"THIS PROJECT IS A PARTIALLY CONTROLLED ACCESS FACILITY"

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.		061080	1	110

(2) SOUTH LOOP BYPASS (MABELVALE RD. - ALEXANDER RD.)(LITTLE ROCK)(S)

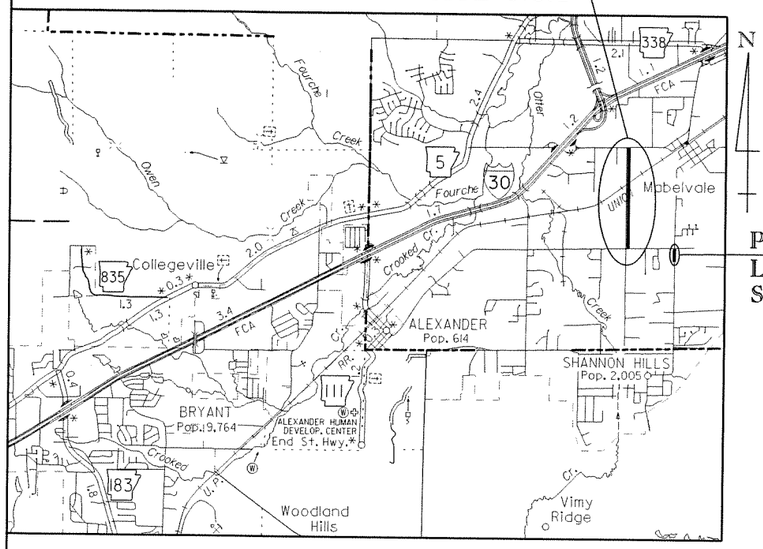
CONSTRUCTION PLANS

SOUTH LOOP BYPASS (MABELVALE RD.- ALEXANDER RD.) (LITTLE ROCK)(S)

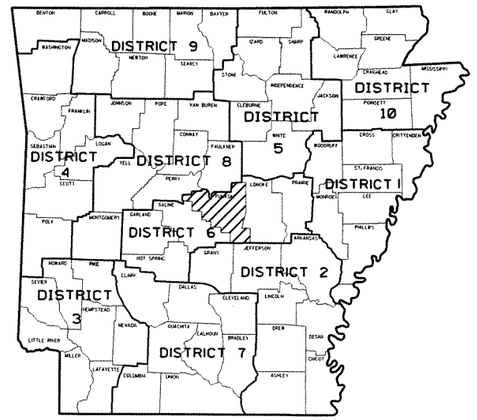
PULASKI COUNTY

FEDERAL AID PROJECT STPU-HPP2-9253(48)

JOB 061080



VICINITY MAP

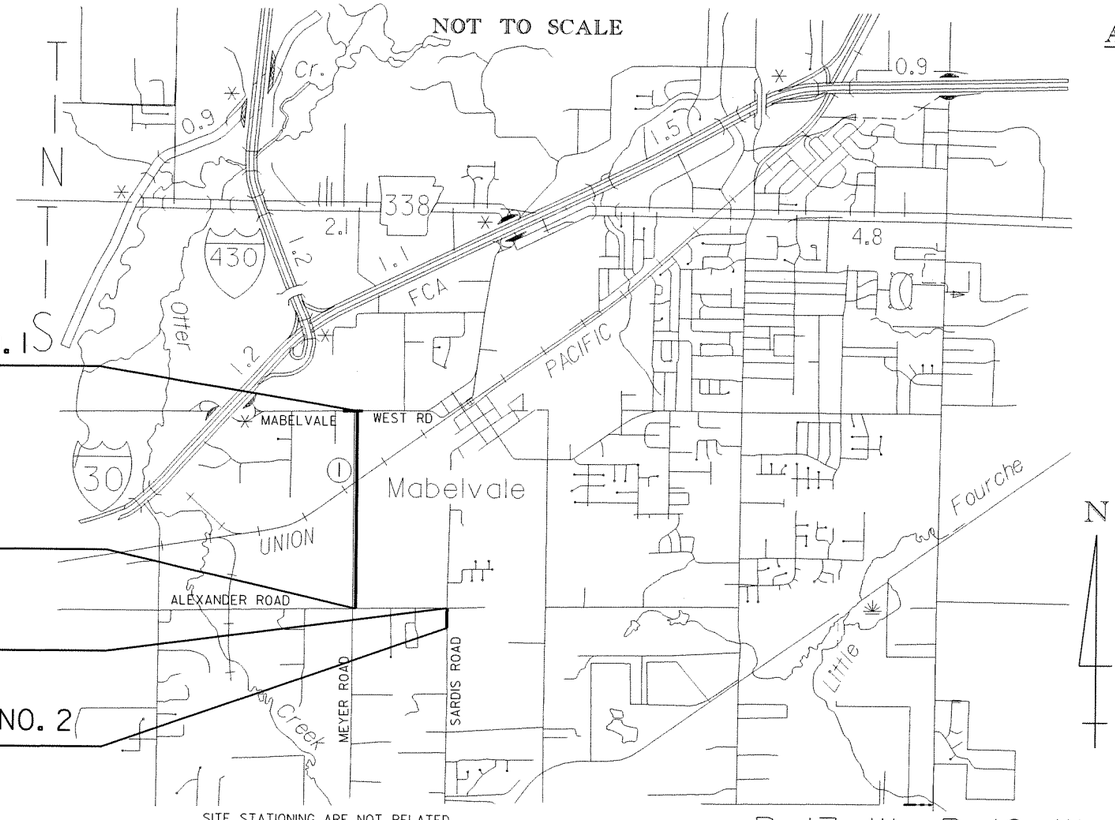


ARKANSAS HIGHWAY DISTRICT 6

BRIDGE DATA

(1) STA. 43+29.66 BRIDGE END
BRIDGE NO. 07157 U.P. RAILROAD OVERPASS
322'-0" CONT. COMP. PLATE GIRDER UNIT
40'-0" CLEAR ROADWAY
324'-8¼" BRIDGE LENGTH
STA. 46+54.34 BRIDGE END

NOT TO SCALE



SITE STATIONING ARE NOT RELATED

DESIGN TRAFFIC DATA

DESIGN YEAR----------2029
2009 ADT----------5900
2029 ADT----------9700
2029 DHV----------1065
DIRECTIONAL DISTRIBUTION----------60%
TRUCKS----------10%
DESIGN SPEED----------45 MPH

PROJECT COORDINATES

	BEGIN	MID-POINT	END
LATITUDE	N 34°38'27"	N 34°38'54"	N 34°39'20"
LONGITUDE	W 92°23'55"	W 92°23'54"	W 92°23'53"

LENGTH COMPUTED ALONG C.L. CONSTRUCTION

GROSS LENGTH OF PROJECT	5552.73 FEET OR 1.052 MILES
NET LENGTH OF ROADWAY	5228.05 FEET OR 0.990 MILES
NET LENGTH OF BRIDGES	324.68 FEET OR 0.062 MILES
NET LENGTH OF PROJECT	5552.73 FEET OR 1.052 MILES

GARVER LLC No. 766 CERTIFICATE OF AUTHORIZATION ARKANSAS ENGINEER

STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No.6901 GLYNN A. FULMER

12-8-11

P.E. JOB 061080
F.A.P. 0230-9253-047

sroberson 12/8/2011 10:06:35 AM
WORKSPACE: AHTD
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REVISED DATE:

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
1-30-12				6	ARK.			
				JOB NO.		061080	2	110

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

INDEX OF SHEETS

SHEET NO.	TITLE	BRIDGE NO.	DRAWING NO.	DATE
1	TITLE SHEET			
2	INDEX OF SHEETS, GOVERNING SPECIFICATIONS AND GENERAL NOTES			
3-4	TYPICAL SECTIONS OF IMPROVEMENT			
5-7	SPECIAL DETAILS			
8	INTERSECTION DETAILS			
9-10	TEMPORARY EROSION CONTROL DETAILS			
11-12	MAINTENANCE OF TRAFFIC			
13-14	PERMANENT PAVEMENT MARKINGS			
15	SOIL BORING LOG			
16-18	QUANTITY SHEETS			
19	SCHEDULE OF BRIDGE QUANTITIES	07157	50643	
20	SUMMARY OF QUANTITIES AND REVISIONS			
21-22	SURVEY CONTROL DETAILS			
23	PLAN AND PROFILE SOUTH LOOP BYPASS STA. 10+29.91 TO 24+00			
24	PLAN AND PROFILE SOUTH LOOP BYPASS STA. 24+00 TO 39+00			
25	PLAN AND PROFILE SOUTH LOOP BYPASS STA. 39+00 TO 54+00			
26	PLAN AND PROFILE SOUTH LOOP BYPASS STA. 54+00 TO 62+28.38			
27	PLAN AND PROFILE ALEXANDER ROAD			
28	PLAN AND PROFILE MABELVALE WEST ROAD			
29	PLAN AND PROFILE SARDIS ROAD			
30	LAYOUT OF BRIDGE OVER UNION PACIFIC RAILROAD (SHEET 1 OF 5)	07157	50644	
31	LAYOUT OF BRIDGE OVER UNION PACIFIC RAILROAD (SHEET 2 OF 5)	07157	50645	
32	EXHIBIT "A" LAYOUT OF BRIDGE OVER UNION PACIFIC RAILROAD (SHEET 3 OF 5)	07157	50646	
33	EXHIBIT "A" LAYOUT OF BRIDGE OVER UNION PACIFIC RAILROAD (SHEET 4 OF 5)	07157	50647	
34	EXHIBIT "A" LAYOUT OF BRIDGE OVER UNION PACIFIC RAILROAD (SHEET 5 OF 5)	07157	50648	
35	CONCEPTUAL LAYOUT OF BRIDGE OVER UNION PACIFIC RAILROAD	07157	50649	
36	DETAILS OF END BENTS (SHEET 1 OF 4)	07157	50650	
37	DETAILS OF END BENTS (SHEET 2 OF 4)	07157	50651	
38	DETAILS OF END BENTS (SHEET 3 OF 4)	07157	50652	
39	DETAILS OF END BENTS (SHEET 4 OF 4)	07157	50653	
40	DETAILS OF INTERMEDIATE BENTS (SHEET 1 OF 2)	07157	50654	
41	DETAILS OF INTERMEDIATE BENTS (SHEET 2 OF 2)	07157	50655	
42	DETAILS OF 322'-0" COMPOSITE PLATE GIRDER UNIT (SHEET 1 OF 9)	07157	50656	
43	DETAILS OF 322'-0" COMPOSITE PLATE GIRDER UNIT (SHEET 2 OF 9)	07157	50657	
44	DETAILS OF 322'-0" COMPOSITE PLATE GIRDER UNIT (SHEET 3 OF 9)	07157	50658	
45	DETAILS OF 322'-0" COMPOSITE PLATE GIRDER UNIT (SHEET 4 OF 9)	07157	50659	
46	DETAILS OF 322'-0" COMPOSITE PLATE GIRDER UNIT (SHEET 5 OF 9)	07157	50660	
47	DETAILS OF 322'-0" COMPOSITE PLATE GIRDER UNIT (SHEET 6 OF 9)	07157	50661	
48	DETAILS OF 322'-0" COMPOSITE PLATE GIRDER UNIT (SHEET 7 OF 9)	07157	50662	
49	DETAILS OF 322'-0" COMPOSITE PLATE GIRDER UNIT (SHEET 8 OF 9)	07157	50663	
50	DETAILS OF 322'-0" COMPOSITE PLATE GIRDER UNIT (SHEET 9 OF 9)	07157	50664	
51	DETAILS OF ELASTOMERIC BEARINGS	07157	50665	
52	EMBANKMENT CONSTRUCTION AND BACKFILL AT BRIDGE ENDS		1888A	4-10-03
53	DETAILS FOR DUMPED RIPRAP AND FILTER BLANKET AND DETAILS FOR COMPUTING EXCAVATION FOR STRUCTURES		1891F	4-10-03
54	DETAILS OF STANDARD TYPE B APPROACH GUTTERS		2016B	7-14-10
55	DETAILS OF STANDARD TYPE D BRIDGE NAME PLATES		2387	9-8-11
56	DETAILS OF PERMISSIBLE TYPE PERMANENT STEEL BR. DECK FORMS FOR STEEL & CONC. GIRDER SPANS		1499I	4-10-03
57	DETAILS OF CONCRETE RIPRAP AND MISC. DETAILS OF STEEL PILING		14995A	4-10-03
58	CONCRETE DITCH PAVING		CDP-1	11-17-10
59	CURBING DETAILS		CG-1	11-29-07
60	DETAILS OF DRIVEWAYS & ISLANDS		DR-1	11-29-07
61	FLARED END SECTION		FES-1	10-18-96
62	FLARED END SECTION		FES-2	10-18-96
63	DETAILS OF DROP INLET (TYPE C)		FPC-9E	8-22-02
64	DETAILS OF DROP INLET (TYPE MO)		FPC-9M	8-22-02
65	DETAILS OF DROP INLET & JUNCTION BOX (TYPE ST)		FPC-9S	11-16-01
66	GUARD RAIL DETAILS		GR-8	7-14-10
67	GUARD RAIL DETAILS		GR-8A	7-14-10
68	GUARD RAIL DETAILS		GR-9	4-17-08
69	GUARD RAIL DETAILS		GR-9A	4-17-08
70	GUARD RAIL DETAILS		GR-10	7-14-10
71	GUARD RAIL DETAILS		GR-10A	7-14-10
72	GUARD RAIL DETAILS		GRT-1	7-14-10
73	PRECAST CONCRETE BOX CULVERTS		PBC-1	12-15-11
74	CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING		PCC-1	12-15-11
75	PAVEMENT MARKING DETAILS		PM-1	11-17-10
76	DETAILS OF PIPE UNDERDRAIN		PU-1	4-10-03
77	REINFORCED CONCRETE BOX CULVERT DETAILS		RCB-1	12-15-11
78	EXCAVATION PAY LIMITS, BACKFILL, & SOLID SODDING FOR BOX CULVERTS		RCB-2	11-20-03
79	DETAILS OF SPECIAL ITEMS		SI-1	4-17-08
80	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION		TC-1	12-15-11
81	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION		TC-2	3-11-10
82	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION		TC-3	10-15-09
83	TEMPORARY EROSION CONTROL DEVICES		TEC-1	12-15-11
83 A	TEMPORARY EROSION CONTROL DEVICES		TEC-2	6-2-94
84	TEMPORARY EROSION CONTROL DEVICES		TEC-3	11-3-94
85	WIRE FENCE TYPE A & B		WF-1	8-22-02
86	WIRE FENCE WATER GAPS		WF-2	4-20-79
87	CHAIN LINK FENCE		WF-3	11-17-10
88	DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS		W-X003-1	5-10-66
89	DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS		R-100X-0	2-8-63
90	DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS (45° SKEW)		W-X45	6-15-64
91	DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS (45° SKEW)		W-X453-1	5-10-66
92	DETAILS OF STANDARD BARREL SECTION FOR REINFORCED CONCRETE BOX CULVERTS (45° SKEW)		R-245X-01	7-14-64
93-110	CROSS SECTIONS			

NOTE - CROSS SECTIONS NOT NORMALLY INCLUDED IN PLANS SOLD TO PROSPECTIVE BIDDERS BUT MAY BE OBTAINED BY REQUEST.

GOVERNING SPECIFICATIONS

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

NUMBER	TITLE
ERRATA	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273	FHWA-1273 REVISIONS
FHWA-1273	REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS
FHWA-1273	SUPPLEMENT - SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140)
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - FEDERAL STANDARDS
FHWA-1273	SUPPLEMENT - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS
FHWA-1273	SUPPLEMENT - WAGE RATE DETERMINATION
100-2	MANUAL FOR ASSESSING SAFETY HARDWARE (MASH)
103-1	DETERMINATION OF DBE PARTICIPATION
105-1	CONSTRUCTION CONTROL MARKINGS
105-2	EQUIPMENT AND MATERIAL STORAGE ON BRIDGE STRUCTURES
107-1	WORKER VISIBILITY
108-1	LIQUIDATED DAMAGES
110-1	PROTECTION OF WATER QUALITY AND WETLANDS
303-1	AGGREGATE BASE COURSE
404-1	PRODUCTION VERIFICATION OF ASPHALT CONCRETE HOT MIX
409-1	MINERAL AGGREGATES
410-3	DENSITY TESTING FOR ACHM LEVELING COURSES AND BOND BREAKERS
600-1	WATER FOR VEGETATION
603-1	MAINTENANCE OF TRAFFIC
604-1	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
606-2	PIPE CULVERTS
718-2	REFLECTORIZED PAINT PAVEMENT MARKINGS
719-2	THERMOPLASTIC PAVEMENT MARKING MATERIAL
804-1	INSTALLATION OF DOWEL BARS AND TIE BARS

JOB 061080 ARMORED JOINT WITH NEOPRENE STRIP SEAL
JOB 061080 BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 061080 BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 061080 EXCAVATION AND EMBANKMENT
JOB 061080 GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 061080 HIGH PERFORMANCE PAVEMENT MARKING
JOB 061080 INSURANCE, CONSTRUCTION, AND FLAGGING REQUIREMENTS ON RAILROAD PROPERTY (UPRR)
JOB 061080 INTERNET BIDDING
JOB 061080 NESTING SITES OF MIGRATORY BIRDS
JOB 061080 PARTNERING REQUIREMENTS
JOB 061080 SOIL STABILIZATION
JOB 061080 STORM WATER POLLUTION PREVENTION PLAN
JOB 061080 SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 061080 UTILITY ADJUSTMENTS
JOB 061080 VALUE ENGINEERING
JOB 061080 WARM MIX ASPHALT

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER 1-30-12 No. 11835 JOOD E. MUELLER

GENERAL NOTES

1. GRADE LINE DENOTES FINISHED GRADE WHERE SHOWN ON THE 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 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 WHICH ARE TO BE REMOVED SHALL BE PAID FOR UNDER ITEM NO. 210 UNCLASSIFIED EXCAVATION.
9. LIMITS OF CONSTRUCTION SHOWN ON THE PLANS AND CROSS SECTIONS ARE BASED ON THE DESIGNER'S INTERPRETATION OF SOIL BORING LOGS. CLEARING AND GRUBBING SHALL EXTEND TO APPROXIMATELY 10 FEET OUTSIDE THE LIMITS OF CONSTRUCTION SHOWN ON THE PLANS AND CROSS SECTIONS.
10. THIS PROJECT IS COVERED UNDER A NATIONWIDE 14 SECTION 404 PERMIT. REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS, EDITION OF 2003, FOR PERMIT REQUIREMENTS.
11. PAVEMENT TO BE REMOVED FROM THE REMAINING PAVEMENT SHALL BE SEPARATED BY SAWING ALONG A NEAT LINE. ANY DAMAGE TO THE PAVEMENT THAT IS TO REMAIN SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

LEGEND

E — OVERHEAD ELECTRIC LINE	G — G — UNDERGROUND GAS LINE	EDGE OF GRAVEL
GUY WIRE	GM GAS METER	340 CONTOUR LINE
LIGHT POLE	SD STORM DRAIN MANHOLE	X — X — X WIRE FENCE
POWER POLE	GRATE INLET	SIGN
C^W — C^W UNDERGROUND TELEPHONE/FIBER OPTIC LINE	S S — S S SANITARY SEWER LINE	EVERGREEN TREE
TELEPHONE RISER	(S) SEWER MANHOLE	DECIDUOUS TREE
TELEPHONE VAULT	W — W — UNDERGROUND WATER LINE	O SHRUB
	(W) WATER METER	
	WATER VALVE	
	FIRE HYDRANT	

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WORKSPACE: AHTD
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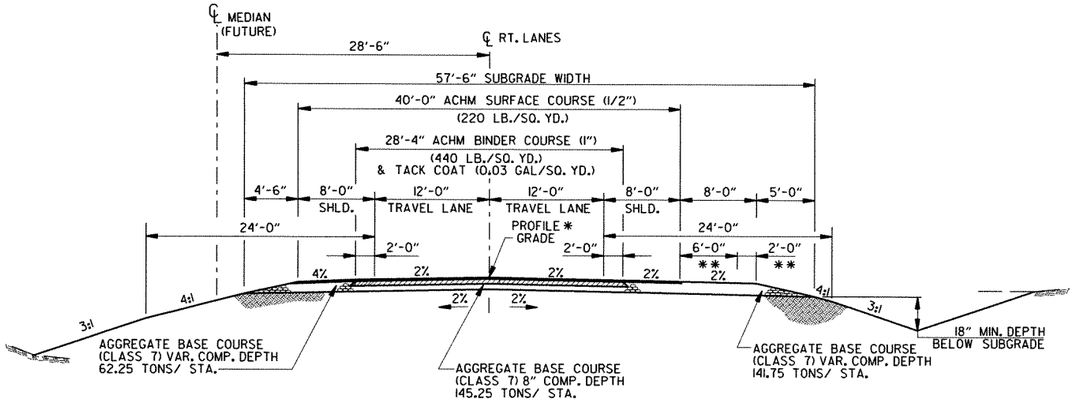
REVISED DATE:

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.		061080	3	110

(2) TYPICAL SECTIONS OF IMPROVEMENT



TYPICAL SECTION - RT. MAIN LANE - TANGENT
N.T.S. (LOOKING NORTH)

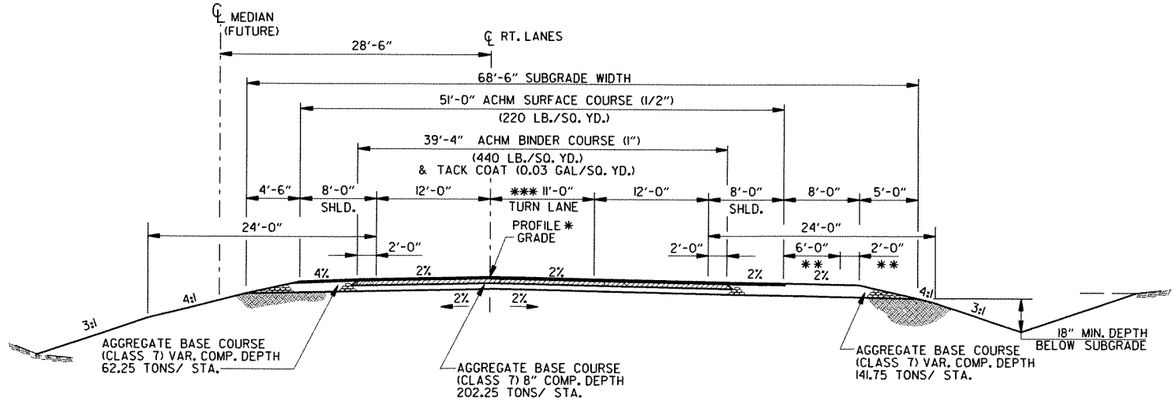
STA. 10+29.91 TO STA. 56+91.38

* PROFILE GRADE (BASED ON FUTURE 2" OVERLAY & 2% CROSS SLOPE) IS 0.41' BELOW FUTURE 4-LANE PROFILE GRADE REQUIRING TRANSITIONAL TIES AT BEGIN AND END OF PROJECT AND BRIDGE ENDS.

** FUTURE 6' ONE WAY SHARED USE PATH AND 2' WIDE GRADED AREA PER AASHTO "GUIDE FOR THE DEVELOPMENT OF BICYCLE FACILITIES," 1999 ED.

NOTES:

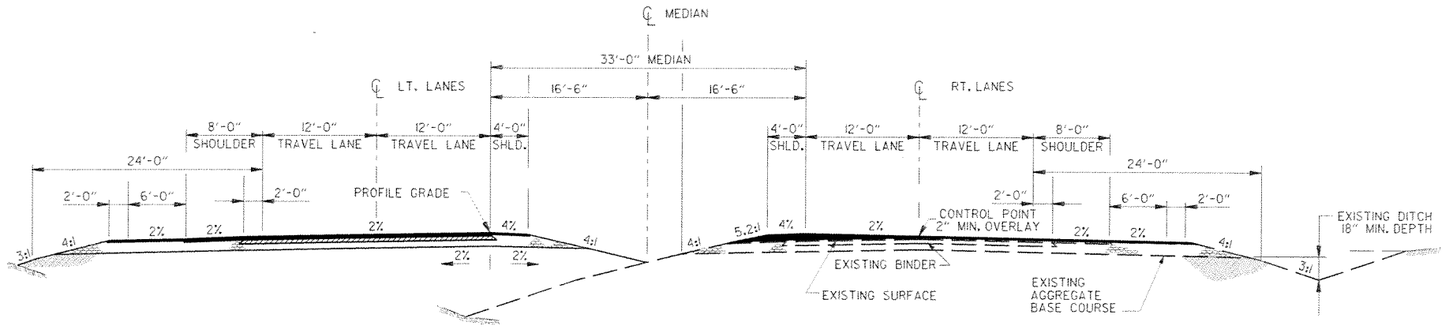
1. FUTURE ONE WAY SHARED USE PATH AND WIDENING TO CONSIST OF AGGREGATE BASE COURSE.
2. REFER TO CROSS SECTIONS FOR DEVIATIONS FROM NORMAL SLOPES. NO CHANGES SHALL BE MADE FROM THE PLANNED SLOPES WITHOUT THE APPROVAL OF THE ENGINEER.
3. THE THICKNESS OF THE AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS ONE INCH OF THE PLAN THICKNESS SHOWN. THE CONTRACTOR WILL CORRECT ANY DEFICIENT THICKNESS THAT DOES NOT MEET THE TOLERANCE INDICATED. PAYMENT WILL NOT BE MADE FOR MATERIAL PLACED IN EXCESS OF THE TOLERANCE INDICATED.
4. MATERIAL WITH A PI ≤ 20 IS REQUIRED FOR THE TOP 1'-6" OF EMBANKMENTS.



*** TAPER FROM 0' TO 11' FROM STA. 56+91.38 TO STA. 61+86.38

TYPICAL SECTION - LT. TURN LANE - TANGENT
N.T.S. (LOOKING NORTH)

STA. 61+86.38 TO STA. 63+28.38



FUTURE 4-LANE TYPICAL SECTION - NOT IN CONTRACT
(LOOKING NORTH)
N.T.S.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
11-20-09
No. 11835
TODD E. MUELLER

TYPICAL SECTIONS OF IMPROVEMENT

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WORKSPACE: AHTDVB
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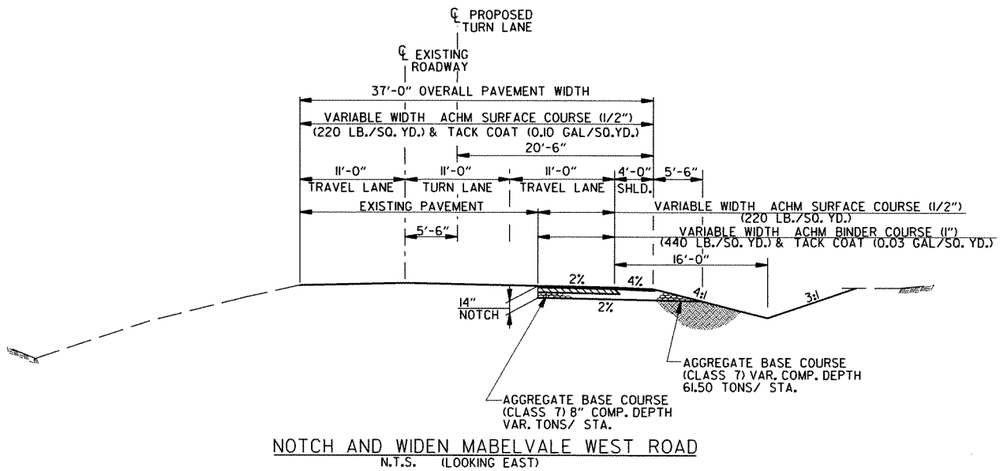
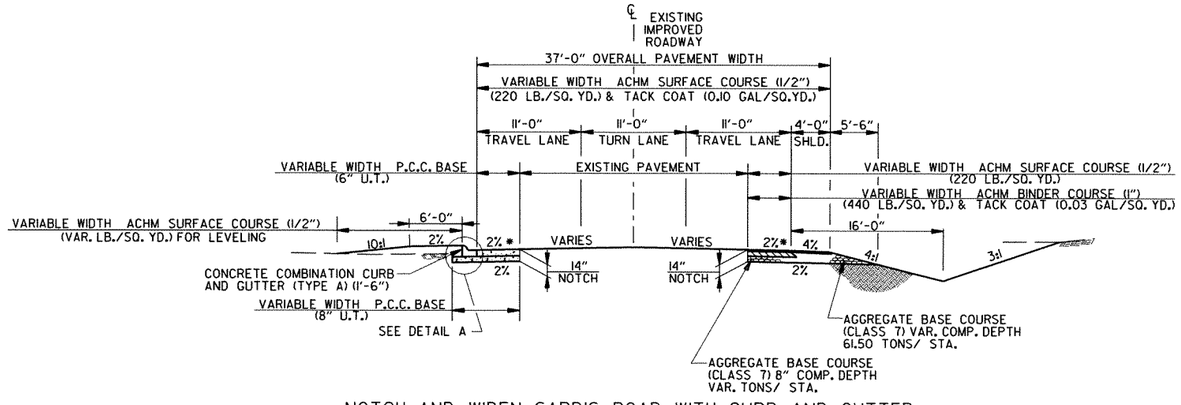
REVISED DATE:

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.		061080	4	110

(2) TYPICAL SECTIONS OF IMPROVEMENT



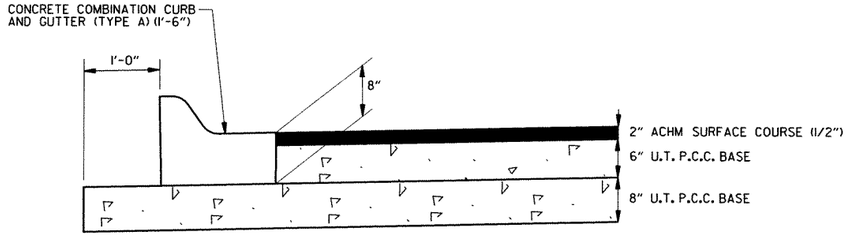
NOTCH AND WIDEN MABELVALE WEST ROAD
N.T.S. (LOOKING EAST)



NOTCH AND WIDEN SARDIS ROAD WITH CURB AND GUTTER
N.T.S. (LOOKING NORTH)

STA. 12+09.21 TO STA. 12+83.79
STA. 13+78.79 TO STA. 14+63.47

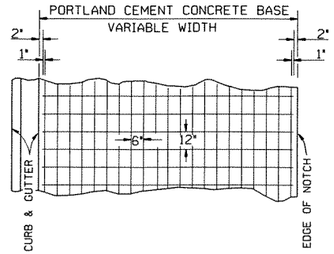
* TRANSITION FROM 0' AT STA. 12+09.21 TO 3.59' AT STA. 12+83.79
6.5' FROM STA. 13+78.79 TO 14+01.17
VARIES FROM STA. 14+01.17 TO STA. 14+63.47



DETAIL A

NOTES:

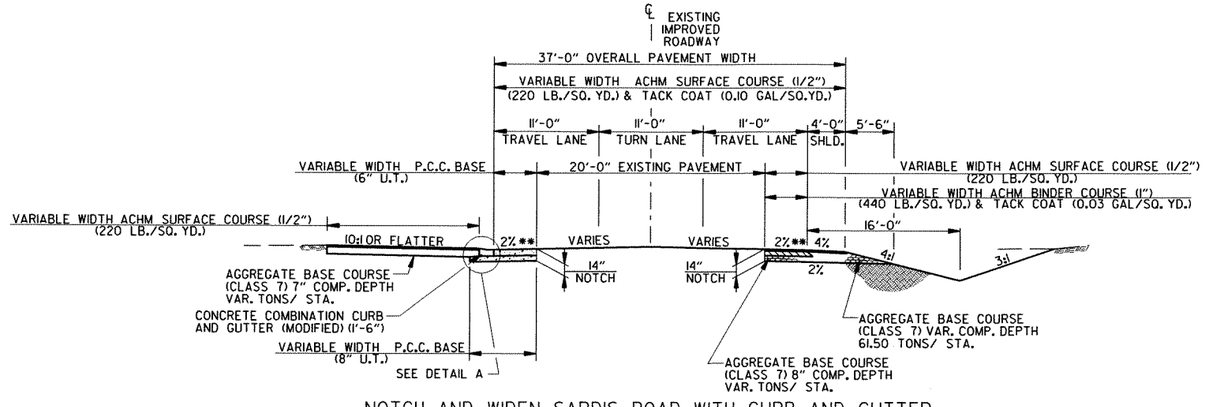
1. REFER TO CROSS SECTIONS FOR DEVIATIONS FROM NORMAL SLOPES. NO CHANGES SHALL BE MADE FROM THE PLANNED SLOPES WITHOUT THE APPROVAL OF THE ENGINEER.
2. THE THICKNESS OF THE AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS ONE INCH OF THE PLAN THICKNESS SHOWN. THE CONTRACTOR WILL CORRECT ANY DEFICIENT THICKNESS THAT DOES NOT MEET THE TOLERANCE INDICATED. PAYMENT WILL NOT BE MADE FOR MATERIAL PLACED IN EXCESS OT THE TOLERANCE INDICATED.
3. THE FINAL 2" OF SURFACE COURSE IS TO BE PLACED AFTER ALL OTHER COURSES HAVE BEEN LAID. LONGITUDINAL JOINTS SHALL BE AT LANE LINES.
4. PRIOR TO AND DURING PLACEMENT OF PAVEMENT IN FRONT OF CURB AND GUTTER, THE CONTRACTOR SHALL PROVIDE POSITIVE DRAINAGE AT ALL TIMES. THE METHODS USED SHALL BE APPROVED BY THE ENGINEER. PAYMENT FOR THIS WORK SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS CONTRACT ITEMS.



DETAIL OF REINFORCING STEEL FOR PAVEMENT (MESH FABRIC TYPE 3)

6"X 12" MESH FABRIC (TYPE 3) (W5.5 x W2.9) = 4.26 LBS./SQ.YD.

NOTES:
1. LAP MESH FABRIC MIN. 12" LONGITUDINALLY AND MIN. 6" TRANSVERSELY.
2. MESH FABRIC IS NOT REQUIRED WHEN WIDTH OF PORTLAND CEMENT CONCRETE BASE IS LESS THAN 12".
3. MESH FABRIC (TYPE 3) WILL NOT BE PAID FOR DIRECTLY, BUT FULL COMPENSATION THEREFOR WILL BE CONSIDERED INCLUDED IN THE CONTRACT PRICE BID PER SQ. YD. FOR PORTLAND CEMENT CONCRETE BASE (6" & 8" U.T.)



NOTCH AND WIDEN SARDIS ROAD WITH CURB AND GUTTER
N.T.S. (LOOKING NORTH)

STA. 12+97.17 TO STA. 13+64.79

** TRANSITION FROM 4.15' AT STA. 12+83.79 TO 6.5' AT STA. 13+44.21
6.5' FROM STA. 13+44.21 TO STA. 13+64.79

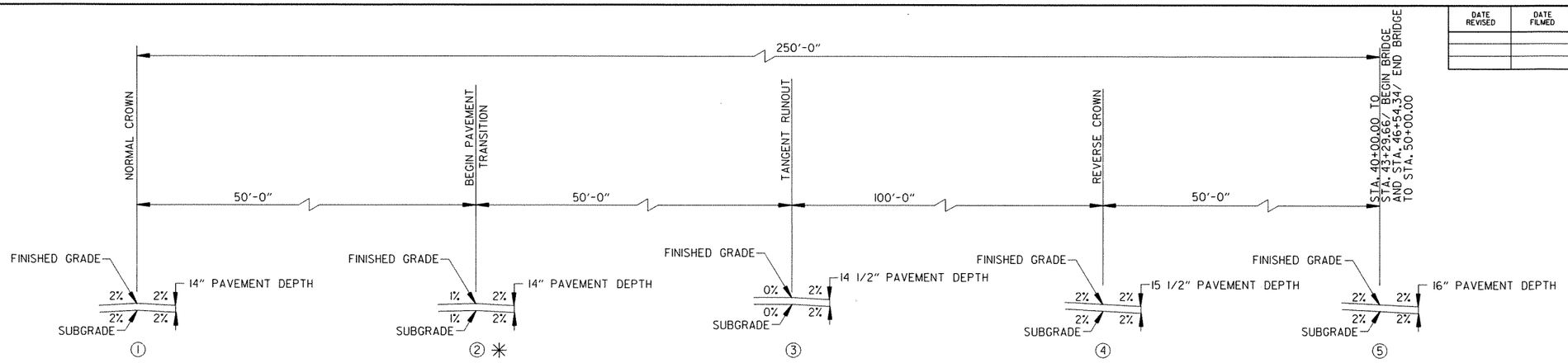
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11835
11-20-09
TODD E. MUELLER

TYPICAL SECTIONS OF IMPROVEMENT

rmfortner 11/19/2009 10:28:10 AM
WORKSPACE: AHTD#8
L:\2004\049\980 - South Loop - Phase I\Drawings\RWY\SLO_TY_02.dgn
REVISED DATE:

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.		061080	5	110

(2) SPECIAL DETAILS



BRIDGE PROFILE TRANSITION DETAIL *

(1) FINISHED GRADE = PROFILE GRADE

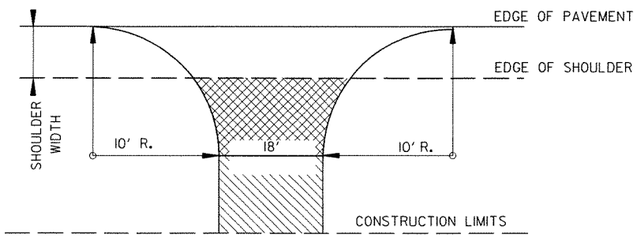
(2) FINISHED GRADE = PROFILE GRADE

(3) FINISHED GRADE = PROFILE GRADE PLUS 1/2"

(4) FINISHED GRADE = PROFILE GRADE PLUS 11/2"

(5) FINISHED GRADE = PROFILE GRADE PLUS 2"

* VARY ACHM BINDER COURSE (1") TO ACCOMPLISH PAVEMENT TRANSITION.

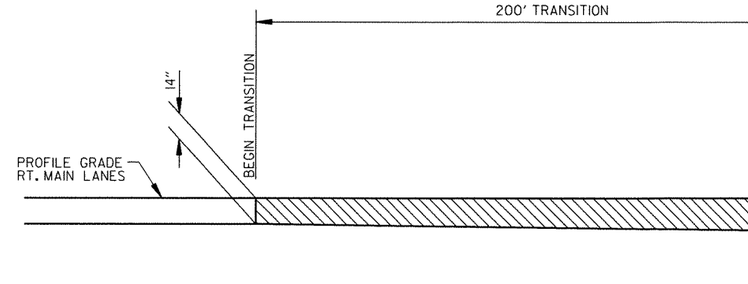


ASPHALT CONCRETE HOT MIX SURFACE COURSE (1/2") (220 LBS. PER SQ. YD.) AGGREGATE BASE COURSE (CLASS 7) 7" COMP. DEPTH IF ASPHALT DRIVE EXISTS OR 6" CONCRETE IF CONCRETE DRIVE EXIST.

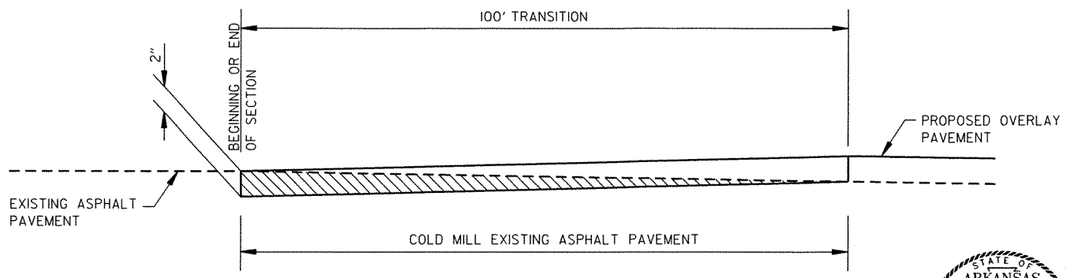
AGGREGATE BASE COURSE (CLASS 7) 9" COMP. DEPTH OR CONFORM TO EXISTING DRIVEWAY.

DETAIL FOR DRIVEWAY TURNOUT

SARDIS RD. STA. 12+34



DETAIL FOR TRANSITIONS AT BEGINNING AND END OF RT. MAIN LANES *



* ESTIMATED TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

DETAIL OF UNDERCUT

STA. 10+30 TO STA. 37+00	d = 3'	W=54'
STA. 37+00 TO STA. 54+00	d = 4'	W=157'
SARDIS RD	d = 2'	W=13' ON LT. & RT. OF EXISTING

DETAIL FOR TRANSITIONS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
11-20-09
No. 11835
TODD E. MUELLER

SPECIAL DETAILS

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REVISED DATE:

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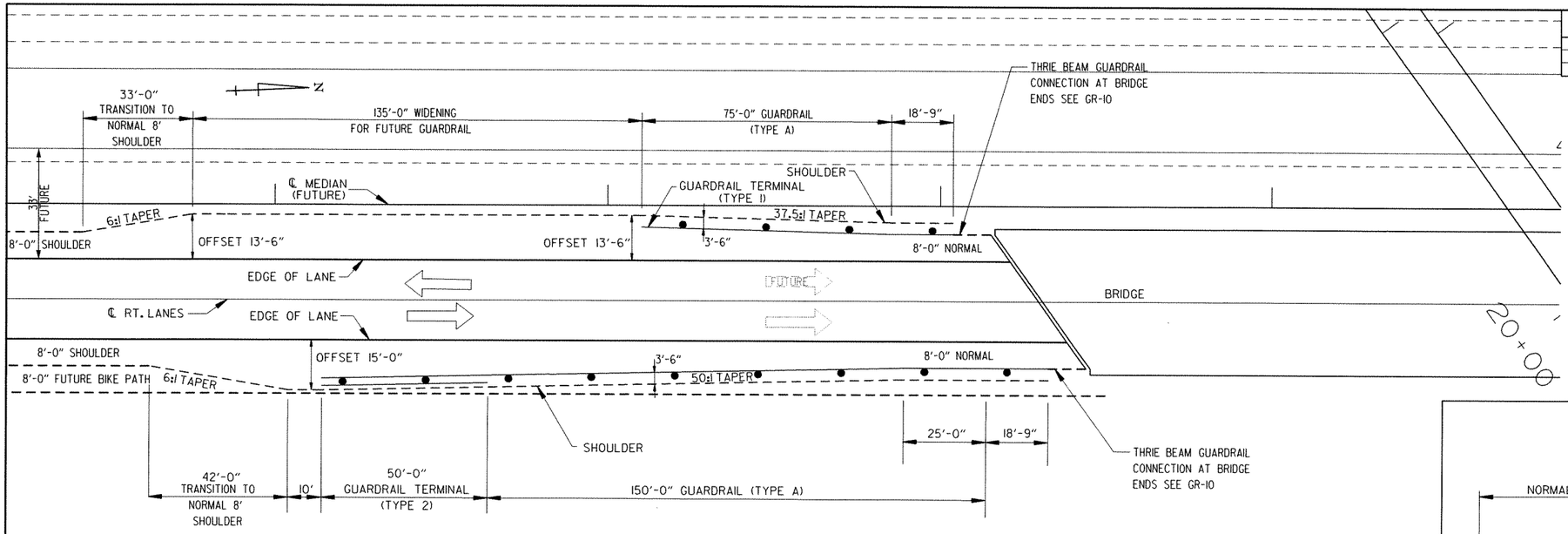
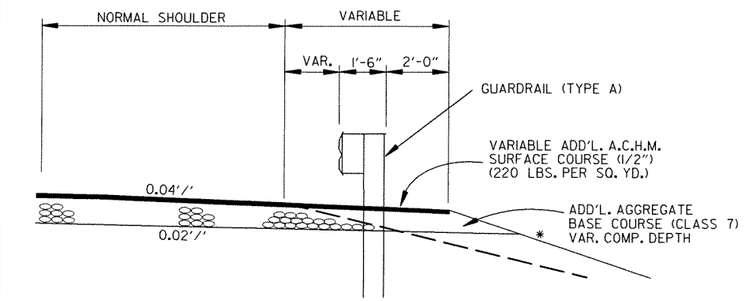
				6	ARK.			
				JOB NO.		061080	6	110

(2) SPECIAL DETAILS



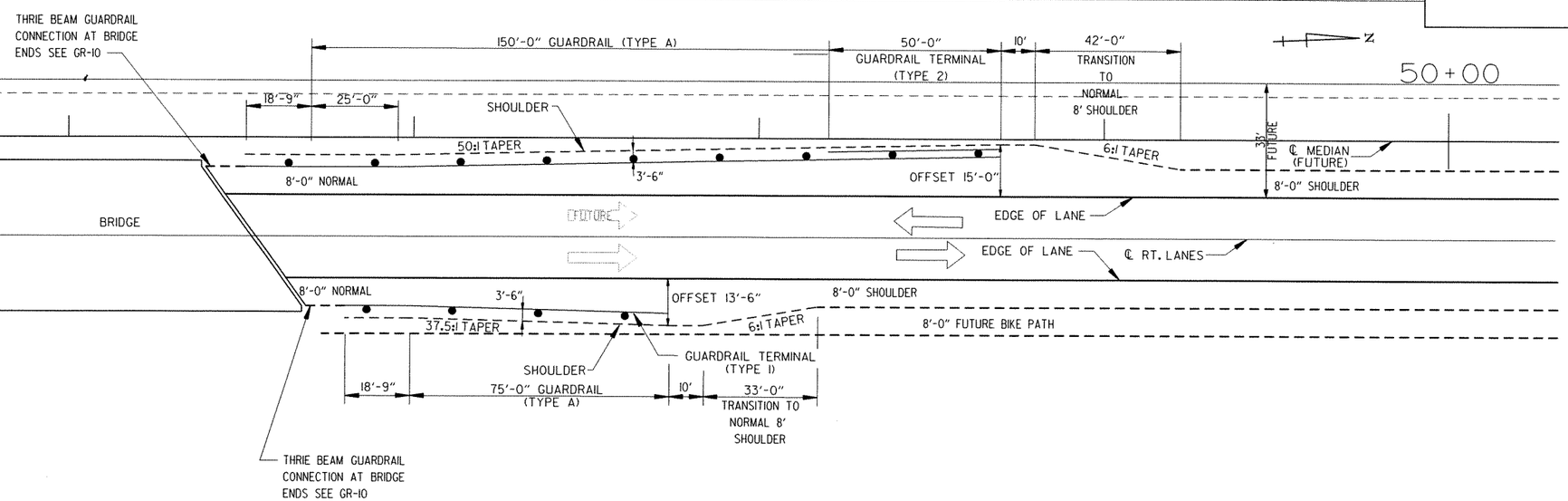
WIDENING FOR GUARDRAIL AT SOUTH BRIDGE END - U.P. RAILROAD

NOTE: REFER TO STANDARD DRAWINGS GR-8, GR-8A, GR-9, GR-9A, GR-10, & GRT-1FOR ADDITIONAL INFORMATION.



WIDENING FOR GUARDRAIL AT BRIDGE ENDS

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



WIDENING FOR GUARDRAIL AT NORTH BRIDGE END - U.P. RAILROAD

NOTE: REFER TO STANDARD DRAWINGS GR-8, GR-8A, GR-9, GR-9A, GR-10, & GRT-1FOR ADDITIONAL INFORMATION.

STATE OF ARKANSAS
TODD E. MUELLER
REGISTERED PROFESSIONAL ENGINEER
11-20-09
No.11835

SPECIAL DETAILS

rnfortner 11/9/2009 10:04:6 PM
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REVISED DATE:

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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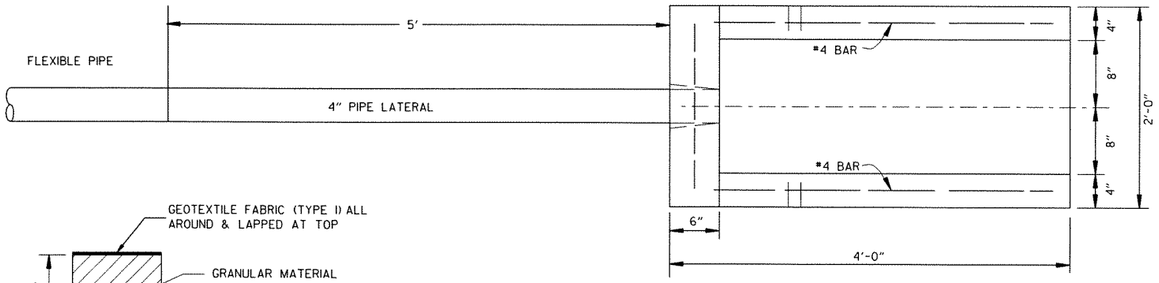
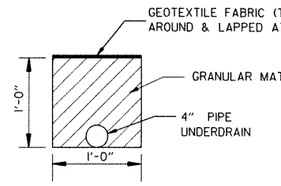
				JOB NO.		061080	7	110

(2) SPECIAL DETAILS



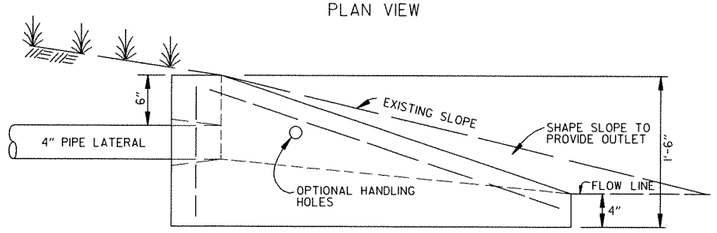
PLAN VIEW



DETAIL OF PIPE UNDERDRAINS

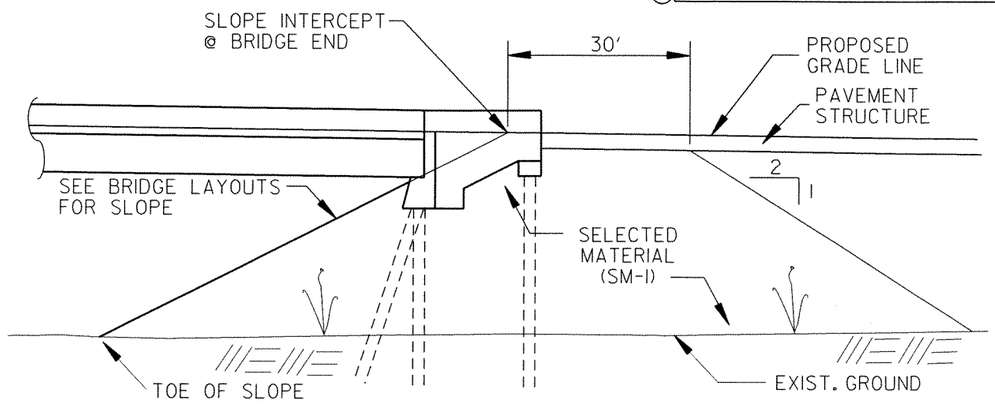
NOTE: 4" PIPE UNDERDRAINS AND OUTLET PROTECTORS AS SHOWN HEREON ARE TO BE INSTALLED AND PAID FOR AS SPECIFIED IN SP- EXCAVATION AND EMBANKMENT.

NO ADDITIONAL PAYMENT WILL BE MADE FOR THE 5' SCHEDULE 40 PORTIONS OF THE 4" PIPE LATERAL AND SHALL BE INCLUDED IN THE LINEAR FOOT BID PRICE.



SIDE VIEW

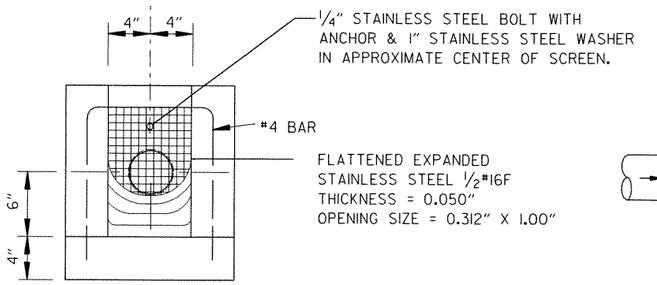
UNDERDRAIN OUTLET PROTECTORS



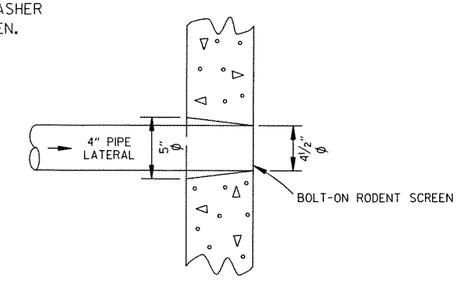
LONGITUDINAL SECTION OF BRIDGE END EMBANKMENT
(SEE SPECIAL PROVISION - EXCAVATION AND EMBANKMENT)

DETAILS OF INTERNAL DRAINAGE FOR EMBANKMENT CONSTRUCTION

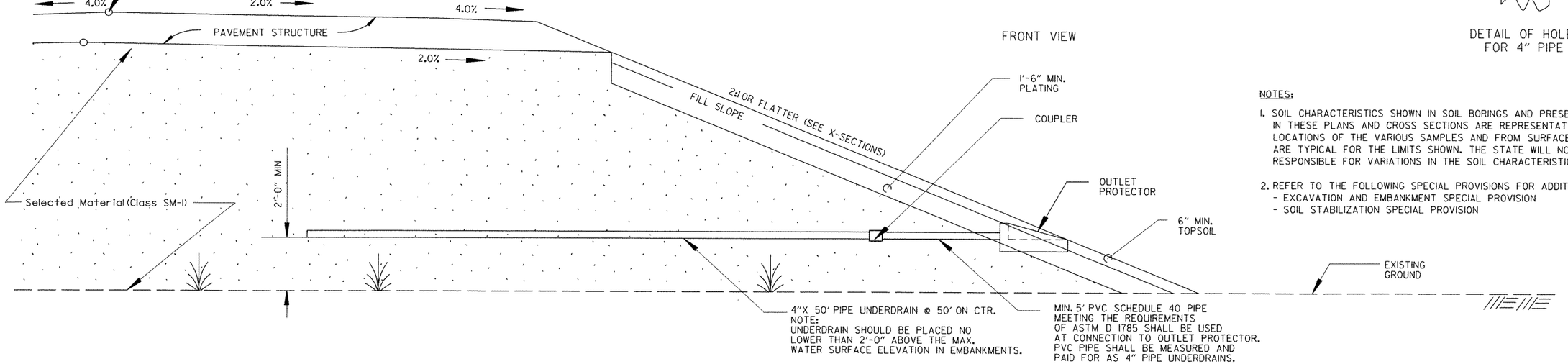
(REFER TO SP- EXCAVATION AND EMBANKMENT FOR APPLICATION)



FRONT VIEW



DETAIL OF HOLE FOR 4" PIPE



NOTES:

1. SOIL CHARACTERISTICS SHOWN IN SOIL BORINGS AND PRESENTED IN THESE PLANS AND CROSS SECTIONS ARE REPRESENTATIVE AT THE LOCATIONS OF THE VARIOUS SAMPLES AND FROM SURFACE INDICATIONS ARE TYPICAL FOR THE LIMITS SHOWN. THE STATE WILL NOT BE RESPONSIBLE FOR VARIATIONS IN THE SOIL CHARACTERISTICS.
2. REFER TO THE FOLLOWING SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION
   - EXCAVATION AND EMBANKMENT SPECIAL PROVISION
   - SOIL STABILIZATION SPECIAL PROVISION

HALF-SECTION OF BRIDGE END EMBANKMENTS
(SEE SPECIAL PROVISION - EXCAVATION AND EMBANKMENTS)

NOTES:
1. ALL EMBANKMENTS CONSTRUCTED OUT OF GRANULAR MATERIAL SHALL BE PLATED AS SHOWN.
2. THIS DETAIL SHALL BE USED FOR ALL EMBANKMENTS CONSTRUCTED OUT OF GRANULAR MATERIAL, HOWEVER, AT LOCATIONS OTHER THAN THOSE SHOWN ABOVE OR ON THE PLANS AND CONSTRUCTED WITH GRANULAR MATERIAL, INTERNAL DRAINAGE SHALL BE PROVIDED AS SHOWN AT NO COST TO THE DEPARTMENT AS DIRECTED BY THE ENGINEER.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
11-20-09
No. 11835
TODD E. MUELLER

DETAILS OF EMBANKMENT CONSTRUCTION SPECIAL DETAILS

rnfortner 11/9/2009 10:29:35 AM
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REVISED DATE:

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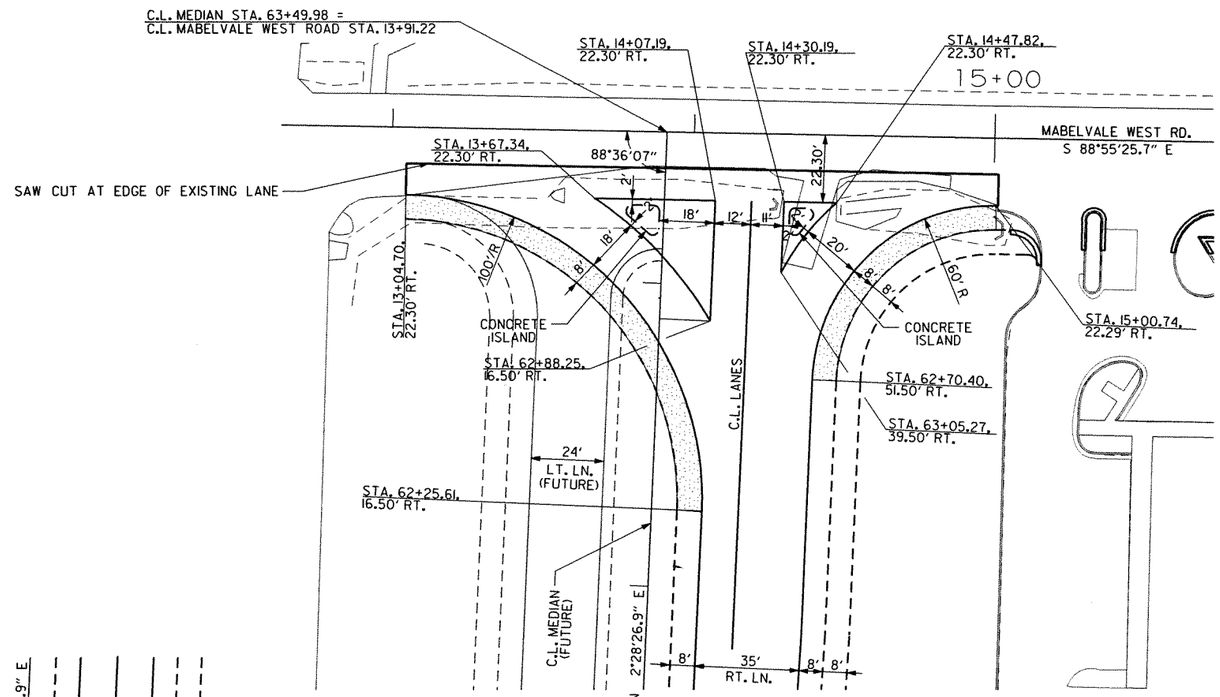
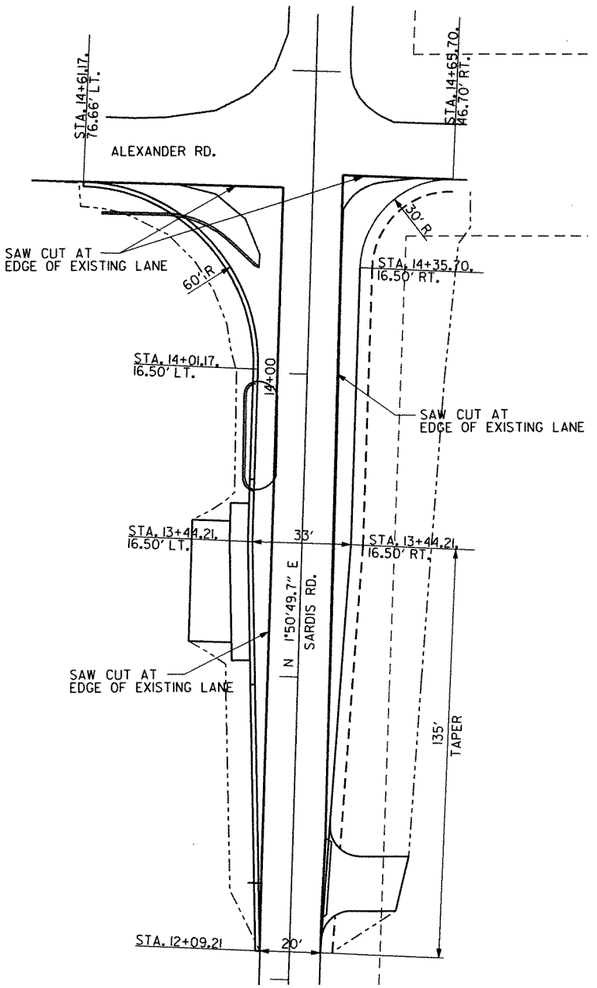
				6	ARK.			
				JOB NO.		061080	8	110

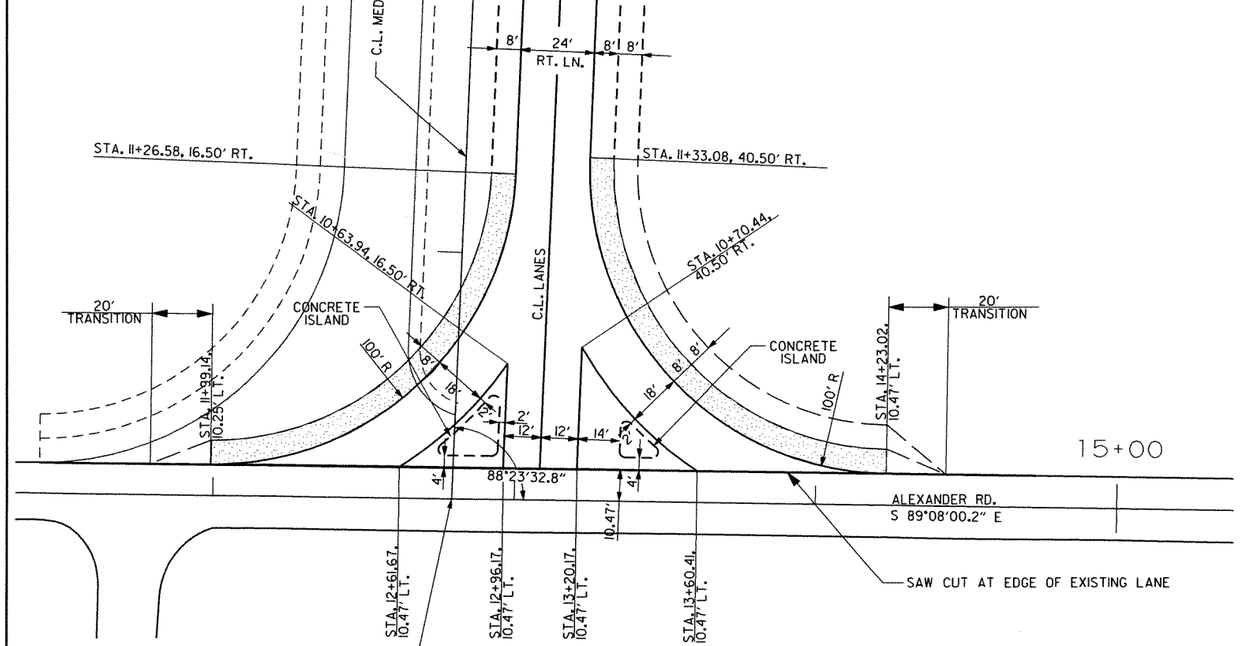
(2) INTERSECTION DETAILS



C.L. MEDIAN/MABELVALE WEST RD.



SARDIS RD./ALEXANDER RD.



C.L. MEDIAN/ALEXANDER RD.

DENOTES FULL DEPTH SHOULDER

NOTE:
ALL CONCRETE ISLAND RADII ARE 2'.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
10-29-10
No. 11835
TODD E. MUELLER

INTERSECTION DETAILS

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				6	ARK.			
				JOB NO.		061080	9	110

(2) TEMP. EROSION CONT. DETAILS 10+00 TO 40+00

LEGEND

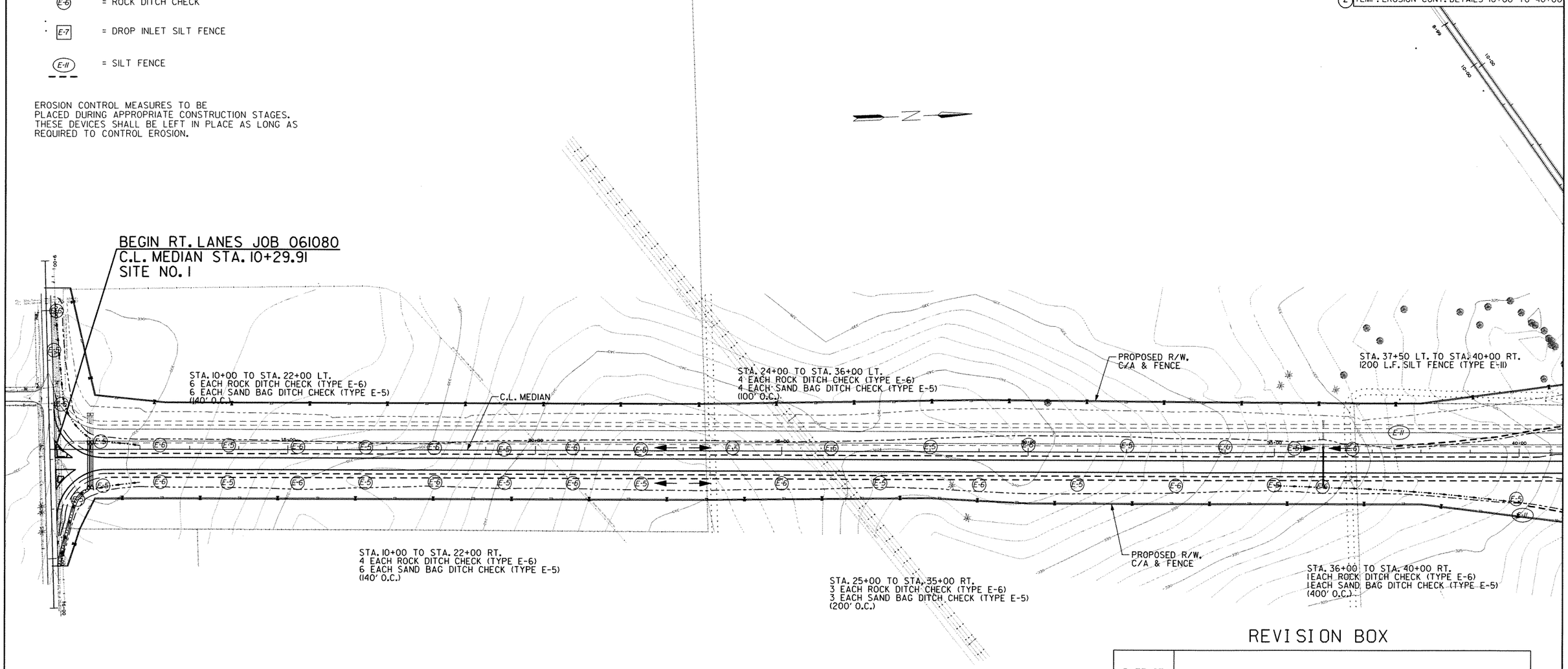
(E-5) = SAND BAG DITCH CHECK

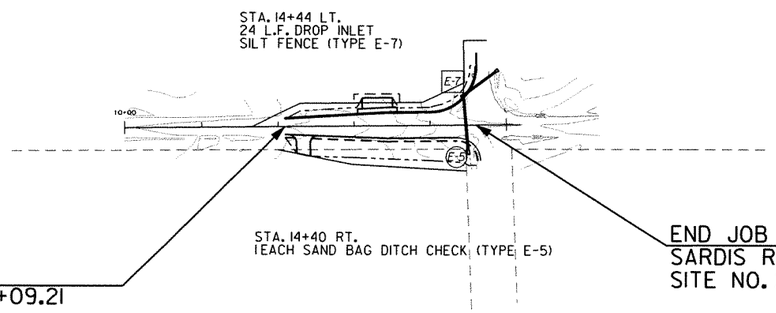
(E-6) = ROCK DITCH CHECK

[E-7] = DROP INLET SILT FENCE

(E-11) = SILT FENCE

EROSION CONTROL MEASURES TO BE PLACED DURING APPROPRIATE CONSTRUCTION STAGES. THESE DEVICES SHALL BE LEFT IN PLACE AS LONG AS REQUIRED TO CONTROL EROSION.





SITE NO. 2

REVISION BOX

DATE OF REVISION	REVISION

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
11-20-09
No. 11835
TODD E. MUELLER

TEMPORARY EROSION CONTROL DETAILS
STA. 10+00 TO STA. 40+00

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				6	ARK.			
				JOB NO.		061080	10	110

(2) TEMP. EROSION CONT. DETAILS 40+00 TO 63+29

LEGEND

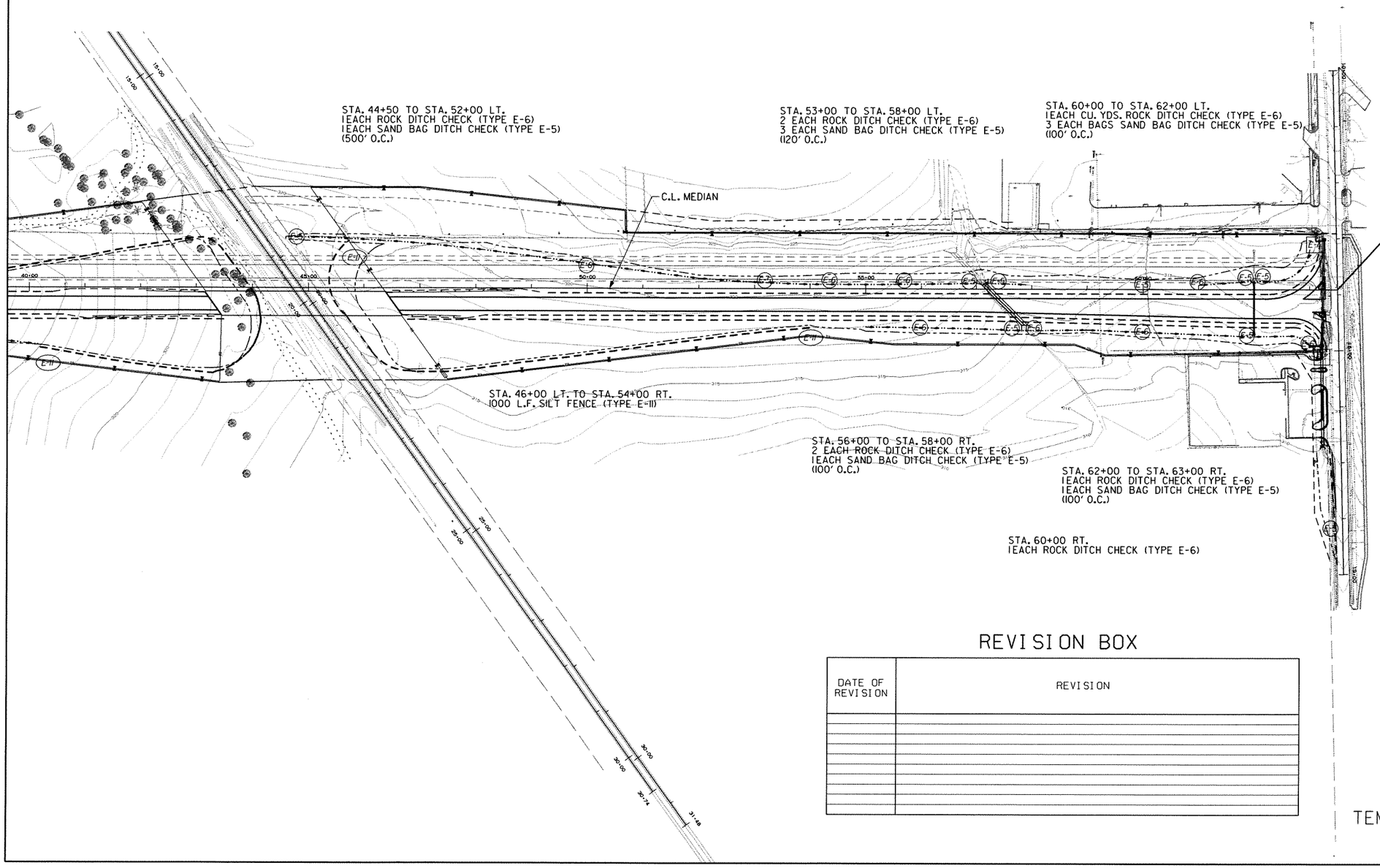
(E-5) = SAND BAG DITCH CHECK

(E-6) = ROCK DITCH CHECK

[E-7] = DROP INLET SILT FENCE

(E-11) = SILT FENCE

EROSION CONTROL MEASURES TO BE PLACED DURING APPROPRIATE CONSTRUCTION STAGES. THESE DEVICES SHALL BE LEFT IN PLACE AS LONG AS REQUIRED TO CONTROL EROSION.



REVISION BOX

DATE OF REVISION	REVISION

STATE OF ARKANSAS
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11-20-09
No. 11835
TODD E. MUELLER

TEMPORARY EROSION CONTROL DETAILS
STA. 40+00 TO STA. 63+28.38

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				6	ARK.			
				JOB NO.		061080	11	110
				(2) MAINTENANCE OF TRAFFIC				

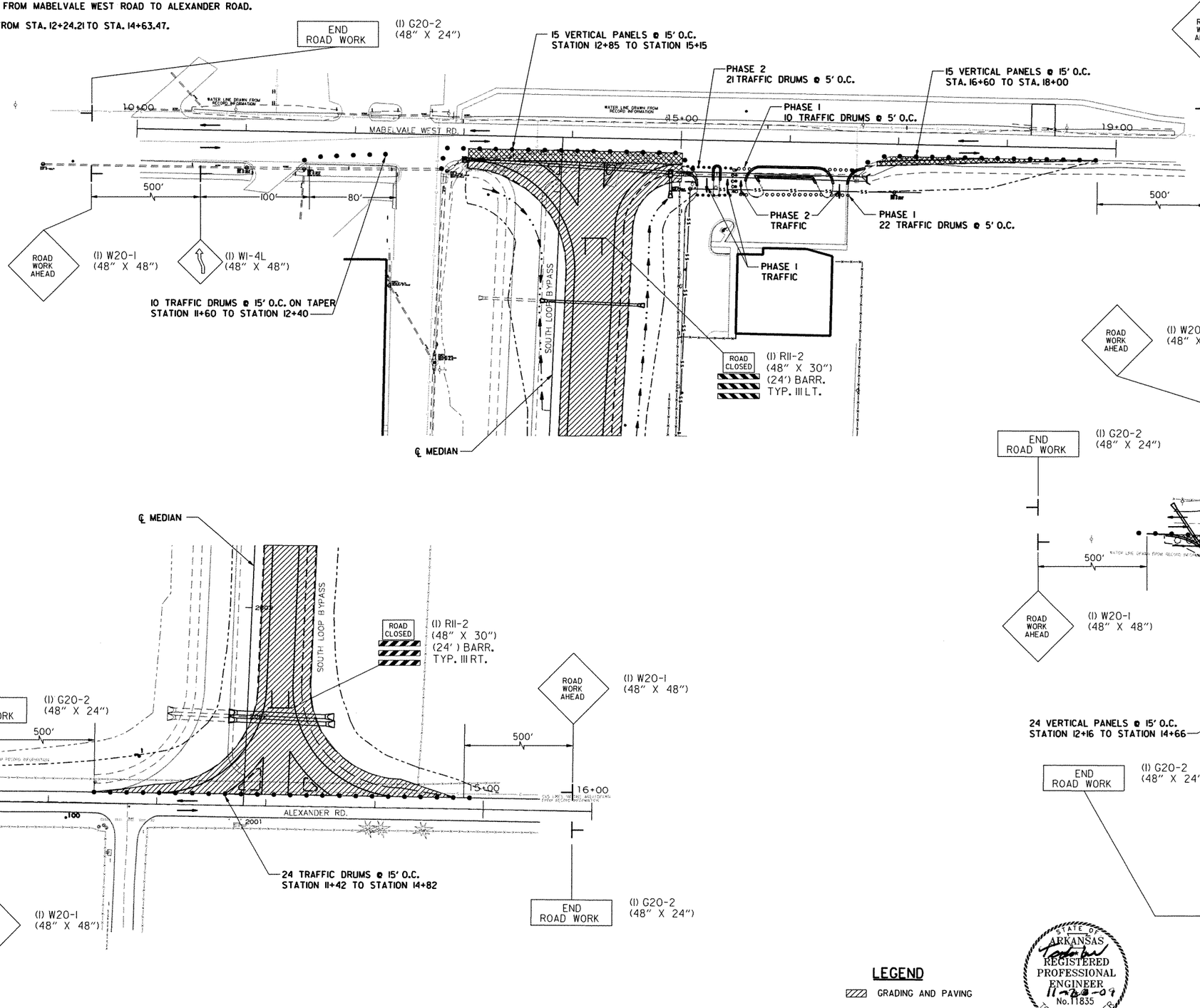
MAINTENANCE OF TRAFFIC NOTES

1) MAINTAIN 10' LANES MINIMUM ON MABELVALE WEST ROAD, ALEXANDER ROAD AND SARDIS ROAD.

2) NOTCH AND WIDEN MABELVALE WEST ROAD FROM STA. 13+04.70 TO STA. 15+00.74 AND STA. 16+80.57 TO STA. 17+82.54.

3) CONSTRUCT SOUTH LOOP BYPASS FROM MABELVALE WEST ROAD TO ALEXANDER ROAD.

4) NOTCH AND WIDEN SARDIS ROAD FROM STA. 12+24.21 TO STA. 14+63.47.



LEGEND

- GRADING AND PAVING
- NOTCH AND WIDENING
- TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11835
11-20-09
TODD E. MUELLER

MAINTENANCE OF TRAFFIC

rnfortner 11/9/2009 1:28:44 PM
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REVISED DATE:

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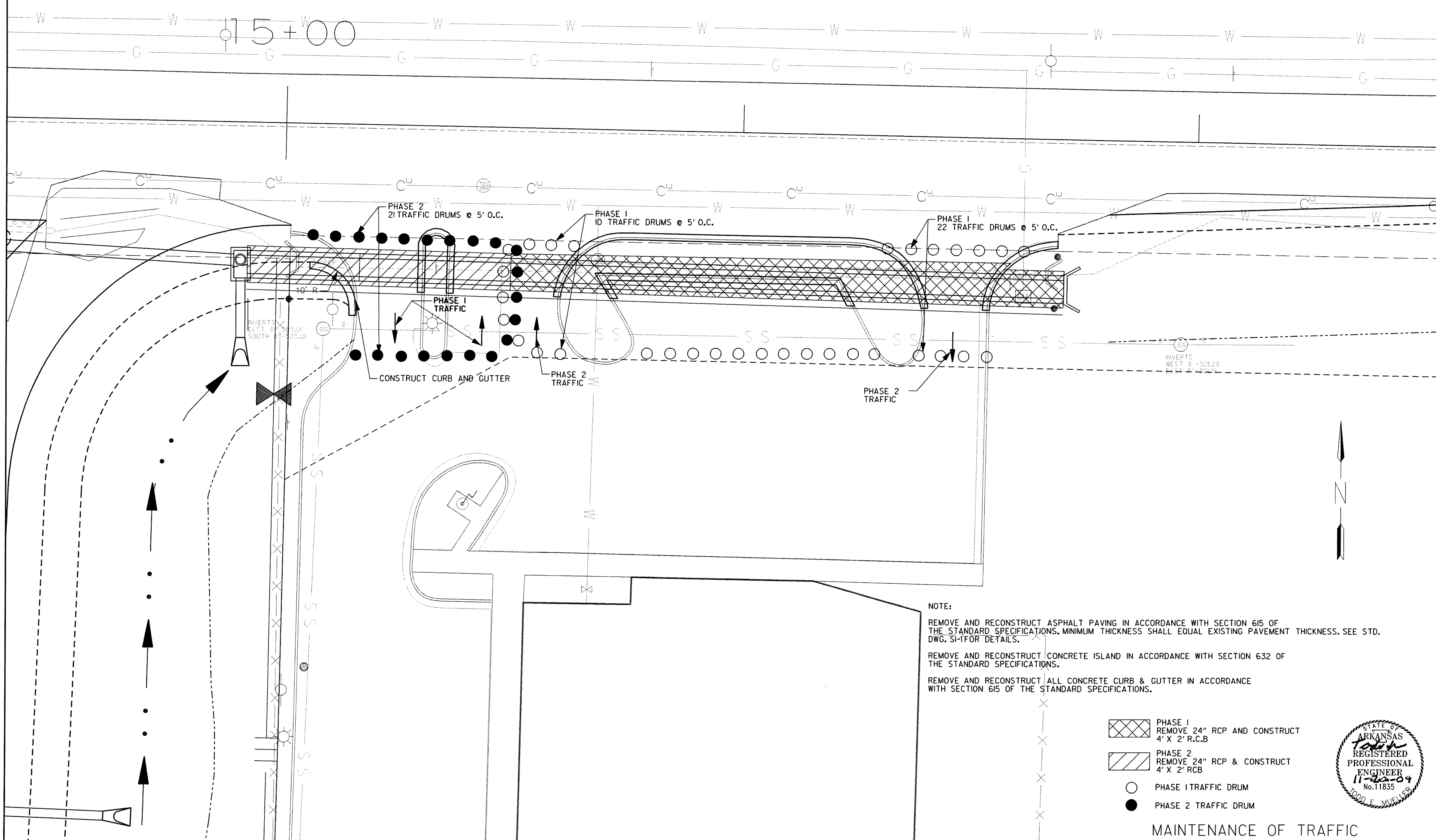
(2) MAINTENANCE OF TRAFFIC



NOTE:

REMOVE AND RECONSTRUCT ASPHALT PAVING IN ACCORDANCE WITH SECTION 615 OF THE STANDARD SPECIFICATIONS. MINIMUM THICKNESS SHALL EQUAL EXISTING PAVEMENT THICKNESS. SEE STD. DWG. SI-1 FOR DETAILS.

REMOVE AND RECONSTRUCT CONCRETE ISLAND IN ACCORDANCE WITH SECTION 632 OF THE STANDARD SPECIFICATIONS.

REMOVE AND RECONSTRUCT ALL CONCRETE CURB & GUTTER IN ACCORDANCE WITH SECTION 615 OF THE STANDARD SPECIFICATIONS.

PHASE 1 REMOVE 24" RCP AND CONSTRUCT 4' X 2' R.C.B

PHASE 2 REMOVE 24" RCP & CONSTRUCT 4' X 2' RCB

PHASE 1 TRAFFIC DRUM

PHASE 2 TRAFFIC DRUM

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11835 TODD E. MUELLER 11-20-09

MAINTENANCE OF TRAFFIC

rnfortner 11/19/2009 1:33:57 PM
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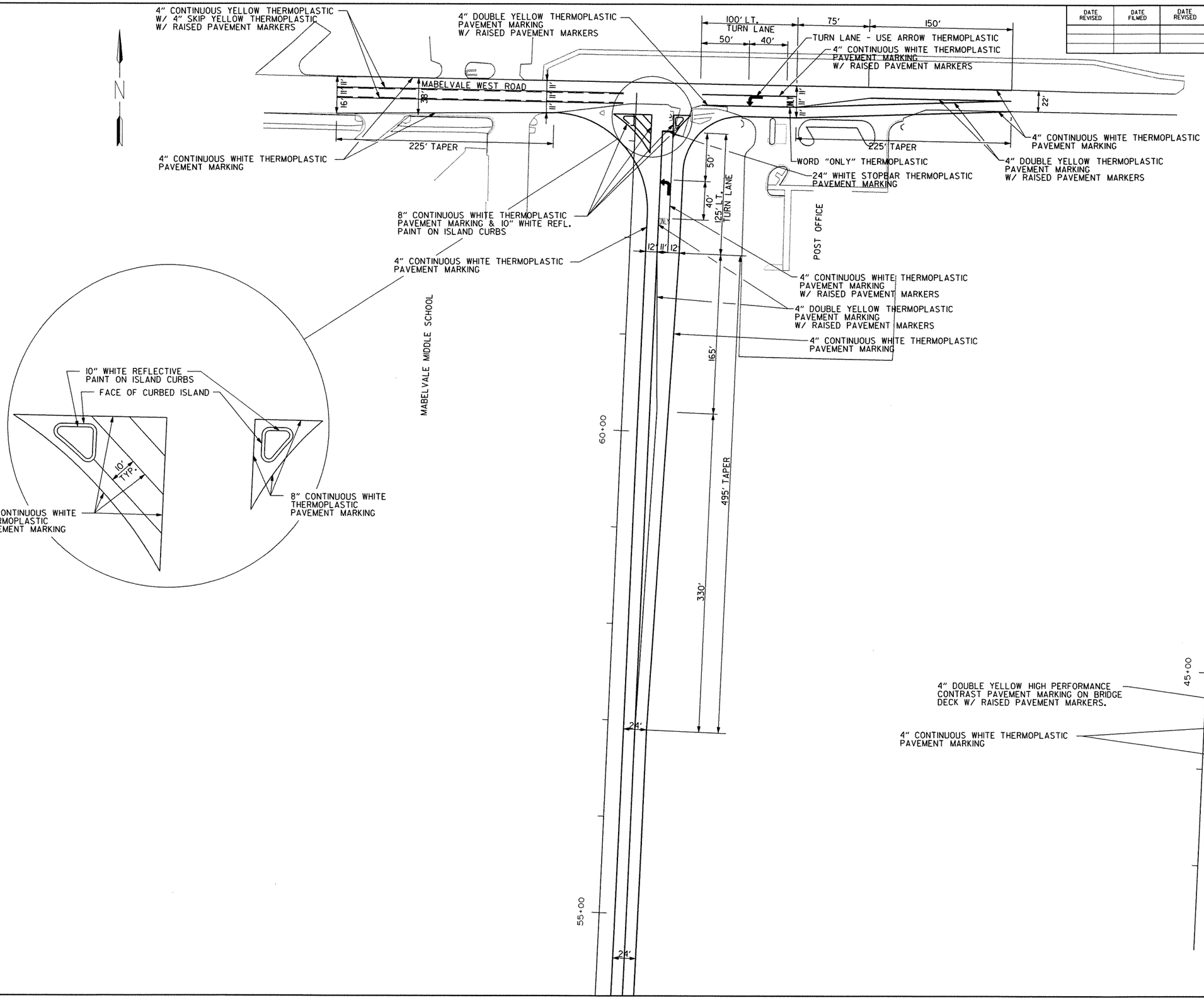
				6	ARK.			
				JOB NO.		061080	13	110

(2) PERMANENT PAVEMENT MARKINGS



STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
11-20-09
No. 11835
TODD E. MUELLER

PERMANENT PAVEMENT MARKINGS
(MABELVALE WEST)

rnfortner 11/19/2009 10:23:42 AM
WORKSPACE: AHTDV8
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REVISED DATE:

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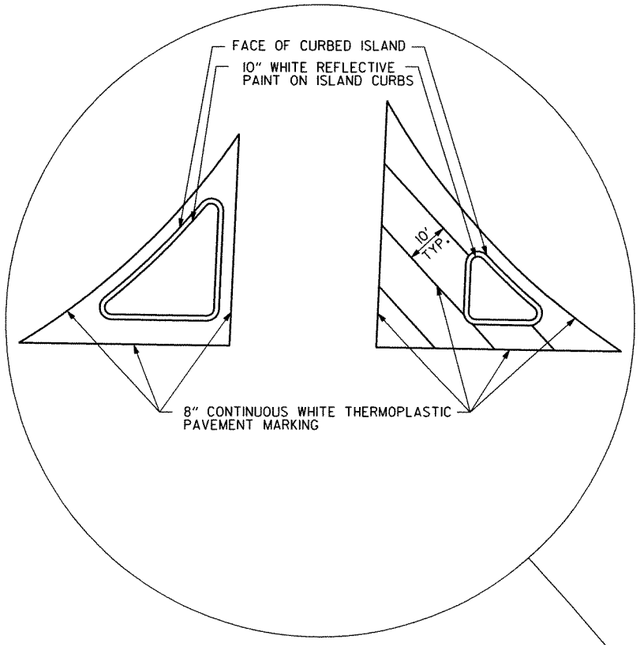
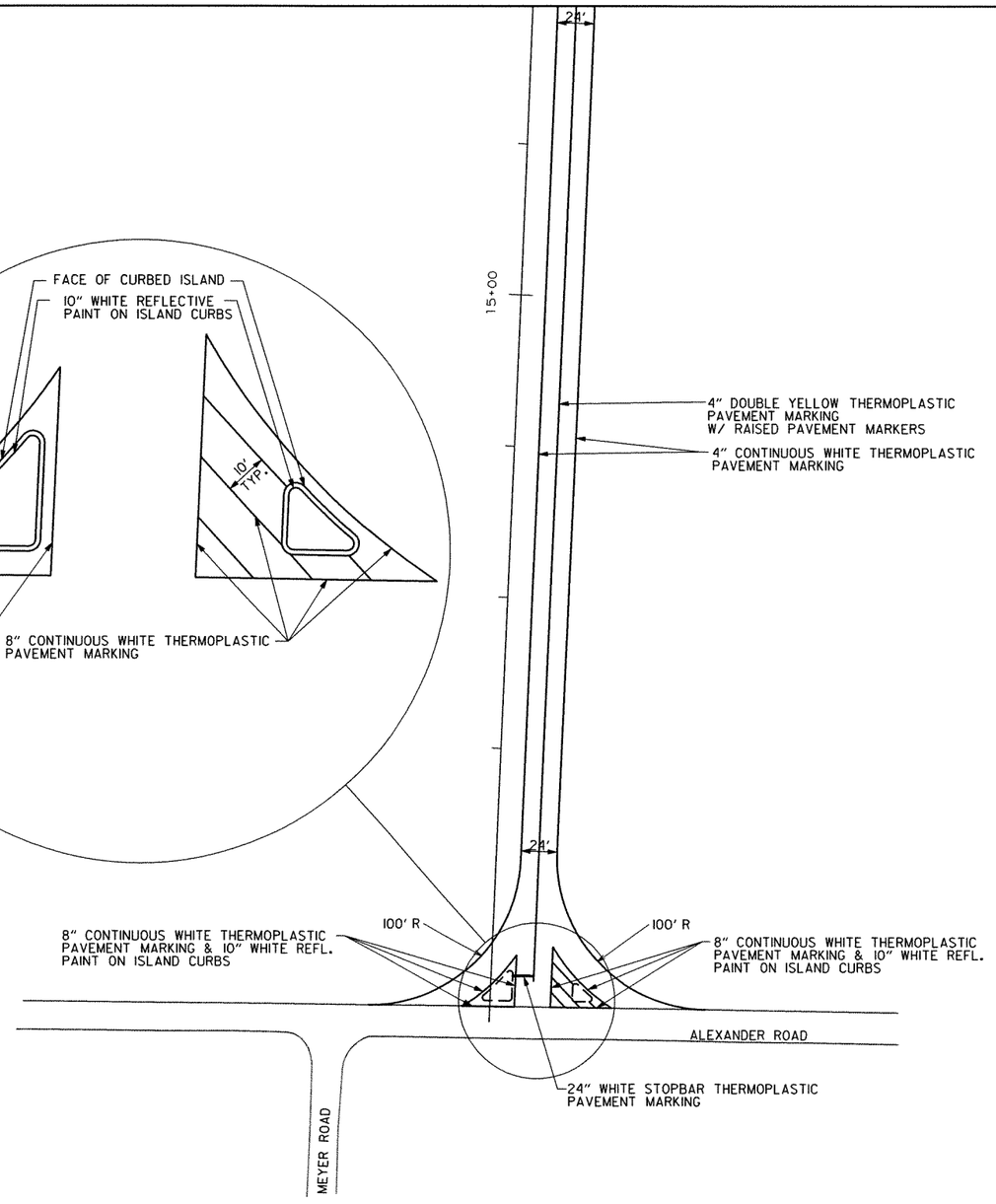
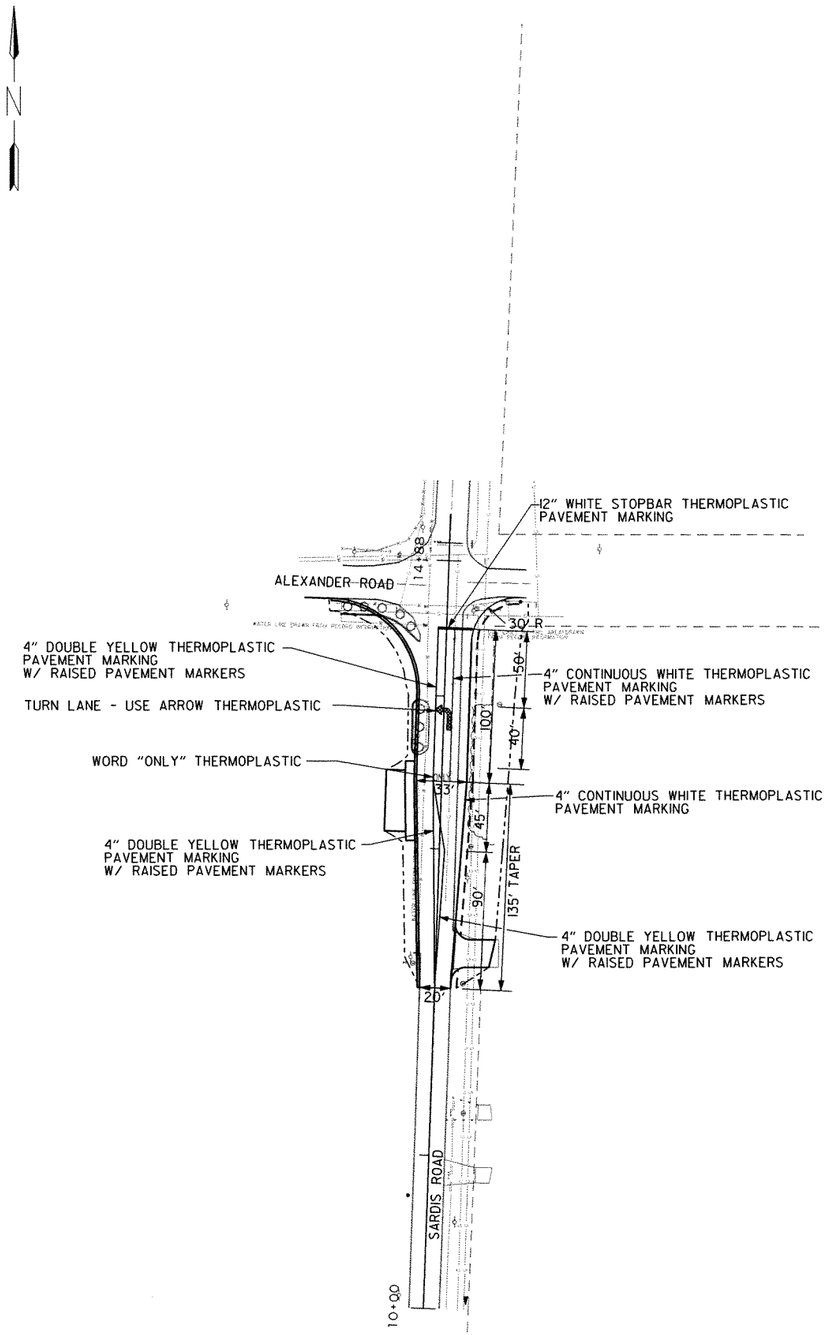
				JOB NO.		061080	14	110

(2) PERMANENT PAVEMENT MARKINGS







STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
11-20-09
No.11835
TODD E. MUELLER

PERMANENT PAVEMENT MARKINGS
(ALEXANDER ROAD) (SARDIS ROAD)

rnfortner 11/19/2009 10:2h29 AM
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REVISED DATE:

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.		061080	15	110
				(2)		SOIL BORING LOG		

SOIL BORING LOG

061080 STATION	LOCATION *	SAMPLE DEPTH (FT)	WATER CONTENT (%)	ATTERBERG LIMITS			SIEVE ANALYSIS			UNIFIED CLASS.	AASHTO CLASS.
				LIQUID LIMIT	PLASTIC INDEX	PLASTICITY INDEX	PERCENT PASSING				
							#10	#40	#200		
44+20	40' RT.	4.5-5.5	18	27	17	10	-	-	46	SC	A-4
44+20	40' RT.	14-15	28	-	-	-	100	100	8	SP-SM	A-3
44+20	40' RT.	33.5-34	18	50	21	29	-	-	-	CH	A-7-6
43+49	CL	2.5-3.5	26	17	13	4	-	-	46	SC	A-4
43+49	CL	6.5-7.5	16	22	18	4	-	-	22	SC	A-2-4
43+49	CL	14-15	26	NON-PLASTIC			100	100	6	SP-SM	A-3
44+12	CL	2.5-3.5	21	19	14	5	-	-	48	SC	A-4
44+12	CL	9-10	20	28	17	11	-	-	26	SC	A-2-6
44+12	CL	19-20	24	NON-PLASTIC			100	100	4	SP	A-3
44+12	CL	29-30	20	42	17	25	-	-	62	CL	A-7-6
45+45	20' LT.	0.5-1.5	29	26	19	7	-	-	56	CL-ML	A-4
45+45	20' LT.	6.5-7.5	17	23	18	5	-	-	31	SC-SM	A-2-4
45+45	20' LT	14-15	27	NON-PLASTIC			100	100	6	SP-SM	A-3
45+45	20' LT.	24-25	36	59	20	39	-	-	71	CH	A-7-6
46+10	60' LT.	2.5-3.5	23	28	16	12	-	-	57	CL	A-6
46+10	60' LT.	6.5-7.5	19	33	17	16	-	-	50	CL	A-6
46+10	60' LT.	19-20	27	-	-	-	-	-	4	SP	A-3
46+10	60' LT.	29-30	20	45	16	29	-	-	-	CL	A-7-6
46+70	40' RT.	4.5-5.5	20	31	18	13	-	-	46	SC	A-6
46+70	40' RT.	24-25	27	-	-	-	100	100	3	SP	A-3
46+70	40' RT.	38.5-39	17	41	17	24	-	-	-	CL	A-7-6
12+60	CL	0.5-1.5	26	33	20	13	-	-	85	CL	A-6
12+60	CL	6.5-7.5	35	79	27	52	-	-	98	CH	A-7-6
17+70	CL	2.5-3.5	20	32	20	12	-	-	71	CL	A-6
23+80	CL	1-1.5	22	31	20	11	-	-	73	CL	A-6
30+40	CL	1-1.5	21	32	19	13	-	-	73	CL	A-6
36+70	CL	2.5-3.5	24	39	22	17	-	-	78	CL	A-6
55+00	30' RT.	2.5-3.5	24	33	18	15	-	-	71	CL	A-6
62+45	CL	2.5-3.5	12	31	16	15	-	-	67	CL	A-6
62+45	CL	6.5-7.5	11	25	17	8	-	-	70	CL	A-4
SARDIS RD. STA.	13+65	85' RT.	0.5-1.5	17	19	14	5	-	-	57	CL-ML	A-4
SARDIS RD. STA.	13+65	85' RT.	2.5-3.5	16	27	14	13	-	-	43	GC	A-6

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.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
11-20-09
No. 11835
TODD E. MUELLER

rnfortner 11/9/2009 10:30:01 PM
WORKSPACE: AHTDV8
L:\2004\0491980 - South Loop - Phase I\Drawings\RWY\SL0_BL_01.dgn
REVISED DATE:

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	DISTRICT	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		061080	16	110

(2) **QUANTITIES**

EARTHWORK

LOCATION	UNCLASSIFIED EXCAVATION			COMPACTED EMBANKMENT		
	UNDERCUT*	TYPICAL	TOTAL	TYPICAL	SM-1 **	TOTAL
	CU. YD.					
MAIN LANES	55,441	28,750	84,191	71,191	83,421	154,612
MABELVALE WEST RD.		360	360	51		51
SARDIS RD.	476	360	836		476	476
ALEXANDER RD.		424	424			
DRIVEWAYS		270	270	2		2
TOTAL	55,917	30,164	86,081	71,244	83,897	155,141

* QUANTITY ESTIMATED FOR REMOVAL OF UNSUITABLE MATERIAL , TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER. SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS AND SPECIAL DETAILS.

** INCLUDES AN ESTIMATED 55,917 CU. YDS. COMPACTED EMBANKMENT FOR UNDERCUT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER. SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS. SEE SPECIAL DETAILS.

EARTHWORK NOTES:

1. CULVERT CHANNELIZATION MATERIAL TO BE WASTED AND PLACED AS DIRECTED BY THE ENGINEER.
2. ESTIMATES FOR QUANTITIES OF EXCAVATION AND EMBANKMENT ARE TAKEN DIRECTLY FROM THE CROSS SECTIONS, DETAILED IN ACCORDANCE WITH THE PLANS.
3. MATERIAL WITH A PI $\leq$ 20 IS REQUIRED TO BE PLACED IN THE UPPER 1.5 FT. OF EMBANKMENTS.
4. ALL FLEXIBLE BASE AND ASPHALTIC PAVEMENT REMOVED SHALL BE PAID FOR UNDER PAY ITEM 210 - EXCAVATION AND EMBANKMENT, UNLESS OTHERWISE NOTED.

CLEARING AND GRUBBING

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STA.	
10+30	63+28	MAIN LANES	53	53
15+00	18+83	MABELVALE WEST RD.	4	4
12+09	14+63	SARDIS RD.	3	3
TOTALS			60	60

SOIL STABILIZATION

LOCATION	TON
ENTIRE PROJECT	300

QUANTITY ESTIMATED. TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER. SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

CONCRETE DITCH PAVING

STATION	STATION	DESCRIPTION	LENGTH	CONCRETE DITCH PAVING (TYPE B)		SOLID SODDING	WATER
			FEET	"W"	SQ. YD.	SQ. YD.	M.G.
13+58	14+45	ALEXANDER RD - LT	105	6.0	70	47	0.6
TOTALS					70	47	0.6

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

* 16' GATES (STEEL OR ALUMINUM)

STATION	LOCATION	SIDE	EACH
42+25	MAIN LANE	LT.	1
47+40	MAIN LANE	RT.	1
TOTAL			2

* DENOTES ALTERNATE BID ITEM

PERMANENT PAVEMENT MARKINGS

DESCRIPTION	UNIT	MAIN LANES (1)	MABELVALE RD.	SARDIS RD.	TOTAL
THERMOPLASTIC PAVEMENT MARKING WHITE (4")	L.F.	10,923	1,310	375	12,608
THERMOPLASTIC PAVEMENT MARKING WHITE (8")	L.F.	596			596
THERMOPLASTIC PAVEMENT MARKING WHITE (12")	L.F.			24	24
THERMOPLASTIC PAVEMENT MARKING WHITE (24")	L.F.	25			25
THERMOPLASTIC PAVEMENT MARKING YELLOW (4")	L.F.	10,866	1,845	740	13,451
THERMOPLASTIC PAVEMENT MARKING (WORDS)	EACH	1	1	1	3
THERMOPLASTIC PAVEMENT MARKING (ARROWS)	EACH	1	1	1	3
REFLECTORIZED PAINT PAVEMENT MARKING WHITE (10")	L.F.	173			173
HIGH PERFORMANCE CONTRAST PAVEMENT MARKING YELLOW (4")	L.F.	648			648
RAISED PAVEMENT MARKERS (TYPE II)(YELLOW/YELLOW)	EACH	144	29	10	183
RAISED PAVEMENT MARKERS (TYPE II)(CLEAR)	EACH	4	3	3	10

NOTE:
(1) THIS IS A HIGH VOLUME ROAD AS DEFINED IN SECTION 604.03 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, EDITION OF 2003

FENCING

STATION	STATION	LOCATION	TYPE A
			L.F.
10+59	11+10	MAIN LANE - LT.	221
10+80	11+10	MAIN LANE - RT.	67
11+10	42+90	MAIN LANE - LT.	3,293
11+10	45+29	MAIN LANE - RT.	3,356
44+03	63+18	MAIN LANE - LT.	2,000
46+52	63+23	MAIN LANE - RT.	1,810
TOTAL			10,747

REMOVAL AND DISPOSAL OF STRUCTURES

STATION	STATION	LOCATION	FENCE	DROP INLET	ASPHALT CURB	PIPE CULVERTS	CURB AND GUTTER	CONC. ISLAND	DESCRIPTION
			L.F.	EACH	L.F.	EACH	L.F.	SQ. YD.	
10+04	15+16	ALEXANDER RD. - LT.	512						
10+45	10+80	MAIN LANES - RT.	35						
23+45		ACROSS MAIN LANES	196						
36+63	42+75	MAIN LANES - LT.	682						
36+68		ACROSS MAIN LANES	205						
45+01	50+72	MAIN LANES - LT.	582						
59+42	61+21	MAIN LANES - RT.	179						
60+74	63+14	MAIN LANES - RT.	240						
13+01		MABELVALE WEST RD. - RT.		1		1			30"x51" RCP w/FES & Drop Inlet
14+90		MABELVALE WEST RD. - RT.				1			24" x 165" R.C.P. w/ Hdwls.
14+39		MABELVALE WEST RD. - RT.				1			15" x 22" R.C.P. w/ Hdwls.
15+08		MABELVALE WEST RD. - RT.					22		
15+32		MABELVALE WEST RD. - RT.						8	
15+33		MABELVALE WEST RD. - RT.					30		
15+99		MABELVALE WEST RD. - RT.					94		
15+95		MABELVALE WEST RD. - RT.					67		
16+58		MABELVALE WEST RD. - RT.					23		
13+80		SARDIS RD. - LT.			40				
14+50		SARDIS RD. - LT.			58				
TOTALS			2,631	1	98	3	236	8	

4" PIPE UNDERDRAINS

LOCATION	4" PIPE UNDERDRAINS	UNDERDRAIN OUTLET PROTECTORS
	LIN. FT.	EACH
ENTIRE PROJECT	600	5

QUANTITIES ESTIMATED, TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER, SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

GUARDRAIL

STATION	STATION	LOCATION	GUARDRAIL TYPE "A"	GUARDRAIL TERMINAL (TYPE 2)	TERMINAL ANCHOR POSTS (TYPE 1)	THRIE BEAM GUARDRAIL TERMINAL
			L.F.	EACH	EACH	EACH
41+14.00	43+32.75	MAIN LANES - RT.	150	1		1
42+10.07	43+03.82	MAIN LANES - LT.	75		1	1
46+51.25	48+70.00	MAIN LANES - LT.	150	1		1
46+80.18	47+73.93	MAIN LANES - RT.	75		1	1
TOTAL			450	2	2	4

APPROACH GUTTERS

STATION	STATION	LOCATION	APPROACH GUTTERS (TYPE C)	REINFORCING STEEL - ROADWAY (GR 60)
			CU. YD.	LB.
42+78.69	43+15.19	MAIN LANES - LT.	9.28	807
43+07.63	43+44.13	MAIN LANES- RT.	9.28	807
46+39.87	46+76.37	MAIN LANES - LT.	9.28	807
46+68.81	47+05.31	MAIN LANES - RT.	9.28	807
TOTAL			37.12	3,228

ADVANCE WARNING SIGNS AND DEVICES

SIGN NUMBER	DESCRIPTION	SIGN SIZE	STAGE 1	MAX. NUMBER REQ'D.	TOTAL REQUIRED	TRAFFIC DRUMS	VERTICAL PANELS	BARRICADES TYPE III
		IN.	EACH		SQ. FT.	EACH	EACH	L.F.
G20-2	END ROAD WORK	48" X 24"	8	8	64			
R1-1	STOP	48" X 48"	2	2	32			
R11-2	ROAD CLOSED	48" X 30"	2	2	20			
W1-4L	LANE SHIFT LEFT	48" X 48"	1	1	16			
W20-1	ROAD WORK AHEAD	48" X 48"	8	8	128			
	TRAFFIC CONTROL DEVICES					66	76	48
TOTALS					260	66	76	48

PAVEMENT REPAIR OVER CULVERTS

STATION	LOCATION	SIDE	ASPHALT	DESCRIPTION
			TONS	
15+88	MABELVALE WEST RD.	RT.	112	REPAIR OVER R.C.B.C.
14+47	SARDIS RD.		29	REPAIR OVER R.C.A.P.
14+43	ALEXANDER RD.		28	REPAIR OVER R.C.A.P.
		TOTAL	169	

BASIS OF ESTIMATE: 1.5' OUTSIDE TRENCH EXCAVATION
12" ESTIMATED PAVEMENT DEPTH

TEMPORARY EROSION CONTROL

STATION	STATION	SAND BAG DITCH CHECK (E-5)	ROCK DITCH CHECK (E-6)	DROP INLET SILT FENCE (E-7)	SILT FENCE (E-11)	SEDIMENT REMOVAL AND DISPOSAL	TEMPORARY SEEDING	MULCH COVER	WATER	SEDIMENT BASIN	OBLITERATION OF SEDIMENT BASIN
		BAG	CU. YD.	L.F.	L.F.	CU. YD.	ACRE	ACRE	M.G.	CU. YD.	CU. YD.
MAIN LANES											
10+00	36+00	418	204								
36+00	44+50	22	12		1,200						
44+50	52+00	22	12		1,000						
52+00	58+00	88	48								
58+00	63+23	88	36								
MABELVALE WEST RD.											
13+04	17+83	22		56							
SARDIS RD.											
12+09	14+64	22		24							
* ENTIRE PROJECT AS DIRECTED BY THE ENGINEER						1,100	27.70	27.70	565.1	200	200
TOTALS		682	312	80	2,200	1,100	27.70	27.70	565.1	200	200

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

BASIS OF ESTIMATE:
WATER = 20.4 M.G. PER ACRE TEMPORARY SEEDING
SAND BAG: 22 BAGS PER INSTALLATION
ROCK DITCH CHECK: 12 CU.YD. PER INSTALLATION

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

EROSION CONTROL

STATION	STATION	LOCATION	LIME	SEEDING	MULCH COVER	SECOND SEEDING APPLICATION	WATER
			TON	ACRE			M.G.
10+29.91	63+28.38	MAIN LANES	22.36	11.18	11.18	11.18	1,140.4
16+50.00	18+82.54	MABELVALE WEST RD.	0.18	0.09	0.09	0.09	9.2
12+09.21	14+63.47	SARDIS RD.	0.32	0.16	0.16	0.16	16.3
TOTALS			22.86	11.43	11.43	11.43	1,165.9

BASIS OF ESTIMATE:
LIME = 2 TONS PER ACRE SEEDING
WATER = 102.0 M.G.PER ACRE SEEDING

CONCRETE ISLAND

STATION	LOCATION	SIDE	AREA
			SQ. YDS.
10+45	MAIN LANES	RT.	12
10+45	MAIN LANES	LT.	27
63+15	MAIN LANES	RT.	6
63+15	MAIN LANES	LT.	9
15+32	MABELVALE WEST RD.	RT.	8
		TOTAL	62

CONSTRUCTION PAVEMENT MARKINGS

STATION	STATION	LOCATION	REMOVAL OF PERMANENT PAVEMENT MARKINGS
			L.F.
10+80	13+04	MABELVALE WEST RD. EXISTING DOUBLE YELLOW	848
12+85	13+04	MABELVALE WEST RD. EXISTING RT. EDGE LINE	20
11+99	14+23	ALEXANDER RD. EXISTING LT. EDGE LINE	224
		TOTAL	1092

CONCRETE COMBINATION CURB & GUTTER (TYPE A)(1' 6")

STATION	LOCATION	SIDE	L.F.
15+12	MABELVALE WEST RD.	RT.	18
15+33	MABELVALE WEST RD.	RT.	30
15+95	MABELVALE WEST RD.	RT.	94
15+99	MABELVALE WEST RD.	RT.	67
16+58	MABELVALE WEST RD.	RT.	23
12+09	SARDIS RD.	LT.	285
		TOTAL	517

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 13835
11-22-11
TODD E. MUELLER

QUANTITIES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	DISTRICT	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		061080	17	110

(2) QUANTITIES

DRAINAGE STRUCTURES

STATION	LOCATION	DESCRIPTION	REINFORCED CONCRETE PIPE CULVERT CLASS III				FLARED END SECTION FOR REINFORCED CONCRETE PIPE			JUNCTION BOX (TYPE ST)	DROP INLETS (TYPE ST)	DROP INLETS (TYPE MO)	DIMENSIONS				SOLID SODDING	WATER	STANDARD DRAWINGS
			24"	30"	22" X 14"	44" X 27"	24"	22" X 14"	44" X 27"				L	W	H	DIAMETER			
			L.F.				EACH			EACH	EACH	EACH					SQ. YD.	M.G.	
11+00	MAIN LANE	CONSTRUCT DOUBLE R.C. ARCH PIPE CULVERT & 4 FES				168			4								36	0.45	FES-1, FES-2, PCC-1
36+00	MAIN LANE	CONSTRUCT R.C. PIPE CULVERT & 2 FES	68				2										16	0.20	FES-1, FES-2, PCC-1
62+00	MAIN LANE	CONSTRUCT R.C. PIPE CULVERT & 2 FES	84				2										16	0.20	FES-1, FES-2, PCC-1
13+01	MABELVALE WEST RD.	CONSTRUCT DROP INLET W/ R.C. PIPE CULVERT		188							1		4'-0"	3'-0"	6'-0"				FPC-9S, PCC-1
14+90	MABELVALE WEST RD.	CONSTRUCT JUNCTION BOX W/ R.C. PIPE CULVERT & FES	14				1			1			6'-0"	3'-0"	6'-0"		8	0.10	FES-1, FES-2, FPC-9S, PCC-1
14+47	SARDIS RD.	CONSTRUCT R.C. ARCH PIPE CULVERT & FES (5° RT. FWD. SKEW)			70			1									8	0.10	FES-1, FES-2, PCC-1
14+43	SARDIS RD.	CONSTRUCT DROP INLET W/ R.C. ARCH PIPE CULVERT & FES			50			1				1	5'-0"	3'-0"	3'-5"	4'-0"	8	0.10	FES-1, FES-2, FPC-9M, FPC-9E, PCC-1
		TOTAL	166	188	120	168	5	2	4	1	1	1					92	1.15	

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

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

R.C. BOX CULVERTS

STATION	LOCATION	DESCRIPTION	DIMENSIONS			BOX CULVERTS CLASS S CONCRETE - ROADWAY	BOX CULVERTS REINFORCING STEEL - ROADWAY (GR 60)	BOX CULVERTS UNCL. EX. FOR STRUCTURES - ROADWAY	SOLID SODDING	WATER	STANDARD DRAWINGS
			L	W	H						
						CU. YD.	LB.	CU. YD.	SQ. YD.	M.G.	
57+23	MAIN LANE	CONSTRUCT DBL. R.C. BOX CULVERT (45° RT. FWD. SKEW)	102'-0"	4'-0"	2'-0"	58.09	9,517	28	16	0.20	RCB-1, RCB-2, R-245X-01, W-X453-1
14+90.48	MABELVALE WEST RD.	CONSTRUCT R.C. BOX CULVERT	179'-0"	4'-0"	2'-0"	52.73	7,604	30	5	0.06	RCB-1, RCB-2, W-X003-1, R-100X-0
		TOTAL				110.82	17,121	58	21	0.26	

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

SELECTED PIPE BEDDING AND BACKFILL

LOCATION	SELECTED BEDDING	SELECTED BACKFILL
	CU. YD.	
ENTIRE PROJECT	100	200

QUANTITIES ESTIMATED. TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER. SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
11-20-09
No. 11835
TODD E. MUELLER

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	DISTRICT	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		061080	18	110

(2) QUANTITIES

BASE & SURFACING - MAIN LANE

STATION	STATION	LOCATION	LENGTH	ACHM SURFACE COURSE (1/2")				ACHM BINDER COURSE (1")				AGGREGATE BASE COURSE (CLASS 7)		TACK COAT		
			FEET	AVG. WIDTH FEET	SQUARE YARDS	LBS. PER SQ. YD.	TON	AVG. WIDTH FEET	SQUARE YARDS	LBS. PER SQ. YD.	TON	TONS PER STATION	TON	AVG. WIDTH FEET	SQUARE YARDS	0.03 G/SY GAL.
10+29.91	12+29.91	TRANSITION	200.00	VAR	1,501.78	220	165	VAR	1,332.89	550	367		978	VAR	1,332.89	40
12+29.91	38+00.00	RT. MAIN LANE	2,570.09	40.00	11,422.62	220	1,256	28.33	8,090.07	440	1,780	349.25	8,976	28.33	8,090.07	243
38+00.00	40+00.00	RT. MAIN LANE	200.00	40.00	888.89	220	98	28.33	629.56	550	173	356.24	712	28.33	629.56	19
40+00.00	43+29.66	RT. MAIN LANE	329.66	40.00	1,465.16	440	322	28.33	1,037.70	440	228	363.22	1,197	28.33	1,037.70	31
40+42.07	43+03.82	GUARDRAIL WIDENING - LT.	261.75	VAR	137.44	220	15						96			
40+62.00	43+32.75	GUARDRAIL WIDENING - RT.	270.75	VAR	143.22	220	16									
46+51.25	49+22.00	GUARDRAIL WIDENING - LT.	270.75	VAR	143.33	220	16						99			
46+80.18	48+16.93	GUARDRAIL WIDENING - RT.	136.75	VAR	61.44	220	7									
46+54.34	50+00.00	RT. MAIN LANE	345.66	40.00	1,536.27	440	338	28.33	1,088.06	440	239	363.22	1,256	28.33	1,088.06	33
50+00.00	52+00.00	RT. MAIN LANE	200.00	40.00	888.89	220	98	28.33	629.56	550	173	356.24	712	28.33	629.56	19
52+00.00	56+91.38	RT. MAIN LANE	491.38	40.00	2,183.91	220	240	28.33	1,546.76	440	340	349.25	1,716	28.33	1,546.76	46
56+91.38	61+28.38	RT. MAIN LANE	437.00	44.86	2,178.20	220	240	33.19	1,611.56	440	355	374.39	1,636	33.19	1,611.56	48
61+28.38	63+28.38	TRANSITION	200.00	VAR	1,533.33	220	169	VAR	1,382.56	550	380		1,000	VAR	1,382.56	41
TOTAL							2,980				4,035		18,378			520

BASIS OF ESTIMATE:
ACHM BINDER COURSE (1"): 3.9% ASPHALT BINDER, 96.1% MINERAL AGGREGATE (PG 64-22), N_{MAX} = 115
ACHM SURFACE COURSE (1/2"): 4.9% ASPHALT BINDER, 95.1% MINERAL AGGREGATE (PG 76-22), N_{MAX} = 205

BASE & SURFACING - DRIVEWAYS

LOCATION	PORTLAND CEMENT CONCRETE DRIVEWAY	AGGREGATE BASE COURSE (CLASS 7)(7" DEPTH)			ACHM SURFACE COURSE (1/2") (220 LBS. PER S.Y.)	
	WIDTH (L.F.)	SQUARE YARDS	AVG. AREA (S.Y.)	TON PER S.Y.	TON	SQUARE YARDS	TON
SARDIS ROAD @ STA. 12+34 RT	18	56.00					
SARDIS ROAD @ STA. 13+30.79 LT	40	34.67	58.67	0.408	24	58.67	6
MABELVALE WEST ROAD @ STA. 15+22 RT						36.89	4
MABELVALE WEST ROAD @ STA. 15+50 RT						45.78	5
MABELVALE WEST ROAD @ STA. 16+47 RT						63.44	7
TOTAL		90.67			24	204.78	22

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2"): 4.9% ASPHALT BINDER, 95.1% MINERAL AGGREGATE (PG 64-22), N_{MAX} = 115

BASE & SURFACING - SIDE ROADS, MISC.

STATION	STATION	LOCATION	LENGTH	ACHM SURFACE COURSE (1/2")				ACHM BINDER COURSE (1")				AGGREGATE BASE COURSE (CLASS 7)		PORTLAND CEMENT CONC. BASE (6" U.T.)		PORTLAND CEMENT CONC. BASE (8" U.T.)		TACK COAT					
			FEET	AVG. WIDTH FEET	SQUARE YARDS	LBS. PER SQ. YD.	TON	AVG. WIDTH FEET	SQUARE YARDS	LBS. PER SQ. YD.	TON	TONS PER STATION	TON	AVG. WIDTH	SQUARE YARDS	AVG. WIDTH	SQUARE YARDS	AVG. WIDTH FEET	SQUARE YARDS	0.03 G/SY GAL.	AVG. WIDTH FEET	SQUARE YARDS	0.10 G/SY GAL.
13+04.70	15+00.74	MABELVALE WEST RD.	196.04	43.30	943.17	220	104	10.30	224.36	440	49	53.41	105					10.30	224.36	7	33.00	718.81	72
15+00.74	15+57.54	MABELVALE WEST RD.	56.80	33.00	208.27	220	23														33.00	206.27	21
15+57.54	16+80.57	MABELVALE WEST RD.	123.03	30.00	410.10	220	45														30.00	410.10	41
16+80.57	17+82.54	MABELVALE WEST RD.	101.97	31.04	351.68	220	39	2.71	30.70	440	7	74.67	76					2.71	30.70	1	24.50	277.59	28
17+82.54	18+82.54	MABELVALE WEST RD.-RT.(TRANSITION)	100.00	24.00	266.67	220	29					30.75	31								22.00	244.44	24
12+09.21	13+44.21	SARDIS RD.	135.00	33.75	506.25	220	56	3.42	51.30	440	11	108.17	146	3.25	48.75			3.42	51.30	2	26.50	397.50	40
13+44.21	14+01.17	SARDIS RD.	56.96	43.50	275.31	220	30	6.67	42.21	440	9	141.87	81	6.50	41.14			6.67	42.21	1	33.00	208.85	21
14+01.17	14+35.70	SARDIS RD. - RT.	34.53	27.00	103.59	220	11	6.67	25.59	440	6	95.20	33					6.67	25.59	1	16.50	63.31	6
14+01.17	14+61.17	SARDIS RD. - LT.	60.00	VAR	196.56	220	22							VAR	129.89	VAR	155.56				VAR	196.56	20
14+35.70	14+65.70	SARDIS RD. - RT.	30.00	VAR	96.33	220	11	VAR	44.67	440	10		45					VAR	44.67	1	VAR	96.33	10
12+09.21	14+61.17	SARDIS RD. - LT. (BEHIND C&G)			175.78	VAR	28														VAR	175.78	18
TOTAL							398				92		517		219.78		155.56			13			301

BASIS OF ESTIMATE:
ACHM BINDER COURSE (1"): 3.9% ASPHALT BINDER, 96.1% MINERAL AGGREGATE (PG 64-22), N_{MAX} = 115
ACHM SURFACE COURSE (1/2"): 4.9% ASPHALT BINDER, 95.1% MINERAL AGGREGATE (PG 76-22), N_{MAX} = 205

COLD MILLING ASPHALT PAVEMENT

STATION	STATION	LOCATION	LENGTH	WIDTH	AREA
			FEET	FEET	S.Y.
13+04.70	14+04.70	MABELVALE WEST RD.	100.00	22.00	244.44
17+82.54	18+82.54	MABELVALE WEST RD.	100.00	22.00	244.44
12+09.21	13+09.21	SARDIS ROAD	100.00	20.00	222.22
13+63.47	14+63.47	SARDIS ROAD	100.00	20.00	222.22
TOTAL					933.32

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11835
TODD E. MUELLER
11-20-09

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.		061080	19	110
				(1) 07157		QUANTITIES		50643

SCHEDULE OF BRIDGE QUANTITIES FOR JOB 061080

BRIDGE NO. / CODE NO.	NAME PLATE TITLE	UNIT OF STRUCTURE	ITEM NO.	619	801	802	802	803	SS & 804	SS & 804	805	805	807	808	812	816	SP JOB 061080
			ITEM	7' STEEL CHAIN LINK FENCE	UNCLASSIFIED EXCAVATION FOR STRUCTURES-BRIDGE	CLASS S CONCRETE - BRIDGE	CLASS S(AE) CONCRETE - BRIDGE	CLASS 1 PROTECTIVE SURFACE TREATMENT	REINFORCING STEEL-BRIDGE (GRADE 60)	EPOXY COATED REINFORCING STEEL (GRADE 60)	STEEL PILING HP12 X 53	STEEL PILING HP14 X 73	STRUCTURAL STEEL IN PLATE GIRDER SPANS (M270-GR. 50W)	ELASTOMERIC BEARINGS	BRIDGE NAME PLATE (TYPE D)	CONCRETE RIPRAP	ARMORED JOINT WITH NEOPRENE STRIP SEAL
			UNIT	LINEAR FOOT	CUBIC YARD	CUBIC YARD	CUBIC YARD	GALLON	POUND	POUND	LINEAR FOOT	LINEAR FOOT	POUND	CUBIC INCH	EACH	CUBIC YARD	LINEAR FOOT
07157 X171	U.P.R.R. OVERPASS	BENT NO. 1				60.65		0.4	6,230		638		920	4,250.0		127	
		BENT NO. 2			194	136.91			26,830			1,290		5,865.0			
		BENT NO. 3			178	138.34			26,830			1,170		7,140.0			
		BENT NO. 4				60.50		0.4	6,470		825		920	4,250.0		139	
		322'-0" CONT. COMP. PLATE GIRDER UNIT		250.0			429.60	34.0		116,710			424,980		1		103
		TOTALS FOR BRIDGE NO. 07157		250.0	372	396.40	429.60	34.8	66,360	116,710	1,463	2,460	426,820	21,505.0	1	266	103
		TOTALS FOR JOB 061080		250.0	372	396.40	429.60	34.8	66,360	116,710	1,463	2,460	426,820	21,505.0	1	266	103

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
12854
JOHN H. RUDDELL
NO. 9017

BRIDGE ENGINEER

SCHEDULE OF BRIDGE QUANTITIES
SOUTH LOOP BYPASS (MABELVALE RD.-ALEXANDER RD.) (LITTLE ROCK) (S)
PULASKI COUNTY
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: CWT DATE: APR. 2009 FILENAME: B061080_01.DGN
CHECKED BY: JHR DATE: APR. 2009 SCALE: AS SHOWN
DESIGNED BY: MRA DATE: APR. 2009
BRIDGE NO. 07157 DRAWING NO. 50643

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WORKSPACE: AHTD
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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
1-30-12				6	ARK.			
				JOB NO.		061080	20	110

(2) SUMMARY OF QUANTITIES & REVISIONS

SUMMARY OF QUANTITIES

ITEM NUMBER	ITEM	QUANTITY	UNIT
201	CLEARING	60	STA.
201	GRUBBING	60	STA.
202	REMOVAL AND DISPOSAL OF PIPE CULVERTS	3	EACH
202	REMOVAL AND DISPOSAL OF ASPHALT CURB	98	L.F.
202	REMOVAL AND DISPOSAL OF FENCE	2,631	L.F.
202	REMOVAL AND DISPOSAL OF DROP INLETS	1	EACH
202	REMOVAL AND DISPOSAL OF CURB AND GUTTER	236	L.F.
202	REMOVAL AND DISPOSAL OF CONCRETE ISLAND	8	SQ.YD.
210	UNCLASSIFIED EXCAVATION	86,081	CU.YD.
SP & 210	COMPACTED EMBANKMENT	155,141	CU.YD.
SP & 210	SOIL STABILIZATION	300	TON
SS & 303	AGGREGATE BASE COURSE (CLASS 7)	18,919	TON
309	PORTLAND CEMENT CONCRETE BASE (6" UNIFORM THICKNESS)	220	SQ.YD.
309	PORTLAND CEMENT CONCRETE BASE (8" UNIFORM THICKNESS)	156	SQ.YD.
401	TACK COAT	834	GAL.
SP, SS & 406	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")	3,966	TON
SP, SS & 406	ASPHALT BINDER (PG 64-22) IN ACHM BINDER COURSE (1")	161	TON
SP, SS & 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")	3,233	TON
SP, SS & 407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2")	1	TON
SP, SS & 407	ASPHALT BINDER (PG 76-22) IN ACHM SURFACE COURSE (1/2")	166	TON
412	COLD MILLING ASPHALT PAVEMENT	933	SQ.YD.
504	APPROACH GUTTERS (TYPE C)	37.12	CU.YD.
505	PORTLAND CEMENT CONCRETE DRIVEWAY	90.67	SQ.YD.
601	MOBILIZATION	1.00	L.S.
SP & 602	FURNISHING FIELD OFFICE	1	EACH
SS & 603	MAINTENANCE OF TRAFFIC	1.00	L.S.
SS & 604	SIGNS	260	SQ.FT.
SS & 604	TRAFFIC DRUMS	66	EACH
SS & 604	BARRICADES	48	L.F.
SS & 604	VERTICAL PANELS	76	EACH
604	REMOVAL OF PERMANENT PAVEMENT MARKINGS	1,092	L.F.
605	CONCRETE DITCH PAVING (TYPE B)	70	SQ.YD.
SS & 606	24" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)	166	L.F.
SS & 606	30" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)	188	L.F.
SS & 606	22" X 14" REINFORCED CONCRETE ARCH PIPE CULVERTS (CLASS III)	120	L.F.
SS & 606	44" X 27" REINFORCED CONCRETE ARCH PIPE CULVERTS (CLASS III)	168	L.F.
606	24" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS	5	EACH
606	22" X 14" FLARED END SECTIONS FOR REINFORCED ARCH PIPE CULVERTS	2	EACH
606	44" X 27" FLARED END SECTIONS FOR REINFORCED ARCH PIPE CULVERTS	4	EACH
606	SELECTED PIPE BEDDING	100	CU.YD.
606	SELECTED PIPE BACKFILL	200	CU.YD.
609	DROP INLETS (TYPE ST)	1	EACH
609	DROP INLETS (TYPE MO)	1	EACH
609	JUNCTION BOXES (TYPE ST)	1	EACH
611	4" PIPE UNDERDRAINS	600	L.F.
611	UNDERDRAIN OUTLET PROTECTORS	5	EACH
615	PAVEMENT REPAIR OVER CULVERTS (ASPHALT)	169	TON
SS & 617	GUARDRAIL (TYPE A)	450	L.F.
SS & 617	THRIE BEAM GUARDRAIL TERMINAL	4	EACH
SS & 617	TERMINAL ANCHOR POSTS (TYPE 1)	2	EACH
SS & 617	GUARDRAIL TERMINAL (TYPE 2)	2	EACH
619	WIRE FENCE (TYPE A)	10,747	L.F.
619	16' STEEL GATES (ALTERNATE NO. 1)	2	EACH
619	16' ALUMINUM GATES (ALTERNATE NO. 2)	2	EACH
620	LIME	23	TON
620	SEEDING	11.43	ACRE
620	MULCH COVER	39.13	ACRE
SS & 620	WATER	1,733.0	M.G.
621	TEMPORARY SEEDING	27.70	ACRE
621	DROP INLET SILT FENCE	80	L.F.
621	SILT FENCE	2,200	L.F.
621	SAND BAG DITCH CHECKS	682	BAG
621	ROCK DITCH CHECKS	312	CU.YD.
621	SEDIMENT REMOVAL AND DISPOSAL	1,100	CU.YD.
621	SEDIMENT BASIN	200	CU.YD.
621	OBLITERATION OF SEDIMENT BASIN	200	CU.YD.
623	SECOND SEEDING APPLICATION	11.43	ACRE
624	SOLID SODDING	160	SQ.YD.
632	CONCRETE ISLAND	62	SQ.YD.
634	CONCRETE COMBINATION CURB AND GUTTER (TYPE A)(1' 6")	517	L.F.
635	ROADWAY CONSTRUCTION CONTROL	1.00	L.S.
SS & 718	REFLECTORIZED PAINT PAVEMENT MARKING WHITE (10")	173	L.F.
SS & 719	THERMOPLASTIC PAVEMENT MARKING WHITE (4")	12,608	L.F.
SS & 719	THERMOPLASTIC PAVEMENT MARKING WHITE (8")	596	L.F.
SS & 719	THERMOPLASTIC PAVEMENT MARKING WHITE (12")	24	L.F.
SS & 719	THERMOPLASTIC PAVEMENT MARKING WHITE (24")	25	L.F.
SS & 719	THERMOPLASTIC PAVEMENT MARKING YELLOW (4")	13,451	L.F.
SS & 719	THERMOPLASTIC PAVEMENT MARKING (WORDS)	3	EACH
SS & 719	THERMOPLASTIC PAVEMENT MARKING (ARROWS)	3	EACH
SP & 719	INVERTED PROFILE THERMOPLASTIC CONTRAST PAVEMENT MARKING YELLOW (4") (ALT. NO. 1)	648	L.F.
SP	HIGH PERFORMANCE CONTRAST MARKING TAPE YELLOW (4") (ALT. NO. 2	648	L.F.
721	RAISED PAVEMENT MARKERS (TYPE II)	193	EACH
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES - ROADWAY	58	CU.YD.
802	CLASS S CONCRETE - ROADWAY	110.82	CU.YD.
SS & 804	REINFORCING STEEL - ROADWAY (GRADE 60)	20,349	LB.

STRUCTURES OVER 20' SPAN

ITEM NUMBER	ITEM	QUANTITY	UNIT
619	7' STEEL CHAIN LINK FENCE	250	L.F.
636	BRIDGE CONSTRUCTION CONTROL	1.00	L.S.
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES - BRIDGE	372	CU.YD.
802	CLASS S CONCRETE - BRIDGE	396.40	CU.YD.
802	CLASS S(AE) CONCRETE - BRIDGE	429.60	CU.YD.
803	CLASS 1 PROTECTIVE SURFACE TREATMENT	34.8	GAL.
SS & 804	REINFORCING STEEL - BRIDGE (GRADE 60)	66,360	LB.
SS & 804	EPOXY COATED REINFORCING STEEL (GRADE 60)	116,710	LB.
805	STEEL PILING (HP12 X 53)	1,463	L.F.
805	STEEL PILING (HP14 X 73)	2,460	L.F.
807	STRUCTURAL STEEL IN PLATE GIRDER SPANS (M270-GR 50W)	426,820	LB.
808	ELASTOMERIC BEARINGS	21,505	CU.IN.
812	BRIDGE NAME PLATE (TYPE D)	1	EACH
816	CONCRETE RIPRAP	266	CU.YD.
SP	ARMORED JOINT WITH NEOPRENE STRIP SEAL	103	L.F.

REVISION BOX

DATE	REVISION	SHEET NUMBER
1/30/12	SP ADDED FOR NESTING SITES OF MIGRATORY BIRDS	2,20

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
1-30-12
No. 11835
TODD E. MUELLER

SUMMARY OF QUANTITIES AND REVISIONS

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WORKSPACE: AHTD
L:\2004\049I980 - South Loop - Phase I\Drawings\RWY\SL0_Summary of Quantities 12-8-11.dgn
REVISED DATE:

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.		061080	21	110

(2) SURVEY CONTROL DETAILS

COORDINATES
ARKANSAS STATE PLANE, BASED ON GPS CONTROL, PROJECTED TO GROUND

POINT	NORTHING	EASTING	ELEVATION	PREFERENCE	DESCRIPTION
100	112197.3155	1192228.0477	329.08	SU	2" ALUM MON
101	111361.4493	1192244.1151	322.65	SU	2" ALUM MON
1	112253.6922	1192295.7640	329.07	SU	2" ALUM MON
3	114231.1067	1192351.0065	339.14	SU	2" ALUM MON
4	115564.6833	1192424.3466	317.63	SU	2" ALUM MON
5	115776.6089	1192452.3926	320.53	SU	2" ALUM MON
9	117482.5023	1192553.0283	318.00	SU	2" ALUM MON
2	113270.5492	1192325.0138	340.70	SU	2" ALUM MON
102	112160.3443	1194955.1913	386.06	SU	2" ALUM MON
104	117512.4587	1192171.0824	326.73	SU	2" ALUM MON
103	111772.8810	1194882.2223	386.93	SU	2" ALUM MON
105	117549.0592	1193707.2741	301.27	SU	2" ALUM MON
7	116286.2757	1192466.8656	327.21	SU	2" ALUM MON
6	116062.4313	1192459.7957	323.73	SU	2" ALUM MON
8	116937.5038	1192402.4859	323.36	SU	2" ALUM MON
2050	112907.9924	1195039.3927	379.98		PAGIS ALUM MON
2051	107143.6122	1194752.3523	365.98		PAGIS ALUM MON
10354	114854.2037	1192500.3949			GPS CNTRL

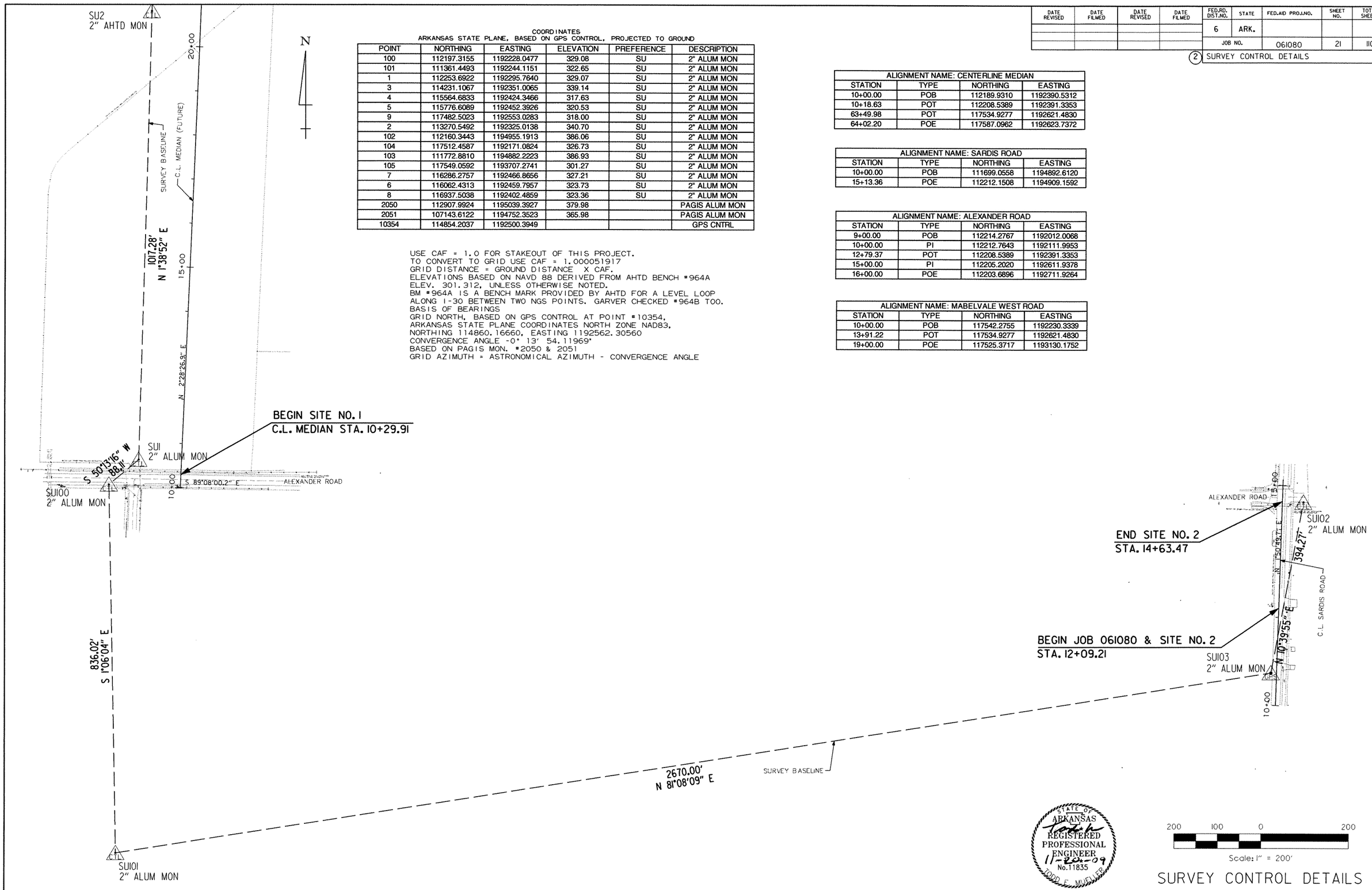
USE CAF = 1.0 FOR STAKEOUT OF THIS PROJECT.
TO CONVERT TO GRID USE CAF = 1.00005191?
GRID DISTANCE = GROUND DISTANCE X CAF.
ELEVATIONS BASED ON NAVD 88 DERIVED FROM AHTD BENCH #964A
ELEV. 301.312, UNLESS OTHERWISE NOTED.
BM #964A IS A BENCH MARK PROVIDED BY AHTD FOR A LEVEL LOOP
ALONG I-30 BETWEEN TWO NGS POINTS. GARVER CHECKED #964B TOO.
BASIS OF BEARINGS
GRID NORTH, BASED ON GPS CONTROL AT POINT #10354,
ARKANSAS STATE PLANE COORDINATES NORTH ZONE NAD83,
NORTHING 114860.16660, EASTING 1192562.30560
CONVERGENCE ANGLE -0° 13' 54.11969"
BASED ON PAGIS MON. #2050 & 2051
GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE

ALIGNMENT NAME: CENTERLINE MEDIAN			
STATION	TYPE	NORTHING	EASTING
10+00.00	POB	112189.9310	1192390.5312
10+18.63	POT	112208.5389	1192391.3353
63+49.98	POT	117534.9277	1192621.4830
64+02.20	POE	117587.0962	1192623.7372

ALIGNMENT NAME: SARDIS ROAD			
STATION	TYPE	NORTHING	EASTING
10+00.00	POB	111699.0558	1194892.6120
15+13.36	POE	112212.1508	1194909.1592

ALIGNMENT NAME: ALEXANDER ROAD			
STATION	TYPE	NORTHING	EASTING
9+00.00	POB	112214.2767	1192012.0068
10+00.00	PI	112212.7643	1192111.9953
12+79.37	POT	112208.5389	1192391.3353
15+00.00	PI	112205.2020	1192611.9378
16+00.00	POE	112203.6896	1192711.9264

ALIGNMENT NAME: MABELVALE WEST ROAD			
STATION	TYPE	NORTHING	EASTING
10+00.00	POB	117542.2755	1192230.3339
13+91.22	POT	117534.9277	1192621.4830
19+00.00	POE	117525.3717	1193130.1752



STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11835
11-20-09
TODD E. MUELLER

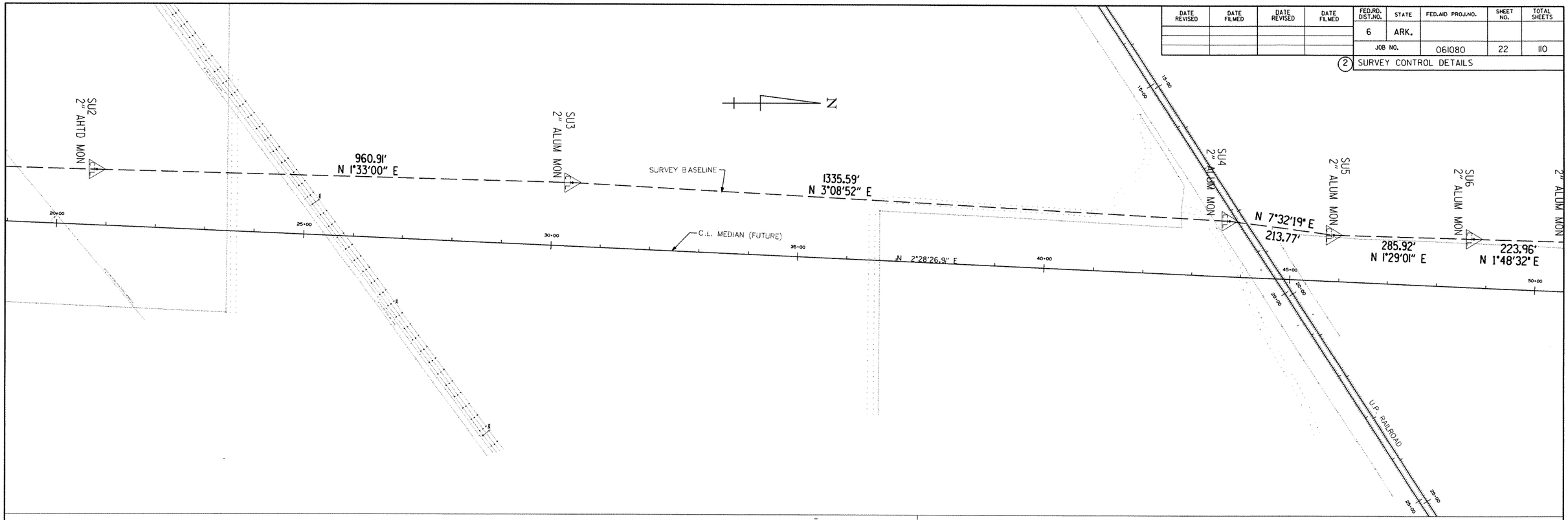
200 100 0 200
Scale: 1" = 200'

SURVEY CONTROL DETAILS

rnfortner 11/9/2009 10:30:29 AM
WORKSPACE: AHTDV8
L:\2004\049980 - South Loop - Phase I\Drawings\RWY\SL0_SC_01.dgn
REVISED DATE:

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.		061080	22	110

(2) SURVEY CONTROL DETAILS



STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
11-20-09
No. 11835
TODD E. MUELLER

SURVEY CONTROL DETAILS

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WORKSPACE: AHTD\8 L:\2004\049180 - South Loop - Phase I\Drawings\RWY\SL0_SC_02.dgn
REVISED DATE:

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.		061080	23	110

(2) PLAN & PROFILE STA. 10+29.91 TO STA. 24+00

STA. 11+00 CONSTRUCT
DOUBLE 44" X 27" X 84' R.C. ARCH PIPE CULVERT
(CLASS III) TYPE 3 BEDDING
WITH FES LT. & RT.
Q50 = 94 CFS DA = 31 ACRES

BEGIN RT. LANES JOB 061080
C.L. MEDIAN STA. 10+29.91
SITE NO. 1

ALEXANDER ROAD
MEYER LANE
S 89°08'00.2" E
20' SHOULDER TRANSITION
100' R
+10 100
+50 95'
PROPOSED R/W, C/A & FENCE
+04 95'
+38.22 95'
FUTURE CONSTRUCTION LIMITS
8'
8' (FUTURE)
C.L. MEDIAN (FUTURE)
4' 24' 8' (FUTURE)
15+00
20+00
CONSTRUCTION LIMITS
N2°28'26.9"E
33'
C.L. MEDIAN STA. 10+18.63 = C.L. ALEXANDER RD. STA. 12+79.37
88°23'32.8"
24' 8' 18'
100' R
+10 100
CONSTRUCTION LIMITS
PROPOSED R/W, C/A & FENCE
+10.35 100'
+44.29 100'
12' GRAVEL FIELD ROAD
+80
160.63' BEGIN C/A & FENCE
20' SHOULDER TRANSITION
15+00' ALEXANDER ROAD
+55.25
235.51'

200' TRANSITION
SEE SPECIAL DETAILS

BEGIN RT. LANES JOB 061080
C.L. MEDIAN STA. 10+29.91
SITE NO. 1

C.L. ALEXANDER RD. STA. 13+66.18, 10.47' LT.
C.L. MEDIAN STA. 10+29.91, 28.50' RT.
ELEV. 331.09

PVC. 11+50.00
ELEV. 330.59
K 109.29
VC=200.00'
PVI. 12+50.00
ELEV. 330.18
P.G. ELEV. 330.64
PVT. 13+50.00
ELEV. 331.60
0.4%
1.77% RT/GHT DITCH GRADE
0.98% LEFT DITCH GRADE
1.42%
PROFILE GRADE
EXISTING GROUND ALONG C.L. RT. LANES
PVC. 21+00.00
ELEV. 342.25
K 123.97
VC=300.00'
1.42%
-1.00%
PVI. 22+50.00
ELEV. 344.98
P.G. ELEV. 343.47
PVT. 24+00.00
ELEV. 342.88
ELEV. 342.88

+00.00 RT. 325.50
+00.00 LT. 325.00
+00.00 RT. 327.27
+00.00 LT. 325.98
F.L. = 325.00 LT.
F.L. = 325.50 RT.

PN: 1
PD: 5/8 REBAR & CAP
ST: 10+59.61
OF: 97.43' LT
ZC: 329.07

PN: 2
PD: 5/8 REBAR & CAP
ST: 20+76.78
OF: 112.11' LT
ZC: 340.70

ARKANSAS REGISTERED PROFESSIONAL ENGINEER 10-20-10 No. 11835 DONALD E. MUELLER

SOUTH LOOP BYPASS
(SITE NO. 1)

380 370 360 350 340 330 320 310 300 290

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00 24+00

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WORKSPACE: AHTDV8
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REVISED DATE:

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.		061080	24	110

(2) PLAN & PROFILE STA. 24+00 TO STA. 39+00

PROPOSED R/W, C/A & FENCE
FUTURE CONSTRUCTION LIMITS
POWER LINE TO BE RELOCATED BY OTHERS
CONSTRUCTION LIMITS
C.L. MEDIAN (FUTURE)
N2°28'26.9"E
CONSTRUCTION LIMITS
PROPOSED R/W, C/A & FENCE
STA. 36+00 CONSTRUCT 24" X 68' R.C. PIPE CULVERT (CLASS III) TYPE 3 BEDDING WITH FES LT. & RT.
Q50 = 16 CFS DA = 4 ACRES
12' GRAVEL FIELD ROAD
8' 24' 8' (FUTURE)
33'
8' 24' 8'

ELEV. 342.88
-1.00%
EXISTING GROUND ALONG C.L. RT. LANES
-1.00%
PROFILE GRADE
PVC 35+00.00 ELEV. 391.88
-1.70% RIGHT DITCH GRADE
-1.00%
3.20%
-0.42% RIGHT DITCH GRADE
K 95.24 VC=400.00'
STA. 37+50.00
SEE SPECIAL DETAILS - BRIDGE PROFILE TRANSITION DETAIL
ELEV. 336.28
PVT 24+00.00 ELEV. 342.88
+00.00 RT. 328.46
+00.00 RT. 326.76
F.L.= 326.89 LT.
F.L.= 326.76 RT.
PVI 37+00.00 ELEV. 329.88 P.G. ELEV. 331.98
PVT 39+00.00 ELEV. 336.28

380 370 360 350 340 330 320 310 300 290

24+00 25+00 26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00 35+00 36+00 37+00 38+00 39+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
11-20-09
No. 11835
TODD E. MUELLER

PN: 3
PD: ¾ REBAR & CAP
ST: 30+37.57
OF: 127.60' LT
ZC: 339.14

SOUTH LOOP BYPASS (SITE NO. 1)

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WORKSPACE: AHTDV8
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REVISED DATE:

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.		061080	25	110

(2) PLAN & PROFILE STA. 39+00 TO STA. 54+00

PROPOSED R/W, C/A & FENCE
12' GRAVEL FIELD ROAD
16' GATE
+90.05 165'
+02.64 180'
+00 180'
FUTURE CONSTRUCTION LIMITS
+69.55 140'
+70.33 100'
+25 125'
FUTURE TEMPORARY CONSTRUCTION EASEMENT
CONSTRUCTION LIMITS
8' 24' 8' (FUTURE)
40+00
RR MM 1/2
45+00
50+00
C.L. MEDIAN (FUTURE)
N2°28'26.9"E
33'
8' 24' 8'
20+00
20+00
70 60
70 RAILROAD 60 SIGN
CONSTRUCTION LIMITS
PROPOSED R/W, C/A & FENCE
+42.13 170'
12' GRAVEL FIELD ROAD
+28.89 165'
EXISTING RR R/W
+52.35 165'
16' GATE
+50 165'
+50 85'
PROPOSED R/W, C/A & FENCE

STA. 43+29.66 TO STA. 46+54.34
C.L. MEDIAN CONSTRUCT
324.68' X 40.0' (CLEAR ROADWAY
CONT. COMP. PLATE GIRDER BRIDGE)

C.L. MEDIAN STATIONING

		GUARDRAIL (TYPE A)	GUARDRAIL TERMINAL (TYPE 2)	TERMINAL ANCHOR POSTS (TYPE 1)	THRIE BEAM GUARDRAIL TERMINAL
STA. 41+14.00 TO STA. 43+32.75 RT. OF RT. LNS.	=	150 LIN. FT.	1 EACH		1 EACH
STA. 42+10.07 TO STA. 43+03.82 LT. OF RT. LNS.	=	75 LIN. FT.		1 EACH	1 EACH
STA. 46+51.25 TO STA. 48+70.00 LT. OF RT. LNS.	=	150 LIN. FT.	1 EACH		1 EACH
STA. 46+80.18 TO STA. 47+73.93 RT. OF RT. LNS.	=	75 LIN. FT.		1 EACH	1 EACH

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
11-23-09
No. 11835
JOHN F. MUELLER

NOTE: PROFILE GRADE SHOWN IS FOR ROADWAY ELEVATIONS. FOR BRIDGE PROFILE GRADE CONTROL, SEE BRIDGE LAYOUT.

390 380 370 360 350 340 330 320 310 300

SEE SPECIAL DETAILS - BRIDGE PROFILE TRANSITION DETAIL
STA. 40+00.00
ELEV. 336.28
PROFILE GRADE
3.20%
PVC 41+50.00
ELEV. 344.28
K 97.49
VC=700.00'
STA. 43+29.66 BEGIN BRIDGE RT.
PVI 45+00.00
ELEV. 355.48
P.G. ELEV. 349.20
3.20%
3.98%
STA. 46+54.34 END BRIDGE RT.
SEE SPECIAL DETAILS - BRIDGE PROFILE TRANSITION DETAIL
STA. 50+00.00
PVT 48+50.00
ELEV. 341.55
-3.98%
PVC 52+50.00
ELEV. 325.63
K 90.09
VC=300.00'
ELEV. 320.91
-0.42% RIGHT DITCH GRADE
PVT 39+00.00
ELEV. 336.28
-22.00 RT 325.00
SM-I
52.60 LT. 317.00
SM-I
EXISTING GROUND ALONG C.L. RT. LANES
0.35% LEFT DITCH GRADE
+00.00 LT. 319.62
-1.66% LEFT DITCH GRADE
-3.98%
PVI 54+00.00
ELEV. 319.66
P.G. ELEV. 320.11
PN: 4
PD: 5/8 REBAR & CAP
ST: 43+73.07
OF: 111.90' LT
ZC: 317.63

39+00 40+00 41+00 42+00 43+00 44+00 45+00 46+00 47+00 48+00 49+00 50+00 51+00 52+00 53+00 54+00

SOUTH LOOP BYPASS
(SITE NO. 1)

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WORKSPACE: AHTDVB
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REVISED DATE:

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.		061080	26	110
				(2) PLAN & PRO. STA. 54+00 TO STA. 63+28.38				

C.L. MEDIAN STA. 57+23 CONSTRUCT
DOUBLE 4' X 2' X 102' R.C. BOX CULVERT
45° RT. FWD. SKEW
WITH 3:1 WINGS LT. & RT.
Q50 = 102 CFS DA = 30 ACRES

MABELVALE MIDDLE SCHOOL

FUTURE TEMPORARY CONSTRUCTION EASEMENT

FUTURE CONSTRUCTION LIMITS

PROPOSED R/W, C/A & FENCE

FUTURE TEMPORARY CONSTRUCTION EASEMENT

END C/A & FENCE

MABELVALE WEST ROAD

100' R

C.L. MEDIAN (FUTURE)

CONSTRUCTION LIMITS

N2°28'26.9"E

495' TAPER

60' R

PROPOSED R/W, C/A & FENCE

END C/A & FENCE

POST OFFICE

TEMPORARY CONSTRUCTION EASEMENT

STA. 62+00 CONSTRUCT
24" X 84' R.C. PIPE CULVERT
WITH FES LT. & RT.
(CLASS III) TYPE 3 BEDDING
Q50 = 10 CFS DA = 2 ACRES

END RT. LANES JOB 061080
C.L. MEDIAN STA. 63+28.38
SITE NO. 1

C.L. MEDIAN STA. 63+49.98 =
C.L. MABELVALE WEST ROAD STA. 13+91.22

88°36'07"

K 90.09
VC=300.00'

PVT 55+50.00
ELEV. 318.69

PVI 54+00.00
ELEV. 319.66

-0.65%

-1.66% LEFT DITCH GRADE

-1.12% RIGHT DITCH GRADE

-1.10% LEFT DITCH GRADE

0.33% LEFT DITCH GRADE

-0.46% RIGHT DITCH GRADE

-2.73% RIGHT DITCH GRADE

-0.51% RIGHT DITCH GRADE

-1.60% LEFT DITCH GRADE

1.00% LEFT DITCH GRADE

-1.79% RIGHT DITCH GRADE

PROFILE GRADE

EXISTING GROUND ALONG C.L. RT. LANES

200' TRANSITION
SEE SPECIAL DETAILS

+00.00 RT. 315.25
+00.00 LT. 314.63

+15.16 LT. 312.27

+87.16 RT. 312.02
+00.00 LT. 312.55

+00.00 RT. 312.54

+00.00 RT. 309.81

+00.00 LT. 310.60

+00.00 RT. 308.79
+00.00 LT. 309.00

00 RT. 307.00
00 LT. 310.00

C.L. MABELVALE WEST ROAD STA. 14+19.18, 22.29' RT.
C.L. MEDIAN STA. 63+28.38, 28.50' RT.
ELEV. 313.64

F.L. = 312.27 LT.
F.L. = 312.02 RT.

PN: 8
PD: 5/8" REBAR & CAP
STATION 57+43.66
OF: 193.00' LT
ZC: 323.36

F.L. = 309.00 LT.
F.L. = 308.79 RT.

F.L. = 307.00 RT.

PN: 9
PD: 5/8" REBAR & CAP
STATION 62+94.65
OF: 66.13' LT
ZC: 318.00

END RT. LANES JOB 061080
C.L. MEDIAN STA. 63+28.38
SITE NO. 1

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
11-20-09
No. 11835
TODD E. MUSELER

SOUTH LOOP BYPASS
(SITE NO. 1)

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WORKSPACE: AHTD V8
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REVISED DATE:

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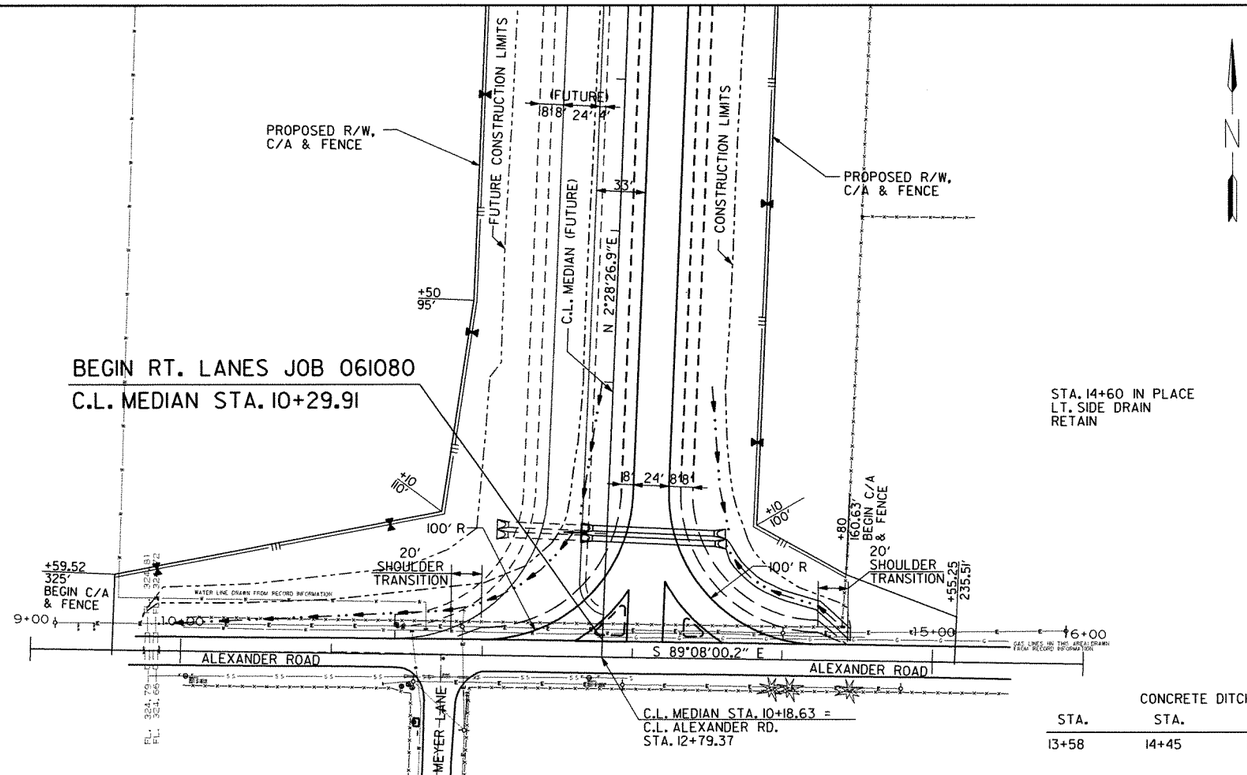
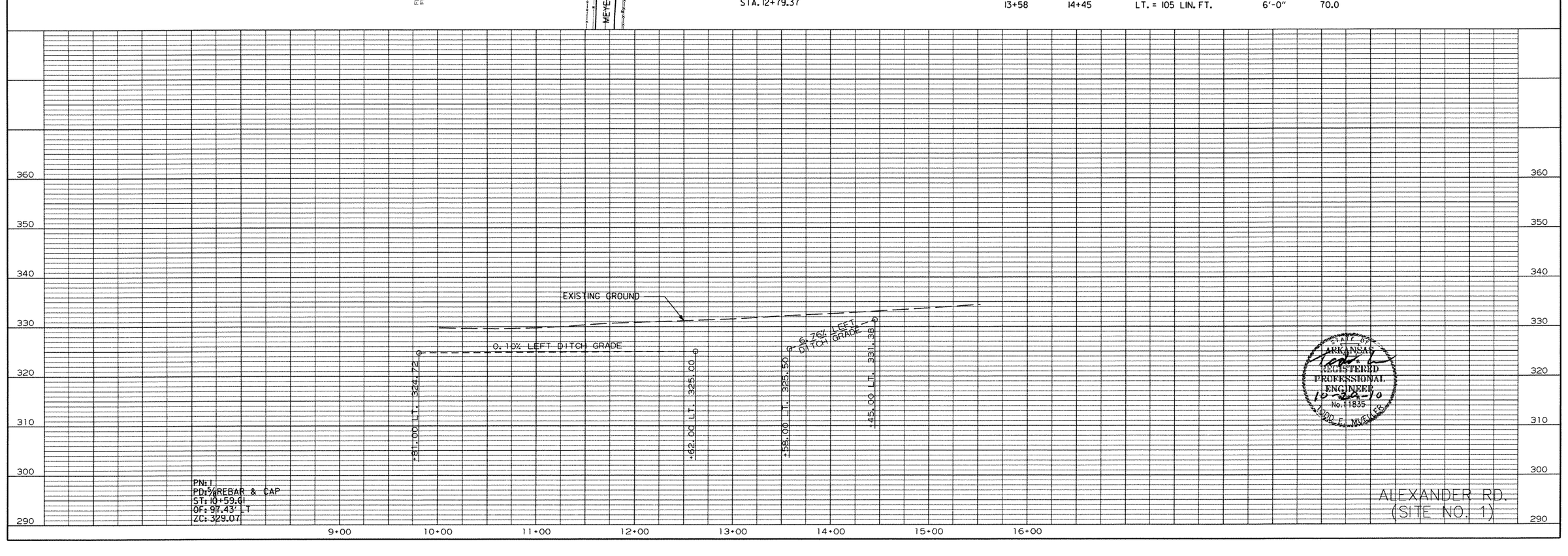
				6	ARK.			
				JOB NO.		061080	27	110

(2) PLAN AND PROFILE ALEXANDER RD.



CONCRETE DITCH PAVING (TYPE B)

STA.	STA.	SIDE	"W"	SQ. YDS.
13+58	14+45	LT. = 105 LIN. FT.	6'-0"	70.0



STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER 10-22-10 No. 11835 TODD E. MUELLER

ALEXANDER RD. (SITE NO. 1)

dwyandell
WORKSPACE: AHTDV8
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REVISED DATE:

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				6	ARK.			
				JOB NO.		061080	28	110

(2) PLAN & PROFILE MABELVALE WEST ROAD

MABELVALE WEST ROAD
STA. 13+04.70, 22.30' RT.
BEGIN NOTCH, WIDEN
& OVERLAY

CL. MABELVALE WEST ROAD
STA. 13+91.22 =
C.L. MEDIAN
STA. 63+49.98

MABELVALE WEST ROAD
STA. 15+00.74, 22.30' RT.
END NOTCH AND WIDEN

MABELVALE WEST STA. 15+22 RT. - IN PLACE
14' DRIVEWAY - RETAIN AND OVERLAY

MABELVALE WEST STA. 15+50 RT. - IN PLACE
22' DRIVEWAY - RETAIN AND OVERLAY

MABELVALE WEST STA. 16+47 RT. - IN PLACE
12' DRIVEWAY - RETAIN AND OVERLAY

10+00 | 15+00 | 19+00

C.L. MABELVALE WEST ROAD

S88°55'25.7"E

88°36'07"

100' TRANSITION TO MATCH EXISTING

+17.79
100'
END C/A & FENCE

+37.68
484.23'

+03.87
159.95'

+09.73
396.68'

+75
111.87'

EXISTING R/W

STA. 13+01.28 - IN PLACE
DROP INLET W/ GRATE AND
30" X 51' R.C. PIPE CULVERT WITH FES RT.
REMOVE AND CONSTRUCT
TYPE ST DROP INLET, 22.11' RT
(4' X 3' X H=6'-0") WITH RIBBED VANE GRATE &
30" X 187' R.C. PIPE OUTLET TO JUNCTION BOX RT.
(CLASS III) TYPE 3 BEDDING

MABELVALE MIDDLE SCHOOL

TEMPORARY CONSTRUCTION EASEMENT

MABELVALE WEST ROAD
STA. 17+82.54 11.11' RT.
END NOTCH AND WIDEN

POST OFFICE

MABELVALE WEST ROAD
STA. 16+80.57 16.18' RT.
BEGIN NOTCH AND WIDEN

MABELVALE WEST STA. 15+12 RT. - CONSTRUCT
18' CONCRETE COMBINATION CURB AND GUTTER (TYPE A) (1'-6")

MABELVALE WEST STA. 15+33 RT. - IN PLACE
30' CURB AND GUTTER - REMOVE &
REPLACE W/ CONCRETE COMBINATION CURB AND GUTTER (TYPE A) (1'-6")

MABELVALE WEST STA. 15+99 RT. - IN PLACE
94' CURB AND GUTTER - REMOVE &
REPLACE W/ CONCRETE COMBINATION CURB AND GUTTER (TYPE A) (1'-6")

MABELVALE WEST STA. 15+95 RT. - IN PLACE
67' CURB AND GUTTER - REMOVE &
REPLACE W/ CONCRETE COMBINATION CURB AND GUTTER (TYPE A) (1'-6")

MABELVALE WEST STA. 16+58 RT. - IN PLACE
23' CURB AND GUTTER - REMOVE &
REPLACE W/ CONCRETE COMBINATION CURB AND GUTTER (TYPE A) (1'-6")

+00
109'

+75
100'

18' 35' 8 18'

FUTURE CONSTRUCTION LIMITS

STA. 14+38.86 RT. - IN PLACE
15" X 22' R.C. PIPE CULVERT RT. SIDE DRAIN
WITH HDWL.
REMOVE

FUTURE TEMPORARY CONSTRUCTION EASEMENT

PROPOSED R/W, C/A & FENCE

60'±00 CONSTRUCTION LIMITS

N2°28'26.9"E

CONSTRUCTION LIMITS

STA. 14+90.48 RT. - IN PLACE
24" X 165' R.C. PIPE CULVERT
WITH HDWLS. - REMOVE &
CONSTRUCT TYPE ST JUNCTION BOX, 30.97' RT.
(6' X 3' X H=6'-0") &
4' X 2' X 179' R.C. BOX CULVERT OUTLET
WITH 3:1 WINGS, 32.68' RT.
Q50 = 68 CFS DA = 12 ACRES &
24" X 13' R.C. PIPE CULVERT WITH FES, 50.00' RT.
(CLASS III) TYPE 3 BEDDING

+73.63
116.06'

PROPOSED R/W, C/A & FENCE

MABELVALE WEST STA. 15+32 RT. - IN PLACE
8 SQ. YD. CONC. ISLAND - REMOVE AND RECONSTRUCT

NOTE:

REMOVE AND RECONSTRUCT ASPHALT PAVING IN ACCORDANCE WITH SECTION 615 OF THE STANDARD SPECIFICATIONS. MINIMUM THICKNESS SHALL EQUAL EXISTING PAVEMENT THICKNESS. SEE STD. DWG. SI-1 FOR DETAILS.

REMOVE AND RECONSTRUCT CONCRETE ISLAND IN ACCORDANCE WITH SECTION 632 OF THE STANDARD SPECIFICATIONS.

REMOVE AND RECONSTRUCT ALL CONCRETE CURB & GUTTER IN ACCORDANCE WITH SECTION 615 OF THE STANDARD SPECIFICATIONS.

196.04' NOTCH, WIDEN & OVERLAY
MABELVALE WEST ROAD

OVERLAY
MABELVALE WEST ROAD

101.97' NOTCH, WIDEN & OVERLAY
MABELVALE WEST ROAD

+04.7

+00.74

+80.57

+82.54

EXISTING SURFACE

330 320 310 300 290 280 270 260

30" X 187' R.C.P. OUTLET @ -2.35%

4' X 2' X 179' R.C. BOX CULVERT OUTLET @ -0.49%

TOP = 316.40
INV. = 310.40
FL IN = 312.50

TOP = 312.00
INV. = 306.00
FL IN = 306.00
FES. FL IN = 307.00
FL OUT = 305.12

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00

PN: 9
PD: 5/8" REBAR & CAP
STATION 62+94.65
OF: 66.13' LT
ZC: 318.00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
11-20-09
No. 11835
JOHN F. MURLESS

MABELVALE WEST ROAD
(SITE NO. 1)

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WORKSPACE: AHTD\8
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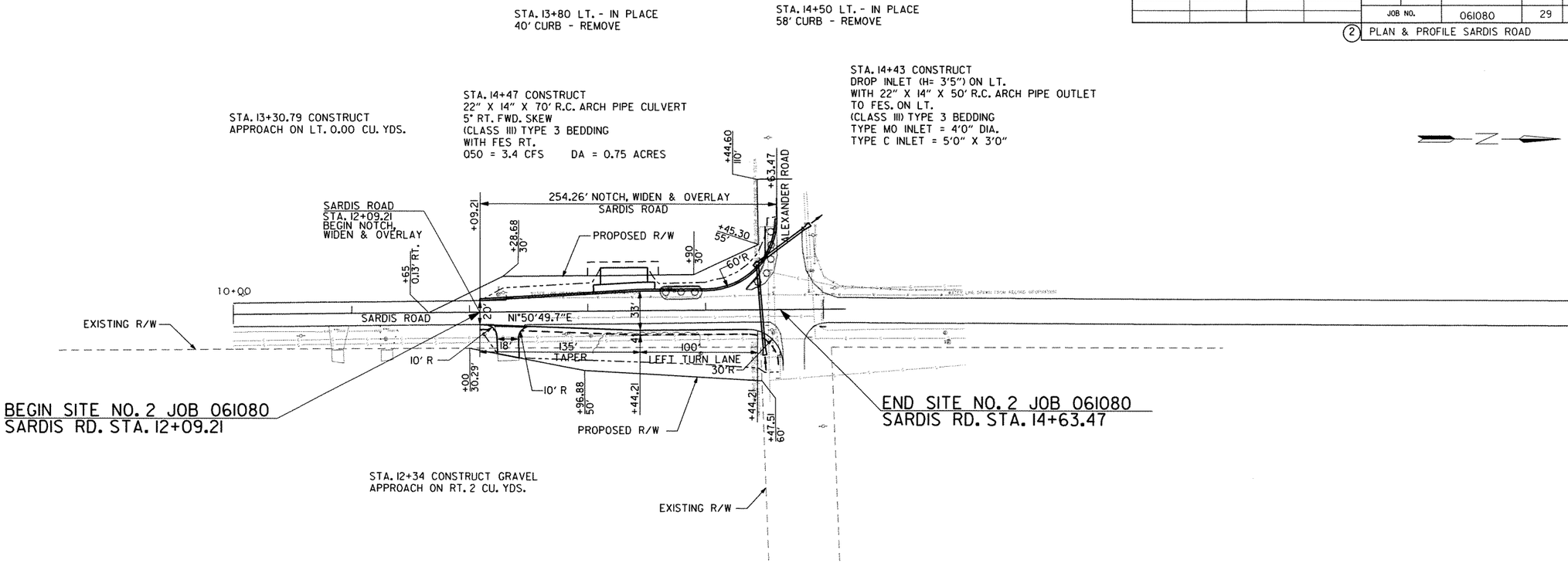
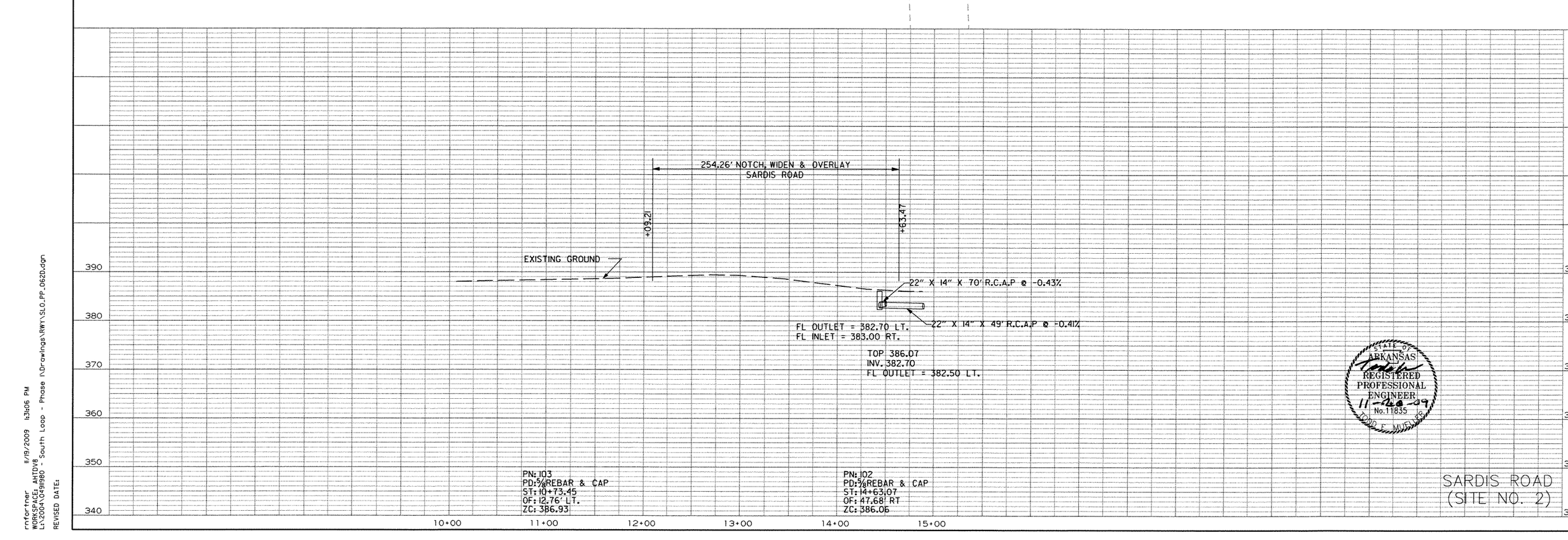
REVISED DATE:

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.		061080	29	110

(2) PLAN & PROFILE SARDIS ROAD





STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
11-20-09
No. 11835
DONALD E. MUELLER

SARDIS ROAD
(SITE NO. 2)

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WORKSPACE: ANTDIV8
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REVISED DATE:

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.		061080	30	110
				① 07157		LAYOUT		50644

Note:
For R/W Data,
See Roadway Plans.

Note:
Use Type C Approach Gutters (w = 8'-0") At
Each End of Bridge, See Std. Dwg. No. 2016C.

Level 3 Optic Cable
MCI Optic Cable
UNION PACIFIC RAILROAD
CL U.P.R.R. No. 1 Track
CL U.P.R.R. No. 2 Track
CL Future Track
RR R/W
50'-0"
55'-5" (Min.)
35'-3" (Min.)
42'-4" (Min.)
Mile Post 355
Foc
Toe Of Fill Slope
Limits of Concrete Riprap (Typ.) See Std. Dwg. No. 14995A
CL Median (Future)
8'-0" Shoulder
16'-6"
24'-0" Pavement
12'-0"
12'-0"
Bridge Profile Grade
CL Bridge & Construction
Tang. Dist. > 500'
43'-6" Out-To-Out
40'-0" Clr. Roadway
1'-7" Parapet
2% Slope
7'-0" Chainlink Fence
60°
45°
1V:3H
1V:2H
35°52'48" (Typ.)
8'-0" (Typ.)
Boring 43+49
Boring 44+12
Boring 44+20
Boring 45+45
Boring 46+10
Boring 46+70
43+00
44+00
45+00
46+00
47+00
48+00
CL Bridge Sta. 44+91.69 = CL Track No. 2 Sta. 20+00.00
CL Bridge Sta. 45+08.24 = CL Track No. 1 Sta. 20+00.00
N2°28'26.9"E
Tang. Dist. > 500'
Limits of Concrete Riprap (Typ.) See Std. Dwg. No. 14995A
Toe Of Fill Slope
END BRIDGE STA. 46+54.34
BEGIN BRIDGE STA. 43+29.66
319
320
318
317
316

① Point of Minimum Vertical Clearance
② UPRR Milepost 355.64

PLAN

Note:
Stations And Elevations
Shown Are Along CL Bridge

PVI Sta. 45+00
PVI Elev. 355.89
3.20%
-3.98%
L = 700'

BRIDGE VERTICAL CURVE DATA
(Profile Grade Along Inside Edge Of Lane)

Note:
The Above Vertical Curve Data is Applicable Only to the Construction of the Bridge. See "ROADWAY TO BRIDGE PROFILE GRADE TRANSITION" Sketch Below.

Total Length Of Bridge = 324'-8¼"
1'-4⅛"
322'-0" Continuous Composite Plate Girder Unit (90'-142'-90')
1'-4⅛"
CL 2⅝" Strip Seal Joint (4" Movement Rating)
CL 2⅝" Strip Seal Joint (4" Movement Rating)
Bridge Profile Grade To Low Steel = 5'-6⅜"
Slope Intercept Sta. 43+17.00 Elev. 348.36
Guardrail
Concrete Parapet Railing
Elev. 348.54
Sta. 44+21.00 Elev. 349.36
Top of Deck At CL Bridge & CL Bent To Low Side Top of Cap = 5'-9⅜"
7'-0" Chainlink Fence (Typ. Both Sides)
Sta. 45+63.00 Elev. 348.92
Top of Deck At CL Bridge & CL Bent To Low Side Top of Cap = 6'-0⅛"
Elev. 347.54
Slope Intercept Sta. 46+67.00 Elev. 347.29
Guardrail
Proposed Grade Line
Existing Ground Line @ CL Bridge
Elev. 318.0
Elev. 317.0
Elev. 310.54
Elev. 309.91
33'-0"
24'-9" Clr.
24'-7" Clr.
25'-0" Clr.
CL Future Track
CL Existing Tracks
58' Piles
43' Piles
39' Piles
75' Piles
Bent No. 1
Bent No. 2
Bent No. 3
Bent No. 4
Sta. 43+49 CL Future Median
Sta. 44+12 CL Future Median
Sta. 44+20, 40' Rt. of CL Future Median
Sta. 45+45, 20' Rt. of CL Future Median
Sta. 46+10, 60' Lt. of CL Future Median
Sta. 46+70, 40' Rt. of CL Future Median

ELEVATION

Note:
For General Notes, See Dwg. No. 50645.
For Boring Legend And "N" Values,
See Dwg. No. 50645.

Inside Edge of Lane
12'-0"
Bridge Profile Grade
0.41'
2"
0.02%
0.02%
0.02%
Roadway Profile Grade
C.L. Bridge

ROADWAY TO BRIDGE PROFILE GRADE TRANSITION
(Looking Ahead)

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 8017
JOHN H. RUDDELL
11-25-09
BRIDGE ENGINEER

SHEET 1 OF 5
LAYOUT OF BRIDGE OVER UNION PACIFIC RAILROAD
SOUTH LOOP BYPASS (MABELVALE RD.-ALEXANDER RD.) (LITTLE ROCK) (S)
PULASKI COUNTY
ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: APR. 2009
CHECKED BY: JHR DATE: APR. 2009
DESIGNED BY: WMM DATE: APR. 2009
FILENAME: B061080_L11.DGN
SCALE: 1"=20'

BRIDGE NO. 07157 DRAWING NO. 50644

hewilliams 11/3/2009 10:29:41 AM
WORKSPACE: AHTDV8
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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.		061080	31	110
				①	07157	LAYOUT		50645

GENERAL NOTES

BENCH MARK: TBM Pt. 4, 5/8" Rebar And Cap, 111.90' Lt. Of Sta 43+73.07 Elev. 317.627

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway And Transportation Department Standard Specifications For Highway Construction (2003 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 (4th Edition)

LIVE LOADING: HL93

SEISMIC PERFORMANCE ZONE: I

MATERIALS AND STRENGTHS:

Class S(AE) - Bridge Concrete (Superstructure)	f'c = 4000 psi
Class S - Bridge Concrete (Substructure)	f'c = 3500 psi
Reinforcing Steel(AASHTO M 31Or M 53, GR. 60)	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

STEEL PILING: Piling at End Bents 1 & 4 shall be HP12 x 53 and shall be driven with an approved air, steam or diesel hammer to a minimum safe bearing capacity of 70 tons. Piling at Bents 2 & 3 shall be HP14 x 73 and shall be driven with an approved air, stream or diesel hammer to a minimum safe bearing capacity of 95 tons. All piling shall be driven into the material designated as novaculite or shale on the boring legend unless bearing is achieved at a higher elevation. Lengths shown are for estimating quantities and for use in determining payment for cut-off and build-up in accordance with the Standard Specifications. Piles in end bents to be driven after embankment to bottom of cap is in place. On all piles the contractor shall use approved steel H-Pile driving points.

MINIMUM PENETRATION: Piling at Bents 1 & 4 shall be driven until a tip elevation of 306 or lower has been obtained. Preboring or other methods as approved by the Engineer may be used to obtain the minimum penetration requirements at Bents 1 & 4. The actual size and depth of Preboring will be determined by the Engineer. The Contractor shall be responsible for keeping the prebored holes free from debris prior to backfilling which may require the use of temporary casings or other methods. The cost of the temporary casings and the Preboring or will not be paid for directly but will be considered Subsidiary to "Steel Piling".

Piling at Bents 2 & 3 shall be driven until a minimum penetration of 15' below bottom of footing has been obtained. The Contractor shall provide a hammer of sufficient size to achieve the 15' minimum penetration requirements at Bents 2 & 3 without the use of Preboring.

BRIDGE DECK: The Concrete Bridge Deck Shall Be Given A Tine Finish As Specified For Final Finishing In Subsection 802.19 For Class 5 Tined Bridge Roadway Surface Finish.

PROTECTIVE SURFACE TREATMENT: Class I Protective Surface Treatment Shall Be Applied To The Roadway Surface And To The Face And Top Of The Concrete Parapet Rail.

BORING LOGS: Boring Logs May Be Obtained From Programs And Contracts Division.

FOOTING: The Top of Footings Shall Be Set A Minimum Of 3'-0" Below Finished Ground. Foundations For Footings Shall Be Prepared In Accordance With Section 801.04 And Backfilled In Accordance With Section 801.08.

SHORING: Temporary Shoring At Interior Bents No. 2 & 3 May Be Required To Protect Existing Fiber Optic Utilities. The Cost For Any Temporary Shoring Will Not Be Paid For Directly But Shall Be Considered Subsidiary To The Item "Class S Concrete-Bridge".

DETAIL DRAWINGS:	DRAWINGS NO:
End Bents	50650-50653
Interior Bents	50654-50655
322' Cont. Comp. Plate Girder Unit	50656-50664
Elastomeric Bearings	50665
Type C Approach Gutters	2016C
Steel Piling	14995A

"N" VALUES

Sta. 43+49, CL Of Future Median

0.5-1.5, N=2
2.5-3.5, N=0
4.5-5.5, N=30
6.5-7.5, N=22
9.0-10.0, N=24
14.0-15.0, N=21
19.0-20.0, N=38
24.0-25.0, N=44
29.0-30.0, N=48
34.0-35.0, N=30/0"
38.0-39.0, N=30/0"
43.0-44.0, N=30/0"
48.0-49.0, N=30/0"
53.0-54.0, N=30/0"
58.0-59.0, N=30/0"

Sta. 44+12, CL Of Future Median

0.5-1.5, N=7
2.5-3.5, N=7
4.5-5.5, N=48
6.5-7.5, N=38
9.0-10.0, N=34
14.0-15.0, N=22
19.0-20.0, N=13
24.0-25.0, N=50/6"
28.5-29.0, N=50/3"
34.0-35.0, N=50
39.0-40.0, N=50/10"
44.0-45.0, N=41
48.5-49.0, N=30/0"
53.5-54.0, N=30/0"
58.5-59.0, N=30/0"
63.0-63.5, N=30/0"

Sta. 44+20, 40' Rt. Of CL Future Median

0.5-1.5, N=5
2.5-3.5, N=5
4.5-5.5, N=25
6.5-7.5, N=28
9.0-10.0, N=22
14.0-15.0, N=9
19.0-20.0, N=17
24.0-25.0, N=23
28.5-29.0, N=50/3"
33.5-34.5, N=50/10"
38.5-39.5, N=50/11"
43.5-44.5, N=50/11"
49.0-49.5, N=25/0"
54.0-54.5, N=25/0"
59.0-59.5, N=25/0"
64.0-65.0, N=25/0"

Sta. 45+45, 20 Rt. Of CL Future Median

0.5-1.5, N=2
2.5-3.5, N=3
4.5-5.5, N=24
6.5-7.5, N=50
9.0-10.0, N=43
14.0-15.0, N=24
19.0-20.0, N=18
24.0-25.0, N=13
28.5-29.0, N=25/0"
33.5-34.0, N=25/0"
39.0-40.0, N=50/10"
44.0-45.0, N=50/6"

Sta. 46+10, 60' Lt. Of CL Future Median

0.5-1.5, N=6
2.5-3.5, N=9
4.5-5.5, N=28
6.5-7.5, N=29
9.0-10.0, N=32
14.0-15.0, N=29
19.0-20.0, N=25
24.0-25.0, N=24
29.0-30.0, N=44
34.0-35.0, N=50
38.5-39.5, N=50/11"
43.5-44.5, N=50/10"
48.5-49.0, N=25/0"
53.5-54.0, N=25/0"
58.5-59.0, N=25/0"
64.0-65.0, N=25/0"

Sta. 46+70, 40' Rt. Of CL Future Median

0.5-1.5, N=4
2.5-3.5, N=11
4.5-5.5, N=33
6.5-7.5, N=30
9.0-10.0, N=32
14.0-15.0, N=45
19.0-20.0, N=42
24.0-25.0, N=17
29.0-30.0, N=8
33.5-34.0, N=50/5"
38.5-39.0, N=50/4"
44.0-45.0, N=50/9"
49.0-50.0, N=30/0"
58.5-59.0, N=30/0"
64.0-65.0, N=30/0"

BORING LEGEND

A1 - Loose Brown Silt W/Organics
Gray, Reddish Tan And Tan Below 2.5 ft.
B1 - Medium Dense Brown And Gray Clayey Fine Sand W/Ferrous Nodules And Stains
Water At 5 ft.
C1 - Loose Light Tan And Gray Fine Sand, Slightly Silty, Wet
Medium Dense, Reddish Tan Below 19 ft.
D1 - Very Stiff To Hard Dark Gray Clay, Calcareous
With Limestone Seams Below 31ft
Fossiliferous With Shell Fragments Below 34 ft
With Limestone Fragments Below 45 ft
E1 - Hard To Very Hard Light Gray And Gray Novaculite, Fractured W/Occational Clay Seams
F1 - Very Loose Brown Silt W/Some Rootlets
Water At 1.5 ft
G1 - Very Loose Tan And Gray Clayey Fine Sand W/Rootlets
Medium Dense, Reddish Tan And Gray Below 4 ft.
H1 - Medium Dense Tan And Gray Fine Sand, Slightly Silty
J1 - Very Stiff Dark Gray Clay, Fossiliferous W/Shell Fragments
With Occational Soft Limestone Seams Below 25 ft.
K1 - Hard To Very Hard Light gray, Dark gray And Gray Novaculite
L1 - Loose Gray And Tan Clayey Fine Sand
With ferrous Nodules Below 2.5 ft.
Dense Below 4.5 ft.
Water At 5 ft.
M1 - Medium Dense Gray And Reddish Tan Fine Sand W/Ferrous Pockets And Seams And Parting
Light Brownish Yellow Below 18 ft.
N1 - Very Stiff To Hard Gray To Dark Gray Clay, Fossiliferous
With Limestone Seams Below 24.5 ft.
Dark Gray Below 28.5 ft.
With Numerous Shell fragments Below 34 ft.
O1 - Very Soft Gray And Dark Gray Highly Weathered Novaculite, W/Interbedded Clay Seams
P1 - Hard To Very Hard Light Gray Novaculite, Fractured W/Interbedded Clay Seams
Q1 - Very Loose Brown Silt W/Roots
R1 - Very Soft Brown Silty Clay W/Numerous Ferrous Nodules And Stains
Water At 3 ft.
S1 - Medium Dense Brown, Tan And Reddish Tan Clayey Fine Sand W/A Little Gravel And Ferrous Stains
Dense, Gray And Tan Below 6 ft.
With Less Clay Below 9 ft.
T1 - Medium Dense Reddish Tan Fine Sand, Slightly Silty W/Organic Stains
U1 - Stiff Gray And Tan Clay W/Organic Stains And Occational Fine Sandy Clay Pockets
V1 - Soft To Medium Soft Gray Limestone W/Interbedded Clay Seams And Layers
W1 - Very Stiff To Hard gray Clay W/Interbedded Limestone Seams
X1 - Hard To Very Hard Gray And Light Gray Novaculite, Fractured
Core Barrel Plugged, No Recovery
Y1 - Loose Brown Silt W/Roots
Z1 - Firm Tan Fine Sandy Clay W/Occasional Ferrous Nodules
A2 - Very Stiff Tan, Gray And Reddish Tan Fine Sandy Clay W/Ferrous Nodules And Stains
Water At 4 ft.
B2 - Dense Light Gray And Tan Clayey Fine Sand W/Ferrous Stains
C2 - Medium dense Brown And Tan Fine Sand, Wet
With Occational Clay Pockets Below 24 ft.
D2 - Very Stiff Dark Gray Clay, Fossiliferous W/Shell Fragments
Very Stiff To Hard With Interbedded Limestone Seams Below 33 ft
E2 - Hard To Very Hard Light Gray And Gray Novaculite, Fractured W/Occational Clay Seams
F2 - Loose Brown Silt W/Organics
G2 - Soft Brown Silty Clay, Slightly Sandy, Damp
H2 - Medium Dense Brown, Gray And Reddish Tan Clayey Fine Sand W/Ferrous Nodules And Stains
Dense Below 4 ft.
Water At 6 ft.
I2 - Dense Brown And Light Gray Fine Sand W/Occasional Organic Inclusions
Medium Dense Below 23 ft.
J2 - Firm Brown And Tan Clay W/Occational Fine Sand Pockets
K2 - Very Stiff To Hard Dark Gray Clay, Calcareous
Fossiliferous With Shell Fragments Below 38 ft.
L2 - Medium Soft Dark Gray Slightly Weathered To Fresh Shale

BRIDGE ENGINEER

SHEET 2 OF 5
LAYOUT OF BRIDGE OVER
UNION PACIFIC RAILROAD
SOUTH LOOP BYPASS (MABELVALE RD.-
ALEXANDER RD.) (LITTLE ROCK) (S)
PULASKI COUNTY
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: APR. 2009
CHECKED BY: JHR DATE: APR. 2009
DESIGNED BY: WMM DATE: APR. 2009
FILENAME: B061080_L12.DGN
SCALE: 1"=20'

BRIDGE NO. 07157 DRAWING NO. 50645

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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.		061080	32	110
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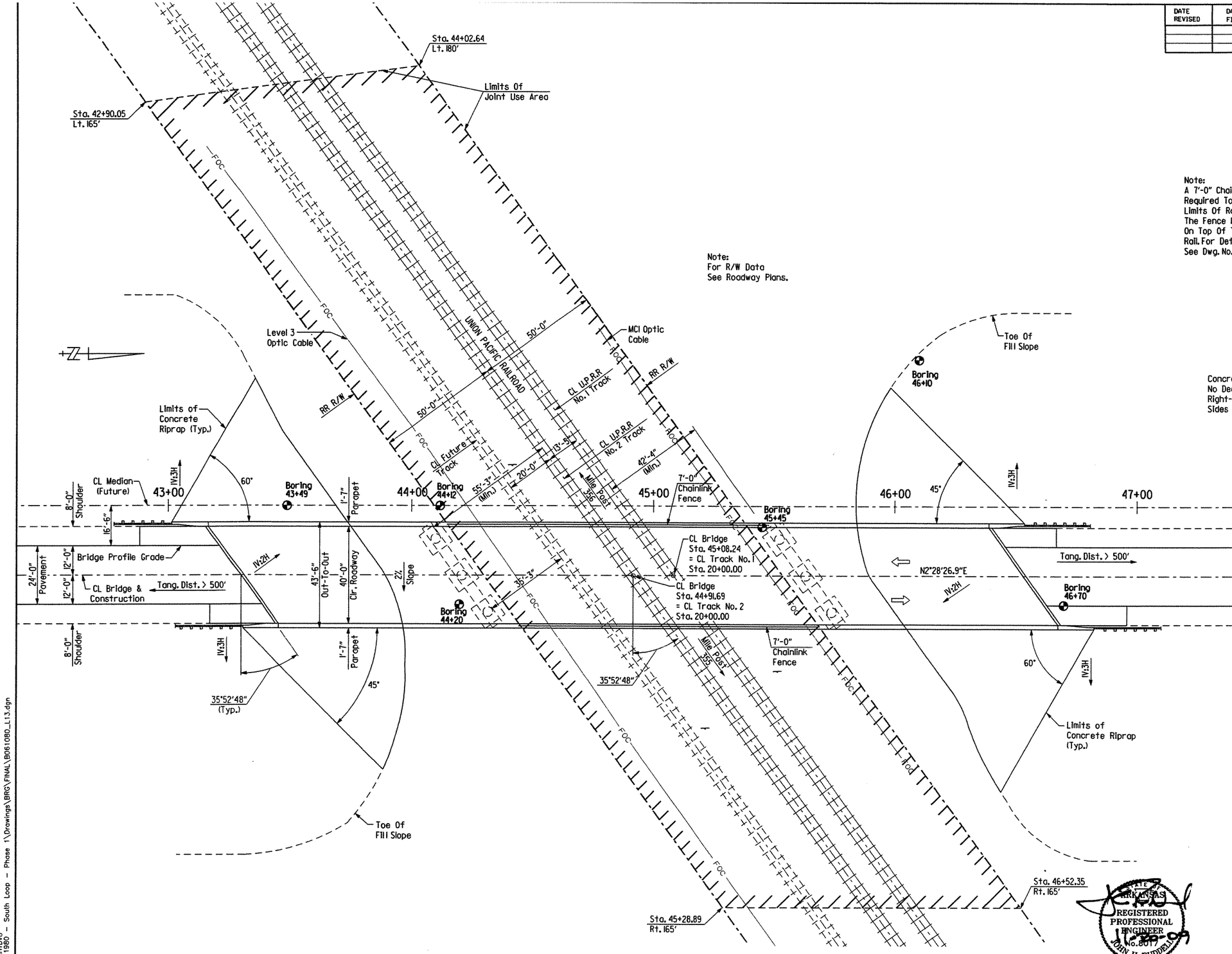
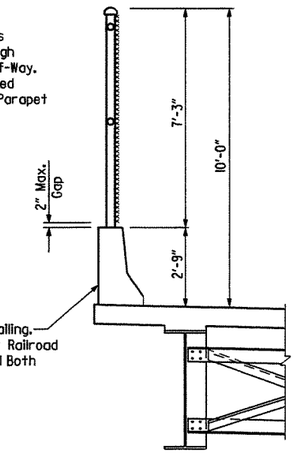


LOCATION SKETCH

Note:
For R/W Data
See Roadway Plans.

Note:
A 7'-0" Chain Link Fence Is Required To Extend Through Limits Of Railroad Right-of-Way. The Fence Is To Be Mounted On Top Of The Concrete Parapet Rail. For Details Of Fence, See Dwg. No. 50663.



CHAIN LINK FENCE DETAIL
Scale: 3/8" = 1'-0"

Note:
Currently There Are No Known Utilities On The Railroad Right-of-Way Other Than That Shown.

Note:
The Following Statement Is In The "City-Rail Agreement". The City Shall Not Plow Ice, Snow, Or Sleet Over The Sides Of The Structure. In Consideration Of This Practice, The Carrier Waives It's Request For The City To Attach Splash Boards To The Sides Of The Structure.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 8017
JOHN H. RUDDELL
12-08-09

BRIDGE ENGINEER

EXHIBIT "A"
SHEET 3 OF 5
LAYOUT OF BRIDGE OVER UNION PACIFIC RAILROAD SOUTH LOOP BYPASS (MABELVALE RD.-ALEXANDER RD.) (LITTLE ROCK) (S) PULASKI COUNTY

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

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CHECKED BY: JHR DATE: APR. 2009
DESIGNED BY: WMM DATE: APR. 2009
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				6	ARK.			
				JOB NO.		061080	33	110
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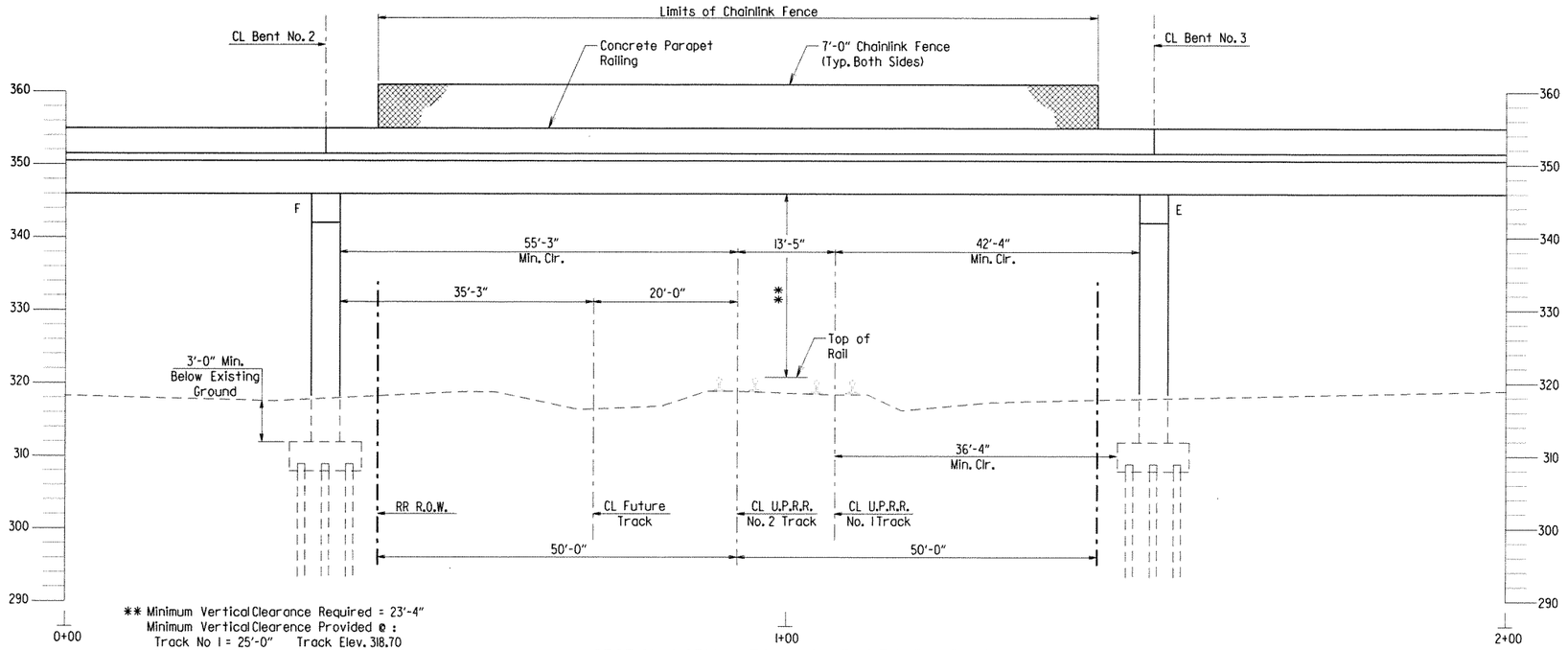
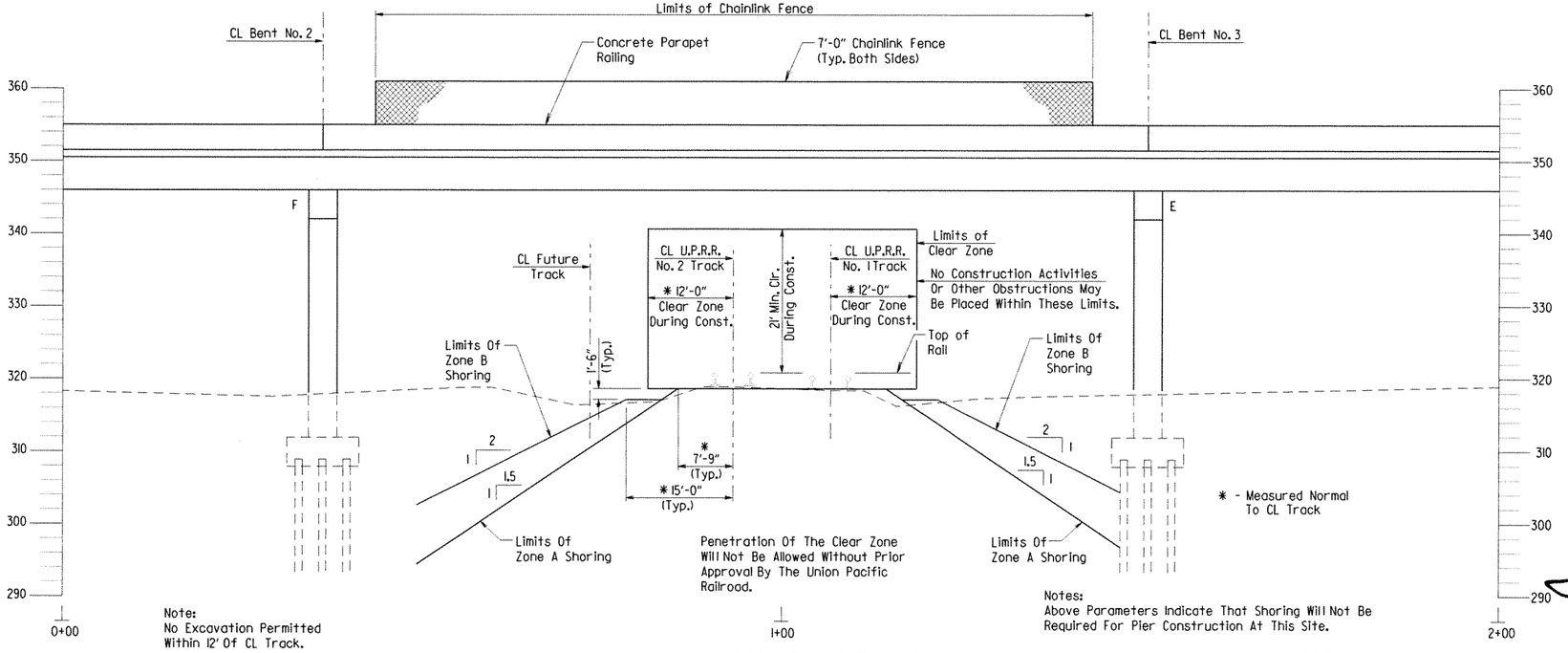


** Minimum Vertical Clearance Required = 23'-4"
Minimum Vertical Clearance Provided @ :
Track No 1 = 25'-0" Track Elev. 318.70
Track No 2 = 24'-7" Track Elev. 319.23
Future Track = 24'-9" Track Elev. Assumed 319.28

SECTION NORMAL TO UNION PACIFIC RAILROAD

Scale: 1" = 10'-0"



Note:
No Excavation Permitted Within 12' Of CL Track.

Penetration Of The Clear Zone Will Not Be Allowed Without Prior Approval By The Union Pacific Railroad.

* - Measured Normal To CL Track

MINIMUM CONSTRUCTION CLEARANCES

Scale: 1" = 10'-0"

Notes:
Above Parameters Indicate That Shoring Will Not Be Required For Pier Construction At This Site.

However The Contractor Shall Be Aware Of The Potential Need For Temp. Shoring Required To Protect The Existing Fiber Optic Lines. See GENERAL NOTES On Dwg. No. 50645.

RAILROAD GENERAL NOTES

1. Shoring Shall Comply With The Union Pacific Railroad Requirements. Construction Shall Comply With The Requirements Of SP Job 061080 "Insurance, Construction and Flagging Requirements On Railroad Property (UPRR)". Railroad Review And Approval Of Shoring, Erection And Falsework Is Required. Allow A Minimum Of Four Weeks For The Review And Approval Of Each Submittal.

   For Railroad Coordination, Refer To The Railroad Minimum Requirements Of SP Job 061080 "Insurance, Construction And Flagging Requirements On Railroad Property (UPRR)".

2. The Proposed Grade Separation Project Shall Not Increase The Quantity And/Or Characteristics Of The Flow In The Railroad's Ditches And/Or Drainage Structures.

3. The Elevation Of The Existing Top-Of-Rail Profile Shall Be Verified Before Beginning Construction. All Discrepancies Shall Be Brought To The Attention Of The Railroad Prior To Construction.

4. The Contractor Must Submit A Proposed Method Of Erosion And Sediment Control And Have The Method Approved By The Railroad Before Any Grading On The Project Site.

5. All Demolitions Within The Railroads Right-Of-Way And/Or Demolition That May Impact The Railroad's Tracks Or Operations Shall Be In Compliance With The Railroads Demolition Guidelines.

6. Erection Over The Railroad's Right-Of-Way Shall Be Designed To Cause No Interruption To The Railroad's Operation, Enabling The Track(s) To Remain Open To Traffic Per The Railroad's Requirements.

7. All Construction Phasing That May Impact The Railroad Operations Shall Be Designed To Cause No Interruption To The Railroad's Operation, Enabling The Track(s) To Remain Open To Traffic Per The Railroad's Requirements.

8. False-work Clearances Shall Comply With Minimum Construction Clearances.

9. All Permanent Clearances Shall Be Verified Before Project Closing.

10. Railroad Requirments Do Not Allow Work Within 50 Feet Of Track Centerline When A Train Passes The Work Site And All Personnel Must Clear The Area Within 25 Feet Of The Track Centerline And Secure Equipment When Trains Are Present.

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER JOHN H. RUDDELL

BRIDGE ENGINEER

EXHIBIT "A"
SHEET 4 OF 5
LAYOUT OF BRIDGE OVER UNION PACIFIC RAILROAD
SOUTH LOOP BYPASS (MABELVALE RD.-ALEXANDER RD.) (LITTLE ROCK) (S)
PULASKI COUNTY

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY:	HEW	DATE:	APR. 2009	FILENAME:	B061080_LI4.DGN
CHECKED BY:	JHR	DATE:	APR. 2009	SCALE:	AS NOTED
DESIGNED BY:	WMM	DATE:	APR. 2009		

BRIDGE NO. 07157 DRAWING NO. 50647

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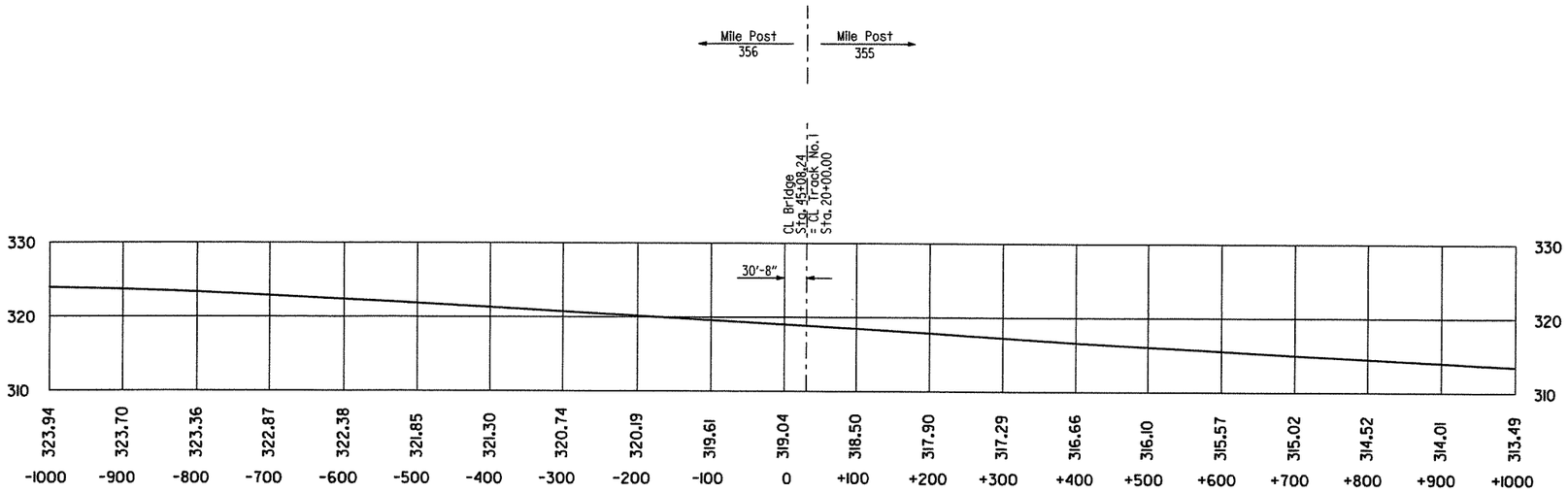
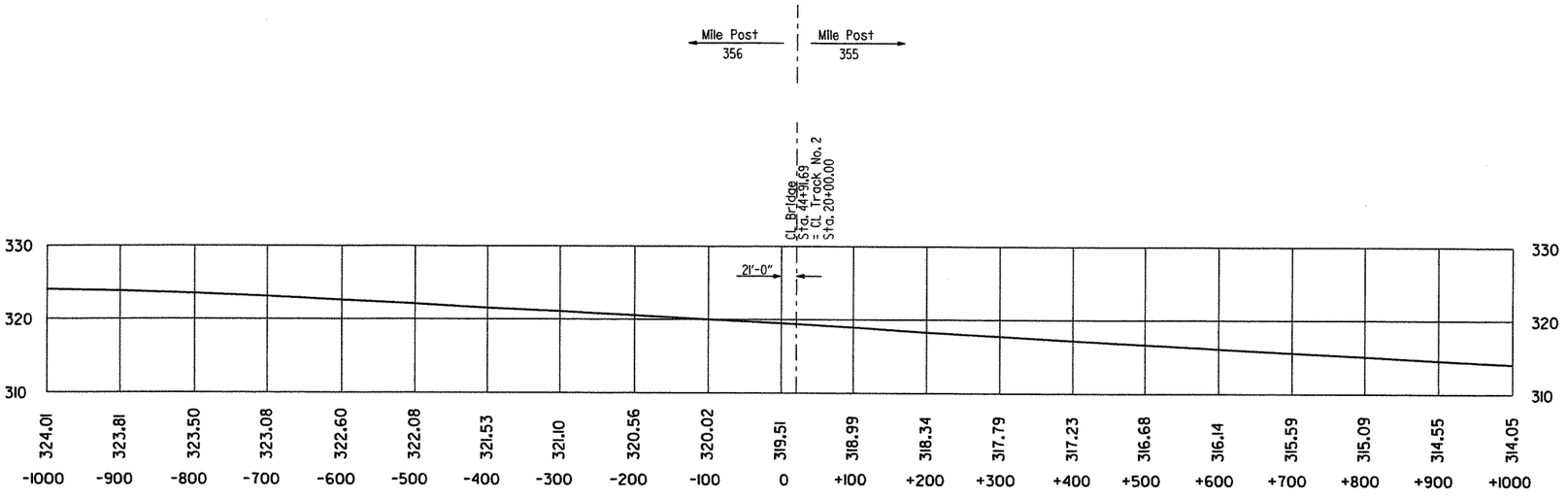
				6	ARK.			
				JOB NO.		061080	34	110
				(1) 07157		LAYOUT		50648



PROFILE ALONG TRACK NO. 1
(FROM SOUTHWEST TO NORTHEAST)



PROFILE ALONG TRACK NO. 2
(FROM SOUTHWEST TO NORTHEAST)

Note:
Elevation Of Existing Top Of
Rail Profile Shall Be Verified
Prior To Beginning Of Construction.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 8017
JOHN H. RUDDELL
1-20-09

BRIDGE ENGINEER

EXHIBIT "A"
SHEET 5 OF 5
LAYOUT OF BRIDGE OVER
UNION PACIFIC RAILROAD
SOUTH LOOP BYPASS (MABELVALE RD.-
ALEXANDER RD.) (LITTLE ROCK) (S)
PULASKI COUNTY
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

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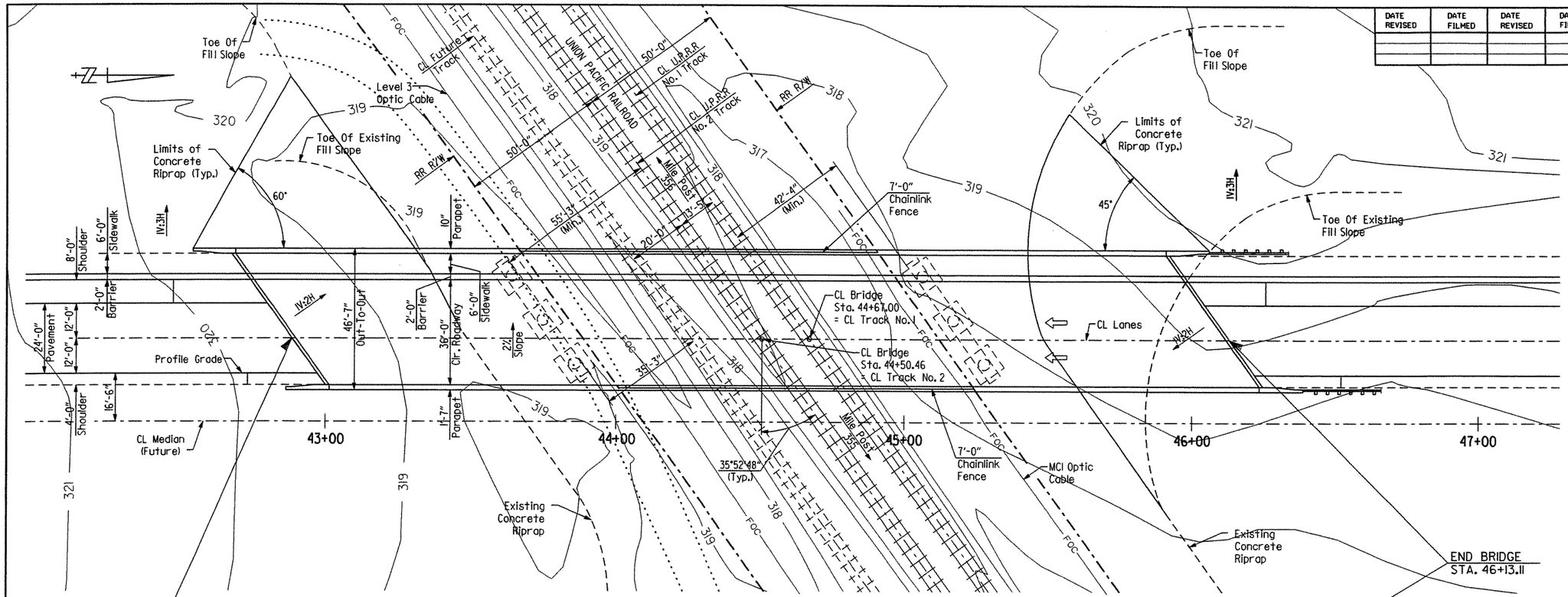
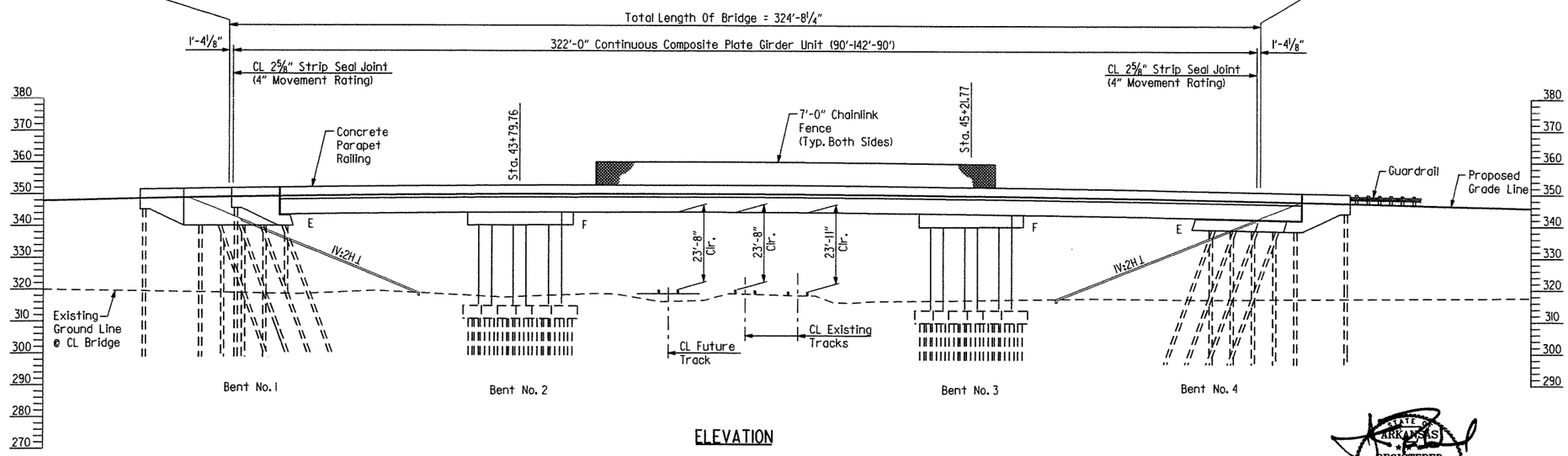
6	ARK.			
JOB NO.		061080	35	110
1 -		LAYOUT		50649



PLAN



ELEVATION

NOTE:
THE DEVELOPMENT OF THIS LAYOUT IS FOR THE PURPOSE OF ESTABLISHING A VERTICAL PROFILE THAT WILL ACCOMMODATE THE BRIDGE IN A FUTURE CONSTRUCTION CONTRACT.

FUTURE CONSTRUCTION NOT IN CONTRACT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 8017
JOHN H. RUDDELL

BRIDGE ENGINEER

CONCEPTUAL LAYOUT OF BRIDGE OVER UNION PACIFIC RAILROAD PULASKI COUNTY

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: APR. 2009 FILENAME: B061080_L21.DGN
CHECKED BY: JHR DATE: APR. 2009 SCALE: 1"=20'
DESIGNED BY: MRA DATE: APR. 2009

BRIDGE NO. - DRAWING NO. 50649

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				6	ARK.			
				JOB NO.		061080	36	110
				(1) 07157		END BENTS		50650

GENERAL NOTES

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

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

Structural steel in end bents shall be AASHTO M270, Gr. 50W and shall be paid for as "Structural Steel In Plate Girder Spans (AASHTO M270, Gr.50W)".

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

For additional information, see LAYOUT.

Class I Protective Surface Treatment shall be applied to top of backwall and roadway face and top of parapet.

Notes:
For Details Of Wing & Rail, See Dwg. Nos. 50652-50653.

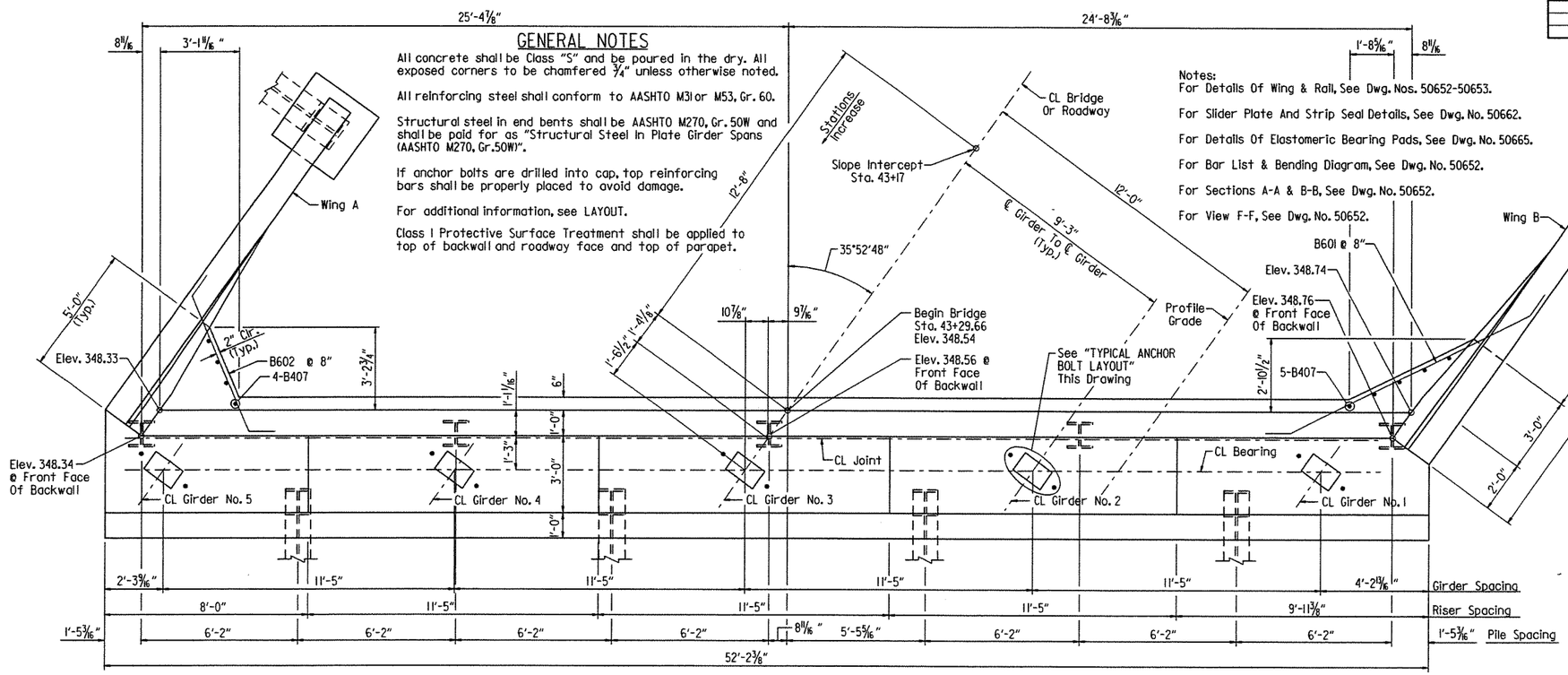
For Slider Plate And Strip Seal Details, See Dwg. No. 50662.

For Details Of Elastomeric Bearing Pads, See Dwg. No. 50665.

For Bar List & Bending Diagram, See Dwg. No. 50652.

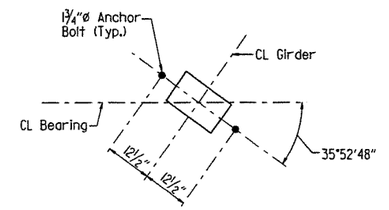
For Sections A-A & B-B, See Dwg. No. 50652.

For View F-F, See Dwg. No. 50652.

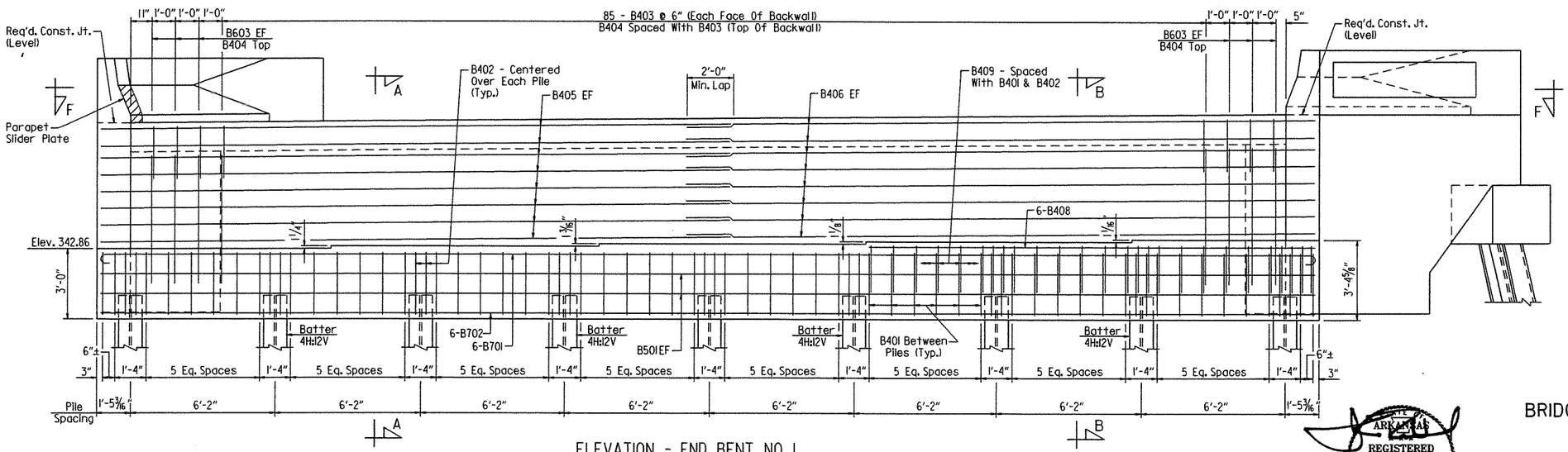


PLAN - END BENT NO. 1
Scale: ⅜" = 1'-0"

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 "DETAILS FOR BLOCKING EXPANSION JOINT DEVICE" On Dwg. No. 50662 for additional information.



TYPICAL ANCHOR BOLT LAYOUT
Scale: NTS



ELEVATION - END BENT NO. 1
(Looking Back)
Scale: ⅜" = 1'-0"

LEGEND
EF = Each Face

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 8017
JOHN H. RUDDELL

BRIDGE ENGINEER

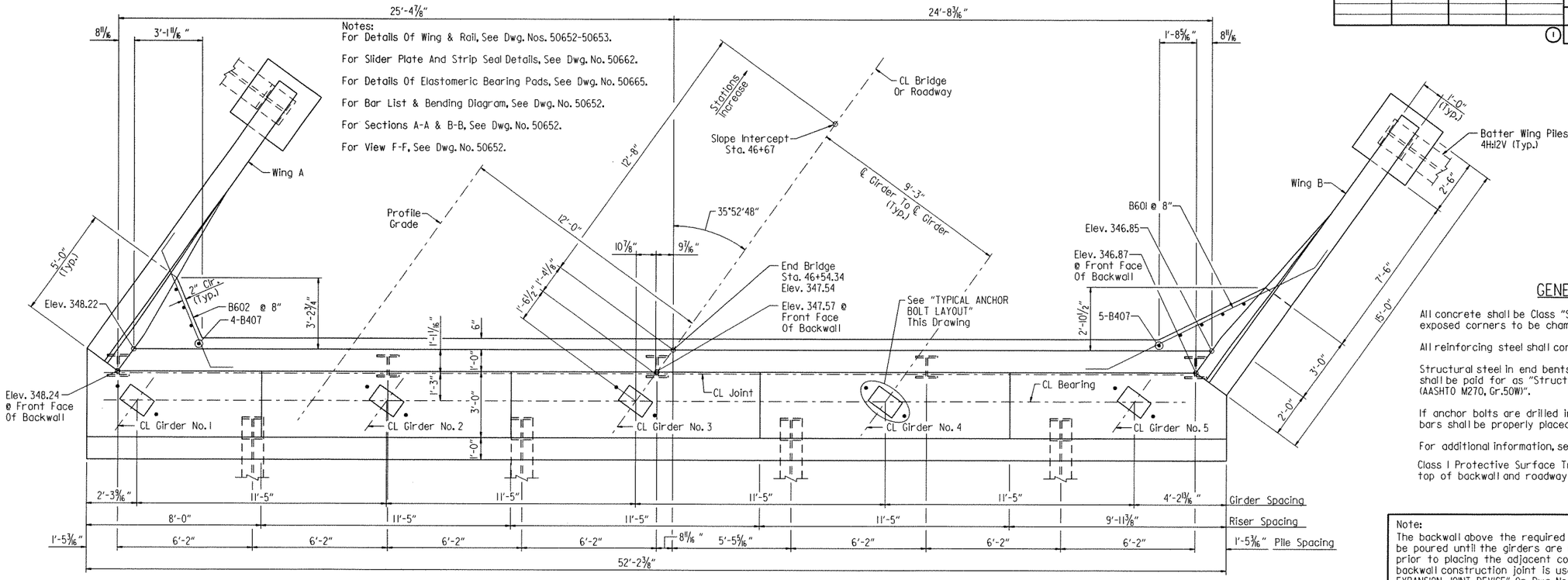
SHEET 1 OF 4
DETAILS OF END BENTS
BRIDGE OVER UNION PACIFIC RAILROAD
PULASKI COUNTY
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: APR. 2009
CHECKED BY: JHR DATE: APR. 2009
DESIGNED BY: MRA DATE: APR. 2009
FILENAME: B061080_B11.DGN
SCALE: AS NOTED

BRIDGE NO. 07157 DRAWING NO. 50650

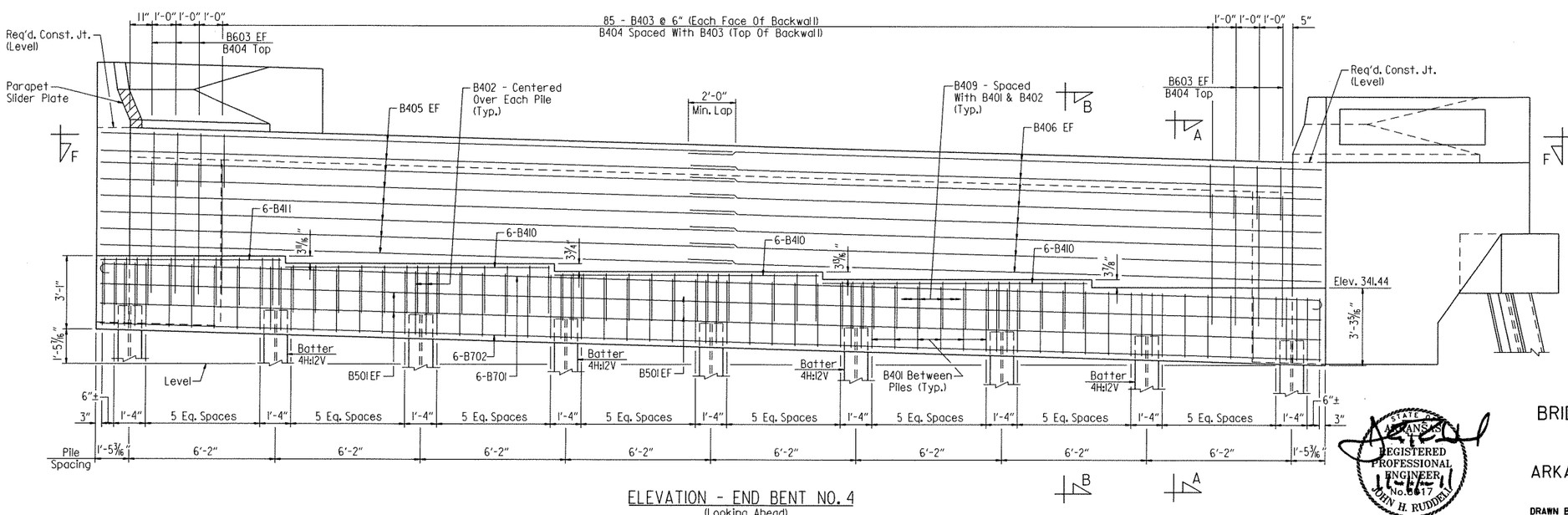
hewilliams 11/6/2009 7:15:23 AM
WORKSPACE: AHTDV8
L:\2004\04911980 - South Loop - Phase 1\Drawings\BRG\FINAL\B061080_B11.dgn

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.		061080	37	110
				(1) 07157		END BENTS		50651



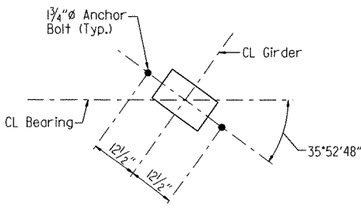
PLAN - END BENT NO. 4

Scale: ⅜" = 1'-0"



ELEVATION - END BENT NO. 4

(Looking Ahead)
Scale: ⅜" = 1'-0"



TYPICAL ANCHOR BOLT LAYOUT

Scale: NTS

GENERAL NOTES

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

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

Structural steel in end bents shall be AASHTO M270, Gr. 50W and shall be paid for as "Structural Steel In Plate Girder Spans (AASHTO M270, Gr.50W)".

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

For additional information, see LAYOUT.

Class 1 Protective Surface Treatment shall be applied to top of backwall and roadway face and top of parapet.

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 "DETAILS FOR BLOCKING EXPANSION JOINT DEVICE" On Dwg. No. 50662 for additional information.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 5617
JOHN H. RUDDELL
1-5-11

BRIDGE ENGINEER

SHEET 2 OF 4
DETAILS OF END BENTS
BRIDGE OVER UNION PACIFIC RAILROAD
PULASKI COUNTY

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

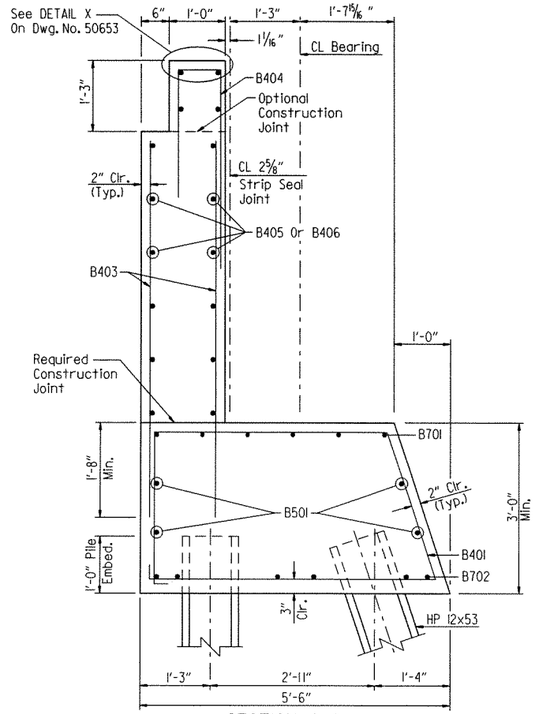
LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: APR. 2009 FILENAME: B061080_BI2.DGN
CHECKED BY: JHR DATE: APR. 2009 SCALE: AS NOTED
DESIGNED BY: MRA DATE: APR. 2009

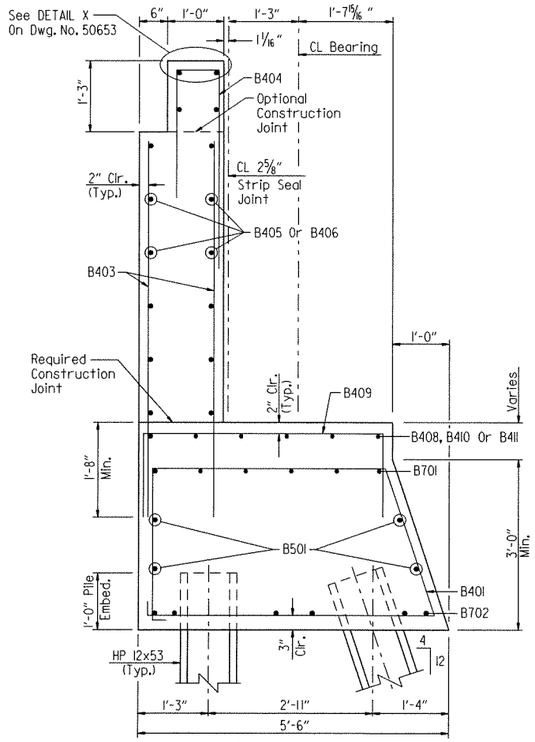
BRIDGE NO. 07157 DRAWING NO. 50651

CWThomas 11/7/2011 11:47:22 AM
WORKSPACE: AHTD
L:\2004\04911980 - South Loop - Phase 1\Drawings\BRG\FINAL\B061080_BI2.dgn

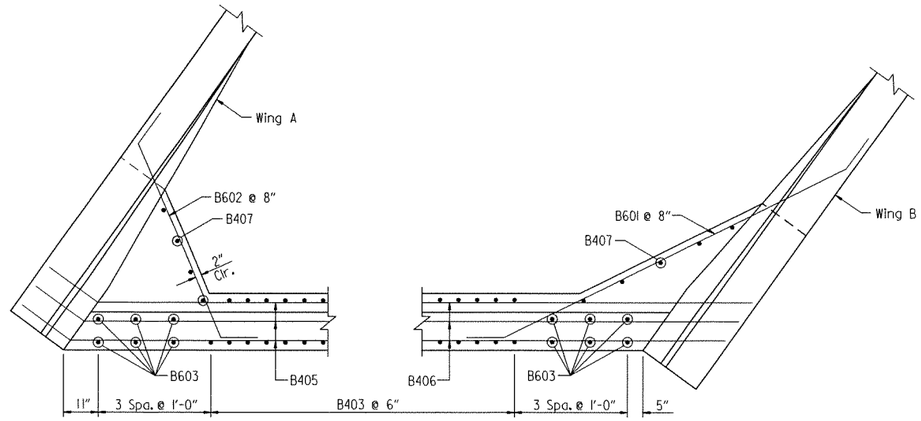
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		061080	38	110
				(1) 07157		END BENTS		50652



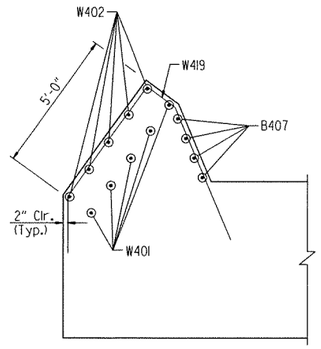
SECTION A-A
Scale: 3/4" = 1'-0"



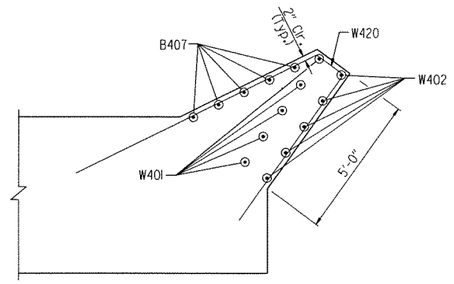
SECTION B-B
Scale: 3/4" = 1'-0"



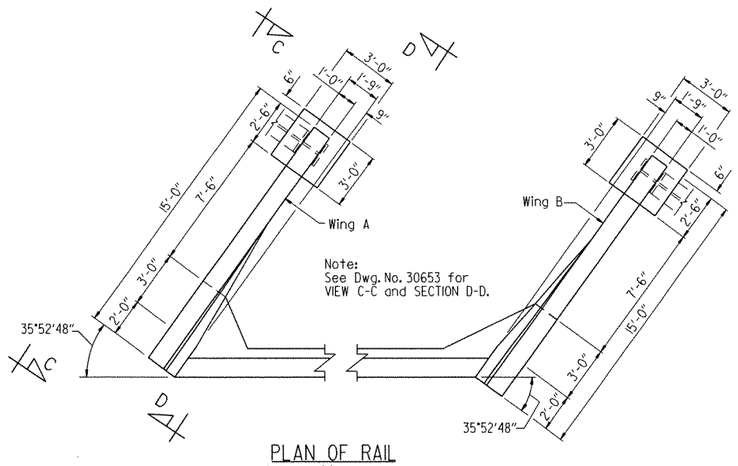
VIEW F-F
Scale: 1/2" = 1'-0"



SECTION E-E (WING A)
Scale: 3/8" = 1'-0"



SECTION E-E (WING B)
Scale: 3/8" = 1'-0"

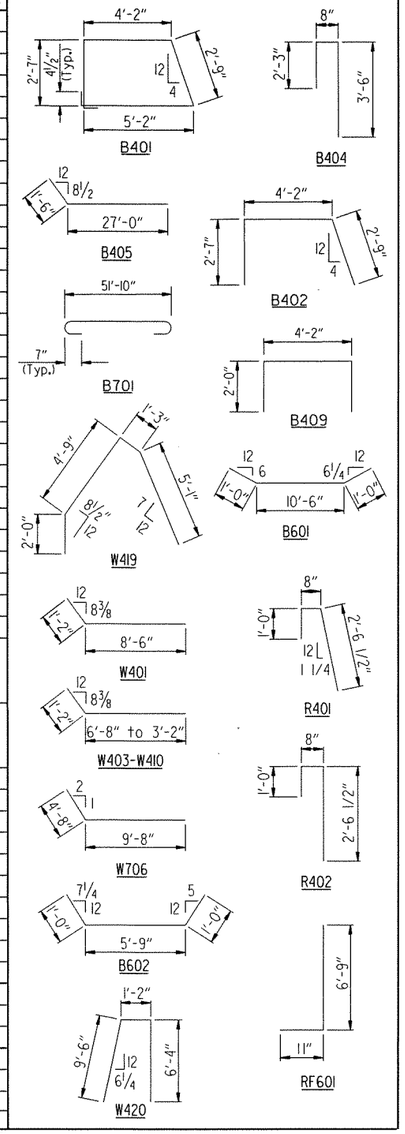


PLAN OF RAIL
Scale: 1/4" = 1'-0"

BAR LIST

	Mark	No. Req'd.	Length	Pin. Dia.
COMMON BARS - PIER BENT	B401	52	15'-0"	2"
	B402	18	9'-4"	2"
	B403	170	7'-0"	STR.
	B404	91	6'-3"	2"
	B405	16	28'-6"	2"
	B406	16	26'-4"	STR.
	B407	9	6'-10"	STR.
	B501	4	51'-10"	STR.
	B601	6	12'-6"	4 1/2"
	B602	6	7'-9"	4 1/2"
	B603	12	7'-0"	STR.
	B701	6	53'-6"	5 1/4"
	B702	6	51'-10"	STR.
	F601	28	2'-6"	STR.
	R401	8	4'-1"	2"
	R402	18	4'-1"	2"
	R403	12	14'-8"	STR.
	RF601	16	7'-6"	4 1/2"
	R601	6	5'-0"	STR.
	W401	10	9'-8"	2"
	W402	10	10'-9"	STR.
	W403 To W410	2 Each	7'-10" To 4'-4"	2"
	W411 To W418	2 Each	8'-11" To 5'-5"	STR.
	W419	4	13'-0"	2"
	W420	4	16'-10"	2"
	W701	16	14'-6"	STR.
	W702	4	10'-10"	STR.
	W703	4	9'-5"	STR.
	W704	4	8'-1"	STR.
	W705	4	6'-8"	STR.
	W706	4	14'-4"	5 1/4"
BENT 1	B408	6	21'-0"	STR.
	B409	26	8'-0"	2"
BENT 4	B409	56	8'-0"	2"
	B410	18	11'-1"	STR.
	B411	6	7'-8"	STR.

BAR BENDING DIAGRAMS



Note: Dimensions Shown Are Out-To-Out Of Bars.

SHEET 3 OF 4
DETAILS OF END BENTS
BRIDGE OVER UNION PACIFIC RAILROAD
PULASKI COUNTY
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

ARKANSAS REGISTERED PROFESSIONAL ENGINEER JOHN H. RUDDELL No. 9017

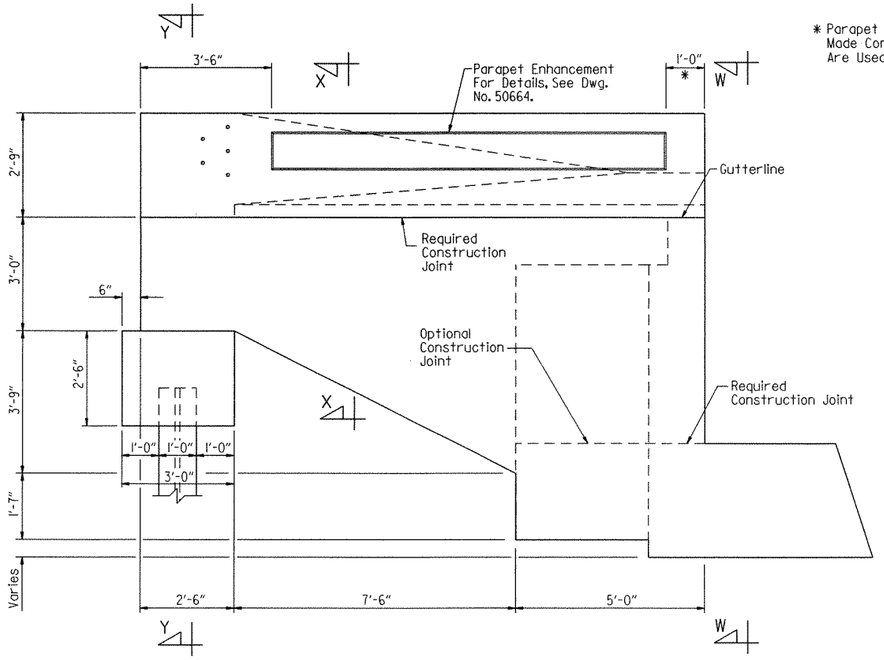
BRIDGE ENGINEER

DRAWN BY: HEW DATE: APR. 2009
CHECKED BY: JHR DATE: APR. 2009
DESIGNED BY: MRA DATE: APR. 2009
FILENAME: B061080_BI3.DGN
SCALE: AS NOTED

BRIDGE NO. 07157 DRAWING NO. 50652

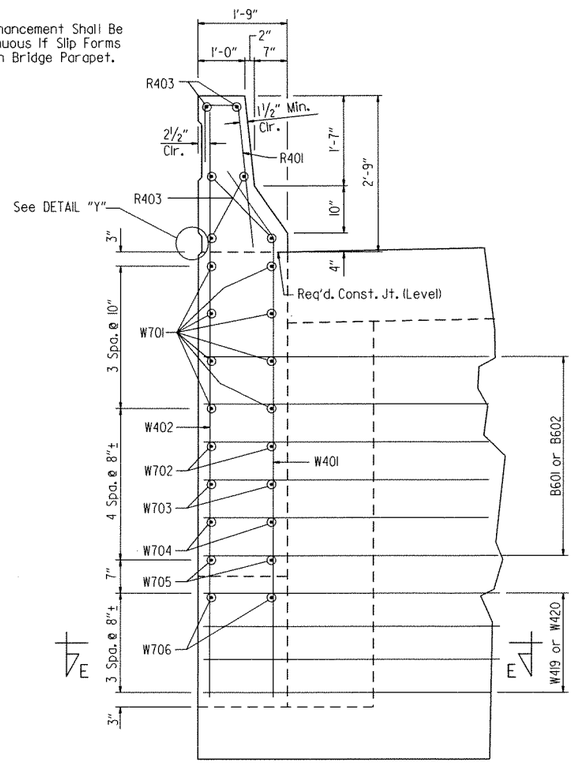
CWThomas 11/7/2011 11:47:38 AM
WORKSPACE: AHTD
L:\2004\04911980 - South Loop - Phase 1\Drawings\BRG\FINAL\B061080_B13.dgn

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.		061080	39	110
				1	07157	END BENT		50653

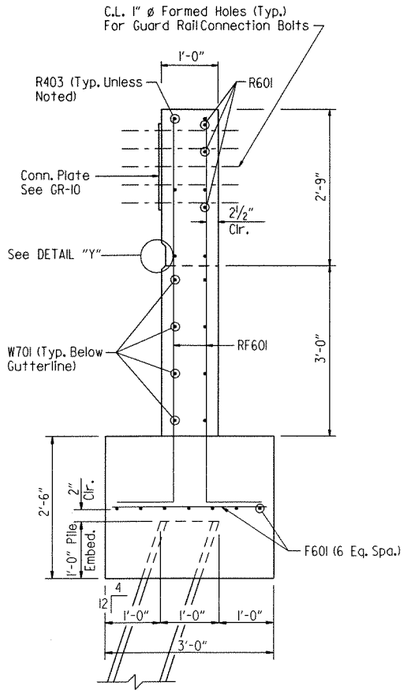


VIEW C-C
Scale: ½" = 1'-0"

* Parapet Enhancement Shall Be Made Continuous If Slip Forms Are Used On Bridge Parapet.

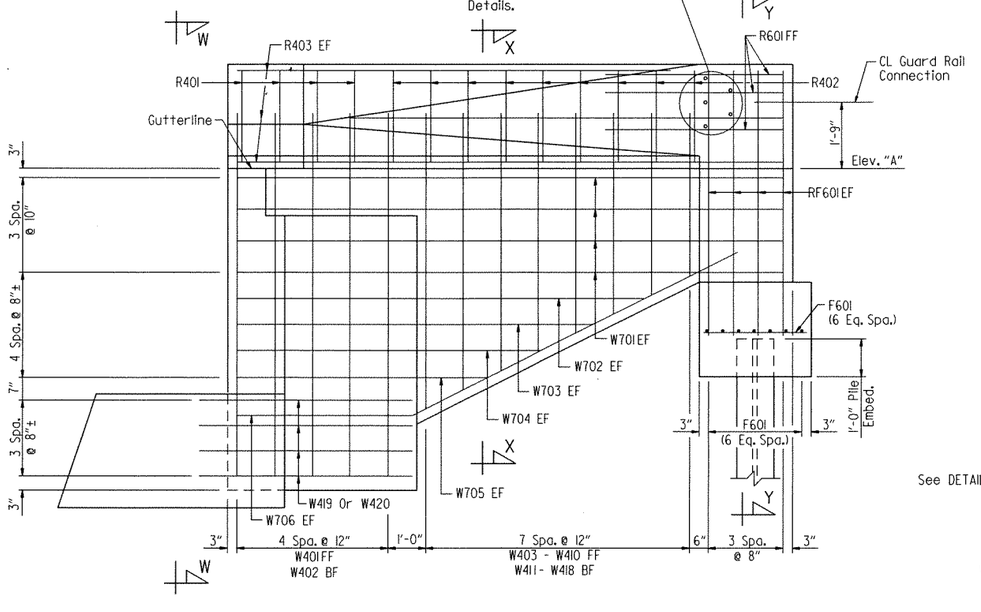


VIEW W-W
Scale: ¾" = 1'-0"

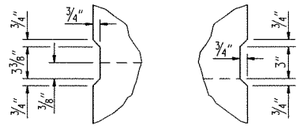


SECTION Y-Y
Scale: ¾" = 1'-0"

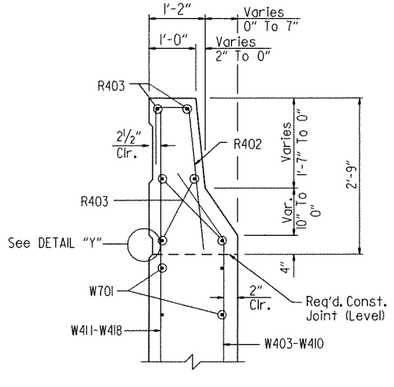
5 - 1" ø Formed Holes For Guard Rail Connection. See Dwg. No. GR-10 For Bolt Spacing And Additional Connection Details.



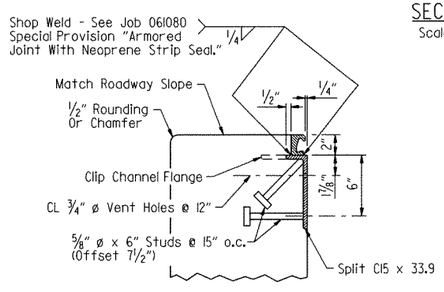
SECTION D-D
Scale: ½" = 1'-0"



DETAIL "Y"
Scale: NTS

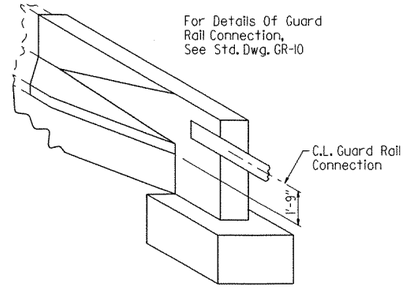


SECTION X-X
Scale: ¾" = 1'-0"



DETAIL X
Scale: N.T.S.

Note:
Concrete Shall Be Hand Packed Under Joint Armor.



THREE DIMENSIONAL VIEW OF RAIL
Scale: N.T.S.

LEGEND

EF = Each Face
BF = Back Face
FF = Front Face

TABLE OF VARIABLES (ELEV. "A")

Bent No.	Wing	Elev.
1	A	348.14
	B	348.53
4	A	347.97
	B	346.53

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 8017 JOHN H. RUDDICK

BRIDGE ENGINEER

SHEET 4 OF 4
DETAILS OF END BENTS
BRIDGE OVER UNION PACIFIC RAILROAD
PULASKI COUNTY

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

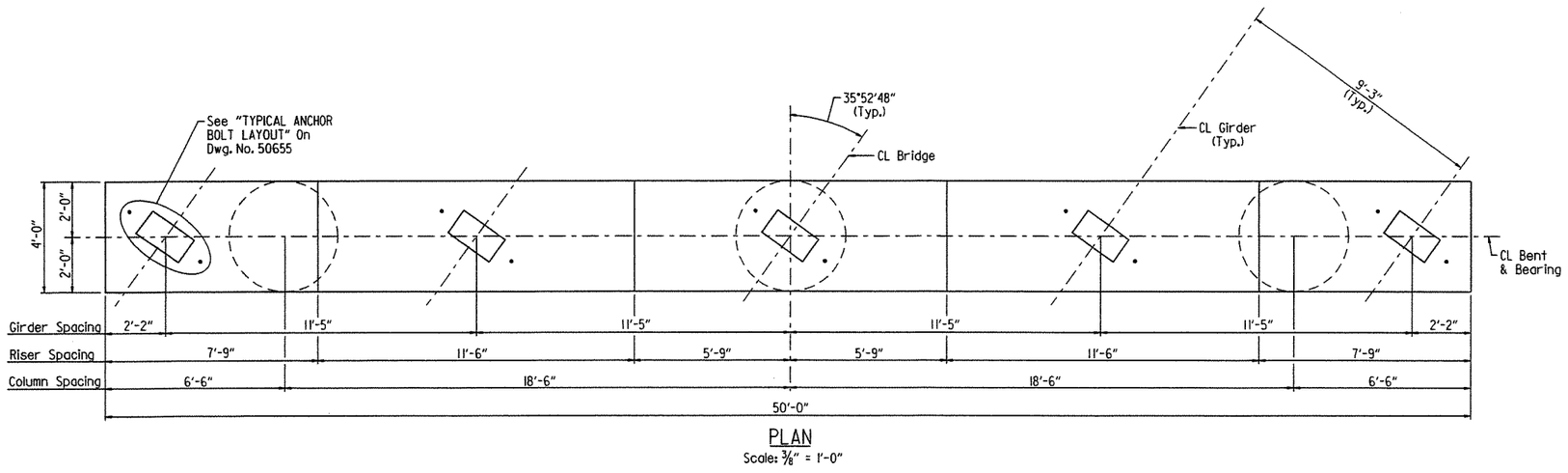
LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: APR. 2009 FILENAME: B061080_B14.DGN
CHECKED BY: JHR DATE: APR. 2009 SCALE: AS NOTED
DESIGNED BY: MRA DATE: APR. 2009

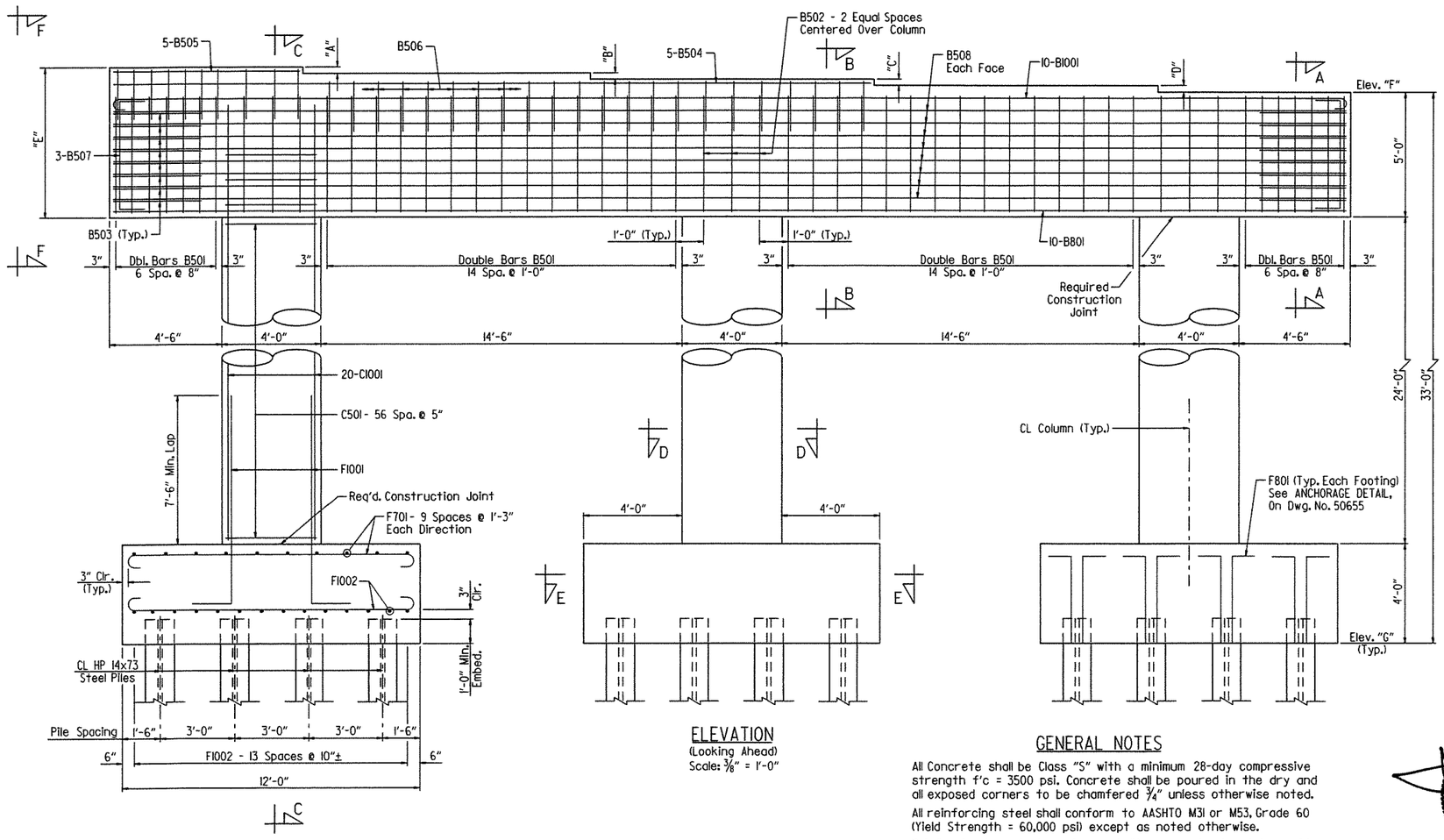
BRIDGE NO. 07157 DRAWING NO. 50653

CWThomas 11/7/2011 11:46:34 AM
WORKSPACE: AHTD
L:\2004\04911980 - South Loop - Phase 1\Drawings\BRG\FINAL\B061080_B14.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.		061080	40	110
				(1) 07157		INT. BENT DETAILS		50654



PLAN
Scale: 3/8" = 1'-0"

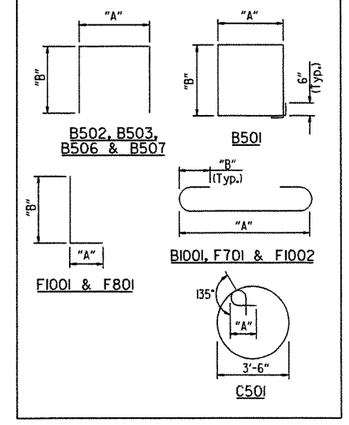


ELEVATION
(Looking Ahead)
Scale: 3/8" = 1'-0"

BAR LIST

MARK	NO. REQ'D.	LENGTH	"A"	"B"	P.D.
B501	88	14'-10"	2'-6"	4'-8"	2½"
B502	9	12'-10"	3'-8"	4'-8"	2½"
B503	16	9'-4"	3'-6"	3'-0"	2½"
B504	5	30'-5"			Str.
B505	5	7'-5"			Str.
B506	32	9'-6"	3'-8"	3'-0"	2½"
B507	6	10'-4"	4'-6"	3'-0"	2½"
B508	16	49'-8"			Str.
B801	10	49'-8"			Str.
B1001	10	52'-6"	49'-8"	11½"	10"
C501	183	12'-4"	6¼"		3¾"
C1001	60	28'-6"			Str.
F701	60	13'-2"	11'-6"	7"	5¼"
(1) F801	48	4'-8"	1'-4"	3'-6"	6"
F1001	60	11'-9"	1'-10"	10-3"	10"
F1002	84	14'-4"	11'-6"	11½"	10"

(1) Bars F801 Shall Be A Weldable Grade Meeting The Requirements Of ASTM A706 Grade 60 And Will Be Paid For As "Reinforcing Steel- Bridge".



Notes:
(1) Dimension Of Bars Are Out-To-Out.
(2) Number Of Bars Shown Is For One Bent Only.

TABLE OF VARIABLES

	BENT 2	BENT 3
"A"	1 15/16"	3"
"B"	1 7/8"	3"
"C"	1 5/16"	3/16"
"D"	1 15/16"	3/8"
"E"	5'-7 9/16"	6'-0 3/16"
"F"	343.54	342.91
"G"	310.54	309.91

GENERAL NOTES

All Concrete shall be Class "S" with a minimum 28-day compressive strength f'c = 3500 psi. Concrete shall be poured in the dry and all exposed corners to be chamfered ¾" unless otherwise noted.

All reinforcing steel shall conform to AASHTO M31 or M53, Grade 60 (Yield Strength = 60,000 psi) except as noted otherwise.

Reinforcing bars in top of cap shall be properly placed to avoid interference with anchor bolts or sheet metal sleeves.

For additional information, see Layout.

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 8017 JOHN H. RUDDELL

BRIDGE ENGINEER

SHEET 1 OF 2
DETAILS OF INTERMEDIATE BENTS
BRIDGE OVER UNION PACIFIC RAILROAD
PULASKI COUNTY

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

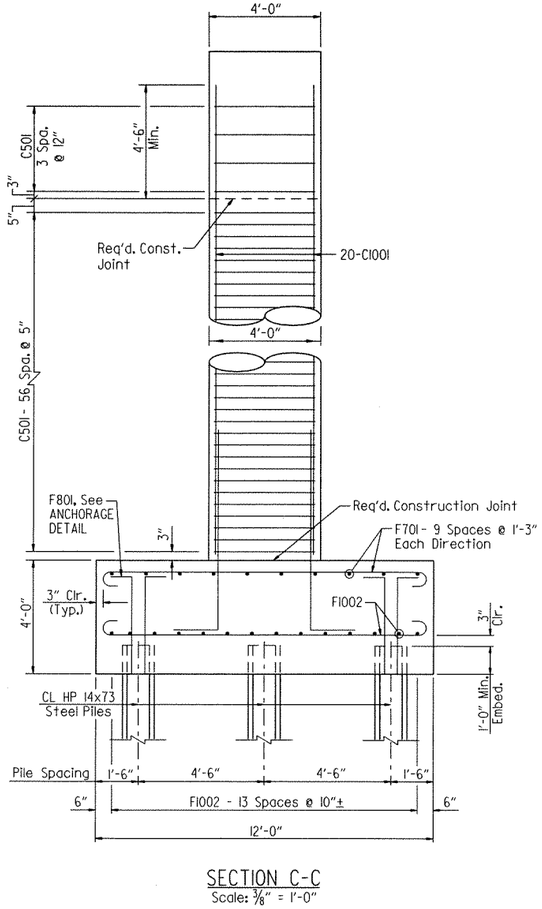
LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: APR. 2009 FILENAME: B061080_B21.DGN
CHECKED BY: JHR DATE: APR. 2009 SCALE: AS NOTED
DESIGNED BY: MRA DATE: APR. 2009

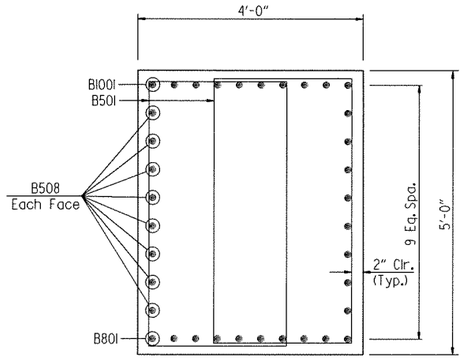
BRIDGE NO. 07157 DRAWING NO. 50654

hewilliams
WORKSPACE: AHTD08
L:\2009\061080 - South Loop - Phase 1\Drawings\BRG\FINAL\B061080_B21.dgn
11/3/2009 10:39:03 AM

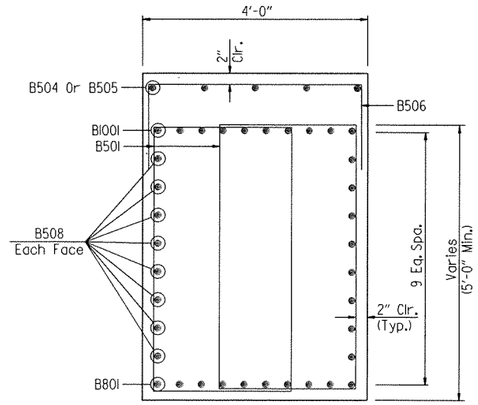
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		061080	41	110
				① 07157		INT. BENT DETAILS		50655



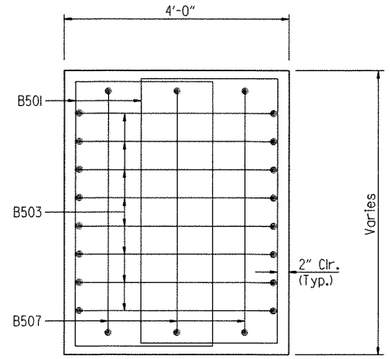
SECTION C-C
Scale: 3/8" = 1'-0"



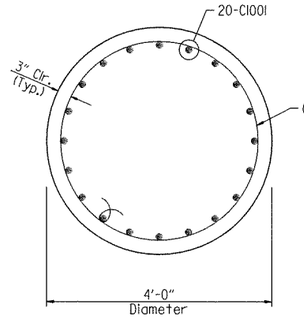
SECTION A-A
Scale: 3/4" = 1'-0"



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

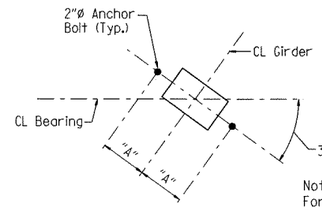


VIEW F-F
Scale: 3/4" = 1'-0"



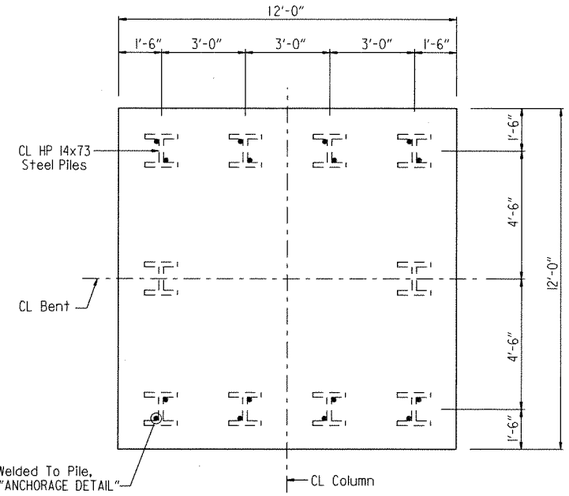
SECTION D-D
Scale: 3/4" = 1'-0"

TABLE OF VARIABLES		
	BENT 2	BENT 3
"A"	16 9/16"	19 1/16"

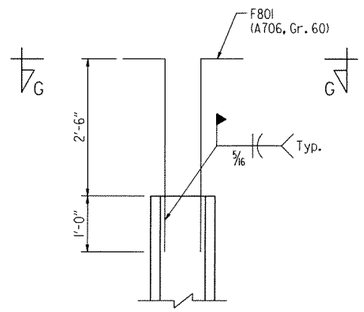


Note:
For Details on Elastomeric Bearing Pads, See Dwg. No. 50665.

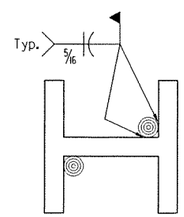
TYPICAL ANCHOR BOLT LAYOUT
Scale: NTS



SECTION E-E
Scale: 3/8" = 1'-0"



ANCHORAGE DETAIL



SECTION G-G

REGISTERED PROFESSIONAL ENGINEER No. 8004 JOHN H. RUDDELL

BRIDGE ENGINEER

SHEET 2 OF 2
DETAILS OF INTERMEDIATE BENTS
BRIDGE OVER UNION PACIFIC RAILROAD
PULASKI COUNTY
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: APR. 2009 FILENAME: B061080_B22.DGN
CHECKED BY: JHR DATE: APR. 2009 SCALE: AS NOTED
DESIGNED BY: MRA DATE: APR. 2009
BRIDGE NO. 07157 DRAWING NO. 50655

CWThomas 11/7/2011 11:45:52 AM
WORKSPACE: AHTD
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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.		061080	42	110
				(1) 07157		322' PL GIRDER		50656

Note:
Class I Protective Surface Treatment Shall Be Applied To The Roadway Surface And The Face And Top Of Concrete Parapet Rail.

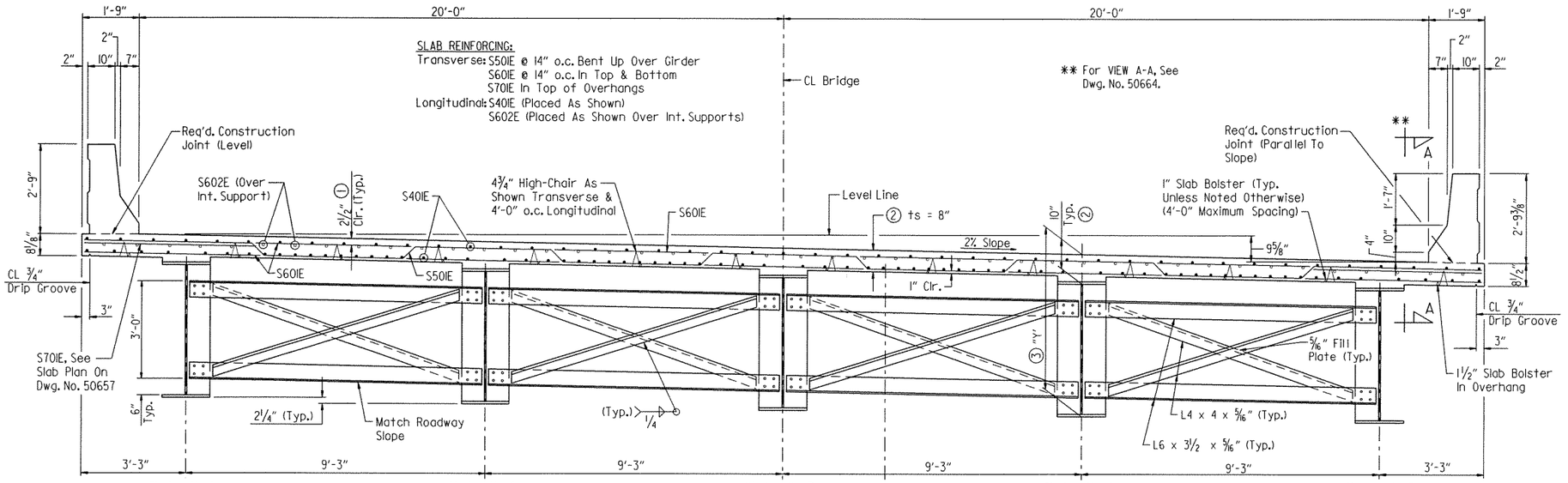
Note:
One Epoxy Coated #5 Bar In The Top And One Epoxy Coated #5 Bar In The Bottom May Be Substitued For Each Bar S501E. Payment Will Be Based On The Weight Of Bar S501E.

Note:
All Bars Designated With An E Suffix Are To Be Epoxy Coated.

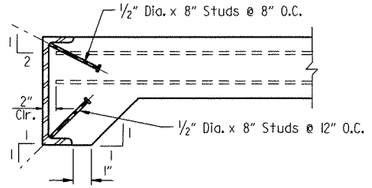
(1) TOLERANCE:
Minus = 1/4"
Plus = Equal To Amount Of Slab Thickening Used To Meet Slab Thickness Tolerance- See "ADJUSTMENT FOR SLAB THICKNESS TOLERANCE WHEN REMOVABLE DECK FORMING IS USED".

(2) See "ADJUSTMENT FOR SLAB THICKNESS TOLERANCE WHEN REMOVABLE DECK FORMING IS USED".

(3) "Y" = 4'-10" + Bottom Flange Thickness Measured At CL Bearing And CL Girder. (Typ. Unless Noted Otherwise)



TYPICAL SECTION
(Looking Ahead)
Scale: ½" = 1'-0"

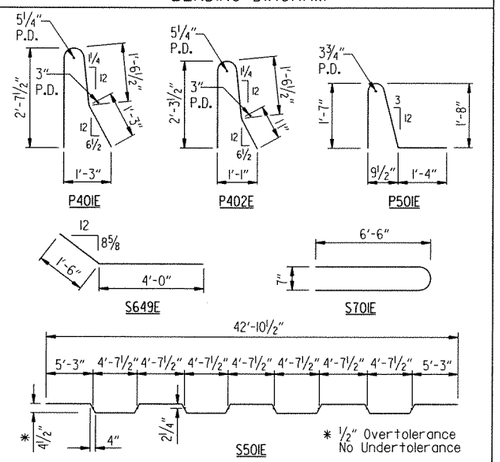


Note:
As An Alternate To ⅝" Dia. Studs, ½" Dia. x 8" Studs Spaced As Shown May Be Used. Use Weight Of ⅝" Dia. Stud As Basis Of Measurement Of Structural Steel In Anchors

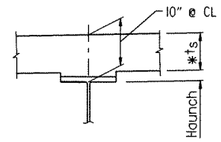
DETAIL OF ALTERNATE ANCHORS
N.T.S.

BAR LIST			
Mark	No. Req'd.	Length	Pin. Dia.
S401E	1053	37'-6"	STR.
S501E	250	43'-8½"	3"
S601E	502	43'-2"	STR.
S602E	176	41'-6"	STR.
S603E To S648E	4 Each	4'-10" To 41'-2"	STR.
S649E	16	5'-6"	4½"
S701E	546	13'-3"	5¼"
P401E	1208	5'-7½"	5¼"
P402E	80	4'-11½"	5¼"
P403E	140	13'-8"	STR.
P404E	224	9'-8"	STR.
P405E	28	10'-8"	STR.
P406E	104	5'-4"	STR.
P501E	1208	4'-9½"	3¾"

BENDING DIAGRAM



NOTES:
1.) Dimensions Of Bars Are Out-To-Out.
2.) Bar Designations Ending With "E" Indicates Epoxy Coated Bars.



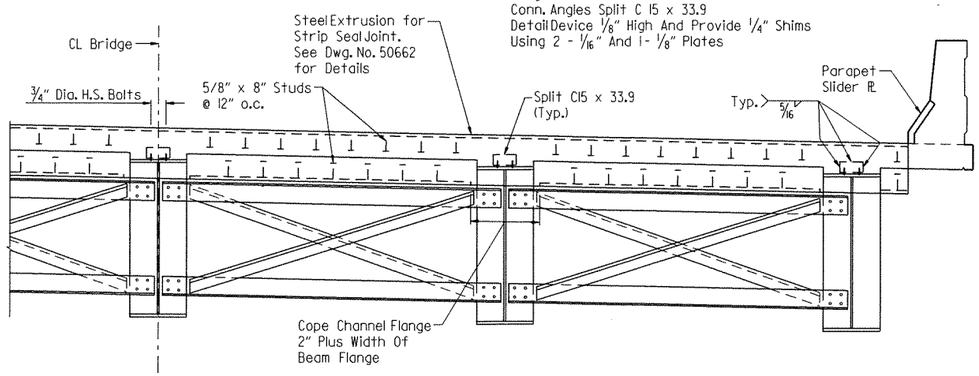
Note: t_S = Slab Thickness As Shown On "TYPICAL SECTION".
* Tolerance When Removable Deck Forming Is Used Is + 1/2", -1/4". Haunch Forming Is Required And Shall Be Adjusted To Maintain Slab Thickness Tolerance.

ADJUSTMENT FOR SLAB THICKNESS TOLERANCE WHEN REMOVABLE DECK FORMING IS USED
N.T.S.

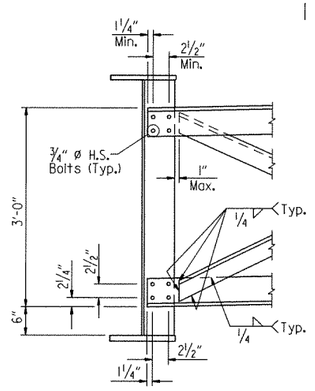
Haunch Dimension May Vary Within The Following Limits To Maintain The Grade And Slab Thickness Tolerance: Minimum - Occurs When The Top Flange Contacts The Bottom Reinforcing Steel; Maximum - Top Flange Thickness Plus 1 3/4". No Increase In Concrete And Structural Steel Quantities Will Be Made To Maintain Tolerances.

Tolerances Shown Are Applicable Only When Removable Deck Forming Is Used. See Std. Dwg. No. 149911 For Tolerances When Permanent Steel Deck Forms Are Used. Payment For Concrete Shall Be Based On Removable Deck Forming.

EXPANSION DEVICE:
Rdwy. MC 18 x 42.7
Conn. Angles Split C 15 x 33.9
Detail Device ⅛" High And Provide ¼" Shims Using 2 - 1/16" And 1 - ⅛" Plates



HALF-SECTION AT CL JOINT
(Looking Ahead - End Bent No. 1)
(Looking Back - End Bent No. 4)
N.T.S.



CROSS FRAME CONNECTION DETAIL
N.T.S.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 8817
JOHN H. RUDDELL

BRIDGE ENGINEER

SHEET 1 OF 9
DETAILS OF 322'-0" COMPOSITE PLATE GIRDER UNIT BRIDGE OVER UNION PACIFIC RAILROAD PULASKI COUNTY

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: APR. 2009
CHECKED BY: JHR DATE: APR. 2009
DESIGNED BY: WMM DATE: APR. 2009
FILENAME: B061080_S11.DGN
SCALE: AS NOTED

BRIDGE NO. 07157 DRAWING NO. 50656

CWThomas 11/7/2011 11:45:36 AM
WORKSPACE: AHTD
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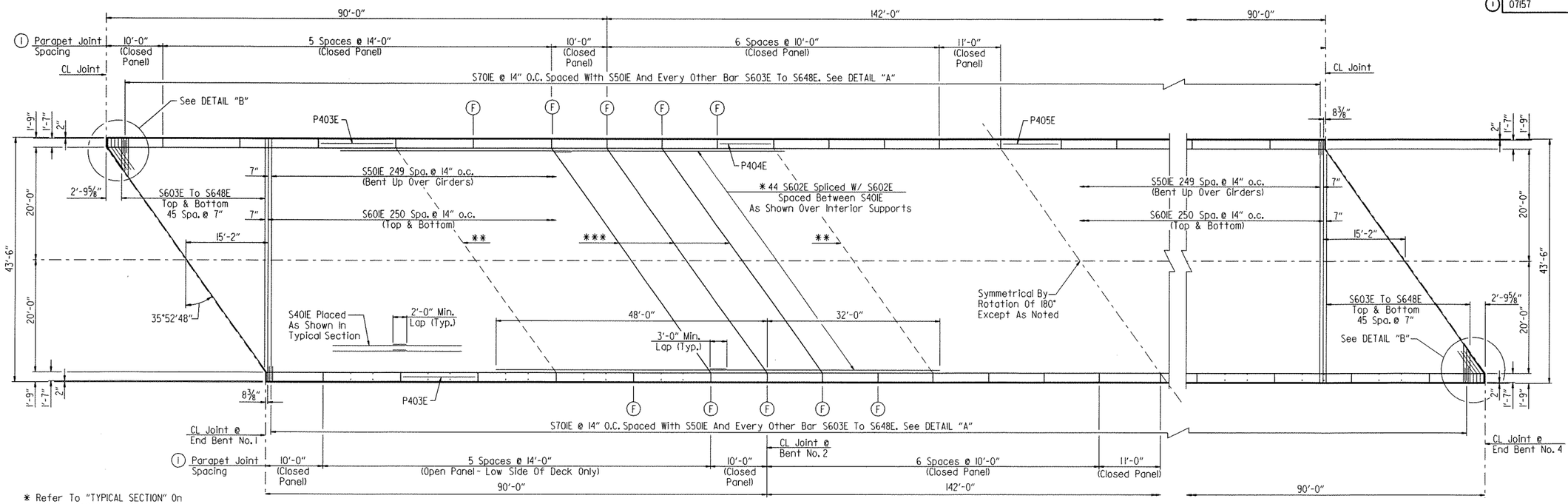
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		061080	43	110
				(1) 07157		322' PL GIRDER		50657

(1) Parapet Joints designated with symbol (F) shall be stopped 4" from top of slab. All other parapet joints shall be partial depth joints stopped 1'-2" from top of slab.



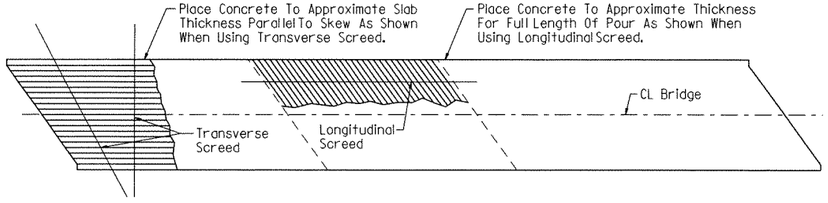
* Refer To "TYPICAL SECTION" On Dwg. No. 50656 For Placement

** Pouring Sequence Construction Joint

*** Required Slab Joint

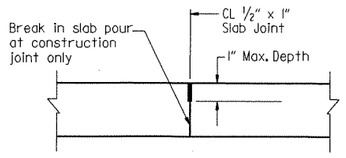
Note:
Required Slab Joints And Pouring Sequence Joints Shall Align With The Parapet Open Joint At The Gutterline.

SLAB PLAN
Scale: 1" = 10'-0"



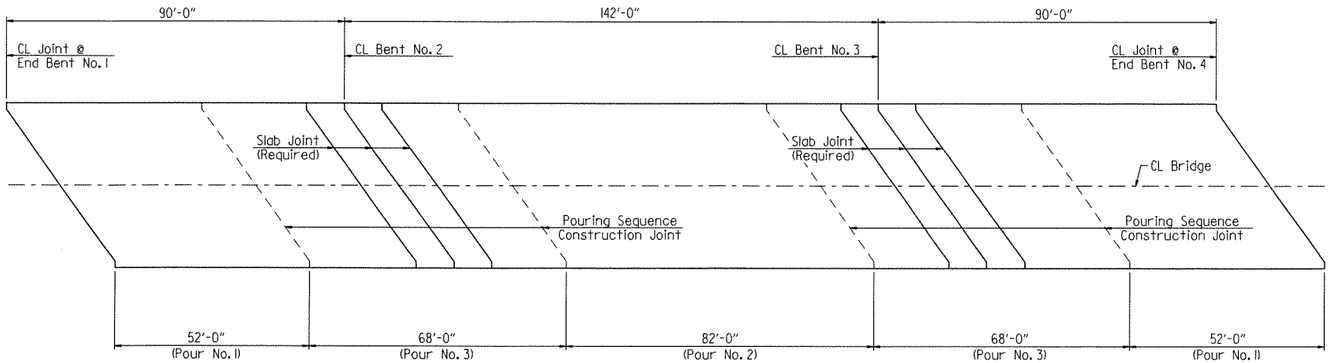
CONCRETE PLACEMENT PROCEDURE
Scale: NTS

Note:
At The Contractor's Option, The Transverse Screed May Be Placed Parallel To The Skew Or Perpendicular To CL Bridge.



The 1/2" x 1" Poured Joint Sealer (Type 3, 4 or 6) in slab shall conform to Subsection 501.02 (H) And 501.05 (J). Backer Rod Filler will not be required. The Poured Joint Sealer shall be paid for as Class S(AE) Concrete-Bridge. Slab joints shall extend to the outside edge of the deck slab. 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.

SLAB JOINT DETAIL
Scale: NTS

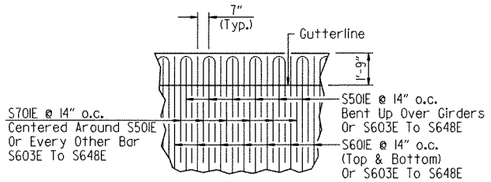


POURING SEQUENCE
Scale: N.T.S.

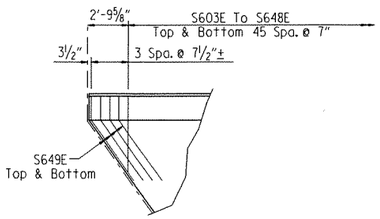
Note:
Pours With The Same Number May Be Placed Simultaneously Or Separately. All Pours (1) Must Be Placed Before Pour (2) Can Be Placed. All Pours (1) And (2) Must Be Placed Before Pour (3) Can Be Placed. 7 Days Shall Elapse Before The End Of Pour (1) And The Start Of Pour (2) Unless The Concrete Deck Placed In Pour (1) Has Attained A Minimum Compressive Strength Of 3000 psi. 72 Hours Shall Elapse Between The End Of A Pour And The Start Of An Adjacent Pour. 72 Hours Shall Elapse Between The Completion Of The Entire Deck and The Pouring of The Parapet. 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.
Concrete in bridge superstructure shall be consolidated for the entire pour before any concrete has taken its initial set. This may require the use of a retarding agent.

BRIDGE ENGINEER



DETAIL "A"
Scale: N.T.S.



DETAIL "B"
Scale: N.T.S.

SHEET 2 OF 9
DETAILS OF 322'-0" COMPOSITE PLATE GIRDER UNIT BRIDGE OVER UNION PACIFIC RAILROAD PULASKI COUNTY

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: APR. 2009 FILENAME: B061080_SI2.DGN
CHECKED BY: JHR DATE: APR. 2009 SCALE: AS NOTED
DESIGNED BY: WMM DATE: APR. 2009

BRIDGE NO. 07157 DRAWING NO. 50657

CWThomas 11/7/2011 11:45:22 AM
WORKSPACE: AHTD
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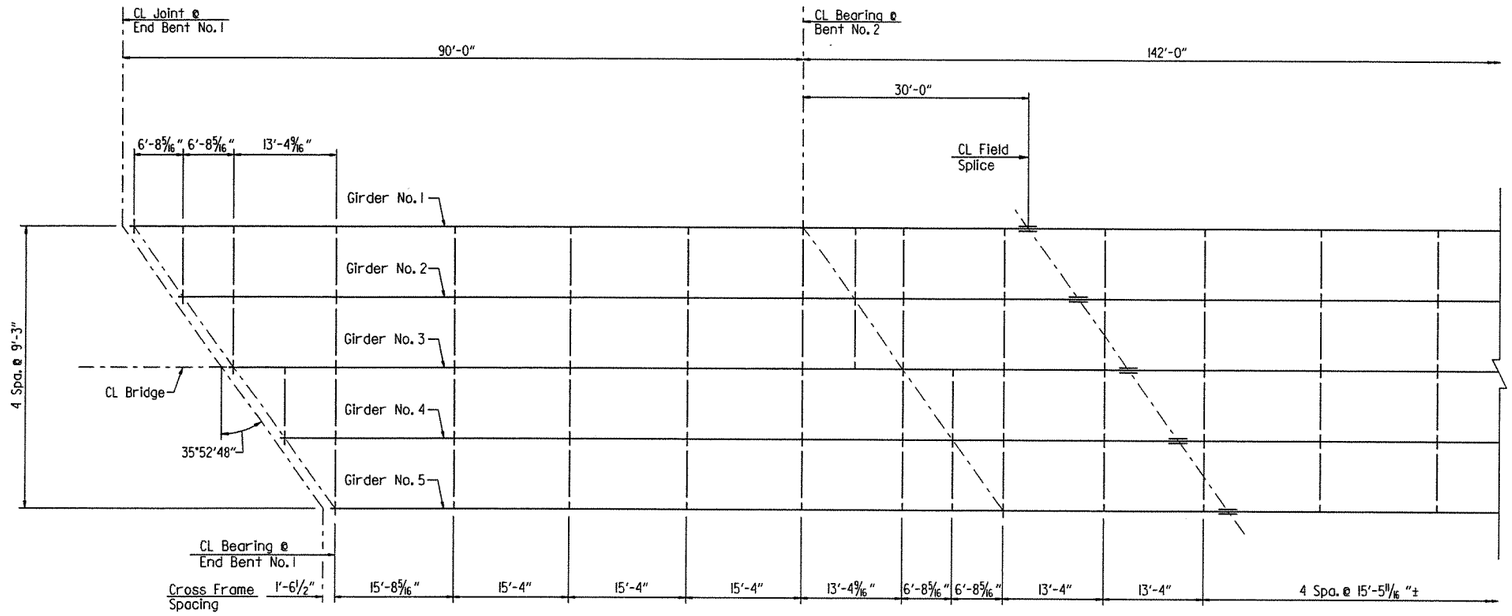
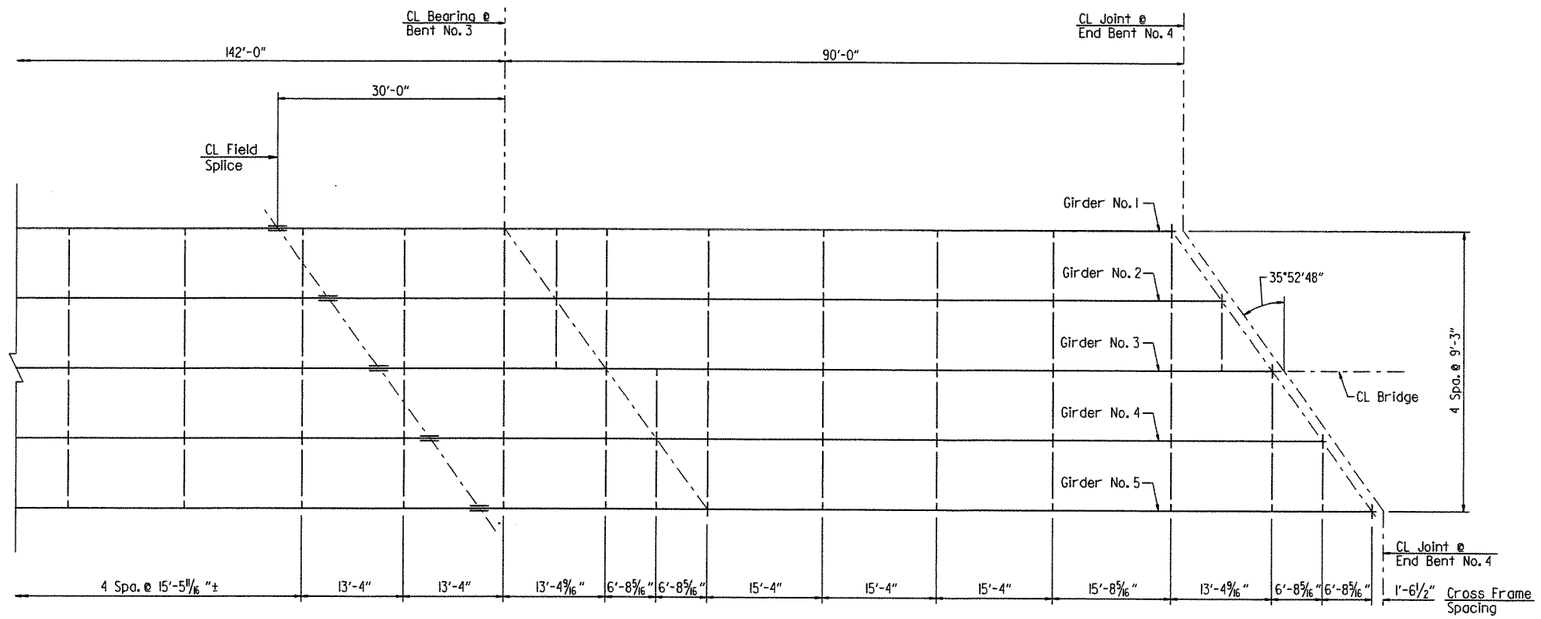
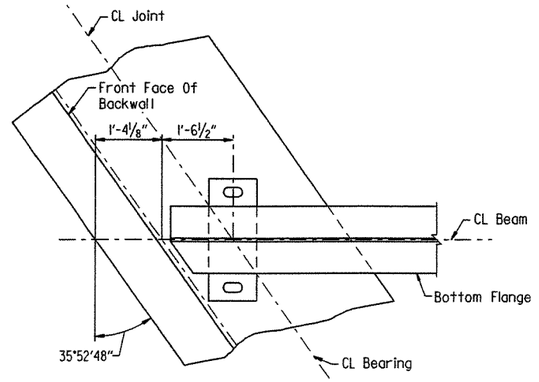
				6	ARK.			
				JOB NO.		061080	44	110
				1	07157	322' PL GIRDER		50658



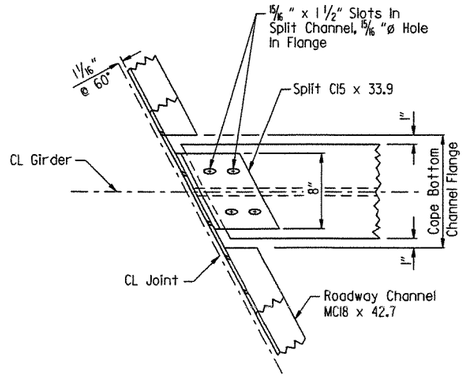
FRAMING PLAN
Scale: 1" = 10'-0"



FRAMING PLAN
Scale: 1" = 10'-0"



BEARING PLAN AT END BENT



CHANNEL CONNECTION DETAIL
Scale: NTS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 8017
JOHN H. RUDDELL

BRIDGE ENGINEER

SHEET 3 OF 9
DETAILS OF 322'-0" COMPOSITE PLATE GIRDER UNIT BRIDGE OVER UNION PACIFIC RAILROAD PULASKI COUNTY

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: APR. 2009 FILENAME: B061080_SI3.DGN
CHECKED BY: WMM DATE: APR. 2009 SCALE: AS NOTED
DESIGNED BY: JHR DATE: APR. 2009

BRIDGE NO. 07157 DRAWING NO. 50658

hewilliams 11/3/2009 10:41:35 AM
WORKSPACE: AHTDV8
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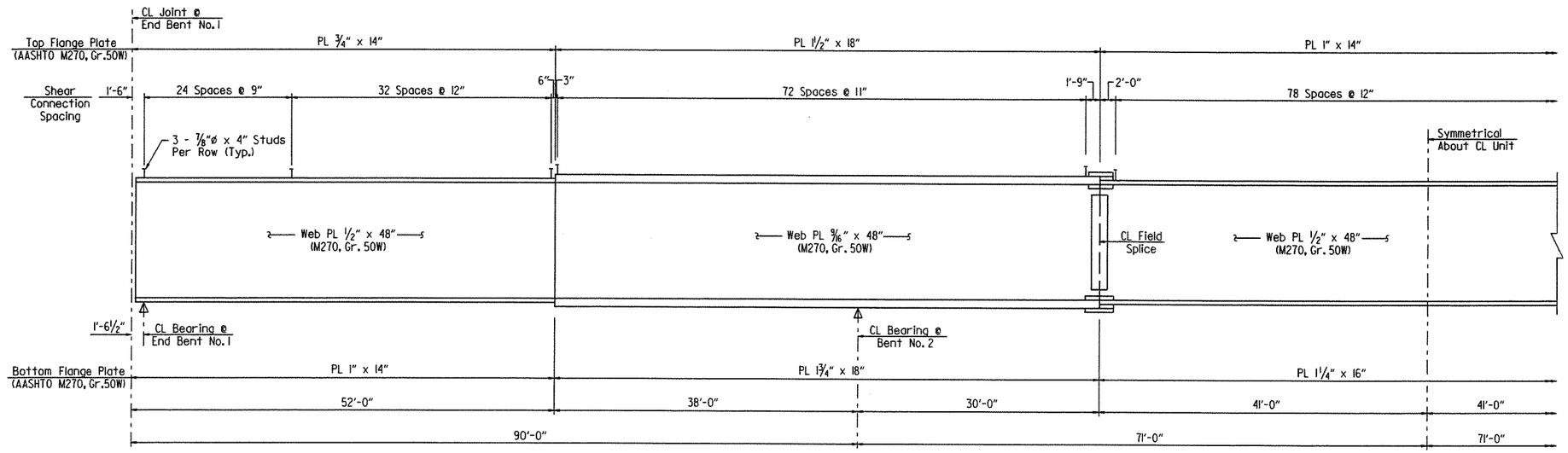
				6	ARK.			
				JOB NO.		061080	45	110
				(1) 07157		322' PL GIRDER		50659



TYP. GIRDER ELEVATION
Scale: NTS

SERVICE LOAD DIST. TABLE

	Int. Girder	Ext. Girder
Dead Load Non-Composite	925 PLF + Girder	788 PLF + Girder
Dead Load Composite **	376 PLF	376 PLF

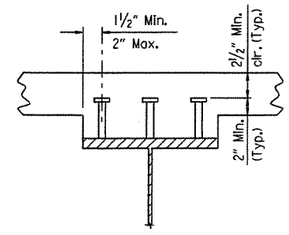
** Includes 192 PLF Allowance For Future Overlay.

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"	

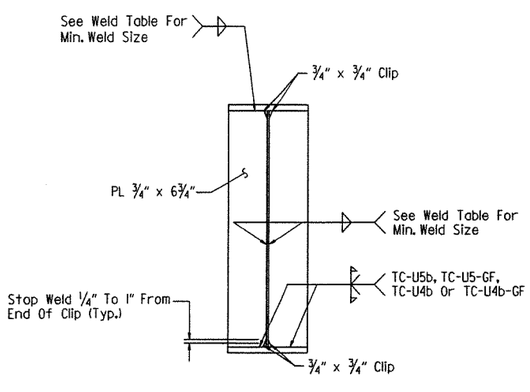
NOTE: When a fillet weld size, as shown on the plans, is larger than the minimum, the first pass shallbe that specified for minimum size of fillet weld.

NOTES:
1. For General Notes, See Drawing No. 50661.
2. All Structural Steel Including Girders, Cross Frames, Bearing Stiffeners And Conn. Plate's, Shall Be AASHTO M270 Grade 50W.
3. For Elastomeric Bearing Details, See Dwg. No. 50665.
4. For Details of Field Splices, See Dwg. No. 50660.
5. For Typ. Haunch Details, See Dwg. No. 50656.
6. For Anchor Details, See Dwg. No. 50656.
7. For Dead Load Deflection Diagram, See Dwg. No. 50660.

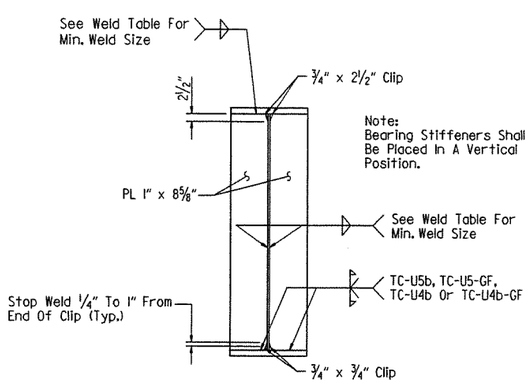


SHEAR CONNECTOR DETAIL
N.T.S.

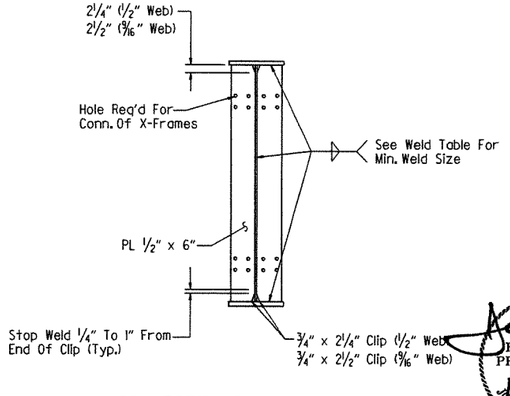
Stud shear connectors shown shall be 7/8" dia. x 4" long. granular flux filled, solid fluxed or equal, and automatically end welded to the beam flange in accordance with the recommendations of the manufacturer. 3/4" dia. studs may be used in place of the 7/8" dia. studs shown, at the ratio ratio of 1.361 - 3/4" dia. studs in place of one 7/8" dia. stud. 7/8" dia. studs will be used as basis for measurement of structural steelin shear connectors.



BEARING STIFFENER @ END BENTS



BEARING STIFFENER @ INTERIOR BENT



CONNECTION PLATE DETAIL
Scale: 1/2"=1'-0"

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 8017 JOHN H. RUDDELL

BRIDGE ENGINEER

SHEET 4 OF 9
DETAILS OF 322'-0"
COMPOSITE PLATE GIRDER UNIT
BRIDGE OVER UNION PACIFIC RAILROAD
PULASKI COUNTY
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: APR. 2009 FILENAME: B061080_S14.DGN
CHECKED BY: WMM DATE: APR. 2009 SCALE: AS NOTED
DESIGNED BY: JHR DATE: APR. 2009
BRIDGE NO. 07157 DRAWING NO. 50659

hwilliams 11/3/2009 10:42:00 AM
WORKSPACE: AHTDVB
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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
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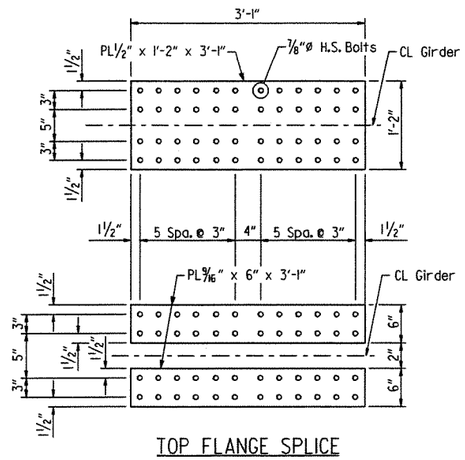
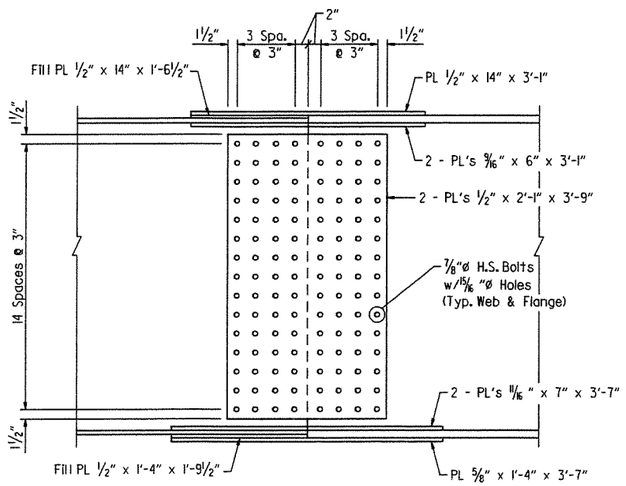
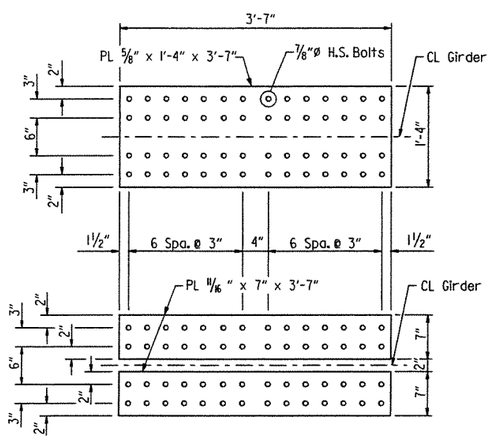
				JOB NO.		061080	46	110
				①	07157	322' PL GIRDER		50660



TOP FLANGE SPLICE

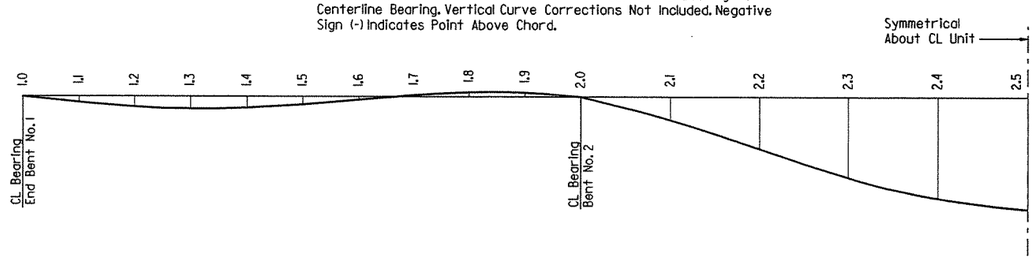


DETAILS OF FIELD SPLICE



BOTTOM FLANGE SPLICE

NOTE:
Camber For Dead Load Deflection Plus Vertical Curve ±¼" Tolerance. Deflections Shown Are From A Chord From Centerline Bearing To Centerline Bearing. Vertical Curve Corrections Not Included. Negative Sign (-) Indicates Point Above Chord.



DEAD LOAD DEFLECTION

TABLE OF DEAD LOAD DEFLECTIONS (Inches)

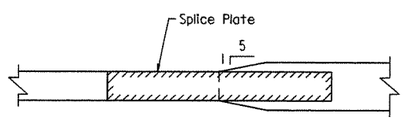
Point Of Deflection	Wt. Of Girder And Cross Frames	Wt. Of Girder, Cross Frames And Slab	Wt. Of Girder, Cross Frames, Slab And Parapet
1.0	0.000	0.000	0.000
1.1	0.035	0.185	0.202
1.2	0.059	0.320	0.350
1.3	0.069	0.377	0.412
1.4	0.062	0.346	0.379
1.5	0.040	0.240	0.263
1.6	0.010	0.095	0.104
1.7	-0.019	-0.046	-0.050
1.8	-0.038	-0.142	-0.156
1.9	-0.036	-0.146	-0.160
2.0	0.000	0.000	0.000
2.1	0.147	0.614	0.675
2.2	0.352	1.485	1.632
2.3	0.555	2.361	2.592
2.4	0.701	2.996	3.288
2.5	0.753	3.226	3.540

← CL Unit

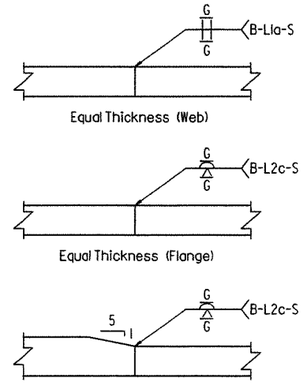
NOTE:
Table is Symmetrical About CL Unit.

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

All field splice bolts shall be ⅞"ø H.S. Bolts.
All holes for splice bolts shall be 15/16 "ø.
All field splice plates shall be AASHTO M270 Gr. 50W steel.



FLANGE TRANSITION DETAIL
Scale: NTS



DETAILS OF WELDED SPLICES
Scale: NTS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 8017
JOHN H. RUDDELL
11-20-09

BRIDGE ENGINEER

SHEET 5 OF 9
DETAILS OF 322'-0" COMPOSITE PLATE GIRDER UNIT
BRIDGE OVER UNION PACIFIC RAILROAD
PULASKI COUNTY
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: APR. 2009 FILENAME: B061080_S15.DGN
CHECKED BY: JHR DATE: APR. 2009 SCALE: AS SHOWN
DESIGNED BY: JHR DATE: APR. 2009
BRIDGE NO. 07157 DRAWING NO. 50660

hewilliams 11/3/2009 10:42:39 AM
WORKSPACE: AHTDV8
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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.		061080	47	110
				① 07157		322' PL GIRDER		50661

GENERAL NOTES:

CONCRETE:

Concrete shall be poured in the dry and all exposed corners to be chamfered ¾" unless otherwise noted. All concrete shall be Class S(AE) with a minimum 28 day compressive strength f'c = 4,000 psi.

The superstructure details shown are for use when removable deck forming is used and are the basis for measurements of Class S(AE) Concrete. See Standard Drawing No. 149911 for allowable modifications and for tolerances when Permanent Steel Deck Forms are used.

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

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

REINFORCING STEEL:

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

All structural steel shall be AASHTO M270, Gr. 50W and shall be paid for at the unit price per pound bid for "Structural Steel in Plate Girder Spans (M270, Gr. 50W)". M270 Gr. 50W Steel shall not be painted but shall be cleaned in accordance with Section 807.84(e) unless otherwise noted. Structural Steel completely embedded in concrete may be AASHTO M270, Gr. 36. See Drawing No. 50665 for cleaning requirements of external load plates on elastomeric bearings.

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 approved shop drawings. Shapes and materials shown in the plans will be the basis of payment and no additional compensation will be made for any adjustments due to substitutions.

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

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 plan quantities.

All girder webs & flanges of plate girders and splice plates are considered main load carrying members and shall meet the Longitudinal Charpy V-Notch Test specified in Section 807.05. This work and material will not be paid for directly but are considered as subsidiary to the item "Structural Steel in Plate Girder Spans (M270, Gr. 50W)".

Steel plates for main load carrying members (flange and web plates) and 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.

Girder webs may be made by shop splicing with a minimum length of 25'-0" for sections. Flange plates longer than 50'-0" may be made by shop splicing with a minimum length of 25'-0" for sections. Material specifications and locations of shop-welded splice, if any, shall be shown on the shop drawings. No additional payment for these welded splices will be made.

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 temporary or permanent, 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

All girders shall be blocked in their true position with webs horizontal in the shop as specified in section 807.54 (b)(2) of the Standard Specifications. The camber, length of sections, distance between bearings and opening of joints shall be measured with the girders in their true position and this information shall become a part of the permanent records of this job. The component parts shall be match marked in this assembly and these marks shall be shown on the erection diagram. All girder dimensions are based on a temperature of 60°F. A tolerance of +/- ¼" is allowed for camber.

Groove welds in flange and web plates shall be Quality Control (Q.C.) tested by nondestructive testing, as required by Section 807.23(b) of the Standard Specifications.

Fillet welds at flange to web plate connections shall be Quality Control (Q.C.) tested by the magnetic particle method.

All quality control (o.c.) testing is at the contractor's expense.

All connection plates shall be fabricated normal to the top flange and on the side of the girder web as indicated on the framing plans. No connection plates are to be placed on the outside of the exterior girders except as noted. All bearing stiffeners shall be fabricated to be plumb in final position.

Cross frames shall be installed as girders are erected. All bolts in cross frames and field splices shall be installed and tightened in accordance with subsection 807.71 prior to pouring of the concrete deck.

Field connections shall be bolted with high-strength bolts and shall be ¾"ø bolts unless otherwise noted. Bolts shall be placed with heads on the outside face of the exterior girder webs and on the bottom of the girder flanges. Holes for ¾"ø high-strength bolts may be 15/16 "ø diameter if a washer is supplied for use under both the nut and head of the bolt.

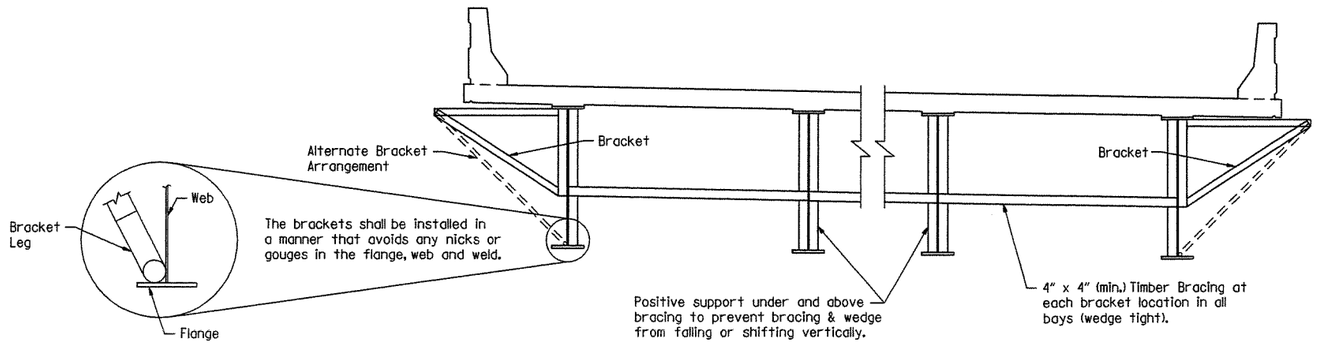
All contact surfaces between plates at field splices shall be free of paint, oil, rust or scale before assembly.

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.

Bearings without masonary plates shall be firmly seated in accordance with section 808.08 of the Standard Specifications. Bearings with masonry plates shall be firmly seated in accordance with Section 807.66. This work is to be considered subsidiary to the item "Structural Steel in Plate Girder Spans (M270 Gr.50W)" and will not be paid for directly.

The steel extrusions and parapet slider plate anchor system for strip seal joints will not be paid for directly but shall be paid for under the pay item "Armored Joint with Neoprene Strip Seal". The parapet slider plates at strip seal joints shall be paid for at the unit price per pound bid for "Structural Steel in Plate Girder Spans (M 270, Gr. 50W)".

Anchor bolts shall be AASHTO designation M314 Gr. 55, including supplemental requirement S1, and shall be galvanized to conform to AASHTO M 232, Class C or AASHTO M298 Class 50. Anchor bolts will be paid for at the contract unit price bid for "Structural Steel in Plate Girder Spans (M 270, Gr. 50W)".



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 the overhang brackets if the above strutting system is used. The strutting system may be omitted if ½" x 6" web stiffeners are welded to the insides of the exterior girders at the location of each bracket or if the alternate bracket 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 intermediate connection plates shown on Drawing No. 50659. 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 (M270, Gr. 50W)."

SCREED RAIL SUPPORT DETAIL
No Scale

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 8077
JOHN H. RUDDELL
11-30-09

BRIDGE ENGINEER

SHEET 6 OF 9
DETAILS OF 322'-0" COMPOSITE PLATE GIRDER UNIT BRIDGE OVER UNION PACIFIC RAILROAD PULASKI COUNTY

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: APR. 2009 FILENAME: B061080_SI6.DGN
CHECKED BY: JHR DATE: APR. 2009 SCALE: AS SHOWN
DESIGNED BY: JHR DATE: APR. 2009

BRIDGE NO. 07157 DRAWING NO. 50661

hewilliams 11/3/2009 10:43:16 AM
WORKSPACE: AHTDV8
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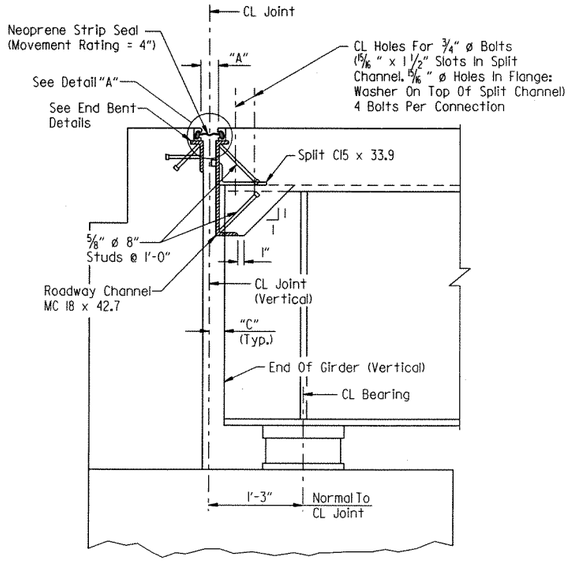
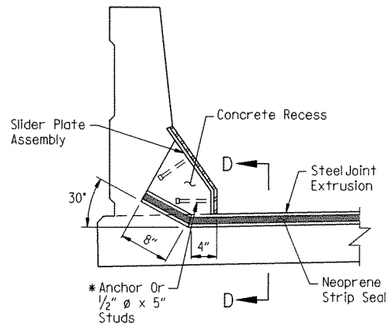
				JOB NO.		061080	48	110
				1 07157		322' PL GIRDER		50662



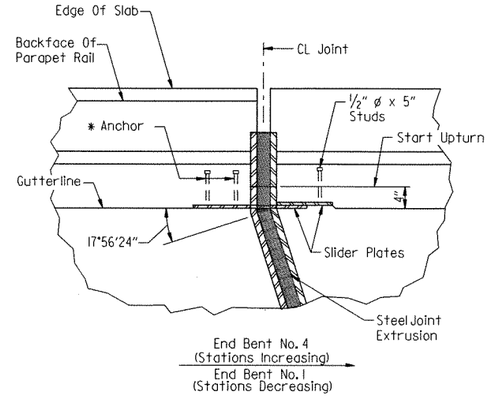
SECTION THRU JOINT AT END BENTS

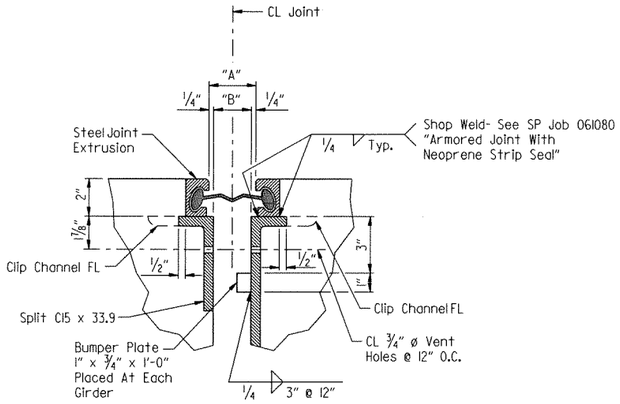
Note: Section Taken Normal To CL Joint
Scale: 1" = 1'-0"



SECTION B-B

Scale: 1" = 1'-0"

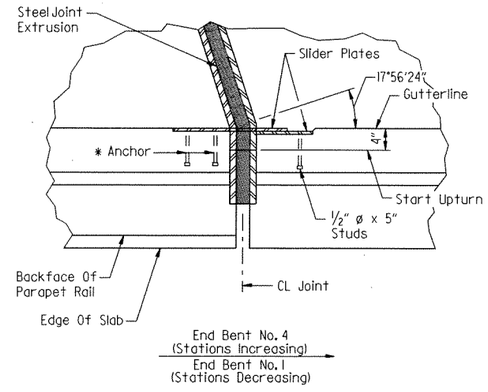




DETAIL A

Scale: 3" = 1'-0"

Note:
Concrete Shall Be Hand Packed Under The Joint Armor.



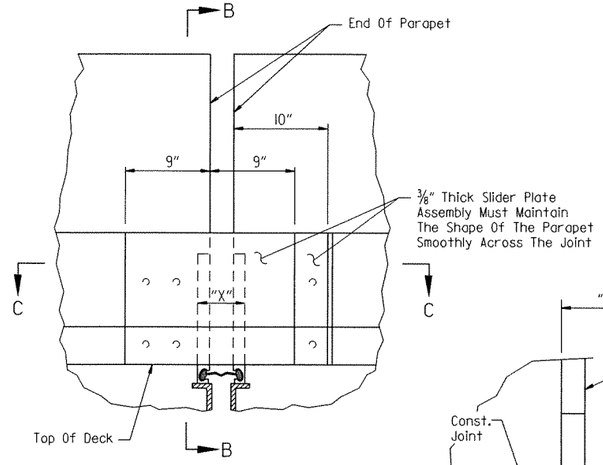
SECTION C-C

Scale: 1" = 1'-0"

* The Method Of Attachment Of The Cover Slider Plate Assembly Or Similar Device Must Be Such That It May Be Removed In Order To Provide For Future Replacement Of The Neoprene Seal.

Method Of Installition And Fabrication Shall Be Determined By The Manufacturer.

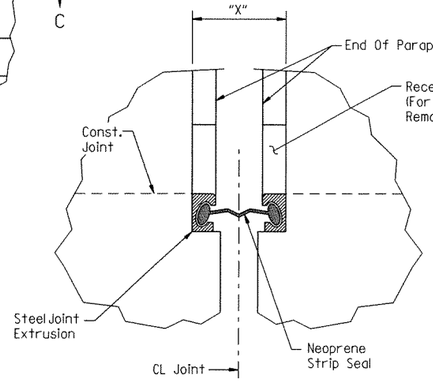
Anchors Will Not Be Paid For Directly But Will Be Considered Subsidiary To "STRUCTURAL STEEL IN PLATE GIRDER SPANS (M 270, Grade 50W)".



DETAIL OF NEOPRENE SEAL AT GUTTERLINE

Scale: 1" = 1'-0"

Note:
Dimension "X" Equals The Width Of The Recess In Parapet At Gutterline To Allow For Removal Or Repair Of Joint.



SECTION D-D

Scale: 3" = 1'-0"

STRIP SEAL JOINT DATA							
Bent No.	Movement Rating (inch)	"A" Width Perpendicular To Joint At 24 Hour Average Temperature ** Of:			"B" Width Perpendicular To Joint At 24 Hour Average Temperature ** Of:			"C" 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"	2¾"	2⅝"	2½"	2¼"	2⅛"	2"	2⅜"
4	4"	3"	2⅝"	2¼"	2½"	2⅛"	1¾"	2⅜"

** 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.

Installation Is Limited To 40 Degrees Fahrenheit Min. And 80 degrees Fahrenheit Max. Interpolation Of The Table May Be Necessary. The Temperature Limitations Of The Lubricant-Adhesive Manufacturer Shall Be Observed.

ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 8017 JOHN H. RUDDELL

BRIDGE ENGINEER

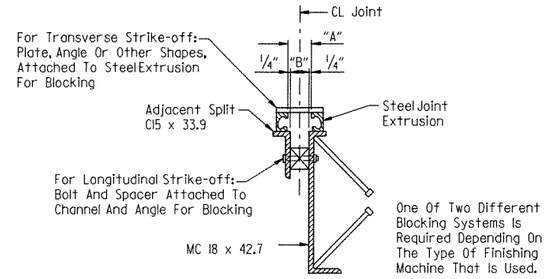
GENERAL NOTES

EXPANSION NEOPRENE STRIP SEAL: The Expansion Device Shall Provide A Movement Of 4" As 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.

All Structural Steel Shall Be AASHTO M 270, Grade 50W Unless Otherwise Noted. The Slider PL asembly shall be cleaned and painted in accordance with Section 638 of the Standard Specifications and will not be paid for directly but will be considered subsidiary to "STRUCTURAL STEEL IN PLATE GIRDER SPANS (M 270, Grade 50W)".

All Structural Steel, Except For The Steel Extrusion For The Strip Seal, Shall Be Paid For As "STRUCTURAL STEEL IN PLATE GIRDER SPANS (M 270, Grade 50W)". The Steel Extrusion And Neoprene Strip Seal Shall Be Paid For In Accordance With Special Provision Job 061080 "ARMORED JOINT WITH NEOPRENE STRIP SEAL".

Details of the proposed Slider PL Anchor Assembly shall be submitted for approval by the Engineer prior to fabrication.



Note:
Each Expansion Joint Device Shall Be Blocked In The Shop By The Fabricator To The Dimension Shown For 60°F And The Blocking Details Shall Be Shown On The Shop Drawings. Blocking Shall Be Placed Within 2' Of Each End Of The Device And With A Maximum Spacing Of 8'.

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 Girders Erected, The Blocked Expansion Device Shall Be Installed And Adjusted For Grade. All Connection Bolts Shall Be Fully Tightened Prior To Placing The Deck Concrete Adjacent To The Bent. Immediately Prior To Pouring The Backwall Concrete, The Blocking Shall Be Removed, The Opening Adjusted For Temperature, And The Backwall Constructed.

2) The Backwall Shall Be Poured To The Optional Construction Joint After Girders Are Erected. The Blocked Expansion Device Shall Be Installed And Adjusted For Grade. All Connection Bolts Shall Be Fully Tightened Prior To Placing The Deck Concrete Adjacent To The Bent. Immediately Prior To Pouring The Remainder Of The Backwall Concrete, The Blocking Shall Be Removed And The Opening Adjusted For Temperature.

SHEET 7 OF 9
DETAILS OF 322'-0"
COMPOSITE PLATE GIRDER UNIT
BRIDGE OVER UNION PACIFIC RAILROAD
PULASKI COUNTY

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: APR. 2009 FILENAME: B061080_SI7.DGN
CHECKED BY: JHR DATE: APR. 2009 SCALE: AS NOTED
DESIGNED BY: MRA DATE: APR. 2009

BRIDGE NO. 07157 DRAWING NO. 50662

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WORKSPACE: AHTD
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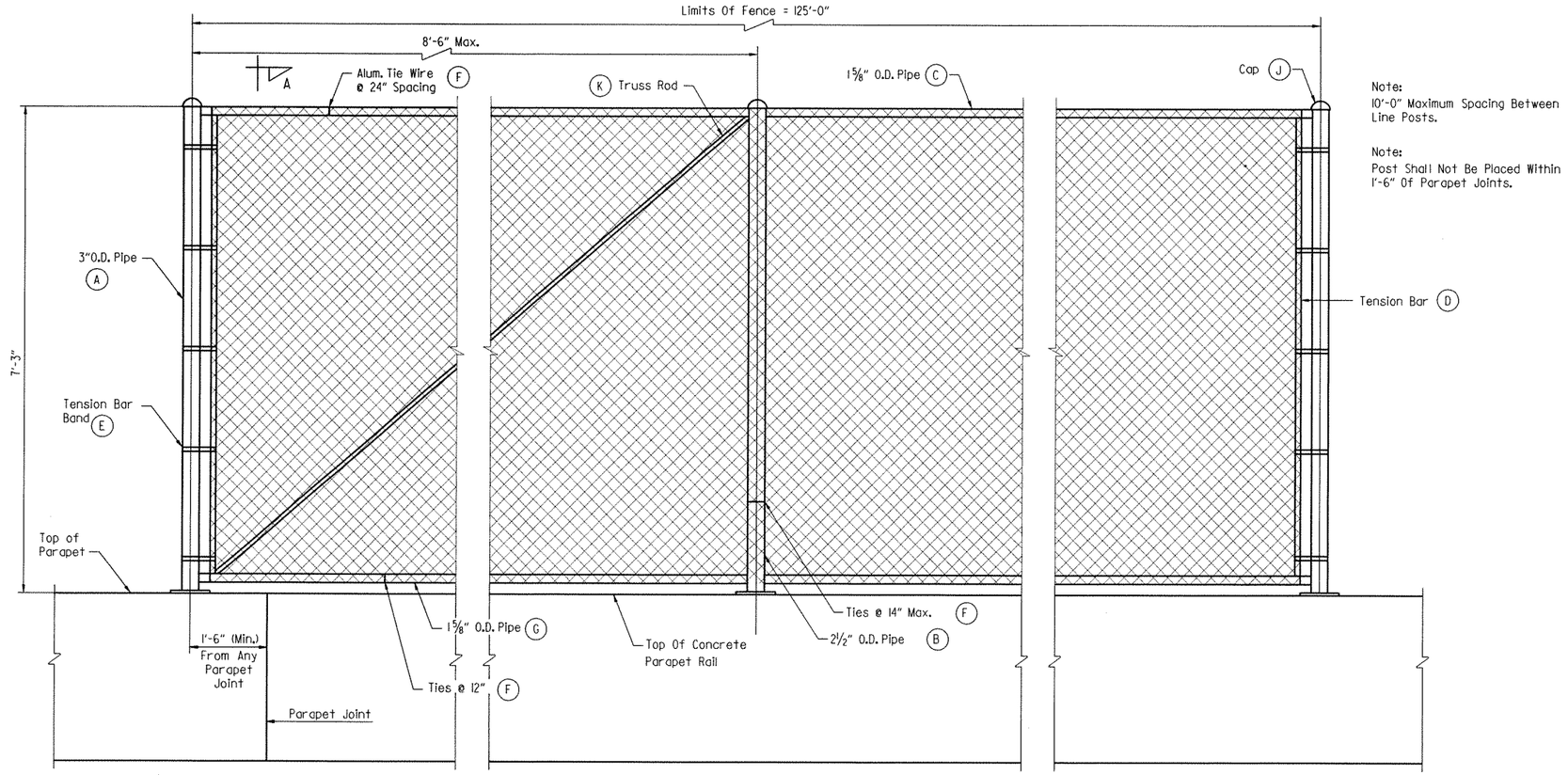
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		061080	49	110
				(1) 07157		322' PL GIRDER		50663



Note:
10'-0" Maximum Spacing Between Line Posts.

Note:
Post Shall Not Be Placed Within 1'-6" Of Parapet Joints.

(A) End Post: 3" O.D.
(B) Line Post: 2½" O.D.
(C) Top Rail: 1⅝" O.D.
(D) Tension Bar: 3/16" x ¾" Bar
(E) Tension Bar Band: ¾" x .074 w/⅝"ø x 1¼" Bolt (1 Band Top & Bottom w/15" Max. Spaces)
(F) Tie Wire: 9 Ga. Aluminum
(G) Bottom Rail: 1⅝" O.D.
(H) Fabric: 9 Ga. 2" Mesh w/Knuckle or Twisting Selvage
(J) Caps: All Posts Shall Be Capped & Shall Conform To ASTM F626-84
(K) Truss Rod: Min. Of 5/16" Round With Tighteners And Fittings

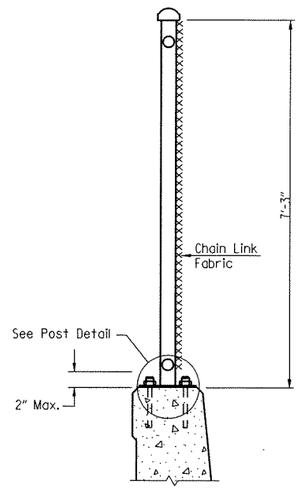
A (Typ.)

GENERAL NOTES:

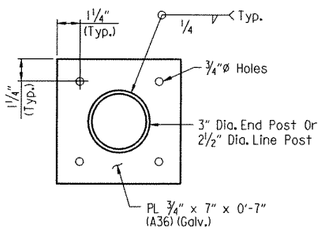
1. Post Anchorage Shall Be Cast In The Parapet. Unless The Alternate Post Anchor System Is Used. No Portion Of The Fence Shall Be Erected Until The Entire Parapet Has Been Poured And Cured.
2. All Galvanizing Which Has Been Damaged In Handling Or Transportation Shall Be Repaired.
3. All Exposed Edges Shall Be Smooth.
4. Base Plates Shall Not Be Placed In Areas That Are Improperly Finished, Deformed Or Irregular.
5. Base Plates, Galvanizing, Anchor System, Neoprene Pad And Template Plates Will Not Be Paid For Directly But Will Be Considered Subsidiary To The Unit Price Bid For "7' Steel Chain Link Fence".
6. For Additional Details, See Std. Dwg. WF-3.

FENCE LOCATION		
	BEGIN STA.	END STA.
Left	44+14.50	45+39.50
Right	44+44.50	45+69.50

DETAIL OF CHAIN LINK FENCE
Scale: None

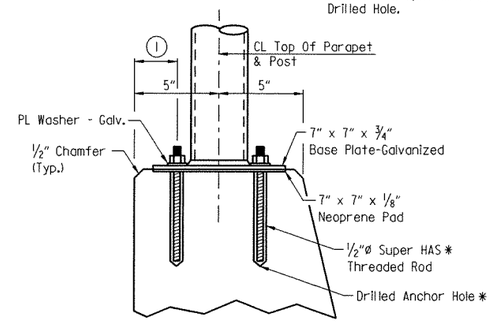


SECTION A-A
Scale: None



BASE PLATE
Scale: None

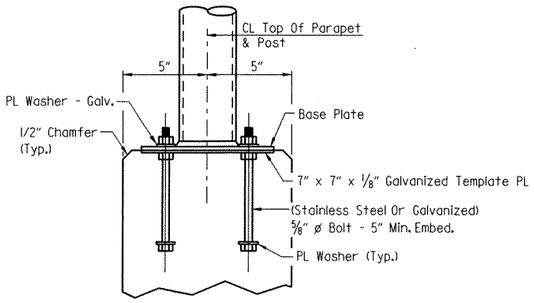
Note:
Chain Link Fabric To Be Placed On Roadway Face Of Posts.



* HILTI HIT RE 500 Epoxy Adhesive Anchor System With 4½" Embedment Or An Approved Equal.

The HILTI Epoxy Adhesive Anchor System Shall Be Installed In Accordance With Manufacturer's Recommendations.

DETAILS OF ALTERNATE POST ANCHOR SYSTEM
(Epoxy Adhesive Anchors)



POST DETAIL
Scale: 3" = 1'-0"

ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 8817
JOHN H. RUDDELL

BRIDGE ENGINEER

SHEET 8 OF 9
DETAILS OF 322'-0" COMPOSITE PLATE GIRDER UNIT BRIDGE OVER UNION PACIFIC RAILROAD PULASKI COUNTY

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: APR. 2009
CHECKED BY: JHR DATE: APR. 2009
DESIGNED BY: JHR DATE: APR. 2009
FILENAME: B061080_S18.DGN
SCALE: AS SHOWN

BRIDGE NO. 07157 DRAWING NO. 50663

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WORKSPACE: AHTD
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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
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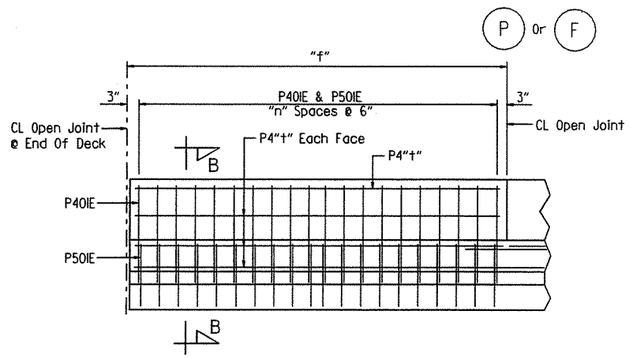
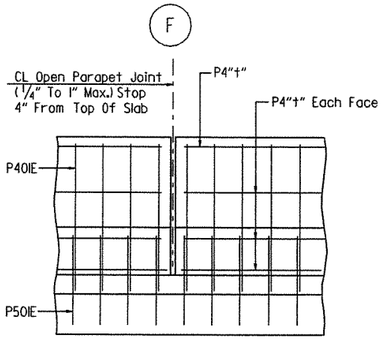
				JOB NO.		061080	50	110
				① 07157		322' PL GIRDER		50664



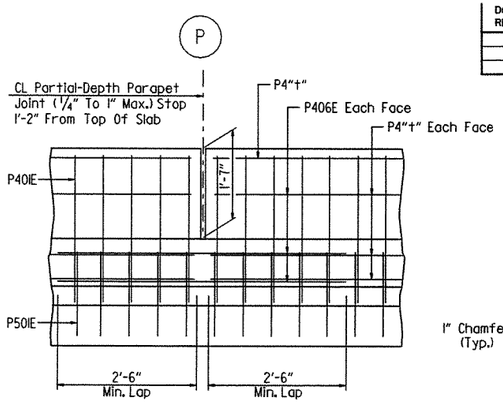
VIEW A-A (TYPICAL CLOSED PARAPET RAIL)
Scale: 1/2" = 1'-0"

P Indicates Partial Depth Joint (Stop 1'-2" From Top Of Slab) See Slab Plan For Joint Locations.

F Indicates Full Depth Joint (Stop 4" From Top Of Slab) See Slab Plan For Joint Locations.



PARAPET REINFORCING AT FULL DEPTH JOINTS
Scale : 3/8" = 1'-0"

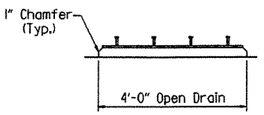


PARAPET REINFORCING AT PARTIAL DEPTH JOINTS
Scale : 3/8" = 1'-0"

GENERAL NOTES

CONCRETE: All Concrete Shall Be Class S(AE) With A Minimum 28 Day Compressive Strength f'c = 4000 psi. Concrete Deck Thickness Shall Be 8" Min. Except In Overhang Where Deck Thickness Is 8 1/2" & 8 1/8".

REINFORCING STEEL: All Reinforcing Steel Shall Conform To AASHTO M31 Or M53, Grade 60



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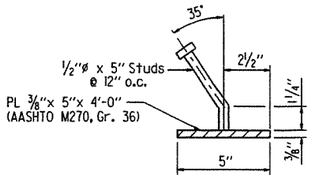
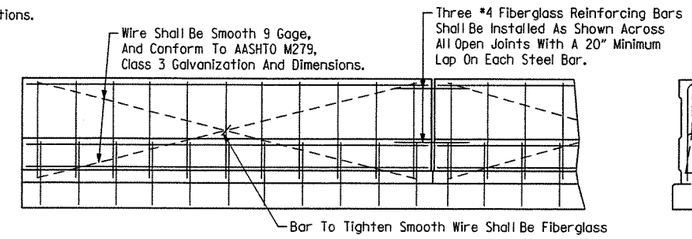
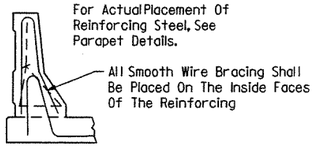


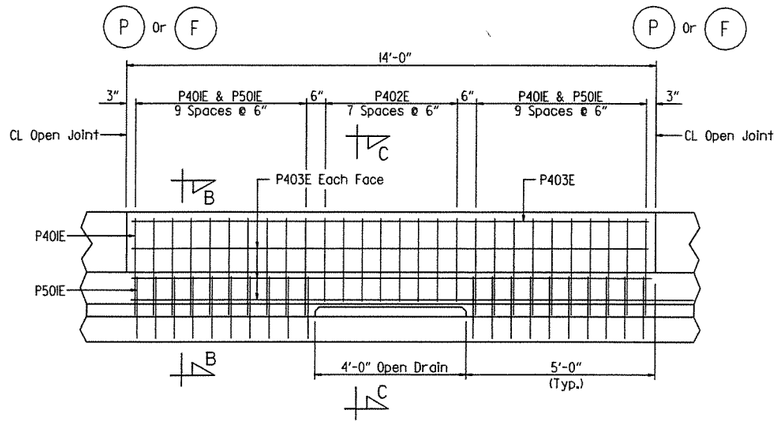
DETAIL Z
Scale : 1 1/2" = 1'-0"





Notes:
Parapet Studs Shall Be 5" Long, Granular Flux Filled, Solid Fluxed, Or Equal, And Automatically End Welded To The Plate. Studs And Plate Shall Meet The Requirements Of Section 807. Studs And Plate Shall Be Measured And Paid For As "Structural Steel In Plate Girder Spans (M270, Gr. 50W)".

The Surfaces Of The Plate Which Will Not Be In Contact With Concrete Shall Be Painted In Accordance With Section 638, Or As Approved By The Engineer. Only One Coat Is Required And Shall Be Applied In The Fabricator's Shop. Painting Will Not Be Paid For Directly But Will Be Considered Subsidiary to "Structural Steel In Plate Girder Spans (M270, Gr. 50W)".



VIEW A-A (TYPICAL OPEN PARAPET RAIL)
Scale: 1/2" = 1'-0"

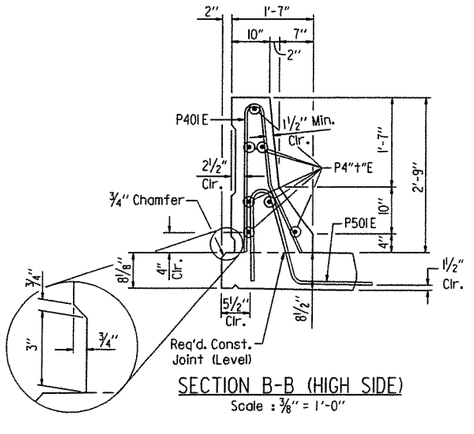
All Panels Shall Be Braced As Shown To Prevent Racking. All Open Joints Shall Be Sawed As Soon As Practical To A Minimum Width Of 1/4". To Control Cracking Before Sawing All Joints Must Be Grooved Before The Concrete Is Set. Sawing Of The Joints Must Be Controlled So It Will Follow The Grooved Joint.

The Extruded Parapet Shall Conform To The Horizontal And Vertical Lines Shown On The Plans Or As Directed By The Engineer And Shall Present A Smooth, Uniform Appearance And Texture. Exposed Surfaces May Be Given A Light Brush Finish Or A Class 3, Textured Coating Finish, In Place Of Class 2, Rubbed Finish.

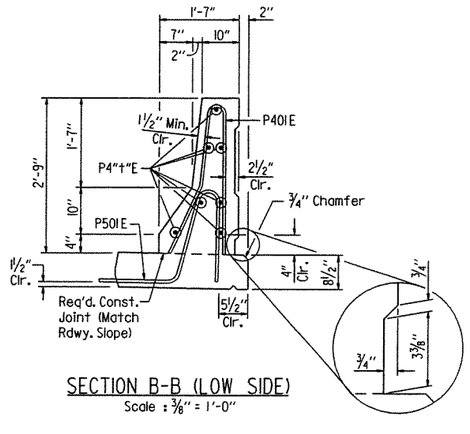
DETAILS OF OPTIONAL SLIPFORMING OF CONCRETE PARAPET RAIL

No Scale

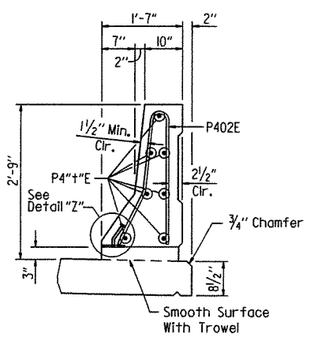
TABLE OF PARAPET VARIABLES		
PANEL LENGTH		CLOSED PARAPET
"f"	"t"	"n"
10'-0"	04E	19
11'-0"	05E	21
14'-0"	03E	27



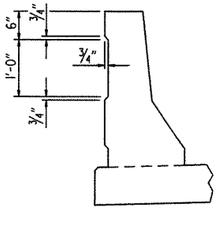
SECTION B-B (HIGH SIDE)
Scale : 3/8" = 1'-0"



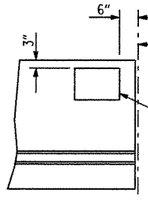
SECTION B-B (LOW SIDE)
Scale : 3/8" = 1'-0"



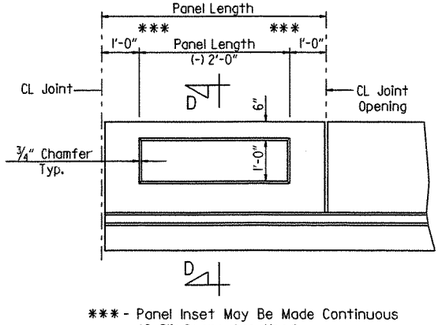
SECTION C-C
Scale : 3/8" = 1'-0"



SECTION D-D
Scale: 3/4" = 1'-0"



VIEW SHOWING LOCATION OF NAME PLATE
Scale: 1/2" = 1'-0"



*** - Panel Inset May Be Made Continuous If Slipforms Are Used.

PARAPET ENHANCEMENT DETAILS
Scale: 1/2" = 1'-0"

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 8617 JOHN H. RUDDELL 11-30-09

BRIDGE ENGINEER

SHEET 9 OF 9
DETAILS OF 322'-0" COMPOSITE PLATE GIRDER UNIT BRIDGE OVER UNION PACIFIC RAILROAD PULASKI COUNTY

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

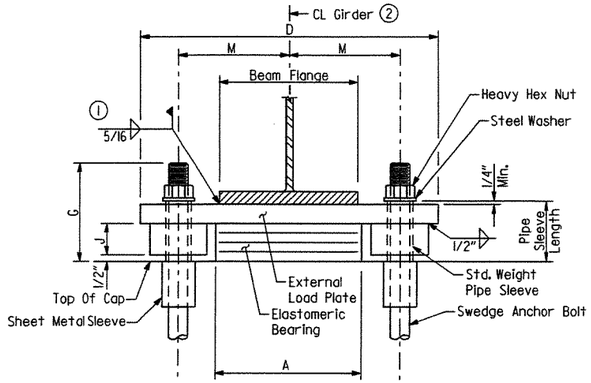
LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: APR. 2009 FILENAME: B061080_S19.DGN
CHECKED BY: JHR DATE: APR. 2009 SCALE: AS NOTED
DESIGNED BY: WMM DATE: APR. 2009

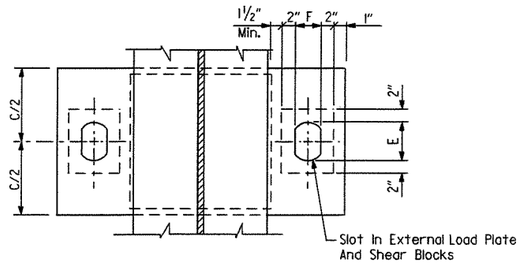
BRIDGE NO. 07157 DRAWING NO. 50664

hewilliams 11/3/2009 1:08:14 PM
WORKSPACE: AHTDV8
L:\2004\04911980 - South Loop - Phase 1\Drawings\BRG\FINAL\B061080_S19.dgn

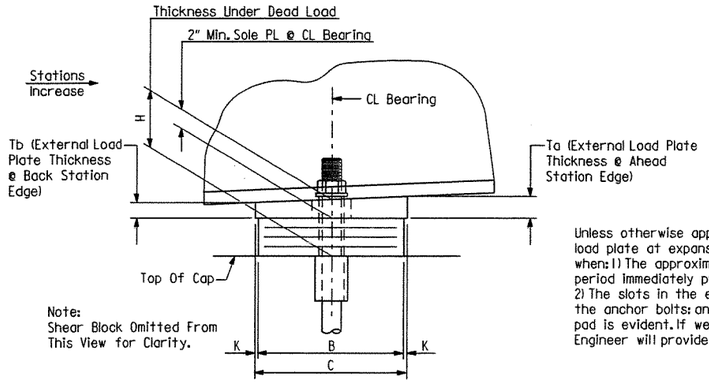
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		061080	51	110
				① 07157		ELASTO. BRGS.		50665



FRONT VIEW - AT BENTS 2 & 3



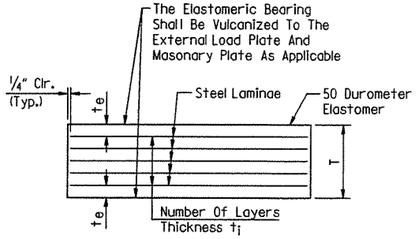
PLAN VIEW - AT BENTS 2 & 3



SIDE VIEW - AT BENTS 2 & 3

① Care shall be taken to ensure that the external load plate is in full and complete contact with the girder flange before welding begins.

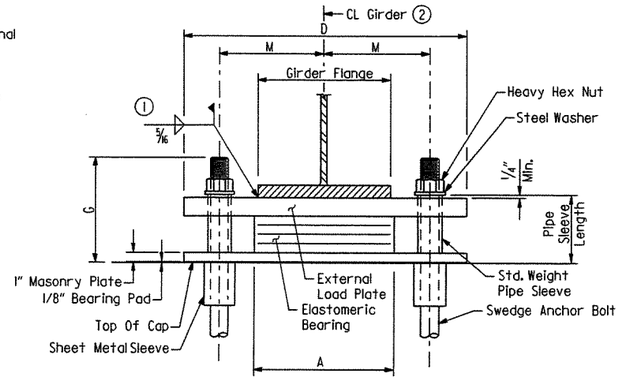
② Centerline elastomeric pad shall be aligned with centerline girder.



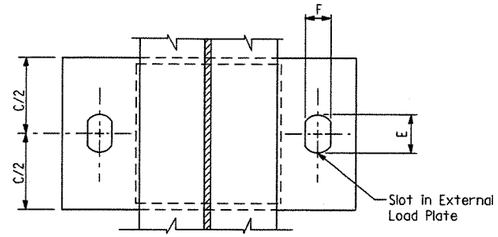
t_e = Thickness Of Elastomer Cover On Top And Bottom Of Pad
t_i = Thickness Of Elastomer Between Steel Laminae
N = Number Of Elastomer Layers Of Thickness t_i

ELASTOMERIC BEARING

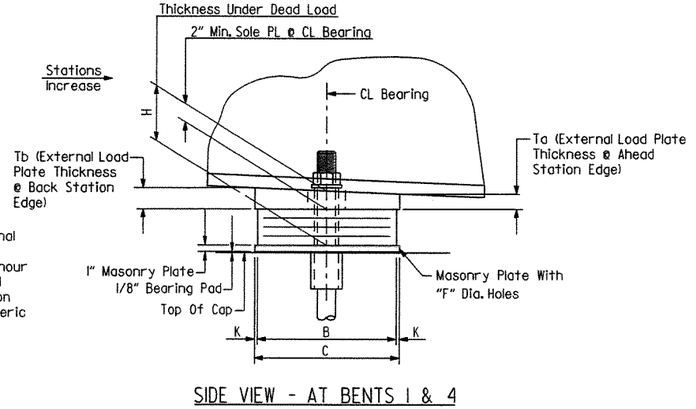
Unless otherwise approved by the Engineer, welding of the external load plate at expansion bearings to the beam will be allowed only when: 1) The approximate average air temperature during the 24 hour period immediately preceding welding is between 40°F and 80°F; and 2) The slots in the external load 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.



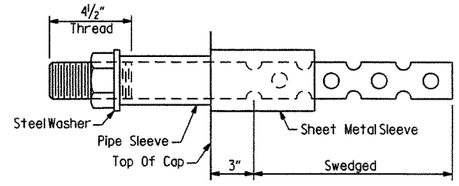
FRONT VIEW - AT BENTS 1 & 4



PLAN VIEW - AT BENTS 1 & 4



SIDE VIEW - AT BENTS 1 & 4



ANCHOR BOLT DETAIL

Note: 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 masonry. 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 Plate Girder Spans, (M270, Gr. 50W)"

GENERAL NOTES

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

External load plates, shear blocks, and masonry plates shall conform to AASHTO M270, Grade 50W. Pipe sleeves shall be ASTM A53, Grade B, and shall be galvanized to conform to AASHTO M232, Class C or AASHTO M298, Class 50.

External load plates, with and without shear blocks, and masonry 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. Other surfaces shall be blast cleaned in accordance with Subsection 807.84(E) for Unpainted Grade 50W Steel.

Anchor bolts, washers and nuts shall conform to Subsection 807.07 of the Standard Specifications. The anchor bolt grade of steel shall be as specified in the "Table Of Fabricator Variables". Indentations shall be circular with rounded bottoms and staggered as shown in the details.

Pipe sleeves, anchor bolts, washers and nuts shall be paid for at the unit price bid for "Structural Steel In Plate Girder Spans (M270, Gr. 50W)". External load plates, masonry plates, 1/8" bearing pads, and shear blocks will not be measured or paid for separately but will be considered included in the unit bid price for "Elastomeric Bearings".

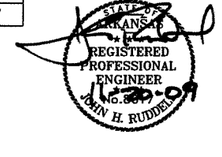
Bearings without masonry plates shall be seated in accordance with Subsection 808.08. Bearings with masonry plates shall be seated in accordance with Subsection 807.66.

TABLE OF FABRICATOR VARIABLES

Bridge No.	Location		Bearing Type	No. Of Bearings Each Bent	*Maximum Design Load (Kips)	Elastomeric Pad								External Load Plate									Anchor Bolt			
	Bent No.(s)	Beam Or Girder No.				G	H	A	B	N	t_i	t_e	No. & Thickness Of Steel Laminate	T	C	D	**E	F	J	K	M	T_a	T_b	Anchor Bolt (Dia. x L)	Grade	Pipe Sleeve Size (Dia. x L)	Sheet Metal Sleeve Size (Dia. x L)	Steel Washer Size (O.D.)
07157	1	All	Exp.	5	124	10 5/16"	7 5/16"	20"	10"	6	1/2"	1/4"	7 @ 12 Ga.	4 1/4"	11"	31"	4 1/8"	2 5/16"		1/2"	12 1/2"	2.07	1.93	1 3/4" x 32"	55	2" x 7 9/16"	4" x 8"	3 3/8"
	2	All	Fixed	5	401	9 7/16"	6 7/16"	23"	12"	6	1/2"	1/4"	7 @ 12 Ga.	4 1/4"	13"	42 1/4"	3 1/8"	3 1/8"	3 1/16"	1/2"	16 9/16"	2.03	1.97	2" x 34"	55	2 1/2" x 6 7/16"	4" x 12"	3 3/4"
	3	All	Exp.	5	401	9 7/16"	6 7/16"	28"	12"	6	1/2"	1/4"	7 @ 12 Ga.	4 1/4"	13"	47 1/4"	5 3/8"	3 1/8"	3 1/16"	1/2"	19 1/16"	1.93	2.07	2" x 34"	55	2 1/2" x 6 7/16"	4" x 15"	3 3/4"
	4	All	Exp.	5	124	10 5/16"	7 5/16"	20"	10"	6	1/2"	1/4"	7 @ 12 Ga.	4 1/4"	11"	31"	6 1/4"	2 5/16"		1/2"	12 1/2"	1.89	2.11	1 3/4" x 32"	55	2" x 7 9/16"	4" x 8"	3 3/8"

* Maximum Design Load = Service I Limit State

** The Dimension "E" Does Not Apply To Masonry Plates - See "SIDE VIEW - AT BENTS 1 & 4



BRIDGE ENGINEER

DETAILS OF ELASTOMERIC BEARINGS BRIDGE OVER UNION PACIFIC RAILROAD PULASKI COUNTY

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: APR. 2009 FILENAME: B061080_E1.DGN
CHECKED BY: JHR DATE: APR. 2009 SCALE: AS NOTED
DESIGNED BY: MRA DATE: APR. 2009

BRIDGE NO. 07157 DRAWING NO. 50665

hewilliams 11/3/2009 10:44:23 AM
WORKSPACE: AHTDV8
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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
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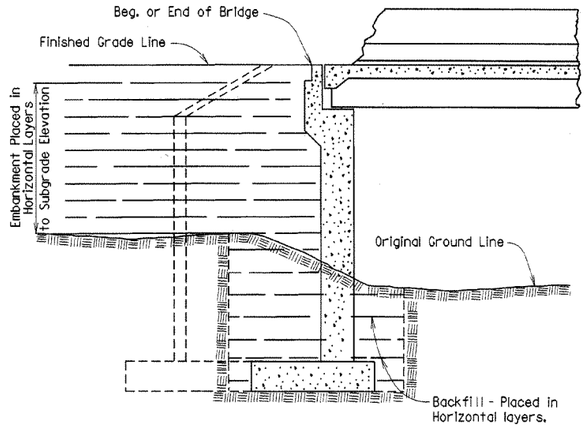
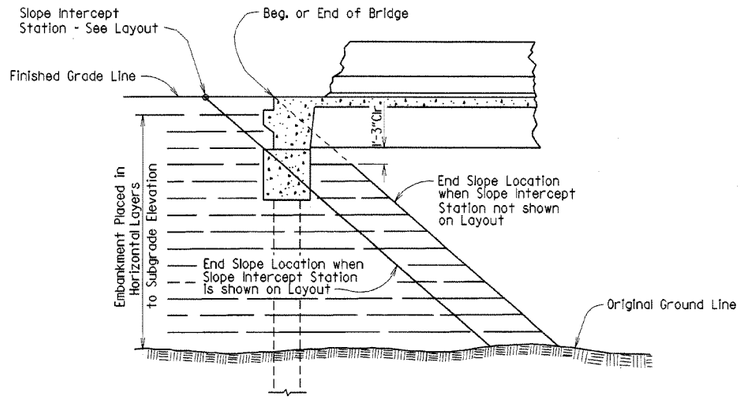
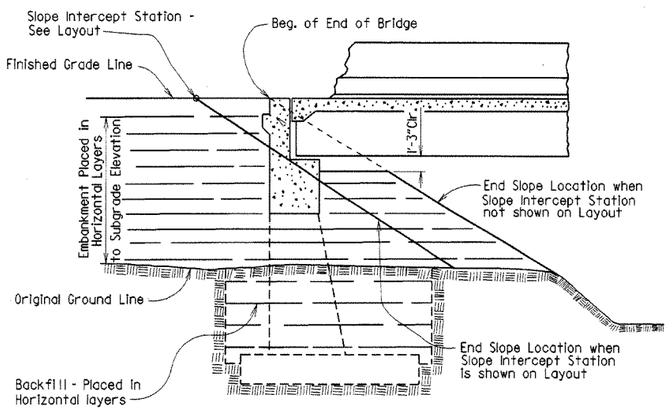
				JOB NO.				
				①	EMBANKMENT & BACKFILL			1888A



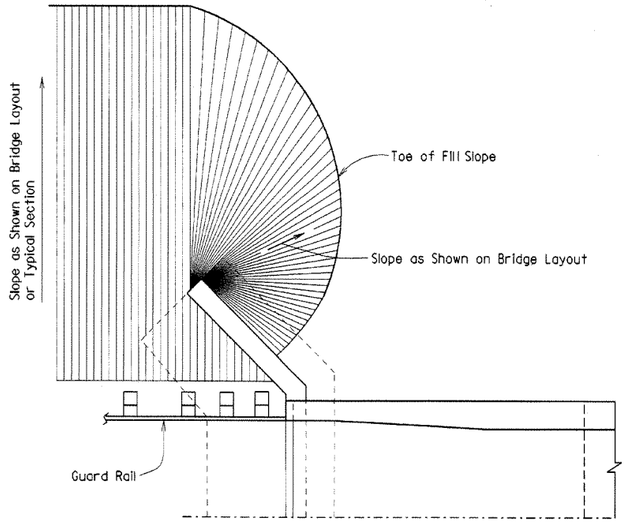
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT VERTICAL WALL ABUTMENTS



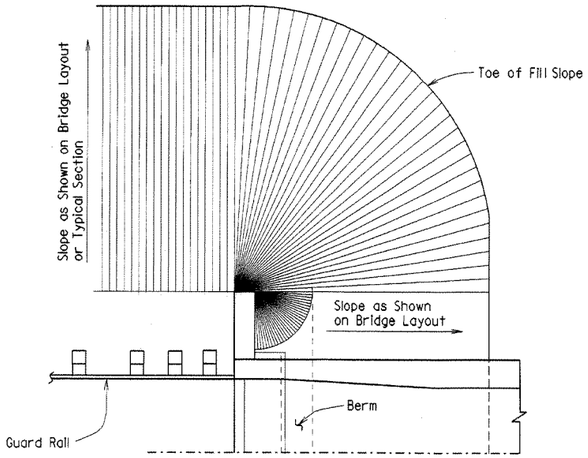
EMBANKMENT CONSTRUCTION AT SPILL-THROUGH PILE END BENTS



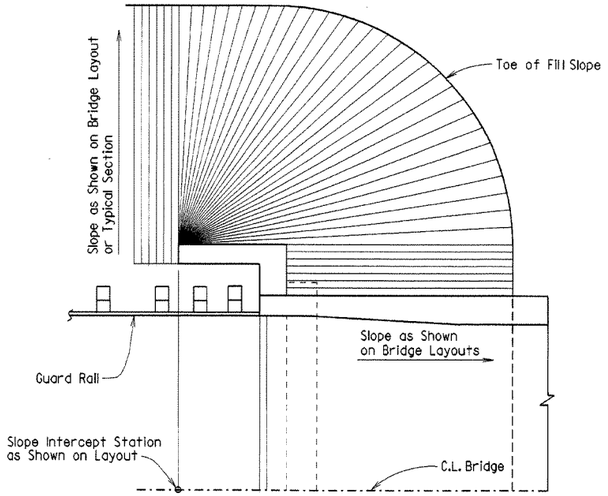
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT SPILL-THROUGH END BENTS



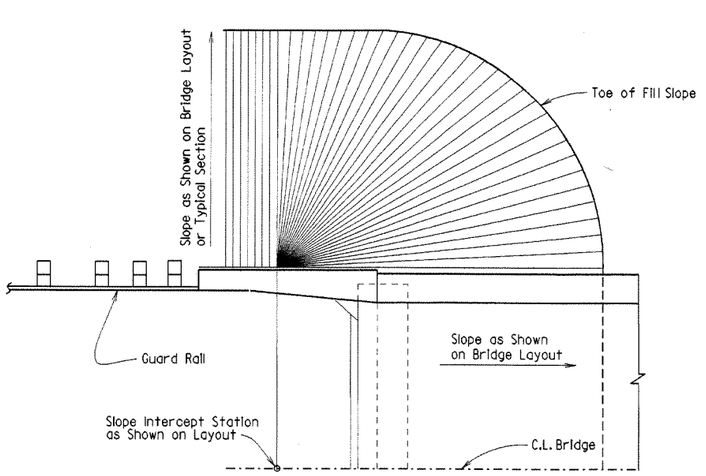
VERTICAL WALL ABUTMENTS



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 4 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 of the Specifications for construction requirements.

⚠ Revised and redrawn MJT 04-10-2003
Chk'd. By: CJF 04-10-2003

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4537
CHARLES P. BRAND
BRIDGE ENGINEER

EMBANKMENT CONSTRUCTION AND BACKFILL AT BRIDGE ENDS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

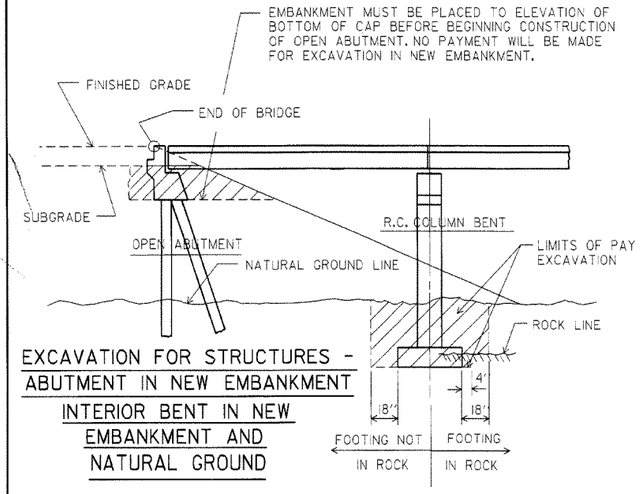
DRAWN BY: MJT DATE: 04-10-2003 FILENAME: BI888A.STD
CHECKED BY: CJF DATE: 04-10-2003 SCALE: NO SCALE
DESIGNED BY: STD. DATE: ——

BRIDGE NO. DRAWING NO. 1888A

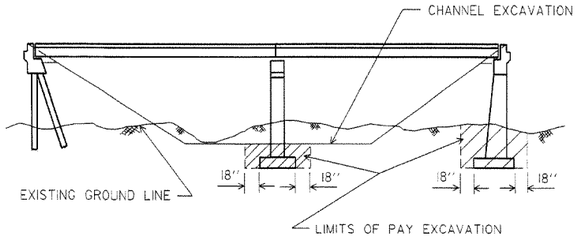
BI888A.STD

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
04-10-2003				6	ARK.		53	
				JOB NO.				

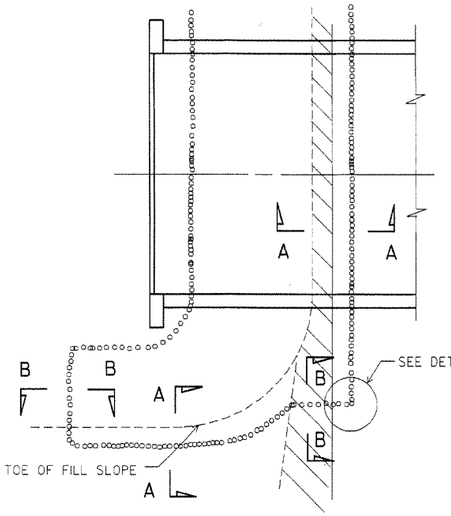
1 RIP. & EXCAV. 1891F



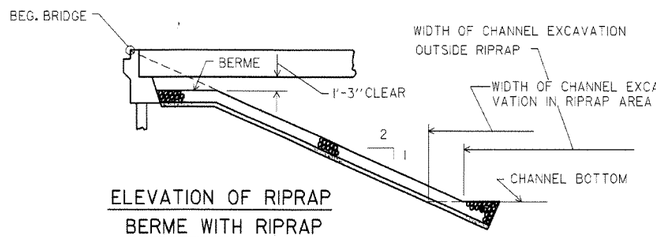
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NEW EMBANKMENT AND NATURAL GROUND



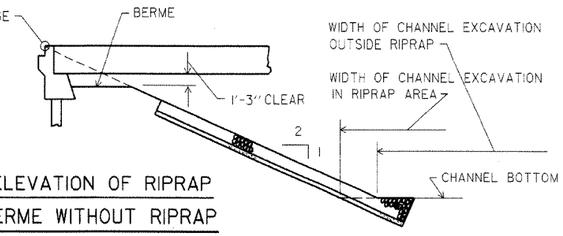
EXCAVATION FOR STRUCTURES - BRIDGE LOCATION WITH DESIGNATED CHANNEL CHANGE



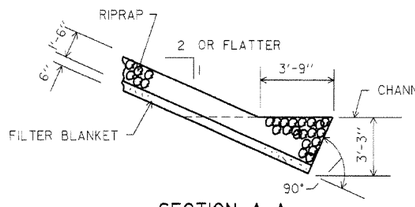
PLAN OF DUMPED RIPRAP



ELEVATION OF RIPRAP BERME WITH RIPRAP



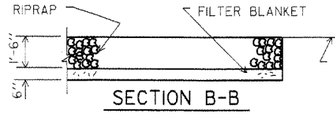
ELEVATION OF RIPRAP BERME WITHOUT RIPRAP



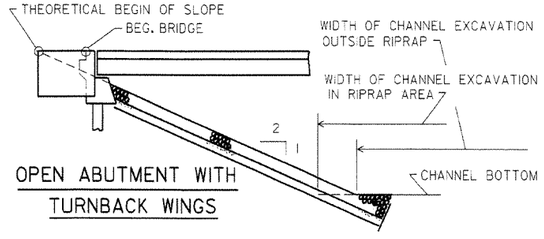
SECTION A-A

(TOE EXCAVATION IN SOIL)

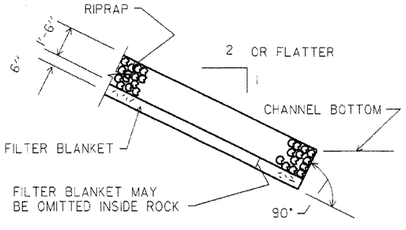
EXCAVATION FOR TOES IS NOT A PAY ITEM



SECTION B-B



OPEN ABUTMENT WITH TURNBACK WINGS



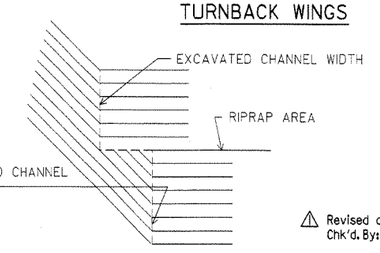
SECTION A-A

(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.



DETAIL C

STATE OF ARKANSAS ★★★ REGISTERED PROFESSIONAL ENGINEER ★★★ No. 4337 CHARLES P. BRAND

BRIDGE ENGINEER

⚠ Revised and redrawn MJT 04-10-2003
Chk'd. By: CJF 04-10-2003

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

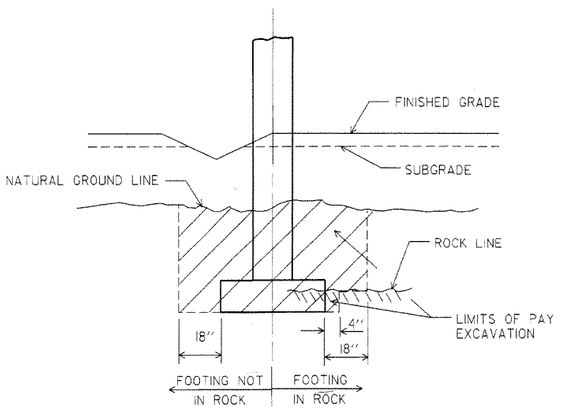
ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

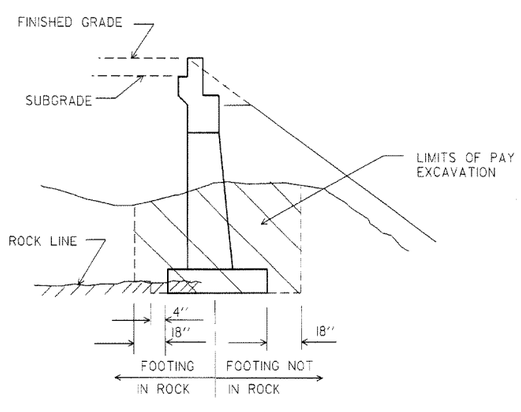
LITTLE ROCK, ARK.

DRAWN BY: MJT DATE: 04-10-2003 FILENAME: B1891F.STD
CHECKED BY: CJF DATE: 04-10-2003 SCALE: NO SCALE
DESIGNED BY: STD. DATE:

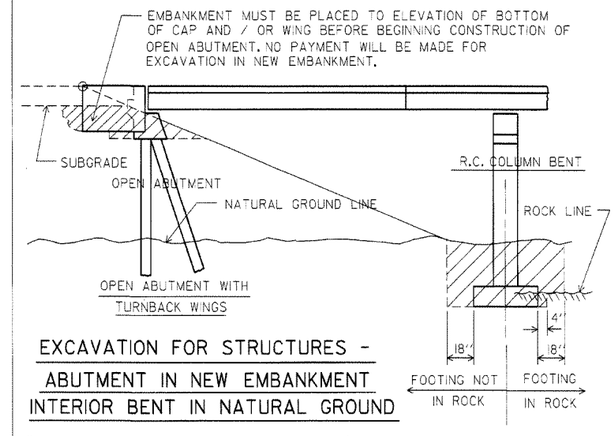
BRIDGE NO. DRAWING NO. 1891F



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



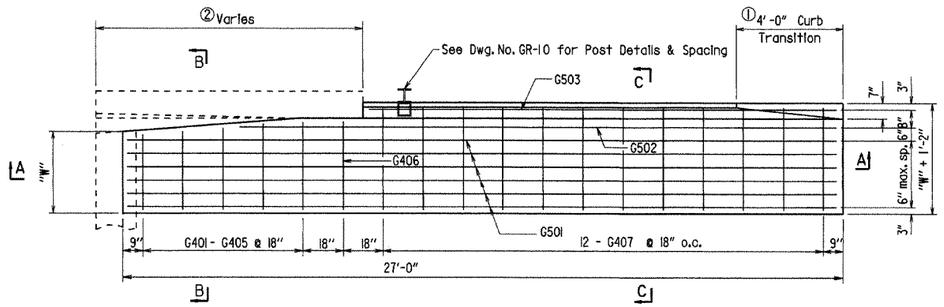
EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND AND NEW EMBANKMENT



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

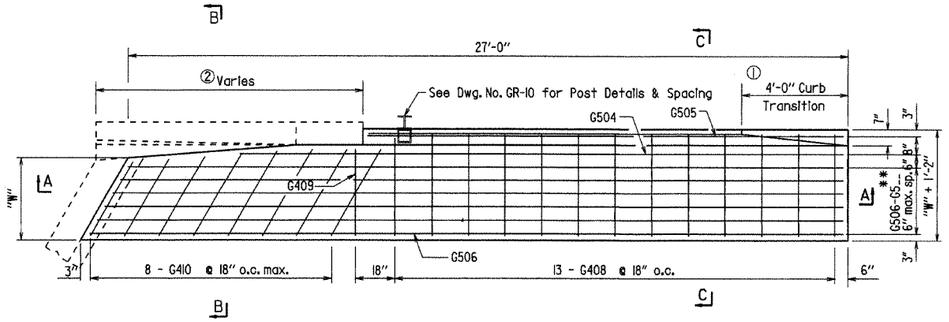
EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND

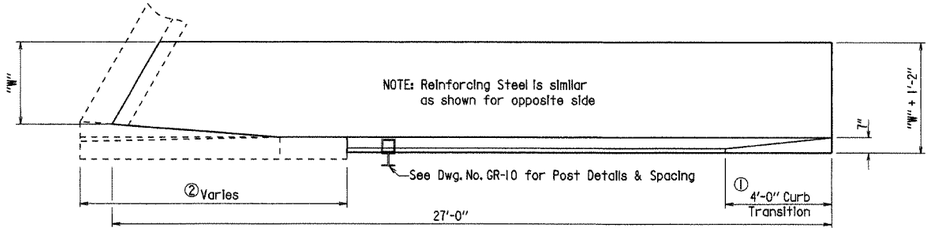
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
4-10-2003				6	ARK.		54	
07-14-2010				JOB NO.				
①				TYPE B GUTTERS				2016B



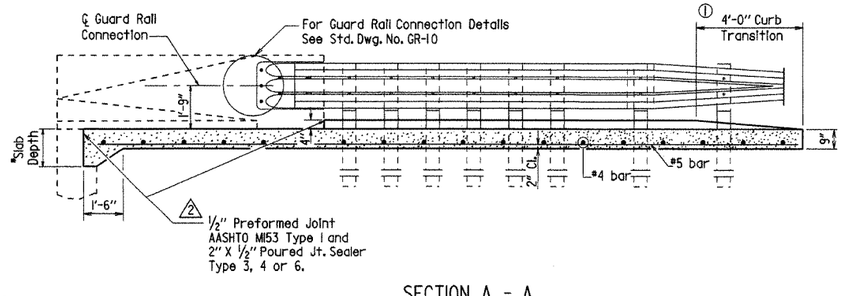
HALF PLAN OF APPROACH GUTTERS FOR SQUARE BRIDGE

② Length varies. See End Bent details for actual length. Quantities shown are for 10'-0" Transition Rail.





PLAN OF APPROACH GUTTERS FOR SKEWED BRIDGE

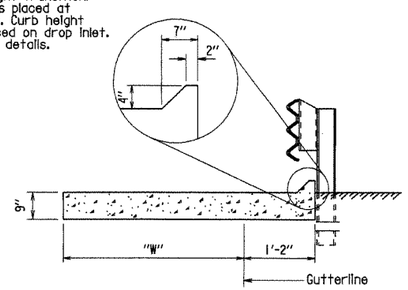


SECTION A - A

*Slab Depth Varies - See Span and Bent Details

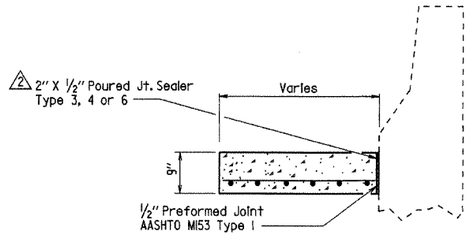
① Construct gutter curb with height-transition as shown if drop inlet is not placed at end of gutter.

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 C - C

N.T.S.



SECTION B - B

N.T.S.

***BAR LIST ②
TYPE B GUTTER

Mark	No. Required for Width "W"				Length	Square or Skewed
	3'-0"	4'-0"	6'-0"	8'-0"		
G401 - G405	1 each	1 each	1 each	1 each	"W" - 3" to "W" + 3"	Square
G406	1	1	1	1	"W" + 3"	Square
G407	12	12	12	12	"W" + 10"	Square
G408	13	13	13	13	"W" + 10"	Skewed
G409	1	1	1	1	"W" + 3"	Skewed
G410	8	8	8	8	*	Skewed
G501	6	8	12	16	26'-8"	Square
G502	1	1	1	1	22'-2"	Square
G503	1	1	1	1	17'-8"	Square
G504	1	1	1	1	*	Skewed
G505	1	1	1	1	*	Skewed
G506-G5__**	1 each	1 each	1 each	1 each	*	Skewed

*Bar Lengths vary with Skew,

**G512 for "W" = 3'
G514 for "W" = 4'
G518 for "W" = 6'
G522 for "W" = 8'

***Special bar list required when skew angle exceeds 40° for W = 8'; 50° for W = 6'; or 60° for W = 4'.

QUANTITIES FOR ONE SQUARE APPROACH GUTTER

"W" Width (ft.)	Reinforcing Steel (lbs.)	Concrete (cubic yards)
3	252	3.00
4	319	3.75
6	459	5.25
8	590	6.75

GENERAL NOTES

Concrete shall be Class S or Class S(AE) or mixture used for Portland Cement Concrete Pavement.

Reinforcement Steel shall conform to AASHTO M31 or M53, Grade 60 (fy = 60,000 psi).

Approach Gutters will be measured and paid for in accordance with Section 504 of the Standard Specifications.

1 Revised and redrawn 4-10-2003. By KDH Ck. By: CJF 4-10-2003

2 Added joint sealer type & revised transition rail length 07-14-2010 by MJT Checked by: CJF 07-14-2010

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4337
CHARLES P. BRAND

BRIDGE ENGINEER

DETAILS OF STANDARD TYPE B APPROACH GUTTERS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 4-10-2003 FILENAME: B2016B.STD
CHECKED BY: CJF DATE: 4-10-2003 SCALE: 3/8" = 1'-0"
DESIGNED BY: STD DATE:

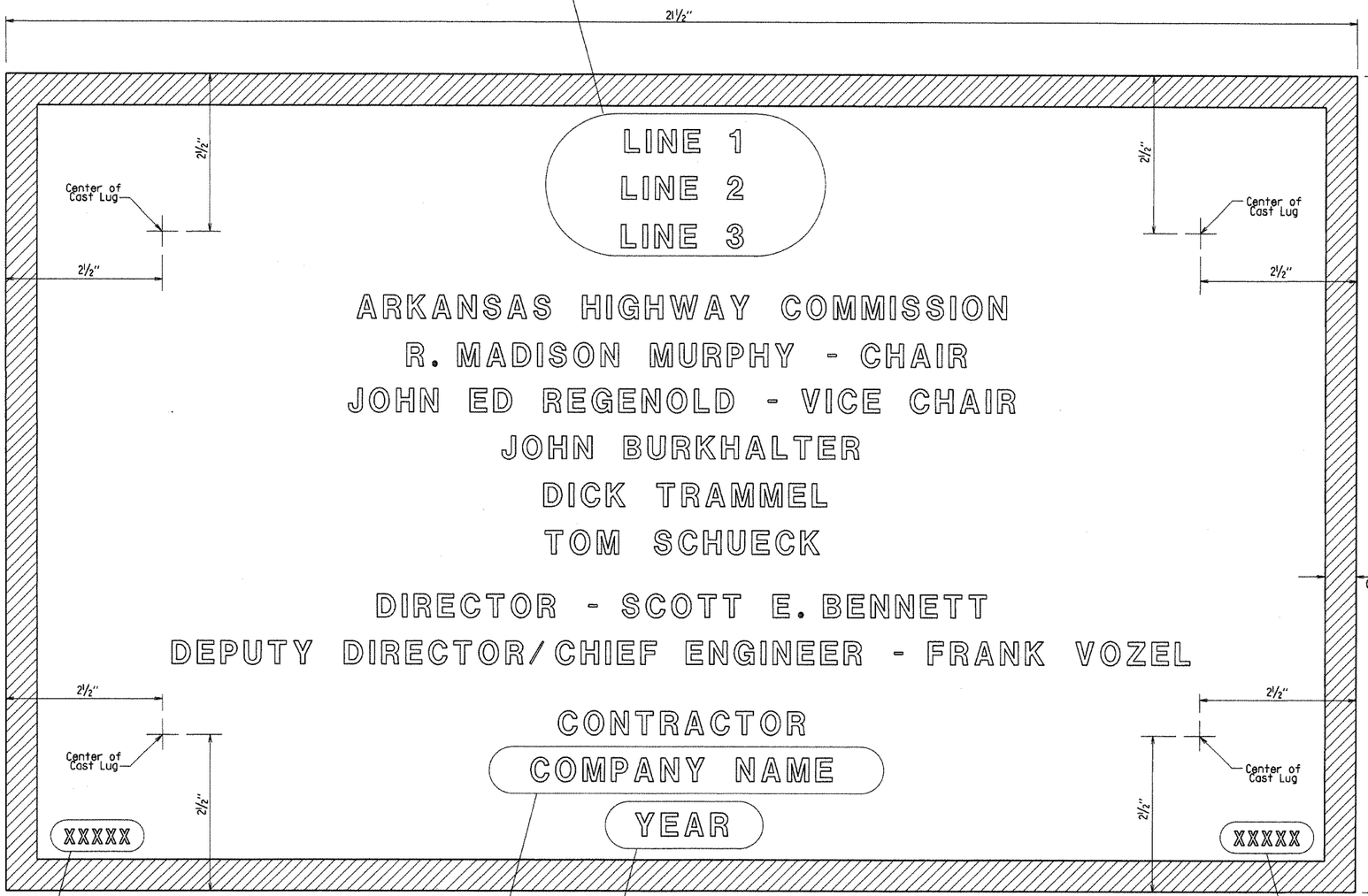
BRIDGE NO. DRAWING NO. 2016B

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
9-8-11				6	ARK.		55	
				JOB NO.				

① NAME PLATE 2387

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	



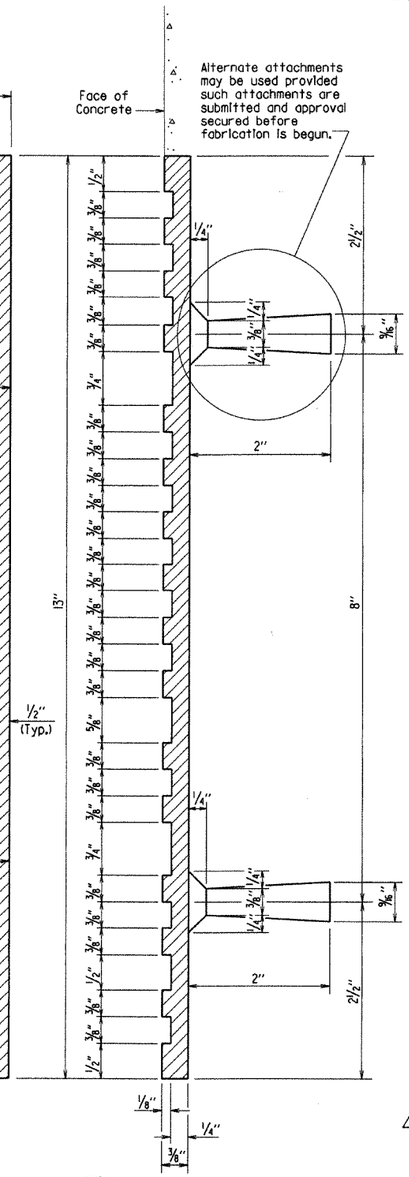
Place the design live loading here using 1/8" raised letters and numerals 1/4" high. Examples : HS 20
HL-93

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

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 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, (2003 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 of the Standard Specifications.

Body of plate shall be 1/4" thick and shall include four tapering cone lugs 3/8" to 5/16" x 2" long. The border and all lettering shall be raised 1/8" above the face of plate and shall be polished.

All lettering shall be plain gothic, square cut and not tapered. The number of plates required and the location and name on the plate for each bridge shall be as designated on the plans.

⚠ Revised and Redrawn 9-8-11 KDH Checked By: CRE

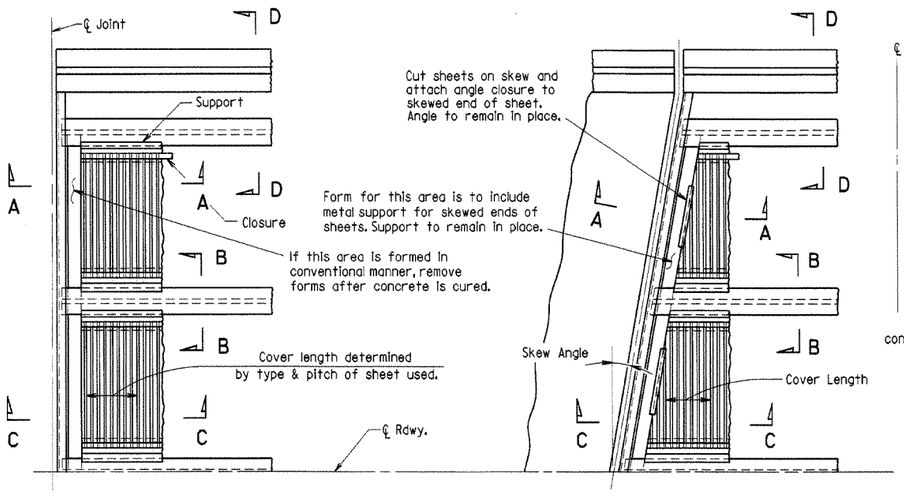
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7510
CARL J. FUSELIER
BRIDGE ENGINEER

DETAILS OF STANDARD TYPE D
BRIDGE NAME PLATE
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 9-8-11
CHECKED BY: CRE DATE: 9-8-11
DESIGNED BY: STD. DATE: —
FILENAME: B2387.STD
SCALE: 1'-0" = 1'-0" OR AS NOTED
BRIDGE NO.
DRAWING NO. 2387

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
11-27-96						6	ARK.		56	
04-10-2003						JOB NO.				

① BR. DECK FORMS 14991

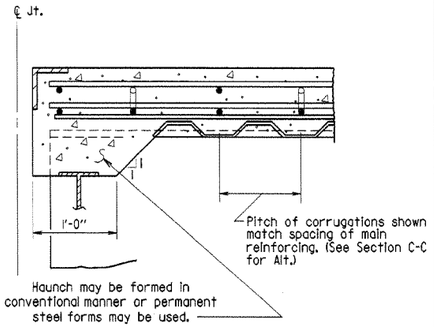


PART PLAN - SQUARE SPAN

3/8" = 1'-0"

PART PLAN - SKEWED SPAN

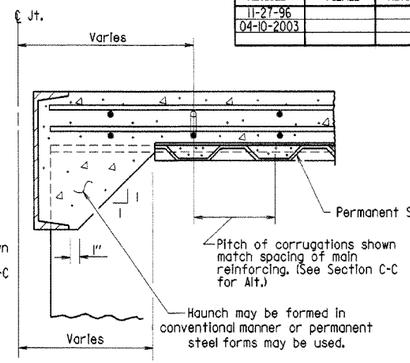
3/8" = 1'-0"



SECTION A-A

N.T.S.

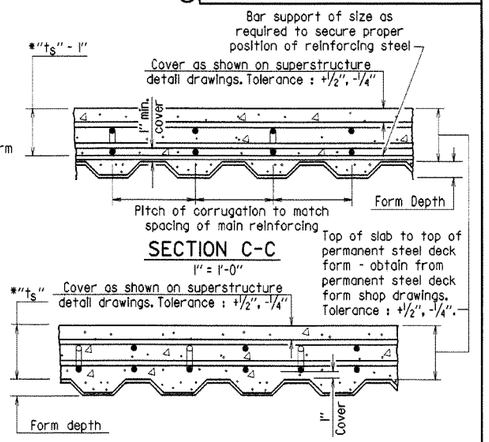
(Angle at end of span)



SECTION A-A

N.T.S.

(Channel at end of span)



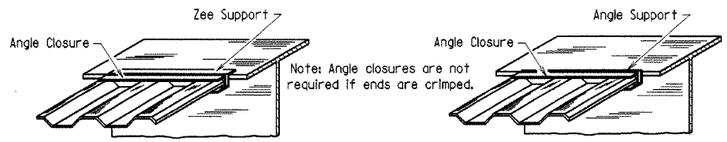
SECTION C-C

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) of the Standard Specifications. Detailed plans, including detailed calculations and manufacturer's technical brochure, shall be submitted to and approved by the Bridge 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 Bridge Engineer.

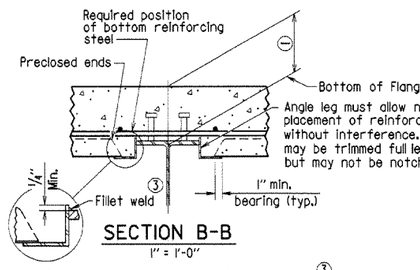
Form sheets shall be fastened to supporting members and to each other with galvanized metal screws sufficient in size and number to provide a secure attachment. Alternate methods of attachment must be approved by the Bridge Engineer.

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.

⚠2 Specifications: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2003 Edition), with applicable supplemental specifications and special provisions.

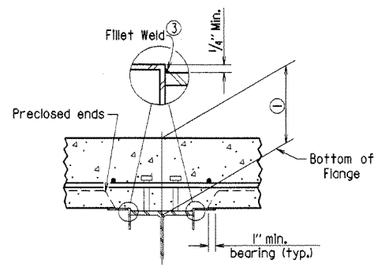


SECTION B-B

1" = 1'-0"

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

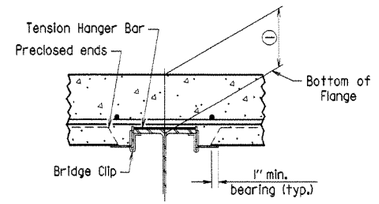
③ Minimum weld: 1/8" x 1" @ 18". More weld may be required; maximum length per weld = 1 1/2" (typ.)



SECTION B-B

1" = 1'-0"

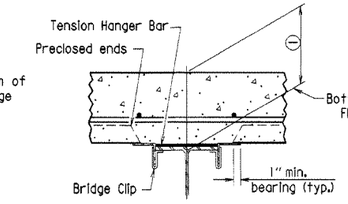
(Showing permissible support for tension flange where shear connectors are used and for all compression flanges)



SECTION B-B

1" = 1'-0"

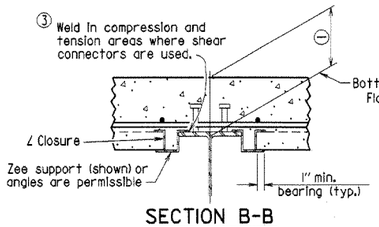
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

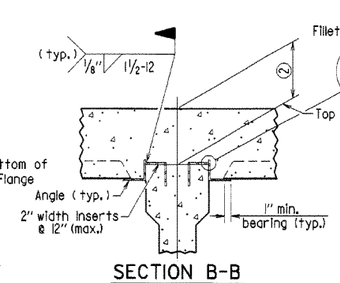
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

(Showing ∠ Closure)

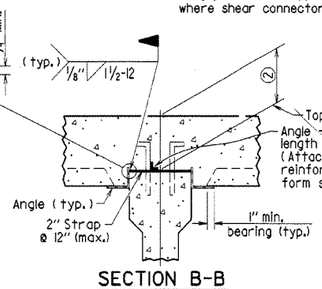


SECTION B-B

(FOR CONCRETE GIRDERS)

1" = 1'-0"

(Showing support by insert cast in girder)

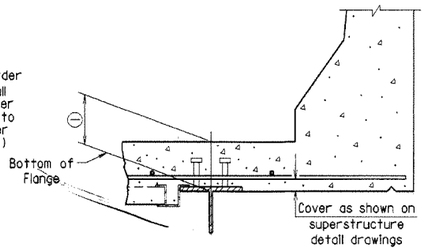


SECTION B-B

(FOR CONCRETE GIRDERS)

1" = 1'-0"

(Showing support by Strap)



SECTION D-D

1" = 1'-0"

Note: Only Bottom Reinforcing is shown.

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

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

⚠1 Redrawn and revised 11/27/96; MJT

⚠2 Revised for 2003 AHTD Construction Specifications and CPB Seal. MJT 04-10-2003
Chk'd. By: CJF 04-10-2003

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4537
CHARLES P. BRAND

BRIDGE ENGINEER

DETAILS OF PERMISSIBLE TYPE PERMANENT STEEL BRIDGE DECK FORMS FOR STEEL & CONCRETE GIRDER SPANS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: MJT DATE: 10-17-96

CHECKED BY: CPB DATE: 10-17-96

DESIGNED BY: STD. DATE: —

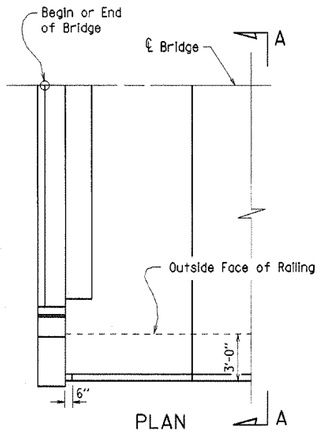
SCALE: as noted

BRIDGE NO. DRAWING NO. 14991

B14991.STD

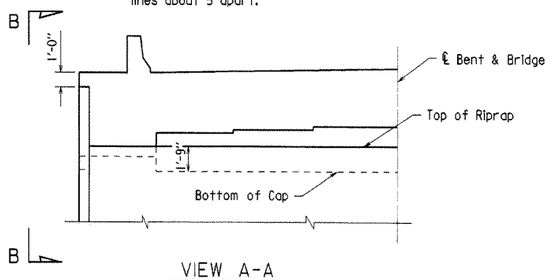
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
04-10-2003				6	ARK.		57	
				JOB NO.				

1 RIPRAP & PILE - 14995A

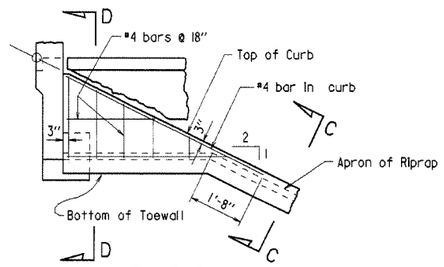


PLAN

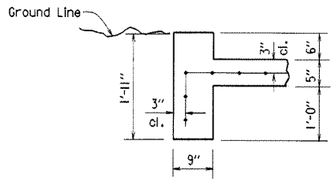
Note:
Sloped surfaces of concrete riprap to be marked off into blocks (construction joints optional) with an approved grooving tool, spacing the grooved lines about 5' apart.



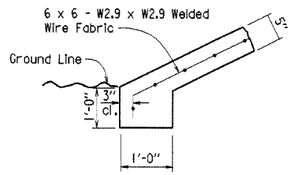
VIEW A-A



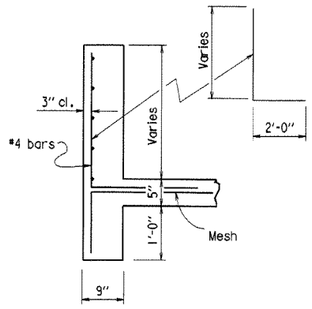
VIEW B-B



SECTION C-C

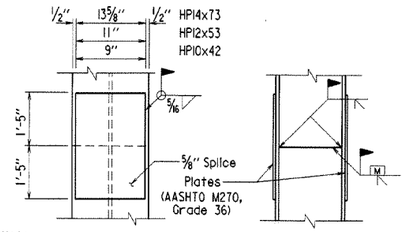


TOE WALL



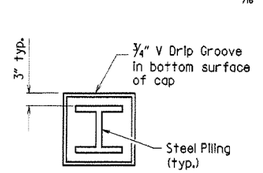
SECTION D-D

DETAILS OF CONCRETE RIPRAP

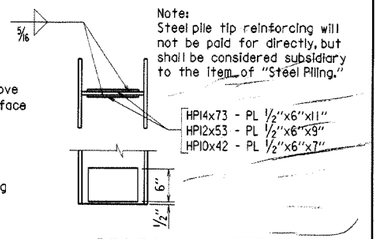


Note:
The contractor may for his own convenience and at this own expense provide as many as three splices per pile for steel bearing piling. Minimum spacing between splices shall be 5 ft.

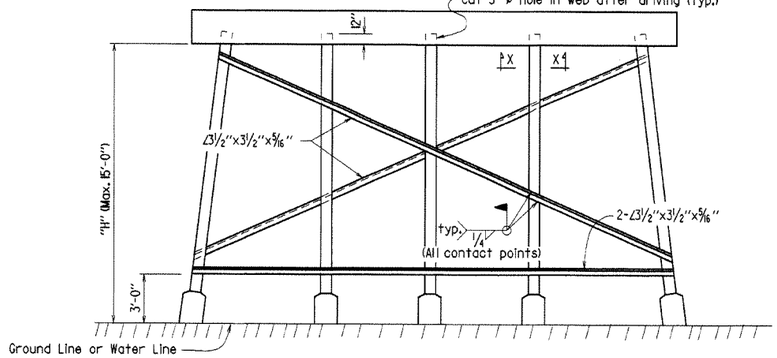
PILE SPLICE DETAIL
Scale : 1" = 1'-0"



VIEW X-X



REINFORCING DETAIL FOR STEEL PILE TIP
Scale : 1" = 1'-0"



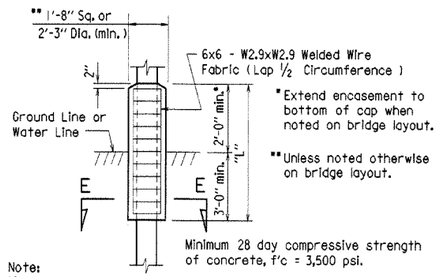
Note:
All bracing shall be cut and welded in the field. Each brace shall be furnished in one piece. Payment shall be made under Item 807.

Omit bottom bracing where "H" is less than 10 ft. Omit all bracing where "H" is less than 5 ft.

Note:
Where required by the bridge layout sheet, pile encasements shall be constructed.

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

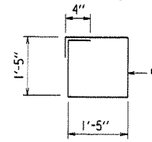
TYPICAL BRACING FOR INT. STEEL PILE BENTS

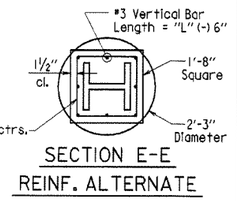


Note:
If concrete cannot be placed in the dry, seal concrete may be deposited under water. Concrete & welded wire fabric or reinforcing in encasements shall be paid for at the contract unit price per linear foot bid for "Pile Encasement."

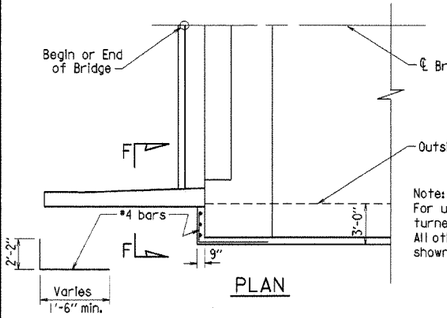
PILE ENCASEMENT DETAIL

Reinforcing Alternate
#3 Vertical - 8 per encasement
#3 ties @ 12" ctrs.
Yield Strength , fy = 60,000 psi.



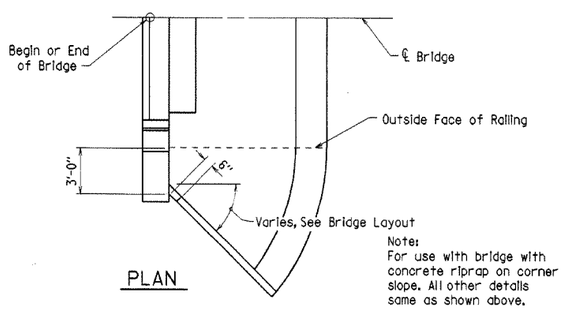


SECTION E-E
REINF. ALTERNATE



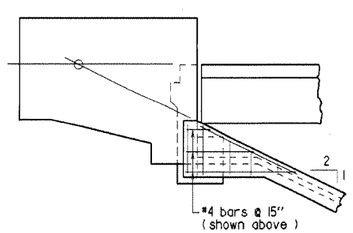
PLAN

Note:
For use on bridges with turned back wings. All other details same as shown above.

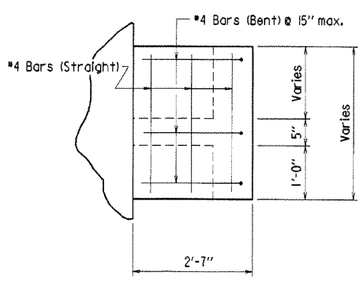


PLAN

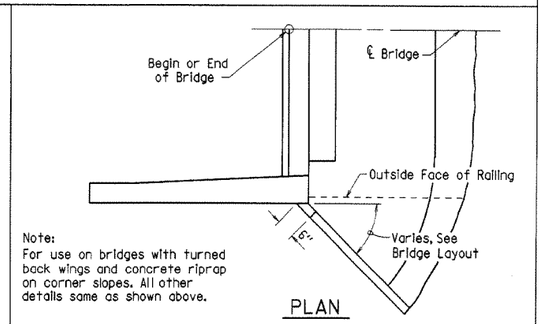
Note:
For use with bridge with concrete riprap on corner slope. All other details same as shown above.



ELEVATION



SECTION F-F



PLAN

Note:
For use on bridges with turned back wings and concrete riprap on corner slopes. All other details same as shown above.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4337
CHARLES P. BRAND

BRIDGE ENGINEER

⚠1 Revised and redrawn MJT 04-10-2003
Chk'd. By: CJF 04-10-2003

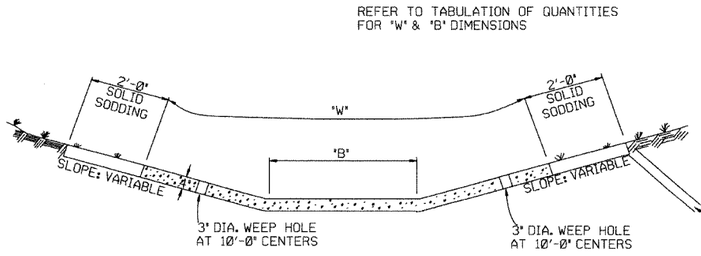
DETAILS OF CONCRETE RIPRAP
AND MISC. DETAILS OF STEEL PILING

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

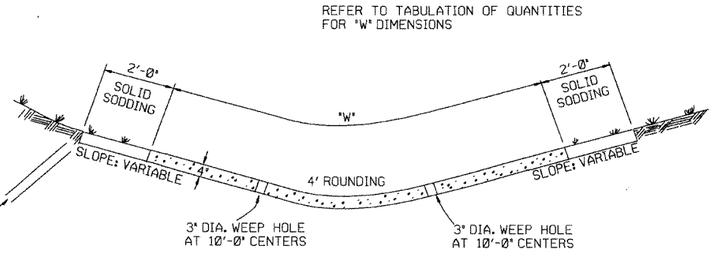
LITTLE ROCK, ARK.

DRAWN BY: MJT DATE: 04-10-2003 FILENAME: BI4995A.STD
CHECKED BY: CJF DATE: 04-10-2003 SCALE: No Scale or As Noted
DESIGNED BY: STD. DATE: —
BRIDGE NO. DRAWING NO. 14995A



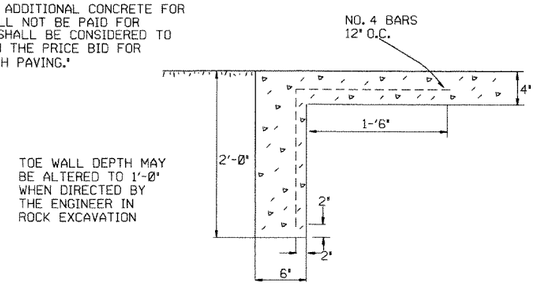
TYPE A

EXCAVATE TO NEAT LINES TO CONSTRUCT DITCH PAVING AND SOLID SODDING.



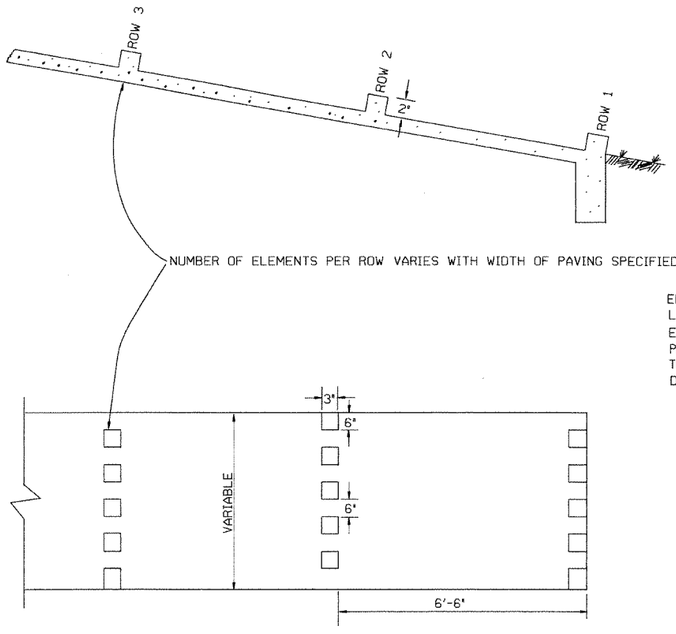
TYPE B

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.

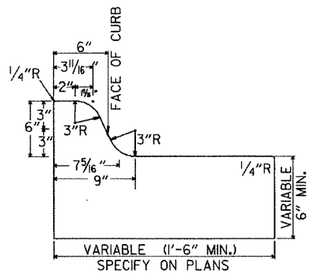
1" WIDE TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE DITCH PAVING AT 45' INTERVALS. THE SPACE SHALL BE FILLED WITH APPROVED JOINT FILLER COMPLYING WITH AASHTO M213.

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	653-7-15-88
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

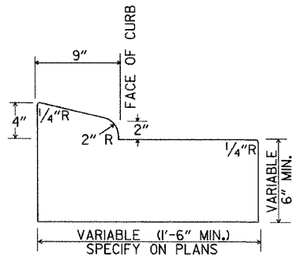
ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE DITCH PAVING

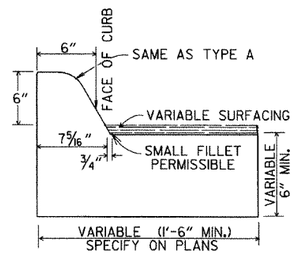
STANDARD DRAWING CDP-1



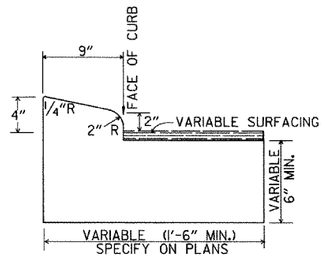
TYPE A



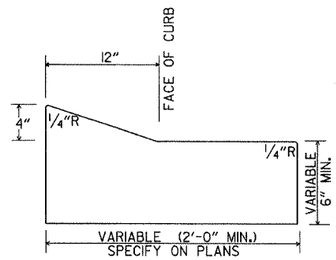
TYPE B-1



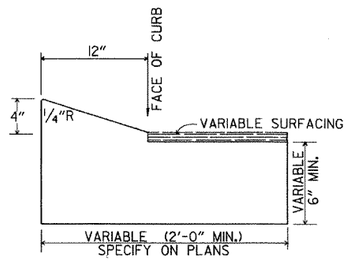
TYPE C



TYPE B-2

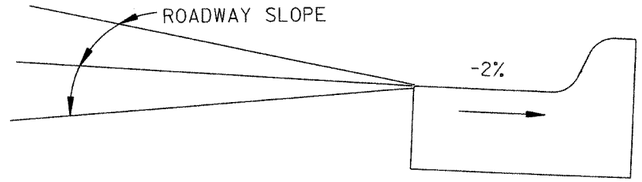


TYPE E-1



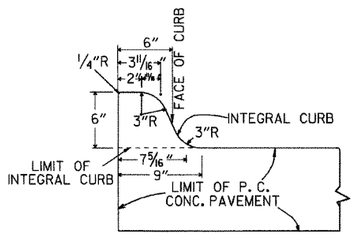
TYPE E-2

CONCRETE COMBINATION CURB AND GUTTER

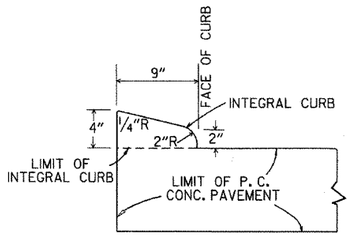


DETAIL OF GUTTER SLOPE

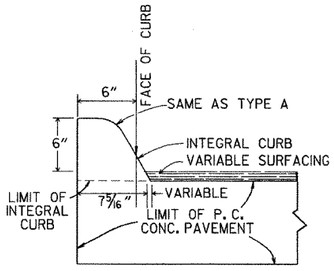
GUTTER SHALL BE CONSTRUCTED ON 2% SLOPE AWAY FROM ROADWAY, REGARDLESS OF ROADWAY SLOPE.



TYPE A

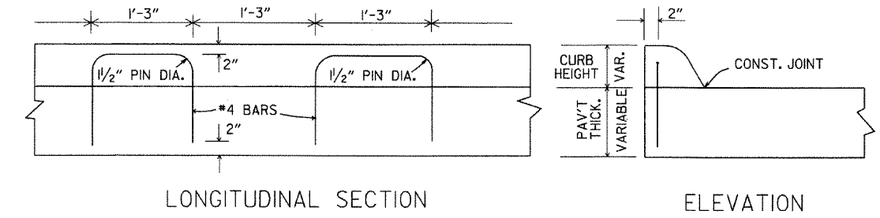


TYPE B

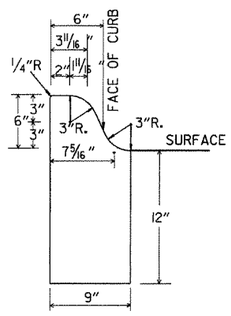


TYPE C

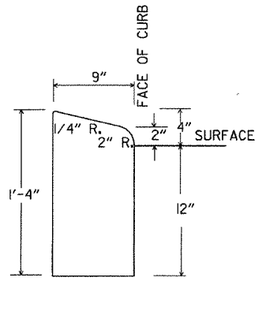
INTEGRAL CURB



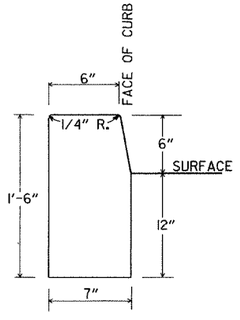
ALTERNATE CONSTRUCTION METHOD FOR INTEGRAL CURB



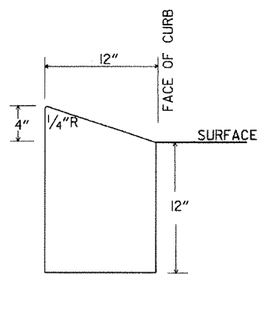
TYPE A



TYPE B

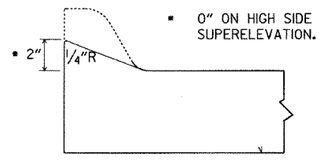


TYPE D



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.

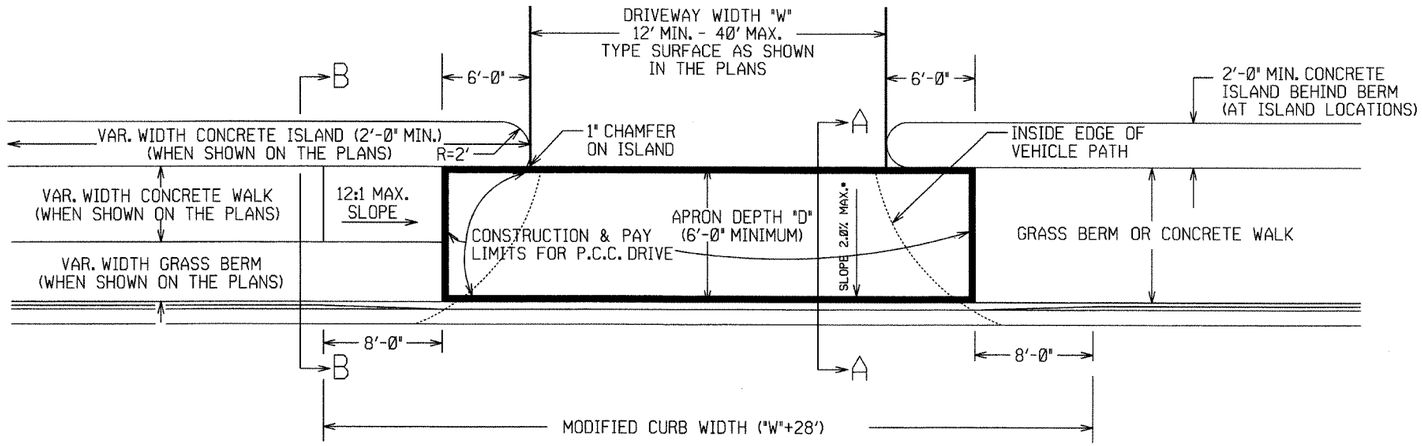
DETAILS OF MODIFIED CURB

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 1	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

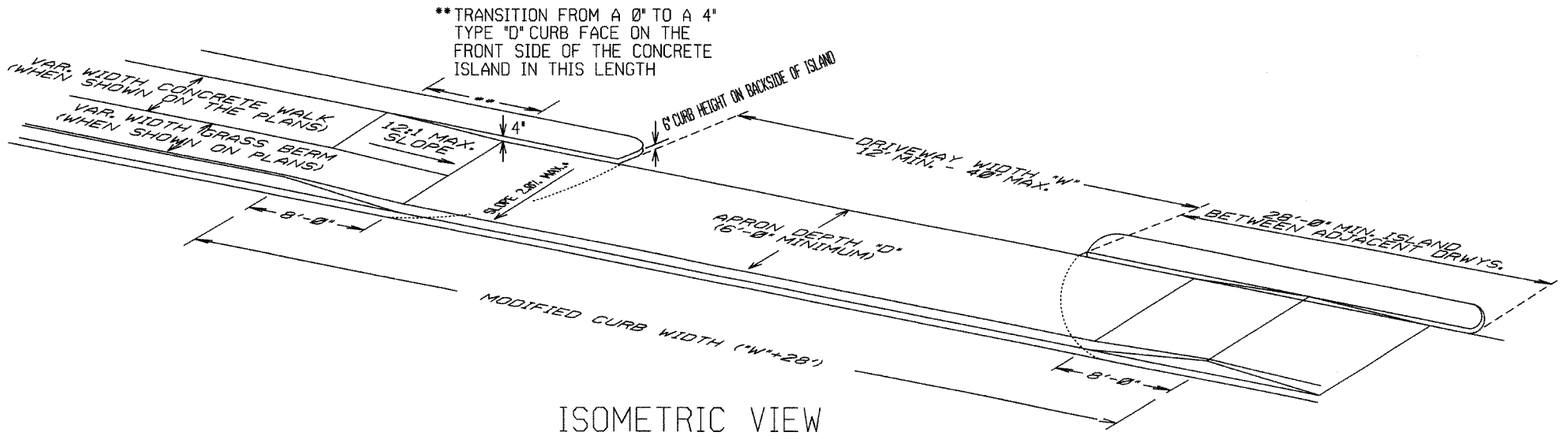
ARKANSAS STATE HIGHWAY COMMISSION

CURBING DETAILS

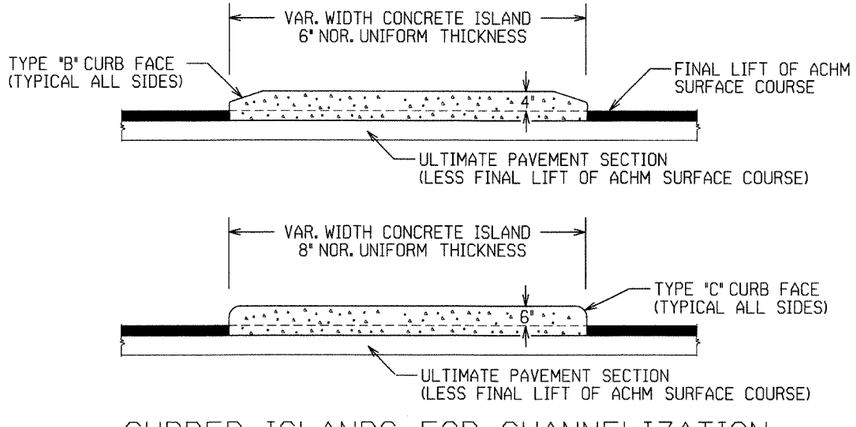
STANDARD DRAWING CG-1



PLAN VIEW

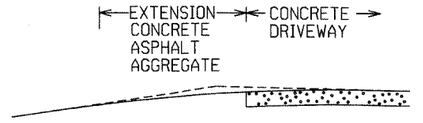


ISOMETRIC VIEW



CURBED ISLANDS FOR CHANNELIZATION

REFER TO PLANS FOR TYPE OF CURB FACE TO BE USED. NO DIRECT PAYMENT WILL BE MADE FOR THE CURB FACES SHOWN ON THE ISLAND DETAILS. PAYMENT FOR THE CURB FACE WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE ITEM "CONCRETE ISLAND".



EXTENSION TYPICAL SECTIONS

1: CONCRETE - 6" P.C. CONCRETE DRIVEWAY

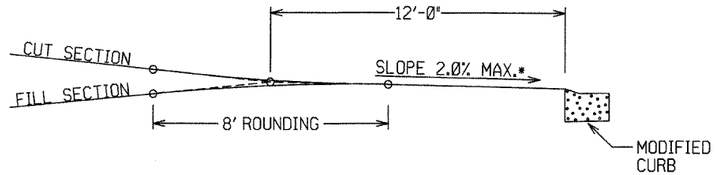
2: ASPHALT - 2" ACHM SURFACE COURSE (1/2")
4" ACHM BINDER COURSE.(1") OR
4" ACHM BASE COURSE (1-1/2")

3: ASPHALT - 2" ACHM SURFACE COURSE (1/2")
7" AGGREGATE BASE COURSE

4: AGGREGATE - 6" AGGREGATE BASE COURSE

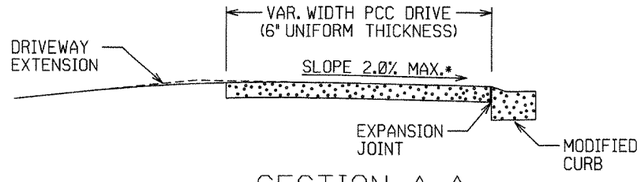
THE TYPE OF EXTENSION SHALL BE AS SHOWN IN THE PLANS. THE CONTRACTOR MAY, WITH THE APPROVAL OF THE ENGINEER, SUBSTITUTE A LOWER NUMBERED TYPE OF EXTENSION IN LIEU OF THE TYPE SPECIFIED IN THE PLANS, BUT AT NO ADDITIONAL COST TO THE DEPARTMENT.

DRIVEWAY EXTENSION DETAILS

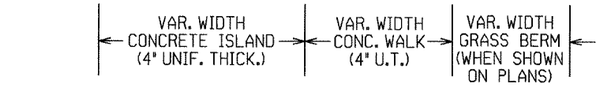


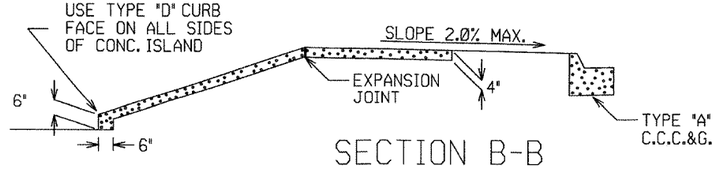
DRIVEWAY VERTICAL ALIGNMENT DETAILS

* NOTE: DRIVEWAYS MAY NOT BE SLOPED AWAY FROM THE ROADWAY UNLESS APPROVED BY THE ENGINEER.



SECTION A-A

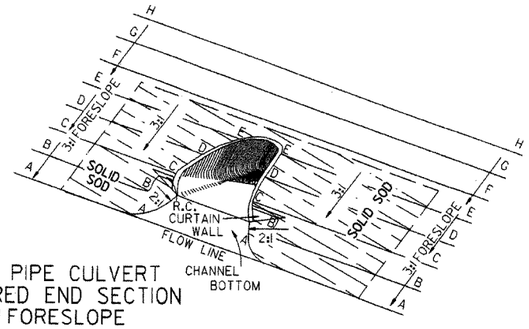




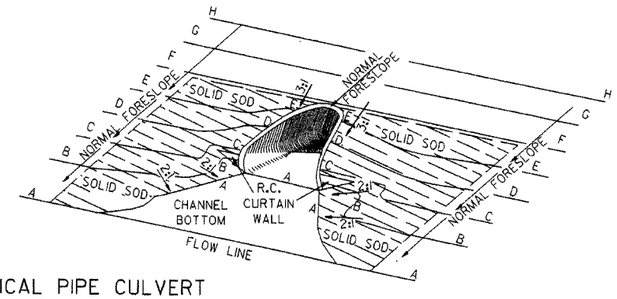
SECTION B-B
CURBED ISLAND BEHIND WALK

DATE REV	DATE FILMED	DESCRIPTION
11-29-07		ADDED CHANNELIZATION ISLAND WITH TYPE C CURB FACE & REVISED DRIVEWAY SLOPE NOTE & VERTICAL ALIGNMENT DETAIL
11-10-05		REV. APRON SLOPE & DEPTH OF AGG. BASE.
8-22-02		ADDED ISLAND DETAILS & NOTES
3-30-00		REV. MOD. CURB WIDTH & TRANS. NOTE
11-19-98		REVISED NOTES
11-18-98		REDRAWN AND REISSUED

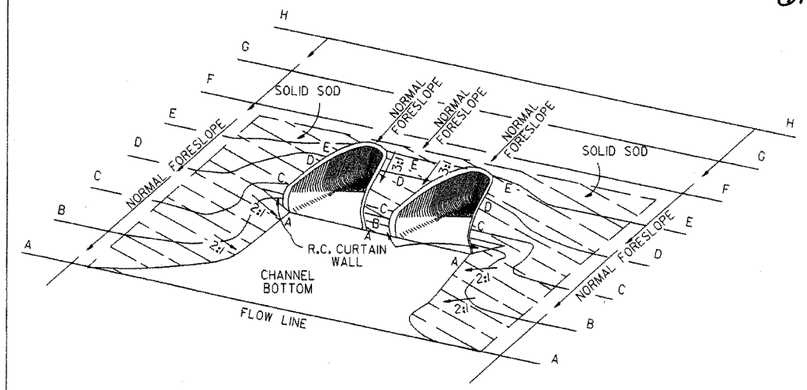
ARKANSAS STATE HIGHWAY COMMISSION
DETAILS OF DRIVEWAYS & ISLANDS
STANDARD DRAWING DR-1



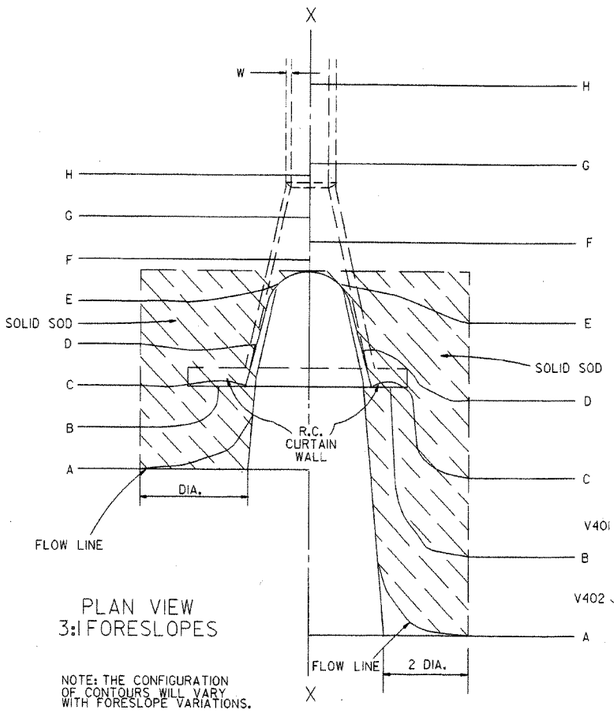
TYPICAL PIPE CULVERT
WITH FLARED END SECTION
& 3:1 FORESLOPE



TYPICAL PIPE CULVERT
WITH FLARED END SECTION
& FLATTENED ADJACENT SLOPES



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



PLAN VIEW
3:1 FORESLOPES

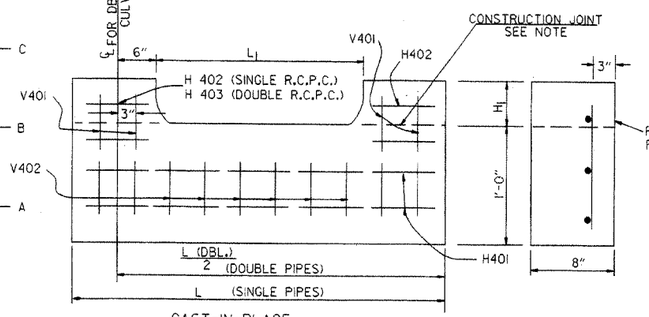
NOTE: THE CONFIGURATION OF CONTOURS WILL VARY WITH FORESLOPE VARIATIONS.

PLAN VIEW
FLATTENED FORESLOPES

R.C. CURTAIN WALL
DIMENSIONS & QUANTITIES

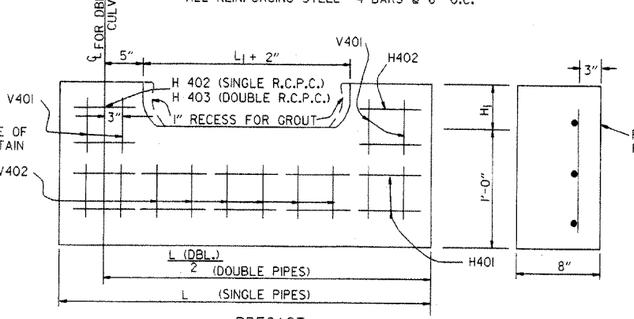
PIPE DIA.	H_1	L_1	L	L (DBL.)/2	SINGLE R.C.P.C.		DOUBLE R.C.P.C.	
					CONC.	REINF. STEEL	CONC.	REINF. STEEL
					CU. YDS.	LBS.	CU. YDS.	LBS.
18"	1'-1½"	3'-5"	8'-0"	6'-3"	0.31	27.7	0.45	39.5
24"	1'-0½"	4'-6"	9'-6"	7'-6"	0.37	33.4	0.53	48.0
30"	1'-3½"	5'-7"	11'-0"	9'-0"	0.45	39.0	0.67	59.0
36"	1'-7"	6'-8"	13'-0"	10'-6"	0.58	52.6	0.83	73.9
42"	2'-1½"	7'-3"	15'-6"	12'-0"	0.82	77.1	1.10	100.7
48"	2'-5"	7'-10"	17'-0"	13'-0"	0.98	94.9	1.27	120.4
54"	2'-9½"	8'-5"	18'-6"	14'-0"	1.16	115.8	1.47	143.7
60"	3'-4"	9'-0"	20'-6"	15'-6"	1.47	149.7	1.84	180.3
72"	4'-5"	10'-2"	25'-6"	18'-6"	2.31	232.6	2.73	271.0

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



CAST-IN-PLACE

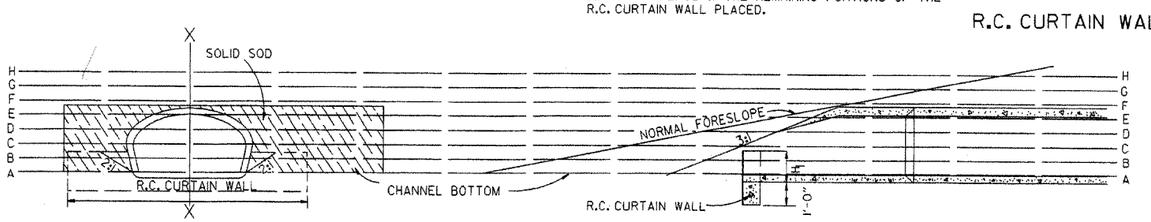
NOTE: THE PORTION OF THE R.C. CURTAIN WALL BENEATH THE FLARED END SECTION (LOWER 1'-0") SHALL BE PLACED MONOLITHICALLY. THE FLARED END SECTION SHALL THEN BE SET IN PLACE & THE REMAINING PORTIONS OF THE R.C. CURTAIN WALL PLACED.



PRECAST

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

R.C. CURTAIN WALL DETAILS



END VIEW

SECTIONAL VIEW "X-X"

REINFORCING STEEL SCHEDULE

PIPE DIA.	SINGLE R.C. PIPE CULVERT								DOUBLE R.C. PIPE CULVERT											
	H401		H402		V401		V402		H401		H402		H403		V401		V402	
	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.
18"	7'-8"	2	1'-11½"	4	1'-7½"	8	8"	8	12'-2"	2	1'-11½"	4	8"	2	1'-7½"	10	8"	14
24"	9'-2"	2	2'-2"	4	1'-8½"	10	8"	9	14'-8"	2	2'-2"	4	8"	2	1'-8½"	12	8"	18
30"	10'-8"	2	2'-4½"	4	1'-11½"	10	8"	12	17'-8"	2	2'-4½"	4	8"	2	1'-11½"	14	8"	22
36"	12'-8"	2	2'-10"	6	2'-3"	12	8"	14	20'-8"	2	2'-10"	6	8"	3	2'-3"	14	8"	28
42"	15'-2"	2	3'-9½"	8	2'-9½"	16	8"	15	23'-8"	2	3'-9½"	8	8"	4	2'-9½"	18	8"	30
48"	16'-8"	2	4'-3"	10	3'-1"	18	8"	16	25'-8"	2	4'-3"	10	8"	5	3'-1"	20	8"	32
54"	18'-2"	2	4'-8½"	12	3'-5½"	20	8"	17	27'-8"	2	4'-9"	12	8"	6	3'-5½"	22	8"	34
60"	20'-2"	2	5'-5"	14	4'-0"	24	8"	18	30'-8"	2	5'-5"	14	8"	7	4'-0"	26	8"	36
72"	25'-2"	2	7'-4"	18	5'-1"	30	8"	20	36'-8"	2	7'-4"	18	8"	9	5'-1"	33	8"	40

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

SOLID SODDING

PIPE DIA.	SINGLE R.C.P.C.			DOUBLE R.C.P.C.		
	3:1	4:1	6:1	3:1	4:1	6:1
	SQ. YDS.			SQ. YDS.		
18"	5	7	12	6	8	13
24"	8	12	19	9	13	20
30"	13	18	29	14	19	30
36"	17	26	41	18	28	43
42"	23	35	55	25	37	57
48"	29	46	68	31	48	70
54"	36	57	85	37	59	87
60"	45	62	104	48	65	107
72"	64	92	156	67	95	159

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

GENERAL NOTES

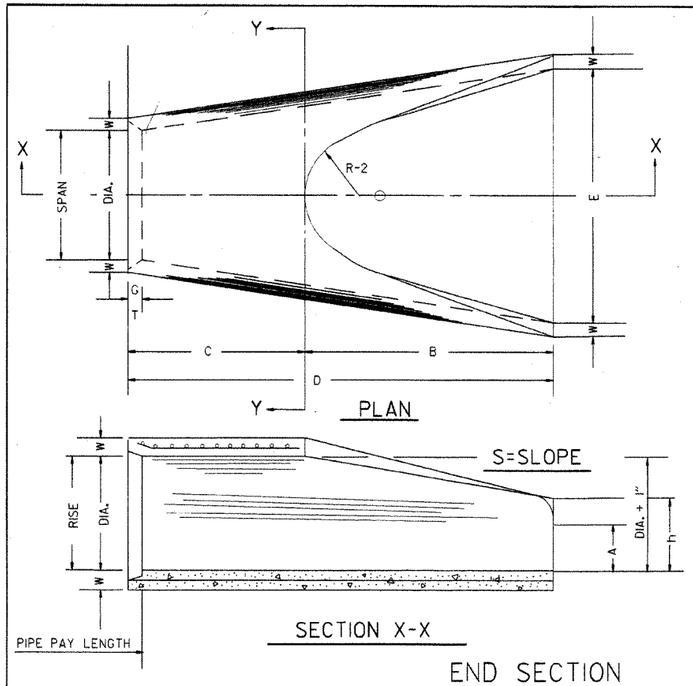
1. A CAST-IN-PLACE OR PRECAST CURTAIN WALL MAY BE USED. PAYMENT FOR THE CURTAIN WALL SHALL BE CONSIDERED TO BE INCLUDED IN THE UNIT PRICE BID EACH FOR FLARED END SECTIONS OF THE SEVERAL SIZES, WHICH PRICE SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIALS INCLUDING REINFORCING STEEL AND CONCRETE: FOR FORMS, MIXING AND PLACING; FOR EXCAVATION AND BACKFILL, AND FOR ALL LABOR, TOOLS, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.
2. ALL EXPOSED EDGES SHALL BE CHAMFERED ¾".
3. CONCRETE FOR CURTAIN WALL SHALL MEET THE REQUIREMENTS FOR CLASS A OR S CONCRETE AS PROVIDED IN SECTION 802 OF THE STANDARD SPECIFICATIONS OR FOR PAVING CONCRETE AS PROVIDED IN SECTION 501 OF THE STANDARD SPECIFICATIONS.
4. WELDED WIRE MESH 3 x 3 W/10 x W10 MAY BE USED IN LIEU OF REINFORCING BARS.

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

ARKANSAS STATE HIGHWAY COMMISSION

FLARED END SECTION

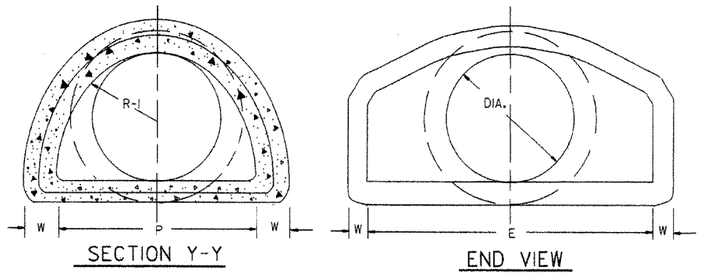
STANDARD DRAWING FES-1



END SECTION FOR REINFORCED CONCRETE PIPE CULVERTS

TABLE OF DIMENSIONS

DIA.	WALL	A	B	C	D	E	S	DIA. + 1"	P	R-1	R-2	G-T	WT.	h
18"	2½"	9"	2'-3"	3'-10"	6'-1"	3'-0"	3:1	19"	29"	15½"	12"	2"	1000	1'-0½"
24"	3"	9½"	3'-7½"	2'-6"	6'-1½"	4'-0"	3:1	25"	33⅜"	16Ⅼ⅛"	14"	2½"	1600	1'-1½"
30"	3½"	1'-0"	4'-6"	1'-7¾"	6'-1¾"	5'-0"	3:1	31"	37"	18½"	15"	3¼"	1940	1'-4⅝"
36"	4"	1'-3"	5'-3"	2'-10¾"	8'-1¾"	6'-0"	3:1	37"	47Ⅼ⅛"	24⅜"	20"	3½"	4100	1'-8"
42"	4½"	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"	3:1	43"	53⅜"	27½"	22"	3½"	5380	2'-2½"
48"	5"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	3:1	49"	56½"	28½"	22"	3½"	6550	2'-6"
54"	5½"	2'-4"	6'-6"	1'-10"	8'-4"	7'-6"	3:1	55"	65½"	33⅛"	24"	4"	8750	2'-10½"
60"	6"	2'-10"	6'-6"	1'-10"	8'-4"	8'-0"	3:1	61"	72½"	36Ⅼ⅛"	24"	4"	9270	3'-5"
72"	7"	3'-10"	6'-6"	1'-10"	8'-4"	9'-0"	3:1	73"	77Ⅼ⅛"	38Ⅼ⅛"	24"	5"	13250	4'-6"

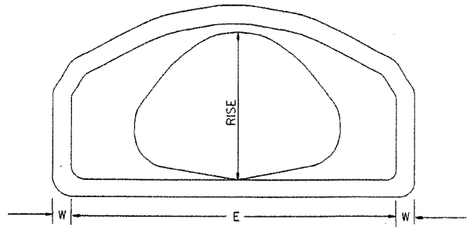


NOTE: TONGUE END ON UPSTREAM SECTION
GROOVE END ON DOWNSTREAM SECTION

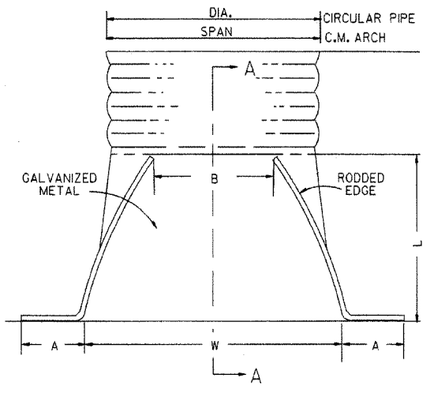
ARCH PIPE

EQUIV. DIA.	• SPAN AASHTO M 206	• SPAN AHD NOMINAL	• RISE AASHTO M 206	• RISE AHD NOMINAL	W	A	B	C	D	E	P	R2	G-T	S
	INCHES													
15	18	18	11	11	2"	4"	2'-0"	4'-0"	6'-0"	3'-0"	29"	12"	1½"	2½:1
18	22	22	13½	14	2½"	5"	2'-0"	4'-1"	6'-1"	3'-6"	32⅛"	13"	2½"	2½:1
21	26	26	15½	16	2¾"	7"	2'-3"	3'-10"	6'-1"	4'-0"	34⅛"	14"	2½"	2½:1
24	28½	29	18	18	3"	9"	2'-3"	3'-10"	6'-1"	5'-0"	36Ⅼ⅛"	15"	2½"	2½:1
30	36¼	36	22½	23	3½"	10"	3'-1"	3'-0½"	6'-1½"	6'-0"	47Ⅼ⅛"	20"	3"	2½:1
36	43¾	44	26⅜	27	4"	10½"	4'-0"	2'-1½"	6'-1½"	6'-6"	54Ⅼ⅛"	22"	3½"	2½:1
42	51⅛	51	31⅝	31	4½"	11½"	4'-7"	1-10¼"	6'-5¼"	7'-2"	59½"	23"	3¾"	2½:1
48	58½	59	36	36	5"	1'-3"	5'-3"	2'-10¾"	8'-1¾"	7'-10"	70⅝"	24"	4¼"	2½:1
54	65	65	40	40	5½"	1'-7"	5'-3"	2'-11"	8'-2"	8'-6"	72Ⅼ⅛"	24"	4¾"	2¼:1
60	73	73	45	45	6"	1'-10"	5'-6"	2'-8"	8'-2"	9'-0"	77Ⅼ⅛"	24"	5"	2¼:1

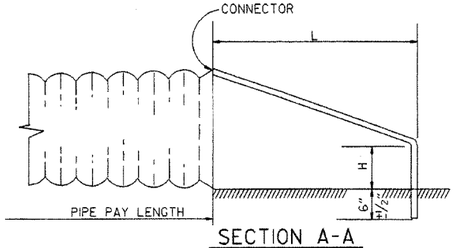
• THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PER CENT FROM THE VALUES SPECIFIED BY AASHTO M 206.



END VIEW
CONCRETE ARCH PIPE

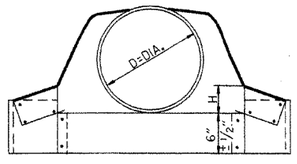


PLAN



SECTION A-A

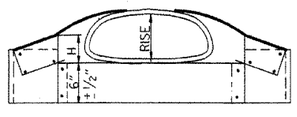
NOTE: ALTERNATE CONNECTIONS TO THE PIPE CULVERTS, IN ACCORDANCE WITH MANUFACTURER'S STANDARD PRACTICES, MAY BE MADE SUBJECT TO THE APPROVAL OF THE ENGINEER.



CIRCULAR PIPE

CIRCULAR PIPE

D. DIA.	GAUGE	A 1" ±	B MAX.	H 1" ±	L 1½" ±	W 2" ±	S
		INCHES					
12	16	6	6	6	21	24	2½:1
15	16	7	8	6	26	30	2½:1
18	16	8	10	6	31	36	2½:1
21	16	9	12	6	36	42	2½:1
24	16	10	13	6	41	48	2½:1
30	14	12	16	8	51	60	2½:1
36	14	14	19	9	60	72	2½:1
42	12	16	22	11	69	84	2½:1
48	12	18	27	12	78	90	2½:1
54	12	18	30	12	84	102	2:1
60	12	18	33	12	87	114	1¾:1
66	12	18	36	12	87	120	1½:1
72	12	18	39	12	87	126	1 1/3:1

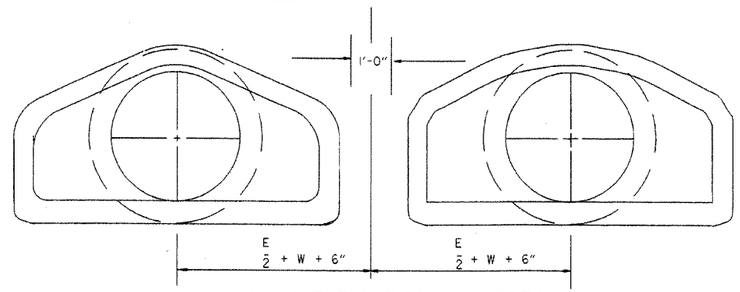


C.M. ARCH PIPE

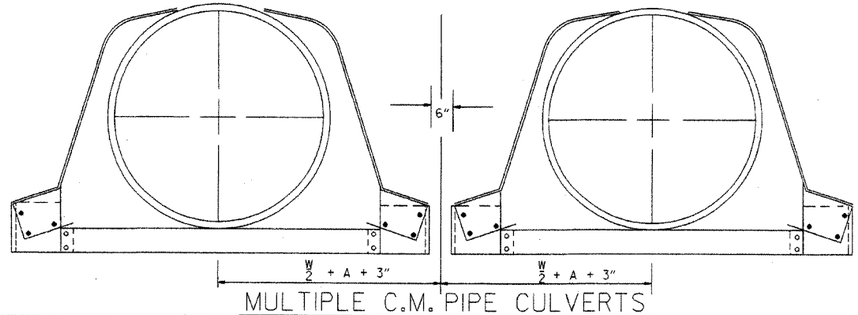
C.M. ARCH PIPE

EQUIV. DIA.	SPAN	RISE	A 1" ±	B MAX.	H 1" ±	L 1½" ±	W 2" ±	S	GAUGE
	INCHES								
15"	17	13	7	9	6	19	30	2½:1	16
18"	21	15	7	10	6	23	36	2½:1	16
21"	24	18	8	12	6	28	42	2½:1	16
24"	28	20	9	14	6	32	48	2½:1	16
30"	35	24	10	16	6	39	60	2½:1	14
36"	42	29	12	18	8	46	75	2½:1	14
42"	49	33	13	21	9	53	85	2½:1	12
48"	57	38	18	26	12	63	90	2½:1	12
54"	64	43	18	30	12	70	102	2¼:1	12
60"	71	47	18	33	12	77	114	2¼:1	12

END SECTIONS FOR CORRUGATED METAL PIPE CULVERTS



MULTIPLE R.C. PIPE CULVERTS



MULTIPLE C.M. PIPE CULVERTS

DATE	REVISION	FILMED
10-18-96	REVISED ASTM REF. TO AASHTO	10-18-96
5-15-80	REVISED DISTANCE BETWEEN MULTIPLE R.C.P. F.E.S.	664-5-15-80
7-14-78	C.M. ARCH SIZES TO CONFORM WITH AASHTO SIZES	752-7-14-78
8-22-75	ADDED MULTIPLE PIPE CULVERTS	517-8-22-75
12-5-74	REMOVED NOTE RE REINF. FOR R.C. F.E.S.	500-12-5-74
5-24-73	CMP END SECTION, SHOW PIPE PAY LENGTH	627-5-24-73
10-2-72	REVISED AND REDRAWN	760-10-2-72

ARKANSAS STATE HIGHWAY COMMISION

FLARED END SECTION

STANDARD DRAWING FES-2

stdfes2.dgn

4'-0" LENGTH DROP INLET — DROP INLET EXTENSION

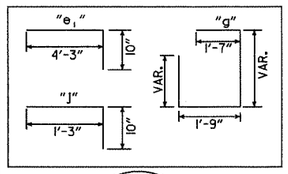
PIPE SIZE	MIN. WIDTH	HEIGHT 5'-0" CLASS A CONC. CU. YDS.	HEIGHT 5'-0" REINF. STEEL POUNDS	PLUS OR MINUS PER LIN. FT. OF HEIGHT CLASS A CONC. CU. YDS.	PLUS OR MINUS PER LIN. FT. OF HEIGHT REINF. STEEL POUNDS	4'-0" EXTENSION CLASS A CONC. CU. YDS.	4'-0" EXTENSION REINF. STEEL POUNDS	8'-0" EXTENSION CLASS A CONC. CU. YDS.	8'-0" EXTENSION REINF. STEEL POUNDS
18"	2'-6"	1.77	156	0.28	22	0.58	38	0.87	72
24"	2'-6"	1.79	156	0.28	22				
30"	3'-2"	2.39	205	0.30	26				
36"	3'-8"	2.63	236	0.32	28	DEDUCT FROM QUANTITY COMPUTED FOR EACH EXTENSION ADDED.			
42"	4'-4"	2.95	250	0.34	30				
48"	4'-10"	3.21	265	0.36	32				
						0.04	3		

NOTE: QUANTITIES ARE APPROXIMATE AND ARE SHOWN FOR BIDDER INFORMATION ONLY.

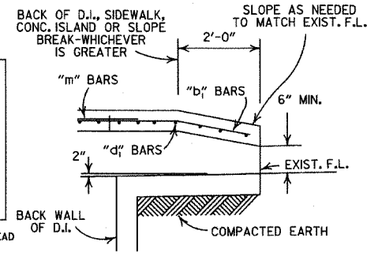
DEDUCT FROM QUANTITY COMPUTED FOR EACH PIPE ENTERING INLET

INSIDE DIA. PIPE	CLASS A CONC. CU. YDS.	REINF. STEEL POUNDS
INCHES		
18	0.05	2
24	0.09	3
30	0.13	4
42	0.24	8

BAR DIAGRAM



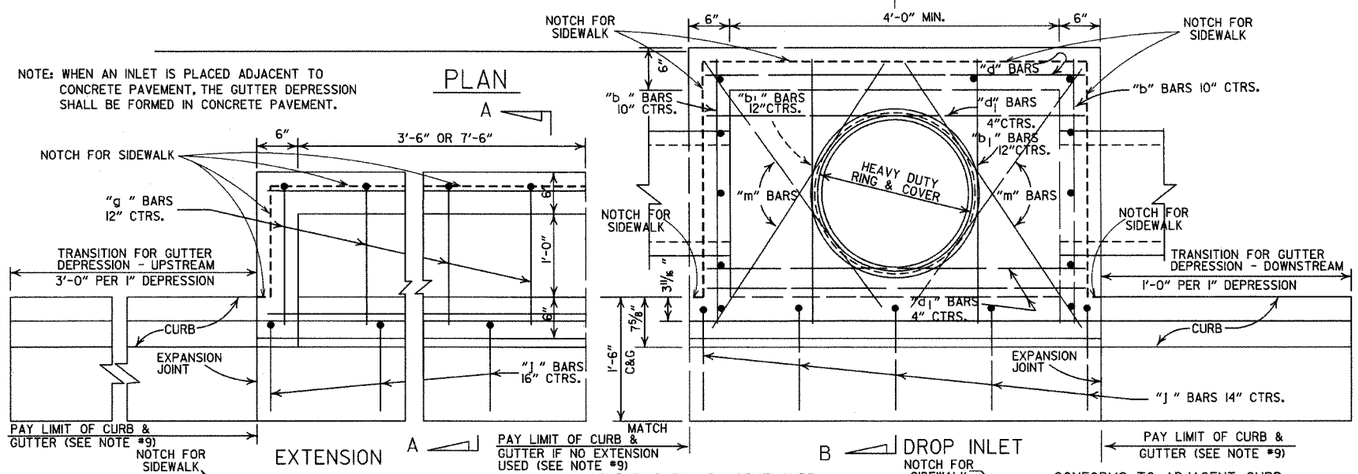
BACK OPENING



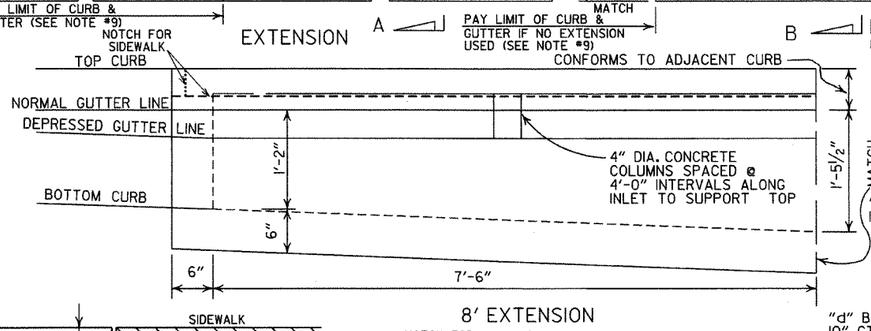
WHEN OPENING IN BACK IS CALLED FOR ON PLANS EXTEND OPENING AS SHOWN IN DETAIL. PAYMENT TO BE INCLUDED IN PRICE BID FOR DROP INLET (TYPE C).

PLAN

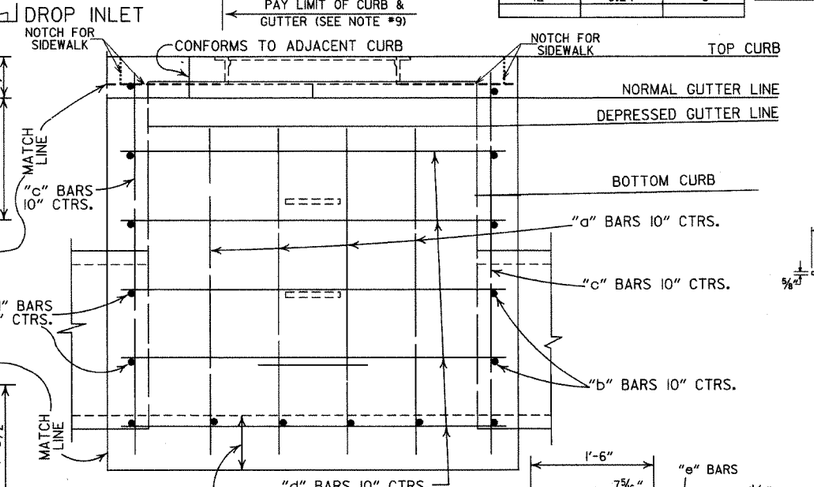
NOTE: WHEN AN INLET IS PLACED ADJACENT TO CONCRETE PAVEMENT, THE GUTTER DEPRESSION SHALL BE FORMED IN CONCRETE PAVEMENT.

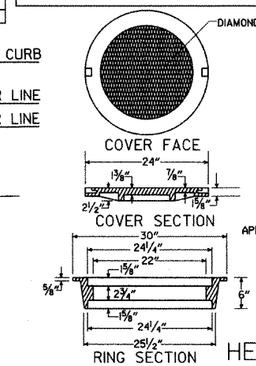


EXTENSION



DROP INLET



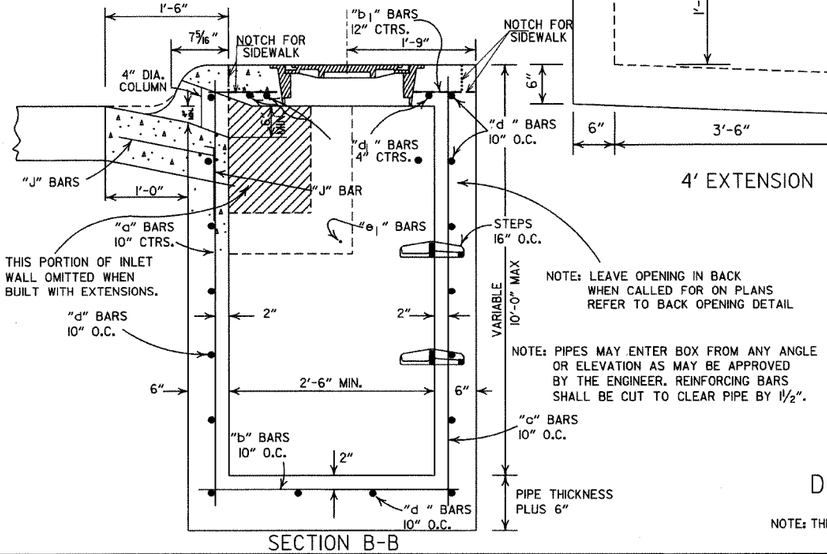


APPROXIMATE TOTAL WEIGHT = 333 LBS.

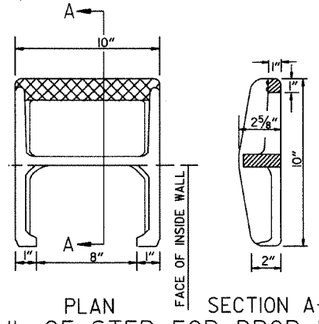
HEAVY DUTY RING & COVER

GENERAL NOTES:
1. ALL EXPOSED CORNERS TO HAVE 3/4" CHAMFER.
2. STEPS SHALL BE INSTALLED IN ALL INLETS 4'-0" HIGH AND OVER OF AS APPROVED BY THE ENGINEER.
3. ALL REINF. BARS SHALL BE #4 AND HAVE 1 1/2" COVER.
4. DROP INLETS AND EXTENSION ON CURVED SECTIONS SHALL CONFORM TO THE CURVATURE OF THE CURB.
5. THIS DROP INLET MAY BE CONSTRUCTED ON NEW OR EXISTING R.C. BOX CULVERT AS SHOWN ON F.P.C.-9.
6. WHEN PLANS CALL FOR DROP INLET OVER 10'-0" HIGH, FLOOR AND WALLS SHALL BE CONSTRUCTED AS SHOWN FOR TYPE "RM" DROP INLET (F.P.C.-9D).
7. HEAVY DUTY RING SHALL ALWAYS BE INSTALLED WITH FLANGE ON TOP.
8. DURING CONSTRUCTION OF THE ROADWAY THE CONTRACTOR SHALL MAINTAIN DRAINAGE INTO OR AROUND THE DROP INLET AS APPROVED BY THE ENGINEER.
9. PAYMENT FOR CURB AND/OR CURB AND GUTTER WITHIN THE LIMITS OF DROP INLETS AND DROP INLET EXTENSIONS SHALL BE CONSIDERED INCLUDED IN PAYMENT MADE FOR DROP INLETS AND/OR DROP INLET EXTENSIONS.
10. HEAVY DUTY RING AND COVER SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M105 CLASS 35B & AASHTO M306.
11. HEAVY DUTY RING AND COVER SHALL NOT BE PAINTED.
12. 4"x2" NOTCH SHALL BE FORMED IN ALL DROP INLETS TO SUPPORT SIDEWALK CONSTRUCTION. REFER TO DETAIL OF NOTCH FOR SIDEWALKS.
13. DIMENSIONS SHOWN FOR RING AND COVER ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR CASTINGS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR CASTING DESIGNS MAY BE MADE BY REFERRING TO PREVIOUSLY APPROVED DRAWINGS.

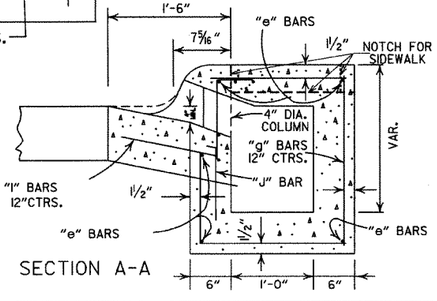
SECTION B-B



DETAIL OF STEP FOR DROP INLET



APPROX. WEIGHT = 11 LBS. (CAST IRON)
NOTE: THIS DETAIL IS TYPICAL. OTHERS MAY BE USED WITH PRIOR APPROVAL OF THE ENGINEER.



SECTION A-A

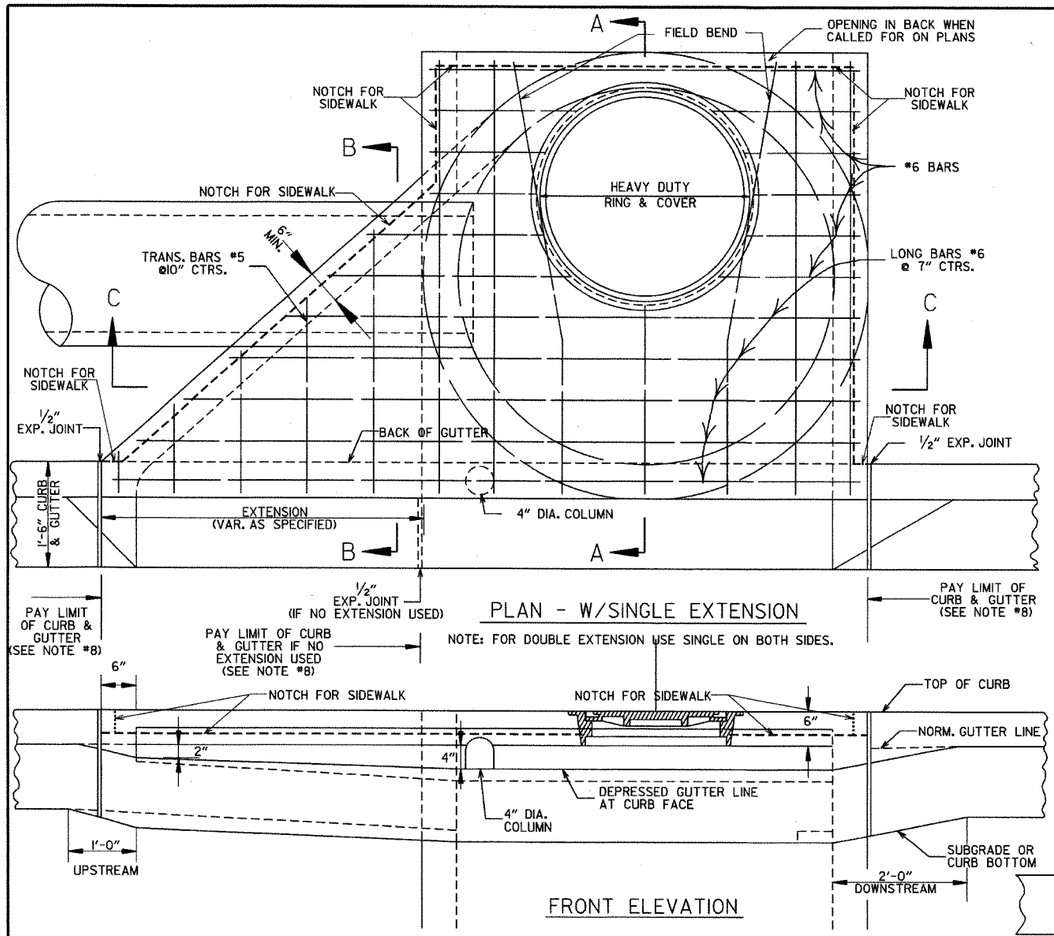
DATE REV.	REVISION	DATE FILMED
8-22-02	ADDED PAY LIMIT CURB NOTES TO SECTIONS A-A & B-B	
11-16-01	ADDED NOTE 13; REVISED SECTION B-B	
1-12-00	CORRECTED DIMENSION ON SECTION B-B & REVISED RING & COVER	
5-13-99	ADDED DETAIL OF NOTCH FOR SIDEWALKS	
7-02-98	REPLACED RING & COVER W/HEAVY DUTY RING & COVER ADDED NOTES 9,10,&11	
10-18-96	CORRECTED SPELLING	
4-26-96	ADDED NOTE 8 & REVISED (4')(8') EXTENSION TITLES	10-18-96
4-1-93	REVISED BACK OPENING & NOTE	
8-15-91	DELETE TYPE IV GRATE	
7-15-88	REVISED STEP DETAIL	
5-20-83	REVISED DETAILS OF GRATES (TYPE IV & IV-A)	
2-4-83	ADDED GENERAL NOTE NO. 4	
3-2-81	ADDED TYPE IV-A GRATE	
5-22-74	DELETED INLET (TYPE F) & GRATE (TYPE III)	
10-2-72	REVISED AND REDRAWN	

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF DROP INLETS

(TYPE C)

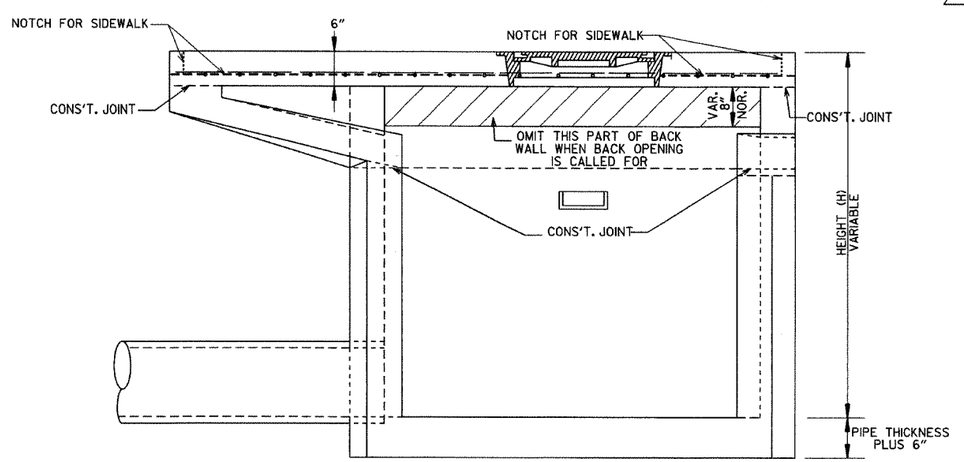
STANDARD DRAWING FPC-9E



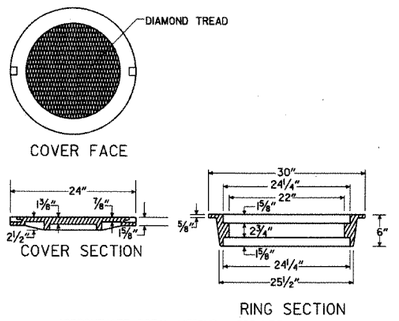
PLAN - W/SINGLE EXTENSION

NOTE: FOR DOUBLE EXTENSION USE SINGLE ON BOTH SIDES.

FRONT ELEVATION



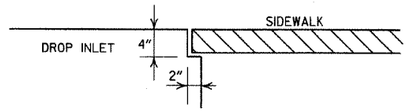
SECTION C-C



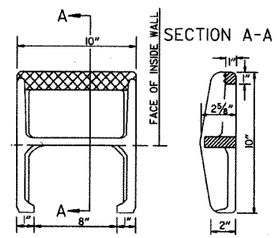
APPROXIMATE TOTAL WEIGHT = 333 LBS.

HEAVY DUTY RING & COVER

1. HEAVY DUTY RING AND COVER SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M105 CLASS 35B & AASHTO M306.
2. HEAVY DUTY RING AND COVER SHALL NOT BE PAINTED.
3. HEAVY DUTY RING SHALL ALWAYS BE INSTALLED WITH FLANGE ON TOP.



DETAIL OF NOTCH FOR SIDEWALKS

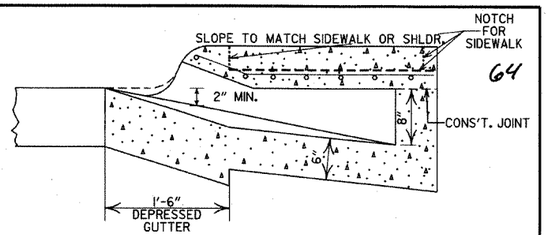


APPROX. WEIGHT = 11 LBS. (CAST IRON)

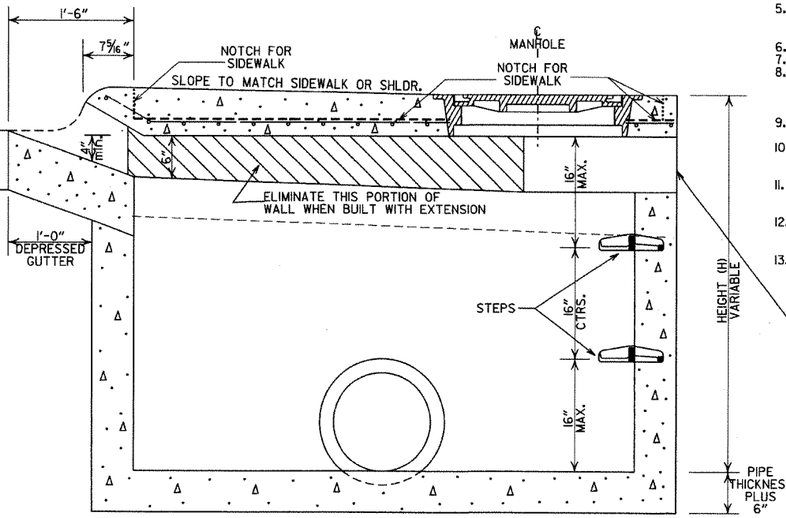
PLAN

NOTE: THIS DETAIL IS TYPICAL. OTHERS MAY BE USED WITH PRIOR APPROVAL OF THE ENGINEER.

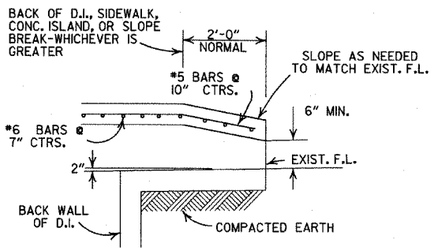
DETAIL OF STEP FOR DROP INLET



SECTION B-B



SECTION A-A



BACK OPENING

WHEN OPENING IN BACK IS CALLED FOR ON PLANS EXTEND OPENING AS SHOWN IN DETAIL. PAYMENT TO BE INCLUDED IN PRICE BID FOR DROP INLET (TYPE MO).

GENERAL NOTES:

1. ALL EXPOSED CORNERS TO HAVE 3/4" CHAMFER.
2. STEPS SHALL BE INSTALLED IN ALL INLETS 4'-0" HIGH AND OVER OR AS DIRECTED BY THE ENGINEER.
3. ALL REINFORCING BARS SHALL BE GRADE 60 AND HAVE MIN. 1/2" COVER.
4. DROP INLETS AND EXTENSION ON CURVED SECTIONS SHALL CONFORM TO THE CURVATURE OF THE CURB.
5. 4" DIA. COLUMNS SPACED AT MAX. 4'-0" INTERVALS SHALL BE INSTALLED ALONG INLET AND EXTENSION TO SUPPORT TOP.
6. BASE AND INLET WALLS SHALL BE CAST MONOLITHICALLY.
7. THE THROAT SHALL BE CAST INTEGRALLY WITH THE GUTTER.
8. PAYMENT FOR CURB AND/OR CURB AND GUTTER WITHIN THE LIMITS OF DROP INLETS AND DROP INLET EXTENSIONS SHALL BE CONSIDERED INCLUDED IN PAYMENT MADE FOR DROP INLETS AND/OR DROP INLET EXTENSIONS.
9. PIPES MAY ENTER DROP INLET FROM ANY ANGLE OR ELEVATION AS MAY BE APPROVED BY THE ENGINEER.
10. APPROPRIATE SIZE TYPE C DROP INLETS MAY BE SUBSTITUTED FOR TYPE MO DROP INLETS AS APPROVED BY THE ENGINEER. PAYMENT TO BE AS DROP INLET (TYPE MO).
11. DURING CONSTRUCTION OF THE ROADWAY THE CONTRACTOR SHALL MAINTAIN DRAINAGE INTO OR AROUND THE DROP INLET AS APPROVED BY THE ENGINEER.
12. 4"x2" NOTCH SHALL BE FORMED IN ALL DROP INLETS TO SUPPORT SIDEWALK CONSTRUCTION. REFER TO DETAIL OF NOTCH FOR SIDEWALKS.
13. DIMENSIONS SHOWN FOR RING AND COVER ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR CASTINGS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR CASTING DESIGNS MAY BE MADE BY REFERRING TO PREVIOUSLY APPROVED DRAWINGS.

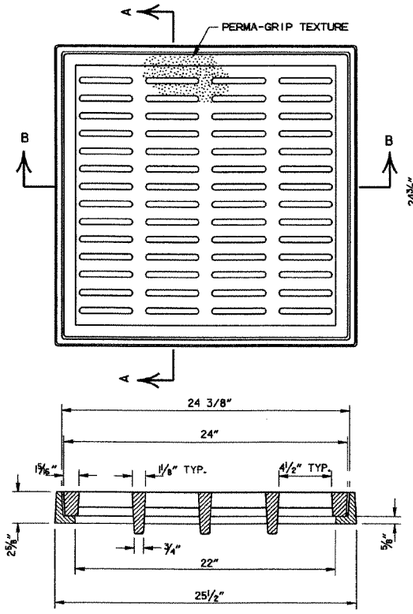
DIA. OF D.I.	DIA. OF OUTLET PIPE	MINIMUM WALL THICKNESS CAST IN PLACE	MINIMUM WALL THICKNESS PRECAST
4' I.D.	12" THRU 27"	6"	5"
5' I.D.	30" THRU 42"	8"	6"
6' I.D.	48" THRU 54"	8"	7"

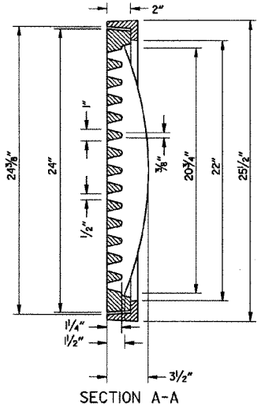
DATE	REVISIONS	DATE FILMED
8-22-02	ADDED PAY LIMIT CURB NOTES TO SECTIONS A-A & B-B	
11-16-01	ADDED NOTE 13	
1-12-00	REVISED HEAVY DUTY RING & COVER	
5-13-99	ADDED NOTCH DETAIL FOR SIDEWALKS	
7-02-98	REP. NOTE 8, REM. PLAN DET., REV. PICTURE FOR NEW RING & COVER, ADDED HEAVY DUTY RING & COVER AND DETAIL OF STEP FOR DROP INLET	
4-26-96	ADDED NOTE 11 & ADJ. OPENING DIMENSION	
10-12-95	CORRECTED *5 BAR SPACING	
7-20-95	CORRECTED DIAMETER OF D.I. IN BOX	
2-2-95	TYPE C TO MO (OPEN BACK DETAIL)	
11-3-94	REVISED GENERAL NOTES	11-3-94
4-1-93	REV. BACK OPEN DETAIL & NOTE	4-1-93
8-15-91	REVISED NOTES 1,12 & ADDED BK.OPEN DETAIL	8-15-91
11-30-89	ADDED NOTE NO. 12	11-30-89
5-23-89	ADDED NOTE & MINIMUM WALL THICKNESS	5-23-89
7-15-88	ADDED EXTEND NOTE TO SECTION A-A	7-15-88
11-14-87	MODIFIED WALL THICKNESS	11-14-87
6-12-87	ISSUED	6-12-87

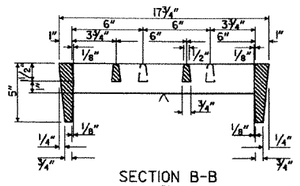
ARKANSAS STATE HIGHWAY COMMISSION

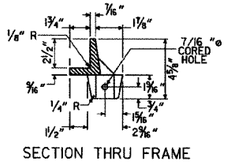
DETAILS OF DROP INLET (TYPE MO)

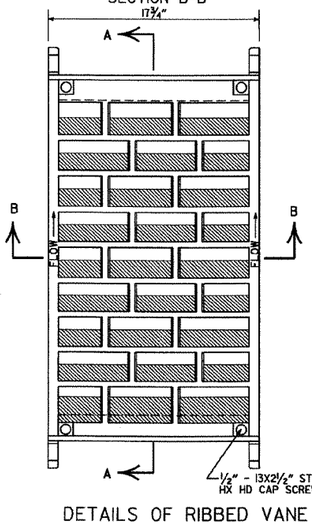
STANDARD DRAWING FPC-9M

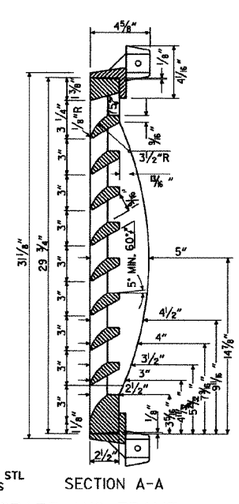












SECTION A-A

SECTION B-B

DETAILS OF PEDESTRIAN GRATE AND FRAME

GENERAL NOTES (PEDESTRIAN GRATE & FRAME)

1. THE PEDESTRIAN GRATE SHALL BE ORIENTED IN THE TOP OF THE DROP INLET SO THAT THE ½" OPENINGS ARE PERPENDICULAR TO THE PATH OF PEDESTRIAN TRAVEL.
2. THE PEDESTRIAN GRATE AND FRAME SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M 105, CLASS 35B, & AASHTO M 306.
3. THE GRATE AND FRAME SHALL NOT BE PAINTED.
4. THE GRATE AND FRAME SHALL BE INSTALLED IN THE DROP INLET IN THE ASSEMBLED POSITION.
5. THE APPROXIMATE WEIGHT OF THE GRATE AND FRAME SHALL BE 211LBS.
6. THE MINIMUM WATERWAY OPENING SHALL BE 122 SQ. IN.

DETAIL OF BENT "b" BAR

SECTION A-A

DETAILS OF DROP INLET (TYPE ST)

SECTION B-B

SECTION C-C

DETAILS OF JUNCTION BOX (TYPE ST)

GENERAL NOTES (TYPE ST DROP INLET & JUNCTION BOX)

1. THE 'D' DIMENSION SHALL MATCH THE FINAL LIFT OF ACHM SURFACE COURSE SHOWN IN THE PLANS WHEN ASPHALT PAVING SURROUNDS THE GRATE OR RING COVER, AND SHALL BE 0" AT OTHER INSTALLATIONS.
2. THE STEPS SHALL BE OMITTED WHERE 'H' IS LESS THAN 4'-0".
3. ALL EXPOSED CORNERS ARE TO HAVE A ¾" CHAMFER.
4. ALL #4 & #5 REINFORCING BARS ARE TO HAVE A MIN. 1½" COVER. ALL LARGER SIZE BARS ARE TO HAVE A 2" MIN. COVER.

GENERAL NOTES (HEAVY DUTY RING & COVER):

1. HEAVY DUTY RING AND COVER SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M 105, CLASS 35B, & AASHTO M 306.
2. HEAVY DUTY RING AND COVER SHALL NOT BE PAINTED.
3. HEAVY DUTY RING SHALL ALWAYS BE INSTALLED WITH FLANGE ON TOP.
4. DIMENSIONS SHOWN FOR RING AND COVER ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR CASTINGS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR CASTING DESIGNS MAY BE MADE BY REFERRING TO PREVIOUSLY APPROVED DRAWINGS.

SECTION B-B

SECTION THRU FRAME

SECTION A-A

DETAILS OF RIBBED VANE GRATE AND FRAME

GENERAL NOTES (RIBBED VANE GRATE & FRAME)

1. RIBBED VANE GRATE AND FRAME SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M 105, CLASS 35B, & AASHTO M 306.
2. GRATE AND FRAME SHALL NOT BE PAINTED.
3. GRATE AND FRAME SHALL BE INSTALLED IN DROP INLET IN ASSEMBLED POSITION.
4. APPROXIMATE WEIGHT OF GRATE SHALL BE 170 LBS.

COVER FACE

COVER SECTION

RING SECTION

HEAVY DUTY RING & COVER

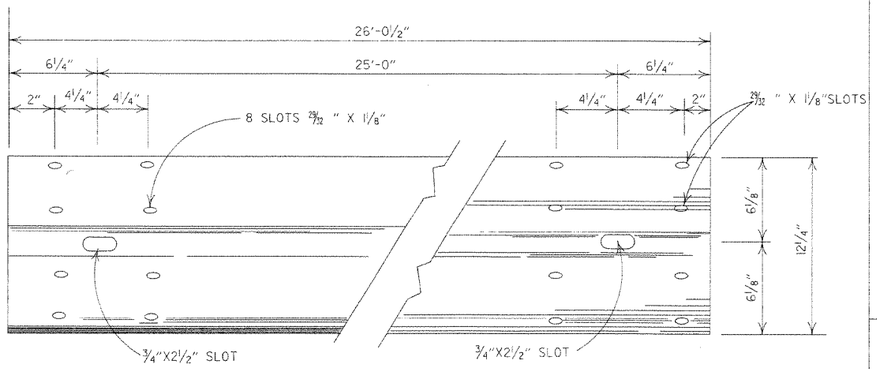
APPROXIMATE TOTAL WEIGHT = 333 LBS.

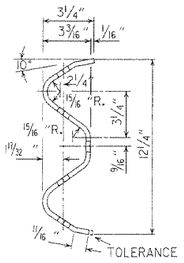
DATE REVISED	DATE FILMED	DESCRIPTION
11-16-01		ADDED NOTE 4
1-12-00		REVISED HEAVY DUTY RING & COVER
5-13-99		ADDED PEDESTRIAN FRAME & GRATE
7-02-98		REMOVED NOTE 5, REV. DIMENSIONS, ADDED HEAVY DUTY RING & COVER ADDED AASHTO REF. REVISED GRATE
10-18-96		REVISED ASTM REF. TO AASHTO
10-1-92		REVISED & REISSUED
8-15-91	8-15-91	REVISED & REISSUED

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF DROP INLET & JUNCTION BOX (TYPE ST)

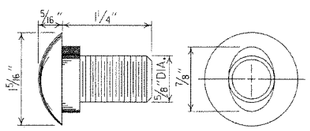
STANDARD DRAWING FPC-9S



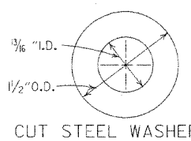


DETAILS OF W-BEAM GUARD RAIL

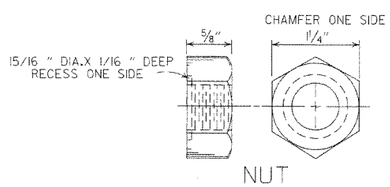
RAIL SECTION OF CLOSELY SIMILAR DIMENSIONS AND COMPARABLE STRENGTH MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.



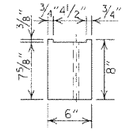
SPLICE BOLT
POST BOLT - SAME EXCEPT LENGTH



CUT STEEL WASHER

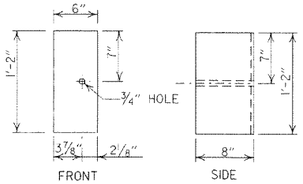


NUT

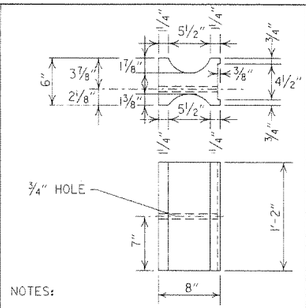


WOOD BLOCKOUT USED WITH WOOD POSTS SHALL BE 6"x8"x1'-2" WITH NO NOTCH REQUIRED.

TOP



WOOD BLOCKOUT (W-BEAM)

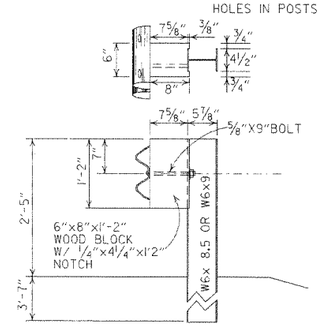


NOTES:

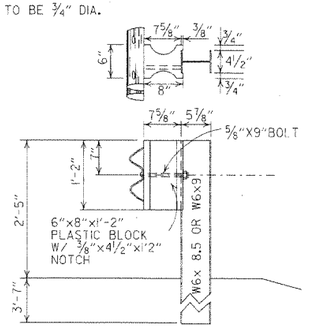
1. SIMILAR SHAPED PLASTIC BLOCKOUTS MAY BE USED AS LONG AS THEY MEET NCHRP-350 TEST LEVEL 3 SPECIFICATIONS OR REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
2. DIMENSIONS ARE SUBJECT TO MANUFACTURERS TOLERANCES.

PLASTIC BLOCKOUT (W-BEAM)

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

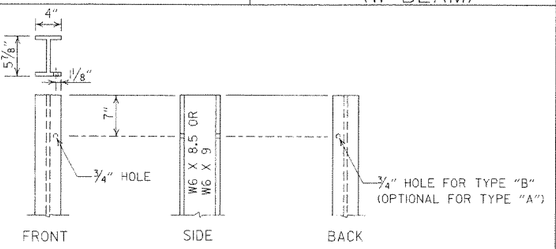


WOOD BLOCKOUT CONNECTIONS

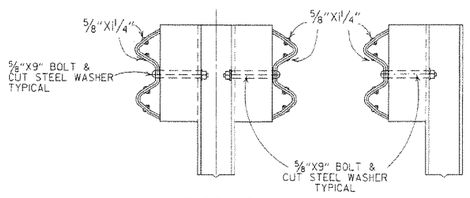


PLASTIC BLOCKOUT CONNECTIONS

DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)



STEEL POST



TYPE "B" TYPE "A"

DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)

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

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

WOOD BLOCKOUT CONNECTIONS

PLASTIC BLOCKOUT CONNECTIONS

DETAILS OF WOOD LINE POST CONNECTIONS (W-BEAM)

-GENERAL NOTES-

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

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

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

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

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

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

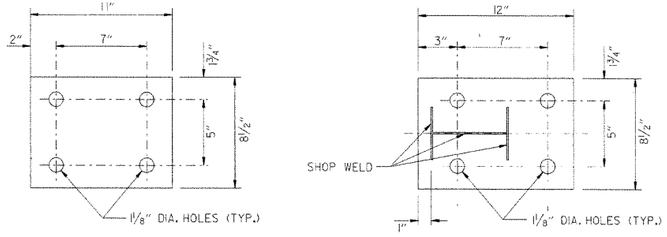
CONTRACTOR SHALL HAVE THE OPTION OF USING WOOD BLOCKOUTS FOR W-BEAM GUARD RAIL OR PLASTIC BLOCKOUTS, AS LONG AS BLOCKOUT USED MEETS NCHRP-350 TEST LEVEL 3 SPECIFICATIONS OR REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) FOR W-BEAM GUARD RAIL.

DATE	REVISION	DATE FILM
7-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
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 ALT. STEEL POST SIZE	
8-5-93	REVISED STEEL POST SIZE	8-5-93
10-1-92	REDRAWN & REVISED	10-1-92
8-15-91	REVISED WASHER NOTE	8-15-91
8-2-90	REV. GEN. NOTE & DEPHT OF ANC. POST IN ROCK	8-2-90
7-15-88	REVISED SECTION 3 & GENERAL NOTES	
3-4-88	REV. ANCHOR POST, ELEV. NOTES & POST IN ROCK	780-3-4-88
10-30-87	REVISED WOOD LINE POST DETAIL	546-10-30-87
10-9-87	REDRAWN & REVISED	802-10-9-87

ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

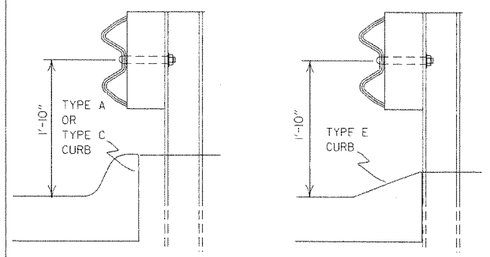
STANDARD DRAWING GR-8



WASHER PLATE

BASE PLATE

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



FOR DESIGN SPEEDS OF 50 MPH OR LESS

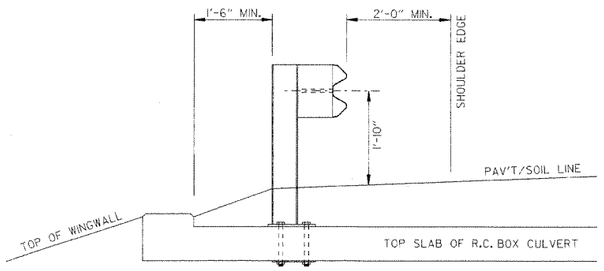
ALIGN FACE OF GUARD RAIL WITH FACE OF CURB.

FOR DESIGN SPEEDS OF 55 MPH OR MORE

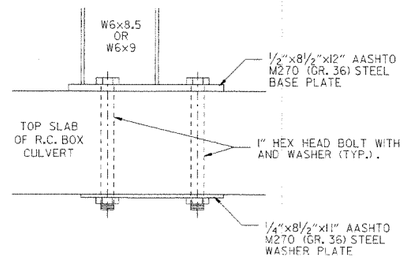
PLACE GUARD RAIL POSTS AGAINST BACK OF CURB.

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

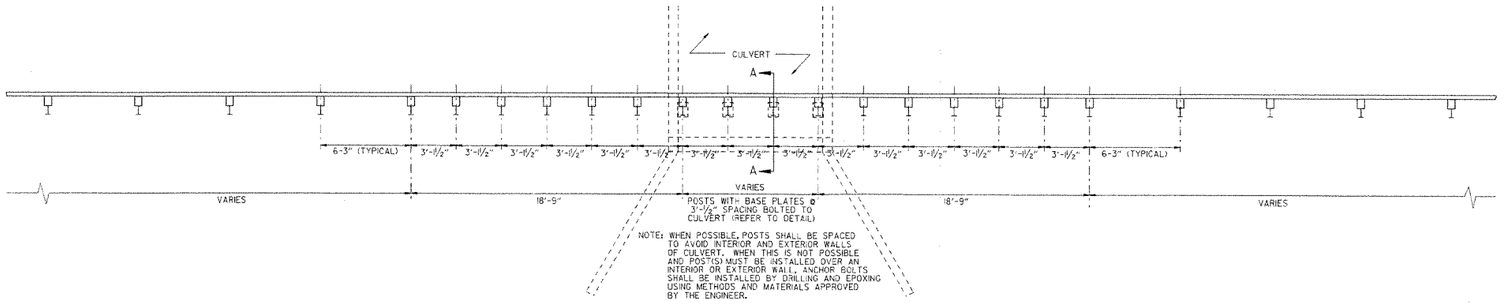
FOR DESIGN SPEEDS OF 50 MPH OR LESS ALL CURB FACES, AS SHOWN ON STD. DRWG. CG-1, MAY BE USED. FOR DESIGN SPEEDS OF 55 MPH OR MORE TYPE "E" CURB FACE SHALL BE USED.



SECTION A-A



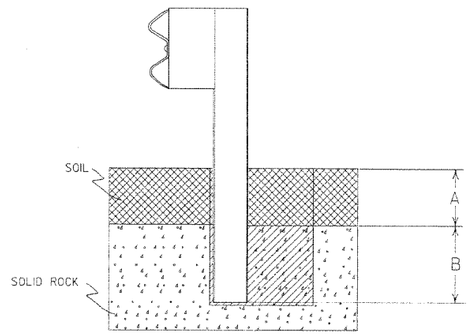
DETAIL OF CONNECTION



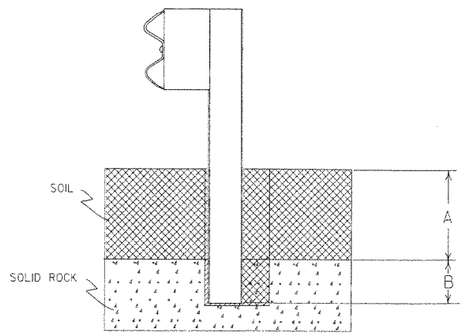
PLAN LAYOUT OF TYPE A GUARD RAIL AT LOW-FILL CULVERTS

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

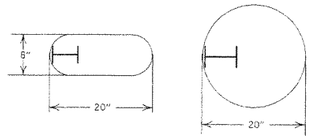


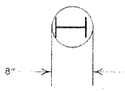
Case 2



Plan View Steel Posts

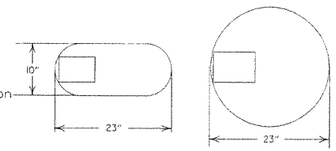
Either hole configuration acceptable

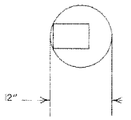




Plan View Wood Posts

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).

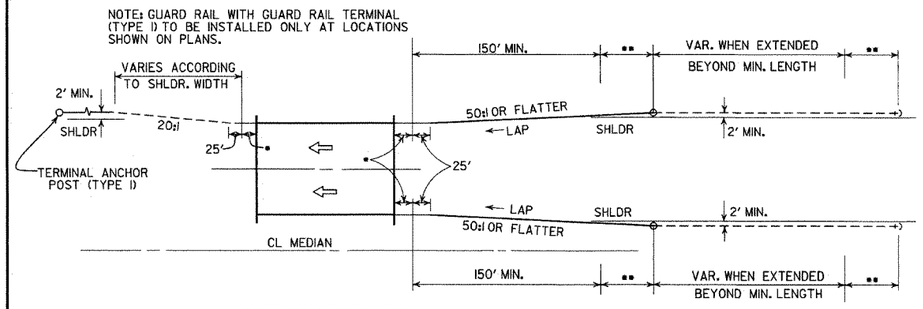
DETAIL OF POST PLACEMENT IN SOLID ROCK (W-BEAM)

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	712-10-30-87
10-30-87	REVISED PLACEMENT BEHIND CURB	547-10-30-87
10-9-87	REDRAWN & REVISED	803-10-9-87

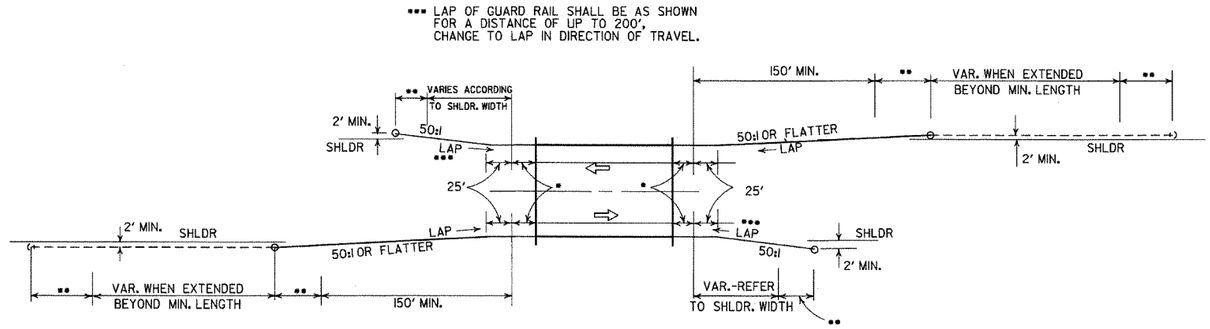
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-8A

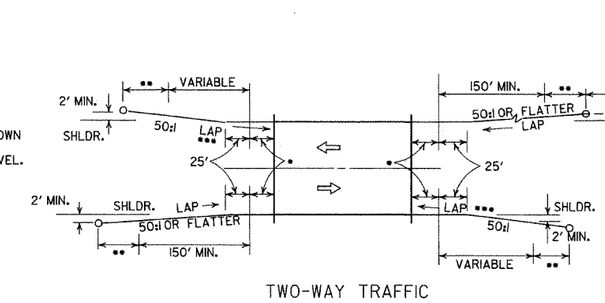


ONE-WAY TRAFFIC

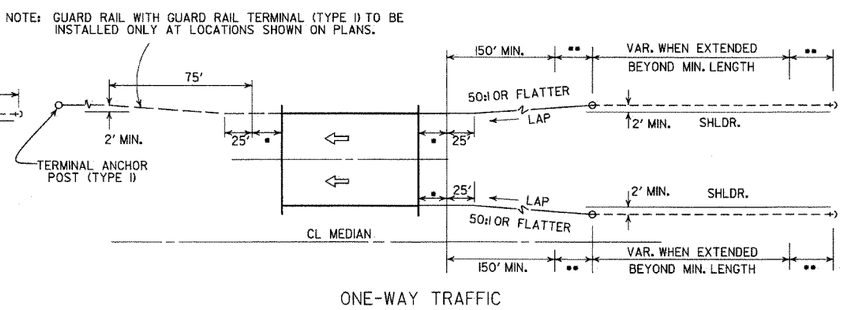


TWO-WAY TRAFFIC

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



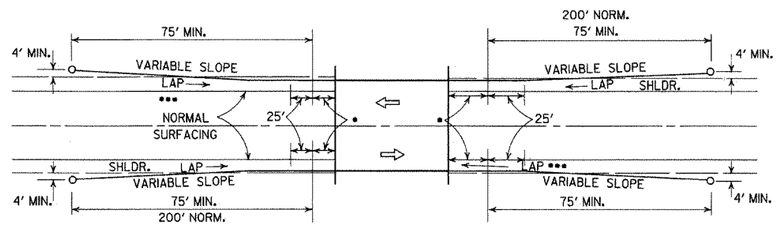
TWO-WAY TRAFFIC



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

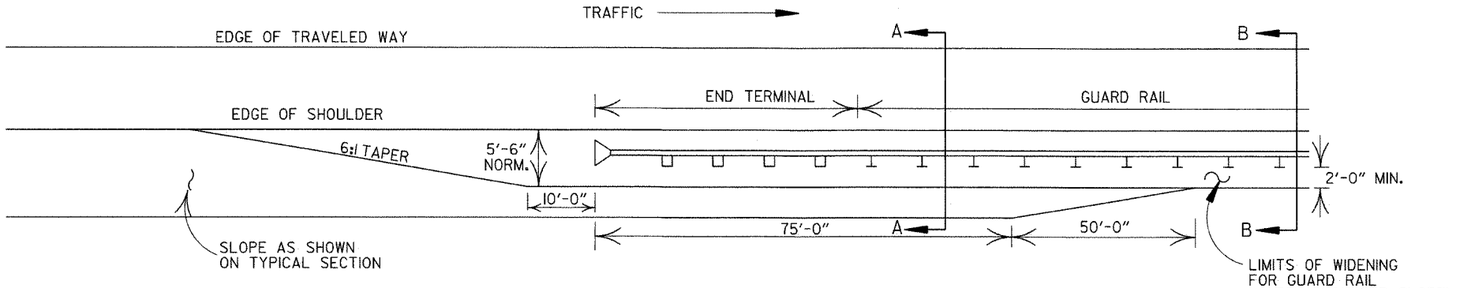
- • THRIE BEAM GUARD RAIL TERMINAL
- •• GUARD RAIL TERMINAL (TYPE 2)

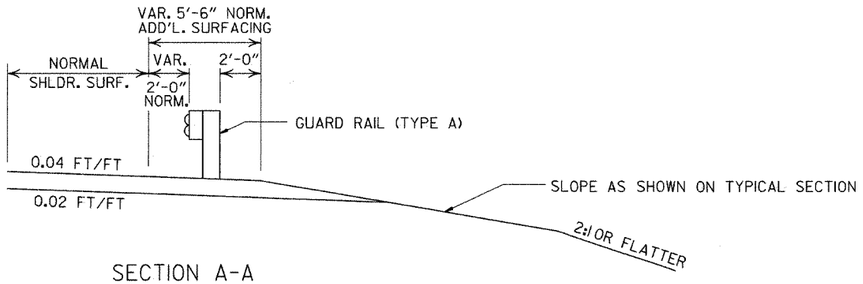
DATE	REVISION	DATE FILM
4-17-08	REVISED LAYOUTS	
11-10-05	REMOVED GUARD RAIL NOTES AND DETAILS	
11-16-01	DELETED NOTE-METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERM. (TY. I)	
1-12-00	ADDED CONSTRUCTION NOTE	1-12-00
6-26-97	REVISED LAYOUT	
10-1-92	REDRAWN & REVISED	10-1-92
	ADDED NOTE	
10-9-87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

ARKANSAS STATE HIGHWAY COMMISSION

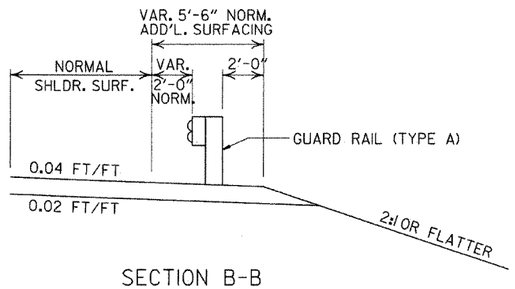
GUARD RAIL DETAILS

STANDARD DRAWING GR-9





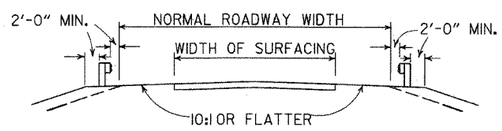
SECTION A-A



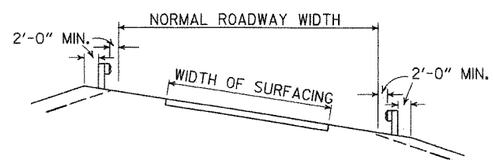
SECTION B-B

DETAILS OF WIDENING FOR GUARD RAIL

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

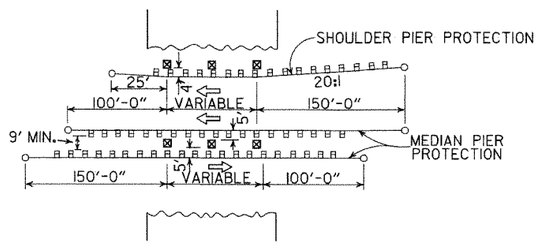


SECTION ON TANGENT



SECTION ON CURVE

DETAILS SHOWING POSITION OF GUARD RAIL ON HIGHWAY



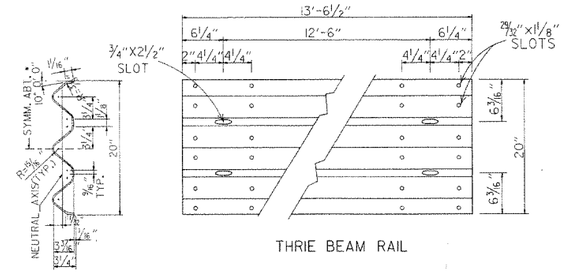
METHOD OF INSTALLATION OF GUARD RAIL AT FIXED OBSTACLE

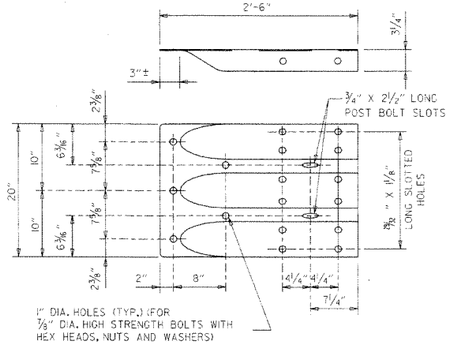
DATE	REVISION	DATE FILM
4-17-08	MINOR REVISION	
11-10-05	DRAWN	

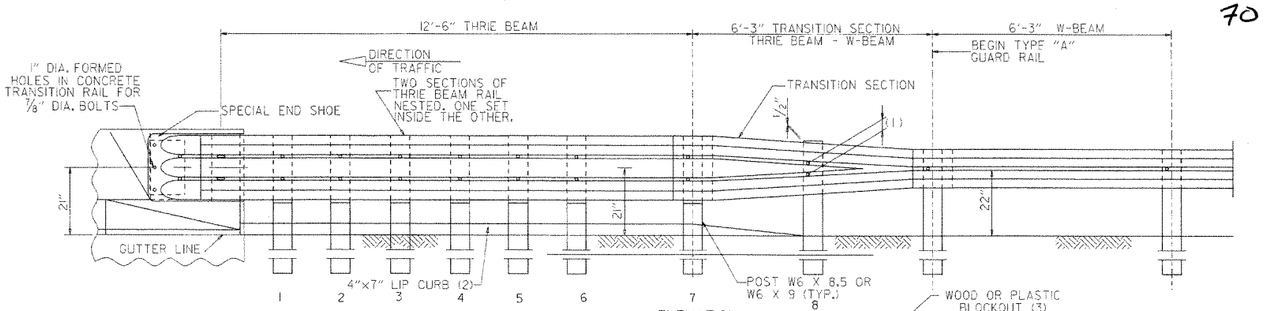
ARKANSAS STATE HIGHWAY COMMISSION

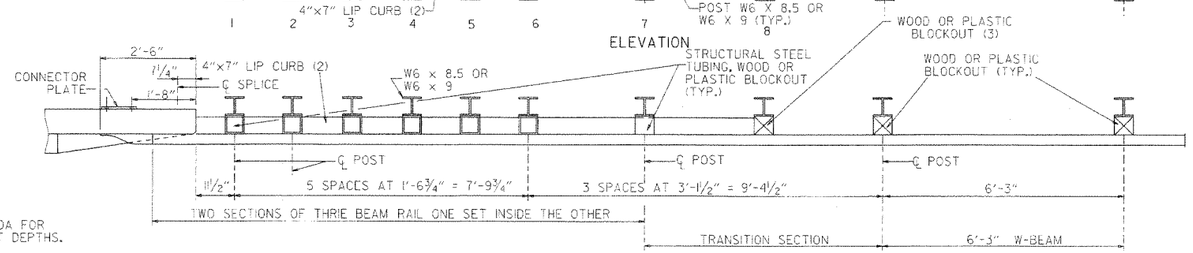
GUARD RAIL DETAILS

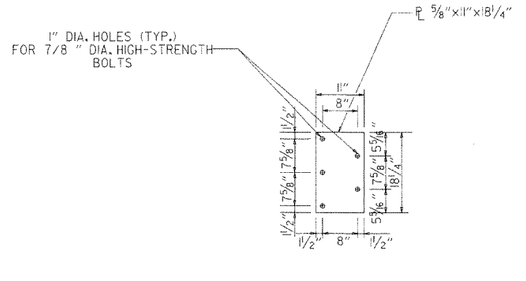
STANDARD DRAWING GR-9A



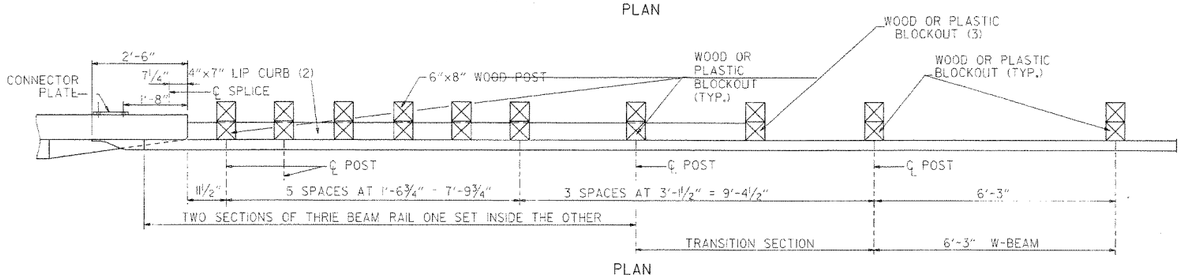


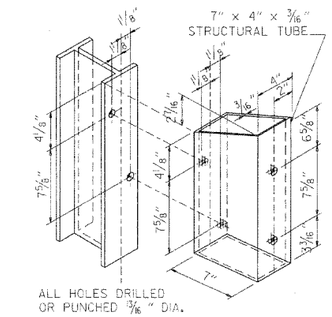




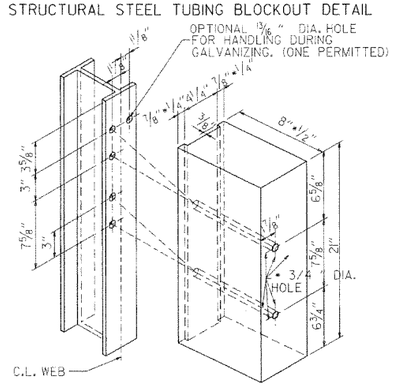


NOTE:
SEE STANDARD DRAWING GR-10A FOR GUARD RAIL POST EMBEDMENT DEPTHS.





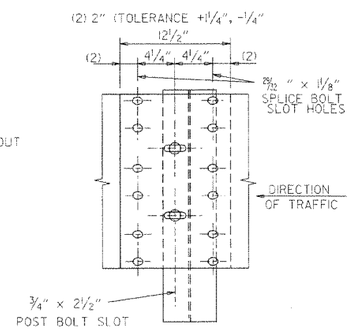
ATTACH BLOCKOUT TO POST USING ⅝" DIA. HEX HEAD BOLTS WITH 1½" O.D. CUT STEEL WASHERS AND NUT.

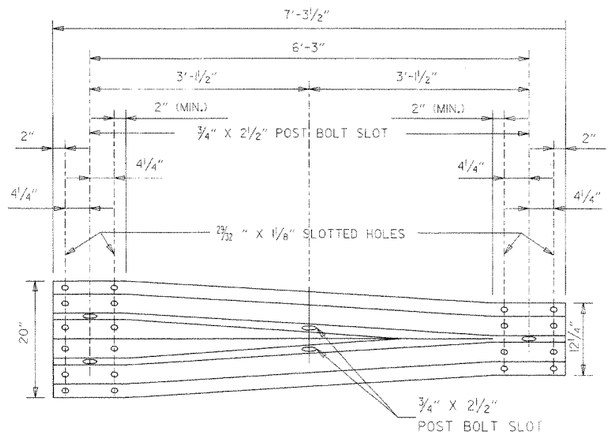


NOTE: BLOCKS SHALL BE THE SAME TYPE THROUGHOUT THE PROJECT LIMITS.

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.





(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# (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.

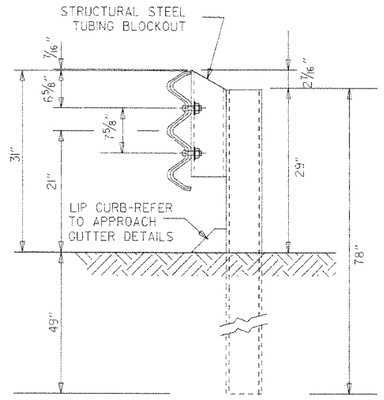
THRIE BEAM POSTS SHALL BE SAME MATERIAL AS W-BEAM POSTS FOR ENTIRE JOB.

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	

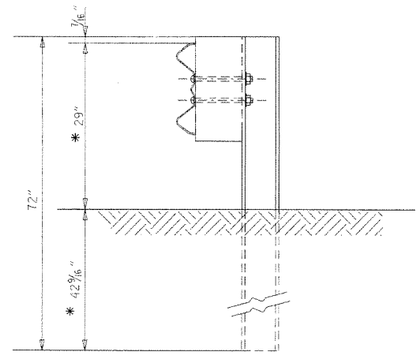
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-10

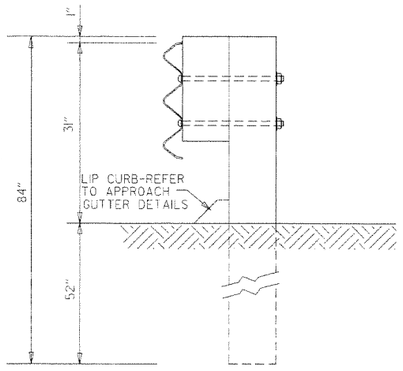


THRIE BEAM RAIL WITH STEEL TUBING BLOCKOUT
AND STEEL POST
POSTS 1-7

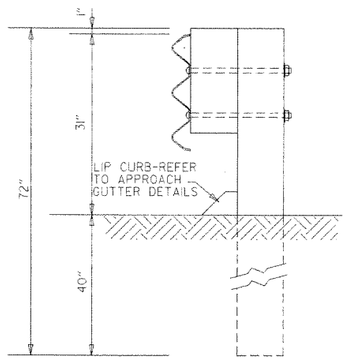


W-BEAM TO THRIE BEAM TRANSITION RAIL
WITH WOOD OR PLASTIC BLOCKOUT AND STEEL POST
POST 8

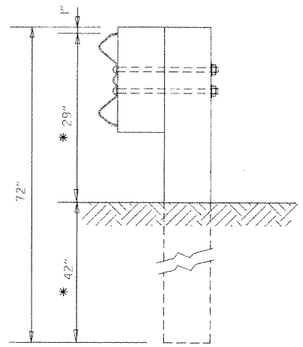
* NOTE:
THESE DIMENSIONS WILL NEED TO BE ADJUSTED IN THE FIELD TO MAKE THE TRANSITION FROM 21" MID POINT OF THRIE BEAM TO 22" MID POINT OF W-BEAM.



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.

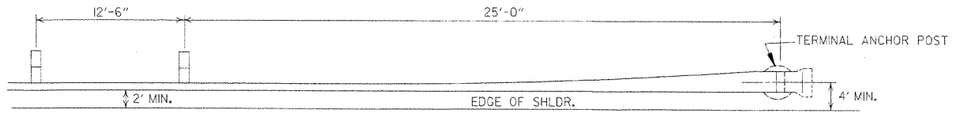
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7f (1400 f) OR NO. 1 (1350 f SOUTHERN PINE.

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

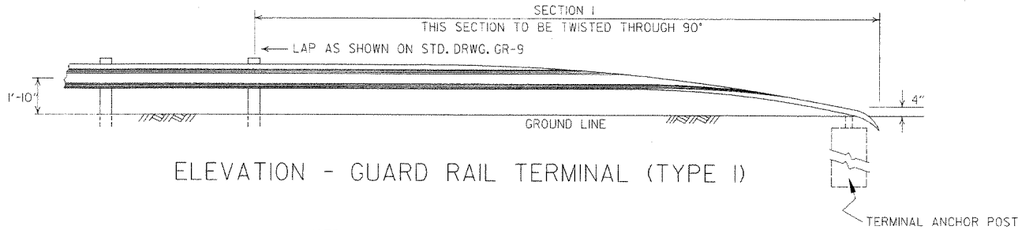
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-10A

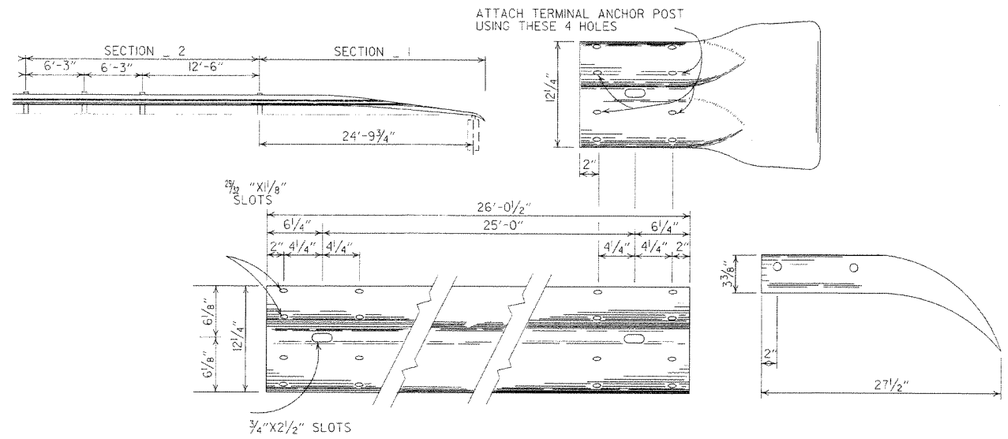


PLAN - GUARD RAIL TERMINAL (TYPE I)



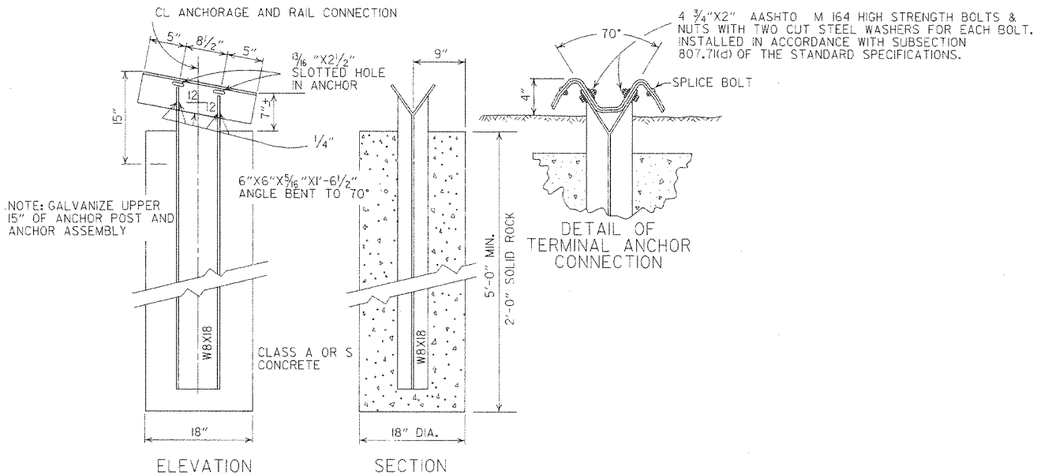
ELEVATION - GUARD RAIL TERMINAL (TYPE I)

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



SECTION 1

TERMINAL SECTION



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

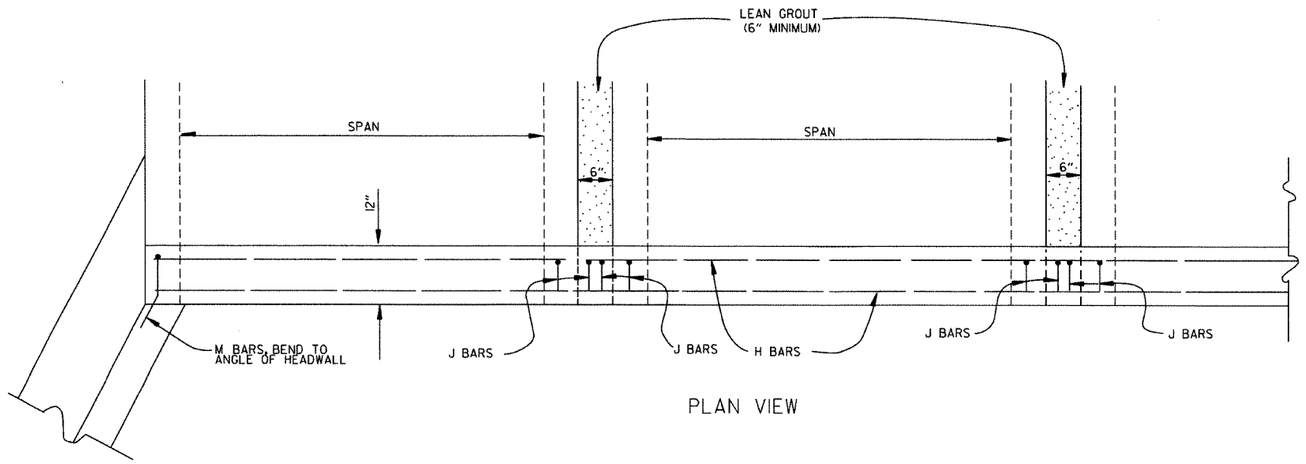
DETAIL OF TERMINAL ANCHOR POST (TYPE I)

DATE	REVISION	DATE FILM
7-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
6-26-97	REVISED LAP NOTE	
10-18-96	REVISED ASTM REF. TO AASHTO	
11-3-94	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

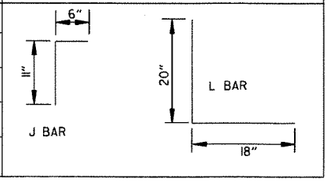
STANDARD DRAWING GRT-1



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.

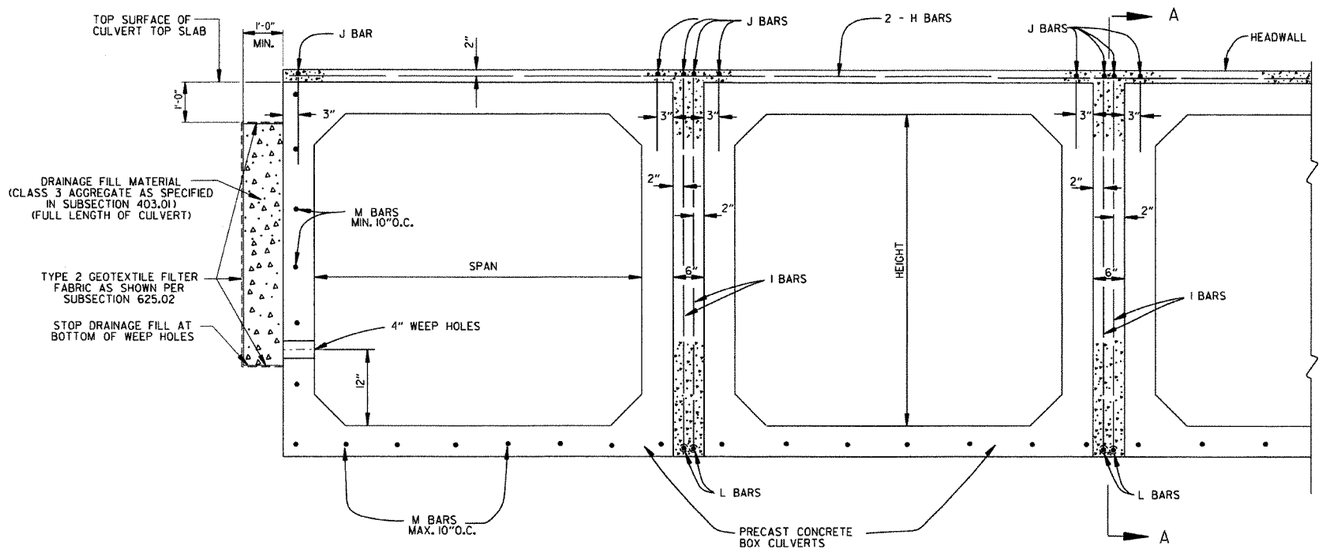
THE MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERNAL JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE CULVERT.

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.

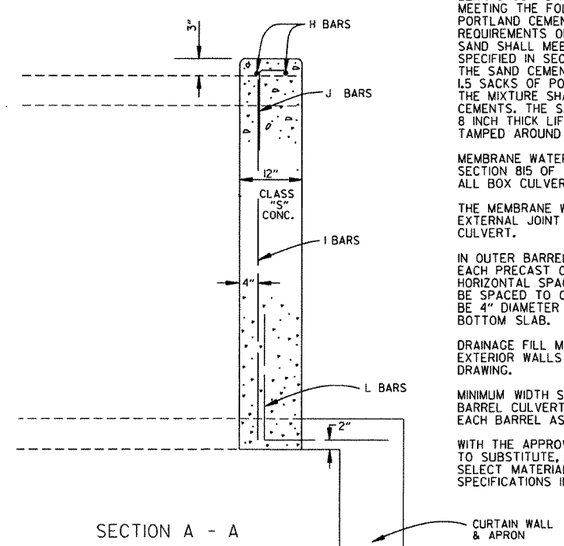
DRAINAGE FILL MATERIAL WITH GEOTEXTILE FABRIC IS REQUIRED AT THE EXTERIOR WALLS OF THE ASSEMBLED CULVERT. SEE DETAILS ON THIS DRAWING.

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
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	43⅞	44	26⅝	27
42	51⅛	51	31⅞	31
48	58½	59	36	36
54	65	65	40	40
60	73	73	45	45
72	88	88	54	54
84	102	102	62	62
90	115	115	72	72
96	122	122	77½	77
108	138	138	87⅛	87
120	154	154	96⅞	97
132	168¾	169	106½	107

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

REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE DIMENSIONS

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

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

CONSTRUCTION SEQUENCE

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

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

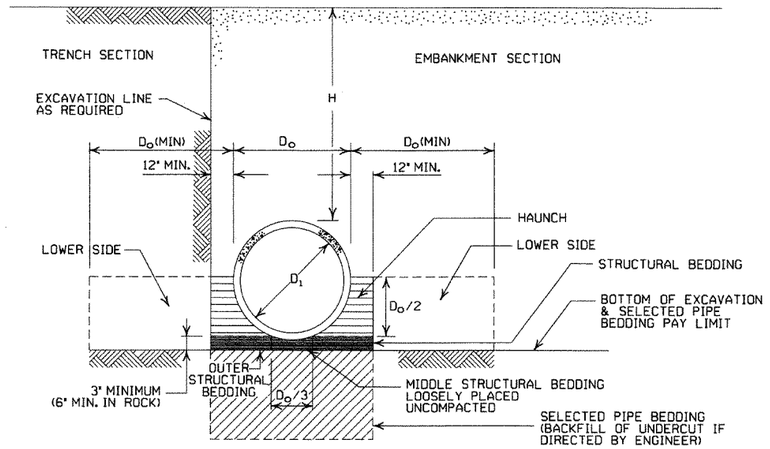
- LEGEND -

D_1 = NORMAL INSIDE DIAMETER OF PIPE
D_o = OUTSIDE DIAMETER OF PIPE
H = FILL COVER HEIGHT OVER PIPE (FEET)
MIN. = MINIMUM
▨ = UNDISTURBED SOIL

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

* SM-3 WILL NOT BE ALLOWED.

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



EMBANKMENT AND TRENCH INSTALLATIONS

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

GENERAL NOTES

1. CONCRETE PIPE CULVERT CONSTRUCTION SHALL CONFORM TO ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2003 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

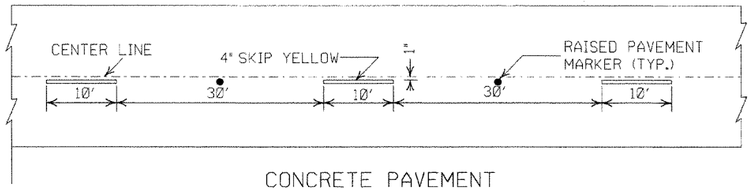
NOTE: TYPE 1 INSTALLATION WILL NOT BE ALLOWED FOR ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS.

DATE	REVISION	DATE FILMED
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	

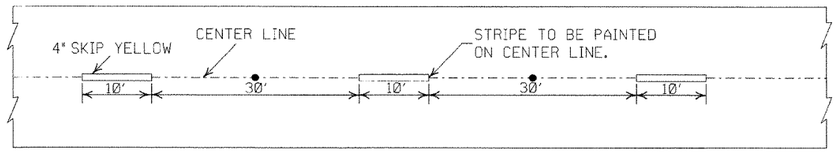
ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCC-1

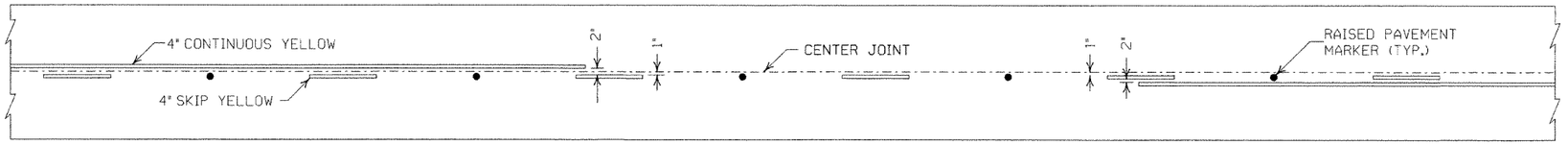


CONCRETE PAVEMENT

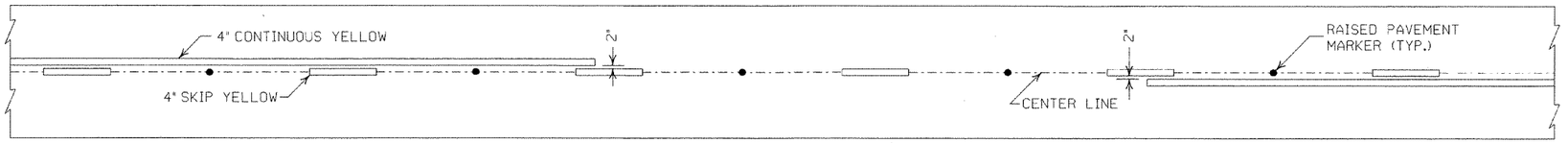


ASPHALT PAVEMENT

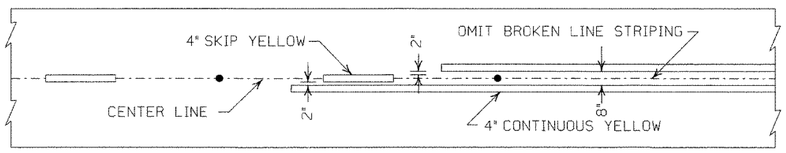
BROKEN LINE STRIPING



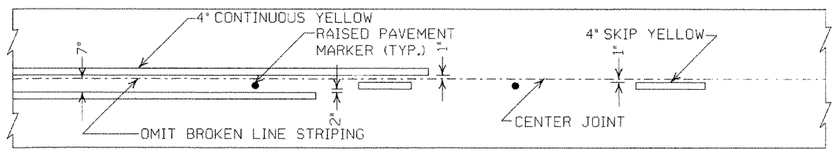
SOLID LINE STRIPING ON CONCRETE PAVEMENT



SOLID LINE STRIPING ON ASPHALT PAVEMENT



ASPHALT PAVEMENT



CONCRETE PAVEMENT

STRIPING AT ADJACENT NO PASSING LANES

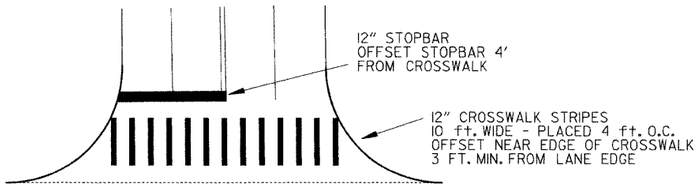
GENERAL NOTES:

THIS DRAWING SHOULD BE CONSIDERED AS TYPICAL ONLY AND THE FINAL LOCATION OF THE STRIPING AND RAISED PAVEMENT MARKERS SHALL BE DETERMINED BY THE ENGINEER.

THIS DRAWING SHOULD BE USED IN CONJUNCTION WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST REVISION.

NOTE:

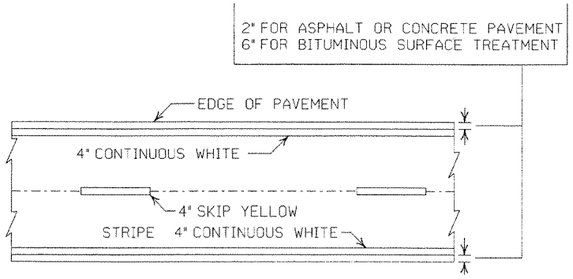
DIMENSIONS SHOWN FOR RAISED PAVEMENT MARKERS ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR MARKERS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR SIMILAR MARKERS MAY BE MADE BY REFERRING TO THE AHTD QUALIFIED PRODUCTS LIST.



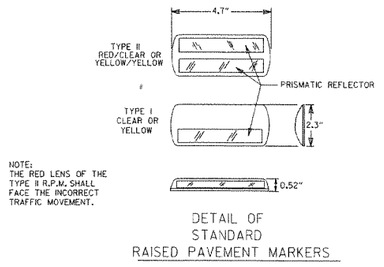
CROSSWALK AND STOPBAR DETAILS

NOTES:

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



PAVEMENT EDGE LINE MARKING



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

DETAIL OF STANDARD RAISED PAVEMENT MARKERS

DATE	REVISION	FILMED
11-17-10	REVISED GENERAL NOTES & REMOVED PLOWABLE 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

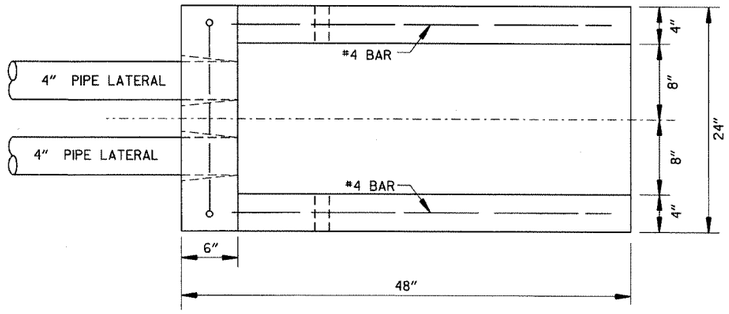
PAVEMENT MARKING DETAILS

STANDARD DRAWING PM-1

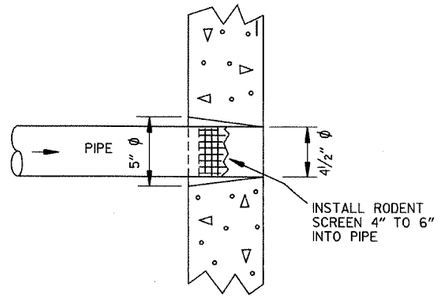
NOTE:
1. GRANULAR BACKFILL TO BE SUBSIDIARY TO PIPE UNDERDRAIN.

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

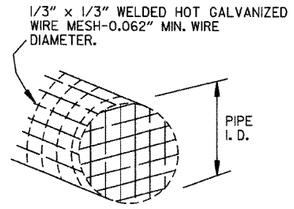
3. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. LAP FABRIC 12" OR THE WIDTH OF THE TRENCH AT THE TOP.



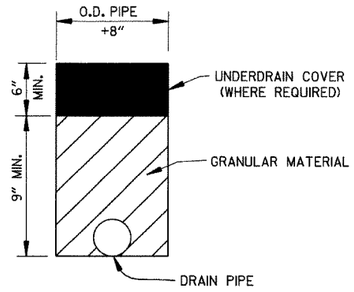
PLAN VIEW

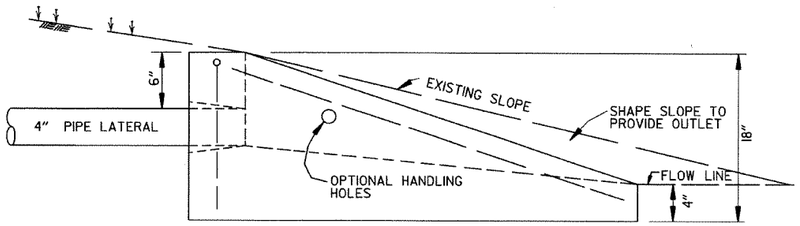


DETAIL OF HOLE FOR 4" PIPE

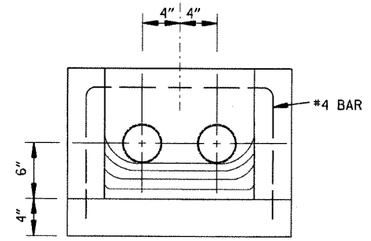


DETAIL OF RODENT SCREEN

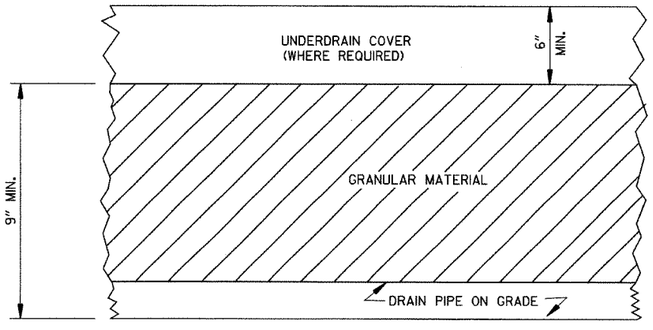




SIDE VIEW

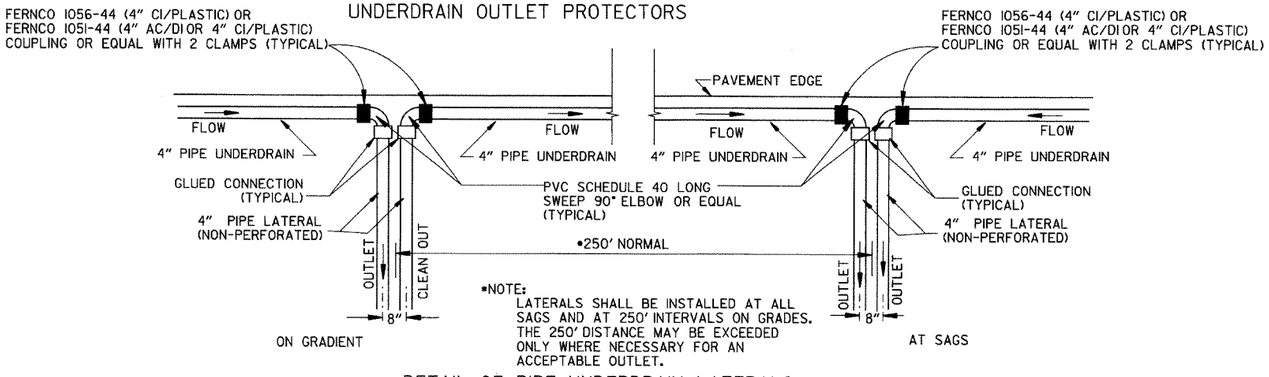


FRONT VIEW



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

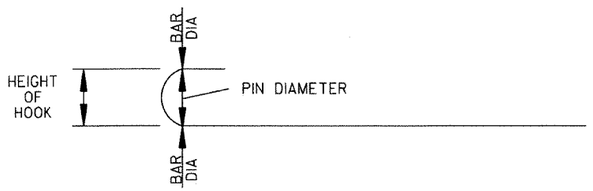
STANDARD DRAWING PU-1

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

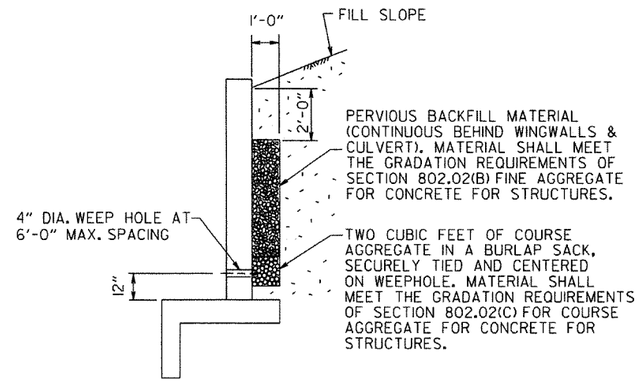
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

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.

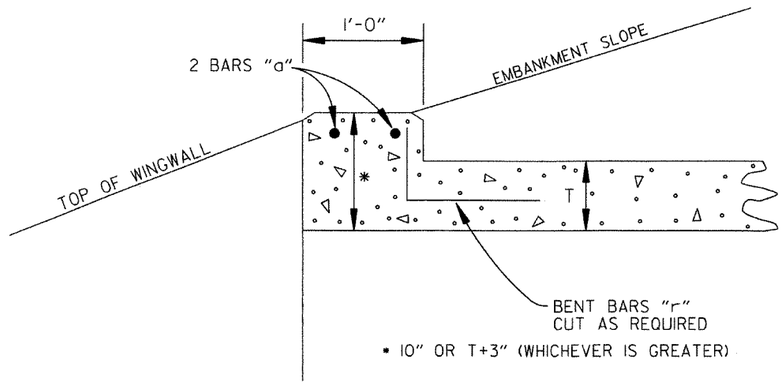
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

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.

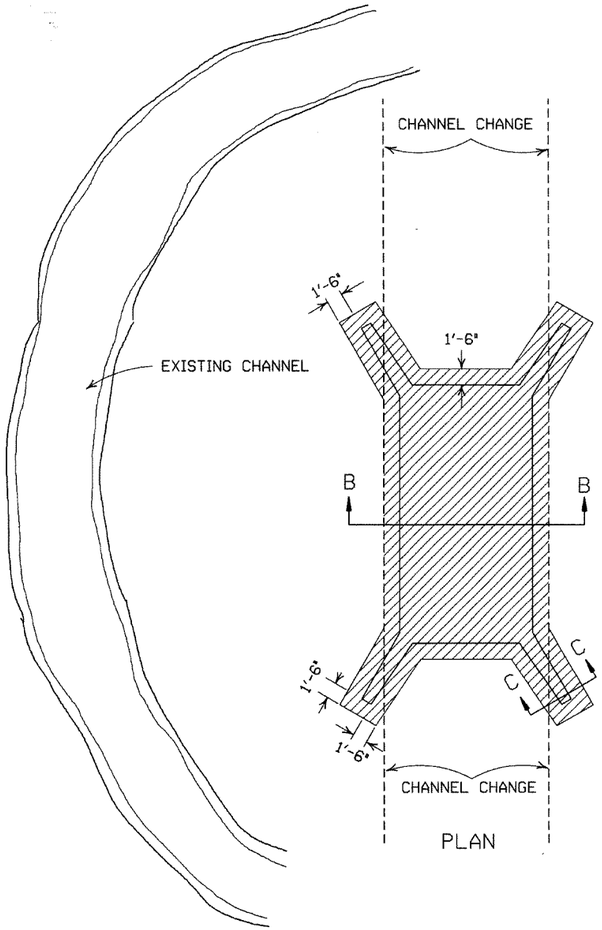
R.C. BOX CULVERT HEADWALL MODIFICATIONS

DATE	REVISION	DATE FILMED
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	

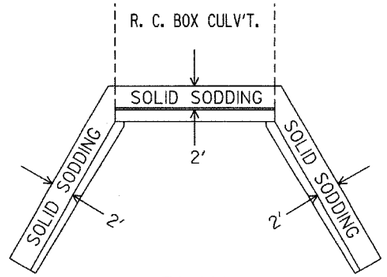
ARKANSAS STATE HIGHWAY COMMISSION

REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1



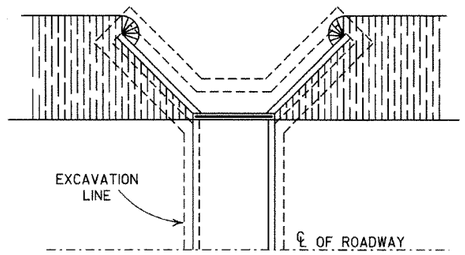
PLAN



PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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



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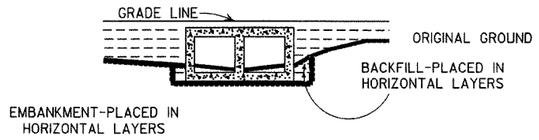
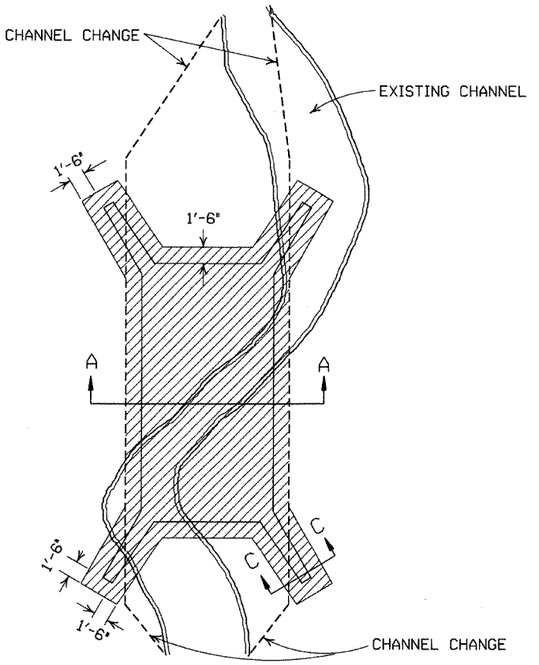
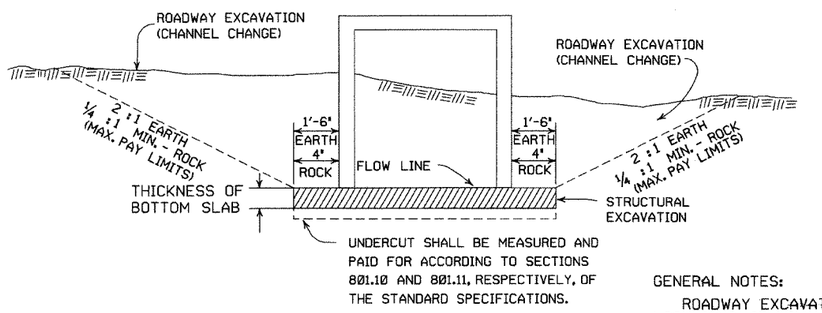


LONGITUDINAL SECTION

BACKFILL DETAILS FOR BOX CULVERT

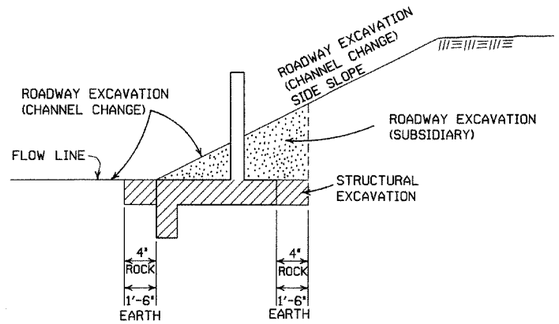


PLAN

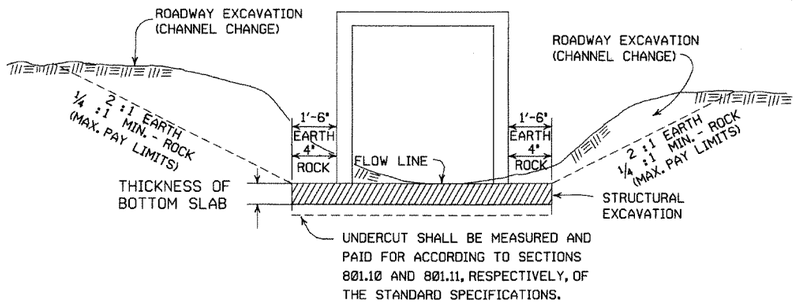


SECTION B-B

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.

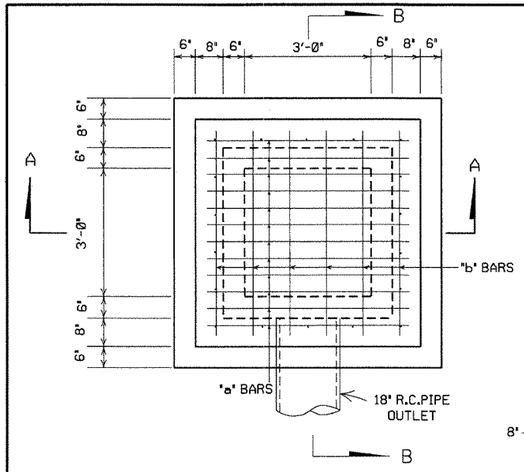
ROADWAY EXCAVATION SHOWN IN SECTION C-C ABOVE AS SUBSIDIARY WILL NOT BE MEASURED OR PAID FOR DIRECTLY, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS OF EXCAVATION.

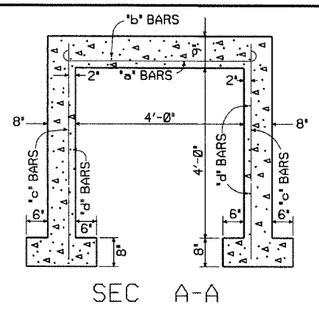
DATE	REVISION	FILMED
11-20-03	REVISED SECTION A-A NOTE	
8-22-02	REVISED SECTION B-B NOTE	
10-12-95	COMBINED 1891B AND 1888A	
1-4-83	REVISED GENERAL NOTES AND ADDED MAXIMUM PAY LIMIT NOTES.	674-1-4-83
2-2-76	EXCAV. PAY LIMITS	917-2-2-76
10-2-72	REVISED AND REDRAWN	564-10-16-72

ARKANSAS STATE HIGHWAY COMMISSION

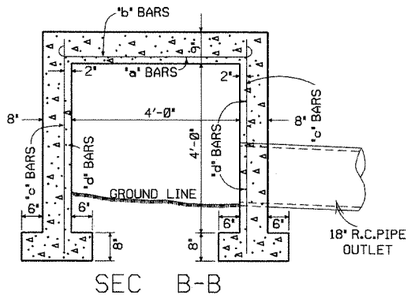
EXCAVATION PAY LIMITS, BACKFILL, & SOLID SODDING FOR BOX CULVERTS

STANDARD DRAWING RCB-2





SEC A-A

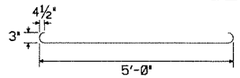


SEC B-B

STEEL SCHEDULE

BARS	NUMBER	LENGTH	SPACING
'a'	11	6'-0"	5"
'b'	6	6'-0"	10"
'c'	16	5'-1"	12"
'd'	16	5'-0"	12"

ALL STEEL TO BE #4 BARS



'a' & 'b' BARS

QUANTITIES

CONCRETE 3.40 CU. YDS.
REINFORCING STEEL 176 LB.

GENERAL NOTE:

THE PAY ITEMS FOR REINFORCED CONCRETE SPRING BOXES SHALL BE FOR THE QUANTITTIES OF CONCRETE OF THE CLASS SPECIFIED, REINFORCING STEEL, EXCAVATION FOR STRUCTURES AND 18" R.C. PIPE CULVERT.

REINFORCED CONCRETE SPRING BOX

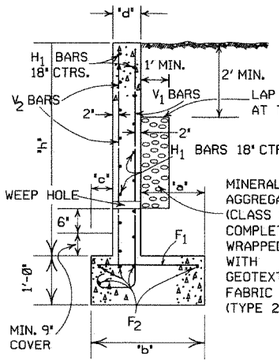
GENERAL NOTES

THE PAY ITEMS FOR THE CONSTRUCTION OF REINFORCED CONCRETE RETAINING WALL SHALL BE FOR THE QUANTITIES OF CONCRETE OF THE CLASS SPECIFIED, REINFORCING STEEL AND EXCAVATION FOR STRUCTURES.

MINERAL AGGREGATE WRAPPED WITH GEOTEXTILE FABRIC (CONTINUOUS) TO BE PLACED 1'-0" IN WIDTH AND 1'-0" IN HEIGHT AS A SUBSIDIARY ITEM TO THE VARIOUS PAY ITEMS.

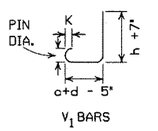
3" WEEP HOLES (MAX. SPACING 10'-0"CTRS.) TO BE PLACED WHERE SPECIFIED BY THE ENGINEER. THE CONTRACTOR WILL BE REQUIRED TO PLACE CONTRACTION JOINTS ON 20' CENTERS AND EXPANSION JOINTS ON 60' CENTERS.

ALL EXPOSED EDGES TO BE CHAMFERED ¾".



BENDING DIAGRAM

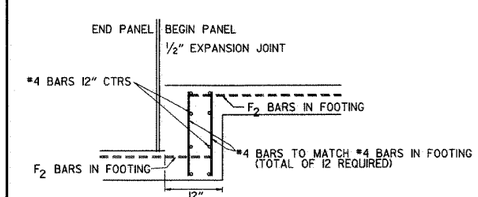
BAR SIZE	K	PIN DIA.
#4	4½"	2½"
#5	5"	3"



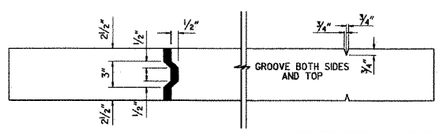
V1 BARS

STEEL SCHEDULE

'c'	'd'	'h'	'a'	'b'	V1 BARS SIZE	V1 BARS SPACING	F1 BARS SIZE	F1 BARS SPACING	H1 SPAC.	V2 SPAC.	F2 NO. REQ'D.
					* 4 BARS						
8'	8'	1'-0"	8'	2'-0"	#4	12"	#4	18"	18"	18"	5
8'	8'	2'-0"	8'	2'-0"	#4	12"	#4	18"	18"	18"	5
8'	8'	3'-0"	8'	2'-0"	#4	12"	#4	18"	18"	18"	5
8'	8'	4'-0"	1'-2"	2'-6"	#4	12"	#4	12"	18"	18"	5
8'	8'	5'-0"	1'-8"	3'-0"	#4	9"	#4	9"	18"	18"	5
8'	8'	6'-0"	2'-2"	3'-6"	#4	6"	#4	6"	18"	18"	6
12'	8'	7'-0"	2'-4"	4'-0"	#4	8"	#4	8"	18"	18"	6
12'	8'	8'-0"	2'-10"	4'-6"	#4	6"	#4	6"	18"	18"	6
15'	10'	9'-0"	2'-11"	5'-0"	#4	5"	#4	5"	18"	18"	6
17'	10'	10'-0"	3'-3"	5'-6"	#5	6"	#5	6"	18"	18"	7



FOOTING STEPS



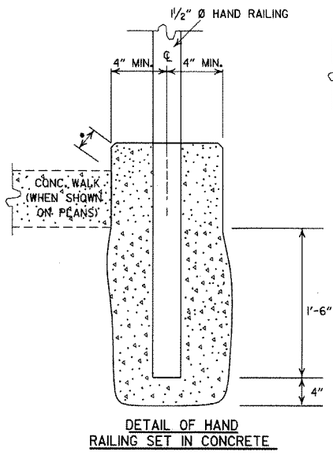
EXPANSION JOINT CONTRACTION JOINT

JOINT DETAILS

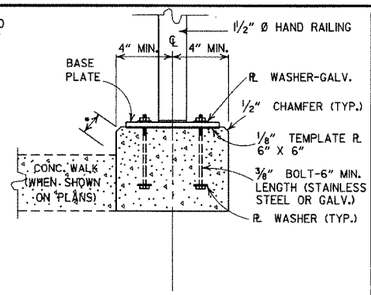
NOTE: JOINT MATERIAL SHALL BE PREFORMED MEETING THE REQUIREMENTS OF SUBSECTION 501.02(n) FOR TYPE 2

REINFORCED CONCRETE RETAINING WALL

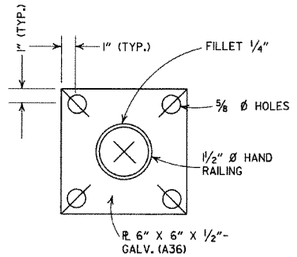
* A 2" MIN. HIGH CURB IS REQUIRED WHEN CONCRETE WALK IS ADJACENT TO THE HAND RAILING. PAYMENT FOR CURB SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR CONCRETE WALKS.



DETAIL OF HAND RAILING SET IN CONCRETE

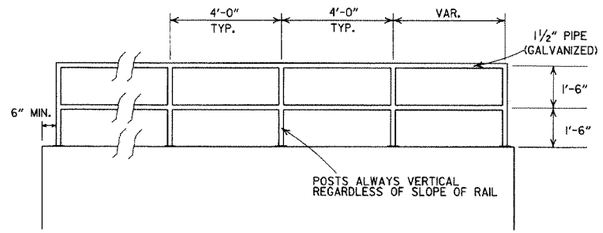


POST CONNECTION TO WALL

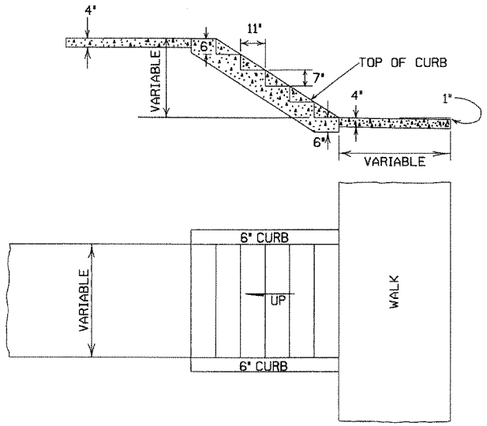


BASE PLATE

POST CONNECTION DETAILS



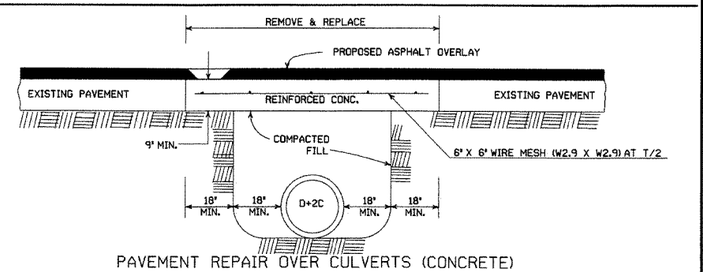
HAND RAILING DETAILS



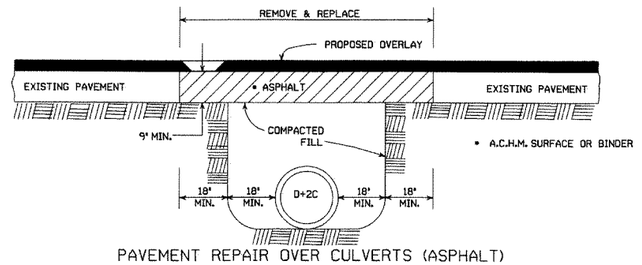
GENERAL NOTES

1. RISE AND TREAD DIMENSIONS OF STEPS MAY BE VARIED AS DIRECTED BY THE ENGINEER, HOWEVER, TREAD WIDTHS SHALL BE 11" MIN. ALL STEPS IN A FLIGHT SHALL HAVE CONSISTENT TREAD & RISER DIMENSIONS.
2. TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE WALKS AT 45' INTERVALS.

DETAILS OF CONCRETE STEPS & WALKS

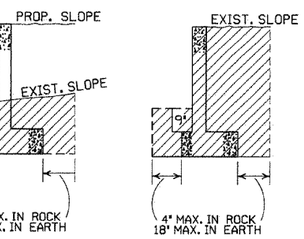


PAVEMENT REPAIR OVER CULVERTS (CONCRETE)



PAVEMENT REPAIR OVER CULVERTS (ASPHALT)

DETAIL SHOWING REPAIR OF EXISTING PAVEMENT AT CULVERT INSTALLATIONS



NOTE: HATCHED AREA DENOTES MAX. LIMITS OF EXCAVATION FOR STRUCTURES FOR RETAINING WALL.

5-25-06	REVISED PVMT REPAIR OVER CULVERTS (CONC); REVISED REINFORCED CONC SPRING BOX	
10-9-03	REVISED PIPE RAILING DETAILS TO HAND RAILING DETAILS	
4-10-03	REVISED RETAINING WALL DRAWING	
8-22-02	ADDED HAND RAILING DETAIL	
11-16-01	REVISED PVMT REPAIR OVER CULVERTS (CONC); CORRECTED SPELLING IN GENERAL NOTES	
11-18-98	ADDED GENERAL NOTES TO CONCRETE STEPS & WALKS	
7-02-98	ENLARGED PIPE	
4-03-97	ADDED NOTE TO STEEL BAR SCHED.	
10-18-96	CORRECTED SPELLING	
4-26-96	ADD WEEP HOLE;REV. JOINT SPACING IN RET. WALL	
6-2-94	CHANGED CONST. TO CONTRACTION JOINT	
10-1-92	CHANGED MESH FABRIC TO WIRE MESH	10-1-92
8-15-91	DELETED HDWL MODIFICATION DETAIL	8-15-91
11-8-90	DELETED COLD MIX FROM CULV'T. REPAIR	11-8-90
11-30-89	REV. RETAINING WALL STEEL SCHEDULE	11-30-89
11-17-88	V1 BARS BEHIND ARROW	665-11-17-88
7-15-88	REV. PAVEMENT REPAIR	649-7-15-88
	ADDED HDWL. MODS, DEL. PIPE UNDERDRAINS	
11-1-84	REV. TRENCH FOR PIPE UNDERDRAIN	510-11-1-84
1-4-83	ELIMINATED CONC. CLASS & ADDED CHAMFER NOTE	682-1-4-83
3-2-81	SPELLING OF 'UNDERDRAIN'	721-3-2-81
4-20-79	REV. UNDERDRAIN DET.& PAVEMENT REPAIR	674-4-20-79
2-2-76	12"MIN. GRAN. MAT'L. OVER PIPE	919-2-2-76
4-10-75	REM. SPECS. FOR GRAN. MAT'L.	568-4-10-75-853
5-22-74	GRANULAR MAT'L. TO BE SB-3	567-5-22-74-740
10-2-72	REVISED AND REDRAWN	564-10-16-72
DATE	REVISION	DATE FILMED

4-17-08	REV. JOINT & FOOTING STEP DETAILS	
11-29-07	REVISED RETAINING WALL DRAINAGE	

ARKANSAS STATE HIGHWAY COMMISSION

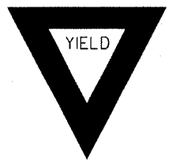
DETAILS OF SPECIAL ITEMS

STANDARD DRAWING SI - 1

R1-1

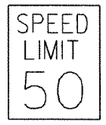
STANDARD 30"X30"
EXPRESSWAY 36"X36"
SPECIAL 48"X48"

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"

R2-5A

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

R2-5C

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

R4-1

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

R4-2

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

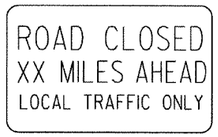
R5-1

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

R11-2

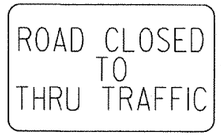
48"X30"

R11-3A



60"X30"

R11-4

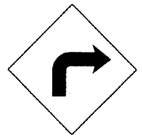


60"X30"

RSP-1

48"X30"

W1-1



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

W1-2

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

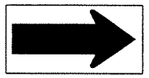
W1-3

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"

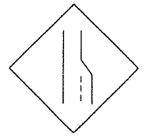
W3-1

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"

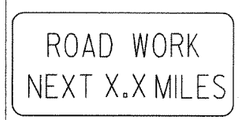
W8-11

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

W8-9

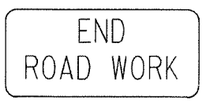
STD. 36"X36"
FWY. 48"X48"

G20-1



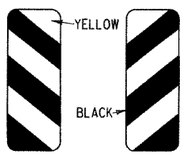
60"X24"

G20-2



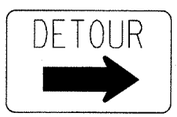
48"X24"

OM-3L OM-3R



12"X36"

M4-9

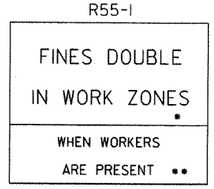


STD. 30"X24"
SPECIAL 48"X36"
SPECIAL 60"X48"

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.

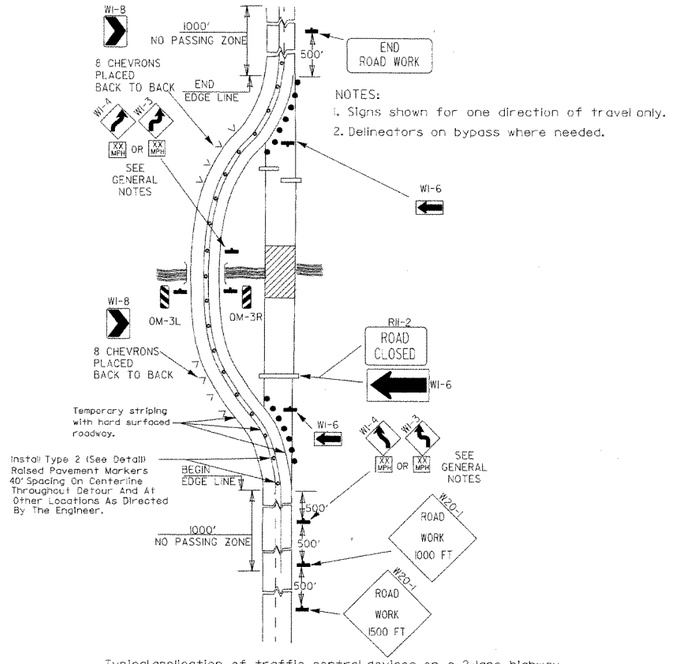
• NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY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

DATE	REVISION	FILMED
12-15-11	REVISED W24-1	
11-17-10	DELETED W8-9a & ADDED W8-9	
10-15-09	ADDED REFERENCE TO MASH & ADDED SIGN W24-1	
4-17-08	REVISED SIGN DESIGNATIONS	
11-18-04	REVISED NOTES	
10-9-03	REVISED NOTE 1	
11-16-01	REVISED NOTE 7	
9-28-00	REVISED NOTE	
11-18-98	ADDED NOTE	
6-26-97	REVISED NOTE 5	
4-03-97	REVISED NOTE 5	
10-18-96	ADDED CONTROLLED ACCESS HWY. SIGN & TO NOTE 7	
10-12-95	ADDED R55-1	
6-8-95	REVISED TO CORRECT SIGN ILLUSTRATIONS	6-8-95
2-2-95	REVISED PER PART VI, MUTCD SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

ARKANSAS STATE HIGHWAY COMMISSION

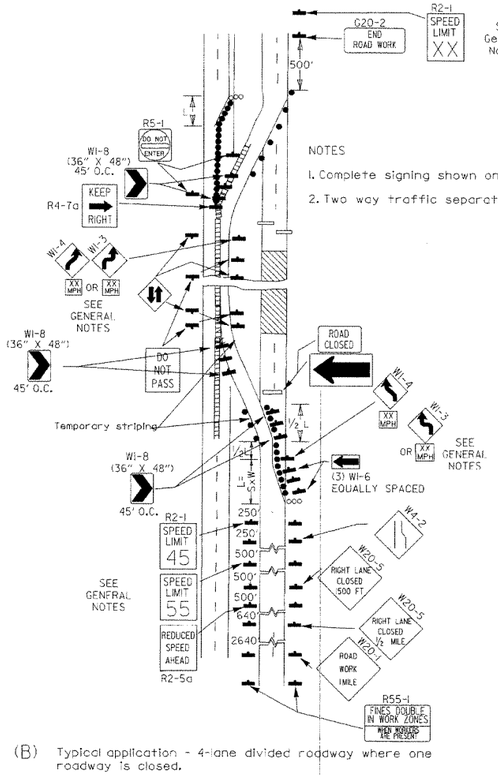
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



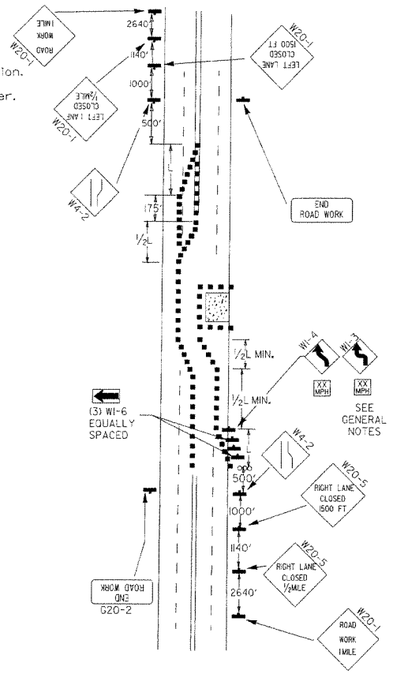
NOTES:
1. Signs shown for one direction of travel only.
2. Delineators on bypass where needed.

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

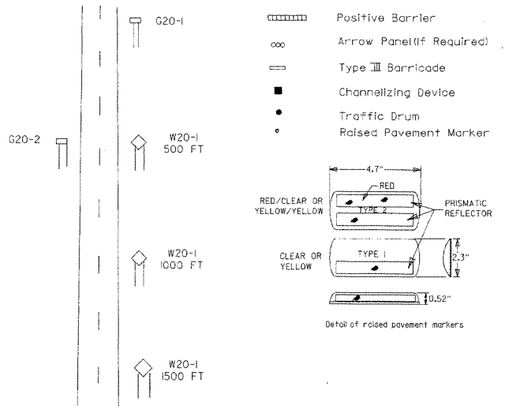


NOTES
1. Complete signing shown only in crossover direction.
2. Two way traffic separated with positive barrier.

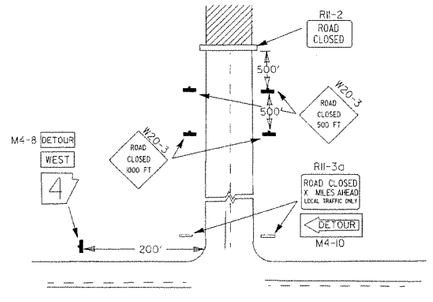
(B) Typical application - 4-lane divided roadway where one roadway is closed.

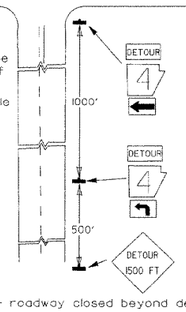


(C) Typical application - 4-lane undivided roadway where half of the roadway is closed.



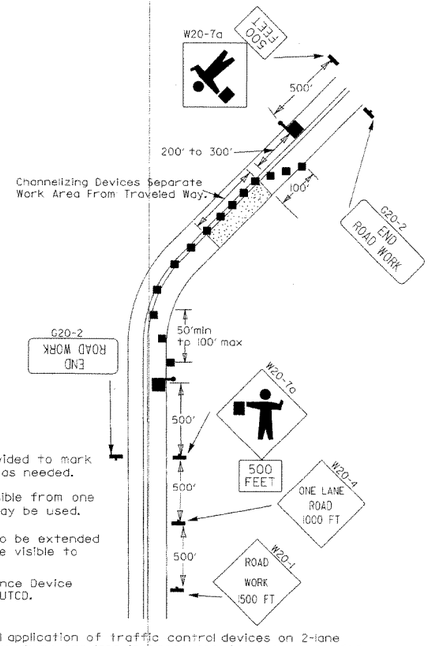
Typical advance warning sign placement





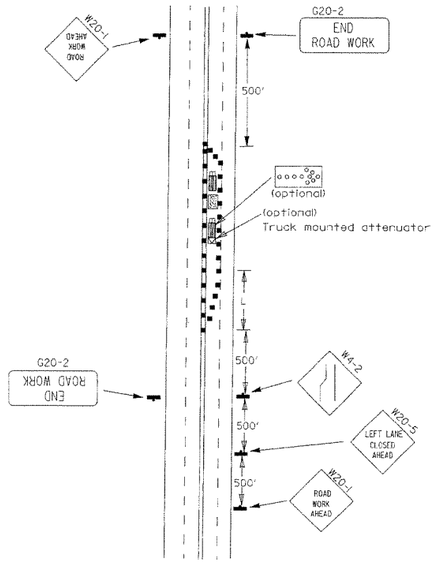
NOTES:
1. Regulatory traffic control devices to be modified as needed for the duration of the detour.
2. Street names may be used when desirable for directing detoured traffic.

(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.

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:

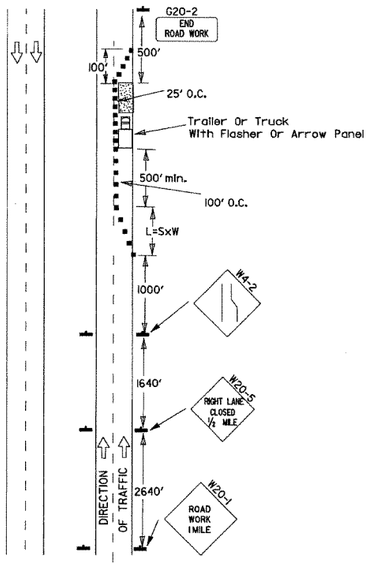
1. Advisory speed posted on W1-3 or W1-4 curve warning signs to be determined at site. Use W1-4 when speed is greater than 30mph and W1-3 when 30mph or less.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the R2-5A shall be installed 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.

DATE	REVISION	FILMED
3-11-10	ADDED (AFAD)	
8-29-08	REVISED SIGN DESIGNATIONS	
6-18-04	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	

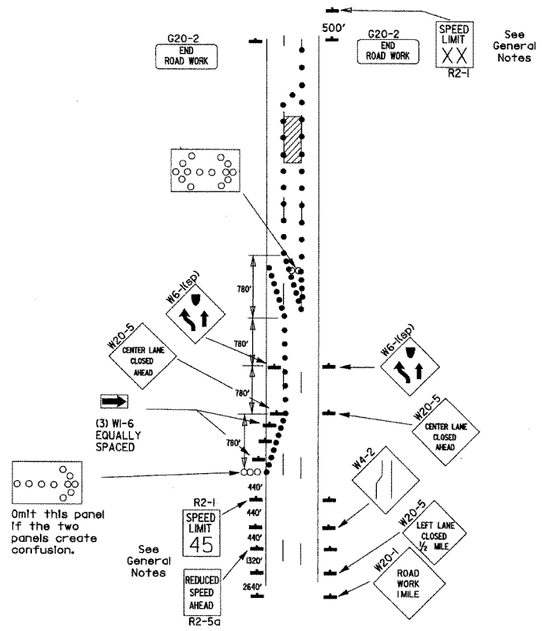
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

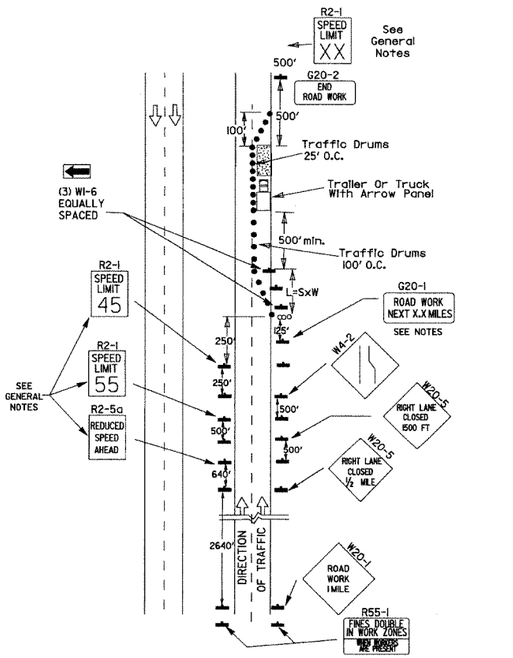
STANDARD DRAWING TC-2



(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 operatipns of intermediate to long term duration on a 4-lane divided roadway where half of the roadway is closed.

KEY:

○○○ Arrow Panel (If Required)

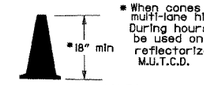
■ Channelizing Device

● Traffic drum

GENERAL NOTES:

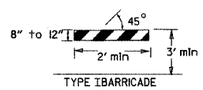
1. A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the R2-5A shall be installed at that location. Additional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

Channelizing devices



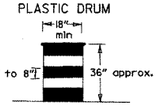
* When cones are used on freeways and multi-lane highways, they shall be 28" min. During hours of darkness, 28" cones shall be used on all roadways, and shall be reflectorized in accordance with the M.U.T.C.D.

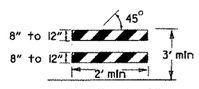
CONES



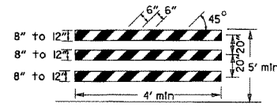
TYPE I BARRICADE

PLASTIC DRUM

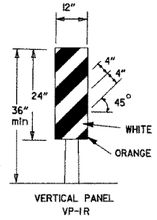




TYPE II BARRICADE



TYPE III BARRICADE



VERTICAL PANEL
VP-1R

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

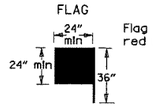
TRAFFIC CONTROL DEVICES
FOR
VERTICAL PAVEMENT DIFFERENTIALS

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

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

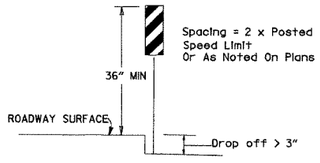
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.

FLAG

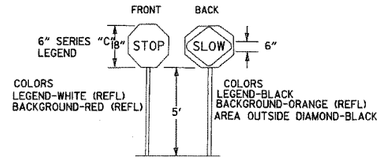


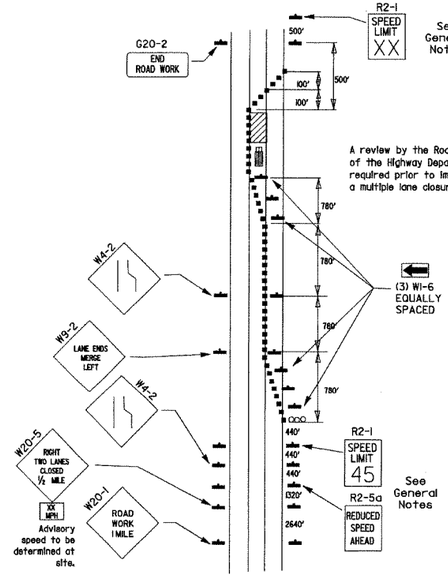
Flag shall be of good grade red material

VERTICAL PANEL PLACEMENT



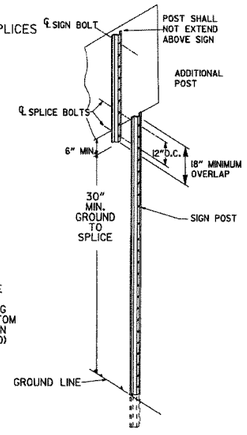
STOP SLOW PADDLE





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

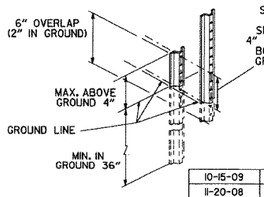
DETAIL OF SPLICES



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

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

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



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

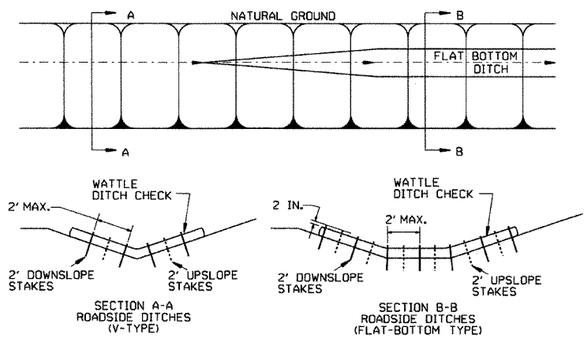
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

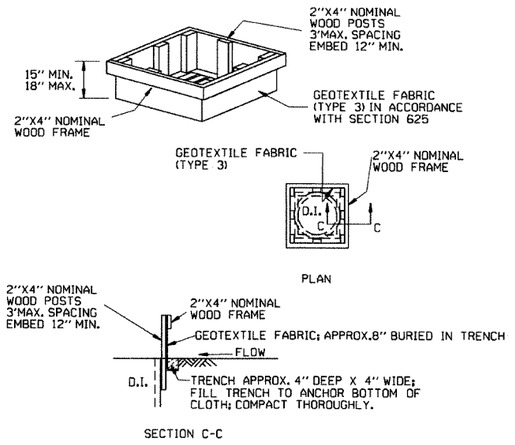
STANDARD DRAWING TC-3

GENERAL NOTES

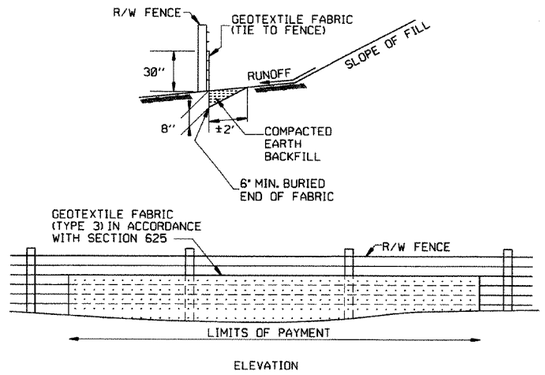
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



WATTLE DITCH CHECK (E-1)



DROP INLET SILT FENCE (E-7)



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

GENERAL NOTES

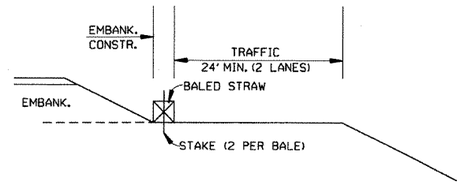
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST, OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

GENERAL NOTES

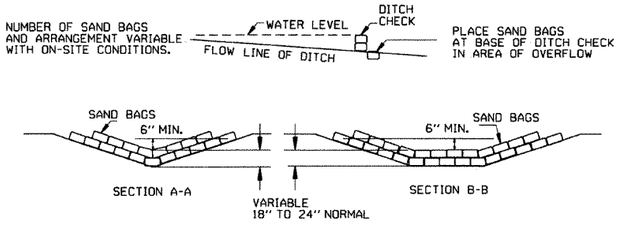
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.

2. NO GAPS SHALL BE LEFT BETWEEN BALES.

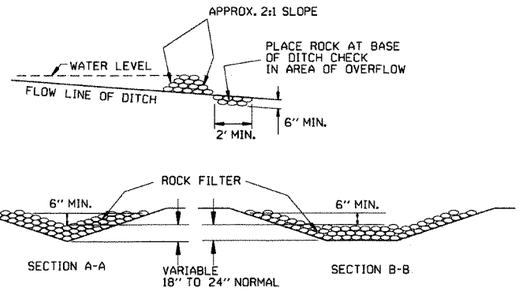
3. BALED STRAW FILTER BARRIERS COMPLETED AND ACCEPTED WILL BE MEASURED BY THE BALE IN PLACE AS AUTHORIZED BY THE ENGINEER AND WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER BALE FOR BALED STRAW DITCH CHECKS.



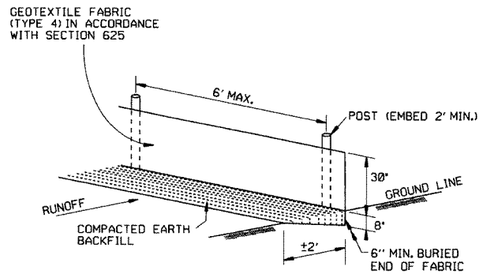
BALED STRAW FILTER BARRIER (E-2)



SAND BAG DITCH CHECK (E-5)



ROCK DITCH CHECK (E-6)



SILT FENCE (E-11)

GENERAL NOTES

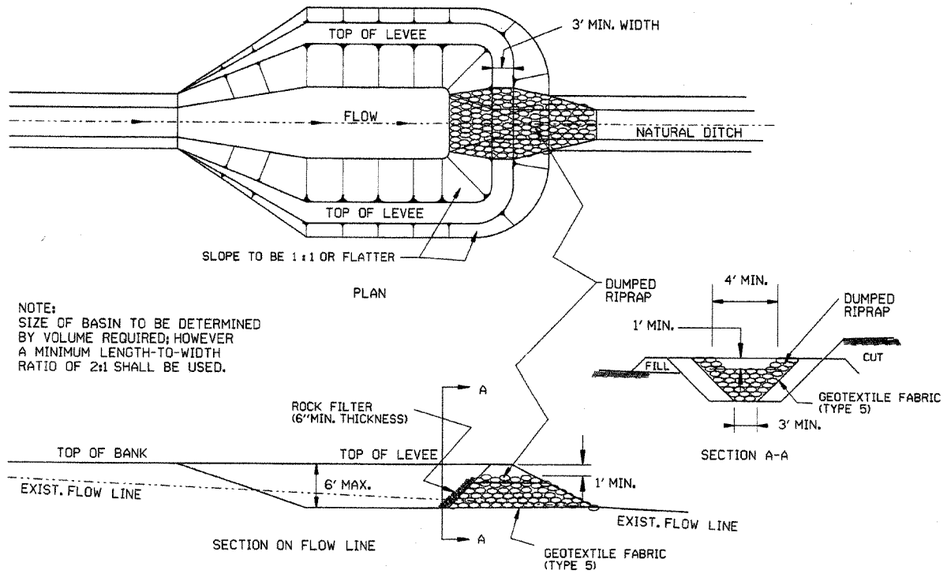
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

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

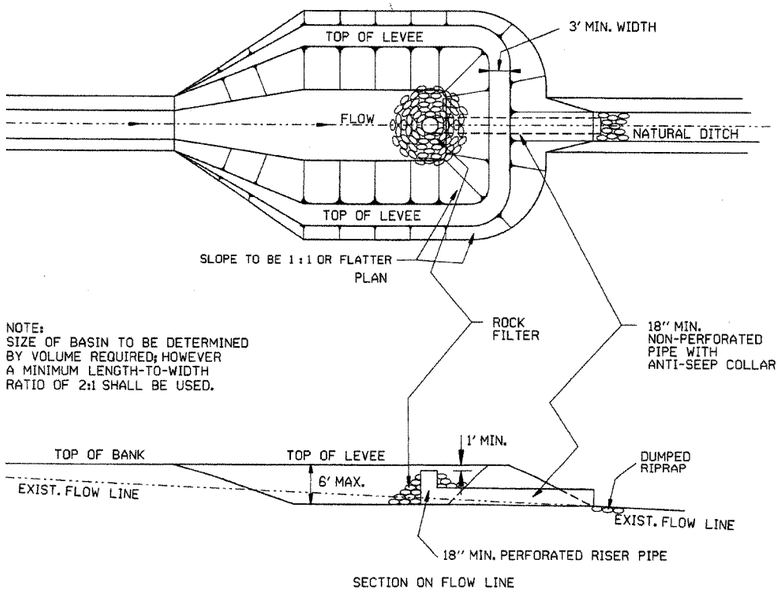
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

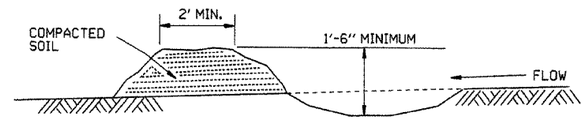
STANDARD DRAWING TEC-1



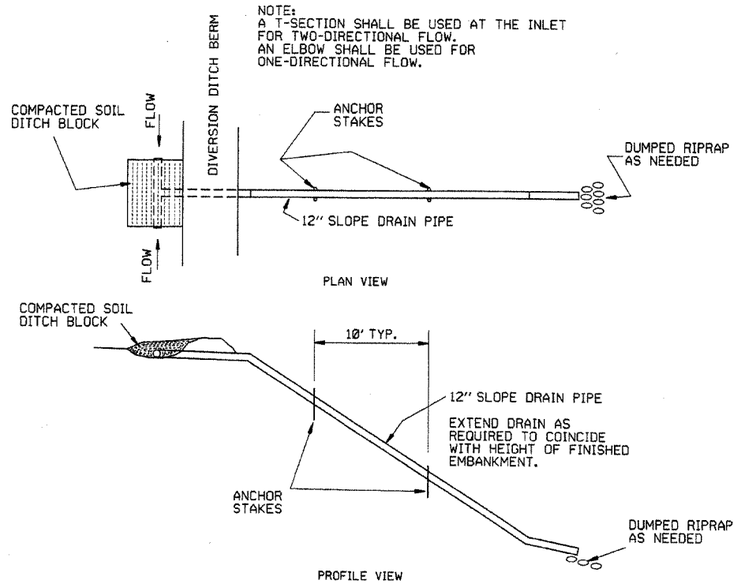
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



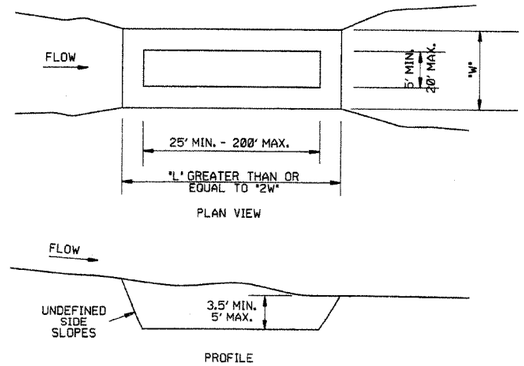
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



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

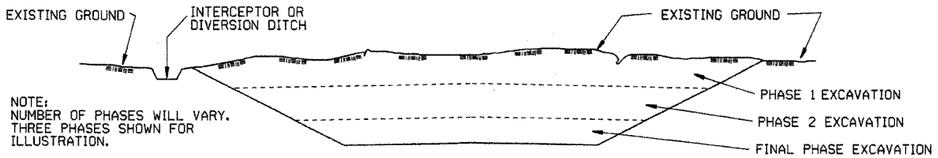
STANDARD DRAWING TEC-2

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



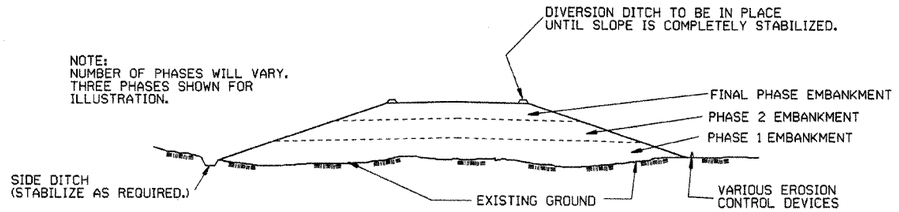
GENERAL NOTE

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

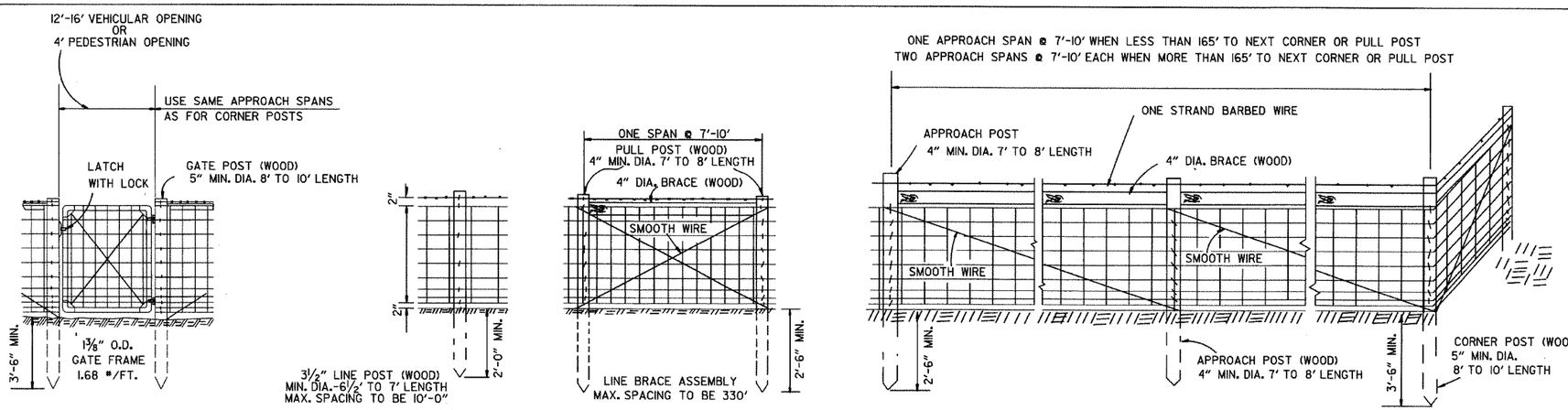
1. CONSTRUCT DIVERSION DITCHES, DITCH CHECKS, SEDIMENT BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD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

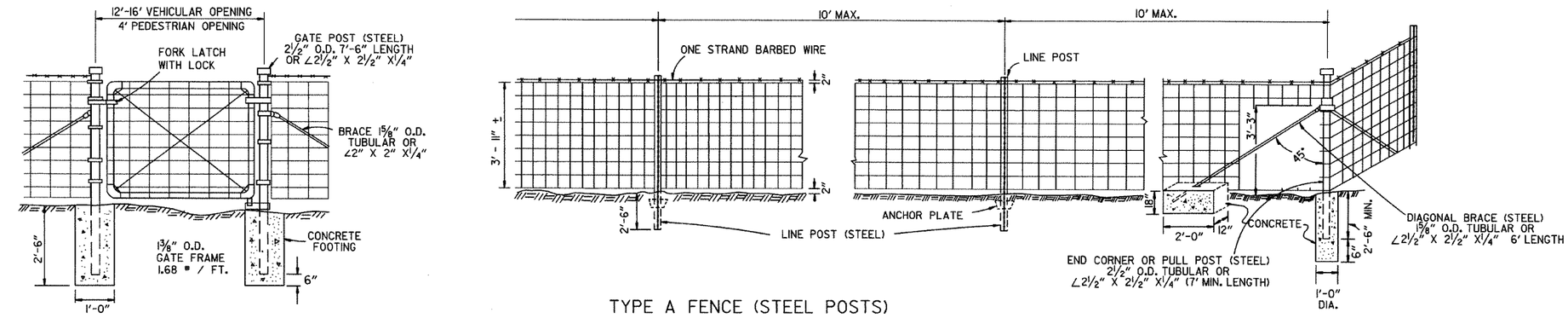
TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-3



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

TYPE A FENCE (WOOD POSTS)



TYPE A FENCE (STEEL POSTS)

GENERAL NOTES:

STEEL LINE POSTS SHALL BE GALVANIZED, 7 FT. IN LENGTH.

TUBULAR END, CORNER, PULL, OR DIAGONAL BRACES MUST CONFORM TO THE DIMENSIONS AND WEIGHTS SPECIFIED ON STANDARD DRAWING WF-3 (CHAIN LINK).

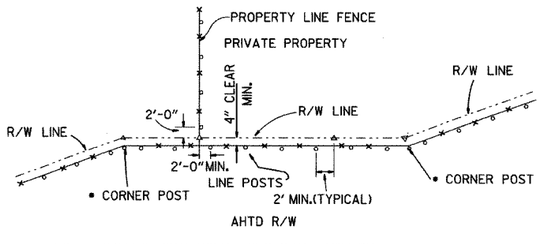
THE CONTRACTOR SHALL FURNISH AT LEAST 25% OF WOOD LINE POSTS OF 7' LENGTHS IN ORDER TO PROVIDE SUFFICIENT SET IN SOFT GROUND OR SMALL DEPRESSIONS.

GATE HINGES AND LATCHES WITH LOCKS TO BE OF A TYPE APPROVED BY THE ENGINEER. DRIVEWAY GATES, EITHER SINGLE 12' OR 16' OR DOUBLE 6' TO 8' OPENINGS 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 BY MAINTENANCE EQUIPMENT. LOCATION OF GATES TO BE SHOWN ON THE 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 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 SUFFIEICNT, THE FENCE SHALL BE TERMINATED WITH CROSS CONNECTIONS AND END POSTS ADJACENT TO THE BRIDGE ABUTMENTS OR CULVERT WINGWALLS.

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.

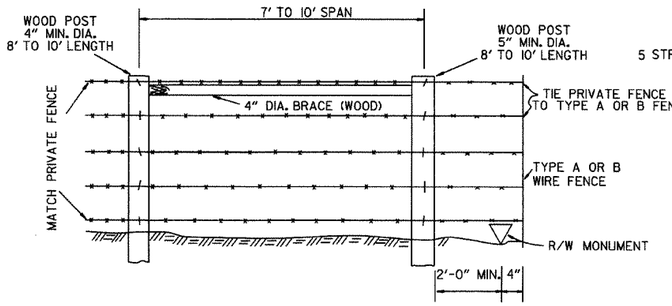
SPLICE FOR BARBED WIRE BETWEEN PULL POST ASSEMBLY SHALL BE BY THE "EYE METHOD": AS DESCRIBED AS FOLLOWS: THE ENDS OF THE BARBED WIRE SHALL BE BENT TO FORM A LOOP. THE LOOPS SHALL BE CONNECTED. AFTER THE LOOPS ARE CONNECTED THE ENDS OF THE WIRE SHALL BE WRAPPED AROUND THE PROJECTING WIRE A MINIMUM OF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



•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.

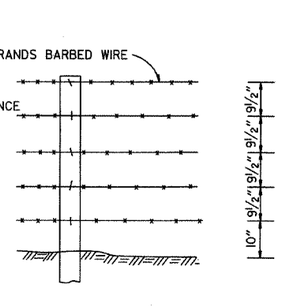
△ - R/W MONUMENTS
○ - FENCE POSTS

RIGHT-OF-WAY FENCE LOCATION



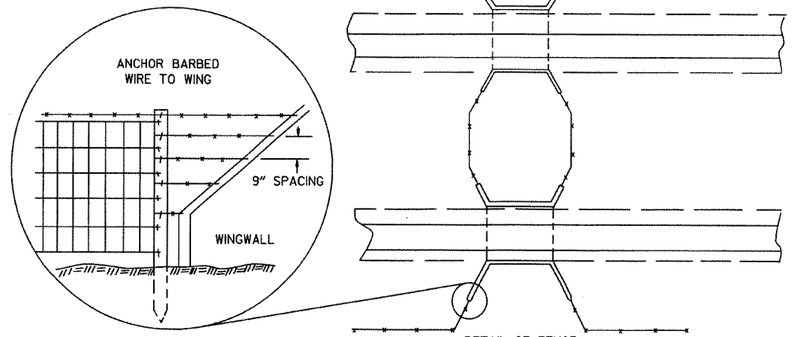
WHERE EXISTING PRIVATE FENCE CONSISTS OF STEEL POSTS, USE END POST ASSEMBLY AS SHOWN WITH TYPE A FENCE OR OTHER END POST ASSEMBLY AS APPROVED BY THE ENGINEER.

PRIVATE FENCE TERMINAL INSTALLATION



SPACING AND SIZE OF POSTS FOR TYPE B FENCE SHALL BE THE SAME AS TYPE A FENCE.

TYPE B FENCE



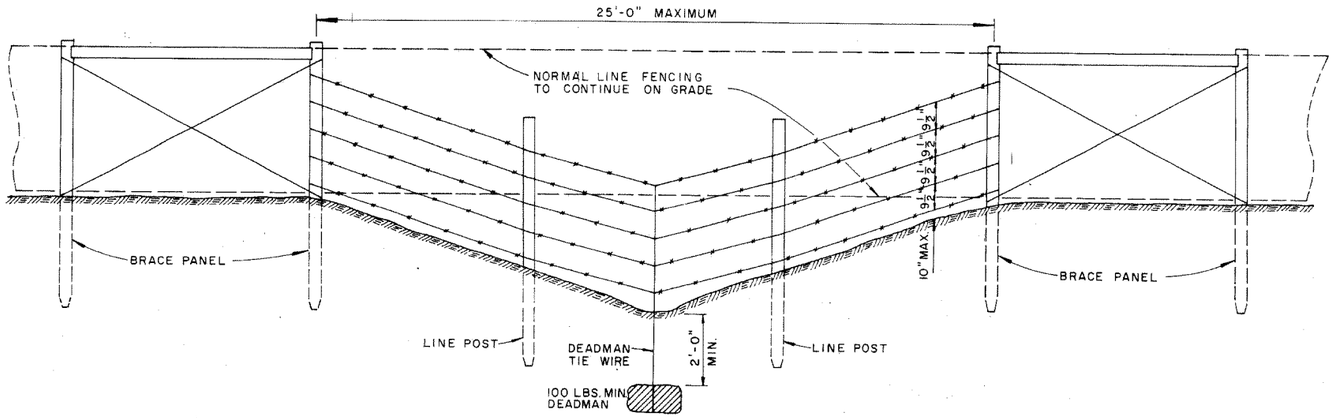
DETAIL OF FENCE CONSTRUCTION AT LARGE CULVERTS (5' IN HEIGHT AND OVER)

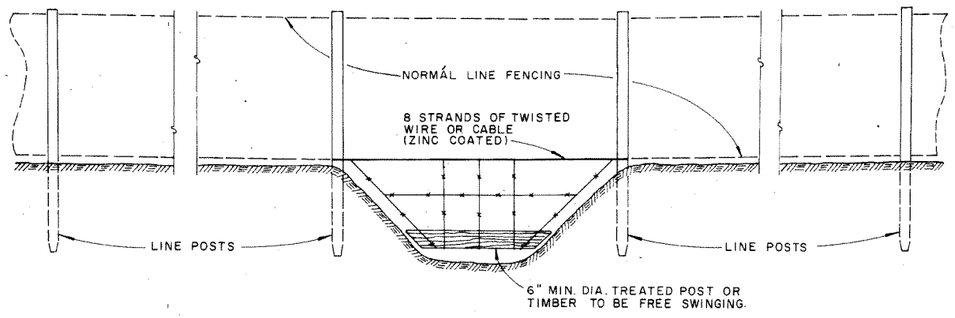
DATE	REVISION	DATE FILMED
8-22-02	REVISED GENERAL NOTES	
10-18-96	REVISED ASTM REF. TO AASHTO	
11-22-95	REVISED R-O-W LOCATION DETAIL	
6-2-94	ADDED CORNER POST NOTE	6-2-94
8-5-93	REVISED R-O-W LOCATION DETAIL	8-5-93
10-1-92	ADDED STAPLE NOTE	
8-2-90	REV'D PULL POST LENGTH	
11-30-89	DELETED CLASS CONC.	
7-15-88	ADDED SPLICE NOTES	
7-15-88	ADDED HEIGHT DIMENSION	
4-3-87	REVISED VARIOUS NOTES	
	AND GENERAL NOTES	
11-1-84	MAX. POST SPACING	
1-4-83	MIN. DIA. LINE POST	
10-2-72	REVISED & REDRAWN	

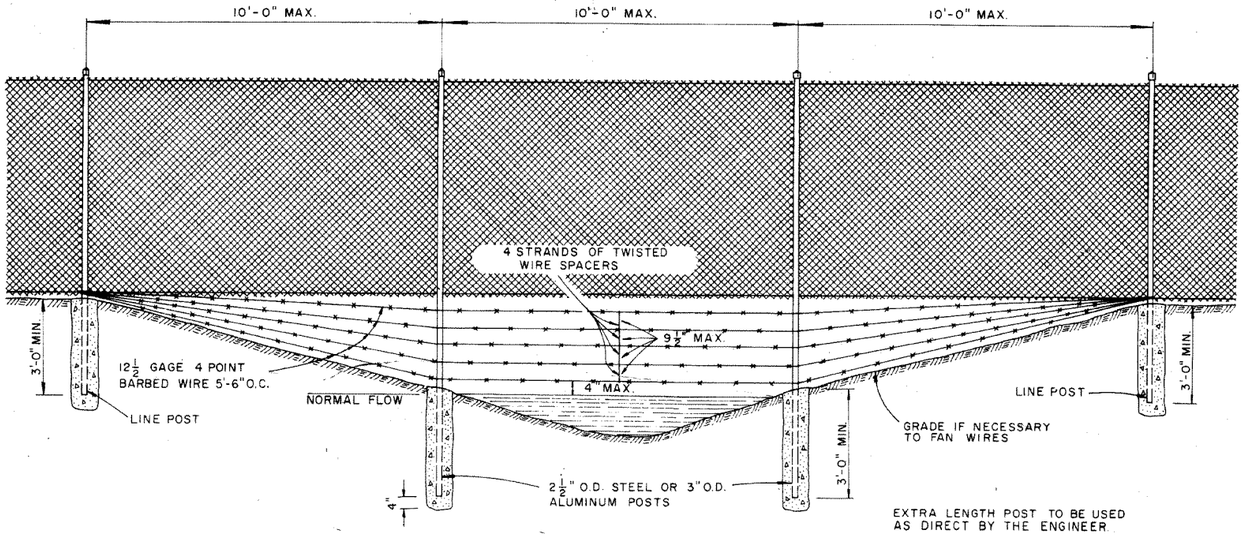
ARKANSAS STATE HIGHWAY COMMISSION

WIRE FENCE
TYPE A AND B

STANDARD DRAWING WF-1







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

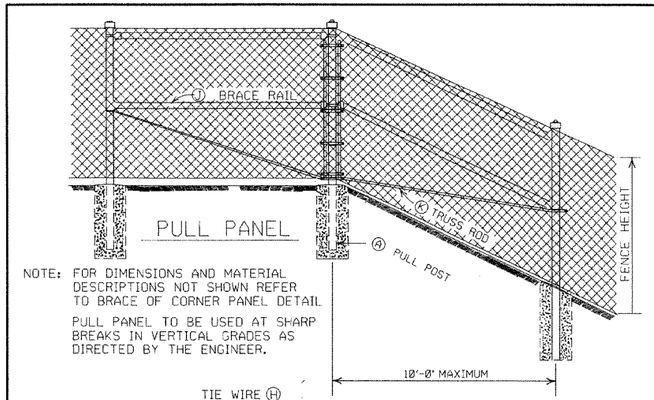
WIRE FENCE WATER GAPS

STANDARD DRAWING

WF-2

73

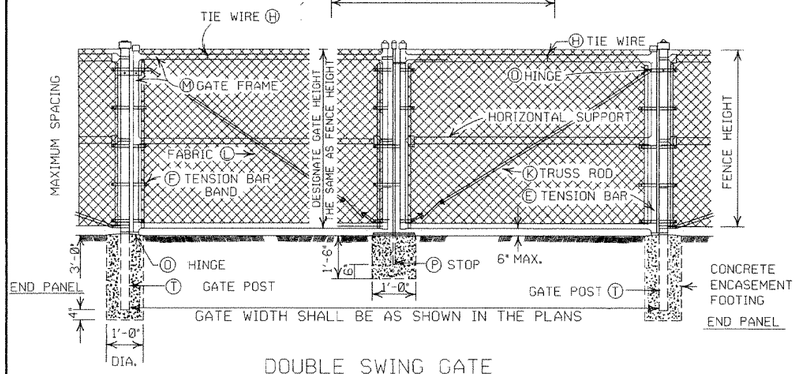
1M—11-71—67001—PPASCo



PULL PANEL

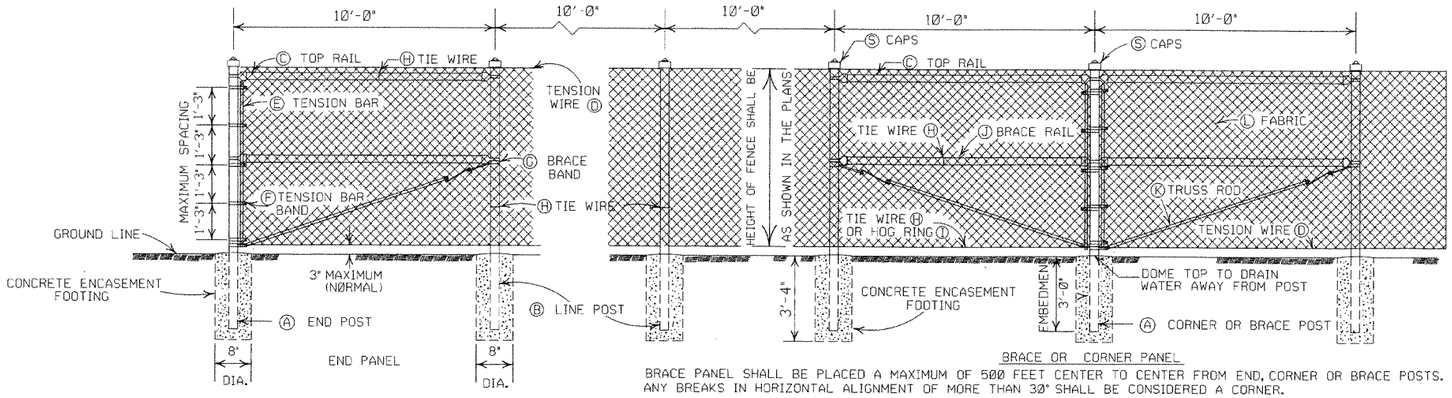
NOTE: FOR DIMENSIONS AND MATERIAL DESCRIPTIONS NOT SHOWN REFER TO BRACE OF CORNER PANEL DETAIL.

PULL PANEL TO BE USED AT SHARP BREAKS IN VERTICAL GRADES AS DIRECTED BY THE ENGINEER.



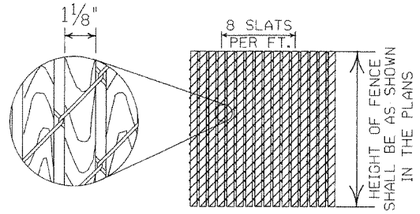
DOUBLE SWING GATE

POST SPACING DETAIL



BRACE OR CORNER PANEL

BRACE PANEL SHALL BE PLACED A MAXIMUM OF 500 FEET CENTER TO CENTER FROM END, CORNER OR BRACE POSTS. ANY BREAKS IN HORIZONTAL ALIGNMENT OF MORE THAN 30° SHALL BE CONSIDERED A CORNER.



1⅛" X ¼" REDWOOD SLATS (LENGTH TO MATCH HEIGHT OF FENCE)

DETAIL OF REDWOOD SLAT INSTALLATION

GENERAL NOTES:

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

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

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

(L) FABRIC: SHALL CONFORM TO THE SPECIFICATIONS.

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

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

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

(S) CAPS: ALL POSTS, EXCEPT ROLL FORMED POSTS AND "T" POSTS SHALL BE CAPPED OVER THE EXTERIOR OF THE POST, AND SHALL CONFORM TO ASTM F626.

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

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

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

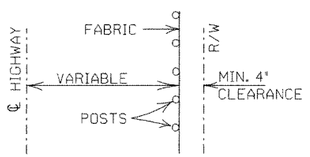
HEIGHT OF FENCE FABRIC	(A) END, PULL CORNER OR BRACE POST	(B) LINE POSTS SIZE	(B) LINE POSTS TIE SPACING	(C) TOP RAIL SIZE	(C) TOP RAIL TIE SPACING	(C) TOP RAIL MIN. LENGTH	(D) TENSION WIRE SIZE	(D) TENSION WIRE TIE SPACING	(E) TENSION BAR SIZE	(E) TENSION BAR LENGTH	(F) TENSION BAR BAND SIZE	(F) TENSION BAR BAND BOLT SIZE	(F) TENSION BAR BAND SPACING	(G) BRACE BAND SIZE	(G) BRACE BAND BOLT SIZE
6' AND LESS	2½" O.D.	2" O.D.	1 TIE EVERY 1'-2" OF FABRIC HEIGHT	1⅝" O.D.	1 TIE EVERY 2'-0"	10'-0"	7 GAUGE COIL SPRING WIRE	1 TIE EVERY 1'-0"	MIN. OF 3/16" X ¾"	MIN. OF 2" LESS THAN FABRIC HEIGHT	MIN. OF ¾" X 0.074	5/16" X 1¼"	1 BAND AT TOP AND BOTTOM 15" MAX. INTERVAL BETWEEN BANDS	MIN. OF ¾" X 0.105	5/16" X 1¼"
OVER 6' TO 12' INCL.	3 " O.D.	2½" O.D.													

HEIGHT OF FENCE FABRIC	(H) TIE WIRE	(I) HOG RING	(J) BRACE RAIL SIZE	(J) BRACE RAIL TIE SPACING	(K) TRUSS ROD	(L) FABRIC SIZE	(L) FABRIC MESH	(L) FABRIC SELVAGE	(M) GATE FRAME SIZE	(N) HORIZONTAL SUPPORT SIZE	(N) HORIZONTAL SUPPORT TIE SPACING	(O) HINGE TYPE 180° SWING	(T) GATE POST GATE WIDTH 12' AND LESS	(T) GATE POST GATE WIDTH OVER 12' TO 24' INCL.
6' AND LESS	MIN. OF 12 GA. STEEL OR 9 GA. ALUM.	SAME GAUGE AS FABRIC	1⅝" O.D.	1 TIE EVERY 2'-0"	MIN. OF ⅜" ROUND WITH TIGHTNERS AND FITTINGS	9 GA.	2"	KNUCK -ING AND/OR TWIST -ING	2" O.D.	1 TIE EVERY 1'-0"	2" O.D.	1 TIE EVERY 1'-0"	OFFSET	3" O.D.	4" O.D.
OVER 6' TO 12' INCL.														4" O.D.	

NOTE: POST SIZES SHOWN ARE FOR STEEL. WHERE ALUMINUM IS PROVIDED, LINE POSTS SHALL HAVE AN OUT SIDE DIAMETER OF 2½" FOR FENCE HEIGHT OF 6' AND LESS, AN OUTSIDE DIAMETER OF 3" FOR FENCE HEIGHT OF 6' TO 12'. END, PULL, CORNER OR BRACE POSTS SHALL HAVE AN OUTSIDE DIAMETER OF 3" FOR FENCE HEIGHT OF 6' AND LESS; AN OUTSIDE DIAMETER OF 3½" FOR FENCE HEIGHTS OF 6' TO 12'. GATE POSTS WHERE GATE WIDTH IS 12' AND LESS SHALL HAVE AN OUTSIDE DIAMETER OF 3½" FOR FENCE HEIGHT OF 6' AND LESS. ALUMINUM TENSION WIRE SHALL BE 0.192" IN DIAMETER. MINIMUM THICKNESS OF MATERIAL FROM WHICH EXPANSION SLEEVES SHALL BE MADE WILL BE 0.078". POSTS AND RAILS MAY HAVE ANY CROSS-SECTIONAL SHAPE THAT WILL MEET THE SPECIFICATIONS.

OTHER DETAILS APPLY TO BOTH STEEL AND ALUMINUM FENCE.

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



INSTALLATION MAY BE MODIFIED AS SHOWN IN THE PLANS

TYPICAL INSTALLATION DIAGRAM

POSTS AND RAILS

SIZE O.D.	GRADE 1 AND ALUMINUM ALLOY O.D. INCHES	WALL THICKNESS	LBS. PER LINEAR FT. STEEL	LBS. PER LINEAR FT. ALUMINUM	GRADE 2 O.D. INCHES	WALL THICKNESS	LBS. PER LINEAR FT.
1⅝	1.660	0.140	2.27	0.786	1.660	0.111	1.84
2	1.900	0.145	2.72	0.940	1.900	0.120	2.28
2½	2.375	0.154	3.65	1.264	2.375	0.130	3.11
3	2.875	0.203	5.79	2.004	2.875	0.160	4.64
3½	3.500	0.216	7.58	2.621	3.500	0.160	5.71
4	4.000	0.226	9.11	3.151	4.000	0.160	6.56

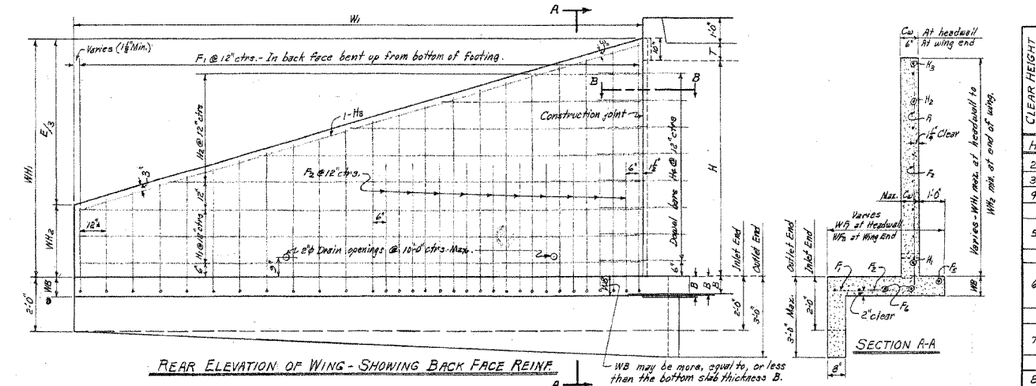
TOLERANCES ON DIMENSIONS AND WEIGHTS ACCORDING TO AASHTO M 181

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

ARKANSAS STATE HIGHWAY COMMISSION

CHAIN LINK FENCE

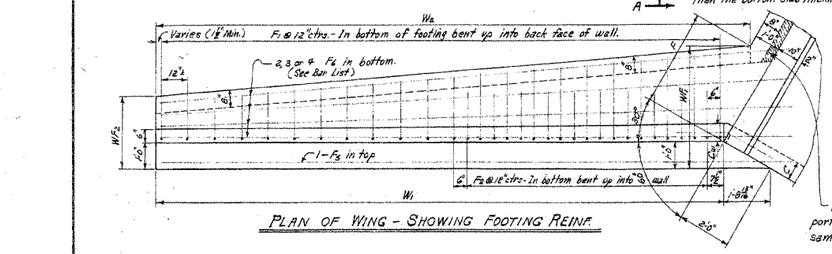
STANDARD DRAWING WF-3



REAR ELEVATION OF WING - SHOWING BACK FACE REINF.

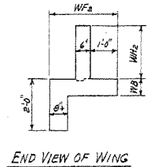
SECTION A-A

WB may be more, equal to, or less than the bottom slab thickness B.

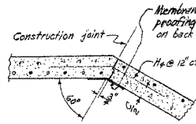


PLAN OF WING - SHOWING FOOTING REINF.

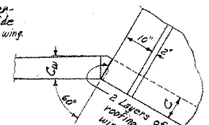
When B is more than WB, the shaded portion of the apron shall be made the same thickness as the barrel base B.



END VIEW OF WING



SECTION B-B THRU CONSTRUCTION JOINT



DETAIL AT TOP OF WING

Note:- Payment for membrane waterproofing and roofing felt to be included in the price bid for Class S Concrete.

WING DIMENSIONS

CLEAR HEIGHT OF BOX	THICKNESS OF WING FOOTING	THICKNESS OF WING AT HEADWALL = C	WINGWALL HEIGHTS AT HEADWALL	WINGWALL HEIGHTS AT END OF WING	WIDTHS OF WING FOOTINGS AT HEADWALL	WIDTHS OF WING FOOTINGS AT END OF WING	PERPENDICULAR FOOTING DIMENSION E	PERPENDICULAR DIST. FROM HDWL TO END OF WING W1	LENGTH OF WING WALLS W2	INSIDE FOOTING DIMENSION	* QUANTITY PER WING CLASS S CONCRETE	
											INLET END	OUTLET END
H	WB	Cw	WH1	WH2	WF1	WF2	E	W1	W2	F	CU.YD.	CU.YD.
2'	7"	6"	2'-10"	0'-8"	2'-4"	2'-0"	0'-11½"	6'-6"	7'-6"	7'-1½"	0.889	0.986
3'	7"	6"	3'-10"	1'-0"	2'-8"	2'-1½"	1'-0⅜"	8'-6"	9'-3⅜"	9'-2½"	1.338	1.466
4'	7"	6"	4'-10"	1'-4"	3'-0"	2'-3"	1'-3"	10'-6"	12'-1⅜"	12'-1½"	1.868	2.027
5'	7"	6"	5'-10"	1'-8"	3'-4"	2'-4⅜"	2'-1⅜"	12'-6"	14'-5⅝"	14'-5½"	2.978	2.668
		7"	5'-10"	1'-8"	3'-4"	2'-4⅜"	2'-1⅜"	12'-6"	14'-5⅝"	14'-5½"	2.582	2.772
6'	8"	7"	6'-10"	2'-0"	3'-8"	2'-6"	2'-4⅝"	14'-6"	16'-9"	17'-1⅝"	3.990	3.661
		8"	6'-10"	2'-0"	3'-8"	2'-6"	2'-4⅝"	14'-6"	16'-9"	17'-1½"	3.511	3.732
		8"	6'-10"	2'-0"	3'-8"	2'-6"	2'-4⅝"	14'-6"	16'-9"	17'-1½"	3.582	3.803
7'	8½"	7½"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-1⅛"	16'-6"	19'-0⅝"	19'-8⅜"	4.505	4.758
		8"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-1⅛"	16'-6"	19'-0⅝"	19'-8⅜"	4.597	4.851
8'	9"	8"	8'-10"	2'-8"	4'-8"	2'-9"	3'-4"	18'-6"	21'-4⅝"	22'-1"	5.761	6.049

* Quantity per wing does not include headwall or that portion of apron or footwall for the length W3.

APRON DIMENSION W3

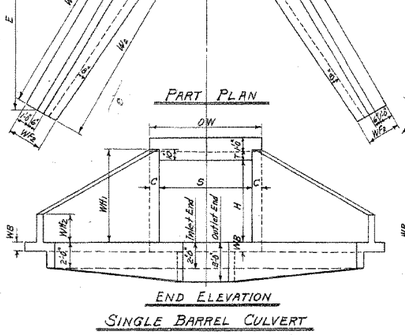
W3 = (OW - 2F)

CLEAR SPAN	CLEAR HEIGHT	F & 2F DIMENSION	SINGLE BARREL CULVERT		DOUBLE BARREL CULVERT		TRIPLE BARREL CULVERT		QUADRUPLE BARREL CULVERT		QUINTUPLE BARREL CULVERT	
			OW	W3	OW	W3	OW	W3	OW	W3	OW	W3
S	H	2F										
4'	2'	1'-11½"	5'-0"	3'-0½"	9'-8"	7'-8½"	14'-4"	12'-4½"	19'-0"	17'-0½"	23'-8"	21'-8½"
	3'	2'-8⅜"	5'-0"	2'-3¼"	9'-8"	6'-11⅛"	14'-4"	11'-7⅝"	19'-0"	16'-3¾"	23'-8"	20'-11⅝"
	4'	3'-5"	5'-0"	1'-6"	9'-8"	6'-2"	14'-4"	10'-10"	19'-0"	15'-6"	23'-8"	20'-2"
	5'	4'-3⅝"	5'-0"	0'-8⅝"	9'-8"	5'-4⅝"	14'-4"	10'-0⅝"	19'-0"	14'-8⅝"	23'-8"	19'-9⅝"
	6'	5'-0⅜"	5'-2"	0'-1½"	9'-11"	4'-10½"	14'-8"	9'-7½"	19'-5"	14'-0⅝"	24'-2"	19'-1⅝"
5'	3'	2'-8⅜"	6'-0"	3'-3⅝"	11'-8"	8'-11⅛"	17'-4"	14'-7⅝"	23'-0"	20'-3⅝"	28'-8"	25'-11⅝"
	4'	3'-5"	6'-0"	2'-6"	11'-8"	8'-2"	17'-4"	13'-10"	23'-0"	19'-6"	28'-8"	25'-2"
	5'	4'-3⅝"	6'-0"	1'-8⅝"	11'-8"	7'-4⅝"	17'-4"	13'-0⅝"	23'-0"	18'-8⅝"	28'-8"	24'-9⅝"
	6'	5'-0⅜"	6'-2"	1'-1½"	11'-11"	6'-10½"	17'-8"	12'-7½"	23'-5"	18'-0⅝"	29'-2"	24'-1⅝"
	7'	6'-2⅝"	6'-3"	0'-0½"	12'-1"	5'-10½"	17'-11"	11'-8⅝"	23'-9"	17'-6⅝"	29'-7"	23'-4⅝"
6'	3'	2'-8⅜"	7'-0"	4'-3½"	13'-8"	10'-11⅛"	20'-4"	17'-7⅝"	27'-0"	24'-3⅝"	33'-8"	30'-11⅝"
	4'	3'-5"	7'-0"	3'-6"	13'-8"	10'-2"	20'-4"	16'-10"	27'-0"	23'-6"	33'-8"	30'-2"
	5'	4'-3⅝"	7'-0"	2'-8⅝"	13'-8"	9'-5⅛"	20'-4"	16'-0⅝"	27'-0"	22'-8⅝"	33'-8"	29'-5⅛"
	6'	5'-0⅜"	7'-2"	2'-1½"	13'-11"	8'-10½"	20'-8"	15'-7½"	27'-5"	22'-0⅝"	34'-2"	28'-10½"
	7'	6'-2⅝"	7'-3"	1'-0½"	14'-1"	7'-10½"	20'-11"	14'-8⅝"	27'-9"	21'-0⅝"	34'-7"	27'-10½"
	8'	7'-1"	7'-4"	0'-0"	14'-5"	6'-10"	21'-0"	13'-8"	27'-10"	20'-6"	34'-8"	27'-0"
7'	4'	3'-5"	8'-0"	4'-6"	15'-8"	12'-4"	23'-4"	19'-10"	31'-0"	27'-6"	38'-8"	35'-2"
	5'	4'-3⅝"	8'-0"	3'-8⅝"	15'-8"	11'-6⅝"	23'-4"	19'-0⅝"	31'-0"	26'-8⅝"	38'-8"	34'-6⅝"
	6'	5'-0⅜"	8'-2"	3'-1½"	15'-11"	10'-10½"	23'-8"	18'-7½"	31'-5"	26'-0⅝"	39'-2"	34'-1⅝"
	7'	6'-2⅝"	8'-3"	2'-0½"	16'-1"	9'-10½"	23'-11"	17'-8⅝"	31'-9"	25'-0⅝"	39'-7"	33'-1⅝"
	8'	7'-1"	8'-4"	1'-0"	16'-5"	8'-10"	24'-0"	16'-8"	31'-10"	24'-6"	39'-8"	32'-4"
8'	5'	4'-3⅝"	9'-0"	5'-1⅝"	17'-11"	13'-7⅝"	26'-8"	22'-0⅝"	35'-5"	31'-1⅝"	44'-2"	39'-10⅝"
	6'	5'-0⅜"	9'-2"	4'-4½"	17'-11"	12'-10½"	26'-8"	21'-2½"	35'-5"	30'-4⅝"	44'-8"	39'-1½"
	7'	6'-2⅝"	9'-3"	3'-3½"	18'-1"	11'-10½"	26'-11"	20'-3⅝"	35'-9"	29'-4⅝"	44'-7"	38'-4⅝"
	8'	7'-1"	9'-4"	2'-0"	18'-5"	10'-10"	27'-0"	19'-8"	35'-10"	28'-6"	44'-8"	37'-9"
9'	5'	4'-3⅝"	10'-3"	5'-10⅝"	19'-11"	15'-7⅝"	29'-8"	25'-0⅝"	39'-5"	35'-1⅝"	49'-2"	44'-10⅝"
	6'	5'-0⅜"	10'-3"	5'-2½"	20'-1"	15'-0½"	29'-11"	24'-1½"	39'-9"	34'-3⅝"	49'-7"	44'-1½"
	7'	6'-2⅝"	10'-3"	4'-1½"	20'-1"	14'-0½"	29'-11"	23'-2⅝"	39'-9"	33'-3⅝"	49'-7"	43'-4⅝"
	8'	7'-1"	10'-4"	3'-0"	20'-5"	13'-0"	30'-0"	22'-8"	39'-10"	32'-6"	49'-8"	42'-9"
10'	5'	4'-3⅝"	11'-2"	6'-0⅝"	21'-11"	17'-7⅝"	32'-8"	28'-0⅝"	43'-5"	39'-1⅝"	54'-2"	49'-10⅝"
	6'	5'-0⅜"	11'-3"	5'-2½"	22'-1"	17'-0½"	32'-11"	27'-1½"	43'-9"	38'-3⅝"	54'-7"	49'-1½"
	7'	6'-2⅝"	11'-3"	4'-1½"	22'-1"	15'-10½"	32'-11"	26'-0⅝"	43'-9"	37'-1⅝"	54'-7"	48'-0⅝"
	8'	7'-1"	11'-4"	3'-0"	22'-5"	14'-10"	33'-0"	25'-8"	43'-10"	36'-6"	54'-8"	47'-9"
11'	6'	5'-0⅜"	12'-4"	7'-3½"	24'-2"	19'-1½"	36'-0"	30'-1⅛"	47'-10"	42'-3⅝"		
	7'	6'-2⅝"	12'-4"	6'-1½"	24'-2"	17'-11½"	36'-0"	28'-10⅝"	47'-10"	41'-1⅝"		
	8'	7'-1"	12'-4"	5'-0"	24'-2"	16'-10"	36'-0"	28'-8"	47'-10"	40'-6"		
12'	6'	5'-0⅜"	13'-4"	8'-3½"	26'-2"	21'-1½"	39'-0"	33'-1⅛"	51'-10"	46'-3⅝"		
	7'	6'-2⅝"	13'-4"	7'-1½"	26'-2"	19'-11½"	39'-0"	32'-0⅝"	51'-10"	45'-1⅝"		
	8'	7'-1"	13'-4"	6'-0"	26'-2"	18'-10"	39'-0"	31'-8"	51'-10"	44'-6"		

QUANTITIES

CLEAR SPAN	CLEAR HEIGHT	THICKNESS OF WING AT HEADWALL	THICKNESS OF WING FOOTING	REINFORCING STEEL - FOR 4 WINGS *	CLASS S CONCRETE - 4 WINGS HEADWALLS, WINGWALLS, FOOTINGS, TOE WALLS AND APRONS				
					SINGLE BARREL CULVERT	DOUBLE BARREL CULVERT	TRIPLE BARREL CULVERT	QUADRUPLE BARREL CULVERT	QUINTUPLE BARREL CULVERT
S	H	Cw	WB	LB.	CU.YD.	CU.YD.	CU.YD.	CU.YD.	CU.YD.
4'	2'	6"	7"	108.0	4.50	5.96	6.92	7.38	8.34
	3'	6"	7"	164.9	6.24	7.21	8.17	9.13	10.09
	4'	6"	7"	259.6	8.83	9.28	10.24	11.20	12.16
	5'	6"	7"	357.8	10.72	11.68	12.64	13.60	14.56
	6'	7"	8"	583.1	14.55	15.53	16.52	17.51	18.49
5'	3'	6"	7"	164.9	6.97	7.63	8.29	9.36	11.12
	4'	6"	7"	259.6	8.84	9.70	10.87	10.03	12.20
	5'	6"	7"	357.8	10.94	12.10	13.26	14.42	15.59
	6'	7"	8"	583.1	14.77	15.96	17.15	18.34	19.54
	7'	7½"	8½"	1139.6	18.94	20.15	21.37	22.59	23.80
6'	3'	6"	7"	164.9	6.68	8.06	9.42	10.80	12.18
	4'	6"	7"	259.6	8.75	10.19	11.49	12.87	14.25
	5'	6"	7"	357.8	11.15	12.53	13.89	15.27	16.65
	6'	7"	8"	583.1	14.98	16.39	17.78	19.18	20.59
	7'	7½"	8½"	1139.6	19.15	20.58	22.00	23.43	24.86
	8'	8"	9"	1925.6	24.04	25.53	26.96	28.39	29.83
7'	4'	6"	7"	259.6	8.37	10.58	12.15	13.76	15.35
	5'	6"	7"	357.8	11.36	12.97	14.54	16.15	17.75
	6'	7"	8"	583.1	15.20	16.82	18.42	20.04	21.66
	7'	7½"	8½"	1139.6	19.38	21.02	22.68	24.28	25.92
	8'	8"	9"	1925.6	24.32	25.97	27.60	29.25	30.89
8'	4'	6"	7"	259.6	9.19	11.03	12.82	14.65	16.45
	5'	7"	7"	357.8	12.03	13.89	15.70	17.55	19.34
	6'	7"	8"	583.1	15.92	17.27	19.29	20.93	22.75
	7'	7½"	8½"	1139.6	19.39	21.46	23.30	25.16	26.93
	8'	8"	9"	1925.6	24.52	26.41	28.29	30.11	31.96
9'	5'	7"	7"	357.8	12.26	14.34	16.87	18.45	20.47
	6'	7½"	8"	583.1	15.94	18.04	20.09	22.19	24.23
	7'	7½"	8½"	1139.6	19.81	21.91	23.96	26.06	28.10
	8'	8"	9"	1925.6	24.76	26.86	28.91	31.00	33.05
10'	5'	7"	7"	357.8	12.49	14.80	17.05	19.26	21.52
	6'	7½"	8"	583.1	16.17	18.50	20.77	22.99	25.28
	7'	7½"	8½"	1139.6	20.04	22.37	24.64	26.87	29.15
	8'	8"	9"	1925.6	24.98	27.31	29.58	31.81	34.10
11'	6'	8"	8"	583.1	16.69	19.27	21.76	24.23	
	7'	8"	8½"	1139.6	20.64	23.22	25.71	28.18	
	8'	8"	9"	1925.6	25.19	27.77	30.27	32.74	
12'	6'	8"	8"	583.1	16.92	19.75	22.45	25.18	
	7'	8"	8½"	1139.6	20.87	23.69	26.40	29.13	
	8'	8"	9"	1925.6	25.42	28.25	30.96	33.69	

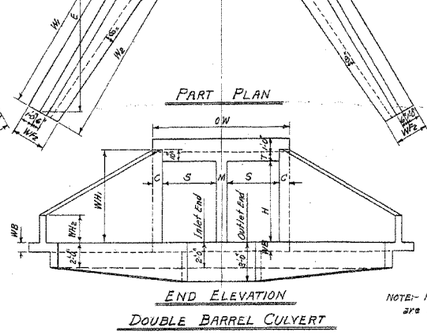
* For reinforcing steel in Headwalls and Aprons, See Details of Standard Barrel Sections for R.C. Box Culverts for the desired Span and Height.



PART PLAN

END ELEVATION

SINGLE BARREL CULVERT

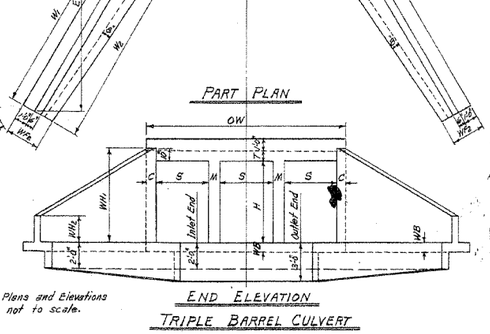


PART PLAN

END ELEVATION

DOUBLE BARREL CULVERT

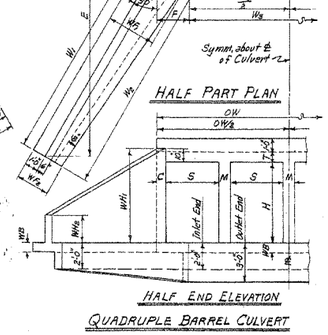
NOTE:- Plans and Elevations are not to scale.



PART PLAN

END ELEVATION

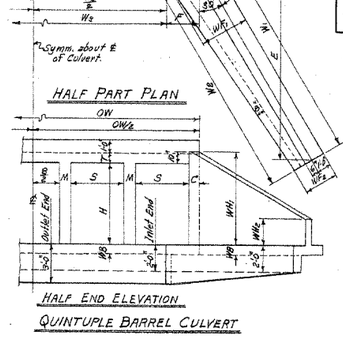
TRIPLE BARREL CULVERT



HALF PART PLAN

HALF END ELEVATION

QUADRUPLE BARREL CULVERT



HALF PART PLAN

HALF END ELEVATION

QUINTUPLE BARREL CULVERT

MEMBRANE:- A membrane waterproofing 12" wide, consisting of three mopings of waterproofing asphalt and two alternate layers of treated cotton fabric shall be applied to the back face of wing to cover the construction joints in wings.

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing steel to be deformed bars of intermediate or hard grade.

CONSTRUCTION JOINTS:- Construction joints between wingwall, footings and sidewalls shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

UNIT STRESSES:-

Class S Concrete (n=10) 1200#/□"
Reinforcing Steel 20,000#/□"

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

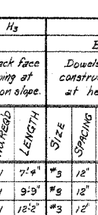
SINGLES	DOUBLES	TRIPLES	QUADRUPLES	QUINTUPLES
R-100X-0	R-200X-0	R-300X-0	R-400X-0	R-500X-0
R-100X-X1	R-200X-X1	R-300X-X1	R-400X-X1	R-500X-X1
R-100X-X2	R-200X-X2	R-300X-X2	R-400X-X2	
	R-200X-X3	R-300X-X3		

CLASS S CONCRETE

BAR LIST FOR ONE WING - 4 REQUIRED

CLEAR HEIGHT	F1 BENT: In bottom of footing, bent up into back face of wing. One bar of each length. SIZE	SPACING	NO. REQD	LENGTHS VARY MIN.	LENGTHS VARY MAX.	X MIN.	X MAX.	Y MIN.	Y MAX.	F2 BENT: In bottom of footing, bent up into back face of wing. Alt. with F1 bars. SIZE	SPACING	NO. REQD	LENGTH	X	Y	F3 STRAIGHT: Longitudinal in top of wing footing heel. SIZE	NO. REQD	LENGTH	F4 STRAIGHT: Longitudinal in bottom of wing footing toe. SIZE	NO. REQD	LENGTH	H1 Horizontal in back face of wing. SIZE	SPACING	NO. REQD	LENGTH	H2 STRAIGHT: Horizontal in back face of wing. One bar of each length. SIZE	SPACING	NO. REQD	LENGTHS VARY MAX.	LENGTHS VARY MIN.	H3 In back face of wing at top - on slope. SIZE	NO. REQD	LENGTH	H4 BENT: Dowels thru construction joint at headwall. SIZE	SPACING	NO. REQD	LENGTH	X	QUANTITY REINFORCING STEEL PER WING LB.
H																																									
2'	#3	12"	8	1'-6"	3'-10"	0'-8"	1'-0"	0'-11"	2'-11"	#3	12"	1	9'-8"	#3	2	9'-6"	#3	2	9'-6"	#3	12"	1	7'-2"	#3	12"	1	———	4'-0"	#8	1	7'-4"	#8	12"	2	2'-8"	1'-9"	27.0
3'	#3	12"	10	2'-2"	5'-2"	0'-8"	1'-3"	1'-5"	4'-5"	#3	12"	1	12'-0"	#3	2	11'-0"	#3	12"	1	9'-6"	#3	12"	2	7'-6"	4'-0"	#8	1	9'-9"	#8	12"	3	2'-8"	1'-6"	41.1
4'	#3	12"	13	2'-9"	6'-6"	0'-11"	1'-7"	1'-6"	5'-0"	#3	1	14'-9"	#3	3	13'-6"	#8	12"	1	11'-10"	#3	12"	3	10'-11"	4'-0"	#3	1	12'-2"	#3	12"	4	2'-8"	1'-9"	63.7
5'	#3	12"	15	2'-11"	7'-10"	1'-1"	1'-11"	1'-11"	6'-0"	#3	12"	4	3'-6"	1'-1"	2'-6"	#3	1	16'-8"	#3	3	16'-0"	#3	12"	2	14'-2"	#3	12"	3	10'-11"	4'-0"	#3	1	14'-7"	#3	12"	5	2'-8"	1'-9"	89.5
6'	#4	12"	17	3'-6"	9'-3"	1'-2"	2'-3"	2'-5"	7'-1"	#3	12"	4	4'-1"	1'-4"	3'-3"	#3	1	19'-0"	#3	3	18'-6"	#3	12"	2	16'-4"	#3	12"	4	14'-4"	4'-0"	#3	1	17'-0"	#3	12"	6	2'-8"	1'-9"	145.8
7'	#4	12"	20	3'-9"	10'-3"	1'-3"	2'-9"	2'-7"	8'-1"	#4	12"	7	5'-6"	1'-7"	4'-3"	#4	1	21'-4"	#4	4	21'-0"	#4	12"	2	18'-3"	#4	12"	4	17'-9"	4'-0"	#4	1	19'-5"	#4	12"	7	3'-6"	1'-9"	263.7
8'	#4	12"	22	4'-4"	12'-3"	1'-5"	3'-2"	3'-0"	9'-2"	#4	12"	10	6'-6"	1'-10"	4'-9"	#4	1	23'-8"	#4	4	23'-9"	#4	12"	3	21'-1"	#4	12"	5	17'-9"	4'-0"	#4	1	21'-10"	#4	12"	8	3'-6"	1'-9"	356.4

BAR BENDING DIAGRAMS



NOTE:- Dimensions are to bar centers.

REVISIONS:- Membrane added. 5-10-66 W.C.H.

Designed By:- W.C.H. 6-20-62. Checked By:- RMS - 1-9-63
Drawn By:- W.C.H. 12-4-62. Checked By:- RMS - 1-31-63
Quantities By:- W.C.H. 12-14-62. Checked By:- RMS - 3-22-63
Traced By:- Checked By:-

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 SLOPES

SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES. — ALL DEPTHS OF COVER FOR H = 8'-0" OR LESS

STANDARD DRAWING NO. W-X003-1

W.H.D.R. (5)

RESHOT 3-4-93

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			89	
JOB No.					

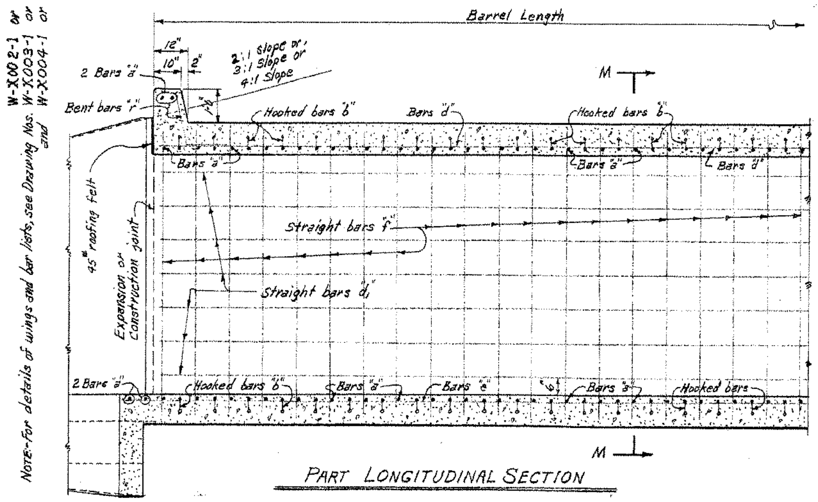
BAR LIST FOR BARREL SECTION 60'-0" IN LENGTH

DEPTH OF COVER D	CLEAR SPAN S	CLEAR HEIGHT H	"a" bars STRAIGHT – In Top and Bottom Slabs of Barrel. 2 Add'l in Apron and Headwall-Each. SIZE	"a" SPACING	"a" NUMBER REQ'D 3:1	"a" NUMBER REQ'D 4:1	"a" LENGTH	"b" bars BENT - See Diagram below. In Top and Bottom Slabs of Barrel. Alternate with "a" bars. SIZE	"b" SPACING	"b" NUMBER REQ'D 3:1	"b" NUMBER REQ'D 4:1	"b" LENGTH	"b" X	"d" bars STRAIGHT – Longitudinal in Top Slab of Barrel SIZE	"d" SPACING	"d" No. REQ'D	"d" LENGTH	"d1" bars STRAIGHT – Longitudinal in Sidewalls SIZE	"d1" SPACING	"d1" No. REQ'D	"d1" LENGTH	"e" bars STRAIGHT – Longitudinal in Bottom Slab of Barrel SIZE	"e" SPACING	"e" No. REQ'D	"e" LENGTH	"f" bars STRAIGHT – Verticals in Sidewalls SIZE	"f" SPACING	"f" NUMBER REQ'D 3:1	"f" NUMBER REQ'D 4:1	"f" LENGTH
0'-0" TO 5'-0" MAXIMUM	1 @ 4'	2'	#5	13"	120	120	4'-9"	#6	13"	110	110	5'-10"	4'-8"	#5	10½"	6	2 @ 30'-8" for 60'-0" Length Barrel. (1'-8" Lap)	#4	12"	4	2 @ 30'-6" for 60'-0" Length Barrel. (1'-3" Lap)	#4	12"	5	2 @ 31'-6" for 60'-0" Length Barrel. (1'-3" Lap)	#4	12"	120	120	2'-11"
		3'			120	120	4'-9"			110	110	5'-10"	4'-8"			6				6				5				120	120	3'-11"
		4'			120	120	4'-9"			110	110	5'-10"	4'-8"			6				8				5				120	120	4'-11"
		5'			120	120	4'-9"			110	110	5'-10"	4'-8"			6				10				5				120	120	5'-11"
		6'			120	120	4'-11"			110	110	6'-0"	4'-10"			6				12				5				120	120	6'-11"
	1 @ 5'	3'	#6	13"	120	120	5'-9"	#6	13"	110	110	6'-10"	5'-8"	#5	10½"	7		#4	12"	6		#4	12"	6		#4	12"	120	120	4'-0"
		4'			120	120	5'-9"			110	110	6'-10"	5'-8"			7				8				6				120	120	5'-0"
		5'			120	120	5'-9"			110	110	6'-10"	5'-8"			7				10				6				120	120	6'-0"
		6'			120	120	5'-11"			110	110	7'-0"	5'-10"			7				12				6				120	120	7'-0"
		7'			120	120	6'-0"			110	110	7'-1"	5'-11"			7				14				6				120	120	8'-0"
	1 @ 6'	3'	#6	12"	128	128	6'-9"	#6	12"	118	118	7'-10"	6'-8"	#5	10½"	8		#4	12"	6		#4	12"	7		#4	12"	120	120	4'-1"
		4'			128	128	6'-9"			118	118	7'-10"	6'-8"			8				8				7				120	120	5'-1"
		5'			128	128	6'-9"			118	118	7'-10"	6'-8"			8				10				7				120	120	6'-1"
		6'			128	128	6'-11"			118	118	8'-0"	6'-10"			8				12				7				120	120	7'-1"
		7'			128	128	7'-0"			118	118	8'-1"	6'-11"			8				14				7				120	120	8'-1"
		8'			128	128	7'-1"			118	118	8'-2"	7'-0"			8				16				7		#5	12"	120	120	9'-1"
	1 @ 7'	4'	#6	11"	140	140	7'-9"	#6	11"	130	130	8'-10"	7'-8"	#5	10½"	9		#4	12"	8		#4	12"	8		#4	12"	120	120	5'-2"
		5'			140	140	7'-9"			130	130	8'-10"	7'-8"			9				10				8				120	120	6'-2"
		6'			140	140	7'-11"			130	130	9'-0"	7'-10"			9				12				8				120	120	7'-2"
		7'			140	140	8'-0"			130	130	9'-1"	7'-11"			9				14				8				120	120	8'-2"
		8'			140	140	8'-1"			130	130	9'-2"	8'-0"			9				16				8			10"	144	144	9'-2"
		9'			140	140	8'-3"			130	130	9'-4"	8'-2"			9				18				8		#5	12"	120	120	10'-2"
	1 @ 8'	4'	#7	12"	128	128	8'-9"	#6	12"	118	118	9'-10"	8'-8"	#5	10"	11		#4	12"	8		#4	12"	9		#4	12"	120	120	5'-4"
		5'			128	128	8'-11"			118	118	10'-0"	8'-10"			11				10				9				120	120	6'-4"
		6'			128	128	8'-11"			118	118	10'-0"	8'-10"			11				12				9				120	120	7'-4"
		7'			128	128	9'-0"			118	118	10'-1"	8'-11"			11				14				9				120	120	8'-4"
		8'			128	128	9'-1"			118	118	10'-2"	9'-0"			11				16				9			10"	144	144	9'-4"
		9'			128	128	9'-3"			118	118	10'-4"	9'-2"			11				18				9		#5	12"	120	120	10'-4"
		10'			128	128	9'-5"			118	118	10'-6"	9'-4"			11				20				9			11"	132	132	11'-4"
	1 @ 9'	5'	#7	11"	140	140	9'-11"	#6	11"	130	130	11'-0"	9'-10"	#5	10"	12		#4	12"	10		#4	12"	10		#4	12"	120	120	6'-5"
		6'			140	140	10'-0"			130	130	11'-1"	9'-11"			12				12				10				120	120	7'-5"
		7'			140	140	10'-0"			130	130	11'-1"	9'-11"			12				14				10				120	120	8'-5"
		8'			140	140	10'-1"			130	130	11'-2"	10'-0"			12				16				10			10"	144	144	9'-5"
		9'			140	140	10'-3"			130	130	11'-4"	10'-2"			12				18				10		#5	12"	120	120	10'-5"
		10'			140	140	10'-5"			130	130	11'-6"	10'-4"			12				20				10			11"	132	132	11'-5"
		11'			140	140	10'-7"			130	130	11'-8"	10'-6"			12				22				10			10"	144	144	12'-5"
	1 @ 10'	5'	#7	12"	128	128	10'-11"	#7	12"	118	118	12'-2"	10'-10"	#5	10"	13		#4	12"	10		#4	12"	11		#4	12"	120	120	6'-6"
		6'			128	128	11'-0"			118	118	12'-3"	10'-11"			13				12				11				120	120	7'-6"
		7'			128	128	11'-0"			118	118	12'-3"	10'-11"			13				14				11				120	120	8'-6"
		8'			128	128	11'-1"			118	118	12'-4"	11'-0"			13				16				11			10"	144	144	9'-6"
		9'			128	128	11'-3"			118	118	12'-6"	11'-2"			13				18				11		#5	12"	120	120	10'-6"
		10'			128	128	11'-5"			118	118	12'-8"	11'-4"			13				20				11			11"	132	132	11'-6"
		11'			128	128	11'-7"			118	118	12'-10"	11'-6"			13				22				11			10"	144	144	12'-6"
		12'			128	128	11'-9"			118	118	13'-0"	11'-8"			13				24				11		#6	12"	120	120	13'-6"
	1 @ 11'	6'	#7	11"	140	140	12'-1"	#7	11"	130	130	13'-4"	12'-0"	#5	9½"	15		#4	12"	12		#4	12"	12		#4	12"	120	120	7'-7"
		7'			140	140	12'-1"			130	130	13'-4"	12'-0"			15				14				12				120	120	8'-7"
		8'			140	140	12'-1"			130	130	13'-4"	12'-0"			15				16				12			10"	144	144	9'-7"
		9'			140	140	12'-3"			130	130	13'-6"	12'-2"			15				18				12		#5	12"	120	120	10'-7"
		10'			140	140	12'-5"			130	130	13'-8"	12'-4"			15				20				12			11"	132	132	11'-7"
		11'			140	140	12'-7"			130	130	13'-10"	12'-6"			15				22				12			10"	144	144	12'-7"
		12'			140	140	12'-9"			130	130	14'-0"	12'-8"			15				24				12		#6	12"	120	120	13'-7"
	1 @ 12'	6'	#8	12"	128	128	13'-1"	#7	12"	118	118	14'-4"	13'-0"	#5	9½"	16		#4	12"	12		#4	12"	13		#4	12"	120	120	7'-9"
		7'			128	128	13'-1"			118	118	14'-4"	13'-0"			16				14				13				120	120	8'-9"
		8'			128	128	13'-1"			118	118	14'-4"	13'-0"			16				16				13			10"	144	144	9'-9"
		9'			128	128	13'-3"			118	118	14'-6"	13'-2"			16				18				13		#5	12"	120	120	10'-9"
		10'			128	128	13'-5"			118	118	14'-8"	13'-4"			16				20				13			11"	132	132	11'-9"
		11'			128	128	13'-7"			118	118	14'-10"	13'-6"			16				22				13			10"	144	144	12'-9"
		12'			128	128	13'-9"			118	118	15'-0"	13'-8"			16				24				13		#6	12"	120	120	13'-9"

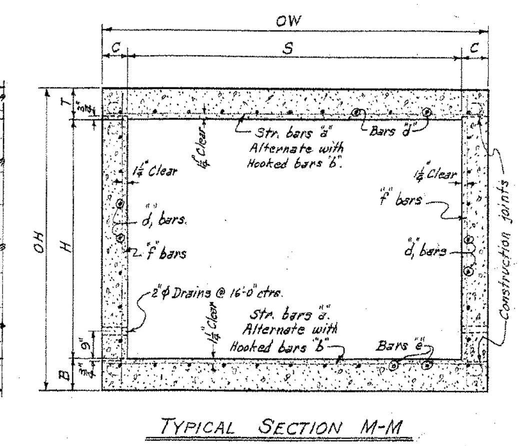
DIMENSIONS / QUANTITIES

MAX. DESIGN DEPTH OF COVER D	BARREL DIMENSIONS: CLEAR SPAN S	CLEAR HEIGHT H	SQ. FT. OPENING A	OVERALL WIDTH OW	THICKNESS OF TOP SLAB T	THICKNESS OF SIDEWALLS C	THICKNESS OF BOTTOM SLAB B	OVERALL HEIGHT OH	UNIT QUANTITIES: CLASS S CONC. PER LIN. FT. OF BARREL CU.YD.	REINFORCING STEEL: PER LIN. FT. OF BARREL LB.	ADDITIONAL: PER LAP LB.	ADDITIONAL: TWO HEADWALLS & APRONS LB.
5'-0"	1 @ 4'	2'	8	5'-0"	7"	6"	6½"	3'-1½"	0.282	41.49	17.95	66.35
		3'	12	5'-0"		6"		4'-1½"	0.319	44.16	19.62	66.35
		4'	16	5'-0"		6"		5'-1½"	0.356	46.83	21.29	66.35
		5'	20	5'-0"		6"		6'-1½"	0.394	49.50	22.96	66.35
		6'	24	5'-2"		7"		7'-1½"	0.474	52.96	24.63	67.75
	1 @ 5'	3'	15	6'-0"	7½"	6"	7"	4'-2½"	0.380	55.55	22.19	101.27
		4'	20	6'-0"		6"		5'-2½"	0.417	58.23	23.86	101.27
		5'	25	6'-0"		6"		6'-2½"	0.454	60.90	25.53	101.27
		6'	30	6'-2"		7"		7'-2½"	0.535	64.49	27.20	103.27
		7'	35	6'-3"		7½"		8'-2½"	0.604	67.63	28.87	104.27
	1 @ 6'	3'	18	7'-0"	8"	6"	7½"	4'-3½"	0.446	66.29	24.76	118.96
		4'	24	7'-0"		6"		5'-3½"	0.483	68.96	26.43	118.96
		5'	30	7'-0"		6"		6'-3½"	0.520	71.64	28.10	118.96
		6'	36	7'-2"		7"		7'-3½"	0.602	75.31	29.77	120.96
		7'	42	7'-3"		7½"		8'-3½"	0.671	78.98	31.44	121.97
		8'	48	7'-4"		8"		9'-3½"	0.746	88.47	33.11	122.97
	1 @ 7'	4'	28	8'-0"	8½"	6"	8½"	5'-5"	0.568	81.32	29.01	136.88
		5'	35	8'-0"		6"		6'-5"	0.605	84.00	30.68	136.88
		6'	42	8'-2"		7"		7'-5"	0.688	87.76	32.35	138.88
		7'	49	8'-3"		7½"		8'-5"	0.757	90.98	34.02	139.88
		8'	56	8'-4"		8"		9'-5"	0.832	96.65	35.69	140.88
		9'	63	8'-6"		9"		10'-5"	0.946	105.59	37.36	142.89
	1 @ 8'	4'	32	9'-0"	9½"	6"	9½"	5'-7"	0.676	95.26	33.32	194.07
		5'	40	9'-2"		7"		6'-7"	0.754	99.12	34.99	196.80
		6'	48	9'-2"		7"		7'-7"	0.797	101.79	36.66	196.80
		7'	56	9'-3"		7½"		8'-7"	0.867	105.05	38.33	198.16
		8'	64	9'-4"		8"		9'-7"	0.942	110.81	40.00	199.52
		9'	72	9'-6"		9"		10'-7"	1.057	119.92	41.67	202.25
		10'	80	9'-8"		10"		11'-7"	1.189	126.67	43.34	204.97
	1 @ 9'	5'	45	10'-2"	10"	7"	10"	6'-8"	0.844	114.72	37.56	219.61
		6'	54	10'-3"		7½"		7'-8"	0.910	118.04	39.23	220.97
		7'	63	10'-3"		7½"		8'-8"	0.957	120.71	40.90	220.97
		8'	72	10'-4"		8"		9'-8"	1.033	126.54	42.57	222.33
		9'	81	10'-6"		9"		10'-8"	1.148	135.80	44.24	225.06
		10'	90	10'-8"		10"		11'-8"	1.276	142.68	45.91	227.78
		11'	99	10'-10"		11"		12'-8"	1.416	150.40	47.58	230.51
	1 @ 10'	5'	50	11'-2"	10½"	7"	11"	6'-9½"	0.957	130.64	40.13	242.64
		6'	60	11'-3"		7½"		7'-9½"	1.024	133.99	41.80	244.00
		7'	70	11'-3"		7½"		8'-9½"	1.071	136.66	43.47	244.00
		8'	80	11'-4"		8"		9'-9½"	1.147	142.55	45.14	245.36
		9'	90	11'-6"		9"		10'-9½"	1.263	151.92	46.81	248.09
		10'	100	11'-8"		10"		11'-9½"	1.391	158.89	48.48	250.81
		11'	110	11'-10"		11"		12'-9½"	1.532	166.71	50.15	253.54
		12'	120	12'-0"		12"		13'-9½"	1.685	178.67	51.82	256.26
	1 @ 11'	6'	66	12'-4"	11"	8"	11½"	7'-10½"	1.153	156.16	46.12	268.62
		7'	77	12'-4"		8"		8'-10½"	1.202	157.83	47.79	268.62
		8'	88	12'-4"		8"		9'-10½"	1.252	162.06	49.46	268.62
		9'	99	12'-6"		9"		10'-10½"	1.368	172.60	51.13	271.34
		10'	110	12'-8"		10"		11'-10½"	1.497	179.70	52.80	274.07
		11'	121	12'-10"		11"		12'-10½"	1.638	187.67	54.47	276.79
		12'	132	13'-0"		12"		13'-10½"	1.792	199.79	56.14	279.52
	1 @ 12'	6'	72	13'-4"	11¾"	8"	12¼"	8'-0"	1.284	172.20	48.69	357.62
		7'	84	13'-4"		8"		9'-0"	1.333	174.87	50.36	357.62
		8'	96	13'-4"		8"		10'-0"	1.383	180.15	52.03	357.62
		9'	108	13'-6"		9"		11'-0"	1.500	189.85	53.70	361.18
		10'	120	13'-8"		10"		12'-0"	1.630	197.07	55.37	364.74
		11'	132	13'-10"		11"		13'-0"	1.772	205.16	57.04	368.30
		12'	144	14'-0"		12"		14'-0"	1.926	217.45	58.71	371.86

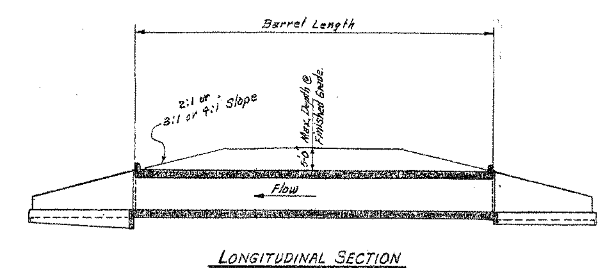
NOTE:- For details of wings and bar lists, see Drawing Nos. W-X002-1 or W-X002-2, W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2.



PART LONGITUDINAL SECTION



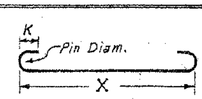
TYPICAL SECTION M-M



LONGITUDINAL SECTION

BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS
#6	3"	5"	1'-2"
#7	3½"	5¾"	1'-4"

BENDING DIAGRAM Bars "b".

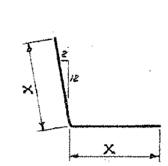


NOTE:- Dimensions are to centers of bars.

DOWEL BARS FOR TWO HEADWALLS

SPAN	SIZE	SPACING	NO. REQ'D	LENGTH	X
4'	#4	11"±	12	2'-6"	1'-3"
5'	#4	11"±	14	2'-7"	1'-3½"
6'	#4	11"±	16	2'-8"	1'-4"
7'	#4	11"±	18	2'-9"	1'-4½"
8'	#4	11½"±	20	2'-11"	1'-5½"
9'	#4	11½"±	22	3'-0"	1'-6"
10'	#4	11½"±	24	3'-1"	1'-6½"
11'	#4	12"±	26	3'-2"	1'-7"
12'	#4	12"±	28	3'-3"	1'-7½"

Bars "r" Dowel bars in Headwalls.



GENERAL NOTES:-
CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.
REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.
BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 32'-0". Lap longitudinal bars 30 diameters.
CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls and slabs shall be only where shown on plans.
SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

DESIGN LIVE LOAD
H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING
Two 24,000 Lb. Axles @ 4'-0" ctrs.
UNIT STRESSES:-
Class S Concrete (n=10) 1200#/□"
Reinforcing Steel 20,000#/□"

NOTE:- This drawing to be used in conjunction with Standard Drawing Nos. W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2. Also Drawing Nos. W-X002-1 or W-X002-2.

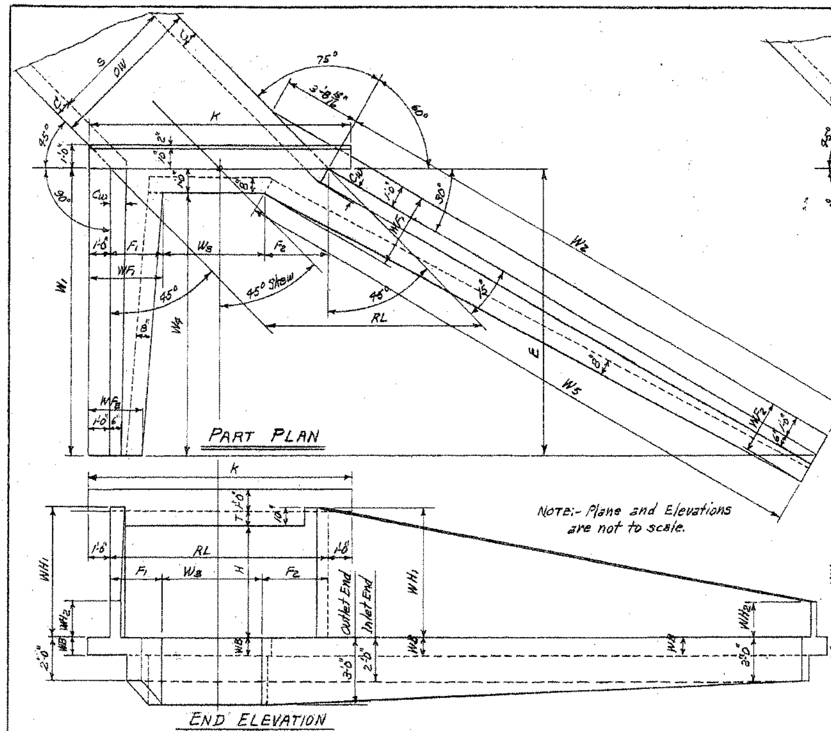
CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION
DETAILS OF STANDARD BARREL SECTIONS
FOR
REINFORCED CONCRETE BOX CULVERTS
4,5,6,7,8,9,10,11&12' SPANS — 3:1 OR 4:1 SLOPES
SINGLES — UNDER 5'-0" COVER
STANDARD DRAWING NO. R-100X-0

Designed By:- W.C.H. 1-23-63 Checked By:- TAHS 5-8-63
Drawn By:- W.C.H. 2-8-63 Checked By:- TAHS 5-24-63
Quantities By:- W.C.H. 2-18-63 Checked By:- TAHS 5-24-63

Reshot 3-8-93 21

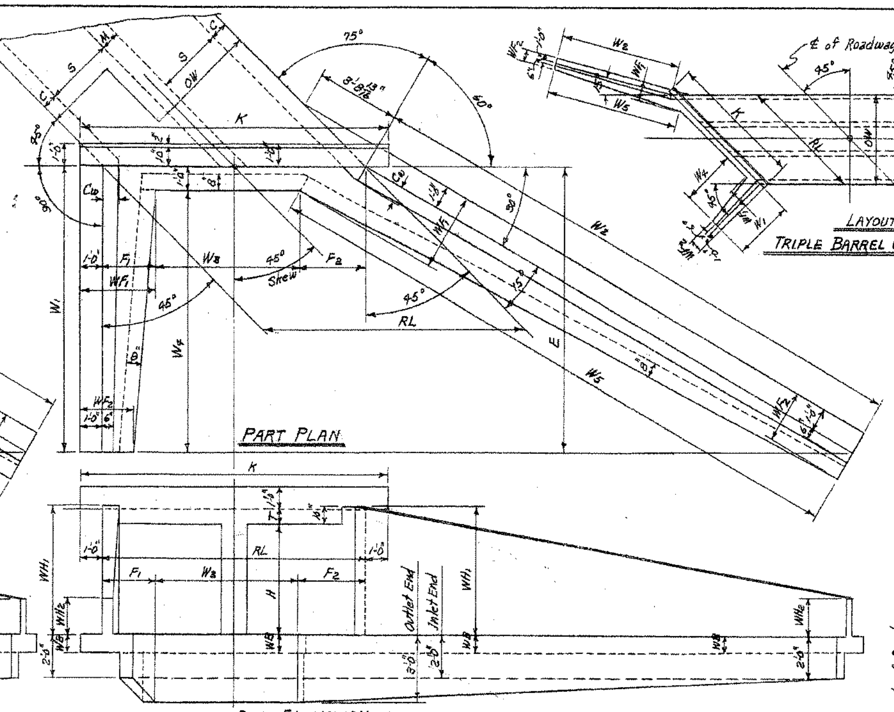
FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			90	
JOB No.					



END ELEVATION

SINGLE BARREL CULVERT - 45° SKEW RIGHT FORWARD

Details of Culvert with 45° Skew Left Forward is reversed, see Layout below.



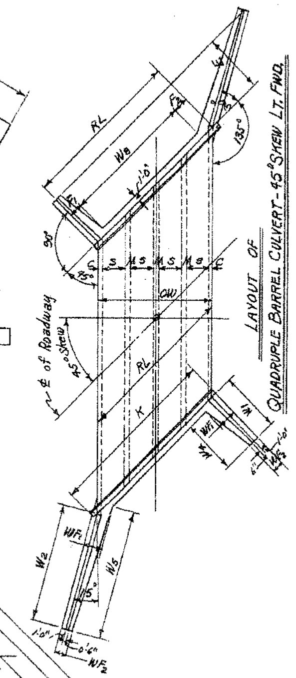
Note:- Plans and Elevations are not to scale.

END ELEVATION

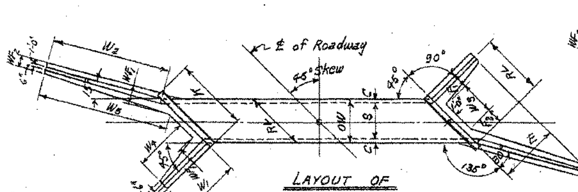
DOUBLE BARREL CULVERT - 45° SKEW RIGHT FORWARD

Details of Culvert with 45° Skew Left Forward is reversed, see Layout below.

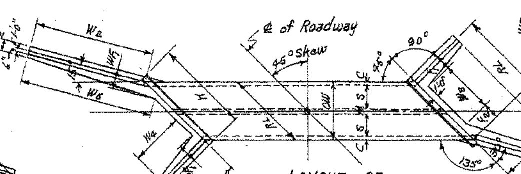
LAYOUT OF TRIPLE BARREL CULVERT - 45° SKEW LT. FWD.



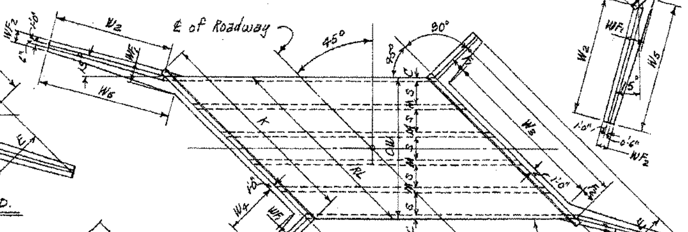
LAYOUT OF QUADRUPLE BARREL CULVERT - 45° SKEW LT. FWD.



LAYOUT OF SINGLE BARREL CULVERT - 45° SKEW LT. FWD.

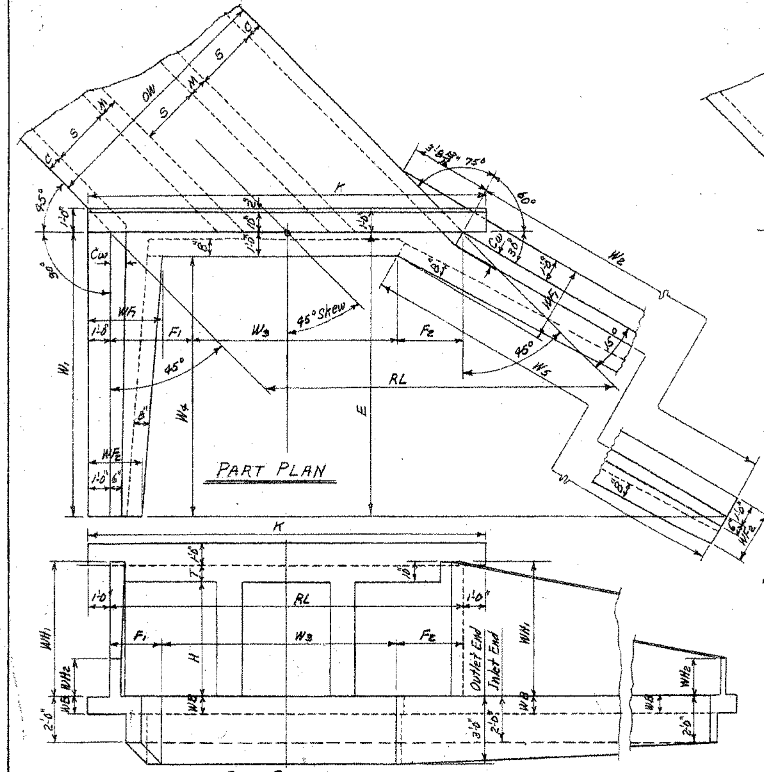


LAYOUT OF DOUBLE BARREL CULVERT - 45° SKEW LT. FWD.



LAYOUT OF QUINTUPLE BARREL CULVERT - 45° SKEW LT. FWD.

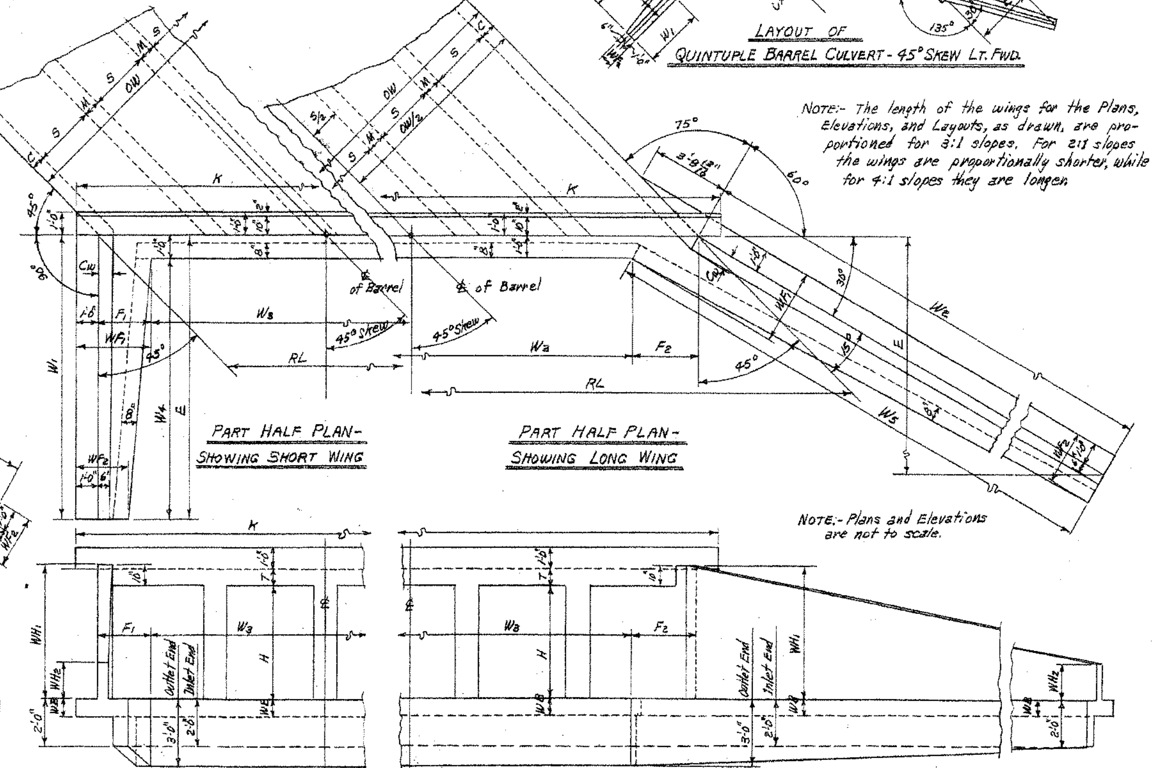
Note:- The length of the wings for the Plans, Elevations, and Layouts, as drawn, are proportioned for 3:1 slopes. For 2:1 slopes the wings are proportionally shorter, while for 4:1 slopes they are longer.



END ELEVATION

TRIPLE BARREL CULVERT - 45° SKEW RIGHT FORWARD

Details of Culvert with 45° Skew Left Forward is reversed, see Layout at top center of sheet.



PART HALF PLAN - SHOWING SHORT WING

PART HALF PLAN - SHOWING LONG WING

Note:- Plans and Elevations are not to scale.

PART END ELEVATION

QUADRUPLE BARREL CULVERT - 45° SKEW RT. FWD.

Details of Culvert with 45° Skew Left Forward is reversed, see Layout at above center.

PART END ELEVATION

QUINTUPLE BARREL CULVERT - 45° SKEW RT. FWD.

Details of Culvert with 45° Skew Left Forward is reversed, see Layout above.

ROADWAY LENGTH RL — HEADWALL LENGTH K — APRON DIMENSION W_3

$RL = OW \times 1.41421$ — $K = RL + (2'0")$ — $W_3 = RL - (F_1 + F_2)$

Use with Drawing No.	Clear Span S	Clear Height H	Sum of Footing Dimensions F_1 & F_2	Single OW	Single RL	Single K	Single W_3	Double OW	Double RL	Double K	Double W_3	Triple OW	Triple RL	Triple K	Triple W_3	Quadruple OW	Quadruple RL	Quadruple K	Quadruple W_3	Quintuple OW	Quintuple RL	Quintuple K	Quintuple W_3
W-X452-1, W-X453-1 or W-X454-1. (For H=8'-0" or less)	4'	2'	2'-3 1/4"	5'-0"	7'-0 7/8"	9'-0 7/8"	4'-9 5/8"	9'-8"	13'-8"	15'-8"	11'-4 7/8"	14'-4"	20'-3 1/4"	22'-3 1/4"	18'-0"	19'-0"	26'-10 1/2"	28'-10 1/2"	24'-7 1/4"	23'-8"	33'-5 5/8"	35'-5 3/4"	31'-2 1/2"
		3'	3'-3 1/4"	5'-0"	"	"	3'-9 5/8"	9'-8"	"	"	10'-4 7/8"	14'-4"	"	"	17'-0"	19'-0"	"	"	23'-7 1/4"	23'-8"	"	"	30'-2 1/2"
		4'	4'-3 1/4"	5'-0"	"	"	2'-9 5/8"	9'-8"	"	"	9'-4 7/8"	14'-4"	"	"	16'-0"	19'-0"	"	"	22'-7 1/4"	23'-8"	"	"	29'-2 1/2"
		5'	5'-3 1/4"	5'-0"	7'-0 7/8"	9'-0 7/8"	1'-9 5/8"	9'-8"	13'-8"	15'-8"	8'-4 7/8"	14'-4"	20'-3 1/4"	22'-3 1/4"	15'-0"	19'-0"	26'-10 1/2"	28'-10 1/2"	21'-7 1/4"	23'-8"	33'-5 5/8"	35'-5 3/4"	28'-2 1/2"
		6'	6'-3 1/4"	5'-2"	7'-3 5/8"	9'-3 5/8"	1'-0 1/8"	9'-11"	14'-0 1/4"	16'-0 1/4"	7'-9 1/8"	14'-8"	20'-8 3/8"	22'-9"	14'-5 3/4"	19'-5"	27'-5 1/2"	29'-5 1/2"	21'-2 1/4"	24'-2"	34'-2 1/8"	36'-2"	27'-10 3/4"
	5'	3'	3'-3 1/4"	6'-0"	8'-5 7/8"	10'-5 7/8"	5'-2 5/8"	11'-8"	16'-6"	18'-6"	13'-2 3/4"	17'-4"	24'-6 1/8"	26'-6 1/8"	21'-3"	23'-0"	32'-6 3/8"	34'-6 1/4"	29'-3"	28'-8"	40'-6 1/2"	42'-6 1/2"	37'-3 1/4"
		4'	4'-3 1/4"	6'-0"	"	"	4'-2 5/8"	11'-8"	"	"	12'-2 3/4"	17'-4"	"	"	20'-3"	23'-0"	"	"	28'-3"	28'-8"	"	"	36'-3 1/4"
		5'	5'-3 1/4"	6'-0"	8'-5 7/8"	10'-5 7/8"	3'-2 5/8"	11'-8"	16'-6"	18'-6"	11'-2 3/4"	17'-4"	24'-6 1/8"	26'-6 1/8"	19'-3"	23'-0"	32'-6 3/8"	34'-6 1/4"	27'-3"	28'-8"	40'-6 1/2"	42'-6 1/2"	35'-3 1/4"
		6'	6'-3 1/4"	6'-2"	8'-8 5/8"	10'-8 5/8"	2'-5 3/8"	11'-11"	16'-10 1/4"	18'-10 1/4"	10'-7"	17'-8"	24'-11 3/8"	27'-0"	18'-8 3/4"	23'-5"	33'-1 3/4"	35'-1 1/2"	26'-10 1/4"	29'-2"	41'-3"	43'-3"	34'-11 3/4"
		7'	7'-9 1/4"	6'-3"	8'-10 1/8"	10'-10 1/8"	1'-0 7/8"	12'-1"	17'-1"	19'-1"	9'-3 3/8"	17'-11"	25'-4"	27'-4"	17'-6 3/4"	23'-9"	33'-7"	35'-7"	26'-9 3/4"	29'-7"	41'-10"	43'-10"	34'-0 3/4"
	6'	3'	3'-3 1/4"	7'-0"	9'-10 3/4"	11'-10 3/4"	6'-7 5/8"	13'-8"	19'-3 7/8"	21'-4"	16'-0 3/4"	20'-4"	28'-9 5/8"	30'-9"	25'-5 3/4"	27'-0"	38'-2 1/4"	40'-2 1/4"	34'-11"	33'-8"	47'-7 3/8"	49'-7 1/2"	44'-4"
		4'	4'-3 1/4"	7'-0"	"	"	5'-7 5/8"	13'-8"	"	"	15'-0 3/4"	20'-4"	"	"	24'-5 3/4"	27'-0"	"	"	33'-11"	33'-8"	"	"	43'-4"
		5'	5'-3 1/4"	7'-0"	9'-10 3/4"	11'-10 3/4"	4'-7 5/8"	13'-8"	19'-3 7/8"	21'-4"	14'-0 3/4"	20'-4"	28'-9 5/8"	30'-9"	23'-5 3/4"	27'-0"	38'-2 1/4"	40'-2 1/4"	32'-11"	33'-8"	47'-7 3/8"	49'-7 1/2"	42'-4"
		6'	6'-3 1/4"	7'-2"	10'-1 5/8"	12'-1 1/2"	3'-10 3/8"	13'-11"	19'-8 1/8"	21'-8 1/4"	13'-5"	20'-8"	29'-2 3/4"	31'-2 3/4"	22'-11 1/4"	27'-5"	38'-9 1/4"	40'-9 1/4"	32'-6"	34'-2"	48'-3 3/4"	50'-3 3/4"	42'-0 1/2"
		7'	7'-9 1/4"	7'-3"	10'-3"	12'-3"	2'-5 7/8"	14'-1"	19'-11"	21'-11"	12'-1 3/4"	20'-11"	29'-7"	31'-7"	21'-9 3/4"	27'-9"	39'-3"	41'-3"	31'-5 3/4"	34'-7"	48'-10 3/8"	50'-11"	41'-1 3/4"
		8'	9'-3 1/4"	7'-4"	10'-4 1/2"	12'-4 1/2"	1'-1 1/4"	14'-2"	20'-0 3/8"	22'-0 1/2"	10'-9 1/4"	21'-0"	29'-8 3/8"	31'-8 1/2"	20'-5 1/4"	27'-10"	39'-4 3/8"	41'-4 1/2"	30'-1"	34'-8"	49'-0 1/2"	51'-0 1/2"	39'-9"
	7'	4'	4'-3 1/4"	8'-0"	11'-3 3/4"	13'-3 3/4"	7'-0 1/2"	15'-8"	22'-1 7/8"	24'-1 3/4"	17'-10 1/2"	23'-4"	33'-0"	35'-0"	28'-8 3/4"	31'-0"	43'-10 1/8"	45'-10"	39'-6 3/4"	38'-8"	54'-8 1/4"	56'-8 1/4"	50'-5"
		5'	5'-3 1/4"	8'-0"	11'-3 3/4"	13'-3 3/4"	6'-0 1/2"	15'-8"	22'-1 7/8"	24'-1 3/4"	16'-10 1/2"	23'-4"	33'-0"	35'-0"	27'-8 3/4"	31'-0"	43'-10 1/8"	45'-10"	38'-6 3/4"	38'-8"	54'-8 1/4"	56'-8 1/4"	49'-5"
		6'	6'-3 1/4"	8'-2"	11'-6 5/8"	13'-6 1/2"	5'-3 3/8"	15'-11"	22'-6 1/8"	24'-6"	16'-2 3/4"	23'-8"	33'-5 5/8"	35'-5 1/2"	27'-2 1/4"	31'-5"	44'-5 3/8"	46'-5 1/4"	38'-2"	39'-2"	55'-4 5/8"	57'-4 3/4"	49'-1 1/2"
		7'	7'-9 1/4"	8'-3"	11'-8"	13'-8"	3'-10 3/8"	16'-1"	22'-9"	24'-9"	14'-11 3/4"	23'-11"	33'-9 7/8"	35'-10"	26'-0 3/4"	31'-9"	44'-10 3/8"	46'-10 3/8"	37'-1 1/2"	39'-7"	56'-11 3/8"	57'-11 3/4"	48'-2 1/2"
		8'	9'-3 1/4"	8'-4"	11'-9 3/8"	13'-9 1/2"	2'-6 1/4"	16'-2"	22'-10 3/8"	24'-10 1/2"	13'-7"	24'-0"	33'-11 1/4"	35'-11 1/4"	24'-8"	31'-10"	45'-0 1/4"	47'-0 1/2"	35'-9"	39'-8"	56'-1 1/8"	58'-1 1/4"	46'-10"
	8'	4'	4'-3 1/4"	9'-0"	12'-8 3/4"	14'-8 3/4"	8'-5 1/2"	17'-8"	24'-11 3/8"	26'-11 3/8"	20'-8 1/2"	26'-4"	37'-2 3/8"	39'-3"	32'-11 3/4"	35'-0"	49'-6"	51'-6"	45'-2 3/4"	43'-8"	61'-9"	63'-9"	57'-5 3/4"
		5'	5'-3 1/4"	9'-2"	12'-11 5/8"	14'-11 1/2"	7'-8 3/8"	17'-11"	25'-4"	27'-4"	20'-0 3/4"	26'-8"	37'-8 1/2"	39'-8 1/2"	32'-5 1/2"	35'-5"	50'-1"	52'-1"	44'-9 3/4"	44'-2"	62'-5 1/2"	64'-5 1/2"	57'-2 1/4"
		6'	6'-3 1/4"	9'-2"	12'-11 5/8"	14'-11 1/2"	6'-8 3/8"	17'-11"	25'-4"	27'-4"	19'-0 3/4"	26'-8"	37'-8 1/2"	39'-8 1/2"	31'-5 1/2"	35'-5"	50'-1"	52'-1"	43'-9 3/4"	44'-2"	62'-5 1/2"	64'-5 1/2"	56'-2 1/4"
		7'	7'-9 1/4"	9'-3"	13'-1"	15'-1"	5'-3 3/4"	18'-1"	25'-6 7/8"	27'-7"	17'-9 3/4"	26'-11"	38'-0 3/4"	40'-0 3/4"	30'-3 1/2"	35'-9"	50'-6 3/8"	52'-6 3/8"	42'-9 1/2"	44'-7"	63'-0 5/8"	65'-0 1/2"	55'-3 1/4"
		8'	9'-3 1/4"	9'-4"	13'-2 1/2"	15'-2 1/2"	3'-11 3/8"	18'-2"	25'-8 1/4"	27'-8 1/4"	16'-5"	27'-0"	38'-2 1/4"	40'-2 1/4"	28'-11"	35'-10"	50'-8"	52'-8"	41'-5"	44'-8"	63'-2"	65'-2"	53'-10 3/4"
	9'	5'	5'-3 1/4"	10'-2"	14'-4 1/2"	16'-4 1/2"	9'-1 3/8"	19'-11"	28'-2"	30'-2"	22'-10 3/4"	29'-8"	41'-11 5/8"	43'-11 1/2"	36'-8 1/4"	39'-5"	55'-8 7/8"	57'-9"	50'-5 3/4"	49'-2"	69'-6 3/8"	71'-6 1/2"	64'-3 1/4"
		6'	6'-3 1/4"	10'-3"	14'-6"	16'-6"	8'-2 3/4"	20'-1"	28'-4 7/8"	30'-4 7/8"	22'-1 1/2"	29'-11"	42'-3 3/4"	44'-3 3/4"	36'-0 1/2"	39'-9"	56'-2 5/8"	58'-2 1/2"	49'-11 1/4"	49'-7"	70'-1 1/2"	72'-1 1/2"	63'-10 1/4"
		7'	7'-9 1/4"	10'-3"	14'-6"	16'-6"	6'-8 3/4"	20'-1"	28'-4 7/8"	30'-4 7/8"	20'-7 1/4"	29'-11"	42'-3 3/4"	44'-3 3/4"	34'-6 1/2"	39'-9"	56'-2 5/8"	58'-2 1/2"	48'-5 1/4"	49'-7"	70'-1 1/2"	72'-1 1/2"	62'-4 1/4"
		8'	9'-3 1/4"	10'-4"	14'-7 3/8"	16'-7 1/4"	5'-4 1/8"	20'-2"	28'-6 1/4"	30'-6 1/4"	19'-3"	30'-0"	42'-5 1/8"	44'-5"	33'-2"	39'-10"	56'-4"	58'-4"	47'-0 3/4"	49'-8"	70'-2 3/8"	72'-3"	60'-11 3/4"
	10'	5'	5'-3 1/4"	11'-2"	15'-9 1/2"	17'-9 1/2"	10'-6 1/4"	21'-11"	31'-0"	33'-0"	25'-8 3/4"	32'-8"	46'-2 3/8"	48'-2 1/2"	40'-11"	43'-5"	61'-4 3/8"	63'-4 3/8"	56'-1 1/2"	54'-2"	76'-7 1/4"	78'-7 1/4"	71'-4"
		6'	6'-3 1/4"	11'-3"	15'-11"	17'-11"	9'-7 3/4"	22'-1"	31'-2 3/4"	33'-2 3/4"	24'-11 1/2"	32'-11"	46'-6 5/8"	48'-6 1/2"	40'-3 1/4"	43'-9"	61'-10 1/4"	63'-10 1/4"	55'-7 1/4"	54'-7"	77'-2 1/4"	79'-2 1/4"	70'-11"
		7'	7'-9 1/4"	11'-3"	15'-11"	17'-11"	8'-1 3/4"	22'-1"	31'-2 3/4"	33'-2 3/4"	23'-5 1/2"	32'-11"	46'-6 5/8"	48'-6 1/2"	38'-9 1/4"	43'-9"	61'-10 1/4"	63'-10 1/4"	54'-1 1/4"	54'-7"	77'-2 1/4"	79'-2 1/4"	69'-5"
		8'	9'-3 1/4"	11'-4"	16'-0 3/8"	18'-0 1/4"	6'-9 1/8"	22'-2"	31'-4 1/8"	33'-4 1/4"	22'-1"	33'-0"	46'-8"	48'-8"	37'-4 3/4"	43'-10"	61'-11 3/4"	64'-0"	52'-8 3/4"	54'-8"	77'-3 3/4"	79'-3 3/4"	68'-0 1/2"
	11'	6'	6'-3 1/4"	12'-4"	17'-5 1/8"	19'-5 1/8"	11'-2 1/8"	24'-2"	34'-2 1/8"	36'-2"	27'-11"	36'-0"	50'-11"	52'-11"	44'-7 3/4"	47'-10"	67'-7 3/4"	69'-7 3/4"	61'-4 1/2"	—	—	—	—
		7'	7'-9 1/4"	12'-4"	"	"	9'-8 1/8"	24'-2"	"	"	26'-5"	36'-0"	"	"	43'-1 3/4"	47'-10"	"	"	59'-10 1/2"	—	—	—	—
		8'	9'-3 1/4"	12'-4"	"	"	8'-2 1/8"	24'-2"	"	"	24'-11"	36'-0"	"	"	41'-7 3/4"	47'-10"	"	"	58'-4 1/2"	—	—	—	—
	12'	6'	6'-3 1/4"	13'-4"	18'-10 1/4"	20'-10 1/4"	12'-7 1/8"	26'-2"	37'-0 1/8"	39'-0"	30'-8 3/4"	39'-0"	55'-1 7/8"	57'-1 7/8"	48'-10 3/4"	51'-10"	73'-3 5/8"	75'-3 5/8"	67'-0 1/2"	—	—	—	—
		7'	7'-9 1/4"	13'-4"	"	"	11'-1 1/8"	26'-2"	"	"	29'-2 3/4"	39'-0"	"	"	47'-4 3/4"	51'-10"	"	"	65'-6 1/2"	—	—	—	—
		8'	9'-3 1/4"	13'-4"	"	"	9'-7 1/8"	26'-2"	"	"	27'-8 3/4"	39'-0"	"	"	45'-10 3/4"	51'-10"	"	"	64'-0 1/2"	—	—	—	—
W-X452-2, W-X453-2 or W-X454-2. (For H=9'-0" & over)	7'																						
		9'	10'-9 1/4"	8'-6"	12'-0 1/4"	14'-0 1/4"	1'-3"	16'-5"	23'-2 3/8"	25'-2 1/2"	12'-5 3/8"	24'-4"	34'-5"	36'-5"	23'-7 3/4"	32'-3"	45'-7 1/4"	47'-7 1/4"	34'-10"	40'-2"	56'-9 5/8"	58'-9 3/4"	46'-0 1/2"
	8'	9'	10'-9 1/4"	9'-6"	13'-5 1/4"	15'-5 1/4"	2'-8"	18'-5"	26'-0 1/2"	28'-0 1/2"	15'-3 1/4"	27'-4"	38'-7 7/8"	40'-8"	27'-10 3/4"	36'-3"	51'-3 1/4"	53'-3 1/4"	40'-6"	45'-2"	63'-10 3/8"	65'-10 1/2"	53'-1 1/4"
		10'	12'-3 1/4"	9'-8"	13'-8"	15'-8"	1'-4 3/4"	18'-8"	26'-4 3/4"	28'-4 3/4"	14'-1 1/2"	27'-8"	39'-1 1/2"	41'-1 1/2"	26'-10 1/2"	36'-8"	51'-10 1/4"	53'-10 1/4"	39'-7"	45'-8"	64'-7"	66'-7"	52'-3 3/4"
	9'	9'	10'-9 1/4"	10'-6"	14'-10 1/4"	16'-10 1/4"	4'-1"	20'-5"	28'-10 1/2"	30'-10 1/2"	18'-1 1/4"	30'-4"	42'-10 3/4"	44'-10 3/4"	32'-1 1/4"	40'-3"	56'-11 3/8"	58'-11"	46'-1 3/4"	50'-2"	70'-11 3/8"	72'-11 1/2"	60'-2 1/4"
		10'	12'-3 1/4"	10'-8"	15'-1"	17'-1"	2'-9 3/4"	20'-8"	29'-2 3/4"	31'-2 3/4"	16'-11 1/2"	30'-8"	43'-4 3/4"	45'-4 1/2"	31'-1 1/4"	40'-8"	57'-6 1/8"	59'-6 1/4"	45'-3"	50'-8"	71'-7 3/4"	73'-7 3/4"	59'-4 1/2"
		11'	13'-9 1/4"	10'-10"	15'-3 3/4"	17'-3 3/4"	1'-6 5/8"	20'-10"	29'-5 1/4"	31'-5 1/4"	15'-8 1/4"	30'-10"	43'-7 1/4"	45'-7 1/4"	29'-10"	40'-10"	57'-9"	59'-9"	43'-11 3/4"	50'-10"	71'-10 3/8"	73'-10 3/4"	58'-1 1/2"
	10'	9'	10'-9 1/4"	11'-6"	16'-3 1/4"	18'-3 1/4"	5'-6"	22'-5"	31'-8 3/8"	33'-8 1/2"	20'-11 1/4"	33'-4"	47'-1 5/8"	49'-1 3/4"	36'-4 1/4"	44'-3"	62'-7"	64'-7"	51'-9 3/4"	55'-2"	78'-0 1/4"	80'-0 1/4"	67'-3"
		10'	12'-3 1/4"	11'-8"	16'-6"	18'-6"	4'-2 3/4"	22'-8"	32'-0 3/8"	34'-0 3/4"	19'-9 1/2"	33'-8"	47'-7 3/4"	49'-7 3/4"	35'-4 3/4"	44'-8"	63'-2"	65'-2"	50'-10 3/4"	55'-8"	78'-8 3/4"	80'-8 3/4"	66'-5 1/2"
		11'	13'-9 1/4"	11'-10"	16'-8 3/4"	18'-8 3/4"	2'-11 5/8"	22'-10"	32'-3 1/2"	34'-3 1/2"	18'-6 1/4"	33'-10"	47'-10 1/8"	49'-10 1/4"	34'-1"	44'-10"	63'-4 7/8"	65'-5"	49'-7 3/4"	55'-10"	78'-11 1/2"	80'-11 1/2"	65'-2 1/4"
		12'	15'-3 1/4"	12'-0"	16'-11 5/8"	18'-11 5/8"	1'-8 3/8"	23'-0"	32'-6 3/8"	34'-6 1/2"	17'-3"	34'-0"	48'-1"	50'-1"	32'-9 3/4"	45'-0"	63'-7 5/8"	65'-7 3/4"	48'-4 1/2"	56'-0"	79'-2 3/8"	81'-2 1/2"	63'-11 1/4"
	11'	9'	10'-9 1/4"	12'-6"	17'-8 1/8"	19'-8 1/4"	6'-10 7/8"	24'-5"	34'-6 3/8"	36'-6 1/2"	23'-9 1/4"	36'-4"	51'-4 5/8"	53'-4 1/2"	40'-7 1/4"	48'-3"	68'-2 3/8"	70'-2 3/8"	57'-5 1/4"	—	—	—	—
		10'	12'-3 1/4"	12'-8"	17'-11"	19'-11"	5'-7 3/4"	24'-8"	34'-10 5/8"	36'-10 1/2"	22'-7 1/2"	36'-8"	51'-10 1/4"	53'-10 1/4"	39'-7"	48'-8"	68'-9 7/8"	70'-10"	56'-6 3/4"	—	—	—	—
		11'	13'-9 1/4"	12'-10"	18'-1 3/4"	20'-1 3/4"	4'-4 1/2"	24'-10"	35'-1 3/8"	37'-1 1/2"	21'-4 3/4"	36'-10"	52'-1 1/8"	54'-1"	38'-3 3/4"	48'-10"	69'-0 3/4"	71'-0 3/4"	55'-3 1/2"	—	—	—	—
		12'	15'-3 1/4"	13'-0"	18'-4 5/8"	20'-4 1/2"	3'-1 3/8"	25'-0"	35'-4 3/4"	37'-4 3/4"	20'-1"	37'-0"	52'-3 5/8"	54'-4"	37'-0 3/4"	49'-0"	69'-3 1/4"	71'-3 1/2"	54'-0 1/4"	—	—	—	—
	12'	9'	10'-9 1/4"	13'-6"	19'-1 1/8"	21'-1"	8'-3 3/4"	26'-5"	37'-4 1/4"	39'-4 1/4"	26'-7"	39'-4"	55'-7 1/4"	57'-7 1/4"	44'-10 1/4"	52'-3"	73'-10 3/4"	75'-10 3/4"	63'-1 1/2"	—	—	—	—
		10'	12'-3 1/4"	13'-8"	19'-3 7/8"	21'-4"	7'-0 3/4"	26'-8"	37'-8 5/8"	39'-8 1/2"	25'-5 1/4"	39'-8"	56'-1 1/8"	58'-1"	43'-10"	52'-8"	74'-5 3/4"	76'-5 3/4"	62'-2 1/2"	—	—	—	—
		11'	13'-9 1/4"	13'-10"	19'-6 3/4"	21'-6 3/4"	5'-9 1/2"	26'-10"	37'-11 3/8"	39'-11 1/2"	24'-2 1/4"	39'-10"	56'-4"	58'-4"	42'-6 3/4"	52'-10"	74'-8 5/8"	76'-8 1/2"	60'-11 1/4"	—	—	—	—
		12'	15'-3 1/4"	14'-0"	19'-9 5/8"	21'-9 1/2"	4'-6 3/8"	27'-0"	38'-2 1/2"	40'-2 1/2"	22'-11"	40'-0"	56'-6 5/8"	58'-6 3/4"	41'-3 1/2"	53'-0"	74'-11 1/2"	76'-11 1/2"	59'-8 1/4"	—	—	—	—

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

2:1 Slopes	3:1 Slopes	4:1 Slopes
W-X452-1 or W-X452-2	W-X453-1 or W-X453-2	W-X454-1 or W-X454-2.

NOTE:-

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

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

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS 45° SKEW

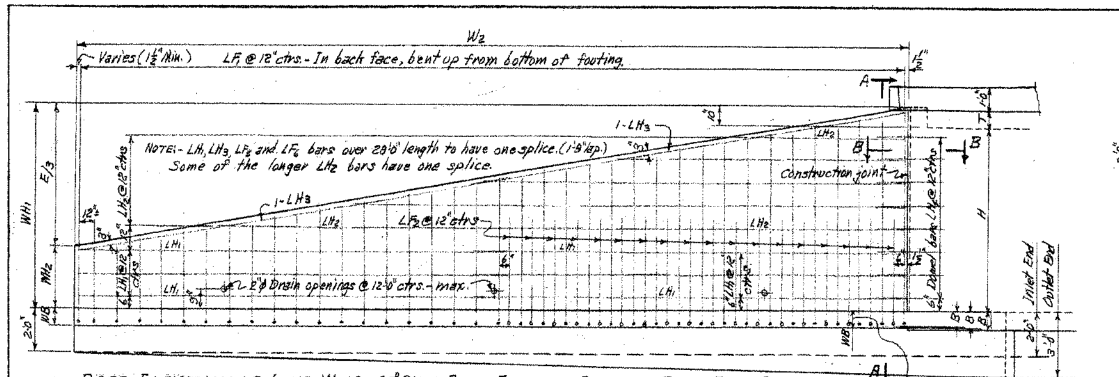
4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 2:1, 3:1 & 4:1 SLOPES

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

STANDARD DRAWING No. W-X45

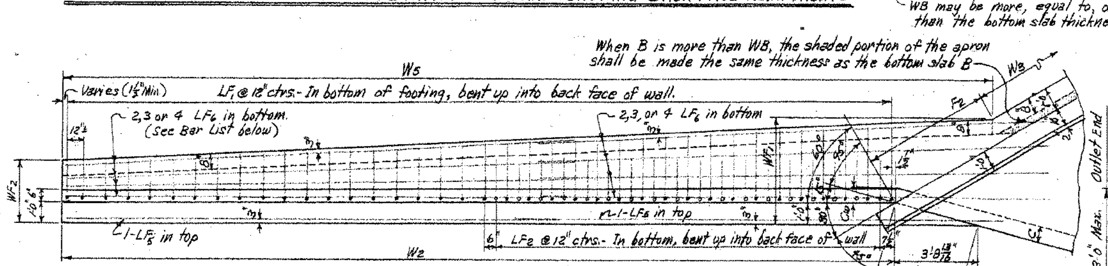
Designed by:- W.C.H. 5-16-63 Checked by:-
Drawn by:- W.C.H. 6-15-64 Checked by:- J.E.M. 6-23-64
Quantities by:- Checked by:-

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			91	
JOB No.					

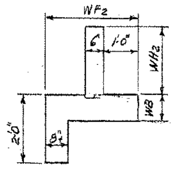


REAR ELEVATION OF LONG WING - 45° SKEW RIGHT FORWARD - SHOWING BACK FACE REINFORCING

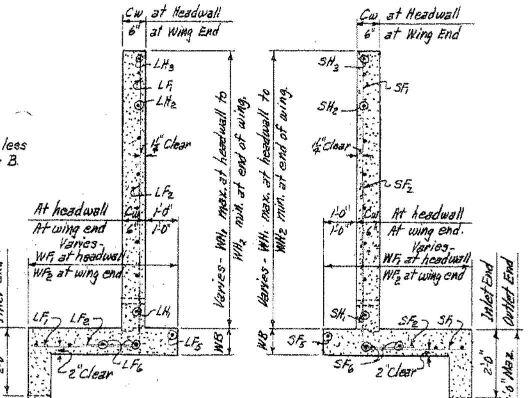
WB may be more, equal to, or less than the bottom slab thickness B.



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



TYPICAL END VIEW OF WING



SECTION A-A

SECTION C-C

REGULAR WING DIMENSIONS - 3:1 SLOPES

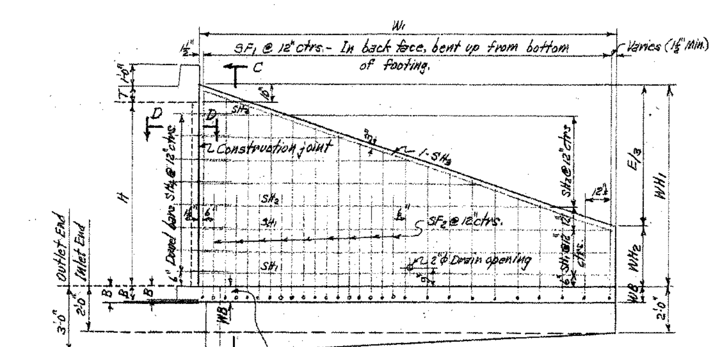
Clear Height of Box	Thickness of Wing Footing	Thickness of Wing at Hdwl. = C	Wingwall Heights: At Headwall	Wingwall Heights: At End of Wing	Widths of Wing Footings: At Headwall	Widths of Wing Footings: At End of Wing	Footing Dimension - Parallel with Headwall: Short Wing	Footing Dimension - Parallel with Headwall: Long Wing	Perpendicular Dist. from Hdwl. to End of Wing	Lengths of Wingwalls: Short Wing	Lengths of Wingwalls: Long Wing	Inside Footing Dimension: Short Wing	Inside Footing Dimension: Long Wing	* Quantity per Wing, Class S Concrete, Inlet End: Short Wing	Inlet End: Long Wing	Outlet End: Short Wing	Outlet End: Long Wing
H	WB	Cw	WH1	WH2	WF1	WF2	F1	F2	E	W1	W2	W4	W5	Cu.Yd.	Cu.Yd.	Cu.Yd.	Cu.Yd.
2'	7"	6"	2'-10"	0'-8"	2'-4"	2'-0"	1'-4"	0'-11¾"	6'-6"	6'-6"	13'-0"	5'-6"	13'-3¾"	0.793	1.572	0.827	1.741
3'	7"	6"	3'-10"	1'-0"	2'-8"	2'-1½"	1'-8"	1'-7¾"	8'-6"	8'-6"	17'-0"	7'-6"	17'-10¾"	1.120	2.364	1.229	2.590
4'	7"	6"	4'-10"	1'-4"	3'-0"	2'-3"	2'-0"	2'-3¼"	10'-6"	10'-6"	21'-0"	9'-6"	22'-5½"	1.567	3.295	1.700	3.577
5'	7"	6"	5'-10"	1'-8"	3'-4"	2'-4½"	2'-4"	2'-11¼"	12'-6"	12'-6"	25'-0"	11'-6"	27'-0½"	2.082	4.367	2.241	4.705
		7"	5'-10"	1'-8"	3'-4"	2'-4½"	2'-4"	2'-11¼"	12'-6"	12'-6"	25'-0"	11'-6"	27'-0½"	2.166	4.551	2.325	4.889
6'	8"	7"	6'-10"	2'-0"	3'-8"	2'-6"	2'-8"	3'-7¼"	14'-6"	14'-6"	29'-0"	13'-6"	31'-7½"	2.894	6.055	3.078	6.450
		7½"	6'-10"	2'-0"	3'-8"	2'-6"	2'-8"	3'-7¼"	14'-6"	14'-6"	29'-0"	13'-6"	31'-7½"	2.952	6.180	3.135	6.575
		8"	6'-10"	2'-0"	3'-8"	2'-6"	2'-8"	3'-7¼"	14'-6"	14'-6"	29'-0"	13'-6"	31'-7½"	3.009	6.305	3.192	6.700
7'	8½"	7½"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-2"	4'-7¼"	16'-6"	16'-6"	33'-0"	15'-6"	36'-5¾"	3.794	7.930	4.003	8.385
		8"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-2"	4'-7¼"	16'-6"	16'-6"	33'-0"	15'-6"	36'-5¾"	3.870	8.093	4.078	8.548
8'	9"	8"	8'-10"	2'-8"	4'-8"	2'-9"	3'-8"	5'-7¼"	18'-6"	18'-6"	37'-0"	17'-6"	41'-4½"	4.855	10.136	5.088	10.651

* Quantity per wing does not include headwall or that portion of apron or toewall for the length W_3.

QUANTITIES

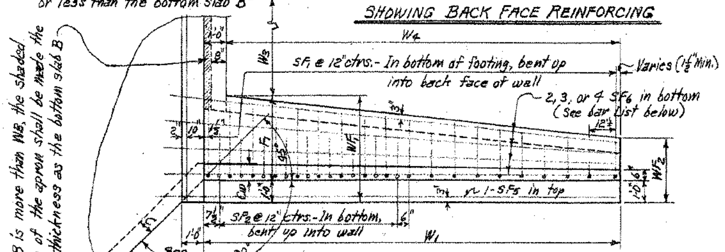
Clear Span	Clear Height	Thickness of Wing at Headwall	Thickness of Wing Footing	Reinforcing Steel ⊕ - for 4 Wings	Class S Concrete - 4 Wings (Headwalls, Wingwalls, Footings, Toewalls and Aprons): Single Barrel Culvert	Double Barrel Culvert	Triple Barrel Culvert	Quadruple Barrel Culvert	Quintuple Barrel Culvert
S	H	Cw	WB	Lb.	Cu.Yd.	Cu.Yd.	Cu.Yd.	Cu.Yd.	Cu.Yd.
4'	2'	6"	7"	142	6.15	7.50	8.86	10.22	11.58
	3'	6"	7"	214	8.44	9.79	11.14	12.50	13.86
	4'	6"	7"	328	11.13	12.48	13.84	15.20	16.56
	5'	6"	7"	468	14.25	15.60	16.96	18.32	19.68
	6'	7"	8"	763	19.23	20.62	22.02	23.41	24.81
5'	3'	6"	7"	214	8.74	10.38	12.03	13.67	15.32
	4'	6"	7"	328	11.43	13.07	14.72	16.37	18.02
	5'	6"	7"	463	14.55	16.19	17.84	19.49	21.14
	6'	7"	8"	763	19.53	21.21	22.90	24.59	26.28
	7'	7½"	8½"	1475	24.98	26.69	28.41	30.14	31.86
6'	3'	6"	7"	214	9.03	10.99	12.91	14.86	16.79
	4'	6"	7"	328	11.73	13.69	15.60	17.56	19.48
	5'	6"	7"	463	14.85	16.80	18.72	20.68	22.60
	6'	7"	8"	763	19.83	21.82	23.79	25.78	27.76
	7'	7½"	8½"	1475	25.28	27.30	29.31	31.33	33.35
	8'	8"	9"	1872	31.70	33.74	35.75	37.79	39.81
7'	4'	6"	7"	328	12.04	14.31	16.54	18.81	21.02
	5'	6"	7"	463	15.15	17.43	19.65	21.93	24.13
	6'	7"	8"	763	20.14	22.44	24.69	26.99	29.24
	7'	7½"	8½"	1475	25.59	27.91	30.21	32.53	34.83
	8'	8"	9"	1872	32.02	34.36	36.66	38.99	41.31
8'	4'	6"	7"	328	12.35	14.95	17.49	20.08	22.57
	5'	7"	7"	463	16.05	18.67	21.24	23.86	26.37
	6'	7"	8"	763	20.45	23.07	25.64	28.26	30.77
	7'	7½"	8½"	1475	25.90	28.54	31.13	33.78	36.32
	8'	8"	9"	1872	32.33	34.97	37.56	40.81	42.80
9'	5'	7"	7"	463	16.37	19.32	22.18	25.02	27.91
	6'	7½"	8"	763	21.16	24.13	27.02	29.89	32.81
	7'	7½"	8½"	1475	26.21	29.18	32.08	34.94	37.86
	8'	8"	9"	1872	32.63	35.61	38.51	41.37	44.29
10'	5'	7"	7"	463	16.69	19.96	28.14	26.27	29.47
	6'	7½"	8"	763	21.48	24.77	27.99	31.13	34.36
	7'	7½"	8½"	1475	26.53	29.82	33.04	36.19	39.42
	8'	8"	9"	1872	32.95	36.25	39.46	42.62	45.85
11'	6'	8"	8"	763	22.18	25.83	29.35	32.84	—
	7'	8"	8½"	1475	27.33	30.99	34.51	38.01	—
	8'	8"	9"	1872	33.86	36.91	40.43	43.93	—
12'	6'	8"	8"	763	22.50	26.51	30.83	34.19	—
	7'	8"	8½"	1475	27.66	31.66	35.49	39.35	—
	8'	8"	9"	1872	33.58	37.58	41.41	45.27	—

⊕ For reinforcing steel in Headwalls and Aprons, see Drawing Nos. of Barrel Sections listed below.

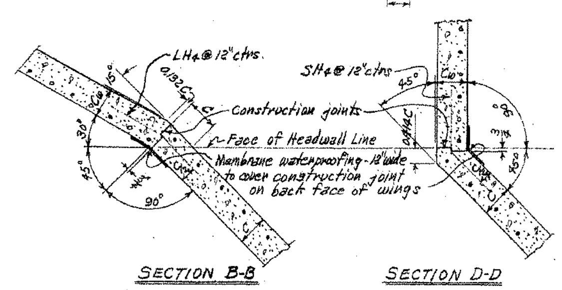


WB may be more, equal to, or less than the bottom slab B

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



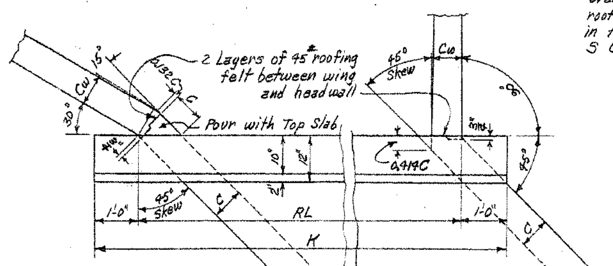
PLAN OF SHORT WING - 45° SKEW RIGHT FORWARD SHOWING FOOTING REINFORCING



SECTION B-B

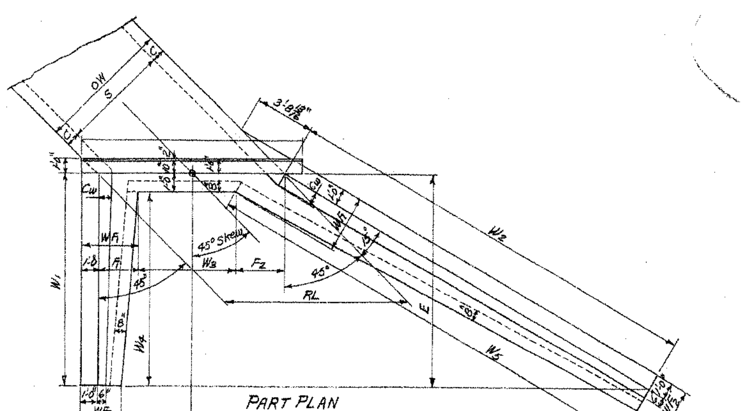
SECTION D-D

SECTIONS THRU CONSTRUCTION JOINTS



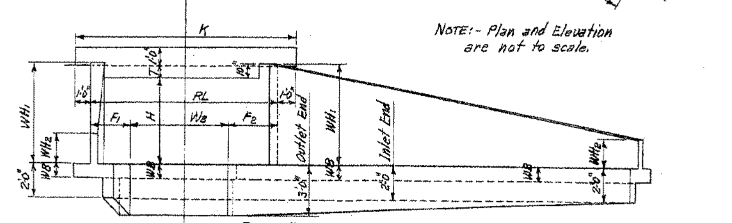
DETAILS AT TOP OF WINGS - 45° SKEW RIGHT FORWARD

NOTE:- Payment for the membrane waterproofing and roofing felt to be included in the price bid for Class S Concrete.



PART PLAN

NOTE:- Plan and Elevation are not to scale.



END ELEVATION

SINGLE BARREL CULVERT - 45° SKEW RIGHT FORWARD

Details of Culvert with 45° Skew Left Forward is reversed, see Drawing No. W-X45.

TYPICAL WING DETAILS

NOTE:-
For remainder of General Plans and Elevations of Single, Double, Triple, Quadruple and Quintuple Span Culverts, see Std. Drawing No. W-X45.
For values of RL, K and W_3 for each box, see above Std. also.

MEMBRANE:- A membrane waterproofing 12" wide, consisting of three moppings of waterproofing asphalt and two alternate layers of treated cotton fabric shall be applied to the back face of wing to cover the construction joints in wings.

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

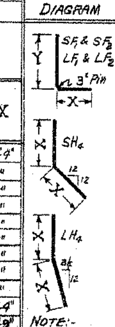
SF1 & LF1 — Bent — In bottom of footing, bent up into back face of wing. One bar (or two bars) of each length.
SF2 & LF2 — Bent — In bottom of footing, bent up into back face of wing. Alt. with F1 bars.

H	Short or Long	SF1&LF1 Size	Spacing	No. Req'd	Lengths Vary Min.	Lengths Vary Max.	X Min.	X Max.	Y Min.	Y Max.	SF2&LF2 Size	Spacing	No. Req'd	Length	X	Y
2'	Short	#3	12"	7	1'-7"	3'-11"	0'-8"	1'-0"	1'-0"	3'-0"	—	—	—	—	—	—
	Long	#3	12"	14	1'-5"	3'-11"	0'-8"	1'-0"	0'-10"	3'-0"	—	—	—	—	—	—
3'	Short	#3	12"	9	2'-1"	5'-3"	0'-10"	1'-4"	1'-4"	4'-0"	—	—	—	—	—	—
	Long	#3	12"	18	1'-11"	5'-3"	0'-10"	1'-4"	1'-2"	4'-0"	—	—	—	—	—	—
4'	Short	#3	12"	11	2'-6"	6'-7"	0'-11"	1'-8"	1'-8"	5'-0"	—	—	—	—	—	—
	Long	#3	12"	22	2'-4"	6'-6"	0'-11"	1'-7"	1'-6"	5'-0"	—	—	—	—	—	—
5'	Short	#3	12"	13	2'-11"	7'-11"	1'-0"	2'-0"	2'-0"	6'-0"	#3	12"	3	3'-6"	1'-1"	2'-6"
	Long	#3	12"	26	2'-9"	7'-10"	1'-0"	1'-11"	1'-10"	6'-0"	#3	12"	6	3'-6"	1'-1"	2'-6"
6'	Short	#4	12"	15	3'-6"	9'-4"	1'-2"	2'-4"	2'-5"	7'-1"	#3	12"	3	4'-6"	1'-4"	3'-3"
	Long	#4	12"	30	3'-4"	9'-3"	1'-2"	2'-3"	2'-3"	7'-1"	#3	12"	6	4'-6"	1'-4"	3'-3"
7'	Short	#4	12"	17	3'-11"	10'-10"	1'-3"	2'-10"	2'-9"	8'-1"	#4	12"	6	5'-6"	1'-7"	4'-0"
	Long	#4	12"	34	3'-9"	10'-8"	1'-3"	2'-8"	2'-7"	8'-1"	#4	12"	12	5'-6"	1'-7"	4'-0"
8'	Short	#4	12"	19	4'-6"	12'-5"	1'-5"	3'-4"	3'-2"	9'-2"	#4	12"	9	6'-6"	1'-10"	4'-9"
	Long	#4	12"	38	4'-4"	12'-3"	1'-5"	3'-2"	3'-0"	9'-2"	#4	12"	18	6'-6"	1'-10"	4'-9"

SF5 & LF5 — Straight — Longitudinal in top of wing footing heel.
SF6 & LF6 — Straight — Longitudinal in bottom of wing footing toe.
SH1 & LH1 — Straight — Horizontal in back face of wing.
SH2 & LH2 — Straight — Horizontal in back face of wing. One bar of each length. ✗
SH3 & LH3 — Straight — In back face of wing at top - on slope.
SH4 & LH4 — Bent — Dowels thru construction joint at headwall.

H	Short or Long	SF5&LF5 Size	No. Req'd	Length	SF6&LF6 Size	No. Req'd	Length	SH1&LH1 Size	Spacing	No. Req'd	Length	SH2&LH2 Size	Spacing	No. Req'd	Lengths Vary Max.	Lengths Vary Min.	SH3&LH3 Size	No. Req'd	Length	SH4&LH4 Size	Spacing	No. Req'd	Length	X	Quantity: Reinforcing Steel per Wing - Lbs. Short Wing	Long Wing
2'	Short	#3	1	8'-4"	#3	2	8'-0"	#3	12"	1	6'-3"	#3	12"	1	—	3'-3"	#3	1	6'-7"	#3	12"	2	2'-8"	1'-4"	24.4	46.3
	Long	#3	1	17'-6"	#3	2	15'-6"	#3	12"	1	12'-8"	#3	12"	1	—	6'-6"	#3	1	12'-11"	#3	12"	2	"	"		
3'	Short	#3	1	10'-4"	#3	2	10'-0"	#3	12"	1	8'-3"	#3	12"	2	6'-3"	3'-3"	#3	1	8'-8"	#3	12"	3	"	"	36.8	70.3
	Long	#3	1	21'-6"	#3	2	20'-2"	#3	12"	1	16'-8"	#3	12"	2	12'-6"	6'-6"	#3	1	16'-11"	#3	12"	3	"	"		
4'	Short	#3	1	12'-4"	#3	3	12'-0"	#3	12"	1	10'-3"	#3	12"	3	9'-8"	3'-3"	#3	1	10'-9"	#3	12"	4	"	"	55.9	107.9
	Long	#3	1	25'-6"	#3	3	24'-10"	#3	12"	1	20'-8"	#3	12"	3	18'-6"	6'-6"	#3	1	21'-0"	#3	12"	4	"	"		
5'	Short	#3	1	14'-4"	#3	3	14'-0"	#3	12"	2	12'-3"	#3	12"	3	9'-3"	3'-3"	#3	1	12'-11"	#3	12"	5	"	"	72.7	153.7
	Long	#3	2	15'-8"	#3	6	15'-7"	#3	12"	2	24'-8"	#3	12"	3	18'-6"	6'-6"	#3	1	25'-1"	#3	12"	5	"	"		
6'	Short	#3	1	16'-4"	#3	3	16'-0"	#3	12"	2	14'-9"	#3	12"	4	12'-3"	3'-3"	#3	1	15'-0"	#3	12"	6	"	"	127.6	253.9
	Long	#3	2	17'-8"	#3	6	18'-0"	#3	12"	4	15'-2"	#3	12"	4	24'-6"	6'-6"	#3	2	15'-5"	#3	12"	6	2'-8"	1'-4"		
7'	Short	#4	1	18'-4"	#4	4	18'-0"	#4	12"	2	16'-3"	#4	12"	5	15'-3"	3'-3"	#4	1	17'-1"	#4	12"	7	3'-6"	1'-9"	246.5	491.1
	Long	#4	2	19'-8"	#4	8	20'-4"	#4	12"	4	17'-2"	#4	12"	5	✗30'-6"	6'-6"	#4	2	17'-5"	#4	12"	7	"	"		
8'	Short	#4	1	20'-4"	#4	4	20'-0"	#4	12"	3	18'-3"	#4	12"	5	15'-3"	3'-3"	#4	1	19'-9"	#4	12"	8	"	"	312.5	623.6
	Long	#4	2	21'-8"	#4	8	22'-9"	#4	12"	6	19'-2"	#4	12"	5	✗30'-6"	6'-6"	#4	2	19'-6"	#4	12"	8	3'-6"	1'-9"		

BAR BENDING DIAGRAM



NOTE:- Dimensions are to bar centers.

NOTE:- Bars for short wing shall be marked with prefix letter "S", while those for long wing shall be marked with letter "L".

✗ Length without splice. Bars over 28'-0" length may be spliced. (1'-8" lap)

REVISIONS:- Membrane Added. 5-10-66 W.C.H.

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing steel to be deformed bars of intermediate or hard grade.

CONSTRUCTION JOINTS:- Construction joints between wingwall, footings and sidewalls shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

UNIT STRESSES:-
Class S Concrete (n=10) 1200#/□"
Reinforcing Steel 20,000#/□"

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

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

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS 45° SKEW

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 SLOPES

SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES — ALL DEPTHS OF COVER FOR H = 8'-0" OR LESS

STANDARD DRAWING No. W-X453-1

Designed By:- W.C.H. 5-13-63 Checked By:- J.E.M. 7-21-64
Drawn By:- W.C.H. 6-5-64 Checked By:- J.E.M. 7-21-64
Quantities By:- W.C.H. 7-2-64 Checked By:- J.E.M. 7-21-64

RESHOT 3-9-93 386 [redacted]

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			92	
JOB No.					

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

DEPTH OF COVER	CLEAR SPAN	CLEAR HEIGHT	"a" bars				"a₁" bars					"b" bars						
			STRAIGHT									BENT - See Diagrams below.						
			In Top and Bottom Slab of Barrel.				In Top and Bottom Slab of Barrel. (Four of each Length)					In Bottom of Top Slab bent up over Division Wall - hooked. Alternate with "a" and "c" bars.						
D	S	H	SIZE	SPACING	No. REQ'D	LENGTH	SIZE	SPACING	No. REQ'D	LENGTH MAX.	LENGTH MIN.	SIZE	SPACING	No. REQ'D	LENGTH	X	Y	Z
0'-0" TO 5'-0" MAXIMUM	2 @ 4'	2'	#5	12"	104	9'-5"	#5	12"	28	8'-5"	2'-5"	#5	12"	50	10'-6"	0'-3"	2'-2½"	3'-4"
		3'			104	9'-5"			28	"	"			50	10'-6"	"	"	"
		4'			104	9'-5"			28	"	"			50	10'-6"	"	"	"
		5'			104	9'-5"			28	"	"			50	10'-6"	"	"	"
		6'			104	9'-8"			28	8'-11"	2'-8"			50	10'-9"	0'-3"	2'-3½"	3'-5"
	2 @ 5'	3'	#6	12"	100	11'-5"	#6	12"	36	10'-5"	2'-5"	#5	12"	48	12'-7"	0'-3½"	2'-7½"	4'-1"
		4'			100	11'-5"			36	"	"			48	12'-7"	"	"	"
		5'			100	11'-5"			36	"	"			48	12'-7"	"	"	"
		6'			100	11'-8"			36	10'-8"	2'-8"			48	12'-10"	"	2'-8½"	4'-2"
		7'			100	11'-10"			36	10'-10"	2'-10"			48	13'-0"	0'-3½"	2'-9½"	4'-2½"
	2 @ 6'	3'	#6	11"	106	13'-5"	#6	11"	48	12'-6"	2'-5"	#5	11"	50	14'-7"	0'-4"	3'-0½"	4'-10"
		4'			106	13'-5"			48	"	"			50	14'-7"	"	"	"
		5'			106	13'-5"			48	"	"			50	14'-7"	"	"	"
		6'			104	13'-8"			48	12'-9"	2'-8"			50	14'-10"	"	3'-1½"	4'-11"
		7'			104	13'-10"			48	12'-11"	2'-10"			50	15'-0"	"	3'-2½"	4'-11½"
		8'			104	13'-11"			48	13'-0"	2'-11"			50	15'-1"	0'-4"	"	5'-0"
	2 @ 7'	4'	#6	12"	92	15'-5"	#6	12"	52	14'-5"	2'-5"	#6	12"	44	16'-9"	0'-4½"	3'-5"	5'-7"
		5'			92	15'-5"			52	"	"			44	"	"	"	"
		6'			92	15'-8"			52	14'-8"	2'-8"			44	17'-0"	"	3'-6"	5'-8"
		7'			92	15'-10"			52	14'-10"	2'-10"			44	17'-2"	"	3'-7"	5'-8½"
		8'			92	15'-11"			52	14'-11"	2'-11"			44	17'-3"	"	"	5'-9"
		9'			92	16'-2"			52	15'-2"	3'-2"			43	17'-6"	0'-4½"	3'-8"	5'-10"
	2 @ 8'	4'	#6	11"	96	17'-5"	#6	11"	64	16'-6"	2'-9"	#6	11"	46	18'-10"	0'-5"	3'-10"	6'-4"
		5'			96	17'-8"			64	16'-9"	3'-0"			46	19'-1"	"	3'-11"	6'-5"
		6'			96	17'-9"			64	"	"			46	19'-1"	"	"	"
		7'			96	17'-10"			64	16'-11"	3'-2"			45	19'-3"	"	4'-0"	6'-5½"
		8'			96	17'-11"			68	17'-0"	2'-4"			45	19'-4"	"	"	6'-6"
		9'			94	18'-2"			68	17'-3"	2'-7"			45	19'-7"	"	4'-1"	6'-7"
		10'			94	18'-5"			68	17'-6"	2'-10"			45	19'-10"	0'-5"	4'-2"	6'-8"

S	H	"b₁" bars							"b₂" bars						
		BENT - See Diagrams below.													
		In Bottom of Top Slab - some bent up over Division Wall - one end hooked. (2 of Each Length) Alternate with "a₁" and "c" or "c₁" bars.							In Top of Bottom Slab - bent down under Division Wall - hooked. Alternate with "a" and "c" bars.						
S	H	SIZE	SPACING	No. REQ'D	LENGTH MAX.	LENGTH MIN.	L MAX.	L MIN.	SIZE	SPACING	No. REQ'D	LENGTH	X	Y	Z
2 @ 4'	2'	#5	12"	14	9'-6"	3'-4"	8'-10"	2'-10"	#5	12"	52	10'-6"	0'-2½"	2'-3½"	3'-4"
	3'			14	"	"	"	"			52	10'-6"	"	"	"
	4'			14	"	"	"	"			52	10'-6"	"	"	"
	5'			14	"	"	"	"			52	10'-6"	"	"	"
	6'			14	9'-9"	3'-7"	9'-1"	3'-1"			52	10'-9"	0'-2½"	2'-4½"	3'-5"
2 @ 5'	3'	#5	12"	18	11'-6"	3'-4"	10'-10"	2'-10"	#5	12"	50	12'-6"	0'-3"	2'-8½"	4'-1"
	4'			18	"	"	"	"			50	12'-6"	"	"	"
	5'			18	"	"	"	"			50	12'-6"	"	"	"
	6'			18	11'-9"	3'-7"	11'-1"	3'-1"			50	12'-9"	"	2'-9½"	4'-2"
	7'			18	11'-11"	3'-9"	11'-3"	3'-3"			50	12'-11"	0'-3"	2'-10½"	4'-2½"
2 @ 6'	3'	#5	11"	24	13'-8"	3'-4"	12'-11"	2'-10"	#5	11"	52	14'-7"	0'-4"	3'-0½"	4'-10"
	4'			24	"	"	"	"			52	14'-7"	"	"	"
	5'			24	"	"	"	"			52	14'-7"	"	"	"
	6'			24	13'-11"	3'-7"	13'-2"	3'-1"			52	14'-10"	"	3'-1½"	4'-11"
	7'			26	14'-1"	2'-10"	13'-4"	2'-4"			52	15'-0"	"	3'-2½"	4'-11½"
	8'			26	14'-2"	2'-11"	13'-5"	2'-5"			52	15'-1"	0'-4"	"	5'-0"
2 @ 7'	4'	#6	12"	26	15'-8"	3'-5"	14'-10"	2'-10"	#6	12"	46	16'-9"	0'-4½"	3'-5"	5'-7"
	5'			26	"	"	"	"			46	"	"	"	"
	6'			26	15'-11"	3'-8"	15'-1"	3'-1"			46	17'-0"	"	3'-6"	5'-8"
	7'			26	16'-1"	3'-10"	15'-3"	3'-3"			46	17'-2"	"	3'-7"	5'-8½"
	8'			28	16'-2"	2'-11"	15'-4"	2'-4"			46	17'-3"	"	"	5'-9"
	9'			28	16'-5"	3'-2"	15'-7"	2'-7"			45	17'-6"	0'-4½"	3'-8"	5'-10"
2 @ 8'	4'	#6	11"	32	17'-10"	3'-9"	16'-11"	3'-2"	#6	11"	48	18'-10"	0'-5"	3'-10"	6'-4"
	5'			34	18'-1"	3'-1"	17'-2"	2'-6"			48	19'-1"	"	3'-11"	6'-5"
	6'			34	"	"	"	"			48	"	"	"	"
	7'			34	18'-3"	3'-3"	17'-4"	2'-8"			47	19'-3"	"	4'-0"	6'-5½"
	8'			34	18'-4"	3'-4"	17'-5"	2'-9"			47	19'-4"	"	"	6'-6"
	9'			34	18'-7"	3'-7"	17'-8"	3'-0"			47	19'-7"	"	4'-1"	6'-7"
	10'			34	18'-10"	3'-10"	17'-11"	3'-3"			47	19'-10"	0'-5"	4'-2"	6'-8"

S	H	"b₃" bars							"c" bars				"c₁" bars				
		BENT - See Diagrams below							STRAIGHT								
		In Top of Bottom Slab - some bent down under Division Wall - one end hooked. (2 of Each Length) Alternate with "a₁" and "c" or "c₁" bars.							In Top and Bottom Slab of Barrel. Alternate with "b" and "b₂" bars.				In Top and Bottom Slab of Barrel. Alt. with "b₁" & "b₃" bars. (Four of each Length.)				
S	H	SIZE	SPACING	No. REQ'D	LENGTH MAX.	LENGTH MIN.	L MAX.	L MIN.	SIZE	SPACING	No. REQ'D	LENGTH	SIZE	SPACING	No. REQ'D	LENGTH MAX.	LENGTH MIN.
2 @ 4'	2'	#5	12"	14	9'-6"	3'-4"	8'-10"	2'-10"	#5	12"	112	4'-8"	#5	12"	8	4'-1"	3'-1"
	3'			14	"	"	"	"			112	4'-8"			8	"	"
	4'			14	"	"	"	"			112	4'-8"			8	"	"
	5'			14	"	"	"	"			112	4'-8"			8	"	"
	6'			14	9'-9"	3'-7"	9'-1"	3'-1"			112	4'-9"			8	4'-3"	3'-3"
2 @ 5'	3'	#5	12"	18	11'-6"	3'-4"	10'-10"	2'-10"	#6	12"	112	5'-8"	#6	12"	12	4'-7"	2'-7"
	4'			18	"	"	"	"			112	5'-8"			12	"	"
	5'			18	"	"	"	"			112	5'-8"			12	"	"
	6'			18	11'-9"	3'-7"	11'-1"	3'-1"			112	5'-9"			12	4'-9"	2'-9"
	7'			18	11'-11"	3'-9"	11'-3"	3'-3"			112	5'-10"			12	4'-10"	2'-10"
2 @ 6'	3'	#5	11"	24	13'-8"	3'-4"	12'-11"	2'-10"	#6	11"	118	6'-8"	#6	11"	16	6'-5"	2'-9"
	4'			24	"	"	"	"			118	6'-8"			16	"	"
	5'			24	"	"	"	"			118	6'-8"			16	"	"
	6'			24	13'-11"	3'-7"	13'-2"	3'-1"			118	6'-9"			16	6'-6"	2'-10"
	7'			26	14'-1"	2'-10"	13'-4"	2'-4"			118	6'-10"			16	6'-8"	3'-0"
	8'			26	14'-2"	2'-11"	13'-5"	2'-5"			118	6'-10"			16	6'-9"	3'-1"
2 @ 7'	4'	#6	12"	26	15'-8"	3'-5"	14'-10"	2'-10"	#6	12"	108	7'-8"	#6	12"	20	6'-7"	2'-7"
	5'			26	"	"	"	"			108	7'-8"			20	"	"
	6'			26	15'-11"	3'-8"	15'-1"	3'-1"			108	7'-9"			20	6'-9"	2'-9"
	7'			26	16'-1"	3'-10"	15'-3"	3'-3"			108	7'-10"			20	6'-10"	2'-10"
	8'			28	16'-2"	2'-11"	15'-4"	2'-4"			108	7'-10"			20	6'-11"	2'-11"
	9'			28	16'-5"	3'-2"	15'-7"	2'-7"			108	7'-11"			20	7'-1"	3'-1"
2 @ 8'	4'	#6	11"	32	17'-10"	3'-9"	16'-11"	3'-2"	#6	11"	112	8'-8"	#6	11"	28	8'-6"	3'-1"
	5'			34	18'-1"	3'-1"	17'-2"	2'-6"			112	8'-9"			28	8'-8"	3'-2"
	6'			34	"	"	"	"			112	8'-9"			28	"	"
	7'			34	18'-3"	3'-3"	17'-4"	2'-8"			116	8'-10"			28	7'-10"	2'-4"
	8'			34	18'-4"	3'-4"	17'-5"	2'-9"			116	8'-10"			28	7'-11"	2'-5"
	9'			34	18'-7"	3'-7"	17'-8"	3'-0"			114	8'-11"			28	8'-1"	2'-7"
	10'			34	18'-10"	3'-10"	17'-11"	3'-3"			114	9'-0"			28	8'-3"	2'-9"

S	H	"d" bars				"d₁" bars				"e" bars				"f" bars				"k₁" bars			"k₂" bars		
		STRAIGHT												STRAIGHT				STRAIGHT					
		Longitudinal in Top Slab of Barrel				Longitudinal in Sidewalls and Division Wall.				Longitudinal in Bottom Slab of Barrel.				Verticals in Sidewalls and Division Wall.				In Bottom of Headwalls			In Top of Headwalls and Aprons (2 Each)		
S	H	SIZE	SPACING	No. REQ'D	LENGTH	SIZE	SPACING	No. REQ'D	LENGTH	SIZE	SPACING	No. REQ'D	LENGTH	SIZE	SPACING	No. REQ'D	LENGTH	SIZE	No. REQ'D	LENGTH	SIZE	No. REQ'D	LENGTH
2 @ 4'	2'	#5	12"	14	2 @ 30'-8" for 60'-0" Length Barrel (1'-8" Lap).	#4	12"	8	2 @ 30'-6" for 60'-0" Length Barrel (1'-3" Lap).	#4	12"	14	2 @ 31'-10" for 60'-0" Length Barrel (1'-3" Lap).	#4	12"	240	2'-10"	#5	6	13'-3"	#5	8	15'-5"
	3'			14				12				14				240	3'-10"		6	"		8	"
	4'			14				16				14				240	4'-10"		6	"		8	"
	5'			14				20				14				240	5'-10"		6	"		8	"
	6'			14				24				14				240	6'-10"		6	13'-7"		8	15'-9"
2 @ 5'	3'	#5	11½"	16		#4	12"	12		#4	12"	16		#4	12"	240	3'-11"	#6	6	16'-1"	#6	8	18'-3"
	4'			16				16				16				240	4'-11"		6	"		8	"
	5'			16				20				16				240	5'-11"		6	"		8	"
	6'			16				24				16				240	6'-11"		6	16'-5"		8	18'-7"
	7'			16				28				16				240	7'-11"		6	16'-8"		8	18'-10"
2 @ 6'	3'	#5	11½"	18		#4	12"	12		#4	12"	18		#4	12"	240	4'-0"	#6	6	18'-11"	#6	8	21'-1"
	4'			18				16				18				240	5'-0"		6	"		8	"
	5'			18				20				18				240	6'-0"		6	"		8	"
	6'			18				24				18				240	7'-0"		6	19'-3"		8	21'-5"
	7'			18				28				18				240	8'-0"		6	19'-6"		8	21'-8"
	8'			18				32				18			10"	288	9'-0"		6	19'-7"		8	21'-9"
2 @ 7'	4'	#5	11½"	20		#4	12"	16		#4	12"	20		#4	12"	240	5'-1"	#7	6	21'-9"	#7	8	23'-10"
	5'			20				20				20				240	6'-1"		6	"		8	"
	6'			20				24				20				240	7'-1"		6	22'-1"		8	24'-3"
	7'			20				28				20				240	8'-1"		6	22'-4"		8	24'-6"
	8'			20				32				20			10"	288	9'-1"		6	22'-5"		8	24'-7"
	9'			20				36				20		#5	12"	240	10'-1"		6	22'-10"		8	24'-11"
2 @ 8'	4'	#5	11½"	23		#4	12"	16		#4	12"	22		#4	12"	240	5'-2"	#7	6	24'-7"	#7	8	26'-8"
	5'			23				20				22				240	6'-2"		6	24'-11"		8	27'-1"
	6'			23				24				22				240	7'-2"		6	"		8	"
	7'			23				28				22				240	8'-2"		6	25'-2"		8	27'-4"
	8'			23				32				22			10"	288	9'-2"		6	25'-3"		8	27'-5"
	9'			23				36				22		#5	12"	240	10'-2"		6	25'-8"		8	27'-9"
	10'			23				40				22			11"	264	11'-2"		6	26'-0"		8	28'-1"

BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS	BENDING DIAGRAM FOR BARS "b" AND "b₂"
#5	2½"	4¼"	0'-11½"	
#6	3"	5"	1'-2"	

BAR SIZE	PIN DIAM.	K	ADD FOR 1 HOOK	BENDING DIAGRAM FOR BARS "b₁" AND "b₃"
#5	2½"	4¼"	0'-5¾"	
#6	3"	5"	0'-7"	

SPAN	SIZE	SPACING	No. REQ'D	LENGTH	X	Dowel bars "f" in Two Headwalls
4'	#4	12"±	28	2'-5"	1'-2½"	
5'	#4	12"±	34	2'-6"	1'-3"	
6'	#4	12"±	40	2'-7"	1'-3½"	
7'	#4	12"±	46	2'-8"	1'-4"	
8'	#4	12"±	52	2'-9"	1'-4½"	

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

▼ These bars are in the skewed portion of barrel only.
The length of "a₁" and "c₁" bars and overall length "L" of "b₁" and "b₃" bars vary by 1'-0" for 12" spacing and 0'-11" for 11" spacing.
In the regular portion of the barrel begin and end with a set of "a" and "c" bars. If the spacing is such that the last set of bars would be "b" & "b₂" bars, use a set of "a" & "c" bars instead.

NOTE:- For Details of Standard Wings and bar lists, see Drawing No. W-X452-1 or W-X452-2; W-X453-1 or W-X453-2, and W-X454-1 or W-X454-2. Also W-X45.

TOP SLAB REINFORCING
PART PLAN AT END OF CULVERT

BOTTOM SLAB REINFORCING
PART PLAN AT END OF CULVERT

SECTION N-N

TYPICAL SECTION M-M

LONGITUDINAL SECTION N-N'

LAYOUT OF DOUBLE BARREL CULVERT
45° SKEW LEFT FORWARD
45° Skew Right Forward is reversed.

MAX DESIGN DEPTH OF COVER	BARREL DIMENSIONS											* QUANTITIES			
	CLEAR SPANS	CLEAR HEIGHT	SQ. FT. OPENING	OVERALL WIDTH	THICKNESS OF TOP SLAB	THICKNESS OF SIDEWALLS	THICKNESS OF DIVISION WALL	THICKNESS OF BOTTOM SLAB	OVERALL HEIGHT	ROADWAY LENGTH	LENGTH OF HEADWALL	CLASS S CONC. PER LIN. FT. OF BARREL	REINFORCING STEEL TOTAL FOR 60'-0" LENGTH OF BARREL	REINFORCING STEEL PER LIN. FT. OF BARREL	REINFORCING STEEL ADDITIONAL PER LAP
D	S	H	A	OW	T	C	M	B	OH	RL	K	CU. YD.	LB.	LB.	LB.
5'-0"	2 @ 4'	2'	16	9'-8"	6½"	6"	8"	6"	3'-0½"	13'-8"	15'-8"	0.496	5,587	88.15	42.71
		3'	24	9'-8"		6"	8"		4'-0½"	"	"	0.558	5,910	93.49	46.05
		4'	32	9'-8"		6"	8"		5'-0½"	"	"	0.620	6,234	98.84	49.39
		5'	40	9'-8"		6"	8"		6'-0½"	"	"	0.682	6,557	104.18	52.73
		6'	48	9'-11"		7"	9"		7'-0½"	14'-0½"	16'-0½"	0.809	6,965	110.74	56.07
	2 @ 5'	3'	30	11'-8"	7"	6"	8"	6½"	4'-1½"	16'-6"	18'-6"	0.671	7,882	123.34	51.19
		4'	40	11'-8"		6"	8"		5'-1½"	"	"	0.733	8,205	128.68	54.53
		5'	50	11'-8"		6"	8"		6'-1½"	"	"	0.795	8,529	134.03	57.87
		6'	60	11'-11"		7"	9"		7'-1½"	16'-10¼"	18'-10¼"	0.922	8,962	140.89	61.21
		7'	70	12'-1"		7½"	10"		8'-1½"	17'-1"	19'-1"	1.044	9,363	147.34	64.55
	2 @ 6'	3'	36	13'-8"	7½"	6"	8"	7½"	4'-3"	19'-3⅜"	21'-4"	0.818	9,483	148.50	56.34
		4'	48	13'-8"		6"	8"		5'-3"	"	"	0.880	9,806	153.85	59.68
		5'	60	13'-8"		6"	8"		6'-3"	"	"	0.941	10,129	159.19	63.02
		6'	72	13'-11"		7"	9"		7'-3"	19'-8⅜"	21'-8¼"	1.070	10,532	166.20	66.36
		7'	84	14'-1"		7½"	10"		8'-3"	19'-11"	21'-11"	1.192	10,956	172.74	69.70
		8'	96	14'-2"		8"	10"		9'-3"	20'-0⅜"	22'-0½"	1.298	11,316	183.36	73.04
	2 @ 7'	4'	56	15'-8"	8"	6"	8"	8"	5'-4"	22'-1⅞"	24'-1¾"	1.021	11,514	178.15	64.83
		5'	70	15'-8"		6"	8"		6'-4"	"	"	1.082	11,837	183.49	68.17
		6'	84	15'-11"		7"	9"		7'-4"	22'-6⅜"	24'-6"	1.212	12,297	190.59	71.51
		7'	98	16'-1"		7½"	10"		8'-4"	22'-9"	24'-9"	1.334	12,716	197.19	74.85
		8'	112	16'-2"		8"	10"		9'-4"	22'-10⅜"	24'-10¼"	1.440	13,389	207.89	78.19
		9'	126	16'-5"		9"	11"		10'-4"	23'-2⅝"	25'-2½"	1.616	14,414	225.25	81.53
	2 @ 8'	4'	64	17'-8"	8½"	6"	8"	8½"	5'-5"	24'-11⅞"	26'-11¾"	1.174	13,555	210.37	71.71
		5'	80	17'-11"		7"	9"		6'-5"	25'-4"	27'-4"	1.295	14,047	217.63	75.05
		6'	96	17'-11"		7"	9"		7'-5"	"	"	1.366	14,371	222.97	78.39
		7'	112	18'-1"		7½"	10"		8'-5"	25'-6⅞"	27'-7"	1.489	14,756	229.68	81.73
		8'	128	18'-2"		8"	10"		9'-5"	25'-8½"	27'-8¼"	1.595	15,414	240.47	85.07
		9'	144	18'-5"		9"	11"		10'-5"	26'-0⅛"	28'-0⅛"	1.772	16,432	258.08	88.41
		10'	160	18'-8"		10"	12"		11'-5"	26'-4¾"	28'-4⅜"	1.967	17,276	271.07	91.75

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

GENERAL NOTES

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.

BAR LAP:- In computing the quantities of steel from the tables add one lap for each add'l 33'-0" length of barrel over 32'-0". Lap longitudinal bars 30 diam. min.

CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls, division wall and slabs shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING
Two 24000 Lb. Axles @ 4'-0" ctrs.

UNIT STRESSES:-
Class S Concrete (n=10) 1200#/□"
Reinforcing Steel 20,000#/□"

NOTE:- This drawing to be used in conjunction with Standard Wing Drawing Nos. W-X452-1 or W-X452-2, W-X453-1 or W-X453-2, and W-X454-1 or W-X454-2. Also W-X45.

CLASS S CONCRETE

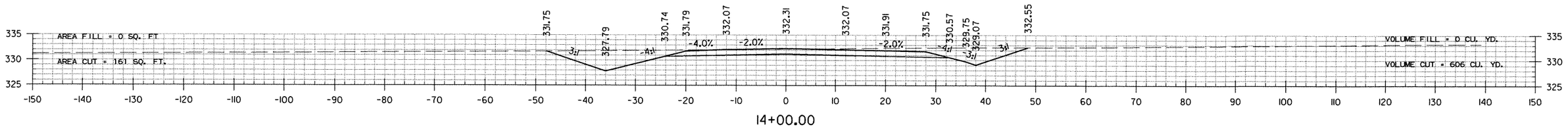
ARKANSAS STATE HIGHWAY COMMISSION
DETAILS OF STANDARD BARREL SECTIONS
FOR
REINFORCED CONCRETE BOX CULVERTS
45° SKEW
4', 5', 6', 7' AND 8' SPANS 2:1, 3:1 OR 4:1 SLOPES
DOUBLES UNDER 5'-0" COVER
STANDARD DRAWING No. R-245X-01

Designed by:- W.C.H. 1-17-63. Checked by:- R.H.S. 5-14-63
Drawn by:- W.C.H. 7-14-64. Checked by:-
Quantities by:- W.C.H. 10-1-64. Checked by:-

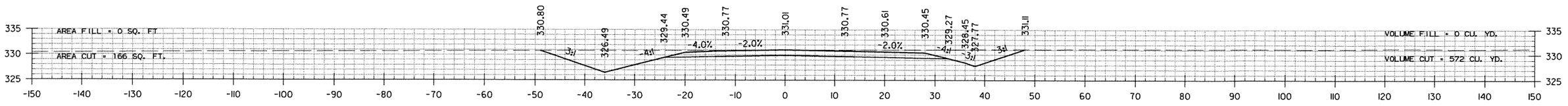
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		061080	93	110

(2) CROSS SECTIONS

NOTE: C.L. OF CROSS SECTIONS IS 28.5' RIGHT OF C.L. MEDIAN



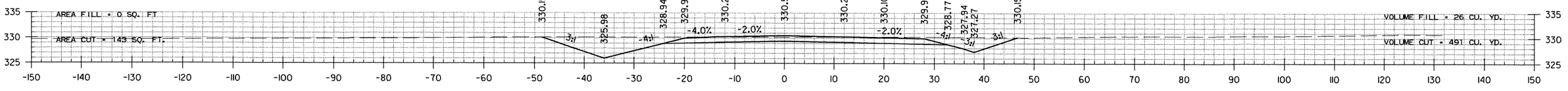
14+00.00



13+00.00

STA. 12+00
END SP. DITCH LT. 0.98%
ELEV. 325.98

STA. 12+00
END SP. DITCH RT. 1.77%
ELEV. 327.27

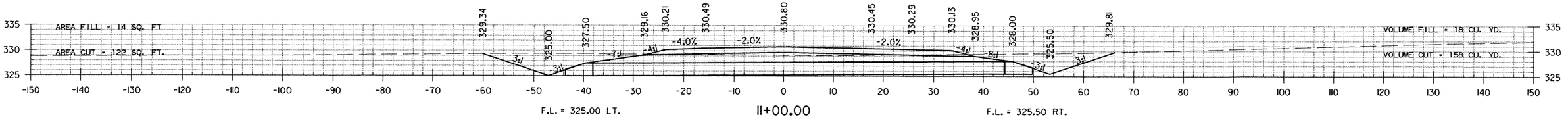


12+00.00

STA. 11+00 CONSTRUCT
DOUBLE 44" X 27" X 84' R.C. ARCH PIPE CULVERT
(CLASS III) TYPE 3 BEDDING
WITH FES LT. & RT.
Q50 = 94 CFS DA = 31 ACRES

STA. 11+00
BEGIN SP. DITCH LT. 0.98%
ELEV. 325.00

STA. 11+00
BEGIN SP. DITCH RT. 1.77%
ELEV. 325.50



F.L. = 325.00 LT.

11+00.00

F.L. = 325.50 RT.

BEGIN RT. LANES SITE NO. 1 C.L. MEDIAN STA. 10+29.91

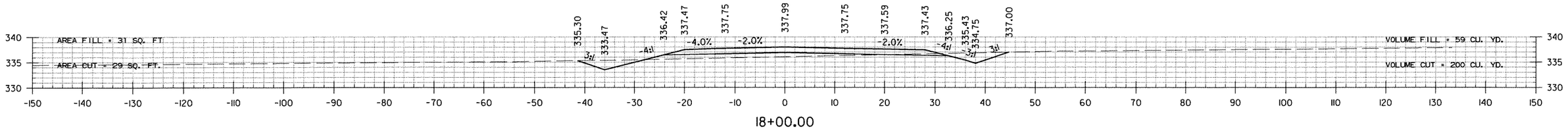
STA. 11+00 TO STA. 14+00

rnfortner 11/9/2009 10:34 PM
WORKSPACE: AHTDV8
L:\2004\049980 - South Loop - Phase 1\Drawings\RWY\SLO_MNLCX_01.dgn
REVISED DATE:

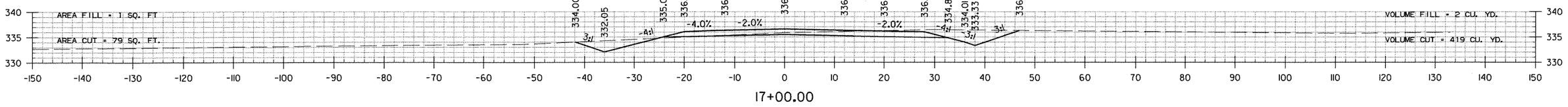
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		061080	94	110

(2) CROSS SECTIONS

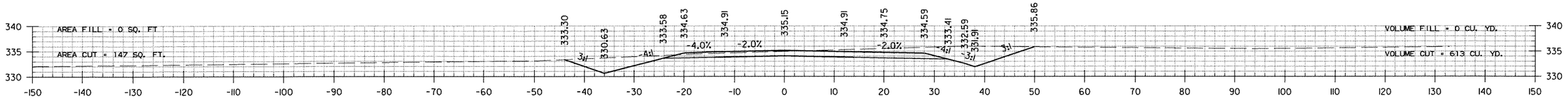
NOTE: C.L. OF CROSS SECTIONS IS 28.5' RIGHT OF C.L. MEDIAN



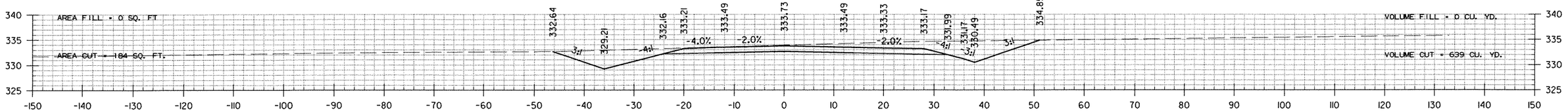
18+00.00



17+00.00



16+00.00



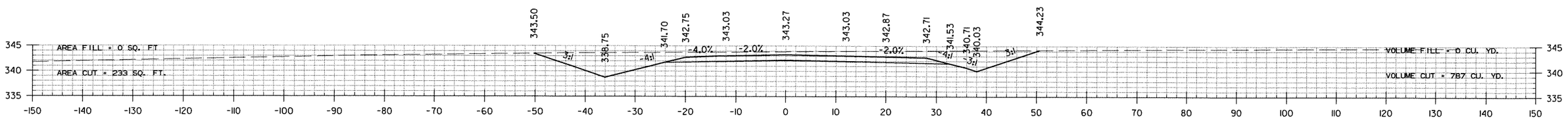
15+00.00

STA. 15+00 TO STA. 18+00

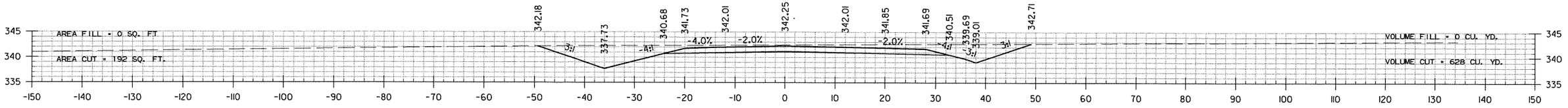
rnforfner 11/9/2009 14:04:47 PM
WORKSPACE: AHTD\8
L:\2004\049180 - South Loop - Phase I\Drawings\RWY\SL0_MNLCX_01.dgn
REVISED DATE:

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.		061080	95	110
				(2)	CROSS SECTIONS			

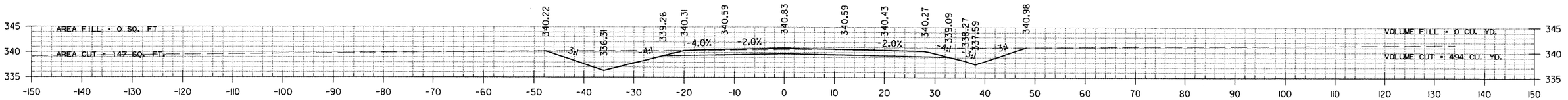
NOTE: C.L. OF CROSS SECTIONS IS 28.5' RIGHT OF C.L. MEDIAN



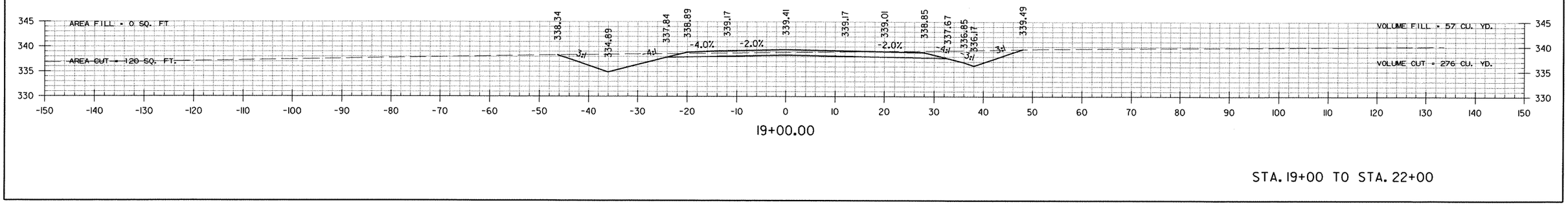
22+00.00



21+00.00



20+00.00

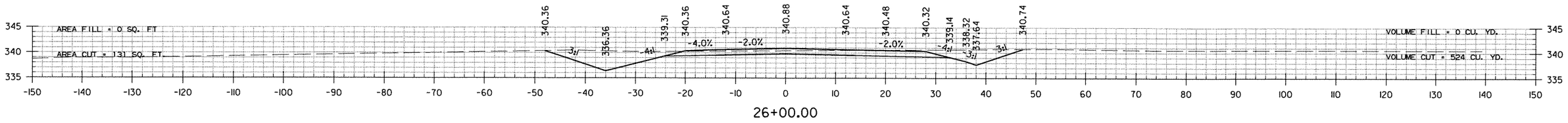


19+00.00

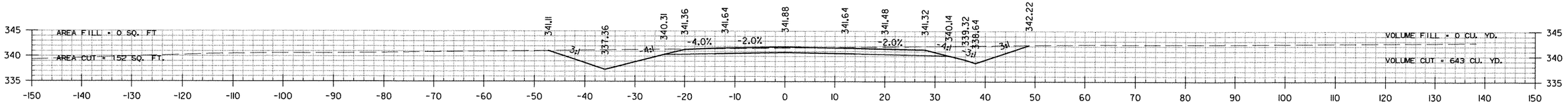
STA. 19+00 TO STA. 22+00

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.		061080	96	110
				(2)	CROSS SECTIONS			

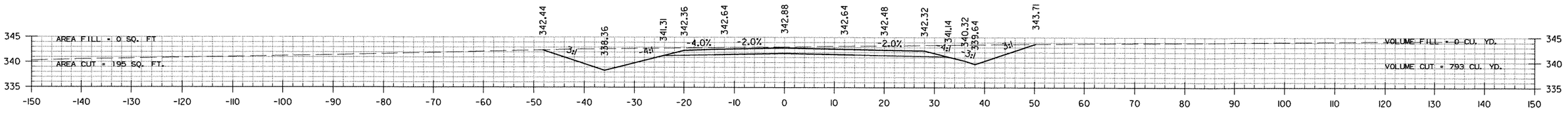
NOTE: C.L. OF CROSS SECTIONS IS 28.5' RIGHT OF C.L. MEDIAN



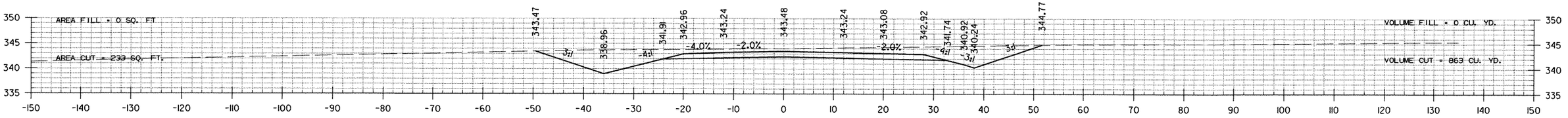
26+00.00



25+00.00



24+00.00



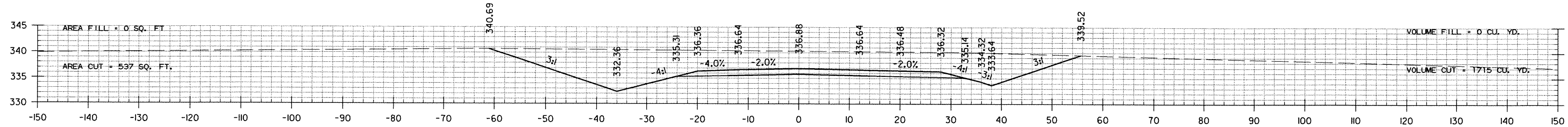
23+00.00

STA. 23+00 TO STA. 26+00

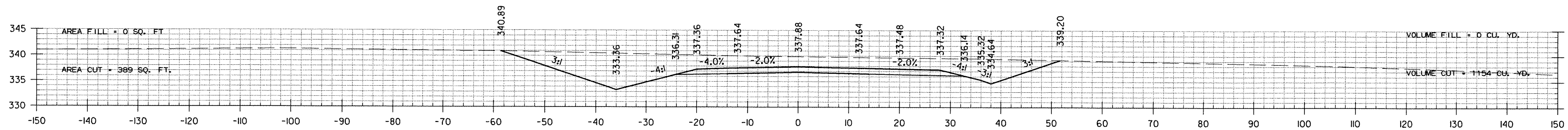
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		061080	97	110

(2) CROSS SECTIONS

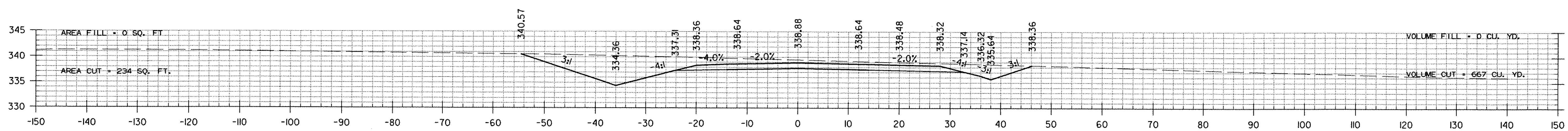
NOTE: C.L. OF CROSS SECTIONS IS 28.5' RIGHT OF C.L. MEDIAN



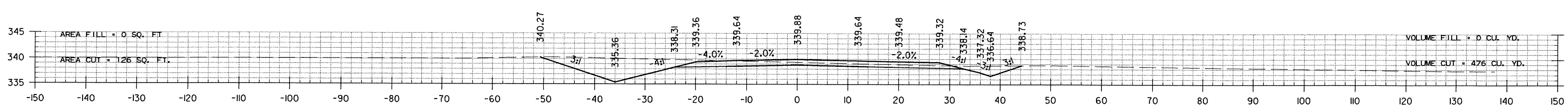
30+00.00



29+00.00



28+00.00



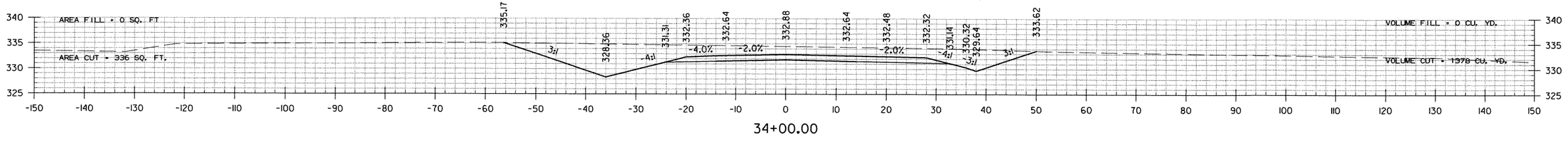
27+00.00

STA. 27+00 TO STA. 30+00

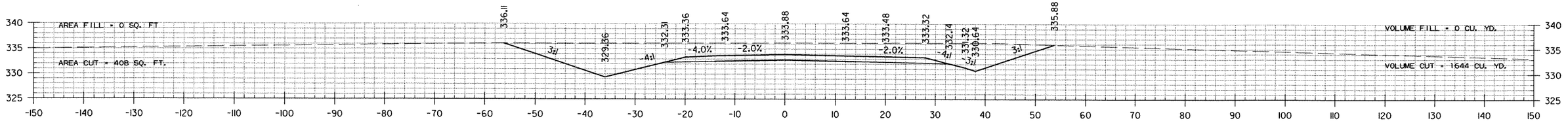
rnfortner 11/9/2009 1:46:24 PM
WORKSPACE: AHTDV8
L:\2004\0491980 - South Loop - Phase I\Drawings\RWY\SLO_MNLCX_01.dgn
REVISED DATE:

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.		061080	98	110
				(2)	CROSS SECTIONS			

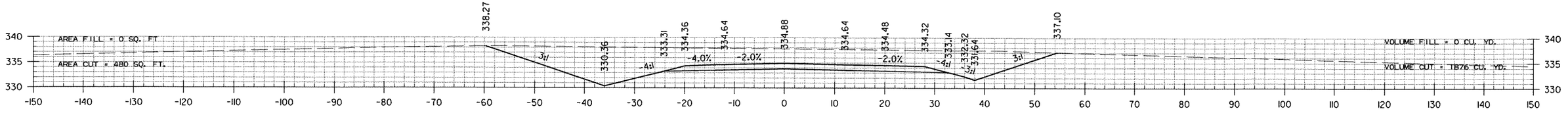
NOTE: C.L. OF CROSS SECTIONS IS 28.5' RIGHT OF C.L. MEDIAN



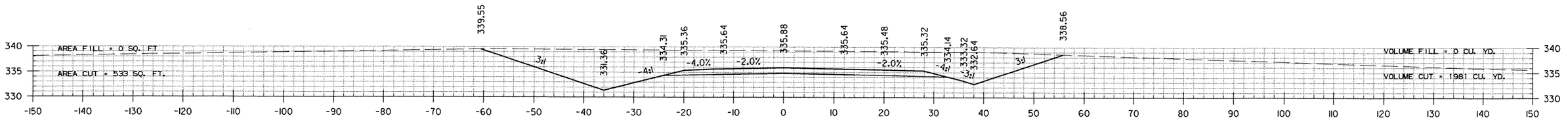
34+00.00



33+00.00



32+00.00



31+00.00

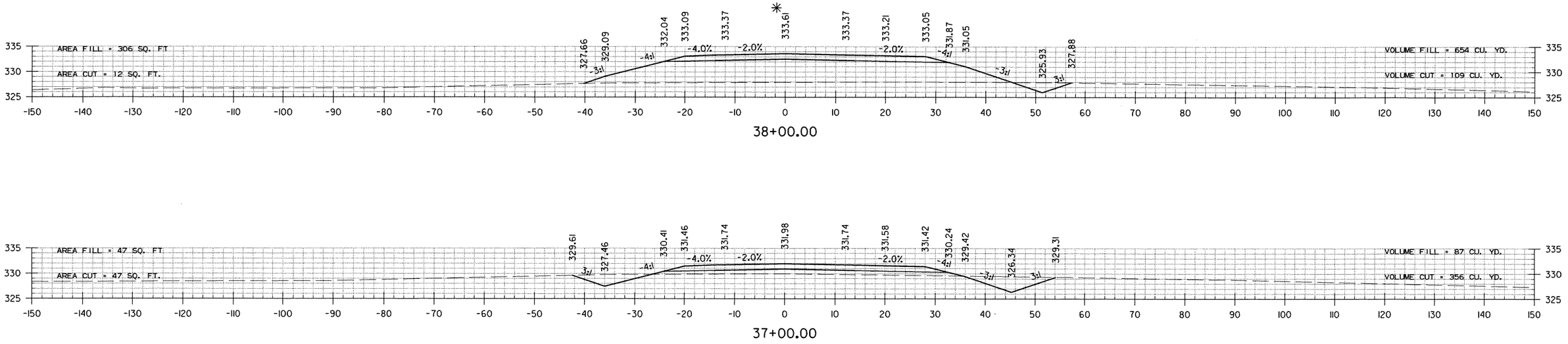
STA. 31+00 TO STA. 34+00

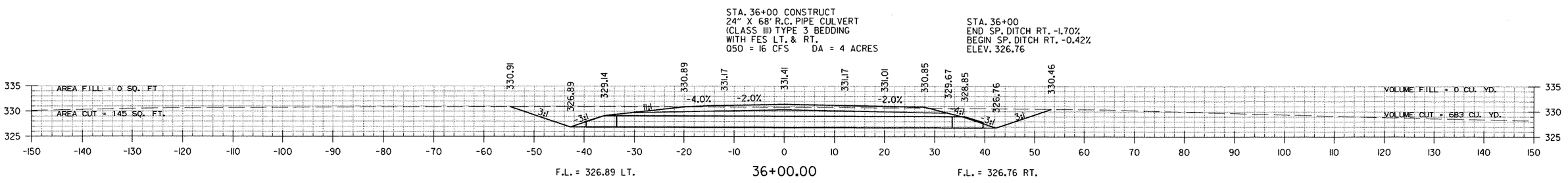
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		061080	99	110

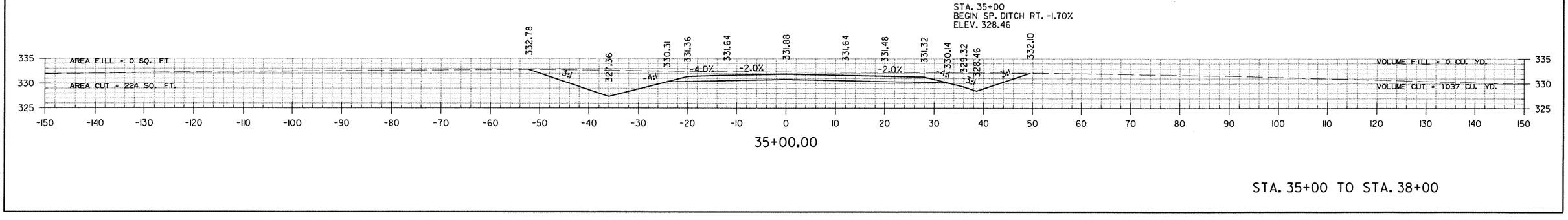
(2) CROSS SECTIONS

✳ PROFILE GRADE - REFER TO SPECIAL DETAILS - BRIDGE PROFILE TRANSITION DETAIL FOR FINISHED GRADE

NOTE: C.L. OF CROSS SECTIONS IS 28.5' RIGHT OF C.L. MEDIAN





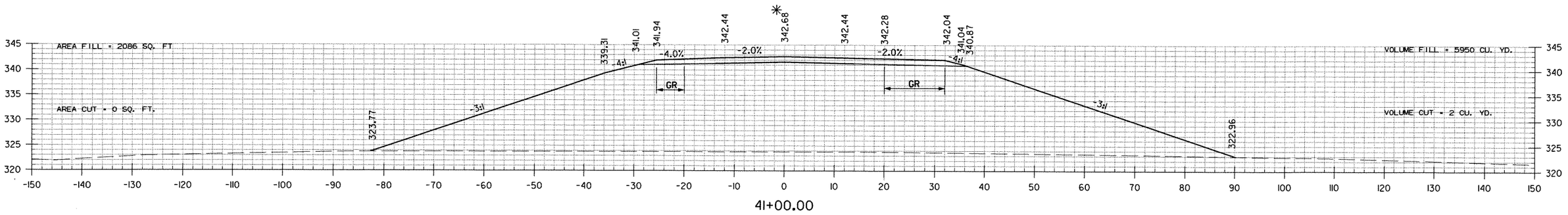


STA. 35+00 TO STA. 38+00

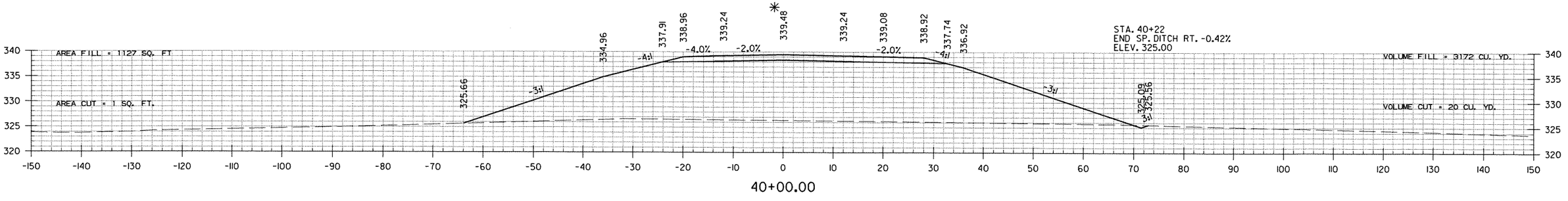
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		061080	100	110
				(2) CROSS SECTIONS				

NOTE: C.L. OF CROSS SECTIONS IS 28.5' RIGHT OF C.L. MEDIAN

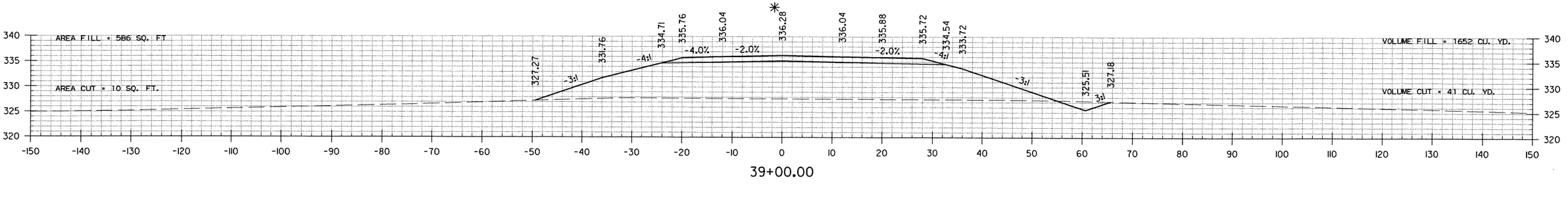
✳ PROFILE GRADE - REFER TO SPECIAL DETAILS - BRIDGE PROFILE TRANSITION DETAIL FOR FINISHED GRADE



41+00.00



40+00.00



39+00.00

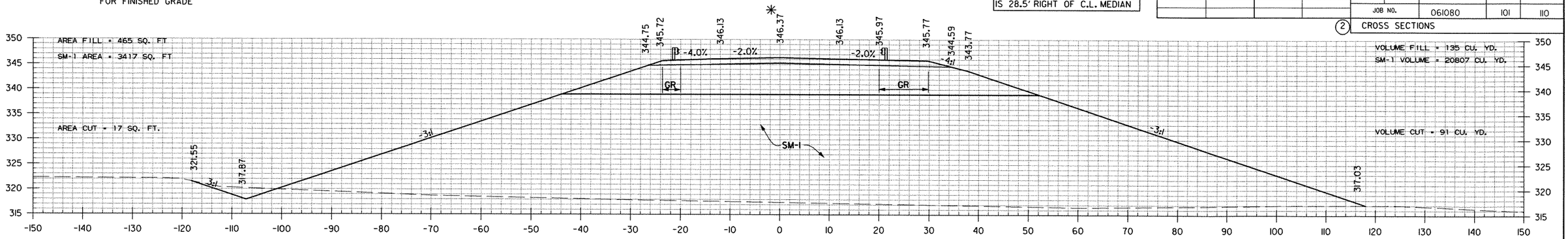
STA. 39+00 TO STA. 41+00

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.		061080	101	110
				(2)	CROSS SECTIONS			

✳ PROFILE GRADE - REFER TO SPECIAL DETAILS - BRIDGE PROFILE TRANSITION DETAIL FOR FINISHED GRADE

NOTE: C.L. OF CROSS SECTIONS IS 28.5' RIGHT OF C.L. MEDIAN

STA. 47+49 END SM-1 EMBANKMENT



STA. 44+52
BEGIN SP. DITCH LT. 0.35%
ELEV. 317.00

47+00.00

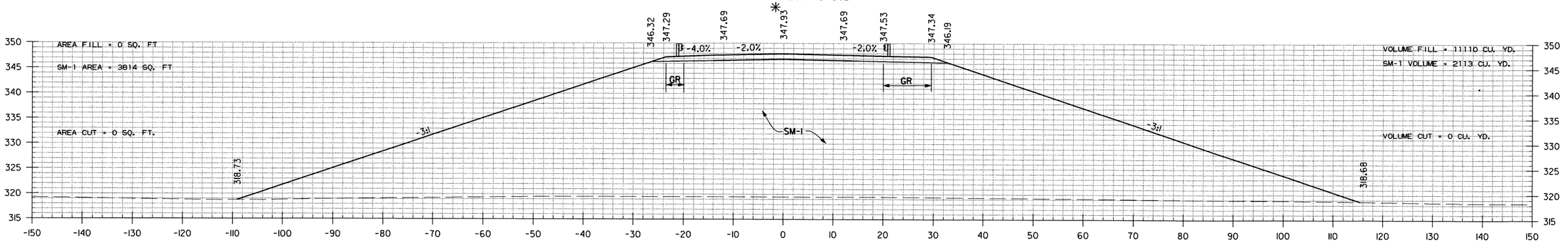
STA. 46+54.34 END BRIDGE

STA. 45+89.25 BRIDGE EMBANKMENT TOE OF SLOPE

NOTE: EARTHWORK TO BRIDGE ENDS AND BRIDGE TOES INCLUDED IN MAIN LANES.

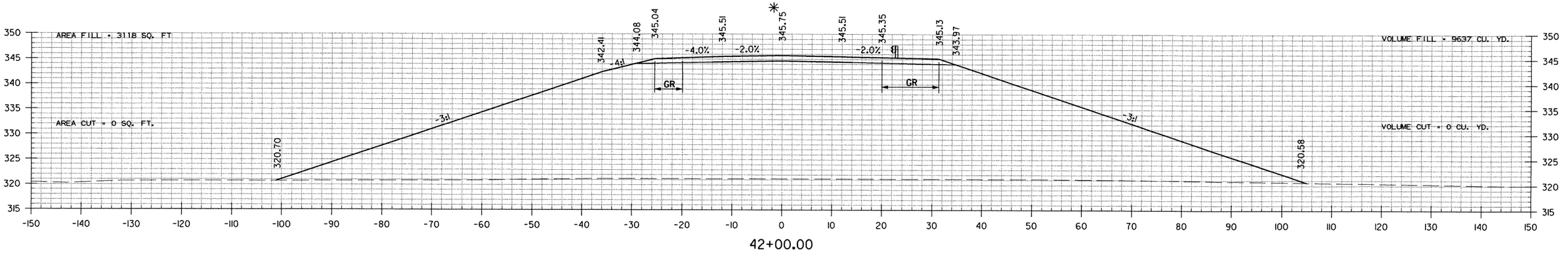
STA. 43+89.23 BRIDGE EMBANKMENT TOE OF SLOPE

STA. 43+29.66 BEGIN BRIDGE



43+00.00

STA. 42+70 BEGIN SM-1 EMBANKMENT



42+00.00

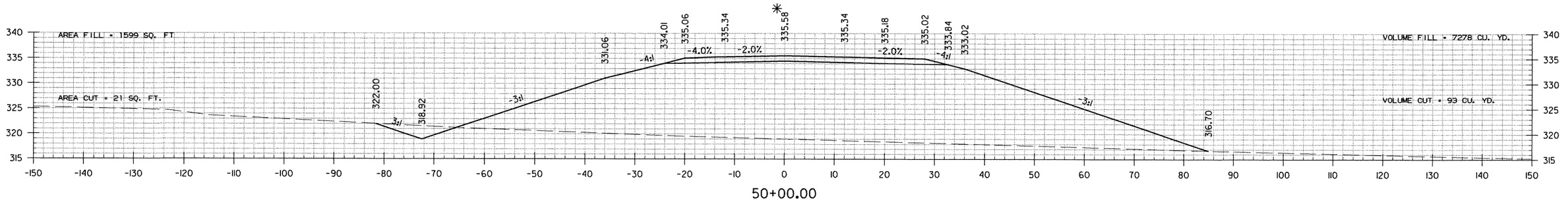
STA. 42+00 TO STA. 47+00

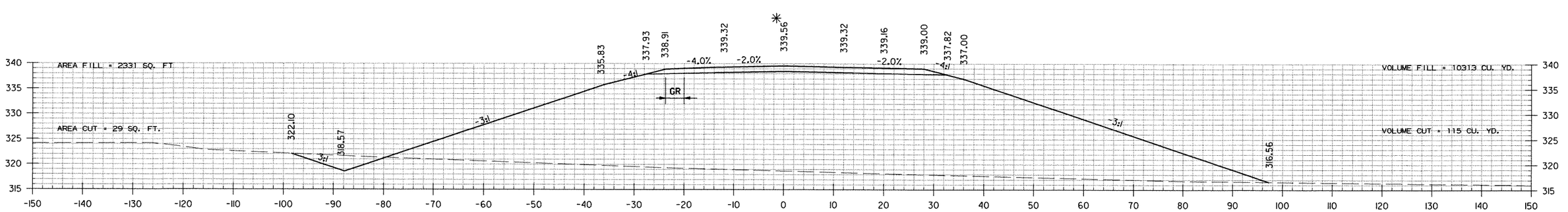
rnfortner 11/19/2009 12:54:44 PM
WORKSPACE: AHTDV8
L:\2004\049180 - South Loop - Phase 1\Drawings\RWY\SLO_MNLCX_01.dgn
REVISED DATE:

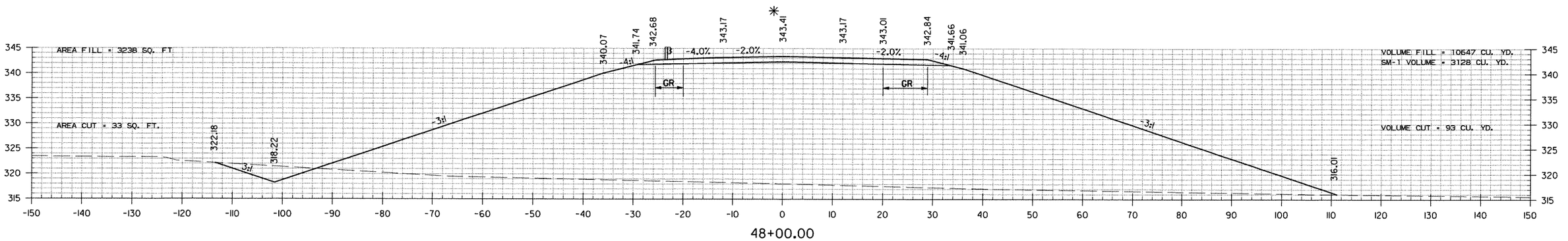
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		061080	102	110
				(2)	CROSS SECTIONS			

✳ PROFILE GRADE - REFER TO SPECIAL DETAILS - BRIDGE PROFILE TRANSITION DETAIL FOR FINISHED GRADE

NOTE: C.L. OF CROSS SECTIONS IS 28.5' RIGHT OF C.L. MEDIAN





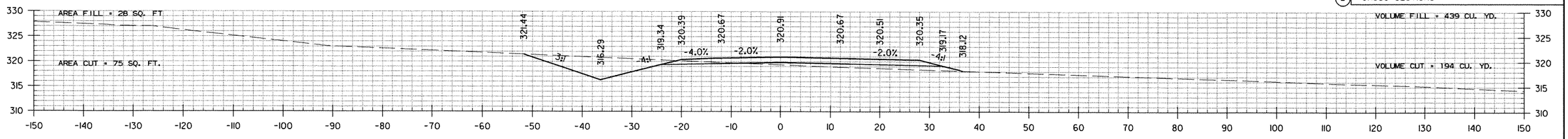


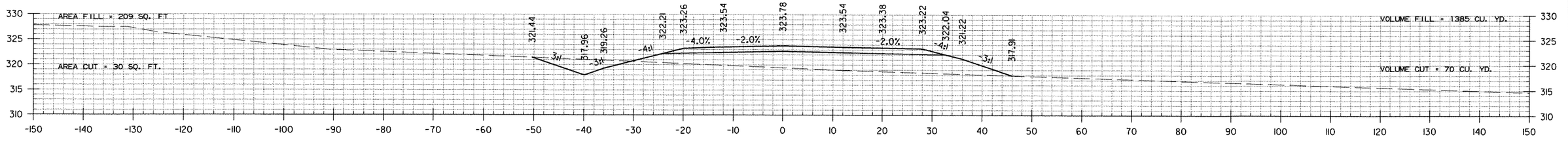
STA. 48+00 TO STA. 50+00

NOTE: C.L. OF CROSS SECTIONS IS 28.5' RIGHT OF C.L. MEDIAN

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.		061080	103	110

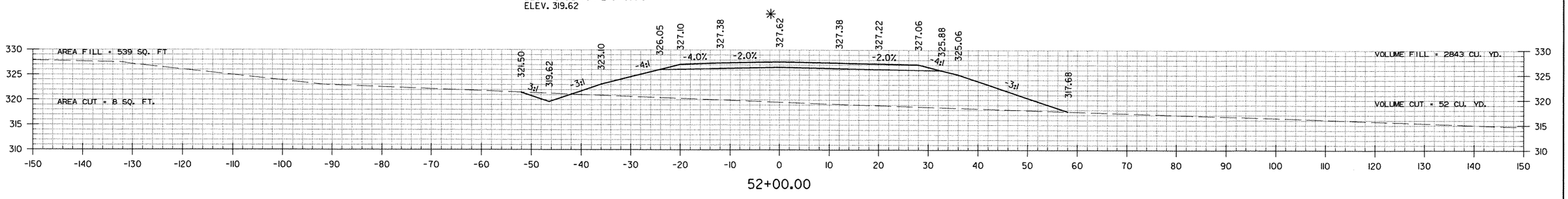
(2) CROSS SECTIONS

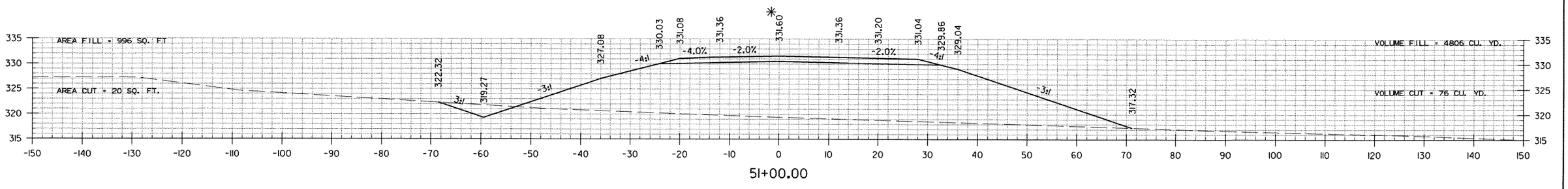




✳ PROFILE GRADE - REFER TO SPECIAL DETAILS - BRIDGE PROFILE TRANSITION DETAIL FOR FINISHED GRADE

STA. 52+00
END SP. DITCH LT. 0.35%
BEGIN SP. DITCH LT. -1.66%
ELEV. 319.62



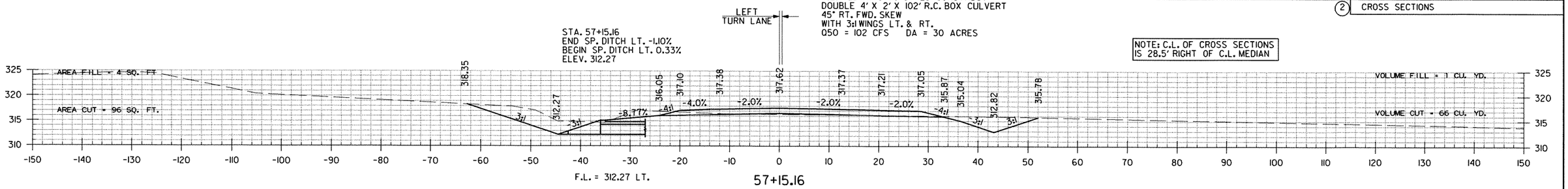


STA. 51+00 TO STA. 54+00

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.		061080	104	110
				(2)	CROSS SECTIONS			

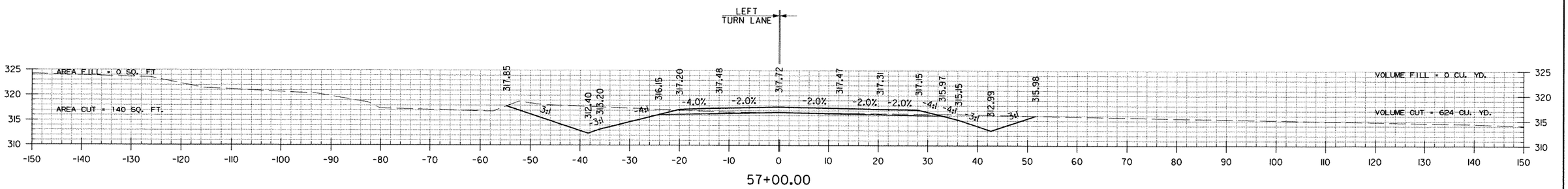
C.L. MEDIAN STA. 57+23 CONSTRUCT
DOUBLE 4' X 2' X 102' R.C. BOX CULVERT
45° RT. FWD. SKEW
WITH 3:1 WINGS LT. & RT.
Q50 = 102 CFS DA = 30 ACRES

NOTE: C.L. OF CROSS SECTIONS IS 28.5' RIGHT OF C.L. MEDIAN

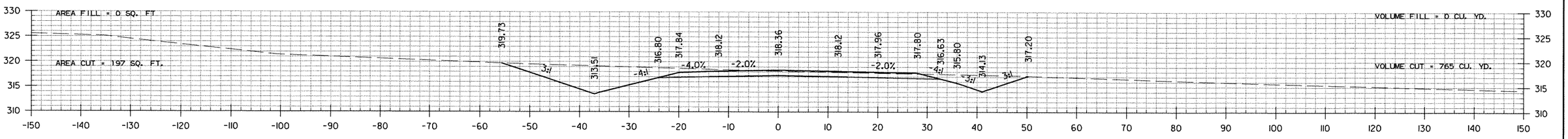


F.L. = 312.27 LT.

57+15.16



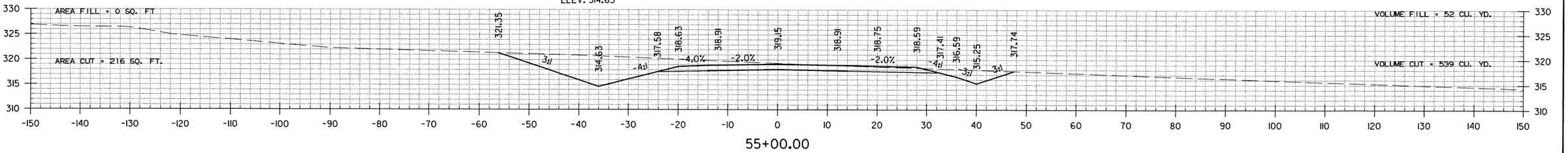
57+00.00



56+00.00

STA. 55+00
END SP. DITCH LT. -1.66%
BEGIN SP. DITCH LT. -1.10%
ELEV. 314.63

STA. 55+00
BEGIN SP. DITCH RT. -1.12%
ELEV. 315.25

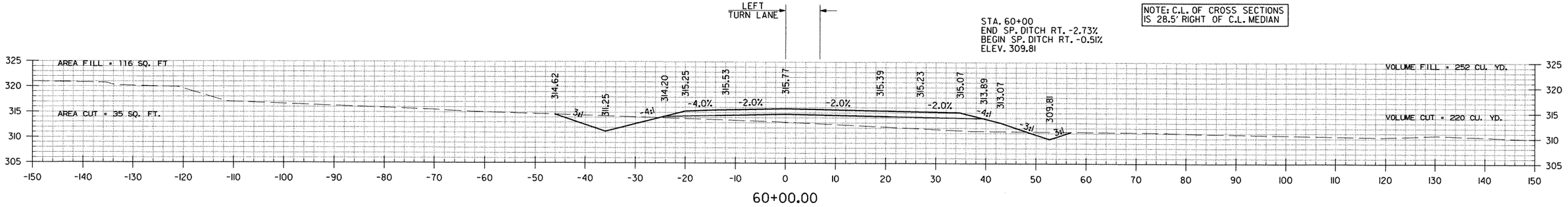


55+00.00

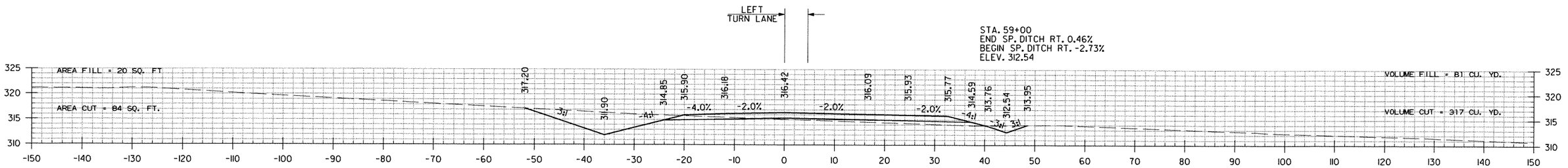
STA. 55+00 TO STA. 57+15

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.		061080	105	110
				(2) CROSS SECTIONS				

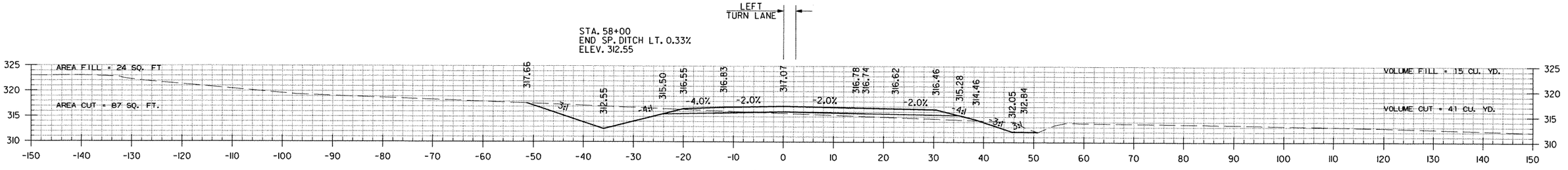
NOTE: C.L. OF CROSS SECTIONS IS 28.5' RIGHT OF C.L. MEDIAN



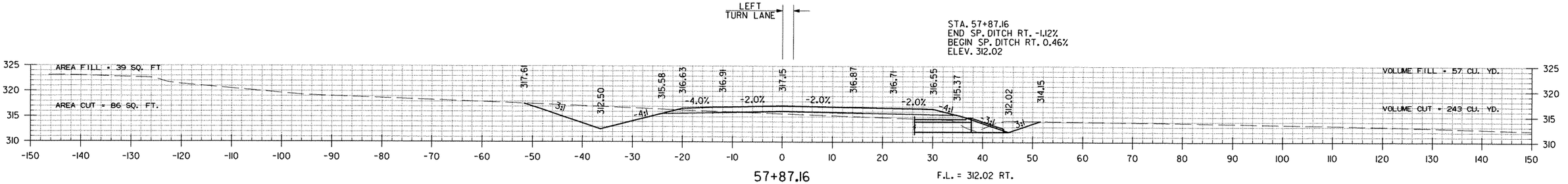
60+00.00



59+00.00



58+00.00



57+87.16

F.L. = 312.02 RT.

STA. 57+87 TO STA. 60+00

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.		061080	106	110

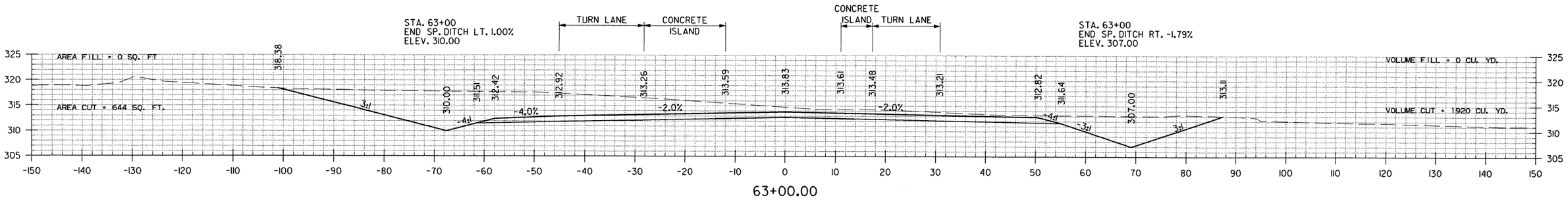
(2) CROSS SECTIONS

NOTE: C.L. OF CROSS SECTIONS IS 28.5' RIGHT OF C.L. MEDIAN

VOLUME FILL = 0 CU. YD.

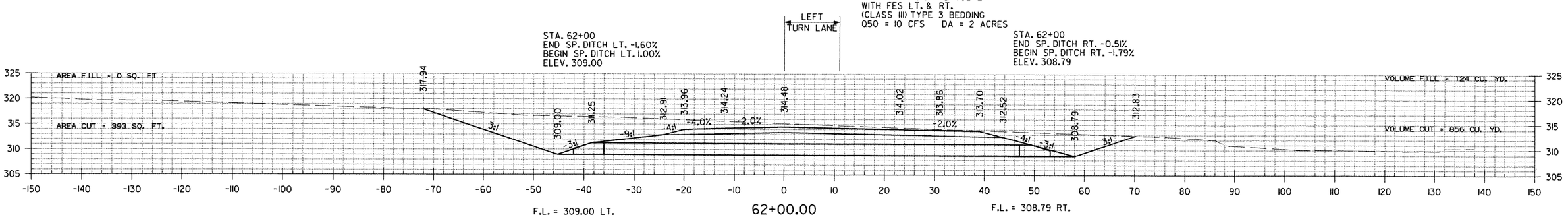
VOLUME CUT = 338 CU. YD.

END RT. LANES JOB 061080 & SITE NO. 1 C.L. MEDIAN STA. 63+28.38

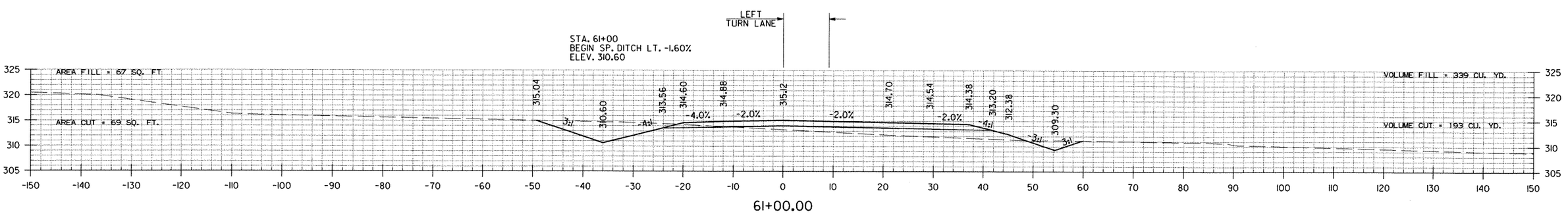


63+00.00

STA. 62+00 CONSTRUCT
24" X 84' R.C. PIPE CULVERT
WITH FES LT. & RT.
(CLASS III) TYPE 3 BEDDING
Q50 = 10 CFS DA = 2 ACRES



F.L. = 309.00 LT. 62+00.00 F.L. = 308.79 RT.



61+00.00

STA. 61+00 TO STA. 63+00

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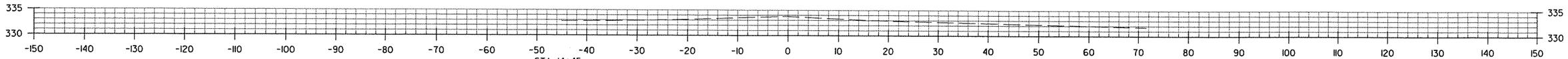
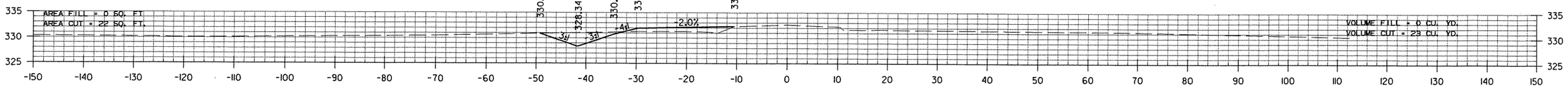
WORKSPACE: AHTDVB
L:\2004\049180 - South Loop - Phase 1\Drawings\RWY\SLO_MNLCX_01.dgn
REVISED DATE:

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.		061080	107	110
				(2)	CROSS SECTIONS			



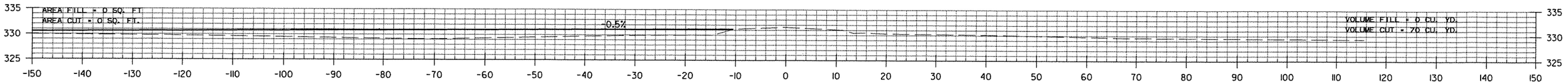
STA. 14+45
END SP. DITCH LT. 6.76%
ELEV. 331.38

15+00.00



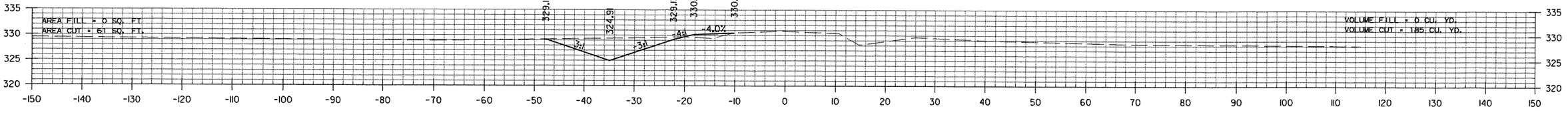
STA. 13+58
BEGIN SP. DITCH LT. 6.76%
ELEV. 325.50

14+00.00

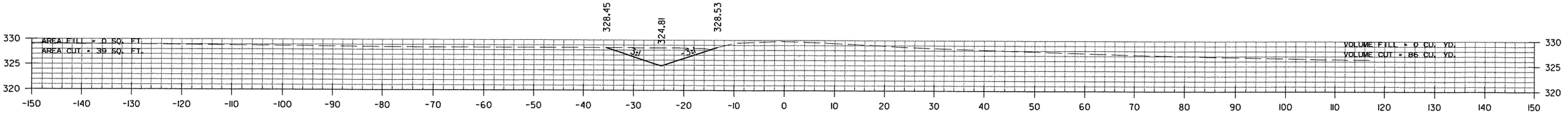


13+00.00

STA. 12+62
END SP. DITCH LT. 0.10%
ELEV. 325.00



12+00.00



11+00.00

STA. 9+81
BEGIN SP. DITCH LT. 0.10%
ELEV. 324.72

STA. 11+00 TO STA. 15+00
ALEXANDER RD.

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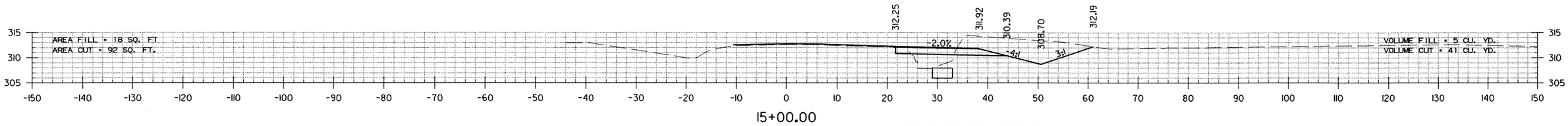
WORKSPACE: AHTDV8
I:\2004\049180 - South Loop - Phase I\Drawings\RWY\SLO_ALEXCX_01.dgn

REVISED DATE:

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.		061080	108	110

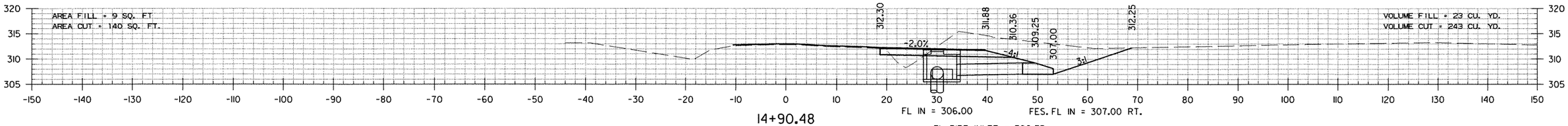
(2) CROSS SECTIONS

STA. 15+00.74 END NOTCH AND WIDEN



15+00.00

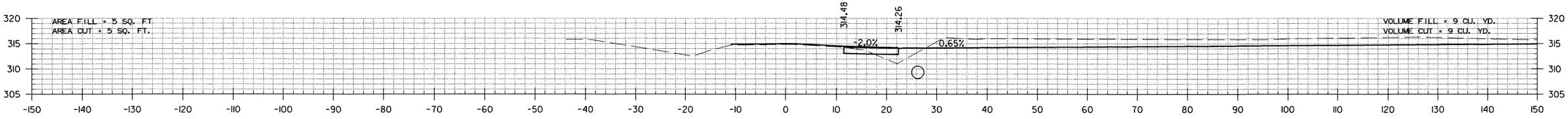
STA. 14+90.48 RT. - IN PLACE
24" X 165' R.C. PIPE CULVERT
WITH HDWLS. - REMOVE &
CONSTRUCT TYPE ST JUNCTION BOX, 30.97' RT.
(6' X 3' X H=6'-0") &
4' X 2' X 179' R.C. BOX CULVERT OUTLET
WITH 3:1 WINGS, 32.68' RT.
Q50 = 68 CFS DA = 12 ACRES &
24" X 13' R.C. PIPE CULVERT WITH FES, 50.00' RT.
(CLASS III) TYPE 3 BEDDING
TOP = 312.00
INV. 306.00



14+90.48

FL IN = 306.00 FES. FL IN = 307.00 RT.

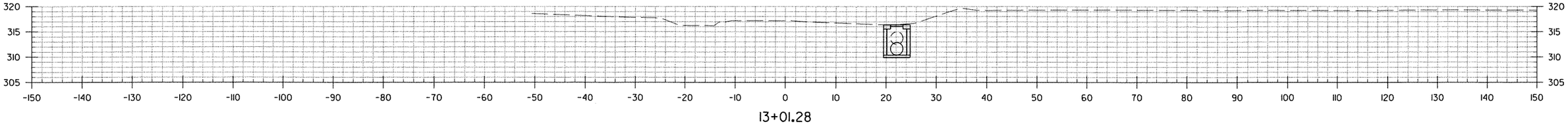
FL PIPE INLET = 306.75



14+00.00

STA. 13+04.70 BEGIN NOTCH, WIDEN & OVERLAY

STA. 13+01.28 - IN PLACE
DROP INLET W/ GRATE AND
30" X 51' R.C. PIPE CULVERT WITH FES RT.
REMOVE DROP INLET W/ GRATE AND
R.C. PIPE CULVERT & FES RT.
CONSTRUCT TYPE ST JUNCTION BOX, 22.11' RT
(4' X 3' X H=6'-0") WITH RIBBED VANE GRATE &
30" X 187' R.C. PIPE OUTLET TO JUNCTION BOX RT.
(CLASS III) TYPE 3 BEDDING
TOP = 316.40
INV. = 310.40
FL IN = 312.50



13+01.28

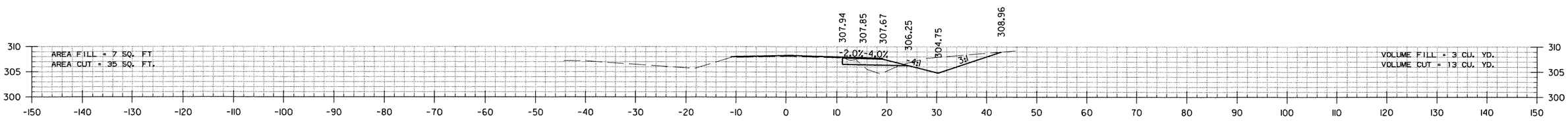
MABELVALE WEST RD.
STA. 13+01.28 TO STA. 15+00

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.		061080	109	110
				(2)	CROSS SECTIONS			

STA. 18+82.54 MATCH EXISTING

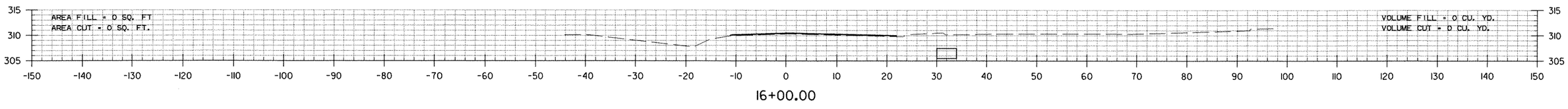
VOLUME FILL = 11 CU. YD.
VOLUME CUT = 53 CU. YD.

STA. 17+82.54 END NOTCH AND WIDEN
BEGIN TRANSITION TO MATCH EXISTING



17+00.00

STA. 16+80.57 BEGIN NOTCH AND WIDEN



16+00.00

MABELVALE WEST RD.
STA. 16+00 TO STA. 17+00

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WORKSPACE: AHTDV8
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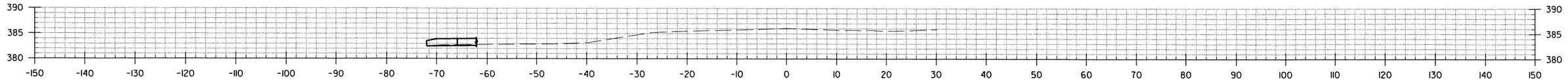
REVISED DATE:

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.		061080	110	110

(2) CROSS SECTIONS



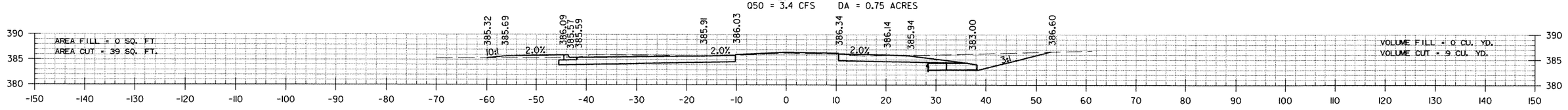
FL OUTLET = 382.50 LT.

14+89.19

END SITE NO. 2 STA. 14+63.47

VOLUME FILL = 0 CU. YD.
VOLUME CUT = 10 CU. YD.

STA. 14+47 CONSTRUCT
22" X 14" X 70' R.C. ARCH PIPE CULVERT
5° RT. FWD. SKEW
(CLASS III) TYPE 3 BEDDING
WITH FES RT.
Q50 = 3.4 CFS DA = 0.75 ACRES

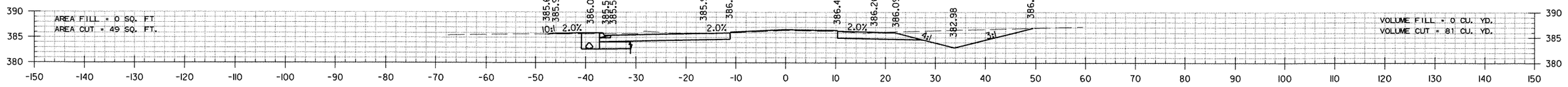


VOLUME FILL = 0 CU. YD.
VOLUME CUT = 9 CU. YD.

14+50.15

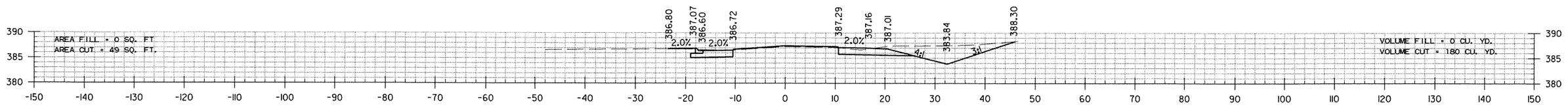
FL INLET = 383.00 RT.

STA. 14+43 CONSTRUCT
DROP INLET (H= 3'5") ON LT.
WITH 22" X 14" X 49' R.C. ARCH PIPE OUTLET
TO FES. ON LT.
(CLASS III) TYPE 3 BEDDING
TYPE MO INLET = 4'0" DIA.
TYPE C INLET = 5'0" X 3'0"
TOP = 386.07
INV. = 382.70



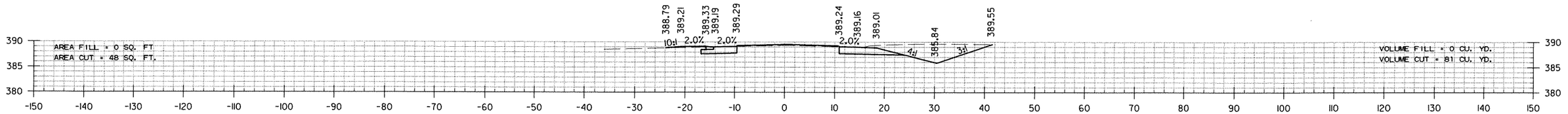
VOLUME FILL = 0 CU. YD.
VOLUME CUT = 81 CU. YD.

14+44.58



VOLUME FILL = 0 CU. YD.
VOLUME CUT = 180 CU. YD.

14+00.00



VOLUME FILL = 0 CU. YD.
VOLUME CUT = 81 CU. YD.

13+00.00

BEGIN JOB 061080 & SITE NO. 2 STA. 12+09.21 & 135' TAPER

SARDIS ROAD
STA. 13+00 TO STA. 14+89

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WORKSPACE: AHTOV8
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