =
END SITE 2 DETOUR

STA. 401+42.55 =
STA. 204+42.63 CL CONST.
BEGIN SITE 2 DETOUR

(3) VERTICAL PANELS SPACED 45' ON CENTER

+10.77 100' +10.77 TRANSITION

(1) R11-2 (48" X 30")
ROAD CLOSED
16' BARR. TYP. III RT.

SITE 2:

STAGE I CONSTRUCTION SEQUENCE

INSTALL ADVANCE WARNING SIGNS, END ROAD WORK SIGNS, AND INSTALL ROAD WORK AHEAD (W20-1) SIGN AS SHOWN ON THE ADVANCE WARNING MAINTENANCE OF TRAFFIC DETAIL.

USE VERTICAL PANELS AND TRAFFIC DRUMS SPACED 45' ON CENTER TO DELINEATE THE WORK ZONE. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

CONSTRUCT DETOUR FROM STA. 401+42.55 TO STA. 411+28.82 AS SHOWN IN THE STAGE I MAINTENANCE OF TRAFFIC DETAILS.

SITE 2 - STAGE I
MAINTENANCE OF TRAFFIC DETAILS

5/17/2018

R110646.DGN

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.		110646	25	48

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-31-18

CONSTRUCTION PAVEMENT MARKING WHITE (6") = 1973 LIN. FT.
CONSTRUCTION PAVEMENT MARKING YELLOW (6") = 1973 LIN. FT.

N

(1) RII-2 (48" X 30")
(1) WI-6 (48" X 24")
ROAD CLOSED
16' BARR. TYP. III LT.

STA. 206+83.56
BEGIN SITE 2
LOG MILE 4.73

+83.56 100' +83.56 TRANSITION

(19) TRAFFIC DRUMS SPACED 45' ON CENTER

ROAD CLOSED
(1) RII-2 (48" X 30")
(1) WI-6 (48" X 24")
16' BARR. TYP. III RT.

(3) VERTICAL PANELS SPACED 45' ON CENTER

STA. 411+28.82 =
END SITE 2 DETOUR

POB 400+00.00
PC 204+42.63
PI 402+70.68
PC404+61.47
PT 208+63.51
PROPOSED ROW
CONST. LIMITS
EXIST. ROW
PC 211+36.20
PI 406+93.40
PI 213+90.31
POE 214+82.82
POB 214+82.82
S 88°55'10" E
S 89°58'18" E
N 83°36'12" E
N 16°16'59" E
N 30°17'27" W
PC401+42.55
PI 206+53.08
PT403+97.75
PI 405+48.22
PI 408+77.30
PI 212+43.40
T.C.E.
CONST. LIMITS
EXIST. ROW
120' R
+10.77 100' +10.77 TRANSITION
POE 500+00.00
TELEPHONE
POND
CYPRESS CREEK
TED FIELD
(18) TRAFFIC DRUMS AT DRIVEWAY TURNOUTS
6" WHITE CONSTRUCTION PAVEMENT MARKING
6" DOUBLE YELLOW CONSTRUCTION PAVEMENT MARKING
3004B BM MARKER
10025 BM MARKER
STA. 214+10.77
END SITE 2
END JOB 110646
5 BARB WOOD CN&POOR
4 BARB WOOD AND
WEB 2 BARB WOOD POST CN&POOR

STA. 401+42.55 =
STA. 204+42.63 CL CONST.
BEGIN SITE 2 DETOUR

SITE 2:

STAGE 2 CONSTRUCTION SEQUENCE

MAINTAIN ADVANCE WARNING SIGNS AS SHOWN ON THE ADVANCE WARNING MAINTENANCE OF TRAFFIC DETAIL.

SHIFT TRAFFIC ONTO THE DETOUR AS SHOWN IN THE STAGE 2 MAINTENANCE OF TRAFFIC DETAILS.

USE VERTICAL PANELS AND TRAFFIC DRUMS SPACED 45' ON CENTER TO DELINEATE THE WORK ZONE. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

CONSTRUCT STRUCTURES AND EMBANKMENT LT. & RT. FROM STA. 206+83.56 TO STA. 213+10.81, AND EMBANKMENT LT. FROM STA. 213+10.81 TO STA. 214+10.81 AS SHOWN IN THE STAGE 2 MAINTENANCE OF TRAFFIC DETAILS. CONSTRUCT ALL OF PAVEMENT STRUCTURE BUT FINAL LIFT OF ACHM SURFACE COURSE. STAGE 2 CONSTRUCTION WILL CONSIST OF ONLY WINGWALLS ON THE NORTH SIDE OF THE R.C. BOX CULVERT.

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SITE 2 - STAGE 2
MAINTENANCE OF TRAFFIC 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.		110646	26	48

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-31-18

CONSTRUCTION PAVEMENT MARKING WHITE (6") = 1645 LIN. FT.
CONSTRUCTION PAVEMENT MARKING YELLOW (6") = 1645 LIN. FT.

OBLITERATE DETOUR

ROAD CLOSED
(1) R11-2 (48" X 30")
16' BARR. TYP. III RT.

STA. 206+83.56
BEGIN SITE 2
LOG MILE 4.73

+83.56 100' TRANSITION +83.56

(13) TRAFFIC DRUMS SPACED 45' ON CENTER

(12) TRAFFIC DRUMS AT DRIVEWAY TURNOUTS

STA. 411+28.82 =
END SITE 2 DETOUR

STA. 214+10.77
END SITE 2
END JOB 110646

(2) VERTICAL PANELS SPACED 45' ON CENTER

(5) VERTICAL PANELS SPACED 45' ON CENTER

STA. 401+42.55 =
STA. 204+42.63 CL CONST.
BEGIN SITE 2 DETOUR

SITE 2:

STAGE 3 CONSTRUCTION SEQUENCE

MAINTAIN ADVANCE WARNING SIGNS AS SHOWN ON THE ADVANCE WARNING MAINTENANCE OF TRAFFIC DETAIL.

SHIFT TRAFFIC ONTO THE NEW ROADWAY AS SHOWN IN THE STAGE 3 MAINTENANCE OF TRAFFIC DETAILS.

USE VERTICAL PANELS AND TRAFFIC DRUMS SPACED 45' ON CENTER TO DELINEATE THE WORK ZONE. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

OBLITERATE DETOUR AND CONSTRUCT FINAL PORTIONS OF EMBANKMENT RT. FROM STA. 213+10.81 TO STA. 214+10.81 AS SHOWN IN THE STAGE 2 MAINTENANCE OF TRAFFIC DETAILS. CONSTRUCT FINAL LIFT OF ACHM SURFACE COURSE. CONSTRUCT FINAL PORTIONS OF STRUCTURES AND DRIVEWAYS AS SHOWN IN THE STAGE 3 MAINTENANCE OF TRAFFIC DETAILS.

(1) R11-2 (48" X 30")
ROAD CLOSED
16' BARR. TYP. III LT.

+10.77 100' TRANSITION +10.77

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SITE 2 - STAGE 3
MAINTENANCE OF TRAFFIC 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.		110646	27	48

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-31-18

PERMANENT PAVEMENT MARKINGS

REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6") = 600 LIN. FT.
REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (6") = 600 LIN. FT.
REFLECTORIZED PAINT PAVEMENT MARKING (RAILROAD EMBLEMS) = 1 EACH
RAISED PAVEMENT MARKERS (TYPE II)(YELLOW/YELLOW)(80' O.C.) = 4 EACH

N

PN#1100A
PD:8" SPIKE SET UNDER JOB 110646

105
CULTIVATED FIELD

+00 100' TRANSITION +00

+00 100' TRANSITION +00

110

6" WHITE
REFLECTORIZED PAINT PAVEMENT MARKING

CULTIVATED FIELD

115

KP

C

T

KEEVIL RD.

R. I. 107+48.70
Δ = 1°52' 16" LT.

P. I. 108+93.39
Δ = 0°21' 42" RT.

P. I. 112+05.38
Δ = 0°46' 48" LT.

CONST. LIMITS

PROPOSED R/W

EXIST. R/W

BELL TYSTELEPHONE

WOOD POST (SBX)

S 88°50' 29" E

S 89°12' 53" E

S 88°37' 45" E

S 89°22' 28" E

200 CPS

RR SIGNAL BOX MM 207.14

PN#1350
PD:TBM 900

ST. LOUIS SOUTHWESTERN RAILROAD

CULTIVATED FIELD

STA. 110+00.00
BEGIN JOB 110646
BEGIN SITE 1
LOG MILE 1.76

CULTIVATED FIELD

6" DBL. YELLOW
REFLECTORIZED PAINT PAVEMENT MARKING
WITH R.P.M. (TYPE II)(YELLOW/YELLOW)
SPACED 80' O.C.

UNNAMED CREEK

STA. 111+00.00
END SITE 1

PN#1101A
PD:8" SPIKE SET UNDER JOB 110646

PN#1102A
PD:8" SPIKE SET UNDER JOB 110646

GATE FOR BAR DITCH

NOTE: THE 6" YELLOW STRIPING QUANTITY HAS BEEN ESTIMATED BASED ON A DOUBLE YELLOW CENTERLINE STRIPE FOR THE ENTIRE PROJECT. THE PROJECT MUST BE MARKED FOR PASSING/NO PASSING ZONES PRIOR TO THE PLACEMENT OF ANY FINAL STRIPING. CONTACT THE MAINTENANCE DIVISION AFTER THE FINAL LIFT OF SURFACE COURSE HAS BEEN PLACED TO SCHEDULE THE ZONING OF THE PROJECT.

6/15/2018

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SITE 1
PERMANENT PAVEMENT MARKING 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.		110646	28	48

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
TRINITY D. SMITH
LICENSED PROFESSIONAL ENGINEER
No. 11425
8-31-18

PERMANENT PAVEMENT MARKINGS

REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6") = 1656 LIN. FT.
REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (6") = 1634 LIN. FT.
RAISED PAVEMENT MARKERS (TYPE II)(YELLOW/YELLOW)(80' O.C.) = 11 EACH

N

STA. 206+83.56
BEGIN SITE 2
LOG MILE 4.73

+83.56 100' +83.56
TRANSITION

6" WHITE
REFLECTORIZED PAINT PAVEMENT MARKING

STA. 214+10.81
END SITE 2
END JOB 110646

HWY. 241 - STA. 214+22.38 =
HWY. 49 - STA. 504+26.52
Δ = 66°09'25"

PC 204+42.63
PT 208+63.51
PC 211+36.20
PT. 213+30.37
POE 214+22.82
POE 507+97.06
PI 206+53.08
PI 212+43.40
PROPOSED ROW
CONST. LIMITS
EXIST. ROW
EXIST. ROW
CONST. LIMITS
PROPOSED ROW
CONST. LIMITS
S 88°55'10" E
S 89°58'18" E
N 83°36'13" E
N 30°19'23" W
205
210
50' R
120' R
EXIST. ROW
EXIST. ROW
T.C.E.
T.C.E.
T.C.E.
PN:II03
PD:8" SPIKE SET UNDER JOB 110615
PN:II04
PD:8" SPIKE SET UNDER JOB 110615
PN:II05
PD:8" SPIKE SET UNDER JOB 110615
PN:II06
PD:8" SPIKE SET UNDER JOB 110615
PN:II01
PD:8" SPIKE
BOX PLASTIC POST
30048
R/W MARKER
30025
R/W MARKER
TELEPHONE
POND
CYPRESS CREEK
CULTIVATED FIELD
BARB WOOD CN:POOR
BARB WOOD CN:GOOD
+10.77 100' +10.77
TRANSITION

6" DBL. YELLOW
REFLECTORIZED PAINT PAVEMENT MARKING
WITH R.P.M. (TYPE II)(YELLOW/YELLOW)
SPACED 80' O.C.

NOTE: THE 6" YELLOW STRIPING QUANTITY HAS BEEN ESTIMATED BASED ON A DOUBLE YELLOW CENTERLINE STRIPE FOR THE ENTIRE PROJECT. THE PROJECT MUST BE MARKED FOR PASSING/NO PASSING ZONES PRIOR TO THE PLACEMENT OF ANY FINAL STRIPING. CONTACT THE MAINTENANCE DIVISION AFTER THE FINAL LIFT OF SURFACE COURSE HAS BEEN PLACED TO SCHEDULE THE ZONING OF THE PROJECT.

6/15/2018
R110646.DGN

SITE 2
PERMANENT PAVEMENT MARKING 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.		110646	29	48

(2) QUANTITIES

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-31-18

ADVANCE WARNING SIGNS AND DEVICES

SIGN NUMBER	DESCRIPTION	SIGN SIZE	STAGE 1	STAGE 2	STAGE 3	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED		VERTICAL PANELS	TRAFFIC DRUMS	BARRICADES (TYPE III)	
											RIGHT	LEFT
			LIN. FT. - EACH				NO.	SQ. FT.	EACH		LIN. FT.	
W20-1	ROAD WORK 1500 FT.	48"x48"	2	2	2	2	2	32.0				
W20-1	ROAD WORK 1000 FT.	48"x48"	2	2	2	2	2	32.0				
W20-1	ROAD WORK 500 FT.	48"x48"	2	2	2	2	2	32.0				
G20-2	END ROAD WORK	48"x24"	2	2	2	2	2	16.0				
R4-1	DO NOT PASS	24"x30"	2	2	2	2	2	10.0				
W21-5a	RIGHT SHOULDER CLOSED	36"x36"	2	2	2	2	2	18.0				
W8-1	BUMP	30"x30"	2	2	2	2	2	12.5				
R2-1	SPEED LIMIT XX MPH	24"x30"	2	2	2	2	2	10.0				
M4-8A	END DETOUR	24"x18"	2			2	2	6.0				
M4-8	DETOUR	24"x12"	4			4	4	8.0				
M6-3	DIRECTIONAL ARROW	21"x15"	4			4	4	8.8				
D3-1	HIGHWAY NAME	36"x12"	4			4	4	12.0				
RII-4	ROAD CLOSED TO THRU TRAFFIC	60"x30"	1			1	1	12.5				
RII-3A	ROAD CLOSED 1.75 MILES AHEAD LOCAL TRAFFIC ONLY	60"x30"	1			1	1	12.5				
RII-2	ROAD CLOSED	48"x30"	4	2	2	4	4	40.0				
W1-6	LARGE ARROW	48"x24"		2		2	2	16.0				
	VERTICAL PANELS		8	3	7	8			8			
	TRAFFIC DRUMS		9	37	13	37				37		
	TYPE III BARRICADE-RT. (8')		2			2					16	
	TYPE III BARRICADE-LT. (8')		2			2						16
	TYPE III BARRICADE-RT. (16')		1	1	1	1					16	
	TYPE III BARRICADE-LT. (16')		1	1	1	1						16
TOTALS:								278.3	8	37	32	32

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

CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS

DESCRIPTION	STAGE 2	STAGE 3	END OF JOB	CONSTRUCTION PAVEMENT MARKINGS	RAISED PAVEMENT MARKERS	REFLECTORIZED PAINT PAVEMENT MARKING			
					TYPE II	24"	RAILROAD	6"	
					(YEL/YEL)	WHITE	EMBLEMS	WHITE	YELLOW
	LIN. FT. - EACH			LIN. FT.	EACH	LIN. FT.	EACH	LIN. FT.	
CONSTRUCTION PAVEMENT MARKINGS	3946	3290		7236					
RAISED PAVEMENT MARKERS TYPE II (YEL/YEL)			15		15				
REFLECTORIZED PAVEMENT MARKING WHITE (24")			20			20			
REFLECTORIZED PAVEMENT MARKING (RAILROAD EMBLEMS)			1				1		
REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6")			2256					2256	
REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (6")			2234						2234
TOTALS:				7236	15	20	1	2256	2234

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

NOTE: THE 6" YELLOW STRIPING QUANTITY HAS BEEN ESTIMATED BASED ON A DOUBLE YELLOW CENTERLINE STRIPE FOR THE ENTIRE PROJECT.
THE PROJECT MUST BE MARKED FOR PASSING/NO PASSING ZONES PRIOR TO THE PLACEMENT OF ANY FINAL STRIPING.
CONTACT THE MAINTENANCE DIVISION AFTER THE FINAL LIFT OF SURFACE COURSE HAS BEEN PLACED TO SCHEDULE THE ZONING OF THE PROJECT.

6/26/2018

R110646.DGN

QUANTITIES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
11/1/18				6	ARK.			
				JOB NO.		110646	30	48

(2) QUANTITIES

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-6-18

DUMPED RIPRAP AND FILTER BLANKET

STATION	STATION	LOCATION	DUMPED RIPRAP	FILTER BLANKET
			CU. YD.	SQ. YD.
210+20	210+70	LT. SLOPE OF DETOUR RD.	129	258
210+20	210+70	RT. SLOPE OF DETOUR RD.	242	484
TOTALS:			371	742

*NOTE: QUANTITY ESTIMATED.
SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS

NOTE: FILTER BLANKET SHALL BE GEOTEXTILE FABRIC (TYPE 5).

REMOVAL OF EXISTING BRIDGE STRUCTURE

STATION	STATION	LOCATION	LUMP SUM
110+30	110+76	HWY. 241 (SITE NO. 1)	1.00
210+24	210+71	HWY. 241 (SITE NO. 2)	1.00

CLEARING AND GRUBBING

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	
109+28	112+02	HWY. 241 SITE 1	3	3
205+41	213+75	HWY. 241 SITE 2	9	9
TOTALS:			12	12

EARTHWORK

	STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT	* SOIL STABILIZATION
				CU. YD.		TON
	110+00.00	111+00.00	STAGE 1- SITE 1	581	203	
	206+83.56	214+10.77	STAGE 1 - SITE 2	1006	2856	
	206+83.56	214+10.77	STAGE 2 - SITE 2	296	1580	
	206+83.56	214+10.77	STAGE 3 - SITE 2	3573	925	
	ENTIRE	PROJECT	APPROACHES		95	
	110+53.00		CHANNEL CHANGE	400		
	210+48.00		CHANNEL CHANGE	200		
*	ENTIRE	PROJECT	TO BE USED IF AND WHERE			75
			DIRECTED BY THE ENGINEER			
	TOTALS:			6056	5659	75

* QUANTITY ESTIMATED.
SEE SECTION 104.03 OF THE STD. SPECS.

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

SOIL LOG

STATION	LATITUDE			LONGITUDE			LOCATION	DEPTH	LIQUID LIMIT	PLASTICITY INDEX	AASHTO CLASSIFICATION	COLOR
	DEG	MIN	SEC	DEG	MIN	SEC		FEET				
109+00	24	46	51.00	91	15	10.00	6' RT.	0-5	31	15	A-6(12)	GRAY
109+00	34	46	51.00	91	15	10.00	17' RT.	0-5	30	16	A-6(9)	GRAY
112+00	34	46	51.00	91	15	6.00	6' LT.	0-5	46	30	A-7-6(28)	GRAY
112+00	34	46	51.00	91	15	6.00	15' LT.	0-5	46	31	A-7-6(25)	GRAY
209+00	34	45	53.00	91	9	40.00	6' RT.	0-5	41	24	A-7-6(24)	GRAY
209+00	34	45	53.00	91	9	40.00	15' RT.	0-5	44	27	A-7-6(18)	GRAY
212+00	34	45	53.00	91	9	36.00	6' LT.	0-5	38	19	A-6(15)	GRAY
212+00	34	45	53.00	91	9	36.00	18' LT.	0-5	34	18	A-6(16)	GRAY

SOIL CHARACTERISTICS TABULATED ABOVE ARE REPRESENTATIVE AT THE LOCATION OF THE SAMPLE, AND FROM SURFACE INDICATIONS ARE TYPICAL FOR THE LIMITS SHOWN. THESE DATA ARE SHOWN FOR INFORMATION ONLY. THE STATE WILL NOT BE RESPONSIBLE FOR VARIATIONS IN THE SOIL CHARACTERISTICS AND/OR EXTENT OF SAME DIFFERING FROM THE ABOVE TABULATIONS.

EROSION CONTROL

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL					TEMPORARY EROSION CONTROL									
			SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	TEMPORARY SEEDING	MULCH COVER	WATER	TRIANGULAR SILT DIKE	SAND BAG DITCH CHECKS (E-5)	ROCK DITCH CHECKS (E-6)	SILT FENCE (E-11)	SEDIMENT BASIN (E-14)	OBLITERATION OF SEDIMENT BASIN	*SEDIMENT REMOVAL & DISPOSAL
			ACRE	TON	ACRE	M.GAL.	ACRE	ACRE	ACRE	M.GAL.	LIN. FT.	BAG	CU.YD.	LIN. FT.	CU.YD.	CU.YD.	CU. YD.
109+28	112+02	CLEARING AND GRUBBING - SITE 1						0.66	0.66	13.5				657			24
204+43	214+11	CLEARING AND GRUBBING - SITE 2						2.22	2.22	45.3				1058			39
109+28	112+02	STAGE 1 - SITE 1	0.18	0.36	0.18	18.4	0.18	0.66	0.66	13.5		88	12	303			19
204+43	214+11	STAGE 1 - SITE 2						1.63	1.63	33.3		154	18				13
204+43	214+11	STAGE 2 - SITE 2						0.99	0.99	20.2	40	88	12	236			17
204+43	214+11	STAGE 3 - SITE 2	0.89	1.78	0.89	90.8	0.89	1.23	1.23	25.1	47	66	12	272			17
*ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.			0.22	0.44	0.22	22.4	0.22	1.85	1.85	37.7	22	99	14	632	150	150	173
TOTALS:			1.29	2.58	1.29	131.6	1.29	9.24	9.24	188.6	109	495	68	3158	150	150	302

BASIS OF ESTIMATE:
LIME .....2 TONS / ACRE OF SEEDING
WATER.....102.0 M.G. / ACRE OF SEEDING
WATER.....20.4 M.G. / ACRE OF TEMPORARY SEEDING
SAND BAG DITCH CHECKS.....22 BAGS / LOCATION
ROCK DITCH CHECKS.....3 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 ESTIMATED.
SEE SECTION 104.03 OF THE STD. SPECS.

6/26/2018

R110646.DGN

QUANTITIES

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.		110646	31	48

(2) QUANTITIES

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-31-18

EROSION CONTROL MATTING

STATION	STATION	LOCATION	LENGTH	CLASS 3
			LIN. FT.	SQ. YD.
207+65.00	209+99.00	HWY. 241 SITE 2	234.00	208.00
TOTAL:				208.00

NOTE: AVERAGE WIDTH = 8'-0"

SELECTED PIPE BEDDING

LOCATION	SELECTED PIPE BEDDING
	CU.YD.
ENTIRE PROJECT TO BE USED IF	
AND WHERE DIRECTED BY THE	30
ENGINEER	
TOTAL:	30

NOTE: QUANTITY ESTIMATED.
SEE SECTION 104.03 OF THE STD. SPECS.

BENCH MARKS

STATION	LOCATION	BENCH MARKS
		EACH
110+73	HDWL. OF R.C. BOX CULVERT ON LT.	1
210+73	HDWL. OF R.C. BOX CULVERT ON LT.	1
TOTAL:		2

NOTE: SHOWN FOR INFORMATION ONLY. BENCH MARKS SHALL BE FURNISHED AND PLACED BY STATE FORCES.

4" PIPE UNDERDRAIN

STATION	STATION	LOCATIONS	4" PIPE UNDERDRAINS	UNDERDRAIN OUTLET PROTECTORS
			LIN. FT.	EACH
* ENTIRE PROJECT TO BE USED IF AND			200	2
WHERE DIRECTED BY THE ENGINEER				
TOTALS:			200	2

* NOTE: QUANTITY ESTIMATED.
SEE SECTION 104.03 OF THE STD. SPECS.

STRUCTURES

STATION	DESCRIPTION	TEMPORARY CULVERTS 60"	SPAN	HEIGHT	LENGTH	CLASS S CONCRETE-ROADWAY	REINF. STEEL-ROADWAY (GRADE 60)	UNCL.EXC. FOR STR.-ROADWAY	SOLID SODDING	WATER	STD. DWG. NOS.
		LIN. FT.	LIN. FT.			CU.YD.	POUND	CU.YD.	SQ.YD.	M.GAL.	
407+68	SEXT. 60" x 47' TEMP. PIPE CULVERT	282									PCC-1, PCM-1
SUBTOTALS:		282									
STRUCTURES OVER 20' - 0" SPAN											
110+53	QUINT. 8' x 4' x 48' R.C. BOX CULVERT		8	4	48	170.80	21629	91	30	0.38	PBC-1, RCB-1, RCB-2, SPECIAL DETAILS
210+48	QUINT. 10' x 5' x 48' R.C. BOX CULVERT		10	5	48	243.00	28817	127	36	0.45	PBC-1, RCB-1, RCB-2, SPECIAL DETAILS
SUBTOTALS:						413.80	50446	218	66	0.83	
TOTALS:		282				413.80	50446	218	66	0.83	

BASIS OF ESTIMATE:
WATER.....12.6 GAL. / SQ. YD. OF SOLID SODDING

NOTE: FOR R.C. PIPE CULVERT INSTALLATIONS USE TYPE 3 BEDDING UNLESS OTHERWISE SPECIFIED.

NOTE: FOR C.M. PIPE CULVERT INSTALLATIONS USE TYPE 2 BEDDING UNLESS OTHERWISE SPECIFIED.

ACHM PATCHING OF EXISTING ROADWAY

DESCRIPTION	TON
ENTIRE PROJECT - TO BE USED IF AND WHERE	10
DIRECTED BY THE ENGINEER	
TOTAL:	10

NOTE: QUANTITY ESTIMATED.
SEE SECTION 104.03 OF THE STD. SPECS.

COLD MILLING ASPHALT PAVEMENT

STATION	STATION	LOCATION	AVG. WIDTH	COLD MILLING ASPHALT PAVEMENT
			FEET	SQ. YD.
109+00.00	110+00.00	HWY. 241 SITE 1 MAIN LANES	20.00	222.22
111+00.00	112+00.00	HWY. 241 SITE 1 MAIN LANES	20.00	222.22
205+83.56	206+83.56	HWY. 241 SITE 2 MAIN LANES	20.00	222.22
213+98.70	214+10.77	HWY. 241 SITE 2 MAIN LANES	20.00	26.82
TOTAL:				693.48

NOTE: AVERAGE MILLING DEPTH 1".

6/26/2018

R110646.DGN

QUANTITIES

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.		110646	32	48

(2) QUANTITIES

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-31-18

DRIVEWAYS & TURNOUTS

STATION	SIDE	LOCATION	WIDTH	ACHM SURFACE COURSE (1/2") 220 LBS. PER SQ. YD. (PG 64-22)		AGGREGATE BASE COURSE (CLASS 7)	SIDE DRAINS	STANDARD DRAWINGS
							24"	
			FEET	SQ. YD.	TON	TON	LIN. FT.	
205+66	RT.	HWY. 241 SITE 2	20	52.80	5.81	21.56	36	PCC-1, PCM-1, PCP-1, PCP-2
207+38	RT.	HWY. 241 SITE 2	30	72.80	8.01	29.73	46	PCC-1, PCM-1, PCP-1, PCP-2
* ENTIRE PROJECT TEMPORARY DRIVES						60.00		
TOTALS:				125.60	13.82	111.29	82	

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.8% MIN. AGGR.....5.2% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22

* QUANTITY ESTIMATED
SEE SECTION 104.03 OF THE STD. SPECS.
TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.

NOTE: FOR R.C. PIPE CULVERT INSTALLATIONS USE TYPE 3 BEDDING UNLESS OTHERWISE SPECIFIED.
NOTE: FOR C.M. PIPE CULVERT INSTALLATIONS USE TYPE 2 BEDDING UNLESS OTHERWISE SPECIFIED.

BASE AND SURFACING

STATION	STATION	LOCATION	LENGTH	AGGREGATE BASE COURSE (CLASS 7)		TACK COAT				ACHM BINDER COURSE (1")				ACHM SURFACE COURSE (1/2")								
				TON / STATION	TON	AVG. WID.	SQ.YD.	GALLONS / SQ.YD.	GALLON	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 64-22	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 64-22	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 64-22	TOTAL PG 64-22
			FEET			FEET				FEET			TON	FEET			TON	FEET			TON	TON
MAIN LANES - SITE 1																						
109+00.00	110+00.00	TRANSITION	100.00			VAR.	248.82	0.17	42.30									VAR.	248.82	220.00	27.37	27.37
110+00.00	111+00.00	FULL DEPTH	100.00	170.75	170.75	40.71	452.33	0.05	22.62	20.46	227.33	330.00	37.51	20.25	225.00	220.00	24.75	24.00	266.67	220.00	29.33	54.08
111+00.00	112+00.00	TRANSITION	100.00			VAR.	255.12	0.17	43.37									VAR.	255.12	220.00	28.06	28.06
MAIN LANES - SITE 2																						
205+83.56	206+83.56	TRANSITION	100.00			VAR.	262.86	0.17	44.69									VAR.	262.86	220.00	28.91	28.91
206+83.56	207+70.00	NOTCH & WIDEN	86.44	93.00	80.39	20.00	192.09	0.17	32.66									24.00	230.51	220.00	25.36	25.36
207+70.00	213+80.00	FULL DEPTH	610.00	170.75	1041.58	40.71	2759.23	0.05	137.96	20.46	1386.73	330.00	228.81	20.25	1372.50	220.00	150.98	24.00	1626.67	220.00	178.93	329.91
213+80.00	214+10.81	NOTCH & WIDEN	30.81	93.00	28.65	20.00	68.47	0.17	11.64									24.00	82.16	220.00	9.04	9.04
213+10.81	214+22.67	TRANSITION	111.86			VAR.	253.24	0.17	43.05									VAR.	253.24	220.00	27.86	27.86
DETOUR - SITE 2																						
401+42.67	403+44.96	DETOUR - NOTCH & WIDEN	202.29	VAR.	144.61													VAR.	209.29	220.00	23.02	23.02
403+44.96	410+45.52	DETOUR - FULL DEPTH	700.56	181.25	1269.77													24.00	1868.16	220.00	205.50	205.50
410+45.52	410+75.41	DETOUR - NOTCH & WIDEN	29.89	VAR.	39.12													VAR.	73.66	220.00	8.10	8.10
ADDITIONAL FOR LEVELING AND GRADE RAISE - SITE 2																						
206+83.56	207+70.00	LEVELING	86.44			20.00	192.09	0.05	9.60									20.00	192.09	VAR.	21.13	21.13
209+00.00	210+20.00	GRADE RAISE	120.00			20.00	2.19	0.17	0.37	20.00	2.19	VAR.	4.33									
210+80.00	213+10.00	GRADE RAISE	230.00			20.00	3.62	0.17	0.62	20.00	3.62	VAR.	7.17									
213+80.00	214+10.81	LEVELING	30.81			20.00	253.24	0.05	12.66									20.00	253.24	VAR.	27.86	27.86
ADDITIONAL FOR SUPERELEVATION - SITE 2																						
211+17.91	212+43.28	SUPERELEVATION TRANSITION	125.37	9.50	11.91																	
212+43.29	213+68.66	SUPERELEVATION TRANSITION	125.37	9.50	11.91																	
404+29.61	405+47.80	DETOUR SUPERELEVATION TRANSITION	118.19	9.75	11.52																	
405+47.80	409+05.09	DETOUR MAXIMUM SUPERELEVATION	357.29	19.50	69.67																	
409+05.09	410+45.52	DETOUR SUPERELEVATION TRANSITION	140.43	9.75	13.69																	
TOTALS:					2893.57		4943.30		401.54		1619.87		277.82		1597.50		175.73		5822.49		640.47	816.20

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.8% MIN. AGGR.....5.2% ASPHALT BINDER
ACHM BINDER COURSE (1").....95.9% MIN. AGGR.....4.1% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22
TACK COAT QUANTITIES WERE CALCULATED USING THE EMULSIFIED ASPHALT RATES. REFER TO SS-400-1 FOR THE RESIDUAL ASPHALT APPLICATION RATES.

6/26/2018

R110646.DGN

SUMMARY OF QUANTITIES

ITEM NUMBER	ITEM	QUANTITY	UNIT
201	CLEARING	12	STATION
201	GRUBBING	12	STATION
SP & 210	UNCLASSIFIED EXCAVATION	6056	CU. YD.
210	COMPACTED EMBANKMENT	5659	CU. YD.
SP & 210	SOIL STABILIZATION	75	TON
SS & 303	AGGREGATE BASE COURSE (CLASS 7)	3005	TON
SS & 401	TACK COAT	402	GAL.
SP, SS, & 406	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")	267	TON
SP, SS, & 406	ASPHALT BINDER (PG 64-22) IN ACHM BINDER COURSE (1")	11	TON
SP, SS, & 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")	787	TON
SP, SS, & 407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2")	43	TON
412	COLD MILLING ASPHALT PAVEMENT	693	SQ. YD.
SP, SS, & 415	ACHM PATCHING OF EXISTING ROADWAY	10	TON
601	MOBILIZATION	1.00	LUMP SUM
SP & 602	FURNISHING FIELD OFFICE	1	EACH
SP & 603	MAINTENANCE OF TRAFFIC	1.00	LUMP SUM
603	60" TEMPORARY CULVERT	282	LIN. FT.
SS & 604	SIGNS	278	SQ. FT.
SS & 604	BARRICADES	64	LIN. FT.
SS & 604	TRAFFIC DRUMS	37	EACH
604	CONSTRUCTION PAVEMENT MARKINGS	7236	LIN. FT.
SS & 604	VERTICAL PANELS	8	EACH
SP, SS, & 606	24" SIDE DRAIN	82	LIN. FT.
606	SELECTED PIPE BEDDING	30	CU. YD.
SS & 611	4" PIPE UNDERDRAINS	200	LIN. FT.
SS & 611	UNDERDRAIN OUTLET PROTECTORS	2	EACH
620	LIME	3	TON
620	SEEDING	1.29	ACRE
SS & 620	MULCH COVER	10.53	ACRE
620	WATER	321.0	M. GAL.
621	TEMPORARY SEEDING	9.24	ACRE
621	SILT FENCE	3158	LIN. FT.
621	SAND BAG DITCH CHECKS	495	BAG
621	SEDIMENT BASIN	150	CU. YD.
621	OBLITERATION OF SEDIMENT BASIN	150	CU. YD.
621	SEDIMENT REMOVAL AND DISPOSAL	302	CU. YD.
621	ROCK DITCH CHECKS	68	CU. YD.
621	TRIANGULAR SILT DIKE	109	LIN. FT.
623	SECOND SEEDING APPLICATION	1.29	ACRE
624	SOLID SODDING	66	SQ. YD.
626	EROSION CONTROL MATTING (CLASS 3)	208	SQ. YD.
635	ROADWAY CONSTRUCTION CONTROL	1.00	LUMP SUM
718	REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6")	2256	LIN. FT.
718	REFLECTORIZED PAINT PAVEMENT MARKING WHITE (24")	20	LIN. FT.
718	REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (6")	2234	LIN. FT.
718	REFLECTORIZED PAINT PAVEMENT MARKING (RAILROAD EMBLEMS)	1	EACH
721	RAISED PAVEMENT MARKERS (TYPE II)	15	EACH
816	FILTER BLANKET	742	SQ. YD.
816	DUMPED RIPRAP	371	CU. YD.
	STRUCTURES OVER 20' SPAN		
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	218	CU. YD.
SS & 802	CLASS S CONCRETE-ROADWAY	413.80	CU. YD.
804	REINFORCING STEEL-ROADWAY (GRADE 60)	50446	POUND

REVISIONS

DATE	REVISION	SHEET NUMBER
11/1/2018	A "FLEXIBLE BEGINNING OF WORK" SPECIAL PROVISION WAS ADDED ALONG WITH THE ADDITION OF THE SUPPLEMENTAL SPECIFICATIONS 410-2, 600-2. AND 802-3. THE QUANTITIES OF DUMPED RIPRAP AND FILTER BLANKET WERE ADDED. A DETOUR SPECIAL DETAIL WAS ADDED. REVISED ALL SPECIAL PROVISIONS.	3, 6, 30, & 33
11/16/2018	THE SUPPLEMENTAL SPECIFICATION 306-1 WAS ADDED TO THE PLANS.	3 & 33

SUMMARY OF QUANTITIES & REVISIONS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11485
KENNETH D. SMITH
11-16-18

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED
11/1/18			
11/16/18			

(2) SUMMARY OF QUANTITIES & REVISIONS

FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.		33	48

JOB NO. 110646

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.		110646	34	48

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-31-18

SURVEY CONTROL COORDINATES

Project Name: s110646
Date: 10/11/2016
Coordinate System: ARKANSAS STATE PLANE - NORTH ZONE BASED ON GPS CONTROL, PROJECTED TO GROUND.
Units: U.S. SURVEY FOOT

Point Name	Northing	Easting	Elev	Feature	Description
1	158103.6321	1562136.8418	184.00	CTL	STD AHTD MON. STAMPED PN: 1
2	158095.6595	1562941.4838	183.94	CTL	STD AHTD MON. STAMPED PN: 2
3	158054.3385	1563809.3362	184.19	CTL	STD AHTD MON. STAMPED PN: 3
4	158073.3977	1564540.6971	182.54	CTL	STD AHTD MON. STAMPED PN: 4
5	158048.9599	1564927.8605	187.17	CTL	STD AHTD MON. STAMPED PN: 5
6	163784.7651	1535835.2940	182.26	CTL	STD AHTD MON. STAMPED PN: 6
7	163771.7505	1536404.5919	182.73	CTL	STD AHTD MON. STAMPED PN: 7
8	163735.6249	1536915.5152	183.39	CTL	STD AHTD MON. STAMPED PN: 8
9	163723.5792	1537285.0520	188.43	CTL	STD AHTD MON. STAMPED PN: 9
10	163750.9524	1537925.9031	185.82	CTL	STD AHTD MON. STAMPED PN: 10
100	156137.1515	1566102.0103	200.13	GPS	AHTD GPS MON 480007
101	154860.1198	1567088.6539	197.63	GPS	AHTD GPS MON 480007A
102	167537.4616	1556502.2372	188.65	GPS	AHTD GPS MON 480008
103	166116.9217	1556914.4005	191.93	GPS	AHTD GPS MON 480008A
900	163777.0805	1537334.3508	184.15	TBM	
950	158117.7387	1564796.4077	184.31	BM	USGS BM STAMPED 30DWB

*Note - Rebar and Cap - Standard - 5/8" Rebar with 2" Aluminum Cap stamped
*(standard markings common to all caps), or as indicated
(other markings indicated in the point description of the individual point).
ALL DISTANCES ARE GROUND.
USE CAF = 1.0 FOR STAKEOUT FOR THIS PROJECT.
A PROJECT CAF OF 1.000024836 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. s110646gi.ct1
HORIZONTAL DATUM: NAD 83 (1997)
VERTICAL DATUM: NAVD 88 POSITIONAL ACCURACY THIRD ORDER, UNLESS SPECIFIED OTHERWISE AT A SPECIFIC POINT.

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

BASIS OF BEARING:
ARKANSAS STATE PLANE GRID BEARINGS - 0301-NORTH ZONE
DETERMINED FROM GPS CONTROL POINTS: 480007 - 480007A, 480008 - 480008A
CONVERGENCE ANGLE: 00-29-22 RIGHT AT LAT N 34-45-52 LON W90-09-32
GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.

R110646.DGN 6/14/2018

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.		110646	35	48
				(2) SURVEY CONTROL DETAILS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-31-18

HWY. 241 SITE 1

POINT NO.	TYPE	STATION	NORTHING	EASTING
8000	POB	100+00.00	163769.5596	1535834.5990
8001	PI	107+48.70	163754.4193	1536583.1412
8003	PI	108+93.39	163752.4365	1536727.8223
8005	PI	112+05.38	163744.9722	1537039.7274
8007	POE	120+00.00	163736.2956	1537834.2956

HWY. 241 SITE 2

POINT NO.	TYPE	STATION	NORTHING	EASTING
8009	POB	200+00.00	158073.8241	1563440.2454
8011	PC	204+42.63	158065.4769	1563882.8007
8015	PT	208+63.51	158061.4042	1564303.6473
8017	PC	211+36.20	158061.2692	1564576.3423
8021	PT	213+50.37	158073.1594	1564790.0712
8023	POE	214+22.82	158081.2314	1564862.7860

HWY. 241 SITE 2 DETOUR

POINT NO.	TYPE	STATION	NORTHING	EASTING
8025	POB	400+00.00	158068.1667	1563740.1921
8027	PC	401+42.55	158065.4785	1563882.7143
8029	PT	403+97.75	158032.4104	1564135.2339
8031	PC	404+61.47	158017.1671	1564197.1038
8033	PT	406+34.12	157996.3723	1564368.0801
8035	PC	407+59.08	157996.3104	1564493.0395
8037	PT	409+93.40	158034.1863	1564723.2178
8039	POE	411+40.01	158081.2314	1564862.0713

HWY. 49 EXISTING

POINT NO.	TYPE	STATION	NORTHING	EASTING
8041	POB	500+00.00	157712.7088	1565076.4321
8043	POE	507+97.06	158401.3099	1564675.0168

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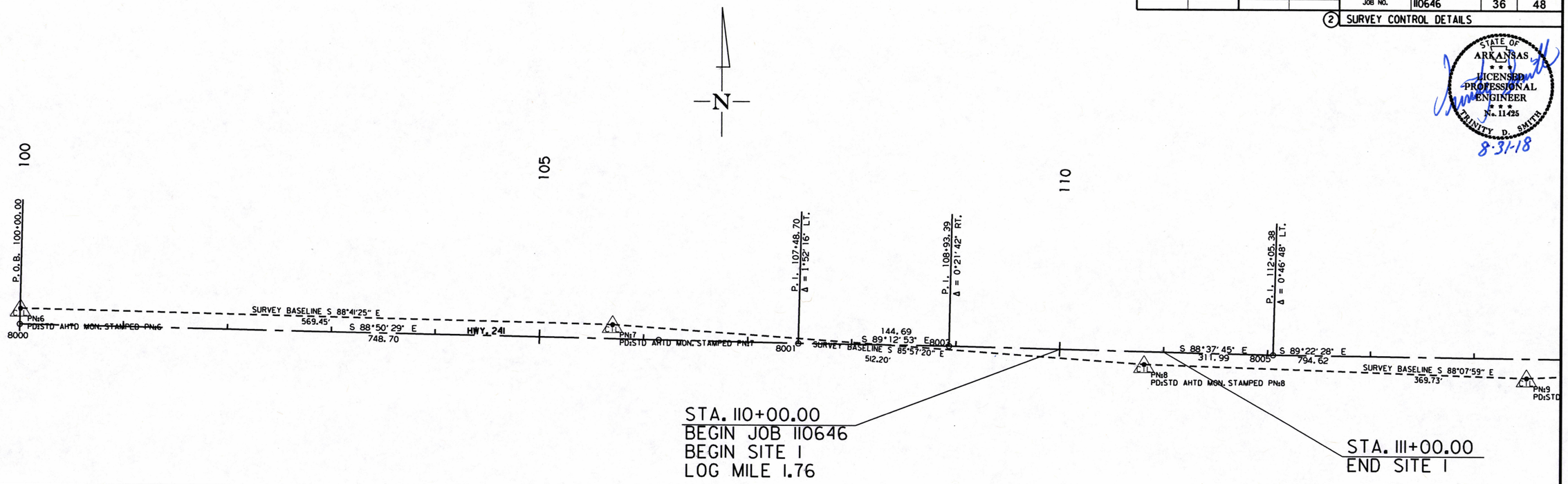
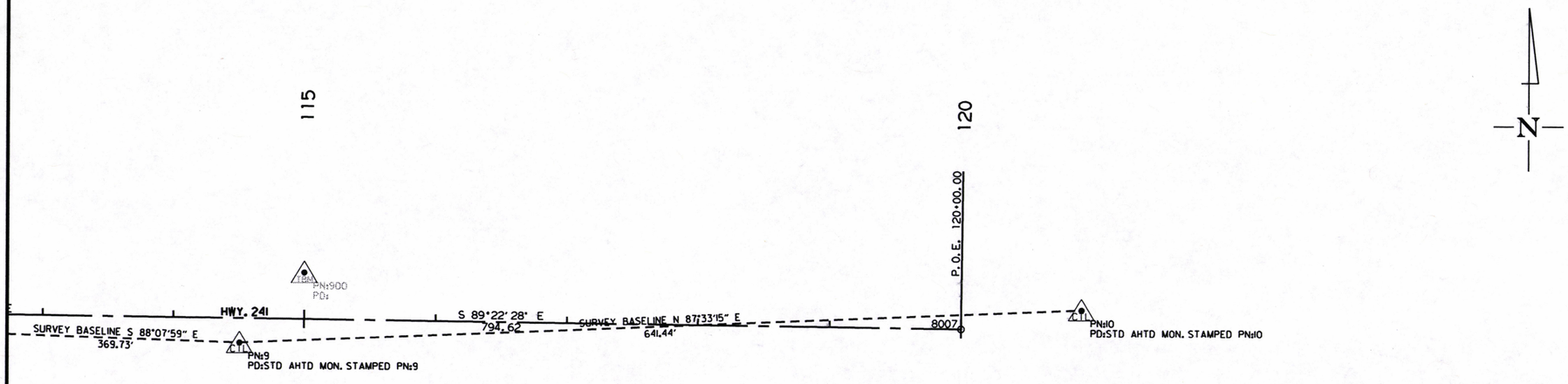
SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110646	36	48

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY P. SMITH
8-31-18





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SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110646	37	48

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-31-18

STA. 206+83.56
BEGIN SITE 2
LOG MILE 4.73

SITE 2 CONST.
P.I. = 206+53.08
Δ = 1°03'08" LT.
D = 0°15'00"
T = 210.45'
L = 420.88'
P.C. = 204+42.63
P.T. = 208+63.51
NO SUPERELEVATION

SITE 2 DETOUR
P.I. = 405+48.22
Δ = 13°48'44" LT.
D = 8°00'00"
T = 86.75'
L = 172.65'
P.C. = 404+61.47
P.T. = 406+34.12
e = 0.094 '/'
Ls = 275'

POB 200+00.00
200
PN:2
PD:STD AHTD MON. STAMPED PN:2
SURVEY BASELINE S 87°16'27" E 8009
868.84'
HWY. 241
POB 400+00.00
400
S 88°55'10" E 8011
8025 442.63
142.55
8027
PN:3
PD:STD AHTD MON. STAMPED PN:3
PC 204+42.63
PC401+42.55
205
PI 402+70.68
SURVEY BASELINE N 88°30'26" E
731.61'
8015
PC 404+61.47
PT 208+63.51
PT 406+34.12
210
S 89°58'18" E
272.70'
PG 407+59.08
PG 407+59.08
8029
S 76°09'34" E
63.72
8031
405
HWY. 241 DETOUR
8033
S 89°58'18" E
124.96

SITE 2 DETOUR
P.I. = 402+70.68
Δ = 12°45'36" RT.
D = 5°00'00"
T = 128.13'
L = 255.20'
P.C. = 401+42.55
P.T. = 403+97.75
NO SUPERELEVATION

PI 206+53.08
PT 403+97.75
PI 405+48.22

STA. 401+42.55 =
STA. 204+42.63 CL CONST.
BEGIN SITE 2 DETOUR

HWY. 241 - STA. 214+22.82 =
HWY. 241 DETOUR - STA. 411+40.01
Δ = 12°19'13"

HWY. 49 - STA. 504+26.41 =
HWY. 241 DETOUR - STA. 411+39.58
Δ = 78°28'38"

HWY. 241 - STA. 214+22.38 =
HWY. 49 - STA. 504+26.52
Δ = 66°09'25"

STA. 411+28.82 =
END SITE 2 DETOUR

SITE 2 DETOUR
P.I. = 408+77.30
Δ = 18°44'43" LT.
D = 8°00'00"
T = 118.22'
L = 234.32'
P.C. = 407+59.08
P.T. = 409+93.40
e = 0.094 '/'
Ls = 275'

SITE 2 CONST.
P.I. = 212+43.40
Δ = 6°25'30" LT.
D = 3°00'00"
T = 107.20'
L = 214.17'
P.C. = 211+36.20
P.T. = 213+50.37
e = 0.067 '/'
Ls = 300'

PC 211+36.20
PT 213+50.37
PT 409+93.40
POE 411+40.01
POE 214+22.82
505
PN:50
PD:USCS BM STAMPED 30DWB
72.45
N 83°36'14" E
8021
8023
8039
N 30°14'23" E
787.06
PN:5
PD:STD AHTD MON. STAMPED PN:5
210
S 89°58'18" E
272.70'
PG 407+59.08
PN:4
PD:STD AHTD MON. STAMPED PN:4
HWY. 241
SURVEY BASELINE S 86°23'18" E
387.93'
146.61
71°16'59" R
8037
8017
HWY. 241 DETOUR
S 89°58'18" E
124.96
8035
PI 212+43.40
PI 408+77.30
HWY. 49

STA. 214+10.81
END SITE 2
END JOB 110646

SITE 2 DETOUR
P.I. = 408+77.30
Δ = 18°44'43" LT.
D = 8°00'00"
T = 118.22'
L = 234.32'
P.C. = 407+59.08
P.T. = 409+93.40
e = 0.094 '/'
Ls = 275'

SITE 2 CONST.
P.I. = 212+43.40
Δ = 6°25'30" LT.
D = 3°00'00"
T = 107.20'
L = 214.17'
P.C. = 211+36.20
P.T. = 213+50.37
e = 0.067 '/'
Ls = 300'

PC 211+36.20
PT 213+50.37
PT 409+93.40
POE 411+40.01
POE 214+22.82
505
PN:50
PD:USCS BM STAMPED 30DWB
72.45
N 83°36'14" E
8021
8023
8039
N 30°14'23" E
787.06
PN:5
PD:STD AHTD MON. STAMPED PN:5
PI 212+43.40
PI 408+77.30
HWY. 241 DETOUR
HWY. 49
POB 500+00.00
500
8041
PG 507+97.06
507
8043

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SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110646	38	48

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-31-18

STA. 110+53 CONSTRUCT
QUINT. 8' X 4' X 48' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
Q25 = 500 CFS D.A. = 1.2 SQ. MI.
SPAN = 43'-8"
CHANNEL CHANGE = 400 CU. YDS.

STA. 109+52 43' LT.
IN PLACE PINE TREE
RETAIN

STA. 109+98 56' LT.
IN PLACE OAK TREE
RETAIN

+00 100' TRANSITION +00

+00 100' TRANSITION +00

105

110

115

CULTIVATED FIELD

CULTIVATED FIELD

CULTIVATED FIELD

CULTIVATED FIELD

N

P.I. 107+48.70 LT.
Δ = 1°52'16"

P.I. 108+93.39
Δ = 0°21'42" RT.

P.I. 112+05.38 LT.
Δ = 0°46'48"

CONST. LIMITS

PROPOSED ROW

EXIST. ROW

BELL TYTELEPHONE

WOOD POST INDEX

S 88°50'29" E

PN7
PD:STD ALTD MON. STAMPED PN7

200 CFS

S 89°12'53" E

10' HWY. 241 10'

10' S 88°37'45" E 10'

PN8
PD:STD ALTD MON. STAMPED PN8

EXIST. ROW

EXIST. ROW

PROPOSED ROW

CONST. LIMITS

RR SIGNAL BOX

PN:8550
PD:TBM 900

S 89°22'28" E

PN9
PD:STD ALTD MON. STAMPED PN9

ST. LOUIS SOUTHWESTERN RAILROAD

UNNAMED CREEK

STA. 110+00.00
BEGIN JOB 110646
BEGIN SITE 1
LOG MILE 1.76

STA. 110+30.39 - STA. 110+76.24 IN PLACE
BR. NO. M2509
46' X 28'-0" CLEAR ROADWAY WIDTH
REMOVAL OF EXISTING BRIDGE STRUCTURE
(SITE NO. 1)= 1.00 LUMP SUM

STA. 111+00.00
END SITE 1

REFER TO SURVEY CONTROL DETAIL SHEETS FOR HORIZONTAL AND VERTICAL CONTROL DATA.

HWY. 241 SITE 1

P.V.I. 110+00.00
ELEV. 184.04

P.V.I. 111+05.00
ELEV. 184.42

0.36%

+53

Q25 DESIGN HIGH WATER 182.02

F.L. OUTLET LT. = 176.70
F.L. INLET RT. = 177.00

RT. DT. GR. 0.00%

LT. DT. GR. 0.00%

110+00.00 RT. 177.00

110+00.00 LT. 176.70

111+00.00 LT. 176.70

111+00.00 RT. 177.00

NOTE:

FOR THE CONSTRUCTION OF TEMPORARY WORK RAMPS OR HAUL ROADS, THIS STREAM, STA. 110+30 TO STA. 110+75, IS CLASSIFIED AS AN INTERMITTENT STREAM. THE TOP OF CHANNEL ELEVATION IS 184 FT. MSL. REFER TO SECTION 110.06(c) OF THE 2014 STANDARD SPECIFICATIONS.

200 195 190 185 180 175 170 165 160 155

103+00 104+00 105+00 106+00 107+00 108+00 109+00 110+00 111+00 112+00 113+00 114+00 115+00 116+00 117+00 118+00

5/15/2018

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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.		110646	39	48

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
TRINITY D. SMITH
No. 11425
8-31-18

+83.56 100' +83.56 TRANSITION

STA. 210+25.60 - STA. 210+71.34 IN PLACE
BR. NO. M251
46' X 28'-0" CLEAR ROADWAY WIDTH
REMOVAL OF EXISTING BRIDGE STRUCTURE
(SITE NO. 2) - LOO LUMP SUM

SITE 2 CONST.
P.I. = 212+43.40
Δ = 6°25'30" LT.
D = 3°00'00"
T = 107.20'
L = 214.17'
P.C. = 211+36.20
P.T. = 213+50.37
e = 0.067 '/'
Ls = 300'

SITE 2 CONST.
P.I. = 206+53.08
Δ = 1°03'08" LT.
D = 0°15'00"
T = 210.45'
L = 420.88'
P.C. = 204+42.63
P.T. = 208+63.51
NO SUPERELEVATION

STA. 210+48 CONSTRUCT
QUINT. 10' x 5' x 48' R.C. BOX CULVERT
W/3:1 WINGS LT. & RT.
Q25 = 1260 CFS, D.A. = 20.5 SQ. MI.
SPAN = 53'-8"
CHANNEL CHANGE = 200 CU. YDS.

HWY. 241 - STA. 214+22.38 =
HWY. 49 - STA. 504+26.52
Δ = 66°09'25"

STA. 205+66 IN PLACE
24" X 26' C.M.
PIPE CULVERT RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 36' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 40 CU. YDS.

STA. 206+83.56
BEGIN SITE 2
LOG MILE 4.73

STA. 207+38 IN PLACE
24" X 45' C.M.
PIPE CULVERT RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 46' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 55 CU. YDS.

STA. 214+10.77
END SITE 2
END JOB 110646

+10.77 100' +10.77 TRANSITION

REFER TO SURVEY CONTROL DETAIL SHEETS FOR HORIZONTAL AND VERTICAL CONTROL DATA.

HWY. 241 SITE 2

STA. 211+17.91 BEGIN SUPERELEVATION
STA. 212+43.28 MAX SUPERELEVATION (0.028'/')
STA. 212+43.29 MAX SUPERELEVATION (0.028'/')
STA. 213+68.66 END SUPERELEVATION

FLOODPLAIN LIMITS
STA. 206+30 TO 213+50

P.V.I. 206+83.56 ELEV. 183.93
P.V.C. 207+84.01 ELEV. 183.93
K=120.97 VC=75' e=0.06'
P.V.T. 208+59.01 ELEV. 184.17
P.V.C. 210+09.65 ELEV. 185.10
P.V.I. 210+49.65 ELEV. 185.35
K=115.94 VC=80' e=-0.07'
P.V.C. 211+70.35 ELEV. 185.26
K=124.35 VC=240' e=0.58'

0.00% 0.62% -0.07% 1.85%

207+03.56 RT. 180.00
P.V.I. 208+81.51 ELEV. 183.93
RT. DITCH GRADE -1.35%
209+99.00 RT. 176.00
209+99.00 LT. 176.20
RT. DITCH GRADE 0.00%
LT. DITCH GRADE 0.00%
210+89.65 ELEV. 185.32
210+98.00 RT. 176.00
210+98.00 LT. 176.20
+48
Q25 DESIGN HIGH WATER 183.01
P.V.I. 212+90.35 ELEV. 185.18
P.V.T. 214+10.35 ELEV. 187.41
P.V.I. 214+10.77 ELEV. 187.41

F.L. INLET LT. = 176.20
F.L. OUTLET RT. = 176.00

HWY. 241 - STA. 214+10.77 =
HWY. 49 12.0' LT OFFSET -
STA. 504+31.23
ELEV. = 187.41

NOTE:

FOR THE CONSTRUCTION OF TEMPORARY WORK RAMPS OR HAUL ROADS, THIS STREAM, AT STA. 210+20 TO 210+70 IS CLASSIFIED AS A PERENNIAL STREAM. THE TOP OF CHANNEL ELEVATION IS 183.00 FT. MSL. REFER TO SECTION 110.06(c) OF THE 2014 STANDARD SPECIFICATIONS.

200 195 190 185 180 175 170 165 160 155

203+00 204+00 205+00 206+00 207+00 208+00 209+00 210+00 211+00 212+00 213+00 214+00 215+00 216+00 217+00 218+00

5/15/2018

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				6	ARK.			
				JOB NO.		110646	40	48

(2) DETOUR PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-31-18

SITE 2 DETOUR
P.I. = 405+48.22
Δ = 13°48'44" LT.
D = 8°00'00"
T = 86.75'
L = 172.65'
P.C. = 404+61.47
P.T. = 406+34.12
e = 0.094 '/'
Ls = 275'

SITE 2 DETOUR
P.I. = 408+77.30
Δ = 18°44'43" LT.
D = 8°00'00"
T = 118.22'
L = 234.32'
P.C. = 407+59.08
P.T. = 409+93.40
e = 0.094 '/'
Ls = 275'

HWY. 241 - STA. 214+22.82 =
HWY. 241 DETOUR - STA. 411+40.01
Δ = 12°19'13"

HWY. 49 - STA. 504+26.41 =
HWY. 241 DETOUR - STA. 411+39.58
Δ = 78°28'38"

HWY. 241 - STA. 214+22.38 =
HWY. 49 - STA. 504+26.52
Δ = 66°09'25"

SITE 2 DETOUR
P.I. = 402+70.68
Δ = 12°45'36" RT.
D = 5°00'00"
T = 128.13'
L = 255.20'
P.C. = 401+42.55
P.T. = 403+97.75
NO SUPERELEVATION

STA. 401+42.55 =
STA. 204+42.63 CL CONST.
BEGIN SITE 2 DETOUR

STA. 411+28.82 =
END SITE 2 DETOUR

HWY. 241 SITE 2 DETOUR

REFER TO SURVEY CONTROL DETAIL SHEETS FOR HORIZONTAL AND VERTICAL CONTROL DATA.

STA. 205+66 INSTALL
24" X 36' TEMP. PIPE CULVERT

STA. 207+38 INSTALL
24" X 44' TEMP. PIPE CULVERT

STA. 407+68 INSTALL
SEXT. 60" X 47' TEMP. PIPE CULVERT
60" TEMPORARY PIPE CULVERT = 282 LIN. FT.
Q2 = 630 CFS, D.A. = 20.5 SQ. MI.
CHANNEL CHANGE = 73 CU. YDS.

STA. 404+29.61 BEGIN SUPERELEVATION
STA. 405+47.80 MAX SUPERELEVATION (0.048'/')
STA. 409+05.09 MAX SUPERELEVATION (0.048'/')
STA. 410+45.52 END SUPERELEVATION

P.V.I. 401+41.94 ELEV. 184.69
0.00%
P.V.C. 401+85.00 ELEV. 184.69
P.V.I. 402+35.00 ELEV. 184.69
K=85.47 VC=100' e=-0.15'
P.V.C. 402+89.77 ELEV. 184.05
-1.17%
P.V.T. 402+85.00 ELEV. 184.11
P.V.I. 403+44.77 ELEV. 183.41
K=81.48 VC=110' e=0.19'
403+44.77 179.65
P.V.T. 403+99.77 ELEV. 183.51
0.18%
RT. DITCH GRADE -0.90%
+87 F.L. INLET=176.60 F.L. OUTLET=176.00
407+51.00 RT. 176.00
407+96.00 RT. 176.00
RT. DITCH GRADE 0.00%
RT. DITCH GRADE 2.14%
P.V.C. 408+94.55 ELEV. 184.40
409+34.96 178.98
K=90.66 VC=165' e=0.38'
P.V.I. 409+77.05 ELEV. 184.55
P.V.T. 410+59.55 ELEV. 186.20
2.00%
P.T. 411+28.83 ELEV. 187.59

NOTE:

FOR THE CONSTRUCTION OF TEMPORARY WORK RAMPS OR HAUL ROADS, THIS STREAM, AT STA. 210+20 TO 210+70 IS CLASSIFIED AS A PERENNIAL STREAM. THE TOP OF CHANNEL ELEVATION IS 183.00 FT. MSL. REFER TO SECTION 110.06(c) OF THE 2014 STANDARD SPECIFICATIONS.

200 195 190 185 180 175 170 165 160 155

400+00 401+00 402+00 403+00 404+00 405+00 406+00 407+00 408+00 409+00 410+00 411+00 412+00 413+00 414+00 415+00

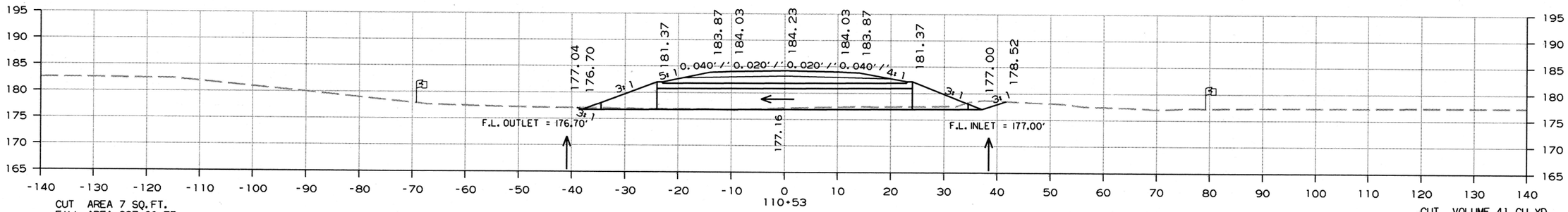
5/15/2018

R110646.DGN

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.		110646	41	48

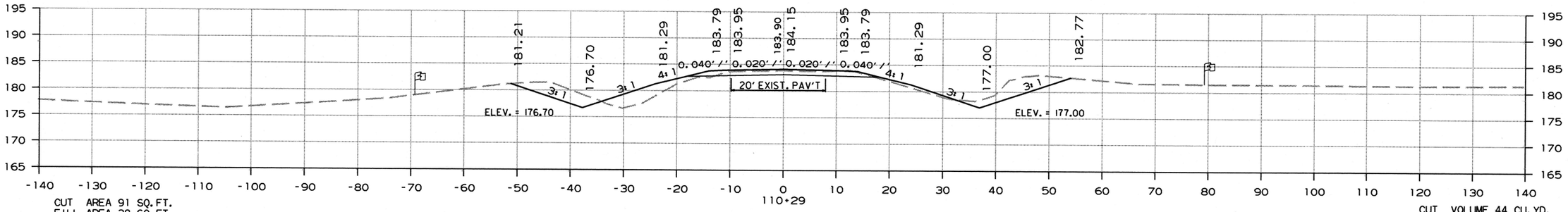
(2) CROSS SECTIONS

STA. 110+53 CONSTRUCT
QUINT. 8' x 4' x 48' R.C. BOX CULVERT
W/3:1 WINGS LT. & RT.
Q25 = 500 CFS., D.A. = 1.20 SQ. MI.
SPAN = 43'-8"
CHANNEL CHANGE = 400 CU. YDS.



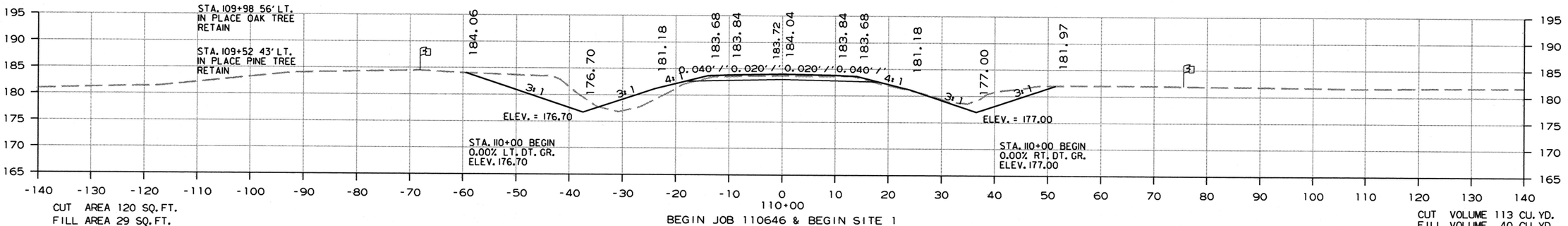
CUT AREA 7 SQ. FT.
FILL AREA 337 SQ. FT.

CUT VOLUME 41 CU. YD.
FILL VOLUME 41 CU. YD.



CUT AREA 91 SQ. FT.
FILL AREA 38 SQ. FT.

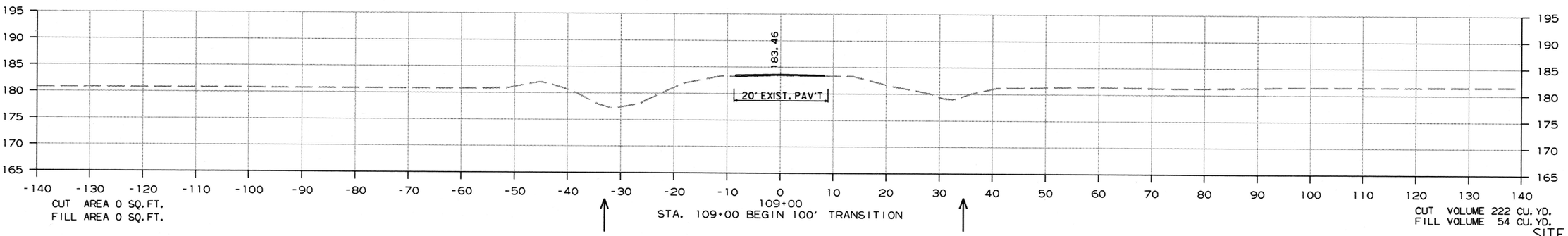
CUT VOLUME 44 CU. YD.
FILL VOLUME 43 CU. YD.



CUT AREA 120 SQ. FT.
FILL AREA 29 SQ. FT.

CUT VOLUME 113 CU. YD.
FILL VOLUME 40 CU. YD.

BEGIN JOB 110646 & BEGIN SITE 1
END 100' TRANSITION



CUT AREA 0 SQ. FT.
FILL AREA 0 SQ. FT.

CUT VOLUME 222 CU. YD.
FILL VOLUME 54 CU. YD.

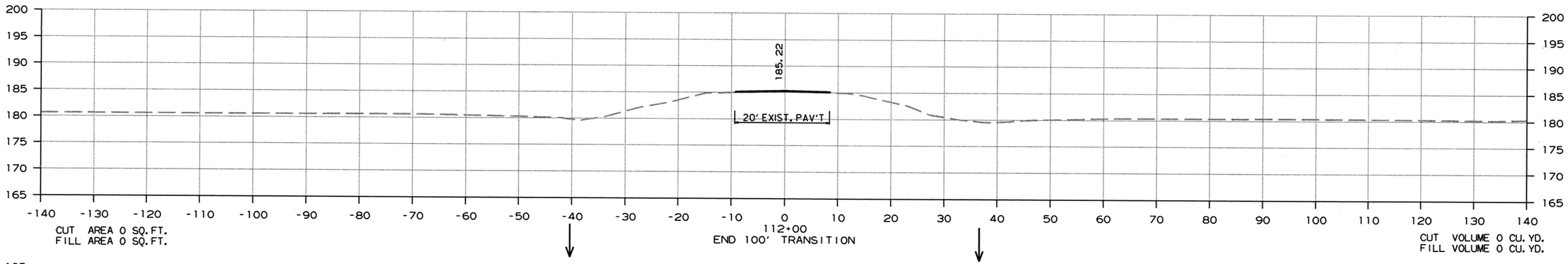
SITE 1
CROSS SECTION STA. 110+00 TO STA. 110+53

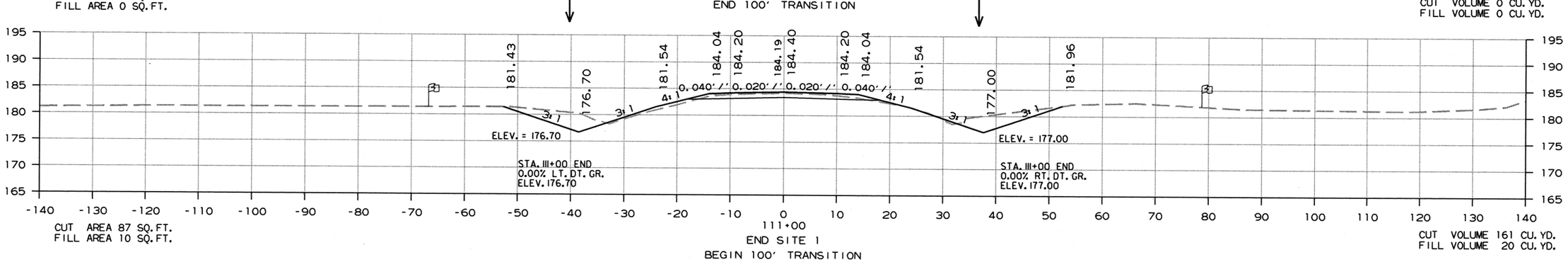
8/29/2018

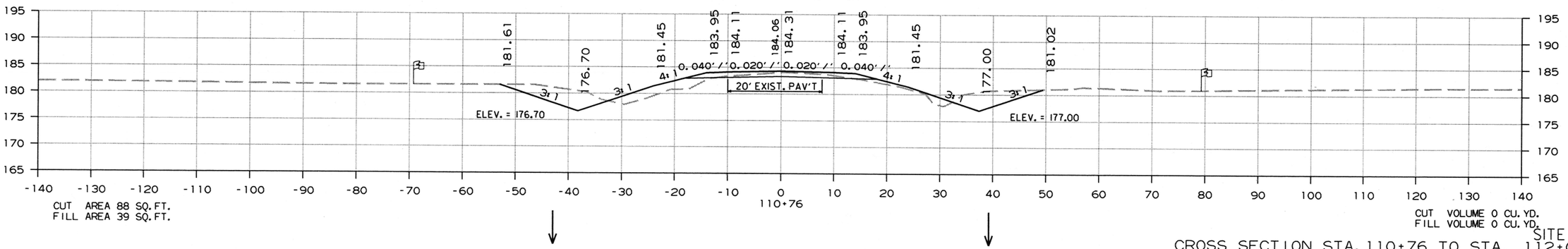
R110646.DGN

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.		110646	42	48

(2) CROSS SECTIONS







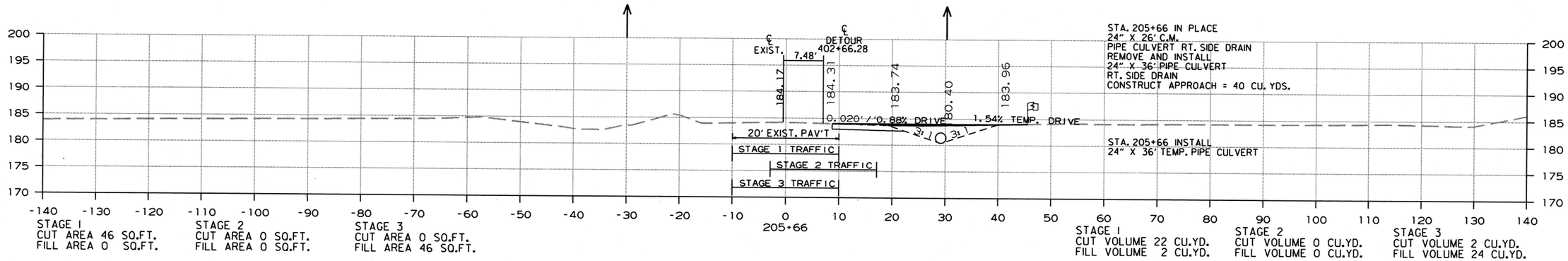
SITE 1
CROSS SECTION STA. 110+76 TO STA. 112+00

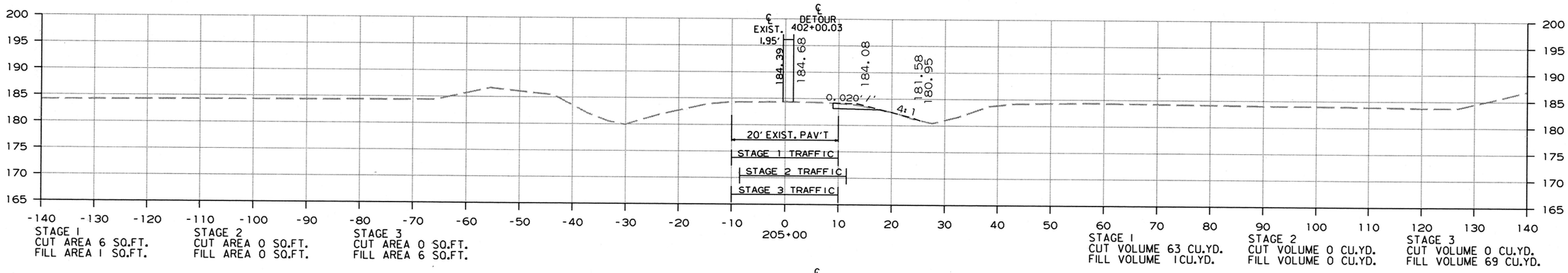
8/29/2018

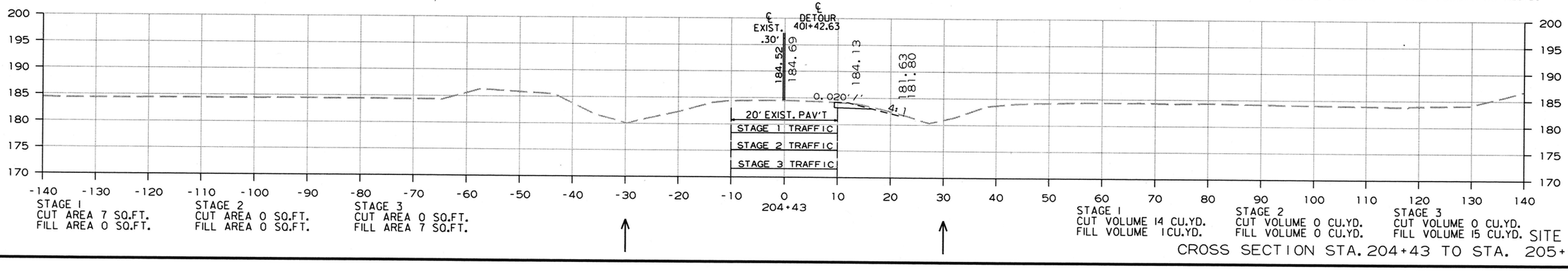
R110646.DGN

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.		110646	43	48

(2) CROSS SECTIONS







CROSS SECTION STA. 204+43 TO STA. 205+66

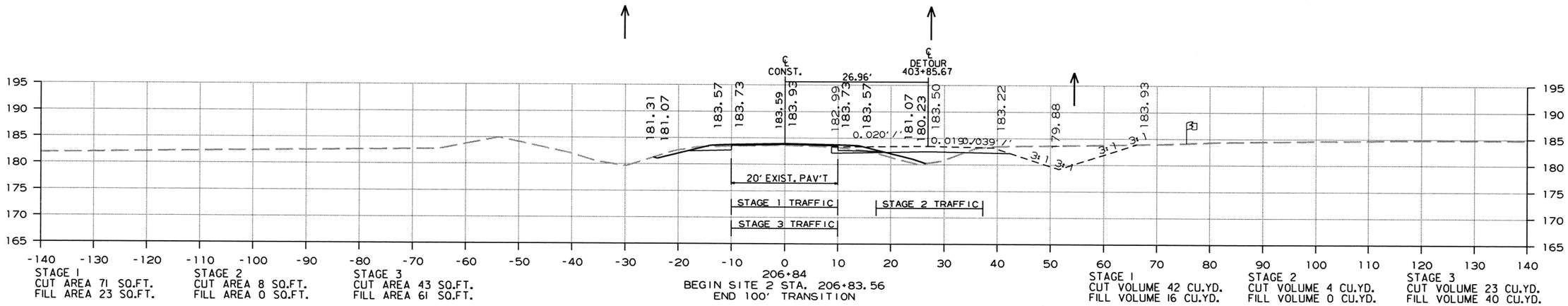
SITE 2

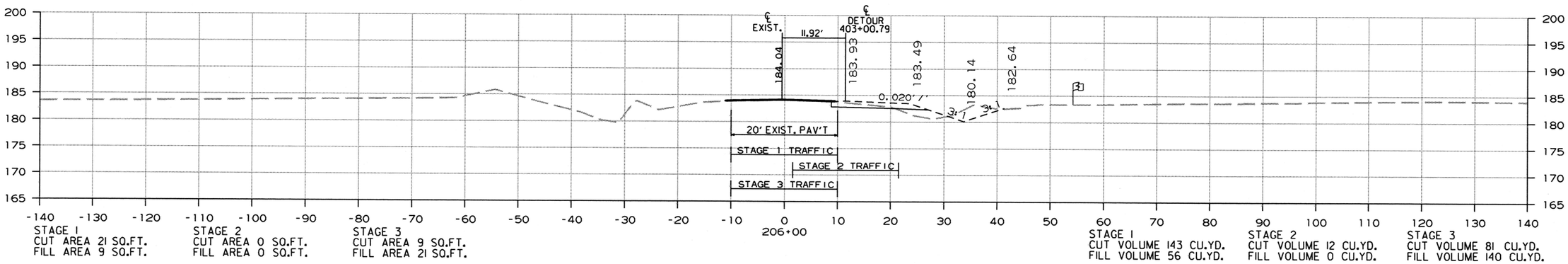
8/29/2018

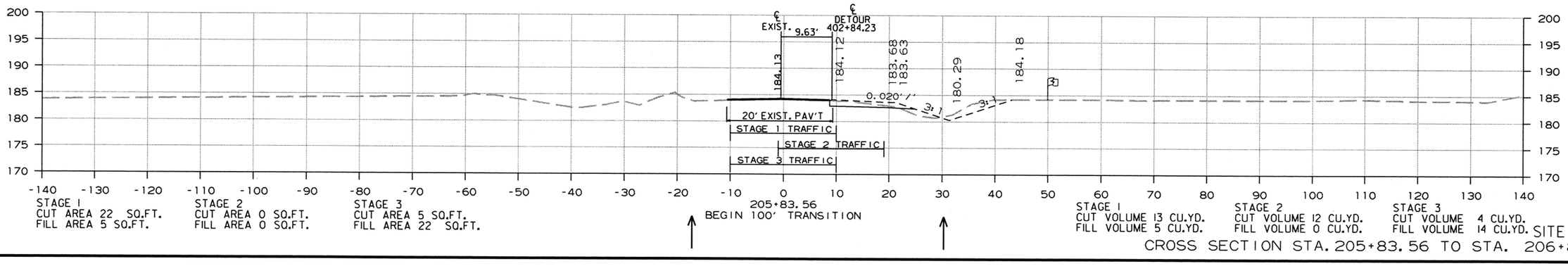
R110646.DGN

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.		110646	44	48

(2) CROSS SECTIONS







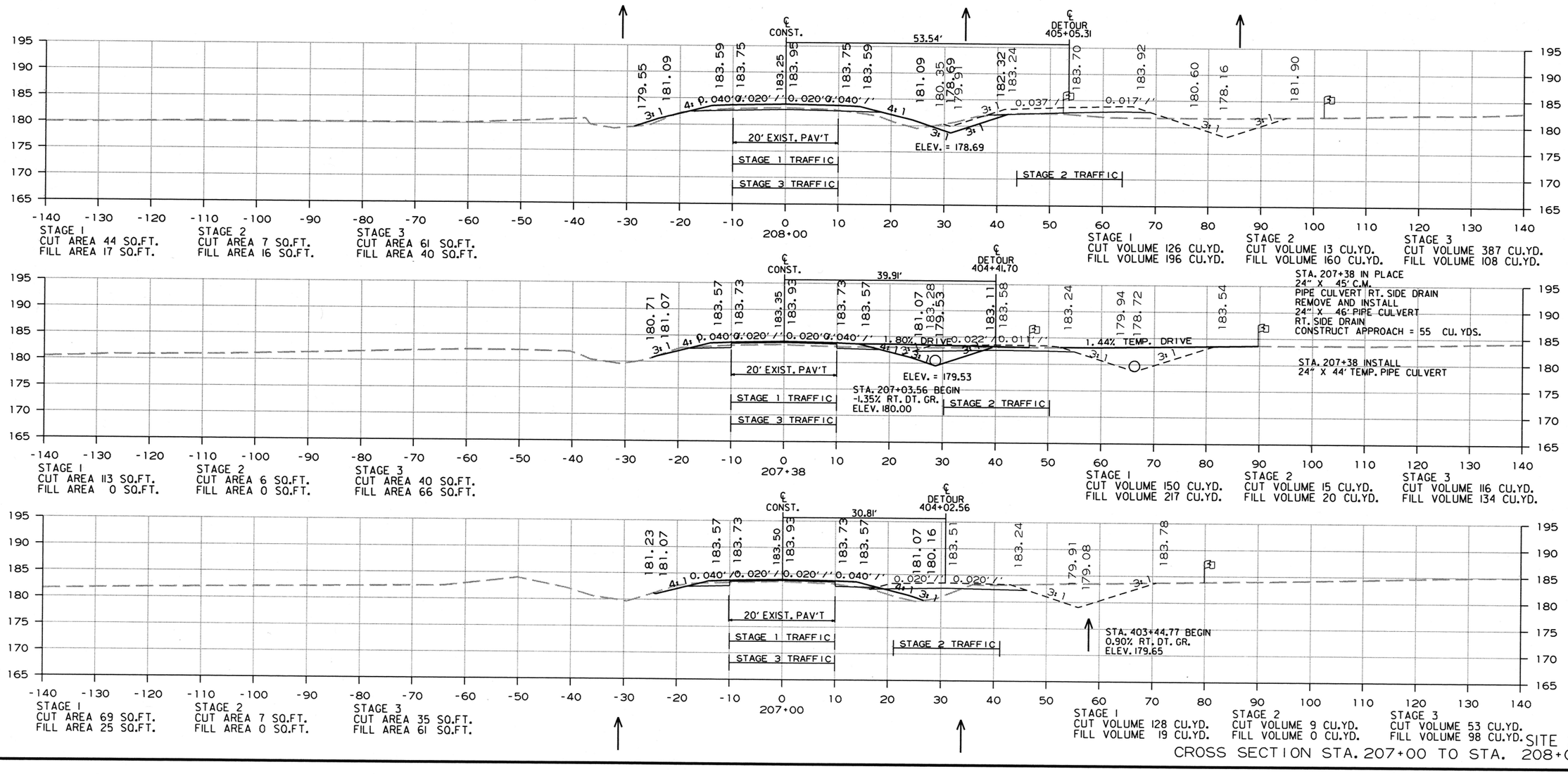
SITE 2
CROSS SECTION STA. 205+83.56 TO STA. 206+84

8/29/2018

R110646.DGN

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.		110646	45	48

(2) CROSS SECTIONS



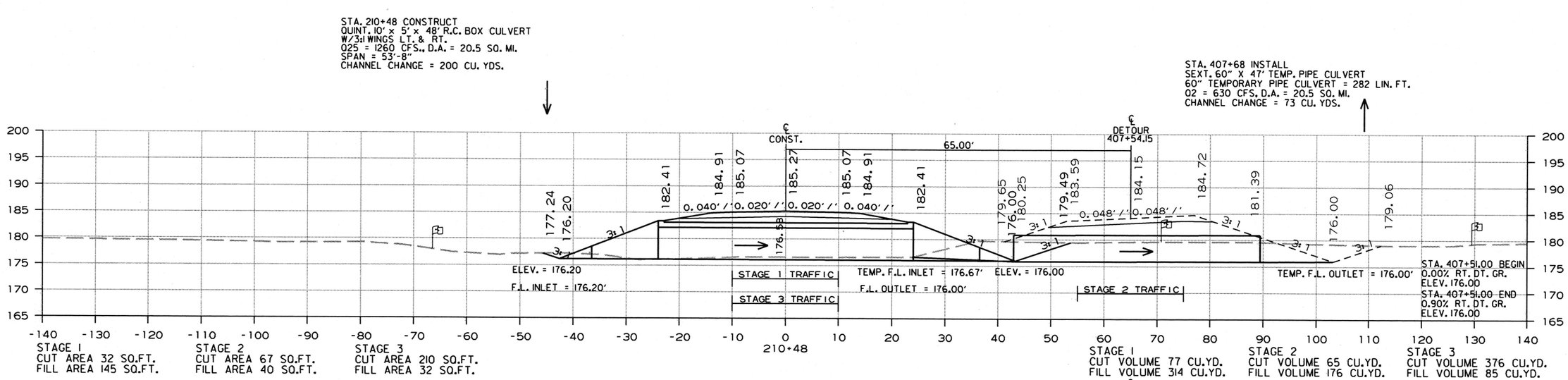
SITE 2
CROSS SECTION STA. 207+00 TO STA. 208+00

8/29/2018

R110646.DGN

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.		110646	46	48

(2) CROSS SECTIONS



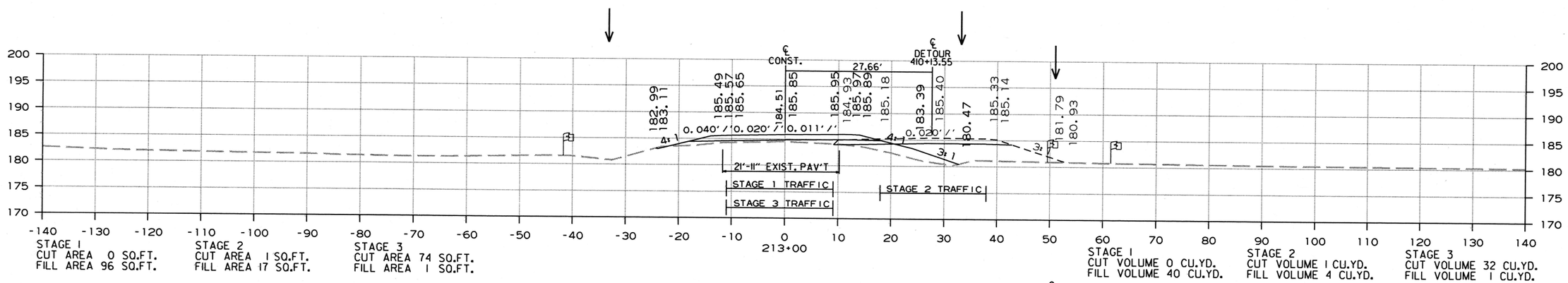
SITE 2
CROSS SECTION STA. 209+00 TO STA. 210+48

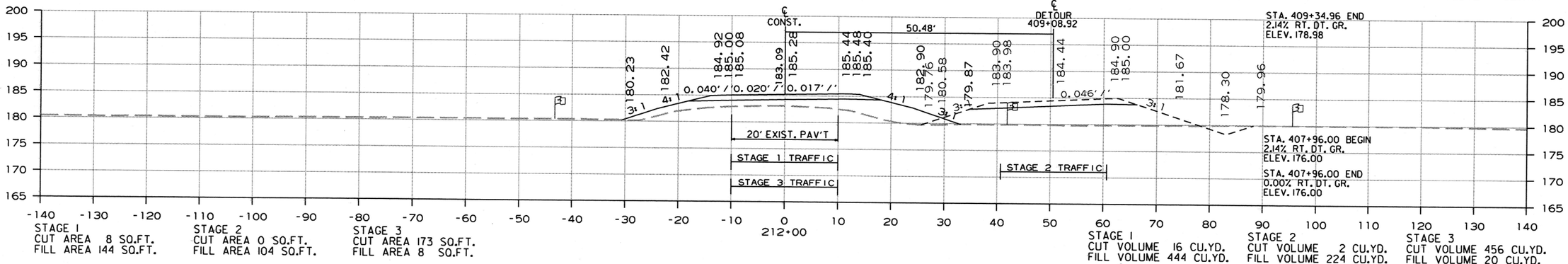
8/29/2018

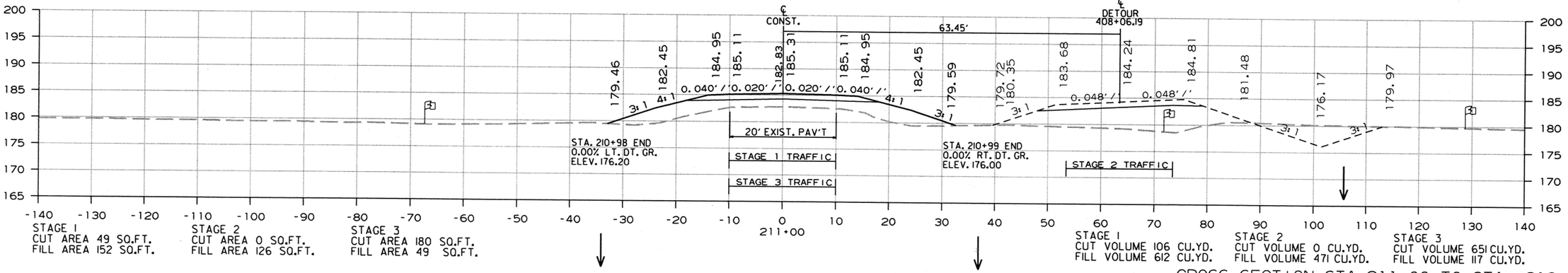
R110646.DGN

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.		110646	47	48

(2) CROSS SECTIONS







CROSS SECTION STA. 211+00 TO STA. 213+00

8/29/2018

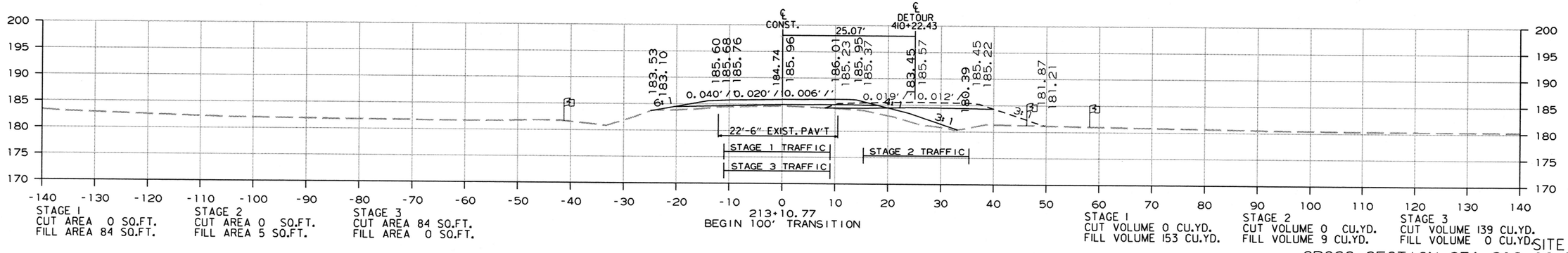
R110646.DGN

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.		110646	48	48

(2) CROSS SECTIONS

STA. 214+10.77 END 100' TRANSITION
END SITE 2 &
END JOB 110646



STAGE 1
CUT AREA 0 SQ.FT.
FILL AREA 84 SQ.FT.

STAGE 2
CUT AREA 0 SQ.FT.
FILL AREA 5 SQ.FT.

STAGE 3
CUT AREA 84 SQ.FT.
FILL AREA 0 SQ.FT.

213+10.77
BEGIN 100' TRANSITION

STAGE 1
CUT VOLUME 0 CU.YD.
FILL VOLUME 153 CU.YD.

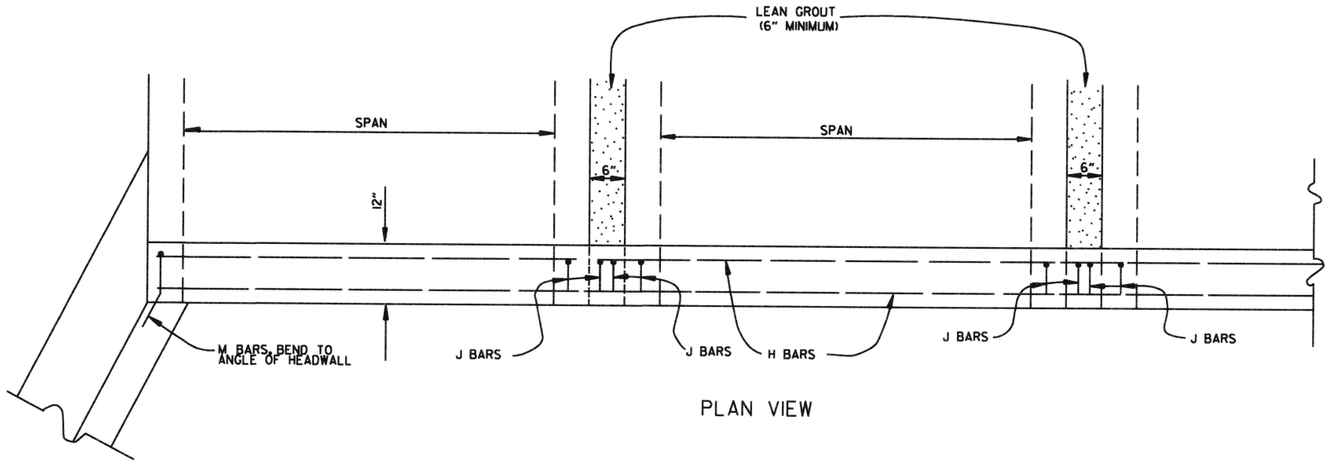
STAGE 2
CUT VOLUME 0 CU.YD.
FILL VOLUME 9 CU.YD.

STAGE 3
CUT VOLUME 139 CU.YD.
FILL VOLUME 0 CU.YD.

SITE 2
CROSS SECTION STA. 213+10.77

8/29/2018

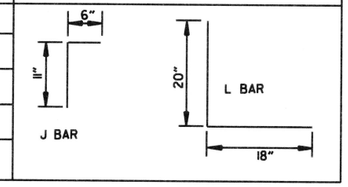
R110646.DGN



PLAN VIEW

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 ¾" 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.

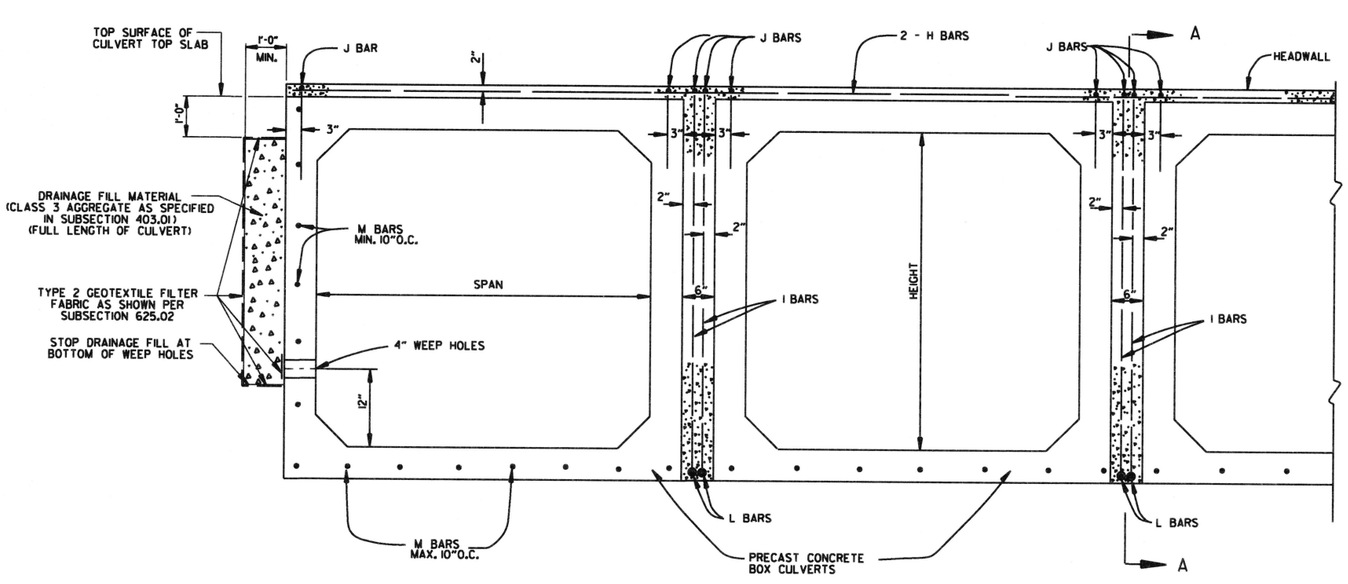
THE MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERNAL JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE CULVERT.

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.

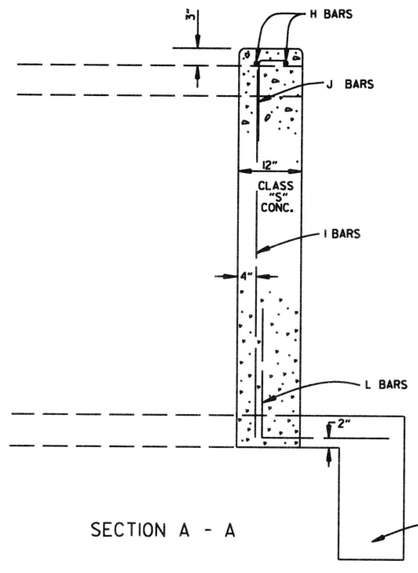
DRAINAGE FILL MATERIAL WITH GEOTEXTILE FABRIC IS REQUIRED AT THE EXTERIOR WALLS OF THE ASSEMBLED CULVERT, SEE DETAILS ON THIS DRAWING.

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.



END VIEW



SECTION A - A

DATE	REVISION	DATE FILMED
1-28-15	REVISED GEOTEXTILE FABRIC PLACEMENT	
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	

ARKANSAS STATE HIGHWAY COMMISSION

PRECAST CONCRETE BOX CULVERTS

STANDARD DRAWING PBC-1

REINFORCED CONCRETE ARCH PIPE DIMENSIONS

EQUIV. DIA.	SPAN		RISE	
	AASHTO M 206	AHTD NOMINAL	AASHTO M 206	AHTD NOMINAL
INCHES	INCHES			
15	18	18	11	11
18	22	22	13½	14
21	26	26	15½	16
24	28½	29	18	18
30	36¼	36	22½	23
36	43⅜	44	26⅝	27
42	51⅛	51	31 5/16	31
48	58½	59	36	36
54	65	65	40	40
60	73	73	45	45
72	88	88	54	54
84	102	102	62	62
90	115	115	72	72
96	122	122	77½	77
108	138	138	87⅛	87
120	154	154	96⅞	97
132	168¾	169	106½	107

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

REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE DIMENSIONS

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

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

CONSTRUCTION SEQUENCE

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

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

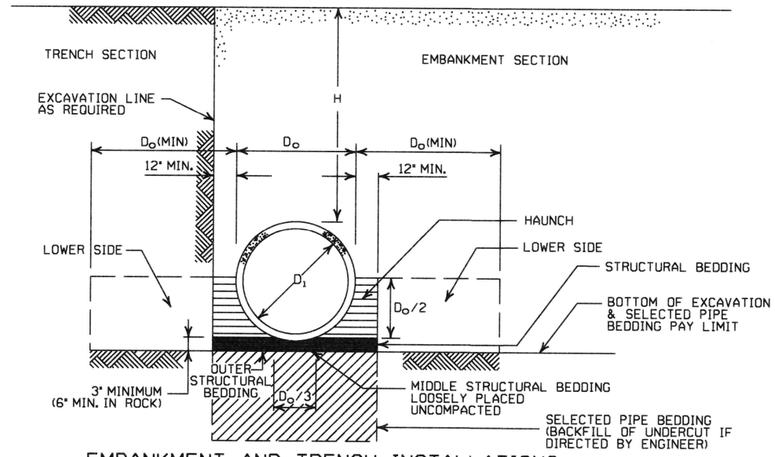
- LEGEND -

D_i = NORMAL INSIDE DIAMETER OF PIPE
D_o = OUTSIDE DIAMETER OF PIPE
H = FILL COVER HEIGHT OVER PIPE (FEET)
MIN. = MINIMUM
▨ = UNDISTURBED SOIL

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

* SM-3 WILL NOT BE ALLOWED.

** MATERIALS SHALL NOT INCLUDE ORGANIC MATERIALS OR STONES LARGER THAN 3 INCHES.



EMBANKMENT AND TRENCH INSTALLATIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

GENERAL NOTES

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

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

ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCC-1

CORRUGATED STEEL PIPE (ROUND)

PIPE DIAMETER (INCHES)	① MINUMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET)	MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS (INCHES)				
		0.064	0.079	0.109	0.138	0.168
2⅔ INCH BY ½ INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM						
12	1	84	91			
15	1	67	73			
18	1	56	61			
24	1	42	46	59		
30	2	34	36	47		
36	2		30	39	41	
42	2		43	67	70	73
48	2		37	58	61	64
② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, BOLTED, OR HELICAL LOCK-SEAM						
36	1	48	60	88	111	118
42	1	41	51	72	90	102
48	1	36	45	64	77	85
54	2	32	40	59	71	79
60	2	29	36	53	64	71
66	2	26	33	47	58	64
72	2	24	30	44	53	59
78	2		28	41	49	54
84	2		26	38	45	51
90	2		24	35	43	45
96	2		22	33	40	44
102	2			31	38	42
108	2			30	35	39
114	2			28	34	37
120	2			27	32	35

CORRUGATED ALUMINUM PIPE (ROUND)

PIPE DIAMETER (INCHES)	① MINUMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET)	MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS IN INCHES				
		0.060	0.075	0.105	0.135	0.164
		2⅔ INCH BY ½ INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM				
12	1	45	45			
18	2	30	30	52		
24	2	22	22	39	41	
30	2		18	31	32	34
36	2.5		15	26	27	28
42	2			43	43	44
48	2			40	41	43
54	2			35	37	38
60	2				33	34
66	2					31
72	2					29

CONSTRUCTION SEQUENCE

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

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

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

③ SM-3 WILL NOT BE ALLOWED.

EQUIVALENT METAL THICKNESSES AND GAUGES

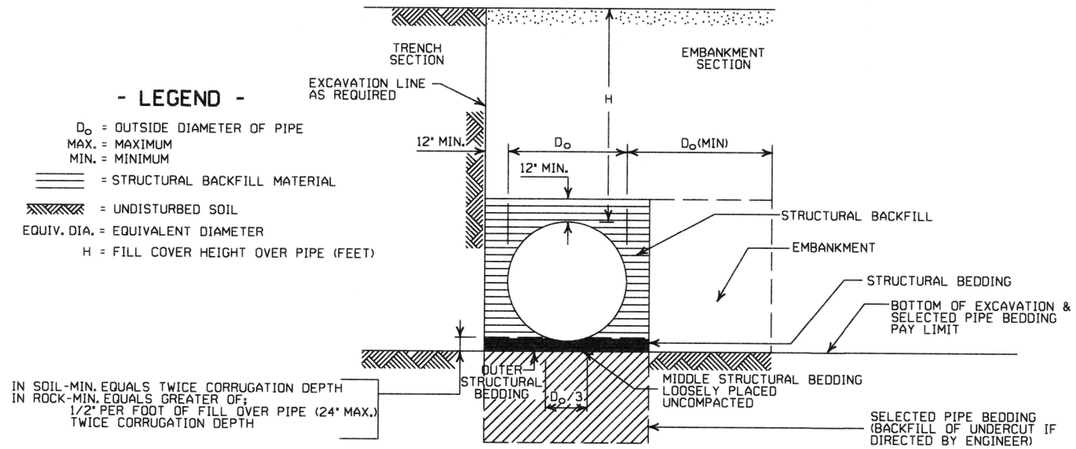
METAL THICKNESS IN INCHES			GAUGE NUMBER
STEEL			
ZINC COATED	UNCOATED	ALUMINUM	
0.064	0.0598	0.060	16
0.079	0.0747	0.075	14
0.109	0.1046	0.105	12
0.138	0.1345	0.135	10
0.168	0.1644	0.164	8

CORRUGATED METAL PIPE ARCHES

EQUIV. DIA. (INCHES)	PIPE DIMENSION SPAN X RISE (INCHES)	MINUMUM CORNER RADIUS (INCHES)	STEEL					ALUMINUM				
			MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.)		MAX. HEIGHT OF FILL, "H" (FT.)		MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.)		MAX. HEIGHT OF FILL, "H" (FT.)	
				INSTALLATION		INSTALLATION			INSTALLATION		INSTALLATION	
				TYPE 1		TYPE 1			TYPE 1		TYPE 1	
			2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM					2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM				
15	17x13	3	0.064	2		15		0.060	2		15	
18	21x15	3	0.064	2		15		0.060	2		15	
21	24x18	3	0.064	2.25		15		0.060	2.25		15	
24	28x20	3	0.064	2.5		15		0.075	2.5		15	
30	35x24	3	0.079	3		12		0.075	3		12	
36	42x29	3½	0.079	3		12		0.105	3		12	
42	49x33	4	0.079	3		12		0.105	3		12	
48	57x38	5	0.109	3		13		0.135	3		13	
54	64x43	6	0.109	3		14		0.135	3		14	
60	71x47	7	0.138	3		15		0.164	3		15	
66	77x52	8	0.168	3		15						
72	83x57	9	0.168	3		15						
			② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM									
				INSTALLATION		INSTALLATION						
				TYPE 2	TYPE 1	TYPE 2	TYPE 1					
36	40x31	5	0.079	3	2	12	15					
42	46x36	6	0.079	3	2	13	15					
48	53x41	7	0.079	3	2	13	15					
54	60x46	8	0.079	3	2	13	15					
60	66x51	9	0.079	3	2	13	15					
66	73x55	12	0.079	3	2	15	15					
72	81x59	14	0.079	3	2	15	15					
78	87x63	14	0.079	3	2	15	15					
84	95x67	16	0.109	3	2	15	15					
90	103x71	16	0.109	3	2	15	15					
96	112x75	18	0.109	3	2	15	15					
102	117x79	18	0.109	3	2	15	15					
108	128x83	18	0.138	3	2	15	15					

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

② WHERE THE STANDARD 2 2/3"x ½" CORRUGATION AND GAUGE IS SPECIFIED FOR A GIVEN DIAMETER, A PIPE OF THE SAME DIAMETER WITH A 3" x 1" OR 5" x 1" CORRUGATION MAY BE SUBSTITUTED, PROVIDING IT IS GAUGED FOR A FILL HEIGHT CONDITION EQUAL TO OR GREATER THAN THE MAXIMUM FILL HEIGHT CONDITION FOR THE SPECIFIED GAUGE AND CORRUGATION.



EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.
2. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE (ROUND).
3. INSTALALTION TYPE 1 SHALL BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 2⅔" X ½" CORRUGATION.
4. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 3" X 1" OR 5" X 1" CORRUGATION.

GENERAL NOTES

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

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

ARKANSAS STATE HIGHWAY COMMISSION

METAL PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCM-1

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

• AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.

SM3 WILL NOT BE ALLOWED.

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

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

MULTIPLE INSTALLATION OF HIGH DENSITY POLYETHYLENE PIPES

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

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

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

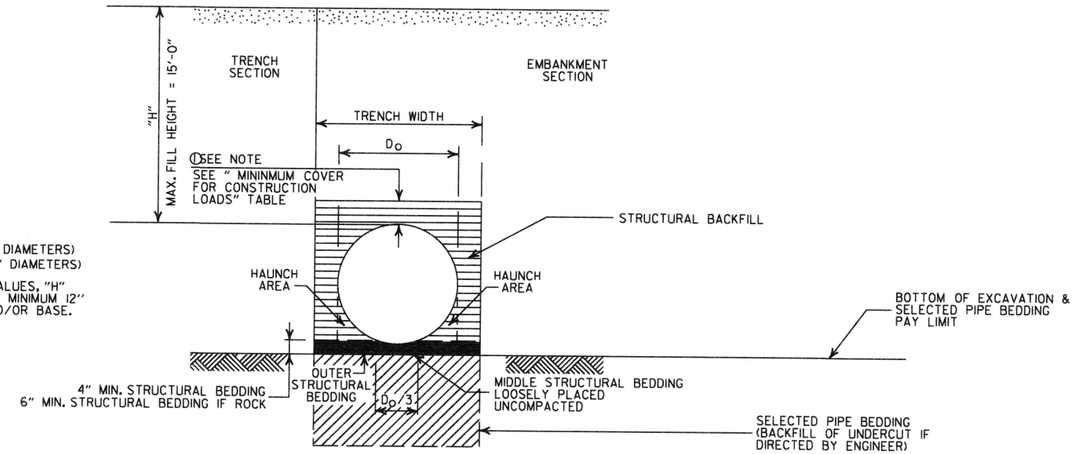
①NOTE:
18" MIN. (18" - 30" DIAMETERS)
24" MIN. (36" - 48" DIAMETERS)

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

MINIMUM COVER FOR CONSTRUCTION LOADS

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

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



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

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

CONSTRUCTION SEQUENCE

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

GENERAL NOTES

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

- LEGEND -

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

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

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

ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)

STANDARD DRAWING PCP-1

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

• AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.

SM3 WILL NOT BE ALLOWED.

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

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

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

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

MULTIPLE INSTALLATION OF PVC PIPES

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

MAXIMUM FILL HEIGHT BASED ON STRUCTURAL BACKFILL

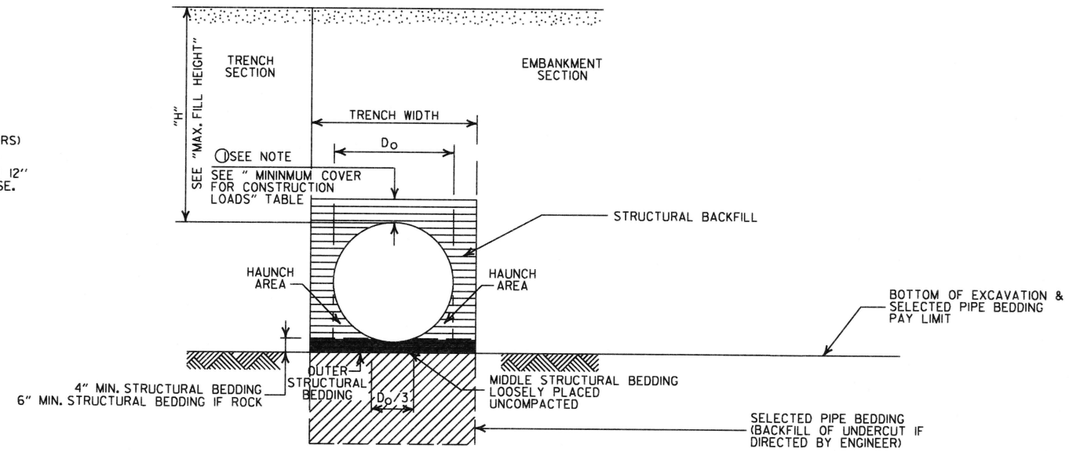
PIPE DIAMETER	"H"
18"	45'-0"
24"	45'-0"
30"	40'-0"
36"	40'-0"

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

MINIMUM COVER FOR CONSTRUCTION LOADS

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

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



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

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

CONSTRUCTION SEQUENCE

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

GENERAL NOTES

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

- LEGEND -

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

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

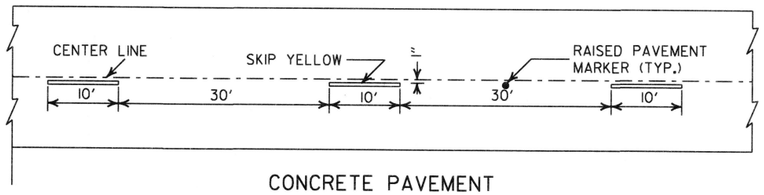
DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REV GENERAL NOTES & MINIMUM COVER NOTE; DELETED SM3 MATERIAL	
11-17-10	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

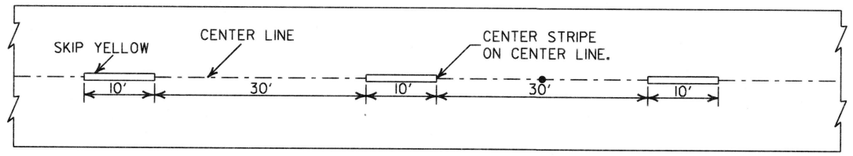
PLASTIC PIPE CULVERT (PVC F949)

STANDARD DRAWING PCP-2

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

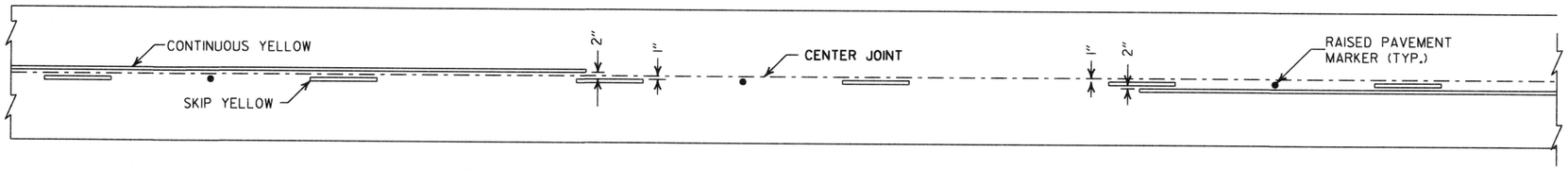


CONCRETE PAVEMENT

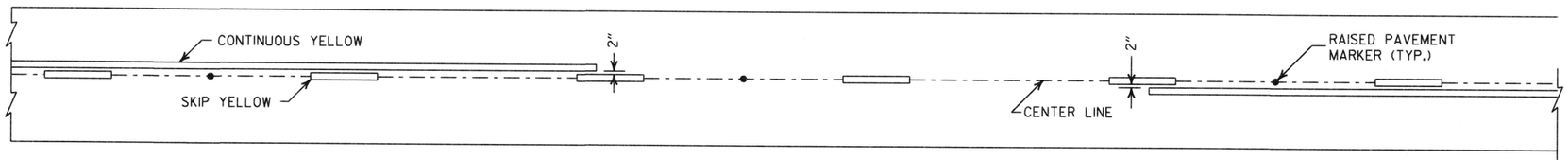


ASPHALT PAVEMENT

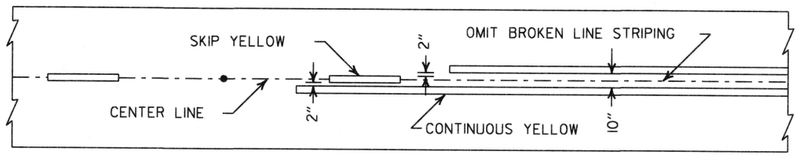
BROKEN LINE STRIPING



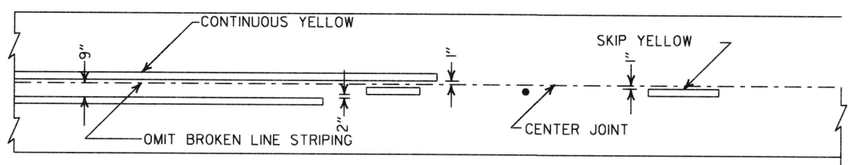
SOLID LINE STRIPING ON CONCRETE PAVEMENT



SOLID LINE STRIPING ON ASPHALT PAVEMENT

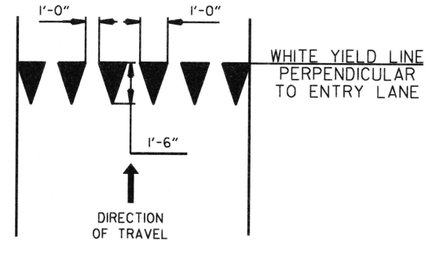


ASPHALT PAVEMENT

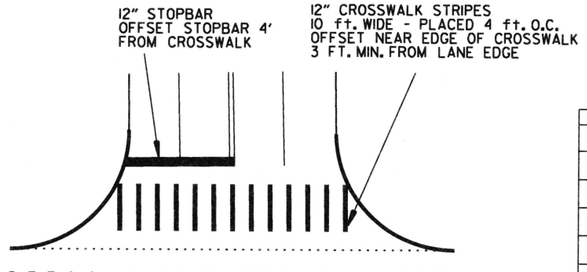


CONCRETE PAVEMENT

STRIPING AT ADJACENT NO PASSING LANES

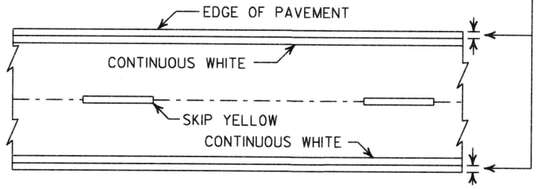


YIELD LINE DETAIL



CROSSWALK AND STOPBAR DETAILS

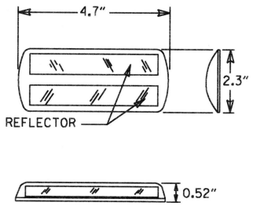
2" FOR ASPHALT OR CONCRETE PAVEMENT
6" FOR BITUMINOUS SURFACE TREATMENT



PAVEMENT EDGE LINE MARKING

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

TYPE II
RED/CLEAR OR
YELLOW/YELLOW



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.

DETAIL OF STANDARD RAISED PAVEMENT MARKERS

DATE	REVISION	FILMED
6-1-17	ADDED YIELD LINE DETAIL	
5-12-16	REVISED LINE WIDTHS, SPACING, & NOTES	
9-12-13	REVISED DETAIL OF STANDARD RAISED PAVEMENT MARKERS	
11-17-10	REVISED GENERAL NOTES & REMOVED PLOWABLE PVMT MRKRS	
11-18-04	REVISED NOTE 2 & GENERAL NOTES	
8-22-02	ADDED CROSSWALK & STOPBAR DTLS.	
7-02-98	ADDED DETAILS OF STD. RAISED PAV'T. MARKERS	
4-26-96	REV. NOTES 3&4; ADDED R.P.M.	
9-30-80	DRAWN	1-9-30-80

ARKANSAS STATE HIGHWAY COMMISSION

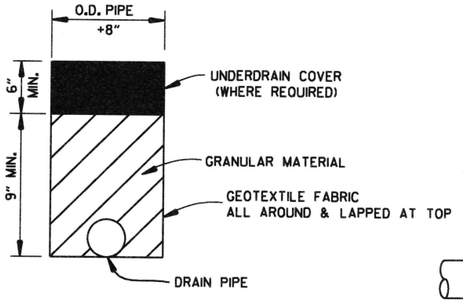
PAVEMENT MARKING DETAILS

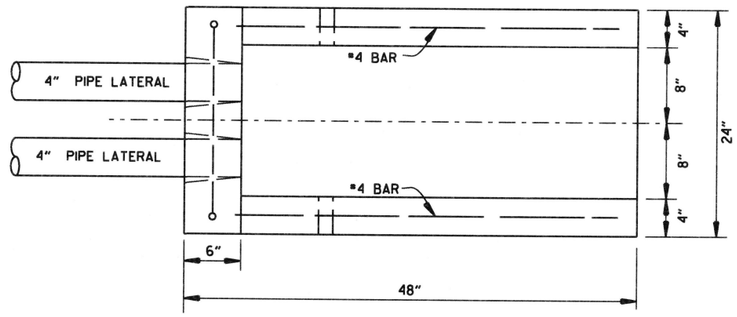
STANDARD DRAWING PM-1

NOTE:

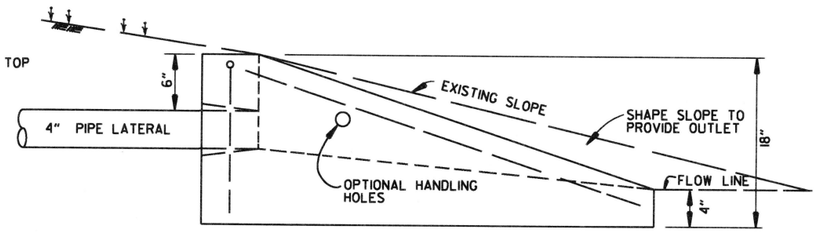
1. UNLESS OTHERWISE SPECIFIED ON THE PLANS, THE UNDERDRAIN COVER SHALL BE THOROUGHLY COMPACTED EARTH AND SHALL BE SUBSIDIARY TO PIPE UNDERDRAIN.

2. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. LAP FABRIC 12" OR THE WIDTH OF THE TRENCH AT THE TOP.

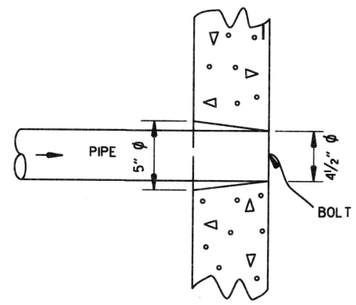




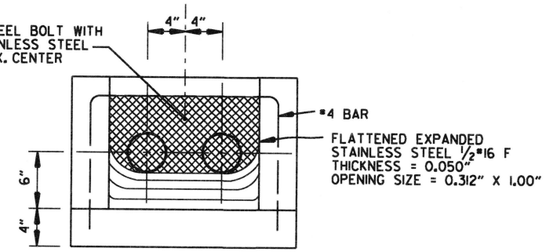
PLAN VIEW



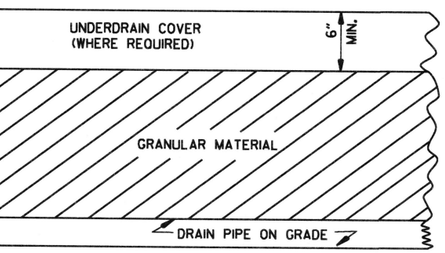
SIDE VIEW



DETAIL OF HOLE FOR 4" PIPE



FRONT VIEW
(DETAIL OF RODENT SCREEN)



DETAILS OF PIPE UNDERDRAIN

NOTES FOR PIPE UNDERDRAINS

1. GEOTEXTILE FABRIC SHALL MEET THE REQUIREMENTS OF SECTION 625 FOR TYPE 1. PAYMENT FOR GEOTEXTILE FABRIC AND GRANULAR FILTER MATERIAL SHALL BE INCLUDED IN THE PRICE BID PER LIN. FT. FOR "4" PIPE UNDERDRAINS" IN ACCORDANCE WITH SECTION 611 OF THE STANDARD SPECIFICATIONS.

2. 4" NON-PERFORATED SCHEDULE 40 PVC PIPE LATERALS WITH OUTLET PROTECTORS SHALL BE INSTALLED AS SHOWN HEREON. LATERALS WILL BE MEASURED AND PAID FOR AS "4" PIPE UNDERDRAINS." UNDERDRAIN OUTLET PROTECTORS WILL BE MEASURED AND PAID FOR BY THE UNIT IN ACCORDANCE WITH SECTION 611 OF THE STANDARD SPECIFICATIONS.

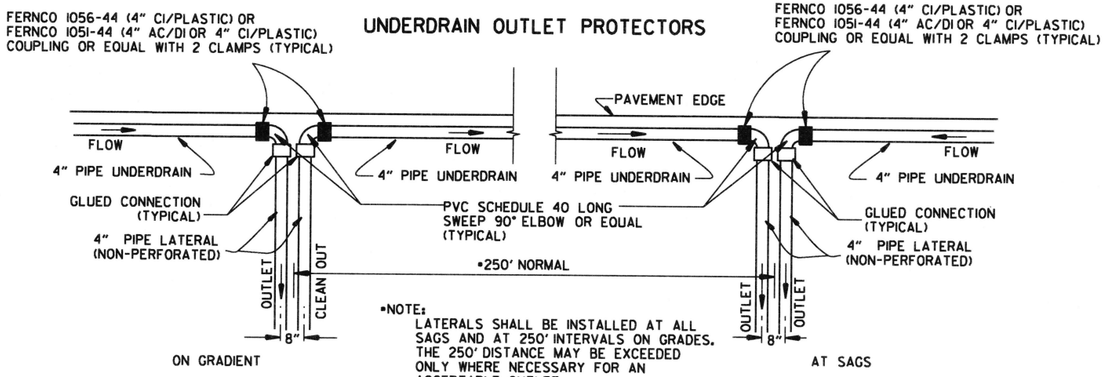
3. EXISTING 4" PIPE UNDERDRAINS MAY BE CONNECTED TO PROPOSED DROP INLETS OR EXTENDED WHERE DIRECTED BY THE ENGINEER. PAYMENT FOR CONNECTING TO DROP INLETS SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR "4" PIPE UNDERDRAINS."

4. THE LOCATION OF ALL LATERALS SHALL BE MARKED WITH 4" X 12" PERMANENT PAVEMENT MARKING TAPE (TYPE III WHITE) AT THE OUTSIDE EDGE OF THE SHOULDER, PLACED TRANSVERSE TO TRAFFIC. PAYMENT FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE VARIOUS CONTRACT ITEMS.

5. PAYMENT FOR THE RODENT SCREEN SHALL BE INCLUDED IN THE PRICE BID PER EACH FOR "UNDERDRAIN OUTLET PROTECTORS."

6. ANY EXISTING UNDERDRAINS THAT INTERFERE WITH INSTALLATION OF THE NEW UNDERDRAIN SYSTEM SHALL BE REMOVED AND DISPOSED OF AS DIRECTED BY THE ENGINEER. PAYMENT WILL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS CONTRACT ITEMS. EXISTING UNDERDRAIN OUTLET PROTECTORS SHALL BE REMOVED UNDER THE ITEM "REMOVAL AND DISPOSAL OF UNDERDRAIN OUTLET PROTECTORS."

7. AT LOCATIONS WHERE A SINGLE LATERAL IS USED THE CONTRACTOR SHALL HAVE THE FOLLOWING OPTIONS: 1. INSTALL OUTLET PROTECTOR AS SHOWN ON STANDARD DRAWING PU-1 AND GROUT THE UNUSED HOLE OR 2. INSTALL AN OUTLET PROTECTOR WITH A SINGLE HOLE.



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.

DATE	REVISION	DATE FILMED
12-8-16	ADDED NOTES FOR PIPE UNDERDRAINS, REVISED RODENT SCREEN DETAIL AND NOTES, REMOVED NOTE 1 FOR GRANULAR MATERIAL, ADDED NOTE FOR GEOTEXTILE FABRIC	
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; 5½" 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 POLYEDTHYLENE PIPE	8-15-91
11- 8-90	DELETED ALTERNATE NOTE	11- 8-90
1-25-90	ADDED 4" SNAP ADAPTER	1-25-90
11-30-89	DEL. (SUBGRADE); ADDED (WHERE REQUIRED)	11-30-89
7-15-88	ISSUED P.L.M.	647-7-15-88

ARKANSAS STATE HIGHWAY COMMISSION

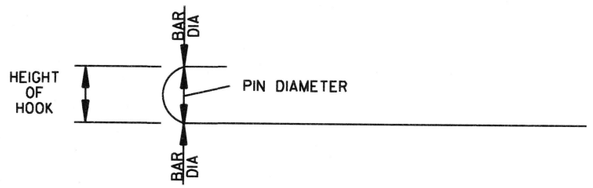
DETAILS OF PIPE UNDERDRAIN

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	2¼"	4"
4	3 "	4½"
5	3¾"	5"
6	4½"	6"
7	5¼"	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 2¾ 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

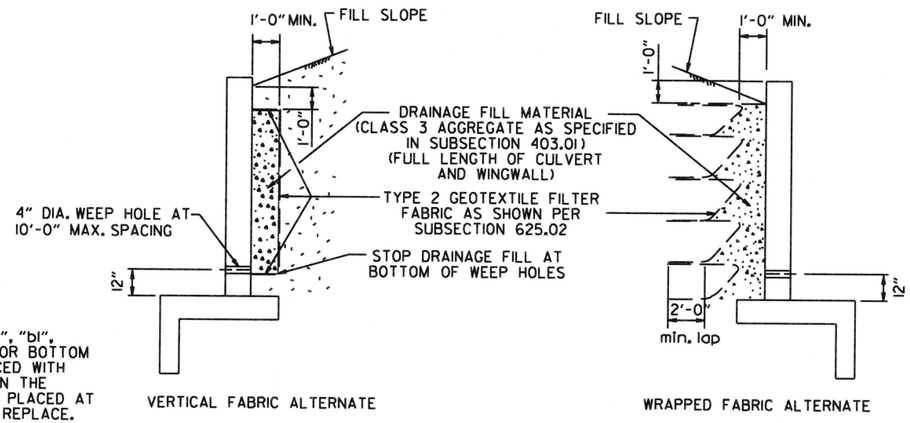
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

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.

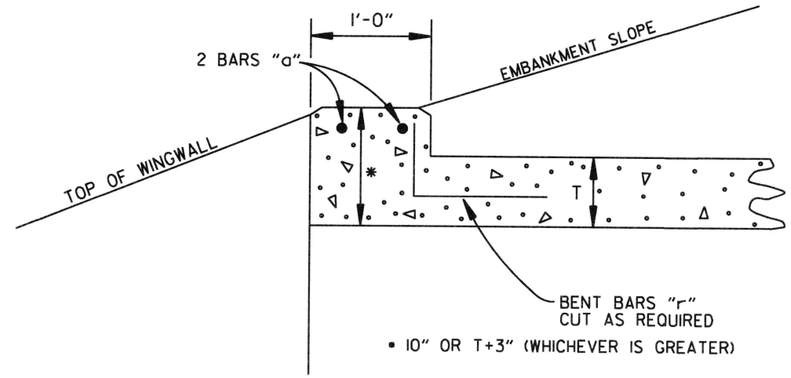
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

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 ½ 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.

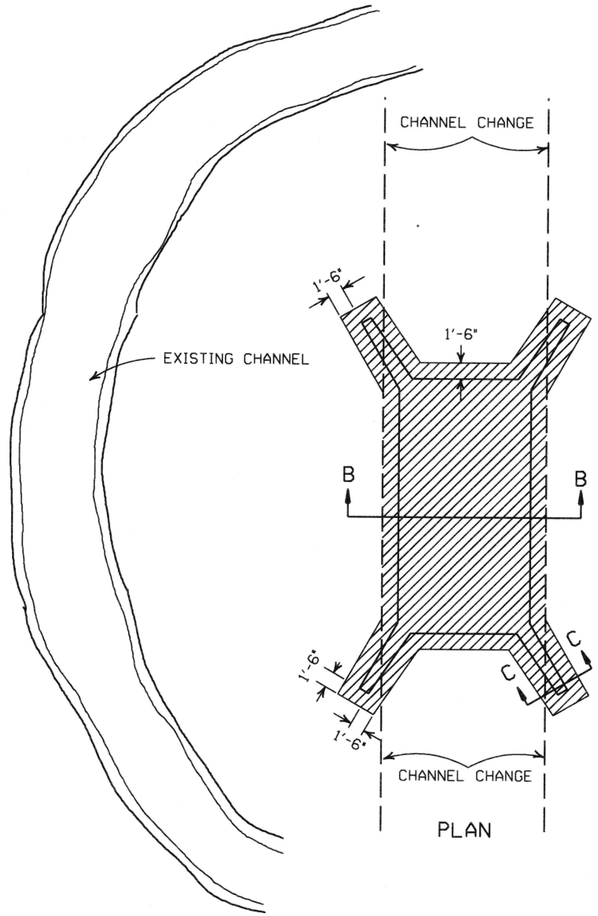
R.C. BOX CULVERT HEADWALL MODIFICATIONS

DATE	REVISION	DATE FILMED
7/26/12	REV. DRAINAGE FILL MATERIAL & DETAIL	
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

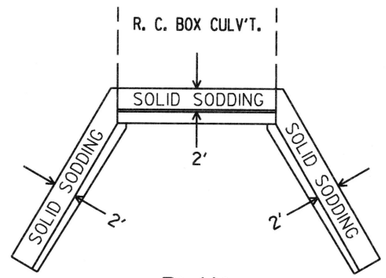
REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1



PLAN

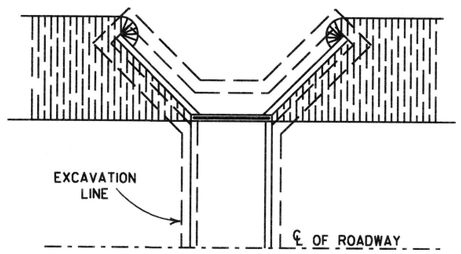
SOLID SODDING



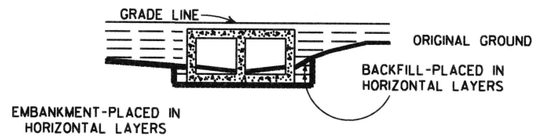
PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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

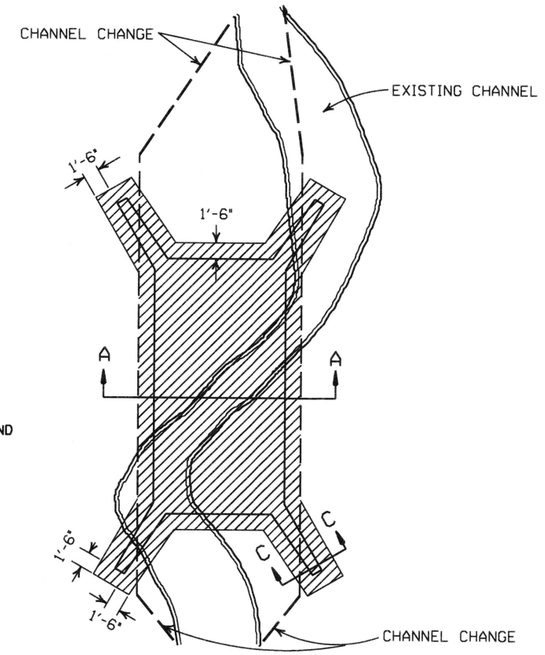


PLAN

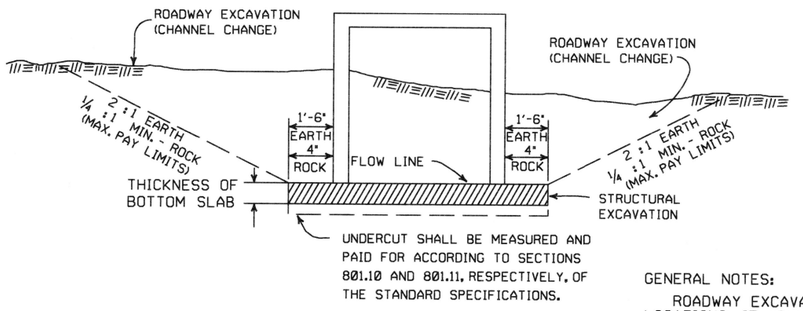


LONGITUDINAL SECTION

BACKFILL DETAILS FOR BOX CULVERT

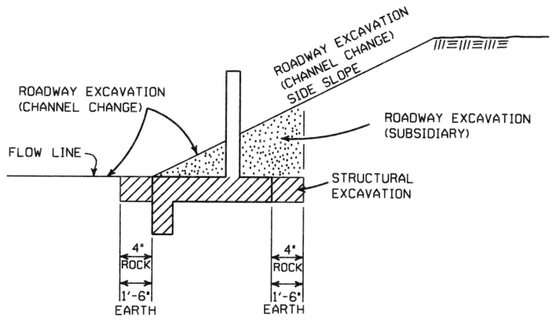


PLAN

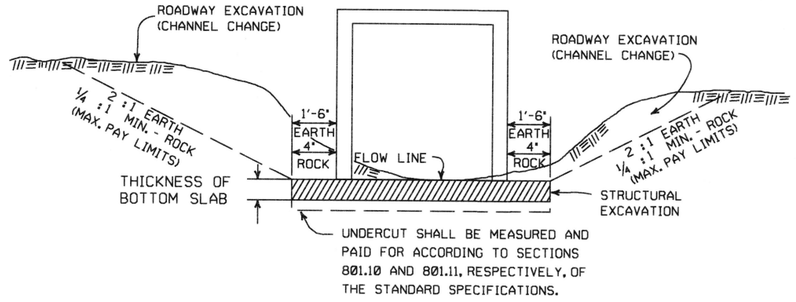


SECTION B-B

DETAILS FOR NEW CHANNELS



SECTION C-C



SECTION A-A

DETAILS THROUGH EXISTING CHANNELS

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.

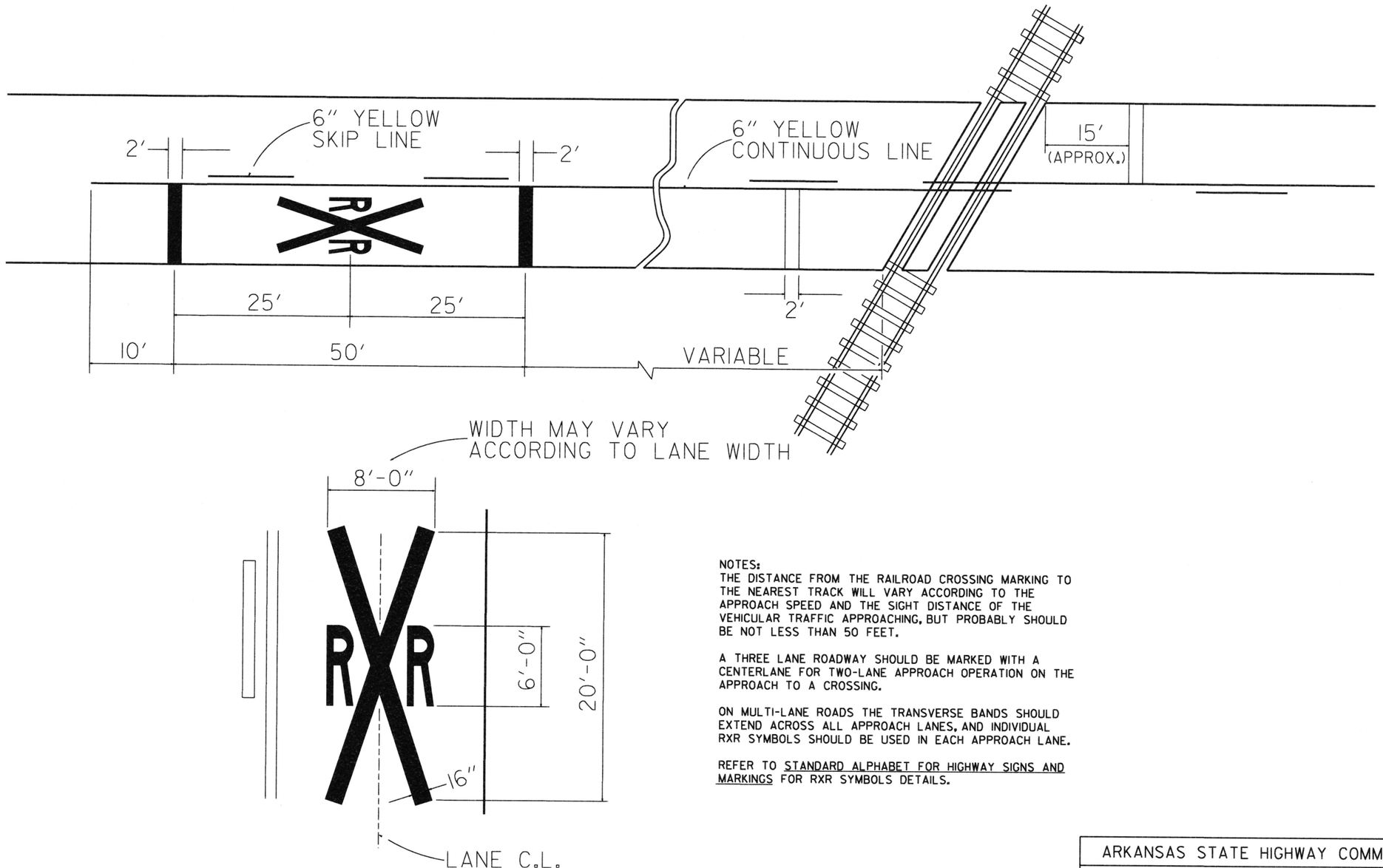
ROADWAY EXCAVATION SHOWN IN SECTION C-C ABOVE AS SUBSIDIARY WILL NOT BE MEASURED OR PAID FOR DIRECTLY, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS OF EXCAVATION.

DATE	REVISION	FILMED
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	674-1-4-83
	AND ADDED MAXIMUM PAY	
	LIMIT NOTES.	
2-2-76	EXCAV. PAY LIMITS	917-2-2-76
10-2-72	REVISED AND REDRAWN	564-10-16-72

ARKANSAS STATE HIGHWAY COMMISSION

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

STANDARD DRAWING RCB-2



DETAIL OF PAVEMENT MARKINGS FOR RAILROAD CROSSING

PAVEMENT MARKING TO BE
SYMMETRICAL ABOUT RAILROAD

NOTES:
THE DISTANCE FROM THE RAILROAD CROSSING MARKING TO THE NEAREST TRACK WILL VARY ACCORDING TO THE APPROACH SPEED AND THE SIGHT DISTANCE OF THE VEHICULAR TRAFFIC APPROACHING, BUT PROBABLY SHOULD BE NOT LESS THAN 50 FEET.

A THREE LANE ROADWAY SHOULD BE MARKED WITH A CENTERLANE FOR TWO-LANE APPROACH OPERATION ON THE APPROACH TO A CROSSING.

ON MULTI-LANE ROADS THE TRANSVERSE BANDS SHOULD EXTEND ACROSS ALL APPROACH LANES, AND INDIVIDUAL RXR SYMBOLS SHOULD BE USED IN EACH APPROACH LANE.

REFER TO STANDARD ALPHABET FOR HIGHWAY SIGNS AND MARKINGS FOR RXR SYMBOLS DETAILS.

DATE	REVISION	DATE FILMED
12-8-16	REVISED CENTERLINE LABELS	
11-20-08	CORRECTED SPELLING	
4-10-03	REVISED NOTES	
3-2-81	DELETED LETTER & ADDED NOTE	684-3-2-81
7-20-79	STOP LINE CHGD. TO PERP.	636-8-30-79
4-23-75	SHEET RENUMBER	697-4-20-79
4-23-75	REDRAWN	860-4-23-75

ARKANSAS STATE HIGHWAY COMMISSION

PAVEMENT MARKING
FOR RAILROAD CROSSING

STANDARD DRAWING RRS-1

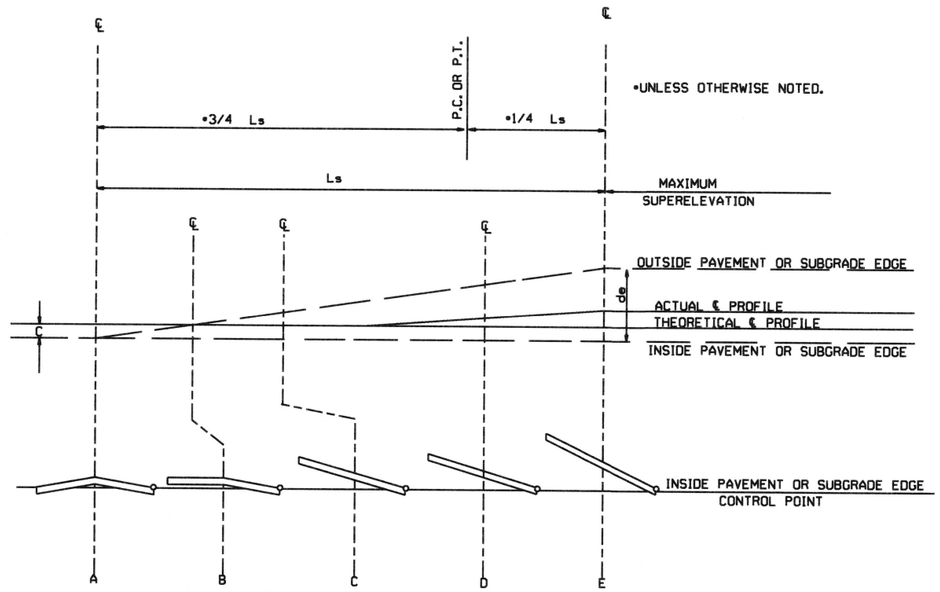
SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

DEGREE OF CURVE	e	30 MPH Ls (FT) MINIMUM	30 MPH Ls (FT) DESIRABLE	e	40 MPH Ls (FT) MINIMUM	40 MPH Ls (FT) DESIRABLE	e	50 MPH Ls (FT) MINIMUM	50 MPH Ls (FT) DESIRABLE	e	55 MPH Ls (FT) MINIMUM	55 MPH Ls (FT) DESIRABLE	e	60 MPH Ls (FT) MINIMUM	60 MPH Ls (FT) DESIRABLE	e	70 MPH Ls (FT) MINIMUM	70 MPH Ls (FT) 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	275	300
1° 15'	N.C.			R.C.			0.026			0.032			0.037			0.046		
1° 30'	N.C.			0.021			0.031	200		0.037	225		0.043	250		0.054		
1° 45'	N.C.			0.025	175		0.036			0.043			0.049			0.062		
2° 00'	R.C.			0.028			0.040			0.048			0.055			0.070		
2° 15'	R.C.			0.031			0.045		250	0.053		300	0.061		300	0.078	300	350
2° 30'	0.021			0.034			0.049			0.058			0.067			0.085	315	
2° 45'	0.023			0.037			0.053			0.063			0.072			0.091	335	
3° 00'	0.025			0.040			0.057			0.067	230		0.077	260		0.096	350	
3° 15'	0.027	150		0.043		200	0.061			0.072	245		0.082	275		0.098	360	400
3° 30'	0.029			0.046			0.065	205		0.076	255		0.086	285		0.100	360	
3° 45'	0.031			0.049			0.069	215		0.080	265		0.090	295				
4° 00'	0.033			0.051			0.072	225		0.083	270		0.093	305	350			
4° 30'	0.037			0.056			0.078	240		0.087	280	350	0.096	315				
5° 00'	0.040			0.061			0.083	250		0.091	295		0.098	320				
5° 30'	0.043			0.066	185		0.088	260		0.094	300							
6° 00'	0.046			0.070	190		0.092	270		0.096	305							
6° 30'	0.050			0.074	200		0.095	280	300	0.100	315							
7° 00'	0.053			0.078	210		0.098	285										
7° 30'	0.056			0.081	215		0.099	290										
8° 00'	0.058			0.084	220		0.100	290										
8° 30'	0.061			0.087	225	250												
9° 00'	0.063			0.089	230													
10° 00'	0.068	160		0.094	235													
11° 00'	0.072	170		0.097	250													
12° 00'	0.076	175		0.099	250													
13° 00'	0.080	180		0.100	250													
14° 00'	0.083	190																
15° 00'	0.086	195																
16° 00'	0.089	200																
17° 00'	0.091	200																
18° 00'	0.093	205																
19° 00'	0.095	210																
20° 00'	0.097	215	250															
21° 00'	0.098	215																
22° 00'	0.099	215																
23° 00'	0.099	215																
24° 00'	0.100	220																

D MAX = 24° 45' | D MAX = 13° 15' | D MAX = 8° 15' | D MAX = 6° 30' | D MAX = 5° 15' | D MAX = 3° 30'

ABBREVIATIONS

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



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

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

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

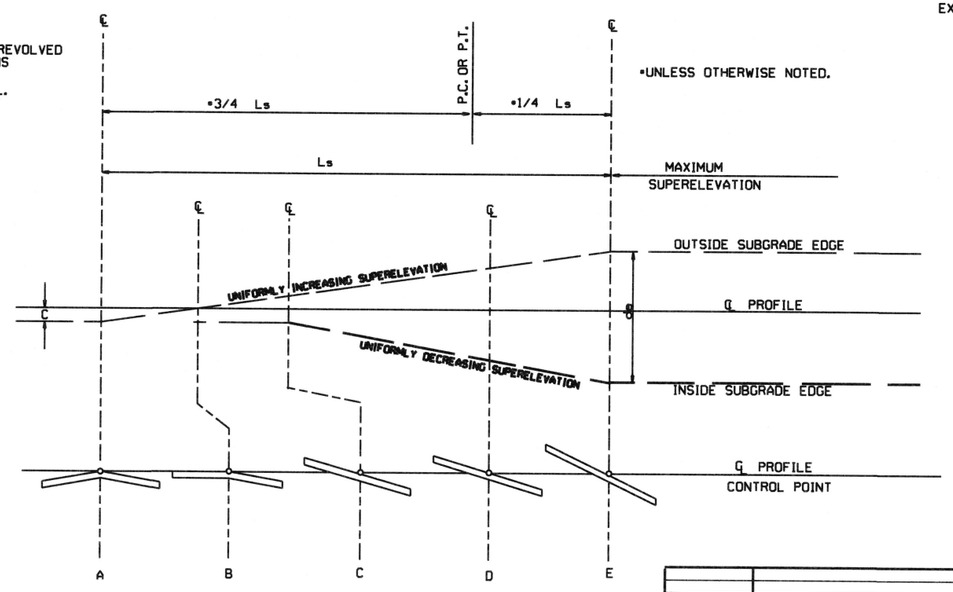
GENERAL NOTES

1. ON PAVEMENT WITH TWO-WAY TRAFFIC, THE SUPERELEVATION SHALL BE REVOLVED ON THE INSIDE PAVEMENT EDGE UNLESS OTHERWISE NOTED ON THE PLANS
2. SUPERELEVATION VALUES SHOWN ON THE CROSS SECTIONS ARE VALUES (+) OR (-) TO BE ADDED TO OR SUBTRACTED FROM THE POINT OF CONTROL.
3. LENGTHS FOR L MAY BE ROUNDED IN MULTIPLES OF 25 FT. OR 50 FT. TO PERMIT SIMPLER CALCULATIONS.
4. 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 2C.

RATE OF SUPERELEVATION SHALL BE COMPUTED ON STRAIGHT LINE METHOD USING APPLICABLE Ls.



STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND CENTER LINE

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

ARKANSAS STATE HIGHWAY COMMISSION

TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

STANDARD DRAWING SE-2

R1-1

STANDARD 30"X30"
EXPRESSWAY 36"X36"
SPECIAL 48"X48"

R1-2

STD. 36"X36"X36"
EXPWY. 48"X48"X48"
FWY. 60"X60"X60"

R2-1

STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

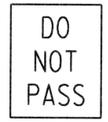
W3-5

STD. 36"X36"
EXPWY. 48"X48"
FWY. 48"X48"

W3-5a

STD. 36"X36"
EXPWY. 48"X48"
FWY. 48"X48"

R4-1



STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

R4-2

STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

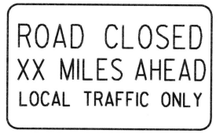
R5-1

STD. 30"X30"
EXPWY. 36"X36"
SPECIAL 48"X48"

RII-2

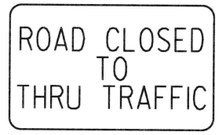
48"X30"

RII-3A



60"X30"

RII-4



60"X30"

W21-5a

STD. 36"X36"
FWY. 48"X48"

WI-1

STD. 36"X36"
FWY. 48"X48"

WI-2

STD. 36"X36"
FWY. 48"X48"

WI-3

STD. 48"X48"

WI-4

STD. 48"X48"

WI-6

STD. 48"X24"
SPECIAL 60"X30"

WI-8

STD. 18"X24"
SPECIAL 24"X30"
EXPWY. 30"X36"
FWY. 36"X48"

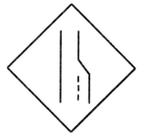
W3-1

STD. 36"X36"
SPECIAL 48"X48"

W3-2

STD. 36"X36"
SPECIAL 48"X48"

W4-2



STD. 36"X36"
FWY. 48"X48"

W5-1

STD. 36"X36"
SPECIAL 48"X48"

W6-3

EXPWY. 36"X36"
SPECIAL 48"X48"

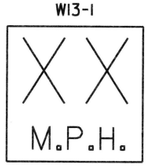
W8-7

EXPWY. 36"X36"
FWY. 48"X48"

W9-2

STD. 36"X36"
FWY. 48"X48"

WI3-1



STD. 24"X24"

W20-1

STD. 48"X48"

W20-2

STD. 48"X48"

W20-3

STD. 48"X48"

W20-4

STD. 48"X48"

W20-5

STD. 48"X48"

W20-7a

STD. 36"X36"
FWY. 48"X48"

W21-2

STD. 30"X30"
SPECIAL 36"X36"

W21-5

STD. 30"X30"
SPECIAL 36"X36"

W24-1

STD. 36"X36"

WI-4b

STD. 48"X48"

R56-1

STD. 18"X18"

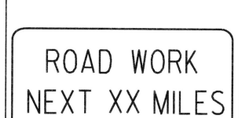
W8-11

STD. 36"X36"
FWY. 48"X48"

W8-9

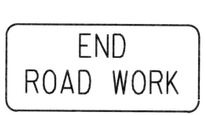
STD. 36"X36"
FWY. 48"X48"

G20-1



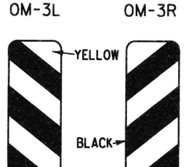
60"X24"

G20-2



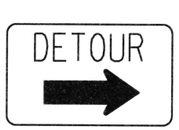
48"X24"

OM-3L OM-3R



12"X36"

M4-9

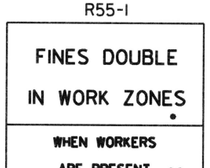


STD. 30"X24"
SPECIAL 48"X36"
SPECIAL 60"X48"

M4-10

48"X18"

R55-1



36"X60"

• USE 6" C LETTERS
•• USE 4" D LETTERS

ADVANCE DISTANCES
(XXXX)

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

GENERAL NOTES:

1. 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.
2. 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.
3. 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.
- 4. 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.
- 5. 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.
6. 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.
7. 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.
8. FLAGGERS SHALL USE REFLECTORIZED STOP-SLOW PADDLES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.
9. 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.
10. 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.

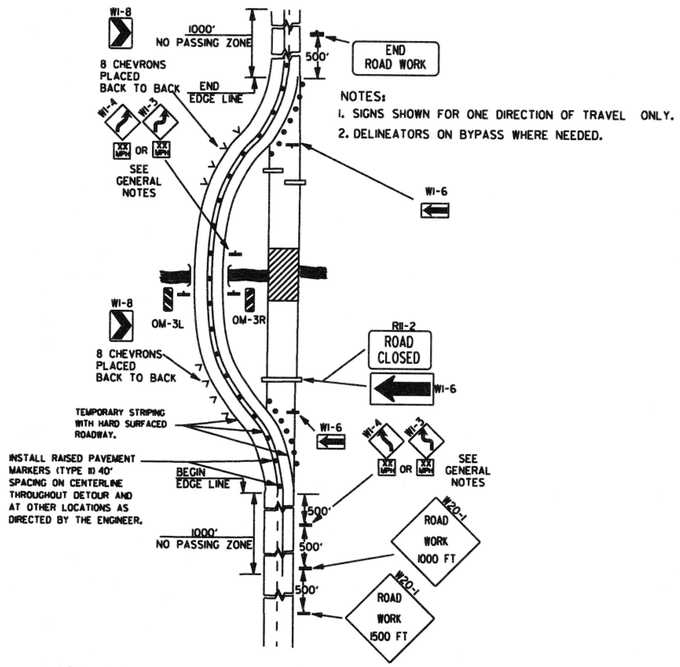
• NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) IS REQUIRED FOR ALL PROJECTS.

DATE	REVISION	FILMED
4-13-17	DELETED RSP-1 & ADDED W21-5a	
9-2-15	REVISED REDUCED SPEED LIMIT AHEAD SIGNS REVISED ROAD WORK NEXT XX MILES	
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	

ARKANSAS STATE HIGHWAY COMMISSION

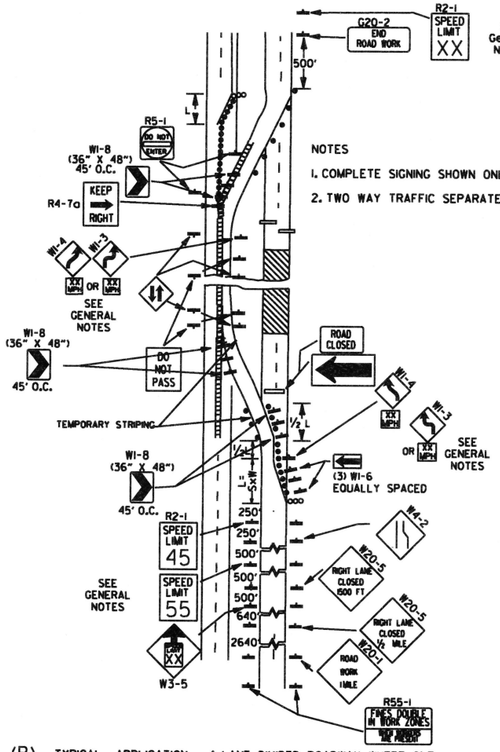
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



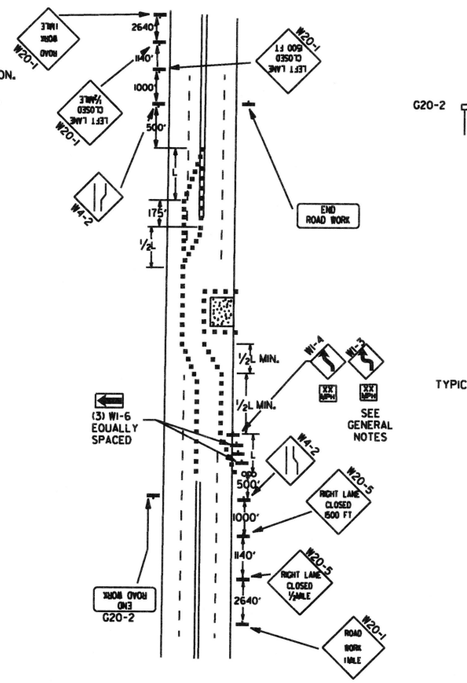
NOTES:
1. SIGNS SHOWN FOR ONE DIRECTION OF TRAVEL ONLY.
2. DELINEATORS ON BYPASS WHERE NEEDED.

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

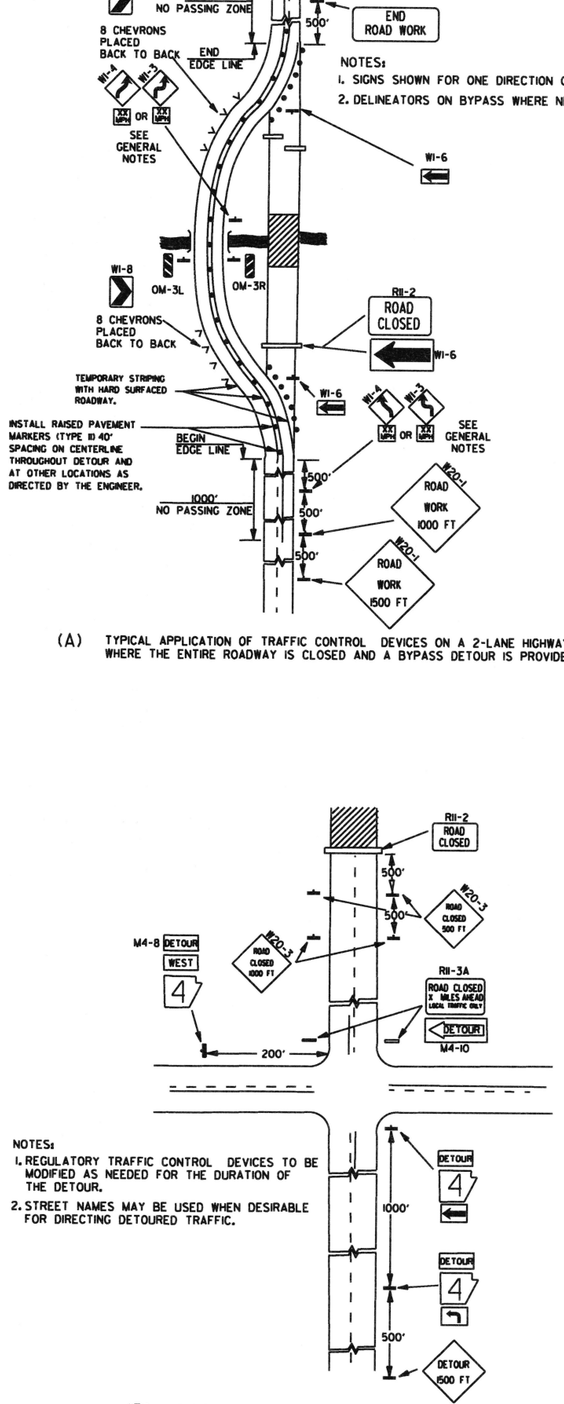


NOTES
1. COMPLETE SIGNING SHOWN ONLY IN CROSSOVER DIRECTION.
2. TWO WAY TRAFFIC SEPARATED WITH POSITIVE BARRIER.

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

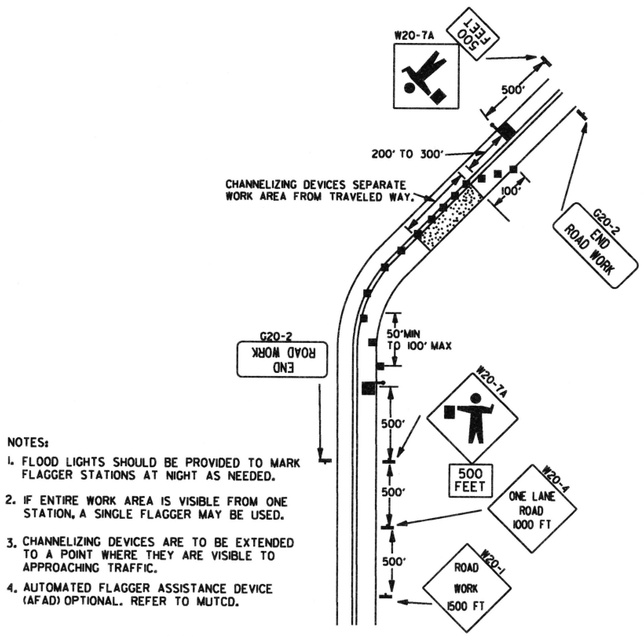


(C) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WHERE HALF OF THE ROADWAY IS CLOSED.



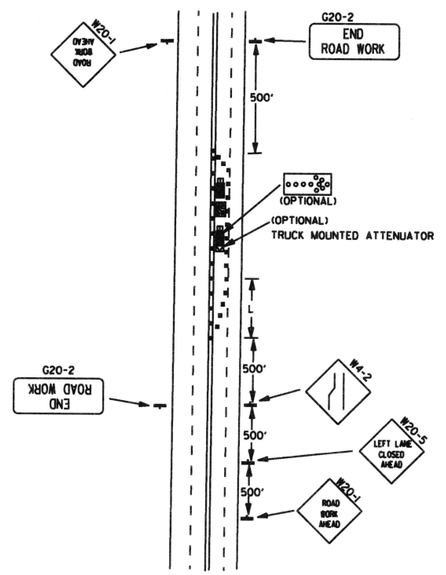
NOTES:
1. REGULATORY TRAFFIC CONTROL DEVICES TO BE MODIFIED AS NEEDED FOR THE DURATION OF THE DETOUR.
2. STREET NAMES MAY BE USED WHEN DESIRABLE FOR DIRECTING DETOURED TRAFFIC.

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



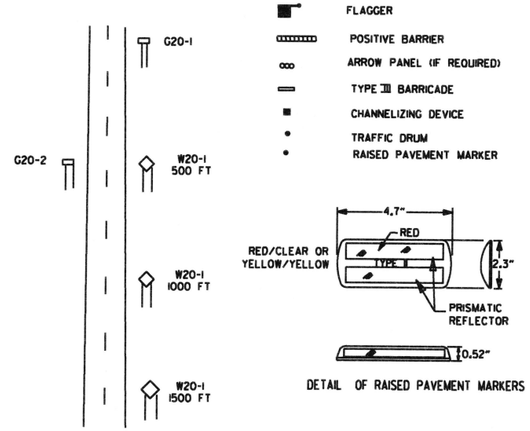
NOTES:
1. FLOOD LIGHTS SHOULD BE PROVIDED TO MARK FLAGGER STATIONS AT NIGHT AS NEEDED.
2. IF ENTIRE WORK AREA IS VISIBLE FROM ONE STATION, A SINGLE FLAGGER MAY BE USED.
3. CHANNELIZING DEVICES ARE TO BE EXTENDED TO A POINT WHERE THEY ARE VISIBLE TO APPROACHING TRAFFIC.
4. AUTOMATED FLAGGER ASSISTANCE DEVICE (AFAD) OPTIONAL. REFER TO MUTCD.

(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.

KEY:
- FLAGGER
- POSITIVE BARRIER
- ARROW PANEL (IF REQUIRED)
- TYPE III BARRICADE
- CHANNELIZING DEVICE
- TRAFFIC DRUM
- RAISED PAVEMENT MARKER



TYPICAL ADVANCE WARNING SIGN PLACEMENT

DETAIL OF RAISED PAVEMENT MARKERS

TAPER FORMULAE:

L=SXW 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.

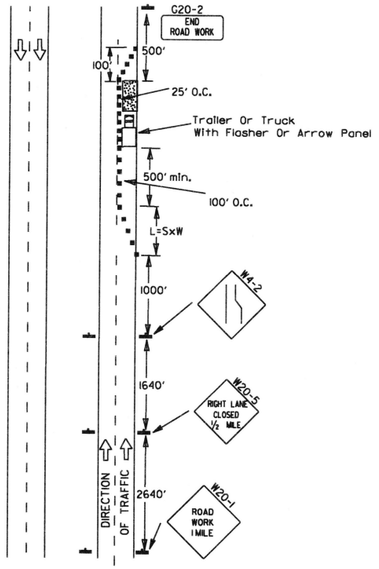
GENERAL NOTES:
1. ADVISORY SPEED POSTED ON W1-3 OR W1-4 CURVE WARNING SIGNS TO BE DETERMINED AT SITE. USE W1-4 WHEN SPEED IS GREATER THAN 30MPH AND W1-3 WHEN 30MPH OR LESS.
2. WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-1(55) SHALL BE OMITTED AND THE W3-5 SHALL BE INSTALLED AT THAT LOCATION. ADDITIONAL R2-1 45MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE 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(45) SHALL BE OMITTED. ADDITIONAL R2-1 55MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE 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. 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.
8. 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.

DATE	REVISION	FILMED
9-2-15	REVISED NOTE 2, ADDED NOTE 8, REVISED DRAWING (A) & REPLACED R2-5A WITH W3-5	
9-12-13	REVISED DETAIL OF RAISED PAVEMENT MARKERS	
3-11-10	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	

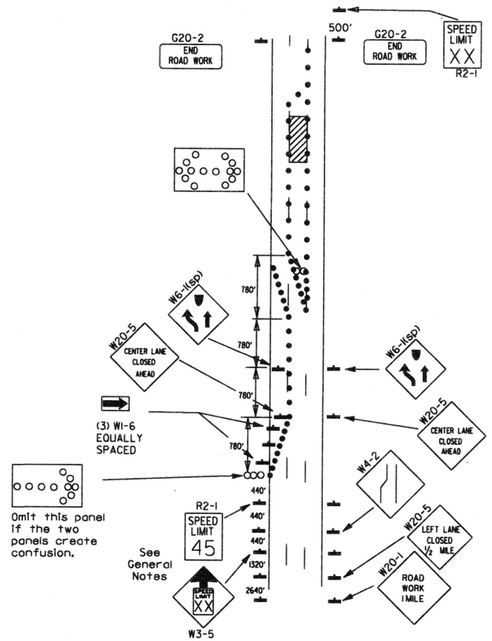
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

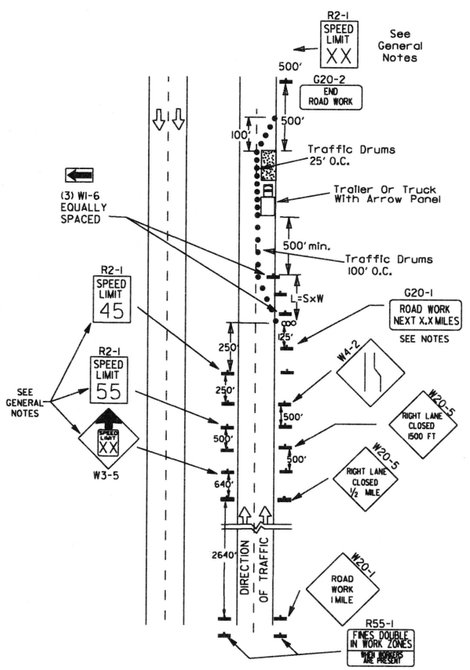
STANDARD DRAWING TC-2



(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.

KEY:

ooo Arrow Panel (If Required)

■ Channelizing Device

● Traffic drum

GENERAL NOTES:

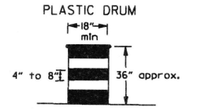
1. A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the W3-5 shall be installed at that location. Additional R2-1 45mph speed limit signs shall be installed at a maximum of 1 mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
3. When the existing speed limit is 65mph and the plans require a speed limit of 55mph, the R2-1(45) shall be omitted. Additional R2-1 55mph speed limit signs shall be installed at a maximum of 1 mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
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 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.

Channelizing devices

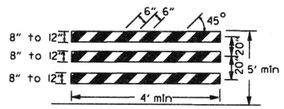
* When cones are used on freeways and multi-lane highways, they shall be 28" min. During hours of darkness, 28" cones shall be used on all roadways, and shall be reflectorized in accordance with the M.U.T.C.D.

CONES

TYPE I BARRICADE



TYPE II BARRICADE



TYPE III BARRICADE

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

VERTICAL PANEL
VP-1R

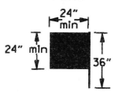
TRAFFIC CONTROL DEVICES FOR VERTICAL PAVEMENT DIFFERENTIALS

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-1 and vertical panels, drums or concrete barrier
Greater than 3"	Edge of shoulder	*Vertical panels, drums or concrete barrier

* When shown on the plans concrete barrier will be used.

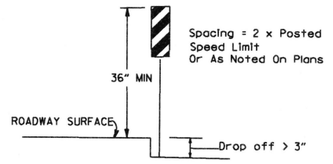
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.

FLAG

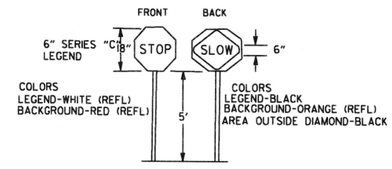


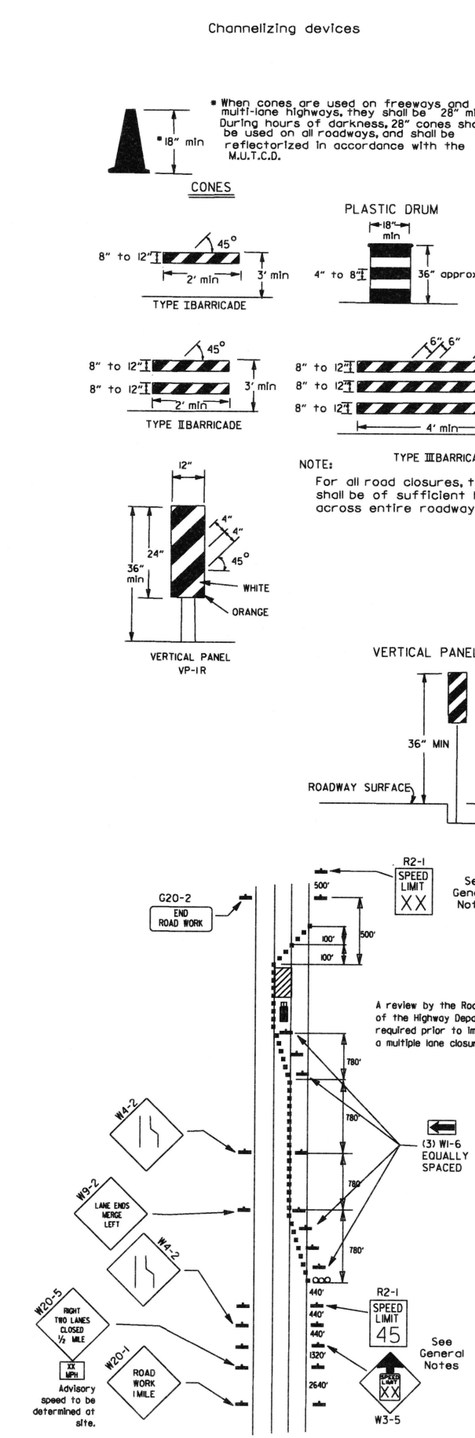
Flag shall be of good grade red material

VERTICAL PANEL PLACEMENT



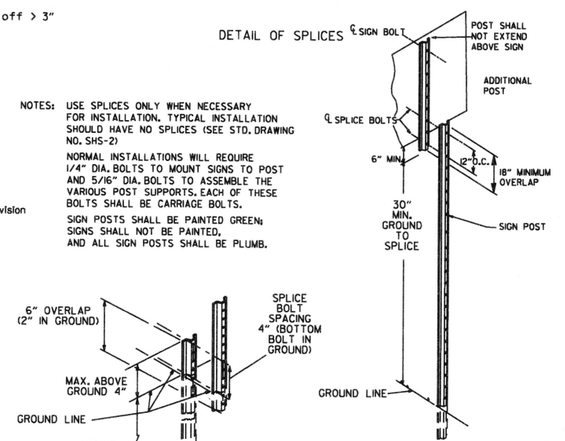
STOP SLOW PADDLE





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

DETAIL OF SPLICES



NOTES: USE SPLICES ONLY WHEN NECESSARY FOR INSTALLATION. TYPICAL INSTALLATION SHOULD HAVE NO SPLICES (SEE STD. DRAWING NO. SHS-2)

NORMAL INSTALLATIONS WILL REQUIRE 1/4" DIA. BOLTS TO MOUNT SIGNS TO POST AND 5/16" DIA. BOLTS TO ASSEMBLE THE VARIOUS POST SUPPORTS. EACH OF THESE BOLTS SHALL BE CARRIAGE BOLTS.

SIGN POSTS SHALL BE PAINTED GREEN; SIGNS SHALL NOT BE PAINTED, AND ALL SIGN POSTS SHALL BE PLUMB.

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

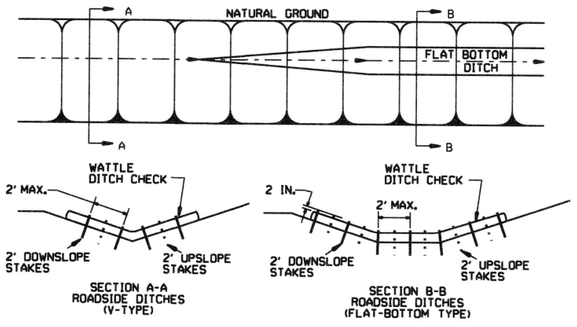
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

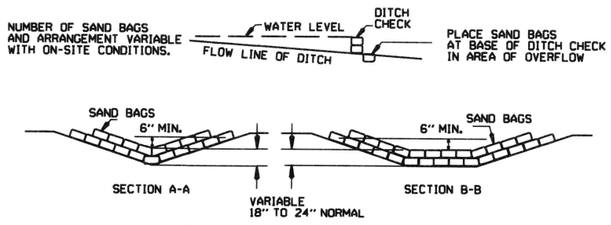
STANDARD DRAWING TC-3

GENERAL NOTES

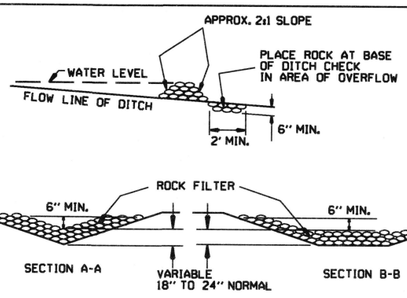
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



WATTLE DITCH CHECK (E-1)



SAND BAG DITCH CHECK (E-5)

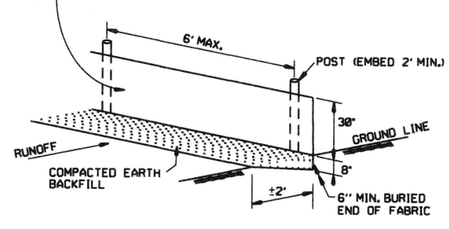


ROCK DITCH CHECK (E-6)

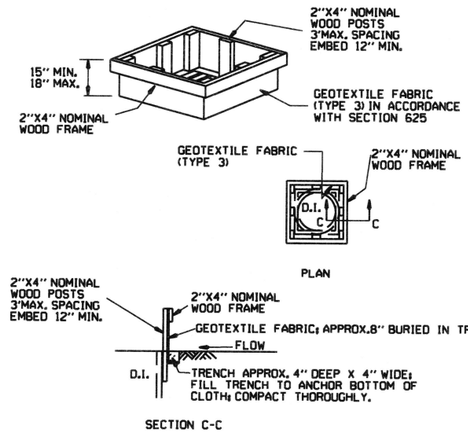
GENERAL NOTES

GEOTEXTILE FABRIC (TYPE 4) IN ACCORDANCE WITH SECTION 625

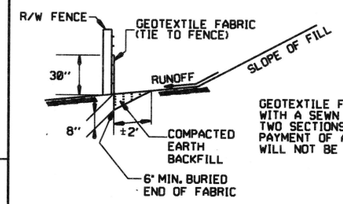
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.



SILT FENCE (E-11)

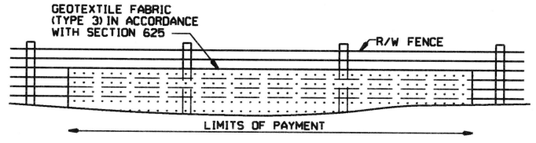


DROP INLET SILT FENCE (E-7)



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.



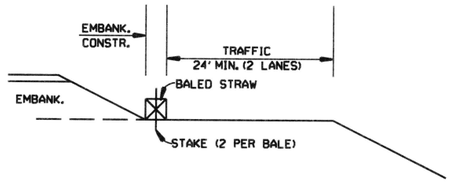
SILT FENCE ON R/W FENCE (E-4)

GENERAL NOTES

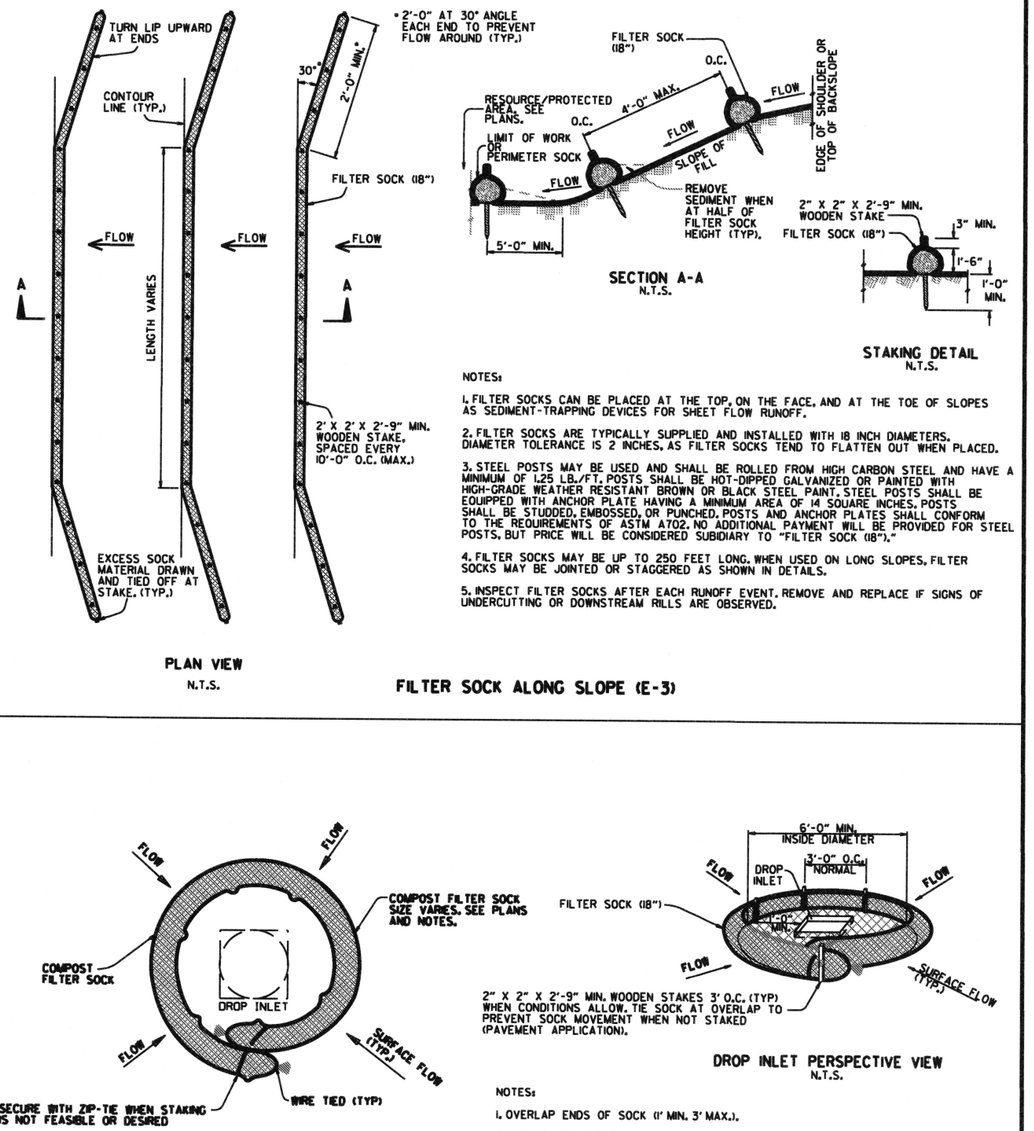
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.

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)



NOTES:

1. FILTER SOCKS CAN BE PLACED AT THE TOP, ON THE FACE, AND AT THE TOE OF SLOPES AS SEDIMENT-TRAPPING DEVICES FOR SHEET FLOW RUNOFF.

2. FILTER SOCKS ARE TYPICALLY SUPPLIED AND INSTALLED WITH 18 INCH DIAMETERS. DIAMETER TOLERANCE IS 2 INCHES, AS FILTER SOCKS TEND TO FLATTEN OUT WHEN PLACED.

3. STEEL POSTS MAY BE USED AND SHALL BE ROLLED FROM HIGH CARBON STEEL AND HAVE A MINIMUM OF 1.25 LB./FT. POSTS SHALL BE HOT-DIPPED GALVANIZED OR PAINTED WITH HIGH-GRADE WEATHER RESISTANT BROWN OR BLACK STEEL PAINT. STEEL POSTS SHALL BE EQUIPPED WITH ANCHOR PLATE HAVING A MINIMUM AREA OF 14 SQUARE INCHES. POSTS SHALL BE STUDDED, EMBOSSED, OR PUNCHED. POSTS AND ANCHOR PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A702. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR STEEL POSTS, BUT PRICE WILL BE CONSIDERED SUBIDIARY TO "FILTER SOCK (18")."

4. FILTER SOCKS MAY BE UP TO 250 FEET LONG. WHEN USED ON LONG SLOPES, FILTER SOCKS MAY BE JOINTED OR STAGGERED AS SHOWN IN DETAILS.

5. INSPECT FILTER SOCKS AFTER EACH RUNOFF EVENT. REMOVE AND REPLACE IF SIGNS OF UNDERCUTTING OR DOWNSTREAM RILLS ARE OBSERVED.

FILTER SOCK ALONG SLOPE (E-3)

NOTES:

1. OVERLAP ENDS OF SOCK (1' MIN. 3' MAX.).

2. USE 18" DIA. SOCK IN NON-TRAFFIC AREAS OR AREAS WHERE SAFETY IS NOT A CONCERN.

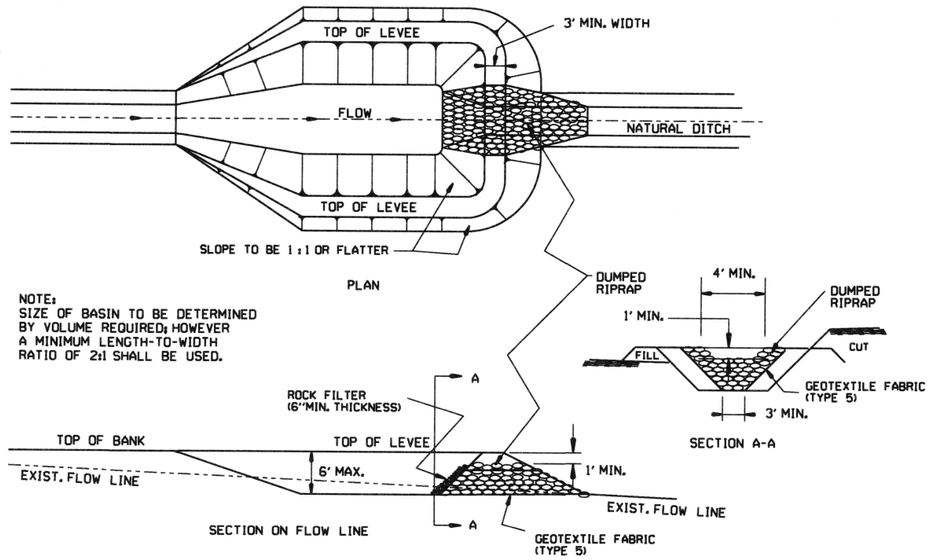
COMPOST FILTER SOCK DROP INLET PROTECTION (E-13)

DATE	REVISION	FILMED
11-16-17	ADDED FILTER SOCK E-3 AND E-13	
12-15-11	DELETED BALED STRAW DITCH CHECK & ADDED WATTLE DITCH CHECK	
11-18-98	ADDED NOTES	
07-02-98	ADDED BALED STRAW FILTER BARRIER (E-2)	
07-20-95	REVISED SILT FENCE E-4 AND E-11	7-20-95
07-15-94	REV. E-4 & E-11 MIN. 13" BURIED END OF FABRIC	
06-02-94	REVISED E-1,4,7 & 11; DELETED E-2 & 3	6-2-94
04-01-93	REDRAWN	
10-01-92	REDRAWN	
08-02-76	ISSUED R.D.M.	298-7-28-76

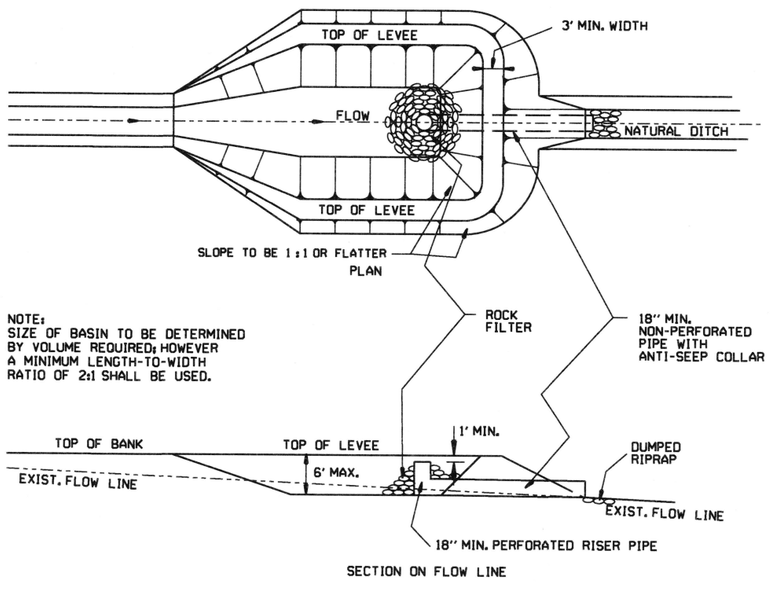
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

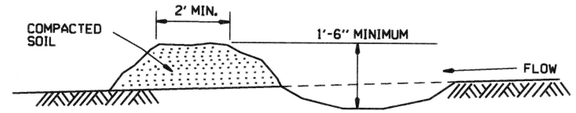
STANDARD DRAWING TEC-1



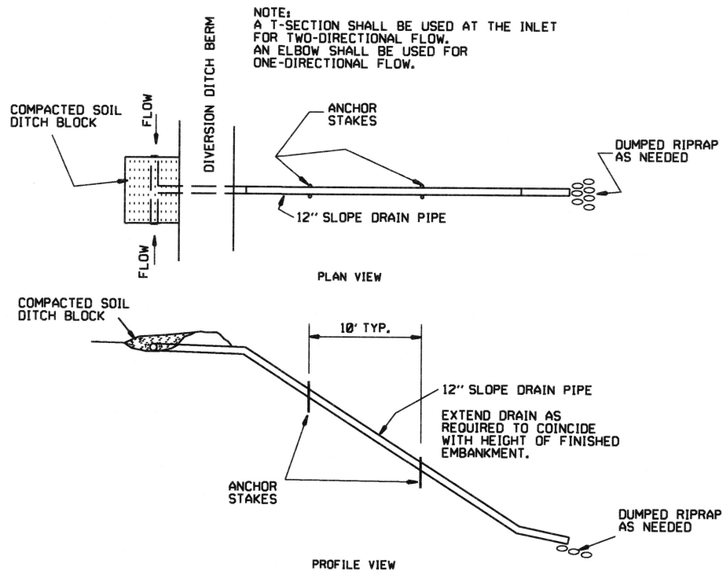
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



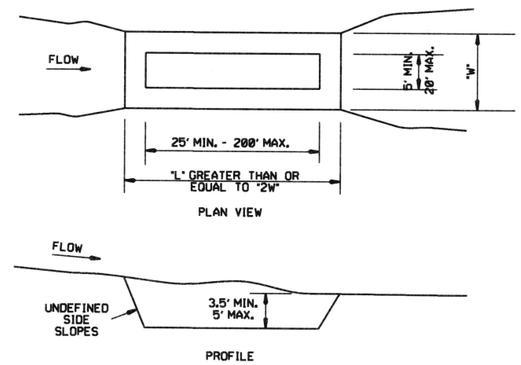
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



DIVERSION DITCH (E-8)



SLOPE DRAIN (E-12)



SEDIMENT BASIN (E-14)

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

ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

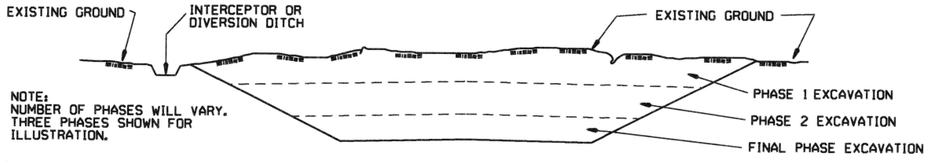
STANDARD DRAWING TEC-2

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



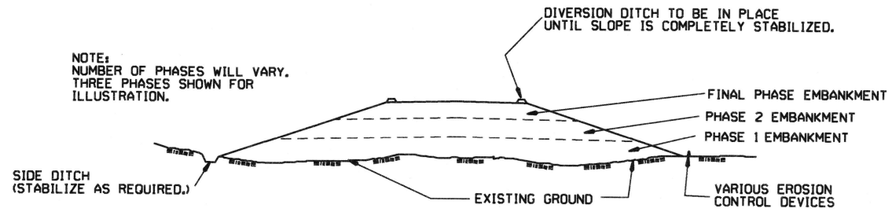
GENERAL NOTE

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



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

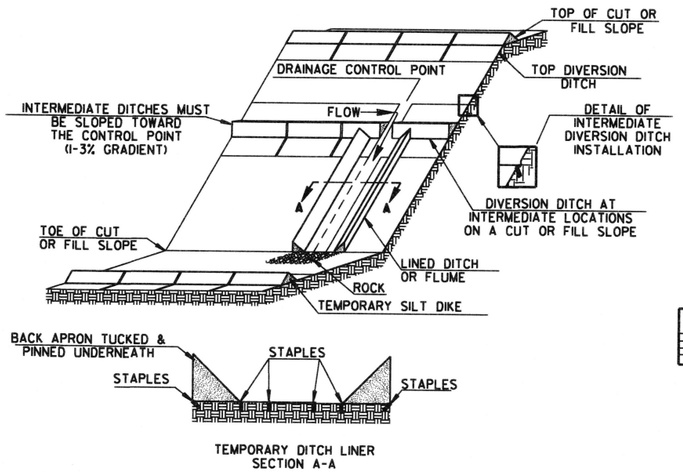
1. CONSTRUCT DIVERSION DITCHES, DITCH CHECKS, SEDIMENT BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD 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.

DATE	REVISION	FILMED
11-03-94	CORRECTED SPELLING	
6-2-94	Drawn & Issued	6-2-94

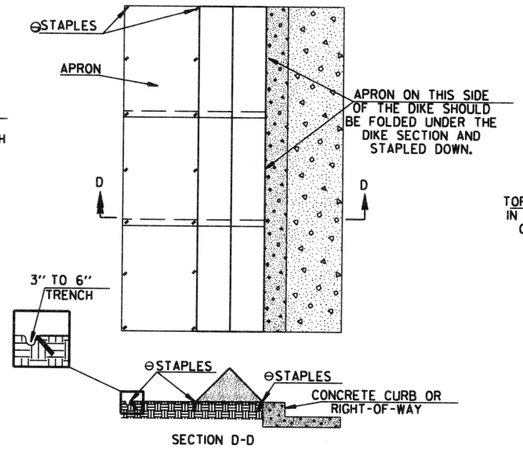
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

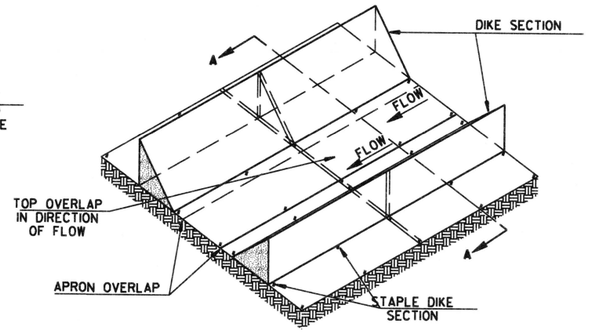
STANDARD DRAWING TEC-3



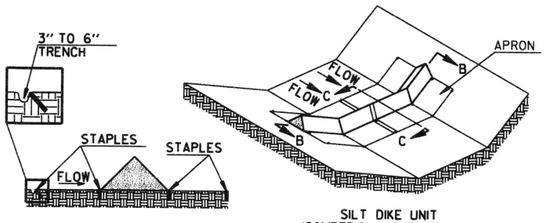
TRIANGULAR SILT DIKE INSTALLATION FOR DIVERSION DITCH AND/OR DITCH LINER

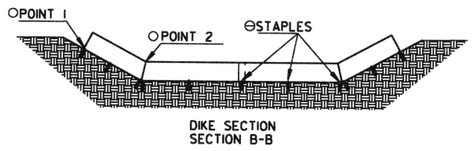


TRIANGULAR SILT DIKE INSTALLATION FOR CONTINUOUS BARRIER



TRIANGULAR SILT DIKE INSTALLATION FOR TEMPORARY DITCH LINER

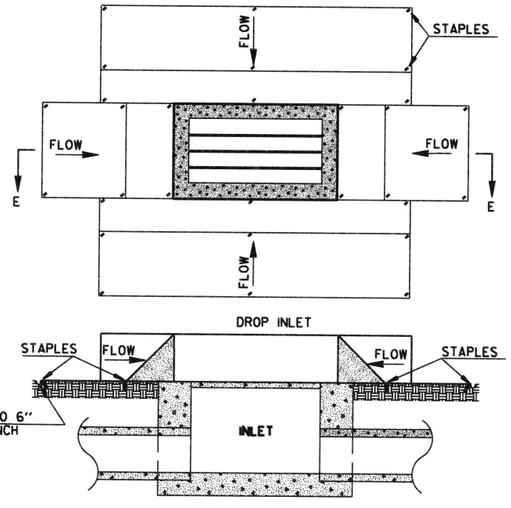




TRIANGULAR SILT DIKE INSTALLATION FOR ROADWAY DITCH OR DRAINAGE DITCH

○ POINT "1" MUST BE HIGHER THAN POINT "2" TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND THE ENDS.

⊖ STAPLES SHALL BE PLACED WHERE THE UNITS OVERLAP AND IN THE CENTER OF THE UNIT AS SHOWN ON THE DIAGRAM.



TRIANGULAR SILT DIKE INSTALLATION FOR DROP INLETS

SYMBOLOGY

SYMBOL TO BE USED TO DENOTE DEVICE ON PLANS

NOTE: SILT DIKE SHOULD ONLY BE USED FOR DROP INLETS IN SUMP LOCATIONS.

GENERAL NOTES

1. THIS WORK SHALL CONSIST OF FURNISHING, INSTALLING, AND MAINTAINING THE TRIANGULAR SILT DIKE. THE DIKES SHALL BE USED AS A CONTINUOUS LINE BARRIER AT THE TOE OF SLOPE OR ACROSS THE ROADWAY DITCH TO CONTAIN SEDIMENT AND MINIMIZE EROSION, OR AS DIRECTED BY THE ENGINEER. THESE DIKES SHALL BE INSTALLED AND LOCATED AS SOON AS CONSTRUCTION WILL ALLOW OR AS DIRECTED BY THE ENGINEER.

2. TRIANGULAR SILT DIKE SHALL BE TRIANGULAR SHAPED HAVING A HEIGHT OF AT LEAST 8" TO 10" IN THE CENTER WITH EQUAL SIDES AND A 16" TO 20" BASE. THE TRIANGULAR SHAPED INNER MATERIAL SHALL BE URETHANE FOAM. THE OUTER COVER SHALL BE A WOVEN GEOTEXTILE FABRIC PLACED AROUND THE INNER MATERIAL & ALLOWED TO EXTEND BEYOND BOTH SIDES OF THE TRIANGLE 24" TO 36". THIS FABRIC SHOULD BE MILDEW RESISTANT, ROT-PROOF AND RESISTANT TO HEAT AND ULTRAVIOLET RADIATION MEETING REQUIREMENTS FOR SEDIMENT CONTROL IN AASHTO M288. THE DIKES SHALL BE ATTACHED TO THE GROUND WITH WIRE STAPLES. THE STAPLES SHALL BE NO. 11 GAUGE WIRE AND BE AT LEAST 6" TO 8" LONG. STAPLES SHALL BE PLACED AS SHOWN ON THESE DETAILS.

   THE CONTRACTOR SHALL INSPECT ALL DIKES AFTER EACH RAINFALL EVENT OF AT LEAST 0.5" OR GREATER. ANY DEFICIENCIES OR DAMAGE SHALL BE REPAIRED BY THE CONTRACTOR. ACCUMULATED SILT OR DEBRIS SHALL BE REMOVED AND RELOCATED AS DIRECTED BY THE ENGINEER. IF THE DIKES ARE DAMAGED OR INADVERTENTLY MOVED DURING THE SILT REMOVAL PROCESS, THE CONTRACTOR SHALL IMMEDIATELY REPLACE AFTER DAMAGE OCCURS.

3. ACCEPTED TRIANGULAR SILT DIKE, MEASURED AS PROVIDED ABOVE, WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID FOR TRIANGULAR SILT DIKE. PRICE BID WILL INCLUDE THE COST OF FURNISHING THE DIKES, INSTALLING, MAINTAINING AND REMOVAL WHEN DIRECTED BY THE ENGINEER.

DATE	REVISION	FILMED
7-26-12	REVISED GENERAL NOTE 2.	
12-15-11	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-4