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.		040623	1	115
				(2)	NATURAL DAM-NORTH STRS. & APPRS. (S)			

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
CONSTRUCTION PLANS FOR STATE HIGHWAY

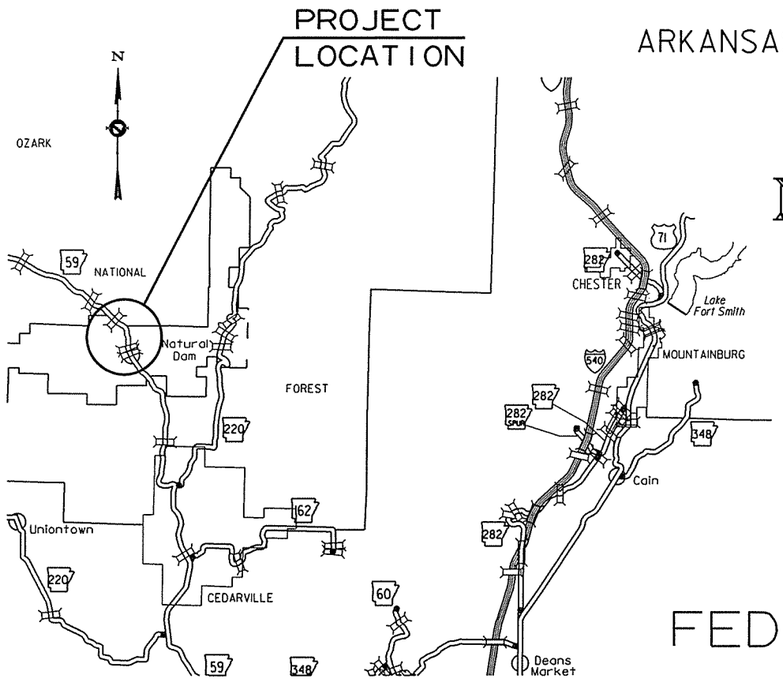
NATURAL DAM-NORTH STRS. & APPRS. (S)

CRAWFORD COUNTY

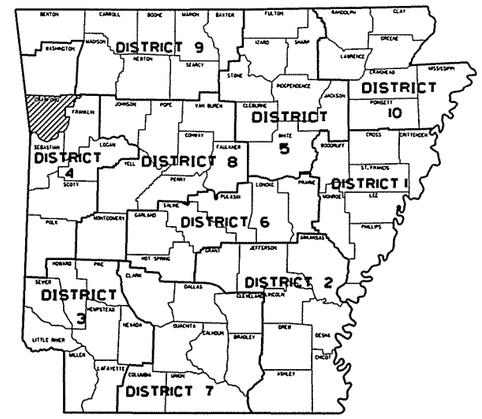
ROUTE 59 SECTION 5

JOB 040623

FED. AID PROJ. NHPP-0017(33)



VICINITY MAP



ARK. HWY. DIST. NO. 4

STRUCTURES OVER 20'-0" SPAN

(1) STA. 106+10 - CONSTRUCT
QUAD. 11' x 6' x 71' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
Q50 = 2460 CFS, D.A. = 2.56 SQ. MI.
ROADWAY SPAN = 47.08 LIN. FT.

(2) STA. 208+10 - CONSTRUCT
TRIPLE 12' x 10' x 81' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
Q50 = 1510 CFS, D.A. = 1.54 SQ. MI.
ROADWAY SPAN = 39.67 LIN. FT.

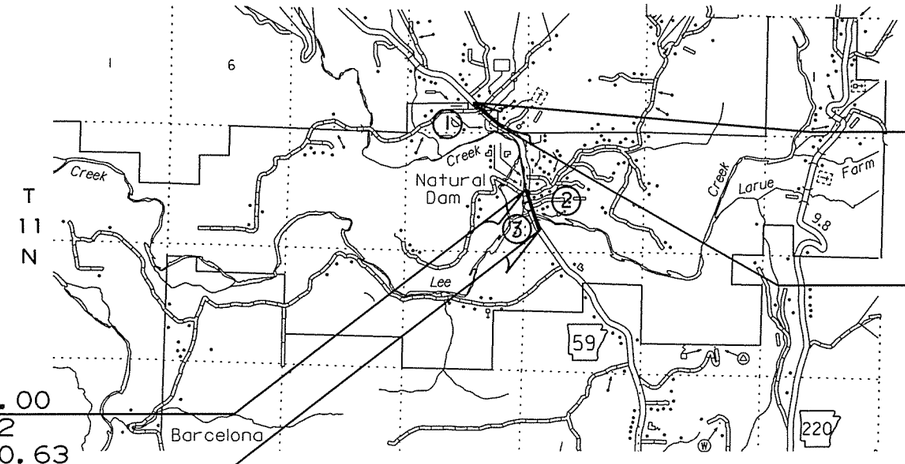
BRIDGE DATA

(3) STA. 213+64.92- BRIDGE END
BRIDGE NO. 07373
360'-0" CONT. COMPOSITE PLATE GIRDER UNIT (110'-140'-110')
240'-0" CONT. COMPOSITE W-BEAM UNIT (80'-80'-80')
40'-0" CLEAR ROADWAY
602'-2" BRIDGE LENGTH
STA. 219+67.08 - BRIDGE END

• DESIGN TRAFFIC DATA •

DESIGN YEAR	2036
2016 ADT	2000
2036 ADT	2400
2036 DHV	264
DIRECTIONAL DISTRIBUTION	60%
TRUCKS	22%
DESIGN SPEED	45 MPH

NOT TO SCALE



STA. 102+60.86
BEGIN JOB 040623 &
SITE 1
LOG MILE 9.85

STA. 108+00.86
END SITE 1

STA. 202+10.00
BEGIN SITE 2
LOG MILE 10.63

STA. 227+44.49
END SITE 2 &
JOB 040623

N

APPROVED

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

6-30-16

DEPUTY DIRECTOR
AND CHIEF ENGINEER

GROSS LENGTH OF PROJECT	3074.49	FEET OR	0.582 MILES
NET " " ROADWAY	2385.58	" "	0.452 "
NET " " BRIDGES	688.91	" "	0.130 "
NET " " PROJECT	3074.49	" "	0.582 "

P.E. 040623

	BEGIN PROJECT	MID-POINT OF PROJECT	END PROJECT
LATITUDE	N 35°39'30"	N 35°39'13"	N 35°38'35"
LONGITUDE	W 94°24'04"	W 94°23'42"	W 94°23'30"

6/22/2016

R040623.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.		040623	2	115

(2) INDEX OF SHEETS

INDEX OF SHEETS

SHEET NO.		TITLE	BRIDGE NO.	DRWG.NO.	DATE
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2		INDEX OF SHEETS			
3		GOVERNING SPECIFICATIONS AND GENERAL NOTES			
4	6	TYPICAL SECTIONS OF IMPROVEMENT			
7	16	SPECIAL DETAILS			
17	21	TEMPORARY EROSION CONTROL DETAILS			
22	26	MAINTENANCE OF TRAFFIC DETAILS			
27		PERMANENT PAVEMENT MARKING DETAILS			
28	32	QUANTITIES			
33		SCHEDULE OF BRIDGE QUANTITIES	07373	57963	
34		SUMMARY OF QUANTITIES AND REVISIONS			
35	37	SURVEY CONTROL DETAILS			
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60		DETAILS OF 240'-0" CONTINUOUS W-BEAM UNIT (SHEET 3 OF 3)	07373	57981	
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66		STANDARD GENERAL NOTES FOR STEEL BRIDGE STRUCTURES		55006	9-02-15
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68		STANDARD DETAILS FOR STEEL H-PILES AND PILE ENCASEMENTS		55020	3-24-16
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70		CONCRETE DITCH PAVING		CDP-1	11-17-10
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73		GUARD RAIL DETAILS		GR-8A	7-14-10
74		GUARD RAIL DETAILS		GR-9	4-17-08
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76		GUARD RAIL DETAILS		GR-10	7-14-10
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79		MAILBOX DETAILS		MB-1	11-18-04
80		PRECAST CONCRETE BOX CULVERTS		PBC-1	1-28-15
81		CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING		PCC-1	2-27-14
82		METAL PIPE CULVERT FILL HEIGHTS & BEDDING		PCM-1	2-27-14
83		PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)		PCP-1	2-27-14
84		PLASTIC PIPE CULVERT (PVC F949)		PCP-2	2-27-14
85		PAVEMENT MARKING DETAILS		PM-1	5-12-16
86		DETAILS OF PIPE UNDERDRAIN		PU-1	4-10-03
87		REINFORCED CONCRETE BOX CULVERT DETAILS		RCB-1	7-26-12
88		EXCAVATION PAY LIMITS, BACKFILL, & SOLID SODDING FOR BOX CULVERTS		RCB-2	11-20-03
89		TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC		SE-2	10-18-96
90		STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION		TC-1	9-02-15
91		STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION		TC-2	9-02-15
92		STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION		TC-3	9-02-15
93		STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION-TEMPORARY PRECAST BARRIER		TC-4	2-27-14
94		STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION-TEMPORARY PRECAST BARRIER		TC-5	10-15-09
95		TEMPORARY EROSION CONTROL DEVICES		TEC-1	12-15-11
96		TEMPORARY EROSION CONTROL DEVICES		TEC-2	6-02-94
97		TEMPORARY EROSION CONTROL DEVICES		TEC-3	11-03-94
98		TEMPORARY EROSION CONTROL DEVICES		TEC-4	7-26-12
99		WIRE FENCE WATER GAPS		WF-2	4-20-79
100		WIRE FENCE TYPE C AND D		WF-4	8-22-02
101	115	CROSS SECTIONS			

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

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
6-29-16

6/8/2016

R040623.DGN

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				6	ARK.			
				JOB NO.		040623	3	115
				(2)	GOV. SPECS. & GEN. NOTES			

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
6-29-16

GOVERNING SPECIFICATIONS

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

NUMBER	TITLE
ERRATA_____	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273__	REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS
FHWA-1273__	SUPPLEMENT - SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140)
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - FEDERAL STANDARDS
FHWA-1273__	SUPPLEMENT - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS
FHWA-1273__	SUPPLEMENT - WAGE RATE DETERMINATION
100-3_____	CONTRACTOR'S LICENSE
108-1_____	LIQUIDATED DAMAGES
108-2_____	WORK ALLOWED PRIOR TO ISSUANCE OF WORK ORDER
303-1_____	AGGREGATE BASE COURSE
400-1_____	TACK COATS
410-1_____	CONSTRUCTION REQUIREMENTS AND ACCEPTANCE OF ASPHALT CONCRETE PLANT MIX COURSES
604-1_____	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
606-1_____	PIPE CULVERTS FOR SIDE DRAINS
620-1_____	MULCH COVER
JOB 040623__	BIDDING REQUIREMENTS AND CONDITIONS
JOB 040623__	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 040623__	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 040623__	CARGO PREFERENCE ACT REQUIREMENTS
JOB 040623__	CAVE DISCOVERY
JOB 040623__	CONSTRUCTION IN SPECIAL FLOOD HAZARD AREAS
JOB 040623__	CULTURAL RESOURCES MONITORING REQUIREMENTS
JOB 040623__	DELAY IN RIGHT OF WAY OCCUPANCY
JOB 040623__	DISADVANTAGED BUSINESS ENTERPRISE BIDDER'S RESPONSIBILITIES
JOB 040623__	DIRECT TENSION INDICATORS FOR HIGH STRENGTH BOLT ASSEMBLIES
JOB 040623__	DRILLED SHAFT FOUNDATIONS
JOB 040623__	FOREST SERVICE REQUIREMENTS
JOB 040623__	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 040623__	HIGH PERFORMANCE PAVEMENT MARKING
JOB 040623__	ISSUANCE OF PROPOSALS
JOB 040623__	MANDATORY ELECTRONIC CONTRACT
JOB 040623__	MANDATORY ELECTRONIC DOCUMENT SUBMITTAL
JOB 040623__	NESTING SITES OF MIGRATORY BIRDS
JOB 040623__	NONDESTRUCTIVE TESTING OF DRILLED SHAFTS
JOB 040623__	OFF-SITE RESTRAINING CONDITIONS FOR INDIANA AND NORTHERN LONG-EARED BATS
JOB 040623__	PARTNERING REQUIREMENTS
JOB 040623__	PLASTIC PIPE
JOB 040623__	REMOVAL OF HISTORIC TRUSS SPANS OF BRIDGE NO. 01811
JOB 040623__	RESTRAINING CONDITION
JOB 040623__	SECTION 404 NATIONWIDE 14 PERMIT REQUIREMENTS
JOB 040623__	SHORING FOR CULVERTS
JOB 040623__	SOIL STABILIZATION
JOB 040623__	SPECIAL SEEDING REQUIREMENTS
JOB 040623__	STORM WATER POLLUTION PREVENTION PLAN
JOB 040623__	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 040623__	UTILITY ADJUSTMENTS
JOB 040623__	VALUE ENGINEERING
JOB 040623__	VEGETATED BUFFER
JOB 040623__	WARM MIX ASPHALT
JOB 040623__	WATER POLLUTION CONTROL & RESTRAINING CONDITION

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.

6/8/2016

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GOVERNING SPECIFICATIONS & GENERAL NOTES

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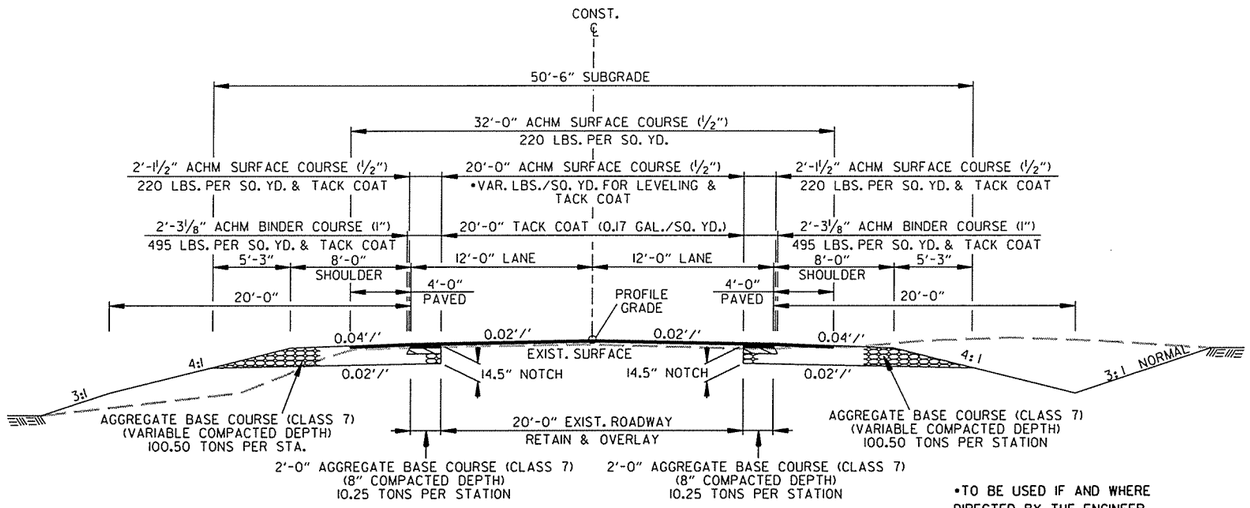
(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
6-29-16



•TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

TYPICAL SECTION OF IMPROVEMENT
NOTCH & WIDEN TANGENT SECTION

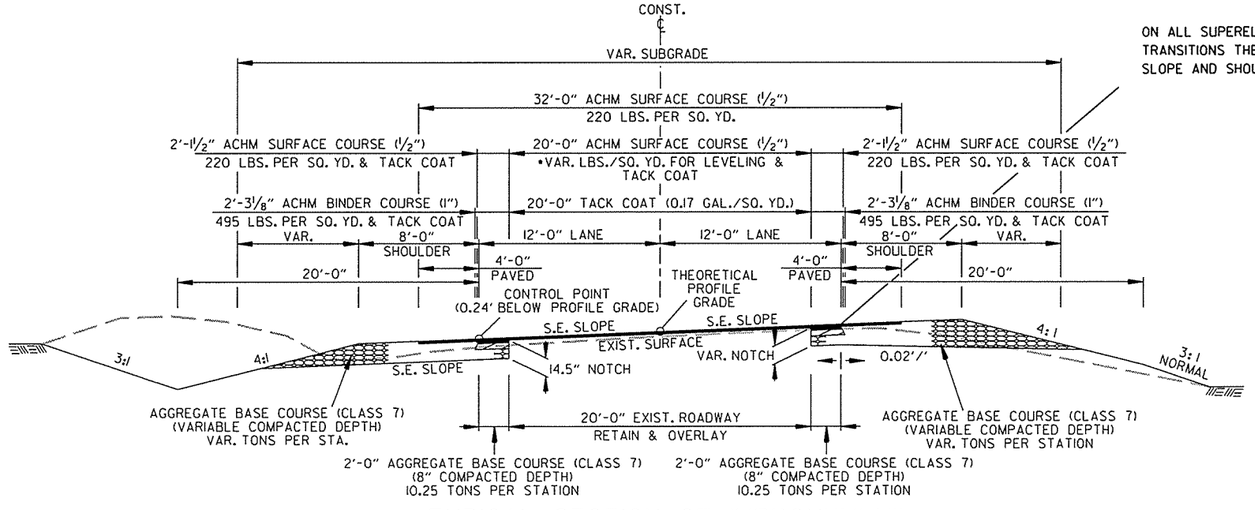
STA. 102+60.86 TO STA. 103+75.00

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

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

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

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



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

TYPICAL SECTION OF IMPROVEMENT
NOTCH & WIDEN SUPERELEVATION SECTION

STA. 107+50.00 TO STA. 108+00.86
STA. 202+10.00 TO STA. 203+44.74
STA. 225+75.74 TO STA. 227+44.49

2/25/2016

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(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
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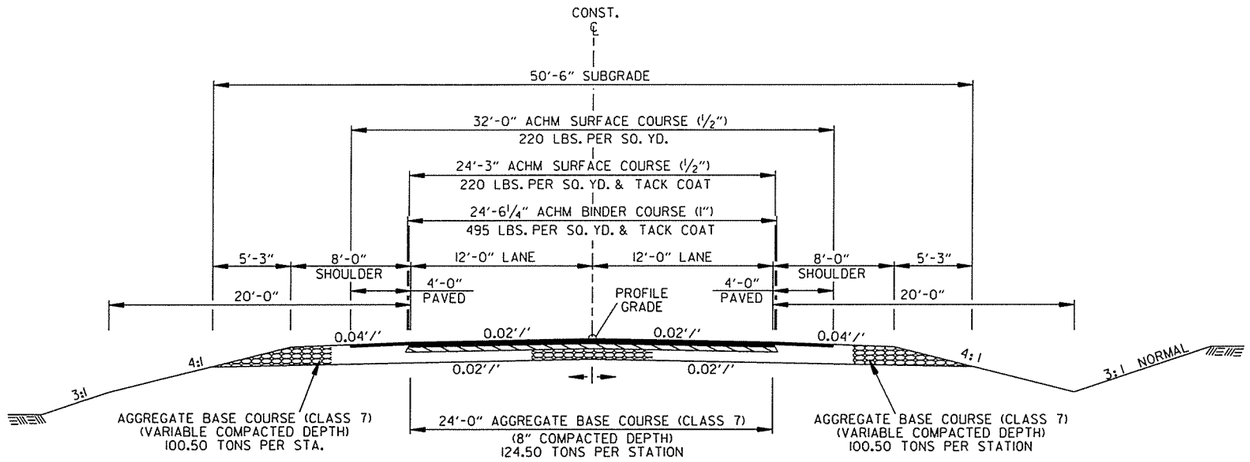


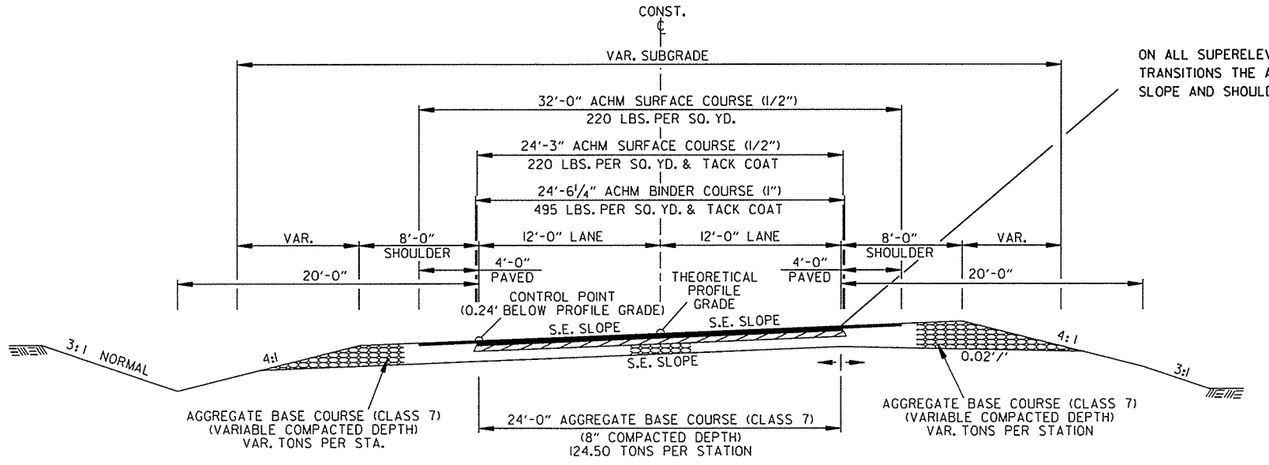
TYPICAL SECTION OF IMPROVEMENT
FULL DEPTH TANGENT SECTION

STA. 103+75.00 TO STA. 107+45.43
STA. 210+66.05 TO STA. 213+64.92
STA. 219+67.08 TO STA. 221+73.20

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

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

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



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

TYPICAL SECTION OF IMPROVEMENT
FULL DEPTH SUPERELEVATION SECTION

STA. 107+45.43 TO STA. 107+50.00
STA. 205+96.26 TO STA. 210+66.05
STA. 221+73.20 TO STA. 223+36.47

2/25/2016

R040623.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
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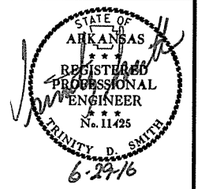
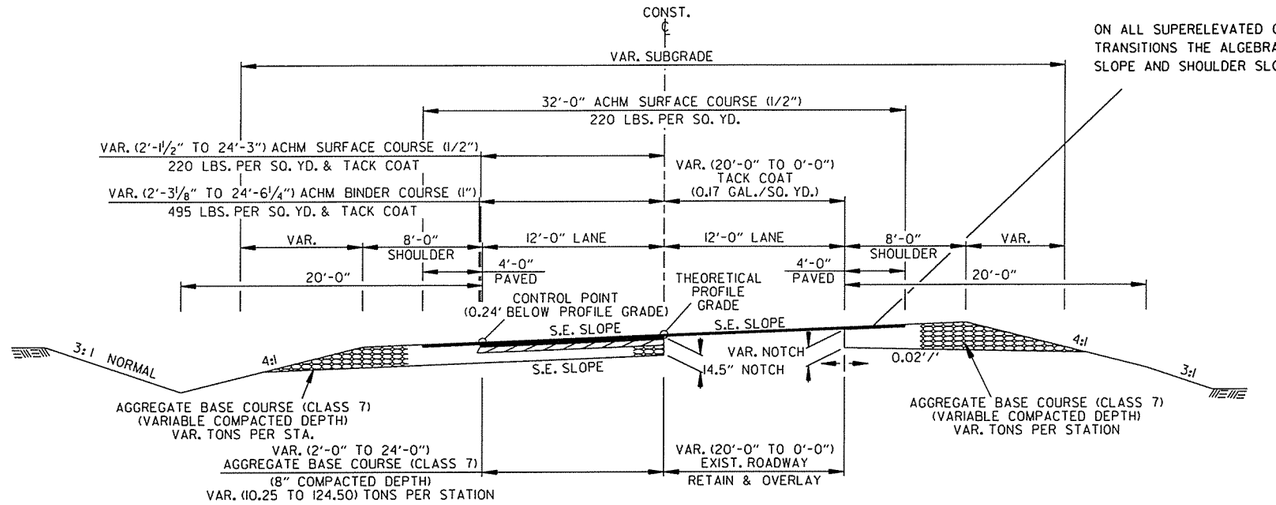
(2) TYPICAL SECTIONS OF IMPROVEMENT





TYPICAL SECTION OF IMPROVEMENT
NOTCH & WIDEN TO LEFT
SUPERELEVATION SECTION

STA. 203+44.74 TO STA. 205+96.26
STA. 223+36.47 TO STA. 225+75.74

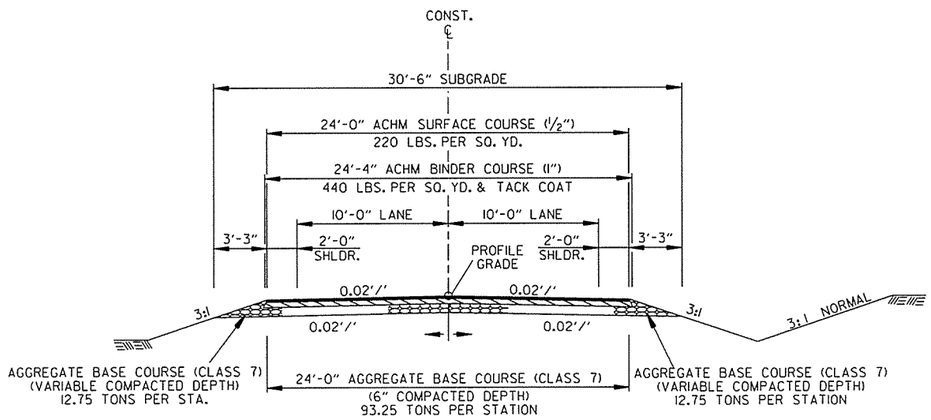
ON ALL SUPERELEVATED CURVES AND THRU SUPERELEVATION TRANSITIONS THE ALGEBRAIC DIFFERENCE BETWEEN PAVEMENT SLOPE AND SHOULDER SLOPE SHALL NOT EXCEED 0.08'/'.

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

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

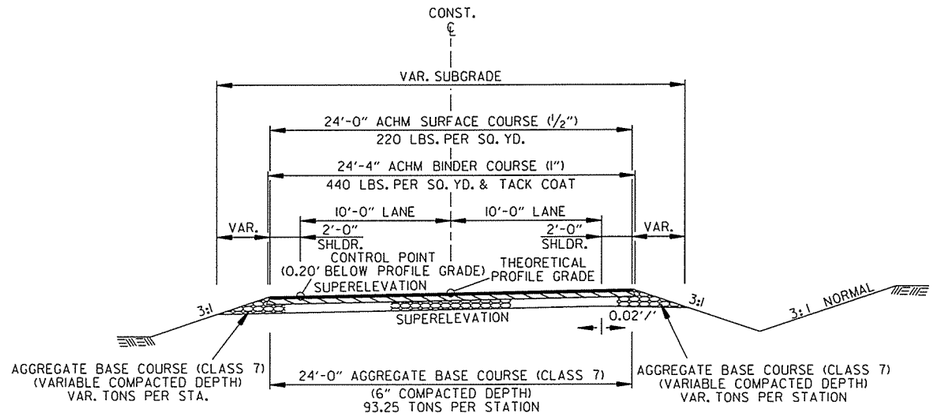
THE FINAL 2" OF SURFACE COURSE IS TO BE PLACED AFTER ALL OTHER COURSES HAVE BEEN LAID. LONGITUDINAL JOINTS SHALL BE AT LANE LINES.

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



DETOUR
TYPICAL SECTION OF IMPROVEMENT
FULL DEPTH TANGENT SECTION

STA. 301+91.88 TO STA. 304+01.16



DETOUR
TYPICAL SECTION OF IMPROVEMENT
FULL DEPTH TANGENT SECTION

STA. 304+01.16 TO STA. 311+41.32

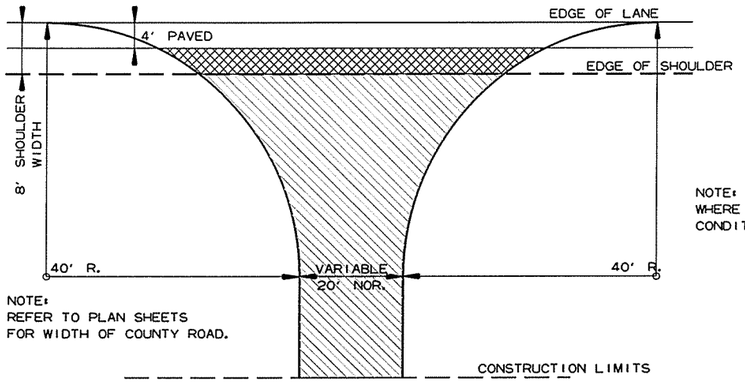
2/25/2016

R040623.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.		040623	7	115

(2) SPECIAL DETAILS



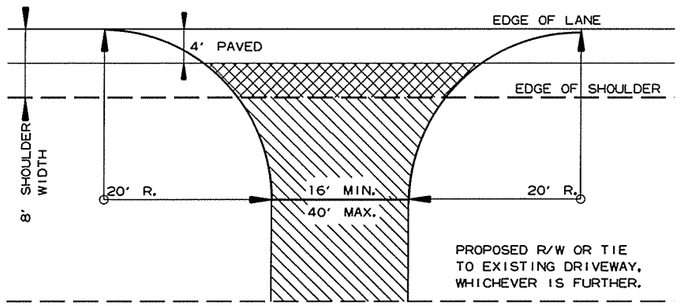
NOTE:
REFER TO PLAN SHEETS
FOR WIDTH OF COUNTY ROAD.

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

ACHM SURFACE COURSE (1/2") (220 LBS. PER SQ. YD.)

ACHM SURFACE COURSE (1/2") (220 LBS. PER SQ. YD.) AND AGGREGATE BASE COURSE (CLASS 7) 7" COMP. DEPTH

DETAIL FOR COUNTY ROAD TURNOUTS OPEN SHOULDER SECTION

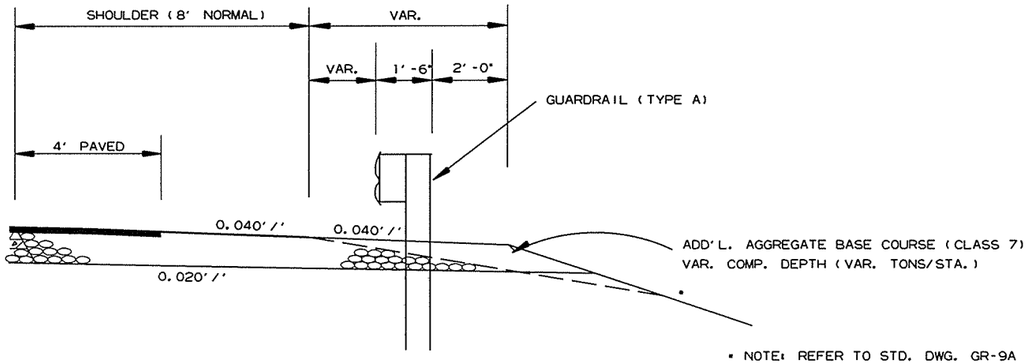


NOTE: TURNOUTS AND PRIVATE DRIVES SHALL BE MODIFIED WHERE NECESSARY TO MEET LOCAL CONDITIONS AS DIRECTED BY THE ENGINEER.

ACHM SURFACE COURSE (1/2") (220 LBS. PER SQ. YD.)

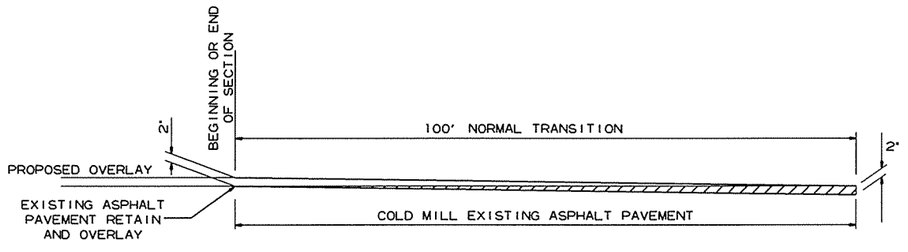
ACHM SURFACE COURSE (1/2") (220 LBS. PER SQ. YD.) AND AGGREGATE BASE COURSE (CLASS 7) 7" COMP. DEPTH IF ASPHALT OR GRAVEL DRIVE EXISTING; OR 6" CONCRETE IF CONCRETE DRIVE EXISTING.

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

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
6-23-16

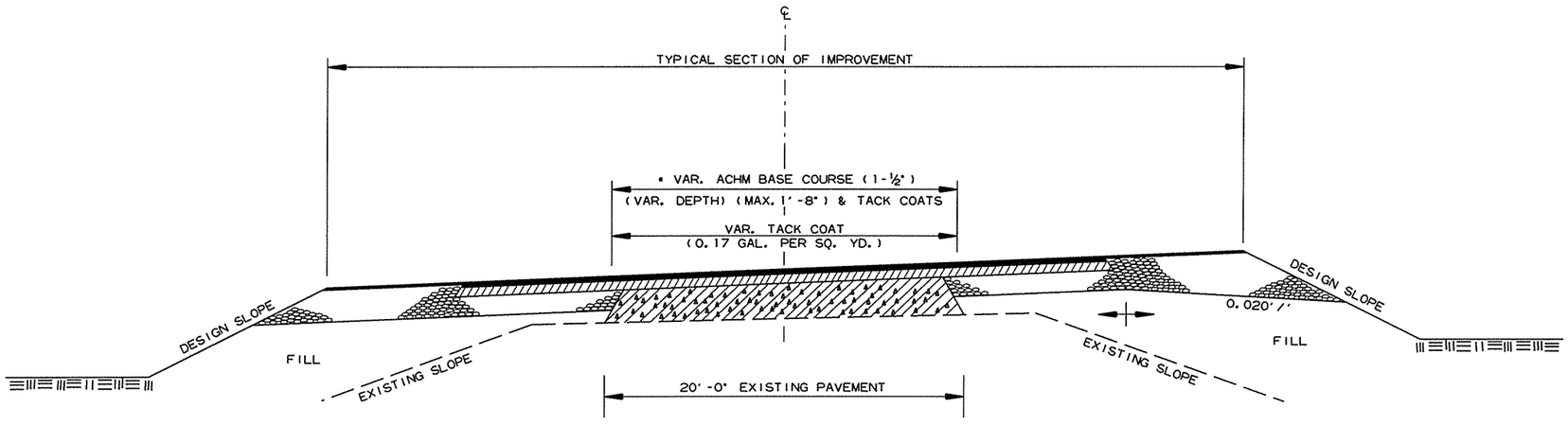
6/8/2016

R040623.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.		040623	8	115

(2) SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TIMOTHY D. SMITH
6-22-16



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

METHOD OF RAISING GRADE

NOTES:

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

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

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

6/8/2016

R040623.DGN

SPECIAL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	9	115
			①	SPECIAL DETAILS				

INLET WINGWALL TABLE

OVER ALL WIDTH	CLEAR HEIGHT	FOOTING THK.	WING WALL THK.	BOX SKEW (DEG.)	SLOPE	HDWL LENGTH	HEEL	WALL HEIGHT AT HDWL	WALL HEIGHT AT WING END	WINGWALL ANGLE (DEGREE) WING A	WINGWALL ANGLE (DEGREE) WING B	FOOTING WIDTH AT WALL END	WIDTH OF WING FOOTINGS AT HDWL WING A	WIDTH OF WING FOOTINGS AT HDWL WING B	FOOTING DIMENSION PARALLEL WITH HDWL WING A	FOOTING DIMENSION PARALLEL WITH HDWL WING B	LENGTH OF WINGWALLS WING A	LENGTH OF WINGWALLS WING B	LENGTH OF FOOTING HEEL WING A	LENGTH OF FOOTING HEEL WING B
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	AF1	AF2	WE	WF1	WF2	G1	G2	W1	W2	W3	W4
47'-1"	6'-0"	0'-9"	0'-8"	0	3:1	46'-0"	2'-0"	6'-10"	2'-0"	30	30	3'-2"	3'-4 7/8"	3'-4 7/8"	0'-3 1/4"	0'-3 1/4"	16'-6"	16'-6"	20'-0 3/8"	20'-0 3/8"

CLASS "S" CONCRETE (Includes apron)	REINFORCING STEEL (Includes apron and laps if required)
INLET	INLET
CU.YD	LBS.
10.44	840

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	17	L Min 3'-0"	-	-	-	L -	-	-	-	L -	4	18	4	Min 5'-6"	4	18	4	16'-2"	4	18	11	L Min 4'-10"	4	8	20'-10"	4	18	11	Min 2'-8"	-	-	-	Min -	4	2	16'-9"	4	2	17'-9"	6	12	6	L 3'-4"	420
				L Max 7'-11"																				L Max 9'-3"																						
				X Min 0'-9"				X -				X -				Max 10'-8"								X Min 2'-4"							Max 2'-11"				Max -										X 1'-8"	
				X Max 1'-0"																				X Max 2'-4"																						
				Y Min 2'-4"				Y -				Y -												Y Min 2'-7"																						
				Y Max 7'-0"																				Y Max 7'-0"																						
WING B	4	12	17	L Min 3'-0"	-	-	-	L -	-	-	-	L -	4	18	4	Min 5'-6"	4	18	4	16'-2"	4	18	11	L Min 4'-10"	4	8	20'-10"	4	18	11	Min 2'-8"	-	-	-	Min -	4	2	16'-9"	4	2	17'-9"	6	12	6	L 3'-4"	420
				L Max 7'-11"																				L Max 9'-3"																						
				X Min 0'-9"				X -				X -				Max 10'-8"								X Min 2'-4"							Max 2'-11"				Max -										X 1'-8"	
				X Max 1'-0"																				X Max 2'-4"																						
				Y Min 2'-4"				Y -				Y -												Y Min 2'-7"																						
				Y Max 7'-0"																				Y Max 7'-0"																						

MID-SECTION BAR LAP TABLE

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

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

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

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
★ ★ ★
No. 9235
CHARLES R. ELLIS
Charles R. Ellis
4-7-16

TABULAR DATA BY: LJB DATE: 3/21/16
CHECKED BY: Eon DATE: 3/21/16

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

INLET SKEWED END SECTION

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

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

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

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

INLET SLOPE SECTION(S)

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

CLASS "S" CONCRETE	REINFORCING STEEL (GR. 60)
CU. YDS.	LBS.
TOTAL	
0.44	126

HDWL DEPTH. HD	ADDITIONAL REINF. FOR HDWL LBS.	"h" HDWL BARS SIZE	Y	LENGTH	NO. REQ'D
3"	62	4	1'-0"	2'-0"	48

MID-SECTION

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.) D	CLEAR SPAN (FT.) S	CLEAR HEIGHT (FT.) H	TOP SLAB THK. T	BOTTOM SLAB THK. B	SIDE WALL THK. C	INTERIOR WALL THK. W	OVER ALL WIDTH OW	OVER ALL HEIGHT OH	SECTION LENGTH (FT.) SL	TOP SLAB REINFORCING STEEL (LENGTH = OW - 4" + BENDS) "a" SIZE	"a" L	Bent "b" SIZE	Bent "b" L	"c" SIZE	"c" L	SPACING	NO. REQ'D	BOTTOM SLAB REINFORCING STEEL (LENGTH = OW - 4" + BENDS) "d" SIZE	"d" L	Bent "b1" SIZE	Bent "b1" L	"f" SIZE	"f" L	SPACING	NO. REQ'D	SIDE WALL REINFORCING STEEL "f0" (LENGTH = OH - 4") SIZE	SPACING	NO. REQ'D	LENGTH	INTERIOR WALL REINFORCING STEEL "f1" (LENGTH = OH - 4") SIZE	SPACING	NO. REQ'D	LENGTH	TOP SLAB DISTRIBUTION REINF. STEEL "g" (LENGTH = SL) SIZE	SPACING	NO. REQ'D	BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" (LENGTH = SL) SIZE	SPACING	NO. REQ'D	SIDE WALL DISTRIBUTION REINF. STEEL "d1" (LENGTH = SL) SIZE	SPACING	NO. REQ'D	INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" (LENGTH = SL) SIZE	SPACING	NO. REQ'D
A	5	11	6	13	13	6.5	8	47'-1"	8'-2"	69	5	46'-9"	8	47'-11"	4	46'-9"	20	41	4	46'-9"	4	47'-11"	4	46'-9"	11	75	5	6.5	254	7'-10"	4	12	414	7'-10"	4	8.5	135	4	8.5	135	4	12	12	4	12	36

CLASS "S" CONCRETE	REINFORCING STEEL (GR. 60)
CU. YDS.	LBS.
307.98	35908

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.

SHEET 1 OF 2
DETAILS OF R.C. BOX CULVERT
QUADRUPLE BARREL BOX CULVERT
Sta. 106+10
SPECIAL DETAILS

LRFD

Ver. 1.114 b040623_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.		040623	10	115

① SPECIAL DETAILS

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
4-7-16
CHARLES R. ELLIS

TABULAR DATA BY: LJB DATE: 3/21/16
CHECKED BY: EOR DATE: 3/21/16

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) OUTLET	REINFORCING STEEL (Includes apron and laps if required) OUTLET
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	AF1	AF2	WE	WF1	WF2	G1	G2	W1	W2	W3	W4	CU.YD	LBS.
47'-1"	6'-0"	0'-9"	0'-8"	0	3:1	46'-0"	2'-0"	6'-10"	2'-0"	30	30	3'-2"	3'-4 7/8"	3'-4 7/8"	0'-3 1/4"	0'-3 1/4"	16'-6"	16'-6"	20'-0 3/8"	20'-0 3/8"	11.95	840

WING	F1 BAR SIZE	F1 MAX. SPACING	F1 NO. REQ'D	F1 LENGTHS VARY	F1 Min	F1 Max	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	F4 Min	F4 Max	F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY	F6 Min	F6 Max	F7 BAR SIZE	F7 NO. REQ'D	F7 LENGTHS	F8 BAR SIZE	F8 SPACING	F8 NO. REQ'D	F8 LENGTHS VARY	F8 Min	F8 Max	F9 BAR SIZE	F9 SPACING	F9 NO. REQ'D	F9 LENGTHS	F9 Min	F9 Max	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	17	X	Min	0'-9"	-	-	-	X -	-	-	-	X -	4	18	4	Min	5'-6"	Max 10'-8"	4	18	4	16'-2"	4	18	11	Min	4'-10"	Max 9'-3"	4	8	20'-10"	4	18	11	Min	2'-8"	Max 2'-11"	-	-	-	Min -	Max -	4	2	16'-9"	4	2	17'-9"	6	12	6	L 3'-4"	X 1'-8"	420
																												X	Min 2'-4"	Max 2'-7"																										
				Y	Min	2'-4"				Y -				Y -														Y	Min 2'-7"	Max 7'-0"																										
					Max	7'-11"																																																	
WING B	4	12	17	X	Min	0'-9"	-	-	-	X -	-	-	-	X -	4	18	4	Min	5'-6"	Max 10'-8"	4	18	4	16'-2"	4	18	11	Min	4'-10"	Max 9'-3"	4	8	20'-10"	4	18	11	Min	2'-8"	Max 2'-11"	-	-	-	Min -	Max -	4	2	16'-9"	4	2	17'-9"	6	12	6	L 3'-4"	X 1'-8"	420
																												X	Min 2'-4"	Max 2'-7"																										
				Y	Min	2'-4"				Y -				Y -														Y	Min 2'-7"	Max 7'-0"																										
					Max	7'-11"																																																

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

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

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

OUTLET SKEWED END SECTION

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

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

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

OUTLET SLOPE SECTION(S)

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

HDWL DEPTH HD	ADDITIONAL REINF. FOR HDWL LBS.	"h" HDWL BARS SIZE	"h" HDWL BARS Y	"h" HDWL BARS LENGTH	"h" HDWL BARS NO. REQ'D
3"	62	4	1'-0"	2'-0"	48

CLASS "S" CONCRETE CU. YDS.	REINFORCING STEEL (GR. 60) LBS.
TOTAL	
0.44	126

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

QUADRUPLE BARREL BOX CULVERT
Sta. 106+10

SPECIAL DETAILS

Ver. 1.14 b040623_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.		040623	11	115

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
39'-8"	10'-0"	0'-11"	0'-10"	0	3:1	37'-4"	2'-0"	10'-10"	3'-4"	30	30	3'-4"	5'-4 1/4"	5'-4 1/4"	2'-4"	2'-4"	25'-6"	25'-6"	28'-0 7/8"	28'-0 7/8"

CLASS "S" CONCRETE (Includes apron)	REINFORCING STEEL (Includes apron and laps if required)
INLET	INLET
CU.YD	LBS.
22.23	1744

WING	F1 BAR SIZE	F1 MAX. SPACING	F1 NO. REQ'D	F1 LENGTHS VARY	F1	F2 BAR SIZE	F2 SPACING	F2 NO. REQ'D	F2 LENGTHS	F2	F3 BAR SIZE	F3 SPACING	F3 NO. REQ'D	F3 LENGTHS	F3	F4 BAR SIZE	F4 SPACING	F4 NO. REQ'D	F4 LENGTHS VARY	F4
WING A	4	12	26	L	Min 4'-8"	5	12	4	L	7'-6"	4	12	7	L	5'-8"	4	18	10	Min	
					Max 14'-0"														3'-10"	
				X	Min 0'-11"				X	2'-8"				X	2'-1"				Max	
					Max 2'-11"														24'-2"	
				Y	Min 3'-10"				Y	4'-11"				Y	3'-8"					
					Max 11'-2"															
WING B	4	12	26	L	Min 4'-8"	5	12	4	L	7'-6"	4	12	7	L	5'-8"	4	18	10	Min	
					Max 14'-0"														3'-10"	
				X	Min 0'-11"				X	2'-8"				X	2'-1"				Max	
					Max 2'-11"														24'-2"	
				Y	Min 3'-10"				Y	4'-11"				Y	3'-8"					
					Max 11'-2"															

WING	F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY	F6	F7 BAR SIZE	F7 NO. REQ'D	F7 LENGTHS	F8 BAR SIZE	F8 SPACING	F8 NO. REQ'D	F8 LENGTHS VARY	F8	F9 BAR SIZE	F9 SPACING	F9 NO. REQ'D	F9 LENGTHS	F9
WING A	4	18	4	25'-2"	4	18	17	L Min 6'-6"		4	8	28'-11"	4	18	18	Min		4	18	2	Min	
								Max 13'-7"								2'-10"					21'-1"	
								X Min 2'-6"								Max					Max	
								Max 2'-6"								4'-10"					21'-1"	
								Y Min 4'-1"														
								Max 11'-2"														
WING B	4	18	4	25'-2"	4	18	17	L Min 6'-6"		4	8	28'-11"	4	18	18	Min		4	18	2	Min	
								Max 13'-7"								2'-10"					21'-1"	
								X Min 2'-6"								Max					Max	
								Max 2'-6"								4'-10"					21'-1"	
								Y Min 4'-1"														
								Max 11'-2"														

WING	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	2	26'-1"	4	2	27'-11"	6	12	10	L	3'-4"	872
										X	1'-8"	
WING B	4	2	26'-1"	4	2	27'-11"	6	12	10	L	3'-4"	872
										X	1'-8"	

MID-SECTION BAR LAP TABLE

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

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

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

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
4-7-16
CHARLES R. ELLIS

TABULAR DATA BY: LJB DATE: 3/21/16
CHECKED BY: EOR DATE: 3/21/16

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.

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

INLET SKEWED END SECTION

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

TOP SLAB REINFORCING STEEL "a"				TOP SLAB REINFORCING STEEL "c"				BOTTOM SLAB REINFORCING STEEL "d"				BOTTOM SLAB REINFORCING STEEL "f"				SIDE WALL REINFORCING STEEL "f0"				INTERIOR WALL REINFORCING STEEL "f1"			
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
		Max				Max				Max				Max									
		Min				Min				Min				Min									

TOP SLAB DISTRIBUTION REINFORCING STEEL "g"				BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e"				SIDE WALL DISTRIBUTION REINFORCING STEEL "d1"				INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2"			
SIZE	SPACING	NO. REQ'D	LENGTHS VARY	SIZE	SPACING	NO. REQ'D	LENGTHS VARY	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH
			Max				Max				LONG				LONG
			Min				Min				SHORT				SHORT

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

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

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.)
D	S	H	T	B	C	W	OW	OH	SL	

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

HDWL DEPTH	ADDITIONAL REINF. FOR HDWL	"h" HDWL BARS			
HD	LBS.	SIZE	Y	LENGTH	NO. REQ'D
3"	52	4	0'-10"	1'-10"	40

CLASS "S" CONCRETE	REINFORCING STEEL (GR. 60)
CU. YDS.	LBS.
0.36	101
TOTAL	
0.36	101

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.)
D	S	H	T	B	C	W	OW	OH	SL	
A	10	12	10	12	13	14	8	39'-8"	12'-1"	79

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	39'-4"	8	40'-0"	8	39'-4"	15	63

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	39'-4"	7	40'-1"	7	39'-4"	11	86

SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH
6	8	236	11'-9"

INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH
4	12	316	11'-9"

TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL SIZE	SPACING	NO. REQ'D
4	9	101

BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL SIZE	SPACING	NO. REQ'D
4	8.5	107

SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL SIZE	SPACING	NO. REQ'D
5	12	20

INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL SIZE	SPACING	NO. REQ'D
4	12	40

CLASS "S" CONCRETE	REINFORCING STEEL (GR. 60)
CU. YDS.	LBS.
349.08	53370

SHEET 1 OF 2
DETAILS OF R.C. BOX CULVERT
TRIPLE BARREL BOX CULVERT
Sta. 208+10

SPECIAL DETAILS

Ver. Lil4 b040623_c2.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	12	115

(1) SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
★ ★ ★
No. 9235
CHARLES R. ELLIS
4-7-16

TABULAR DATA BY: LJB DATE: 3/21/16
CHECKED BY: EOR DATE: 3/21/16

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) OUTLET	REINFORCING STEEL (Includes apron and laps if required) OUTLET
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	AF1	AF2	WE	WF1	WF2	G1	G2	W1	W2	W3	W4	CU.YD	LBS.
39'-8"	10'-0"	0'-11"	0'-10"	0	3:1	37'-4"	2'-0"	10'-10"	3'-4"	30	30	3'-4"	5'-4 1/4"	5'-4 1/4"	2'-4"	2'-4"	25'-6"	25'-6"	28'-0 7/8"	28'-0 7/8"	23.67	1744

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	
WING A	4	12	26	L	Min	4'-8"	5	12	4	L	7'-6"	4	12	7	L	5'-8"
					Max	14'-0"										
				X	Min	0'-11"				X	2'-8"				X	2'-1"
					Max	2'-11"										
				Y	Min	3'-10"				Y	4'-11"				Y	3'-8"
					Max	11'-2"										
WING B	4	12	26	L	Min	4'-8"	5	12	4	L	7'-6"	4	12	7	L	5'-8"
					Max	14'-0"										
				X	Min	0'-11"				X	2'-8"				X	2'-1"
					Max	2'-11"										
				Y	Min	3'-10"				Y	4'-11"				Y	3'-8"
					Max	11'-2"										

WING	F4 BAR SIZE	F4 SPACING	F4 NO. REQ'D	F4 LENGTHS VARY	F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY		
WING A	4	18	10	Min	4	18	4	25'-2"	4	18	17	L	Min	6'-6"
				3'-10"									Max	13'-7"
				Max								X	Min	2'-6"
				24'-2"									Max	2'-6"
												Y	Min	4'-1"
													Max	11'-2"
WING B	4	18	10	Min	4	18	4	25'-2"	4	18	17	L	Min	6'-6"
				3'-10"									Max	13'-7"
				Max								X	Min	2'-6"
				24'-2"									Max	2'-6"
												Y	Min	4'-1"
													Max	11'-2"

WING	F7 BAR SIZE	F7 NO. REQ'D	F7 LENGTHS	F8 BAR SIZE	F8 SPACING	F8 NO. REQ'D	F8 LENGTHS VARY	F9 BAR SIZE	F9 SPACING	F9 NO. REQ'D	F9 LENGTHS	F10 BAR SIZE	F10 NO. REQ'D	F10 LENGTHS	F11 BAR SIZE	F11 NO. REQ'D	F11 LENGTHS	F12 BAR SIZE	F12 SPACING	F12 NO. REQ'D	F12 LENGTHS		REINF. STEEL QTY. PER WING (LBS)
WING A	4	8	28'-11"	4	18	18	Min	4	18	2	Min	4	2	26'-1"	4	2	27'-11"	6	12	10	L	3'-4"	872
							2'-10"				21'-1"												
							Max				Max										X	1'-8"	
							4'-10"				21'-1"												
WING B	4	8	28'-11"	4	18	18	Min	4	18	2	Min	4	2	26'-1"	4	2	27'-11"	6	12	10	L	3'-4"	872
							2'-10"				21'-1"												
							Max				Max										X	1'-8"	
							4'-10"				21'-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 DEPTH	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT
SK	SL	D	S	H	LL	T	HD	B	C	W	OW	OH

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

SIDE WALL REINFORCING STEEL "f0" SIZE	"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
											Max				Max				LONG				LONG
											Min				Min				SHORT				SHORT

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

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

OUTLET SLOPE SECTION(S)

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

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

HDWL DEPTH	ADDITIONAL REINF. FOR HDWL	"h" HDWL BARS SIZE	"h" Y	"h" LENGTH	"h" NO. REQ'D
HD	LBS.	SIZE	Y	LENGTH	NO. REQ'D
3"	52	4	0'-10"	1'-10"	40

CLASS "S" CONCRETE	REINFORCING STEEL (GR. 60)
CU. YDS.	LBS.
TOTAL	
0.36	101

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.

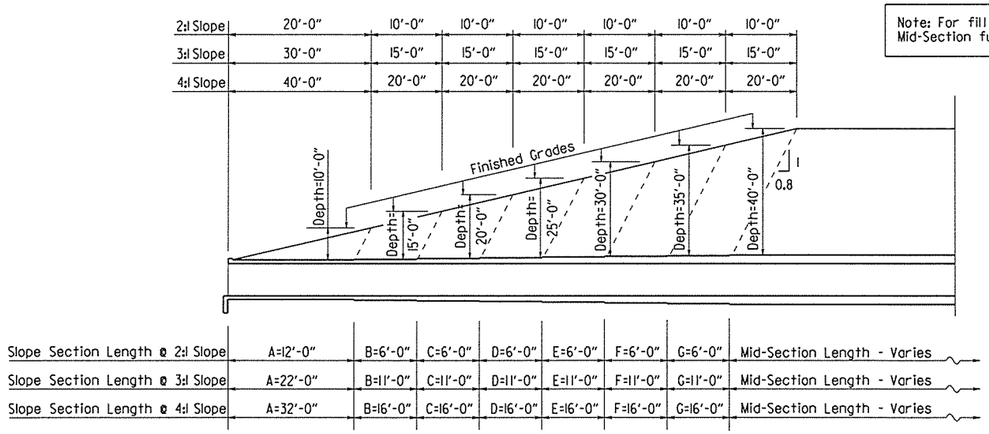
SHEET 2 OF 2
DETAILS OF R.C. BOX CULVERT
TRIPLE BARREL BOX CULVERT
Sta. 208+10
SPECIAL DETAILS

LRFD

Ver. 1.114 b040623_c2.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	13	115

(1) SPECIAL DETAILS

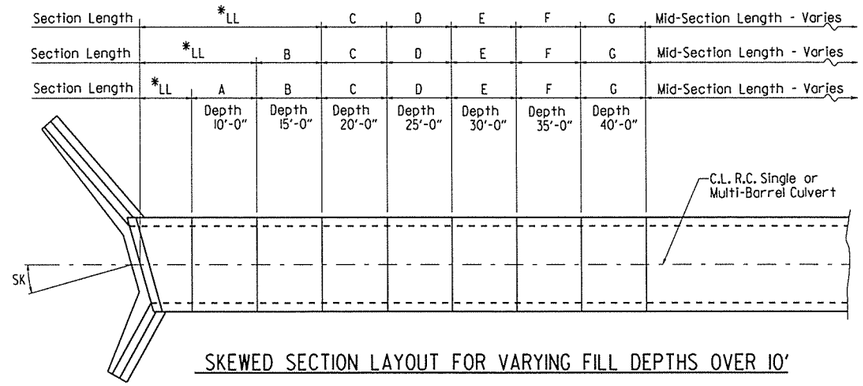


Note: For fill depths 10' and under, use Mid-Section full length of box culvert.

LONGITUDINAL SECTION LENGTH SCHEDULE FOR VARYING FILL DEPTHS OVER 10'

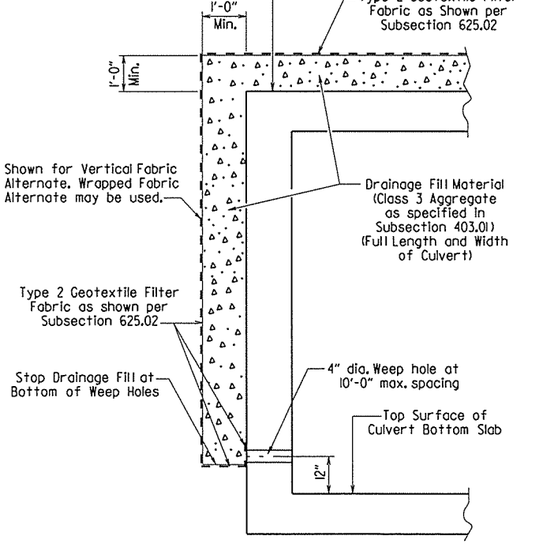
Lengths for Non-Skewed Boxes

* 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.



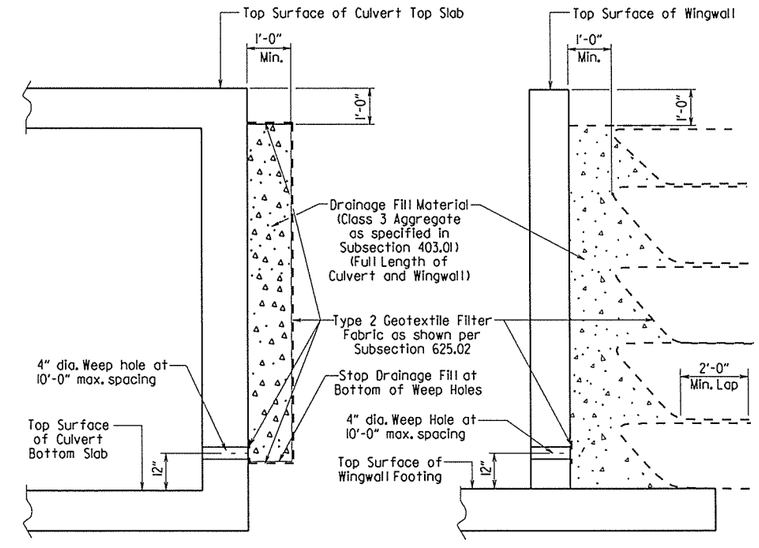
SKEWED SECTION LAYOUT FOR VARYING FILL DEPTHS OVER 10'

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
4-4-16
CHARLES R. ELLIS



CULVERT DRAINAGE DETAIL FOR ROCK FILL

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



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

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

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

WINGWALL & CULVERT DRAINAGE DETAIL

GENERAL NOTES:

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

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

LIVE LOADING: HL-93

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

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

Reinforcing Steel Tolerances: The tolerances for reinforcing steel shall meet those listed in 'Manual of Standard Practice' published by Concrete Reinforcing Steel Institute (CRSI) except that the tolerance for truss bars such as Figure 3 on page 7-4 of the CRSI Manual shall be minus zero to plus 1/2 inch.

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

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

Weep Holes in box culvert walls shall have a maximum horizontal spacing of 10'-0" and shall be spaced to clear all reinforcing steel. The drain opening shall be 4" diameter and shall be placed 12" above the top of the bottom slab.

Weep Holes in wingwalls shall have a maximum horizontal spacing of 10'-0" and shall be spaced to clear all reinforcing steel. There shall be a minimum of two (2) weep holes in each wingwall. The drain opening shall be 4" diameter and shall be placed 12" above the top of the wingwall footing.

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

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

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

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

SHEET 1 OF 4

GENERAL DETAILS OF R.C. BOX CULVERT

GENERAL NOTES &
LONGITUDINAL SECTION LENGTH SCHEDULE

SPECIAL DETAILS

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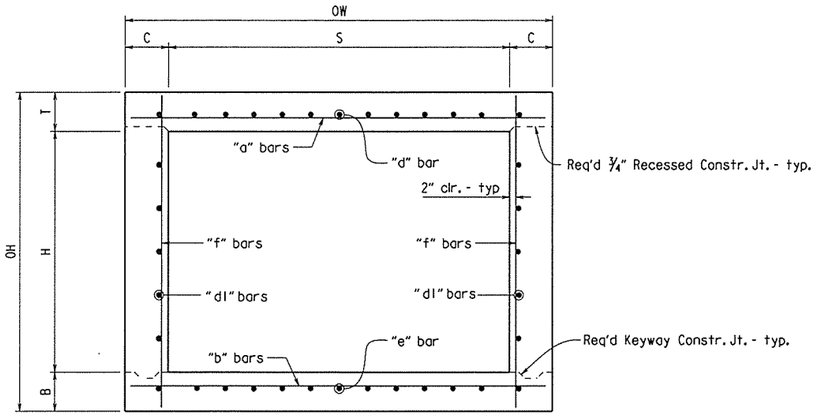
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	14	115

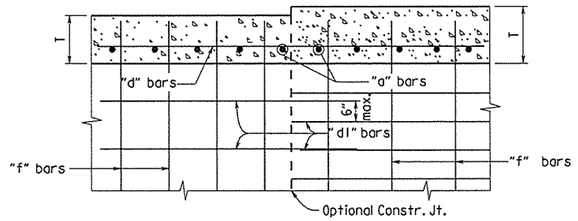
(1) SPECIAL DETAILS

STATE OF ARKANSAS
Charlotte Ellis
REGISTERED PROFESSIONAL ENGINEER
* * *
No. 9235
9-9-16
CHARLES R. ELLIS

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



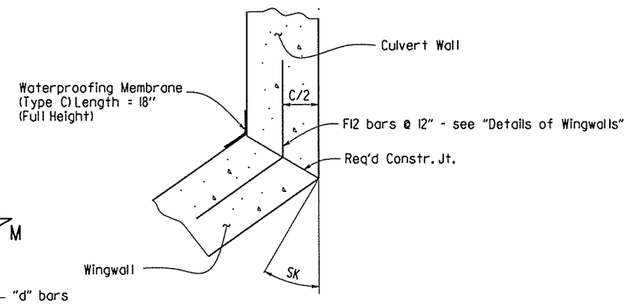
TYPICAL SECTION M-M



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

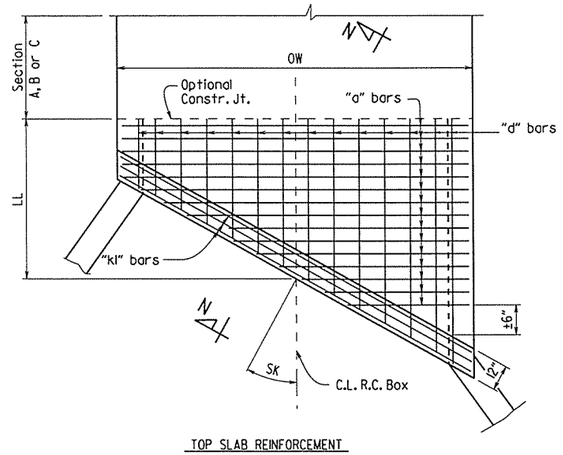
LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

TOP SLAB SHOWN, BOTTOM SLAB SIMILAR

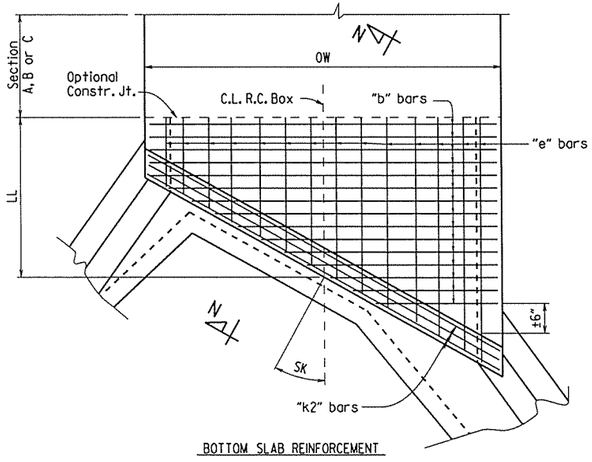


WINGWALL ATTACHMENT

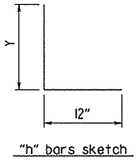
See "Details of Wingwalls" for additional information and wingwall details.



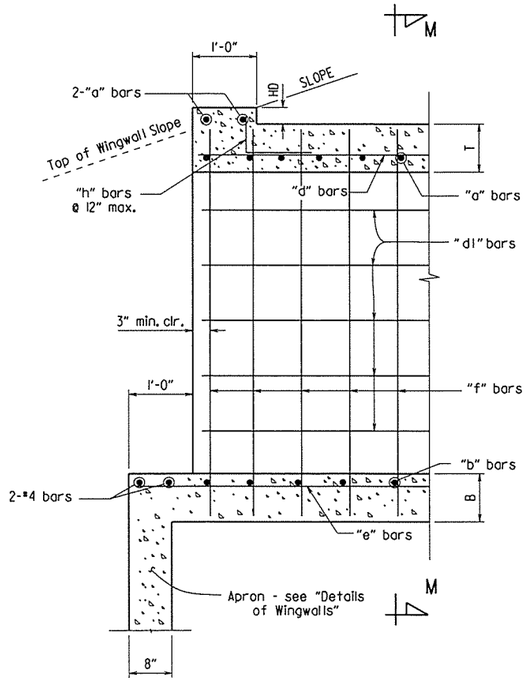
TOP SLAB REINFORCEMENT



BOTTOM SLAB REINFORCEMENT

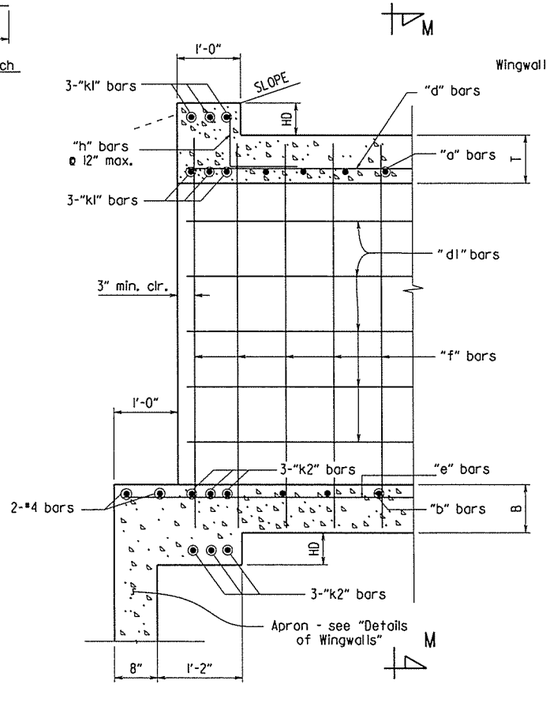


"h" bars sketch



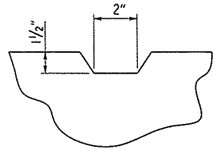
PART LONGITUDINAL SECTION

(Non-Skewed Ends)



PART LONGITUDINAL SECTION N-N

(Skewed Ends)



TYPICAL KEYWAY DETAIL

(All Construction Joints)

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

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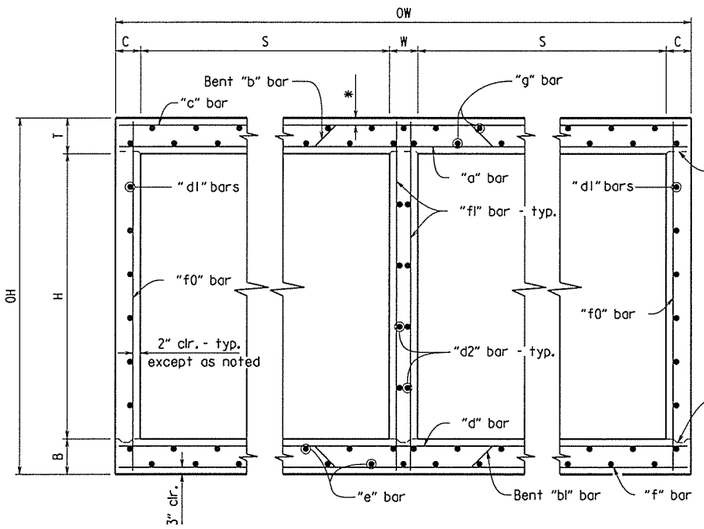
DATE REVISED	DATE FILMED	REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	15	16

(1) SPECIAL DETAILS

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

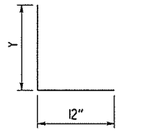
Note: When top slab of culvert serves as finished roadway surface, see General Notes on Sheet 1 of 4.



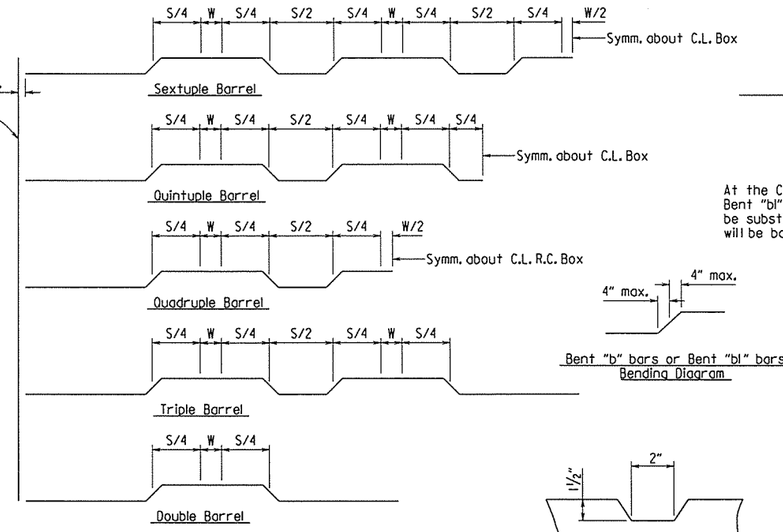
TYPICAL SECTION M-M

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

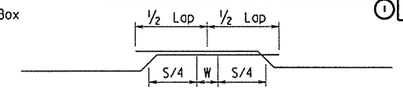
Bottom Slab
Straight "d" bars shall alternate with Bent "b1" bars in top.
Straight "f" bars shall alternate with Bent "b1" bars in bottom.



"h" bars sketch



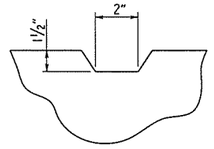
Bent "b" bars or Bent "b1" bars sketch



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

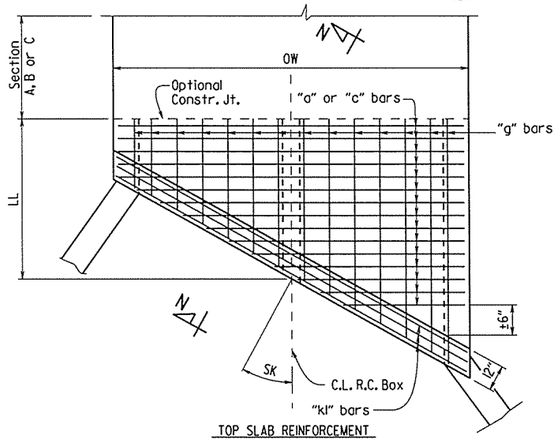
At the Contractor's option in lieu of providing Bent "b" or Bent "b1" bars, one bar top and bottom of equivalent size may be substituted for each bent bar. Payment for the reinforcing will be based on the weight of the "b" or "b1" bar.

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

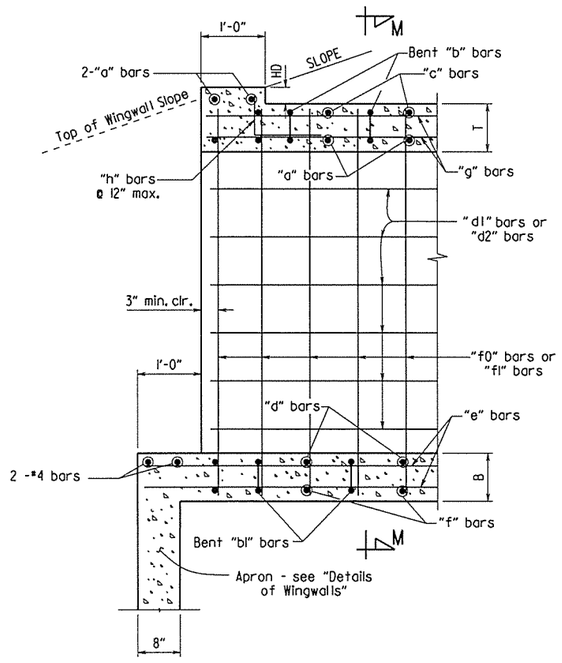


TYPICAL KEYWAY DETAIL

(All Construction Joints)

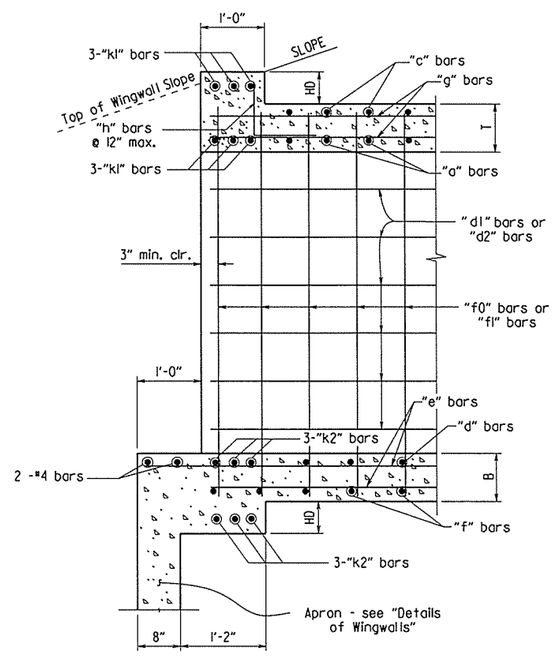


TOP SLAB REINFORCEMENT
Straight "c" bars in top.
Straight "a" bars in bottom.



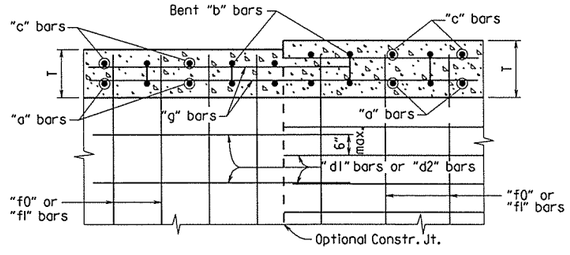
PART LONGITUDINAL SECTION

(Non-Skewed Ends)



PART LONGITUDINAL SECTION N-N

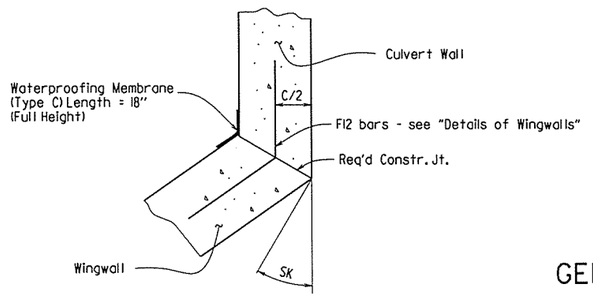
(Skewed Ends)



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

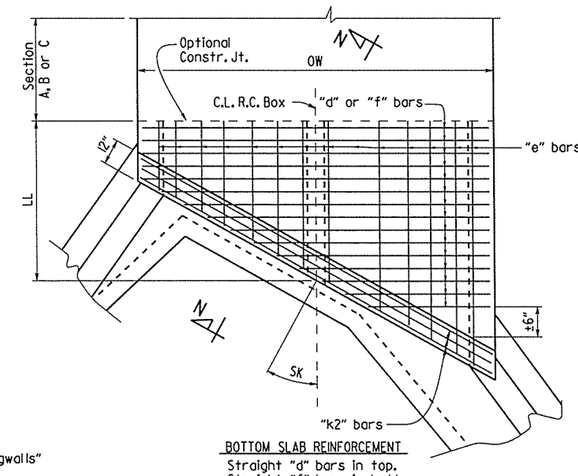
LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

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

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
4-7-16
CHARLES R. ELLIS

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

DETAILS OF MULTI-BARREL
R.C. BOX CULVERT

SPECIAL DETAILS

LRFD

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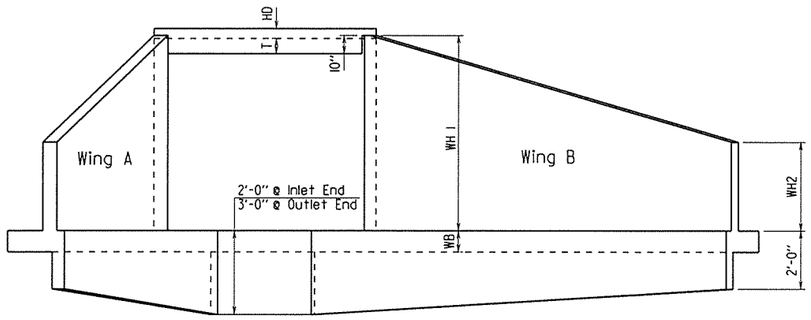
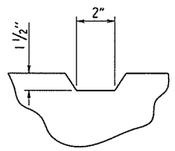
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	16	115

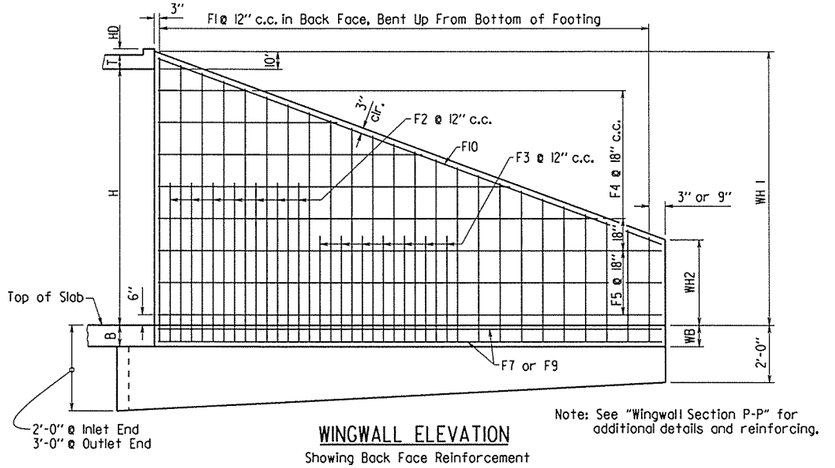
1 SPECIAL DETAILS



END ELEVATION
Flared Wingwalls Shown

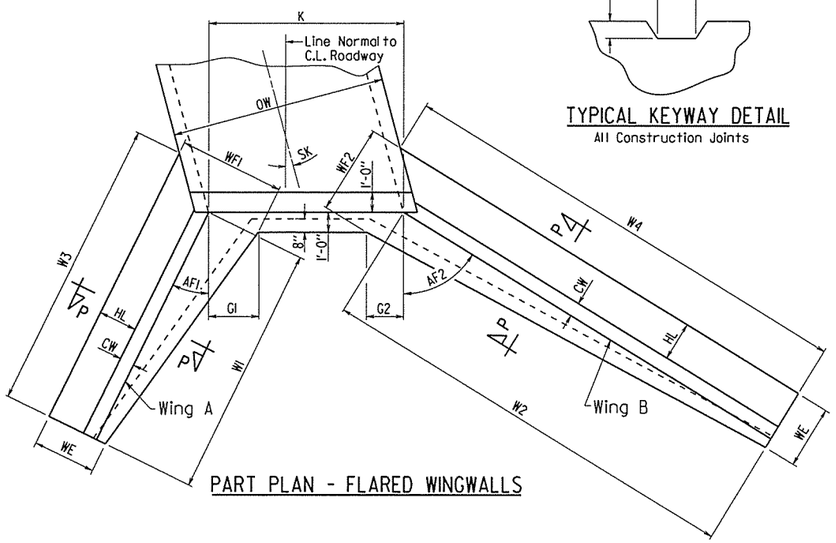


TYPICAL KEYWAY DETAIL
All Construction Joints

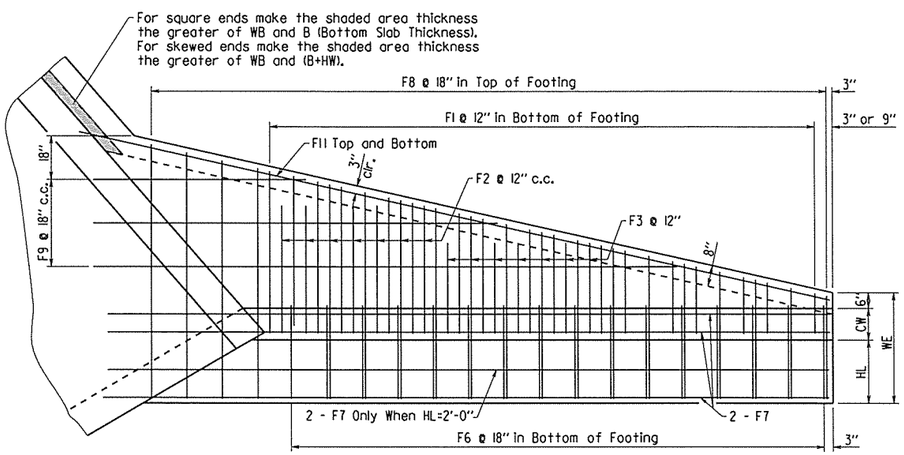


WINGWALL ELEVATION
Showing Back Face Reinforcement

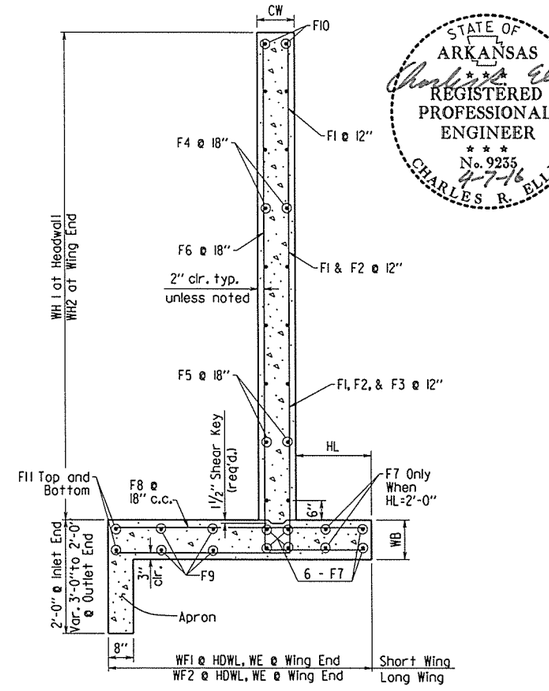
Note: See "Wingwall Section P-P" for additional details and reinforcing.



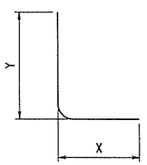
PART PLAN - FLARED WINGWALLS



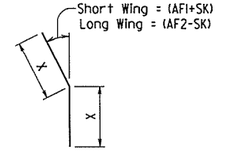
PLAN - FLARED WINGWALLS
Showing Footing Reinforcement



WINGWALL SECTION P-P

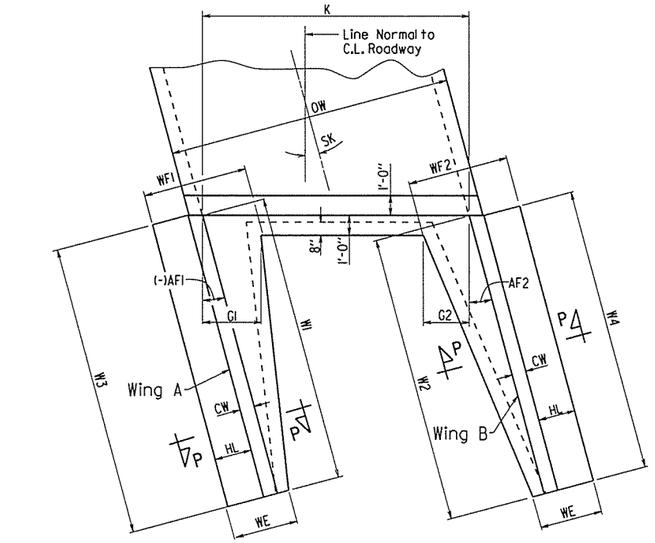


F1, F2, F3, & F6 BARS

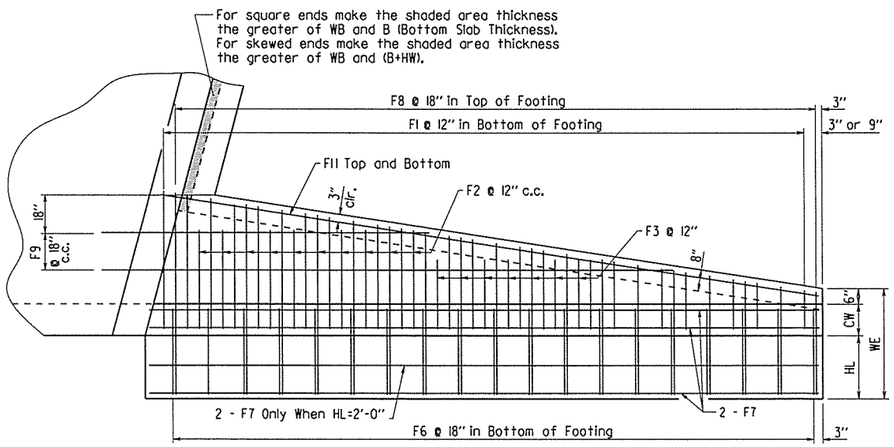


*F12 BAR

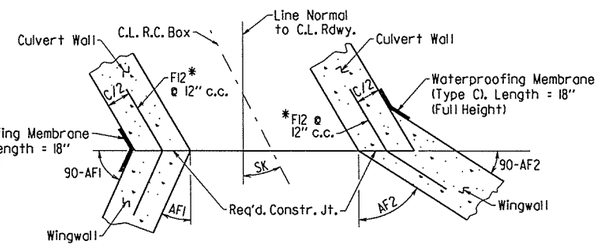
*F12 is a straight bar for parallel wingwalls



PART PLAN - PARALLEL WINGWALLS



PLAN - PARALLEL WINGWALLS
Showing Footing Reinforcement



CONSTRUCTION JOINTS
Flared Wingwalls Shown

SHEET 4 OF 4

GENERAL DETAILS OF R.C. BOX CULVERT

DETAILS OF WINGWALLS

SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
4-7-16
CHARLES R. ELLIS

b040623_culvert.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	17	115

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
6-29-16

STA. 102+60.86
BEGIN JOB 040623
BEGIN SITE I
LOG MILE 9.85

STA. 108+00.86
END SITE I

STA. 103+50 - 106+00
SILT FENCE = 251 LIN. FT.

STA. 106+50 - 107+80
SILT FENCE = 131 LIN. FT.

STA. 105+00 - 106+10
SILT FENCE = 131 LIN. FT.

STA. 105+85 - 106+10
SILT FENCE = 71 LIN. FT.

STA. 106+40 - 108+25
SILT FENCE = 322 LIN. FT.

STA. 106+10 - 106+10
TRIANGULAR SILT DIKE = 32 LIN. FT.

16 CU. YD.

REVISIONS

DATE	REVISION

LEGEND

- E-6 ROCK DITCH CHECKS
- E-11 SILT FENCE
- E-14 SEDIMENT BASIN
- △△△ TRIANGULAR SILT DIKE

NOTE: RETAIN ALL EROSION CONTROL DEVICES UNTIL END OF CONSTRUCTION UNLESS OTHERWISE NOTED.

SITE I - CLEARING & GRUBBING

100
300

STA. 301+91.88
BEGIN DETOUR

STA. 311+10.96
END DETOUR

STA. 105+00 - 105+90
SILT FENCE = 92 LIN. FT.

STA. 106+65 - 108+25
SILT FENCE = 176 LIN. FT.

SITE I - STAGE I
TEMPORARY EROSION CONTROL DETAILS

6/20/2016

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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.		040623	18	115

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
6-29-16
TRINITY D. SMITH

STA. 102+60.86
BEGIN JOB 040623
BEGIN SITE I
LOG MILE 9.85

STA. 108+00.86
END SITE I

REVISIONS

DATE	REVISION

LEGEND

- (E-6) ROCK DITCH CHECKS
- (E-11) SILT FENCE
- (E-14) SEDIMENT BASIN
- △△△ TRIANGULAR SILT DIKE

NOTE: RETAIN ALL EROSION CONTROL DEVICES UNTIL END OF CONSTRUCTION UNLESS OTHERWISE NOTED.

SITE I - STAGE 2

STA. 105+85 - 106+10
SILT FENCE = 71 LIN. FT.

STA. 105+90 - 106+10
SILT FENCE = 39 LIN. FT.

STA. 106+40 - 106+65
SILT FENCE = 146 LIN. FT.

SITE I - STAGE 3
TEMPORARY EROSION CONTROL DETAILS

6/20/2016

RO40623.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.		040623	19	115

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
6-29-16

STA. 201+10 - 201+85
SILT FENCE = 75 LIN. FT.

STA. 202+10.00
BEGIN SITE 2

STA. 202+10 - 205+10
SILT FENCE = 306 LIN. FT.

STA. 205+45 - 205+90
SILT FENCE = 45 LIN. FT.

STA. 206+25 - 207+00
SILT FENCE = 81 LIN. FT.

STA. 207+30 - 208+20
SILT FENCE = 98 LIN. FT.

STA. 208+50 - 211+70
SILT FENCE = 325 LIN. FT.

STA. 211+95 - 212+35
SILT FENCE = 40 LIN. FT.

STA. 212+60 - 213+20
SILT FENCE = 373 LIN. FT.

STA. 217+60 - 228+45
SILT FENCE = 1364 LIN. FT.

STA. 227+44.49
END SITE 2
END JOB 040623

REVISIONS

DATE	REVISION

LEGEND

- E-6 ROCK DITCH CHECKS
- E-11 SILT FENCE
- E-14 SEDIMENT BASIN
- △△△ TRIANGULAR SILT DIKE

NOTE: RETAIN ALL EROSION CONTROL DEVICES UNTIL END OF CONSTRUCTION UNLESS OTHERWISE NOTED.

6/20/2016

R040623.DGN

SITE 2 - CLEARING & 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.		040623	20	115

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
6-22-16

STA. 202+10.00
BEGIN SITE 2

BEGIN BRIDGE
STA. 213+64.92

END BRIDGE
STA. 219+67.08

STA. 227+44.49
END SITE 2
END JOB 040623

REVISIONS

DATE	REVISION

LEGEND

- E-6 ROCK DITCH CHECKS
- E-11 SILT FENCE
- E-14 SEDIMENT BASIN
- △△△ TRIANGULAR SILT DIKE

NOTE: RETAIN ALL EROSION CONTROL DEVICES UNTIL END OF CONSTRUCTION UNLESS OTHERWISE NOTED.

6/20/2016

R040623.DGN

SITE 2 - STAGE I
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	21	115

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
6-29-16

STA. 202+10.00
BEGIN SITE 2

STA. 207+60 - 208+65
SILT FENCE = 202 LIN. FT.

STA. 227+44.49
END SITE 2
END JOB 040623

REVISIONS

DATE	REVISION

LEGEND

- E-6 ROCK DITCH CHECKS
- E-11 SILT FENCE
- E-14 SEDIMENT BASIN
- △△△ TRIANGULAR SILT DIKE

NOTE: RETAIN ALL EROSION CONTROL DEVICES UNTIL END OF CONSTRUCTION UNLESS OTHERWISE NOTED.

6/20/2016

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SITE 2 - STAGE 2
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	22	115

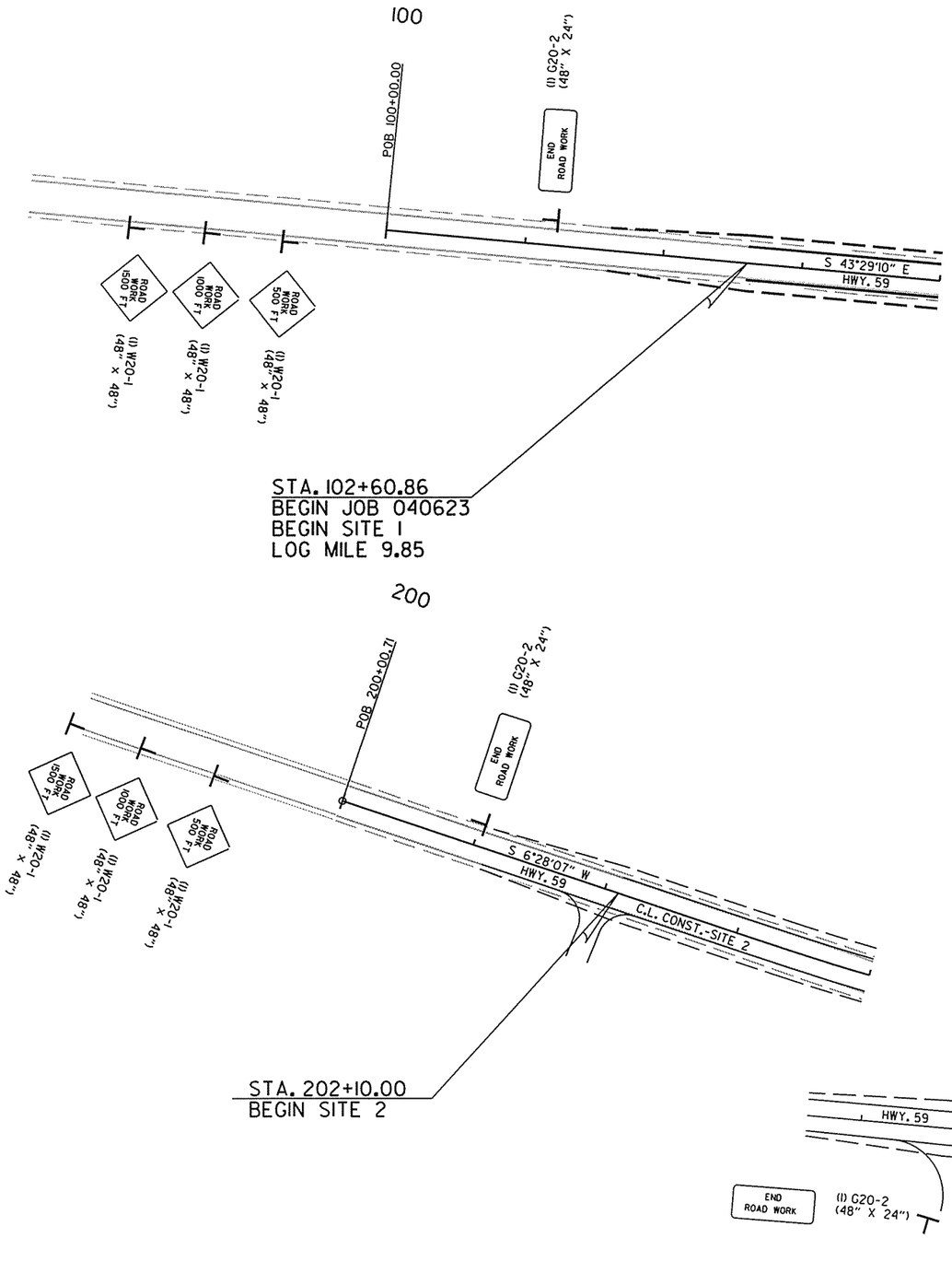
(2) MAINTENANCE OF TRAFFIC DETAILS

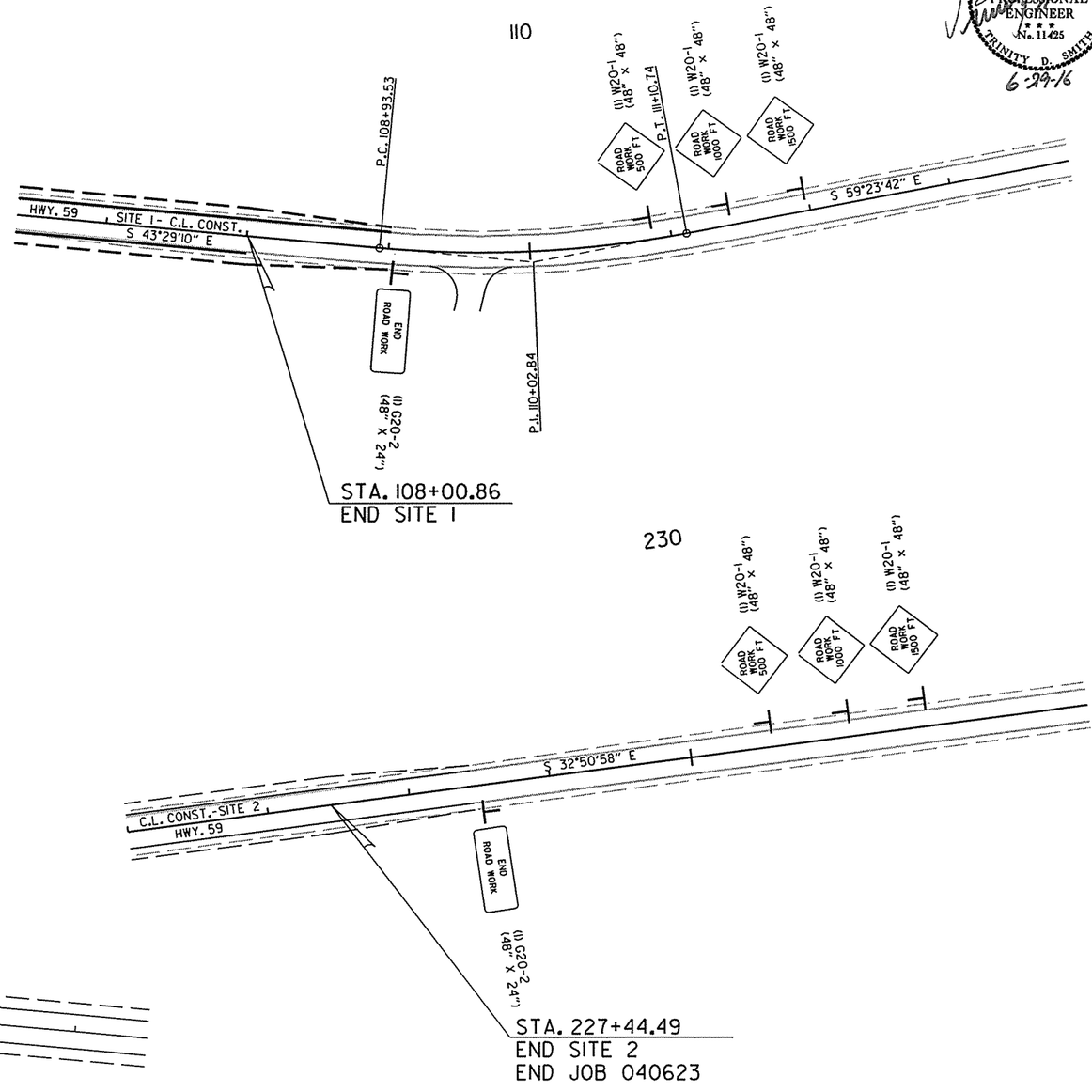
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
6-29-16

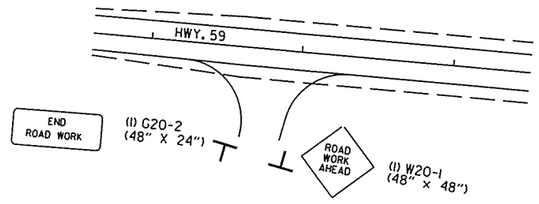
SHOULDER CLOSED (4) RSP-1 (48" X 30")

DO NOT PASS (4) R4-1 (24" X 30")

TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.







ADVANCE WARNING SIGNS FOR COUNTY ROADS

(5 LOCATIONS: W. RODEO CRSG., W. RODEO CRSG., NATURAL DAM RD. PEACEFUL HOME RD., & GRANDVIEW ACRES LN.)

ALL STAGES MAINTENANCE OF TRAFFIC DETAILS

6/20/2016

R040623.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.		040623	23	115

(2) MAINTENANCE OF TRAFFIC DETAILS

SEQUENCE OF CONSTRUCTION:

STAGE 1:
MAINTAIN TRAFFIC ON EXISTING ROADWAY
SITE 1 - CONSTRUCT DETOUR
SITE 2 - CONSTRUCT WIDENING ON LT. AND ROADWAY ON NEW LOCATION

STAGE 2:
SITE 1 - SHIFT TRAFFIC TO DETOUR
REMOVE EXISTING BRIDGE
CONSTRUCT BOX CULVERT AND APPROACHES
SITE 2 - SHIFT TRAFFIC TO ROADWAY ON NEW LOCATION
CONSTRUCT SHOULDER ON RT. AT BEGINNING AND END OF SITE
CONSTRUCT TURNOUTS ON RT.
REMOVE EXISTING BRIDGE AND APPROACHES

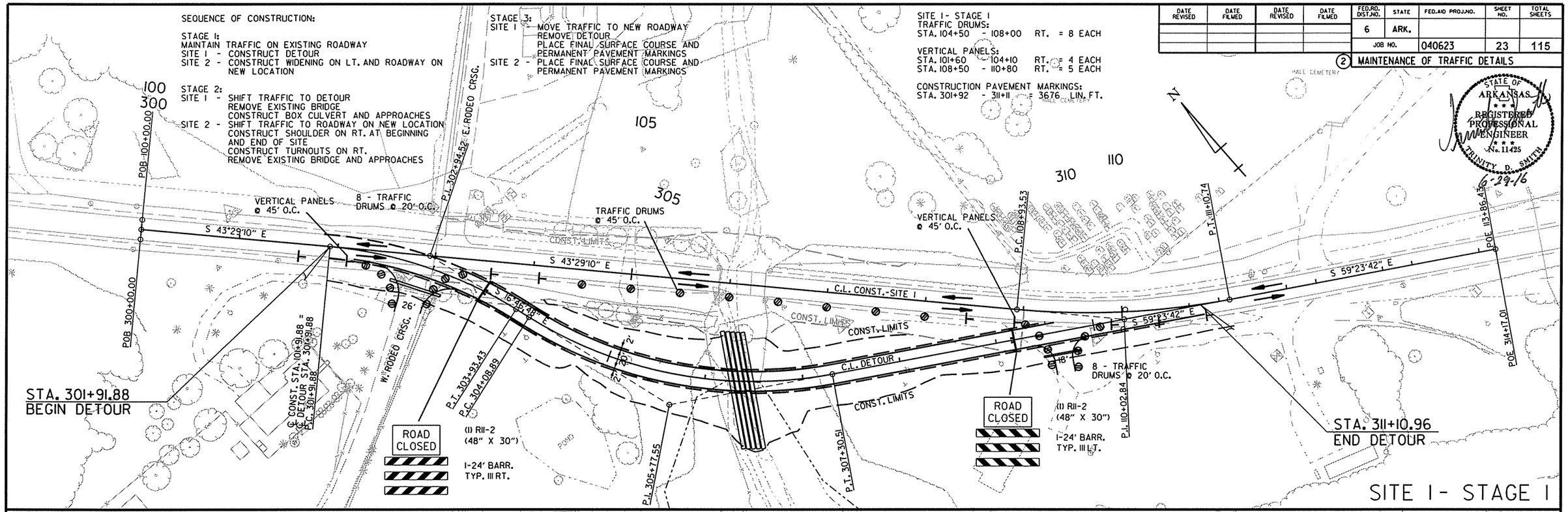
STAGE 3:
SITE 1 - MOVE TRAFFIC TO NEW ROADWAY
REMOVE DETOUR
PLACE FINAL SURFACE COURSE AND PERMANENT PAVEMENT MARKINGS
SITE 2 - PLACE FINAL SURFACE COURSE AND PERMANENT PAVEMENT MARKINGS

SITE 1- STAGE 1
TRAFFIC DRUMS:
STA. 104+50 - 108+00 RT. = 8 EACH

VERTICAL PANELS:
STA. 101+60 - 104+10 RT. = 4 EACH
STA. 108+50 - 110+80 RT. = 5 EACH

CONSTRUCTION PAVEMENT MARKINGS:
STA. 301+92 - 311+11 = 3676 LIN. FT.

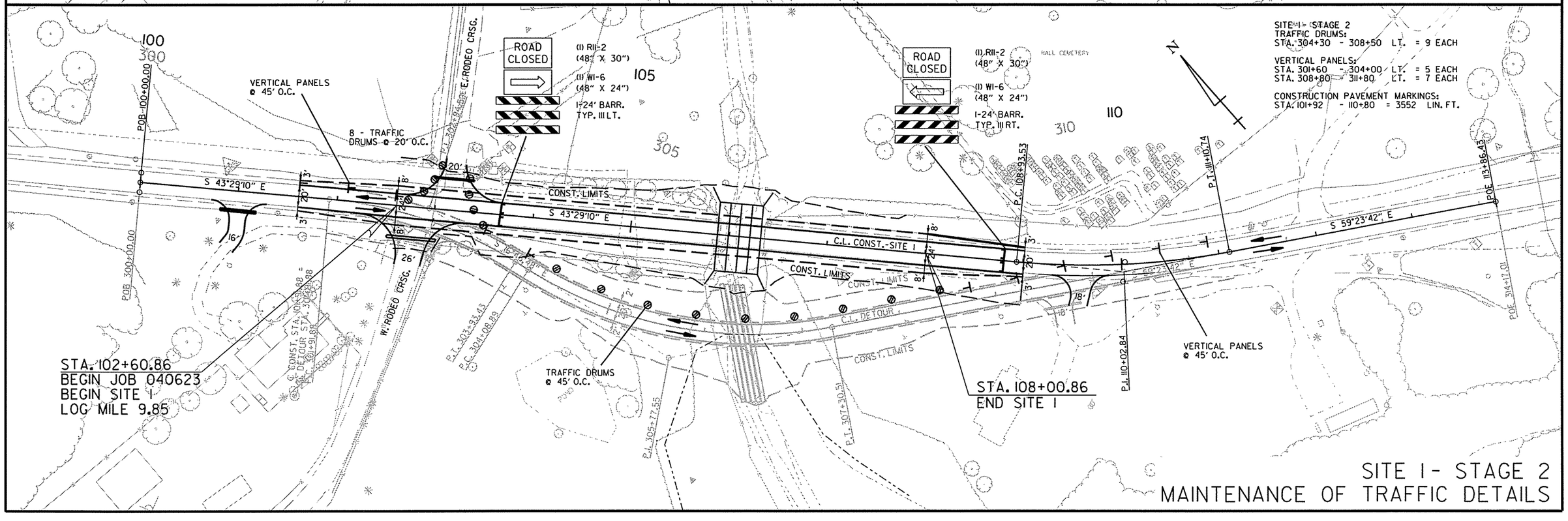
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
6-29-16



SITE 1- STAGE 2
TRAFFIC DRUMS:
STA. 304+30 - 308+50 LT. = 9 EACH

VERTICAL PANELS:
STA. 301+60 - 304+00 LT. = 5 EACH
STA. 308+80 - 311+80 LT. = 7 EACH

CONSTRUCTION PAVEMENT MARKINGS:
STA. 101+92 - 110+80 = 3552 LIN. FT.



STA. 102+60.86
BEGIN JOB 040623
BEGIN SITE 1
LOG MILE 9.85

STA. 108+00.86
END SITE 1

SITE 1 - STAGE 1

SITE 1 - STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

6/20/2016

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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.		040623	24	115

(2) MAINTENANCE OF TRAFFIC DETAILS

SEQUENCE OF CONSTRUCTION:

STAGE 1:
MAINTAIN TRAFFIC ON EXISTING ROADWAY
SITE 1 - CONSTRUCT DETOUR
SITE 2 - CONSTRUCT WIDENING ON LT. AND ROADWAY ON NEW LOCATION

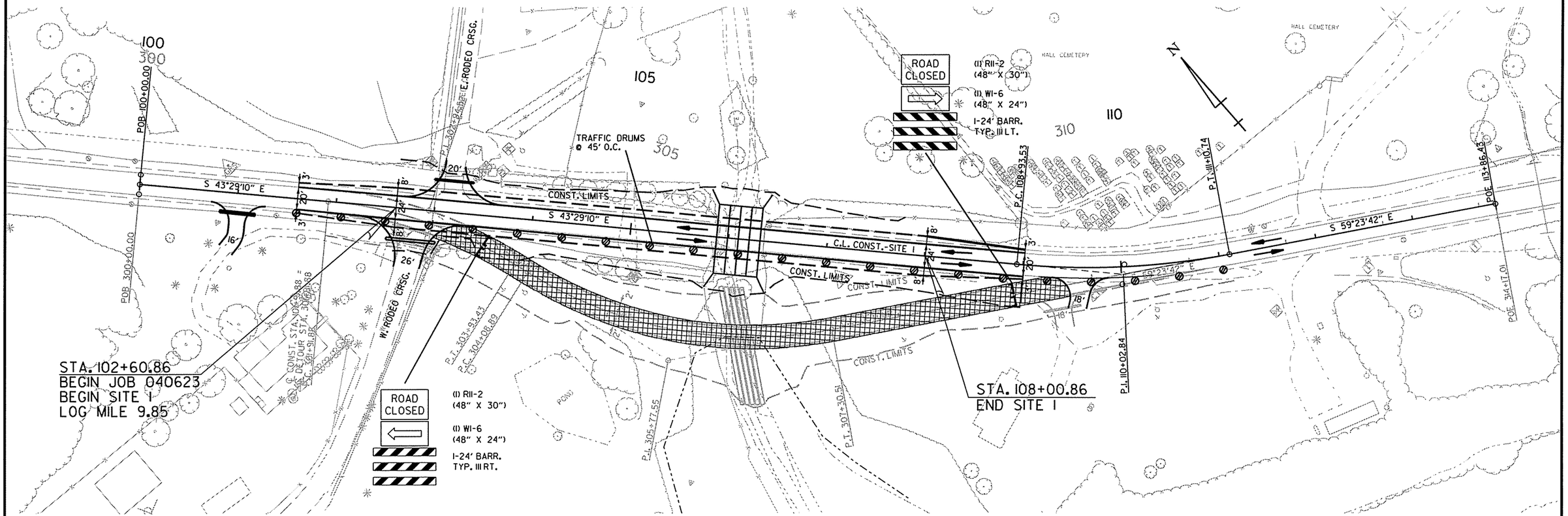
STAGE 2:
SITE 1 - SHIFT TRAFFIC TO DETOUR
REMOVE EXISTING BRIDGE
CONSTRUCT BOX CULVERT AND APPROACHES
SITE 2 - SHIFT TRAFFIC TO ROADWAY ON NEW LOCATION
CONSTRUCT SHOULDER ON RT. AT BEGINNING AND END OF SITE
CONSTRUCT TURNOUTS ON RT.
REMOVE EXISTING BRIDGE AND APPROACHES

STAGE 3:
SITE 1 - MOVE TRAFFIC TO NEW ROADWAY
REMOVE DETOUR
PLACE FINAL SURFACE COURSE AND PERMANENT PAVEMENT MARKINGS
SITE 2 - PLACE FINAL SURFACE COURSE AND PERMANENT PAVEMENT MARKINGS

REMOVAL OF DETOUR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
6-29-16

SITE 1- STAGE 3
TRAFFIC DRUMS:
STA. 101+61 - 111+00 RT. = 22 EACH



SITE 1- STAGE 3
MAINTENANCE OF TRAFFIC DETAILS

6/20/2016

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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.		040623	25	115

(2) MAINTENANCE OF TRAFFIC DETAILS

SEQUENCE OF CONSTRUCTION:

STAGE 1:
MAINTAIN TRAFFIC ON EXISTING ROADWAY
SITE 1 - CONSTRUCT DETOUR
SITE 2 - CONSTRUCT WIDENING ON LT. AND ROADWAY ON NEW LOCATION

STAGE 2:
SITE 1 - SHIFT TRAFFIC TO DETOUR
REMOVE EXISTING BRIDGE
CONSTRUCT BOX CULVERT AND APPROACHES
SITE 2 - SHIFT TRAFFIC TO ROADWAY ON NEW LOCATION
CONSTRUCT SHOULDER ON RT. AT BEGINNING AND END OF SITE
CONSTRUCT TURNOUTS ON RT.
REMOVE EXISTING BRIDGE AND APPROACHES

STAGE 3:
SITE 1 - MOVE TRAFFIC TO NEW ROADWAY
REMOVE DETOUR
PLACE FINAL SURFACE COURSE AND PERMANENT PAVEMENT MARKINGS
SITE 2 - PLACE FINAL SURFACE COURSE AND PERMANENT PAVEMENT MARKINGS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
6-24-16

STA. 202+10.00
BEGIN SITE 2

SITE 2 - STAGE 1
TRAFFIC DRUMS:
STA. 209+75 - 213+25 LT. = 7 EACH
STA. 220+20 - 221+70 LT. = 4 EACH

VERTICAL PANELS:
STA. 201+10 - 207+50 LT. = 10 EACH
STA. 222+00 - 227+45 LT. = 14 EACH

CONSTRUCTION PAVEMENT MARKINGS:
STA. 201+10 - 227+45 = 10540 LIN. FT.

POB 200+00.71
S 6°28'07" W
C.L. CONST.-SITE 2
VERTICAL PANELS @ 45' O.C.
P.C. 203+44.74
6 - TRAFFIC DRUMS @ 20' O.C.
PEACEFUL HOME RD.
8 - TRAFFIC DRUMS @ 20' O.C.
ROAD CLOSED
(1) RII-2 (48" X 30")
I-24' BARR. TYP. III LT.
8 - TRAFFIC DRUMS @ 20' O.C.
8 - TRAFFIC DRUMS @ 20' O.C.
P.I. 206+26.50
NATURAL DAM RD.
(3) OM-3L (12"X 36")
FURNISH & INSTALL TEMP. PRECAST CONC. BARRIER WALL = 53 LIN. FT.
P.T. 208+97.30
FURNISH & INSTALL TEMP. PRECAST CONC. BARRIER WALL = 153 LIN. FT.
(4) OM-3R (12"X 36")
TRAFFIC DRUMS @ 45' O.C.
GRANDVIEW ACRES LN.
P.C. 501+58.63
P.I. 501+63.51
P.I. 501+30.21
P.C. 500+96.43
P.I. 500+67.46
24 - TRAFFIC DRUMS @ 20' O.C.
P.T. 500+19.16
P.C. 500+43.13
CONST. LIMITS
POB 500+00.00
S 21°09'34" E
C.L. CONST.-SITE 2
BEGIN BRIDGE STA. 213+64.92
ROAD CLOSED
(2) RII-2 (48" X 30")
2-16' BARR. TYP. III LT.
2-16' BARR. TYP. III RT.

LEE CREEK
S 21°09'34" E
C.L. CONST.-SITE 2
END BRIDGE STA. 219+67.08
ROAD CLOSED
(1) RII-2 (48" X 30")
I-24' BARR. TYP. III RT.
P.C. 223+41.95
VERTICAL PANELS @ 45' O.C.
P.T. 225+75.14
CONST. LIMITS
S 32°50'58" E
C.L. CONST.-SITE 2
TRAFFIC DRUMS @ 45' O.C.
P.I. 224+59.25
POE 225+75.74
STA. 227+44.49
END SITE 2
END JOB 040623

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SITE 2 - STAGE 1
MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	26	115

(2) MAINTENANCE OF TRAFFIC DETAILS

SEQUENCE OF CONSTRUCTION:

STAGE 1:
MAINTAIN TRAFFIC ON EXISTING ROADWAY
SITE 1 - CONSTRUCT DETOUR
SITE 2 - CONSTRUCT WIDENING ON LT. AND ROADWAY ON NEW LOCATION

STAGE 2:
SITE 1 - SHIFT TRAFFIC TO DETOUR
REMOVE EXISTING BRIDGE
CONSTRUCT BOX CULVERT AND APPROACHES
SITE 2 - SHIFT TRAFFIC TO ROADWAY ON NEW LOCATION
CONSTRUCT SHOULDER ON RT. AT BEGINNING AND END OF SITE
CONSTRUCT TURNOUTS ON RT.
REMOVE EXISTING BRIDGE AND APPROACHES

STAGE 3:
SITE 1 - MOVE TRAFFIC TO NEW ROADWAY
REMOVE DETOUR
PLACE FINAL SURFACE COURSE AND PERMANENT PAVEMENT MARKINGS
SITE 2 - PLACE FINAL SURFACE COURSE AND PERMANENT PAVEMENT MARKINGS

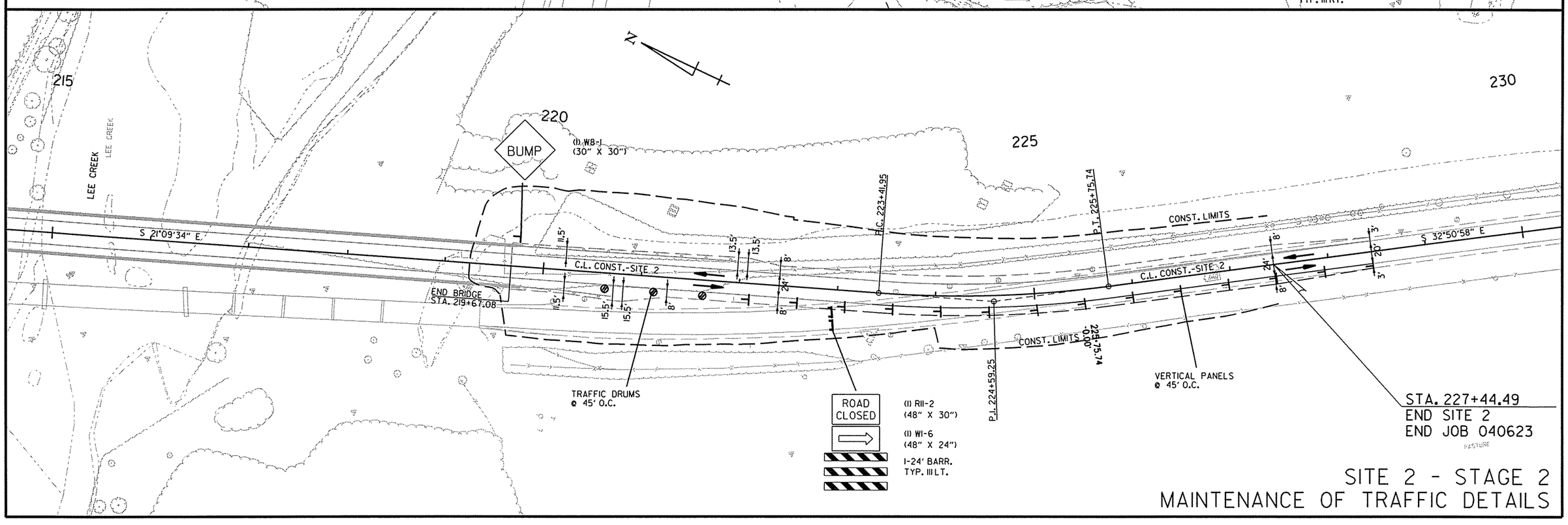
SITE 2 - STAGE 2
TRAFFIC DRUMS:
STA. 209+90 - 213+80 RT. = 8 EACH
STA. 220+75 - 221+75 RT. = 3 EACH

VERTICAL PANELS:
STA. 201+10 - 207+40 RT. = 9 EACH
STA. 222+10 - 227+45 RT. = 14 EACH

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
6-29-16

STA. 202+10.00
BEGIN SITE 2

POB 200+00.71
S 6°28'07" W
P.C. 203+44.14
6 - TRAFFIC DRUMS @ 20' O.C.
VERTICAL PANELS @ 45' O.C.
8 - TRAFFIC DRUMS @ 20' O.C.
6 - TRAFFIC DRUMS @ 20' O.C.
P.I. 206+26.50
NATURAL DAM RD.
PEACEFUL HOME RD.
ROAD CLOSED
(1) RII-2 (48" X 30")
(1) WI-6 (48" X 24")
1-24' BARR. TYP. III RT.
(4) OM-3R (12"X 36")
P.T. 208+97.30
RELOCATING TEMP. PRECAST CONC. BARRIER WALL = 193 LIN. FT.
TEMP. IMPACT ATTENUATION BARRIER = 1 EACH
CHATMAN BRANCH
(3) OM-3L (12"X 36")
TRAFFIC DRUMS @ 45' O.C.
ROAD CLOSED
(2) RII-2 (48" X 30")
2-8' BARR. TYP. III LT.
2-8' BARR. TYP. III RT.
P.C. 500+96.43
P.I. 501+30.21
P.C. 501+63.91
POB 501+68.63
GRANDVIEW ACRES LN.
N 85°50'25" E 89.24'
P.T. 500+19.16
P.I. 500+67.46
P.C. 500+43.13
CONST. LIMITS
N 73°50'26" E
POB 500+00.00
C.L. CONST.-SITE 2
BEGIN BRIDGE STA. 213+64.92
S 21°09'34" E
17 - TRAFFIC DRUMS @ 20' O.C.
BUMP
(1) W8-1 (30" X 30")



6/20/2016

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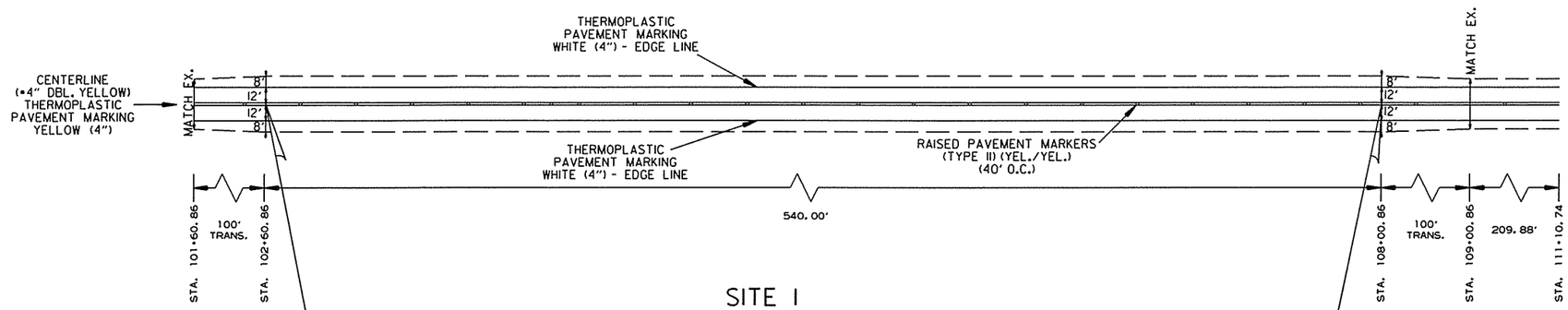
SITE 2 - STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	27	115

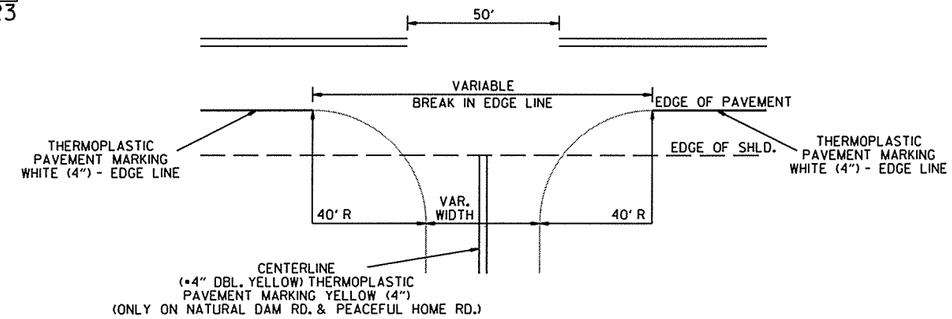
(2) PERMANENT PAVEMENT MARKING DETAILS



SITE 1

STA. 102+60.86
BEGIN JOB 040623
BEGIN SITE 1
LOG MILE 9.85

STA. 108+00.86
END SITE 1



DETAIL FOR STRIPING
AT COUNTY ROAD TURNOUTS

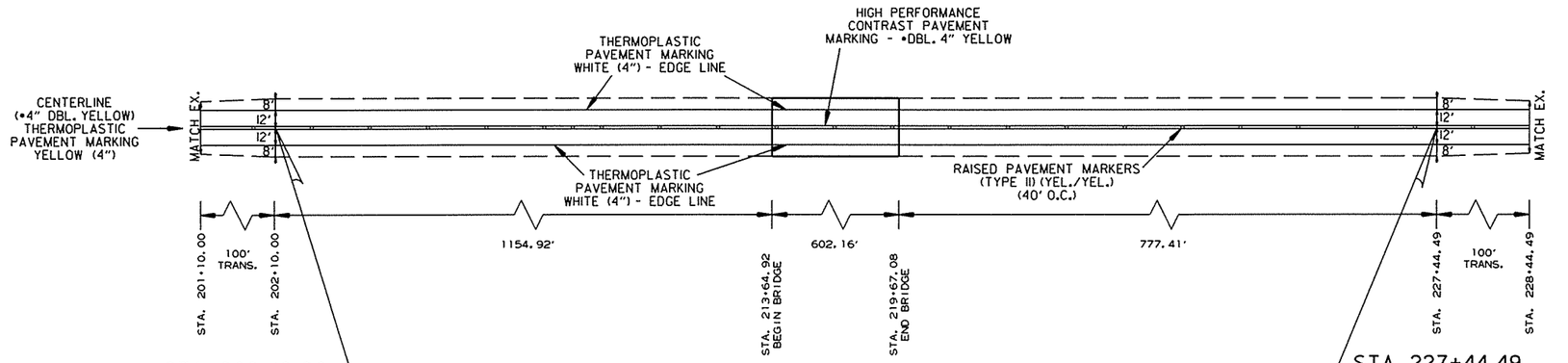
SITE 1 - W. RODEO CRSG. & E. RODEO CRSG.
SITE 2 - NATURAL DAM RD., PEACEFUL HOME RD., & GRANDVIEW ACRES LN.

PERMANENT PAVEMENT MARKINGS:

THERMOPLASTIC PAVEMENT MARKING:
RT. AND LT. EDGE LINES = 1694 LIN. FT. 4" WHITE
DBL. CENTERLINE = 1700 LIN. FT. 4" YELLOW

RAISED PAVEMENT MARKERS:
TYPE II (YEL./YEL.) 40' O.C. ON CENTERLINE = 21 EACH

•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. 202+10.00
BEGIN SITE 2

SITE 2

STA. 227+44.49
END SITE 2
END JOB 040623

PERMANENT PAVEMENT MARKINGS:

THERMOPLASTIC PAVEMENT MARKING:
RT. AND LT. EDGE LINES = 5165 LIN. FT. 4" WHITE
DBL. CENTERLINE = 4265 LIN. FT. 4" YELLOW
NATURAL DAM RD. DOUBLE CENTERLINE = 191 LIN. FT. 4" YELLOW
PEACEFUL HOME RD. DOUBLE CENTERLINE = 204 LIN. FT. 4" YELLOW

HIGH PERFORMANCE CONTRAST MARKING
DBL. CENTERLINE = 1204 LIN. FT. 4" YELLOW

RAISED PAVEMENT MARKERS:
TYPE II (YEL./YEL.) 40' O.C. ON CENTERLINE = 68 EACH

6/8/2016

R040623.DGN

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.		040623	28	115

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
6-23-16

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)		FURNISHING & INSTALLING PRECAST CONC. BARRIER	RELOCATING PRECAST CONCRETE BARRIER	TEMPORARY IMPACT ATTENUATION BARRIER	TEMP. IMPACT ATTEN.BARR. (REPAIR)
											RIGHT	LEFT				
			LIN. FT. - EACH				NO.	SQ. FT.	EACH				LIN. FT.		EACH	
W20-1	ROAD WORK 1500 FT.	48"x48"	4	4	4	4	4	64.0								
W20-1	ROAD WORK 1000 FT.	48"x48"	4	4	4	4	4	64.0								
W20-1	ROAD WORK 500 FT.	48"x48"	4	4	4	4	4	64.0								
W20-1	ROAD WORK AHEAD	48"x48"	5	5	5	5	5	80.0								
G20-2	END ROAD WORK	48"x24"	9	9	9	9	9	72.0								
R11-2	ROAD CLOSED	48"x30"	5	4	2	5	5	50.0								
OM-3L	OBJECT MARKER	12"x36"	3	4		4	4	12.0								
OM-3R	OBJECT MARKER	12"x36"	4	3		4	4	12.0								
W1-6	LARGE ARROW	48"x24"		4	2	4	4	32.0								
R4-1	DO NOT PASS	24"x30"	4	4	4	4	4	20.0								
RSP-1	SHOULDER CLOSED	48"x30"	4	4	4	4	4	40.0								
W8-1	BUMP	30"x30"		2		2	2	12.5								
	VERTICAL PANELS		33	35		35			35							
	TRAFFIC DRUMS		89	71	22	89				89						
	TYPE III BARRICADE-RT. (8')			2		2					16					
	TYPE III BARRICADE-LT. (8')			2		2						16				
	TYPE III BARRICADE-RT. (16')		2			2					32					
	TYPE III BARRICADE-LT. (16')		2			2						32				
	TYPE III BARRICADE-RT. (24')		2	2	1	2					48					
	TYPE III BARRICADE-LT. (24')		2	2	1	2						48				
	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER		206			206							206			
	RELOCATING PRECAST CONCRETE BARRIER			193		193								193		
	TEMPORARY IMPACT ATTENUATION BARRIER			1		1									1	
	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)			1		1										1
TOTALS:								522.5	35	89	96	96	206	193	1	1

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

CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS

DESCRIPTION	STAGE 1	STAGE 2	STAGE 3	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.	LIN. FT.	EACH	LIN. FT.		
REMOVAL OF PERMANENT PAVEMENT MARKINGS		2569		2569					
CONSTRUCTION PAVEMENT MARKINGS	14216	3552			17768				
RAISED PAVEMENT MARKERS TYPE II (YEL/YEL)			92			92			
THERMOPLASTIC PAVEMENT MARKING WHITE (4")			6859				6859		
THERMOPLASTIC PAVEMENT MARKING YELLOW (4")			6165					6165	
HIGH PERFORMANCE CONTRAST PAVEMENT MARKING YELLOW (4")			1204						1204
TOTALS:				2569	17768	92	6859	6165	1204

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

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.

5/23/2016

R040623.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.		040623	29	115

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-5-16

REMOVAL AND DISPOSAL OF FENCE

STATION	STATION	LOCATION	FENCE
			LIN. FT.
102+98	106+36	SITE 1 RT.	664
103+42	105+89	SITE 1 LT.	262
106+36	108+50	SITE 1 LT.	218
206+27	208+02	SITE 2 RT.	200
207+88	208+00	SITE 2 LT. & RT.	108
208+37	210+38	SITE 2 LT. & RT.	252
212+05	212+26	SITE 2 LT.	99
213+42	213+60	SITE 2 LT. & RT.	118
219+24	227+45	SITE 2 LT. & RT.	859
223+85	228+11	SITE 2 RT.	440
TOTAL:			3220

REMOVAL AND DISPOSAL OF CULVERTS

STATION	DESCRIPTION	PIPE CULVERTS
		EACH
102+80	SITE 1 - 30" x 39' R.C. PIPE CULVERT RT. SIDE DRAIN	1
103+18	SITE 1 - 18" x 32' R.C. PIPE CULVERT LT. SIDE DRAIN	1
201+44	SITE 2 - 18" x 40' R.C. PIPE CULVERT LT. SIDE DRAIN	1
204+03	SITE 2 - 18" x 31' R.C. PIPE CULVERT LT. SIDE DRAIN	1
205+36	SITE 2 - 18" x 49' R.C. PIPE CULVERT LT. SIDE DRAIN	1
206+17	SITE 2 - 18" x 36' R.C. PIPE CULVERT LT. SIDE DRAIN	1
207+36	SITE 2 - 18" x 38' R.C. PIPE CULVERT LT. SIDE DRAIN	1
TOTAL:		7

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

CLEARING AND GRUBBING

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	
102+61	108+81	SITE 1	7	7
202+10	227+49	SITE 2	26	26
TOTALS:			33	33

4" PIPE UNDERDRAIN

STATION	STATION	LOCATIONS	4" PIPE UNDERDRAINS	UNDERDRAIN OUTLET PROTECTORS
			LIN. FT.	EACH
* ENTIRE PROJECT TO BE USED IF AND			250	8
WHERE DIRECTED BY THE ENGINEER				
TOTALS:			250	8

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

REMOVAL AND DISPOSAL OF ITEMS

STATION	STATION	LOCATION	AIR STATION	CONCRETE PAVEMENT	POLE & FOUNDATION	SIGN FOUNDATIONS	GUARDRAIL	SIGNS
			EACH	SQ. YD.	EACH	EACH	LIN. FT.	EACH
202+49		SITE 2 LT.				1		1
203+44		SITE 2 LT.			1			
205+75		SITE 2 LT.				1		1
206+34		SITE 2 LT.	1					
213+34		SITE 2 LT.		89				
213+27	213+54	SITE 2 RT.					54	
213+52		SITE 2 LT.			1			
219+39	220+12	SITE 2 RT.					146	
TOTALS:			1	89	2	2	200	2

NOTE: THE QUANTITY SHOWN ABOVE FOR THE REMOVAL AND DISPOSAL OF GUARDRAIL SHALL INCLUDE THE REMOVAL AND DISPOSAL OF ALL GUARDRAIL

SOIL LOG

STATION	LATITUDE			LONGITUDE			LOCATION	DEPTH	LIQUID LIMIT	PLASTICITY INDEX	AASHTO CLASSIFICATION	COLOR
	DEG	MIN	SEC	DEG	MIN	SEC		FEET				
102+00	35	39	31.30	94	24	4.90	4' RT.	0-3Z	21	4	A-2-4(0)	BROWN
102+00	35	39	31.20	94	24	4.90	13' RT.	0-3Z	ND	NP	A-2-4(0)	BROWN
102+00	35	39	31.20	94	24	5.00	22' RT.	0-2.5Z	ND	NP	A-2-4(0)	BROWN
110+00	35	39	25.30	94	23	57.20	6' LT.	0-5	27	12	A-6(2)	BR/GR
110+00	35	39	25.40	94	23	57.20	14' LT.	0-5	27	12	A-6(4)	BR/GR
110+00	35	39	25.40	94	23	57.10	20' LT.	0-5	32	15	A-6(9)	BR/GR
201+00	35	38	59.50	94	23	40.30	5' RT.	0-5	17	3	A-4(0)	BR/GR
201+00	35	38	59.50	94	23	40.40	13' RT.	0-5	ND	NP	A-4(0)	BR/GR
201+00	35	38	59.50	94	23	40.50	20' RT.	0-5	20	5	A-4(1)	BR/GR
223+00	35	38	37.20	94	23	31.70	C.L.	0-5	22	8	A-4(1)	BROWN
228+00	35	38	34.00	94	23	29.50	5' LT.	0-5	21	8	A-4(1)	BROWN
228+00	35	38	34.10	94	23	29.40	14' LT.	0-5	21	7	A-4(1)	BROWN
228+00	35	38	34.10	94	23	29.30	22' LT.	0-5	21	6	A-4(0)	BROWN
110+00	35	39	25.40	94	23	57.10	20' LT.	0-5	33	15	A-6(6)	BR/GR
201+00	35	38	59.50	94	23	40.50	20' RT.	0-5	21	4	A-4(0)	BR/GR

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
NP - NON-PLASTIC
ND - NOT DETERMINABLE

CONCRETE DITCH PAVING

STATION	STATION	LOCATION	LENGTH	"W"	CONC. DITCH PAVING (TYPE B)	SOLID SODDING	WATER
			LIN. FT.	FEET	SQ. YD.	SQ. YD.	M. GAL.
207+70.00	207+87.00	SITE 2 - LT.	17.00	6.00	11.33	7.56	0.10
* ENTIRE	PROJECT	TO BE USED IF AND WHERE			50.00	33.33	0.42
		DIRECTED BY THE ENGINEER					
TOTALS:					61.33	40.89	0.52

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

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

EARTHWORK

STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT	* SOIL STABILIZATION
			CU. YD.	CU. YD.	TON
		SITE 1			
ENTIRE	PROJECT	STAGE 1-MAIN LANES	846	6400	
ENTIRE	PROJECT	STAGE 2-MAIN LANES	648	3466	
ENTIRE	PROJECT	STAGE 3-MAIN LANES	7278	201	
		SITE 2			
ENTIRE	PROJECT	STAGE 1-MAIN LANES	2549	21044	
ENTIRE	PROJECT	STAGE 2-MAIN LANES	2500	2132	
ENTIRE	PROJECT	BRIDGE BENTS 1 & 7	315		
ENTIRE	PROJECT	APPROACHES	15	1075	
ENTIRE	PROJECT	TEMPORARY APPROACHES	100	250	
* ENTIRE	PROJECT	TO BE USED IF AND WHERE			100
		DIRECTED BY THE ENGINEER			
TOTALS:			14251	34568	100

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

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

6/30/2016

R040623.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.		040623	30	115

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-5-16

EROSION CONTROL

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL						TEMPORARY EROSION CONTROL									
			SPECIAL SEEDING: NATIVE GRASSES	SPECIAL SEEDING: NATIVE WILDFLOWERS	LIME	SPECIAL MULCH COVER	WATER	SPECIAL SECOND SEEDING	TEMPORARY SEEDING	SPECIAL MULCH COVER	WATER	TRIANGULAR SILT DIKE	SAND BAG DITCH CHECKS (E-5)	ROCK DITCH CHECKS (E-6)	SILT FENCE (E-11)	SEDIMENT BASIN (E-14)	OBLITERATION OF SEDIMENT BASIN	*SEDIMENT REMOVAL & DISPOSAL
			ACRE	ACRE	TON	ACRE	M.GAL.	ACRE	ACRE	ACRE	M.GAL.	LIN. FT.	BAG	CU.YD.	LIN. FT.	CU.YD.	CU.YD.	CU. YD.
ENTIRE	PROJECT	CLEARING AND GRUBBING						8.41	16.82	16.82	343.1	32		51	3613	48	48	199
ENTIRE	PROJECT	STAGE 1	0.99	0.99	1.98	0.99	101.0	0.99	0.57	0.57	11.6			30	268			20
ENTIRE	PROJECT	STAGE 2	1.57	1.57	3.14	1.57	160.1	1.57							202	16	16	23
ENTIRE	PROJECT	STAGE 3	0.37	0.37	0.74	0.37	37.7	0.37				32			256			9
*ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.			5.00	5.00	10.00	5.00	510.0	5.00	11.49	11.49	234.4	60	220	30	500	3600	3600	3629
TOTALS:			7.93	7.93	15.86	7.93	808.8	16.34	28.88	28.88	589.1	124	220	111	4839	3664	3664	3880

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
WATER.....12.6 GAL. / SQ. YD. OF SOLID SODDING
ROCK DITCH CHECKS.....3 CU.YD./LOCATION

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

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

EROSION CONTROL MATTING

STATION	STATION	LOCATION	LENGTH	CLASS 3
			LIN. FT.	SQ. YD.
301+92.00	303+60.00	RT.	168.00	149.33
102+61.00	102+95.00	LT.	34.00	30.22
103+05.00	103+40.00	RT.	35.00	31.11
103+38.00	103+65.00	LT.	27.00	24.00
ENTIRE	PROJECT	TO BE USED IF AND WHERE	180.00	160.00
		DIRECTED BY THE ENIGINEER		
TOTAL:				394.66

NOTE: AVERAGE WIDTH = 8'-0"

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

BENCH MARKS

STATION	LOCATION	BENCH MARKS
		EACH
105+88	SITE 1 CORNER OF BOX CULVERT	1
207+90	SITE 2 CORNER OF BOX CULVERT	1
213+65	SITE 2 BRIDGE END	1
TOTAL:		3

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

GUARDRAIL

STATION	STATION	LOCATION	GUARDRAIL (TYPE A)	THRIE BEAM GUARDRAIL TERMINAL	GUARDRAIL TERMINAL (TYPE 2)	TERMINAL ANCHOR POST (TYPE 1)
			LIN. FT.	EACH		
211+33.77	213+52.52	RT. SIDE	150	1	1	
212+58.77	213+52.52	LT. SIDE	75	1		1
219+78.48	220+72.23	RT. SIDE	75	1		1
219+78.48	221+97.23	LT. SIDE	150	1	1	
TOTALS:			450	4	2	2

CONCRETE CURB

STATION	STATION	LOCATION	TYPE B (9")
			LIN. FT.
108+01	109+01	SITE 1 - LT.	100
TOTAL:			100

MAILBOXES

LOCATION	MAILBOXES	MAILBOX SUPPORTS (SINGLE)
	EACH	
ENTIRE PROJECT	1	1
TOTALS:	1	1

FENCING

STATION	STATION	LOCATION	WIRE FENCE (TYPE C)
			LIN. FT.
102+98	105+88	SITE 1 - RT.	295
103+69	105+88	SITE 1 - LT.	236
105+75	106+31	SITE 1 - RT.	144
105+86	106+32	SITE 1 - RT.	157
106+32	108+50	SITE 1 - LT.	241
207+64	207+90	SITE 2 - RT.	57
207+88	208+00	SITE 2 - LT.	75
208+24	208+57	SITE 2 - RT.	55
208+26	210+38	SITE 2 - LT.	233
212+05	212+26	SITE 2 - LT.	80
223+80	228+12	SITE 2 - RT.	433
TOTAL:			2006

APPROACH GUTTERS

STATION	STATION	LOCATION	APPROACH GUTTER (TYPE A)	REINFORCING STEEL-RDWY. (GR. 60)
			CU.YD.	POUND
213+34.92	213+64.92	LT. SIDE	7.55	665
213+34.92	213+64.92	RT. SIDE	7.55	665
219+67.08	219+97.08	LT. SIDE	7.55	665
219+67.08	219+97.08	RT. SIDE	7.55	665
TOTALS:			30.20	2660

NOTE: USE T =16.5" FOR 8' SHOULDER.

COLD MILLING ASPHALT PAVEMENT

STATION	STATION	LOCATION	AVG. WIDTH	COLD MILLING ASPHALT PAVEMENT
			FEET	SQ. YD.
101+60.86	102+60.86	SITE 1 - MAIN LANES	20.00	222.22
108+00.86	109+00.86	SITE 1 - MAIN LANES	20.00	222.22
201+10.00	202+10.00	SITE 2 - MAIN LANES	20.00	222.22
227+44.49	228+44.49	SITE 2 - MAIN LANES	20.00	222.22
TOTAL:				888.88

NOTE: AVERAGE MILLING DEPTH 1".

6/30/2016

R040623.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.		040623	31	115

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
6-29-16

STRUCTURES

STATION	DESCRIPTION	TEMPORARY CULVERTS 18"	30"	48"	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.	
302+88	30" x 54' TEMP. PIPE CULVERT		54										PCC-1, PCM-1, PCP-1, PCP-2
306+38	QUINT. 48" x 121' TEMP. PIPE CULVERT			605									PCC-1, PCM-1, PCP-1, PCP-2
309+70	18" x 38' TEMP. PIPE CULVERT	38											PCC-1, PCM-1, PCP-1, PCP-2
SUBTOTALS:		38	54	605									
	STRUCTURES OVER 20' - 0" SPAN												
106+10	QUAD. 11' x 6' x 71' R.C. BOX CULVERT				11	6	71	331.25	37840	142	36	0.45	RCB-1, RCB-2, SPECIAL DETAILS
208+10	TRIPLE 12' x 10' x 81' R.C. BOX CULVERT				12	10	81	395.70	57060	155	41	0.52	RCB-1, RCB-2, SPECIAL DETAILS
SUBTOTALS:								726.95	94900	297	77	0.97	
TOTALS:		38	54	605				726.95	94900	297	77	0.97	

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.

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.

ACHM PATCHING OF EXISTING ROADWAY

DESCRIPTION	TON
ENTIRE PROJECT - TO BE USED IF AND WHERE	25
DIRECTED BY THE ENGINEER	
TOTAL:	25

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

DRIVEWAYS & TURNOUTS

STATION	SIDE	LOCATION	WIDTH	PORTLAND CEMENT CONCRETE DRIVEWAY	ACHM SURFACE COURSE (1/2") 220 LBS. PER SQ. YD. (PG 64-22)		AGGREGATE BASE COURSE (CLASS 7)	SIDE DRAINS 18"	30"	35"X24"	STANDARD DRAWINGS
			FEET	SQ. YD.	SQ. YD.	TON	TON	LIN. FT.			
101+00	RT.	SITE 1	16		89.79	9.88	36.66			36	PCC-1, PCM-1
102+80	RT.	SITE 1	26		177.33	19.51	72.41		50		PCC-1, PCM-1, PCP-1, PCP-2
103+18	LT.	SITE 1	20		131.06	14.42	53.52	48			PCC-1, PCM-1, PCP-1, PCP-2
109+58	RT.	SITE 1	18		63.62	7.00	25.98				
201+44	LT.	SITE 2	16		52.32	5.76	21.36	42			PCC-1, PCM-1, PCP-1, PCP-2
201+97	RT.	SITE 2	16		77.77	8.55	31.76				
204+03	LT.	SITE 2	20	95.96				38			PCC-1, PCM-1, PCP-1, PCP-2
205+00	LT.	SITE 2	20		109.45	12.04	44.69				
205+30	RT.	SITE 2	22		296.30	32.59	120.99				
205+36	LT.	SITE 2	22		139.05	15.30	56.78	116			PCC-1, PCM-1, PCP-1, PCP-2
205+45	RT.	SITE 2	32		32.00	3.52	13.07				
206+07	RT.	SITE 2	32		186.51	20.52	76.16				
206+17	LT.	SITE 2	24		116.24	12.79	47.46	76			PCC-1, PCM-1, PCP-1, PCP-2
207+02	RT.	SITE 2	18		169.92	18.69	69.38				
207+36	LT.	SITE 2	40		130.89	14.40	53.45	112			PCC-1, PCM-1, PCP-1, PCP-2
211+03	RT.	SITE 2	16		366.06	40.27	149.47				
212+14	LT.	SITE 2	20		397.73	43.75	162.41				
212+38	LT.	SITE 2	16		169.47	18.64	69.20				
* ENTIRE PROJECT TEMPORARY DRIVES							200.00				
TOTALS:				95.96	2705.51	297.63	1304.75	432	50	36	

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.5% MIN. AGGR.....5.5% 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.

ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC

LOCATION	TON	TACK COAT
		GALLON
ENTIRE PROJECT - TO BE USED IF AND WHERE	15	30
DIRECTED BY THE ENGINEER		
TOTALS:	15	30

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

DUMPED RIPRAP AND FILTER BLANKET

STATION	LOCATION	DUMPED RIPRAP	FILTER BLANKET
		CU. YD.	SQ. YD.
ENTIRE	TO BE USED IF AND WHERE	50	100
PROJECT	DIRECTED BY THE ENGINEER		
TOTALS:		50	100

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

5/23/2016

R040623.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.		040623	32	115

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
6-29-16

BASE AND SURFACING

STATION	STATION	LOCATION	LENGTH	AGGREGATE BASE COURSE (CLASS 7)		TACK COAT				ACHM BASE COURSE (1 1/2")				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	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 64-22	TOTAL PG 64-22
			FEET			FEET				FEET			TON	FEET			TON	FEET			TON	FEET			TON	TON
MAIN LANES																									
101+60.86	102+60.86	TRANSITION	100.00			20.00	222.22	0.17	37.78																
101+60.86	102+60.86	TRANSITION	100.00	167.75	167.75	24.39	271.00	0.05	13.55					2.26	25.11	495.00	6.21	2.13	23.67	220.00	2.60	29.00	322.22	220.00	35.44	38.04
102+60.86	103+75.00	NOTCH & WIDEN	114.14	221.50	252.82	28.77	364.87	0.05	18.24					4.52	57.32	495.00	14.19	4.25	53.90	220.00	5.93	32.00	405.83	220.00	44.64	50.57
103+75.00	107+50.00	FULL DEPTH	375.00	325.50	1220.63	48.77	2032.08	0.05	101.60					24.52	1021.67	495.00	252.86	24.25	1010.42	220.00	111.15	32.00	1333.33	220.00	146.67	257.82
107+50.00	108+00.86	NOTCH & WIDEN	50.86	221.50	112.65	28.77	162.58	0.05	8.13					4.52	25.54	495.00	6.32	4.25	24.02	220.00	2.64	32.00	180.84	220.00	19.89	22.53
108+00.86	109+00.86	TRANSITION	100.00	167.75	167.75	24.39	271.00	0.05	13.55					2.26	25.11	495.00	6.21	2.13	23.67	220.00	2.60	29.00	322.22	220.00	35.44	38.04
108+00.86	109+00.86	TRANSITION	100.00			20.00	222.22	0.17	37.78																
201+10.00	202+10.00	TRANSITION	100.00			20.00	222.22	0.17	37.78																
201+10.00	202+10.00	TRANSITION	100.00	167.75	167.75	24.39	271.00	0.05	13.55					2.26	25.11	495.00	6.21	2.13	23.67	220.00	2.60	29.00	322.22	220.00	35.44	38.04
202+10.00	203+44.74	NOTCH & WIDEN	134.74	221.50	298.45	28.77	430.72	0.05	21.54					4.52	67.67	495.00	16.75	4.25	63.63	220.00	7.00	32.00	479.08	220.00	52.70	59.70
203+44.74	205+96.26	TRANS. NOTCH & WIDEN TO FULL DEPTH	251.52	268.38	675.03	38.77	1083.49	0.05	54.17					13.39	374.21	495.00	92.62	13.19	368.62	220.00	40.55	32.00	894.29	220.00	98.37	138.92
205+96.26	213+64.92	FULL DEPTH	768.66	325.50	2501.99	48.77	4165.28	0.05	208.26					24.52	2094.17	495.00	518.31	24.25	2071.11	220.00	227.82	32.00	2733.01	220.00	300.63	528.45
219+67.08	223+36.47	FULL DEPTH	369.39	325.50	1202.36	48.77	2001.68	0.05	100.08					24.52	1006.38	495.00	249.08	24.25	995.30	220.00	109.48	32.00	1313.39	220.00	144.47	253.95
223+36.47	225+75.74	TRANS. FULL DEPTH TO NOTCH & WIDEN	239.27	268.38	642.15	38.77	1030.72	0.05	51.54					13.39	355.98	495.00	88.11	13.19	350.66	220.00	38.57	32.00	850.74	220.00	93.58	132.15
225+75.74	227+44.49	NOTCH & WIDEN	168.75	221.50	373.78	28.77	539.44	0.05	26.97					4.52	84.75	495.00	20.98	4.25	79.69	220.00	8.77	32.00	600.00	220.00	66.00	74.77
227+44.49	228+44.49	TRANSITION	100.00	167.75	167.75	24.39	271.00	0.05	13.55					2.26	25.11	495.00	6.21	2.13	23.67	220.00	2.60	29.00	322.22	220.00	35.44	38.04
227+44.49	228+44.49	TRANSITION	100.00			20.00	222.22	0.17	37.78																
DETOUR																									
301+91.88	303+56.96	TRANS. FROM EXISTING TO DETOUR	165.08	59.38	98.02	12.17	223.22	0.05	11.16					12.17	223.22	440.00	49.11					12.00	220.11	220.00	24.21	24.21
303+56.96	309+37.36	FULL DEPTH SECTION	580.40	118.75	689.23	24.33	1569.01	0.05	78.45					24.33	1569.01	440.00	345.18					24.00	1547.73	220.00	170.25	170.25
309+37.36	311+41.32	TRANS. FROM DETOUR TO EXISTING	203.96	59.38	121.11	12.17	275.80	0.05	13.79					12.17	275.80	440.00	60.68					12.00	271.95	220.00	29.91	29.91
ADDITIONAL FOR GUARDRAIL WIDENING																									
210+90.77	211+23.77	BEGIN AGG. BASE COURSE TRANS. RT.	33.00	22.63	7.47																				
211+23.77	211+33.77	GUARDRAIL WIDENING AT TERMINAL ON RT.	10.00	45.25	4.53																				
211+33.77	213+08.77	GUARDRAIL RT.	175.00	37.38	65.42																				
213+08.77	213+52.52	TIE GUARDRAIL TO PARAPET WALL ON RT.	43.75	29.50	12.91																				
212+03.77	212+48.77	BEGIN AGG. BASE COURSE TRANS. LT.	45.00	29.88	13.45																				
212+48.77	212+58.77	GUARDRAIL WIDENING AT TERMINAL ON LT.	10.00	59.75	5.98																				
212+58.77	213+08.77	GUARDRAIL LT.	50.00	44.63	22.32																				
213+08.77	213+52.52	TIE GUARDRAIL TO PARAPET WALL ON LT.	43.75	29.50	12.91																				
219+78.48	220+22.23	TIE GUARDRAIL TO PARAPET WALL ON RT.	43.75	29.50	12.91																				
220+22.23	220+72.23	GUARDRAIL RT.	50.00	44.63	22.32																				
220+72.23	220+82.23	GUARDRAIL WIDENING AT TERMINAL ON RT.	10.00	59.75	5.98																				
220+82.23	221+27.23	BEGIN AGG. BASE COURSE TRANS. RT.	45.00	29.88	13.45																				
219+78.48	220+22.23	TIE GUARDRAIL TO PARAPET WALL ON LT.	43.75	29.50	12.91																				
220+22.23	221+97.23	GUARDRAIL LT.	175.00	37.38	65.42																				
221+97.23	222+07.23	GUARDRAIL WIDENING AT TERMINAL ON LT.	10.00	45.25	4.53																				
222+07.23	222+40.23	BEGIN AGG. BASE COURSE TRANS. LT.	33.00	22.63	7.47																				
ADDITIONAL FOR LEVELING																									
102+60.86	103+75.00	SITE 1 - NOTCH & WIDENING SECTION	114.14			20.00	253.64	0.17	43.12									20.00	253.64	220.00	27.90					27.90
107+50.00	108+00.86	SITE 1 - NOTCH & WIDENING SECTION	50.86			20.00	113.02	0.17	19.21									20.00	113.02	220.00	12.43					12.43
202+10.00	203+44.74	SITE 2 - NOTCH & WIDENING SECTION	134.74			20.00	299.42	0.17	50.90									20.00	299.42	220.00	32.94					32.94
203+44.74	205+96.26	SITE 2 - TRANS. NOTCH & WIDENING TO FULL DEPTH	251.52			10.00	279.47	0.17	47.51									10.00	279.47	220.00	30.74					30.74
223+36.47	225+75.74	SITE 2 - TRANS. FULL DEPTH TO NOTCH & WIDENING	239.27			10.00	265.86	0.17	45.20									10.00	265.86	220.00	29.24					29.24
225+75.74	227+44.49	SITE 2 - NOTCH & WIDENING SECTION	168.75			20.00	375.00	0.17	63.75									20.00	375.00	220.00	41.25					41.25
ADDITIONAL FOR GRADE RAISE																									
103+00.00	103+75.00	SITE 1 - NOTCH & WIDENING SECTION	75.00			20.00	166.67	0.17	28.33	20.00	166.67	VAR.	29.73	20.00	166.67	VAR.	27.87									
107+50.00	108+00.86	SITE 1 - NOTCH & WIDENING SECTION	50.86			20.00	113.02	0.17	19.21	20.00	113.02	VAR.	24.45	20.00	113.02	VAR.	55.00									
202+10.00	205+96.26	SITE 2 - NOTCH & WIDENING SECTION	386.26			20.00	858.36	0.17	145.92	20.00	858.36	VAR.	64.70	20.00	858.36	VAR.	132.25									
223+36.47	227+44.49	SITE 2 - NOTCH & WIDENING SECTION	408.02			10.00	453.36	0.17	77.07	10.00	453.36	VAR.	176.11	20.00	906.71	VAR.	126.78									
ADDITIONAL FOR SUPERELEVATION																									
107+45.43	109+00.86	SITE 1 - SUPERELEVATION TRANS.	155.43	40.38	62.76																				
202+10.00	204+35.00	SITE 2 - SUPERELEVATION TRANS.	225.00	50.63	113.92																				
204+35.00	208+41.05	SITE 2 - MAX SUPERELEVATION	406.05	101.25	411.13																				
208+41.05	210+66.05	SITE 2 - SUPERELEVATION TRANS.	225.00	50.63	113.92																				
221+73.20	223+98.20	SITE 2 - SUPERELEVATION TRANS.	225.00	50.63	113.92																				
223+98.20	225+19.49	SITE 2 - MAX SUPERELEVATION	121.29	101.25	122.81																				
225+19.49	227+44.49	SITE 2 - SUPERELEVATION TRANS.	225.00	50.63	113.92																				
304+01.16	305+68.66	DETOUR - SUPERELEVATION TRANS.	167.50	0.88	1.47																				
305+68.66	311+41.32	DETOUR - MAX SUPERELEVATION	572.66	1.75	10.02																				
TOTALS:					**10213.07**		**19029.59**		**1439.47**		**1591.41**		**294.99**		**9300.92**		**2080.93**		**6698.44**		**736.81**		**12119.18**		**1333.08**	**2069.89**

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.5% MIN. AGGR.....5.5% ASPHALT BINDER
ACHM BINDER COURSE (1").....95.4% MIN. AGGR.....4.6% ASPHALT BINDER
ACHM BASE COURSE (1 1/2").....95.9% MIN. AGGR.....4.1% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22
TACK COAT QUANTITIES WERE CALCULATED USING THE EMULSIFIED ASPHALT RATES. REFER TO SS-400-1 FOR THE RESIDUAL ASPHALT APPLICATION RATES.

5/23/2016

R040623.DGN

QUANTITIES

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.		040623	33	115
				①	07373 - QUANTITIES - 57963			

SCHEDULE OF BRIDGE QUANTITIES - JOB NO. 040623

BRIDGE NO.	NAME PLATE TITLE	UNIT OF STRUCTURE	ITEM NO.	SP & 205	801	802	802	803	804	804	805	SP & 807	SP & 807	808	809	812	816	816	SPJOB 040623	SPJOB 040623	SPJOB 040623	SPJOB 040623
			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	REINFORCING STEEL-BRIDGE (GRADE 60)	EPOXY COATED REINFORCING STEEL (GRADE 60)	③ STEEL PILING (HP 12X53)	STRUCTURAL STEEL IN BEAM SPANS (M 270, GRADE 50W)	STRUCTURAL STEEL IN PLATE GIRDER SPANS (M 270, GRADE 50W)	ELASTOMERIC BEARINGS	ARMORED JOINT WITH NEOPRENE STRIP SEAL	BRIDGE NAME PLATE (TYPE D)	FILTER BLANKET	DUMPED RIPRAP	④ DRILLED SHAFTS (72" DIA.)	PERMANENT STEEL CASING (78" DIA.)	CROSSHOLE SONIC LOGGING (72" DIA.)	⑤ CORING DRILLED SHAFT
			UNIT	LUMP SUM	CU. YD.	CU. YD.	CU. YD.	SQ. YD.	LB.	LB.	LIN. FT.	LB.	LB.	CU. IN.	LIN. FT.	EACH	SQ. YD.	CU. YD.	LIN. FT.	LIN. FT.	EACH	LIN. FT.
07373	LEE CREEK	BENT 1			42	62.01		139.2	5,445			720		2,610.0					63	33	2	
		BENT 2				45.71			8,015					2,610.0					60	30	2	
		BENT 3				44.73			7,890					2,610.0					55	33	2	
		BENT 4				47.83			8,170					4,530.0					70	48	2	35
		BENT 5				37.34			7,675					2,030.0					43	21	2	
		BENT 6				36.78			7,595					2,030.0								
		BENT 7				35.80		139.2	3,650		140	720		1,920.0			781	415				
		360' CONT. PLATE GIRDER UNIT					461.00	1,888.7		101,580			459,340		86	1						
		240' CONT. W-BEAM UNIT					306.00	1,259.2		69,140		258,390			43							
		SITE NO. 3 (STA. 216+65)		1																		
		① SITE NO. 1 (STA. 106+12)		1																		
		① SITE NO. 2 (STA. 208+16)		1																		
		TOTALS FOR JOB NO. 040623			② 42	310.20	767.00	3,426.3	48,440	170,720	140	259,830	459,340	18,340.0	129	1	781	415	291	165	10	35

① EXISTING BRIDGE NO. 02620 (LOG MILE 9.91) IS 26.0' WIDE AND 46' LONG AND CONSISTS OF STEEL BEAM SPANS SUPPORTED BY ROCK MASONRY PIERS.

EXISTING BRIDGE NO. 01829 (LOG MILE 10.74) IS 28.6' WIDE AND 42' LONG AND CONSISTS OF A SINGLE STEEL BEAM SPAN SUPPORTED BY CONCRETE ABUTMENTS.

THE ABOVE BRIDGES SHALL BE REMOVED IN ACCORDANCE WITH SECTION 205 AND ALL MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR.

② INCLUDES APPROX. 40 CU. YDS. OF ROCK EXCAVATION

③ THESE STEEL PILES SHALL BE GRADE 50 AND ARE REQUIRED TO HAVE SPECIAL PILE TIPS WHICH WILL NOT BE PAID FOR DIRECTLY, BUT WILL BE CONSIDERERED SUBSIDIARY TO THE ITEM 'STEEL PILING (HP 12X53)'.

④ ALL DRILLED SHAFTS SHALL BE CONSTRUCTED WITH PIPES FOR NONDESTRUCTIVE TESTING. SEE SPECIAL PROVISION JOB 040623 'NONDESTRUCTIVE TESTING OF DRILLED SHAFTS'.

⑤ QUANTITY SHOWN IS FOR ESTIMATING AND BIDDING PURPOSES ONLY. ACTUAL QUANTITIES, IF ANY, WILL BE DETERMINED IN THE FIELD.

AILEEN SCHUBEL
DESIGN SECTION SUPERVISOR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
6-13-16
BRIDGE ENGINEER

SCHEDULE OF BRIDGE QUANTITIES
NATURAL DAM - NORTH STRS. & APPRS. (S)
CRAWFORD COUNTY
ROUTE 59 SEC. 5
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: ACP DATE: 10-29-15 FILENAME: b040623_qi.dgn
CHECKED BY: CRE DATE: 6-7-16 SCALE: No Scale
DESIGNED BY: — DATE: —
BRIDGE NO. 07373 DRAWING NO. 57963

PRINT DATE: 6/8/2016

SUMMARY OF QUANTITIES

ITEM NUMBER	ITEM		QUANTITY	UNIT
SP & 201	CLEARING		33	STATION
SP & 201	GRUBBING		33	STATION
202	REMOVAL AND DISPOSAL OF FENCE		3220	LIN. FT.
202	REMOVAL AND DISPOSAL OF CONCRETE PAVEMENT		89	SQ. YD.
202	REMOVAL AND DISPOSAL OF SIGN FOUNDATIONS		2	EACH
202	REMOVAL AND DISPOSAL OF PIPE CULVERTS		7	EACH
202	REMOVAL AND DISPOSAL OF GUARDRAIL		200	LIN. FT.
202	REMOVAL AND DISPOSAL OF SIGNS		2	EACH
202	REMOVAL AND DISPOSAL OF AIR STATION		1	EACH
202	REMOVAL AND DISPOSAL OF POLE AND FOUNDATION		2	EACH
210	UNCLASSIFIED EXCAVATION		14251	CU. YD.
210	COMPACTED EMBANKMENT		34568	CU. YD.
SP & 210	SOIL STABILIZATION		100	TON
SS & 303	AGGREGATE BASE COURSE (CLASS 7)		11518	TON
SS & 401	TACK COAT		1469	GAL.
SP & 405	MINERAL AGGREGATE IN ACHM BASE COURSE (1 1/2")		283	TON
SP & 405	ASPHALT BINDER (PG 64-22) IN ACHM BASE COURSE (1 1/2")		12	TON
SP, SS, & 406	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")		1985	TON
SP, SS, & 406	ASPHALT BINDER (PG 64-22) IN ACHM BINDER COURSE (1")		96	TON
SP, SS, & 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")		2238	TON
SP, SS, & 407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2")		130	TON
412	COLD MILLING ASPHALT PAVEMENT		889	SQ. YD.
SP & 414	ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC		15	TON
SP & 415	ACHM PATCHING OF EXISTING ROADWAY		25	TON
504	APPROACH GUTTERS		30.20	CU. YD.
505	PORTLAND CEMENT CONCRETE DRIVEWAY		95.96	SQ. 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		38	LIN. FT.
603	30" TEMPORARY CULVERT		54	LIN. FT.
603	48" TEMPORARY CULVERT		605	LIN. FT.
SS & 604	SIGNS		523	SQ. FT.
SS & 604	BARRICADES		192	LIN. FT.
SS & 604	TRAFFIC DRUMS		89	EACH
604	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER		206	LIN. FT.
604	RELOCATING PRECAST CONCRETE BARRIER		193	LIN. FT.
604	CONSTRUCTION PAVEMENT MARKINGS		17768	LIN. FT.
604	REMOVAL OF PERMANENT PAVEMENT MARKINGS		2569	LIN. FT.
SS & 604	VERTICAL PANELS		35	EACH
605	CONCRETE DITCH PAVING (TYPE B)		61	SQ. YD.
SP, SS, & 606	18" SIDE DRAIN		432	LIN. FT.
SP, SS, & 606	30" SIDE DRAIN		50	LIN. FT.
SS & 606	35" X 24" SIDE DRAIN		36	LIN. FT.
606	SELECTED PIPE BEDDING		50	CU. YD.
611	UNDERDRAIN OUTLET PROTECTORS		8	EACH
611	4" PIPE UNDERDRAINS		250	LIN. FT.
617	GUARDRAIL (TYPE A)		450	LIN. FT.
617	GUARDRAIL TERMINAL (TYPE 2)		2	EACH
617	TERMINAL ANCHOR POSTS (TYPE 1)		2	EACH
617	THRIE BEAM GUARDRAIL TERMINAL		4	EACH
619	WIRE FENCE (TYPE C)		2006	LIN. FT.
620	LIME		16	TON
SP & 620	SPECIAL SEEDING: NATIVE GRASSES		7.93	ACRE
SP & 620	SPECIAL SEEDING: NATIVE WILDFLOWERS		7.93	ACRE
SP, SS, & 620	SPECIAL MULCH COVER		36.81	ACRE
620	WATER		1399.4	M.GAL.
621	TEMPORARY SEEDING		28.88	ACRE
621	SILT FENCE		4839	LIN. FT.
621	SAND BAG DITCH CHECKS		220	BAG
621	SEDIMENT BASIN		3664	CU. YD.
621	OBLITERATION OF SEDIMENT BASIN		3664	CU. YD.
621	SEDIMENT REMOVAL AND DISPOSAL		3880	CU. YD.
621	ROCK DITCH CHECKS		111	CU. YD.
621	TRIANGULAR SILT DIKE		124	LIN. FT.
SP & 623	SPECIAL SECOND SEEDING		16.34	ACRE
624	SOLID SODDING		118	SQ. YD.
626	EROSION CONTROL MATTING (CLASS 3)		395	SQ. YD.
634	CONCRETE CURB (TYPE B)		100	LIN. FT.
635	ROADWAY CONSTRUCTION CONTROL		1.00	LUMP SUM
637	MAILBOXES		1	EACH
637	MAILBOX SUPPORTS (SINGLE)		1	EACH
719	THERMOPLASTIC PAVEMENT MARKING WHITE (4")		6859	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING YELLOW (4")		6165	LIN. FT.
* SP & 719	INVERTED PROFILE THERMOPLASTIC CONTRAST PAVEMENT MARKING YELLOW (4")	(ALTERNATE NO. 1)	1204	LIN. FT.
* SP	HIGH PERFORMANCE CONTRAST MARKING TAPE YELLOW (4")	(ALTERNATE NO. 2)	1204	LIN. FT.
721	RAISED PAVEMENT MARKERS (TYPE II)		92	EACH
731	TEMPORARY IMPACT ATTENUATION BARRIER		1	EACH
731	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)		1	EACH
804	REINFORCING STEEL-ROADWAY (GRADE 60)		2660	POUND
816	FILTER BLANKET		100	SQ. YD.
816	DUMPED RIPRAP		50	CU. YD.
	STRUCTURES OVER 20' SPAN			
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 1)		1.00	LUMP SUM
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 2)		1.00	LUMP SUM
SP & 205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 3)		1.00	LUMP SUM
636	BRIDGE CONSTRUCTION CONTROL		1.00	LUMP SUM
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-BRIDGE		42	CU. YD.
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY		297	CU. YD.
802	CLASS S CONCRETE-BRIDGE		310.20	CU. YD.
802	CLASS S CONCRETE-ROADWAY		726.95	CU. YD.
802	CLASS S(AE) CONCRETE-BRIDGE		767.00	CU. YD.
803	CLASS 2 PROTECTIVE SURFACE TREATMENT		3426.3	SQ. YD.
804	REINFORCING STEEL-ROADWAY (GRADE 60)		94900	POUND
804	REINFORCING STEEL-BRIDGE (GRADE 60)		48440	POUND
804	EPOXY COATED REINFORCING STEEL (GRADE 60)		170720	POUND
805	STEEL PILING (HP 12X53)		140	LIN. FT.
SP & 807	STRUCTURAL STEEL IN BEAM SPANS (M270-GR50W)		259830	POUND
SP & 807	STRUCTURAL STEEL IN PLATE GIRDER SPANS (M270-GR50W)		459340	POUND
808	ELASTOMERIC BEARINGS		18340.0	CU. IN.
809	ARMORED JOINT WITH NEOPRENE STRIP SEAL		129	LIN. FT.
812	BRIDGE NAME PLATE (TYPE D)		1	EACH
816	FILTER BLANKET		781	SQ. YD.
816	DUMPED RIPRAP		415	CU. YD.
SP	DRILLED SHAFT (72" DIAMETER)		291	LIN. FT.
SP	PERMANENT STEEL CASING (78" DIAMETER)		165	LIN. FT.
SP	CROSSHOLE SONIC LOGGING (72" DIAMETER)		10	EACH
SP	CORING DRILLED SHAFT		35	LIN. FT.

* DENOTES ALTERNATE BID ITEMS.

REVISIONS

DATE	REVISION	SHEET NUMBER
7/26/2016	REVISED THE NOTE ABOUT THE EXISTING PAINT ON THE EXISTING TRUSS ON PAGE 44 - LAYOUT OF BRIDGE OVER LEE CREEK (SHEET 2 OF 2).	34 & 44

SUMMARY OF QUANTITIES & REVISIONS

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

7-26-16

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.AID PROJ.NO.
7-26-16				

(2) SUMMARY OF QUANTITIES & REVISIONS

JOB NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
040623	ARK.	6	34	115

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.		040623	35	115

(2) SURVEY CONTROL DETAILS

MIDPOINT:
LAT 35 39 46.16
LON 094 24 23.54

SURVEY CONTROL COORDINATES

Project Name: s040623
Date: 7/3/2013
Coordinate System: ARKANSAS STATE PLANE - NORTH ZONE BASED ON GPS CONTROL, PROJECTED TO GROUND.
Units: U.S. SURVEY FOOT

Point Name	Northing	Easting	Elev	Feature	Description
1	485717.8091	601585.7019	658.199	CTL	*5/8" Rebar with 2" Aluminum Cap stamped PN: 1
2	486647.9774	601233.0423	670.778	CTL	*5/8" Rebar with 2" Aluminum Cap stamped PN: 2
3	486628.4985	601179.7711	665.233	CTL	*5/8" Rebar with 2" Aluminum Cap stamped PN: 3
4	487453.0413	600979.2084	663.670	CTL	*5/8" Rebar with 2" Aluminum Cap stamped PN: 4
5	490527.8189	599687.4027	689.205	CTL	*5/8" Rebar with 2" Aluminum Cap stamped PN: 5
6	491037.4249	599195.9855	692.080	CTL	*5/8" Rebar with 2" Aluminum Cap stamped PN: 6
7	498699.5995	587481.2531	778.282	CTL	*5/8" Rebar with 2" Aluminum Cap stamped PN: 7
8	499005.9155	587072.2948	777.238	CTL	*5/8" Rebar with 2" Aluminum Cap stamped PN: 8
100	482619.6461	600481.8061	669.544	GPS	*AHTD GPS #170021
101	484299.4383	602483.5004	666.864	GPS	*AHTD GPS #170021A
102	491203.2092	599108.9910	698.808	GPS	*AHTD GPS #170022
103	492692.4085	597607.3271	758.433	GPS	*AHTD GPS #170022A
104	498494.8056	587782.0904	779.281	GPS	*AHTD GPS #170023
105	499176.6841	586778.1406	774.218	GPS	*AHTD GPS #170023A
996	484055.2851	602725.0157	673.937	TBM	*USGS TBM LC 57, CUT SQ N END W HEADWALL, 15.9' NE C\L HWY 59
997	486109.1365	601453.8280	660.714	TBM	*USGS TBM LC 58, CUT SQ SE COR E BRIDGE OVER LEE CREEK
998	490708.3716	599501.8525	681.112	BM	*USGS BRASS CAP 15 DWB, 11.5' NE C\L HWY 59
999	498798.5562	587237.1676	778.185	BM	*USGS BRASS CAP 16 DWB, 21.6' SW C\L HWY 59

*Note - Rebar and Cap - Standard - 5/8" Rebar with 2" Aluminum Cap stamped
*(standard markings common to all caps), or as indicated
(other markings indicated in the point description of the individual point).
ALL DISTANCES ARE GROUND.
USE CAF = 1.0 FOR STAKEOUT FOR THIS PROJECT.
A PROJECT CAF OF 0.999901916 HAS BEEN USED TO COMPUTE THE ABOVE LISTED GROUND COORDINATES.
THIS CAF IS INTENDED FOR USE WITHIN THE PROJECT LIMITS.
GRID DISTANCE = GROUND DISTANCE X CAF.
GROUND COORDINATES ARE PROJECTED FROM AR. STATE PLANE GRID COORDINATES BY SCALING ALL X,Y COORDINATE VALUES WITH THE INVERSE (1/X) OF THE COMBINED AJUSTMENT FACTOR (CAF) ABOUT X=0,Y=0.

GRID COORDINATES ARE STORED UNDER FILE NAME. s040623gi.ctl
HORIZONTAL DATUM: NAD 83 (1997)
VERTICAL DATUM: NAVD 88 ELEVATIONS FOR POINTS 1-8, 100-105, AND 996-999 WERE ESTABLISHED BY 3-WIRE LEVEL TECHNIQUES FROM NGS BENCHMARKS.

POSITIONAL ACCURACY:

HORIZONTAL-GPS(POINTS 100-105): 1.0 CM 10 PPM, PRIMARY CONTROL(POINTS 1-8): 2.0 CM 20 PPM

VERTICAL-POSITIONAL ACCURACY IS THIRD ORDER, UNLESS SPECIFIED OTHERWISE AT A SPECIFIC POINT

BASIS OF BEARING:
ARKANSAS STATE PLANE GRID BEARINGS - 0301-NORTH ZONE
DETERMINED FROM GPS CONTROL POINTS: 100-105
CONVERGENCE ANGLE: 01 24 01.30 LEFT AT PN: 103
GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.

LT: 35-39-46.16 LG: 094-24-23.54

GRID NORTHING: 492644.0833 GRID EASTING: 597548.7114

GROUND NORTHING: 492692.4085 GROUND EASTING: 597607.3271

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
6-29-16

SITE 1

POINT NAME	TYPE	STATION	NORTHING	EASTING
8000	POB	100+00.00	491248.0038	599029.2177
8001	P.C.	108+93.53	490599.7142	599644.1245
8002	P.T.	111+10.74	490464.7533	599813.4329
8003	POE	113+86.43	490324.3941	600050.7196

DETOUR

POINT NAME	TYPE	STATION	NORTHING	EASTING
8000	POB	300+00.00	491248.0038	599029.2177
8020	P.C.	301+91.88	491108.7905	599161.2624
8022	P.T.	303+93.43	490936.0453	599261.5324
8023	P.C.	304+08.89	490921.2483	599265.9942
8025	P.T.	307+30.51	490673.9027	599459.8504
8003	POE	314+17.01	490324.3941	600050.7196

SITE 2

POINT NAME	TYPE	STATION	NORTHING	EASTING
8004	POB	200+00.71	487957.1918	601075.6499
8005	P.C.	203+44.74	487615.3569	601036.8916
8007	P.T.	208+97.30	487072.6199	601106.8550
8008	P.C.	223+41.95	485725.3717	601628.3242
8011	P.T.	225+75.74	485517.4273	601734.2975
8009	POE	232+83.19	484923.1032	902118.0381

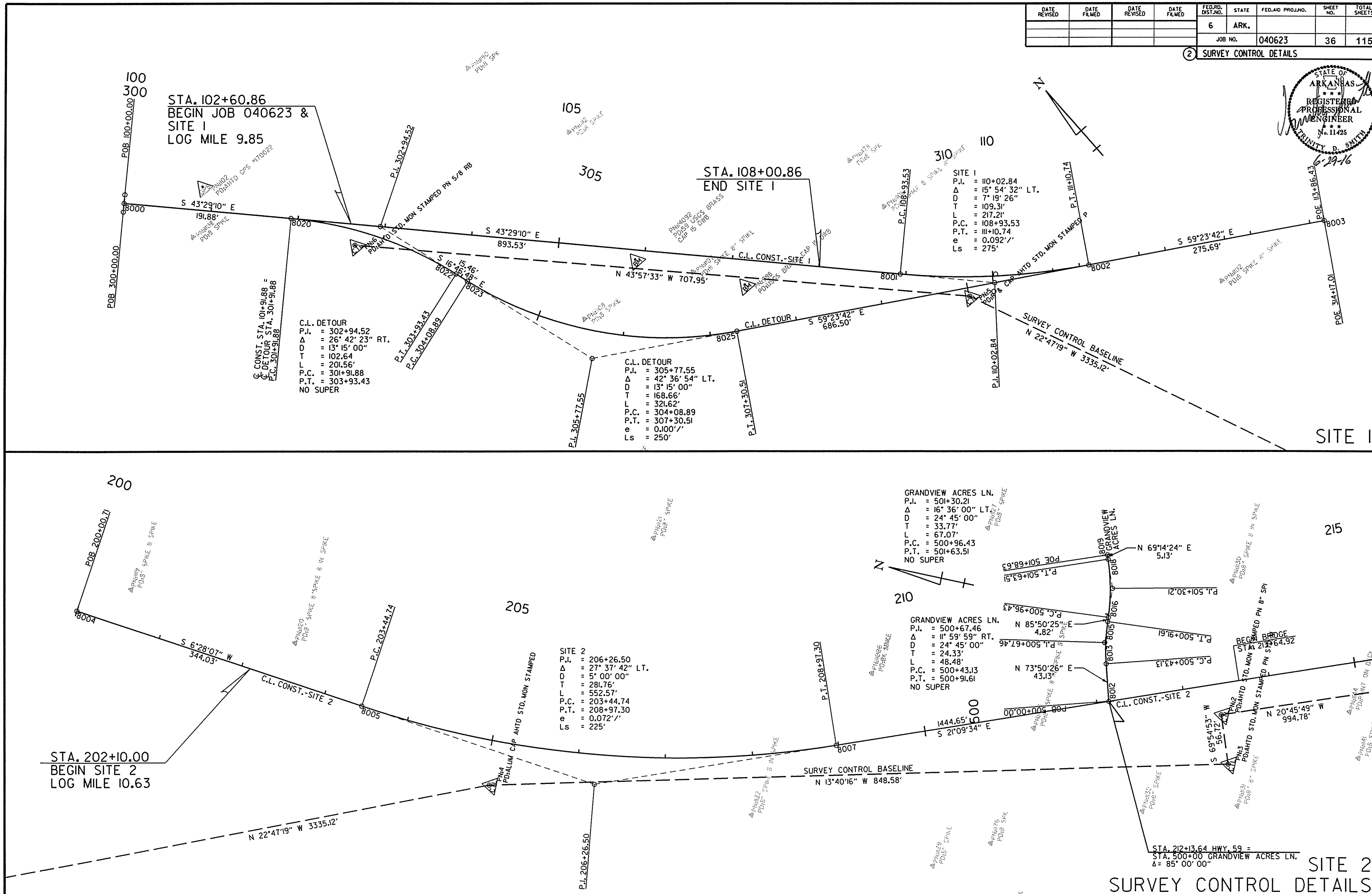
GRANDVIEW ACRES LN.

POINT NAME	TYPE	STATION	NORTHING	EASTING
8012	POB	500+00.00	486777.6119	601221.0415
8013	P.C.	500+43.13	486789.6143	601262.4633
8015	P.T.	500+91.61	486798.1509	601310.1000
8016	P.C.	500+96.43	486798.5009	601314.9119
8018	P.T.	501+63.51	486812.9212	601380.1746
8019	POE	501+68.63	486814.7384	601384.9686

6/21/2016

R040623.DGN

SURVEY CONTROL DETAILS



6/21/2016

R040623.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.		040623	37	115

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
6-24-16

215

220

225

230

N

S 21°09'34" E
1444.65'

END BRIDGE
STA. 219+67.08

C.L. CONST.-SITE 2

N 20°45'49" W 994.78'

SURVEY CONTROL BASELINE

P.C. 223+41.95

8008

P.I. 224+59.25

P.T. 225+75.74

8011

S 32°50'58" E
707.44'

SITE 2
P.I. = 224+59.25
Δ = 11° 41' 23" LT.
D = 5° 00' 00"
T = 117.31'
L = 233.79'
P.C. = 223+41.95
P.T. = 225+75.74
e = 0.072'/'
Ls = 225'

STA. 227+44.49
END SITE 2 &
JOB 040623

230

N

S 32°50'58" E
707.44'

POE 232+83.19

8009

SITE 2
SURVEY CONTROL DETAILS

6/21/2016

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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.		040623	38	115

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
6-29-16

STA. 103+18 IN PLACE
18" x 32' R.C. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" x 48' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 30 CU. YDS. COMP. EMBANKMENT,
5 CU. YDS. UNCLASSIFIED EXCAVATION

100

STA. 106+10 - CONSTRUCT
QUAD. 11' x 6' x 71' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
Q50 = 2460 CFS, D.A. = 2.56 SQ. MI.
ROADWAY SPAN = 47.08 LIN. FT.

STA. 105+88.88 - 106+36.01 IN PLACE
24' CLEAR ROADWAY X 46' LENGTH
BRIDGE NO. 02620 CONSISTING OF A
CONCRETE DECK WITH ASPHALT OVERLAY
AND 2 SPAN STEEL STRINGERS/GIRDERS, CONCRETE/MASONRY ABUTMENTS
REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 1) = 1.00 LUMP SUM

105

CONCRETE CURB (TYPE B)

STA.	STA.	SIDE	LIN. FT.
108+01	109+01	LT.	100

P.I. = 110+02.84
Δ = 15° 54' 32" LT.
D = 7° 19' 26"
T = 109.31'
L = 217.21'
P.C. = 108+93.53
P.T. = 111+10.74
e = 0.092'/'
Ls = 275'

110

STA. 102+60.86
BEGIN JOB 040623 &
SITE 1
LOG MILE 9.85

STA. 101+00 INSTALL
35" x 24" x 36' ARCH PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 15 CU. YDS. COMP. EMBANKMENT

STA. 102+80 IN PLACE
30" x 39' R.C. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" x 50' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 40 CU. YDS. COMP. EMBANKMENT,
5 CU. YDS. UNCLASSIFIED EXCAVATION

STA. 108+00.86
END SITE 1

STA. 109+58 CONSTRUCT
APPROACH ON RT. = 5 CU. YDS. COMP. EMBANKMENT

CONCRETE CURB (TYPE B)

STA.	STA.	SIDE	LIN. FT.
108+00.86	109+00.86	LT.	100

WIRE FENCE (TYPE C)

STA.	STA.	SIDE	LIN. FT.
102+98	105+88	RT.	295
103+69	105+88	LT.	236
105+75	106+31	RT.	144
105+86	106+32	RT.	157
106+32	108+50	LT.	241

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

HWY. 59 - SITE 1

TUDOR CREEK AT STA. 105+89 TO 106+36
IS CLASSIFIED AS AN INTERMITTENT STREAM.
THE TOP OF CHANNEL ELEVATION IS 683.0 FT.
MSL. REFER TO SECTION 110.05(c) TEMPORARY
FILL OF THE 2014 STANDARD SPECIFICATIONS.

STA. 107+45.43 BEGIN SUPERELEVATION
STA. 109+00.86 MATCH EXISTING SUPERELEVATION (0.052'/')

P.V.I. 101+90.63
ELEV. 695.92

P.V.C. 102+60.86
ELEV. 692.40

-5.00%

K=80.00
VC=640'
e=6.40'

Q50 DESIGN
HIGH WATER
679.40

P.V.I. 105+80.86
ELEV. 676.40

STA. 106+10.00
F.I. INLET LT. = 671.86
F.I. OUTLET RT. = 670.19

P.V.T. 109+00.86
ELEV. 686.00

3.00%

P.V.I. 109+10.00
ELEV. 686.28

720
710
700
690
680
670
660
650
640

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

10/16/2014

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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.		040623	39	115

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
6-24-16

C.L. DETOUR
STA. 306+38 CONSTRUCT
QUINT. 48"x 121' TEMP. PIPE CULVERT
WITH A 12° RT. FWD. SKEW
Q2=460 CFS D.A. 169 SQ.MI.

C.L. DETOUR
P.I. = 305+77.55
Δ = 42° 36' 54" LT.
D = 13° 15' 00"
T = 168.66'
L = 321.62'
P.C. = 304+08.89
P.T. = 307+30.51
e = 0.100'/'
Ls = 250'

RESTRAINING CONDITIONS

STA. 301+91.88
BEGIN DETOUR

C.L. DETOUR
P.I. = 302+94.52
Δ = 26° 42' 23" RT.
D = 13° 15' 00"
T = 102.64
L = 201.56'
P.C. = 301+91.88
P.T. = 303+93.43
NO SUPER

STA. 302+88 INSTALL
30" x 54' TEMP. PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT TEMP. APPROACH = 45

STA. 309+70 INSTALL
18" x 38' TEMP. PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT TEMP. APPROACH = 20

STA. 311+41.32
END DETOUR

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

HWY. 59 - SITE 1 DETOUR

TUDOR CREEK AT STA. 105+89 TO 106+36
IS CLASSIFIED AS AN INTERMITTENT STREAM.
THE TOP OF CHANNEL ELEVATION IS 683.0 FT.
MSL. REFER TO SECTION 110.05(c) TEMPORARY
FILL OF THE 2014 STANDARD SPECIFICATIONS.

STA. 304+01.16 BEGIN SUPERELEVATION
STA. 305+68.66 MAX SUPERELEVATION 0.067'/'
STA. 311+41.32 MATCH EXISTING SUPERELEVATION (0.067'/')

P.V.I. 301+91.88
ELEV. 695.70

P.V.C. 303+12.48
ELEV. 689.73

-4.96%

K=50.75
VC=320'
e=2.52'

P.V.I. 304+72.48
ELEV. 681.80

P.V.T. 306+32.48
ELEV. 683.96

1.35%

P.V.I. 311+10.96
ELEV. 690.42

STA. 306+25.00
F.L. INLET LT.=670.19

STA. 306+50.00
F.L. OUTLET RT.=665.80

720 710 700 690 680 670 660 650 640

300+00 301+00 302+00 303+00 304+00 305+00 306+00 307+00 308+00 309+00 310+00 311+00 312+00 313+00 314+00 315+00

10/16/2014

R040623.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.		040623	40	115

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
6-24-16

STA. 204+03 IN PLACE
18" x 31' R.C. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" x 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 45 CU. YDS.

STA. 205+00 CONSTRUCT (PEACEFUL HOME RD.)
APPROACH ON LT. = 5 CU. YDS.

STA. 205+36 IN PLACE
18" x 49' R.C. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 18" x 58' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 50 CU. YDS. COMP. EMBANKMENT,
5 CU. YDS. UNCLASSIFIED EXCAVATION

STA. 206+17 IN PLACE
18" x 36' R.C. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 18" x 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 50 CU. YDS. COMP. EMBANKMENT,
5 CU. YDS. UNCLASSIFIED EXCAVATION

STA. 207+36 IN PLACE
18" x 38' R.C. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 18" x 56' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 70 CU. YDS.

P.I. = 206+26.50
Δ = 27° 37' 42" LT.
D = 5° 00' 00"
T = 281.76'
L = 552.57'
P.C. = 203+44.74
P.T. = 208+97.30
e = 0.072'/'
Ls = 225'

STA. 212+38 CONSTRUCT
APPROACH ON LT. = 15 CU. YDS.

STA. 212+14 CONSTRUCT
APPROACH ON LT. = 45 CU. YDS.

STA. 201+44 IN PLACE
18" x 40' R.C. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" x 42' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH =
30 CU. YDS. COMP. EMBANKMENT,
5 CU. YDS. UNCLASSIFIED EXCAVATION

STA. 202+10.00
BEGIN SITE 2
LOG MILE 10.63

WIRE FENCE (TYPE C)

STA.	STA.	SIDE	LIN. FT.
207+64	207+90	RT.	57
207+88	208+00	LT.	75
208+24	208+57	RT.	55
208+26	210+38	LT.	233
212+05	212+26	LT.	80

STA. 201+97 CONSTRUCT
APPROACH ON RT. = 40 CU. YDS.

STA. 205+30 CONSTRUCT
APPROACH ON RT. = 185 CU. YDS.

STA. 205+45 CONSTRUCT (ON NATURAL DAM ROAD)
APPROACH ON RT. = 20 CU. YDS.

STA. 206+07 CONSTRUCT
APPROACH ON RT. = 110 CU. YDS.

STA. 207+02 CONSTRUCT
APPROACH ON RT. = 155 CU. YDS.

STA. 208+10 - CONSTRUCT
TRIPLE 12' x 10' x 8' R.C. BOX CULVERT
WITH 30° WINGS LT. & RT.
Q50 = 1510 CFS, D.A. = 1.54 SQ. MI.
ROADWAY SPAN = 39.67 LIN. FT.

STA. 207+97.99 - 208+33.58 IN PLACE
26' CLEAR ROADWAY X 42' LENGTH
BRIDGE NO. 01829 CONSISTING OF A
CONCRETE DECK WITH ASPHALT OVERLAY
AND SINGLE SPAN STEEL STRINGERS/GIRDERS. CONCRETE ABUTMENTS
REMOVE AS EXISTING BRIDGE STRUCTURE SITE NO. 2 = 1.00 LUMP SUM

STA. 211+03 CONSTRUCT
APPROACH ON RT. = 145 CU. YDS.

STA. 212+13.64 HWY. 59 =
STA. 500+00 GRANDVIEW ACRES LN.
Δ = 85° 00' 00"

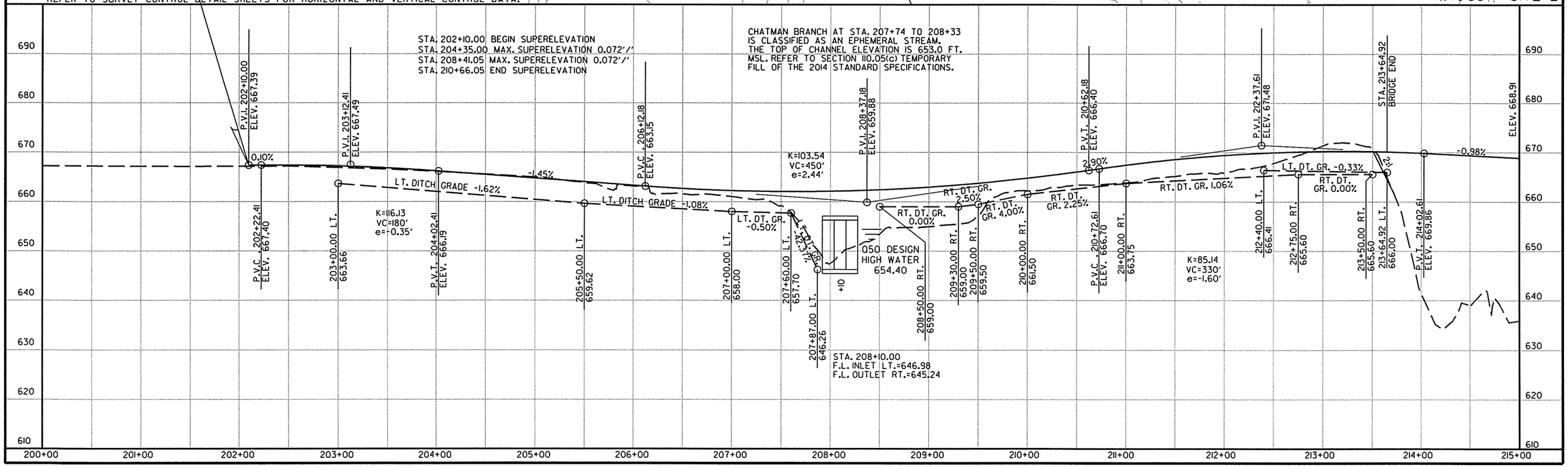
SPECIAL FLOOD HAZARD AREA

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

HWY. 59 - SITE 2

STA. 202+10.00 BEGIN SUPERELEVATION
STA. 204+35.00 MAX. SUPERELEVATION 0.072'/'
STA. 208+41.05 MAX. SUPERELEVATION 0.072'/'
STA. 210+66.05 END SUPERELEVATION

CHATMAN BRANCH AT STA. 207+74 TO 208+33
IS CLASSIFIED AS AN EPHEMERAL STREAM.
THE TOP OF CHANNEL ELEVATION IS 653.0 FT.
MSL. REFER TO SECTION 110.05(c) TEMPORARY
FILL OF THE 2014 STANDARD SPECIFICATIONS.



10/6/2014

R040623.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.		040623	41	115

(2) PLAN AND PROFILE SHEETS

STA. 213+48.57 - 219+32.93 IN PLACE
22' CLEAR ROADWAY X 586' LENGTH
BRIDGE NO. 01811 CONSISTING OF A
CONCRETE DECK WITH ASPHALT OVERLAY
AND 2 MAIN SPANS STEEL TRUSS-THRU
AND SIX APPROACH SPANS STEEL STRINGERS/GIRDERS, CONCRETE ABUTMENTS
REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 3) = 1.00 LUMP SUM

P.I. = 224+59.25
Δ = 11° 41' 23" LT.
D = 5° 00' 00"
T = 117.31'
L = 233.79'
P.C. = 223+41.95
P.T. = 225+75.74
e = 0.072'/'
Ls = 225'

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
6-29-16

215 220 225

LEE CREEK

EXIST. ROW

100' TRANSITION +44.49 +44.49

S 21°09'34" E

S 32°50'58" E

11.5' 13.5' 13.5' 8' 24' 8' 3' 20' 3'

C.L. CONST.-SITE 2

P.C. 223+41.95

P.T. 225+75.74

CONST. LIMITS

END BRIDGE STA. 219+67.08

11.5' 15.5' 15.5' 8' 8' 24' 8'

+31.00 39.86

+80.00 66.25

+07.00 65.00

+08.00 54.00

CONST. LIMITS

PROP. ROW

EXIST. ROW

P.I. 224+59.25

STA. 213+64.92 - BRIDGE END
BRIDGE NO. 07373
360'-0" CONT. COMPOSITE PLATE GIRDER UNIT (110'-140'-110')
240'-0" CONT. COMPOSITE W-BEAM UNIT (80'-80'-80')
40'-0" CLEAR ROADWAY
602'-2" BRIDGE LENGTH
STA. 219+67.08 - BRIDGE END

GUARDRAIL

STA.	STA.	SIDE	GUARDRAIL (TYPE A) LIN. FT.	GUARDRAIL TERMINAL (TYPE I) EACH	GUARDRAIL TERMINAL (TYPE 2) EACH	THRIE BEAM GUARDRAIL TERMINAL EACH
211+33.77	213+52.52	RT.	150			
212+58.77	213+52.52	LT.	75			
219+78.48	220+72.23	RT.	75			
219+78.48	221+97.23	LT.	150			

WIRE FENCE (TYPE C)

STA.	STA.	SIDE	LIN. FT.
223+80	228+12	RT.	433

STA. 227+44.49
END SITE 2 &
JOB 040623

PASTURE

SPECIAL FLOOD HAZARD AREA
STA. 215+00 TO STA. 230+00

HWY. 59 - SITE 2

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

STA. 221+73.20 BEGIN SUPERELEVATION
STA. 223+98.20 MAX. SUPERELEVATION 0.072'/'
STA. 225+19.49 MAX. SUPERELEVATION 0.072'/'
STA. 227+44.49 END SUPERELEVATION

LEE CREEK AT STA. 213+87 TO 219+85
IS CLASSIFIED AS A 5 C.F.S. STREAM.
THE TOP OF CHANNEL ELEVATION IS 647.0 FT.
MSL. REFER TO SECTION 110.05(c) TEMPORARY
FILL OF THE 2014 STANDARD SPECIFICATIONS.

700 690 680 670 660 650 640 630 620 610

ELEV. 668.91

-0.98%

STA. 219+67.08 BRIDGE END

P.V.I. 220+93.24 ELEV. 663.09

P.V.C. 222+04.96 ELEV. 660.75

K=108.11 VC=200' e=0.46'

P.V.T. 224+04.96 ELEV. 658.40

P.V.I. 228+00.01 ELEV. 657.41

-0.25%

050 DESIGN HIGH WATER 654.70

2:1

219+67.00 RT. 658.74

P.V.C. 219+93.24 ELEV. 664.07

RT. DT. GR. -0.66%

K=178.60 VC=200' e=-0.28'

221+15.88 RT. 657.67

RT. DT. GR. -0.24%

P.V.I. 221+93.24 ELEV. 660.99

222+50.00 RT. 657.44

RT. DT. GR. 0.04%

RT. DITCH GRADE 0.51%

LT. DITCH GRADE 0.13%

P.V.I. 223+04.96 ELEV. 658.65

224+05.00 RT. 650.49

225+00.00 RT. 650.53

227+44.49 RT. 651.78

219+80.00 LT. 644.00

222+00.00 LT. 644.28

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

10/6/2014

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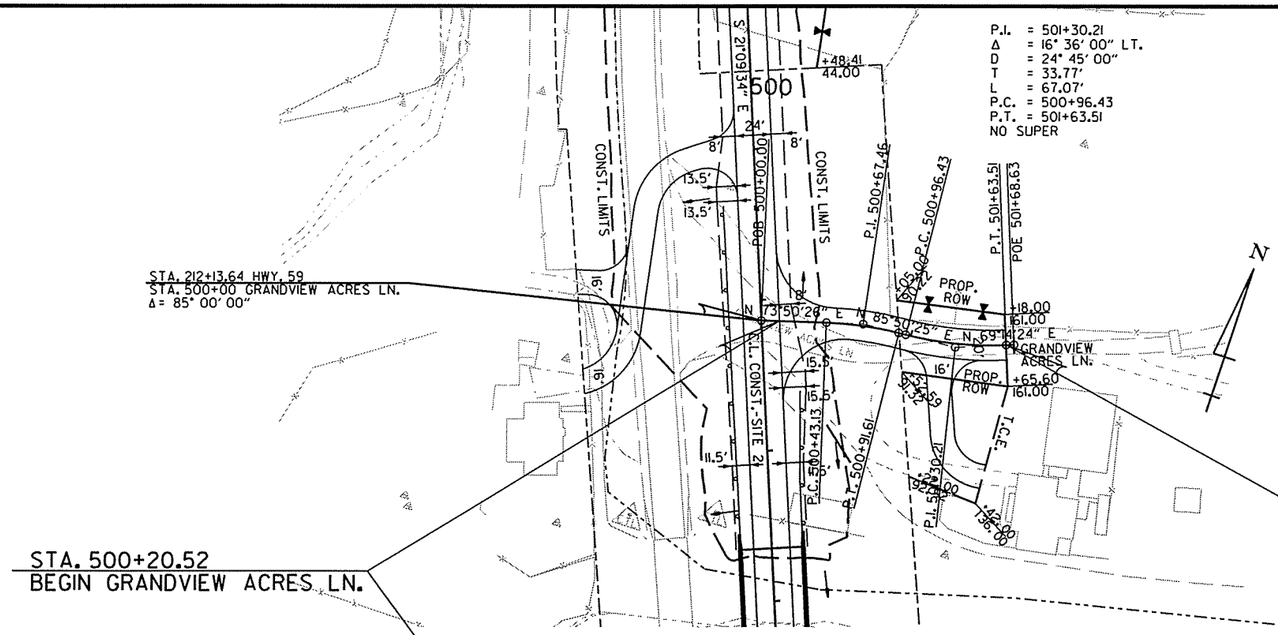
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	42	115

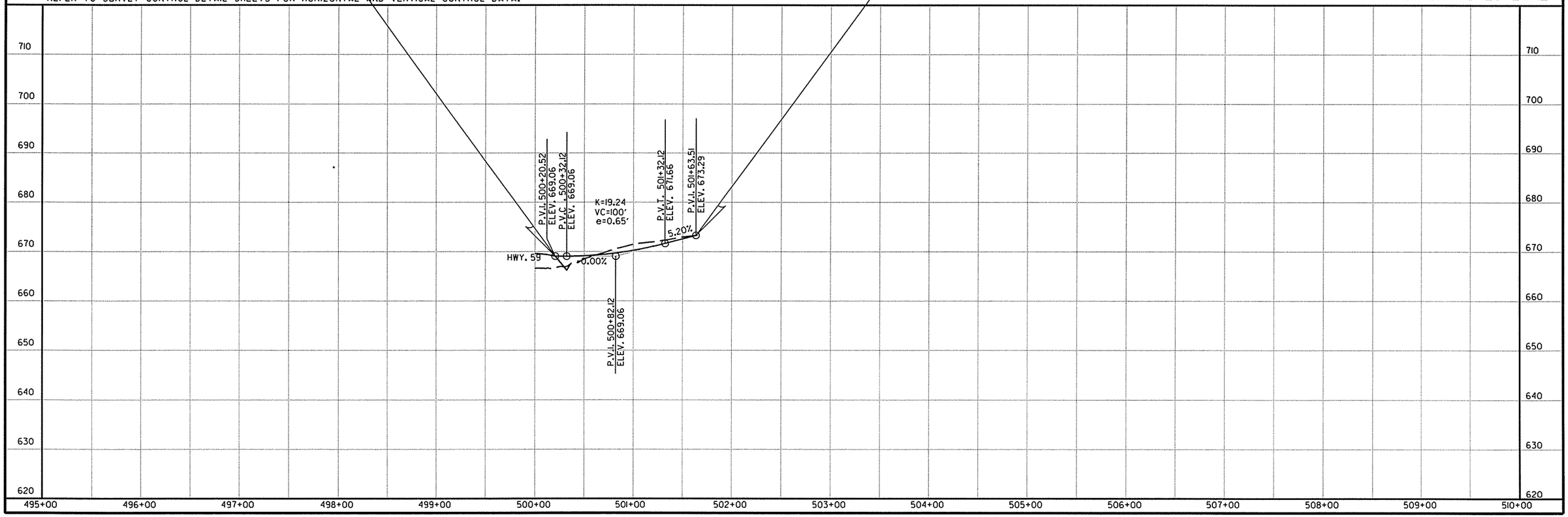
(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
6-29-16



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

GRANDVIEW ACRES LANE



10/6/2014

R040623.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.		040623	43	115

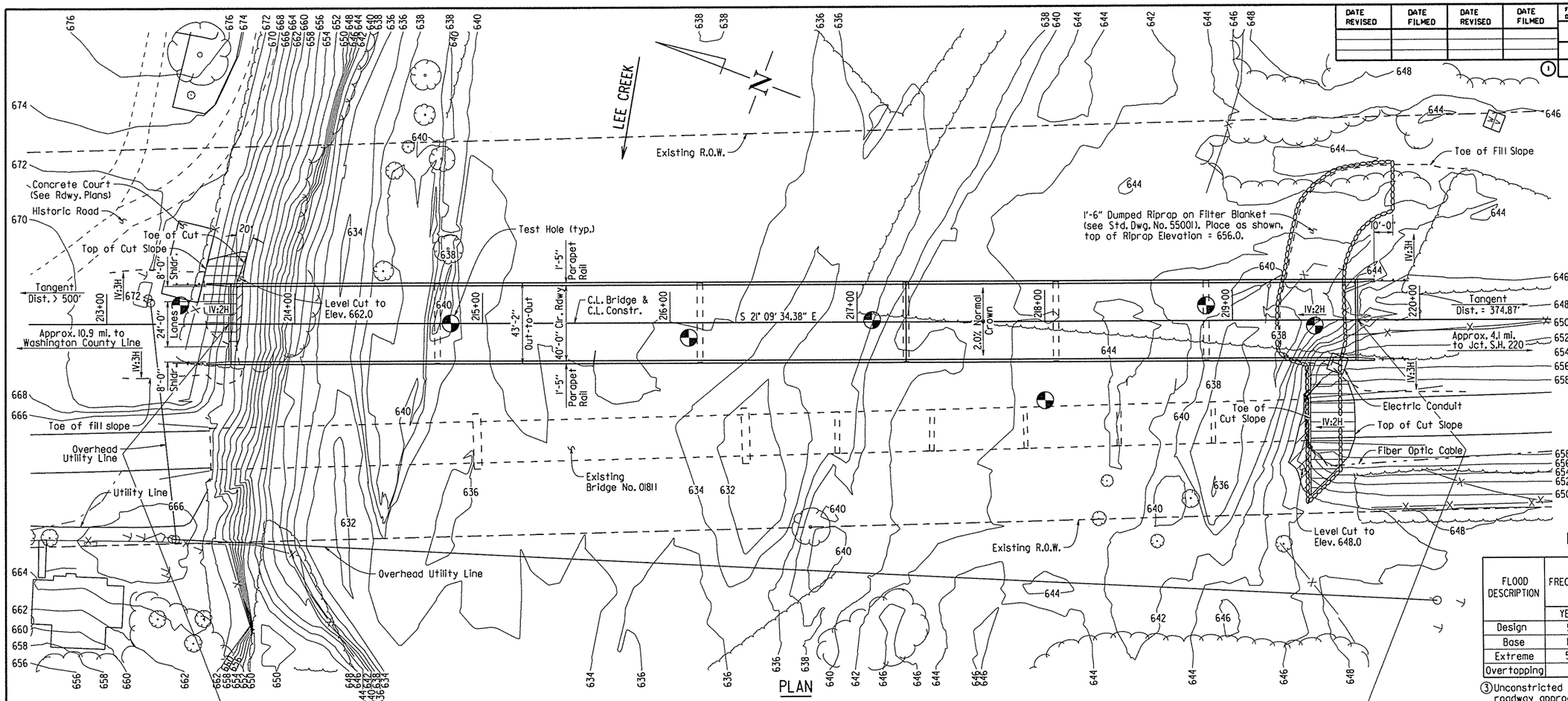
07373 - LAYOUT - 57964

Notes:

For R/W Data, see Roadway Plans.

Type A Approach Gutters ("W" = 8'-0") shall be placed at both ends of the bridge. See Std. Dwg. No. 55030A.

The Contractor shall remove a portion of the approach embankment at Bent 1 and of the existing embankment at Bent 7 as shown using 1V:2H cut slopes. Approximately 35 cubic yards of excavation of the approach embankment at Bent 1 and approximately 280 cubic yards of excavation of the existing embankment at Bent 7.



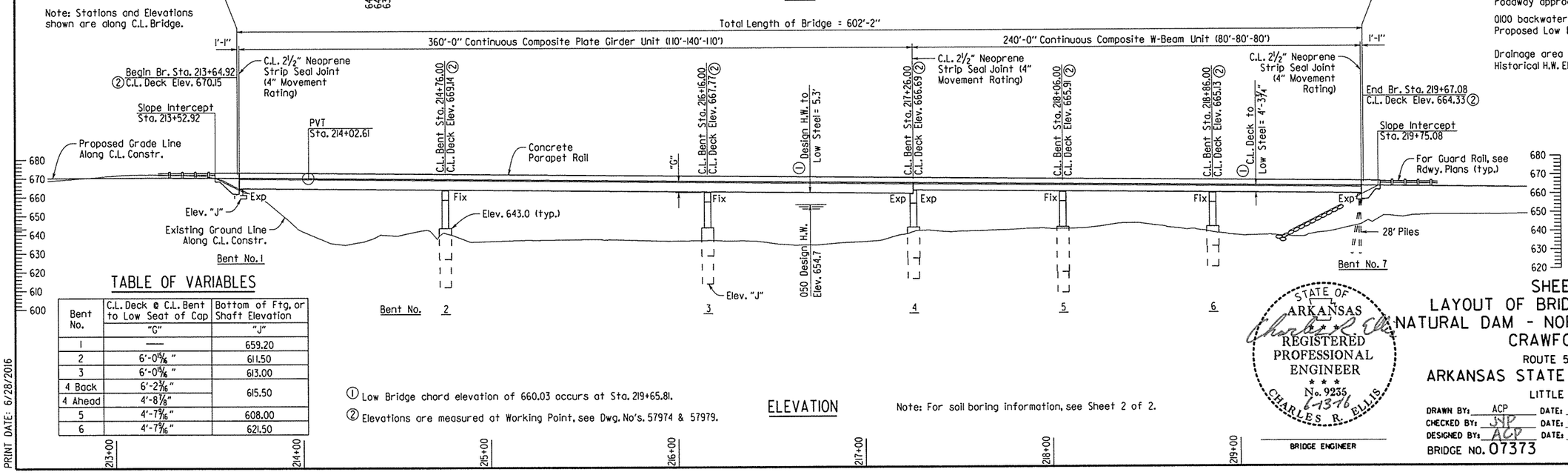


TABLE OF VARIABLES

Bent No.	C.L. Deck @ C.L. Bent to Low Seat of Cap "G"	Bottom of Ftg. or Shaft Elevation "J"
1	——	659.20
2	6'-0 15/16"	611.50
3	6'-0 15/16"	613.00
4 Back	6'-2 3/16"	615.50
4 Ahead	4'-8 1/8"	
5	4'-7 9/16"	608.00
6	4'-7 9/16"	621.50

① Low Bridge chord elevation of 660.03 occurs at Sta. 219+65.81.

② Elevations are measured at Working Point, see Dwg. No's. 57974 & 57979.

Note: For soil boring information, see Sheet 2 of 2.

HYDRAULIC DATA

FLOOD DESCRIPTION	FREQUENCY	DISCHARGE	③ NATURAL WATER SURFACE ELEVATION	WATER SURFACE ELEV. WITH BACKWATER
	YEARS	CFS	FEET	FEET
Design	50	66,200	654.1	654.7
Base	100	80,400	655.4	657.3
Extreme	500	120,000	658.2	661.2
Overtopping	90	79,100	655.3	657.1

③ Unconstricted water surface without structure or roadway approaches.

Q100 backwater elevation for existing structure = 657.1
Proposed Low Bridge Chord Elev. = 660.03

Drainage area = 169 square miles
Historical H.W. Elev. = 660.1

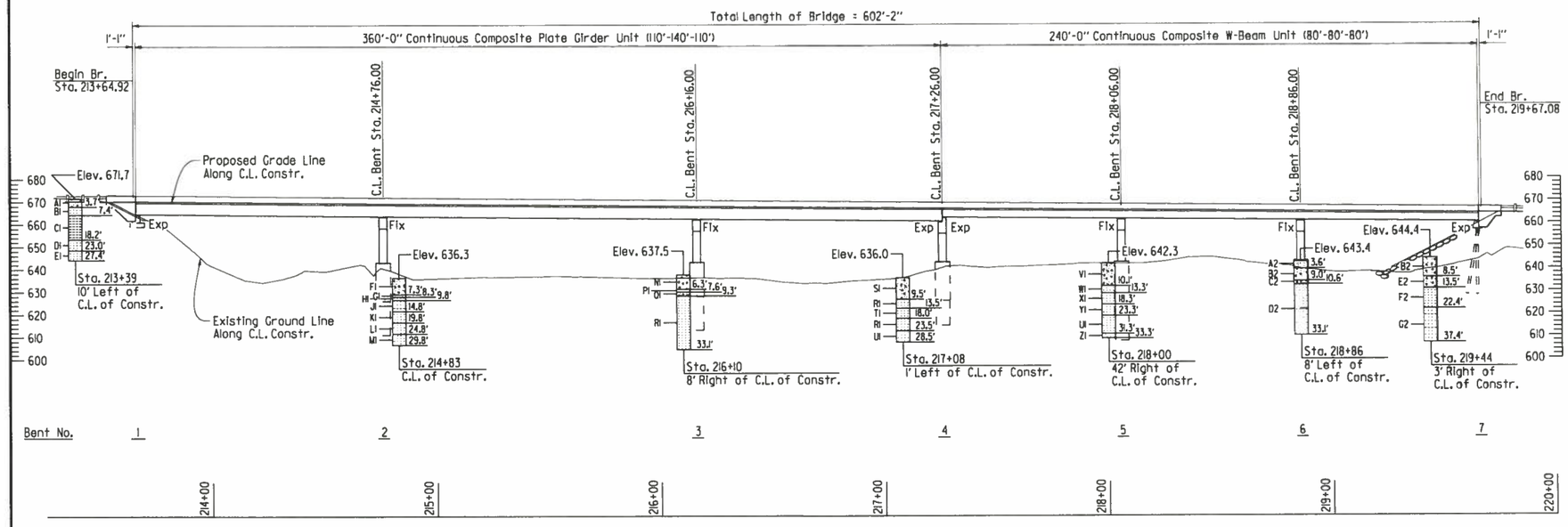
VERTICAL CURVE DATA
Along C.L. Constr.
L = 330'
+2.896% -0.980%
PVI Sta. 212+37.61
Elev. 671.48

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 1 OF 2
LAYOUT OF BRIDGE OVER LEE CREEK
NATURAL DAM - NORTH STRS. & APPRS. (S)
CRAWFORD COUNTY
ROUTE 59 SEC. 5
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: ACP DATE: 07-29-14
CHECKED BY: JNP DATE: 6-7-16
DESIGNED BY: ACP DATE: 7-14
FILENAME: b040623_11.dgn
SCALE: 1" = 30'
BRIDGE NO. 07373
DRAWING NO. 57964

PRINT DATE: 6/28/2016



BORING ELEVATION

BORING LEGEND

A1-Moist, Very Dense, Brown Sand with Gravel(Sandstone Fragments)
B1-SANDSTONE - Brown and Dark Gray, Thin Bedded, Slightly Weathered, Well-Cemented, with Slight Dip amd Fractured Layers
C1-SHALE WITH FREQUENT WEATHERED AND HIGHLY WEATHERED SHALE LAYERS - Dark Gray and Brown, Laminated, Medium Hard, with Slight Dip
D1-SANDSTONE WITH OCCASIONAL MEDIUM HARD DARK GRAY AND BROWN WEATHERED SHALE LAYERS - Gray, Medium Bedded, Slightly Weathered, Cemented
E1-SANDSTONE WITH DARK GRAY SHALE PARTINGS - Brown and Dark Gray, Thick Bedded, Slightly Weathered, Well-Cemented, with Slight Dip
F1-Wet, Medium Dense, Brown Sand with Gravel(Sandstone Fragments)
G1-Wet, Very Dense, Brown Sand with Gravel (Sandstone Fragments) and some Cobbles
H1-SHALE - Dark Gray, Laminated, Slightly Weathered, Medium Hard, with Slight Dip
J1-SANDSTONE WITH DARK GRAY SHALE SEAMS AND PARTINGS - Gray, Medium Bedded, Slightly Weathered, Cemented, with Slight Dip
K1-SANDSTONE - Gray, Medium Bedded, Slightly Weathered, Cemented, with Slight Dip
L1-SANDSTONE WITH DARK GRAY SHALE PARTINGS - Gray, Thin Bedded, Slightly Weathered, Cemented, with Slight Dip and Fractured Layers
M1-SANDSTONE WITH DARK GRAY SHALE PARTINGS AND OCCASIONAL LAYERS - Gray, Medium Bedded, Slightly Weathered, Cemented, with Slight Dip
N1-Sandstone Gravel
P1-SHALE - Gray and Brown, Weathered, Soft
Q1-Sandstone Gravel and Cobbles
R1-SANDSTONE WITH DARK GRAY SHALE PARTINGS - Gray, Medium Bedded, Slightly Weathered, Cemented, with Slight Dip
S1-Wet, Very Dense, Brown Sand with Gravel (Sandstone Fragments)
T1-SANDSTONE WITH OCCASIONAL POORLY-CEMENTED LAYERS - Gray, Medium Bedded, Slightly Weathered, Cemented, with Slight Dip
U1-SANDSTONE WITH DARK GRAY SHALE PARTINGS - Gray, Thick Bedded, Slightly Weathered, Cemented, with Slight Dip
V1-Moist to Wet, Medium Dense to Very Dense, Brown Sand with Gravel(Sandstone Fragments)
W1-SANDSTONE WITH OCCASIONAL POORLY-CEMENTED LAYERS - Gray, Medium Bedded, Slightly Weathered, Cemented, with Slight Dip
X1-SANDSTONE WITH POORLY-CEMENTED LAYERS AND OCCASIONAL DARK GRAY SHALE SEAMS - Gray, Thick Bedded, Slightly Weathered, Cemented, with Slight Dip
Y1-SANDSTONE WITH OCCASIONAL POORLY-CEMENTED LAYERS AND SHALE PARTINGS - Gray, Thin Bedded, Slightly Weathered, Cemented, with Slight Dip
Z1-SANDSTONE WITH DARK GRAY SHALE SEAMS - Light Gray, Medium Bedded, Slightly Weathered, Cemented, with Slight Dip
A2-Moist, Medium Dense, Brown Sand with some Clay
B2-Moist, Medium Dense, Brown Sand with Gravel(Sandstone Fragments)
C2-Gravel(Sandstone Fragments) with some Sandy Clay
D2-SANDSTONE WITH DARK GRAY SHALE PARTINGS - Gray, Medium to Thick Bedded , Slightly Weathered, Cemented, with Slight Dip
E2-Wet, Dense, Brown Sand with Gravel(Sandstone Fragments)
F2-SANDSTONE WITH DARK GRAY SHALE PARTINGS - Gray, Medium Bedded, Slightly Weathered, Well-Cemented to Cemented, with Slight Dip
G2-SANDSTONE WITH DARK GRAY SHALE SEAMS - Gray, Medium Bedded, Slightly Weathered, Cemented, with Slight Dip

"N" VALUES

Sta. 213+39 - 10' Left of C.L. of Constr.
3.7 - 3.8, N=60(11")

Sta. 214+83 - C.L. of Construction
4.5 - 5.5, N=20
7.8 - 8.0, N=60(2")

Sta. 216+10 - 8' Right of C.L. of Constr.
5.1 - 6.1, N=11
9.3 - 9.3, N=60(.01")

Sta. 217+08 - 1' Left of C.L. of Constr.
4.5 - 4.7, N=60(2")
9.5 - 9.5, N=30(.01")

Sta. 218+00 - 42' Right of C.L. of Constr.
5.3 - 6.3, N=16
9.8 - 9.9, N=60(1")

Sta. 218+86 - 8' Left of C.L. of Constr.
4.5 - 5.5, N=24
9.0 - 9.3, N=60(4")

Sta. 219+44 - 3' Right of C.L. of Constr.
4.0 - 5.0, N=23
9.0 - 10.0, N=35
13.5 - 3.6, N=60(1")

⚠ Revised Note.
7-26-16 JYP

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
7-26-16				6	ARK.			
				JOB NO.		040623	44	115
				①		07373 - LAYOUT - 57965		

GENERAL NOTES

BENCH MARK: Vertical Control Data is shown in the Survey Control Data 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 in the plans, Section and Subsection refer to the Standard Construction Specifications.

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications, 6th Edition with 2013 interim revisions.

LIVE LOADING: HL-93
SEISMIC PERFORMANCE ZONE: 1

MATERIALS AND STRENGTHS:

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

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

STEEL PILING: All Piling shall be HP 12x53 (Grade 50) and shall be driven with an approved air, steam, or diesel hammer into material designated as Sandstone with Dark Gray Shale Partings on the boring legend and to a minimum safe bearing capacity of 95 tons per pile. Piling in Bent 7 shall be driven to a minimum penetration of 8' below natural ground 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 Section 805. The Contractor shall use approved steel H-Pile driving points on all piles.

FOOTING: The footing at Bent 1 shall be set a minimum of 2'-0" into material designated as Sandstone or Shale on the boring legend. The top of footing elevation shall also be at or below finished ground. The footing foundation shall be prepared in accordance with Subsection 801.04, Rock excavations shall be made to neat lines of the concrete footing. Care shall be exercised to avoid shattering of rock faces by excessive blasting. Concrete in the footing shall be poured directly against surfaces of rock. The excavation shall be backfilled and compacted to the level of the existing ground in accordance with Subsection 801.08.

DRILLED SHAFTS: Drilled shafts in Bents 2 thru 6 shall be constructed in accordance with Special Provision Job No. 040623 "Drilled Shaft Foundations". Drilled shafts shall be socketed into material designated as Sandstone with Dark Gray Shale Seams and/or Partings on the boring legend for the minimum lengths shown on the intermediate bent details. No adjustment to plan tip elevations shall be made without prior approval from the Engineer.

BRIDGE DECK: The concrete bridge deck shall be given a fine finish as specified for final finishing in Subsection 802.19 for Class S Fined 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 NOS.
End Bents	57966-57967, 57971-57972
Intermediate Bents	57968-57970
Elastomeric Bearings	57973
360'-0" Continuous Plate Girder Unit	57974-57978 & 57982-57983
240'-0" Continuous W-Beam Unit	57979-57983
General Notes For Steel Bridge Structures	55006
Type A Approach Gutters	55030A
Steel Piling	55020

EXISTING BRIDGE: Existing Bridge No. 01811 (L.M. 10.85) is 23.4' wide and 586' long. The bridge consists of two 140' thru-truss main spans and simple approach spans with concrete decks on steel beams. All spans are supported by concrete pier walls with columns on footings.

REMOVAL AND SALVAGE: After the new bridge is opened to traffic, Existing Bridge No. 01811, including dumped riprap and grouted riprap gutters, shall be removed in accordance with Section 205 and Job Special Provision "Removal of Historic Truss Spans of Bridge No. 01811". Removal of riprap shall not be paid for directly but shall be considered subsidiary to the item "Removal of Existing Bridge Structure". All material from the existing bridge shall become the property of the Contractor except for the two 140' truss spans which shall be salvaged for re-erection and shall become the property of the Fort Chaffee Redevelopment Authority. Payment for this work shall be included in the item "Removal of Existing Bridge Structure".
⚠ The existing truss spans have a ~~lead and chromate paint coating system~~ modified basic lead silica chromate paint system.

MAINTENANCE OF TRAFFIC: See Roadway Plans for maintenance of traffic.

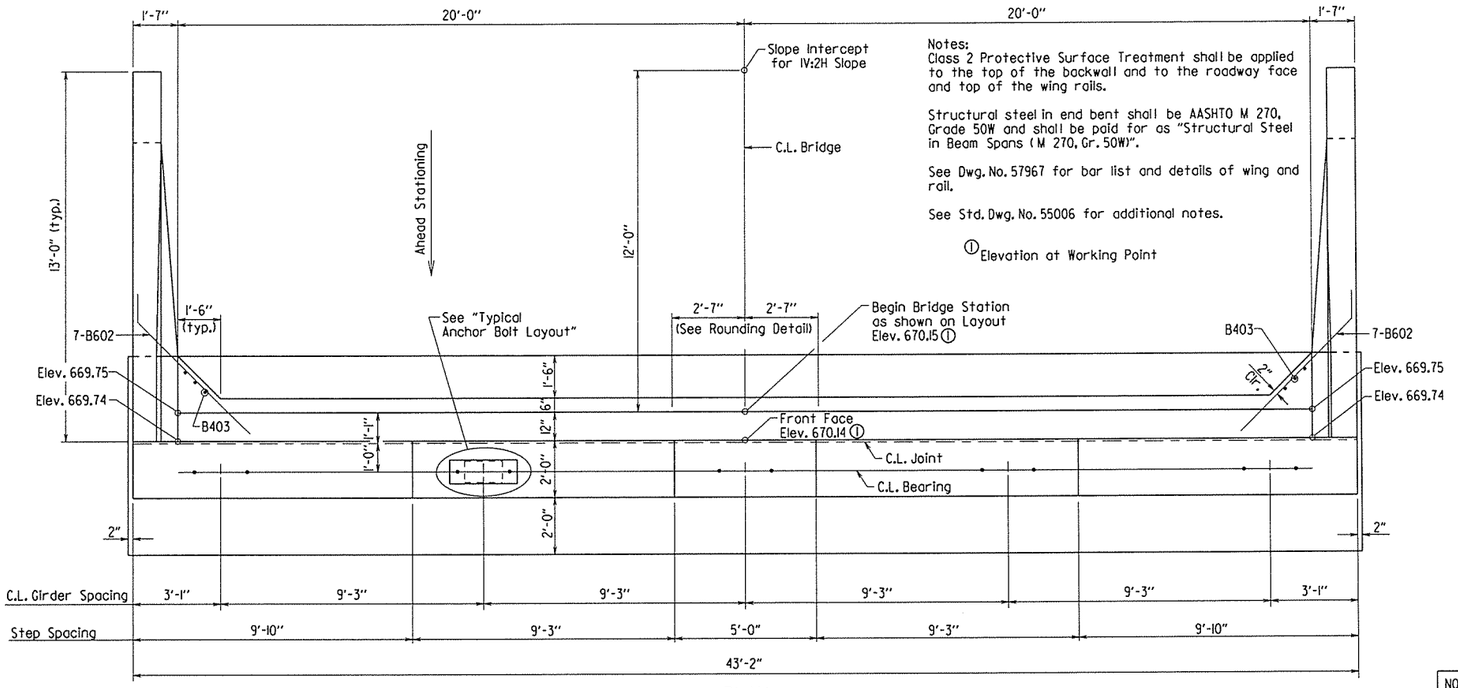
STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
7-26-16
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 2 OF 2
LAYOUT OF BRIDGE OVER LEE CREEK
NATURAL DAM - NORTH STRS. & APPRS. (S)
CRAWFORD COUNTY
ROUTE 59 SEC. 5
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: ACP DATE: 07-29-14 FILENAME: b040623_11.dgn
CHECKED BY: JYP DATE: 6-7-16 SCALE: 1" = 30'
DESIGNED BY: ACP DATE: 07-14
BRIDGE NO. 07373 DRAWING NO. 57965

PRINT DATE: 7/26/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	45	115
				① 07373		END BENT		57966



PLAN

3/8" = 1'-0"

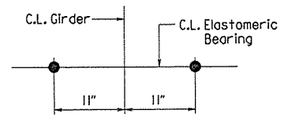
Notes:
Class 2 Protective Surface Treatment shall be applied to the top of the backwall and to the roadway face and top of the wing rails.

Structural steel in end bent shall be AASHTO M 270, Grade 50W and shall be paid for as "Structural Steel in Beam Spans (M 270, Gr. 50W)".

See Dwg. No. 57967 for bar list and details of wing and rail.

See Std. Dwg. No. 55006 for additional notes.

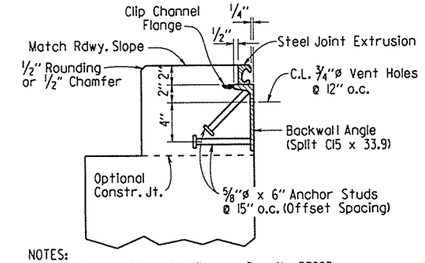
① Elevation at Working Point



For Details of Elastomeric Bearings, see Dwg. No. 57973.

TYPICAL ANCHOR BOLT LAYOUT

No Scale

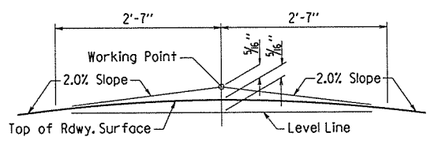


NOTES:
For additional joint details, see Dwg. No. 57983.

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

DETAIL Z

No Scale

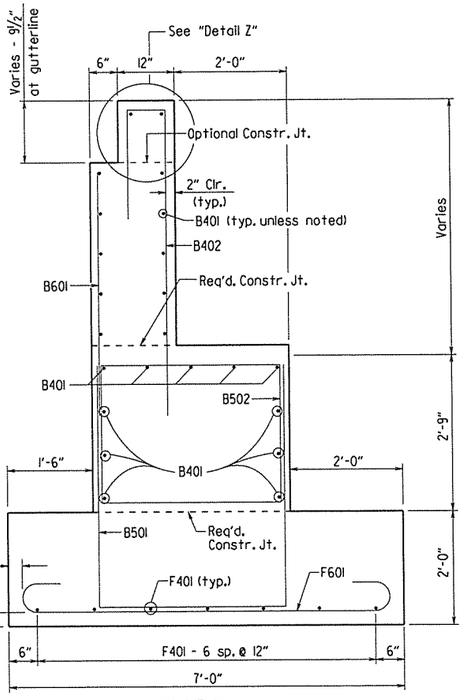


NOTE: Working Point matches Theoretical Roadway Grade.

ROUNDING DETAIL

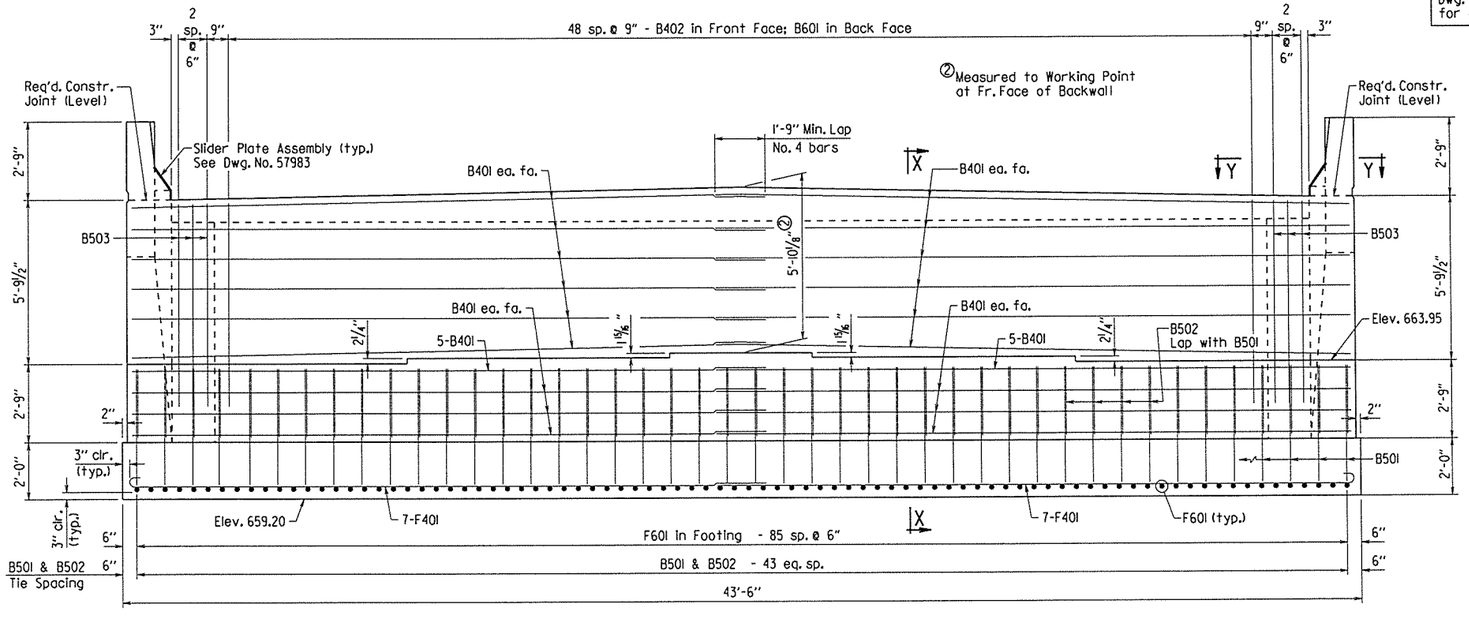
No Scale

NOTE: The Backwall above the required construction joint shall not be poured until the girders are in place. Backwall may be placed prior to placing the adjacent concrete deck only if the optional backwall construction joint is used. See Dwg. No. 57983, "Expansion Device Installation at End Bents" for additional information.



SECTION X-X

3/4" = 1'-0"

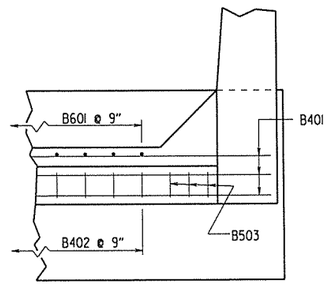


ELEVATION

Looking Back

3/8" = 1'-0"

② Measured to Working Point at Fr. Face of Backwall



VIEW Y-Y

1/2" = 1'-0"

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
6-13-16
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 1 OF 2

DETAILS OF END BENT 1

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 7/15/15 FILENAME: b040623_b1.dgn

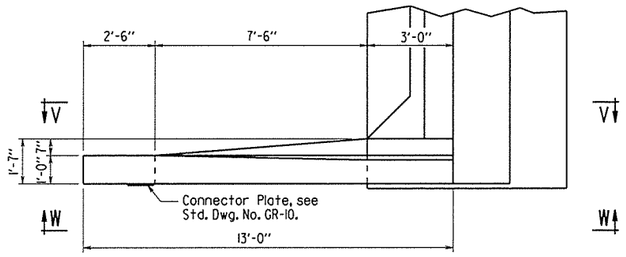
CHECKED BY: ACP DATE: 6-6-2016 SCALE: As Noted

DESIGNED BY: JYP DATE: 6-15

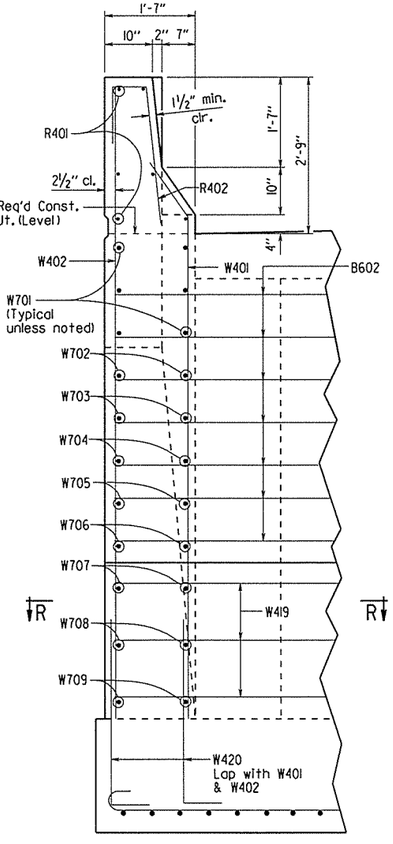
BRIDGE NO. 07373 DRAWING NO. 57966

PRINT DATE: 6/6/2016

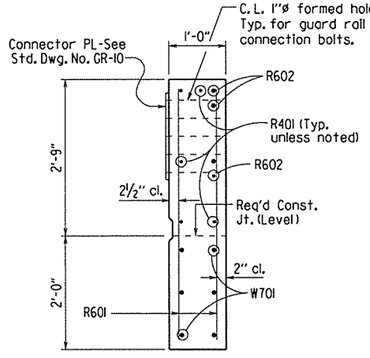
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	96	115
				(1) 07373		END BENT		57967



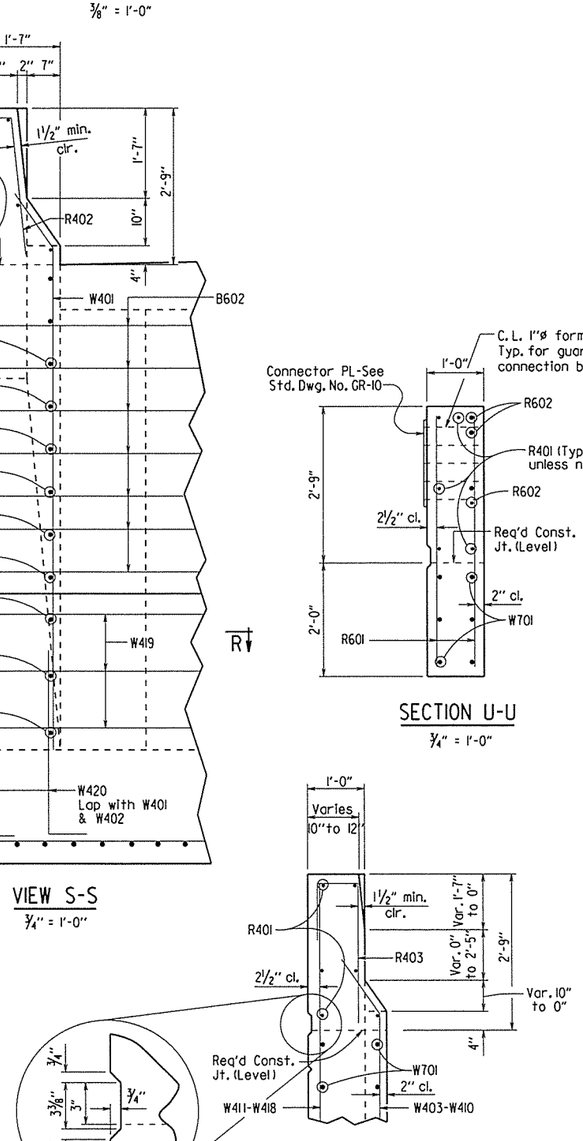
PLAN OF WING
3/8" = 1'-0"



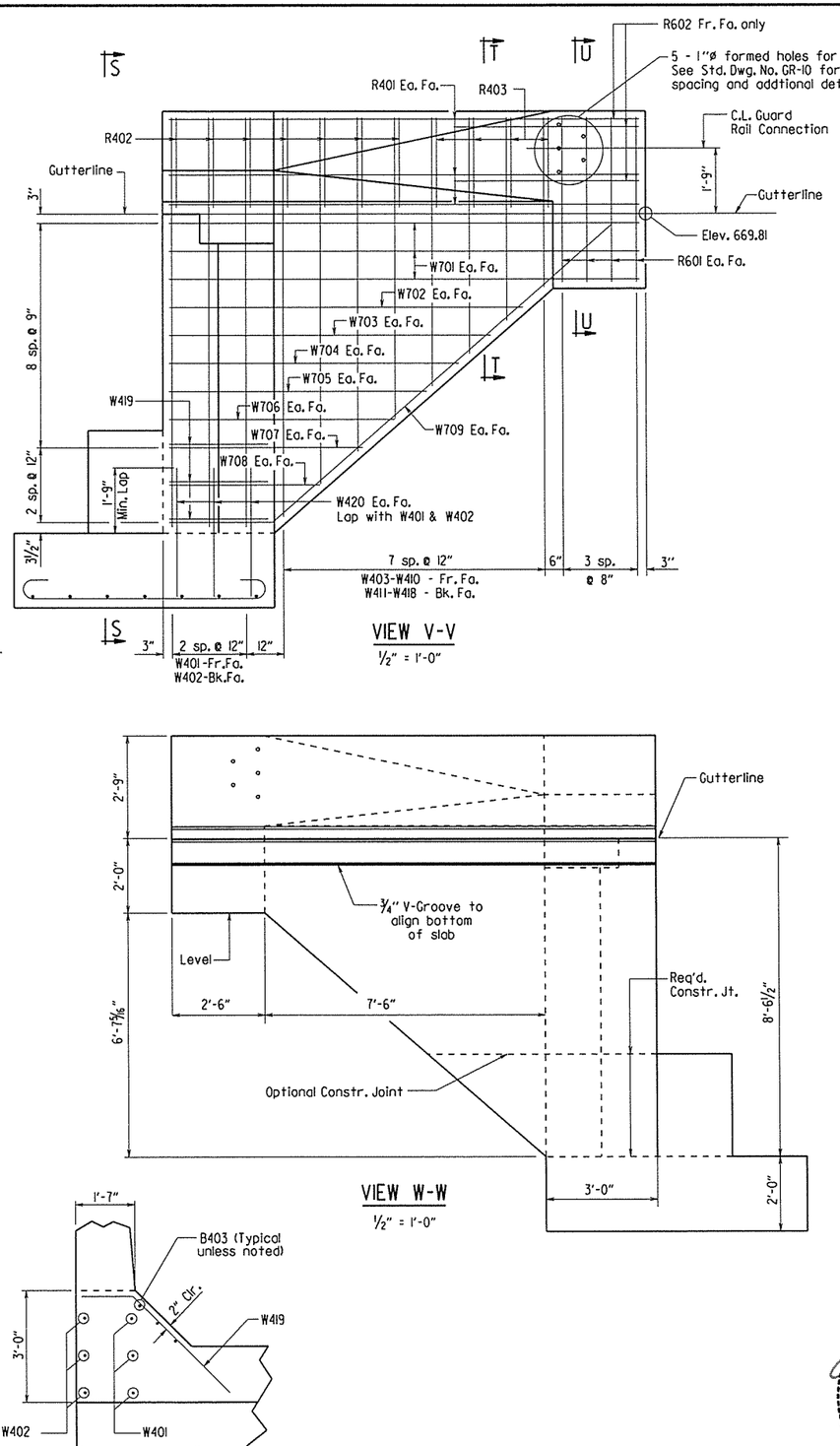
VIEW S-S
3/4" = 1'-0"



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

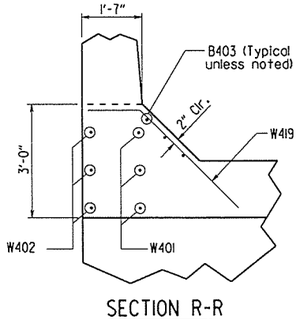


SECTION T-T
3/4" = 1'-0"



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

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

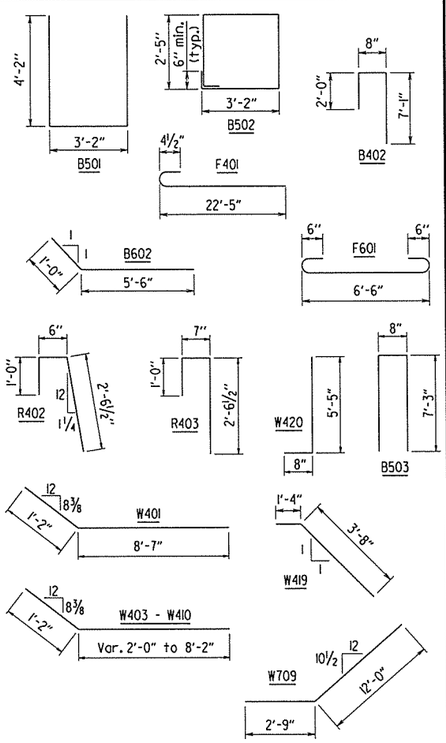


SECTION R-R
1/2" = 1'-0"

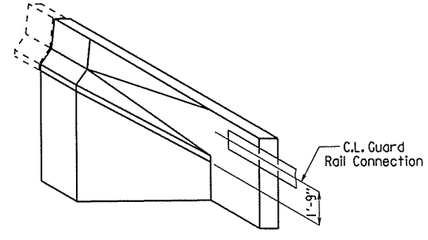
BAR LIST

MARK	NO. REQ'D.	LENGTH	P.D.
B401	46	22'-4"	Str.
B402	49	9'-7"	2"
B403	6	7'-4"	Str.
B501	44	11'-4"	2½"
B502	44	11'-8"	2½"
B503	6	15'-0"	2½"
B601	49	6'-4"	Str.
B602	14	6'-6"	4½"
F401	14	22'-11"	3"
F601	86	7'-10"	4½"
R401	12	12'-8"	Str.
R402	14	3'-11"	2"
R403	8	4'-0"	2"
R601	16	4'-5"	Str.
R602	6	5'-0"	Str.
W401	6	9'-9"	2"
W402	6	11'-1"	Str.
W403-W410	2 each	Var. 3'-2" to 9'-4"	2"
W411-W418	2 each	Var. 4'-6" to 10'-8"	Str.
W419	6	5'-0"	2"
W420	12	6'-0"	3"
W701	12	12'-8"	Str.
W702	4	9'-6"	Str.
W703	4	8'-7"	Str.
W704	4	7'-9"	Str.
W705	4	6'-11"	Str.
W706	4	6'-1"	Str.
W707	4	5'-2"	Str.
W708	4	4'-1"	Str.
W709	4	14'-9"	5¼"

BENDING DIAGRAMS



Dimensions are out to out of bars.



THREE DIMENSIONAL VIEW OF RAIL
No Scale

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
6-13-16
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 2 OF 2
DETAILS OF END BENT 1

ROUTE SEC.

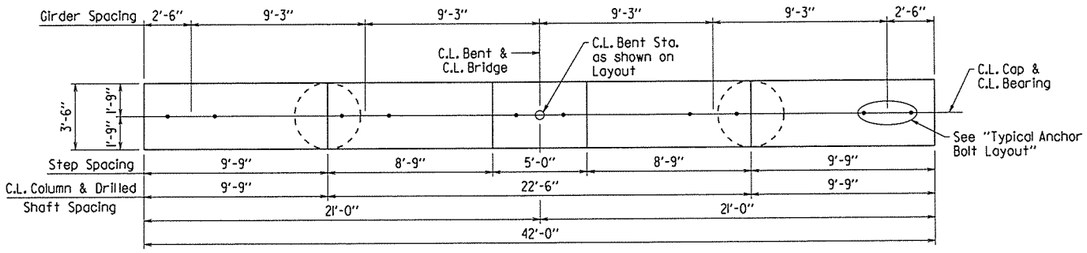
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 7/15/15 FILENAME: b040623_bl.dgn
CHECKED BY: ACP DATE: 6-6-16 SCALE: As Noted
DESIGNED BY: JYP DATE: 6-15

BRIDGE NO. 07373 DRAWING NO. 57967

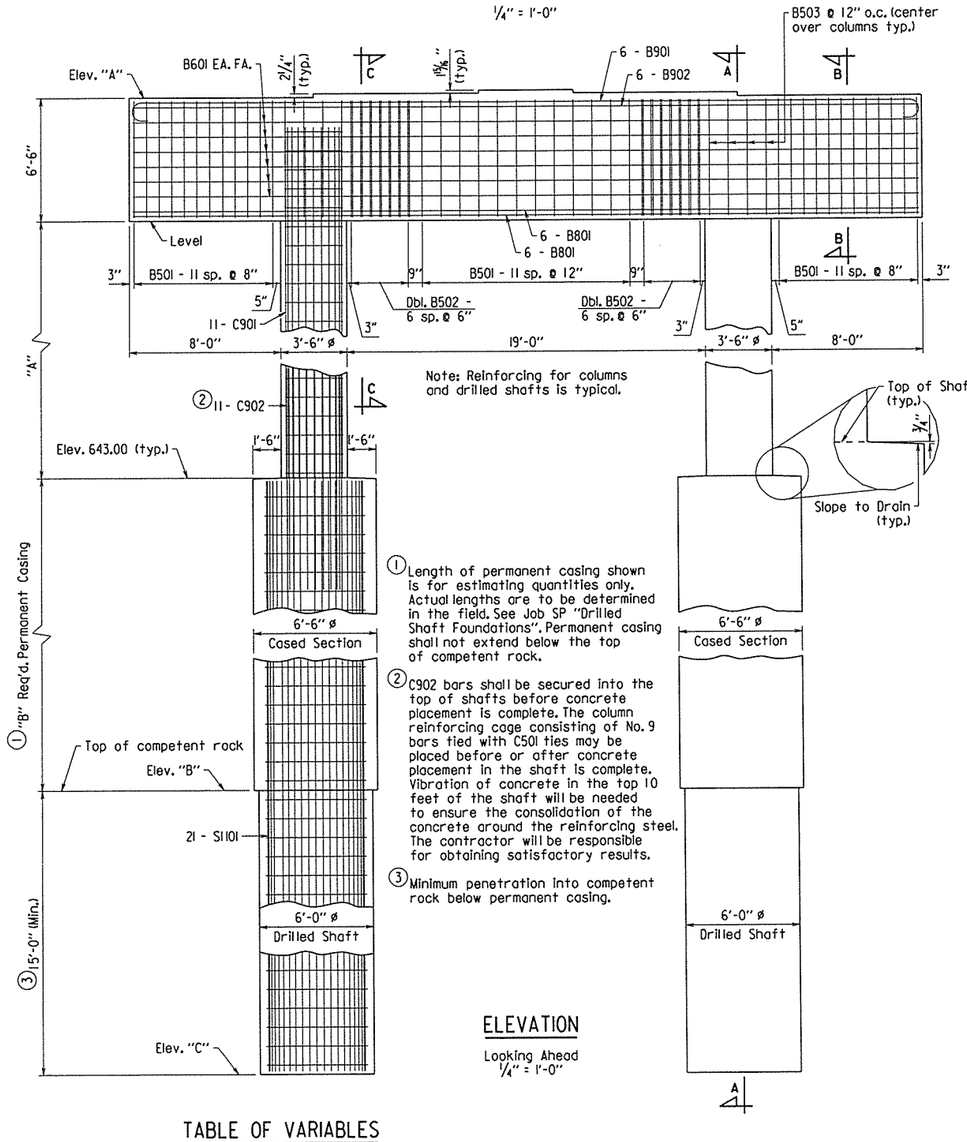
PRINT DATE: 6/28/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	47	115
				①	07373 - INT. BENTS - 57968			



PLAN

1/4" = 1'-0"



1 Length of permanent casing shown is for estimating quantities only. Actual lengths are to be determined in the field. See Job SP "Drilled Shaft Foundations". Permanent casing shall not extend below the top of competent rock.

2 C902 bars shall be secured into the top of shafts before concrete placement is complete. The column reinforcing cage consisting of No. 9 bars tied with C501 ties may be placed before or after concrete placement in the shaft is complete. Vibration of concrete in the top 10 feet of the shaft will be needed to ensure the consolidation of the concrete around the reinforcing steel. The contractor will be responsible for obtaining satisfactory results.

3 Minimum penetration into competent rock below permanent casing.

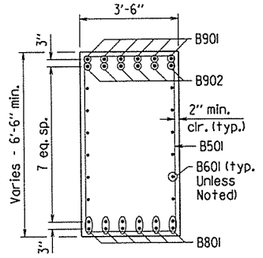
ELEVATION

Looking Ahead
1/4" = 1'-0"

TABLE OF VARIABLES

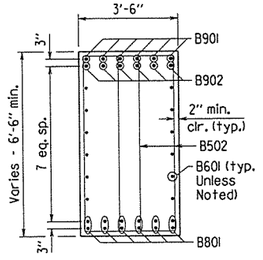
Bent	Elev. "A"	Elev. "B"	Elev. "C"	"A"	"B"	"C"	"D"	"E"	"F"	"G"
2	663.06	626.50	611.50	13'-6¾"	16'-6"	19	50	18'-6"	64	31'-2"
3	661.69	628.00	613.00	12'-2¼"	15'-0"	18	48	17'-2"	60	29'-8"

AHEAD STATIONING



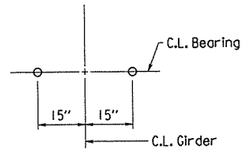
SECTION B-B

3/8" = 1'-0"



SECTION C-C

3/8" = 1'-0"



For Details of Elastomeric Bearings, See Dwg. No. 57973.

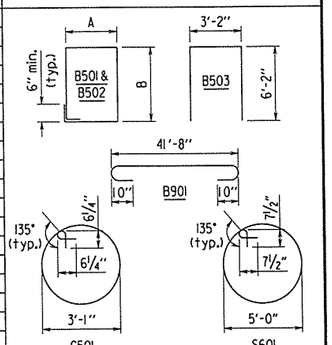
TYPICAL ANCHOR BOLT LAYOUT

No Scale

BAR LIST PER BENT

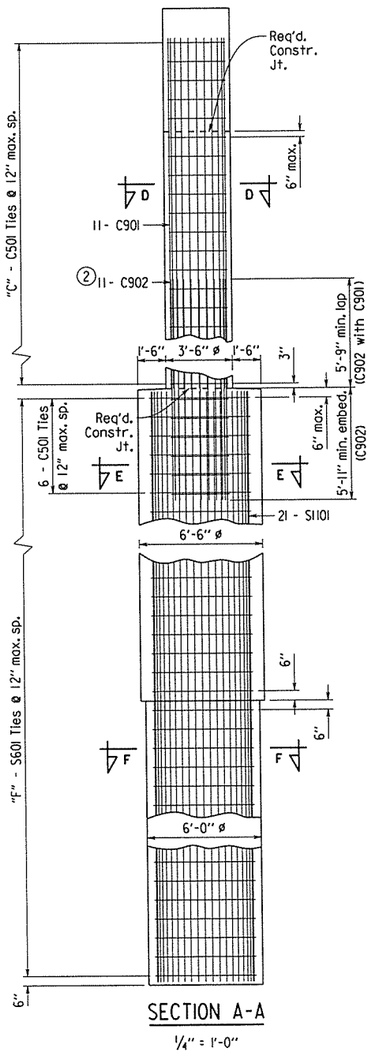
Mark	No. Req'd.	Length	A	B	Pin Dia.
B501	36	19'-2"	3'-2"	6'-2"	2½"
B502	28	16'-10"	2'-0"	6'-2"	2½"
B503	8	15'-4"			2½"
B601	12	41'-8"			Str.
B801	12	41'-8"			Str.
B901	6	44'-2"			9"
B902	6	41'-8"			Str.
C501	"D"	11'-2"			3¾"
C901	22	"E"			Str.
C902	22	11'-8"			Str.
4 S601	"F"	17'-4"			4½"
4 S1101	42	"G"			Str.

Bending Diagrams



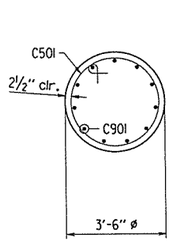
(Dimensions are out to out of bars.)

4 No direct payment for bars in drilled shafts, see Job SP "Drilled Shaft Foundations".



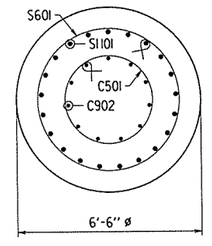
SECTION A-A

1/4" = 1'-0"



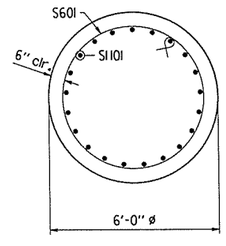
SECTION D-D

3/8" = 1'-0"



SECTION E-E

3/8" = 1'-0"



SECTION F-F

3/8" = 1'-0"

Notes:
Concrete in the cap and columns shall be Class "S" with a minimum 28 day compressive strength f'c = 3,500 psi., and shall be poured in the dry. Concrete in the drilled shafts shall be Class "S" as modified by Job SP "Drilled Shaft Foundations". All exposed corners shall be chamfered ¾" unless otherwise noted.

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

Concrete and Reinforcing Steel placed in the the Drilled Shaft will not be paid for directly but shall be considered subsidiary to the unit price bid for "Drilled Shaft (72" Dia.)". No additional payment shall be made for spacers, additional splices, or bracing needed for assembly, shipping, handling, or erecting.

Drilled shafts shall conform to Job SP "Drilled Shaft Foundations" and shall be paid for at the unit price bid for "Drilled Shaft (72" Dia.)".

For additional information, see Layout.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
6-13-16
BRIDGE ENGINEER

DETAILS OF INTERMEDIATE BENTS 2 AND 3

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

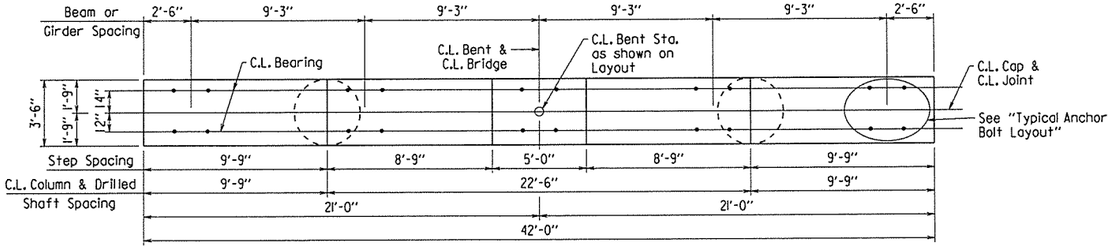
LITTLE ROCK, ARK.

DRAWN BY: EOR DATE: 10-29-15 FILENAME: b040623_b2.dgn
CHECKED BY: ACP DATE: 6-7-16 SCALE: AS NOTED
DESIGNED BY: JHP DATE: 10-15

BRIDGE NO. 07373 DRAWING NO. 57968

PRINT DATE: 6/7/2016

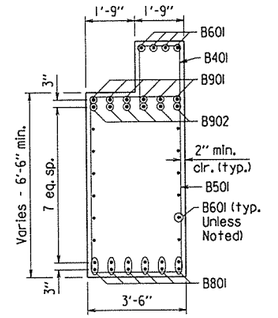
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	45	115
				①		07373 - INT. BENTS - 57969		



PLAN

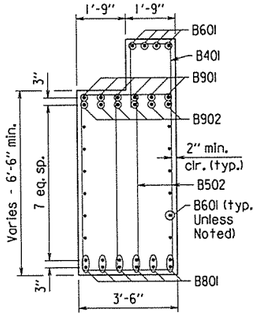
1/4" = 1'-0"

AHEAD STATIONING



SECTION B-B

3/8" = 1'-0"

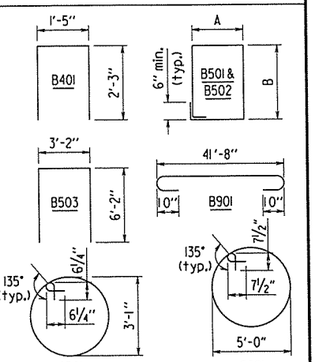


SECTION C-C

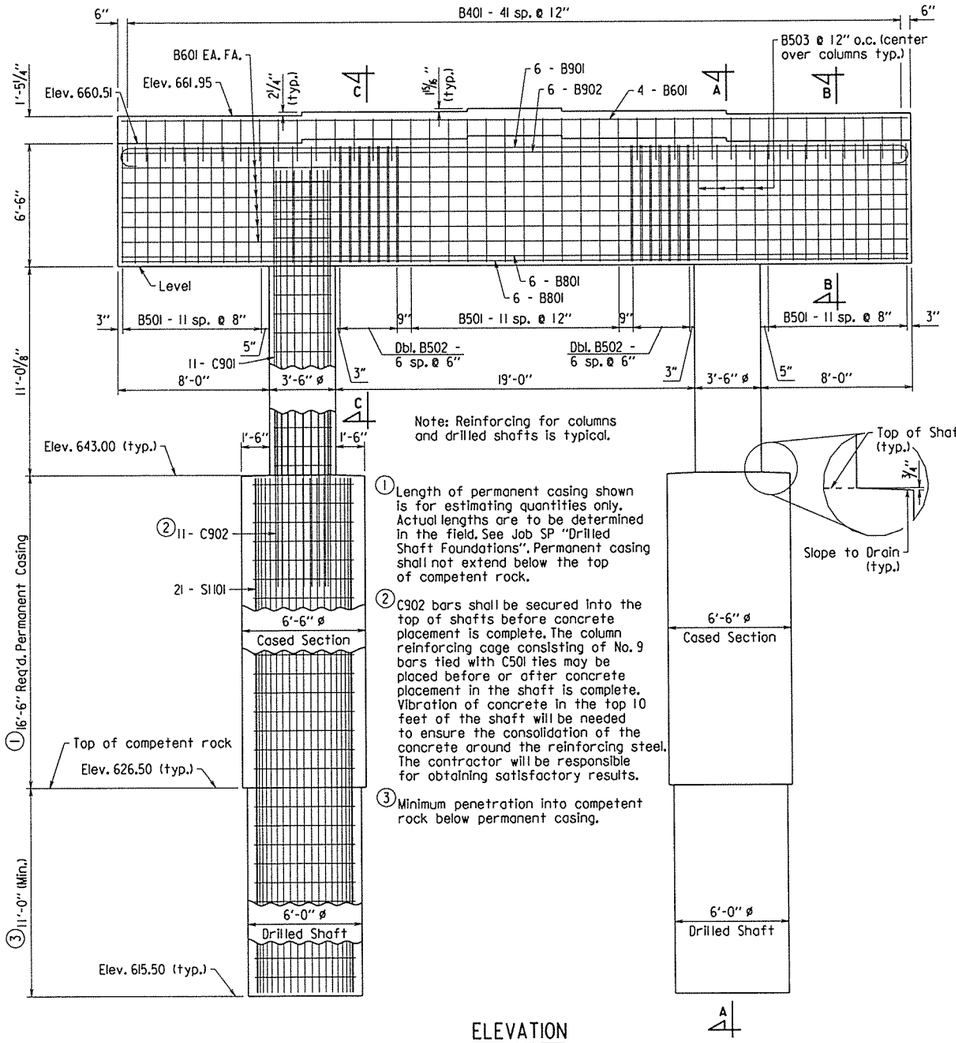
3/8" = 1'-0"

BAR LIST

Mark	No. Req'd.	Length	A	B	Pin Dia.	Bending Diagrams
B401	42	5'-9"			2"	
B501	36	19'-2"	3'-2"	6'-2"	2½"	
B502	28	16'-10"	2'-0"	6'-2"	2½"	
B503	8	15'-4"			2½"	
B601	16	41'-8"			Str.	
B801	12	41'-8"			Str.	
B901	6	44'-2"			9"	
B902	6	41'-8"			Str.	
C501	44	11'-2"			3¾"	
C901	22	16'-0"			Str.	
C902	22	11'-8"			Str.	
④ S601	54	17'-4"			4½"	
④ S1101	42	27'-2"			Str.	



④ No direct payment for bars in drilled shafts, see Job SP "Drilled Shaft Foundations".



① Length of permanent casing shown is for estimating quantities only. Actual lengths are to be determined in the field. See Job SP "Drilled Shaft Foundations". Permanent casing shall not extend below the top of competent rock.

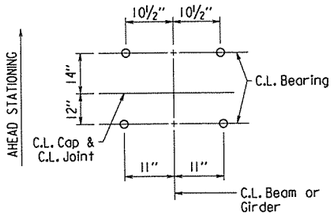
② C902 bars shall be secured into the top of shafts before concrete placement is complete. The column reinforcing cage consisting of No. 9 bars tied with C501 ties may be placed before or after concrete placement in the shaft is complete. Vibration of concrete in the top 10 feet of the shaft will be needed to ensure the consolidation of the concrete around the reinforcing steel. The contractor will be responsible for obtaining satisfactory results.

③ Minimum penetration into competent rock below permanent casing.

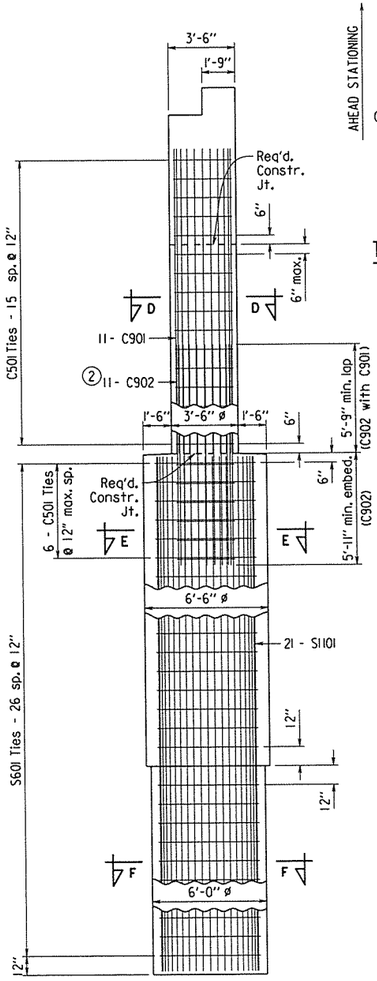
ELEVATION

Looking Ahead
1/4" = 1'-0"

AHEAD STATIONING



For Details of Elastomeric Bearings, See Dwg. No. 57973.

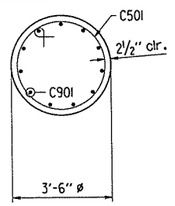


SECTION A-A

1/4" = 1'-0"

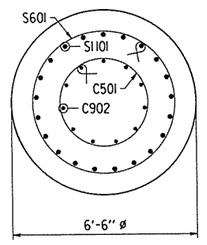
TYPICAL ANCHOR BOLT LAYOUT

No Scale



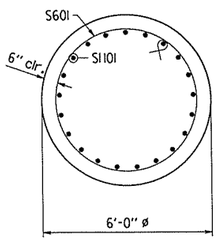
SECTION D-D

3/8" = 1'-0"



SECTION E-E

3/8" = 1'-0"



SECTION F-F

3/8" = 1'-0"

Notes:
Concrete in the cap and columns shall be Class "S" with a minimum 28 day compressive strength f'c = 3,500 psi., and shall be poured in the dry. Concrete in the drilled shafts shall be Class "S" as modified by Job SP "Drilled Shaft Foundations". All exposed corners shall be chamfered ¾" unless otherwise noted.

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

Concrete and Reinforcing Steel placed in the the Drilled Shaft will not be paid for directly but shall be considered subsidiary to the unit price bid for "Drilled Shaft (72" Dia.)". No additional payment shall be made for spacers, additional splices, or bracing needed for assembly, shipping, handling, or erecting.

Drilled shafts shall conform to Job SP "Drilled Shaft Foundations" and shall be paid for at the unit price bid for "Drilled Shaft (72" Dia.)".

For additional information, see Layout.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
6-13-16
CHARLES R. ELLIS
BRIDGE ENGINEER

DETAILS OF INTERMEDIATE BENT 4

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

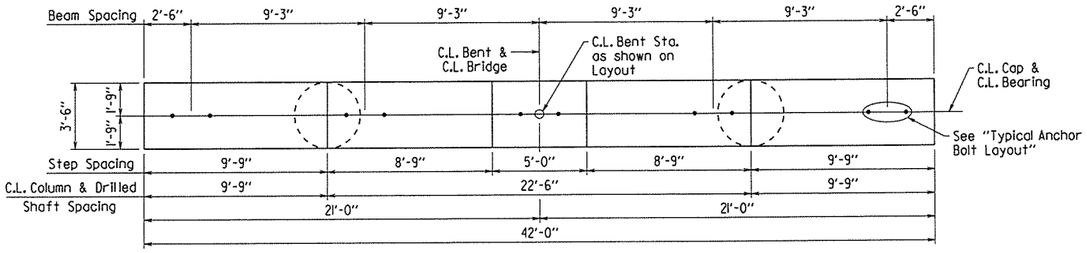
LITTLE ROCK, ARK.

DRAWN BY: EOR DATE: 11-2-15 FILENAME: b040623_b4.dgn
CHECKED BY: AGP DATE: 6-7-16 SCALE: AS NOTED
DESIGNED BY: MP DATE: 10-15

BRIDGE NO. 07373 DRAWING NO. 57969

PRINT DATE: 6/7/2016

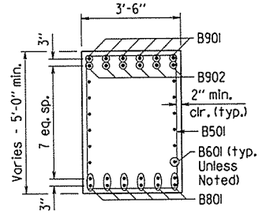
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	49	115
				①	07373 - INT. BENTS - 57970			



PLAN

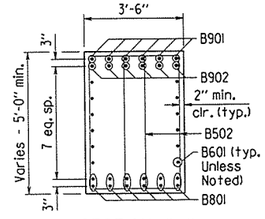
1/4" = 1'-0"

AHEAD STATIONING



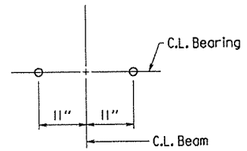
SECTION B-B

3/8" = 1'-0"



SECTION C-C

3/8" = 1'-0"

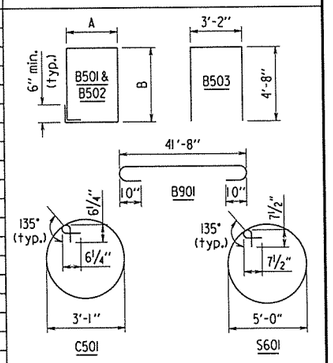


For Details of Elastomeric Bearings, See Dwg. No. 57973.

BAR LIST PER BENT

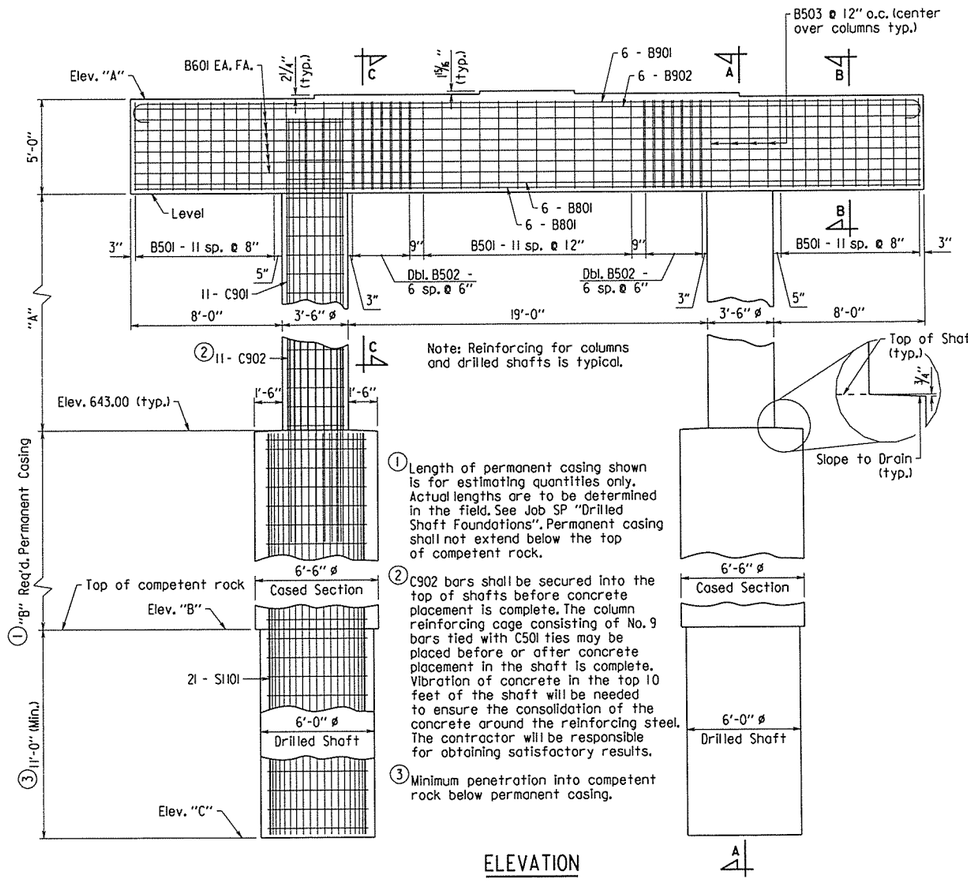
Mark	No. Req'd.	Length	A	B	Pin Dia.
B501	36	16'-2"	3'-2"	4'-8"	2½"
B502	28	13'-10"	2'-0"	4'-8"	2½"
B503	8	12'-4"			2½"
B601	12	41'-8"			Str.
B801	12	41'-8"			Str.
B901	6	44'-2"			9"
B902	6	41'-8"			Str.
C501	"D"	11'-2"			3¾"
C901	22	"E"			Str.
C902	22	11'-8"			Str.
④ S601	"F"	17'-4"			4½"
④ S1101	42	"G"			Str.

Bending Diagrams



(Dimensions are out to out of bars.)

④ No direct payment for bars in drilled shafts, see Job SP "Drilled Shaft Foundations".



① Length of permanent casing shown is for estimating quantities only. Actual lengths are to be determined in the field. See Job SP "Drilled Shaft Foundations". Permanent casing shall not extend below the top of competent rock.

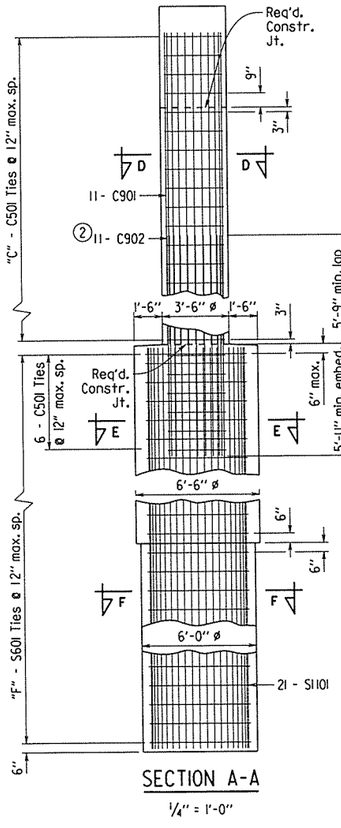
② C902 bars shall be secured into the top of shafts before concrete placement is complete. The column reinforcing cage consisting of No. 9 bars tied with C501 ties may be placed before or after concrete placement in the shaft is complete. Vibration of concrete in the top 10 feet of the shaft will be needed to ensure the consolidation of the concrete around the reinforcing steel. The contractor will be responsible for obtaining satisfactory results.

③ Minimum penetration into competent rock below permanent casing.

ELEVATION

Looking Ahead

1/4" = 1'-0"

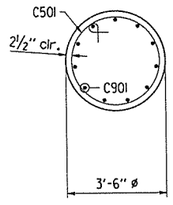


SECTION A-A

1/4" = 1'-0"

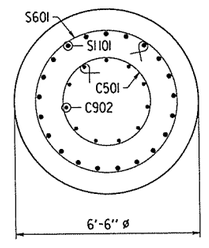
TYPICAL ANCHOR BOLT LAYOUT

No Scale



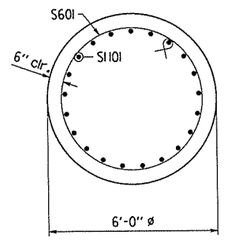
SECTION D-D

3/8" = 1'-0"



SECTION E-E

3/8" = 1'-0"



SECTION F-F

3/8" = 1'-0"

Notes:
Concrete in the cap and columns shall be Class "S" with a minimum 28 day compressive strength f'c = 3,500 psi., and shall be poured in the dry. Concrete in the drilled shafts shall be Class "S" as modified by Job SP "Drilled Shaft Foundations". All exposed corners shall be chamfered ¾" unless otherwise noted.

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

Concrete and Reinforcing Steel placed in the the Drilled Shaft will not be paid for directly but shall be considered subsidiary to the unit price bid for "Drilled Shaft (72" Dia.)". No additional payment shall be made for spacers, additional splices, or bracing needed for assembly, shipping, handling, or erecting.

Drilled shafts shall conform to Job SP "Drilled Shaft Foundations" and shall be paid for at the unit price bid for "Drilled Shaft (72" Dia.)".

For additional information, see Layout.

TABLE OF VARIABLES

Bent	Elev. "A"	Elev. "B"	Elev. "C"	"A"	"B"	"C"	"D"	"E"	"F"	"G"
5	661.28	619.00	608.00	13'-3⅜"	24'-0"	18	48	17'-3"	70	34'-8"
6	660.50	632.50	621.50	12'-6"	10'-6"	17	46	16'-6"	44	21'-2"

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
6-13-16
BRIDGE ENGINEER

DETAILS OF INTERMEDIATE BENTS 5 AND 6

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

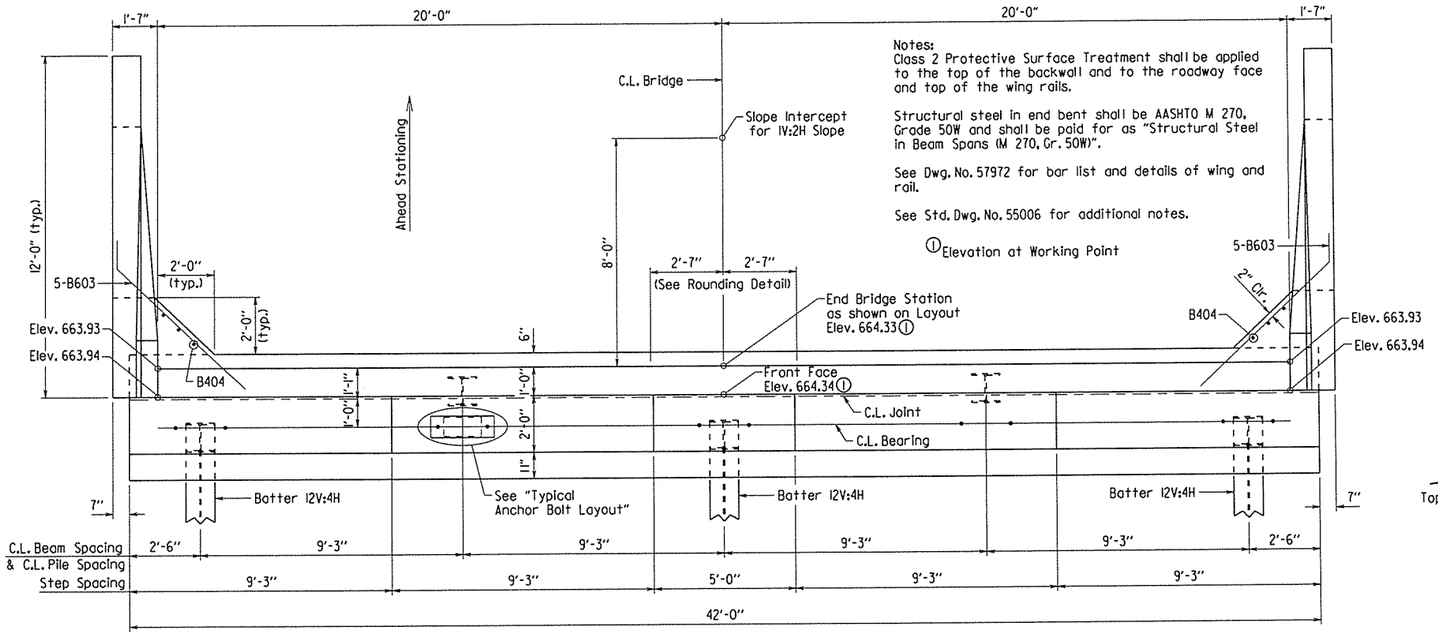
LITTLE ROCK, ARK.

DRAWN BY: EOR DATE: 10-29-15 FILENAME: b040623_b5.dgn
CHECKED BY: ACP DATE: 6-7-16 SCALE: AS NOTED
DESIGNED BY: JHP DATE: 10-15

BRIDGE NO. 07373 DRAWING NO. 57970

PRINT DATE: 6/7/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	90	115
				① 07373		END BENT		57971



Notes:
Class 2 Protective Surface Treatment shall be applied to the top of the backwall and to the roadway face and top of the wing rails.

Structural steel in end bent shall be AASHTO M 270, Grade 50W and shall be paid for as "Structural Steel in Beam Spans (M 270, Gr. 50W)".

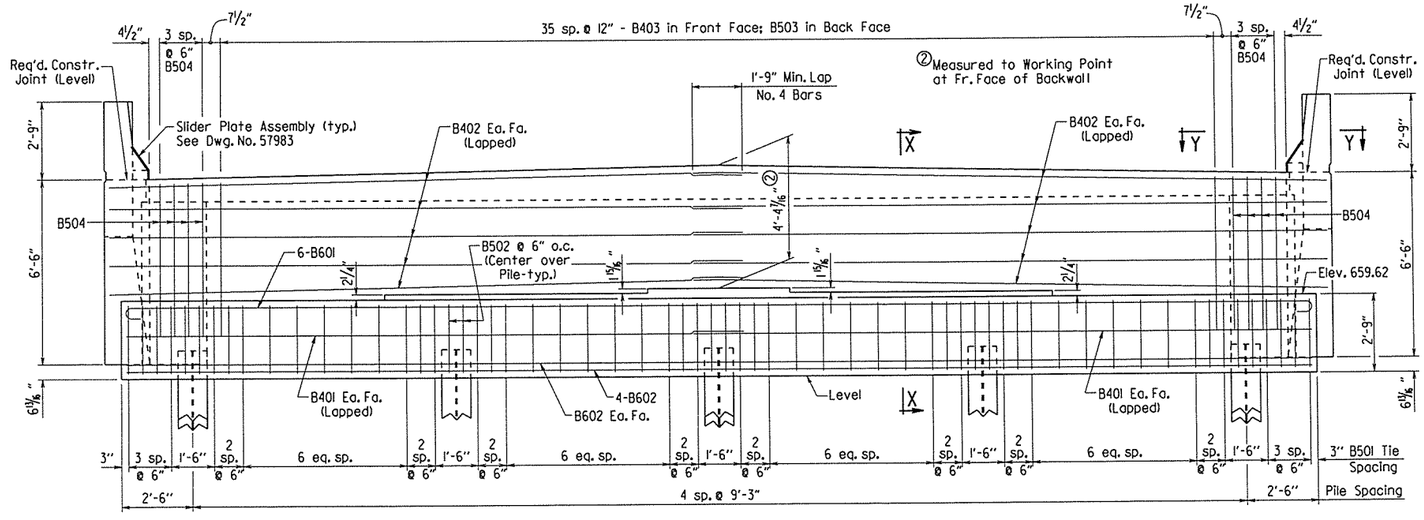
See Dwg. No. 57972 for bar list and details of wing and rail.

See Std. Dwg. No. 55006 for additional notes.

①Elevation at Working Point

PLAN

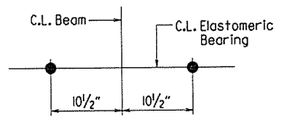
3/8" = 1'-0"



ELEVATION

Looking Ahead

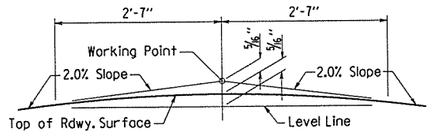
3/8" = 1'-0"



For Details of Elastomeric Bearings, see Dwg. No. 57973.

TYPICAL ANCHOR BOLT LAYOUT

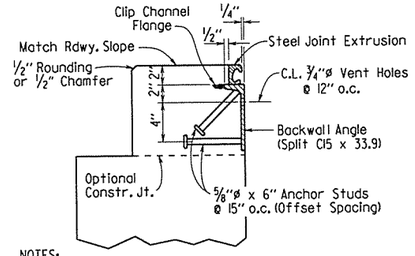
No Scale



NOTE: Working Point matches Theoretical Roadway Grade.

ROUNDING DETAIL

No Scale

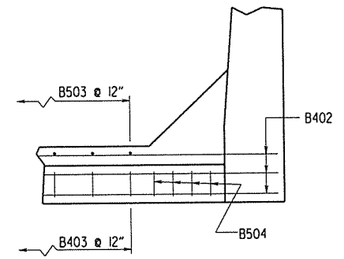


NOTES:
For additional joint details, see Dwg. No. 57983.

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

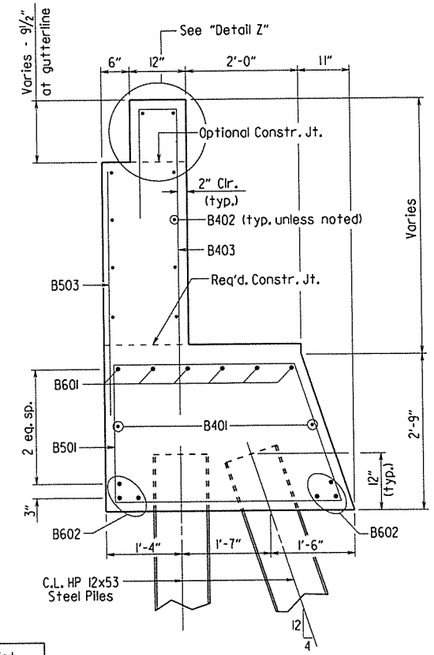
DETAIL Z

No Scale



VIEW Y-Y

½" = 1'-0"



SECTION X-X

¾"= 1'-0"

NOTE: The Backwall above the required construction joint shall not be poured until the beams are in place. Backwall may be placed prior to placing the adjacent concrete deck only if the optional backwall construction joint is used. See Dwg. No. 57983, "Expansion Device Installation at End Bents" for additional information.

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
6-13-16
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 1 OF 2
DETAILS OF END BENT 7

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

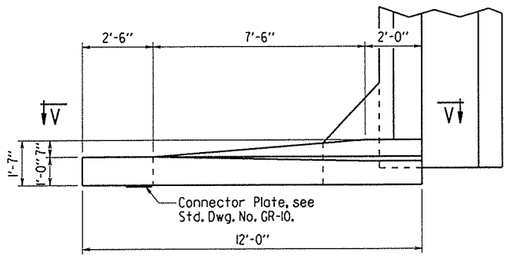
LITTLE ROCK, ARK.

DRAWN BY: AMS. DATE: 7/9/15 FILENAME: b040623_b7.dgn
CHECKED BY: ACP DATE: 6-6-2016 SCALE: As Noted
DESIGNED BY: JWP DATE: 6-15

BRIDGE NO. 07373 DRAWING NO. 57971

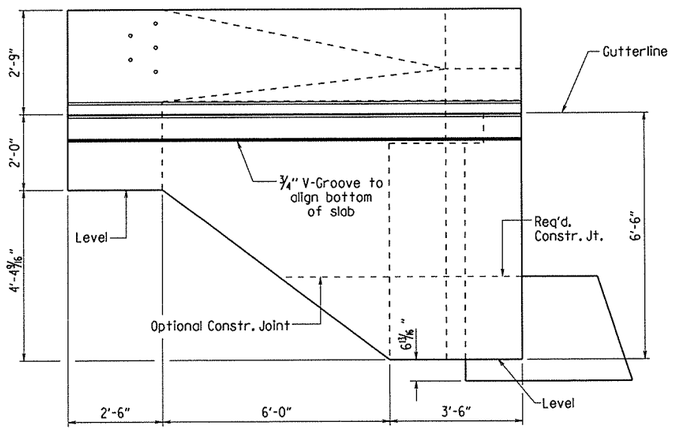
PRINT DATE: 6/6/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	51	115
				1 07373		END BENT		57972



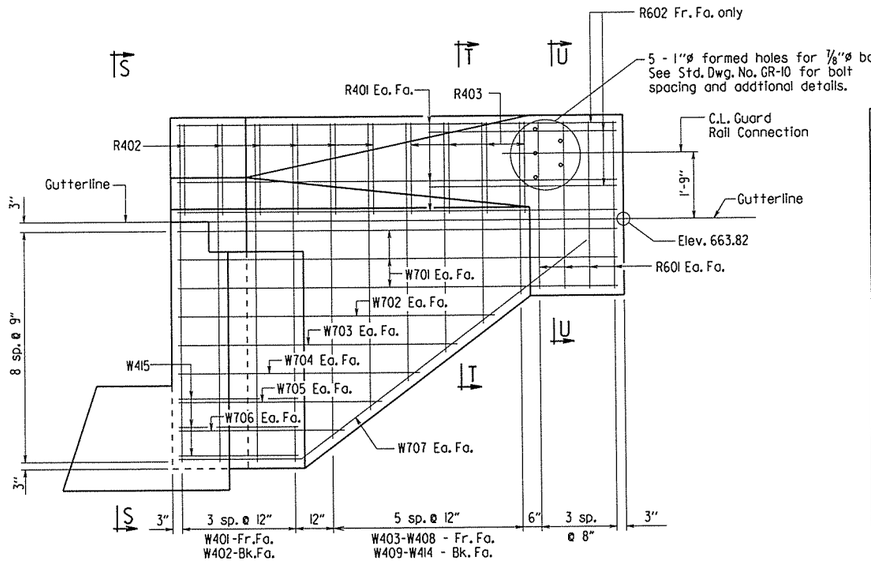
PLAN OF WING

3/8" = 1'-0"



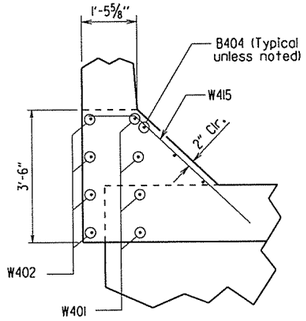
VIEW W-W

1/2" = 1'-0"



VIEW V-V

1/2" = 1'-0"



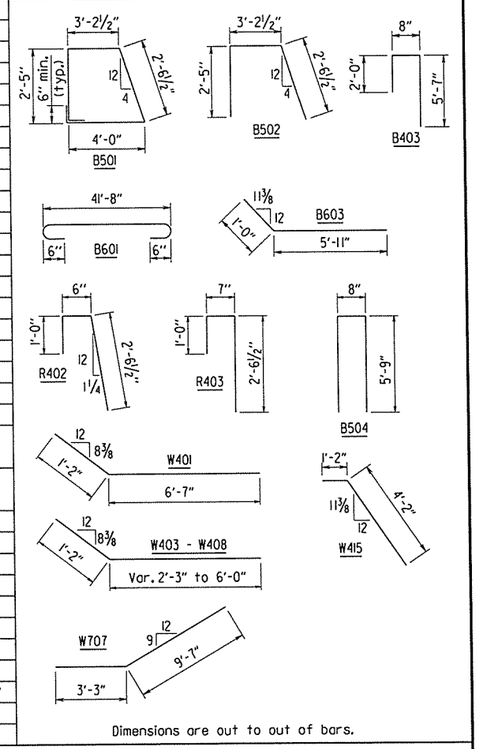
SECTION R-R

1/2" = 1'-0"

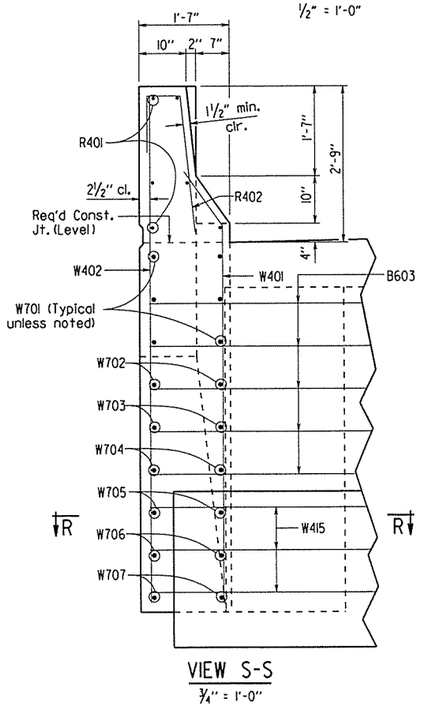
BAR LIST

MARK	NO. REQ'D.	LENGTH	P.D.
B401	4	21'-9"	Str.
B402	20	22'-4"	Str.
B403	36	8'-1"	2"
B404	6	5'-4"	Str.
B501	52	12'-8"	2 1/2"
B502	10	8'-1"	2 1/2"
B503	36	4'-10"	Str.
B504	8	12'-0"	2 1/2"
B601	6	43'-0"	4 1/2"
B602	6	41'-8"	Str.
B603	10	6'-11"	4 1/2"
R401	12	11'-8"	Str.
R402	12	3'-11"	2"
R403	8	4'-0"	2"
R601	16	4'-5"	Str.
R602	6	5'-0"	Str.
W401	8	7'-9"	2"
W402	8	8'-11"	Str.
W403-W408	2 each	Var. 3'-5" to 7'-2"	2"
W409-W414	2 each	Var. 4'-7" to 8'-4"	Str.
W415	6	5'-4"	2"
W701	12	11'-8"	Str.
W702	4	8'-5"	Str.
W703	4	7'-5"	Str.
W704	4	6'-5"	Str.
W705	4	5'-5"	Str.
W706	4	4'-5"	Str.
W707	4	12'-10"	5 1/4"

BENDING DIAGRAMS

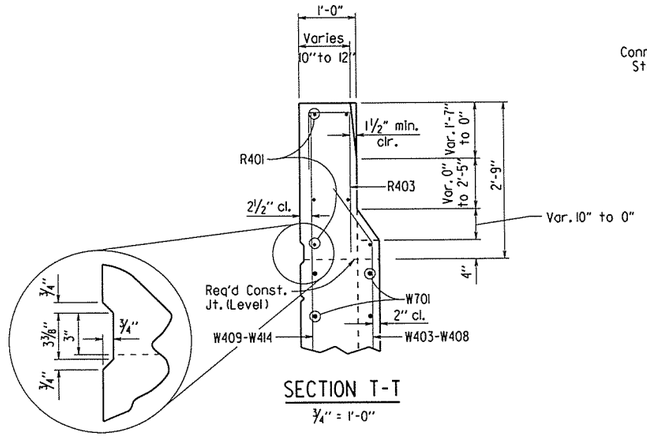


Dimensions are out to out of bars.



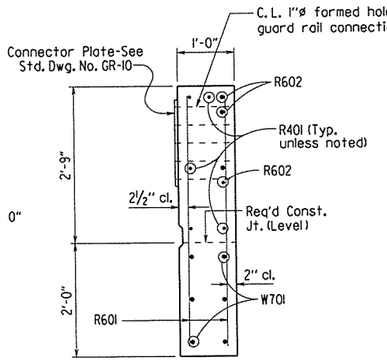
VIEW S-S

3/4" = 1'-0"



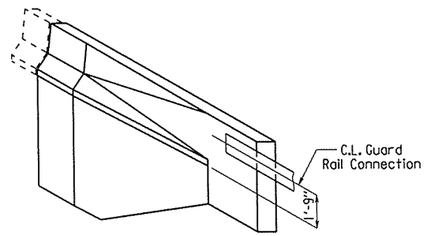
SECTION T-T

3/4" = 1'-0"



SECTION U-U

3/4" = 1'-0"



THREE DIMENSIONAL VIEW OF RAIL

No Scale

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
6-13-16
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 2 OF 2
DETAILS OF END BENT 7

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 7/9/15 FILENAME: b040623_b7.dgn

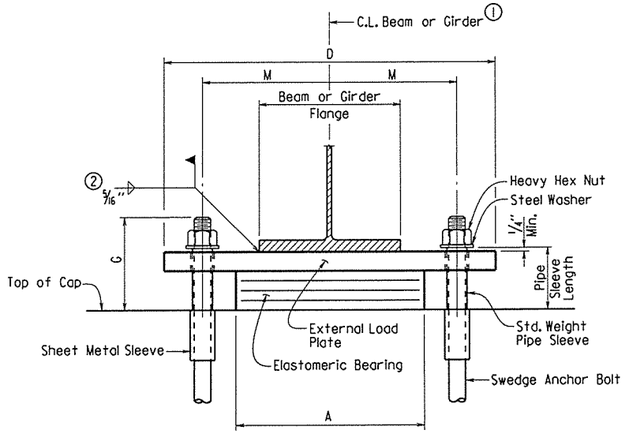
CHECKED BY: ACP DATE: 6-6-2016 SCALE: As Noted

DESIGNED BY: SNP DATE: 6-15

BRIDGE NO. 07373 DRAWING NO. 57972

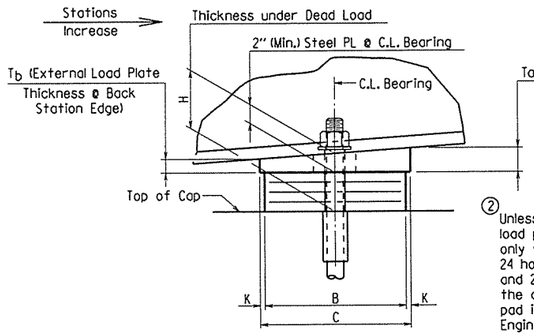
PRINT DATE: 6/6/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	52	115
				①	07373 - ELASTO BRGS. - 57973			



FRONT VIEW

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

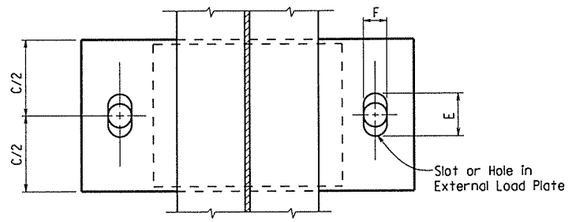


SIDE VIEW

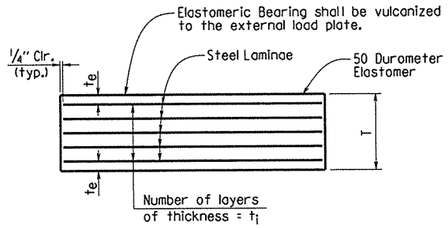
The direction of bevel of the external load plate may not be accurately depicted with respect to Ta and Tb values shown in the "Table of Fabricator Variables".

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.



PLAN VIEW

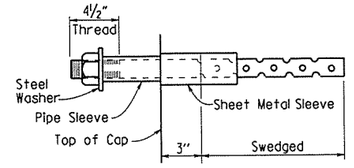


t_e = Thickness of elastomer cover on top and bottom of pad

t_i = Thickness of elastomer between steel laminae

N = Number of elastomer layers of thickness t_i

ELASTOMERIC BEARING



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)" or "Structural Steel in Plate Girder Spans (M 270, Gr. 50W)".

TABLE OF FABRICATOR VARIABLES

③ 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	③ 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	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.)
07373	1 & 4 Bk.	All	Exp.	5	151	8 7/8"	5 5/16"	16"	9"	5	1/2"	1/4"	6 @ 12 Ga.	3 5/8"	10"	28 1/2"	5 1/2"	3 1/8"	1/2"	11"	1.96"	2.04"	2" x 31"	55	2 1/2" x 5 7/8"	4" x 9"	3 3/4"
	2 & 3	All	Fix	5	420	8 1/8"	3 11/16"	24"	12"	2	1/2"	1/4"	3 @ 12 Ga.	1 13/16"	13"	37"	3 3/4"	3 3/4"	1/2"	15"	1.94"	2.06"	2 3/4" x 38"	55	3" x 4 1/8"	5" x 9"	5"
	4 Ahd.	All	Exp.	5	127	8"	4 15/16"	16"	8"	4	1/2"	1/4"	5 @ 12 Ga.	3"	9"	27"	4 7/8"	2 5/8"	1/2"	10 1/2"	1.96"	2.04"	1 3/4" x 33"	55	2" x 5 1/4"	4" x 28"	3 3/8"
	5 & 6	All	Fix	5	265	7 5/8"	3 11/16"	16"	14"	2	1/2"	1/4"	3 @ 12 Ga.	1 13/16"	15"	29"	3 3/4"	3 3/4"	1/2"	11"	1.93"	2.07"	2 1/2" x 35"	55	3" x 4 1/8"	4" x 9"	4 1/2"
	7	All	Exp.	5	127	8"	4 15/16"	16"	8"	4	1/2"	1/4"	5 @ 12 Ga.	3"	9"	27"	4 7/8"	2 5/8"	1/2"	10 1/2"	1.96"	2.04"	1 3/4" x 28"	55	2" x 5 1/4"	4" x 8"	3 3/8"

GENERAL NOTES

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

External load plates shall conform to AASHTO M 270, Grade 50W. Pipe sleeves shall be ASTM A 500, Grade B, and shall be galvanized to conform to AASHTO M 232, Class C or ASTM B 695, Class 50.

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

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

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

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

STATE OF ARKANSAS
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REGISTERED PROFESSIONAL ENGINEER
No. 9235
6-13-16
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DETAILS OF ELASTOMERIC BEARINGS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: ACP DATE: 10/28/15 FILENAME: b040623_el.dgn
CHECKED BY: JNP DATE: 6-7-16 SCALE: None
DESIGNED BY: JNP/LSB DATE: 9-14

BRIDGE NO. 07373 DRAWING NO. 57973

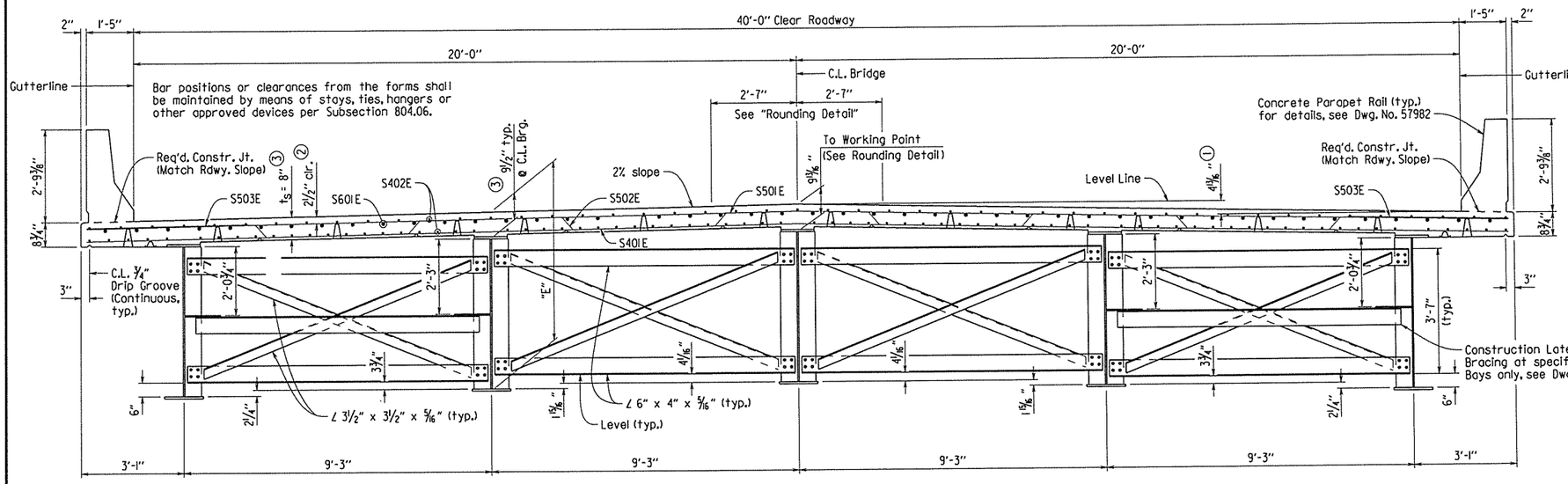
PRINT DATE: 6/7/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	53	115
				(1) 07373 - 360' CONT. UNIT - 57974				

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

Note: At the Contractor's option, two straight epoxy coated #5 bars, top and bottom, may be substituted for bar S502E. Payment will be based on weight of S502E.

Note: Bars designated with an "E" suffix shall be Epoxy Coated.



TYPICAL ROADWAY SECTION

½" = 1'-0"

Longitudinal: S402E Top & Bottom placed as shown
S601E placed as shown over Interior Supports
(See "Half-Reinforcing Plan" on Dwg. No. 57978)

Transverse: S501E @ 12" o.c. in top, S401E @ 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)

Note: For "Typical Cross-Frame Connection" and details of cross-frame connections and lateral bracing, see Dwg. No. 57975.

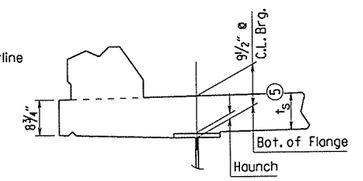
(1) Working point to gutterline.

(2) Tolerance: Minus = ¼":
Plus equal to the amount of slab thickening used to meet slab thickness tolerance. See "Adjustment for Slab Thickness Tolerance".

(3) See "Adjustment for Slab Thickness Tolerance".

(4) "E" equals 5'-3½" plus bottom flange thickness measured at C.L. Bearing & C.L. Girder.

t_s = slab thickness as shown in "Typical Roadway Section"



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

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.

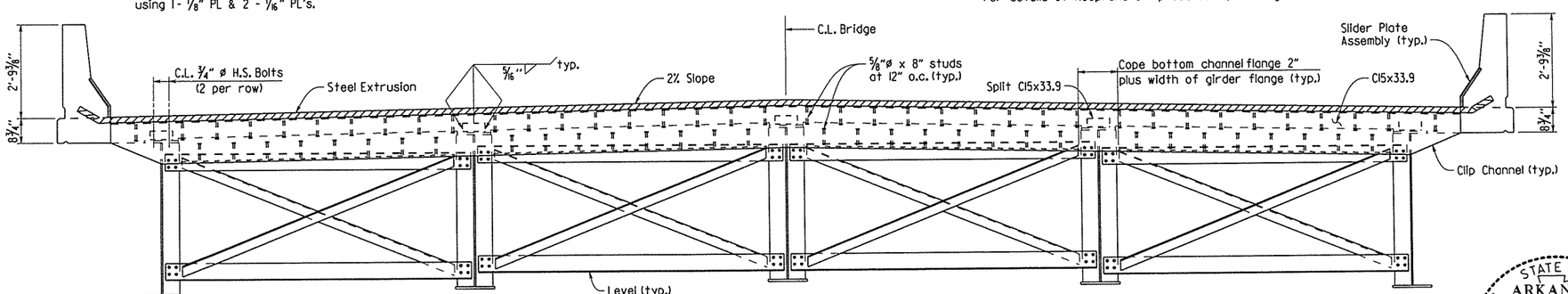
Tolerances shown are applicable only when removable deck forming is used. See Std. Dwg. No. 55005 for tolerances when permanent steel deck forms are used. Payment for concrete shall be based on removable deck forming.

ADJUSTMENT FOR SLAB THICKNESS TOLERANCE

No Scale

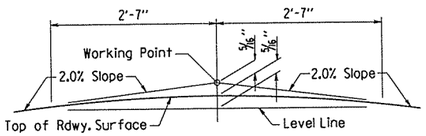
Expansion Device:
Rdwy. Channel - C15x33.9
Connection Angle - Split C15x33.9
Detail Device ⅛" high & provide ¼" Shims using 1 - ⅛" PL & 2 - 1/16" PL's.

For details of Neoprene Strip Seal Joint, see Dwg. No. 57983.



TYPICAL ROADWAY SECTION NEAR JOINT

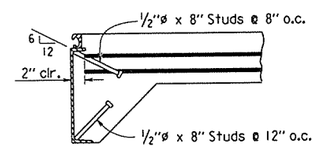
½" = 1'-0"



NOTE: Working Point matches Theoretical Roadway Grade.

ROUNDING DETAIL

No Scale



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

No Scale

STATE OF ARKANSAS
Charles R. Ellis
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SHEET 1 OF 5
DETAILS OF
360'-0" CONTINUOUS PLATE GIRDER UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: JYP DATE: 10-1-14 FILENAME: b040623_sl.dgn
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BRIDGE NO. 07373 DRAWING NO. 57974

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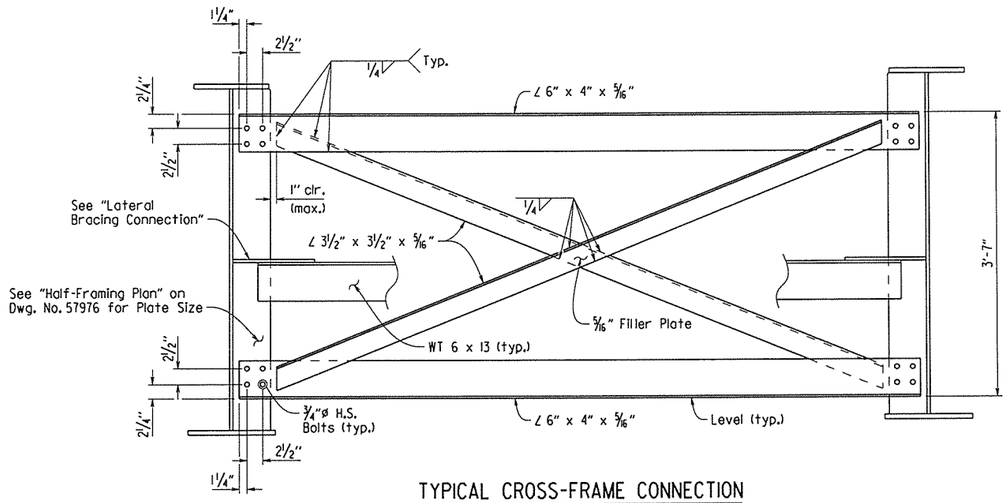
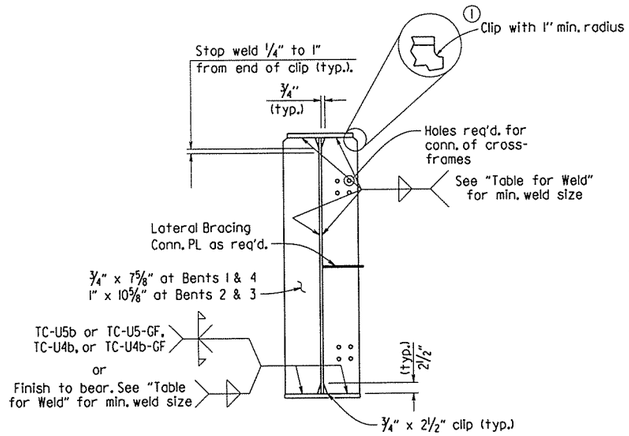
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		040623	52	115
① 07373 - 360' CONT. UNIT - 57975				



TYPICAL CROSS-FRAME CONNECTION

1" = 1'-0"

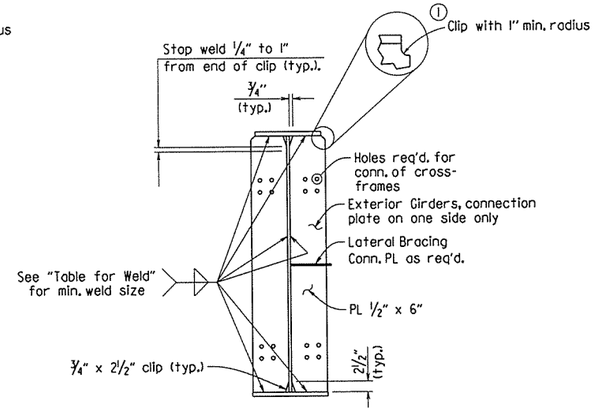
① If permanent steel bridge deck forms are used, the Fabricator shall clip plate as necessary to accomodate the deck form supports.



BEARING STIFFENER DETAIL

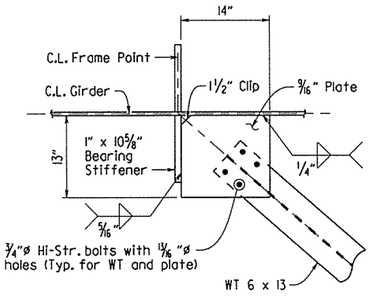
No Scale

NOTE: Bearing stiffeners shall be vertical in final position.



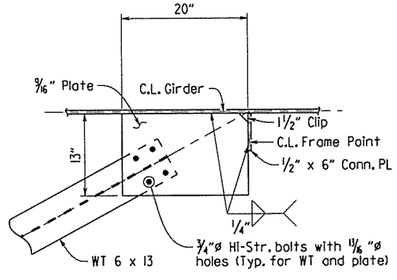
CROSS-FRAME CONNECTION DETAIL

No Scale



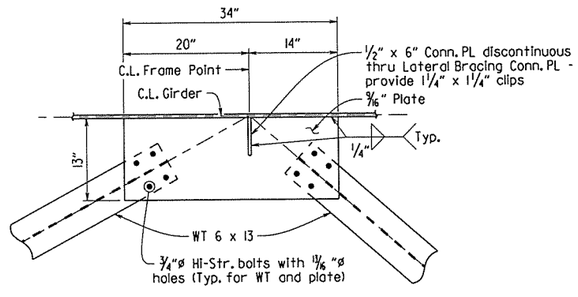
LATERAL BRACING CONNECTION AT BENTS 2 AND 3

1" = 1'-0"



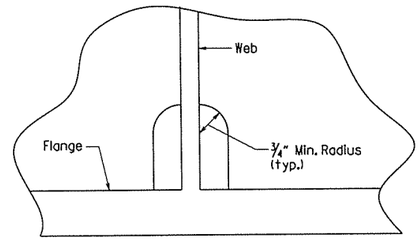
LATERAL BRACING CONNECTION AT EXTERIOR GIRDER

1" = 1'-0"



LATERAL BRACING CONNECTION AT INTERIOR GIRDER

1" = 1'-0"



Height and width of clip shall be as noted in other details.

ALTERNATE CLIP DETAIL

(For Bearing Stiffeners and Cross-frame Connection Plates)
N.T.S.

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"	⅝"	

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.

Notes:
The ends of lateral bracing members shall be a minimum of 4" clear from the web and any stiffener or connection plate.

At the Contractor's option, holes in one end of the WT may be field drilled. Minimum clearance from C.L. Bolt to edge of plate is 1¼".

STATE OF ARKANSAS
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6-13-16
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SHEET 2 OF 5
DETAILS OF
360'-0" CONTINUOUS PLATE GIRDER UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: JYP DATE: 10-1-14 FILENAME: b040623_sl.dgn
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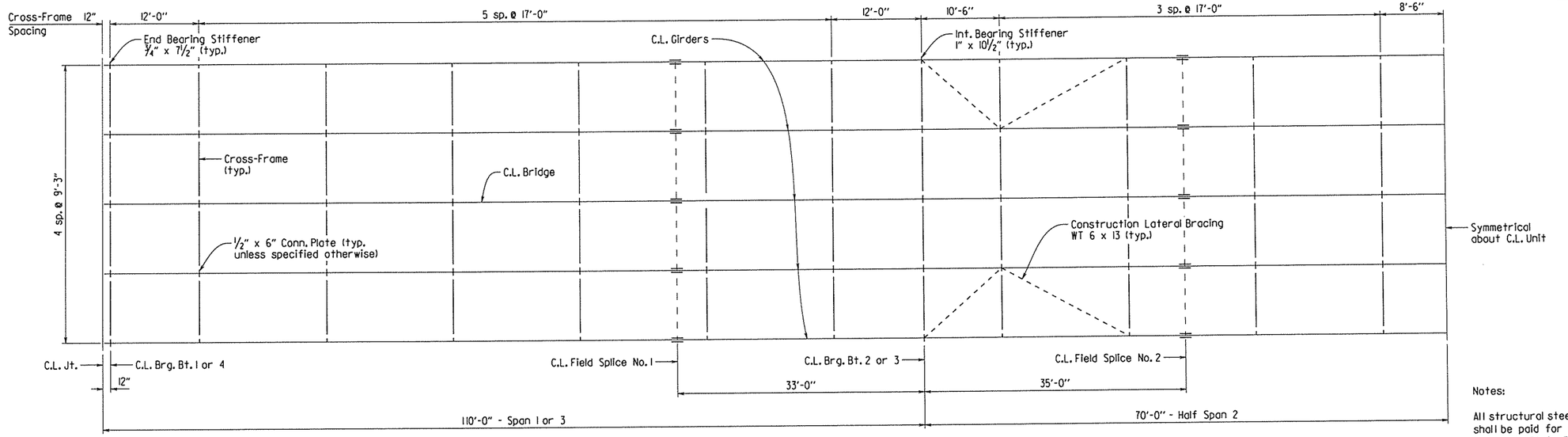
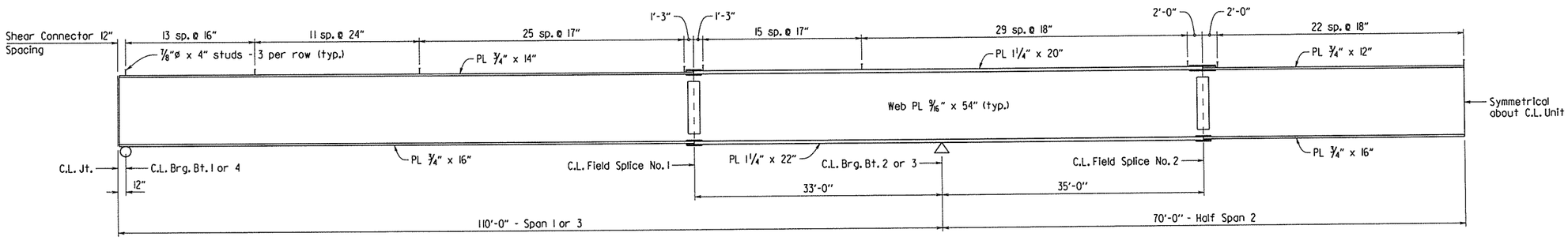
6	ARK.			
JOB NO.		040623	55	115

(1) 07373 - 360' CONT. UNIT - 57976



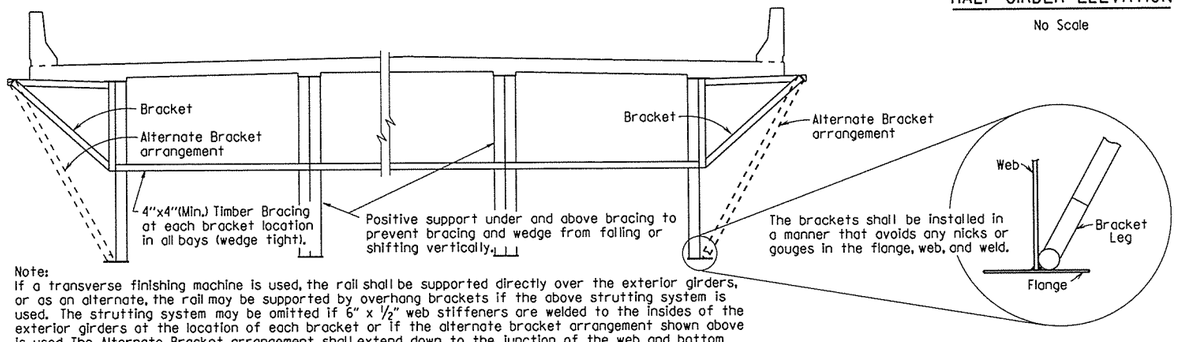
HALF-FRAMING PLAN

1/8" = 1'-0"



HALF-GIRDER ELEVATION

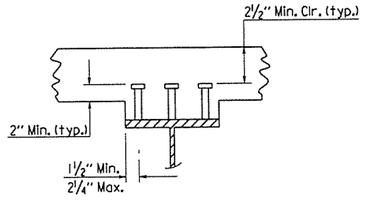
No Scale



Note:
If a transverse finishing machine is used, the rail shall be supported directly over the exterior girders, or as an alternate, the rail may be supported by overhang brackets if the above strutting system is used. The strutting system may be omitted if 6" x 1/2" web stiffeners are welded to the insides of the exterior girders at the location of each bracket or if the alternate bracket arrangement shown above is used. The Alternate Bracket arrangement shall extend down to the junction of the web and bottom flange. The stiffener shall conform to the details for cross frame connection plates shown on Dwg. No. 57975. No direct payment will be made for brackets, timber bracing, supports, or welded stiffeners. Payment shall be subsidiary to "Structural Steel in Plate Girder Spans (M 270, Gr. 50W)".

SCREED RAIL SUPPORT

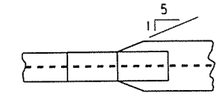
No Scale



Stud Shear Connectors shown shall be 7/8"ø x 4" automatically end welded to the girder flange in accordance with the recommendations of the Manufacturer. 3/4"ø studs may be used in place of the 7/8"ø studs shown at the ratio of 1.361-3/4"ø studs in place on one 7/8"ø stud. 7/8"ø studs will be used as the basis for measurement of structural steel in shear connectors.

SHEAR CONNECTOR DETAIL

No Scale



FIELD SPLICE AT UNEQUAL FLANGE WIDTHS

No Scale

Notes:

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

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

See Std. Dwg. No. 55006 for additional notes.

STATE OF ARKANSAS
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REGISTERED PROFESSIONAL ENGINEER
No. 9235
6-13-16
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 3 OF 5
DETAILS OF
360'-0" CONTINUOUS PLATE GIRDER UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

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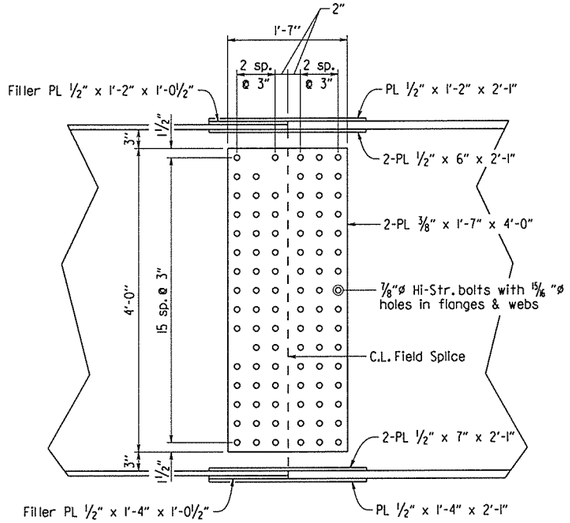
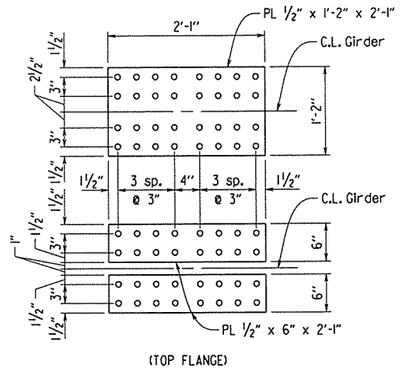
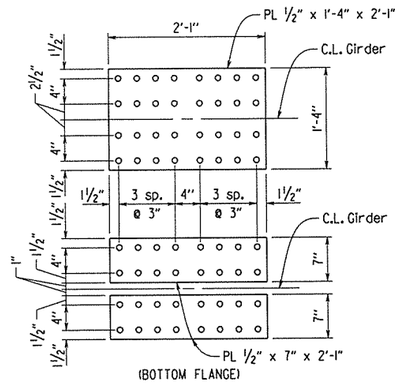
				6	ARK.			
				JOB NO.		040623	56	115
				①		07373 - 360' CONT. UNIT - 57977		





(TOP FLANGE)



(BOTTOM FLANGE)

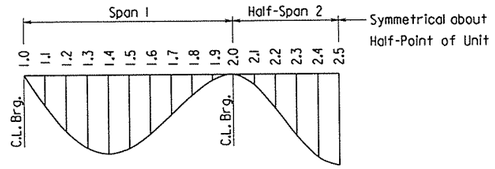
DETAILS OF FIELD SPLICE NO. 1

1" = 1'-0"

TABLE OF DEAD LOAD DEFLECTIONS - INCHES

Span	Point of Deflection	Structural Steel		Structural Steel + Slab		Structural Steel + Slab + Parapet	
		Exterior	Interior	Exterior	Interior	Exterior	Interior
1	1.0	0	0	0	0	0	0
	1.1	0.121	0.131	0.626	0.745	0.676	0.792
	1.2	0.221	0.240	1.143	1.359	1.234	1.445
	1.3	0.287	0.311	1.477	1.756	1.595	1.868
	1.4	0.311	0.337	1.591	1.891	1.718	2.012
	1.5	0.293	0.318	1.487	1.767	1.607	1.880
	1.6	0.240	0.260	1.203	1.428	1.300	1.520
	1.7	0.165	0.179	0.815	0.967	0.881	1.030
	1.8	0.088	0.095	0.425	0.504	0.459	0.536
	1.9	0.026	0.028	0.120	0.142	0.129	0.150
2	2.0	0	0	0	0	0	0
	2.1	0.043	0.046	0.223	0.265	0.245	0.286
	2.2	0.137	0.147	0.709	0.841	0.775	0.904
	2.3	0.244	0.263	1.267	1.505	1.382	1.614
	2.4	0.327	0.352	1.707	2.029	1.859	2.174
	2.5	0.358	0.386	1.872	2.225	2.038	2.383

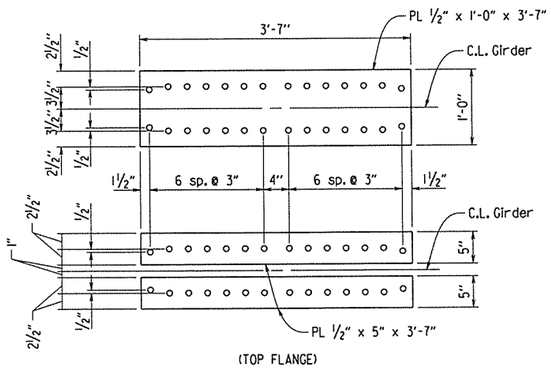
Symmetrical about Half-Point of Unit



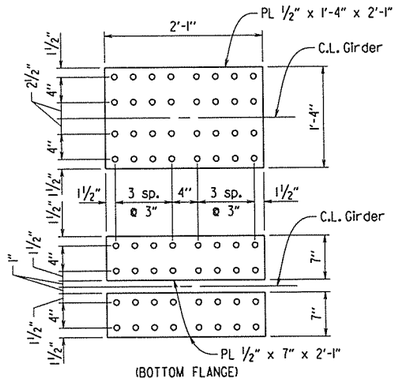
DEAD LOAD DEFLECTION DIAGRAM

No Scale

NOTE: Camber for Dead Load Deflection ± ¼" tolerance. Deflections shown are along C.L. Girder from a chord from C.L. Bearing to C.L. Bearing. Vertical curve corrections are not included.



(TOP FLANGE)

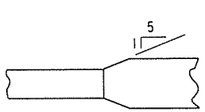


(BOTTOM FLANGE)

DETAILS OF FIELD SPLICE NO. 2

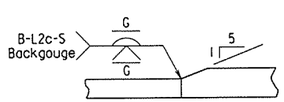
1" = 1'-0"

Notes:
All field splice bolts shall be ⅞"ø Hi-strength bolts.
All holes for splice bolts shall be 15/16 "ø.
All field splice plates shall be AASHTO M 270, Gr. 50W steel.



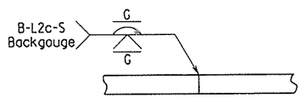
Plan-Unequal Width (Flg.)

FLANGE SPLICE



Unequal Thickness

FLANGE SPLICE



Equal Thickness

WEB AND FLANGE SPLICE

DETAILS OF WELDED SPLICES

No Scale

STATE OF ARKANSAS
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No. 9235
6-13-16
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BRIDGE ENGINEER

SHEET 4 OF 5
DETAILS OF 360'-0" CONTINUOUS PLATE GIRDER UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: JYP DATE: 10-1-14 FILENAME: b040623_sl.dgn
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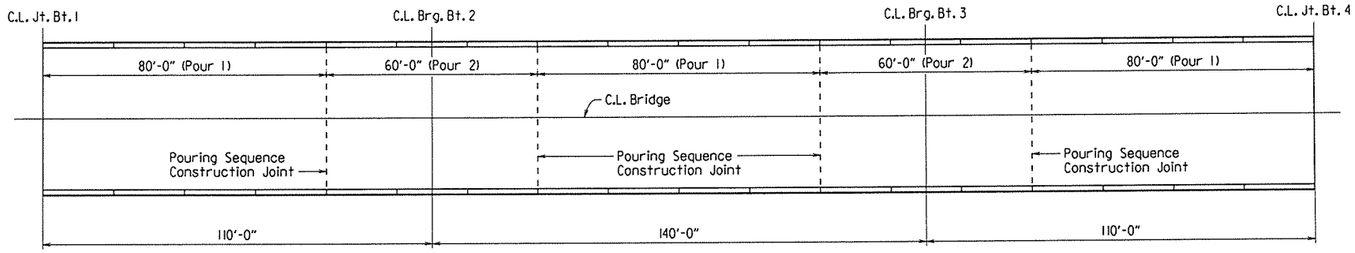
				6	ARK.			
				JOB NO.		040623	57	115
				①	07373 - 360' CONT. UNIT - 57978			



SLAB POURING SEQUENCE

No Scale

SLAB POURING SEQUENCE NOTES:
Pours with the same number may be placed simultaneously or separately. All Pours (1) must be placed before Pours (2) can be placed. 48 hours shall elapse between the end of a pour and the start of the next pour. 72 hours shall elapse between adjacent pours.

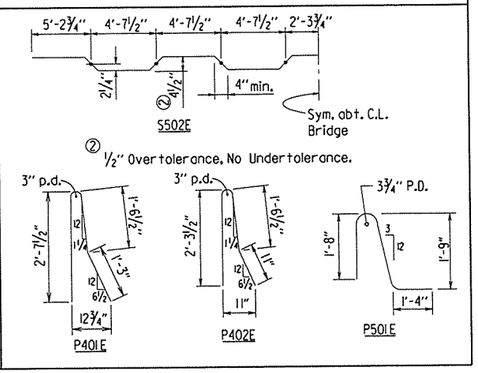
Concrete in bridge superstructure shall be placed, consolidated and screeded off for the entire pour before any concrete has taken its initial set. This may require the use of a retarding agent.

A minimum of 72 hours shall elapse between completion of the slab and the pouring of the parapet railing. 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.

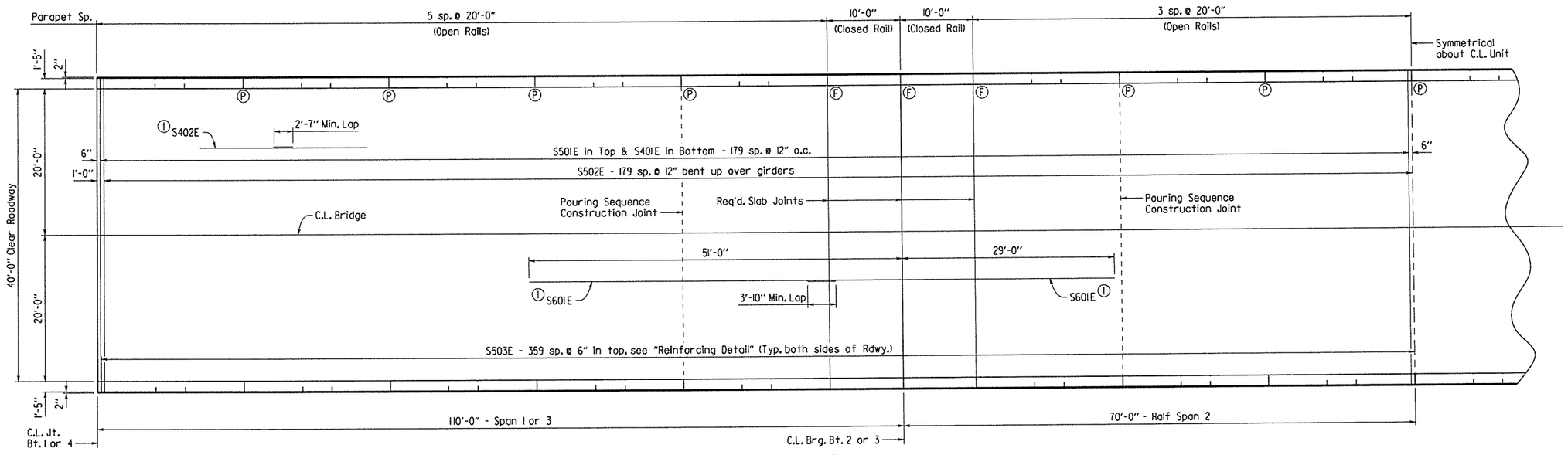
BAR LIST

Mark	No. Req'd.	Length	Pin Dia.
S401E	360	42'-10"	Str.
S402E	1,210	38'-4"	Str.
S501E	360	42'-10"	Str.
S502E	359	43'-8"	3"
S503E	1,438	4'-10"	Str.
S601E	92	41'-11"	Str.
P401E	1,184	5'-6"	3"
P402E	256	4'-10"	3"
P403E	104	5'-7"	Str.
P404E	56	9'-7"	Str.
P405E	224	19'-7"	Str.
P501E	1,184	4'-10"	3¾"

Bending Diagrams (Dimensions are out to out of bars.)

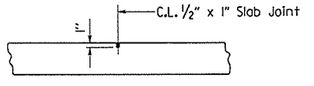


① Place reinforcing as shown in "Typical Roadway Section" on Dwg. No. 57974.



HALF-REINFORCING PLAN

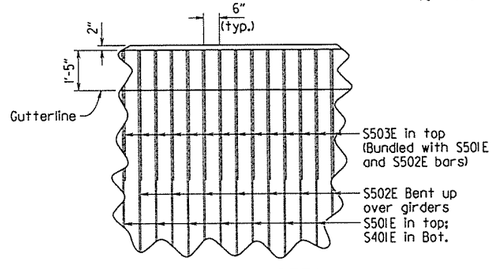
1/8" = 1'-0"



Use 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 and shall align with open joints at the front face of the parapet. Slab joints shall be installed before the parapet railing is poured. If slab joints are to be sawed, they shall be sawed as soon as the concrete has sufficiently set to allow sawing of the joint without damage to the slab. Slab joints shall be placed at all pouring sequence construction joints and required slab joint locations. The joint sealer shall extend across the deck from gutterline to gutterline.

SLAB JOINT DETAIL

No Scale



REINFORCING DETAIL

No Scale

Notes:
For parapet details, see Dwg. No. 57982.

Required slab joints and pouring sequence joints shall align with open joints in parapet rail at the gutterline.

Parapet rail spacing and joint depth shown are typical for both sides of roadway.

Ⓟ Partial depth parapet joint at this location
Ⓕ Full depth parapet joint at this location

STATE OF ARKANSAS
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REGISTERED PROFESSIONAL ENGINEER
No. 9235
6-13-16
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SHEET 5 OF 5
DETAILS OF 360'-0" CONTINUOUS PLATE GIRDER UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: JYP DATE: 10-1-14 FILENAME: b040623_sl.dgn
CHECKED BY: ACP DATE: 6-7-16 SCALE: As Noted
DESIGNED BY: JYP DATE: 9-14

BRIDGE NO. 07373 DRAWING NO. 57978

PRINT DATE: 6/7/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	54	115
				①	07373 - 240' CONT. UNIT - 57979			

Slab Reinforcing:

Longitudinal: S402E Top and Bottom placed as shown
S601E placed as shown over int. supports, See "Half Reinforcing Plan & Pouring Sequence", Dwg. No. 57981.

Transverse: S501E @ 12" o.c. in top, S401E @ 12" o.c. in bottom — Alternate
S502E @ 12" o.c. bent up over beams —
S503E @ 6" in top of overhangs (bundled with #5 bars)

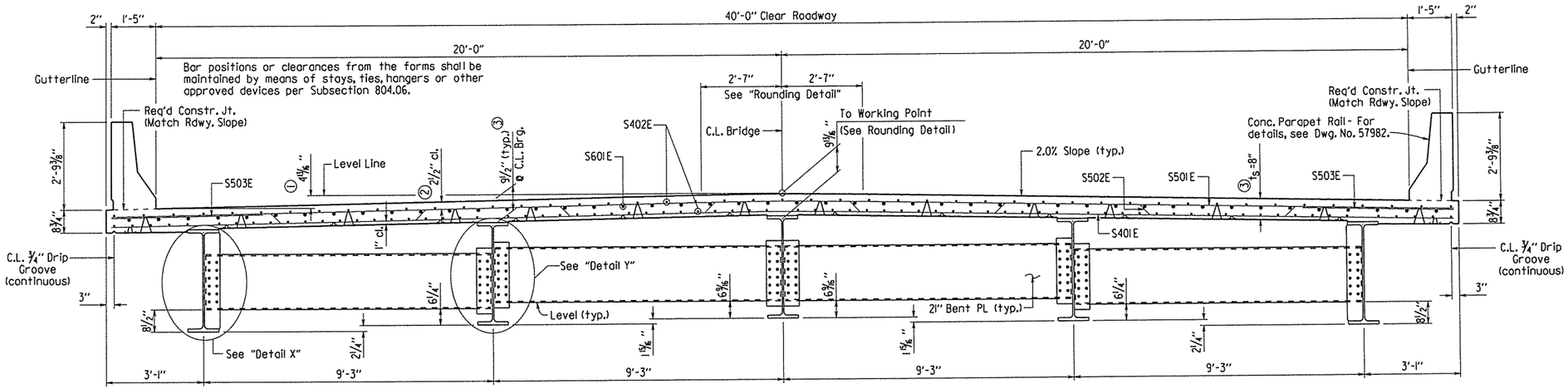
Notes:
At the Contractor's option, two straight epoxy coated #5 bars, top and bottom, may be substituted for bar S502E. Payment will be based on the weight of bar S502E.

Bars with an "E" suffix are epoxy coated.

① Working point to gutterline.

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

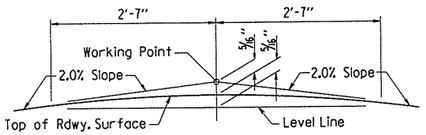
③ See "Adjustment for Slab Thickness Tolerance".



TYPICAL ROADWAY SECTION

1/2" = 1'-0"

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



NOTE: Working Point matches Theoretical Roadway Grade.

ROUNDING DETAIL

No Scale

TABLE FOR WELD

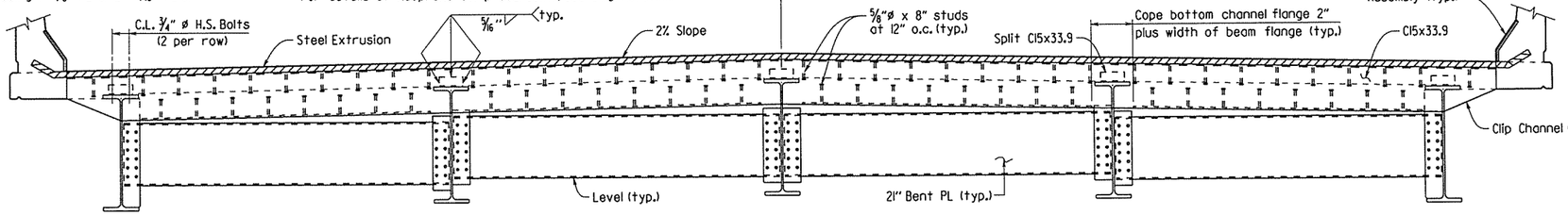
Material Thickness of Thicker Part Joined (Inches)	Minimum Size of Fillet Weld (Inches)	Single Pass Weld Must Be Used
To 3/4" Inclusive	1/4"	
Over 3/4"	5/16"	

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

Expansion Device:

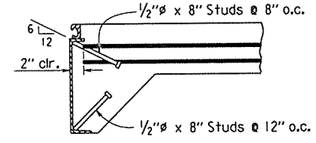
Rdwy. Channel - C15x33.9
Connection Angle - Split C15x33.9
Detail Device 1/8" high & provide 1/4" Shims using 1 - 1/8" PL & 2 - 1/16" PL's.

For details of Neoprene Strip Seal Joint, see Dwg. No. 57983.



TYPICAL ROADWAY SECTION NEAR JOINT

1/2" = 1'-0"



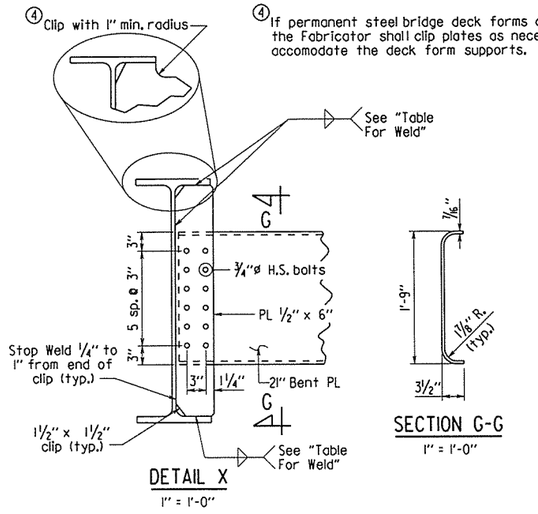
Note: As an alternate to 5/8"ø studs, 1/2"ø x 8" studs spaced as shown may be used. Use weight of 5/8"ø stud as basis of measurement of structural steel in anchors.

DETAILS OF ALTERNATE ANCHORS AND PLACEMENT OF LONGITUDINAL REINFORCEMENT

No Scale

④ Clip with 1" min. radius

④ If permanent steel bridge deck forms are used, the Fabricator shall clip plates as necessary to accomodate the deck form supports.

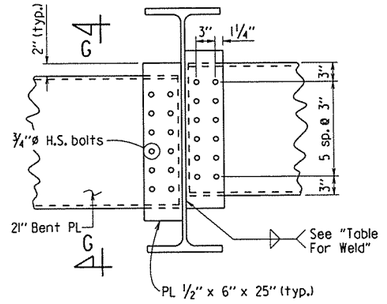


DETAIL X

1" = 1'-0"

SECTION G-G

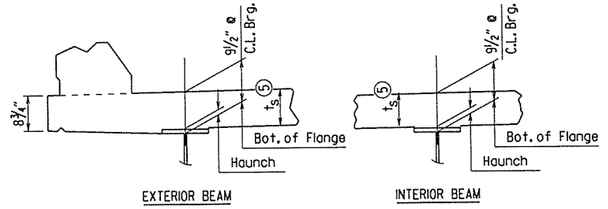
1" = 1'-0"



DETAIL Y

1" = 1'-0"

t_s = slab thickness as shown in "Typical Roadway Section"



EXTERIOR BEAM

INTERIOR BEAM

⑤ Tolerance when removable deck forming is used is + 1/2", - 1/4". Haunch forming is required and shall be adjusted to maintain slab thickness tolerance.

ADJUSTMENT FOR SLAB THICKNESS TOLERANCE

No Scale

NOTES:
Haunch dimension may vary within the following limits to maintain the grade and slab thickness tolerance: Minimum occurs when top flange contacts bottom reinforcing steel; Maximum = top flange thickness plus 1 3/4". No increase in concrete and structural steel quantities will be made to maintain tolerances.

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

STATE OF ARKANSAS
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No. 9235
6-13-16
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SHEET 1 OF 3
DETAILS OF
240'-0" CONTINUOUS W-BEAM UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: LJB DATE: 12/2014
CHECKED BY: ACP DATE: 6-7-16
DESIGNED BY: LJB DATE: 10/14
FILENAME: b040623_s2.dgn
SCALE: As Noted

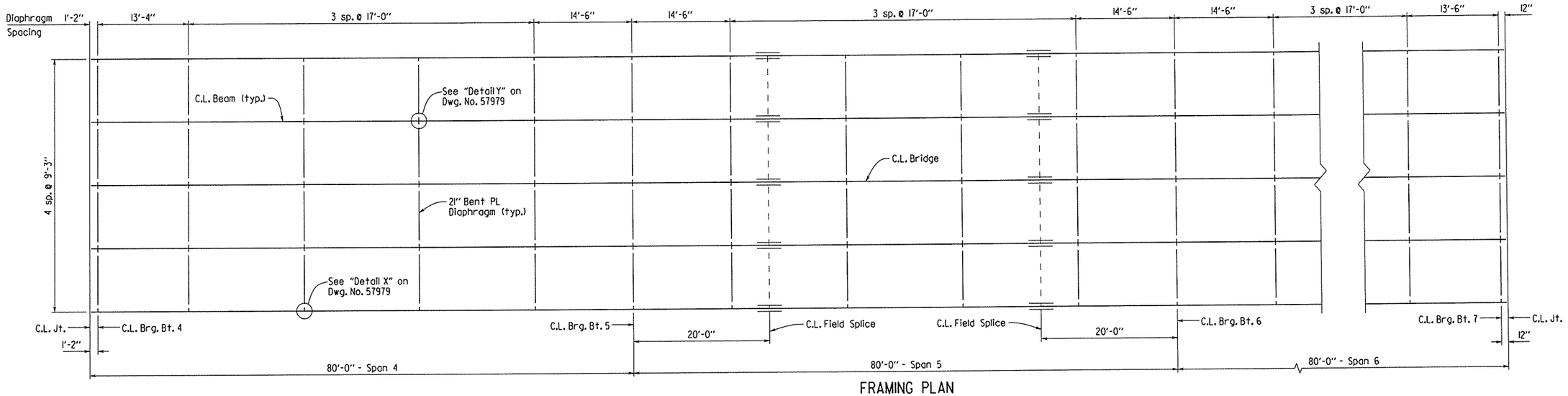
BRIDGE NOS. 07373 DRAWING NO. 57979

PRINT DATE: 6/9/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

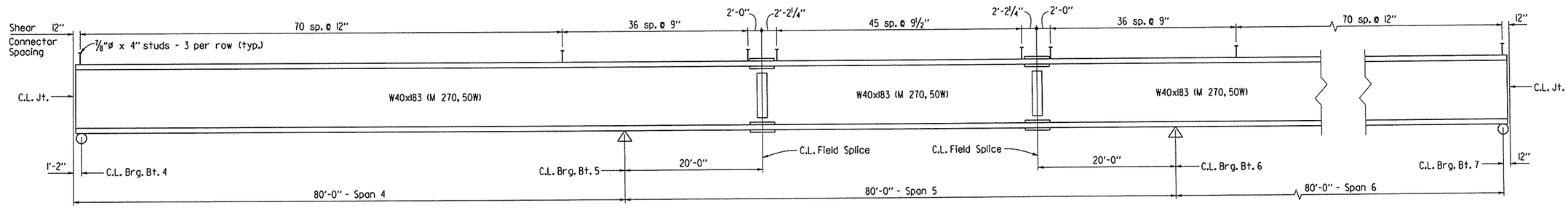
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		040623	59	115

(1) 07373 - 240' CONT. UNIT - 57980



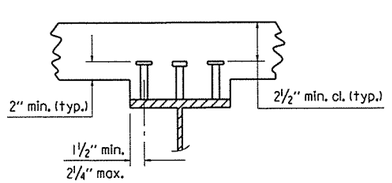
FRAMING PLAN

1/8" = 1'-0"



BEAM ELEVATION

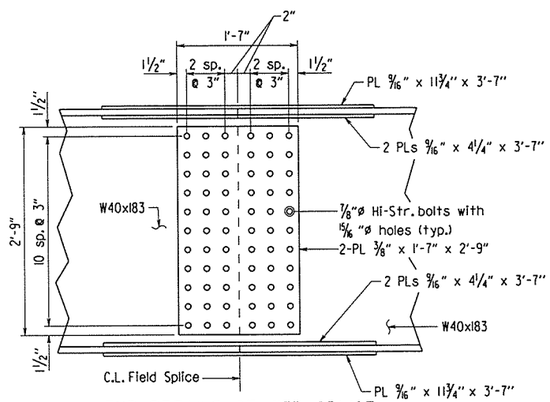
No Scale



Stud Shear Connectors shown shall be 7/8"ø x 4" 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 7/8"ø studs shown, at the ratio of 1.361 -¾"ø studs in place of one 7/8"ø stud. 7/8"ø studs will be used as basis for measurement of structural steel in shear connectors.

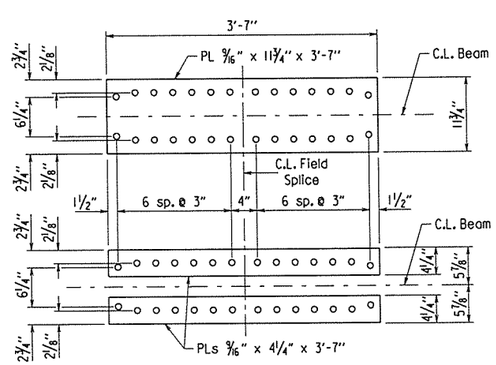
SHEAR CONNECTOR DETAIL

No Scale



TYP. DETAILS OF WEB SPLICE

No Scale



TYP. DETAILS OF FLANGE SPLICE

No Scale

Notes:

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

All field splice bolts shall be 7/8"ø Hi-strength bolts.
All holes for splice bolts shall be 15/16 "ø.
All field splice plates shall be AASHTO M 270, Gr. 50W steel.

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

See Std. Dwg. No. 55006 for additional notes.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
6-13-16
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BRIDGE ENGINEER

SHEET 2 OF 3
DETAILS OF
240'-0" CONTINUOUS W-BEAM UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: LJB DATE: 12/2014
CHECKED BY: ACP DATE: 6-7-16
DESIGNED BY: LJB DATE: 10/14
FILENAME: b040623_s2.dgn
SCALE: As Noted

BRIDGE NOS. 07373 DRAWING NO. 57980

PRINT DATE: 6/7/2016

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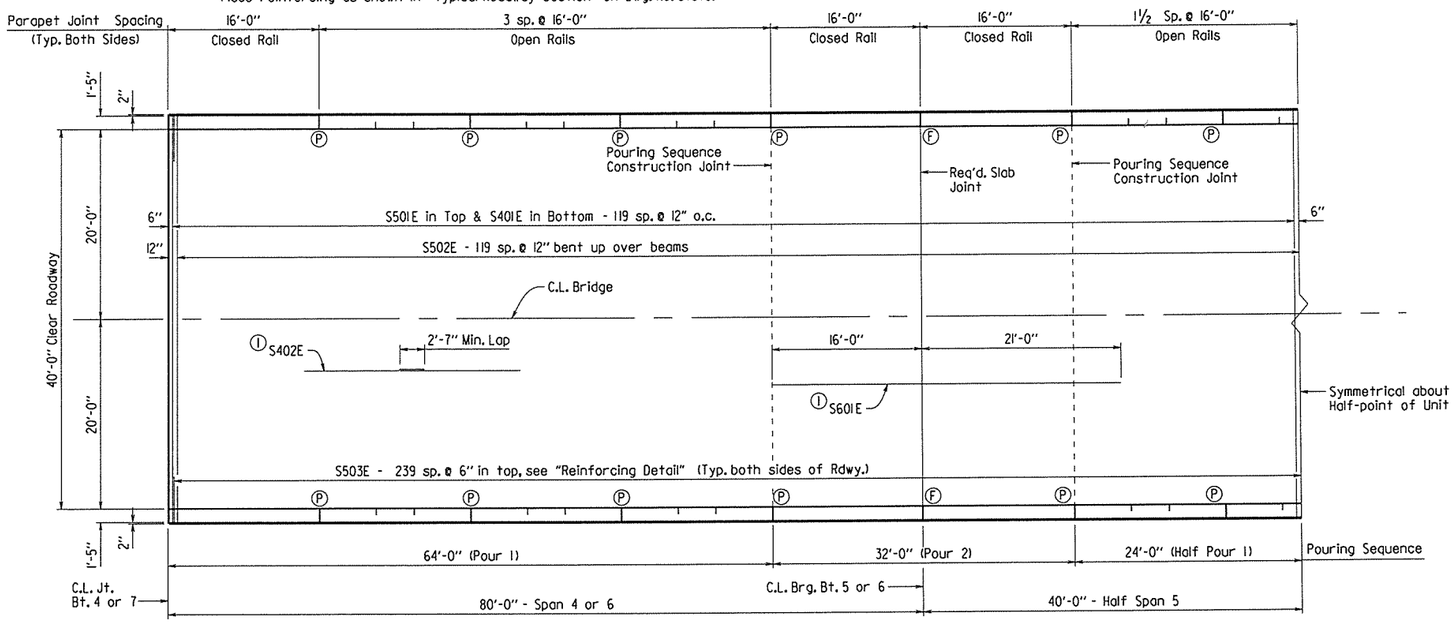
				6	ARK.			
				JOB NO.		040623	60	115
				①	07373 - 240' CONT. UNIT - 57981			

① Place reinforcing as shown in "Typical Roadway Section" on Dwg. No. 57979.



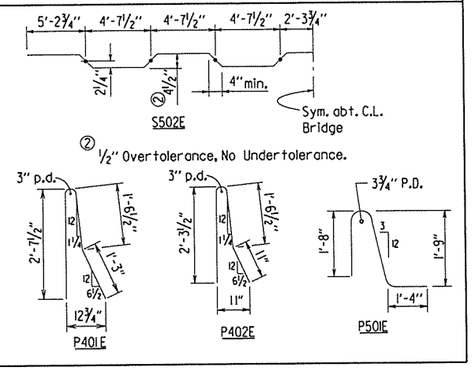
HALF REINFORCING PLAN AND SLAB POURING SEQUENCE

⅛" = 1'-0"

BAR LIST

Mark	No. Req'd.	Length	Pin Dia.
S401E	240	42'-10"	Str.
S402E	847	36'-5"	Str.
S501E	240	42'-10"	Str.
S502E	239	43'-8"	3"
S503E	958	4'-10"	Str.
S601E	92	37'-0"	Str.
P401E	816	5'-6"	3"
P402E	144	4'-10"	3"
P403E	96	5'-7"	Str.
P406E	210	15'-7"	Str.
P501E	816	4'-10"	3¾"

Bending Diagrams (Dimensions are out to out of bars.)

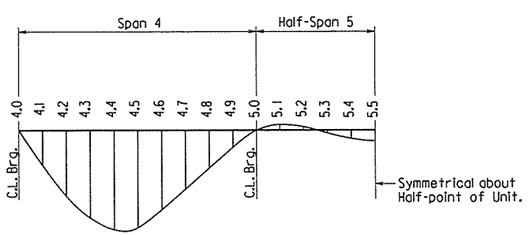


Bars with "E" designation shall be epoxy coated.

TABLE OF DEAD LOAD DEFLECTIONS - INCHES

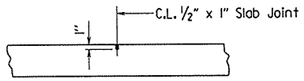
Span	Point of Deflection	Structural Steel		Structural Steel + Slab		Structural Steel + Slab + Rail	
		Ext. Beam	Int. Beam	Ext. Beam	Int. Beam	Ext. Beam	Int. Beam
4	4.0	0	0	0	0	0	0
	4.1	0.083	0.089	0.454	0.540	0.500	0.569
	4.2	0.155	0.166	0.845	1.005	0.930	1.059
	4.3	0.206	0.221	1.125	1.337	1.238	1.408
	4.4	0.232	0.248	1.266	1.504	1.393	1.584
	4.5	0.231	0.247	1.259	1.496	1.385	1.576
	4.6	0.204	0.218	1.113	1.323	1.224	1.393
	4.7	0.157	0.168	0.858	1.020	0.943	1.074
	4.8	0.099	0.106	0.541	0.643	0.595	0.677
	4.9	0.041	0.044	0.226	0.269	0.249	0.283
	5.0	0	0	0	0	0	0
5	5.1	-0.013	-0.014	-0.070	-0.083	-0.077	-0.088
	5.2	-0.006	-0.006	-0.032	-0.037	-0.036	-0.040
	5.3	0.008	0.009	0.045	0.053	0.048	0.055
	5.4	0.020	0.022	0.110	0.132	0.119	0.138
	5.5	0.025	0.027	0.136	0.162	0.147	0.169

Symmetrical about Half-point of Unit.



DEAD LOAD DEFLECTION DIAGRAM

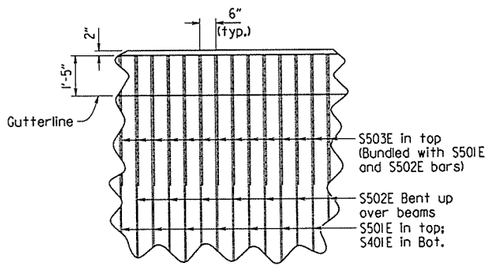
NOTE: Camber for Dead Load Deflection ± ¼" tolerance. Deflections shown are along C.L. Beam from a chord from C.L. Bearing to C.L. Bearing. Negative sign (-) indicates point above chord.



Use 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 and shall align with open joints at the front face of the parapet. Slab joints shall be installed before the parapet railing is poured. If slab joints are to be sawed, they shall be sawed as soon as the concrete has sufficiently set to allow sawing of the joint without damage to the slab. Slab joints shall be placed at all pouring sequence construction joints and required slab joint locations. The joint sealer shall extend across the deck from gutterline to gutterline.

SLAB JOINT DETAIL

No Scale



REINFORCING DETAIL

No Scale

Notes:

For Parapet Details, See Dwg. No. 57982.

Required slab joints and pouring sequence joints shall align with open joints in parapet rail at the gutterline.

Ⓟ Partial depth parapet joint at this location

Ⓕ Full depth parapet joint at this location

Slab Pouring Sequence Notes:

Pours with the same number may be placed simultaneously or separately. All Pours (1) must be placed before Pours (2) can be placed. 48 hours shall elapse between the end of a pour and the start of the next pour. 72 hours shall elapse between adjacent pours.

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.

A minimum of 72 hours shall elapse between completion of the slab and the pouring of the parapet railing. 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.

STATE OF ARKANSAS
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6-13-16
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SHEET 3 OF 3
DETAILS OF
240'-0" CONTINUOUS W-BEAM UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

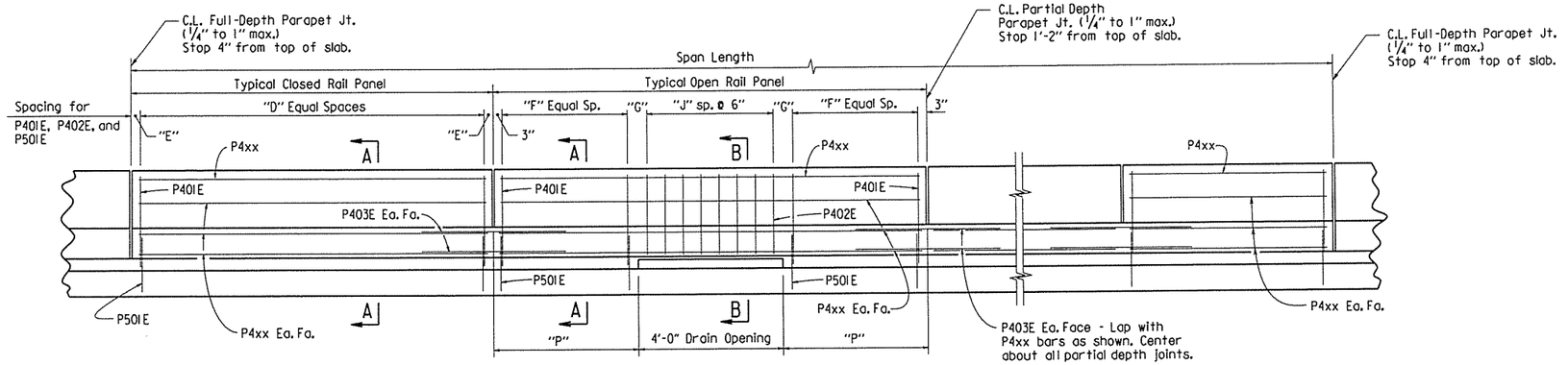
LITTLE ROCK, ARK.

DRAWN BY: LJB DATE: 12/2014
CHECKED BY: ACP DATE: 6-7-16
DESIGNED BY: LJB DATE: 10/14
FILENAME: b040623_s2.dgn
SCALE: As Noted

BRIDGE NOS. 07373 DRAWING NO. 57981

PRINT DATE: 6/7/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	61	115
				(1) 07373 -		COMMON		- 57982

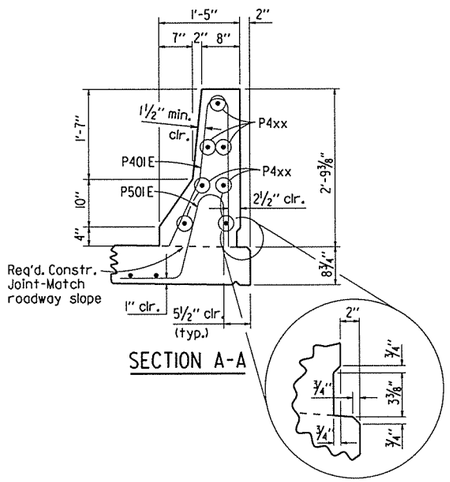


ELEVATION - CONCRETE PARAPET RAIL

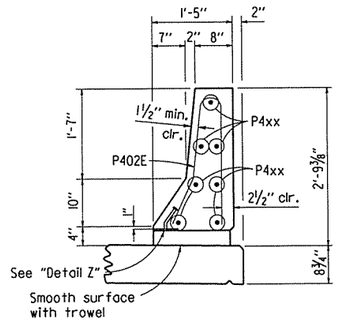
Note:
For location of full and partial depth parapet joints, see Dwg. Nos. 57978 and 57981.

TABLE OF VARIABLES

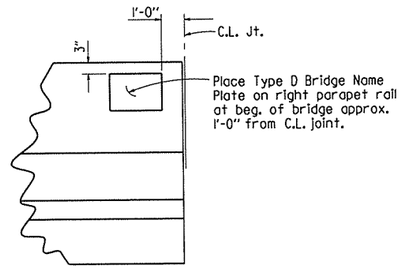
Closed Rail Panels				Open Rail Panels					
Panel Length	"D"	"E"	P4xx Bar	Panel Length	"F"	"G"	"J"	"P"	P4xx Bar
10'-0"	19	3"	P404E	20'-0"	15	6"	7	8'-0"	P405E
16'-0"	31	3"	P406E	16'-0"	11	6"	7	6'-0"	P406E



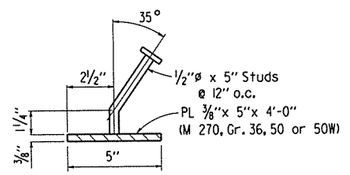
SECTION A-A



SECTION B-B



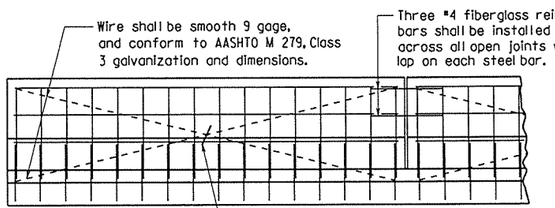
VIEW SHOWING LOCATION OF NAME PLATE

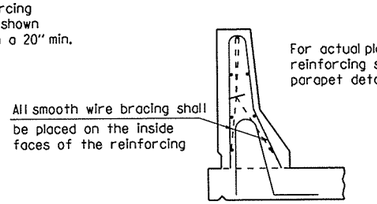


Note:
Parapet Studs shall be 5" long, granular flux filled, solid fluxed, or equal, and automatically end welded to the plate. Studs and plate shall meet the requirements of Section 807. Studs and plate shall be measured and paid for as Structural Steel in Beam Spans (M 270, Gr. 50W) or Structural Steel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

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

DETAIL Z





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. Unless otherwise noted, exposed surfaces may be given a light brush finish or a Class 3 Textured Coating Finish in place of Class 2 Rubbed Finish.

DETAILS OF OPTIONAL SLIPFORMING OF CONCRETE PARAPET RAIL

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
6-13-16
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 1 OF 2
DETAILS COMMON TO PLATE GIRDER AND W-BEAM UNITS

ROUTE SEC.

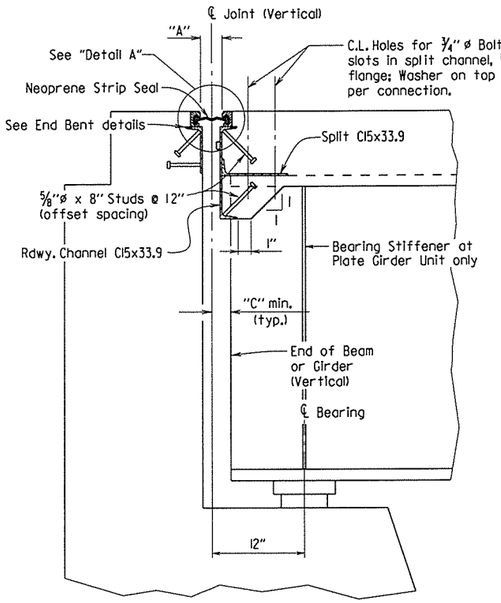
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: JYP DATE: 10-1-14 FILENAME: b040623_sl.dgn
CHECKED BY: ACP DATE: 6-7-16 SCALE: No Scale
DESIGNED BY: JYP/LSB DATE: 9-14

BRIDGE NO. 07373 DRAWING NO. 57982

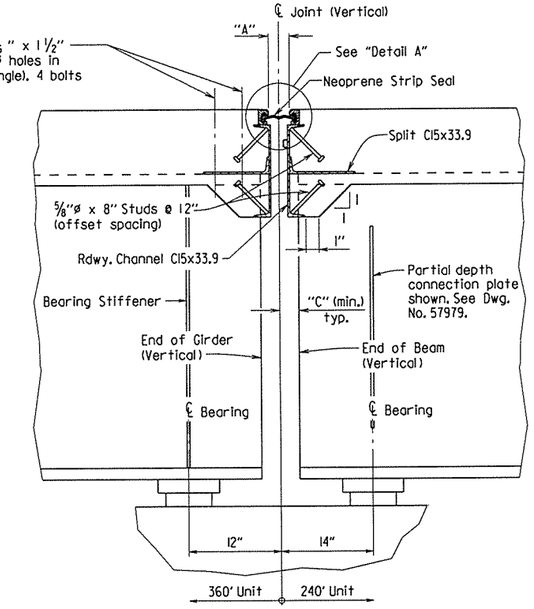
PRINT DATE: 6/7/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	62	115
				① 07373 -		COMMON		- 57983



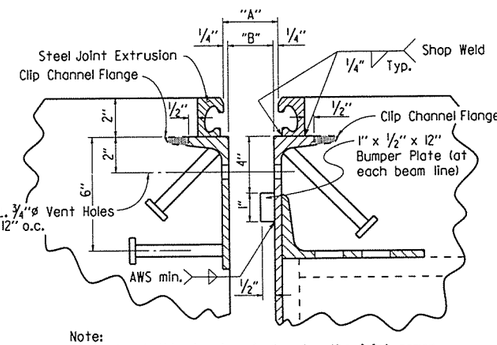
Note: Section thru Joint is taken perpendicular to C.L. Joint.

SECTION THRU JOINT AT END BENTS



Note: Section thru Joint is taken perpendicular to C.L. Joint.

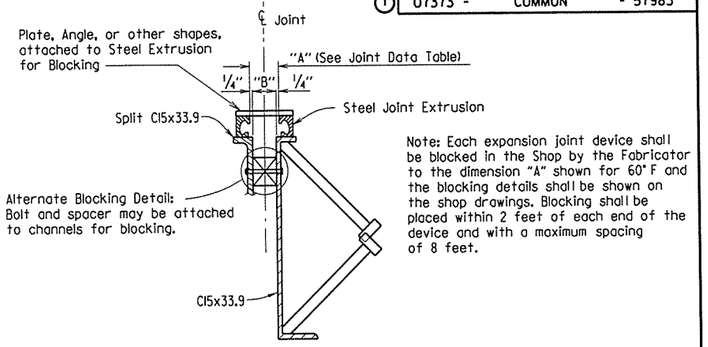
SECTION THRU JOINT AT INT. BENT



Note:
Concrete shall be hand packed under the joint armor. Care shall be taken to ensure that concrete completely fills the areas below the top channel flanges in the backwall and in the span.

DETAIL A

Detail is shown at end bent. Details at interior bents are similar.



Note: Each expansion joint device shall be blocked in the Shop by the Fabricator to the dimension "A" shown for 60° F and the blocking details shall be shown on the shop drawings. Blocking shall be placed within 2 feet of each end of the device and with a maximum spacing of 8 feet.

DETAILS FOR BLOCKING EXPANSION JOINT DEVICE

EXPANSION DEVICE INSTALLATION AT END BENTS:
The Contractor may elect to install the expansion device using one of the following two alternatives:

1) The concrete span pour adjacent to joint shall be placed before the end bent backwall is placed. After the end bent backwall forms are in place and the 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, and the opening adjusted for temperature and grade.

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 and grade.

EXPANSION DEVICE INSTALLATION AT INTERMEDIATE BENTS:
After all beams and girders on each side of the joint are erected the blocked expansion device shall be installed and adjusted for grade. Deck concrete shall be placed for the entire unit span on one side of the joint before deck concrete on the other side is placed. Connection bolts for the first side to have deck concrete placed shall be completely bolted. Bolts on the other side shall be loosely installed so that thermal and rotational movements will not be restricted during concrete placement on the first side.

Connection bolts on the second side shall remain loose until the concrete pour adjacent to the joint is to be placed. Immediately prior to pouring the span concrete on the second side, the blocking shall be removed, the joint adjusted for temperature and grade, and the connection bolts tightened.

GENERAL NOTES FOR NEOPRENE STRIP SEAL JOINTS:
Section and Subsection refer to the Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2014 Edition).

The expansion device shall provide for the movement rating(s) shown in the "STRIP SEAL JOINT DATA" table. The expansion joint shall be capable of sealing the deck surface and parapet area to prevent moisture and other contaminants from descending through the joint.

Details of proposed slider plate assembly shall be submitted to and approved by the Engineer prior to the fabrication of any structural steel at the expansion device.

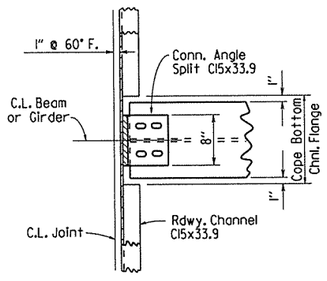
All structural steel shall be AASHTO M 270, Grade 50W and all exposed surfaces shall be cleaned in accordance with Subsection 807.84(e). The parapet slider plates and structural steel completely embedded in concrete shall conform to AASHTO M 270, Grade 36, 50 or 50W steel. Unless otherwise noted in the plans, all exposed surfaces of the parapet slider plates shall be cleaned and painted in accordance with Section 638. Painting shall not be paid for directly, and structural steel completely embedded in concrete need not be painted. Structural steel shall be paid for at the unit price bid for "Structural Steel in Beam Spans (M 270, Gr. 50W)" or "Structural Steel in Plate Girder Spans (M 270, Gr. 50W)".

The steel extrusion and neoprene strip seal shall be paid for in accordance with Section 809.

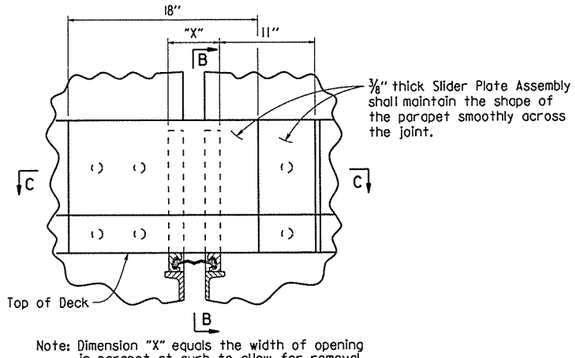
STRIP SEAL JOINT DATA

Bent No(s).	Movement Rating (inch)	"A" Width Perpendicular to Joint at 24 Hour Average Temperature② of:			"B" Width Perpendicular to Joint at 24 Hour Average Temperature② of:			"C" (min.) Perpendicular to Joint at 24 Hour Average Temperature of 60° F
		40° F	60° F	80° F	40° F	60° F	80° F	
1	4"	2 15/16"	2 1/2"	2 3/16"	2 5/16"	2"	1 11/16"	2 1/4" +/-
4	4"	2 15/16"	2 1/2"	2 1/16"	2 1/16"	2"	1 9/16"	2 1/4" +/-
7	4"	2 11/16"	2 1/2"	2 5/16"	2 3/16"	2"	1 13/16"	2 1/4" +/-

② 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.

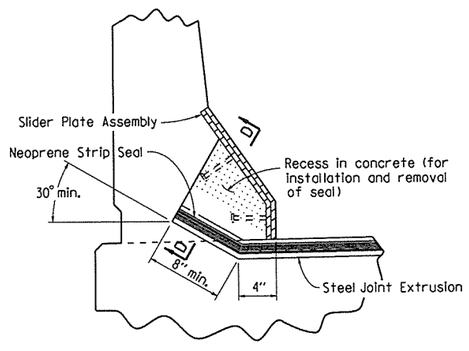


CHANNEL CONNECTION DETAIL



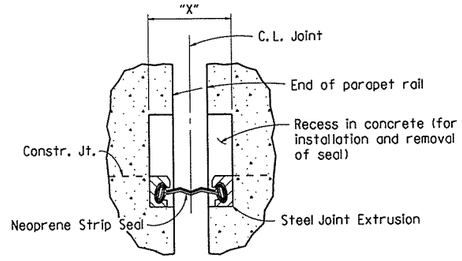
Note: Dimension "X" equals the width of opening in parapet at curb to allow for removal or repair of joint.

DETAIL OF PARAPET SLIDER PLATES

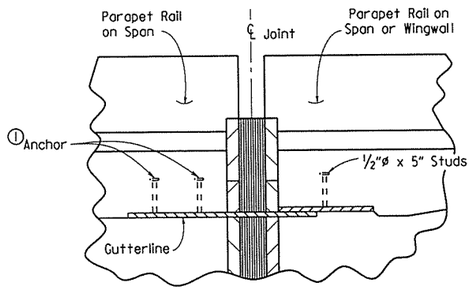


Note: Details of Joint turn-up in parapet are general and show basic design controls only.

SECTION B-B



SECTION D-D



SECTION C-C

① The method of attachment of the slider plate assembly must be such that it may be removed to provide for future replacement of the neoprene seal. Anchors will not be paid for directly, but shall be considered subsidiary to "Structural Steel in Beam Spans (M 270, Gr. 50W)" or "Structural Steel in Plate Girder Spans (M 270, Gr. 50W)".

Method of installation and fabrication shall be determined by the Manufacturer.

STATE OF ARKANSAS
Charles R. Ellis
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No. 9235
6-13-16
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BRIDGE ENGINEER

SHEET 2 OF 2
DETAILS COMMON TO PLATE GIRDER AND W-BEAM UNITS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

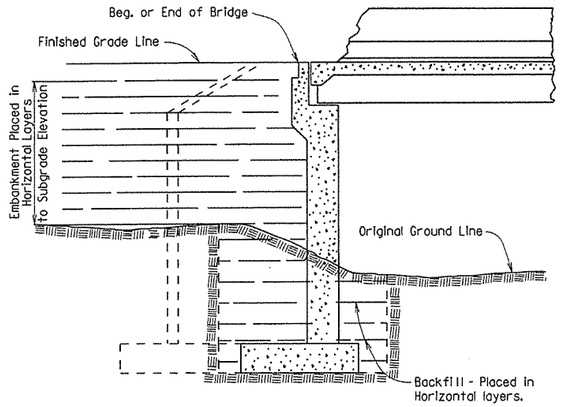
LITTLE ROCK, ARK.

DRAWN BY: JYP DATE: 10-1-14
CHECKED BY: AGP DATE: 6-7-16
DESIGNED BY: JYP/LSP DATE: 9-14
FILENAME: b040623_sl.dgn
SCALE: No Scale

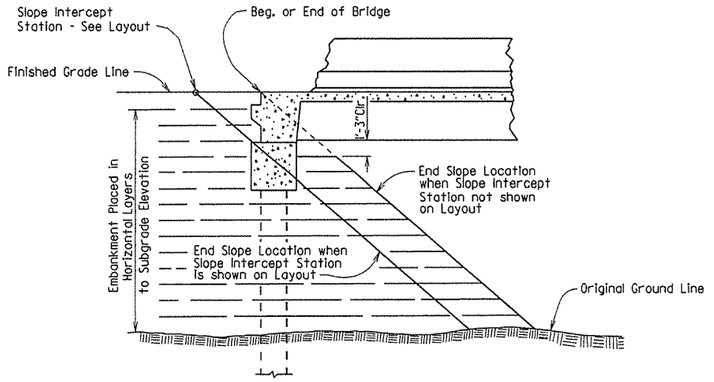
BRIDGE NO. 07373 DRAWING NO. 57983

PRINT DATE: 6/9/2016

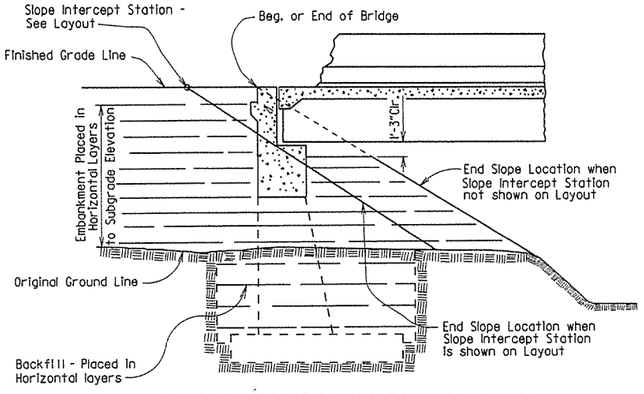
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		63	
				JOB NO.				
				(1) EMBANKMENT & BACKFILL			55000	



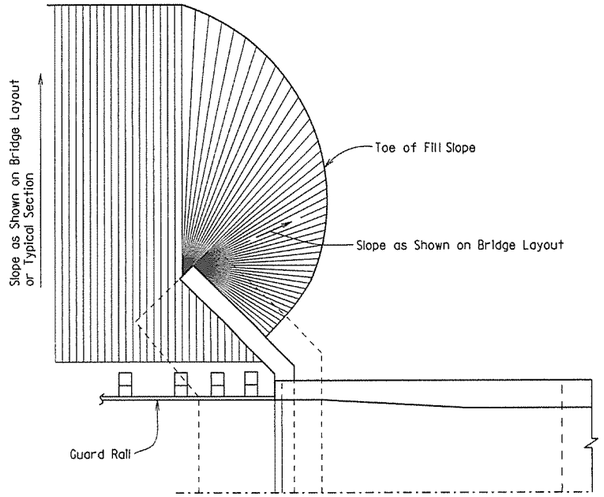
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT VERTICAL WALL ABUTMENTS



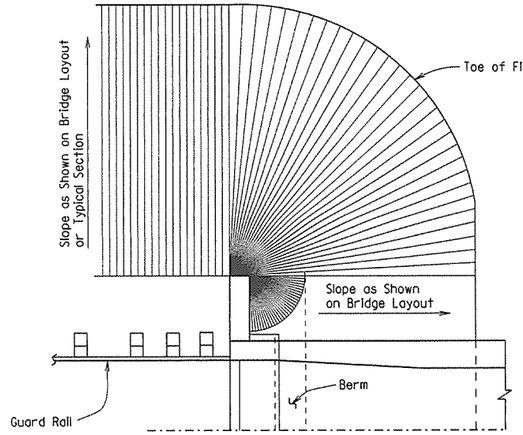
EMBANKMENT CONSTRUCTION AT SPILL-THROUGH PILE END BENTS



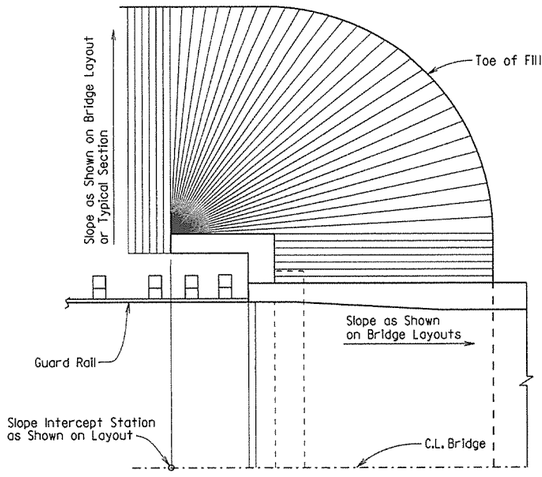
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT SPILL-THROUGH END BENTS



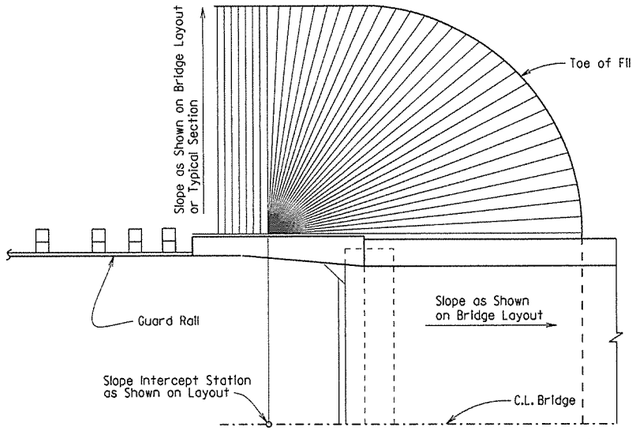
VERTICAL WALL ABUTMENTS



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.

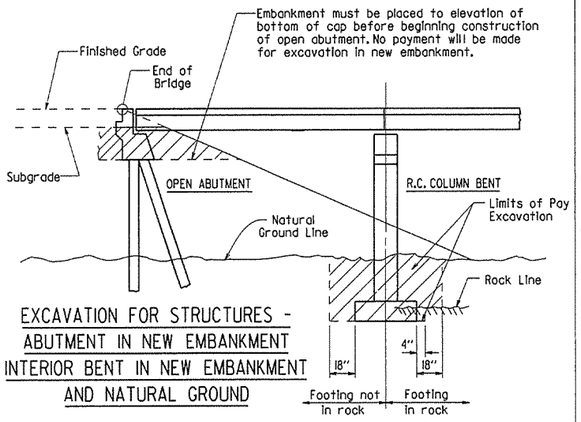
DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55000.dgn

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

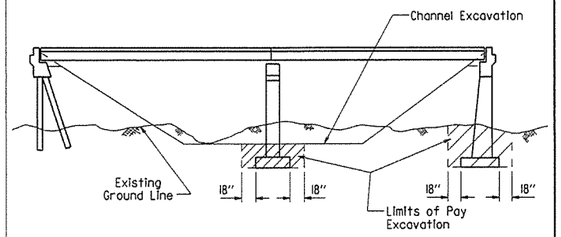
DESIGNED BY: STD. DATE: -

DRAWING NO. 55000

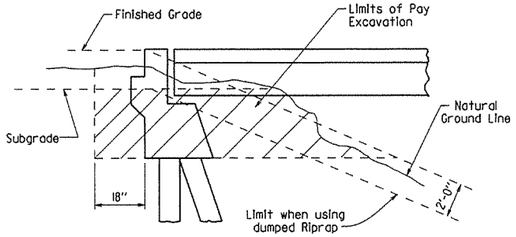
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		64	
				JOB NO.				
				RIPRAP & EXCAV. 55001				



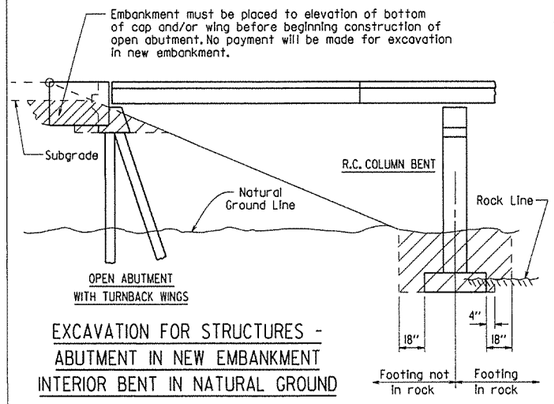
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NEW EMBANKMENT AND NATURAL GROUND



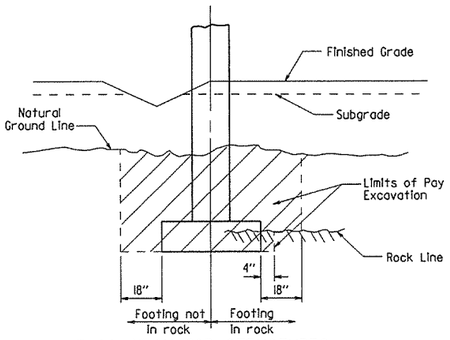
EXCAVATION FOR STRUCTURES - BRIDGE LOCATION WITH DESIGNATED CHANNEL CHANGE



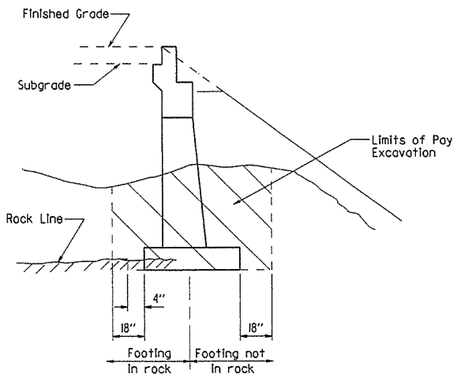
EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND



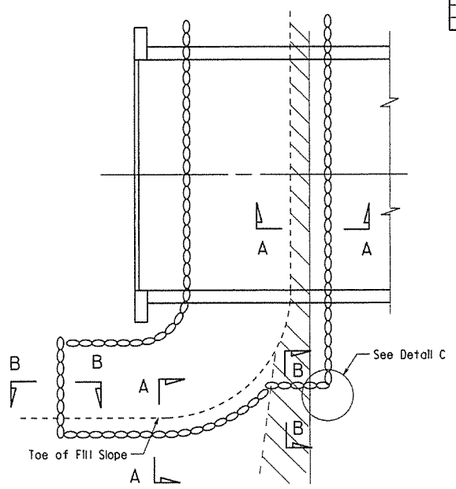
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NATURAL GROUND



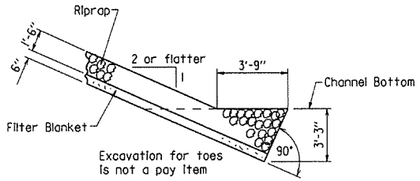
EXCAVATION FOR STRUCTURES - BENT IN ROADWAY FILL SECTION AND NATURAL GROUND



EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND AND NEW EMBANKMENT

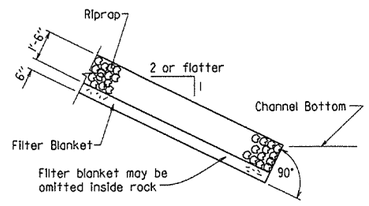


PLAN OF DUMPED RIPRAP



SECTION A-A

(Toe Excavation In Soil)



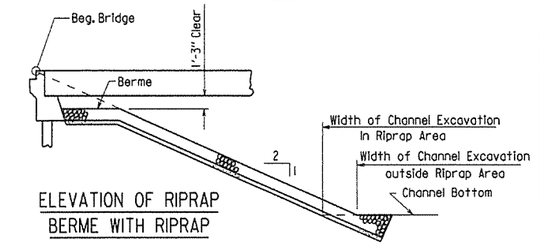
SECTION A-A

(Toe Excavation In Rock)

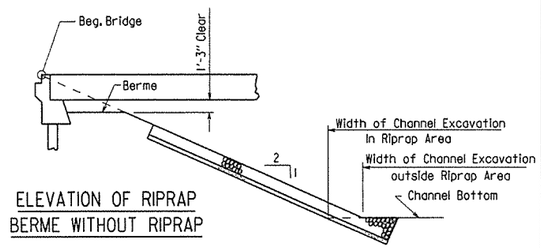
Note : Use this type of toe when rock is encountered which is in a stable condition.

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.

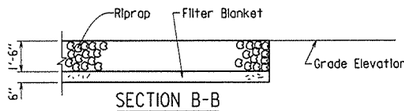
Note : Details for computing excavation for structures are included for information as to how plan quantities were calculated and for use when adjusting quantities when changing footing elevation.



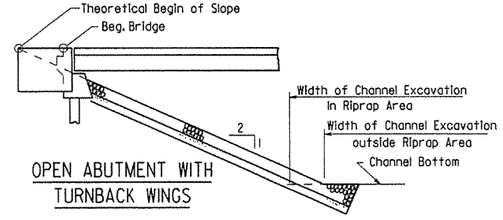
ELEVATION OF RIPRAP BERME WITH RIPRAP



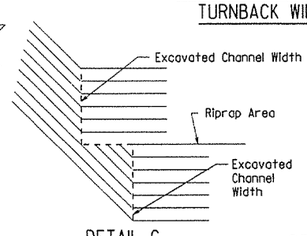
ELEVATION OF RIPRAP BERME WITHOUT RIPRAP



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.

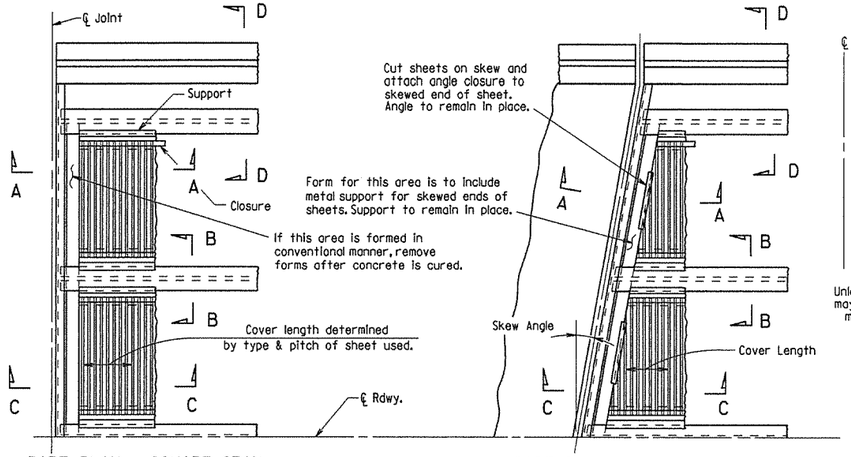
DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55001.dgn

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
3/24/16				6	ARK.		65	
				JOB NO.				
				①	BRIDGE DECK FORMS		55005	

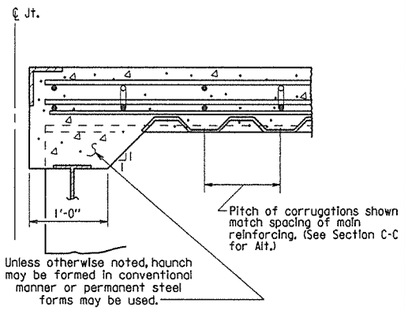


PART PLAN - SQUARE SPAN

3/8" = 1'-0"

PART PLAN - SKEWED SPAN

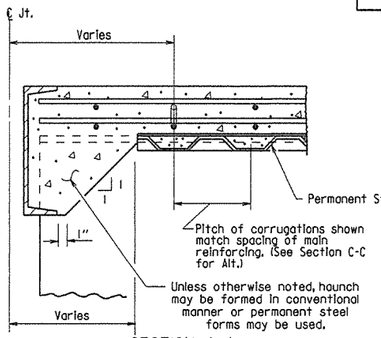
3/8" = 1'-0"



SECTION A-A

N.T.S.

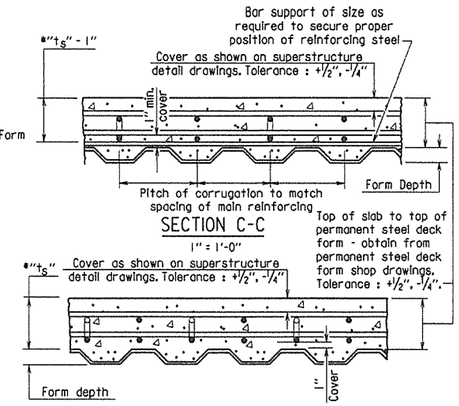
(Angle at end of span)



SECTION A-A

N.T.S.

(Channel at end of span)



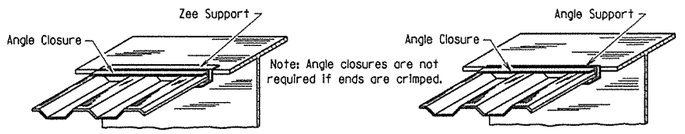
SECTION C-C

1" = 1'-0"

SECTION C-C - ALTERNATE

1" = 1'-0"

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



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.

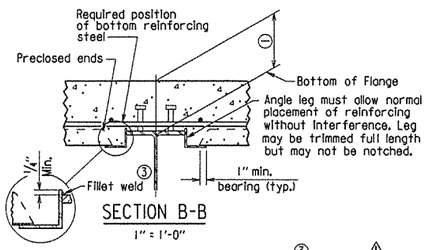
Form sheets shall be fastened to supporting members and to each other with galvanized metal screws sufficient in size and number to provide a secure attachment. Alternate methods of attachment must be approved by the Engineer.

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.

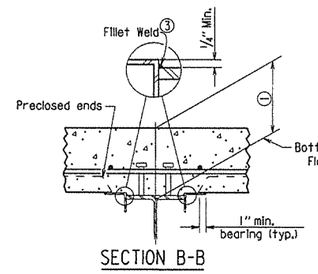


SECTION B-B

1" = 1'-0"

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

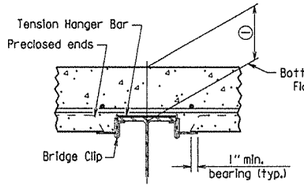
③ ⚠ Minimum weld: ⅛" x 1" ℄ 18". More weld may be required; maximum length per weld = 1½" (typ.)



SECTION B-B

1" = 1'-0"

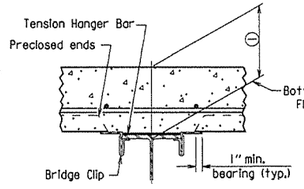
(Showing permissible support for tension flange where shear connectors are used and for all compression flanges)



SECTION B-B

1" = 1'-0"

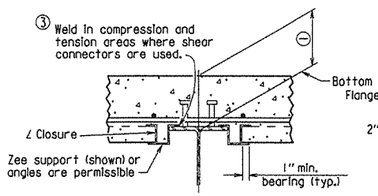
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

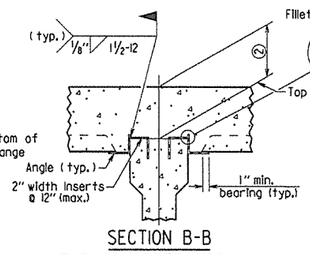
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

(Showing ∠ Closure)

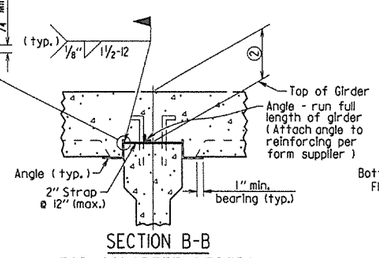


SECTION B-B

(FOR CONCRETE GIRDERS)

1" = 1'-0"

(Showing support by Insert cast in girder)

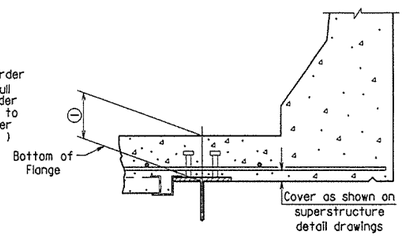


SECTION B-B

(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 + 1¾" + 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.

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

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
				6	ARK.		66	
				JOB NO.				
			①		GENERAL NOTES		55006	

GENERAL NOTES

These GENERAL NOTES are applicable unless otherwise shown in the Plan Details, Special Provisions, or Supplemental Specifications.

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: See Bridge Layout(s).

SUPERSTRUCTURE NOTES:

MATERIALS AND STRENGTHS:

Class S(AE) Concrete	f'c =	4,000 psi
Reinforcing Steel (Gr. 60, AASHTO M 31 or M 322, Type A)	fy =	60,000 psi
Structural Steel (AASHTO M 270, Gr. 36)	Fy =	36,000 psi
Structural Steel (AASHTO M 270, Gr. 50)	Fy =	50,000 psi
Structural Steel (AASHTO M 270, Gr. 50W)	Fy =	50,000 psi
Structural Steel (AASHTO M 270, Gr. HPS70W)	Fy =	70,000 psi

See Plan Details for Grade(s) of Structural Steel required.

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 shall be chamfered ¾" unless otherwise noted.

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 Drawing No. 55005 for allowable modifications and for tolerances when Permanent Steel Bridge Deck Forms are used.

Use of a longitudinal screed is not permitted on any span of a bridge deck with horizontal curvature.

The concrete deck (roadway surface) shall be given a tine finish in accordance with Subsection 802.19 for Class 5 Tined Bridge Roadway Surface Finish. Sidewalks shall receive a broomed finish as specified for final finishing in Subsection 802.19 for Class 6 Broomed 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. When permitted, the use of a longitudinal strike-off will require that a vertical camber adjustment be made in the strike-off to account for the future dead load deflection due to any railings, median barrier, and sidewalks.

REINFORCING STEEL:

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

STRUCTURAL STEEL (COMMON TO W-BEAMS AND PLATE GIRDERS):

Structural steel shall be AASHTO M 270 with grade and payment as specified in the plans. Grade 50W steel shall not be painted and all exposed surfaces shall be cleaned in accordance with Subsection 807.84(e). Grade 36 and Grade 50 steel shall be painted unless otherwise noted and all exposed surfaces shall be cleaned in accordance with Subsection 807.84. Structural steel completely embedded in concrete may be AASHTO M 270, Gr. 36, Gr. 50 or Gr. 50W unless otherwise noted.

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

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.

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.

Unless otherwise noted, field connections shall be bolted with ¾" ø high-strength bolts using 15/16 " ø open holes. Holes for ¾" ø high-strength bolts may be 15/16 " ø if a washer is supplied for use under both the nut and head of the bolt. The use of oversized holes will not be allowed on main members unless otherwise noted. Bolts shall be placed with heads on the outside face of the exterior beam or girder webs and on the bottom of the beam or girder flanges.

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

When painting is required, all structural steel except galvanized steel and steel completely encased in concrete shall be painted in accordance with Subsection 807.75. The color of paint shall be as specified in the plans.

STRUCTURAL STEEL (W-BEAMS):

All beams and field splice plates, and all diaphragms and connection plates attached to horizontally curved beams 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. ___)".

All beams in continuous units and simple spans with field splices shall be blocked in their true position in the shop in groups as specified in Subsection 807.54(b)(2) with the webs horizontal. The camber, length of sections, distance between bearings, and openings of joints shall be measured and this information shall become part of the permanent records. The component parts shall be match marked in this assembly and these marks shall be shown on the erection diagram.

All beams in simple spans without field splices shall be blocked in their true position with webs horizontal. The camber, distance between bearings, and openings of joints shall be measured and this information shall become part of the permanent records.

Flange field splice plates 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.

All beam dimensions are based on a temperature of 60 degrees F. A tolerance of ¼" +/- is allowed for camber.

Bent plate diaphragms for horizontally curved beams 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. Bent plate diaphragms for straight beams may be cut and fabricated in accordance with Subsection 807.35 or as required for horizontally curved beams.

Unless otherwise noted, 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.

STRUCTURAL STEEL (PLATE GIRDERS):

All references to cross-frames shall include "X" or "K" types.

All girder web and flange plates, all field splice plates, and all diaphragms, cross-frames and connection plates attached to horizontally curved girders 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 Plate Girder Spans (M 270, Gr. ___)".

All girders in continuous units and simple spans with field splices shall be assembled in the shop as specified in Subsection 807.54(b)(2) and blocked in their true position with webs horizontal. The camber, length of sections, distance between bearings, and openings of joints shall be measured and this information shall become part of the permanent records. The component parts shall be match marked in this assembly and these marks shall be shown on the erection diagram.

All girders in simple spans without field splices shall be blocked in their true position with webs horizontal. The camber, distance between bearings, and openings of joints shall be measured and this information shall become part of the permanent records.

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

Girder webs may be made by shop splicing with minimum lengths of 25 feet for sections. Flange plates longer than 50 feet may be made by shop splicing with minimum lengths of 25 feet for sections. No additional payment will be made for shop welded splices.

All girder dimensions are based on a temperature of 60 degrees F. A tolerance of ¼" +/- is allowed for camber.

Groove welds in web and flange plates shall be Quality Control (Q.C.) tested by nondestructive testing, as required in Subsection 807.23(b). Fillet welds at flange to web plate connections shall be Q.C. tested by the magnetic particle method. All Q.C. testing shall be considered subsidiary to the item "Structural Steel in Plate Girder Spans (M 270, Gr. ___)".

Bent plate diaphragms for horizontally curved girders 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. Bent plate diaphragms for straight girders may be cut and fabricated in accordance with Subsection 807.35 or as required for horizontally curved girders.

Unless otherwise noted, cross-frames and diaphragms shall be installed as girders are erected. All bolts in cross-frames, diaphragms, and field splices shall be installed and tightened in accordance with Subsection 807.71 prior to pouring the concrete deck.

SUBSTRUCTURE NOTES:

CONCRETE:

Unless otherwise noted, concrete in caps, columns and footings (except seal footings) shall be Class "S" with a minimum 28 day compressive strength f'c = 3,500 psi and shall be poured in the dry. Seal Concrete for footings shall have a minimum 28 day compressive strength f'c = 2,100 psi.

Concrete in drilled shafts shall be Class "S" as modified by Job SP "Drilled Shaft Foundations".

All exposed corners shall be chamfered ¾" unless otherwise noted.

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.

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

STRUCTURAL STEEL:

Structural steel in end bents shall be AASHTO M 270 with grade and payment as specified in the plans.

FOR ADDITIONAL INFORMATION AND NOTES, SEE LAYOUT(S) AND PLAN DETAILS.

FOR ADDITIONAL INFORMATION AND NOTES, SEE LAYOUT(S) AND PLAN DETAILS.

STANDARD GENERAL NOTES
FOR STEEL BRIDGE STRUCTURES

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 9-2-2015 FILENAME: b55006.dgn
CHECKED BY: B.E.F. DATE: 9-2-2015 SCALE: NO SCALE
DESIGNED BY: STD. DATE:

DRAWING NO. 55006

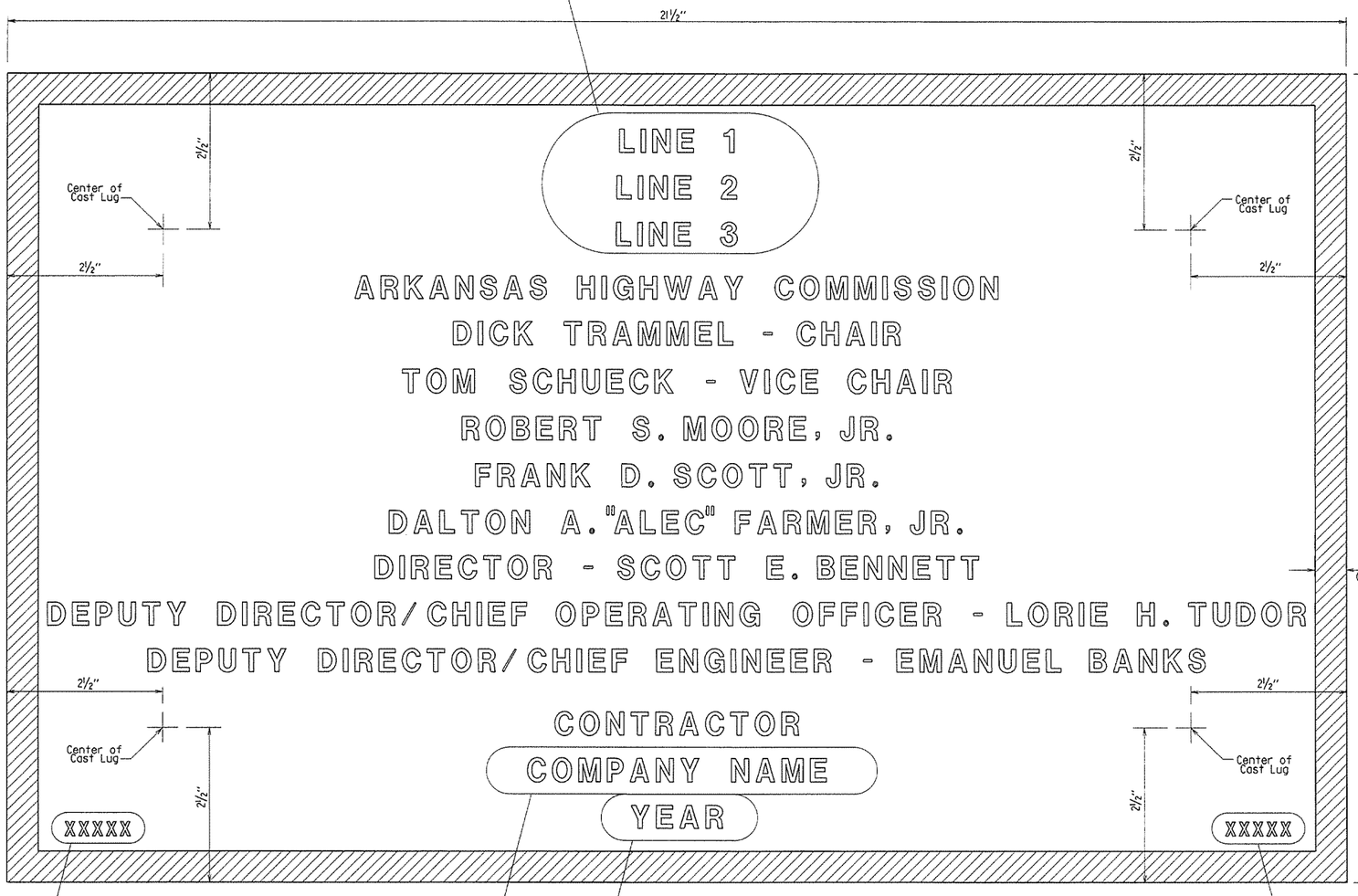
PRINT DATE: 9/10/2015

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.		67	
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	



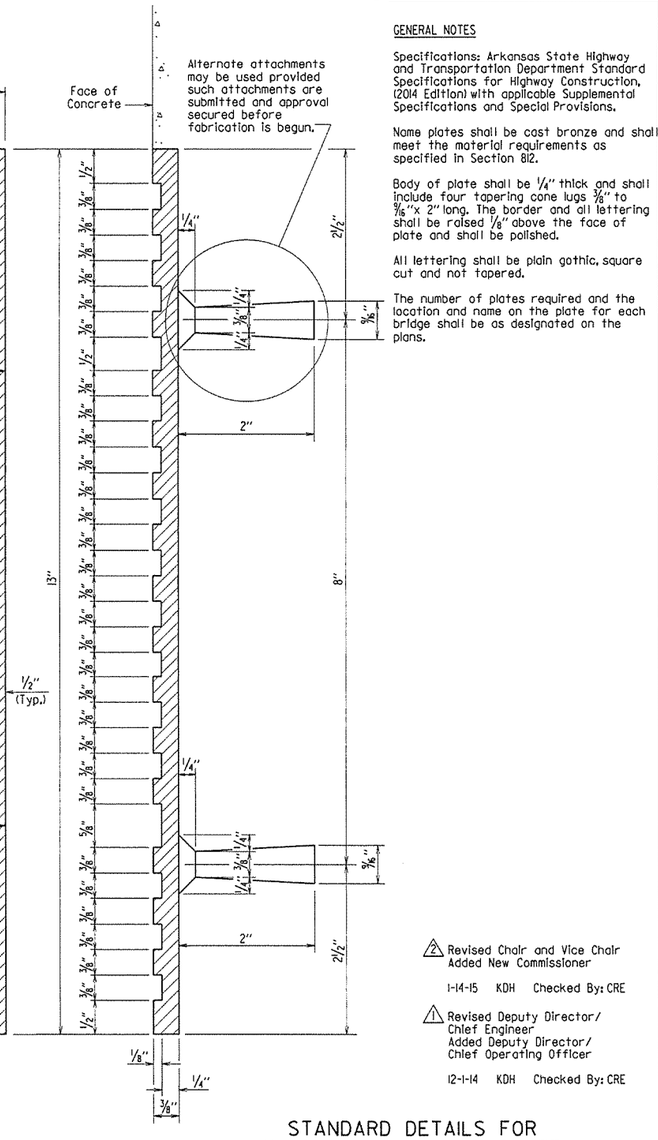
Place the design live loading here using 1/8" raised letters and numerals 1/4" high. Examples : HS 20
HL-93

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 : A1234
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 5/8"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
3/24/16				6	ARK.		68	
				JOB NO.				
						STEEL H-PILES		55020

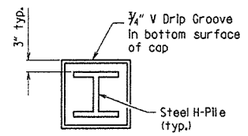
GENERAL NOTES FOR STEEL H-PILES:

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

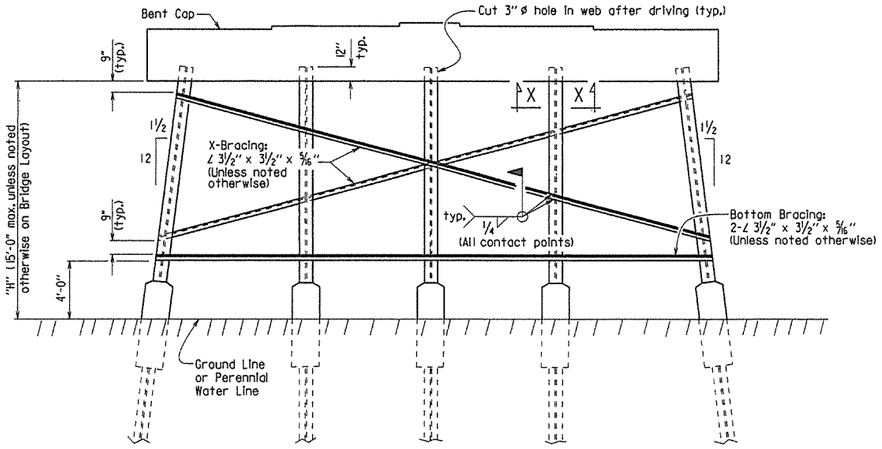
See Bridge Layout and Bent Details for pile size, estimated length, spacing, pile anchorage (if required) and for driving information.

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.

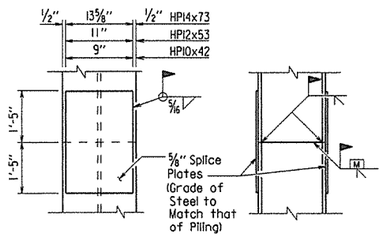
Omit X-Bracing and Bottom Bracing when "H" is 5 feet or less.

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)



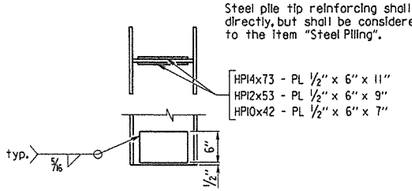
The Contractor may for his own convenience and at his own expense provide as many as three splices per pile. Minimum spacing between splices shall be 5 feet.

TYPICAL SPLICE DETAILS

⚠ H-pile splicers manufactured by Associated Pile and Fitting Corporation, LB Foster Piling, Skyline Steel or equivalent may be used in lieu of the "Typical Splice Details" shown. H-pile splicers shall match the same grade of steel specified for the piling and shall be welded to the pile with a 5/16" fillet weld around the entire perimeter of the splice. Flanges shall be welded with a complete penetration groove weld complying with AASHTO/AWS Joint Designation B-U4a or B-U4b. All welding shall conform to Subsection 807.26 of the AHTD Standard Specifications for Highway Construction (2014 Edition).

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:

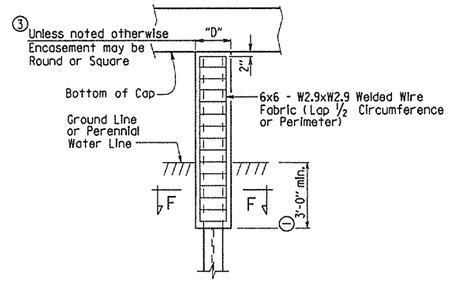
⚠ See Bridge Layout for additional notes, any pile encasement restrictions and required location of pile encasements.

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.

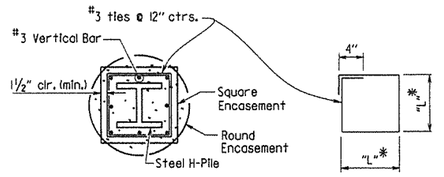
Welded Wire Fabric shall conform to AASHTO M 55 or M 221. Galvanized Corrugated Steel Pipe shall conform to AASHTO M 36 and M 218.

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)

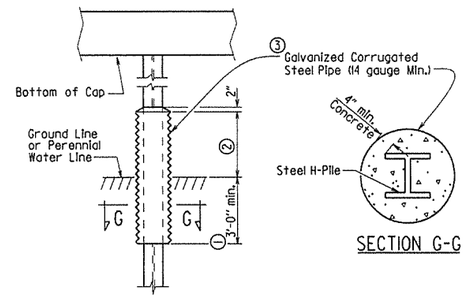


SECTION F-F

*Measured out-to-out of bar.

TABLE OF VARIABLES FOR PILE ENCASEMENT

Pile Size	"D" Square Encsmt.	"D" Round Encsmt.	"L"*
HPI0x42	1'-7"	2'-0"	1'-4"
HPI2x53	1'-8"	2'-2"	1'-5"
HPI4x73	1'-11"	2'-6"	1'-8"



SECTION G-G

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.

⚠ Added alternate method of splicing H-piles and revised pile encasement note.
3/24/2016 AMS

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

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

BRIDGE ENGINEER

STANDARD DETAILS FOR STEEL H-PILES AND PILE ENCASEMENTS

ARKANSAS STATE HIGHWAY COMMISSION

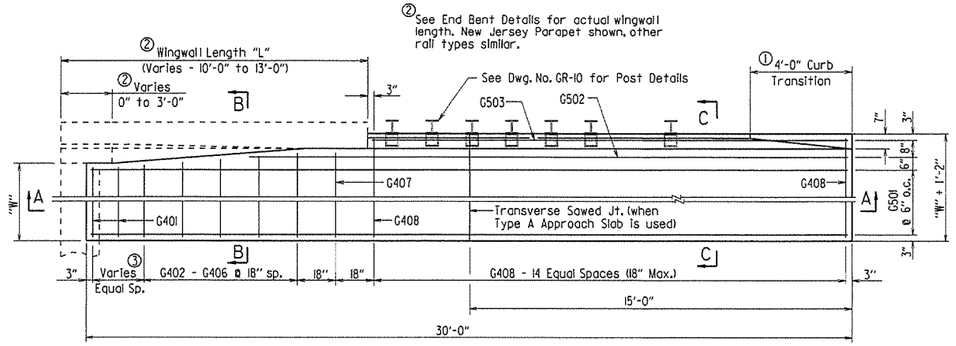
LITTLE ROCK, ARK.

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

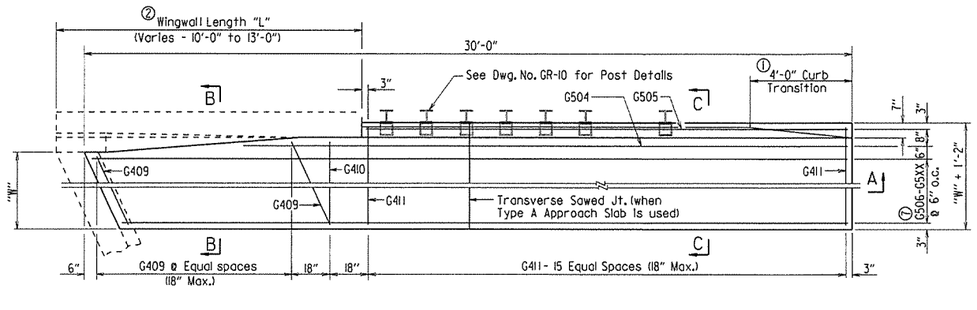
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
9/2/15				6	ARK.		69	
				JOB NO.				

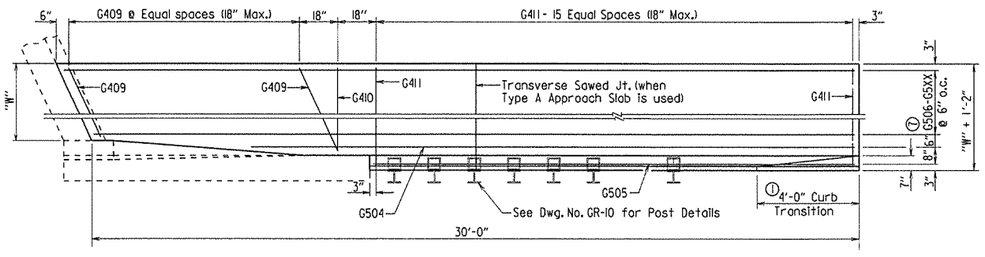
① TYPE A GUTTERS 55030A



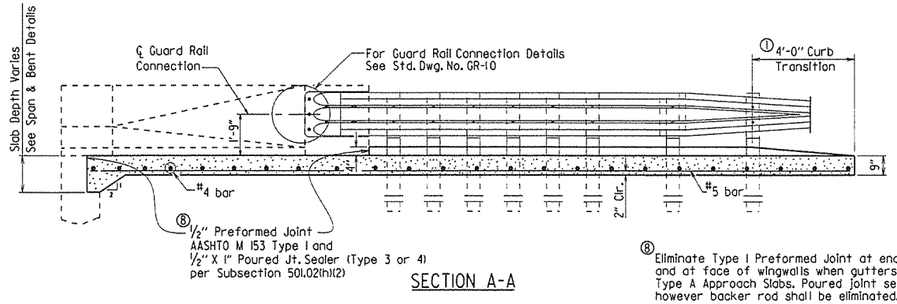
③ Number of G401 bars vary with wingwall length - See Bar List

HALF PLAN OF APPROACH GUTTERS FOR SQUARE BRIDGE





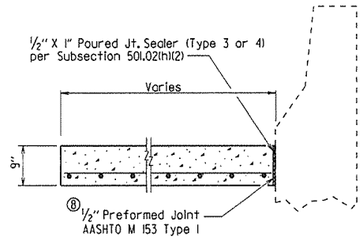
PLAN OF APPROACH GUTTERS FOR SKEWED BRIDGE



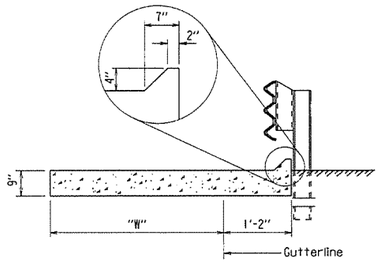
SECTION A-A

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" ⚠ 2'-0"	3'-0"	4'-0"	6'-0"	8'-0"	Length
Square Bridge	G401	④	④	④	④	④	"W"- 4"
	G402-G406	1 each	1 each	1 each	1 each	1 each	"W"-3" to "W"+2"
	G407	1	1	1	1	1	"W"+3"
	G408	15	15	15	15	15	"W"+ 10"
	G501	4	6	8	12	16	29'-8"
	G502	1	1	1	1	1	(35'-5") - "L"
	G503	1	1	1	1	1	30'-8"-"L"
Skewed Bridge	G409	⑥	⑥	⑤	⑥	⑥	⑤
	G410	1	1	1	1	1	"W"+3"
	G411	16	16	16	16	16	"W"+ 10"
	G504	1	1	1	1	1	⑤
	G505	1	1	1	1	1	⑤
	G506 - G5XX ⑦	1 each	1 each	1 each	1 each	1 each	⑤

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

⑦ G509 for "W" = 2' ⚠
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.)
2	210	2.55
3	285	3.40
4	360	4.25
6	515	5.90
8	665	7.55

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

GENERAL NOTES

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

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

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

⚠ Revised to add "W" = 2'-0" ; By LJB
Checked By: KWY 9/2/15

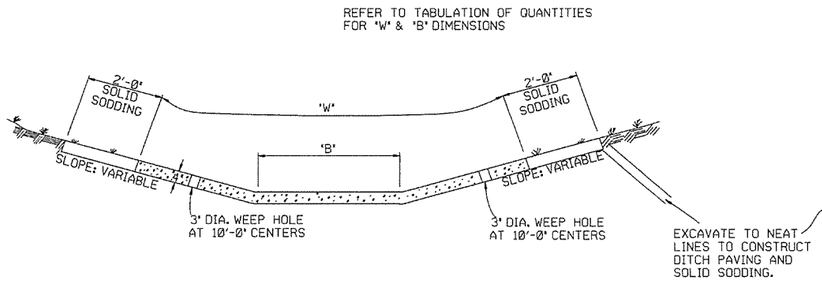
STANDARD DETAILS FOR TYPE A APPROACH GUTTERS

ARKANSAS STATE HIGHWAY COMMISSION

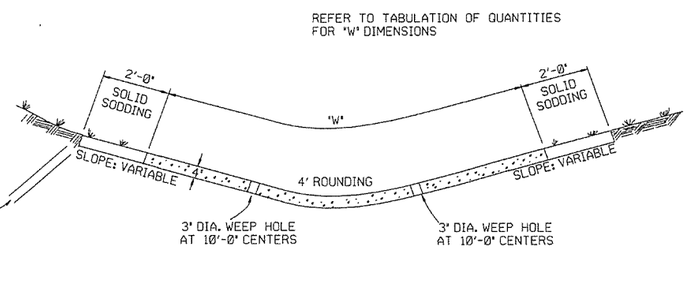
LITTLE ROCK, ARK.

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

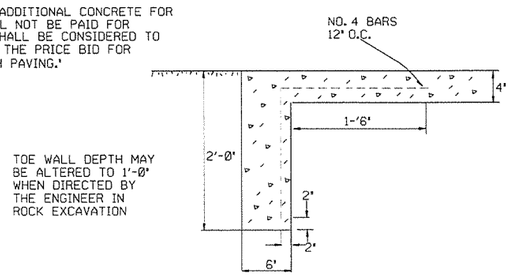


TYPE A



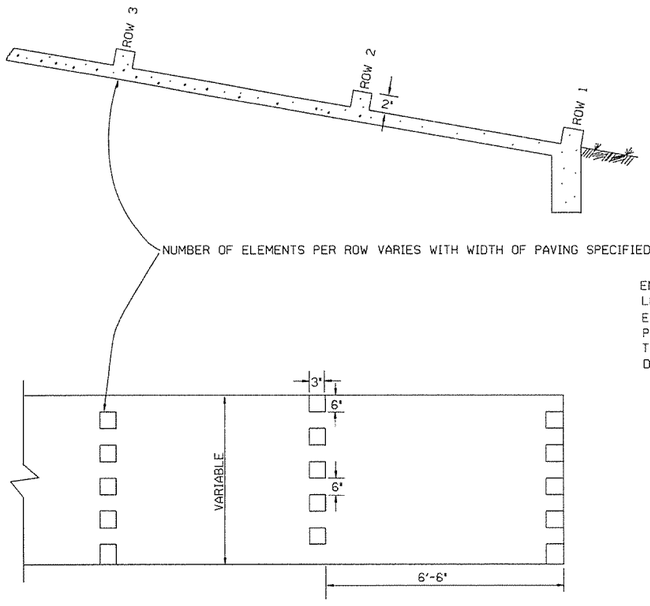
TYPE B

THE STEEL AND ADDITIONAL CONCRETE FOR THE WALLS SHALL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID FOR 'CONCRETE DITCH PAVING.'



TOE WALL DEPTH MAY BE ALTERED TO 1'-0" WHEN DIRECTED BY THE ENGINEER IN ROCK EXCAVATION

TOE WALL DETAIL FOR CONCRETE DITCH PAVING



ENERGY DISSIPATORS
(NO SCALE)

ENERGY DISSIPATORS TO BE USED FOR THE ENTIRE LENGTH OF DITCH WHEN SLOPE OF DITCH PAVING EXCEEDS 7%. THE DISSIPATORS WILL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED TO BE UNCLUDED IN THE PRICE BID FOR CONCRETE DITCH PAVING.

GENERAL NOTES:

THE FULL WIDTH OF EACH SECTION SHALL BE POURED MONOLITHICALLY.

TOE WALLS TO BE CONSTRUCTED FULL WIDTH AT EACH END OF DITCH PAVING, AND POURED MONOLITHICALLY.

SOLID SOD ALONG DITCH PAVING TO BE PLACED WITHIN 14 DAYS OF DITCH PAVING CONSTRUCTION.

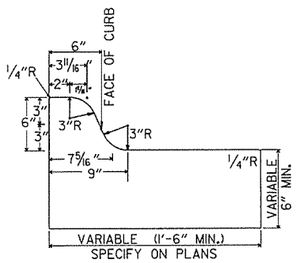
1" WIDE TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE DITCH PAVING AT 45' INTERVALS. THE SPACE SHALL BE FILLED WITH APPROVED JOINT FILLER COMPLYING WITH AASHTO M213.

DATE	REVISION	DATE FILM'D
11-17-10	ADDED GENERAL NOTE	
6-2-94	ADDED GENERAL NOTE ABOUT SOLID SODDING	
11-30-8	ELIMINATED MIN. ROWS OF ELEMENTS	111-30-89
7-15-88	REVISED DISSIPATOR NOTE	663-7-15-88
4-3-87	REVISED ENERGY DISSIPATOR	671-4-3-87
1-9-87	MODIFIED NOTE ON ENERGY DISS.	532-1-9-87
11-3-86	ADDED NOTE TO ENERGY DISS.	599-12-1-86
11-1-84	ENERGY DISSIPATOR DETAILS ADDED	508-11-1-84
11-1-84	EXCAVATION DETAILS ADDED TYPED A & B	
10-2-72	REVISED AND REDRAWN	508-10-2-72

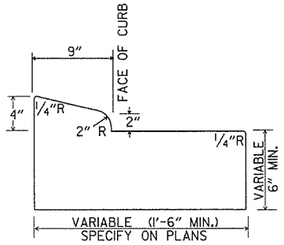
ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE DITCH PAVING

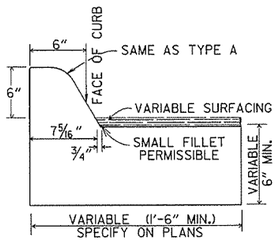
STANDARD DRAWING CDP-1



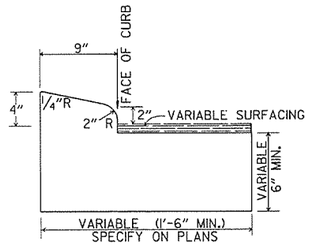
TYPE A



TYPE B-1



TYPE C



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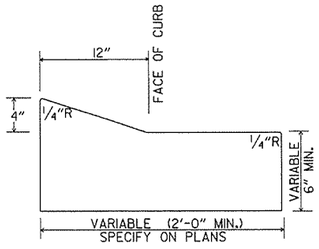
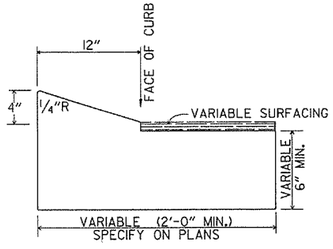
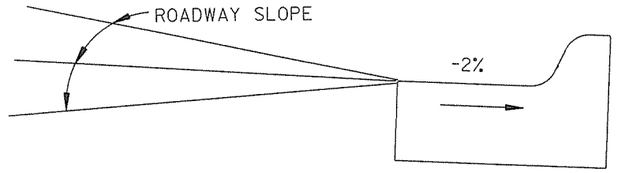


TYPE E-1



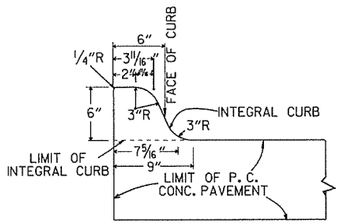
TYPE E-2

CONCRETE COMBINATION CURB AND GUTTER

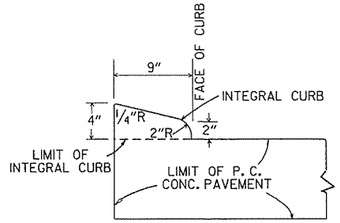


DETAIL OF GUTTER SLOPE

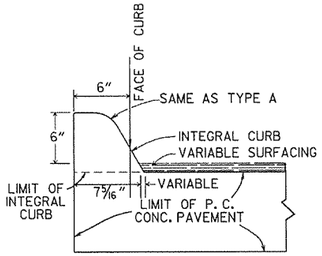
GUTTER SHALL BE CONSTRUCTED ON 2% SLOPE AWAY FROM ROADWAY, REGARDLESS OF ROADWAY SLOPE.



TYPE A

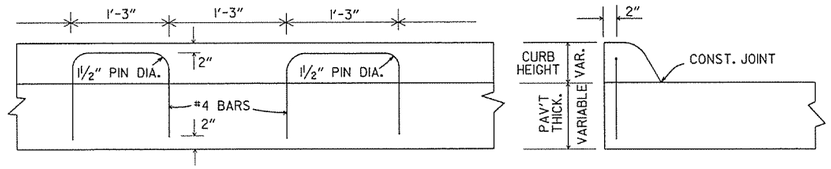


TYPE B



TYPE C

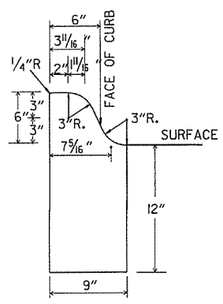
INTEGRAL CURB



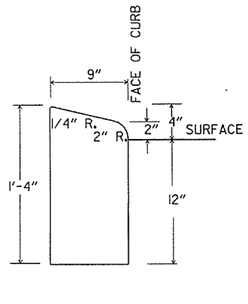
LONGITUDINAL SECTION

ELEVATION

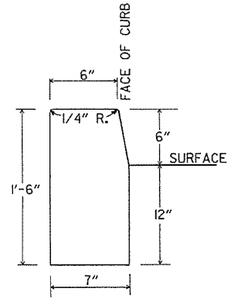
ALTERNATE CONSTRUCTION METHOD FOR INTEGRAL CURB



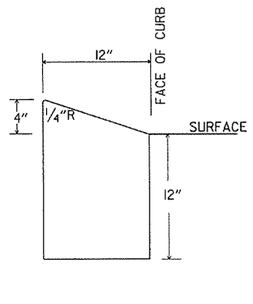
TYPE A



TYPE B

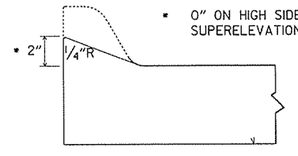


TYPE D



TYPE E

CONCRETE CURB



NOTE: USE MODIFIED CURB AS SPECIFIED ON STD. DR-1. COMPENSATION FOR MODIFIED CURB WILL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE TYPE OF CURB OR CURB AND GUTTER SPECIFIED.

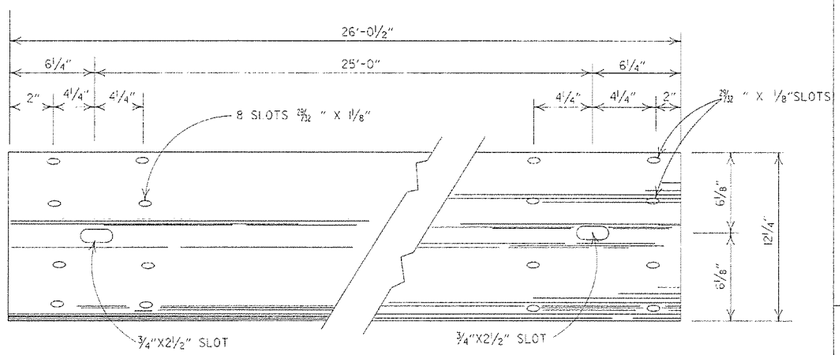
DETAILS OF MODIFIED CURB

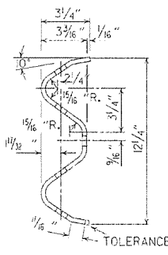
DATE	REVISION	DATE FILMED
11-29-07	REVISED GUTTER SLOPE & MODIFIED CURB DETAILS	
11-10-05	ADDED DETAILS OF TYPE E CURBS	
11-16-01	REVISED CONCRETE CURB TYPE B	
11-18-98	REVISED MODIFIED CURB	
6-2-94	ADDED NOTE TO SPECIAL MODIFIED CURB	
8-5-93	CORRECTED GUTTER SLOPE	8-5-93
10-1-92	ADDED DETAILS OF GUTTER SLOPE	10-1-92
5-24-90	ADDED DETAILS OF MODIFIED CURB	5-24-90
11-30-89	VARIBLE DEPTH TYPE A & B I	11-30-89
7-15-88	REVISED MODIFIED CURB	630-7-15-88
11-1-73	REVISED MODIFIED CURB	500-11-1-73
10-2-72	REVISED AND REDRAWN	512-10-2-72

ARKANSAS STATE HIGHWAY COMMISSION

CURBING DETAILS

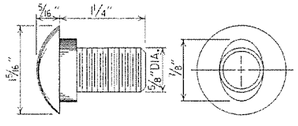
STANDARD DRAWING CG-1



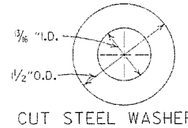


DETAILS OF
W-BEAM GUARD RAIL

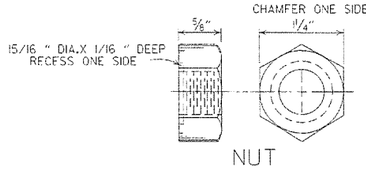
RAIL SECTION OF CLOSELY SIMILAR DIMENSIONS AND COMPARABLE STRENGTH MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.



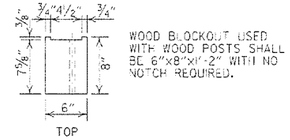
SPLICE BOLT
POST BOLT - SAME EXCEPT LENGTH



CUT STEEL WASHER

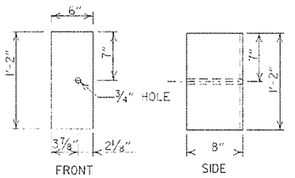


NUT

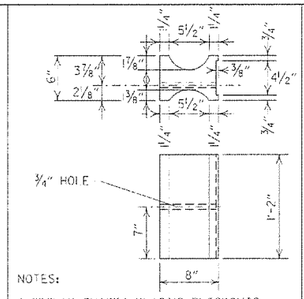


WOOD BLOCKOUT USED WITH WOOD POSTS SHALL BE 6"x8"x1'-2" WITH NO NOTCH REQUIRED.

TOP

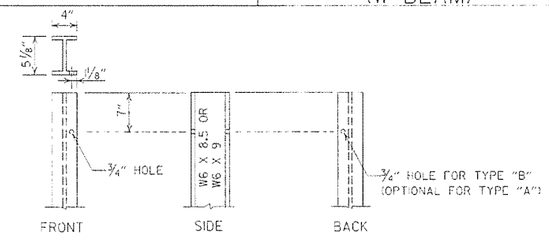


WOOD BLOCKOUT
(W-BEAM)

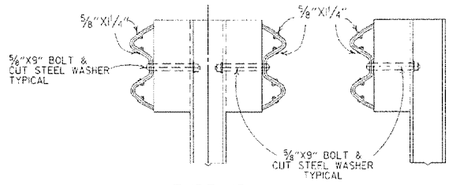


NOTES:
1. SIMILAR SHAPED PLASTIC BLOCKOUTS MAY BE USED AS LONG AS THEY MEET NCHRP-350 TEST LEVEL 3 SPECIFICATIONS OR REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
2. DIMENSIONS ARE SUBJECT TO MANUFACTURERS TOLERANCES.

PLASTIC BLOCKOUT
(W-BEAM)



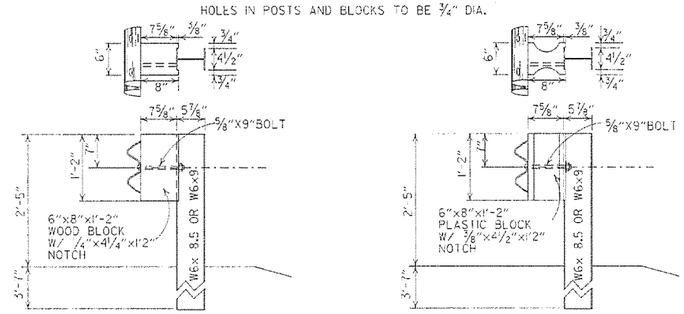
STEEL POST



TYPE "B" TYPE "A"

DETAILS OF STEEL LINE POST CONNECTIONS
(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)

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 9.7f 0400 f OR NO. 1 1350 f SOUTHERN PINE.

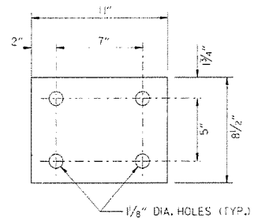
CONTRACTOR SHALL HAVE THE OPTION OF USING WOOD BLOCKOUTS FOR W-BEAM GUARD RAIL OR PLASTIC BLOCKOUTS, AS LONG AS BLOCKOUT USED MEETS NCHRP-350 TEST LEVEL 3 SPECIFICATIONS OR REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) FOR W-BEAM GUARD RAIL.

DATE	REVISION	DATE FILM
7 4 10	RAISED HEIGHT OF GUARD RAIL 1"	
10-15-09	ADDED REFERENCE TO MASH	
4 10 03	REVISED GENERAL NOTES	
8-22-02	REVISED DIMENSION ON WOOD & PLASTIC BLOCKOUT CONNECTIONS & ON STEEL POST	
11-16-01	REVISED WOOD BLOCKOUT & DETAILS OF WOOD LINE POST CONNECTIONS	
3-30-00	REMOVED GUARD RAIL AT BRIDGE ENDS	
1-12-00	ADDED PLASTIC BLOCKOUT	
8-12-98	REV. BLOCKOUTS TO WOOD, DELETED CONC. POST & REV. GENERAL NOTE, DELETED DET. OF GUARD RAIL REPLACE. BEHIND CURB & DET. OF POST PLACE. IN SOLID ROCK, & ADDED DETAILS OF STEEL LINE POST CONN. REMOVED BACK-UP PLATE, REVISED HOLES IN STEEL POLES	
4-3-97	REMOVED "LAP IN DIRECTION OF TRAFFIC" NOTE & PLACED ARROWS ON WASHERS	
10-18-96	REVISED WOOD POST NOTE	
6-2-94	ADDED M.T. 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, CLEV. 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

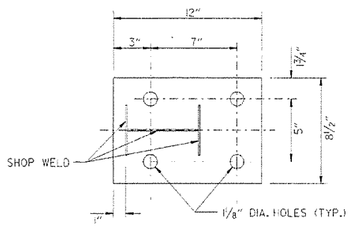
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-8

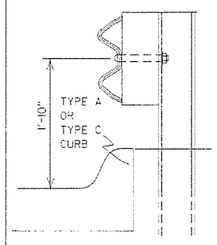


WASHER PLATE



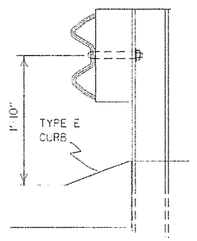
BASE PLATE

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



FOR DESIGN SPEEDS OF 50 MPH OR LESS

ALIGN FACE OF GUARD RAIL WITH FACE OF CURB.

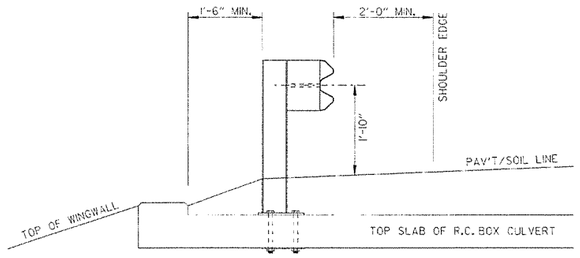


FOR DESIGN SPEEDS OF 55 MPH OR MORE

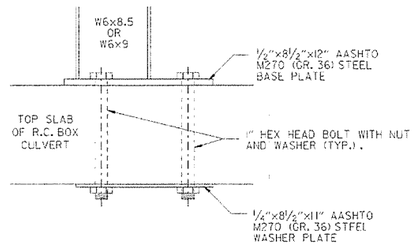
PLACE GUARD RAIL POSTS AGAINST BACK OF CURB.

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

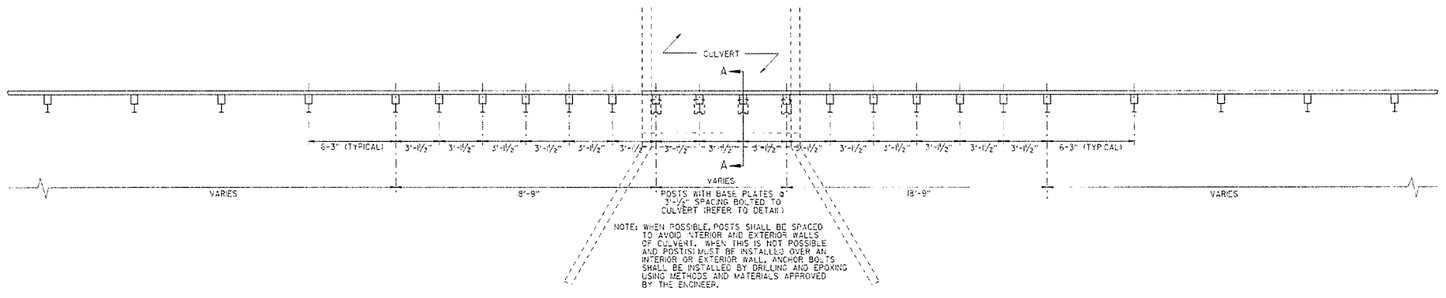
FOR DESIGN SPEEDS OF 50 MPH OR LESS ALL CURB FACES, AS SHOWN ON STD. DRWG. CG-1, MAY BE USED. FOR DESIGN SPEEDS OF 55 MPH OR MORE TYPE "E" CURB FACE SHALL BE USED.



SECTION A-A



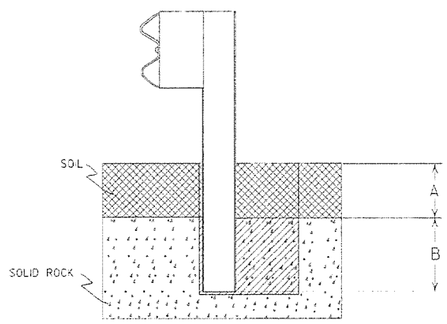
DETAIL OF CONNECTION



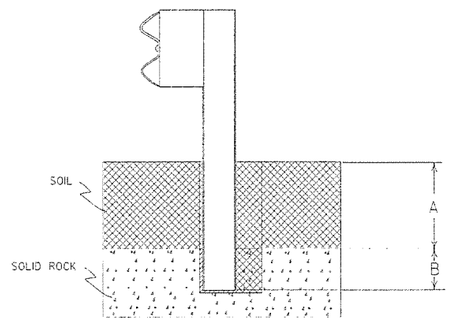
PLAN LAYOUT OF TYPE A GUARD RAIL AT LOW-FILL CULVERTS

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

Case 1

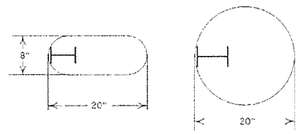


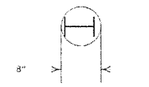
Case 2



Plan View Steel Posts

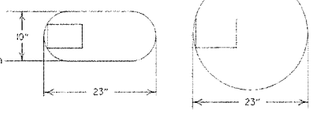
Either hole configuration acceptable

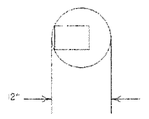




Plan View Wood Posts

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).

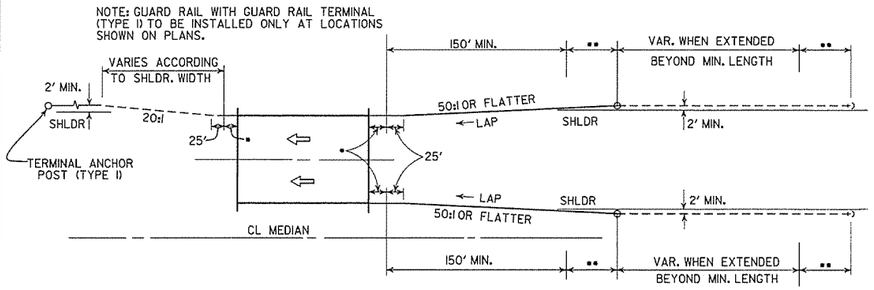
DETAIL OF POST PLACEMENT IN SOLID ROCK (W-BEAM)

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 CULV'T. DELETED DET. OF STEEL LINE POST CONN.& ADDED DET. OF GUARD RAIL PLACE. BEHIND CURB & DET. OF POST PLACE. IN SOLID ROCK	
4-3-96	PLACED ARROWS AT CUT STEEL WASHERS	4-3-96
10-18-96	REV. ASTM REF. TO AASHTO	
11-22-95	ADDED OPTIONAL HOLES	
6-2-94	REVISED ALTERNATE POST SIZE	
8-5-93	REVISED STEEL POST SIZE	
10-1-92	REDRAWN & REVISED	10-1-92
8-2-90	DEL. WASHER ON ANCHOR ASSEMBLY	8-2-90
7-15-88	CONFORMED TO 1988 SPECS	-
3-4-88	REVISED ANCHOR NOTE	
10-30-87	REVISED ANCHOR ASSEMBLY	742-10-30-87
10-30-87	REVISED PLACEMENT BEHIND CURB	547-10-30-87
10-9-87	REDRAWN & REVISED	803-10-9-87

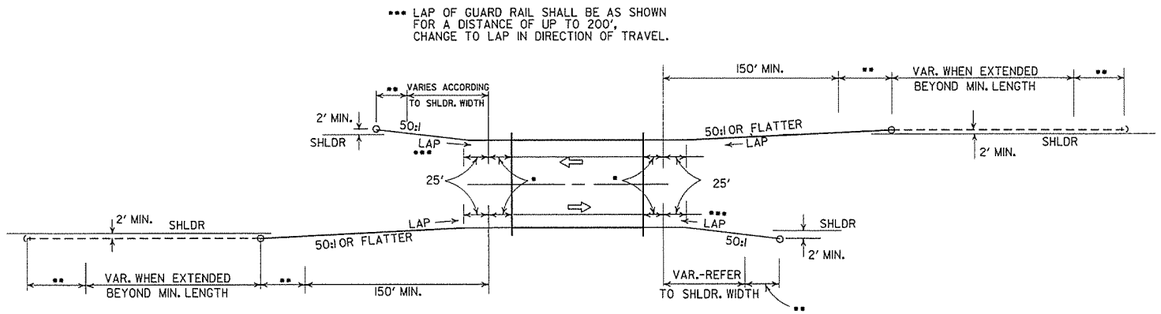
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-8A

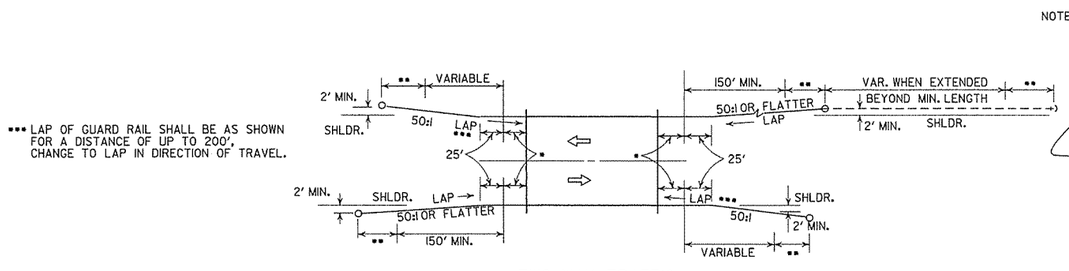


ONE-WAY TRAFFIC

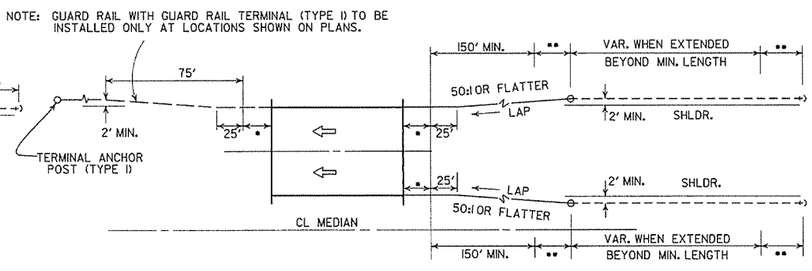


TWO-WAY TRAFFIC

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



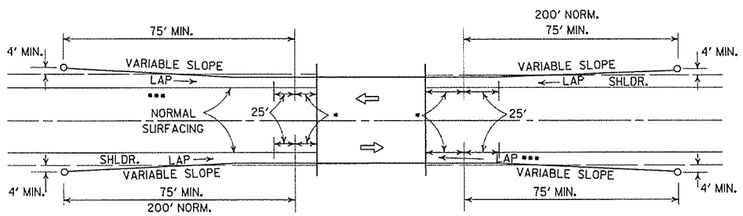
TWO-WAY TRAFFIC



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

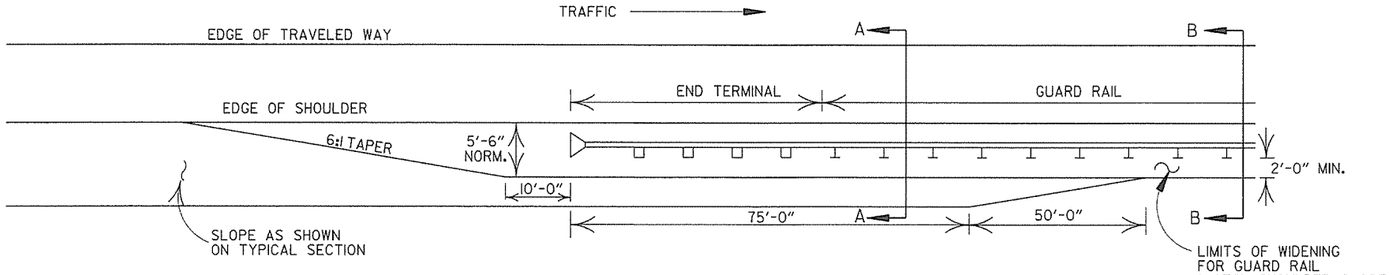
- ▪ THRIE BEAM GUARD RAIL TERMINAL
- ▪▪ GUARD RAIL TERMINAL (TYPE 2)

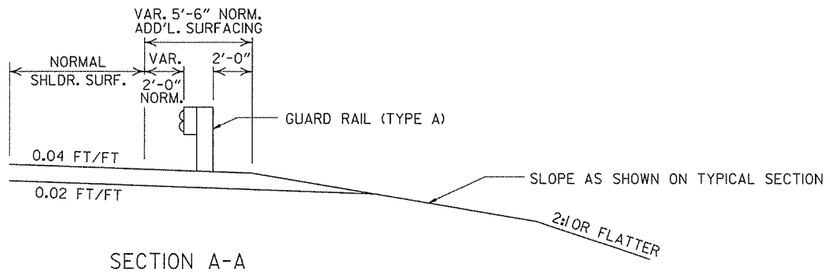
DATE	REVISION	DATE FILM
4-17-08	REVISED LAYOUTS	
11-10-05	REMOVED GUARD RAIL NOTES AND DETAILS	
11-16-01	DELETED NOTE-METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERM. (TY. I)	
1-12-00	ADDED CONSTRUCTION NOTE	1-12-00
6-26-97	REVISED LAYOUT	
10-1-92	REDRAWN & REVISED	10-1-92
	ADDED NOTE	
10-9-87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

ARKANSAS STATE HIGHWAY COMMISSION

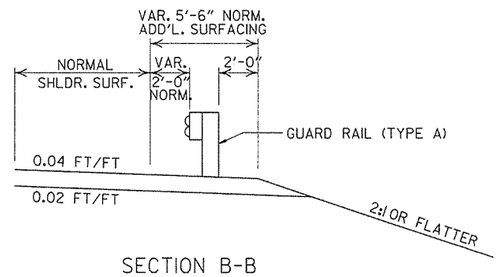
GUARD RAIL DETAILS

STANDARD DRAWING GR-9





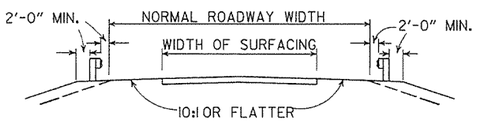
SECTION A-A



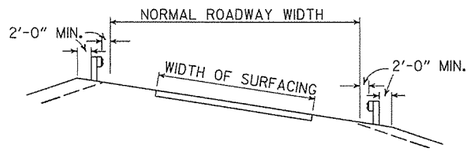
SECTION B-B

DETAILS OF WIDENING FOR GUARD RAIL

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

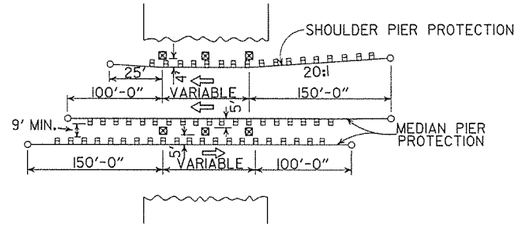


SECTION ON TANGENT



SECTION ON CURVE

DETAILS SHOWING POSITION OF GUARD RAIL ON HIGHWAY



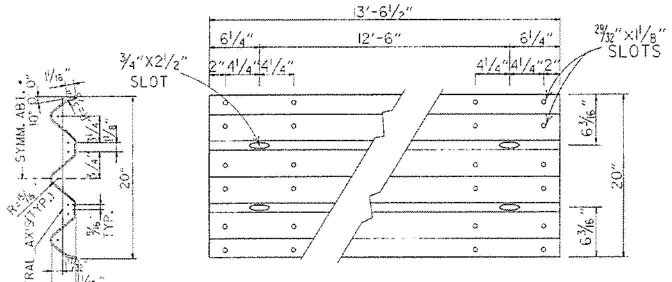
METHOD OF INSTALLATION OF GUARD RAIL AT FIXED OBSTACLE

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

ARKANSAS STATE HIGHWAY COMMISSION

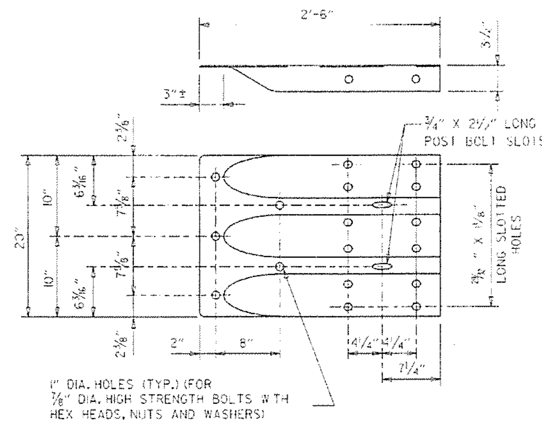
GUARD RAIL DETAILS

STANDARD DRAWING GR-9A

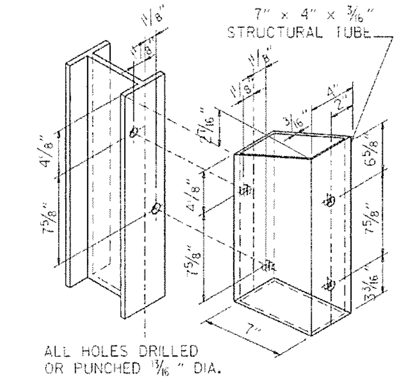


SECTION THRU THRIE BEAM RAIL

THRIE BEAM RAIL

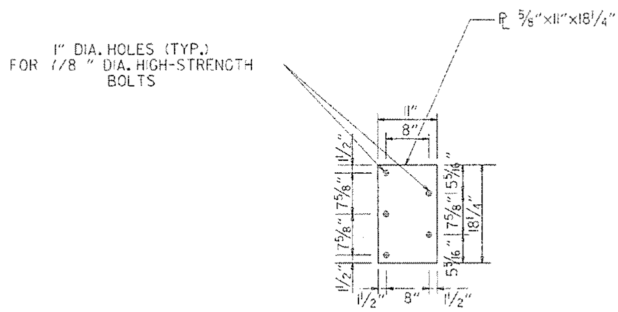


SPECIAL END SHOE



STRUCTURAL STEEL TUBING BLOCKOUT DETAIL

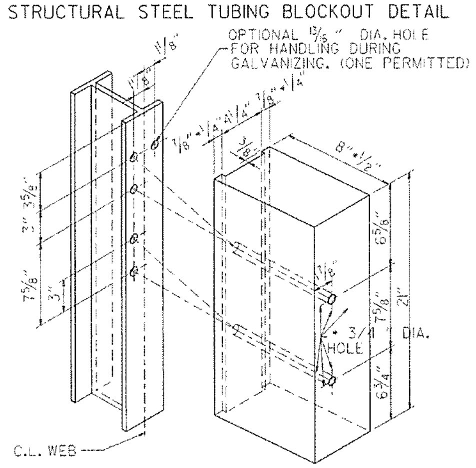
ATTACH BLOCKOUT TO POST USING ⅝" DIA. HEX HEAD BOLTS WITH 1½" O.D. CUT STEEL WASHERS AND NUT.



CONNECTOR PLATE

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.

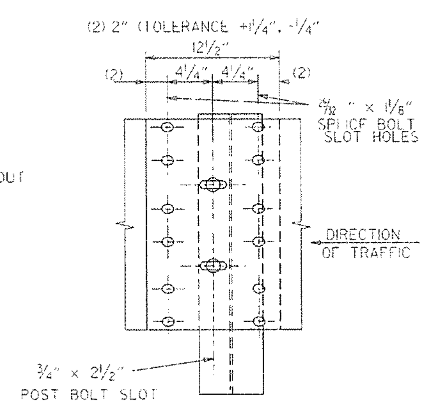
NOTE:
SEE STANDARD DRAWING GR-10A FOR GUARD RAIL POST EMBEDMENT DEPTHS.



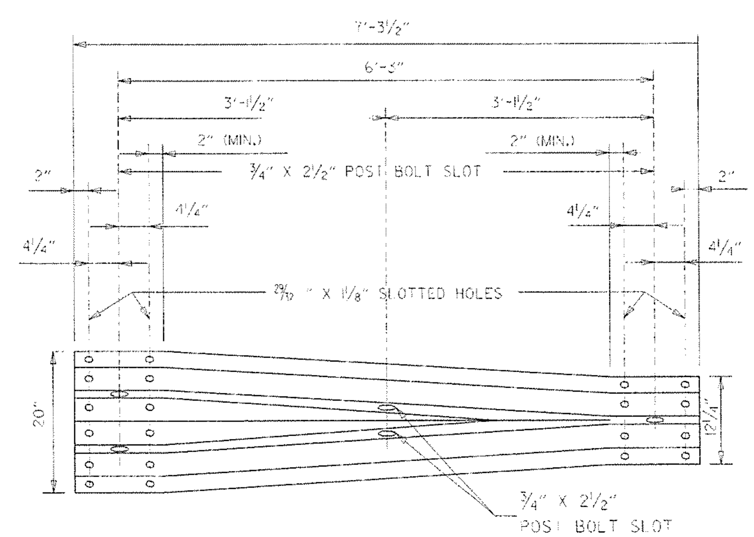
ALL HOLES 13/16" DIAMETER EXCEPT AS NOTED

HOLE PUNCHING DETAIL
FOR STEEL POST & WOOD
OR PLASTIC BLOCKOUTS

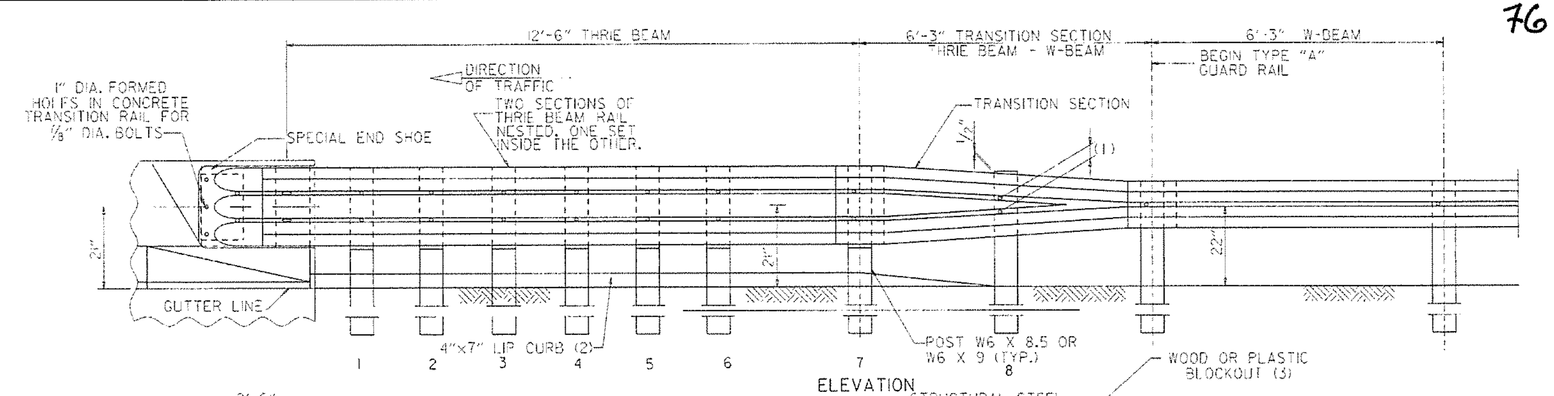
NOTE: BLOCKS SHALL BE THE SAME TYPE THROUGHOUT THE PROJECT LIMITS.



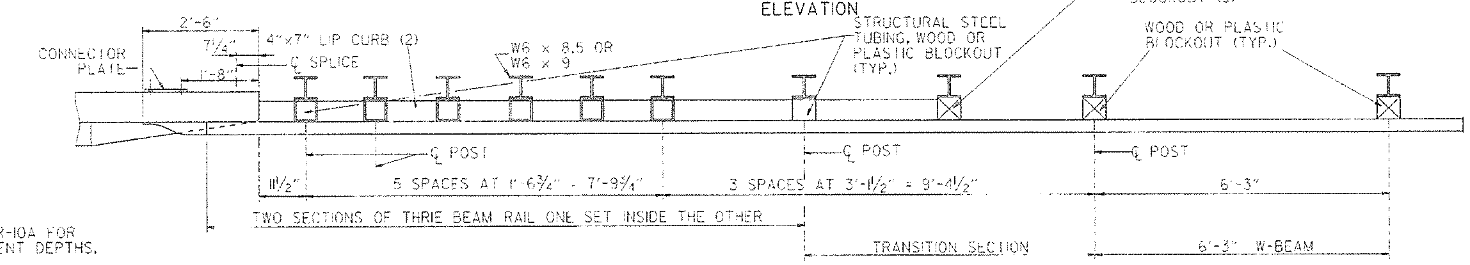
THRIE BEAM RAIL
SPLICE AT POST



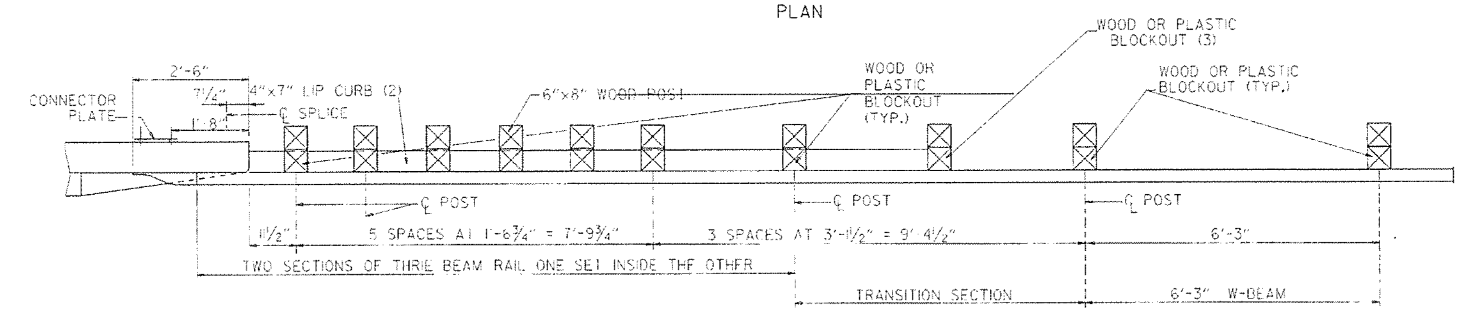
TRANSITION SECTION



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 I.

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

ALL BOLTS SHALL BE SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN 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 9.7 f (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.

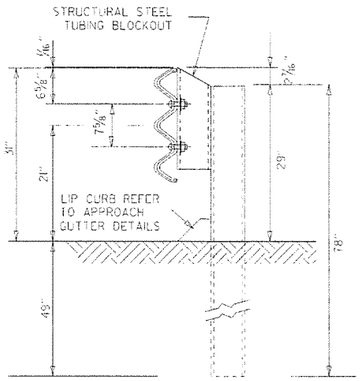
THRIE BEAM POSTS SHALL BE SAME MATERIAL AS W-BEAM POSTS FOR ENTIRE JOB.

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	

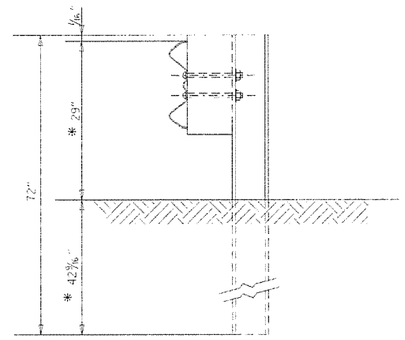
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-10

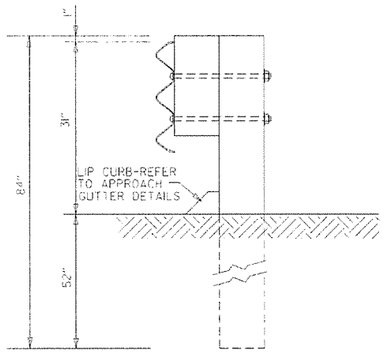


THRIE BEAM RAIL WITH STEEL TUBING BLOCKOUT
AND STEEL POST
POSTS 1-7

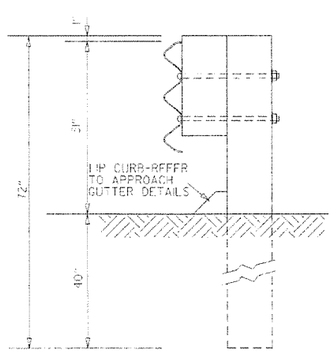


W-BEAM TO THRIE BEAM TRANSITION RAIL
WITH WOOD OR PLASTIC BLOCKOUT AND STEEL POST
POST 8

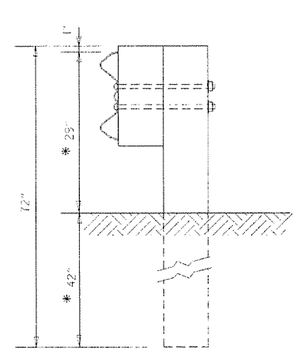
* NOTE:
THESE DIMENSIONS WILL NEED TO BE ADJUSTED IN THE FIELD TO MAKE THE TRANSITION FROM 21" MID POINT OF THRIE BEAM TO 22" MID POINT OF W-BEAM.



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.

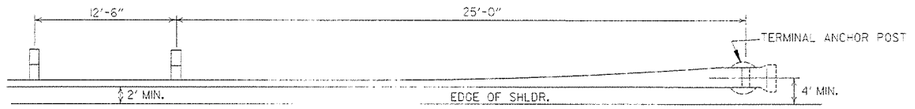
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7# (1400 #) OR NO. 1 1350 # SOUTHERN PINE.

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	

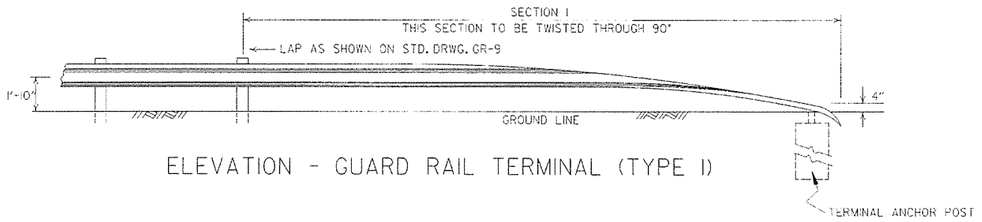
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-10A

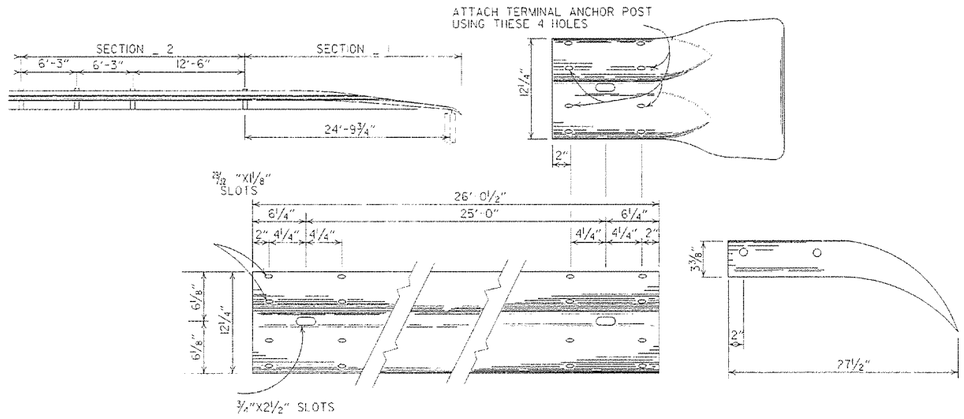


PLAN - GUARD RAIL TERMINAL (TYPE I)



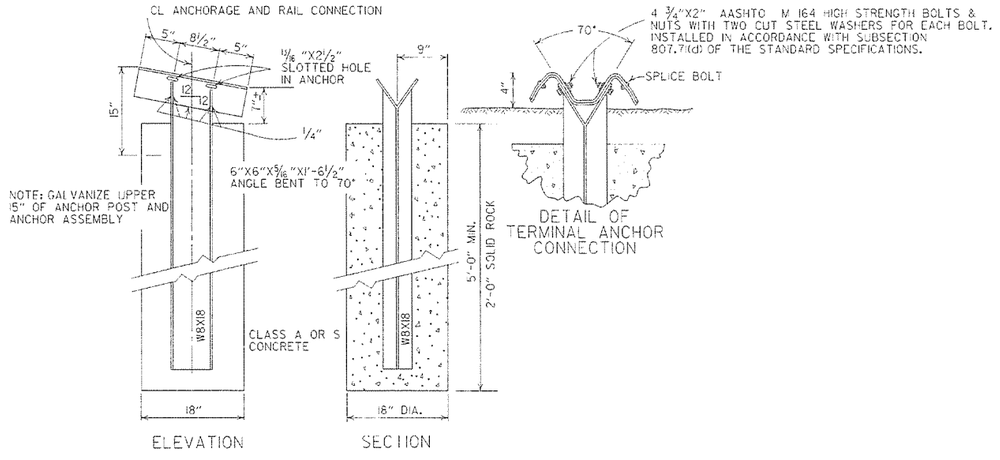
ELEVATION - GUARD RAIL TERMINAL (TYPE I)

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.

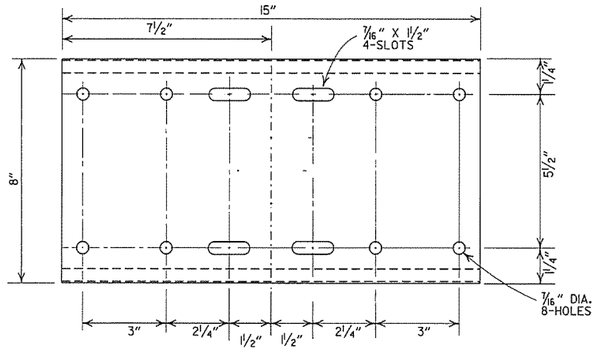
DETAIL OF TERMINAL ANCHOR POST (TYPE I)

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	
11-3-94	DIMENSION TERMINAL DETAIL	
11-11-92	ADDED NOTE FOR PAYMENT	11-11-92
10-1-92	DRAWN & ISSUED	10-1-92

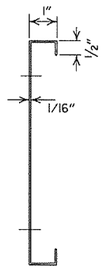
ARKANSAS STATE HIGHWAY COMMISSION

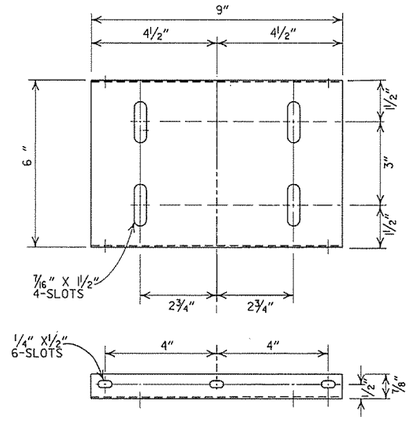
GUARD RAIL DETAILS

STANDARD DRAWING GRT-1

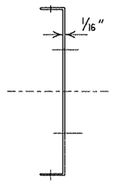


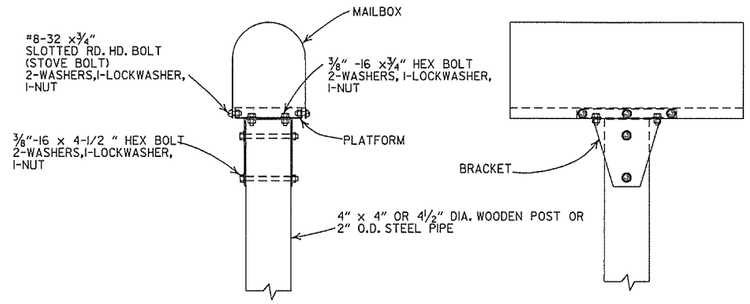
SHELF



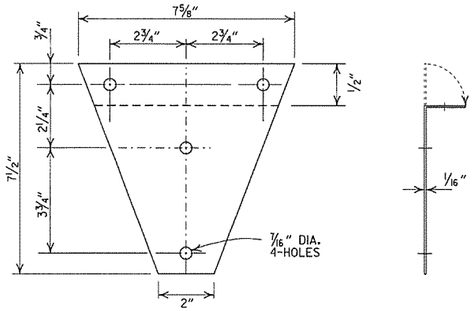


PLATFORM





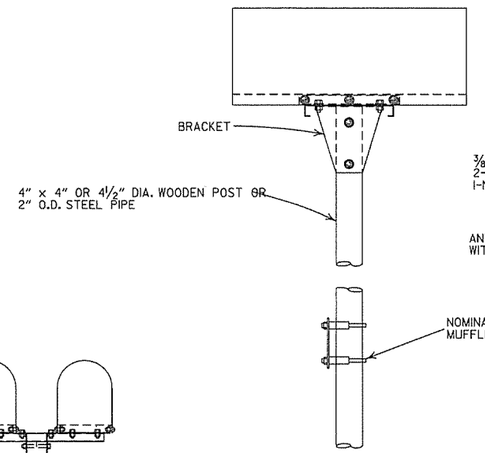
SINGLE INSTALLATION



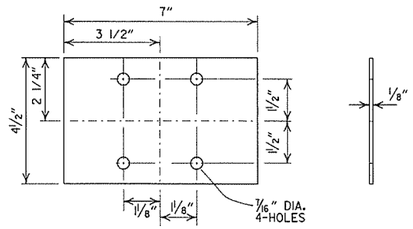
BRACKET

GENERAL NOTES

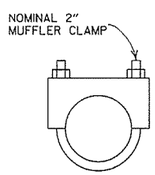
1. MAILBOX POSTS MAY BE WOOD OR METAL. WOOD POSTS SHALL BE PRESSURE TREATED FOR GROUND CONTACT IN ACCORDANCE WITH SECTION 637.02 OF THE STANDARD SPECIFICATIONS.
2. ANTI-TWIST PLATES SHALL BE USED ONLY ON METAL POSTS.
3. MAILBOX SHELF, BRACKET & PLATFORM SHALL BE GALVANIZED OR PAINTED STEEL, HOWEVER TREATED 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.



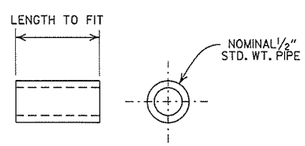
DOUBLE INSTALLATION



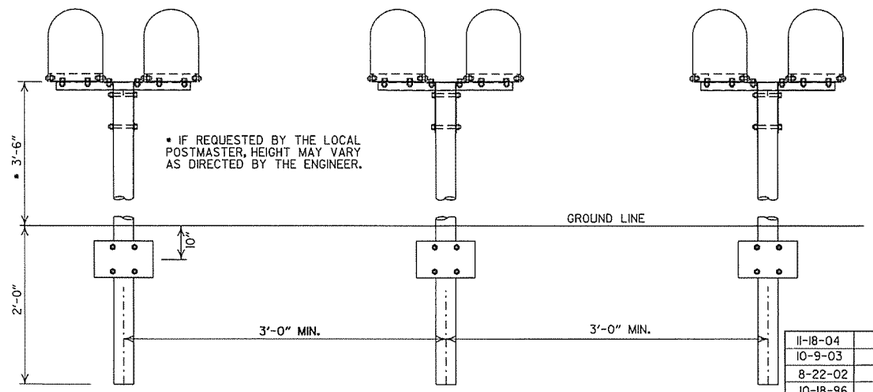
ANTI-TWIST PLATE



CLAMP



SPACER



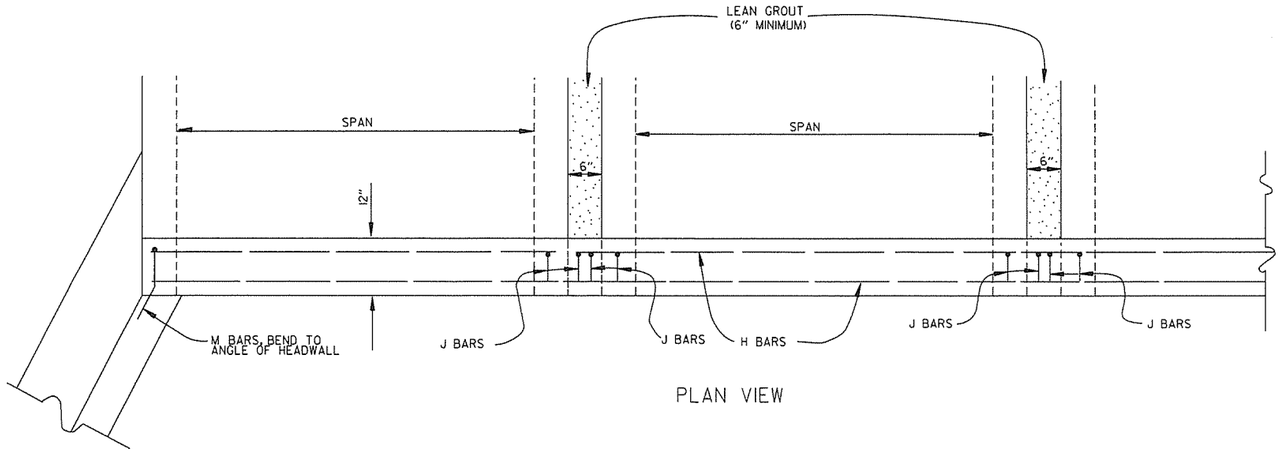
SPACING FOR MULTIPLE POST INSTALLATION

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

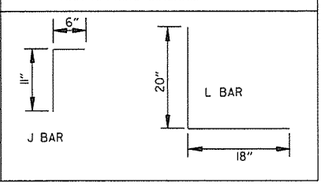
STANDARD DRAWING MB-1



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 ¾" CHAMFERS.

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

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

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

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

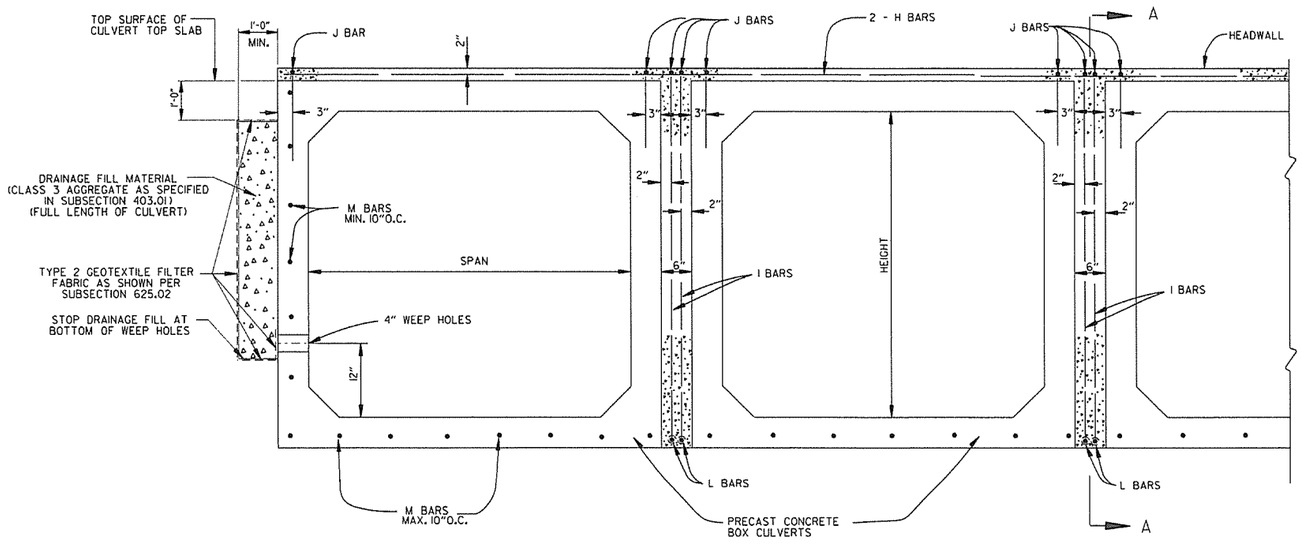
THE MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERNAL JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE CULVERT.

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

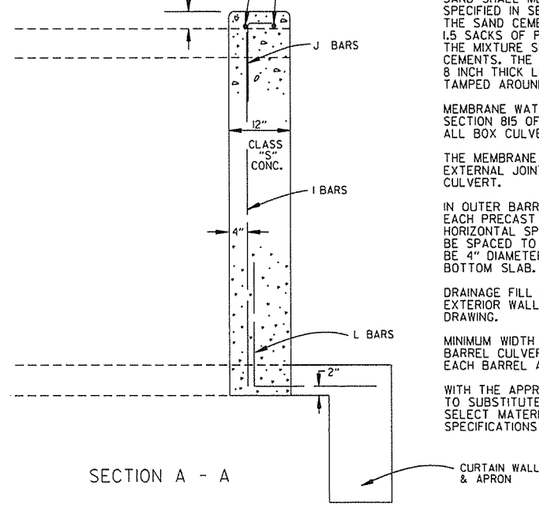
DRAINAGE FILL MATERIAL WITH GEOTEXTILE FABRIC IS REQUIRED AT THE EXTERIOR WALLS OF THE ASSEMBLED CULVERT, SEE DETAILS ON THIS DRAWING.

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

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



END VIEW



SECTION A - A

DATE	REVISION	DATE FILMED
1-28-15	REVISED GEOTEXTILE FABRIC PLACEMENT	
12-15-11	ADDED NOTE & DTLS FOR WEEP HOLE AND DRAINAGE FILL	
10-15-09	ADDED GENERAL NOTE	
11-10-05	REVISED SPACING OF "M" BARS	
4-10-03	REVISED GENERAL NOTES	
10-18-96	CORRECTED AASHTO REF.	
10-1-92	ADDED NOTE FOR MEMBRANE WATERPROOFING	
8-15-91	ADDED NOTE FOR LEAN GROUT	
11- 8-90	REVISED FOR 1991 SPECS	
11-30-89	ISSUED; JABE	

ARKANSAS STATE HIGHWAY COMMISSION

PRECAST CONCRETE BOX CULVERTS

STANDARD DRAWING PBC-1

REINFORCED CONCRETE ARCH PIPE DIMENSIONS

EQUIV. DIA.	SPAN		RISE	
	AASHTO M 206	AHTD NOMINAL	AASHTO M 206	AHTD NOMINAL
INCHES	INCHES			
15	18	18	11	11
18	22	22	13½	14
21	26	26	15½	16
24	28½	29	18	18
30	36¼	36	22½	23
36	43⅜	44	26⅝	27
42	51⅛	51	31 1/16	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)(11).

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.

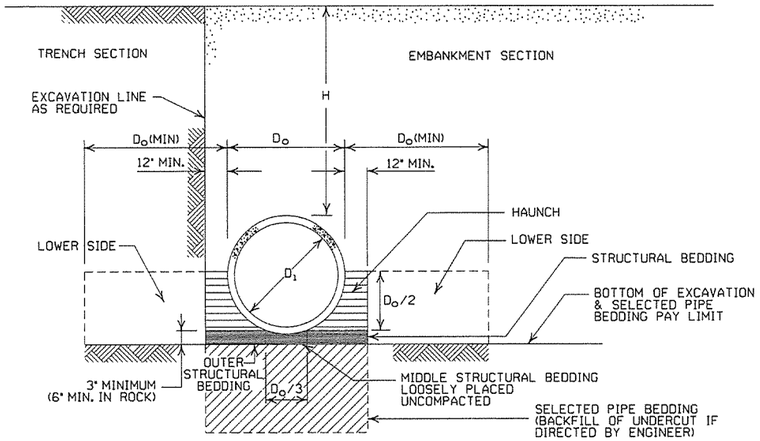
- LEGEND -

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.) INSTALLATION TYPE 1	MAX. HEIGHT OF FILL, "H" (FT.) INSTALLATION TYPE 1	MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.) INSTALLATION TYPE 1	MAX. HEIGHT OF FILL, "H" (FT.) INSTALLATION 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 TYPE 2	INSTALLATION 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.

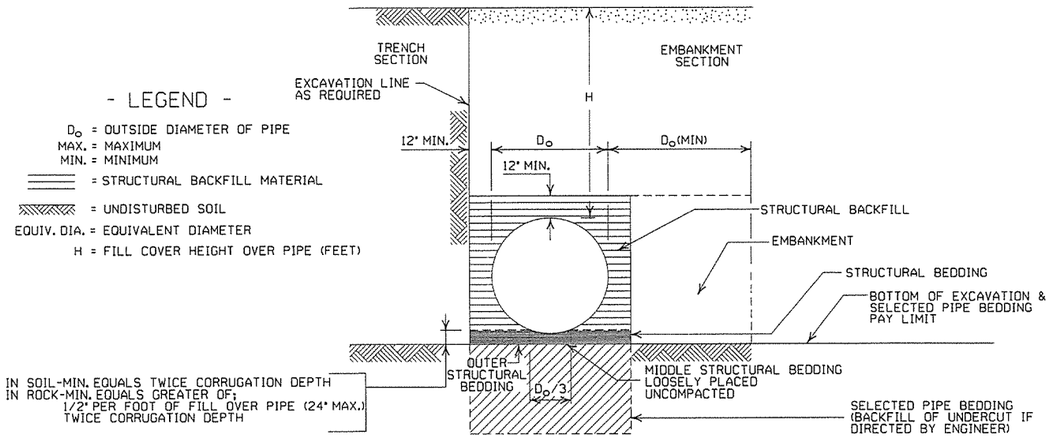
NOTE: STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF METAL PIPE.

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



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"

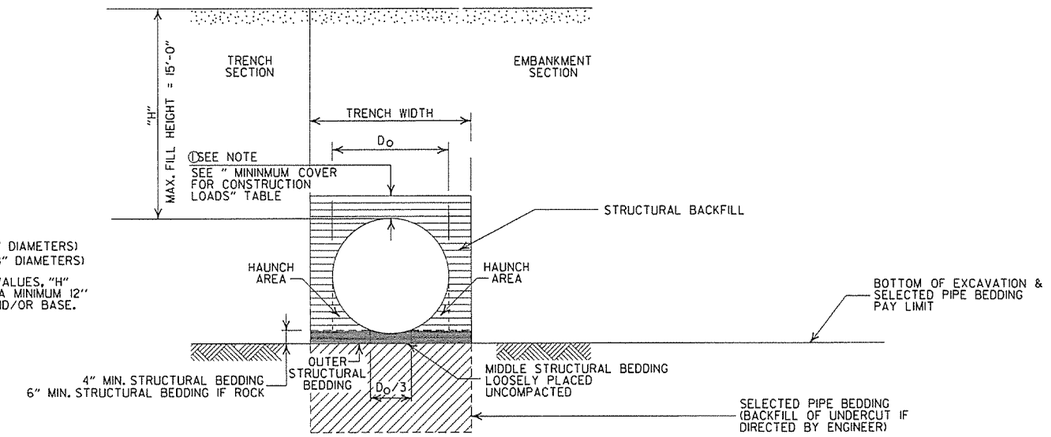
①NOTE:
18" MIN. (18" - 30" DIAMETERS)
24" MIN. (36" - 48" DIAMETERS)

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

MINIMUM COVER FOR CONSTRUCTION LOADS

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

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



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

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

CONSTRUCTION SEQUENCE

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

GENERAL NOTES

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

- LEGEND -

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

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

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

ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)

STANDARD DRAWING PCP-1

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

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

SM3 WILL NOT BE ALLOWED.

•• STRUCTURAL BEDDING MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE OF 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 PVC PIPE.

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

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

MULTIPLE INSTALLATION OF PVC PIPES

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

MAXIMUM FILL HEIGHT BASED ON STRUCTURAL BACKFILL

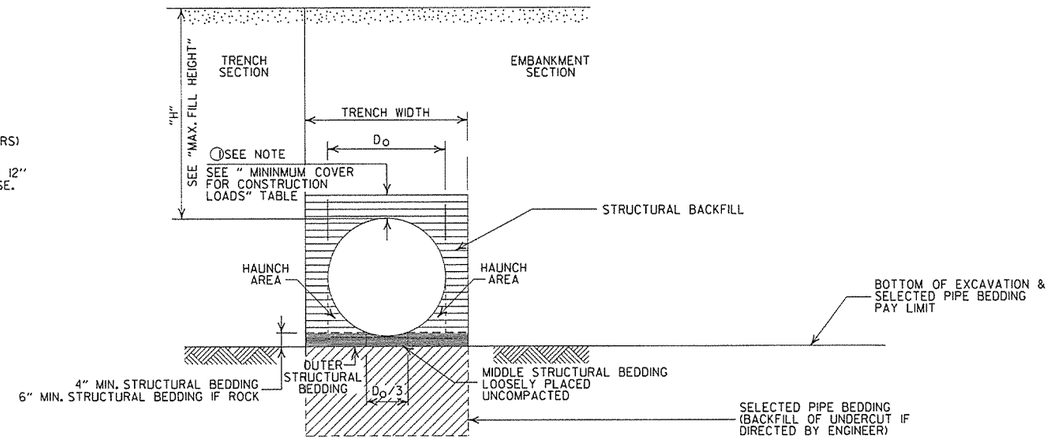
PIPE DIAMETER	"H"
18"	45'-0"
24"	45'-0"
30"	40'-0"
36"	40'-0"

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

MINIMUM COVER FOR CONSTRUCTION LOADS

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

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



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

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

CONSTRUCTION SEQUENCE

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

GENERAL NOTES

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

- LEGEND -

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

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

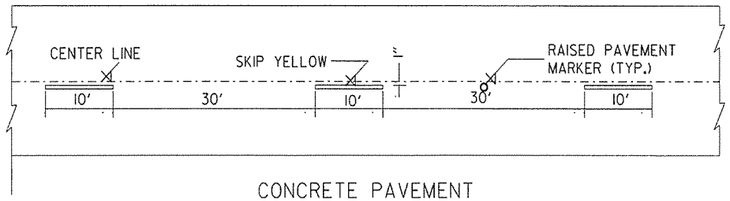
DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REV GENERAL NOTES & MINIMUM COVER NOTE; DELETED SM3 MATERIAL	
11-17-10	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

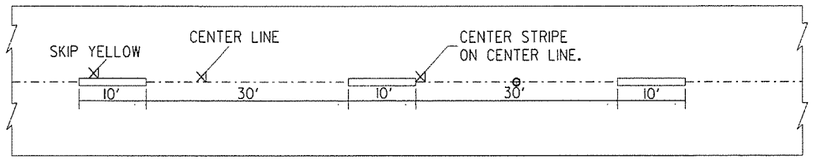
PLASTIC PIPE CULVERT
(PVC F949)

STANDARD DRAWING PCP-2

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

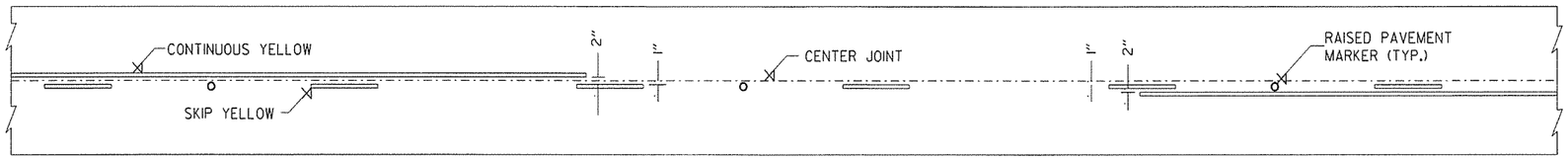


CONCRETE PAVEMENT

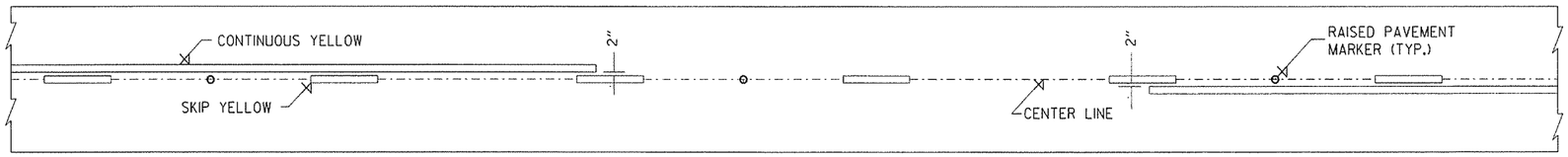


ASPHALT PAVEMENT

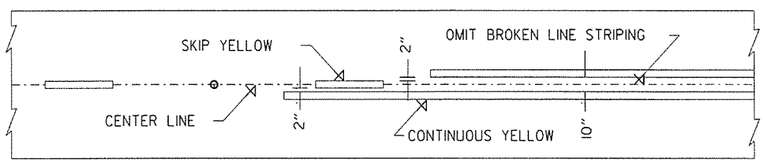
BROKEN LINE STRIPING



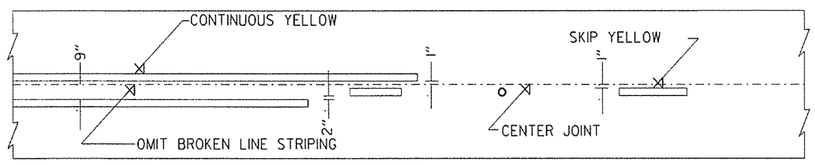
SOLID LINE STRIPING ON CONCRETE PAVEMENT



SOLID LINE STRIPING ON ASPHALT PAVEMENT

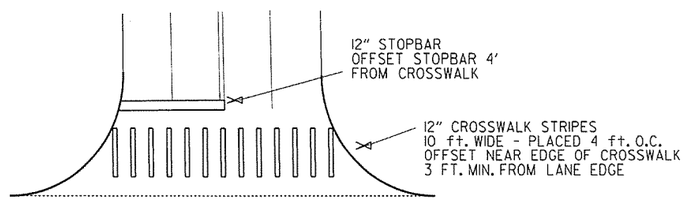


ASPHALT PAVEMENT



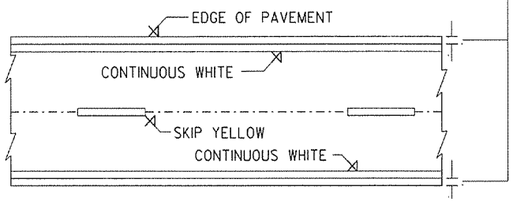
CONCRETE PAVEMENT

STRIPING AT ADJACENT NO PASSING LANES

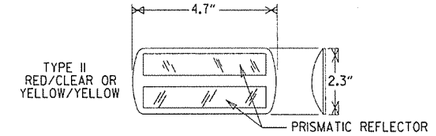


CROSSWALK AND STOPBAR DETAILS

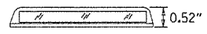
2" FOR ASPHALT OR CONCRETE PAVEMENT
6" FOR BITUMINOUS SURFACE TREATMENT



PAVEMENT EDGE LINE MARKING



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



DETAIL OF STANDARD RAISED PAVEMENT MARKERS

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.

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

ARKANSAS STATE HIGHWAY COMMISSION

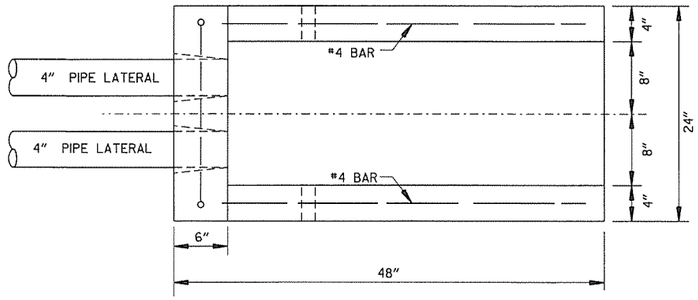
PAVEMENT MARKING DETAILS

STANDARD DRAWING PM-1

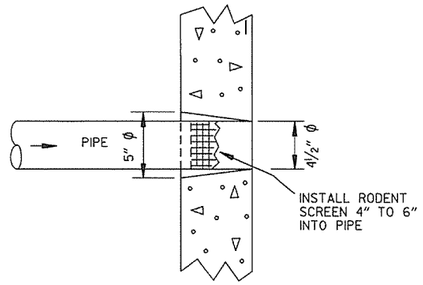
NOTE:
1. GRANULAR BACKFILL TO BE SUBSIDIARY TO PIPE UNDERDRAIN.

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

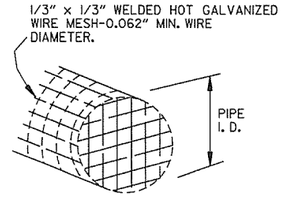
3. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. LAP FABRIC 12" OR THE WIDTH OF THE TRENCH AT THE TOP.



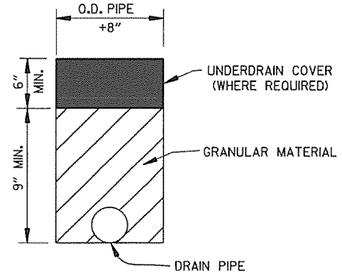
PLAN VIEW

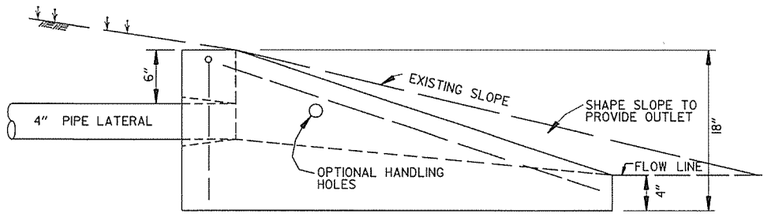


DETAIL OF HOLE FOR 4" PIPE

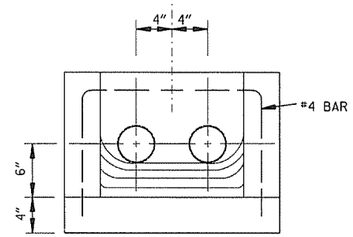


DETAIL OF RODENT SCREEN

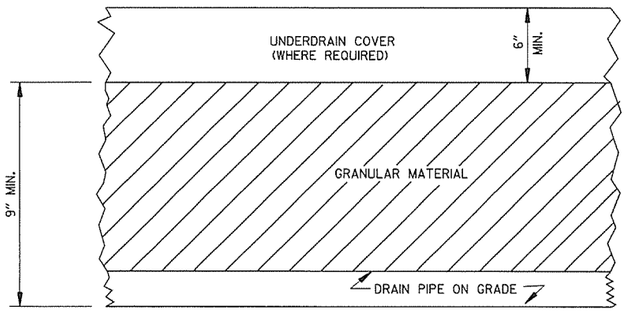




SIDE VIEW

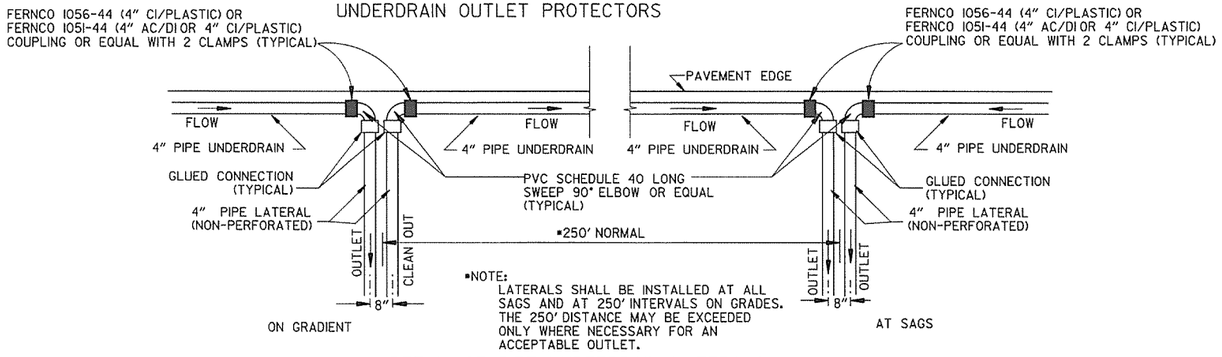


FRONT VIEW



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

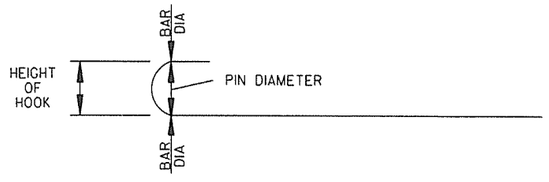
STANDARD DRAWING PU-1

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

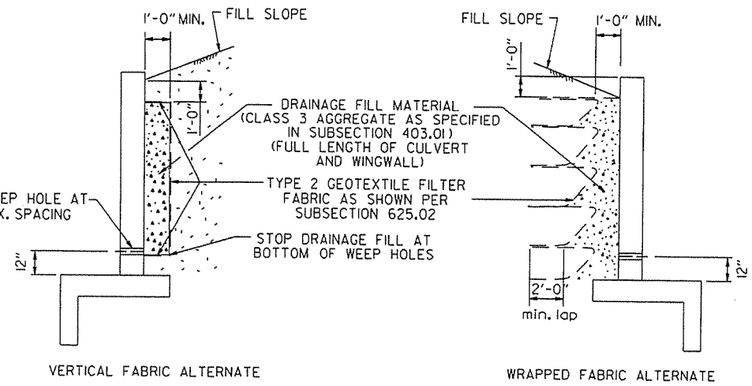
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

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.

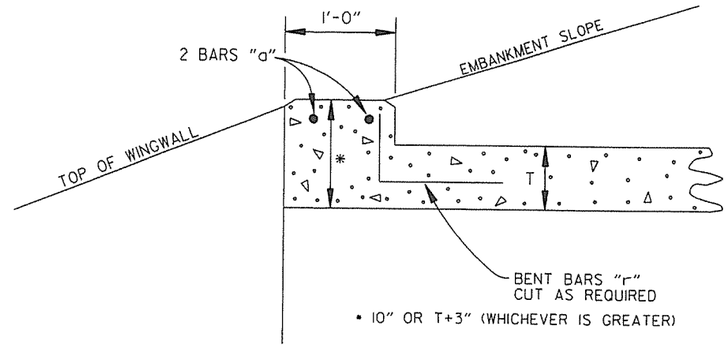
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

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.

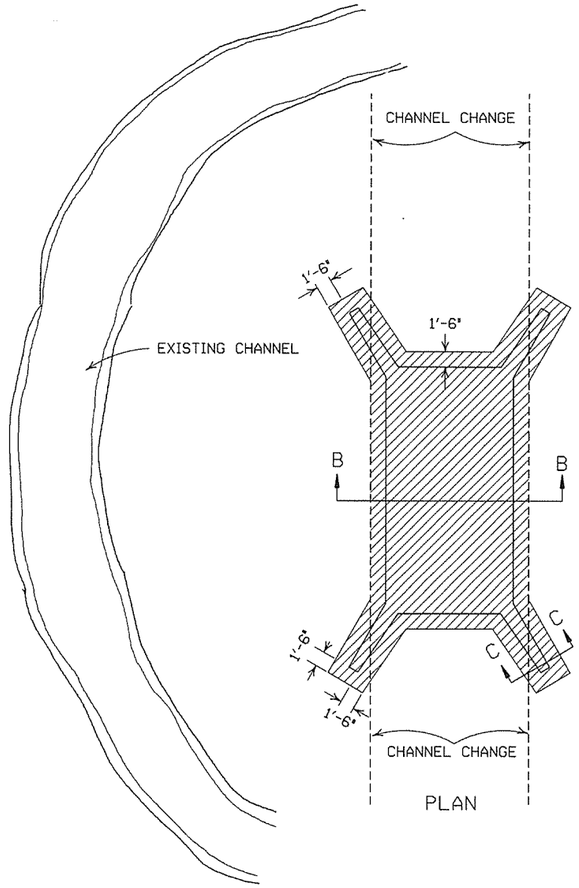
R.C. BOX CULVERT HEADWALL MODIFICATIONS

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

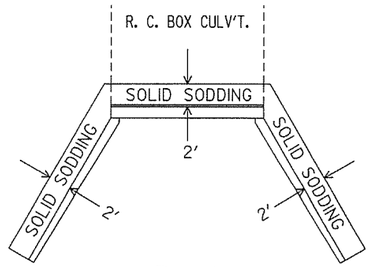
REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1



PLAN

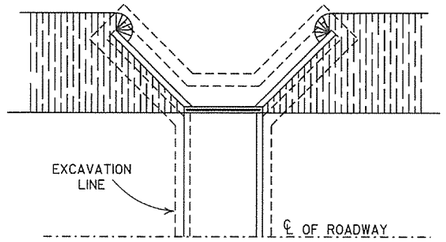
SOLID SODDING



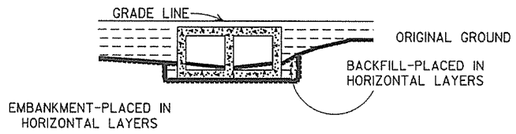
PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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

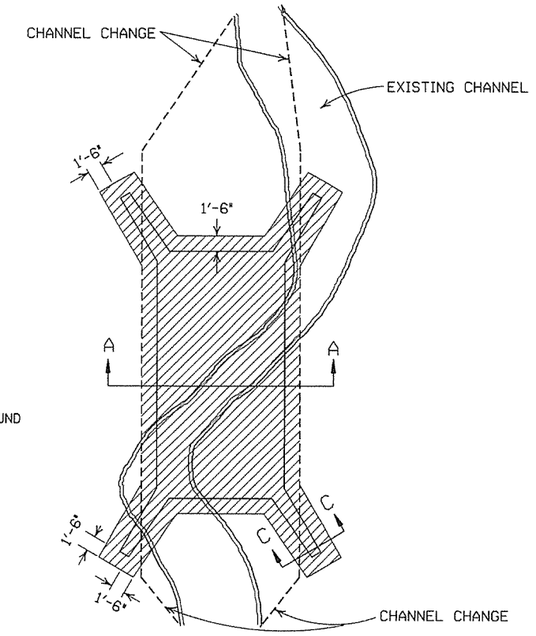


PLAN

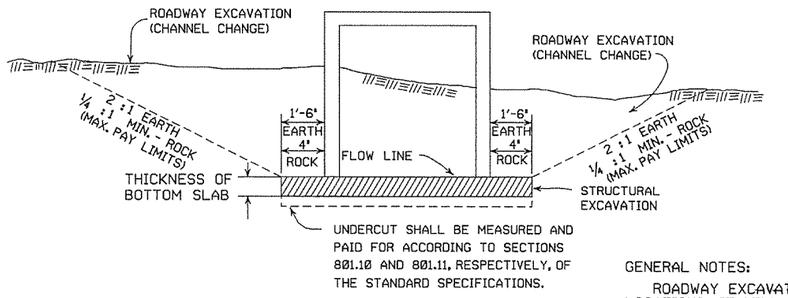


LONGITUDINAL SECTION

BACKFILL DETAILS FOR BOX CULVERT

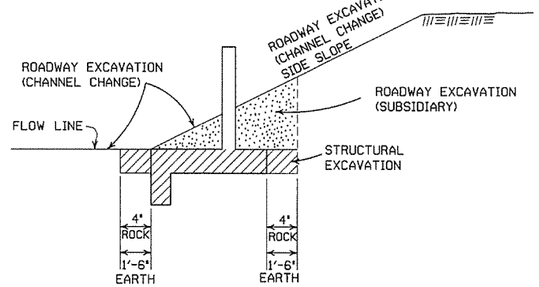


PLAN

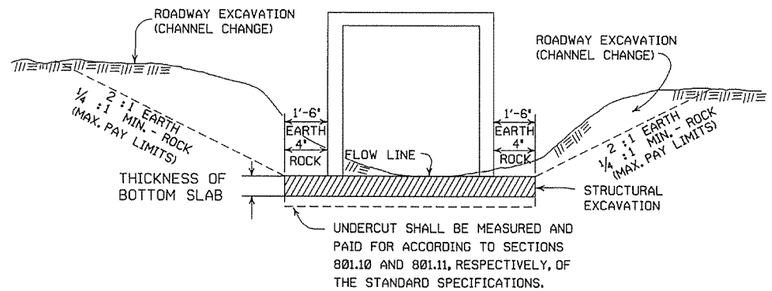


SECTION B-B

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 AND ADDED MAXIMUM PAY LIMIT NOTES.	674-1-4-83
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

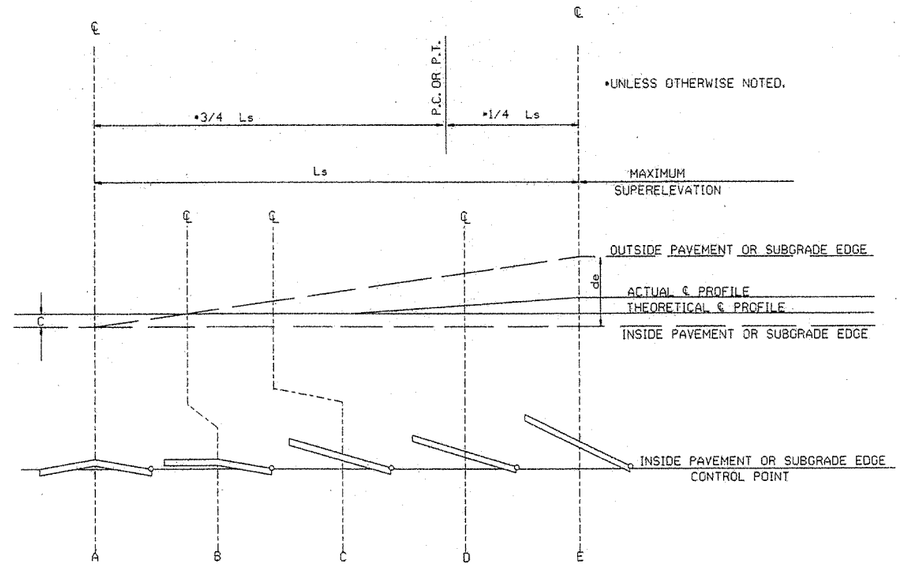
SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

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	200		0.032			0.037	250		0.046		
1° 30′	N.C.			0.021			0.031			0.037	225		0.043		300	0.054		
1° 45′	N.C.			0.025	175		0.036			0.043		300	0.049			0.062		
2° 00′	R.C.			0.028			0.040			0.048			0.055			0.070		
2° 15′	R.C.			0.031			0.045		250	0.053			0.061			0.078	300	350
2° 30′	0.021			0.034			0.049			0.058			0.067			0.085	315	
2° 45′	0.023			0.037		200	0.053			0.063			0.072			0.091	335	400
3° 00′	0.025	150		0.040			0.057			0.067	230		0.077	260		0.096	350	
3° 15′	0.027			0.043			0.061			0.072	245		0.082	275		0.038	380	
3° 30′	0.029			0.046			0.065	205		0.076	255		0.086	285		0.100	380	
3° 45′	0.031		200	0.049			0.069	215		0.080	265		0.090	295	350			
4° 00′	0.033			0.051			0.072	225		0.083	270		0.093	305				
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	350	0.098	320				
5° 30′	0.043			0.066	185		0.088	260		0.094	300							
6° 00′	0.046			0.070	190		0.092	270	300	0.096	305							
6° 30′	0.050			0.074	200		0.095	280		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.

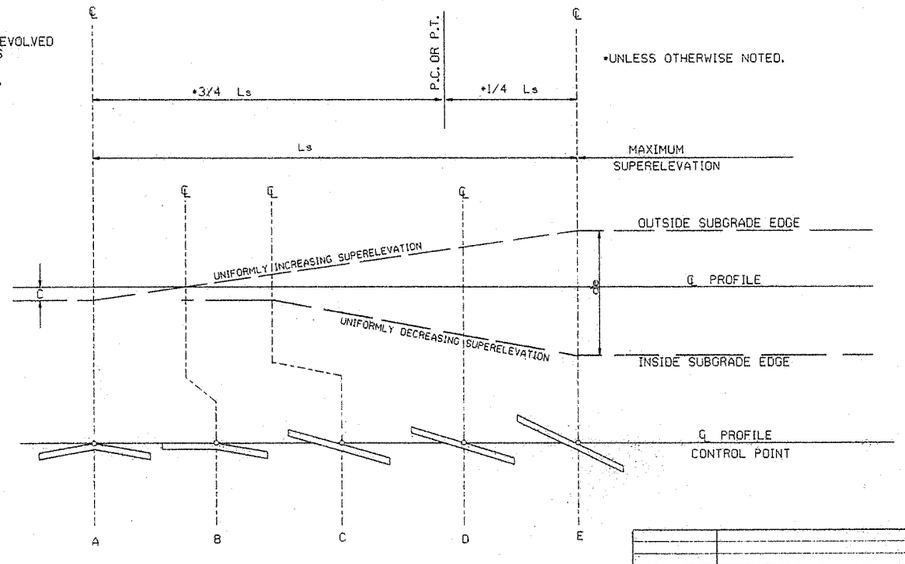
GENERAL NOTES

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

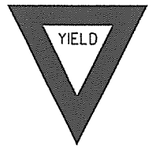
TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

STANDARD DRAWING SE-2

R1-1

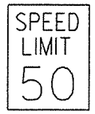
STANDARD 30"X30"
EXPRESSWAY 36"X36"
SPECIAL 48"X48"

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"

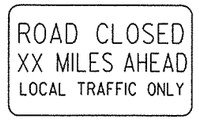
R5-1

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

R11-2

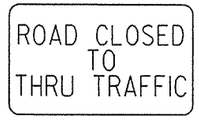
48"X30"

R11-3A



60"X30"

R11-4



60"X30"

RSP-1

48"X30"

W1-1

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

W1-2

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

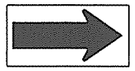
W1-3

STD. 48"X48"

W1-4

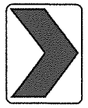
STD. 48"X48"

W1-6



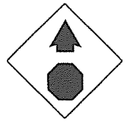
STD. 48"X24"
SPECIAL 60"X30"

W1-8



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

W3-1

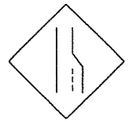


STD. 36"X36"
SPECIAL 48"X48"

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"

W13-1

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"

W1-4b

STD. 48"X48"

R56-1

STD. 18"X18"

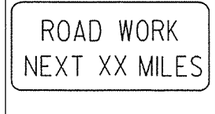
W8-11

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

W8-9

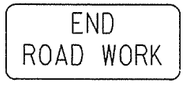
STD. 36"X36"
FWY. 48"X48"

G20-1



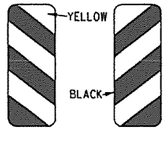
60"X24"

G20-2



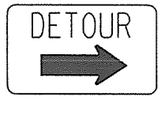
48"X24"

OM-3L OM-3R



12"X36"

M4-9

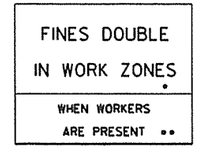


STD. 30"X24"
SPECIAL 48"X36"
SPECIAL 60"X48"

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.

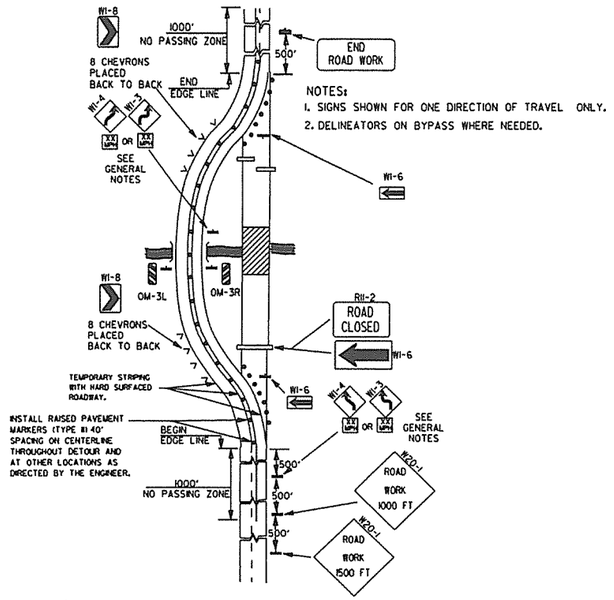
• NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY 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	
1-17-10	DELETED W8-9a & ADDED W8-9	
10-15-09	ADDED REFERENCE TO MASH & ADDED SIGN W24-1	
4-17-08	REVISED SIGN DESIGNATIONS	
11-18-04	REVISED NOTES	
10-9-03	REVISED NOTE 1	
8-16-01	REVISED NOTE 7	
9-28-00	REVISED NOTE	
1-18-98	ADDED NOTE	
6-26-97	REVISED NOTE 5	
4-03-97	REVISED NOTE 5	
10-18-96	ADDED CONTROLLED ACCESS HWY. SIGN & TO NOTE 7	
10-12-95	ADDED R55-1	
6-8-95	REVISED TO CORRECT SIGN ILLUSTRATIONS	6-8-95
2-2-95	REVISED PER PART VI, MUTCD SEPT. 3, 1993	
8-15-9	DRAWN AND PLACED IN USE	

ARKANSAS STATE HIGHWAY COMMISSION

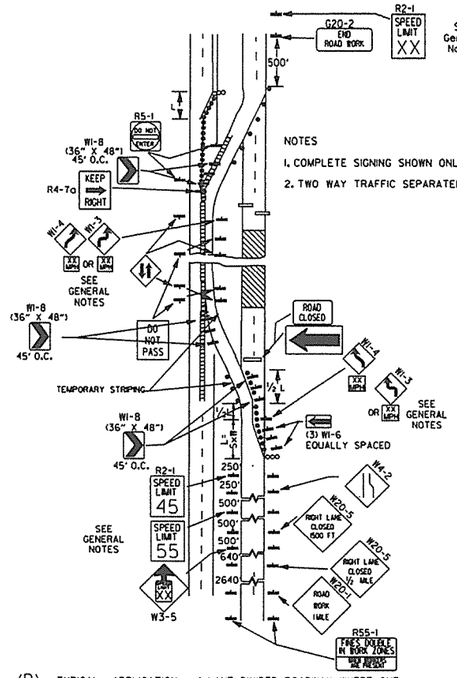
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



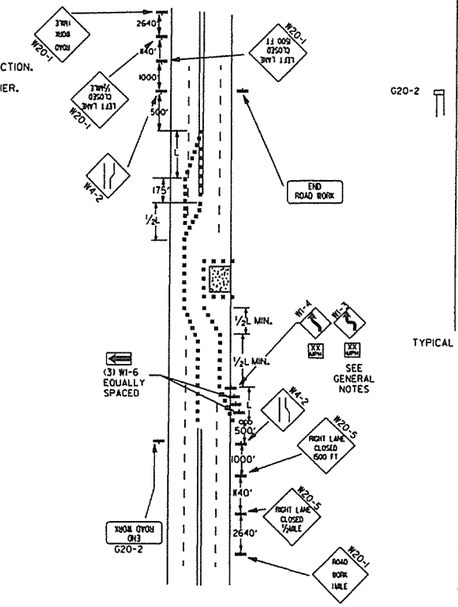
NOTES:
1. SIGNS SHOWN FOR ONE DIRECTION OF TRAVEL ONLY.
2. DELINEATORS ON BYPASS WHERE NEEDED.

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

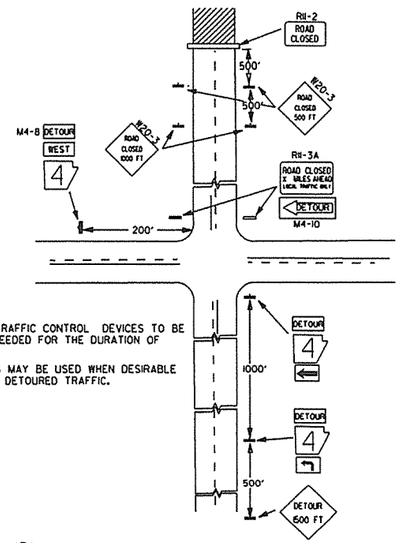


NOTES
1. COMPLETE SIGNING SHOWN ONLY IN CROSSOVER DIRECTION.
2. TWO WAY TRAFFIC SEPARATED WITH POSITIVE BARRIER.

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

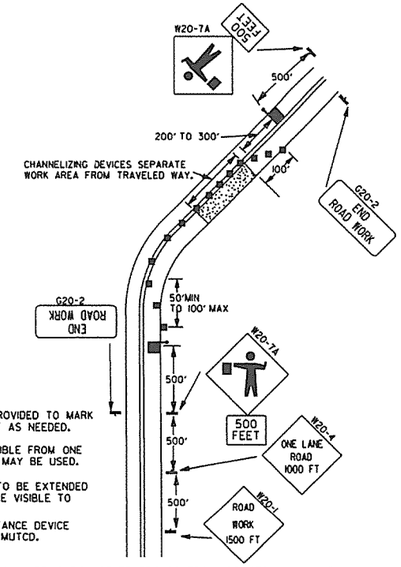


(C) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WHERE HALF OF THE ROADWAY IS CLOSED.



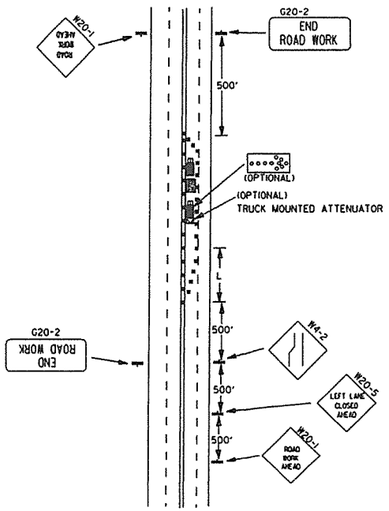
NOTES:
1. REGULATORY TRAFFIC CONTROL DEVICES TO BE MODIFIED AS NEEDED FOR THE DURATION OF THE DETOUR.
2. STREET NAMES MAY BE USED WHEN DESIRABLE FOR DIRECTING DETOURED TRAFFIC.

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



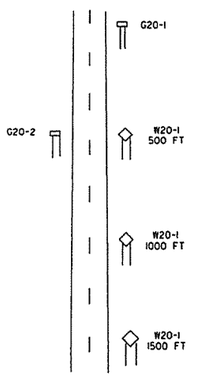
NOTES:
1. FLOOD LIGHTS SHOULD BE PROVIDED TO MARK FLAGGER STATIONS AT NIGHT AS NEEDED.
2. IF ENTIRE WORK AREA IS VISIBLE FROM ONE STATION, A SINGLE FLAGGER MAY BE USED.
3. CHANNELIZING DEVICES ARE TO BE EXTENDED TO A POINT WHERE THEY ARE VISIBLE TO APPROACHING TRAFFIC.
4. AUTOMATED FLAGGER ASSISTANCE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

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

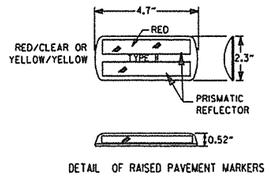


(F) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WITH INSIDE LANE CLOSED.

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



TYPICAL ADVANCE WARNING SIGN PLACEMENT



DETAIL OF RAISED PAVEMENT MARKERS

TAPER FORMULAE:

L=SXW FOR SPEEDS OF 45MPH OR MORE.

$L = \frac{WS^2}{60}$ FOR SPEEDS OF 40MPH OR LESS.

WHERE:
L= MINIMUM LENGTH OF TAPER,
S= NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85TH PERCENTILE SPEED.
W= WIDTH OF OFFSET.

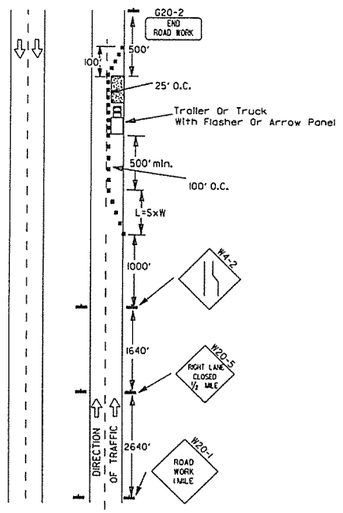
GENERAL NOTES:
1. ADVISORY SPEED POSTED ON W1-3 OR W1-4 CURVE WARNING SIGNS TO BE DETERMINED AT SITE. USE W1-4 WHEN SPEED IS GREATER THAN 30MPH AND W1-3 WHEN 30MPH OR LESS.
2. WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-1(55) SHALL BE OMITTED AND THE W3-5 SHALL BE INSTALLED AT THAT LOCATION. ADDITIONAL R2-1 45MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
3. WHEN THE EXISTING SPEED LIMIT IS 65MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 55MPH, THE R2-1(45) SHALL BE OMITTED. ADDITIONAL R2-1 55MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
4. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT. BEYOND THE TAPER, MAXIMUM SPACING SHALL BE TWO TIMES THE SPEED LIMIT, OR AS DIRECTED BY THE ENGINEER.
5. WARNING LIGHTS AND/OR FLAGS MAY BE MOUNTED TO SIGNS OR CHANNELIZING DEVICES AT NIGHT AS NEEDED.
6. PAVEMENT MARKINGS NO LONGER APPLICABLE WHICH MIGHT CREATE CONFUSION IN THE MINDS OF VEHICLE OPERATORS SHALL BE REMOVED OR OBLITERATED AS SOON AS PRACTICABLE.
7. TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL BE DELINEATED BY AFFIXING CONSPICUITY MATERIAL IN A CONTINUOUS LINE ON THE FACE OF THE TRAILER. WHEN PLACED ON OR ADJACENT TO THE SHOULDER AND NOT BEHIND A POSITIVE BARRIER, THESE DEVICES SHALL BE DELINEATED BY PLACING FIVE (5) TRAFFIC DRUMS, EQUALLY SPACED ALONG THE TRAFFIC SIDE OF THE DEVICE.
8. DIMENSIONS SHOWN FOR RAISED PAVEMENT MARKERS ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR MARKERS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR SIMILAR MARKERS MAY BE MADE BY REFERRING TO THE AHTD QUALIFIED PRODUCTS LIST.

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

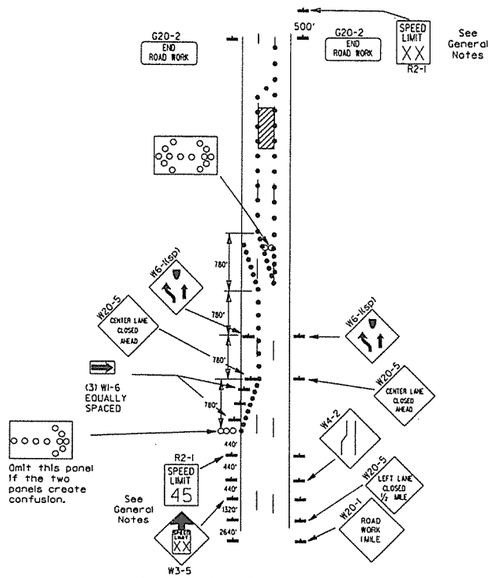
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

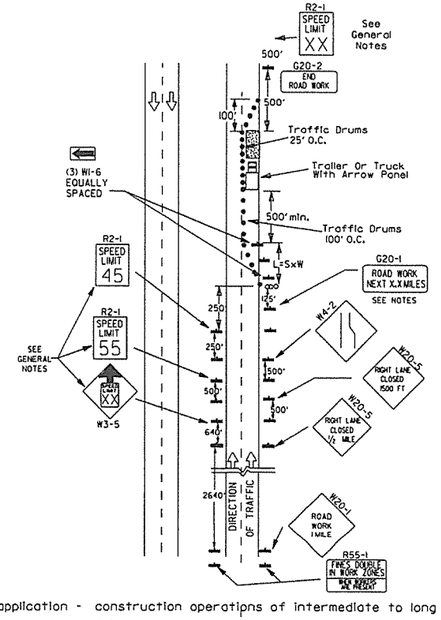
STANDARD DRAWING TC-2



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



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



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

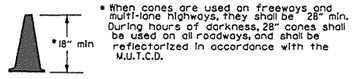
KEY:

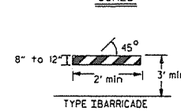
- Arrow Panel (if Required)
- Channelizing Device
- Traffic drum

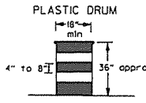
GENERAL NOTES:

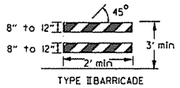
1. A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the W3-5 shall be installed at that location. Additional 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.

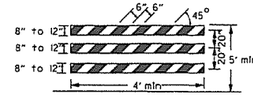
Channelizing devices



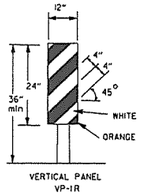




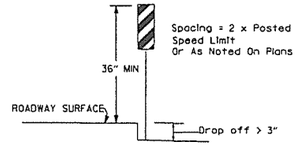




NOTE:
For all road closures, the Type III barricades shall be of sufficient length to extend across entire roadway.



VERTICAL PANEL PLACEMENT



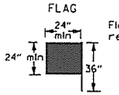
TRAFFIC CONTROL DEVICES FOR VERTICAL PAVEMENT DIFFERENTIALS

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

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

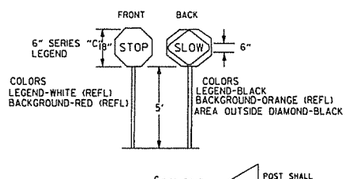
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.

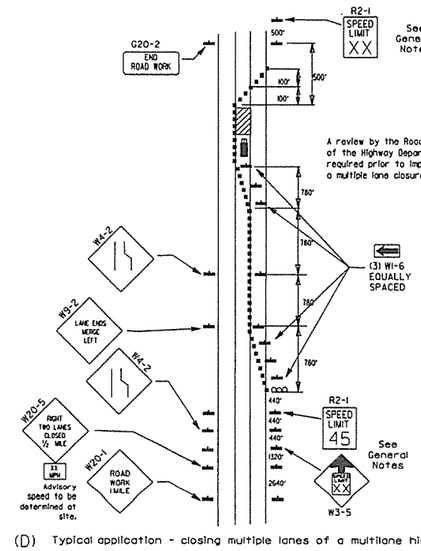
FLAG



Flag shall be of good grade red material

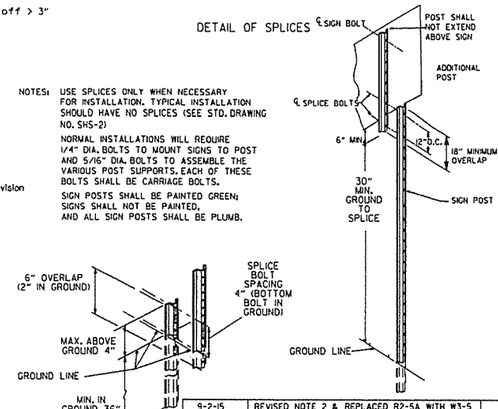
STOP SLOW PADDLE





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

DETAIL OF SPLICES



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

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

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

DATE	REVISION	FILMED
9-2-15	REVISED NOTE 2 & REPLACED R2-5A WITH W3-5	
10-15-09	ADDED REFERENCE TO MASH	
8-20-08	REVISED SIGN DESIGNATIONS	
8-18-04	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	

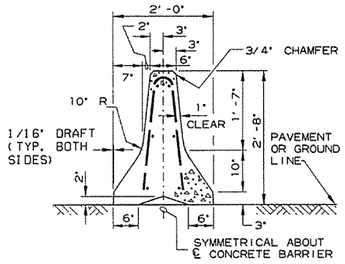
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

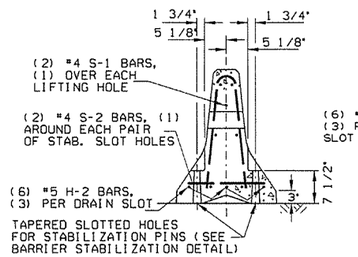
STANDARD DRAWING TC-3

REINFORCING BAR TABLE PER BARRIER UNIT

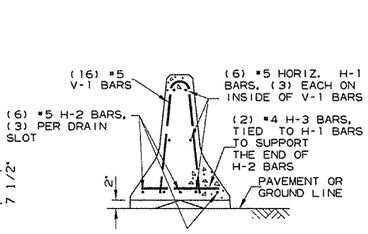
MARK	LOCATION	BAR SIZE	(NO. BARS)	SKETCH
H-1	HORIZONTAL IN BARRIER TIED INSIDE V-1 BARS	#5	(6)	19'-3"
H-2	CENTERED ABOVE DRAIN SLOTS LONG. & TRANSVERSELY	#5	(6)	6'-6"
H-3	TIED ABOVE H-1 BARS TO SUPPORT H-2. TIED TO V-1	#4	(2)	1'-6"
S-1	OVER LIFT HOLES	#4	(2)	2'-5", LIFTING HOLE, 90°, 3 3/8" R
S-2	HORIZ. AROUND SLOTS BETWEEN V-1'S @ DRAIN SLOTS	#4	(2)	1 1/2" R, SLOTS, 7", 1'-6", 1" MIN. CLEAR TO BAR, 5'-1" BAR W/(4) 1 1/2" R BENDS & MIN. 1'-0" OVERLAP
V-1	VERTICAL IN BARRIER(3) EACH END & (2) AT EACH DRAIN SLOTS	#5	(16)	TOTAL LENGTH 4'-9", 2 3/16" R, 12°, 19 1/2", 2'-1 3/8", 4 3/8"



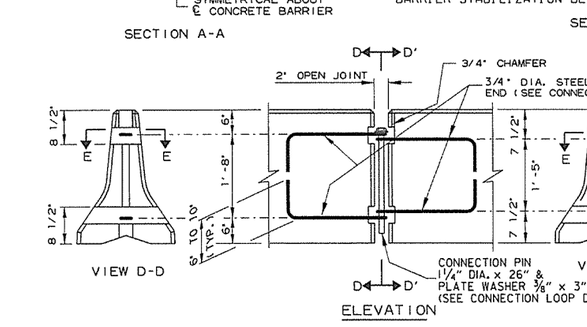
SECTION A-A



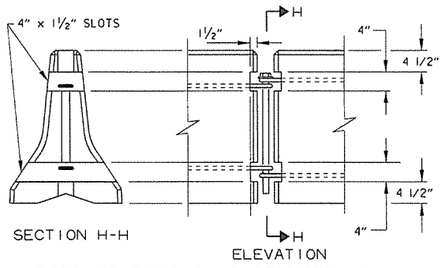
SECTION B-B



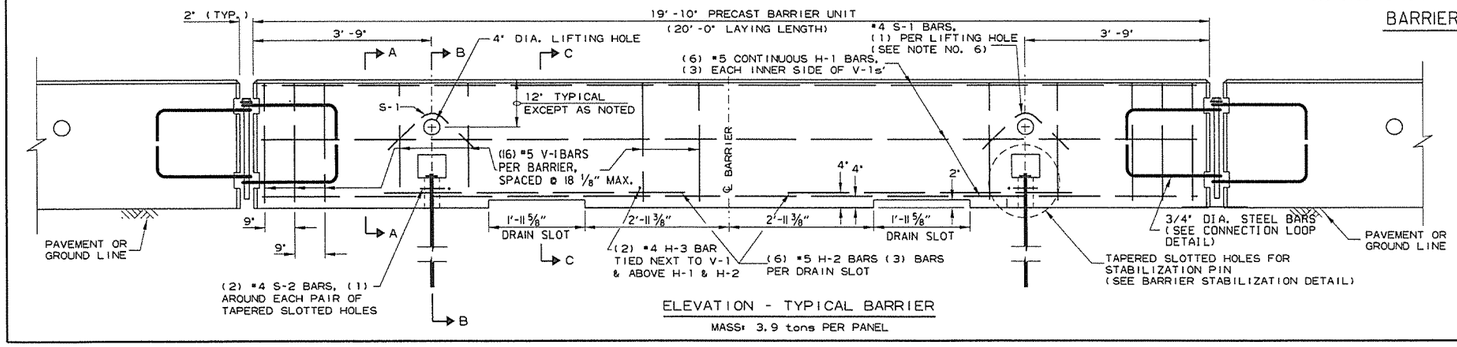
SECTION C-C



ELEVATION



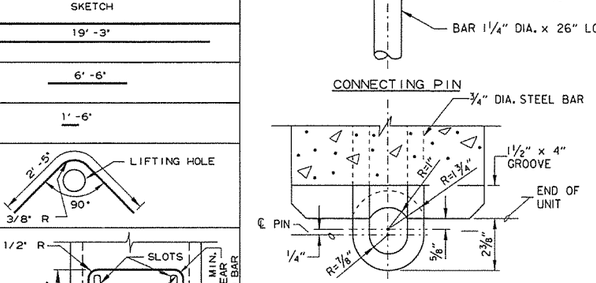
BARRIER REMOVAL SLOT DETAILS



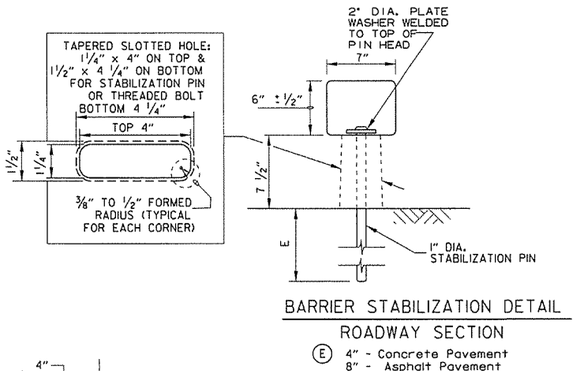
ELEVATION - TYPICAL BARRIER

MASS: 3.9 tons PER PANEL

CONNECTION LOOP



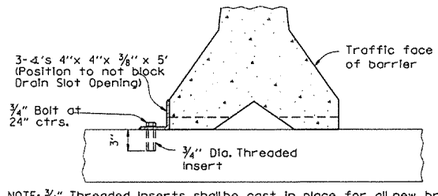
CONNECTION DETAILS



BARRIER STABILIZATION DETAIL

ROADWAY SECTION

(E) 4" - Concrete Pavement
8" - Asphalt Pavement
12" - Shoulder Areas



NOTE: ¾" Threaded Inserts shall be cast in place for all new bridge decks and drilled and grouted for existing bridge decks. Inserts shall have a minimum ultimate load capacity of 8000 lbs. in tension. After removal of barrier, bolts, and angles, the inserts shall be filled with approved non-shrink epoxy.

BARRIER STABILIZATION DETAIL

BRIDGE DECKS

General Notes

(1) The contractor shall furnish the Precast Concrete Barrier Units and shall be responsible for the manufacture, shipment, storage, placement and removal. At the completion of the project, the precast units will remain the property of the contractor.

(2) Materials shall meet the following minimum requirements:
Concrete: 2500 psi compressive strength at 28 days.
Reinforcing Steel: AASHTO M 31 or M 53, Grade 60
Structural Steel: AASHTO-M270 Grade 36 shall be used for the Connection Pin, Connection Loops, and Stabilization Pins. A One Piece Pin with a 3" rounded top may be used in place of the detailed Connection Pin.
Delineators: Delineators shall be mounted at 10' spacing on top of precast barrier.

In applications where barrier walls within 6 feet of a traffic lane, additional delineators shall be placed on the barrier at 10' spacing approximately one (1) foot from the top of the barrier. Delineators shall be on the AHTD Qualified Products List for Construction Concrete Barrier Markers.
Delineator color shall be in accordance with the Manual on Uniform Traffic Control Devices.
Payment for delineators shall be considered included in the price bid per Lin. Ft. for "Furnishing and Installing Precast Concrete Barrier". The contractor shall certify to the Engineer that the material and the design used in the precast barrier units meets the requirements as shown on this standard drawing.

(3) Other Precast Concrete Barriers that have been crash tested and approved by the Federal Highway Administration to meet the requirements of NCHRP-350 test level 3 or Manual For Assessing Safety Hardware (MASH) will be accepted in lieu of the barrier shown. Drain slots shall be provided as needed or as directed by the Engineer. The Contractor shall furnish a certification of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) compliance for any other types of precast barrier to be used. The certification shall state that the precast concrete barrier meets the requirements of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) and include a copy of the Federal Highway Administration's (FHWA) approval letter with all attachments. Precast concrete barrier units shall be fabricated and installed in accordance with crash testing and documentation provided in the FHWA approval letter. Mixing of shapes will not be allowed in a continuous line of units.

(4) Dowel holes in pavement or bridge slabs that are to remain in place shall be filled. Holes in concrete pavement and bridge slabs shall be filled with an approved non-shrink epoxy grout. Holes in asphalt pavement shall be filled with an approved asphalt joint filler. Payment for drilling and filling holes to be included in the price for various barrier items.

(5) Attach Units To Roadway Surface with Stabilization Pins and to Deck Slabs using bolts when required.

(6) A 4" White PVC Sleeve may be used to form the Lifting Hole and if used the Sleeve is to be left in place.

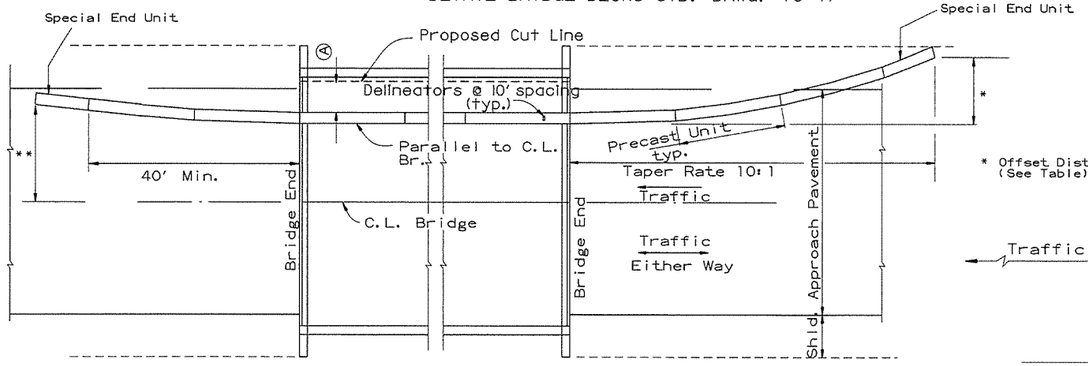
DATE	REVISION	FILMED
2-27-14	REVISED BARRIER STABILIZATION DETAIL	
10-15-09	ADDED REFERENCE TO MASH	
8-5-09	REV. NOTE 3 CONCERNING DRAIN SLOTS	
11-29-07	REVISED NOTE 3	
5-25-06	DELETED GENERAL NOTE 7	
11-18-04	REVISED BARRIER STABILIZATION DETAIL BRIDGE DECKS	
4-10-03	REVISED GENERAL NOTE 2	
8-22-02	ISSUED NEW DRAWING	

ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

STANDARD DRAWING TC-4

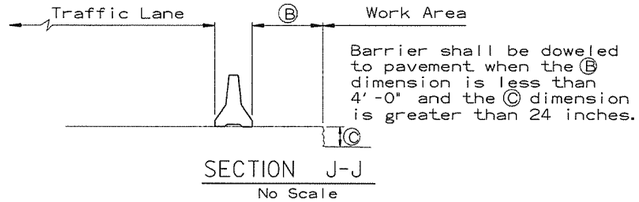
Ⓐ 4 feet or greater preferred. If less than 4 feet, Precast Units shall be connected to slab (SEE BARRIER STABILIZATION DETAIL-BRIDGE DECKS STD. DRWG. TC-4)



BARRIER PLACEMENT ALONG BRIDGE WITH OFFSET

No Scale

* Offset Distance (See Table)

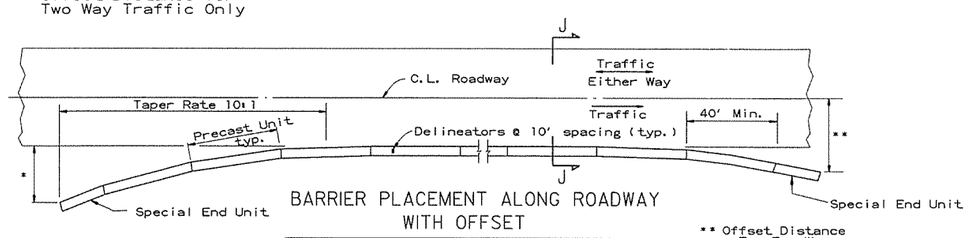


Barrier shall be doweled to pavement when the Ⓑ dimension is less than 4'-0" and the Ⓒ dimension is greater than 24 inches.

SECTION J-J

No Scale

** Offset Distance for Two Way Traffic Only



BARRIER PLACEMENT ALONG ROADWAY WITH OFFSET

No Scale

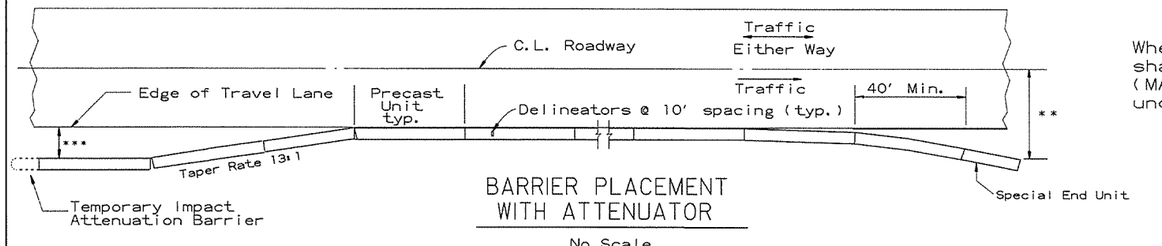
* Offset Distance (See Table)

** Offset Distance For Two Way Traffic Only

Offset Distance Table

Speed (MPH)	Offset Distance (FT.)
≤ 45	12
> 45	18

If offset distance is not attainable, then see 'Barrier Placement With Attenuator' Detail shown below.

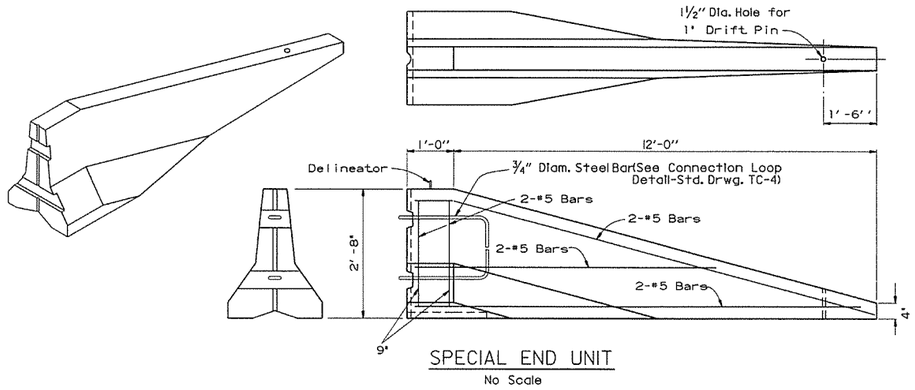


BARRIER PLACEMENT WITH ATTENUATOR

No Scale

** Offset Distance For Two Way Traffic Only

*** Min. 3'-0" From Edge of Travel Lane to Nearest Edge of Attenuator



SPECIAL END UNIT

No Scale

General Notes

When shown on the Plans, the ends of the Temporary Precast Concrete Barrier shall be protected with an NCHRP-350 or Manual For Assessing Safety Hardware (MASH) approved Crash Cushion. Payment for Crash Cushions shall be made under the item of "Temporary Impact Attenuation Barrier."

DATE	REVISION	FILMED
10-15-09	ADDED REFERENCE TO MASH	
5-25-06	REVISED BARRIER PLACEMENT	
8-22-02	ISSUED NEW DRAWING	

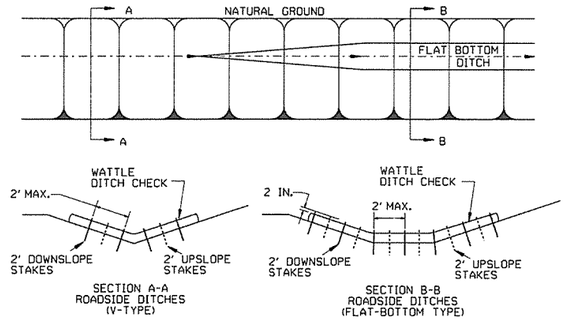
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

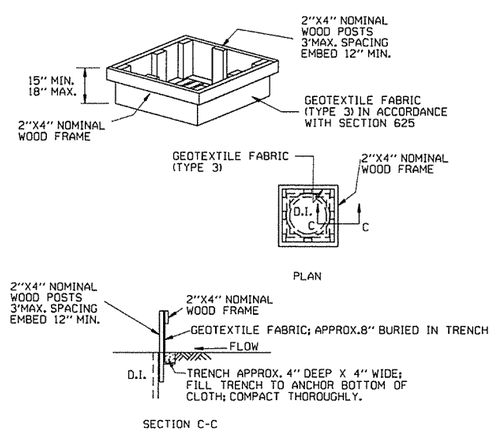
STANDARD DRAWING TC-5

GENERAL NOTES

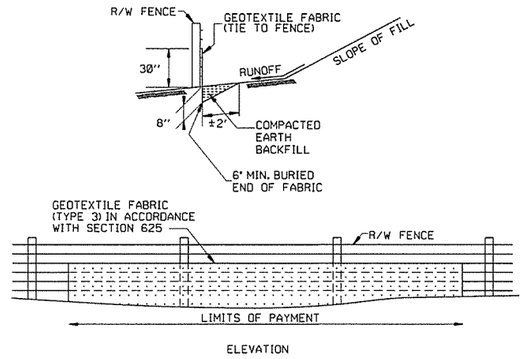
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



WATTLE DITCH CHECK (E-1)



DROP INLET SILT FENCE (E-7)



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

GENERAL NOTES

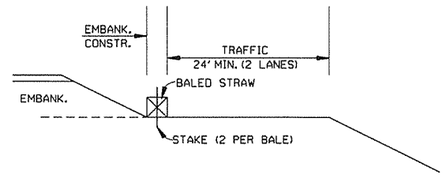
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST, OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

GENERAL NOTES

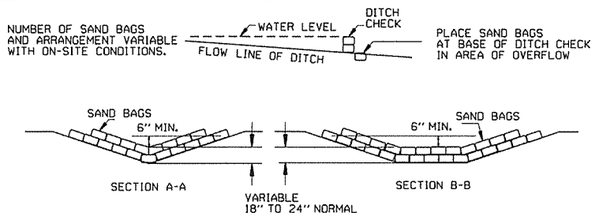
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.

2. NO GAPS SHALL BE LEFT BETWEEN BALES.

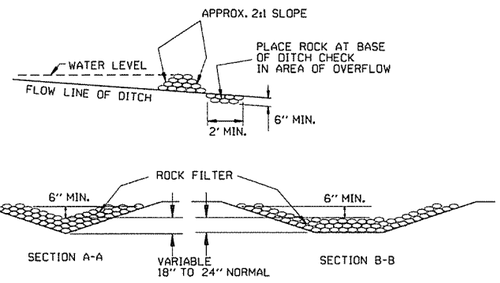
3. BALED STRAW FILTER BARRIERS COMPLETED AND ACCEPTED WILL BE MEASURED BY THE BALE IN PLACE AS AUTHORIZED BY THE ENGINEER AND WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER BALE FOR BALED STRAW DITCH CHECKS.



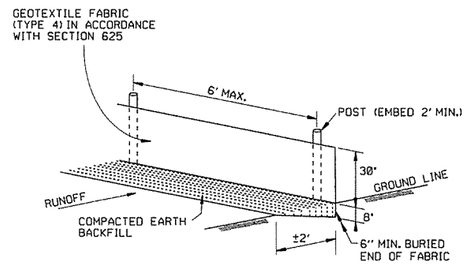
BALED STRAW FILTER BARRIER (E-2)



SAND BAG DITCH CHECK (E-5)



ROCK DITCH CHECK (E-6)



SILT FENCE (E-11)

GENERAL NOTES

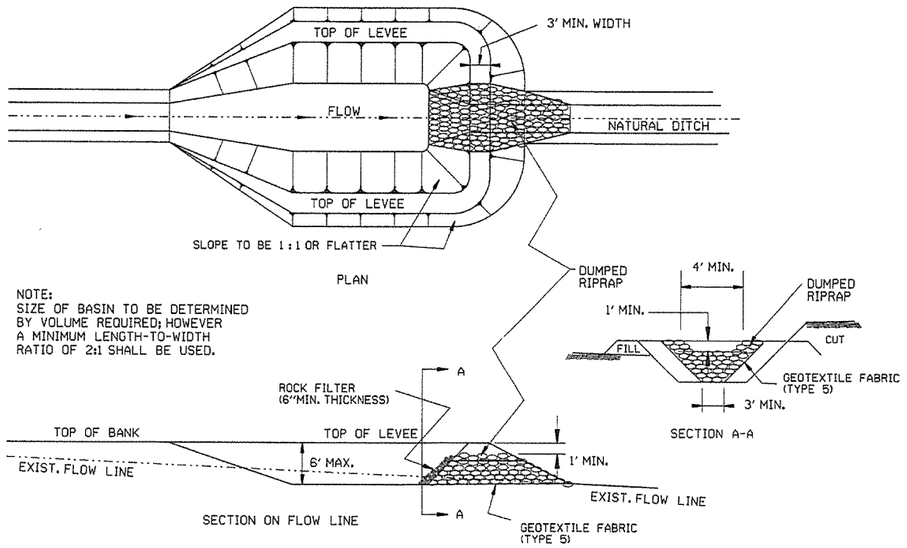
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

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

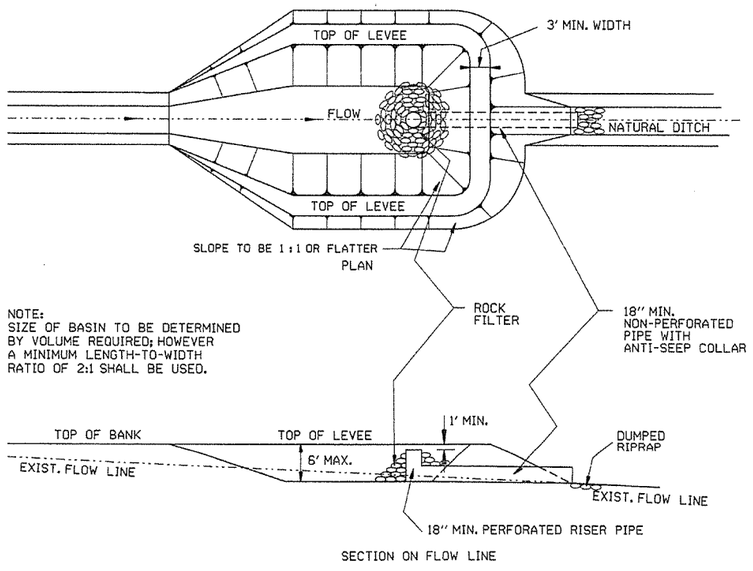
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

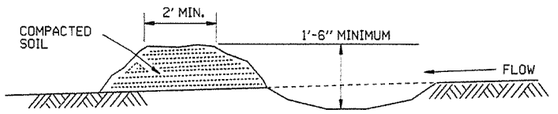
STANDARD DRAWING TEC-1



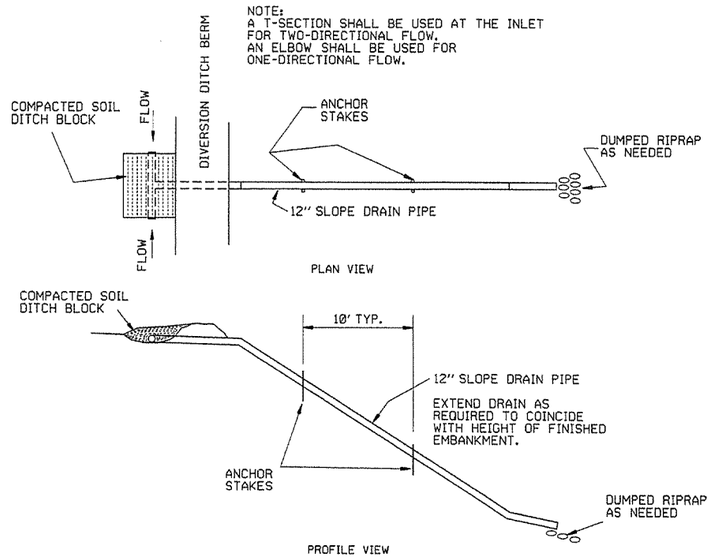
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



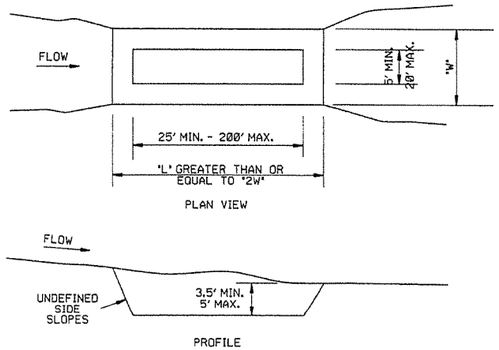
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



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

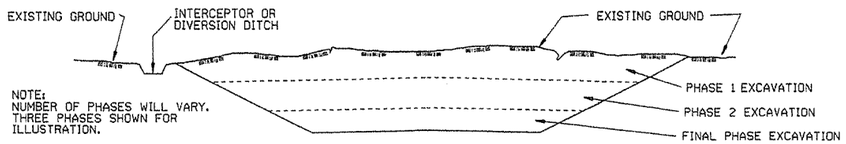
STANDARD DRAWING TEC-2

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



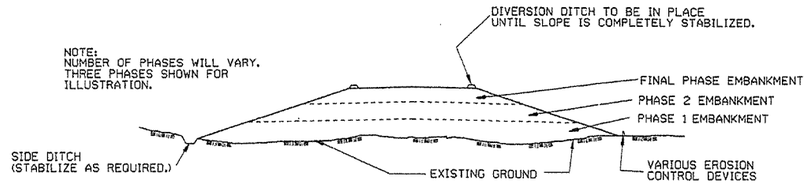
GENERAL NOTE

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

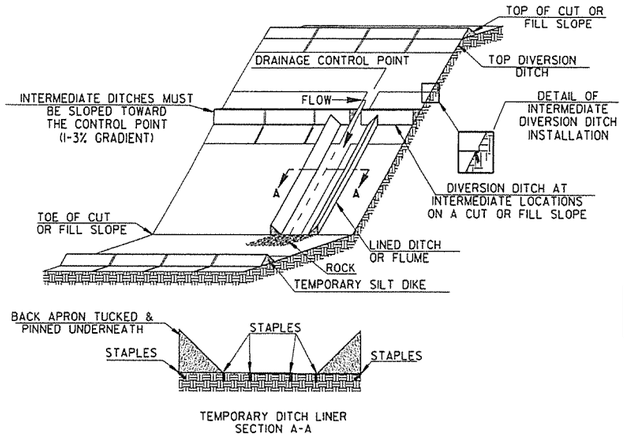
1. CONSTRUCT DIVERSION DITCHES, DITCH CHECKS, SEDIMENT BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD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

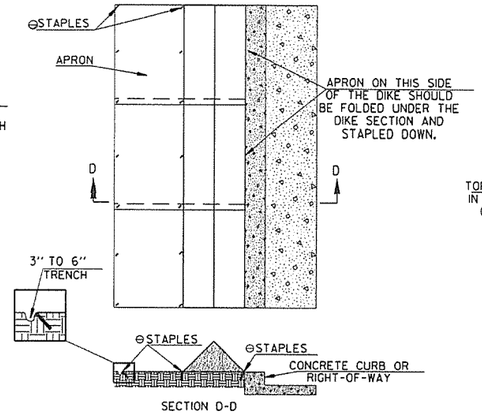
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

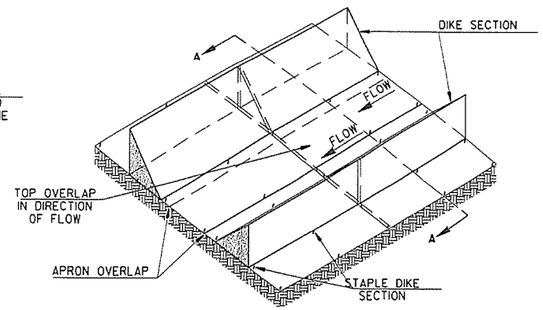
STANDARD DRAWING TEC-3



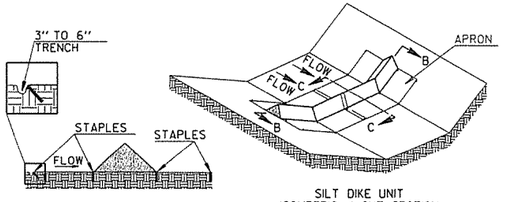
TRIANGULAR SILT DIKE INSTALLATION
FOR
DIVERSION DITCH AND/OR DITCH LINER

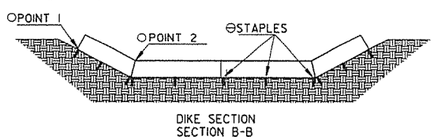


TRIANGULAR SILT DIKE INSTALLATION
FOR
CONTINUOUS BARRIER



TRIANGULAR SILT DIKE INSTALLATION
FOR
TEMPORARY DITCH LINER

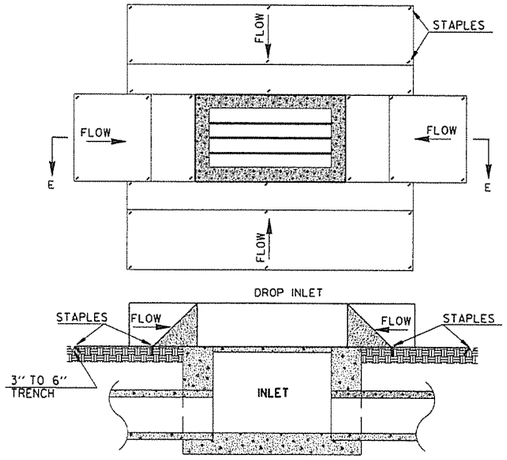




TRIANGULAR SILT DIKE INSTALLATION
FOR
ROADWAY DITCH OR DRAINAGE DITCH

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

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



TRIANGULAR SILT DIKE INSTALLATION
FOR
DROP INLETS

SYMBOLOGY
SYMBOL TO BE USED TO DENOTE DEVICE ON PLANS

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

GENERAL NOTES

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

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

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

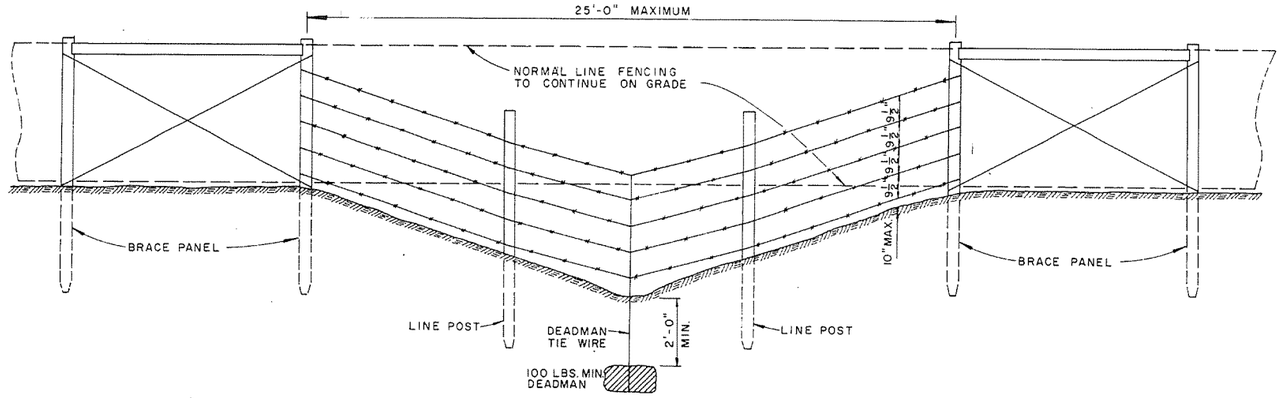
3. ACCEPTED TRIANGULAR SILT DIKE, MEASURED AS PROVIDED ABOVE, WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID FOR TRIANGULAR SILT DIKE. PRICE BID WILL INCLUDE THE COST OF FURNISHING THE DIKES, INSTALLING, MAINTAINING AND REMOVAL WHEN DIRECTED BY THE ENGINEER.

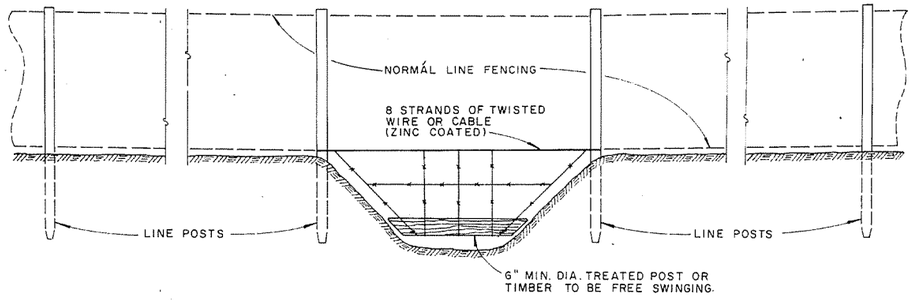
DATE	REVISION	FILMED
7-26-12	REVISED GENERAL NOTE 2.	
12-15-11	ISSUED	

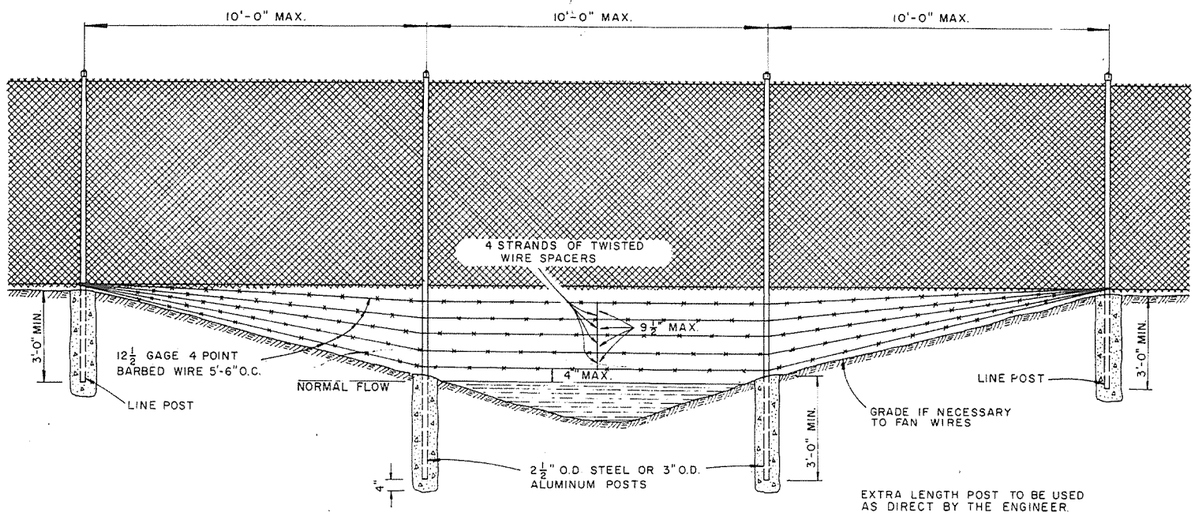
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-4







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.

DATE	REVISION	DATE FILM'D.
4-20-79	REVISED TOP RAIL & TENSION WIRE	696-4-20-79
10-2-72	REVISED & REDRAWN	529-10-2-72

ARKANSAS STATE HIGHWAY COMMISSION

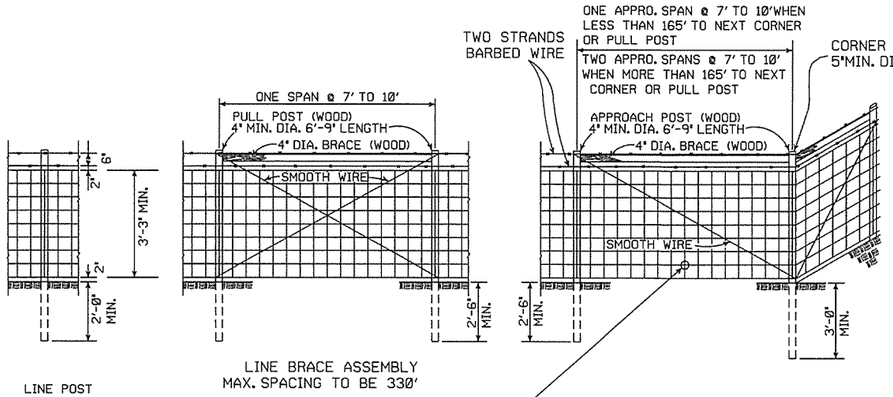
WIRE FENCE WATER GAPS

STANDARD DRAWING

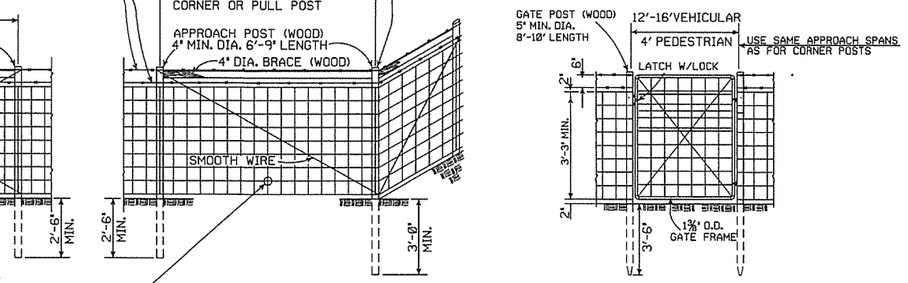
WF-2

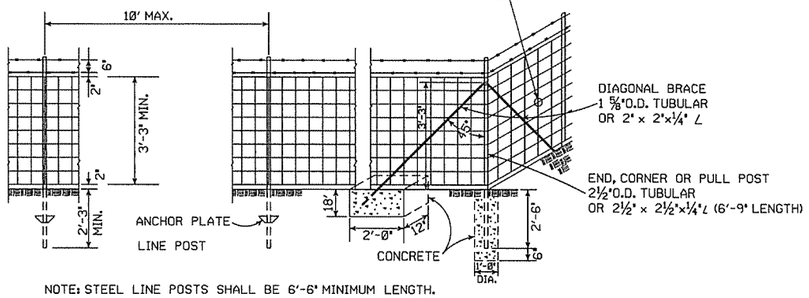
73

1M—11-71—67001—PP&SC

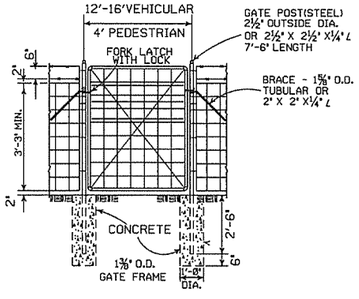


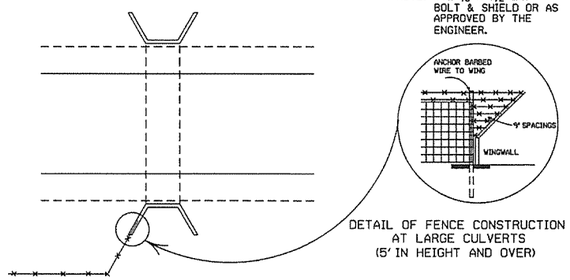
TYPE C FENCE (WOOD POSTS)

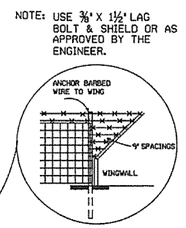




NOTE: STEEL LINE POSTS SHALL BE 6'-6" MINIMUM LENGTH.



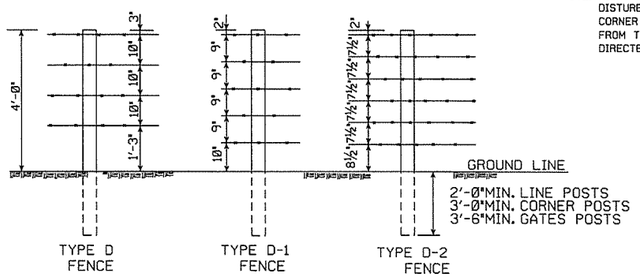




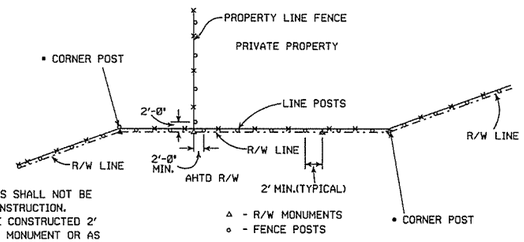
DETAIL OF FENCE CONSTRUCTION AT LARGE CULVERTS (5' IN HEIGHT AND OVER)

TYPE C FENCE (STEEL POSTS)

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



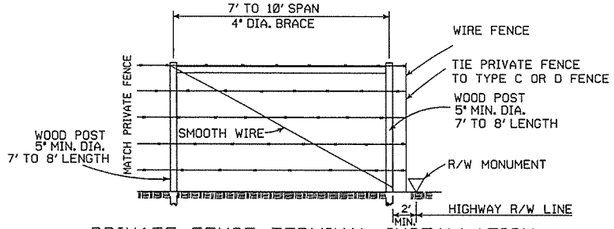
NOTE: SPACING AND SIZE (EXCEPT LENGTH) OF POSTS, APPROACH SPANS, PULL POST ASSEMBLIES, AND CORNER BRACING FOR TYPE D FENCE SHALL CONFORM TO TYPE C FENCE. USE GALVANIZED STAPLES ON WOOD POSTS AND APPROVED FASTENERS ON STEEL POSTS.



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

△ - R/W MONUMENTS
○ - FENCE POSTS

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.

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.

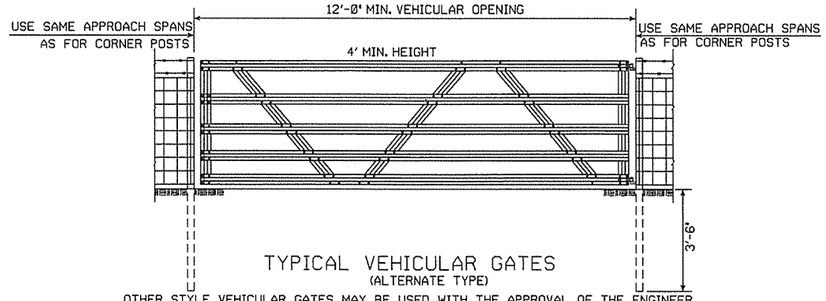
DRIVEWAY GATES, EITHER SINGLE 12' TO 16' OR DOUBLE 6' TO 8' OPENING OF THE SAME TYPE AS THE PEDESTRIAN GATE, SHALL BE INSTALLED ON THE RIGHT SIDE OF EACH THROUGH LANE ROAD AT LARGE CULVERTS OR BRIDGE CROSS FENCE, FOR USE OF MAINTENANCE EQUIPMENT. LOCATION OF GATES TO BE SHOWN ON PLANS OR AS DESIGNATED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



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	
10-10-96	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

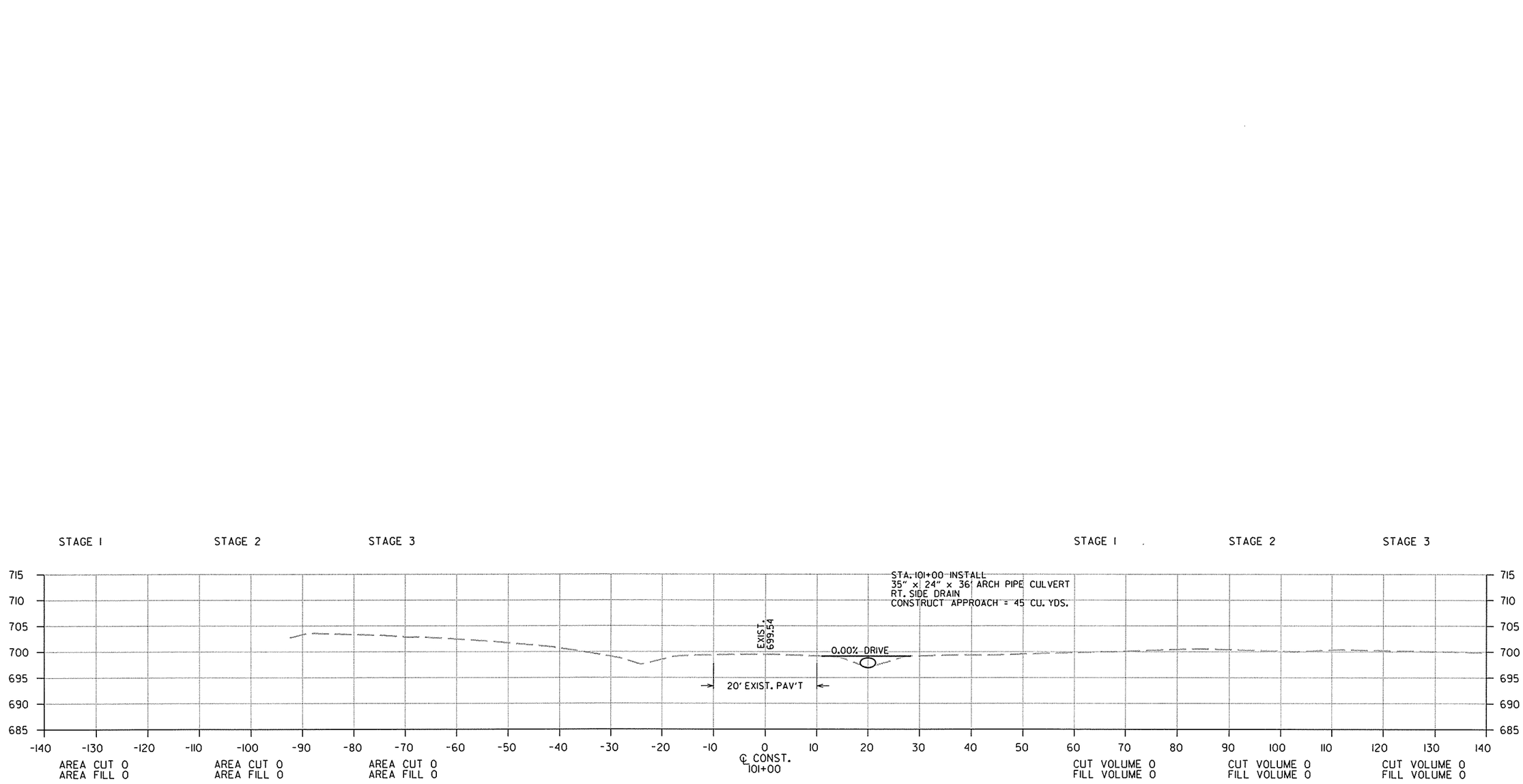
ARKANSAS STATE HIGHWAY COMMISSION

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.		040623	101	115

(2) CROSS SECTIONS



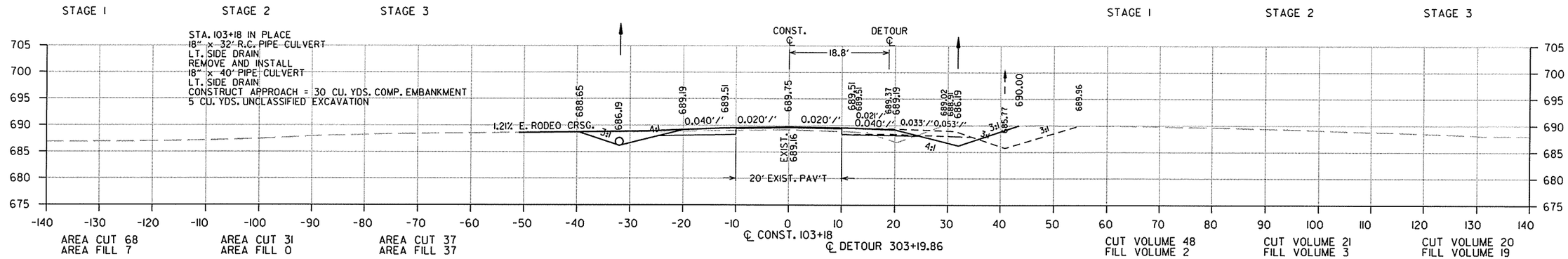
CROSS SECTION STA. 101+00 TO STA. 101+00

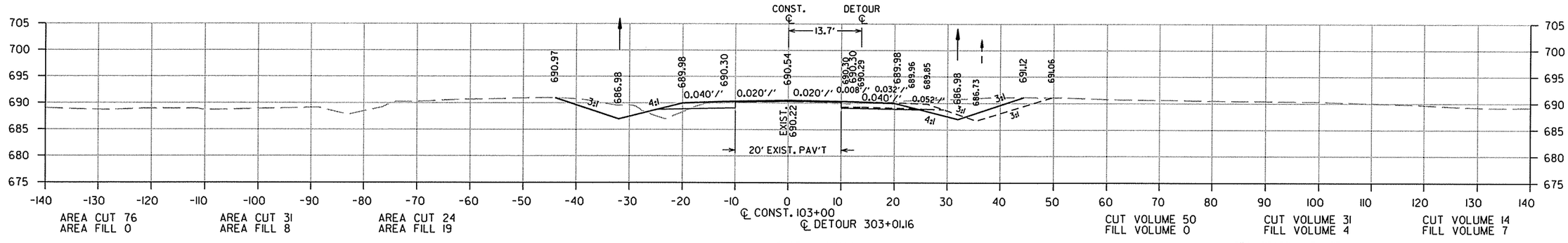
10/30/2014

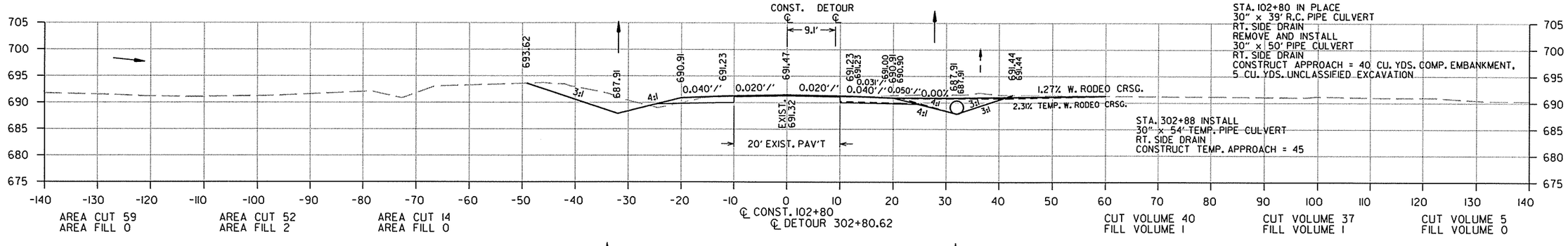
R040623.DGN

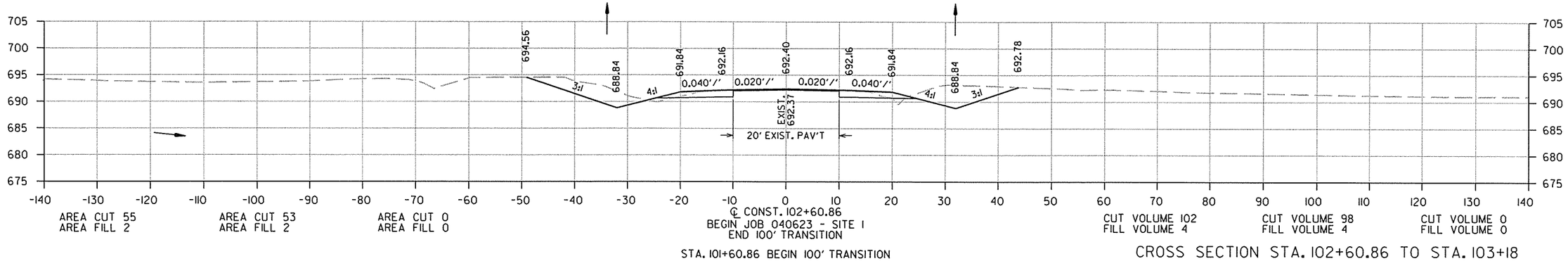
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	102	115

(2) CROSS SECTIONS









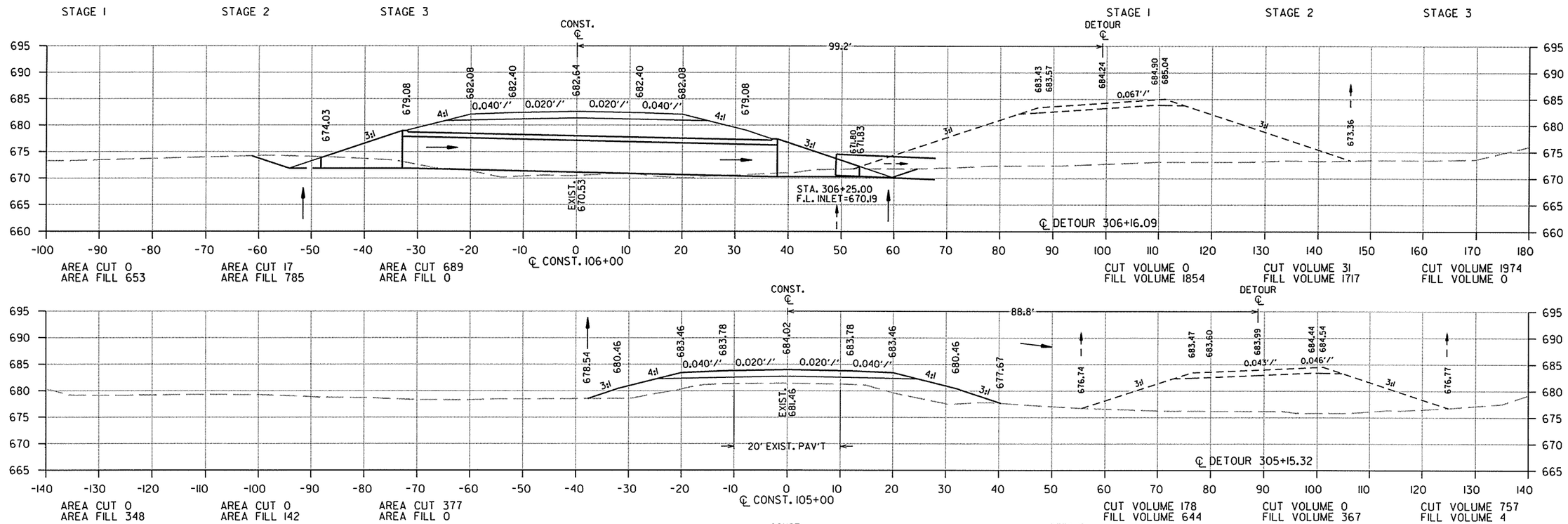
CROSS SECTION STA. 102+60.86 TO STA. 103+18

10/30/2014

R040623.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.		040623	103	115

(2) CROSS SECTIONS



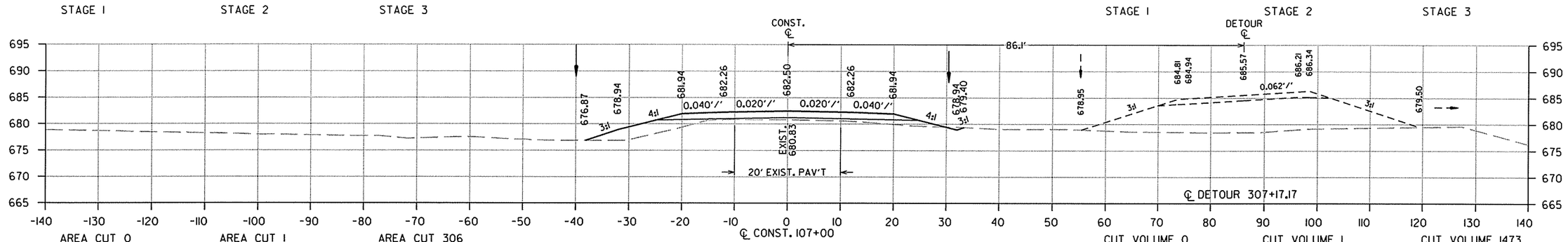
CROSS SECTION STA. 104+00 TO STA. 106+00

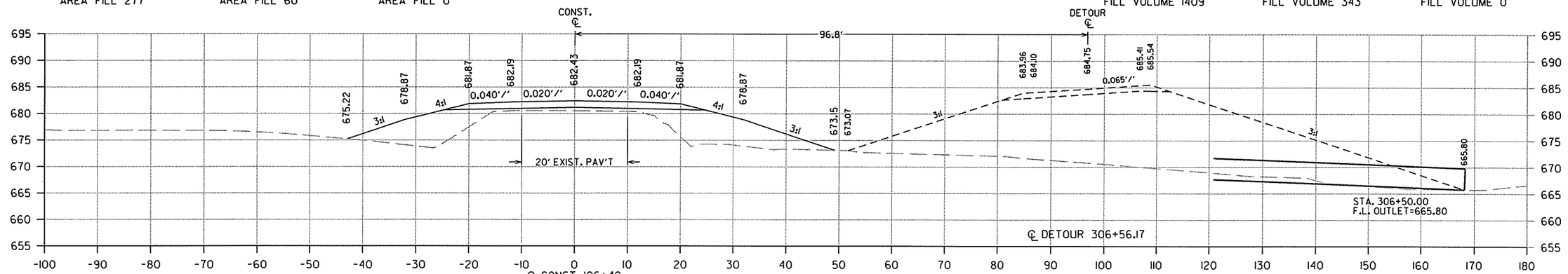
10/30/2014

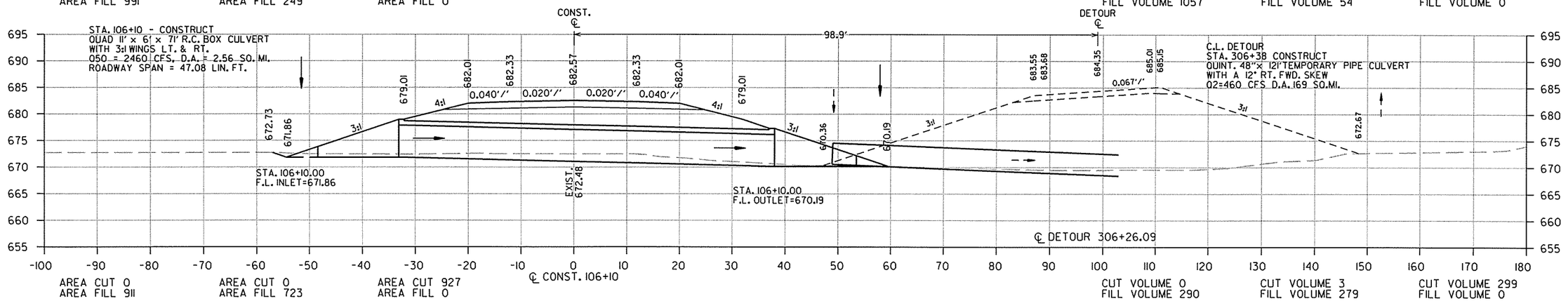
R040623.DGN

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.		040623	104	115

(2) CROSS SECTIONS







CROSS SECTION STA. 106+10 TO STA. 107+00

10/30/2014

R040623.DGN

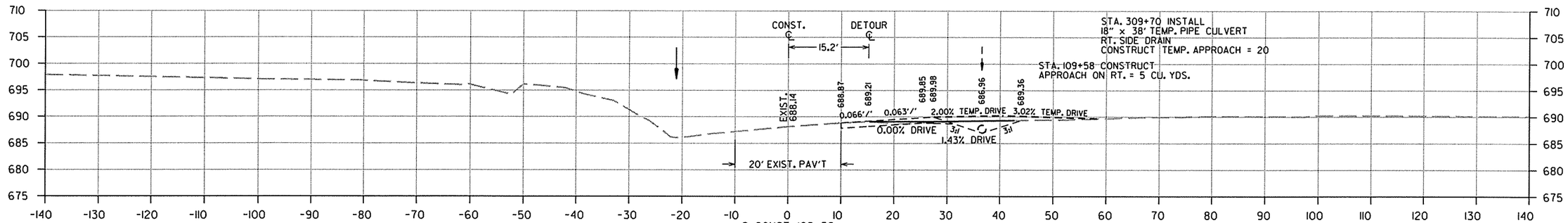
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	105	115

(2) CROSS SECTIONS

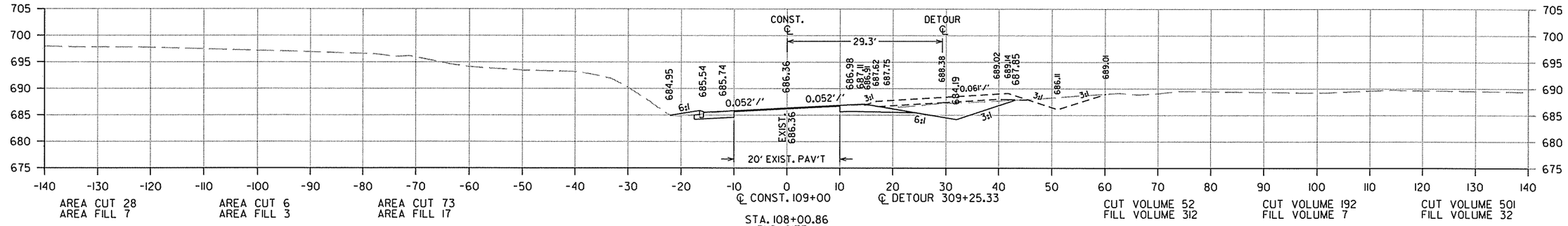
STAGE 1 — AREA CUT 0, AREA FILL 0
STAGE 2 — AREA CUT 0, AREA FILL 0
STAGE 3 — AREA CUT 0, AREA FILL 0

STA. 111+10.74
END DETOUR

STAGE 1 — CUT VOLUME 71, FILL VOLUME 0
STAGE 2 — CUT VOLUME 0, FILL VOLUME 0
STAGE 3 — CUT VOLUME 31, FILL VOLUME 45

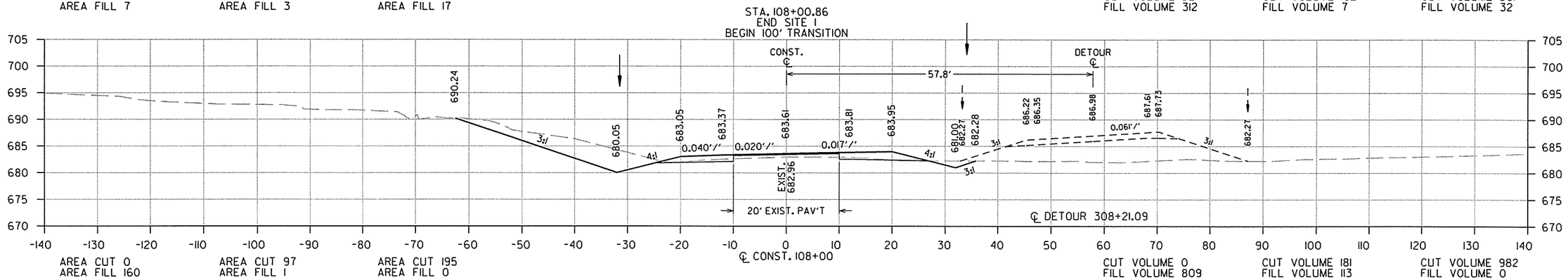


AREA CUT 25, AREA FILL 0 — AREA CUT 0, AREA FILL 0 — AREA CUT 11, AREA FILL 16
℄ CONST. 109+58
℄ DETOUR 309+86.61
CUT VOLUME 56, FILL VOLUME 7 — CUT VOLUME 6, FILL VOLUME 3 — CUT VOLUME 89, FILL VOLUME 35



AREA CUT 28, AREA FILL 7 — AREA CUT 6, AREA FILL 3 — AREA CUT 73, AREA FILL 17
℄ CONST. 109+00
℄ DETOUR 309+25.33
CUT VOLUME 52, FILL VOLUME 312 — CUT VOLUME 192, FILL VOLUME 7 — CUT VOLUME 501, FILL VOLUME 32

STA. 108+00.86
END SITE 1
BEGIN 100' TRANSITION



AREA CUT 0, AREA FILL 160 — AREA CUT 97, AREA FILL 1 — AREA CUT 195, AREA FILL 0
℄ CONST. 108+00
CUT VOLUME 0, FILL VOLUME 809 — CUT VOLUME 181, FILL VOLUME 113 — CUT VOLUME 982, FILL VOLUME 0

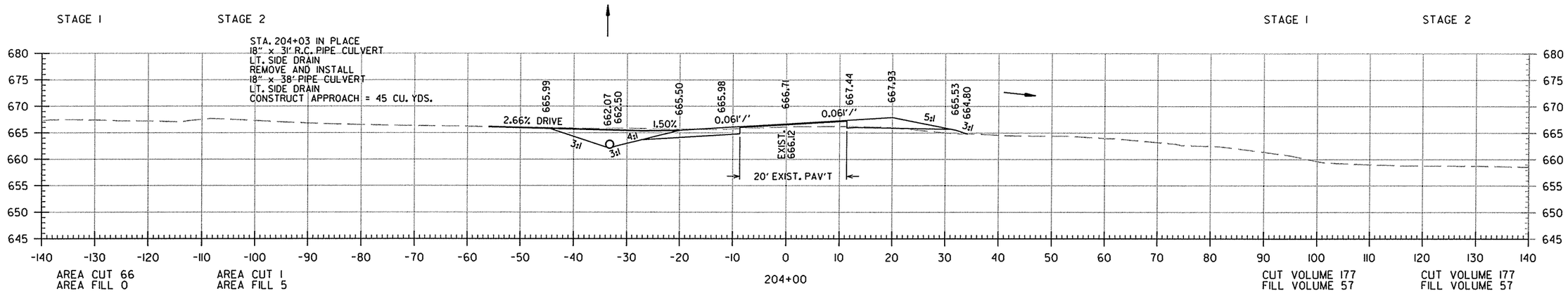
CROSS SECTION STA. 108+00 TO STA. 109+58

10/30/2014

R040623.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.		040623	106	115

(2) CROSS SECTIONS - SITE 2

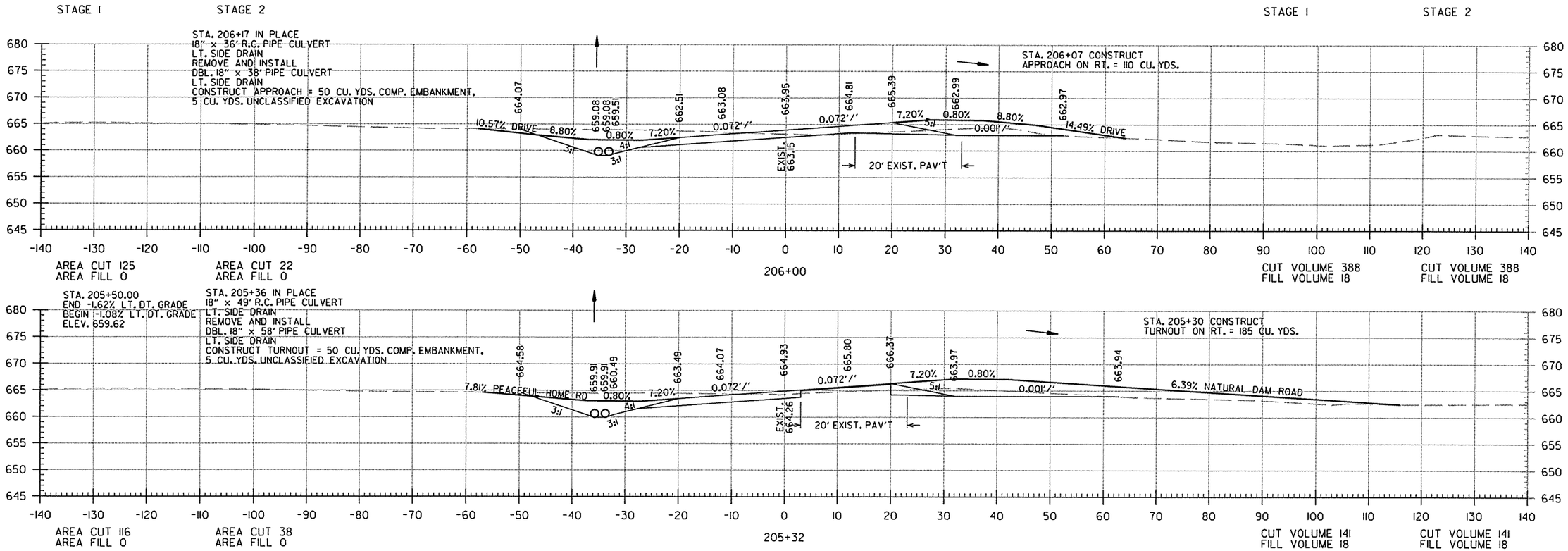


3/22/2016

R040623.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.		040623	107	115

(2) CROSS SECTIONS - SITE 2



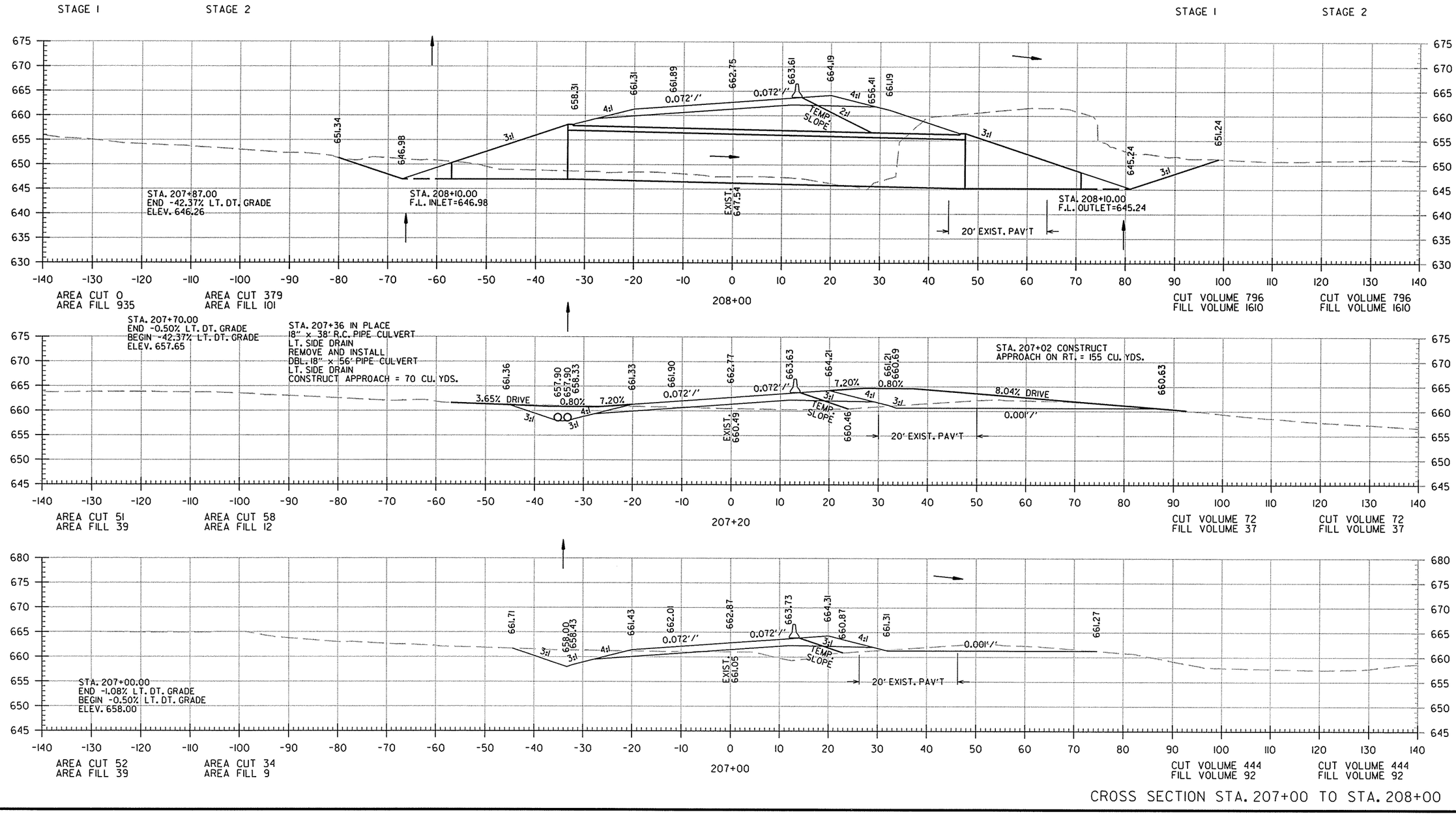
CROSS SECTION STA. 205+00 TO STA. 206+00

3/22/2016

R040623.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.		040623	108	115

(2) CROSS SECTIONS - SITE 2



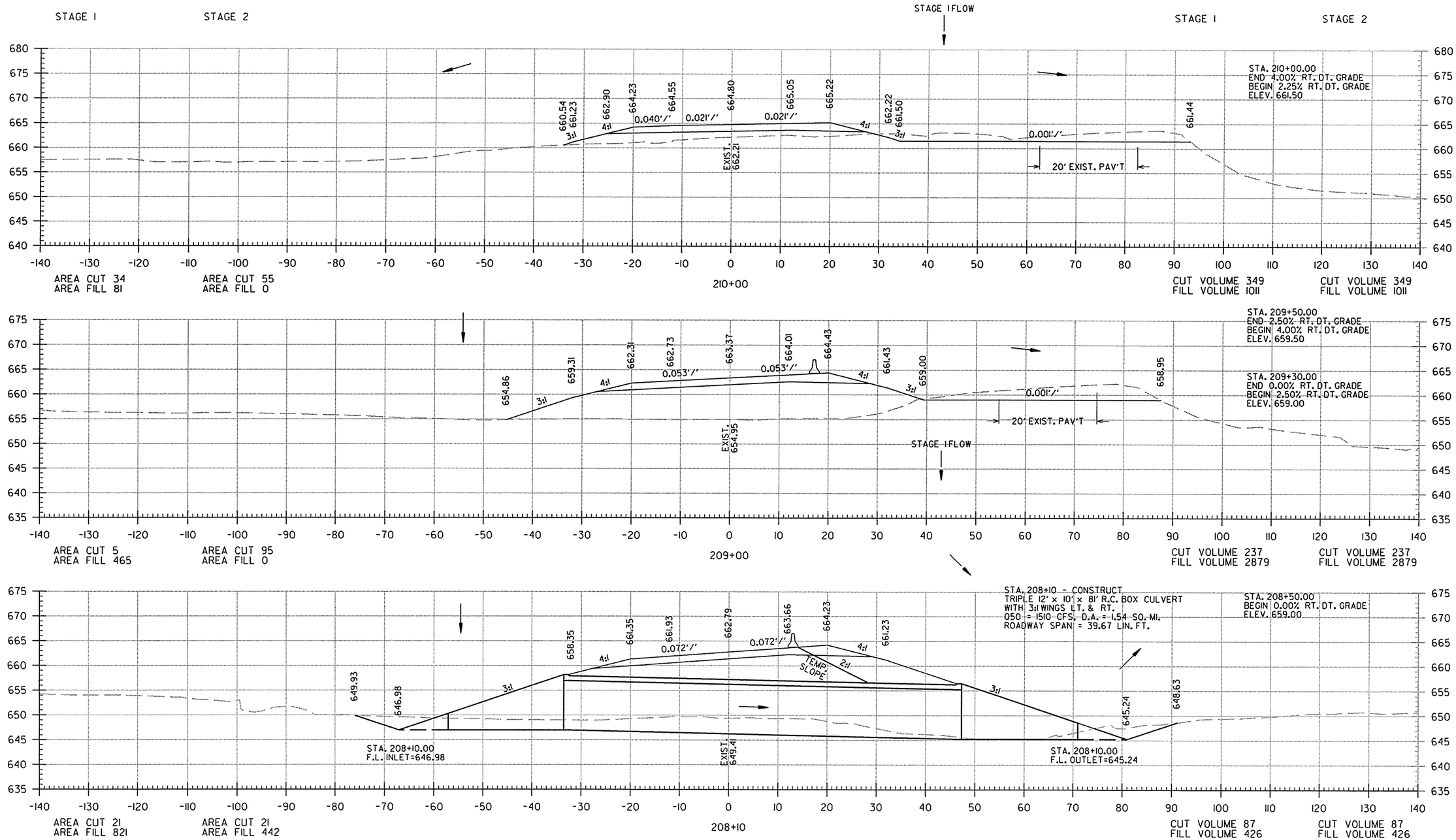
CROSS SECTION STA. 207+00 TO STA. 208+00

3/22/2016

R040623.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.		040623	109	115

(2) CROSS SECTIONS - SITE 2



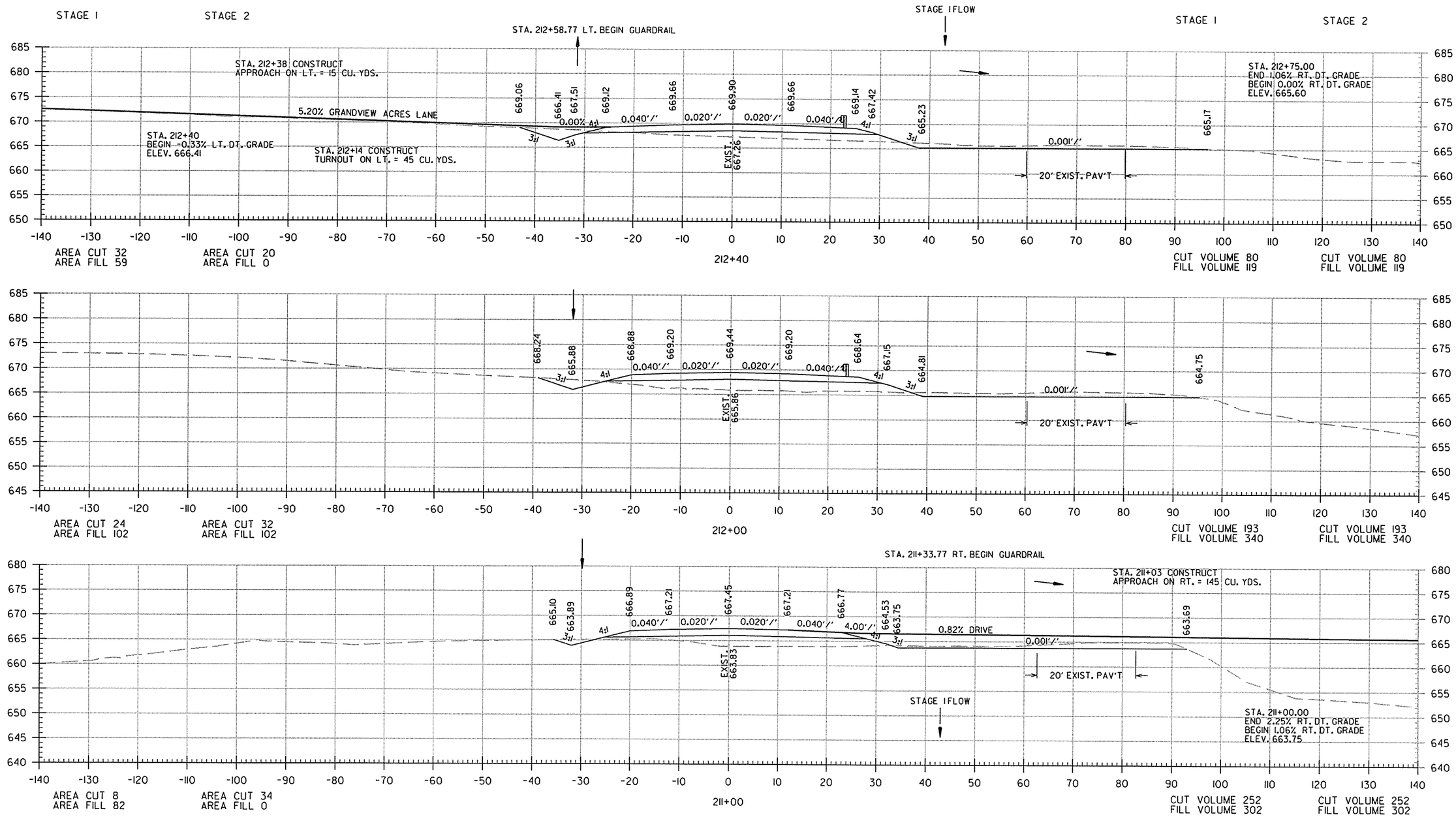
CROSS SECTION STA. 208+10 TO STA. 210+00

3/22/2016

R040623.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.		040623	110	115

(2) CROSS SECTIONS - SITE 2



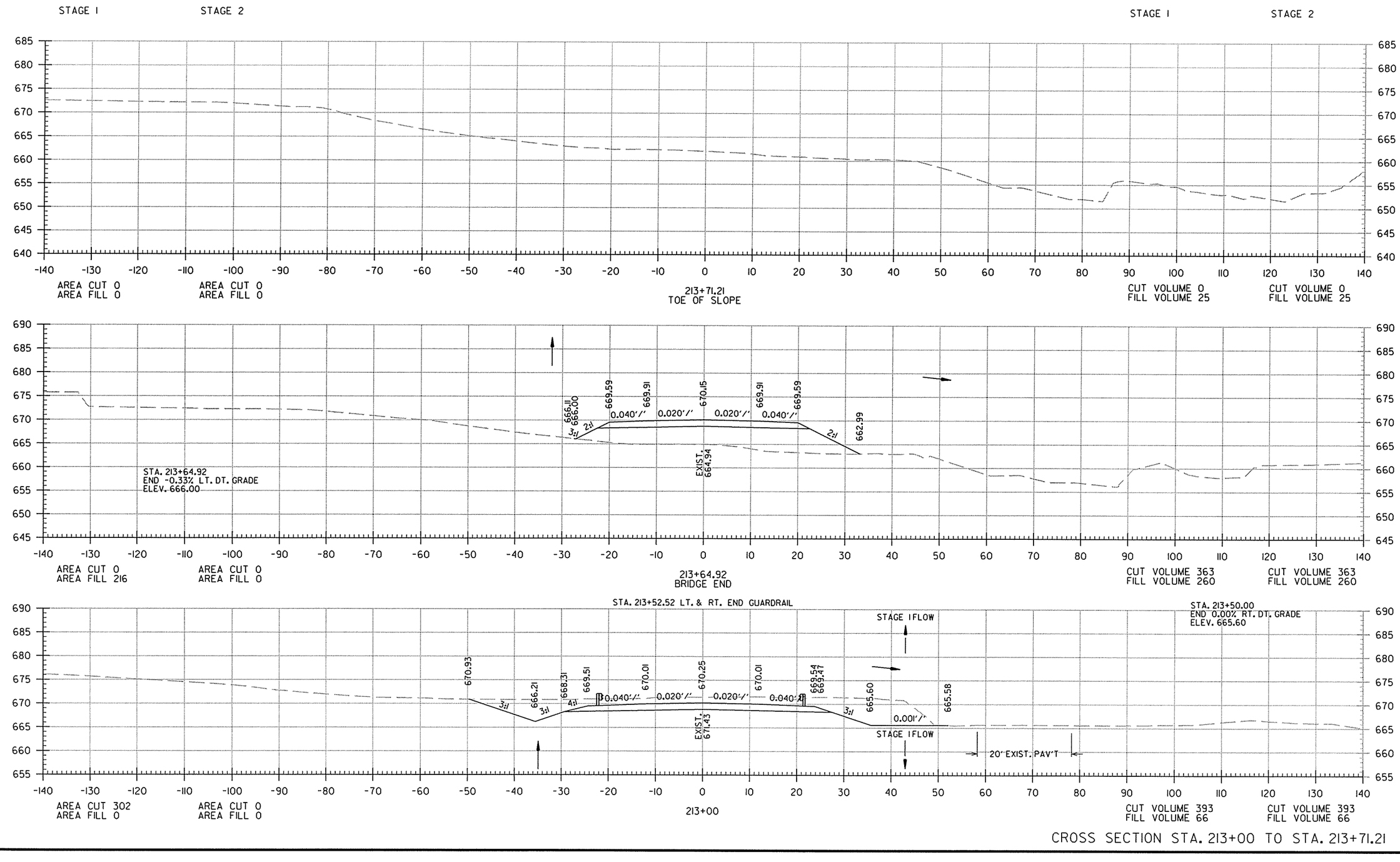
CROSS SECTION STA. 211+00 TO STA. 212+40

3/22/2016

R040623.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.		040623	111	115

(2) CROSS SECTIONS - SITE 2



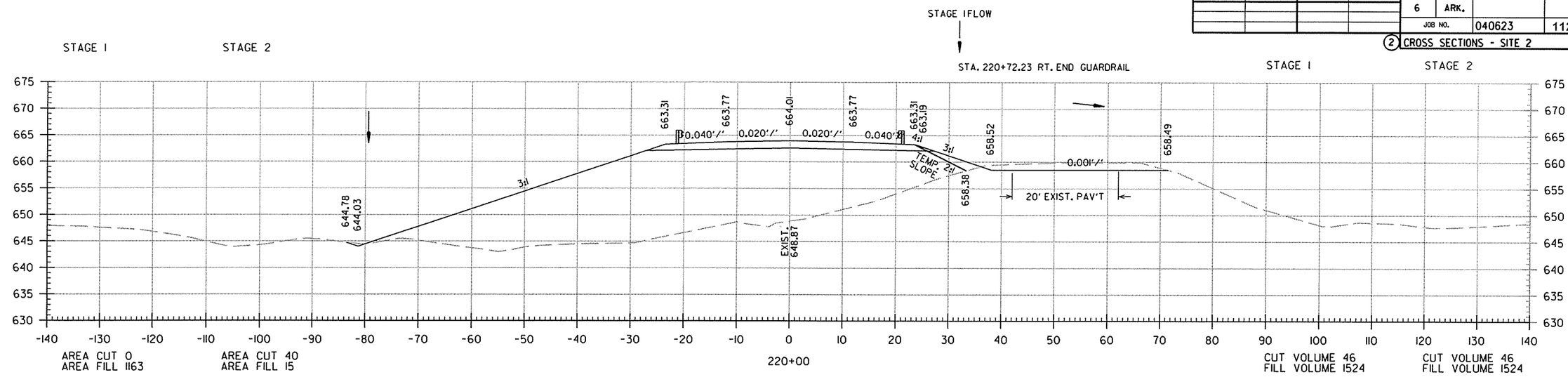
CROSS SECTION STA. 213+00 TO STA. 213+71.21

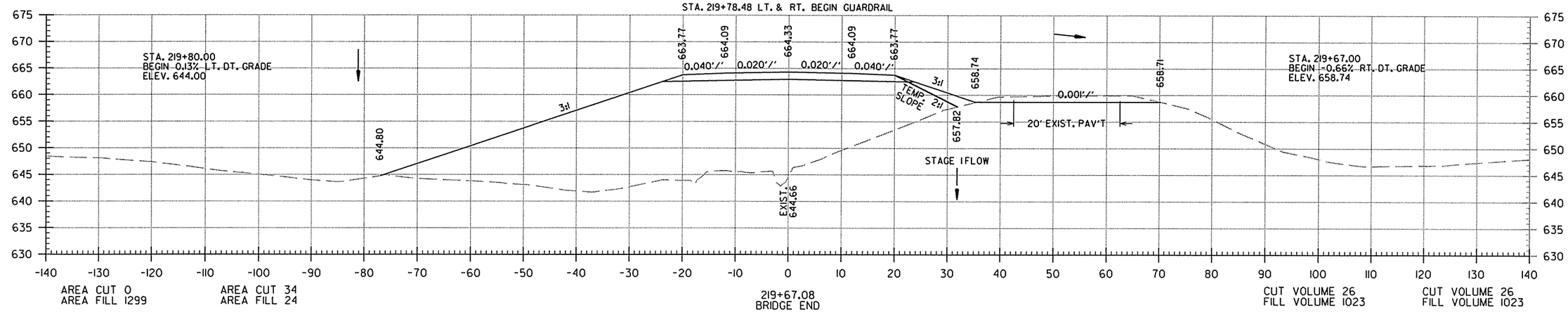
3/22/2016

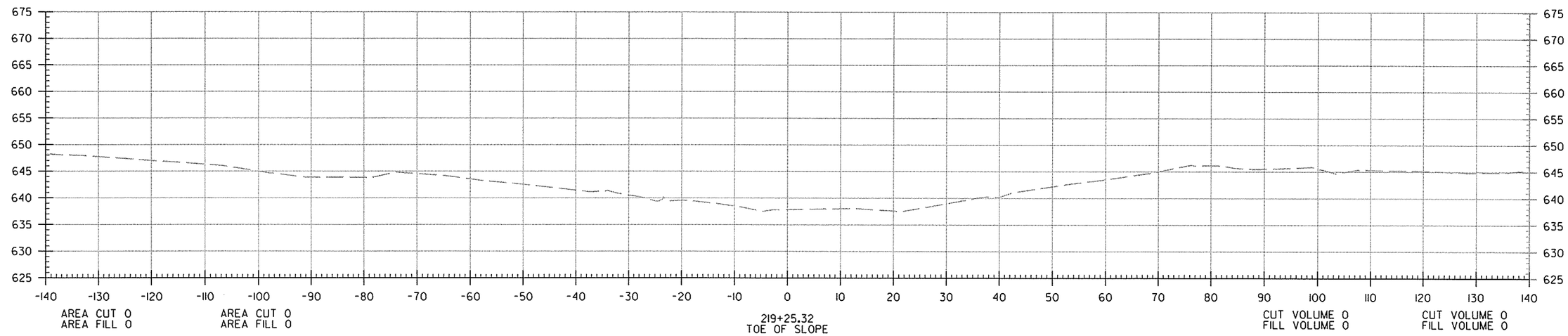
R040623.DGN

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.		040623	112	115

(2) CROSS SECTIONS - SITE 2







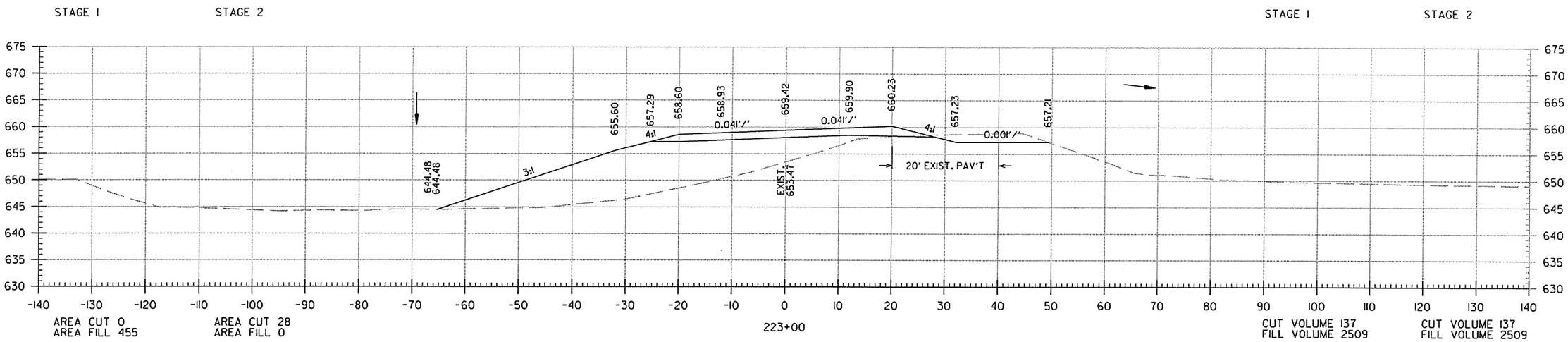
CROSS SECTION STA. 219+25.32 TO STA. 220+00

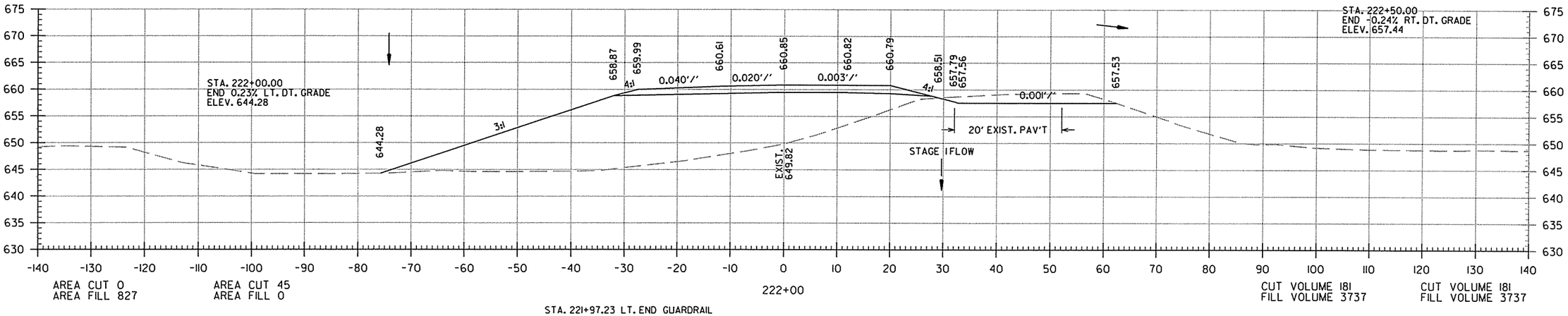
3/22/2016

R040623.DGN

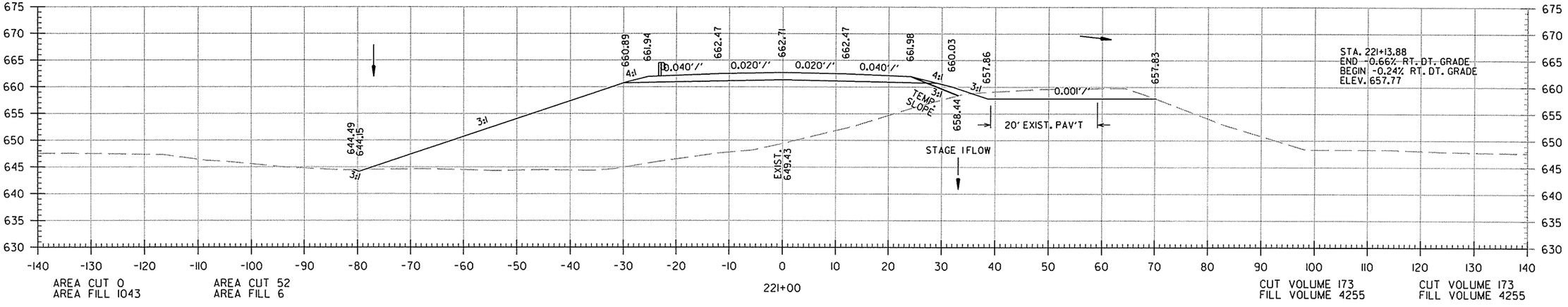
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040623	113	115

(2) CROSS SECTIONS - SITE 2





STA. 221+97.23 LT. END GUARDRAIL



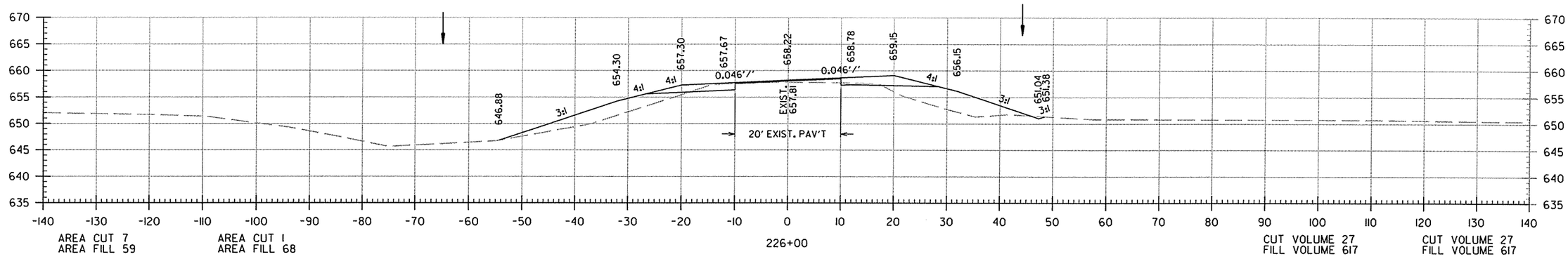
CROSS SECTION STA. 221+00 TO STA. 223+00

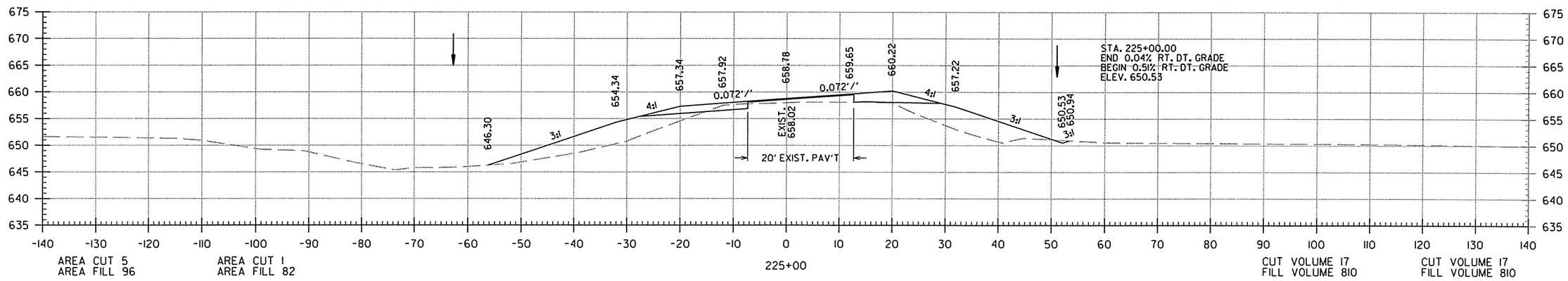
3/22/2016

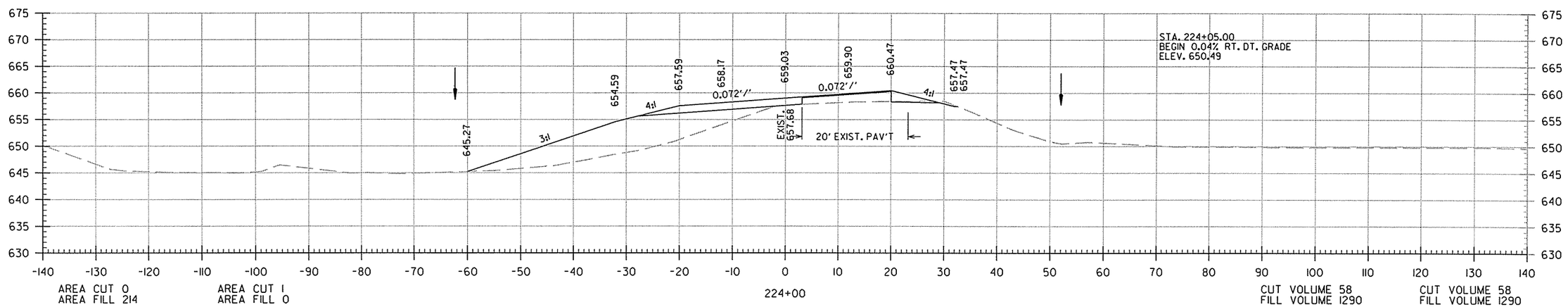
RD40623.DGN

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.		040623	114	115

(2) CROSS SECTIONS - SITE 2







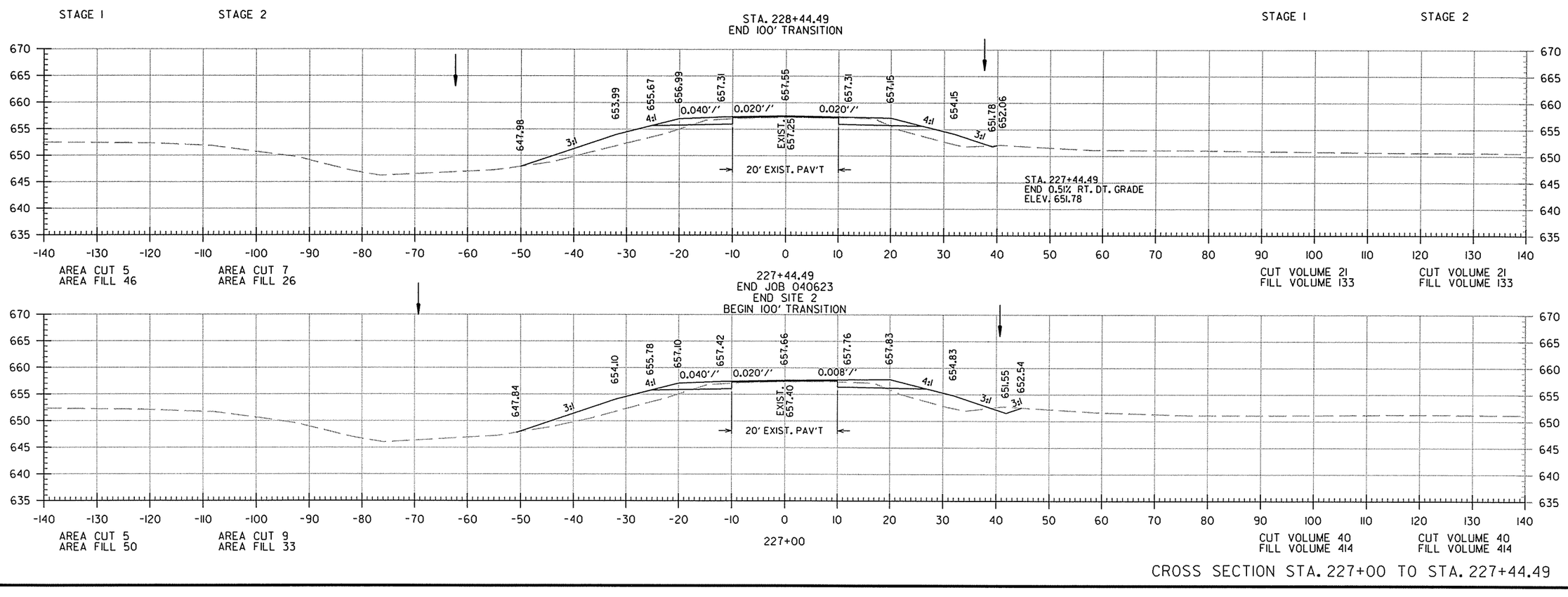
CROSS SECTION STA. 224+00 TO STA. 226+00

3/22/2016

R040623.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.		040623	115	115

(2) CROSS SECTIONS - SITE 2



CROSS SECTION STA. 227+00 TO STA. 227+44.49

3/22/2016

R040623.DGN