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.		110544	1	134
				(2) HWY. 17-ST. FRANCIS CO. LINE STRS. & APPRS. (S)				

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
CONSTRUCTION PLANS FOR STATE HIGHWAY

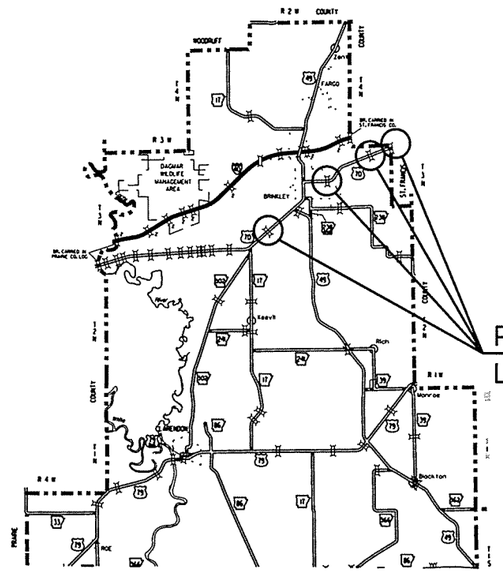
HWY. 17 - ST. FRANCIS CO. LINE
STRS. & APPRS. (S)

MONROE COUNTY

ROUTE 70 SECTION 17

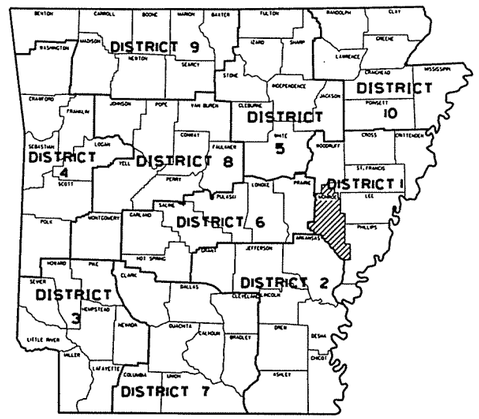
JOB 110544

FED. AID PROJ. EBS-0048(24)



PROJECT LOCATION

VICINITY MAP



ARK. HWY. DIST. NO. 1

STRUCTURES OVER 20'-0" SPAN

(1) STA. 107+50 CONSTRUCT
QUAD. 10' X 10' X 74' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
ROADWAY SPAN = 43.50'
Q25 = 550 CFS D.A. = 2.2 SQ. MI.

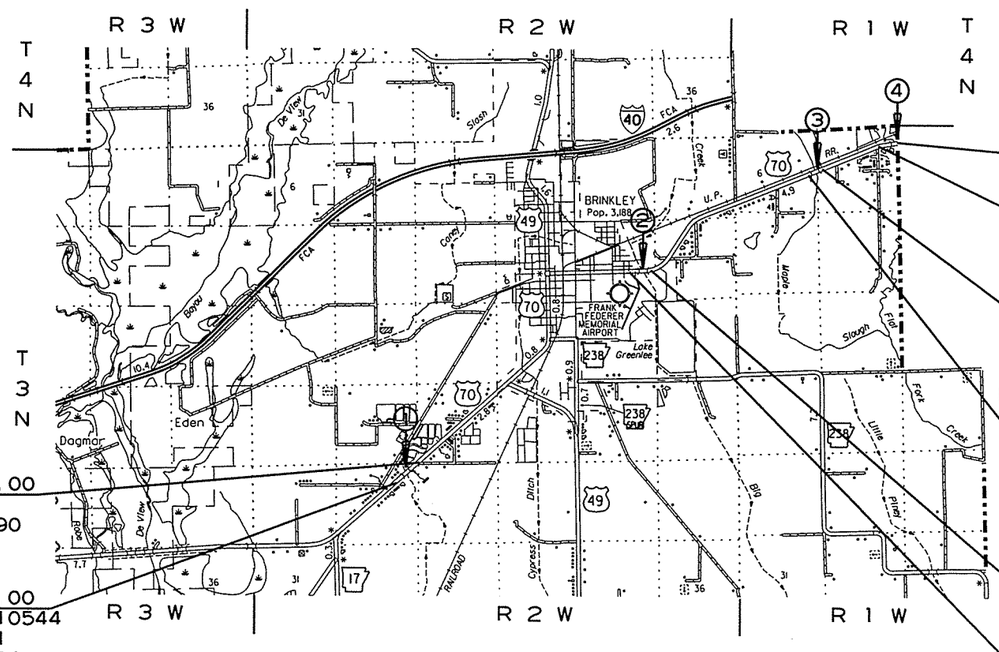
(2) STA. 207+50 CONSTRUCT
QUINT. 10' X 9' X 86' R.C. BOX CULVERT
AT 30° RT. FWD SKEW
WITH 3:1 WINGS LT. & RT.
ROADWAY SPAN = 54.08'
Q25 = 1000 CFS D.A. = 8.4 SQ. MI.

(3) STA. 307+50 CONSTRUCT
QUINT. 10' X 5' X 74' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
ROADWAY SPAN = 53.67'
Q25 = 570 CFS D.A. = 6.2 SQ. MI.

(4) BR. END STA. 415+44.50
BRIDGE NO. 07302
40'-00" CLEAR ROADWAY
AT 45° RT. FWD. SKEW
189'-00" TOTAL LENGTH
186.00' CONT. COMPOSITE W-BEAM UNIT
(58', 70', 58')
BR. END STA. 417+33.50

BEGINNING:	
LAT: N 34°51'06"	
LONG: W 91°13'39"	
MID POINT:	
LAT: N 34°53'14"	
LONG: W 91°10'25"	
ENDING:	
LAT: N 34°54'34"	
LONG: W 91°06'56"	

NOT TO SCALE



STA. 109+00.00
END SITE 1
LOG MILE 8.90

STA. 106+00.00
BEGIN JOB 110544
BEGIN SITE 1
LOG MILE 8.84

STA. 424+00.00
END SITE 4
END JOB 110544

STA. 410+00.00
BEGIN SITE 4
LOG MILE 16.88

STA. 309+00.00
END SITE 3
LOG MILE 15.94

STA. 306+00.00
BEGIN SITE 3
LOG MILE 15.89

STA. 209+00.00
END SITE 2
LOG MILE 13.35

STA. 206+00.00
BEGIN SITE 2
LOG MILE 13.30

GROSS LENGTH OF PROJECT	2300.00	FEET	OR	0.436	MILES	
NET " " ROADWAY	1959.75	"	"	0.371	"	
NET " " BRIDGES	340.25	"	"	0.065	"	
NET " " PROJECT	2300.00	"	"	0.436	"	

• DESIGN TRAFFIC DATA •	SITE 1	SITES 2-4
DESIGN YEAR	2034	2034
2014 ADT	3100	3500
2034 ADT	3700	4200
2034 DHV	407	462
DIRECTIONAL DISTRIBUTION	60%	60%
TRUCKS	24%	8%
DESIGN SPEED	55 MPH	55 MPH

N

APPROVED

STATE OF ARKANSAS
8-15-14
REGISTERED PROFESSIONAL ENGINEER
No. 4215
RALPH J. HALL

DEPUTY DIRECTOR
AND CHIEF ENGINEER

7/31/2014

R110544.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	2	134

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

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-4-14

INDEX OF SHEETS

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2	INDEX OF SHEETS, GOVERNING SPECIFICATIONS, AND GENERAL NOTES			
3-6	TYPICAL SECTIONS OF IMPROVEMENT			
7-19	SPECIAL DETAILS			
20-23	TEMPORARY EROSION CONTROL DETAILS			
24-35	MAINTENANCE OF TRAFFIC DETAILS			
36-39	PERMANENT PAVEMENT MARKING DETAILS			
40-44	QUANTITIES			
45	SCHEDULE OF BRIDGE QUANTITIES	07302	55493	
46	SUMMARY OF QUANTITIES AND REVISIONS			
47-51	SURVEY CONTROL DETAILS			
52-63	PLAN AND PROFILE SHEETS			
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65	SOIL BORINGS	07302	55495	
66	DETAILS OF END BENTS (SHEET 1 OF 3)	07302	55496	
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71	DETAILS OF 186'-0" CONTINUOUS COMPOSITE W-BEAM UNIT (SHEET 2 OF 7)	07302	55501	
72	DETAILS OF 186'-0" CONTINUOUS COMPOSITE W-BEAM UNIT (SHEET 3 OF 7)	07302	55502	
73	DETAILS OF 186'-0" CONTINUOUS COMPOSITE W-BEAM UNIT (SHEET 4 OF 7)	07302	55503	
74	DETAILS OF 186'-0" CONTINUOUS COMPOSITE W-BEAM UNIT (SHEET 5 OF 7)	07302	55504	
75	DETAILS OF 186'-0" CONTINUOUS COMPOSITE W-BEAM UNIT (SHEET 6 OF 7)	07302	55505	
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78	DETAILS OF TYPE SPECIAL APPROACH SLABS	07302	55508	
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85	STANDARD DETAILS FOR PERMANENT STEEL BRIDGE DECK FORMS FOR STEEL & CONCRETE GIRDER SPANS		55005	02/27/14
86	STANDARD DETAILS FOR TYPE D BRIDGE NAME PLATE		55010	02/27/14
87	STANDARD DETAILS FOR CONCRETE FILLED STEEL SHEEL PILES AND PILE ENCASEMENTS		55021	02/27/14
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96	GUARD RAIL DETAILS		GR-10A	7/14/10
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116	WIRE FENCE TYPE C AND D		WF-4	8/22/02
117-134	CROSS SECTIONS			

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

GOVERNING SPECIFICATIONS

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

NUMBER	TITLE
ERRATA	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273	REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS
FHWA-1273	SUPPLEMENT- SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140)
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - FEDERAL STANDARDS
FHWA-1273	SUPPLEMENT - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS
FHWA-1273	SUPPLEMENT - WAGE RATE DETERMINATION
108-1	LIQUIDATED DAMAGES
410-1	CONSTRUCTION REQUIREMENTS AND ACCEPTANCE OF ASPHALT CONCRETE PLANT MIX COURSES
620-1	MULCH COVER
JOB 110544	AIRPORT CLEARANCE REQUIREMENTS
JOB 110544	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 110544	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 110544	CONSTRUCTION IN SPECIAL FLOOD HAZARD AREAS
JOB 110544	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 110544	HIGH PERFORMANCE PAVEMENT MARKING
JOB 110544	MANDATORY USE OF INTERNET BIDDING
JOB 110544	NESTING SITES OF MIGRATORY BIRDS
JOB 110544	PARTNERING REQUIREMENTS
JOB 110544	PLASTIC PIPE
JOB 110544	REMOVAL AND DISPOSAL OF GUARDRAIL
JOB 110544	SECTION 404 NATIONWIDE 23 PERMIT REQUIREMENTS
JOB 110544	SHORING
JOB 110544	SOIL STABLIZATION
JOB 110544	STORM WATER POLLUTION PREVENTION PLAN
JOB 110544	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 110544	UTILITY ADJUSTMENTS
JOB 110544	VALUE ENGINEERING
JOB 110544	WARM MIX ASPHALT

GENERAL NOTES

1. GRADE LINE DENOTES FINISHED GRADE WHERE SHOWN ON PLANS.
2. ALL PIPE LINES, POWER, TELEPHONE, AND TELEGRAPH LINES TO BE MOVED OR LOWERED BY THE RESPECTIVE OWNERS AS PER AGREEMENT WITH SUCH OWNERS.
3. ANY EQUIPMENT OR APPURTENANCE THAT INTERFERES WITH THE PROPOSED CONSTRUCTION AND WHICH MAY BE THE PROPERTY OF UTILITY SERVICE ORGANIZATIONS SHALL BE MOVED BY THE OWNERS UNLESS OTHERWISE PROVIDED.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING U.S. MAILBOXES WITHIN THE PROJECT LIMITS IN SUCH A MANNER THAT THE PUBLIC MAY RECEIVE CONTINUED MAIL SERVICE. PAYMENT WILL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS BID ITEMS.
5. ALL LAND MONUMENTS LOCATED WITHIN THE CONSTRUCTION AREA SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 107.12 OF THE STANDARD SPECIFICATIONS.
6. ALL TREES THAT DO NOT DIRECTLY INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE SPARED AS DIRECTED BY THE ENGINEER. CARE AND DISCRETION SHALL BE USED TO INSURE THAT ALL TREES NOT TO BE REMOVED SHALL BE HARMED AS LITTLE AS POSSIBLE DURING THE CONSTRUCTION OPERATIONS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A FENCE TO CONTROL LIVESTOCK IN AREAS WHERE PASTURES ARE SEVERED. WIRE FENCE MAY BE CONSTRUCTED INITIALLY, OR IN LIEU THEREOF, THE CONTRACTOR AT HIS OWN EXPENSE, MAY ELECT TO PROVIDE TEMPORARY FENCING SUITABLE TO CONTAIN LIVESTOCK.
8. ALL FLEXIBLE BASE AND ASPHALTIC PAVEMENTS REMOVED SHALL BE PAID FOR UNDER THE ITEM NO. 210 UNCLASSIFIED EXCAVATION.
9. THE EXISTING ASPHALT PAVEMENT TO BE REMOVED FROM THE REMAINING PAVEMENT SHALL BE SEPARATED BY SAWING ALONG A NEAT LINE. AFTER SAWING, THE PAVEMENT TO BE REMOVED SHALL BE CAREFULLY REMOVED IN A MANNER THAT WILL NOT DAMAGE THE PAVEMENT THAT IS TO REMAIN. ANY DAMAGE OF THE ASPHALT PAVEMENT THAT IS TO REMAIN IN PLACE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

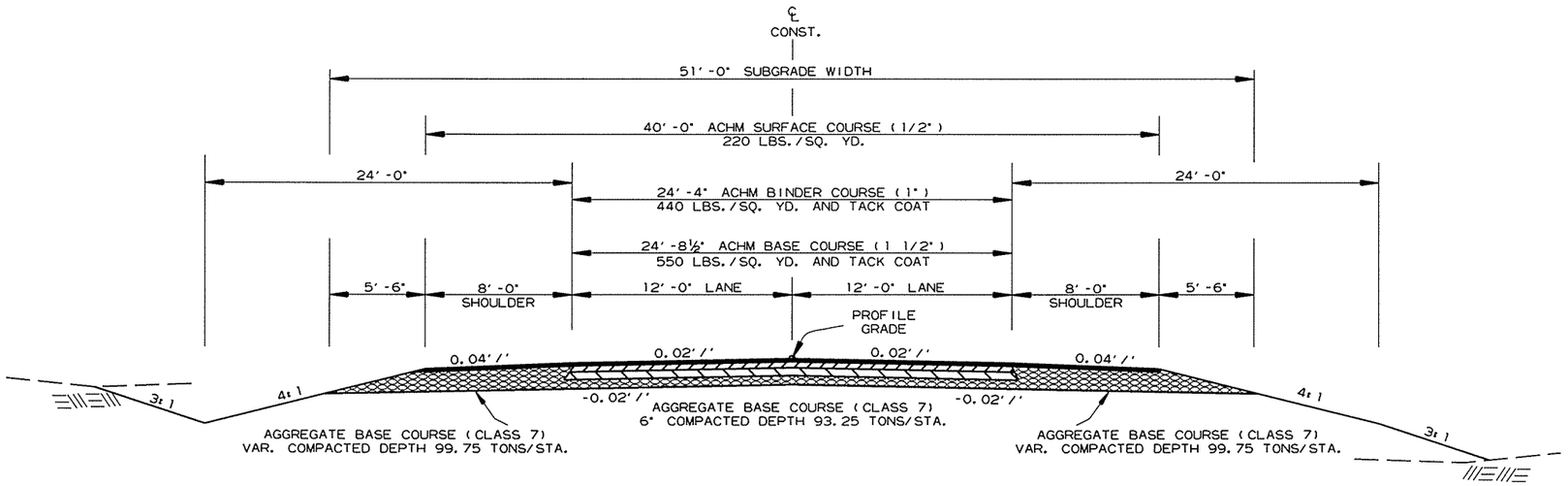
7/25/2014

RI10544.DGN

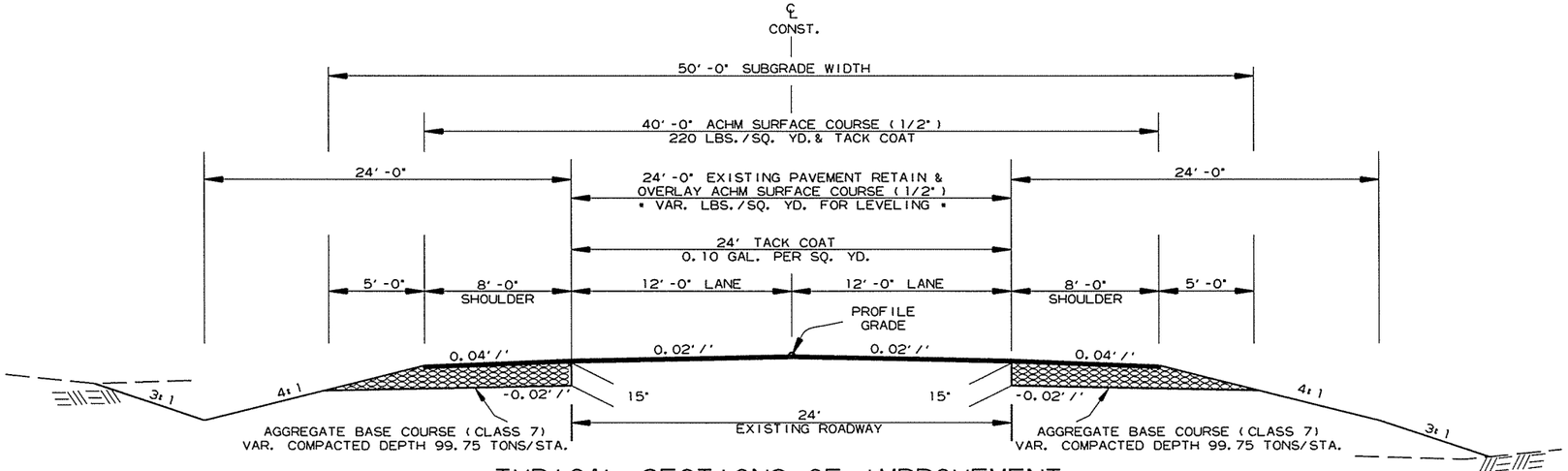
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	3	134

(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-5-14



TYPICAL SECTIONS OF IMPROVEMENT -
FULL DEPTH
SITE 1
STA. 106+98.71 TO STA. 108+00.97



TYPICAL SECTIONS OF IMPROVEMENT -
NOTCH & WIDENING
SITE 1
STA. 106+00.00 TO STA. 106+98.71
STA. 108+00.91 TO STA. 109+00.00

* NOTE TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.

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

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

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

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

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

AFTER PLACING FINAL 2" OF SURFACE COURSE, THE EXISTING SLOPE SHALL BE REDRESSED AS DIRECTED BY THE ENGINEER PRIOR TO SEEDING IN ORDER TO MAINTAIN A UNIFORM SLOPE. PAYMENT FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR VARIOUS CONTRACT ITEMS.

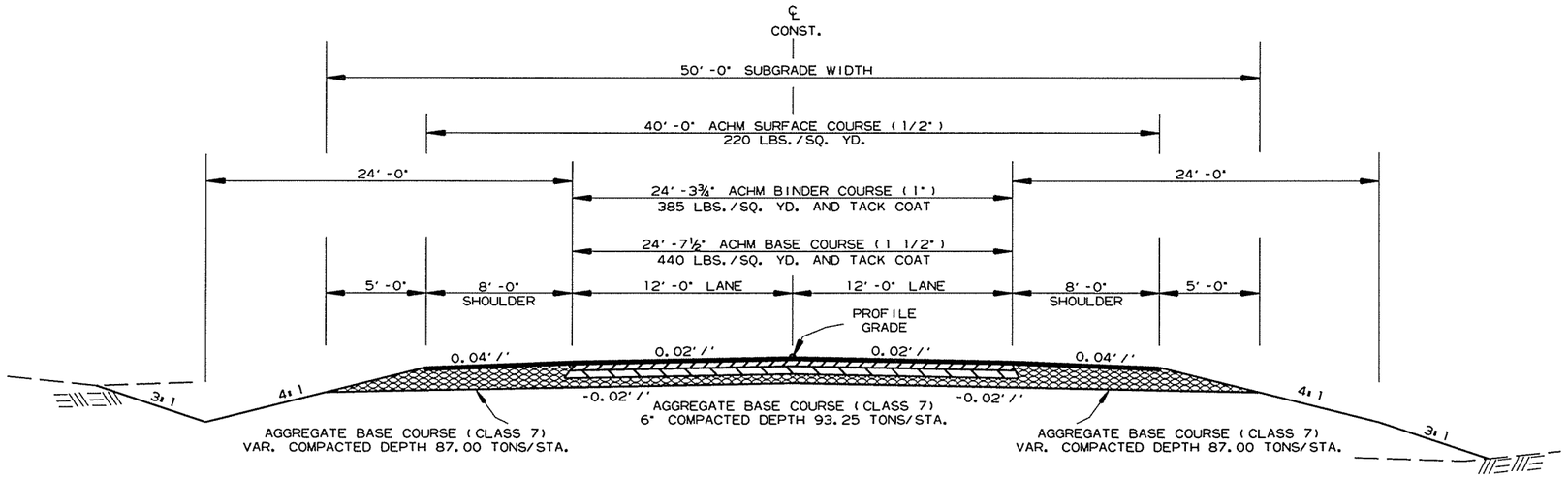
8/5/2014

R110544.DGN

TYPICAL SECTIONS OF IMPROVEMENT

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	4	134

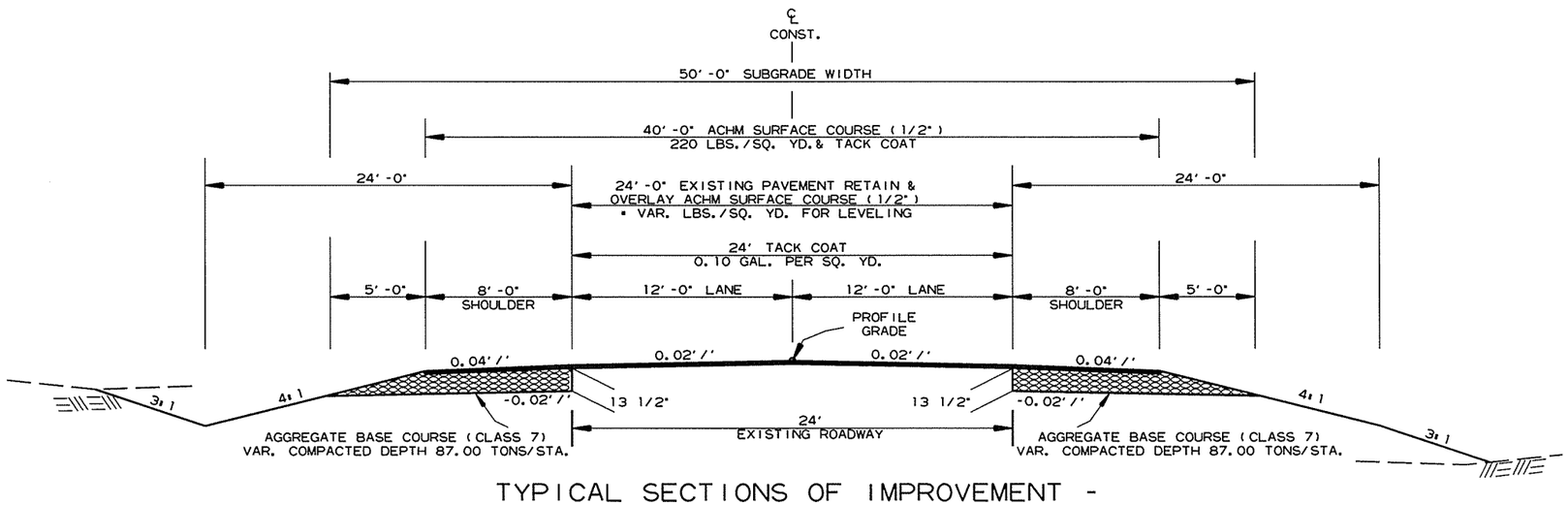
(2) TYPICAL SECTIONS OF IMPROVEMENT



TYPICAL SECTIONS OF IMPROVEMENT - FULL DEPTH

SITES 2, 3, & 4

STA. 206+87.00 TO STA. 208+07.00
STA. 307+07.00 TO STA. 307+93.00
STA. 411+50.00 TO STA. 415+44.50
STA. 417+33.50 TO STA. 423+00.00



TYPICAL SECTIONS OF IMPROVEMENT - NOTCH & WIDENING

SITES 2, 3, & 4

STA. 206+00.00 TO STA. 206+87.00
STA. 208+07.00 TO STA. 209+00.00
STA. 306+00.00 TO STA. 307+07.00
STA. 307+93.00 TO STA. 309+00.00
STA. 410+00.00 TO STA. 411+50.00
STA. 423+00.00 TO STA. 424+00.00

NOTES:
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▪ NOTE: TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-5-14

8/5/2014

R110544.DGN

TYPICAL SECTIONS OF IMPROVEMENT

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
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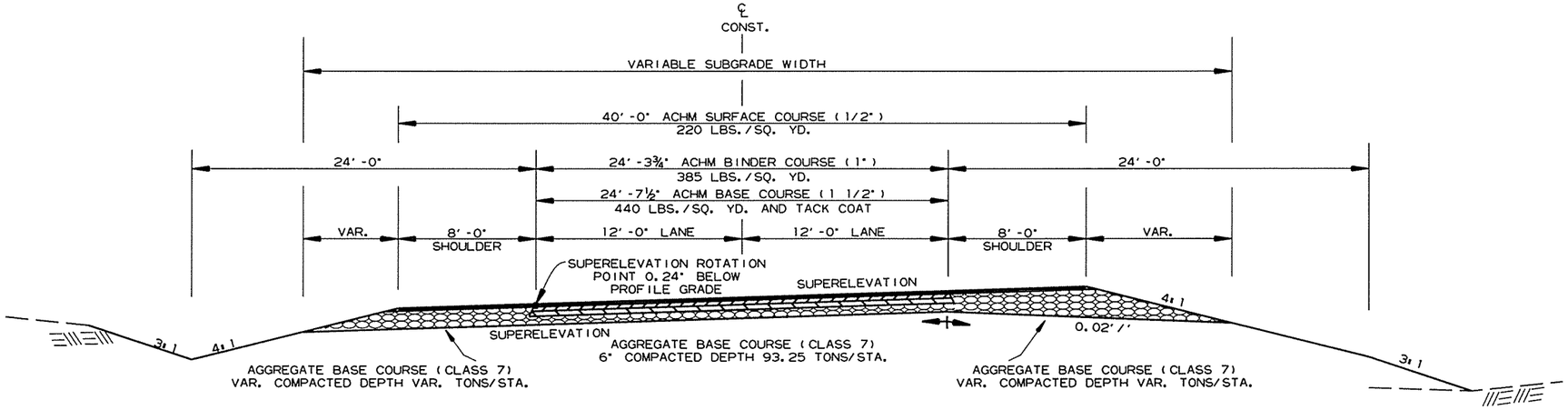
(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-5-14



TYPICAL SECTIONS OF IMPROVEMENT SITES 2, 3, & 4

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

NOTES:
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R110544.DGN 8/5/2014

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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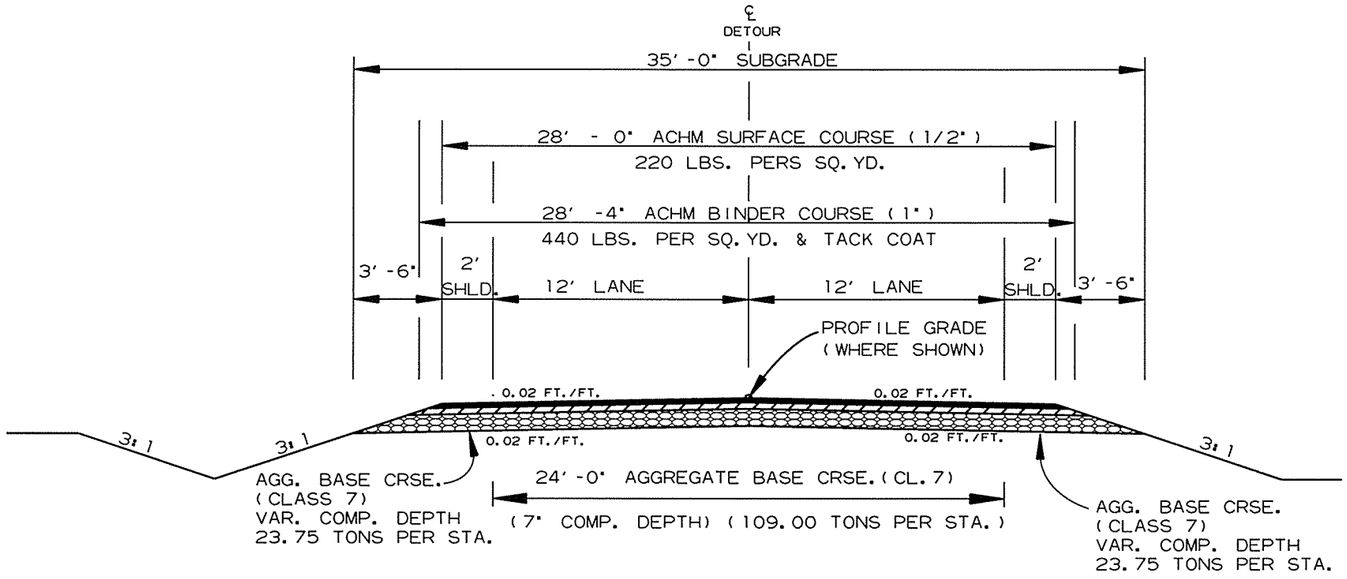
				JOB NO.		110544	6	134

(2) TYPICAL SECTIONS OF IMPROVEMENT

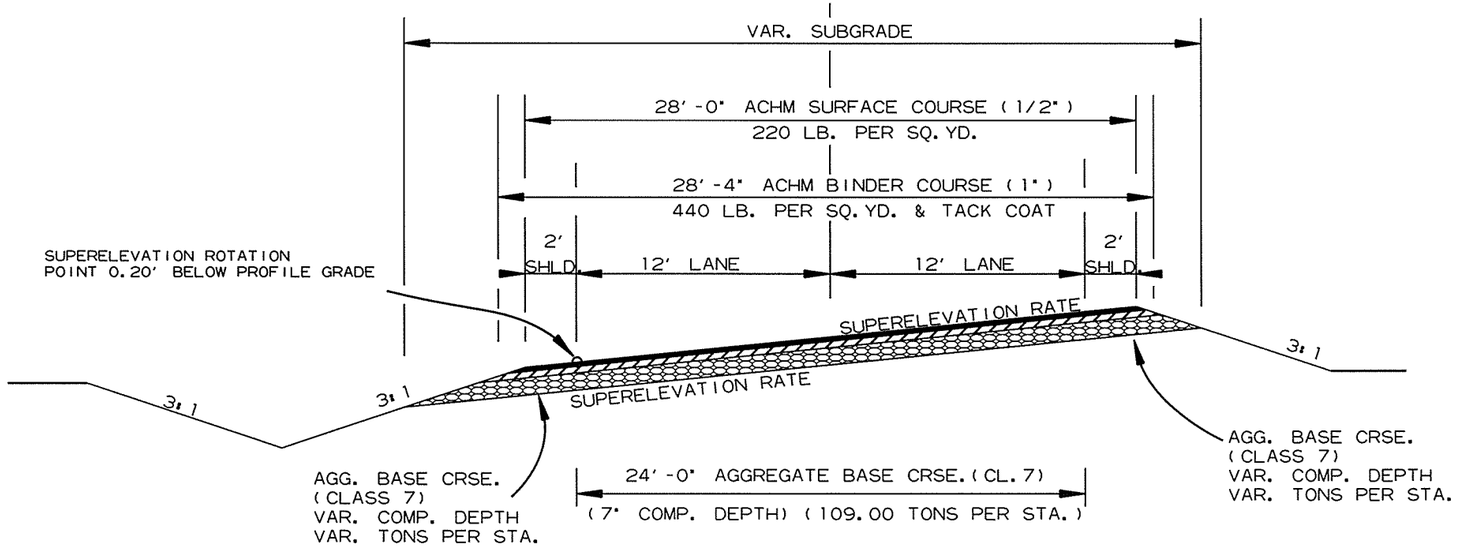
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-5-14



TYPICAL SECTIONS OF IMPROVEMENT - DETOUR ROAD
NORMAL CROWN

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

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



TYPICAL SECTIONS OF IMPROVEMENT - DETOUR ROAD
SUPERELEVATION

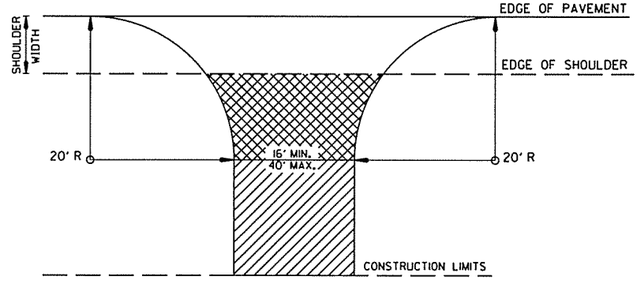
8/5/2014

R110544.DGN

TYPICAL SECTIONS OF IMPROVEMENT

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	7	134

(2) SPECIAL DETAILS

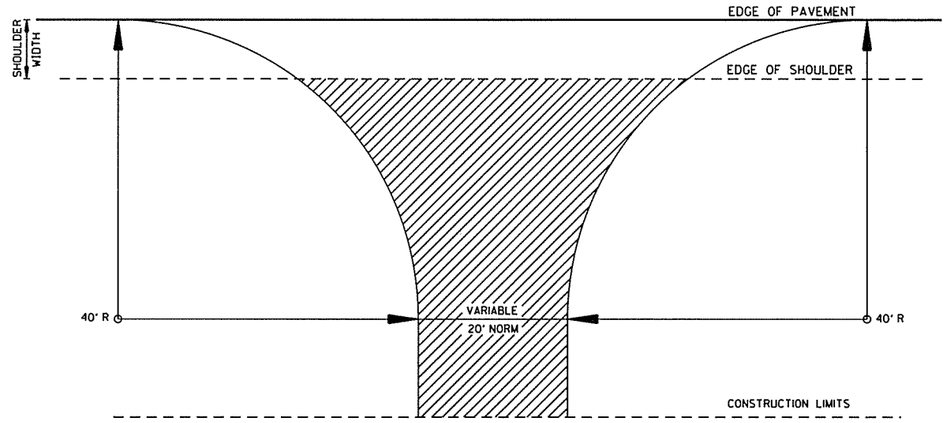


A.C.H.M. SURFACE COURSE (1/2") (220 LBS./SQ. YD.) & AGGREGATE BASE COURSE (CLASS 7) (7" COMPACTED DEPTH)

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

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

DETAIL FOR DRIVEWAY TURNOUTS

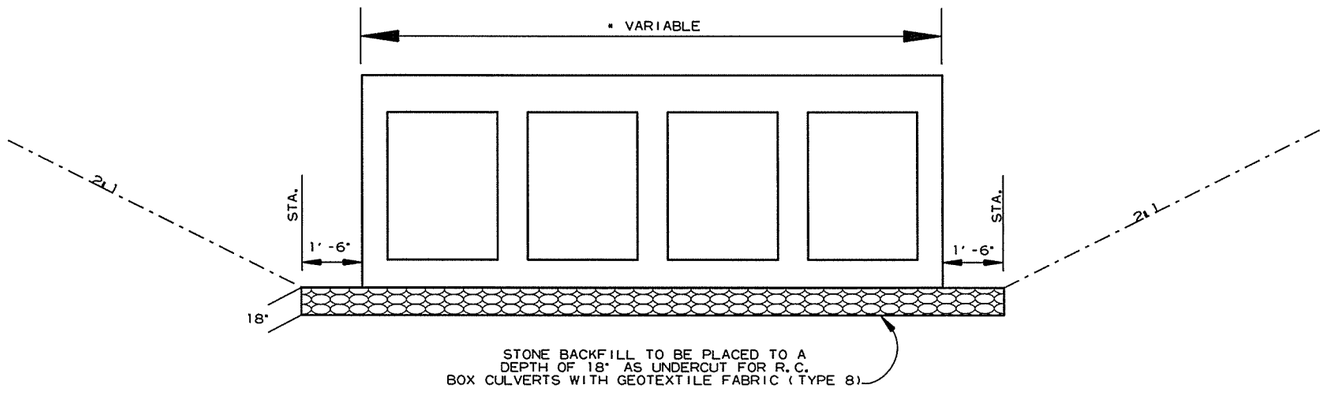


ASPHALT CONCRETE HOT MIX SURFACE COURSE (1/2") (220 LBS. PER SQ. YD.) AND AGGREGATE BASE COURSE (CLASS 7) (7" COMPACTED DEPTH)

TURNOUTS SHALL BE MODIFIED AS NECESSARY TO MEET LOCAL CONDITIONS, AS SHOWN IN PLANS AND IF AND WHERE DIRECTED BY THE ENGINEER.

DETAIL FOR COUNTY ROAD TURNOUT

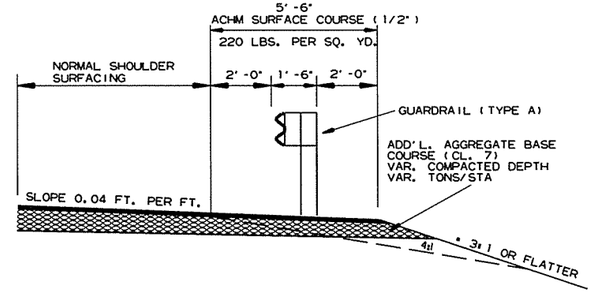
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-5-14



DETAIL FOR STONE BACKFILL UNDER R.C. BOX CULVERTS

STATION	STATION	DESCRIPTION	STONE BACKFILL TON	GEOTEXTILE (TYPE 8) SQ. YD.
107+26.75	107+73.75	QUAD. 10' X 10' X 74' - SITE 1	306	382
207+21.46	207+78.54	QUINT. 10' X 9' X 86' - SITE 2	436	545
307+21.67	307+78.34	QUINT. 10' X 5' X 74' - SITE 3	373	466

* SEE R.C. BOX CULVERT DETAILS FOR DIMENSIONS



DETAIL OF WIDENING FOR GUARDRAIL

* REFER TO STD. DWG. GR-9A FOR SLOPE REQUIREMENTS BEHIND GUARDRAIL.

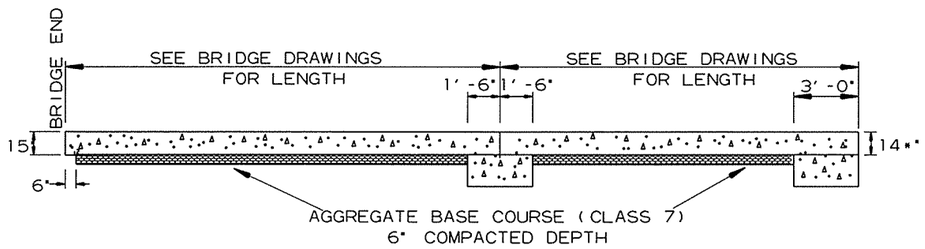
8/9/2012

R110544.DGN

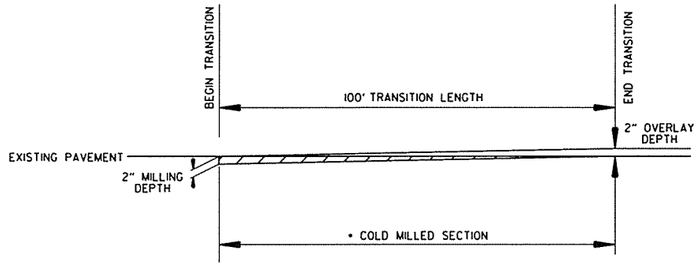
SPECIAL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	8	134

(2) SPECIAL DETAILS

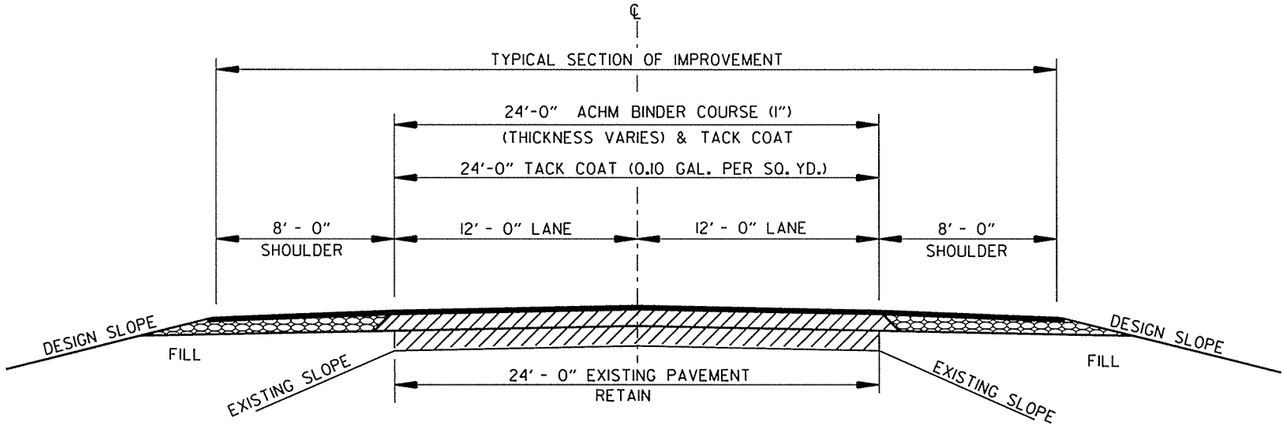


SPECIAL DETAIL OF APPROACH SLAB



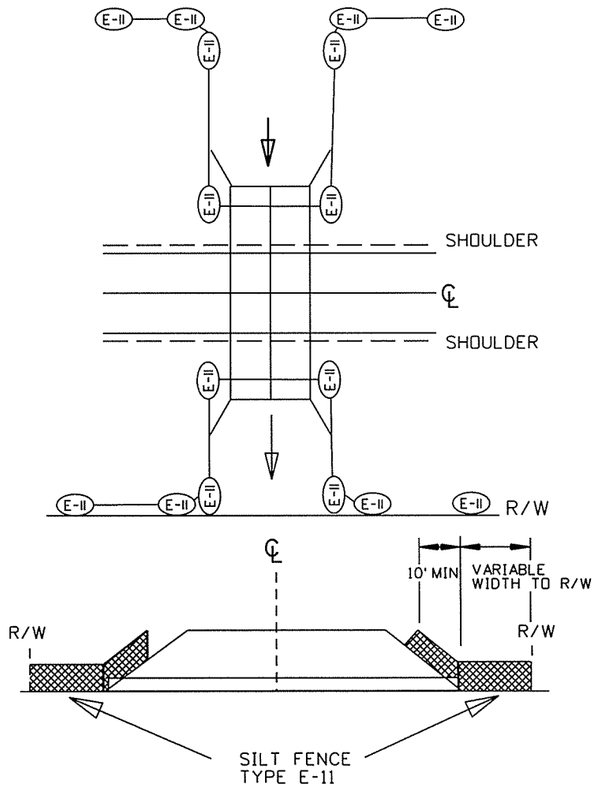
DETAIL SHOWING TAPER TO EXISTING PAVEMENT

• TO BE USED AS DIRECTED BY THE ENGINEER



METHOD OF RAISING GRADE

NOTES:
(1) THIS DETAIL TO BE USED ONLY WHERE DIRECTED BY THE ENGINEER.
(2) QUANTITIES FOR METHOD OF GRADE RAISE USING ASPHALT WERE CALCULATED ON THIS PROJECT AT LOCATIONS WHERE THE DISTANCE BETWEEN THE EXISTING ASPHALT ROADWAY AND THE PROPOSED SUBGRADE WAS ONE FOOT OR LESS.
(3) IN LOCATIONS WHERE THE DISTANCE BETWEEN THE PROPOSED SUBGRADE AND THE EXISTING ASPHALT ROADWAY IS MORE THAN ONE FOOT, SCARIFICATION OF THE EXISTING ASPHALT ROADWAY WILL BE REQUIRED AS STATED IN SECTION 210, SUBSECTION 210.09 OF THE STANDARD SPECIFICATIONS, EDITION OF 2014.



DETAILS OF SILT FENCE AT CROSS DRAINS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-5-14

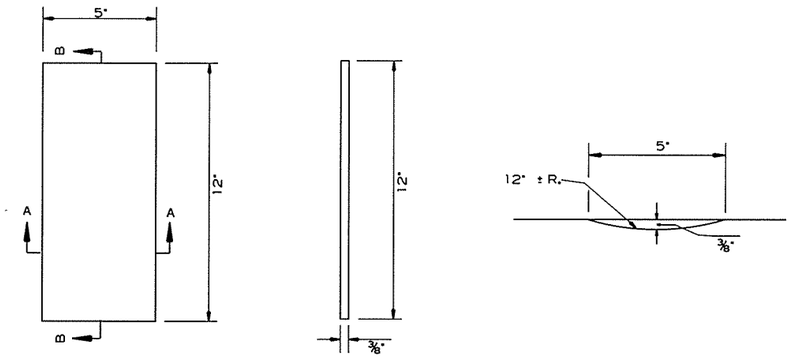
7/14/2014

R110544.DGN

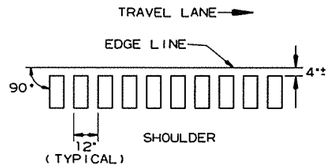
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	9	134

(2) SPECIAL DETAILS

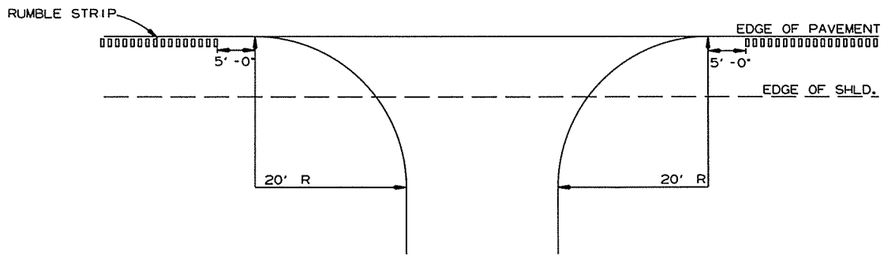
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-4-14



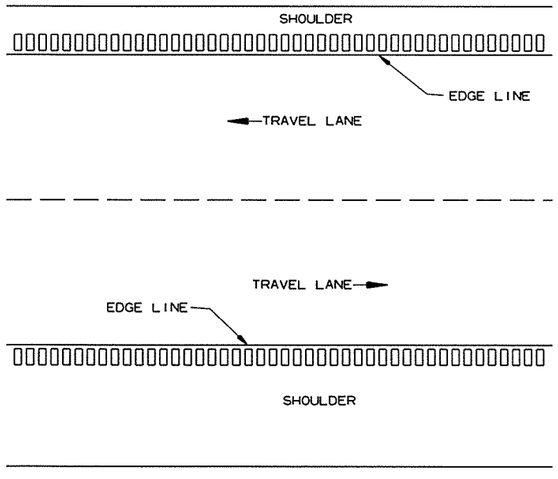
DETAILS OF RUMBLE STRIPS



LOCATION PLAN OF RUMBLE STRIPS
LEFT OR RIGHT SHOULDER



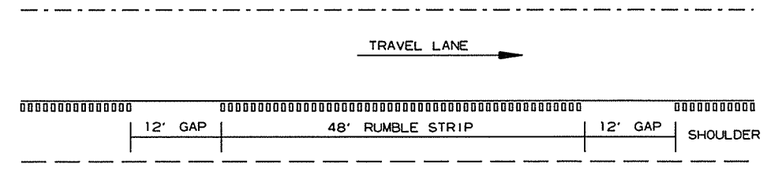
DETAIL FOR RUMBLE STRIP GAP
AT DRIVEWAY TURNOUTS



PLAN VIEW

GENERAL NOTES

1. RUMBLE STRIPS SHALL NOT BE INSTALLED ON CURB SECTIONS, BRIDGE DECKS, APPROACH SLABS, INTERSECTING STREETS OR ROADWAYS, RESIDENTIAL OR COMMERCIAL DRIVEWAYS OR ACROSS TRANSVERSE JOINTS OF CONCRETE SHOULDERS.
2. RUMBLE STRIPS SHALL NOT BE INSTALLED ON A PAVED SHOULDER THAT IS USED AS A DECELERATION LANE FOR THE LENGTH DEEMED APPROPRIATE BY THE ENGINEER.
3. THE 4" OFFSET FROM THE EDGE LINE MAY BE INCREASED TO AVOID LONGITUDINAL JOINTS. IN ALL CASES, THE LATERAL DEVIATION FROM THE PLANNED OFFSET SHOULD BE KEPT TO A MINIMUM.
4. RUMBLE STRIPS SHALL BE MEASURED BY THE LINEAR FOOT LONGITUDINALLY ALONG THE SHOULDER. PAYMENT SHALL ONLY INCLUDE THAT PORTION OF THE SHOULDER ON WHICH RUMBLE STRIPS HAVE BEEN CONSTRUCTED. NO MEASUREMENT OR PAYMENT WILL BE MADE FOR GAPS, DRIVEWAYS, TURNOUTS, OR OTHER PUBLIC ROAD INTERSECTIONS WHERE RUMBLE STRIPS HAVE NOT BEEN CONSTRUCTED.
5. THE 3/8" DEPTH SHALL GENERALLY APPLY FOR THE ENTIRE 12" LENGTH. SOME VARIATION TO SUIT SHOULDER SLOPE BREAKS MAY BE NECESSARY.



NOTE: GAP PATTERN SHALL BE ADJUSTED BY THE ENGINEER IN THE FIELD ALLOWING FOR DRIVEWAYS TO SERVE AS THE GAP.

DETAIL FOR GAP PATTERN RUMBLE STRIP

7/7/2014

R110544.DGN

SPECIAL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	10	134

① SPECIAL DETAILS

③ MID-SECTION

BAR LAP TABLE

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

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

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

STATE OF ARKANSAS — REGISTERED PROFESSIONAL ENGINEER — No. 7510 — CARL J. FUSELIER — 4/11/14

TABULAR DATA BY: JGT DATE: 02/12/2014
CHECKED BY: CJF DATE: 3/25/14

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

INLET WINGWALL TABLE

OVER ALL WIDTH	CLEAR HEIGHT	FOOTING THK.	WING WALL THK.	BOX SKEW (DEG.)	SLOPE	HDWL LENGTH	HEEL	WALL HEIGHT AT HDWL	WALL HEIGHT AT WING END	WINGWALL ANGLE (DEGREE) WING A	WINGWALL ANGLE (DEGREE) WING B	FOOTING WIDTH AT WALL END	WIDTH OF WING FOOTINGS AT HDWL WING A	WIDTH OF WING FOOTINGS AT HDWL WING B	FOOTING DIMENSION PARALLEL WITH HDWL WING A	FOOTING DIMENSION PARALLEL WITH HDWL WING B	LENGTH OF WINGWALLS WING A	LENGTH OF WINGWALLS WING B	LENGTH OF FOOTING HEEL WING A	LENGTH OF FOOTING HEEL WING B	CLASS "S" CONCRETE (Includes apron)	REINFORCING STEEL (Includes apron and laps if required)
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	AF1	AF2	WE	WF1	WF2	G1	G2	W1	W2	W3	W4	INLET	INLET
43'-6"	10'-0"	0'-11"	0'-10"	0	3:1	42'-0"	2'-0"	10'-10"	3'-4"	30	30	3'-4"	5'-4 1/4"	5'-4 1/4"	2'-4"	2'-4"	25'-6"	25'-6"	28'-10 7/8"	28'-10 7/8"	CU.YD	LBS.
																					22.62	1764

WING	F1 BAR SIZE	F1 MAX. SPACING	F1 NO. REQ'D	F1 LENGTHS VARY	F1	F1	F2 BAR SIZE	F2 SPACING	F2 NO. REQ'D	F2 LENGTHS	F2	F2	F3 BAR SIZE	F3 SPACING	F3 NO. REQ'D	F3 LENGTHS	F4 BAR SIZE	F4 SPACING	F4 NO. REQ'D	F4 LENGTHS VARY	F4	F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY	F6	F7 BAR SIZE	F7 NO. REQ'D	F7 LENGTHS	F8 BAR SIZE	F8 SPACING	F8 NO. REQ'D	F8 LENGTHS VARY	F8	F9 BAR SIZE	F9 SPACING	F9 NO. REQ'D	F9 LENGTHS	F10 BAR SIZE	F10 NO. REQ'D	F10 LENGTHS	F11 BAR SIZE	F11 NO. REQ'D	F11 LENGTHS	F12 BAR SIZE	F12 SPACING	F12 NO. REQ'D	F12 LENGTHS	F12	REINF. STEEL QTY. PER WING (LBS)
WING A	4	12	26	X	L	Min 4'-8"	5	12	4	X	L	7'-6"	4	12	7	X	L	5'-8"	4	18	10	Min	4	18	4	25'-2"	4	18	17	X	L	Min 6'-6"	4	8	29'-9"	4	18	18	Min	4	18	2	Min	4	2	26'-1"	4	2	27'-11"	6	12	10	L	3'-4"	882
						Max 14'-0"														3'-10"											Max 13'-7"							2'-10"			21'-1"											
				X		Min 0'-11"				X		2'-1"				X		2'-1"		Max								X		Min 2'-6"							Max			Max										X	1'-8"	
						Max 2'-11"														24'-2"										Max 2'-6"							4'-10"			21'-1"											
				Y		Min 3'-10"				Y		4'-11"				Y		3'-8"										Y		Min 4'-1"																						
						Max 11'-2"																								Max 11'-2"																						
WING B	4	12	26	X	L	Min 4'-8"	5	12	4	X	L	7'-6"	4	12	7	X	L	5'-8"	4	18	10	Min	4	18	4	25'-2"	4	18	17	X	L	Min 6'-6"	4	8	29'-9"	4	18	18	Min	4	18	2	Min	4	2	26'-1"	4	2	27'-11"	6	12	10	L	3'-4"	882
						Max 14'-0"														3'-10"										Max 13'-7"							2'-10"			21'-1"											
				X		Min 0'-11"				X		2'-1"				X		2'-1"		Max								X		Min 2'-6"							Max			Max										X	1'-8"	
						Max 2'-11"														24'-2"										Max 2'-6"							4'-10"			21'-1"											
				Y		Min 3'-10"				Y		4'-11"				Y		3'-8"										Y		Min 4'-1"																						
						Max 11'-2"																								Max 11'-2"																						

INLET SKEWED END SECTION

SKEW (DEGREE)	SLOPE	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	SECTION LENGTH	TOP SLAB THK.	HDWL THK.	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT	TOP SLAB REINFORCING STEEL a SIZE	a SPACING	a LENGTHS VARY	a NO. REQ'D	TOP SLAB REINFORCING STEEL c SIZE	c SPACING	c LENGTHS VARY	c NO. REQ'D	BOTTOM SLAB REINFORCING STEEL d SIZE	d SPACING	d LENGTHS VARY	d NO. REQ'D	BOTTOM SLAB REINFORCING STEEL f SIZE	f SPACING	f LENGTHS VARY	f NO. REQ'D	SIDE WALL REINFORCING STEEL f0 SIZE	f0 SPACING	f0 NO. REQ'D	f0 LENGTH	INTERIOR WALL REINFORCING STEEL f1 SIZE	f1 SPACING	f1 NO. REQ'D	f1 LENGTH	TOP SLAB DISTRIBUTION REINFORCING STEEL g SIZE	g SPACING	g NO. REQ'D	g LENGTHS VARY	BOTTOM SLAB DISTRIBUTION REINFORCING STEEL e SIZE	e SPACING	e NO. REQ'D	e LENGTHS VARY	SIDE WALL DISTRIBUTION REINFORCING STEEL d1 SIZE	d1 SPACING	d1 NO. REQ'D	d1 LENGTH	INTERIOR WALL DISTRIBUTION REINFORCING STEEL d2 SIZE	d2 SPACING	d2 NO. REQ'D	d2 LENGTH
SK	SL	D	S	H	LL	T	HW	B	C	W	OW	OH	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTHS VARY	SIZE	SPACING	NO. REQ'D	LENGTHS VARY	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH
															Max				Max				Max				Max												Max				Max				LONG				LONG			
					0'-0"										Min				Min				Min				Min												Min								SHORT				MID			
																																																				SHORT			

k1 SIZE	k1 LENGTH	k1 NO. REQ'D	k2 SIZE	k2 LENGTH	k2 NO. REQ'D	h SIZE	h LENGTH	h Y	h NO. REQ'D

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

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

INLET SLOPE SECTION(S)

R.C. BOX SECTION D	DESIGN FILL DEPTH (FT.) S	CLEAR SPAN (FT.) S	CLEAR HEIGHT (FT.) H	TOP SLAB THK. T	BOTTOM SLAB THK B	SIDE WALL THK C	INTERIOR WALL THK. W	OVER ALL WIDTH OW	OVER ALL HEIGHT OH	SECTION LENGTH (FT.) SL	TOP SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS a SIZE	a L	Bent b SIZE	b L	c SIZE	c L	SPACING	NO. REQ'D	BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS d SIZE	d L	Bent b1 SIZE	b1 L	f SIZE	f L	SPACING	NO. REQ'D	SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL SIZE	SPACING	NO. REQ'D	BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL SIZE	SPACING	NO. REQ'D	SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL SIZE	SPACING	NO. REQ'D	INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL SIZE	SPACING	NO. REQ'D
5	10	10																																																				

HDWL THK.	ADDITIONAL REINF. FOR HDWL	*h" BARS SIZE	Y	LENGTH	NO. REQ'D
HW	LBS.				
3"	58	4	0'-11"	1'-11"	45

CLASS "S" CONCRETE PER LIN. FT.	REINFORCING STEEL (GR. 60) LBS. PER LIN. FT.	② ADTL. REINF. PER LONG. LAP LOCATION (S) LBS.	ADTL. REINF. FOR TRANS. LAP LBS. PER LIN. FT.	ADDITIONAL CONCRETE FOR HDWL CU. YDS.	TOTAL ADTL. REINF. FOR HDWL LBS.
				0.40	115

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

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

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

MID-SECTION

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.) D	CLEAR SPAN (FT.) S	CLEAR HEIGHT (FT.) H	TOP SLAB THK. T	BOTTOM SLAB THK. B	SIDE WALL THK. C	INTERIOR WALL THK. W	OVER ALL WIDTH OW	OVER ALL HEIGHT OH	SECTION LENGTH (FT.) SL	TOP SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS a SIZE	a L	Bent b SIZE	b L	c SIZE	c L	SPACING	NO. REQ'D	BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS d SIZE	d L	Bent b1 SIZE	b1 L	f SIZE	f L	SPACING	NO. REQ'D	SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL SIZE	SPACING	NO. REQ'D	BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL SIZE	SPACING	NO. REQ'D	SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL SIZE	SPACING	NO. REQ'D	INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL SIZE	SPACING	NO. REQ'D
A	5	10	10	12	12	9	8	43'-6"	12'-0"	74	5	43'-2"	7	44'-3"	4	43'-2"	17	52	4	43'-2"	4	44'-2"	4	43'-2"	11	80	6	5	354	11'-8"	4	12	444	11'-8"	4	9	119	4	9	119	4	12	20	4	12	60

CLASS "S" CONCRETE PER LIN. FT.	REINFORCING STEEL (GR. 60) LBS PER LIN. FT.	③ ADTL. REINF. PER LONG. LAP LOCATION (S) LBS.	ADTL. REINF. FOR TRANS. LAP LBS. PER LIN. FT.
4.52	554	372	11

SHEET 1 OF 2
DETAILS OF R.C. BOX CULVERT
QUADRUPLE BARREL BOX CULVERT
STA. 107+50

SPECIAL DETAILS

Ver. 1.1.14 bll0544_cl.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	11	134

① SPECIAL DETAILS

STATE OF ARKANSAS — REGISTERED PROFESSIONAL ENGINEER — No. 7510 — CARL J. FUSELIER — 4/1/14

TABULAR DATA BY: JGT DATE: 02/12/2014
CHECKED BY: LJB DATE: 3/25/14

OUTLET WINGWALL TABLE

OVER ALL WIDTH	CLEAR HEIGHT	FOOTING THK.	WING WALL THK.	BOX SKEW (DEG.)	SLOPE	HDWL LENGTH	HEEL	WALL HEIGHT		WINGWALL ANGLE (DEGREE)		FOOTING WIDTH AT WALL END	WIDTH OF WING FOOTINGS AT HDWL		FOOTING DIMENSION PARALLEL WITH HDWL		LENGTH OF WINGWALLS		LENGTH OF FOOTING HEEL	
								AT HDWL	AT WING END	WING A	WING B		WING A	WING B	WING A	WING B	WING A	WING B	WING A	WING B
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	AF1	AF2	WE	WF1	WF2	G1	G2	W1	W2	W3	W4
43'-6"	10'-0"	0'-11"	0'-10"	0	3:1	42'-0"	2'-0"	10'-10"	3'-4"	30	30	3'-4"	5'-4 1/4"	5'-4 1/4"	2'-4"	2'-4"	25'-6"	25'-6"	28'-10 7/8"	28'-10 7/8"

CLASS "S" CONCRETE (Includes apron)	REINFORCING STEEL (Includes apron and laps if required)
OUTLET	OUTLET
CU.YD	LBS.
24.19	1764

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

WING	F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY		F6 LENGTHS	F7 BAR SIZE	F7 NO. REQ'D	F7 LENGTHS	F8 BAR SIZE	F8 SPACING	F8 NO. REQ'D	F8 LENGTHS VARY	F9 BAR SIZE	F9 SPACING	F9 NO. REQ'D	F9 LENGTHS	F10 BAR SIZE	F10 NO. REQ'D	F10 LENGTHS	F11 BAR SIZE	F11 NO. REQ'D	F11 LENGTHS	F12 BAR SIZE	F12 SPACING	F12 NO. REQ'D	F12 LENGTHS		REINF. STEEL QTY. PER WING (LBS)
WING A	4	18	4	25'-2"	4	18	17	L	Min	6'-6"	4	8	29'-9"	4	18	18	Min	4	18	2	Min	4	2	26'-1"	4	2	27'-11"	6	12	10	L	3'-4"	882
									Max	13'-7"							2'-10"				21'-1"												
								X	Min	2'-6"							Max				Max										X	1'-8"	
									Max	2'-6"																						
								Y	Min	4'-1"							4'-10"				21'-1"											
									Max	11'-2"																						
WING B	4	18	4	25'-2"	4	18	17	L	Min	6'-6"	4	8	29'-9"	4	18	18	Min	4	18	2	Min	4	2	26'-1"	4	2	27'-11"	6	12	10	L	3'-4"	882
									Max	13'-7"							2'-10"				21'-1"											
								X	Min	2'-6"							Max				Max										X	1'-8"	
									Max	2'-6"																						
								Y	Min	4'-1"							4'-10"				21'-1"											
									Max	11'-2"																						

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

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

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

SKEWED END SECTION

SKEW (DEGREE)	SLOPE	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	SECTION LENGTH	TOP SLAB THK.	HDWL THK.	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT	TOP SLAB REINFORCING STEEL a				TOP SLAB REINFORCING STEEL c				BOTTOM SLAB REINFORCING STEEL d				BOTTOM SLAB REINFORCING STEEL f				SIDE WALL REINFORCING STEEL f0			
SK	SL	D	S	H	LL	T	HW	B	C	W	OW	OH	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	NO. REQ'D	LENGTH
					0'-0"										Max				Max				Max				Max					
															Min				Min				Min				Min					

SIDE WALL REINFORCING STEEL f1				INTERIOR WALL REINFORCING STEEL f1				TOP SLAB DISTRIBUTION REINFORCING STEEL g				BOTTOM SLAB DISTRIBUTION REINFORCING STEEL e				SIDE WALL DISTRIBUTION REINFORCING STEEL d1				INTERIOR WALL DISTRIBUTION REINFORCING STEEL d2			
SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTHS VARY	SIZE	SPACING	NO. REQ'D	LENGTHS VARY	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH
											Max				Max				LONG				LONG
											Min				Min				SHORT				MID
																							SHORT

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

k1			k2			h			
SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	Y	NO. REQ'D

OUTLET SLOPE SECTION(S)

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	TOP SLAB THK.	BOTTOM SLAB THK	SIDE WALL THK	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT	SECTION LENGTH (FT.)	TOP SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS a		Bent b		c				BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS d		Bent b1		f				SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4"				INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4"			
	D	S	H	T	B	C	W	OW	OH	SL	SIZE	L	SIZE	L	SIZE	L	SPACING	NO. REQ'D	SIZE	L	SIZE	L	SIZE	L	SPACING	NO. REQ'D	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH
	5	10	10																													

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

CLASS "S" CONCRETE	REINFORCING STEEL (GR. 60)	② ADTL. REINF. PER LONG. LAP LOCATION (S)	ADTL. REINF. FOR TRANS. LAP	ADDITIONAL CONCRETE FOR HDWL	TOTAL ADTL. REINF. FOR HDWL
CU. YDS. PER LIN. FT.	LBS. PER LIN. FT.	LBS.	LBS. PER LIN. FT.	CU. YDS.	LBS.
				0.40	115

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

HDWL THK.	ADDITIONAL REINF. FOR HDWL	"h" BARS			
HW	LBS.	SIZE	Y	LENGTH	NO. REQ'D
3"	58	4	0'-11"	1'-11"	45

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

Unless otherwise noted, all dimensions are in inches.

SHEET 2 OF 2
DETAILS OF R.C. BOX CULVERT
QUADRUPLE BARREL BOX CULVERT
STA. 107+50

SPECIAL DETAILS

Ver. 1.14 bll0544_cl.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
9/12/2014				6	ARK.			
				JOB NO.		110544	12	134

① SPECIAL DETAILS

INLET WINGWALL TABLE

OVER ALL WIDTH	CLEAR HEIGHT	FOOTING THK.	WING WALL THK.	BOX SKEW (DEG.)	SLOPE	HDWL LENGTH	HEEL	WALL HEIGHT AT HDWL	WALL HEIGHT AT WING END	WINGWALL ANGLE (DEGREE) WING A	WINGWALL ANGLE (DEGREE) WING B	FOOTING WIDTH AT WALL END	WIDTH OF WING FOOTINGS AT HDWL WING A	WIDTH OF WING FOOTINGS AT HDWL WING B	FOOTING DIMENSION PARALLEL WITH HDWL WING A	FOOTING DIMENSION PARALLEL WITH HDWL WING B	LENGTH OF WINGWALLS WING A	LENGTH OF WINGWALLS WING B	LENGTH OF FOOTING HEEL WING A	LENGTH OF FOOTING HEEL WING B	CLASS "S" CONCRETE (Includes apron) INLET	REINFORCING STEEL (Includes apron and laps if required) INLET
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	AF1	AF2	WE	WF1	WF2	G1	G2	W1	W2	W3	W4	CU.YD	LBS.
54'-1"	9'-0"	0'-10"	0'-9"	30	3:1	60'-6 1/4"	2'-0"	9'-10"	3'-0"	0	60	3'-3"	4'-4 3/8"	5'-4 1/2"	1'-7 3/8"	3'-6 1/4"	20'-6"	41'-0"	23'-7 1/8"	44'-1 1/8"	24.20	1982

WING	F1 BAR SIZE	F1 MAX. SPACING	F1 NO. REQ'D	F1 LENGTHS VARY			F2 BAR SIZE	F2 SPACING	F2 NO. REQ'D	F2 LENGTHS		F3 BAR SIZE	F3 SPACING	F3 NO. REQ'D	F3 LENGTHS		F4 BAR SIZE	F4 SPACING	F4 NO. REQ'D	F4 LENGTHS VARY	F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY			F7 NO. REQ'D	F7 LENGTHS	F8 BAR SIZE	F8 SPACING	F8 NO. REQ'D	F8 LENGTHS VARY	F9 BAR SIZE	F9 SPACING	F9 NO. REQ'D	F9 LENGTHS	F10 BAR SIZE	F10 NO. REQ'D	F10 LENGTHS	F11 BAR SIZE	F11 NO. REQ'D	F11 LENGTHS	F12 BAR SIZE	F12 SPACING	F12 NO. REQ'D	F12 LENGTHS		REINF. STEEL QTY. PER WING (LBS)
WING A	4	12	21	L	Min	4'-2"	4	12	6	L	5'-2"	-	-	-	L	-	4	18	8	Min	4	18	4	20'-2"	4	18	14	L	Min	5'-11"	4	8	24'-5"	4	18	14	Min	4	18	4	28'-2"	4	2	21'-2"	4	2	21'-4"	6	12	9	L	3'-4"	680
					Max	12'-0"														4'-10"								Max	12'-5"							2'-9"														
				X	Min	0'-10"				X	1'-8"				X	-											X	Min	2'-5"										Max									X	1'-8"	
					Max	2'-0"														Max								Max	2'-5"																			
				Y	Min	3'-5"				Y	3'-7"				Y	-				Min							Y	Min	3'-7"							3'-10"														
					Max	10'-1"														18'-4"								Max	10'-1"																			
WING B	4	12	41	L	Min	4'-3"	4	12	18	L	6'-5"	-	-	-	L	-	4	18	8	Min	4	18	4	40'-8"	4	18	28	L	Min	5'-8"	4	8	44'-11"	4	18	30	Min	4	18	4	33'-5"	4	2	41'-1"	4	2	46'-8"	6	12	9	L	3'-4"	1302
					Max	12'-11"														9'-10"								Max	12'-6"							2'-9"														
				X	Min	0'-10"				X	1'-11"				X	-											X	Min	2'-5"										Max									X	1'-8"	
					Max	2'-10"														Max								Max	2'-5"																			
				Y	Min	3'-6"				Y	4'-7"				Y	-				Min							Y	Min	3'-4"							4'-11"														
					Max	10'-2"														36'-10"								Max	10'-2"																			

MID-SECTION

BAR LAP TABLE

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

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

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

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
9-12-14

TABULAR DATA BY: JGT DATE: 02/12/2014
CHECKED BY: CRE DATE: 9/12/14

⚠ Revised Skewed End Section Qtys.
By: TMG Date: 9/12/2014
Check: JGT Date: 9/12/14

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

INLET SKEWED END SECTION

SKEW (DEGREE)	SLOPE	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	SECTION LENGTH	TOP SLAB THK.	HDWL THK.	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVERALL WIDTH	OVERALL HEIGHT	TOP SLAB REINFORCING STEEL a SIZE	a SPACING	a LENGTHS VARY	a NO. REQ'D	TOP SLAB REINFORCING STEEL c SIZE	c SPACING	c LENGTHS VARY	c NO. REQ'D	BOTTOM SLAB REINFORCING STEEL d SIZE	d SPACING	d LENGTHS VARY	d NO. REQ'D	BOTTOM SLAB REINFORCING STEEL f SIZE	f SPACING	f LENGTHS VARY	f NO. REQ'D	SIDE WALL REINFORCING STEEL f0 SIZE	f0 SPACING	f0 NO. REQ'D	f0 LENGTH	INTERIOR WALL REINFORCING STEEL f1 SIZE	f1 SPACING	f1 NO. REQ'D	f1 LENGTH	TOP SLAB DISTRIBUTION REINFORCING STEEL g SIZE	g SPACING	g NO. REQ'D	g LENGTHS VARY	BOTTOM SLAB DISTRIBUTION REINFORCING STEEL e SIZE	e SPACING	e NO. REQ'D	e LENGTHS VARY	SIDE WALL DISTRIBUTION REINFORCING STEEL d1 SIZE	d1 SPACING	d1 NO. REQ'D	d1 LENGTH	INTERIOR WALL DISTRIBUTION REINFORCING STEEL d2 SIZE	d2 SPACING	d2 NO. REQ'D	d2 LENGTH
SK	SL	D	S	H	LL	T	HW	B	C	W	OW	OH	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTHS VARY	SIZE	SPACING	NO. REQ'D	LENGTHS VARY	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH
30	3:1	5	10	9	17'-7"	12	3	12	8.5	8	54'-1"	11'-0"	5	6	Max 53'-9" / Min 3'-3"	59		5	7	Max 53'-9" / Min 3'-3"	50	4	6	Max 53'-9" / Min 3'-3"	59		4	7.5	Max 53'-9" / Min 3'-3"	47	6	6	71	10'-8"	4	12	152	10'-8"	4	9	149	Max 33'-1" / Min 1'-10"	4	9	149	Max 33'-1" / Min 1'-10"	4	12	9	LONG 32'-9" / SHORT 2'-2"	4	12	18	LONG 26'-10"
															53'-9"	4				53'-9"	4			53'-9"	4				53'-9"	4																												36	MID 20'-7"
																																																													18	SHORT 8'-1"

k1 SIZE	k1 LENGTH	k1 NO. REQ'D	k2 SIZE	k2 LENGTH	k2 NO. REQ'D	h SIZE	h LENGTH	h Y	h NO. REQ'D
4	31'-11"	12	4	31'-11"	12	4	1'-11"	0'-11"	64

CLASS "S" CONCRETE (Includes HDWL) CU. YDS.	① REINFORCING STEEL (GR 60) (Includes HDWL) LBS.
⚠ 96.07 ~~40.81~~	13408

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

INLET SLOPE SECTION(S)

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	TOP SLAB THK.	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT	SECTION LENGTH (FT.)	TOP SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS a SIZE	a L	Bent b SIZE	Bent b L	c SIZE	c L	SPACING	NO. REQ'D	BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS d SIZE	d L	Bent b1 SIZE	Bent b1 L	f SIZE	f L	SPACING	NO. REQ'D	SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL SIZE	SPACING	NO. REQ'D	BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL SIZE	SPACING	NO. REQ'D	SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL SIZE	SPACING	NO. REQ'D	INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL SIZE	SPACING	NO. REQ'D
D	S	H	T	B	C	W	OW	OH	SL																																										
A	5	10	9	12	12	8.5	8	54'-1"	11'-0"	50.8333	5	53'-9"	7	55'-2"	4	53'-9"	17	35	4	53'-9"	4	55'-1"	4	53'-9"	12	50	6	6	202	10'-8"	4	12	400	10'-8"	4	9	149	4	9	149	4	12	18	4	12	72

CLASS "S" CONCRETE CU. YDS. PER LIN. FT.	REINFORCING STEEL (GR. 60) LBS. PER LIN. FT.	③ ADTL. REINF. PER LONG. LAP LOCATION (S) LBS.	ADTL. REINF. FOR TRANS. LAP LBS. PER LIN. FT.
5.37	633	454	11

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

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

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

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

SHEET 1 OF 2
DETAILS OF R.C. BOX CULVERT
QUINTUPLE BARREL BOX CULVERT
STA. 207+50

SPECIAL DETAILS

Ver. 1.1.4 bll0544.c2.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
9/12/2014				6	ARK.			
				JOB NO.		110544	13	134

① SPECIAL DETAILS

OUTLET WINGWALL TABLE

OVER ALL WIDTH	CLEAR HEIGHT	FOOTING THK.	WING WALL THK.	BOX SKEW (DEG.)	SLOPE	HDWL LENGTH	HEEL	WALL HEIGHT AT HDWL	WALL HEIGHT AT WING END	WINGWALL ANGLE (DEGREE) WING A	WINGWALL ANGLE (DEGREE) WING B	FOOTING WIDTH AT WALL END	WIDTH OF WING FOOTINGS AT HDWL WING A	WIDTH OF WING FOOTINGS AT HDWL WING B	FOOTING DIMENSION PARALLEL WITH HDWL WING A	FOOTING DIMENSION PARALLEL WITH HDWL WING B	LENGTH OF WINGWALLS WING A	LENGTH OF WINGWALLS WING B	LENGTH OF FOOTING HEEL WING A	LENGTH OF FOOTING HEEL WING B	CLASS "S" CONCRETE (Includes apron) OUTLET	REINFORCING STEEL (Includes apron and laps if required) OUTLET
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	AF1	AF2	WE	WF1	WF2	G1	G2	W1	W2	W3	W4	CU.YD	LBS.
54'-1"	9'-0"	0'-10"	0'-9"	30	3:1	60'-6 1/4"	2'-0"	9'-10"	3'-0"	0	60	3'-3"	4'-4 3/8"	5'-4 1/2"	1'-7 3/8"	3'-6 1/4"	20'-6"	41'-0"	23'-7 1/8"	44'-1 1/8"	26.35	1982

WING	F1 BAR SIZE	F1 MAX. SPACING	F1 NO. REQ'D	F1 LENGTHS VARY			F2 BAR SIZE	F2 SPACING	F2 NO. REQ'D	F2 LENGTHS		F3 BAR SIZE	F3 SPACING	F3 NO. REQ'D	F3 LENGTHS		F4 BAR SIZE	F4 SPACING	F4 NO. REQ'D	F4 LENGTHS VARY	F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS		F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY			F7 BAR SIZE	F7 NO. REQ'D	F7 LENGTHS	F8 BAR SIZE	F8 SPACING	F8 NO. REQ'D	F8 LENGTHS VARY	F9 BAR SIZE	F9 SPACING	F9 NO. REQ'D	F9 LENGTHS	F10 BAR SIZE	F10 NO. REQ'D	F10 LENGTHS	F11 BAR SIZE	F11 NO. REQ'D	F11 LENGTHS	F12 BAR SIZE	F12 SPACING	F12 NO. REQ'D	F12 LENGTHS		REINF. STEEL QTY. PER WING (LBS)
WING A	4	12	21	L	Min	4'-2"	4	12	6	L	5'-2"	-	-	-	L	-	4	18	8	Min	4	18	4	20'-2"	4	18	14	L	Min	5'-11"	4	8	24'-5"	4	18	14	Min	4	18	2	Min	4	2	21'-2"	4	2	21'-4"	6	12	9	L	3'-4"	680
					Max	12'-0"														4'-10"									Max	12'-5"									2'-9"			28'-2"								
				X	Min	0'-10"				X	1'-8"				X	-				Min								X	Min	2'-5"									Max			Max							X	1'-8"	
					Max	2'-0"														Max									Max	2'-5"																			
				Y	Min	3'-5"				Y	3'-7"				Y	-				Min								Y	Min	3'-7"									3'-10"			28'-2"								
					Max	10'-1"														18'-4"									Max	10'-1"																			
WING B	4	12	41	L	Min	4'-3"	4	12	18	L	6'-5"	-	-	-	L	-	4	18	8	Min	4	18	4	40'-8"	4	18	28	L	Min	5'-8"	4	8	44'-11"	4	18	30	Min	4	18	2	Min	4	2	41'-1"	4	2	46'-8"	6	12	9	L	3'-4"	1302
					Max	12'-11"														9'-10"									Max	12'-6"									2'-9"			33'-5"								
				X	Min	0'-10"				X	1'-11"				X	-				Min								X	Min	2'-5"									Max			Max							X	1'-8"	
					Max	2'-10"														Max									Max	2'-5"																			
				Y	Min	3'-6"				Y	4'-7"				Y	-				Min								Y	Min	3'-4"									4'-11"			33'-5"								
					Max	10'-2"														36'-10"									Max	10'-2"																			

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

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

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
9-12-14

TABULAR DATA BY: JGT DATE: 02/12/2014
CHECKED BY: CRE DATE: 9/12/14

⚠ Revised Skewed End Section Qtys.
By: TMG Date: 9/12/2014
Check: CRE Date: 9/12/14

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

OUTLET SKEWED END SECTION

SKEW (DEGREE)	SLOPE	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	SECTION LENGTH	TOP SLAB THK.	HDWL THK.	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVERALL WIDTH	OVERALL HEIGHT	TOP SLAB REINFORCING STEEL a SIZE	a SPACING	a LENGTHS VARY	a NO. REQ'D	TOP SLAB REINFORCING STEEL c SIZE	c SPACING	c LENGTHS VARY	c NO. REQ'D	BOTTOM SLAB REINFORCING STEEL d SIZE	d SPACING	d LENGTHS VARY	d NO. REQ'D	BOTTOM SLAB REINFORCING STEEL f SIZE	f SPACING	f LENGTHS VARY	f NO. REQ'D	SIDE WALL REINFORCING STEEL f0 SIZE	f0 SPACING	f0 NO. REQ'D	f0 LENGTH	INTERIOR WALL REINFORCING STEEL f1 SIZE	f1 SPACING	f1 NO. REQ'D	f1 LENGTH	TOP SLAB DISTRIBUTION REINFORCING STEEL g SIZE	g SPACING	g NO. REQ'D	g LENGTHS VARY	BOTTOM SLAB DISTRIBUTION REINFORCING STEEL e SIZE	e SPACING	e NO. REQ'D	e LENGTHS VARY	SIDE WALL DISTRIBUTION REINFORCING STEEL d1 SIZE	d1 SPACING	d1 NO. REQ'D	d1 LENGTH	INTERIOR WALL DISTRIBUTION REINFORCING STEEL d2 SIZE	d2 SPACING	d2 NO. REQ'D	d2 LENGTH
SK	SL	D	S	H	LL	T	HW	B	C	W	OW	OH	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTHS VARY	SIZE	SPACING	NO. REQ'D	LENGTHS VARY	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH
30	3:1	5	10	9	17'-7"	12	3	12	8.5	8	54'-1"	11'-0"	5	6	Max 53'-9" / Min 3'-3"	59	5	7	Max 53'-9" / Min 3'-3"	50	4	6	Max 53'-9" / Min 3'-3"	59	4	7.5	Max 53'-9" / Min 3'-3"	47	6	6	71	10'-8"	4	12	152	10'-8"	4	9	149	Max 33'-1" / Min 1'-10"	4	9	149	Max 33'-1" / Min 1'-10"	4	12	9	LONG 32'-9" / SHORT 2'-2"	4	12	18	LONG 26'-10"
																							53'-9"	4			53'-9"	4																											36	MID 20'-7"
																																																										18	SHORT 8'-1"

k1 SIZE	k1 LENGTH	k1 NO. REQ'D	k2 SIZE	k2 LENGTH	k2 NO. REQ'D	h SIZE	h LENGTH	h Y	h NO. REQ'D
4	31'-11"	12	4	31'-11"	12	4	1'-11"	0'-11"	64

CLASS "S" CONCRETE (Includes HDWL) CU. YDS.	① REINFORCING STEEL (GR 60) (Includes HDWL) LBS.
⚠1 96.07 ~~46.81~~	13408

OUTLET SLOPE SECTION(S)

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

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

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

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

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

Unless otherwise noted, all dimensions are in inches.

SHEET 2 OF 2
DETAILS OF R.C. BOX CULVERT
QUINTUPLE BARREL BOX CULVERT
STA. 207+50

SPECIAL DETAILS

bil0544_c2.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	14	134

① SPECIAL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7510 CARL J. FUSELIER 4/1/14

Carl J. Fuselier

TABULAR DATA BY: JGT DATE: 02/12/2014
CHECKED BY: LJG DATE: 3/25/14

INLET WINGWALL TABLE

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

CLASS "S" CONCRETE (Includes apron)	REINFORCING STEEL (Includes apron and laps if required)
INLET	INLET
CU.YD	LBS.
8.49	628

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

③ MID-SECTION BAR LAP TABLE

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

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

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

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

For additional information and outlet sections, see Sheet 2 of 2.

INLET SKEWED END SECTION

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

k1			k2			h			
SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	Y	NO. REQ'D

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

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

INLET SLOPE SECTION(S)

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	TOP SLAB THK.	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT	SECTION LENGTH (FT.)	TOP SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS								BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS								SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4"				INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4"				TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL			BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL			SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL			INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL		
											a		Bent b		c		SPACING	NO. REQ'D	d		Bent b1		f		SPACING	NO. REQ'D	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	SIZE	SPACING	NO. REQ'D	SIZE	SPACING	NO. REQ'D	SIZE	SPACING	NO. REQ'D
	D	S	H	T	B	C	W	OW	OH	SL	SIZE	L	SIZE	L	SIZE	L			SIZE	L	SIZE	L	SIZE	L																						
	5	10	5																																											

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

CLASS "S" CONCRETE	REINFORCING STEEL (GR. 60)	② ADTL. REINF. PER LONG. LAP LOCATION	ADTL. REINF. FOR TRANS. LAP	ADDITIONAL CONCRETE FOR HDWL	TOTAL ADTL. REINF. FOR HDWL
CU. YDS. PER LIN. FT.	LBS. PER LIN. FT.	LBS.	LBS. PER LIN. FT.	CU. YDS.	LBS.
				0.49	142

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

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

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

MID-SECTION

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	TOP SLAB THK.	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT	SECTION LENGTH (FT.)	TOP SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS								BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS								SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4"				INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4"				TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL			BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL			SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL			INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL		
											a		Bent b		c		SPACING	NO. REQ'D	d		Bent b1		f		SPACING	NO. REQ'D	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	SIZE	SPACING	NO. REQ'D	SIZE	SPACING	NO. REQ'D	SIZE	SPACING	NO. REQ'D
	D	S	H	T	B	C	W	OW	OH	SL	SIZE	L	SIZE	L	SIZE	L			SIZE	L	SIZE	L	SIZE	L																						
A	5	10	5	12	12	6	8	53'-8"	7'-0"	74	5	53'-4"	7	54'-9"	4	53'-4"	17	52	4	53'-4"	4	54'-8"	4	53'-4"	11	80	4	5.5	322	6'-8"	4	12	592	6'-8"	4	9	149	4	9	149	4	12	10	4	12	40

CLASS "S" CONCRETE	REINFORCING STEEL (GR. 60)	③ ADTL. REINF. PER LONG. LAP LOCATION (S)	ADTL. REINF. FOR TRANS. LAP
CU. YDS. PER LIN. FT.	LBS. PER LIN. FT.	LBS.	LBS. PER LIN. FT.
4.65	549	407	11

SHEET 1 OF 2

DETAILS OF R.C. BOX CULVERT

QUINTUPLE BARREL BOX CULVERT
STA. 307+50

SPECIAL DETAILS

LRFD

Ver. 1.114 b110544_c3.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	15	134

① SPECIAL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7610 CARL J. FUSSLIER

TABULAR DATA BY: JGT DATE: 02/12/2014
CHECKED BY: L.JB DATE: 3/25/14

OUTLET WINGWALL TABLE

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

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

WING	F1 BAR SIZE	F1 MAX. SPACING	F1 NO. REQ'D	F1 LENGTHS VARY	F2 BAR SIZE	F2 SPACING	F2 NO. REQ'D	F2 LENGTHS	F3 BAR SIZE	F3 SPACING	F3 NO. REQ'D	F3 LENGTHS
WING A	4	12	14	L Min 2'-10"	-	-	-	L -	-	-	-	L -
				L Max 7'-6"								
				X Min 0'-9"				X -				X -
				X Max 1'-7"								
				Y Min 2'-2"				Y -				Y -
				Y Max 6'-0"								
WING B	4	12	14	L Min 2'-10"	-	-	-	L -	-	-	-	L -
				L Max 7'-6"								
				X Min 0'-9"				X -				X -
				X Max 1'-7"								
				Y Min 2'-2"				Y -				Y -
				Y Max 6'-0"								

WING	F4 BAR SIZE	F4 SPACING	F4 NO. REQ'D	F4 LENGTHS VARY	F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY
WING A	4	18	6	Min 2'-1"	4	18	2	13'-8"	4	18	10	L Min 3'-3"
				Max 12'-2"								L Max 7'-3"
												X Min 1'-4"
												X Max 1'-4"
												Y Min 2'-0"
												Y Max 6'-0"
WING B	4	18	6	Min 2'-1"	4	18	2	13'-8"	4	18	10	L Min 3'-3"
				Max 12'-2"								L Max 7'-3"
												X Min 1'-4"
												X Max 1'-4"
												Y Min 2'-0"
												Y Max 6'-0"

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

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

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

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

OUTLET SKEWED END SECTION

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

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

SIDE WALL REINFORCING STEEL f0 SIZE	f0 SPACING	f0 NO. REQ'D	f0 LENGTH	INTERIOR WALL REINFORCING STEEL f1 SIZE	f1 SPACING	f1 NO. REQ'D	f1 LENGTH	TOP SLAB DISTRIBUTION REINFORCING STEEL g SIZE	g SPACING	g NO. REQ'D	g LENGTHS VARY	BOTTOM SLAB DISTRIBUTION REINFORCING STEEL e SIZE	e SPACING	e NO. REQ'D	e LENGTHS VARY	SIDE WALL DISTRIBUTION REINFORCING STEEL d1 SIZE	d1 SPACING	d1 NO. REQ'D	d1 LENGTH	INTERIOR WALL DISTRIBUTION REINFORCING STEEL d2 SIZE	d2 SPACING	d2 NO. REQ'D	d2 LENGTH
											Max				Max				LONG				LONG
											Min				Min				SHORT				MID
																							SHORT

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

k1 SIZE	k1 LENGTH	k1 NO. REQ'D	k2 SIZE	k2 LENGTH	k2 NO. REQ'D	h SIZE	h LENGTH	h Y	h NO. REQ'D

OUTLET SLOPE SECTION(S)

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	TOP SLAB THK.	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT	SECTION LENGTH (FT.)
	D	S	H	T	B	C	W	OW	OH	SL
	5	10	5							

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

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

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

CLASS "S" CONCRETE	REINFORCING STEEL (GR. 60)	② ADTL. REINF. PER LONG. LAP LOCATION	ADTL. REINF. FOR TRANS. LAP	ADDITIONAL CONCRETE FOR HDWL	TOTAL ADTL. REINF. FOR HDWL
CU. YDS. PER LIN. FT.	LBS. PER LIN. FT.	LBS.	LBS. PER LIN. FT.	CU. YDS.	LBS.
				0.49	142

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

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

Unless otherwise noted, all dimensions are in inches.

SHEET 2 OF 2

DETAILS OF R.C. BOX CULVERT

QUINTUPLE BARREL BOX CULVERT
STA. 307+50

SPECIAL DETAILS

LRFD

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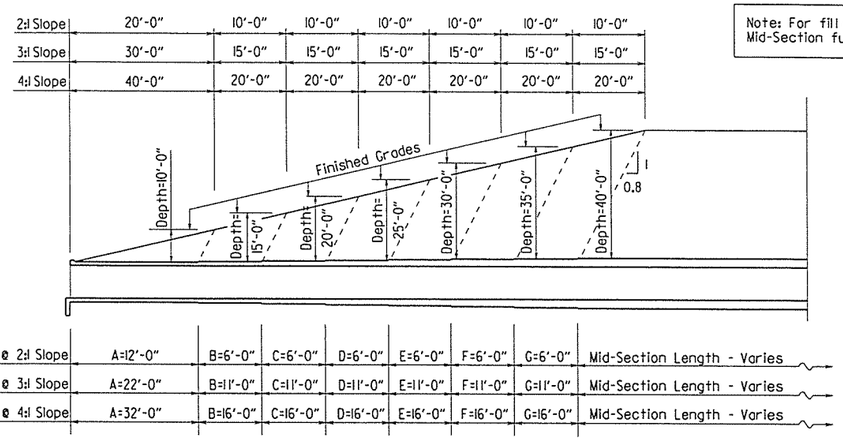
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	160	134

(1) SPECIAL DETAILS

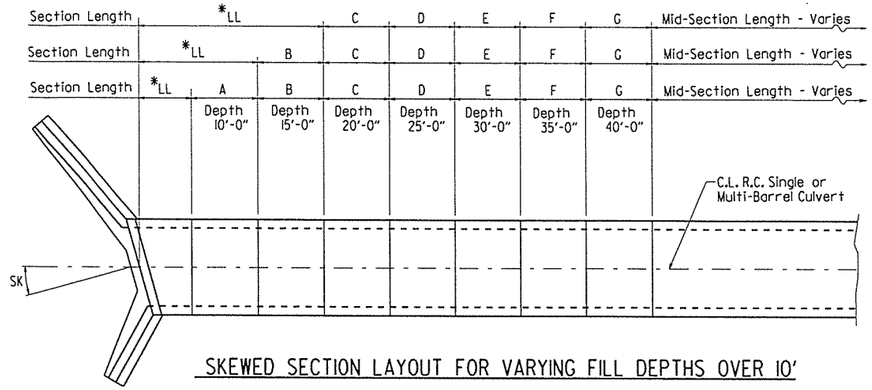


Note: For fill depths 10' and under, use Mid-Section full length of box culvert.

LONGITUDINAL SECTION LENGTH SCHEDULE FOR VARYING FILL DEPTHS OVER 10'

Lengths for Non-Skewed Boxes

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



SKEWED SECTION LAYOUT FOR VARYING FILL DEPTHS OVER 10'

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7510 CARL L. FUSELIER 4/11/14

GENERAL NOTES:

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

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

LIVE LOADING: HL-93

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

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

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

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

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

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

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

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

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

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

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

CULVERT DRAINAGE DETAIL FOR ROCK FILL

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

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

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

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

WINGWALL & CULVERT DRAINAGE DETAIL

SHEET 1 OF 4
GENERAL DETAILS OF R.C. BOX CULVERT
GENERAL NOTES &
LONGITUDINAL SECTION LENGTH SCHEDULE

SPECIAL DETAILS

LRFD

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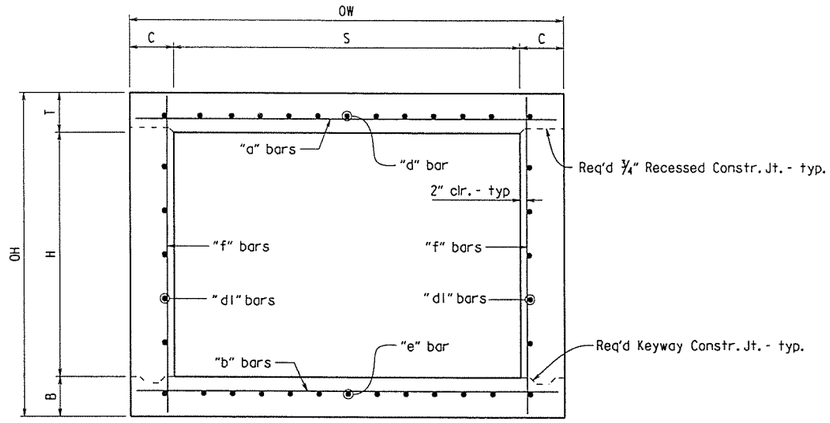
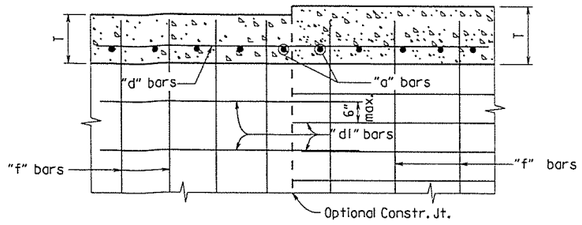
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	17	134

(1) SPECIAL DETAILS

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



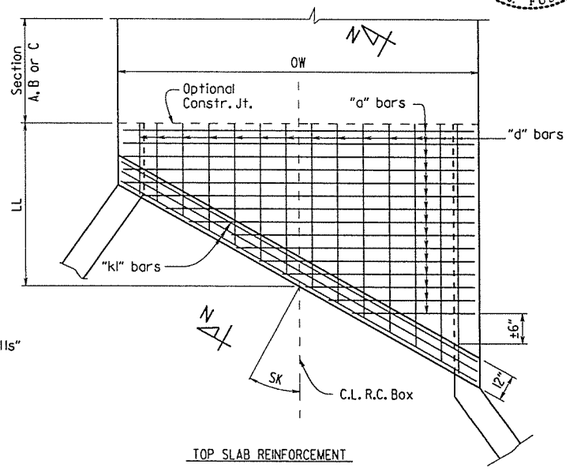
TYPICAL SECTION M-M



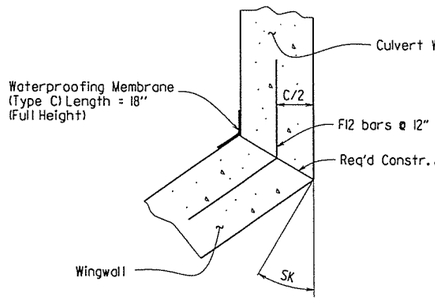
Longitudinal Bar Spacing at individual sections shall be maintained, which may result in noncontact bar laps.

LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

TOP SLAB SHOWN, BOTTOM SLAB SIMILAR

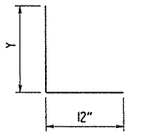


TOP SLAB REINFORCEMENT

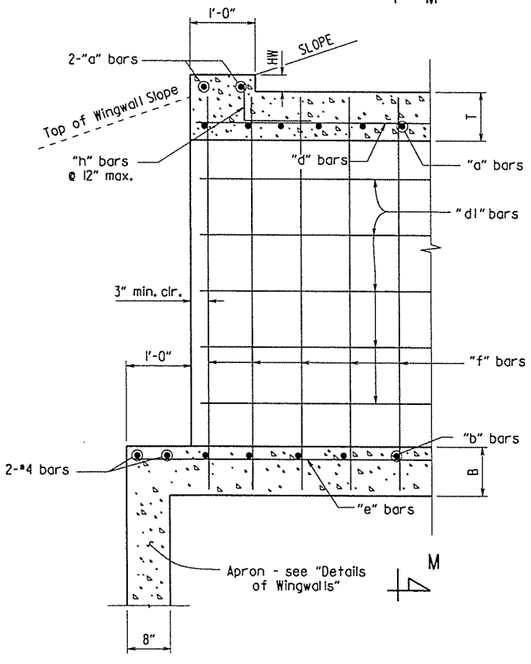


WINGWALL ATTACHMENT

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

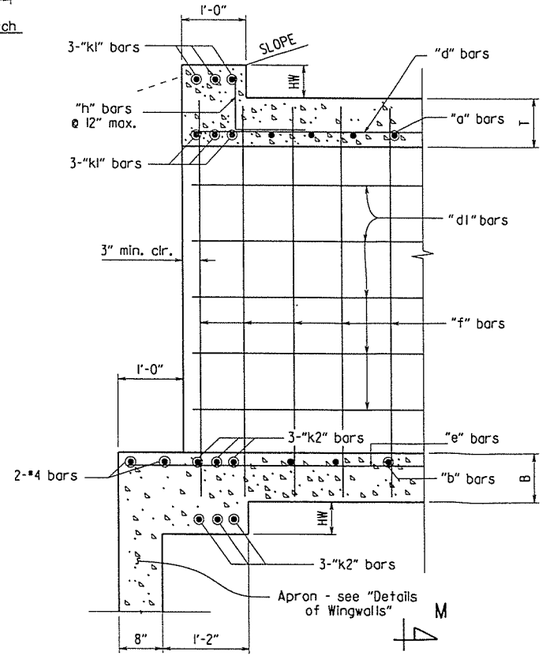


"h" bars sketch



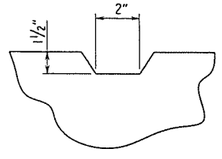
PART LONGITUDINAL SECTION

(Non-Skewed Ends)



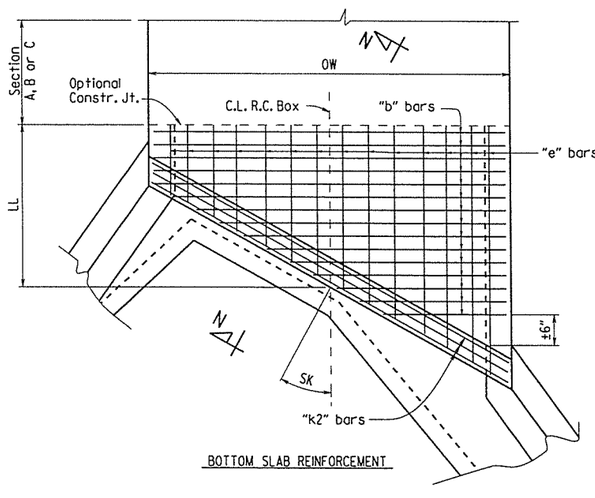
PART LONGITUDINAL SECTION N-N

(Skewed Ends)



TYPICAL KEYWAY DETAIL

(All Construction Joints)



BOTTOM SLAB REINFORCEMENT

SKEWED END SECTION DETAILS

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

DETAILS OF SINGLE BARREL
R.C. BOX CULVERT

SPECIAL DETAILS

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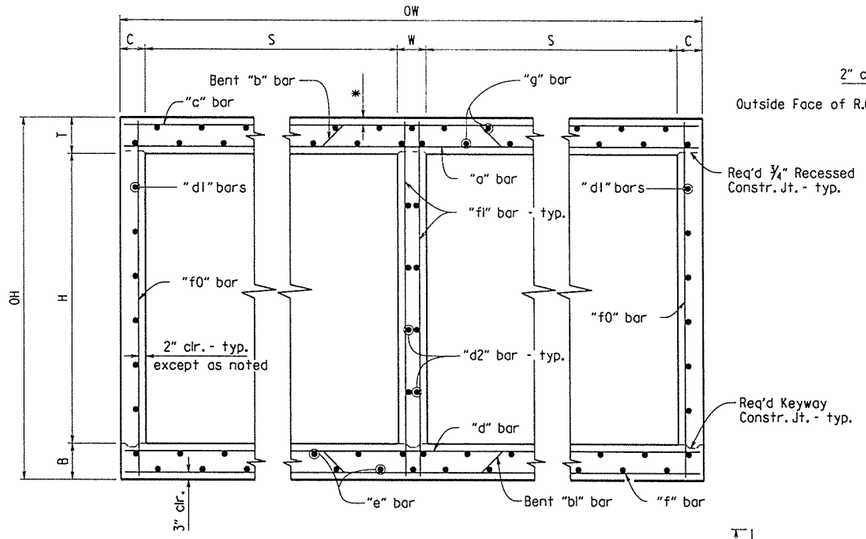
DATE REVISED	DATE FILMED	REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	18	134

(1) SPECIAL DETAILS

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

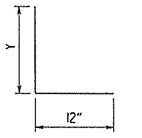
Note: When top slab of culvert serves as finished roadway surface, see General Notes on Sheet 1 of 4.



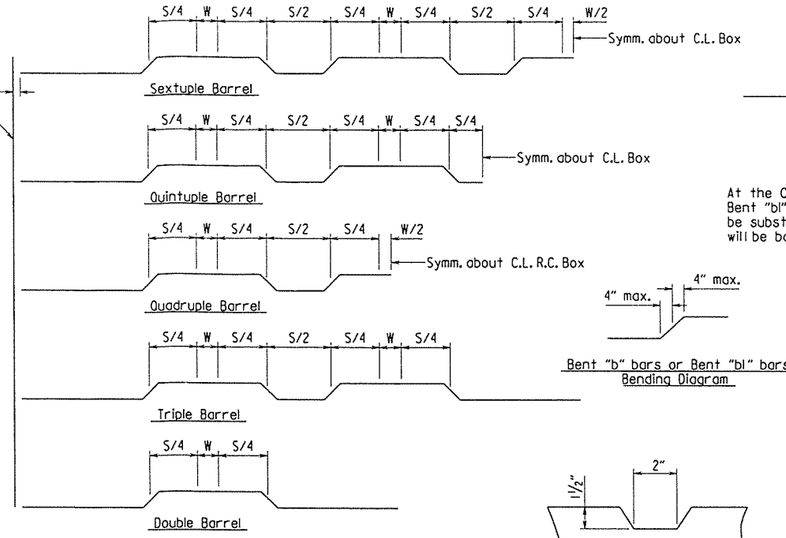
TYPICAL SECTION M-M

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

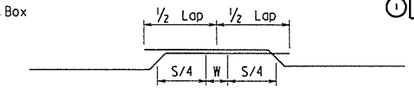
Bottom Slab
Straight "d" bars shall alternate with Bent "bl" bars in top.
Straight "f" bars shall alternate with Bent "bl" bars in bottom.



"h" bars sketch



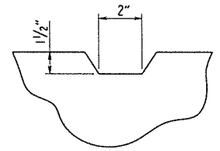
Bent "b" bars or Bent "bl" bars sketch



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

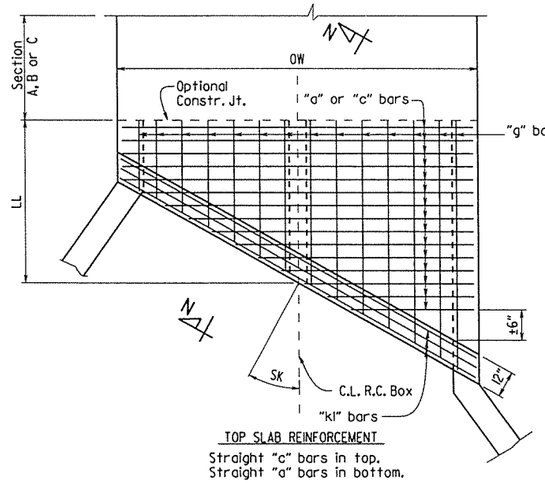
At the Contractor's option in lieu of providing Bent "b" or Bent "bl" bars, one bar top and bottom of equivalent size may be substituted for each bent bar. Payment for the reinforcing will be based on the weight of the "b" or "bl" bar.

Bent "b" bars or Bent "bl" bars Bending Diagram

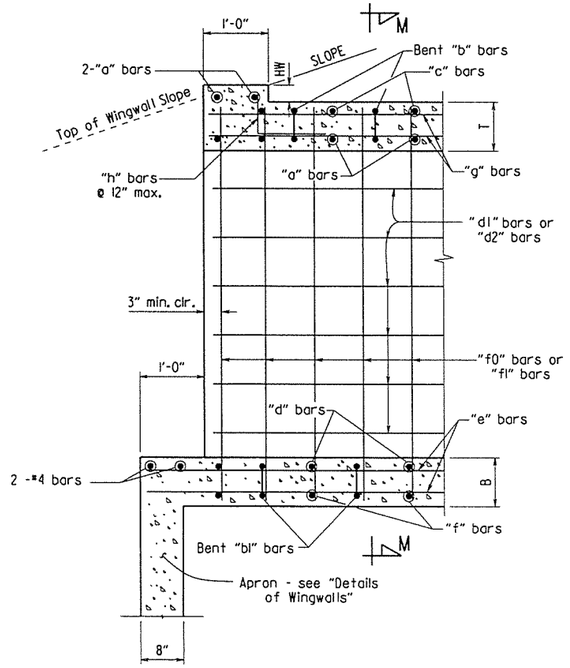


TYPICAL KEYWAY DETAIL

(All Construction Joints)

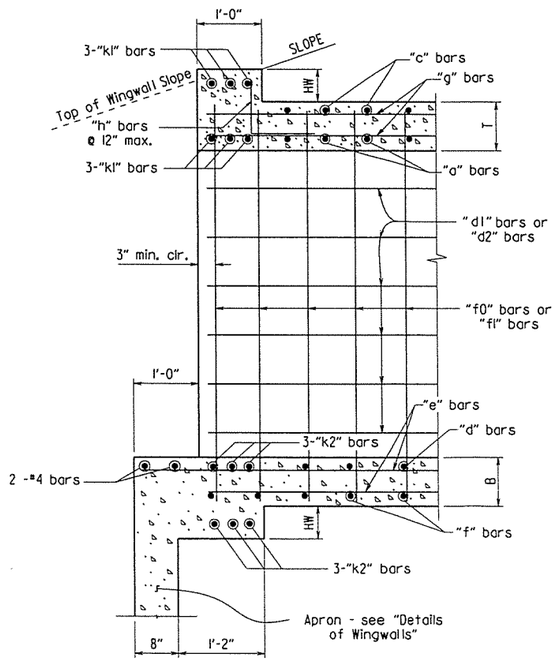


TOP SLAB REINFORCEMENT
Straight "c" bars in top.
Straight "a" bars in bottom.



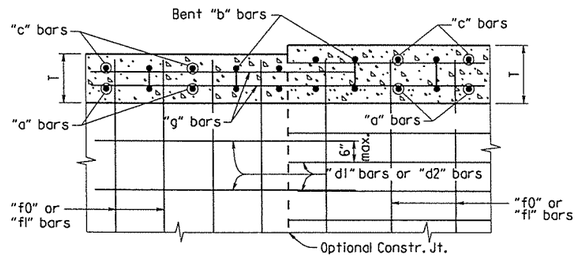
PART LONGITUDINAL SECTION

(Non-Skewed Ends)



PART LONGITUDINAL SECTION N-N

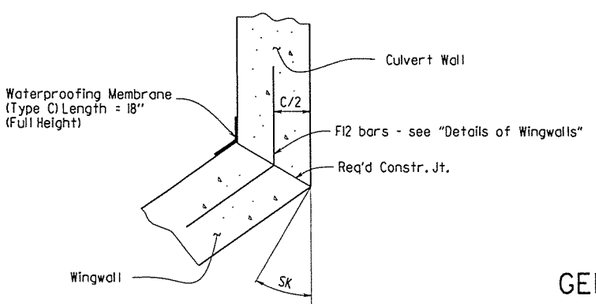
(Skewed Ends)



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

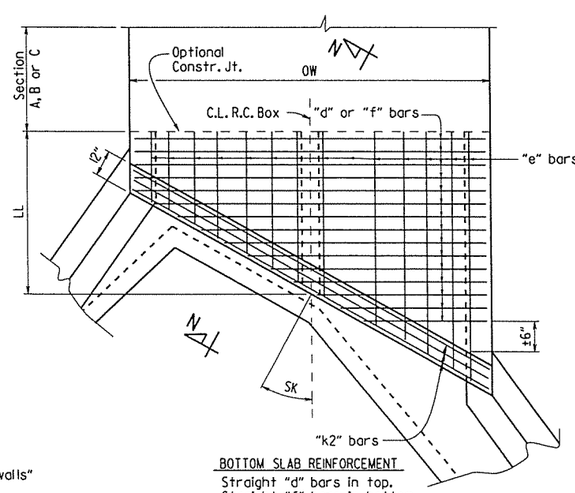
LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

TOP SLAB SHOWN, BOTTOM SLAB SIMILAR



WINGWALL ATTACHMENT

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



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

SKEWED END SECTION DETAILS

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

DETAILS OF MULTI-BARREL R.C. BOX CULVERT

SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7510
CARL RUSELER
4/1/14

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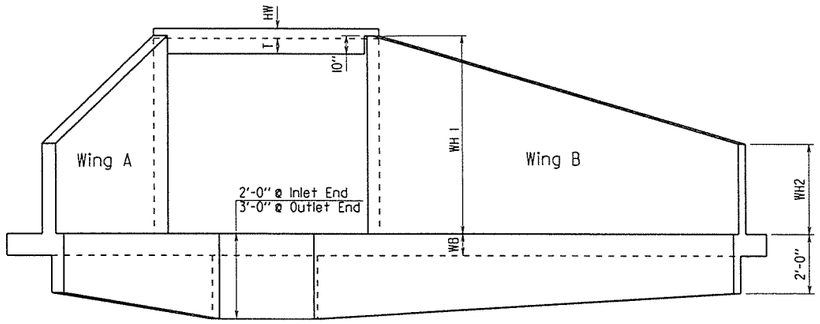
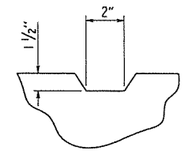
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	19	134

① SPECIAL DETAILS



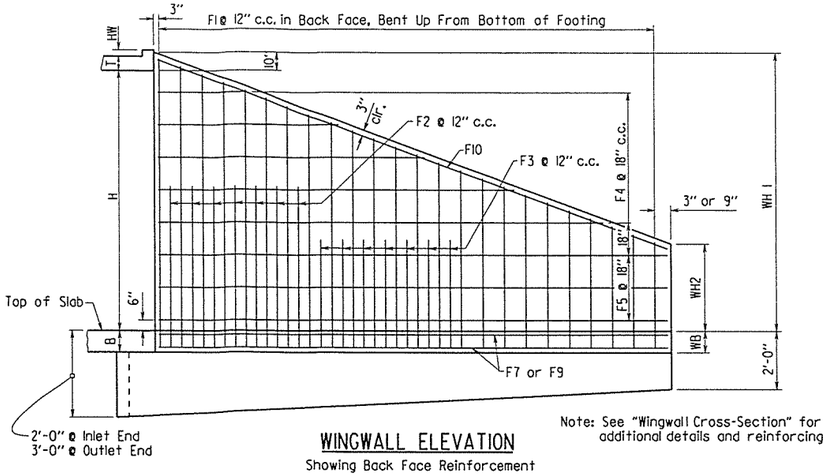
END ELEVATION

Flared Wingwalls Shown



TYPICAL KEYWAY DETAIL

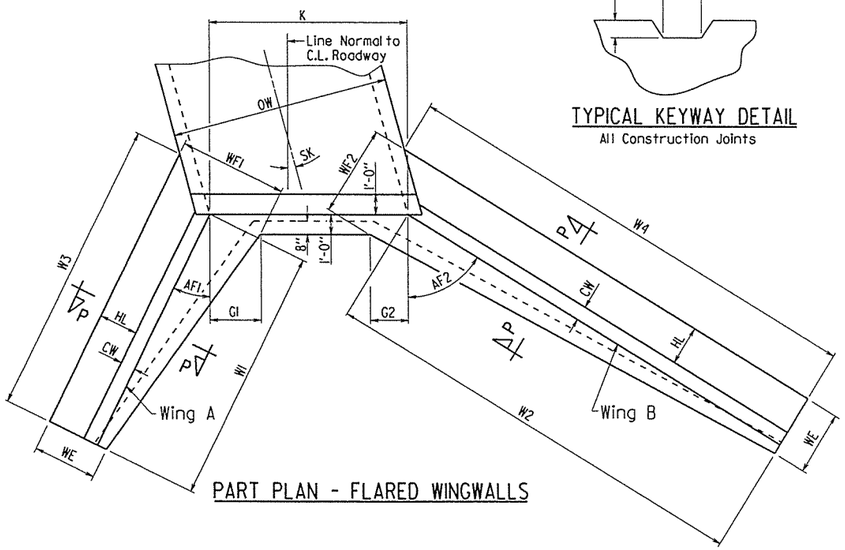
All Construction Joints



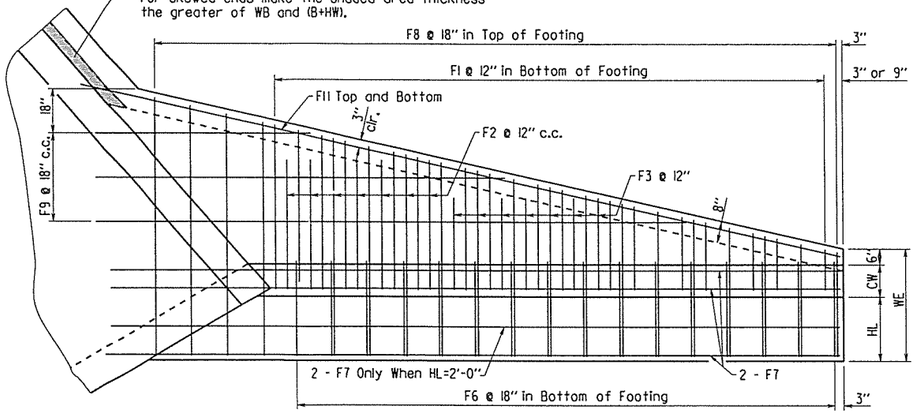
WINGWALL ELEVATION

Showing Back Face Reinforcement

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

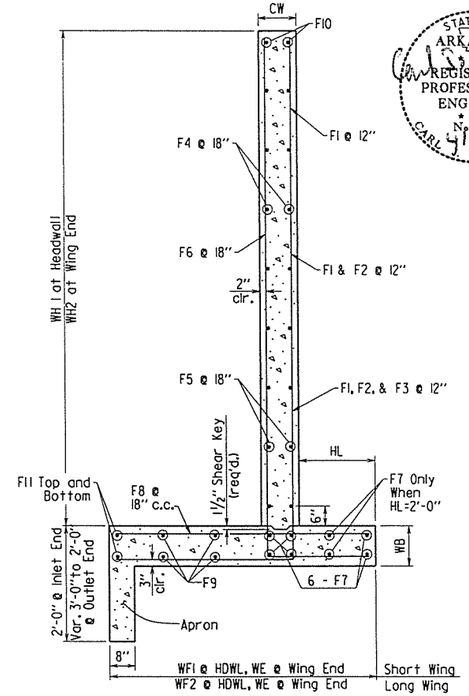


PART PLAN - FLARED WINGWALLS

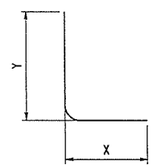


PLAN - FLARED WINGWALLS

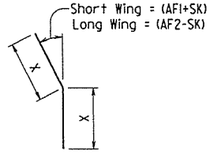
Showing Footing Reinforcement



WINGWALL SECTION P-P

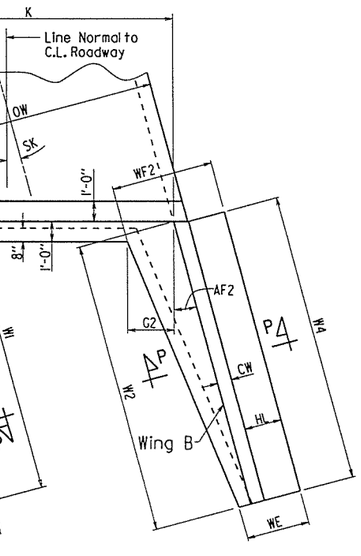


F1, F2, F3, & F6 BARS

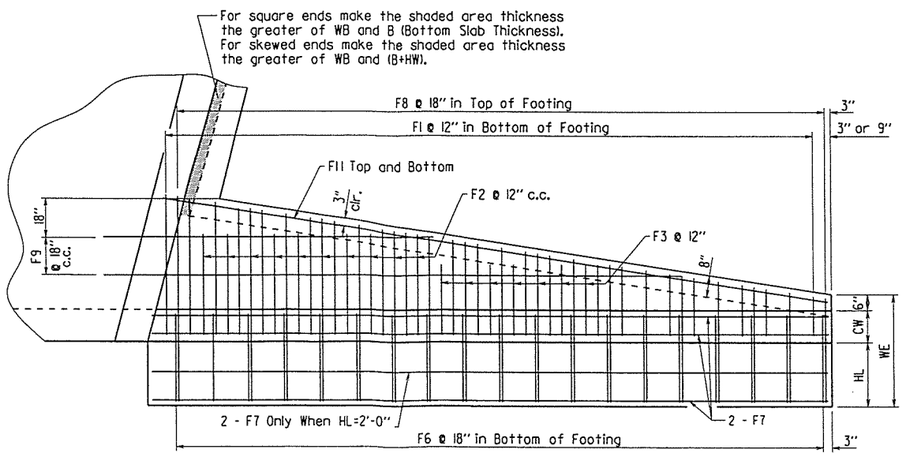


*F12 BAR

*F12 is a straight bar for parallel wingwalls

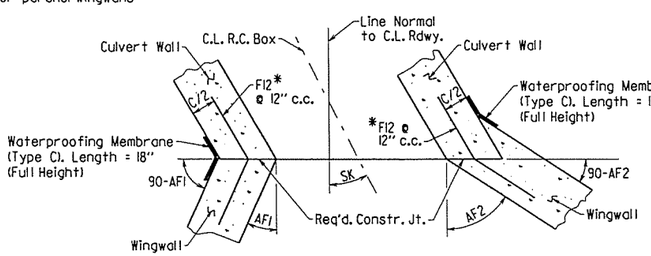


PART PLAN - PARALLEL WINGWALLS



PLAN - PARALLEL WINGWALLS

Showing Footing Reinforcement



CONSTRUCTION JOINTS

Flared Wingwalls Shown

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

SHEET 4 OF 4

GENERAL DETAILS OF R.C. BOX CULVERT

DETAILS OF WINGWALLS

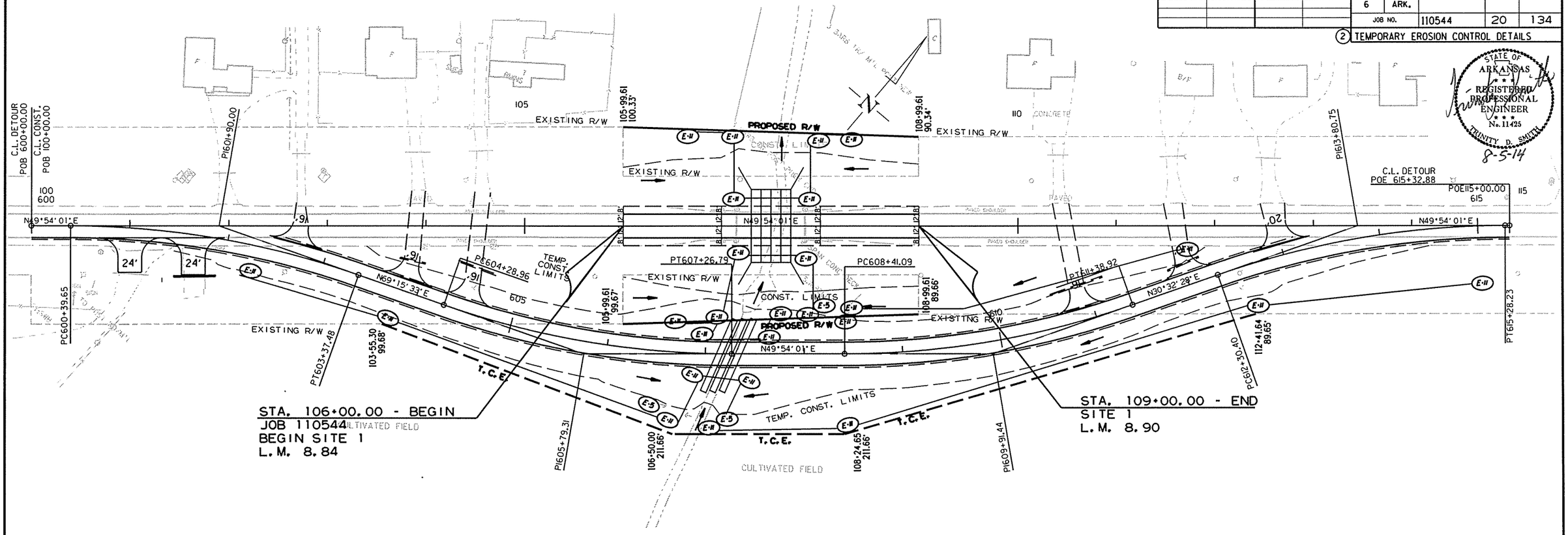
SPECIAL DETAILS

bll0544_culvert.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	20	134

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-5-14



EROSION CONTROL ITEMS

STA.	STA.	SIDE	SAND BAG DITCH CHECKS (BAGS E-5	SILT FENCE (LIN. FT.) E-11	STAGE
102+00	106+50	RT.		450'	1,2
106+25		RT.	18		1,2
106+85	114+75	RT.		790'	1,2
106+95		LT.	18		2
107+05		RT.	18		1,2
107+00		RT.		359'	1,2
107+50		LT.		310'	1,2
107+50		RT.		272'	1,2
108+00		RT.	18		1,2
108+05		LT.	18		2
108+30	111+80	RT.		350'	1,2

REVISIONS

DATE	REVISION

LEGEND

SAND BAG DITCH CHECK	E-5
SILT FENCE	E-11
SEDIMENT BASIN	E-14

SITE 1-BURNT BRIDGE CREEK
TEMPORARY EROSION CONTROL DETAILS

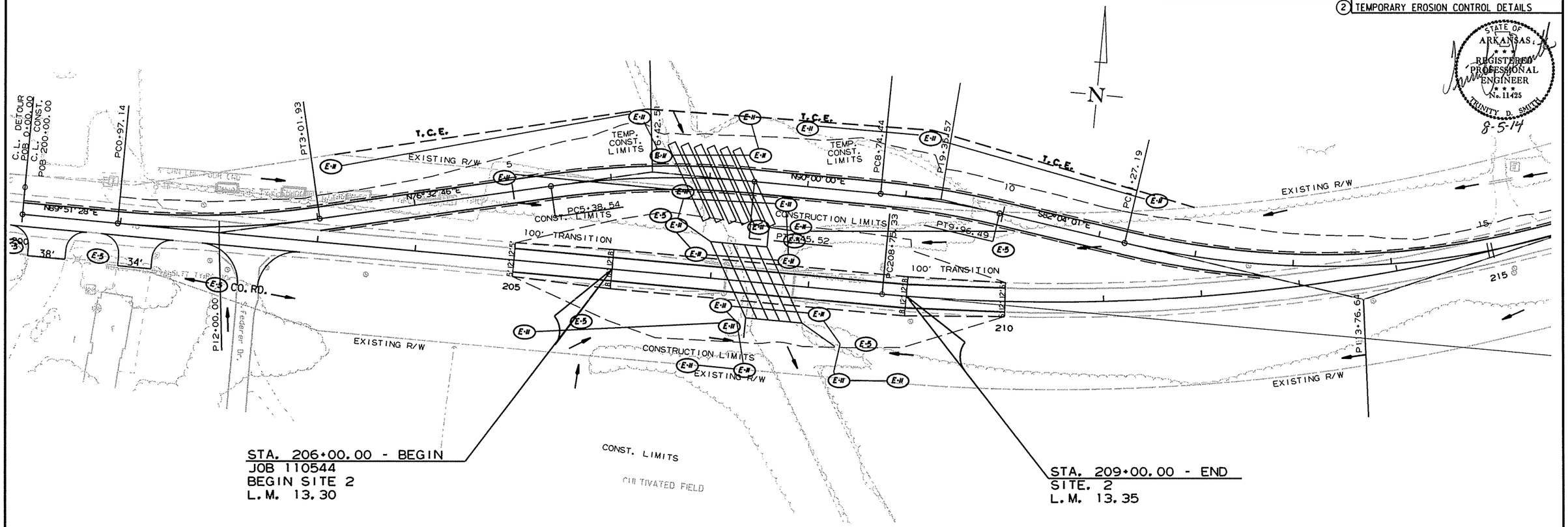
8/5/2014

R110544.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	21	134

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-5-14



EROSION CONTROL ITEMS

STA.	STA.	SIDE	SAND BAG DITCH CHECKS (BAGS E-5	SILT FENCE (LIN. FT.) E-11	STAGE
200+00		RT.	18		1,2
200+86		RT.	18		1,2
204+00	205+94	RT.		215'	1,2
204+82	206+61	LT.		215	2
205+52		RT.	18		1,2
205+77		RT.	18		2
207+2		RT.	18		1,2
207+57	210+14	LT.		235	2
207+79		LT.	18		1,2
208+15		RT.		363	1,2
208+15		LT.		496	1,2
208+62		RT.	18		1,2
209+26		RT.	18		1,2
209+96		LT.	18		2

LEGEND

SAND BAG DITCH CHECK (E-5)
SILT FENCE (E-11)
SEDIMENT BASIN (E-11)

REVISIONS

DATE	REVISION

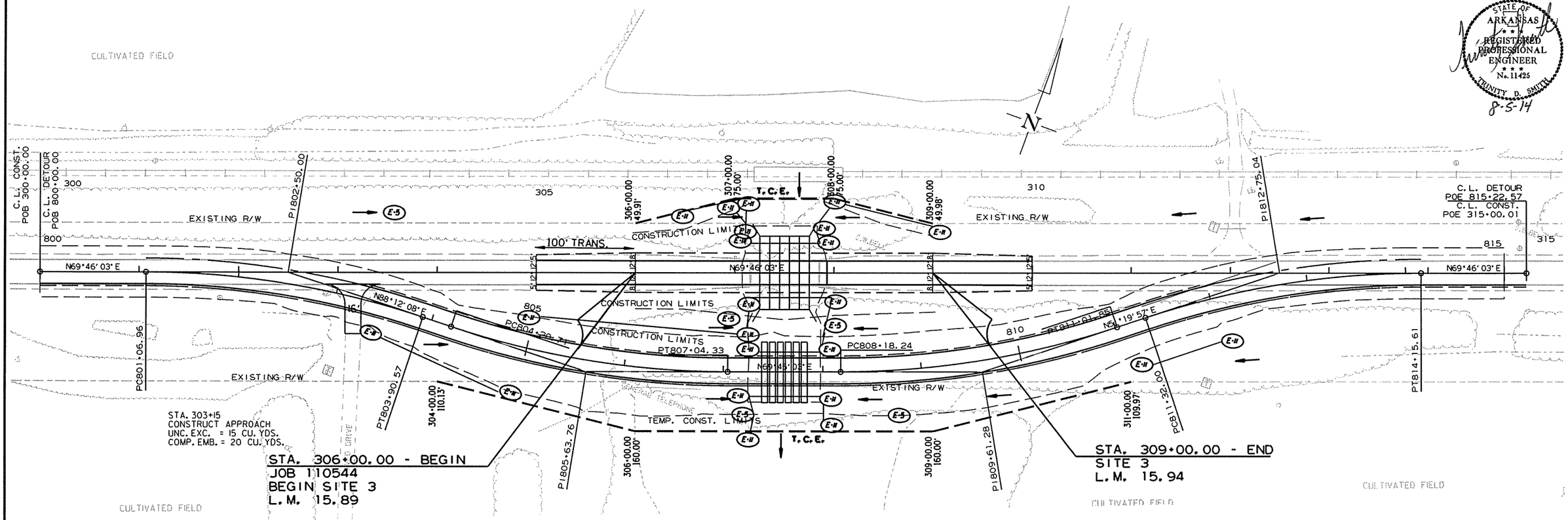
SITE 2-PINEY DITCH
TEMPORARY EROSION CONTROL DETAILS

8/5/2014
R110544.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	22	134

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-5-14



EROSION CONTROL ITEMS

STA.	STA.	SIDE	SAND BAG DITCH CHECKS (BAGS E-5	SILT FENCE (LIN. FT.) E-11	STAGE
303+28	304+76	RT.		175	1,2
303+56		LT.	18		2
304+85	307+22	RT.		245	1,2
307+06		RT.	18		1,2
307+50		LT.		255	1,2
307+50		RT.		422	1,2
308+00		RT.	18		1,2
307+80	309+15	LT.		120	2
308+63		RT.	18		1,2
311+00	312+00	RT.		100	1,2

REVISIONS

DATE	REVISION

LEGEND

SAND BAG DITCH CHECK (E-5)
SILT FENCE (E-11)
SEDIMENT (E-11)

SITE 3-MAPLE SLOUGH
TEMPORARY EROSION CONTROL DETAILS

8/5/2014
R110544.DGN

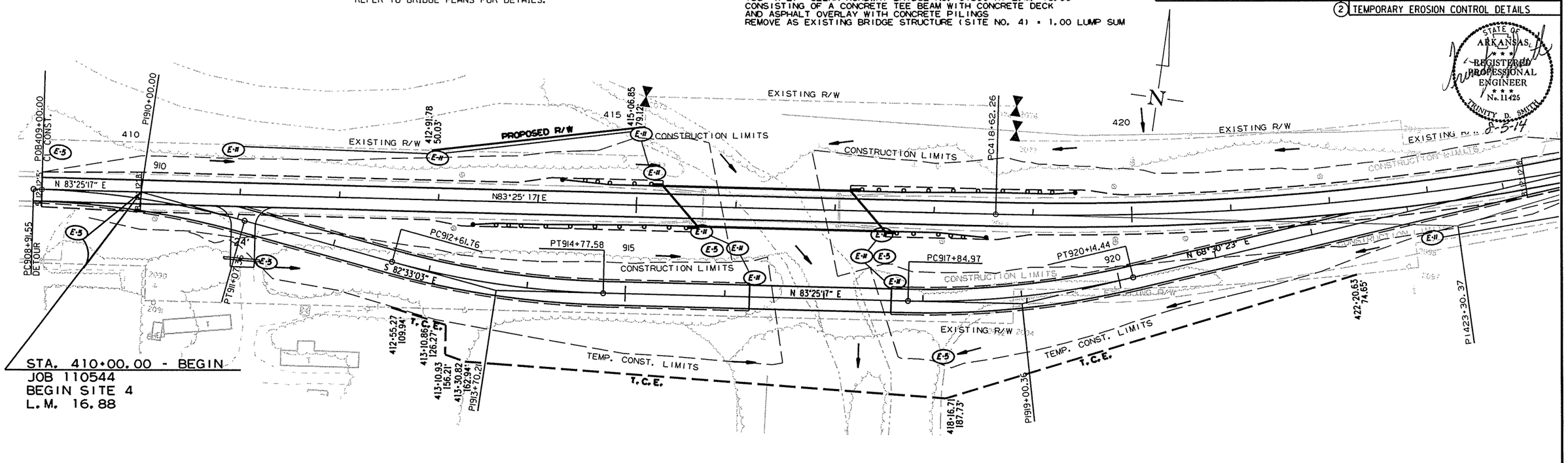
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	23	134

(2) TEMPORARY EROSION CONTROL DETAILS

STA. 916+19 - STA. 917+62
INSTALL TEMPORARY DETOUR BRIDGE (ELEV. 195.52)
REFER TO BRIDGE PLANS FOR DETAILS.

STA. 415+67.41 TO STA. 417+03.41 - IN PLACE
138' X 27' CLEAR ROADWAY BRIDGE NO. 01390 AT L.M. 16.99
CONSISTING OF A CONCRETE TEE BEAM WITH CONCRETE DECK
AND ASPHALT OVERLAY WITH CONCRETE PILINGS
REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 4) = 1.00 LUMP SUM

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-5-14

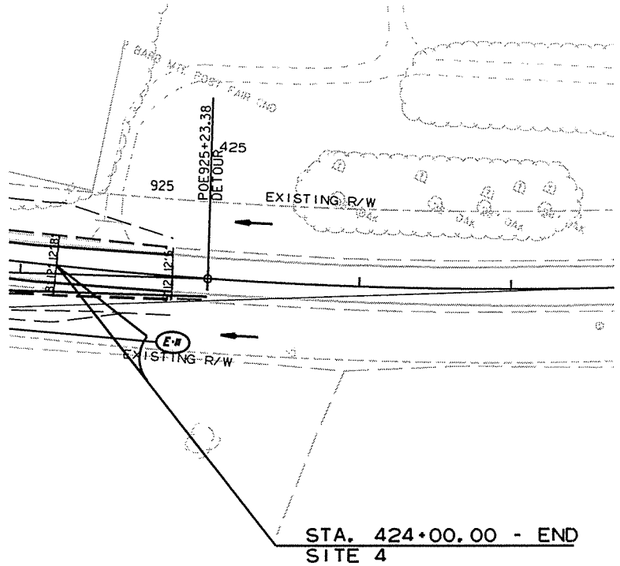


EROSION CONTROL ITEMS

STA.	STA.	SIDE	SAND BAG DITCH CHECKS (BAGS E-5	SILT FENCE (LIN. FT.) E-11	STAGE
409+17		LT.	18		1,2
409+34		RT.	18		2
410+91	415+04	LT.		250	1,2
411+00		LT.	18		1,2
411+28		RT.	18		1,2
415+62	416+26	RT.		90	2
415+76		RT.	18		1,2
417+50		RT.	18		1,2
418+12		RT.	18		1,2
423+00	425+00	RT.		200	1,2

REVISIONS

DATE	REVISION



LEGEND

SAND BAG DITCH CHECK	E-5
SILT FENCE	E-11
SEDIMENT BASIN	E-M

SITE 4-FLAT FORK CREEK
TEMPORARY EROSION CONTROL DETAILS

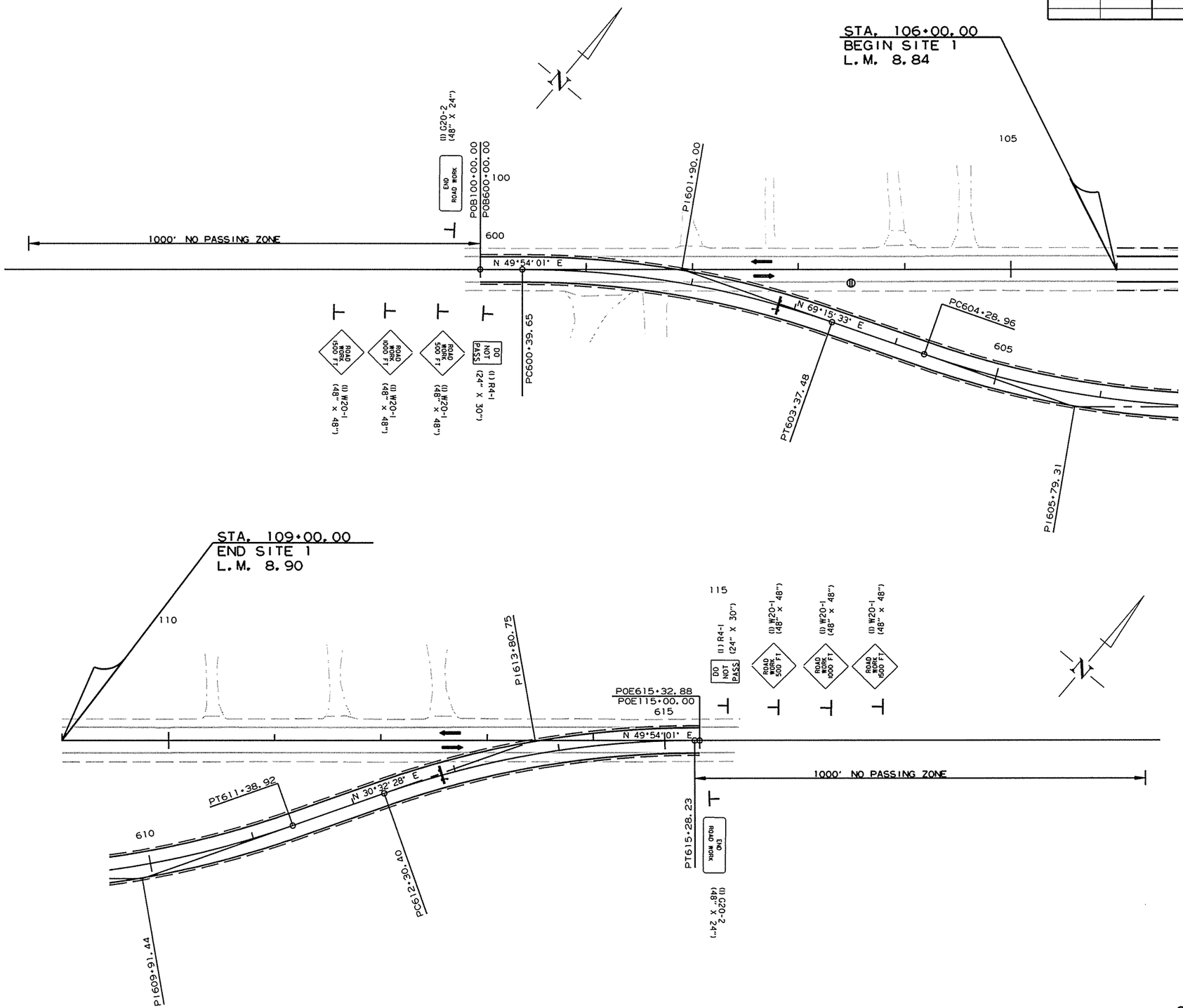
8/5/2014

R110544.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	24	134

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-4-14



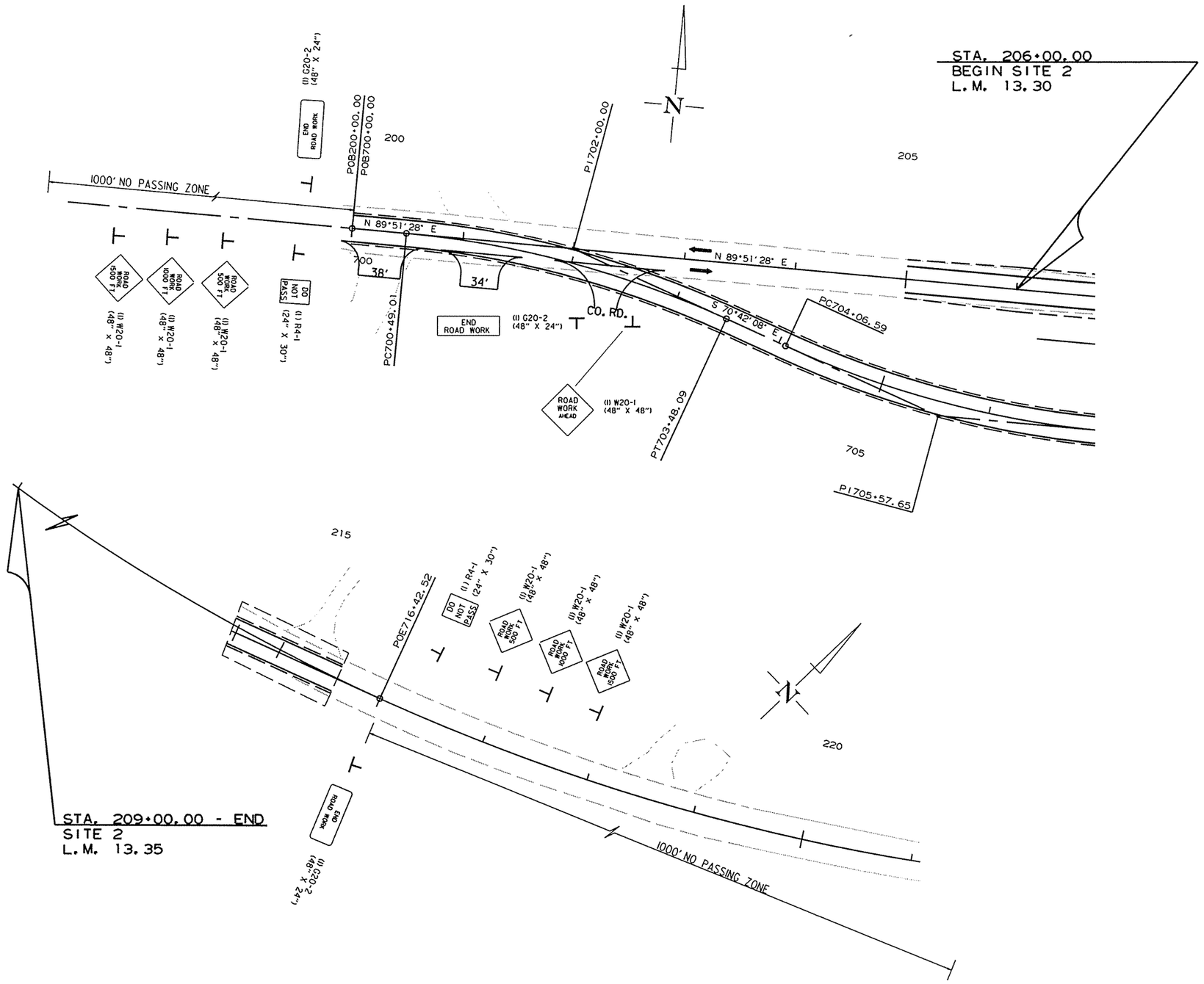
SITE 1-BURNT BRIDGE CREEK
ADVANCE WARNING SIGNS
MAINTENANCE OF TRAFFIC DETAILS

R110544.DGN 7/31/2014

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.		110544	25	134

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-4-14



SITE 2-PINEY DITCH
ADVANCE WARNING SIGNS
MAINTENANCE OF TRAFFIC DETAILS

7/31/2014

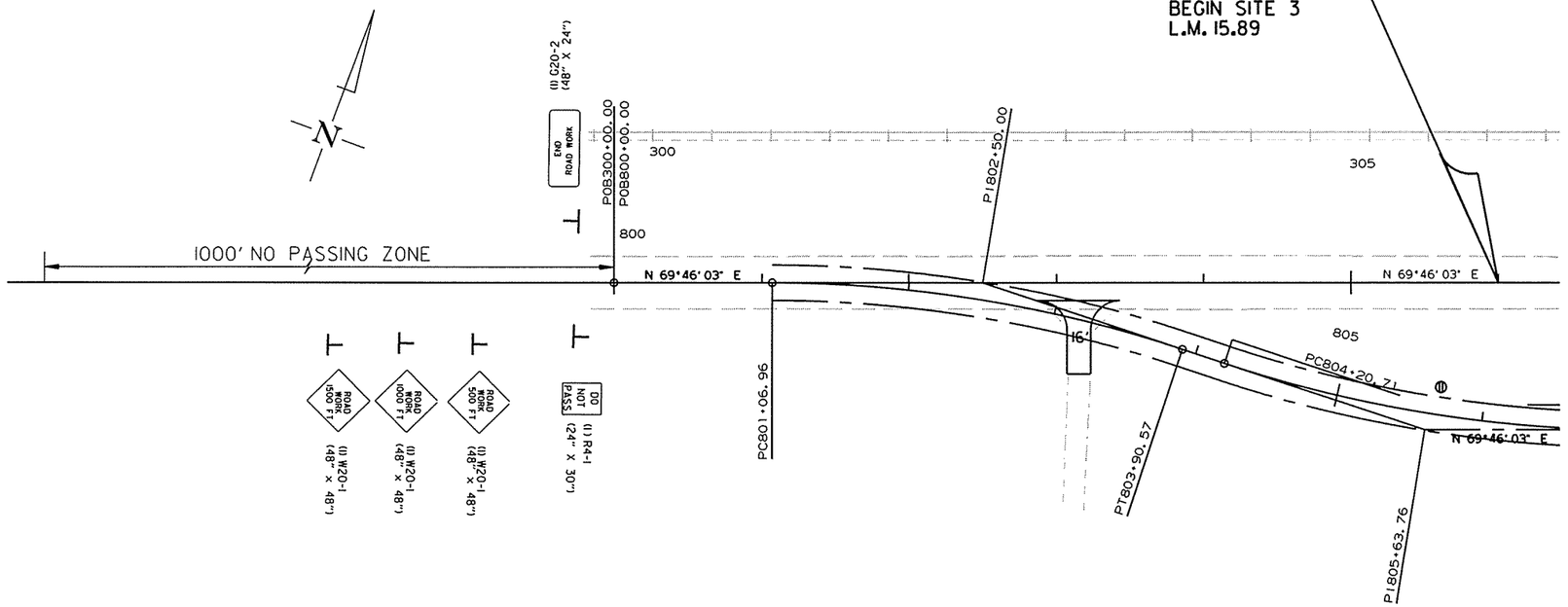
R110544.DGN

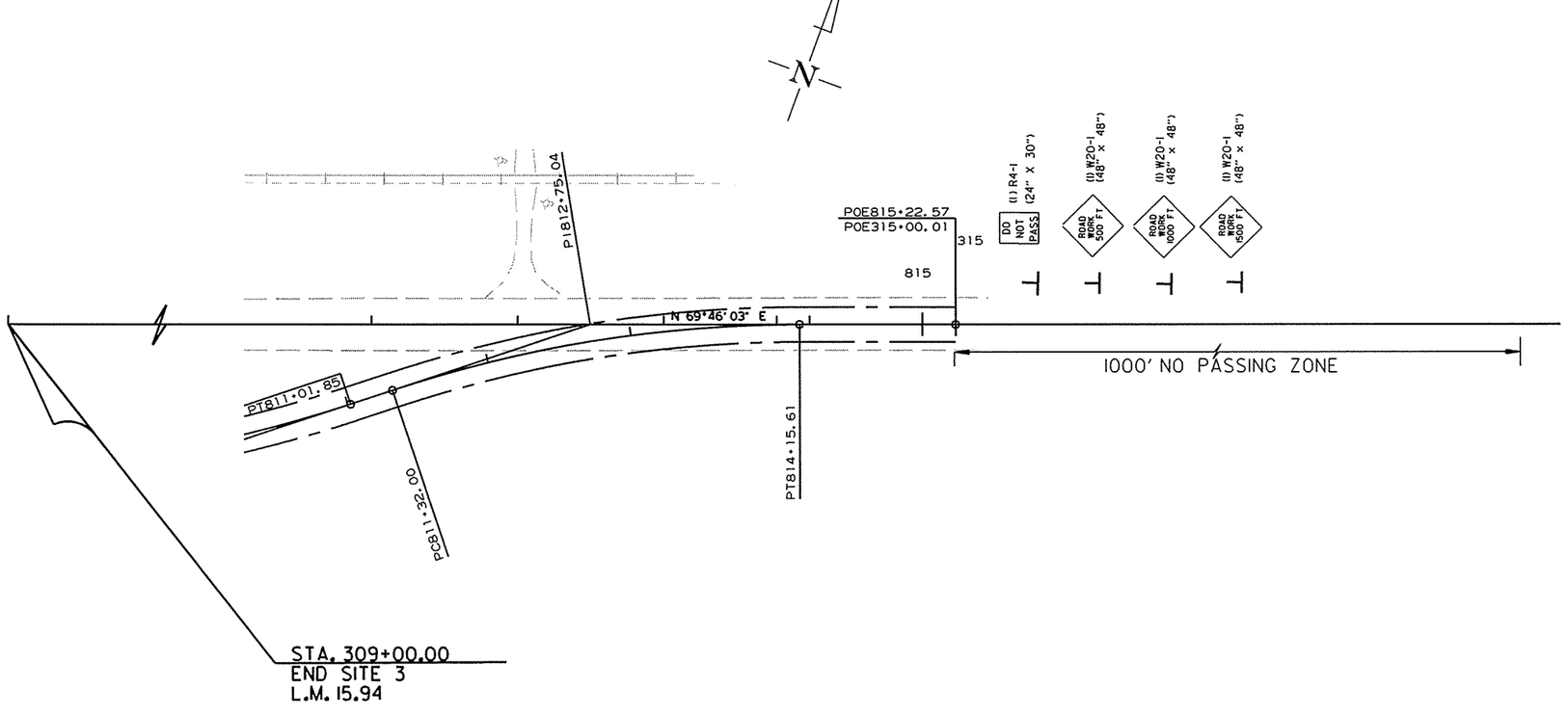
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	26	134

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-4-14

STA. 306+00.00
BEGIN SITE 3
L.M. 15.89





STA. 309+00.00
END SITE 3
L.M. 15.94

SITE 3-MAPLE SLOUGH
ADVANCE WARNING SIGNS
MAINTENANCE OF TRAFFIC DETAILS

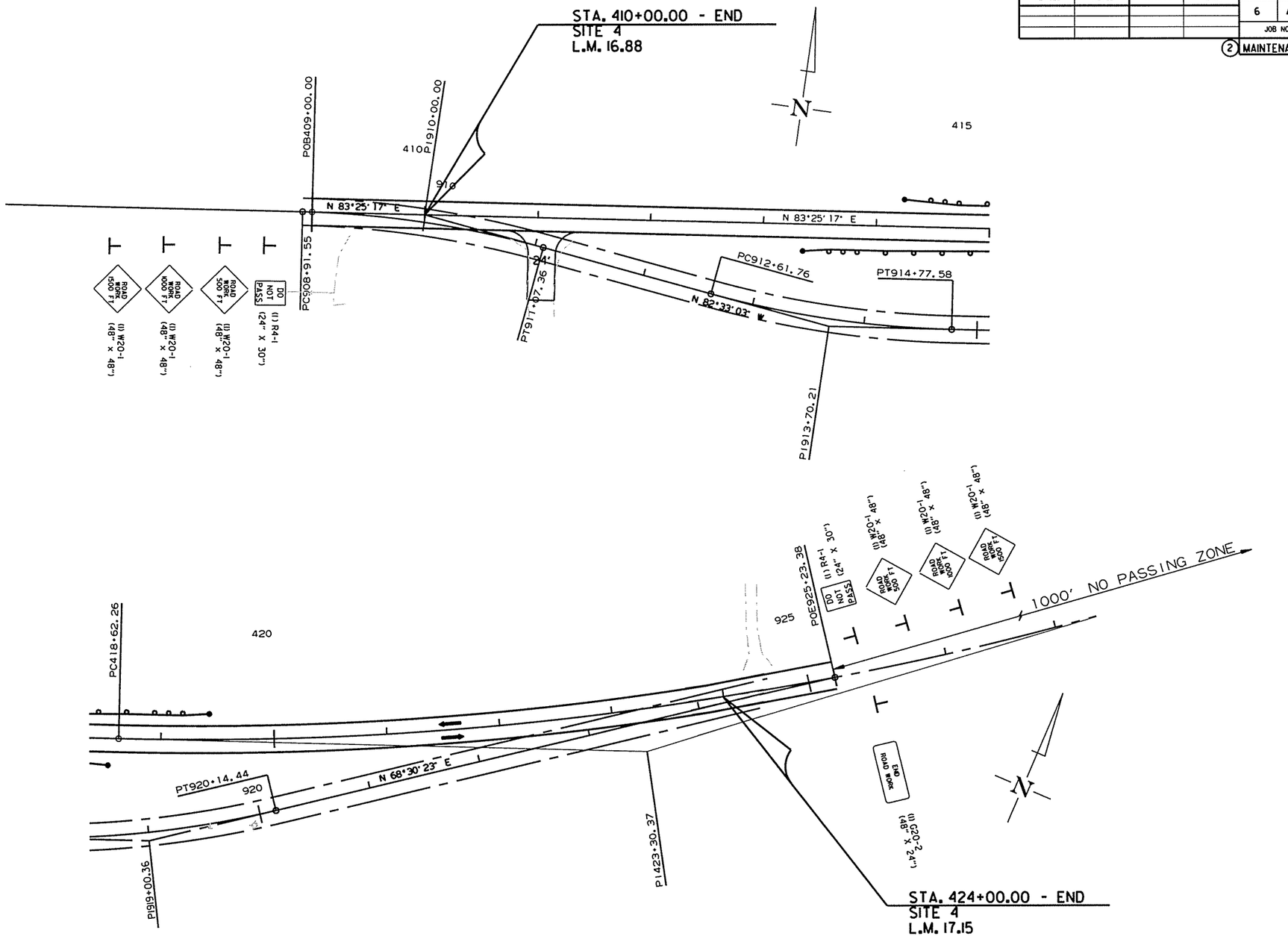
7/31/2014

R110544.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	27	134

(2) MAINTENANACE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-4-14



SITE 4-FLAT FORK CREEK
ADVANCE WARNING SIGNS
MAINTENANCE OF TRAFFIC DETAILS

R110544.DGN 7/31/2014

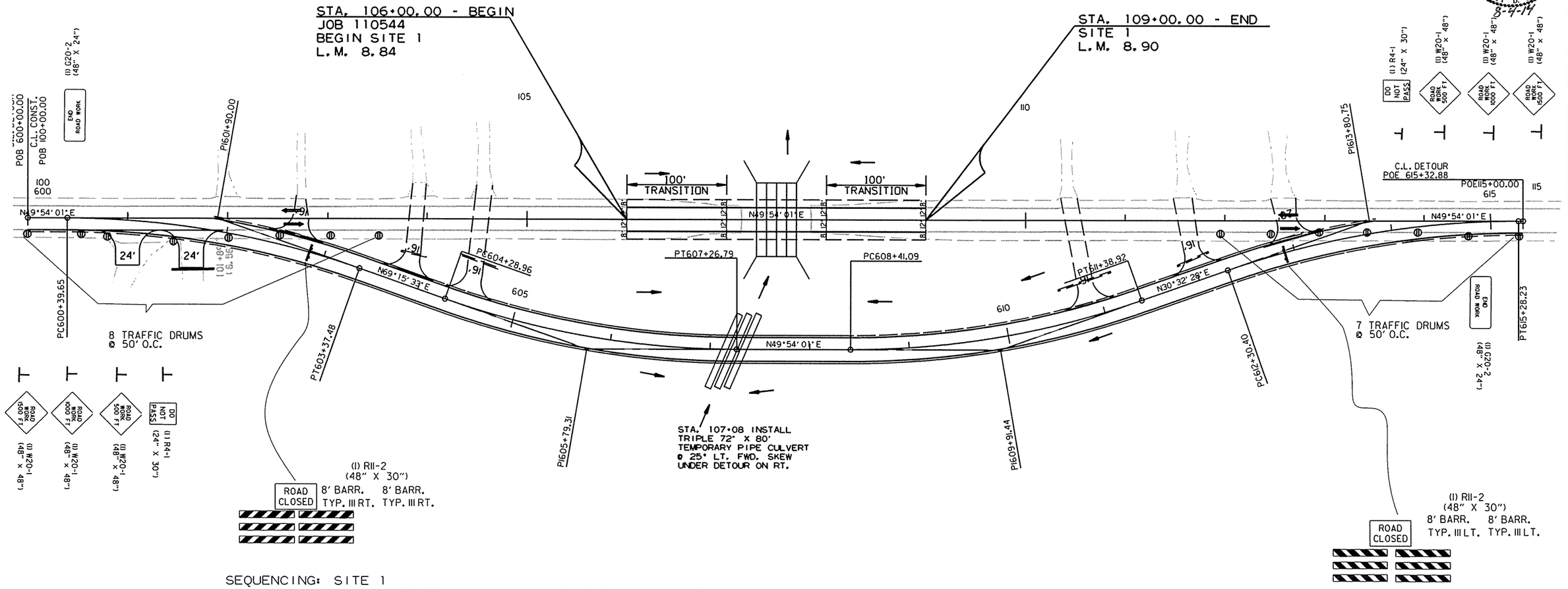
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	28	134

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-14

STA. 106+00.00 - BEGIN
JOB 110544
BEGIN SITE 1
L.M. 8.84

STA. 109+00.00 - END
SITE 1
L.M. 8.90



SEQUENCING: SITE 1
STAGE 1: MAINTAIN TRAFFIC ON EXISTING ROADWAY, CONSTRUCT DETOUR ROADWAY.

STAGE 2: SHIFT TRAFFIC TO DETOUR ALIGNMENT AND MAINTAIN, REMOVE EXISTING BRIDGE, AND CONSTRUCT NEW R.C. BOX CULVERT. PERFORM FINAL SURFACE COURSE AND STRIPING.

STAGE 3: SHIFT TRAFFIC TO CONSTRUCTION ALIGNMENT AND REMOVE DETOUR.

REMOVAL OF PERMANENT PAVEMENT MARKINGS	= 1134 LIN. FT.
CONSTRUCTION PAVEMENT MARKINGS	= 3868 LIN. FT.
REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	= 2296 LIN. FT.
RAISED PAVEMENT MARKERS (TYPE II) (40' O.C.)	= 38 EACH
TRAFFIC DRUMS	= 15 EACH

STAGE 1
SITE 1-BURNT BRIDGE CREEK
MAINTENANCE OF TRAFFIC DETAILS

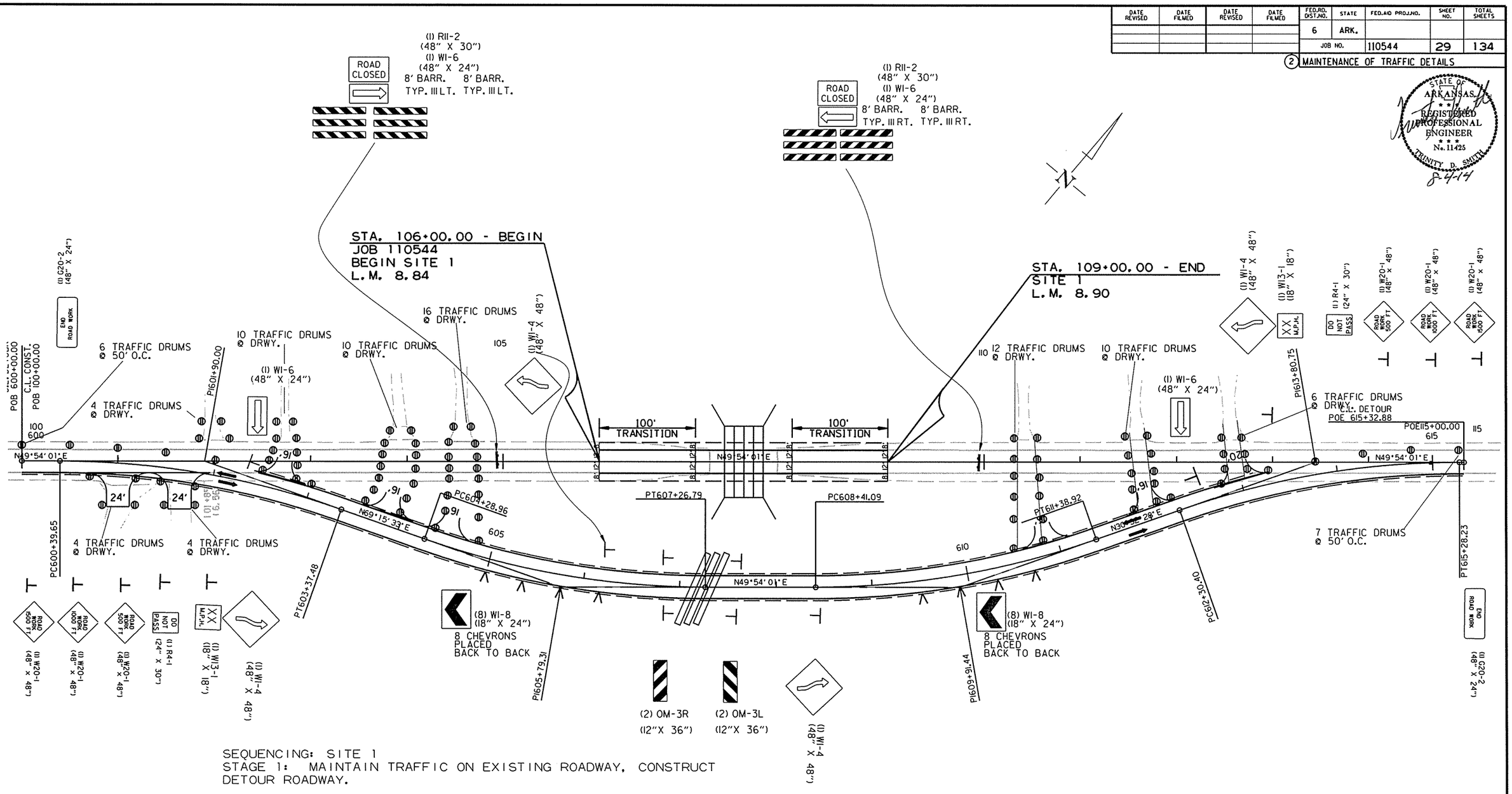
7/31/2014

R110544.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	29	134

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-4-14



SEQUENCING: SITE 1
STAGE 1: MAINTAIN TRAFFIC ON EXISTING ROADWAY, CONSTRUCT DETOUR ROADWAY.

STAGE 2: SHIFT TRAFFIC TO DETOUR ALIGNMENT AND MAINTAIN, REMOVE EXISTING BRIDGE, AND CONSTRUCT NEW R.C. BOX CULVERT. PERFORM FINAL SURFACE COURSE AND STRIPING.

STAGE 3: SHIFT TRAFFIC TO CONSTRUCTION ALIGNMENT AND REMOVE DETOUR.

REMOVAL OF PERMANENT PAVEMENT MARKINGS	= 1134 LIN. FT.
CONSTRUCTION PAVEMENT MARKINGS	= 3868 LIN. FT.
REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	= 2296 LIN. FT.
RAISED PAVEMENT MARKERS (TYPE II) (40' O.C.)	= 38 EACH
TRAFFIC DRUMS	= 89 EACH

STAGE 2
SITE 1-BURNT BRIDGE CREEK
MAINTENANCE OF TRAFFIC DETAILS

7/31/2014

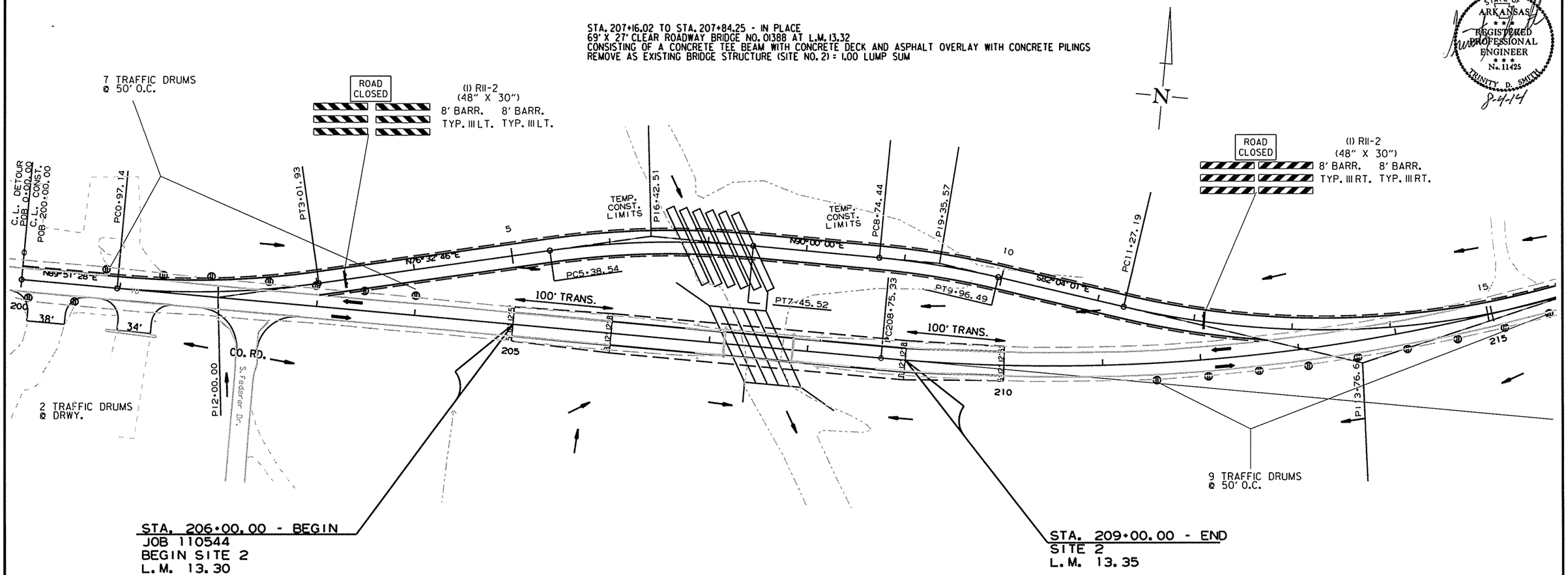
R110544.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	30	134

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-4-14

STA. 207+16.02 TO STA. 207+84.25 - IN PLACE
69' X 27' CLEAR ROADWAY BRIDGE NO. 01388 AT L.M. 13.32
CONSISTING OF A CONCRETE TEE BEAM WITH CONCRETE DECK AND ASPHALT OVERLAY WITH CONCRETE PILINGS
REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 2) = 1.00 LUMP SUM



STA. 206+00.00 - BEGIN
JOB 110544
BEGIN SITE 2
L.M. 13.30

STA. 209+00.00 - END
SITE 2
L.M. 13.35

SQUENCING: SITE 2
STAGE 1: MAINTAIN TRAFFIC ON EXISTING ROADWAY, CONSTRUCT DETOUR ROADWAY.

STAGE 2: SHIFT TRAFFIC TO DETOUR ALIGNMENT AND MAINTAIN, REMOVE EXISTING BRIDGE, AND CONSTRUCT NEW R.C. BOX CULVERT. PERFORM FINAL SURFACE COURSE AND STRIPING.

STAGE 3: SHIFT TRAFFIC TO CONSTRUCTION ALIGNMENT AND REMOVE DETOUR.

REMOVAL OF PERMANENT PAVEMENT MARKINGS	= 2483 LIN. FT.
CONSTRUCTION PAVEMENT MARKINGS	= 3552 LIN. FT.
REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	= 3264 LIN. FT.
RAISED PAVEMENT MARKERS (TYPE II)	= 41 EACH
TRAFFIC DRUMS	= 18 EACH

STAGE 1
SITE 2-PINEY DITCH
MAINTENANCE OF TRAFFIC DETAILS

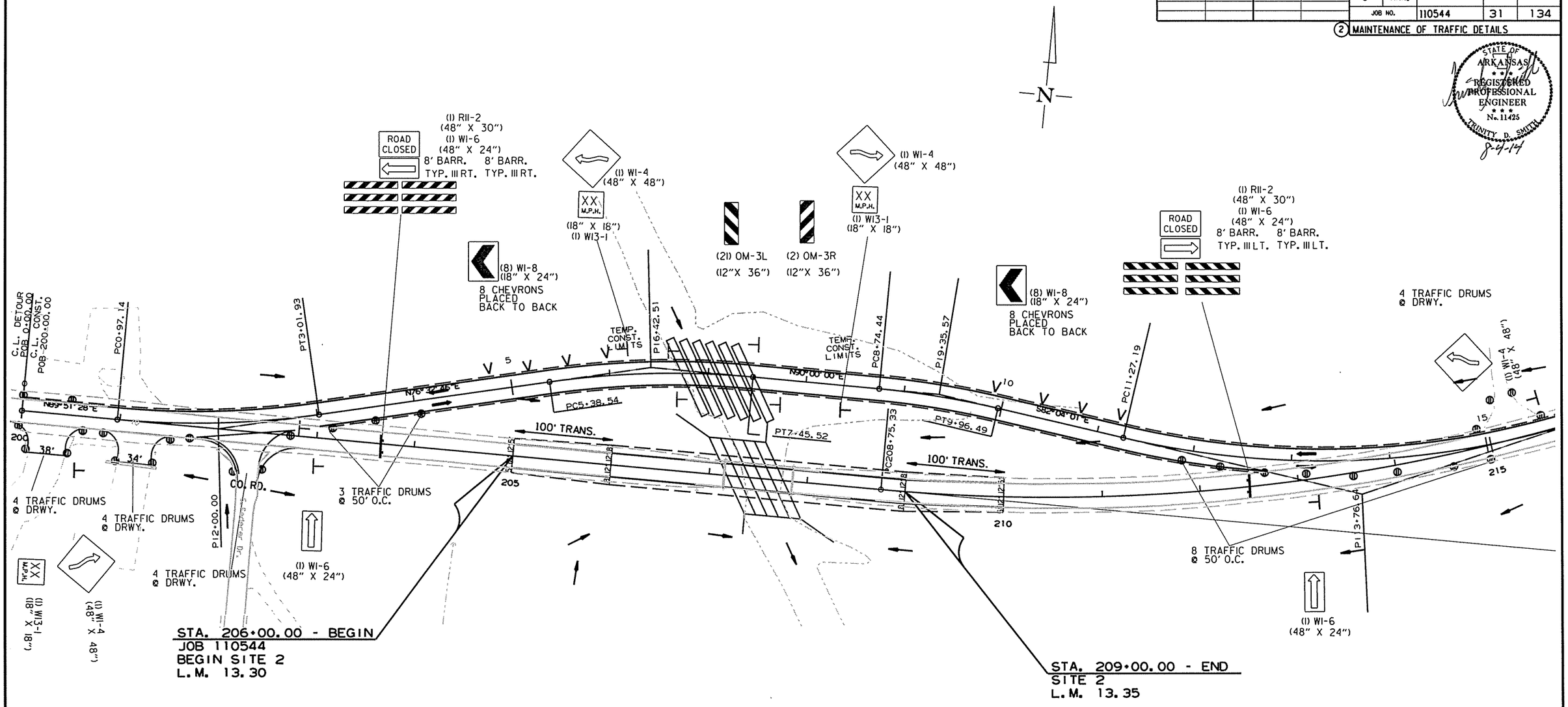
7/31/2014

R110544.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	31	134

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-9-14



STA. 206+00.00 - BEGIN
JOB 110544
BEGIN SITE 2
L.M. 13.30

STA. 209+00.00 - END
SITE 2
L.M. 13.35

SEQUENCING: SITE 2
STAGE 1: MAINTAIN TRAFFIC ON EXISTING ROADWAY, CONSTRUCT DETOUR ROADWAY.

STAGE 2: SHIFT TRAFFIC TO DETOUR ALIGNMENT AND MAINTAIN, REMOVE EXISTING BRIDGE, AND CONSTRUCT NEW R.C. BOX CULVERT. PERFORM FINAL SURFACE COURSE AND STRIPING.

STAGE 3: SHIFT TRAFFIC TO CONSTRUCTION ALIGNMENT AND REMOVE DETOUR.

REMOVAL OF PERMANENT PAVEMENT MARKINGS	= 2483 LIN. FT.
CONSTRUCTION PAVEMENT MARKINGS	= 3552 LIN. FT.
REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	= 3264 LIN. FT.
RAISED PAVEMENT MARKERS (TYPE II)(40' O.C.)	= 41 EACH
TRAFFIC DRUMS	= 27 EACH

STAGE 2
SITE 2-PINEY DITCH
MAINTENANCE OF TRAFFIC DETAILS

7/31/2014

R110544.DGN

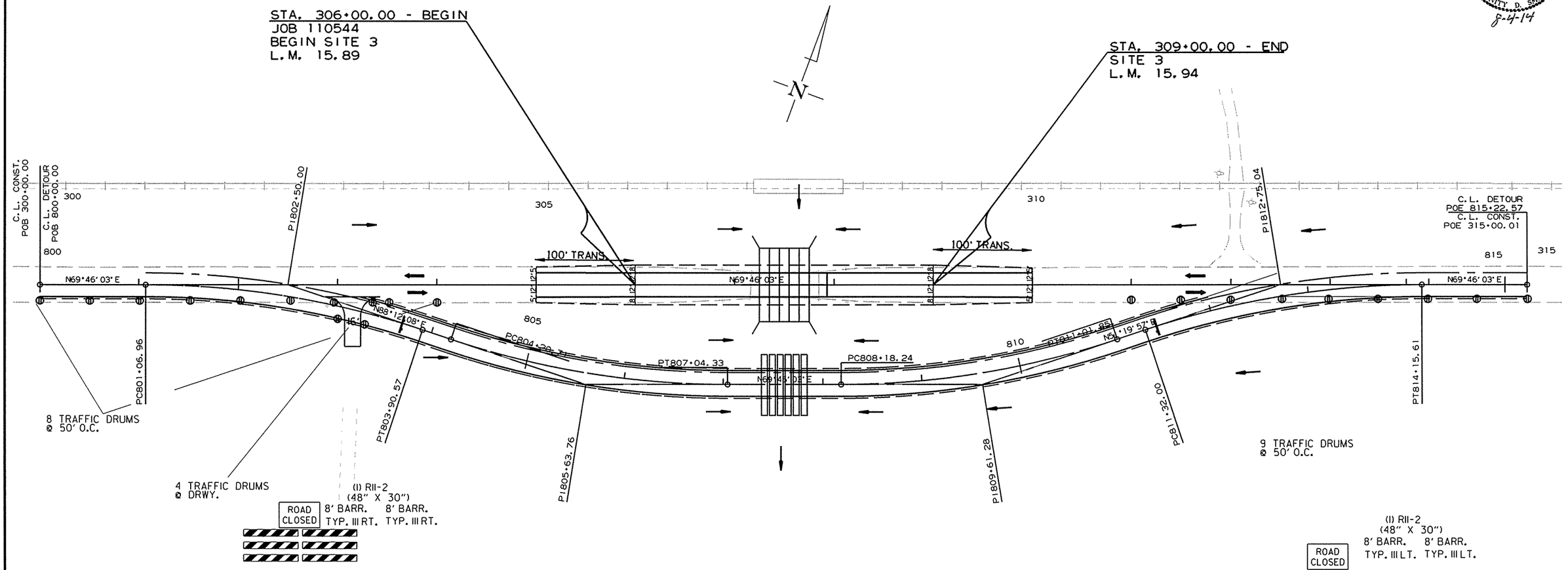
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	32	134

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-4-14

STA. 306+00.00 - BEGIN
JOB 110544
BEGIN SITE 3
L.M. 15.89

STA. 309+00.00 - END
SITE 3
L.M. 15.94



SEQUENCING: SITE 3
STAGE I: MAINTAIN TRAFFIC ON EXISTING ROADWAY, CONSTRUCT DETOUR ROADWAY.

STAGE 2: SHIFT TRAFFIC TO DETOUR ALIGNMENT AND MAINTAIN, REMOVE EXISTING BRIDGE, AND CONSTRUCT NEW R.C. BOX CULVERT. PERFORM FINAL SURFACE COURSE AND STRIPING.

STAGE 3: SHIFT TRAFFIC TO CONSTRUCTION ALIGNMENT AND REMOVE DETOUR.

REMOVAL OF PERMANENT PAVEMENT MARKINGS	= 1635 LIN. FT.
CONSTRUCTION PAVEMENT MARKINGS	= 3000 LIN. FT.
REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	= 3040 LIN. FT.
RAISED PAVEMENT MARKERS (TYPE II) (40' O.C.)	= 38 EACH
TRAFFIC DRUMS	= 21 EACH

STAGE 1
SITE 3-MAPLE SLOUGH
MAINTENANCE OF TRAFFIC DETAILS

7/31/2014

R110544.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	33	134

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-14

STA. 306+00.00 - BEGIN
JOB 110544
BEGIN SITE 3
L.M. 15.89

STA. 807+61 INSTALL
SEXT. 72" X 80'
TEMPORARY PIPE CULVERT
UNDER DETOUR ON RT.

STA. 309+00.00 - END
SITE 3
L.M. 15.94

(1) RII-2 (48" X 30")
(1) WI-6 (48" X 24")
8' BARR. 8' BARR.
TYP. III LT. TYP. III LT.

ROAD CLOSED

(1) RII-2 (48" X 30")
(1) WI-6 (48" X 24")
8' BARR. 8' BARR.
TYP. III RT. TYP. III RT.

ROAD CLOSED

9 TRAFFIC DRUMS @ 50' O.C.

(1) WI-6 (48" X 24")

(1) WI-4 (48" X 48")

(1) WI-6 (48" X 24")

(1) WI-4 (48" X 48")

(1) WI3-1 (18" X 18")

XX M.P.H.

C.L. CONST. POB 300+00.00

C.L. DETOUR POB 800+00.00

P1802+50.00

300

305

310

315

800

805

810

815

100' TRANS.

100' TRANS.

N69°46'03"E

N88°12'08"E

N5°19'52"E

PC804+20.33

PT807+04.33

PC808+18.24

PT811+01.85

P1812+75.04

8 TRAFFIC DRUMS @ DRWY.

C.L. DETOUR POE 815+22.57

C.L. CONST. POE 315+00.01

J1+06.96

8 TRAFFIC DRUMS @ DRWY.

PT803+90.57

P1805+63.76

PC811+32.00

P1809+61.28

PT814+15.61

7 TRAFFIC DRUMS @ 50' O.C.

(8) WI-8 (18" X 24")
8 CHEVRONS PLACED BACK TO BACK

(2) OM-3R (12"X 36")

(2) OM-3L (12"X 36")

(1) WI-4 (48" X 48")

(8) WI-8 (18" X 24")
8 CHEVRONS PLACED BACK TO BACK

XX M.P.H.

(1) WI3-1 (18" X 18")

(1) WI-4 (48" X 48")

SEQUENCING: SITE 3
STAGE 1: MAINTAIN TRAFFIC ON EXISTING ROADWAY, CONSTRUCT DETOUR ROADWAY.

STAGE 2: SHIFT TRAFFIC TO DETOUR ALIGNMENT AND MAINTAIN, REMOVE EXISTING BRIDGE, AND CONSTRUCT NEW R.C. BOX CULVERT. PERFORM FINAL SURFACE COURSE AND STRIPING.

STAGE 3: SHIFT TRAFFIC TO CONSTRUCTION ALIGNMENT AND REMOVE DETOUR.

REMOVAL OF PERMANENT PAVEMENT MARKINGS	= 1635 LIN. FT.
CONSTRUCTION PAVEMENT MARKINGS	= 3000 LIN. FT.
REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	= 3040 LIN. FT.
RAISED PAVEMENT MARKERS (TYPE II) (40' O.C.)	= 38 EACH
TRAFFIC DRUMS	= 30 EACH

STAGE 2
SITE 3-MAPLE SLOUGH
MAINTENANCE OF TRAFFIC DETAILS

7/31/2014

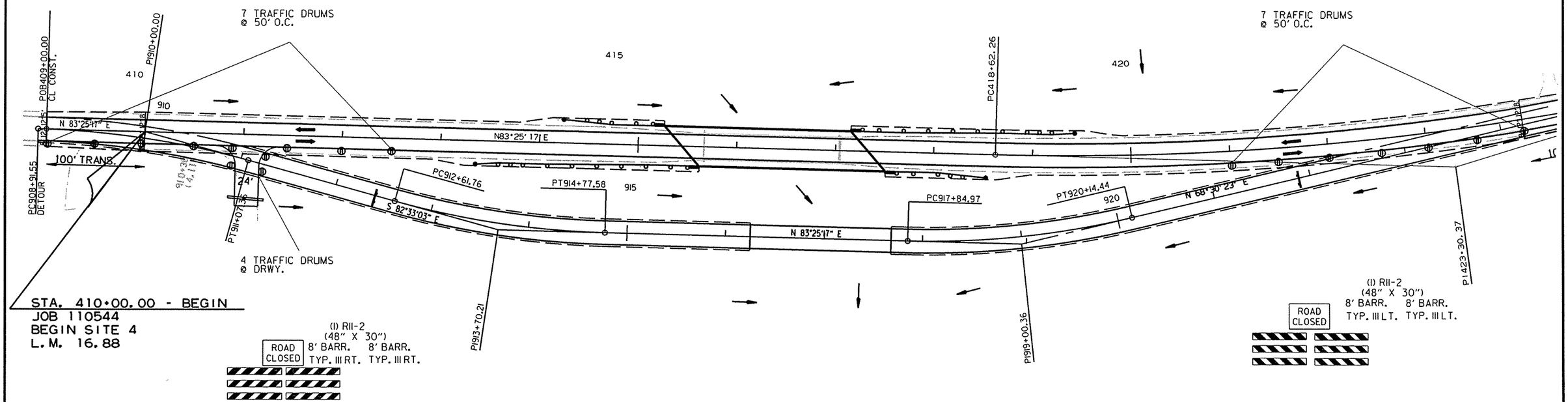
R110544.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	34	134

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-4-14

STA. 916+19 - STA. 917+62
INSTALL TEMPORARY DETOUR BRIDGE (ELEV. 195.52)
REFER TO BRIDGE PLANS FOR DETAILS.



STA. 410+00.00 - BEGIN
JOB 110544
BEGIN SITE 4
L.M. 16.88

STA. 424+00.00 - END
SITE 4
L.M. 17.15

SEQUENCING: SITE 4
STAGE I: MAINTAIN TRAFFIC ON EXISTING ROADWAY, CONSTRUCT DETOUR ROADWAY AND TEMPORARY BRIDGE.

STAGE 2: SHIFT TRAFFIC TO DETOUR ALIGNMENT AND MAINTAIN, REMOVE EXISTING BRIDGE, AND CONSTRUCT NEW BRIDGE. PERFORM FINAL SURFACE COURSE AND STRIPING.

STAGE 3: SHIFT TRAFFIC TO CONSTRUCTION ALIGNMENT AND REMOVE DETOUR.

REMOVAL OF PERMANENT PAVEMENT MARKINGS	= 2456 LIN. FT.
CONSTRUCTION PAVEMENT MARKINGS	= 4320 LIN. FT.
REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	= 2288 LIN. FT.
RAISED PAVEMENT MARKERS (TYPE II)	= 23 EACH
TRAFFIC DRUMS	= 20 EACH

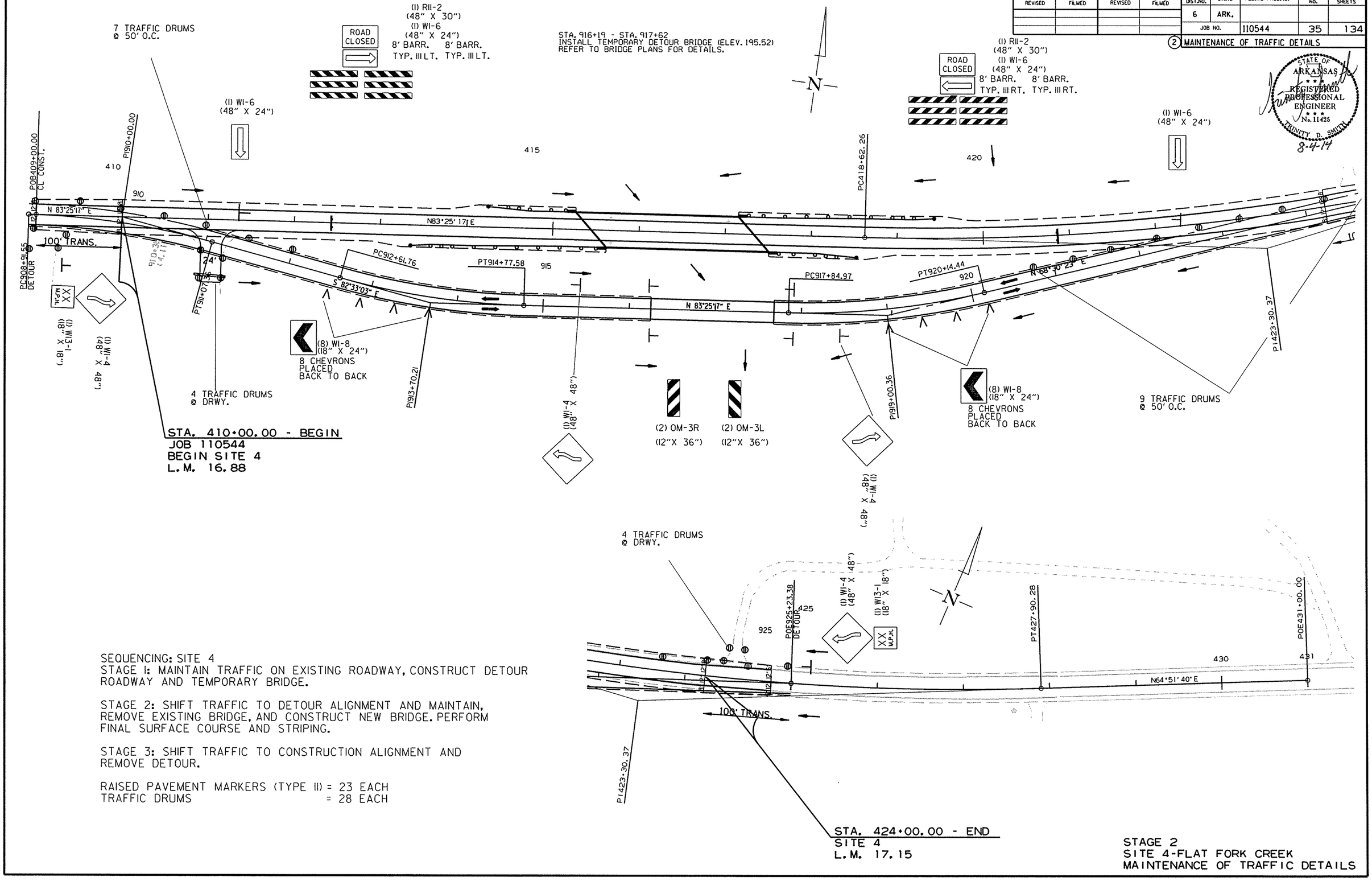
STAGE 1
SITE 4-FLAT FORK CREEK
MAINTENANCE OF TRAFFIC DETAILS

7/31/2014
R110544.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	35	134

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-4-14



SEQUENCING: SITE 4
STAGE I: MAINTAIN TRAFFIC ON EXISTING ROADWAY, CONSTRUCT DETOUR ROADWAY AND TEMPORARY BRIDGE.

STAGE 2: SHIFT TRAFFIC TO DETOUR ALIGNMENT AND MAINTAIN, REMOVE EXISTING BRIDGE, AND CONSTRUCT NEW BRIDGE. PERFORM FINAL SURFACE COURSE AND STRIPING.

STAGE 3: SHIFT TRAFFIC TO CONSTRUCTION ALIGNMENT AND REMOVE DETOUR.

RAISED PAVEMENT MARKERS (TYPE II) = 23 EACH
TRAFFIC DRUMS = 28 EACH

STAGE 2
SITE 4-FLAT FORK CREEK
MAINTENANCE OF TRAFFIC DETAILS

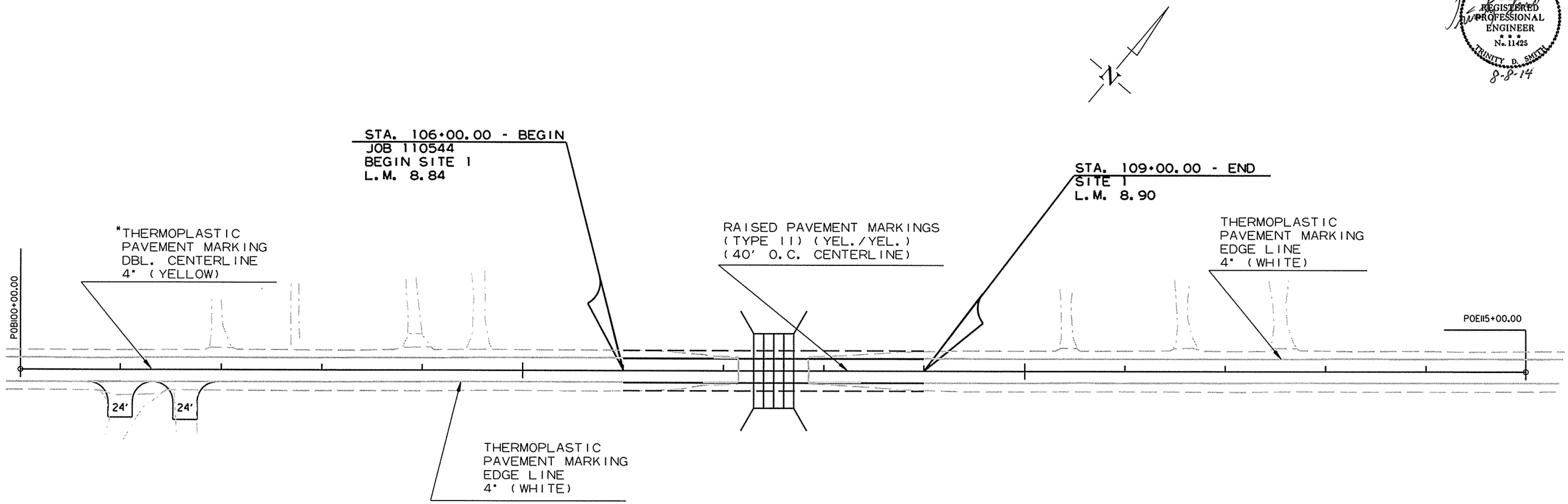
7/31/2014

R110544.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	36	134

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-8-14



FINAL STRIPING

THERMOPLASTIC PAVEMENT MARKINGS

LT. & RT. EDGE LINES (WHITE (4")	=	3000 LIN. FT.
DBL. CENTERLINE (YELLOW) (4")	=	3000 LIN. FT.
RAISED PAVEMENT MARKERS (TYPE II) (40' O.C.)	=	38 EACH

*THE 4" YELLOW STRIPING QUANTITY HAS BEEN ESTIMATED BASED ON A DOUBLE YELLOW CENTERLINE STRIPE FOR THE ENTIRE PROJECT. THE PROJECT MUST BE MARKED FOR PASSING/NO PASSING ZONES PRIOR TO THE PLACEMENT OF ANY FINAL STRIPING. CONTACT THE MAINTENANCE DIVISION AFTER THE FINAL LIFT OF SURFACE COURSE HAS BEEN PLACED TO SCHEDULE THE ZONING OF THE PROJECT.

8/7/2014

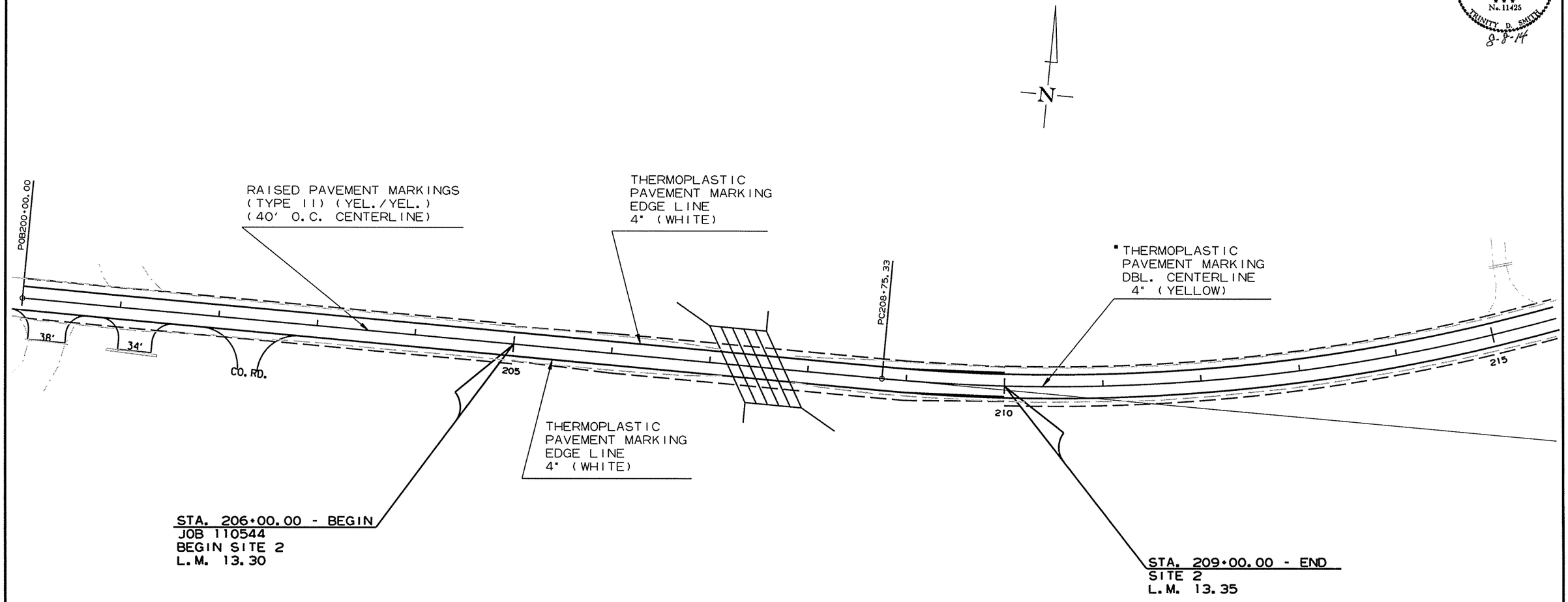
R110544.DGN

SITE 1-BURNT BRIDGE CREEK
PERMANENT PAVEMENT MARKING DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	37	134

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-8-14



FINAL STRIPING

THERMOPLASTIC PAVEMENT MARKINGS

LT. & RT. EDGE LINES (WHITE (4")	=	3000 LIN. FT.
DBL. CENTERLINE (YELLOW) (4")	=	3000 LIN. FT.
RAISED PAVEMENT MARKERS (TYPE II)	=	38 EACH

* THE 4" YELLOW STRIPING QUANTITY HAS BEEN ESTIMATED BASED ON A DOUBLE YELLOW CENTERLINE STRIPE FOR THE ENTIRE PROJECT. THE PROJECT MUST BE MARKED FOR PASSING/NO PASSING ZONES PRIOR TO THE PLACEMENT OF ANY FINAL STRIPING. CONTACT THE MAINTENANCE DIVISION AFTER THE FINAL LIFT OF SURFACE COURSE HAS BEEN PLACED TO SCHEDULE THE ZONING OF THE PROJECT.

8/8/2014

R110544.DGN

SITE 2-PINEY DITCH
PERMANENT PAVING MARKING DETAILS

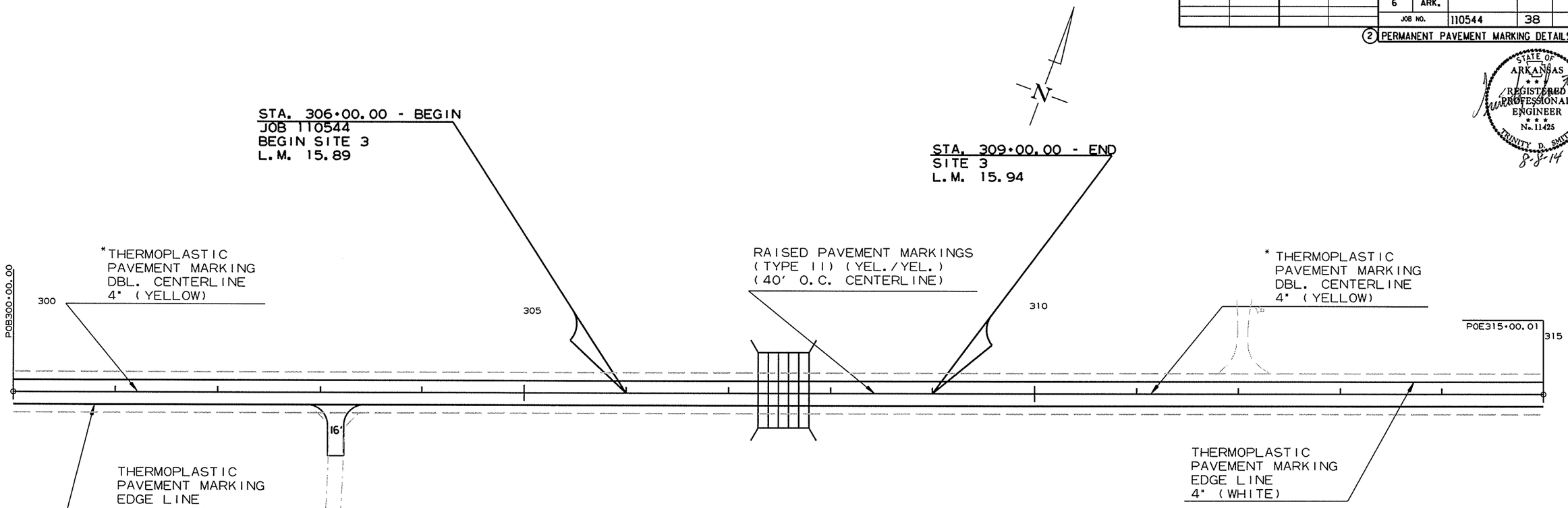
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	38	134

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-8-14

STA. 306+00.00 - BEGIN
JOB 110544
BEGIN SITE 3
L.M. 15.89

STA. 309+00.00 - END
SITE 3
L.M. 15.94



FINAL STRIPING

THERMOPLASTIC PAVEMENT MARKINGS

LT. & RT. EDGE LINES (WHITE) (4")	=	3000 LIN. FT.
DBL. CENTERLINE (YELLOW) (4")	=	3000 LIN. FT.
RAISED PAVEMENT MARKERS (TYPE II)	=	38 EACH

* THE 4" YELLOW STRIPING QUANTITY HAS BEEN ESTIMATED BASED ON A DOUBLE YELLOW CENTERLINE STRIPE FOR THE ENTIRE PROJECT. THE PROJECT MUST BE MARKED FOR PASSING/NO PASSING ZONES PRIOR TO THE PLACEMENT OF ANY FINAL STRIPING. CONTACT THE MAINTENANCE DIVISION AFTER THE FINAL LIFT OF SURFACE COURSE HAS BEEN PLACED TO SCHEDULE THE ZONING OF THE PROJECT.

8/8/2014

R110544.DGN

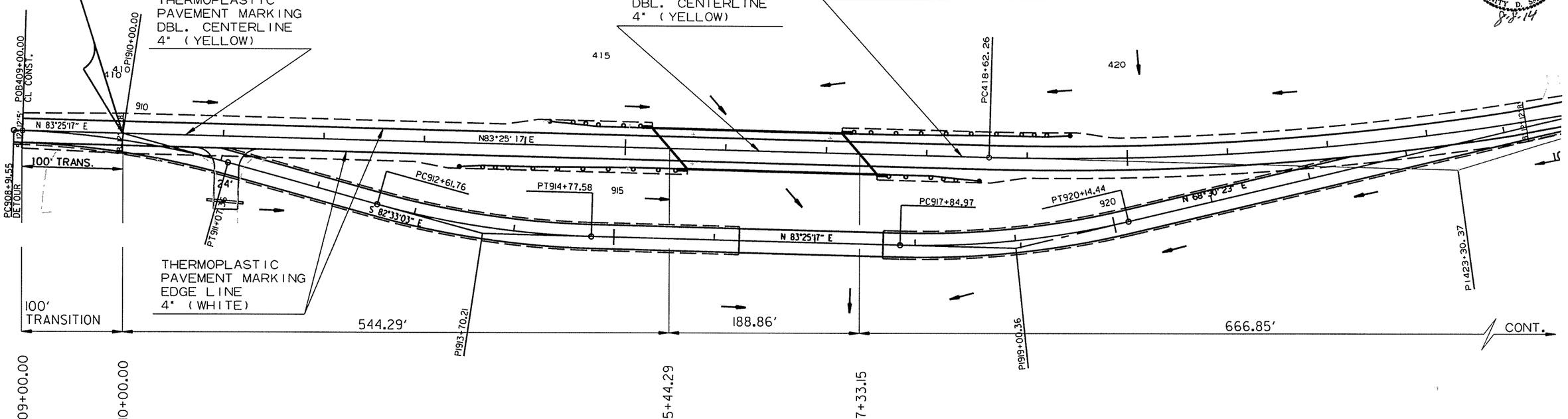
SITE 3-MAPLE SLOUGH
PERMANENT PAVEMENT MARKING DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	39	134

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-5-14

STA. 410+00.00 - BEGIN
JOB 110544
BEGIN SITE 4
L.M. 16.88

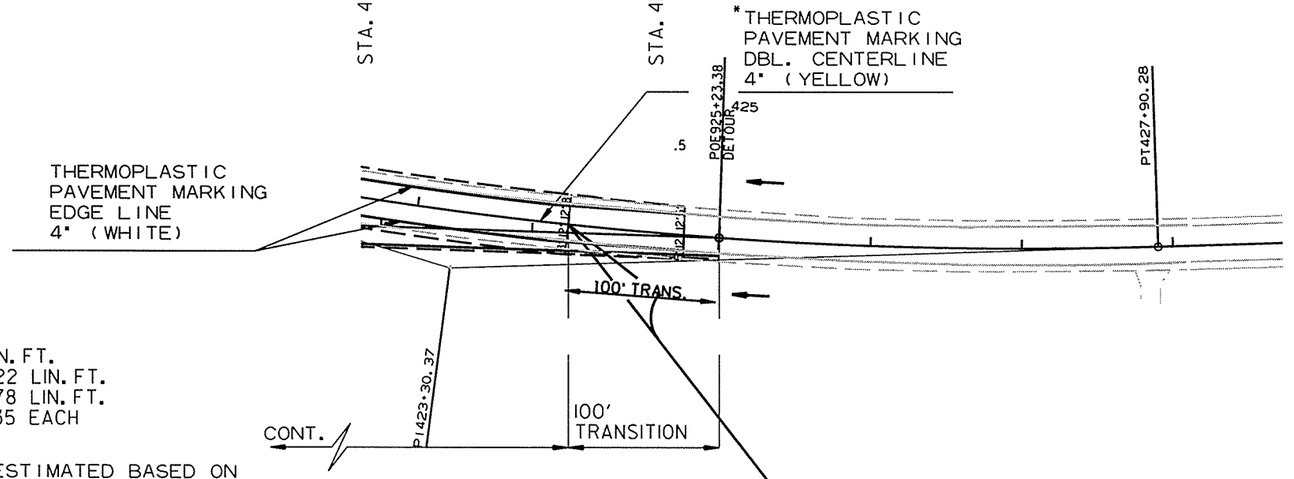


STA. 409+00.00

STA. 410+00.00

STA. 415+44.29

STA. 417+33.15



STA. 424+00.00

STA. 425+00.00

FINAL STRIPING

THERMOPLASTIC PAVEMENT MARKINGS

LT. & RT. EDGE LINES (WHITE) (4")	=	2800 LIN. FT.
DBL. CENTERLINE (YELLOW) (4")	=	2422 LIN. FT.
HIGH PERFORMANCE CONTRAST MARKING	=	378 LIN. FT.
RAISED PAVEMENT MARKERS (TYPE II)	=	35 EACH

*THE 4" YELLOW STRIPING QUANTITY HAS BEEN ESTIMATED BASED ON A DOUBLE YELLOW CENTERLINE STRIPE FOR THE ENTIRE PROJECT. THE PROJECT MUST BE MARKED FOR PASSING/NO PASSING ZONES PRIOR TO THE PLACEMENT OF ANY FINAL STRIPING. CONTACT THE MAINTENANCE DIVISION AFTER THE FINAL LIFT OF SURFACE COURSE HAS BEEN PLACED TO SCHEDULE THE ZONING OF THE PROJECT.

8/8/2014

R110544.DGN

SITE 4-FLAT FORK CREEK
PERMANENT PAVEMENT MARKING DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	40	134

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-4-14

ADVANCE WARNING SIGNS AND DEVICES,CONSTRUCTION PAVEMENT MARKINGS, AND PERMANENT PAVEMENT MARKINGS

SIGN NUMBER	DESCRIPTION	SIGN SIZE	STAGE 1	STAGE 2	STAGE 3	END JOB	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED		TRAFFIC DRUMS	BARRICADES (TYPE III)		REMOVABLE CONSTRUCTION PVMT. MARKING	REMOVAL OF PERM. PVMT. MARKING	CONSTRUCTION PAVEMENT MARKINGS	RAISED PAVEMENT MARKERS	THERMOPLASTIC PAVEMENT MARKINGS		HIGH PERFORMANCE CONTRAST PAVEMENT MARKING
											RIGHT	LEFT				TYPE II (YEL/YEL)	WHITE (4")	YELLOW (4")	YELLOW (4")
			SQ.FT. - LIN.FT. - EACH					NO.	SQ.FT.	EACH	LIN. FT.		LIN. FT.			EACH	LIN.FT.		LIN.FT.
W20-1	ROAD WORK 1500 FT.	48"X48"	8	8	8	8	8	8	128.0										
W20-1	ROAD WORK 1000 FT.	48"X48"	8	8	8	8	8	8	128.0										
W20-1	ROAD WORK 500 FT.	48"X48"	8	8	8	8	8	8	128.0										
W20-1	ROAD WORK AHEAD	48"X48"	1	1	1	1	1	1	16.0										
G20-2	END ROAD WORK	48"X24"	9	9	9	9	9	9	72.0										
R11-2	ROAD CLOSED	48"X30"	8	8	8	8	8	8	80.0										
OM-3R	OBJECT MARKER	12"X36"		8	8	8	8	8	24.0										
OM-3L	OBJECT MARKER	12"X36"		8	8	8	8	8	24.0										
R4-1	DO NOT PASS	24"X30"	8	8	8	8	8	8	40.0										
RSP-1	SHOULDER CLOSED	48"X30"	8	8		8	8	8	80.0										
W1-4	CURVE	48"X48"		8		8	8	8	128.0										
W1-6	ARROW	48"X24"		16	16	16	16	16	128.0										
W1-8	CHEVRONS	18"X24"		64	64	64	64	64	192.0										
W13-1	SPEED LIMIT (XX M.P.H.)	24"X24"		8		8	8	8	32.0										
	TRAFFIC DRUMS		74	174			174			174									
	TYPE III BARRICADE-RT. (8')		8	8	8	8	8				64								
	TYPE III BARRICADE-LT. (8')		8	8	8	8	8					64							
	REMOVAL OF PERMANENT PAVEMENT MARKING													7708					
	CONSTRUCTION PAVEMENT MARKINGS														14740				
	REMOVABLE CONSTRUCTION PAVEMENT MARKINGS												10888						
	RAISED PAVEMENT MARKERS TYPE II (YEL/YEL)															289			
	THERMOPLASTIC PAVEMENT MARKINGS-WHITE(4")																4600		
	THERMOPLASTIC PAVEMENT MARKINGS-YELLOW(4")																	4222	
	HIGH PERFORMANCE CONTRAST PAVEMENT MARKING YELLOW (4")																		378
TOTALS:								1200.0		174	64	64	10888	7708	14740	289	4600	4222	378

THIS IS A HIGH TRAFFIC VOLUME ROAD AS DEFINED IN SECTION 604.03, STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, 2014 EDITION.

RUMBLE STRIPS IN ASPHALT SHOULDERS

LOCATION	RUMBLE STRIPS IN ASPHALT SHOULDERS
	LIN. FT.
ENTIRE PROJECT - IF AND WHERE	3378
DIRECTED BY THE ENGINEER	
TOTAL:	3378

QUANTITY ESTIMATED.
SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	41	134

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-4-14

ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC

LOCATION	ASPHALT CONC. PATCHING FOR MAINT. OF TRAFFIC	TACK COAT
	TON	GALLON
ENTIRE PROJECT - IF	11	22
AND WHERE DIRECTED		
BY THE ENGINEER.		
TOTALS:	11	22

BASIS FOR ESTIMATE:
ASPHALT PATCH - 25 TONS PER MI.
TACK COAT - 50 GAL. PER MI.
QUANTITIES ESTIMATED.
SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

CLEARING AND GRUBBING

STATION	STATION	CLEARING	GRUBBING
		STATION	
100+00	115+00	15	15
200+00	217+00	17	17
300+00	316+00	16	16
400+00	426+00	26	26
TOTALS:		74	74

COLD MILLING ASPHALT PAVEMENT

STATION	STATION	DESCRIPTION	LENGTH	WIDTH	COLD MILLING ASPHALT PAVEMENT
			LIN. FT.		SQ. YD.
105+00	106+00	SITE 1 - MAIN LANES	100	24	267
109+00	110+00	SITE 1 - MAIN LANES	100	24	267
105+00	206+00	SITE 2 - MAIN LANES	100	24	267
209+00	210+00	SITE 2 - MAIN LANES	100	24	267
305+00	306+00	SITE 3 - MAIN LANES	100	24	267
309+00	310+00	SITE 3 - MAIN LANES	100	24	267
409+00	410+00	SITE 4 - MAIN LANES	100	24	267
424+00	425+00	SITE 4 - MAIN LANES	100	24	267
TOTAL:					2136

QUANTITY ESTIMATED.
SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

ACHM PATCHING OF EXISTING ROADWAY

LOCATION	ACHM PATCHING OF EXISTING ROADWAY	TACK COAT
	TON	GALLON
ENTIRE PROJECT - IF	100	200
AND WHERE DIRECTED		
BY THE ENGINEER.		
TOTALS:	100	200

QUANTITIES ESTIMATED.
SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

BENCH MARKS

LOCATION	BENCH MARKS
	EACH
STA. 107+50 R.C. BOX CULVERT	1
STA. 207+18 R.C. BOX CULVERT	1
STA. 307+50 R.C. BOX CULVERT	1
STA. 415+44.29 BRIDGE	1

SHOWN FOR INFORMATIONAL PURPOSES ONLY.
BENCH MARKS TO BE FURNISHED, PLACED AND RECORDED BY STATE FORCES.

4" PIPE UNDERDRAINS

LOCATION	4" PIPE UNDERDRAINS	UNDERDRAIN OUTLET PROTECTORS
	LIN.FT.	EACH
ENTIRE PROJECT - IF AND WHERE	1600	12
DIRECTED BY THE ENGINEER		
TOTALS:	1600	12

QUANTITIES ESTIMATED.
SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

SOIL STABILIZATION

LOCATION	SOIL STABILIZATION
	TON
ENTIRE PROJECT - IF AND WHERE	400
DIRECTED BY THE ENGINEER	
TOTAL:	400

QUANTITY ESTIMATED.
SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

SOIL LOG

STATION	LOCATION	DEPTH	LIQUID LIMIT	PLASTICITY INDEX	AASHTO SOIL CLASS	COLOR
104+00	6' RT.	0-5	46	17	A-7-6(18)	GRAY
104+00	18' RT.	0-5	23	10	A-4(2)	GRAY
104+00	30' RT.	0-5	35	19	A-6(12)	BR/GR
111+00	6' LT.	0-5	48	29	A-7-6(28)	BR/GR
111+00	18' LT.	0-5	19	4	A-4(0)	BR/GR
111+00	33' LT.	0-5	30	13	A-6(7)	BR/RD
204+00	6' RT.	0-5	30	14	A-6(12)	BR/GR
204+00	17' RT.	0-5	ND	NP	A-4(0)	BR/GR
204+00	27' RT.	0-5	27	9	A-4(6)	BR/GR
211+00	6' LT.	0-5	37	20	A-6(17)	GRAY
211+00	16' LT.	0-5	19	6	A-4(0)	BR/GR
211+00	26' LT.	0-5	35	16	A-6(12)	BR/GR
304+00	6' RT.	0-5	29	10	A-4(8)	BR/GR
304+00	16' RT.	0-5	23	10	A-4(1)	BR/GR
304+00	27' RT.	0-5	31	10	A-4(6)	BR/GR
311+00	6' LT.	0-5	34	15	A-6(13)	BR/GR
311+00	15' LT.	0-5	17	4	A-4(0)	BR/GR
311+00	24' LT.	0-5	29	10	A-4(6)	BR/GR
412+00	6' RT.	0-5	32	14	A-4(12)	BROWN
412+00	15' RT.	0-5	32	14	A-6(3)	BR/GR
412+00	24' RT.	0-5	30	10	A-4(7)	BROWN
420+05	6' LT.	0-5	31	12	A-6(10)	BROWN
420+05	15' LT.	0-5	18	4	A-4(0)	BROWN
420+05	24' LT.	0-5	33	10	A-4(5)	BROWN

NOTE: 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 ABOVE TABULATIONS.

8/4/2014

R110544.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	42	134

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-4-14

SELECTED PIPE BEDDING

LOCATION	SELECTED PIPE BEDDING
	CU.YD.
ENTIRE PROJECT - TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.	200
TOTAL:	200

QUANTITY ESTIMATED.
SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

MAILBOXES

LOCATION	MAILBOXES	MAILBOX SUPPORTS (SINGLE)
	EACH	
SITE 1	3	3
SITE 2	1	1
SITE 3	1	1
SITE 4	1	1
TOTALS:	6	6

FENCING ITEMS

STATION	STATION	SIDE	REMOVAL AND DISPOSAL OF FENCE	WIRE FENCE (TYPE D)
			LIN. FT.	LIN. FT.
415+07	418+81	LT.	374	400
TOTALS:			374	400

PERMANENT EROSION CONTROL

STATION	STATION	LOCATION	SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION
			ACRE	TON	ACRE	M. GAL.	ACRE
102+00	112+50	MAIN LANES - SITE 1	0.68	1	0.68	69.4	0.68
201+00	214+00	MAIN LANES - SITE 2	0.47	1	0.47	47.9	0.47
302+00	312+00	MAIN LANES - SITE 3	0.32	1	0.32	32.6	0.32
410+00	425+00	MAIN LANES - SITE 4	1.22	2	1.22	124.4	1.22
602+44	614+08	OBLITERATE DETOUR SITE 1	2.92	6	2.92	297.8	2.92
0+00	17+14	OBLITERATE DETOUR SITE 2	4.02	8	4.02	410.0	4.02
802+54	812+68	OBLITERATE DETOUR SITE 3	3.11	6	3.11	317.2	3.11
910+38	923+47	OBLITERATE DETOUR SITE 4	5.27	11	2.27	537.5	5.27
ENTIRE	PROJECT	TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.	2.00	4	2.00	204.0	2.00
TOTALS:			20.01	40	17.01	2040.8	20.01

BASIS OF ESTIMATE:
LIME ……... 2 TONS PER ACRE SEEDING;
WATER ….. 102.0 M.GAL. PER ACRE SEEDING

REMOVAL AND DISPOSAL OF ITEMS

STATION	STATION	DESCRIPTION	SIDE	GUARDRAIL	PIPE CULVERT	CATCH BASINS
				LIN.FT.	EACH	EACH
101+68		18" x 30' CM PIPE CULVERT	RT.		1	
106+89	107+15	EXISTING GUARDRAIL	LT.	26		
106+88	107+15	EXISTING GUARDRAIL	RT.	27		
107+83	108+13	EXISTING GUARDRAIL	RT.	30		
107+84	108+11	EXISTING GUARDRAIL	LT.	27		
202+34		24" x 30' CM PIPE CULVERT	RT.		1	
202+70		CONC. DRAIN BOX	LT.			1
202+70		18"X44' RC PIPE CULVERT	LT.		1	
203+38		CONC. DRAIN BOX	LT.			1
203+38		18'X51' RC PIPE CULVERT	LT.		1	
204+10		CONC. DRAIN BOX	LT.			1
204+10		18"X30' RC PIPE CULVERT	LT.		1	
206+88	207+16	EXISTING GUARDRAIL	LT.	28		
206+89	207+15	EXISTING GUARDRAIL	RT.	26		
207+84	208+12	EXISTING GUARDRAIL	RT.	28		
207+85	208+13	EXISTING GUARDRAIL	LT.	28		
306+88	307+17	EXISTING GUARDRAIL	LT.	29		
306+88	307+15	EXISTING GUARDRAIL	RT.	27		
307+84	308+12	EXISTING GUARDRAIL	RT.	28		
307+84	308+13	EXISTING GUARDRAIL	LT.	29		
411+04		24" x 30' CM PIPE CULVERT	RT.		1	
415+04	415+67	EXISTING GUARDRAIL	LT.	63		
415+03	415+67	EXISTING GUARDRAIL	RT.	64		
417+03	417+67	EXISTING GUARDRAIL	RT.	64		
417+03	417+69	EXISTING GUARDRAIL	LT.	66		
TOTALS:				590	6	3

LIME TREATED SUBGRADE

STATION	STATION	DESCRIPTION	LENGTH	AVERAGE WIDTH	PROCESSING LIME TREATED SUBGRADE	ALT. NO. 1 QUICK LIME (SLURRY) IN TREATED SUBGRADE	ALT. NO. 2 QUICKLIME (DRY) IN TREATED SUBGRADE	ALT. NO. 3 HYDRATED LIME IN TREATED SUBGRADE
			LIN.FT.		SQ. YD.	TON		
ENTIRE	PROJECT	DETOUR LANES - SITE 1	1200	35.00	4666.67	108	81	108
ENTIRE	PROJECT	DETOUR LANES - SITE 2	1130	35.00	4394.44	102	76	102
ENTIRE	PROJECT	DETOUR LANES - SITE 3	968	35.00	3764.44	87	65	87
ENTIRE	PROJECT	DETOUR LANES - SITE 4	1300	35.00	5055.56	117	88	117
TOTALS:					17881.11	414	310	414

BASIS OF ESTIMATE:
HYDRATED = 4% =46.2 LBS./SQ. YD.
QUICK LIME PEBBBLE 3% = 34.7 LBS./SQ. YD.
TREATED SUBGRADE DEPTH = 16"

7/31/2014

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
9/12/14				6	ARK.			
				JOB NO.		110544	43	134

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-12-14

EARTHWORK

STATION	STATION	LOCATION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT
			CU.YD.	CU. YD.
106+00	109+00	MAIN LANES (SITE 1)	1067	1346
206+00	209+00	MAIN LANES (SITE 2)	634	3482
306+00	309+00	MAIN LANES (SITE 3)	497	1272
410+00	424+00	MAIN LANES (SITE 4)	738	4767
102+00	113+00	DETOUR CONSTRUCTION (SITE 1)	385	9794
102+00	113+00	DETOUR OBLITERATION (SITE 1)	11053	380
201+00	214+00	DETOUR CONSTRUCT (SITE 2)	463	11519
201+00	214+00	DETOUR OBLITERATION (SITE 2)	13152	549
302+00	312+00	DETOUR CONSTRUCTION (SITE 3)	291	8930
302+00	312+00	DETOUR OBLITERATION (SITE 3)	9241	261
410+00	425+00	DETOUR CONSTRUCTION (SITE 4)	1528	8655
410+00	425+00	DETOUR OBLITERATION (SITE4)	8967	1611
ENTIRE	PROJECT	DRIVEWAYS	170	15
ENTIRE	PROJECT	TEMPORARY DRIVEWAYS		566
ENTIRE	PROJECT	BRIDGE EMBANKMENT EXCAVATION (SITE 4)	750	
ENTIRE	PROJECT	* IF AND WHERE DIRECTED BY THE ENGINEER		
ENTIRE	PROJECT	CHANNEL CHANGE (SITE 1, 2, & 3)	6000	
TOTALS:			54936	53147

NOTE: EARTHWORK QUANTITIES TO BE PAID AS PLAN QUANTITY.

STONE BACKFILL

STATION	STATION	LOCATION	STONE BACKFILL	GEOTEXTILE FABRIC (TYPE 8)
			TON	SQ. YD.
107+26.75	107+73.75	MAIN LANES - SITE 1	306	382
207+21.46	207+78.54	MAIN LANES - SITE 2	436	545
307+21.67	307+78.34	MAIN LANES - SITE 3	373	466
TOTALS:			1115	1393

GUARDRAIL

STATION	STATION	SIDE	GUARDRAIL (TYPE A)	TERMINAL ANCHOR POSTS (TYPE 1)	THRIE BEAM GUARDRAIL TERMINAL
			LIN. FT.	EACH	
413+31.77	415+50.52	RT.	200	1	1
414+16.77	415+10.52	LT.	75	1	1
417+67.48	418+61.23	RT.	75	1	1
417+27.48	419+46.23	LT.	200	1	1
TOTALS:			550	4	4

STRUCTURES - OVER 20'-0" SPAN

STATION	DESCRIPTION	SPAN	LENGTH	HEIGHT	CLASS "S" CONCRETE - ROADWAY	REINFORCING STEEL ROADWAY- (GRADE 60)	UNCLASSIFIED EXCAVATION FOR STRUCTURES- ROADWAY	SOLID SODDING	WATER	STANDARD DRAWINGS NUMBERS
		LIN. FT.			CU. YD.	POUND	CU. YD.	SQ.YD.	M.GAL.	
107+50	CONSTRUCT QUAD. 10' X 10' R.C. BOX CULVERT W/3:1 WINGS LT. & RT.	74	10	10	382.09	45940	148	44	0.6	RCB-1, RCB-2, PBC-1,SPECIAL DETAILS
207+50	CONSTRUCT QUINT. 10' X 9' R.C. BOX CULVERT W/3:1 WINGS LT. & RT.	86	10	9	515.66	63971	187	53	0.7	RCB-1, RCB-2, PBC-1,SPECIAL DETAILS
307+50	CONSTRUCT QUINT. 10' X 5' R.C. BOX CULVERT W/3:1 WINGS LT. & RT.	74	10	5	363.65	43387	146	38	0.5	RCB-1, RCB-2, PBC-1,SPECIAL DETAILS
TOTALS:					1261.40	153298	481	135	1.8	

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

APPROACH GUTTERS

STATION	STATION	SIDE	APPROACH GUTTERS (TYPE B) W=8'-0"	REINFORCING STEEL - RDWY. (GRADE 60)
			CU. YD.	POUNDS
414+91.5	415+24.5	LT.	8.20	730
415+31.5	415+64.5	RT.	8.20	730
417+13.5	417+46.5	LT.	8.20	730
417+53.5	417+86.5	RT.	8.20	730
TOTALS:			32.80	2920

DRIVEWAYS

STATION	SIDE	LOCATION	DESCRIPTION	WIDTH	ACHM EXTENSION LENGTH	TURNOUT AREA	TOTAL DRIVEWAY AREA	AGGREGATE BASE CRSE. (CL.7) (7" COMP. DEPTH)	ACHM SURFACE CRSE. (1/2") (PG64-22) (220 LB./SQ. YD.)	18" SIDE DRAIN	24" SIDE DRAIN	18" TEMPORARY CULVERT	72" TEMPORARY CULVERT	96" TEMPORARY CULVERT
				LIN.FT.		SQ. YD.	SQ. YD.	TON	TON	LIN.FT.		LIN. FT.	LIN. FT.	LIN. FT.
101+00	RT.	MAIN LANES	DRIVEWAY	24	15	72	112	45	8					
101+68	RT.	MAIN LANES	DRIVEWAY	24	15	72	112	45	8	42				
103+89	LT.	MAIN LANES	DRIVEWAY	16		55	55	22	6			26		
104+57	LT.	MAIN LANES	DRIVEWAY	16		55	55	22	6			42		
110+41	LT.	MAIN LANES	DRIVEWAY	16		55	55	22	6			56		
111+57	RT.	MAIN LANES	DRIVEWAY	16		55	55	22	6			34		
112+54	RT.	MAIN LANES	DRIVEWAY	16		55	55	22	6					
200+28	RT.	MAIN LANES	DRIVEWAY	38		104	104	42	11					
201+18	RT.	MAIN LANES	DRIVEWAY	34		95	95	39	10					
202+34	RT.	MAIN LANES	COUNTY ROADWAY	20		64	64	26	7		36	36		
303+15	RT.	MAIN LANES	DRIVEWAY	16	30	55	108	44	6					
411+04	RT.	MAIN LANES	DRIVEWAY	24	41	72	181	73	8		36	36		
607+24		DETOUR LANES	TRP. TEMPORARY PIPE CULVERT ON 25^ LT. FWD. SKEW										240	
708+24		DETOUR LANES	SEXT. TEMPORARY PIPE CULVERT ON 27^ RT. FWD SKEW											432
807+61		DETOUR LANES	SEXT. TEMPORARY PIPE CULVERT										360	
		ENTIRE PROJECT	TEMPORARY DRIVES					225						
TOTALS:								649	88	42	72	230	600	432

BASIS OF ESTIMATE:

VOLUME CONTROL: ACHM SURFACE COURSE (1/2"): MIN. AGGR. 94.8%, ASPHALT BINDER (PG 64-22) 5.2%

Nmax = 115 GYRATIONS FOR PG 64-22.

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

APPROACH SLABS

STATION	STATION	APPROACH SLABS (TYPE SP.) WIDTH = 24'-0"	REINF. STEEL - RDWY. (GRADE 60)	AGGREGATE BASE COURSE (CLASS 7)
		CU. YD.	POUNDS	TONS
414+99.50	415+44.50	63.60	8040	36.40
417+33.50	417+78.50	63.60	8040	36.40
TOTALS:		127.20	16080	72.80

9/12/2014

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	44	134

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-4-14

TEMPORARY EROSION CONTROL

STATION	STATION	LOCATION	SAND BAG DITCH CHECKS (E-5)	* DIVERSION DITCH (E-8)	SILT FENCE (E-11)	PIPE FOR SLOPE DRAIN (E-12)	SEDIMENT BASIN	OBLITERATION OF SEDIMENT BASIN	*SEDIMENT REMOVAL AND DISPOSAL	DUMPED RIPRAP	TEMPORARY SEEDING	MULCH COVER	WATER
			BAGS	LIN. FT.		LIN. FT.	CU. YD.			CU. YD.	ACRE	ACRE	M.GAL.
		DETOUR LANES - SITE 1	90		1590		16	16	200		0.94	0.94	19.2
		DETOUR LANES - SITE 2	162		665		16	16			1.52	1.52	31.0
		DETOUR LANES - SITE 3	72		640		16	16			0.83	0.83	16.9
		DETOUR LANES - SITE 4	126		540		16	16			0.97	0.97	19.8
ENTIRE	PROJECT	DETOUR LANES		200									
ENTIRE	PROJECT	IF AND WHERE DIRECTED BY THE ENGINEER.				416				16	1.00	1.00	20.4
TOTALS :			450	200	3435	416	64	64	200	16	5.26	5.26	107.3

BASIS FOR ESTIMATE:
WATER .....20.4 M.G. / ACRE OF TEMPORARY SEEDING
SAND BAG DITCH CHECKS..... 18 BAGS / LOCATION
ROCK DITCH CHECKS ..... 10 CU. YD./ LOCATION

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.

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

BASE AND SURFACING

STATION	STATION	LOCATION	LENGTH	AGGREGATE BASE COURSE (CLASS 7)		TACK COAT				ACHM BASE COURSE (1 1/2")				ACHM BINDER COURSE (1")				ACHM SURFACE COURSE (1/2")			
						AVERAGE WIDTH	SQ. YD.	GAL. PER SQ.YD.	GALLON	AVERAGE WIDTH	SQ. YD.	LBS. PER SQ.YD.	(PG 64-22) TON	AVERAGE WIDTH	SQ.YD.	LBS. PER SQ.YD.	(PG 64-22) TON	AVERAGE WIDTH	SQ.YD.	LBS. PER SQ.YD.	(PG 64-22) TON
			LIN.FT.	TONS/STA.	TON	LIN. FT.				LIN. FT.				LIN. FT.				LIN. FT.			
105+00.00	106+00.00	MAIN LANE TRANSITION - SITE 1	100.00			37.00	411.11	0.10	41.11									37.00	411.11	220	45.22
106+00.00	106+98.71	MAIN LANE NOTCH & WIDENING - SITE 1	98.71	199.50	196.93	24.00	263.23	0.10	26.32									40.00	438.71	220	48.26
106+98.71	108+00.91	MAIN LANE FULL DEPTH - SITE 1	102.20	292.75	299.19	72.96	828.50	0.03	24.86	24.71	280.60	550	77.17	24.33	276.28	440	60.78	40.00	454.22	220	49.96
108+00.91	109+00.00	MAIN LANE NOTCH & WIDENING - SITE 1	99.09	199.50	197.68	24.00	264.24	0.10	26.42									40.00	440.40	220	48.44
109+00.00	110+00.00	MAIN LANE TRANSITION - SITE 1	100.00			37.00	411.11	0.10	41.11									37.00	411.11	220	45.22
205+00.00	206+00.00	MAIN LANE TRANSITION - SITE 2	100.00			36.00	400.00	0.10	40.00									36.00	400.00	220	44.00
206+00.00	206+87.00	MAIN LANE NOTCH & WIDENING - SITE 2	87.00	174.00	151.38	40.00	386.67	0.10	38.67									40.00	386.67	220	42.53
206+87.00	208+07.00	MAIN LANE FULL DEPTH - SITE 2	120.00	267.25	320.70	48.94	652.53	0.03	19.58	24.63	328.40	440	72.25	24.33	324.40	385	62.45	40.00	533.33	220	58.67
208+07.00	209+00.00	MAIN LANE NOTCH & WIDENING - SITE 3	93.00	174.00	161.82	40.00	413.33	0.10	41.33									40.00	413.33	220	45.47
209+00.00	210+00.00	MAIN LANE TRANSITION - SITE 2	100.00			36.00	400.00	0.10	40.00									36.00	400.00	220	44.00
305+00.00	306+00.00	MAIN LANE TRANSITION - SITE 3	100.00			36.00	400.00	0.10	40.00									36.00	400.00	220	44.00
306+00.00	307+07.00	MAIN LANE NOTCH & WIDENING - SITE 3	107.00	174.00	186.18	40.00	475.56	0.10	47.56									40.00	475.56	220	52.31
307+07.00	307+93.00	MAIN LANE FULL DEPTH - SITE 3	86.00	267.25	229.84	48.94	467.65	0.03	14.03	24.63	235.35	440	51.78	24.33	232.49	385	44.75	40.00	382.22	220	42.04
307+93.00	309+00.00	MAIN LANE NOTCH & WIDENING - SITE 3	107.00	174.00	186.18	40.00	475.56	0.10	47.56									40.00	475.56	220	52.31
309+00.00	310+00.00	MAIN LANE TRANSITION - SITE 3	100.00			36.00	400.00	0.10	40.00									36.00	400.00	220	44.00
409+00.00	410+00.00	MAIN LANE TRANSITION - SITE 4	100.00			36.00	400.00	0.10	40.00									36.00	400.00	220	44.00
410+00.00	411+50.00	MAIN LANE NOTCH & WIDEN - SITE 4	150.00	174.00	261.00	40.00	666.67	0.10	66.67									40.00	666.67	220	73.33
411+50.00	415+44.50	MAIN LANE FULL DEPTH - SITE 4	394.50	267.25	1054.30	48.94	2145.20	0.03	64.36	24.63	1079.62	440	237.52	24.33	1066.47	385	205.30	40.00	1753.33	220	192.87
417+33.50	423+00.00	MAIN LANE FULL DEPTH - SITE 4	566.50	174.00	985.71	40.00	2517.78	0.10	251.78	24.63	1550.32	440	341.07	24.33	1531.44	385	294.80	40.00	2517.78	220	276.96
423+00.00	424+00.00	MAIN LANE NOTCH & WIDEN - SITE 4	100.00			36.00	400.00	0.10	40.00									36.00	400.00	220	44.00
424+00.00	425+00.00	MAIN LANE TRANSITION SITE - 4																			
602+44	614+08	DETOUR LANES - SITE 1	1164.00	156.50	1821.66	28.33	3664.01	0.03	109.92					28.33	3664.01	440	806.08	28.00	3621.33	220	398.35
0+00	17+04	DETOUR LANES - SITE 2	1704.00	156.50	2666.76	28.33	5363.81	0.03	160.91					28.33	5363.81	440	1180.04	28.00	5301.33	220	583.15
802+54	812+68	DETOUR LANES - SITE 3	1014.00	156.50	1586.91	28.33	3191.85	0.03	95.76					28.33	3191.85	440	702.21	28.00	3154.67	220	347.01
910+38	923+47	DETOUR LANES - SITE 4	1309.00	156.50	2048.59	28.33	4120.44	0.03	123.61					28.33	4120.44	440	906.50	28.00	4072.44	220	447.97
412+91.35	413+24.35	MAIN LANE - ADD'L - GUARDRAIL WIDENING TAPER RT.	33.00	12.75	4.21													5.50	20.17	220	2.22
413+24.35	415+64.5	MAIN LANE - ADD'L - GUARDRAIL WIDENING RT.	240.15	25.50	61.24													5.50	146.76	220	16.14
413+76.35	414+09.35	MAIN LANE - ADD'L - GUARDRAIL WIDENING TAPER LT.	33.00	12.75	4.21													5.50	20.17	220	2.22
414+09.35	415+24.5	MAIN LANE - ADD'L - GUARDRAIL WIDENING LT.	113.15	25.50	28.85													5.50	69.15	220	7.61
417+53.5	418+68.65	MAIN LANE - ADD'L - GUARDRAIL WIDENING RT.	115.15	25.50	29.36													5.50	70.37	220	7.74
418+68.65	419+01.65	MAIN LANE - ADD'L - GUARDRAIL WIDENING TAPER RT.	33.00	12.75	4.21													5.50	20.17	220	2.22
417+13.5	419+53.65	MAIN LANE - ADD'L - GUARDRAIL WIDENING LT.	240.15	25.50	61.24													5.50	146.76	220	16.14
419+53.65	419+86.65	MAIN LANE - ADD'L - GUARDRAIL WIDENING TAPER LT.	33.00	12.75	4.21													5.50	20.17	220	2.22
		.																			9.00
ENTIRE	PROJECT	ADDITIONAL AGGREGATE FOR SUPERELEVATION			211.00																9.00
ADDITIONAL FOR MAIN LANE - LEVELING SITE 4			254.00			24.00	677.33	0.10	67.73					24.00	677.33	330	111.76	24.00	677.00	220	74.47
TOTALS:					12763.36		29796.58		1549.29		3474.29		779.79		20448.52		4374.67		29500.49		3263.05

VOLUME CONTROL:
Nmax= 115 GYRATIONS (PG 64-22)
ACHM SURFACE COURSE (1/2"): MIN. AGGR. 94.8%, ASPHALT BINDER (PG 64-22) 5.2%
ACHM BINDER COURSE (1"): MIN. AGGR. 95.6%, ASPHALT BINDER (PG 64-22) 4.4%
ACHM BASE COURSE (1 1/2"): MIN. AGGR. 96.1%, ASPHALT BINDER (PG 64-22) 3.9%

8/4/2014

R110544.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED
9-04-14			

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		110544	45	134
① 07302 -		QUANTITIES	- 55493	

SCHEDULE OF BRIDGE QUANTITIES - JOB 110544

BRIDGE NO.	CODE NO.	NAME PLATE TITLE	UNIT OF STRUCTURE	ITEM NO.	205	603	801	802	802	803	804	804	805	805	805	807	808	809	812	816	816
				ITEM	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO.)	TEMPORARY BRIDGE STRUCTURE (24' ROADWAY WIDTH)	UNCLASSIFIED EXCAVATION FOR STRUCTURES - BRIDGE	CLASS S CONCRETE - BRIDGE	CLASS S(AE) CONCRETE - BRIDGE	CLASS I PROTECTIVE SURFACE TREATMENT	REINFORCING STEEL - BRIDGE (GRADE 60)	EPOXY COATED REINFORCING STEEL (GRADE 60)	① STEEL SHELL PILING (16" DIA.)	① STEEL SHELL PILING (24" DIA.)	PILE ENCASEMENT	STRUCTURAL STEEL IN BEAM SPANS (M270, GRADE 50W)	ELASTOMERIC BEARINGS	SILICONE JOINT SEALANT	BRIDGE NAME PLATE (TYPE D)	FILTER BLANKET	DUMPED RIPRAP
				UNIT	LUMP SUM	LIN. FT.	CU. YD.	CU. YD.	CU. YD.	GAL.	LB.	LB.	LIN. FT.	LIN. FT.	LIN. FT.	LB.	CU. IN.	LIN. FT.	EACH	SQ. YD.	CU. YD.
0 7 3 0 2	X071	FLAT FORK CREEK	EXISTING BR. NO. 01387 (Site 1)		1																
			EXISTING BR. NO. 01388 (Site 2)		1																
			EXISTING BR. NO. 01389 (Site 3)		1																
			END BENT 1 & 4				100	104.40		0.8	13,030	980	1,440			2,690	1,885			767	412
			INT. BENT 2 & 3					55.70			7,530	450		1,120	140						
			186' CONT. COMP. W-BEAM UNIT			143			267.70	18.0		63,840				⚠ 175,660 ~~154,990~~		119	1		
			EXISTING BR. NO. 01390 (Site 4)		1																
			TOTALS FOR BRIDGE NO. 07302			143	100	160.10	267.70	18.8	20,560	65,270	1,440	1,120	140	~~157,680~~ ⚠ 178,350	1,885	119	1	767	412

① ASTM A252 GRADE 3. (Fy = 45,000 psi)

JIM TRIBO
DESIGN SECTION SUPERVISOR

⚠ Rev'd Structural Steel Quantity.
By: JGT 9-04-2014. Chk'd By: TMG Date: 9/4/14

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
9-4-14
CHARLES R. ELLIS

BRIDGE ENGINEER

SCHEDULE OF BRIDGE QUANTITIES
HWY. 17 - ST. FRANCIS CO. LINE
STRS. & APPRS. (S)
MONROE COUNTY

ROUTE 70 SEC. 17

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: TMG DATE: 3/19/2013 FILENAME: bll0544xl_ql.dgn
CHECKED BY: LJB DATE: 9/4/14 SCALE: No Scale
DESIGNED BY: — DATE: —

BRIDGE NO. 07302 DRAWING NO. 55493

PRINT DATE: 04-SEP-2014

SUMMARY OF QUANTITIES

ITEM NUMBER	ITEM		QUANTITY	UNIT
201	CLEARING		74	STATION
201	GRUBBING		74	STATION
202	REMOVAL AND DISPOSAL OF FENCE		374	LIN.FT.
SP& 202	REMOVAL AND DISPOSAL OF GUARDRAIL		590	LIN.FT.
202	REMOVAL AND DISPOSAL OF PIPE CULVERTS		6	EACH
202	REMOVAL AND DISPOSAL OF CATCH BASINS		3	EACH
207	STONE BACKFILL		1115	TON
210	UNCLASSIFIED EXCAVATION		54936	CU.YD.
210	COMPACTED EMBANKMENT		53147	CU.YD.
SP& 210	SOIL STABILIZATION		400	TON
301	PROCESSING LIME TREATED SUBGRADE		17881	SQ. YD.
* 301	QUICKLIME (SLURRY) IN TREATED SUBGRADE	(ALTERNATE NO. 1)	414	TON
* 301	QUICKLIME (DRY) IN TREATED SUBGRADE	(ALTERNATE NO. 2)	310	TON
* 301	HYDRATED LIME IN TREATED SUBGRADE	(ALTERNATE NO. 3)	414	TON
303	AGGREGATE BASE COURSE (CLASS 7)		13485	TON
401	TACK COAT		1771	GALLON
SP& 405	MINERAL AGGREGATE IN ACHM BASE COURSE (1 1/2")		750	TON
SP& 405	ASPHALT BINDER (PG 64-22) IN ACHM BASE COURSE (1 1/2")		30	TON
SP,SS& 406	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")		4183	TON
SP,SS& 406	ASPHALT BINDER (PG 64-22) IN ACHM BINDER COURSE (1")		192	TON
SP,SS& 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")		3177	TON
SP,SS& 407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2")		174	TON
412	COLD MILLING ASPHALT PAVEMENT		2136	SQ.YD.
SP& 414	ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC		11	TON
SP& 415	ACHM PATCHING OF EXISTING ROADWAY		100	TON
504	APPROACH SLABS		127.20	CU.YD.
504	APPROACH GUTTERS		32.80	CU.YD.
601	MOBILIZATION		1.00	LUMP SUM
SP& 602	FURNISHING FIELD OFFICE		1	EACH
603	MAINTENANCE OF TRAFFIC		1.00	LUMP SUM
603	18" TEMPORARY CULVERT		230	LIN.FT.
603	72" TEMPORARY CULVERT		600	LIN.FT.
603	96" TEMPORARY CULVERT		432	LIN.FT.
604	SIGNS		1200	SQ.FT.
604	BARRICADES		128	LIN.FT.
604	TRAFFIC DRUMS		174	EACH
604	CONSTRUCTION PAVEMENT MARKINGS		14740	LIN.FT.
604	REMOVABLE CONSTRUCTION PAVEMENT MARKINGS		10888	LIN.FT.
604	REMOVAL OF PERMANENT PAVEMENT MARKINGS		7708	LIN.FT.
SP& 606	18" SIDE DRAIN		42	LIN.FT.
SP& 606	24" SIDE DRAIN		72	LIN.FT.
606	SELECTED PIPE BEDDING		200	CU.YD.
611	4" PIPE UNDERDRAINS		1600	LIN.FT.
611	UNDERDRAIN OUTLET PROTECTORS		12	EACH
617	GUARDRAIL (TYPE A)		550	LIN.FT.
617	TERMINAL ANCHOR POSTS (TYPE 1)		4	EACH
617	THRIE BEAM GUARDRAIL TERMINAL		4	EACH
619	WIRE FENCE (TYPE D)		400	LIN.FT.
620	LIME		40	TON
620	SEEDING		20.01	ACRE
SS& 620	MULCH COVER		22.27	ACRE
620	WATER		2149.9	M.GAL.
621	TEMPORARY SEEDING		5.26	ACRE
621	SILT FENCE		3435	LIN.FT.
621	SAND BAG DITCH CHECKS		450	BAG
621	DIVERSION DITCH		200	LIN.FT.
621	PIPE FOR SLOPE DRAINS		416	LIN.FT.
621	SEDIMENT BASIN		64	CU.YD.
621	OBLITERATION OF SEDIMENT BASIN		64	CU.YD.
621	SEDIMENT REMOVAL AND DISPOSAL		200	CU.YD.
623	SECOND SEEDING APPLICATION		20.01	ACRE
624	SOLID SODDING		135	SQ.YD.
625	GEOTEXTILE FABRIC (TYPE 8)		1393	SQ. YD.
635	ROADWAY CONSTRUCTION CONTROL		1.00	LUMP SUM
637	MAILBOXES		6	EACH
637	MAILBOX SUPPORTS (SINGLE)		6	EACH
642	RUMBLE STRIPS IN ASPHALT SHOULDERS		3378	LIN.FT.
719	THERMOPLASTIC PAVEMENT MARKING WHITE (4")		4600	LIN.FT.
719	THERMOPLASTIC PAVEMENT MARKING YELLOW (4")		4222	LIN.FT.
* SP& 719	INVERTED PROFILE THERMOPLASTIC CONTRAST PAVEMENT MARKING YELLOW (4")	(ALTERNATE NO. 1)	378	LIN.FT.
* SP	HIGH PERFORMANCE CONTRAST MARKING TAPE YELLOW (4")	(ALTERNATE NO. 2)	378	LIN.FT.
721	RAISED PAVEMENT MARKERS (TYPE II)		289	EACH
804	REINFORCING STEEL-ROADWAY (GRADE 60)		19000	POUND
816	DUMPED RIPRAP		16	CU.YD.
	STRUCTURES OVER 20' SPAN			
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 1)		1.00	LUMP SUM
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 2)		1.00	LUMP SUM
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 3)		1.00	LUMP SUM
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 4)		1.00	LUMP SUM
603	TEMPORARY BRIDGE STRUCTURE (24' ROADWAY WIDTH)		143	LIN. FT.
636	BRIDGE CONSTRUCTION CONTROL		1.00	LUMP SUM
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-BRIDGE		100	CU. YD.
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY		481	CU.YD.
802	CLASS S CONCRETE-ROADWAY		1261.40	CU.YD.
802	CLASS S CONCRETE-BRIDGE		160.10	CU. YD.
802	CLASS S(AE) CONCRETE-BRIDGE		267.70	CU. YD.
803	CLASS 1 PROTECTIVE SURFACE TREATMENT		18.8	GALLON
804	REINFORCING STEEL-ROADWAY (GRADE 60)		153298	POUND
804	REINFORCING STEEL-BRIDGE (GRADE 60)		20560	POUND
804	EPOXY COATED REINFORCING STEEL (GRADE 60)		65270	POUND
805	STEEL SHELL PILING (16" DIAMETER)		1440	LIN. FT.
805	STEEL SHELL PILING (24" DIAMETER)		1120	LIN. FT.
805	PILE ENCASEMENT		140	LIN. FT.
807	STRUCTURAL STEEL IN BEAM SPANS (M270-GR50W)		178350	POUND
808	ELASTOMERIC BEARINGS		1885	CU. IN.
809	SILICONE JOINT SEALANT		119	LIN. FT.
812	BRIDGE NAME PLATE (TYPE D)		1	EACH
816	FILTER BLANKET		767	SQ. YD.
816	DUMPED RIPRAP		412	CU.YD.

*DENOTES ALTERNATE BID ITEMS.

REVISIONS

DATE	REVISION	SHEET NUMBER(S)
09/04/14	REVISED QUANTITY FOR STRUCTURAL STEEL IN BEAM SPANS (M270-GR50W).	45, 46
09/12/14	REVISED QUANTITY FOR CLASS S CONCRETE FOR ROADWAY.	12,13, 43, 46

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TIMOTHY D. SMITH 09-12-14

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED
9/04/14			
9/12/14			

(2) SUMMARY OF QUANTITIES AND REVISIONS

FED.ROAD DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.	110544	46	134
JOB NO.				

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.		110544	47	134

(2) SURVEY CONTROL DETAILS

MIDPOINT:
LAT: 34-53-13.7
LON: 091-10-24.7

SURVEY CONTROL COORDINATES

Project Name: s110544
Date: 01/24/2012
Coord*ate System: ARKANSAS STATE PLANE - NORTH ZONE BASED ON GPS CONTROL.
PROJECTED TO GROUND.
Units: U.S. SURVEY FOOT

Po*t Name	North*g	East*g	Elev	Feature	Description
1	188834.0065	1543177.8977	189.559	CTL	5/8* REBAR & CAP T-1
2	189236.7650	1543747.3094	184.883	CTL	5/8* REBAR & CAP T-2
3	189615.4995	1544169.2159	188.566	CTL	5/8* REBAR & CAP T-3
4	190198.1192	1544791.1677	185.364	CTL	5/8* REBAR & CAP T-4
5	190661.9588	1545422.1944	186.171	CTL	5/8* REBAR & CAP T-5
6	202619.4702	1558828.3066	190.301	CTL	5/8* REBAR & CAP T-6
7	202619.9222	1559575.5486	188.525	CTL	5/8* REBAR & CAP T-7
8	202616.1672	1560200.6483	191.447	CTL	5/8* REBAR & CAP T-8
9	202722.8964	1560972.6092	189.634	CTL	5/8* REBAR & CAP T-9
10	203000.1377	1561565.7150	190.513	CTL	5/8* REBAR & CAP T-10,US-70 C/L 19' SE
11	208573.5954	1570301.1345	191.870	CTL	5/8* REBAR & CAP T-11
12	208865.0648	1571070.8485	191.711	CTL	5/8* REBAR & CAP T-12,US-70 C/L 19' S
13	209077.5670	1571647.8872	194.017	CTL	5/8* REBAR & CAP T-13
14	209418.3795	1572591.4943	190.288	CTL	5/8* REBAR & CAP T-14
15	209721.2028	1573270.6121	192.640	CTL	5/8* REBAR & CAP T-15
16	210552.1638	1575532.7949	194.002	CTL	5/8* REBAR & CAP T-16,US-70 C/L 21'N
17	210746.3611	1576241.1487	195.609	CTL	5/8* REBAR & CAP T-17
18	210795.6851	1577057.2347	196.613	CTL	5/8* REBAR & CAP T-18
19	210967.8313	1578078.9589	207.761	CTL	5/8* REBAR & CAP T-19
20	211265.7877	1578659.4747	204.971	CTL	5/8* REBAR & CAP T-20
100	209884.4030	1575891.4283	191.838	GPS	AHTD GPS 480018
101	208858.5408	1575860.4793	192.210	GPS	AHTD GPS 480018A
102	185008.0939	1537063.3073	189.360	GPS	AHTD GPS 480016
103	210551.9698	1555072.3981	229.456	GPS	AHTD GPS 480015
200	188937.5197	1542297.2036	183.867	IP	1/2* RBR SET BY FE COR
201	189017.5508	1542298.6016	182.739	IP	1/2* RBR PA*T YELLO
202	190268.6943	1542299.4996	173.663	IP	1/2* RBR SET NEAR FE COR
203	188980.5287	1539630.4074	183.790	IP	1/2* RBR SET NEAR FE COR
204	190268.3473	1542301.7976	173.842	IP	T BAR
205	203359.8841	1566331.4347	189.299	IP	2* PIPE ALUM CAP E 1/4 COR SEC
206	203306.8291	1561038.8553	186.324	IP	2* PIPE ALUM CAP W 1/4 COR SE
207	206207.6046	1569146.2601	187.775	IP	2* PIPE * CTR GR RD N 1/4 CO
208	206248.2116	1566451.7339	188.153	IP	1/2* REBAR SEC COR SEC 6,7 R
209	206007.7683	1566434.3509	188.399	IP	2* PIPE SEC COR SEC 6,7 R-1-

Note - Rebar and Cap - Standard - 5/8 Rebar with 2* Aluminum Cap stamped
*(standard markings common to all caps), or as indicated
(other markings indicated in the point description of the individual point).
USE CAF = 1.0 FOR STAKEOUT FOR THIS PROJECT
A PROJECT CAF OF 0.9999987897 HAS BEEN USED TO COMPUTE THE ABOVE GROUND COORDINATES.
THIS CAF IS INTENDED FOR USE WITHIN THE PROJECT LIMITS.
GRID DISTANCE = GROUND DISTANCE X CAF.
GRID COORDINATES ARE STORED UNDER FILE NAME. s110544gi.ctl
HORIZONTAL DATUM: NAD 83 (1997)
VERTICAL DATUM: NAVD 88 POSITIONAL ACCURACY THIRD ORDER, UNLESS SPECIFIED OTHERWISE
AT A SPECIFIC POINT.

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

BASIS OF BEARING:
ARKANSAS STATE PLANE GRID BEARINGS - 0301-NORTH ZONE
DETERMINED FROM GPS CONTROL POINTS: 480015 - 480016, 480018 - 480018A
CONVERGENCE ANGLE: 0-28-51 RIGHT AT LT: 34-53-13.7 LG: 091-10-24.7
GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.

SITE 1 - CONST LM 08.86

POINT NO.	TYPE	STATION	NORTHING	EASTING
8000	POB	100+00.00	189182.4358	1543626.9551
8001	POE	115+00.00	190148.6176	1544774.3406

SITE 2- CONST LM 13.32

POINT NO.	TYPE	STATION	NORTHING	EASTING
8002	POB	200+00.00	202595.5634	1559491.1083
8003	PC	208+75.33	202597.7360	1560366.4339
8004	PT	227+15.47	203421.6162	1561932.7518
8005	POE	229+68.25	203629.5549	1562076.4867

SITE 3 - CONST LM 15.91

POINT NO.	TYPE	STATION	NORTHING	EASTING
8006	POB	300+00.00	208849.9410	1570976.3789
8007	POE	315+00.01	209368.6927	1572383.8311

SITE 4 - CONST LM 16.99

POINT NO.	TYPE	STATION	NORTHING	EASTING
8030	POB	409+00.00	210737.7472	1576397.5276
8011	PC	418+62.26	210847.9899	1577353.4497
8012	PT	427+90.28	211100.4807	1578242.2489
8031	POE	431+00.00	211232.0557	1578522.6342

SITE 1 - DETOUR LM 08.86

POINT NO.	TYPE	STATION	NORTHING	EASTING
8000	POB	600+00.00	189182.4358	1543626.9551
8038	PC	600+39.65	189207.9762	1543657.2856
8039	PT	603+37.48	189358.0633	1543912.8952
8040	PC	604+28.96	189390.4590	1543998.4434
8041	PT	607+26.79	189540.5461	1544254.0531
8042	PC	608+41.09	189614.1712	1544341.4863
8043	PT	611+38.92	189840.5035	1544532.8920
8044	PC	612+30.40	189919.2890	1544579.3766
8045	PT	615+28.23	190145.6212	1544770.7823
8001	POE	615+32.88	190148.6176	1544774.3406

SITE 2 - DETOUR LM 13.32

POINT NO.	TYPE	STATION	NORTHING	EASTING
8002	POB	0+00.00	202595.5634	1559491.1083
8069	PC	0+97.14	202595.8045	1559588.2474
8071	PT	3+01.93	202619.9916	1559791.1455
8072	PC	5+38.54	202675.0410	1560021.2584
8074	PT	7+45.52	202699.2309	1560226.3445
8075	PC	8+74.44	202699.2309	1560355.2646
8077	PT	9+96.49	202690.7950	1560476.9234
8078	PC	11+27.19	202672.7567	1560606.3683
8080	PT	16+13.38	202738.4712	1561081.8984
8081	POE	17+04.41	202775.0186	1561165.2780

SITE 3 - DETOUR LM 15.91

POINT NO.	TYPE	STATION	NORTHING	EASTING
8006	POB	800+00.00	208849.9410	1570976.3789
8052	PC	801+06.96	208886.9301	1571076.7359
8053	PT	803+90.57	208940.8865	1571353.9261
8054	PC	804+20.71	208941.8320	1571384.0521
8055	PT	807+04.33	208995.7884	1571661.2423
8056	PC	808+18.24	209035.1832	1571768.1265
8057	PT	811+01.85	209174.0260	1572014.0297
8058	PC	811+32.00	209192.8580	1572037.5632
8059	PT	814+15.61	209331.7008	1572283.4664
8007	POE	815+22.57	209368.6927	1572383.8311

SITE 4 - DETOUR LM 16.99

POINT NO.	TYPE	STATION	NORTHING	EASTING
8032	PC	908+91.55	210736.7792	1576389.1346
8033	PT	911+07.36	210735.1438	1576604.4024
8034	PC	912+61.76	210715.1262	1576757.5001
8035	PT	914+77.58	210713.4908	1576972.7678
8036	PC	917+84.97	210748.7083	1577278.1413
8037	PT	920+14.44	210804.2035	1577500.1238
8029	POE	925+23.38	210990.6789	1577973.6737

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-4-14

6/25/2014

R110544.DGN

SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	48	134

(2) SURVEY CONTROL DETAILS SITE 1

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-4-14

DETOUR CURVE DATA
PI = 605+79.31
Δ = 19°21'32"LT.
D = 6°30'00"
T = 150.35
L = 297.83
PC = 604+28.96
PT = 607+26.79
e = 0.100%
Ls = 350

DETOUR CURVE DATA
PI = 609+91.44
Δ = 19°21'32"LT.
D = 6°30'00"
T = 150.35
L = 297.83
PC = 608+41.09
PT = 611+38.92
e = 0.100%
Ls = 350

CONSTRUCTION CL

CL CONST. POB 100+00.00
C.L. DETOUR POB 600+00.00
8000
8038
N49°54'01"E 150.35'
N49°54'01"E 39.65'
PC600+39.65
N2 PDIRBR&ACAP T-2
N69°15'33"E 150.35'
8039
N69°15'33"E 91.48'
8040
N69°15'33"E 150.35'
PT603+37.48
P1601+90.00
600
SURVEY BASELINE N 48°05'11" E 566.96'
P1604+28.96
605
CL CONST. N49°54'01"E 1500.00'
N3 PDIRBR&ACAP T-3
PT607+26.79
PC608+41.09
N49°54'01"E 150.35'
8041
N49°54'01"E 114.30'
8042
N49°54'01"E 150.35'
CL DETOUR
610
SURVEY BASELINE N 46°52'13" E 852.24'
PT611+38.92
N30°32'28"E 150.35'
8043
N30°32'28"E 91.48'
8044
N30°32'28"E 150.35'
P1613+80.75
PT615+28.23
PC612+30.40
615
C.L. DETOUR POE 615+32.88
C.L. CONST. POE 115+00
N49°54'01"E 150.35'
8001
8045
N49°54'

STA. 106+00.00 - BEGIN
JOB 110544
BEGIN SITE 1
L.M. 8.84

STA. 109+00.00 - END
SITE 1
L.M. 8.90

P1605+79.31
DETOUR CL
P1609+91.44

DETOUR CURVE DATA
PI = 601+90.00
Δ = 19°21'32"RT.
D = 6°30'00"
T = 150.35
L = 297.83
PC = 600+39.65
PT = 603+37.48
e = NO SUPER

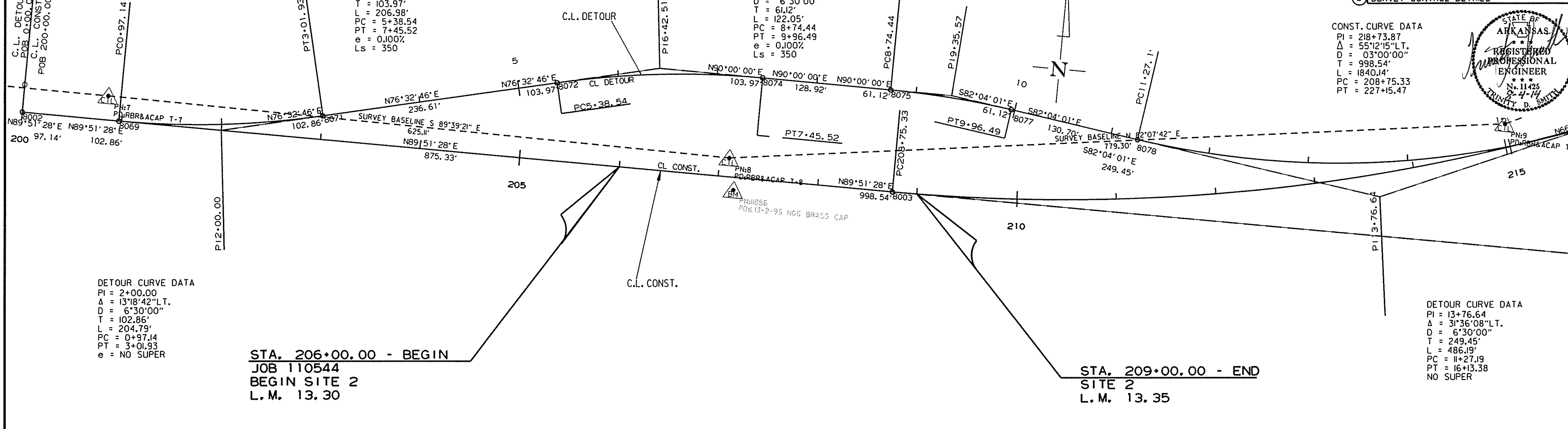
DETOUR CURVE DATA
PI = 613+80.75
Δ = 19°21'32"RT.
D = 6°30'00"
T = 150.35
L = 297.83
PC = 612+30.40
PT = 615+28.23
e = NO SUPER

7/31/2014
R110544.DGN

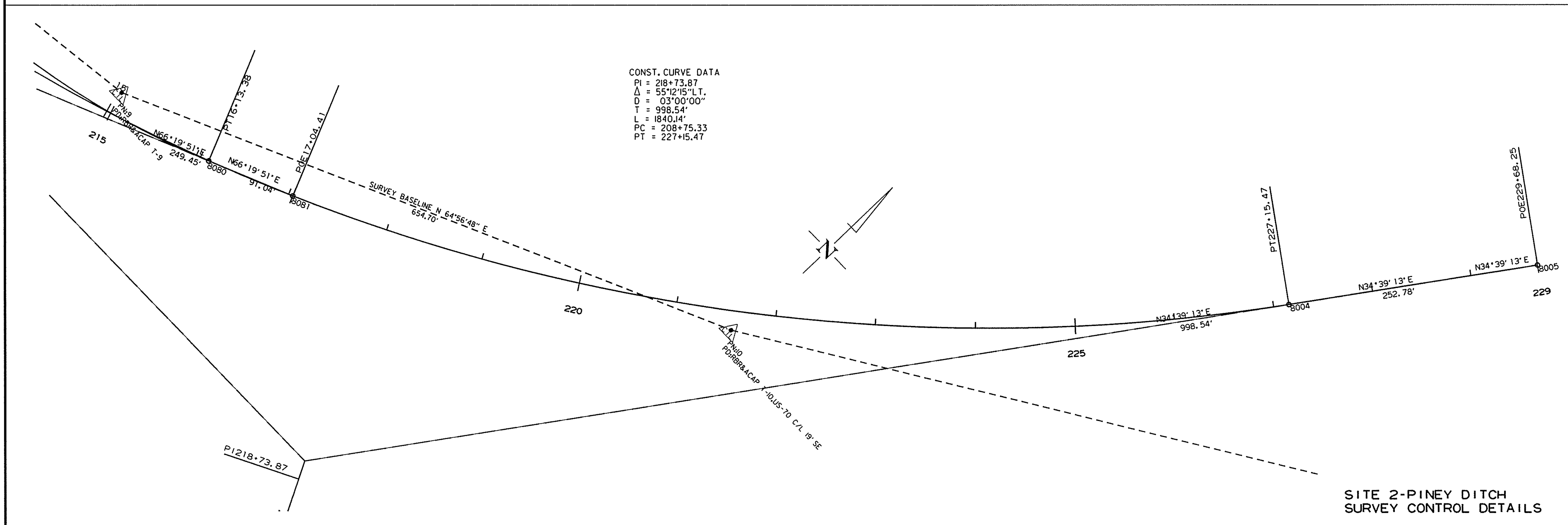
SITE 1-BURNT BRIDGE CREEK
SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	49	134

(2) SURVEY CONTROL DETAILS



DETOUR CURVE DATA
PI = 6+42.51
Δ = 13°27'14"RT.
D = 6°30'00"
T = 103.97'
L = 206.98'
PC = 5+38.54
PT = 7+45.52
e = 0.100%
Ls = 350
DETOUR CURVE DATA
PI = 9+35.57
Δ = 7°55'59"RT.
D = 6°30'00"
T = 61.12'
L = 122.05'
PC = 8+74.44
PT = 9+96.49
e = 0.100%
Ls = 350
CONST. CURVE DATA
PI = 218+73.87
Δ = 55°12'15"LT.
D = 03°00'00"
T = 998.54'
L = 1840.14'
PC = 208+75.33
PT = 227+15.47
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
DETOUR CURVE DATA
PI = 2+00.00
Δ = 13°18'42"LT.
D = 6°30'00"
T = 102.86'
L = 204.79'
PC = 0+97.14
PT = 3+01.93
e = NO SUPER
DETOUR CURVE DATA
PI = 13+76.64
Δ = 31°36'08"LT.
D = 6°30'00"
T = 249.45'
L = 486.19'
PC = 11+27.19
PT = 16+13.38
NO SUPER
C.L. DETOUR POB 0+00.00
C.L. CONST. POB 200+00.00
PC0+97.14
PT3+01.93
C.L. DETOUR
PI6+42.51
PC8+74.44
PI9+35.57
PC11+27.1
PC5+38.54
PT7+45.52
PT9+96.49
PI2+00.00
PC208+75.33
PI3+76.64
SURVEY BASELINE S 89°39'21" E
625.11'
SURVEY BASELINE N 82°07'42" E
779.30'
N89°51'28"E
875.33'
N89°51'28"E
998.54'
C.L. CONST.
PN:7 PD:RBR&ACAP T-7
PN:8 PD:RBR&ACAP T-8
PN:9 PD:RBR&ACAP T-9
PN:856 PD:13-2-93 NGS BRASS CAP
STA. 206+00.00 - BEGIN
JOB 110544
BEGIN SITE 2
L.M. 13.30
STA. 209+00.00 - END
SITE 2
L.M. 13.35



CONST. CURVE DATA
PI = 218+73.87
Δ = 55°12'15"LT.
D = 03°00'00"
T = 998.54'
L = 1840.14'
PC = 208+75.33
PT = 227+15.47
PT16+13.38
POE17+04.41
PT227+15.47
POE229+68.25
PI218+73.87
N66°19'51"E
249.45'
N66°19'51"E
91.04'
SURVEY BASELINE N 64°56'48" E
654.70'
N34°39'13"E
998.54'
N34°39'13"E
252.78'
PN:10 PD:RBR&ACAP T-10,US-70 C/L 19' SE

SITE 2-PINEY DITCH
SURVEY CONTROL DETAILS

7/31/2014

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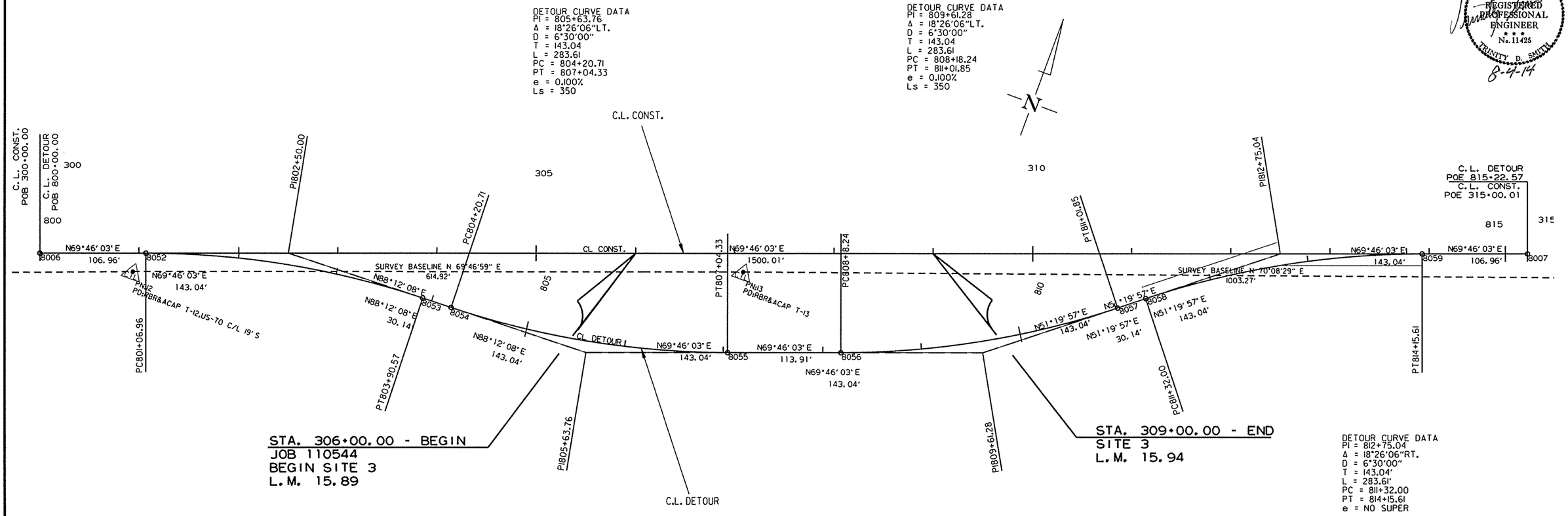
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	50	134

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-4-14



DETOUR CURVE DATA
PI = 805+63.76
Δ = 18°26'06"LT.
D = 6°30'00"
T = 143.04
L = 283.61
PC = 804+20.71
PT = 807+04.33
e = 0.100%
Ls = 350

DETOUR CURVE DATA
PI = 809+61.28
Δ = 18°26'06"LT.
D = 6°30'00"
T = 143.04
L = 283.61
PC = 808+18.24
PT = 811+01.85
e = 0.100%
Ls = 350

STA. 306+00.00 - BEGIN
JOB 110544
BEGIN SITE 3
L.M. 15.89

STA. 309+00.00 - END
SITE 3
L.M. 15.94

DETOUR CURVE DATA
PI = 802+50.00
Δ = 18°26'06"RT.
D = 6°30'00"
T = 143.04'
PC= 801+06.96
PT= 803+90.57
L = 283.61'
e = NO SUPER

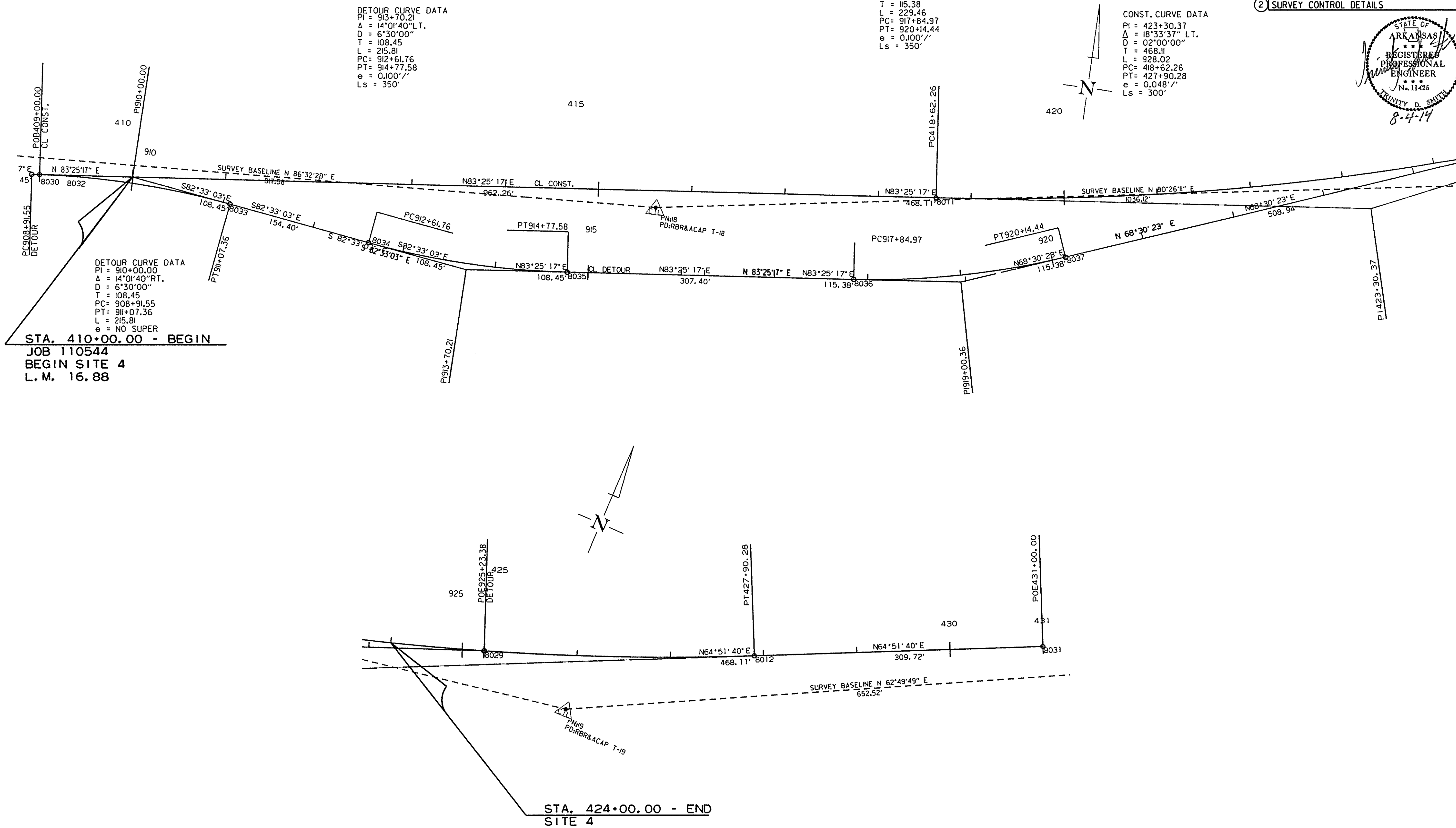
DETOUR CURVE DATA
PI = 812+75.04
Δ = 18°26'06"RT.
D = 6°30'00"
T = 143.04'
L = 283.61'
PC = 811+32.00
PT = 814+15.61
e = NO SUPER

SITE 3-MAPLE SLOUGH
SURVEY CONTROL DETAILS

7/31/2014
R110544.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	51	134

(2) SURVEY CONTROL DETAILS



DETOUR CURVE DATA
PI = 913+70.21
Δ = 14°01'40"LT.
D = 6°30'00"
T = 108.45
L = 215.81
PC= 912+61.76
PT= 914+77.58
e = 0.100'/'
Ls = 350'
DETOUR CURVE DATA
PI = 919+00.36
Δ = 14°54'54"LT.
D = 6°30'00"
T = 115.38
L = 229.46
PC= 917+84.97
PT= 920+14.44
e = 0.100'/'
Ls = 350'
CONST. CURVE DATA
PI = 423+30.37
Δ = 18°33'37" LT.
D = 02°00'00"
T = 468.11
L = 928.02
PC= 418+62.26
PT= 427+90.28
e = 0.048'/'
Ls = 300'
DETOUR CURVE DATA
PI = 910+00.00
Δ = 14°01'40"RT.
D = 6°30'00"
T = 108.45
PC= 908+91.55
PT= 911+07.36
L = 215.81
e = NO SUPER
N
POB409+00.00 CL CONST.
PI910+00.00
PC908+91.55 DETOUR
PT911+07.36
PC912+61.76
PT914+77.58
PI913+70.21
PC418+62.26
PC917+84.97
PT920+14.44
PI919+00.36
PI423+30.37
410
910
415
915
420
920
SURVEY BASELINE N 86°32'29" E
817.58'
N 83°25'17" E
N83°25'17"E CL CONST.
962.26'
N83°25'17"E
468.11' 8071
SURVEY BASELINE N 80°26'11" E
1036.12'
N68°30'23"E
508.94'
N 68°30'23" E
S82°33'03"E
108.45' 8033
S82°33'03"E
154.40'
S 82°33'03" E
8034
S82°33'03"E
108.45'
N83°25'17"E
108.45' 8035
CL DETOUR
N83°25'17"E
307.40'
N 83°25'17" E
N83°25'17"E
115.38' 8036
N68°30'28"E
115.38' 8037
7' E
45'
8030
8032
PN18
PD:RBR&ACAP T-18
STA. 410+00.00 - BEGIN
JOB 110544
BEGIN SITE 4
L.M. 16.88
N
POE925+23.38 DETOUR
425
925
PT427+90.28
POE431+00.00
430
431
8029
N64°51'40"E
468.11' 8012
N64°51'40"E
309.72'
8031
SURVEY BASELINE N 62°49'49" E
652.52'
PN19
PD:RBR&ACAP T-19
STA. 424+00.00 - END
SITE 4

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-4-14

SITE 4-FLAT FORK CREEK
SURVEY CONTROL DETAILS

7/31/2014

R110544.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	110544		52	134

(2) PLAN AND PROFILE SHEETS SITE 1

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-4-14

STA. 102+00 IN PLACE
18" X 23' CM PIPE CULVERT
LT. SIDE DRAIN
RETAIN

STA. 102+74 IN PLACE
18" X 20' CM PIPE CULVERT
LT. SIDE DRAIN
RETAIN

STA. 103+89 IN PLACE
18" X 20' RC PIPE CULVERT
LT. SIDE DRAIN
RETAIN

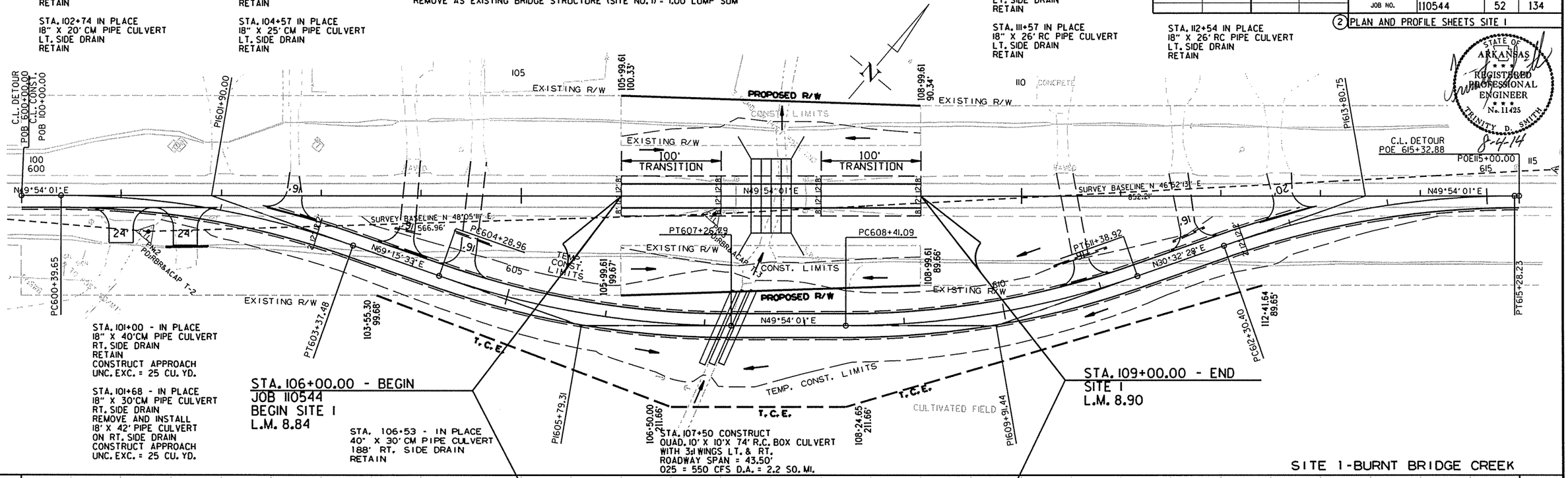
STA. 104+57 IN PLACE
18" X 25' CM PIPE CULVERT
LT. SIDE DRAIN
RETAIN

STA. 107+15.10 TO STA. 107+83.66 - IN PLACE
69' X 27' CLEAR ROADWAY BRIDGE NO. 01387 AT L.M. 8.86
CONSISTING OF A CONCRETE TEE BEAM WITH CONCRETE DECK AND ASPHALT OVERLAY WITH CONCRETE PILINGS
REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 1) = 1.00 LUMP SUM

STA. 110+41 IN PLACE
18" X 26' RC PIPE CULVERT
LT. SIDE DRAIN
RETAIN

STA. 111+57 IN PLACE
18" X 26' RC PIPE CULVERT
LT. SIDE DRAIN
RETAIN

STA. 112+54 IN PLACE
18" X 26' RC PIPE CULVERT
LT. SIDE DRAIN
RETAIN



STA. 101+00 - IN PLACE
18" X 40'CM PIPE CULVERT
RT. SIDE DRAIN
RETAIN
CONSTRUCT APPROACH
UNC. EXC. = 25 CU. YD.

STA. 101+68 - IN PLACE
18" X 30'CM PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
18' X 42' PIPE CULVERT
ON RT. SIDE DRAIN
CONSTRUCT APPROACH
UNC. EXC. = 25 CU. YD.

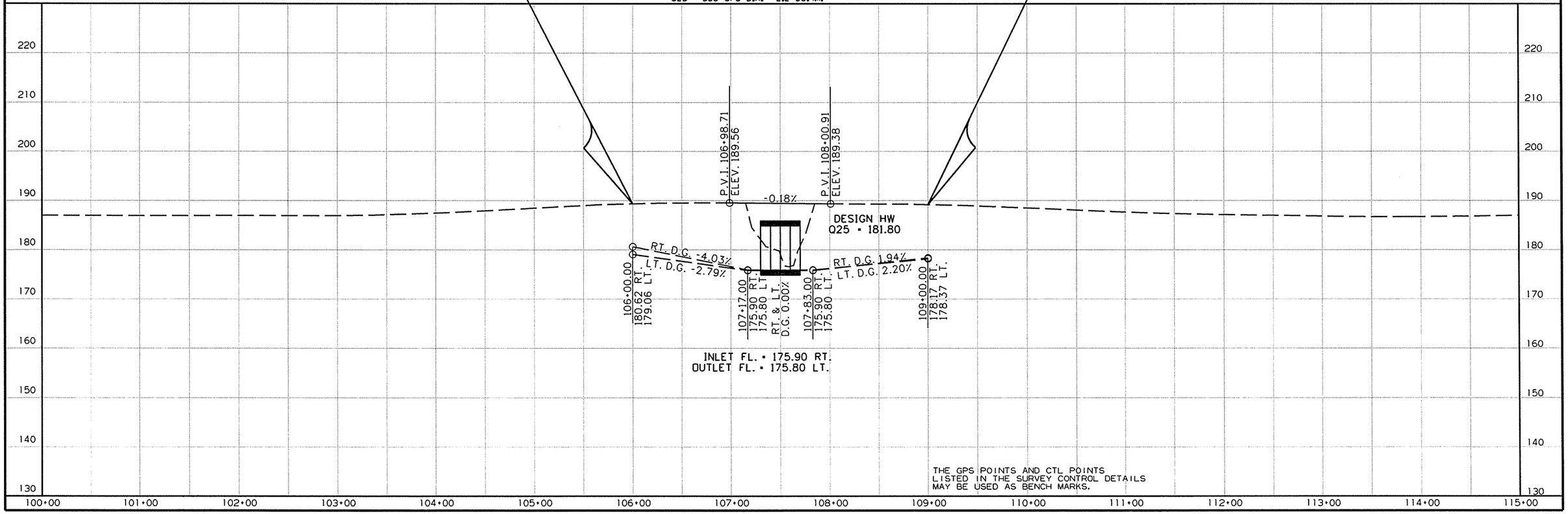
STA. 106+00.00 - BEGIN
JOB 110544
BEGIN SITE 1
L.M. 8.84

STA. 106+53 - IN PLACE
40' X 30' CM PIPE CULVERT
188' RT. SIDE DRAIN
RETAIN

STA. 107+50 CONSTRUCT
QUAD. 10' X 10'X 74' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
ROADWAY SPAN = 43.50'
Q25 = 550 CFS D.A. = 2.2 SQ. MI.

STA. 109+00.00 - END
SITE 1
L.M. 8.90

SITE 1-BURNT BRIDGE CREEK



THE GPS POINTS AND CTL POINTS LISTED IN THE SURVEY CONTROL DETAILS MAY BE USED AS BENCH MARKS.

7/31/2014

R110544.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	110544		53	134

(2) PLAN AND PROFILE SHEETS SITE 1

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 8-4-14

STA. 602+65 - INSTALL TEMP. DRIVEWAY ON RT. CONST. APPR. = 1 CU. YD.

STA. 603+84 - INSTALL 18" X 26' TEMP. PIPE CULVERT RT. SIDE DRAIN CONST. APPR. = 18 CU. YD.

STA. 604+47 - INSTALL 18" X 42' TEMP. PIPE CULVERT RT. SIDE DRAIN CONST. APPR. = 99 CU. YD.

DETOUR CURVE DATA
PI = 605+79.31
Δ = 19°21'32"LT.
D = 6°30'00"
T = 150.35
L = 297.83
PC = 604+28.96
PT = 607+26.79
e = 0.100 "/"
Ls = 350'

STA. 610+89 - INSTALL 18" X 56' TEMP. PIPE CULVERT RT. SIDE DRAIN CONST. APPR. = 347 CU. YD.

STA. 612+02 - INSTALL 18" X 34' TEMP. PIPE CULVERT RT. SIDE DRAIN CONST. APPR. = 61 CU. YD.

DETOUR CURVE DATA
PI = 609+91.44
Δ = 19°21'32"LT.
D = 6°30'00"
T = 150.35
L = 297.83
PC = 608+41.09
PT = 611+38.92
e = 0.100 "/"
Ls = 350'

STA. 602+65 - INSTALL TEMP. DRIVEWAY ON RT.

C.L. DETOUR POB 600+00.00
C.L. CONST. POB 100+00.00
100 600
N9°54'01"E
PC600+39.65
24' 24'
N42 PDRRR&ACAP T-2
EXISTING R/W
PI601+90.00
SURVEY BASELINE N 48°05'11" E 566.96'
N69°15'33"E
PC604+28.96
PT603+37.48
103+55.30 99.68'
105 EXISTING R/W
105+99.61 100.33'
PROPOSED R/W
CONST. LIMITS
EXISTING R/W
100' TRANSITION
100' TRANSITION
N49°54'01"E
PT607+26.79
PC608+41.09
TEMP. CONST. LIMITS
605
105+99.61 99.67'
EXISTING R/W
CONST. LIMITS
PROPOSED R/W
N49°54'01"E
108+99.61 89.66'
EXISTING R/W
610
T.C.E.
T.C.E.
T.C.E.
TEMP. CONST. LIMITS
CULTIVATED FIELD
PI605+79.31
106+50.00 211.66'
108+24.65 211.66'
PI609+91.44
108+99.61 90.34'
EXISTING R/W
110 CONCRETE
PI613+80.75
C.L. DETOUR POE 615+32.88
POE115+00.00 615
115
SURVEY BASELINE N 46°52'13" E 652.2'
N49°54'01"E
PT611+38.92
N30°32'28"E
PC612+30.40
112+41.64 89.65'
PT615+28.23

STA. 600+39.65
BEGIN SITE 1 DETOUR

DETOUR CURVE DATA
PI = 601+90.00
Δ = 19°21'32"RT.
D = 6°30'00"
T = 150.35
L = 297.83
PC = 600+39.65
PT = 603+37.48
e = NO SUPER

DETOUR CURVE DATA
PI = 613+80.75
Δ = 19°21'32"RT.
D = 6°30'00"
T = 150.35
L = 297.83
PC = 612+30.40
PT = 615+28.23
e = NO SUPER

STA. 600+39.65
BEGIN SITE 1 DETOUR

STA. 607+24 INSTALL TRIPLE 72" X 80' TEMPORARY PIPE CULVERT @ 25° LT. FWD. SKEW UNDER DETOUR ON RT.

SITE 1-BURNT BRIDGE CREEK-DETOUR

STA. 603+37.49 BEGIN SUPERELEVATION
STA. 605+77.88 MAX. SUPERELEVATION (0.069 FT./FT.)
STA. 605+77.88 MAX. SUPERELEVATION (0.069 FT./FT.)
STA. 607+83.94 TRANS. SUPERELEVATION (0.041FT./FT.)

STA. 607+83.94 TRANS. SUPERELEVATION (0.041FT./FT.)
STA. 609+90.01MAX. SUPERELEVATION (0.069 FT./FT.)
STA. 609+90.01MAX. SUPERELEVATION (0.069 FT./FT.)
STA. 612+30.39 END SUPERELEVATION

BURNT BRIDGE CREEK AT STA. 107+50 TO WHITE RIVER IS CLASSIFIED AS INTERMITTENT. THE TOP OF CHANNEL ELEVATION IS 180.0 FT. MSL. REFER TO SECTION 110.05(c) TEMPORARY FILL OF THE 2014 STANDARD SPECIFICATIONS.

P.V.I. 601+84.70
ELEV. 186.79

-0.02%

606+00.00 180.62 LT.
606+00.00 180.54 RT.
RT. D.G.-4.72%
RT. D.G.-4.59%
607+00.00 175.90 LT.
607+00.00 175.95 RT.
RT. & LT. D.G.0.00%
607+50.00 175.95
607+50.00 175.90 LT.
LT. D.G.4.17%
LT. D.G.4.26%
608+50.00 180.21 RT.
608+50.00 180.07 LT.

INLET FL. 176.65 RT.
OUTLET FL. 176.59 LT.

P.V.I. 613+85.88
ELEV. 186.53

230 220 210 200 190 180 170 160 150 140

600+00 601+00 602+00 603+00 604+00 605+00 606+00 607+00 608+00 609+00 610+00 611+00 612+00 613+00 614+00 615+00

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	54	134

(2) PLAN AND PROFILE SHEETS SITE 2

STA. 200+46 IN PLACE
18" X 298' RC PIPE CULVERT
RETAIN

STA. 202+04 IN PLACE
CONC. DRAIN BOX
18" X 46' RC PIPE CULVERT OUTLET
RETAIN

STA. 202+70 IN PLACE
CONC. DRAIN BOX
18" X 44' RC PIPE CULVERT OUTLET
RETAIN

STA. 203+38 IN PLACE
CONC. DRAIN BOX
18" X 51' RC PIPE CULVERT OUTLET
REMOVE

STA. 204+10 IN PLACE
CONC. DRAIN BOX
18" X 30' RC PIPE CULVERT OUTLET
REMOVE

ENTIRE PROJECT IN SFHA

PI = 218+73.87
Δ = 55°12'15"LT.
D = 03°00'00"
T = 998.54
L = 1840.14
PC = 208+75.33
PT = 227+15.47
e = MATCH EXISTING

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-4-14

STA. 200+28 IN PLACE
24" X 44' PLASTIC PIPE CULVERT
RT. SIDE DRAIN
RETAIN
CONSTRUCT APPROACH
UNC. EXC. = 25 CU. YDS.

STA. 201+18 IN PLACE
2.5' X 2.5' X 52' RC BOX CULVERT
RT. SIDE DRAIN
RETAIN
CONSTRUCT APPROACH
UNC. EXC. = 25 CU. YDS.

STA. 202+34 IN PLACE
24" X 30' PLASTIC PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 36' PIPE CULVERT
ON RT. SIDE DRAIN
CONSTRUCT CO. RD. APPROACH
UNC. EXC. = 25 CU. YDS.

STA. 206+00.00 - BEGIN
SITE 2 L.M. 13.30

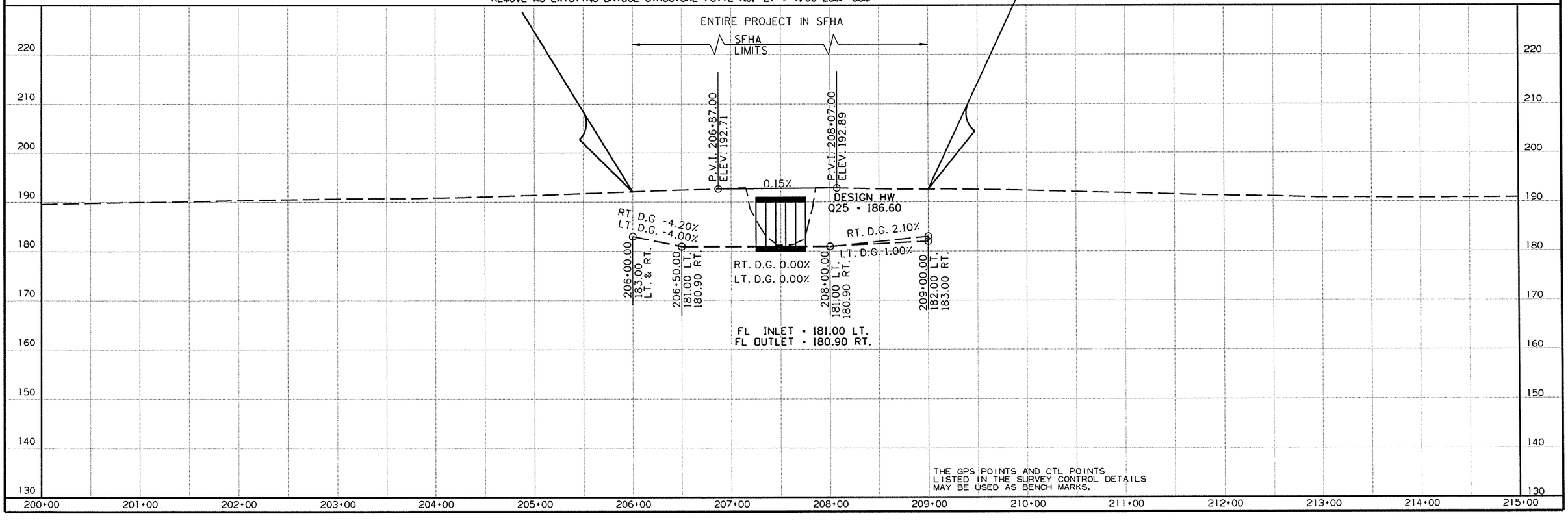
STA. 207+50 CONSTRUCT
QUINT. 10' X 9' X 86' R.C. BOX CULVERT
AT 30° RT. FWD SKEW
WITH 3:1 WINGS LT. & RT.
ROADWAY SPAN = 54.08'
Q25 = 1000 CFS D.A. = 8.4 SQ. MI.

STA. 207+16.02 TO STA. 207+84.25 - IN PLACE
69' X 27' CLEAR ROADWAY BRIDGE NO. 01388 AT L.M. 13.32
CONSISTING OF A CONCRETE TEE BEAM WITH CONCRETE DECK AND ASPHALT OVERLAY WITH CONCRETE PILINGS
REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 2) = 1.00 LUMP SUM

STA. 209+00.00 - END
SITE 2

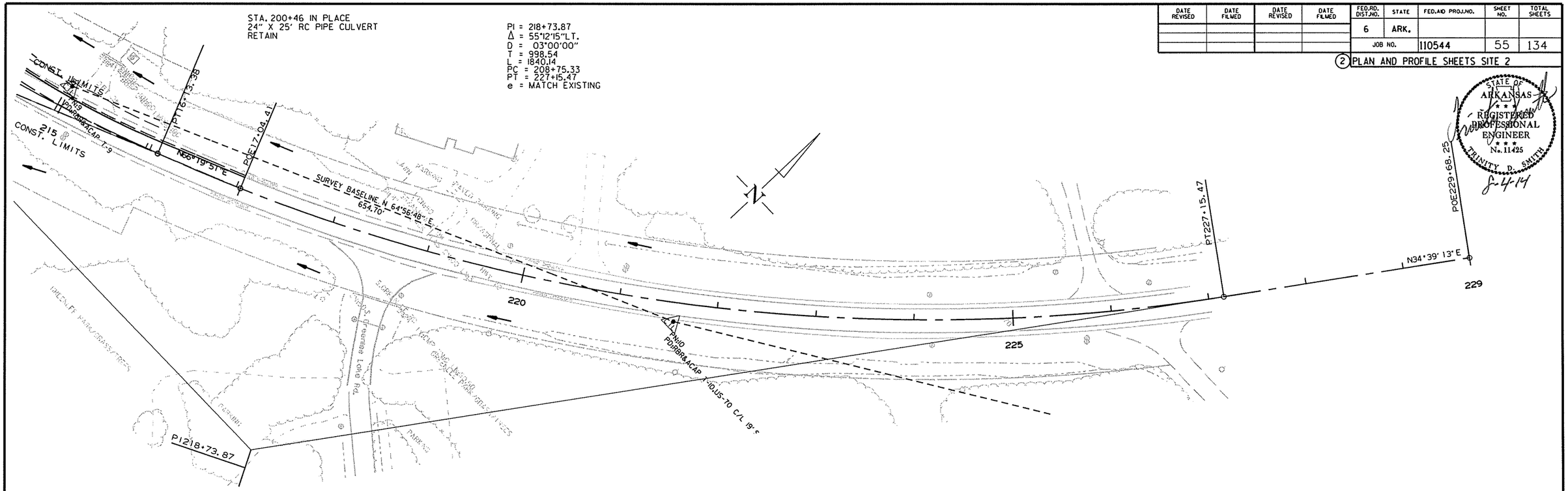
STA. 208+15 INSTALL
SEXT. 96' X 80'
TEMPORARY PIPE CULVERT
@ 27° RT. FWD. SKEW
UNDER DETOUR ON RT.

SITE 2-PINEY DITCH



7/31/2014

R110544.DGN



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	55	134

② PLAN AND PROFILE SHEETS SITE 2

TRINITY D. SMITH
No. 11425
8-4-14

STA. 200+46 IN PLACE
24" X 25' RC PIPE CULVERT
RETAIN

PI = 218+73.87
Δ = 55°12'15"LT.
D = 03°00'00"
T = 998.54
L = 1840.14
PC = 208+75.33
PT = 227+15.47
e = MATCH EXISTING

SITE 2-PINEY DITCH

7/31/2014
R110544.DGN

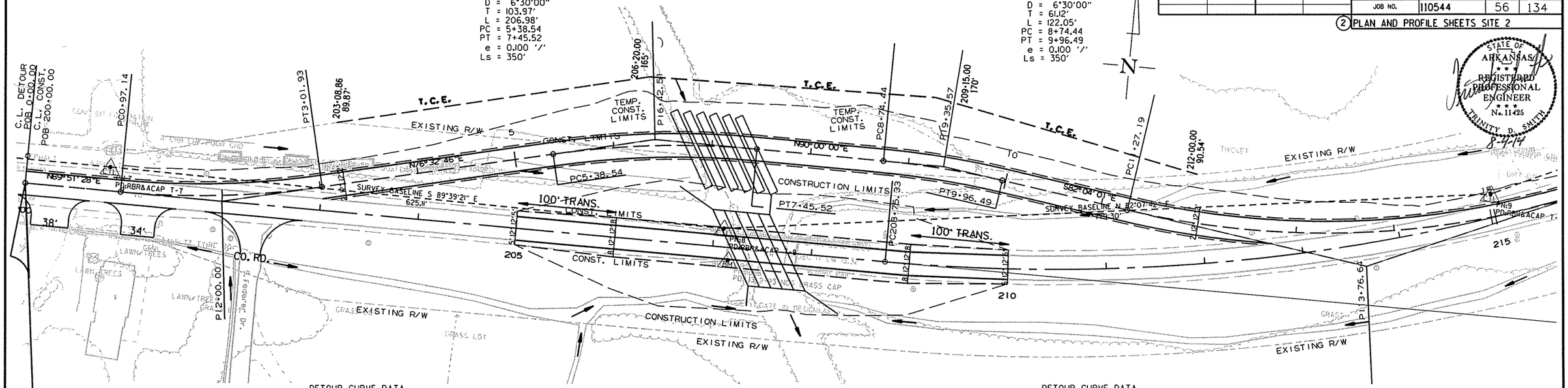
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	56	134

(2) PLAN AND PROFILE SHEETS SITE 2

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-14

DETOUR CURVE DATA
PI = 6+42.51
Δ = 13°27'14"RT.
D = 6°30'00"
T = 103.97'
L = 206.98'
PC = 5+38.54
PT = 7+45.52
e = 0.100 '/'
Ls = 350'

DETOUR CURVE DATA
PI = 9+35.57
Δ = 7°55'59"RT.
D = 6°30'00"
T = 61.12'
L = 122.05'
PC = 8+74.44
PT = 9+96.49
e = 0.100 '/'
Ls = 350'



STA. 0+00.00
BEGIN SITE 2 DETOUR

DETOUR CURVE DATA
PI = 2+00.00
Δ = 13°18'42"LT.
D = 6°30'00"
T = 102.86'
L = 204.79'
PC = 0+97.14
PT = 3+01.93
e = NO SUPER

DETOUR CURVE DATA
PI = 13+76.64
Δ = 31°36'08"LT.
D = 6°30'00"
T = 249.45
L = 486.19
PC = 11+27.19
PT = 16+13.38
e = MATCH EXISTING

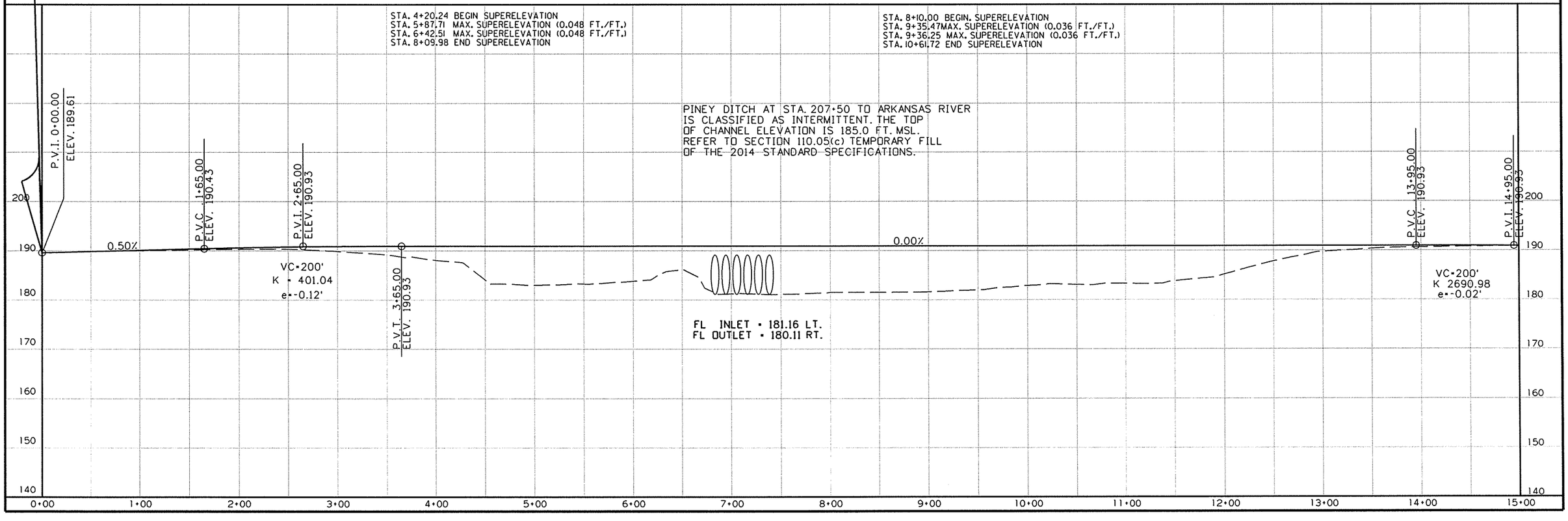
STA. 7+10 INSTALL
SEXT. 96" X 72'
TEMPORARY PIPE CULVERT
@ 27° RT. FWD. SKEW
UNDER DETOUR ON LT.

SITE 2-PINEY DITCH-DETOUR

STA. 4+20.24 BEGIN SUPERELEVATION
STA. 5+87.71 MAX. SUPERELEVATION (0.048 FT./FT.)
STA. 6+42.51 MAX. SUPERELEVATION (0.048 FT./FT.)
STA. 8+09.98 END SUPERELEVATION

STA. 8+10.00 BEGIN. SUPERELEVATION
STA. 9+35.47MAX. SUPERELEVATION (0.036 FT./FT.)
STA. 9+36.25 MAX. SUPERELEVATION (0.036 FT./FT.)
STA. 10+61.72 END SUPERELEVATION

PINEY DITCH AT STA. 207+50 TO ARKANSAS RIVER IS CLASSIFIED AS INTERMITTENT. THE TOP OF CHANNEL ELEVATION IS 185.0 FT. MSL. REFER TO SECTION 110.05(c) TEMPORARY FILL OF THE 2014 STANDARD SPECIFICATIONS.



7/31/2014
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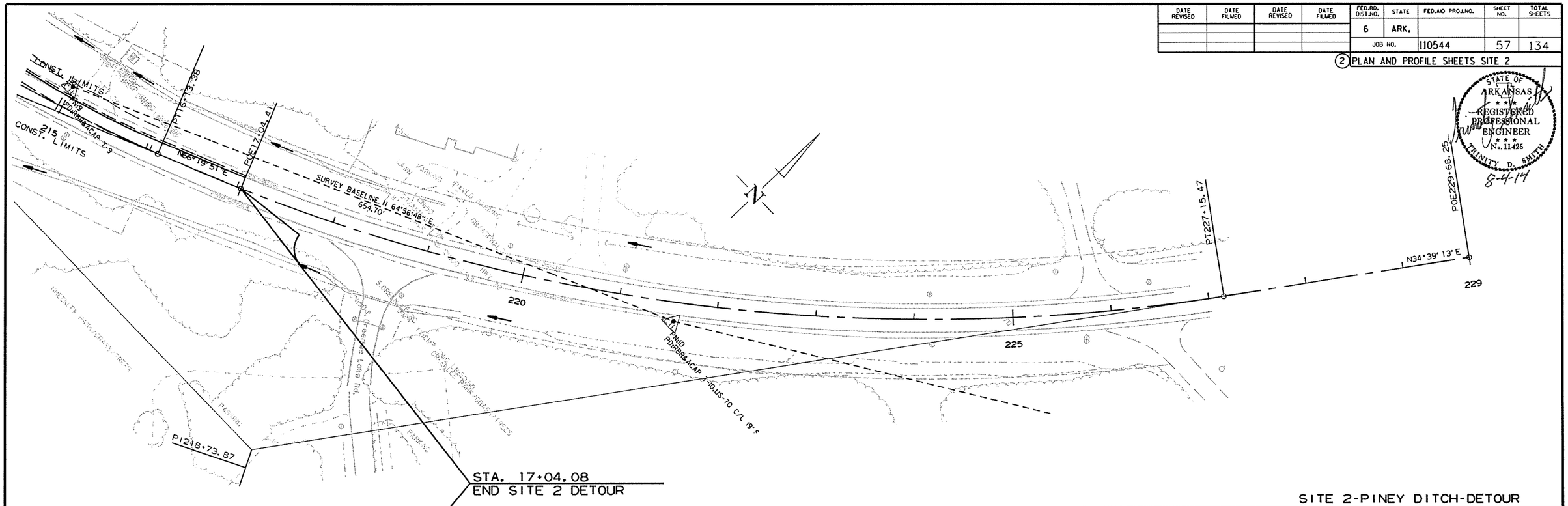
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RO. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	57	134

(2) PLAN AND PROFILE SHEETS SITE 2

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-4-14



7/31/2014

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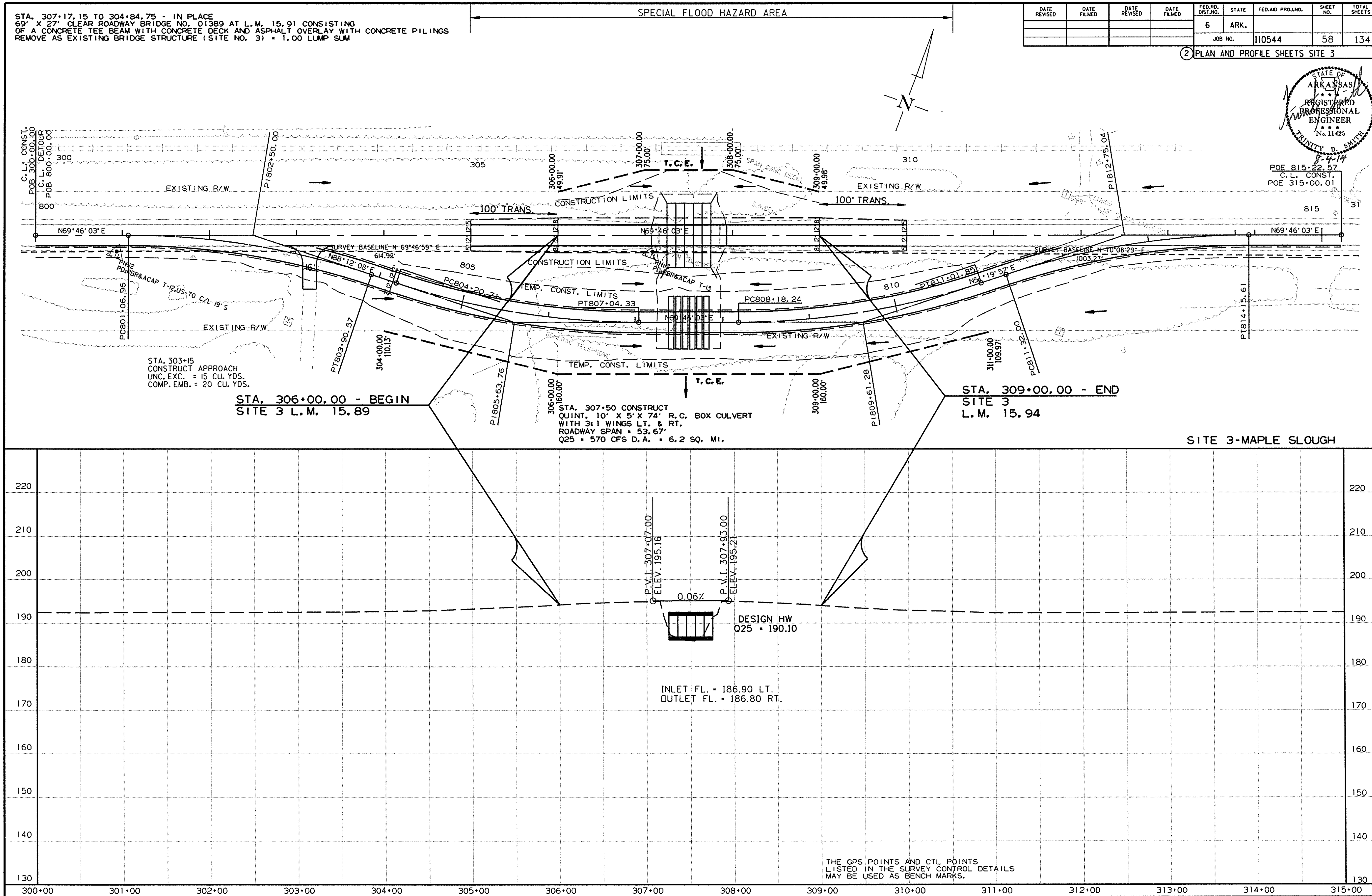
STA. 307+17.15 TO 304+84.75 - IN PLACE
69' X 27' CLEAR ROADWAY BRIDGE NO. 01389 AT L.M. 15.91 CONSISTING
OF A CONCRETE TEE BEAM WITH CONCRETE DECK AND ASPHALT OVERLAY WITH CONCRETE PILINGS
REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 3) = 1.00 LUMP SUM

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	58	134

(2) PLAN AND PROFILE SHEETS SITE 3

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 8-4-14



SPECIAL FLOOD HAZARD AREA
N
C.L. CONST. POB 300+00.00
C.L. DETOUR POB 800+00.00
EXISTING R/W
100' TRANS.
CONSTRUCTION LIMITS
T.C.E.
TEMP. CONST. LIMITS
SURVEY BASELINE N 69°46'59" E 614.92'
SURVEY BASELINE N 70°08'29" E 1003.27'
N69°46'03"E
N88°12'08"E
PC804+20.71
PT807+04.33
PC808+18.24
PT811+01.85
PT803+90.57
PC811+32.00
P1802+50.00
P1805+63.76
P1809+61.28
P1812+75.04
PC801+06.96
PT814+15.61
POE 815+22.57
C.L. CONST. POE 315+00.01
304+00.00 110.13'
306+00.00 49.91'
306+00.00 160.00'
307+00.00 75.00'
308+00.00 75.00'
309+00.00 49.98'
309+00.00 160.00'
311+00.00 109.97'
STA. 303+15
CONSTRUCT APPROACH
UNC. EXC. = 15 CU. YDS.
COMP. EMB. = 20 CU. YDS.
STA. 306+00.00 - BEGIN
SITE 3 L.M. 15.89
STA. 307+50 CONSTRUCT
QUINT. 10' X 5' X 74' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
ROADWAY SPAN = 53.67'
Q25 = 570 CFS D.A. = 6.2 SQ. MI.
STA. 309+00.00 - END
SITE 3
L.M. 15.94
SITE 3-MAPLE SLOUGH
P.V.I. 307+07.00
ELEV. 195.16
P.V.I. 307+93.00
ELEV. 195.21
0.06%
DESIGN HW
Q25 = 190.10
INLET FL. = 186.90 LT.
OUTLET FL. = 186.80 RT.
THE GPS POINTS AND CTL POINTS
LISTED IN THE SURVEY CONTROL DETAILS
MAY BE USED AS BENCH MARKS.
220
210
200
190
180
170
160
150
140
130
300+00
301+00
302+00
303+00
304+00
305+00
306+00
307+00
308+00
309+00
310+00
311+00
312+00
313+00
314+00
315+00

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	59	134

(2) PLAN AND PROFILE SHEETS SITE 3

DETOUR CURVE DATA
PI = 805+63.76
Δ = 18°26'06"LT.
D = 6°30'00"
T = 143.04
L = 283.61
PC = 804+20.71
PT = 807+04.33
e = 0.100 '/'
Ls = 350'

DETOUR CURVE DATA
PI = 809+61.28
Δ = 18°26'06"LT.
D = 6°30'00"
T = 143.04
L = 283.61
PC= 808+18.24
PT = 811+01.85
e = 0.100 '/'
Ls = 350'

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C.L. CONST. POB 300+00.00
C.L. DETOUR POB 800+00.00
300
800
EXISTING R/W
P.I. 802+50.00
305
306+00.00 49.91'
307+00.00 75.00'
T.C.E.
308+00.00 75.00'
309+00.00 49.98'
310
EXISTING R/W
P.I. 812+75.04
POE 815+22.57
C.L. CONST.
POE 315+00.01
815
31
100' TRANS.
CONSTRUCTION LIMITS
100' TRANS.
N69°46'03"E
SURVEY BASELINE N 69°46'59" E 614.92'
N88°12'08"E
15 12 12 8
8 12 12 8
15 12 12 5
CONSTRUCTION LIMITS
PKNAIL FD IRBR&ACAP T-13
PKNAIL FD IRBR&ACAP T-12,US-70 C/L 19' S
805
PC804+20.71
TEMP. CONST. LIMITS
PT807+04.33
PC808+18.24
PT811+01.85
N57°19'57"E
SURVEY BASELINE N 70°08'29" E 1003.22'
810
PC801+06.96
EXISTING R/W
EXISTING R/W
P.I. 803+90.57
304+00.00 110.13'
TEMP. CONST. LIMITS
T.C.E.
P.I. 805+63.76
306+00.00 160.00'
309+00.00 160.00'
P.I. 809+61.28
311+00.00 109.97'
PC811+32.00
P.I. 814+15.61

STA. 801+06.96 - BEGIN
SITE 3 DETOUR

DETOUR CURVE DATA
PI = 802+50.00
Δ = 18°26'06"RT.
D = 6°30'00"
T = 143.04
L = 283.61
PC = 801+06.96
PT = 803+90.57
e = NO SUPER

STA. 807+61 INSTALL
SEXT. 72" X 60"
TEMPORARY PIPE CULVERT
UNDER DETOUR ON RT.

DETOUR CURVE DATA
PI = 812+75.04
Δ = 18°26'06"RT.
D = 6°30'00"
T = 143.04
L = 283.61
PC = 811+32.00
PT = 814+15.61
e = NO SUPER

STA. 814+15.61 - END
SITE 3 DETOUR

SITE 3-MAPLE SLOUGH-DETOUR

STA. 803+90.57 BEGIN SUPERELEVATION
STA. 805+62.52 MAX. SUPERELEVATION (0.049 FT./FT.)
STA. 805+62.52 MAX. SUPERELEVATION (0.049 FT./FT.)
STA. 807+34.47 END SUPERELEVATION

STA. 807+88.10 BEGIN SUPERELEVATION
STA. 809+60.05 MAX. SUPERELEVATION (0.049 FT./FT.)
STA. 809+60.05 MAX. SUPERELEVATION (0.049 FT./FT.)
STA. 811+32.00 END SUPERELEVATION

MAPLE SLOUGH AT STA. 307+50 TO ARKANSAS RIVER IS CLASSIFIED AS INTERMITTENT. THE TOP OF CHANNEL ELEVATION IS 186.0 FT. MSL. REFER TO SECTION 110.05(c) TEMPORARY FILL OF THE 2014 STANDARD SPECIFICATIONS.

P.V.I. 802+00.00 ELEV. 192.46
P.V.C. 802+55.38 ELEV. 192.44
K=174.12 VC=200' e=0.29'
P.V.T. 804+55.38 ELEV. 193.59
P.V.C. 805+00.00 ELEV. 194.10
P.V.I. 806+00.00 ELEV. 195.25
P.V.C. 808+00.00 ELEV. 195.25
P.V.I. 809+00.00 ELEV. 195.25
P.V.C. 810+68.18 ELEV. 193.35
K=176.79 VC=200' e=0.28'
P.V.T. 812+68.18 ELEV. 192.22
P.V.I. 813+00.00 ELEV. 192.31
-0.04%
0.00%
1.15%
0.00%
-1.13%
0.00%
0.28
P.V.I. 803+55.38 ELEV. 192.44
804+00.00 186.70
806+00.00 186.50
P.V.T. 807+00.00 ELEV. 195.25
P.V.T. 810+00.00 ELEV. 194.12
810+50.00 186.50
P.V.I. 811+68.18 ELEV. 192.22
812+00.00 187.40
RT. D.C.-0.10%
RT. D.C. 0.00%
RT. D.C. 0.60%
K=174.12 VC=200' e=-0.29'
K=176.79 VC=200' e=-0.28'
INLET FL. = 186.78 LT.
OUTLET FL. = 186.50 RT.

230 220 210 200 190 180 170 160 150 140

800+00 801+00 802+00 803+00 804+00 805+00 806+00 807+00 808+00 809+00 810+00 811+00 812+00 813+00 814+00 815+00

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				6	ARK.			
				JOB NO.		110544	60	134

(2) PLAN AND PROFILE SHEETS SITE 4

SPECIAL FLOOD HAZARD AREA

STATION	STATION	SIDE	GUARDRAIL (TYPE A) LIN. FT.	THRIE BEAM GUARDRAIL TERMINAL EACH	TERMINAL ANCHOR POSTS (TYPE 1) EACH
413+34.15	415+52.90	RT.	200	1	1
414+23.13	415+16.88	LT.	75	1	1
417+60.56	418+54.31	RT.	75	1	1
417+15.14	419+43.29	LT.	200	1	1

BR. END STA. 415+44.50
BRIDGE NO. 07302
40'-00" CLEAR ROADWAY
AT 45° RT. FWD. SKEW
189'-00" TOTAL LENGTH
186'-00" CONTINUOUS COMPOSITE
W-BEAM UNIT (58', 70', 58')
BR. END STA. 417+33.50

SPECIAL FLOOD HAZARD AREA

FENCE ITEMS

STA.	STA.	SIDE	(TYPE D) LIN.FT.
415+07	418+81	LT.	400

CL CONST.
PI = 423+30.37
Δ = 18°33'37" LT.
D = 02°00'00"
T = 468.11
L = 928.02
PC = 418+62.26
PT = 427+90.28
e = 0.048 '/'
Ls = 300'

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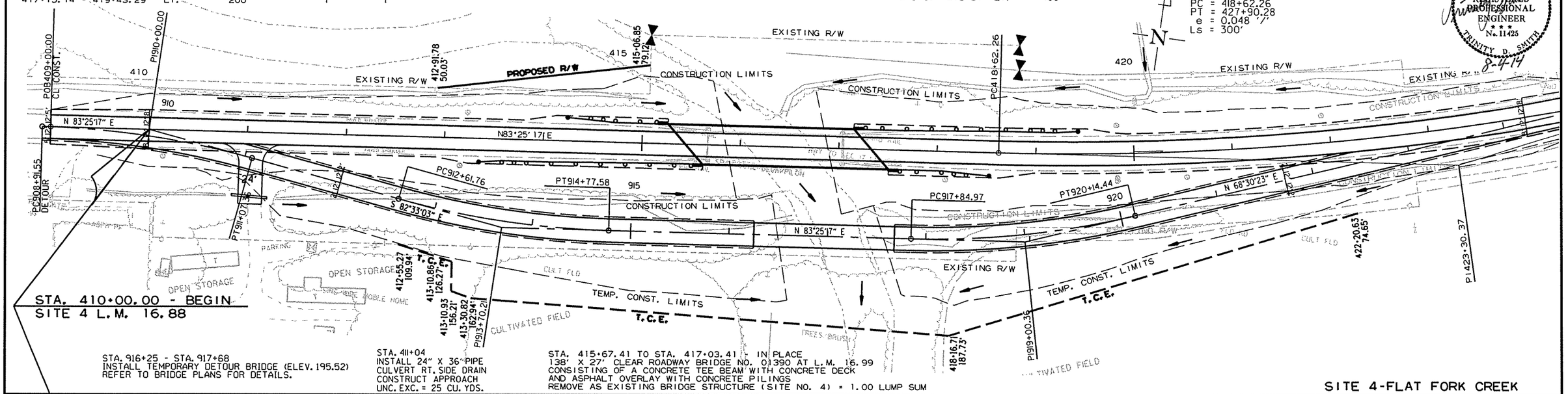
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-4-14

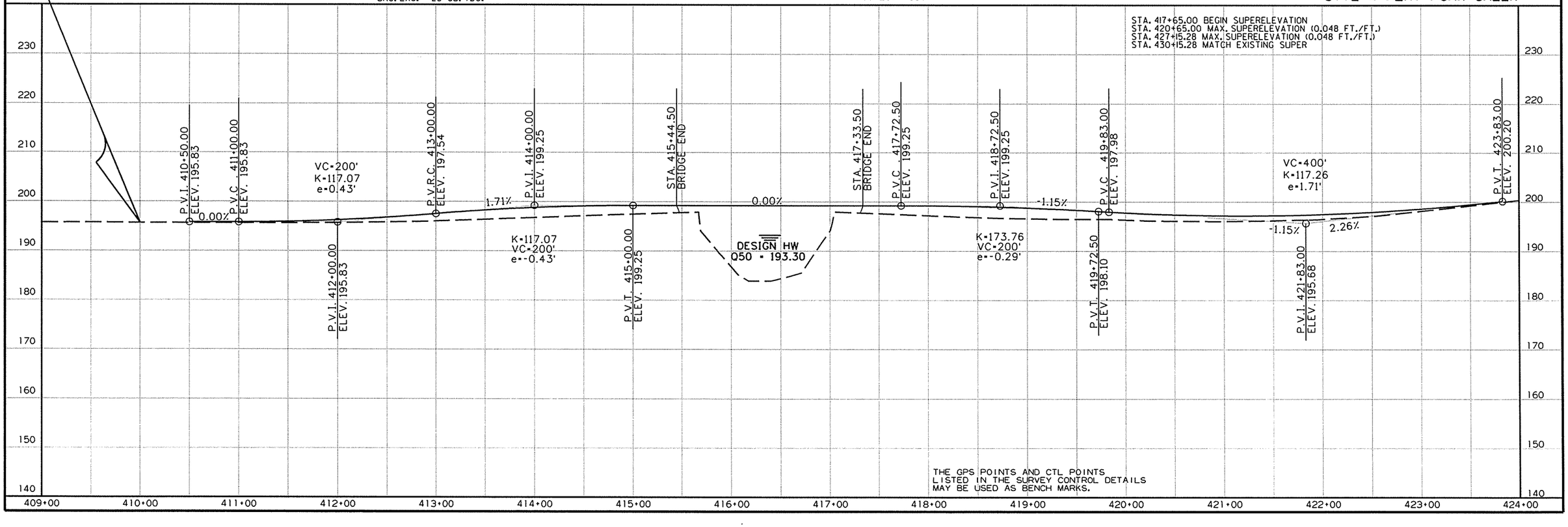


STA. 916+25 - STA. 917+68
INSTALL TEMPORARY DETOUR BRIDGE (ELEV. 195.52)
REFER TO BRIDGE PLANS FOR DETAILS.

STA. 411+04
INSTALL 24" X 36" PIPE
CULVERT RT. SIDE DRAIN
CONSTRUCT APPROACH
UNC. EXC. = 25 CU. YDS.

STA. 415+67.41 TO STA. 417+03.41 - IN PLACE
138' X 27' CLEAR ROADWAY BRIDGE NO. 01390 AT L.M. 16.99
CONSISTING OF A CONCRETE TEE BEAM WITH CONCRETE DECK
AND ASPHALT OVERLAY WITH CONCRETE PILINGS
REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 4) = 1.00 LUMP SUM

SITE 4-FLAT FORK CREEK



THE GPS POINTS AND CTL POINTS LISTED IN THE SURVEY CONTROL DETAILS MAY BE USED AS BENCH MARKS.

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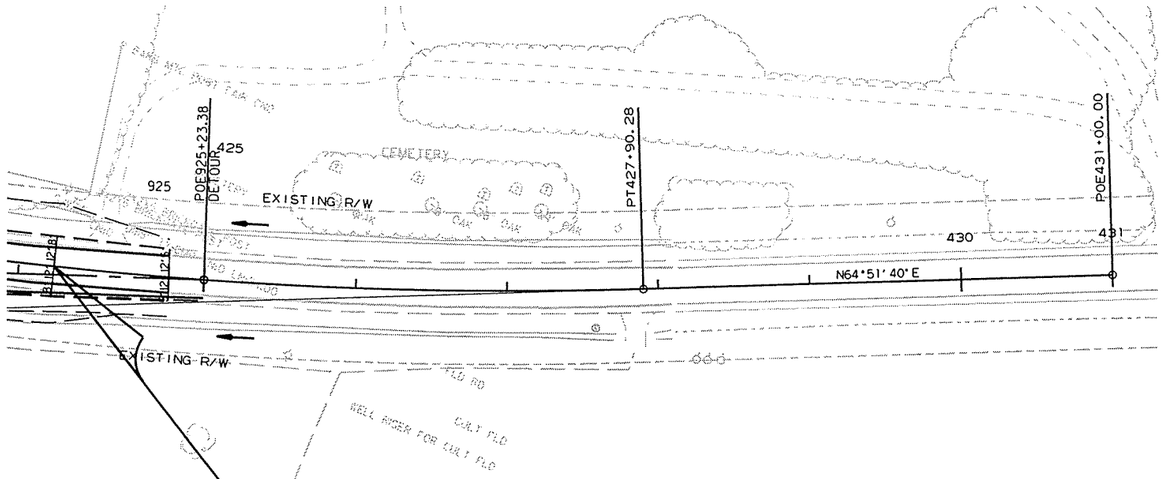
				6	ARK.			
				JOB NO.		110544	61	134

(2) PLAN AND PROFILE SHEETS SITE 4

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-4-14

STA. 424+33
18" X 24' CM PIPE CULVERT
LT. SIDE DRAIN
RETAIN



STA. 424+00.00 - END
SITE 4 & END JOB 110544

SITE 4-FLAT FORK CREEK

STA. 417+65.00 BEGIN SUPERELEVATION
STA. 420+65.00 MAX. SUPERELEVATION (0.048 FT./FT.)
STA. 427+15.28 MAX. SUPERELEVATION (0.048 FT./FT.)
STA. 430+15.28 MATCH EXISTING SUPER

230 220 210 200 190 180 170 160 150 140

424+00 425+00 426+00 427+00 428+00 429+00 430+00 431+00 432+00 433+00 434+00 435+00 436+00 437+00 438+00 439+00

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	62	134

(2) PLAN AND PROFILE SHEETS SITE 4

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-4-14

DETOUR CURVE DATA
PI = 913+70.21
Δ = 14°01'40"LT.
D = 6°30'00"
T = 108.45
L = 215.81
PC = 912+61.76
PT = 914+77.58
e = 0.100 '/'
Ls = 350'

DETOUR CURVE DATA
PI = 919+00.36
Δ = 14°54'54"LT.
D = 6°30'00"
T = 115.38
L = 229.46
PC = 917+84.97
PT = 920+14.44
e = 0.100 '/'
Ls = 350'

DETOUR CURVE DATA
PI = 910+00.00
Δ = 14°01'40"RT.
D = 6°30'00"
T = 108.45
L = 215.81
PC = 908+91.55
PT = 911+07.36
e = NO SUPER

STA. 410+00.00 - BEGIN
DETOUR SITE 4

STA. 916+25 - STA. 917+68
INSTALL TEMPORARY DETOUR BRIDGE (ELEV. 195.52)
REFER TO BRIDGE PLANS FOR DETAILS.

SITE 4-FLAT FORK CREEK-DETOUR

STA. 911+08.00 BEGIN SUPERELEVATION
STA. 913+69.67 MAX. SUPERELEVATION (0.075 FT./FT.)
STA. 913+69.67 MAX. SUPERELEVATION (0.075 FT./FT.)
STA. 916+31.34 END SUPERELEVATION

STA. 917+80.00 BEGIN SUPERELEVATION
STA. 918+99.75 MAX. SUPERELEVATION (0.034 FT./FT.)
STA. 919+00.25 MAX. SUPERELEVATION (0.034 FT./FT.)
STA. 920+20.00 END SUPERELEVATION

STA. 920+20.00 TO STA. 925+23.38
TRANS. TO MATCH EXISTING SUPERELEVATION

FLAT FORK CREEK AT STA. 416+20 - STA. 417+20 TO ARKANSAS RIVER IS CLASSIFIED AS INTERMITTENT. THE TOP OF CHANNEL ELEVATION IS 188.0 FT. MSL. REFER TO SECTION 110.05(c) TEMPORARY FILL OF THE 2014 STANDARD SPECIFICATIONS.

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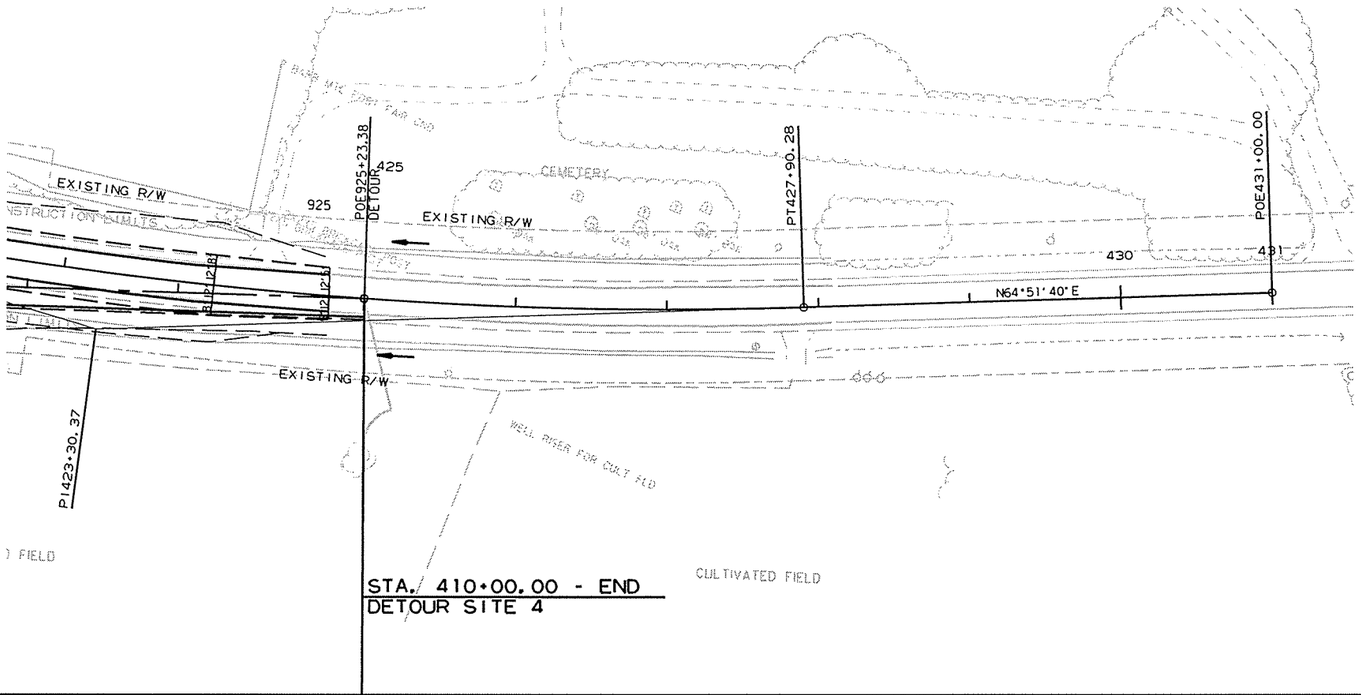
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	63	134

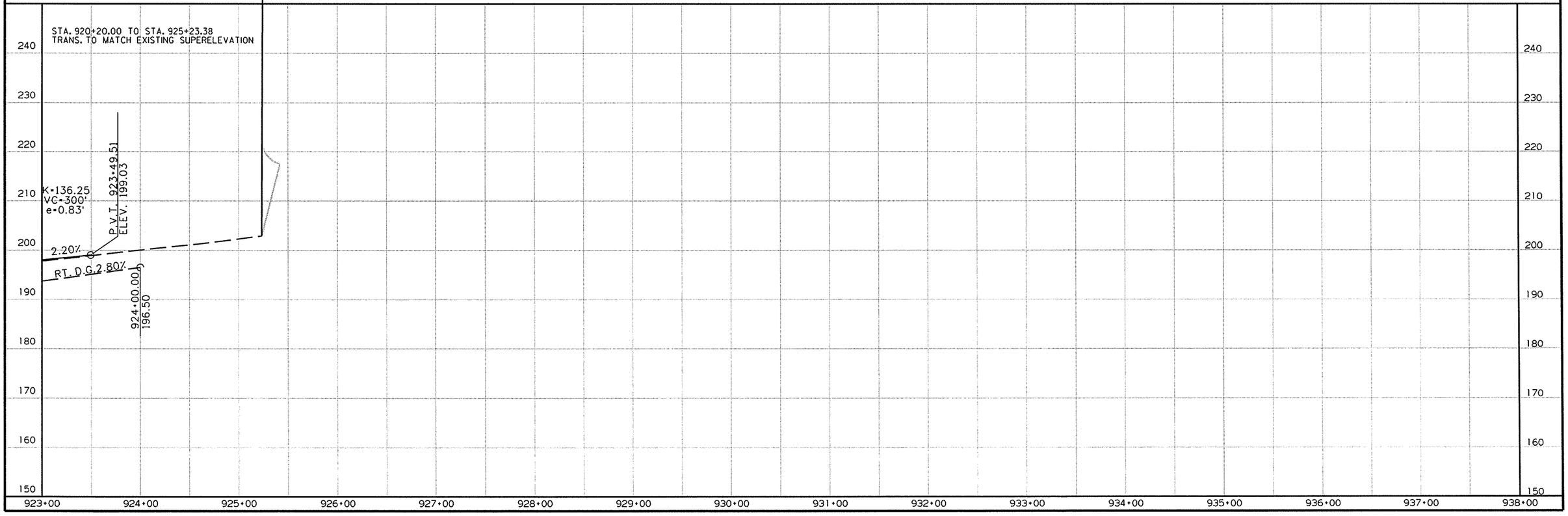
(2) PLAN AND PROFILE SHEETS SITE 4

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-4-14



STA. 410+00.00 - END
DETOUR SITE 4

SITE 4-FLAT FORK CREEK-DETOUR



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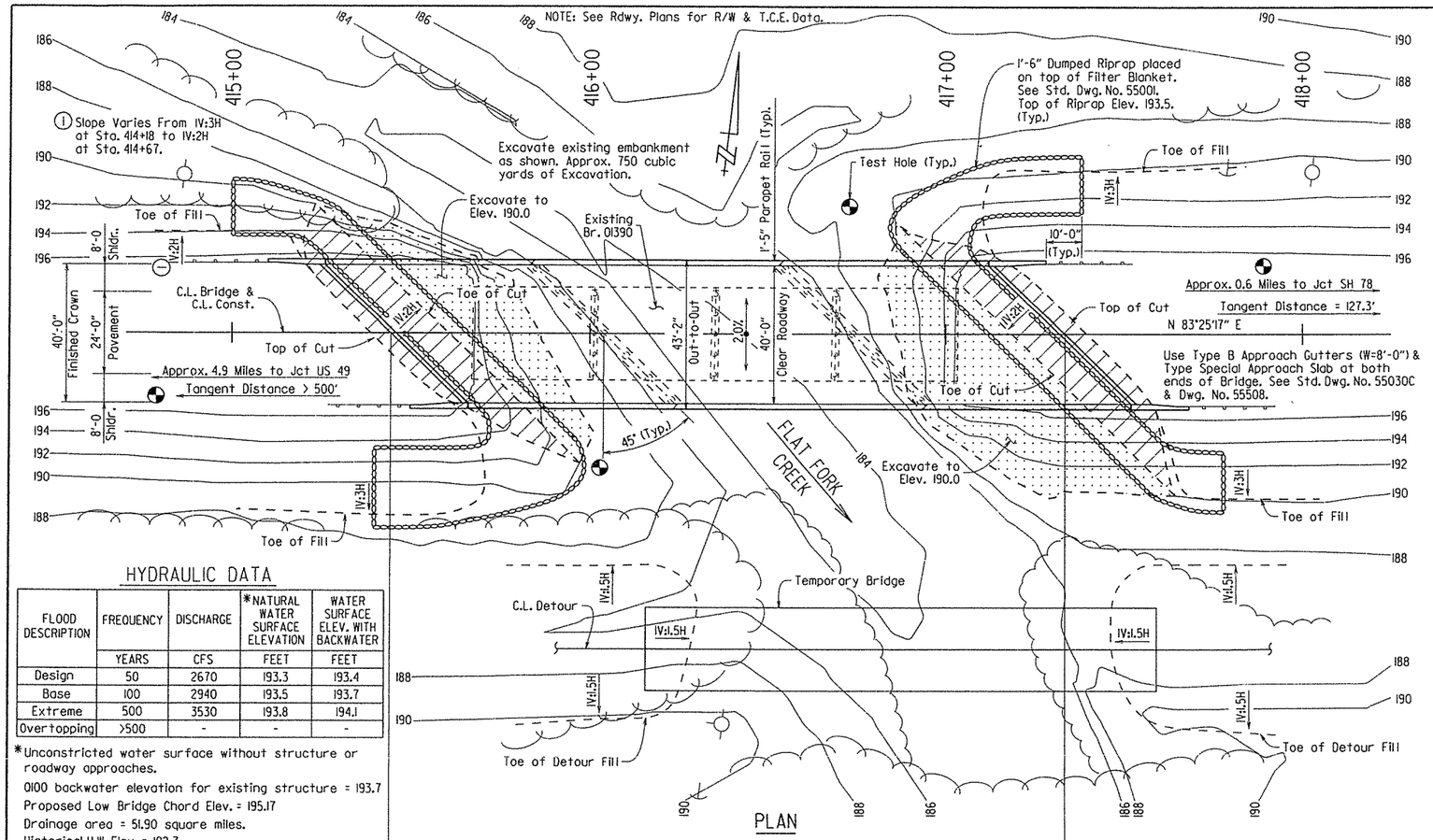
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	1A	134
				①	07302 -	LAYOUT		- 55494



HYDRAULIC DATA

FLOOD DESCRIPTION	FREQUENCY	DISCHARGE	*NATURAL WATER SURFACE ELEVATION	WATER SURFACE ELEV. WITH BACKWATER
	YEARS	CFS	FEET	FEET
Design	50	2670	193.3	193.4
Base	100	2940	193.5	193.7
Extreme	500	3530	193.8	194.1
Overtopping	>500	-	-	-

*Unconstricted water surface without structure or roadway approaches.
Q100 backwater elevation for existing structure = 193.7
Proposed Low Bridge Chord Elev. = 195.17
Drainage area = 51.90 square miles.
Historical H.W. Elev. = 192.7

GENERAL NOTES

BENCH MARK: CTL PT T-18, Rebar and Aluminum Cap, 18.02 Rt. of Sta. 415+62.00, Elev. 196.61.

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction, 2014 edition, with applicable supplemental specifications and special provisions. Unless otherwise noted in the plans Section and Subsection refer to the Standard Construction Specifications.

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications, Sixth Edition (2012).

LIVE LOADING: HL-93

SEISMIC ZONE: 3

MATERIALS AND STRENGTHS:

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

BORING LOGS: Boring logs may be obtained from the Programs and Contracts Division.

PILING: Piling for Bents 1 & 4 shall be 16" diameter concrete filled steel shells and shall be driven to an ultimate bearing capacity of 153 tons per pile. Piling for Bents 2 & 3 shall be 24" diameter concrete filled steel shells and shall be driven to an ultimate bearing capacity of 303 tons per pile. All piling shall be driven with an approved air, steam, or diesel hammer. Drive piling in Bents 1 & 4 after embankment to bottom of cap is in place. All piling shall have a tip elevation of 114 of lower.

Lengths of piling shown are assumed for estimating quantities only. Actual lengths are to be determined in the field. Test piles are not required but may be driven for the Contractor's information in accordance with Subsection 805.08(g). No piles will be paid for as Test Piles. There will be no additional payment for cut-off or build-up of piles. Piling in Bents 2 & 3 are positioned to avoid interference with the existing piling. The Contractor shall verify the location of existing piling before driving any piling. Any adjustments necessary to avoid interference with existing piling shall be submitted for the Engineer's approval.

DRIVING SYSTEM: The driving system approval and the ultimate bearing capacity determination for piling shall be based on the requirements of Subsection 805.09(b), "Method B-Wave Equation Analysis (WEAP)". It is estimated that the minimum required rated energy of the hammer to obtain the minimum ultimate bearing capacity on 16" piles will be 30,000 foot pounds per blow and on 24" piles shall be 80,000 foot pounds per blow.

PILE ENCASEMENT: Pile encasements are required for Bents 2 & 3 and shall extend 3' into the ground and to the bottom of cap. See Dwg. No. 55021 for additional details. Galvanized Corrugated Steel Pipe will not be allowed for encasement.

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.

DETAIL DRAWINGS:	DRAWING NO.
Details of Bents 1 & 4	55496-55498
Details of Bents 2 & 3	55499
186'-0" Cont. Comp. W-Beam Unit	55500-55506
Elastomeric Bearings	55507
Concrete Filled Steel Shell Piles	55021
Type C Approach Gutters	55030C
Type Special Approach Slabs	55508

EXISTING BRIDGE: Existing Bridge No. 01390, LM 16.99, is 138' in length, 30' wide and is comprised of reinforced concrete deck girder spans supported by concrete pile bents.

REMOVAL AND SALVAGE: After the temporary bridge is open to traffic, existing Bridge No. 01390 shall be removed in accordance with Section 205. All material from the existing bridge shall become property of the Contractor.

TEMPORARY BRIDGE: Construct a temporary bridge in accordance with Section 603 approximately 90 feet downstream from centerline construction with a minimum deck elevation of 193.5. See Roadway Plans for actual detour grade and alignment. The temporary bridge shall have a minimum length of 143' with a minimum roadway width of 24', a minimum span length of 19',a minimum span length of 31' over main channel, a minimum live load capacity of H15, and meet the requirements for Seismic Zone 'B'. See Dwg. Nos. 55509 & 55510 for temporary bridge details. Neither a timber deck nor timber piles will be allowed for construction of temporary bridge.

MAINTENANCE OF TRAFFIC: See Roadway Plans.

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
6-26-14
CHARLES R. ELLIS
BRIDGE ENGINEER

LAYOUT OF BRIDGE OVER FLAT FORK CREEK
HWY. 17 - ST. FRANCIS CO. LINE
STRS. & APPRS. (S)
MONROE COUNTY

ROUTE 70 SEC. 17

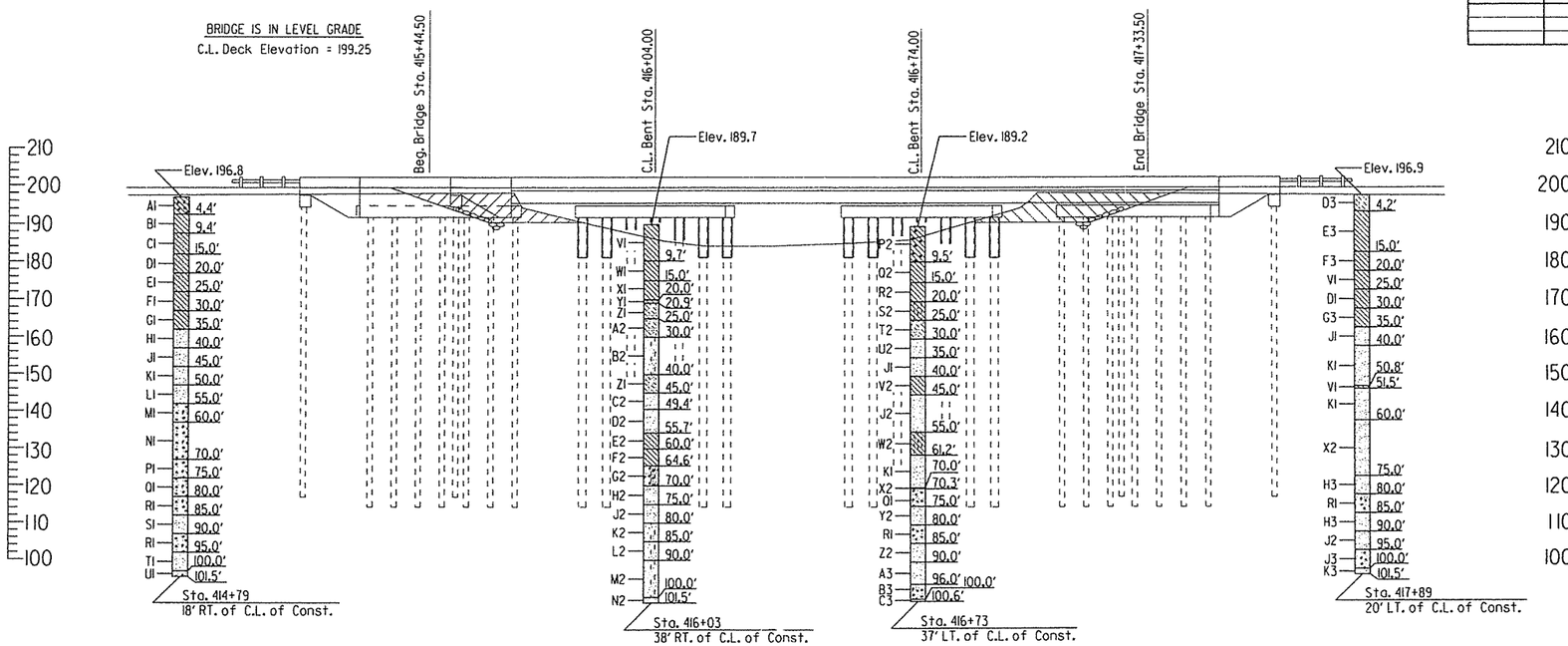
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: LJB DATE: 3/30/12 FILENAME: bll0544x4_ll.dgn
CHECKED BY: DWP DATE: 6/18/14 SCALE: 1"=20'-0"
DESIGNED BY: TMG DATE: 2/12

BRIDGE NO. 07302 DRAWING NO. 55494

PRINT DATE: 18-JUN-2014

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.		110544	65	134
				(1)	07302 -	SOIL BORINGS	- 55495	



BORING LEGEND

A1-Moist, Medium Stiff, Brown Clay with Gravel
B1-Moist, Medium Stiff, Brown Clay with some Organic Matter
C1-Moist, Stiff, Brown Clay with Sand
D1-Moist, Medium Stiff, Gray Sandy Clay
E1-Moist, Stiff, Brown Sandy Clay with Trace of Organic Matter
F1-Moist, Soft, Reddish Brown Clay with Sand
G1-Moist, Medium Stiff, Brown Clay with Sand
H1-Moist, Medium Dense, Brown Sand
J1-Wet, Medium Dense, Gray Sand
K1-Wet, Medium Dense, Brown Sand
L1-Wet, Dense, Gray and Brown Sand
M1-Wet, Medium Dense, Brown Sand with Gravel and Trace of Clay
N1-Wet, Medium Dense, Gray Sand with Gravel
P1-Wet, Medium Dense, Reddish Brown Sand with Gravel
Q1-Wet, Medium Dense, Brown Sand with Gravel
R1-Wet, Dense, Brown Sand with Gravel
S1-Wet, Dense, Brown Sand with occasional Gravel
T1-Wet, Dense, Gray Sand with occasional Gravel
U1-Wet, Dense, Gray Sand with Gravel
V1-Moist, Stiff, Gray Clay
W1-Moist, Stiff, Gray Clay with some Sand and Iron Nodules
X1-Moist, Medium Stiff, Gray Clay with some Iron Nodules
Y1-Wet, Very Soft, Gray Clay
Z1-Wet, Very Loose, Brown Clayey Sand
A2-Wet, Medium Dense, Brown Clayey Sand
B2-Wet, Medium Dense, Brown Silty Sand
C2-Wet, Medium Dense, Brown Sand with Silt
D2-Wet, Medium Dense, Brown to Brown and Gray Sand with Silt
E2-Wet, Stiff, Gray Sandy Clay
F2-Wet, Soft, Gray Clay
G2-Wet, Medium Dense, Brown Sand with Silt and Gravel
H2-Wet, Dense, Brown Sand with Trace of Gravel
J2-Wet, Dense, Brown Sand
K2-Wet, Dense, Brown Sand with Silt
L2-Wet, Dense, Gray Sand with Silt
M2-Wet, Dense to Very Dense, Gray Sand with Silt and some Gravel
N2-Wet, Dense, Gray and Brown Sand
P2-Moist, Stiff, Gray Clay with Organic Matter (Grass roots)
O2-Moist, Medium Stiff, Gray and Brown Clay with some Iron Nodules
R2-Moist, Medium Stiff, Gray Clay
S2-Wet, Soft, Gray Silty Clay
T2-Wet, Medium Dense, Gray Sand with Clay
U2-Wet, Loose, Gray Sand
V2-Wet, Stiff, Brown Sandy Clay
W2-Wet, Soft, Brown Sandy, Silty Clay
X2-Wet, Medium Dense, Brown Sand with Trace of Gravel
Y2-Wet, Dense, Brown Sand with some Gravel
Z2-Wet, Dense, Gray Sand
A3-Wet, Dense, Gray Sand with Trace of Gravel
B3-Wet, Very Dense, Gray Sand with Gravel
C3-Wet, Very Dense, Gray Sand with Cemented Sand
D3-Moist, Medium Dense, Brown Sand with Clay and some Organic Matter
E3-Moist, Medium Stiff to Stiff, Brown Clay with some Organic Matter
F3-Wet, Soft, Brown Sandy Clay
G3-Wet, Soft, Gray Sandy Clay
H3-Wet, Dense, Brown Sand with occasional Gravel
J3-Wet, Very Dense, Gray and Brown Sand with Gravel
K3-Wet, Dense, Gray and Brown Sand with occasional Gravel

"N" VALUES

Sta. 414+79 - 18' RT. of C.L. of Const.

4.9- 5.9, N=6
9.9- 10.9, N=15
15.5- 16.5, N=7
20.5- 21.5, N=13
25.5- 26.5, N=4
30.5- 31.5, N=7
35.5- 36.5, N=20
40.5- 41.5, N=15
45.5- 46.5, N=19
50.5- 51.5, N=37
55.5- 56.5, N=21
60.5- 61.5, N=24
65.5- 66.5, N=21
70.5- 71.5, N=27
75.5- 76.5, N=27
80.5- 81.5, N=38
85.5- 86.5, N=37
90.5- 91.5, N=43
95.5- 96.5, N=41
100.5-101.5, N=38

Sta. 416+03 - 38' RT. of C.L. of Const.

5.2- 6.2, N=11
10.2- 11.2, N=13
15.5- 16.5, N=8
20.5- 21.5, N=1
25.5- 26.5, N=23
30.5- 31.5, N=22
35.5- 36.5, N=26
40.5- 41.5, N=3
45.5- 46.5, N=22
50.5- 51.5, N=20
55.5- 56.5, N=13
60.5- 61.5, N=2
65.5- 66.5, N=26
70.5- 71.5, N=31
75.5- 76.5, N=33
80.5- 81.5, N=37
85.5- 86.5, N=42
90.5- 91.5, N=46
95.5- 96.5, N=60
100.5-101.5, N=33

Sta. 416+73 - 37' LT. of C.L. of Const.

5.0- 6.0, N=12
10.0- 11.0, N=8
15.5- 16.5, N=7
20.5- 21.5, N=4
25.5- 26.5, N=13
30.5- 31.5, N=8
35.5- 36.5, N=14
40.5- 41.5, N=10
45.5- 46.5, N=39
50.5- 51.5, N=24
55.5- 56.5, N=4
60.5- 61.5, N=18
65.5- 66.5, N=27
70.5- 71.5, N=23
75.5- 76.5, N=39
80.5- 81.5, N=40
85.5- 86.5, N=44
90.5- 91.5, N=40
95.5- 96.5, N=63
100.5-100.6, N=69(1")

Sta. 417+89 - 20' LT. of C.L. of Const.

4.7- 5.7, N=6
9.7- 10.7, N=9
15.5- 16.5, N=4
20.5- 21.5, N=10
25.5- 26.5, N=7
30.5- 31.5, N=3
35.5- 36.5, N=27
40.5- 41.5, N=29
45.5- 46.5, N=22
50.5- 51.5, N=15
55.5- 56.5, N=24
60.5- 61.5, N=29
65.5- 66.5, N=25
70.5- 71.5, N=28
75.5- 76.5, N=34
80.5- 81.5, N=34
85.5- 86.5, N=43
90.5- 91.5, N=46
95.5- 96.5, N=66
100.5-101.5, N=37

STATE OF ARKANSAS
Charles R. Ellis
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6-20-14
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SOIL BORINGS
FLAT FORK CREEK
HWY. 17 - ST. FRANCIS CO. LINE
STRS. & APPRS. (S)
MONROE COUNTY

ROUTE 70 SEC. 17

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: LJB DATE: 1/11/13
CHECKED BY: SWP DATE: 6/18/14
DESIGNED BY: TMG DATE: 2/12
FILENAME: bll0544x4_11.dgn
SCALE: 1"=20'-0"

BRIDGE NO. 07302 DRAWING NO. 55495

PRINT DATE: 18-JUN-2014

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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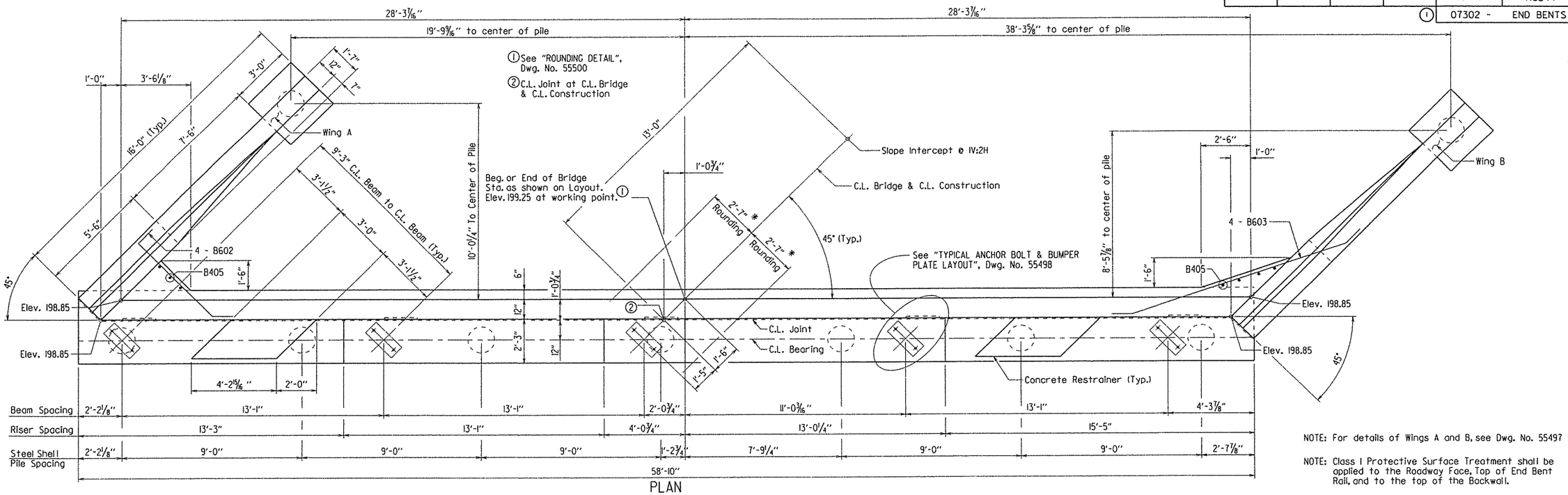
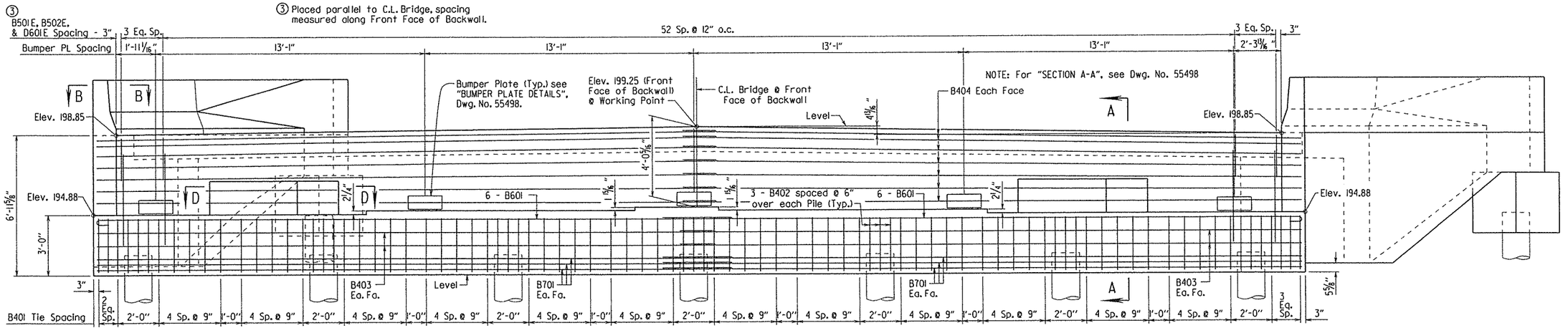
				JOB NO.		110544	60	134
				①	07302 -	END BENTS		- 55496



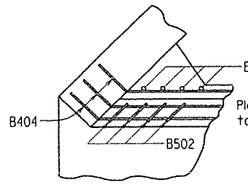
PLAN

NOTE: For details of Wings A and B, see Dwg. No. 55497

NOTE: Class I Protective Surface Treatment shall be applied to the Roadway Face, Top of End Bent Rail, and to the top of the Backwall.



ELEVATION



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

MINIMUM REINFORCING LAP LENGTHS

No. 4 Bars = 1'-9"
No. 7 Bars = 3'-5"

GENERAL NOTES

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

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

No Portion of the Backwall shall be poured before beams are in place. The portion of the backwall above the optional construction joint shall not be placed until the adjacent deck pour has been made.

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

For details of pipe piles, pile anchorage, & pile encasement, see Std. Dwg. No. 55021.

For additional information, see layout.

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
6-20-14
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 1 OF 3

DETAILS OF END BENTS FLAT FORK CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

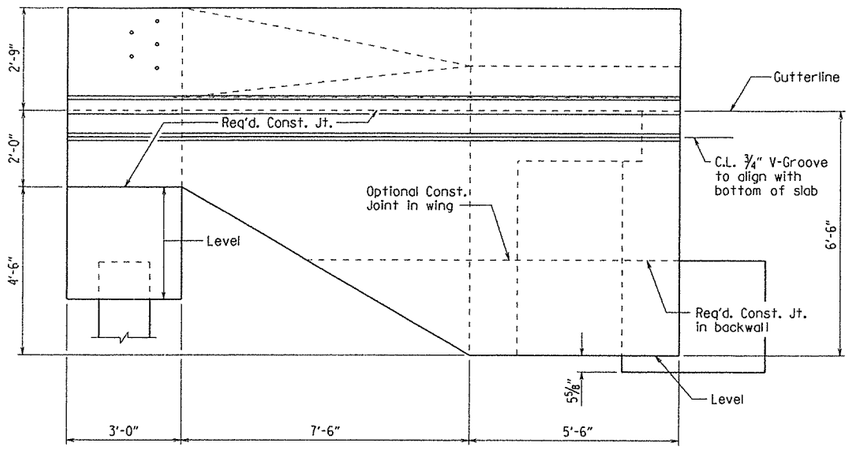
LITTLE ROCK, ARK.

DRAWN BY: TMG DATE: 2/4/2013 FILENAME: bll0544xl_bl.dgn
CHECKED BY: LJS DATE: 6/18/14 SCALE: 3/8" = 1'-0"
DESIGNED BY: TMG DATE: 1/13

BRIDGE NO. 07302 DRAWING NO. 55496

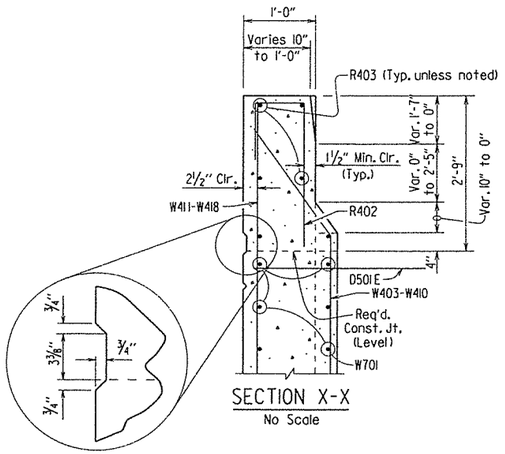
PRINT DATE: 18-JUN-2014

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.		110544	67	134
				(1)	07302 -	END BENTS	- 55497	



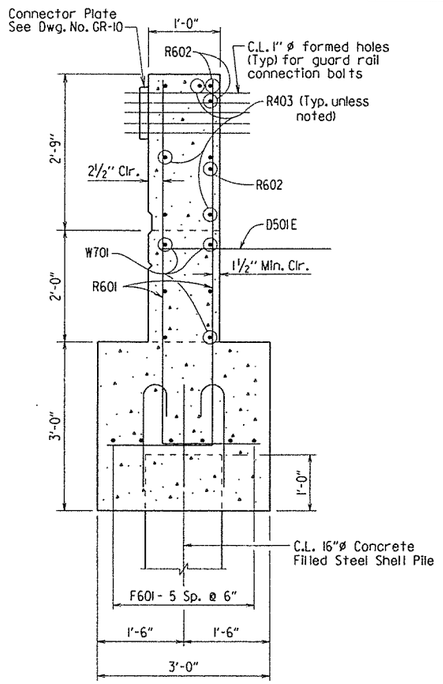
VIEW V-V

½" = 1'-0"



SECTION X-X

No Scale



SECTION Y-Y

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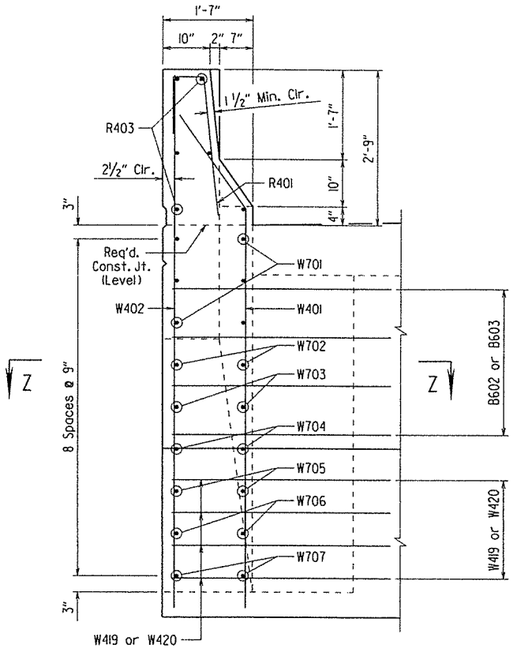
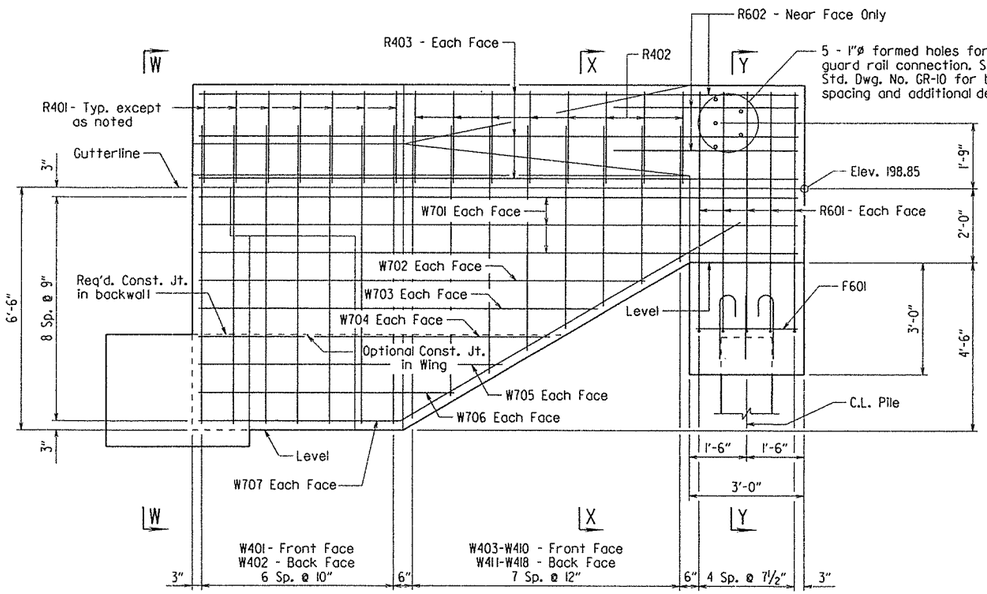


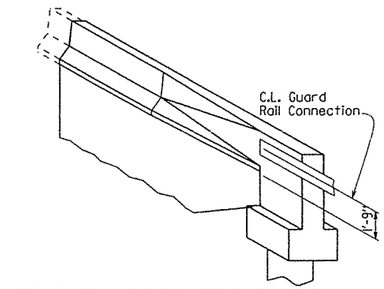
VIEW W-W

No Scale



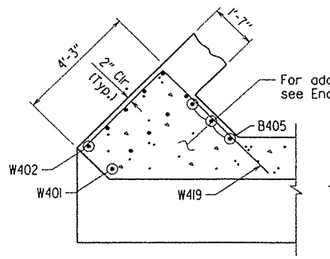
SECTION T-T

½" = 1'-0"



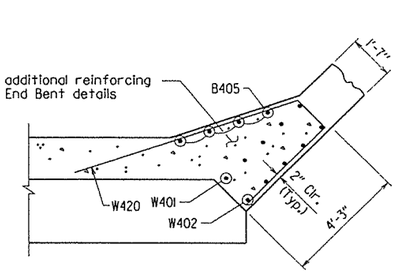
THREE DIMENSIONAL VIEW OF RAIL

No Scale



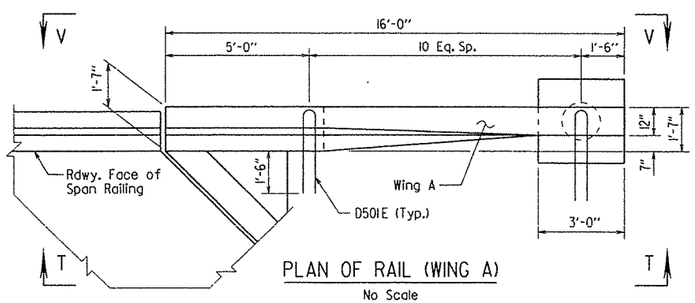
SECTION Z-Z

(WING A)



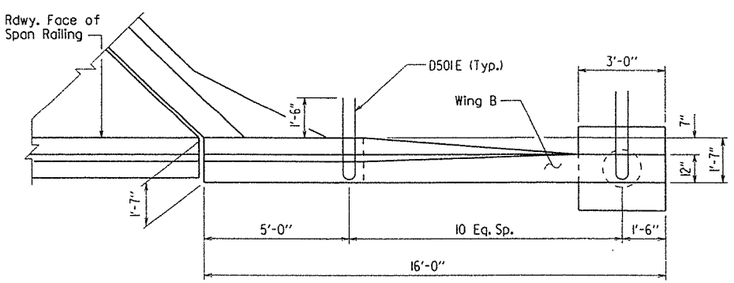
SECTION Z-Z

(WING B)



PLAN OF RAIL (WING A)

No Scale



PLAN OF RAIL (WING B)

No Scale

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
6-20-14
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 2 OF 3

DETAILS OF END BENTS FLAT FORK CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: TMG DATE: 2/4/2013 FILENAME: bl10544xl_bl.dgn

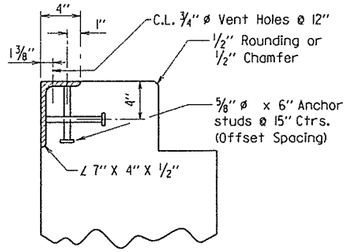
CHECKED BY: LJB DATE: 6/18/14 SCALE: ⅜" = 1'-0"

DESIGNED BY: TMG DATE: 1/13

BRIDGE NO. 07302 DRAWING NO. 55497

PRINT DATE: 18-JUN-2014

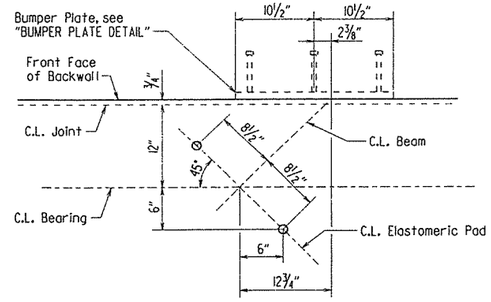
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	68	134
				(1) 07302 -		END BENTS		- 55498



NOTE: For Joint Details see Dwg. No. 55506.

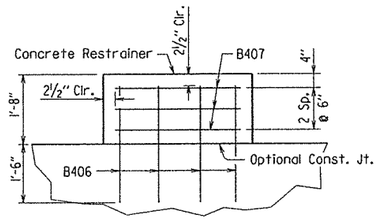
NOTE: Concrete shall be hand packed under the joint armor in the backwall.

DETAIL Z
No Scale



TYPICAL ANCHOR BOLT & BUMPER PLATE LAYOUT
No Scale

NOTE: For details of Elastomeric Bearings, see Dwg. No. 55507.



SECTION C-C
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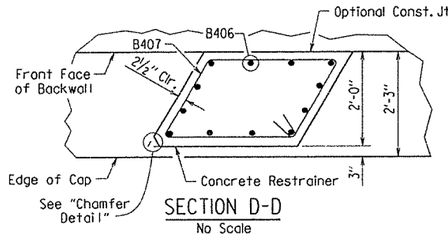

SECTION D-D
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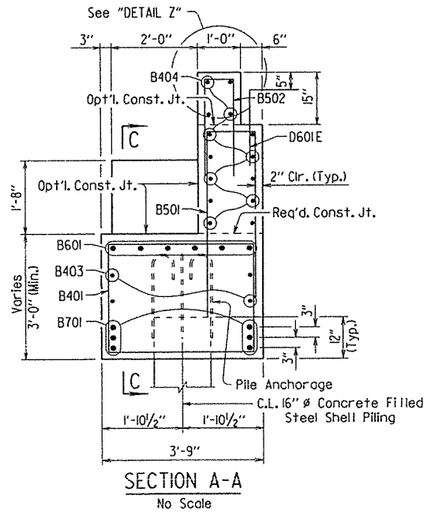

SECTION A-A
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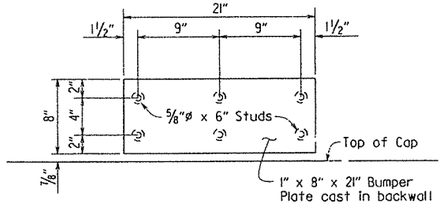
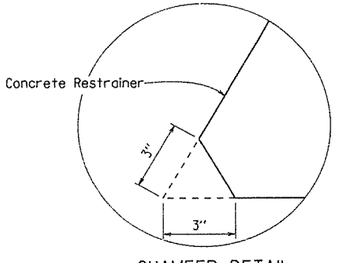


BUMPER PLATE DETAIL
No Scale

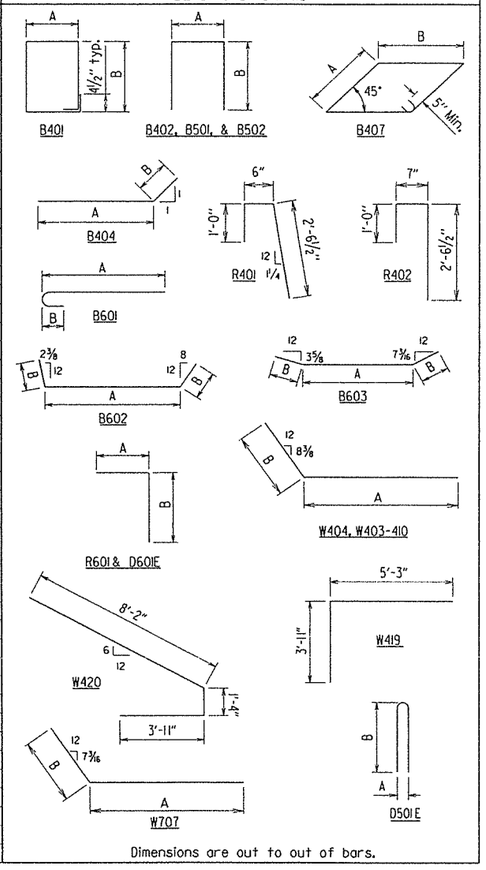


CHAMFER DETAIL
No Scale

BAR LIST PER END BENT

MARK	NO. REQ'D.	LENGTH	A	B	PIN DIA.
B401	66	12'-6"	3'-5"	2'-8"	2"
B402	21	8'-7"	3'-5"	2'-8"	2"
B403	8	30'-2"	-	-	Str.
B404	28	31'-5"	30'-2"	1'-4"	2"
B405	7	4'-11"	-	-	Str.
B406	24	3'-0"	-	-	Str.
B407	6	13'-2"	3'-9"	2'-5"	2"
B501	59	9'-6"	1'-7¾"	4'-0"	2½"
B502	59	6'-5"	11"	2'-10"	2½"
B601	12	31'-3"	30'-7"	6"	4½"
B602	4	6'-9"	4'-9"	12"	4½"
B603	4	14'-0"	12'-0"	12"	4½"
B701	24	31'-0"	-	-	Str.
F601	6	2'-8"	-	-	Str.
R401	14	3'-11"	-	-	2"
R402	16	4'-0"	-	-	2"
R403	12	16'-2"	-	-	Str.
R601	20	8'-2"	1'-8"	6'-7"	4½"
R602	6	4'-5"	-	-	Str.
W401	14	7'-8"	6'-6"	1'-2"	2"
W402	14	8'-11"	-	-	Str.
W403-W410	2 Each	Varies 7'-6" to 3'-4"	Varies 6'-4" to 2'-2"	1'-2"	2"
W411-W418	2 Each	Varies 8'-9" to 4'-7"	-	-	Str.
W419	4	9'-1"	-	-	2"
W420	4	13'-4"	-	-	2"
W701	12	16'-2"	-	-	Str.
W702	4	12'-2"	-	-	Str.
W703	4	10'-10"	-	-	Str.
W704	4	9'-6"	-	-	Str.
W705	4	8'-3"	-	-	Str.
W706	4	7'-2"	-	-	Str.
W707	4	16'-2"	5'-8"	10'-6"	5¼"
D501E	22	6'-2"	5"	3'-0"	3¾"
D601E	58	4'-0"	1'-6"	2'-8"	4½"

BENDING DIAGRAMS



Dimensions are out to out of bars.

NOTE: Bars with an "E" suffix are to be Epoxy-coated and shall be paid for as "Epoxy Coated Reinforcing Steel (Grade 60)".

STATE OF ARKANSAS
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REGISTERED PROFESSIONAL ENGINEER
No. 9235
6-20-14
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BRIDGE ENGINEER

SHEET 3 OF 3

DETAILS OF END BENTS
FLAT FORK CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: TMG DATE: 2/4/2013 FILENAME: bll0544xl_bl.dgn

CHECKED BY: LJB DATE: 6/18/14 SCALE: 3/8" = 1'-0"

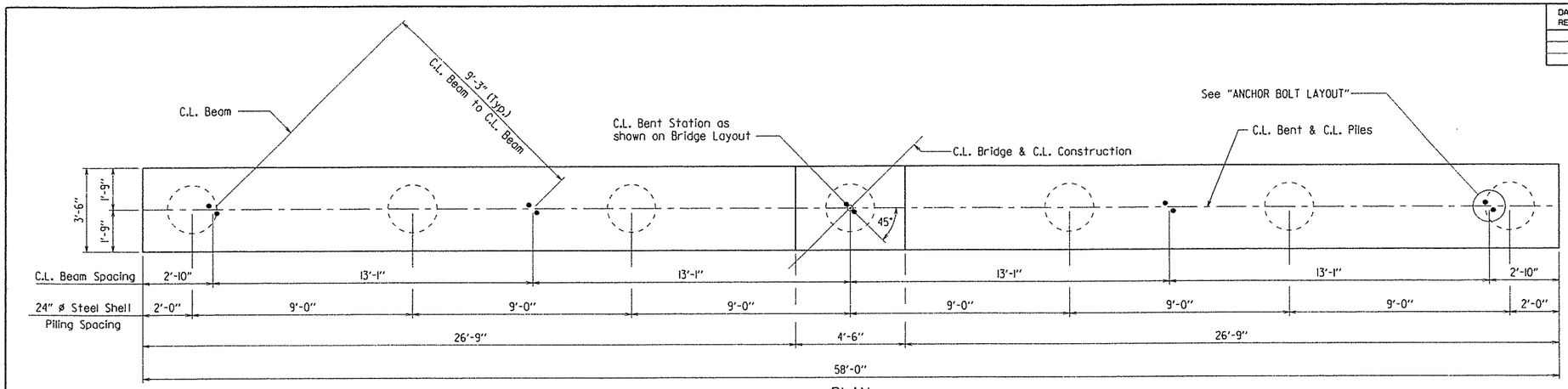
DESIGNED BY: TMG DATE: 1/13

BRIDGE NO. 07302 DRAWING NO. 55498

PRINT DATE: 18-JUN-2014

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.		110544	69	134

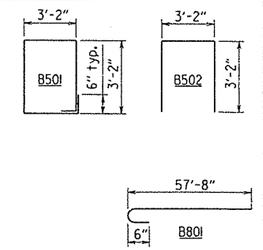
(1) 07302 - INTERMEDIATE BENTS - 55499



PLAN

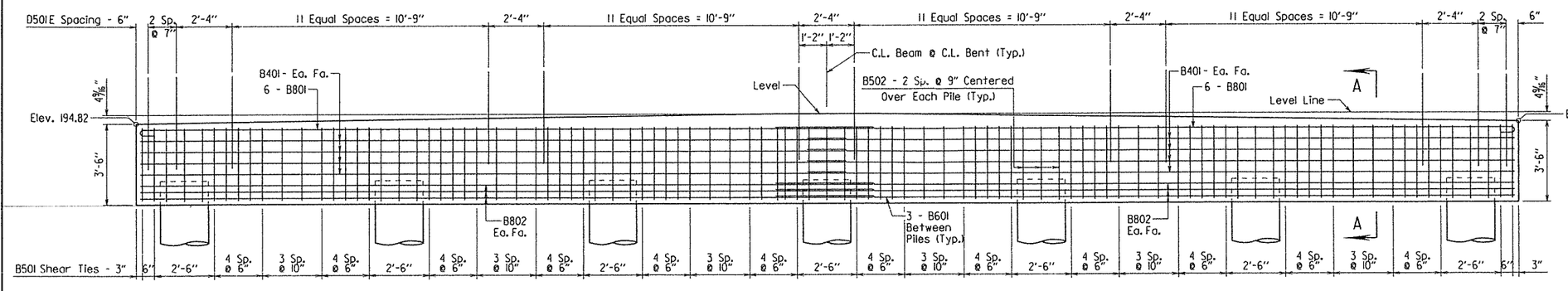
BAR LIST-PER BENT

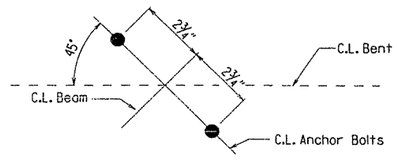
MARK	NO. REQ'D.	LENGTH	P.D.	BENDING DIAGRAMS
B401	16	29'-9"	Str.	
B501	76	13'-2"	2½"	
B502	21	9'-4"	2½"	
B601	18	6'-6"	Str.	
B801	12	32'-0"	6"	
B802	12	31'-1"	Str.	
*D501E	54	4'-0"	Str.	



Dimensions are out to out of bars.

*D501E bars shall be epoxy coated and shall measured and paid for as "Epoxy Coated Reinforcing Steel (Grade 60)."

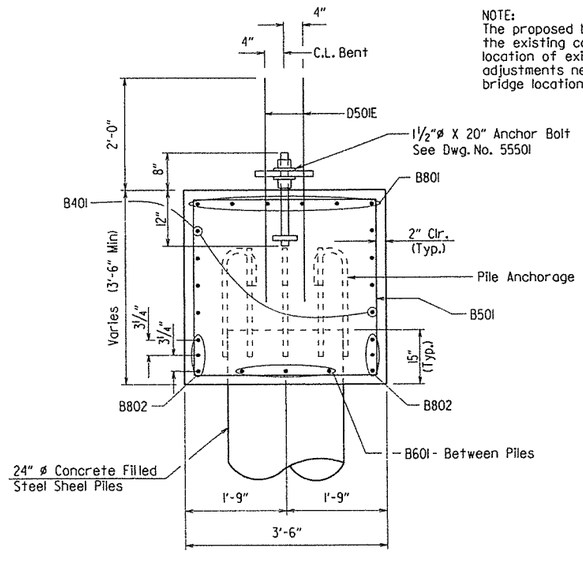




ANCHOR BOLT LAYOUT

No Scale

ELEVATION



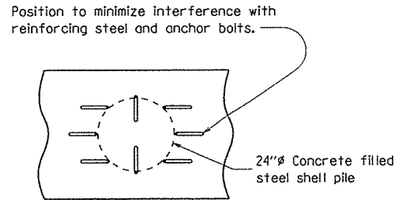
SECTION A - A

¾" = 1'-0"

NOTE:
The proposed bridge is positioned to avoid interference with the existing concrete piling. The Contractor shall verify the location of existing piling before driving any piling. Any adjustments necessary to fit the new bridge to the existing bridge location shall be submitted for the Engineer's approval.

MINIMUM REINFORCING LAP LENGTHS

No. 4 Bars = 1'-9"
No. 8 Bars = 4'-6"



PILE ANCHORAGE DETAIL

No Scale

GENERAL NOTES

All concrete shall be Class "S" with a minimum 28 day compressive strength f'c = 3,500 psi. Concrete shall be poured in the dry and all exposed corners to be chamfered ¾" unless otherwise noted.

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

For details of pipe piles, pile anchorage, & pile encasement, see Std. Dwg. No. 55021.

For additional information, see layout.

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
6-20-14
CHARLES R. ELLIS

BRIDGE ENGINEER

DETAILS OF INTERMEDIATE BENTS
FLAT FORK CREEK
MONROE COUNTY

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: TMG DATE: 2/1/2013 FILENAME: b110544x1_b2.dgn
CHECKED BY: LJB DATE: 6/18/14 SCALE: 3/8" = 1'-0"
DESIGNED BY: TMG DATE: 1/13

BRIDGE NO. 07302 DRAWING NO. 55499

PRINT DATE: 18-JUN-2014

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.		110544	70	134
				①	07302 - SPAN DETAILS - 55500			

Slab Reinforcing:

Longitudinal: S401E as shown
S602E as shown over int. supports, see "Reinforcing Plan", Dwg. No. 55504.

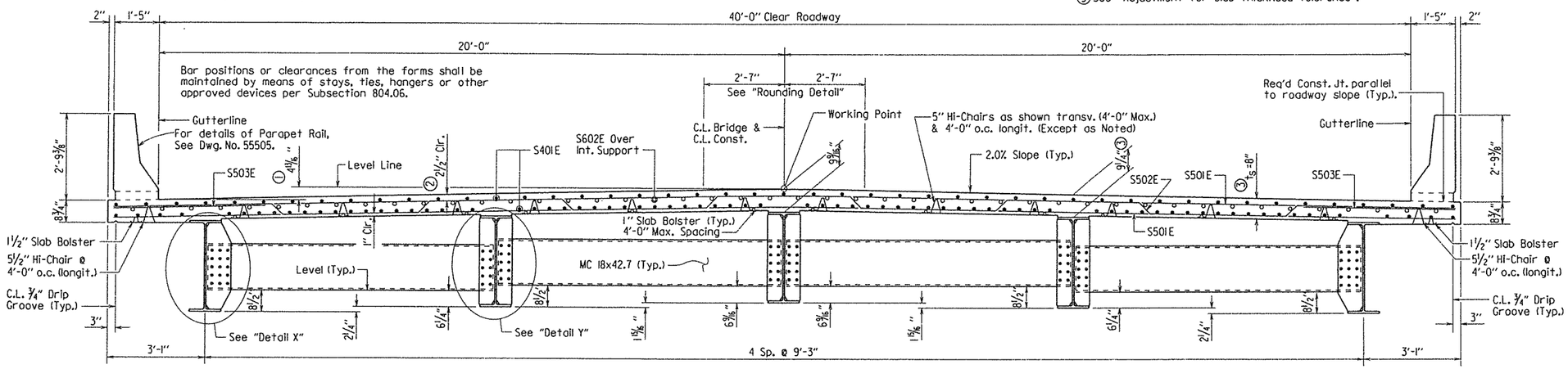
Transverse: S502E @ 12" o.c. bent up over beams — Alternate
S501E @ 12" o.c. in top & bottom —
S503E @ 6" in top of overhangs (bundled with #5 bars)

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

① Working point to gutter line.

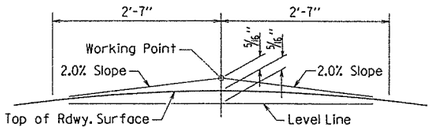
② Tolerance: Minus = 1/4"; Plus equal to the amount of slab thickening used to meet slab thickness tolerance. See "Adjustment for Slab Thickness Tolerance".

③ See "Adjustment for Slab Thickness Tolerance".



TYPICAL ROADWAY SECTION

1/2" = 1'-0"



NOTE: Working Point matches Theoretical Roadway Grade.

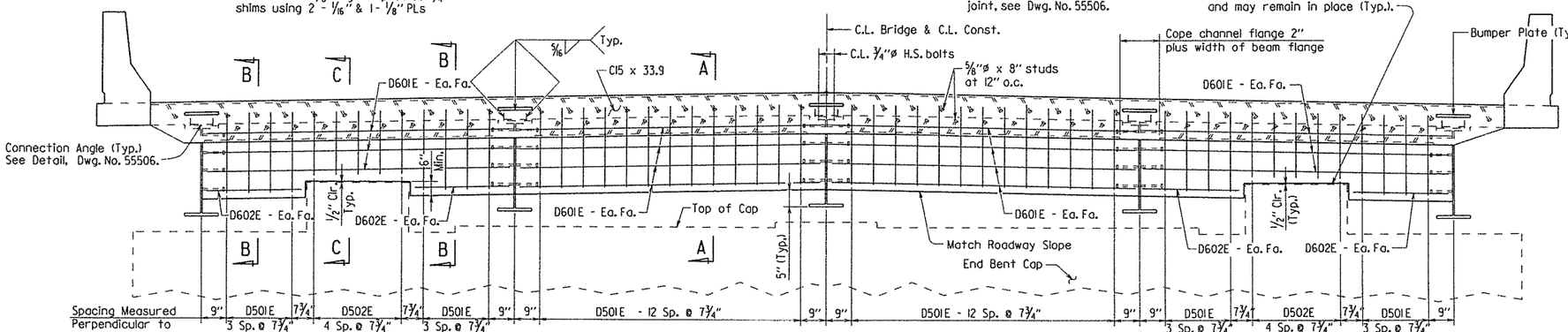
ROUNDING DETAIL

No Scale

Expansion Device:
Rdwy. Channel - C15x33.9
Conn. L's 7" x 4" x 1/2"
Detail Device 1/8" high & provide 1/4" shims using 2 - 1/16" & 1 - 1/8" PLs

For details of poured silicone joint, see Dwg. No. 55506.

NOTE: 1/2" polystyrene shall be used as a bond breaker between the concrete restrainer and the concrete diaphragm and may remain in place (Typ.).

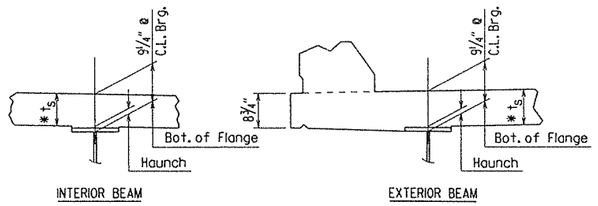


TYPICAL ROADWAY SECTION AT END BENT

NOTE: For additional details, see "PARTIAL PLAN OF CONCRETE DIAPHRAGM REINFORCING AT END BENT", Dwg. No. 55502.

NOTE: For Sections A-A, B-B and C-C, see Dwg. No. 55501.

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



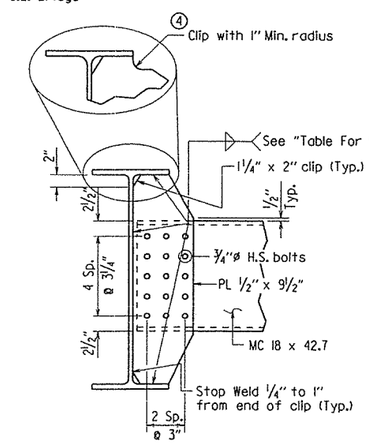
*Tolerance when removable deck forming is used is + 1/2", - 1/4". Haunch forming is required and shall be adjusted to maintain slab thickness tolerance.

ADJUSTMENT FOR SLAB THICKNESS TOLERANCE

No Scale

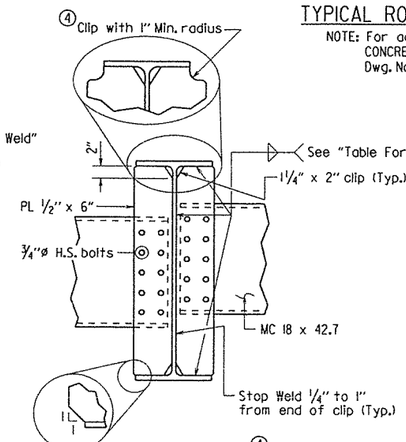
NOTES:
Haunch dimension may vary within the following limits to maintain the grade and slab thickness tolerance: Minimum occurs when top flange contacts bottom reinforcing steel; Maximum = top flange thickness plus 1 3/4". No increase in concrete and structural steel quantities will be made to maintain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

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



DETAIL X

1" = 1'-0"



DETAIL Y

1" = 1'-0"

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

TABLE FOR WELD

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

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

STATE OF ARKANSAS
Charles R. Ellis
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No. 9235
6-20-14
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 1 OF 7

DETAILS OF 186'-0" CONTINUOUS COMPOSITE W-BEAM UNIT FLAT FORK CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

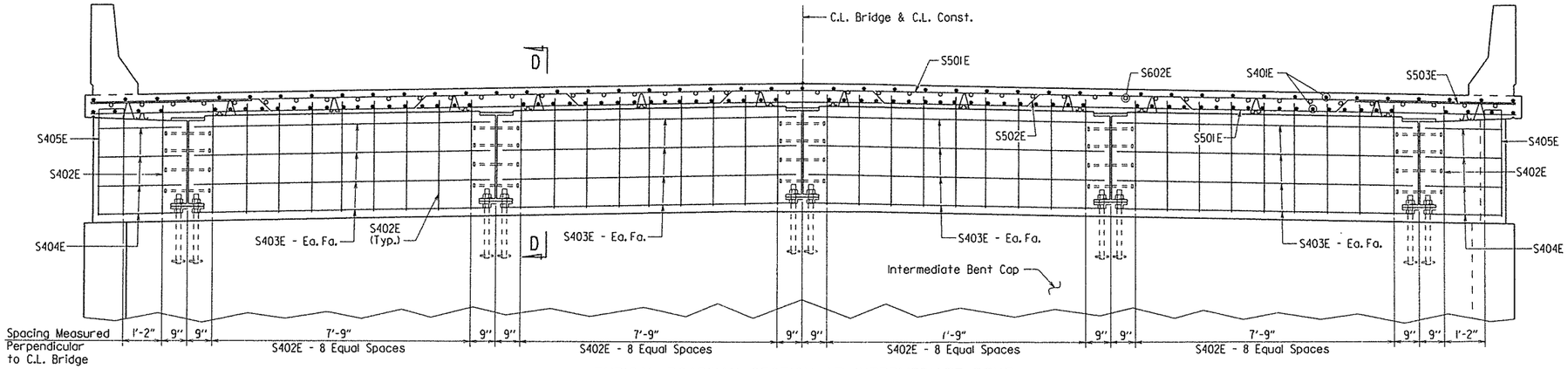
LITTLE ROCK, ARK.

DRAWN BY: MRE DATE: 12/07/12 FILENAME: b110544x4_sl.dgn
CHECKED BY: LJB DATE: 6/18/14 SCALE: 1/2" = 1'-0"
DESIGNED BY: TMG DATE: 11/12

BRIDGE NO. 07302 DRAWING NO. 55500

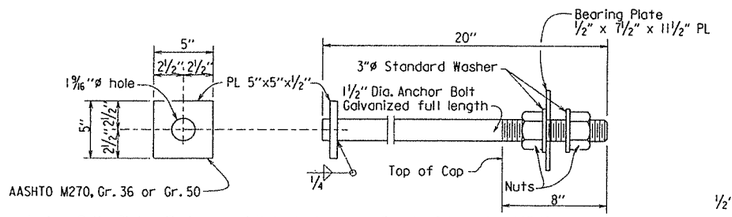
PRINT DATE: 18-JUN-2014

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.		110544	71	134
				①		07302 - SPAN DETAILS - 55501		



TYPICAL ROADWAY SECTION AT INTERMEDIATE BENT

NOTE: For additional details, see "PARTIAL PLAN OF CONCRETE DIAPHRAGM REINFORCING AT INTERMEDIATE BENT", Dwg. No. 55502.

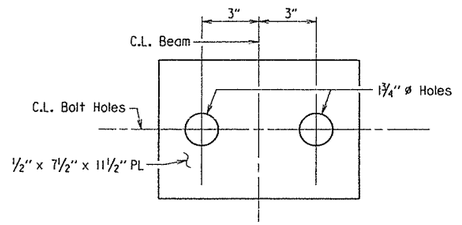


Anchor Bolts, Plates, Washers, and Nuts to be according to Subsection 807.07. Washers shall be a standard washer. Anchor Bolts, Plates, Washers, and Nuts shall be paid for at the unit price bid for "Structural Steel in Beam Spans (M270, Gr. 50W)" and galvanized in accordance with Subsection 807.07 All anchor bolts shall be Grade 55 with Supplimentary Requirement S1.

Use lower nut and washer to adjust to grade. Snug tight top nut and washer after grade is adjusted.

*ANCHOR BOLT DETAIL

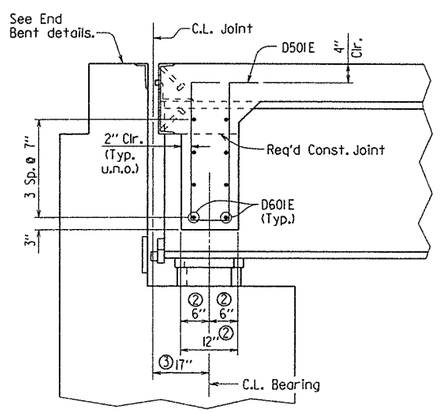
At Intermediate Bents Only
No Scale



*BEARING PLATE DETAIL

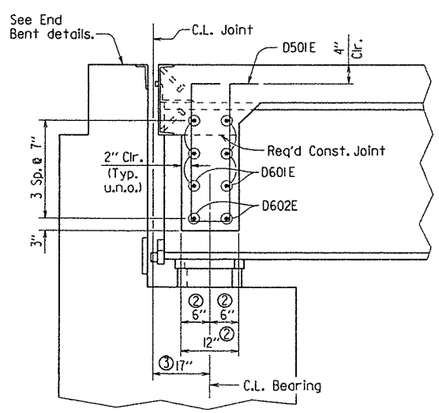
No Scale

* At Bents 2 and 3 only.



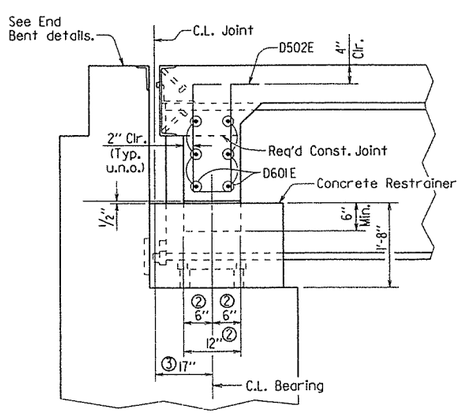
SECTION A-A

No Scale



SECTION B-B

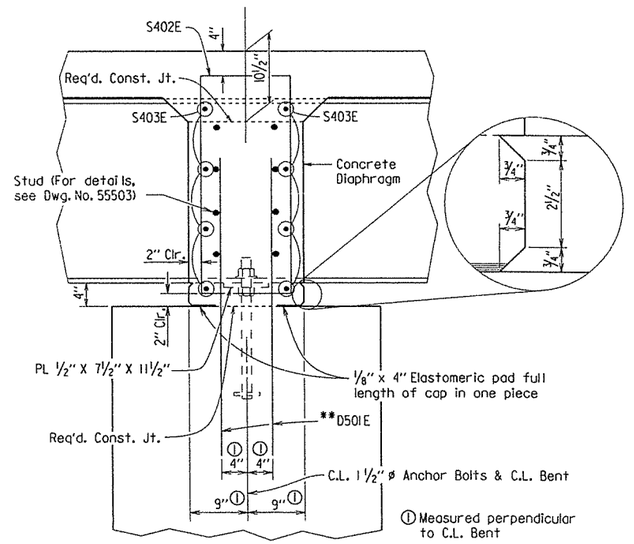
No Scale



SECTION C-C

No Scale

② Measured Perpendicular to C.L. Bearing
③ Measured along C.L. Beam



SECTION D -D

1" = 1'-0"

** NOTE: See Intermediate Bent Detail on Dwg. No. 55499 for reinforcing and additional details.

STATE OF ARKANSAS
Charles R. Ellis
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12-2014
CHARLES R. ELLIS

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SHEET 2 OF 7

DETAILS OF 186'-0" CONTINUOUS COMPOSITE W-BEAM UNIT FLAT FORK CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

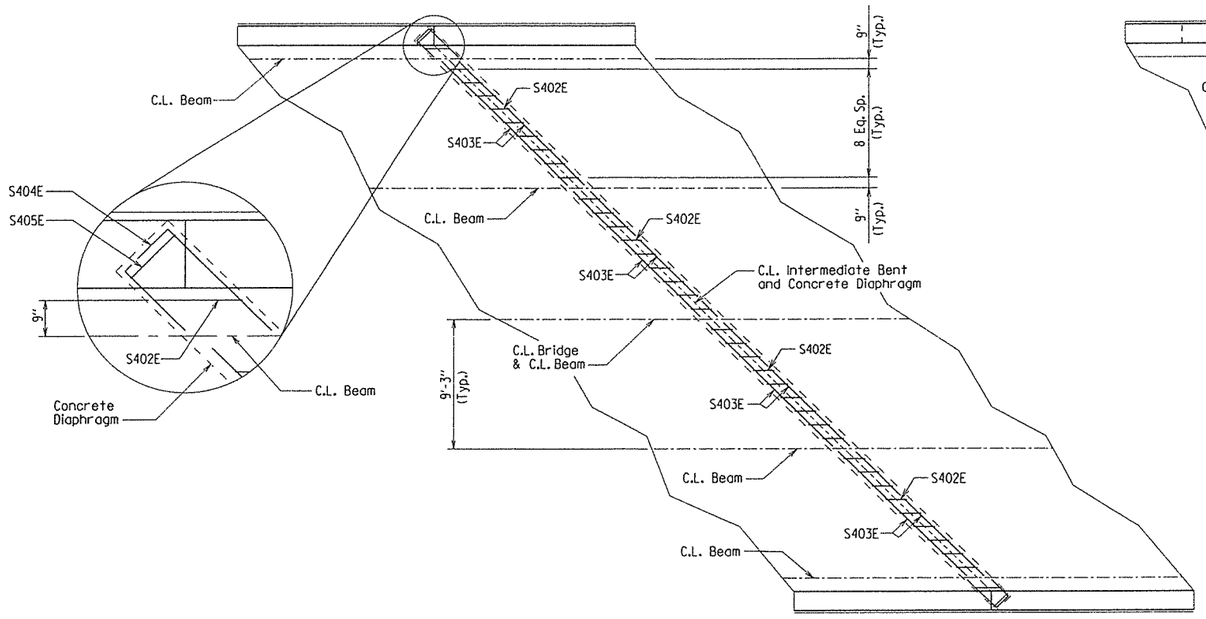
LITTLE ROCK, ARK.

DRAWN BY: MRE	DATE: 12/07/12	FILENAME: bll0544x4_sl.dgn	
CHECKED BY: LJB	DATE: 6/18/14	SCALE: 1/2" = 1'-0"	
DESIGNED BY: TMG	DATE: 11/12		

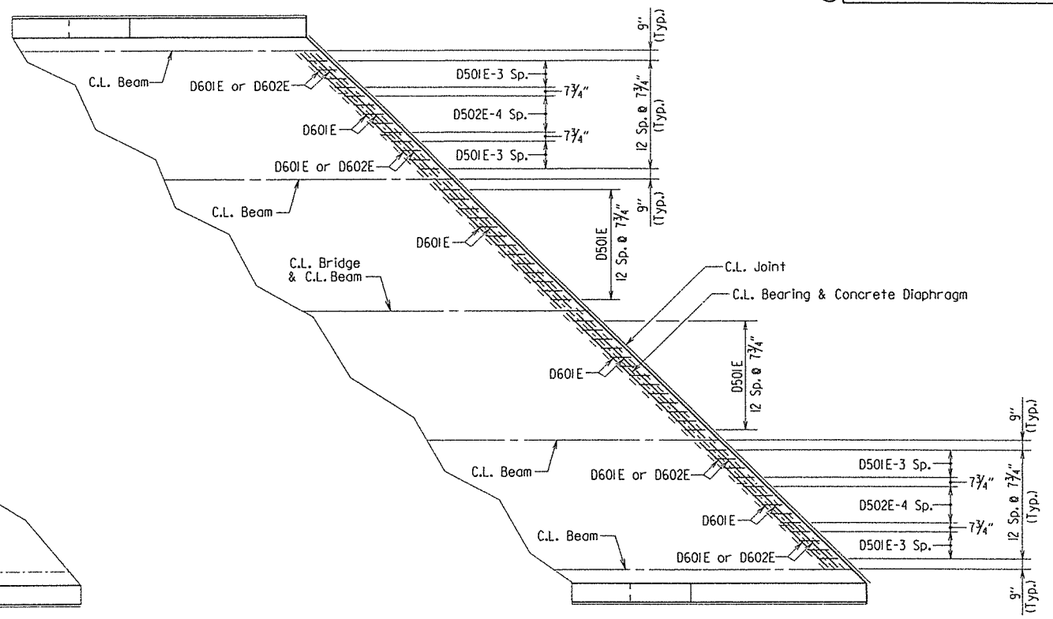
BRIDGE NO. 07302 DRAWING NO. 55501

PRINT DATE: 18-JUN-2014

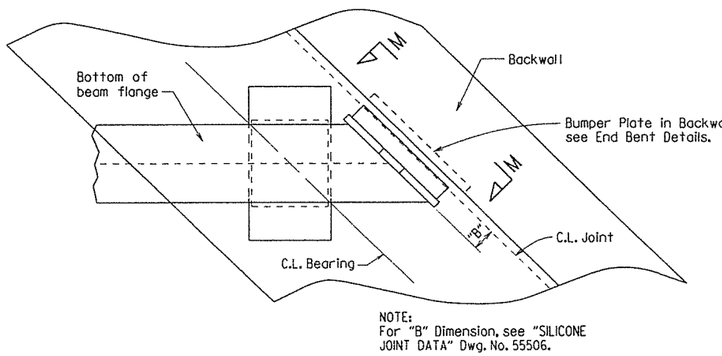
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	72	134
				(1)	07302 - SPAN DETAILS - 55502			



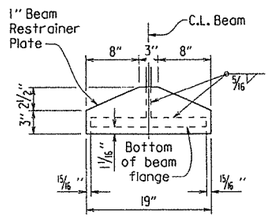
PARTIAL PLAN OF CONCRETE DIAPHRAGM
REINFORCING AT INTERMEDIATE BENT
3/16" = 1'-0"



PARTIAL PLAN OF CONCRETE DIAPHRAGM
REINFORCING AT END BENT
3/16" = 1'-0"

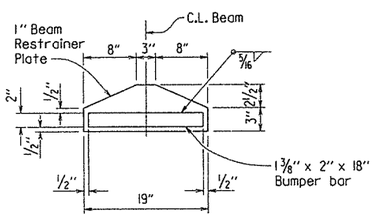


BEAM RESTRAINER DETAILS
No Scale



NOTE: Beam restrainer plate shall be centered on each beam line.

Bumper bar not shown in this view.



NOTE: Hidden lines of beam are not shown in this view.

VIEW M-M
No Scale

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
6-20-14
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 3 OF 7

DETAILS OF 186'-0" CONTINUOUS COMPOSITE W-BEAM UNIT FLAT FORK CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

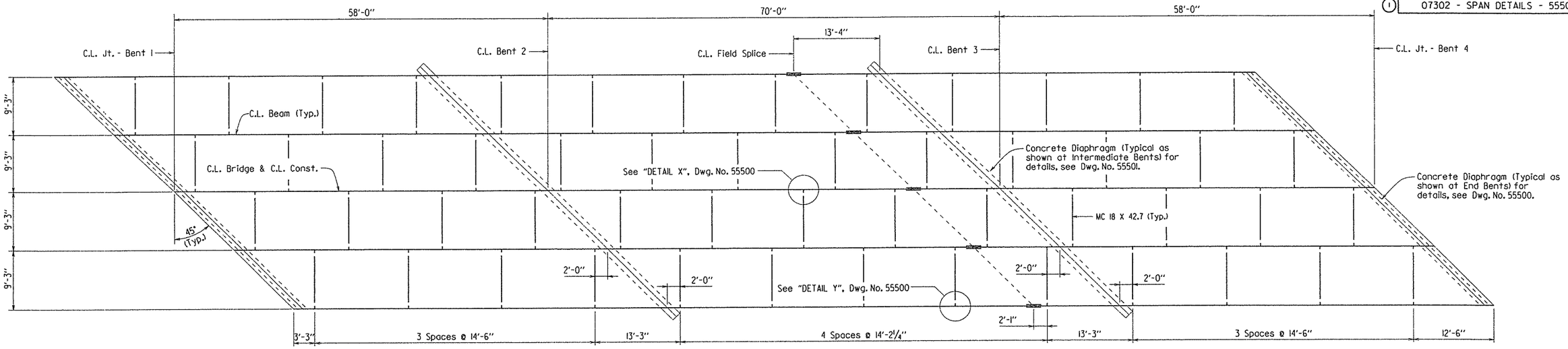
LITTLE ROCK, ARK.

DRAWN BY: MRE DATE: 01/03/13 FILENAME: bll0544x4_sl.dgn
CHECKED BY: LJB DATE: 6/13/14 SCALE: 3/16" = 1'-0"
DESIGNED BY: TMG DATE: 11/12

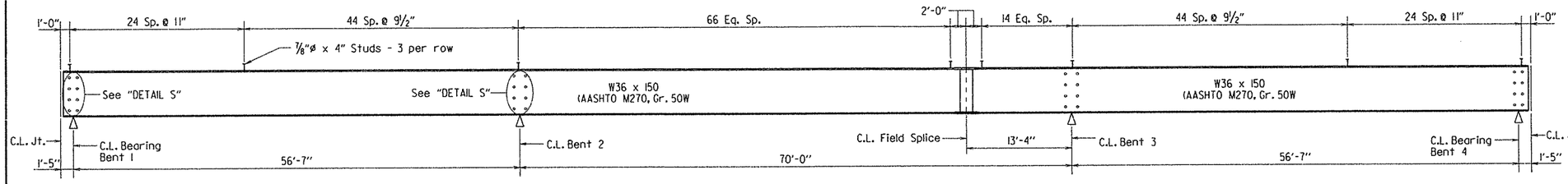
BRIDGE NO. 07302 DRAWING NO. 55502

PRINT DATE: 6/18/2014

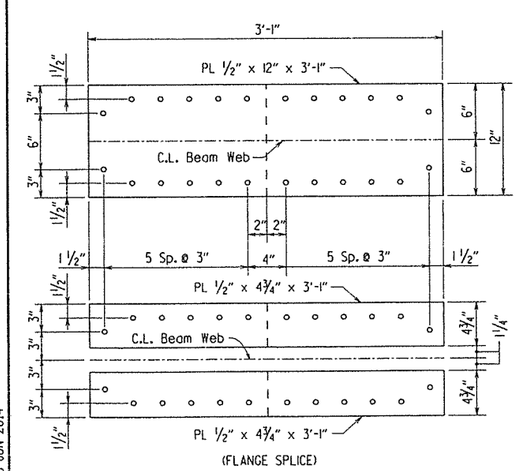
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	73	134
				(1)		07302 - SPAN DETAILS - 55503		



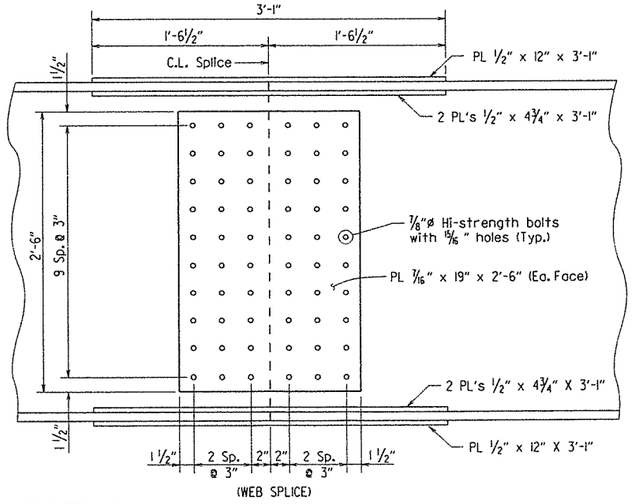
FRAMING PLAN



TYPICAL BEAM ELEVATION



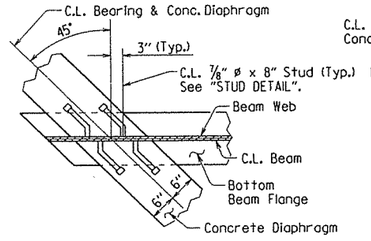
(FLANGE SPLICE)



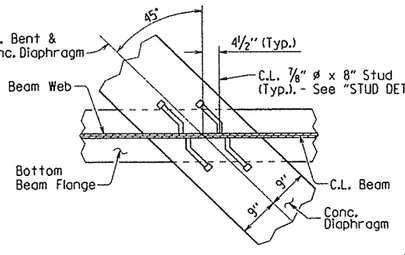
(WEB SPLICE)

FIELD SPLICE DETAILS

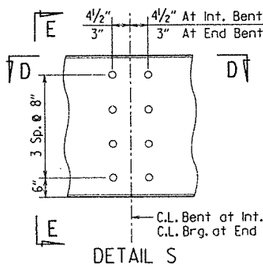
No Scale



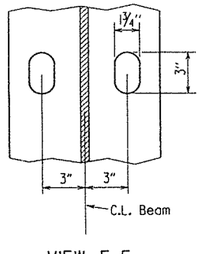
VIEW D
(At End Bent)
No Scale



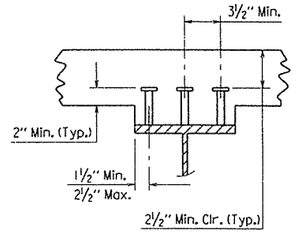
VIEW D
(At Int. Bent)
No Scale



DETAIL S
No Scale



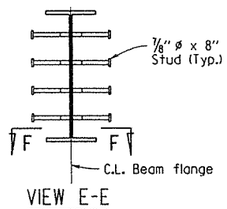
VIEW F-F
At Int. Bents only
No Scale



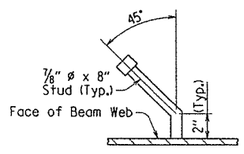
Stud Shear Connectors shown shall be ⅞"ø x 4" long, granular flux filled, solid fluxed or equal, and automatically end welded to the beam flange in accordance with the recommendations of the Manufacturer. ¾"ø studs may be used in place of the ⅞"ø studs shown, at the ratio of 1.361 - ¾"ø studs in place of one ⅞"ø stud. ⅞"ø studs will be used as basis for measurement of structural steel in shear connectors.

SHEAR CONNECTOR DETAIL

No Scale



VIEW E-E
No Scale



STUD DETAIL
No Scale

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
6-20-14
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 4 OF 7

DETAILS OF 186'-0" CONTINUOUS COMPOSITE W-BEAM UNIT FLAT FORK CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

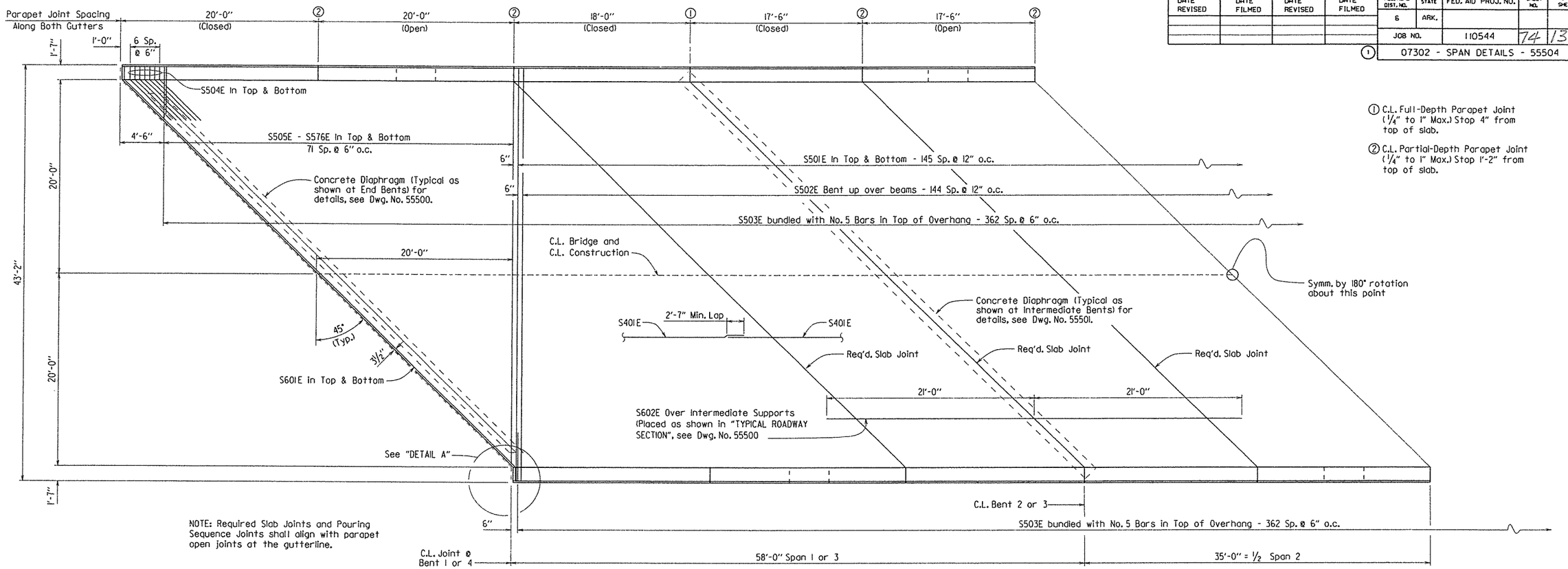
LITTLE ROCK, ARK.

DRAWN BY: MRE DATE: 12/12/12 FILENAME: bill0544x4_sl.dgn
CHECKED BY: LJB DATE: 6/18/14 SCALE: 1/8" = 1'-0"
DESIGNED BY: TMG DATE: 11/12

BRIDGE NO. 07302 DRAWING NO. 55503

PRINT DATE: 18-JUN-2014

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.		110544	74	134
				①	07302 - SPAN DETAILS - 55504			

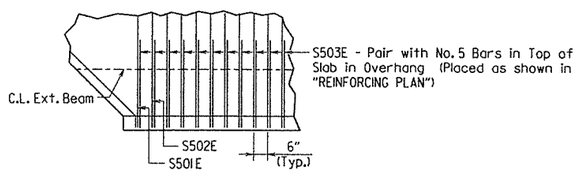


① C.L. Full-Depth Parapet Joint (¼" to 1" Max.) Stop 4" from top of slab.

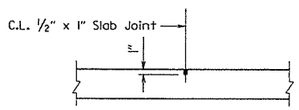
② C.L. Partial-Depth Parapet Joint (¼" to 1" Max.) Stop 1'-2" from top of slab.

NOTE: Required Slab Joints and Pouring Sequence Joints shall align with parapet open joints at the gutterline.

HALF REINFORCING PLAN

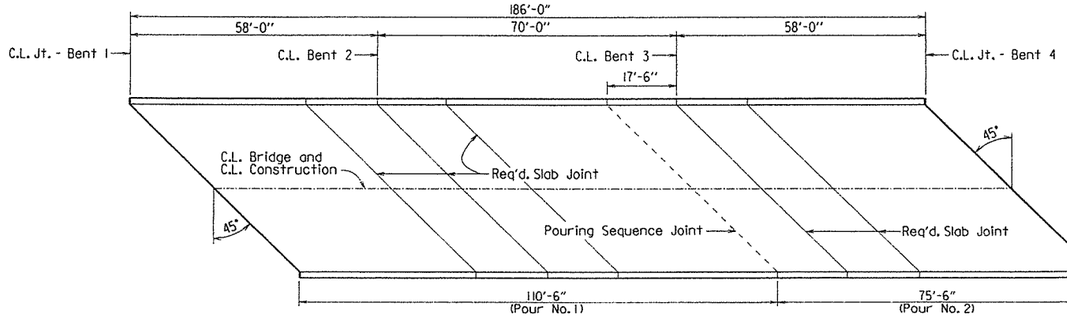


DETAIL A
No Scale



Use ½" x 1" Type 3 or 4 Joint Sealer. See Subsections 501.02(h) and 501.05(j). Backer rod shall not be installed. Joint Sealer shall be measured and paid for as Class S(AE) Concrete-Bridge. Slab Joints shall extend to the outside edge of the deck slab. Slab 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 slab has sufficiently set to allow sawing of the joints without damaging the slab. Slab joints shall be placed at all pouring sequence construction joints and required slab joint locations.

SLAB JOINT DETAIL
No Scale



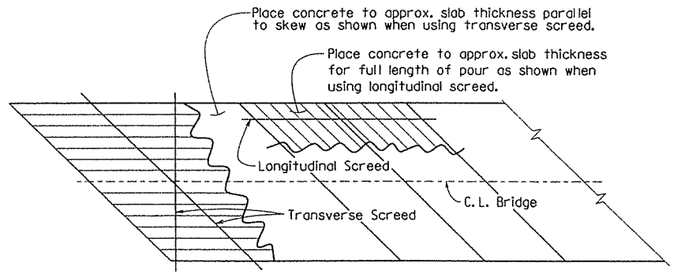
CONCRETE POURING SEQUENCE
No Scale

NOTES:
Any railing pours made before the entire slab unit has been placed must be approved by the Bridge Engineer.

Concrete in bridge superstructure must be consolidated for the entire pour before any concrete has taken its initial set. This may require the use of a retarding agent. The Contractor must obtain approval from the Engineer for any deviations from the Pouring Sequences shown.

Pour (1) must be placed before Pour (2) can be placed. 72 hours shall elapse between the end of Pour (1) and the start of Pour (2).

Concrete Diaphragms shall be poured a minimum of 48 hours before the slab is poured.



NOTE: At the Contractor's option, the transverse screed may be placed parallel to the skew or perpendicular to C.L. Bridge.

CONCRETE PLACEMENT PROCEDURE
No Scale

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
1-20-14
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 5 OF 7

DETAILS OF 186'-0" CONTINUOUS COMPOSITE W-BEAM UNIT FLAT FORK CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: MRE	DATE: 12/12/12	FILENAME: bl10544x4_sl.dgn	
CHECKED BY: LJB	DATE: 6/18/14	SCALE: 3/16" = 1'-0"	or as shown
DESIGNED BY: TMG	DATE: 11/12		

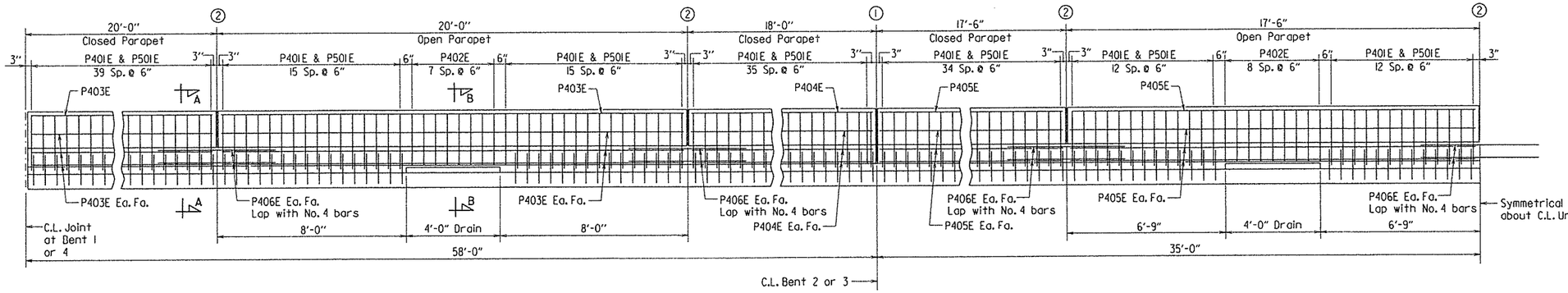
BRIDGE NO. 07302 DRAWING NO. 55504

PRINT DATE: 18-JUN-2014

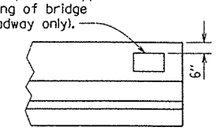
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	75	134
				①	07302 - SPAN DETAILS - 55505			

① C.L. Full-Depth Parapet Joint (1/4" to 1" Max.) Stop 4" from top of slab.

② C.L. Partial-Depth Parapet Joint (1/4" to 1" Max.) Stop 1'-2" from top of slab.

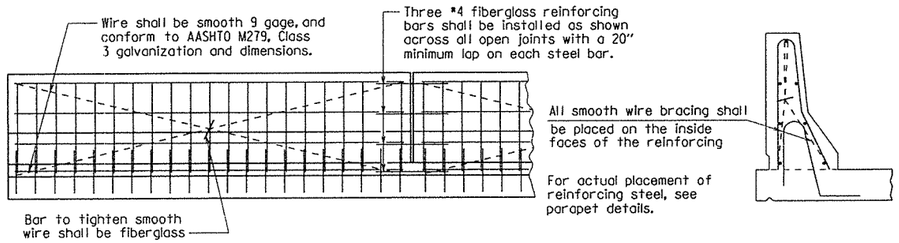


Place Type D Bridge Name Plate on front face of span rail approx. 2'-0" from beginning of bridge (Right side of roadway only).



NAME PLATE DETAIL
No Scale

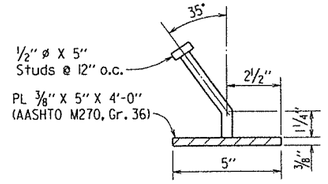
PARAPET RAIL REINFORCING PLAN
No Scale



All panels shall be braced as required to prevent racking. All open joints shall be sawed as soon as practical to a minimum width of 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.

DETAILS OF OPTIONAL SLIPFORMING OF CONCRETE PARAPET RAIL
No Scale



DETAIL Z
No Scale

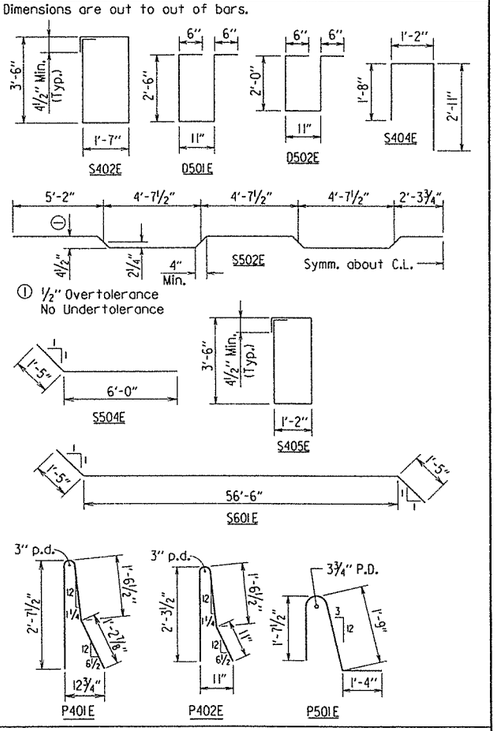
NOTE:
Parapet Studs shall be 5" long, granular flux filled, solid fluxed, or equal, and automatically end welded to the plate. Studs and plate shall meet the requirements of Section 807. Studs and plate shall be measured and paid for as "Structural Steel in Beam Spans (M270, Gr. 50W)". The surfaces of the 3/8" Plates which will not be in contact with concrete shall be painted in accordance with Section 638, or as approved by the Engineer. Only one coat is required and shall be applied in the Fabricator's shop. Painting will not be paid for directly but will be included in the item for structural steel.

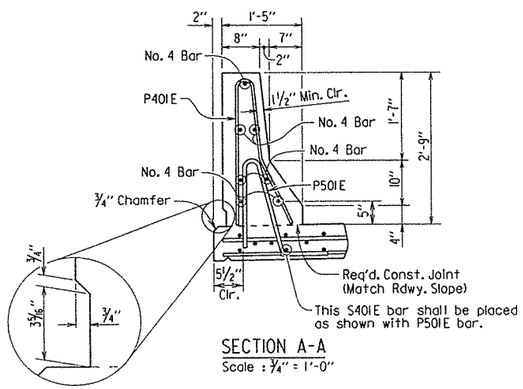
BAR LIST

MARK	NO. REQ'D.	LENGTH	P.D.
S401E	615	39'-3"	Str.
S402E	76	10'-6"	2"
S403E	64	12'-9"	Str.
S404E	16	5'-7"	2"
S405E	4	9'-8"	2"
S501E	292	42'-10"	Str.
S502E	145	43'-7"	3"
S503E	726	5'-0"	Str.
S504E	28	7'-5"	3 3/4"
S505E-S576E	4 Ea.	5'-7"-41'-1"	Str.
S601E	4	59'-4"	4 1/2"
S602E	92	42'-0"	Str.
D501E	84	6'-6"	2 1/2"
D502E	20	5'-6"	2 1/2"
D601E	56	12'-9"	Str.
D602E	16	4'-0"	Str.
P401E	672	5'-6"	2"
P402E	64	4'-10"	2"
P403E	56	19'-8"	Str.
P404E	28	17'-8"	Str.
P405E	56	17'-2"	Str.
P406E	56	5'-0"	Str.
P501E	672	4'-9"	2 1/2"

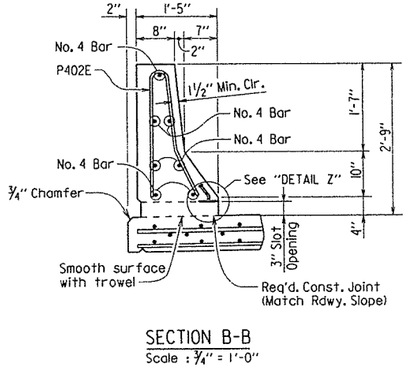
BENDING DIAGRAMS

Dimensions are out to out of bars.





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



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

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
6-20-14
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 6 OF 7

DETAILS OF 186'-0" CONTINUOUS COMPOSITE W-BEAM UNIT FLAT FORK CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: MRE DATE: 12/12/12 FILENAME: bll0544x4_sl.dgn
CHECKED BY: LJB DATE: 6/18/14 SCALE: As Shown
DESIGNED BY: TMG DATE: 11/12

BRIDGE NO. 07302 DRAWING NO. 55505

PRINT DATE: 18-JUN-2014

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.		110544	76	134
				1	07302 - SPAN DETAILS - 55506			

GENERAL NOTES

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction, 2014 edition, with applicable supplemental specifications and special provisions.

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications, Sixth Edition (2012).

MATERIALS AND STRENGTHS:

Class S(AE) Concrete	f'c =	4,000 psi
Reinforcing Steel (Grade 60, AASHTO M31 or M322, Type A)	fy =	60,000 psi
Structural Steel (AASHTO M 270, Gr. 50W)	Fy =	50,000 psi
Structural Steel (AASHTO M 270, Gr. 36)	Fy =	36,000 psi

CONCRETE :
Concrete shall be poured in the dry and all exposed corners to be chamfered 3/4" 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 measurement of Class S(AE) Concrete. See Standard Drawing No. 55005 for allowable modifications and for tolerances when Permanent Steel Bridge Deck Forms are used.

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.

Concrete Diaphragms at Bents shall be poured a minimum of 48 hours before the slab is poured.

The concrete deck shall be given a tine finish in accordance with subsection 802.19 for Class 5 Tined Bridge Roadway Surface Finish. Movement of the finishing machine across new concrete shall be on planks placed on the surface and shall be prohibited for 72 hours after finishing the pour. Sufficient concrete must be placed ahead of the strike-off to fully load the beam. If a longitudinal strike-off is used, a vertical camber adjustment must be made in the strike-off to account for the future dead load deflection due to the railing. 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 be Grade 60 (Yield Strength = 60,000 psi) conforming to AASHTO M31 or M322, Type A, with mill test reports. 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 M 270, Grade 50W unless otherwise noted and shall be paid for as "Structural Steel in Beam Spans (M 270, Gr. 50W)". Grade 50W steel shall not be painted. All exposed surfaces shall be cleaned in accordance with subsection 807.84(e) unless otherwise noted. Structural steel completely embedded in concrete may be AASHTO M 270, Grade 36 unless otherwise noted.

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

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

Beams and field splice plates are considered main load carrying members and shall meet the Longitudinal Charpy V-Notch Test specified in subsection 807.05.

All beams shall be blocked in their true position with webs horizontal in the shop. The camber, length of sections, distance between bearings and openings of joints shall be measured with the beams in their true position and this information shall become part of the permanent records for this job. The component parts shall be match marked in this assembly and these marks shall be shown on the erection diagram. All beam dimensions are based on a temperature of 60 degrees F. A tolerance of 1/4"+/- is allowed for camber.

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

All 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 the Contractor or Erector should want to make additional welds, whether temporary or permanent, a formal request with detailed drawings shall be submitted to the Engineer for approval; however, additional welds used to attach falsework support devices and screed rail supports to the structural steel that does not exceed the limitations of subsection 802.13 will not require approval prior to construction. All welding shall conform to subsection 807.26.

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

Elastomeric pads at intermediate Bents shall conform to subsection 807.15(b). The pads will not be paid for directly, but will be considered subsidiary to the item "Class S Concrete - Bridge".

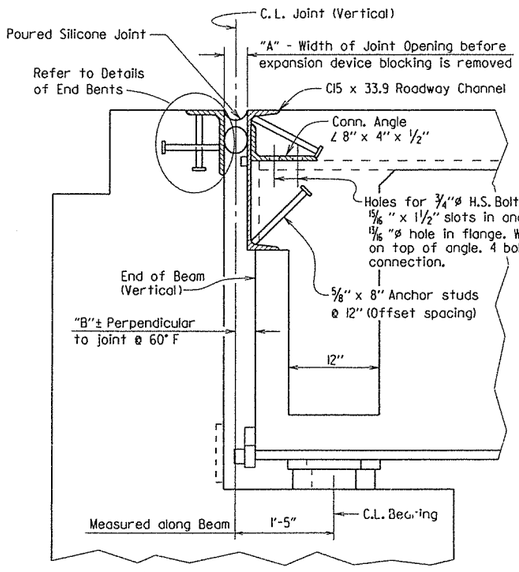
Diaphragms shall be installed as beams are erected. All bolts in diaphragms and field splices shall be installed and tightened in accordance with Subsection 807.71 prior to pouring the concrete deck unless otherwise noted.

SILICONE JOINT DATA

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

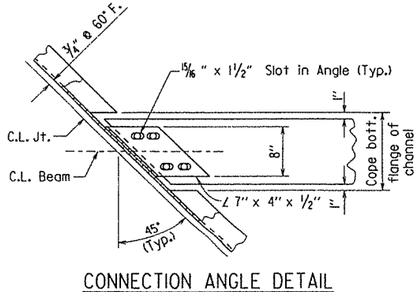
* The temperature used to set the joint opening shall be the approximate average air temperature during the 24 hour period immediately before the bolts are tightened. The Engineer shall establish the temperature. Interpolation of the table may be necessary.

NOTE: The installation temperature limitations recommended by the Sealant Manufacturer shall be observed.

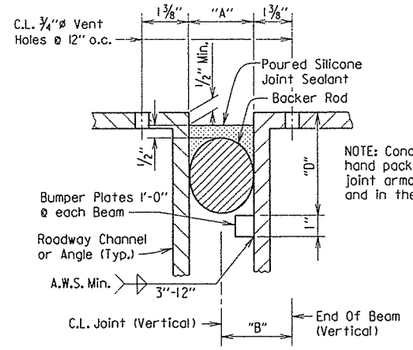


NOTE: Section taken perpendicular to C.L. Joint.

SECTION THRU JOINT AT END BENT
No Scale

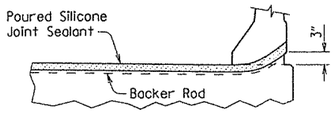


CONNECTION ANGLE DETAIL
No Scale

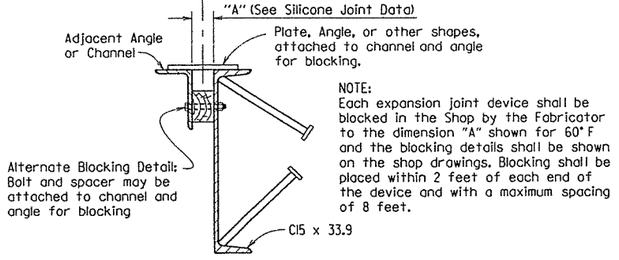


NOTE: Concrete shall be hand packed under the joint armor in the backwall and in the span.

DETAIL OF POURED SILICONE JOINT
No Scale



JOINT SEAL PLACEMENT AT PARAPET
No Scale



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

DETAILS FOR BLOCKING EXPANSION JOINT DEVICE
No Scale

EXPANSION DEVICE INSTALLATION AT END BENTS:

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

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

2) The backwall shall be poured to the optional construction joint after beams are erected. The blocked expansion device shall be installed and adjusted for grade. All connection bolts shall be fully tightened prior to placing the deck concrete adjacent to the bent. Immediately prior to pouring the remainder of the backwall concrete, the blocking shall be removed and the opening adjusted for temperature.

STATE OF ARKANSAS
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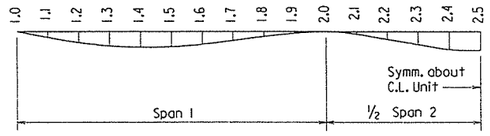
TABLE OF DEAD LOAD DEFLECTIONS - INCHES

POINT OF DEFLECTION	STRUCTURAL STEEL		STRUCTURAL STEEL + SLAB		STRUCTURAL STEEL + SLAB + PARAPET	
	INT. BEAM	EXT. BEAM	INT. BEAM	EXT. BEAM	INT. BEAM	EXT. BEAM
1.0	0.000	0.000	0.000	0.000	0.000	0.000
1.1	0.024	0.024	0.147	0.134	0.154	0.146
1.2	0.045	0.043	0.276	0.236	0.289	0.258
1.3	0.059	0.055	0.361	0.303	0.378	0.331
1.4	0.065	0.061	0.397	0.336	0.416	0.368
1.5	0.063	0.060	0.383	0.331	0.401	0.364
1.6	0.053	0.051	0.324	0.284	0.339	0.313
1.7	0.037	0.036	0.229	0.198	0.239	0.219
1.8	0.020	0.023	0.124	0.127	0.129	0.140
1.9	0.007	0.010	0.043	0.055	0.045	0.061
2.0	0.000	0.000	0.000	0.000	0.000	0.000
2.1	0.010	0.009	0.059	0.048	0.063	0.054
2.2	0.032	0.028	0.194	0.154	0.206	0.173
2.3	0.054	0.048	0.329	0.265	0.349	0.296
2.4	0.071	0.066	0.433	0.364	0.459	0.407
2.5	0.077	0.071	0.470	0.393	0.498	0.439

Symmetrical about C.L. Unit



DEAD LOAD DEFLECTION DIAGRAM
No Scale

NOTE:
Camber for Dead Load Deflection plus Vertical curve +/- 1/4" tolerance. Deflections shown are along a chord from C.L. Bearing to C.L. Bearing. Vertical curve corrections not included.

SHEET 7 OF 7

DETAILS OF 186'-0" CONTINUOUS COMPOSITE W-BEAM UNIT FLAT FORK CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

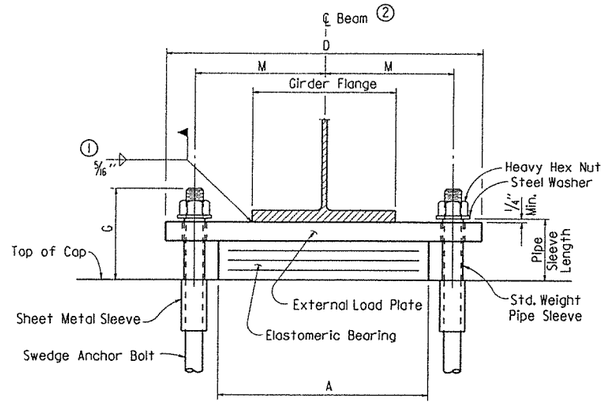
LITTLE ROCK, ARK.

DRAWN BY: MRE DATE: 12/12/12 FILENAME: b110544x4_sl.dgn
CHECKED BY: LJB DATE: 6/18/14 SCALE: No Scale
DESIGNED BY: TMG DATE: 11/12

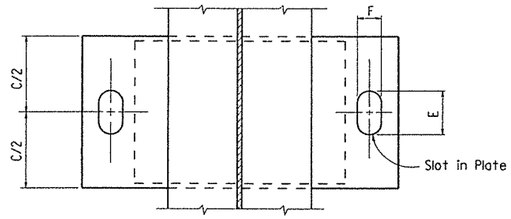
BRIDGE NO. 07302 DRAWING NO. 55506

PRINT DATE: 18-JUN-2014

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.		110544	77	134
				(1)	07302	- ELASTO -	55507	



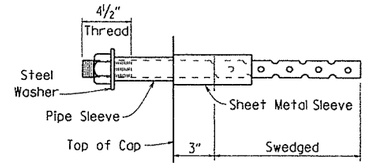
FRONT VIEW - AT BENT NOS. 1, & 4



PLAN VIEW - AT BENT NOS. 1, & 4

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

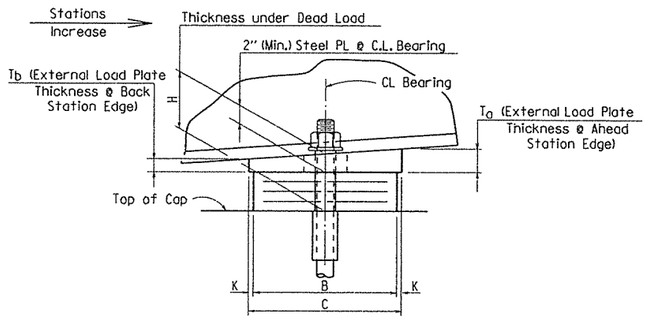
(2) C.L Elastomeric pad shall be aligned with C.L. Girder.



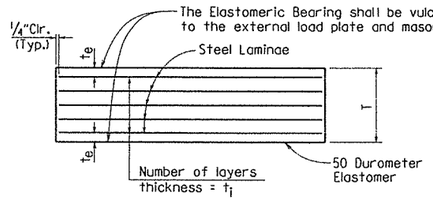
ANCHOR BOLT DETAIL

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 Beam Spans (M 270, Gr. 50W)".



SIDE VIEW - AT BENT NOS. 1, & 4



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

GENERAL NOTES

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

External load plates and shear blocks shall conform to AASHTO M 270, Grade 50W. Pipe sleeves shall be ASTM A53, Grade B, and shall be galvanized to conform to AASHTO M 232, Class C or AASHTO M 298, Class 50.

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

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

Pipe Sleeves, Anchor Bolts, Washers and Nuts shall be paid for at the unit price bid for "Structural Steel in Beam Spans (M270, Gr. 50W)". External load plates will not be measured or paid for separately but will be considered included in the unit bid price for "Elastomeric Bearings".

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

TABLE OF FABRICATOR VARIABLES

BRIDGE NO.	LOCATION BENT NO.	LOCATION UNIT	LOCATION BEAM NO.	BEARING TYPE	NO. of BEARINGS EACH BENT	*MAXIMUM DESIGN LOAD (KIPS)	G	H	ELASTOMERIC PAD A	B	N	t_i	t_e	NO. & THICKNESS OF STEEL LAMINAE	T	EXTERNAL LOAD PLATE C	D	E	F	J	K	M	T_a	T_b	ANCHOR BOLT ANCHOR BOLT (ø x L)	GRADE	PIPE SLEEVE SIZE (ø x L)	SHEET METAL SLEEVE SIZE (ø x L)	STEEL WASHER SIZE (O.D.)
07302	1	186	ALL	EXP.	5	101	6½"	3 13/16"	13"	8"	2	½"	¼"	3 @ 12 Ga.	1 13/16"	9"	22"	3⅝"	2"	-	½"	8½"	2.000	2.000	1¼" x 19"	55	1¼" x 4¼"	3" x 6½"	2½"
	4	186	ALL	EXP.	5	101	6½"	3 13/16"	13"	8"	2	½"	¼"	3 @ 12 Ga.	1 13/16"	9"	22"	3⅝"	2"	-	½"	8½"	2.000	2.000	1¼" x 19"	55	1¼" x 4¼"	3" x 6½"	2½"

* Maximum Design Load = LRFD Service I Limit State

Tabular Data by : TMG Date: 3/20/2013

Checked by : LJB Date: 6/19/14

Designed by : TMG Date: 11/12

STATE OF ARKANSAS Charles R. Ellis REGISTERED PROFESSIONAL ENGINEER No. 9235 6-20-14 CHARLES R. ELLIS

BRIDGE ENGINEER

DETAILS OF ELASTOMERIC BEARINGS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: SAT DATE: 03/20/13 FILENAME: b110544x_e.dgn

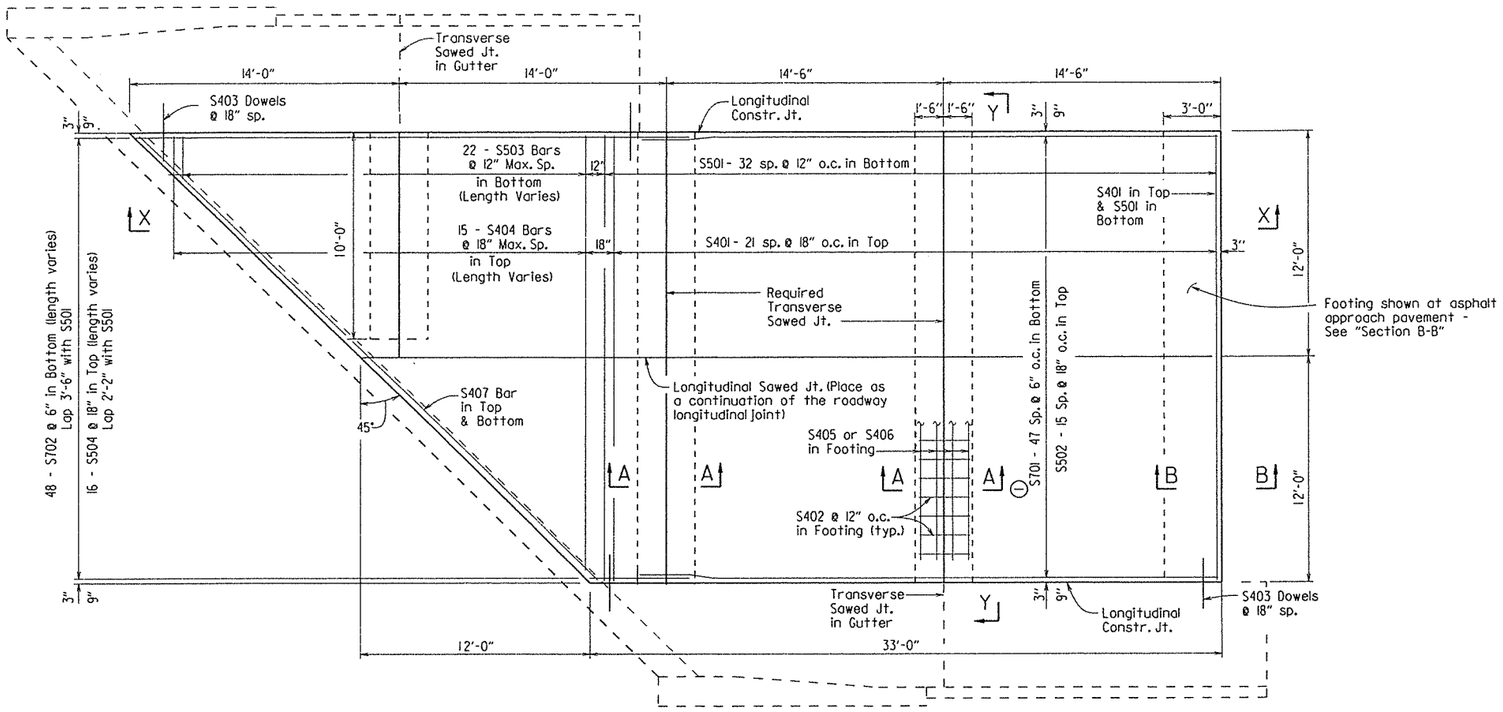
CHECKED BY: AMS DATE: Jul. 7-05 SCALE: NONE

DESIGNED BY: Std. DATE: ——

BRIDGE NO. 07302 DRAWING NO. 55507

PRINT DATE: 18-JUN-2014

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.		110544	78	134
				(1)	07302	TYPE SPECIAL APPR. SLAB		55508



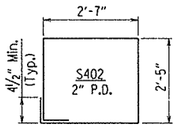
PLAN - SKEWED APPROACH SLAB WITH APPROACH GUTTERS

1/4" = 1'-0"

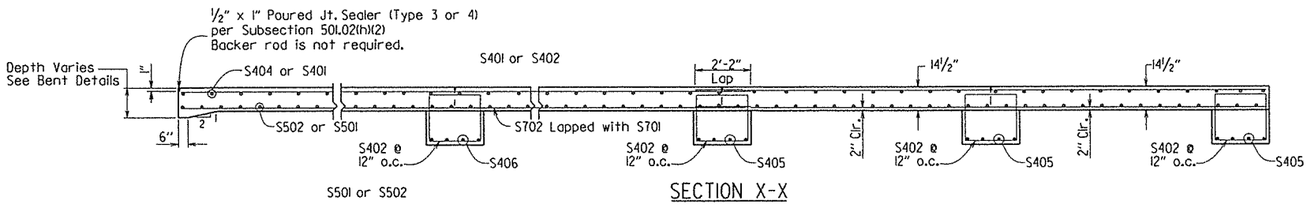
BAR LIST

(One Approach Slab)

Mark	No. Req'd.	Length	BENDING DIAGRAM
S401	22	23'-8"	
S402	82	10'-4"	
S403	60	3'-0"	
S404	15	Varies 22'-6" to 1'-6"	
S405	12	23'-8"	
S406	4	9'-8"	
S407	2	33'-5"	
S501	33	23'-8"	
S502	16	30'-0"	
S503	22	Varies 23'-3" to 2'-3"	
S504	16	Varies 29'-2" to 5'-2"	
S701	48	30'-0"	
S702	48	Varies 30'-0" to 6'-6"	

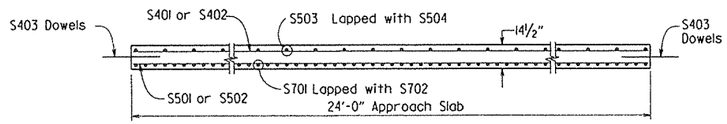


Dimensions are out to out of bar.



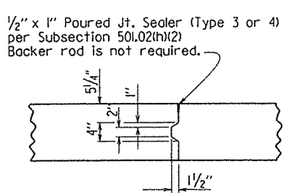
SECTION X-X

1/4" = 1'-0"



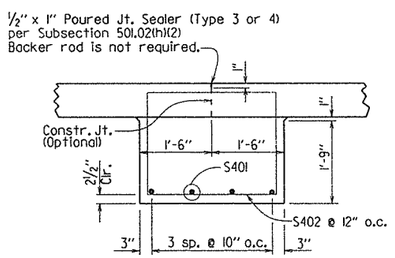
SECTION Y-Y

N.T.S.



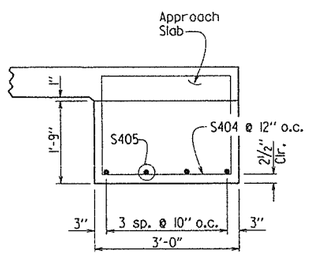
DETAILS OF LONGITUDINAL CONSTRUCTION JOINT

N.T.S.



SECTION A-A

N.T.S.



SECTION B-B

AT ASPHALT APPROACH PAVEMENT

N.T.S.

TABLE OF QUANTITIES FOR ONE APPROACH SLAB

(FOR INFORMATION ONLY)

Slab Width	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
24'-0"	8,040	63.60

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
6-20-14
CHARLES R. ELLIS

BRIDGE ENGINEER

GENERAL NOTES

This drawing shall be used for Approach Slabs in Seismic Performance Zones 2, 3 & 4.

All concrete shall be Class S (AE) with a minimum 28 day compressive strength f'c = 4,000 psi and shall be poured in the dry.

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

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

DETAILS OF TYPE SPECIAL APPROACH SLAB

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: JGT DATE: 2/27/2014 FILENAME: bl10544_AS.dgn

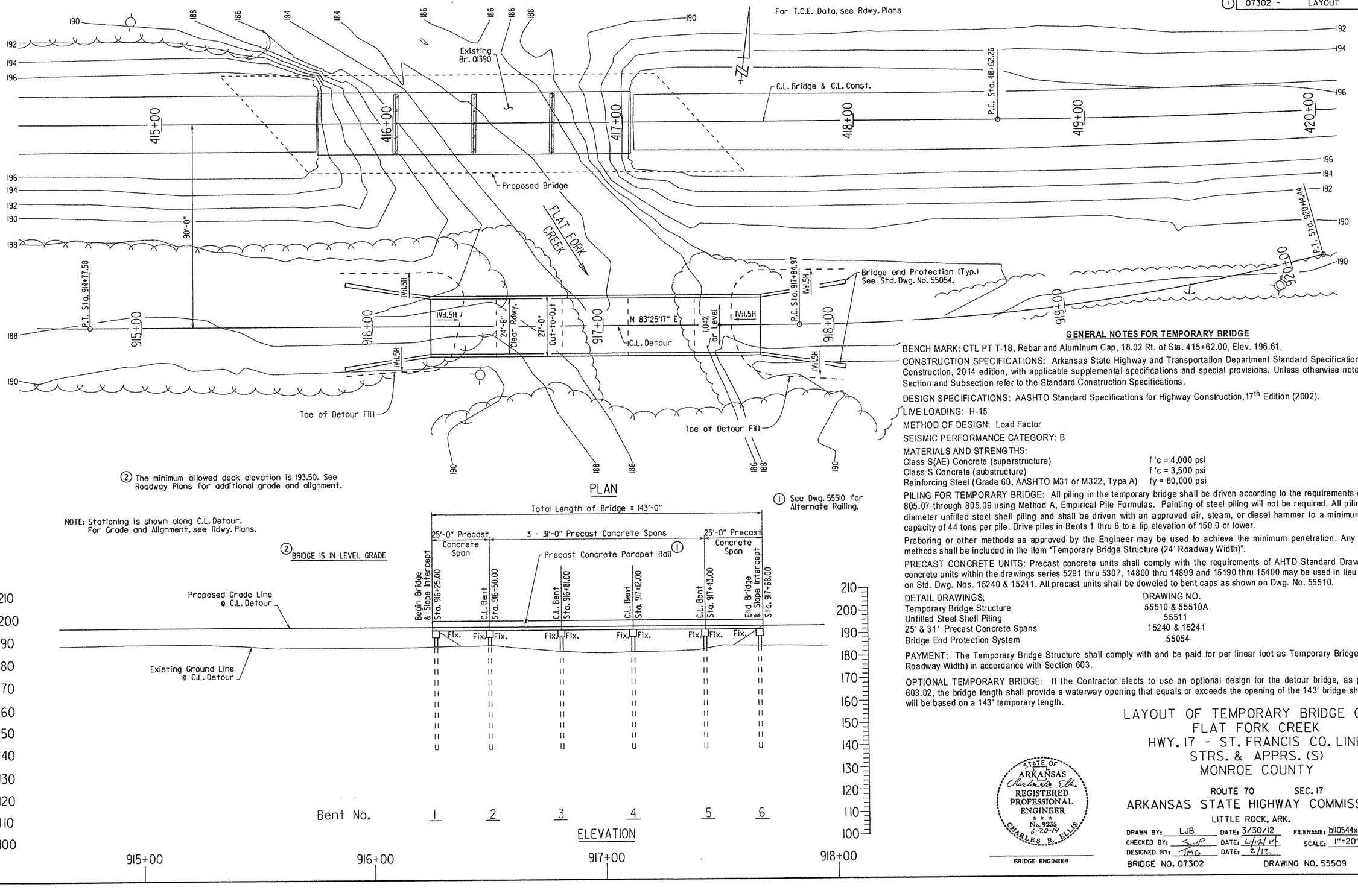
CHECKED BY: L TB DATE: 6/19/14 SCALE: AS SHOWN

DESIGNED BY: STD. DATE: —

BRIDGE NO. 07302 DRAWING NO. 55508

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.		110544	79	134
① 07302 -		LAYOUT		- 55509



GENERAL NOTES FOR TEMPORARY BRIDGE

BENCH MARK: CTL PT T-18, Rebar and Aluminum Cap, 18.02 Rt. of Sta. 415+62.00, Elev. 196.61.

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction, 2014 edition, with applicable supplemental specifications and special provisions. Unless otherwise noted in the plans Section and Subsection refer to the Standard Construction Specifications.

DESIGN SPECIFICATIONS: AASHTO Standard Specifications for Highway Construction, 17th Edition (2002).

LIVE LOADING: H-15

METHOD OF DESIGN: Load Factor

SEISMIC PERFORMANCE CATEGORY: B

MATERIALS AND STRENGTHS:

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

PILING FOR TEMPORARY BRIDGE: All piling in the temporary bridge shall be driven according to the requirements of Subsections 805.07 through 805.09 using Method A, Empirical Pile Formulas. Painting of steel piling will not be required. All piling shall be 16" diameter unfilled steel shell piling and shall be driven with an approved air, steam, or diesel hammer to a minimum safe bearing capacity of 44 tons per pile. Drive piles in Bents 1 thru 6 to a tip elevation of 150.0 or lower.

Preboring or other methods as approved by the Engineer may be used to achieve the minimum penetration. Any cost for these methods shall be included in the item "Temporary Bridge Structure (24' Roadway Width)".

PRECAST CONCRETE UNITS: Precast concrete units shall comply with the requirements of AHTD Standard Drawings. Precast concrete units within the drawings series 5291 thru 5307, 14800 thru 14899 and 15190 thru 15400 may be used in lieu of units shown on Std. Dwg. Nos. 15240 & 15241. All precast units shall be doweled to bent caps as shown on Dwg. No. 55510.

DETAIL DRAWINGS:	DRAWING NO.
Temporary Bridge Structure	55510 & 55510A
Unfilled Steel Shell Piling	55511
25' & 31' Precast Concrete Spans	15240 & 15241
Bridge End Protection System	55054

PAYMENT: The Temporary Bridge Structure shall comply with and be paid for per linear foot as Temporary Bridge Structure (24' Roadway Width) in accordance with Section 603.

OPTIONAL TEMPORARY BRIDGE: If the Contractor elects to use an optional design for the detour bridge, as per Subsection 603.02, the bridge length shall provide a waterway opening that equals or exceeds the opening of the 143' bridge shown. Payment will be based on a 143' temporary length.

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
6-20-14
CHARLES R. ELLIS
BRIDGE ENGINEER

LAYOUT OF TEMPORARY BRIDGE OVER FLAT FORK CREEK
HWY. 17 - ST. FRANCIS CO. LINE
STRS. & APPRS. (S)
MONROE COUNTY

ROUTE 70 SEC. 17

ARKANSAS STATE HIGHWAY COMMISSION

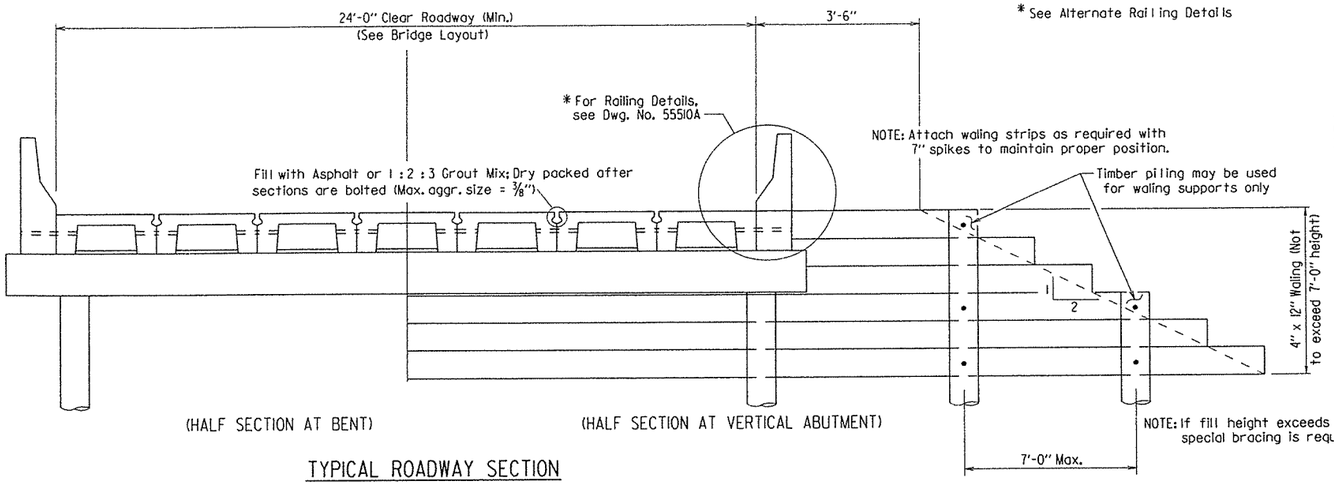
LITTLE ROCK, ARK.

DRAWN BY: LJB DATE: 3/30/12 FILENAME: bll0544x4_ll.dgn
CHECKED BY: SWP DATE: 4/12/14 SCALE: 1"=20'-0"
DESIGNED BY: TMG DATE: 2/12

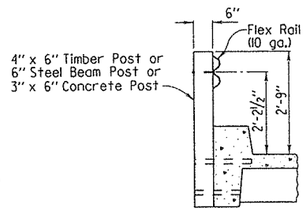
BRIDGE NO. 07302 DRAWING NO. 55509

PRINT DATE: 18-JUN-2014

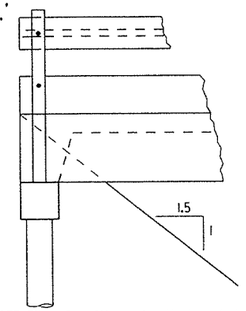
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	20	134
				(1) 07302 - TEMPORARY BRIDGE - 55510				



TYPICAL ROADWAY SECTION

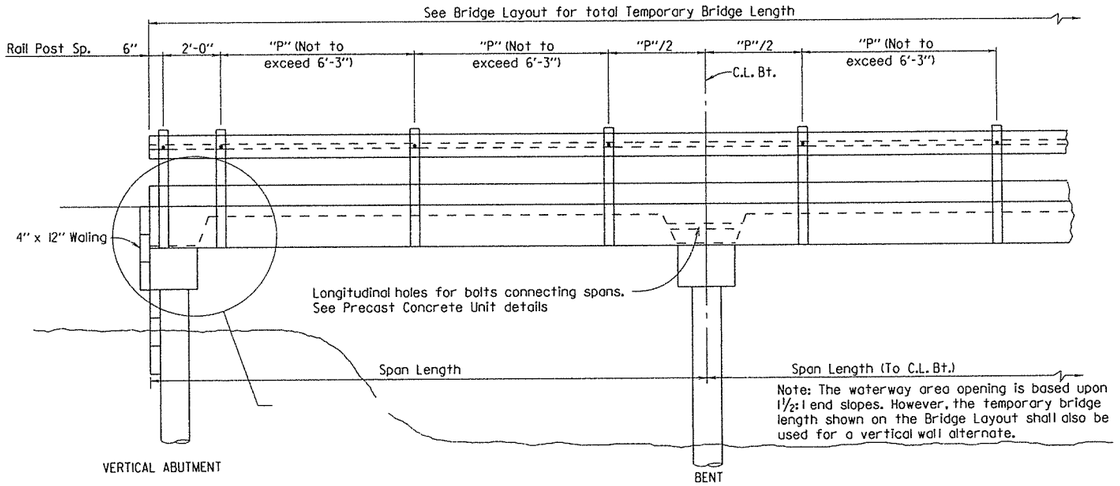


ALTERNATE RAILING DETAILS

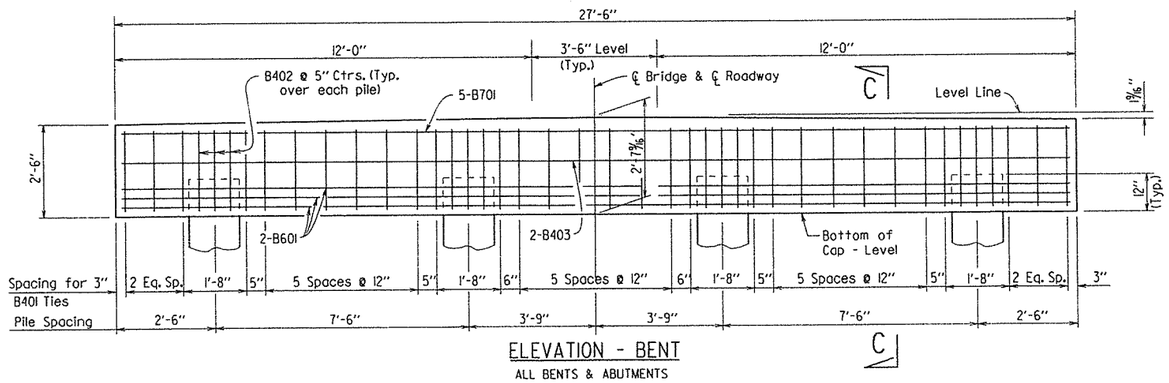


NOTE: Piles for Alternate Abutment to be driven after embankment is in place.

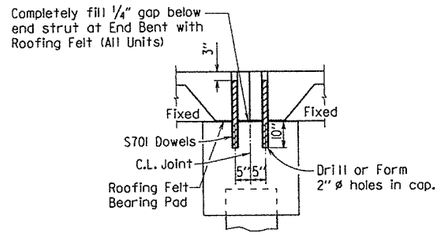
ALTERNATE SPILL-THRU ABUTMENT



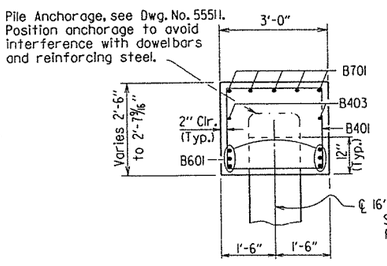
LONGITUDINAL SECTION SHOWING ALTERNATE RAILING DETAILS



ELEVATION - BENT
ALL BENTS & ABUTMENTS



SECTION AT FIXED BENT



SECTION C-C

GENERAL NOTES

Concrete shall be Class S with a minimum 28 day compressive strength f'c = 3500 psi unless otherwise noted.

All Reinforcing Steel shall be Grade 60 (yield strength = 60,000 psi.) conforming to AASHTO M 31 or M 322, TYPE A, with Mill Test Reports.

Structural Steel shall be AASHTO M 270, Grade 36 unless otherwise noted.

Timber piling for waling supports shall comply with Section 818 and shall be driven to a minimum safe bearing capacity of 20 tons per pile and with a minimum penetration of 5 feet. Steel piling shall be 16" Diameter Unfilled Steel Shell piling and shall be driven to a minimum safe bearing capacity of 44 tons per pile.

Malleable or cast iron washers shall be used under all bolt heads and nuts bearing on timber. Standard washers shall be provided under all bolt heads and nuts in connection with concrete.

Bolts shall conform to the requirements of ASTM A 307. Minimum dimensions are shown for bolts, dowels, and drift pins.

Timber material, regardless of species, must be of equal or better strength than no. 2 southern pine or douglas fir, graded by the standard grading rules. All timber widths and thicknesses are shown as nominal.

For additional notes concerning "Bridge End Protection System", see Std. Dwg. No. 55054.

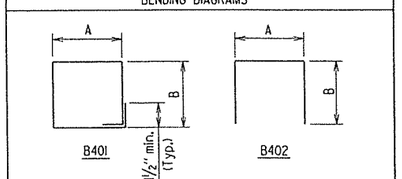
Unless otherwise noted, the Temporary Bridge Structure shall comply with and be paid for in accordance with Section 603.

After each unit is in its final position, two S701 Dowels shall be grouted in place at both ends of the unit using a OPL approved non-shrink grout that completely fills the holes. Dowels are not included in Table Quantities. If Dowels are drilled in caps, top reinforcing bars in cap shall be properly placed to avoid interference.

BAR LIST PER BENT

MARK	NO. REQ'D.	LENGTH	'A'	'B'	P.D.
B401	24	10'-0"	2'-8"	2'-2"	2"
B402	12	6'-10"	2'-8"	2'-2"	2"
B403	2	27'-2"	—	—	Str.
B601	6	27'-2"	—	—	Str.
B701	5	27'-2"	—	—	Str.
S701	**	2'-0"	—	—	Str.

BENDING DIAGRAMS



Dimensions are out to out of bars.

** 28 for Intermediate Bents
14 for End Bents

APPROXIMATE QUANTITIES PER BENT

(FOR INFORMATION ONLY)

Class "S" Concrete -Bridge	Reinforcing Steel (Gr. 60) -Bridge
7.9 Cu. Yds.	850 LBS.

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
6-20-14
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 1 OF 2

DETAILS OF TEMPORARY BRIDGE STRUCTURE 24'-0" ROADWAY

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

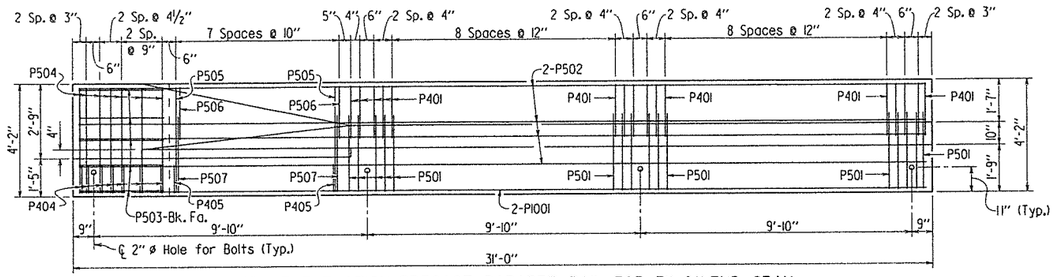
DRAWN BY: JGT DATE: 01/07/14 FILENAME: bll0544xl_tb.dgn
CHECKED BY: L JTS DATE: 6/18/14 SCALE: No Scale
DESIGNED BY: TMG DATE: 1/13

BRIDGE NO. 07302 DRAWING NO. 55510

PRINT DATE: 6/18/2014

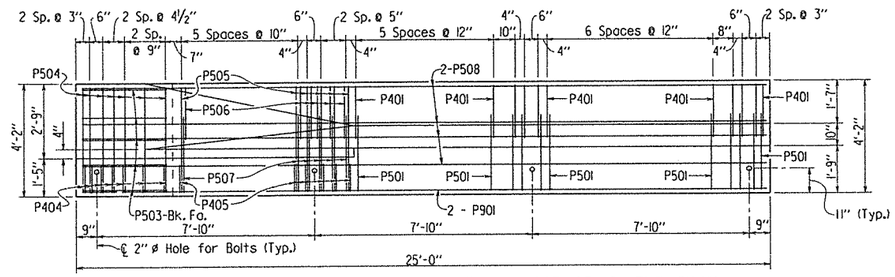
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	21	134

(1) 07302 - TEMPORARY BRIDGE - 55510A



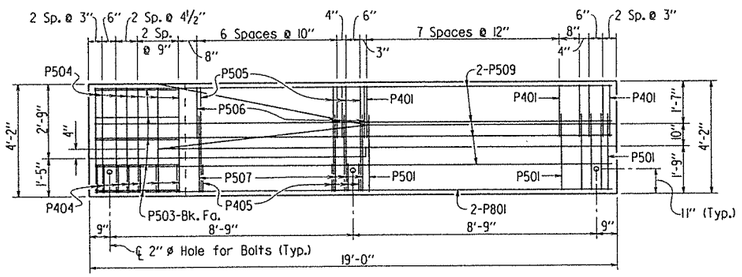
FRONT ELEVATION-PRECAST PARAPET RAIL FOR 31'-0" END SPAN

Scale ⅜" = 1'-0"



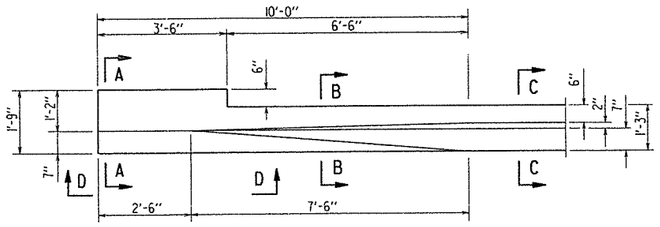
FRONT ELEVATION-PRECAST PARAPET RAIL FOR 25'-0" END SPAN

Scale ⅜" = 1'-0"



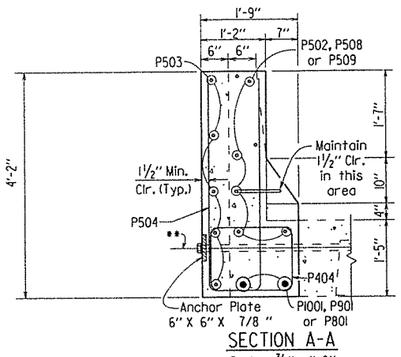
FRONT ELEVATION-PRECAST PARAPET RAIL FOR 19-0" END SPAN

Scale ⅜" = 1'-0"



TYPICAL PLAN OF PRECAST PARAPET RAIL FOR END SPAN

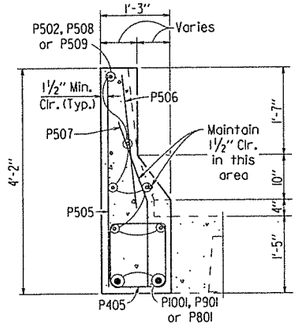
Scale ½" = 1'-0"



SECTION A-A

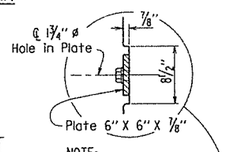
Scale ¾" = 1'-0"

** 1½" ø X 3'-0" Richmond S.C.A.B. or equal required at End Post Connections only.

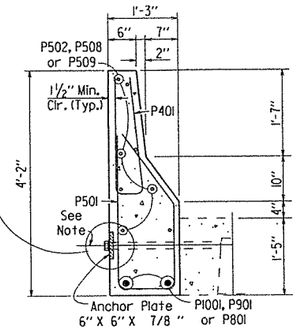


SECTION B-B

Scale ¾" = 1'-0"

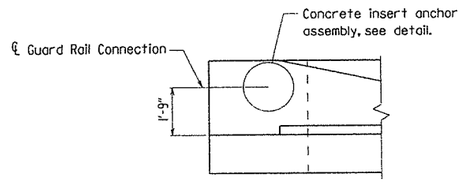


NOTE:
2" ø Hole for Bolt.
1½" ø X 2'-6" Richmond Screw Anchor & Bolt Assembly or equal is typical for all connections except as shown in SECTION A-A.



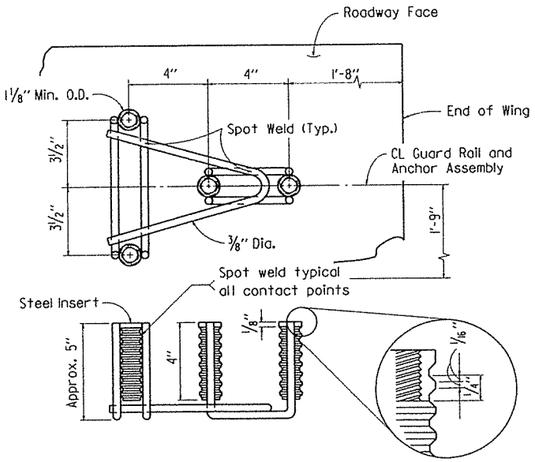
SECTION C-C

Scale ¾" = 1'-0"



VIEW D-D

Scale ⅜" = 1'-0"



CONCRETE INSERT ANCHOR ASSEMBLY

No Scale

Minimum capacity of guard rail attachment by concrete insert anchor assembly or other means shall be 12,000 lbs. ultimate shear capacity per bolt and insert (48,000 lbs. per assembly). There shall be a minimum of four bolts per attachment located as shown. The contractor may use the insert anchor assembly shown, or one similar which provides the same ferrule depth and thread length. The capacity of the insert anchor assembly shall be certified to the Engineer.

Guard rail attachment using other types of concrete insert will be allowed, provided they meet the minimum capacity specified, the capacity is certified, and approval is obtained from the Engineer before use.

The threaded steel insert shall have a solid bottom, tapped to a minimum threaded depth of 2½". The guard rail shall be connected with ⅞"ø x 2½" high strength hex bolts and one hardened steel washer. See Section 807.

Bolts shall conform to the requirements of ASTM A325 or A449 and shall be threaded full length. Bolts and washers shall be galvanized in accordance with ASTM A153.

Bolts shall be installed in accordance with Subsection 807.22(d).

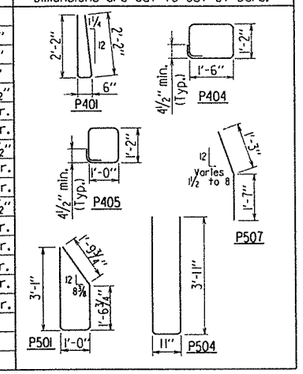
For Details of Guard Rail see Dwg. Nos. GR-8 & GR-8A.

BAR LIST FOR PARAPET RAIL UNITS

MARK	NUMBER REQUIRED PER RAIL 19'-0" RAIL	25'-0" RAIL	31'-0" RAIL	LENGTH	PIN DIA.
P401	12	20	30	4'-8"	2"
P404	7	7	7	5'-8"	2"
P405	9	10	8	4'-8"	2"
P501	12	20	30	7'-3"	2½"
P502			8	30'-8"	Str.
P503	5	5	5	3'-3"	Str.
P504	7	7	7	8'-6"	2½"
P505	9	10	8	3'-11"	Str.
P506	9	10	8	2'-2"	Str.
P507	9	10	8	2'-10"	2½"
P508		8		24'-8"	Str.
P509	8			18'-8"	Str.
P801	2			18'-8"	Str.
P901		2		24'-8"	Str.
P1001			2	30'-8"	Str.

BENDING DIAGRAMS

Dimensions are out to out of bars.



BRIDGE ENGINEER

SHEET 2 OF 2

DETAILS OF TEMPORARY BRIDGE STRUCTURE 24'-0" ROADWAY

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: JGT DATE: 02/07/14 FILENAME: bll0544xl_tb.dgn

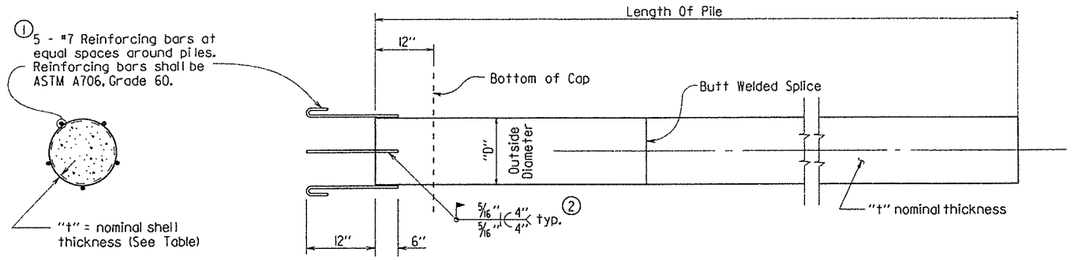
CHECKED BY: L.J.B DATE: 6/18/14 SCALE: As Shown

DESIGNED BY: TMG DATE: 1/13

BRIDGE NO. 07302 DRAWING NO. 55510A

PRINT DATE: 6/18/2014

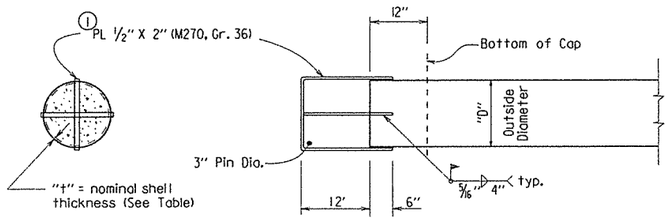
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	82	134
				①	07302 -	PILE DETAILS	- 55511	



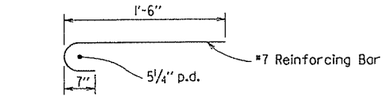
UNFILLED STEEL SHELL PILES

① Pile anchorage shall be placed to minimize interference with anchor bolts and reinforcing in cap or footing.

② Welding shall comply with ANSI/AWS D1.4 Structural Welding Code-Reinforcing Steel and applicable portions of ANSI/AWS D1.5 Bridge Welding Code.



ALTERNATE CONNECTION DETAIL



TYP. HOOKED BAR DETAIL

GENERAL NOTES FOR UNFILLED STEEL SHELL PILES

Steel shells shall conform ASTM A252, Grade 3, (Fy = 45,000 psi.).

Steel Shell Piling shall comply with Section 805 except piling shall not be filled with concrete after driving.

See temporary bridge layout for additional driving information.

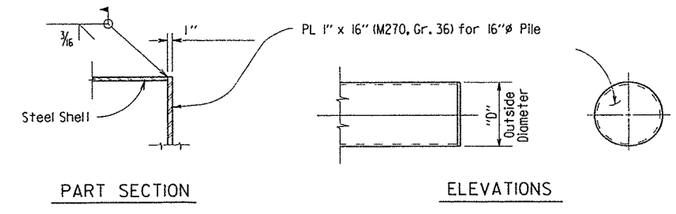
Steel Shell Piling will not be paid for directly but shall be included in the item "Temporary Bridge Structure (24' Roadway Width)".

Painting of steel piles will not be required.

Steel shell piling may be driven open or closed ended.

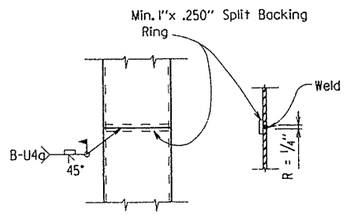
TABLE FOR SHELL PILES

OUTSIDE DIAMETER D	"t"-NOMINAL SHELL THICKNESS
16"	0.50"



PART SECTION ELEVATIONS

ALTERNATE FLAT TIP DETAIL



SPLICE DETAILS

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
6-20-14
CHARLES R. ELLIS

BRIDGE ENGINEER

DETAILS OF UNFILLED STEEL SHEEL PILES FOR TEMPORARY BRIDGE STRUCTURE

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: LJB DATE: 4/14/2014 FILENAME: bll0544xl_us.dgn

CHECKED BY: JGT DATE: 5/4/14 SCALE: NONE

DESIGNED BY: TMG DATE: 1/13

BRIDGE NO. 07302 DRAWING NO. 55511

PRINT DATE: 6/18/2014

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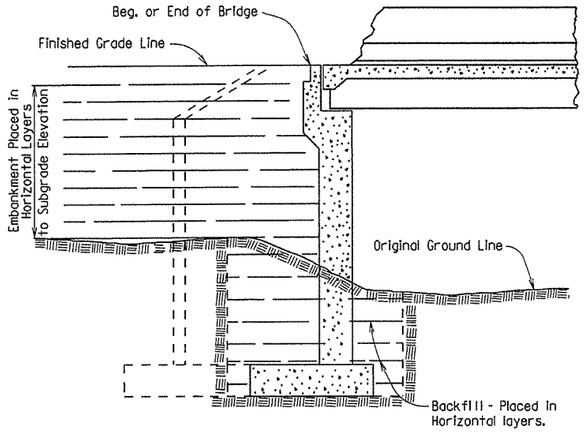
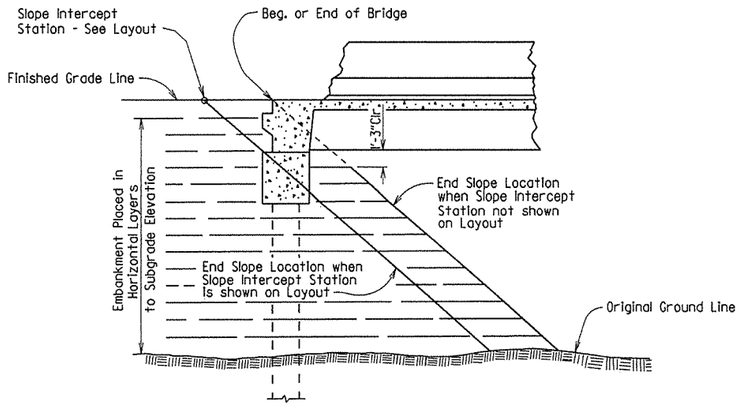
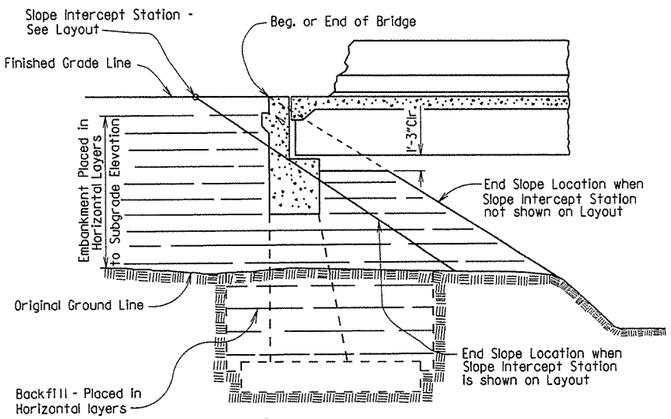
				JOB NO.				
				(1) EMBANKMENT & BACKFILL 55000				



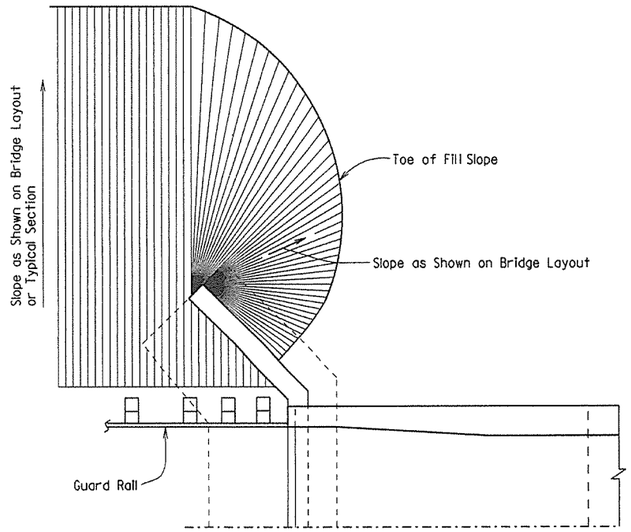
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT VERTICAL WALL ABUTMENTS



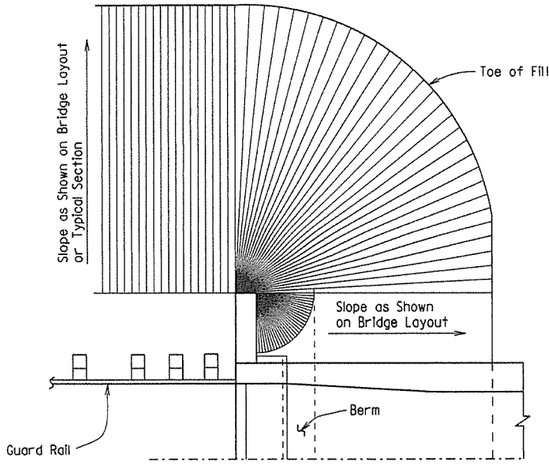
EMBANKMENT CONSTRUCTION AT SPILL-THROUGH PILE END BENTS



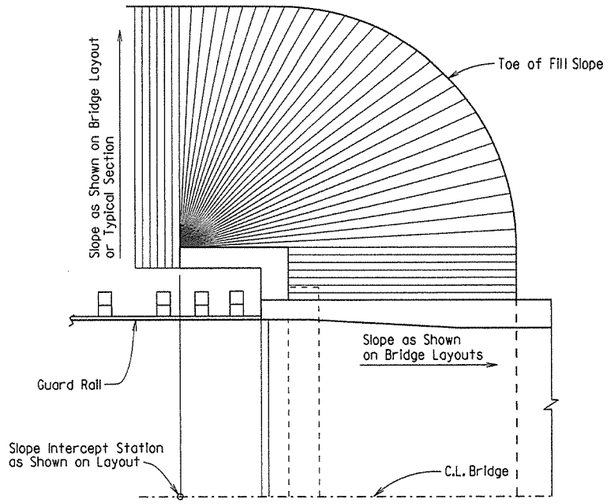
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT SPILL-THROUGH END BENTS



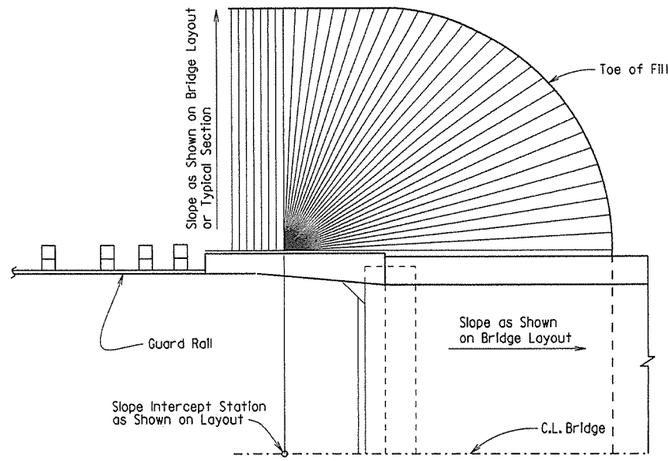
VERTICAL WALL ABUTMENTS



SPILL-THROUGH END BENTS WITH STUB WING



SPILL-THROUGH END BENTS WITH TURNBACK WING



SPILL-THROUGH END BENTS WITH TRANSITION WING

METHOD OF DETERMINING FILL SLOPE LOCATION AT BRIDGE ENDS

GENERAL NOTES

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

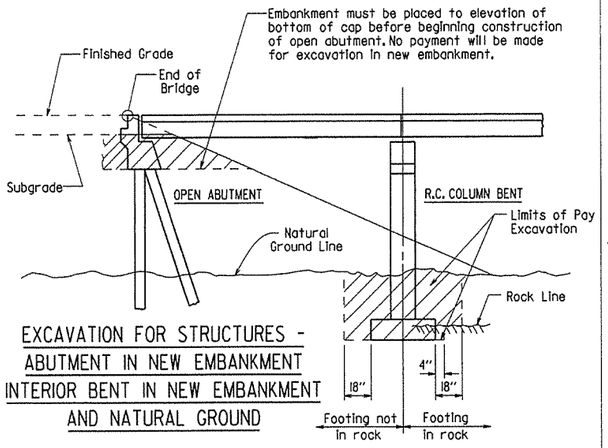
STANDARD DETAILS FOR EMBANKMENT CONSTRUCTION AND BACKFILL AT BRIDGE ENDS

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

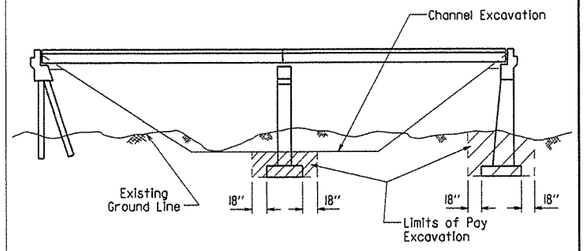
DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55000.dgn
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE
DESIGNED BY: STD. DATE: -

DRAWING NO. 55000

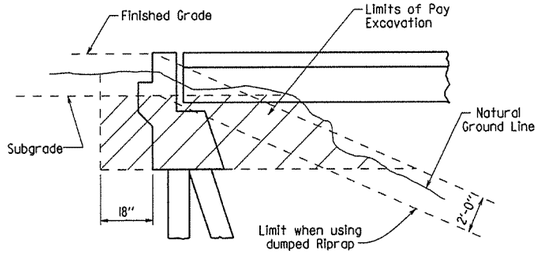
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		84	
				JOB NO.				
				① RIPRAP & EXCAV. 55001				



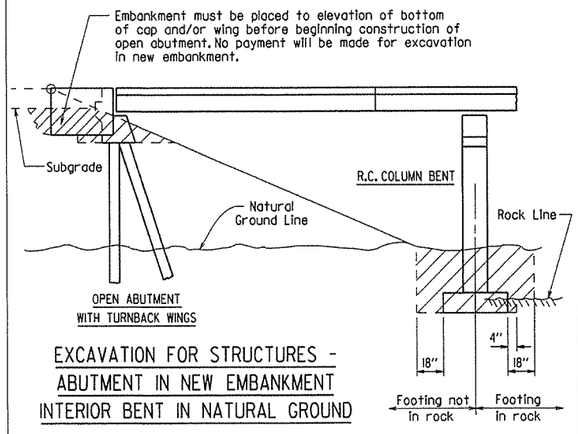
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NEW EMBANKMENT AND NATURAL GROUND



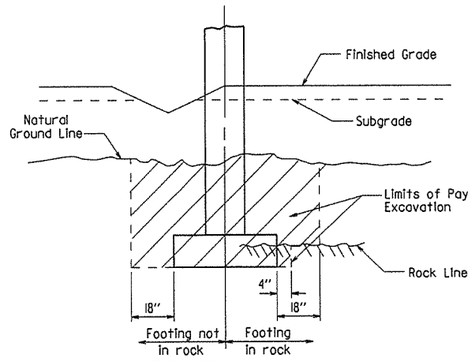
EXCAVATION FOR STRUCTURES - BRIDGE LOCATION WITH DESIGNATED CHANNEL CHANGE



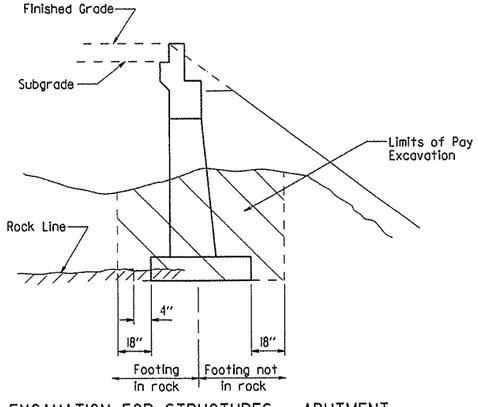
EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND



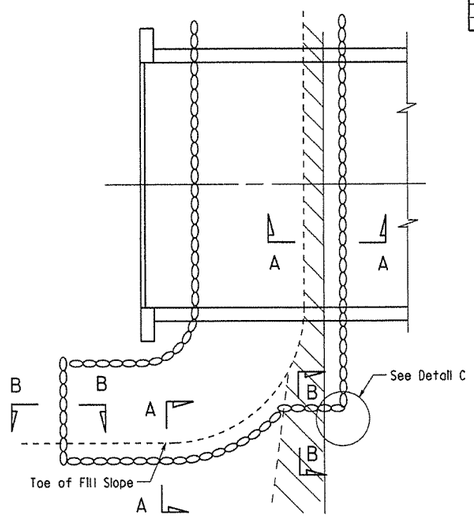
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NATURAL GROUND



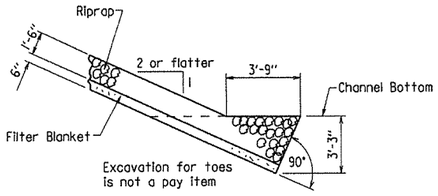
EXCAVATION FOR STRUCTURES - BENT IN ROADWAY FILL SECTION AND NATURAL GROUND



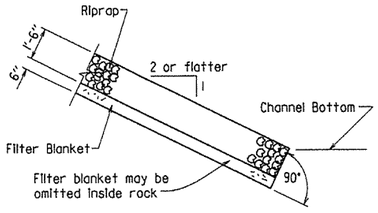
EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND AND NEW EMBANKMENT



PLAN OF DUMPED RIPRAP



SECTION A-A
(Toe Excavation in Soil)

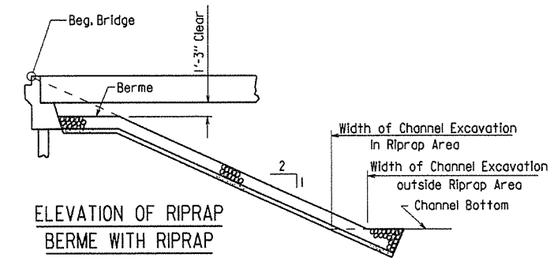


SECTION A-A
(Toe Excavation in Rock)

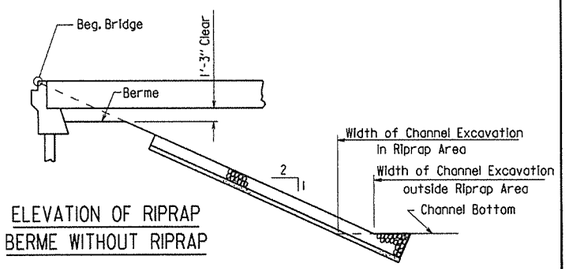
Note : Use this type of toe when rock is encountered which is in a stable condition.

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

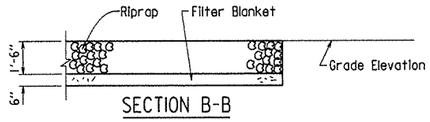
Note : Details for computing excavation for structures are included for information as to how plan quantities were calculated and for use when adjusting quantities when changing footing elevation.



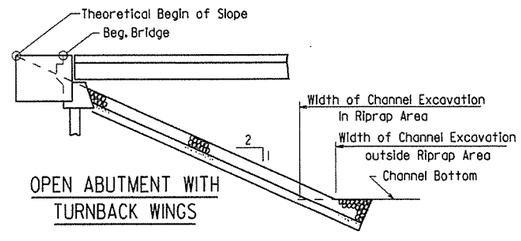
ELEVATION OF RIPRAP BERME WITH RIPRAP



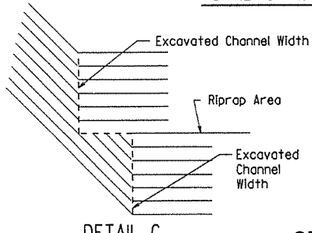
ELEVATION OF RIPRAP BERME WITHOUT RIPRAP



SECTION B-B



OPEN ABUTMENT WITH TURNBACK WINGS



DETAIL C

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

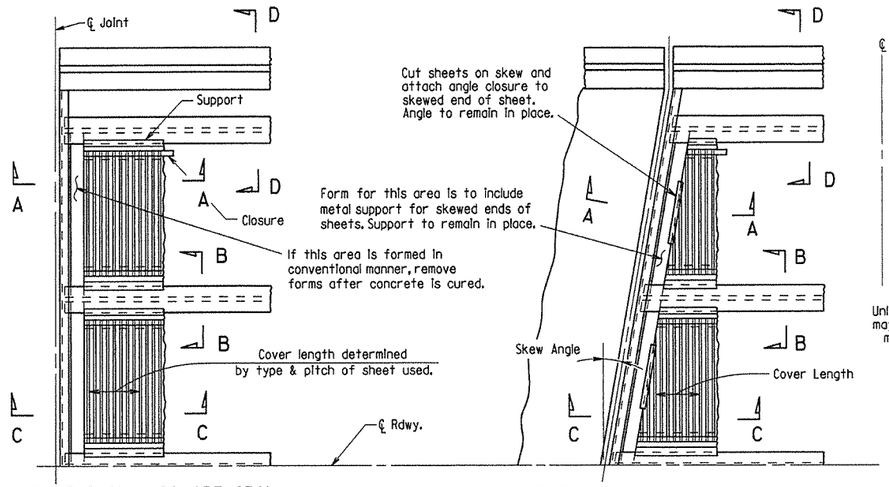
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55001.dgn
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE
DESIGNED BY: STD. DATE:

DRAWING NO. 55001

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		85	
				JOB NO.				
				①	BRIDGE DECK FORMS		55005	

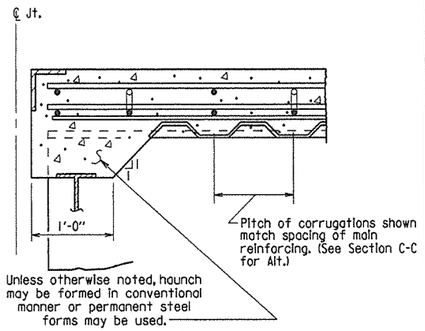


PART PLAN - SQUARE SPAN

3/8" = 1'-0"

PART PLAN - SKEWED SPAN

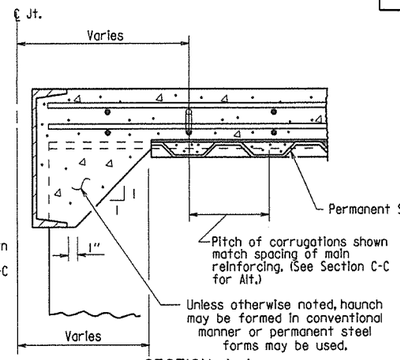
3/8" = 1'-0"



SECTION A-A

N.T.S.

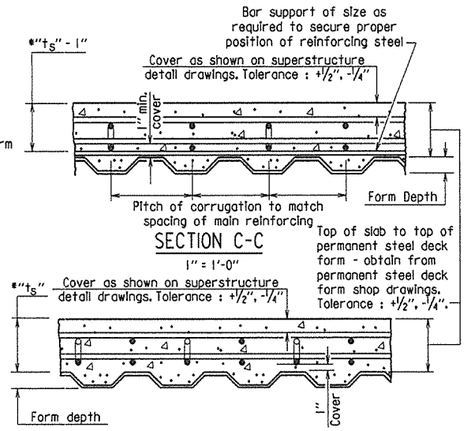
(Angle at end of span)



SECTION A-A

N.T.S.

(Channel at end of span)



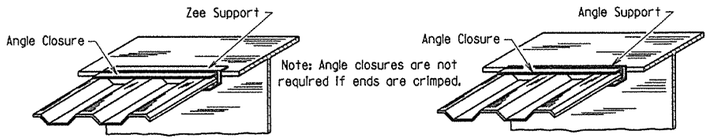
SECTION C-C

1" = 1'-0"

SECTION C-C - ALTERNATE

1" = 1'-0"

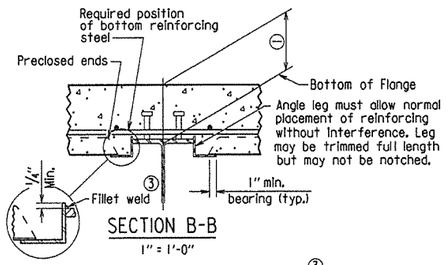
(Applicable when corrugations do not match spacing of main reinforcement)



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

SKETCH OF PERMISSIBLE SUPPORTS

N.T.S.

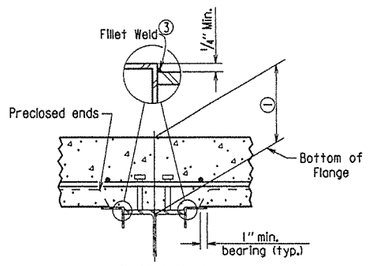


SECTION B-B

1" = 1'-0"

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

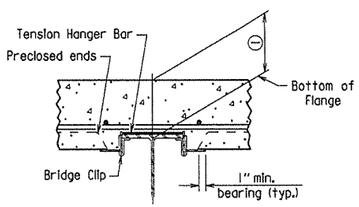
③ Minimum weld: 1/8" x 1' ℄ 18". More weld may be required; maximum length per weld = 1 1/2" (typ.)



SECTION B-B

1" = 1'-0"

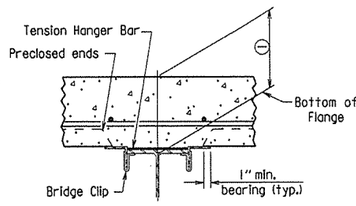
(Showing permissible support for tension flange where shear connectors are used and for all compression flanges)



SECTION B-B

1" = 1'-0"

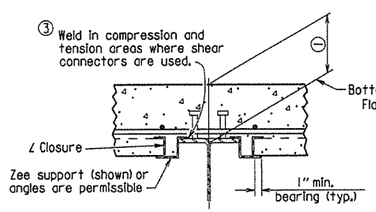
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

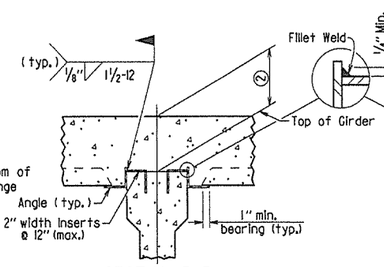
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

(Showing ∠ Closure)

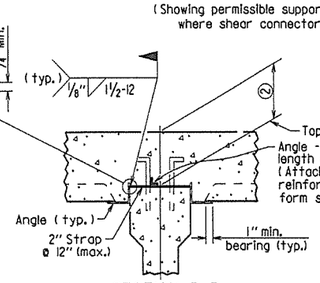


SECTION B-B

(FOR CONCRETE GIRDERS)

1" = 1'-0"

(Showing support by Insert cast in girder)

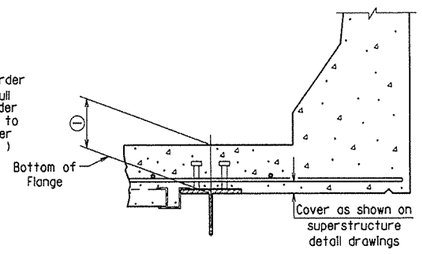


SECTION B-B

(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.

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

GENERAL NOTES

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

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

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

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

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

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

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

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

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

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

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

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

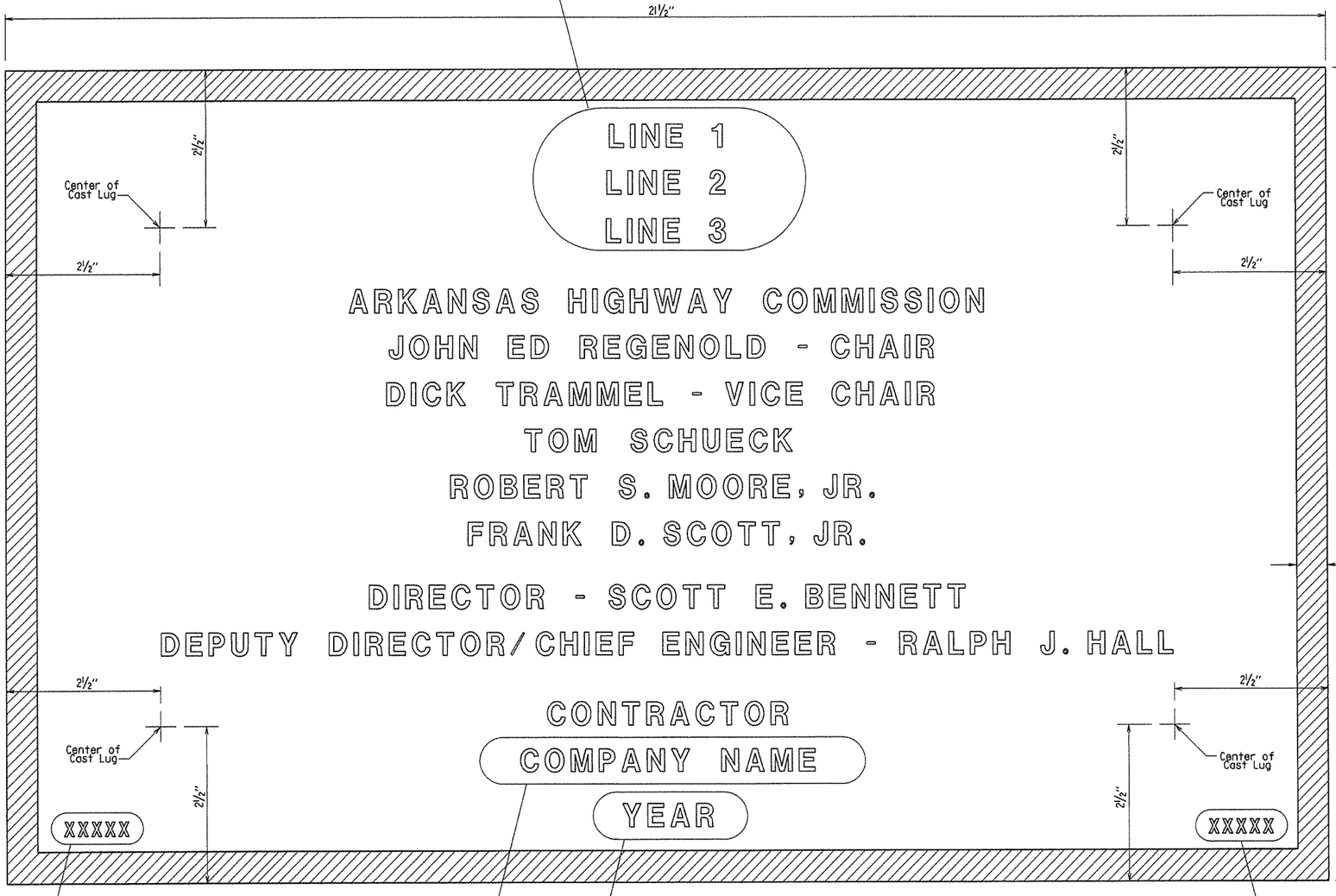
DESIGNED BY: STD. DATE: —

DRAWING NO. 55005

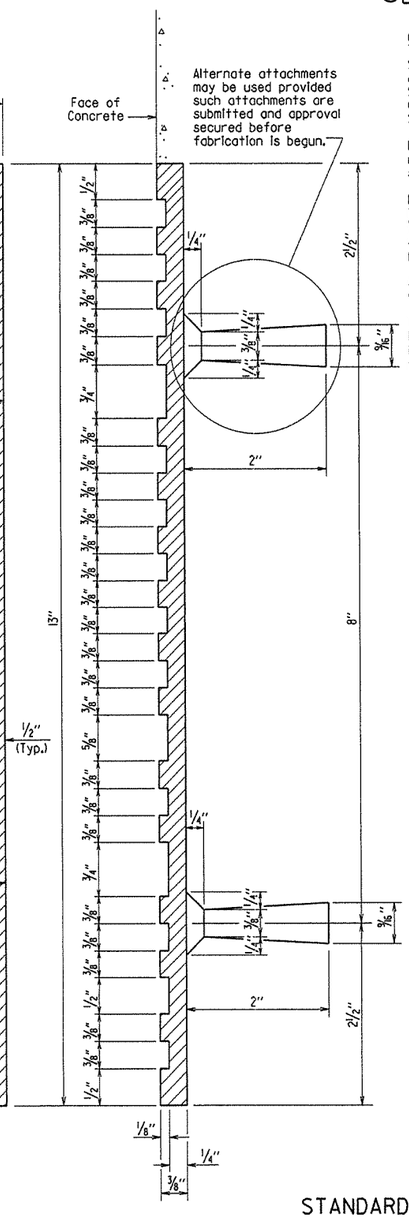
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		86	
				JOB NO.				
				①	TYPE D NAME PLATE		55010	

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

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



TYPICAL BRIDGE NAME PLATE



GENERAL NOTES

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

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

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

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

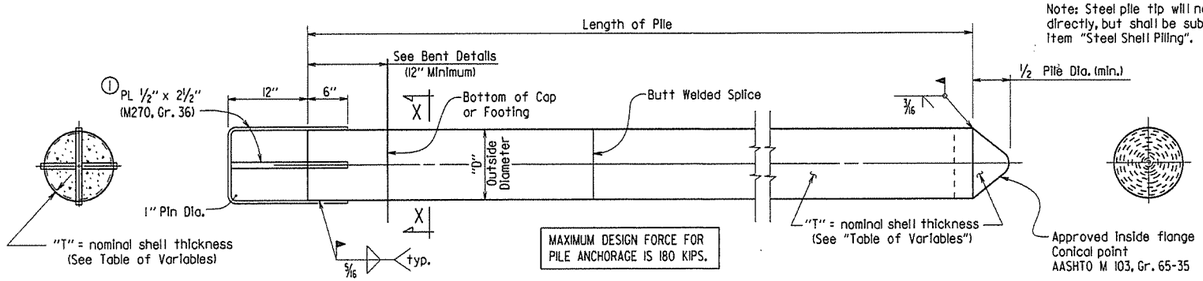
The number of plates required and the location and name on the plate for each bridge shall be as designated on the plans.

STANDARD DETAILS FOR
TYPE D BRIDGE NAME PLATE

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

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

DRAWING NO. 55010

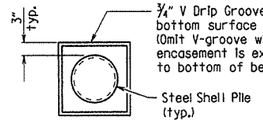


Note: Steel pile tip will not be paid for directly, but shall be subsidiary to the item "Steel Shell Piling".

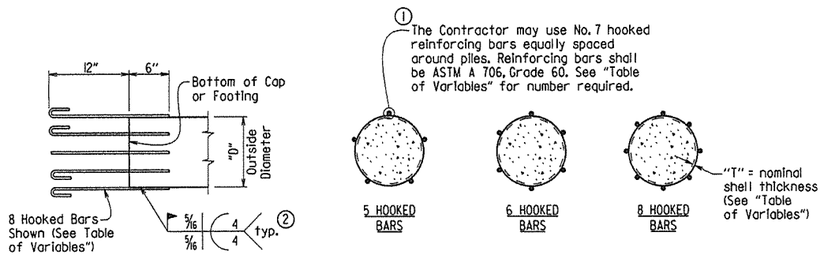
CONCRETE FILLED STEEL SHELL PILE

① Pile anchorage shall be placed to minimize interference with anchor bolts and reinforcing in cap or footing.

② Welding shall comply with ANSI/AWS D1.4 Structural Welding Code-Reinforcing Steel and applicable portions of ANSI/AWS D1.5 Bridge Welding Code.

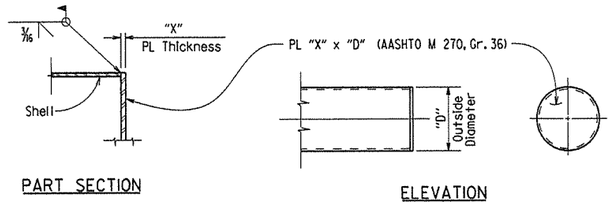


VIEW X-X



ALTERNATE PILE ANCHORAGE DETAIL

Note: Hooked bars shall be oriented to provide the required concrete clearances shown in the plans.

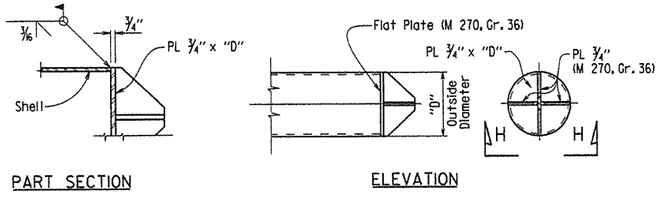


PART SECTION

ELEVATION

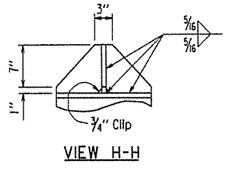
ALTERNATE FLAT TIP DETAIL

Note: The alternate flat tip detail shall not be used on steel shell piling to be driven through embankments constructed with internal geosynthetic reinforcement.



PART SECTION

ELEVATION



VIEW H-H

ALTERNATE VANED TIP DETAIL

GENERAL NOTES FOR CONCRETE FILLED STEEL SHEEL PILES:

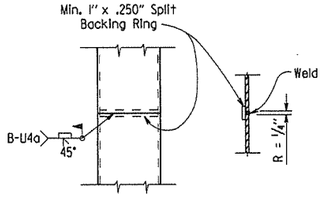
Steel shells shall conform ASTM A252, Grade 3 (Fy = 45,000 psi.)

Concrete used for filling of steel shell shall be Class S with a minimum 28-day compressive strength, f'c = 3,500 psi. and shall be poured in the dry.

Steel shell piling that extends above the ground and is not protected by pile encasement shall be painted in accordance with Subsection 805.02.

See Bridge Layout for size and estimated length of steel shell piles and for driving information.

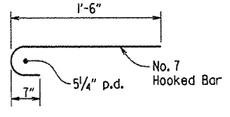
Concrete, structural steel, reinforcing steel (including welding), and painting shall not be paid for directly, but shall be considered subsidiary to the item "Steel Shell Piling".



TYPICAL SPLICE DETAILS

TABLE OF VARIABLES

OUTSIDE DIAMETER "D"	NOMINAL SHELL THICKNESS "T"	PLATE THICKNESS "X"	NO. OF HOOKED BARS FOR ALTERNATE PILE ANCHORAGE
14"	0.50"	¾"	5
16"	0.50"	1"	5
18"	0.50"	1¼"	6
20"	0.50"	1½"	6
24"	0.50"	1¾"	8



HOOKED BAR DETAIL

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		87	
				JOB NO.				
				①		STEEL SHELL PILES		55021

GENERAL NOTES FOR PILE ENCASEMENTS:

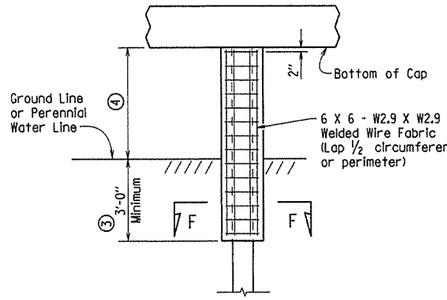
See Bridge Layout for additional notes and required location of pile encasements.

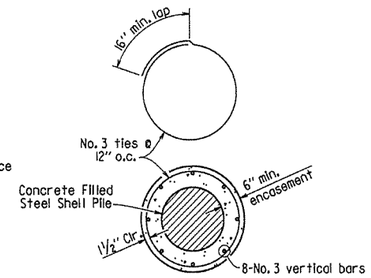
Concrete shall be Class S with a minimum 28-day compressive strength, f'c = 3,500 psi. If concrete cannot be placed in the dry, Seal Concrete may be used from top to bottom of encasement.

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

Welded wire fabric shall conform to AASHTO M 55 or M 221.

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





SECTION F-F (REINF. ALTERNATE)

PILE ENCASEMENT DETAIL FOR STEEL SHELL PILES

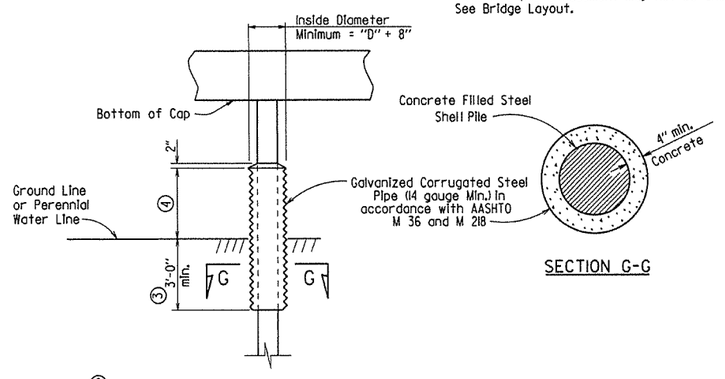
⑤ (Shown with Encasement to Bottom of Cap)

③ Unless otherwise noted on Bridge Layout.

④ See Bridge Layout for height of pile encasement (3'-0" Minimum).

⑤ Pile encasement, when not extended to bottom of cap, shall have 2" concrete taper for water runoff as shown in the detail for partial height encasement.

⑥ Alternate pile encasement may not be allowed. See Bridge Layout.



SECTION G-G

⑥ ALTERNATE PILE ENCASEMENT DETAIL FOR STEEL SHELL PILES

(Shown with Partial Height Encasement)

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

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

STANDARD DETAILS FOR CONCRETE FILLED STEEL SHELL PILES AND PILE ENCASEMENTS

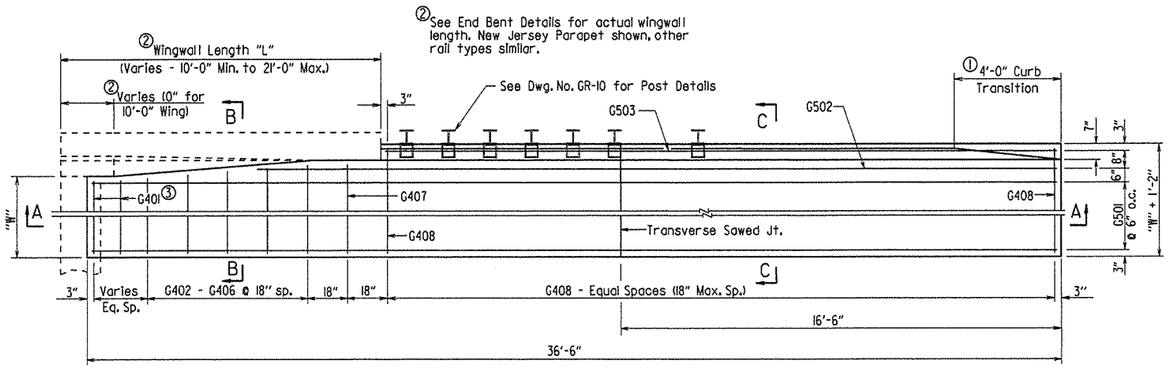
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55021.dgn
CHECKED BY: B.E.F. DATE: 2/27/2014 SCALE: NO SCALE
DESIGNED BY: STD. DATE: —

DRAWING NO. 55021

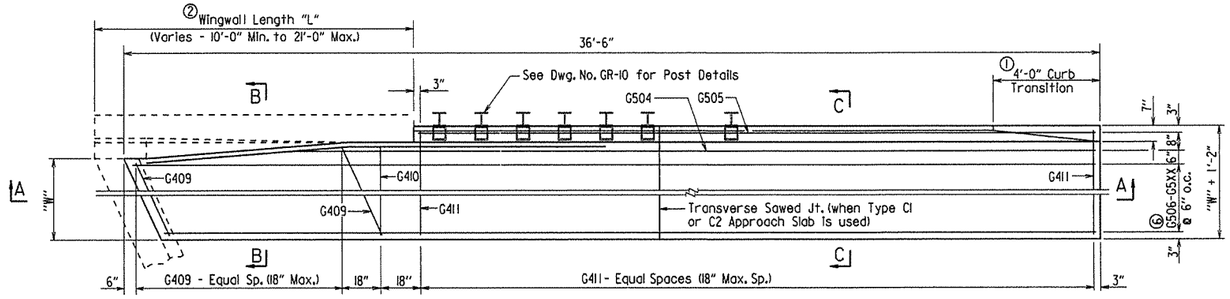
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		88	
				JOB NO.				

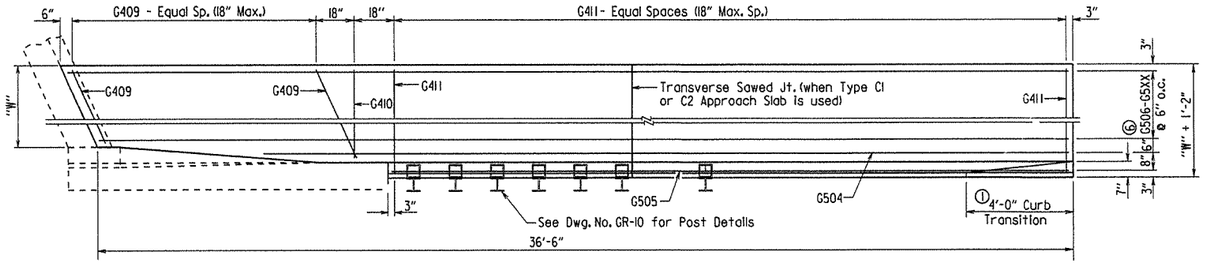
① TYPE C GUTTERS 55030C



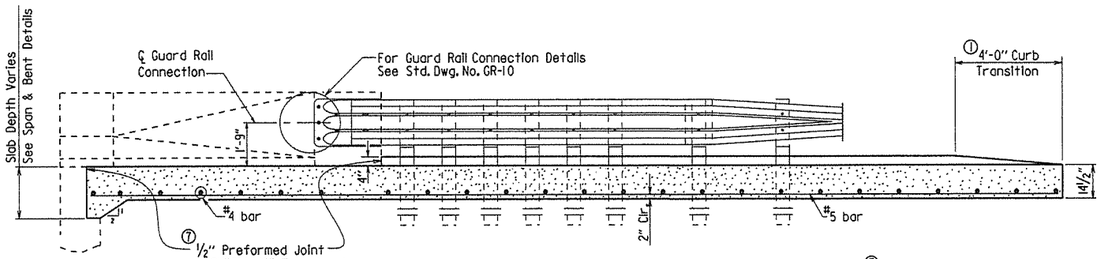
③Provide G401 bars @ 18" max. spacing. Number of G401 bars vary with wingwall length. No G401 bars required for 10'-0" wingwalls.

HALF PLAN OF APPROACH GUTTERS FOR SQUARE BRIDGE





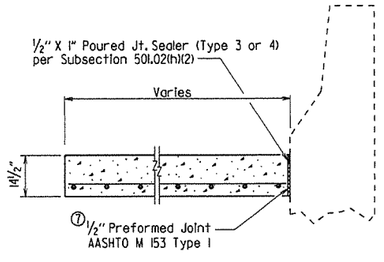
PLAN OF APPROACH GUTTERS FOR SKEWED BRIDGE



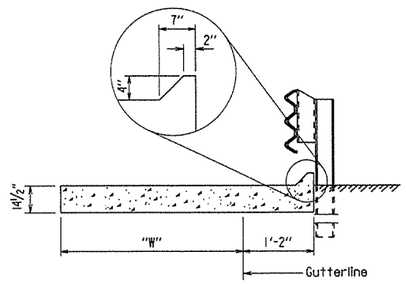
SECTION A-A

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

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



SECTION B-B
N.T.S.



SECTION C-C
N.T.S.

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

⑦Eliminate Type I Preformed Joint at end bent backwall and at face of wingwalls when gutters used with Type C2 Approach Slabs. Poured joint sealer is required, however backer rod shall be eliminated.

BAR LIST FOR ONE TYPE C GUTTER

	Mark	No. Req'd. for Width "W" 4'-0"	6'-0"	8'-0"	10'-0"	Length
Square Bridge	G401	④	④	④	④	"W"- 4"
	G402-G406	1 each	1 each	1 each	1 each	"W"-3" to "W"+2"
	G407	1	1	1	1	"W"+3"
	G408	④	④	④	④	"W"+ 10"
	G501	8	12	16	20	36'-2"
	G502	1	1	1	1	(41'-11") - "L"
	G503	1	1	1	1	(37'-2") - "L"
Skewed Bridge	G409	④	④	④	④	⑤
	G410	1	1	1	1	"W"+3"
	G411	④	④	④	④	"W"+ 10"
	G504	1	1	1	1	⑤
	G505	1	1	1	1	⑤
	G506 - G5XX ⑥	1 each	1 each	1 each	1 each	⑤

④No. Req'd. varies with Skew and Wingwall Length.

⑤Bar Lengths vary with Skew and Wingwall Length.

⑥G513 for "W" = 4'
G517 for "W" = 6'
G521 for "W" = 8'
G525 for "W" = 10'

QUANTITIES FOR ONE SQUARE APPROACH GUTTER

(FOR INFORMATION ONLY)

"W" Width (ft.)	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
4	445	8.30
6	630	11.55
8	810	14.80
10	995	18.10

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

GENERAL NOTES

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

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

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

STANDARD DETAILS FOR TYPE C APPROACH GUTTERS

ARKANSAS STATE HIGHWAY COMMISSION

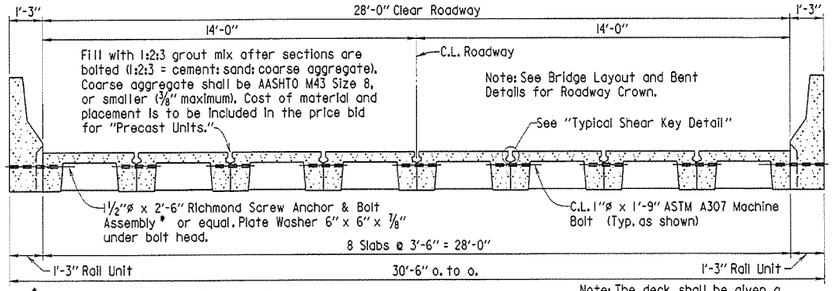
LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55030c.dgn
CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: 3/8" = 1'-0" or As Shown
DESIGNED BY: STD. DATE:

DRAWING NO. 55030C

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.		89	
				JOB NO.				

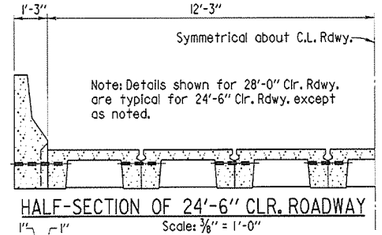
① 31' PRECAST SPAN 15240



*Designated "Richmond SCAB" on the Plans.

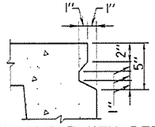
CROSS-SECTION OF 28'-0" CLR. RDWY. (SHOWING ASSEMBLY)

Scale: ⅜" = 1'-0"



HALF-SECTION OF 24'-6" CLR. ROADWAY

Scale: ⅜" = 1'-0"

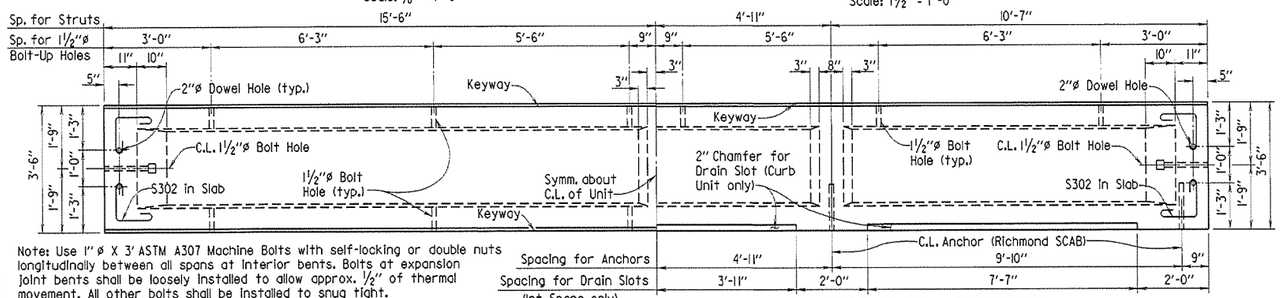


Note: The deck shall be given a tine finish as specified for Class 5 Roadway Surface Finish in subsection 802.19 of the Standard Specifications.

TYPICAL SHEAR KEY DETAIL

Scale: 1½" = 1'-0"

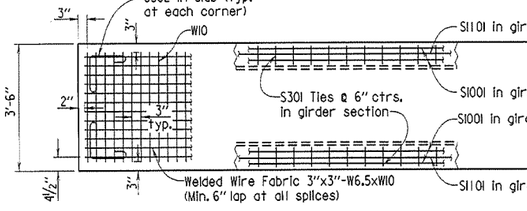
Note: All corners exposed after erection shall have a ½" minimum chamfer. All other corners shall have sufficient chamfer or rounding to prevent breakage during form removal, handling and erection.



Note: Use 1" ø X 3' ASTM A307 Machine Bolts with self-locking or double nuts longitudinally between all spans at interior bents. Bolts at expansion joint bents shall be loosely installed to allow approx. ½" of thermal movement. All other bolts shall be installed to snug tight.

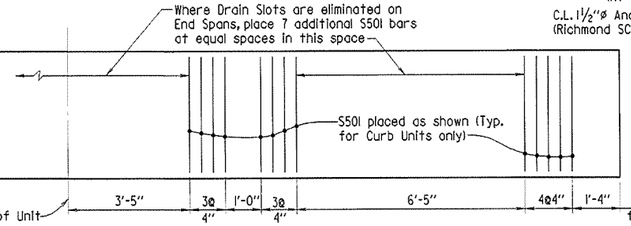
HALF PLAN - INTERIOR UNIT

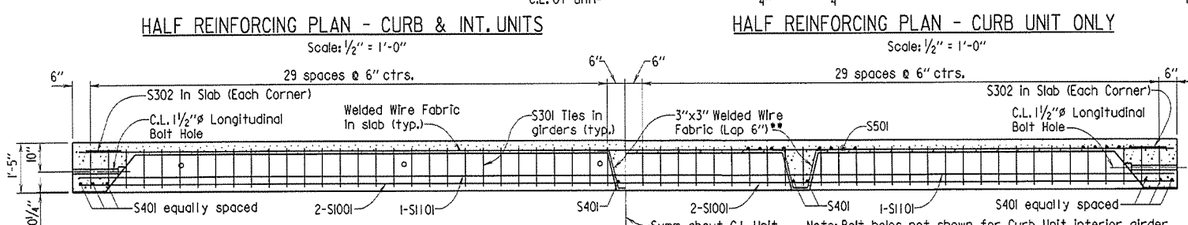
Scale: ½" = 1'-0"



HALF PLAN - CURB UNIT

Scale: ½" = 1'-0"





HALF REINFORCING PLAN - CURB & INT. UNITS

Scale: ½" = 1'-0"

HALF REINFORCING PLAN - CURB UNIT ONLY

Scale: ½" = 1'-0"

HALF LONGIT. SECTION - INTERIOR UNIT

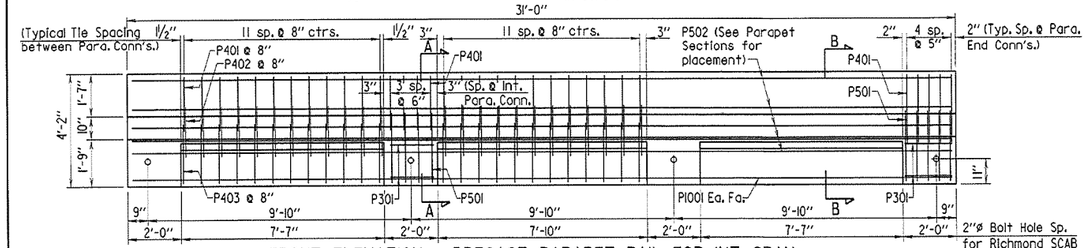
Scale: ½" = 1'-0"

**5 - #3 Stirrups @ 6" ctrs. may be used in place of wire fabric in strut.

HALF LONGIT. SECTION - CURB UNIT

Scale: ½" = 1'-0"

Note: Bolt holes not shown for Curb Unit interior girder.



Note: For details and bar list for Precast Parapet Rail at End Span, see std. drwg. no. 15230.

FRONT ELEVATION - PRECAST PARAPET RAIL FOR INT. SPAN

Scale: ⅜" = 1'-0"

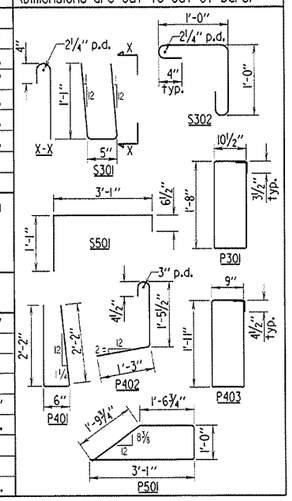
BAR LIST FOR PRECAST BRIDGE COMPONENTS

PRECAST SLAB UNIT

Note: Bar designations ending with "E" indicate epoxy coated bars.

MARK	NUMBER REQUIRED CURB UNIT	NUMBER REQUIRED INT. UNIT	LENGTH	P.D.
S301	122	122	3'-3½"	1½"
S302	4	4	2'-9"	1½"
S401	10	8	3'-2"	Str.
S501	26 (A)	-	4'-6"	2½"
S701E	(B)	(B)	1'-11"	Str.
S1001	4	4	30'-8"	Str.
S1101	2	2	30'-8"	Str.

BENDING DIAGRAMS (Dimensions are out to out of bars)



(A) Plus 7 additional for each Drain Slot eliminated
(B) 2 Per Fixed end of each Unit

PRECAST PARAPET RAIL UNIT

MARK	NUMBER REQUIRED END SPAN	NUMBER REQUIRED INT. SPAN	LENGTH	P.D.
P301	See Std. Drwg. No. 15230	8	5'-4"	1½"
P401		54	4'-8"	2"
P402		36	3'-1½"	2"
P403		36	5'-8"	2"
P501		18	7'-2"	2½"
P502		9	30'-8"	Str.
P1001		2	30'-8"	Str.

GENERAL NOTES

All Reinforcing steel shall be AASHTO M31 or M53, Grade 60. Wire fabric shall be AASHTO M55 or M221. Reinforcing steel and wire fabric shall be accurately located in the forms and securely held in place by steel wire supports.

Concrete for precast units shall be Class S(AE) except that the coarse aggregate size shall meet AASHTO M43, Size 67 (¾" Max.).

Standard washers shall be provided under head and nut of all bolts in connection with concrete. Bolts shall be A307. All bolts, washers and nuts shall be galvanized to meet AASHTO M232, Class C or M298, Class 50.

Screw Anchor and Bolt Assembly (SCAB) shall be 1½"ø Richmond Screw Anchor or equal, and have a minimum ultimate strength of 65,000 psi in tension. Assembly shall be galvanized to meet AASHTO M232, Class C or M298, Class 50. Plate Washers for SCAB shall be AASHTO M270, Grade 36 and shall be galvanized to meet AASHTO M111.

Camber required for dead load deflection is ⅜". Deviation of more than ¼" in dimension of grade or line will be cause for rejection.

Concrete, reinforcing, wire mesh, bar supports, bolts, nuts, washers, threaded anchors, grout, roofing felt bearing pad and expansion joint fillers are considered subsidiary to the pay items for Precast Concrete Units. Roofing felt shall meet or exceed the requirements of ASTM D224 Type I. See Section 802.18(d). The roofing felt shall be in one piece for the full length of the cap and three layers shall be used.

Ends of adjacent units shall be coated (1/16"±) with asphaltic paint. The coating shall adhere and set firm and its softening point shall not be less than 140°F.

Bid items shall be as follows:
"31' Precast Concrete Curb Units"
"31' Precast Concrete Interior Units"
"31' Precast Parapet Rail Units"

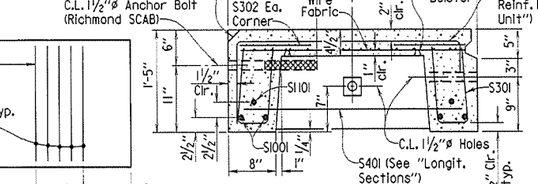
Design Specifications: AASHTO 2002
Method of Design: Load Factor
Live Loading: HS 20, 0.9 Wheels per Unit
Materials: 28 Day compressive strength of Concrete = 4,000 psi
Yield strength of Grade 60 Steel = 60,000 psi
Yield strength of Wire Fabric = 65,000 psi

Seismic Performance Category: A, B or C

Seismic Performance Category A:
1. Maximum spacing between 1 inch Expansion Joints is 155 feet.
2. 2"ø Dowel holes at expansion ends are not required. Grout holes if they exist.

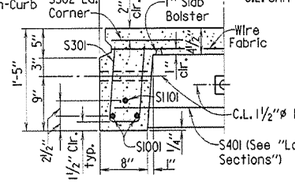
Seismic Performance Category B or C:
1. All bents shall be fixed.
2. Do not use this drawing with bridge lengths that exceed 155 feet in Category B or 93 feet in Category C.

Note: For details and bar list for Precast Parapet Rail at End Span, see std. drwg. no. 15230.



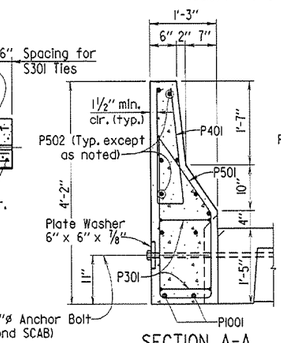
SECTION THRU CURB UNIT

Scale: 1" = 1'-0"



HALF-SECTION THRU INT. UNIT

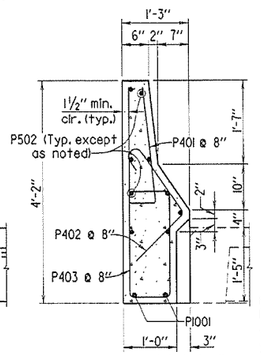
Scale: 1" = 1'-0"



Note: 1½" x 2'-6" Richmond SCAB typical for all connections except as shown in View A-A, Drwg. No. 15230.

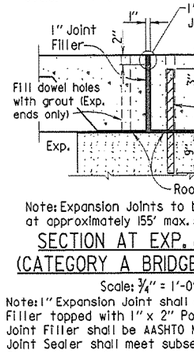
SECTION A-A

Scale: ¾" = 1'-0"



SECTION B-B

Scale: ¾" = 1'-0"



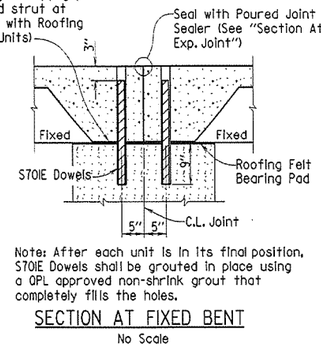
Note: Expansion Joints to be placed at approximately 155' max. spacings.

SECTION AT EXP. JOINT (CATEGORY A BRIDGES ONLY)

Scale: ¾" = 1'-0"

Note: 1" Expansion Joint shall consist of 1" Joint Filler topped with 1" x 2" Poured Joint Sealer. Joint Filler shall be AASHTO M153, Type I. Poured Joint Sealer shall meet subsection 501.02(h) (2), Type 3, 4, 5 or 6.

Completely fill ¼" gap below end strut at End Bent with Roofing Felt (All Units)



Note: After each unit is in its final position, S701E Dowels shall be grouted in place using a DPL approved non-shrink grout that completely fills the holes.

SECTION AT FIXED BENT

No Scale

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

BRIDGE ENGINEER

DETAILS OF STANDARD 31'-0" PRECAST CONCRETE SPANS 28'-0" & 24'-6" CLEAR ROADWAYS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

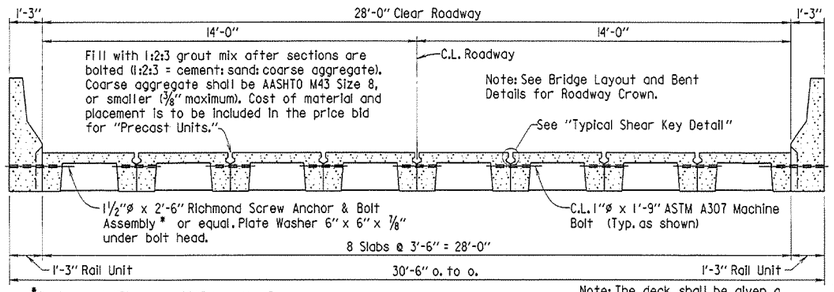
DRAWN BY: KDH DATE: 4-10-2003 FILENAME: BI5240.STD
CHECKED BY: MAH DATE: 4-10-2003 SCALE: As Shown
DESIGNED BY: STD. DATE:

BRIDGE NO. DRAWING NO. 15240

⚠1 Revised and redrawn: KDH 4-10-2003
Chkd. By: MAH

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6-24-94	6-27-94	11-16-2001		6	ARK.		90	
2-20-97	2-20-97	10-09-03		JOB NO.				
01-12-2000	01-12-2000							

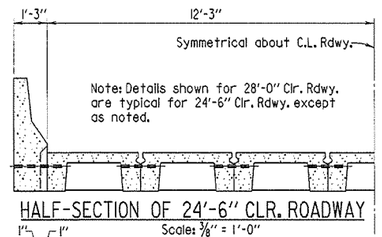
(1) 25' PRECAST SPAN 15241



*Designated "Richmond SCAB" on the Plans.

CROSS-SECTION OF 28'-0" CLR. RDWY. (SHOWING ASSEMBLY)

Scale: ⅜" = 1'-0"

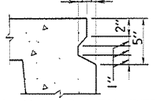


HALF-SECTION OF 24'-6" CLR. ROADWAY

Scale: ⅜" = 1'-0"

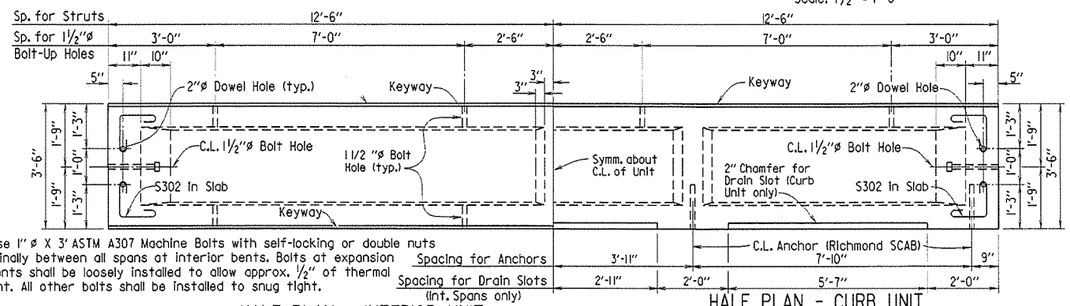
Note: The deck shall be given a tine finish as specified for Class 5 Roadway Surface Finish in subsection 802.19 of the Standard Specifications.

Note: All corners exposed after erection shall have a ½" minimum chamfer. All other corners shall have sufficient chamfer or rounding to prevent breakage during form removal, handling and erection.



TYPICAL SHEAR KEY DETAIL

Scale: 1½" = 1'-0"



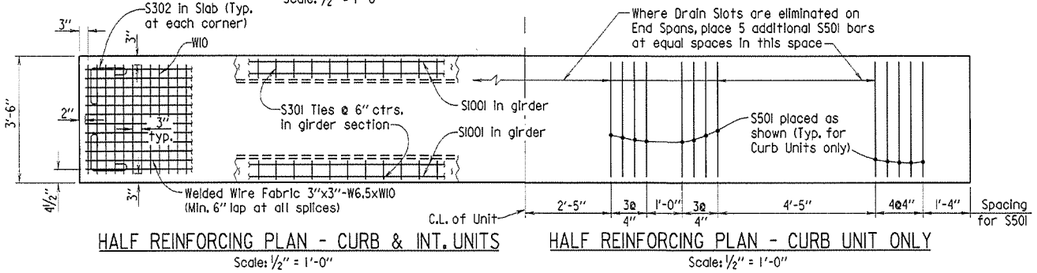
Note: Use 1" ø X 3' ASTM A307 Machine Bolts with self-locking or double nuts longitudinally between all spans at interior bents. Bolts at expansion joint bents shall be loosely installed to allow approx. ½" of thermal movement. All other bolts shall be installed to snug tight.

HALF PLAN - INTERIOR UNIT

Scale: ½" = 1'-0"

HALF PLAN - CURB UNIT

Scale: ½" = 1'-0"

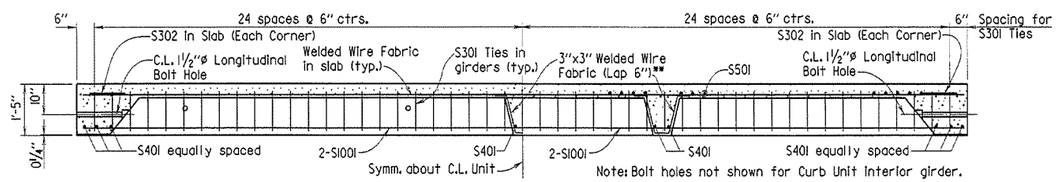


HALF REINFORCING PLAN - CURB & INT. UNITS

Scale: ½" = 1'-0"

HALF REINFORCING PLAN - CURB UNIT ONLY

Scale: ½" = 1'-0"



Note: Bolt holes not shown for Curb Unit interior girder.

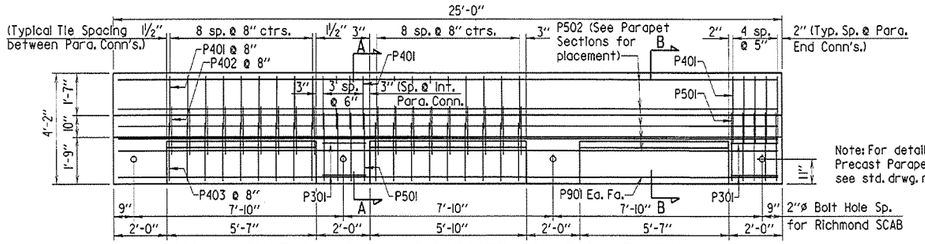
HALF LONGIT. SECTION - INTERIOR UNIT

Scale: ½" = 1'-0"

HALF LONGIT. SECTION - CURB UNIT

Scale: ½" = 1'-0"

**5 - #3 Stirrups @ 6" ctrs. may be used in place of wire fabric in strut.



Note: For details and bar list for Precast Parapet Rail at End Span, see std. drwg. no. 15230.

FRONT ELEVATION - PRECAST PARAPET RAIL FOR INT. SPAN

Scale: ⅜" = 1'-0"

BAR LIST FOR PRECAST BRIDGE COMPONENTS

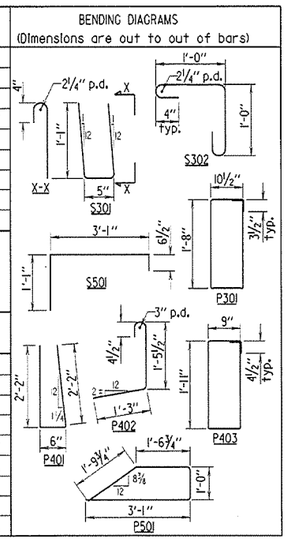
PRECAST SLAB UNIT

Note: Bars designated with an "E" are to be epoxy coated.

MARK	NUMBER REQUIRED: CURB UNIT	NUMBER REQUIRED: INT. UNIT	LENGTH	P.D.
S301	98	98	3'-3½"	1½"
S302	4	4	2'-9"	1½"
S401	10	8	3'-2"	Str.
S501	26 (A)	-	4'-6"	2½"
3 S601E	(B)	(B)	1'-11"	Str.
S1001	4	4	24'-8"	Str.

(A) Plus 5 additional for each Drain Slot eliminated
(B) 2 Per Fixed end of each Unit

BENDING DIAGRAMS (Dimensions are out to out of bars)



PRECAST PARAPET RAIL UNIT

MARK	NUMBER REQUIRED: END SPAN	NUMBER REQUIRED: INT. SPAN	LENGTH	P.D.
P301	See Std. Drwg. No. 15230	8	5'-4"	1½"
P401		45	4'-8"	2"
P402		27	3'-1½"	2"
P403		27	5'-8"	2"
P501		18	7'-2"	2½"
P502		9	24'-8"	Str.
P901		2	24'-8"	Str.

GENERAL NOTES

All Reinforcing steel shall be AASHTO M31 or M53, Grade 60. Wire fabric shall be AASHTO M55 or M221. Reinforcing steel and wire fabric shall be accurately located in the forms and securely held in place by steel wire supports.

Concrete for precast units shall be Class S(AE) except that the coarse aggregate size shall meet AASHTO M43, Size 67 (¾" Max.).

Standard washers shall be provided under head and nut of all bolts in connection with concrete. Bolts shall be A307. All bolts, washers and nuts shall be galvanized to meet AASHTO M232, Class C or M298, Class 50.

Screw Anchor and Bolt Assembly (SCAB) shall be 1½"ø Richmond Screw Anchor or equal, and have a minimum ultimate strength of 65,000 psi in tension. Assembly shall be galvanized to meet AASHTO M232, Class C or M298, Class 50. Plate Washers for SCAB shall be AASHTO M270, Grade 36 and shall be galvanized to meet AASHTO M111.

Camber required for dead load deflection is ¼". Deviation of more than ¼" in dimension of grade or line will be cause for rejection.

2 Concrete, reinforcing, wire mesh, bar supports, bolts, nuts, washers, threaded anchors, grout, roofing felt bearing pad and expansion joint fillers are considered subsidiary to the pay items for the Precast Concrete Units. Roofing felt shall meet or exceed the requirements of ASTM D224 Type I. See Section 802.18(d). The roofing felt shall be in one piece for the full length of the cap and three layers shall be used.

Ends of adjacent units shall be coated (1/16"±) with asphaltic paint. The coating shall adhere and set firm and its softening point shall not be less than 140°F.

Bid items shall be as follows:
"25' Precast Concrete Curb Units"
"25' Precast Concrete Interior Units"
"25' Precast Parapet Rail Units"

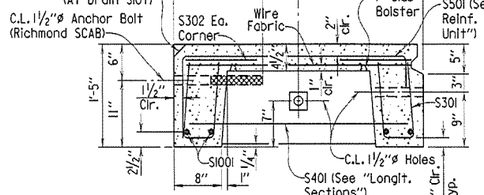
4 Design Specifications: AASHTO 2002
Method of Design: Load Factor
Live Loading: HS 20, 0.9 Wheels per Unit
Materials: 28 Day compressive strength of Concrete = 4,000 psi
Yield strength of Grade 60 Steel = 60,000 psi
Yield strength of Wire Fabric = 65,000 psi

Seismic Performance Category: A, B or C

Seismic Performance Category A:
1. Maximum spacing between 1 inch Expansion Joints is 155 feet.
2. 2"ø Dowel holes at expansion ends are not required. Grout holes if they exist.

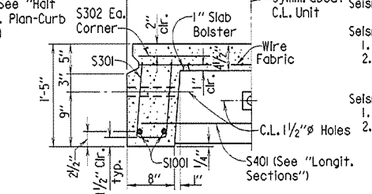
Seismic Performance Category B or C:
1. All bents shall be fixed.
2. Do not use this drawing with bridge lengths that exceed 155 feet in Category B or 93 feet in Category C.

Note: For details and bar list for Precast Parapet Rail at End Span, see std. drwg. no. 15230.



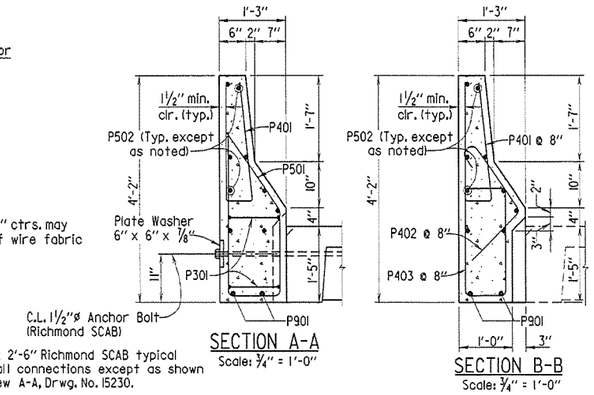
SECTION THRU CURB UNIT

Scale: 1" = 1'-0"



HALF-SECTION THRU INT. UNIT

Scale: 1" = 1'-0"



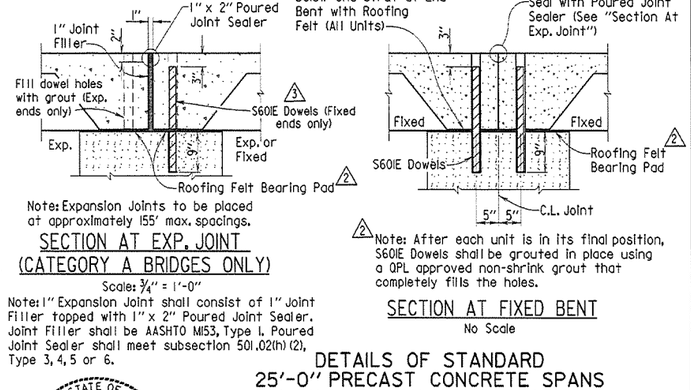
Note: 1½" x 2'-6" Richmond SCAB typical for all connections except as shown in View A-A, Drwg. No. 15230.

SECTION A-A

Scale: ¾" = 1'-0"

SECTION B-B

Scale: ¾" = 1'-0"



Note: Expansion Joints to be placed at approximately 155' max. spacings.

SECTION AT EXP. JOINT (CATEGORY A BRIDGES ONLY)

Scale: ¾" = 1'-0"

Note: 1" Expansion Joint shall consist of 1" Joint Filler topped with 1" x 2" Poured Joint Sealer. Joint Filler shall be AASHTO M153, Type I. Poured Joint Sealer shall meet subsection 501.02(h) (2), Type 3, 4, 5 or 6.

2 Completely fill ¼" gap below end strut at End Bent with Roofing Felt (All Units)

2 Note: After each unit is in its final position, S601E Dowels shall be grouted in place using a QPL approved non-shrink grout that completely fills the holes.

SECTION AT FIXED BENT

No Scale

4 Revised for current specifications and P.E. stamp 10-09-03 MJT Chk'd. By: JGT

3 Revised S601 bars to S601E 11-16-2001, JAC Chk'd. by: JGT

2 Revised type of bearing pad material and grout specifications. 01-12-2000, AMS

1 Revised for 1996 Specs. and Redrawn 02-20-97 MJT Chk'd. By: RLW Date: 1-31-97

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

BRIDGE ENGINEER

DETAILS OF STANDARD 25'-0" PRECAST CONCRETE SPANS 28'-0" & 24'-6" CLEAR ROADWAYS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

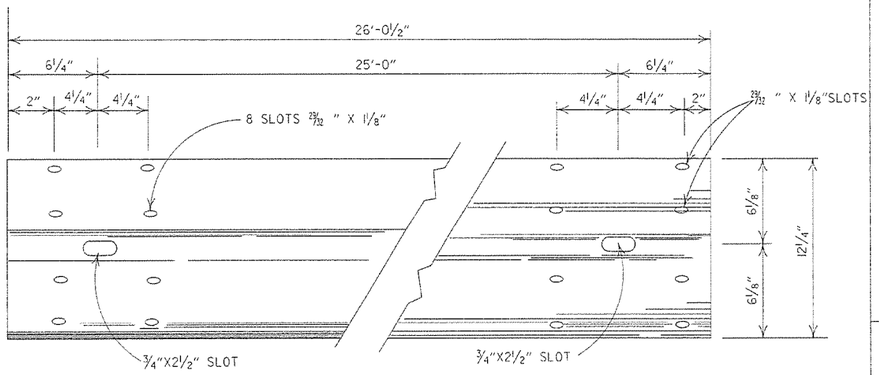
LITTLE ROCK, ARK.

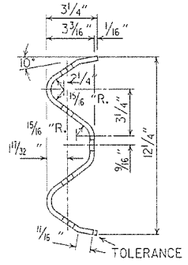
DRAWN BY: MJT DATE: 01-09-97
CHECKED BY: RLW DATE: 01-31-97
DESIGNED BY: STD. DATE: -
SCALE: As Shown

BRIDGE NO. DRAWING NO. 15241

FILENAME: B15240. STD

B15241.STD

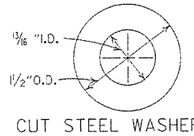




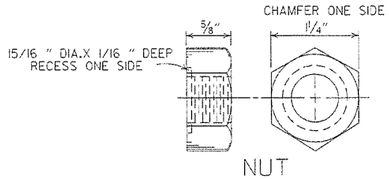
DETAILS OF W-BEAM GUARD RAIL

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

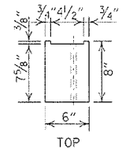
SPLICE BOLT
POST BOLT - SAME EXCEPT LENGTH



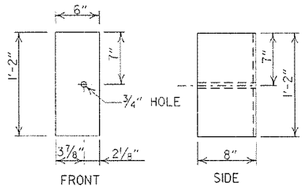
CUT STEEL WASHER



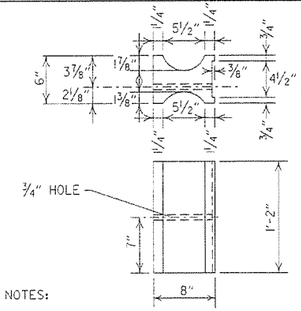
NUT



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



WOOD BLOCKOUT (W-BEAM)

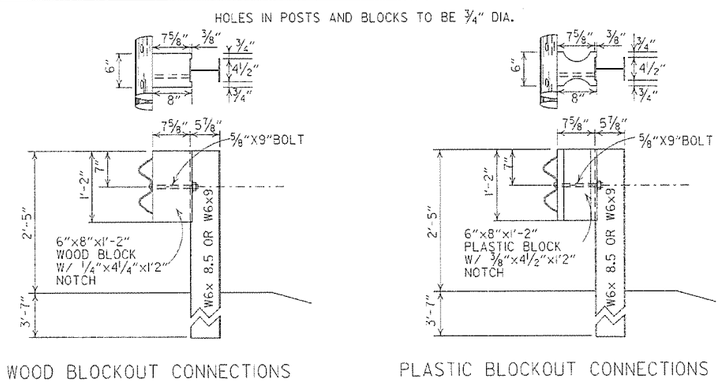


NOTES:

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

PLASTIC BLOCKOUT (W-BEAM)

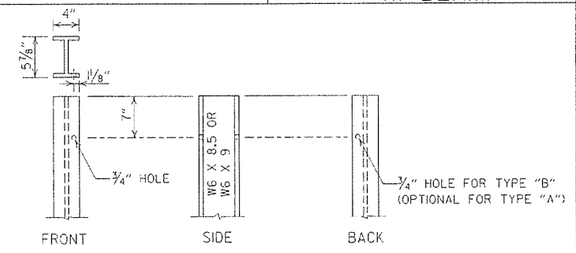
HOLES IN POSTS AND BLOCKS TO BE ¾" DIA.



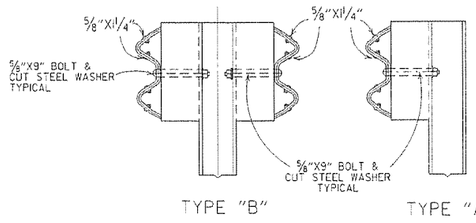
WOOD BLOCKOUT CONNECTIONS

PLASTIC BLOCKOUT CONNECTIONS

DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)

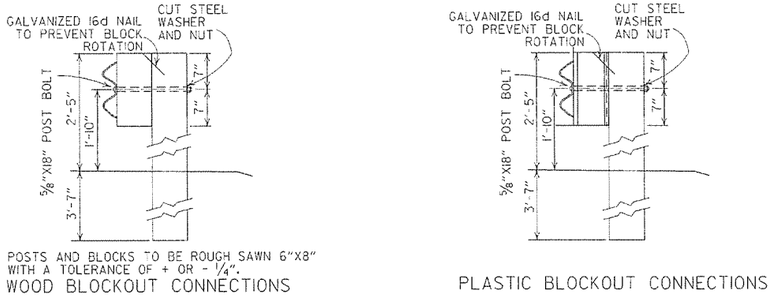


STEEL POST



DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)

HOLES IN POSTS AND BLOCKS TO BE ¾" DIA.



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 ¾" 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.

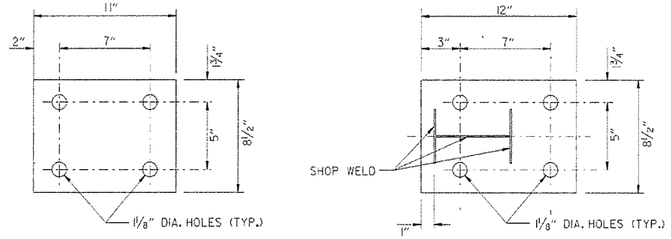
CONTRACTOR SHALL HAVE THE OPTION OF USING WOOD BLOCKOUTS FOR W-BEAM GUARD RAIL OR PLASTIC BLOCKOUTS, AS LONG AS BLOCKOUT USED MEETS NCHRP-350 TEST LEVEL 3 SPECIFICATIONS OR REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) FOR W-BEAM GUARD RAIL.

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

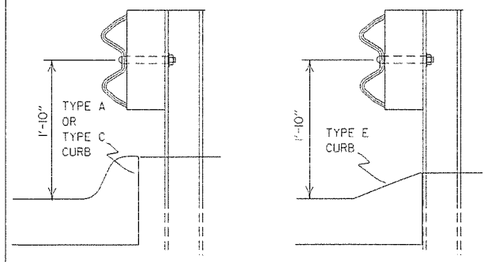
STANDARD DRAWING GR-8



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

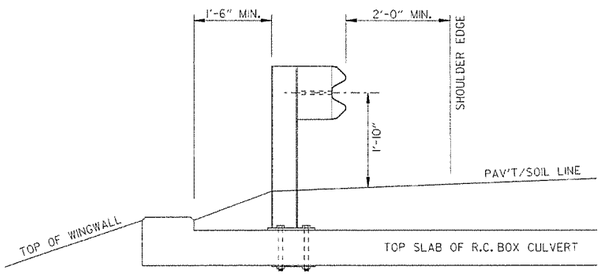
ALIGN FACE OF GUARD RAIL WITH FACE OF CURB.

FOR DESIGN SPEEDS OF 55 MPH OR MORE

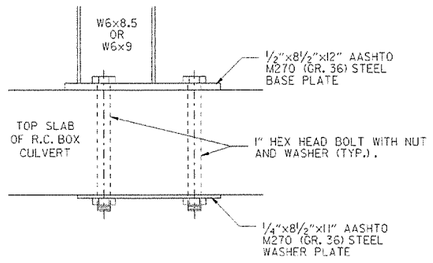
PLACE GUARD RAIL POSTS AGAINST BACK OF CURB.

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.

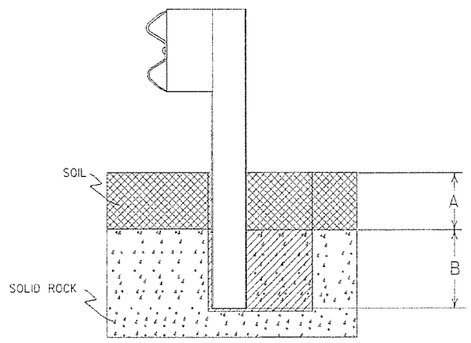


SECTION A-A

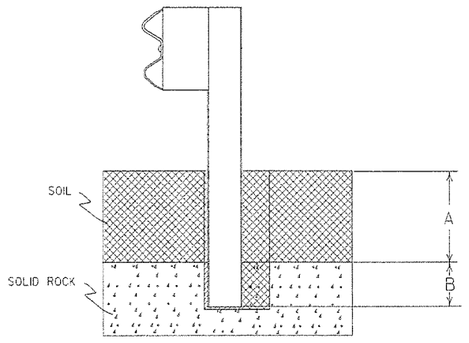


DETAIL OF CONNECTION

Case 1

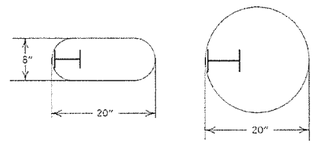


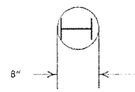
Case 2



Plan View Steel Posts

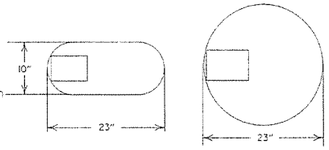
Either hole configuration acceptable

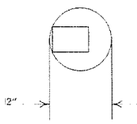




Plan View Wood Posts

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".

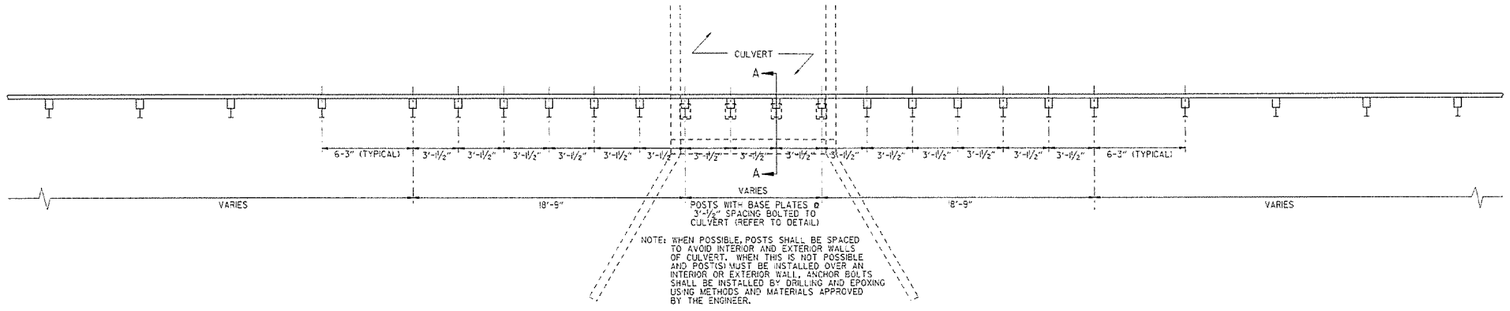
Zone A:
Backfill according to Section 617.03(a).

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)



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

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

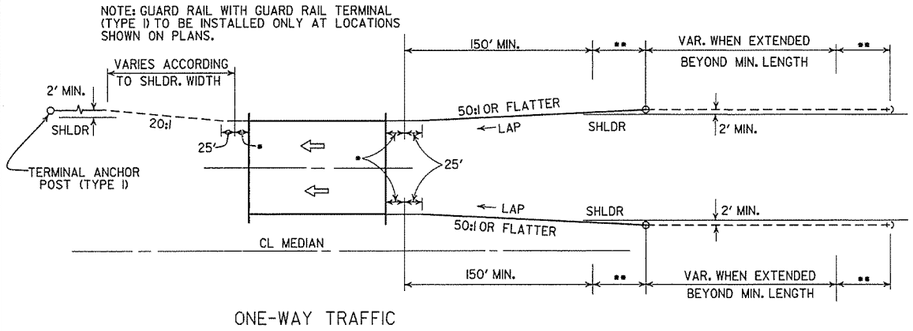
NOTE: THIS DETAIL IS TO BE USED ONLY WHEN THE COVER OVER THE CULVERT DOES NOT PERMIT FULL EMBEDMENT OF GUARD RAIL POSTS AS SHOWN ON STD. DWG. GR-8.

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	
4-18-04	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. BEHND 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

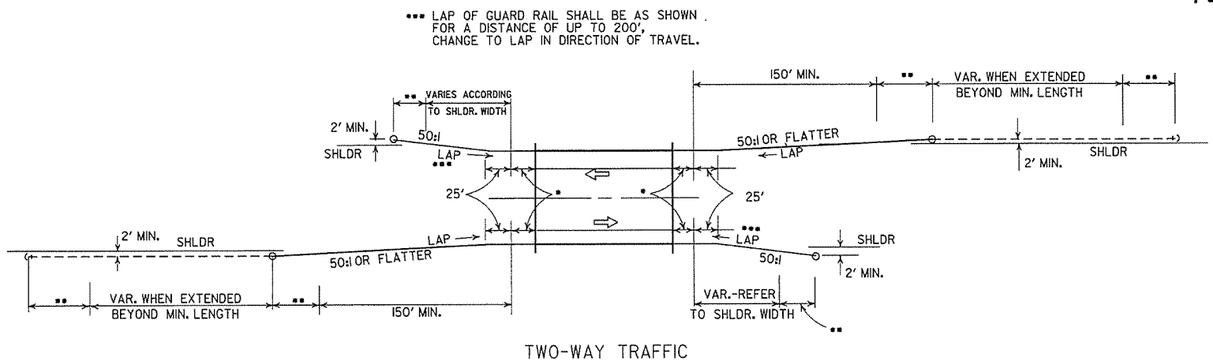
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-8A

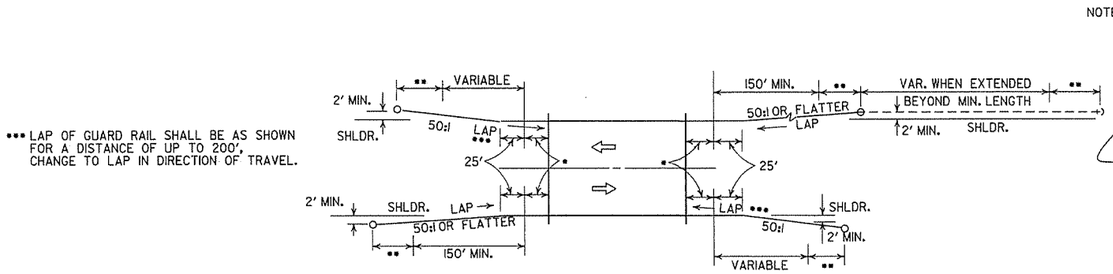


ONE-WAY TRAFFIC

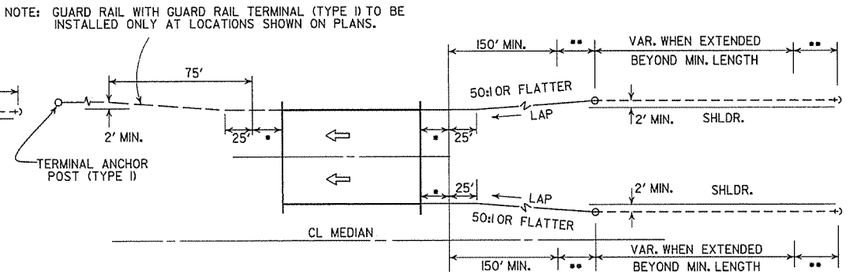


TWO-WAY TRAFFIC

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



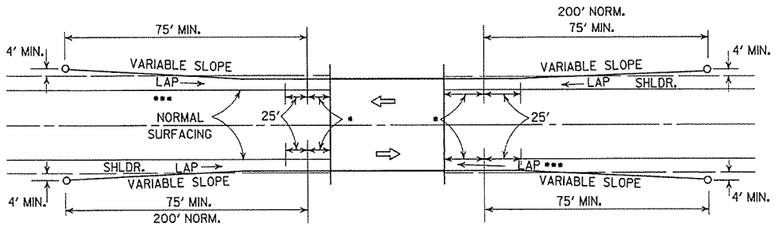
TWO-WAY TRAFFIC



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.



LEGEND

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

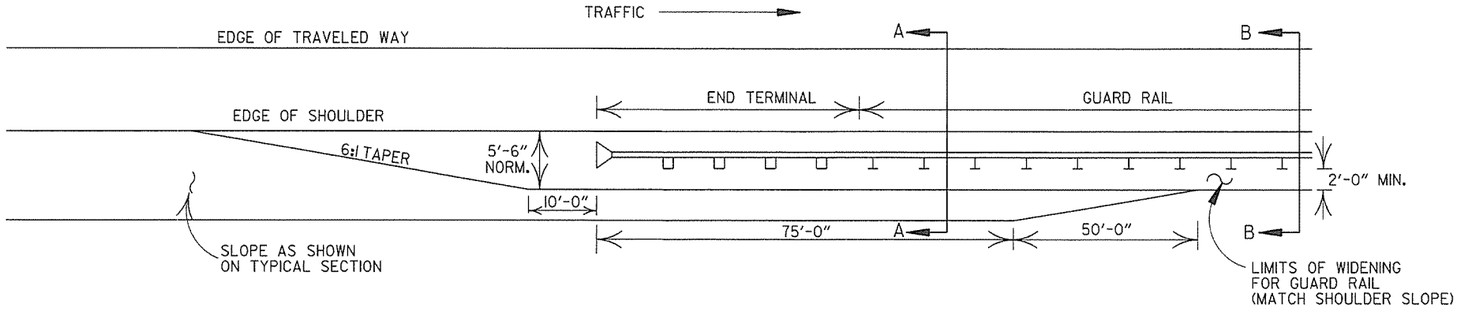
METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERMINAL (TYPE I) (FULL SHOULDER WIDTH OR LESS BRIDGES)

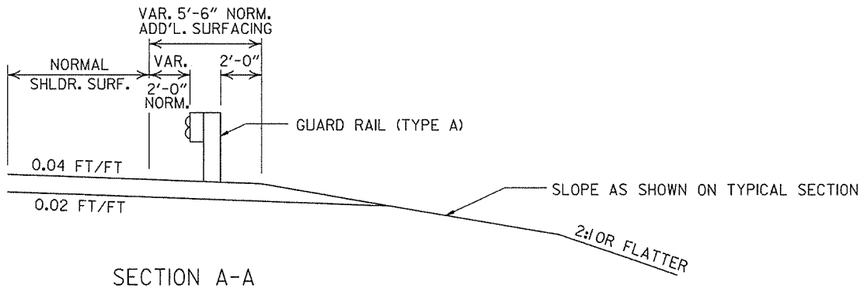
DATE	REVISION	DATE FILM
4-17-08	REVISED LAYOUTS	
11-10-05	REMOVED GUARD RAIL NOTES AND DETAILS	
11-16-01	DELETED NOTE-METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERM. (TY. I)	
1-12-00	ADDED CONSTRUCTION NOTE	1-12-00
6-26-97	REVISED LAYOUT	
10-1-92	REDRAWN & REVISED	10-1-92
	ADDED NOTE	
10-9-87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

ARKANSAS STATE HIGHWAY COMMISSION

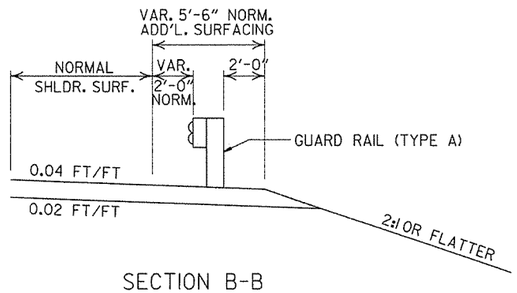
GUARD RAIL DETAILS

STANDARD DRAWING GR-9





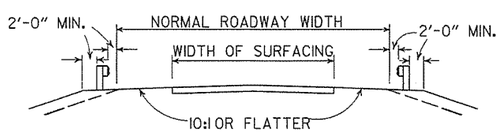
SECTION A-A



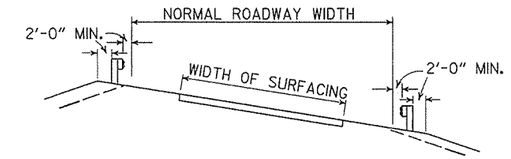
SECTION B-B

DETAILS OF WIDENING FOR GUARD RAIL

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

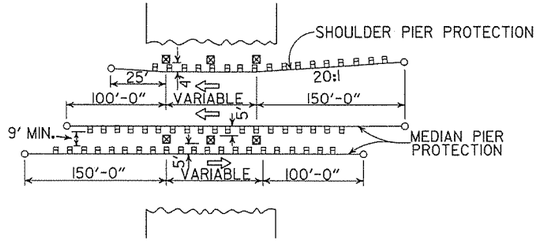


SECTION ON TANGENT



SECTION ON CURVE

DETAILS SHOWING POSITION OF GUARD RAIL ON HIGHWAY



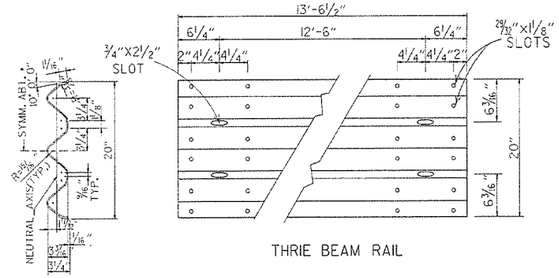
METHOD OF INSTALLATION OF GUARD RAIL AT FIXED OBSTACLE

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

ARKANSAS STATE HIGHWAY COMMISSION

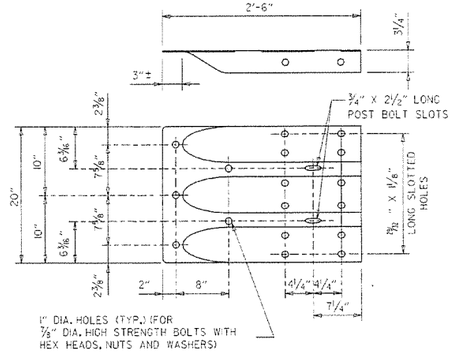
GUARD RAIL DETAILS

STANDARD DRAWING GR-9A



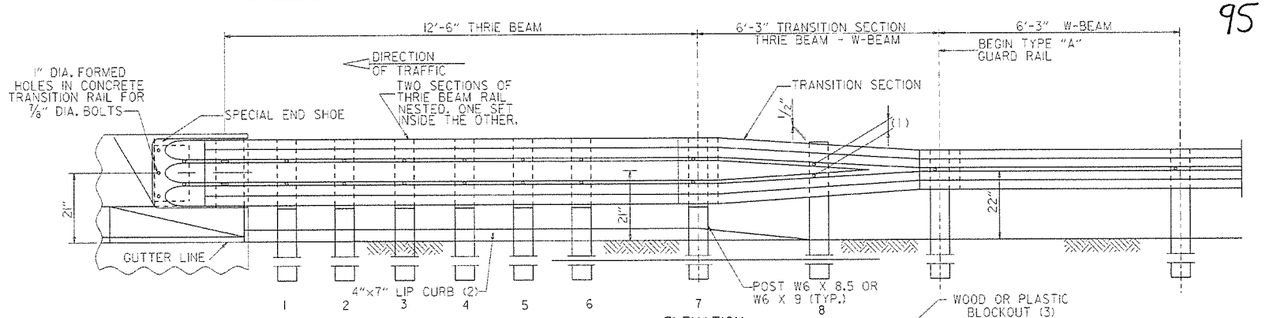
THRIE BEAM RAIL

SECTION THRU THRIE BEAM RAIL

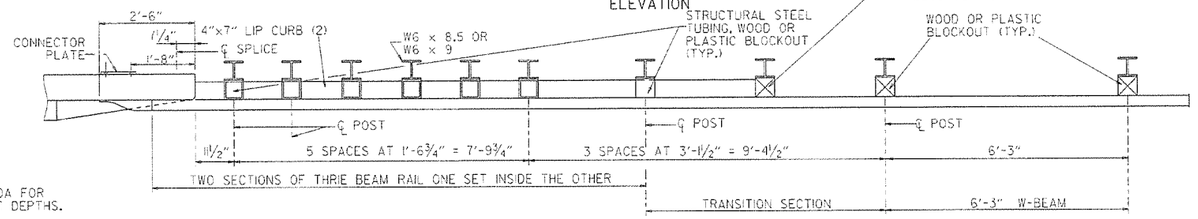


1" DIA. HOLES (TYP.) (FOR ⅞" DIA. HIGH STRENGTH BOLTS WITH HEX HEADS, NUTS AND WASHERS)

SPECIAL END SHOE

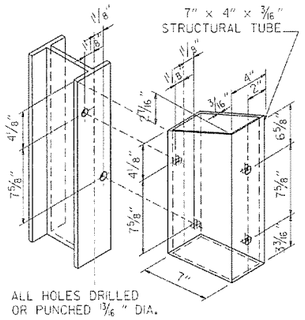


ELEVATION



PLAN

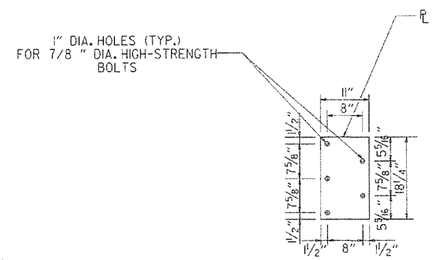
NOTE:
SEE STANDARD DRAWING GR-10A FOR GUARD RAIL POST EMBEDMENT DEPTHS.



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

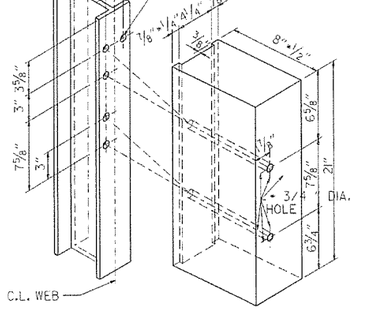
ALL HOLES DRILLED OR PUNCHED ⅜" DIA.

STRUCTURAL STEEL TUBING BLOCKOUT DETAIL



CONNECTOR PLATE

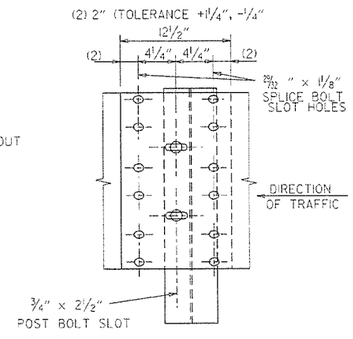
CONNECTOR PLATE SHALL BE AASHTO M270, GR. 36 AND SHALL BE GALVANIZED AFTER FABRICATION. GALVANIZING SHALL CONFORM TO SUBSECTION 807.19 OF THE STANDARD SPECIFICATIONS. CONNECTOR PLATE TO BE BOLTED TO SPECIAL END SHOE USING ⅞" DIA. HIGH STRENGTH BOLTS, WITH THE HEADS PLACED ON THE TRAFFIC FACE. WASHERS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



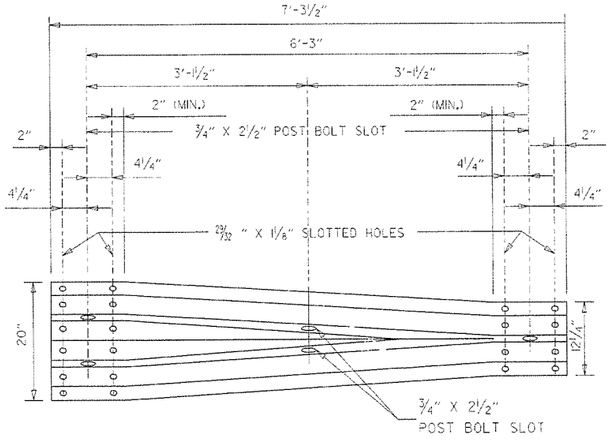
ALL HOLES 13/16" DIAMETER EXCEPT AS NOTED

HOLE PUNCHING DETAIL
FOR STEEL POST & WOOD OR PLASTIC BLOCKOUTS

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



THRIE BEAM RAIL SPLICE AT POST



TRANSITION SECTION

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.

(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.

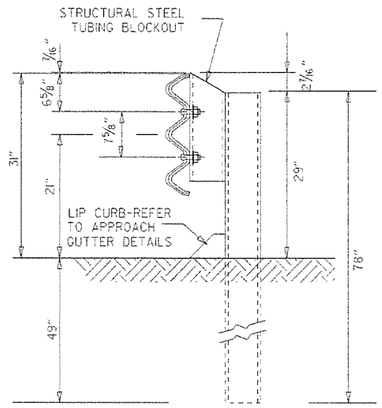
THRIE BEAM GUARD RAIL CONNECTION AT BRIDGE ENDS

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	

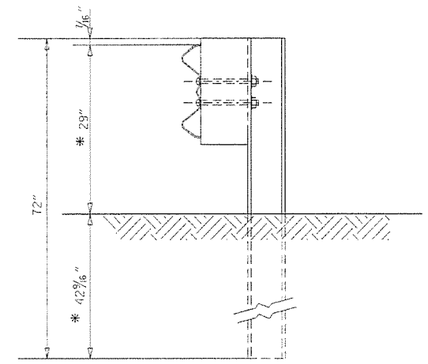
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-10

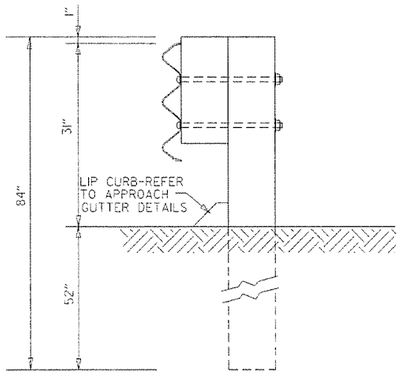


THRIE BEAM RAIL WITH STEEL TUBING BLOCKOUT
AND STEEL POST
POSTS 1-7

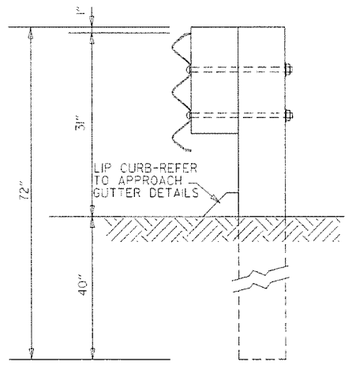


W-BEAM TO THRIE BEAM TRANSITION RAIL
WITH WOOD OR PLASTIC BLOCKOUT AND STEEL POST
POST 8

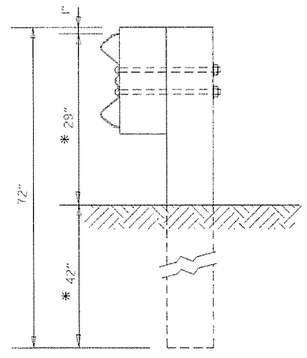
* NOTE:
THESE DIMENSIONS WILL NEED TO BE ADJUSTED IN THE FIELD TO MAKE THE TRANSITION FROM 21" MID POINT OF THRIE BEAM TO 22" MID POINT OF W-BEAM.



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.

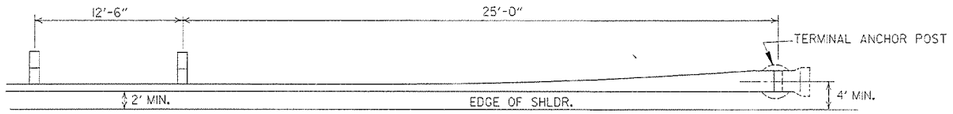
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

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	

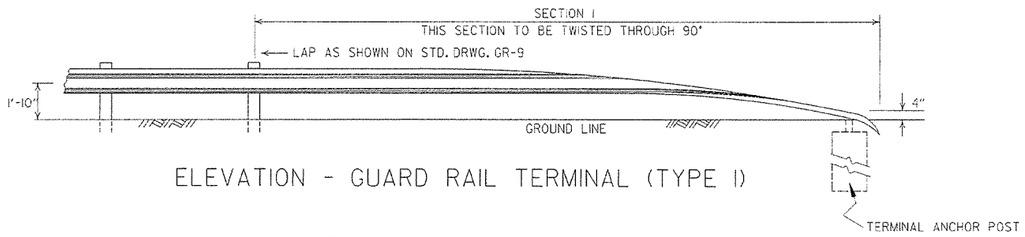
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-10A

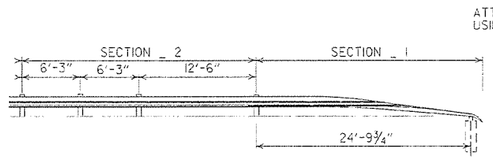


PLAN - GUARD RAIL TERMINAL (TYPE I)

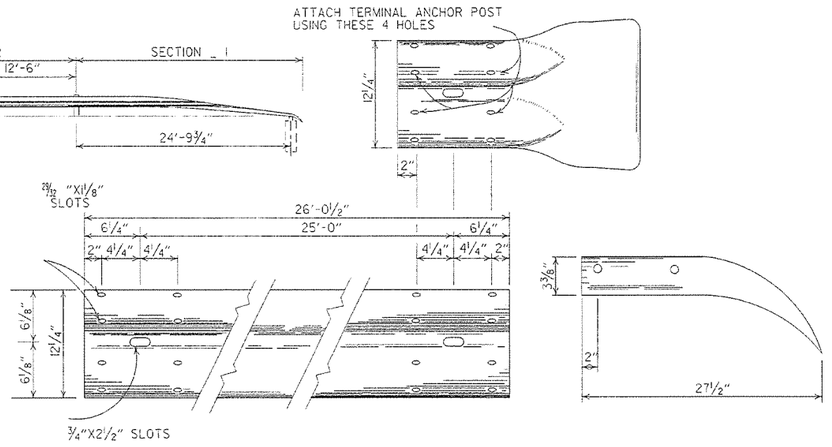


ELEVATION - GUARD RAIL TERMINAL (TYPE I)

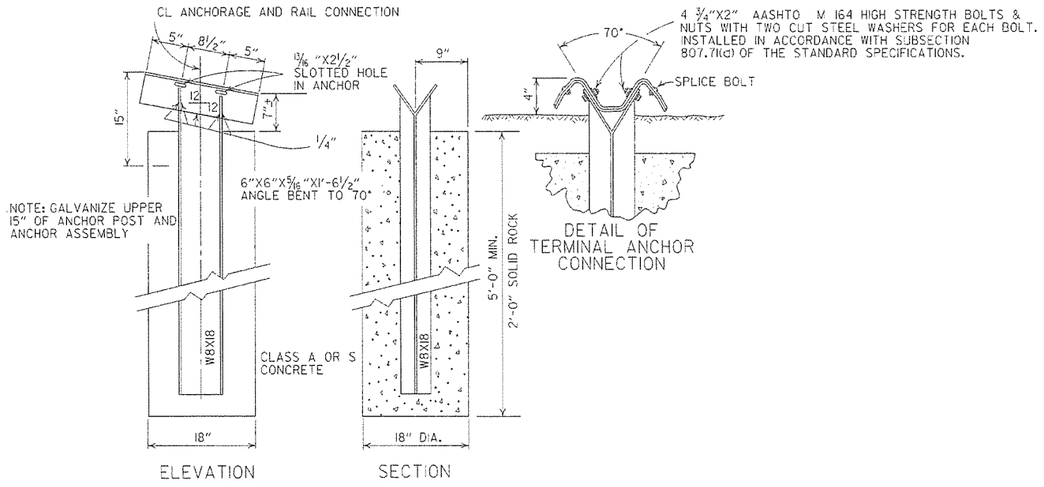
NOTE:
SECTIONS 1 AND 2 OF GUARD RAIL TERMINAL SHALL BE PAID FOR AT THE PRICE BID PER LINEAR FOOT OF THE TYPE OF GUARD RAIL SPECIFIED.



SECTION I



TERMINAL SECTION



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

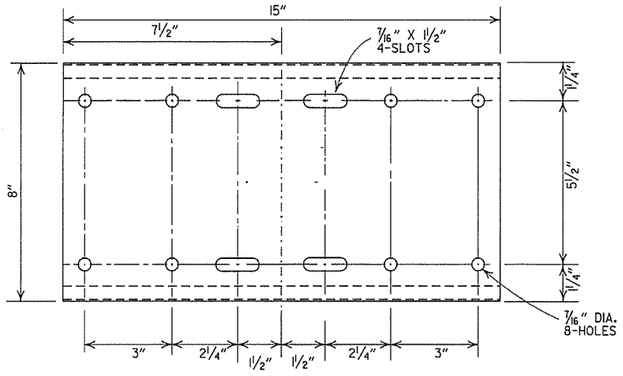
DETAIL OF TERMINAL ANCHOR POST (TYPE I)

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

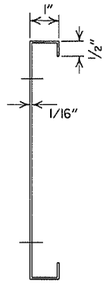
ARKANSAS STATE HIGHWAY COMMISSION

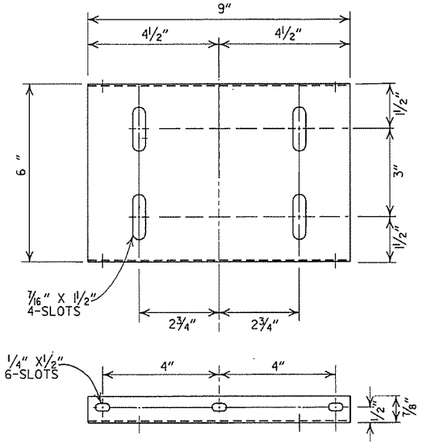
GUARD RAIL DETAILS

STANDARD DRAWING GRT-1

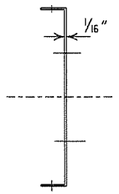


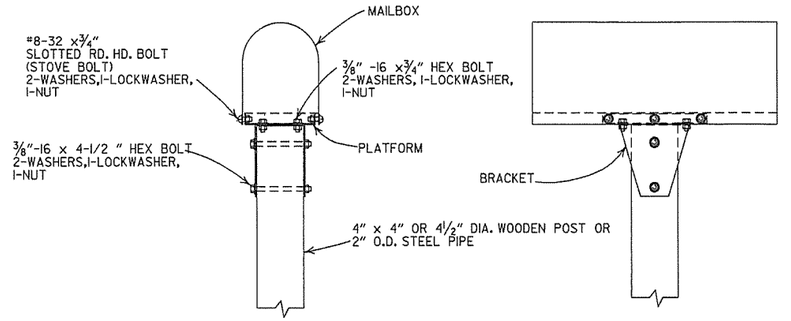
SHELF



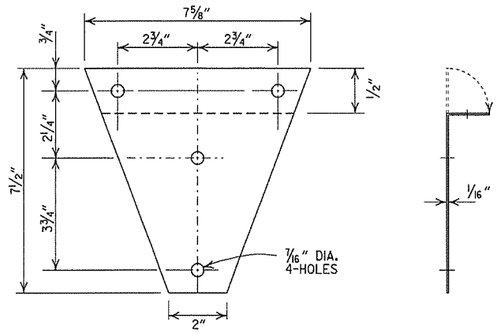


PLATFORM





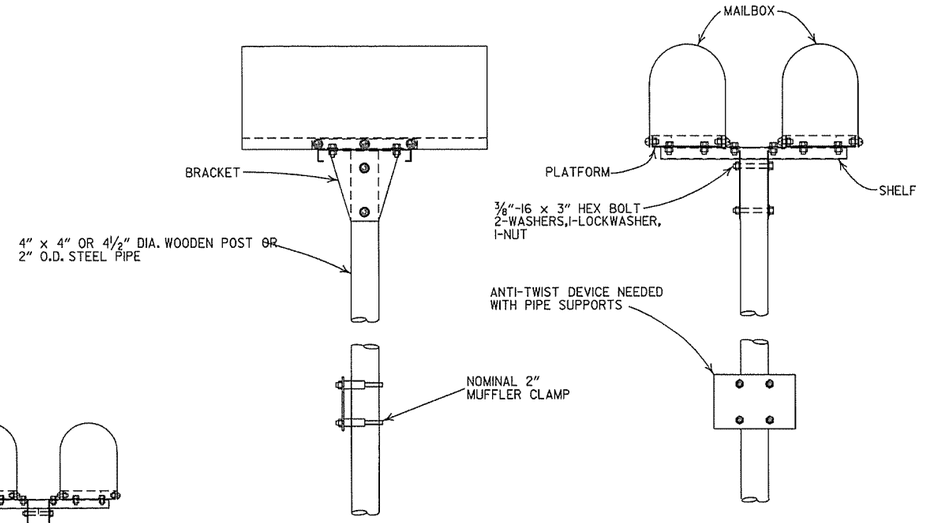
SINGLE INSTALLATION



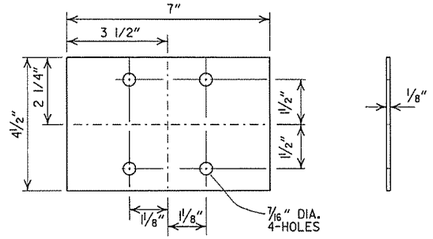
BRACKET

GENERAL NOTES

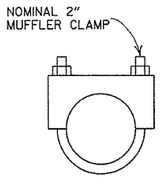
1. MAILBOX POSTS MAY BE WOOD OR METAL. WOOD POSTS SHALL BE PRESSURE TREATED FOR GROUND CONTACT IN ACCORDANCE WITH SECTION 637.02 OF THE STANDARD SPECIFICATIONS.
2. ANTI-TWIST PLATES SHALL BE USED ONLY ON METAL POSTS.
3. MAILBOX SHELF, BRACKET & PLATFORM SHALL BE GALVANIZED OR PAINTED STEEL, HOWEVER TREATED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



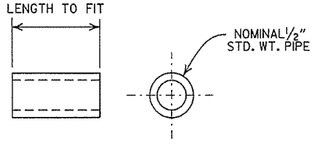
DOUBLE INSTALLATION



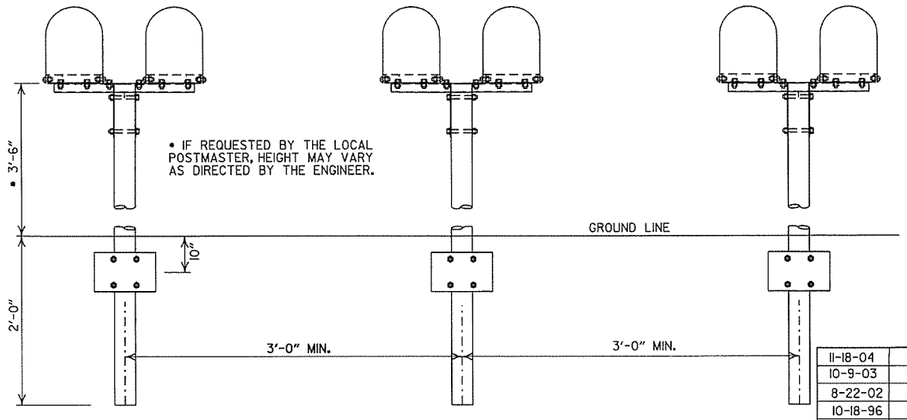
ANTI-TWIST PLATE



CLAMP



SPACER



* IF REQUESTED BY THE LOCAL POSTMASTER, HEIGHT MAY VARY AS DIRECTED BY THE ENGINEER.

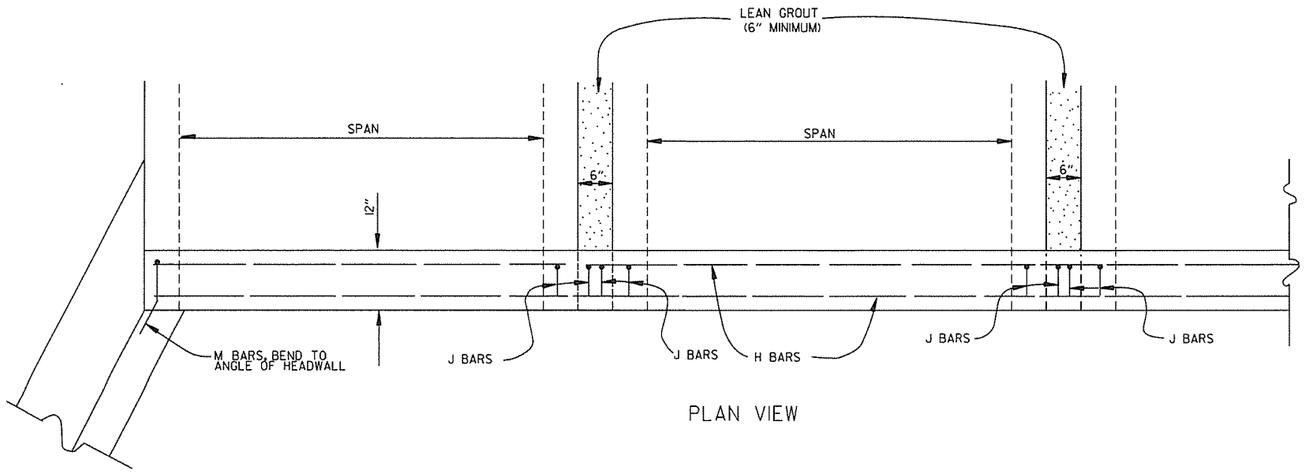
SPACING FOR MULTIPLE POST INSTALLATION

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

ARKANSAS STATE HIGHWAY COMMISSION

MAILBOX DETAILS

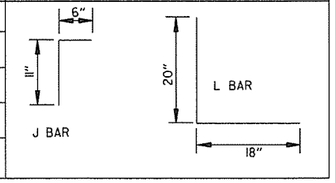
STANDARD DRAWING MB-1



PLAN VIEW

BAR LIST

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



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

GENERAL NOTES

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

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

ALL EXPOSED CORNERS TO HAVE ¾" CHAMFERS.

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

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

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

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

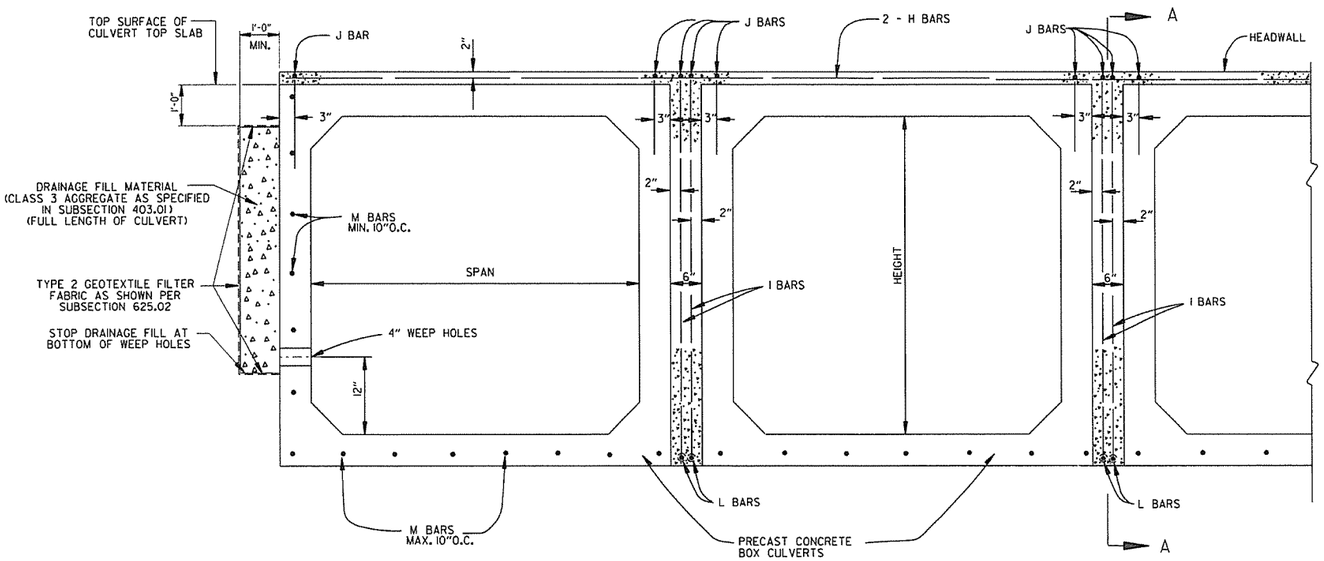
THE MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERNAL JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE CULVERT.

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

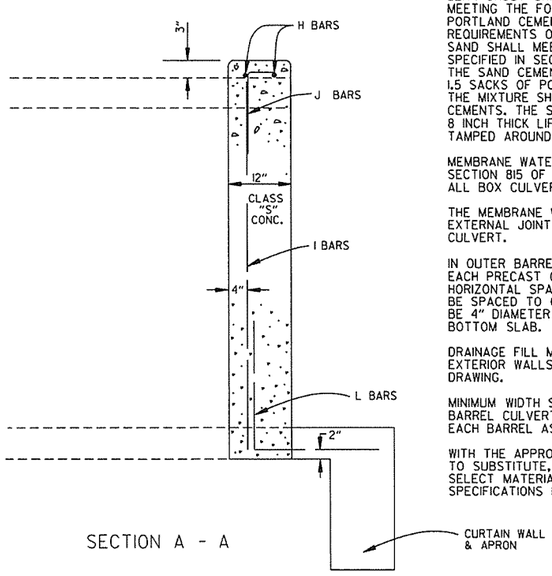
DRAINAGE FILL MATERIAL WITH GEOTEXTILE FABRIC IS REQUIRED AT THE EXTERIOR WALLS OF THE ASSEMBLED CULVERT. SEE DETAILS ON THIS DRAWING.

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

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



END VIEW



SECTION A - A

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

ARKANSAS STATE HIGHWAY COMMISSION

PRECAST CONCRETE BOX CULVERTS

STANDARD DRAWING PBC-1

REINFORCED CONCRETE ARCH PIPE DIMENSIONS

EQUIV. DIA.	SPAN		RISE	
	AASHTO M 206	AHTD NOMINAL	AASHTO M 206	AHTD NOMINAL
INCHES	INCHES			
15	18	18	11	11
18	22	22	13½	14
21	26	26	15½	16
24	28½	29	18	18
30	36¼	36	22½	23
36	43⅜	44	26⅝	27
42	51⅛	51	31⅝	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.

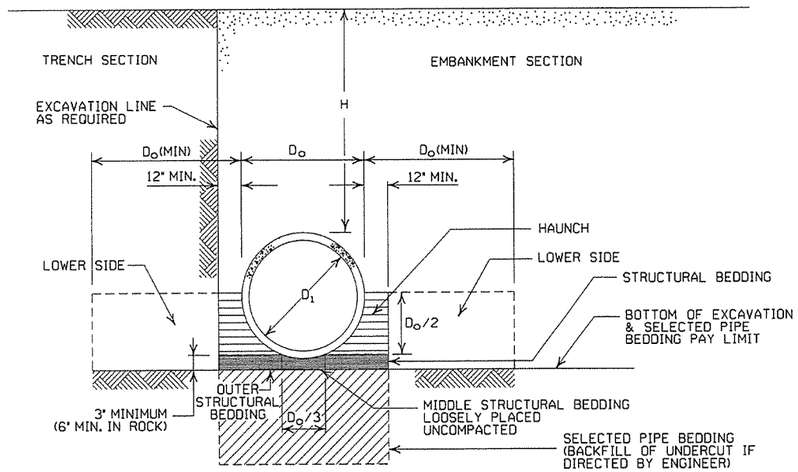
- LEGEND -

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.

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

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

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

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

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

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

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

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

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

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

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

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

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

GENERAL NOTES

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

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

ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCC-1

CORRUGATED STEEL PIPE (ROUND)

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

CORRUGATED ALUMINUM PIPE (ROUND)

PIPE DIAMETER (INCHES)	① MINUMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET)	MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS IN INCHES				
		0.060	0.075	0.105	0.135	0.164
		2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM				
12	1	45	45			
18	2	30	30	52		
24	2	22	22	39	41	
30	2		18	31	32	34
36	2.5		15	26	27	28
42	2			43	43	44
48	2			40	41	43
54	2			35	37	38
60	2				33	34
66	2					31
72	2					29

CONSTRUCTION SEQUENCE

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

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

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

③ SM-3 WILL NOT BE ALLOWED.

EQUIVALENT METAL THICKNESSES AND GAUGES

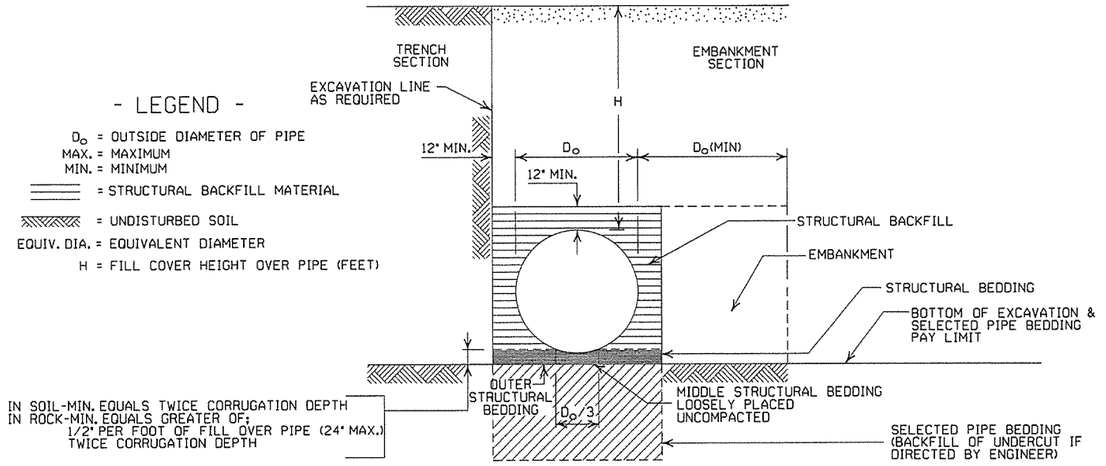
METAL THICKNESS IN INCHES			GAUGE NUMBER
STEEL			
ZINC COATED	UNCOATED	ALUMINUM	
0.064	0.0598	0.060	16
0.079	0.0747	0.075	14
0.109	0.1046	0.105	12
0.138	0.1345	0.135	10
0.168	0.1644	0.164	8

CORRUGATED METAL PIPE ARCHES

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

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

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



EMBANKMENT AND TRENCH INSTALLATIONS

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

GENERAL NOTES

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

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

ARKANSAS STATE HIGHWAY COMMISSION

METAL PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCM-1

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

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

SM3 WILL NOT BE ALLOWED.

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

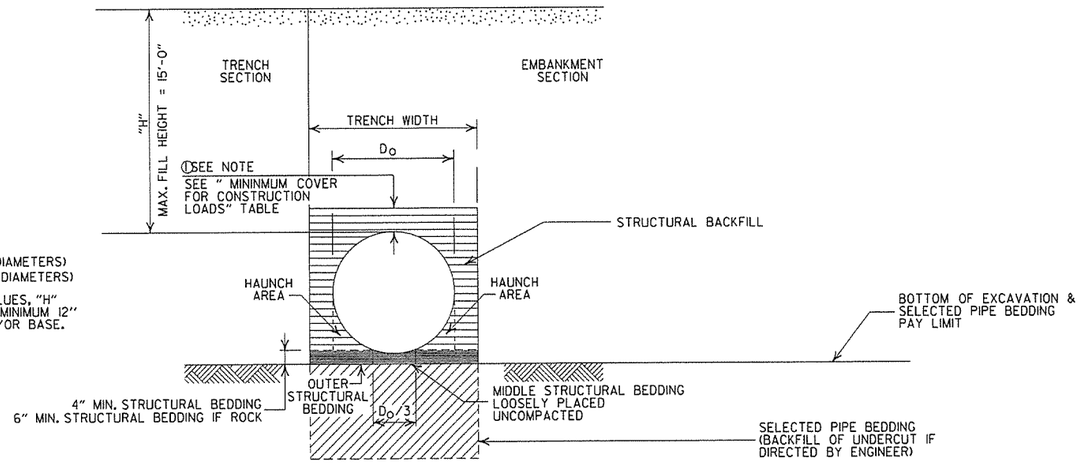
STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF HDPE PIPE.

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

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

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

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



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

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

MULTIPLE INSTALLATION OF HIGH DENSITY POLYETHYLENE PIPES

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

MINIMUM COVER FOR CONSTRUCTION LOADS

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

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

CONSTRUCTION SEQUENCE

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

GENERAL NOTES

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

- LEGEND -

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

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

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

ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)

STANDARD DRAWING PCP-1

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

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

SM3 WILL NOT BE ALLOWED.

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

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

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

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

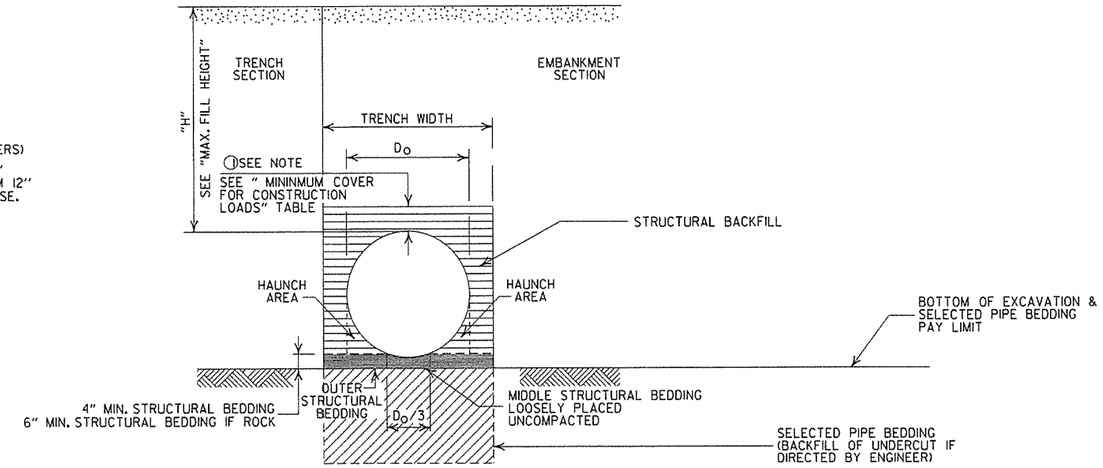
MULTIPLE INSTALLATION OF PVC PIPES

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

MAXIMUM FILL HEIGHT BASED ON STRUCTURAL BACKFILL

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

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



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

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

MINIMUM COVER FOR CONSTRUCTION LOADS

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

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

CONSTRUCTION SEQUENCE

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

GENERAL NOTES

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

- LEGEND -

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

= STRUCTURAL BACKFILL MATERIAL
= UNDISTURBED SOIL

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

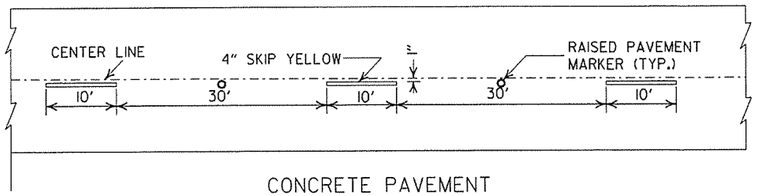
ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT
(PVC F949)

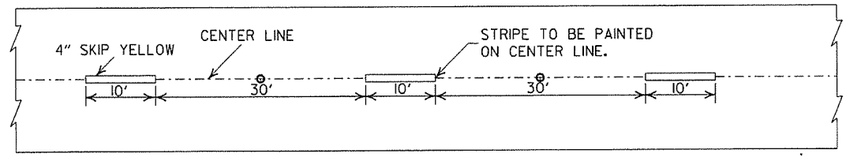
STANDARD DRAWING PCP-2

NOTES:

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

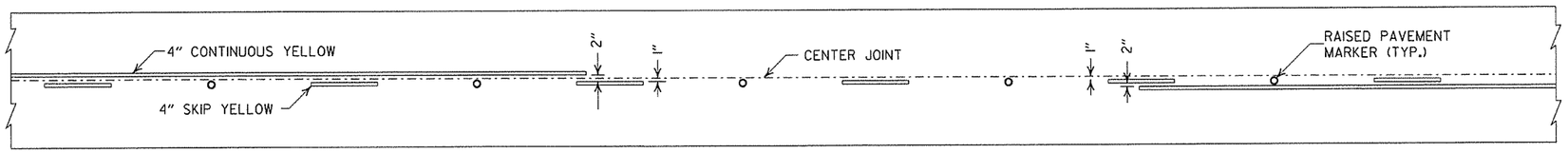


CONCRETE PAVEMENT

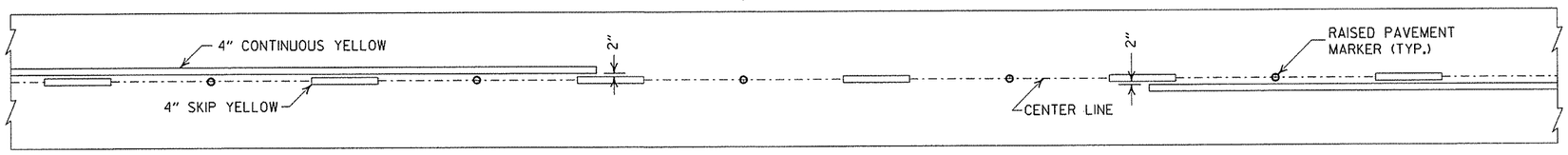


ASPHALT PAVEMENT

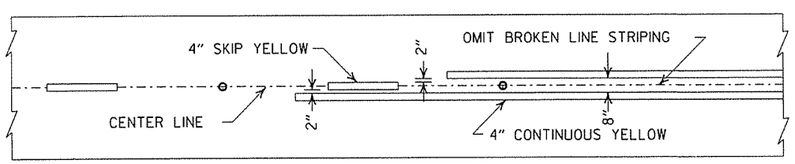
BROKEN LINE STRIPING



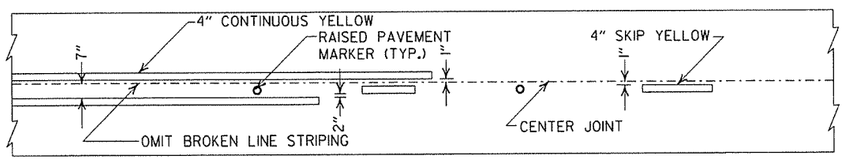
SOLID LINE STRIPING ON CONCRETE PAVEMENT



SOLID LINE STRIPING ON ASPHALT PAVEMENT

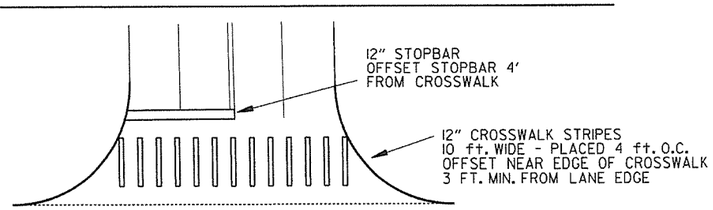


ASPHALT PAVEMENT

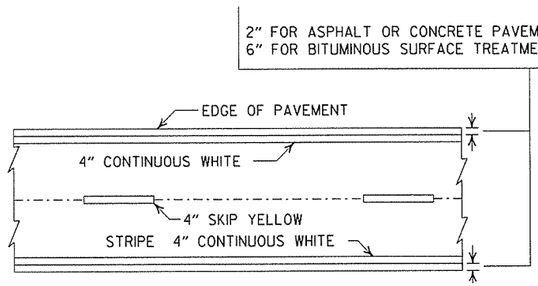


CONCRETE PAVEMENT

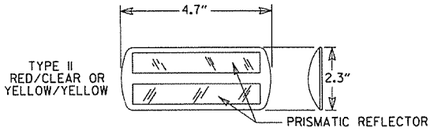
STRIPING AT ADJACENT NO PASSING LANES



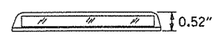
CROSSWALK AND STOPBAR DETAILS



PAVEMENT EDGE LINE MARKING



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



DETAIL OF STANDARD RAISED PAVEMENT MARKERS

GENERAL NOTES:

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

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

NOTE:

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

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

ARKANSAS STATE HIGHWAY COMMISSION

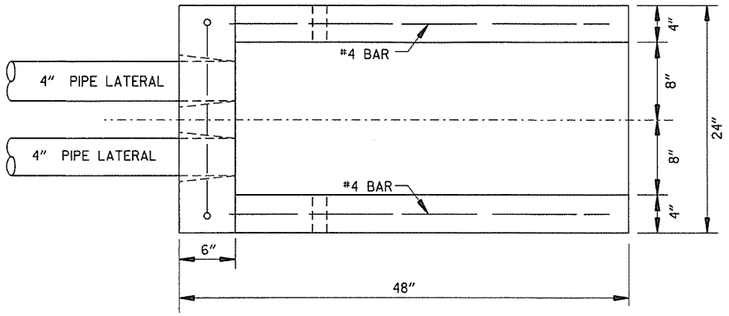
PAVEMENT MARKING DETAILS

STANDARD DRAWING PM-1

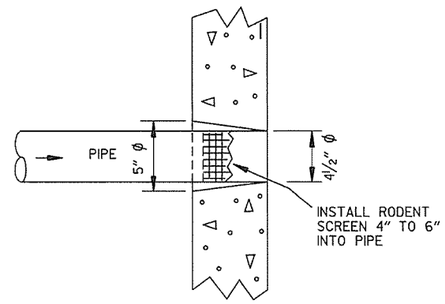
NOTE:
1. GRANULAR BACKFILL TO BE SUBSIDIARY TO PIPE UNDERDRAIN.

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

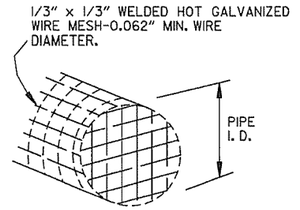
3. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. LAP FABRIC 12" OR THE WIDTH OF THE TRENCH AT THE TOP.



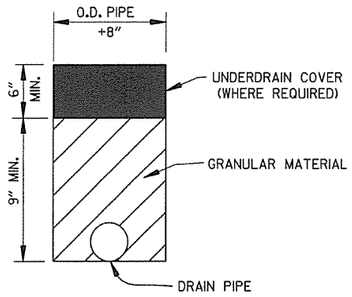
PLAN VIEW

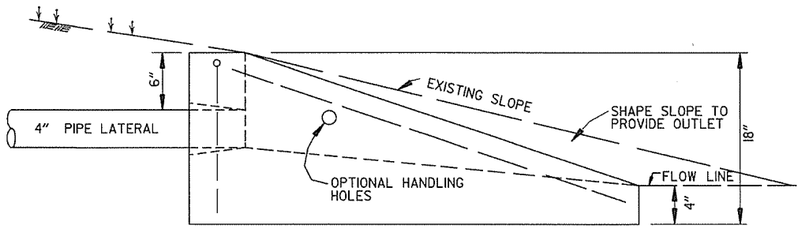


DETAIL OF HOLE FOR 4" PIPE

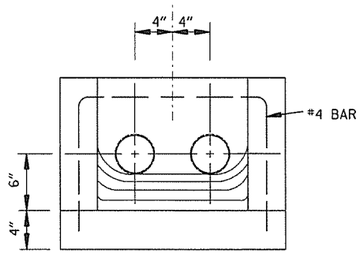


DETAIL OF RODENT SCREEN

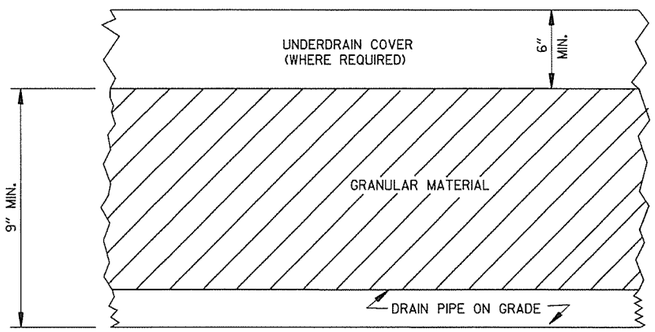




SIDE VIEW

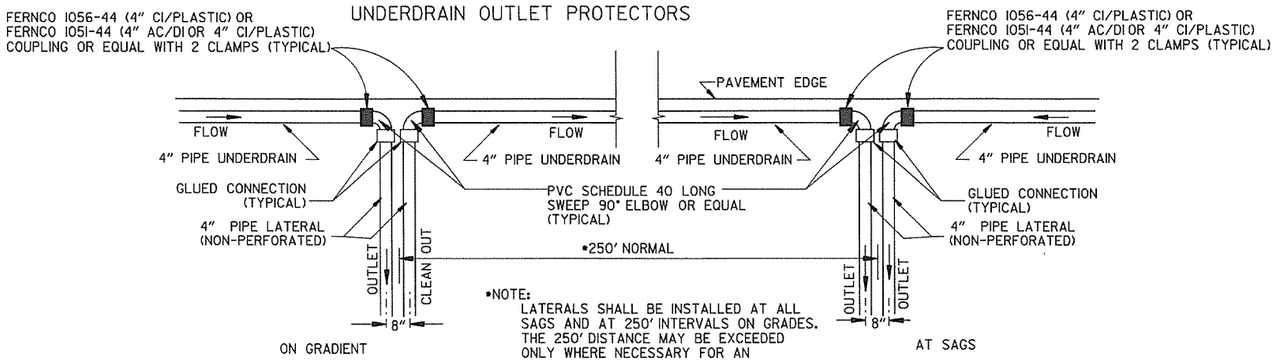


FRONT VIEW



DETAILS OF PIPE UNDERDRAIN

UNDERDRAIN OUTLET PROTECTORS



DETAIL OF PIPE UNDERDRAIN LATERALS WHEN PLACED ALONG PAVEMENT EDGE

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

DATE	REVISION	DATE FILMED
4-10-03	REVISED NOTE 3	
1-12-00	REVISED DETAIL OF UNDERDRAIN LATERALS	
11-18-98	REVISED NOTE	
10-18-96	REVISED MIN. DEPTH & GEOTEXTILE FABRIC	
4-26-96	ADDED LATERAL NOTE; 5½" TO 5"	
11-22-95	REVISED LATERALS	
7-20-95	REVISED LATERALS & ADDED NOTE	
11- 3-94	REVISED FOR DUAL LATERALS	11- 3-94
10- 1-92	SUBSTITUTED GEOTEXTILE	10- 1-92
8-15-91	ADDED POLYEDTHYLENE PIPE	8-15-91
11- 8-90	DELETED ALTERNATE NOTE	11- 8-90
1-25-90	ADDED 4" SNAP ADAPTER	1-25-90
11-30-89	DEL. (SUBGRADE); ADDED (WHERE REQUIRED)	11-30-89
7-15-88	ISSUED P.L.M.	647-7-15-88

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF PIPE UNDERDRAIN

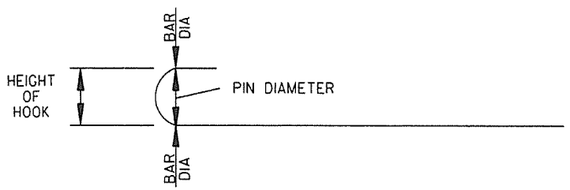
STANDARD DRAWING PU-1

7-20-95 INSTD.PUI

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

BAR SIZE	PIN DIAMETER	HOOK EXTENSION "K"
3	2¼"	4"
4	3 "	4½"
5	3¾"	5"
6	4½"	6"
7	5¼"	7"
8	6"	8"

IF THE OVERALL HEIGHT OF THE HOOK (SEE DIAGRAM BELOW) FOR A "b", "b1", "b2" or "b3" BENT BAR IS GREATER THAN THE CORRESPONDING TOP OR BOTTOM SLAB THICKNESS, LESS 2¾ INCHES, EACH BENT BAR SHALL BE REPLACED WITH ONE HOOKED BAR AND ONE STRAIGHT BAR, USING LENGTHS AS SHOWN IN THE TABLE BELOW. THE TWO BARS SHALL BE THE SAME DIAMETER AS, AND PLACED AT THE SAME SPACING AS, THE "b", "b1", "b2" OR "b3" BENT BARS THEY REPLACE.



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

OVERALL HEIGHT OF HOOKED BAR DIAGRAM

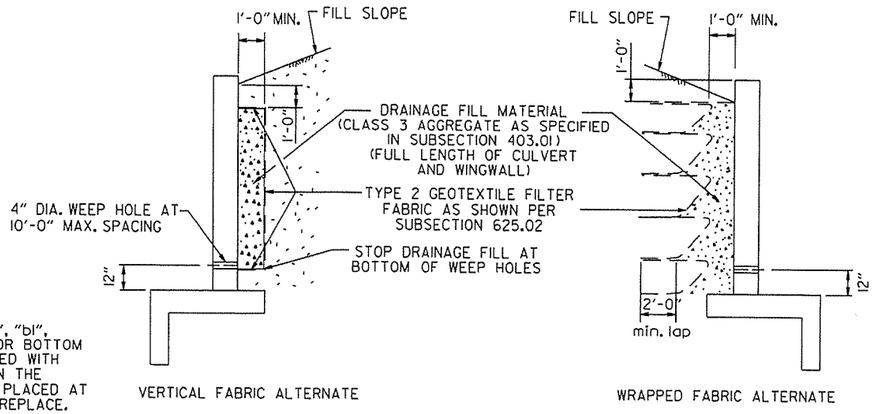
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

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

REPLACEMENT BAR LENGTHS TABLE

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

L = "OW" - 3 INCHES



WINGWALL & CULVERT DRAINAGE DETAIL

REINFORCED CONCRETE BOX CULVERT GENERAL NOTES

CONCRETE SHALL BE CLASS S WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3500 PSI.

REINFORCING STEEL SHALL BE AASHTO M 31 OR M 53, GRADE 60.

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

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

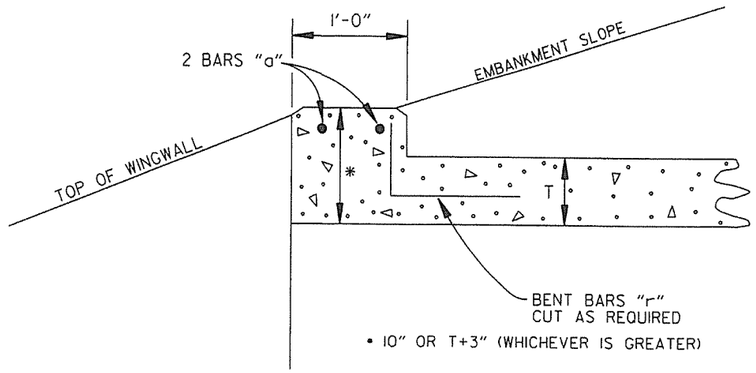
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

REINFORCING STEEL TOLERANCES: THE TOLERANCES FOR REINFORCING STEEL SHALL MEET THOSE LISTED IN "MANUAL OF STANDARD PRACTICE" PUBLISHED BY CONCRETE REINFORCING STEEL INSTITUTE (CRSI) EXCEPT THAT THE TOLERANCE FOR TRUSS BARS SUCH AS FIGURE 3 ON PAGE 7-4 OF THE CRSI MANUAL SHALL BE MINUS ZERO TO PLUS ½ INCH.

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

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

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



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

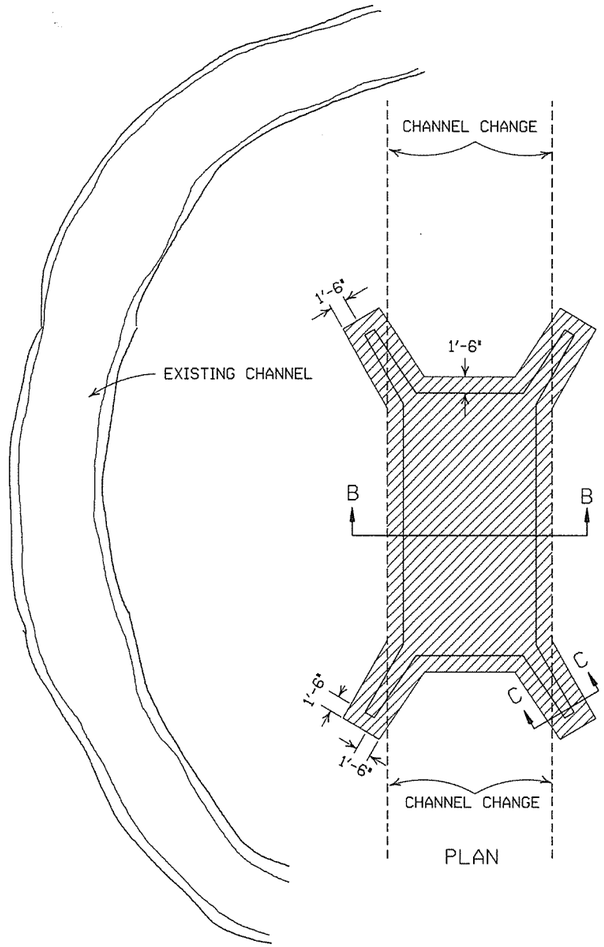
R.C. BOX CULVERT HEADWALL MODIFICATIONS

DATE	REVISION	DATE FILMED
7/26/12	REV. DRAINAGE FILL MATERIAL & DETAIL	
12/15/11	REQUIRE WEEP HOLES IN BOX CULVERT WALLS	
5-25-06	REV. GEN. NOTES AND DETAILS FOR WEEP HOLES; BAR DIAGRAM	
11-16-01	ADDED WINGWALL DRAINAGE DETAIL/EDITED GEN. NOTES	
10-18-96	REV. ASTM REF. TO AASHTO & ADDED BAR DIAGRAM	
10-12-95	MOVED SOLID SODDING DETAIL TO RCB-2	
6-2-94	ADDED SOLID SODDING PLAN DETAIL	
8-5-93	REVISED PIN DIAMETER TO SPECS.	
8-15-91	DRAWN AND ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

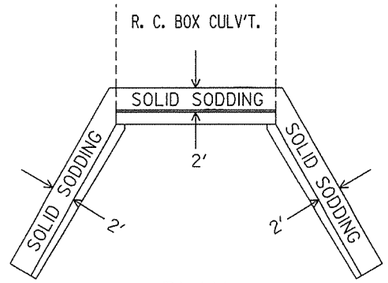
REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1



PLAN

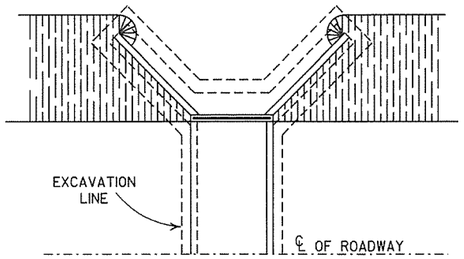
SOLID SODDING



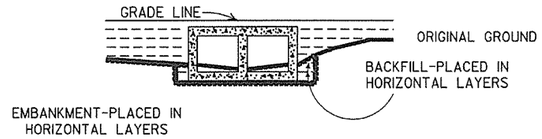
PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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

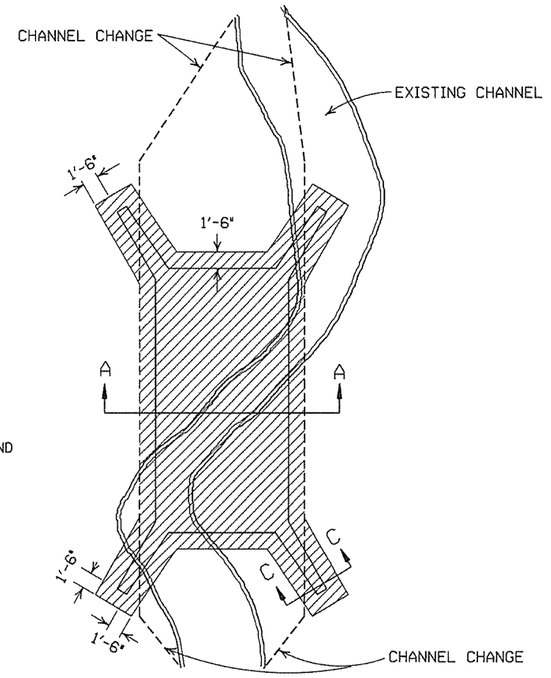


PLAN

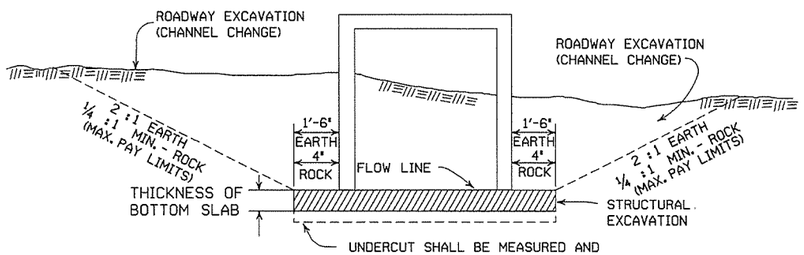


LONGITUDINAL SECTION

BACKFILL DETAILS FOR BOX CULVERT

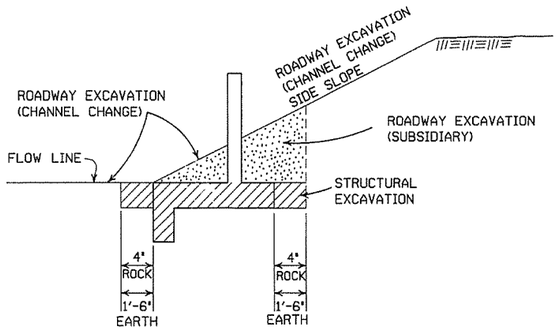


PLAN

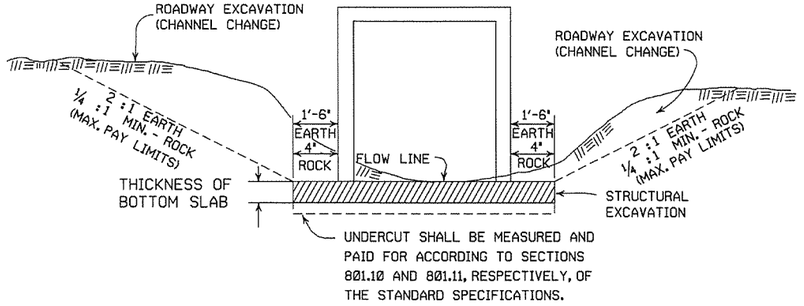


SECTION B-B

DETAILS FOR NEW CHANNELS



SECTION C-C



SECTION A-A

DETAILS THROUGH EXISTING CHANNELS

GENERAL NOTES:

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

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

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

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

ARKANSAS STATE HIGHWAY COMMISSION

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

STANDARD DRAWING RCB-2

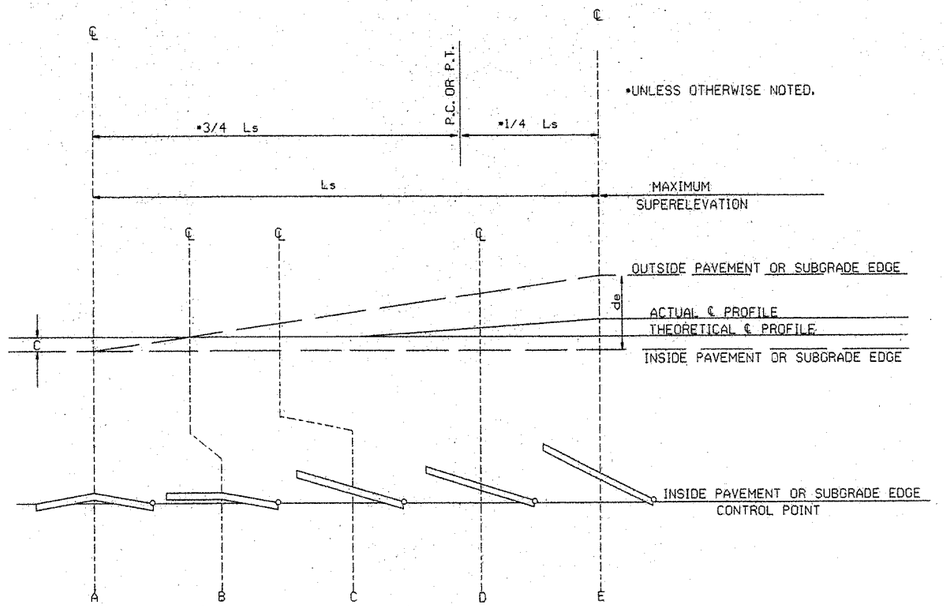
SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

DEGREE OF CURVE	30 MPH e	30 MPH Ls (FT) MINIMUM	30 MPH Ls (FT) DESIRABLE	40 MPH e	40 MPH Ls (FT) MINIMUM	40 MPH Ls (FT) DESIRABLE	50 MPH e	50 MPH Ls (FT) MINIMUM	50 MPH Ls (FT) DESIRABLE	55 MPH e	55 MPH Ls (FT) MINIMUM	55 MPH Ls (FT) DESIRABLE	60 MPH e	60 MPH Ls (FT) MINIMUM	60 MPH Ls (FT) DESIRABLE	70 MPH e	70 MPH Ls (FT) MINIMUM	70 MPH Ls (FT) DESIRABLE
0° 15′	N. C.			N. C.			N. C.			N. C.			N. C.			N. C.		
0° 30′	N. C.			N. C.			N. C.			N. C.			N. C.			N. C.		
0° 45′	N. C.			N. C.			R. C.			0. 022			0. 023			0. 028		
1° 00′	N. C.			N. C.			0. 021			0. 026			0. 030			0. 037	275	300
1° 15′	N. C.			R. C.			0. 026			0. 032			0. 037	250		0. 046		
1° 30′	N. C.			0. 021			0. 031	200		0. 037	225		0. 043		300	0. 054		
1° 45′	N. C.			0. 025	175		0. 036			0. 043		300	0. 049			0. 062		
2° 00′	R. C.			0. 028			0. 040			0. 048			0. 055			0. 070		
2° 15′	R. C.			0. 031			0. 045		250	0. 053			0. 061			0. 078	300	350
2° 30′	0. 021			0. 034			0. 049			0. 058			0. 067			0. 085	315	
2° 45′	0. 023			0. 037		200	0. 053			0. 063			0. 072			0. 091	335	
3° 00′	0. 025	150		0. 040			0. 057			0. 067	230		0. 077	260		0. 096	350	400
3° 15′	0. 027			0. 043			0. 061			0. 072	245		0. 082	275		0. 098	360	
3° 30′	0. 029			0. 046			0. 065	205		0. 076	255		0. 086	285		0. 100	360	
3° 45′	0. 031		200	0. 049			0. 069	215		0. 080	265		0. 090	295	350			
4° 00′	0. 033			0. 051			0. 072	225		0. 083	270		0. 093	305				
4° 30′	0. 037			0. 056			0. 078	240		0. 087	280		0. 096	315				
5° 00′	0. 040			0. 061			0. 083	250		0. 091	295	350	0. 098	320				
5° 30′	0. 043			0. 066	185		0. 088	260		0. 094	300							
6° 00′	0. 046			0. 070	190		0. 092	270		0. 096	305							
6° 30′	0. 050			0. 074	200		0. 095	280	300	0. 100	315							
7° 00′	0. 053			0. 078	210		0. 098	285										
7° 30′	0. 056			0. 081	215		0. 099	290										
8° 00′	0. 058			0. 084	220	250	0. 100	290										
8° 30′	0. 061			0. 087	225													
9° 00′	0. 063			0. 089	230													
10° 00′	0. 068	160		0. 094	235													
11° 00′	0. 072	170		0. 097	250													
12° 00′	0. 076	175		0. 099	250													
13° 00′	0. 080	180		0. 100	250													
14° 00′	0. 083	190																
15° 00′	0. 086	195																
16° 00′	0. 089	200																
17° 00′	0. 091	200																
18° 00′	0. 093	205																
19° 00′	0. 095	210																
20° 00′	0. 097	215	250															
21° 00′	0. 098	215																
22° 00′	0. 099	215																
23° 00′	0. 099	215																
24° 00′	0. 100	220																

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

ABBREVIATIONS

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



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

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

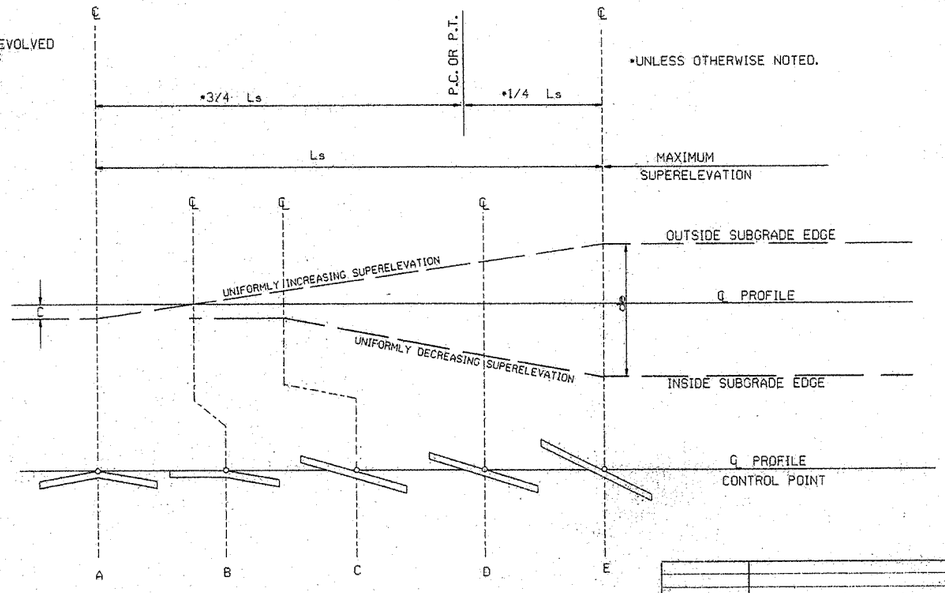
GENERAL NOTES

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

3 LANE UNDIVIDED - - - - - +20%
4 LANE UNDIVIDED - - - - - +50%
5 LANE UNDIVIDED - - - - - +80%
6 LANE UNDIVIDED - - - - - +100%

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

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



STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND CENTER LINE

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

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

ARKANSAS STATE HIGHWAY COMMISSION

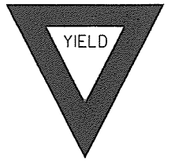
TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

STANDARD DRAWING SE-2

R1-1

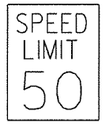
STANDARD 30"X30"
EXPRESSWAY 36"X36"
SPECIAL 48"X48"

R1-2



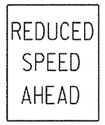
STD. 36"X36"X36"
EXPWY. 48"X48"X48"
FWY. 60"X60"X60"

R2-1



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

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"

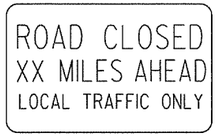
R5-1

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

R11-2

48"X30"

R11-3A



60"X30"

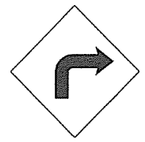
R11-4

60"X30"

RSP-1

48"X30"

W1-1



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

W1-2

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

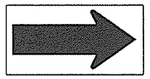
W1-3

STD. 48"X48"

W1-4

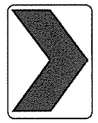
STD. 48"X48"

W1-6



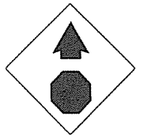
STD. 48"X24"
SPECIAL 60"X30"

W1-8



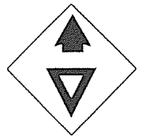
STD. 18"X24"
SPECIAL 24"X30"
EXPWY. 30"X36"
FWY. 36"X48"

W3-1



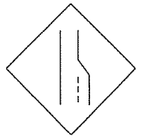
STD. 36"X36"
SPECIAL 48"X48"

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"

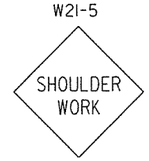
W20-7a

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

W21-2

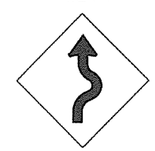
STD. 30"X30"
SPECIAL 36"X36"

W21-5



STD. 30"X30"
SPECIAL 36"X36"

W24-1



STD. 36"X36"

W1-4b

STD. 48"X48"

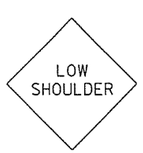
R56-1

STD. 18"X18"

W8-11

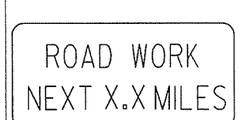
STD. 36"X36"
FWY. 48"X48"

W8-9



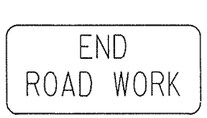
STD. 36"X36"
FWY. 48"X48"

G20-1



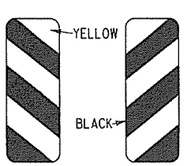
60"X24"

G20-2



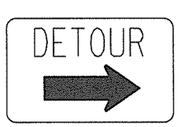
48"X24"

OM-3L OM-3R



12"X36"

M4-9

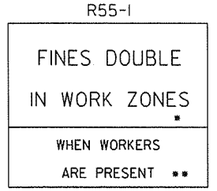


STD. 30"X24"
SPECIAL 48"X36"
SPECIAL 60"X48"

M4-10

48"X18"

R55-1



36"X60"

* USE 6" C LETTERS

ADVANCE DISTANCES
(XXXX)

500 FT	½ MILE
1000 FT	¾ MILE
1500 FT	1 MILE
	AHEAD

GENERAL NOTES:

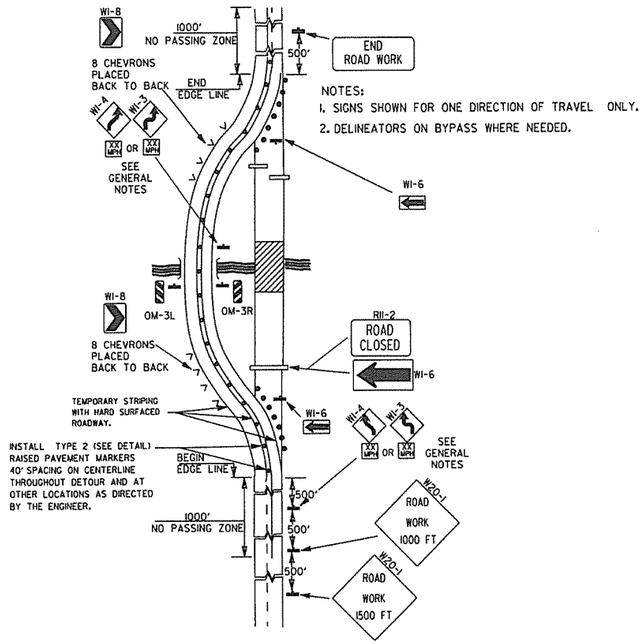
1. ALL TRAFFIC CONTROL DEVICES USED ON ROAD CONSTRUCTION SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION, AND TO THE STANDARD HIGHWAY SIGNS, LATEST EDITION, OR AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION.
2. TRAFFIC CONTROL DEVICES SHALL BE SET UP JUST BEFORE THE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

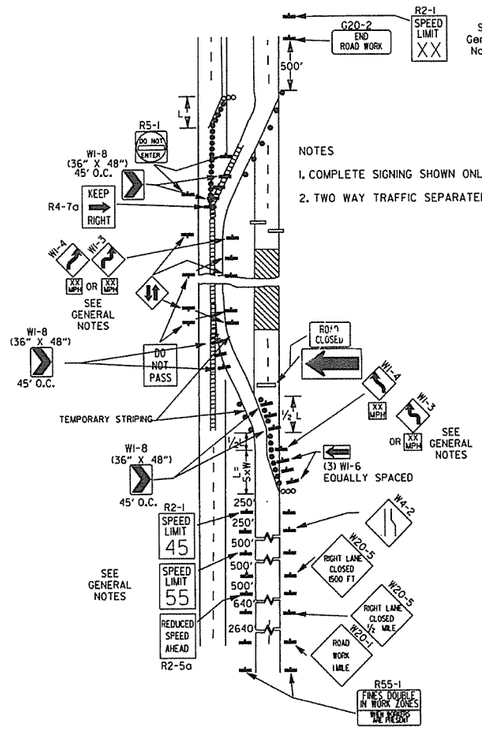
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS
FOR HIGHWAY CONSTRUCTION



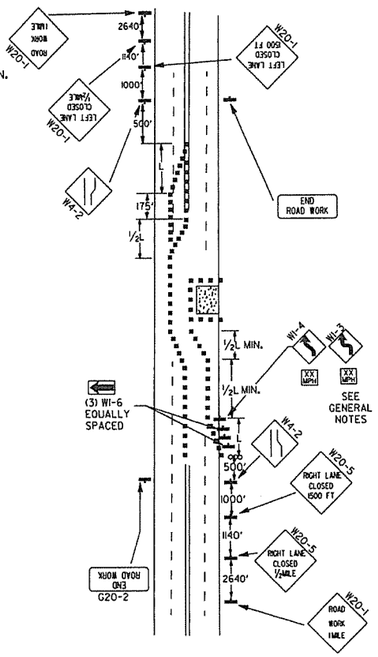
NOTES:
1. SIGNS SHOWN FOR ONE DIRECTION OF TRAVEL ONLY.
2. DELINEATORS ON BYPASS WHERE NEEDED.

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

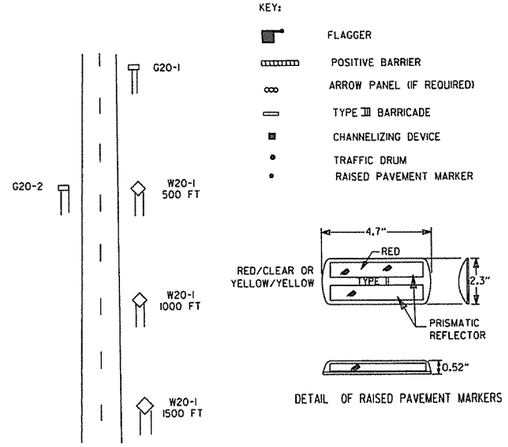


NOTES
1. COMPLETE SIGNING SHOWN ONLY IN CROSSOVER DIRECTION.
2. TWO WAY TRAFFIC SEPARATED WITH POSITIVE BARRIER.

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

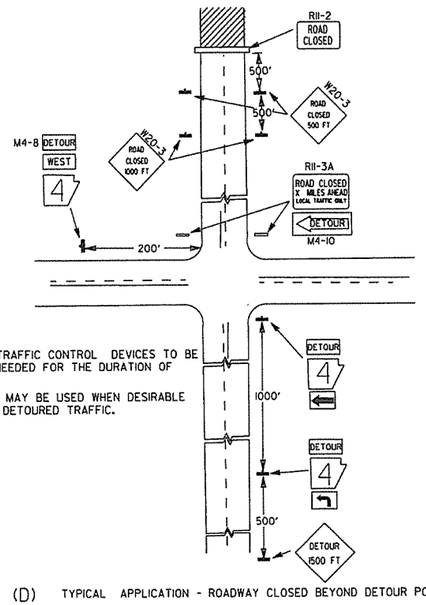


(C) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WHERE HALF OF THE ROADWAY IS CLOSED.



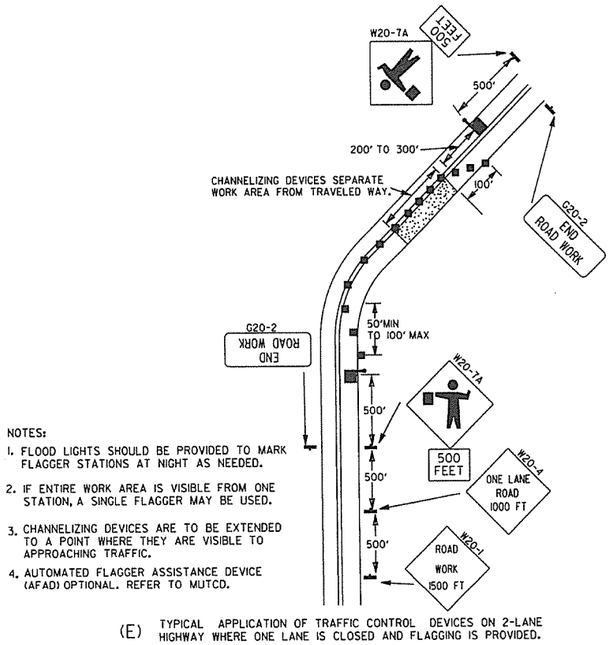
DETAIL OF RAISED PAVEMENT MARKERS

TYPICAL ADVANCE WARNING SIGN PLACEMENT



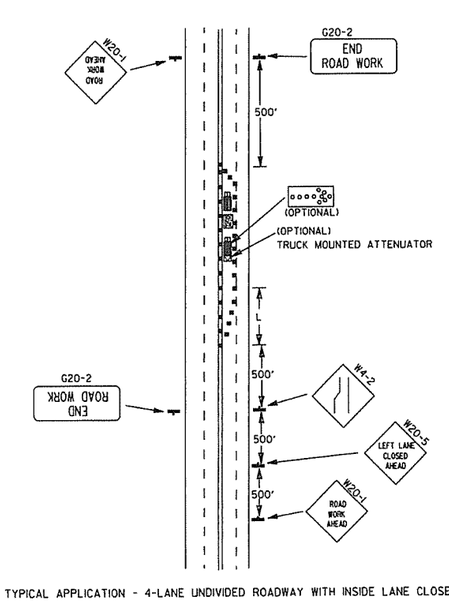
NOTES:
1. REGULATORY TRAFFIC CONTROL DEVICES TO BE MODIFIED AS NEEDED FOR THE DURATION OF THE DETOUR.
2. STREET NAMES MAY BE USED WHEN DESIRABLE FOR DIRECTING DETOURED TRAFFIC.

(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:

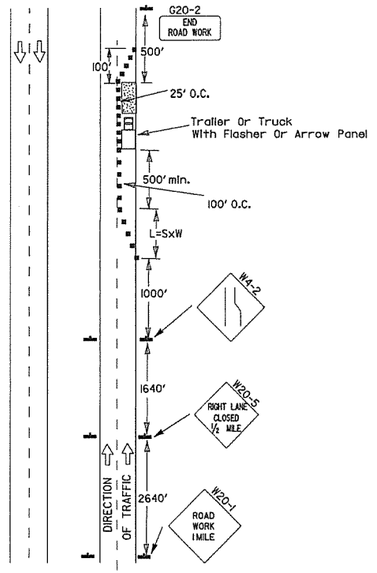
1. ADVISORY SPEED POSTED ON WI-3 OR WI-4 CURVE WARNING SIGNS TO BE DETERMINED AT SITE. USE WI-4 WHEN SPEED IS GREATER THAN 30MPH AND WI-3 WHEN 30MPH OR LESS.
2. WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-1(55) SHALL BE OMITTED AND THE R2-5A SHALL BE INSTALLED 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
9-12-13	REVISED DETAIL OF RAISED PAVEMENT MARKERS	
3-11-10	ADDED (AFAD)	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED GENERAL NOTE	
10-18-96	ADDED R55-1	
4-26-96	CORRECTED (a) BEHIND G20-2	
6-8-95	CORRECTED SIGN IDENT. ON WI-4A	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

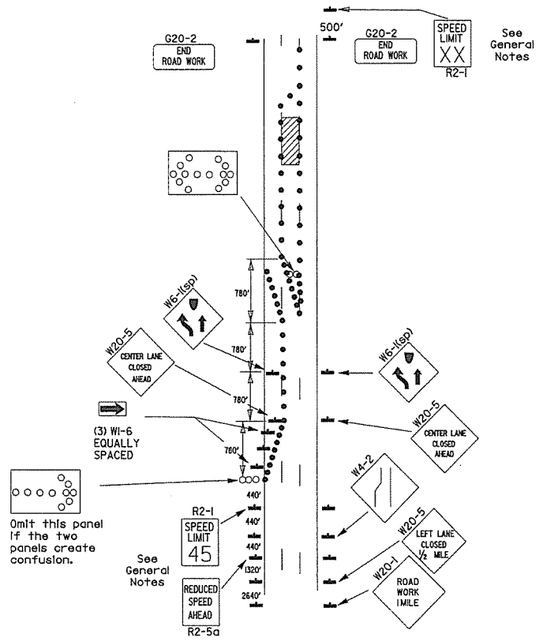
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

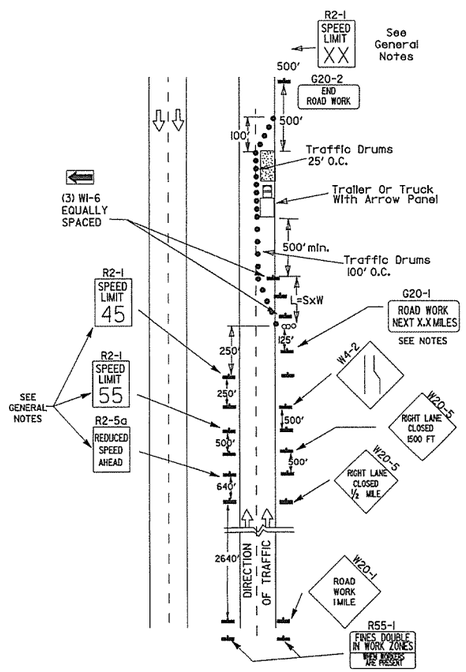
STANDARD DRAWING TC-2



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



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



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

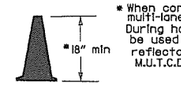
KEY:

- ○○○ Arrow Panel (If Required)
- ■ Channelizing Device
- ● Traffic drum

GENERAL NOTES:

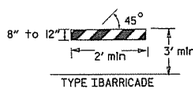
1. A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the R2-5A shall be installed at that location. Additional 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



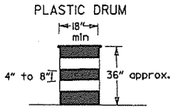
* When cones are used on freeways and multi-lane highways, they shall be 28" min. During hours of darkness, 28" cones shall be used on all roadways, and shall be reflectorized in accordance with the M.U.T.C.D.

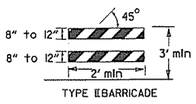
CONES



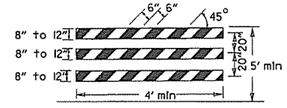
TYPE I BARRICADE

PLASTIC DRUM



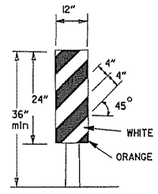


TYPE II BARRICADE



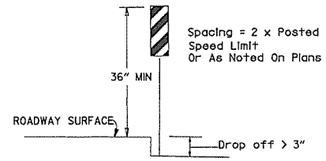
TYPE III BARRICADE

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



VERTICAL PANEL
VP-1R

VERTICAL PANEL PLACEMENT



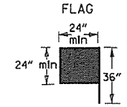
TRAFFIC CONTROL DEVICES FOR VERTICAL PAVEMENT DIFFERENTIALS

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

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

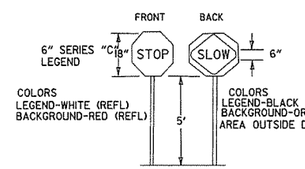
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.

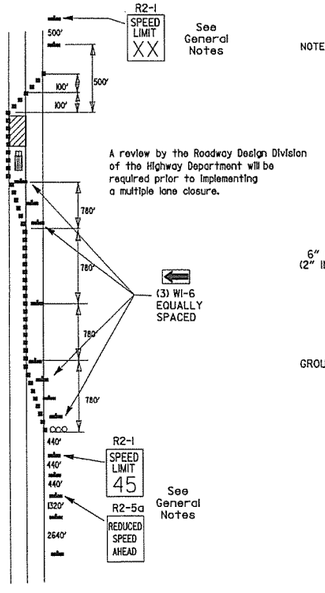
FLAG



Flag shall be of good grade red material

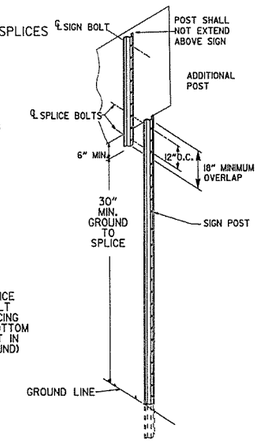
STOP SLOW PADDLE





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

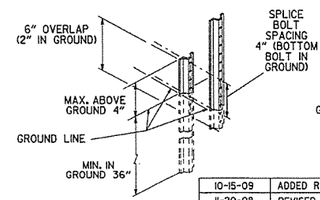
DETAIL OF SPLICES



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

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

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



DATE	REVISION	FILMED
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	

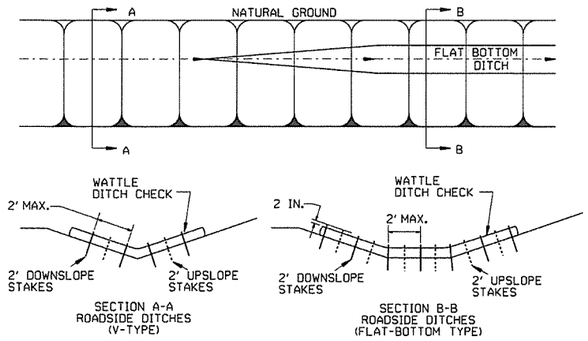
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

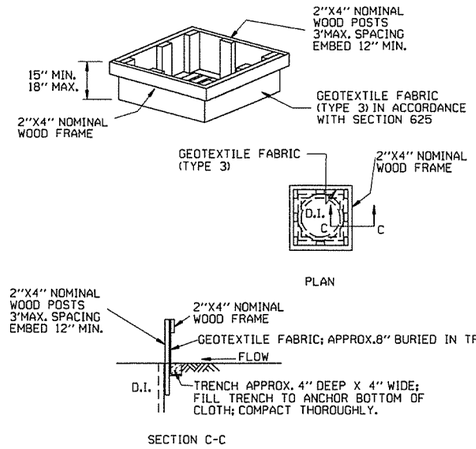
STANDARD DRAWING TC-3

GENERAL NOTES

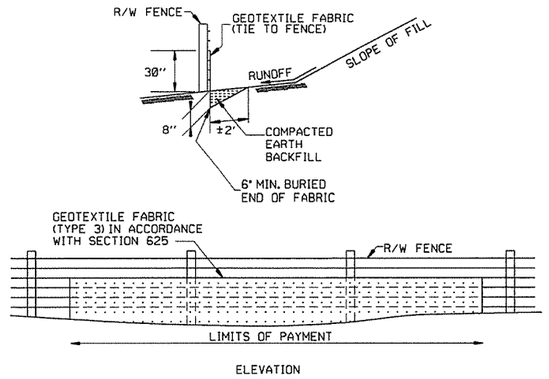
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



WATTLE DITCH CHECK (E-1)



DROP INLET SILT FENCE (E-7)



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

GENERAL NOTES

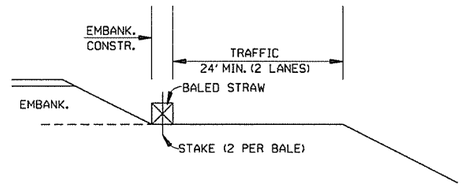
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST, OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

GENERAL NOTES

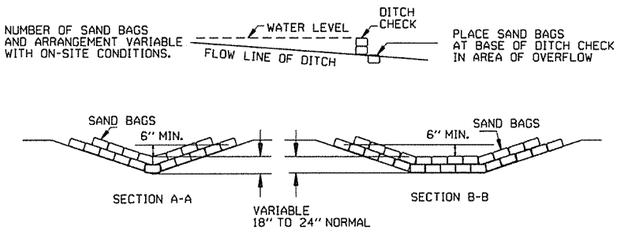
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.

2. NO GAPS SHALL BE LEFT BETWEEN BALES.

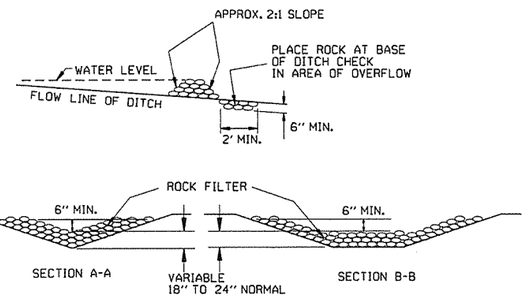
3. BALED STRAW FILTER BARRIERS COMPLETED AND ACCEPTED WILL BE MEASURED BY THE BALE IN PLACE AS AUTHORIZED BY THE ENGINEER AND WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER BALE FOR BALED STRAW DITCH CHECKS.



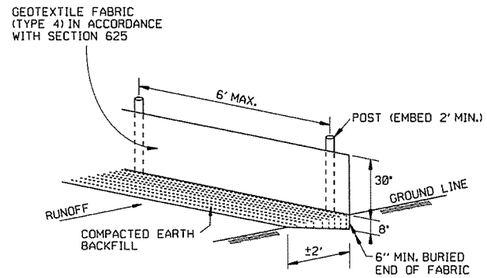
BALED STRAW FILTER BARRIER (E-2)



SAND BAG DITCH CHECK (E-5)



ROCK DITCH CHECK (E-6)



SILT FENCE (E-11)

GENERAL NOTES

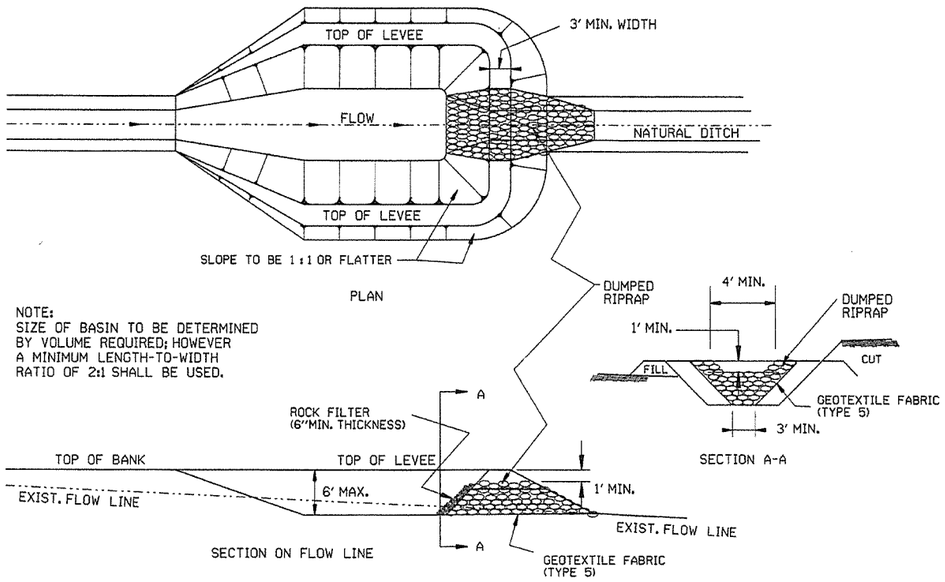
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

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

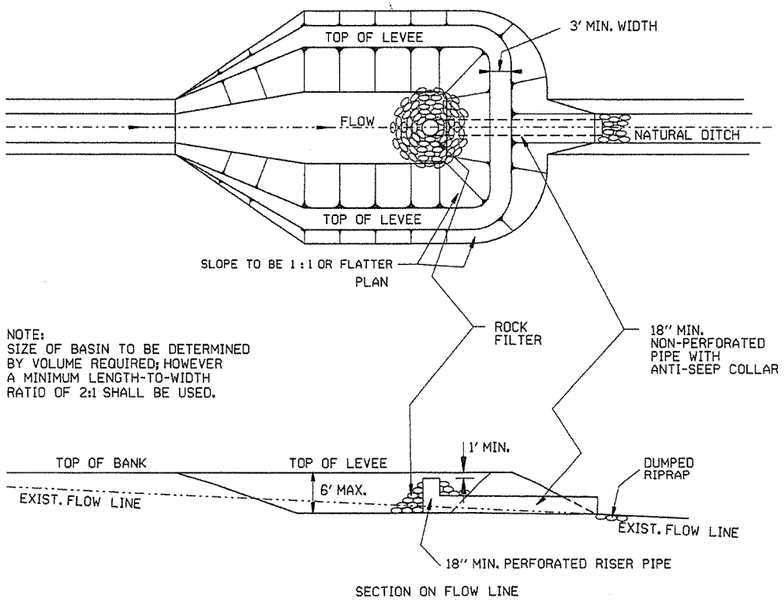
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

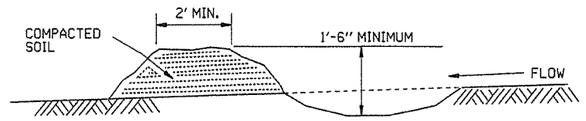
STANDARD DRAWING TEC-1



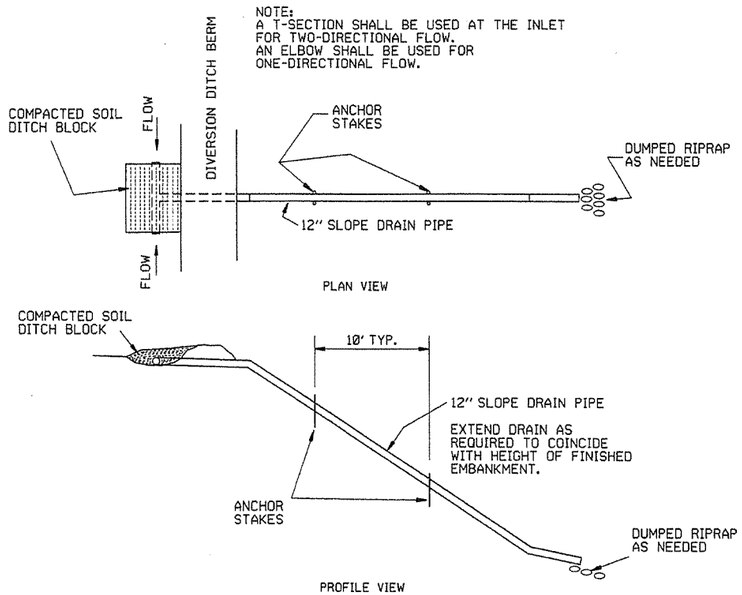
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



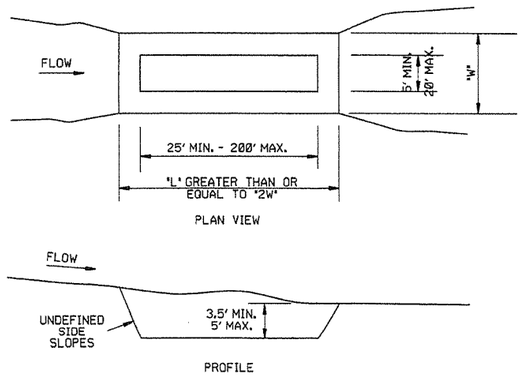
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



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

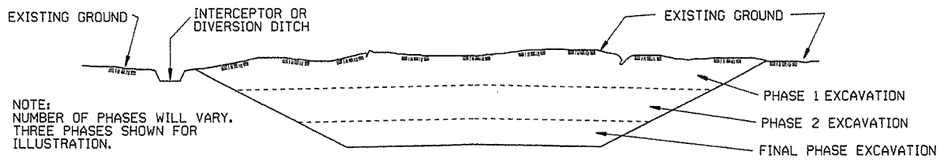
STANDARD DRAWING TEC-2

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



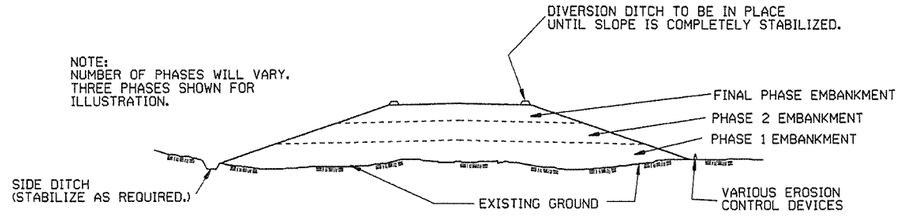
GENERAL NOTE

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

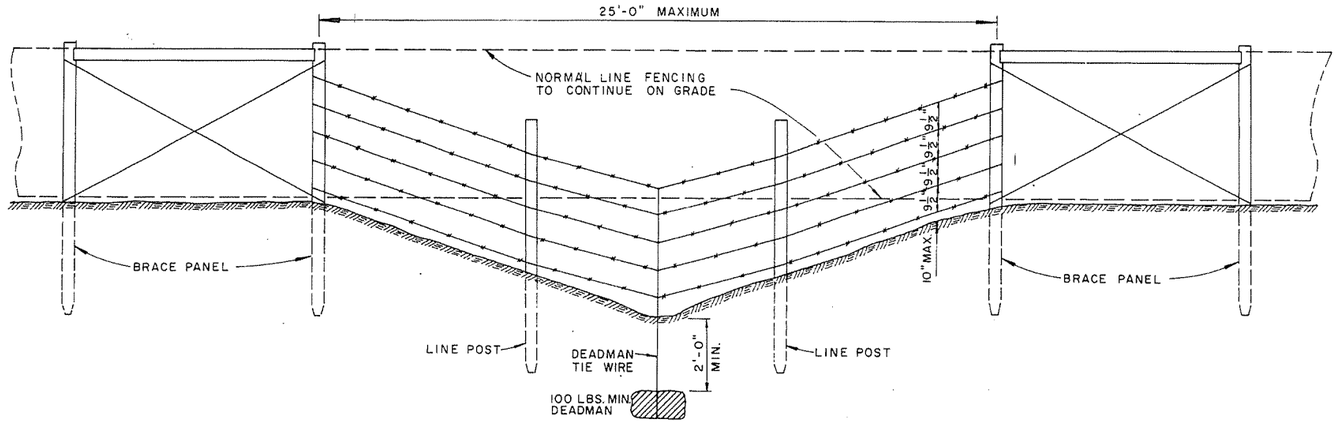
1. CONSTRUCT DIVERSION DITCHES, DITCH CHECKS, SEDIMENT BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD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

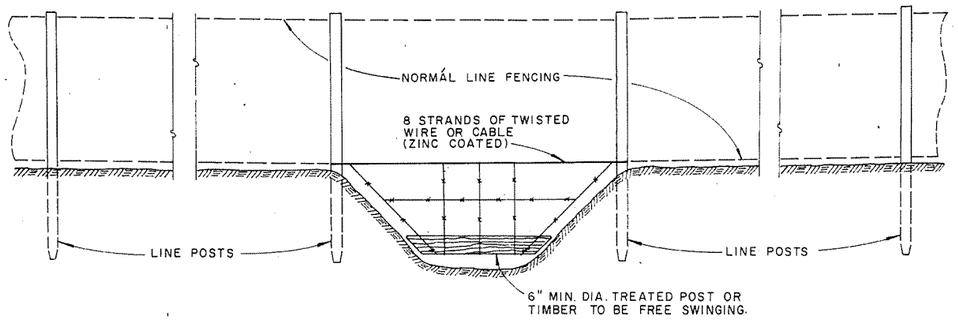
DATE	REVISION	FILMED
11-03-94	CORRECTED SPELLING	
6-2-94	Drawn & Issued	6-2-94

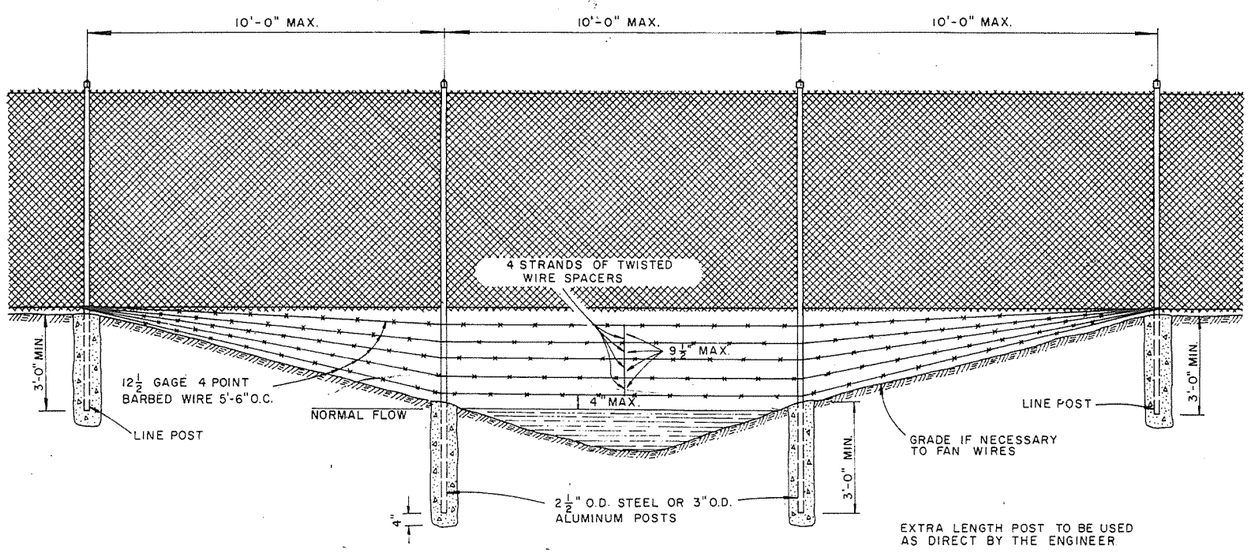
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-3







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

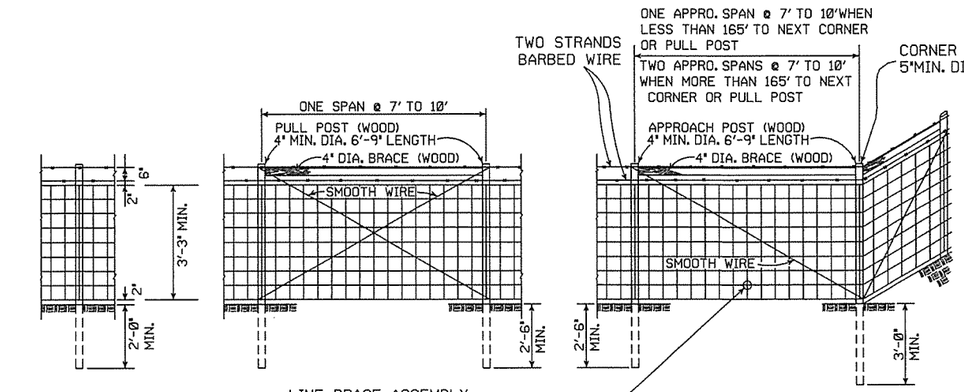
WIRE FENCE WATER GAPS

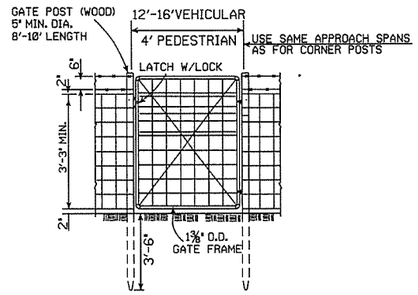
STANDARD DRAWING

WF-2

73

1M—11-71—67001—PPASCo





GENERAL NOTES:

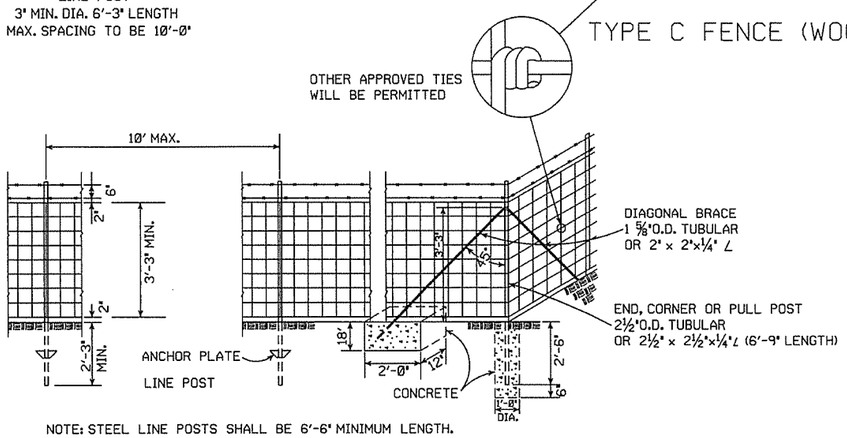
STEEL LINE POSTS SHALL BE PAINTED OR GALVANIZED.
TUBULAR END, CORNER, PULL, OR DIAGONAL BRACES MUST CONFORM TO THE DIMENSIONS AND WEIGHTS SPECIFIED ON STANDARD DRAWING WF-3 (CHAIN LINK). APPROVED ALTERNATES ARE ACCEPTABLE.
AN ACCEPTABLE TOLERANCE IN LENGTH OF TUBULAR OR WOODEN POSTS SHALL BE - 1" TO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

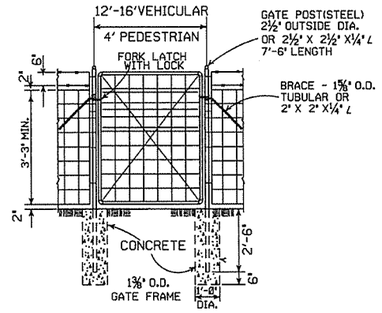
THE CONTRACTOR SHALL FURNISH AT LEAST 25% OF TIMBER LINE POSTS OF 7 FOOT LENGTHS IN ORDER TO PROVIDE SUFFICIENT SET IN SOFT GROUND OR SMALL DEPRESSIONS.

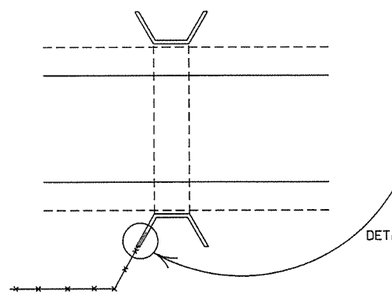
DRIVEWAY GATES, EITHER SINGLE 12' TO 16' OR DOUBLE 6' TO 8' OPENING OF THE SAME TYPE AS THE PEDESTRIAN GATE, SHALL BE INSTALLED ON THE RIGHT SIDE OF EACH THROUGH LANE ROAD AT LARGE CULVERTS OR BRIDGE CROSS FENCE, FOR USE OF MAINTENANCE EQUIPMENT. LOCATION OF GATES TO BE SHOWN ON PLANS OR AS DESIGNATED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

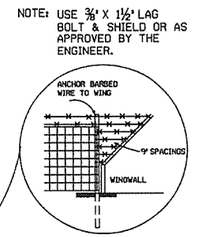
AT STREAM CROSSINGS, THE FENCE SHALL NOT BE CONSTRUCTED ACROSS LARGE STREAMS. WHERE CLEARANCE IS SUFFICIENT FROM THE TOP OF THE BANK TO THE BRIDGE STRUCTURE A CROSS CONNECTION SHALL BE CONSTRUCTED BETWEEN THE FENCE ON EACH SIDE OF THE ROAD. WHERE THE CLEARANCE IS NOT SUFFICIENT, THE FENCE SHALL BE TERMINATED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

TYPE C FENCE (WOOD POSTS)









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

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

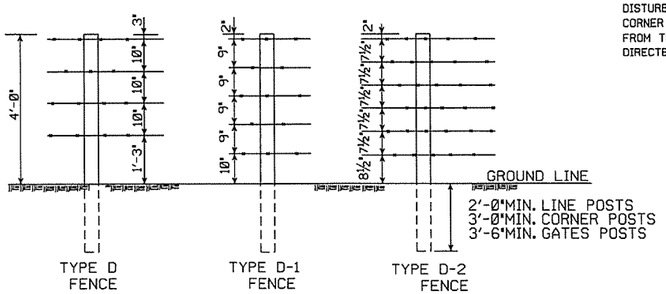
SPLICE FOR WOVEN WIRE BETWEEN PULL POST SHALL BE BY THE "WESTERN UNION METHOD" AS DESCRIBED AS FOLLOWS: THE VERTICAL WIRES FOR EACH END OF THE FENCE FABRIC SHALL BE PLACED SIDE BY SIDE AND THE PROJECTING HORIZONTAL WIRES SHALL BE WRAPPED A MINIMUM OF 4 TIMES AROUND THE HORIZONTAL WIRES OF THE FIRST WEB.

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

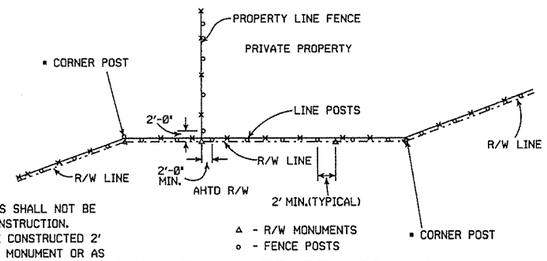
NOTE: STEEL LINE POSTS SHALL BE 6'-6" MINIMUM LENGTH.

TYPE C FENCE (STEEL POSTS)

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

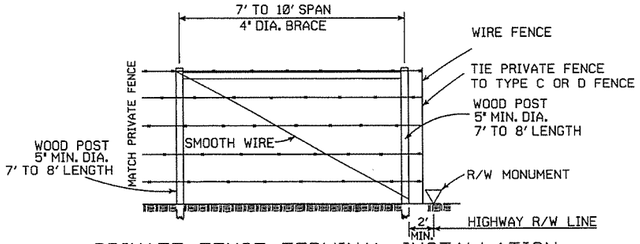


NOTE: SPACING AND SIZE (EXCEPT LENGTH) OF POSTS, APPROACH SPANS, PULL POST ASSEMBLIES, AND CORNER BRACING FOR TYPE D FENCE SHALL CONFORM TO TYPE C FENCE. USE GALVANIZED STAPLES ON WOOD POSTS AND APPROVED FASTENERS ON STEEL POSTS.



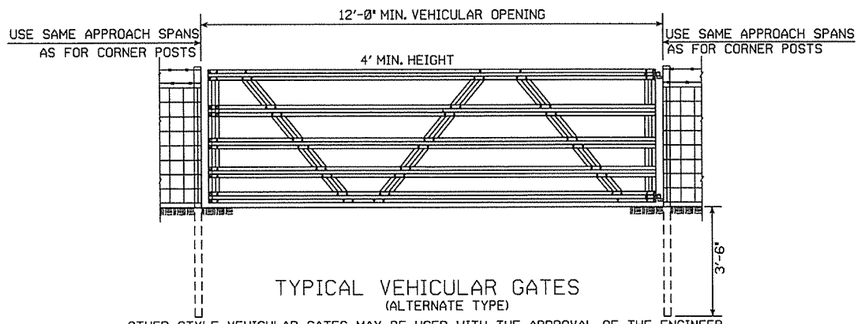
• NOTE: RIGHT-OF-WAY MONUMENTS SHALL NOT BE DISTURBED BY FENCE CONSTRUCTION. CORNER POSTS SHALL BE CONSTRUCTED 2' FROM THE RIGHT-OF-WAY MONUMENT OR AS DIRECTED BY THE ENGINEER.

RIGHT-OF-WAY FENCE LOCATION



PRIVATE FENCE TERMINAL INSTALLATION

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



TYPICAL VEHICULAR GATES
(ALTERNATE TYPE)

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

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

ARKANSAS STATE HIGHWAY COMMISSION

WIRE FENCE TYPE C AND D

STANDARD DRAWING WF-4

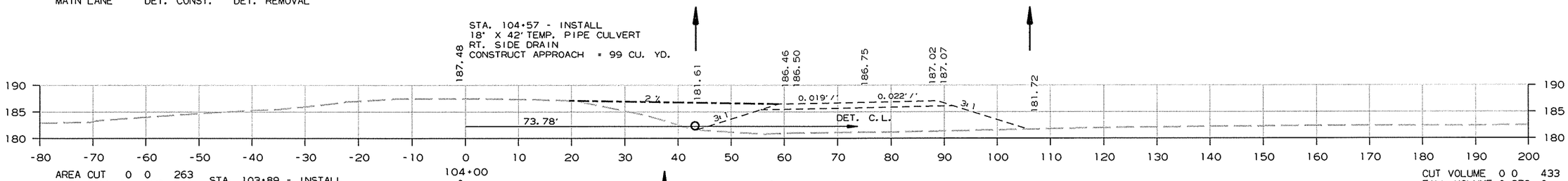
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	117	134

(2) CROSS SECTIONS - SITE 1

MAIN LANE DET. CONST. DET. REMOVAL

MAIN LANE DET. CONST. DET. REMOVAL

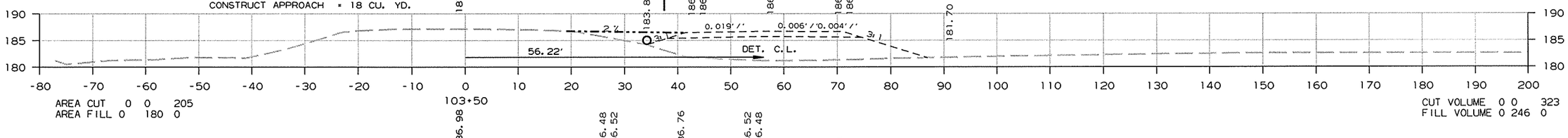
STA. 104+57 - INSTALL
18" X 42' TEMP. PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 99 CU. YD.



AREA CUT 0 0 263
AREA FILL 0 228 0

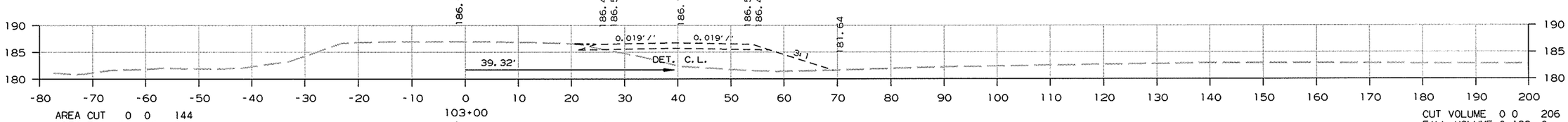
CUT VOLUME 0 0 433
FILL VOLUME 0 378 0

STA. 103+89 - INSTALL
18" X 26' TEMP. PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 18 CU. YD.



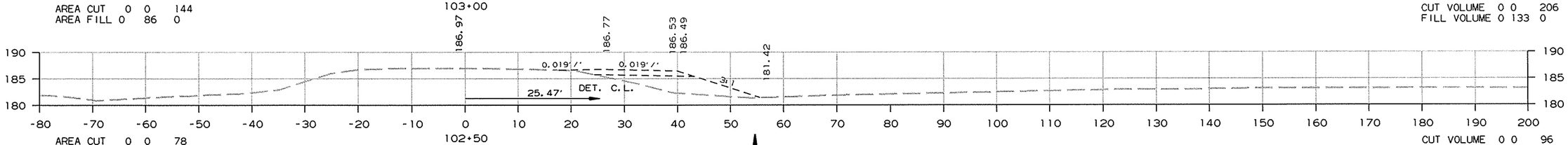
AREA CUT 0 0 205
AREA FILL 0 180 0

CUT VOLUME 0 0 323
FILL VOLUME 0 246 0



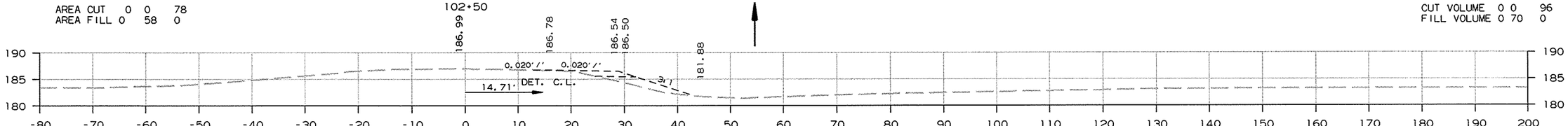
AREA CUT 0 0 144
AREA FILL 0 86 0

CUT VOLUME 0 0 206
FILL VOLUME 0 133 0



AREA CUT 0 0 78
AREA FILL 0 58 0

CUT VOLUME 0 0 96
FILL VOLUME 0 70 0

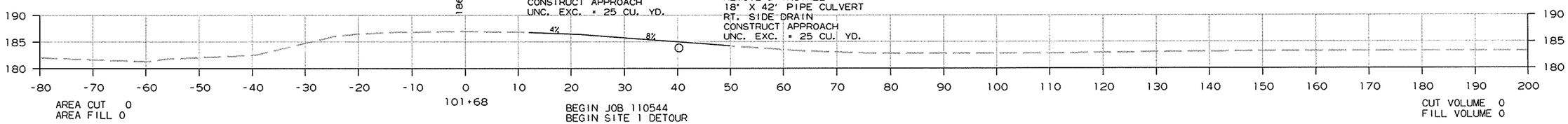


AREA CUT 0 0 26
AREA FILL 0 18 0

CUT VOLUME 0
FILL VOLUME 0

STA. 101+00 - IN PLACE
18" X 40' CMP
RT. SIDE DRAIN
RETAIN
CONSTRUCT APPROACH
UNC. EXC. = 25 CU. YD.

STA. 101+68 - IN PLACE
18" X 30' CMP
RT. SIDE DRAIN
REMOVE & INSTALL
18" X 42' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH
UNC. EXC. = 25 CU. YD.



AREA CUT 0
AREA FILL 0

CUT VOLUME 0
FILL VOLUME 0

BEGIN JOB 110544
BEGIN SITE 1 DETOUR

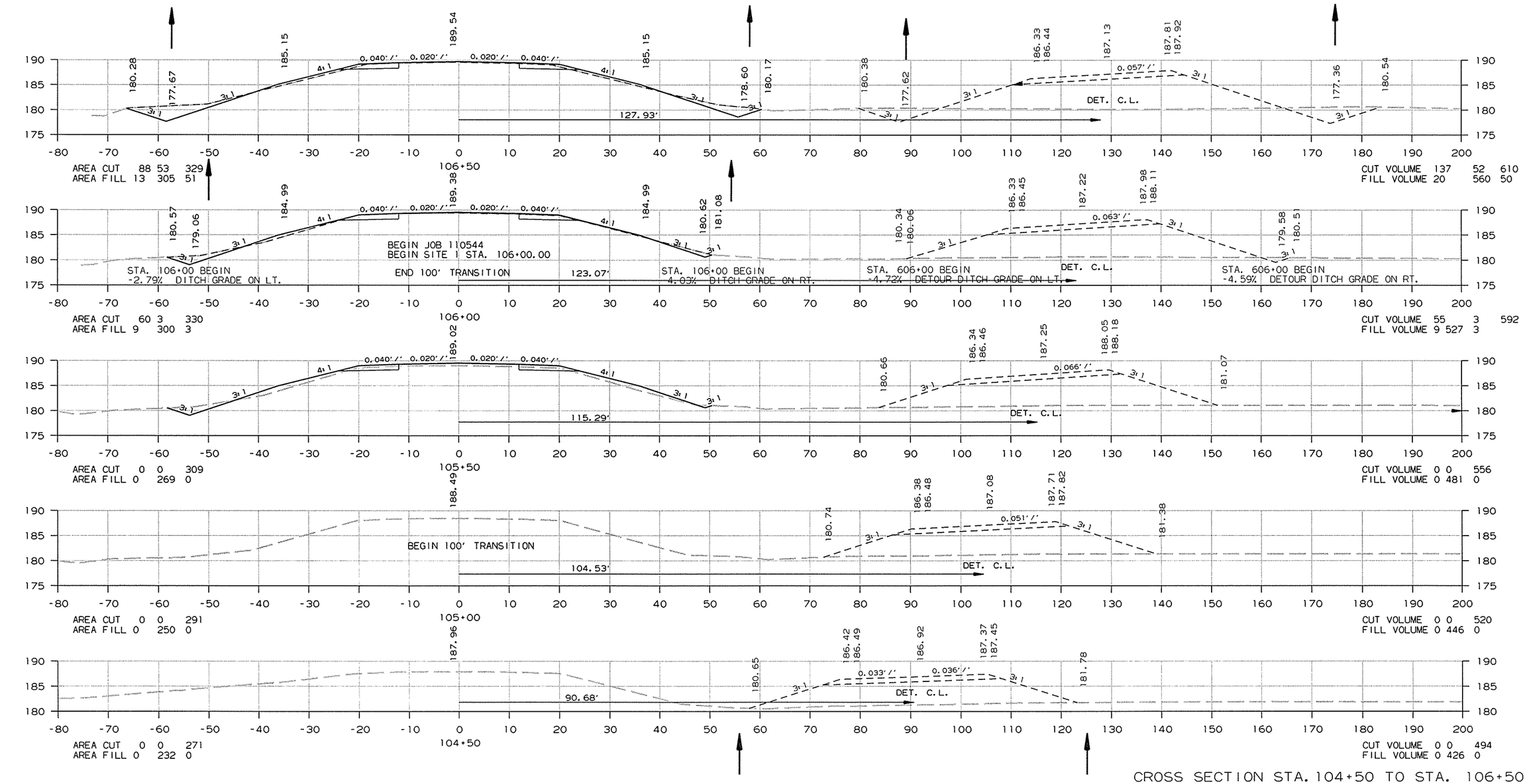
CROSS SECTION STA. 101+68 TO STA. 104+00

7/29/2014

110544.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	118	134

(2) CROSS SECTIONS - SITE 1



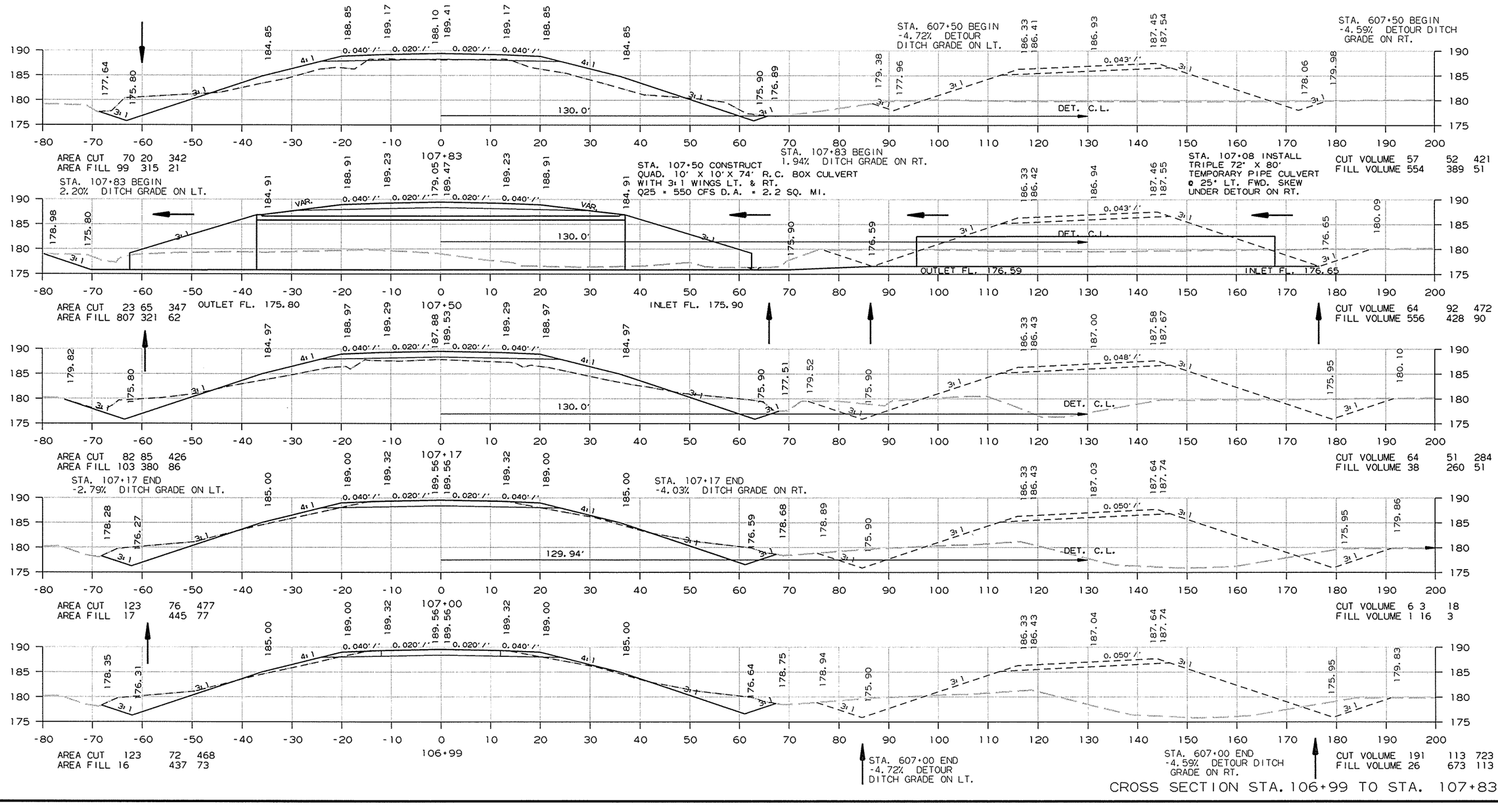
CROSS SECTION STA. 104+50 TO STA. 106+50

7/29/2014

110544.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	119	134

(2) CROSS SECTIONS - SITE 1

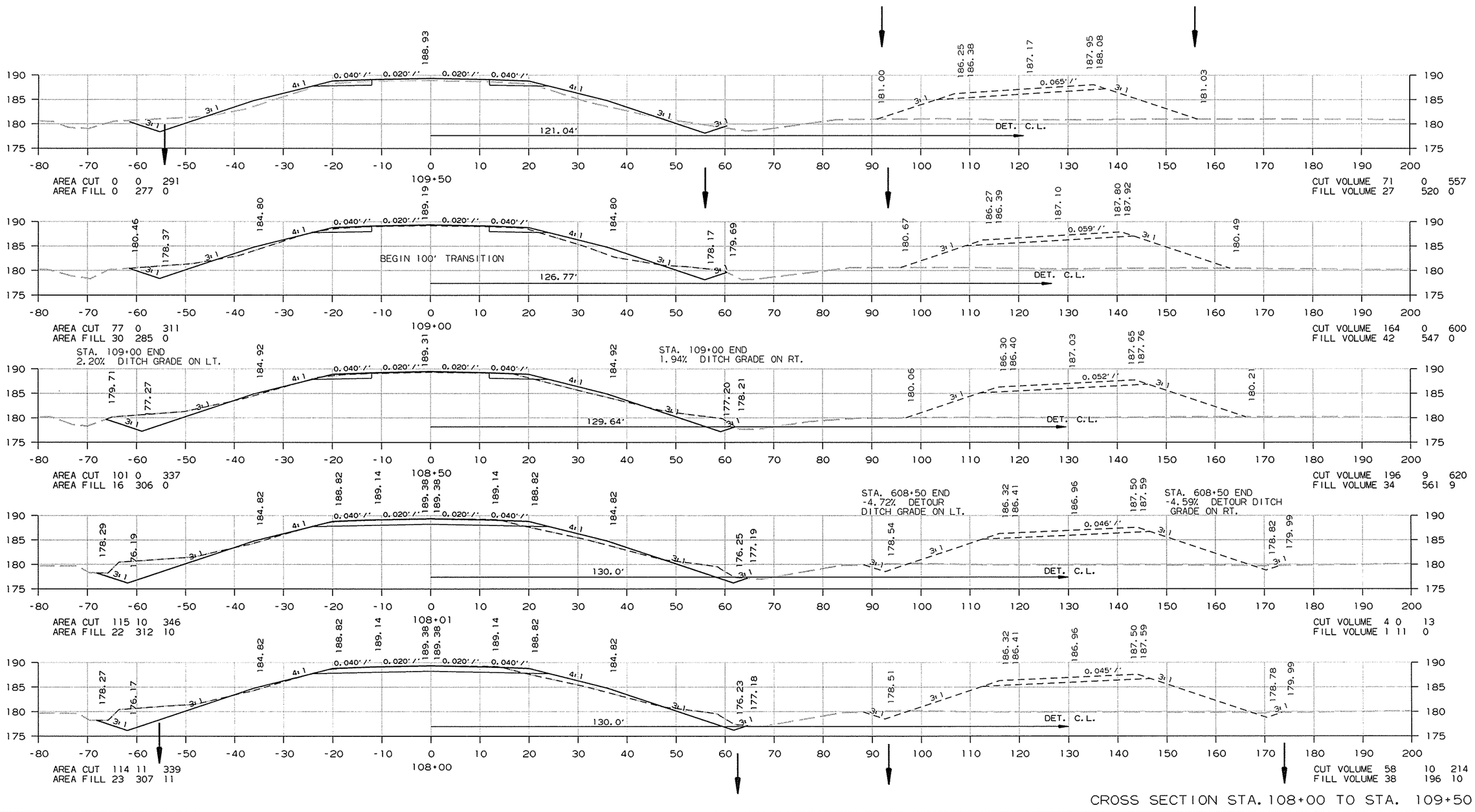


7/29/2014

110544.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	120	134

(2) CROSS SECTIONS - SITE 1



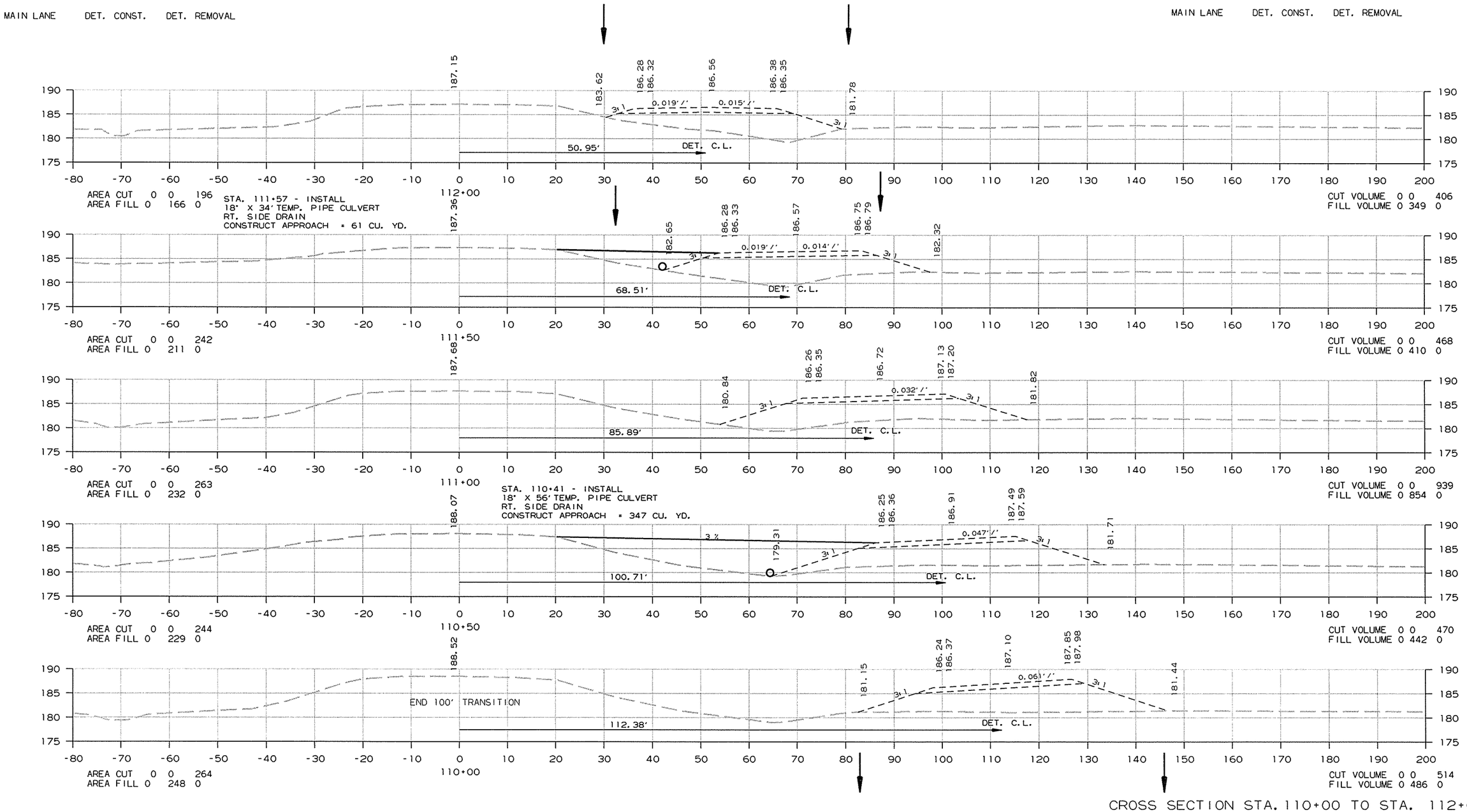
CROSS SECTION STA. 108+00 TO STA. 109+50

7/29/2014

R110544.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	121	134

(2) CROSS SECTIONS - SITE 1



CROSS SECTION STA. 110+00 TO STA. 112+00

7/29/2014

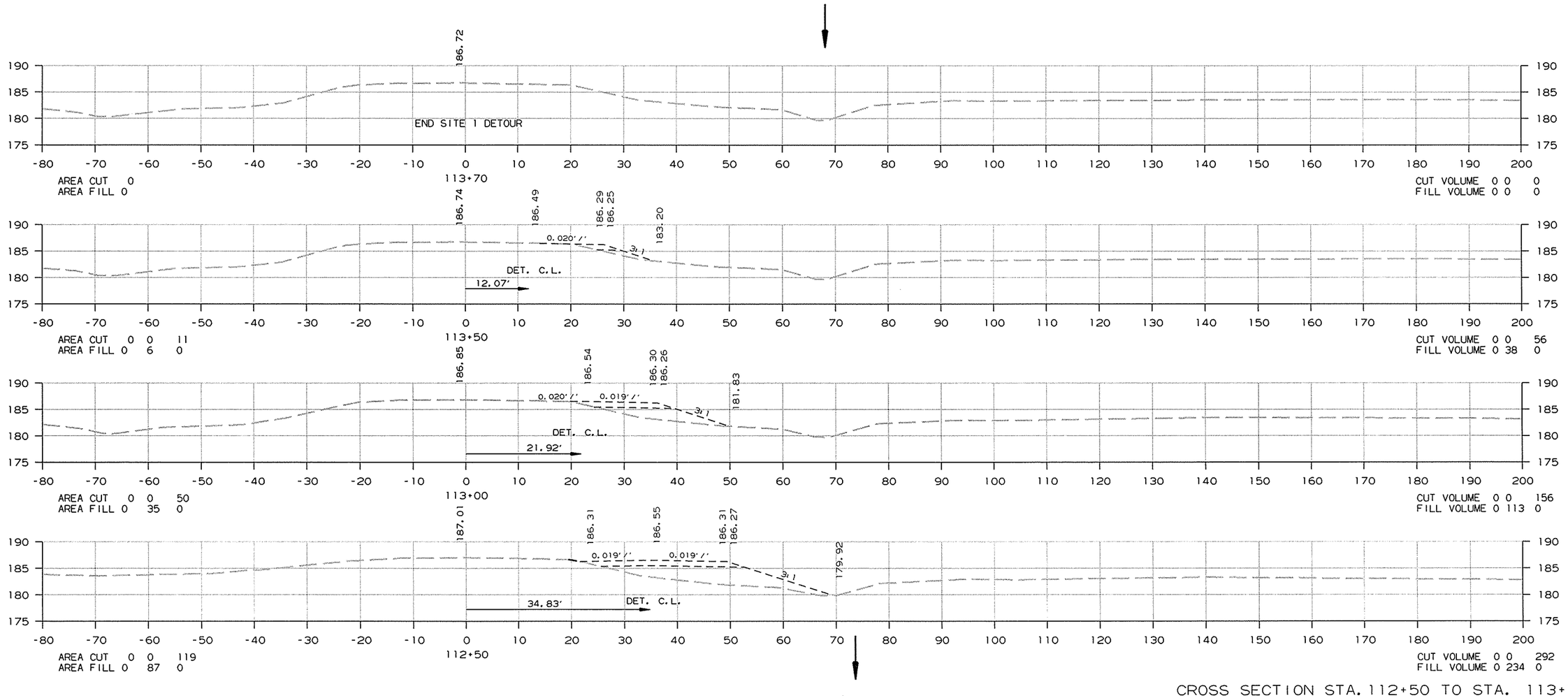
R110544.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	122	134

(2) CROSS SECTIONS - SITE 1

MAIN LANE DET. CONST. DET. REMOVAL

MAIN LANE DET. CONST. DET. REMOVAL



CROSS SECTION STA. 112+50 TO STA. 113+70

7/29/2014

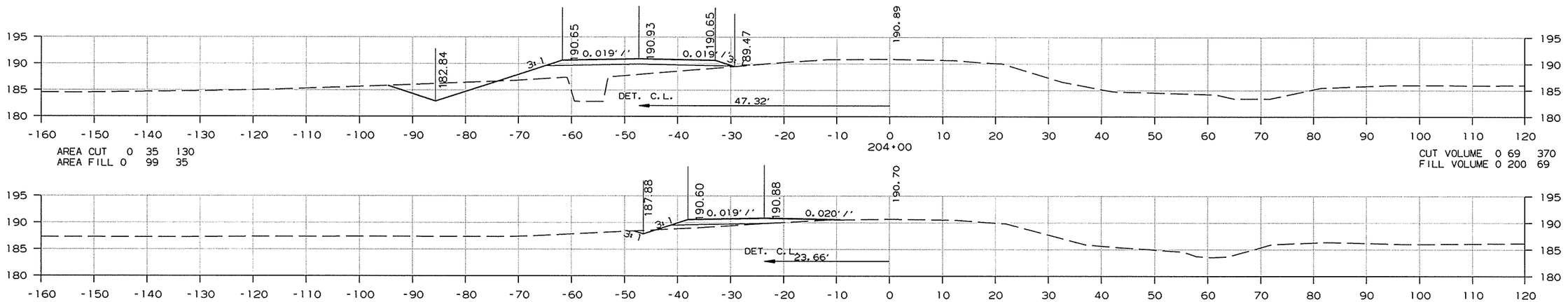
R110544.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	123	134

(2) CROSS SECTIONS - SITE 2

MAIN LANE DET. CONST. DET. REMOVAL

MAIN LANE DET. CONST. DET. REMOVAL



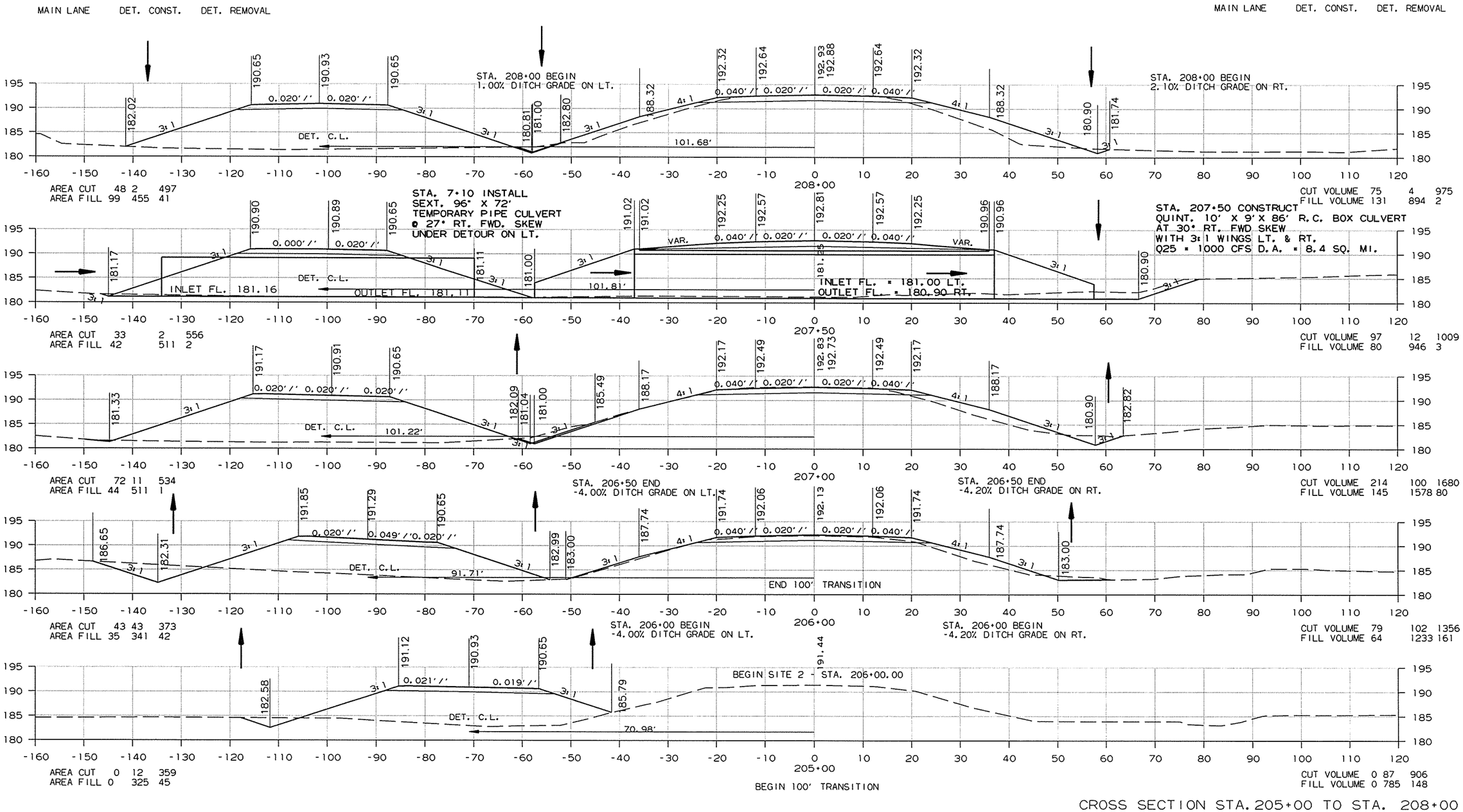
CROSS SECTION STA. 200+00 TO STA. 204+00

7/29/2014

R110544.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	124	134

(2) CROSS SECTIONS - SITE 2



CROSS SECTION STA. 205+00 TO STA. 208+00

7/29/2014

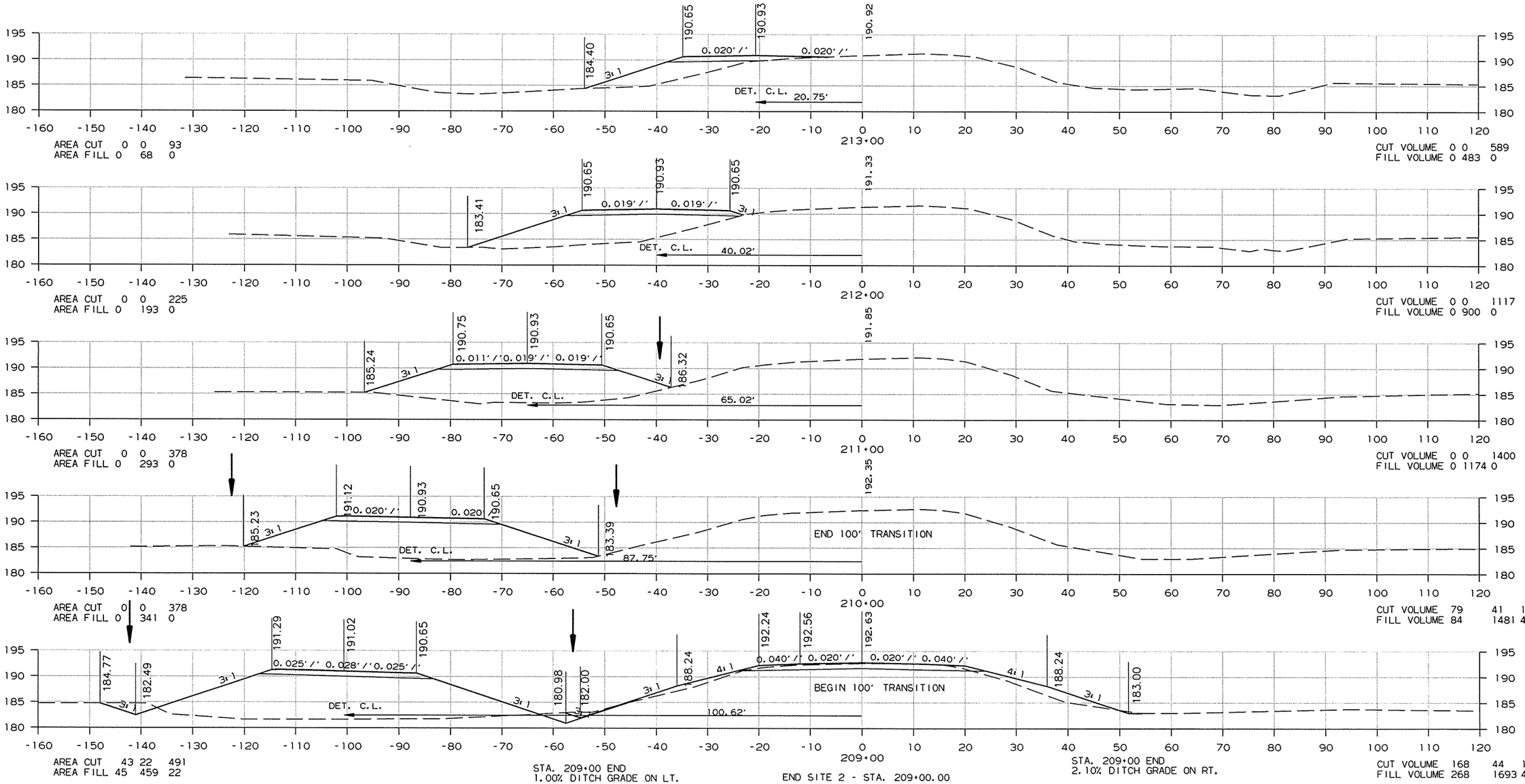
R110544.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	125	134

(2) CROSS SECTIONS - SITE 2

MAIN LANE DET. CONST. DET. REMOVAL

MAIN LANE DET. CONST. DET. REMOVAL



CROSS SECTION STA. 209+00 TO STA. 213+00

7/29/2014

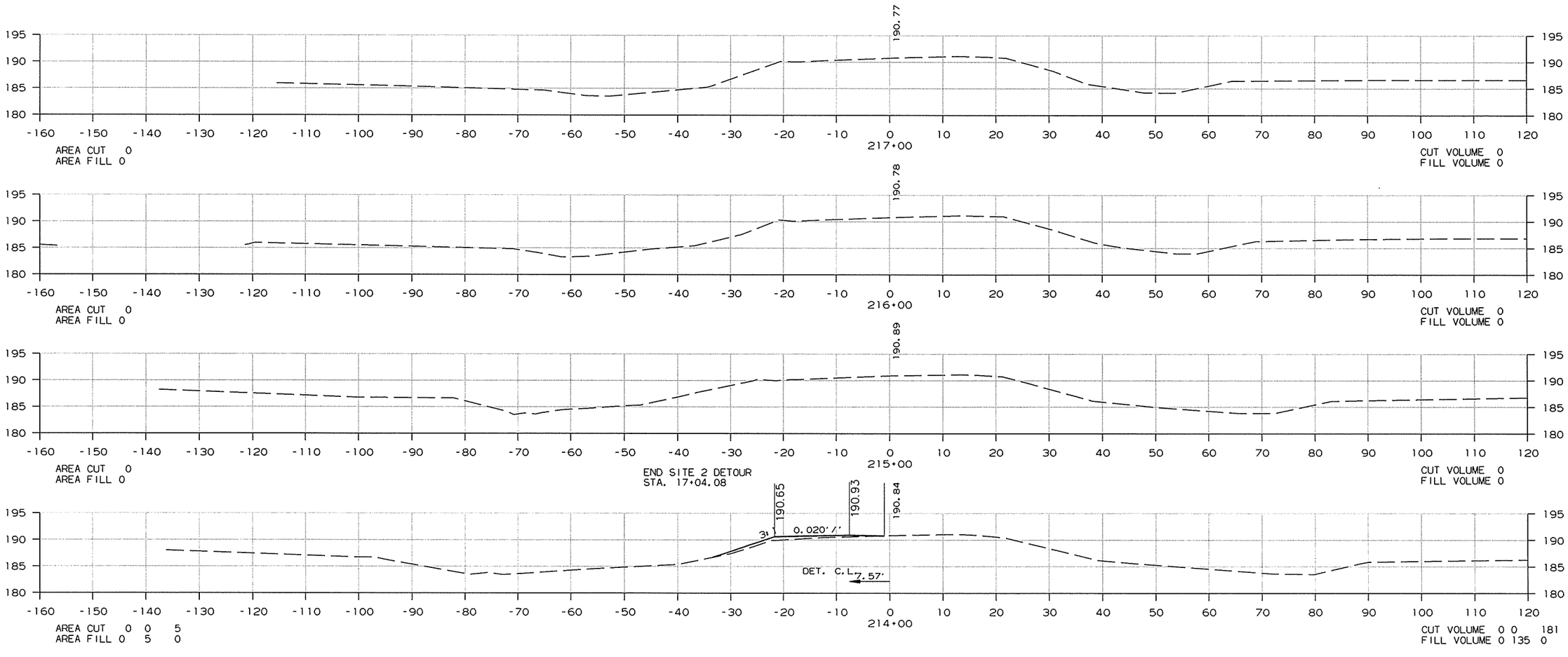
R110544.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	126	134

(2) CROSS SECTIONS - SITE 2

MAIN LANE DET. CONST. DET. REMOVAL

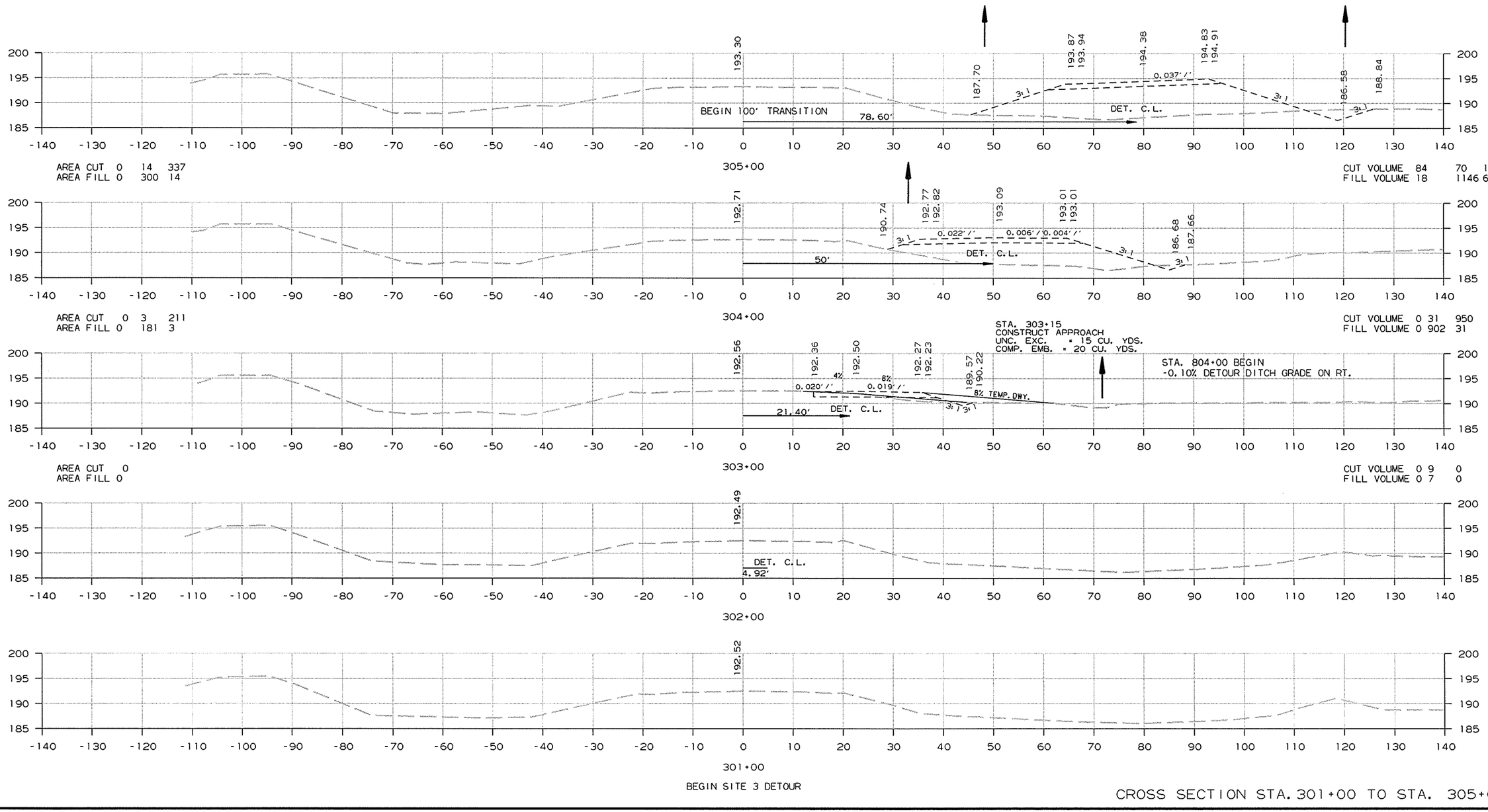
MAIN LANE DET. CONST. DET. REMOVAL



CROSS SECTION STA. 214+00 TO STA. 217+00

7/29/2014

R110544.DGN



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	127	134

② CROSS SECTIONS - SITE 3

MAIN LANE DET. CONST. DET. REMOVAL

MAIN LANE DET. CONST. DET. REMOVAL

305+00

AREA CUT 0 14 337
AREA FILL 0 300 14

CUT VOLUME 84 70 1217
FILL VOLUME 18 1146 69

304+00

AREA CUT 0 3 211
AREA FILL 0 181 3

CUT VOLUME 0 31 950
FILL VOLUME 0 902 31

STA. 303+15
CONSTRUCT APPROACH
UNC. EXC. = 15 CU. YDS.
COMP. EMB. = 20 CU. YDS.

303+00

AREA CUT 0
AREA FILL 0

CUT VOLUME 0 9 0
FILL VOLUME 0 7 0

302+00

301+00

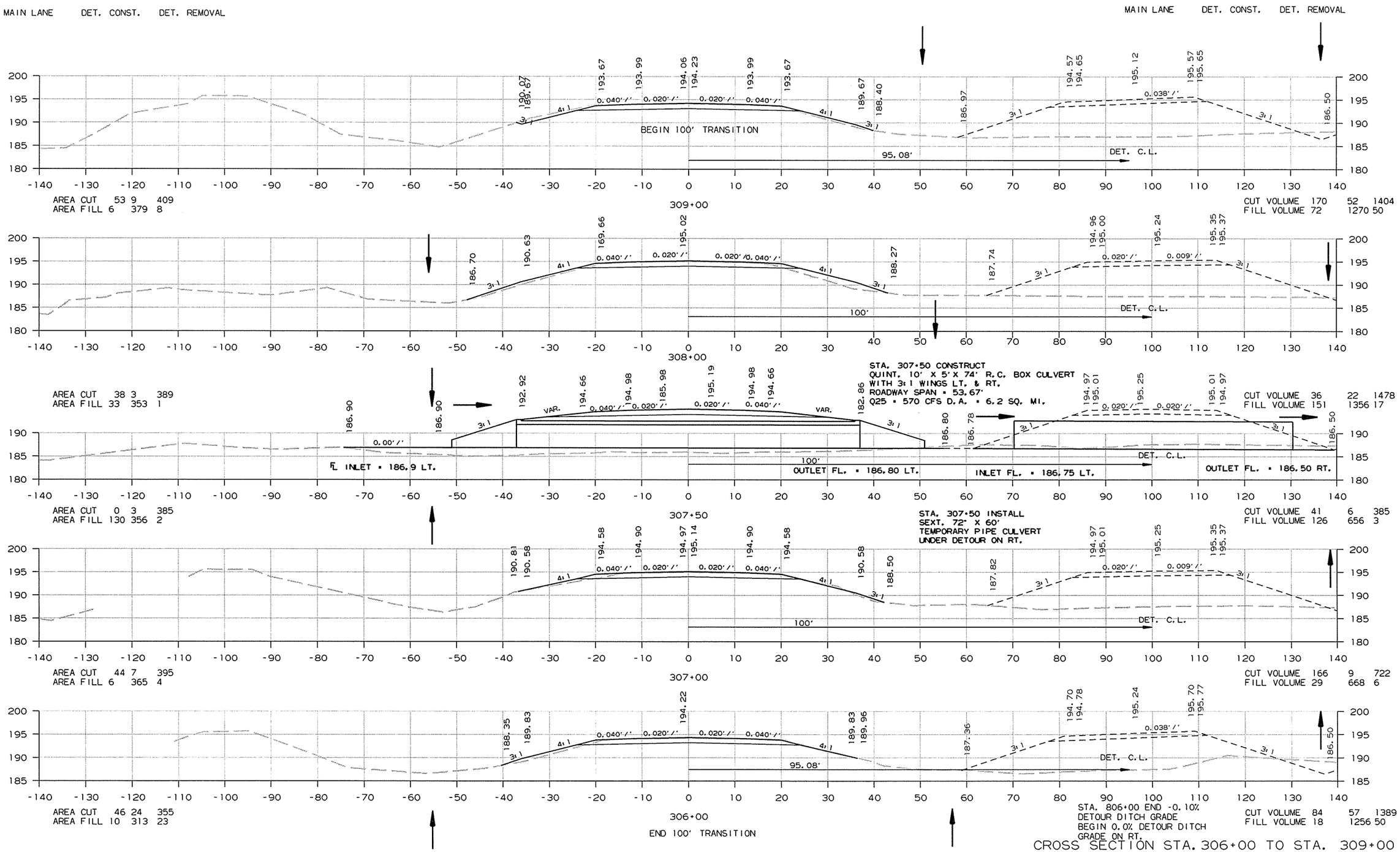
BEGIN SITE 3 DETOUR

CROSS SECTION STA. 301+00 TO STA. 305+00

R110544.DGN 7-29-2014

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.		110544	128	134

(2) CROSS SECTIONS - SITE 3

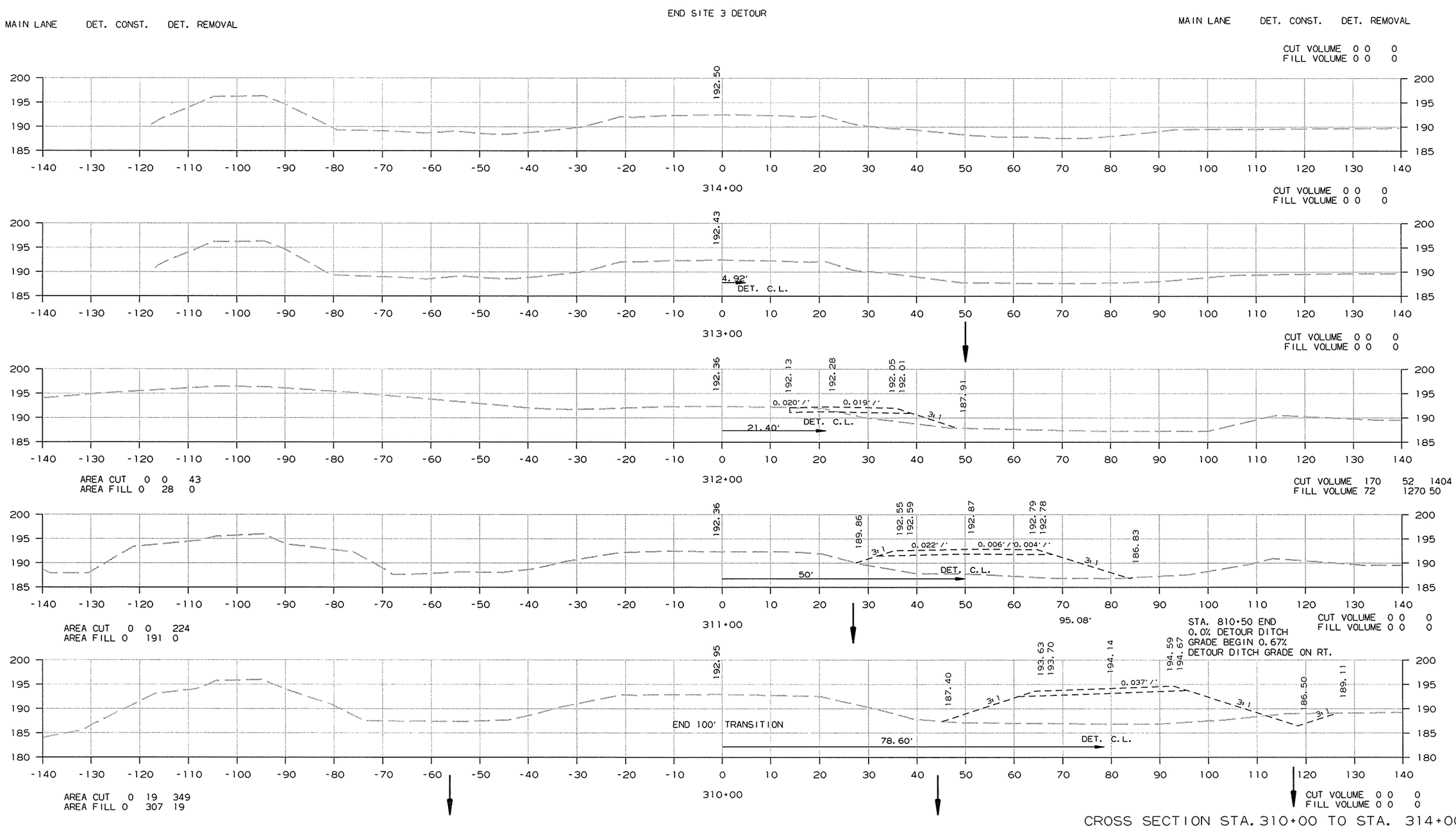


CROSS SECTION STA. 306+00 TO STA. 309+00

R110544.DGN 7-29-2014

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.		110544	129	134

(2) CROSS SECTIONS - SITE 3



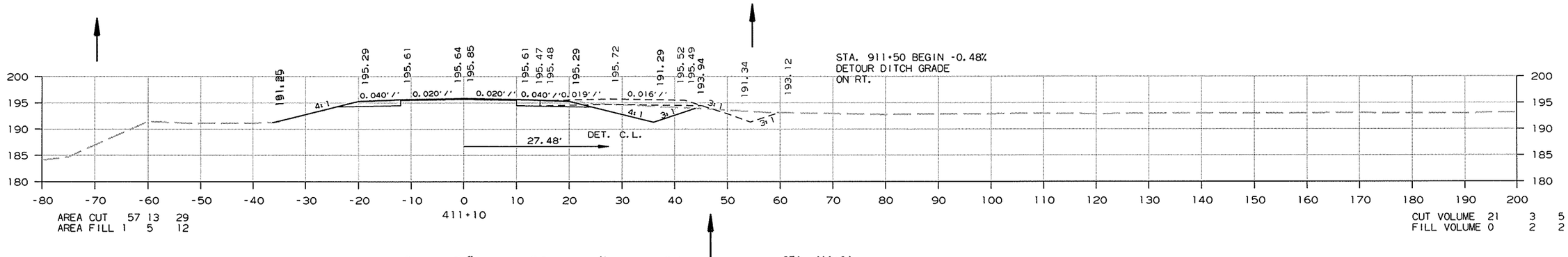
CROSS SECTION STA. 310+00 TO STA. 314+00

R110544.DGN 7-29-2014

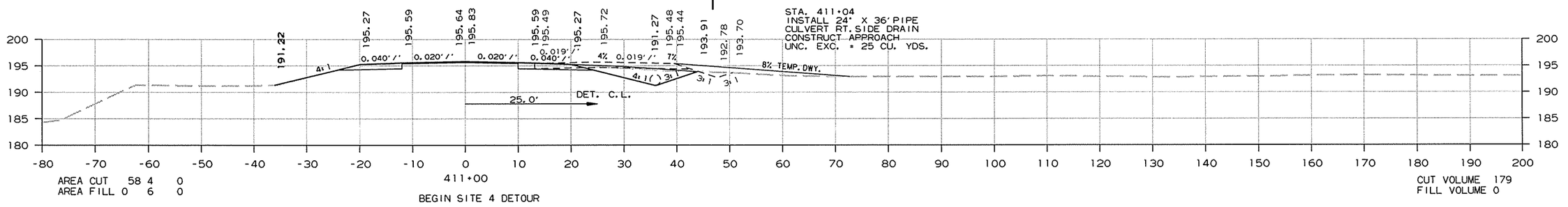
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	130	134

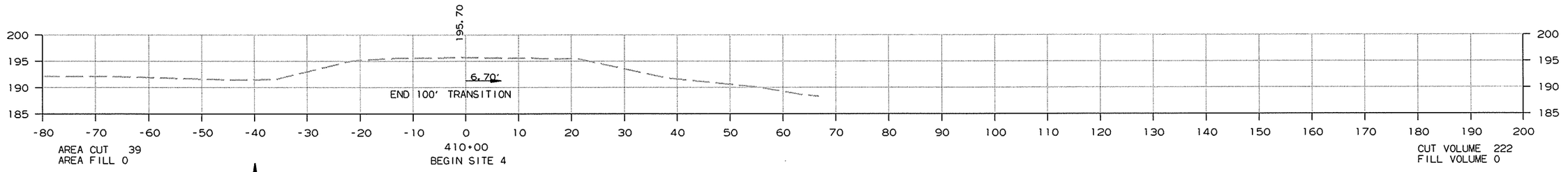
(2) CROSS SECTIONS - SITE 4

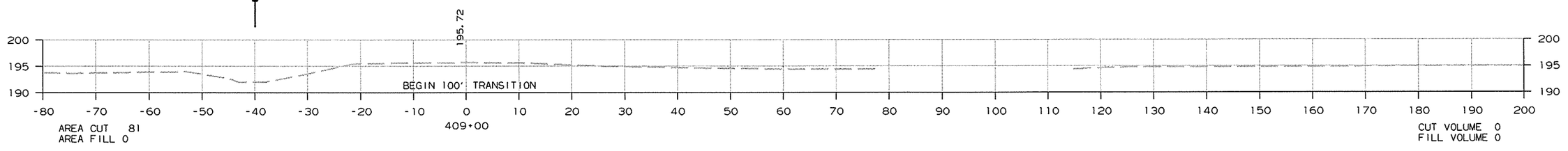
MAIN LANE DET. CONST. DET. REMOVAL



MAIN LANE DET. CONST. DET. REMOVAL







CROSS SECTION STA. 409+00 TO STA. 411+10

R110544.DGN 7-29-2014

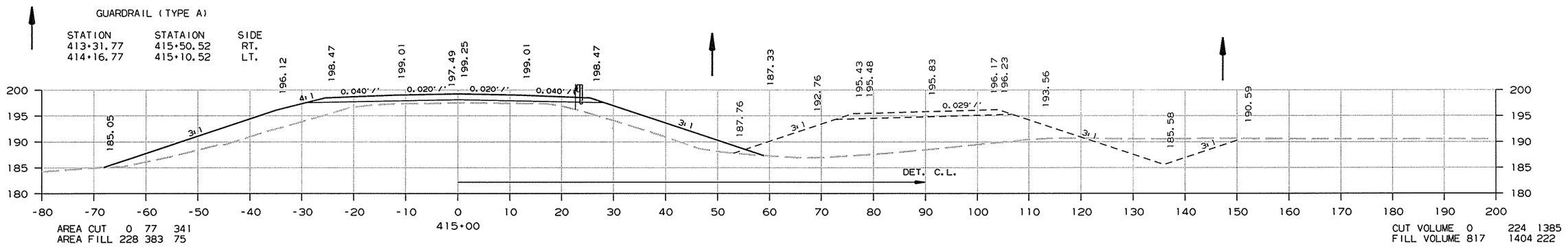
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	131	134

(2) CROSS SECTIONS - SITE 4

MAIN LANE DET. CONST. DET. REMOVAL

GUARDRAIL (TYPE A)

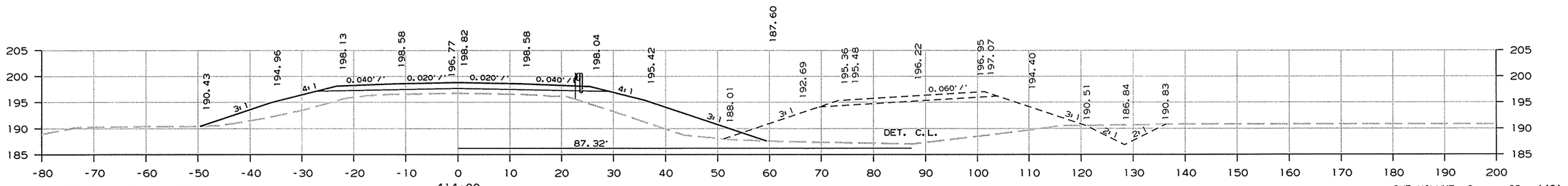
STATION	STATAION	SIDE
413+31.77	415+50.52	RT.
414+16.77	415+10.52	LT.



AREA CUT 0 77 341
AREA FILL 228 383 75

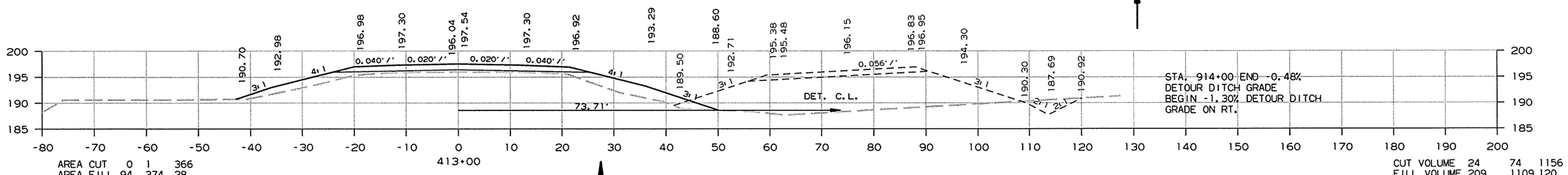
CUT VOLUME 0 224 1385
FILL VOLUME 817 1404 222

MAIN LANE DET. CONST. DET. REMOVAL



AREA CUT 0 44 407
AREA FILL 213 375 45

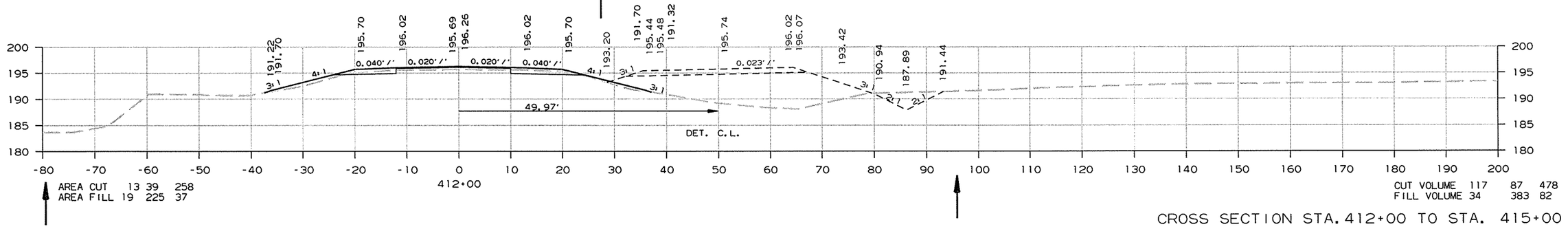
CUT VOLUME 0 83 1431
FILL VOLUME 568 1387 135



STA. 914+00 END -0.48%
DETOUR DITCH GRADE
BEGIN -1.30% DETOUR DITCH
GRADE ON RT.

AREA CUT 0 1 366
AREA FILL 94 374 28

CUT VOLUME 24 74 1156
FILL VOLUME 209 1109 120



AREA CUT 13 39 258
AREA FILL 19 225 37

CUT VOLUME 117 87 478
FILL VOLUME 34 383 82

CROSS SECTION STA. 412+00 TO STA. 415+00

R110544.DGN 7-29-2014

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.		110544	132	134

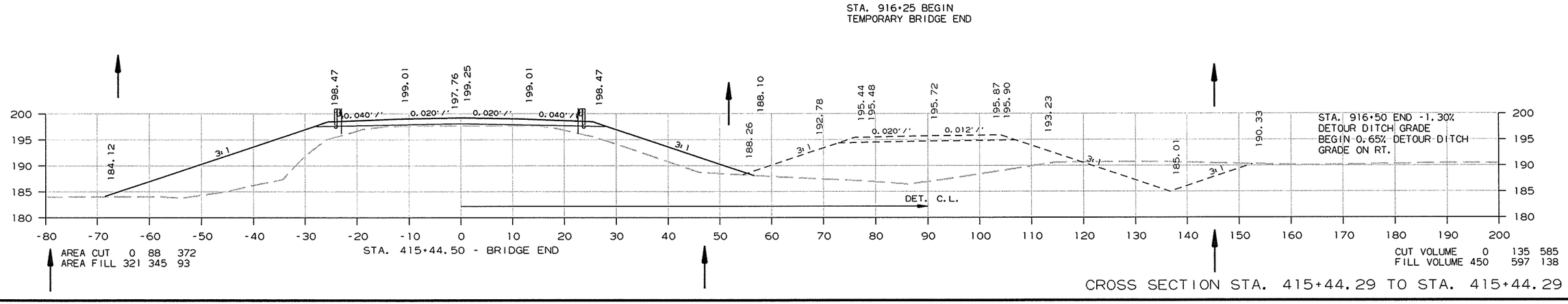
(2) CROSS SECTIONS - SITE 4

MAIN LANE DET. CONST. DET. REMOVAL

MAIN LANE DET. CONST. DET. REMOVAL

GUARDRAIL (TYPE A)

STATION	STATAION	SIDE
413+31.77	415+50.52	RT.
414+16.77	415+10.52	LT.



CROSS SECTION STA. 415+44.29 TO STA. 415+44.29

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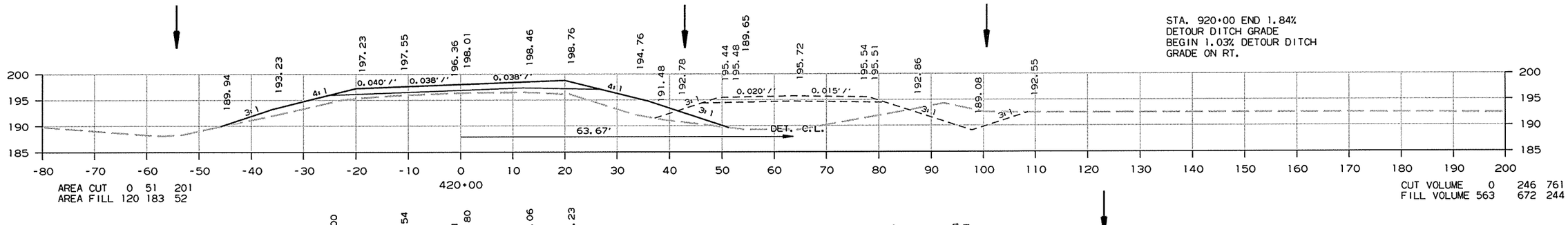
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	133	134

(2) CROSS SECTIONS - SITE 4

MAIN LANE DET. CONST. DET. REMOVAL

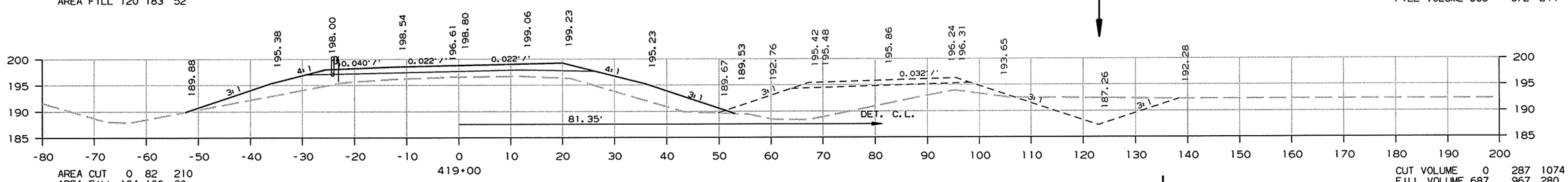
GUARDRAIL (TYPE A)

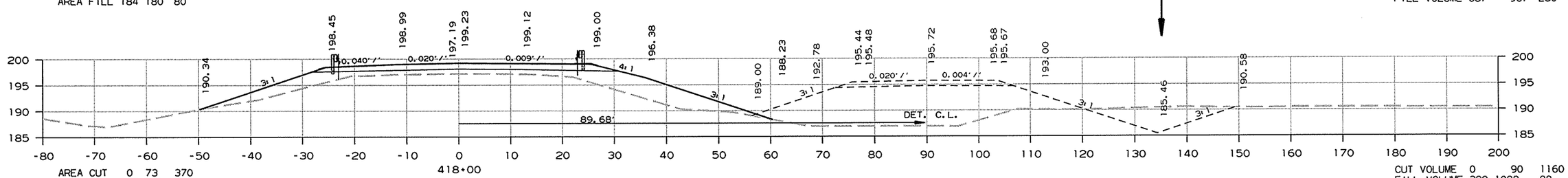
STATION	STATAION	SIDE
417+67.48	418+61.23	RT.
417+27.48	419+46.23	LT.

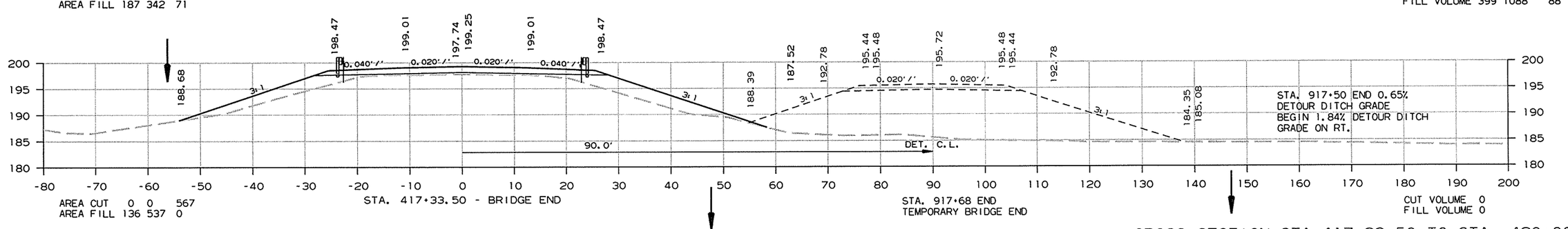


STA. 920+00 END 1.84%
DETOUR DITCH GRADE
BEGIN 1.03% DETOUR DITCH
GRADE ON RT.

MAIN LANE DET. CONST. DET. REMOVAL







STA. 917+50 END 0.65%
DETOUR DITCH GRADE
BEGIN 1.84% DETOUR DITCH
GRADE ON RT.

CROSS SECTION STA. 417+33.50 TO STA. 420+00

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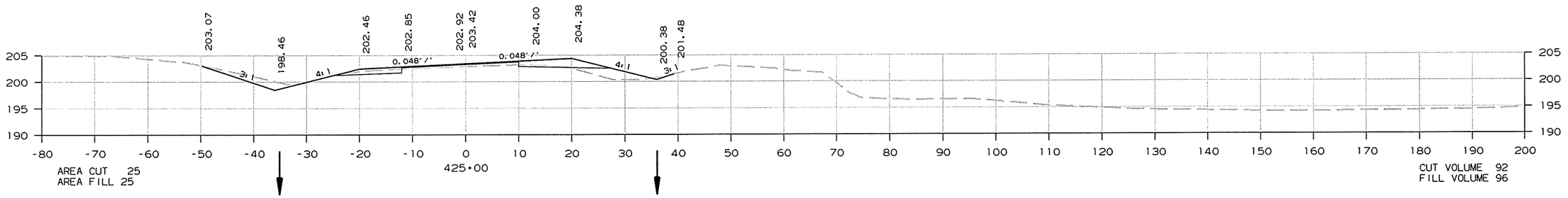
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110544	134	134

(2) CROSS SECTIONS - SITE 4

MAIN LANE DET. CONST. DET. REMOVAL

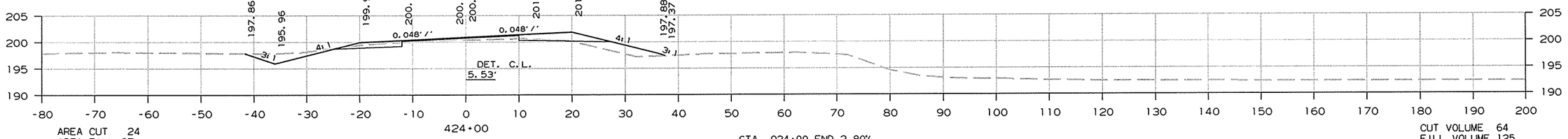
END SITE 4 DETOUR



AREA CUT 25
AREA FILL 25

MAIN LANE DET. CONST. DET. REMOVAL

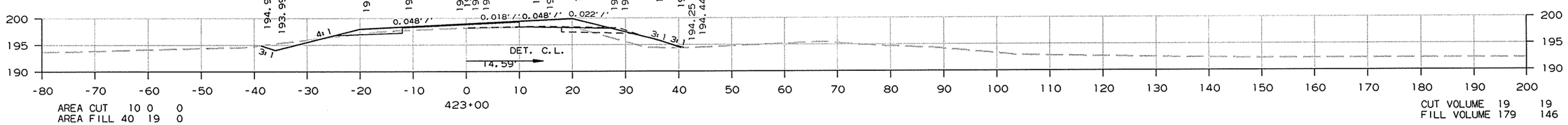
CUT VOLUME 92
FILL VOLUME 96



AREA CUT 24
AREA FILL 27

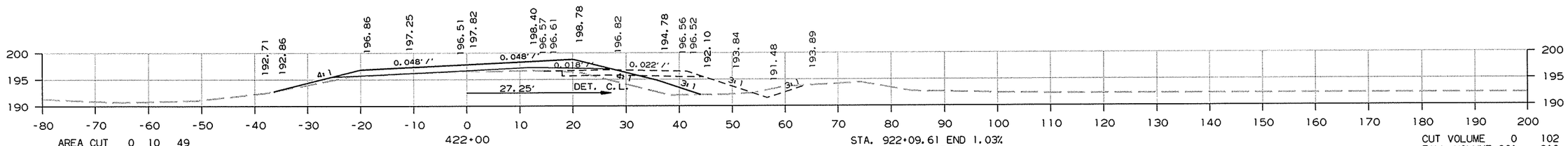
CUT VOLUME 64
FILL VOLUME 125

STA. 924+00 END 2.80%
DETOUR DITCH GRADE
GRADE ON RT.



AREA CUT 10 0 0
AREA FILL 40 19 0

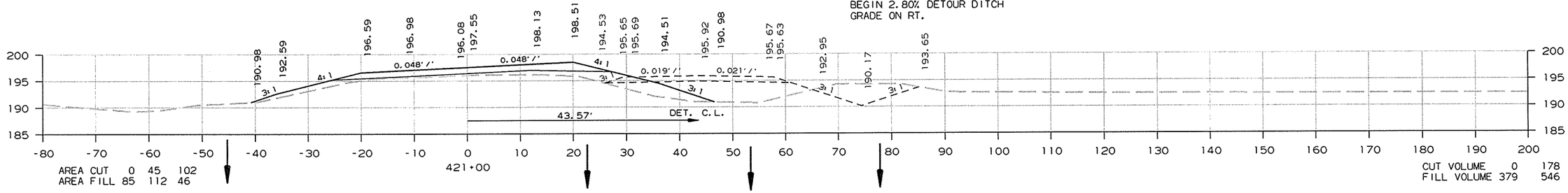
CUT VOLUME 19 19 91
FILL VOLUME 179 146 17



AREA CUT 0 10 49
AREA FILL 56 60 9

STA. 922+09.61 END 1.03%
DETOUR DITCH GRADE
BEGIN 2.80% DETOUR DITCH
GRADE ON RT.

CUT VOLUME 0 102 280
FILL VOLUME 261 319 102



AREA CUT 0 45 102
AREA FILL 85 112 46

CUT VOLUME 0 178 561
FILL VOLUME 379 546 181

CROSS SECTION STA. 421+00 TO STA. 425+00

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