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.		090343	1	141
				(2)	HWY. 74-HUNTSVILLE STRS. & APPRS. (S)			

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
CONSTRUCTION PLANS FOR STATE HIGHWAY

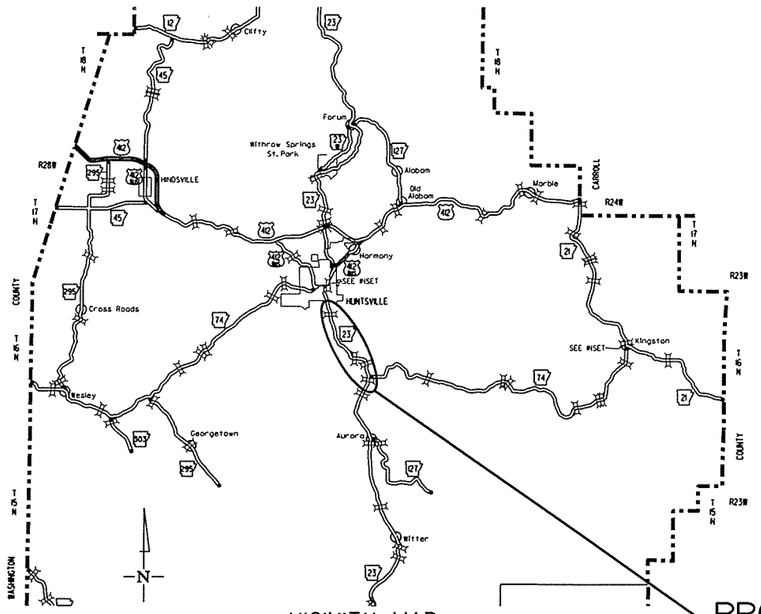
HWY. 74 - HUNTSVILLE STRS. & APPRS. (S)

MADISON COUNTY

ROUTE 23 SECTION 8

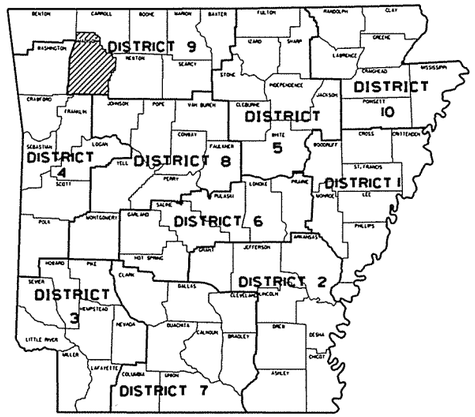
JOB 090343

FED. AID PROJ. STPR-STPF-0044(13)



VICINITY MAP

PROJECT LOCATION



ARK. HWY. DIST. NO. 9

BRIDGE DATA

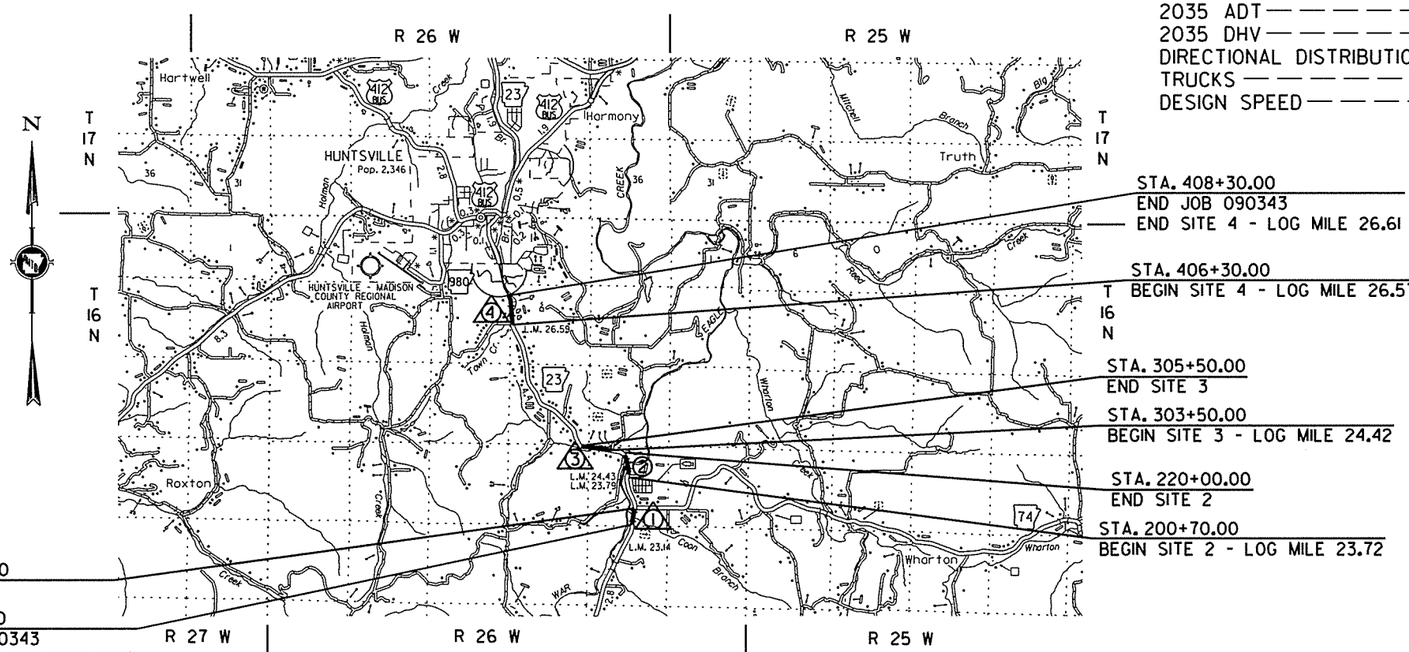
(2) BR. BEGIN STA. 206+18.89
BRIDGE NO. 07346
40'-0" CLEAR ROADWAY
452'-2¼" TOTAL LENGTH
450'-0" CONTINUOUS COMPOSITE W-BEAM UNIT
(65'-80'-80'-80'-80'-65')
BR. END STA. 210+71.11

STRUCTURES OVER 20'-0" SPAN

(1) STA. 104+94.00 - CONSTRUCT
TRIPLE 11' X 9' X 82' R.C. BOX CULVERT
25° LT. FWD. SKEW
WITH 3:1 WINGS LT. & RT.
Q50=1840 CFS; DA=1568 ACRES
SPAN = 37'-10⅝"

(3) STA. 304+60 - CONSTRUCT
QUINT. 11'X 6'X 105' R.C. BOX CULVERT
45° LT. FWD. SKEW
WITH 3:1 WINGS LT. & RT.
Q50=1900 CFS; DA=1664 ACRES
SPAN = 81'-6⅝"

(4) STA. 407+25.00 - CONSTRUCT
QUINT. 8'X 4'X 127' R.C. BOX CULVERT
53° RT. FWD. SKEW
WITH 3:1 WINGS LT. & RT.
Q50=1200 CFS; DA=832 ACRES
SPAN = 70'-10¾"



STA. 105+60.00
END SITE 1

STA. 104+30.00
BEGIN JOB 090343
BEGIN SITE 1 - LOG MILE 23.13

STA. 408+30.00
END JOB 090343
END SITE 4 - LOG MILE 26.61

STA. 406+30.00
BEGIN SITE 4 - LOG MILE 26.57

STA. 305+50.00
END SITE 3

STA. 303+50.00
BEGIN SITE 3 - LOG MILE 24.42

STA. 220+00.00
END SITE 2

STA. 200+70.00
BEGIN SITE 2 - LOG MILE 23.72

• DESIGN TRAFFIC DATA •

	SITE 1	SITES 2-4
DESIGN YEAR	2035	2035
2015 ADT	1900	3700
2035 ADT	2400	4500
2035 DHV	264	495
DIRECTIONAL DISTRIBUTION	60%	60%
TRUCKS	14%	14%
DESIGN SPEED	55 MPH	55 MPH

GROSS LENGTH OF PROJECT	2460.00	FEET	OR	0.466	MILES	
NET " " ROADWAY	1817.44	"	"	0.344	"	
NET " " BRIDGES	642.56	"	"	0.122	"	
NET " " PROJECT	2460.00	"	"	0.466	"	

P.E. 090343

APPROVED

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

9-11-15

DEPUTY DIRECTOR
AND CHIEF ENGINEER

COORDINATES FOR SITE 1:				COORDINATES FOR SITE 2:			COORDINATES FOR SITE 3:			COORDINATES FOR SITE 4:		
	BEGIN PROJECT	MID-POINT OF PROJECT	END PROJECT	BEGIN PROJECT	MID-POINT OF PROJECT	END PROJECT	BEGIN PROJECT	MID-POINT OF PROJECT	END PROJECT	BEGIN PROJECT	MID-POINT OF PROJECT	END PROJECT
LAT.	N 36°01'56"	N 36°01'56"	N 36°01'57"	N 36°02'25"	N 36°02'34"	N 36°02'39"	N 36°02'42"	N 36°02'42"	N 36°02'42"	N 36°04'13"	N 36°04'14"	N 36°04'15"
LONG.	W 93°42'14"	W 93°42'14"	W 93°42'14"	W 93°42'17"	W 93°42'16"	W 93°42'25"	W 93°42'46"	W 93°42'48"	W 93°42'49"	W 93°43'49"	W 93°43'49"	W 93°43'49"

11/24/2014

R090343.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
9-16-15				6	ARK.			
				JOB NO.		090343	2	141

(2) INDEX OF SHEETS, GOV. SPECS., & GEN. NOTES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-16-15

INDEX OF SHEETS

NOTE: CROSS SECTIONS NOT NORMALLY INCLUDED IN PLANS SOLD TO PROSPECTIVE BIDDERS, BUT MAY BE HAD UPON REQUEST.

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
108-1	LIQUIDATED DAMAGES
410-1	CONSTRUCTION REQUIREMENTS AND ACCEPTANCE OF ASPHALT CONCRETE PLANT MIX COURSES
604-1	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
606-1	PIPE CULVERTS FOR SIDE DRAINS
620-1	MULCH COVER
JOB 090343	BIDDING REQUIREMENTS AND CONDITIONS
JOB 090343	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 090343	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 090343	CONSTRUCTION IN SPECIAL FLOOD HAZARD AREAS
JOB 090343	DIRECT TENSION INDICATORS FOR HIGH STRENGTH BOLT ASSEMBLIES
JOB 090343	DISADVANTAGED BUSINESS ENTERPRISE BIDDER'S RESPONSIBILITIES
JOB 090343	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 090343	HIGH PERFORMANCE PAVEMENT MARKING
JOB 090343	MANDATORY ELECTRONIC CONTRACT
JOB 090343	NESTING SITES OF MIGRATORY BIRDS
JOB 090343	OFF-SITE RESTRAINING CONDITIONS FOR BATS
JOB 090343	PARTNERING REQUIREMENTS
JOB 090343	PLASTIC PIPE
JOB 090343	SECTION 404 NATIONWIDE 23 PERMIT REQUIREMENTS
JOB 090343	SHORING FOR CULVERTS
JOB 090343	SOIL STABILIZATION
JOB 090343	SPECIAL CLEARING REQUIREMENTS
JOB 090343	STORM WATER POLLUTION PREVENTION PLAN
JOB 090343	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 090343	UTILITY ADJUSTMENTS
JOB 090343	VALUE ENGINEERING
JOB 090343	WARM MIX ASPHALT
JOB 090343	WATER POLLUTION CONTROL

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. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING U. S. MAILBOXES WITHIN THE PROJECT LIMITS IN SUCH A MANNER THAT THE PUBLIC MAY RECEIVE CONTINUED MAIL SERVICE. PAYMENT WILL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS BID ITEMS.
5. ALL LAND MONUMENTS LOCATED WITHIN THE CONSTRUCTION AREA SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 107.12 OF THE STANDARD SPECIFICATIONS.
6. 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.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A FENCE TO CONTROL LIVESTOCK IN AREAS WHERE PASTURES ARE SEVERED. WIRE FENCE MAY BE CONSTRUCTED INITIALLY, OR IN LIEU THEREOF, THE CONTRACTOR AT HIS OWN EXPENSE, MAY ELECT TO PROVIDE TEMPORARY FENCING SUITABLE TO CONTAIN LIVESTOCK.
8. ALL FLEXIBLE BASE AND ASPHALTIC PAVEMENTS REMOVED SHALL BE PAID FOR UNDER THE ITEM NO. 210 - UNCLASSIFIED EXCAVATION.
9. 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.

9/16/2015

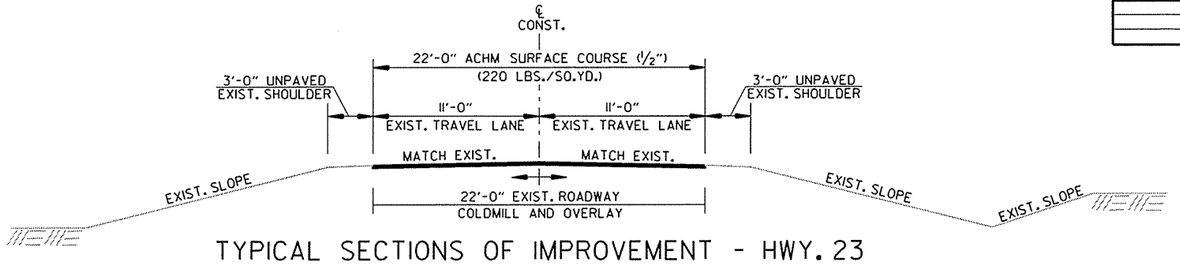
R090343.DGN

INDEX OF SHEETS, GOVERNING SPECIFICATIONS, AND GENERAL NOTES

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.		090343	3	141

(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15

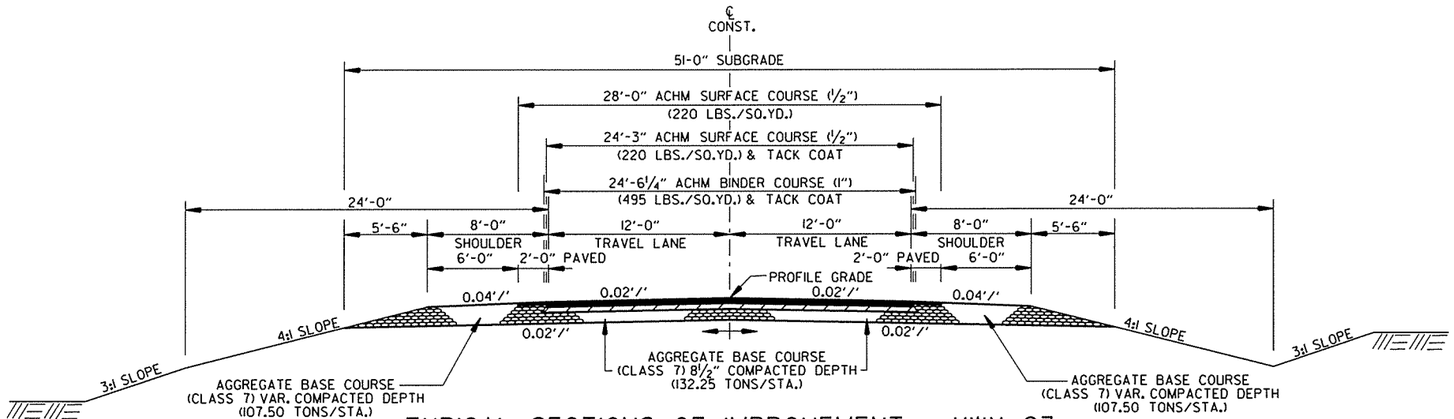


TYPICAL SECTIONS OF IMPROVEMENT - HWY. 23

SITE 1:
STA. 100+00.00 TO STA. 103+30.00
STA. 106+60.00 TO STA. 110+27.00

SITE 3:
STA. 300+00.00 TO STA. 302+50.00
STA. 306+50.00 TO STA. 309+15.00

SITE 4:
STA. 401+95.00 TO STA. 405+30.00
STA. 409+30.00 TO STA. 411+08.00



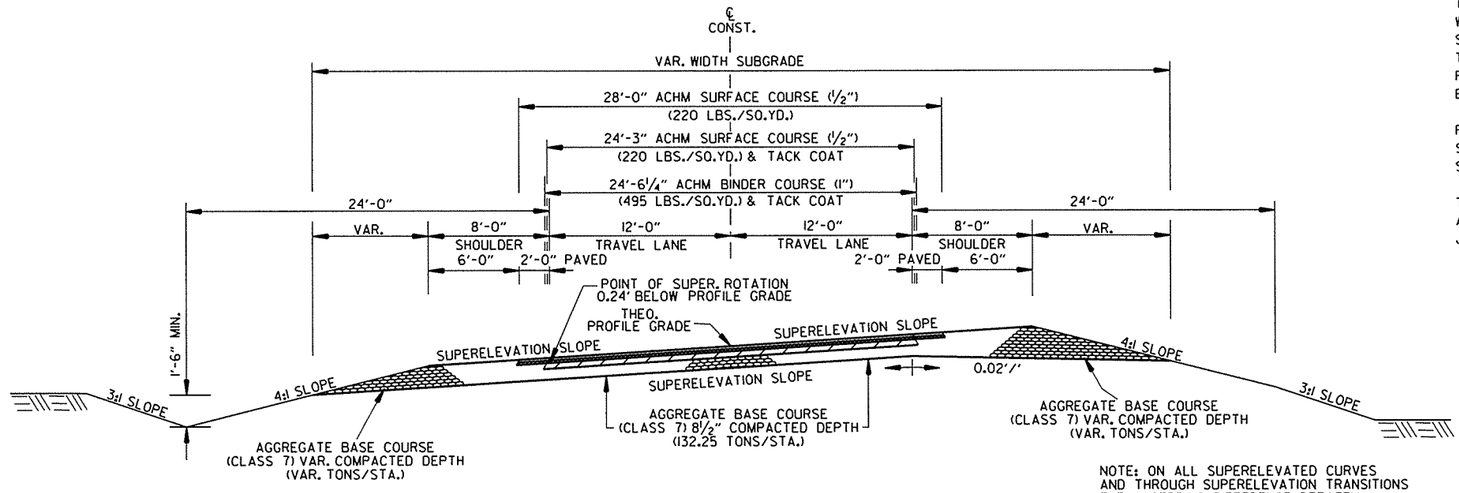
TYPICAL SECTIONS OF IMPROVEMENT - HWY. 23

SITE 1:
STA. 104+30.00 TO STA. 105+60.00

SITE 2:
STA. 200+70 TO STA. 206+18.89
STA. 210+71.11 TO STA. 220+00.00

SITE 3:
STA. 303+50.00 TO STA. 305+50.00

SITE 4:
STA. 406+30.00 TO STA. 408+30.00



TYPICAL SECTIONS OF IMPROVEMENT - HWY. 23
SUPERELEVATION

NOTE: ON ALL SUPERELEVATED CURVES AND THROUGH SUPERELEVATION TRANSITIONS THE ALGEBRAIC DIFFERENCE BETWEEN PAVEMENT SLOPE AND SHOULDER SLOPE SHALL NOT EXCEED 0.08'/'

NOTES:

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.

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

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

4/29/2015

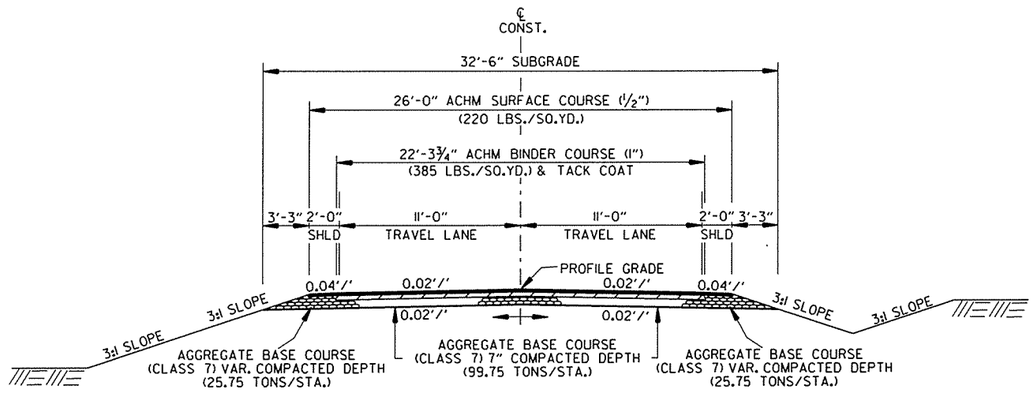
R090343.DGN

TYPICAL SECTIONS OF IMPROVEMENT

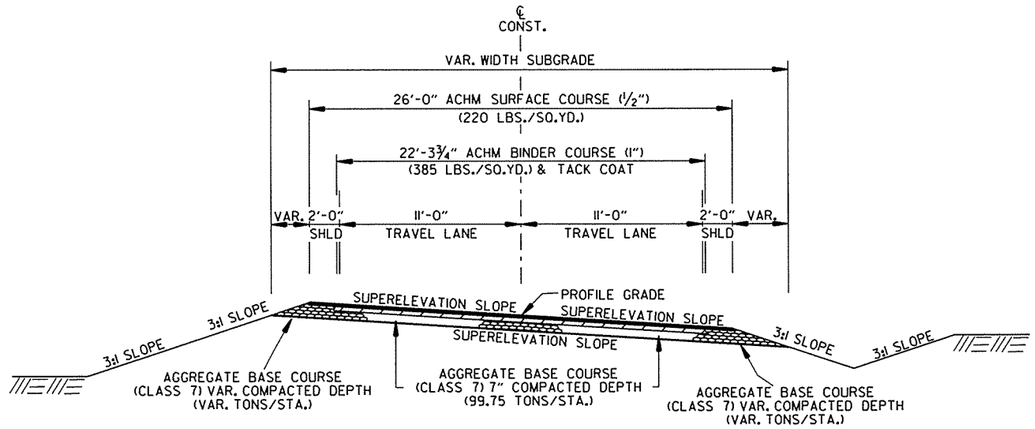
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	4	141

(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15



TYPICAL SECTIONS OF IMPROVEMENT - DETOUR



TYPICAL SECTIONS OF IMPROVEMENT - DETOUR
SUPERELEVATION

NOTES:

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.

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4/29/2015

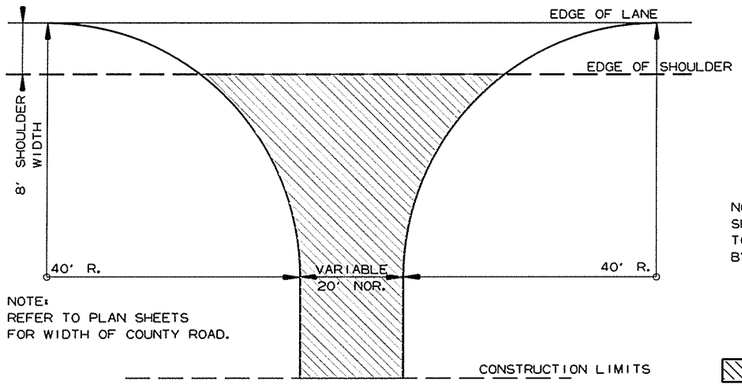
R090343.DGN

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.		090343	5	141

(2) SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15

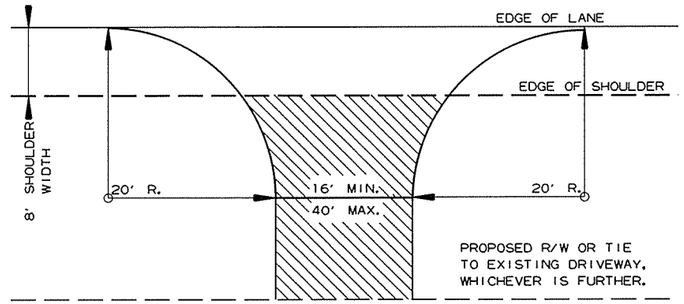


NOTE:
REFER TO PLAN SHEETS FOR WIDTH OF COUNTY ROAD.

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

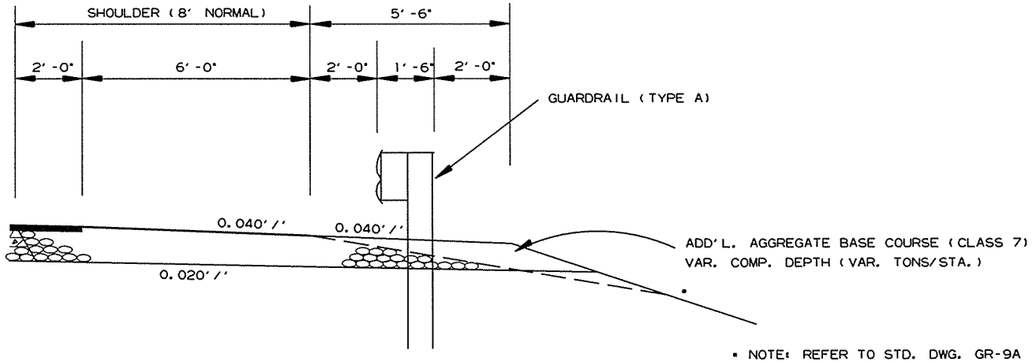
A. C. H. M. SURFACE COURSE (1/2") (220 LBS. PER SQ. YD.) AND AGGREGATE BASE COURSE (CLASS 7) 7" COMP. DEPTH IF ASPHALT OR GRAVEL DRIVE EXISTING; OR 6" CONCRETE IF CONCRETE DRIVE EXISTING.

DETAIL FOR COUNTY ROAD TURNOUTS OPEN SHOULDER SECTION



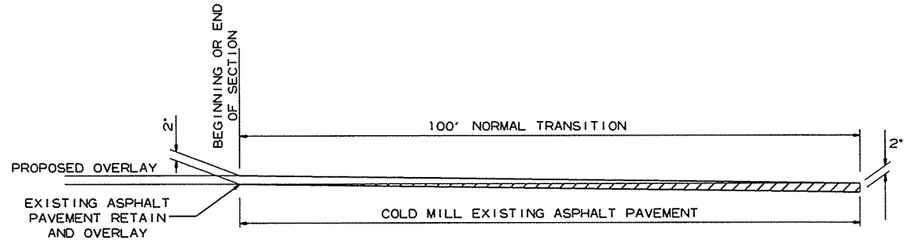
A. C. H. M. SURFACE COURSE (1/2") (220 LBS. PER SQ. YD.) AND AGGREGATE BASE COURSE (CLASS 7) 7" COMP. DEPTH IF ASPHALT OR GRAVEL DRIVE EXISTING; OR 6" CONCRETE IF CONCRETE DRIVE EXISTING.

DETAIL FOR DRIVEWAY TURNOUTS OPEN SHOULDER SECTION (ARTERIALS)



• NOTE: REFER TO STD. DWG. GR-9A AND CROSS SECTIONS FOR SLOPE REQUIREMENTS BEHIND GUARDRAIL.

WIDENING FOR GUARDRAIL



DETAIL FOR TRANSITIONS

12/4/2014

R090343.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.		090343	6	141

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	AP1	AP2	WE	WF1	WF2	G1	G2	W1	W2	W3	W4	CU.YD	LBS.
35'-8"	9'-0"	0'-10"	0'-9"	25	3:1	37'-10 5/8"	2'-0"	9'-10"	3'-0"	5	55	3'-3"	4'-6 3/8"	5'-4 3/8"	1'-8 3/8"	3'-1 1/2"	20'-6"	35'-6"	23'-11 1/8"	38'-11 1/8"	21.07	1798

	WING	F1 BAR SIZE	F1 MAX. SPACING	F1 NO. REQ'D	F1 LENGTHS VARY		F1 LENGTHS	F2 BAR SIZE	F2 SPACING	F2 NO. REQ'D	F2 LENGTHS VARY	F2 LENGTHS	F3 BAR SIZE	F3 SPACING	F3 NO. REQ'D	F3 LENGTHS VARY	F3 LENGTHS	F4 BAR SIZE	F4 SPACING	F4 NO. REQ'D	F4 LENGTHS VARY	F4 LENGTHS	F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS VARY	F5 LENGTHS	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY	F6 LENGTHS	F7 BAR SIZE	F7 NO. REQ'D	F7 LENGTHS	F8 BAR SIZE	F8 SPACING	F8 NO. REQ'D	F8 LENGTHS VARY	F8 LENGTHS	F9 BAR SIZE	F9 SPACING	F9 NO. REQ'D	F9 LENGTHS VARY	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	21	L	Min	4'-2"	4	12	9	L	6'-1"	-	-	-	L	-	4	18	8	Min	4'-10"	4	18	4	Min	20'-2"	4	18	14	L	Min	5'-11"	4	8	24'-9"	4	8	14	Min	2'-9"	4	18	2	Min	24'-11"	4	2	21'-2"	4	2	21'-6"	6	12	9	L	3'-4"	678
						Max	12'-2"														Max	18'-4"				2'-9"					X	Max	12'-5"							Max	4'-0"				Max	24'-11"											
					X	Min	0'-10"				X	1'-7"				X	-				Min										Min	2'-5"																								X	1'-8"	
						Max	2'-2"														Max										Max	2'-5"																							
					Y	Min	3'-5"				Y	4'-7"				Y	-				Min										Min	3'-7"																							
						Max	10'-1"														Max										Max	10'-1"																							
	WING B	4	12	36	L	Min	4'-2"	4	12	16	L	6'-5"	-	-	-	L	-	4	18	8	Min	8'-6"	4	18	4	Min	35'-2"	4	18	24	L	Min	5'-10"	4	8	39'-9"	4	18	25	Min	2'-9"	4	18	2	Min	29'-1"	4	2	35'-8"	4	2	40'-4"	6	12	9	L	3'-4"	1120
						Max	12'-10"														Max										Max	12'-5"																							
					X	Min	0'-10"				X	1'-11"				X	-				Min										Min	2'-5"																						X	1'-8"	
						Max	2'-10"														Max										Max	2'-5"																							
					Y	Min	3'-5"				Y	4'-7"				Y	-				Min										Min	3'-6"																							
						Max	10'-1"														Max										Max	10'-1"																							

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
6-10-15

TABULAR DATA BY: BHS DATE: 6/4/2015
CHECKED BY: [illegible] DATE: 6/10/15

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 THK.	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL 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
SK	SL	D	S	H	FL	T	HW	B	C	W	OW	OH																																																				
25	3:1	2	11	9	10'-4"	12.5	3	12.5	8	8	35'-8"	11'-1"	5	6	Max 35'-4" Min 3'-9" 35'-4"	30 4	8	6	Max 35'-4" Min 3'-9" 35'-4"	30 4	4	8	Max 35'-4" Min 3'-9" 35'-4"	23 3	4	8	Max 35'-4" Min 3'-9" 35'-4"	23 3	4	4	62	10'-9"	4	12	46	10'-9"	4	8.5	101	Max 18'-6" Min 1'-10"	4	8.5	101	Max 18'-6" Min 1'-10"	4	12	9	LONG 18'-3" SHORT 2'-1"	4	12	18	LONG 12'-10" SHORT 7'-5"

k1 SIZE	k1 LENGTH	k1 NO. REQ'D	k2 SIZE	k2 LENGTH	k2 NO. REQ'D	h SIZE	h LENGTH	h Y	h NO. REQ'D
4	39'-0"	6	4	39'-0"	6	4	1'-11"	0'-11"	41

CLASS "S" CONCRETE (Includes HDWL) CU. YDS.	①REINFORCING STEEL (GR 60) (Includes HDWL) LBS.
38.35	6322

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 REINFORCING STEEL "g" LENGTH = SL SIZE	SPACING	NO. REQ'D	BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" LENGTH = SL SIZE	SPACING	NO. REQ'D	SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" LENGTH = SL SIZE	SPACING	NO. REQ'D	INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" LENGTH = SL SIZE	SPACING	NO. REQ'D
D	S	H	T	B	C	W	OW	OH	SL																																																		

HDWL THK. HW	ADDITIONAL REINF. FOR HDWL LBS.	"h" BARS SIZE	Y	LENGTH	NO. REQ'D

CLASS "S" CONCRETE CU. YDS. PER LIN. FT.	REINFORCING STEEL (GR. 60) LBS. PER LIN. FT.	②ADTL. REINF. PER LONG. LAP LOCATION LBS.	ADDITIONAL CONCRETE FOR HDWL CU. YDS.	TOTAL ADTL. REINF. FOR HDWL LBS.

② Bar Lap - Add one long. lap for each Slope Section, and one additional long. lap for Slope Sections greater than 40'-0" in length.

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
D	S	H	T	B	C	W	OW	OH	SL																																																	
A 2	11	9	12.5	12.5	8	8	35'-8"	11'-1"	61.33	4	35'-4"	8	36'-1"	8	35'-4"	12	61	4	35'-4"	4	36'-0"	4	35'-4"	16	45	4	4	366	10'-9"	4	12	244	10'-9"	4	8.5	101	4	8.5	101	4	12	18	4	12	36

CLASS "S" CONCRETE CU. YDS. PER LIN. FT.	REINFORCING STEEL (GR. 60) LBS PER LIN. FT.	③ADTL. STEEL PER LONG. LAP LOCATION (S) LBS.
3.64	511	299

SHEET 1 OF 2
DETAILS OF R.C. BOX CULVERT
TRIPLE BARREL BOX CULVERT
Sta. 104+94

SPECIAL DETAILS

LRFD

Ver. Lll4 b090343_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.		090343	7	141

① SPECIAL DETAILS

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
6-10-15

TABULAR DATA BY: BHS DATE: 6/4/2015
CHECKED BY: KWY DATE: 6/10/15

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
35'-8"	9'-0"	0'-10"	0'-9"	25	3:1	37'-10 5/8"	2'-0"	9'-10"	3'-0"	5	55	3'-3"	4'-6 3/8"	5'-4 3/8"	1'-8 3/8"	3'-1 1/2"	20'-6"	35'-6"	23'-11 1/8"	38'-11 1/8"

CLASS "S" CONCRETE (Includes apron)	REINFORCING STEEL (Includes apron and laps if required)
OUTLET	OUTLET
CU.YD	LBS.
22.59	1798

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	21	L	Min	4'-2"	4	12	9	L	6'-1"	-	-	-	L	-	4	18	8	Min	4	18	4	20'-2"	4	18	14	L	Min	5'-11"	4	8	24'-9"	4	18	14	Min	4	18	2	Min	24'-11"	4	2	21'-2"	4	2	21'-6"	6	12	9	L	3'-4"	678
					Max	12'-2"														4'-10"									Max	12'-5"							2'-9"				Max											
				X	Min	0'-10"				X	1'-7"				X	-				Max	18'-4"							X	Min	2'-5"							Max	4'-0"												X	1'-8"	
					Max	2'-2"																							Max	2'-5"																					
				Y	Min	3'-5"				Y	4'-7"				Y	-				Min								Y	Min	3'-7"							Min															
					Max	10'-1"																							Max	10'-1"																					
WING B	4	12	36	L	Min	4'-2"	4	12	16	L	6'-5"	-	-	-	L	-	4	18	8	Min	4	18	4	35'-2"	4	18	24	L	Min	5'-10"	4	8	39'-9"	4	18	25	Min	4	18	2	Min	29'-1"	4	2	35'-8"	4	2	40'-4"	6	12	9	L	3'-4"	1120
					Max	12'-10"														8'-6"									Max	12'-5"							2'-9"				Max											
				X	Min	0'-10"				X	1'-11"				X	-				Max	31'-10"							X	Min	2'-5"							Max	4'-10"												X	1'-8"	
					Max	2'-10"																							Max	2'-5"																					
				Y	Min	3'-5"				Y	4'-7"				Y	-				Min								Y	Min	3'-6"							Min															
					Max	10'-1"																							Max	10'-1"																					

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 THK.	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL 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
SK	SL	D	S	H	LL	T	HW	B	C	W	OW	OH																																															
25	3:1	2	11	9	10'-4"	12.5	3	12.5	8	8	35'-8"	11'-1"	5	6	Max 35'-4" Min 3'-9" 35'-4"	30 4	8	6	Max 35'-4" Min 3'-9" 35'-4"	30 4	4	8	Max 35'-4" Min 3'-9" 35'-4"	23 3	4	8	Max 35'-4" Min 3'-9" 35'-4"	23 3	4	4	62	10'-9"	4	12	46	10'-9"	4	8.5	101	Max 18'-6" Min 1'-10"	4	8.5	101	Max 18'-6" Min 1'-10"	4	12	9	LONG 18'-3" SHORT 2'-1"	4	12	18	LONG 12'-10" SHORT 7'-5"

CLASS "S" CONCRETE (Includes HDWL)	① REINFORCING STEEL (GR 60) (Includes HDWL)
CU. YDS.	LBS.
38.35	6322

k1 SIZE	k1 LENGTH	k1 NO. REQ'D	k2 SIZE	k2 LENGTH	k2 NO. REQ'D	h SIZE	h LENGTH	h Y	h NO. REQ'D
4	39'-0"	6	4	39'-0"	6	4	1'-11"	0'-11"	41

OUTLET 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	LENGTH = OW - 4" + BENDS a SIZE	a L	Bent b SIZE	Bent b L	c SIZE	c L	LENGTH = OW - 4" + BENDS SPACING	LENGTH = OW - 4" + BENDS 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	BOTTOM SLAB REINFORCING STEEL SPACING	BOTTOM SLAB REINFORCING STEEL NO. REQ'D	SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE	SIDE WALL REINFORCING STEEL "f0" SPACING	SIDE WALL REINFORCING STEEL "f0" NO. REQ'D	SIDE WALL REINFORCING STEEL "f0" LENGTH	INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE	INTERIOR WALL REINFORCING STEEL "f1" SPACING	INTERIOR WALL REINFORCING STEEL "f1" NO. REQ'D	INTERIOR WALL REINFORCING STEEL "f1" LENGTH	TOP SLAB DISTRIBUTION REINFORCING STEEL "g" LENGTH = SL SIZE	TOP SLAB DISTRIBUTION REINFORCING STEEL "g" SPACING	TOP SLAB DISTRIBUTION REINFORCING STEEL "g" NO. REQ'D	BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" LENGTH = SL SIZE	BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" SPACING	BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" NO. REQ'D	SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" LENGTH = SL SIZE	SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" SPACING	SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" NO. REQ'D	INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" LENGTH = SL SIZE	INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" SPACING	INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" NO. REQ'D

HDWL THK. HW	ADDITIONAL REINF. FOR HDWL LBS.	"h" BARS SIZE	"h" BARS Y	"h" BARS LENGTH	"h" BARS NO. REQ'D

CLASS "S" CONCRETE CU. YDS. PER LIN. FT.	REINFORCING STEEL (GR. 60) LBS. PER LIN. FT.	② ADTL. REINF. PER LONG. LAP LOCATION LBS.	ADDITIONAL CONCRETE FOR HDWL CU. YDS.	TOTAL ADTL. REINF. FOR HDWL LBS.

② Bar Lap - Add one long. lap for each Slope Section, and one additional long. lap for Slope Sections greater than 40'-0" in length.

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

TRIPLE BARREL BOX CULVERT
Sta. 104+94

SPECIAL DETAILS

Ver. LJ14 b090343_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.		090343	8	141

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		WINGWALL ANGLE (DEGREE)		FOOTING WIDTH AT WALL END	WIDTH OF WING FOOTINGS AT HDWL		FOOTING DIMENSION PARALLEL WITH HDWL		LENGTH OF WINGWALLS		LENGTH OF FOOTING HEEL	
								AT HDWL	AT WING END	WING A	WING B		WING A	WING B	WING A	WING B	WING A	WING B	WING A	WING B
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	AF1	AF2	WE	WF1	WF2	G1	G2	W1	W2	W3	W4
58'-8"	6'-0"	0'-9"	0'-8"	45	3:1	81'-6 5/8"	2'-0"	6'-10"	2'-0"	0	60	3'-2"	3'-2"	3'-9"	0'-6"	0'-5 1/8"	14'-6"	29'-0"	16'-5 1/2"	37'-0 1/4"

CLASS "S" CONCRETE (Includes apron)	REINFORCING STEEL (Includes apron and laps if required)
INLET	INLET
CU.YD	LBS.
15.13	1123

WING	F1				F2				F3				F4				F5				F6				F7			F8				F9				F10			F11			F12				REINF. STEEL QTY. PER WING (LBS)
	BAR SIZE	MAX. SPACING	NO. REQ'D	LENGTHS VARY	BAR SIZE	SPACING	NO. REQ'D	LENGTHS	BAR SIZE	SPACING	NO. REQ'D	LENGTHS	BAR SIZE	SPACING	NO. REQ'D	LENGTHS VARY	BAR SIZE	SPACING	NO. REQ'D	LENGTHS	BAR SIZE	SPACING	NO. REQ'D	LENGTHS VARY	BAR SIZE	NO. REQ'D	LENGTHS	BAR SIZE	SPACING	NO. REQ'D	LENGTHS VARY	BAR SIZE	SPACING	NO. REQ'D	LENGTHS	BAR SIZE	NO. REQ'D	LENGTHS	BAR SIZE	NO. REQ'D	LENGTHS	BAR SIZE	SPACING	NO. REQ'D	LENGTHS	
WING A	4	12	15	L Min 3'-0" Max 7'-8" X Min 0'-9" Max 0'-9" Y Min 2'-4" Max 7'-0"	-	-	-	L - X - Y -	-	-	-	L - X - Y -	4	18	4	Min 4'-10" Max 9'-4"	4	18	4	14'-2"	4	18	10	L Min 4'-9" Max 9'-3" X Min 2'-4" Max 2'-4" Y Min 2'-6" Max 7'-0"	4	8	17'-4"	4	18	10	Min 2'-8" Max 2'-8"	-	-	-	Min - Max -	4	2	14'-10"	4	2	15'-4"	6	12	6	L 3'-4" X 1'-8"	396
WING B	4	12	29	L Min 3'-0" Max 8'-3" X Min 0'-9" Max 1'-4" Y Min 2'-4" Max 7'-0"	-	-	-	L - X - Y -	-	-	-	L - X - Y -	4	18	4	Min 9'-10" Max 18'-10"	4	18	4	28'-8"	4	18	20	L Min 4'-7" Max 9'-3" X Min 2'-4" Max 2'-4" Y Min 2'-4" Max 7'-0"	4	8	37'-10"	4	18	20	Min 2'-8" Max 3'-3"	-	-	-	Min - Max -	4	2	28'-11"	4	2	31'-9"	6	12	6	L 3'-4" X 1'-8"	727

③ 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"

No. 9235
CHARLES R. ELLIS
Charles R. Ellis
6-10-15

TABULAR DATA BY: BHS DATE: 6/4/15
CHECKED BY: KWY DATE: 6/10/15

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 THK.	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVERALL WIDTH	OVERALL HEIGHT	TOP SLAB REINFORCING STEEL								BOTTOM SLAB REINFORCING STEEL								SIDE WALL REINFORCING STEEL				INTERIOR WALL REINFORCING STEEL				TOP SLAB DISTRIBUTION REINFORCING STEEL				BOTTOM SLAB DISTRIBUTION REINFORCING STEEL				SIDE WALL DISTRIBUTION REINFORCING STEEL				INTERIOR WALL DISTRIBUTION REINFORCING STEEL			
SK	SL	D	S	H	LL	T	HW	B	C	W	OW	OH	a				c				d				f				f0				f1				g				e				d1				d2			
													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
45	3:1	2	11	6	31'-4"	12.5	3	12.5	6	8	58'-8"	8'-1"	5	6	Max 58'-4" Min 2'-1" 58'-4"	113 4	6	5.5	Max 58'-4" Min 2'-1" 58'-4"	123 5	4	8.5	Max 58'-4" Min 2'-1" 58'-4"	80 3	4	10	Max 58'-4" Min 2'-1" 58'-4"	68 3	4	4.5	168	7'-9"	4	12	264	7'-9"	4	8.5	169	Max 60'-6" Min 1'-10"	4	8.5	169	Max 60'-6" Min 1'-10"	4	12	6 6	LONG 60'-2" SHORT 2'-2"	4	12	12 24 12	LONG 48'-9" MID 37'-0" SHORT 13'-7"

k1			k2			h			
SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	Y	NO. REQ'D
7	43'-1"	12	7	43'-1"	12	4	1'-11"	0'-11"	84

CLASS "S" CONCRETE (Includes HDWL)	① REINFORCING STEEL (GR 60) (Includes HDWL)
CU. YDS.	LBS.
169.42	25880

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								BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS								SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4"				INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4"				TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL			BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL			SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL			INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL		
	D	S	H	T	B	C	W	OW	OH	SL	a		Bent b		c		SPACING	NO. REQ'D	d		Bent b1		f		SPACING	NO. REQ'D	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	SIZE	SPACING	NO. REQ'D	SIZE	SPACING	NO. REQ'D	SIZE	SPACING	NO. REQ'D
											SIZE	L	SIZE	L	SIZE	L			SIZE	L	SIZE	L	SIZE	L																						

HDWL THK.	ADDITIONAL REINF. FOR HDWL	"h" BARS			
HW	LBS.	SIZE	Y	LENGTH	NO. REQ'D

CLASS "S" CONCRETE	REINFORCING STEEL (GR. 60)	② ADTL. REINF. PER LONG. LAP LOCATION	ADTL. REINF. FOR TRANS. LAP	ADDITIONAL CONCRETE FOR HDWL	TOTAL ADTL. REINF. FOR HDWL
CU. YDS. PER LIN. FT.	LBS. PER LIN. FT.	LBS.	LBS. PER LIN. FT.	CU. YDS.	LBS.

② Bar Lap - Add one long. lap for each Slope Section, and one additional long. lap for Slope Sections greater than 40'-0" in length.

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								BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS								SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4"				INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4"				TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL			BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL			SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL			INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL		
	D	S	H	T	B	C	W	OW	OH	SL	a		Bent b		c		SPACING	NO. REQ'D	d		Bent b1		f		SPACING	NO. REQ'D	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	SIZE	SPACING	NO. REQ'D	SIZE	SPACING	NO. REQ'D	SIZE	SPACING	NO. REQ'D
											SIZE	L	SIZE	L	SIZE	L			SIZE	L	SIZE	L	SIZE	L																						
A	2	11	6	12.5	12.5	6	8	58'-8"	8'-1"	42.3333	4	58'-4"	8	59'-10"	8	58'-4"	12	42	4	58'-4"	5	59'-9"	4	58'-4"	22	23	4	4.5	224	7'-9"	4	12	336	7'-9"	4	8.5	169	4	8.5	169	4	12	12	4	12	48

CLASS "S" CONCRETE	REINFORCING STEEL (GR. 60)	③ ADTL. REINF. PER LONG. LAP LOCATION (S)	ADTL. REINF. FOR TRANS. LAP
CU. YDS. PER LIN. FT.	LBS. PER LIN. FT.	LBS.	LBS. PER LIN. FT.
5.34	766	465	28

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SHEET 1 OF 2
DETAILS OF R.C. BOX CULVERT
QUINTUPLE BARREL BOX CULVERT
Sta. 304+60
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.		090343	9	141

① SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
6-10-15

TABULAR DATA BY: BHS DATE: 6/4/15
CHECKED BY: KWY DATE: 6/10/15

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	CLASS "S" CONCRETE (Includes apron)	REINFORCING STEEL (Includes apron and laps if required)
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	AF1	AF2	WE	WF1	WF2	G1	G2	W1	W2	W3	W4	OUTLET	OUTLET
58'-8"	6'-0"	0'-9"	0'-8"	45	3:1	81'-6 5/8"	2'-0"	6'-10"	2'-0"	0	60	3'-2"	3'-2"	3'-9"	0'-6"	0'-5 1/8"	14'-6"	29'-0"	16'-5 1/2"	37'-0 1/4"	17.65	1123

WING	F1 BAR SIZE	F1 MAX. SPACING	F1 NO. REQ'D	F1 LENGTHS VARY	F1	F1	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	F6	F6	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	15	L	Min	3'-0"	-	-	-	L -	-	-	-	L -	4	18	4	Min	4	18	4	14'-2"	4	18	10	L	Min	4'-9"	4	8	17'-4"	4	18	10	Min	-	-	-	Min	4	2	14'-10"	4	2	15'-4"	6	12	6	L	3'-4"	396
					Max	7'-8"												4'-10"									Max	9'-3"							2'-8"														
				X	Min	0'-9"				X -				X -				Max								X	Min	2'-4"							Max				Max							X	1'-8"	
					Max	0'-9"												9'-4"									Max	2'-4"							2'-8"														
				Y	Min	2'-4"				Y -				Y -												Y	Min	2'-6"								-												
					Max	7'-0"																					Max	7'-0"																					
WING B	4	12	29	L	Min	3'-0"	-	-	-	L -	-	-	-	L -	4	18	4	Min	4	18	4	28'-8"	4	18	20	L	Min	4'-7"	4	8	37'-10"	4	18	20	Min	-	-	-	Min	4	2	28'-11"	4	2	31'-9"	6	12	6	L	3'-4"	727
					Max	8'-3"												9'-10"									Max	9'-3"							2'-8"														
				X	Min	0'-9"				X -				X -				Max								X	Min	2'-4"							Max				Max							X	1'-8"	
					Max	1'-4"												18'-10"									Max	2'-4"							3'-3"														
				Y	Min	2'-4"				Y -				Y -												Y	Min	2'-4"								-												
					Max	7'-0"																					Max	7'-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 THK.	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	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	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
SK	SL	D	S	H	LL	T	HW	B	C	W	OW	OH																																											
45	3:1	2	11	6	31'-4"	12.5	3	12.5	6	8	58'-8"	8'-1"	5	6	Max 58'-4" Min 2'-1"	113	6	5.5	Max 58'-4" Min 2'-1"	123	4	8.5	Max 58'-4" Min 2'-1"	80	4	10	Max 58'-4" Min 2'-1"	68	4	4.5	168	7'-9"	4	12	264	7'-9"	4	8.5	169	Max 60'-6" Min 1'-10"	4	8.5	169	Max 60'-6" Min 1'-10"	4	12	6	LONG 60'-2" SHORT 2'-2"	4	12	12	LONG 48'-9"
															58'-4"	4			Min 58'-4"	5			58'-4"	3			58'-4"	3																									24	MID 37'-0"
																																																							12	SHORT 13'-7"

k1 SIZE	k1 LENGTH	k1 NO. REQ'D	k2 SIZE	k2 LENGTH	k2 NO. REQ'D	h SIZE	h LENGTH	h Y	h NO. REQ'D
7	43'-1"	12	7	43'-1"	12	4	1'-11"	0'-11"	84

CLASS "S" CONCRETE (Includes HDWL) CU. YDS.	①REINFORCING STEEL (GR 60) (Includes HDWL) LBS.
169.42	25880

OUTLET 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	Bentb SIZE	Bentb L	c SIZE	c L	c SPACING	c NO. REQ'D	BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS d SIZE	d L	Bentb1 SIZE	Bentb1 L	f SIZE	f L	f SPACING	f 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

HDWL THK. HW	ADDITIONAL REINF. FOR HDWL LBS.	"h" BARS SIZE	Y	LENGTH	NO. REQ'D

CLASS "S" CONCRETE CU. YDS. PER LIN. FT.	REINFORCING STEEL (GR. 60) LBS. PER LIN. FT.	②ADTL. REINF. PER LONG. LAP LOCATION LBS.	ADTL. REINF. FOR TRANS. LAP LBS. PER LIN. FT.	ADDITIONAL CONCRETE FOR HDWL CU. YDS.	TOTAL ADTL. REINF. FOR HDWL LBS.

② Bar Lap - Add one long. lap for each Slope Section, and one additional long. lap for Slope Sections greater than 40'-0" in length.

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. 304+60

SPECIAL DETAILS

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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.		090343	10	141

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)	REINFORCING STEEL (Includes apron and laps if required)
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	AP1	AP2	WE	WF1	WF2	G1	G2	W1	W2	W3	W4	INLET	INLET
43'-8"	4'-0"	0'-9"	0'-8"	53	3:1	70'-10 3/4"	1'-0"	4'-10"	1'-4"	0	60	2'-2"	2'-3 3/4"	2'-7 7/8"	0'-7 3/4"	0'-3"	10'-6"	21'-0"	11'-1 1/2"	30'-5 5/8"	CU.YD	LBS.
																					9.66	672

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
WING A	4	12	11	L	Min	2'-4"	-	-	-	L -	-	-	-	L -	4	18	4	Min 3'-4"	4	18	2	10'-2"
					Max	5'-10"												Max 7'-10"				
				X	Min	0'-9"				X -				X -								
					Max	0'-11"																
				Y	Min	1'-8"				Y -				Y -								
					Max	5'-0"																
WING B	4	12	21	L	Min	2'-4"	-	-	-	L -	-	-	-	L -	4	18	4	Min 6'-10"	4	18	2	20'-8"
					Max	6'-2"												Max 15'-10"				
				X	Min	0'-9"				X -				X -								
					Max	1'-3"																
				Y	Min	1'-8"				Y -				Y -								
					Max	5'-0"																

WING	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	7	L	Min	3'-3"	4	6	12'-0"	4	18	7	Min 1'-8"	-	-	-	Min -	4	2	10'-7"	4	2	11'-4"	6	12	4	L	3'-4"	237
					Max	6'-3"							Max 7'-10"				Max -												
				X	Min	1'-4"																						X	1'-8"
					Max	1'-4"																							
				Y	Min	2'-0"																							
					Max	5'-0"																							
WING B	4	18	14	L	Min	3'-1"	4	6	31'-4"	4	18	14	Min 1'-8"	-	-	-	Min -	4	2	20'-10"	4	2	23'-7"	6	12	4	L	3'-4"	435
					Max	6'-3"							Max 2'-2"				Max -												
				X	Min	1'-4"																						X	1'-8"
					Max	1'-4"																							
				Y	Min	1'-10"																							
					Max	5'-0"																							

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.

③ 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
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
6-10-15

TABULAR DATA BY: BHS DATE: 6/4/15
CHECKED BY: KWY DATE: 6/10/15

INLET SKEWED END SECTION

SKEW (DEGREE)	SLOPE	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	SECTION LENGTH	TOP SLAB THK.	HDWL THK.	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVERALL WIDTH	OVERALL HEIGHT
SK	SL	D	S	H	LL	T	HW	B	C	W	OW	OH
53	3:1	2	8	4	31'-0"	11	3	11	6	8	43'-8"	5'-10"

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
5	8	Max 43'-4" / Min 1'-10"	83	7	7	Max 43'-4" / Min 1'-10"	95
		43'-4"	3			43'-4"	4

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
4	9	Max 43'-4" / Min 1'-10"	74	4	12	Max 43'-4" / Min 1'-10"	56
		43'-4"	3			43'-4"	2

SIDE WALL REINFORCING STEEL f0 SIZE	f0 SPACING	f0 NO. REQ'D	f0 LENGTH
4	9	83	5'-6"

INTERIOR WALL REINFORCING STEEL f1 SIZE	f1 SPACING	f1 NO. REQ'D	f1 LENGTH
4	12	256	5'-6"

TOP SLAB DISTRIBUTION REINFORCING STEEL g SIZE	g SPACING	g NO. REQ'D	g LENGTHS VARY
4	10	109	Max 59'-9" / Min 1'-10"

BOTTOM SLAB DISTRIBUTION REINFORCING STEEL e SIZE	e SPACING	e NO. REQ'D	e LENGTHS VARY
4	10	109	Max 59'-9" / Min 1'-10"

SIDE WALL DISTRIBUTION REINFORCING STEEL d1 SIZE	d1 SPACING	d1 NO. REQ'D	d1 LENGTH
4	12	4	LONG 59'-4"
		4	SHORT 2'-3"

INTERIOR WALL DISTRIBUTION REINFORCING STEEL d2 SIZE	d2 SPACING	d2 NO. REQ'D	d2 LENGTH
4	12	8	LONG 48'-2"
		16	MID 36'-7"
		8	SHORT 13'-5"

k1 SIZE	k1 LENGTH	k1 NO. REQ'D	k2 SIZE	k2 LENGTH	k2 NO. REQ'D	h SIZE	h LENGTH	h Y	h NO. REQ'D
6	37'-5"	12	6	37'-5"	12	4	1'-10"	0'-10"	74

CLASS "S" CONCRETE (Includes HDWL) CU. YDS.	①REINFORCING STEEL (GR 60) (Includes HDWL) LBS.
110.46	16990

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

HDWL THK. HW	ADDITIONAL REINF. FOR HDWL LBS.	"h" BARS SIZE	h Y	h LENGTH	h NO. REQ'D

CLASS "S" CONCRETE CU. YDS. PER LIN. FT.	REINFORCING STEEL (GR. 60) LBS. PER LIN. FT.	②ADTL. REINF. PER LONG. LAP LOCATION LBS.	ADTL. REINF. FOR TRANS. LAP LBS. PER LIN. FT.	ADDITIONAL CONCRETE FOR HDWL CU. YDS.	TOTAL ADTL. REINF. FOR HDWL LBS.

② Bar Lap - Add one long. lap for each Slope Section, and one additional long. lap for Slope Sections greater than 40'-0" in length.

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
A	2	8	4	11	11	6	8	43'-8"	5'-10"	65

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
4	43'-4"	8	44'-6"	8	43'-4"	17	45

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
4	43'-4"	4	44'-5"	4	43'-4"	22	35

SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE	f0 SPACING	f0 NO. REQ'D	f0 LENGTH
4	9	172	5'-6"
INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE	f1 SPACING	f1 NO. REQ'D	f1 LENGTH
4	12	520	5'-6"
TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL SIZE	g SPACING	g NO. REQ'D	
4	10	109	
BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL SIZE	e SPACING	e NO. REQ'D	
4	10	109	
SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL SIZE	d1 SPACING	d1 NO. REQ'D	
4	12	8	
INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL SIZE	d2 SPACING	d2 NO. REQ'D	
4	12	32	

CLASS "S" CONCRETE CU. YDS. PER LIN. FT.	REINFORCING STEEL (GR. 60) LBS. PER LIN. FT.	③ ADTL. REINF. PER LONG. LAP LOCATION (S) LBS.	ADTL. REINF. FOR TRANS. LAP LBS. PER LIN. FT.
3.51	445	302	20

SHEET 1 OF 2
DETAILS OF R.C. BOX CULVERT
QUINTUPLE BARREL BOX CULVERT
Sta. 407+25

SPECIAL DETAILS

Ver. 1.9 14 b090343_c3.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.		090343	11	141

① SPECIAL DETAILS

STATE OF ARKANSAS
CHARLES R. ELLIS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
6-10-15

TABULAR DATA BY: BHS DATE: 6/4/15
CHECKED BY: CWW DATE: 6/10/15

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"	53	3:1	70'-10 3/4"	1'-0"	4'-10"	1'-4"	0	60	2'-2"	2'-3 3/4"	2'-7 7/8"	0'-7 3/4"	0'-3"	10'-6"	21'-0"	11'-1 1/2"	30'-5 5/8"

CLASS "S" CONCRETE (Includes apron)	REINFORCING STEEL (Includes apron and laps if required)
OUTLET	OUTLET
CU.YD	LBS.
11.76	672

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"

	F1					F2				F3				F4				F5				F6					F7			F8				F9				F10			F11			F12				
WING	BAR SIZE	MAX. SPACING	NO. REQ'D	LENGTHS VARY		BAR SIZE	SPACING	NO. REQ'D	LENGTHS	BAR SIZE	SPACING	NO. REQ'D	LENGTHS	BAR SIZE	SPACING	NO. REQ'D	LENGTHS VARY	BAR SIZE	SPACING	NO. REQ'D	LENGTHS	BAR SIZE	SPACING	NO. REQ'D	LENGTHS VARY		BAR SIZE	NO. REQ'D	LENGTHS	BAR SIZE	SPACING	NO. REQ'D	LENGTHS VARY	BAR SIZE	SPACING	NO. REQ'D	LENGTHS	BAR SIZE	NO. REQ'D	LENGTHS	BAR SIZE	NO. REQ'D	LENGTHS	BAR SIZE	SPACING	NO. REQ'D	LENGTHS	REINF. STEEL QTY. PER WING (LBS)
WING A	4	12	11	L	Min	2'-4"	-	-	-	L	-	-	-	L	-	-	Min	4	18	2	10'-2"	4	18	7	L	Min	4	6	12'-0"	4	18	7	Min	-	-	-	Min	4	2	10'-7"	4	2	11'-4"	6	12	4	L	3'-4"	237
					Max	5'-10"											3'-4"									Max	6'-3"						1'-8"				Max									
				X	Min	0'-9"				X	-			4	18	4									X	Min	1'-4"							-				2	10'-7"	4	2	11'-4"				X	1'-8"	
					Max	0'-11"											Max									Max	1'-4"						Max													
				Y	Min	1'-8"				Y	-						7'-10"								Y	Min	2'-0"						1'-10"													
					Max	5'-0"																				Max	5'-0"																		
WING B	4	12	21	L	Min	2'-4"	-	-	-	L	-	-	-	L	-	-	Min	4	18	2	20'-8"	4	18	14	L	Min	4	6	31'-4"	4	18	14	Min	-	-	-	Min	4	2	20'-10"	4	2	23'-7"	6	12	4	L	3'-4"	435
					Max	6'-2"											6'-10"									Max	6'-3"						1'-8"				Max									
				X	Min	0'-9"				X	-			4	18	4									X	Min	1'-4"							-				2	20'-10"	4	2	23'-7"				X	1'-8"	
					Max	1'-3"											Max									Max	1'-4"						Max													
				Y	Min	1'-8"				Y	-						15'-10"								Y	Min	1'-10"						2'-2"													
					Max	5'-0"																				Max	5'-0"																		

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 THK.	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	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	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
SK	SL	D	S	H	LL	T	HW	B	C	W	OW	OH																																									
53	3:1	2	8	4	31'-0"	11	3	11	6	8	43'-8"	5'-10"	5	8	Max 43'-4" Min 1'-10"	83	7	7	Max 43'-4" Min 1'-10"	95	4	9	Max 43'-4" Min 1'-10"	74	4	12	Max 43'-4" Min 1'-10"	56	4	9	83	5'-6"	4	12	256	5'-6"	4	10	109	Max 59'-9" Min 1'-10"	4	10	109	Max 59'-9" Min 1'-10"	4	12	4	LONG 59'-4" SHORT 2'-3"	4	12	8	LONG 48'-2" MID 36'-7" SHORT 13'-5"
															43'-4"	3			43'-4"	4			43'-4"	3			43'-4"	2																											

CLASS "S" CONCRETE (Includes HDWL)	① REINFORCING STEEL (GR 60) (Includes HDWL)
CU. YDS.	LBS.
110.46	16990

k1 SIZE	k1 LENGTH	k1 NO. REQ'D	k2 SIZE	k2 LENGTH	k2 NO. REQ'D	h SIZE	h LENGTH	h Y	h NO. REQ'D
6	37'-5"	12	6	37'-5"	12	4	1'-10"	0'-10"	74

OUTLET 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	Bentb SIZE	Bentb L	c SIZE	c L	c SPACING	c NO. REQ'D	BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS d SIZE	d L	Bentb1 SIZE	Bentb1 L	f SIZE	f L	f SPACING	f 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

HDWL THK. HW	ADDITIONAL REINF. FOR HDWL LBS.	"h" BARS SIZE	"h" BARS Y	"h" BARS LENGTH	"h" BARS NO. REQ'D

CLASS "S" CONCRETE CU. YDS. PER LIN. FT.	REINFORCING STEEL (GR. 60) LBS. PER LIN. FT.	② ADTL. REINF. PER LONG. LAP LOCATION LBS.	ADTL. REINF. FOR TRANS. LAP LBS. PER LIN. FT.	ADDITIONAL CONCRETE FOR HDWL CU. YDS.	TOTAL ADTL. REINF. FOR HDWL LBS.

② Bar Lap - Add one long. lap for each Slope Section, and one additional long. lap for Slope Sections greater than 40'-0" in length.

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. 407+25

SPECIAL DETAILS

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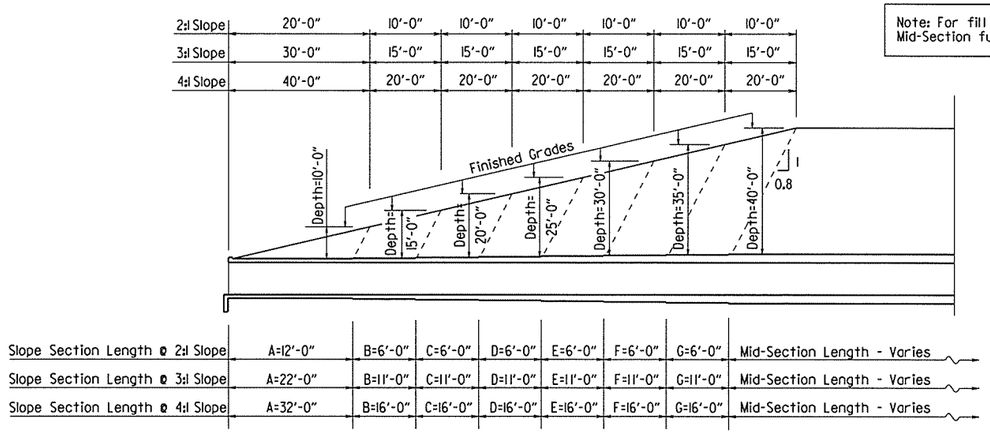
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	12	141

1 SPECIAL DETAILS

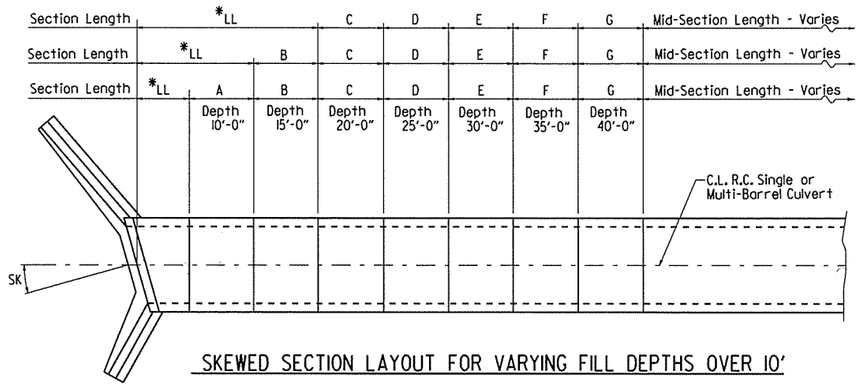


Note: For fill depths 10' and under, use Mid-Section full length of box culvert.

LONGITUDINAL SECTION LENGTH SCHEDULE FOR VARYING FILL DEPTHS OVER 10'

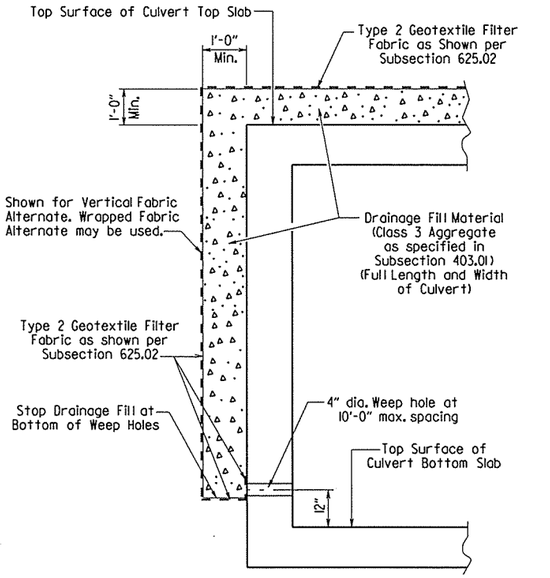
Lengths for Non-Skewed Boxes

*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.



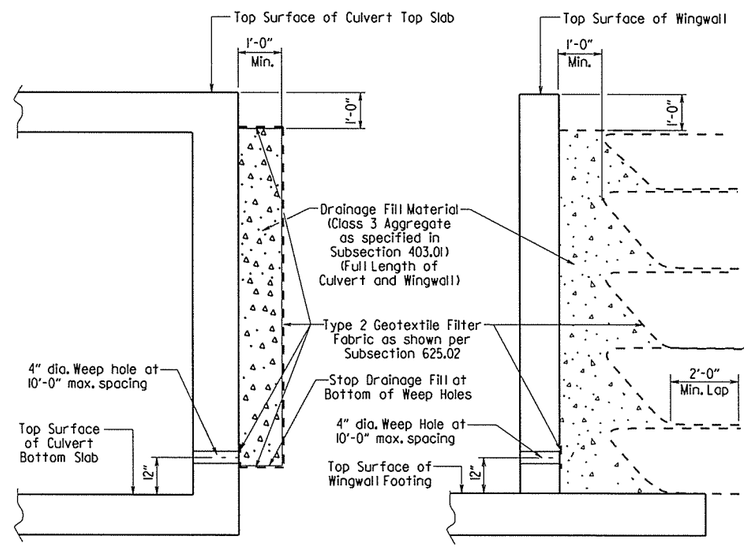
SKEWED SECTION LAYOUT FOR VARYING FILL DEPTHS OVER 10'

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
6-10-15



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

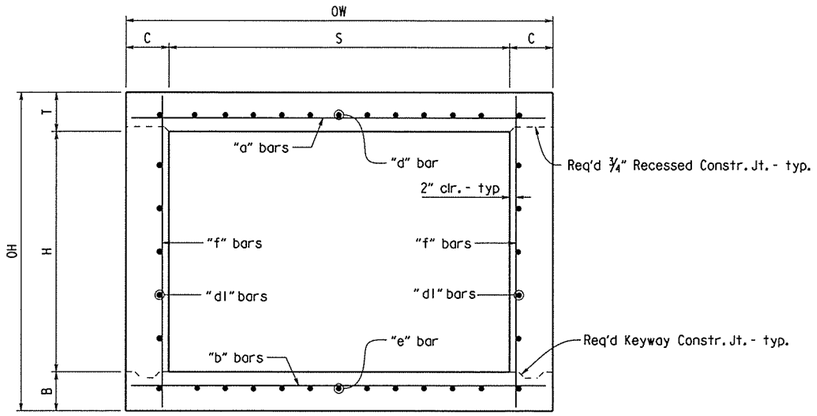
SPECIAL DETAILS

V 1.14 Culvert-General.dgn

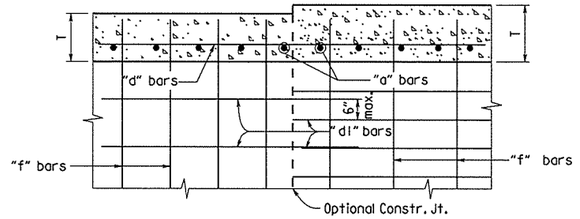
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	13	141

(1) SPECIAL DETAILS

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



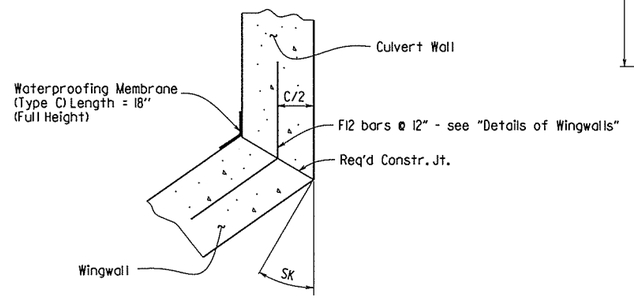
TYPICAL SECTION M-M



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

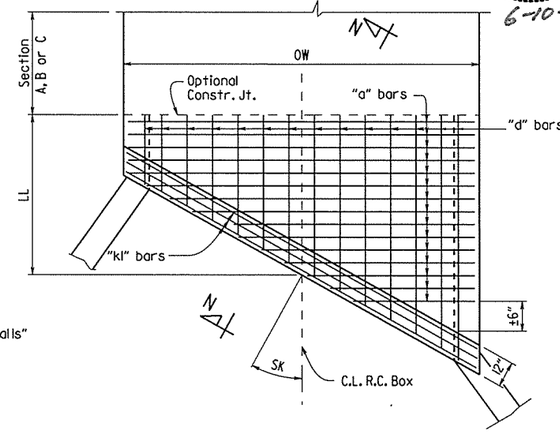
LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

TOP SLAB SHOWN, BOTTOM SLAB SIMILAR

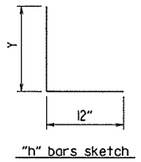


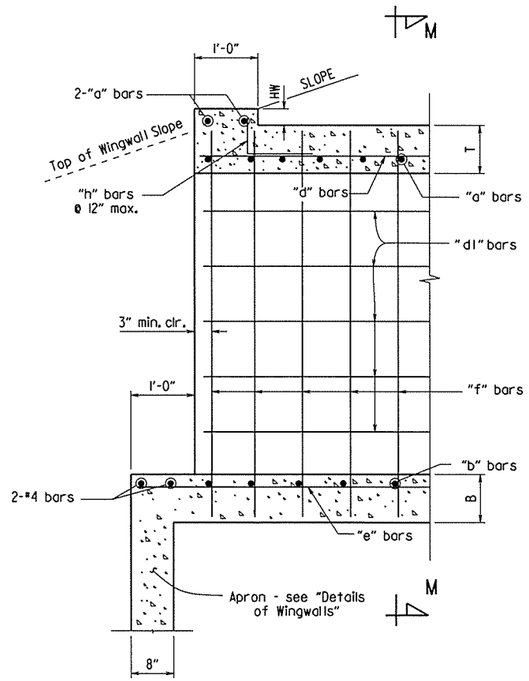
WINGWALL ATTACHMENT

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



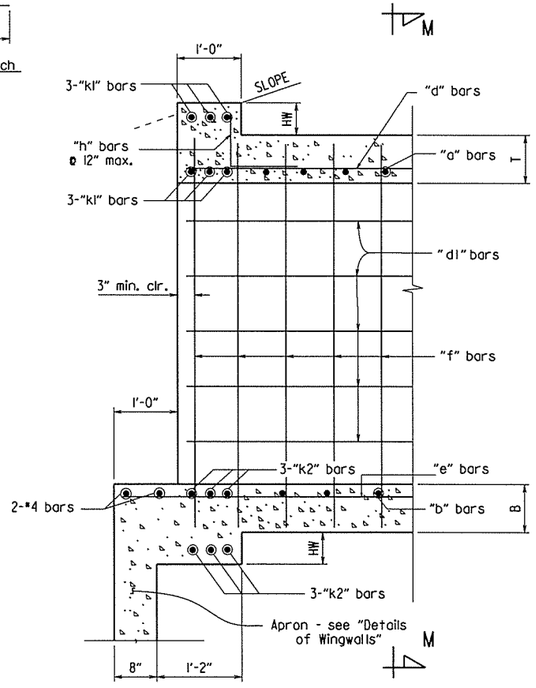
TOP SLAB REINFORCEMENT





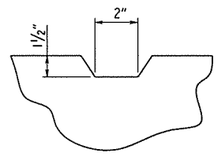
PART LONGITUDINAL SECTION

(Non-Skewed Ends)



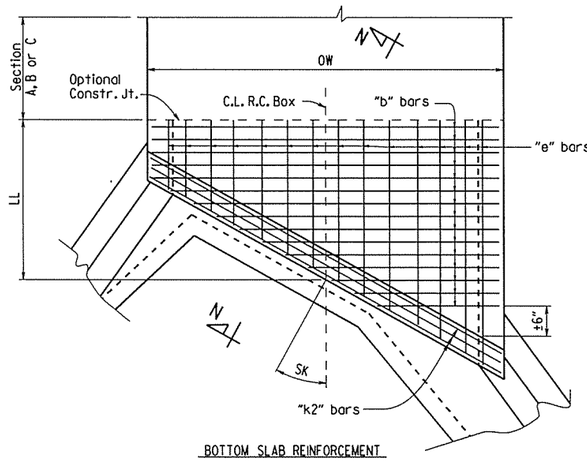
PART LONGITUDINAL SECTION N-N

(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

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
6-10-15

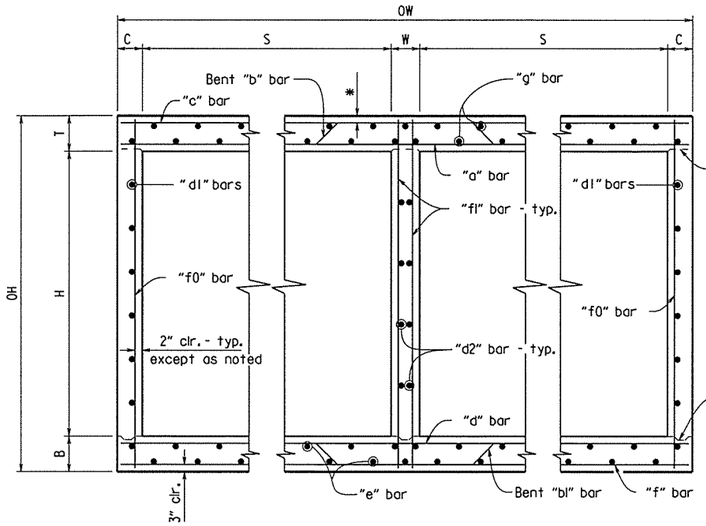
Culvert-General.dgn

DATE REVISED	DATE FILMED	REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	14	141

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.

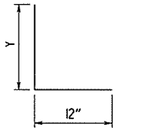
Note: When top slab of culvert serves as finished roadway surface, see General Notes on Sheet 1 of 4.



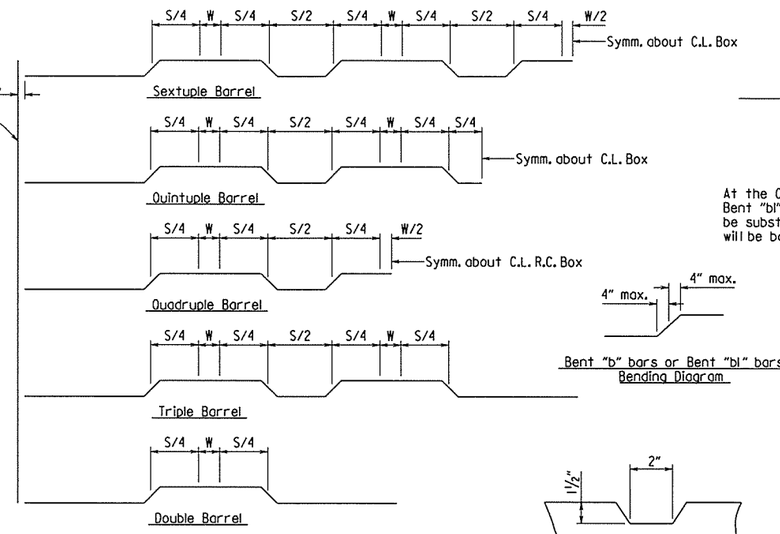
TYPICAL SECTION M-M

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

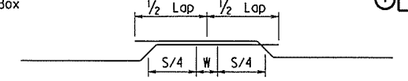
Bottom Slab
Straight "d" bars shall alternate with Bent "b1" bars in top.
Straight "f" bars shall alternate with Bent "b1" bars in bottom.



"h" bars sketch



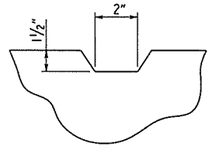
Bent "b" bars or Bent "b1" bars sketch



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

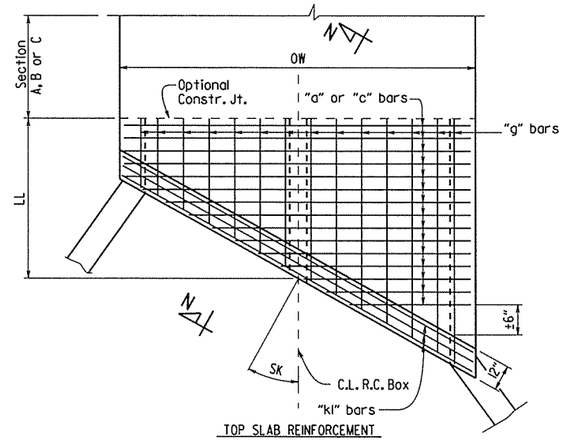
At the Contractor's option in lieu of providing Bent "b" or Bent "b1" bars, one bar top and bottom of equivalent size may be substituted for each bent bar. Payment for the reinforcing will be based on the weight of the "b" or "b1" bar.

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



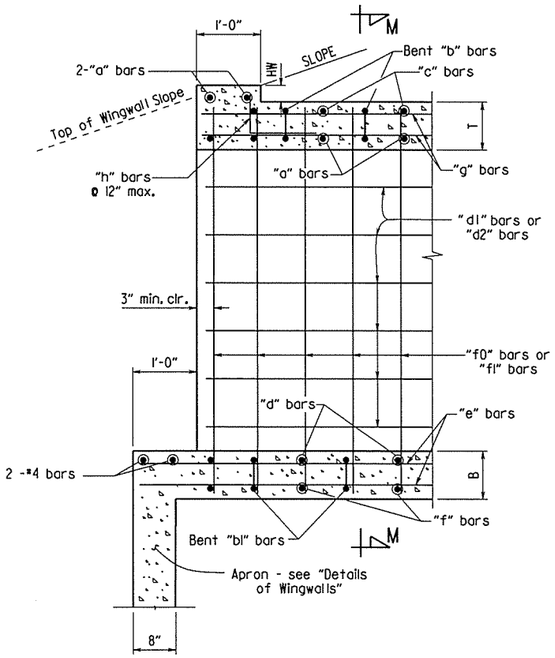
TYPICAL KEYWAY DETAIL

(All Construction Joints)



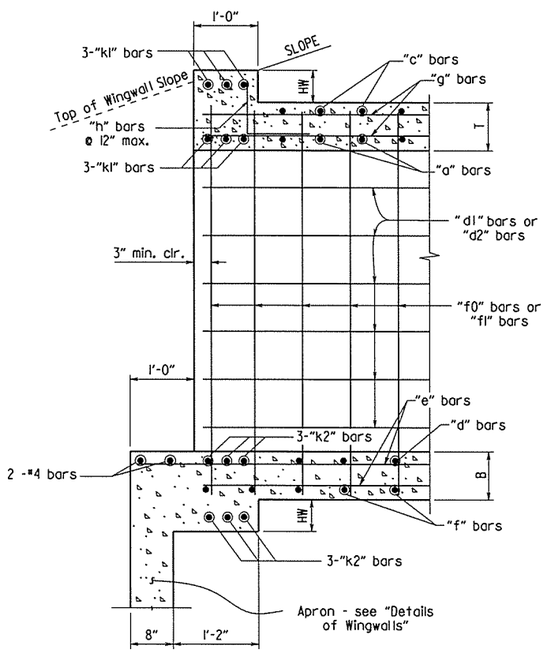
TOP SLAB REINFORCEMENT

Straight "c" bars in top.
Straight "a" bars in bottom.



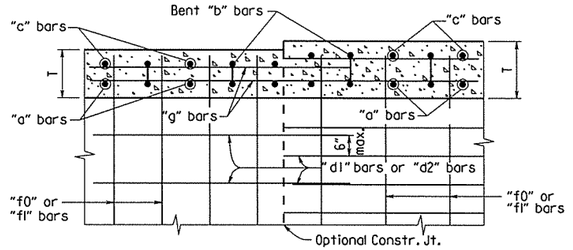
PART LONGITUDINAL SECTION

(Non-Skewed Ends)



PART LONGITUDINAL SECTION N-N

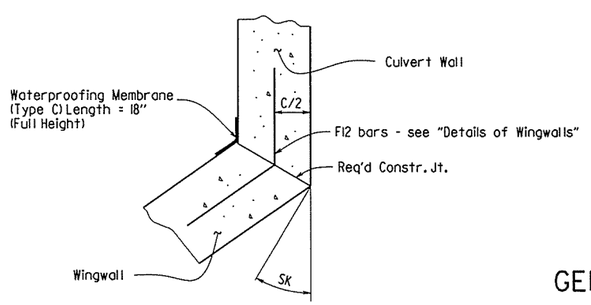
(Skewed Ends)



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

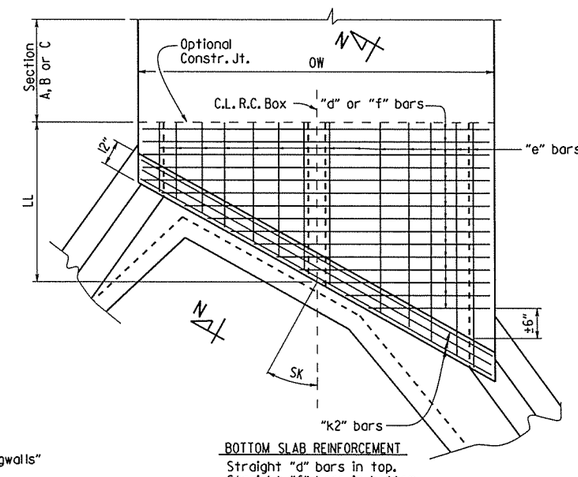
LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

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

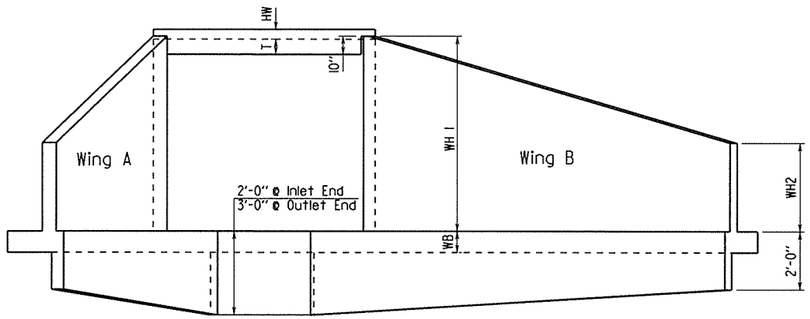
SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
6-10-15

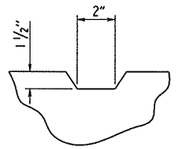
Culvert-General.dgn

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.		090343	15	141

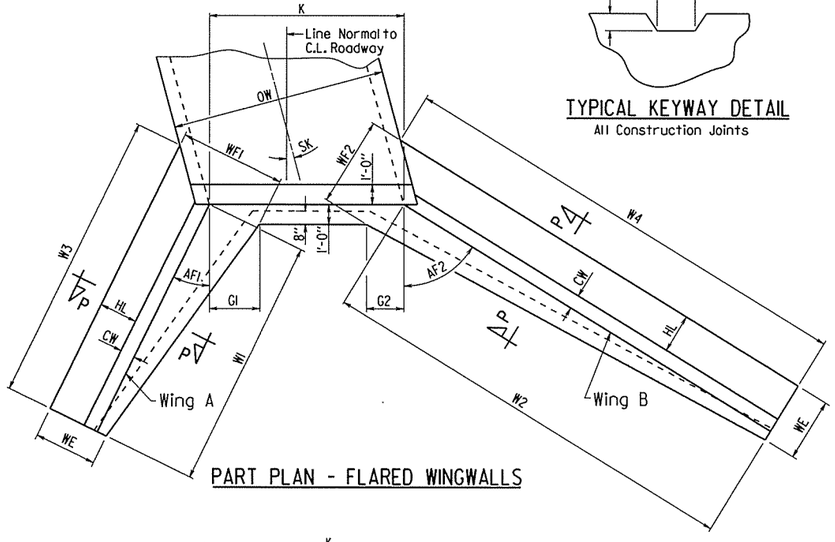
1 SPECIAL DETAILS



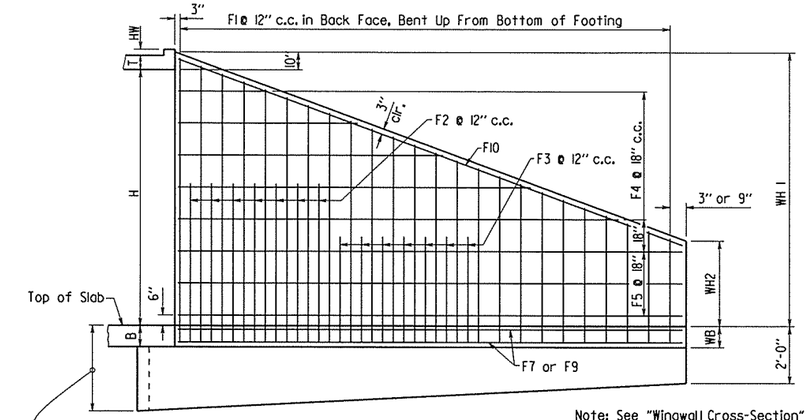
END ELEVATION
Flared Wingwalls Shown



TYPICAL KEYWAY DETAIL
All Construction Joints

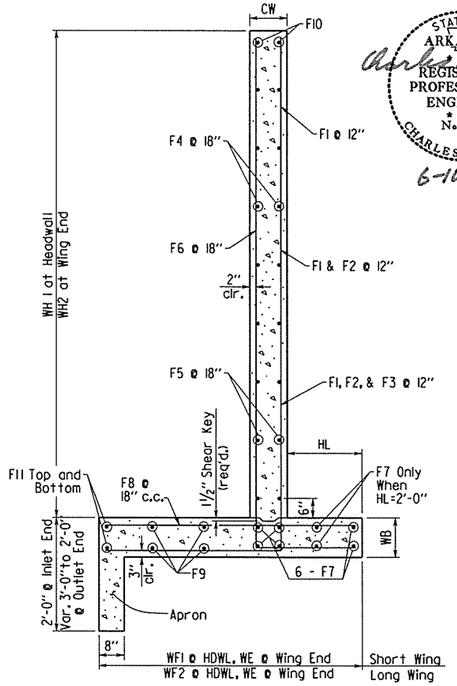


PART PLAN - FLARED WINGWALLS

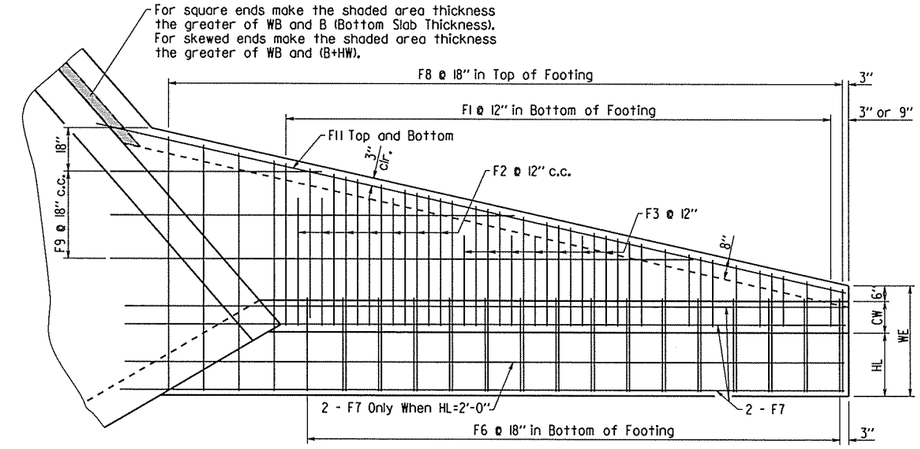


WINGWALL ELEVATION
Showing Back Face Reinforcement

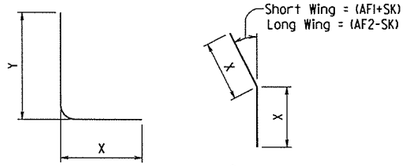
Note: See "Wingwall Cross-Section" for additional details and reinforcing



WINGWALL SECTION P-P



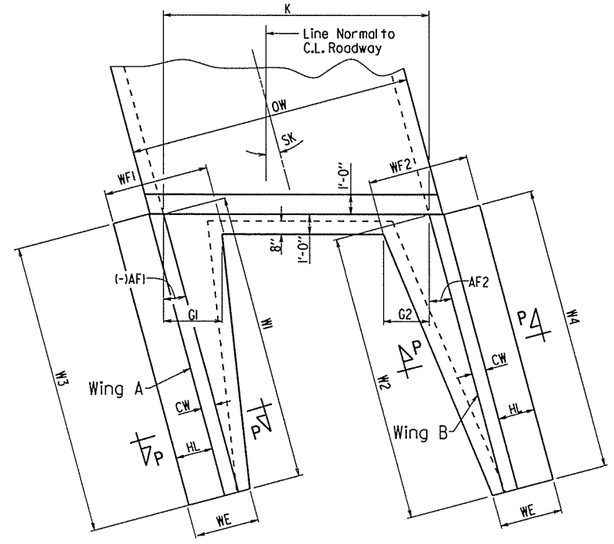
PLAN - FLARED WINGWALLS
Showing Footing Reinforcement



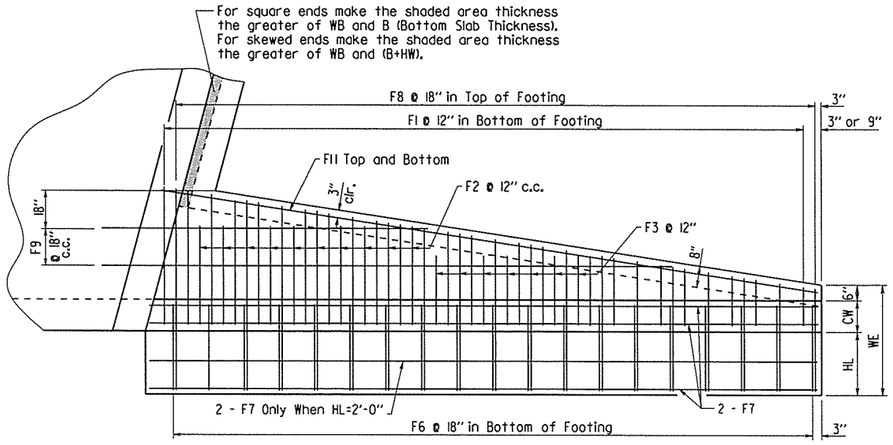
F1, F2, F3, & F6 BARS

*F12 BAR

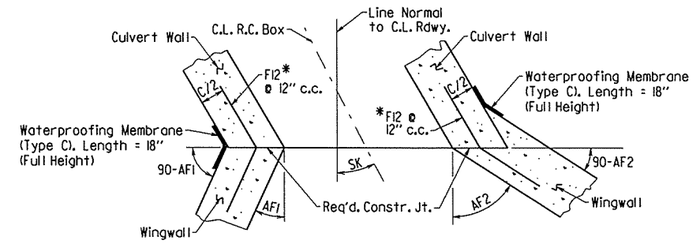
*F12 is a straight bar for parallel wingwalls



PART PLAN - PARALLEL WINGWALLS



PLAN - PARALLEL WINGWALLS
Showing Footing Reinforcement



CONSTRUCTION JOINTS
Flared Wingwalls Shown

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
6-10-15

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

Culvert-General.dgn

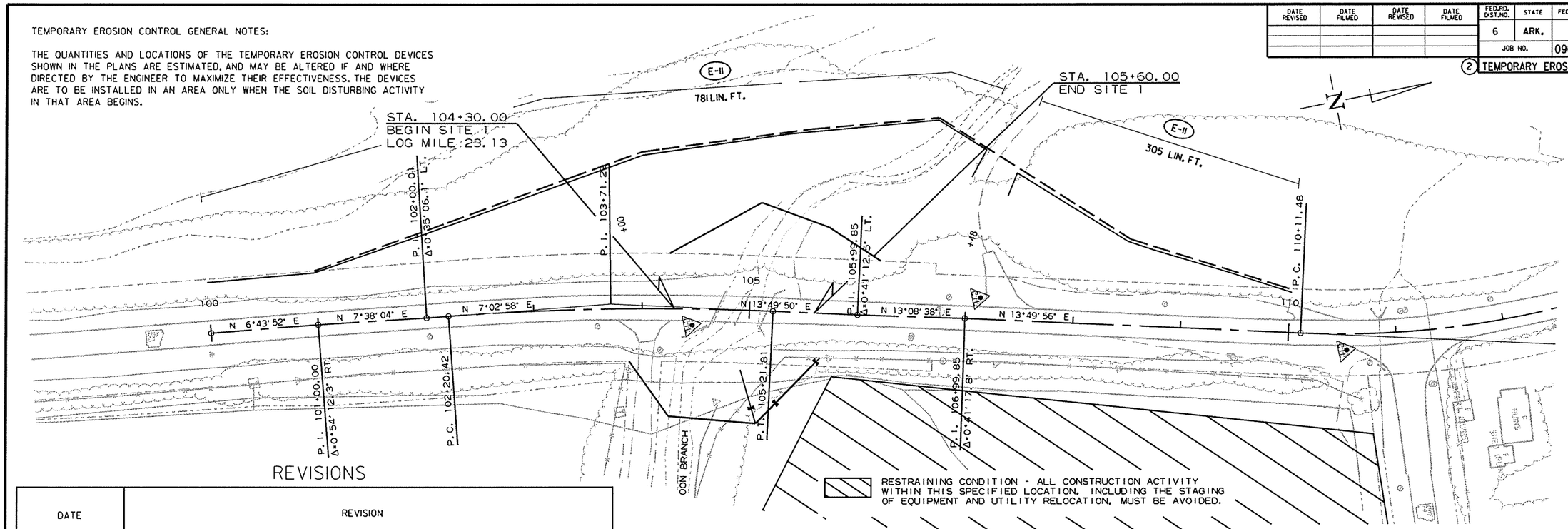
TEMPORARY EROSION CONTROL GENERAL NOTES:

THE QUANTITIES AND LOCATIONS OF THE TEMPORARY EROSION CONTROL DEVICES SHOWN IN THE PLANS ARE ESTIMATED, AND MAY BE ALTERED IF AND WHERE DIRECTED BY THE ENGINEER TO MAXIMIZE THEIR EFFECTIVENESS. THE DEVICES ARE TO BE INSTALLED IN AN AREA ONLY WHEN THE SOIL DISTURBING ACTIVITY IN THAT AREA BEGINS.

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.		090343	16	141

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15



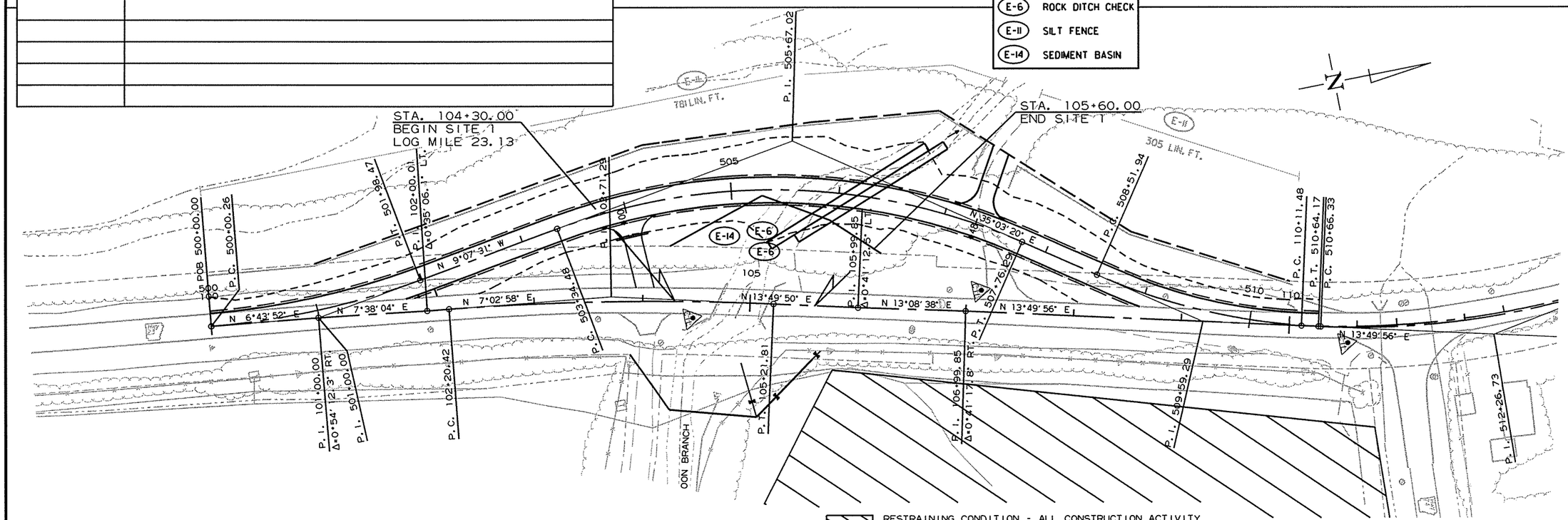
SITE 1
CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

REVISIONS

DATE	REVISION

LEGEND

- (E-6) ROCK DITCH CHECK
- (E-11) SILT FENCE
- (E-14) SEDIMENT BASIN



SITE 1
STAGE 1
TEMPORARY EROSION CONTROL DETAILS

9/8/2015

R090343.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	17	141

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15

STA. 200+70.00
BEGIN SITE 2
LOG MILE 23.72

POB200+00.00

N 24°18'37" E

PC203+26.46

E-II 750 LIN. FT.

E-II 640 LIN. FT.

E-II 670 LIN. FT.

N 79°27'34" W

205 210 215

N

REVISIONS

DATE	REVISION

LEGEND

E-6	ROCK DITCH CHECK
E-II	SILT FENCE
E-14	SEDIMENT BASIN

STA. 220+00.00
END SITE 2

PT219+22.92

POE222+37.24

215 220

N 79°27'34" W

E-II 690 LIN. FT.

N

9/8/2015

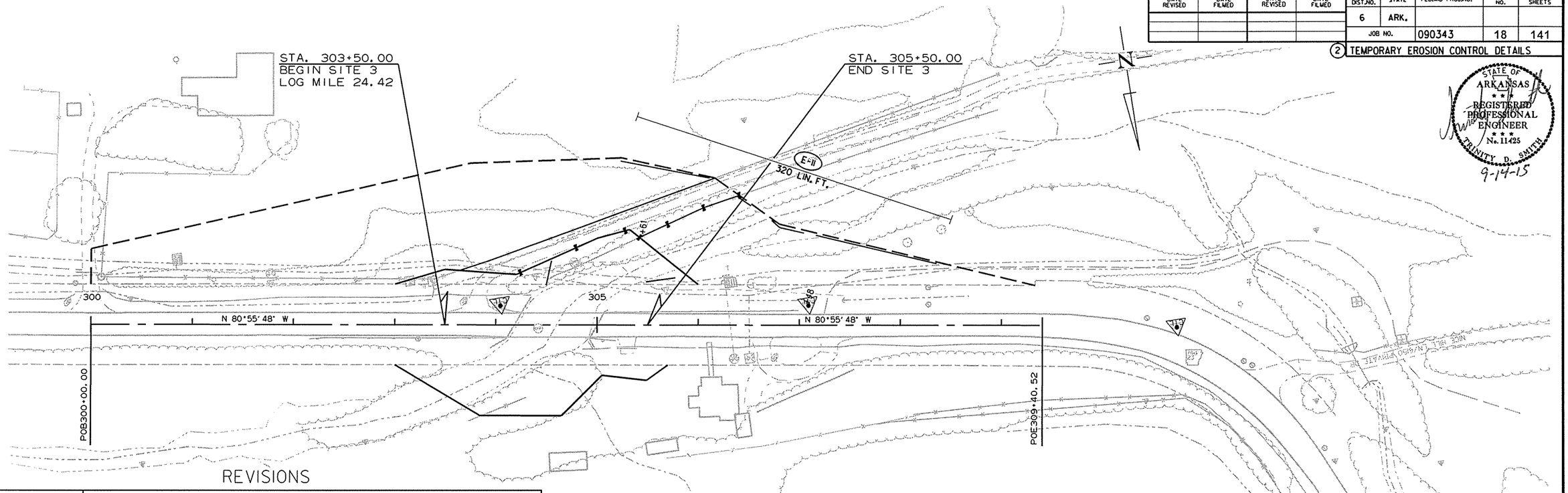
R090343.DGN

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.		090343	18	141

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-14-15



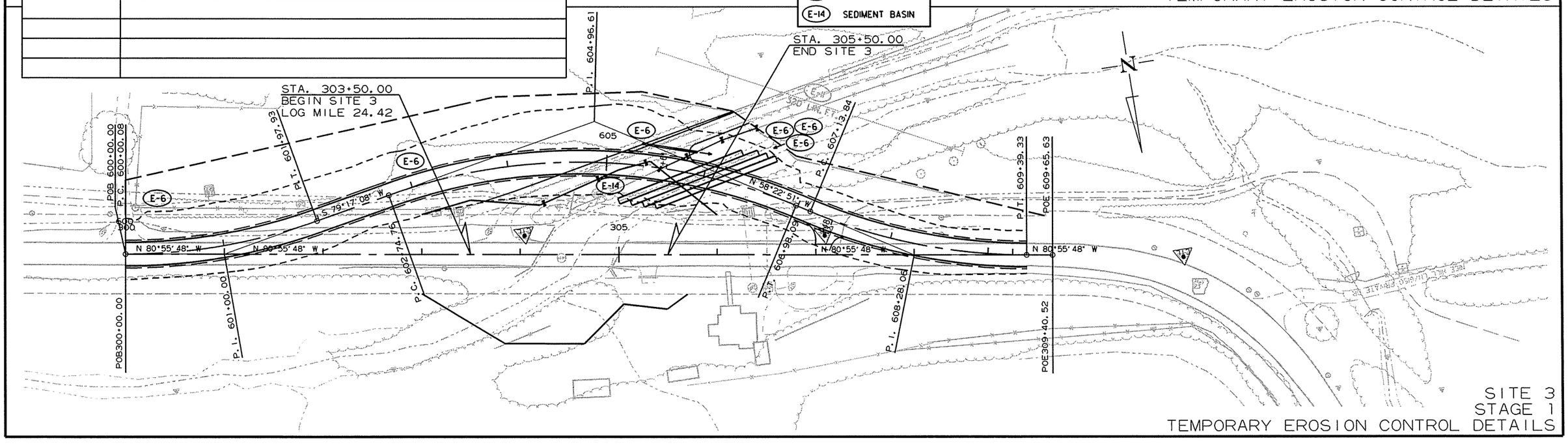
SITE 3
CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

REVISIONS

DATE	REVISION

LEGEND

E-6	ROCK DITCH CHECK
E-11	SILT FENCE
E-14	SEDIMENT BASIN



SITE 3
STAGE 1
TEMPORARY EROSION CONTROL DETAILS

9/14/2015

R090343.DGN

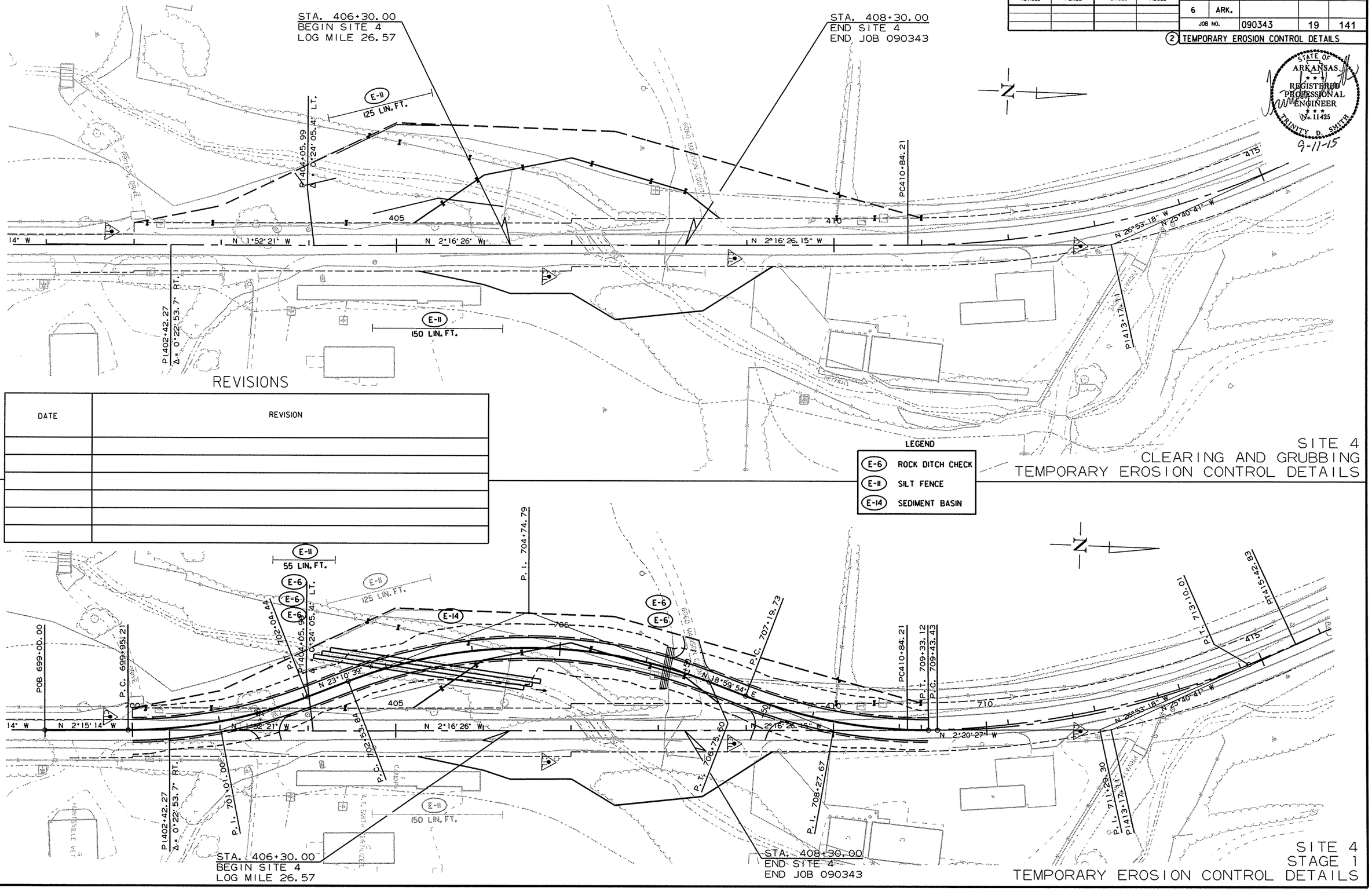
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	19	141

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15

STA. 406+30.00
BEGIN SITE 4
LOG MILE 26.57

STA. 408+30.00
END SITE 4
END JOB 090343



REVISIONS

DATE	REVISION

LEGEND

E-6	ROCK DITCH CHECK
E-11	SILT FENCE
E-14	SEDIMENT BASIN

SITE 4
CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

SITE 4
STAGE 1
TEMPORARY EROSION CONTROL DETAILS

9/8/2015

R090343.DGN

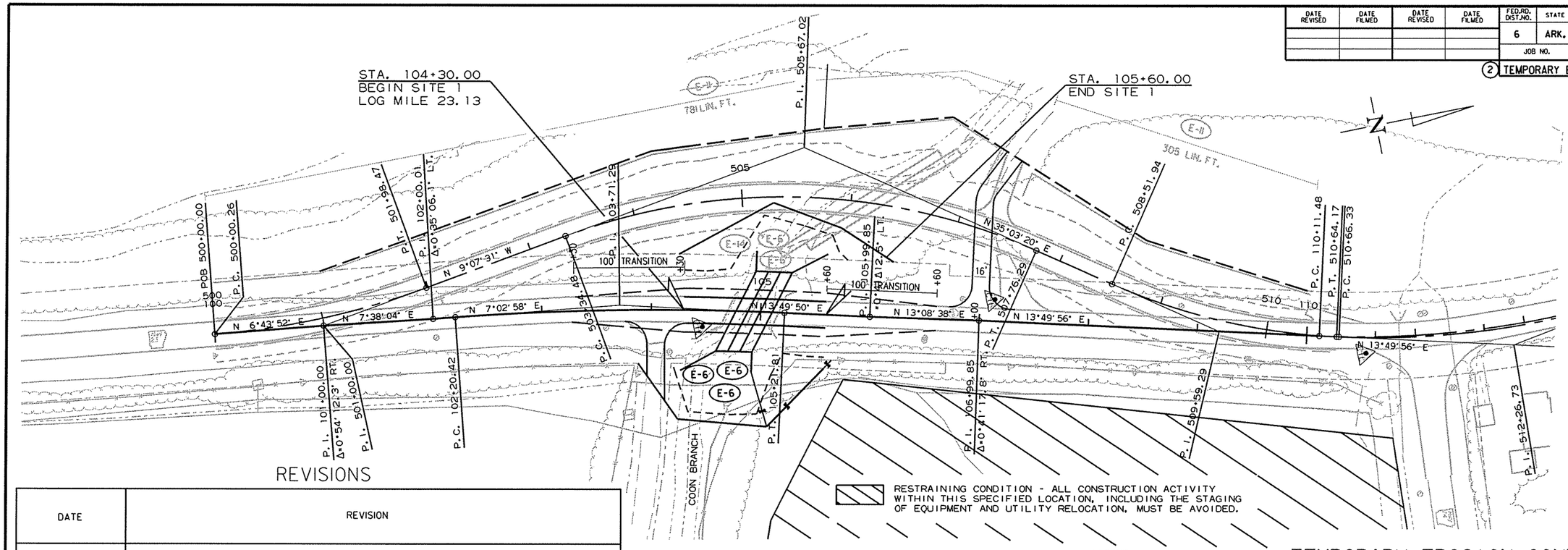
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	20	141

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15

REVISIONS

DATE	REVISION



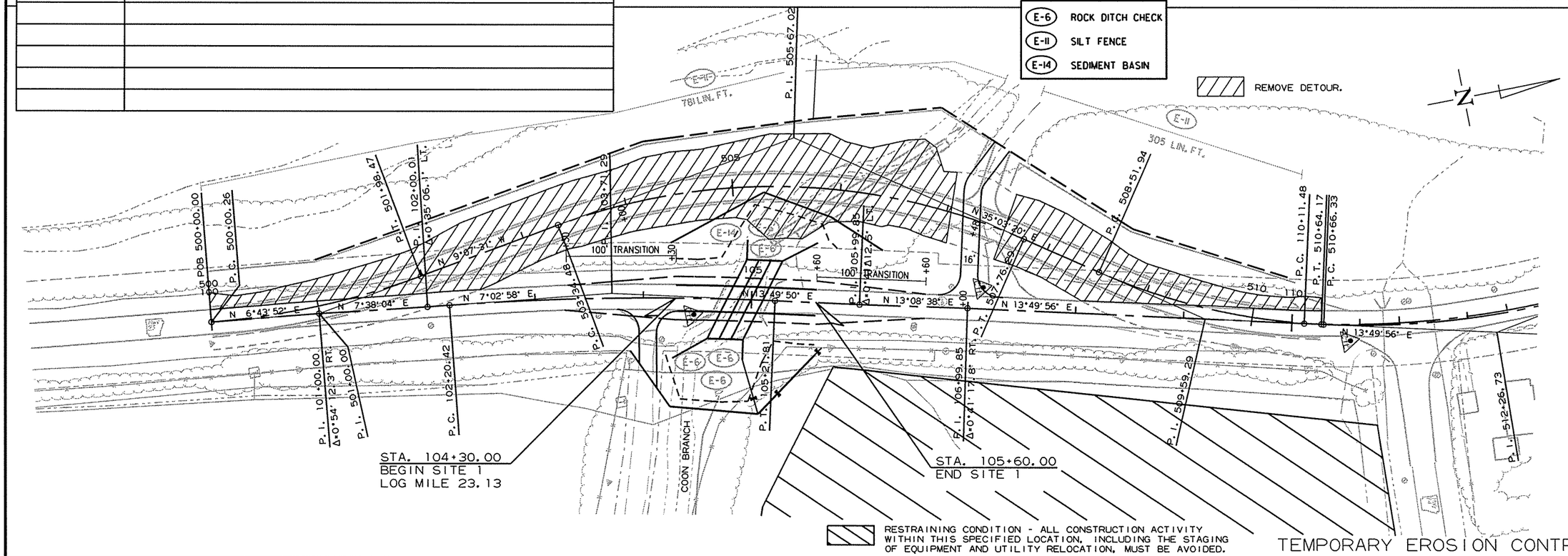
RESTRAINING CONDITION - ALL CONSTRUCTION ACTIVITY WITHIN THIS SPECIFIED LOCATION, INCLUDING THE STAGING OF EQUIPMENT AND UTILITY RELOCATION, MUST BE AVOIDED.

SITE 1
STAGE 2
TEMPORARY EROSION CONTROL DETAILS

LEGEND

E-6	ROCK DITCH CHECK
E-11	SILT FENCE
E-14	SEDIMENT BASIN

REMOVE DETOUR.



RESTRAINING CONDITION - ALL CONSTRUCTION ACTIVITY WITHIN THIS SPECIFIED LOCATION, INCLUDING THE STAGING OF EQUIPMENT AND UTILITY RELOCATION, MUST BE AVOIDED.

SITE 1
STAGE 3
TEMPORARY EROSION CONTROL DETAILS

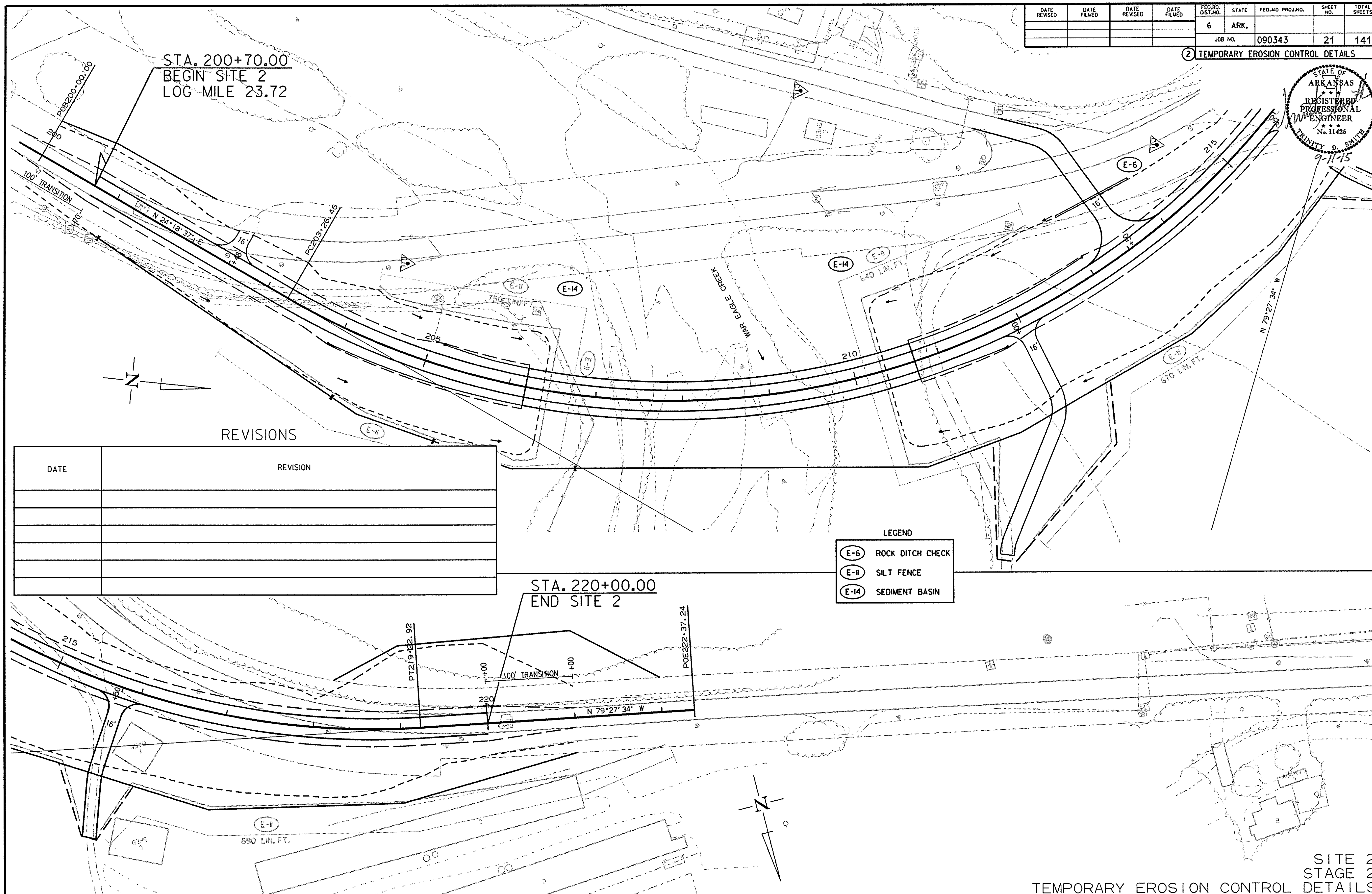
9/8/2015

R090343.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.		090343	21	141

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 9-11-15



REVISIONS

DATE	REVISION

LEGEND

E-6	ROCK DITCH CHECK
E-11	SILT FENCE
E-14	SEDIMENT BASIN

SITE 2
STAGE 2
TEMPORARY EROSION CONTROL DETAILS

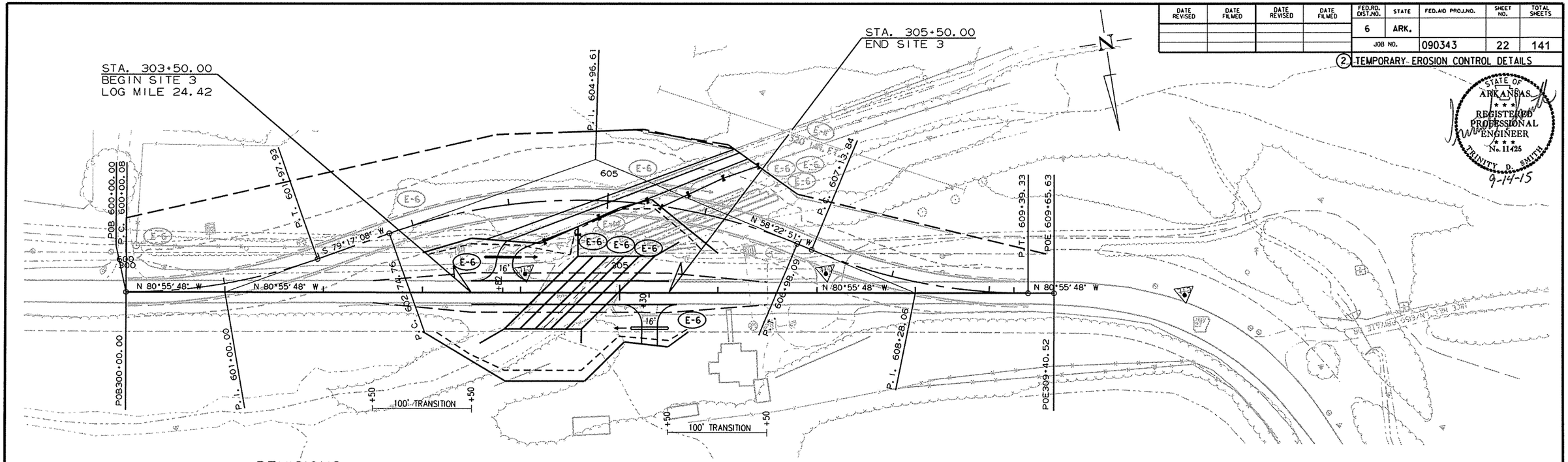
9/8/2015

R090343.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.		090343	22	141

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-14-15



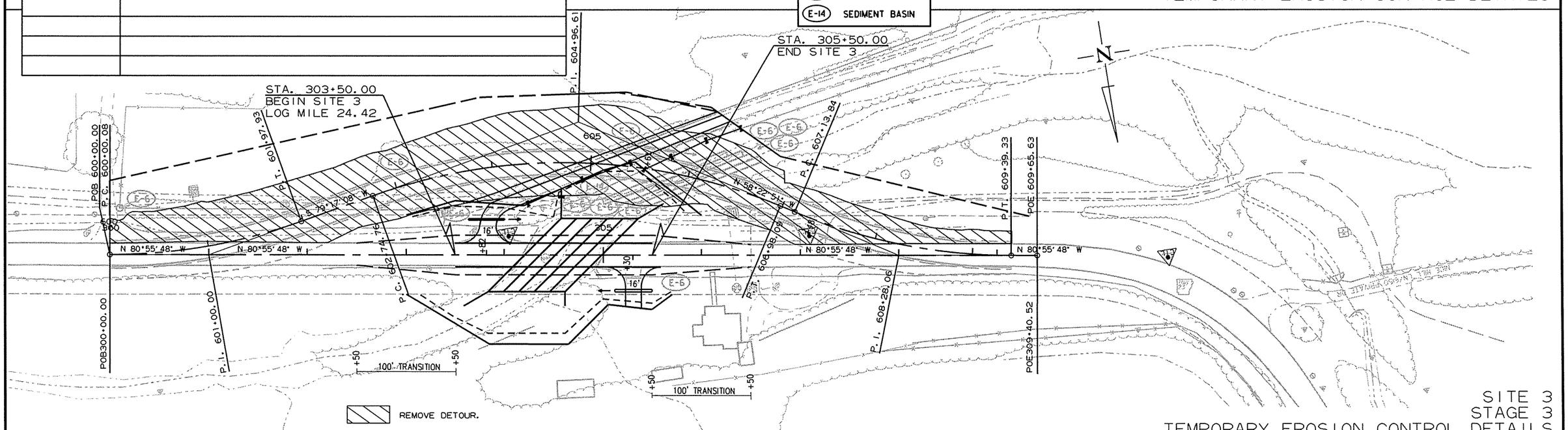
REVISIONS

DATE	REVISION

LEGEND

E-6	ROCK DITCH CHECK
E-11	SILT FENCE
E-14	SEDIMENT BASIN

SITE 3
STAGE 2
TEMPORARY EROSION CONTROL DETAILS



REMOVE DETOUR.

SITE 3
STAGE 3
TEMPORARY EROSION CONTROL DETAILS

9/14/2015

R090343.DGN

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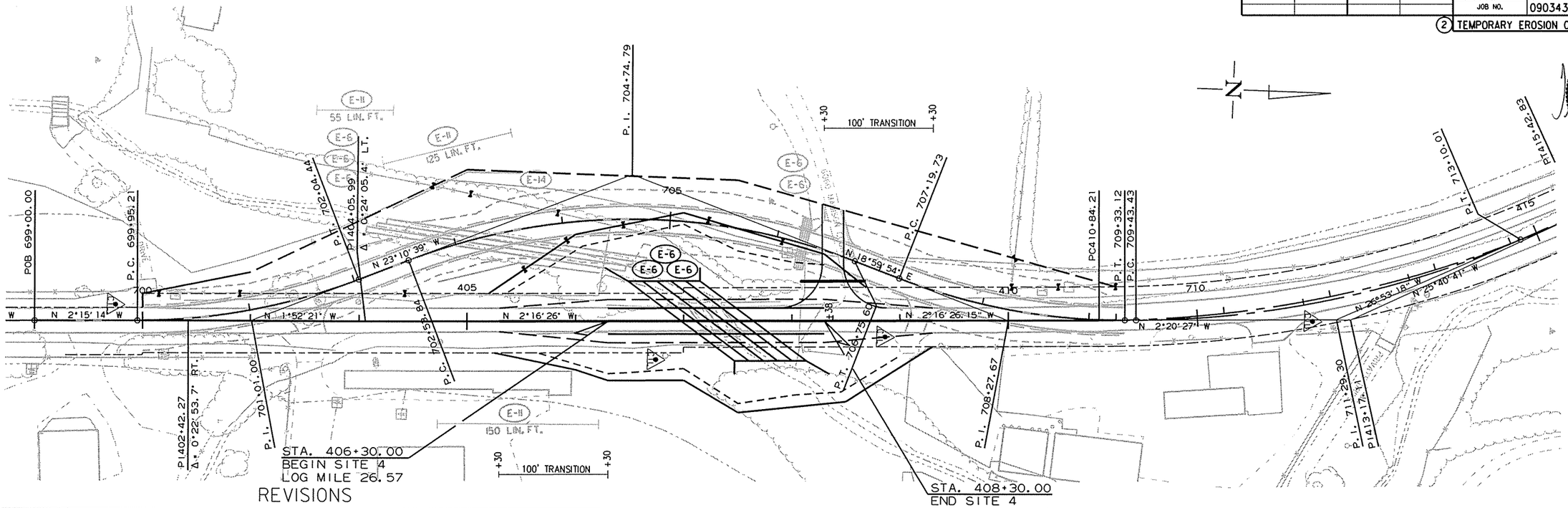
(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15



REVISIONS

DATE	REVISION

SITE 4
STAGE 2
TEMPORARY EROSION CONTROL DETAILS

SITE 4
STAGE 3
TEMPORARY EROSION CONTROL DETAILS

9/8/2015

R090343.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.		090343	24	141

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15

STA. 200+70.00
BEGIN SITE 2
LOG MILE 23.72

POB200+00.00

100' TRANSITION

N 24°18'37" E

E-11 400 LIN. FT.

PCC03+22.16

E-11 540 LIN. FT.

E-11 360 LIN. FT.

E-14 E-11 640 LIN. FT.

WAR EAGLE CREEK

E-11 670 LIN. FT.

N 79°27' 34" W

REVISIONS

DATE	REVISION

REMOVE BRIDGE & APPROACHES.

LEGEND

E-6	ROCK DITCH CHECK
E-11	SILT FENCE
E-14	SEDIMENT BASIN

STA. 220+00.00
END SITE 2

PT219+22.92

100' TRANSITION

POE222+37.24

N 79°27' 34" W

E-11 360 LIN. FT.

E-11 690 LIN. FT.

9/8/2015

R090343.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.		090343	25	141

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-1-15

STAGE 1:

INSTALL ADVANCE WARNING SIGNS

SITE 1: INSTALL DBL. 96" X 99' TEMPORARY PIPE CULVERT (40° LT. FWD. SKEW) AT STA. 506+11.00
AND CONSTRUCT DETOUR FROM STA. 500+00.00 TO STA. 510+47.00 ON LEFT.

SITE 2: CONSTRUCT THE ROADWAY AND BRIDGE AT THE NEW LOCATION.

SITE 3: INSTALL QUAD. 72" X 61' TEMPORARY PIPE CULVERT (35° LT. FWD. SKEW) AT STA. 606+07.00
AND CONSTRUCT DETOUR FROM STA. 600+00.00 TO STA. 609+10.00 ON LEFT.

SITE 4: INSTALL TRP. 60" X 70' TEMPORARY PIPE CULVERT (65° RT. FWD. SKEW) AT STA. 703+16.00
AND CONSTRUCT DETOUR FROM STA. 700+00.00 TO STA. 709+26.00 ON RIGHT.

STRIPE DETOUR WITH CONSTRUCTION PAVEMENT MARKINGS AND REMOVE ANY CONFLICTING PAVEMENT MARKINGS.

DELINEATE CITY STREETS AND DRIVEWAYS THROUGHOUT THE PROJECT
USING TRAFFIC DRUMS (6 PER TURNOUT) ON THE SIDE BEING WIDENED.

DELINEATE THE WORK ZONE USING VERTICAL PANELS AT 45' O.C.

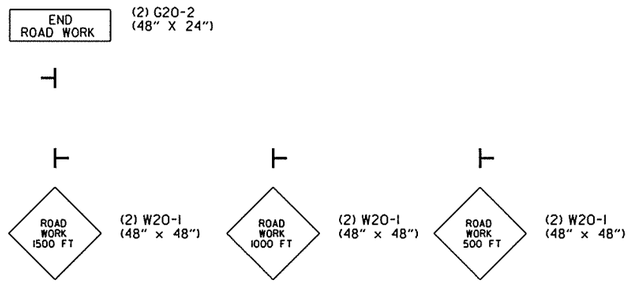
STAGE 2:

SHIFT TRAFFIC ON THE DETOUR ROAD AT SITES 1, 3, & 4.
CONSTRUCT R.C. BOX CULVERTS AT STA. 104+94.00, STA. 302+54.00 AND STA. 407+25.00.
KEEP TRAFFIC ON THE EXISTING ROADWAY AT SITE 2 AND
CONTINUE WITH THE CONSTRUCTION OF NEW ROADWAY AND BRIDGE.

DELINEATE CITY STREETS AND DRIVEWAYS THROUGHOUT THE PROJECT
USING TRAFFIC DRUMS (6 PER TURNOUT) ON THE SIDE BEING WIDENED.

STAGE 3:

REMOVE DETOURS AT SITES 1, 3, & 4. REMOVE EXISTING BRIDGE AND APPROACHES AT SITE 2.
APPLY THE FINAL 2" OF ACHM SURFACE COURSE AFTER ALL CONSTRUCTION HAS BEEN COMPLETED.
SHIFT TRAFFIC TO THE NEW CONSTRUCTION AND INSTALL PERMANENT SEEDING.



ADVANCE WARNING SIGNS

9/9/2015

R090343.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	26	141

(2) MAINTENANCE OF TRAFFIC DETAILS

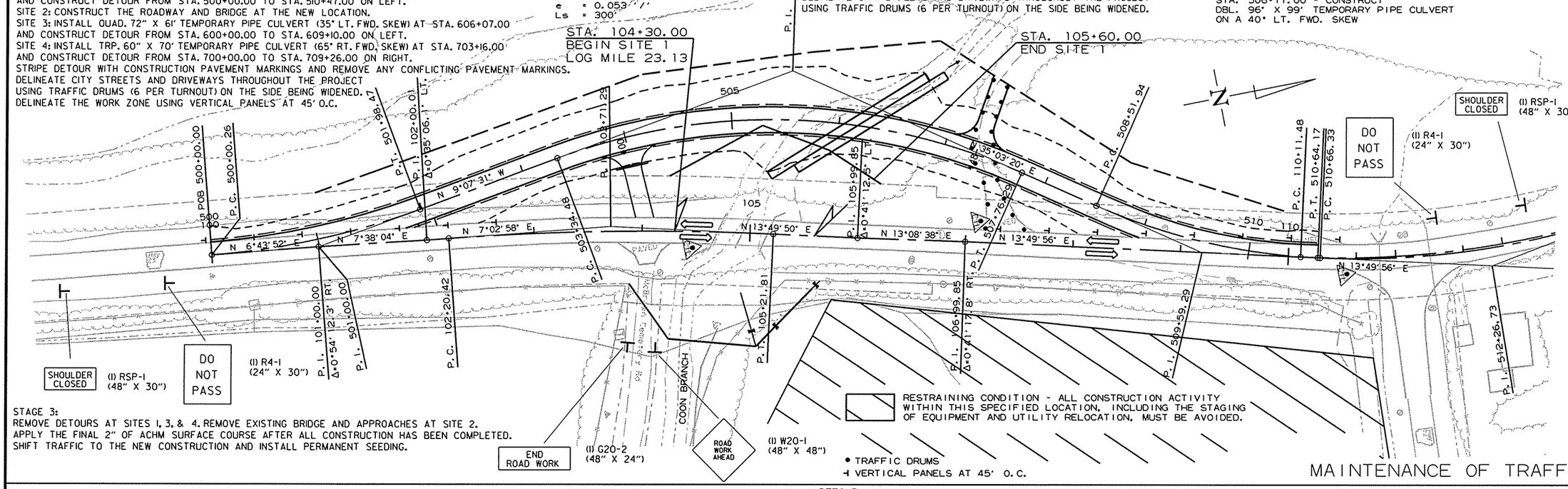
STAGE 1:
INSTALL ADVANCE WARNING SIGNS
SITE 1: INSTALL DBL. 96" X 99' TEMPORARY PIPE CULVERT (40° LT. FWD. SKEW) AT STA. 506+11.00
AND CONSTRUCT DETOUR FROM STA. 500+00.00 TO STA. 510+47.00 ON LEFT.
SITE 2: CONSTRUCT THE ROADWAY AND BRIDGE AT THE NEW LOCATION.
SITE 3: INSTALL QUAD. 72" X 61' TEMPORARY PIPE CULVERT (35° LT. FWD. SKEW) AT STA. 606+07.00
AND CONSTRUCT DETOUR FROM STA. 600+00.00 TO STA. 609+10.00 ON LEFT.
SITE 4: INSTALL TRP. 60" X 70' TEMPORARY PIPE CULVERT (65° RT. FWD. SKEW) AT STA. 703+16.00
AND CONSTRUCT DETOUR FROM STA. 700+00.00 TO STA. 709+26.00 ON RIGHT.
STRIPE DETOUR WITH CONSTRUCTION PAVEMENT MARKINGS AND REMOVE ANY CONFLICTING PAVEMENT MARKINGS.
DELINEATE CITY STREETS AND DRIVEWAYS THROUGHOUT THE PROJECT
USING TRAFFIC DRUMS (6 PER TURNOUT) ON THE SIDE BEING WIDENED.
DELINEATE THE WORK ZONE USING VERTICAL PANELS AT 45' O.C.

P. I. = 103+71.29
Δ = 6°46'52.2" RT.
D = 2°15'00.0"
T = 150.87'
L = 301.38'
PC = 102+20.42
PT = 105+21.81
e = 0.053 '/'
Ls = 300'

STAGE 2:
SHIFT TRAFFIC ON THE DETOUR ROAD AT SITES 1, 3, & 4.
CONSTRUCT R.C. BOX CULVERTS AT STA. 104+94.00, STA. 302+54.00 AND STA. 407+25.00.
KEEP TRAFFIC ON THE EXISTING ROADWAY AT SITE 2 AND
CONTINUE WITH THE CONSTRUCTION OF NEW ROADWAY AND BRIDGE.
DELINEATE CITY STREETS AND DRIVEWAYS THROUGHOUT THE PROJECT
USING TRAFFIC DRUMS (6 PER TURNOUT) ON THE SIDE BEING WIDENED.

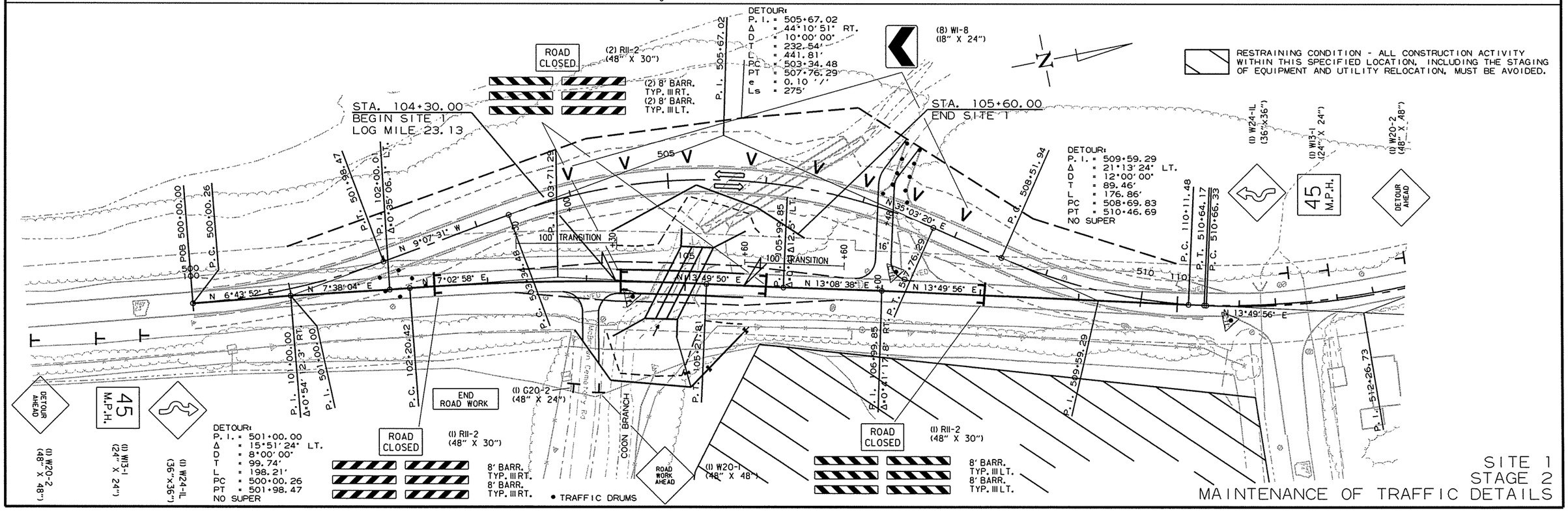
STA. 506+11.00 - CONSTRUCT
DBL. 96" X 99' TEMPORARY PIPE CULVERT
ON A 40° LT. FWD. SKEW

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15



STAGE 3:
REMOVE DETOURS AT SITES 1, 3, & 4. REMOVE EXISTING BRIDGE AND APPROACHES AT SITE 2.
APPLY THE FINAL 2" OF ACHM SURFACE COURSE AFTER ALL CONSTRUCTION HAS BEEN COMPLETED.
SHIFT TRAFFIC TO THE NEW CONSTRUCTION AND INSTALL PERMANENT SEEDING.

SITE 1
STAGE 1
MAINTENANCE OF TRAFFIC DETAILS



SITE 1
STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

9/9/2015
R090343.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.		090343	27	141

(2) MAINTENANCE OF TRAFFIC DETAILS

STAGE 1:
INSTALL ADVANCE WARNING SIGNS
SITE 1: INSTALL DBL. 96" X 99' TEMPORARY PIPE CULVERT (40° LT. FWD. SKEW) AT STA. 506+11.00 AND CONSTRUCT DETOUR FROM STA. 500+00.00 TO STA. 510+47.00 ON LEFT.
SITE 2: CONSTRUCT THE ROADWAY AND BRIDGE AT THE NEW LOCATION.
SITE 3: INSTALL QUAD. 72" X 61' TEMPORARY PIPE CULVERT (35° LT. FWD. SKEW) AT STA. 606+07.00 AND CONSTRUCT DETOUR FROM STA. 600+00.00 TO STA. 609+10.00 ON LEFT.
SITE 4: INSTALL TRP. 60" X 70' TEMPORARY PIPE CULVERT (65° RT. FWD. SKEW) AT STA. 703+16.00 AND CONSTRUCT DETOUR FROM STA. 700+00.00 TO STA. 709+26.00 ON RIGHT.
STRIPE DETOUR WITH CONSTRUCTION PAVEMENT MARKINGS AND REMOVE ANY CONFLICTING PAVEMENT MARKINGS.
DELINEATE CITY STREETS AND DRIVEWAYS THROUGHOUT THE PROJECT USING TRAFFIC DRUMS (6 PER TURNOUT) ON THE SIDE BEING WIDENED.
DELINEATE THE WORK ZONE USING VERTICAL PANELS AT 45' O.C.

STAGE 2:
SHIFT TRAFFIC ON THE DETOUR ROAD AT SITES 1, 3, & 4.
CONSTRUCT R.C. BOX CULVERTS AT STA. 104+94.00, STA. 302+54.00 AND STA. 407+25.00.
KEEP TRAFFIC ON THE EXISTING ROADWAY AT SITE 2 AND CONTINUE WITH THE CONSTRUCTION OF NEW ROADWAY AND BRIDGE.
DELINEATE CITY STREETS AND DRIVEWAYS THROUGHOUT THE PROJECT USING TRAFFIC DRUMS (6 PER TURNOUT) ON THE SIDE BEING WIDENED.

STAGE 3:
REMOVE DETOURS AT SITES 1, 3, & 4. REMOVE EXISTING BRIDGE AND APPROACHES AT SITE 2.
APPLY THE FINAL 2" OF ACHM SURFACE COURSE AFTER ALL CONSTRUCTION HAS BEEN COMPLETED.
SHIFT TRAFFIC TO THE NEW CONSTRUCTION AND INSTALL PERMANENT SEEDING.

STA. 200+70.00
BEGIN SITE 2
LOG MILE 23.72

POB200+00.00

200

100' TRANSITION

70

N 24°18' 37" E

PC203+26.46

SHOULDER CLOSED (I) RSP-1 (48" X 30")

DO NOT PASS (I) R4-1 (24" X 30")

ROAD CLOSED (I) RII-2 (48" X 30")

8' BARR. TYP. III RT.
8' BARR. TYP. III RT.

205

WAR EAGLE CREEK

210

END ROAD WORK (I) G20-2 (48" X 24")

ROAD WORK AHEAD (I) W20-1 (48" X 48")

215

16'

+00

N 79°27' 34" W

P. I. = 214+50.03
Δ = 103°46' 11.2" LT.
D = 6°30' 00.0"
T = 1123.57'
L = 1596.46'
P. C. = 203+26.46
P. T. = 219+22.92
e = 0.100'/'
Ls = 350'

• TRAFFIC DRUMS
⊣ VERTICAL PANELS AT 45' O.C.

SITE 2
STAGE 1 & 2
MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15

P. I. = 214+50.03
Δ = 103°46' 11.2" LT.
D = 6°30' 00.0"
T = 1123.57'
L = 1596.46'
P. C. = 203+26.46
P. T. = 219+22.92
e = 0.100'/'
Ls = 350'

STA. 220+00.00
END SITE 2

PT219+22.92

POE222+37.24

215

100' TRANSITION

220

N 79°27' 34" W

DO NOT PASS (I) R4-1 (24" X 30")

SHOULDER CLOSED (I) RSP-1 (48" X 30")

ROAD CLOSED (I) RII-2 (48" X 30")

8' BARR. TYP. III LT.
8' BARR. TYP. III LT.

• TRAFFIC DRUMS
⊣ VERTICAL PANELS AT 45' O.C.

SITE 2
STAGE 1 & 2
MAINTENANCE OF TRAFFIC DETAILS

9/9/2015

R090343.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.		090343	28	141

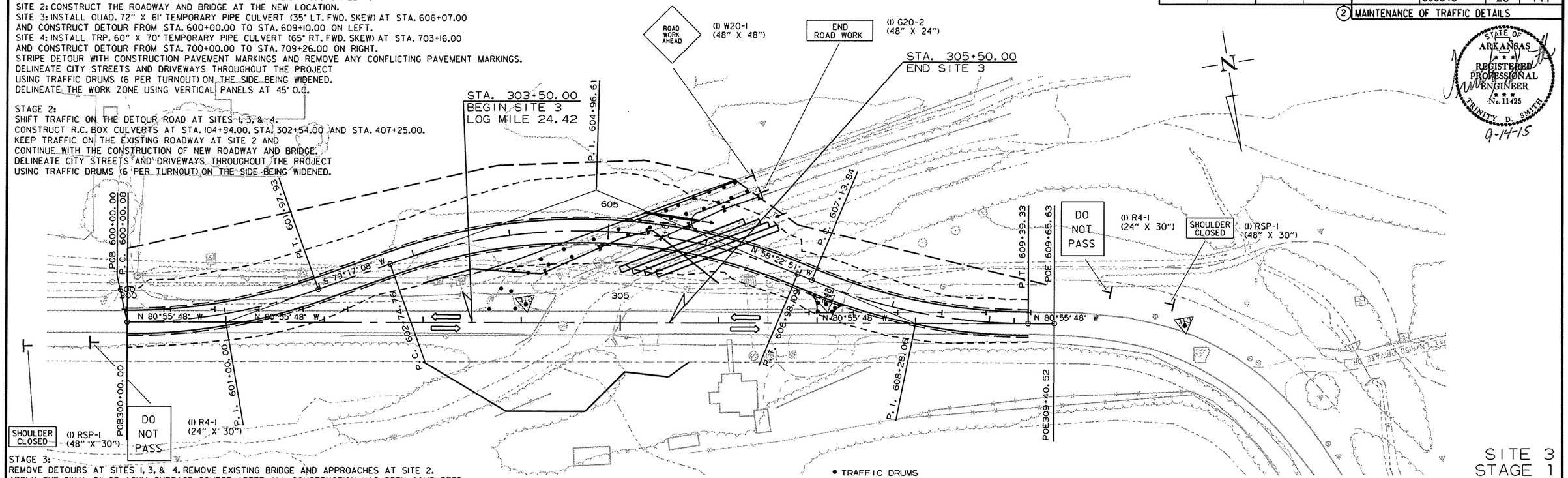
(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-14-15

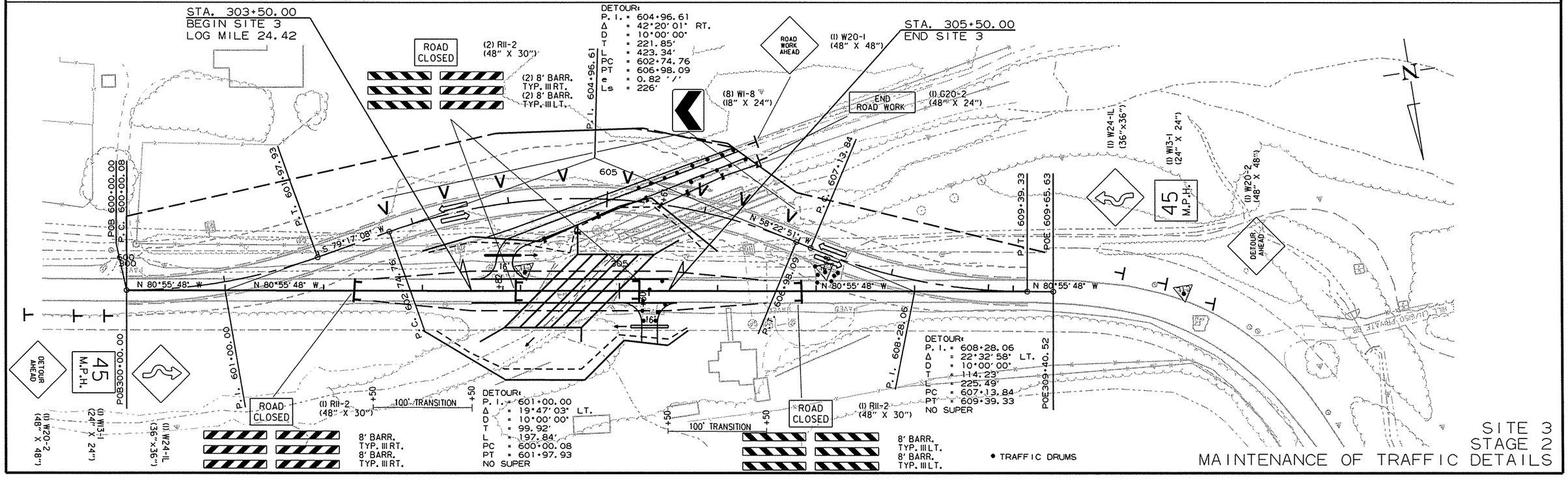
STAGE 1:
INSTALL ADVANCE WARNING SIGNS
SITE 1: INSTALL DBL. 96" X 99' TEMPORARY PIPE CULVERT (40° LT. FWD. SKEW) AT STA. 506+11.00
AND CONSTRUCT DETOUR FROM STA. 500+00.00 TO STA. 510+47.00 ON LEFT.
SITE 2: CONSTRUCT THE ROADWAY AND BRIDGE AT THE NEW LOCATION.
SITE 3: INSTALL QUAD. 72" X 61' TEMPORARY PIPE CULVERT (35° LT. FWD. SKEW) AT STA. 606+07.00
AND CONSTRUCT DETOUR FROM STA. 600+00.00 TO STA. 609+10.00 ON LEFT.
SITE 4: INSTALL TRP. 60" X 70' TEMPORARY PIPE CULVERT (65° RT. FWD. SKEW) AT STA. 703+16.00
AND CONSTRUCT DETOUR FROM STA. 700+00.00 TO STA. 709+26.00 ON RIGHT.
STRIPE DETOUR WITH CONSTRUCTION PAVEMENT MARKINGS AND REMOVE ANY CONFLICTING PAVEMENT MARKINGS.
DELINEATE CITY STREETS AND DRIVEWAYS THROUGHOUT THE PROJECT
USING TRAFFIC DRUMS (6 PER TURNOUT) ON THE SIDE BEING WIDENED.
DELINEATE THE WORK ZONE USING VERTICAL PANELS AT 45' O.C.

STAGE 2:
SHIFT TRAFFIC ON THE DETOUR ROAD AT SITES 1, 3, & 4.
CONSTRUCT R.C. BOX CULVERTS AT STA. 104+94.00, STA. 302+54.00 AND STA. 407+25.00.
KEEP TRAFFIC ON THE EXISTING ROADWAY AT SITE 2 AND
CONTINUE WITH THE CONSTRUCTION OF NEW ROADWAY AND BRIDGE.
DELINEATE CITY STREETS AND DRIVEWAYS THROUGHOUT THE PROJECT
USING TRAFFIC DRUMS (6 PER TURNOUT) ON THE SIDE BEING WIDENED.

STAGE 3:
REMOVE DETOURS AT SITES 1, 3, & 4. REMOVE EXISTING BRIDGE AND APPROACHES AT SITE 2.
APPLY THE FINAL 2" OF ACHM SURFACE COURSE AFTER ALL CONSTRUCTION HAS BEEN COMPLETED.
SHIFT TRAFFIC TO THE NEW CONSTRUCTION AND INSTALL PERMANENT SEEDING.



SITE 3
STAGE 1
MAINTENANCE OF TRAFFIC DETAILS



SITE 3
STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

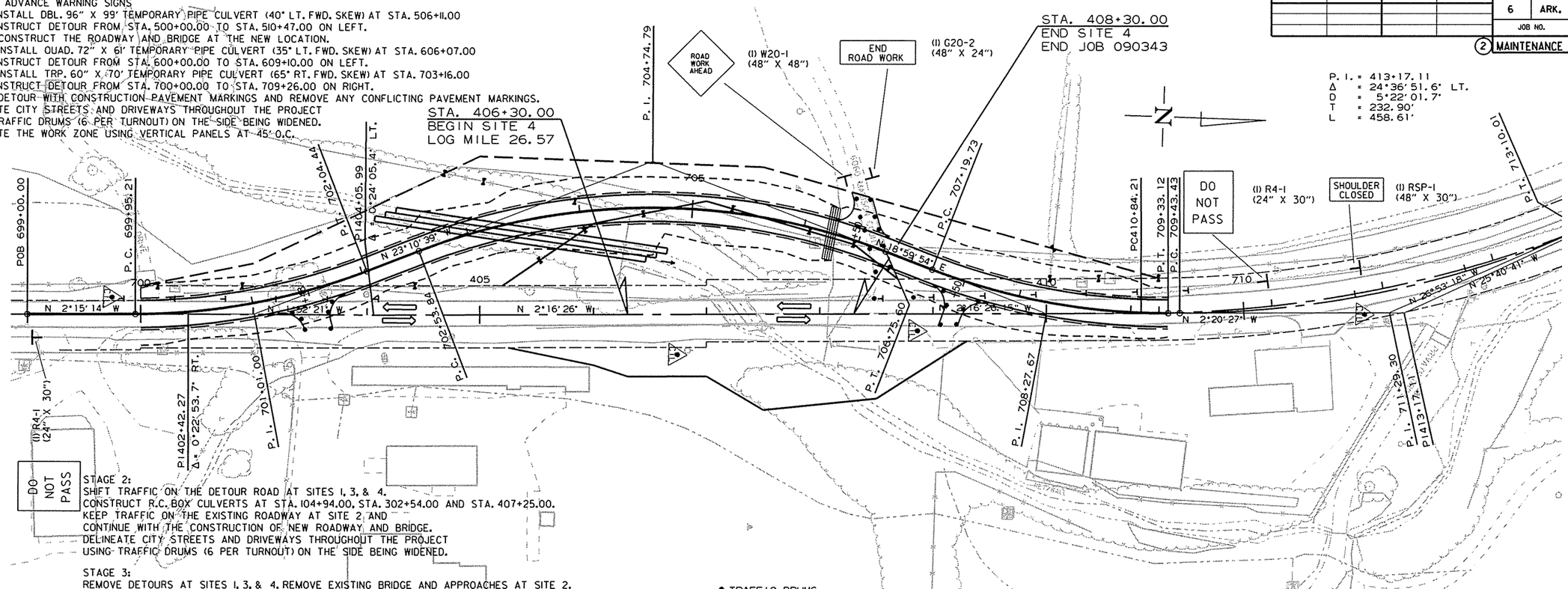
9/14/2015

R090343.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.		090343	29	141

(2) MAINTENANCE OF TRAFFIC DETAILS

STAGE 1:
INSTALL ADVANCE WARNING SIGNS
SITE 1: INSTALL DBL. 96" X 99' TEMPORARY PIPE CULVERT (40° LT. FWD. SKEW) AT STA. 506+11.00
AND CONSTRUCT DETOUR FROM STA. 500+00.00 TO STA. 510+47.00 ON LEFT.
SITE 2: CONSTRUCT THE ROADWAY AND BRIDGE AT THE NEW LOCATION.
SITE 3: INSTALL QUAD. 72" X 61' TEMPORARY PIPE CULVERT (35° LT. FWD. SKEW) AT STA. 606+07.00
AND CONSTRUCT DETOUR FROM STA. 600+00.00 TO STA. 609+10.00 ON LEFT.
SITE 4: INSTALL TRP. 60" X 70' TEMPORARY PIPE CULVERT (65° RT. FWD. SKEW) AT STA. 703+16.00
AND CONSTRUCT DETOUR FROM STA. 700+00.00 TO STA. 709+26.00 ON RIGHT.
STRIPE DETOUR WITH CONSTRUCTION PAVEMENT MARKINGS AND REMOVE ANY CONFLICTING PAVEMENT MARKINGS.
DELINEATE CITY STREETS AND DRIVEWAYS THROUGHOUT THE PROJECT
USING TRAFFIC DRUMS (6 PER TURNOUT) ON THE SIDE BEING WIDENED.
DELINEATE THE WORK ZONE USING VERTICAL PANELS AT 45' O.C.



P. I. = 413+17.11
Δ = 24°36'51.6" LT.
D = 5°22'01.7'
T = 232.90'
L = 458.61'

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15

STAGE 2:
SHIFT TRAFFIC ON THE DETOUR ROAD AT SITES 1, 3, & 4.
CONSTRUCT R.C. BOX CULVERTS AT STA. 104+94.00, STA. 302+54.00 AND STA. 407+25.00.
KEEP TRAFFIC ON THE EXISTING ROADWAY AT SITE 2 AND
CONTINUE WITH THE CONSTRUCTION OF NEW ROADWAY AND BRIDGE.
DELINEATE CITY STREETS AND DRIVEWAYS THROUGHOUT THE PROJECT
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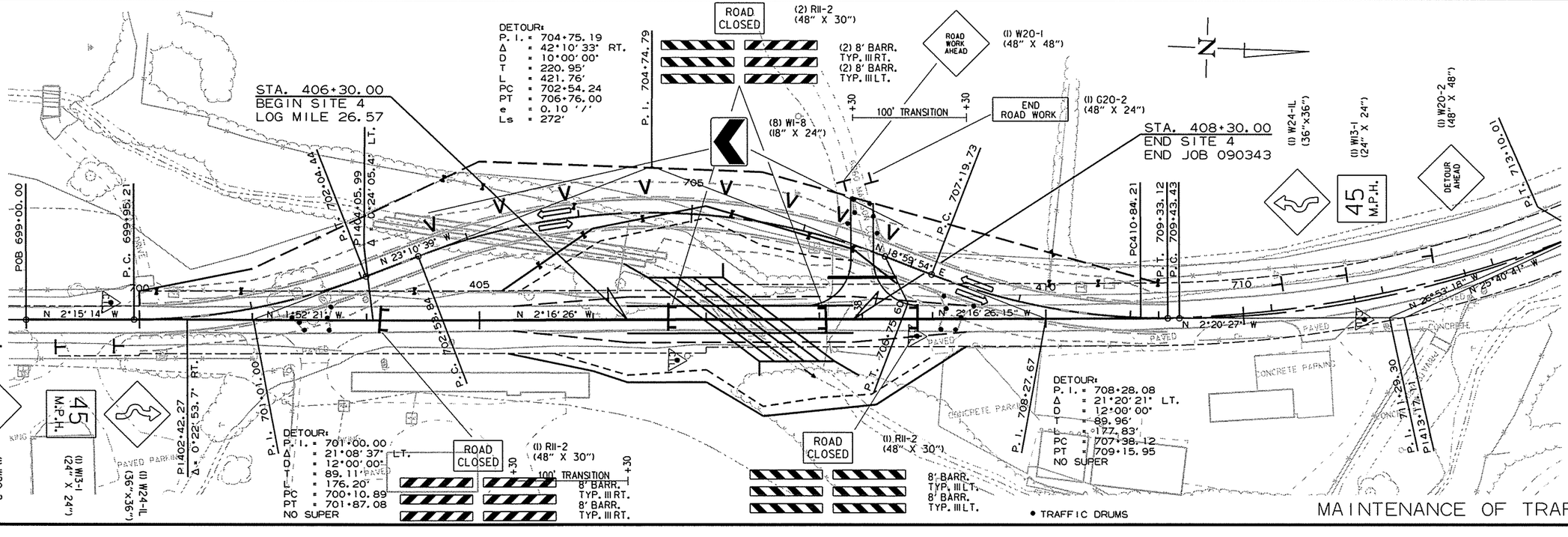
STAGE 3:
REMOVE DETOURS AT SITES 1, 3, & 4. REMOVE EXISTING BRIDGE AND APPROACHES AT SITE 2.
APPLY THE FINAL 2" OF ACHM SURFACE COURSE AFTER ALL CONSTRUCTION HAS BEEN COMPLETED.
SHIFT TRAFFIC TO THE NEW CONSTRUCTION AND INSTALL PERMANENT SEEDING.

• TRAFFIC DRUMS
⊣ VERTICAL PANELS AT 45' O.C.

SITE 4
STAGE 1
MAINTENANCE OF TRAFFIC DETAILS



• TRAFFIC DRUMS

SITE 4
STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

9/9/2015

R090343.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.		090343	30	141

(2) MAINTENANCE OF TRAFFIC DETAILS

STAGE 1:

INSTALL ADVANCE WARNING SIGNS

SITE 1: INSTALL DBL. 96" X 99' TEMPORARY PIPE CULVERT (40° LT. FWD. SKEW) AT STA. 506+11.00
AND CONSTRUCT DETOUR FROM STA. 500+00.00 TO STA. 510+47.00 ON LEFT.

SITE 2: CONSTRUCT THE ROADWAY AND BRIDGE AT THE NEW LOCATION.

SITE 3: INSTALL QUAD. 72" X 61' TEMPORARY PIPE CULVERT (35° LT. FWD. SKEW) AT STA. 606+07.00
AND CONSTRUCT DETOUR FROM STA. 600+00.00 TO STA. 609+10.00 ON LEFT.

SITE 4: INSTALL TRP. 60" X 70' TEMPORARY PIPE CULVERT (65° RT. FWD. SKEW) AT STA. 703+16.00
AND CONSTRUCT DETOUR FROM STA. 700+00.00 TO STA. 709+26.00 ON RIGHT.

STRIPE DETOUR WITH CONSTRUCTION PAVEMENT MARKINGS AND REMOVE ANY CONFLICTING PAVEMENT MARKINGS.

DELINEATE CITY STREETS AND DRIVEWAYS THROUGHOUT THE PROJECT
USING TRAFFIC DRUMS (6 PER TURNOUT) ON THE SIDE BEING WIDENED.

DELINEATE THE WORK ZONE USING VERTICAL PANELS AT 45' O.C.

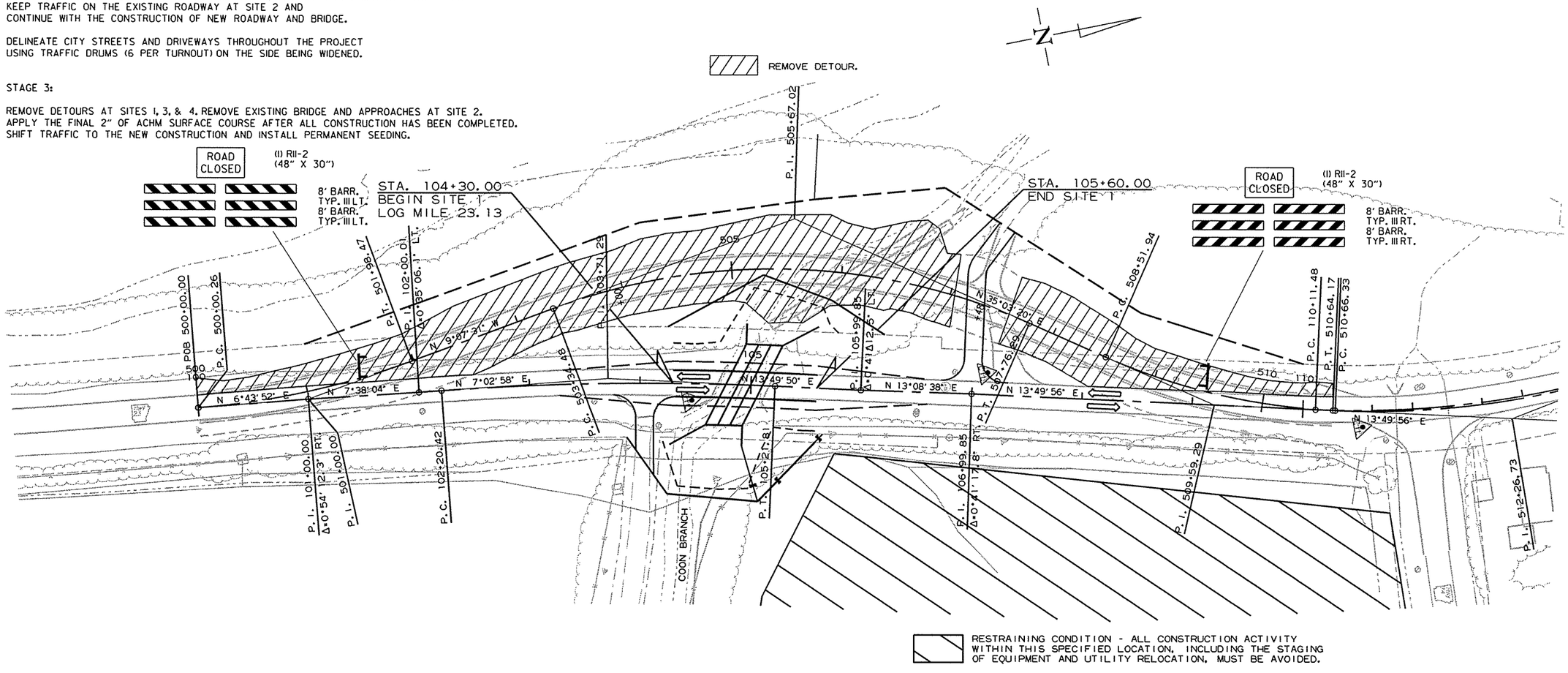
STAGE 2:

SHIFT TRAFFIC ON THE DETOUR ROAD AT SITES 1, 3, & 4.
CONSTRUCT R.C. BOX CULVERTS AT STA. 104+94.00, STA. 302+54.00 AND STA. 407+25.00.
KEEP TRAFFIC ON THE EXISTING ROADWAY AT SITE 2 AND
CONTINUE WITH THE CONSTRUCTION OF NEW ROADWAY AND BRIDGE.

DELINEATE CITY STREETS AND DRIVEWAYS THROUGHOUT THE PROJECT
USING TRAFFIC DRUMS (6 PER TURNOUT) ON THE SIDE BEING WIDENED.

STAGE 3:

REMOVE DETOURS AT SITES 1, 3, & 4. REMOVE EXISTING BRIDGE AND APPROACHES AT SITE 2.
APPLY THE FINAL 2" OF ACHM SURFACE COURSE AFTER ALL CONSTRUCTION HAS BEEN COMPLETED.
SHIFT TRAFFIC TO THE NEW CONSTRUCTION AND INSTALL PERMANENT SEEDING.



RESTRAINING CONDITION - ALL CONSTRUCTION ACTIVITY WITHIN THIS SPECIFIED LOCATION, INCLUDING THE STAGING OF EQUIPMENT AND UTILITY RELOCATION, MUST BE AVOIDED.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15

9/9/2015

R090343.DGN

SITE 1
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.		090343	31	141

2 MAINTENANCE OF TRAFFIC DETAILS

STAGE 1:
INSTALL ADVANCE WARNING SIGNS
SITE 1: INSTALL DBL. 96" X 99' TEMPORARY PIPE CULVERT (40° LT. FWD. SKEW) AT STA. 506+11.00
AND CONSTRUCT DETOUR FROM STA. 500+00.00 TO STA. 510+47.00 ON LEFT.
SITE 2: CONSTRUCT THE ROADWAY AND BRIDGE AT THE NEW LOCATION.
SITE 3: INSTALL QUAD. 72" X 61' TEMPORARY PIPE CULVERT (35° LT. FWD. SKEW) AT STA. 606+07.00
AND CONSTRUCT DETOUR FROM STA. 600+00.00 TO STA. 609+10.00 ON LEFT.
SITE 4: INSTALL TRP. 60" X 70' TEMPORARY PIPE CULVERT (65° RT. FWD. SKEW) AT STA. 703+16.00
AND CONSTRUCT DETOUR FROM STA. 700+00.00 TO STA. 709+26.00 ON RIGHT.
STRIPE DETOUR WITH CONSTRUCTION PAVEMENT MARKINGS AND REMOVE ANY CONFLICTING PAVEMENT MARKING.
DELINEATE CITY STREETS AND DRIVEWAYS THROUGHOUT THE PROJECT
USING TRAFFIC DRUMS (6 PER TURNOUT) ON THE SIDE BEING WIDENED.
DELINEATE THE WORK ZONE USING VERTICAL PANELS AT 45' O.C.

STAGE 2:
SHIFT TRAFFIC ON THE DETOUR ROAD AT SITES 1, 3, & 4.
CONSTRUCT R.C. BOX CULVERTS AT STA. 104+94.00, STA. 302+54.00 AND STA. 407+25.00.
KEEP TRAFFIC ON THE EXISTING ROADWAY AT SITE 2 AND
CONTINUE WITH THE CONSTRUCTION OF NEW ROADWAY AND BRIDGE.
DELINEATE CITY STREETS AND DRIVEWAYS THROUGHOUT THE PROJECT
USING TRAFFIC DRUMS (6 PER TURNOUT) ON THE SIDE BEING WIDENED.

STAGE 3:
REMOVE DETOURS AT SITES 1, 3, & 4. REMOVE EXISTING BRIDGE AND APPROACHES AT SITE 2.
APPLY THE FINAL 2" OF ACHM SURFACE COURSE AFTER ALL CONSTRUCTION HAS BEEN COMPLETED.
SHIFT TRAFFIC TO THE NEW CONSTRUCTION AND INSTALL PERMANENT SEEDING.

REMOVE BRIDGE & APPROACHES.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15

ROAD CLOSED
(2) R11-2 (48" X 30")
(2) 8' BARR. TYP. III RT.
(2) 8' BARR. TYP. III LT.

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

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

STA. 200+70.00
BEGIN SITE 2
LOG MILE 23.72

POB200+00.00

100' TRANSITION

N 24°18'37" E

PC203+26.46

WAR EAGLE CREEK

N 79°27'34" W

STA. 220+00.00
END SITE 2

PT219+22.92

POE222+37.24

SITE 2
STAGE 3
MAINTENANCE OF TRAFFIC DETAILS

9/9/2015

R090343.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.		090343	32	141

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-14-15

STAGE 1:

INSTALL ADVANCE WARNING SIGNS

SITE 1: INSTALL DBL. 96" X 99' TEMPORARY PIPE CULVERT (40° LT. FWD. SKEW) AT STA. 506+11.00
AND CONSTRUCT DETOUR FROM STA. 500+00.00 TO STA. 510+47.00 ON LEFT.

SITE 2: CONSTRUCT THE ROADWAY AND BRIDGE AT THE NEW LOCATION.

SITE 3: INSTALL QUAD. 72" X 61' TEMPORARY PIPE CULVERT (35° LT. FWD. SKEW) AT STA. 606+07.00
AND CONSTRUCT DETOUR FROM STA. 600+00.00 TO STA. 609+10.00 ON LEFT.

SITE 4: INSTALL TRP. 60" X 70' TEMPORARY PIPE CULVERT (65° RT. FWD. SKEW) AT STA. 703+16.00
AND CONSTRUCT DETOUR FROM STA. 700+00.00 TO STA. 709+26.00 ON RIGHT.

STRIPE DETOUR WITH CONSTRUCTION PAVEMENT MARKINGS AND REMOVE ANY CONFLICTING PAVEMENT MARKINGS.

DELINEATE CITY STREETS AND DRIVEWAYS THROUGHOUT THE PROJECT
USING TRAFFIC DRUMS (6 PER TURNOUT) ON THE SIDE BEING WIDENED.

DELINEATE THE WORK ZONE USING VERTICAL PANELS AT 45' O.C.

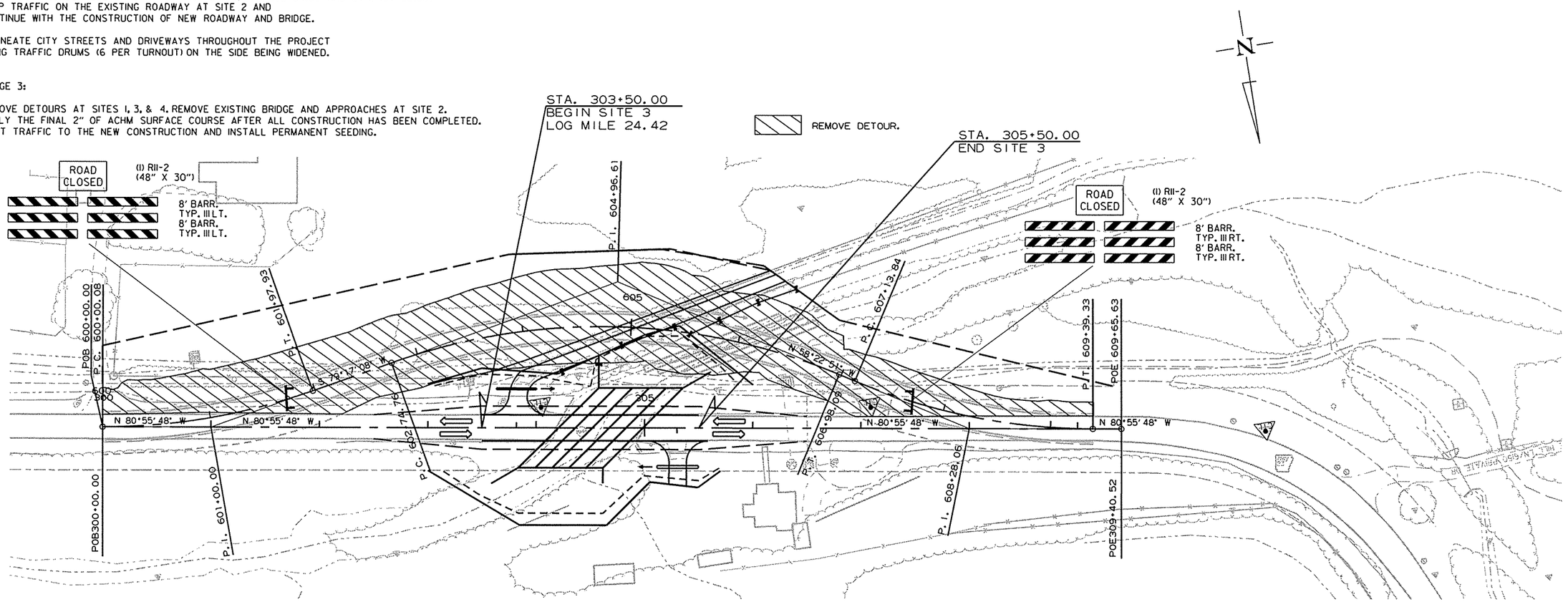
STAGE 2:

SHIFT TRAFFIC ON THE DETOUR ROAD AT SITES 1, 3, & 4.
CONSTRUCT R.C. BOX CULVERTS AT STA. 104+94.00, STA. 302+54.00 AND STA. 407+25.00.
KEEP TRAFFIC ON THE EXISTING ROADWAY AT SITE 2 AND
CONTINUE WITH THE CONSTRUCTION OF NEW ROADWAY AND BRIDGE.

DELINEATE CITY STREETS AND DRIVEWAYS THROUGHOUT THE PROJECT
USING TRAFFIC DRUMS (6 PER TURNOUT) ON THE SIDE BEING WIDENED.

STAGE 3:

REMOVE DETOURS AT SITES 1, 3, & 4. REMOVE EXISTING BRIDGE AND APPROACHES AT SITE 2.
APPLY THE FINAL 2" OF ACHM SURFACE COURSE AFTER ALL CONSTRUCTION HAS BEEN COMPLETED.
SHIFT TRAFFIC TO THE NEW CONSTRUCTION AND INSTALL PERMANENT SEEDING.



SITE 3
STAGE 3
MAINTENANCE OF TRAFFIC DETAILS

9/14/2015

R090343.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.		090343	33	141

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TIMOTHY D. SMITH
9-11-15

STAGE 1:

INSTALL ADVANCE WARNING SIGNS

SITE 1: INSTALL DBL. 96" X 99' TEMPORARY PIPE CULVERT (40° LT. FWD. SKEW) AT STA. 506+11.00 AND CONSTRUCT DETOUR FROM STA. 500+00.00 TO STA. 510+47.00 ON LEFT.

SITE 2: CONSTRUCT THE ROADWAY AND BRIDGE AT THE NEW LOCATION.

SITE 3: INSTALL QUAD. 72" X 61' TEMPORARY PIPE CULVERT (35° LT. FWD. SKEW) AT STA. 606+07.00 AND CONSTRUCT DETOUR FROM STA. 600+00.00 TO STA. 609+10.00 ON LEFT.

SITE 4: INSTALL TRP. 60" X 70' TEMPORARY PIPE CULVERT (65° RT. FWD. SKEW) AT STA. 703+16.00 AND CONSTRUCT DETOUR FROM STA. 700+00.00 TO STA. 709+26.00 ON RIGHT.

STRIPE DETOUR WITH CONSTRUCTION PAVEMENT MARKINGS AND REMOVE ANY CONFLICTING PAVEMENT MARKINGS.

DELINEATE CITY STREETS AND DRIVEWAYS THROUGHOUT THE PROJECT USING TRAFFIC DRUMS (6 PER TURNOUT) ON THE SIDE BEING WIDENED.

DELINEATE THE WORK ZONE USING VERTICAL PANELS AT 45' O.C.

STAGE 2:

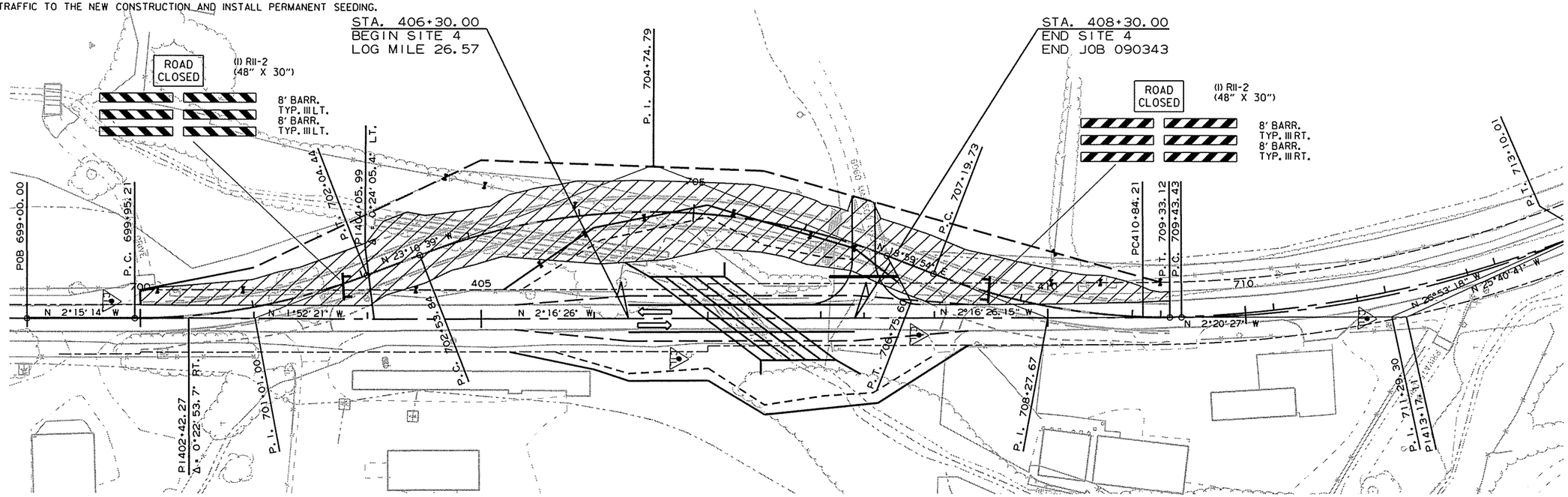
SHIFT TRAFFIC ON THE DETOUR ROAD AT SITES 1, 3, & 4.
CONSTRUCT R.C. BOX CULVERTS AT STA. 104+94.00, STA. 302+54.00 AND STA. 407+25.00.
KEEP TRAFFIC ON THE EXISTING ROADWAY AT SITE 2 AND CONTINUE WITH THE CONSTRUCTION OF NEW ROADWAY AND BRIDGE.

DELINEATE CITY STREETS AND DRIVEWAYS THROUGHOUT THE PROJECT USING TRAFFIC DRUMS (6 PER TURNOUT) ON THE SIDE BEING WIDENED.

STAGE 3:

REMOVE DETOURS AT SITES 1, 3, & 4. REMOVE EXISTING BRIDGE AND APPROACHES AT SITE 2.
APPLY THE FINAL 2" OF ACHM SURFACE COURSE AFTER ALL CONSTRUCTION HAS BEEN COMPLETED.
SHIFT TRAFFIC TO THE NEW CONSTRUCTION AND INSTALL PERMANENT SEEDING.

REMOVE DETOUR.



SITE 4
STAGE 3
MAINTENANCE OF TRAFFIC DETAILS

9/9/2015

R090343.DGN

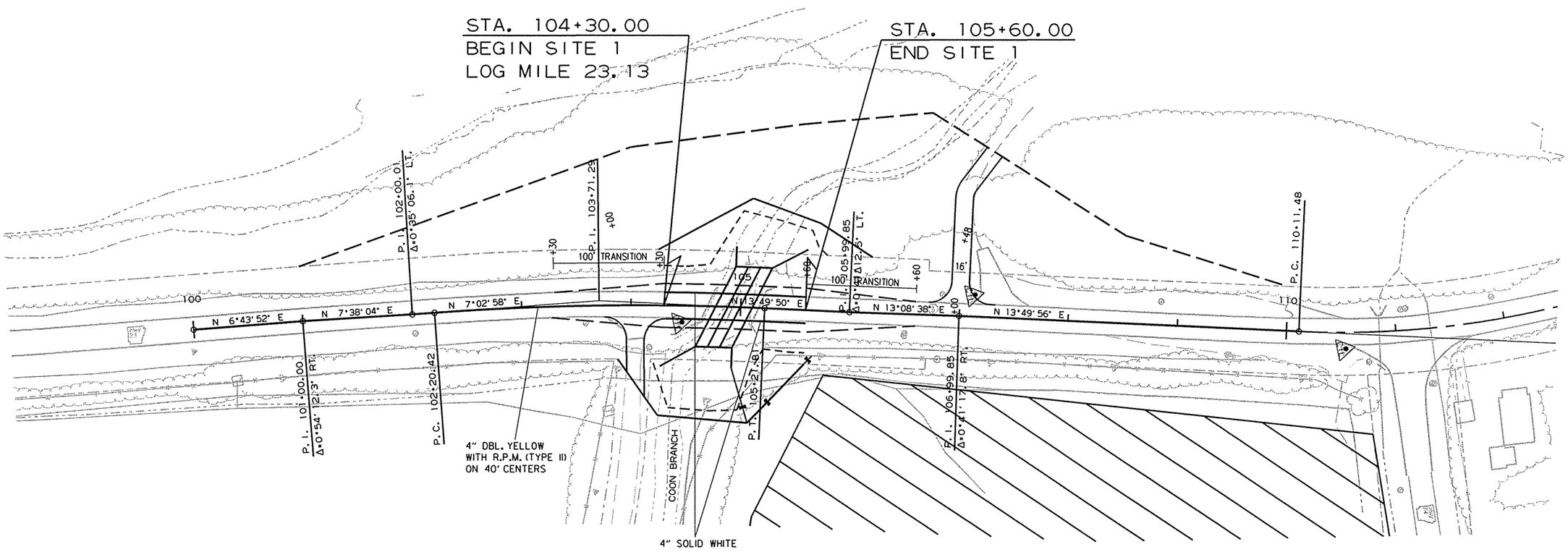
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	34	141

(2) PERMANENT PAVEMENT MARKING DETAILS

PERMANENT PAVEMENT MARKING DETAILS QUANTITIES

THERMOPLASTIC PAVEMENT MARKING WHITE (4")	=	4920 LIN. FT.
THERMOPLASTIC PAVEMENT MARKING YELLOW (4")	=	4016 LIN. FT.
HIGH PERFORMANCE CONTRAST PAVEMENT MARKING YELLOW (4")	=	904 LIN. FT.
RAISED PAVEMENT MARKERS TYPE II(YEL/YEL)	=	65 EACH

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15



THE 4" 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.

R090343.DGN 9/8/2015

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.		090343	35	141

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-1-15

STA. 200+70.00
BEGIN SITE 2
LOG MILE 23.72

POB200+00.00

200

100' TRANSITION

170

N 24°18'37" E

16'

PC203+26.46

205

4" SOLID WHITE

4" DBL. YELLOW
WITH R.P.M. (TYPE II)
ON 40' CENTERS

WAR EAGLE CREEK

4" YELLOW HIGH PERFORMANCE
CONTRAST PAVEMENT MARKING
WITH R.P.M. (TYPE II)
ON 40' CENTERS

210

4" SOLID WHITE

215

16'

4" SOLID WHITE

4" DBL. YELLOW
WITH R.P.M. (TYPE II)
ON 80' CENTERS

N 79°27' 34" W

THE 4" 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.

STA. 220+00.00
END SITE 2

215

50'

16'

PT219+22.92

+00

100' TRANSITION

+00

220

POE222+37.24

N 79°27' 34" W

4" SOLID WHITE

4" DBL. YELLOW
WITH R.P.M. (TYPE II)
ON 80' CENTERS

9/8/2015

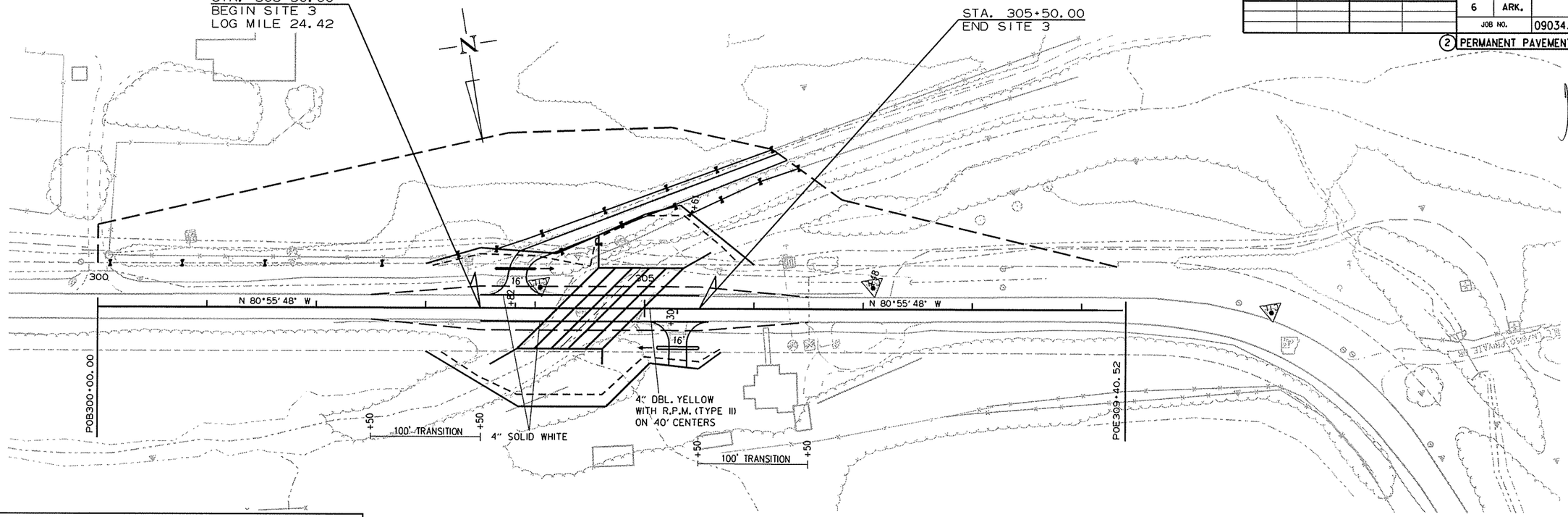
R090343.DGN

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.		090343	36	141

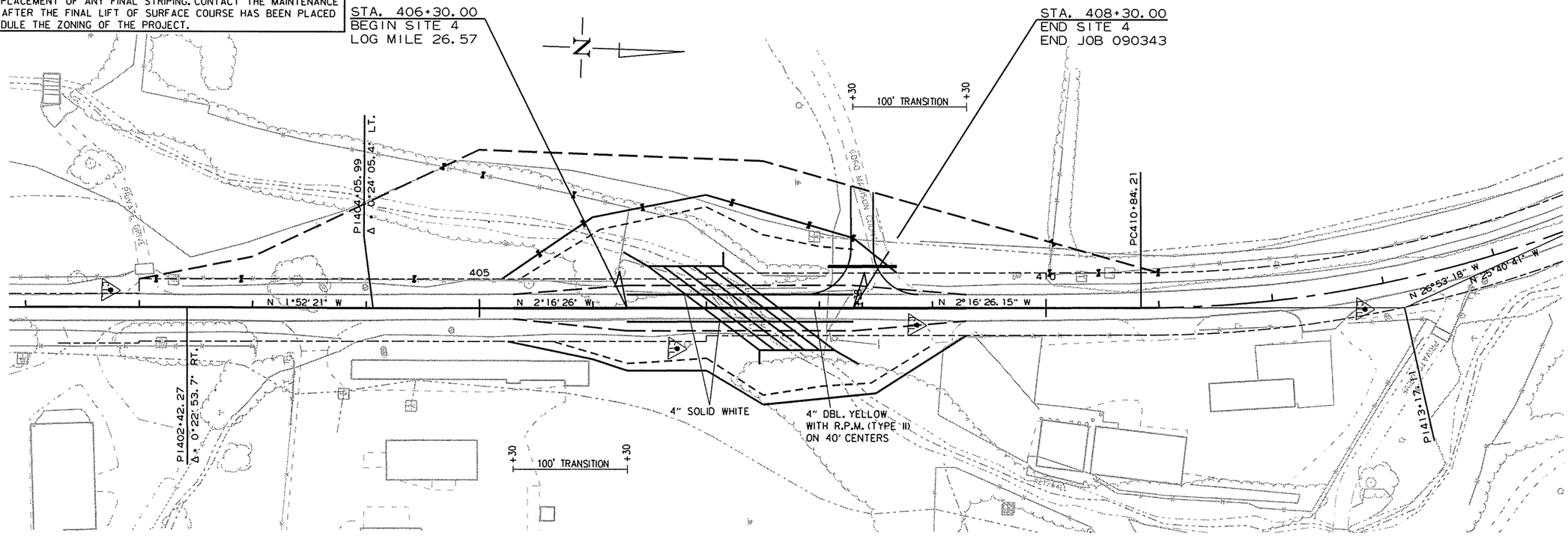
(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-1-15



SITE 3
PERMANENT PAVEMENT MARKING DETAILS

THE 4" 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.



SITE 4
PERMANENT PAVEMENT MARKING DETAILS

9/8/2015

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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.		090343	37	141

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15

CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS

DESCRIPTION	STAGE 1	STAGE 2	END OF JOB	REMOVAL OF PERMANENT PAVEMENT MARKINGS	CONSTRUCTION PAVEMENT MARKINGS	RAISED PAVEMENT MARKERS	THERMOPLASTIC PAVEMENT MARKING		HIGH PERFORMANCE CONTRAST PAVEMENT MARKING
						TYPE II	4"		4"
						(YEL/YEL)	WHITE	YELLOW	YELLOW
	LIN. FT. - EACH			LIN. FT.		EACH	LIN. FT.		
REMOVAL OF PERMANENT PAVEMENT MARKINGS		4467		4467					
CONSTRUCTION PAVEMENT MARKINGS	11768				11768				
RAISED PAVEMENT MARKERS TYPE II (YEL/YEL)			65			65			
THERMOPLASTIC PAVEMENT MARKING WHITE (4")			4920				4920		
THERMOPLASTIC PAVEMENT MARKING YELLOW (4")			4016					4016	
HIGH PERFORMANCE CONTRAST PAVEMENT MARKING YELLOW (4")			904						904
TOTALS:				**4467**	**11768**	**65**	**4920**	**4016**	**904**

NOTE: THIS IS A LOW AND HIGH TRAFFIC VOLUME ROAD AS DEFINED IN SECTION 604.03, STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.
SITE 1: LOW VOLUME ROAD.
SITE 2-4: HIGH VOLUME ROAD.
NOTE: THE 4" 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.

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"	3	3	3	3	3	48.0				
W20-1	ROAD WORK 1000 FT.	48"x48"	3	3	3	3	3	48.0				
W20-1	ROAD WORK 500 FT.	48"x48"	3	3	3	3	3	48.0				
W20-1	ROAD WORK AHEAD	48"x48"	4	4	4	4	4	64.0				
W20-2	DETOUR AHEAD	48"x48"		6		6	6	96.0				
G20-2	END ROAD WORK	48"x24"	7	7		7	7	56.0				
G20-1	ROAD WORK NEXT xx MILES	60"x24"	2	2		2	2	20.0				
W13-1	SPEED LIMIT (ADVISORY)	24"x24"		6		6	6	24.0				
R11-2	ROAD CLOSED	48"x30"	8	14	10	14	14	140.0				
W1-8	CHEVRONS	18"x24"		24		24	24	72.0				
R4-1	DO NOT PASS	24"x30"	8	8		8	8	40.0				
RSP-1	SHOULDER CLOSED	48"x30"	8			8	8	80.0				
W24-1R	DOUBLE REVERSE CURVE RT.	36"X36"		3		3	3	27.0				
W24-1L	DOUBLE REVERSE CURVE LT.	36"X36"		3		3	3	27.0				
	VERTICAL PANELS		60			60			60			
	TRAFFIC DRUMS		146	119		146				146		
	TYPE III BARRICADE-RT. (8')		2	8	10	10					80	
	TYPE III BARRICADE-LT. (8')		2	8	10	10						80
TOTALS:								**790.0**	**60**	**146**	**80**	**80**

NOTE: THIS IS A LOW AND HIGH TRAFFIC VOLUME ROAD AS DEFINED IN SECTION 604.03, STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.
SITE 1: LOW VOLUME ROAD.
SITE 2-4: HIGH VOLUME ROAD.

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				6	ARK.			
				JOB NO.		090343	38	141

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15

CLEARING AND GRUBBING

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	
100+00	110+28	SITE 1	11	11
200+70	211+00	SITE 2	11	11
218+00	221+00	SITE 2	3	3
300+00	307+60	SITE 3	8	8
402+00	411+08	SITE 4	10	10
TOTALS:			43	43

REMOVAL AND DISPOSAL OF FENCE

STATION	STATION	LOCATION	FENCE
			LIN. FT.
104+82	105+35	SITE 1: HWY. 23 - RT.	81
201+00	207+02	SITE 2: HWY. 23 - LT./RT.	738
300+10	306+16	SITE 3: HWY. 23 - LT.	655
303+85	304+31	SITE 3: HWY. 23 - RT.	50
304+51	306+40	SITE 3: HWY. 23 - LT.	207
402+21	408+07	SITE 4: HWY. 23 - LT.	872
410+03	410+90	SITE 4: HWY. 23 - LT.	115
TOTAL:			2718

REMOVAL AND DISPOSAL OF ITEMS

STATION	STATION	LOCATION	GUARDRAIL	TERMINAL ANCHOR POSTS	BUILDINGS
			LIN. FT.	EACH	EACH
204+15	204+48	SITE 2: HWY. 23 - LT.	30	1	
204+46	204+76	SITE 2: HWY. 23 - LT.	30	1	
210+01	210+41	SITE 2: HWY. 23 - LT.	30	1	
210+15	210+51	SITE 2: HWY. 23 - LT.	30	1	
215+89	216+39	SITE 2: HWY. 23 - LT.			1
302+15	304+12	SITE 3: HWY. 23 - LT.	196	1	
303+96	304+26	SITE 3: HWY. 23 - RT.	30	1	
304+93	305+19	SITE 3: HWY. 23 - RT.	26	1	
305+06	306+99	SITE 3: HWY. 23 - LT.	194	1	
TOTALS:			566	8	1

NOTE: THE QUANTITY SHOWN ABOVE FOR THE REMOVAL OF GUARDRAIL SHALL INCLUDE THE REMOVAL AND DISPOSAL OF GUARDRAIL TERMINAL ANCHOR POSTS.

REMOVAL AND DISPOSAL OF CULVERTS

STATION	DESCRIPTION	PIPE CULVERTS
		EACH
303+82	SITE 3: 18" X 22' CMP - LT.	1
305+30	SITE 3: 18" X 20' CMP - RT.	1
307+25	SITE 3: 18" X 32' CMP - LT.	1
408+07	SITE 4: 24" X 39' RCP - C.L.	1
408+18	SITE 4: 24" X 46' RCP - C.L.	1
TOTAL:		5

NOTE: QUANTITIES SHOWN ABOVE SHALL INCLUDE REMOVAL & DISPOSAL OF ALL HEADWALLS AND FLARED END SECTIONS IF APPLICABLE.

4" PIPE UNDERDRAIN

STATION	STATION	LOCATIONS	4" PIPE UNDERDRAINS	UNDERDRAIN OUTLET PROTECTORS
			LIN. FT.	EACH
200+70	204+20		430	3
216+50	220+00		430	3
* ENTIRE PROJECT TO BE USED IF AND			1000	5
WHERE DIRECTED BY THE ENGINEER				
TOTALS:			1860	11

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

4/21/2015

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				6	ARK.			
				JOB NO.		090343	39	141

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15

GUARDRAIL

STATION	STATION	LOCATION	GUARDRAIL (TYPE A)	THRIE BEAM GUARDRAIL TERMINAL	TERMINAL ANCHOR POST (TYPE 1)
			LIN. FT.	EACH	
203+90.74	206+09.49	RT. SIDE	200	1	1
205+15.74	206+09.49	LT. SIDE	75	1	1
210+80.51	211+74.26	RT. SIDE	75	1	1
210+80.51	212+99.26	LT. SIDE	200	1	1
TOTALS:			550	4	4

COLD MILLING ASPHALT PAVEMENT

STATION	STATION	LOCATION	AVG. WIDTH	COLD MILLING ASPHALT PAVEMENT
			FEET	SQ. YD.
100+00	104+30	SITE 1	22	1051.11
105+60	110+10	SITE 1	22	1100.00
199+70	200+70	SITE 2	22	244.44
220+00	221+00	SITE 2	22	244.44
300+00	303+50	SITE 3	22	855.56
305+50	309+15	SITE 3	22	892.22
402+00	406+30	SITE 4	22	1051.11
408+30	411+00	SITE 4	22	660.00
TOTAL:				6098.88

NOTE: AVERAGE MILLING DEPTH 1".

BENCH MARKS

STATION	LOCATION	BENCH MARKS
		EACH
104+94	SITE 1: HEADWALL ON R.C. BOX CULVERT	1
206+19	SITE 2: BRIDGE END	1
304+54	SITE 3: HEADWALL ON R.C. BOX CULVERT	1
407+25	SITE 4: HEADWALL ON R.C. BOX CULVERT	1
TOTAL:		4

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

ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC

LOCATION	TON	TACK COAT
		GALLON
ENTIRE PROJECT - TO BE USED IF AND WHERE	12	24
DIRECTED BY THE ENGINEER		
TOTALS:	12	24

BASIS OF ESTIMATE:
ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC...25 TON/MILE
TACK COAT FOR MAINTENANCE OF TRAFFIC.....50 GAL./MILE

ACHM PATCHING OF EXISTING ROADWAY

DESCRIPTION	TON
ENTIRE PROJECT - TO BE USED IF AND WHERE	50
DIRECTED BY THE ENGINEER	
TOTAL:	50

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

MAILBOXES

LOCATION	MAILBOXES	MAILBOX SUPPORTS (SINGLE)
	EACH	
ENTIRE PROJECT	2	2
TOTALS:	2	2

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				6	ARK.			
				JOB NO.		090343	40	141

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-14-15

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
							18"	24"	30"	
			FEET	SQ. YD.	TON	TON	LIN. FT.			
104+04	RT.	SITE 1: HWY. 23	16	96.20	10.58	39.28				
107+00	RT.	SITE 1: HWY. 23	16	298.34	32.82	121.82				
202+48	LT.	SITE 2: HWY. 23	16	66.21	7.28	27.04				
212+00	RT.	SITE 2: HWY. 23	16	510.06	56.11	208.27				
213+50	LT.	SITE 2: HWY. 23	16	412.29	45.35	168.35		82		PCC-1, PCM-1, PCP-1, PCP-2
215+78	RT.	SITE 2: HWY. 23	16	305.62	33.62	124.79				
303+82	LT.	SITE 3: HWY. 23	16	524.29	57.67	214.09	42			PCC-1, PCM-1, PCP-1, PCP-2
305+30	RT.	SITE 3: HWY. 23	16	83.40	9.17	34.06			36	PCC-1, PCM-1, PCP-1, PCP-2
408+38	RT.	SITE 4: HWY. 23	20	224.15	24.66	91.53	60			PCC-1, PCM-1, PCP-1, PCP-2
504+00	RT.	SITE 1: HWY. 23 - TEMPORARY DRIVE	16	114.09	12.55	46.59	30			PCC-1, PCM-1, PCP-1, PCP-2
507+30	RT.	SITE 1: HWY. 23 - TEMPORARY DRIVE	16	113.45	12.48	46.33				
605+61	RT.	SITE 3: HWY. 23 - TEMPORARY DRIVE	16	188.12	20.69	76.82	32			PCC-1, PCM-1, PCP-1, PCP-2
607+38	RT.	SITE 3: HWY. 23 - TEMPORARY DRIVE	16	37.01	4.07	15.11				PCC-1, PCM-1, PCP-1, PCP-2
701+50	RT.	SITE 4: HWY. 23 - TEMPORARY DRIVE	16	47.68	5.24	19.47	28			PCC-1, PCM-1, PCP-1, PCP-2
706+50	LT.	SITE 4: HWY. 23 - TEMPORARY DRIVE	16	64.57	7.10	26.37	28			PCC-1, PCM-1, PCP-1, PCP-2
707+50	RT.	SITE 1: HWY. 23 - TEMPORARY DRIVE	16	56.05	6.17	22.89				
* ENTIRE PROJECT TEMPORARY DRIVES						90.00				
TOTALS:				**3141.53**	**345.56**	**1372.81**	**220**	**82**	**36**	

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.7% MIN. AGGR.....5.3% 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.

DUMPED RIPRAP AND FILTER BLANKET

STATION	LOCATION	DUMPED RIPRAP	FILTER BLANKET
		CU. YD.	SQ. YD.
104+94	SITE 1: OUTLET OF R.C. BOX CULVERT	103	206
304+60	SITE 3: OUTLET OF R.C. BOX CULVERT	289	578
407+25	SITE 4: OUTLET OF R.C. BOX CULVERT	140	280
	* TO BE USED IF AND WHERE	100	200
	DIRECTED BY THE ENGINEER		
TOTALS:		**632**	**1264**

* NOTE: QUANTITY ESTIMATED.
SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS
NOTE: FILTER BLANKET SHALL BE GEOTEXTILE FABRIC (TYPE 5).

FENCING

STATION	STATION	LOCATION	WIRE FENCE (TYPE D)
			LIN. FT.
104+93	105+67	SITE 1: HWY. 23 - RT.	138
200+70	206+86	SITE 2: HWY. 23 - RT.	624
304+20	306+40	SITE 3: HWY. 23 - LT.	257
402+20	408+30	SITE 4: HWY. 23 - LT.	640
404+68	406+37	SITE 4: HWY. 23 - LT.	173
410+03	411+00	SITE 4: HWY. 23 - LT.	128
TOTALS:			**1960**

SELECTED PIPE BEDDING

LOCATION	SELECTED PIPE BEDDING
	CU.YD.
ENTIRE PROJECT TO BE USED IF	
AND WHERE DIRECTED BY THE	50
ENGINEER	
TOTAL:	**50**

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

4/21/2015

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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.		090343	41	141

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15

EARTHWORK

STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT	* SOIL STABILIZATION
			CU. YD.		TON
ENTIRE	PROJECT	SITE 1: STAGE 1 - DETOUR	114	6886	
ENTIRE	PROJECT	SITE 1: STAGE 2 - MAIN LANES	261	1760	
ENTIRE	PROJECT	SITE 1: STAGE 3 - REMOVE DETOUR	7848	264	
ENTIRE	PROJECT	SITE 2: STAGES 1 & 2 - MAIN LANES	2276	66797	
ENTIRE	PROJECT	SITE 2: STAGES 3 - REMOVE EXIST. ROADWAY	927		
ENTIRE	PROJECT	SITE 3: STAGE 1 - DETOUR	3417	965	
ENTIRE	PROJECT	SITE 3: STAGE 2 - MAIN LANES	687	1738	
ENTIRE	PROJECT	SITE 3: STAGE 3 - REMOVE DETOUR	1786	3298	
ENTIRE	PROJECT	SITE 4: STAGE 1 - DETOUR	1428	1257	
ENTIRE	PROJECT	SITE 4: STAGE 2 - MAIN LANES	1244	747	
ENTIRE	PROJECT	SITE 4: STAGE 3 - REMOVE DETOUR	2124	1406	
ENTIRE	PROJECT	APPROACHES		10405	
ENTIRE	PROJECT	TEMPORARY APPROACHES		440	
ENTIRE	PROJECT	BRIDGE EXCAVATION	1689		
104+94		CHANNEL CHANGE - SITE 1	200		
304+60		CHANNEL CHANGE - SITE 3	300		
407+25		CHANNEL CHANGE - SITE 4	250		
* ENTIRE	PROJECT	TO BE USED IF AND WHERE			100
		DIRECTED BY THE ENGINEER			
TOTALS:			**24551**	**95963**	**100**

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

APPROACH GUTTERS

STATION	STATION	LOCATION	APPROACH GUTTER (TYPE A)	REINFORCING STEEL-RDWY. (GR. 60)
			CU.YD.	POUND
205+88.89	206+18.89	LT. SIDE	7.55	665
205+88.89	206+18.89	RT. SIDE	7.55	665
210+71.11	211+01.11	LT. SIDE	7.55	665
210+71.11	211+01.11	RT. SIDE	7.55	665
TOTALS:			**30.20**	**2660**

NOTE: USE T =17" FOR 8' SHOULDER.

EROSION CONTROL

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL					TEMPORARY EROSION CONTROL							
			SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	TEMPORARY SEEDING	MULCH COVER	WATER	ROCK DITCH CHECKS	SILT FENCE	SEDIMENT BASIN	OBLITERATION OF SEDIMENT BASIN	*SEDIMENT REMOVAL & DISPOSAL
											(E-6)	(E-11)	(E-14)		
			ACRE	TON	ACRE	M.GAL.	ACRE	ACRE	ACRE	M.GAL.	CU.YD.	LIN. FT.	CU.YD.	CU.YD.	CU. YD.
ENTIRE	PROJECT	CLEARING AND GRUBBING										4486			166
ENTIRE	PROJECT	STAGE 1						17.01	17.01	347.0	42		2268	2268	2282
ENTIRE	PROJECT	STAGE 2	6.84	13.68	6.84	697.7	6.84	2.69	2.69	54.9	36		912	912	924
ENTIRE	PROJECT	STAGE 3	3.41	6.82	3.41	347.8	3.41					1300			
*ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.			2.56	5.12	2.56	261.1	2.56	4.93	4.93	100.6	20	1447	795	795	849
TOTALS:			**12.81**	**25.62**	**12.81**	**1306.6**	**12.81**	**24.63**	**24.63**	**502.5**	**98**	**7233**	**3975**	**3975**	**4221**

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
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.

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

4/21/2015

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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.		090343	42	141

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15

STRUCTURES

STATION	DESCRIPTION	TEMPORARY CULVERTS 18"	24"	60"	72"	96"	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.	
506+11	DBL. TEMPORARY PIPE CULVERT					336									PCC-1, PCM-1
605+61	TEMPORARY PIPE CULVERT	32													PCC-1, PCM-1
606+07	QUAD. TEMPORARY PIPE CULVERT				544										PCC-1, PCM-1
701+50	TEMPORARY PIPE CULVERT	28													PCC-1, PCM-1
703+16	TRP. TEMPORARY PIPE CULVERT			726											PCC-1, PCM-1
706+26	QUAD. TEMPORARY PIPE CULVERT		196												PCC-1, PCM-1
706+59	TEMPORARY PIPE CULVERT	28													PCC-1, PCM-1
SUBTOTALS:		**88**	**196**	**726**	**544**	**336**									
STRUCTURES OVER 20' - 0" SPAN															
104+94	TRIPLE 11'X9' R.C. BOX CULVERT WITH 25^ LT. FWD SKEW						11	9	82	344.00	47879	181	94	1.18	SPECIAL DETAILS, RCB-1, RCB-2
304+60	QUINT. 11'X6' R.C. BOX CULVERT WITH 45^ LT. FWD. SKEW						11	6	105	597.66	88081	244	125	1.58	SPECIAL DETAILS, RCB-1, RCB-2
407+25	QUINT. 8'X4' R.C. BOX CULVERT WITH 53^ RT. FWD. SKEW						8	4	127	470.00	65851	201	102	1.29	SPECIAL DETAILS, RCB-1, RCB-2
SUBTOTALS:										**1411.66**	**201811**	**626**	**321**	**4.05**	
TOTALS:		**88**	**196**	**726**	**544**	**336**				**1411.66**	**201811**	**626**	**321**	**4.05**	

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.

4/21/2015
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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.		090343	43	141

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15

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																						
100+00.00	103+30.00	SITE 1: HWY. 23	330.00															22.00	806.67	220.00	88.73	88.73
103+30.00	104+30.00	SITE 1: HWY. 23 - TRANSITION	100.00	107.50	107.50	2.39	26.56	0.03	0.80	1.26	14.00	495.00	3.47	1.13	12.56	220.00	1.38	25.00	277.78	220.00	30.56	31.94
104+30.00	105+60.00	SITE 1: HWY. 23	130.00	347.25	451.43	48.77	704.46	0.03	21.13	24.52	354.18	495.00	87.66	24.25	350.28	220.00	38.53	28.00	404.44	220.00	44.49	83.02
105+60.00	106+60.00	SITE 1: HWY. 23 - TRANSITION	100.00	107.50	107.50	2.39	26.56	0.03	0.80	1.26	14.00	495.00	3.47	1.13	12.56	220.00	1.38	25.00	277.78	220.00	30.56	31.94
106+60.00	110+27.00	SITE 1: HWY. 23	367.00															22.00	897.11	220.00	98.68	98.68
199+70.00	200+70.00	SITE 2: HWY. 23 - TRANSITION	100.00	107.50	107.50	2.39	26.56	0.03	0.80	1.26	14.00	495.00	3.47	1.13	12.56	220.00	1.38	25.00	277.78	220.00	30.56	31.94
200+70.00	206+18.89	SITE 2: HWY. 23	548.89	347.25	1906.02	48.77	2974.37	0.03	89.23	24.52	1495.42	495.00	370.12	24.25	1478.95	220.00	162.68	28.00	1707.66	220.00	187.84	350.52
210+71.11	220+00.00	SITE 2: HWY. 23	928.89	347.25	3225.57	48.77	5033.55	0.03	151.01	24.52	2530.71	495.00	626.35	24.25	2502.84	220.00	275.31	28.00	2889.88	220.00	317.89	593.20
220+00.00	221+00.00	SITE 2: HWY. 24 - TRANSITION	100.00	107.50	107.50	2.39	26.56	0.03	0.80	1.26	14.00	495.00	3.47	1.13	12.56	220.00	1.38	25.00	277.78	220.00	30.56	31.94
300+00.00	302+50.00	SITE 3: HWY. 23	250.00															22.00	611.11	220.00	67.22	67.22
302+50.00	303+50.00	SITE 3: HWY. 23 - TRANSITION	100.00	107.50	107.50	2.39	26.56	0.03	0.80	1.26	14.00	495.00	3.47	1.13	12.56	220.00	1.38	25.00	277.78	220.00	30.56	31.94
303+50.00	305+50.00	SITE 3: HWY. 23	200.00	347.25	694.50	48.77	1083.78	0.03	32.51	24.52	544.89	495.00	134.86	24.25	538.89	220.00	59.28	28.00	622.22	220.00	68.44	127.72
305+50.00	306+50.00	SITE 3: HWY. 23 - TRANSITION	100.00	107.50	107.50	2.39	26.56	0.03	0.80	1.26	14.00	495.00	3.47	1.13	12.56	220.00	1.38	25.00	277.78	220.00	30.56	31.94
306+50.00	309+15.00	SITE 3: HWY. 23	265.00															22.00	647.78	220.00	71.26	71.26
401+95.00	405+30.00	SITE 4: HWY. 23	335.00															22.00	818.89	220.00	90.08	90.08
405+30.00	406+30.00	SITE 4: HWY. 23 - TRANSITION	100.00	107.50	107.50	2.39	26.56	0.03	0.80	1.26	14.00	495.00	3.47	1.13	12.56	220.00	1.38	25.00	277.78	220.00	30.56	31.94
406+30.00	408+30.00	SITE 4: HWY. 23	200.00	347.25	694.50	48.77	1083.78	0.03	32.51	24.52	544.89	495.00	134.86	24.25	538.89	220.00	59.28	28.00	622.22	220.00	68.44	127.72
408+30.00	409+30.00	SITE 4: HWY. 23 - TRANSITION	100.00	107.50	107.50	2.39	26.56	0.03	0.80	1.26	14.00	495.00	3.47	1.13	12.56	220.00	1.38	25.00	277.78	220.00	30.56	31.94
409+30.00	411+08.00	SITE 4: HWY. 23	178.00															22.00	435.11	220.00	47.86	47.86
DETOUR																						
500+00.00	510+64.00	SITE 1: HWY. 23	1064.00	151.25	1609.30	22.31	2637.54	0.03	79.13	22.31	2637.54	385.00	507.73					26.00	3073.78	220.00	338.12	338.12
600+00.00	609+39.00	SITE 3: HWY. 23	939.00	151.25	1420.24	22.31	2327.68	0.03	69.83	22.31	2327.68	385.00	448.08					26.00	2712.67	220.00	298.39	298.39
699+95.00	709+33.00	SITE 4: HWY. 23	938.00	151.25	1418.73	22.31	2325.20	0.03	69.76	22.31	2325.20	385.00	447.60					26.00	2709.78	220.00	298.08	298.08
ADDITIONAL FOR GUARDRAIL WIDENING																						
203+57.74	203+90.74	SITE 2: HWY. 23 ON RT.	33.00	88.75	29.29																	
203+90.74	206+18.89	SITE 2: HWY. 23 ON RT.	228.15	177.50	404.97																	
204+82.74	205+15.74	SITE 2: HWY. 23 ON LT.	33.00	34.25	11.30																	
205+15.74	206+18.89	SITE 2: HWY. 23 ON LT.	103.15	68.50	70.66																	
210+71.11	211+74.26	SITE 2: HWY. 23 ON RT.	103.15	177.50	183.09																	
210+71.11	212+99.26	SITE 2: HWY. 23 ON LT.	228.15	68.50	156.28																	
211+74.26	212+07.26	SITE 2: HWY. 23 ON RT.	33.00	88.75	29.29																	
212+99.26	213+32.26	SITE 2: HWY. 23 ON LT.	33.00	34.25	11.30																	
ADDITIONAL FOR SUPERELEVATION																						
200+70.00	204+20.00	SITE 2: HWY. 23	350.00	51.50	180.25																	
216+50.00	220+00.00	SITE 2: HWY. 23	350.00	51.50	180.25																	
TOTALS:					**13536.97**		**18382.84**		**551.51**		**12872.51**		**2785.02**		**5510.33**		**606.12**		**21181.56**		**2330.00**	**2936.12**

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.7% MIN. AGGR.....5.3% ASPHALT BINDER
ACHM BINDER COURSE (1").....95.7% MIN. AGGR.....4.3% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22

4/21/2015

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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.		090343	44	141

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15

SOIL LOG

STATION	LATITUDE			LONGITUDE			LOCATION	DEPTH	LIQUID LIMIT	PLASTICITY INDEX	AASHTO CLASSIFICATION	COLOR
	DEG	MIN	SEC	DEG	MIN	SEC		FEET				
101+00	36	1	52.70	93	42	14.50	5' RT.	0-4 Z	27	12	A-6 (5)	BR/GR
101+00	36	1	52.70	93	42	14.30	20' RT.	0-5	23	8	A-4 (1)	BR/GR
109+00	36	2	0.40	93	42	12.80	5' LT.	0-5	17	3	A-4 (0)	BR/GR
109+00	36	2	0.40	93	42	13.00	20' LT.	0-5	28	11	A-2-6 (0)	BR/GR
201+00	36	2	24.40	93	42	17.30	5' RT.	0-2.5 Z	31	17	A-6 (7)	BROWN
201+00	36	2	24.30	93	42	17.10	20' RT.	0-5	29	16	A-6 (7)	BR/GR
203+00	36	2	26.60	93	42	16.40	C.L.	0-5	25	9	A-4 (1)	BR/GR
213+00	36	2	36.20	93	42	19.30	C.L.	0-5	26	12	A-6 (5)	BR/GR
219+00	36	2	39.00	93	42	25.30	5' LT.	0-5	48	28	A-7-6 (26)	GRAY
219+00	36	2	38.90	93	42	25.30	20' LT.	0-5	49	28	A-7-6 (25)	GRAY
301+00	36	2	41.60	93	42	43.20	5' RT.	0-5	24	10	A-4 (2)	BR/GR
301+00	36	2	41.80	93	42	43.20	22' RT.	0-5	23	9	A-4 (1)	BR/GR
308+00	36	2	42.50	93	42	51.90	5' LT.	0-5	21	7	A-2-4 (0)	BROWN
308+00	36	2	42.40	93	42	51.90	20' LT.	0-5	18	4	A-1-B (0)	BR/GR
403+00	36	4	9.80	93	43	48.50	5' RT.	0-5	25	12	A-6 (1)	BROWN
403+00	36	4	9.80	93	43	48.30	21' RT.	0-5	44	26	A-7-6 (9)	BROWN
412+00	36	4	18.50	93	43	49.30	5' LT.	0-5	33	18	A-6 (5)	BROWN
412+00	36	4	18.50	93	43	49.50	20' LT.	0-5	25	11	A-6 (2)	BROWN

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.
Z- AUGER REFUSAL

R080484.DGN 4/21/2015

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	45	141
				①		07346 - QUANTITIES - 57106		

SCHEDULE OF BRIDGE QUANTITIES-JOB 090343

BRIDGE NO.	NAME PLATE TITLE	UNIT OF STRUCTURE	ITEM NO.	205	801	802	802	803	804	804	805	805	SP & 807	808	809	812	816	816	816
			ITEM	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO.)	UNCLASSIFIED EXCAVATION FOR STRUCTURES-BRIDGE	CLASS S CONCRETE-BRIDGE	CLASS S(AE) CONCRETE-BRIDGE	CLASS 2 PROTECTIVE SURFACE TREATMENT	EPOXY COATED REINFORCING STEEL (GRADE 60)	REINFORCING STEEL-BRIDGE (GRADE 60)	① STEEL PILING (HP 12X53)	PREBORING	STRUCTURAL STEEL IN BEAM SPANS (M 270, GRADE 50W)	ELASTOMERIC BEARINGS	SILICONE JOINT SEALANT	BRIDGE NAME PLATE (TYPE D)	FILTER BLANKET	FOUNDATION PROTECTION RIPRAP	DUMPED RIPRAP
			UNIT	LUMP SUM	CU. YD.	CU. YD.	CU. YD.	SQ. YD.	LB.	LB.	LIN. FT.	LIN. FT.	LB.	CU. IN.	LIN. FT.	EACH	SQ. YD.	TON	CU. YD.
07346	WAR EAGLE CREEK	BENT 1				45.43		12.8		3,490	165		830	2,695.1			271		152
		BENT 2			170	124.54				16,174	168			3,000.0					
		BENT 3			243	151.30				25,362				1,812.6					
		BENT 4			301	167.49				26,503			830	1,812.6					
		BENT 5			281	155.58				26,075				1,812.6					
		BENT 6			131	133.81				19,716	144	120		3,000.0					
		BENT 7				45.45		12.8		3,490	165			2,695.1			459	941	
		450'-0" W-BEAM UNIT					584.10	2,369.7	136,110				540,840		86	1			
		SITE NO. 2 (STA. 212+81)		1															
TOTALS FOR BRIDGE NO. 07346					② 1,126	823.60	584.10	2,395.3	136,110	120,810	642	120	542,500	16,828.0	86	1	730	941	152
		③ SITE NO. 1 (STA. 104+94)		1															
		④ SITE NO. 3 (STA. 304+60)		1															
		⑤ SITE NO. 4 (STA. 407+25)		1															
TOTALS FOR JOB NO. 090343					② 1,126	823.60	584.10	2,395.3	136,110	120,810	642	120	542,500	16,828.0	86	1	730	941	152

① All steel piling shall be Grade 50 and are required to have approved driving points which will not be paid for directly, but will be considered subsidiary to the item "Steel Piling (HP 12X53)". All piles shall conform to Std. Dwg. No. 55020.

② Includes approx. 109 cu. yds. of rock excavation.

③ Existing Bridge No. M0556 (Log Mile 23.21) is 26.0' wide and 46' long and consists of a concrete deck on steel beams supported by masonry bents. This bridge shall be removed in accordance with Section 205.

④ Existing Bridge No. M0557 (Log Mile 24.50) is 27.8' wide and 81' long and consists of a concrete deck on steel beams supported by concrete piers. This bridge shall be removed in accordance with Section 205.

⑤ Existing Bridge No. M0558 (Log Mile 26.59) is 24.0' wide and 32' long and consists of concrete slab spans (2 @ 16') supported by masonry bents. This bridge shall be removed in accordance with Section 205.

All salvagable guard rail from structures M0556, M0557, and M0558 as selected by District 9 shall remain the property of the Department. The Contractor shall coordinate with the Engineer to provide temporary storage and on site loading onto Department equipment for removal of all salvaged items. All remaining material from the existing bridges shall become the property of the Contractor.

KYLE YEARY
DESIGN SECTION SUPERVISOR

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
8-21-15
CHARLES R. ELLIS
BRIDGE ENGINEER

SCHEDULE OF BRIDGE QUANTITIES
HWY. 74 - HUNTSVILLE STRS. & APPRS. (S)
MADISON COUNTY
ROUTE 23 SEC. 8
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: DHP DATE: 4/14/15 FILENAME: b090343_ql.dgn
CHECKED BY: BHS DATE: 3/14/15 SCALE: ---
DESIGNED BY: — DATE: —
BRIDGE NO. 07346 DRAWING NO. 57106

PRINT DATE: 8/21/2015

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
9-16-15				6	ARK.			
				JOB NO.		090343	46	141

(2) SUMMARY OF QUANTITIES AND REVISIONS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-16-15

SUMMARY OF QUANTITIES (BOX 1 OF 2)

	ITEM NUMBER	ITEM		QUANTITY	UNIT
	SP & 201	CLEARING		43	STATION
	201	GRUBBING		43	STATION
	202	REMOVAL AND DISPOSAL OF FENCE		2718	LIN. FT.
	202	REMOVAL AND DISPOSAL OF PIPE CULVERTS		5	EACH
	202	REMOVAL AND DISPOSAL OF GUARDRAIL		566	LIN. FT.
	202	REMOVAL AND DISPOSAL OF TERMINAL ANCHOR POSTS		8	EACH
	202	REMOVAL AND DISPOSAL OF BUILDINGS		1	EACH
	210	UNCLASSIFIED EXCAVATION		24551	CU. YD.
	210	COMPACTED EMBANKMENT		95963	CU. YD.
	SP & 210	SOIL STABILIZATION		100	TON
	303	AGGREGATE BASE COURSE (CLASS 7)		14910	TON
	401	TACK COAT		576	GAL.
	SP, SS, & 406	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")		2665	TON
	SP, SS, & 406	ASPHALT BINDER (PG 64-22) IN ACHM BINDER COURSE (1")		120	TON
	SP, SS, & 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")		3108	TON
	SP, SS, & 407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2")		174	TON
	412	COLD MILLING ASPHALT PAVEMENT		6099	SQ. YD.
	SP & 414	ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC		12	TON
	SP & 415	ACHM PATCHING OF EXISTING ROADWAY		50	TON
	504	APPROACH GUTTERS		30.20	CU. YD.
	601	MOBILIZATION		1.00	LUMP SUM
	SP & 602	FURNISHING FIELD OFFICE		1	EACH
	603	MAINTENANCE OF TRAFFIC		1.00	LUMP SUM
	603	18" TEMPORARY CULVERT		88	LIN. FT.
	603	24" TEMPORARY CULVERT		196	LIN. FT.
	603	60" TEMPORARY CULVERT		726	LIN. FT.
	603	72" TEMPORARY CULVERT		544	LIN. FT.
	603	96" TEMPORARY CULVERT		336	LIN. FT.
	SS & 604	SIGNS		790	SQ. FT.
	SS & 604	BARRICADES		160	LIN. FT.
	SS & 604	TRAFFIC DRUMS		146	EACH
	604	CONSTRUCTION PAVEMENT MARKINGS		11768	LIN. FT.
	604	REMOVAL OF PERMANENT PAVEMENT MARKINGS		4467	LIN. FT.
	SS & 604	VERTICAL PANELS		60	EACH
	SP, SS, & 606	18" SIDE DRAIN		220	LIN. FT.
	SP, SS, & 606	24" SIDE DRAIN		82	LIN. FT.
	SP, SS, & 606	30" SIDE DRAIN		36	LIN. FT.
	606	SELECTED PIPE BEDDING		50	CU. YD.
	611	UNDERDRAIN OUTLET PROTECTORS		11	EACH
	611	4" PIPE UNDERDRAINS		1860	LIN. FT.
	617	GUARDRAIL (TYPE A)		550	LIN. FT.
	617	TERMINAL ANCHOR POSTS (TYPE 1)		4	EACH
	617	THRIE BEAM GUARDRAIL TERMINAL		4	EACH
	619	WIRE FENCE (TYPE D)		1960	LIN. FT.
	620	LIME		26	TON
	620	SEEDING		12.81	ACRE
	SS & 620	MULCH COVER		37.44	ACRE
	620	WATER		1813.2	M.GAL.
	621	TEMPORARY SEEDING		24.63	ACRE
	621	SILT FENCE		7233	LIN. FT.
	621	SEDIMENT BASIN		3975	CU. YD.
	621	OBLITERATION OF SEDIMENT BASIN		3975	CU. YD.
	621	SEDIMENT REMOVAL AND DISPOSAL		4221	CU. YD.
	621	ROCK DITCH CHECKS		98	CU. YD.
	623	SECOND SEEDING APPLICATION		12.81	ACRE
	624	SOLID SODDING		321	SQ. YD.
	635	ROADWAY CONSTRUCTION CONTROL		1.00	LUMP SUM
	637	MAILBOXES		2	EACH
	637	MAILBOX SUPPORTS (SINGLE)		2	EACH
	719	THERMOPLASTIC PAVEMENT MARKING WHITE (4")		4920	LIN. FT.
	719	THERMOPLASTIC PAVEMENT MARKING YELLOW (4")		4016	LIN. FT.
*	SP & 719	INVERTED PROFILE THERMOPLASTIC CONTRAST PAVEMENT MARKING YELLOW (4")	(ALTERNATE NO. 1)	904	LIN. FT.
*	SP	HIGH PERFORMANCE CONTRAST MARKING TAPE YELLOW (4")	(ALTERNATE NO. 2)	904	LIN. FT.
	721	RAISED PAVEMENT MARKERS (TYPE II)		65	EACH
	804	REINFORCING STEEL-ROADWAY (GRADE 60)		2660	POUND
	816	FILTER BLANKET		1264	SQ. YD.
	816	DUMPED RIPRAP		632	CU. YD.

* DENOTES ALTERNATE BID ITEMS.

SUMMARY OF QUANTITIES (BOX 2 OF 2)

ITEM NUMBER	ITEM	QUANTITY	UNIT
	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
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 3)	1.00	LUMP SUM
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 4)	1.00	LUMP SUM
636	BRIDGE CONSTRUCTION CONTROL	1.00	LUMP SUM
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-BRIDGE	1126	CU. YD.
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY	626	CU. YD.
802	CLASS S CONCRETE-ROADWAY	1411.66	CU. YD.
802	CLASS S CONCRETE-BRIDGE	823.60	CU. YD.
802	CLASS S(AE) CONCRETE-BRIDGE	584.10	CU. YD.
803	CLASS 2 PROTECTIVE SURFACE TREATMENT	2395.3	SQ. YD.
804	REINFORCING STEEL-ROADWAY (GRADE 60)	201811	POUND
804	REINFORCING STEEL-BRIDGE (GRADE 60)	120810	POUND
804	EPOXY COATED REINFORCING STEEL (GRADE 60)	136110	POUND
805	STEEL PILING (HP 12X53)	642	LIN. FT.
805	PREBORING	120	LIN. FT.
SP & 807	STRUCTURAL STEEL IN BEAM SPANS (M270-GR50W)	542500	POUND
808	ELASTOMERIC BEARINGS	16828.0	CU. IN.
809	SILICONE JOINT SEALANT	86	LIN. FT.
812	BRIDGE NAME PLATE (TYPE D)	1	EACH
816	FILTER BLANKET	730	SQ. YD.
816	DUMPED RIPRAP	152	CU. YD.
816	FOUNDATION PROTECTION RIPRAP	941	TON

REVISIONS

DATE	REVISION	SHEET NUMBER
9/16/2015	ADDED "WATER POLLUTION CONTROL" SPECIAL PROVISION	2,46

9/16/2015

R080484.DGN

SUMMARY OF QUANTITIES AND REVISIONS

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.		090343	47	141

(2) SURVEY CONTROL DETAILS

SURVEY CONTROL COORDINATES
Project Name: 090343
Date: 4/2/2014
Coordinate System: Arkansas State Plane Coordinates
Based on AHTD GPS PTS *440020 - 440020A, 40021 - 440021A*
Projected to Ground Coordinates
Units: U.S. Survey Foot

COORDINATES LISTED BELOW ARE GROUND (Localized) COORDINATES !!!!

Point No.	Northing	SY	Easting	SX	Elevation	SZ	Feature Code	Point Description
1	622008.1215	0.0222	808534.4037	0.0217	1319.052	0.0036	CTL	PD:AHTD STD. MON STAMPED T-1
2	622785.1175	0.0226	808645.7881	0.0214	1315.756	0.004	CTL	PD:AHTD STD. MON STAMPED T-2
3	623052.4744	0.0204	808673.3169	0.0196	1314.494	0.004	CTL	PD:AHTD STD. MON STAMPED T-3
4	623376.1801	0.0205	808787.7065	0.0200	1317.171	0.004	CTL	PD:AHTD STD. MON STAMPED T-4
5	625537.6101	0.0193	808378.4787	0.0188	1315.254	0.005	CTL	PD:AHTD STD. MON STAMPED T-5
6	626046.7637	0.0193	808457.7966	0.0189	1318.553	0.006	CTL	PD:AHTD STD. MON STAMPED T-6
7	626474.7802	0.0200	808216.8027	0.0193	1319.497	0.006	CTL	PD:AHTD STD. MON STAMPED T-7
8	626887.8552	0.0199	808238.5531	0.0192	1321.196	0.006	CTL	PD:AHTD STD. MON STAMPED T-8
9	627364.3264	0.0196	806557.0093	0.0193	1334.990	0.007	CTL	PD:AHTD STD. MON STAMPED T-9
10	627471.6546	0.0200	805987.9653	0.0198	1335.385	0.007	CTL	PD:AHTD STD. MON STAMPED T-10
11	627519.1904	0.0199	805687.2265	0.0198	1337.305	0.007	CTL	PD:AHTD STD. MON STAMPED T-11
12	627597.6831	0.0198	805330.7318	0.0199	1356.212	0.007	CTL	PD:AHTD STD. MON STAMPED T-12
13	636316.4438	0.0222	801089.4445	0.0215	1461.329	0.011	CTL	PD:AHTD STD. MON STAMPED T-13
14	636817.4259	0.0232	801121.4243	0.0225	1452.313	0.011	CTL	PD:AHTD STD. MON STAMPED T-14
15	637028.5862	0.0235	801092.3389	0.0235	1454.317	0.011	CTL	PD:AHTD STD. MON STAMPED T-15
16	637423.5512	0.0229	801062.8918	0.0226	1448.380	0.011	CTL	PD:AHTD STD. MON STAMPED T-16
100	623373.0443	0.0001	809256.8785	0.0001	1319.944	0.005	GPS	PD:AHTD GPS #440020
101	623395.7796	0.0001	810873.0616	0.0001	1319.944	0.005	GPS	PD:AHTD GPS #440020A
102	634465.4667	0.0001	801713.2195	0.0001	1534.177	0.010	GPS	PD:AHTD GPS #440021
103	632947.4088	0.0001	801998.3601	0.0001	1586.200	0.009	GPS	PD:AHTD GPS #440021A
901	630059.8576	30.0000	803575.9283	30.0000	1491.470	0.008	TBM	PD:CUT SQUARE IN CENTER OF NORTH HEADWALL
998	625634.796	30.0000	807934.4417	30.0000	1318.686	0.006	BM	PD:USGS BRASS CAP K 51
999	618352.7499	30.0000	806519.8618	30.0000	1328.380	0.000	BM	PD:USGS BRASS CAP J 51

*Standard Primary Control Monument - Rebar and Cap - Standard - 5/8"x 24" Rebar with 2"Aluminum Cap stamped: "(include all common information here)" plus other markings indicated in the point description of the individual point. AHTD monuments will be stamped "Arkansas Hwy & Trans Dept" with "PN: ###" & "Job #######". Monuments that are set by Consultants will be stamped "Arkansas Hwy & Trans Dept" with "PN:###", "Job#######", & "PS#####". The consultant Professional Surveyor in charge will stamp his/her PS license number on the cap.

**Standard GPS Control Point Monument - 5/8" x 48" Rebar with 2.5"Aluminum Cap stamped: "(include all common information here)" plus other markings indicated in the point description of the individual point. These monuments will be stamped "Ark. State Hwy Trans. Dept.", "GPS Survey", & "Point No. #######".

SX, SY, SZ – Represents the standard error estimate of the coordinate values of each point at the 67% confidence level (one sigma) based on the least squares analysis of the control network. See the AASHTO SDMS Technical Data Guide data tag definition for SX:, SY:, and SZ: for additional information. These values shall be used when control points are added and the entire network is reprocessed using least square analysis. A value of 0.001 is defined as fixed (no adjustment) in the least square analysis process. A value of 30 is defined as location by handheld GPS device or scaled from USGS Quadmap.

Reference Control points (1500 series) shall be used to re-establish horizontal datum if the primary control has been destroyed. These reference control points shall not be used for vertical control unless the elevation has been established from the project datum with 3-wire level techiniques.

All additional project control shall be occupied, measured, and adjusted with direct survey ties to at least two of the control points listed in the table above. New survey control shall not be independent of the survey control listed above. This includes horizontal coordinates and elevations.

Positional Accuracy:
Horizontal - GPS (1.0 cm± 1PPM) PN: 100-103
Horizontal - Primary (2.0cm± 20PPM): PN:1-16
Horizontal - Secondary (3 cm ± 50PPM): PN:N/A
Vertical - NGS 1st Order (±4mm x Vdist in km) PN: N/A
Vertical - NGS 2nd Order (±6mm x Vdist in km) PN: J 51 (999)
Vertical - NGS 3rd Order (±8mm x Vdist in km) PN: K 51 (998)

Horizontal Datum: NAD 1983 (1997) State Plane Zone: 0301-North Zone
The adjustment year is based on metadata in the SDMS Control file
A project CAF of: 0.999907428 has been used to compute the above coordinates.
The project CAF shall have a minimum precision of 9 digits right of the decimal.
This CAF is intended for use within the project limits only.
Grid Distance = Ground Distance X CAF
If Coordinates are listed as Ground:
To compute Grid Coordinates, multiply the Ground Coordinates by CAF about the origin of X=0 & Y=0
If Coordinates are listed as Grid:
To compute Ground Coordinates, divide the Grid Coordinates by CAF about the origin of X=0 & Y=0

Vertical Datum: NAVD 1988 based NGS BM:
A project Elevation Factor of: 0.999935615 has been computed and incorporated in the above CAF.
This is based on the average elevation of the project: 1346.11 Feet
3-Wire Leveling techniques have been used to establish elevations on
Points: 1-16, 100-103, 901, 998-999
From NGS BM: J 51 AND K 51

Basis of Bearing: Grid Bearings based on AHTD GPS points: 440020 - 440020A, 40021 - 440021A
Convergence Angle is: 01-00-24 LEFT at PN: 14
LT: 36-04-13.38 N LG: 093-43-48.33 W
Grid Azimuth = Astronomical Azimuth - Convergence Angle

Note: Information in Italics is for clarification only. It is not to be part of the actual Control Table or Control Detail Sheets.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15

SITE 1

POINT NO.	TYPE	STATION	NORTHING	EASTING
8000	POB	100+00.00	622346.2376	808565.8572
8001	PI	101+00.00	622445.5506	808577.5785
8002	PI	102+00.01	622544.6681	808590.8645
8003	PC	102+20.42	622564.9302	808593.3701
8006	PT	105+21.81	622861.1525	808647.9514
8007	PI	105+99.85	622936.9284	808666.6068
8008	PI	106+99.85	623034.3156	808689.3482
8018	PC	110+11.48	623336.9059	808763.8516
8020	PT	115+55.23	623869.7461	808721.7341
8021	POE	117+24.08	624025.3179	808656.1105

SITE 2

POINT NO.	TYPE	STATION	NORTHING	EASTING
8100	POB	200+00.00	625616.2752	808376.8947
8101	PC	203+26.46	625913.7882	808511.2919
8103	PT	219+22.92	627143.2719	807869.2300
8104	POE	222+37.24	627200.7720	807560.2106

SITE 3

POINT NO.	TYPE	STATION	NORTHING	EASTING
8200	POB	300+00.00	627426.5309	806390.5343
8201	POE	309+40.52	627574.7932	805461.7761

SITE 4

POINT NO.	TYPE	STATION	NORTHING	EASTING
8300	POB	400+00.00	636142.1999	801111.2734
8301	PI	402+42.27	636384.2827	801101.7449
8302	PI	404+05.99	636547.9198	801096.3953
8303	PC	410+84.21	637225.6053	801069.4855
8305	PT	415+42.83	637666.0408	800954.9159
8306	POE	420+21.12	638092.6270	800738.6064

SITE 1 DETOUR

POINT NO.	TYPE	STATION	NORTHING	EASTING
8000	POB	500+00.00	622346.2376	808565.8572
8400	PC	500+00.26	622346.4951	808565.8876
8402	PT	501+98.47	622544.0265	808561.7599
8403	PC	503+34.48	622678.3212	808540.1884
8405	PT	507+76.29	623098.2792	808636.8737
8409	PC	508+51.94	623160.2044	808680.3237
8411	PT	510+64.17	623352.3121	808767.6449
8412	PC	510+66.33	623354.4076	808768.1609
8414	PT	513+82.53	623668.1705	808778.9785
8415	PC	513+96.10	623681.5363	808776.6499
8417	PT	515+95.92	623872.8362	808720.4306
8021	POE	517+61.41	624025.3179	808656.1105

SITE 3 DETOUR

POINT NO.	TYPE	STATION	NORTHING	EASTING
8200	POB	600+00.00	627426.5309	806390.5343
8500	PC	600+00.08	627426.5441	806390.4514
8502	PT	601+97.93	627423.7190	806193.6105
8503	PC	602+74.76	627409.4354	806118.1203
8505	PT	606+98.09	627484.5019	805711.2137
8506	PC	607+13.84	627492.7569	805697.8054
8508	PT	609+39.33	627570.6484	805487.7398
8201	POE	609+65.63	627574.7932	805461.7761

SITE 4 DETOUR

POINT NO.	TYPE	STATION	NORTHING	EASTING
8600	POB	699+00.00	636242.1226	801107.3404
8601	PC	699+95.21	636337.2581	801103.5958
8603	PT	702+04.44	636540.2279	801057.7961
8604	PC	702+53.84	636585.6411	801038.3532
8606	PT	706+75.60	636997.6667	801023.3204
8607	PC	707+19.73	637039.3909	801037.6859
8609	PT	709+33.12	637249.3137	801068.4180
8610	PC	709+43.43	637259.6131	801067.9970
8612	PT	713+10.01	637612.8378	800979.8662
8613	POE	715+00.00	637784.0685	800897.5389

9/9/2015

R090343.DGN

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.		090343	48	141

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15

P.I. = 103+71.29
Δ = 6°46'52.2" RT.
D = 2°15'00.0"
T = 150.87'
L = 301.38'
PC = 102+20.42
PT = 105+21.81
e = 0.053 '/'
Ls = 300'

STA. 104+30.00
BEGIN SITE 1
LOG MILE 23.13

POB 100+00.00
100
N 6°43'52" E
100.00'
8000
8001
N 7°38'04" E
100.00'
N 8°09'29" E
784.94'
8002
8003
N 7°02'58" E
150.87'
105
N 13°49'50" E
150.87'
8006
N 13°49'50" E
78.04'
8007
N 13°08'38" E
100.01'
8008
N 13°49'56" E
311.63'
N 19°27'44" E
343.32'
8018
N 13°49'56" E
281.57'
N 22°52'16" W
281.57'

P.I. 102+00.01
Δ = 0°35'06.1" LT.
P.I. 101+00.00
Δ = 0°54'12.3" RT.
P.C. 102+20.42
P.I. 103+71.29
P.I. 105+99.85
Δ = 0°41'12.5" LT.
P.T. 105+21.81
P.I. 106+99.85
Δ = 0°41'17.8" LT.
P.C. 110+11.48
110
P.I. 112+93.05

P.I. = 112+93.05
Δ = 36°42'11.7" LT.
D = 6°45'00.0"
T = 281.57'
L = 543.75'

N 5°52'44" E
268.77'

C.L. SURVEY BASELINE
C.L. SITE 1

PDI-PN2 PDI-AHTD STD. MON STAMPED T-2
PDI-PN3 PDI-AHTD STD. MON STAMPED T-3
PDI-PN4 PDI-AHTD STD. MON STAMPED T-4

STA. 105+60.00
END SITE 1

SITE 1
SURVEY CONTROL DETAILS

DETOUR:
P.I. = 501+00.00
Δ = 15°51'24" LT.
D = 8°00'00"
T = 99.74'
L = 198.21'
PC = 500+00.26
PT = 501+98.47
NO SUPER

DETOUR:
P.I. = 505+67.02
Δ = 44°10'51" RT.
D = 10°00'00"
T = 232.54'
L = 441.81'
PC = 503+34.48
PT = 507+76.29
e = 0.10 '/'
Ls = 275'

DETOUR:
P.I. = 509+59.29
Δ = 21°13'24" LT.
D = 10°00'00"
T = 107.35'
L = 212.23'
PC = 508+51.94
PT = 510+64.17
NO SUPER

STA. 500+00.00
BEGIN SITE 1
DETOUR

POB 500+00.00
P.C. 500+00.26
500
N 6°43'52" E
99.74'
8400
8000
N 9°07'31" W
99.74'
8402
N 9°07'31" W
136.02'
8403
N 9°07'31" W
232.54'
505
N 35°03'20" E
232.54'
8405
N 35°03'20" E
75.65'
8409
N 35°03'20" E
107.35'
510
N 13°49'56" E
107.35'
8411
8412
N 19°27'44" E
343.32'
N 13°49'56" E
160.40'
N 9°52'59" W
160.40'
8414
8415

N 8°09'29" E
784.94'

P.I. 501+00.00
P.C. 503+34.48
P.I. 505+67.02
P.T. 507+76.29
P.C. 508+51.94
P.I. 509+59.29
P.T. 510+64.17
P.C. 510+66.33
P.T. 513+82.53
P.C. 513+96.10
P.I. 512+26.73

C.L. SITE 1 DETOUR
C.L. SURVEY BASELINE

PDI-PN2 PDI-AHTD STD. MON STAMPED T-2
PDI-PN3 PDI-AHTD STD. MON STAMPED T-3
PDI-PN4 PDI-AHTD STD. MON STAMPED T-4

STA. 510+64.17
END SITE 1
DETOUR

SITE 1 DETOUR
SURVEY CONTROL DETAILS

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				6	ARK.			
				JOB NO.		090343	49	141

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
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No. 11425
TRINITY D. SMITH
9-11-15

POB200+00.00

200

8100

C.L. SURVEY BASELINE

N 8°51'17" E
515.29'

N 24°18'37" E
326.46'

PCC203+26.46

8101

PNA6 PDAHTD STD. MON STAMPED T-6

205

C.L. SITE 2

210

N 24°18'37" E
1123.57'

N 29°22'54" W
491.20'

PNA7 PDAHTD STD. MON STAMPED T-7

N 3°00'51" E
413.65'

PNA8 PDAHTD STD. MON STAMPED T-8

215

N 79°27'34" W
1123.57'

P.I. = 214+50.03
Δ = 103°46'11.2" LT.
D = 6°30'00.0"
T = 1123.57'
L = 1596.46'
P.C. = 203+26.46
P.T. = 219+22.92
e = 0.100'/'
Ls = 350'

STA. 200+70.00
BEGIN SITE 2
LOG MILE 23.72

PNA8 PDAHTD

215

C.L. SITE 2

P.I. = 214+50.03
Δ = 103°46'11.2" LT.
D = 6°30'00.0"
T = 1123.57'
L = 1596.46'
P.C. = 203+26.46
P.T. = 219+22.92
e = 0.100'/'
Ls = 350'

PT219+22.92

C.L. SURVEY BASELINE

POE222+37.24

N 74°10'47" W
1747.75'

220

N 79°27'34" W
314.32'

8103

8104

STA. 220+00.00
END SITE 2

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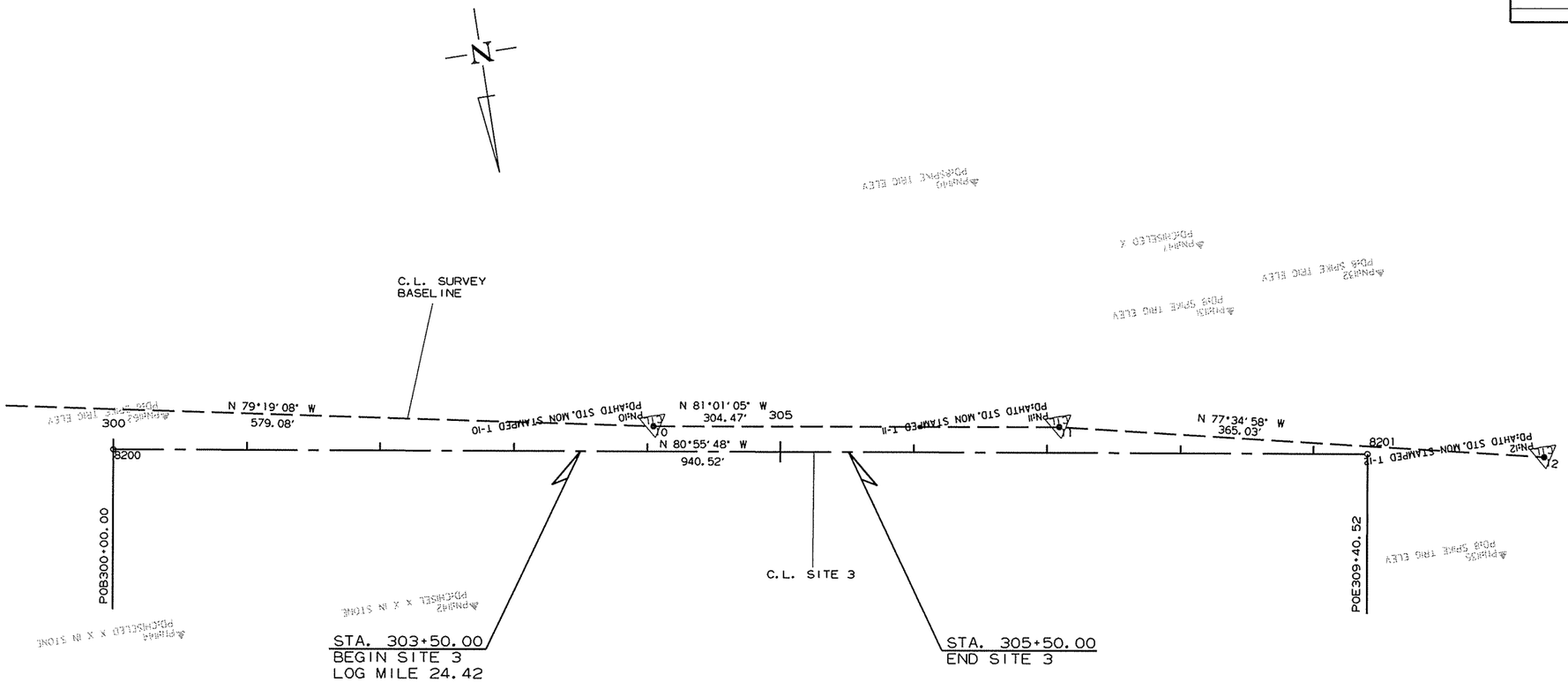
SITE 2
SURVEY CONTROL DETAILS

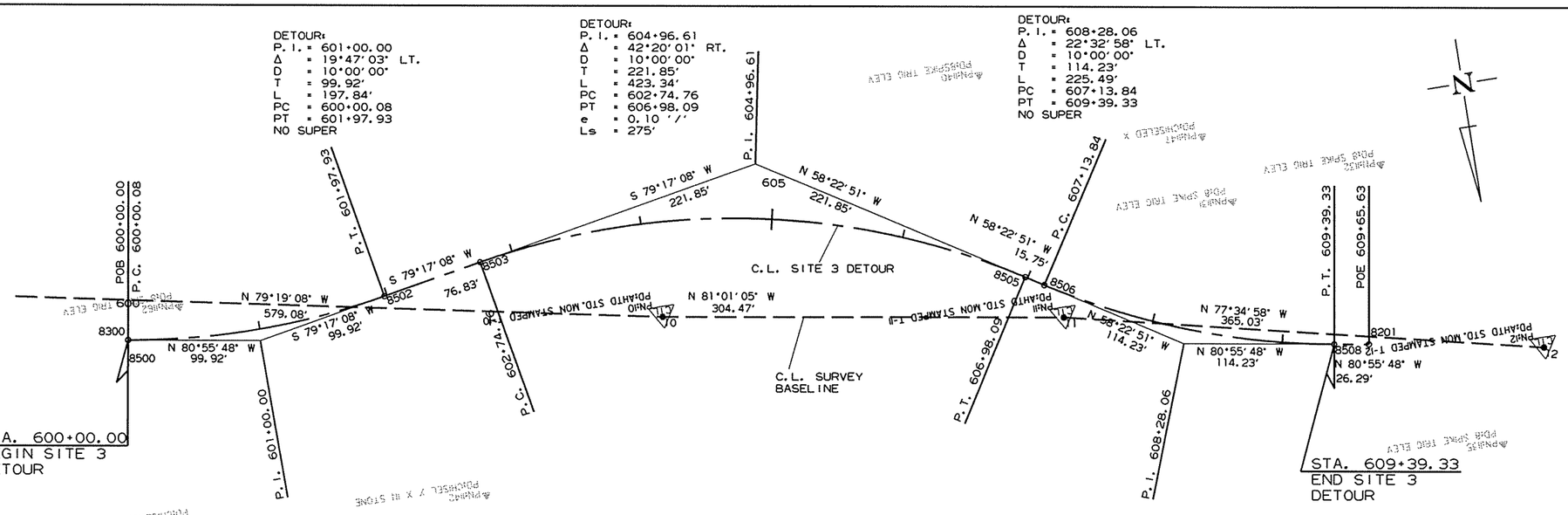
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	50	141

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15



SITE 3
SURVEY CONTROL DETAILS



SITE 3 DETOUR
SURVEY CONTROL DETAILS

9/9/2015

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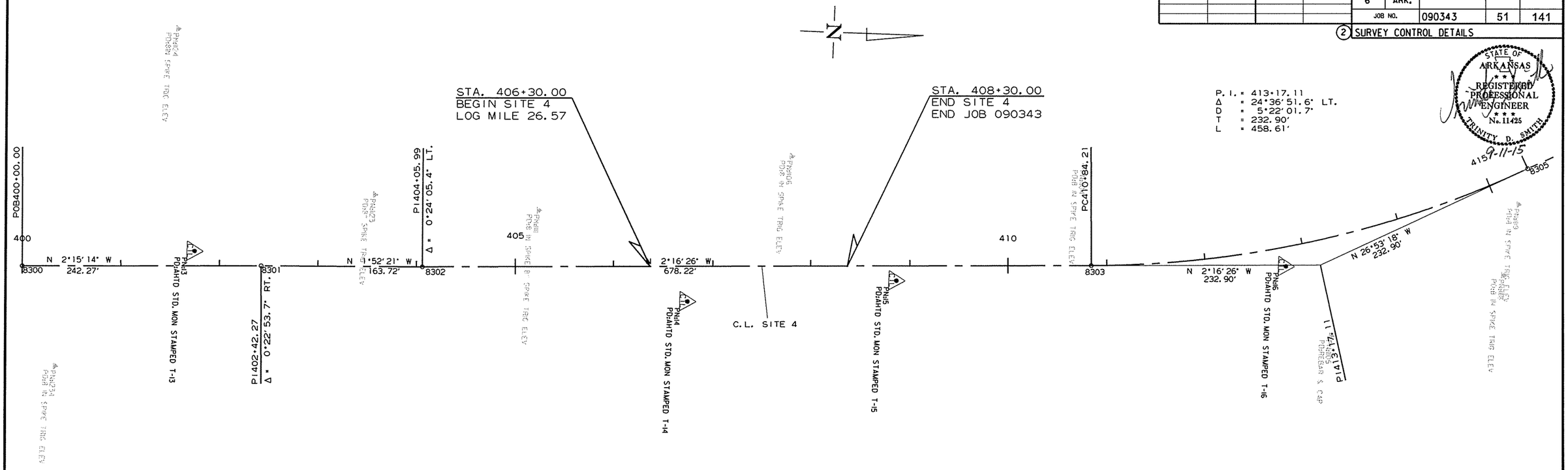
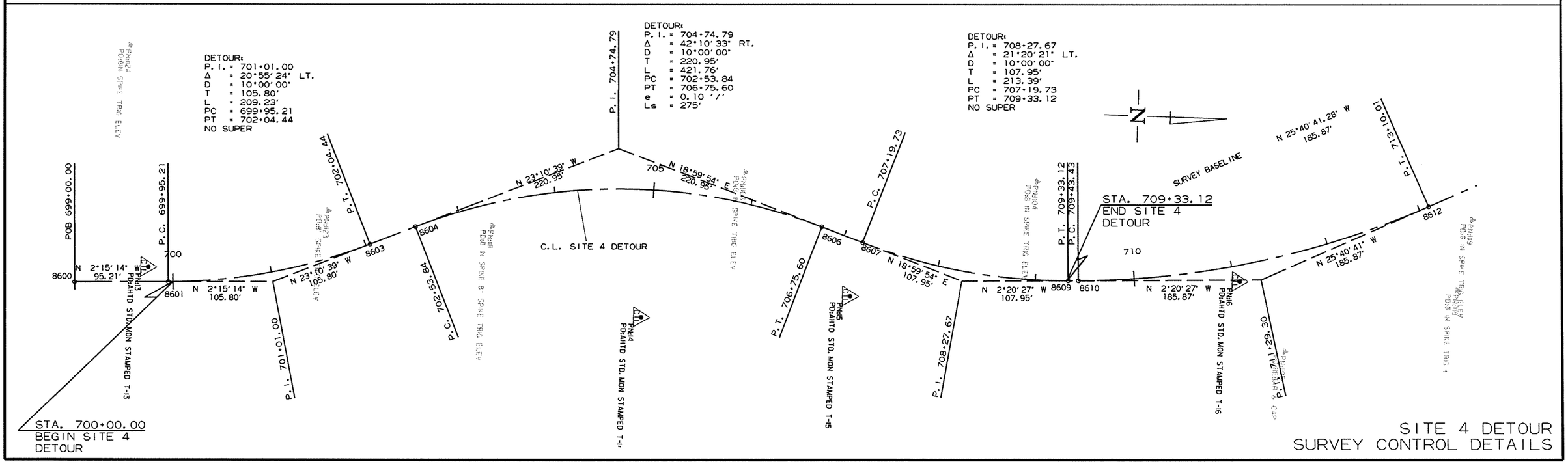
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	51	141

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15



SITE 4
SURVEY CONTROL DETAILS



SITE 4 DETOUR
SURVEY CONTROL DETAILS

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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.		090343	52	141

(2) PLAN AND PROFILE SHEETS-SITE 1

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15

P. I. = 103+71.29
Δ = 6°46'52.2" RT.
D = 2°15'00.0"
T = 150.87'
L = 301.38'
PC = 102+20.42
PT = 105+21.81
NO SUPER

STA. 507+30.00 - CONSTRUCT
TEMPORARY APPROACH LT. = 150 CU. YD.

STA. 107+00.00 - CONSTRUCT
APPROACH LT. = 155 CU. YD.

FLOODPLAIN LIMITS

STA. 104+94.00 - CONSTRUCT
TRIPLE 11' X 9' X 82' R.C. BOX CULVERT
25° LT. FWD. SKEW
WITH 3:1 WINGS LT. & RT.
Q50=1840 CFS; DA=1568 ACRES
SPAN = 37'-10⅝"

REMOVAL AND DISPOSAL OF FENCE

STA.	STA.	SIDE	LIN. FT.
104+82	105+35	RT.	81

WIRE FENCE

STA.	STA.	SIDE	TYPE	LIN. FT.
104+93	105+67	RT.	D	138

STA. 104+70.00 - STA. 105+16.00 - IN PLACE
46'X 26' CLEAR RDWY. BRIDGE
CONCRETE DECK ON STEEL BEAMS SUPPORTED BY MASONRY BENTS
REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 1) = 1.00 LUMP SUM
BR. NO. M0556

STA. 104+30.00
BEGIN SITE 1
LOG MILE 23.13

STA. 105+60.00
END SITE 1

RESTRAINING CONDITION - ALL CONSTRUCTION ACTIVITY WITHIN THIS SPECIFIED LOCATION, INCLUDING THE STAGING OF EQUIPMENT AND UTILITY RELOCATION, MUST BE AVOIDED.

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

SITE 1

STA. 104+04.00 - INPLACE
18" X 22' CM PIPE CULVERT
RT. SIDE DRAIN
RETAIN AND CONSTRUCT
APPROACH RT. = 5 CU. YD.

FOR THE CONSTRUCTION OF TEMPORARY WORK ROADS OR HAUL ROADS,
THIS STREAM IS CLASSIFIED AS AN INTERMITTENT STREAM.
TOP OF CHANNEL ELEVATION = 1310.00 FT. MSL

P.V.I. 104+50.00
ELEV. 1317.11

P.V.I. 105+50.00
ELEV. 1316.81

-0.30%

DESIGN HW
Q50 = 1312.00

STA. 104+94.00
INLET FL = 1305.00 RT.
OUTLET FL = 1304.50 LT.

1360 1350 1340 1330 1320 1310 1300 1290 1280 1270

100+00 101+00 102+00 103+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

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				6	ARK.			
				JOB NO.		090343	53	141

(2) PLAN AND PROFILE SHEETS-SITE 2

FLOODPLAIN LIMITS

OBLITERATION OF EXISTING ASPHALT ROADWAY

STA. 202+48.00 - CONSTRUCT APPROACH LT. = 5 CU. YD.

P. I. = 214+50.03
Δ = 103°46' 11.2" LT.
D = 6°30' 00.0"
T = 1123.57'
L = 1596.46'
P. C. = 203+26.46
P. T. = 219+22.92
e = 0.10'/'
Ls = 350'

STA. 213+50.00 - INSTALL 24" X 82' CM PIPE CULVERT LT. SIDE DRAIN APPROACH LT. = 905 CU. YD.

STA.	STA.	SIDE	GUARDRAIL (TYPE A) LIN. FT.	THRIE BEAM GUARD RAIL TERMINAL EACH	TERMINAL ANCHOR POST (TYPE 1) EACH
203+90.74	206+09.49	RT.	200	1	1
205+15.74	206+09.49	LT.	75	1	1
210+80.51	212+99.26	RT.	200	1	1
210+80.51	211+74.26	LT.	75	1	1

REMOVAL AND DISPOSAL OF FENCE

STA.	STA.	SIDE	LIN. FT.
201+00	207+02	LT. & RT.	738

WIRE FENCE

STA.	STA.	SIDE	TYPE	LIN. FT.
200+70	206+86	RT.	D	624

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STA. 200+70.00
BEGIN SITE 2
LOG MILE 23.72

STA. 204+50.00 - STA. 210+16.00
28.6' X442' COMPOSITE STEEL AND CONCRETE BRIDGE
REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 2) = 1.00 LUMP SUM
BR. NO. 03582

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

STA. 206+18.89 - STA. 210+71.11 - CONSTRUCT 450'-0" CONTINUOUS COMPOSITE W-BEAM UNIT (65'-80'-80'-80'-80'-80'-65')

STA. 212+00.00 - CONSTRUCT APPROACH RT. = 6850 CU. YD.

SITE 2

STA. 200+70.00 BEGIN SUPERELEVATION (N.C.)
STA. 204+20.00 MAX SUPERELEVATION (0.10'/')
STA. 216+50.00 MAX SUPERELEVATION (0.10'/')
STA. 220+00.00 END SUPERELEVATION (N.C.)

FOR THE CONSTRUCTION OF TEMPORARY WORK ROADS OR HAUL ROADS, THIS STREAM IS CLASSIFIED AS 5CFS STREAM.
TOP OF CHANNEL ELEVATION = 1306.00 FT. MSL

450'-0" CONTINUOUS COMPOSITE W-BEAM UNIT (65'-80'-80'-80'-80'-65')

K=1538.46
VC=200'
e=0.03'

K=202.19
VC=200'
e=-0.24'

DESIGN HW Q50 = 1310.40

RT. DITCH GRADE 0.14%

LT. DITCH GRADE 0.37%

LT. DITCH GRADE 1.95%

0.74%

0.61%

1.57%

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				6	ARK.			
				JOB NO.		090343	54	141

(2) PLAN AND PROFILE SHEETS-SITE 2

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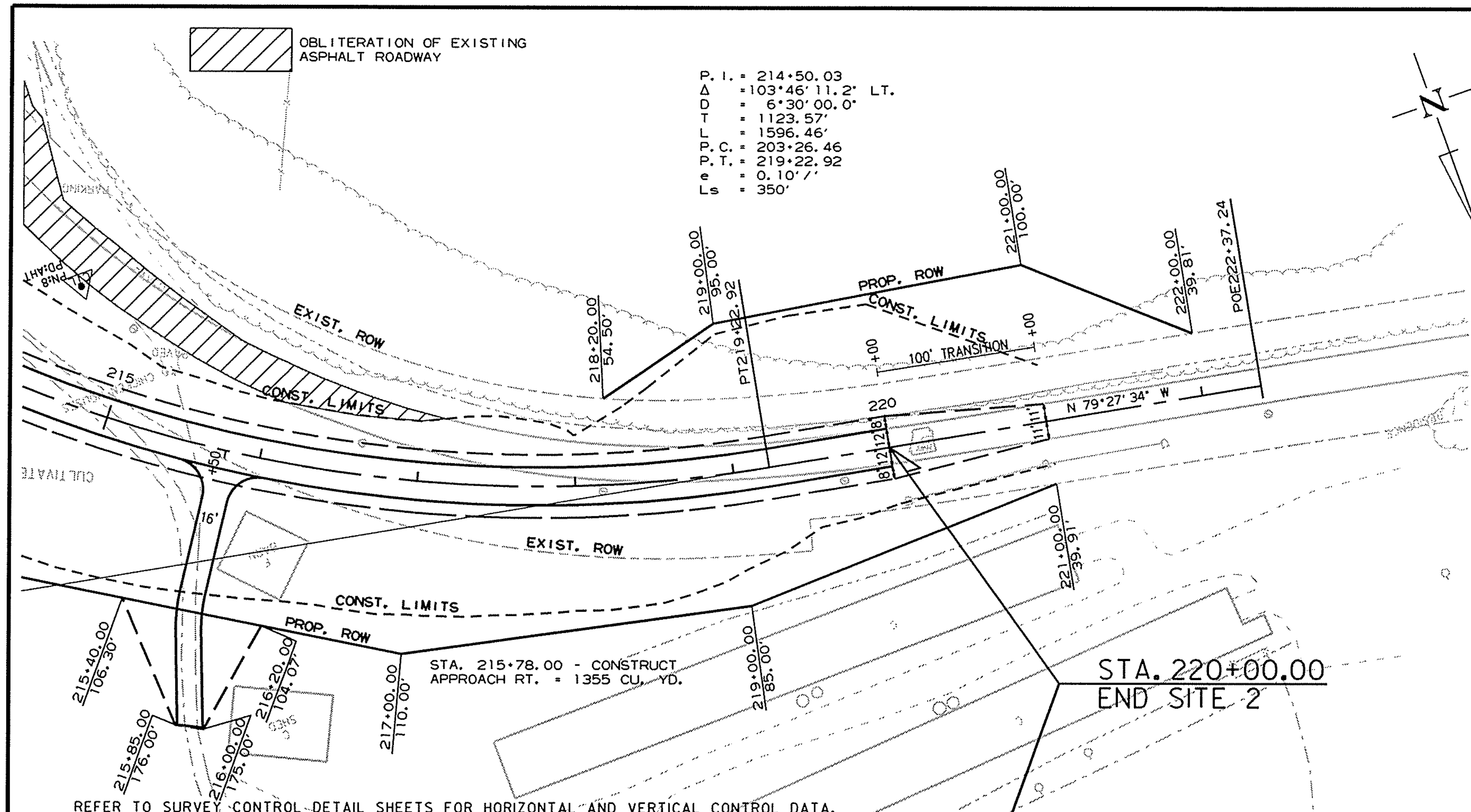
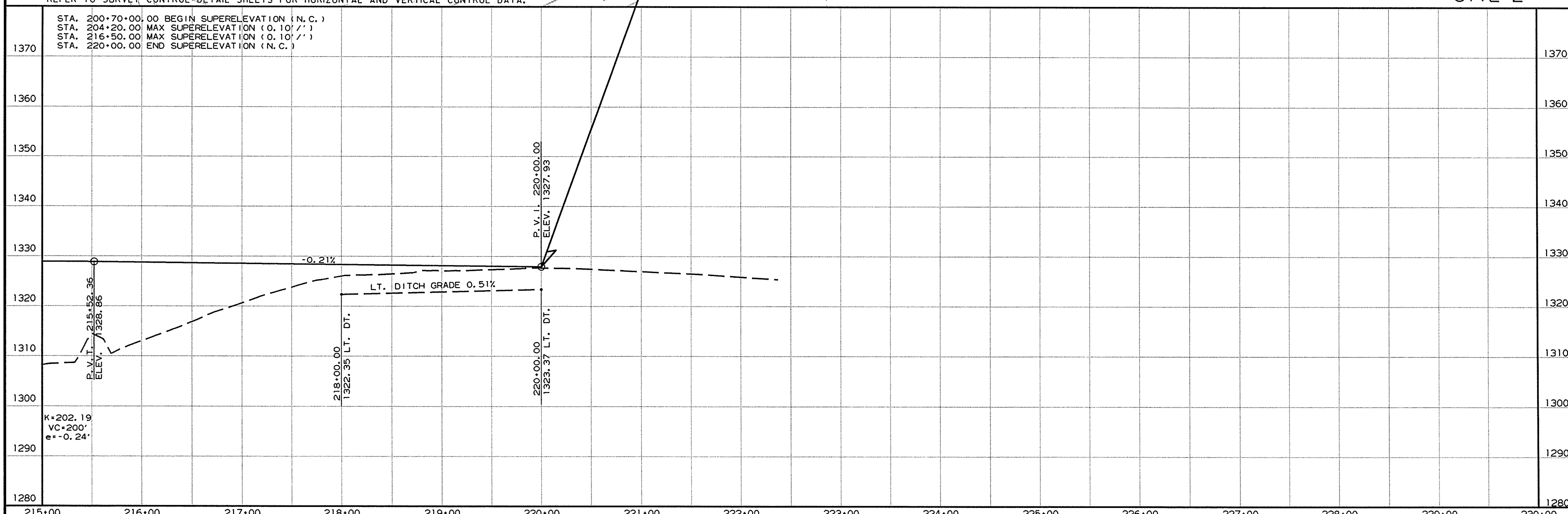
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15



OBLITERATION OF EXISTING ASPHALT ROADWAY
P.I. = 214+50.03
Δ = 103°46' 11.2" LT.
D = 6°30'00.0"
T = 1123.57'
L = 1596.46'
P.C. = 203+26.46
P.T. = 219+22.92
e = 0.10'/'
Ls = 350'
EXIST. ROW
CONST. LIMITS
PROP. ROW
100' TRANSITION
N 79°27'34" W
218+20.00 54.50'
219+00.00 95.00'
PT219+22.92
221+00.00 100.00'
222+00.00 39.81'
POE222+37.24
220
215
+50
16'
EXIST. ROW
CONST. LIMITS
PROP. ROW
221+00.00 39.91'
219+00.00 85.00'
217+00.00 110.00'
216+20.00 104.07'
216+00.00 175.00'
215+85.00 176.00'
215+40.00 106.30'
STA. 215+78.00 - CONSTRUCT APPROACH RT. = 1355 CU. YD.
STA. 220+00.00
END SITE 2
REFER TO SURVEY CONTROL DETAIL SHEETS FOR HORIZONTAL AND VERTICAL CONTROL DATA.

SITE 2



STA. 200+70.00 BEGIN SUPERELEVATION (N.C.)
STA. 204+20.00 MAX SUPERELEVATION (0.10'/')
STA. 216+50.00 MAX SUPERELEVATION (0.10'/')
STA. 220+00.00 END SUPERELEVATION (N.C.)
-0.21%
LT. DITCH GRADE 0.51%
P.V.T. 215+52.36
ELEV. 1328.86
P.V.I. 220+00.00
ELEV. 1327.93
218+00.00 1322.35 LT. DT.
220+00.00 1323.37 LT. DT.
K=202.19
VC=200'
e=-0.24'
1370
1360
1350
1340
1330
1320
1310
1300
1290
1280
215+00
216+00
217+00
218+00
219+00
220+00
221+00
222+00
223+00
224+00
225+00
226+00
227+00
228+00
229+00
230+00

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				6	ARK.			
				JOB NO.		090343	55	141

(2) PLAN AND PROFILE SHEETS-SITE 3

STA. 300+00.00 - INPLACE
21' IRON POST GATE ON LT.
RETAIN

STA. 303+82.00 - INPLACE
18" X 22' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE & INSTALL
18" X 42' SIDE DRAIN
APPROACH LT. = 360 CU. YD.

STA. 304+60 - CONSTRUCT
QUINT. 11'X 6'X 105' R.C. BOX CULVERT
45° LT. FWD. SKEW
WITH 3:1 WINGS LT. & RT.
Q50=1900.00 CFS; DA=1664.00 ACRES
SPAN = 81'-6"

REMOVAL AND DISPOSAL OF FENCE

STA.	STA.	SIDE	LIN. FT.
300+10	306+16	LT.	655
303+85	304+31	RT.	50
304+51	306+40	LT.	207

WIRE FENCE

STA.	STA.	SIDE	TYPE	LIN. FT.
304+20	306+40	LT.	D	257

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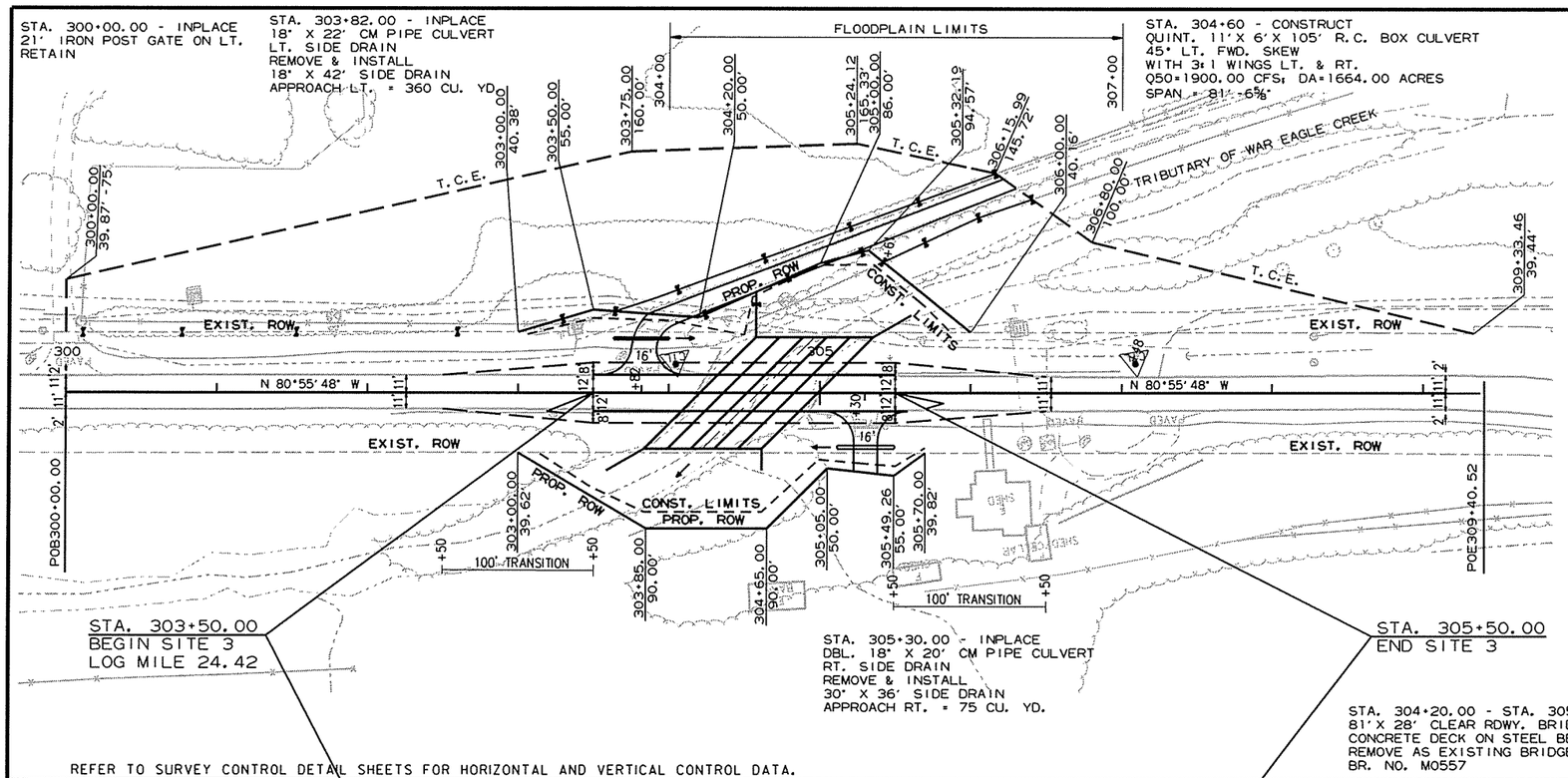


STA. 303+50.00
BEGIN SITE 3
LOG MILE 24.42

STA. 305+30.00 - INPLACE
DBL. 18" X 20' CM PIPE CULVERT
RT. SIDE DRAIN
REMOVE & INSTALL
30" X 36' SIDE DRAIN
APPROACH RT. = 75 CU. YD.

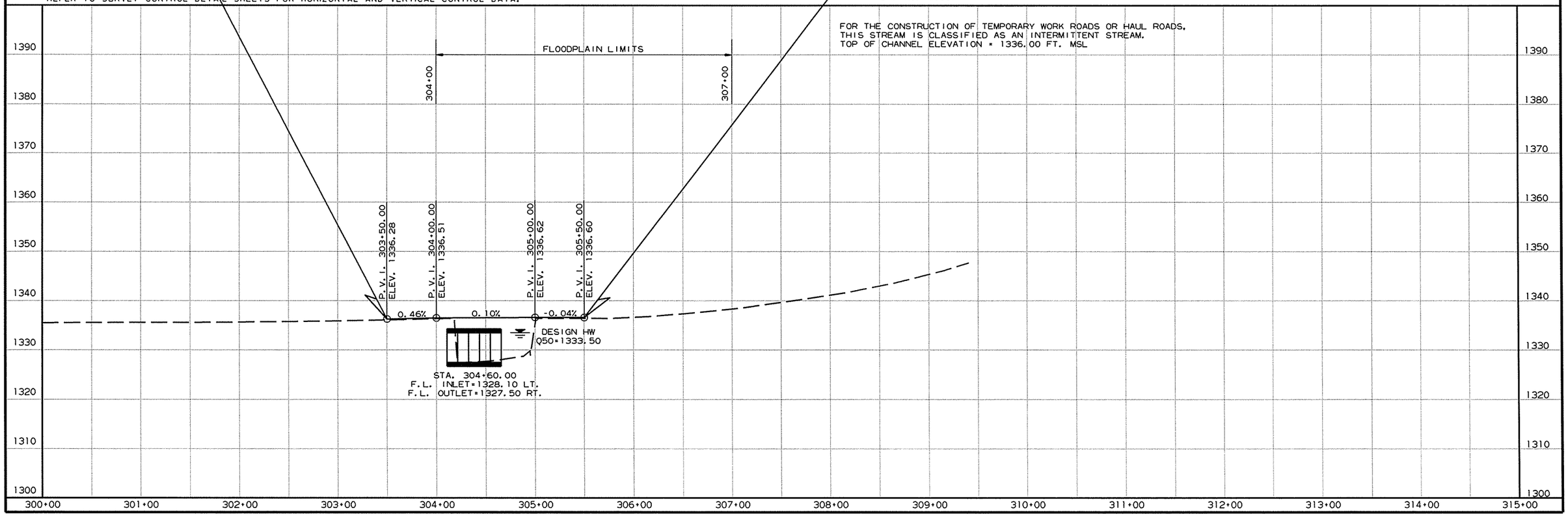
STA. 305+50.00
END SITE 3

STA. 304+20.00 - STA. 305+00 - IN PLACE
81'X 28' CLEAR RDWY. BRIDGE
CONCRETE DECK ON STEEL BEAMS SUPPORTED BY CONCRETE PIERS
REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 3) = 1.00 LUMP SUM
BR. NO. M0557

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

SITE 3

FOR THE CONSTRUCTION OF TEMPORARY WORK ROADS OR HAUL ROADS,
THIS STREAM IS CLASSIFIED AS AN INTERMITTENT STREAM.
TOP OF CHANNEL ELEVATION = 1336.00 FT. MSL



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				6	ARK.			
				JOB NO.		090343	56	141

(2) PLAN AND PROFILE SHEETS-SITE 4

REMOVAL AND DISPOSAL OF FENCE

STA.	STA.	SIDE	LIN. FT.
402+21	408+07	LT.	872
410+03	410+90	LT.	115

WIRE FENCE

STA.	STA.	SIDE	TYPE	LIN. FT.
402+20	408+30	LT.	D	640
404+68	406+37	LT.	D	173
410+03	411+00	LT.	D	128

STA. 407+25.00 - CONSTRUCT
QUINT. 8'X 4'X 127' R.C. BOX CULVERT
53° RT. FWD. SKEW
WITH 3:1 WINGS LT. & RT.
Q50=1200.00 CFS, DA=832.00 ACRES
SPAN = 70'-10¾"

STA. 408+38.00 - INSTALL
18" X 60' PIPE CULVERT
SIDE DRAIN LT.
CONSTRUCT APPROACH LT. = 125 CU. YD.

STA. 407+13.00 - STA. 407+45.00 - IN PLACE
32'X 24' CLEAR RDWY. BRIDGE
CONCRETE SLAB SPANS (2 @ 16') SUPPORTED BY MASONRY BENTS
REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 4) = 1.00 LUMP SUM
BR. NO. M0558

STATE OF ARKANSAS
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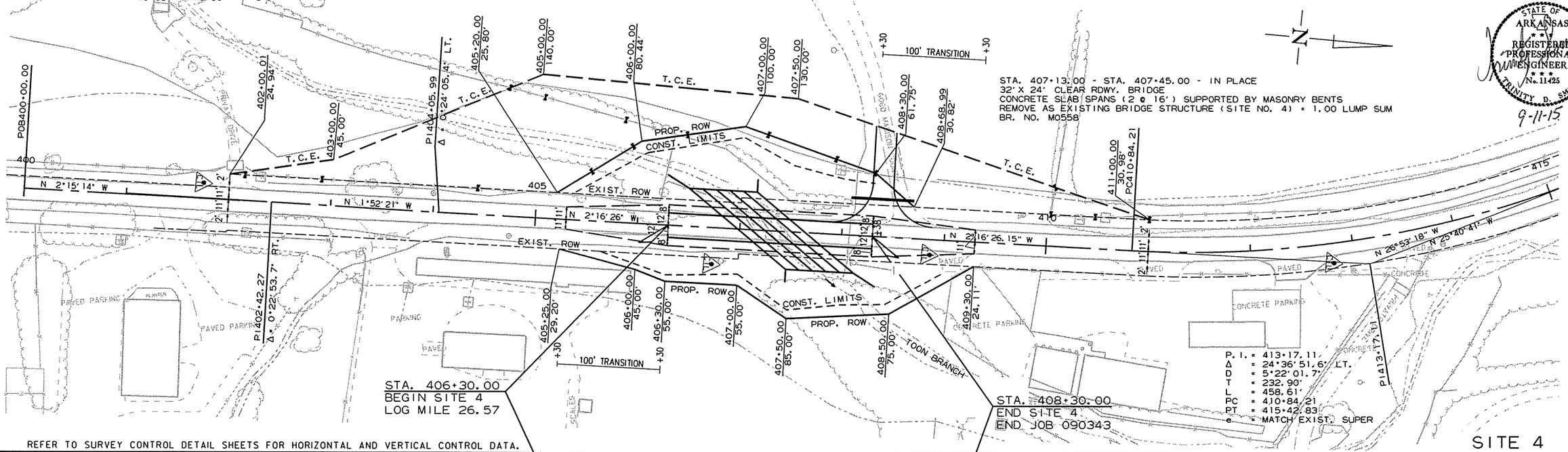
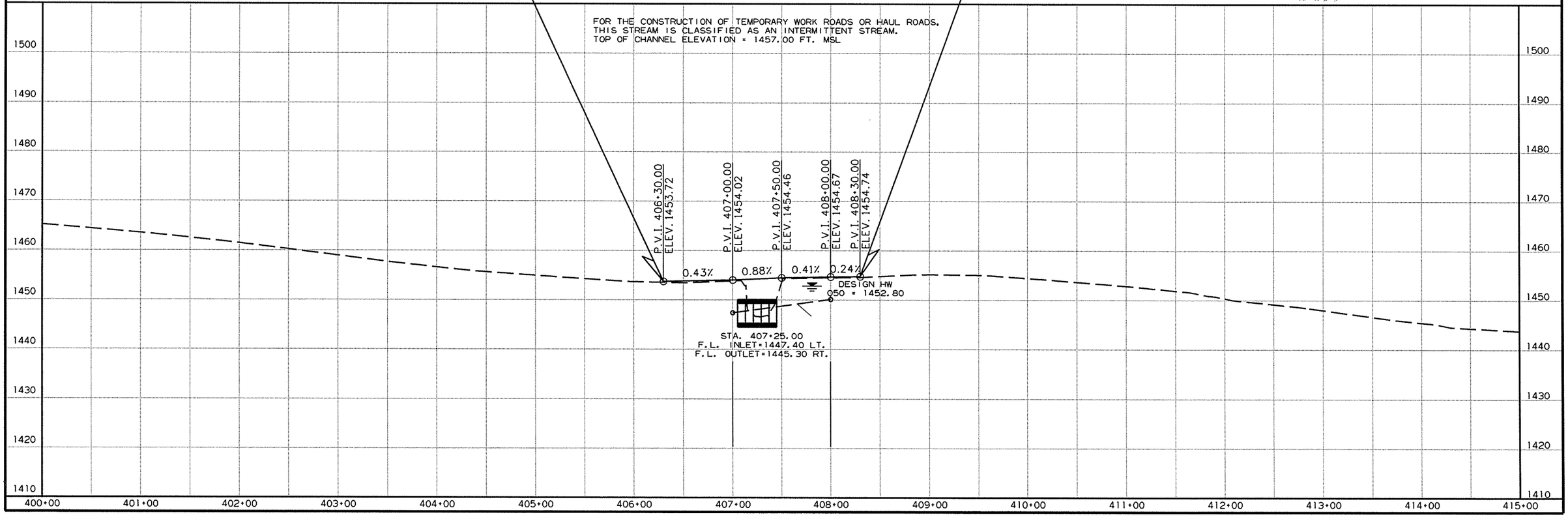
No. 11425
TRINITY D. SMITH
9-11-15



SITE 4

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

FOR THE CONSTRUCTION OF TEMPORARY WORK ROADS OR HAUL ROADS, THIS STREAM IS CLASSIFIED AS AN INTERMITTENT STREAM.
TOP OF CHANNEL ELEVATION = 1457.00 FT. MSL



9/8/2015

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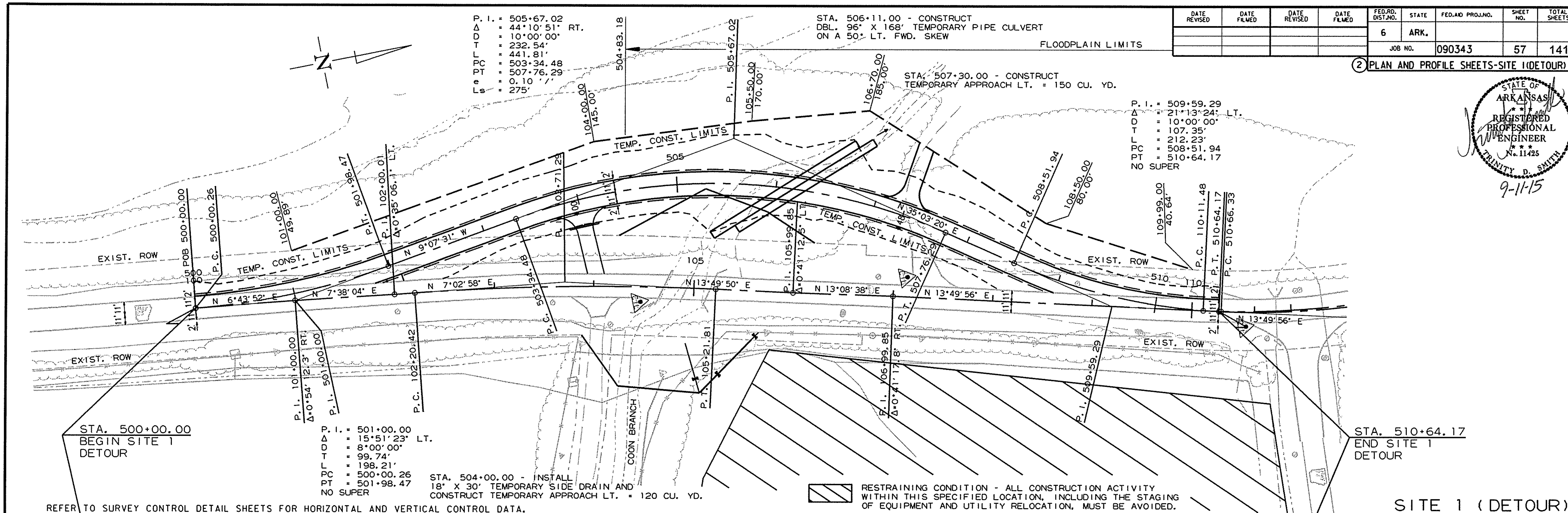
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	57	141

(2) PLAN AND PROFILE SHEETS-SITE 1(DETOUR)

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH

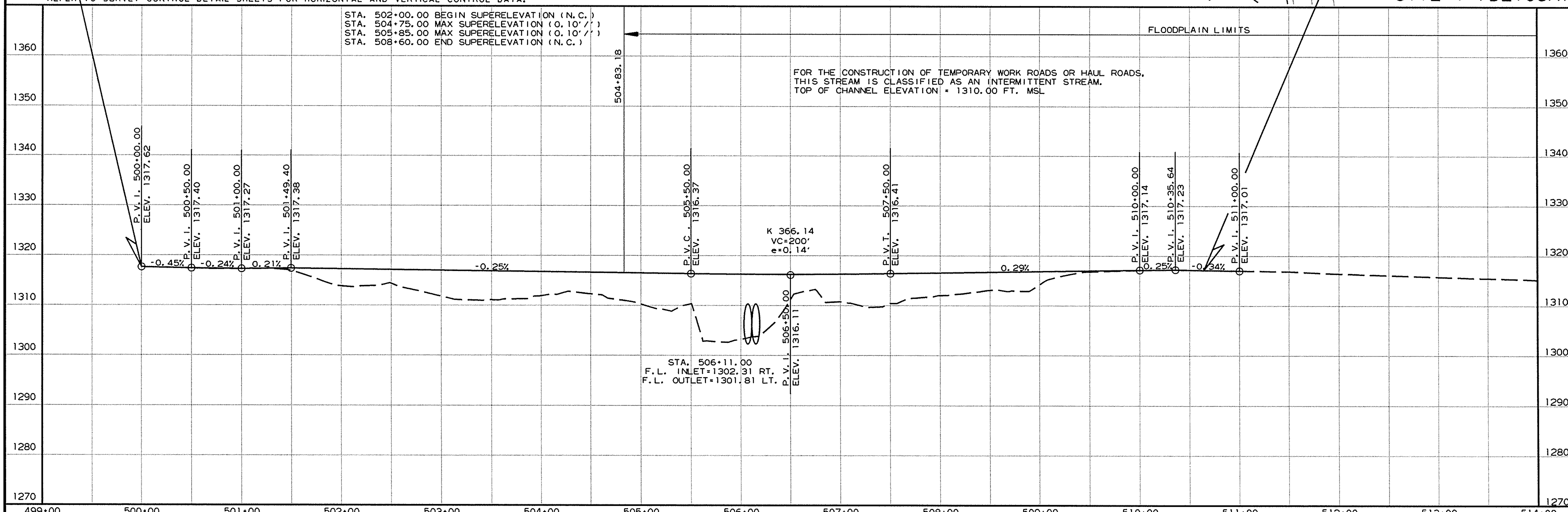
9-11-15



P. I. = 505+67.02
Δ = 44°10'51" RT.
D = 10°00'00"
T = 232.54'
L = 441.81'
PC = 503+34.48
PT = 507+76.29
e = 0.10 '/'
Ls = 275'
STA. 506+11.00 - CONSTRUCT DBL. 96" X 168' TEMPORARY PIPE CULVERT ON A 50° LT. FWD. SKEW
FLOODPLAIN LIMITS
STA. 507+30.00 - CONSTRUCT TEMPORARY APPROACH LT. = 150 CU. YD.
P. I. = 509+59.29
Δ = 21°13'24" LT.
D = 10°00'00"
T = 107.35'
L = 212.23'
PC = 508+51.94
PT = 510+64.17
NO SUPER
TEMP. CONST. LIMITS
EXIST. ROW
N 6°43'52" E
N 7°38'04" E
N 7°02'58" E
N 13°49'50" E
N 13°08'38" E
N 13°49'56" E
N 9°07'31" W
N 35°03'20" E
COON BRANCH
STA. 500+00.00
BEGIN SITE 1
DETOUR
P. I. = 501+00.00
Δ = 15°51'23" LT.
D = 8°00'00"
T = 99.74'
L = 198.21'
PC = 500+00.26
PT = 501+98.47
NO SUPER
STA. 504+00.00 - INSTALL 18" X 30' TEMPORARY SIDE DRAIN AND CONSTRUCT TEMPORARY APPROACH LT. = 120 CU. YD.
RESTRAINING CONDITION - ALL CONSTRUCTION ACTIVITY WITHIN THIS SPECIFIED LOCATION, INCLUDING THE STAGING OF EQUIPMENT AND UTILITY RELOCATION, MUST BE AVOIDED.
STA. 510+64.17
END SITE 1
DETOUR

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

SITE 1 (DETOUR)



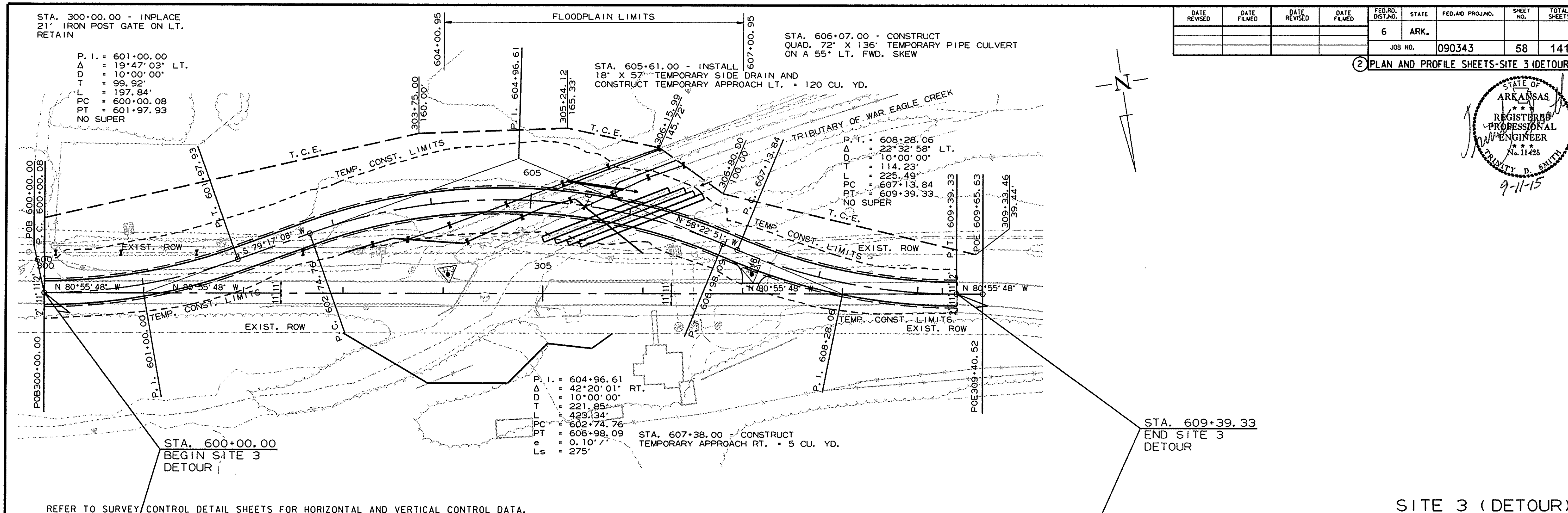
STA. 502+00.00 BEGIN SUPERELEVATION (N.C.)
STA. 504+75.00 MAX SUPERELEVATION (0.10'/')
STA. 505+85.00 MAX SUPERELEVATION (0.10'/')
STA. 508+60.00 END SUPERELEVATION (N.C.)
FLOODPLAIN LIMITS
504+83.18
FOR THE CONSTRUCTION OF TEMPORARY WORK ROADS OR HAUL ROADS, THIS STREAM IS CLASSIFIED AS AN INTERMITTENT STREAM. TOP OF CHANNEL ELEVATION = 1310.00 FT. MSL
P.V.I. 500+00.00 ELEV. 1317.62
P.V.I. 500+50.00 ELEV. 1317.40
P.V.I. 501+00.00 ELEV. 1317.27
P.V.I. 501+49.40 ELEV. 1317.38
P.V.C. 505+50.00 ELEV. 1316.37
K 366.14
VC=200'
e=0.14'
P.V.T. 507+50.00 ELEV. 1316.41
P.V.I. 510+00.00 ELEV. 1317.14
P.V.I. 510+35.64 ELEV. 1317.23
P.V.I. 511+00.00 ELEV. 1317.01
-0.45%
-0.24%
0.21%
-0.25%
0.29%
0.25%
-0.34%
P.V.I. 506+50.00 ELEV. 1316.11
STA. 506+11.00
F.L. INLET=1302.31 RT.
F.L. OUTLET=1301.81 LT.
1360
1350
1340
1330
1320
1310
1300
1290
1280
1270
499+00
500+00
501+00
502+00
503+00
504+00
505+00
506+00
507+00
508+00
509+00
510+00
511+00
512+00
513+00
514+00

9/8/2015

R090343.DGN

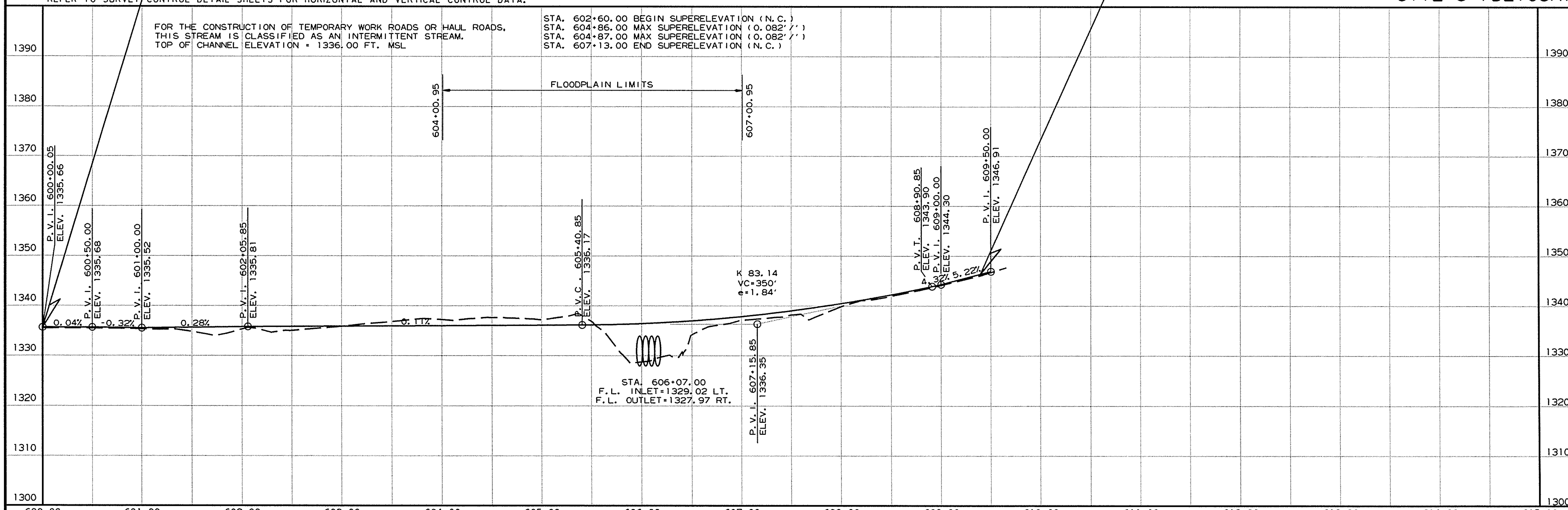
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	58	141

(2) PLAN AND PROFILE SHEETS-SITE 3 (DETOUR)



STA. 300+00.00 - INPLACE
21' IRON POST GATE ON LT.
RETAIN
P.I. = 601+00.00
Δ = 19°47'03" LT.
D = 10°00'00"
T = 99.92'
L = 197.84'
PC = 600+00.08
PT = 601+97.93
NO SUPER
FLOODPLAIN LIMITS
604+00.95
607+00.95
STA. 605+61.00 - INSTALL
18" X 57' TEMPORARY SIDE DRAIN AND
CONSTRUCT TEMPORARY APPROACH LT. = 120 CU. YD.
STA. 606+07.00 - CONSTRUCT
QUAD. 72" X 136' TEMPORARY PIPE CULVERT
ON A 55° LT. FWD. SKEW
TRIBUTARY OF WAR EAGLE CREEK
P.I. = 608+28.06
Δ = 22°32'58" LT.
D = 10°00'00"
T = 114.23'
L = 225.49'
PC = 607+13.84
PT = 609+39.33
NO SUPER
T.C.E.
TEMP. CONST. LIMITS
EXIST. ROW
N 80°55'48" W
S 79°17'08" W
N 58°22'51" W
P.I. = 604+96.61
Δ = 42°20'01" RT.
D = 10°00'00"
T = 221.85'
L = 423.34'
PC = 602+74.76
PT = 606+98.09
e = 0.10'/'
Ls = 275'
STA. 607+38.00 - CONSTRUCT
TEMPORARY APPROACH RT. = 5 CU. YD.
STA. 600+00.00
BEGIN SITE 3
DETOUR
STA. 609+39.33
END SITE 3
DETOUR
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15
REFER TO SURVEY CONTROL DETAIL SHEETS FOR HORIZONTAL AND VERTICAL CONTROL DATA.

SITE 3 (DETOUR)



FOR THE CONSTRUCTION OF TEMPORARY WORK ROADS OR HAUL ROADS,
THIS STREAM IS CLASSIFIED AS AN INTERMITTENT STREAM.
TOP OF CHANNEL ELEVATION = 1336.00 FT. MSL
STA. 602+60.00 BEGIN SUPERELEVATION (N.C.)
STA. 604+86.00 MAX SUPERELEVATION (0.082'/')
STA. 604+87.00 MAX SUPERELEVATION (0.082'/')
STA. 607+13.00 END SUPERELEVATION (N.C.)
FLOODPLAIN LIMITS
604+00.95
607+00.95
P.V.I. 600+00.05 ELEV. 1335.66
P.V.I. 600+50.00 ELEV. 1335.68
P.V.I. 601+00.00 ELEV. 1335.52
P.V.I. 602+05.85 ELEV. 1335.81
P.V.C. 605+40.85 ELEV. 1336.17
P.V.I. 607+15.85 ELEV. 1336.35
P.V.T. 608+90.85 ELEV. 1343.90
P.V.I. 609+00.00 ELEV. 1344.30
P.V.I. 609+50.00 ELEV. 1346.91
0.04%
-0.32%
0.28%
0.11%
4.32%
5.22%
K 83.14
VC=350'
e=1.84'
STA. 606+07.00
F.L. INLET=1329.02 LT.
F.L. OUTLET=1327.97 RT.
1390
1380
1370
1360
1350
1340
1330
1320
1310
1300
600+00
601+00
602+00
603+00
604+00
605+00
606+00
607+00
608+00
609+00
610+00
611+00
612+00
613+00
614+00
615+00

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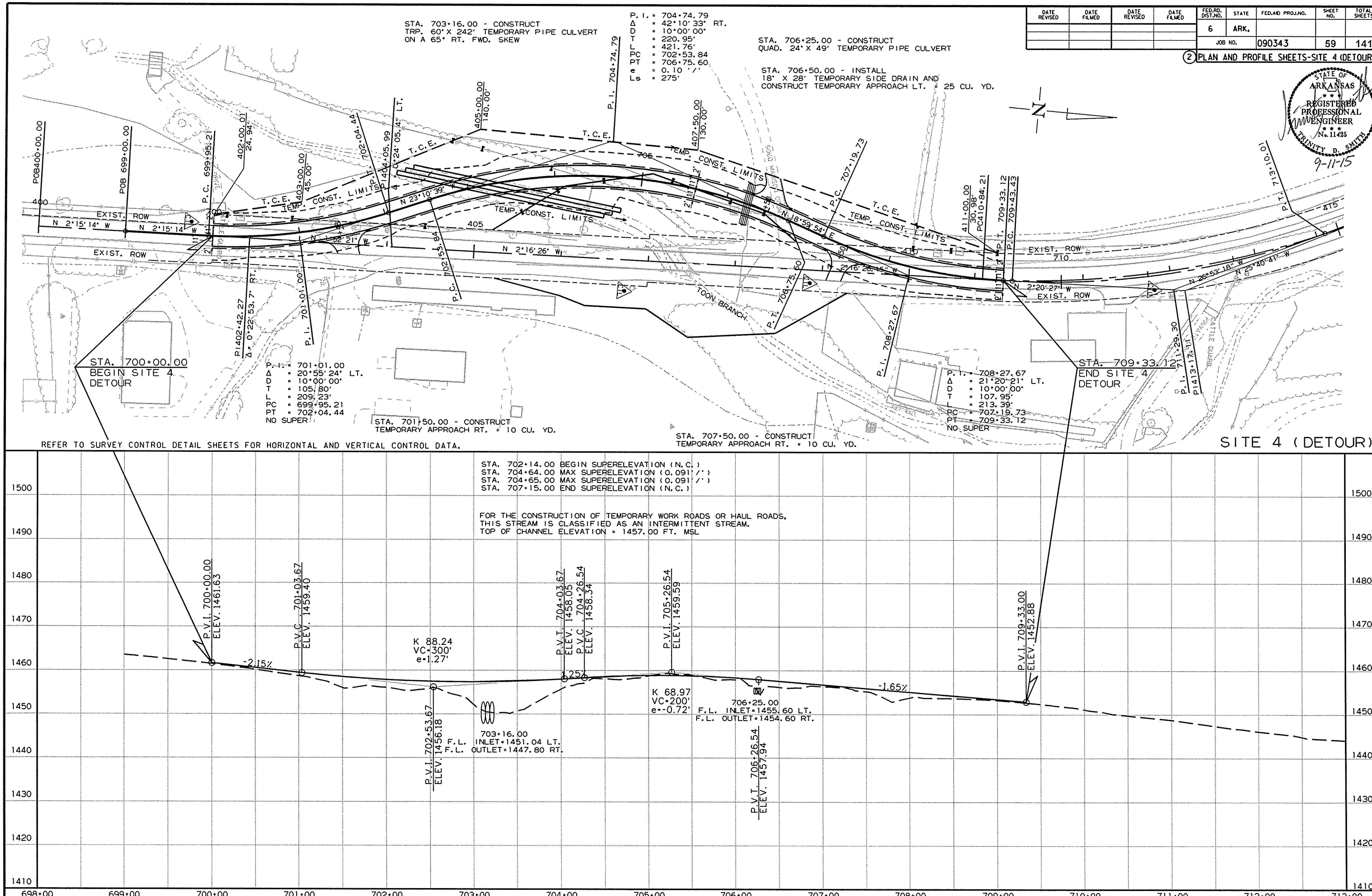
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	59	141

(2) PLAN AND PROFILE SHEETS-SITE 4 (DETOUR)



STA. 703+16.00 - CONSTRUCT
TRP. 60" X 242' TEMPORARY PIPE CULVERT
ON A 65° RT. FWD. SKEW
P.I. = 704+74.79
Δ = 42°10'33" RT.
D = 10°00'00"
T = 220.95'
L = 421.76'
PC = 702+53.84
PT = 706+75.60
e = 0.10 '/'
Ls = 275'
STA. 706+25.00 - CONSTRUCT
QUAD. 24" X 49' TEMPORARY PIPE CULVERT
STA. 706+50.00 - INSTALL
18" X 28' TEMPORARY SIDE DRAIN AND
CONSTRUCT TEMPORARY APPROACH LT. = 25 CU. YD.
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-11-15
STA. 700+00.00
BEGIN SITE 4
DETOUR
P.I. = 701+01.00
Δ = 20°55'24" LT.
D = 10°00'00"
T = 105.80'
L = 209.23'
PC = 699+95.21
PT = 702+04.44
NO SUPER
STA. 701+50.00 - CONSTRUCT
TEMPORARY APPROACH RT. = 10 CU. YD.
STA. 707+50.00 - CONSTRUCT
TEMPORARY APPROACH RT. = 10 CU. YD.
P.I. = 708+27.67
Δ = 21°20'21" LT.
D = 10°00'00"
T = 107.95'
L = 213.39'
PC = 707+19.73
PT = 709+33.12
NO SUPER
STA. 709+33.12
END SITE 4
DETOUR
EXIST. ROW
T.C.E.
TEMP. CONST. LIMITS
TOON BRANCH
SITE 4 (DETOUR)
REFER TO SURVEY CONTROL DETAIL SHEETS FOR HORIZONTAL AND VERTICAL CONTROL DATA.
STA. 702+14.00 BEGIN SUPERELEVATION (N.C.)
STA. 704+64.00 MAX SUPERELEVATION (0.091'/')
STA. 704+65.00 MAX SUPERELEVATION (0.091'/')
STA. 707+15.00 END SUPERELEVATION (N.C.)
FOR THE CONSTRUCTION OF TEMPORARY WORK ROADS OR HAUL ROADS,
THIS STREAM IS CLASSIFIED AS AN INTERMITTENT STREAM.
TOP OF CHANNEL ELEVATION = 1457.00 FT. MSL
P.V.I. 700+00.00
ELEV. 1461.63
P.V.C. 701+03.67
ELEV. 1459.40
K 88.24
VC=300'
e=1.27'
P.V.T. 704+03.67
ELEV. 1458.05
P.V.C. 704+26.54
ELEV. 1458.34
P.V.I. 705+26.54
ELEV. 1459.59
K 68.97
VC=200'
e=-0.72'
706+25.00
F.L. INLET=1455.60 LT.
F.L. OUTLET=1454.60 RT.
703+16.00
F.L. INLET=1451.04 LT.
F.L. OUTLET=1447.80 RT.
P.V.I. 702+53.67
ELEV. 1456.18
P.V.T. 706+26.54
ELEV. 1457.94
P.V.I. 709+33.00
ELEV. 1452.88
-2.15%
1.25%
-1.65%

9/8/2015

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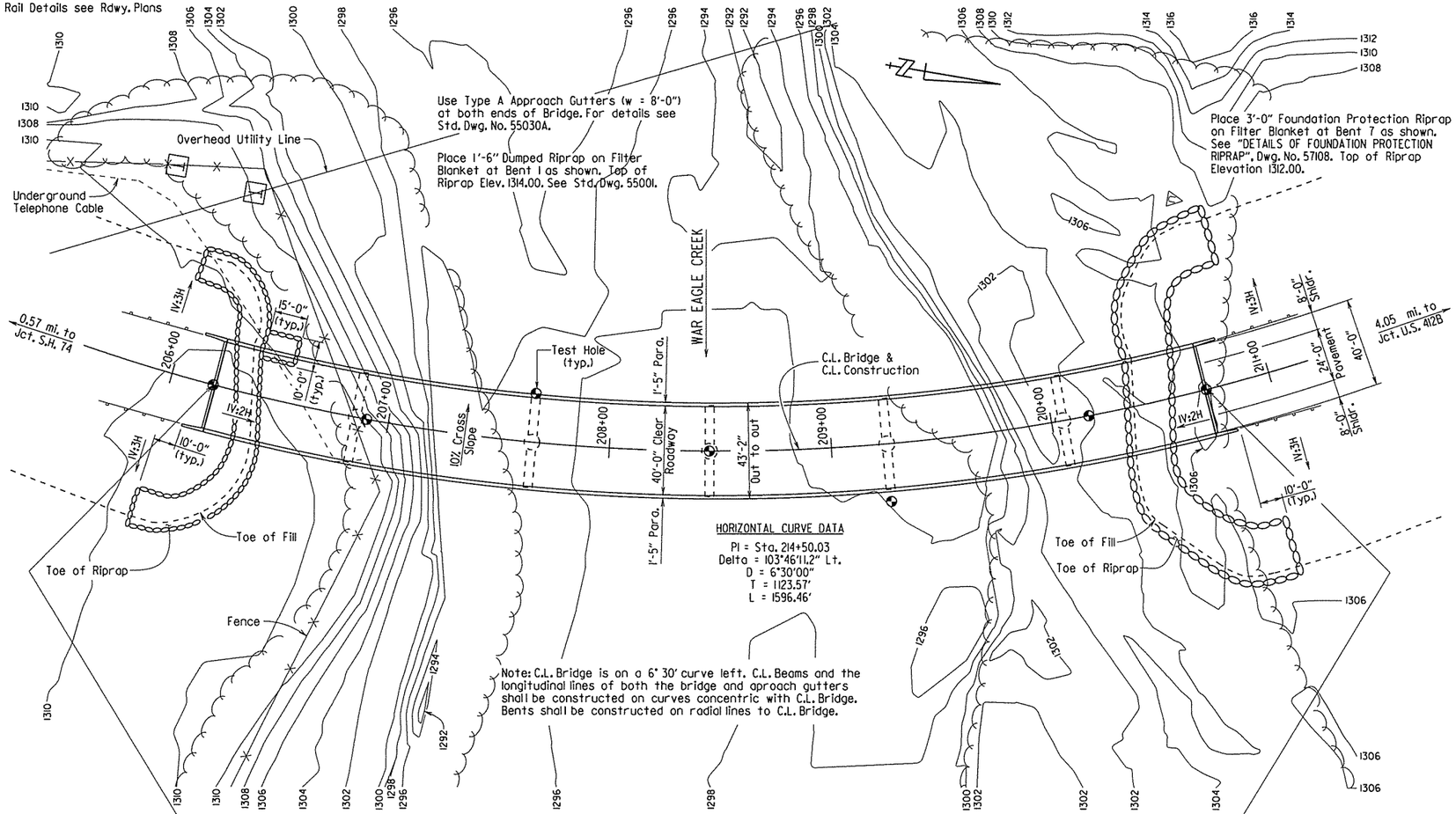
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	60	141
				07346 - LAYOUT - 57107				

For R/W Data and Guard Rail Details see Rdwy. Plans

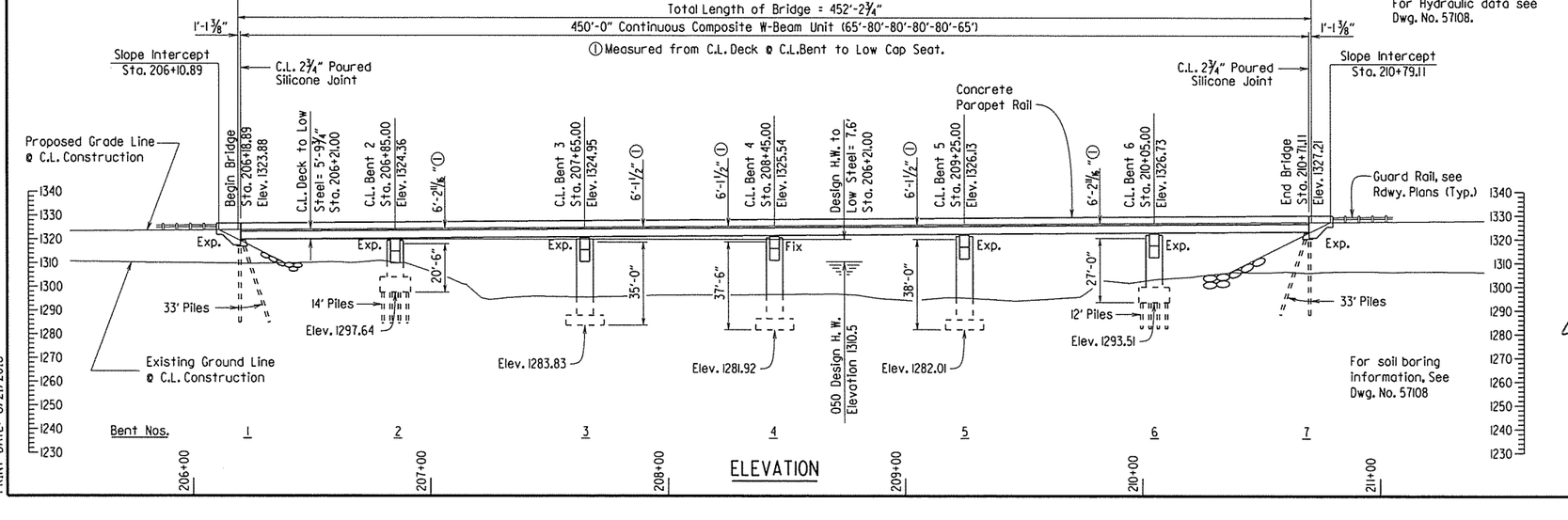


PLAN

Stations and elevations shown are along C.L. Bridge. Elevations shown are actual elevations at C.L. Bridge. See Dwg. No. 57108 for "GRADE ALONG C.L. CONSTRUCTION" and "CROSS SLOPE SKETCH".

Total Length of Bridge = 452'-2¾"
450'-0" Continuous Composite W-Beam Unit (65'-80'-80'-80'-80'-65')
① Measured from C.L. Deck ⌀ C.L. Bent to Low Cap Seat.

For Hydraulic data see Dwg. No. 57108.



ELEVATION

PRINT DATE: 8/21/2015

GENERAL NOTES

BENCH MARK: Horizontal and Vertical Control Data are shown on Survey Control Detail Sheets.

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

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

LIVE LOADING: HL-93

SEISMIC PERFORMANCE ZONE: I S_{DI} = 0.059 SITE CLASS: A

MATERIALS AND STRENGTHS:

Class S (AE) Concrete (superstructure)	f'c = 4,000 psi
Class S Concrete (substructure)	f'c = 3,500 psi
Reinforcing Steel (Grade 60, AASHTO M31 or M322, Type A)	fy = 60,000 psi
Structural Steel (AASHTO M270, Grade 36)	Fy = 36,000 psi
Structural Steel (AASHTO M270, Grade 50W)	Fy = 50,000 psi

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

STEEL PILING: Piling in Bents 1, 2, 6 & 7 shall be HP12x53 (Grade 50) and shall be driven with an approved air, steam, or diesel hammer to a minimum safe bearing capacity of 95 tons per pile and into the material designated as Shale on the boring legend. Minimum penetration shall be 10' below natural ground for all piles in Bents 1 and 7, and 10' below bottom of footings for all piles in Bents 2 and 6. Piling in end bents shall be driven after embankment to bottom of cap is in place. Lengths of piling shown are for estimating quantities and for use in determining payment for cut-off and build-up in accordance with the Standard Specifications. On all piling, the Contractor shall use approved steel H-Pile driving points.

PREBORING: Preboring is required for all piles in Bent 6 to achieve minimum penetration. Preboring shall be to a minimum 3' depth into material designated as Shale on the boring legend. The actual size and depth of preboring shall be determined in the field by the Engineer. The Contractor shall be responsible for keeping prebored holes free of debris prior to driving piles and backfilling which may require the use of temporary casings or other methods. After driving is completed, the prebored hole shall be backfilled with Class S Concrete to the top of the rock and the remaining length backfilled in accordance with Subsection 805.08(a). Any related cost for backfilling, including concrete and temporary casing, shall be considered subsidiary to the item "Preboring".

FOOTINGS: The top of the footings at Bents 2 and 6 shall be set a minimum of 2' below natural ground or at the elevations shown on the plans, whichever is lower.

Footings at Bents 3 thru 5 shall be set a minimum of 2' into material designated as Shale on the boring legend. The top of the footings at Bents 3 thru 5 shall be set 2' below the channel bottom as determined by the lowest channel elevation within the footprint of the footing. Rock excavations shall be made to neat lines of the concrete footings. Blasting will not be allowed. Concrete in footings shall be poured directly against excavated surfaces of rock.

Foundations for footings shall be prepared in accordance with Subsection 801.04. Excavations shall be backfilled and compacted to the level of the existing ground in accordance with Subsection 801.08.

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

PROTECTIVE SURFACE TREATMENT: Class 2 Protective Surface treatment shall be applied to the roadway surface and to the roadway face and top of the concrete parapet rail.

DETAIL DRAWINGS:	DRAWING NUMBER
End Bents	57110-57112
Intermediate Bents	57113-57117
450' Cont. Comp. W-Beam Unit	57118-57124
Elastomeric Bearings	57125
Steel Piling	55020
Type A Approach Gutters	55030A

EXISTING BRIDGE: Existing Bridge No. 03582 (Log Mile 23.79) is 28.6' wide and 442' long with seven composite steel and concrete simple spans (two @ 50', three @ 80', and two @ 50') supported by concrete piers on spread footings at intermediate bents and steel piling at end bents. See Dwg. No. 57109 for location of existing bridge and excavation of existing embankment.

REMOVAL AND SALVAGE: After the new bridge is open to traffic the Contractor shall remove existing Bridge No. 03582, including dumped riprap, in accordance with Section 205. Removal of Dumped Riprap shall not be paid for directly but shall be considered subsidiary to the item "Removal of Existing Bridge Structure." All Salvageable guard rail and beams as selected by District 9 shall remain the property of the Department. The Contractor shall coordinate with the Engineer to provide temporary storage and on site loading onto Department equipment for removal of all salvaged items. All remaining material from the existing bridge shall become the property of the Contractor.

MAINTENANCE OF TRAFFIC: See Roadway Plans.

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
8/21/15
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 1 OF 3

LAYOUT OF BRIDGE OVER WAR EAGLE CREEK HWY. 74 - HUNTSVILLE STRS. & APPRS. (S) MADISON COUNTY

ROUTE 23 SEC. 8

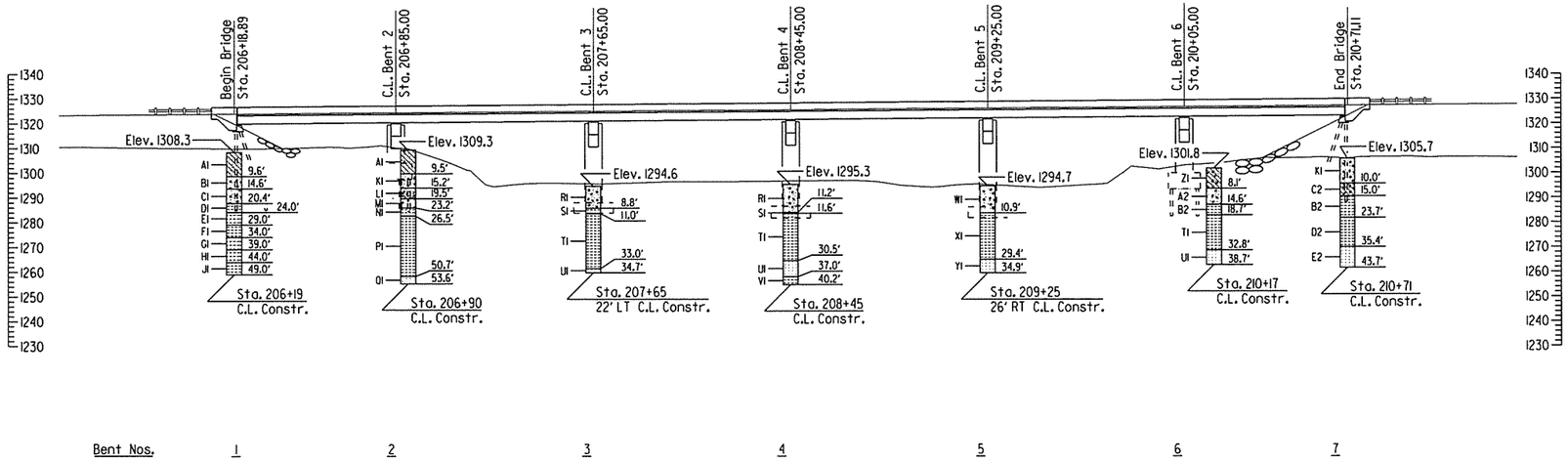
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: BHS DATE: 9/4/2014 FILENAME: b090343_11.dgn
CHECKED BY: DHP DATE: 8/19/15 SCALE: 1" = 30'-0"
DESIGNED BY: BHS DATE: 9/2014

BRIDGE NO. 07346 DRAWING NO. 57107

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.		090343	61	141
				①		07346 - LAYOUT - 57108		



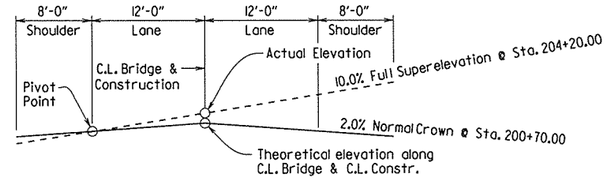
Bent Nos. 1 2 3 4 5 6 7

ELEVATION OF SOIL BORINGS

HYDRAULIC DATA

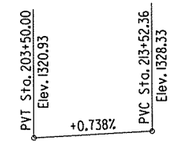
FLOOD DESCRIPTION	FREQUENCY	DISCHARGE	*NATURAL WATER SURFACE ELEVATION	WATER SURFACE ELEV. WITH BACKWATER
	YEARS	CFS	FEET	FEET
Design	50	38100	1309.2	1310.4
Base	100	46100	1310.0	1311.5
Extreme	500	72000	1312.3	1314.7
Overtopping	>500	-	-	-

*Unconstricted water surface without structure or roadway approaches.
Drainage area = 105 square miles.
Historical H.W. Elev. = 1318.42 ft.
0100 Backwater Elev. for existing structure = 1310.5 ft.
Proposed Low Bridge Chord Elev. = 1318.08 ft. @ Sta. 206+21.00



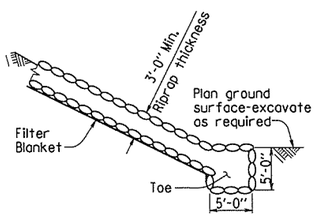
CROSS SLOPE SKETCH

Looking Ahead



Theoretical Elevation along C.L. Bridge & Constr.
See "CROSS SLOPE SKETCH"

GRADE ALONG C.L. CONSTRUCTION



DETAILS OF FOUNDATION PROTECTION RIPRAP

(Bent 7 Only)
No Scale

BORING LEGEND

AI-Moist, Stiff, Reddish Brown Clay with Sand
BI-Moist, Medium Dense, Brown Sand with Gravel (Sandstone Fragments)
CI-Wet, Medium Dense, Brown Sand with Gravel (Sandstone Fragments) and some Cobbles
DI-SHALE - Dark Gray, Laminated, Calcareous, Highly Weathered, Medium Hard, with Slight Dip
EI-SHALE WITH GRAY CALCAREOUS SANDSTONE LAYERS - Dark Gray, Laminated, Calcareous, Slightly Weathered, Medium Hard, with Slight Dip
FI-SHALE WITH OCCASIONAL WEATHERED SHALE LAYERS - Dark Gray, Laminated, Calcareous, Medium Hard, with Slight Dip
GI-SHALE WITH GRAY CALCAREOUS SANDSTONE SEAMS - Dark Gray, Laminated, Calcareous, Slightly Weathered, Medium Hard, with Slight Dip
HI-SHALE WITH FREQUENT WEATHERED SHALE LAYERS AND GRAY CALCAREOUS SANDSTONE SEAMS - Dark Gray, Laminated, Calcareous, Medium Hard, with Slight Dip
JI-SHALE WITH OCCASIONAL WEATHERED SHALE LAYERS AND GRAY CALCAREOUS SANDSTONE SEAMS - Dark Gray, Laminated, Calcareous, Medium Hard, with Slight Dip
KI-Moist, Medium Dense, Brown Sand with Gravel (Sandstone Fragments)
LI-Moist, Medium Dense, Brown Sand with Gravel (Sandstone Fragments) and Cobbles
MI-Sandstone Gravel with Highly Weathered Shale
NI-SHALE - Dark Gray, Calcareous, Highly Weathered, Medium Hard
PI-SHALE WITH FREQUENT WEATHERED SHALE LAYERS - Dark Gray, Laminated, Calcareous, Medium Hard, with Slight Dip
QI-CALCAREOUS SANDSTONE - Light Gray, Thick Bedded, Slightly Weathered, Well-Cemented, with Slight Dip
RI-Wet, Medium Dense, Brown Sand with Gravel (Sandstone Fragments)
SI-SHALE - Dark Gray, Highly Weathered, Medium Hard
TI-SHALE WITH FREQUENT WEATHERED SHALE LAYERS - Dark Gray, Laminated, Slightly Calcareous, Medium Hard, with Slight Dip
UI-SANDSTONE - Gray, Medium Bedded, Slightly Calcareous, Well-Cemented, with Slight Dip
VI-SHALE - Dark Gray, Laminated, Slightly Weathered, Medium Hard, with Slight Dip
WI-Wet, Loose, Brown Sand with Gravel (Sandstone Fragments)
XI-SHALE WITH FREQUENT WEATHERED SHALE LAYERS - Dark Gray, Laminated, Slightly Calcareous, Medium Hard, with Slight Dip and some Slickensides
YI-SANDSTONE WITH OCCASIONAL CALCAREOUS SEAMS - Gray, Very Thick Bedded, Well-Cemented, with Slight Dip
ZI-Moist, Very Stiff, Brown Clay with Sand, Gravel (Sandstone Fragments) and some Organic Matter
A2-Wet, Loose, Brown Sand with Gravel (Sandstone Fragments)
B2-SHALE - Dark Gray, Laminated, Slightly Calcareous, Weathered, Medium Hard, with Slight Dip
C2-Wet, Medium Dense to Loose, Brown Sand with Gravel (Sandstone Fragments)
D2-SHALE WITH FREQUENT WEATHERED SHALE LAYERS AND CALCAREOUS SANDTONE PARTINGS - Dark Gray, Laminated, Slightly Calcareous, Medium Hard, with Slight Dip
E2-SANDSTONE - Gray, Medium Bedded, Slightly Calcareous, Well-Cemented, with Slight Dip and Vertically Fractured Layers

"N" VALUES

Sta. 206+19 - Center Line of Construction
5.1- 6.1, N=10
10.1- 11.1, N=12
15.1- 16.1, N=14
20.1- 21.1, N=46
21.4- 21.4, N=30(.01')

Sta. 206+90 - Center Line of Construction
5.0- 6.0, N=14
10.0- 11.0, N=23
15.0- 16.0, N=18
20.0- 21.0, N=21
25.0- 25.4, N=60(5')
26.5- 26.5, N=60(.01')

Sta. 207+65 - 22' Left of Center Line of Construction
5.1- 6.1, N=26
9.6- 10.0, N=60(5')

Sta. 208+45 - Center Line of Construction
5.2- 6.2, N=12
11.2- 11.6, N=60(5')

Sta. 209+25 - 26' Right of Center Line of Construction
5.0- 6.0, N=6
11.0- 11.3, N=60(4')

Sta. 210+17 - Center Line of Construction
3.6- 4.6, N=22
8.6- 9.6, N=9
15.1- 16.1, N=89

Sta. 210+71 - Center Line of Construction
5.5- 6.5, N=18
10.5- 11.5, N=14
15.5- 16.5, N=10
20.5- 20.7, N=60(2')

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
8/21/15
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 2 OF 3

LAYOUT OF BRIDGE OVER WAR EAGLE CREEK
HWY. 74 - HUNTSVILLE STRS. & APPRS. (S)
MADISON COUNTY

ROUTE 23 SEC. 8

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: BHS DATE: 9/4/2014 FILENAME: b090343_ll.dgn
CHECKED BY: PHP DATE: 8/14/15 SCALE: 1" = 30'-0"
DESIGNED BY: BHS DATE: 9/2014

BRIDGE NO. 07346 DRAWING NO. 57108

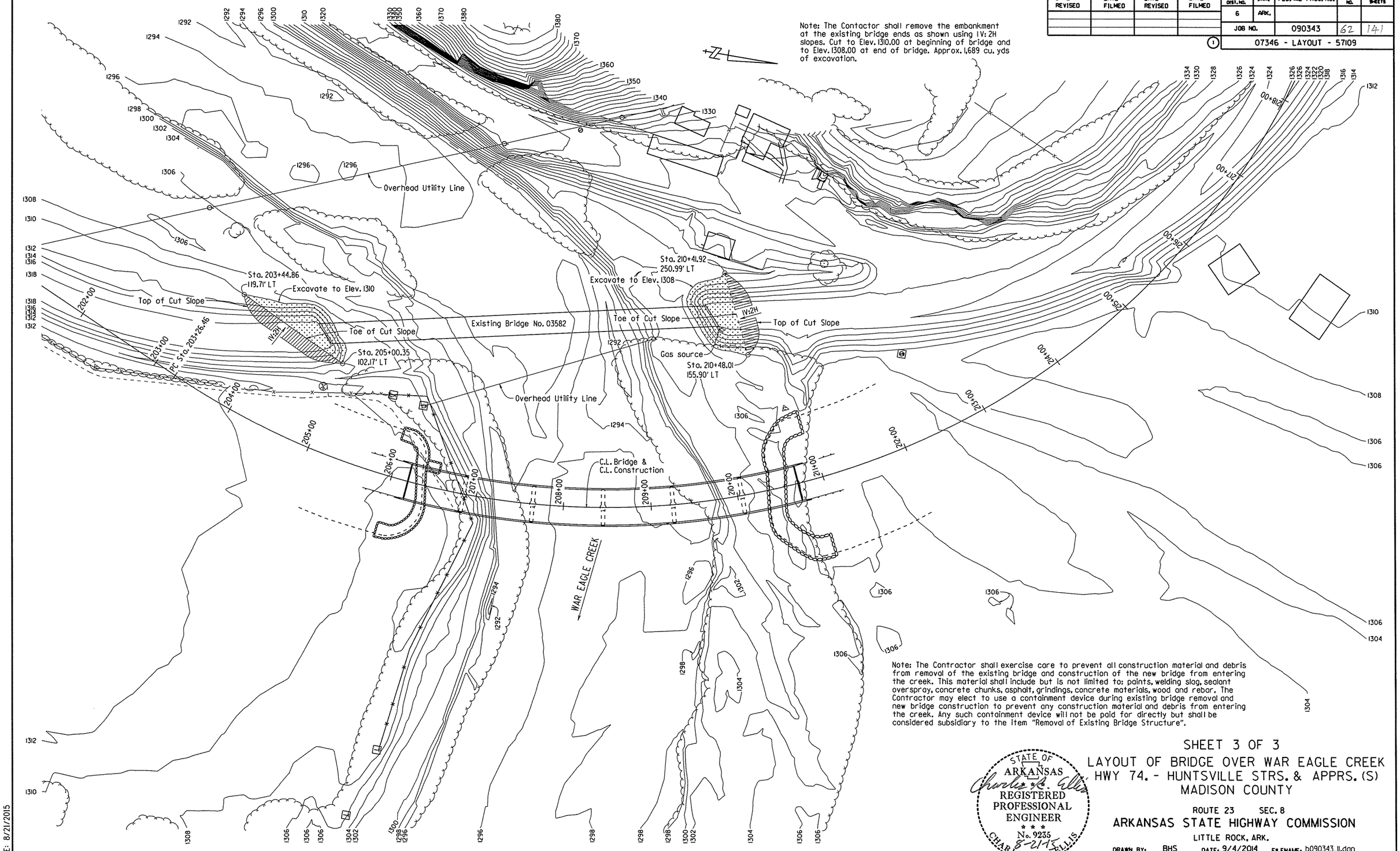
PRINT DATE: 8/12/2015

206+00 207+00 208+00 209+00 210+00 211+00

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.		090343	62	141

(1) 07346 - LAYOUT - 57109

Note: The Contactor shall remove the embankment at the existing bridge ends as shown using 1V: 2H slopes. Cut to Elev. 1310.00 at beginning of bridge and to Elev. 1308.00 at end of bridge. Approx. 1,689 cu. yds of excavation.



LOCATION SKETCH

Note: The Contractor shall exercise care to prevent all construction material and debris from removal of the existing bridge and construction of the new bridge from entering the creek. This material shall include but is not limited to: paints, welding slag, sealant overspray, concrete chunks, asphalt, grindings, concrete materials, wood and rebar. The Contractor may elect to use a containment device during existing bridge removal and new bridge construction to prevent any construction material and debris from entering the creek. Any such containment device will not be paid for directly but shall be considered subsidiary to the item "Removal of Existing Bridge Structure".

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
8-21-15
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 3 OF 3

LAYOUT OF BRIDGE OVER WAR EAGLE CREEK HWY 74. - HUNTSVILLE STRS. & APPRS. (S) MADISON COUNTY

ROUTE 23 SEC. 8

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

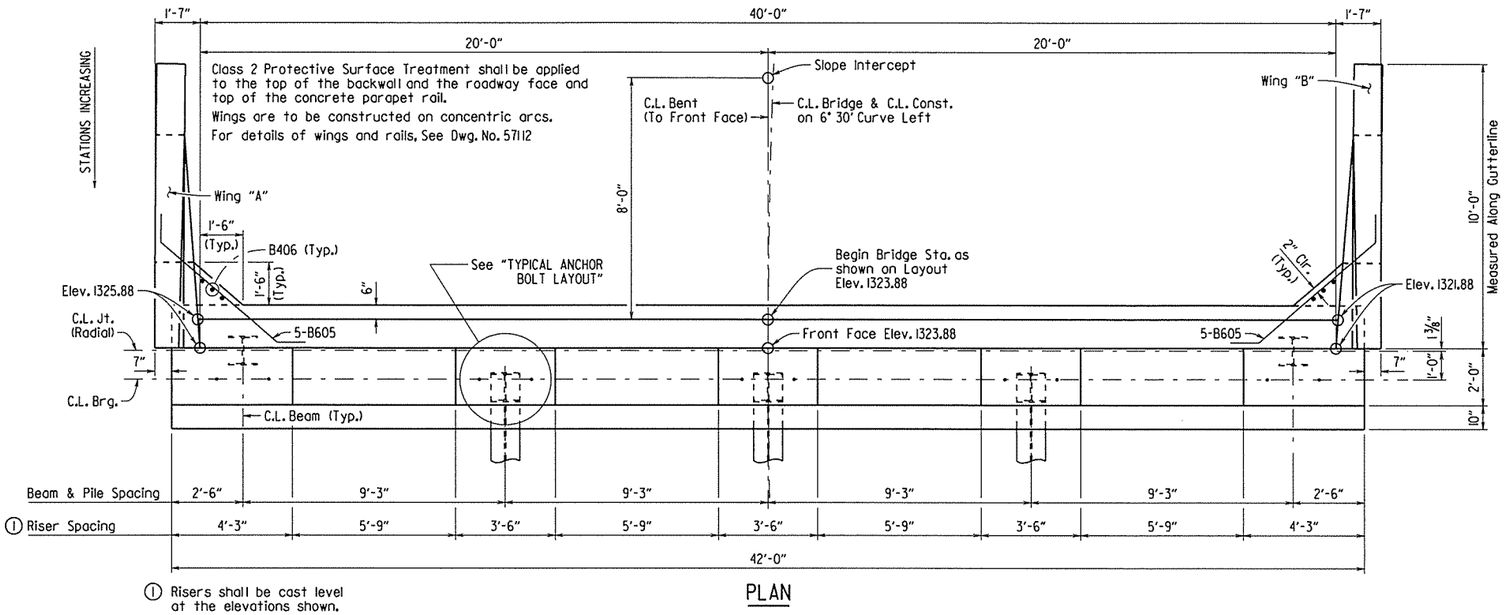
DRAWN BY: BHS DATE: 9/4/2014
CHECKED BY: DHP DATE: 8/19/15
DESIGNED BY: BNS DATE: 9/2014
FILENAME: b090343_11.dgn
SCALE: 1" = 50'-0"

BRIDGE NO. 07346 DRAWING NO. 57109

PRINT DATE: 8/21/2015

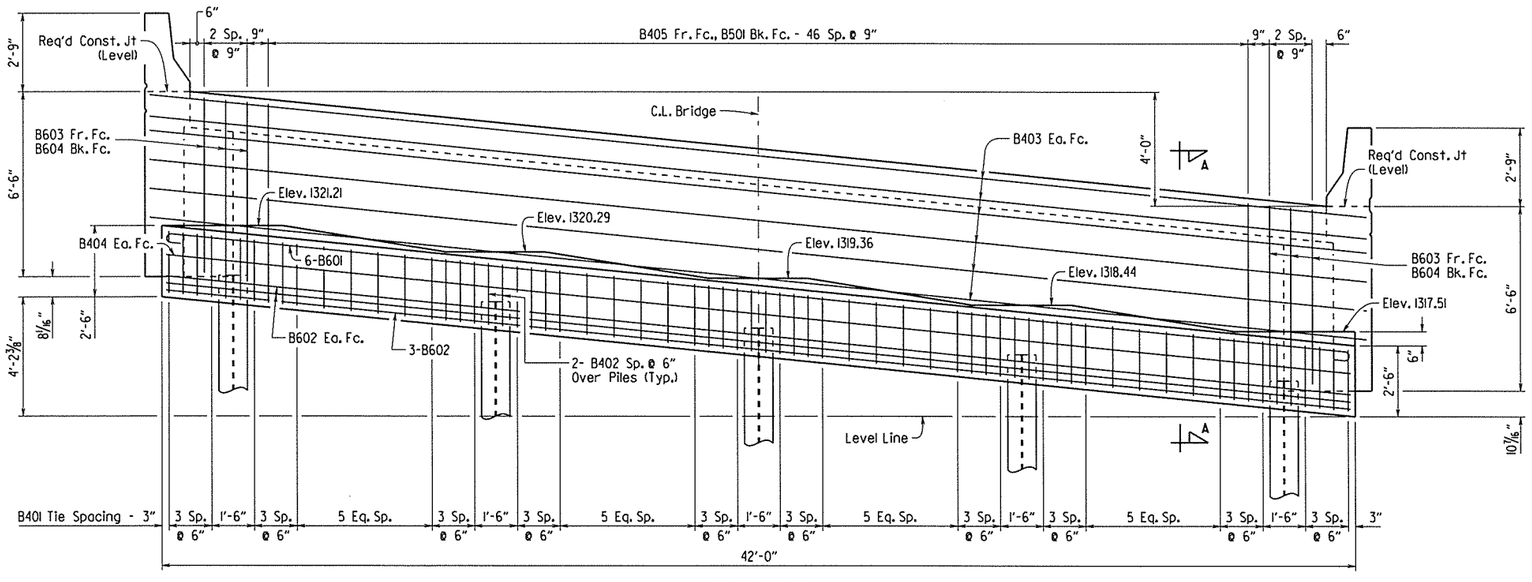
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	63	141

① 07346 - END BENT DETAILS - 57110



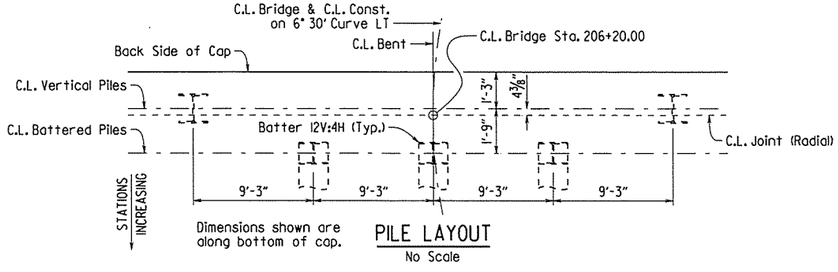
① Risers shall be cast level at the elevations shown.

PLAN



ELEVATION

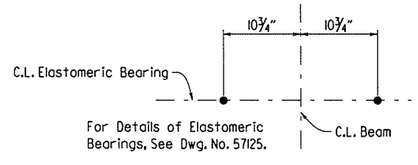
Bent 1- Looking Back



Dimensions shown are along bottom of cap.

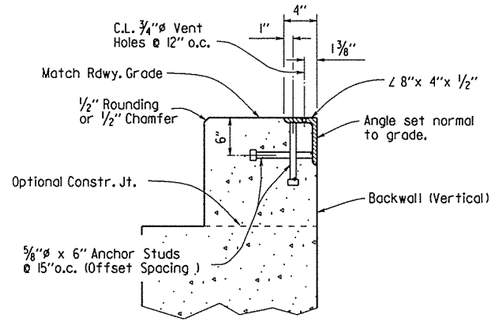
PILE LAYOUT

No Scale



TYPICAL ANCHOR BOLT LAYOUT

No Scale

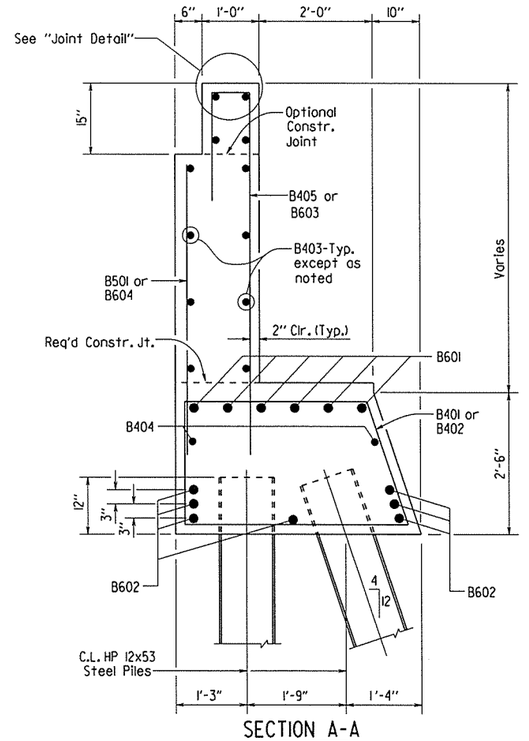


For additional Joint Details See Dwg. No. 57124

Concrete shall be hand packed under joint armor in the backwall.

JOINT DETAIL

No Scale



SECTION A-A

No Scale

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
8-21-15
CHARLES R. ELLIS

BRIDGE ENGINEER

DETAILS OF END BENT 1
WAR EAGLE CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

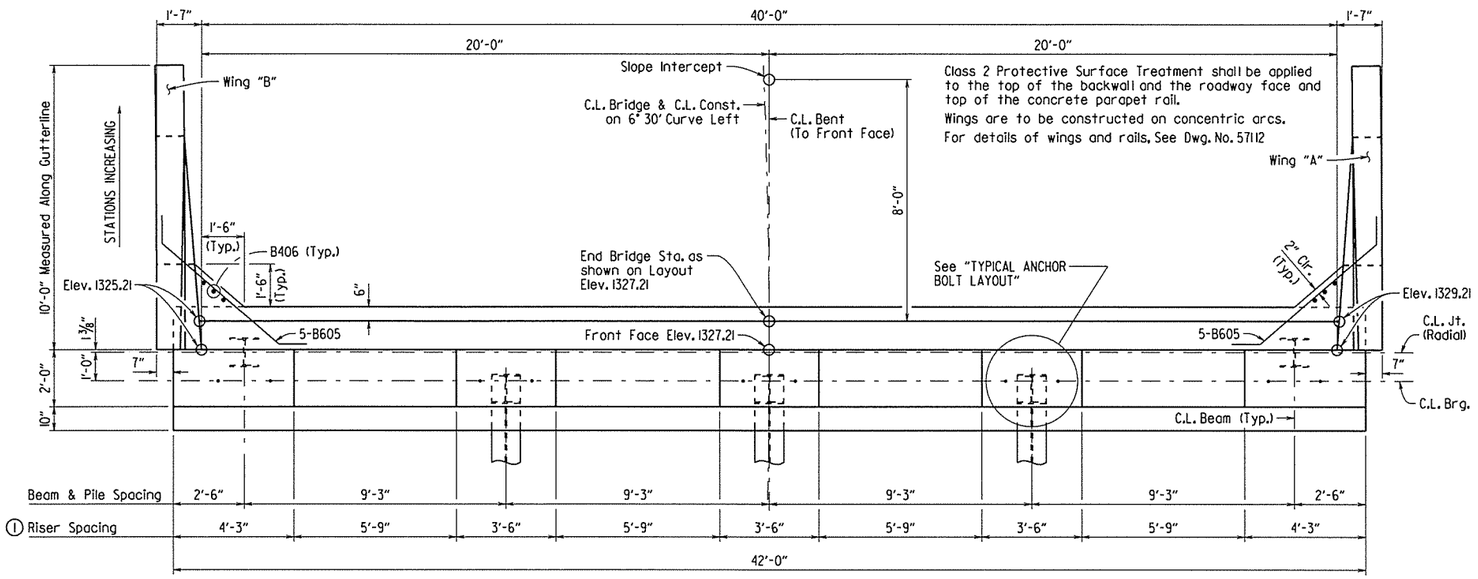
DRAWN BY: BHS DATE: 3/12/2014 FILENAME: b090343_b1.dgn
CHECKED BY: DHP DATE: 8/19/15 SCALE: 3/8" = 1'-0" or As Shown
DESIGNED BY: DHP DATE: 11/2014

BRIDGE NO. 07346 DRAWING NO. 57110

PRINT DATE: 8/20/2015

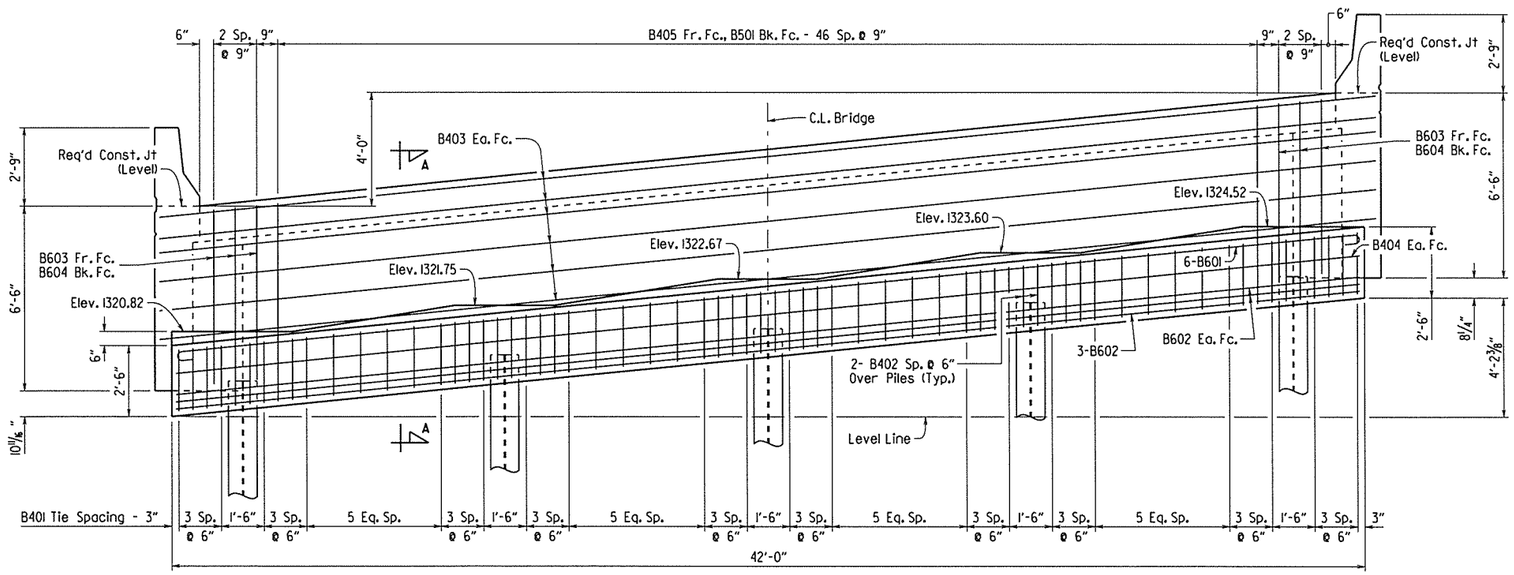
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	64	141

① 07346 - END BENT DETAILS - 57111



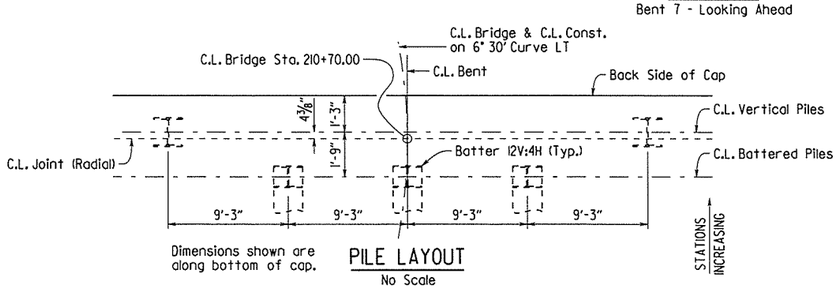
① Risers shall be cast level at the elevations shown.

PLAN



ELEVATION

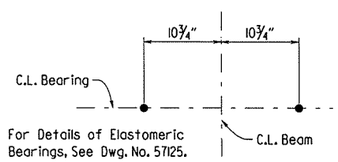
Bent 7 - Looking Ahead



Dimensions shown are along bottom of cap.

PILE LAYOUT

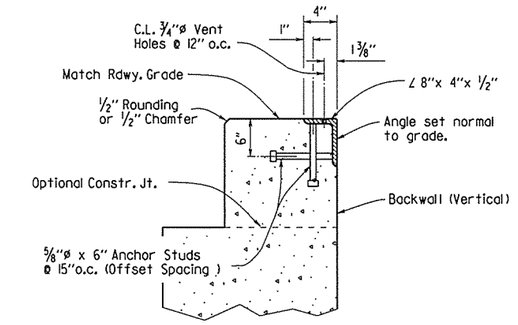
No Scale



For Details of Elastomeric Bearings, See Dwg. No. 57125.

TYPICAL ANCHOR BOLT LAYOUT

No Scale

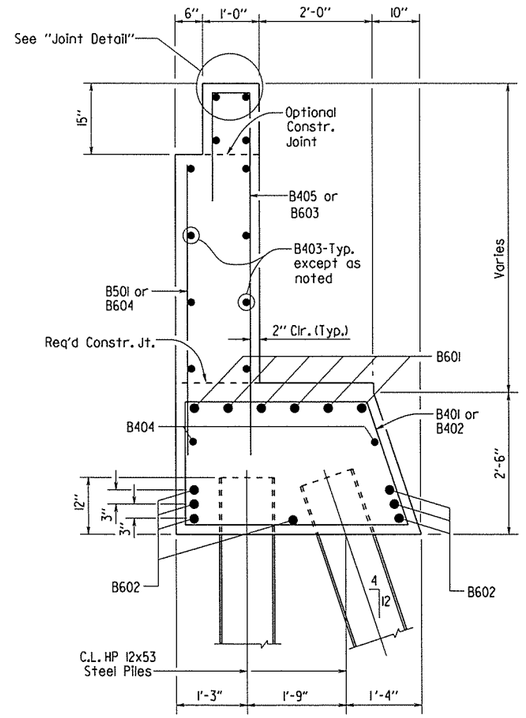


For additional Joint Details See Dwg. No. 57124

Concrete shall be hand packed under joint armor in the backwall.

JOINT DETAIL

No Scale



SECTION A-A

No Scale

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
8-21-15

BRIDGE ENGINEER

DETAILS OF END BENT 7
WAR EAGLE CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

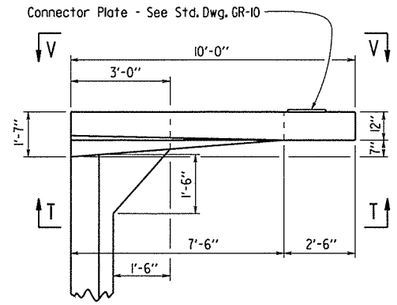
LITTLE ROCK, ARK.

DRAWN BY: BHS DATE: 3/12/2014 FILENAME: b090343_bt.dgn
CHECKED BY: DHP DATE: 3/14/15 SCALE: 3/8" = 1'-0" or As Shown
DESIGNED BY: DHP DATE: 11/2014

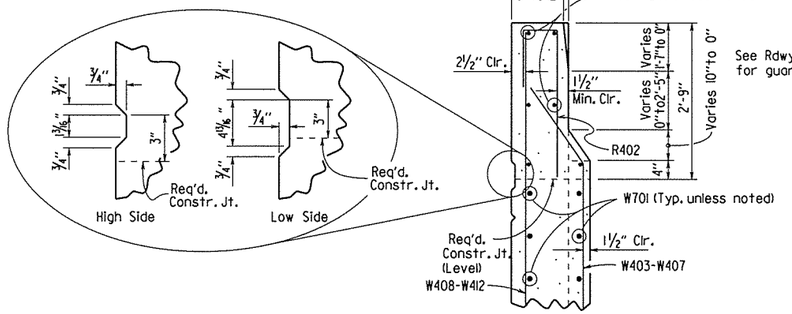
BRIDGE NO. 07346 DRAWING NO. 57111

PRINT DATE: 8/20/2015

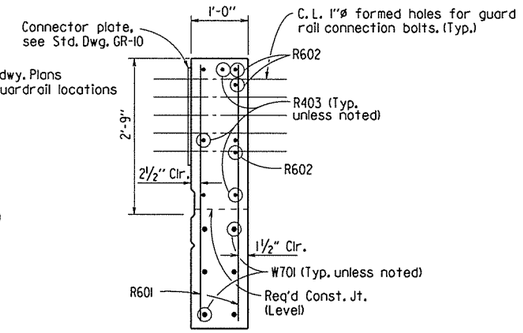
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	65	141
				①	07346 - END BENT DETAILS - 57112			



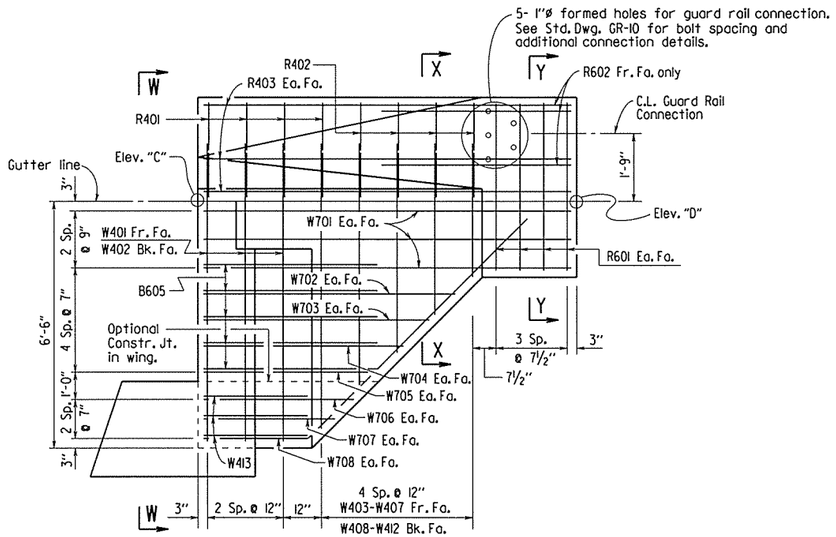
PLAN OF RAIL



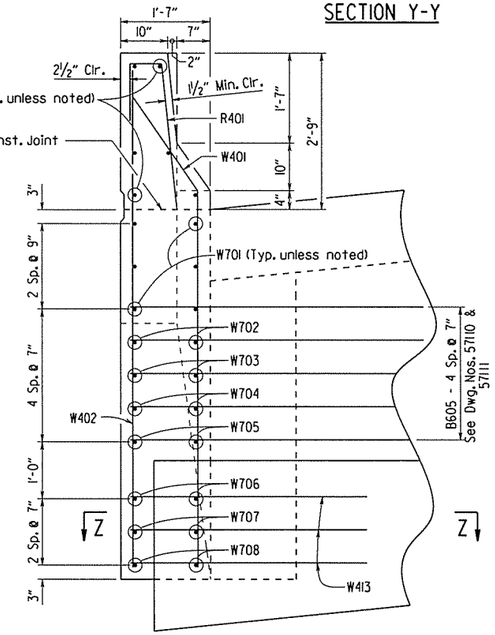
SECTION X-X



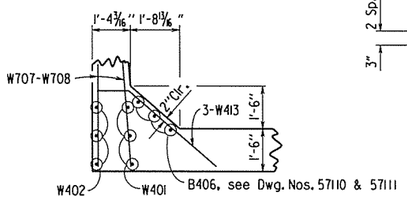
SECTION Y-Y



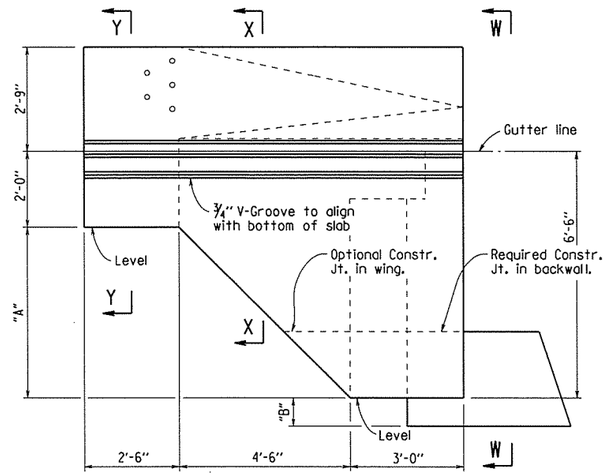
VIEW T-T



VIEW W-W



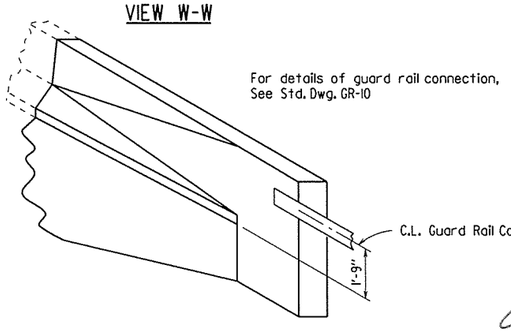
SECTION Z-Z



VIEW V-V

TABLE OF VARIABLES

Bent	Wing	"A"	"B"	"C"	"D"	"E"
1	A	4'-5 1/8"	8/16"	1325.88	1325.81	4'-9"
	B	4'-5 1/8"	10 7/16"	1321.88	1321.81	4'-11"
7	A	4'-6 7/8"	8 1/4"	1329.21	1329.28	4'-9"
	B	4'-6 7/8"	10 11/16"	1325.21	1325.28	4'-11"

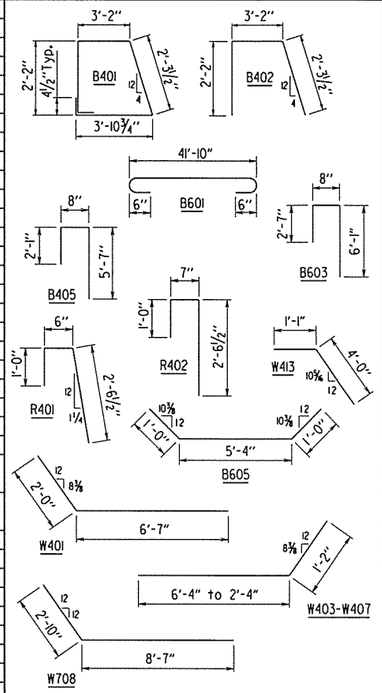


THREE DIMENSIONAL VIEW OF RAIL

BAR LIST-PER BENT

Mark	No. Req'd.	Length	Pin Dia.
B401	56	11'-11"	2"
B402	10	7'-6"	2"
B403	12	43'-0"	Str.
B404	2	41'-10"	Str.
B405	47	8'-2"	2"
B406	6	"E"	Str.
B501	47	4'-8"	Str.
B601	6	43'-2"	4 1/2"
B602	7	41'-10"	Str.
B603	6	9'-0"	4 1/2"
B604	6	4'-10"	Str.
B605	10	7'-4"	4 1/2"
R401	8	3'-11'	2"
R402	8	4'-0"	2"
R403	12	9'-8"	Str.
R601	16	4'-5"	Str.
R602	6	5'-0"	Str.
W401	6	8'-7"	2"
W402	6	8'-11"	Str.
W403-W407	2 ea.	7'-6" to 3'-6"	2"
W408-W412	2 ea.	8'-7" to 4'-7"	Str.
W413	6	5'-1"	2"
W701	12	9'-8"	Str.
W702	4	6'-9"	Str.
W703	4	6'-2"	Str.
W704	4	5'-7"	Str.
W705	4	5'-0"	Str.
W706	4	4'-0"	Str.
W707	4	3'-5"	Str.
W708	4	11'-5"	5 1/4"

Bending Diagram



Dimensions are out to out of bars.

GENERAL NOTES

All concrete shall be Class S with a minimum 28 day compressive strength f'c = 3,500 psi. Concrete shall be poured in the dry and all exposed corners to be chamfered 3/4" unless otherwise noted.

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

All structural steel shall be AASHTO M 270, Gr. 50W. Structural steel in backwall shall be paid for as "Structural Steel in Beam Spans (M 270, Gr. 50W)"

Top reinforcing bars shall be properly placed to avoid interference with anchor bolts.

All piling shall be Grade 50.

No portion of the backwall shall be poured before beams are in place. The portion of the backwall above the optional construction joint at the paving bracket shall not be placed until the deck pour has been made. Refer to the "Expansion Device Installation" note on Dwg. No. 57124.

For additional information see layout.

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
8-21-15
CHARLES R. ELLIS

BRIDGE ENGINEER

COMMON DETAILS OF END BENTS WAR EAGLE CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

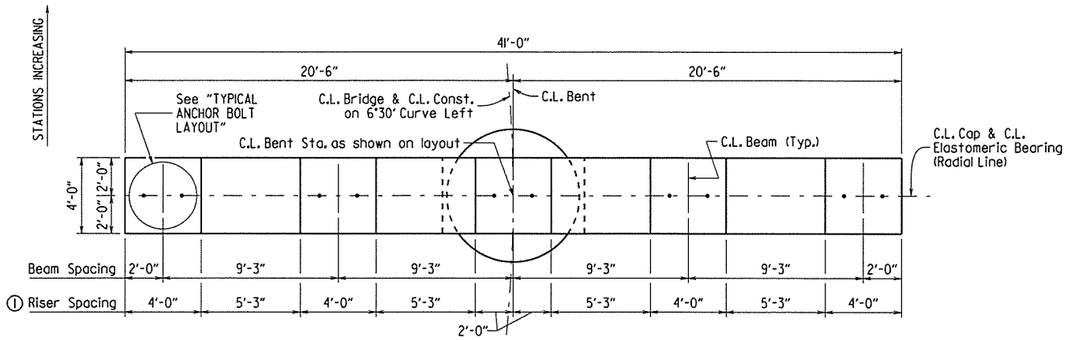
DRAWN BY: BHS DATE: 9/12/2014 FILENAME: b090343_bl.dgn
CHECKED BY: DHP DATE: 8/14/15 SCALE: No Scale
DESIGNED BY: DHP DATE: 11/2014

BRIDGE NO. 07346 DRAWING NO. 57112

PRINT DATE: 8/20/2015

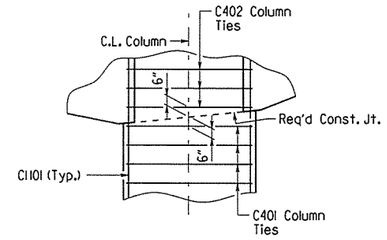
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	66	141

① 07346 - INTERMEDIATE BENTS - 57113

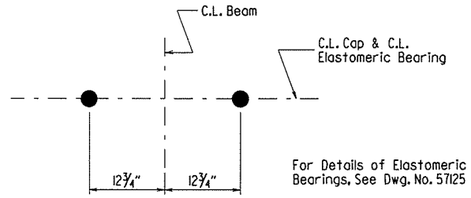


① Risers shall be cast level at the elevations shown

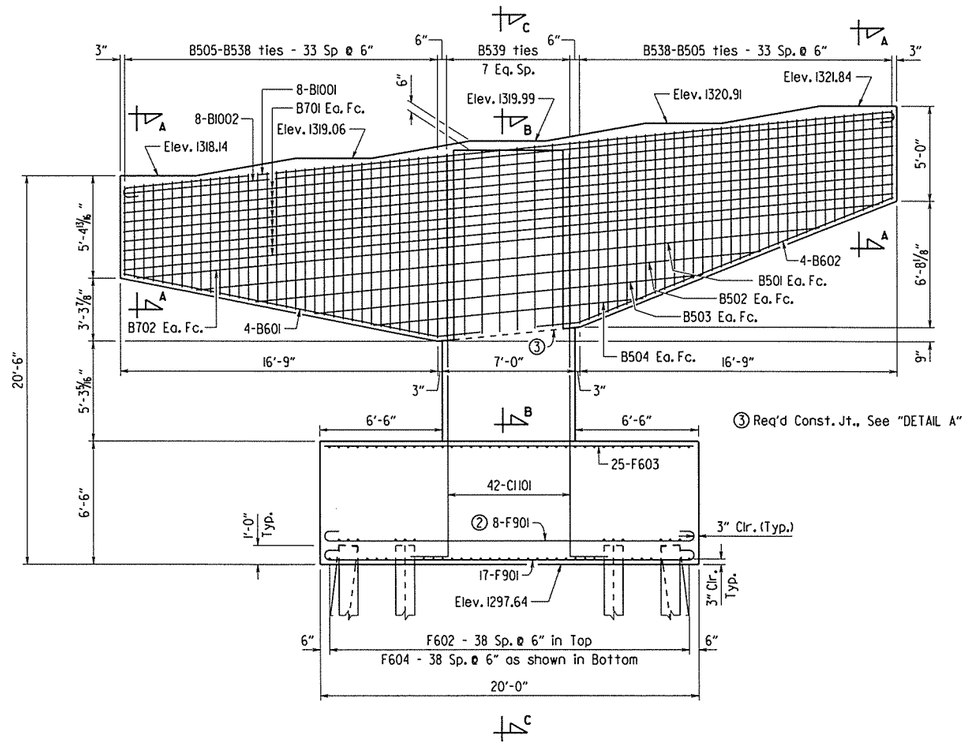
PLAN



DETAIL A
No Scale

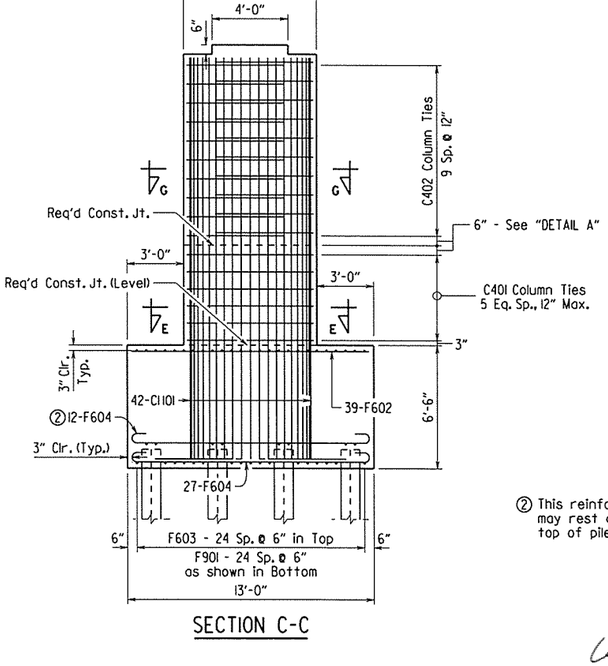


TYPICAL ANCHOR BOLT LAYOUT
No Scale



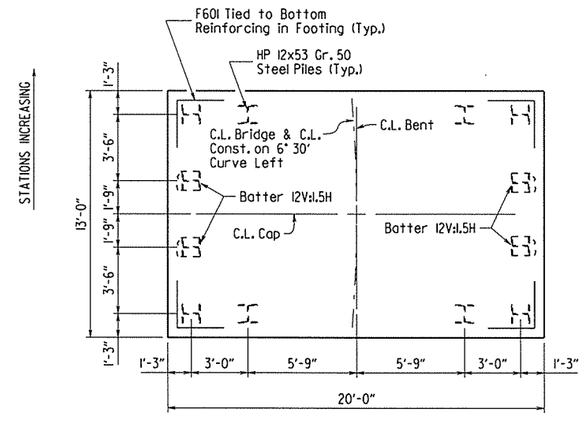
③ Req'd Const. Jt., See "DETAIL A"

ELEVATION
Looking Ahead



SECTION C-C

② This reinforcing mat may rest directly on top of piles.



PLAN OF FOOTING

For General Notes, Sections A-A, B-B, E-E, and G-G, See Dwg. No. 57117.

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
8-21-15
CHARLES R. ELLIS

BRIDGE ENGINEER

DETAILS OF INTERMEDIATE BENT 2 WAR EAGLE CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

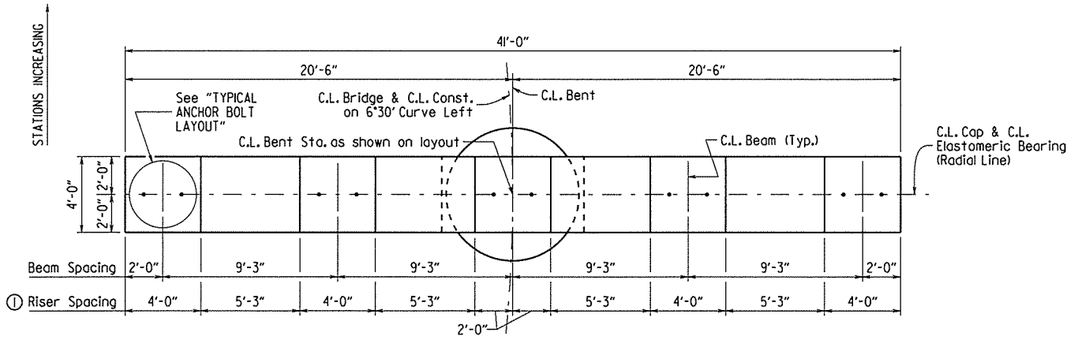
DRAWN BY: BHS DATE: 3/4/14
CHECKED BY: DHP DATE: 8/14/15
DESIGNED BY: DHP DATE: 11/2014
FILENAME: b090343_b2.dgn
SCALE: 1/4" = 1'-0" or As Shown

BRIDGE NO. 07346 DRAWING NO. 57113

PRINT DATE: 8/20/2015

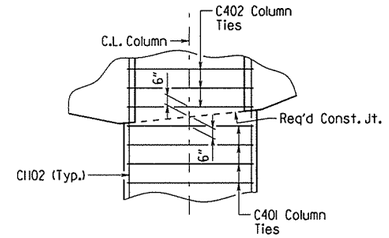
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	67	141

① 07346 - INTERMEDIATE BENTS - 57114

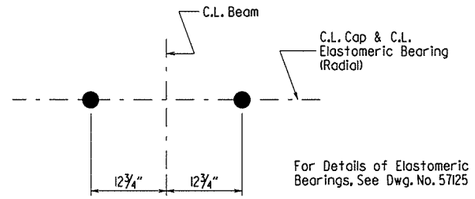


① Risers shall be cast level at the elevations shown

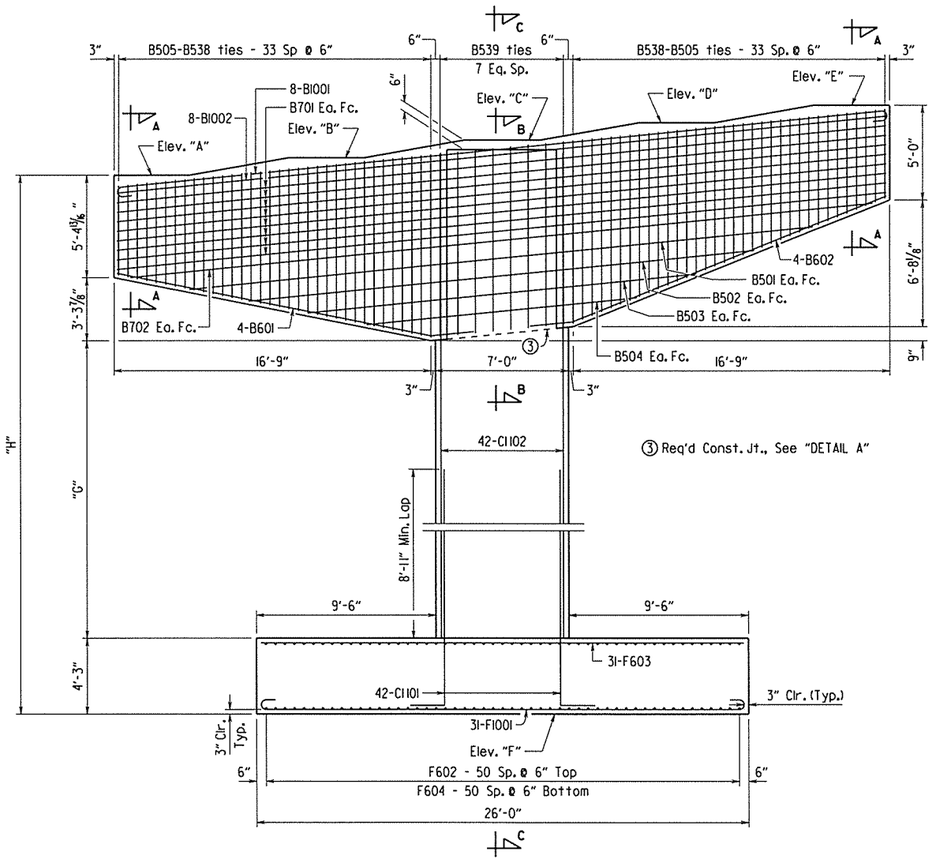
PLAN



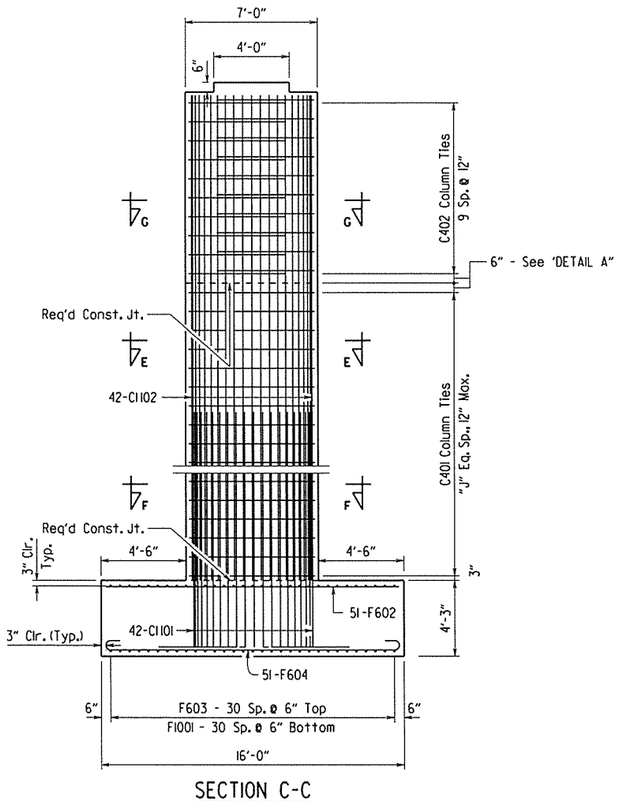
DETAIL A
No Scale



TYPICAL ANCHOR BOLT LAYOUT
No Scale



ELEVATION
Looking Ahead



SECTION C-C

TABLE OF VARIABLES

Bent	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"J"
3	1318.83	1319.75	1320.68	1321.60	1322.53	1283.83	22'-0⅝"	35'-0"	22
5	1320.01	1320.93	1321.86	1322.78	1323.71	1282.01	25'-0⅝"	38'-0"	25

For General Notes, Sections A-A, B-B, E-E, F-F, and G-G, See Dwg. No. 57117.

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
8-21-15
CHARLES R. ELLIS
BRIDGE ENGINEER

DETAILS OF INTERMEDIATE BENTS 3 AND 5 WAR EAGLE CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

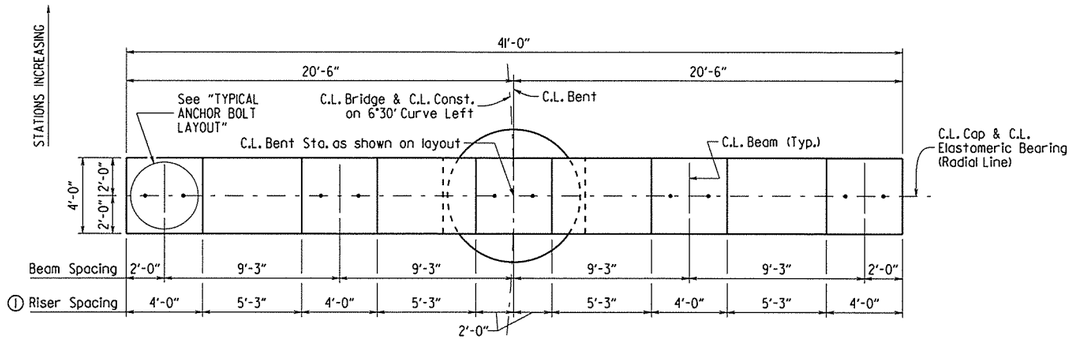
DRAWN BY: BHS DATE: 3/4/14 FILENAME: b090343_b2.dgn
CHECKED BY: DHP DATE: 8/21/15 SCALE: ¼" = 1'-0" or As Shown
DESIGNED BY: DHP DATE: 11/2014

BRIDGE NO. 07346 DRAWING NO. 57114

PRINT DATE: 8/20/2015

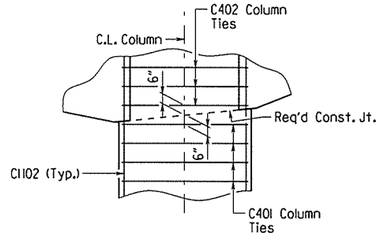
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	68	141

① 07346 - INTERMEDIATE BENTS - 57115

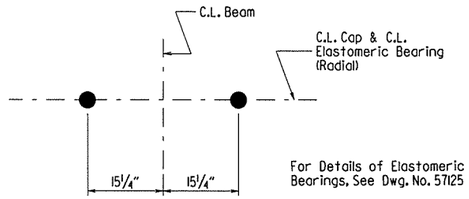


① Risers shall be cast level at the elevations shown

PLAN

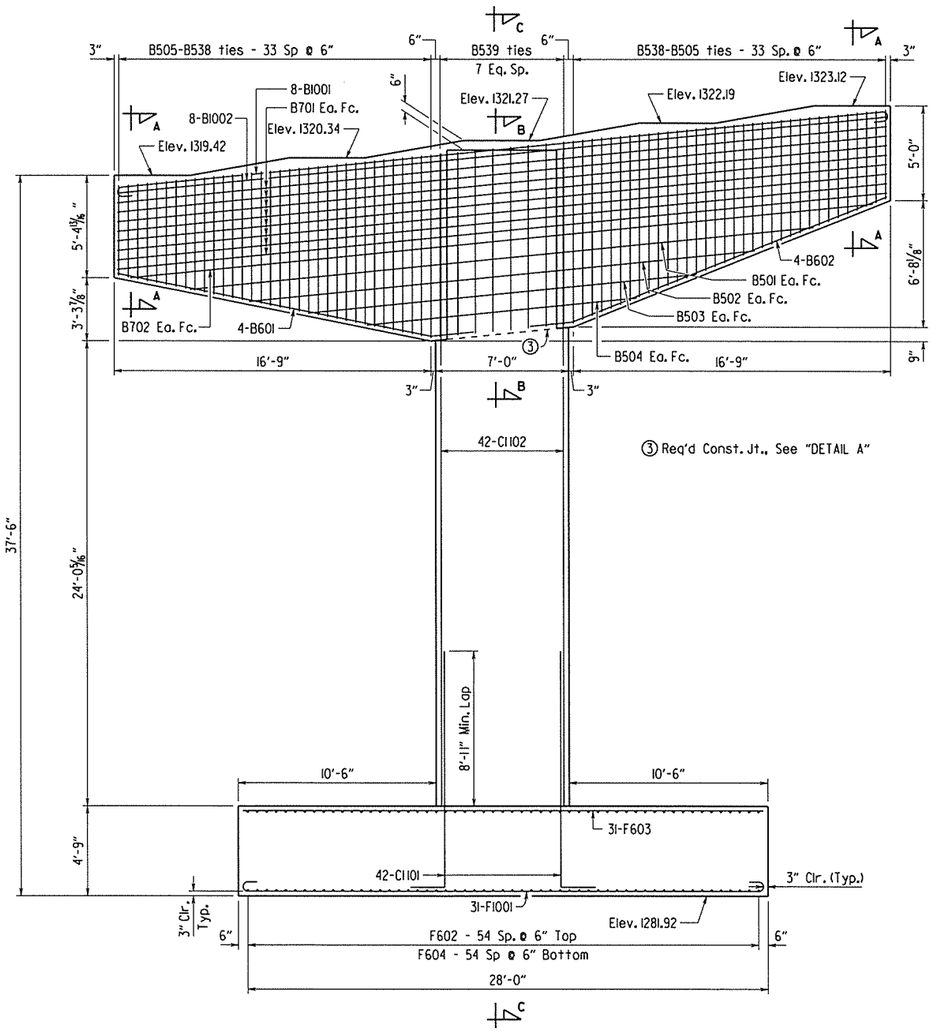


DETAIL A
No Scale

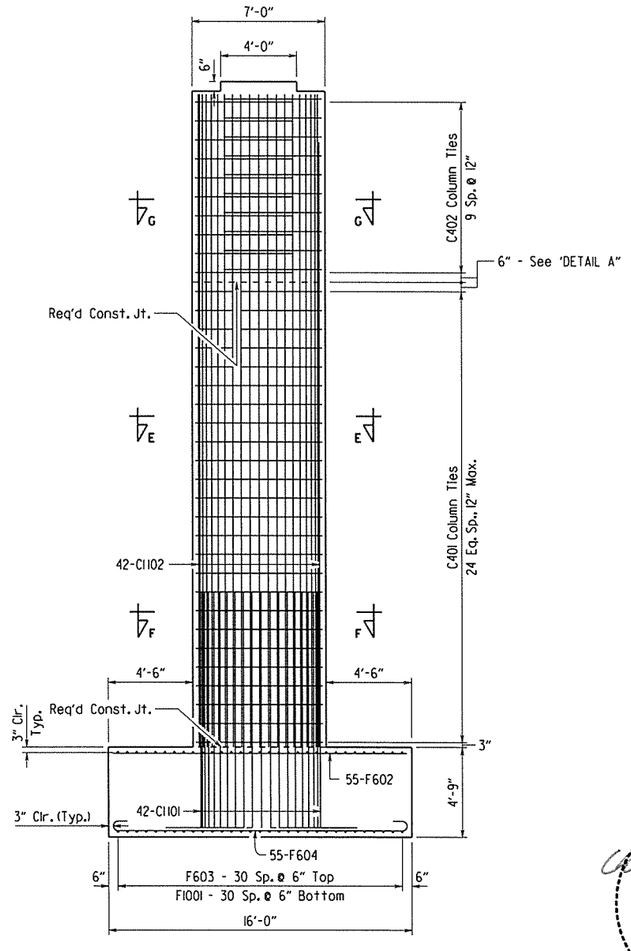


For Details of Elastomeric Bearings, See Dwg. No. 57125

TYPICAL ANCHOR BOLT LAYOUT
No Scale



ELEVATION
Looking Ahead



SECTION C-C

For General Notes, Sections A-A, B-B, E-E, F-F, and G-G, See Dwg. No. 57117.

STATE OF ARKANSAS
Charles R. Ellis
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No. 9235
8-21-15
CHARLES R. ELLIS
BRIDGE ENGINEER

DETAILS OF INTERMEDIATE BENT 4 WAR EAGLE CREEK

ROUTE SEC.

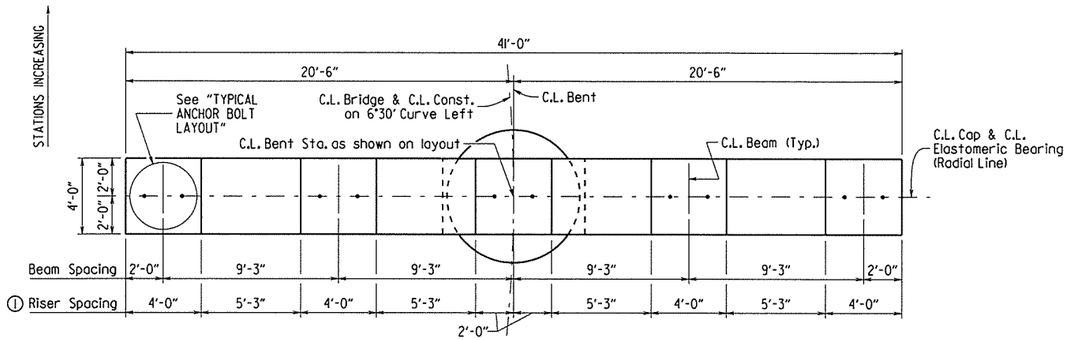
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: BHS DATE: 3/4/14
CHECKED BY: DHP DATE: 3/19/15
DESIGNED BY: DHP DATE: 11/2014
FILENAME: b090343_b2.dgn
SCALE: 1/4" = 1'-0" or As Shown

BRIDGE NO. 07346 DRAWING NO. 57115

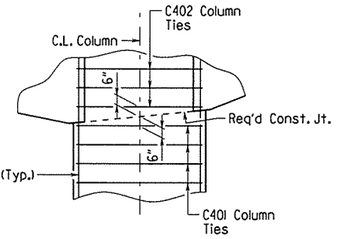
PRINT DATE: 8/20/2015

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	69	141
				①	07346 - INTERMEDIATE BENTS - 57116			

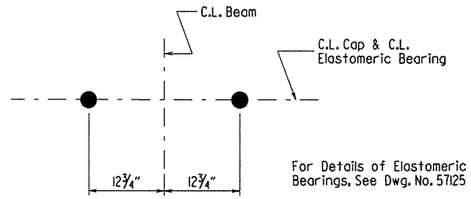


① Risers shall be cast level at the elevations shown

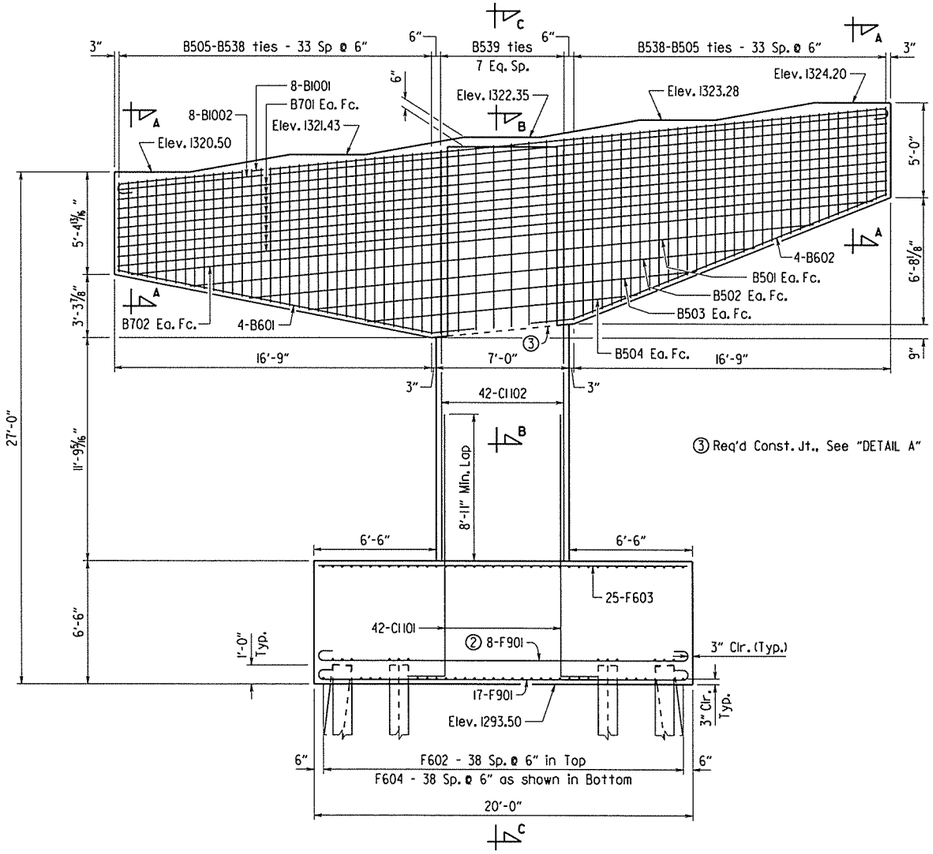
PLAN



DETAIL A
No Scale

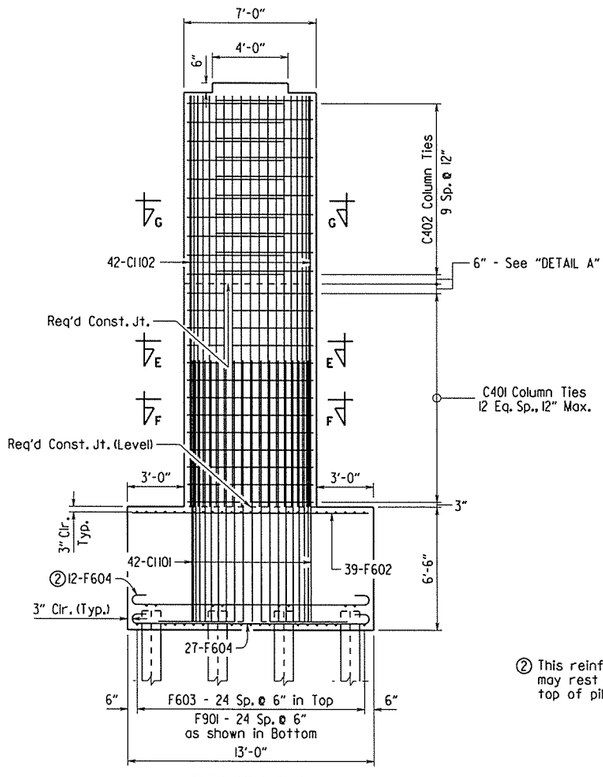


TYPICAL ANCHOR BOLT LAYOUT
No Scale



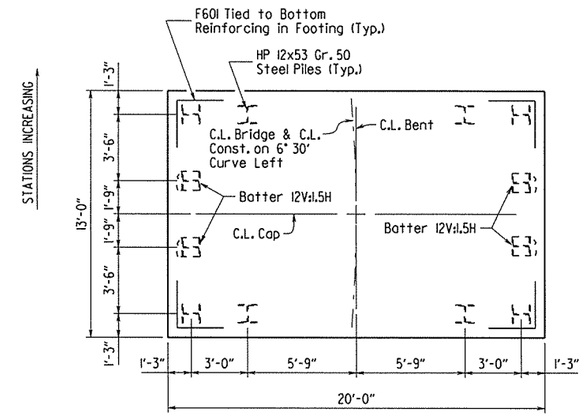
③ Req'd Const. Jt., See "DETAIL A"

ELEVATION
Looking Ahead



SECTION C-C

② This reinforcing mat may rest directly on top of piles.



PLAN OF FOOTING

For General Notes, Sections A-A, B-B, E-E, F-F, and G-G, See Dwg. No. 57117.

STATE OF ARKANSAS
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DETAILS OF INTERMEDIATE BENT 6 WAR EAGLE CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

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BRIDGE NO. 07346 DRAWING NO. 57116

PRINT DATE: 8/20/2015

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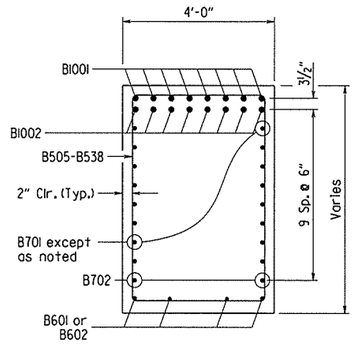
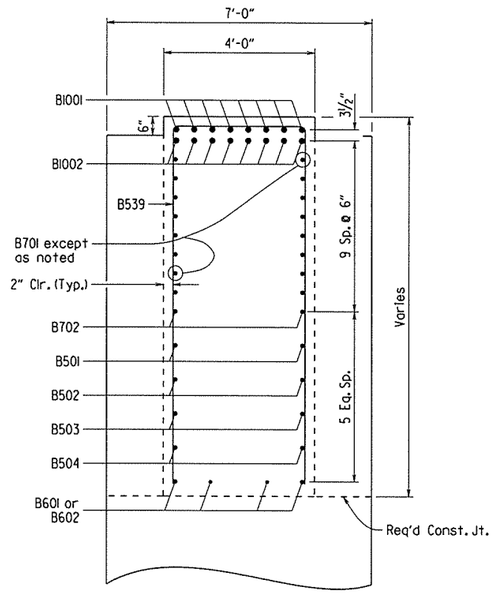


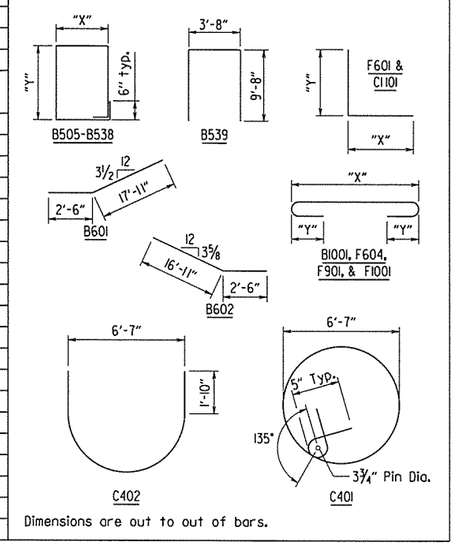
SECTION A-A



SECTION B-B

BAR LIST - PER BENT

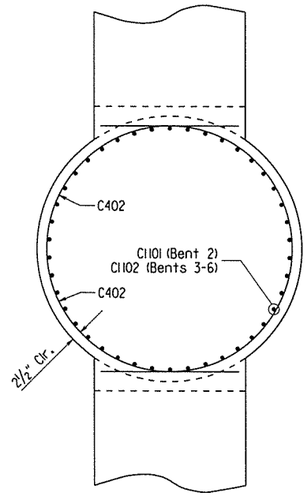
MARK	NO. REQ'D.	LENGTH	"X"	"Y"	P.D.	BENDING DIAGRAMS
B501	2	33'-2"			Str.	
B502	2	26'-10"			Str.	
B503	2	20'-7"			Str.	
B504	2	14'-4"			Str.	
B505-B538	2 Each	Var. 17'-4" to 27'-2"	3'-8"	Var. 4'-9" to 9'-8"	2½"	
B539	8	22'-10"			2½"	
B601	4	20'-5"			4½"	
B602	4	19'-5"			4½"	
B701	16	40'-10"			Str.	
B702	2	39'-5"			Str.	
B1001	8	43'-8"	40'-10"	11½"	10"	
B1002	8	40'-10"			Str.	
C401	"A"	21'-9"			3¾"	
C402	20	14'-0"			6'-6"	
C1101	42	"C"	2'-0"	"B"	11¼"	
C1102	"D"	"E"			Str.	
F601	"F"	4'-11"	2'-6"	2'-6"	4½"	
F602	"G"	"H"			Str.	
F603	"J"	"K"			Str.	
F604	"G"	"L"	"H"	6"	4½"	
F901	"M"	22'-0"	19'-6"	10"	9"	
F1001	"N"	"R"	"P"	11½"	10"	



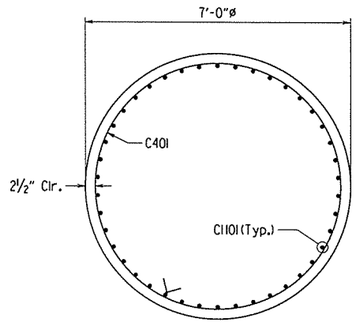
Dimensions are out to out of bars.

TABLE OF VARIABLES

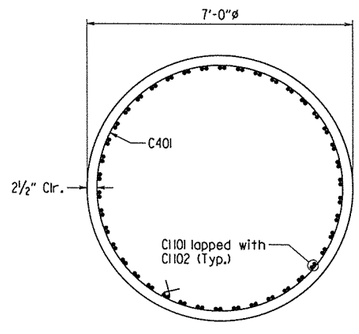
Bent	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"J"	"K"	"L"	"M"	"N"	"P"	"R"
2	6	21'-3"	22'-11"	-	-	4	39	12'-6"	25	19'-6"	13'-10"	25	-	-	-
3	23	14'-9"	16'-5"	42	31'-11"	-	51	15'-6"	31	25'-6"	16'-10"	-	31	25'-6"	28'-4"
4	25	15'-3"	16'-11"	42	33'-11"	-	55	15'-6"	31	27'-6"	16'-10"	-	31	27'-6"	30'-4"
5	26	14'-9"	16'-5"	42	34'-11"	-	51	15'-6"	31	25'-6"	16'-10"	-	31	25'-6"	28'-4"
6	13	15'-0"	16'-8"	42	21'-8"	4	39	12'-6"	25	19'-6"	13'-10"	25	-	-	-



SECTION G-G



SECTION E-E



SECTION F-F

GENERAL NOTES

All concrete shall be Class "S" and shall be poured in the dry. All exposed corners are to be chamfered ¾" unless otherwise noted.

All reinforcing steel shall be Grade 60 (Yield Strength = 60,000 psi.) and shall conform to AASHTO M31 or M322, Type A, with mill test reports.

Top reinforcing bars shall be properly placed to avoid interference with anchor bolts or sheet metal sleeves.

All piling shall be Grade 50.

For Additional Information, see Layout.

STATE OF ARKANSAS
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8-21-15
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BRIDGE ENGINEER

COMMON DETAILS OF INTERMEDIATE BENTS
WAR EAGLE CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: BHS DATE: 3/6/15 FILENAME: b090343_b2.dgn
CHECKED BY: DHP DATE: 3/14/15 SCALE: ½" = 1'-0"
DESIGNED BY: DHP DATE: 11/2014

BRIDGE NO. 07346 DRAWING NO. 57117

PRINT DATE: 8/20/2015

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	71	141
				①	07346 - SPAN DETAILS - 57118			

SLAB REINFORCING

Longitudinal: S401E as shown
S601E placed as shown over interior supports, See "HALF-REINFORCING PLAN & SLAB POURING SEQUENCE" Dwg. No. 57121

Transverse: S501E @ 12" o.c. in top, S402E @ 12" o.c. in bottom — Alternate
S502E @ 12" o.c. bent up over beams —
S503E @ 6" o.c. in top of overhangs (bundled with #5 bars)

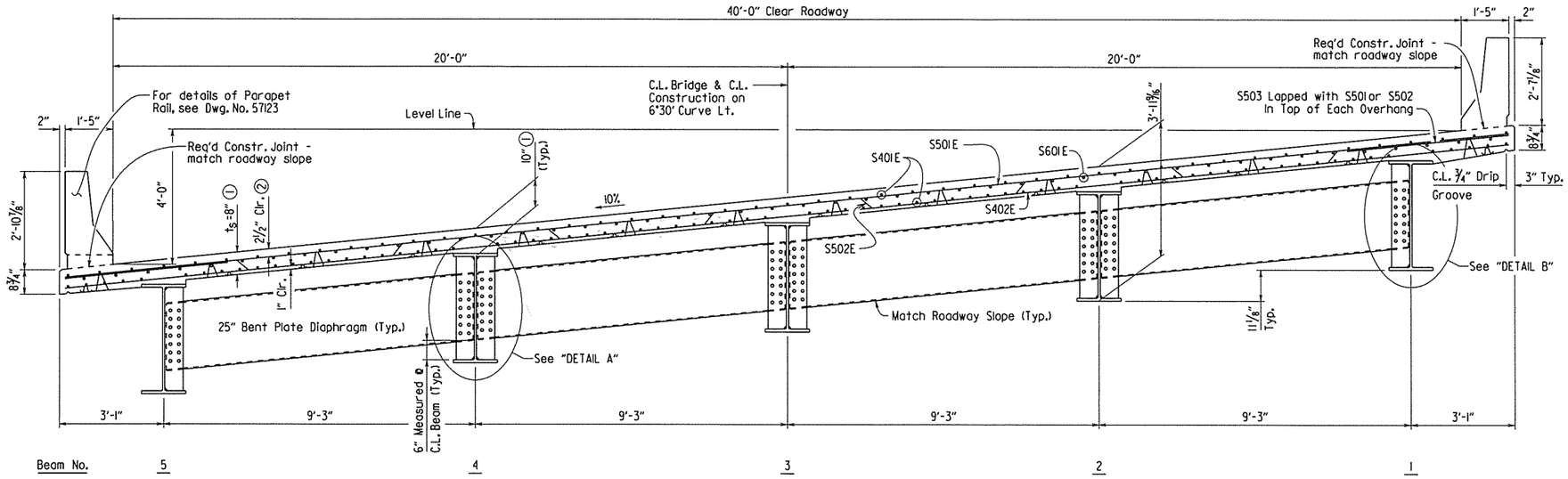
① See "ADJUSTMENT FOR SLAB THICKNESS TOLERANCE"

② Tolerance: Minus = 1/4"
Plus = Equal to amount of slab thickening used to meet slab thickness tolerance- See "ADJUSTMENT FOR SLAB THICKNESS TOLERANCE"

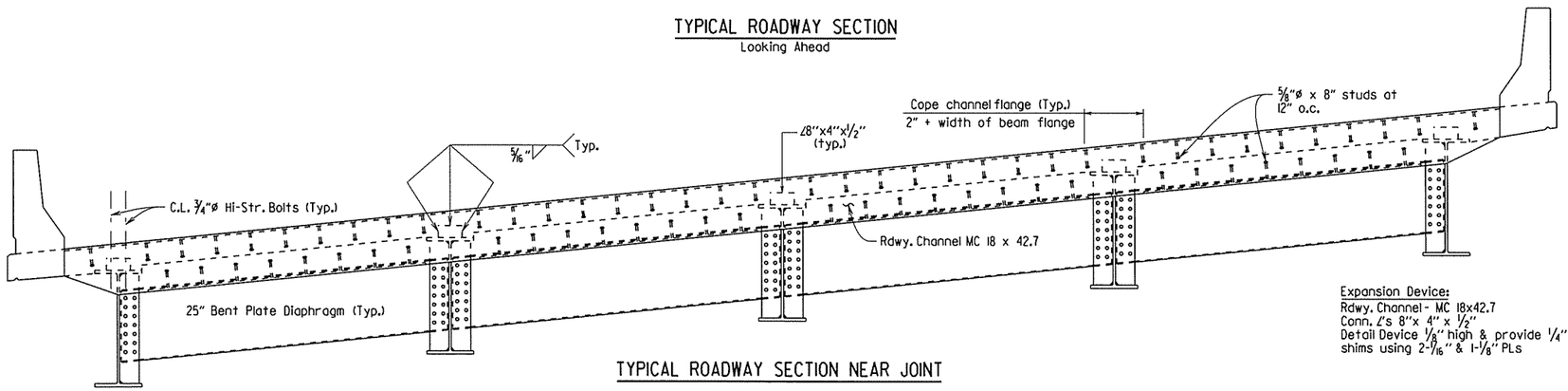
At the contractor's option, two epoxy coated straight #5 bars may be substituted for bar S502E. Payment will be based on weight of S502E.

Class 2 Protective Surface Treatment shall be applied to the Roadway Surface and the Face and Top of Concrete Parapet Rail.

Bar positions and clearances shall be maintained by means of stays, ties, hangers or other approved devices sufficient in size and number to prevent displacement during construction. See Subsection 804.06.

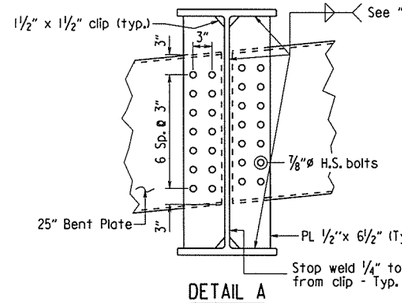


TYPICAL ROADWAY SECTION
Looking Ahead

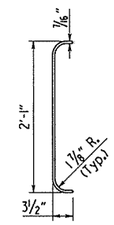


TYPICAL ROADWAY SECTION NEAR JOINT

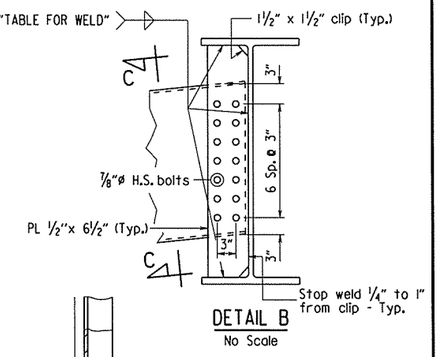
For details of Poured Silicone joint and Superstructure General Notes, see Dwg. No. 57124.



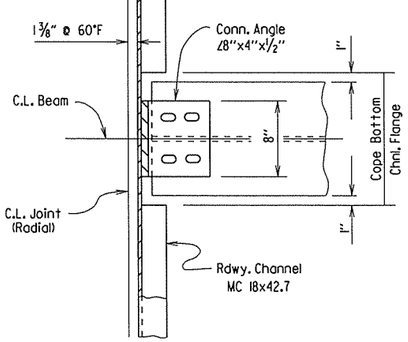
DETAIL A
No Scale



SECTION C-C
No Scale

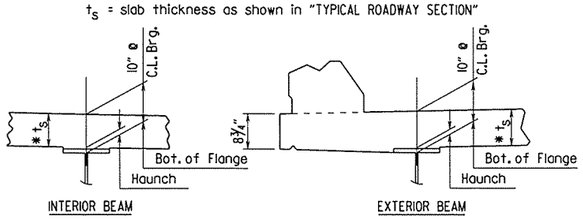


DETAIL B
No Scale



CHANNEL CONNECTION DETAIL - End Bent
No Scale

t_s = slab thickness as shown in "TYPICAL ROADWAY SECTION"



*Tolerance when removable deck forming is used is + ½", - ¼". Haunch forming is required and shall be adjusted to maintain slab thickness tolerance.

ADJUSTMENT FOR SLAB THICKNESS TOLERANCE
No Scale

NOTES:
Haunch dimension may vary within the following limits to maintain the grade and slab thickness tolerance: Minimum occurs when top flange contacts bottom reinforcing steel; Maximum = top flange thickness plus 1¾". No increase in concrete and structural steel quantities will be made to maintain tolerances.

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

TABLE FOR WELD

Material Thickness of Thicker Part Joined (Inches)	Minimum Size of Fillet Weld (Inches)	Single Pass Weld Must Be Used
To ¾" Inclusive	¼"	
Over ¾"	5/16"	

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

STATE OF ARKANSAS
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SHEET 1 OF 7
DETAILS OF 450'-0" CONTINUOUS COMPOSITE W-BEAM UNIT
WAR EAGLE CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: BHS DATE: 12/12/2014 FILENAME: b090343_sl.dgn
CHECKED BY: D HP DATE: 8/14/15 SCALE: ½" = 1'-0"
DESIGNED BY: BHS DATE: 11/2014 or As Shown

BRIDGE NO. 07346 DRAWING NO. 57118

PRINT DATE: 8/12/2015

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
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				JOB NO.		090343	72	141
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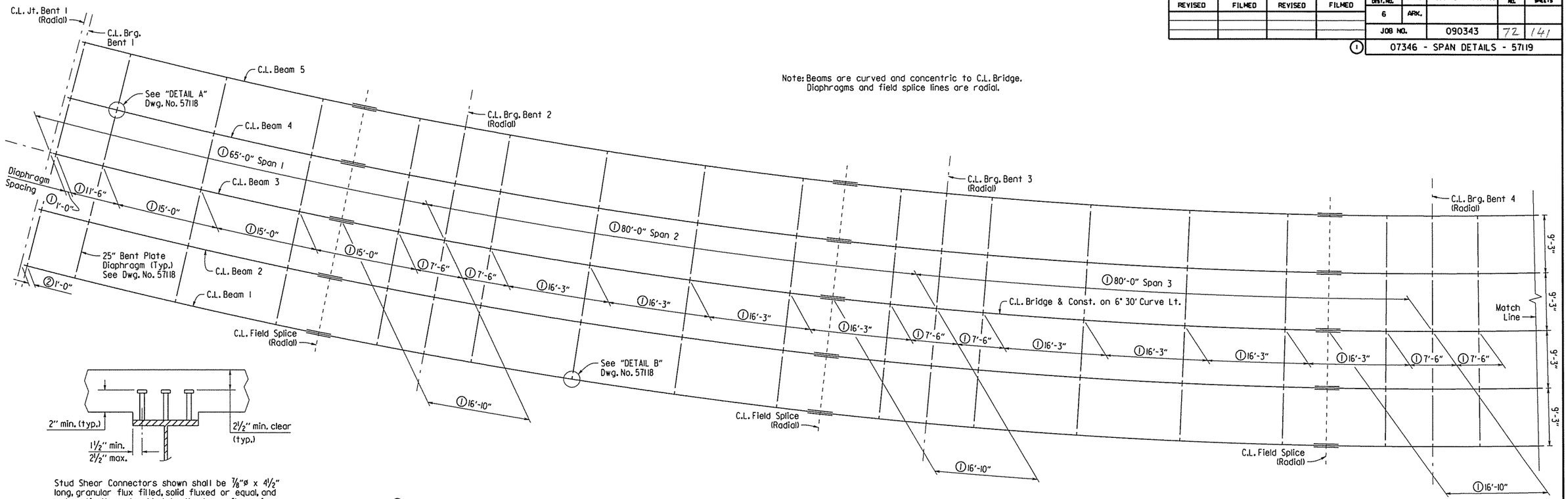


Stud Shear Connectors shown shall be ⅞"ø x 4½" long, granular flux filled, solid fluxed or equal, and automatically end welded to the beam flange in accordance with the recommendations of the Manufacturer. ¾"ø studs may be used in place of the ⅞"ø studs shown, at the ratio of 1.361 - ¾"ø studs in place of one ⅞"ø stud. ⅞"ø studs will be used as basis for measurement of structural steel in shear connectors. Maximum stud spacing = 24".

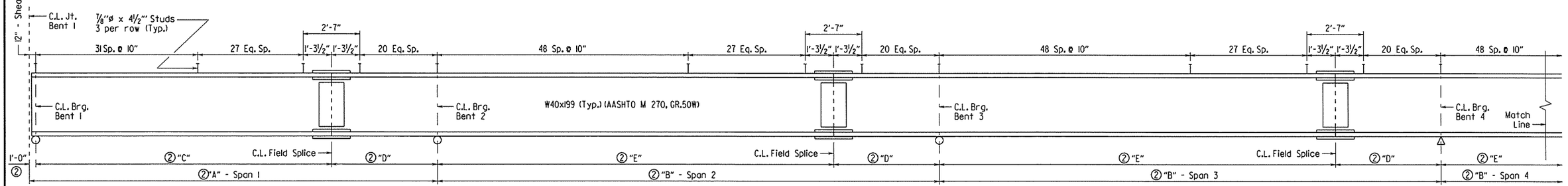
SHEAR CONNECTOR DETAIL

NO SCALE

① Measured along C.L. Bridge
② Measured along C.L. Beam

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

FRAMING PLAN



BEAM ELEVATION

No Scale

TABLE OF VARIABLES

Beam No.	"A"	"B"	"C"	"D"	"E"
1	66'-4⅜"	81'-8⅛"	48'-2⅛"	17'-2¼"	64'-5⅝"
2	65'-8⅜"	80'-10⅛"	47'-8⅛"	17'-0⅛"	63'-9⅝"
3	65'-0"	80'-0"	47'-2"	16'-10"	63'-2"
4	64'-3⅜"	79'-1⅛"	46'-7⅛"	16'-7⅛"	62'-6⅛"
5	63'-7⅝"	78'-3⅜"	46'-1⅛"	16'-5¾"	61'-10⅛"

STATE OF ARKANSAS
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SHEET 2 OF 7
DETAILS OF 450'-0" CONTINUOUS COMPOSITE W-BEAM UNIT
WAR EAGLE CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: BHS DATE: 12/12/2014 FILENAME: b090343_sl.dgn
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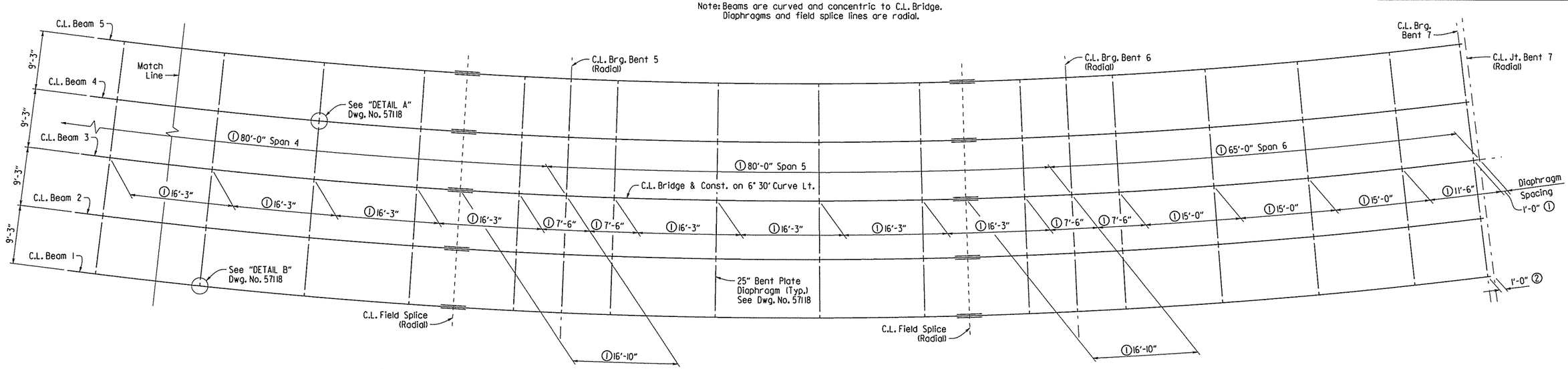
BRIDGE NO. 07346 DRAWING NO. 57119

PRINT DATE: 8/12/2015

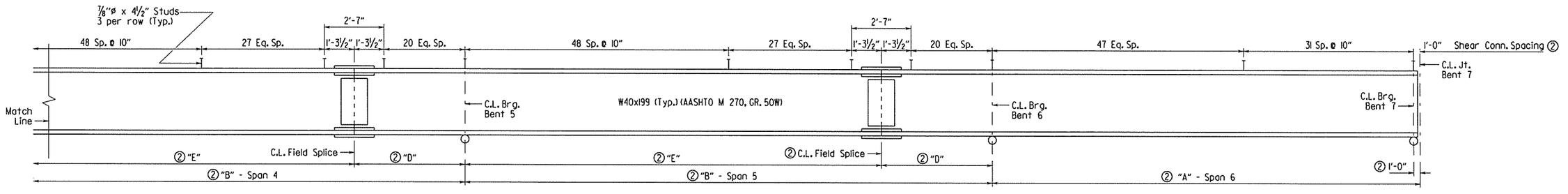
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	73	141
				(1)		07346 - SPAN DETAILS - 57120		

Note: Beams are curved and concentric to C.L. Bridge.
Diaphragms and field splice lines are radial.



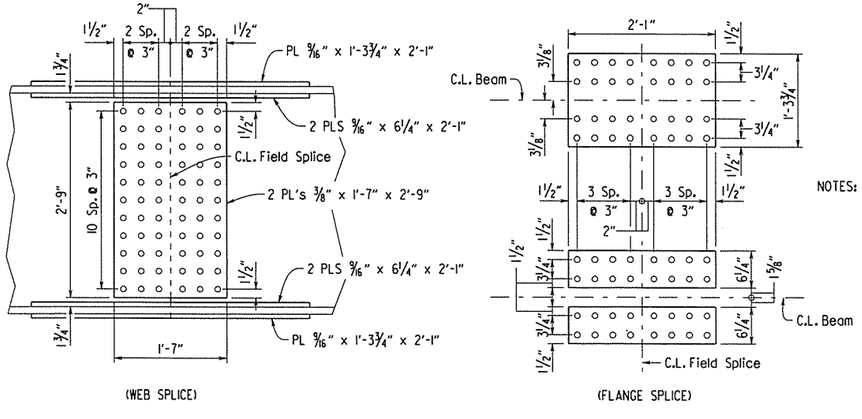
① Measured along C.L. Bridge
② Measured along C.L. Beam

FRAMING PLAN



BEAM ELEVATION

No Scale



DETAILS OF FIELD SPLICE

No Scale

NOTES:
1. All Field Splice Bolts to be 7/8" ø H.S. Bolts.
2. All Field Splice plates to be AASHTO M 270, Gr. 50W steel.
3. All holes for splice bolts to be 15/16 "ø.
4. Bolted Field Splices may be eliminated or shop welds substituted with the approval of the Engineer. Payment will be made on the basis of the splices shown.

TABLE OF VARIABLES

Beam No.	"A"	"B"	"D"	"E"
1	66'-4⅜"	81'-8⅛"	17'-2¼"	64'-5⅝"
2	65'-8⅜"	80'-10⅛"	17'-0⅛"	63'-9⅝"
3	65'-0"	80'-0"	16'-10"	63'-2"
4	64'-3⅜"	79'-1⅝"	16'-7⅞"	62'-6⅛"
5	63'-7⅝"	78'-3⅞"	16'-5¾"	61'-10⅛"

STATE OF ARKANSAS
Charles R. Ellis
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8-21-15
CHARLES R. ELLIS
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SHEET 3 OF 7
DETAILS OF 450'-0" CONTINUOUS COMPOSITE W-BEAM UNIT
WAR EAGLE CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

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BRIDGE NO. 07346 DRAWING NO. 57120

PRINT DATE: 8/12/2015

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
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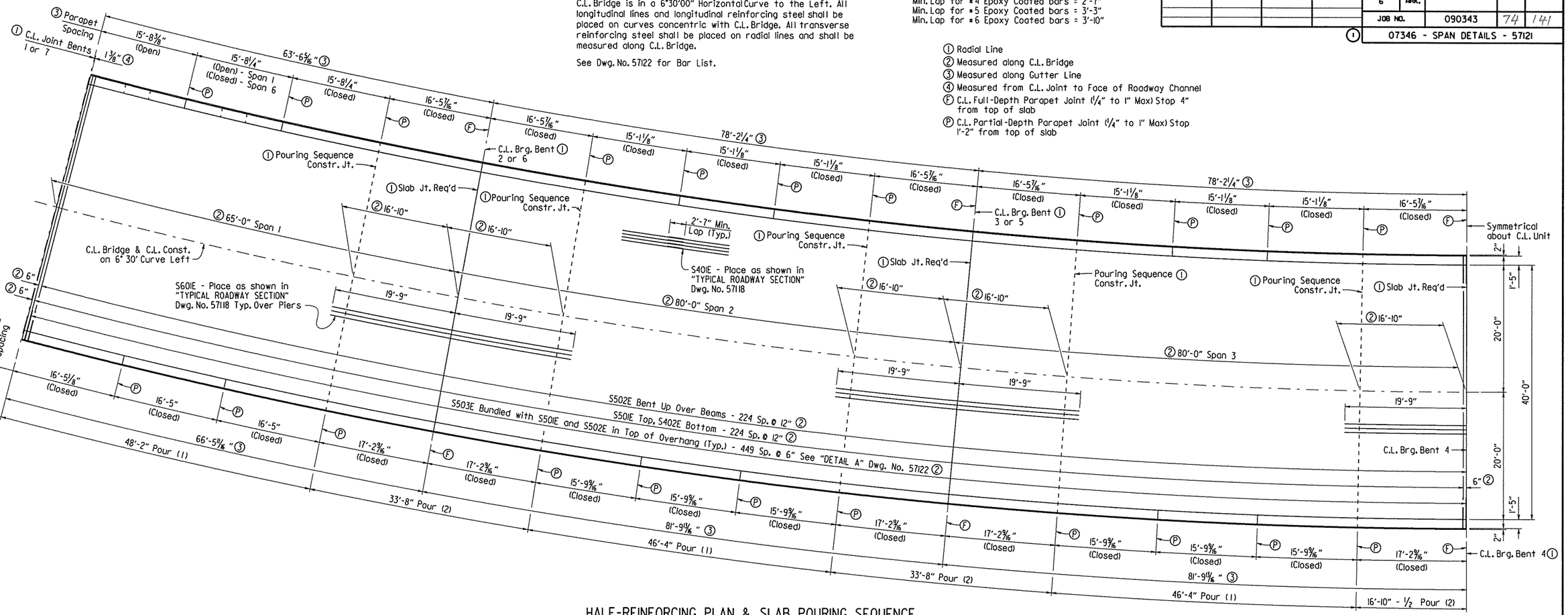
				JOB NO.		090343	74	141
				07346 - SPAN DETAILS - 57121				

C.L. Bridge is in a 6°30'00" Horizontal Curve to the Left. All longitudinal lines and longitudinal reinforcing steel shall be placed on curves concentric with C.L. Bridge. All transverse reinforcing steel shall be placed on radial lines and shall be measured along C.L. Bridge.

See Dwg. No. 57122 for Bar List.

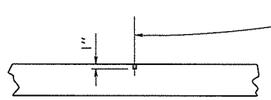
Unless otherwise noted:
Min. Lap for #4 Epoxy Coated bars = 2'-7"
Min. Lap for #5 Epoxy Coated bars = 3'-3"
Min. Lap for #6 Epoxy Coated bars = 3'-10"

① Radial Line
② Measured along C.L. Bridge
③ Measured along Gutter Line
④ Measured from C.L. Joint to Face of Roadway Channel
(F) C.L. Full-Depth Parapet Joint (1/4" to 1" Max) Stop 4" from top of slab
(P) C.L. Partial-Depth Parapet Joint (1/4" to 1" Max) Stop 1'-2" from top of slab



HALF-REINFORCING PLAN & SLAB POURING SEQUENCE

1/2" x 1" Type 3 or 4 Joint Sealer. See Subsections 501.02(h) and 501.05(j). Backer rod filler will not be required. Joint Sealer shall be measured and paid for as Class S (AE) Concrete-Bridge. Slab joints shall extend to the outside edge of the deck slab. Slab joint shall be installed before the parapet rail is poured. If slab joints are to be sawed, they shall be sawed as soon as the concrete has sufficiently set to allow sawing of the joint without damage to the slab. Slab joints shall be placed at all pouring sequence construction joints and required slab joint locations. Slab joints shall align with parapet open joints. The joint sealer shall extend across the deck from gutterline to gutterline.



SLAB JOINT DETAIL

No Scale

POURING SEQUENCE NOTES

Pours with the same number may be placed simultaneously or separately. All pours (1) must be placed before pours (2) can be placed. A minimum of 48 hours shall elapse between the end of a pour and the start of the next pour. A minimum of 72 hours shall elapse between the end of a pour and the start of an adjacent pour. Any railing pours made before the entire slab unit has been placed must be approved by the Engineer. The Contractor must obtain approval from the Engineer for any deviations from the pouring sequence shown.

Required slab joints and pouring sequence construction joints shall align with open joints at the front face of the parapet.

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
8-21-15
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 4 OF 7
DETAILS OF 450'-0" CONTINUOUS COMPOSITE W-BEAM UNIT
WAR EAGLE CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: BHS DATE: 12/12/2014 FILENAME: b090343_sl.dgn
CHECKED BY: DHP DATE: 8/14/15 SCALE: 1/8" = 1'-0"
DESIGNED BY: BHS DATE: 11/2014 or As Shown

BRIDGE NO. 07346 DRAWING NO. 57121

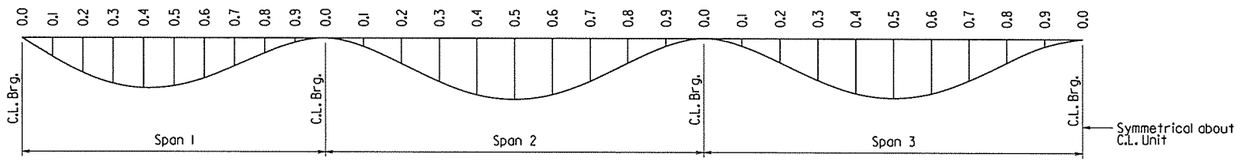
PRINT DATE: 8/21/2015

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	75	141
				①		07346 - SPAN DETAILS - 57122		

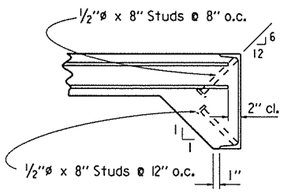
TABLE OF DEAD LOAD DEFLECTIONS (INCHES)

Span	Point of Deflection	Structural Steel					Structural Steel + Slab					Structural Steel + Slab + Parapet				
		Beam 1	Beam 2	Beam 3	Beam 4	Beam 5	Beam 1	Beam 2	Beam 3	Beam 4	Beam 5	Beam 1	Beam 2	Beam 3	Beam 4	Beam 5
1	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	0.1	0.034	0.033	0.032	0.031	0.027	0.179	0.189	0.190	0.178	0.141	0.192	0.198	0.198	0.187	0.152
	0.2	0.062	0.060	0.059	0.057	0.049	0.328	0.348	0.351	0.328	0.259	0.353	0.365	0.366	0.344	0.279
	0.3	0.082	0.079	0.078	0.074	0.064	0.430	0.458	0.461	0.429	0.339	0.463	0.481	0.481	0.451	0.365
	0.4	0.089	0.087	0.086	0.081	0.071	0.470	0.503	0.507	0.469	0.373	0.506	0.528	0.529	0.493	0.402
	0.5	0.086	0.084	0.082	0.078	0.068	0.452	0.484	0.485	0.450	0.358	0.487	0.508	0.506	0.473	0.386
	0.6	0.072	0.070	0.069	0.065	0.057	0.378	0.406	0.406	0.376	0.300	0.407	0.426	0.423	0.395	0.323
	0.7	0.051	0.050	0.048	0.046	0.040	0.266	0.287	0.285	0.265	0.211	0.286	0.301	0.297	0.278	0.227
	0.8	0.027	0.027	0.026	0.025	0.022	0.142	0.154	0.153	0.142	0.114	0.152	0.161	0.159	0.148	0.122
	0.9	0.008	0.008	0.008	0.007	0.006	0.040	0.044	0.044	0.040	0.031	0.042	0.045	0.045	0.041	0.033
2	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	0.1	0.014	0.014	0.014	0.013	0.012	0.077	0.083	0.083	0.077	0.064	0.086	0.090	0.089	0.083	0.071
	0.2	0.044	0.043	0.042	0.040	0.036	0.236	0.254	0.254	0.234	0.192	0.260	0.272	0.269	0.250	0.211
	0.3	0.076	0.074	0.072	0.068	0.061	0.405	0.435	0.434	0.400	0.326	0.445	0.464	0.459	0.426	0.357
	0.4	0.099	0.097	0.094	0.089	0.080	0.529	0.568	0.567	0.523	0.425	0.580	0.605	0.599	0.556	0.465
	0.5	0.107	0.105	0.102	0.097	0.086	0.572	0.614	0.612	0.566	0.459	0.626	0.653	0.646	0.601	0.502
	0.6	0.099	0.097	0.094	0.089	0.080	0.527	0.566	0.563	0.520	0.423	0.576	0.602	0.594	0.552	0.462
	0.7	0.076	0.074	0.071	0.068	0.061	0.403	0.430	0.429	0.396	0.323	0.441	0.458	0.453	0.421	0.353
	0.8	0.044	0.042	0.041	0.039	0.035	0.233	0.248	0.247	0.228	0.186	0.255	0.264	0.261	0.242	0.204
	0.9	0.014	0.014	0.013	0.012	0.011	0.075	0.080	0.079	0.073	0.060	0.082	0.085	0.084	0.078	0.066
3	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	0.1	0.013	0.013	0.013	0.012	0.011	0.068	0.075	0.075	0.070	0.057	0.074	0.080	0.079	0.074	0.062
	0.2	0.042	0.041	0.040	0.038	0.034	0.221	0.240	0.241	0.222	0.181	0.241	0.254	0.253	0.235	0.197
	0.3	0.073	0.072	0.070	0.066	0.060	0.385	0.418	0.419	0.387	0.316	0.420	0.443	0.441	0.410	0.344
	0.4	0.096	0.094	0.092	0.087	0.078	0.508	0.549	0.550	0.508	0.414	0.553	0.582	0.578	0.538	0.450
	0.5	0.104	0.102	0.100	0.094	0.084	0.551	0.595	0.596	0.550	0.447	0.600	0.631	0.627	0.582	0.486
	0.6	0.096	0.094	0.092	0.087	0.078	0.509	0.548	0.551	0.509	0.413	0.554	0.581	0.579	0.539	0.449
	0.7	0.073	0.072	0.070	0.066	0.059	0.387	0.418	0.420	0.387	0.314	0.422	0.443	0.442	0.410	0.342
	0.8	0.042	0.041	0.040	0.038	0.034	0.223	0.241	0.241	0.223	0.181	0.244	0.256	0.254	0.236	0.198
	0.9	0.013	0.013	0.013	0.012	0.011	0.070	0.076	0.077	0.070	0.057	0.077	0.081	0.081	0.074	0.063
	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Symmetrical about C.L. Unit



DEAD LOAD DEFLECTION DIAGRAM



Note: As an alternate to ⅝"ø studs, ½"ø x 8" studs spaced as shown may be used. Use weight of ⅝"ø stud as basis of measurement of structural steel in anchors.

DETAILS OF ALTERNATE ANCHORS AND PLACEMENT OF LONGITUDINAL REINFORCEMENT

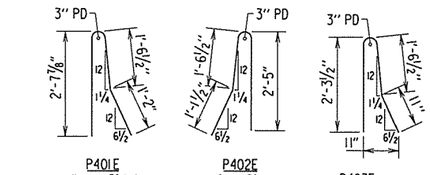
Note:
Camber for Dead Load Deflection plus vertical curve +/- ¼" tolerance. Deflections shown are along C.L. Beam from the plane perpendicular to the web extending from C.L. Bearing to C.L. Bearing. Vertical curve corrections not included.

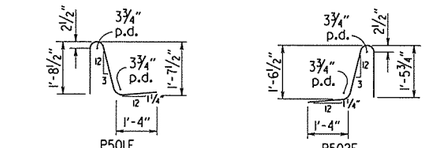
BAR LIST

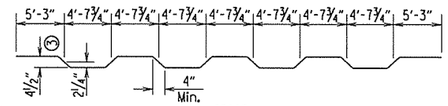
MARK	NO. REQ'D.	LENGTH	P.D.
P401E	864	5'-6"	2"
P402E	932	5'-2"	2"
P403E	27	4'-10"	2"
P404E	42	15'-3"	Str.
P405E	112	16'-1"	Str.
P406E	84	14'-9"	Str.
P407E	70	16'-10"	Str.
P408E	84	15'-5"	Str.
P409E	176	5'-6"	Str.
P501E	864	4'-10"	3¾"
P502E	932	4'-6"	3¾"
S401E	1,573	37'-10"	Str.
S402E	450	43'-0"	Str.
S501E	450	43'-0"	Str.
S502E	449	43'-11"	3"
S503E	1,798	4'-10"	Str.
S601E	230	39'-6"	Str.

BENDING DIAGRAMS

Dimensions are out to out of bars.

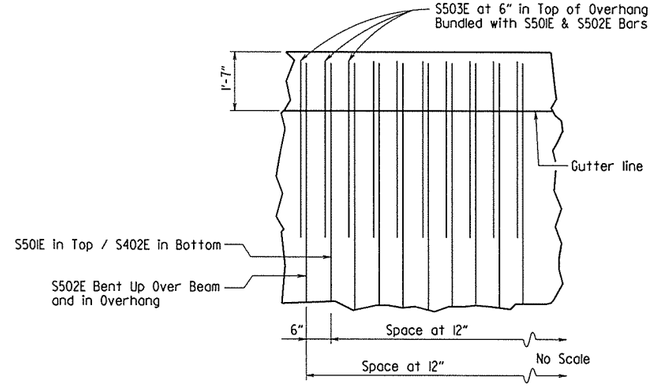






③ ½" Over tolerance
No Under tolerance

All bars with an "E" suffix shall be Epoxy Coated.
Dimensions are Out-To-Out of bars



DETAIL A

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
8-21-15
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 5 OF 7
DETAILS OF 450'-0" CONTINUOUS COMPOSITE W-BEAM UNIT
WAR EAGLE CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: BHS DATE: 12/12/2014 FILENAME: b090343_sl.dgn
CHECKED BY: DHP DATE: 8/14/15 SCALE: No Scale
DESIGNED BY: BHS DATE: 11/2014

BRIDGE NO. 07346 DRAWING NO. 57122

PRINT DATE: 8/24/2015

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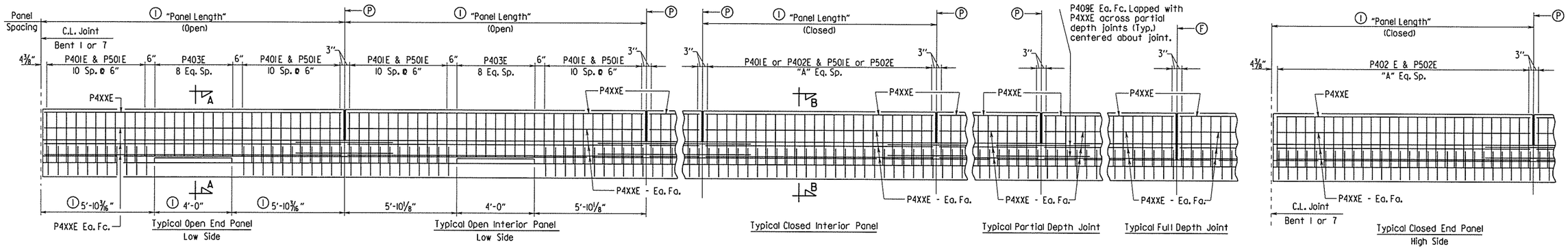
				6	ARK.			
				JOB NO.		090343	76	141
				①	07346 - SPAN DETAILS - 57123			

Ⓕ C.L. Full-Depth Parapet Joint (1¼" to 1" max.) as shown in "HALF REINFORCING PLAN & SLAB POURING SEQUENCE", Dwg. No. 57121. Stop 4" from top of slab.

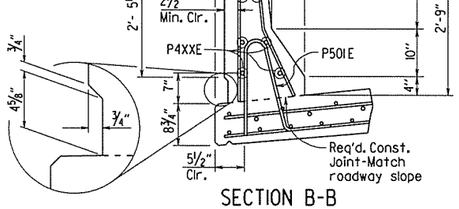
Ⓟ C.L. Partial-Depth Parapet Joint (1¼" to 1" max.) as shown in "HALF REINFORCING PLAN & SLAB POURING SEQUENCE", Dwg. No. 57121. Stop 1'-2" from top of slab.



DETAILS OF PARAPET RAIL

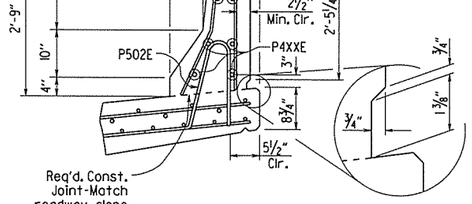
⅜" = 1'-0"

① Measured Along Gutterline



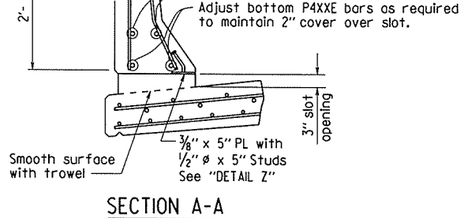
SECTION B-B

Low Side
¾" = 1'-0"



SECTION B-B

High Side
¾" = 1'-0"



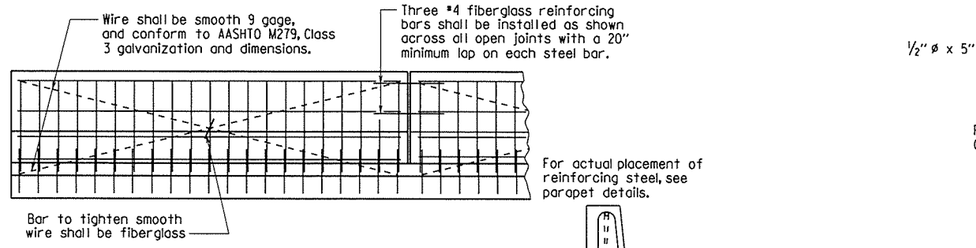
SECTION A-A

¾" = 1'-0"

TABLE OF VARIABLES

① Panel Length	Panel Type	"A"	"P4XXE"
15'-8⅜"	Open	-	P404E
15'-8¼"	Open	-	P404E
15'-8¼"	Closed	31	P404E
16'-5⅞"	Closed	32	P405E
15'-1⅛"	Closed	30	P406E
16'- 5⅛"	Closed	32	P405E
16'-5"	Closed	32	P405E
17'-2⅞"	Closed	34	P407E
15'-9⅞"	Closed	31	P408E

For location of panels, see "HALF REINFORCING PLAN & SLAB POURING SEQUENCE" Dwg. No. 57121.

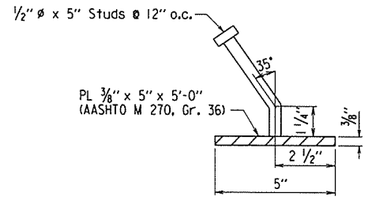


All panels shall be braced as required to prevent racking. All open joints shall be sawed as soon as practical to a minimum width of ¼". To control cracking before sawing all joints must be grooved before the concrete is set. Sawing of the joints must be controlled so it will follow the grooved joint.

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

DETAILS OF OPTIONAL SLIPFORMING OF CONCRETE PARAPET RAIL

No Scale



DETAIL Z

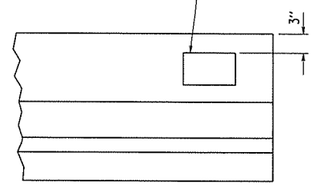
No Scale

NOTE:

The surfaces of the ⅜" plates which will not be in contact with concrete shall be painted with aluminum epoxy paint in accordance with Section 638, or as approved by the Engineer. Only one coat is required and shall be applied in the fabricator's shop. Painting will not be paid for directly, but will be considered subsidiary to "Structural Steel in Beam Spans (M 270, Gr. 50W)."

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

Place Type D name plate on front face of span rail approx. 2'-0" from Beginning of Bridge. (Right side of Roadway only)



NAME PLATE DETAIL

No Scale

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
8-24-15
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 6 OF 7
DETAILS OF 450'-0" CONTINUOUS COMPOSITE W-BEAM UNIT
WAR EAGLE CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: BHS DATE: 12/16/2014 FILENAME: b090343_sl.dgn
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BRIDGE NO. 07346 DRAWING NO. 57123

PRINT DATE: 8/24/2015

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	77	141
				①	07346 - SPAN DETAILS - 57124			

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 Specifications.

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications 6th Edition (2012), with 2013 Interims.

LIVE LOADING: HL-93

MATERIALS AND STRENGTHS:

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

STRUCTURAL STEEL:
All Structural Steel shall be AASHTO M 270, Gr. 50W unless otherwise noted. All structural steel shall be paid for as "Structural Steel in Beam Spans (M 270, Gr. 50W)". Structural Steel completely embedded in concrete may be AASHTO M 270, Gr. 36, Gr 50, or Gr. 50W. All exposed surfaces shall be cleaned in accordance with Subsection 807.84(e) unless noted otherwise.

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

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

Flange field splice plates and bent plate diaphragms shall be cut and fabricated so that the primary direction of rolling is parallel to the direction of the main tensile and/or compressive stresses.

Drawings show general features of design only. Shop drawings shall be made in accordance with Subsection 807.04, submitted and approval secured before fabrication is begun.

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

All Beams shall be blocked in their true position in the shop as specified in Subsection 807.54(b)(2). The camber, length of sections, distance between bearings, and opening of joints shall be measured with the beams in their true position and this information shall become part of the permanent record of this job. Match marks shall be placed on the component parts in this assembly and shown on the erection diagram. All beam dimensions are based on a temperature of 60°F. A tolerance of +/- 1/4" is allowed for camber.

Field connections shall be bolted with 3/4"ø high-strength bolts except as noted. Holes for 3/4"ø bolts may be 15/16 "ø if a washer is supplied for use under both the nut and head of the bolt. For Field Splices and Diaphragms, bolts shall be 1/8"ø unless otherwise noted. Splice Bolts shall be placed with heads on the outside face of the exterior beam web and on the bottom of the beam flanges.

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

Diaphragms shall be installed as beams are erected. All bolts in diaphragms and field splices shall be installed and tightened in accordance with Subsection 807.71 prior to pouring the concrete deck.

REINFORCING STEEL:
All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M 31 or M 322, Type A, with mill test reports. The reinforcing steel shall be accurately located in the forms and firmly held in place by steel wire supports, sufficient in number and size to prevent displacement during the course of construction. The wire supports will not be paid for directly, but will be considered subsidiary to the item of "Epoxy Coated Reinforcing Steel (Grade 60)".

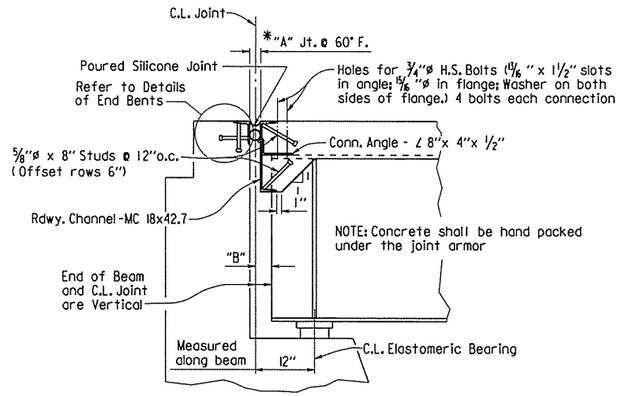
CONCRETE:
All concrete shall be Class S(AE) with a minimum 28 day compressive strength f'c = 4,000 psi. Concrete shall be poured in the dry and all exposed corners are to be chamfered 3/4" unless otherwise noted.

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

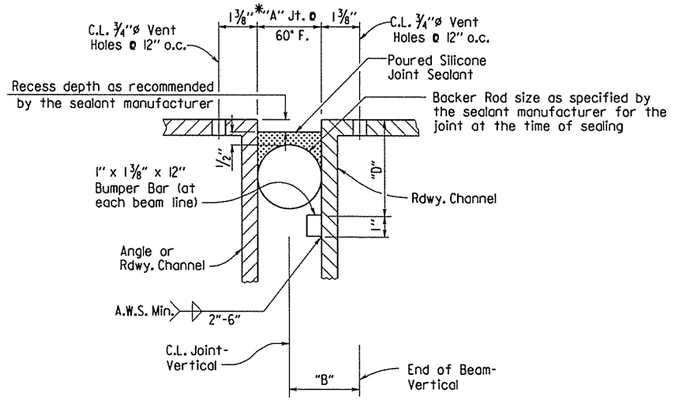
The superstructure details shown are for use when Removable Deck Forming is used and are the basis for measurement of Class S(AE) Concrete. See Standard Dwg. No. 55005 for allowable modifications and for tolerances when Permanent Steel Bridge Deck Forms are used.

The concrete deck shall be given a Tine Finish in accordance with Subsection 802.19 for Class 5, Tined Bridge Roadway Surface Finish. Movement of the finishing machine across new concrete shall be on planks placed on the surface and shall be prohibited for 72 hours after finishing the pour. Sufficient concrete must be placed ahead of the strike-off to fully load the beam or girder. The use of a longitudinal screed is prohibited.

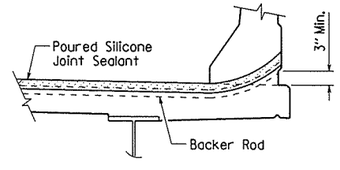
A minimum of 72 hours shall elapse between completion of the bridge deck slab and the pouring of the parapet railing. Any railing pours made before the entire slab has been placed and cured must be approved by the Engineer.



SECTION THRU JOINT



DETAIL OF POURED SILICONE JOINT SEAL



JOINT SEAL PLACEMENT AT CURB

SILICONE JOINT DATA

Bent Number	"A" Width Perpendicular to Joint at 24 Hour Average Temperature* Of:			"B" Perpendicular to Joint at 60°F	Bumper Plate Size	"D"
	40°F	60°F	80°F			
1 & 7	3 1/8"	2 3/4"	2 3/8"	2 5/8" ±	1" x 1 3/8"	5"

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

NOTES: The temperature limitations recommended by the sealant manufacturer shall be observed.

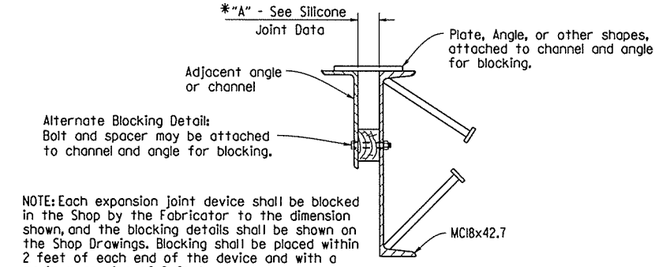
The sealant shall be installed only when the average 24 hour air temperature is between 40° and 80°F.

BACKER ROD NOTE:

Use an appropriately sized backer rod at the depth shown in the manufacturer's literature based on the joint width at the time of sealing.

Except as noted, do not install more backer rod that can be sealed in the same day.

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



NOTE: Each expansion joint device shall be blocked in the Shop by the Fabricator to the dimension shown, and the blocking details shall be shown on the Shop Drawings. Blocking shall be placed within 2 feet of each end of the device and with a maximum spacing of 8 feet.

DETAILS FOR BLOCKING EXPANSION JOINT DEVICE

EXPANSION DEVICE INSTALLATION

The Contractor may elect to install the expansion device for the end bents using one of the following two alternatives:

1) The concrete span pour adjacent to joint shall be placed before the end bent backwall is placed. After the end bent backwall forms are in place and the beams erected, the blocked expansion device shall be installed and adjusted for grade. All connection bolts shall be fully tightened prior to placing the deck concrete adjacent to the bent. Immediately prior to pouring the backwall concrete, the blocking shall be removed, the opening adjusted for temperature, and the backwall constructed.

2) The backwall shall be poured to the optional construction joint after beams are erected. The blocked expansion device shall be installed and adjusted for grade. All connection bolts shall be fully tightened prior to placing the deck concrete adjacent to the bent. Immediately prior to pouring the remainder of the backwall concrete, the blocking shall be removed and the opening adjusted for temperature. Backfill shall not be placed behind the backwall until the deck concrete on the adjacent span has been placed.

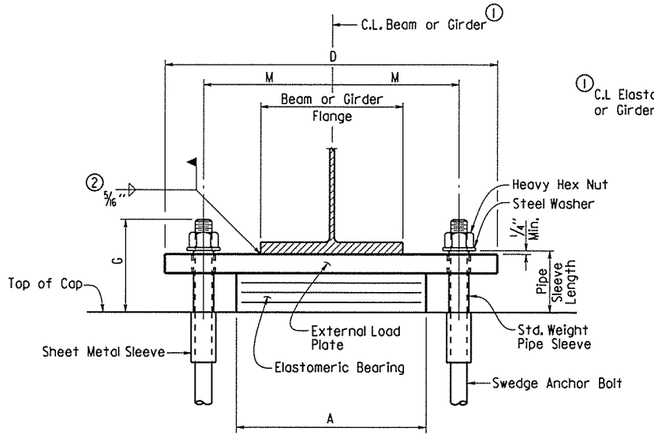
STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
8-21-15
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 7 OF 7
DETAILS OF 450'-0" CONTINUOUS COMPOSITE W-BEAM UNIT
WAR EAGLE CREEK
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: BHS DATE: 12/16/2014 FILENAME: b090343_sl.dgn
CHECKED BY: DHP DATE: 8/14/15 SCALE: No Scale
DESIGNED BY: BHS DATE: 11/2014
BRIDGE NO. 07346 DRAWING NO. 57124

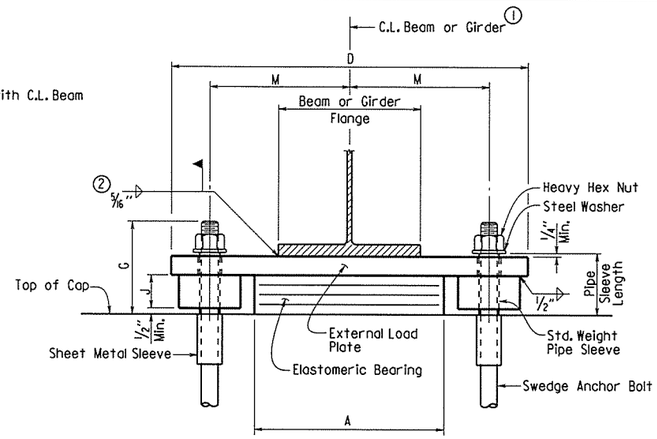
PRINT DATE: 8/13/2015

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	78	141
				①		07346 - ELASTO BRGS. - 57125		

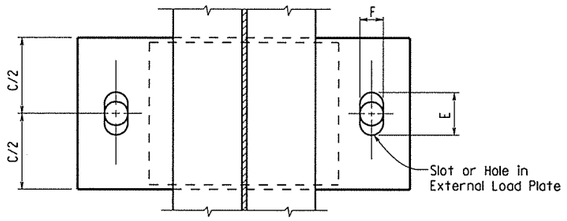


FRONT VIEW - AT BENT NOS. 1, 2, 3, 5, 6, 7

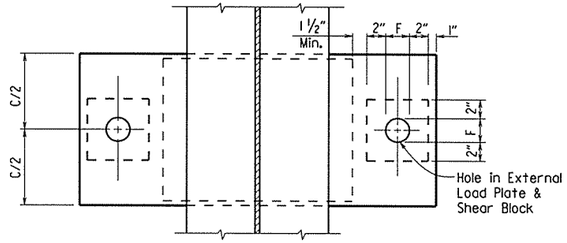
① C.L Elastomeric Pad shall be aligned with C.L. Beam or Girder.



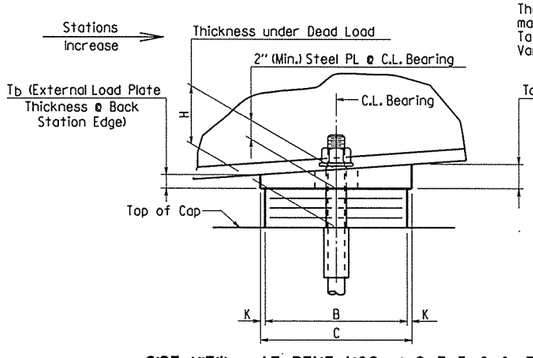
FRONT VIEW - AT BENT NO. 4



PLAN VIEW - AT BENT NOS. 1, 2, 3, 5, 6, 7



PLAN VIEW - AT BENT NO. 4

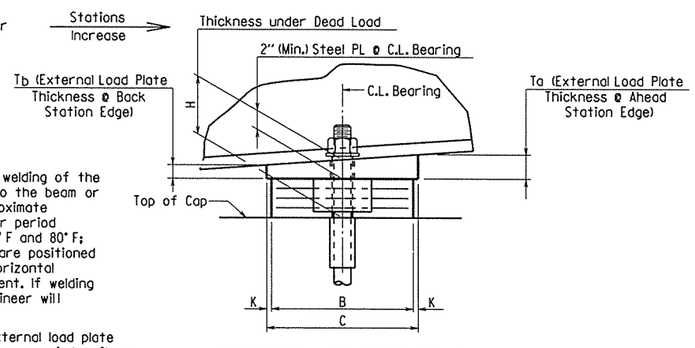


SIDE VIEW - AT BENT NOS. 1, 2, 3, 5, 6, & 7

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

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

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

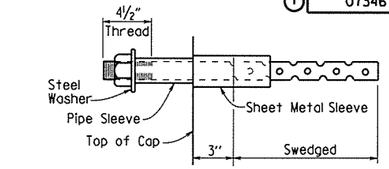


SIDE VIEW - AT BENT NO. 4

TABLE OF FABRICATOR VARIABLES

*Maximum Design Load = Service I Limit State

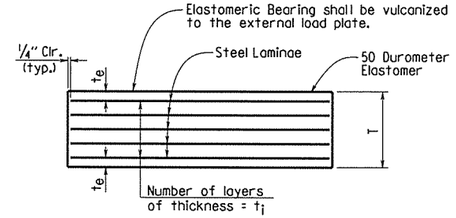
BRIDGE NO.	LOCATION: BENT NO(S).	LOCATION: BEAM OR GIRDER NO.	BEARING TYPE	NO. of BEARINGS EACH BENT	*MAXIMUM DESIGN LOAD (KIPS)	G	H	ELASTOMERIC PAD: A	B	N	t_i	t_e	NO. & THICKNESS OF STEEL LAMINAE	T	EXTERNAL LOAD PLATE: C	D	E	F	J	K	M	T_a	T_b	ANCHOR BOLT: ANCHOR BOLT (ø x L)	GRADE	PIPE SLEEVE SIZE (ø x L)	SHEET METAL SLEEVE SIZE (ø x L)	STEEL WASHER SIZE (O.D.)
07346	1&7	1 - 5	Exp	5	109	9 3/4"	6 3/4"	16"	7"	7	1/2"	1/4"	8 @ 12 Ga.	4 13/16"	8"	27 1/2"	6 1/8"	2 5/8"	NA	1/2"	10 3/4"	2.03"	1.97"	1 3/4"ø x 30"	55	2"ø x 7"	4"ø x 6"	3 3/8"
	2&6	1 - 5	Exp	5	248	8 1/2"	4 15/16"	20"	10"	4	1/2"	1/4"	5 @ 12 Ga.	3"	11"	32"	5 3/4"	3 1/8"	NA	1/2"	12 3/4"	2.04"	1.96"	2 1/4"ø x 33"	55	2 1/2"ø x 5 1/4"	4"ø x 6"	4"
	3&5	1 - 5	Exp	5	251	7 1/4"	3 3/4"	20"	10"	2	1/2"	1/4"	3 @ 12 Ga.	1 13/16"	11"	32"	4 1/2"	3 1/8"	NA	1/2"	12 3/4"	2.04"	1.96"	2 1/4"ø x 32"	55	2 1/2"ø x 4"	4"ø x 6"	4"
	4	1 - 5	Fix	5	250	7"	3 3/4"	20"	10"	2	1/2"	1/4"	3 @ 12 Ga.	1 13/16"	11"	39 3/4"	-	3 1/8"	3"	1/2"	15 1/4"	2.04"	1.96"	2"ø x 29"	55	2 1/2"ø x 4"	4"ø x 6"	3 3/4"



ANCHOR BOLT DETAIL

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

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



t_e = Thickness of elastomer cover on top and bottom of pad

t_i = Thickness of elastomer between steel laminae

N = Number of elastomer layers of thickness t_i

ELASTOMERIC BEARING

GENERAL NOTES

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

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

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

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

Pipe Sleeves, Anchor Bolts, Washers and Nuts shall be paid for at the unit price bid for "Structural Steel in Beam Spans (M 270, Gr. 50W)". External load plates and shear blocks will not be measured or paid for separately, but will be considered incidental to the unit price bid for "Elastomeric Bearings".

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

STATE OF ARKANSAS
CHARLES R. ELLIS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
8-21-15

BRIDGE ENGINEER

DETAILS OF ELASTOMERIC BEARINGS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: BHS DATE: 8/13/2015 FILENAME: b090343_el.dgn

CHECKED BY: DHP DATE: 8/14/15 SCALE: None

DESIGNED BY: BHS DATE: 11/2014

BRIDGE NO. 07346 DRAWING NO. 57125

PRINT DATE: 8/21/2015

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
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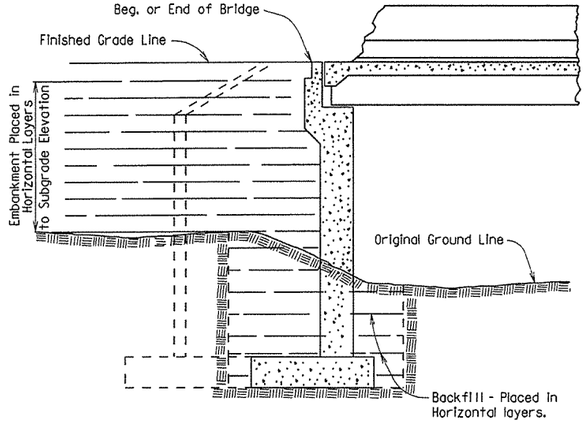
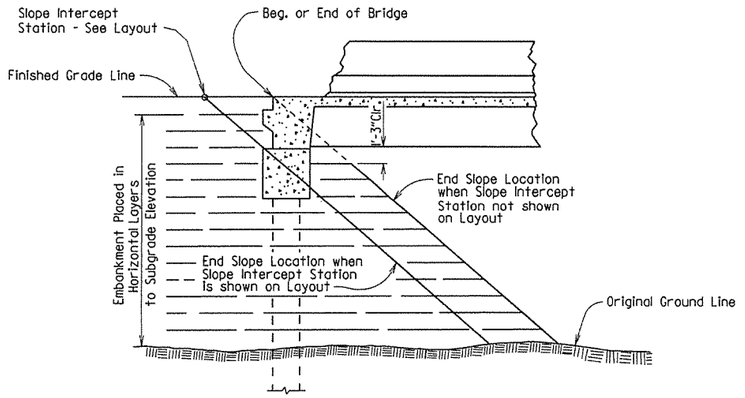
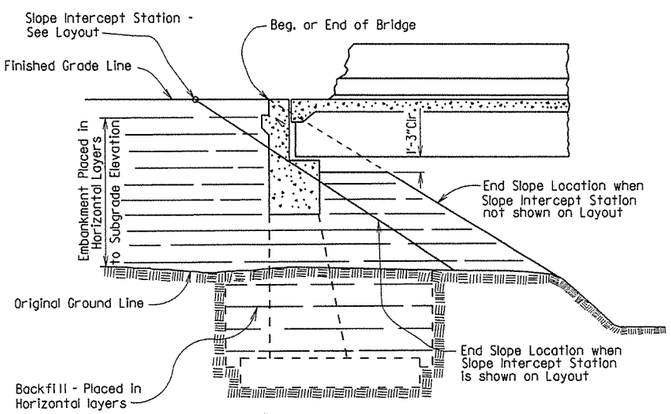
				JOB NO.				
				① EMBANKMENT & BACKFILL 55000				



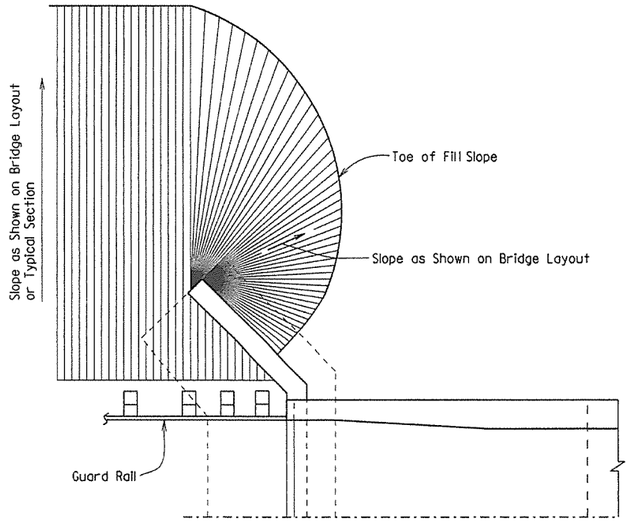
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT VERTICAL WALL ABUTMENTS



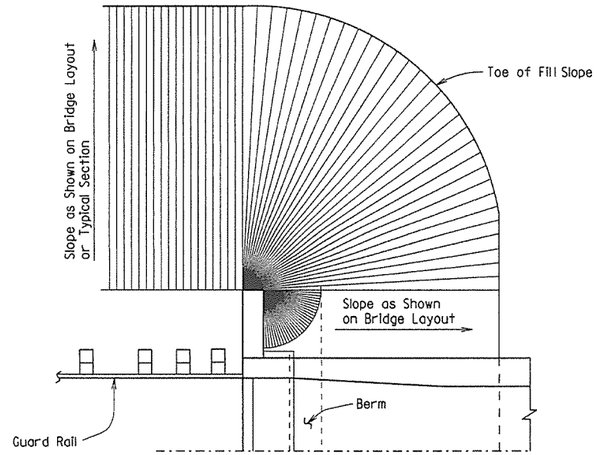
EMBANKMENT CONSTRUCTION AT SPILL-THROUGH PILE END BENTS



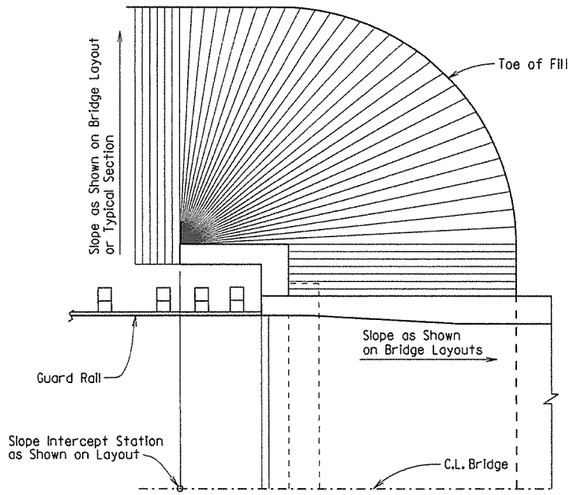
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT SPILL-THROUGH END BENTS



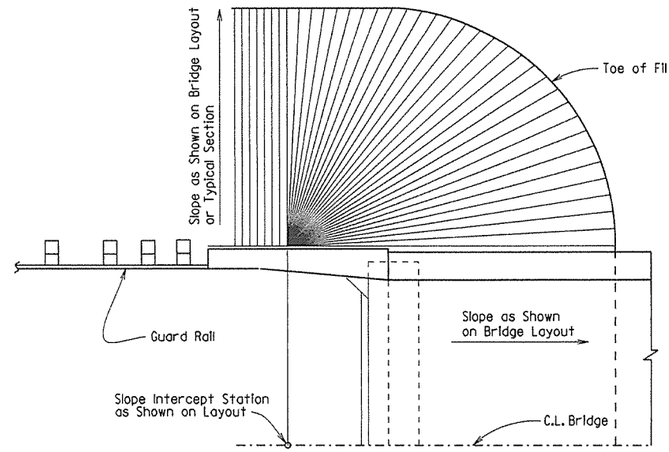
VERTICAL WALL ABUTMENTS



SPILL-THROUGH END BENTS WITH STUB WING



SPILL-THROUGH END BENTS WITH TURNBACK WING



SPILL-THROUGH END BENTS WITH TRANSITION WING

METHOD OF DETERMINING FILL SLOPE LOCATION AT BRIDGE ENDS

GENERAL NOTES

The Bridge End Embankment shall be defined as a section of embankment, not less than 20 feet long adjacent to the bridge end, together with the side slopes and slopes under the bridge end including around the end of wingwalls. Embankment adjacent to structures shall be constructed in 6 inch horizontal layers (loose measure) and compacted by the use of mechanical equipment to the satisfaction of the Engineer. Refer to Subsections 210.09, 210.10 and 801.08 for construction requirements.

STANDARD DETAILS FOR EMBANKMENT CONSTRUCTION AND BACKFILL AT BRIDGE ENDS

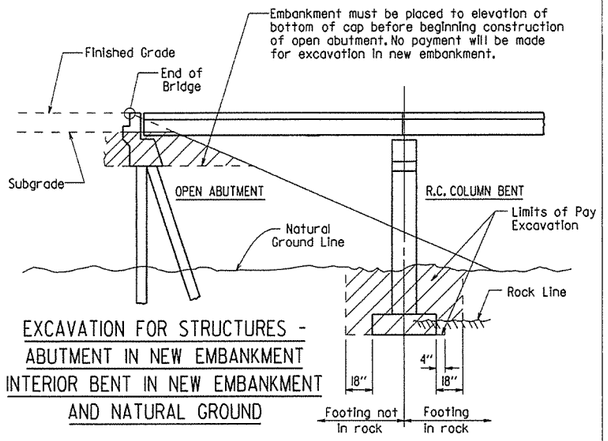
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

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

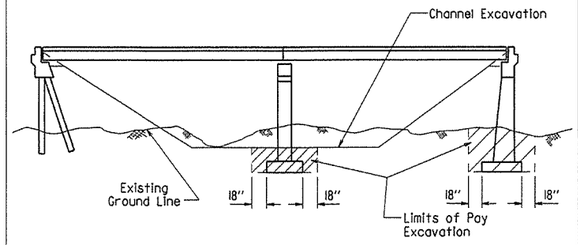
DRAWING NO. 55000

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		80	
				JOB NO.				

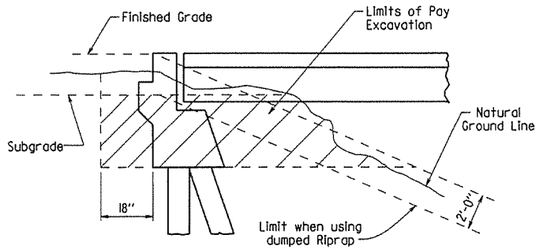
(1) RIPRAP & EXCAV. 55001



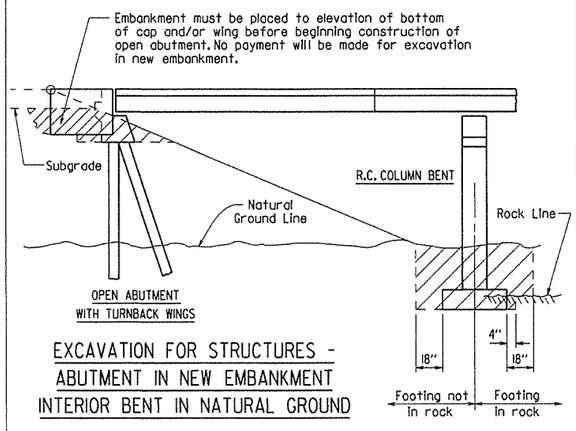
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NEW EMBANKMENT AND NATURAL GROUND



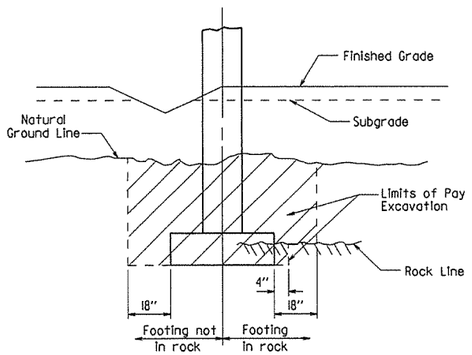
EXCAVATION FOR STRUCTURES - BRIDGE LOCATION WITH DESIGNATED CHANNEL CHANGE



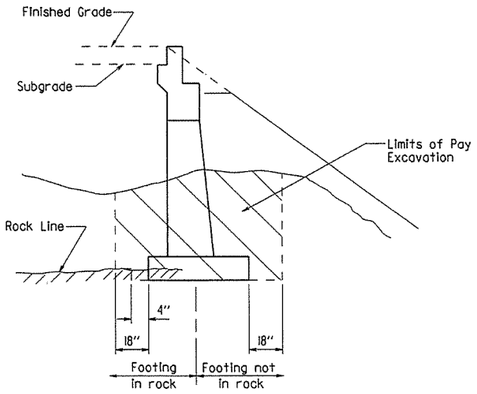
EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND



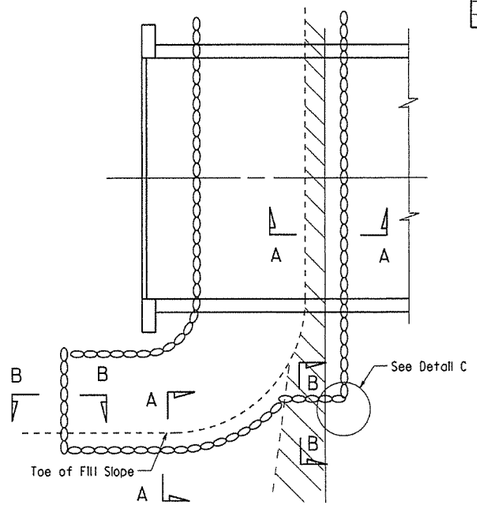
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NATURAL GROUND



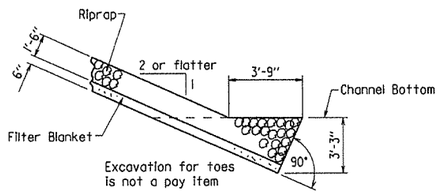
EXCAVATION FOR STRUCTURES - BENT IN ROADWAY FILL SECTION AND NATURAL GROUND



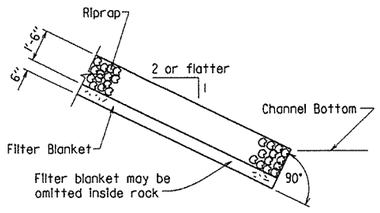
EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND AND NEW EMBANKMENT



PLAN OF DUMPED RIPRAP



SECTION A-A
(Toe Excavation in Soil)

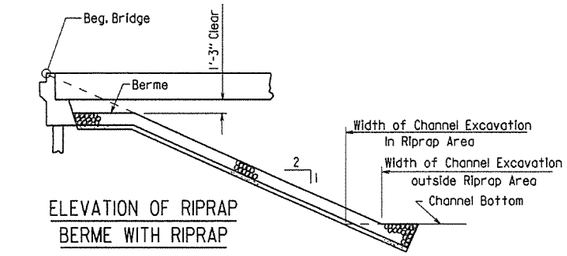


SECTION A-A
(Toe Excavation in Rock)

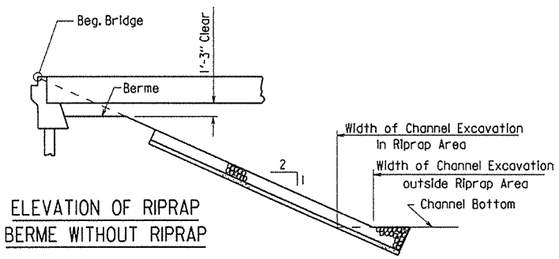
Note : Use this type of toe when rock is encountered which is in a stable condition.

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

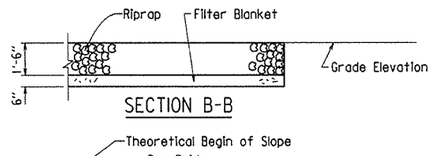
Note : Details for computing excavation for structures are included for information as to how plan quantities were calculated and for use when adjusting quantities when changing footing elevation.



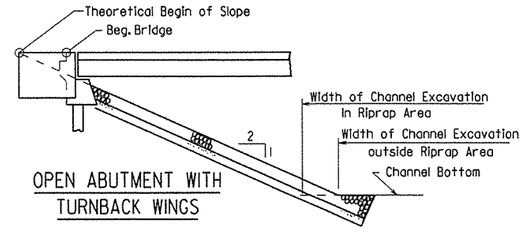
ELEVATION OF RIPRAP BERME WITH RIPRAP



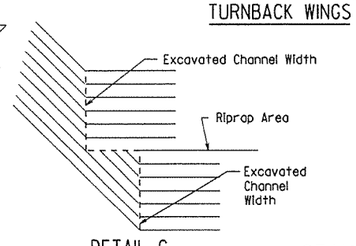
ELEVATION OF RIPRAP BERME WITHOUT RIPRAP



SECTION B-B



OPEN ABUTMENT WITH TURNBACK WINGS



DETAIL C

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

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

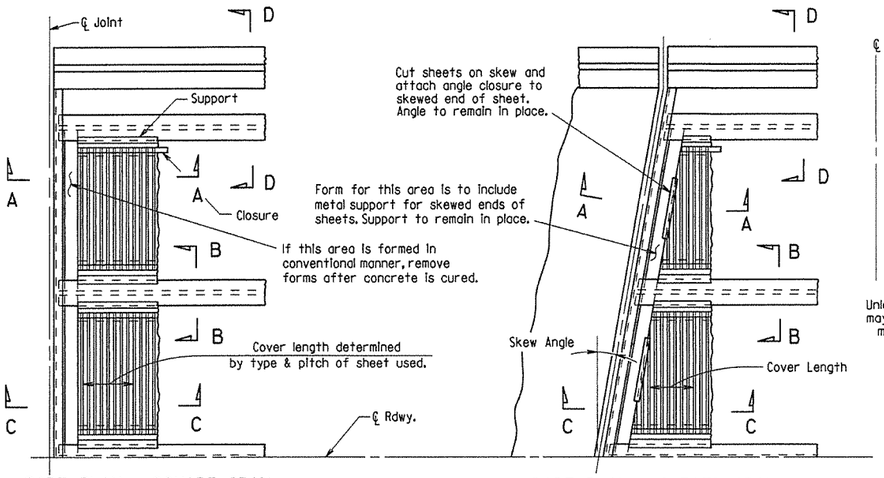
DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55001.dgn

CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE

DESIGNED BY: STD. DATE:

DRAWING NO. 55001

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		81	
				JOB NO.				
				①	BRIDGE DECK FORMS		55005	

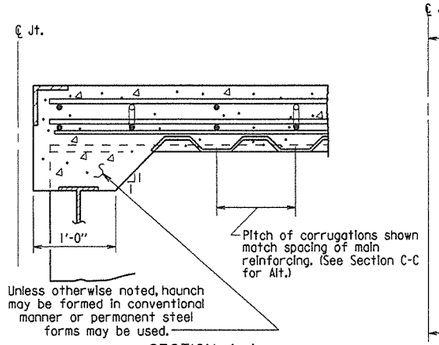


PART PLAN - SQUARE SPAN

3/8" = 1'-0"

PART PLAN - SKEWED SPAN

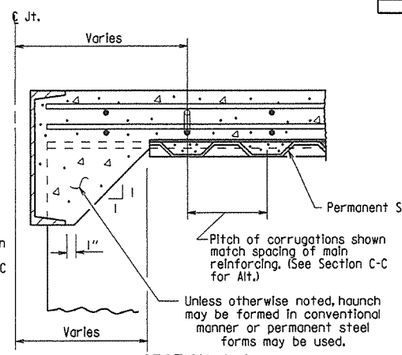
3/8" = 1'-0"



SECTION A-A

N.T.S.

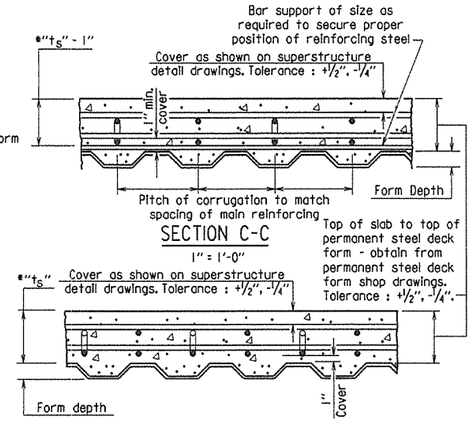
(Angle at end of span)



SECTION A-A

N.T.S.

(Channel at end of span)



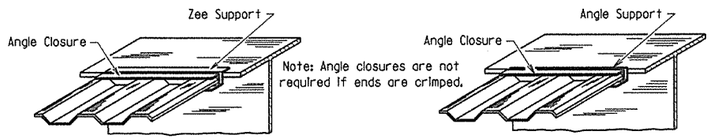
SECTION C-C

1" = 1'-0"

SECTION C-C - ALTERNATE

1" = 1'-0"

(Applicable when corrugations do not match spacing of main reinforcement)



Note: Angle closures are not required if ends are crimped.

SKETCH OF PERMISSIBLE SUPPORTS

N.T.S.

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

GENERAL NOTES

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

Permanent steel deck forms shall conform to Subsection 802.14(b). Detailed plans, including detailed calculations and manufacturer's technical brochure, shall be submitted to and approved by the Engineer before work of forming the bridge deck is started.

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

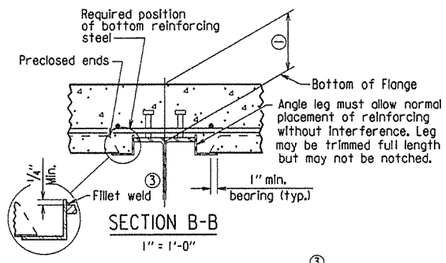
Form sheets shall be fastened to supporting members and to each other with galvanized metal screws sufficient in size and number to provide a secure attachment. Alternate methods of attachment must be approved by the Engineer.

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

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

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

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

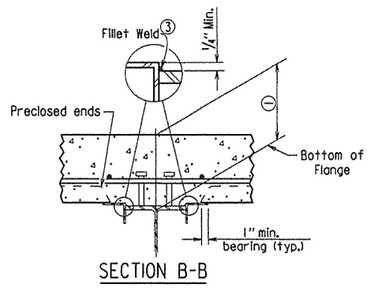


SECTION B-B

1" = 1'-0"

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

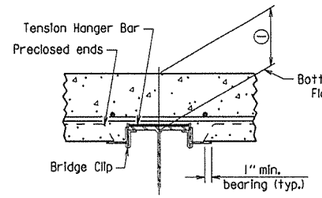
③ Minimum weld: 1/8" x 1' ℄ 18". More weld may be required; maximum length per weld = 1 1/2" (typ.)



SECTION B-B

1" = 1'-0"

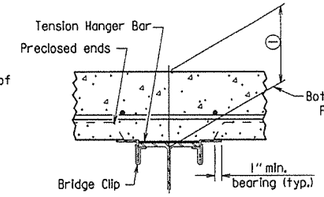
(Showing permissible support for tension flange where shear connectors are used and for all compression flanges)



SECTION B-B

1" = 1'-0"

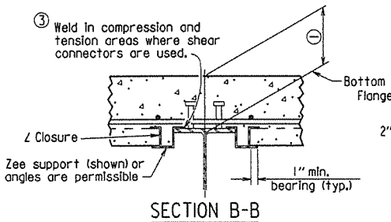
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

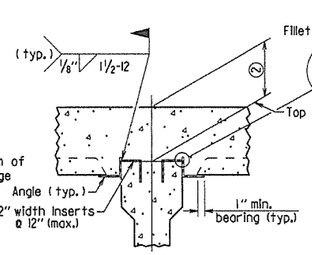
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

(Showing ∠ Closure)

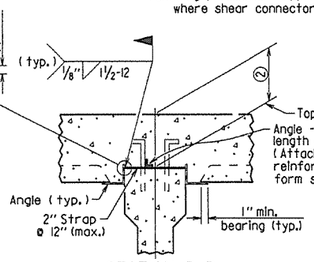


SECTION B-B

(FOR CONCRETE GIRDERS)

1" = 1'-0"

(Showing support by insert cast in girder)

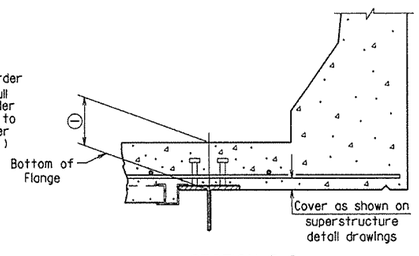


SECTION B-B

(FOR CONCRETE GIRDERS)

1" = 1'-0"

(Showing support by Strap)



SECTION D-D

1" = 1'-0"

Note: Only Bottom Reinforcing is shown.

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

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

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

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55005.dgn

CHECKED BY: BEF DATE: 2-27-2014 SCALE: NONE

DESIGNED BY: STD. DATE: —

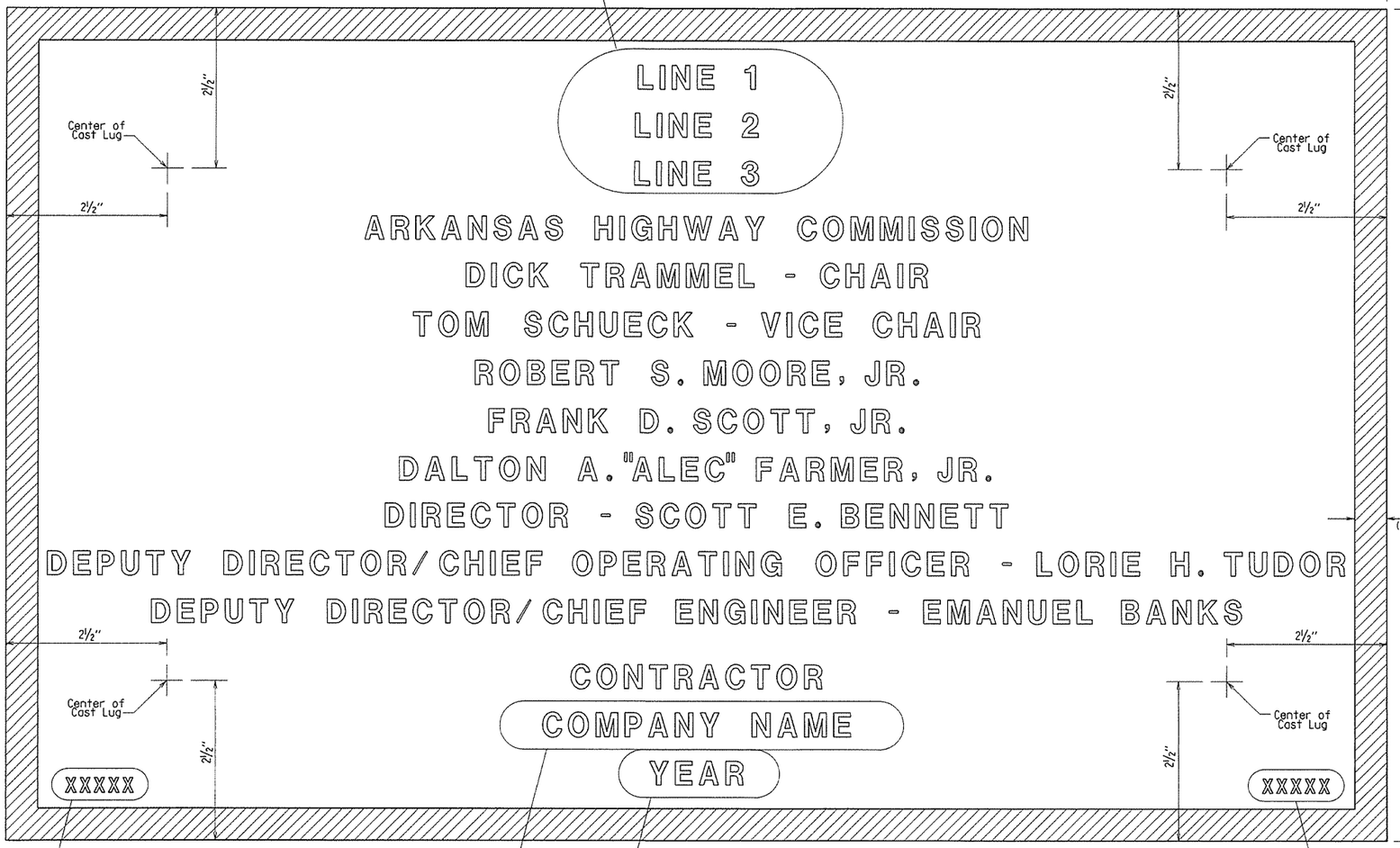
DRAWING NO. 55005

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
12-1-14				6	ARK.		92	
1-14-15				JOB NO.				

① TYPE D NAME PLATE 55010

The name of the bridge as shown on the plans shall be placed on Lines 1 - 3 using 1/8" raised letters and numerals 3/8" high.

	Example 1	Example 2	Example 3	Example 4
Line 1	Red River	Southern	Saline	
Line 2	Relief	Railroad	River	Highway 5
Line 3		Overpass	Relief	



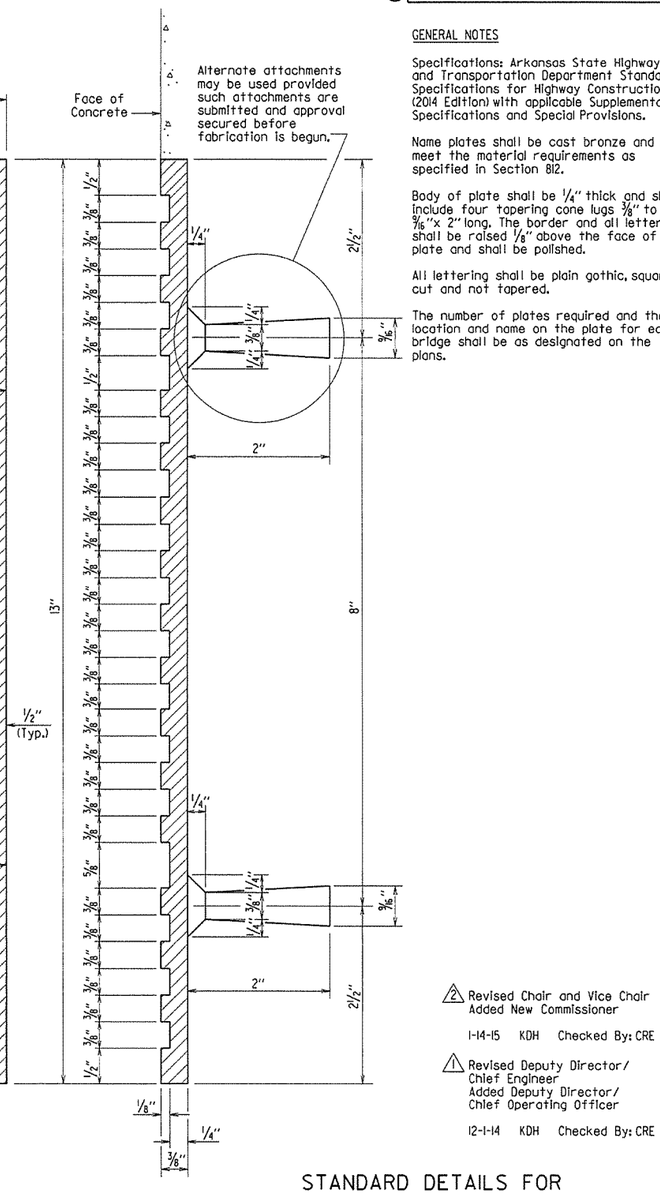
Place the design live loading here using 1/8" raised letters and numerals 1/4" high. Examples : HS 20
HL-93

Place the name of the company awarded the construction contract here using 1/8" raised letters and numerals 3/8" high. Example : ABCD CONSTRUCTION, INC.

Place the Year in which Contract was awarded here using 1/8" raised numerals 3/8" high. Example : 2001

Place the Bridge number here using 1/8" raised letters and numerals 1/4" high. Examples : AI234
05432

TYPICAL BRIDGE NAME PLATE



GENERAL NOTES

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

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

Body of plate shall be 1/4" thick and shall include four tapering cone lugs 3/8" to 9/16" x 2" long. The border and all lettering shall be raised 1/8" above the face of plate and shall be polished.

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

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

② Revised Chair and Vice Chair
Added New Commissioner
1-14-15 KDH Checked By: CRE

① Revised Deputy Director/
Chief Engineer
Added Deputy Director/
Chief Operating Officer
12-1-14 KDH Checked By: CRE

STANDARD DETAILS FOR
TYPE D BRIDGE NAME PLATE

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55010.dgn
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE
DESIGNED BY: STD. DATE: ---

DRAWING NO. 55010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		93	
				JOB NO.				

(1) STEEL H-PILES 55020

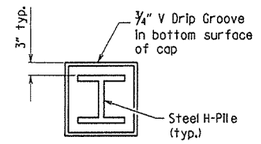
GENERAL NOTES FOR STEEL H-PILES:

Steel H-Piles shall conform to AASHTO M 270, Grade 36 or greater.

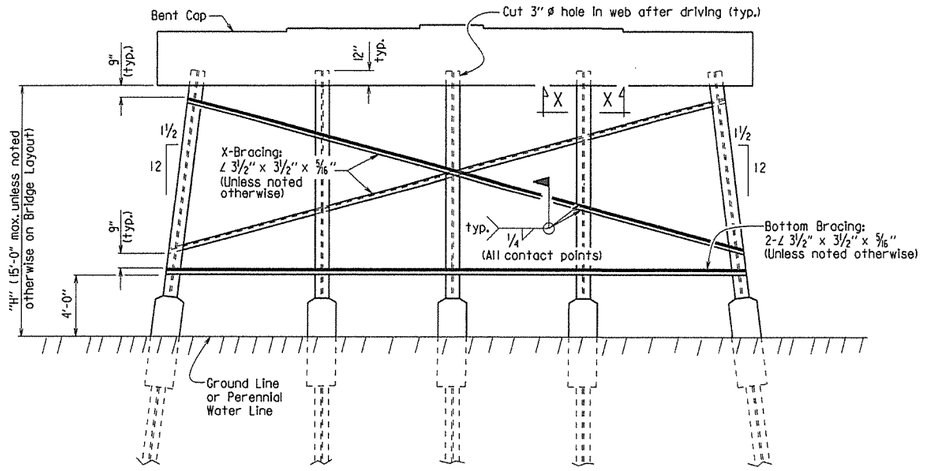
See Bridge Layout and Bent Details for pile size, estimated length, spacing, pile anchorage (if required) and for driving information.

Steel H-Piles that extend above the ground and are not protected by pile encasement shall be painted in accordance with Subsection 805.02.

Brackets, lugs, cap plates, pile tips, driving points, pile painting, splicing and welding shall not be paid for directly, but shall be considered subsidiary to the item "Steel Piling".



VIEW X-X



Notes:
All bracing shall be cut and welded in the field. Each brace shall be furnished in one piece. Payment shall be made under Item 807.

Unless noted otherwise, omit X-Bracing when "H" is less than 8 feet.

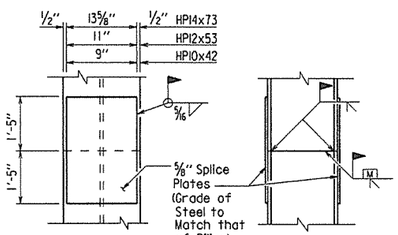
Omit X-Bracing and Bottom Bracing when "H" is 5 feet or less.

When required on the Bridge Layout sheet, pile encasements shall be constructed. See Notes and Details for H-Pile Encasements.

Omit all bracing (and V-groove in cap) when pile encasement is extended to bottom of bent cap.

TYPICAL DETAILS OF H-PILE TRESTLE INTERMEDIATE BENT

(Shown with Partial Height Encasement)

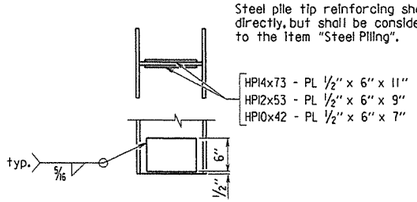


Note:
The Contractor may for his own convenience and at his own expense provide as many as three splices per pile. Minimum spacing between splices shall be 5 feet.

TYPICAL SPLICE DETAILS

Notes:
Steel pile tip reinforcing not required when approved H-Pile driving points are used.

Steel pile tip reinforcing shall not be paid for directly, but shall be considered subsidiary to the item "Steel Piling".



REINFORCING DETAIL FOR STEEL H-PILE TIP

GENERAL NOTES FOR H-PILE ENCASEMENTS:

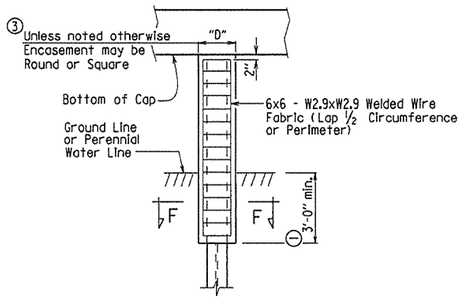
See Bridge Layout for additional notes and required location of pile encasements.

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

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

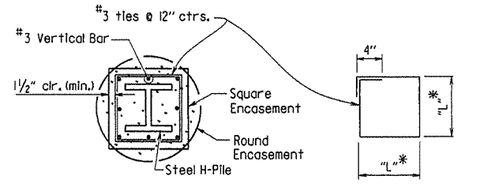
Welded Wire Fabric shall conform to AASHTO M 55 or M 221. Galvanized Corrugated Steel Pipe shall conform to AASHTO M 36 and M 218.

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



PILE ENCASEMENT DETAIL FOR STEEL H-PILES

(4) (Shown with Encasement to Bottom of Cap)

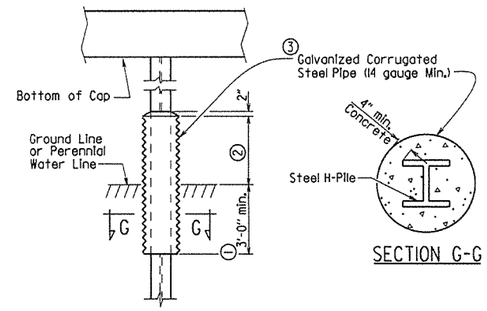


SECTION F-F

*Measured out-to-out of bar.

TABLE OF VARIABLES FOR PILE ENCASEMENT

Pile Size	"D" Square Encsmt.	"D" Round Encsmt.	"L"*
HP10x42	1'-7"	2'-0"	1'-4"
HP12x53	1'-8"	2'-2"	1'-5"
HP14x73	1'-11"	2'-6"	1'-8"



SECTION G-G

(5) ALTERNATE PILE ENCASEMENT DETAIL FOR STEEL H-PILES

(Shown with Partial Height Encasement)

(1) Unless otherwise noted on Bridge Layout.

(2) 3'-0" minimum or as shown on Bridge Layout.

(3) Encasement dimensions shall be sized to maintain a minimum concrete cover of 4" from the H-Pile. Reinforcement shall be sized to provide a minimum concrete cover of 1½" and a minimum clearance of 1¼" from the pile.

(4) Alternate pile encasement, when not extended to bottom of cap, shall have 2" concrete taper for water runoff as shown in the Partial Height Encasement detail.

(5) Alternate pile encasement may not be allowed. See Bridge Layout.

This document was originally issued and sealed by Carl J. Fuselier, PE No. 7510, on February 27, 2014. This copy is not a signed and sealed document.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7510
CARL J. FUSELIER
BRIDGE ENGINEER

STANDARD DETAILS FOR STEEL H-PILES AND PILE ENCASEMENTS

ARKANSAS STATE HIGHWAY COMMISSION

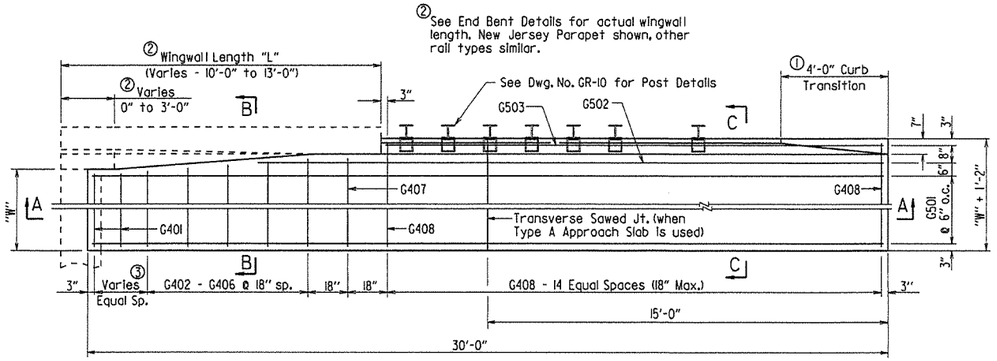
LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55020.dgn
CHECKED BY: B.E.F. DATE: 2/27/2014 SCALE: NO SCALE
DESIGNED BY: STD. DATE: —

DRAWING NO. 55020

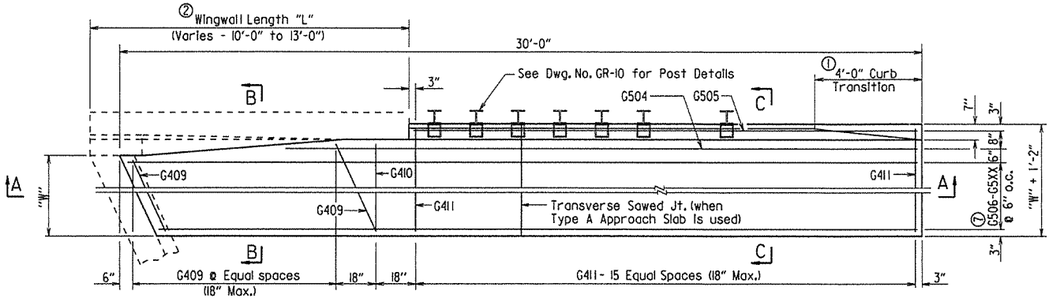
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		84	
				JOB NO.				

① TYPE A GUTTERS 55030A

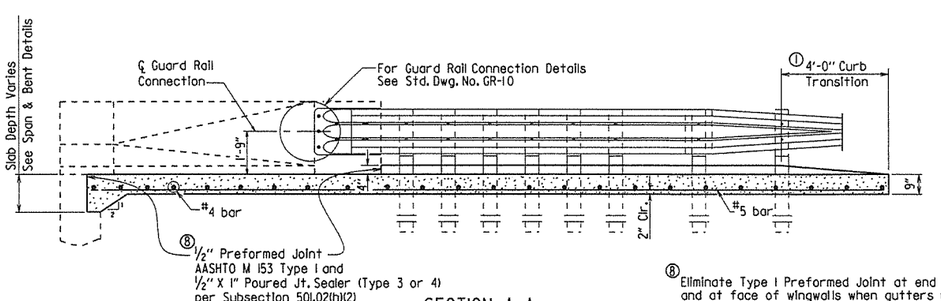


③ Number of G401 bars vary with wingwall length - See Bar List

HALF PLAN OF APPROACH GUTTERS FOR SQUARE BRIDGE



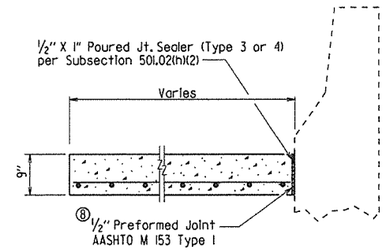
PLAN OF APPROACH GUTTERS FOR SKEWED BRIDGE



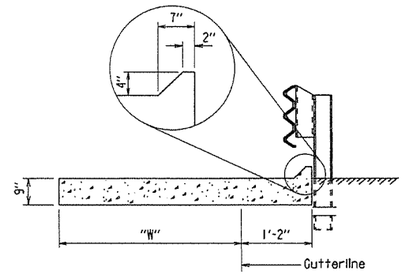
SECTION A-A

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

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



SECTION B-B
N.T.S.



SECTION C-C
N.T.S.

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

⑧ Eliminate Type I Preformed Joint at end bent backwall and at face of wingwalls when gutters used with Type A Approach Slabs. Poured joint sealer is required, however backer rod shall be eliminated.

BAR LIST FOR ONE TYPE A GUTTER

	Mark	No. Req'd. for Width "W" 3'-0"	4'-0"	6'-0"	8'-0"	Length
Square Bridge	G401	④	④	④	④	"W"- 4"
	G402-G406	1 each	1 each	1 each	1 each	"W"-3" to "W"+2"
	G407	1	1	1	1	"W"+3"
	G408	15	15	15	15	"W"+ 10"
	G501	6	8	12	16	29'-8"
	G502	1	1	1	1	(35'-5") - "L"
	G503	1	1	1	1	30'-8"-"L"
Skewed Bridge	G409	⑥	⑥	⑥	⑥	⑤
	G410	1	1	1	1	"W"+3"
	G411	16	16	16	16	"W"+ 10"
	G504	1	1	1	1	⑤
	G505	1	1	1	1	⑤
	G506 - G5XX ⑦	1 each	1 each	1 each	1 each	⑤

④ 0 for "L" = 10'
1 for "L" = 11'
2 for "L" = 12'
2 for "L" = 13'

⑦ G511 for "W" = 3'
G513 for "W" = 4'
G517 for "W" = 6'
G521 for "W" = 8'

⑤ Bar Lengths vary with Skew and Wingwall Length.

⑥ No. Req'd. varies with Skew and Wingwall length.

QUANTITIES FOR ONE SQUARE APPROACH GUTTER

(FOR INFORMATION ONLY)

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

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

GENERAL NOTES

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

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

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

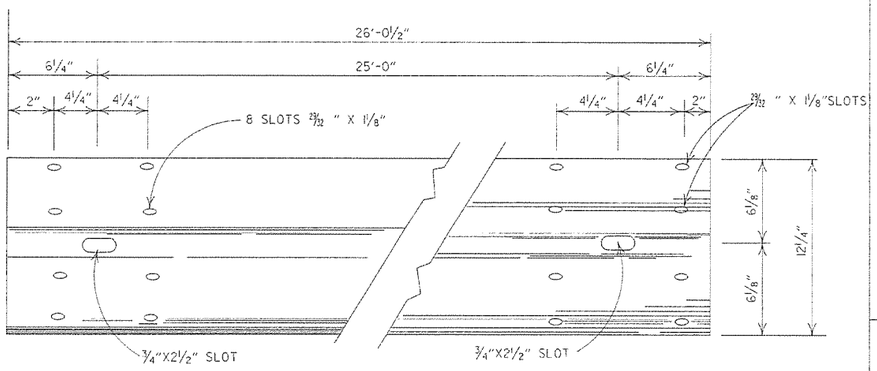
STANDARD DETAILS FOR TYPE A APPROACH GUTTERS

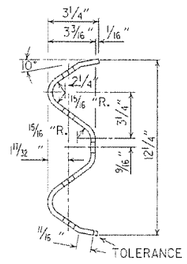
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55030a.dgn
CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: ⅜" = 1'-0" or As Shown
DESIGNED BY: STD. DATE:

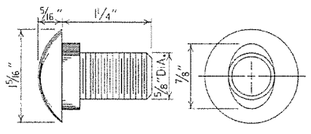
DRAWING NO. 55030A



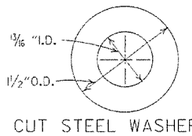


DETAILS OF W-BEAM GUARD RAIL

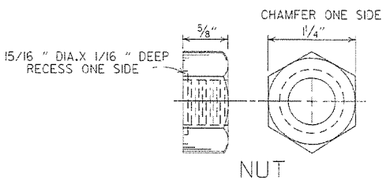
RAIL SECTION OF CLOSELY SIMILAR DIMENSIONS AND COMPARABLE STRENGTH MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.



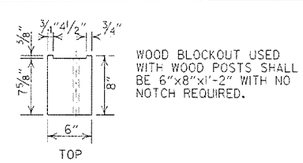
SPLICE BOLT
POST BOLT - SAME EXCEPT LENGTH



CUT STEEL WASHER

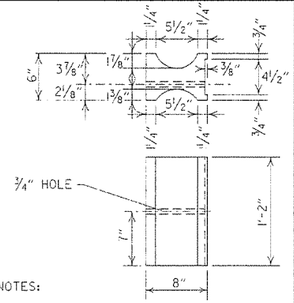


NUT



WOOD BLOCKOUT USED WITH WOOD POSTS SHALL BE 6"x8"x1'-2" WITH NO NOTCH REQUIRED.

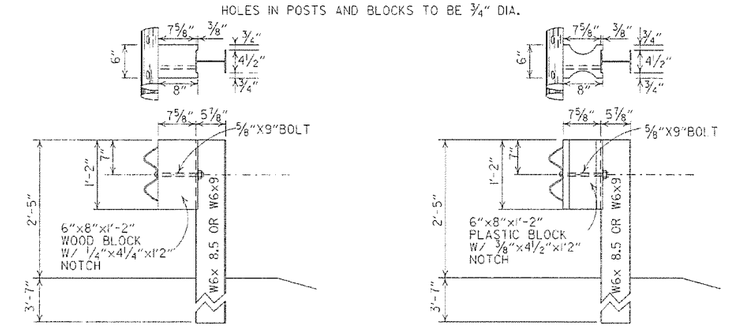
WOOD BLOCKOUT (W-BEAM)



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

PLASTIC BLOCKOUT (W-BEAM)

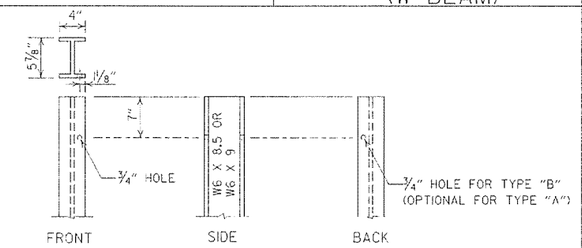
HOLES IN POSTS AND BLOCKS TO BE 3/4" DIA.



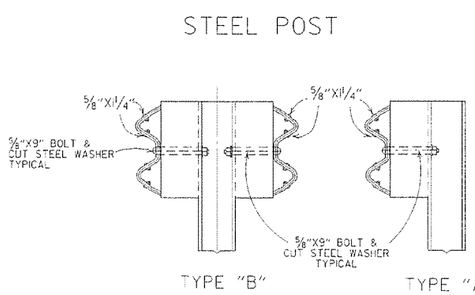
WOOD BLOCKOUT CONNECTIONS

PLASTIC BLOCKOUT CONNECTIONS

DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)



STEEL POST



TYPE "B" TYPE "A"

DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)

HOLES IN POSTS AND BLOCKS TO BE 3/4" DIA.

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

WOOD BLOCKOUT CONNECTIONS

PLASTIC BLOCKOUT CONNECTIONS

DETAILS OF WOOD LINE POST CONNECTIONS (W-BEAM)

-GENERAL NOTES-

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

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

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

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

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

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

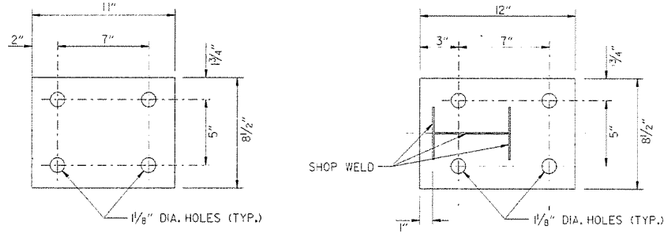
CONTRACTOR SHALL HAVE THE OPTION OF USING WOOD BLOCKOUTS FOR W-BEAM GUARD RAIL OR PLASTIC BLOCKOUTS, AS LONG AS BLOCKOUT USED MEETS NCHRP-350 TEST LEVEL 3 SPECIFICATIONS OR REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) FOR W-BEAM GUARD RAIL.

DATE	REVISION	DATE FILM
7-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
0-15-09	ADDED REFERENCE TO MASH	
4-10-03	REVISED GENERAL NOTES	
9-22-02	REVISED DIMENSION ON WOOD & PLASTIC BLOCKOUT CONNECTIONS & ON STEEL POST	
11-16-01	REVISED WOOD BLOCKOUT & DETAILS OF WOOD LINE POST CONNECTIONS	
3-30-00	REMOVED GUARD RAIL AT BRIDGE ENDS	
1-12-00	ADDED PLASTIC BLOCKOUT	
8-12-98	REV. BLOCKOUTS TO WOOD, DELETED CONC. POST & REV. GENERAL NOTE, DELETED DET. OF GUARD RAIL REPLACE. BEHIND CURB & DET. OF POST PLACE. IN SOLID ROCK, & ADDED DETAILS OF STEEL LINE POST CONN. REMOVED BACK-UP PLATE, REVISED HOLES IN STEEL POLES	
4-3-97	REMOVED "LAP IN DIRECTION OF TRAFFIC" NOTE & PLACED ARROWS ON WASHERS	
10-18-96	REVISED WOOD POST NOTE	
6-2-94	ADDED ALT. STEEL POST SIZE	
8-5-93	REVISED STEEL POST SIZE	8-5-93
10-1-92	REDRAWN & REVISED	10-1-92
8-15-91	REVISED WASHER NOTE	8-15-91
8-2-90	REV. GEN. NOTE & DEPHT OF ANC. POST IN ROCK	8-2-90
7-15-88	REVISED SECTION 3 & GENERAL NOTES	
3-4-88	REV. ANCHOR POST, ELEV. NOTES & POST IN ROCK	780-3-4-88
10-30-87	REVISED WOOD LINE POST DETAIL	546-10-30-87
10-9-87	REDRAWN & REVISED	802-10-9-87

ARKANSAS STATE HIGHWAY COMMISSION

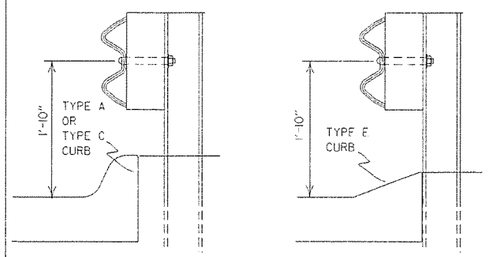
GUARD RAIL DETAILS

STANDARD DRAWING GR-8



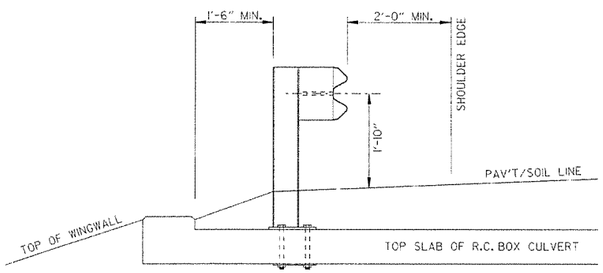
WASHER PLATE BASE PLATE

Note: Bolts, nuts, washers and plates shall be galvanized in accordance with Section 801 of the Standard Specifications.

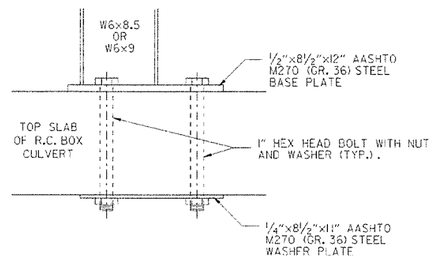


DETAIL OF GUARD RAIL PLACEMENT BEHIND CURB (W-BEAM)

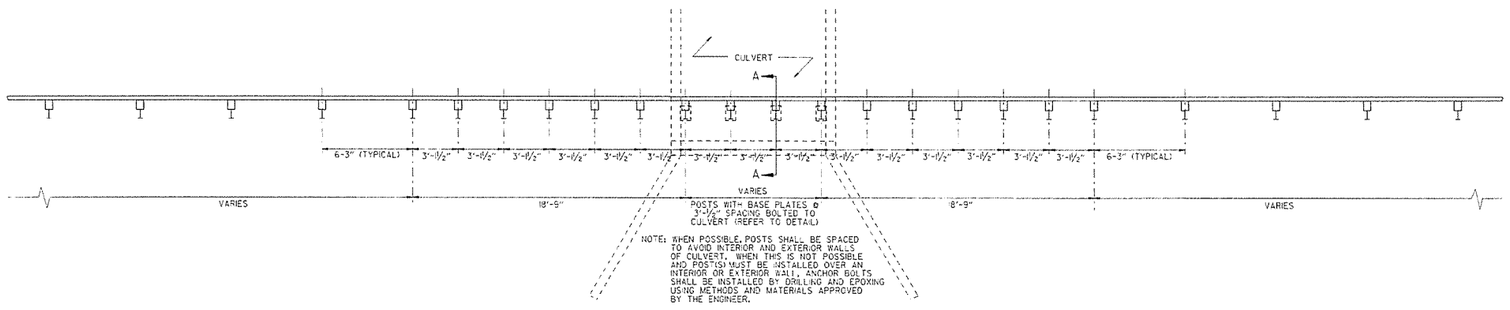
FOR DESIGN SPEEDS OF 50 MPH OR LESS ALL CURB FACES, AS SHOWN ON STD. DRWG. CG-1, MAY BE USED. FOR DESIGN SPEEDS OF 55 MPH OR MORE TYPE "E" CURB FACE SHALL BE USED.



SECTION A-A



DETAIL OF CONNECTION

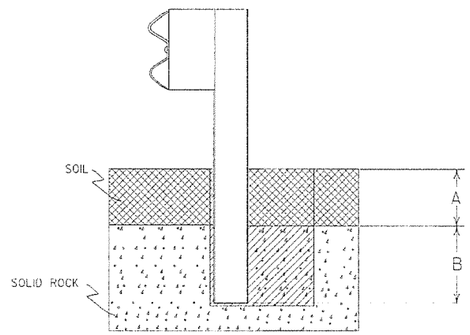


NOTE: WHEN POSSIBLE, POSTS SHALL BE SPACED TO AVOID INTERIOR AND EXTERIOR WALLS OF CULVERT. WHEN THIS IS NOT POSSIBLE AND POST(S) MUST BE INSTALLED OVER AN INTERIOR OR EXTERIOR WALL, ANCHOR BOLTS SHALL BE INSTALLED BY DRILLING AND EPOXING USING METHODS AND MATERIALS APPROVED BY THE ENGINEER.

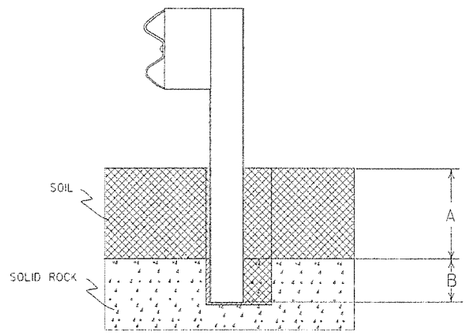
PLAN LAYOUT OF TYPE A GUARD RAIL AT LOW-FILL CULVERTS

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

Case 1

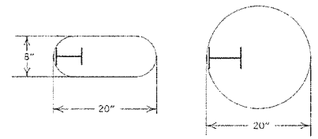


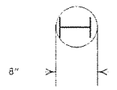
Case 2



Plan View Steel Posts

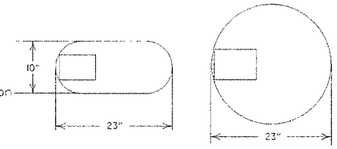
Either hole configuration acceptable

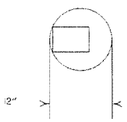




Plan View Wood Posts

Either hole configuration acceptable





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

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

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

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

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

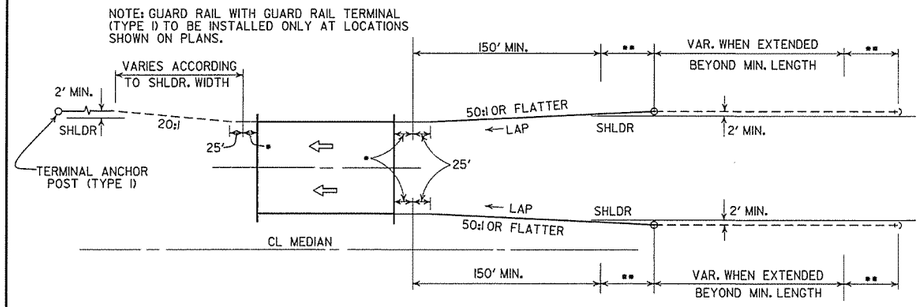
DETAIL OF POST PLACEMENT IN SOLID ROCK (W-BEAM)

DATE	REVISION	DATE FILM
7-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
4-12-07	REVISED DETAIL OF GUARD RAIL PLACEMENT BEHIND CURB	
11-10-05	ADDED GUARD RAIL PLACEMENT BEHIND CURB; REVISED DETAIL OF CONNECTION	
11-18-04	REVISED POST PLACEMENT IN ROCK & CULVERT CONNECTION DETAILS. ADDED DETAIL FOR GUARD RAIL PLACEMENT AT LOW-FILL CULVERTS	
3-30-00	REMOVED CONCRETE INSERT ANCHOR	
8-12-98	CHANGED STEEL SPACER BLOCK TO WOOD BLOCKOUT, ADD. DET. OF GUARD RAIL CONNECTION TO R.C. BOX CULVT. DELETED DET. OF STEEL LINE POST CONN. & ADDED DET. OF GUARD RAIL PLACE. BEHIND CURB & DET. OF POST PLACE. IN SOLID ROCK	
4-3-96	PLACED ARROWS AT CUT STEEL WASHERS	4-3-96
10-18-96	REV. ASTM REF. TO AASHTO	
11-22-95	ADDED OPTIONAL HOLES	
6-2-94	REVISED ALTERNATE POST SIZE	
8-6-93	REVISED STEEL POST SIZE	
10-1-92	REDRAWN & REVISED	10-1-92
8-2-90	DEL. WASHER ON ANCHOR ASSEMBLY	8-2-90
7-15-88	CONFORMED TO 1988 SPECS	
3-4-88	REVISED ANCHOR NOTE	
10-30-87	REVISED ANCHOR ASSEMBLY	712-10-30-87
10-30-87	REVISED PLACEMENT BEHIND CURB	547-10-30-87
10-9-87	REDRAWN & REVISED	803-10-9-87

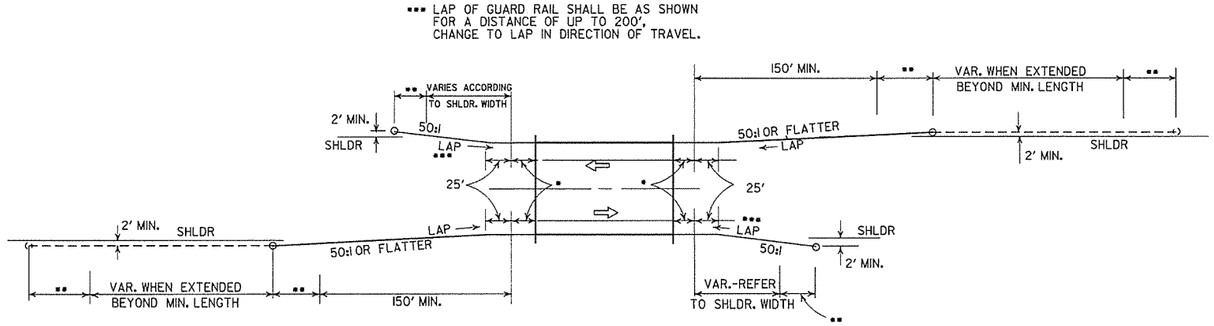
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-8A



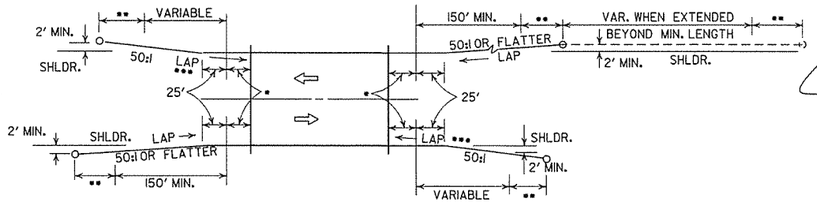
ONE-WAY TRAFFIC



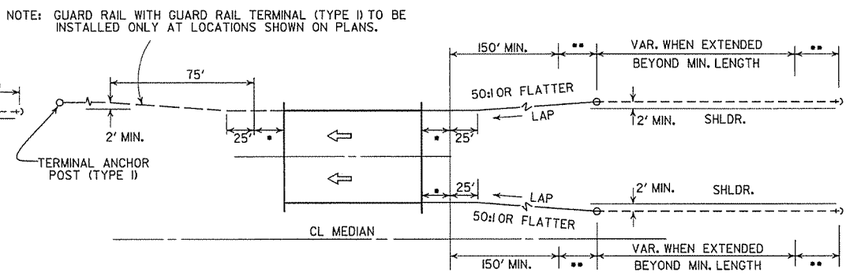
TWO-WAY TRAFFIC

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

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



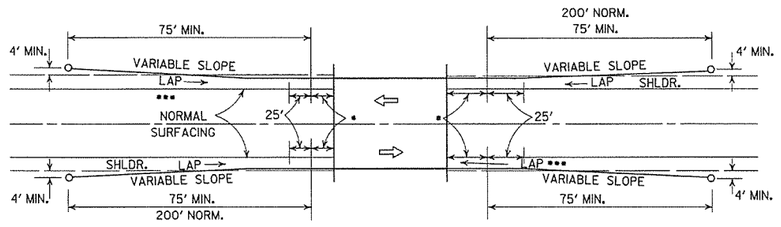
TWO-WAY TRAFFIC



ONE-WAY TRAFFIC

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

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



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

LEGEND

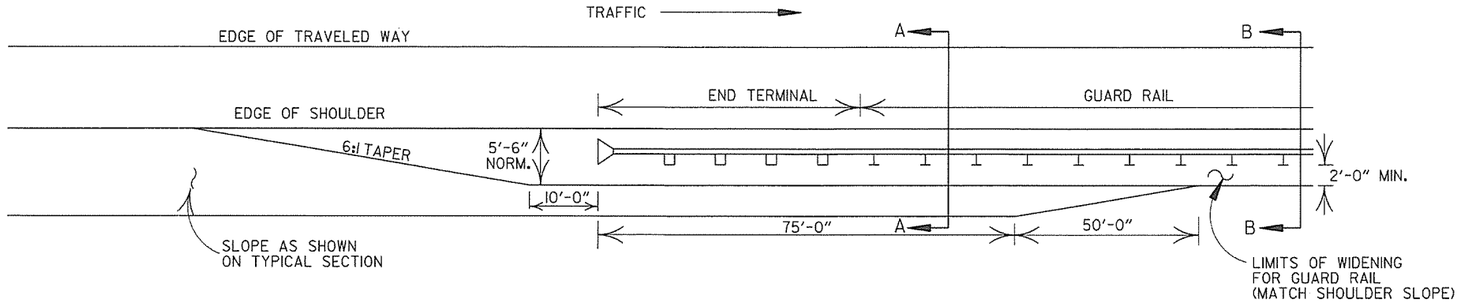
- ▪ THRIE BEAM GUARD RAIL TERMINAL
- ▪▪ GUARD RAIL TERMINAL (TYPE 2)

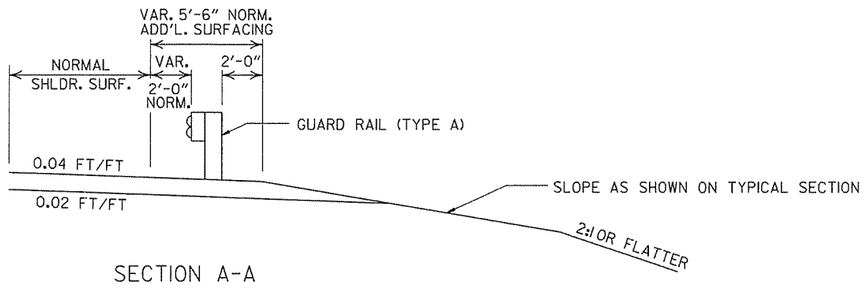
DATE	REVISION	DATE FILM
4-17-08	REVISED LAYOUTS	
11-10-05	REMOVED GUARD RAIL NOTES AND DETAILS	
11-16-01	DELETED NOTE-METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERM. (TY. I)	
1-12-00	ADDED CONSTRUCTION NOTE	1-12-00
6-26-97	REVISED LAYOUT	
10-1-92	REDRAWN & REVISED	10-1-92
	ADDED NOTE	
10-9-87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

ARKANSAS STATE HIGHWAY COMMISSION

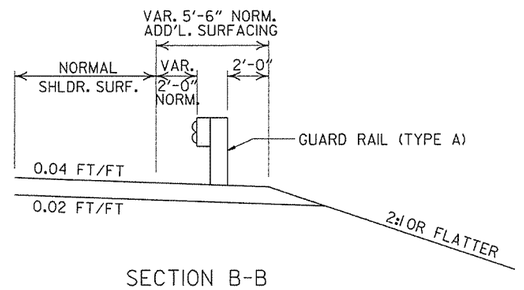
GUARD RAIL DETAILS

STANDARD DRAWING GR-9





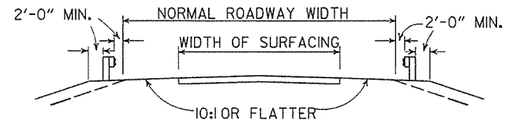
SECTION A-A



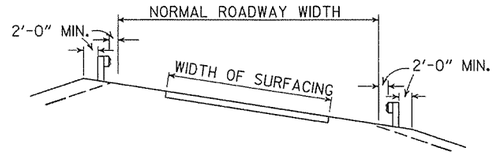
SECTION B-B

DETAILS OF WIDENING FOR GUARD RAIL

NOTE: NORMAL SECTION TO BE WIDENED APPROX. 5'-6" EACH SIDE TO SUPPORT GUARD RAIL.

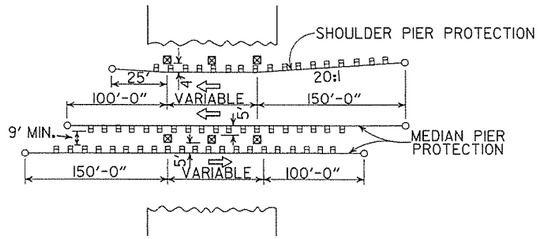


SECTION ON TANGENT



SECTION ON CURVE

DETAILS SHOWING POSITION OF GUARD RAIL ON HIGHWAY



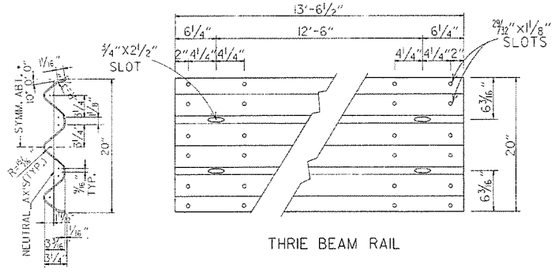
METHOD OF INSTALLATION OF GUARD RAIL AT FIXED OBSTACLE

DATE	REVISION	DATE FILM
4-17-08	MINOR REVISION	
11-10-05	DRAWN	

ARKANSAS STATE HIGHWAY COMMISSION

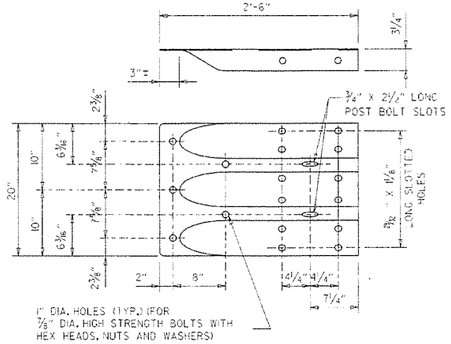
GUARD RAIL DETAILS

STANDARD DRAWING GR-9A



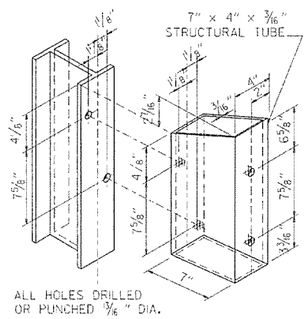
THRIE BEAM RAIL

SECTION THRU
THRIE BEAM RAIL



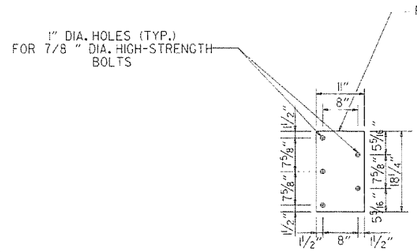
1" DIA. HOLES (TYP.) (FOR
⅞" DIA. HIGH STRENGTH BOLTS WITH
HEX HEADS, NUTS AND WASHERS)

SPECIAL END SHOE



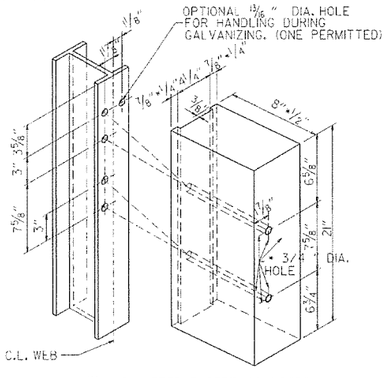
STRUCTURAL STEEL TUBING BLOCKOUT DETAIL

ATTACH BLOCKOUT TO POST USING
⅝" DIA. HEX HEAD BOLTS WITH 1½"
O.D. CUT STEEL WASHERS AND NUT.



CONNECTOR PLATE

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

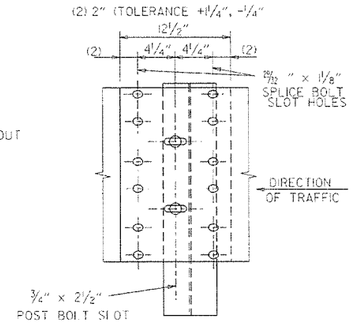


ALL HOLES 13/16" DIAMETER EXCEPT AS NOTED

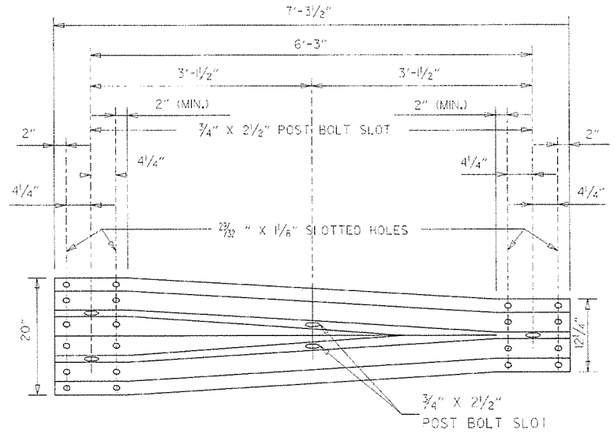
HOLE PUNCHING DETAIL
FOR STEEL POST & WOOD
OR PLASTIC BLOCKOUTS

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

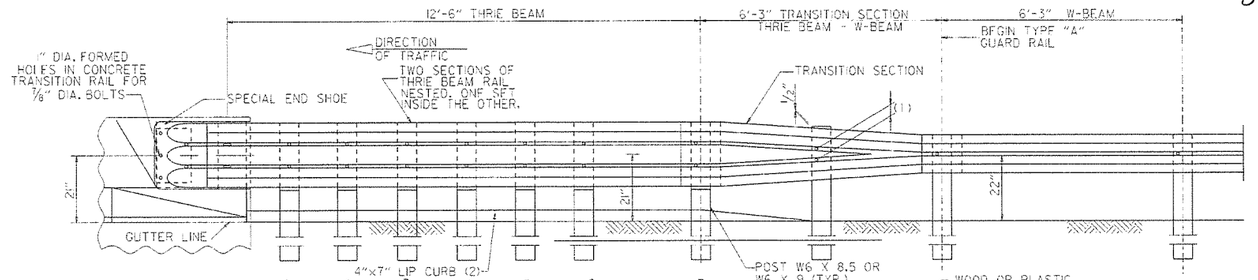
CONNECTOR PLATE SHALL BE AASHTO M270, GR. 36 AND SHALL BE GALVANIZED AFTER FABRICATION. GALVANIZING SHALL CONFORM TO SUBSECTION 807.19 OF THE STANDARD SPECIFICATIONS. CONNECTOR PLATE TO BE BOLTED TO SPECIAL END SHOE USING ⅞" DIA. HIGH STRENGTH BOLTS, WITH THE HEADS PLACED ON THE TRAFFIC FACE. WASHERS SHALL BE USED UNDER THE HEAD AND NUT. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AND SHALL CONFORM TO SUBSECTION 807.06.



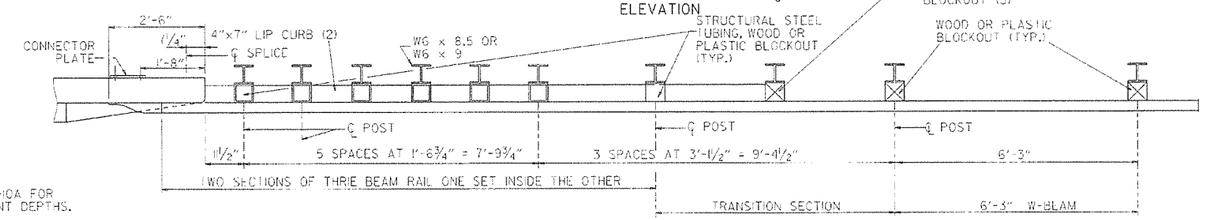
THRIE BEAM RAIL
SPLICE AT POST



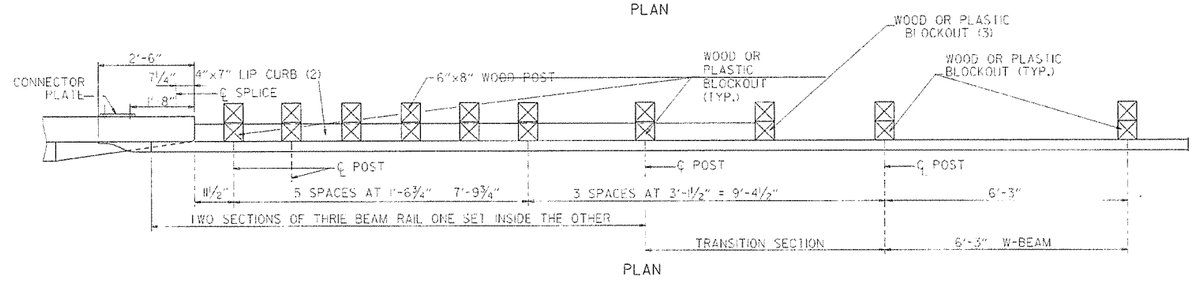
TRANSITION SECTION



ELEVATION



PLAN



PLAN

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

THRIE BEAM GUARD RAIL CONNECTION AT BRIDGE ENDS

GENERAL NOTES:

THE THRIE BEAM RAIL, SPECIAL END SHOE, AND THE TRANSITION SECTION SHALL BE MADE OF STEEL AND SHALL BE 12 GAGE. ZINC COATING SHALL BE TYPE II.

RAIL POSTS SHALL BE SET PERPENDICULAR TO THE ROADWAY PROFILE GRADE AND VERTICALLY IN CROSS SECTION.

ALL BOLTS SHALL BE SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN ¾" BEYOND IT.

ALL LAP SPLICES, INCLUDING SPECIAL END SHOES, SHALL BE MADE IN THE DIRECTION SHOWN ON STANDARD DRAWINGS GR-9 & GR-11.

WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.74 (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

REFER TO STD. DRWG. GR-10A FOR POST DETAILS.

USE THRIE BEAM GUARD RAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB.

THRIE BEAM POSTS SHALL BE SAME MATERIAL AS W BEAM POSTS FOR ENTIRE JOB.

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

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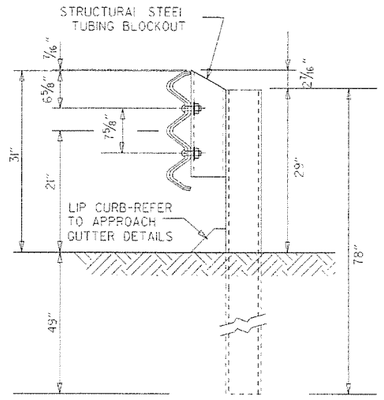
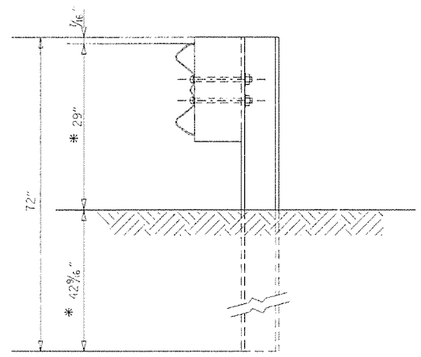
GUARD RAIL DETAILS

STANDARD DRAWING GR-10

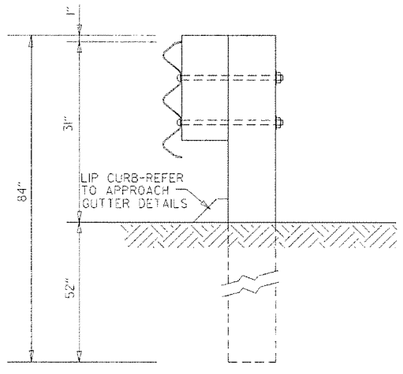


THRIE BEAM RAIL WITH STEEL TUBING BLOCKOUT
AND STEEL POST
POSTS 1-7

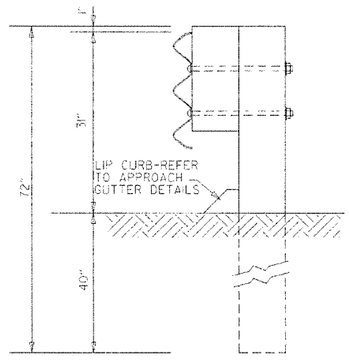


W-BEAM TO THRIE BEAM TRANSITION RAIL
WITH WOOD OR PLASTIC BLOCKOUT AND STEEL POST
POST 8

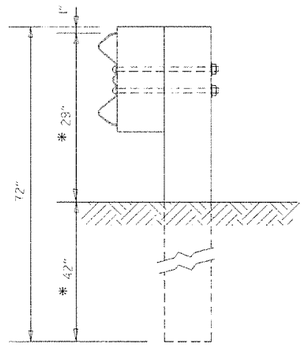
* NOTE:
THESE DIMENSIONS WILL NEED TO BE ADJUSTED IN THE FIELD TO MAKE THE TRANSITION FROM 21" MID POINT OF THRIE BEAM TO 22" MID POINT OF W-BEAM.



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



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



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

GENERAL NOTES:

RAIL POSTS SHALL BE SET PERPENDICULAR TO THE ROADWAY PROFILE GRADE AND VERTICALLY IN CROSS SECTION.

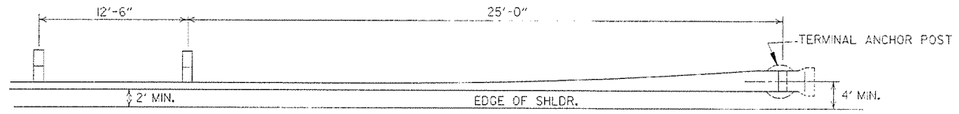
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7f (1400 f) OR NO. 1 (1350 f SOUTHERN PINE.

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

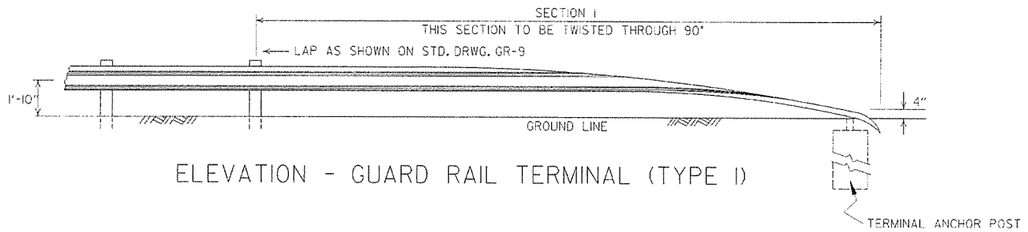
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-10A

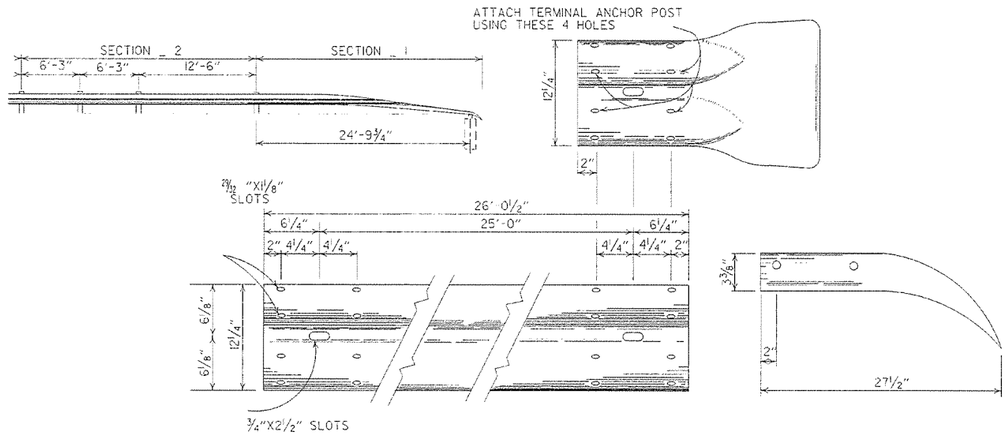


PLAN - GUARD RAIL TERMINAL (TYPE I)



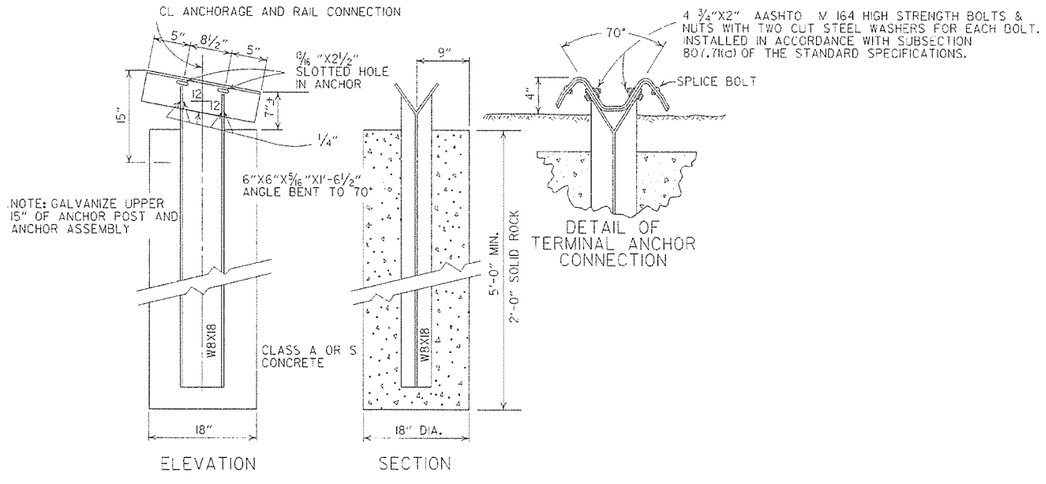
ELEVATION - GUARD RAIL TERMINAL (TYPE I)

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



SECTION 1

TERMINAL SECTION



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

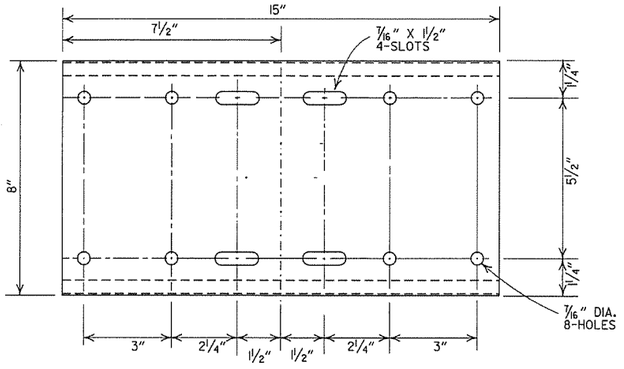
DETAIL OF TERMINAL ANCHOR POST (TYPE I)

DATE	REVISION	DATE FILM
7-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
6-26-97	REVISED LAP NOTE	
10-18-96	REVISED ASTM REF. TO AASHTO	
11-1-94	DIMENSION TERMINAL DETAIL	
11-11-92	ADDED NOTE FOR PAYMENT	11-11-92
10-1-92	DRAWN & ISSUED	10-1-92

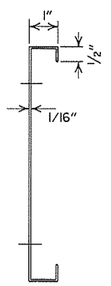
ARKANSAS STATE HIGHWAY COMMISSION

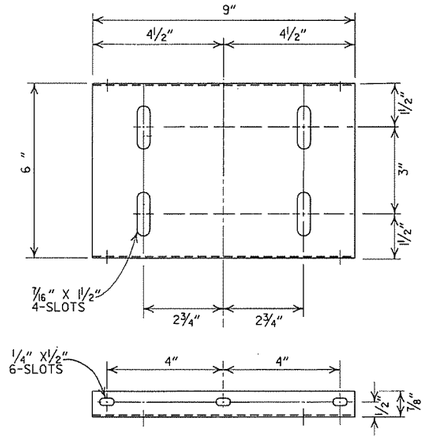
GUARD RAIL DETAILS

STANDARD DRAWING GRT-1

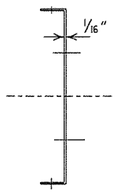


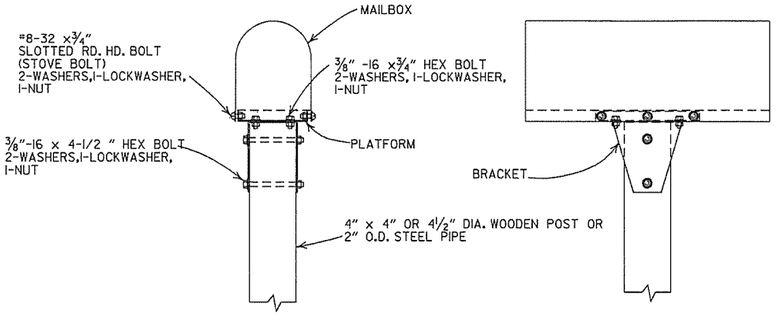
SHELF



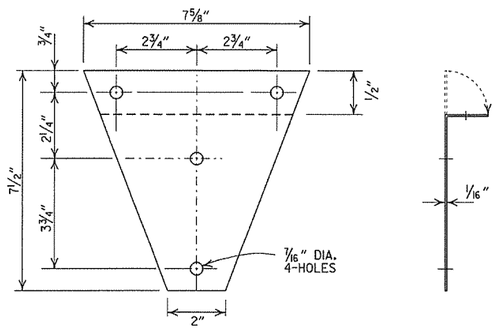


PLATFORM





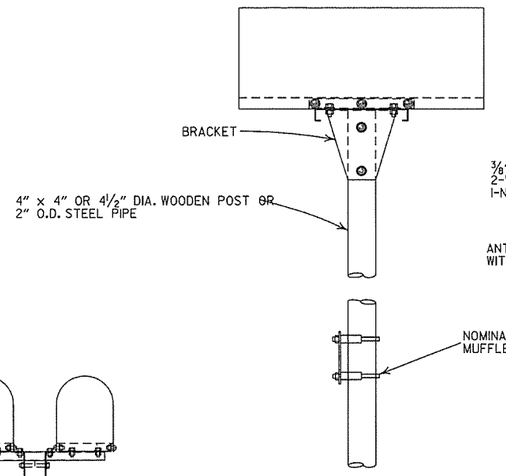
SINGLE INSTALLATION



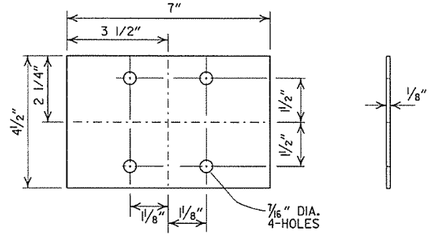
BRACKET

GENERAL NOTES

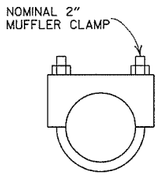
1. MAILBOX POSTS MAY BE WOOD OR METAL. WOOD POSTS SHALL BE PRESSURE TREATED FOR GROUND CONTACT IN ACCORDANCE WITH SECTION 637.02 OF THE STANDARD SPECIFICATIONS.
2. ANTI-TWIST PLATES SHALL BE USED ONLY ON METAL POSTS.
3. MAILBOX SHELF, BRACKET & PLATFORM SHALL BE GALVANIZED OR PAINTED STEEL, HOWEVER TREATED WOOD MAY BE USED WITH WOODEN POSTS. THE WOODEN SHELF, BRACKET & PLATFORM SHALL BE A MINIMUM OF ¾" THICK AND SHALL BE ASSEMBLED WITH BOLTS OF THE APPROPRIATE LENGTH WITH SIX 8 X¾" FLATHEAD WOOD SCREWS USED TO ATTACH THE MAILBOX TO THE PLATFORM.
4. THE MAILBOX SHELF AND PLATFORM THAT IS SHOWN IS FOR STANDARD SIZE MAILBOXES. THE SHELF AND PLATFORM SIZE SHALL BE MODIFIED TO FIT MAILBOXES OF A DIFFERENT SIZE.
5. METAL PIPE FOR MAILBOX SUPPORT SHALL BE 2" OUTSIDE DIAMETER STEEL WITH A WALL THICKNESS OF 0.145" AND A WEIGHT OF 2.72 LBS PER FT. OUTSIDE DIAMETER AND WEIGHT SHALL HAVE A TOLERANCE OF +/- 5% ACCORDING TO AASHTO M 181.
6. MAILBOX SUPPORT SYSTEM DIFFERING FROM THOSE SHOWN MAY BE USED, PROVIDED THEY ARE ON THE AHTD QUALIFIED PRODUCTS LIST FOR MAILBOX SUPPORTS.



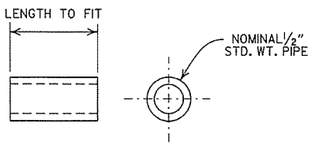
DOUBLE INSTALLATION



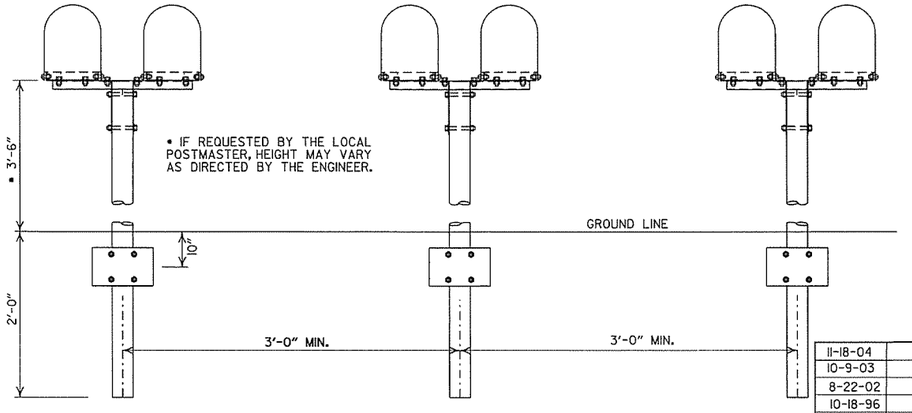
ANTI-TWIST PLATE



CLAMP



SPACER



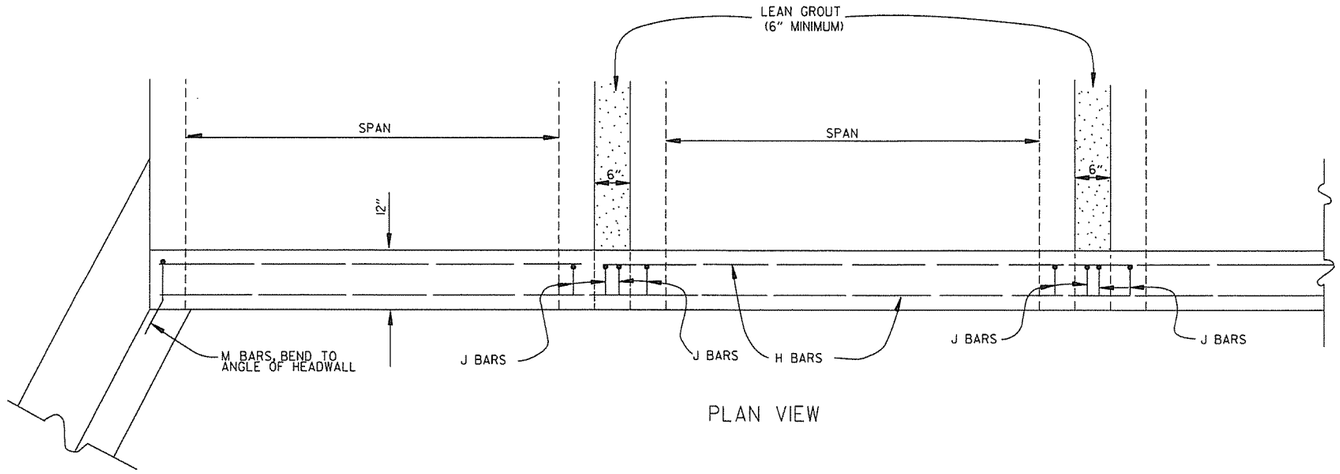
SPACING FOR MULTIPLE POST INSTALLATION

DATE	FILMED	REVISION
11-18-04		REVISED NOTES
10-9-03		REVISED NOTE 6
8-22-02		REVISED NOTE 6
10-18-96		CORRECTED AASHTO
10-1-92		CORRECTED SPELLING
9-26-91		NEW PHONE NUMBER
8-15-91		ADDED NOTE
11-30-89		ADJUSTED HEIGHT & ADDED NOTE
2-16-89		DELETED SLOTS FROM SHELF & PLTF
11-17-88	10-1-92	ADJUSTED DIMENSIONS OF STEEL POSTS
7-15-88	20-7-15-88	ISSUED

ARKANSAS STATE HIGHWAY COMMISSION

MAILBOX DETAILS

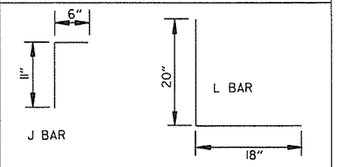
STANDARD DRAWING MB-1



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 3/4" CHAMFERS.

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

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

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

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

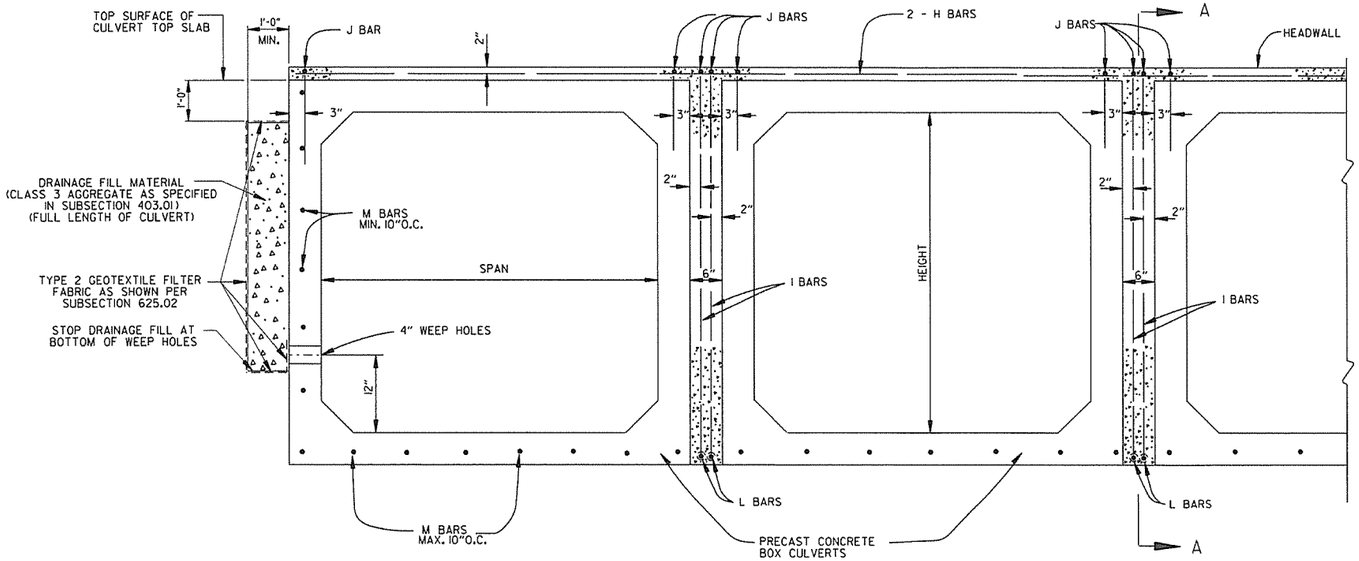
THE MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERNAL JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE CULVERT.

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

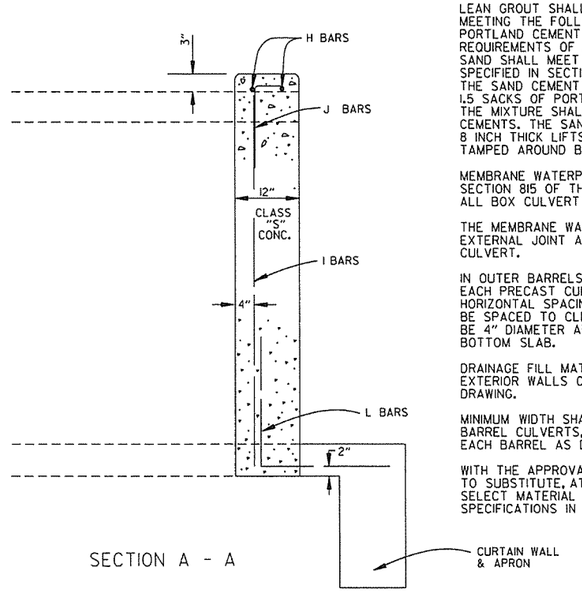
DRAINAGE FILL MATERIAL WITH GEOTEXTILE FABRIC IS REQUIRED AT THE EXTERIOR WALLS OF THE ASSEMBLED CULVERT, SEE DETAILS ON THIS DRAWING.

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

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



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.

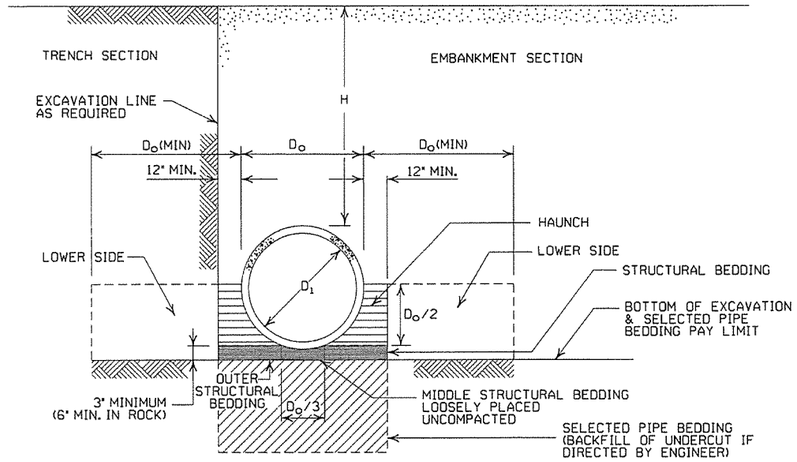
- LEGEND -

D_1 = 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.

GENERAL NOTES

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

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

	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.

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
		2 ⅔ 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

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	

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

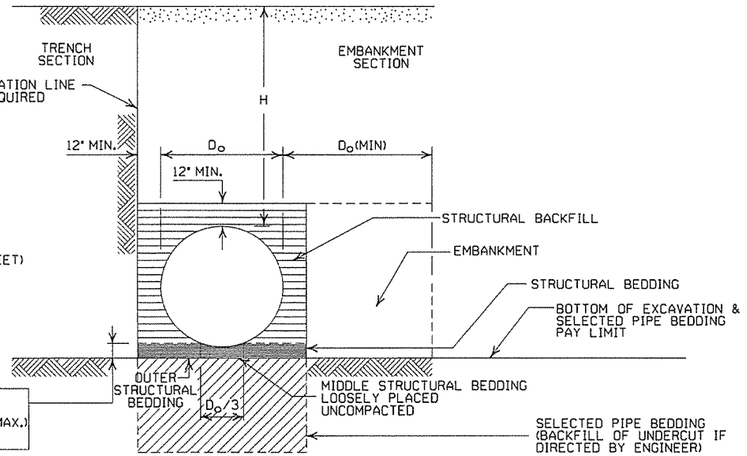
③ SM-3 WILL NOT BE ALLOWED.

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

- LEGEND -

D_o = OUTSIDE DIAMETER OF PIPE
MAX. = MAXIMUM
MIN. = MINIMUM
= STRUCTURAL BACKFILL MATERIAL
= UNDISTURBED SOIL
EQUIV. DIA. = EQUIVALENT DIAMETER
H = FILL COVER HEIGHT OVER PIPE (FEET)



EMBANKMENT AND TRENCH INSTALLATIONS

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

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.

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 1 INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.

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

MULTIPLE INSTALLATION OF HIGH DENSITY POLYETHYLENE PIPES

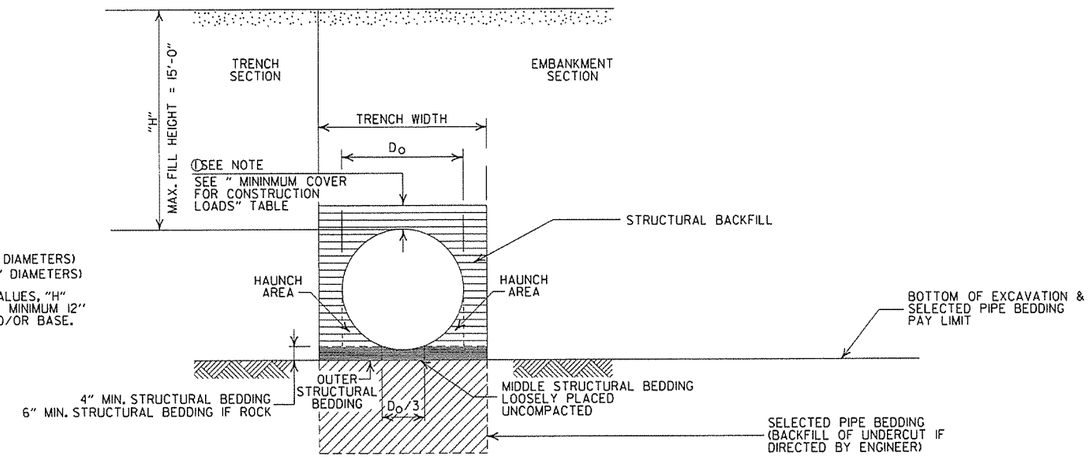
PIPE DIAMETER	CLEAR DISTANCE BETWEEN PIPES
18"	1'-6"
24"	2'-0"
30"	2'-6"
36"	3'-0"
42"	3'-6"
48"	4'-0"

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.



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.

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.

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"	TRENCH WIDTH (FEET) "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

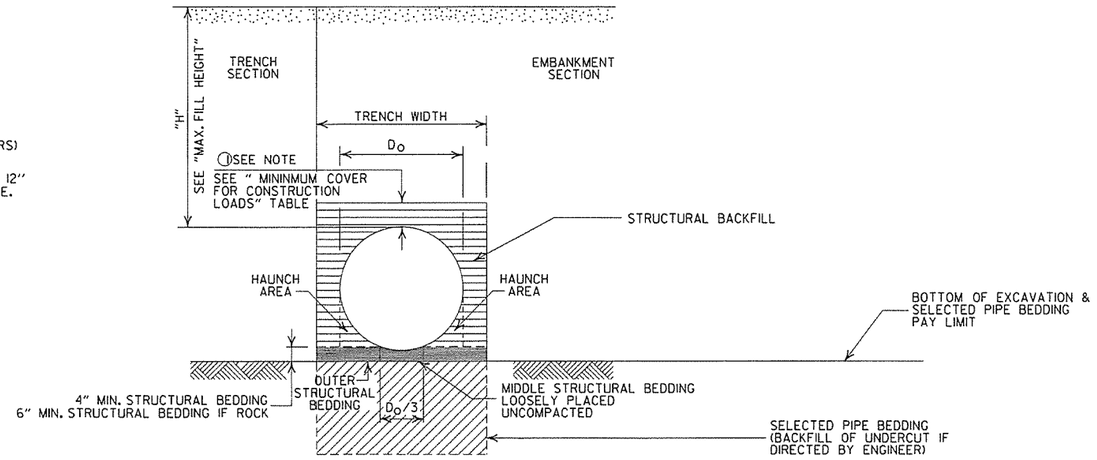
PIPE DIAMETER	"H"
18"	45'-0"
24"	45'-0"
30"	40'-0"
36"	40'-0"

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, EMBANKMEN ', 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	

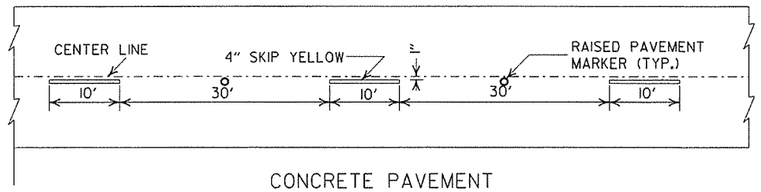
ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT (PVC F949)

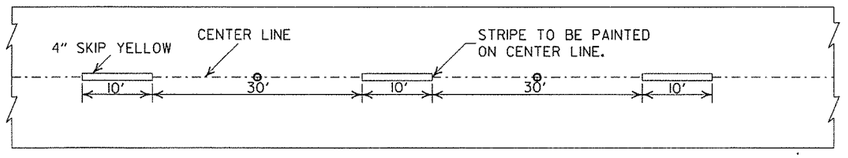
STANDARD DRAWING PCP-2

NOTES:

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

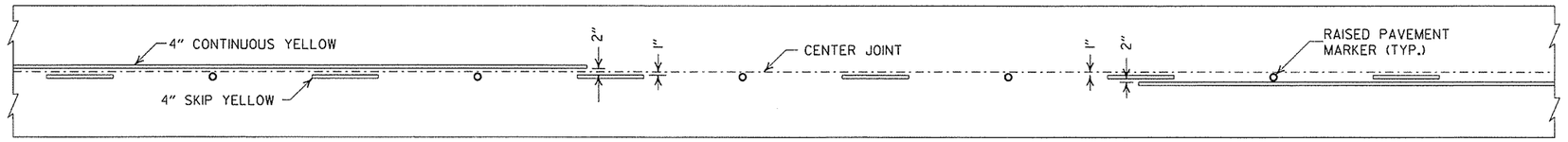


CONCRETE PAVEMENT

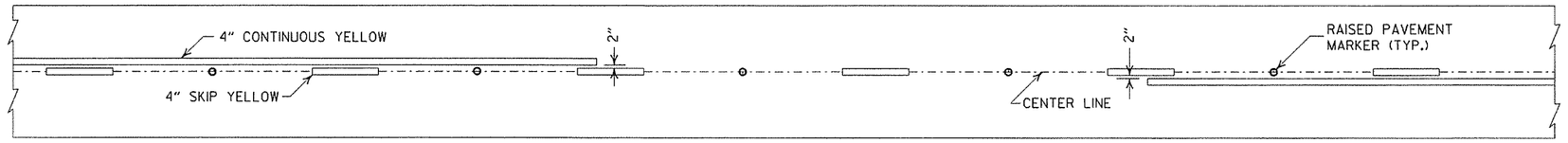


ASPHALT PAVEMENT

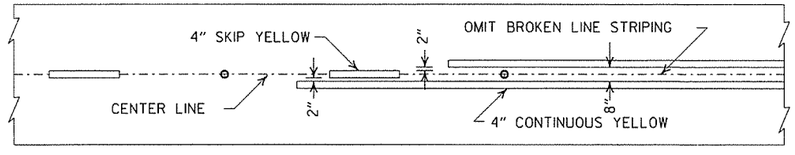
BROKEN LINE STRIPING



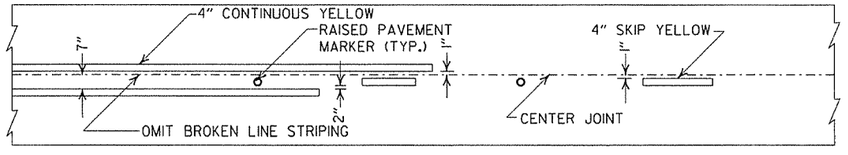
SOLID LINE STRIPING ON CONCRETE PAVEMENT



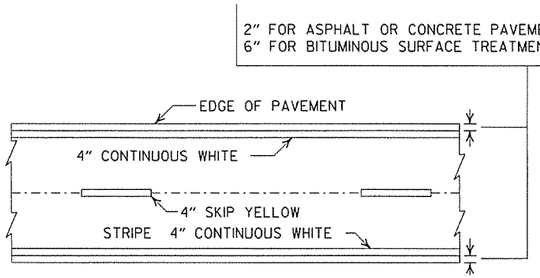
SOLID LINE STRIPING ON ASPHALT PAVEMENT



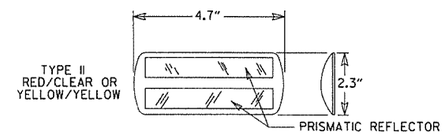
ASPHALT PAVEMENT



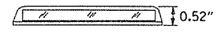
CONCRETE PAVEMENT



PAVEMENT EDGE LINE MARKING



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



DETAIL OF STANDARD RAISED PAVEMENT MARKERS

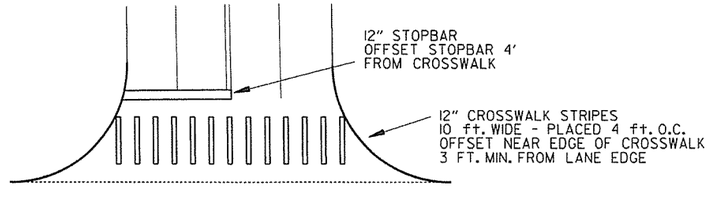
GENERAL NOTES:

THIS DRAWING SHOULD BE CONSIDERED AS TYPICAL ONLY AND THE FINAL LOCATION OF THE STRIPING AND RAISED PAVEMENT MARKERS SHALL BE DETERMINED BY THE ENGINEER.

THIS DRAWING SHOULD BE USED IN CONJUNCTION WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST REVISION.

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

STRIPING AT ADJACENT NO PASSING LANES



CROSSWALK AND STOPBAR DETAILS

DATE	REVISION	FILMED
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

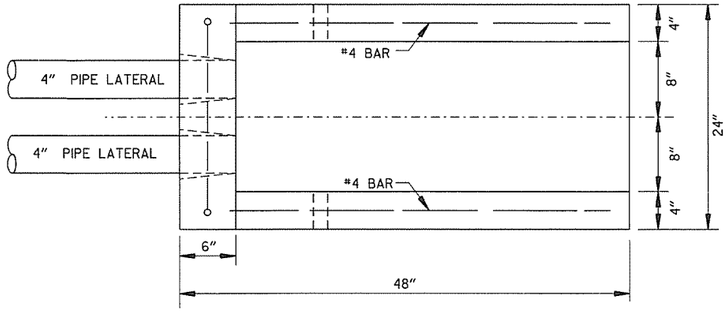
PAVEMENT MARKING DETAILS

STANDARD DRAWING PM-1

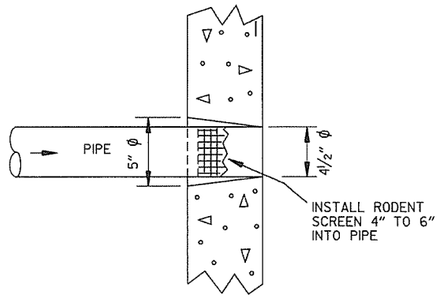
NOTE:
1. GRANULAR BACKFILL TO BE SUBSIDIARY TO PIPE UNDERDRAIN.

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

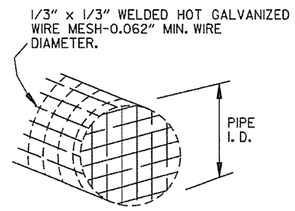
3. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. LAP FABRIC 12" OR THE WIDTH OF THE TRENCH AT THE TOP.



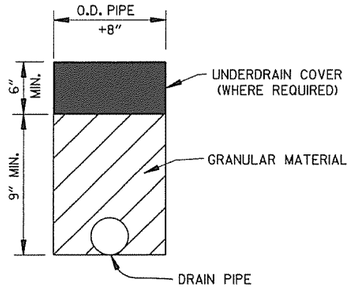
PLAN VIEW

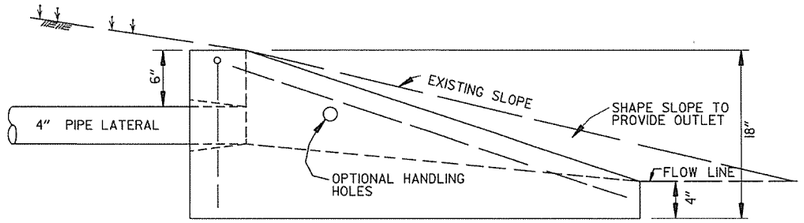


DETAIL OF HOLE FOR 4" PIPE

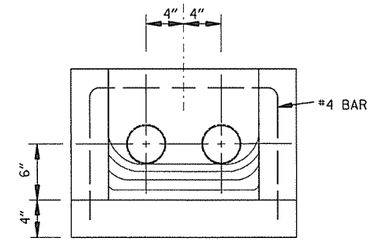


DETAIL OF RODENT SCREEN

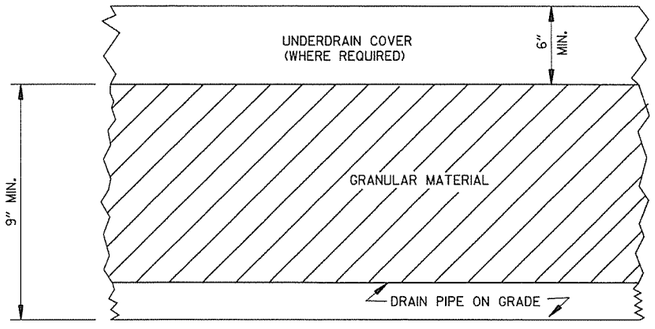




SIDE VIEW

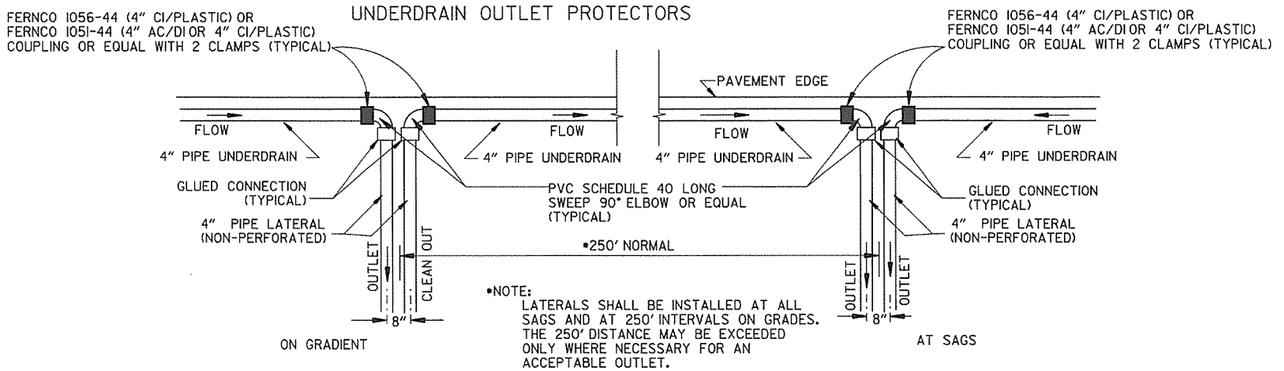


FRONT VIEW



DETAILS OF PIPE UNDERDRAIN

UNDERDRAIN OUTLET PROTECTORS



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
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

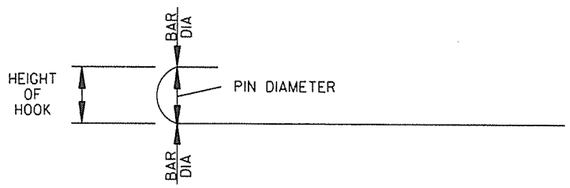
STANDARD DRAWING PU-1

7-20-95 INSTD.PUI

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

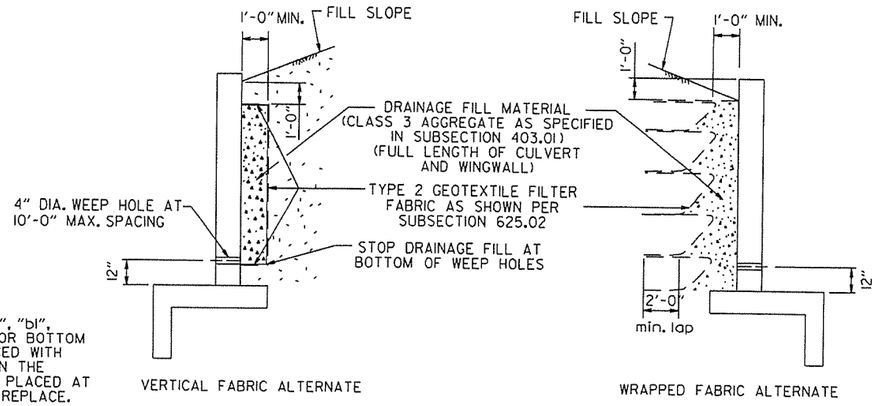
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

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.

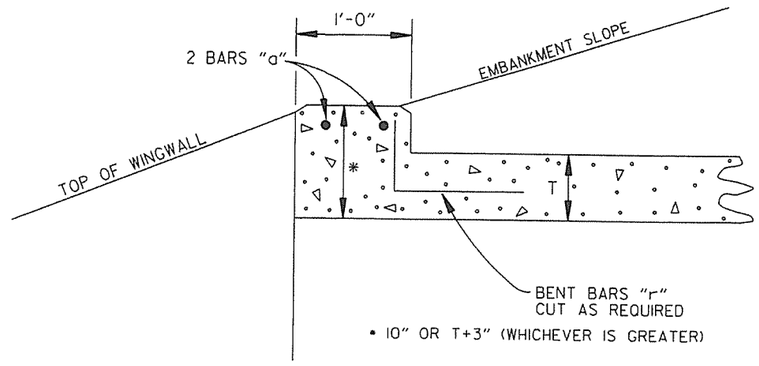
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

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.

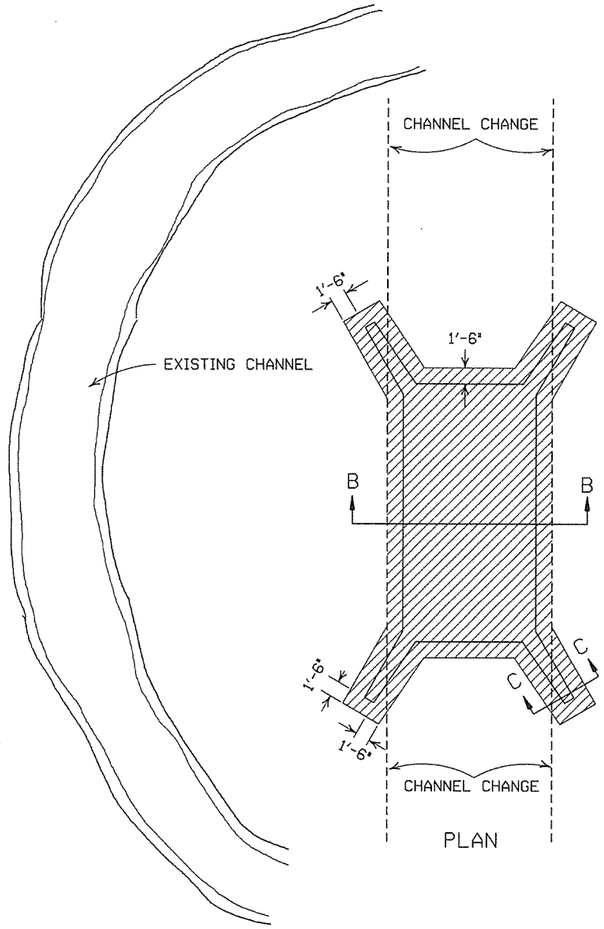
R.C. BOX CULVERT HEADWALL MODIFICATIONS

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

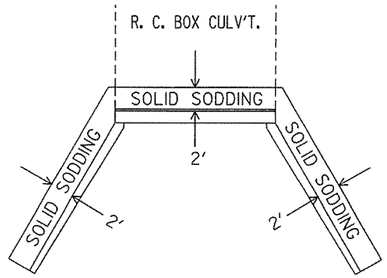
REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1



PLAN

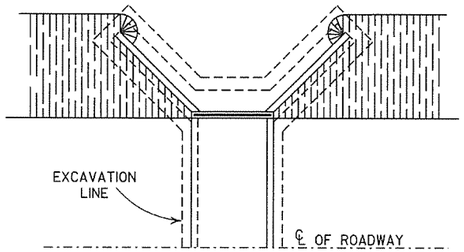
SOLID SODDING



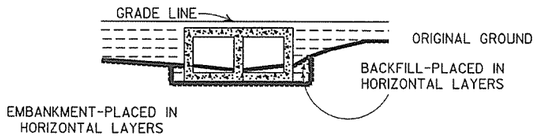
PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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

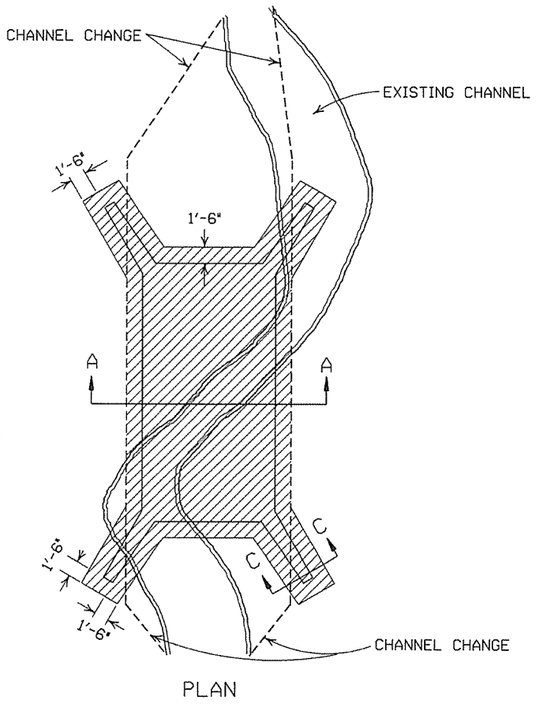


PLAN

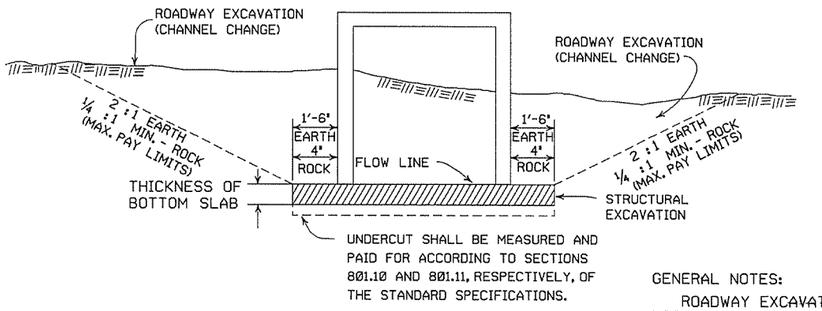


LONGITUDINAL SECTION

BACKFILL DETAILS FOR BOX CULVERT

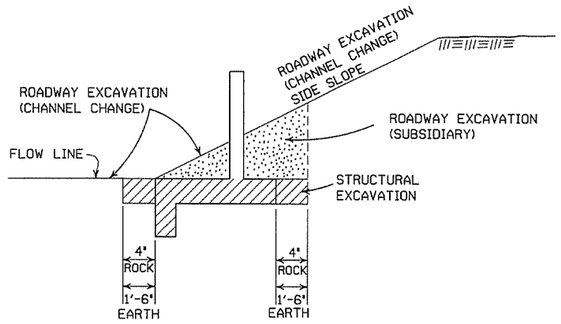


PLAN

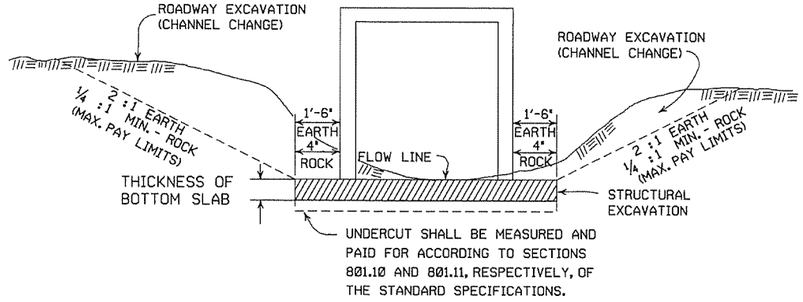


SECTION B-B

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

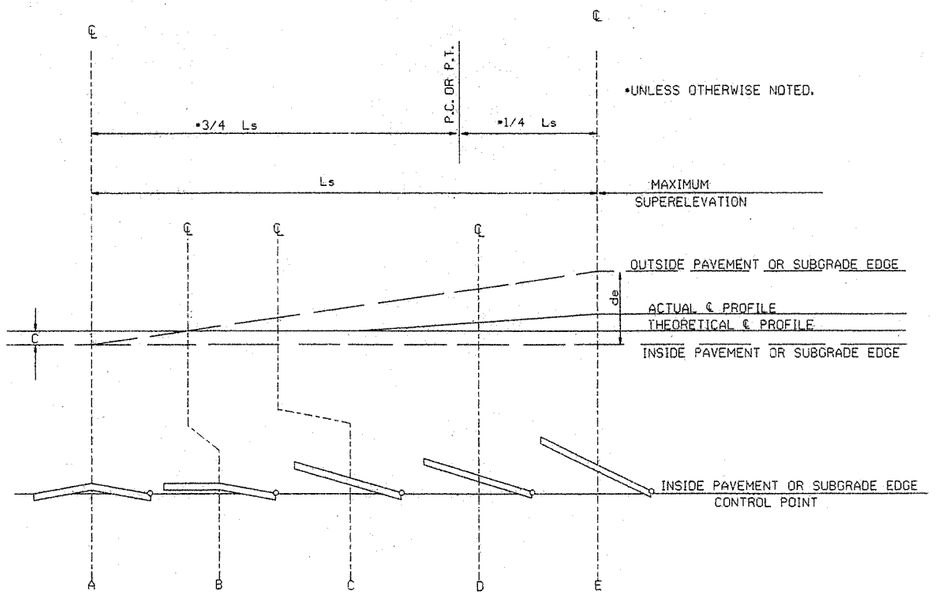
SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

DEGREE OF CURVE	30 MPH e	30 MPH Ls (FT) MINIMUM	30 MPH Ls (FT) DESIRABLE	40 MPH e	40 MPH Ls (FT) MINIMUM	40 MPH Ls (FT) DESIRABLE	50 MPH e	50 MPH Ls (FT) MINIMUM	50 MPH Ls (FT) DESIRABLE	55 MPH e	55 MPH Ls (FT) MINIMUM	55 MPH Ls (FT) DESIRABLE	60 MPH e	60 MPH Ls (FT) MINIMUM	60 MPH Ls (FT) DESIRABLE	70 MPH 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		300	0.049		300	0.062		
2° 00′	R.C.			0.028			0.040		250	0.048			0.055			0.070		
2° 15′	R.C.			0.031			0.045			0.053			0.061			0.078	300	
2° 30′	0.021			0.034			0.049			0.058			0.067			0.085	315	350
2° 45′	0.023			0.037		200	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	400
3° 15′	0.027	150		0.043			0.061			0.072	245		0.082	275		0.098	360	
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		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	350						
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.

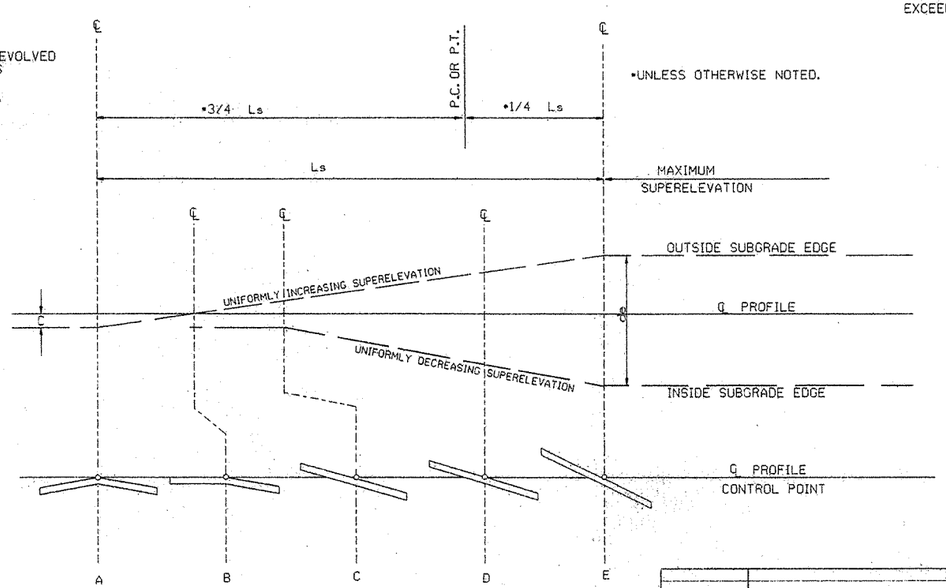
GENERAL NOTES

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

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

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

ARKANSAS STATE HIGHWAY COMMISSION

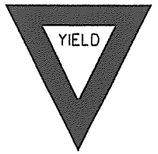
TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

STANDARD DRAWING SE-2

R1-1

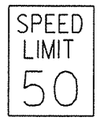
STANDARD 30"X30"
EXPRESSWAY 36"X36"
SPECIAL 48"X48"

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"

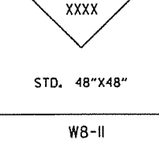
R4-1

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

R4-2

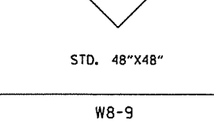
STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

R5-1



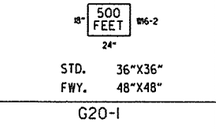
STD. 30"X30"
EXPWY. 36"X36"
SPECIAL 48"X48"

RII-2



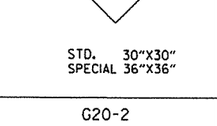
48"X30"

RII-3A



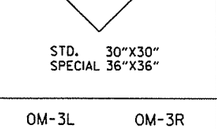
60"X30"

RII-4



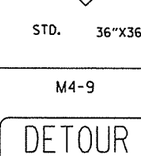
60"X30"

RSP-1



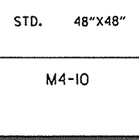
48"X30"

WI-1



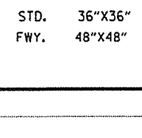
STD. 36"X36"
FWY. 48"X48"

WI-2



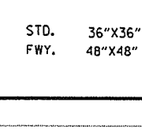
STD. 36"X36"
FWY. 48"X48"

WI-3



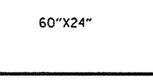
STD. 48"X48"

WI-4



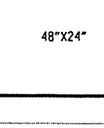
STD. 48"X48"

WI-6



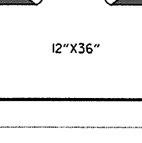
STD. 48"X24"
SPECIAL 60"X30"

WI-8



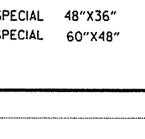
STD. 18"X24"
SPECIAL 24"X30"
EXPWY. 30"X36"
FWY. 36"X48"

W3-1



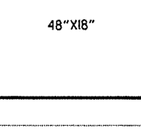
STD. 36"X36"
SPECIAL 48"X48"

W3-2



STD. 36"X36"
SPECIAL 48"X48"

W4-2



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

W5-1

STD. 36"X36"
SPECIAL 48"X48"

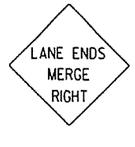
W6-3

EXPWY. 36"X36"
SPECIAL 48"X48"

W8-7

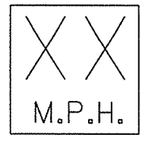
EXPWY. 36"X36"
FWY. 48"X48"

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"

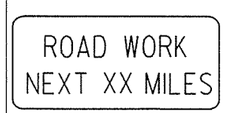
W8-11

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

W8-9

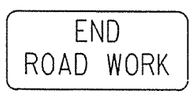
STD. 36"X36"
FWY. 48"X48"

G20-1



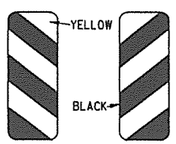
60"X24"

G20-2



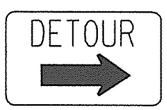
48"X24"

OM-3L OM-3R



12"X36"

M4-9

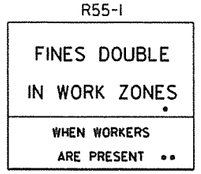


STD. 30"X24"
SPECIAL 48"X36"
SPECIAL 60"X48"

M4-10

48"X18"

R55-1



36"X60"
• USE 6" C LETTERS
•• USE 4" D LETTERS

ADVANCE DISTANCES
(XXXX)

500 FT	½ MILE
1000 FT	¾ 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.

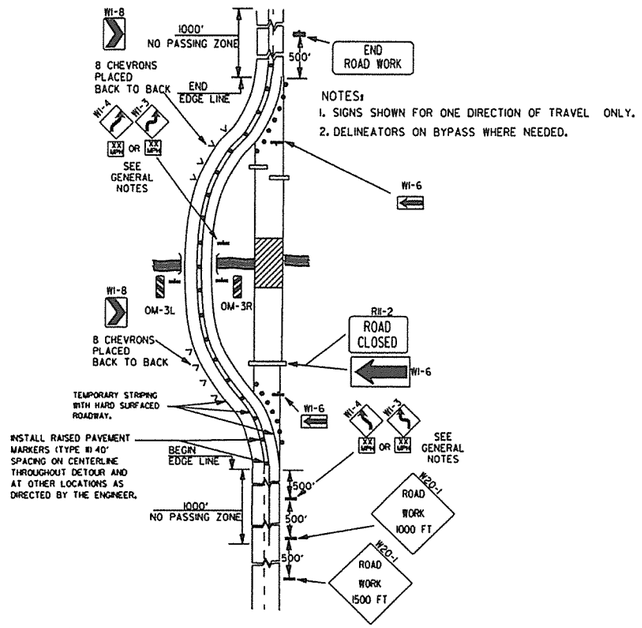
• NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY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

DATE	REVISION	FILMED
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

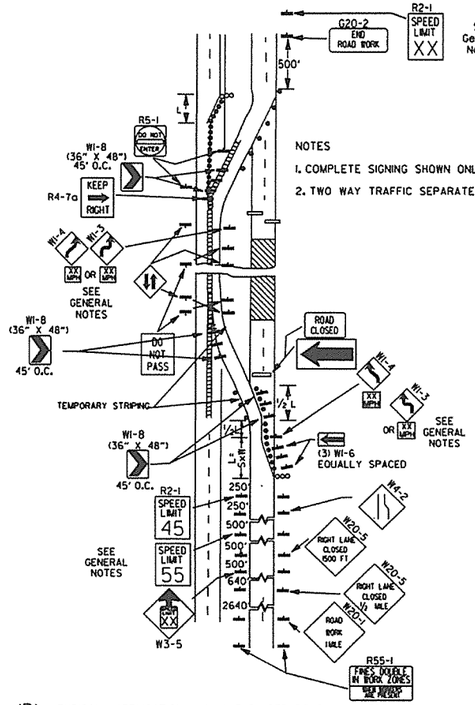
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



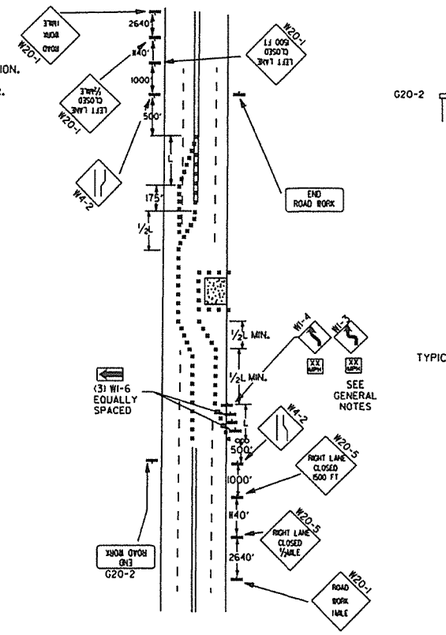
NOTES:
1. SIGNS SHOWN FOR ONE DIRECTION OF TRAVEL ONLY.
2. DELINEATORS ON BYPASS WHERE NEEDED.

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

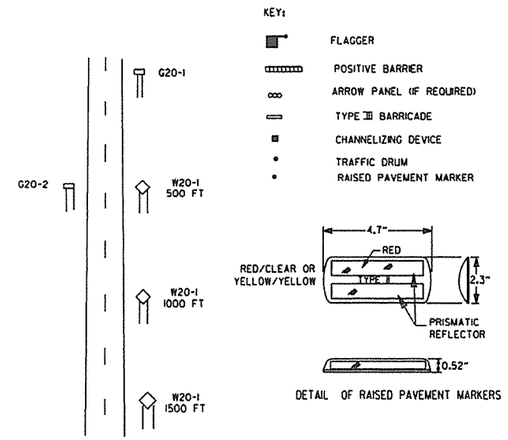


NOTES
1. COMPLETE SIGNING SHOWN ONLY IN CROSSOVER DIRECTION.
2. TWO WAY TRAFFIC SEPARATED WITH POSITIVE BARRIER.

(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.



DETAIL OF RAISED PAVEMENT MARKERS

TYPICAL ADVANCE WARNING SIGN PLACEMENT

TAPER FORMULAE:

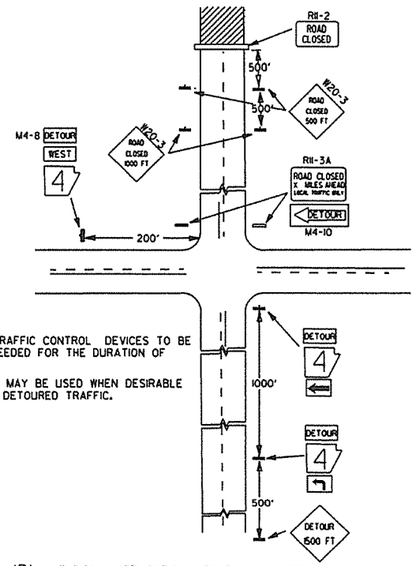
L=SXW FOR SPEEDS OF 45MPH OR MORE.

$L = \frac{WS^2}{60}$ 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.

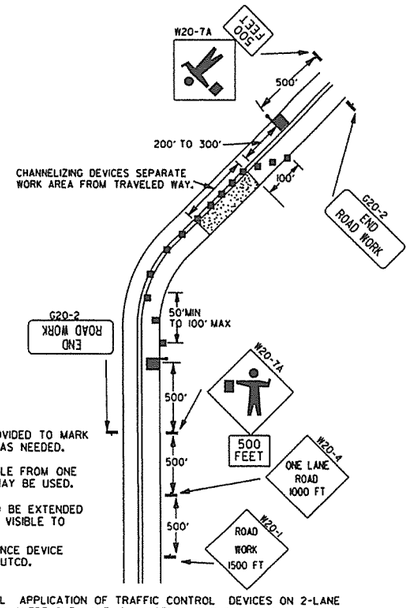
GENERAL NOTES:

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.



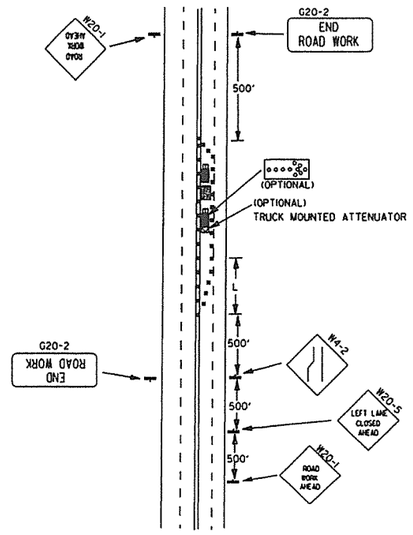
NOTES:
1. REGULATORY TRAFFIC CONTROL DEVICES TO BE MODIFIED AS NEEDED FOR THE DURATION OF THE DETOUR.
2. STREET NAMES MAY BE USED WHEN DESIRABLE FOR DIRECTING DETOURED TRAFFIC.

(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.



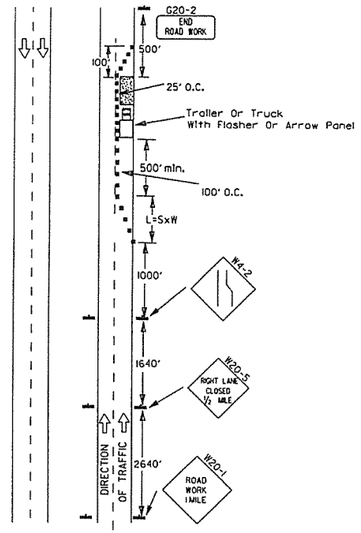
(F) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WITH INSIDE LANE CLOSED.

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	
3-8-10	ADDED (AFAD)	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED GENERAL NOTE	
10-18-96	ADDED R55-1	
4-26-96	CORRECTED (G) 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	

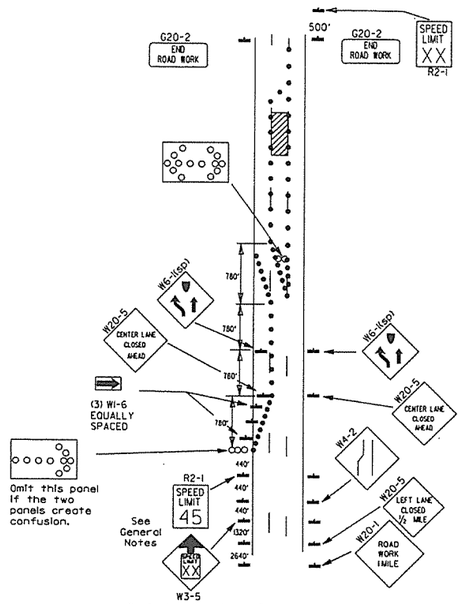
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

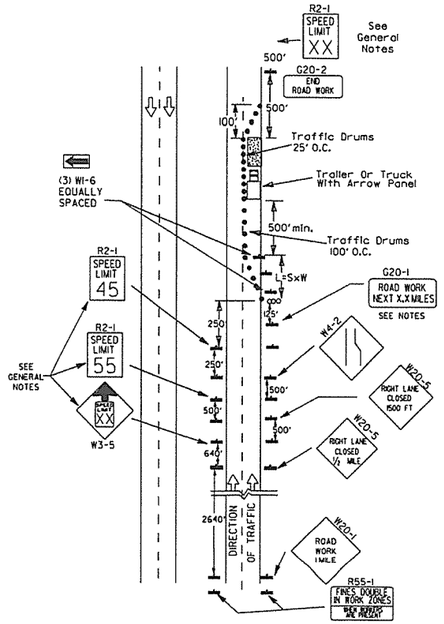
STANDARD DRAWING TC-2



(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.

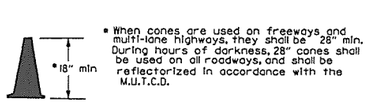
KEY:

- ○○○ Arrow Panel (If Required)
- ■ Channelizing Device
- ● Traffic drum

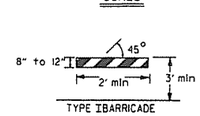
GENERAL NOTES:

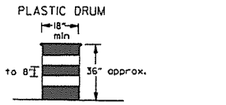
1. A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the W3-5 shall be installed at that location. Additional 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.

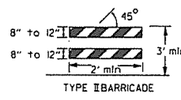
Channelizing devices

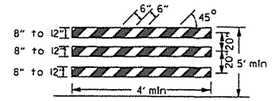


* When cones are used on freeways and multi-lane highways, they shall be 28" min. During hours of darkness, 28" cones shall be used on all roadways, and shall be reflectorized in accordance with the M.U.T.C.D.

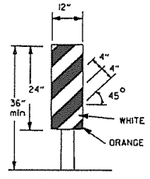








NOTE: For all road closures, the Type III barricades shall be of sufficient length to extend across entire roadway.

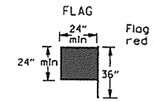


TRAFFIC CONTROL DEVICES FOR VERTICAL PAVEMENT DIFFERENTIALS

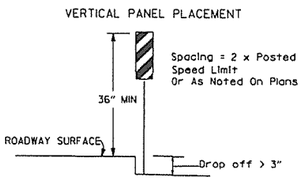
VERTICAL DIFFERENTIAL	LOCATIONS	TRAFFIC CONTROL
1" to 3"	Centerline, lane lines	W8-11
1" to 3"	Edge of shoulder	W8-9
Greater than 3"	Lane lines	Standard lane closure required
Greater than 3"	Edge of traveled lane	*RSP-1 and vertical panels, drums or concrete barrier
Greater than 3"	Edge of shoulder	*Vertical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

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

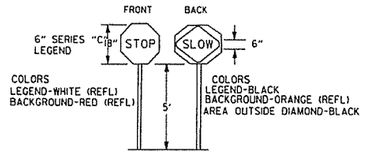
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.

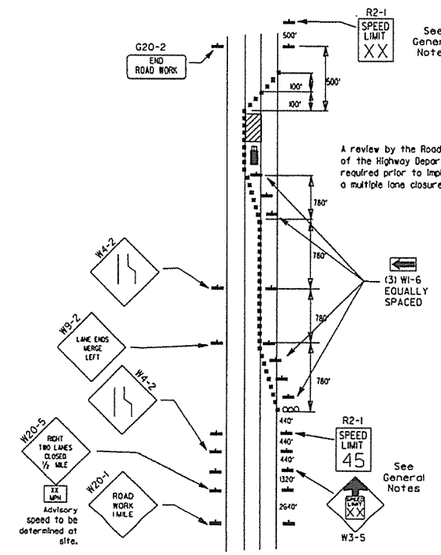


Flag shall be of good grade red material



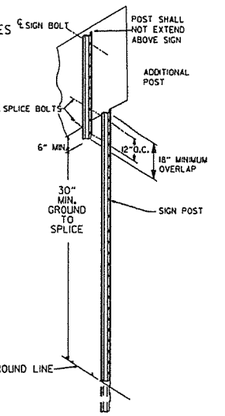
Spacing = 2 x Posted Speed Limit Or As Noted On Plans





(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	

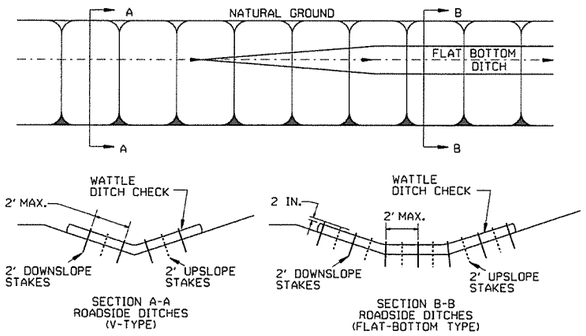
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

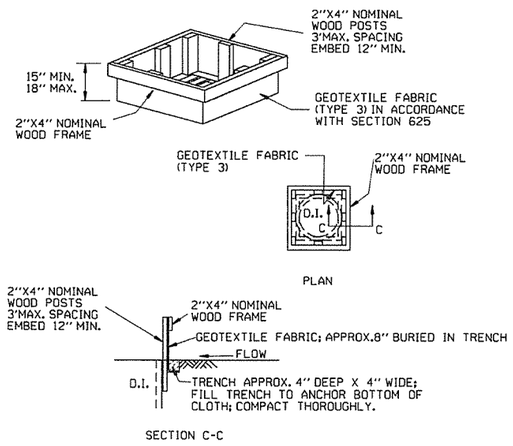
STANDARD DRAWING TC-3

GENERAL NOTES

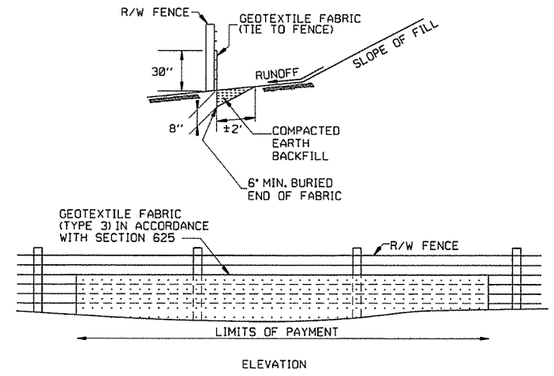
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



WATTLE DITCH CHECK (E-1)



DROP INLET SILT FENCE (E-7)



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

GENERAL NOTES

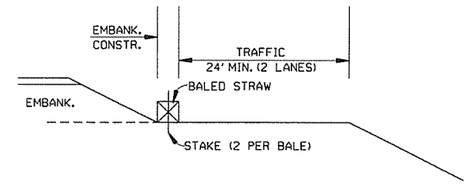
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST, OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

GENERAL NOTES

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

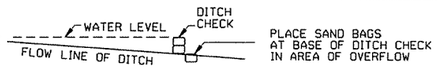
2. NO GAPS SHALL BE LEFT BETWEEN BALES.

3. BALED STRAW FILTER BARRIERS COMPLETED AND ACCEPTED WILL BE MEASURED BY THE BALE IN PLACE AS AUTHORIZED BY THE ENGINEER AND WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER BALE FOR BALED STRAW DITCH CHECKS.

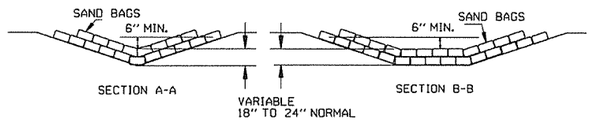


BALED STRAW FILTER BARRIER (E-2)

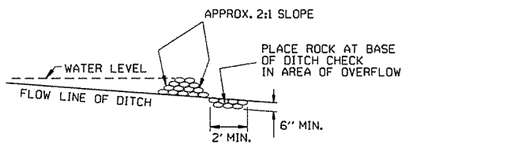
NUMBER OF SAND BAGS AND ARRANGEMENT VARIABLE WITH ON-SITE CONDITIONS.

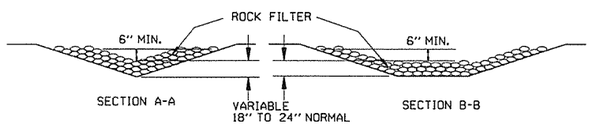


PLACE SAND BAGS AT BASE OF DITCH CHECK IN AREA OF OVERFLOW

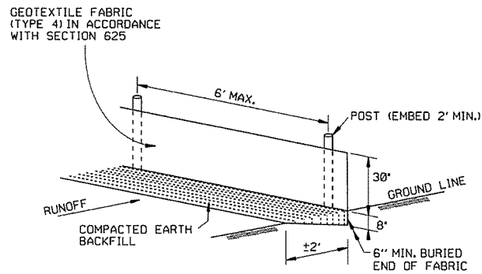


SAND BAG DITCH CHECK (E-5)





ROCK DITCH CHECK (E-6)



SILT FENCE (E-11)

GENERAL NOTES

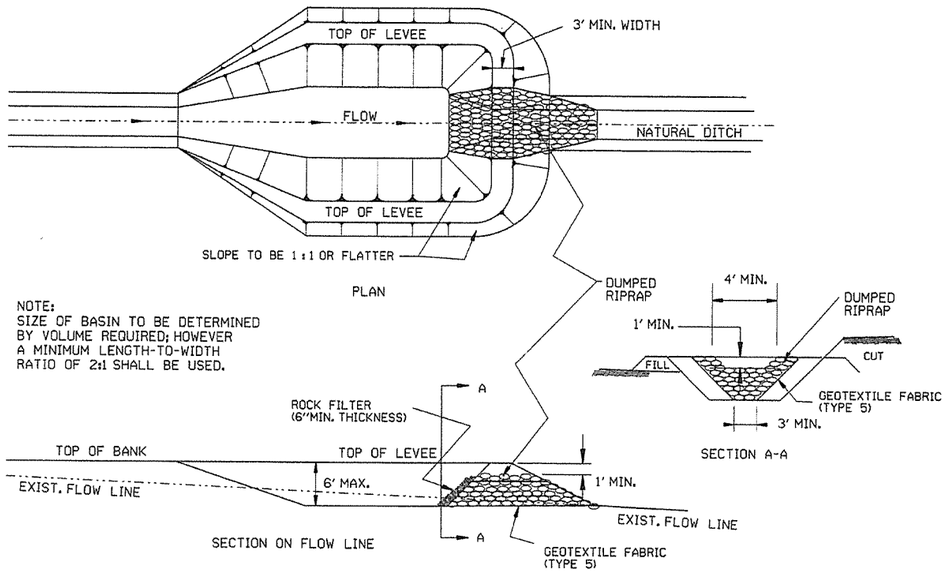
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

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

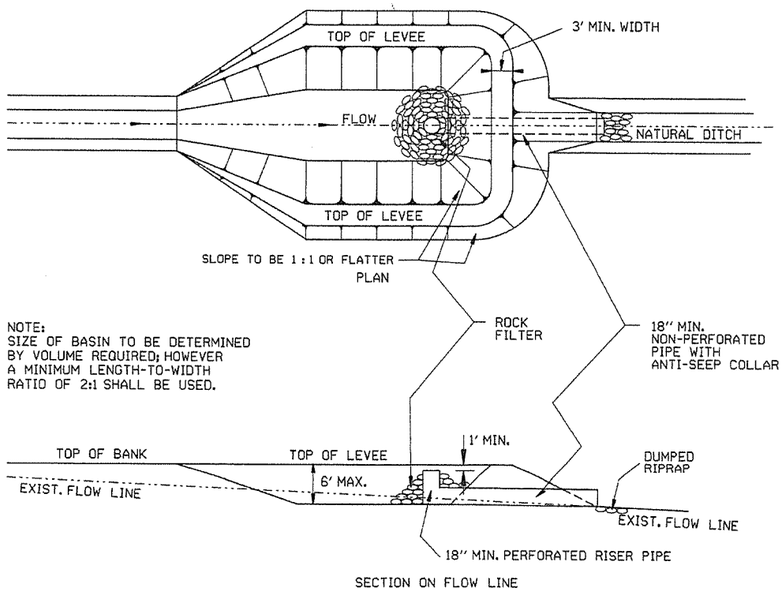
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

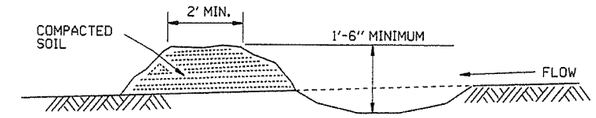
STANDARD DRAWING TEC-1



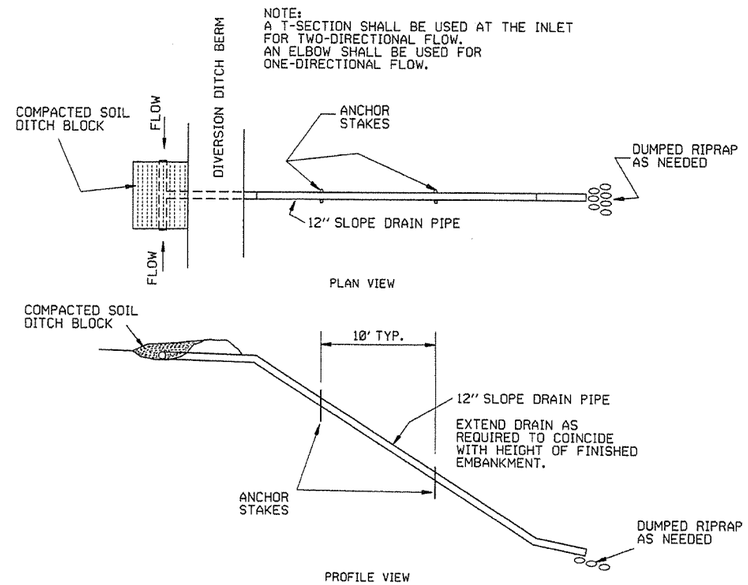
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



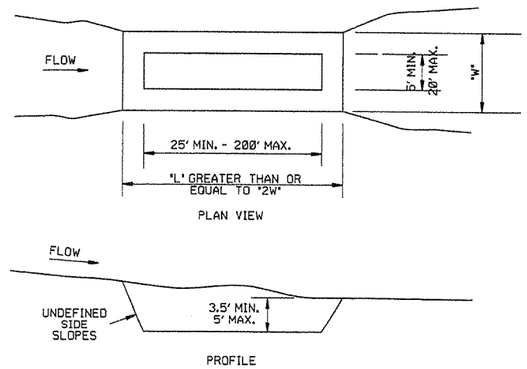
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



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

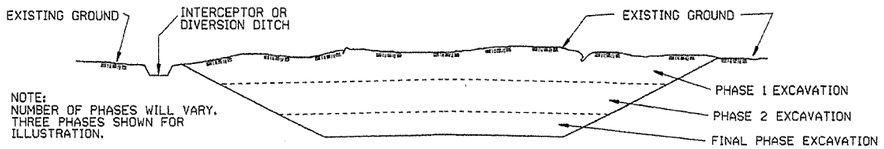
STANDARD DRAWING TEC-2

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



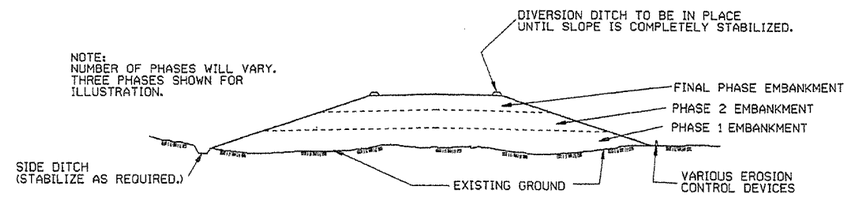
GENERAL NOTE

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

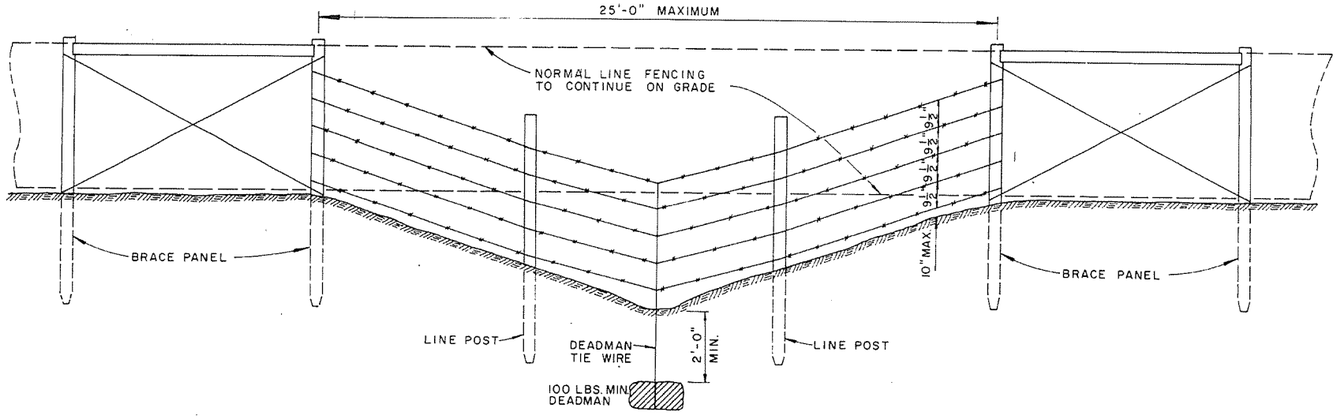
1. CONSTRUCT DIVERSION DITCHES, DITCH CHECKS, SEDIMENT BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD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

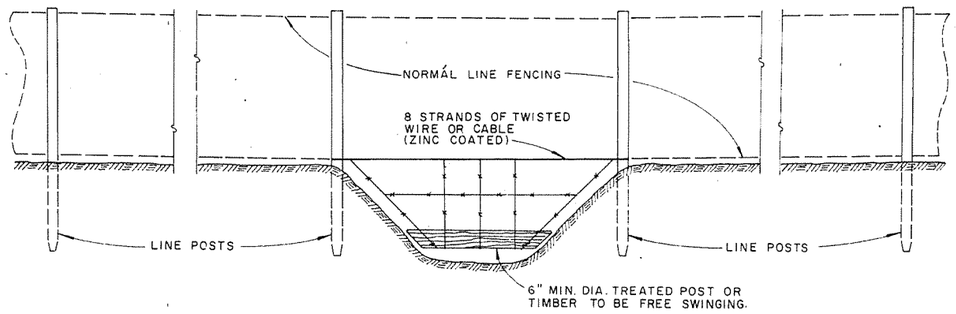
DATE	REVISION	FILMED
11-03-94	CORRECTED SPELLING	
6-2-94	Drawn & Issued	6-2-94

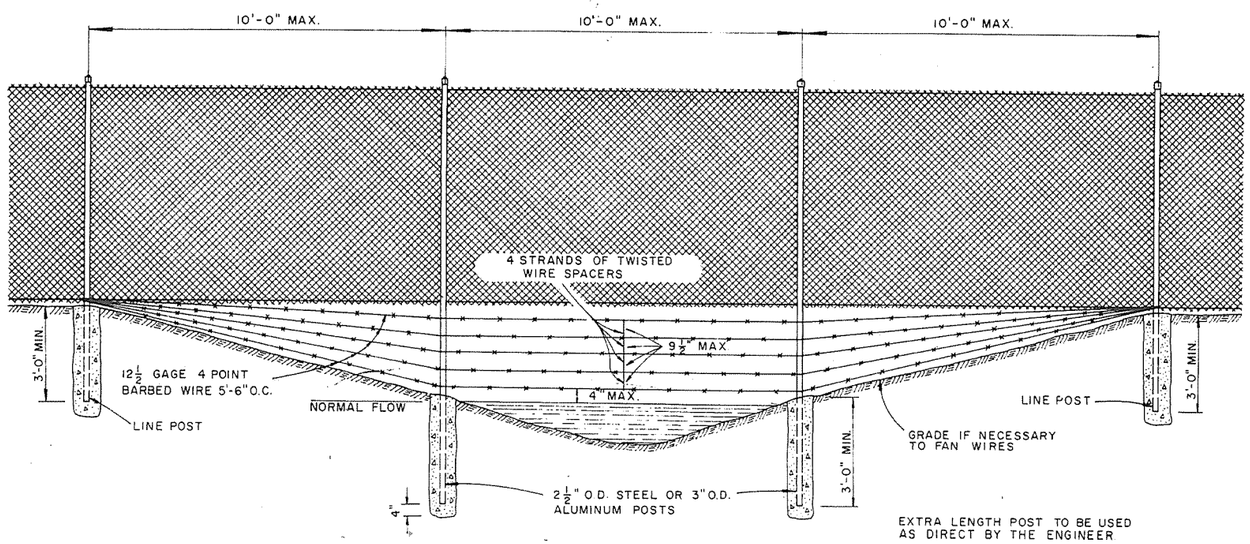
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-3







GENERAL NOTES:

THESE INSTALLATIONS TO BE USED WHERE NORMAL FENCING INSTALLATION WOULD CAUSE THE COLLECTING OF DRIFT IN THE CHANNEL OR THE DEPRESSION WILL NOT PERMIT NORMAL INSTALLATION. INSTALLATIONS WILL BE MADE ONLY WHERE DIRECTED BY THE ENGINEER.

WHEN A FENCE LINE APPROACHES A DITCH, GULLY OR DEPRESSION, THE LAST POST ON LEVEL GROUND SHALL BE PLACED CLOSE ENOUGH TO THE EDGE OF THE DROP OFF THAT THE FENCE MAY BE STRUNG TO THE POST IN THE DEPRESSION WITHOUT TOUCHING THE GROUND.

IN TERRAIN OF SUCH EXTREME IRREGULARITY THAT MINOR GRADING WILL NOT BE FEASIBLE, THE NORMAL FENCE SHALL CONTINUE ON GRADE AND THE GULLIES OR DEPRESSIONS TREATED BY AUXILIARY FENCES AS SHOWN.

PAYMENT FOR THE TYPE INSTALLATION USED WILL NOT BE MADE DIRECTLY BUT WILL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR WIRE FENCE OR CHAIN LINK FENCE.

4-20-79	REVISED TOP RAIL & TENSION WIRE	696-4-20-79
10-2-72	REVISED & REDRAWN	529-10-2-72
DATE	REVISION	DATE FILM'D.

ARKANSAS STATE HIGHWAY COMMISSION

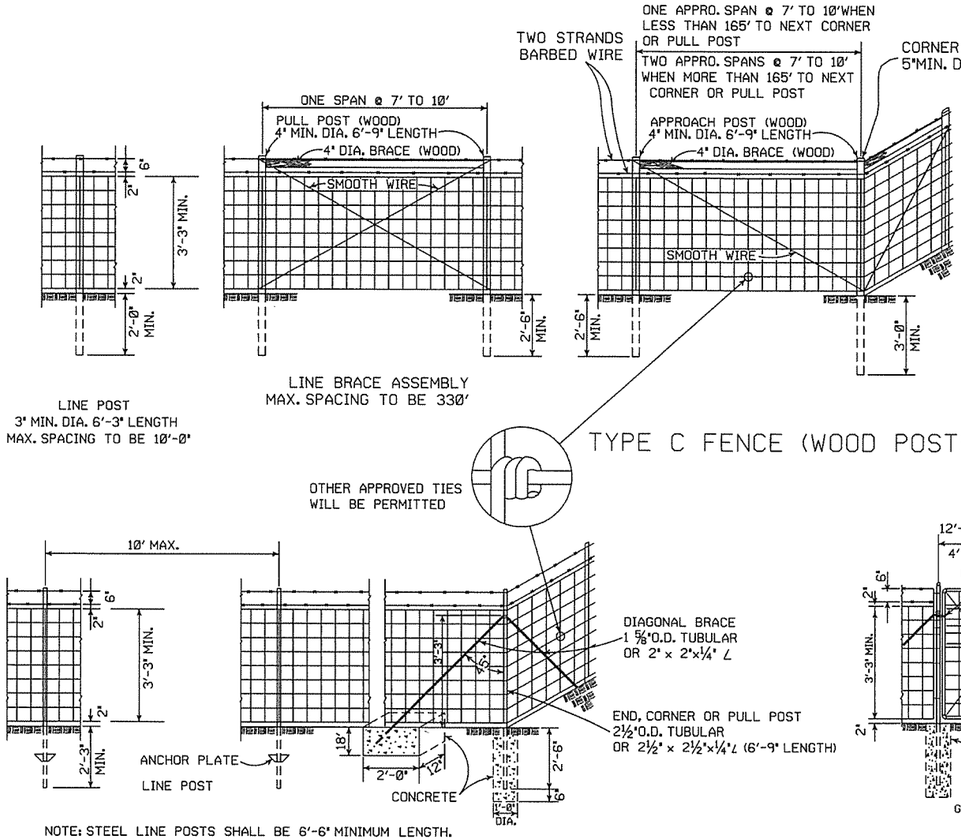
WIRE FENCE WATER GAPS

STANDARD DRAWING

WF-2

73

1M—11-71—67001—PPASCo



GENERAL NOTES:

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

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

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

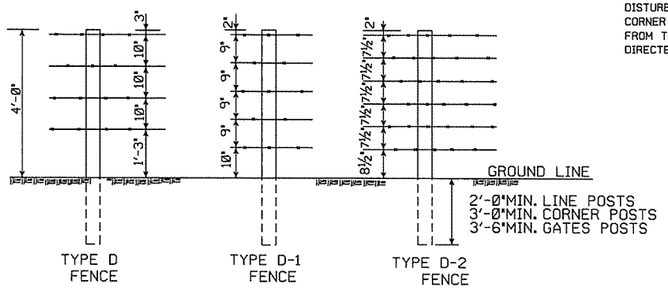
AT STREAM CROSSINGS, THE FENCE SHALL NOT BE CONSTRUCTED ACROSS LARGE STREAMS. WHERE CLEARANCE IS SUFFICIENT FROM THE TOP OF THE BANK TO THE BRIDGE STRUCTURE A CROSS CONNECTION SHALL BE CONSTRUCTED BETWEEN THE FENCE ON EACH SIDE OF THE ROAD. WHERE THE CLEARANCE IS NOT SUFFICIENT, THE FENCE SHALL BE TERMINATED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

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

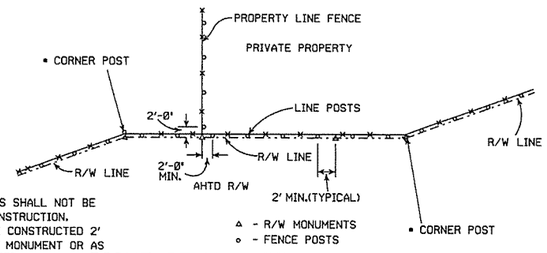
SPLICE FOR WOVEN WIRE BETWEEN PULL POST SHALL BE BY THE "WESTERN UNION METHOD" AS DESCRIBED AS FOLLOWS: THE VERTICAL WIRES FOR EACH END OF THE FENCE FABRIC SHALL BE PLACED SIDE BY SIDE AND THE PROJECTING HORIZONTAL WIRES SHALL BE WRAPPED A MINIMUM OF 4 TIMES AROUND THE HORIZONTAL WIRES OF THE FIRST WEB.

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

TYPE C FENCE (STEEL POSTS)

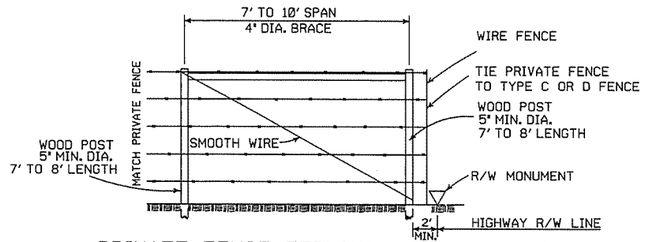


NOTE: SPACING AND SIZE (EXCEPT LENGTH) OF POSTS, APPROACH SPANS, PULL POST ASSEMBLIES, AND CORNER BRACING FOR TYPE D FENCE SHALL CONFORM TO TYPE C FENCE. USE GALVANIZED STAPLES ON WOOD POSTS AND APPROVED FASTENERS ON STEEL POSTS.



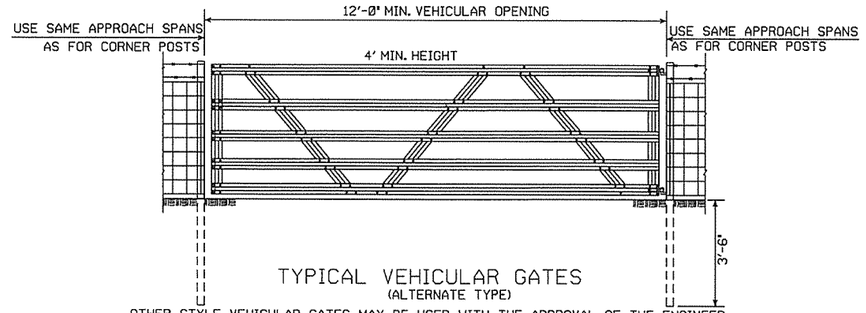
• NOTE: RIGHT-OF-WAY MONUMENTS SHALL NOT BE DISTURBED BY FENCE CONSTRUCTION. CORNER POSTS SHALL BE CONSTRUCTED 2' FROM THE RIGHT-OF-WAY MONUMENT OR AS DIRECTED BY THE ENGINEER.

RIGHT-OF-WAY FENCE LOCATION



PRIVATE FENCE TERMINAL INSTALLATION

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



TYPICAL VEHICULAR GATES

(ALTERNATE TYPE)

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

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

ARKANSAS STATE HIGHWAY COMMISSION

WIRE FENCE TYPE C AND D

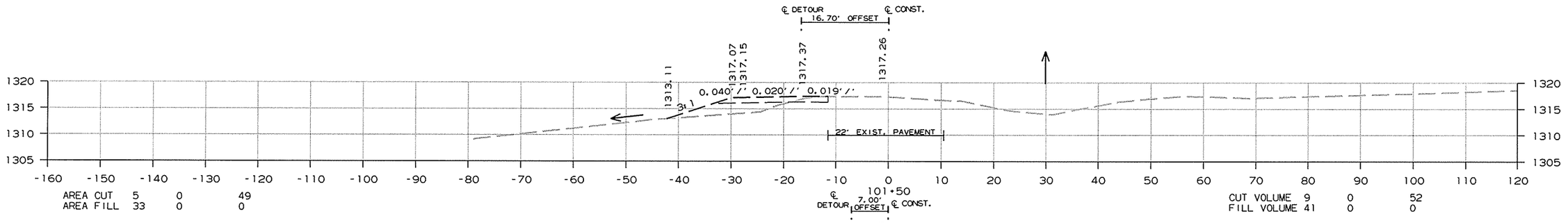
STANDARD DRAWING WF-4

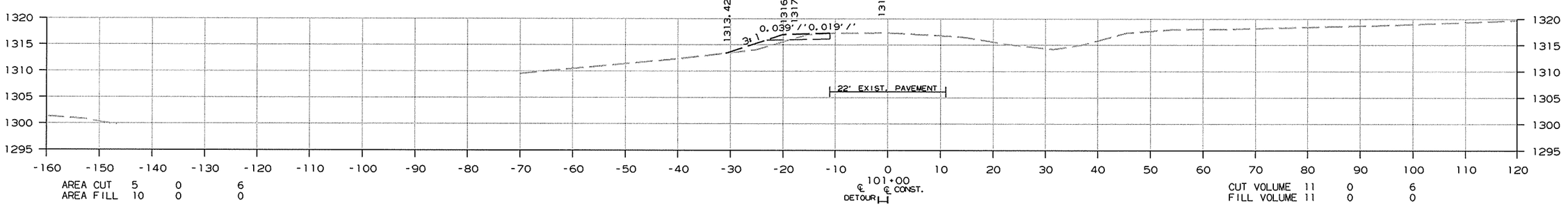
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	111	141

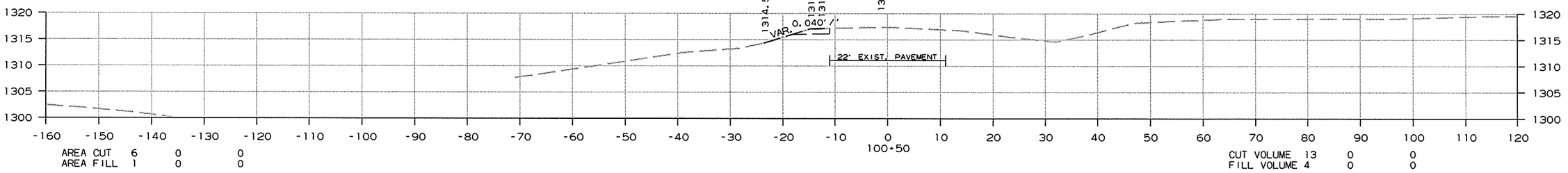
(2) CROSS SECTIONS

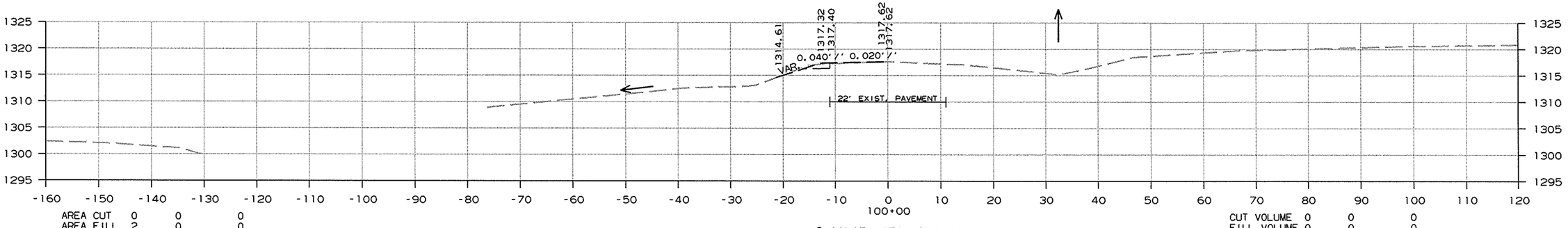
STAGE 1: STAGE 2: STAGE 3:

STAGE 1: STAGE 2: STAGE 3:









℄ CONST. STA. 100+00
℄ DETOUR STA. 500+00 - BEGIN DETOUR 1

CROSS SECTION STA. 100+00 TO STA. 101+50

4/20/2015

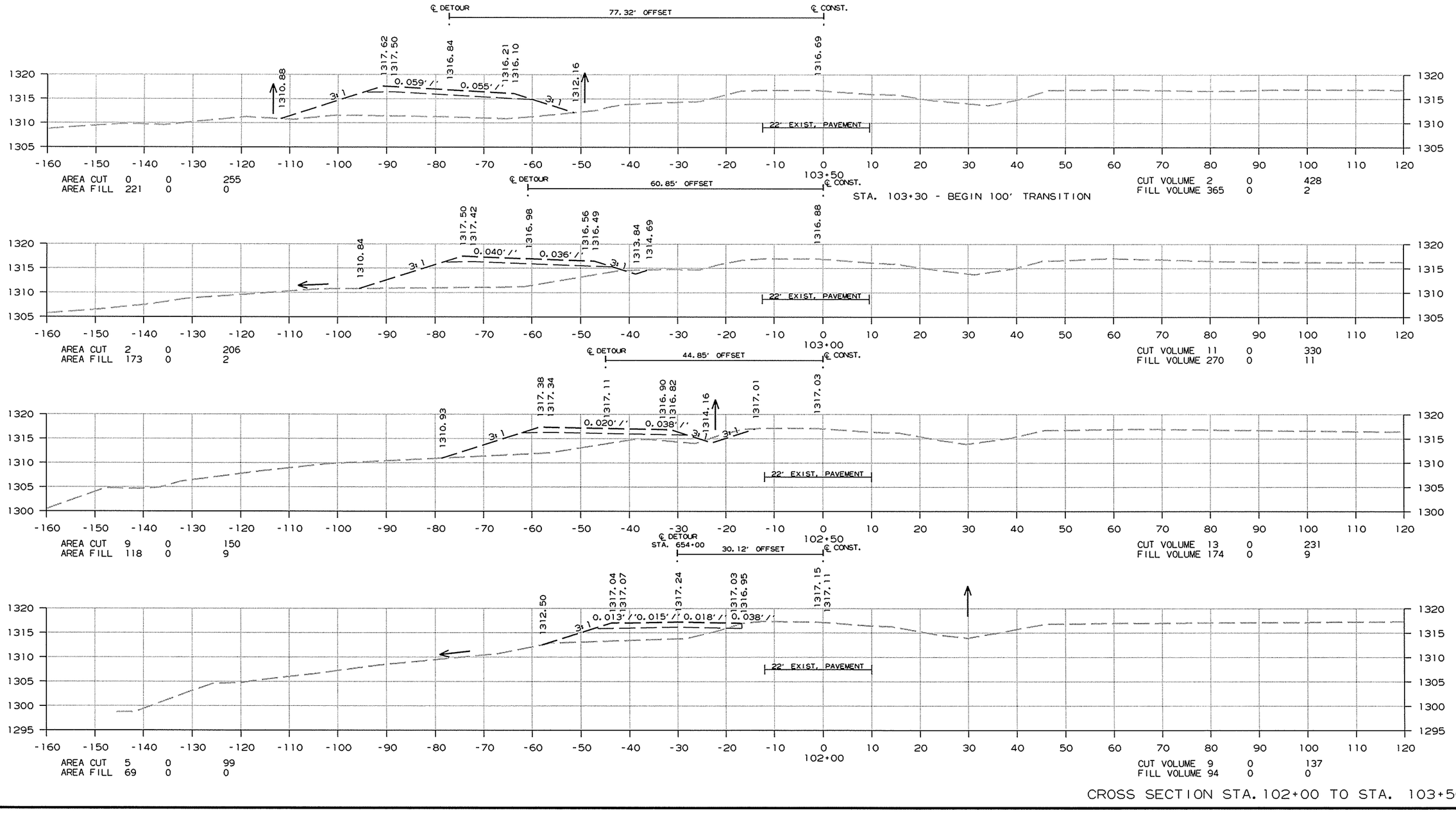
R090343.DGN

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.		090343	112	141

(2) CROSS SECTIONS

STAGE 1: STAGE 2: STAGE 3:

STAGE 1: STAGE 2: STAGE 3:



CROSS SECTION STA. 102+00 TO STA. 103+50

4/20/2015

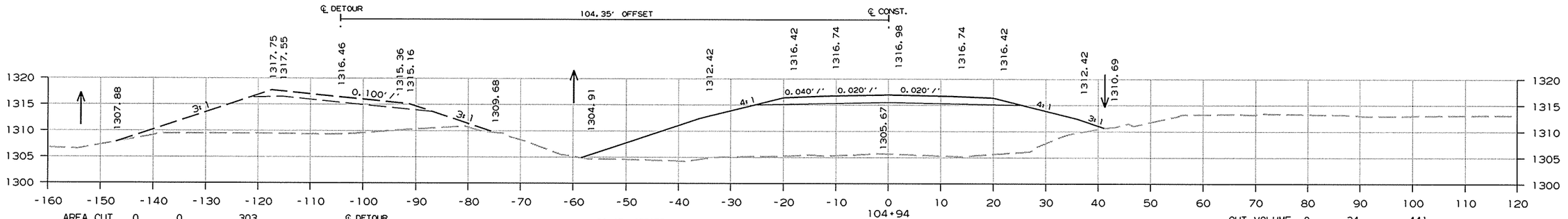
R090343.DGN

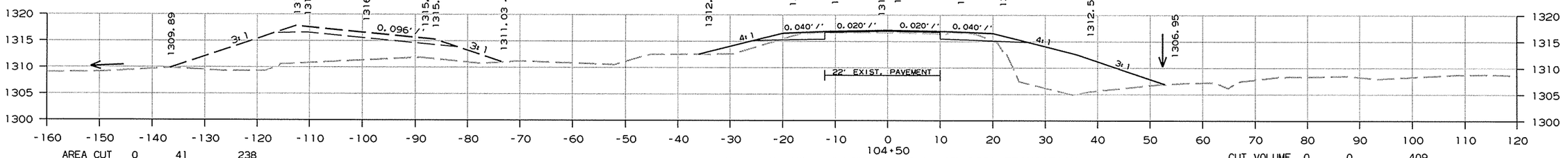
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	113	141

(2) CROSS SECTIONS

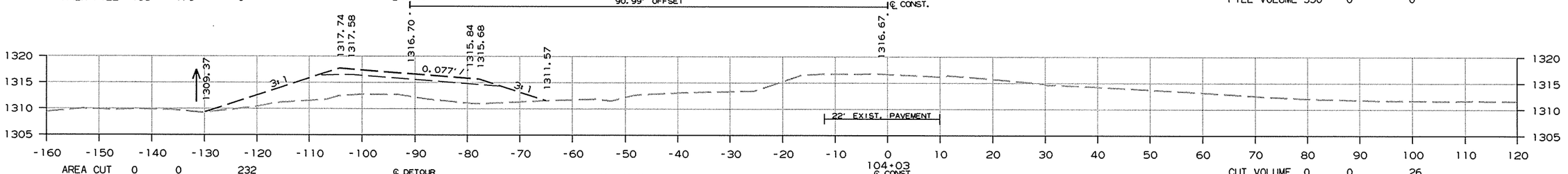
STAGE 1: STAGE 2: STAGE 3:

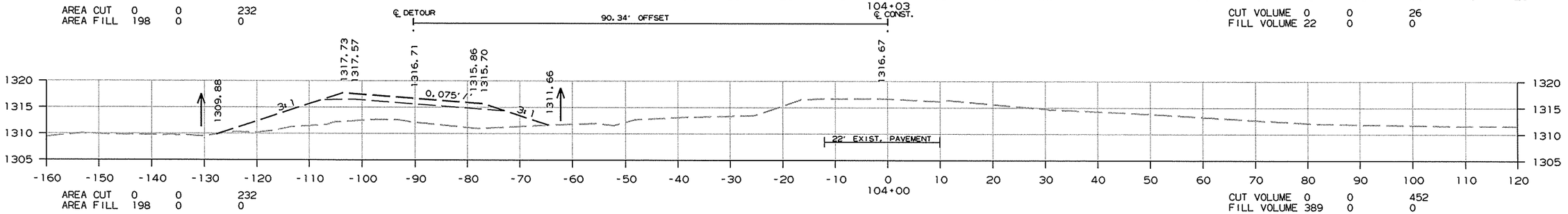
STAGE 1: STAGE 2: STAGE 3:





STA. 104+30 - BEGIN SITE 1 & END 100' TRANSITION





CROSS SECTION STA. 104+00 TO STA. 104+94

4/20/2015

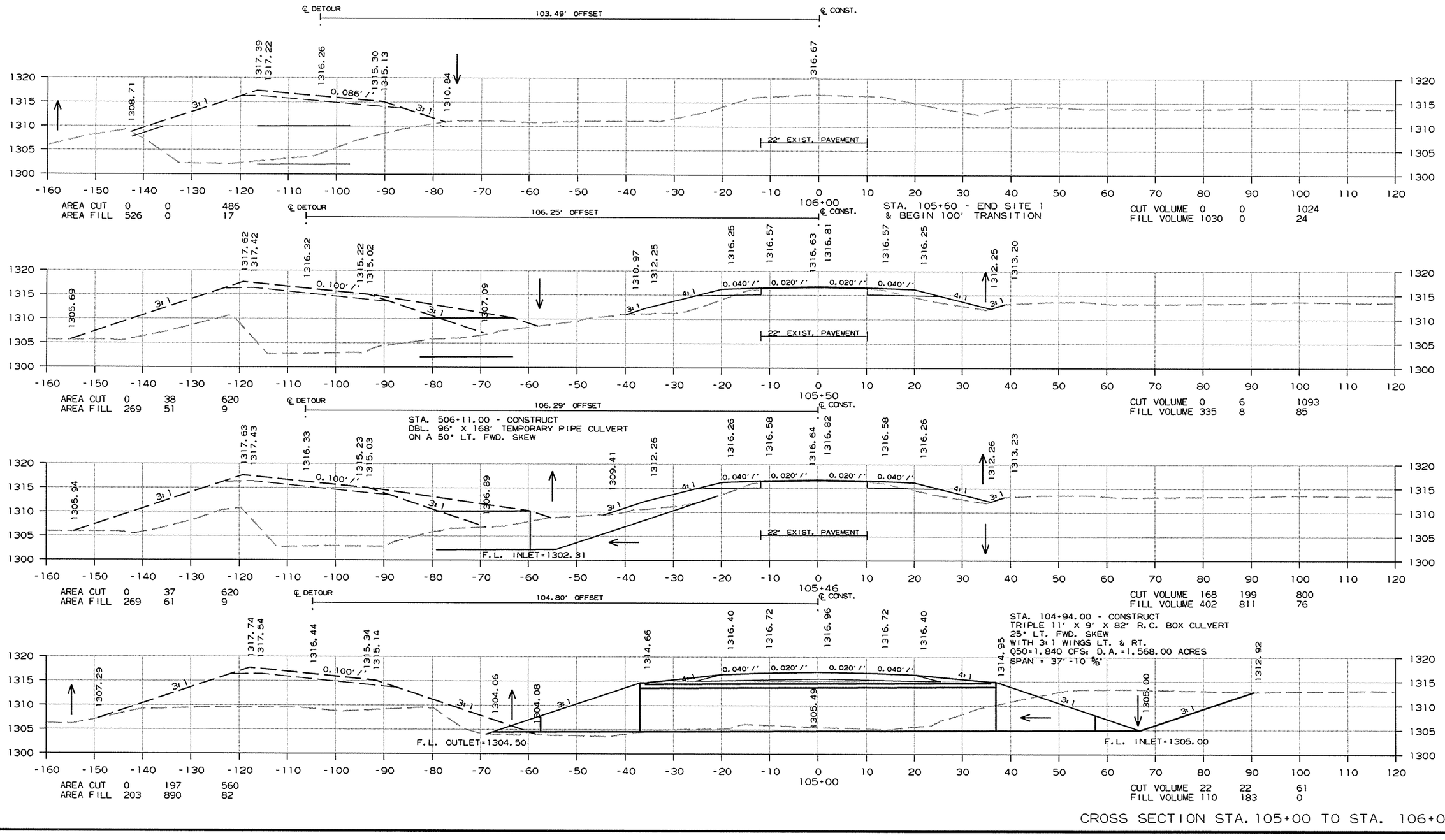
R090343.DGN

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.		090343	114	141

(2) CROSS SECTIONS

STAGE 1: STAGE 2: STAGE 3:

STAGE 1: STAGE 2: STAGE 3:



CROSS SECTION STA. 105+00 TO STA. 106+00

4/20/2015

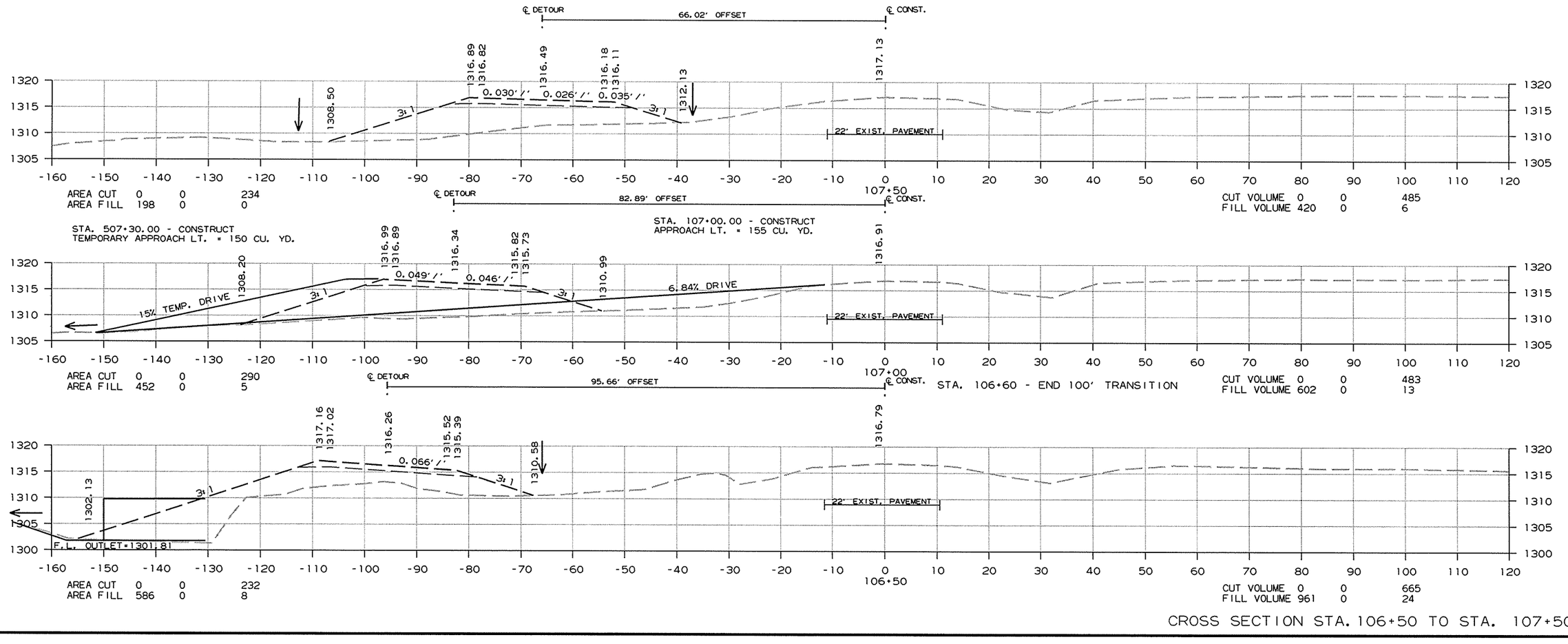
R090343.DGN

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.		090343	115	141

(2) CROSS SECTIONS

STAGE 1: STAGE 2: STAGE 3:

STAGE 1: STAGE 2: STAGE 3:



CROSS SECTION STA. 106+50 TO STA. 107+50

4/20/2015

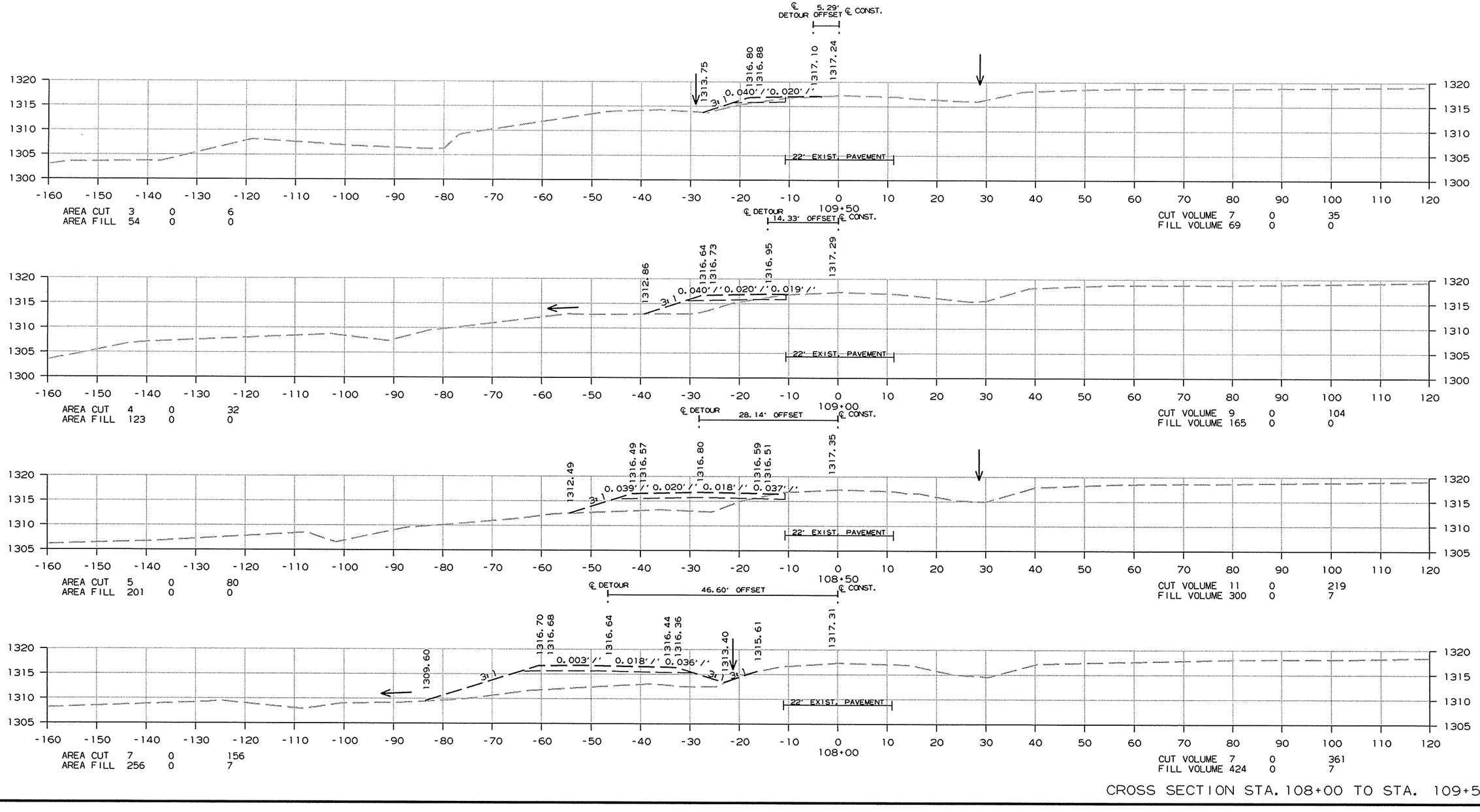
R090343.DGN

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.		090343	116	141

(2) CROSS SECTIONS

STAGE 1: STAGE 2: STAGE 3:

STAGE 1: STAGE 2: STAGE 3:



CROSS SECTION STA. 108+00 TO STA. 109+50

4/20/2015

R090343.DGN

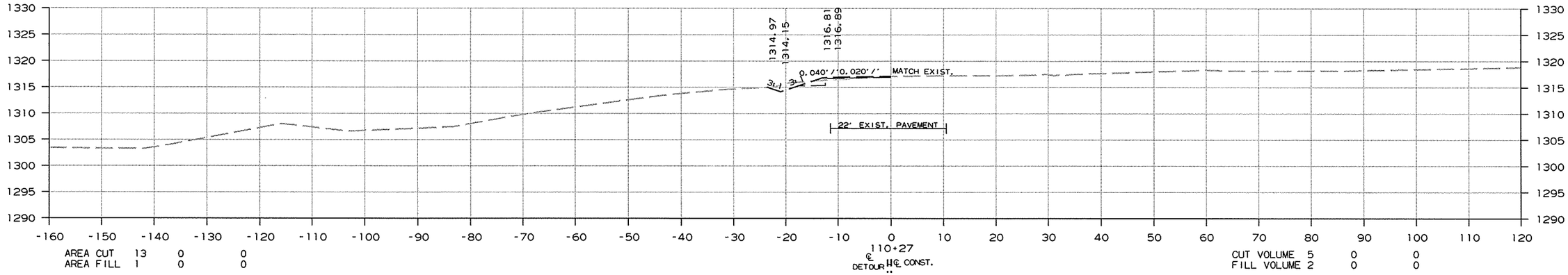
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	117	141

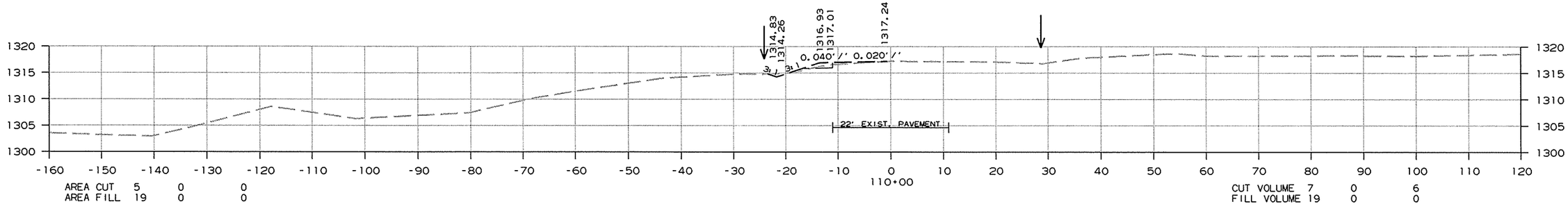
STAGE 1: STAGE 2: STAGE 3:

(2) CROSS SECTIONS

STAGE 1: STAGE 2: STAGE 3:

℄ DETOUR STA. 510+64 - END DETOUR
℄ CONST. STA. 110+27





CROSS SECTION STA. 110+00 TO STA. 110+27

4/20/2015

R090343.DGN

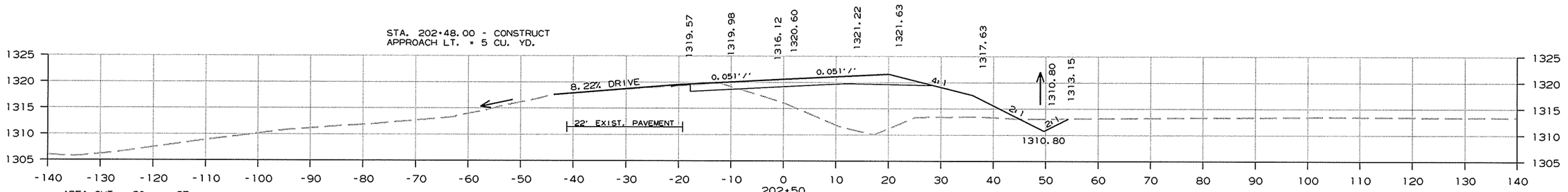
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	118	141

(2) CROSS SECTIONS

STAGE 1 & 2: STAGE 3:

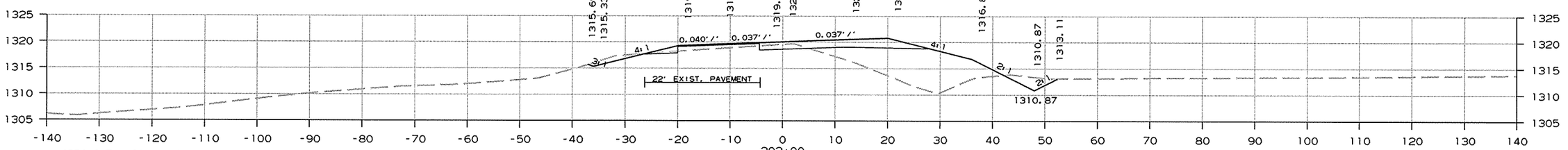
STAGE 1 & 2: STAGE 3:

STA. 202+48.00 - CONSTRUCT APPROACH LT. = 5 CU. YD.



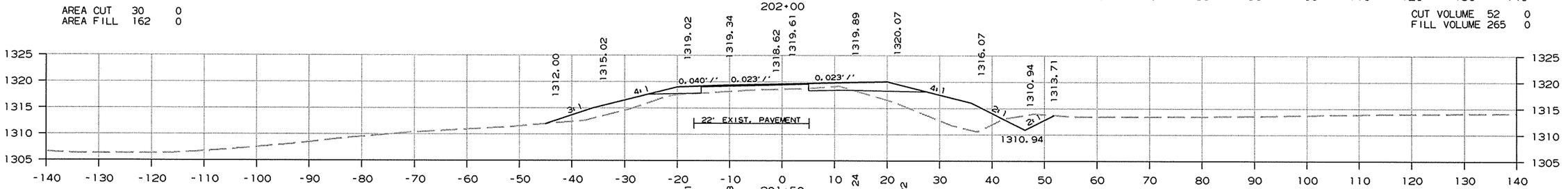
AREA CUT 20 27
AREA FILL 271 0

CUT VOLUME 46 0
FILL VOLUME 402 0



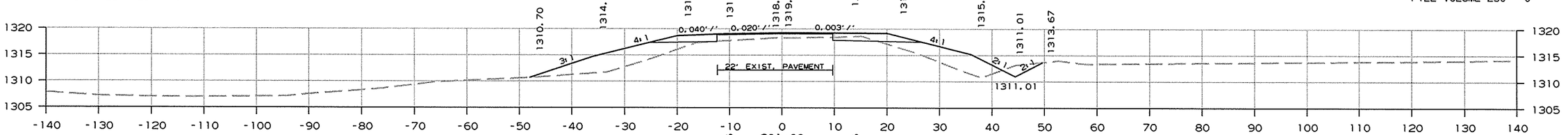
AREA CUT 30 0
AREA FILL 162 0

CUT VOLUME 52 0
FILL VOLUME 265 0



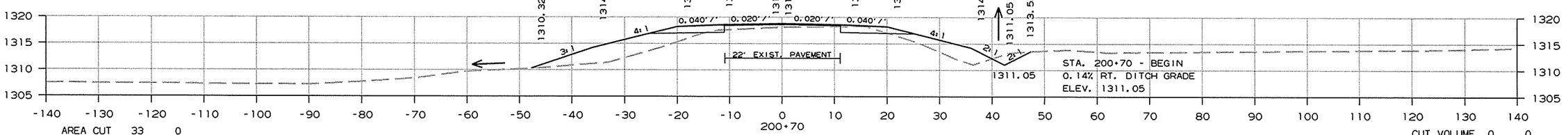
AREA CUT 25 0
AREA FILL 123 0

CUT VOLUME 43 0
FILL VOLUME 230 0



AREA CUT 21 0
AREA FILL 124 0

CUT VOLUME 30 0
FILL VOLUME 128 0



AREA CUT 33 0
AREA FILL 106 0

STA. 200+70 - BEGIN
0.14% RT. DITCH GRADE
ELEV. 1311.05

CUT VOLUME 0 0
FILL VOLUME 0 0

STA. 200+70 - BEGIN SITE 2 & END 100' TRANSITION
STA. 119+70 BEGIN 100' TRANSITION

CROSS SECTION STA. 200+70 TO STA. 202+50

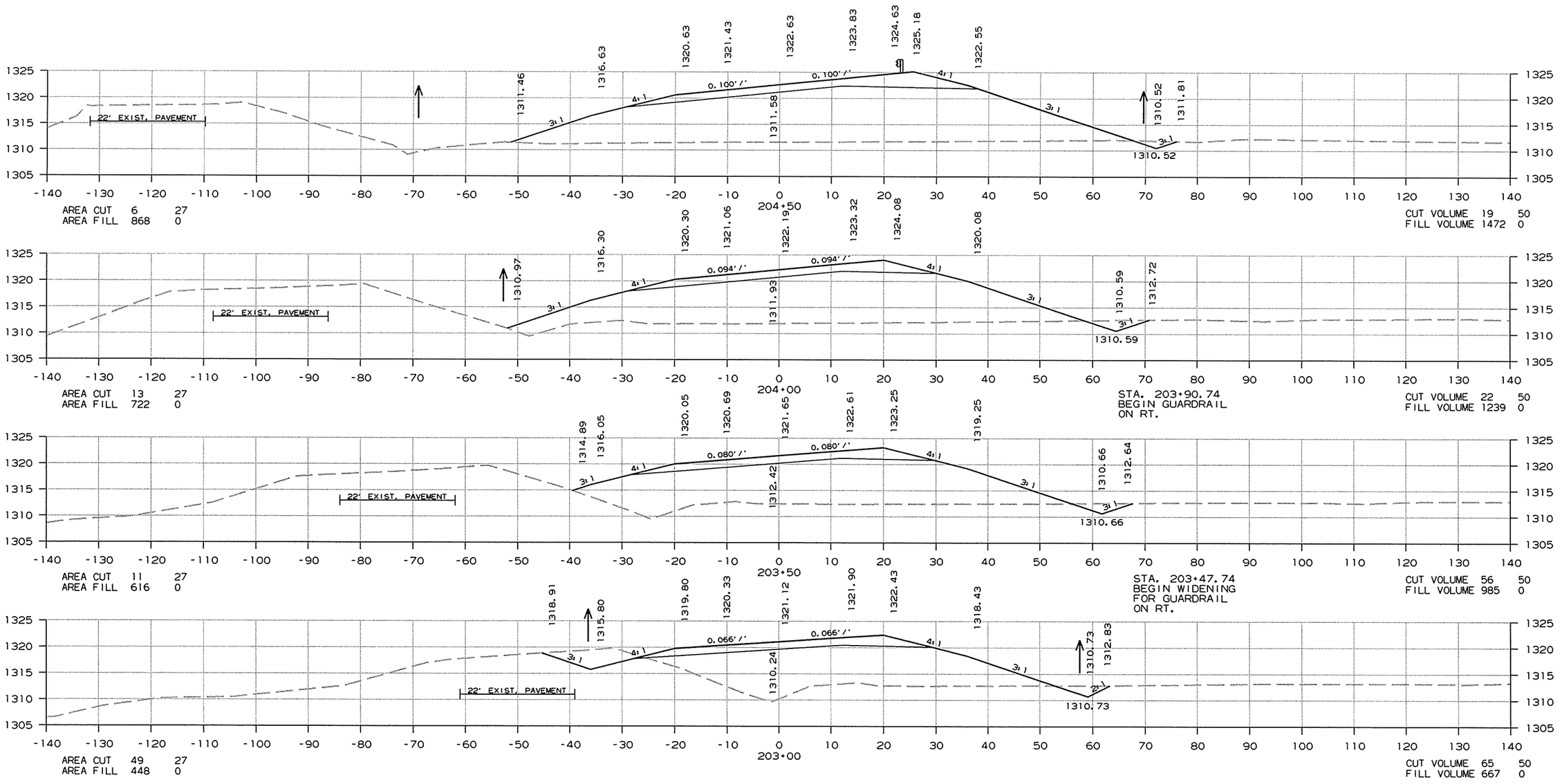
4/20/2015

R090343.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.		090343	119	141

(2) CROSS SECTIONS

STAGE 1 & 2: STAGE 3:



CROSS SECTION STA. 203+00 TO STA. 204+50

4/20/2015

R090343.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.		090343	120	141

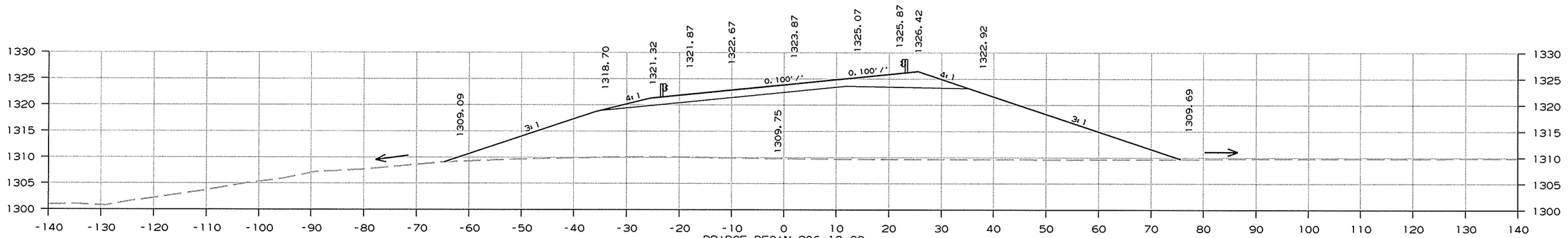
(2) CROSS SECTIONS

STAGE 1 & 2: STAGE 3:

AREA CUT 0 0
AREA FILL 0 0

206+48 - TOE OF SLOPE

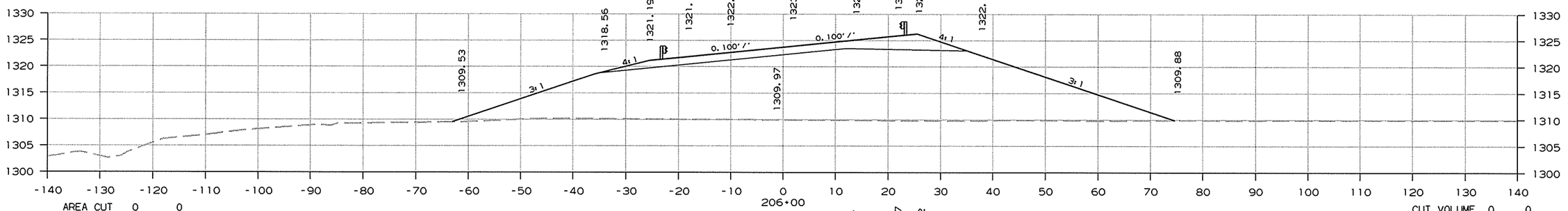
CUT VOLUME 0 0
FILL VOLUME 678 0



BRIDGE BEGIN 206+18.89

AREA CUT 0 0
AREA FILL 1262 0

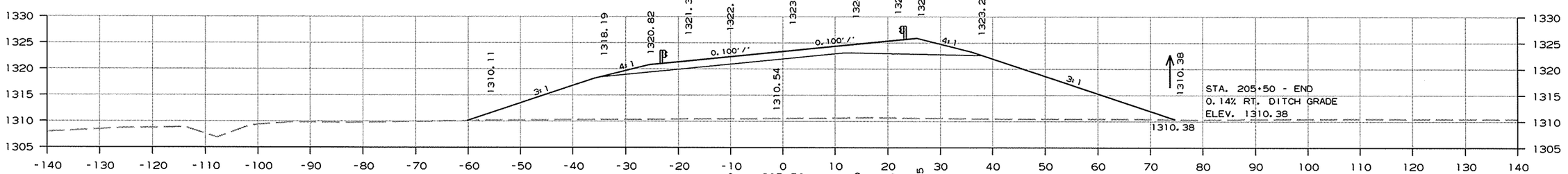
CUT VOLUME 0 0
FILL VOLUME 872 0



206+00

AREA CUT 0 0
AREA FILL 1216 0

CUT VOLUME 0 0
FILL VOLUME 2172 0

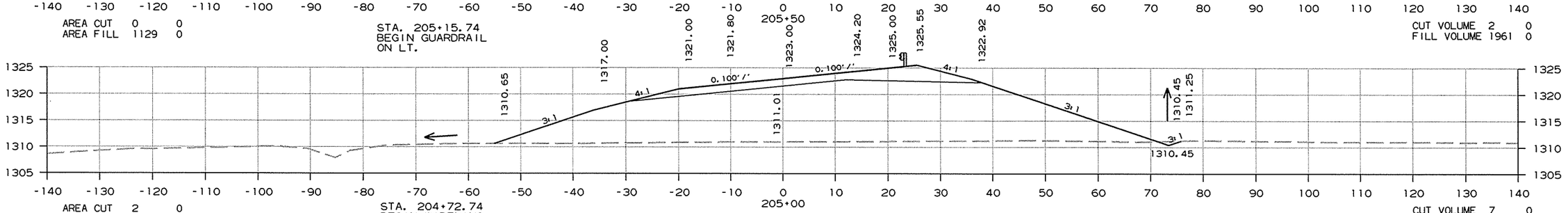


205+50

AREA CUT 0 0
AREA FILL 1129 0

STA. 205+15.74
BEGIN GUARDRAIL
ON LT.

CUT VOLUME 2 0
FILL VOLUME 1961 0



205+00

AREA CUT 2 0
AREA FILL 989 0

STA. 204+72.74
BEGIN WIDENING
FOR GUARDRAIL
ON LT.

CUT VOLUME 7 0
FILL VOLUME 1720 0

CROSS SECTION STA. 205+00 TO STA. 206+19

4/20/2015

R090343.DGN

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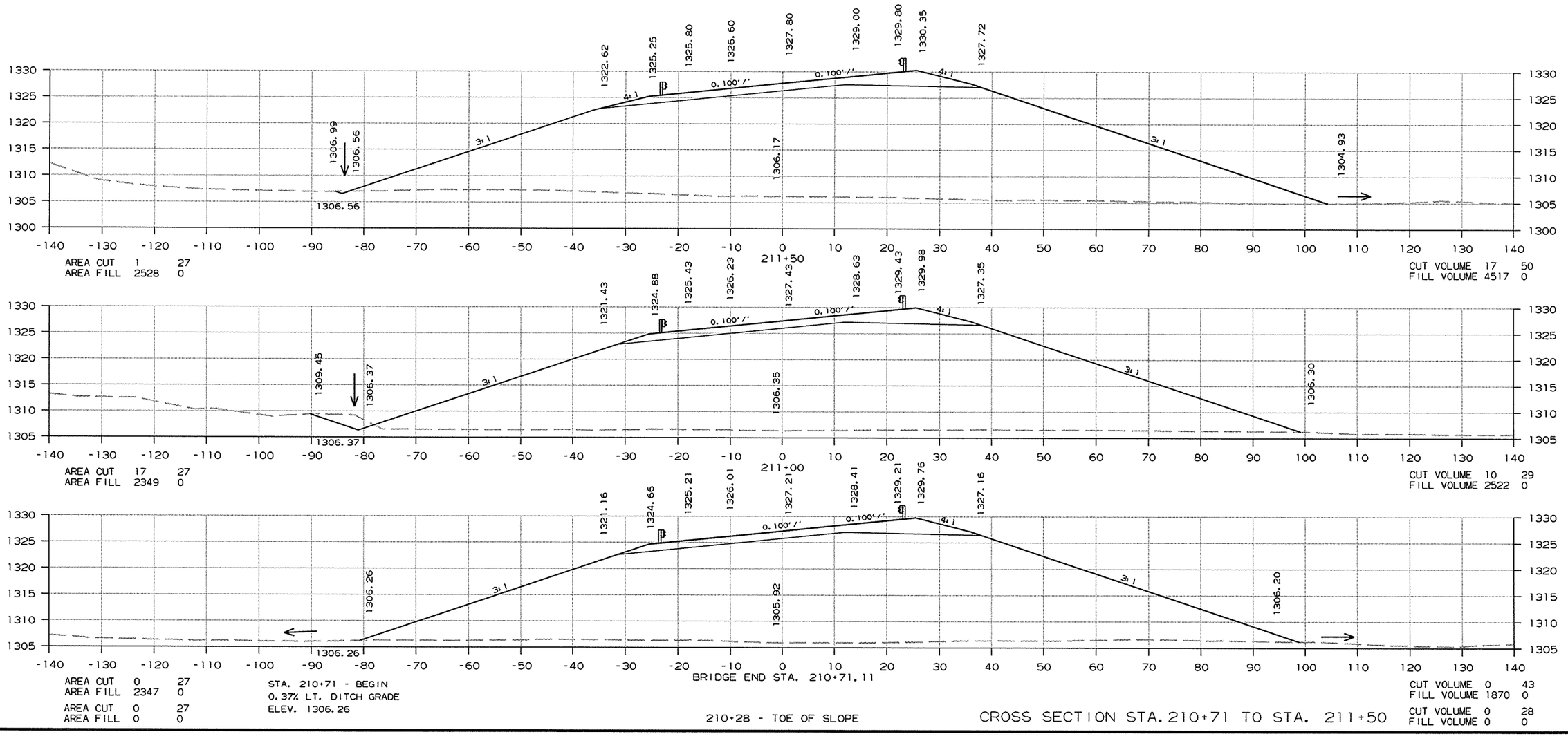
				6	ARK.			
				JOB NO.		090343	121	141

(2) CROSS SECTIONS

STAGE 1 & 2: STAGE 3:

STAGE 1 & 2: STAGE 3:



CROSS SECTION STA. 210+71 TO STA. 211+50

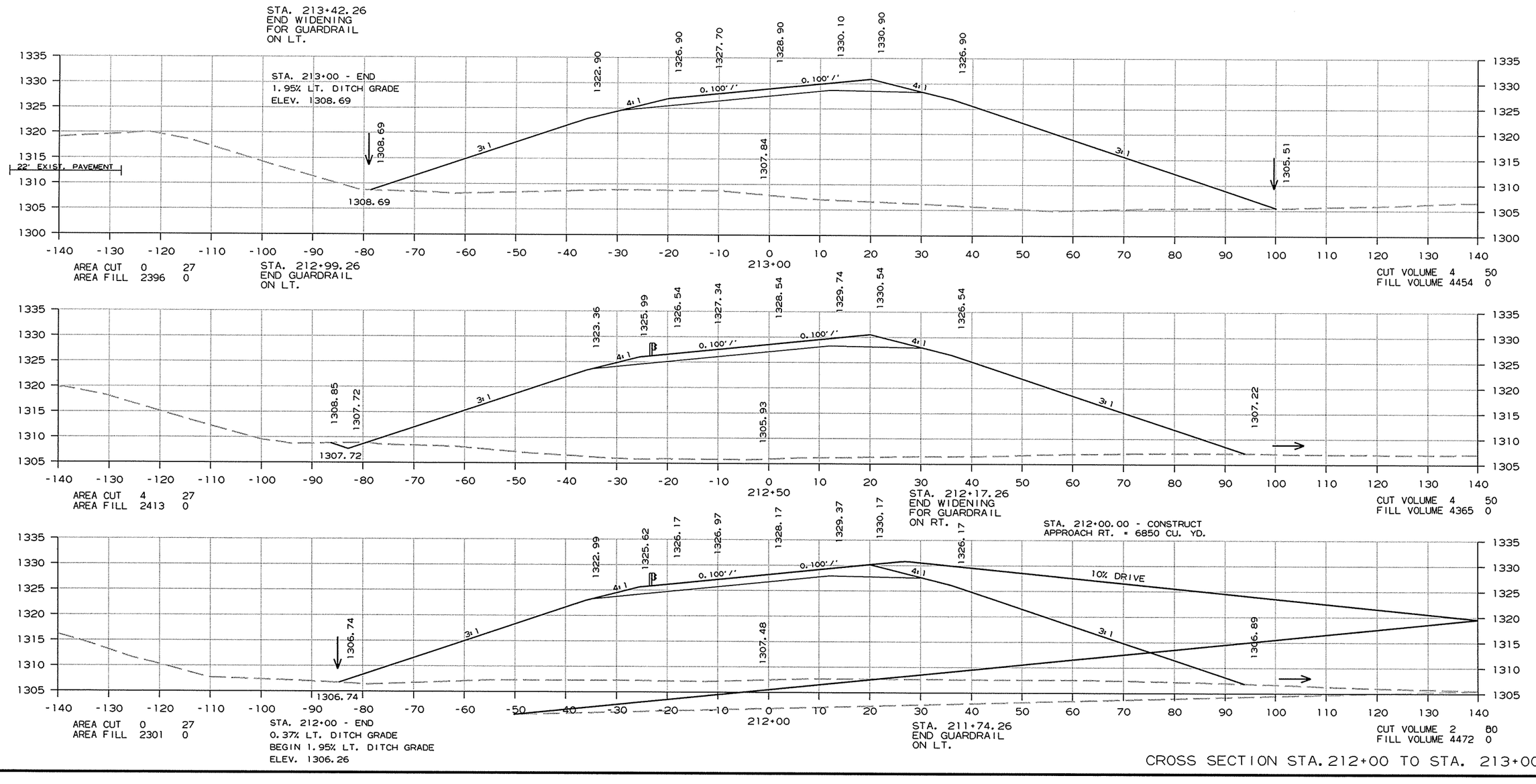
4/20/2015

R090343.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.		090343	122	141

(2) CROSS SECTIONS
STAGE 1 & 2‹ STAGE 3‹

STAGE 1 & 2‹ STAGE 3‹



CROSS SECTION STA. 212+00 TO STA. 213+00

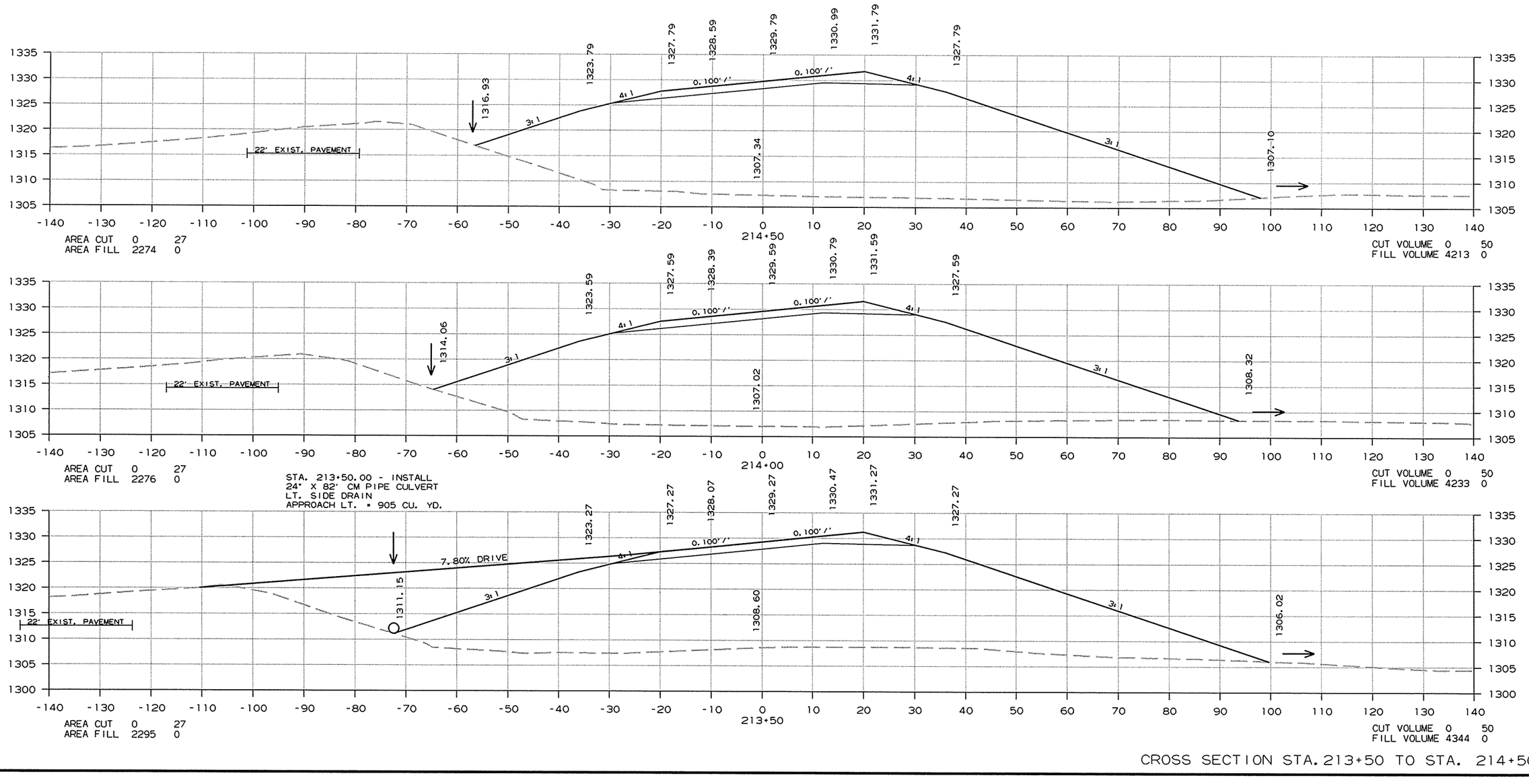
4/20/2015

R090343.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.		090343	123	141

(2) CROSS SECTIONS

STAGE 1 & 2: STAGE 3:



CROSS SECTION STA. 213+50 TO STA. 214+50

4/20/2015

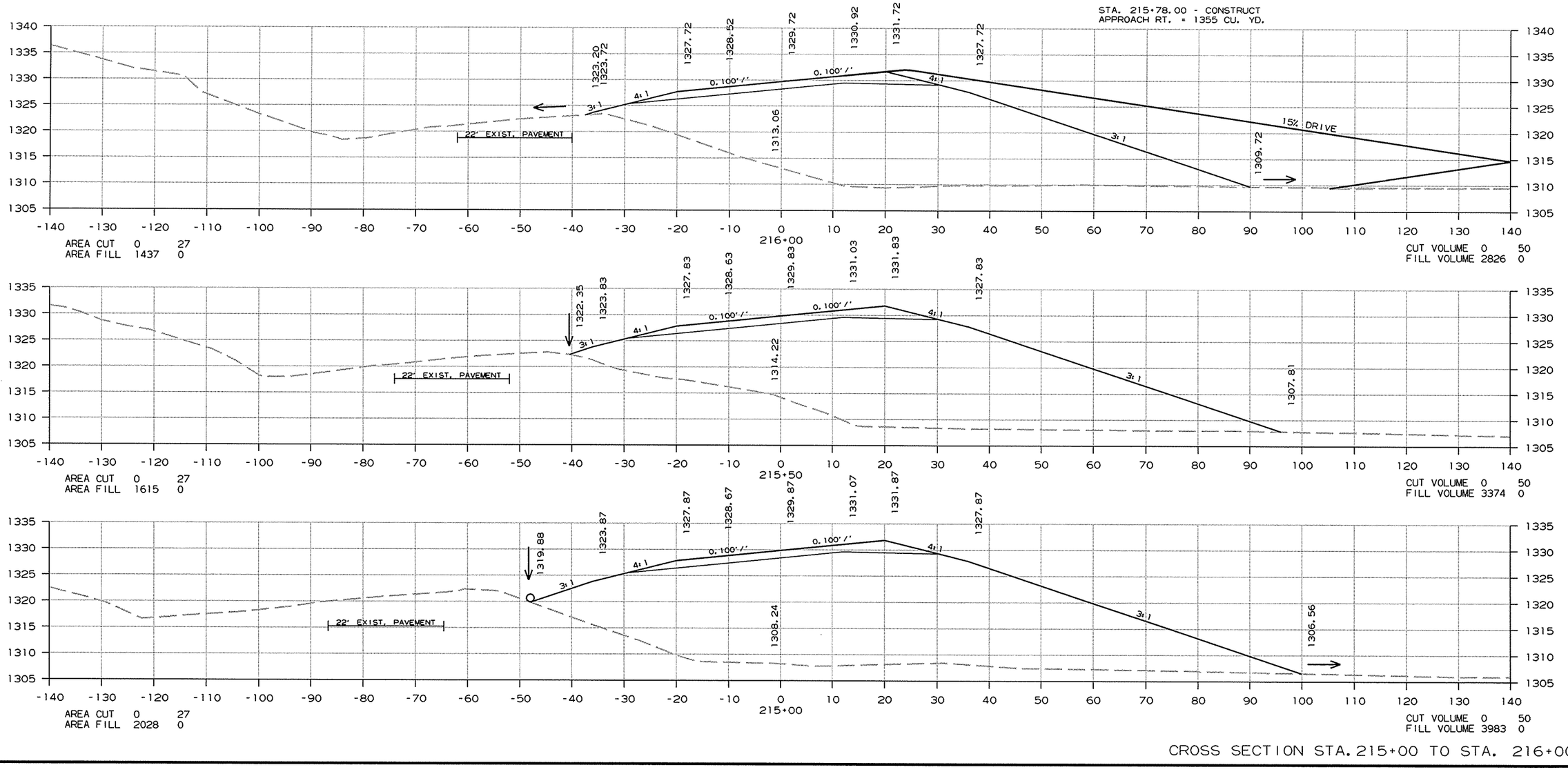
R090343.DGN

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.		090343	124	141

(2) CROSS SECTIONS

STAGE 1 & 2: STAGE 3:

STAGE 1 & 2: STAGE 3:



CROSS SECTION STA. 215+00 TO STA. 216+00

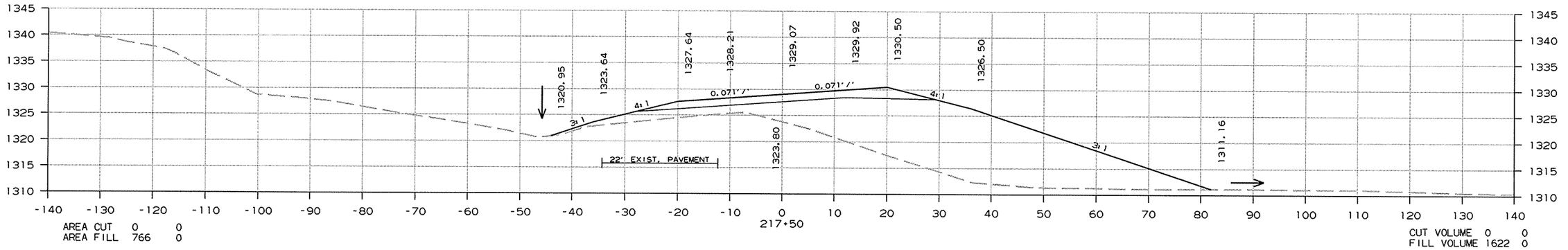
4/20/2015

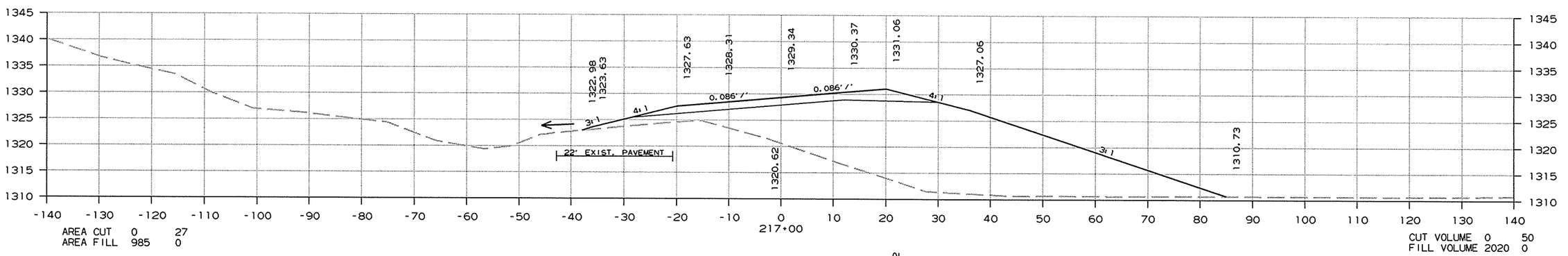
R090343.DGN

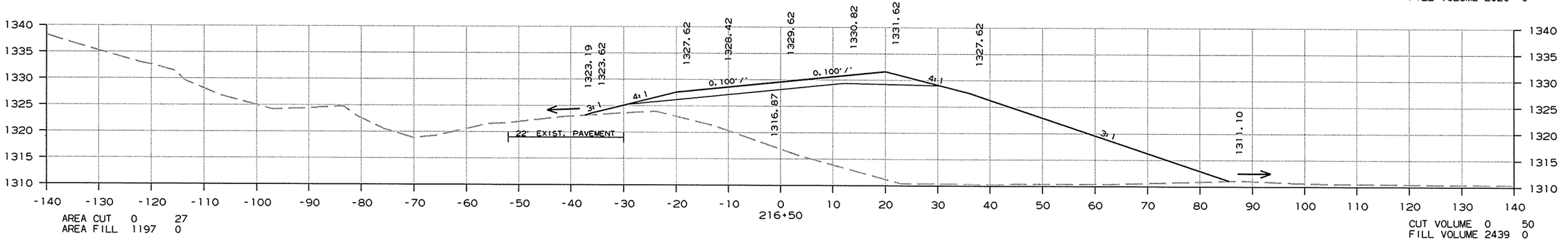
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	125	141

(2) CROSS SECTIONS

STAGE 1 & 2: STAGE 3:







CROSS SECTION STA. 216+50 TO STA. 217+50

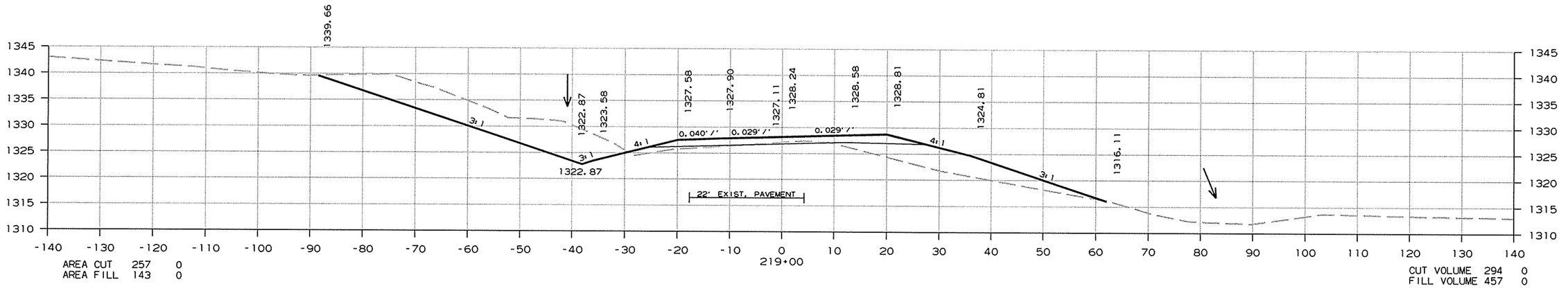
4/20/2015

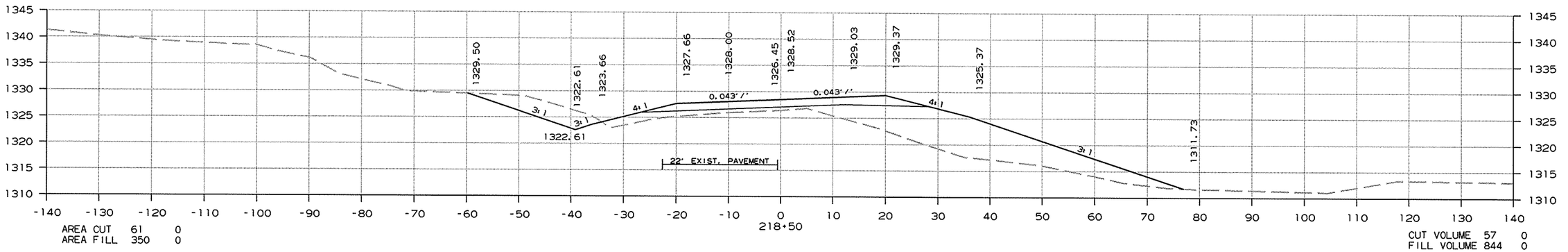
R090343.DGN

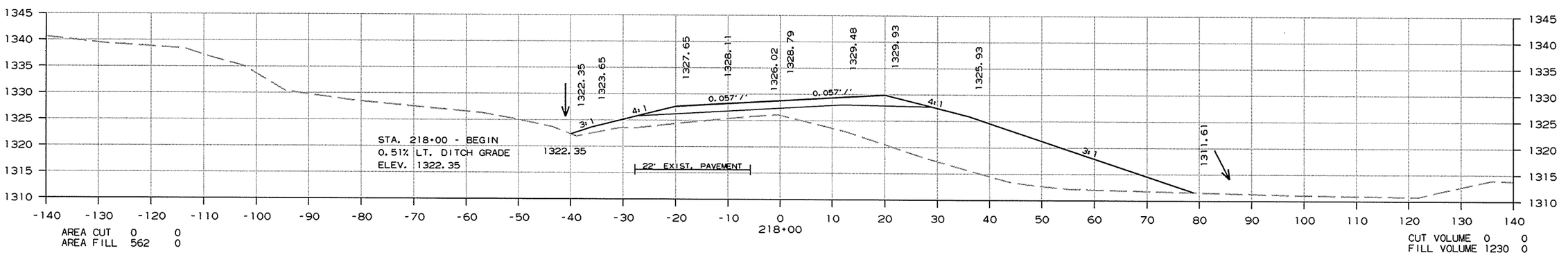
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	126	141

(2) CROSS SECTIONS

STAGE 1 & 2: STAGE 3:







CROSS SECTION STA. 218+00 TO STA. 219+00

4/20/2015

R090343.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.		090343	127	141

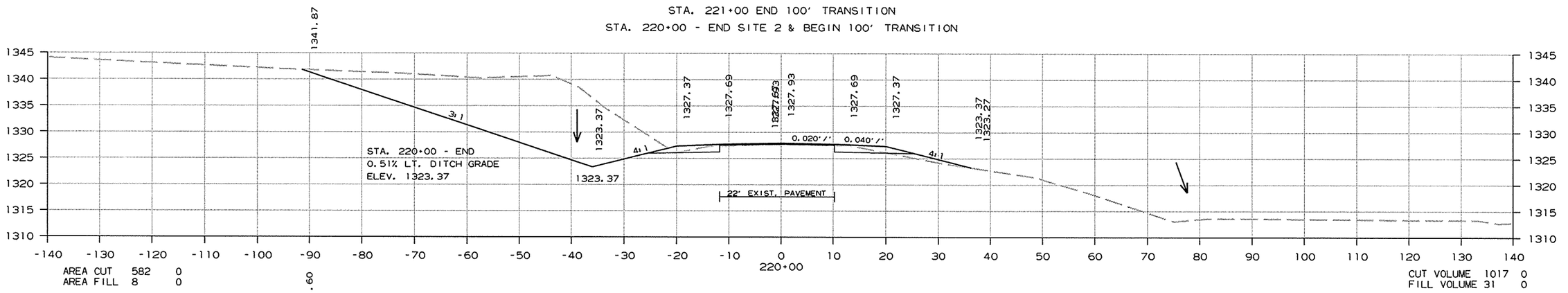
(2) CROSS SECTIONS

STAGE 1 & 2: STAGE 3:

STAGE 1 & 2: STAGE 3:

STA. 221+00 END 100' TRANSITION

STA. 220+00 - END SITE 2 & BEGIN 100' TRANSITION



CROSS SECTION STA. 219+50 TO STA. 220+50

4/20/2015

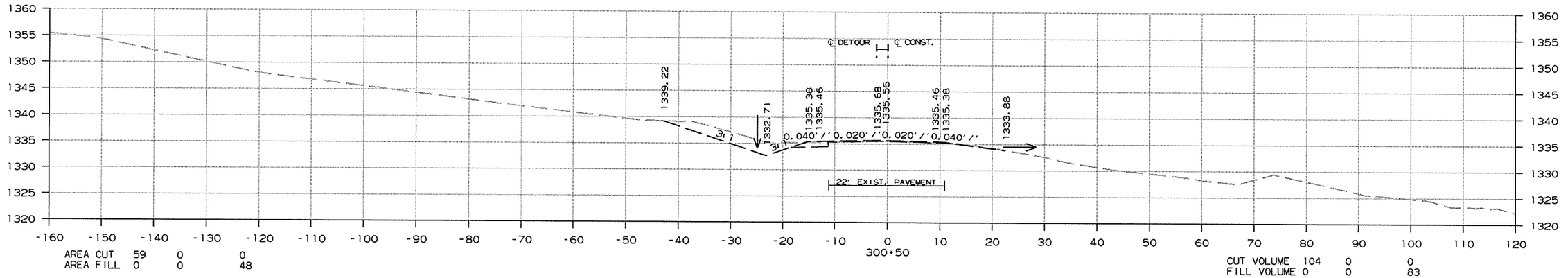
R090343.DGN

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.		090343	128	141

STAGE 1: STAGE 2: STAGE 3:

(2) CROSS SECTIONS

STAGE 1: STAGE 2: STAGE 3:



℄ CONST. STA. 300+00
℄ DETOUR STA. 600+00 - BEGIN DETOUR 3

CROSS SECTION STA. 300+00 TO STA. 300+50

4/20/2015

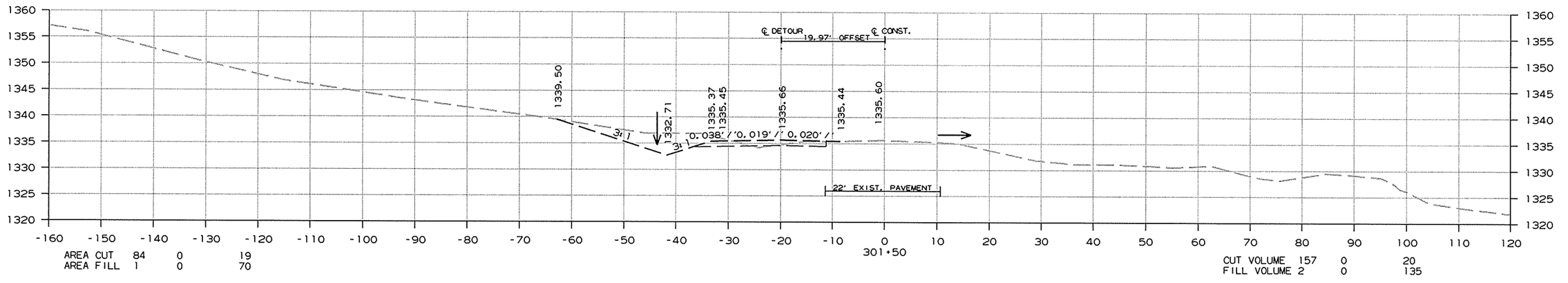
R090343.DGN

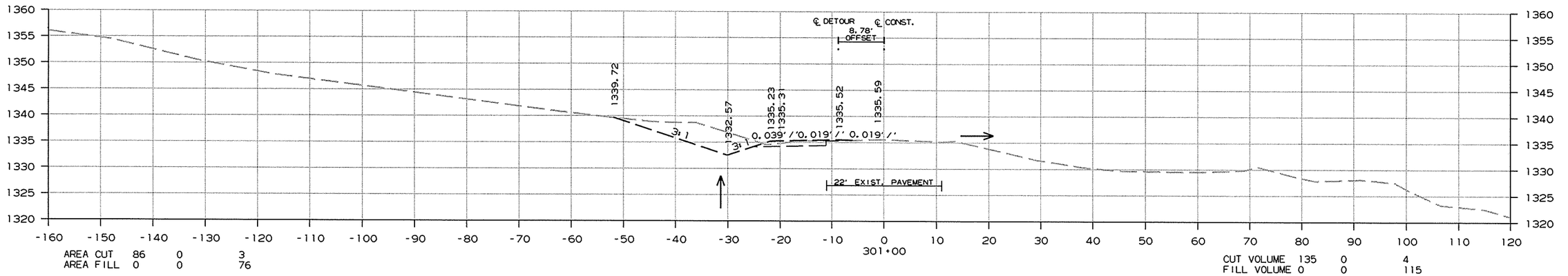
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	129	141

(2) CROSS SECTIONS

STAGE 1: STAGE 2: STAGE 3:

STAGE 1: STAGE 2: STAGE 3:





CROSS SECTION STA. 301+00 TO STA. 301+50

4/20/2015

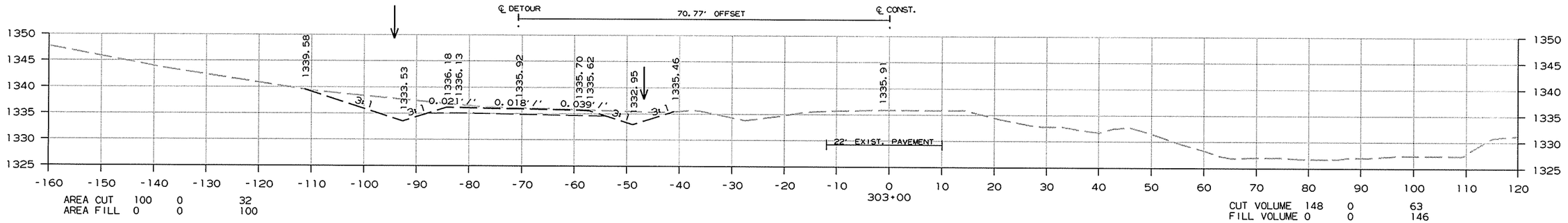
R090343.DGN

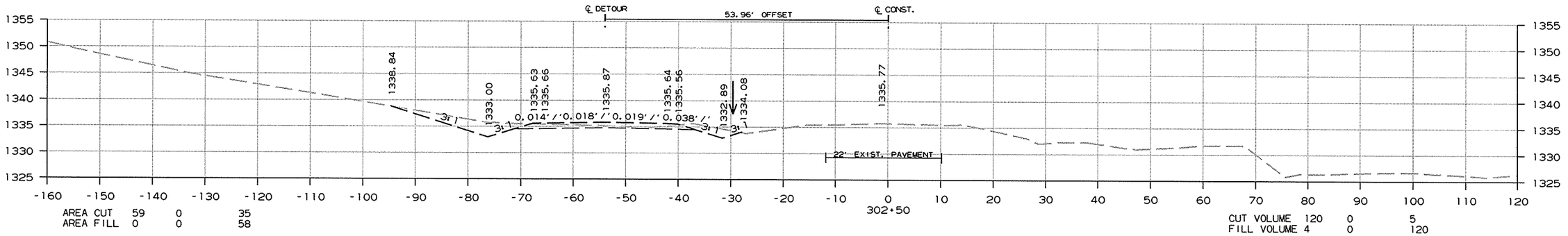
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	130	141

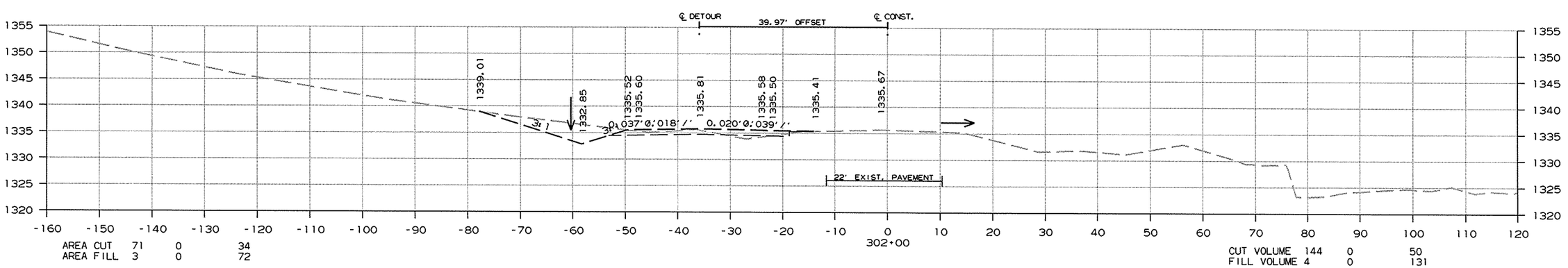
STAGE 1: STAGE 2: STAGE 3:

(2) CROSS SECTIONS

STAGE 1: STAGE 2: STAGE 3:







CROSS SECTION STA. 302+00 TO STA. 303+00

4/20/2015

R090343.DGN

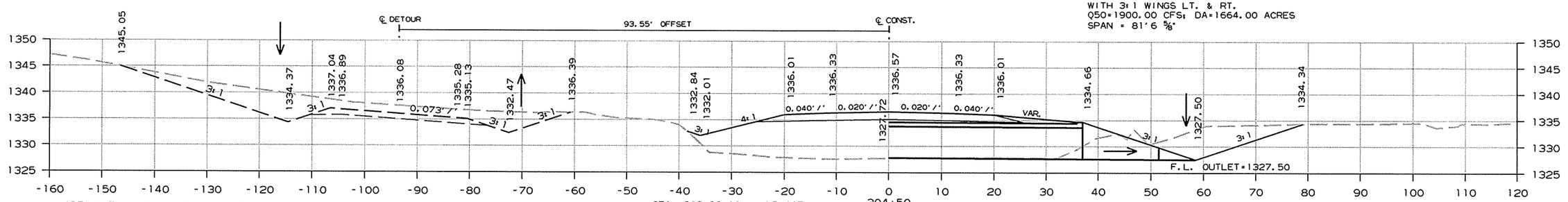
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	131	141

(2) CROSS SECTIONS

STAGE 1: STAGE 2: STAGE 3:

STAGE 1: STAGE 2: STAGE 3:

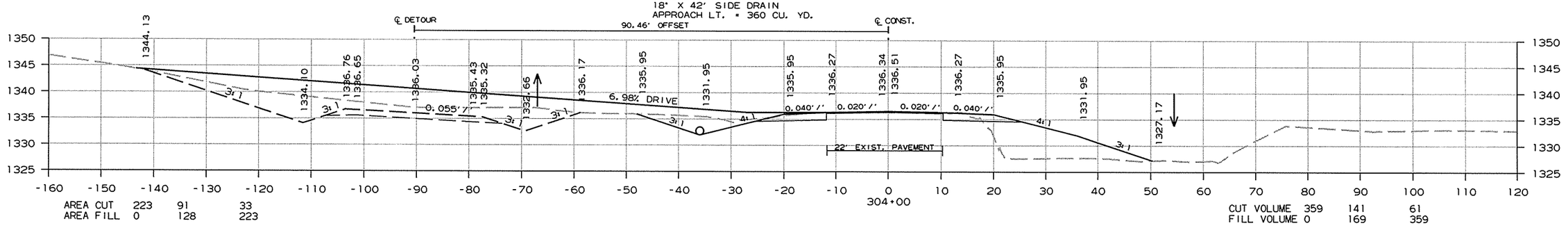
STA. 304+60 - CONSTRUCT
QUINT. 11'X 6'X 105' R.C. BOX CULVERT
45° LT. FWD. SKEW
WITH 3:1 WINGS LT. & RT.
Q50=1900.00 CFS; DA=1664.00 ACRES
SPAN = 81'6 5/8"



AREA CUT	230	89	34
AREA FILL	0	507	230

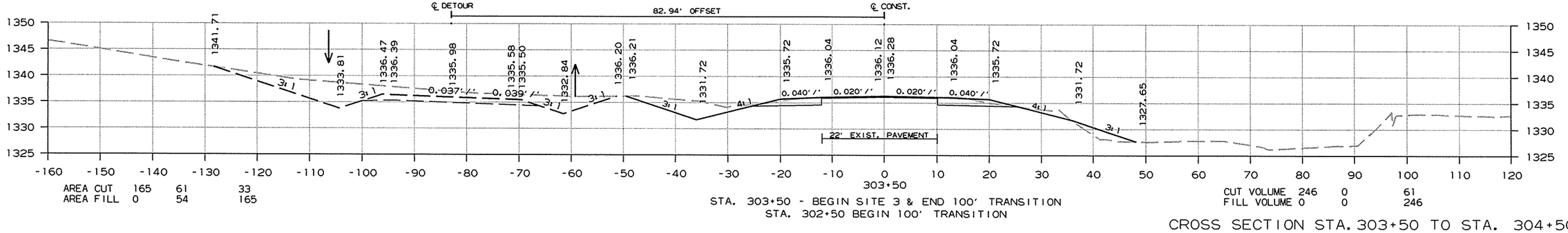
STA. 303+82.00 - INPLACE
18" X 22' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE & INSTALL
18" X 42' SIDE DRAIN
APPROACH LT. = 360 CU. YD.

CUT VOLUME	420	167	63
FILL VOLUME	0	589	420



AREA CUT	223	91	33
AREA FILL	0	128	223

CUT VOLUME	359	141	61
FILL VOLUME	0	169	359



AREA CUT	165	61	33
AREA FILL	0	54	165

CUT VOLUME	246	0	61
FILL VOLUME	0	0	246

STA. 303+50 - BEGIN SITE 3 & END 100' TRANSITION
STA. 302+50 BEGIN 100' TRANSITION

CROSS SECTION STA. 303+50 TO STA. 304+50

4/20/2015

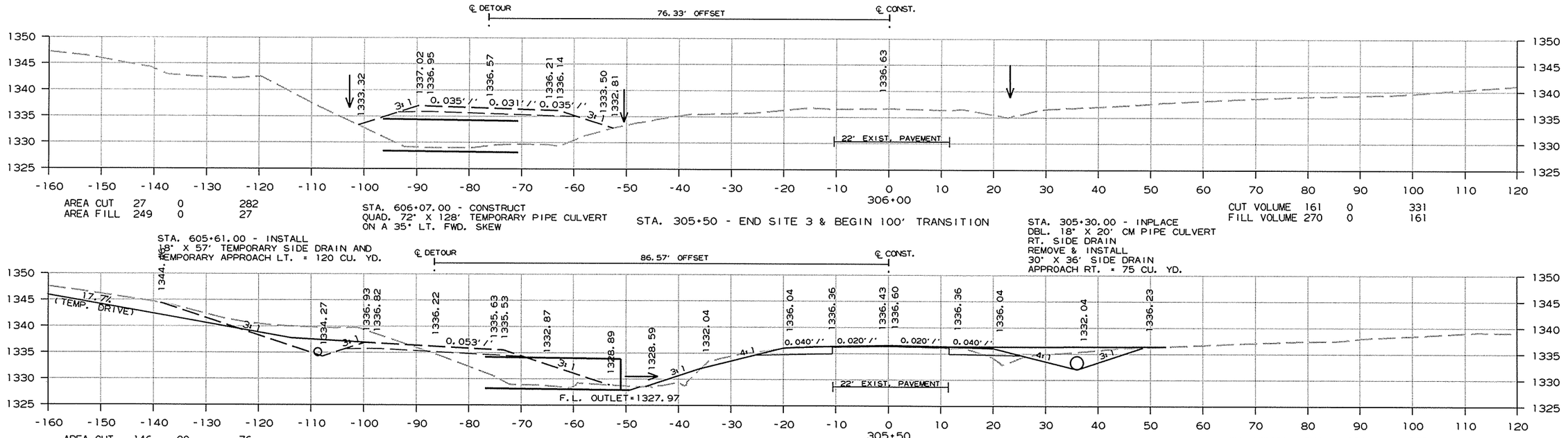
R090343.DGN

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.		090343	132	141

(2) CROSS SECTIONS

STAGE 1: STAGE 2: STAGE 3:

STAGE 1: STAGE 2: STAGE 3:



CROSS SECTION STA. 305+00 TO STA. 306+00

4/20/2015

R090343.DGN

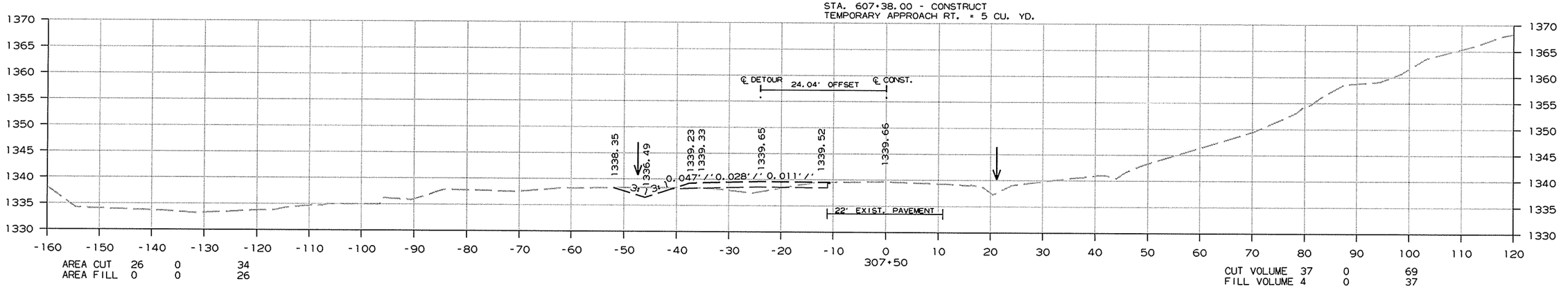
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	133	141

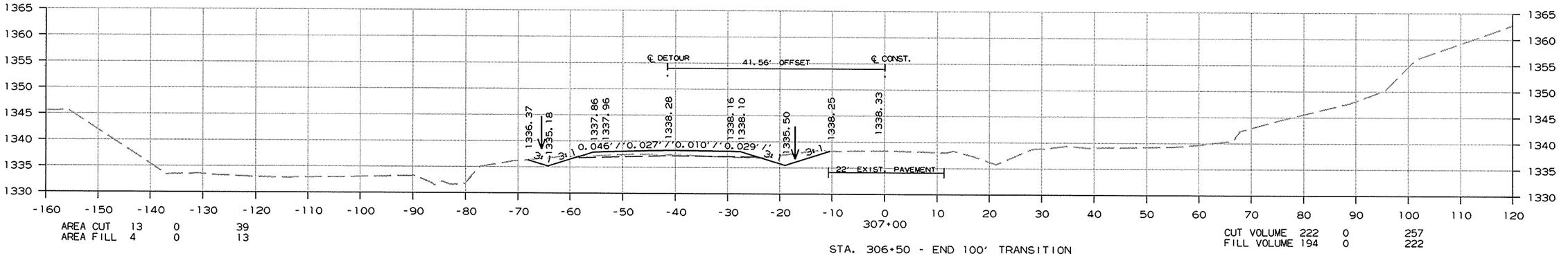
(2) CROSS SECTIONS

STAGE 1: STAGE 2: STAGE 3:

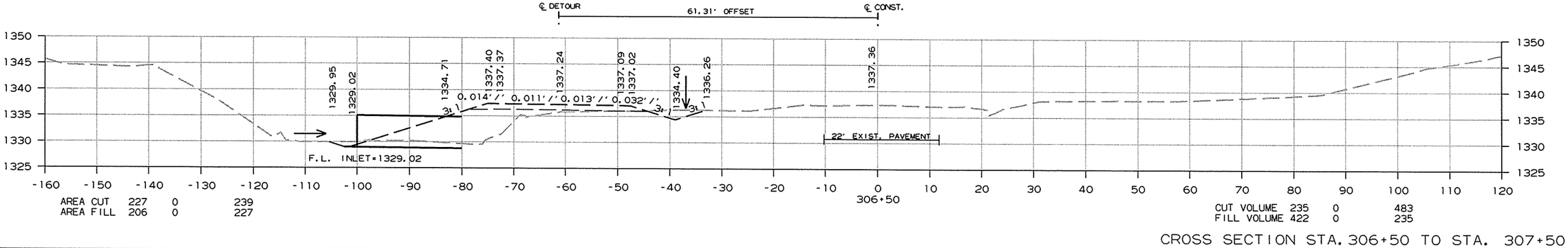
STAGE 1: STAGE 2: STAGE 3:

STA. 607+38.00 - CONSTRUCT
TEMPORARY APPROACH RT. = 5 CU. YD.





STA. 306+50 - END 100' TRANSITION



CROSS SECTION STA. 306+50 TO STA. 307+50

4/20/2015

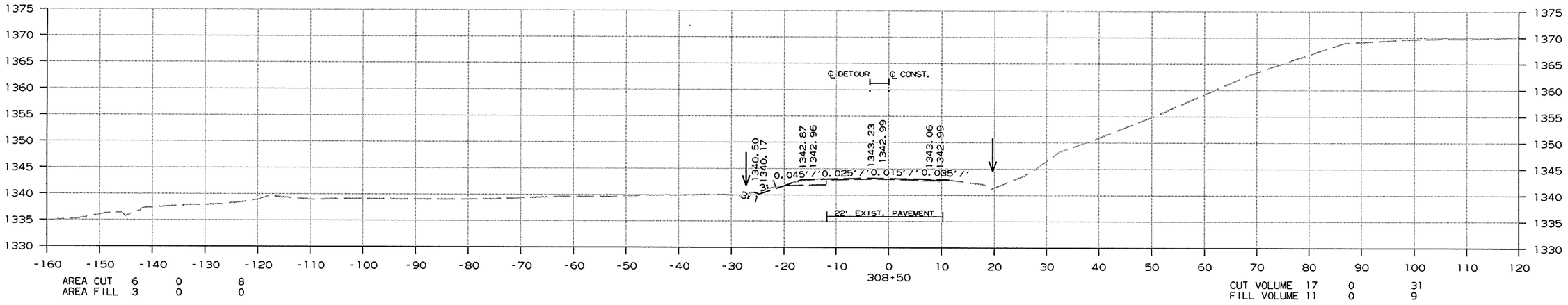
R090343.DGN

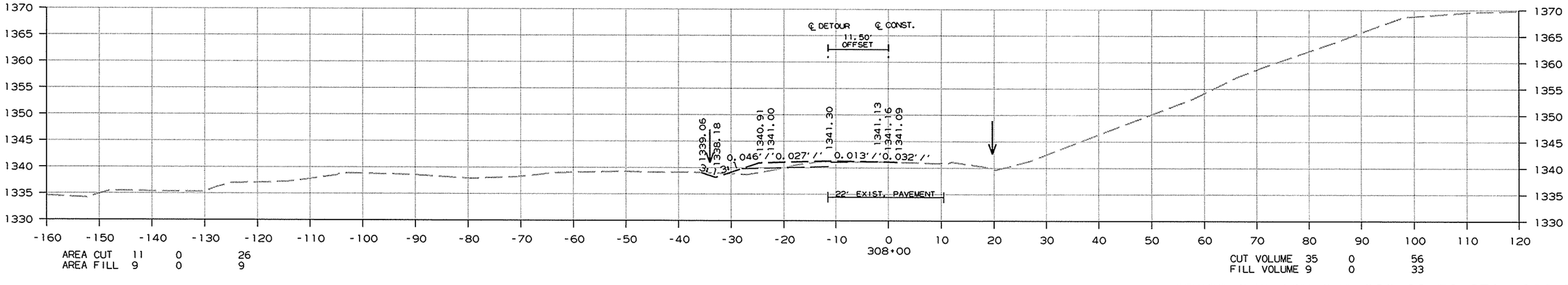
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	134	141

(2) CROSS SECTIONS

STAGE 1: STAGE 2: STAGE 3:

STAGE 1: STAGE 2: STAGE 3:





CROSS SECTION STA. 308+00 TO STA. 308+50

4/20/2015

R090343.DGN

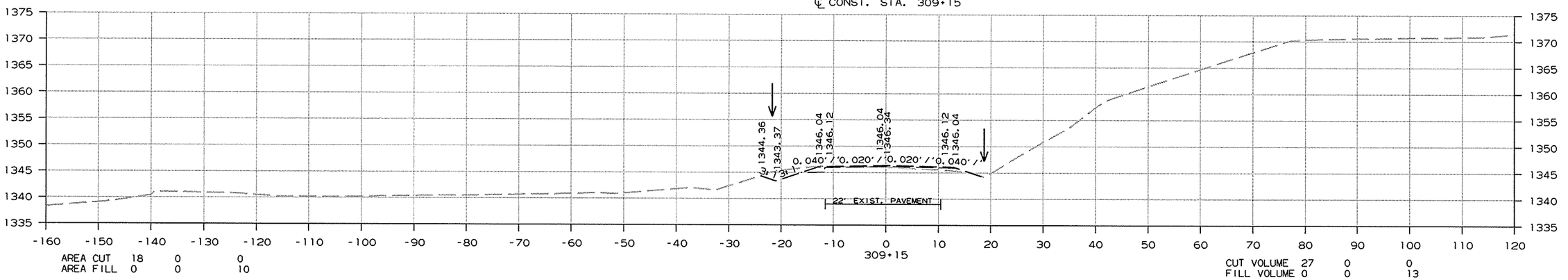
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	135	141

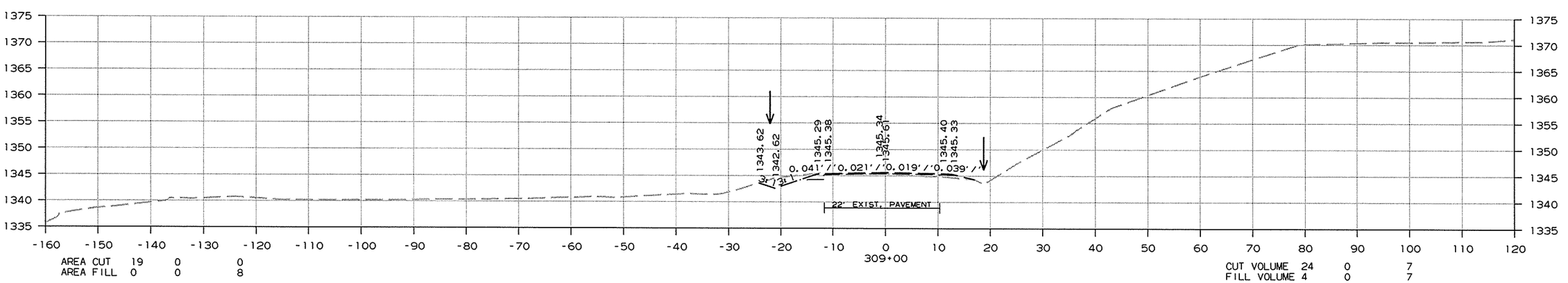
(2) CROSS SECTIONS

STAGE 1: STAGE 2: STAGE 3:

STAGE 1: STAGE 2: STAGE 3:

℄ DETOUR STA. 609+39 - END DETOUR 3
℄ CONST. STA. 309+15





CROSS SECTION STA. 309+00 TO STA. 309+15

4/20/2015

R090343.DGN

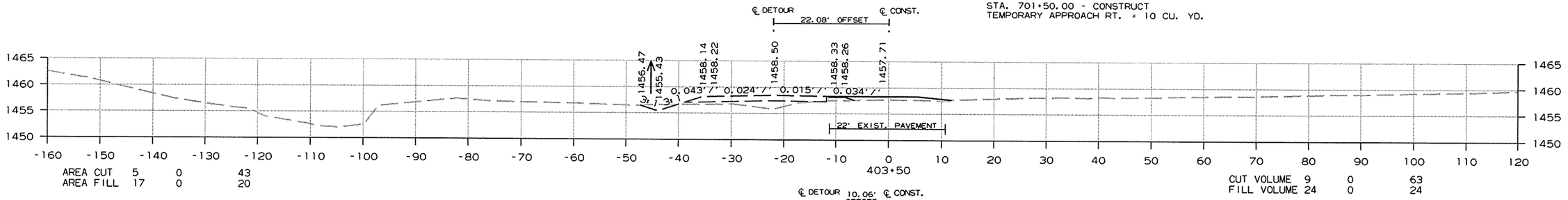
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	136	141

(2) CROSS SECTIONS

STAGE 1: STAGE 2: STAGE 3:

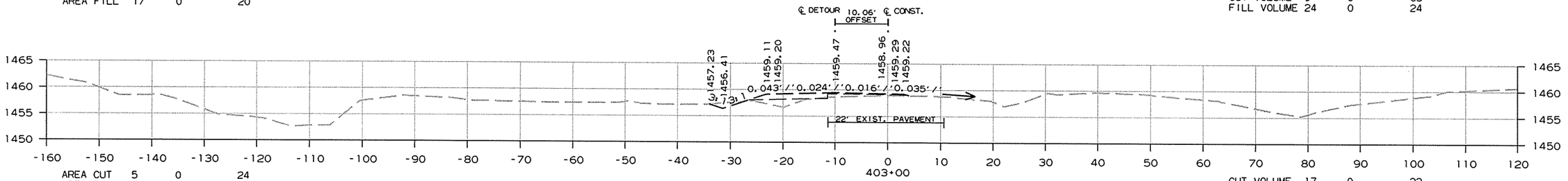
STAGE 1: STAGE 2: STAGE 3:

STA. 701+50.00 - CONSTRUCT
TEMPORARY APPROACH RT. = 10 CU. YD.



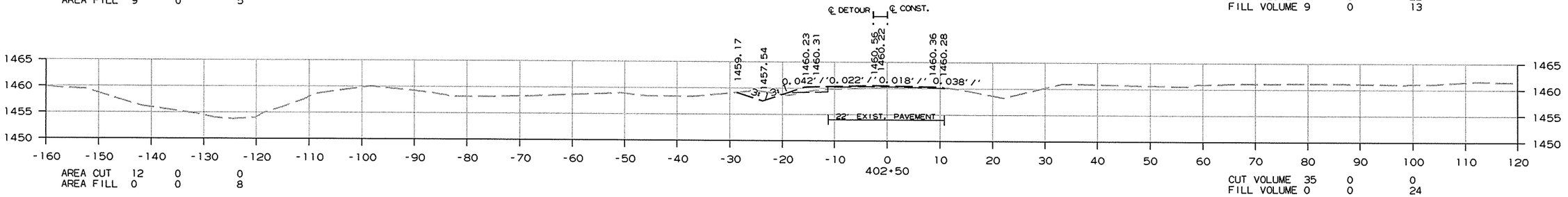
AREA CUT	5	0	43
AREA FILL	17	0	20

CUT VOLUME	9	0	63
FILL VOLUME	24	0	24



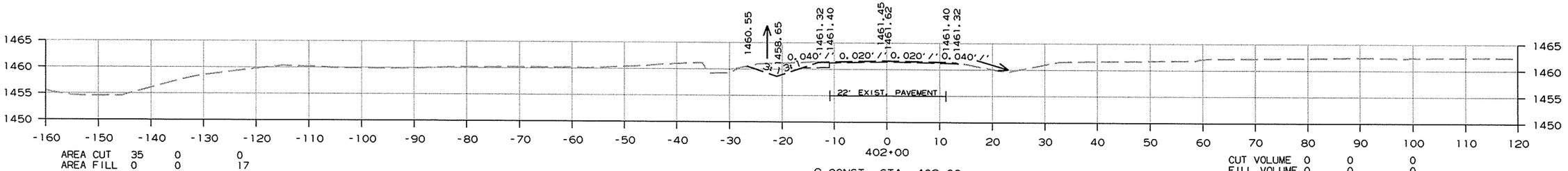
AREA CUT	5	0	24
AREA FILL	9	0	5

CUT VOLUME	17	0	22
FILL VOLUME	9	0	13



AREA CUT	12	0	0
AREA FILL	0	0	8

CUT VOLUME	35	0	0
FILL VOLUME	0	0	24



AREA CUT	35	0	0
AREA FILL	0	0	17

CUT VOLUME	0	0	0
FILL VOLUME	0	0	0

℄ CONST. STA. 402+00
℄ DETOUR STA. 700+00 - BEGIN DETOUR 4

CROSS SECTION STA. 402+00 TO STA. 403+50

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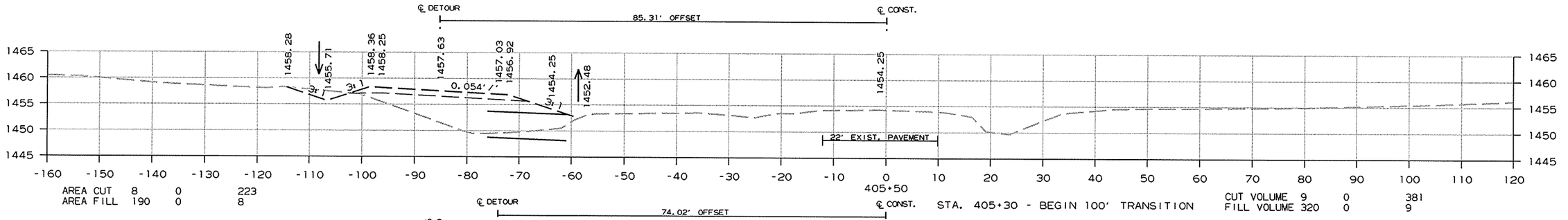
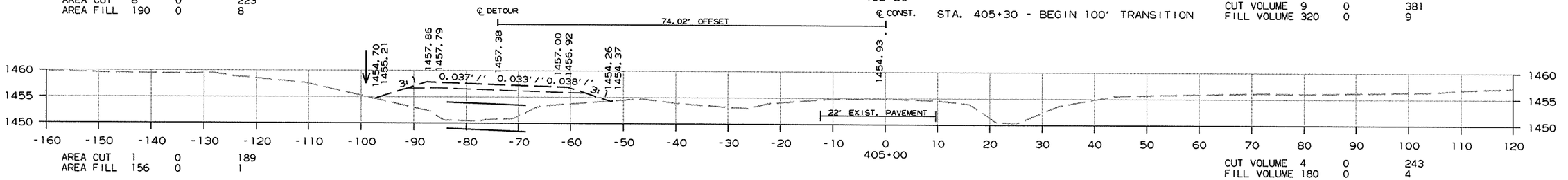
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	137	141

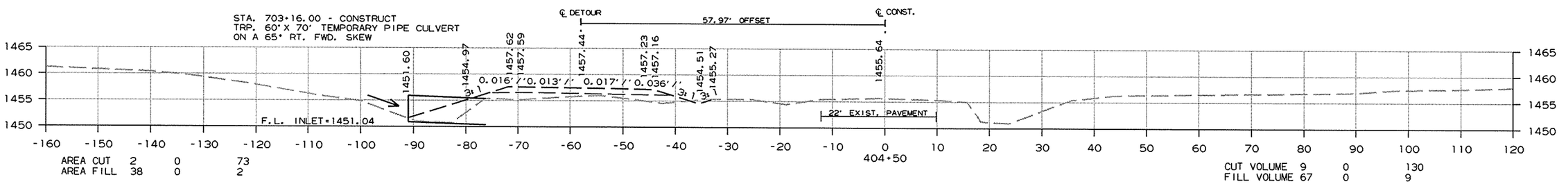
(2) CROSS SECTIONS

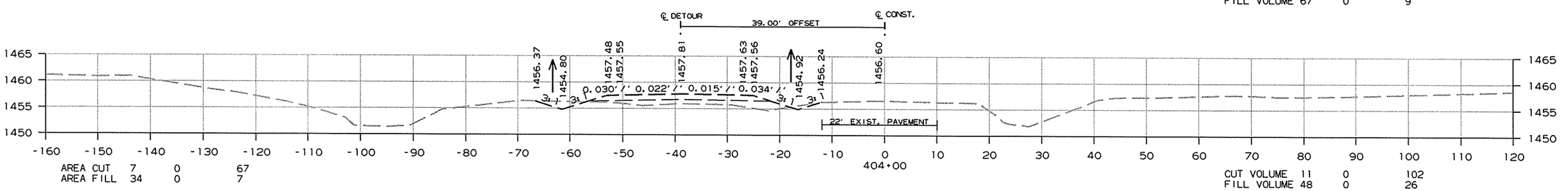
STAGE 1: STAGE 2: STAGE 3:

STAGE 1: STAGE 2: STAGE 3:









CROSS SECTION STA. 404+00 TO STA. 405+50

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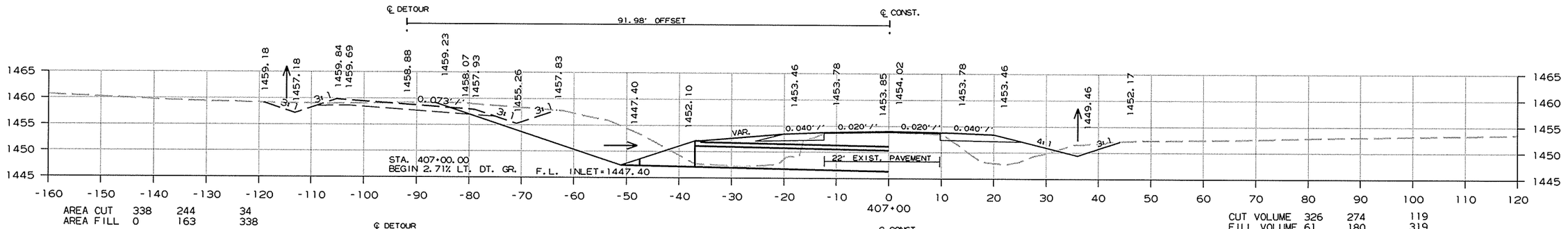
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	138	141

(2) CROSS SECTIONS

STAGE 1: STAGE 2: STAGE 3:

STAGE 1: STAGE 2: STAGE 3:

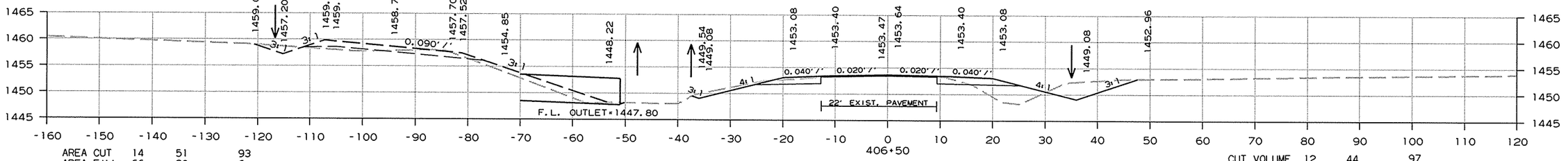
STA. 407+25.00 - CONSTRUCT
QUINT. 8' X 4' X 127' R.C. BOX CULVERT
53° RT. FWD. SKEW
WITH 3:1 WINGS LT. & RT.
Q50=1,200.00 CFS; D.A.=832.00 ACRES
SPAN = 70' 10¾"



AREA CUT 338 244 34
AREA FILL 0 163 338

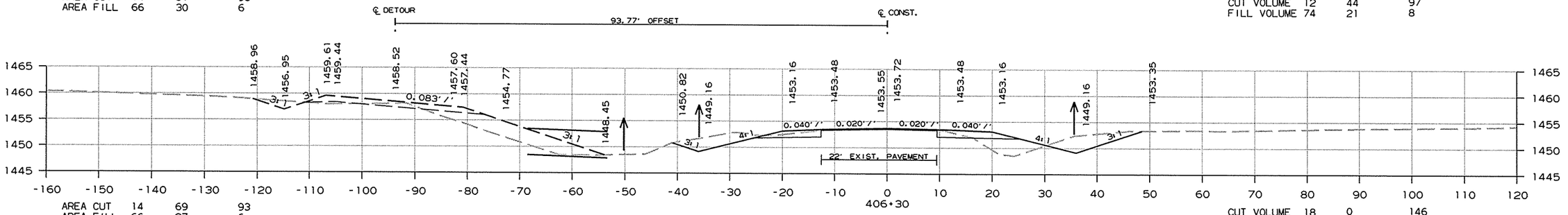
CUT VOLUME 326 274 119
FILL VOLUME 61 180 319

STA. 703+16.00 - CONSTRUCT
TRP. 60" X 234' TEMPORARY PIPE CULVERT
ON A 65° RT. FWD. SKEW



AREA CUT 14 51 93
AREA FILL 66 30 6

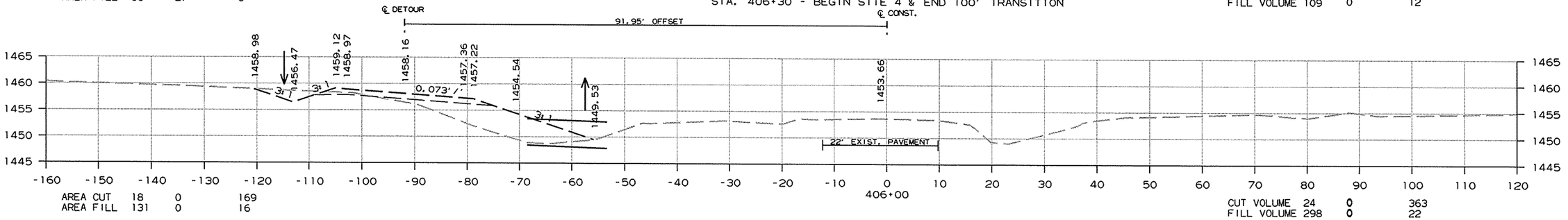
CUT VOLUME 12 44 97
FILL VOLUME 74 21 8



AREA CUT 14 69 93
AREA FILL 66 27 6

CUT VOLUME 18 0 146
FILL VOLUME 109 0 12

STA. 406+30 - BEGIN SITE 4 & END 100' TRANSITION



AREA CUT 18 0 169
AREA FILL 131 0 16

CUT VOLUME 24 0 363
FILL VOLUME 298 0 22

CROSS SECTION STA. 406+00 TO STA. 407+00

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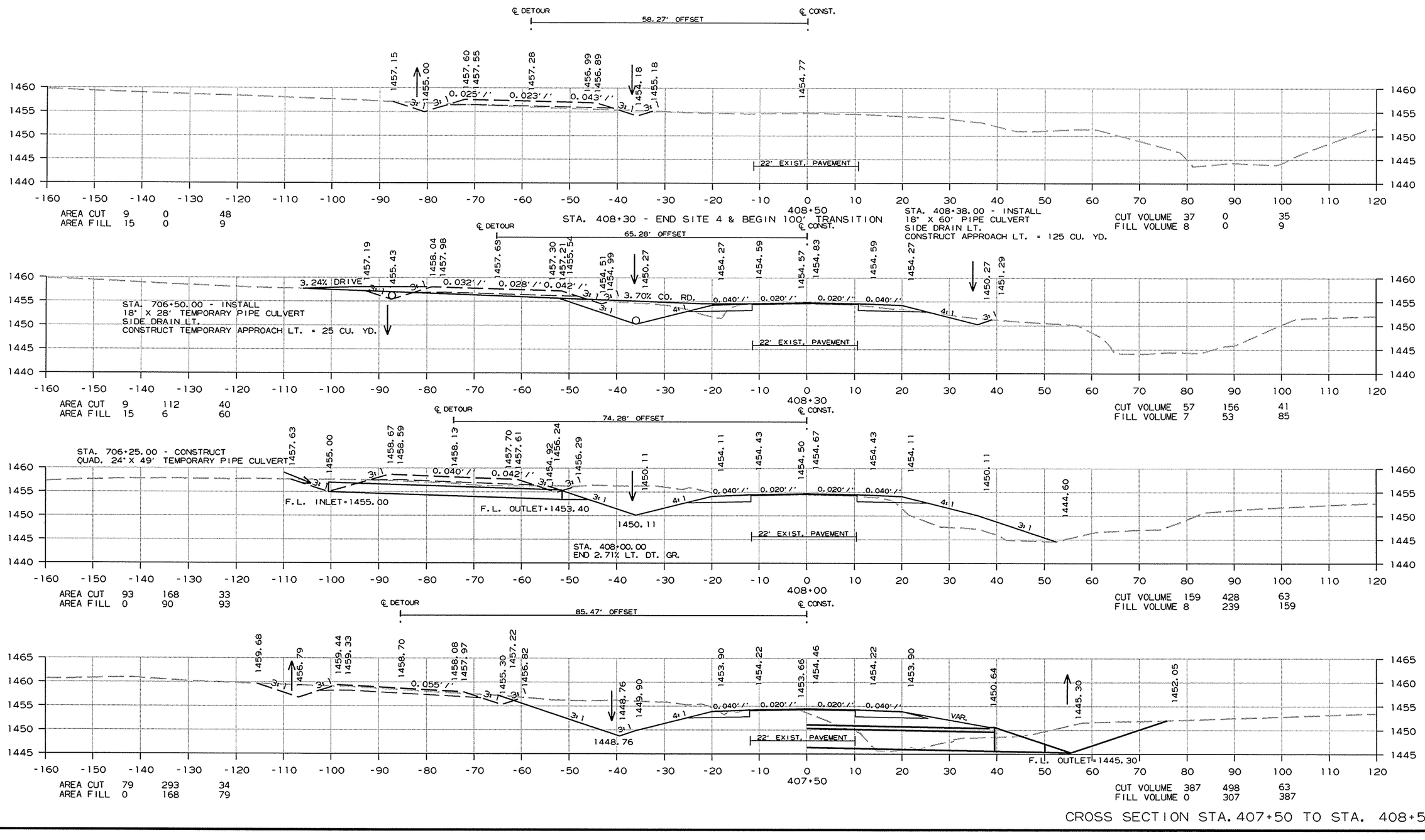
				6	ARK.			
				JOB NO.		090343	139	141

(2) CROSS SECTIONS

STAGE 1: STAGE 2: STAGE 3:

STAGE 1: STAGE 2: STAGE 3:



CROSS SECTION STA. 407+50 TO STA. 408+50

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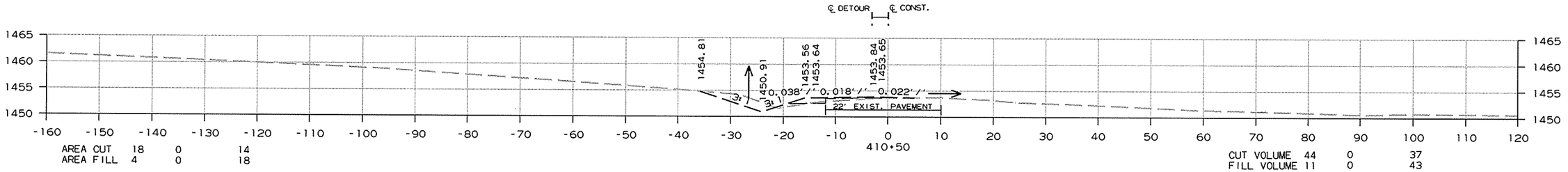
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090343	140	141

(2) CROSS SECTIONS

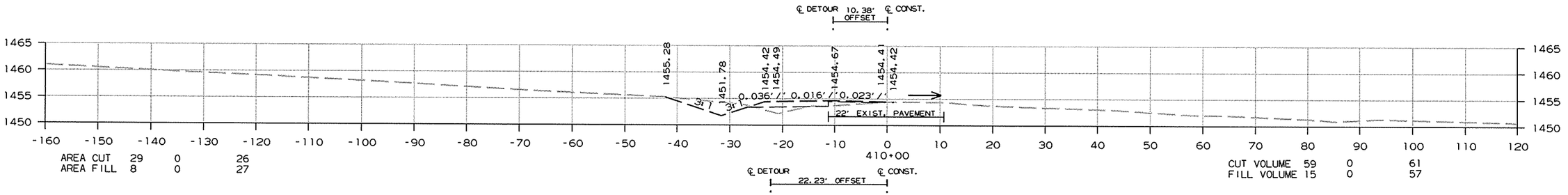
STAGE 1: STAGE 2: STAGE 3:

STAGE 1: STAGE 2: STAGE 3:



AREA CUT	18	0	14
AREA FILL	4	0	18

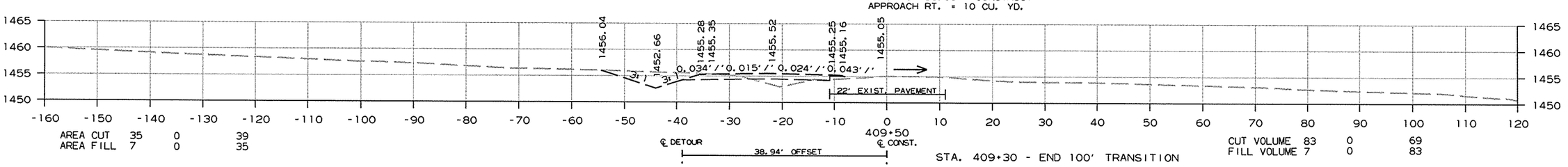
CUT VOLUME	44	0	37
FILL VOLUME	11	0	43



AREA CUT	29	0	26
AREA FILL	8	0	27

CUT VOLUME	59	0	61
FILL VOLUME	15	0	57

STA. 707+50.00 - CONSTRUCT
APPROACH RT. = 10 CU. YD.

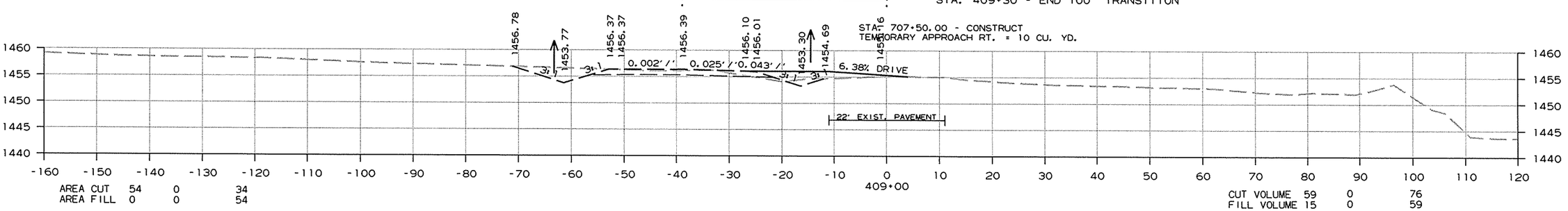


AREA CUT	35	0	39
AREA FILL	7	0	35

CUT VOLUME	83	0	69
FILL VOLUME	7	0	83

STA. 409+30 - END 100' TRANSITION

STA. 707+50.00 - CONSTRUCT
TEMPORARY APPROACH RT. = 10 CU. YD.



AREA CUT	54	0	34
AREA FILL	0	0	54

CUT VOLUME	59	0	76
FILL VOLUME	15	0	59

CROSS SECTION STA. 409+00 TO STA. 410+50

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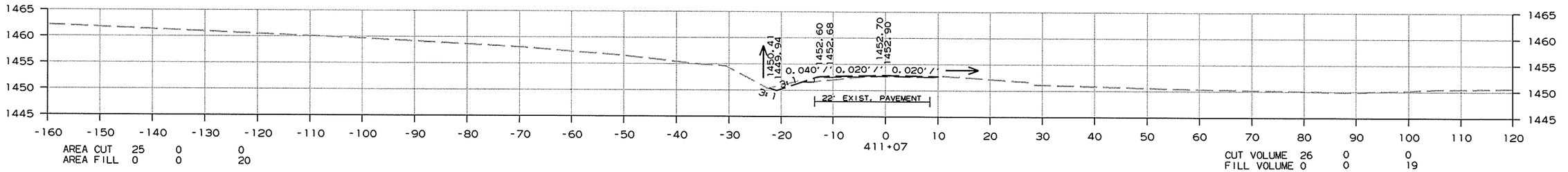
				6	ARK.			
				JOB NO.		090343	141	141

STAGE 1: STAGE 2: STAGE 3:

(2) CROSS SECTIONS

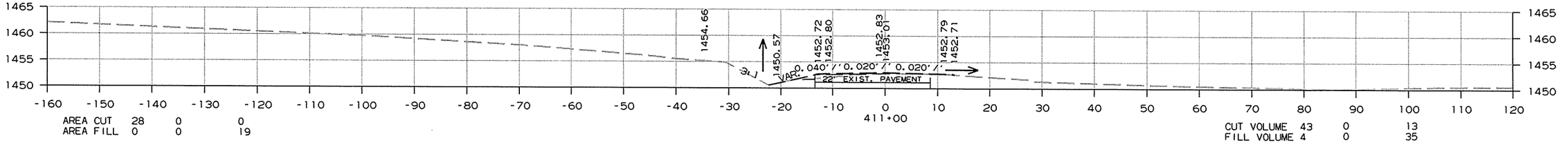
STAGE 1: STAGE 2: STAGE 3:

℄ DETOUR STA. 709+33 - END DETOUR 4
℄ CONST. STA. 411+07



AREA CUT	25	0	0
AREA FILL	0	0	20

CUT VOLUME	26	0	0
FILL VOLUME	0	0	19



AREA CUT	28	0	0
AREA FILL	0	0	19

CUT VOLUME	43	0	13
FILL VOLUME	4	0	35

CROSS SECTION STA. 411+00 TO STA. 411+07

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